



# ELEMENT WASHINGTON DC LLC

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## MEASUREMENT REPORT FCC Part 15.247 / ISED RSS-247 Bluetooth

**Applicant Name:**  
Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052  
United States

**Date of Testing:**  
12/14/2023 - 03/18/2024  
**Test Report Issue Date:**  
03/20/2024  
**Test Site/Location:**  
Element lab., Columbia, MD, USA  
**Test Report Serial No.:**  
1M2312040120-15.C3K

|                   |                              |
|-------------------|------------------------------|
| <b>FCC ID:</b>    | <b>C3K2077</b>               |
| <b>IC:</b>        | <b>3048A-2077</b>            |
| <b>APPLICANT:</b> | <b>Microsoft Corporation</b> |

|                              |   |
|------------------------------|---|
| <b>Application Type:</b>     | Certification                                 |
| <b>Model/HVIN:</b>           | 2077  |
| <b>EUT Type:</b>             | Portable Computing Device                     |
| <b>Max. RF Output Power:</b> | 145.479 mW (21.63 dBm) Peak Conducted         |
| <b>Frequency Range:</b>      | 2402 – 2480MHz                                |
| <b>Type of Modulation:</b>   | GFSK, $\pi/4$ -DQPSK, 8DPSK                   |
| <b>FCC Classification:</b>   | FCC Part 15 Spread Spectrum Transmitter (DSS) |
| <b>ISED Specification:</b>   | RSS-247 Issue 3                               |
| <b>Test Procedure(s):</b>    | ANSI C63.10-2013, KDB 558074 D01 v05r02       |

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**RJ Ortanez**  
Executive Vice President



|   |   |   |  |
|---|---|---|--|
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## 1.0 INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

### 1.2 Element Test Location

These measurement tests were conducted at the Element laboratory located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

### 1.3 Test Facility / Accreditations

**Measurements were performed at Element lab located in Columbia, MD 21046, U.S.A.**

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreements (MRAs).

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Microsoft Corporation Portable Computing Device FCC ID: C3K2077**. The test data contained in this report pertains only to the emissions due to the EUT's Bluetooth transmitter.

- This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:
  - The hopping sequence is pseudorandom
  - All channels are used equally on average
  - The receiver input bandwidth equals the transmit bandwidth
  - The receiver hops in sequence with the transmit signal
- 15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.
- 15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate its channels selection/hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.
- 15.247(h): The EUT employs Adaptive Frequency Hopping (AFH) which identifies sources of interference namely devices operating in 802.11 WLAN and excludes them from the list of available channels. The process of re-mapping reduces the number of test channels from 79 channels to a minimum number of 20 channels.

**Test Device Serial No.:** 7CCX2, 7CDJ2, B44G2, B44D2

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1), 802.11b/g/n/ac/ax/be WLAN, 802.11a/n/ac/ax/be UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE)

| Ch. | Frequency (MHz) |
|-----|-----------------|
| 00  | 2402            |
| :   | :               |
| 39  | 2441            |
| :   | :               |
| 78  | 2480            |

**Table 2-1. Frequency/ Channel Operations**

**Note:** This device is capable of operating in hopping and non-hopping mode. The EUT can hop between 79 different channels in the 2400 – 2483.5MHz band.

### 2.3 Antenna Description

The following antenna was used for the testing.

| Frequency [GHz] | Antenna 1 Gain (dBi) | Antenna 2 Gain (dBi) | Directional Gain (dBi) |
|-----------------|----------------------|----------------------|------------------------|
| 2.4             | 0.55                 | 0.14                 | 3.36                   |

**Table 2-2. Antenna Peak Gain**

**Note:** This device is capable of operating in hopping and non-hopping mode. The EUT can hop between 79 different channels in the 2400 – 2483.5MHz band.

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## 2.4 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013. ANSI C63.10-2013 was also used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, and 7.8 for antenna port conducted emissions test setups. The worst case radiated emissions data is shown in this report.

The emissions below 1GHz and above 18GHz were tested with the highest transmitting power channel and the worst-case configuration.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

For AC line conducted and radiated test below 1GHz, following configuration were investigated and EUT powered by AC/DC was the worst case.

- EUT powered by AC/DC adaptor via USB cable with wire charger
- EUT powered by host PC via USB cable with wire charger

$\pi/4$ -DQPSK has been investigated and confirmed as not the worst case.

## 2.5 Software and Firmware

The test was conducted with software/firmware version 2024.111.46 installed on the EUT.

## 2.6 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) was used in the measurement of the EUT.

**Deviation from measurement procedure.....None**

### 3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The line-conducted facility is located inside a 7m x 3.66m x 2.7m shielded enclosure. The shielded enclosure is manufactured by AP Americas. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1-meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that the cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst-case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.12. The EMI Receiver mode of the Agilent MXE was used to perform AC line conducted emissions testing.

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### 3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3-meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst-case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01 v01r01.

### 3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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## 4.0 ANTENNA REQUIREMENTS

**Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antennas of the EUT are **permanently attached**.
- There are no provisions for connection to an external antenna.

**Conclusion:**

The EUT complies with the requirement of §15.203.

|   |   |   |  |
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## 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Contribution                     | Expanded Uncertainty ( $\pm$ dB) |
|----------------------------------|----------------------------------|
| Conducted Bench Top Measurements | 1.13                             |
| Conducted Disturbance            | 3.09                             |
| Radiated Disturbance (<1GHz)     | 4.98                             |
| Radiated Disturbance (>1GHz)     | 5.07                             |
| Radiated Disturbance (>18GHz)    | 5.09                             |

|   |   |  |                                   |
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## 6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurement antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

| Manufacturer          | Model   | Description                         | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|---------|-------------------------------------|------------|--------------|------------|---------------|
| N/A                   | WL25-1  | Conducted Cable Set (25GHz)         | 11/15/2023 | Annual       | 11/15/2024 | WL25-1        |
| N/A                   | WL25-2  | WLAN Cable Set (25GHz)              | 11/15/2023 | Annual       | 11/15/2024 | WL25-2        |
| N/A                   | WL40-1  | WLAN Cable Set (40GHz)              | 11/15/2023 | Annual       | 11/15/2024 | WL40-1        |
| N/A                   | ETS-001 | EMC Cable and Switch System         | 11/15/2023 | Annual       | 11/15/2024 | ETS-001       |
| N/A                   | ETS-002 | EMC Cable and Switch System         | 11/15/2023 | Annual       | 11/15/2024 | ETS-002       |
| N/A                   | AP1-002 | EMC Cable and Switch System         | 11/15/2023 | Annual       | 11/15/2024 | AP1-002       |
| N/A                   | AP2-001 | EMC Cable and Switch System         | 11/15/2023 | Annual       | 11/15/2024 | AP2-001       |
| N/A                   | AP2-002 | EMC Cable and Switch System         | 11/15/2023 | Annual       | 11/15/2024 | AP2-002       |
| Keysight Technologies | N9038A  | MXE EMI Receiver                    | 8/30/2023  | Annual       | 8/30/2024  | MY51210133    |
| Keysight Technologies | N9030A  | PXA Signal Analyzer                 | 2/29/2024  | Annual       | 3/1/2025   | MY55410501    |
| Keysight Technologies | N9020A  | MXA Signal Analyzer                 | 3/15/2023  | Annual       | 3/15/2024  | MY54500644    |
| Pasternack            | NMLC-2  | Line Conducted Emissions Cable (NM) | 11/15/2023 | Annual       | 11/15/2024 | NMLC-2        |
| Rohde & Schwarz       | ESU26   | EMI Test Receiver (26.5GHz)         | 9/25/2023  | Annual       | 9/25/2024  | 100342        |
| Rohde & Schwarz       | ESU40   | EMI Test Receiver (40GHz)           | 9/11/2023  | Annual       | 9/11/2024  | 100348        |
| Sunol Sciences        | DRH-118 | Horn (Small)                        | 2/21/2024  | Biennial     | 2/21/2026  | A050307       |
| Sunol Sciences        | JB5     | Bi-Log Antenna (30M-5GHz)           | 8/30/2022  | Biennial     | 8/30/2024  | A051107       |

**Table 6-1. Annual Test Equipment Calibration Schedule**

**Notes:**

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Microsoft Corporation  
 FCC ID: C3K2077  
 Method/System: Frequency Hopping Spread Spectrum (FHSS)  
 Number of Channels: 79

| FCC Part Section(s) | RSS Section(s)   | Test Description  | Test Limit  | Test Condition | Test Result | Reference                               |
|---------------------|------------------|---|---|----------------|-------------|---|
| 15.247(a)(1)(iii)   | RSS-247 [5.1(1)] | 20dB Bandwidth  | N/A   | CONDUCTED      | PASS        | Section 7.2                             |
| 15.247(b)(1)        | RSS-247 [5.4(2)] | Peak Transmitter Output Power   | < 1 Watt if $\geq 75$ non-overlapping channels used   |                | PASS        | Section 7.3                             |
| 15.247(a)(1)        | RSS-247 [5.1(2)] | Channel Separation  | > 2/3 of 20 dB BW for systems with Output Power < 125mW   |                | PASS        | Section 7.5                             |
| 15.247(a)(1)(iii)   | RSS-247 [5.1(4)] | Number of Channels  | > 15 Channels   |                | PASS        | Section 7.7                             |
| 15.247(a)(1)(iii)   | RSS-247 [5.1(4)] | Time of Occupancy   | < 0.4 sec in 31.6 sec period  |                | PASS        | Section 7.6                             |
| 15.247(d)           | RSS-247 [5.5]    | Band Edge / Out-of-Band Emissions   | Conducted > 20dBc   |                | PASS        | Section 7.4, Section 7.8                |
| 15.205<br>15.209    | RSS-Gen [8.9]    | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-247 limits) | RADIATED       | PASS        | Section 7.9, Section 7.10, Section 7.11 |
| 15.207              | RSS-Gen [8.8]    | AC Conducted Emissions 150kHz – 30MHz   | < FCC 15.207 limits (RSS-Gen [8.8] limits)  | LINE CONDUCTED | PASS        | Section 7.12                            |

**Table 7-1. Summary of Test Results**

#### Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "BT Auto," Version 3.5.
- 5) For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "Chamber Automation," Version 1.3.1.

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## 7.2 20dB Bandwidth Measurement

§15.247 (a.1.iii); RSS-247 [5.1(1)]

### Test Overview and Limit

The bandwidth at 20dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

### Test Procedure Used

ANSI C63.10-2013 – Section 6.9.2

### Test Settings

1. The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 20dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 20$ . The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2.  $RBW = 1 - 5\% OBW$
3.  $VBW \geq 3 \times RBW$
4. Reference level set to keep signal from exceeding maximum input mixer level for linear operation.
5. Detector = Peak
6. Trace mode = max hold
7. Sweep = auto couple
8. The trace was allowed to stabilize

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-1. Test Instrument & Measurement Setup

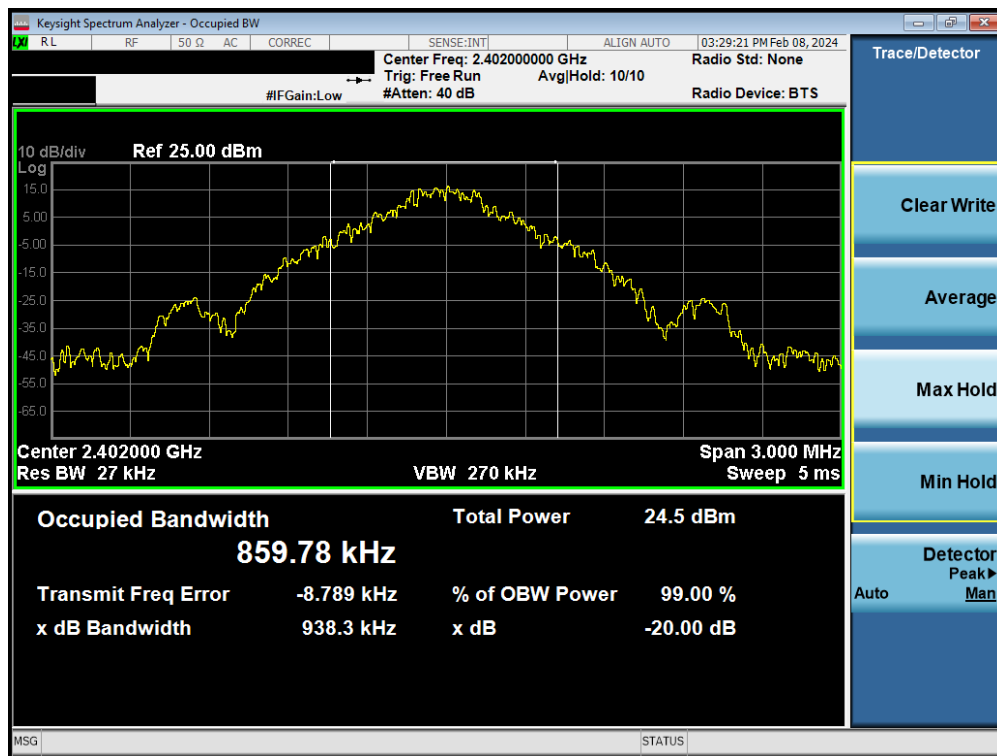
### Test Notes

None

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 12 of 137                    |

| Frequency [MHz] | Data Rate [Mbps] | Mod.           | Channel No. | 20dB Bandwidth Test Results [kHz] |
|-----------------|------------------|----------------|-------------|-----------------------------------|
| 2402            | 1.0              | GFSK           | 0           | 938.30                            |
| 2441            | 1.0              | GFSK           | 39          | 943.50                            |
| 2480            | 1.0              | GFSK           | 78          | 931.20                            |
| 2402            | 2.0              | $\pi/4$ -DQPSK | 0           | 1341.00                           |
| 2441            | 2.0              | $\pi/4$ -DQPSK | 39          | 1331.00                           |
| 2480            | 2.0              | $\pi/4$ -DQPSK | 78          | 1301.00                           |
| 2402            | 3.0              | 8DPSK          | 0           | 1282.00                           |
| 2441            | 3.0              | 8DPSK          | 39          | 1317.00                           |
| 2480            | 3.0              | 8DPSK          | 78          | 1293.00                           |

Table 7-2. Conducted 20dB Bandwidth Measurements – SISO ANT1

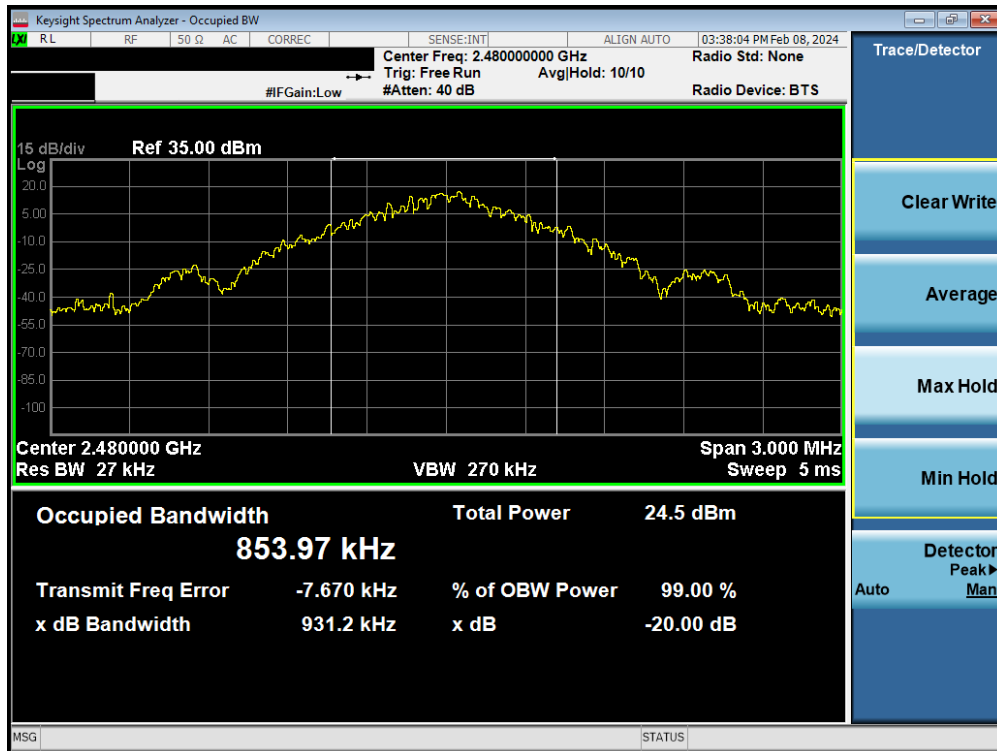


Plot 7-1. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 13 of 137                    |

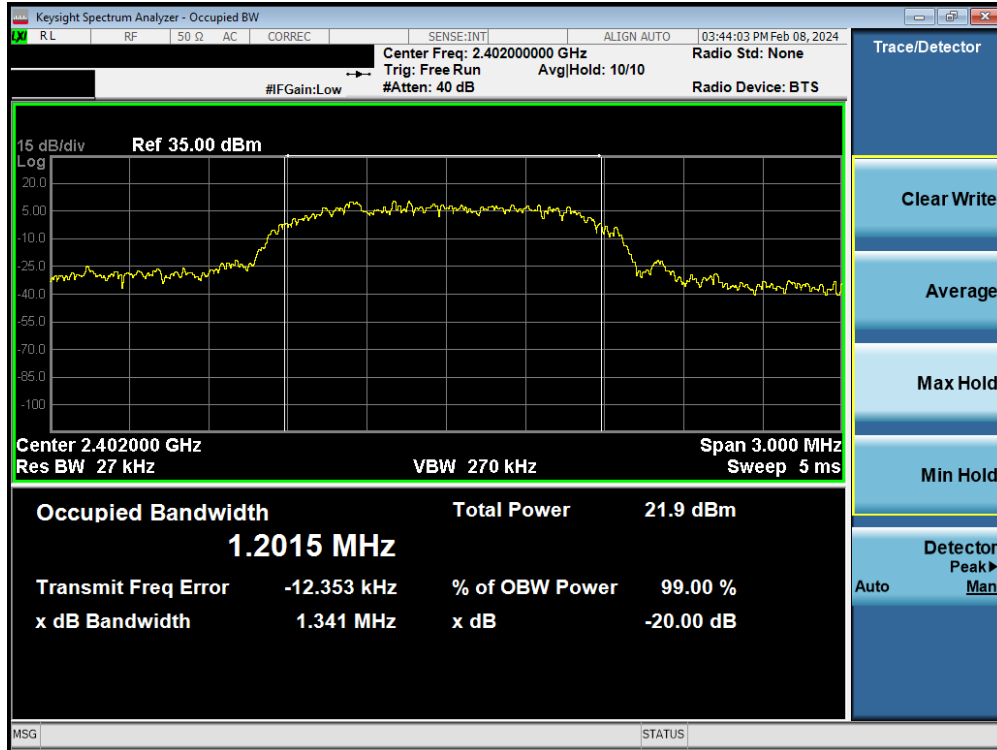


Plot 7-2. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39)

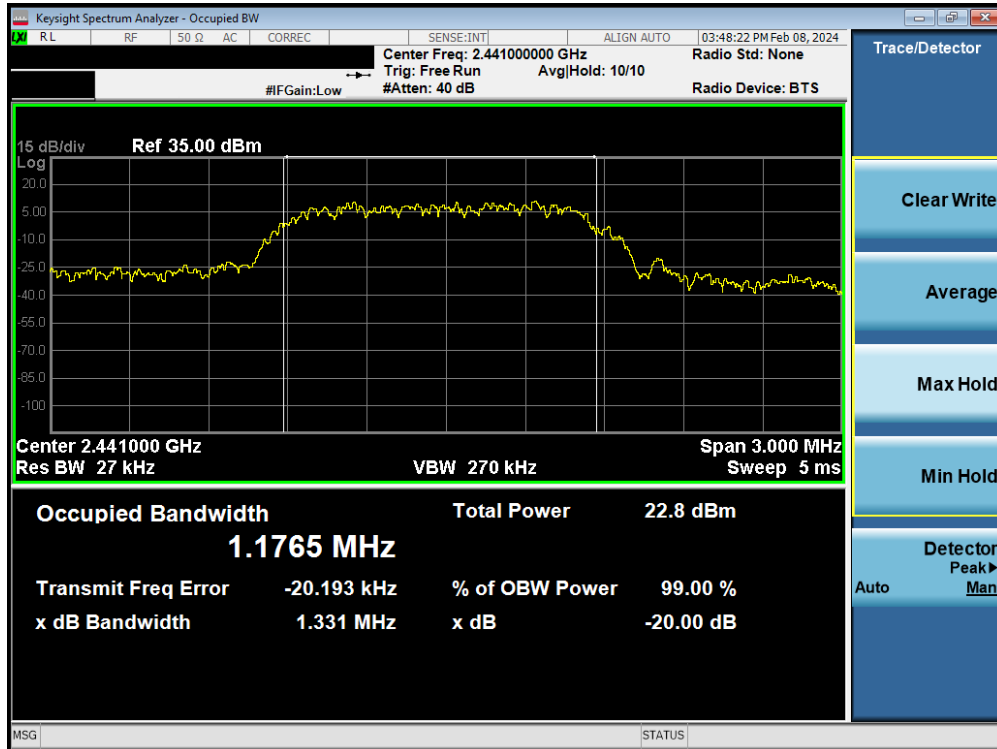


Plot 7-3. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 14 of 137                    |

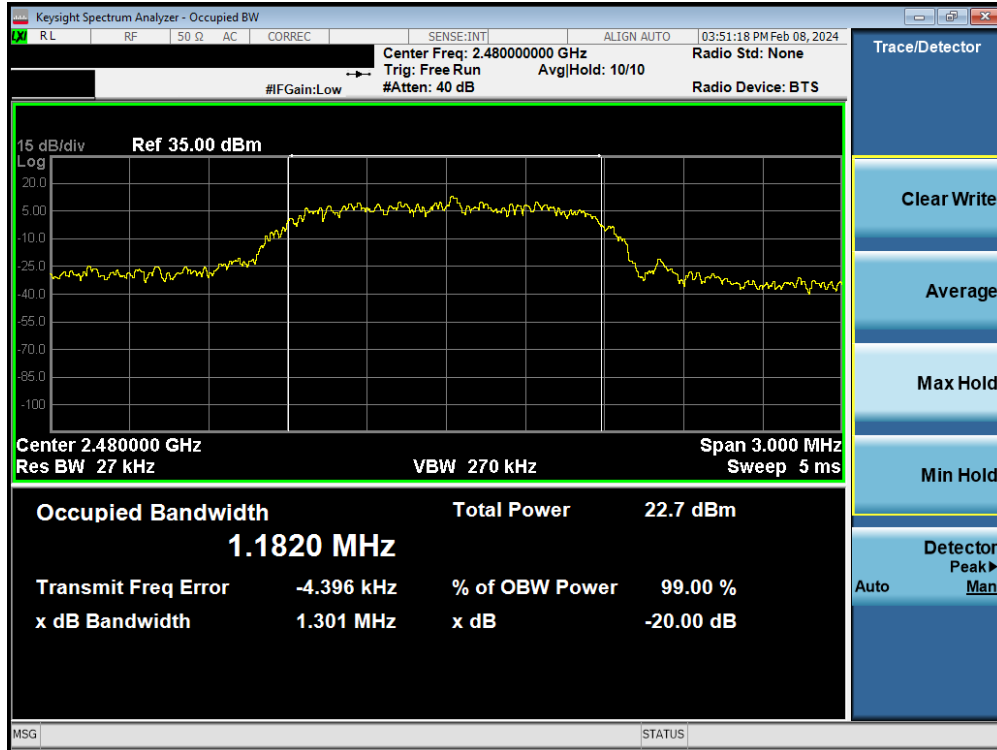


Plot 7-4. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0)

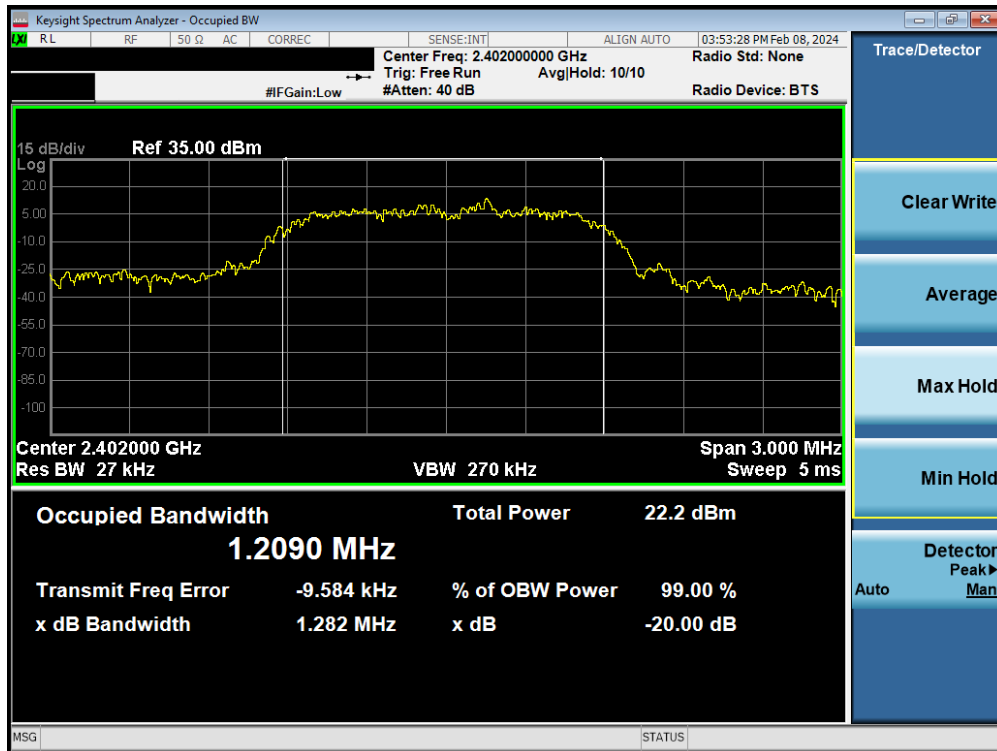


Plot 7-5. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 15 of 137                    |



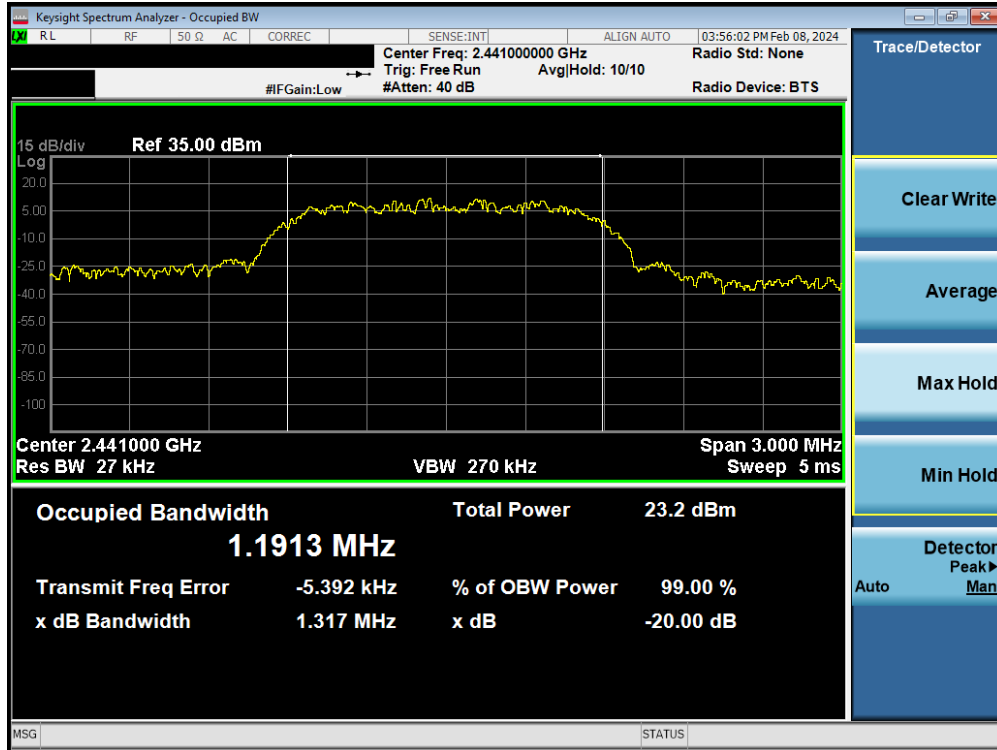
Plot 7-6. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78)



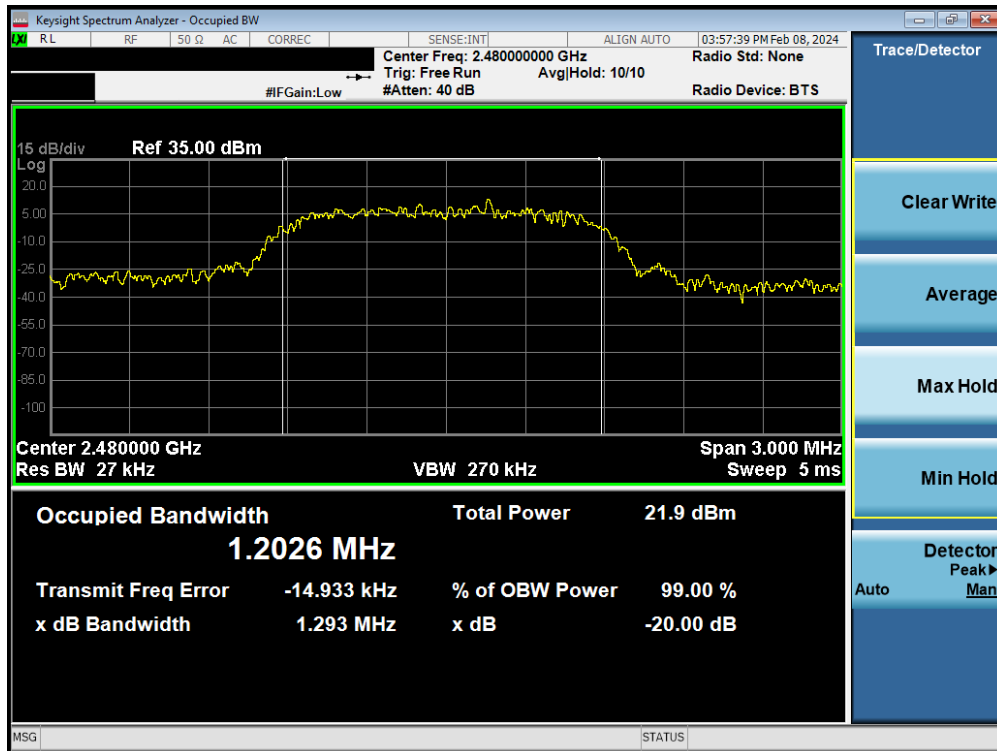
Plot 7-7. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 16 of 137                    |





Plot 7-8. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39)

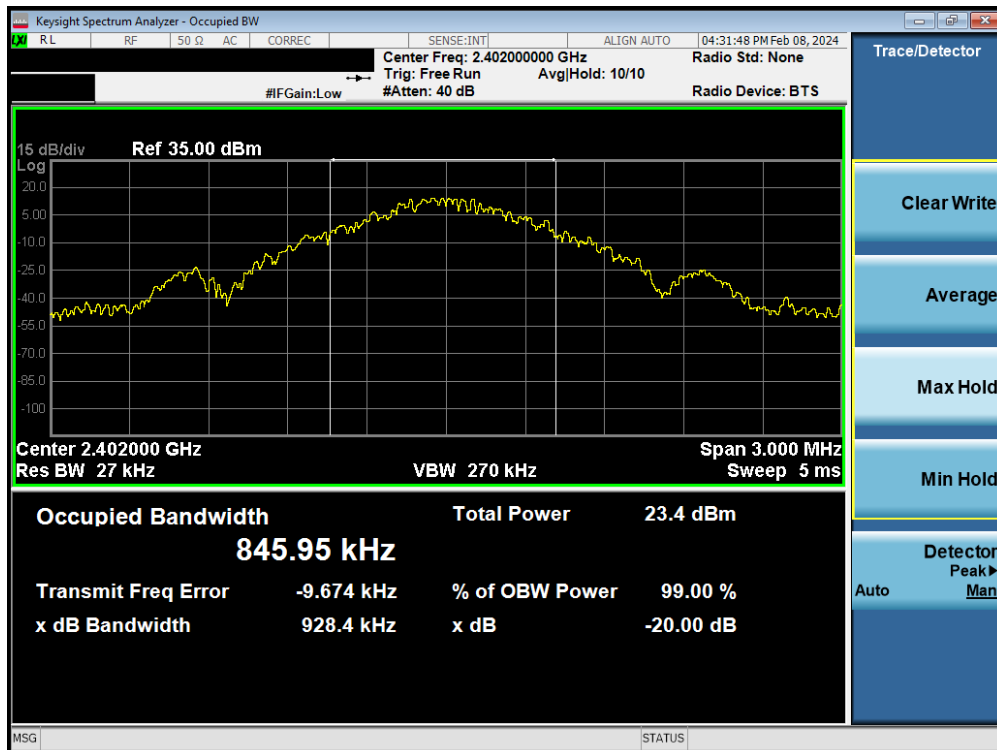


Plot 7-9. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 17 of 137                    |

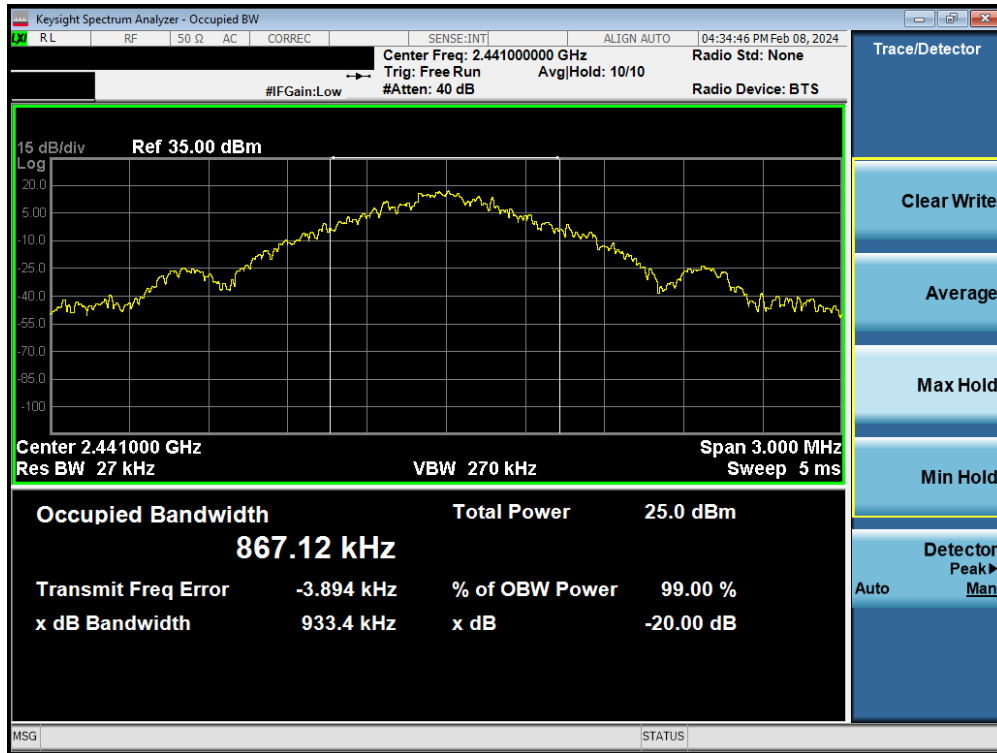
| Frequency [MHz] | Data Rate [Mbps] | Mod.           | Channel No. | 20dB Bandwidth Test Results [kHz] |
|-----------------|------------------|----------------|-------------|-----------------------------------|
| 2402            | 1.0              | GFSK           | 0           | 928.40                            |
| 2441            | 1.0              | GFSK           | 39          | 933.40                            |
| 2480            | 1.0              | GFSK           | 78          | 863.60                            |
| 2402            | 2.0              | $\pi/4$ -DQPSK | 0           | 1333.00                           |
| 2441            | 2.0              | $\pi/4$ -DQPSK | 39          | 1345.00                           |
| 2480            | 2.0              | $\pi/4$ -DQPSK | 78          | 1326.00                           |
| 2402            | 3.0              | 8DPSK          | 0           | 1272.00                           |
| 2441            | 3.0              | 8DPSK          | 39          | 1343.00                           |
| 2480            | 3.0              | 8DPSK          | 78          | 1323.00                           |

Table 7-3. Conducted 20dB Bandwidth Measurements – SISO ANT2

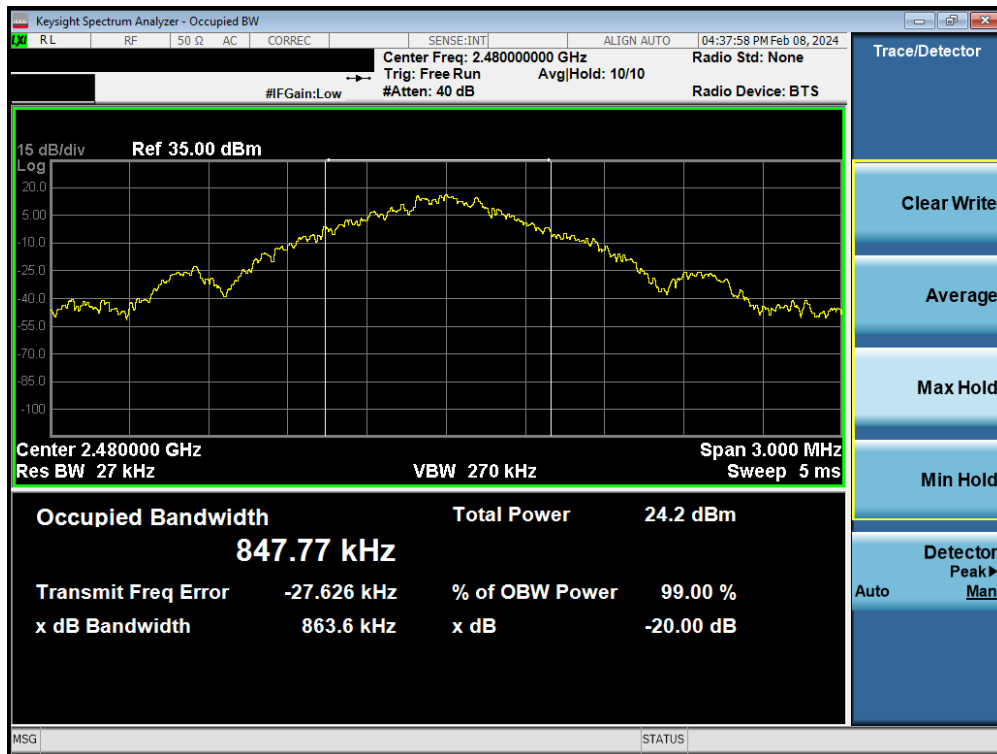


Plot 7-10. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0)

| FCC ID: C3K2077<br>IC: 3048A-2077       |  | MEASUREMENT REPORT<br>(CERTIFICATION)  |                | Approved by:<br>Technical Manager |
|---|--|--|----------------|-----------------------------------|
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 18 of 137 |                                   |

