

**MEASUREMENT REPORT
FCC PART 15.247 Bluetooth**

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
9/6/2023 - 11/06/2023
Test Report Issue Date:
11/06/2023
Test Site/Location:
Element lab., Columbia, MD, USA
Test Report Serial No.:
1M2308210092-09.A3L

FCC ID:	A3LSMS928U
APPLICANT:	Samsung Electronics Co., Ltd.

Application Type: Certification
Model: SM-S928U
Additional Model(s): SM-S928U1
EUT Type: Portable Handset
Max. RF Output Power: 102.565 mW (20.11 dBm) Peak Conducted
Frequency Range: 2402 – 2480MHz
Type of Modulation: GFSK, $\pi/4$ -DQPSK, 8DPSK
FCC Classification: FCC Part 15 Spread Spectrum Transmitter (DSS)
Test Procedure(s): ANSI C63.10-2013, KDB 558074 D01 v05r02, KDB 648474 D03 v01r04

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



FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 1 of 137

TABLE OF CONTENTS

1.0	INTRODUCTION	3
1.1	Scope	3
1.2	Element Test Location.....	3
1.3	Test Facility / Accreditations.....	3
2.0	PRODUCT INFORMATION.....	4
2.1	Equipment Description	4
2.2	Device Capabilities.....	4
2.3	Antenna Description	4
2.4	Test Configuration	5
2.5	Software and Firmware	5
2.6	EMI Suppression Device(s)/Modifications	5
3.0	DESCRIPTION OF TESTS	6
3.1	Evaluation Procedure	6
3.2	AC Line Conducted Emissions	6
3.3	Radiated Emissions.....	7
3.4	Environmental Conditions.....	7
4.0	ANTENNA REQUIREMENTS	8
5.0	MEASUREMENT UNCERTAINTY	9
6.0	TEST EQUIPMENT CALIBRATION DATA	10
7.0	TEST RESULTS.....	11
7.1	Summary.....	11
7.2	20dB Bandwidth Measurement	12
7.3	Output Power Measurement.....	33
7.4	Band Edge Compliance.....	72
7.5	Carrier Frequency Separation	81
7.6	Time of Occupancy.....	86
7.7	Number of Hopping Channels	91
7.8	Conducted Spurious Emissions.....	96
7.9	Radiated Spurious Emission Measurements – Above 1GHz.....	109
7.10	Radiated Restricted Band Edge Measurements.....	124
7.11	Radiated Spurious Emissions Measurements – Below 1GHz	129
7.12	Line Conducted Measurement Data	133
8.0	CONCLUSION.....	137

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 2 of 137

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).

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 3 of 137

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS928U**. 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:
 - A) The hopping sequence is pseudorandom
 - B) All channels are used equally on average
 - C) The receiver input bandwidth equals the transmit bandwidth
 - D) 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.: 0876M, 0042M, 6291M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1 and FR2), 802.11b/g/n/ax/be WLAN, 802.11a/n/ac/ax/be UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

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 [MHz]	Antenna 1 Gain (dBi)	Antenna 2 Gain (dBi)	Directional Gain (dBi)
2400	-1.11	-4.07	0.55

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.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 4 of 137



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.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.5 Software and Firmware

The test was conducted with software/firmware version S928USQU0AW19 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.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 5 of 137

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 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.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 6 of 137

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).

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 7 of 137

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.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 8 of 137

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_{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

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 9 of 137

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
-	NMLC-2	Line Conducted Emissions Cable (NM)	1/11/2023	Annual	1/11/2024	NMLC-2
-	AP2-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-001
-	AP2-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-002
-	ETS-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-001
-	ETS-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-002
-	MD 1M 18-40	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	MD 1M 18-40
-	LTX1	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTX1
-	LTX2	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTX2
EMCO	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
EMCO	3116	Horn Antenna (18-40GHz)	7/5/2023	Biennial	7/5/2025	9203-2178
Keysight Technologies	N9030A	PXA Signal Analyzker	8/7/2023	Annual	8/7/2024	MY54490576
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	3/15/2023	Annual	3/15/2024	MY52350166
Keysight Technologies	N9038A	MXE EMI Receiver	8/30/2023	Annual	8/30/2024	MY51210133
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	1/13/2023	Annual	1/13/2024	101639
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
Rohde & Schwarz	VULB9162	Bilog Antenna	2/21/2023	Biennial	2/21/2025	00301
Sunol Sciences	DRH-118	Horn (Small)	2/14/2022	Biennial	2/14/2024	A102416-2
Sunol Sciences	JB5	Bi-Log Antenna (30M-5GHz)	8/30/2022	Biennial	8/30/2024	A102416-1

Table 6-1. Annual Test Equipment Calibration Schedule

Notes:

- 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.
- Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 10 of 137

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMS928U
 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 ≥ 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 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 "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 "Chamber Automation," Version 1.3.1.

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 11 of 137

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. $RBW = 1 - 5\% \text{ OBW}$
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

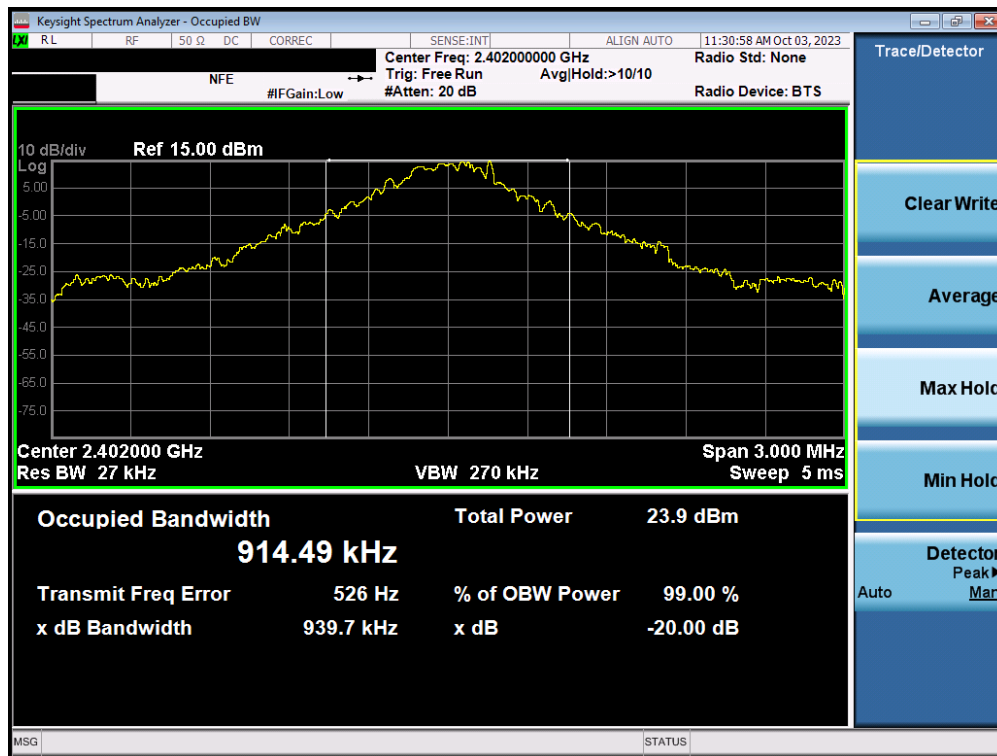
Test Notes

None

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 12 of 137

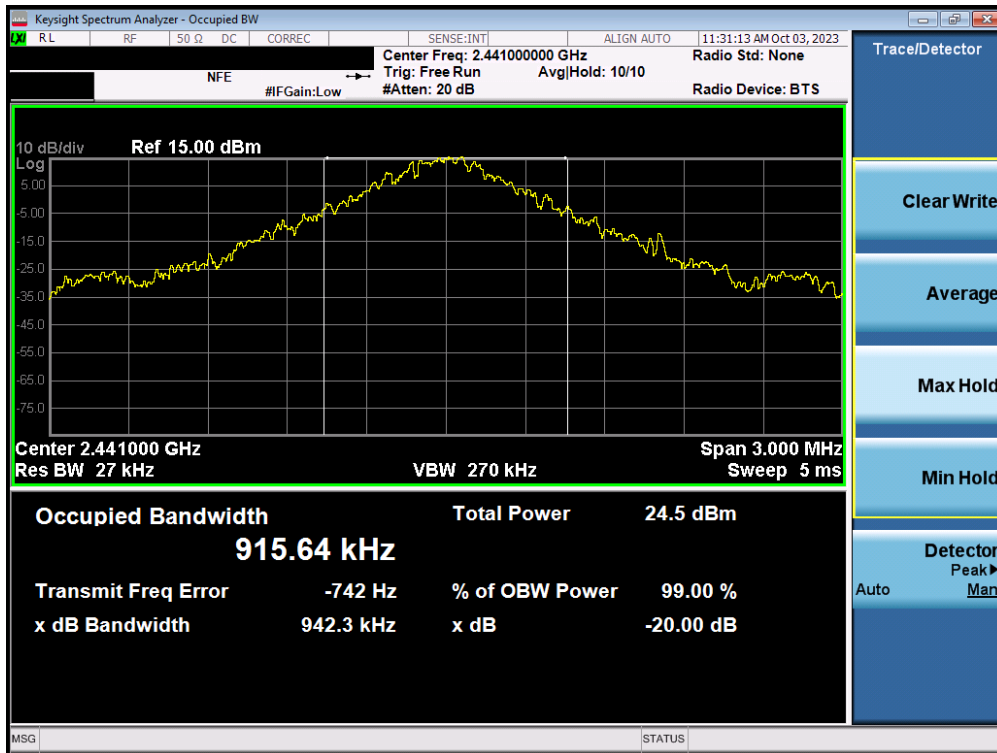
Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	20dB Bandwidth Test Results [kHz]
2402	1.0	GFSK	0	939.70
2441	1.0	GFSK	39	942.30
2480	1.0	GFSK	78	960.90
2402	2.0	$\pi/4$ -DQPSK	0	1354.00
2441	2.0	$\pi/4$ -DQPSK	39	1234.00
2480	2.0	$\pi/4$ -DQPSK	78	1304.00
2402	3.0	8DPSK	0	1276.00
2441	3.0	8DPSK	39	1316.00
2480	3.0	8DPSK	78	1315.00