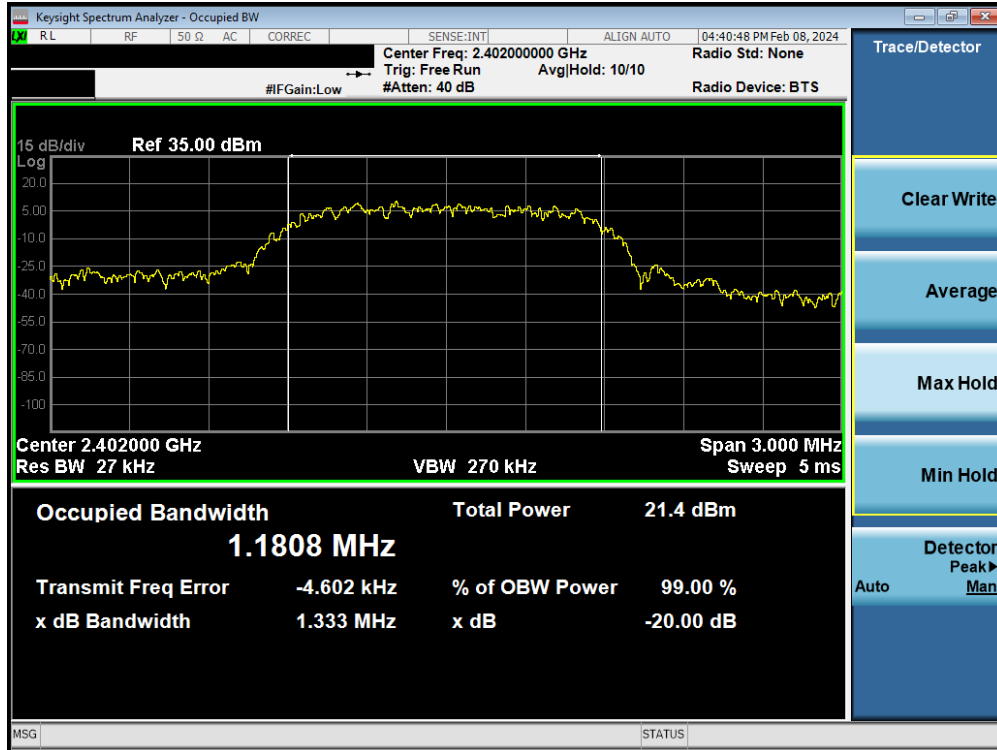


Plot 7-11. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39)

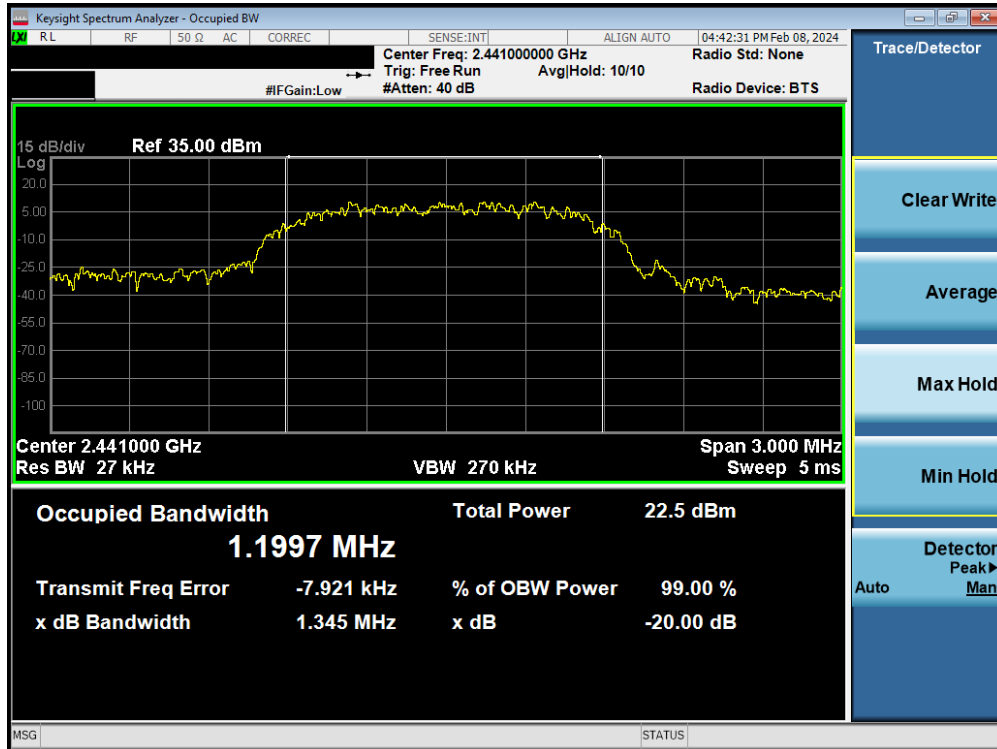


Plot 7-12. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 19 of 137                    |

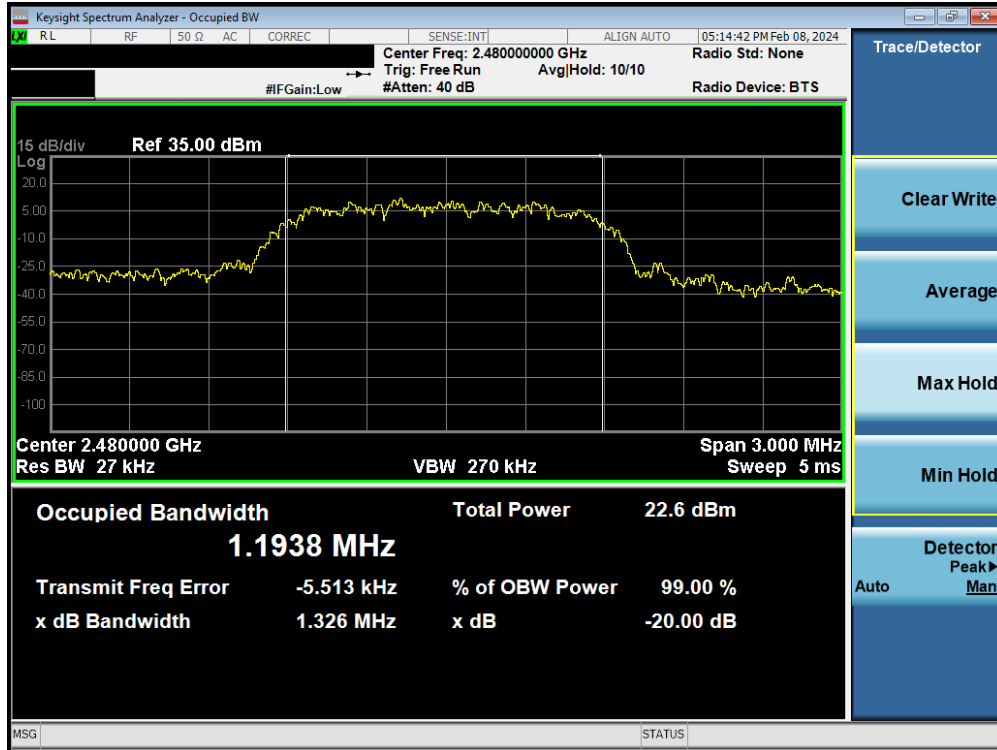


Plot 7-13. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0)

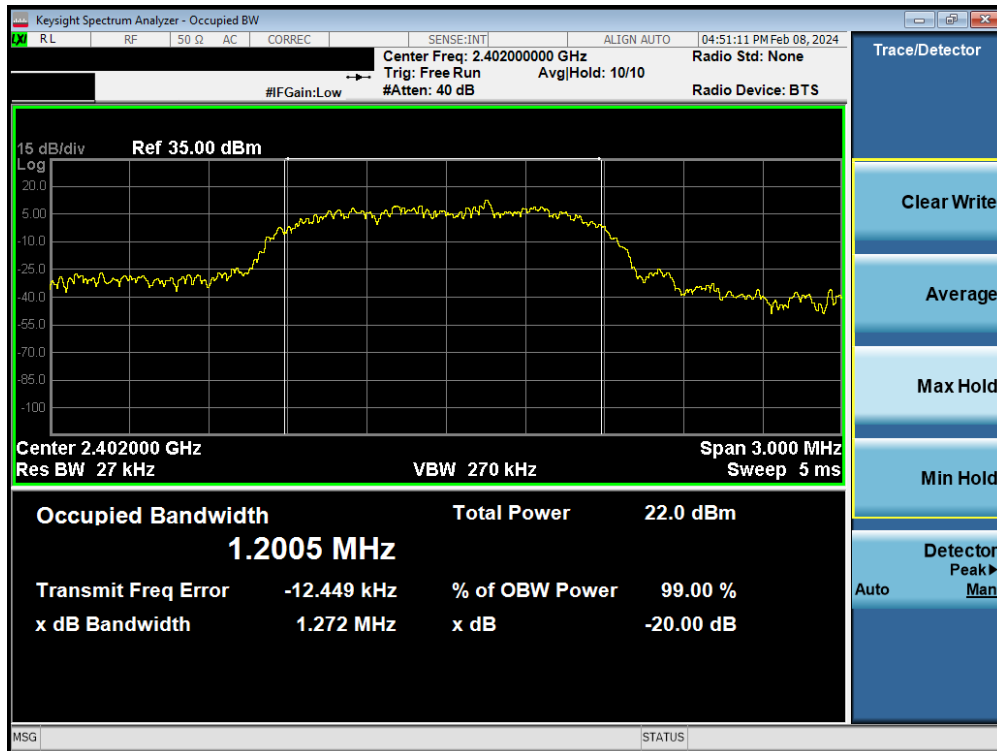


Plot 7-14. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 20 of 137                    |

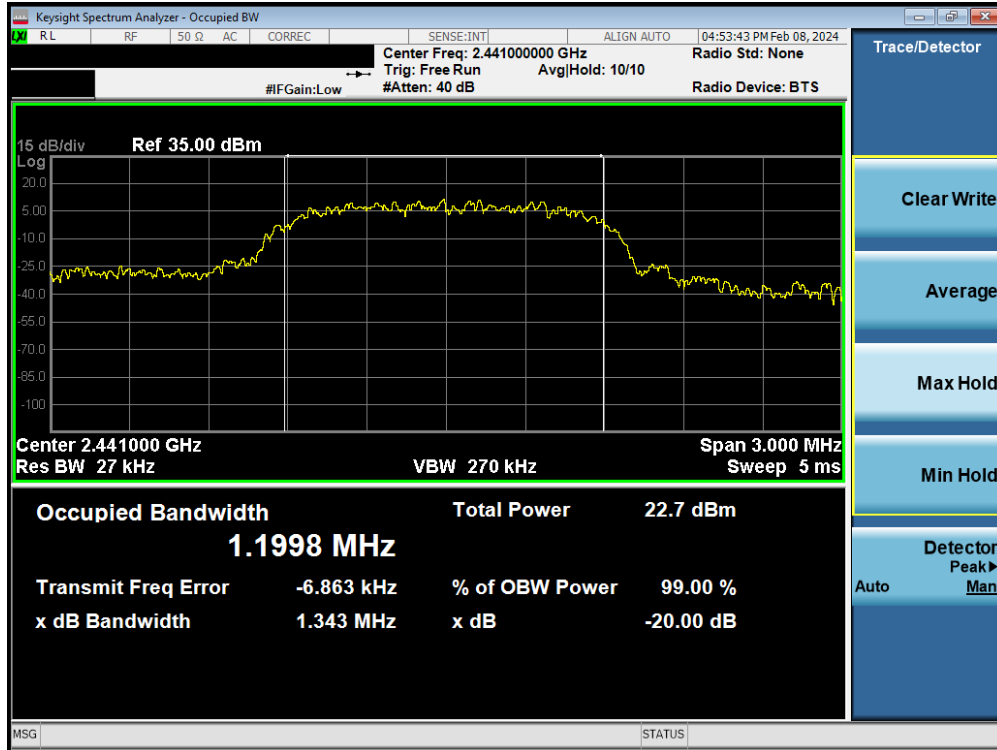


Plot 7-15. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78)

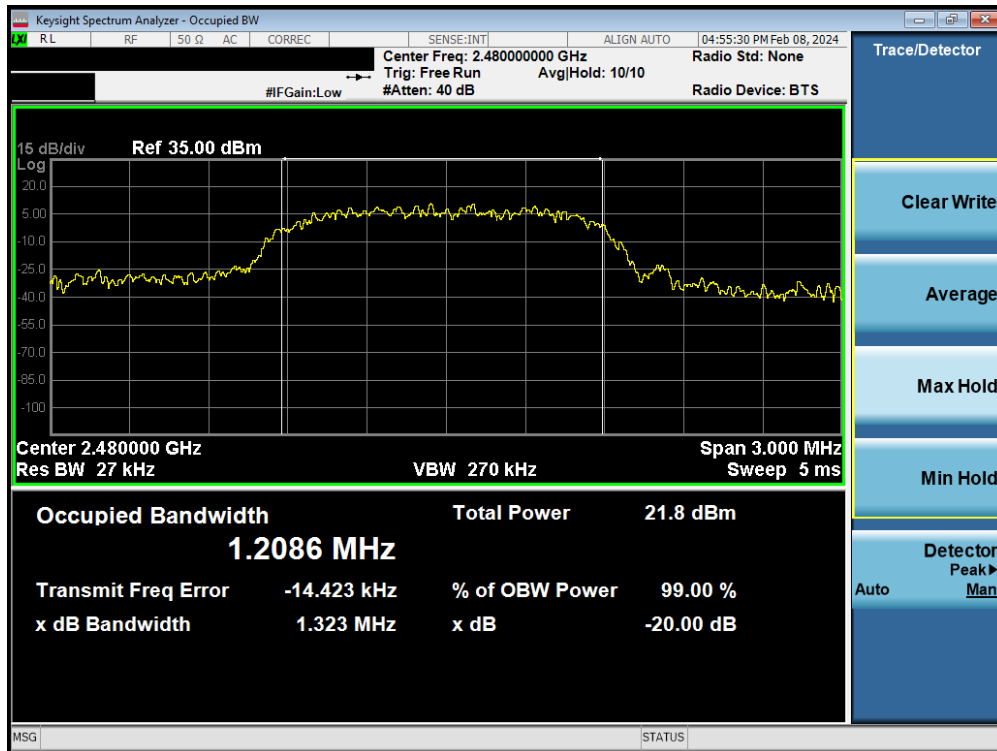


Plot 7-16. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 21 of 137                    |



Plot 7-17. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39)

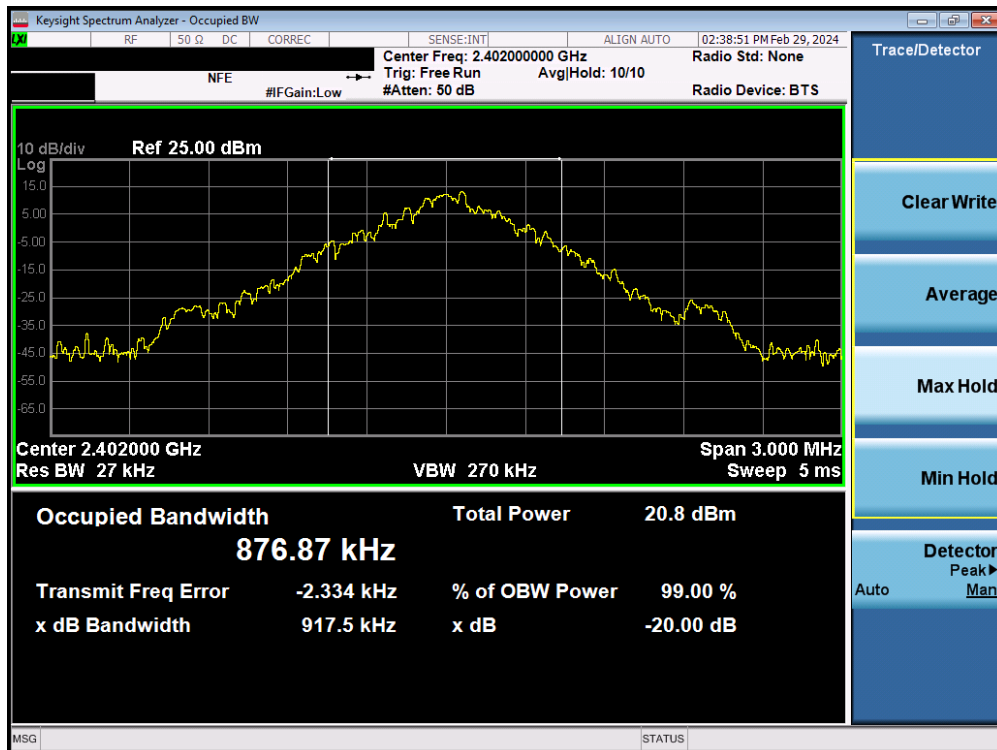


Plot 7-18. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 22 of 137                    |

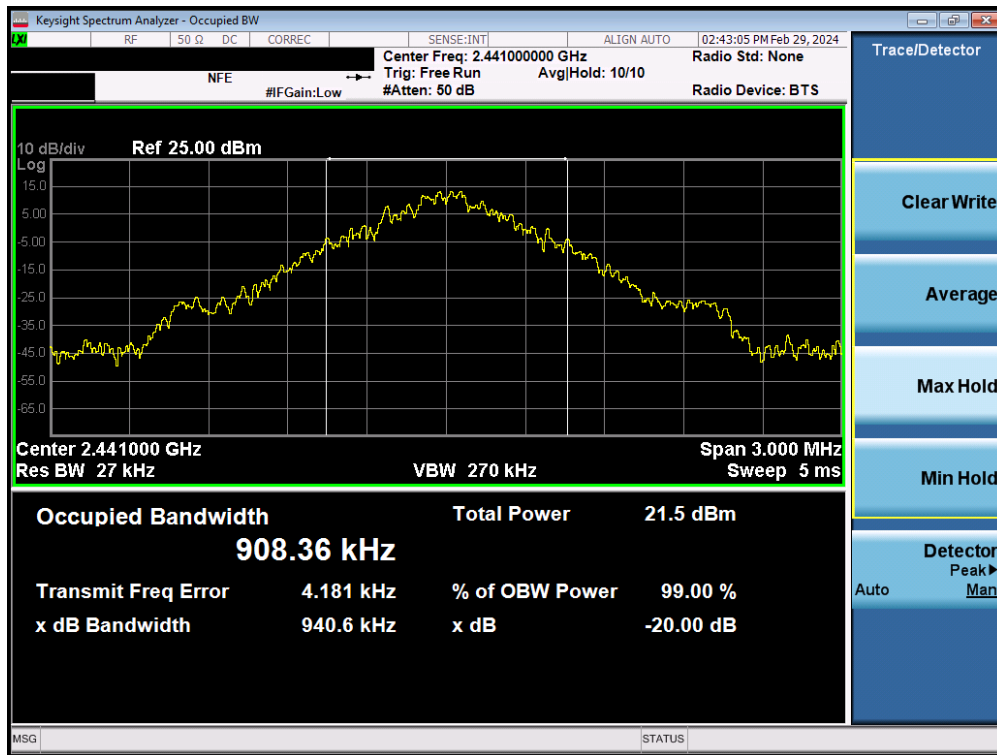
| Frequency [MHz] | Data Rate [Mbps] | Mod.           | Channel No. | 20dB Bandwidth Test Results [kHz] |
|-----------------|------------------|----------------|-------------|-----------------------------------|
| 2402            | 1.0              | GFSK           | 0           | 917.50                            |
| 2441            | 1.0              | GFSK           | 39          | 940.60                            |
| 2480            | 1.0              | GFSK           | 78          | 922.50                            |
| 2402            | 2.0              | $\pi/4$ -DQPSK | 0           | 1378.00                           |
| 2441            | 2.0              | $\pi/4$ -DQPSK | 39          | 1363.00                           |
| 2480            | 2.0              | $\pi/4$ -DQPSK | 78          | 1371.00                           |
| 2402            | 3.0              | 8DPSK          | 0           | 1355.00                           |
| 2441            | 3.0              | 8DPSK          | 39          | 1355.00                           |
| 2480            | 3.0              | 8DPSK          | 78          | 1343.00                           |

Table 7-4. Conducted 20dB Bandwidth Measurements – DUAL ANT1

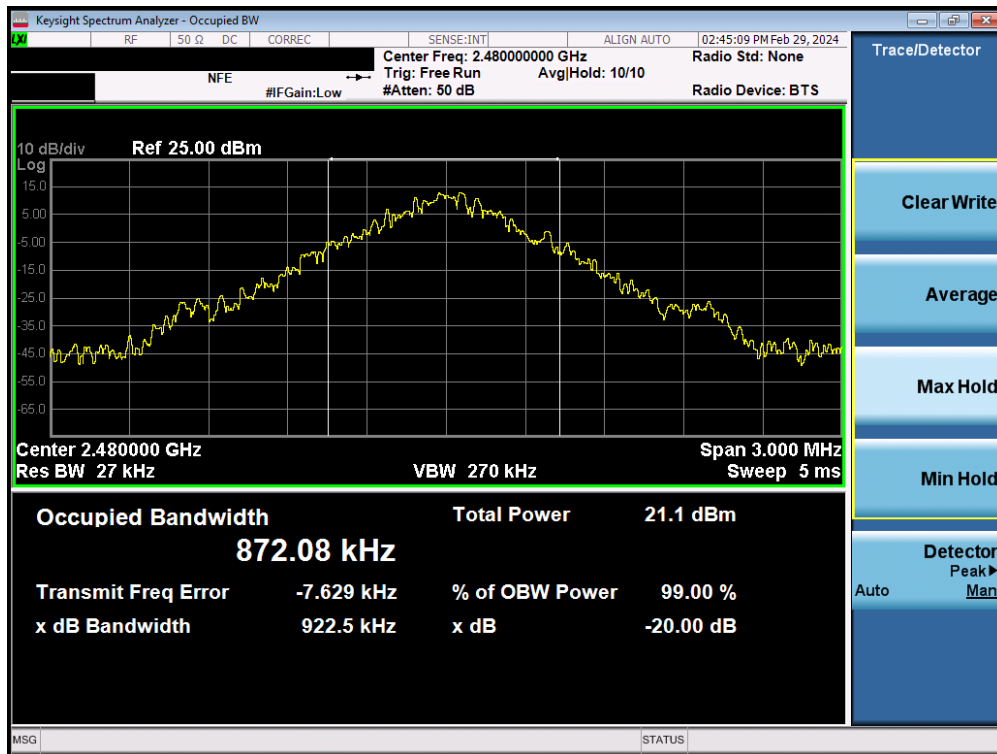


Plot 7-19. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 23 of 137                    |



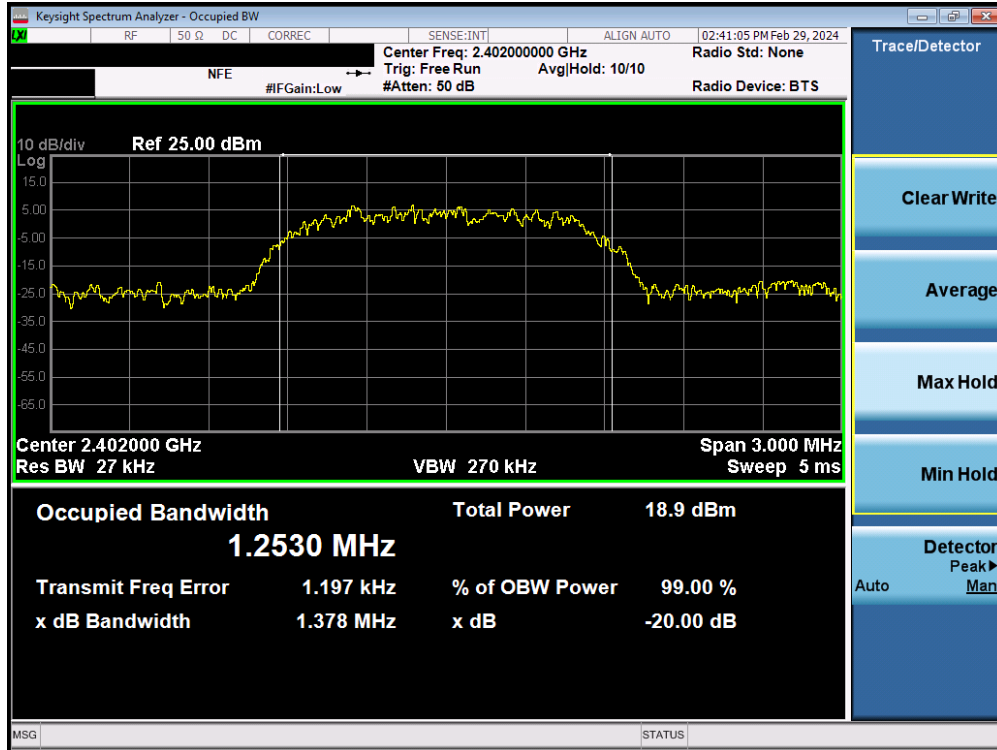
Plot 7-20. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39)



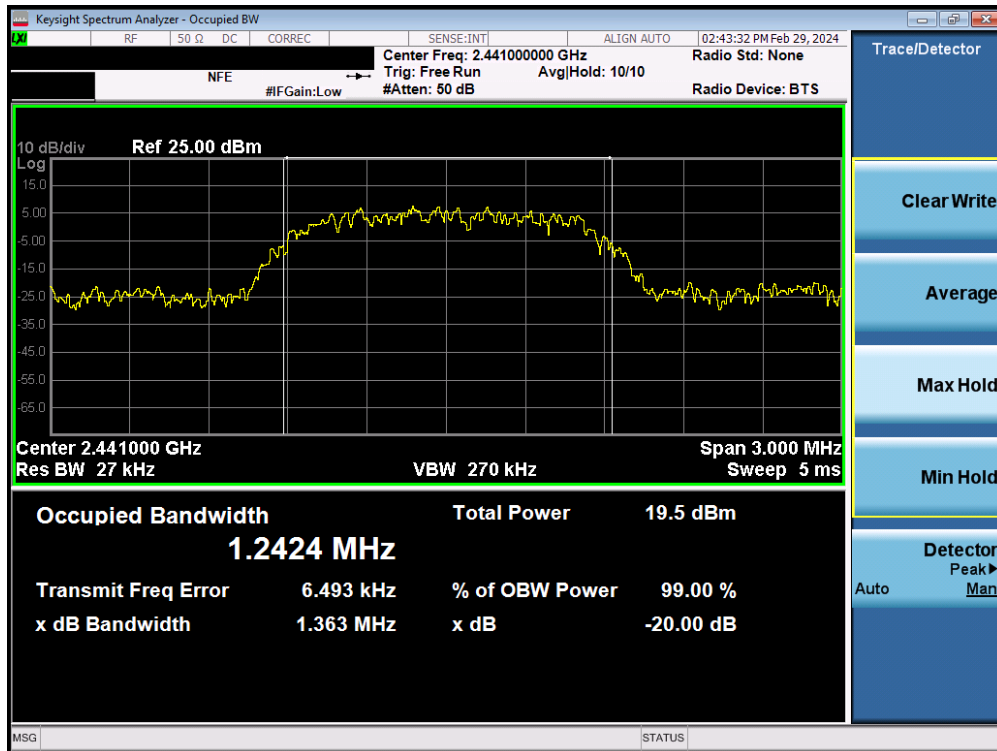
Plot 7-21. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 24 of 137                    |



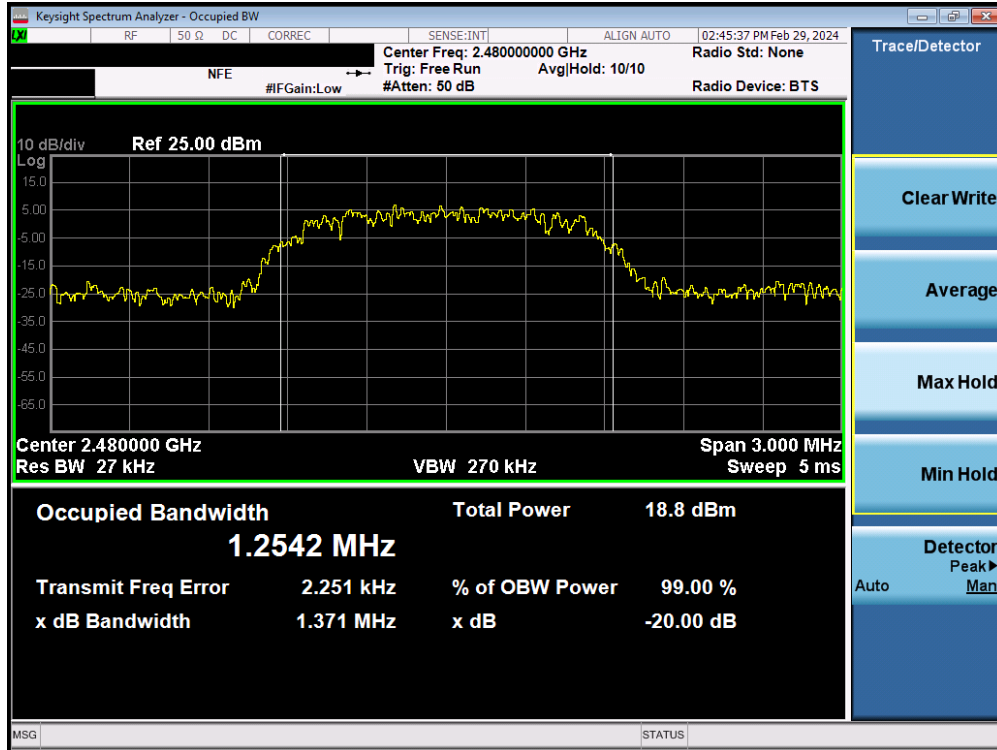


Plot 7-22. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0)

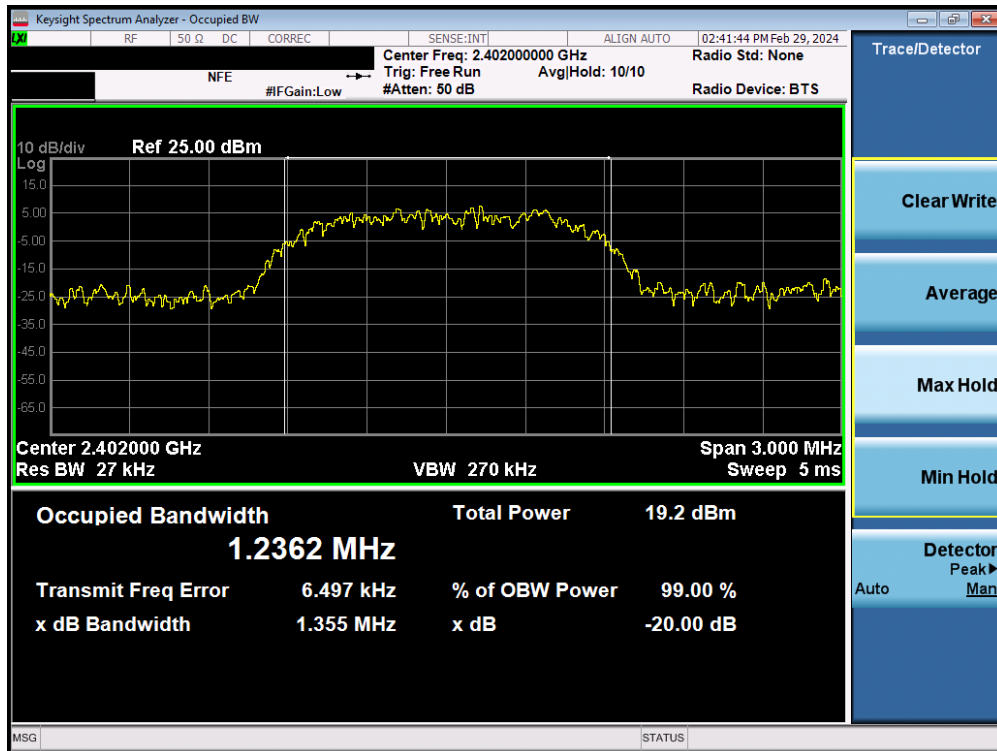


Plot 7-23. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 25 of 137                    |

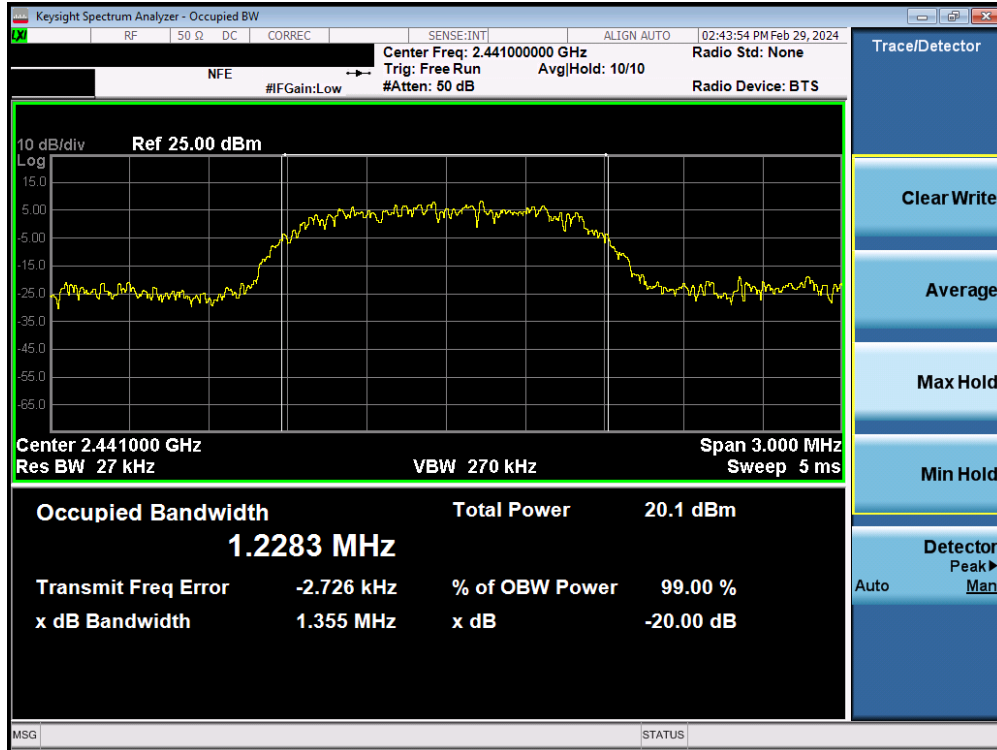


Plot 7-24. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78)

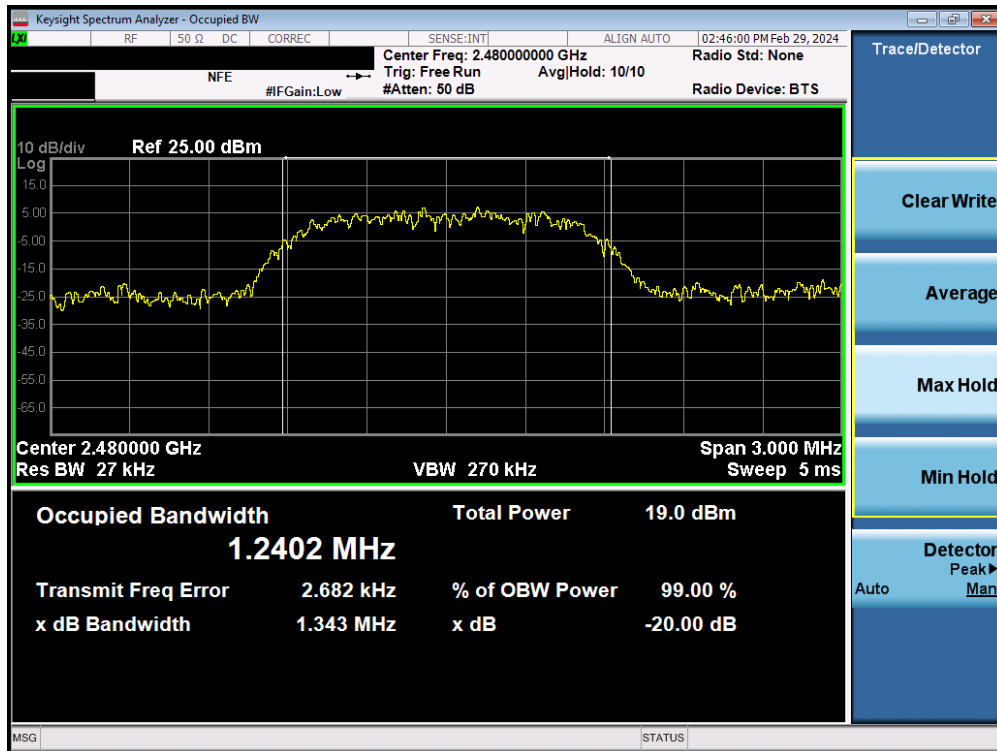


Plot 7-25. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 26 of 137                    |