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

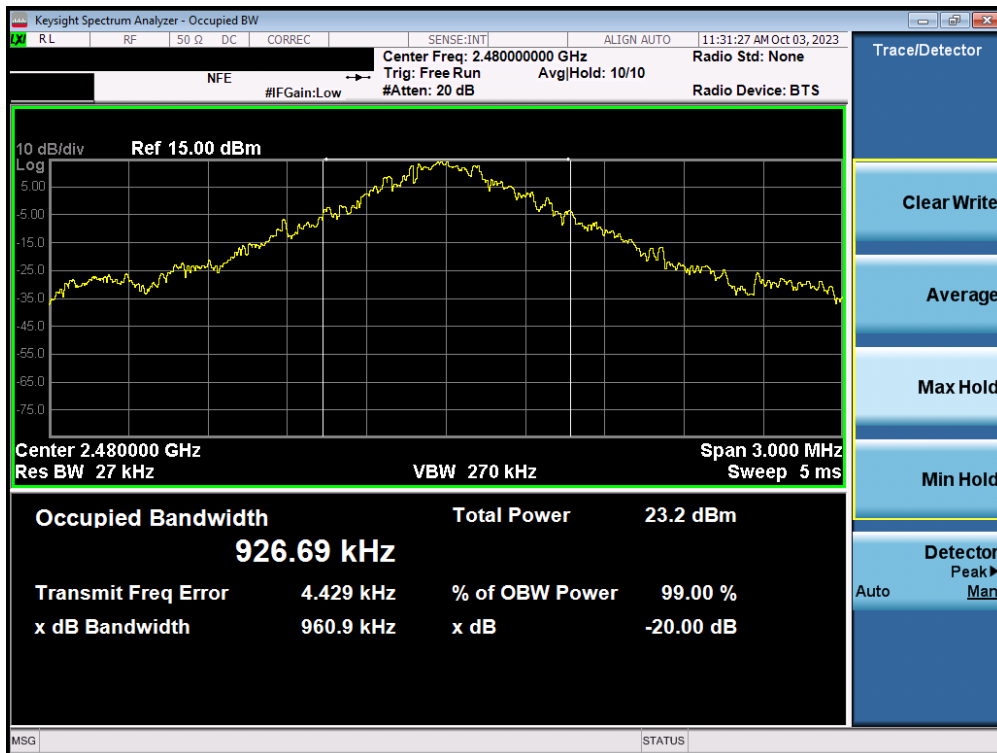


Plot 7-1. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 13 of 137	

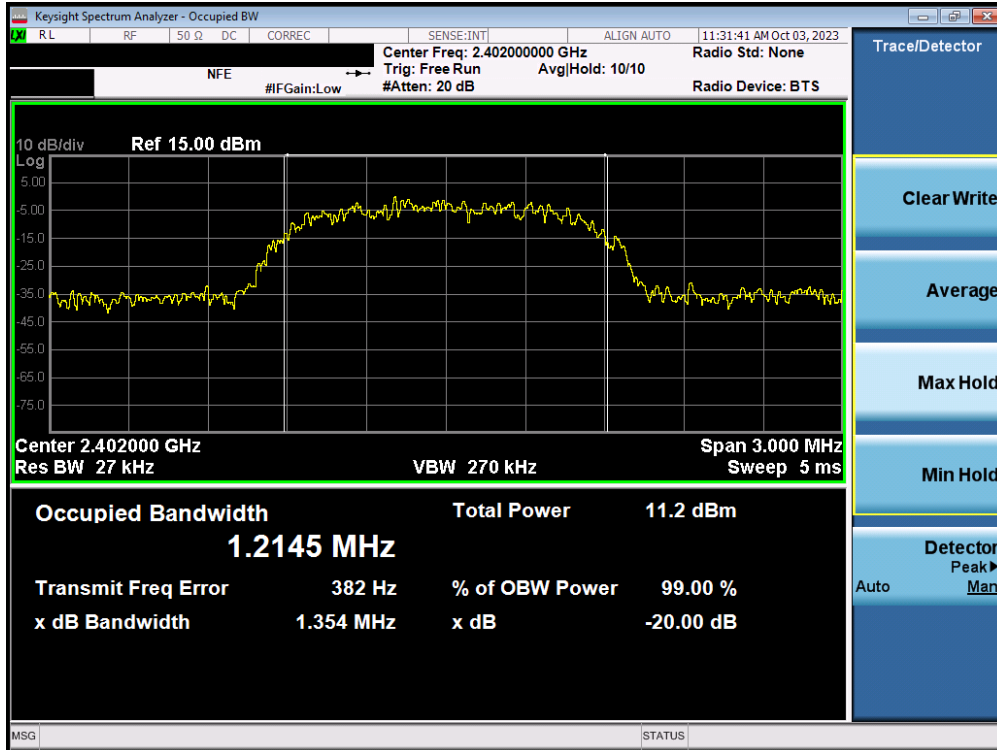


Plot 7-2. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39) – ANT1

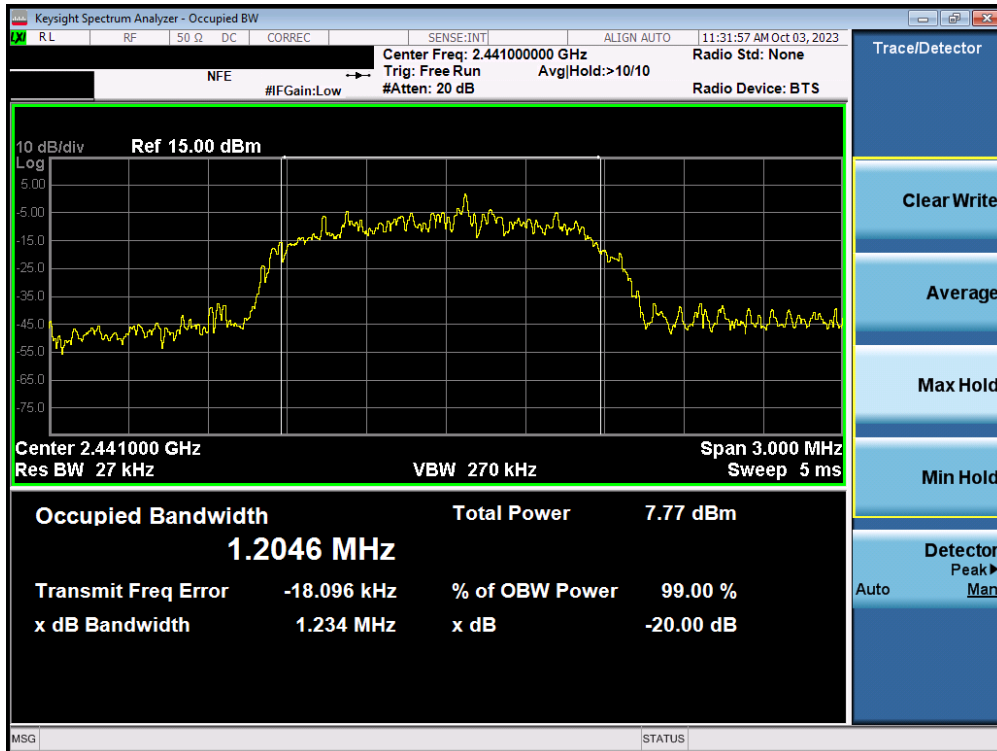


Plot 7-3. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 14 of 137

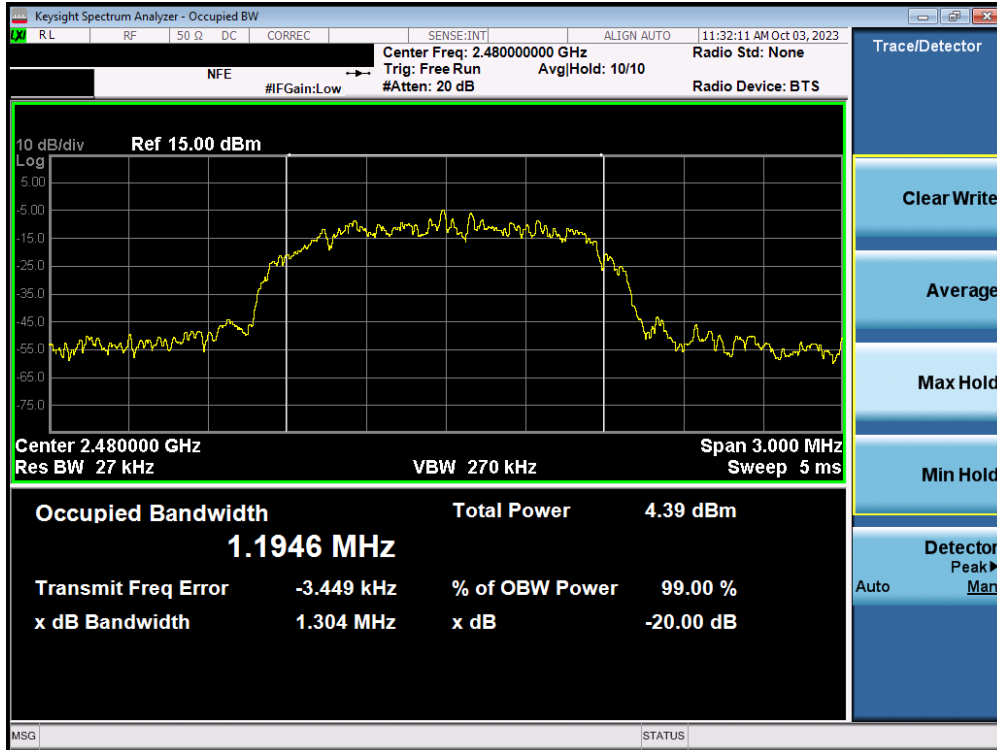


Plot 7-4. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0) – ANT1

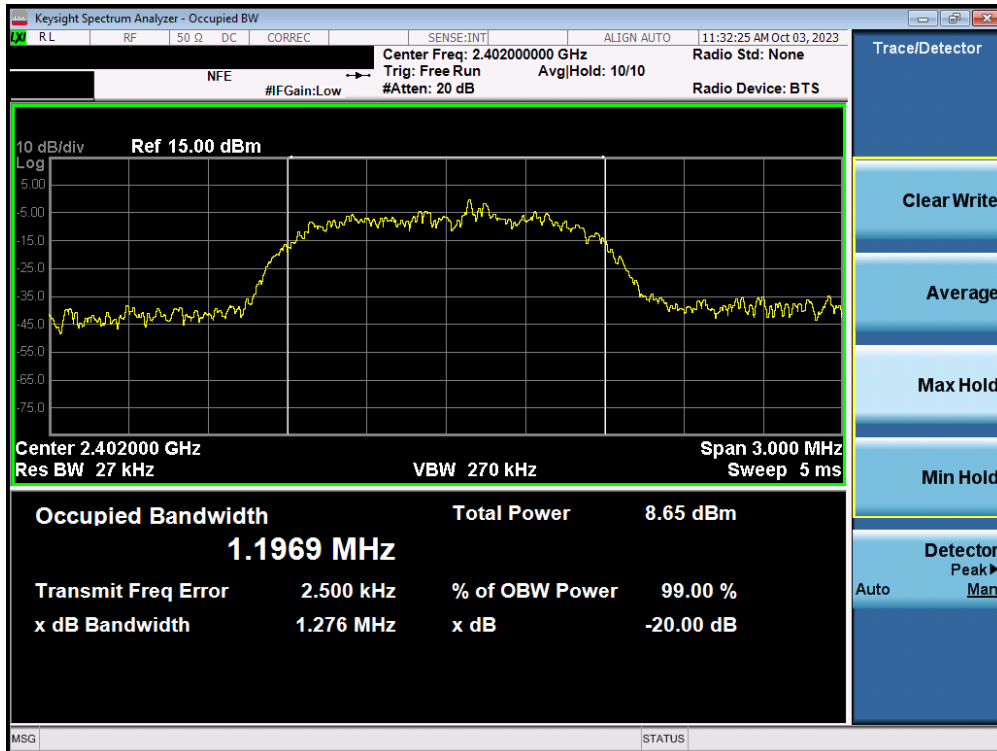


Plot 7-5. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 15 of 137

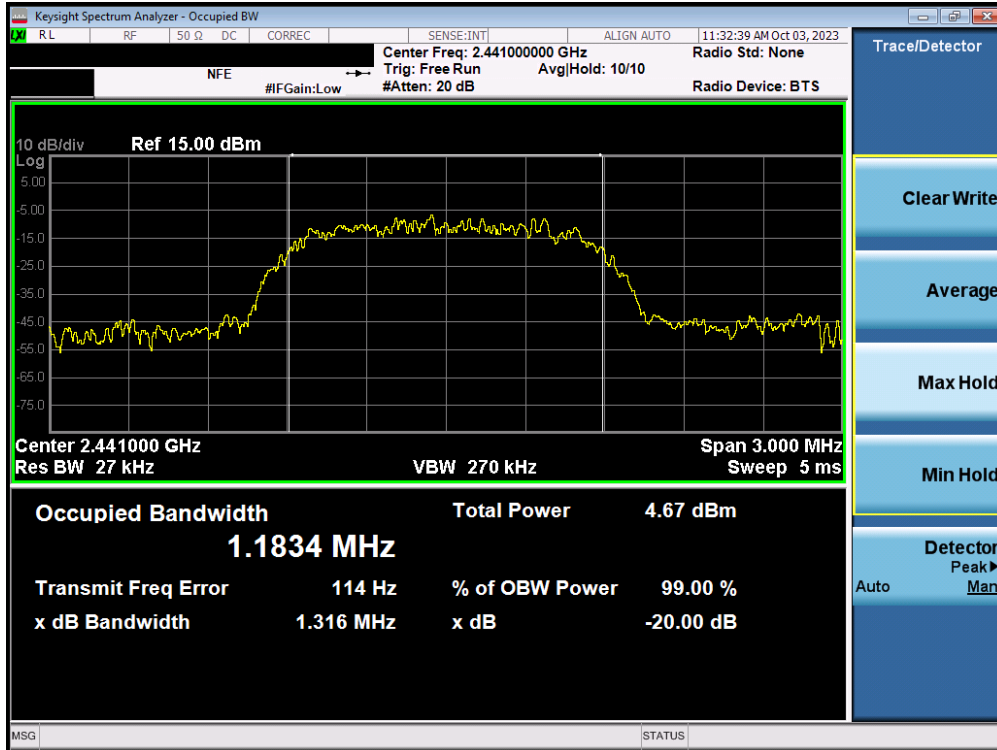


Plot 7-6. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78) – ANT1