Plot 7-26. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39)

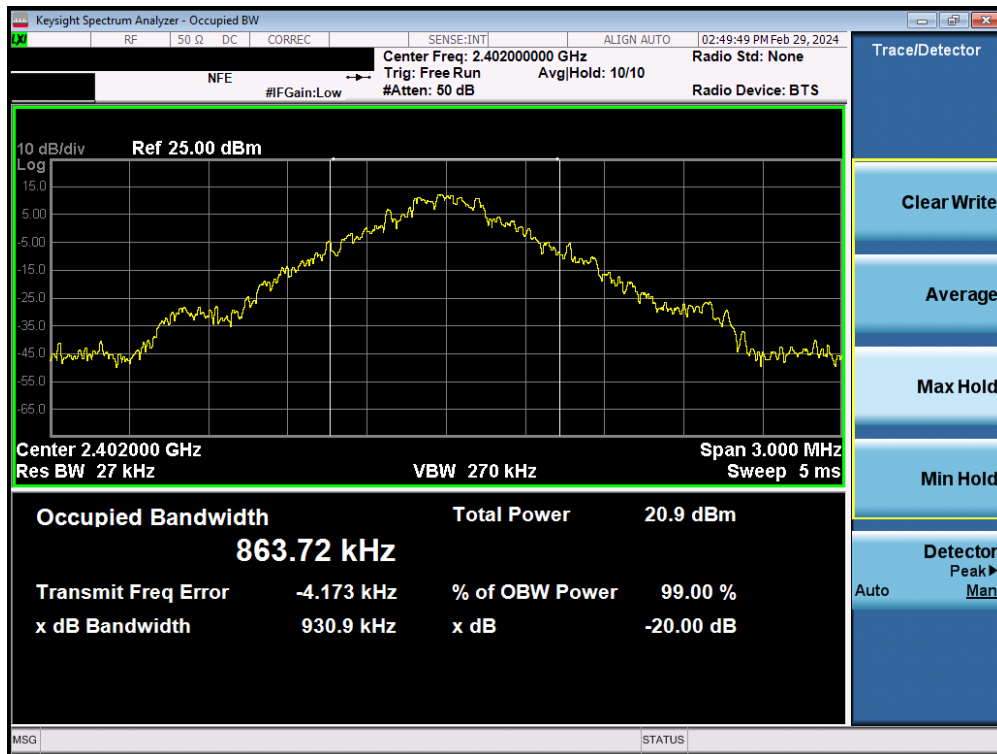


Plot 7-27. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 27 of 137                    |

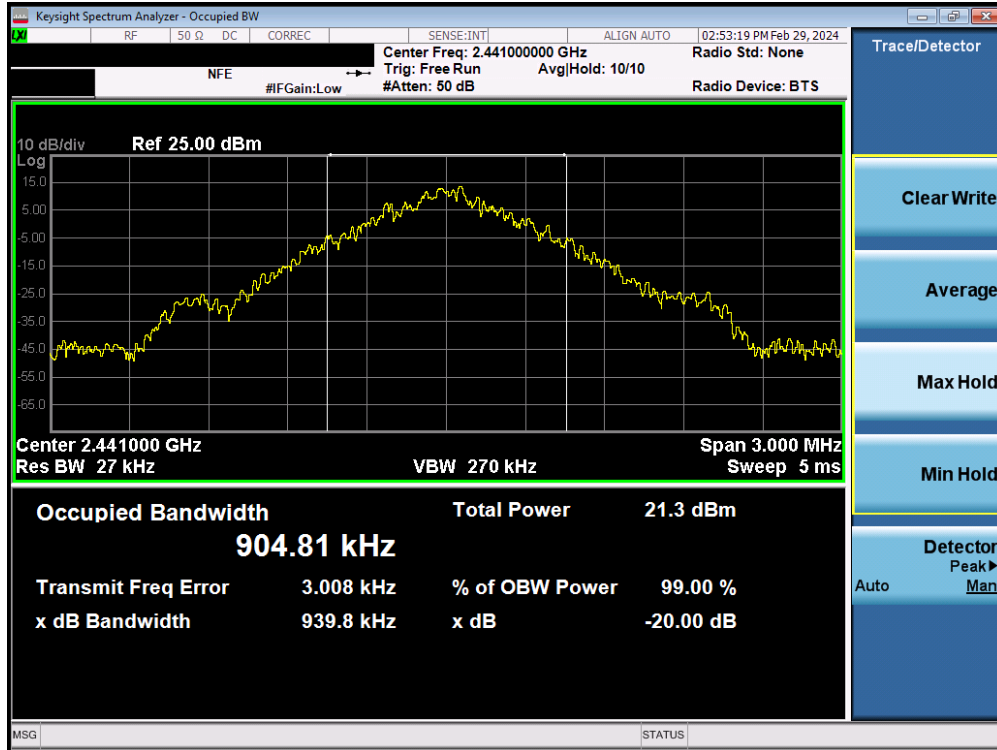
| Frequency [MHz] | Data Rate [Mbps] | Mod.           | Channel No. | 20dB Bandwidth Test Results [kHz] |
|-----------------|------------------|----------------|-------------|-----------------------------------|
| 2402            | 1.0              | GFSK           | 0           | 930.90                            |
| 2441            | 1.0              | GFSK           | 39          | 939.80                            |
| 2480            | 1.0              | GFSK           | 78          | 865.60                            |
| 2402            | 2.0              | $\pi/4$ -DQPSK | 0           | 1363.00                           |
| 2441            | 2.0              | $\pi/4$ -DQPSK | 39          | 1366.00                           |
| 2480            | 2.0              | $\pi/4$ -DQPSK | 78          | 1357.00                           |
| 2402            | 3.0              | 8DPSK          | 0           | 1366.00                           |
| 2441            | 3.0              | 8DPSK          | 39          | 1363.00                           |
| 2480            | 3.0              | 8DPSK          | 78          | 1354.00                           |

Table 7-5. Conducted 20dB Bandwidth Measurements – DUAL ANT2



Plot 7-28. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 28 of 137                    |

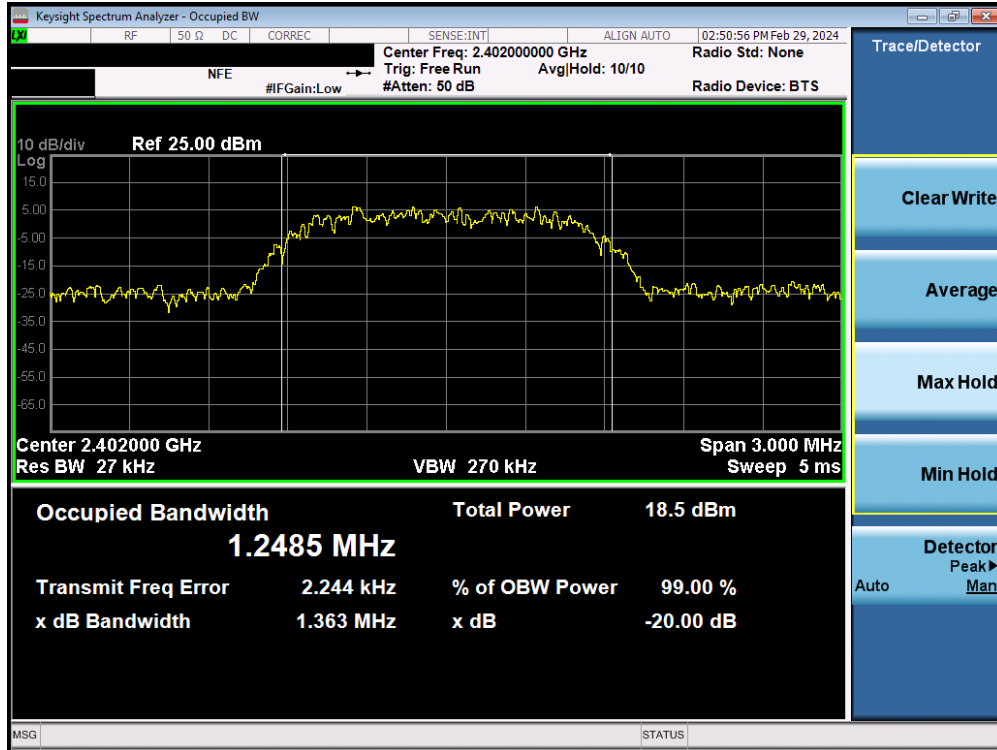


Plot 7-29. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39)

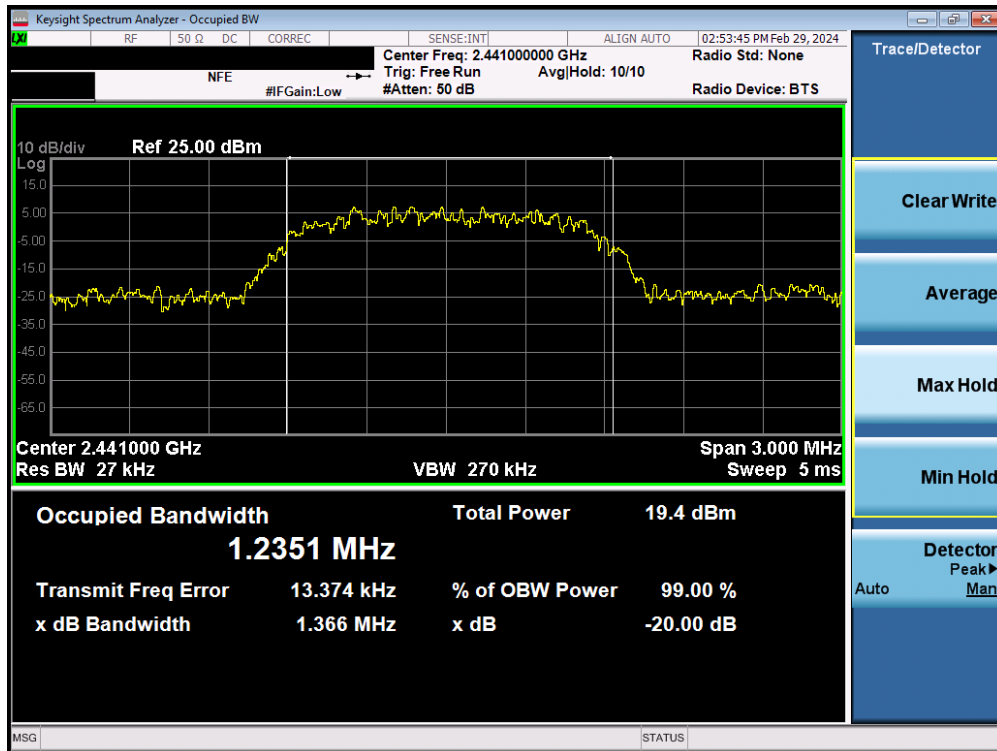


Plot 7-30. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 29 of 137                    |

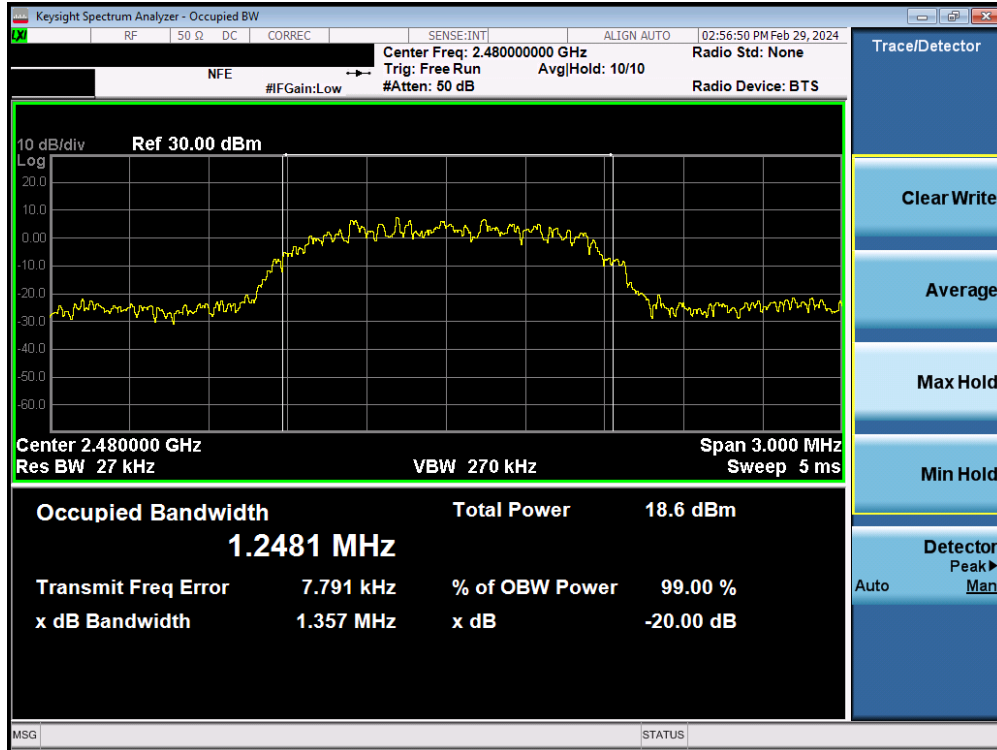


Plot 7-31. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0)

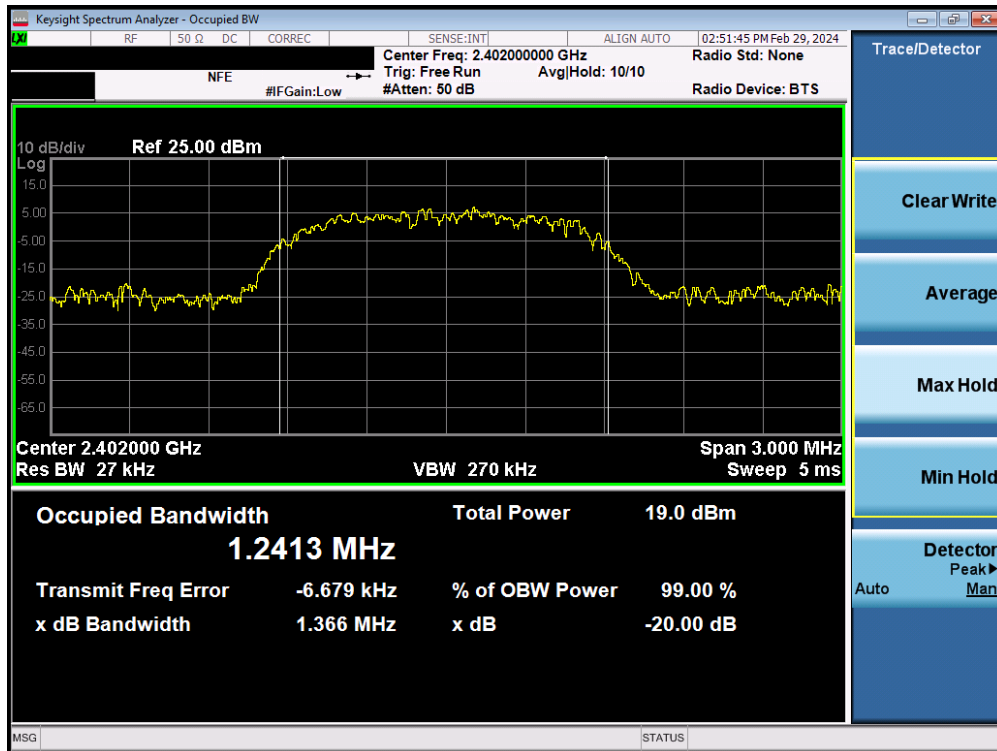


Plot 7-32. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 30 of 137                    |

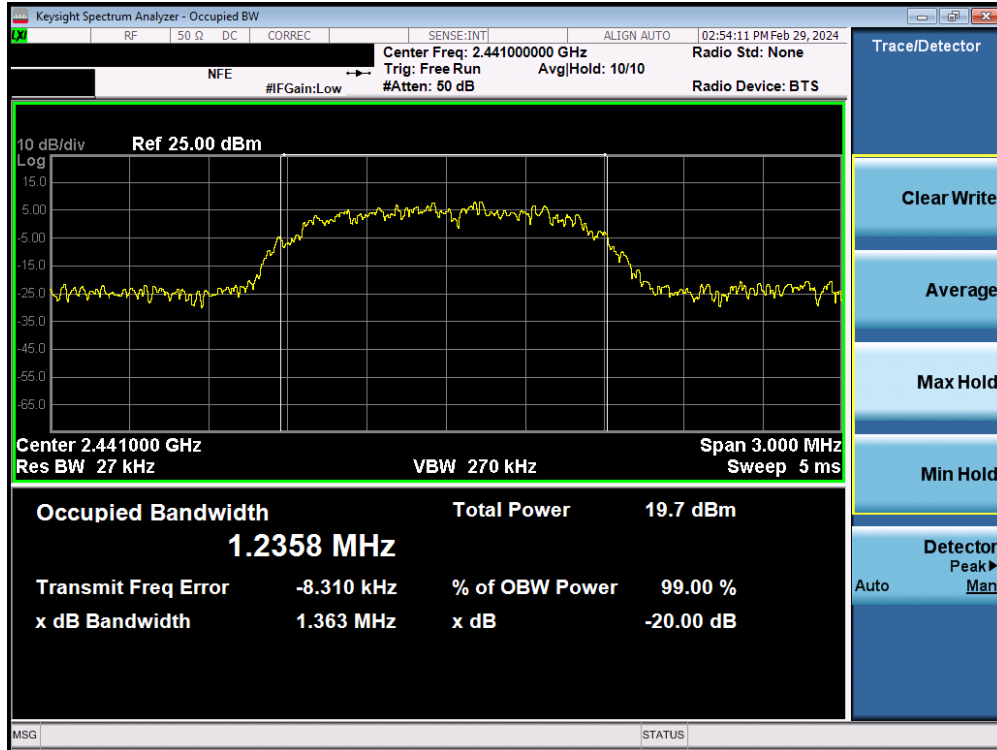


Plot 7-33. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78)

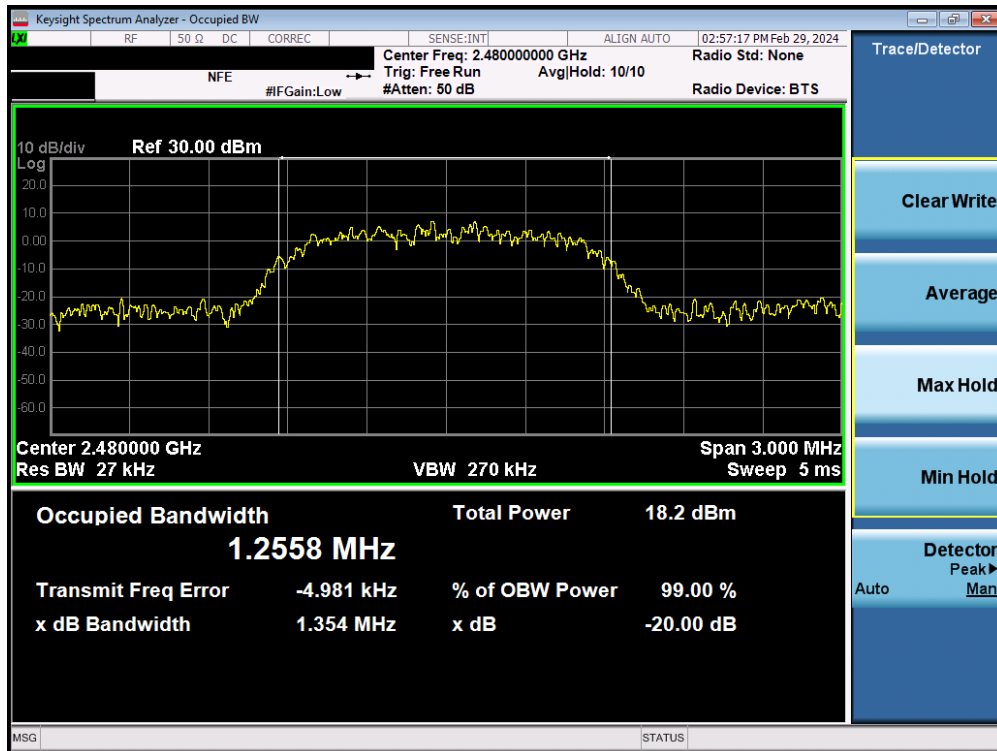


Plot 7-34. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 31 of 137                    |



Plot 7-35. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39)



Plot 7-36. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78)

| FCC ID: C3K2077<br>IC: 3048A-2077       |  | MEASUREMENT REPORT<br>(CERTIFICATION)  |                | Approved by:<br>Technical Manager |
|---|--|--|----------------|-----------------------------------|
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 32 of 137 |                                   |



### 7.3 Output Power Measurement

\$15.247 (b.1); RSS-247 [5.4(2)]

#### Test Overview and Limits

Measurement is made while the EUT is operating in non-hopping transmission mode. The powers shown below were measured using a spectrum analyzer with a Bluetooth signaling test set (Agilent Model: N4010A) used only to maintain a Bluetooth link with the EUT. Average power measurements are performed using the analyzer's "burst power" function with RBW = 3MHz. The burst power function triggers on a single set burst set to maximum power and measures the maximum average power on the on-time.

***The maximum permissible output power is 1 Watt.***

***The maximum e.i.r.p. shall not exceed 4 Watts.***

#### Test Procedure Used

ANSI C63.10-2013 – Section 7.8.5

ANSI C63.10-2013 – Section 11.9.2.3.2 method AVGPM-G

#### Test Settings

##### Peak Power Measurement

1. Span = approximately 5x 20dB bandwidth, centered on hopping channel
2. RBW > 20dB bandwidth of emission being measured
3. VBW ≥ RBW
4. Sweep = auto
5. Detector = peak
6. Trace mode = max hold
7. The trace was allowed to stabilize

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 7-2. Test Instrument & Measurement Setup for Peak Power Measurement**

#### **Note**

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 33 of 137                    |



This unit was tested with all possible data rates and the highest peak power is reported with the unit transmitting at 3Mbps. The EUT was tested for the average power with a broadband power meter for reporting purposes only. Final results were obtained using calibrated couplers, attenuators and cables. The following formula was used:

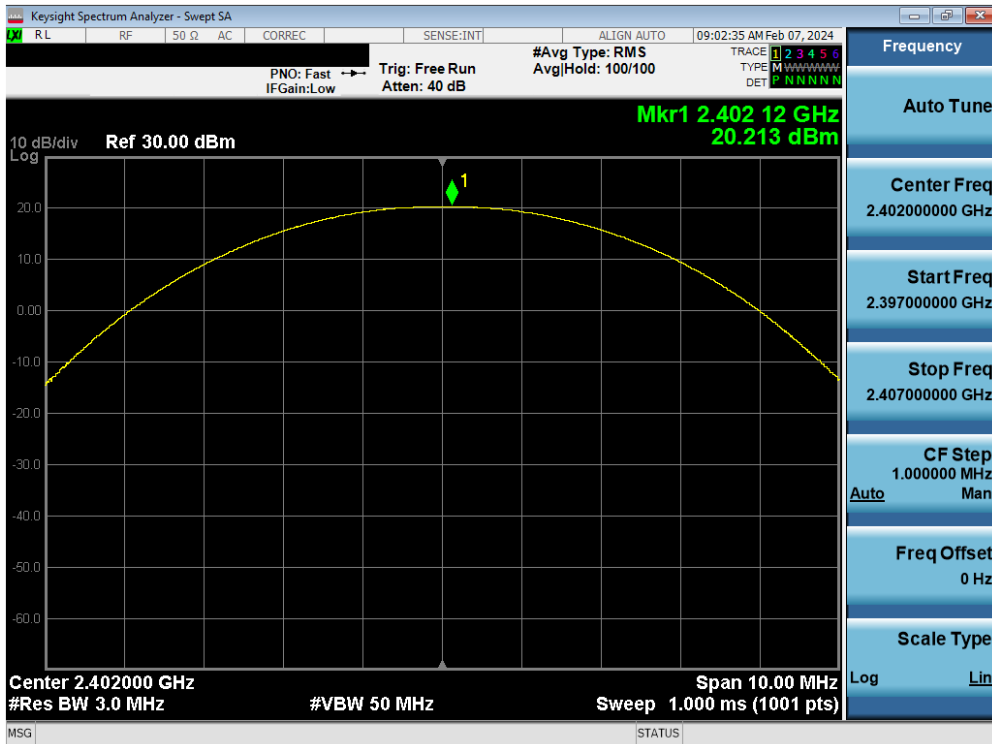
$$\text{Output Power (dBm)} = \text{Raw Analyzer Level (dBm)} + \text{Cable Loss (dB)} + \text{Loss in Directional Coupler/Insertion Loss (dB)}$$

| Frequency [MHz] | Data Rate [Mbps] | Mod.           | Channel No. | Peak Conducted Power |         | Avg Conducted Power |         | Ant. Gain [dBi] | EIRP  | Limit | Margin |
|-----------------|------------------|----------------|-------------|----------------------|---------|---------------------|---------|-----------------|-------|-------|--------|
|                 |                  |                |             | [dBm]                | [mW]    | [dBm]               | [mW]    |                 |       |       |        |
| 2402            | 1.0              | GFSK           | 0           | 20.21                | 105.027 | 19.75               | 94.384  | 0.55            | 20.76 | 36.02 | -15.26 |
| 2441            | 1.0              | GFSK           | 39          | 21.02                | 126.503 | 20.48               | 111.635 | 0.55            | 21.57 | 36.02 | -14.45 |
| 2480            | 1.0              | GFSK           | 78          | 20.36                | 108.568 | 19.84               | 96.450  | 0.55            | 20.91 | 36.02 | -15.11 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | 0           | 20.59                | 114.578 | 17.23               | 52.784  | 0.55            | 21.14 | 36.02 | -14.88 |
| 2441            | 2.0              | $\pi/4$ -DQPSK | 39          | 21.33                | 135.831 | 17.88               | 61.419  | 0.55            | 21.88 | 36.02 | -14.14 |
| 2480            | 2.0              | $\pi/4$ -DQPSK | 78          | 20.39                | 109.471 | 17.33               | 54.125  | 0.55            | 20.94 | 36.02 | -15.08 |
| 2402            | 3.0              | 8DPSK          | 0           | 21.17                | 130.858 | 17.29               | 53.567  | 0.55            | 21.72 | 36.02 | -14.30 |
| 2441            | 3.0              | 8DPSK          | 39          | 21.56                | 143.252 | 17.96               | 62.445  | 0.55            | 22.11 | 36.02 | -13.91 |
| 2480            | 3.0              | 8DPSK          | 78          | 20.91                | 123.225 | 17.40               | 54.903  | 0.55            | 21.46 | 36.02 | -14.56 |

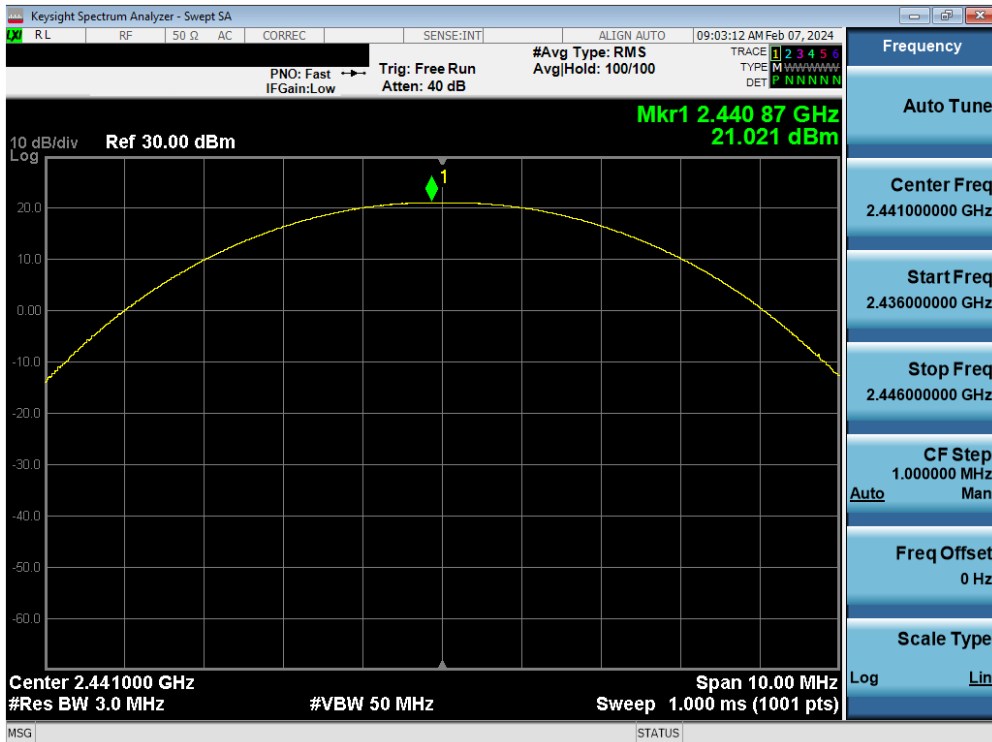
**Table 7-6. Conducted Output Power Measurements – SISO ANT1**

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 34 of 137                    |

SISO ANT 1

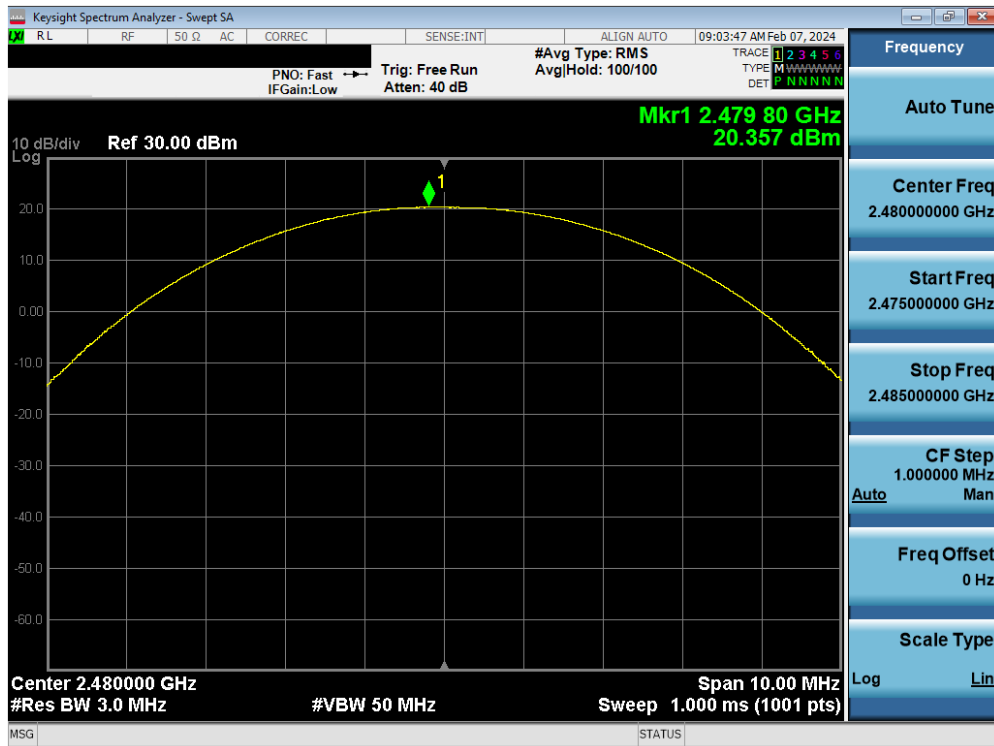


Plot 7-37. Peak Conducted Power (1Mbps – Ch. 0)

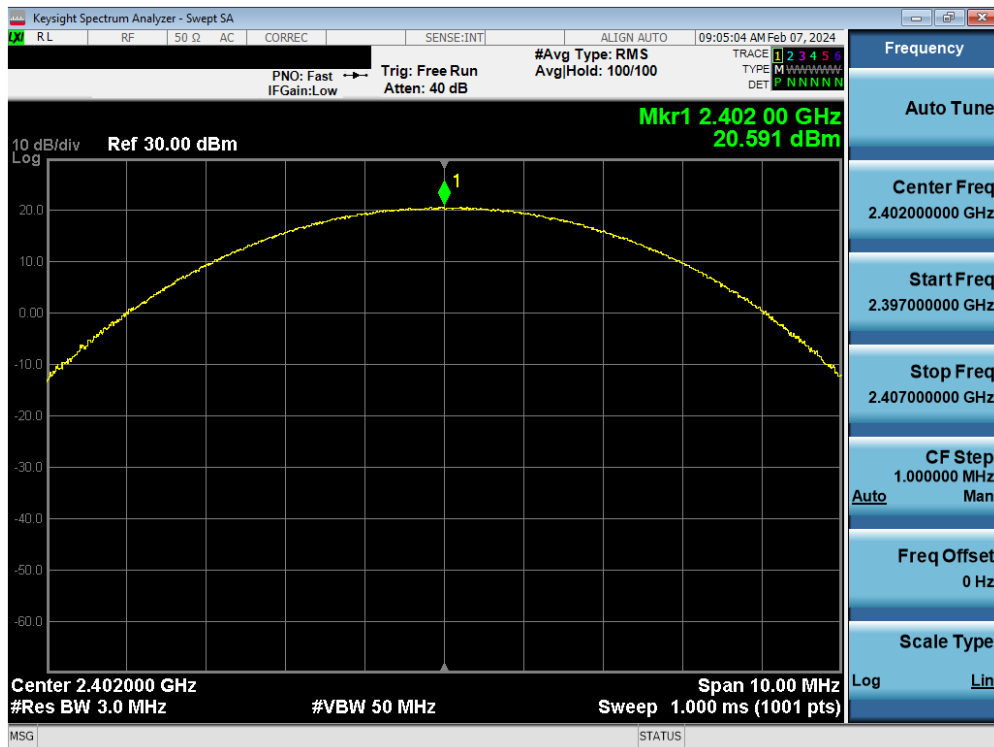


Plot 7-38. Peak Conducted Power (1Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 35 of 137                    |

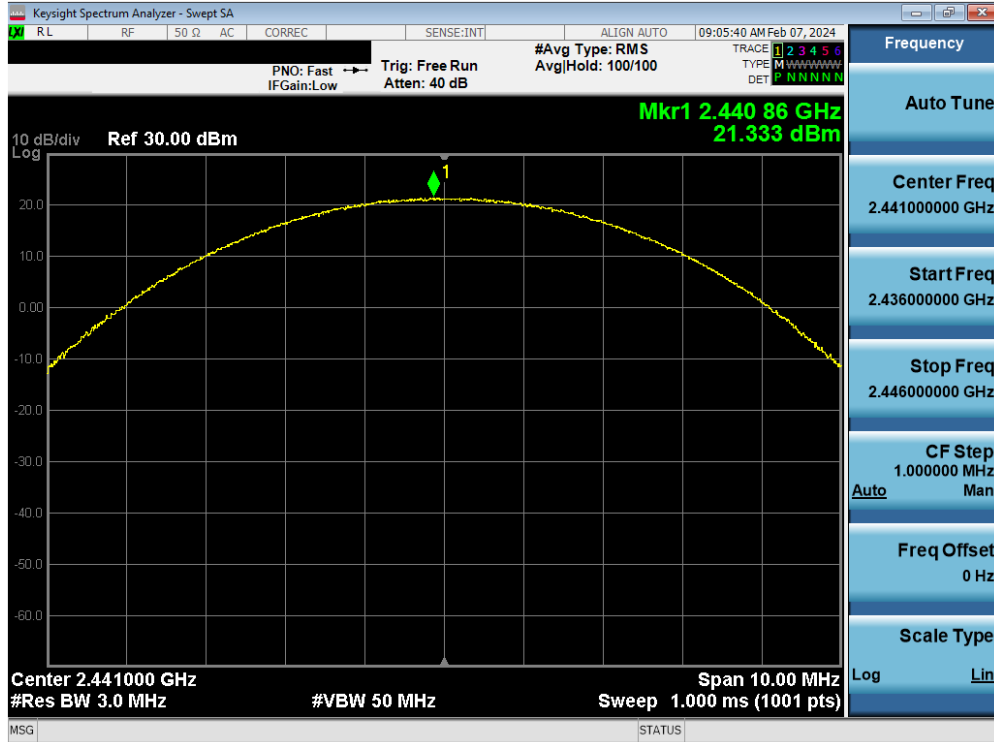


Plot 7-39. Peak Conducted Power (1Mbps – Ch. 78)

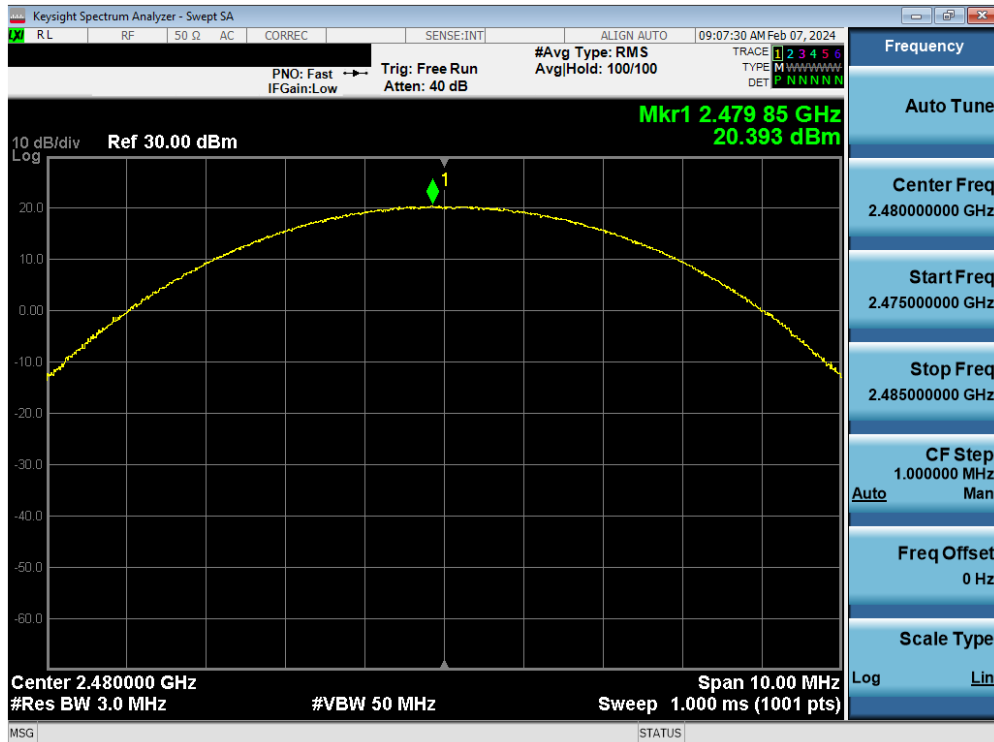


Plot 7-40. Peak Conducted Power (2Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 36 of 137                    |

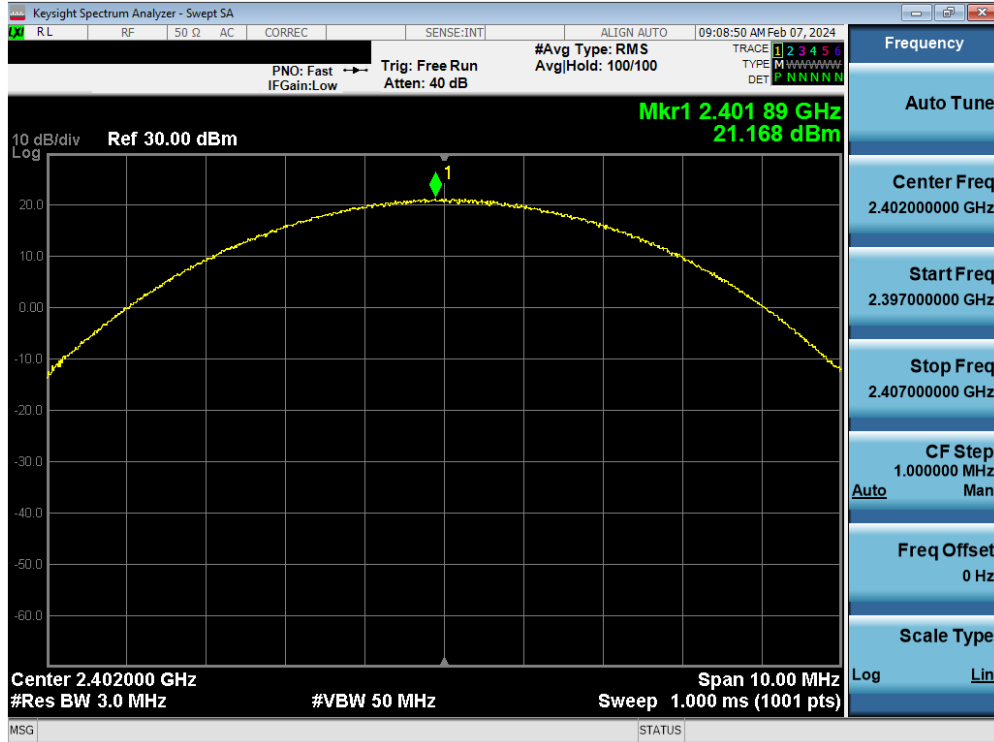


Plot 7-41. Peak Conducted Power (2Mbps – Ch. 39)

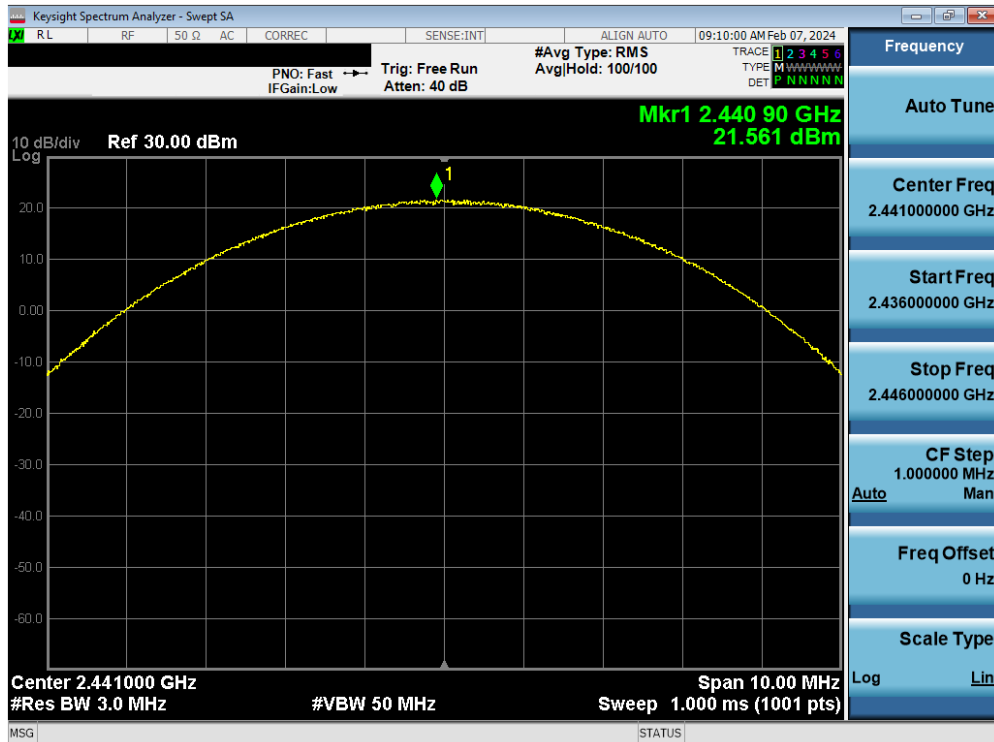


Plot 7-42. Peak Conducted Power (2Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 37 of 137                    |

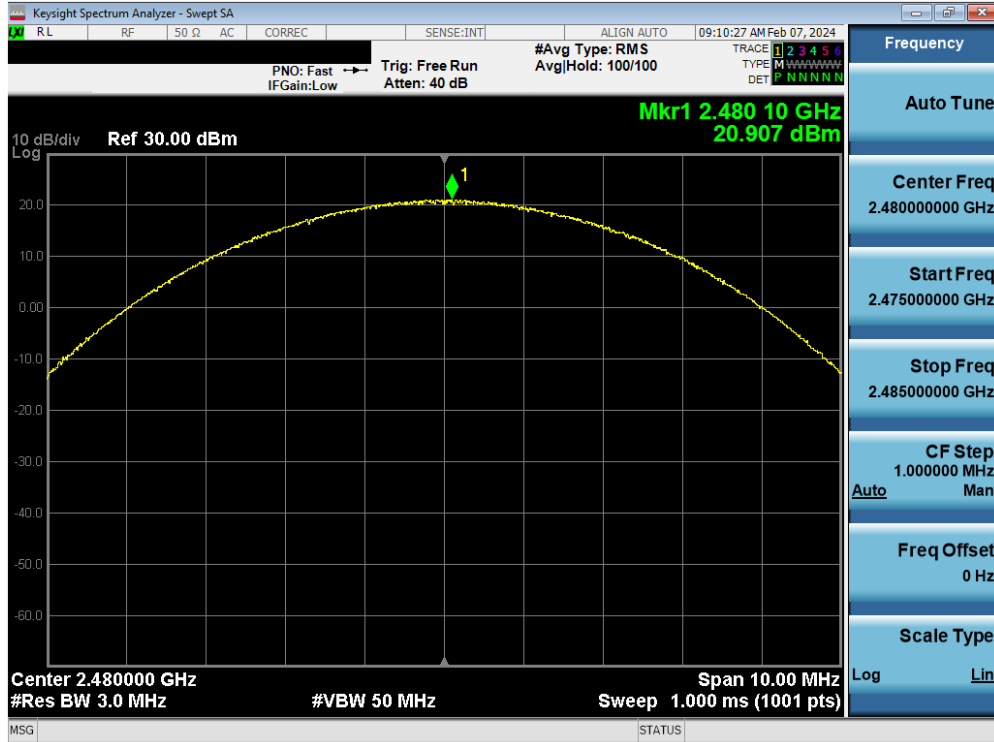


Plot 7-43. Peak Conducted Power (3Mbps – Ch. 0)

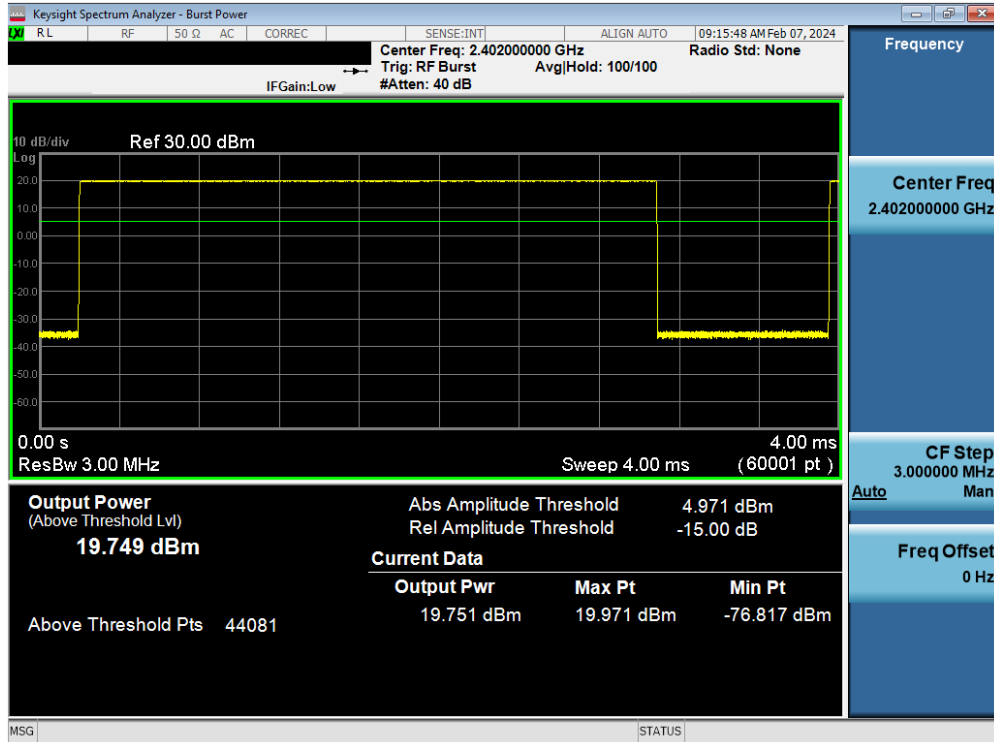


Plot 7-44. Peak Conducted Power (3Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 38 of 137                    |

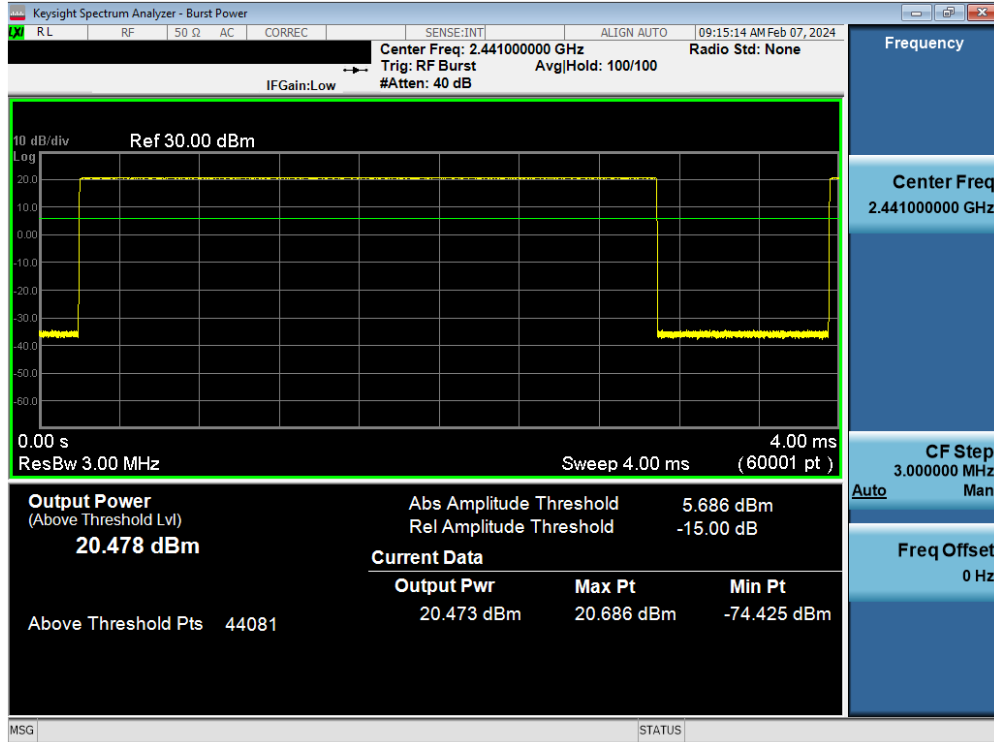


Plot 7-45. Peak Conducted Power (3Mbps – Ch. 78)

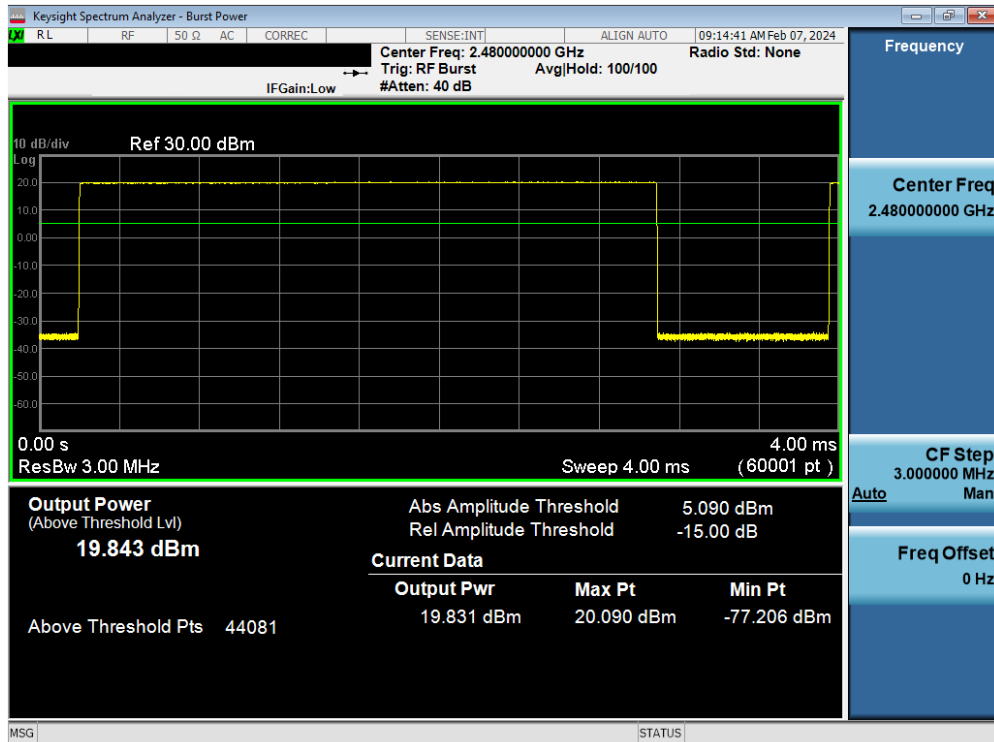


Plot 7-46. Average Conducted Power (1Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 39 of 137                    |



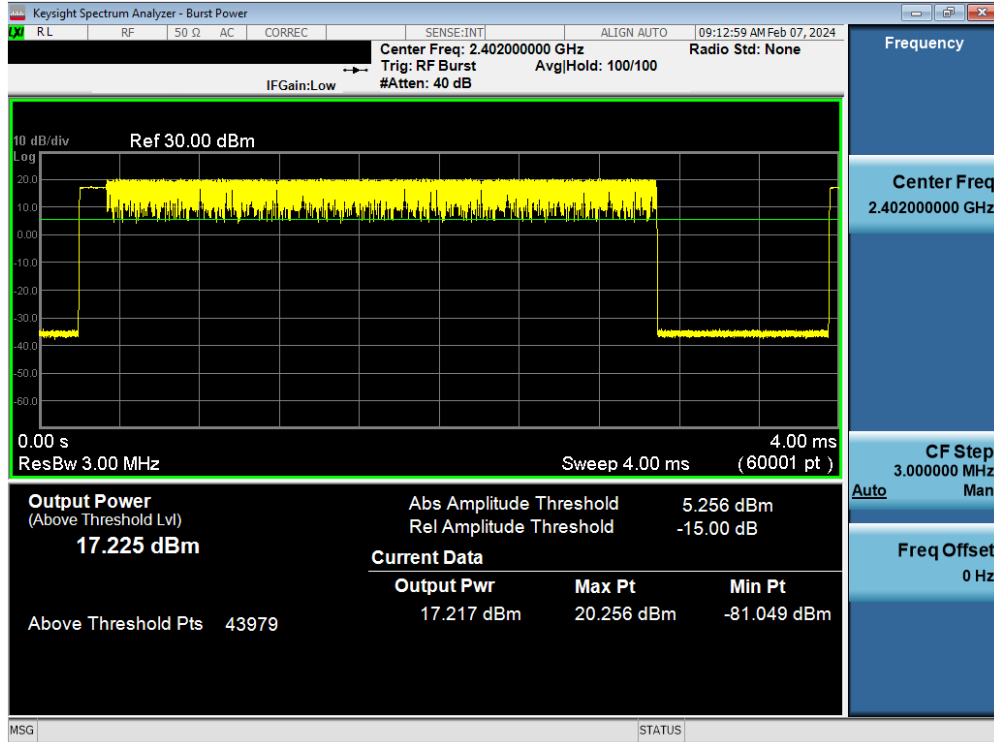
Plot 7-47. Average Conducted Power (1Mbps – Ch. 39)



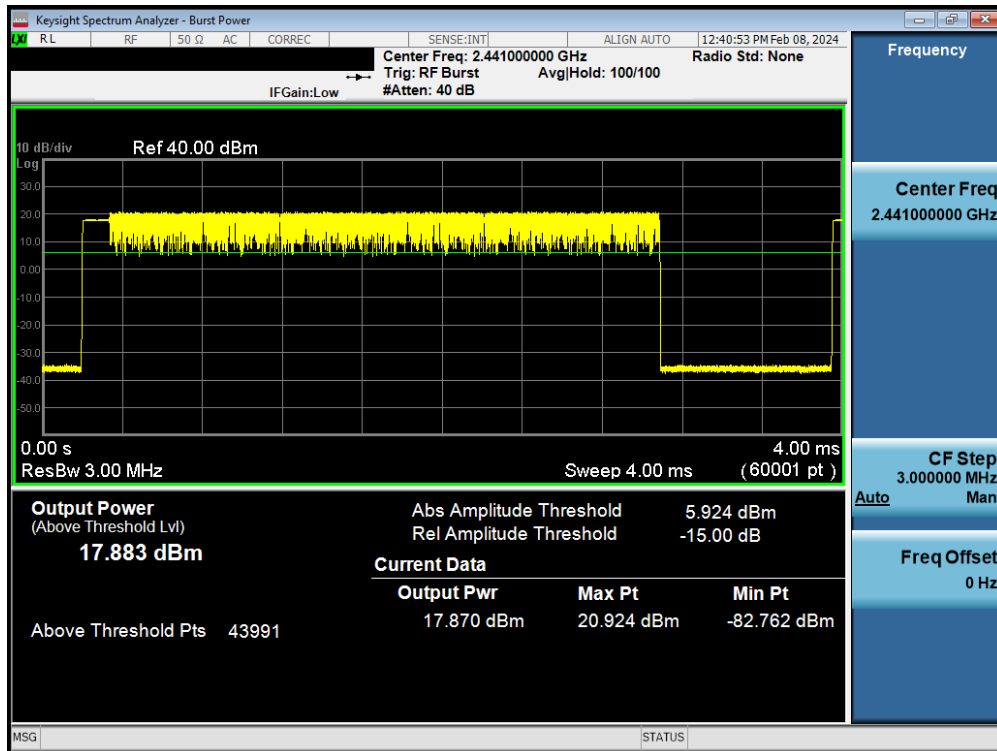
Plot 7-48. Average Conducted Power (1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 40 of 137                    |



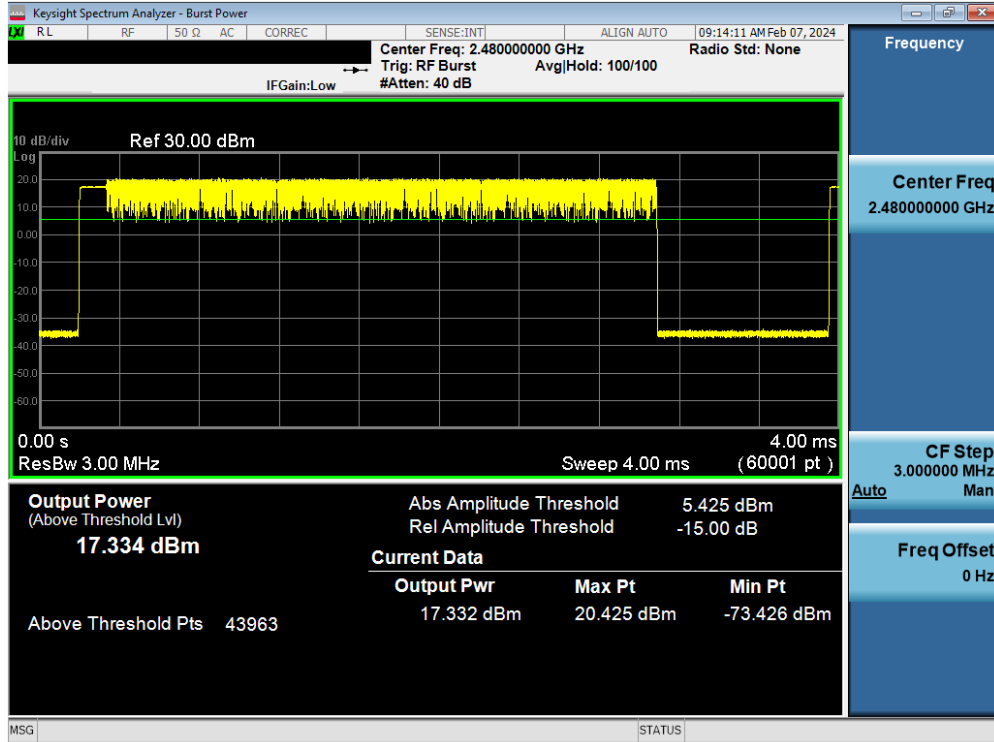


Plot 7-49. Average Conducted Power (2Mbps – Ch. 0)

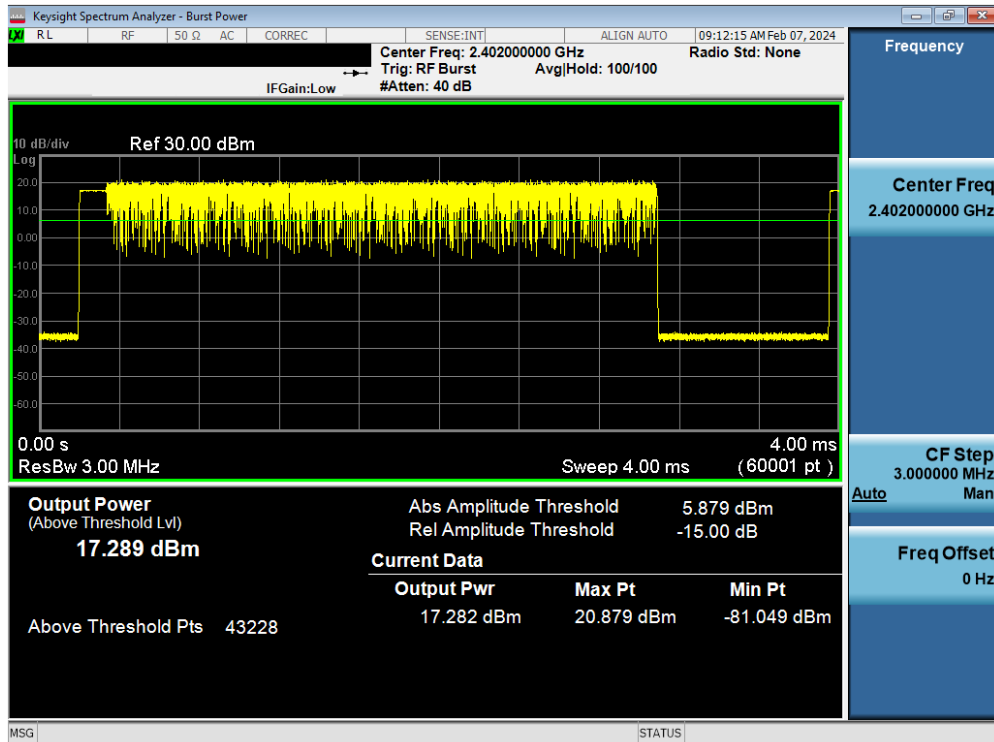


Plot 7-50. Average Conducted Power (2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 41 of 137                    |

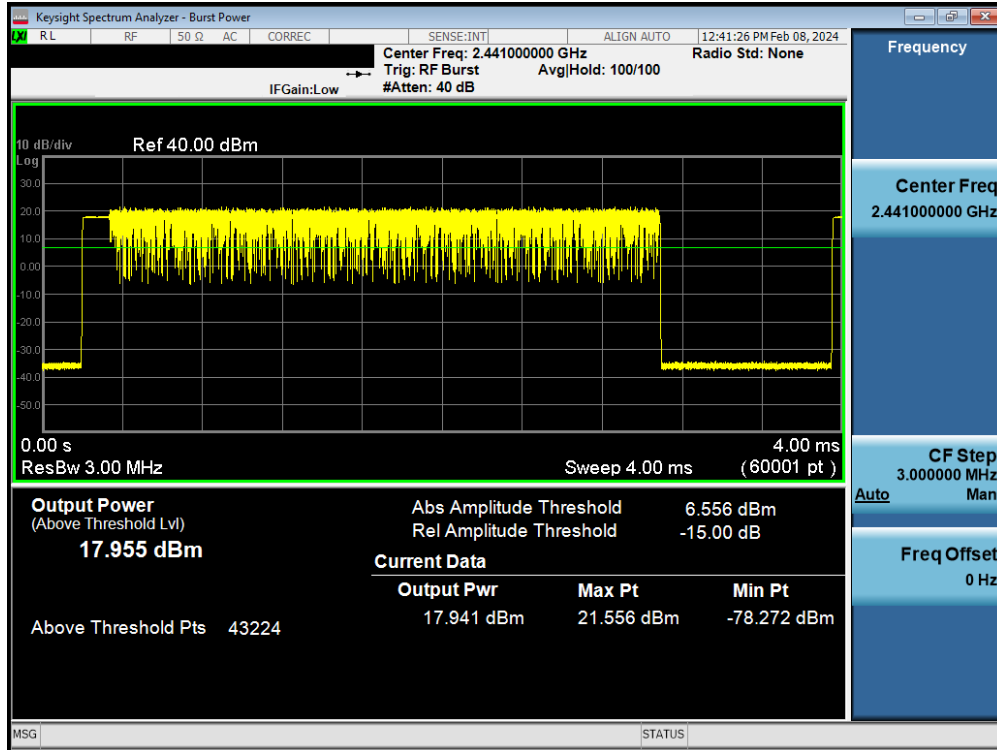


Plot 7-51. Average Conducted Power (2Mbps – Ch. 78)

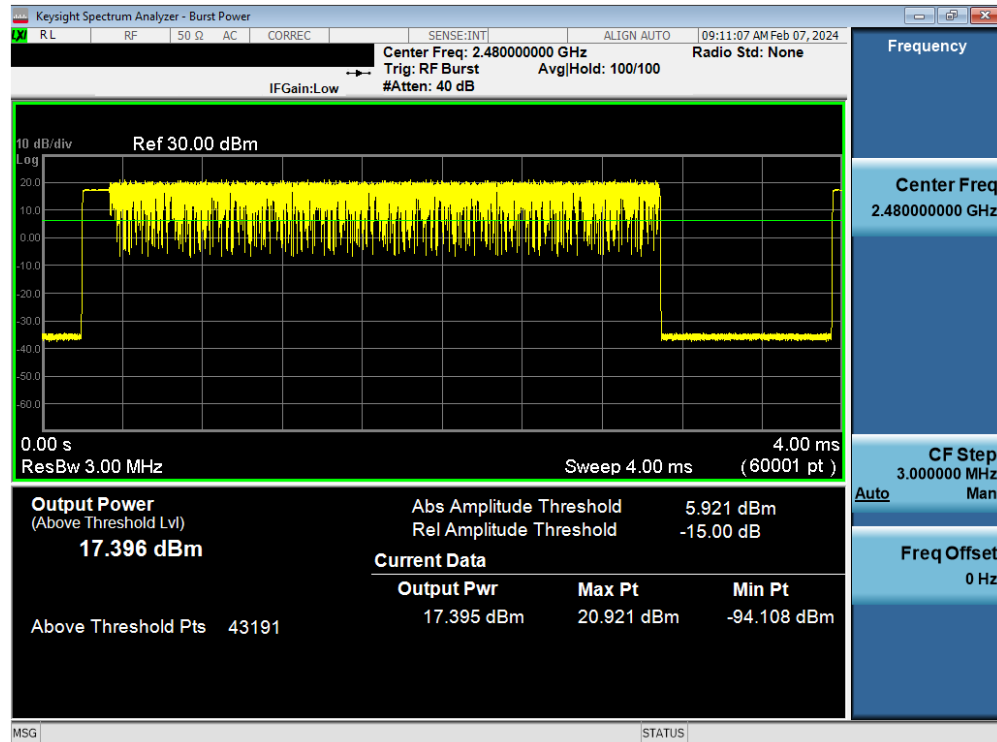


Plot 7-52. Average Conducted Power (3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 42 of 137                    |



Plot 7-53. Average Conducted Power (3Mbps – Ch. 39)



Plot 7-54. Average Conducted Power (3Mbps – Ch. 78)

| FCC ID: C3K2077<br>IC: 3048A-2077       |  | MEASUREMENT REPORT<br>(CERTIFICATION)  |                | Approved by:<br>Technical Manager |
|---|--|--|----------------|-----------------------------------|
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 43 of 137 |                                   |

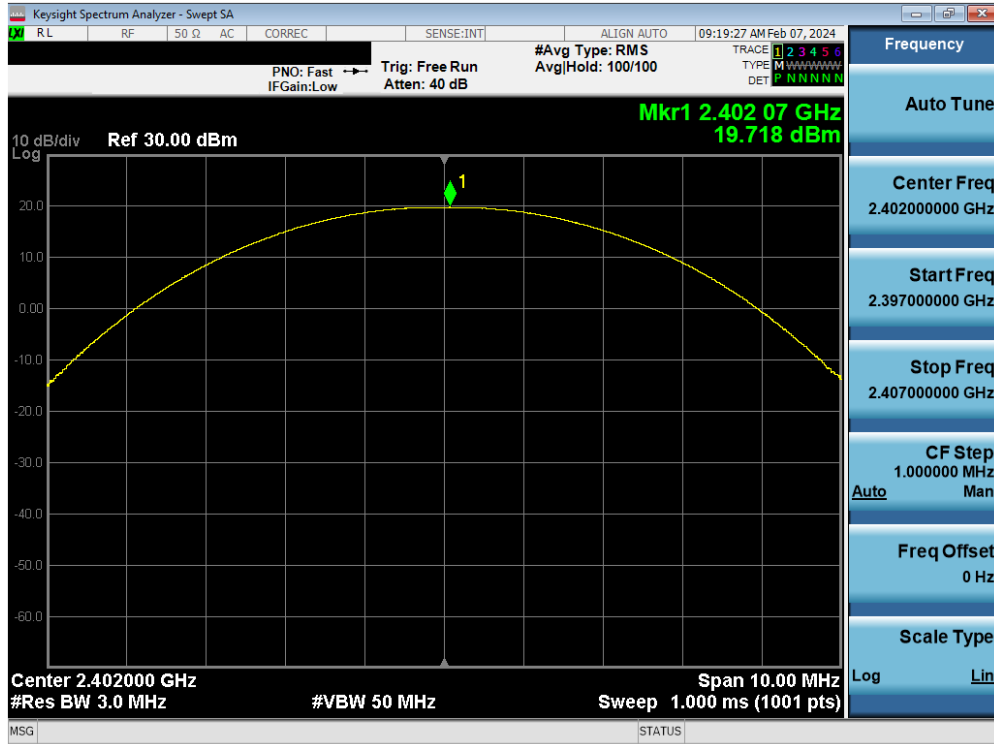


| Frequency [MHz] | Data Rate [Mbps] | Mod.           | Channel No. | Peak Conducted Power |         | Avg Conducted Power |         | Ant. Gain [dBi] | EIRP  | Limit | Margin |
|-----------------|------------------|----------------|-------------|----------------------|---------|---------------------|---------|-----------------|-------|-------|--------|
|                 |                  |                |             | [dBm]                | [mW]    | [dBm]               | [mW]    |                 |       |       |        |
| 2402            | 1.0              | GFSK           | 0           | 19.72                | 93.713  | 19.47               | 88.471  | 0.14            | 19.86 | 36.02 | -16.16 |
| 2441            | 1.0              | GFSK           | 39          | 20.75                | 118.905 | 20.48               | 111.789 | 0.14            | 20.89 | 36.02 | -15.13 |
| 2480            | 1.0              | GFSK           | 78          | 20.20                | 104.785 | 19.88               | 97.208  | 0.14            | 20.34 | 36.02 | -15.68 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | 0           | 19.64                | 91.939  | 16.69               | 46.666  | 0.14            | 19.78 | 36.02 | -16.25 |
| 2441            | 2.0              | $\pi/4$ -DQPSK | 39          | 20.98                | 125.430 | 17.64               | 58.050  | 0.14            | 21.12 | 36.02 | -14.90 |
| 2480            | 2.0              | $\pi/4$ -DQPSK | 78          | 20.06                | 101.438 | 17.10               | 51.298  | 0.14            | 20.20 | 36.02 | -15.82 |
| 2402            | 3.0              | 8DPSK          | 0           | 20.29                | 106.881 | 17.15               | 51.880  | 0.14            | 20.43 | 36.02 | -15.59 |
| 2441            | 3.0              | 8DPSK          | 39          | 21.63                | 145.479 | 17.72               | 59.143  | 0.14            | 21.77 | 36.02 | -14.25 |
| 2480            | 3.0              | 8DPSK          | 78          | 20.97                | 124.968 | 17.17               | 52.095  | 0.14            | 21.11 | 36.02 | -14.91 |

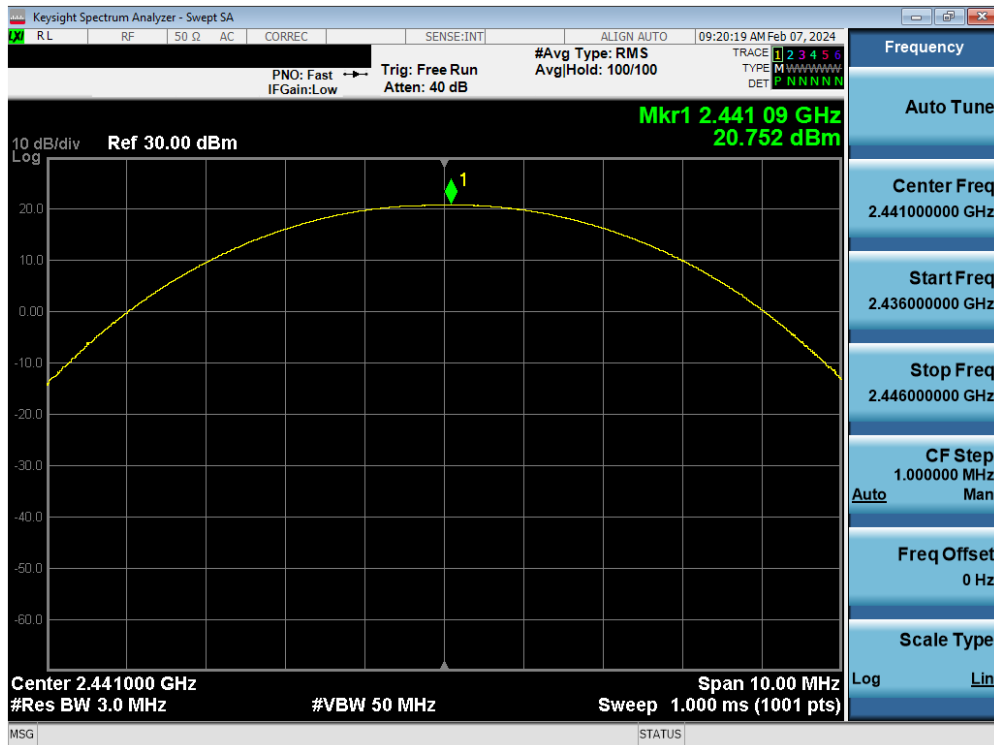
**Table 7-7. Conducted Output Power Measurements – SISO ANT2**

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 44 of 137                    |