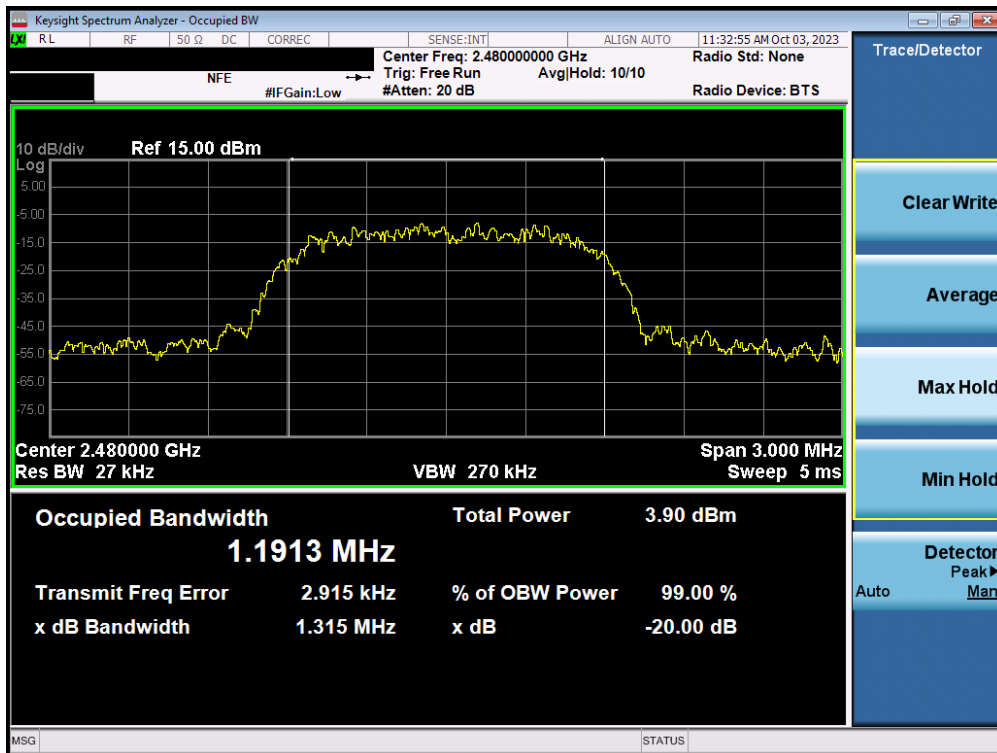


Plot 7-7. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 16 of 137



Plot 7-8. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39) – ANT1

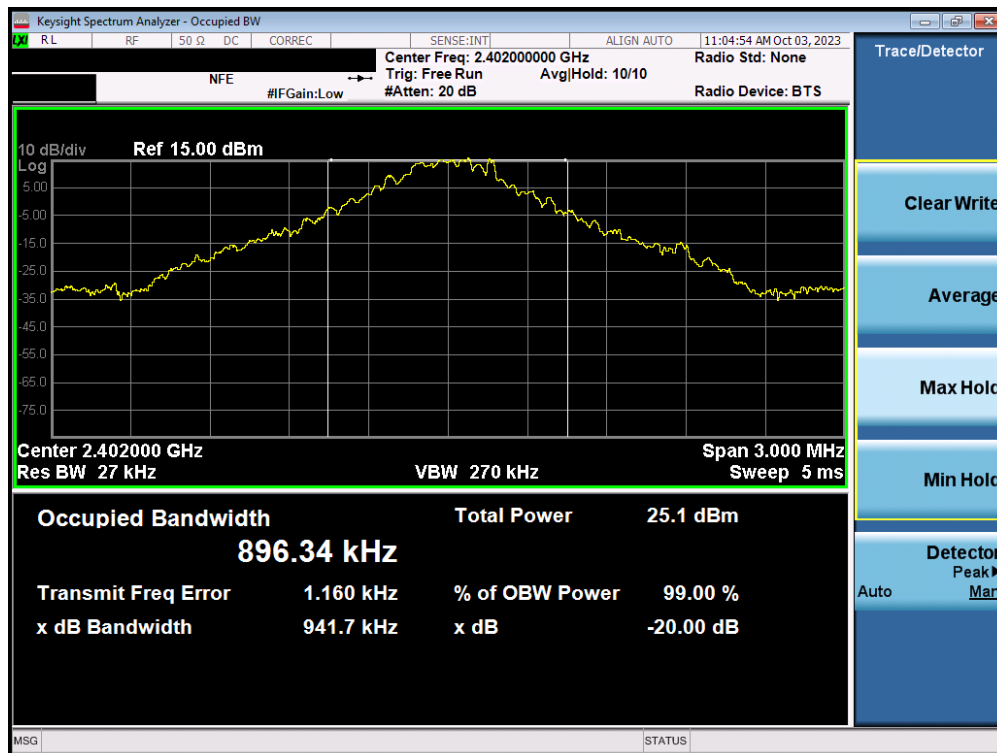


Plot 7-9. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 17 of 137

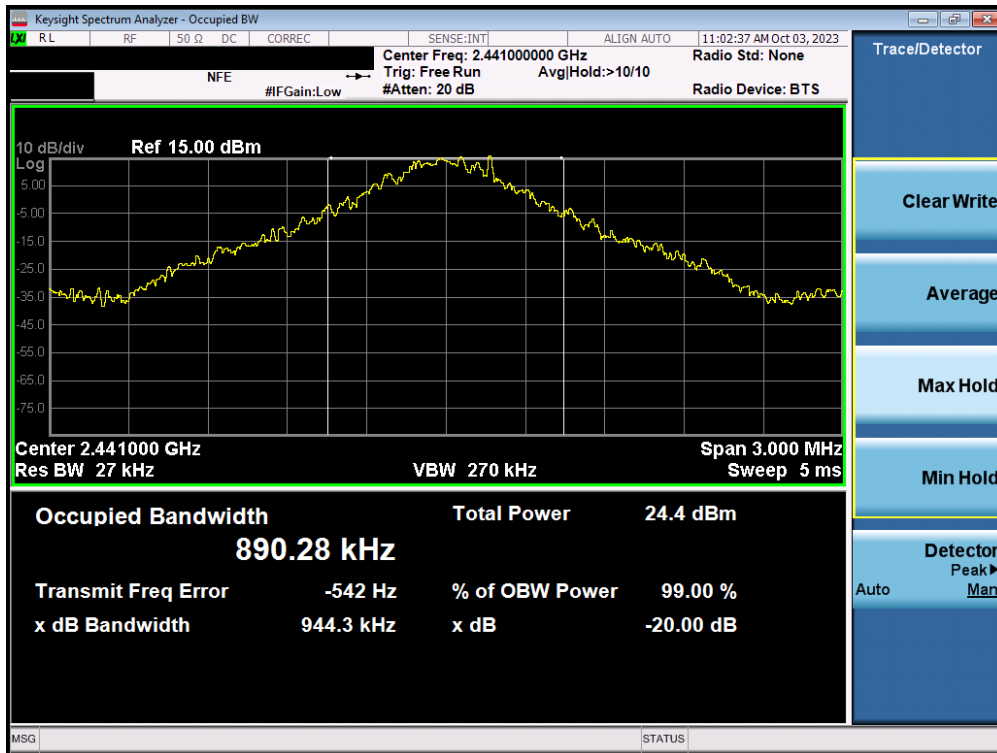
Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	20dB Bandwidth Test Results [kHz]
2402	1.0	GFSK	0	941.70
2441	1.0	GFSK	39	944.30
2480	1.0	GFSK	78	939.30
2402	2.0	$\pi/4$ -DQPSK	0	1331.00
2441	2.0	$\pi/4$ -DQPSK	39	1344.00
2480	2.0	$\pi/4$ -DQPSK	78	1332.00
2402	3.0	8DPSK	0	1260.00
2441	3.0	8DPSK	39	1326.00
2480	3.0	8DPSK	78	1337.00