# SISO ANT 1

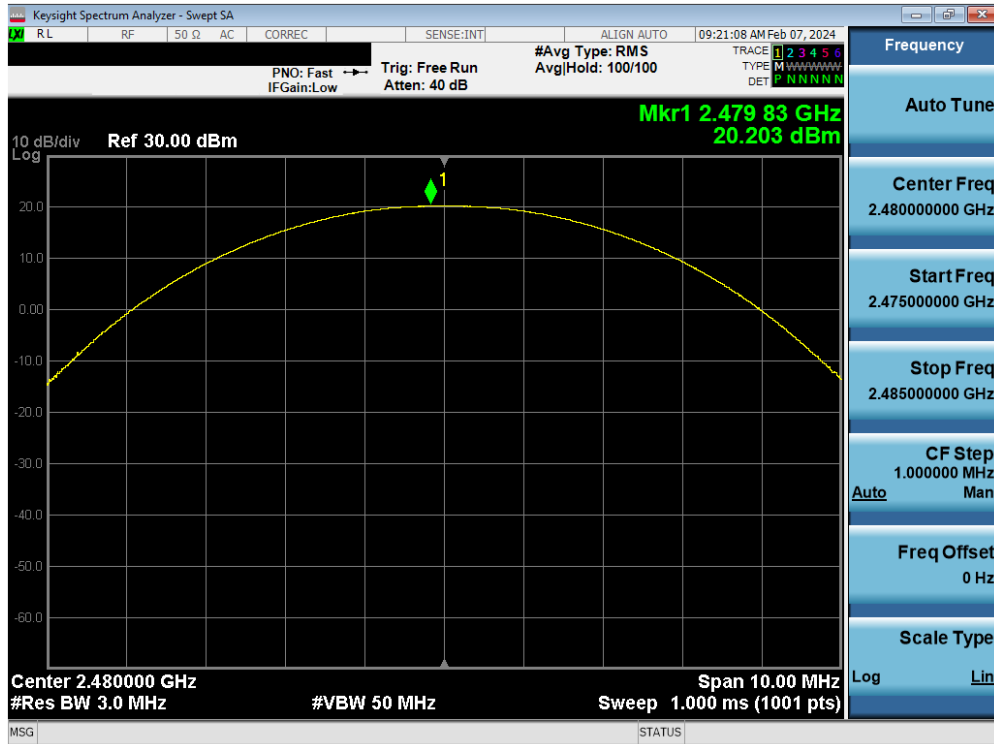


Plot 7-55. Peak Conducted Power (1Mbps – Ch. 0)

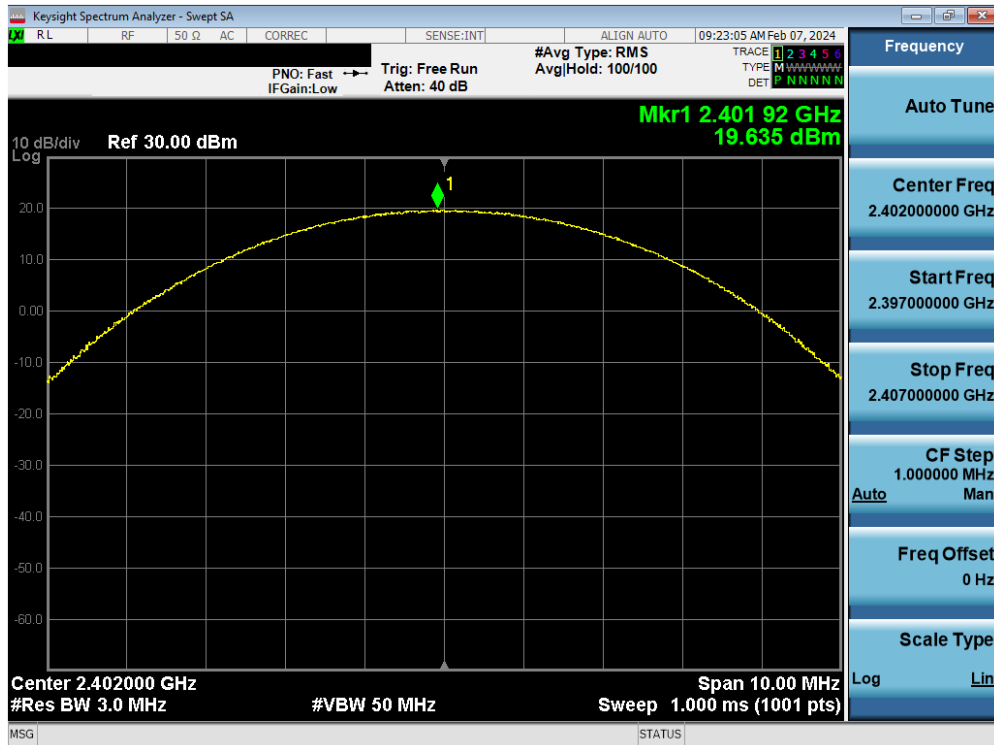


Plot 7-56. Peak Conducted Power (1Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 45 of 137                    |

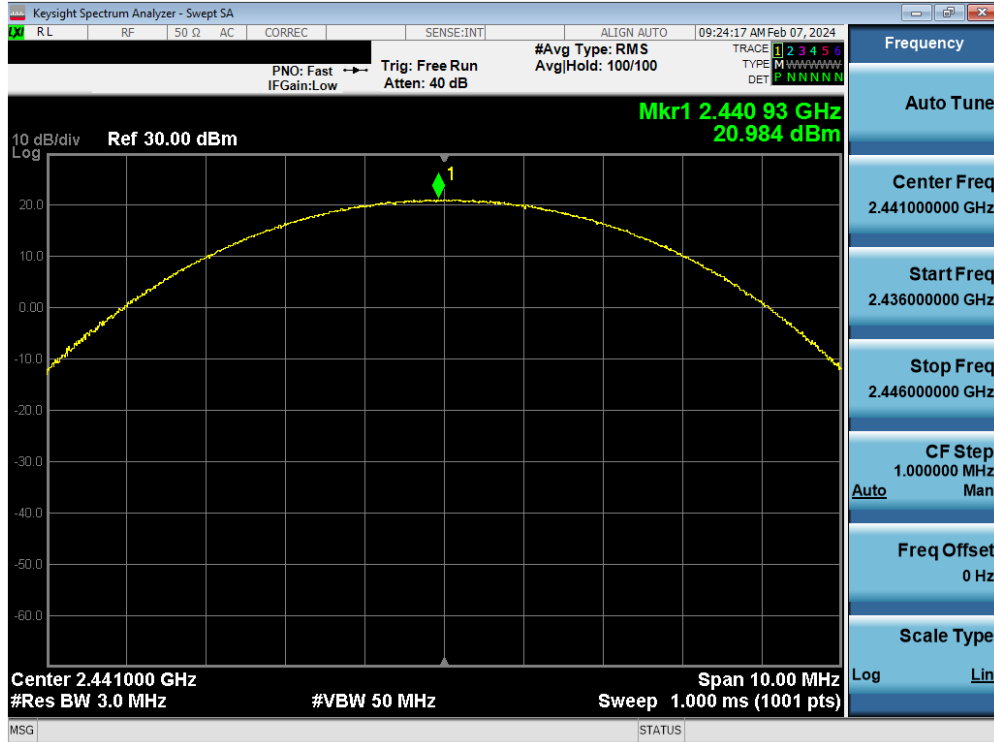


Plot 7-57. Peak Conducted Power (1Mbps – Ch. 78)

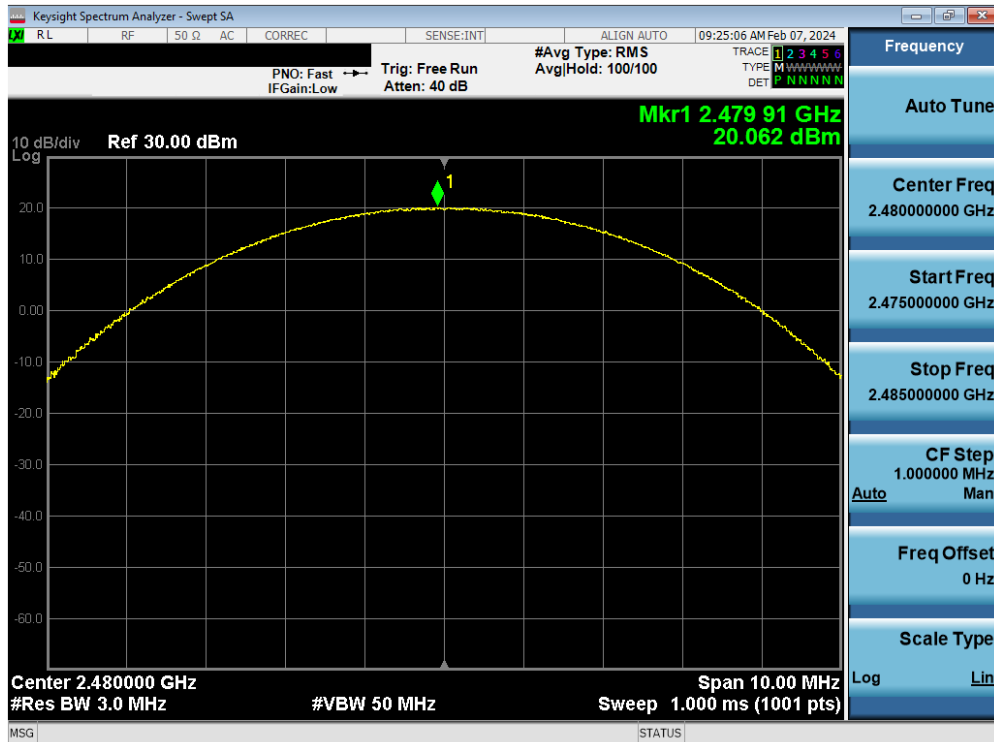


Plot 7-58. Peak Conducted Power (2Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 46 of 137                    |

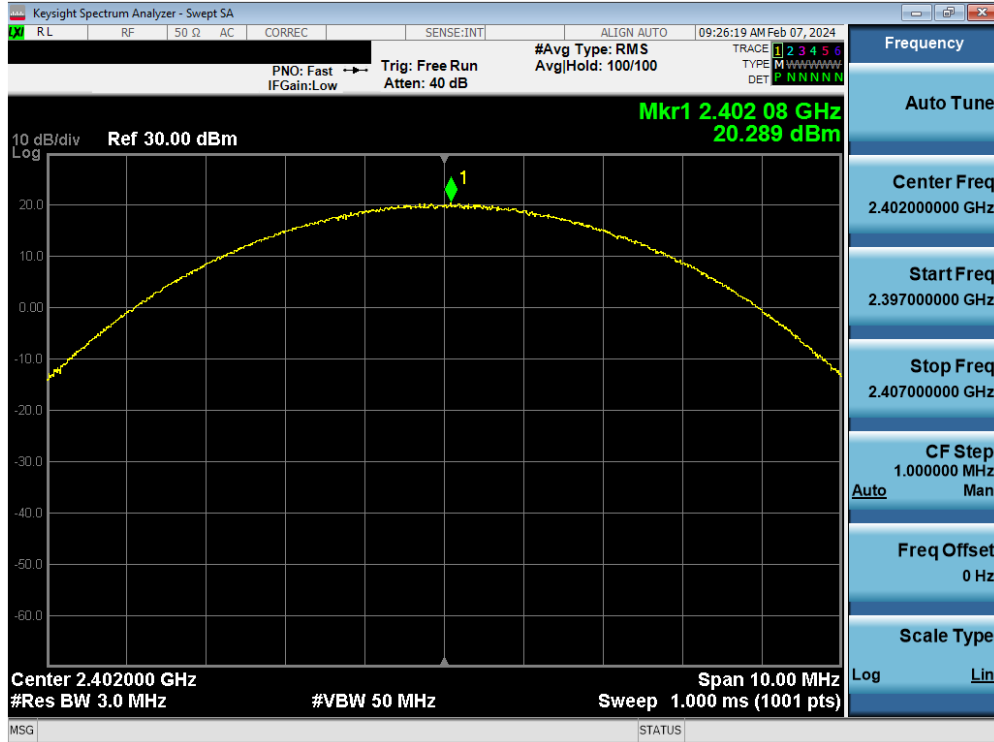


Plot 7-59. Peak Conducted Power (2Mbps – Ch. 39)

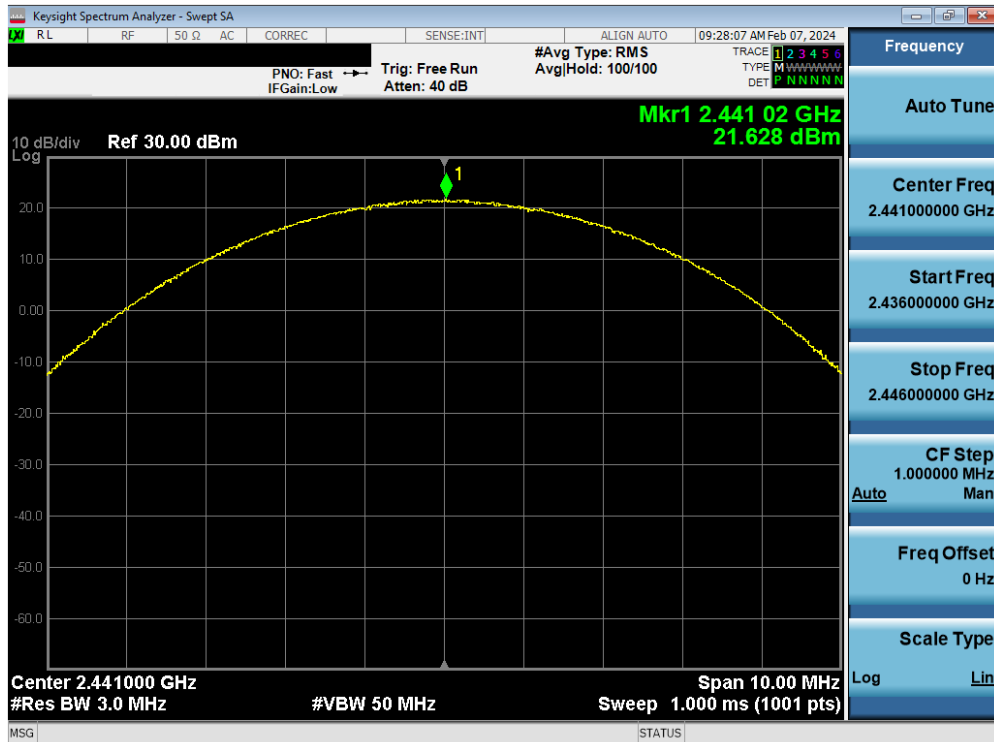


Plot 7-60. Peak Conducted Power (2Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 47 of 137                    |



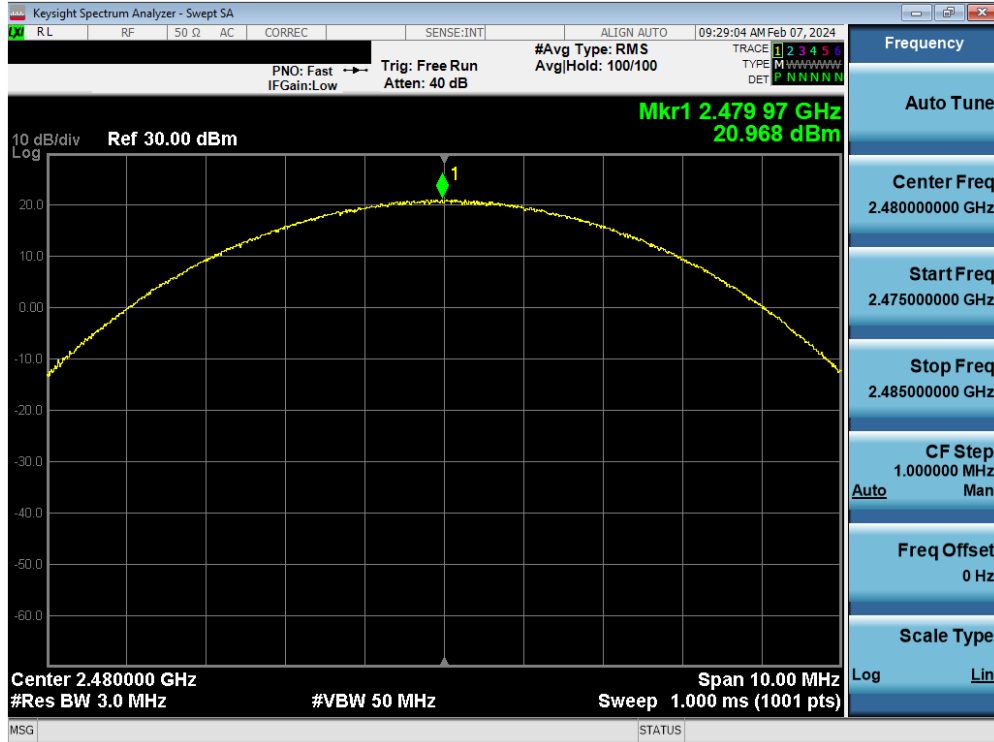
Plot 7-61. Peak Conducted Power (3Mbps – Ch. 0)



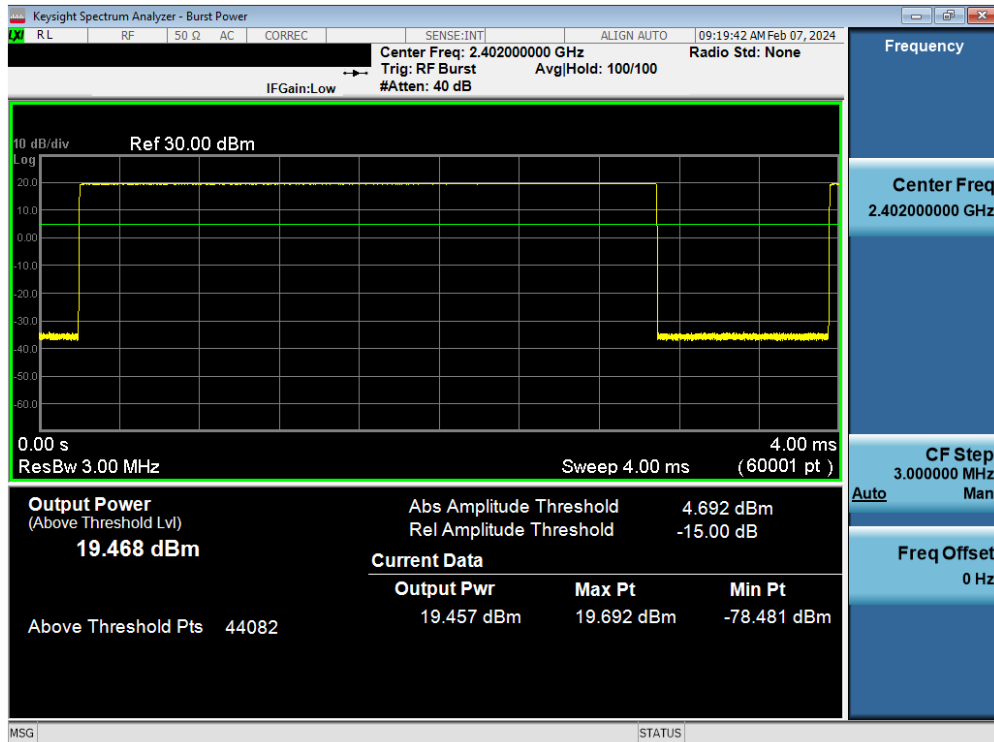
Plot 7-62. Peak Conducted Power (3Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 48 of 137                    |



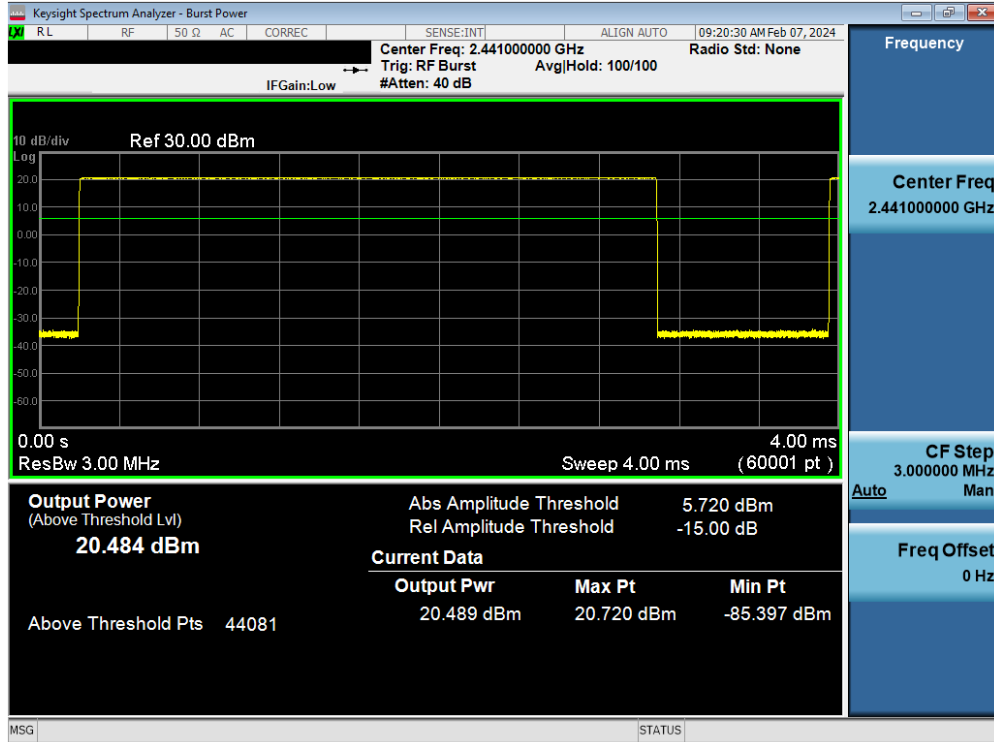


Plot 7-63. Peak Conducted Power (3Mbps – Ch. 78)

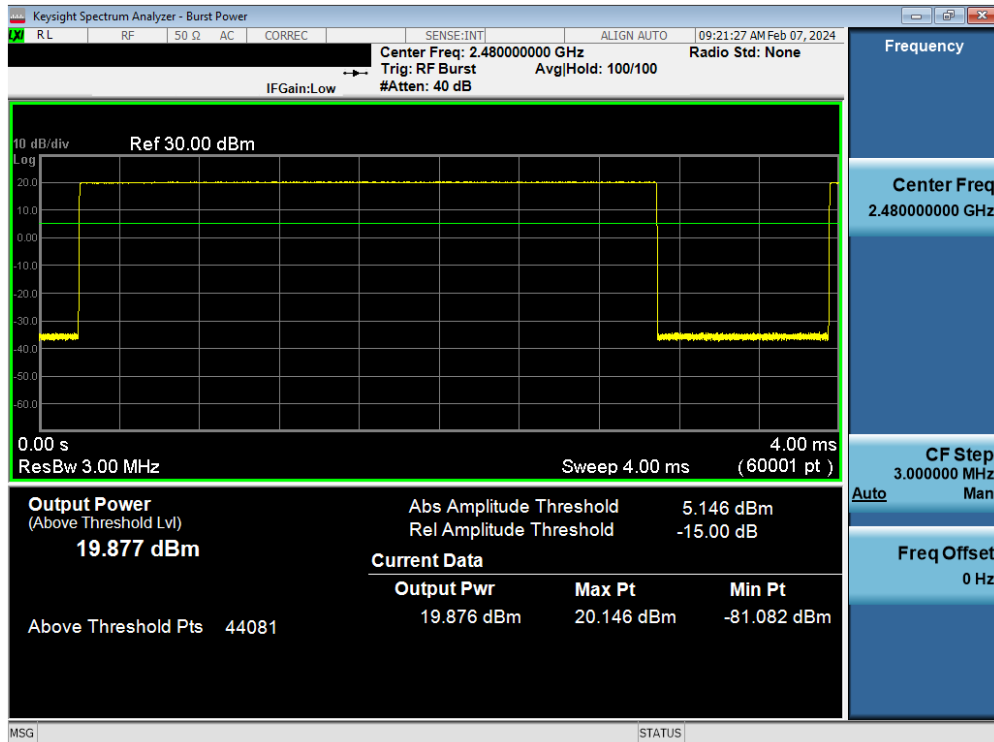


Plot 7-64. Average Conducted Power (1Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 49 of 137                    |

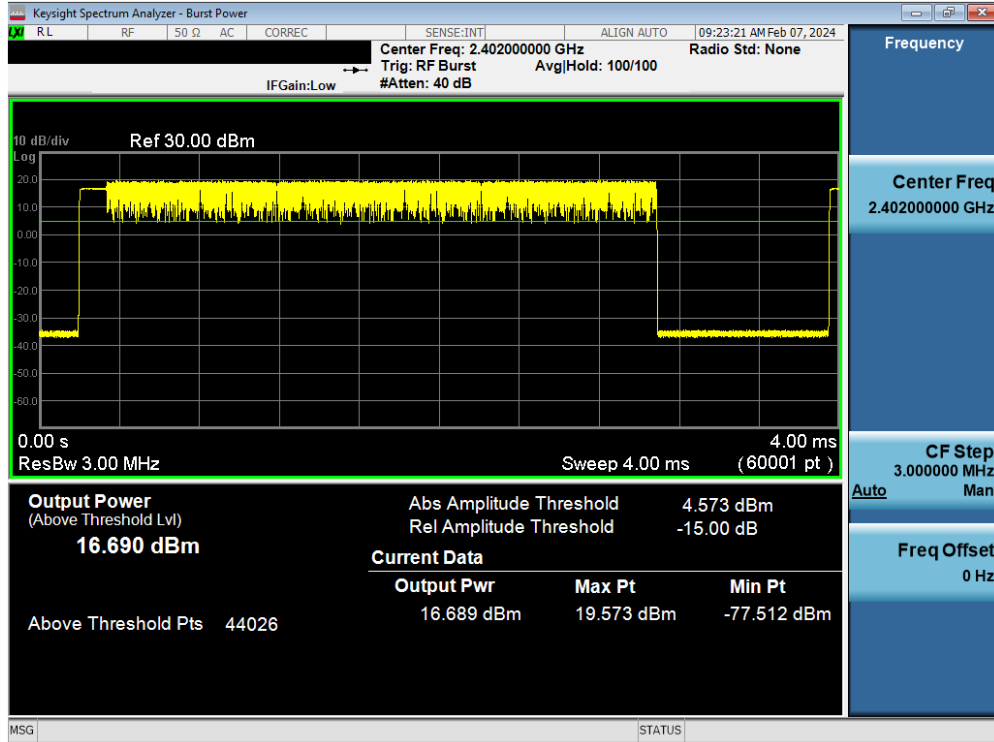


Plot 7-65. Average Conducted Power (1Mbps – Ch. 39)

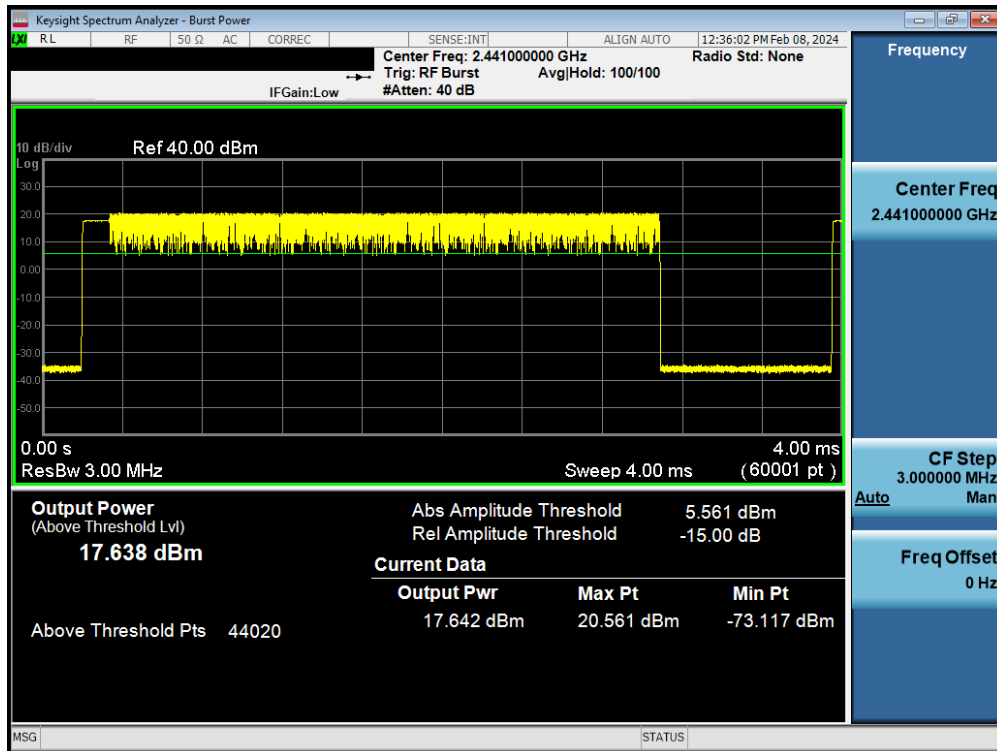


Plot 7-66. Average Conducted Power (1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 50 of 137                    |

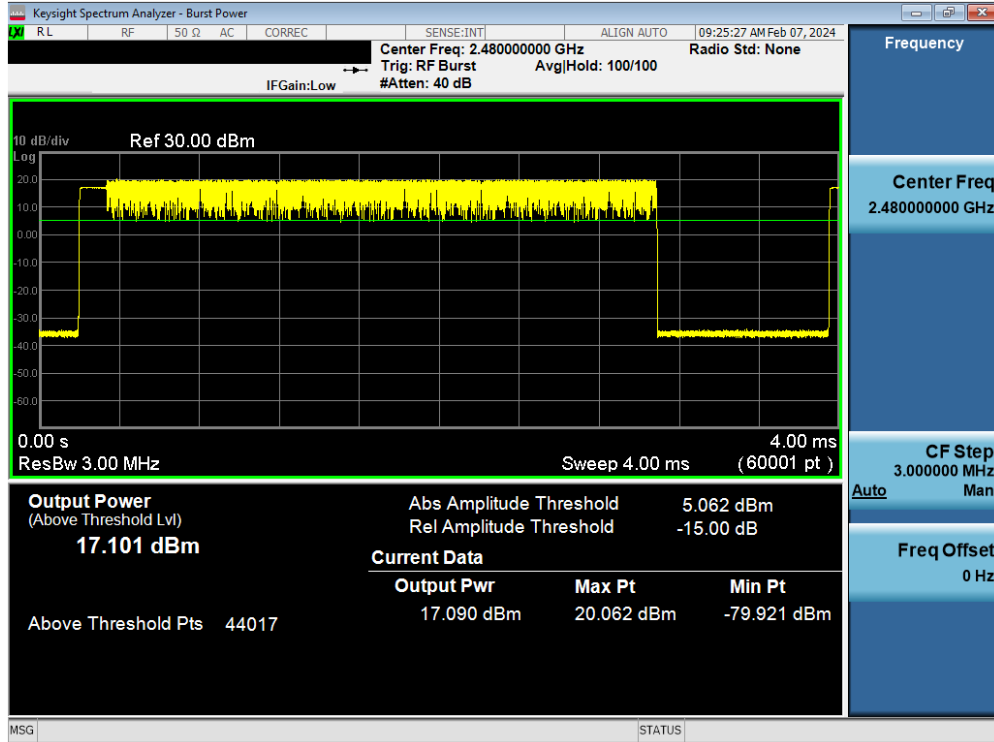


Plot 7-67. Average Conducted Power (2Mbps – Ch. 0)

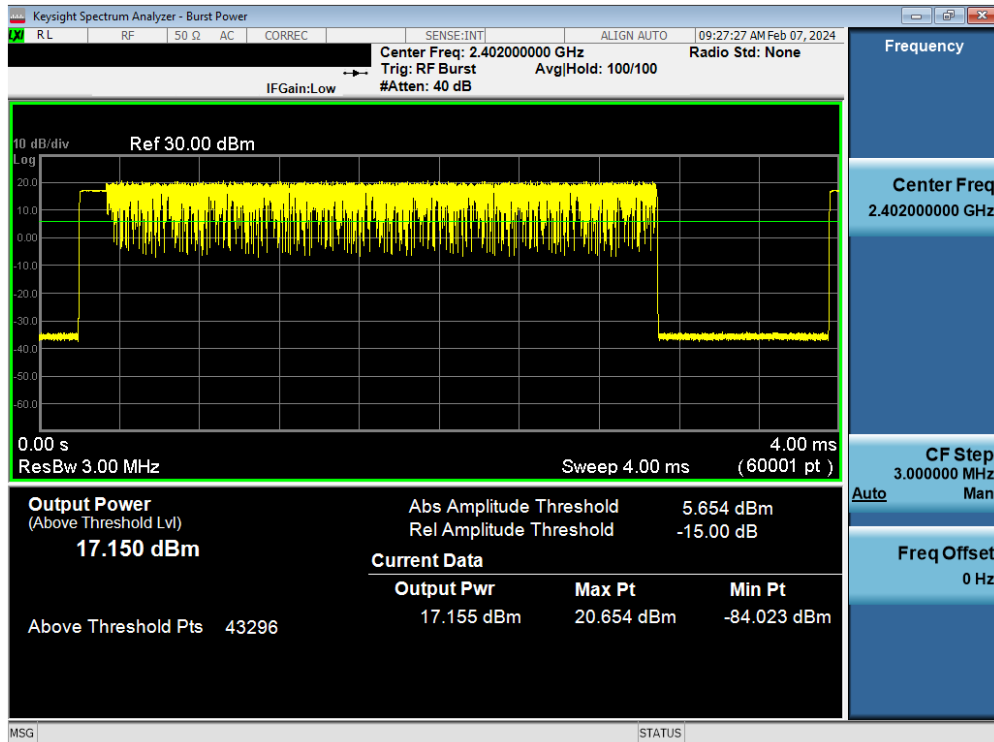


Plot 7-68. Average Conducted Power (2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 51 of 137                    |

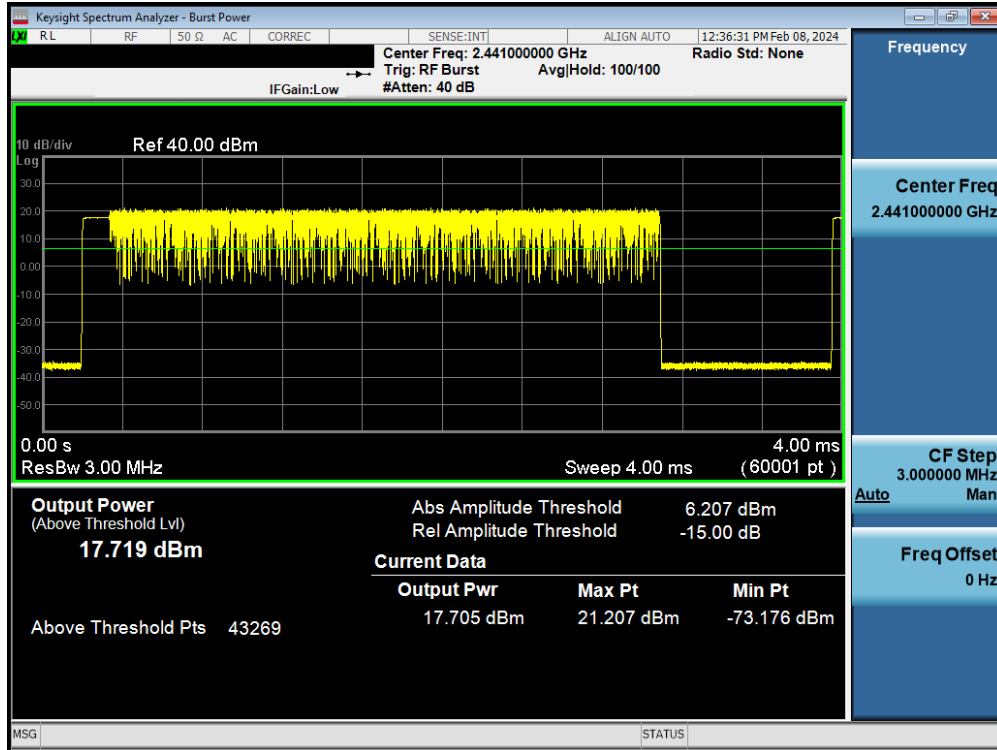


Plot 7-69. Average Conducted Power (2Mbps – Ch. 78)

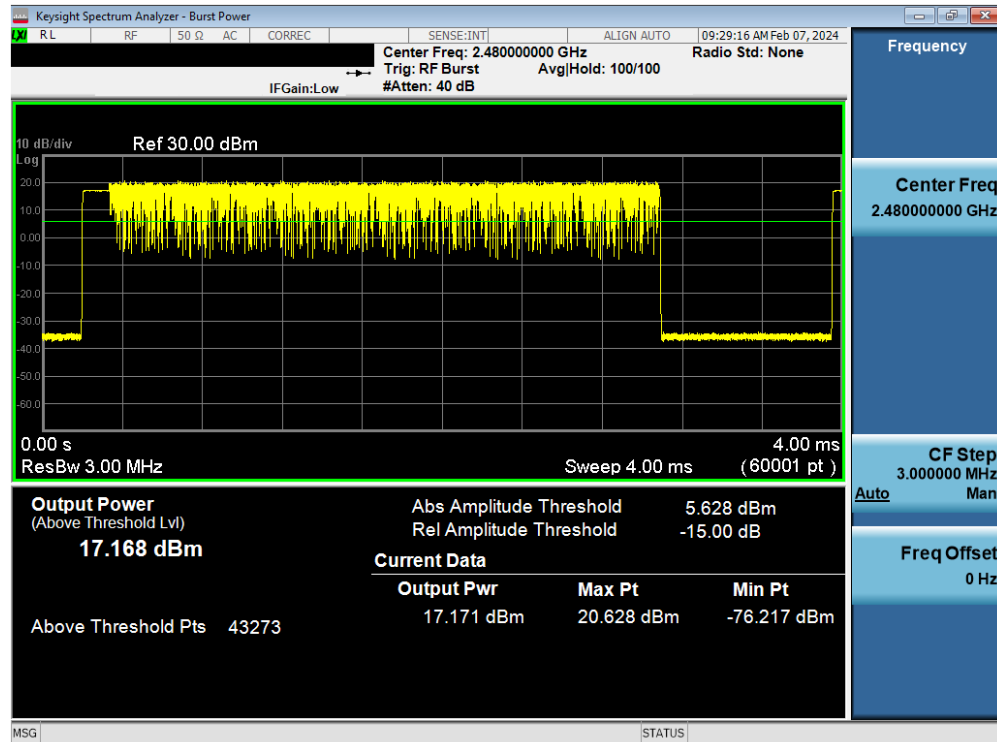


Plot 7-70. Average Conducted Power (3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 52 of 137                    |



Plot 7-71. Average Conducted Power (3Mbps – Ch. 39)