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

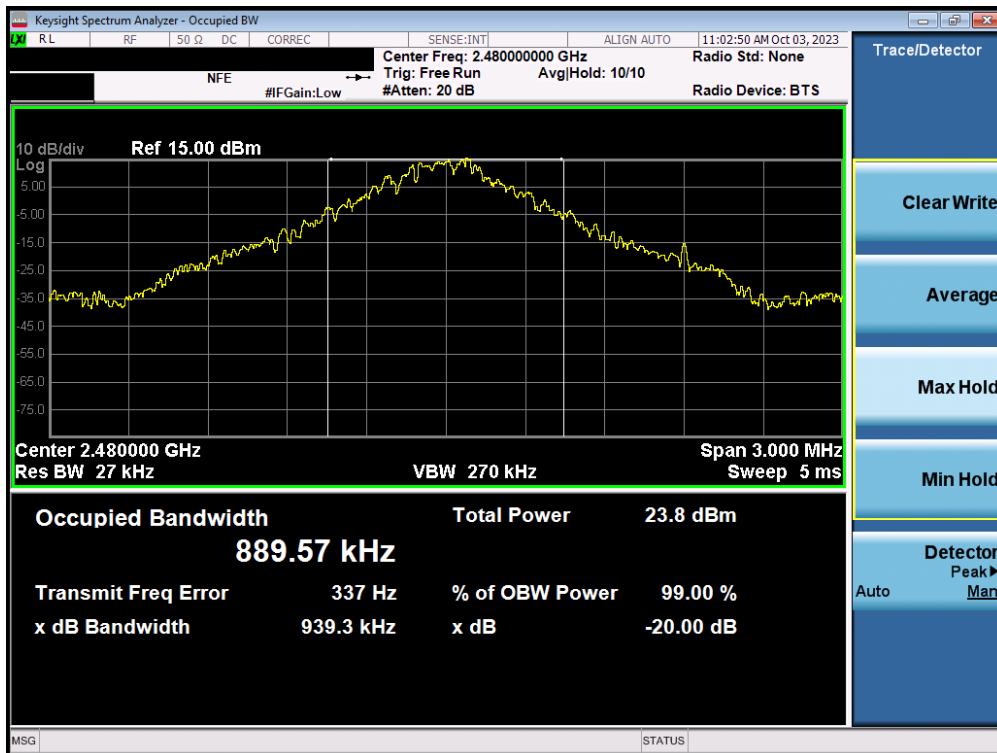


Plot 7-10. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 18 of 137	

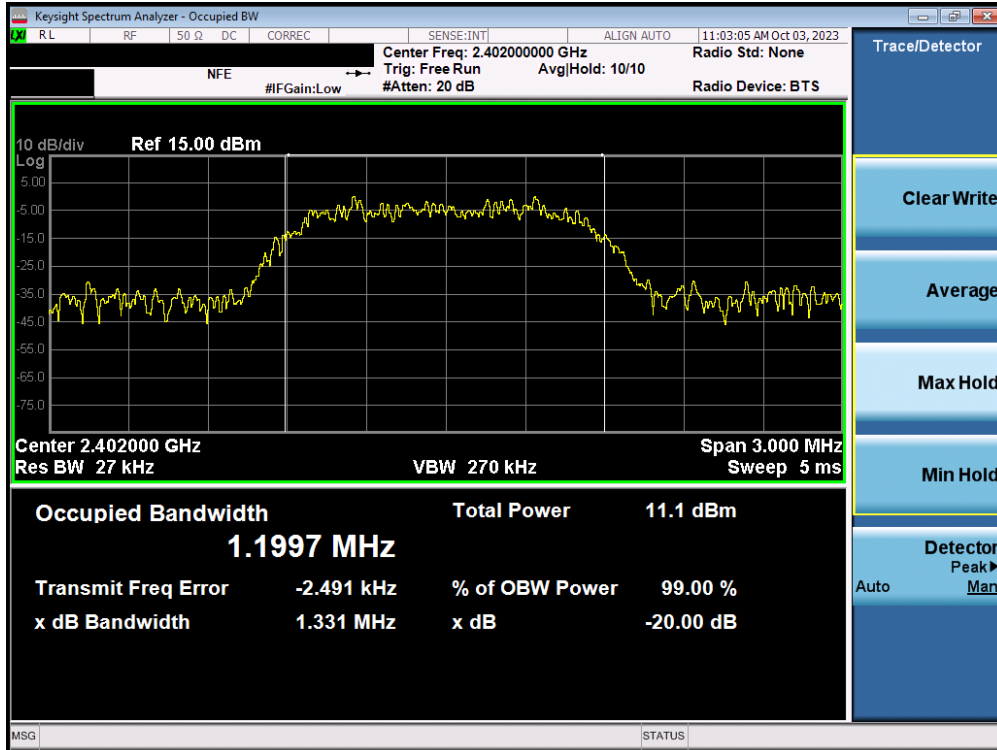


Plot 7-11. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39) – ANT2

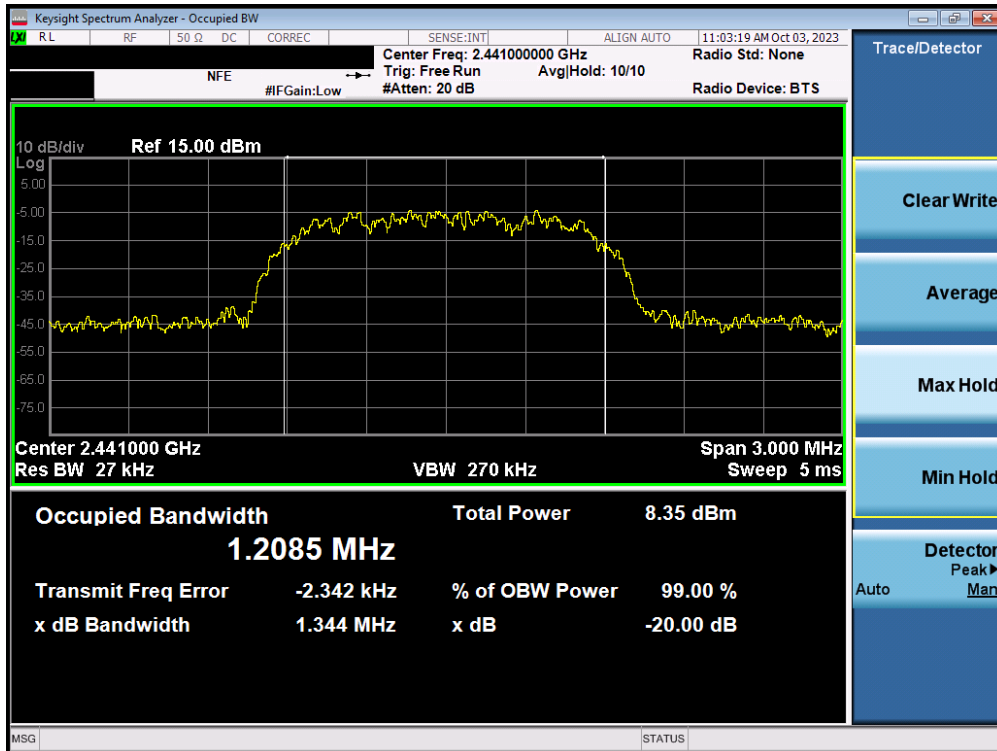


Plot 7-12. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 19 of 137