Plot 7-72. Average Conducted Power (3Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 53 of 137                    |

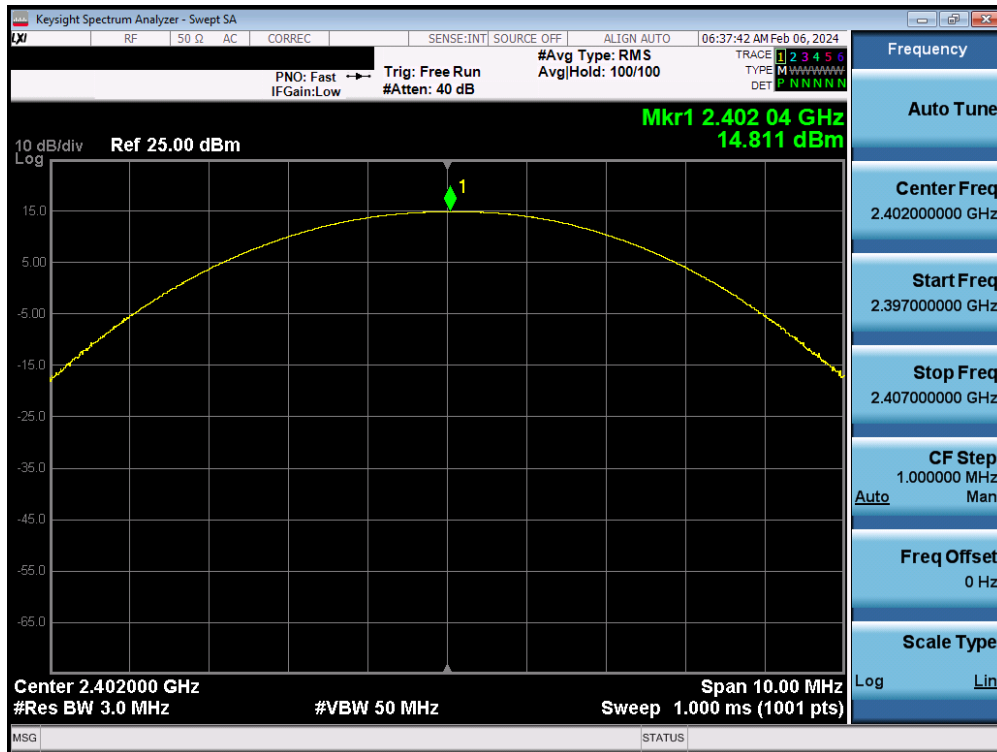


| Frequency [MHz] | Data Rate [Mbps] | Channel No. | Ant1 Peak Cond. Power |        | Ant1. Avg Cond. Power |        | Ant2 Peak Cond. Power |        | Ant2. Avg Cond. Power |        | Dual Peak Cond. Power |        | Dual Avg Cond. Power |        | Ant. Gain [dBi] | EIRP [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|------------------|-------------|-----------------------|--------|-----------------------|--------|-----------------------|--------|-----------------------|--------|-----------------------|--------|----------------------|--------|-----------------|------------|-------------|-------------|
|                 |                  |             | [dBm]                 | [mW]   | [dBm]                 | [mW]   | [dBm]                 | [mW]   | [dBm]                 | [mW]   | [dBm]                 | [mW]   | [dBm]                | [mW]   |                 |            |             |             |
| 2402            | 1.0              | 0           | 14.81                 | 30.276 | 14.64                 | 29.134 | 14.62                 | 28.947 | 14.43                 | 27.759 | 17.72                 | 59.223 | 17.55                | 56.893 | 3.36            | 21.08      | 36.02       | -14.94      |
| 2441            | 1.0              | 39          | 15.69                 | 37.051 | 15.51                 | 35.596 | 15.53                 | 35.719 | 15.36                 | 34.387 | 18.62                 | 72.770 | 18.45                | 69.983 | 3.36            | 21.98      | 36.02       | -14.04      |
| 2480            | 1.0              | 78          | 14.63                 | 29.060 | 14.48                 | 28.067 | 14.24                 | 26.546 | 14.06                 | 25.468 | 17.45                 | 55.606 | 17.29                | 53.536 | 3.36            | 20.81      | 36.02       | -15.21      |
| 2402            | 2.0              | 0           | 14.64                 | 29.134 | 12.45                 | 17.583 | 14.39                 | 27.473 | 12.13                 | 16.342 | 17.53                 | 56.607 | 15.31                | 33.925 | 3.36            | 20.89      | 36.02       | -15.13      |
| 2441            | 2.0              | 39          | 15.45                 | 35.059 | 13.34                 | 21.582 | 15.26                 | 33.535 | 13.11                 | 20.464 | 18.36                 | 68.594 | 16.24                | 42.047 | 3.36            | 21.72      | 36.02       | -14.30      |
| 2480            | 2.0              | 78          | 14.41                 | 27.593 | 12.20                 | 16.592 | 14.11                 | 25.739 | 11.91                 | 15.538 | 17.27                 | 53.333 | 15.07                | 32.130 | 3.36            | 20.63      | 36.02       | -15.39      |
| 2402            | 3.0              | 0           | 14.96                 | 31.311 | 12.50                 | 17.787 | 14.70                 | 29.519 | 12.23                 | 16.692 | 17.84                 | 60.830 | 15.38                | 34.479 | 3.36            | 21.20      | 36.02       | -14.82      |
| 2441            | 3.0              | 39          | 15.70                 | 37.128 | 13.39                 | 21.837 | 15.56                 | 35.934 | 13.19                 | 20.859 | 18.64                 | 73.061 | 16.30                | 42.697 | 3.36            | 22.00      | 36.02       | -14.02      |
| 2480            | 3.0              | 78          | 14.67                 | 29.336 | 12.26                 | 16.827 | 14.37                 | 27.340 | 11.95                 | 15.668 | 17.53                 | 56.676 | 15.12                | 32.494 | 3.36            | 20.89      | 36.02       | -15.13      |

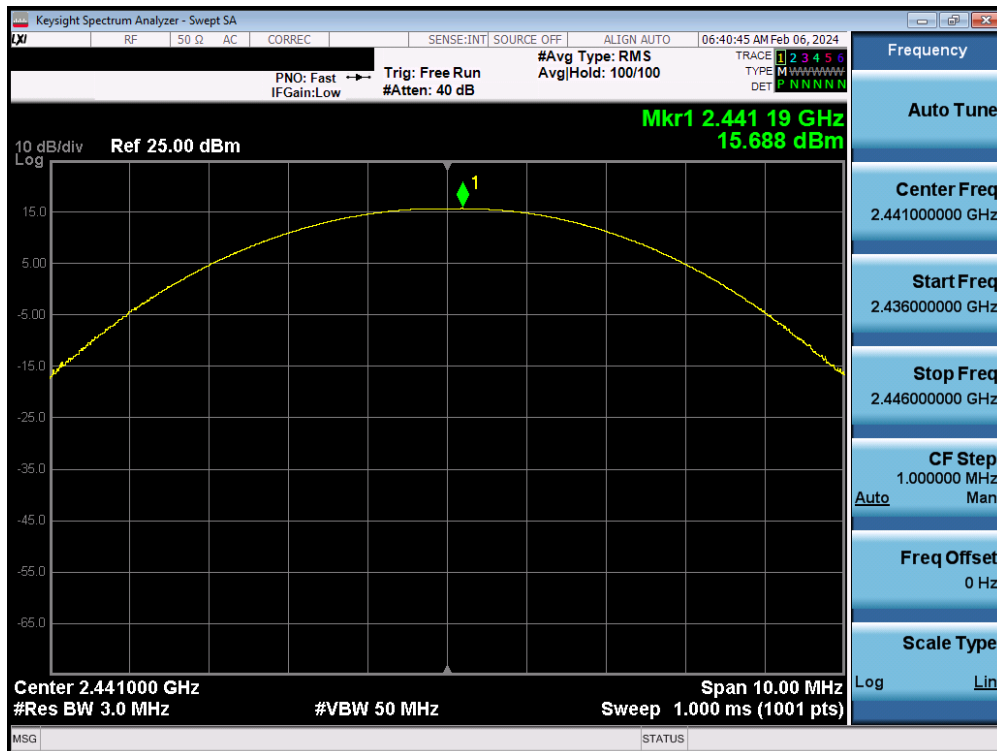
**Table 7-8. Conducted Output Power Measurements – DUAL ANT**

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 54 of 137                    |

# DUAL ANT 1

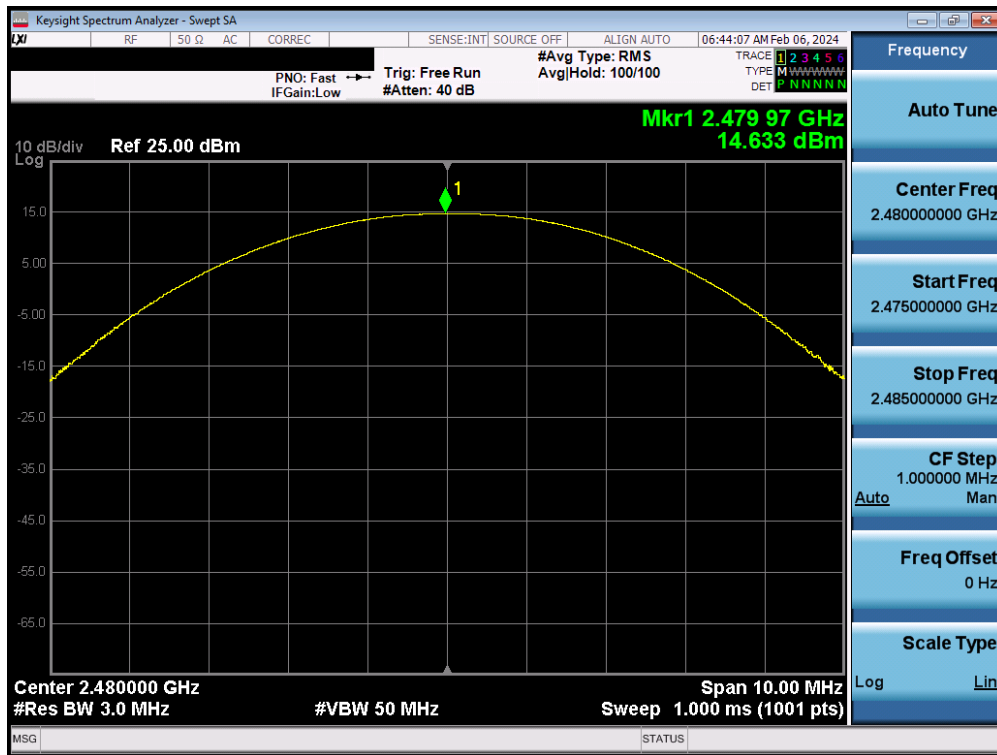


Plot 7-73. Peak Conducted Power (1Mbps – Ch. 0)

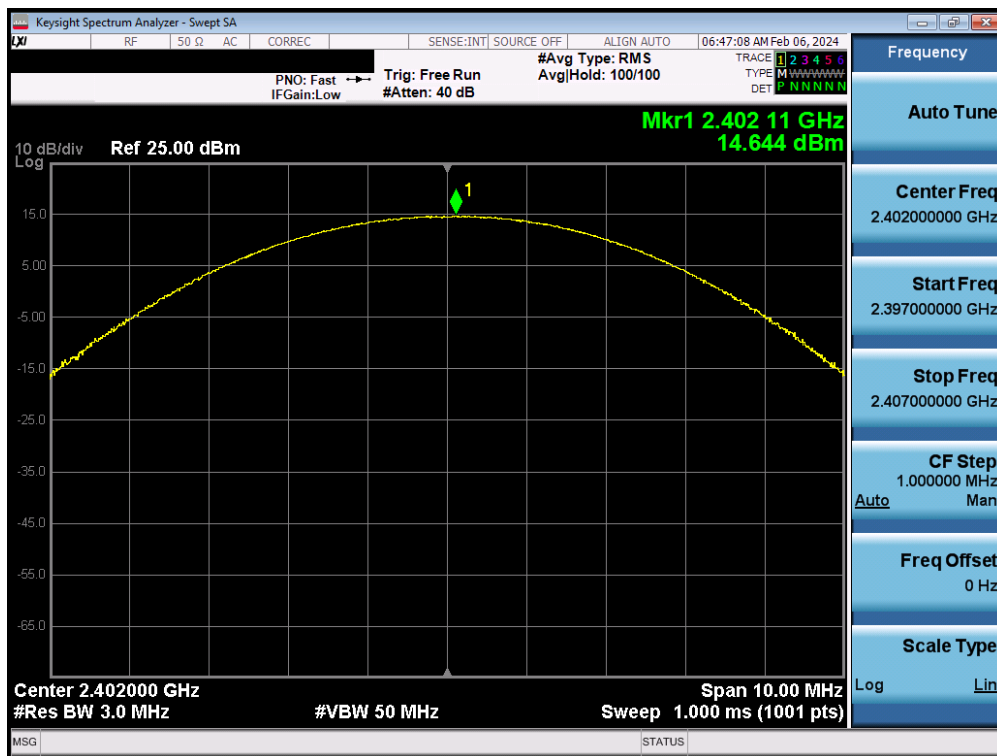


Plot 7-74. Peak Conducted Power (1Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 55 of 137                    |



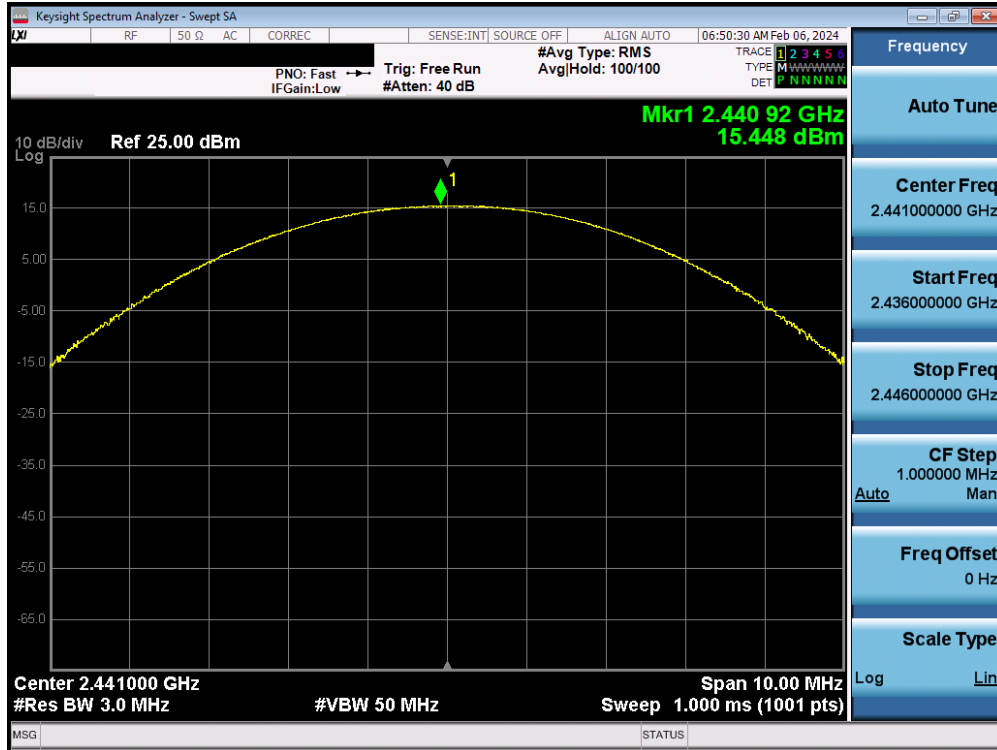
Plot 7-75. Peak Conducted Power (1Mbps – Ch. 78)



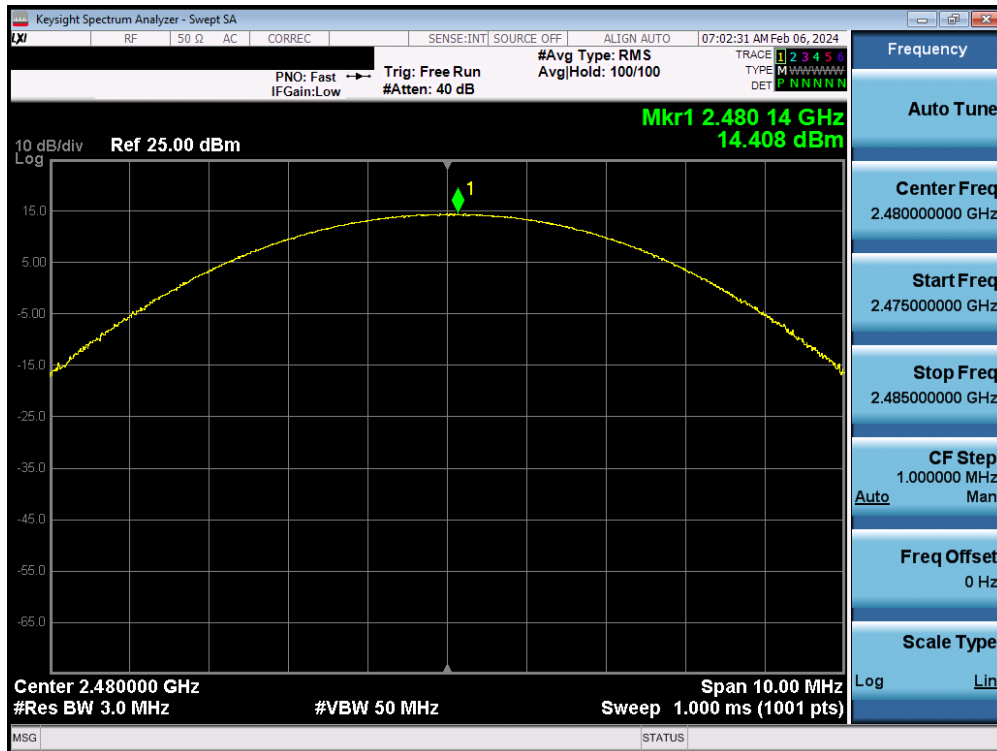
Plot 7-76. Peak Conducted Power (2Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 56 of 137                    |



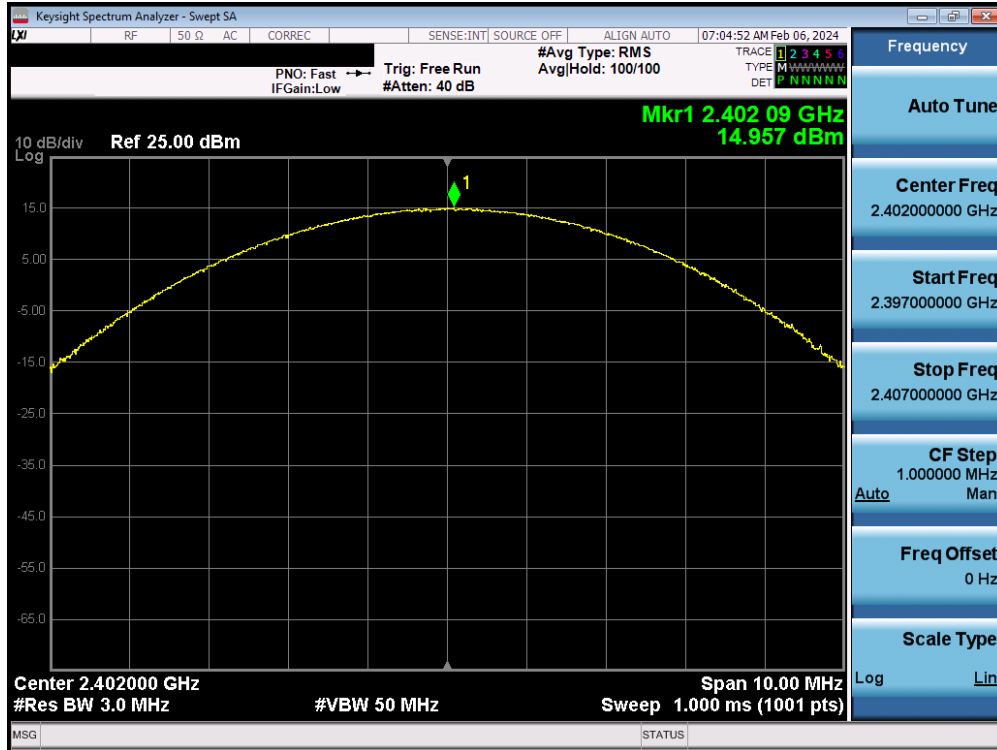


Plot 7-77. Peak Conducted Power (2Mbps – Ch. 39)

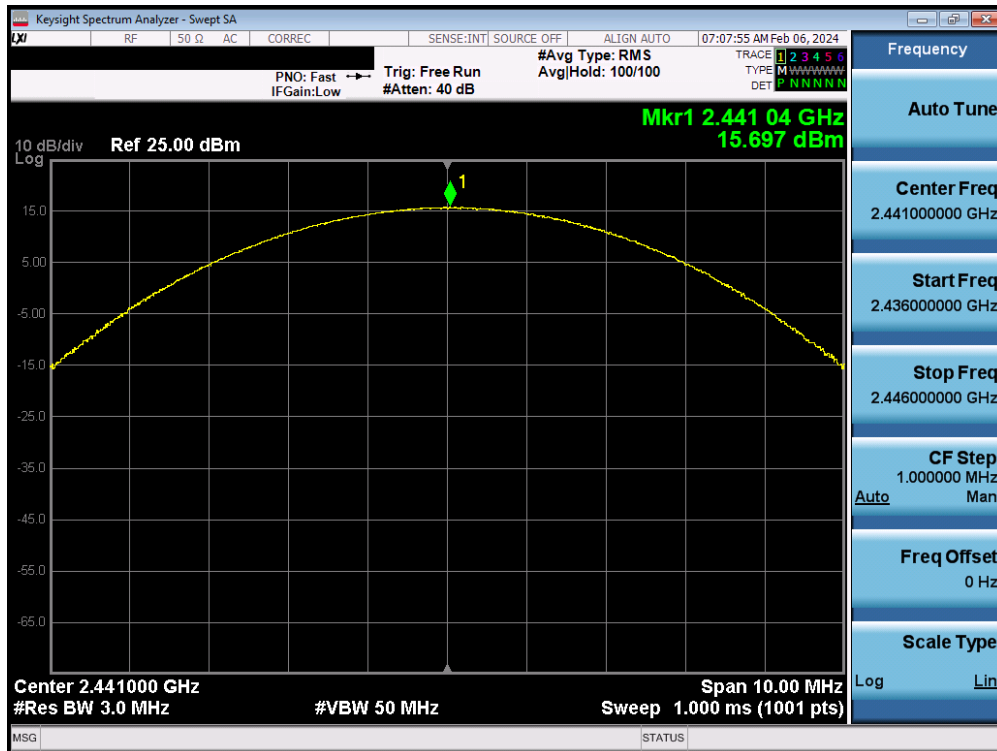


Plot 7-78. Peak Conducted Power (2Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 57 of 137                    |

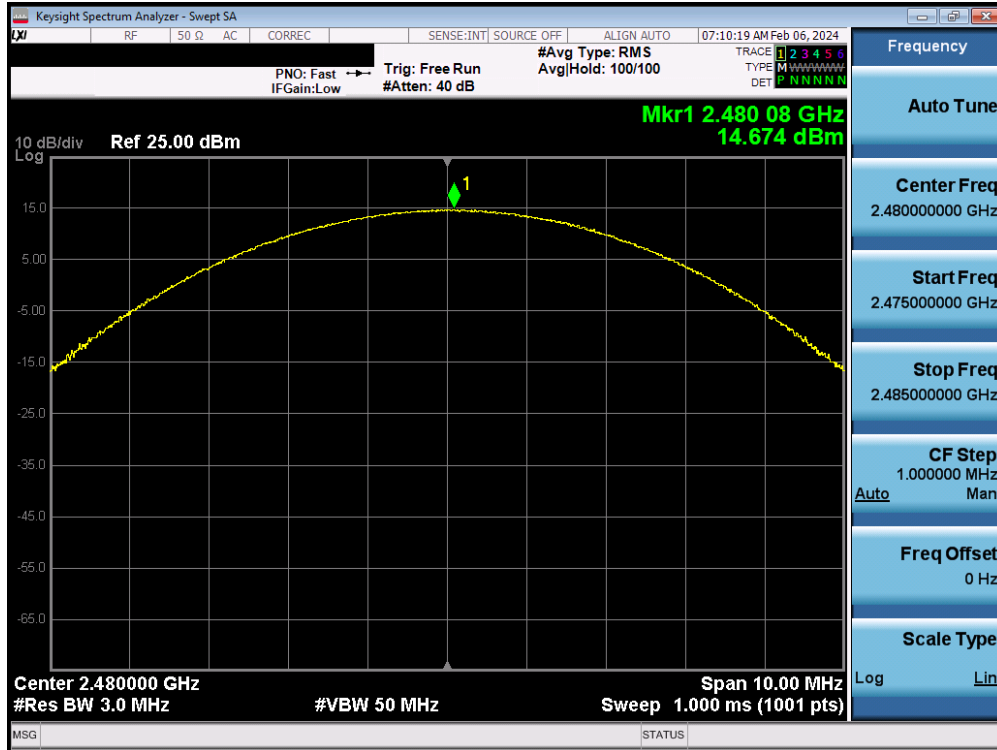


Plot 7-79. Peak Conducted Power (3Mbps – Ch. 0)

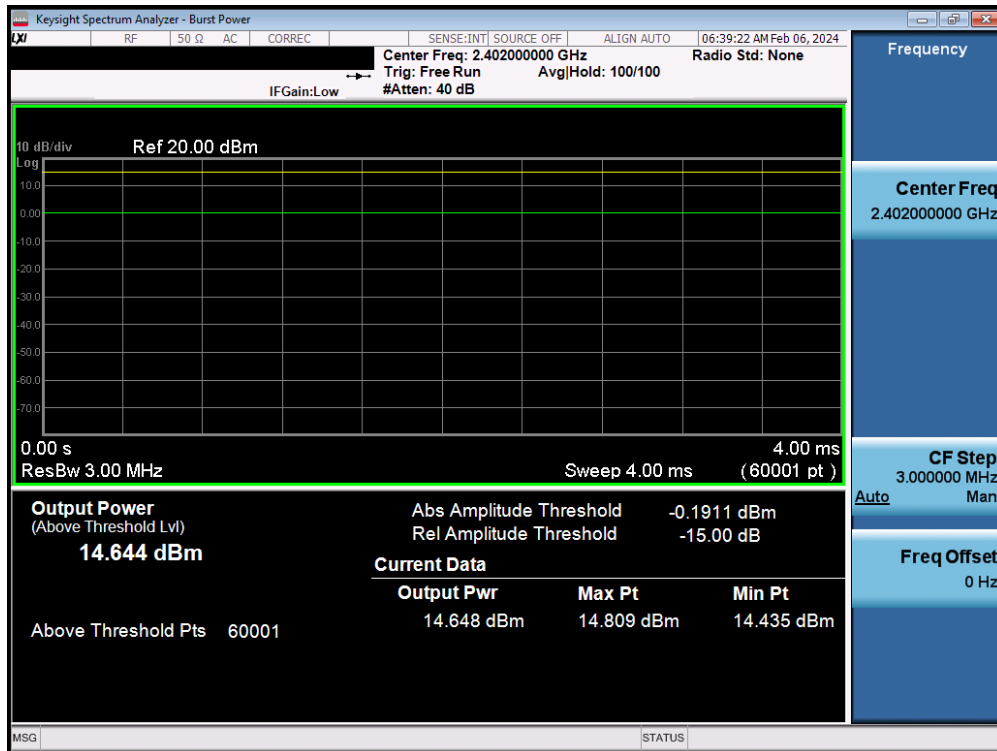


Plot 7-80. Peak Conducted Power (3Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 58 of 137                    |

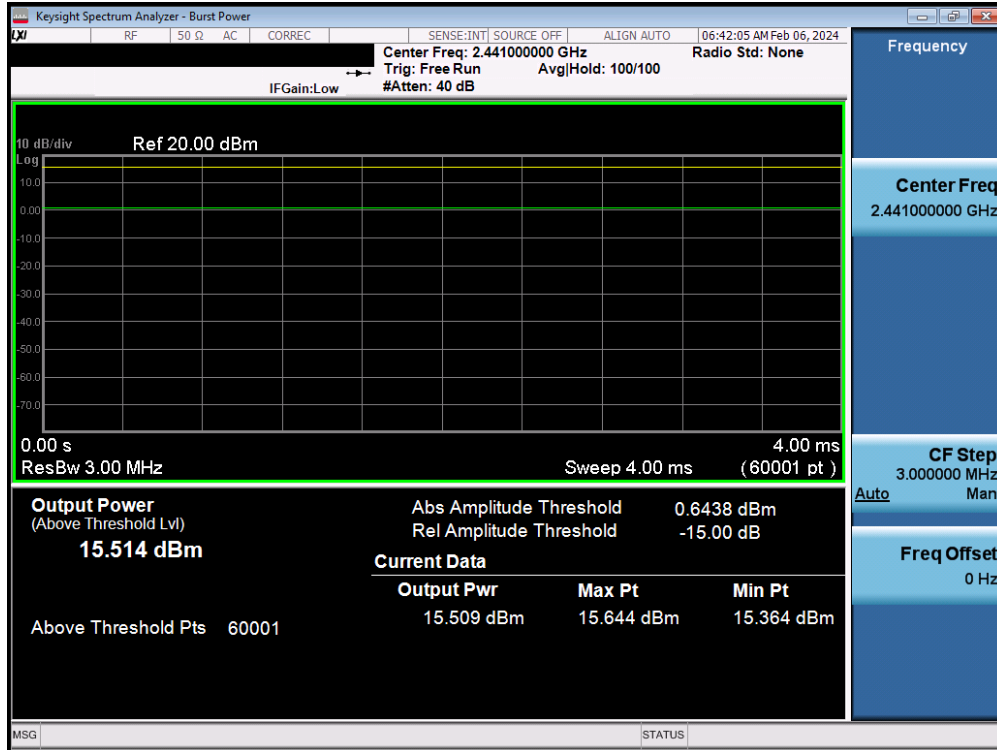


Plot 7-81. Peak Conducted Power (3Mbps – Ch. 78)

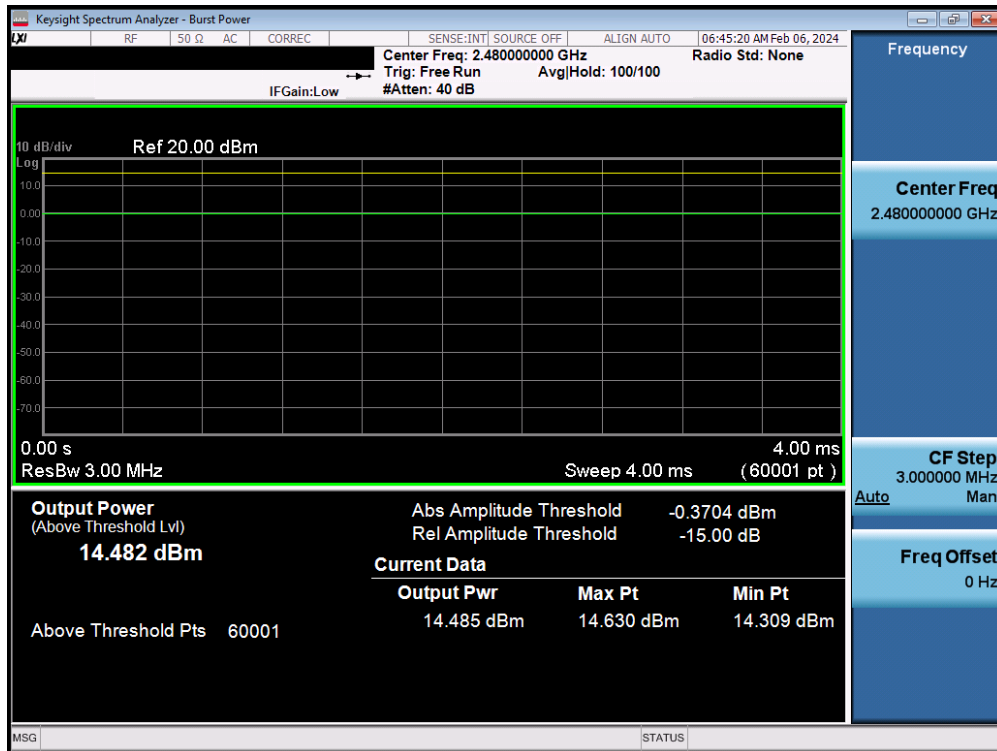


Plot 7-82. Average Conducted Power (1Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 59 of 137                    |

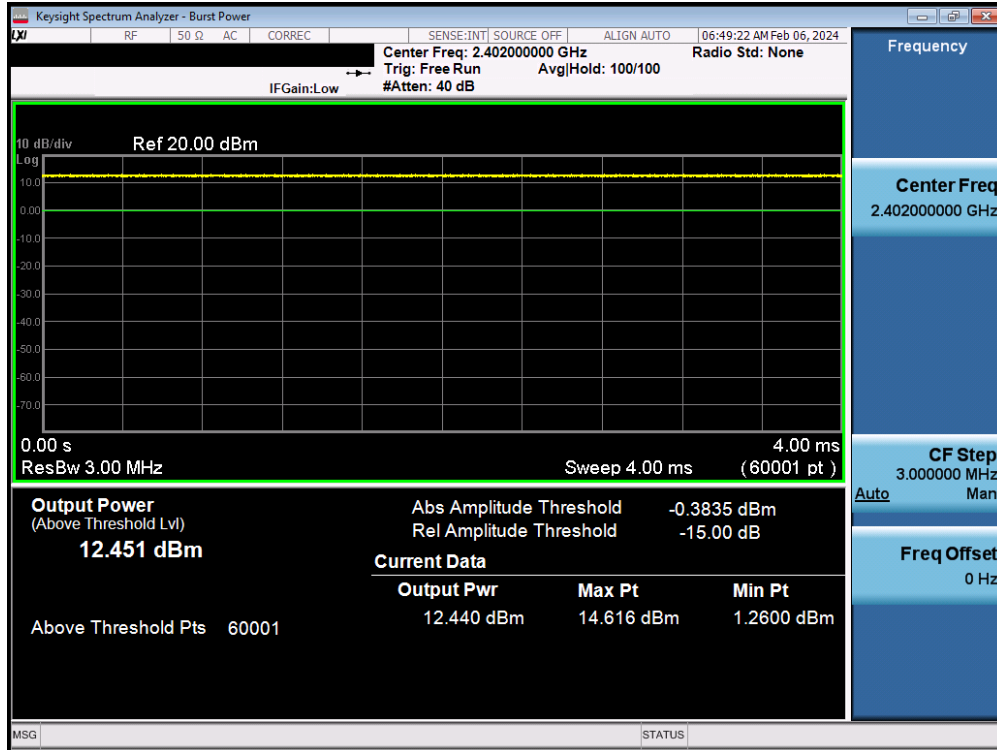


Plot 7-83. Average Conducted Power (1Mbps – Ch. 39)

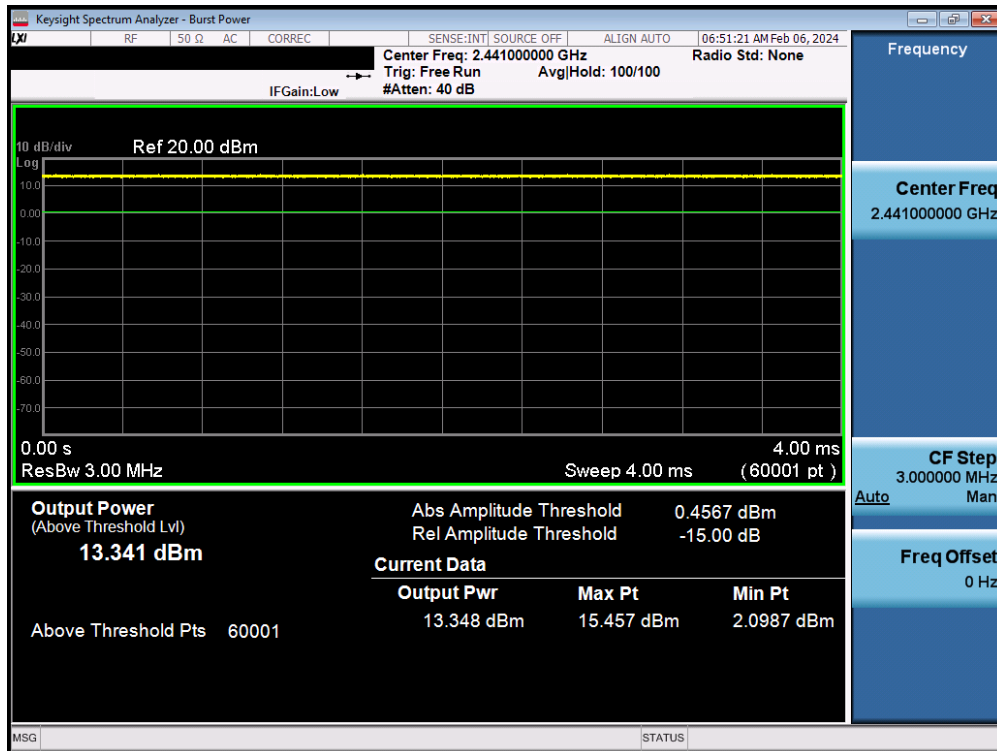


Plot 7-84. Average Conducted Power (1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 60 of 137                    |

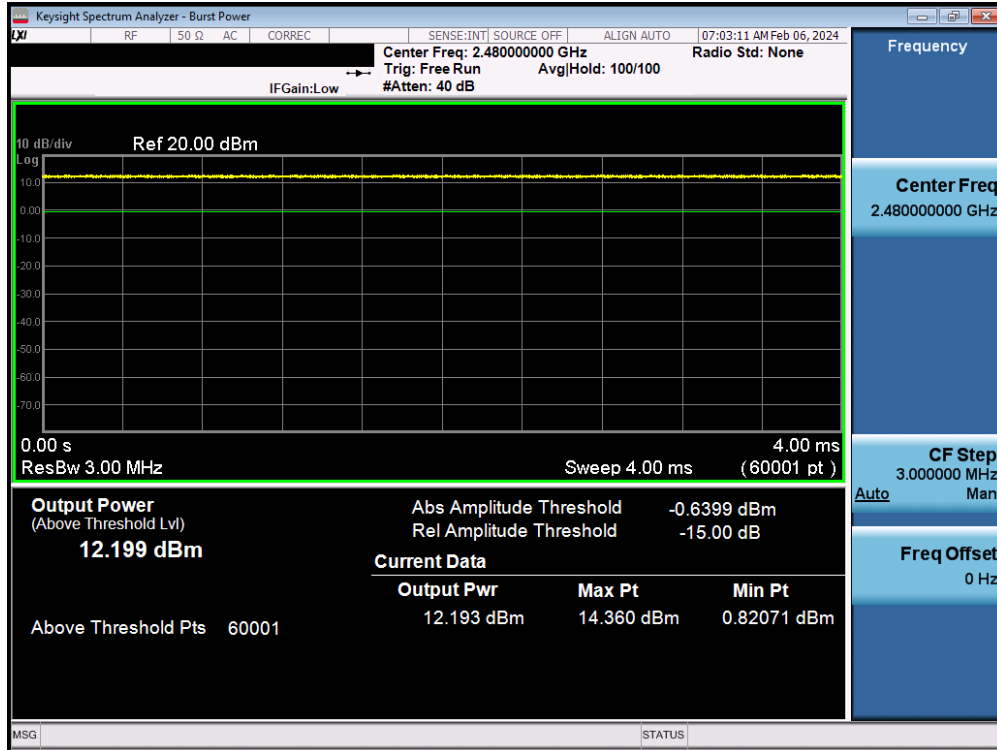


Plot 7-85. Average Conducted Power (2Mbps – Ch. 0)

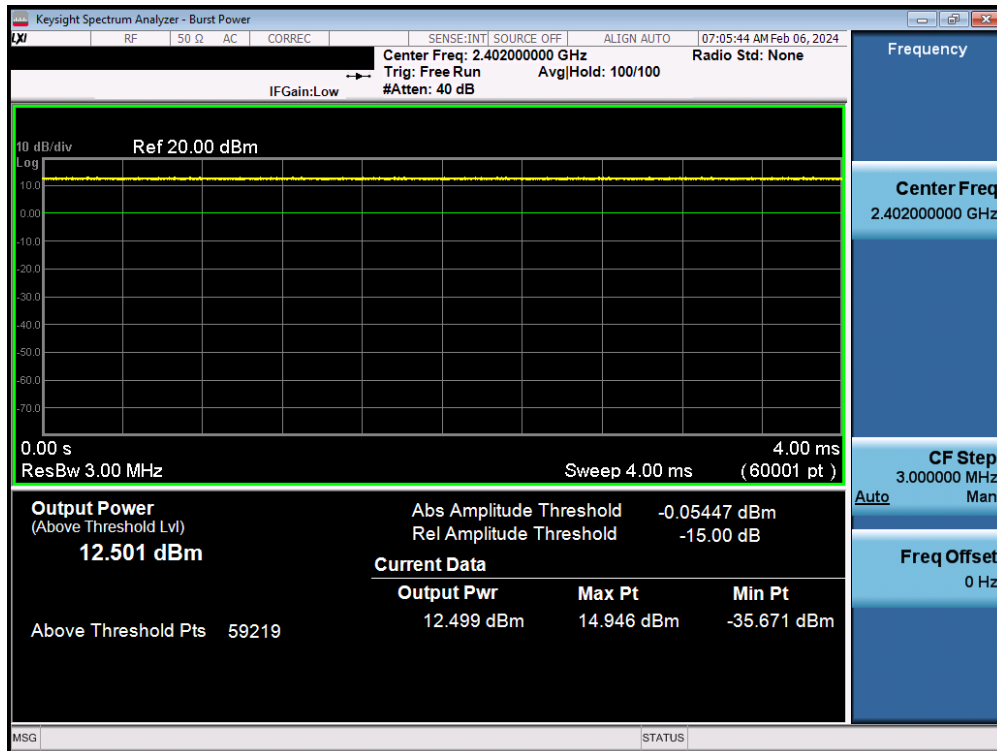


Plot 7-86. Average Conducted Power (2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 61 of 137                    |

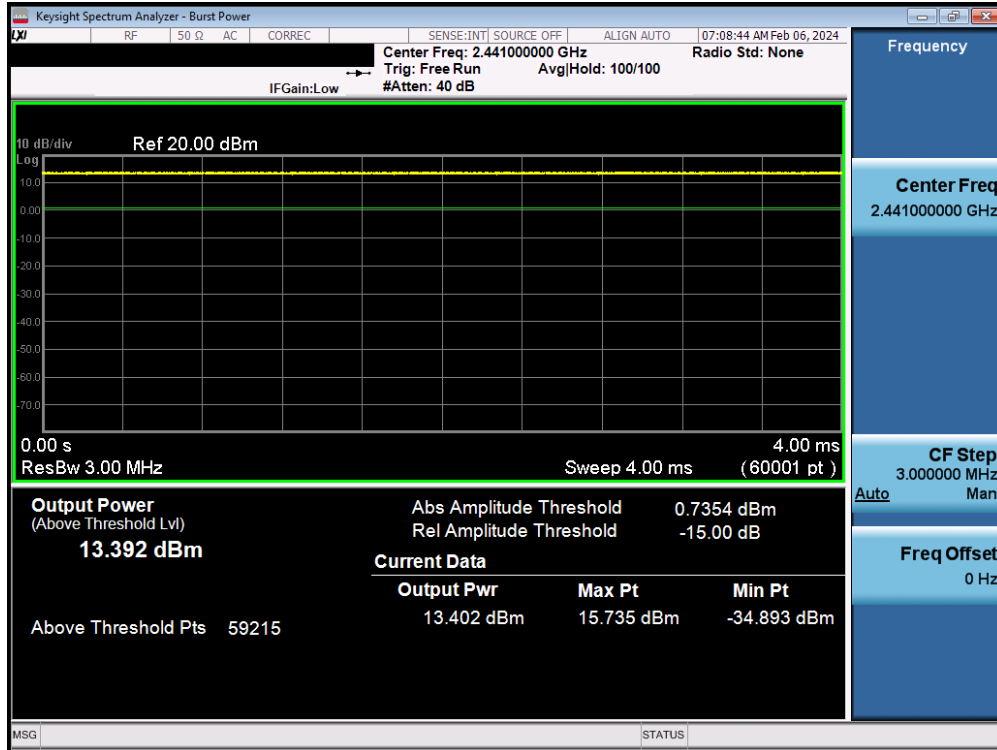


Plot 7-87. Average Conducted Power (2Mbps – Ch. 78)

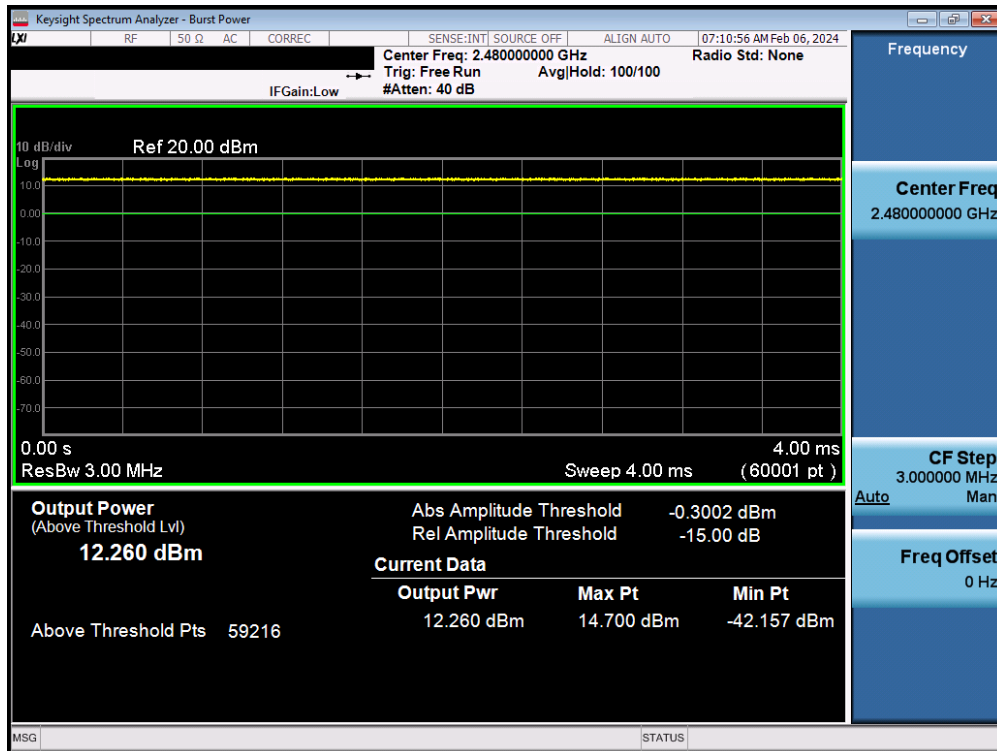


Plot 7-88. Average Conducted Power (3Mbps – Ch. 0)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 62 of 137                    |



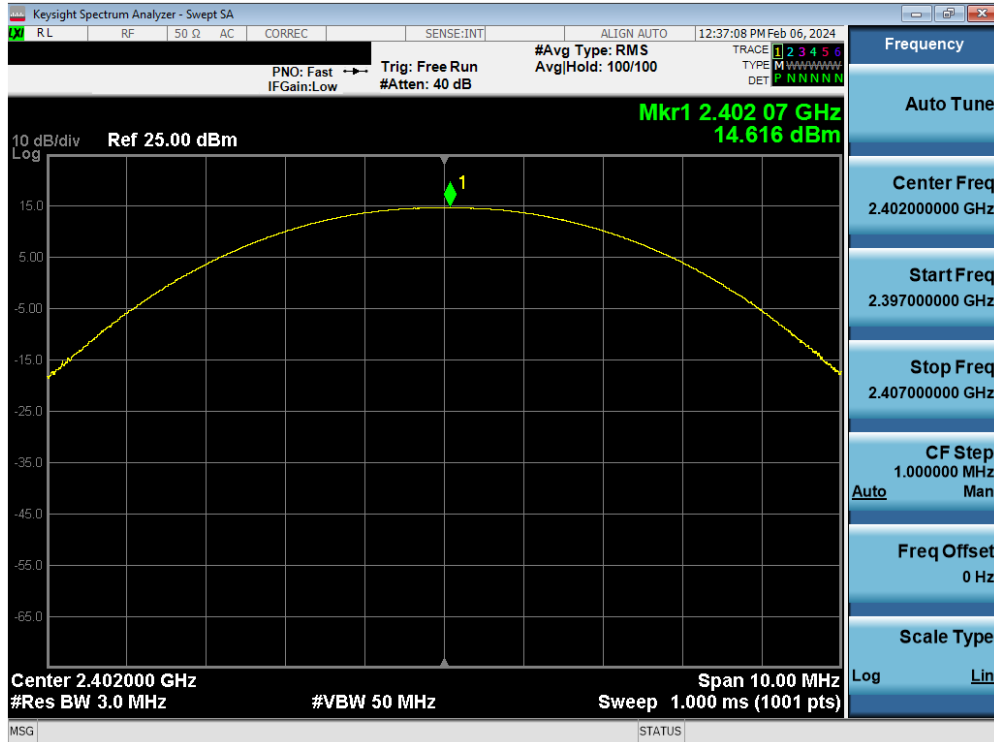
Plot 7-89. Average Conducted Power (3Mbps – Ch. 39)



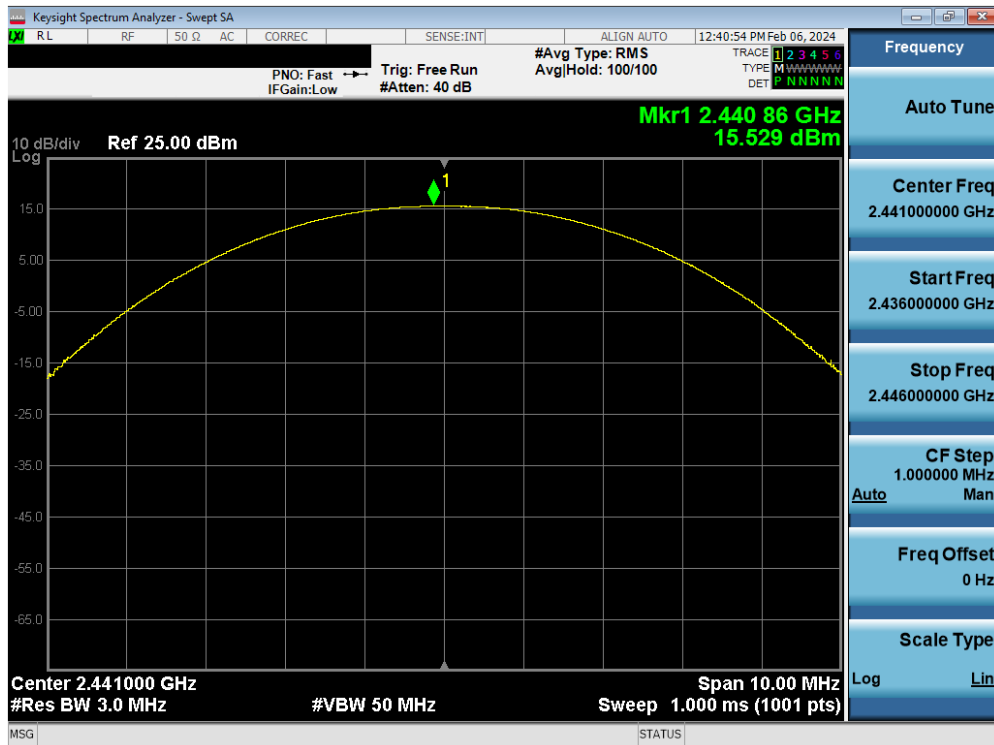
Plot 7-90. Average Conducted Power (3Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 63 of 137                    |

## DUAL ANT 2



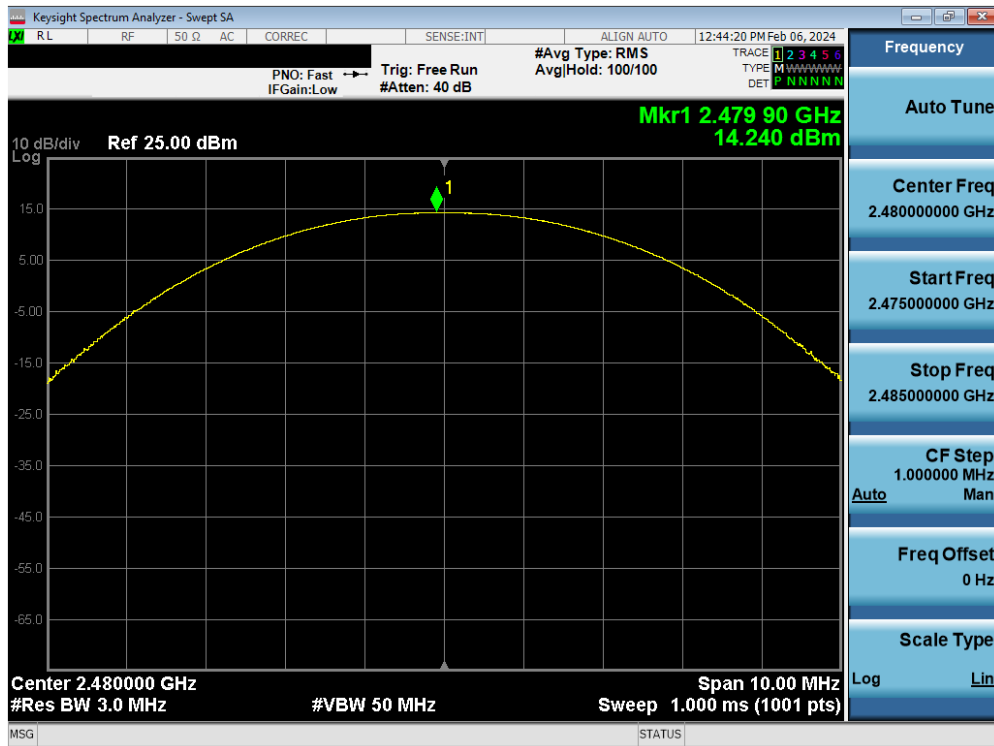
Plot 7-91. Peak Conducted Power (1Mbps – Ch. 0)



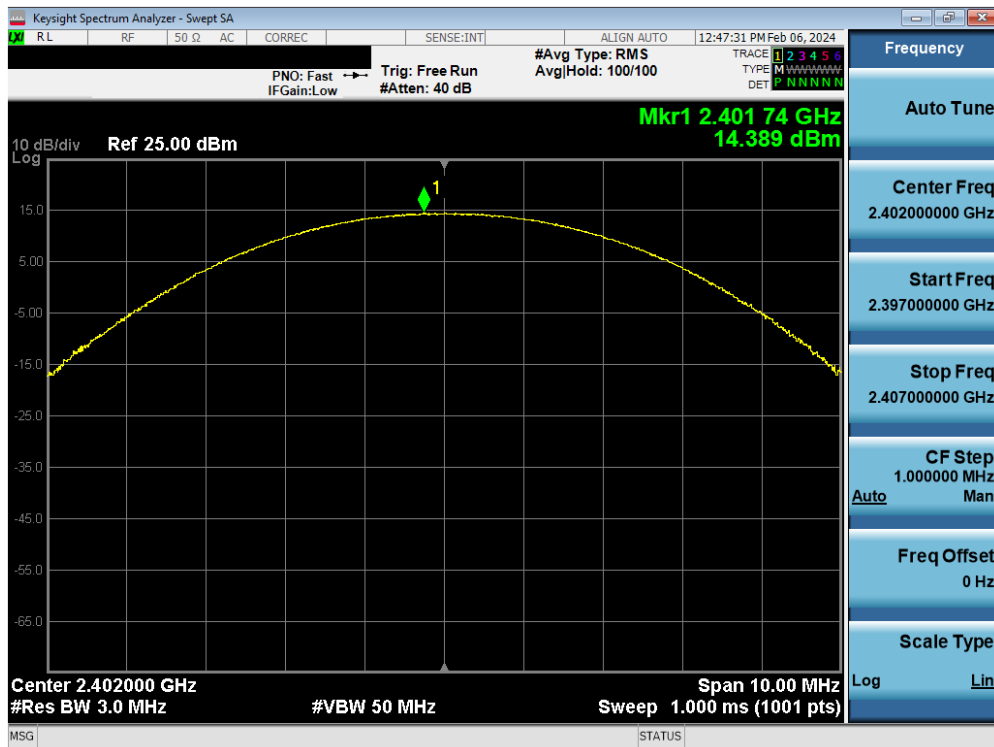
Plot 7-92. Peak Conducted Power (1Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 64 of 137                    |



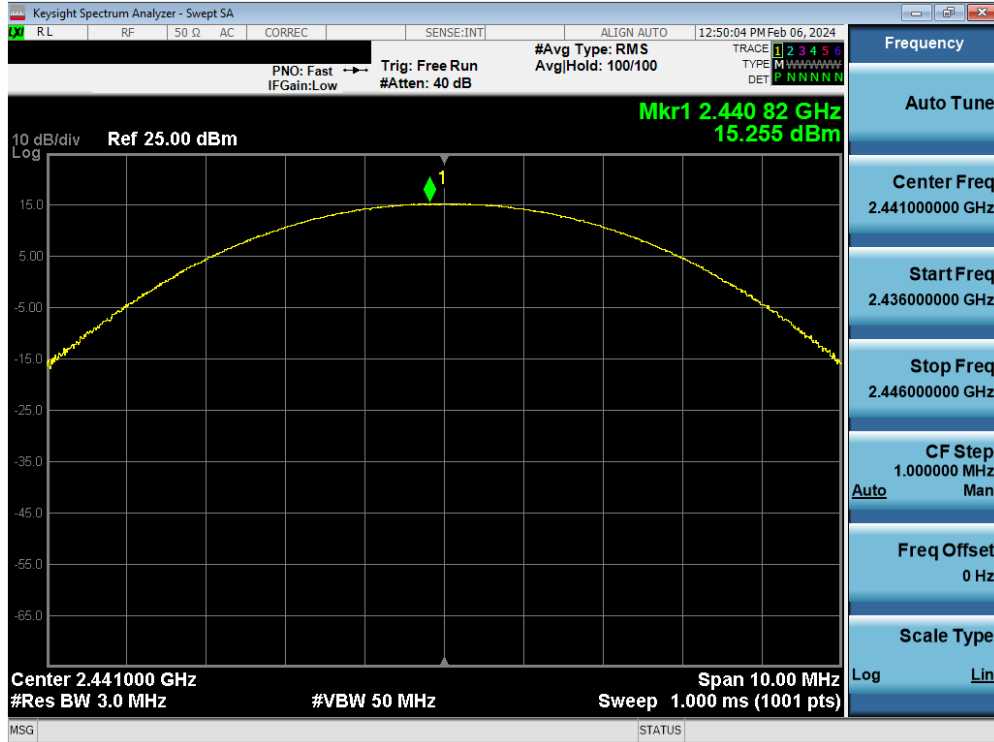


Plot 7-93. Peak Conducted Power (1Mbps – Ch. 78)

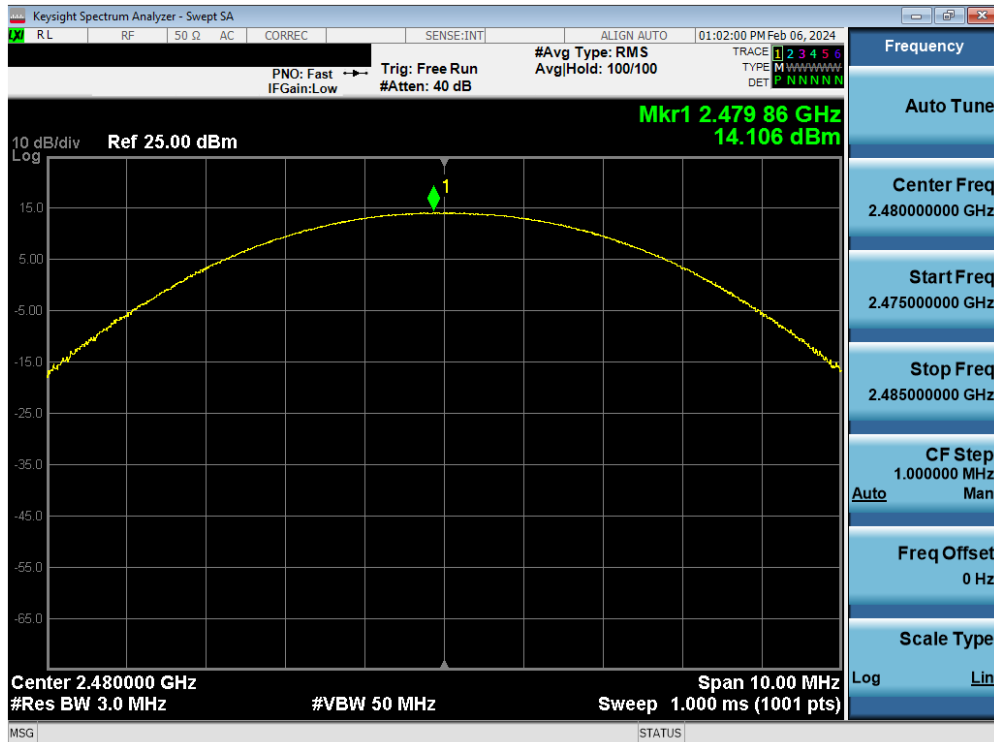


Plot 7-94. Peak Conducted Power (2Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 65 of 137                    |

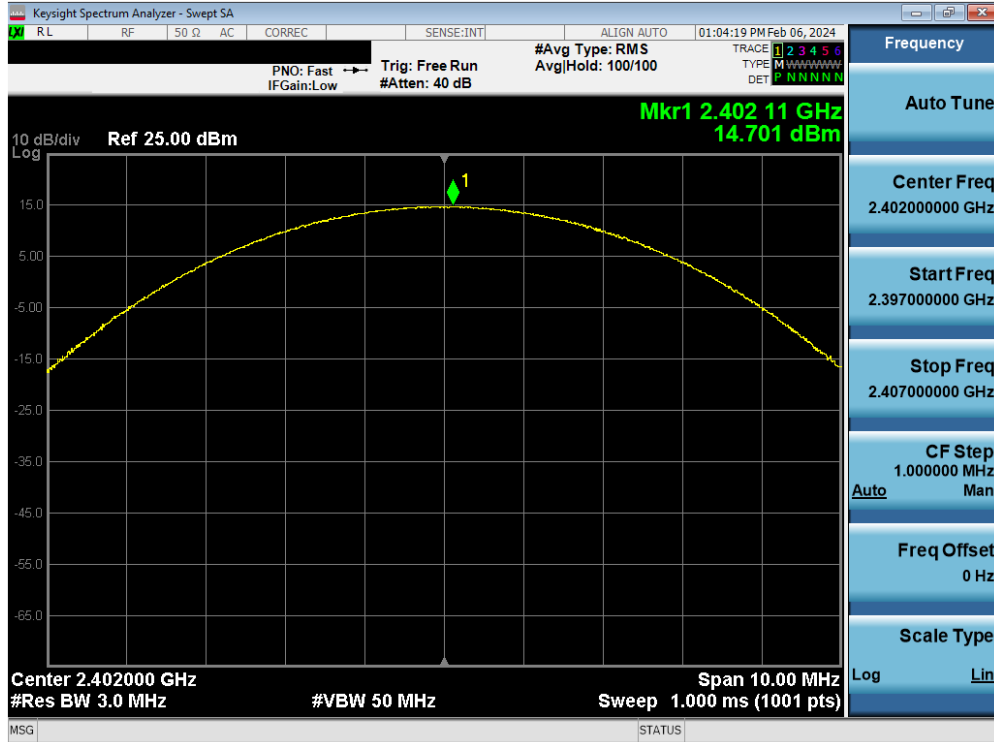


Plot 7-95. Peak Conducted Power (2Mbps – Ch. 39)

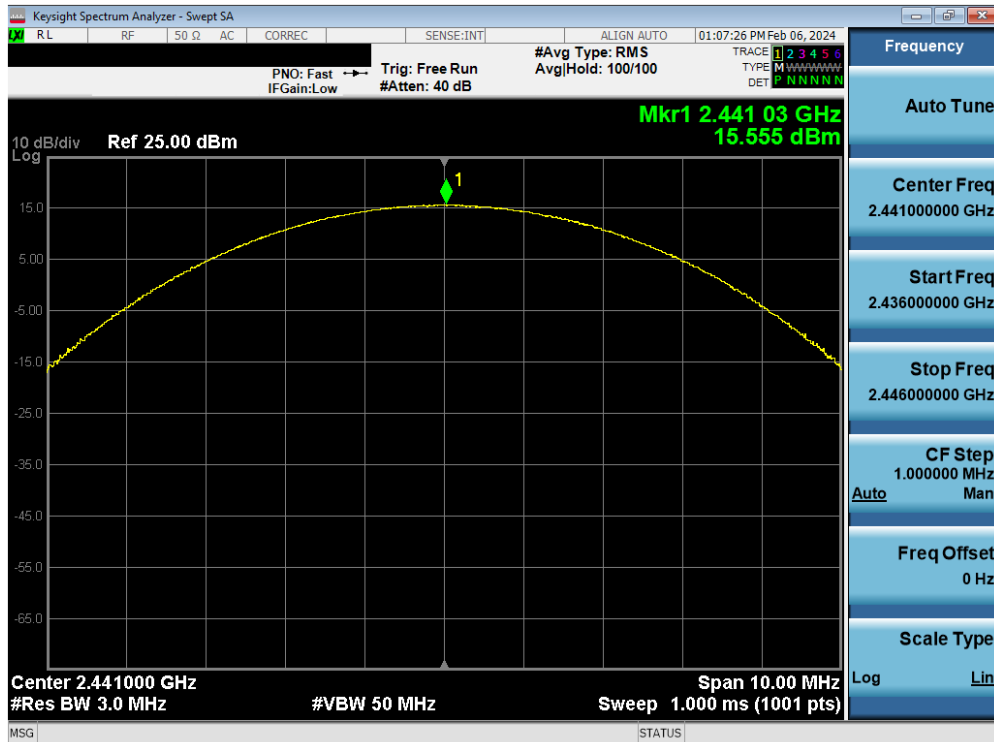


Plot 7-96. Peak Conducted Power (2Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 66 of 137                    |

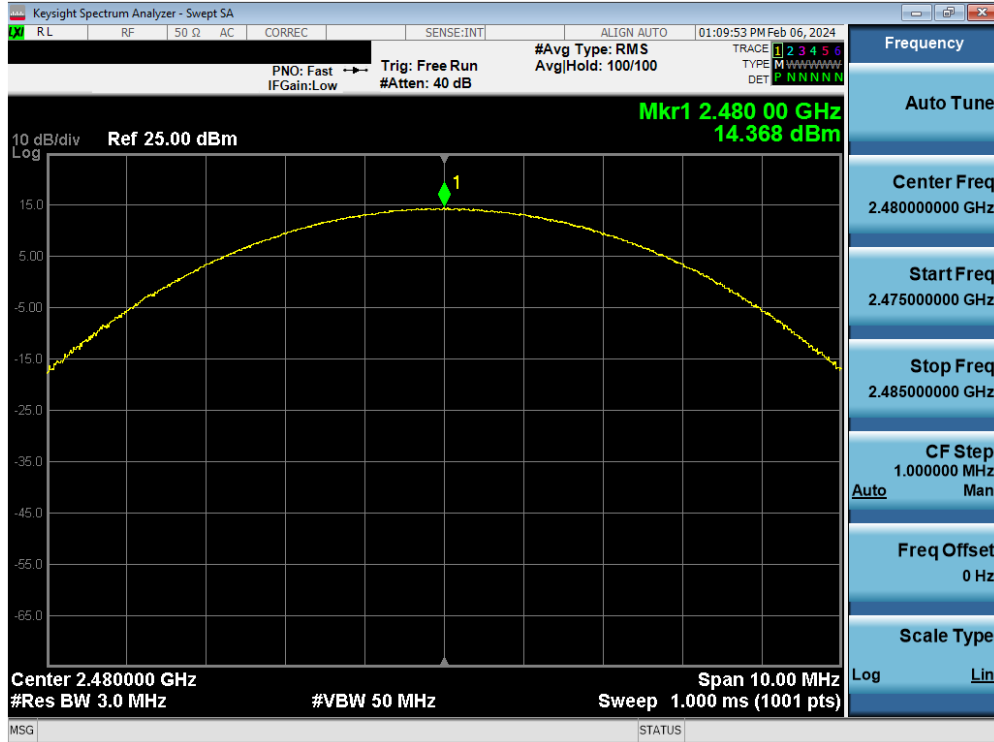


Plot 7-97. Peak Conducted Power (3Mbps – Ch. 0)

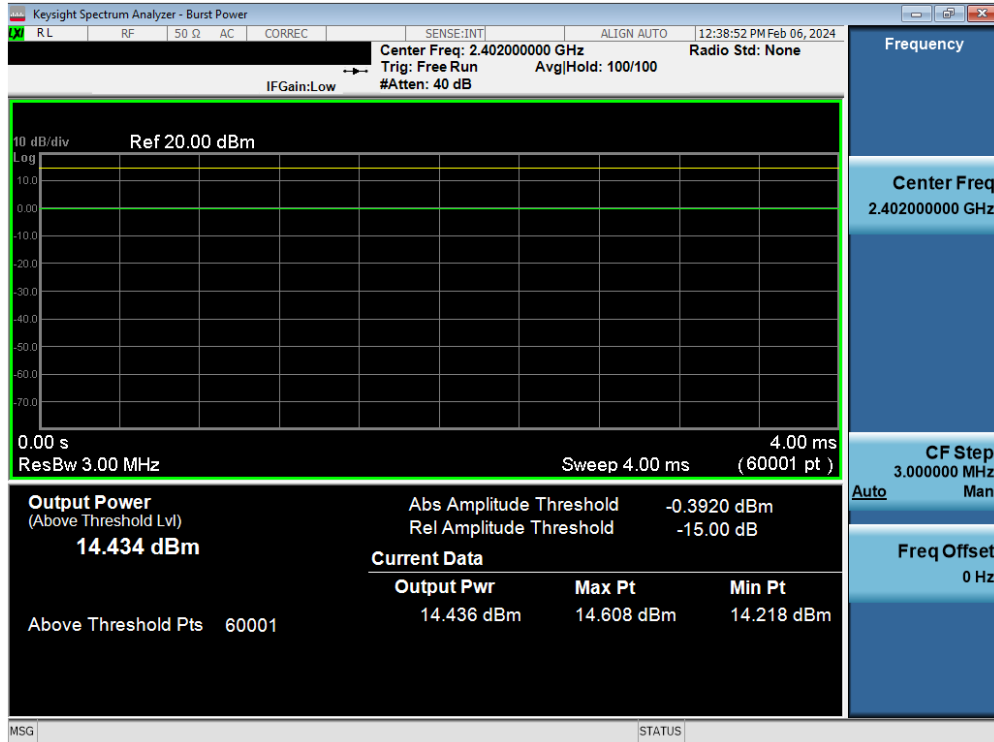


Plot 7-98. Peak Conducted Power (3Mbps – Ch. 39)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 67 of 137                    |

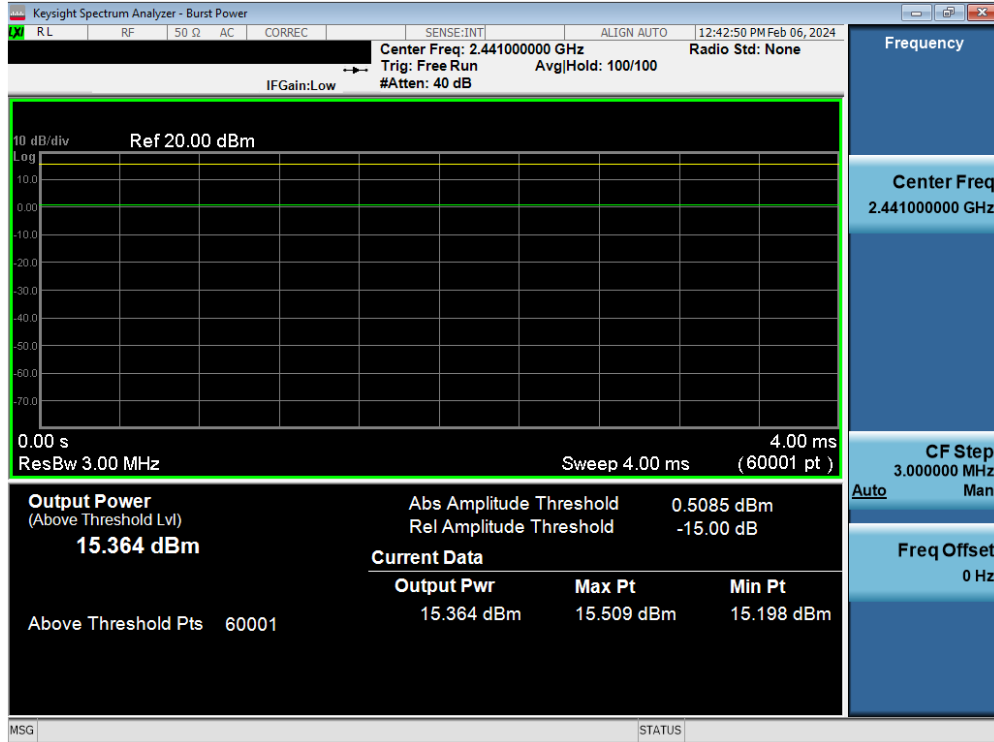


Plot 7-99. Peak Conducted Power (3Mbps – Ch. 78)



Plot 7-100. Average Conducted Power (1Mbps – Ch. 0)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 68 of 137                    |

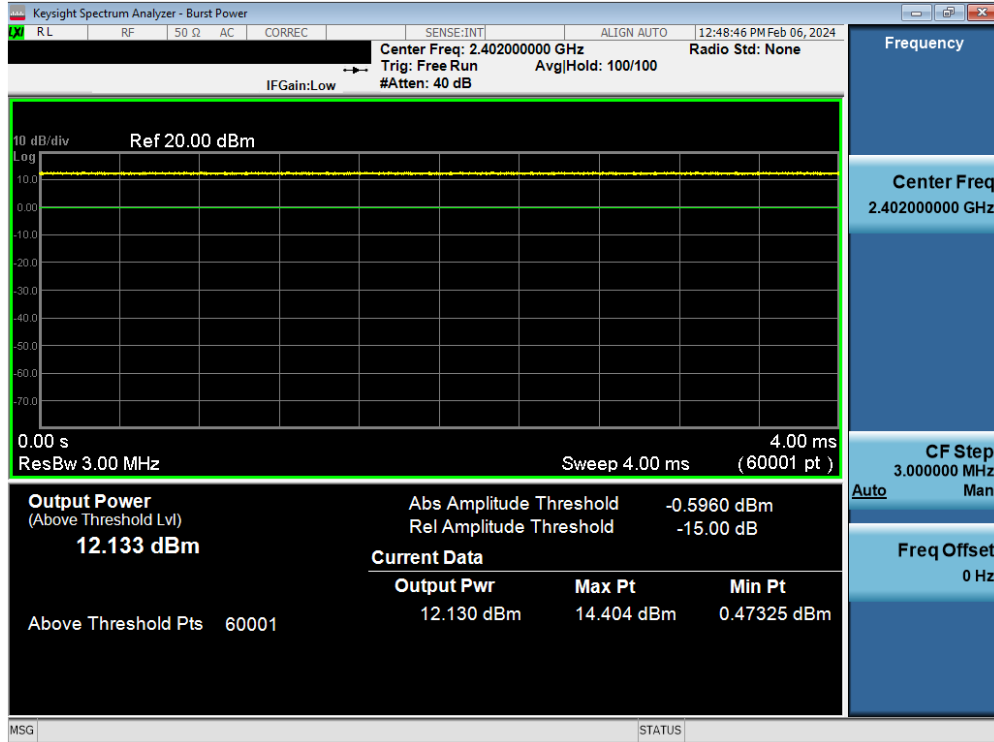


Plot 7-101. Average Conducted Power (1Mbps – Ch. 39)

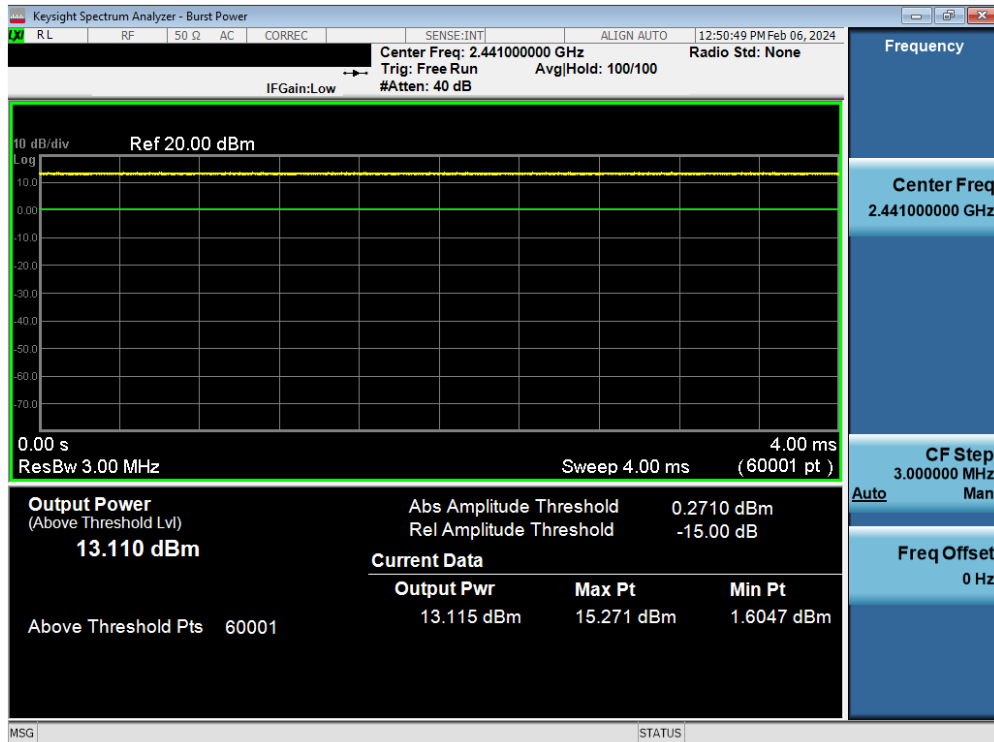


Plot 7-102. Average Conducted Power (1Mbps – Ch. 78)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 69 of 137                    |

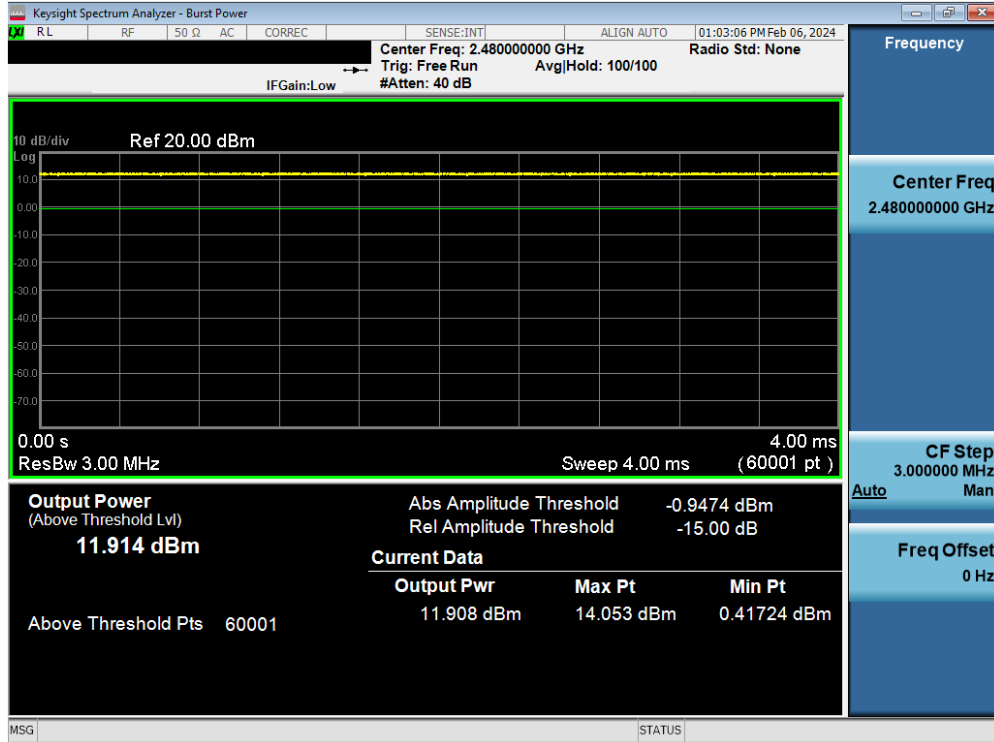


Plot 7-103. Average Conducted Power (2Mbps – Ch. 0)

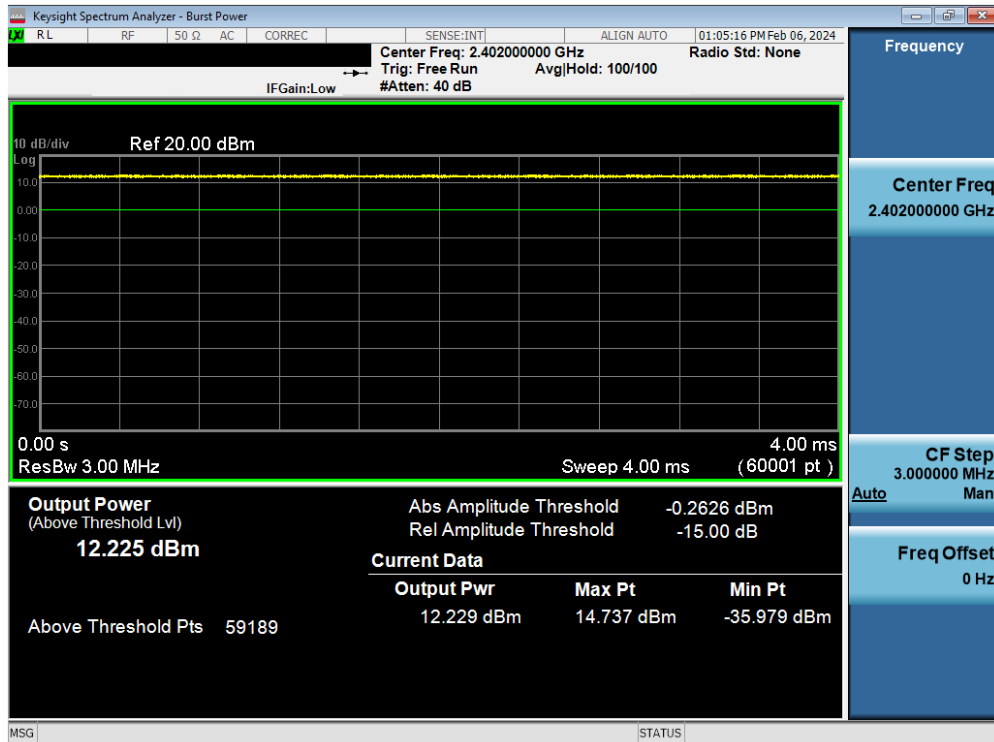


Plot 7-104. Average Conducted Power (2Mbps – Ch. 39)

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 70 of 137                    |

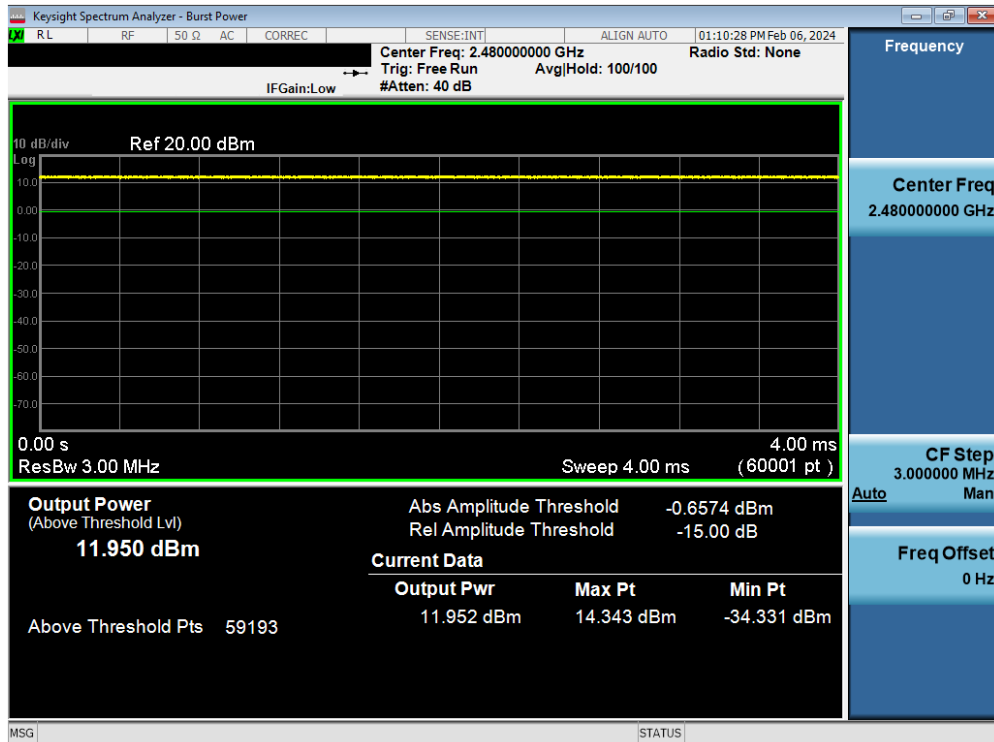
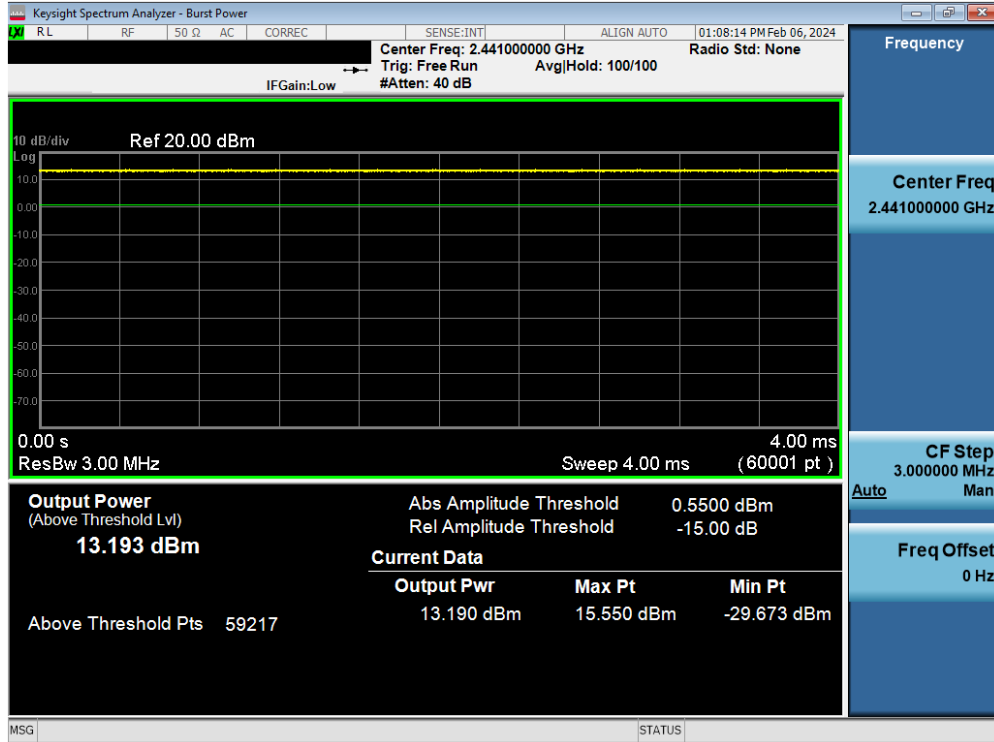


**Plot 7-105. Average Conducted Power (2Mbps – Ch. 78)**



**Plot 7-106. Average Conducted Power (3Mbps – Ch. 0)**

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 71 of 137                    |



|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 72 of 137                    |



## 7.4 Band Edge Compliance

§15.247 (d); RSS-247 [5.5]

### Test Overview and Limits

EUT operates in hopping and non-hopping transmission mode. Measurement is taken at the highest point located outside of the emission bandwidth. **The maximum permissible out-of-band emission level is 20 dBc.**

### Test Procedure Used

ANSI C63.10-2013 – Section 6.10.4

### Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 100kHz
4. VBW = 300kHz
5. Detector = Peak
6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
7. Trace mode = max hold
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



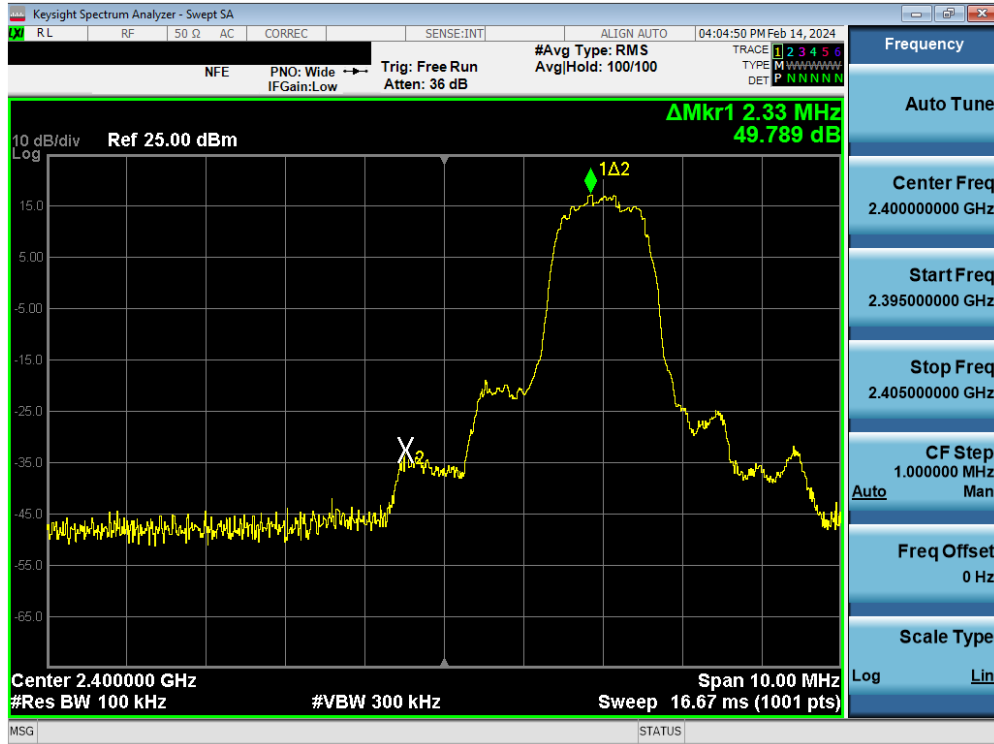
**Figure 7-3. Test Instrument & Measurement Setup**

### Test Notes

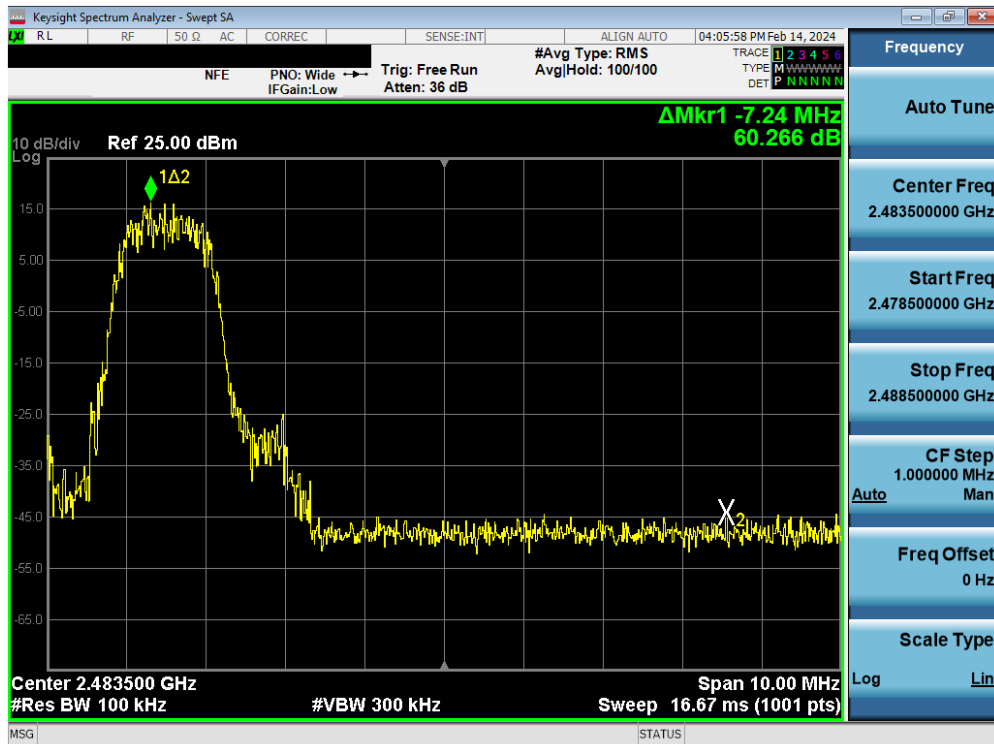
Out of band conducted spurious emissions at the band edge were investigated for all data rates in hopping and non-hopping modes. The worst case emissions were found with the EUT transmitting at 3 Mbps. Band edge emissions were also investigated with the EUT transmitting in all data rates. Plots of the worst case emissions are shown below.

|   |   |  |                                   |
|---|---|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024        | EUT Type:<br>Portable Computing Device | Page 73 of 137                    |

# SISO ANT 1



Plot 7-109. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 0)

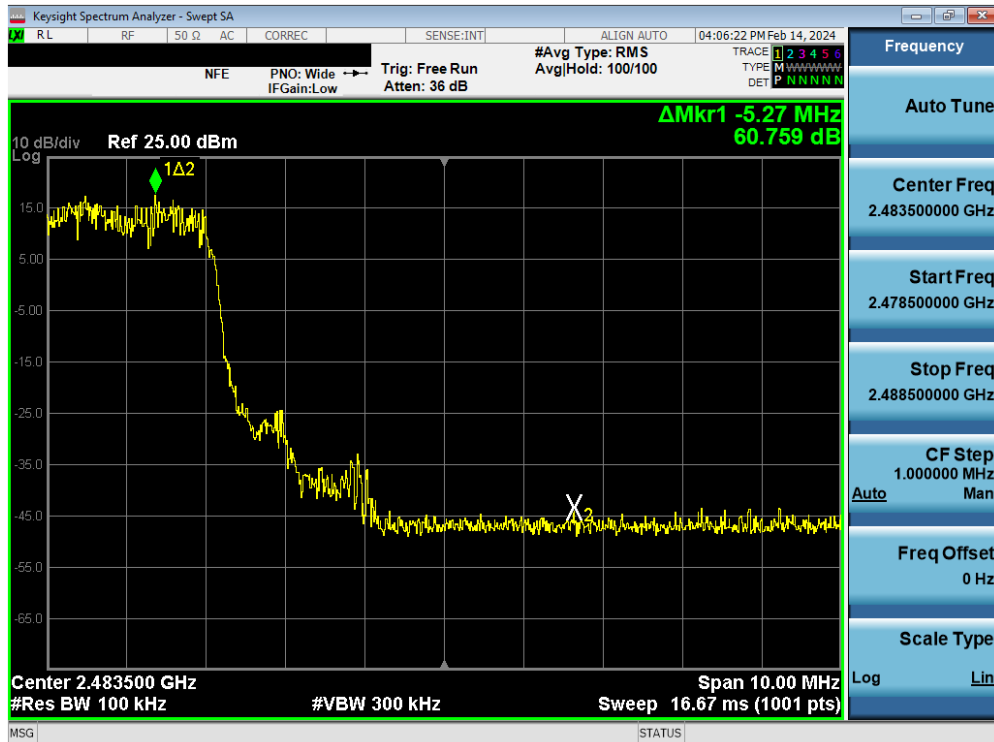


Plot 7-110. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 74 of 137                    |



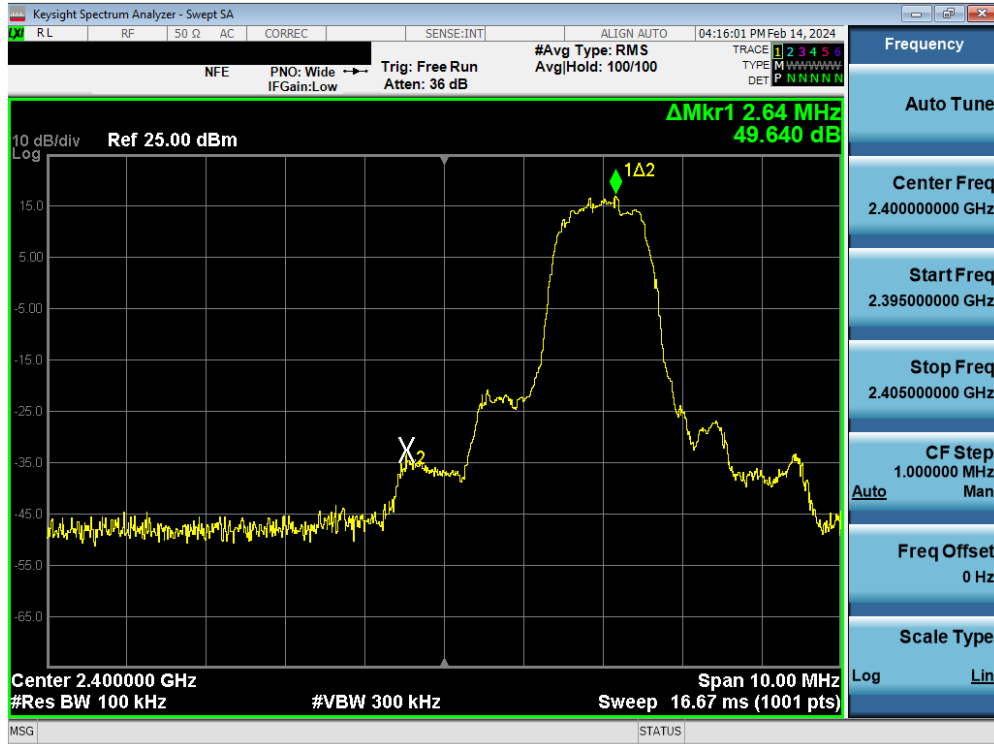
Plot 7-111. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps)



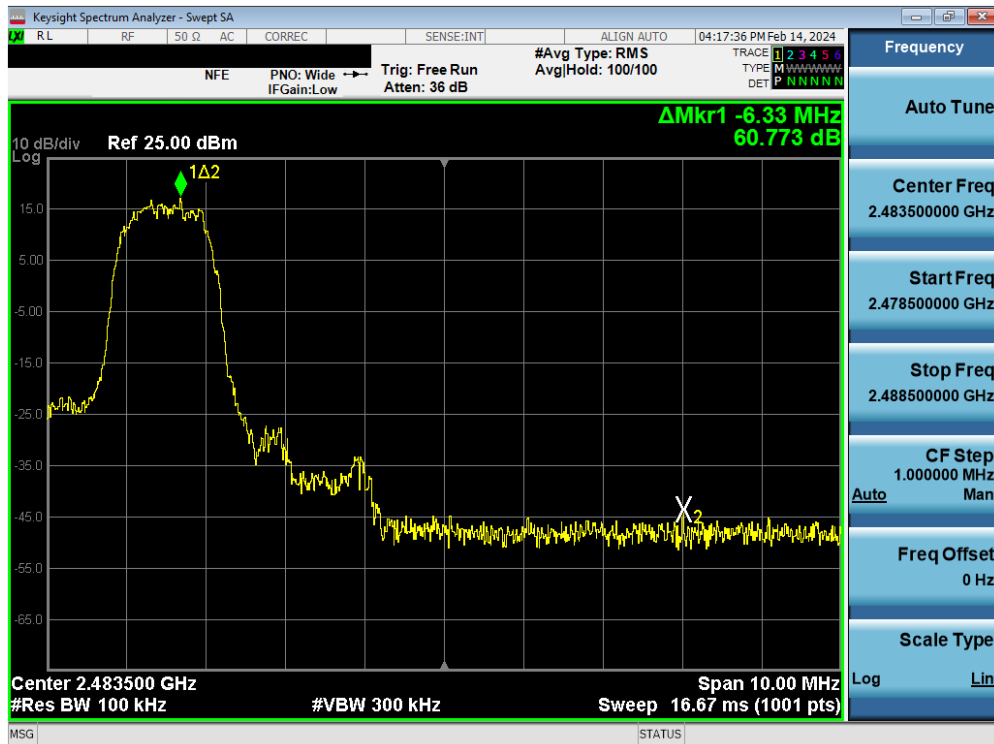
Plot 7-112. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 75 of 137                    |

# SISO ANT 2



Plot 7-113. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 0)



Plot 7-114. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 76 of 137                    |



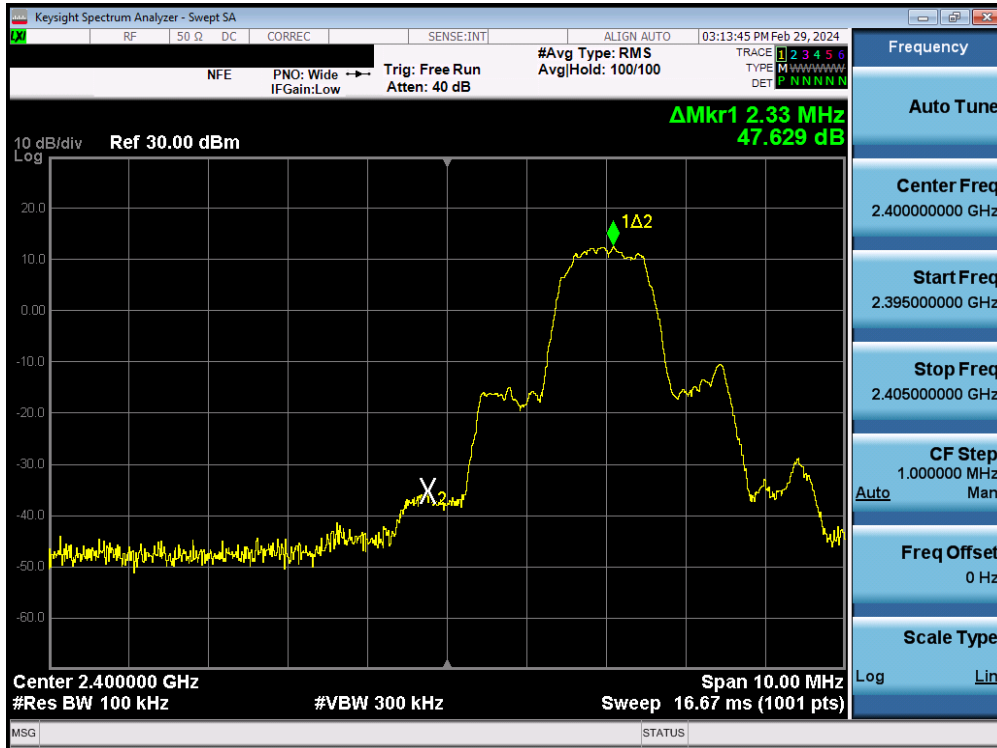
Plot 7-115. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps)



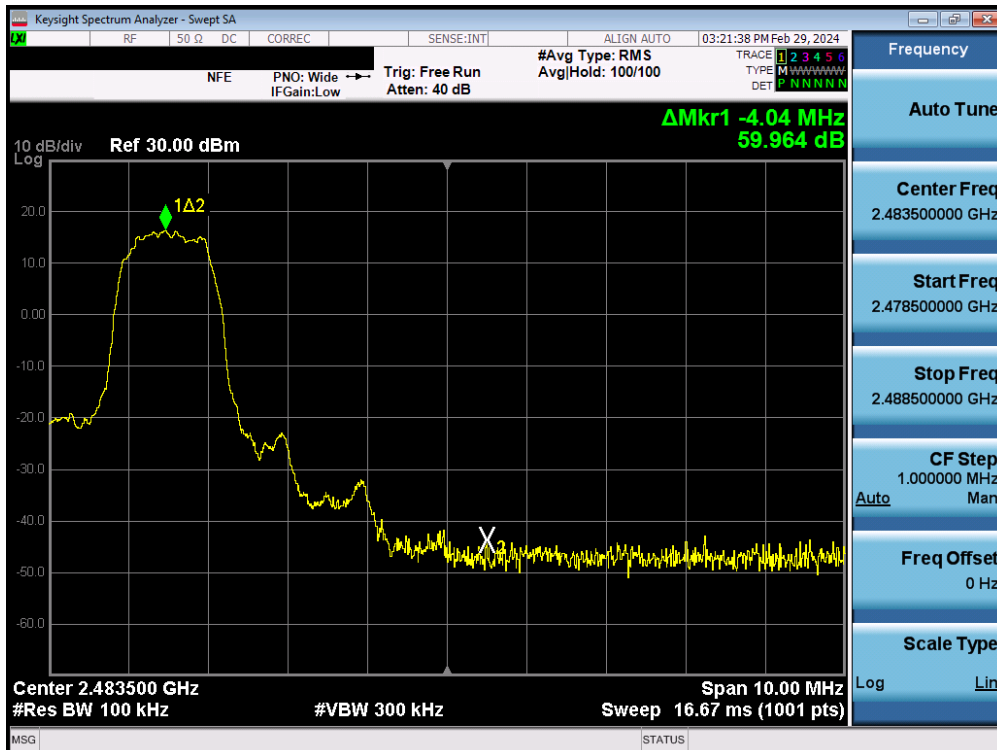
Plot 7-116. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 77 of 137                    |

# DUAL ANT 1

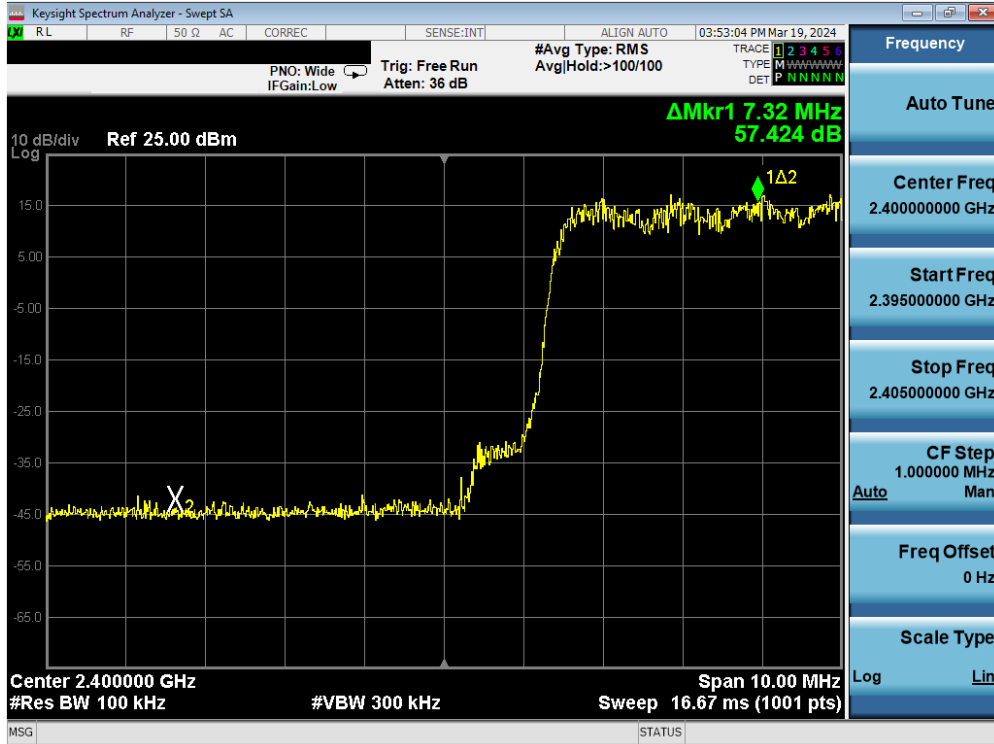


Plot 7-117. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 0)

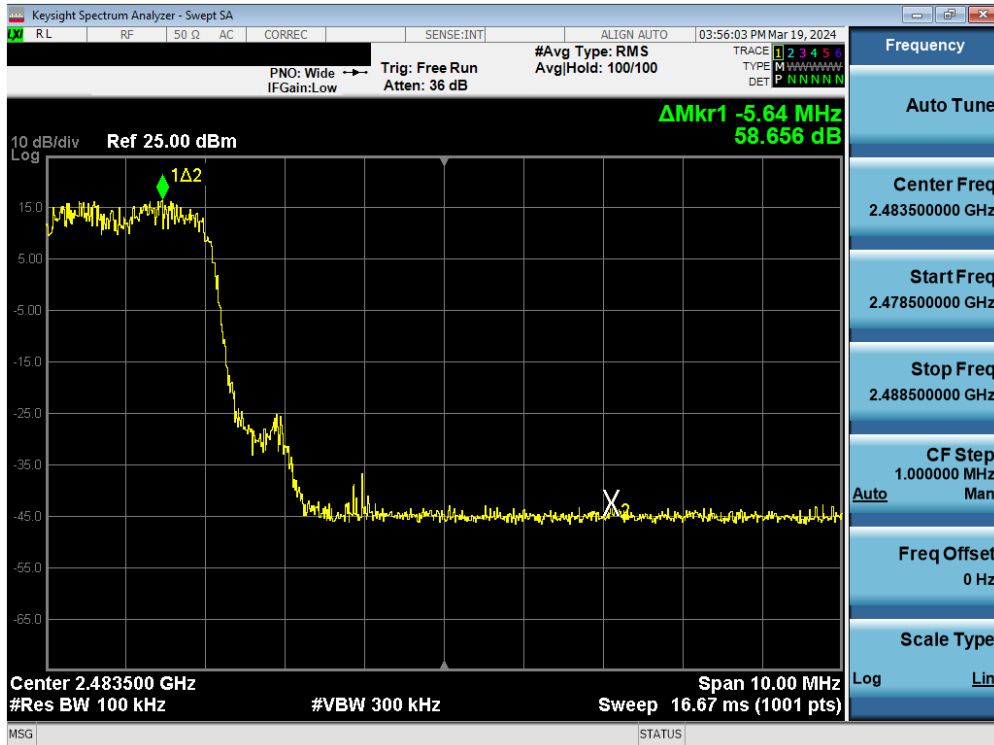


Plot 7-118. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 78 of 137                    |



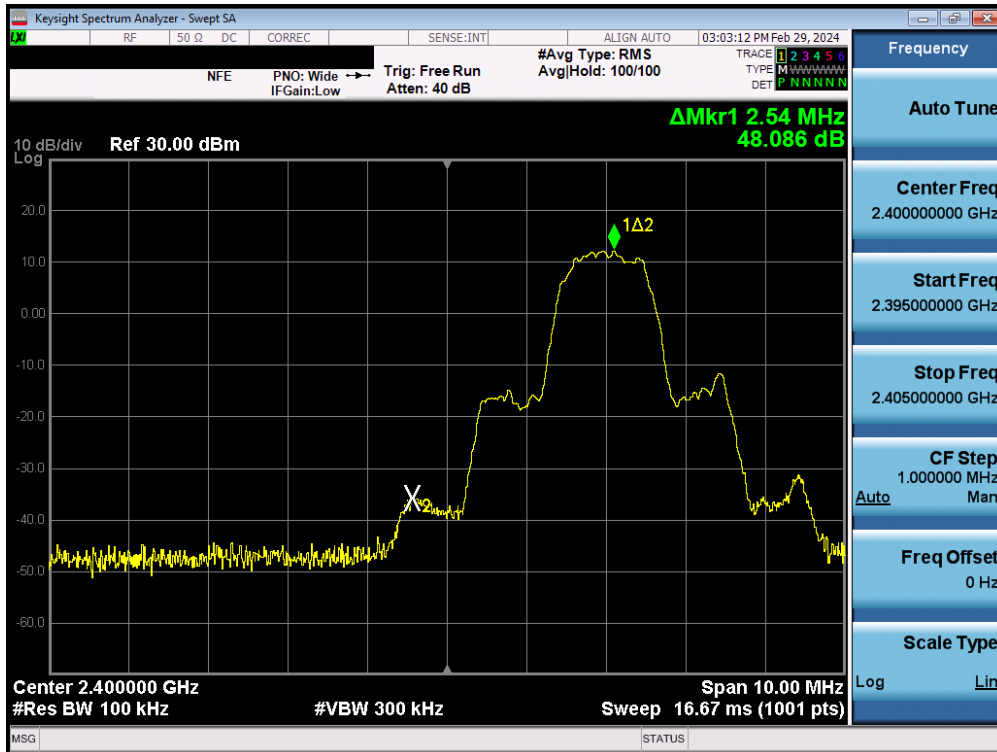
Plot 7-119. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps)



Plot 7-120. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 79 of 137                    |

## DUAL ANT 2



Plot 7-121. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 0)



Plot 7-122. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78)

|   |  |  |                                   |
|---|--|--|-----------------------------------|
| FCC ID: C3K2077<br>IC: 3048A-2077       | MEASUREMENT REPORT<br>(CERTIFICATION)  |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2312040120-15.C3K | Test Dates:<br>12/14/2023 - 03/18/2024 | EUT Type:<br>Portable Computing Device | Page 80 of 137                    |