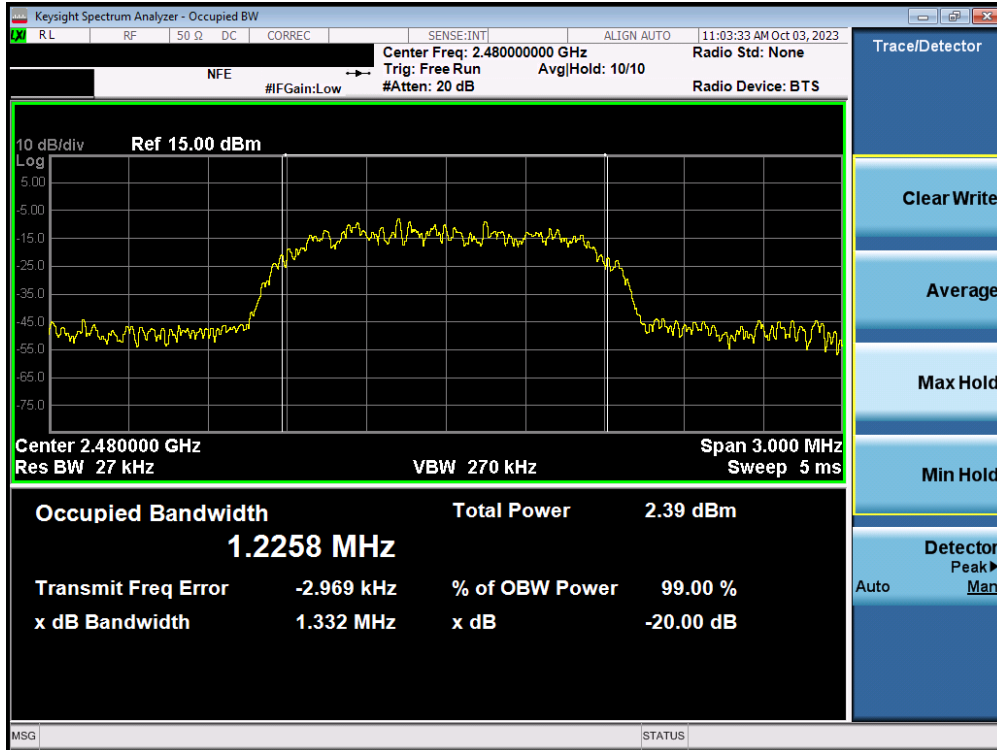


Plot 7-13. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0) – ANT2

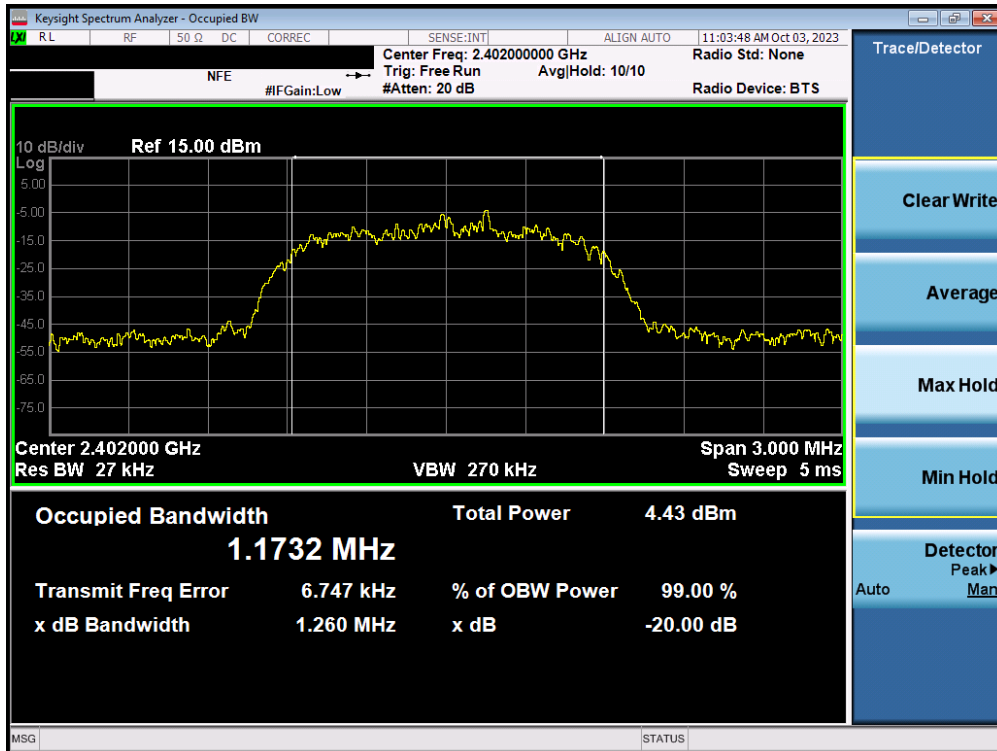


Plot 7-14. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 20 of 137

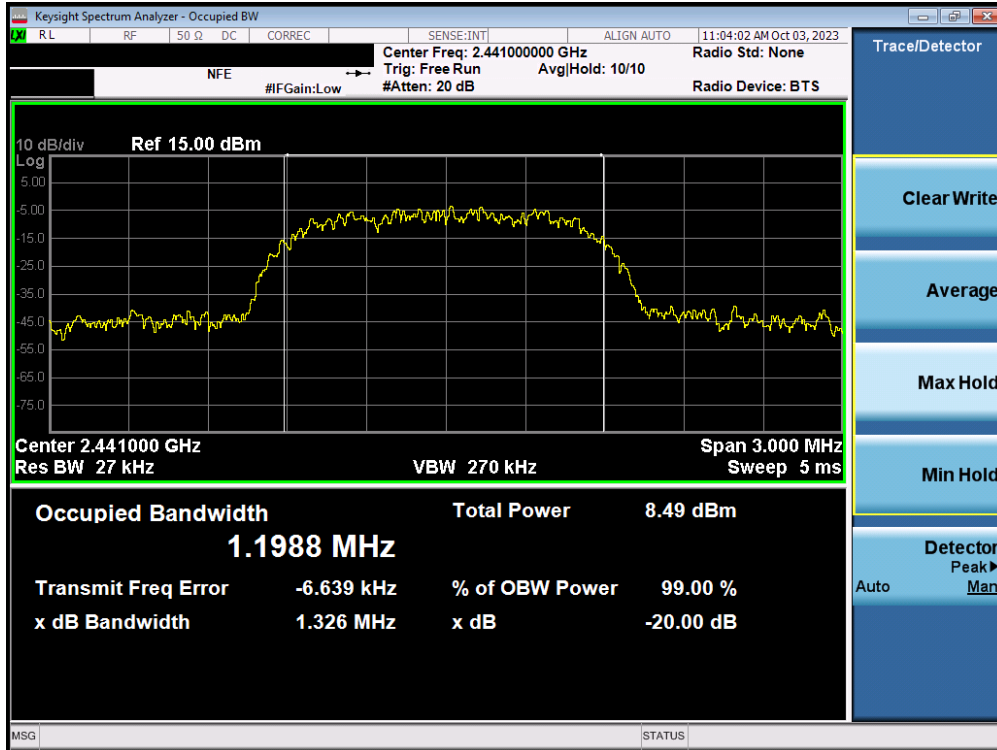


Plot 7-15. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78) – ANT2

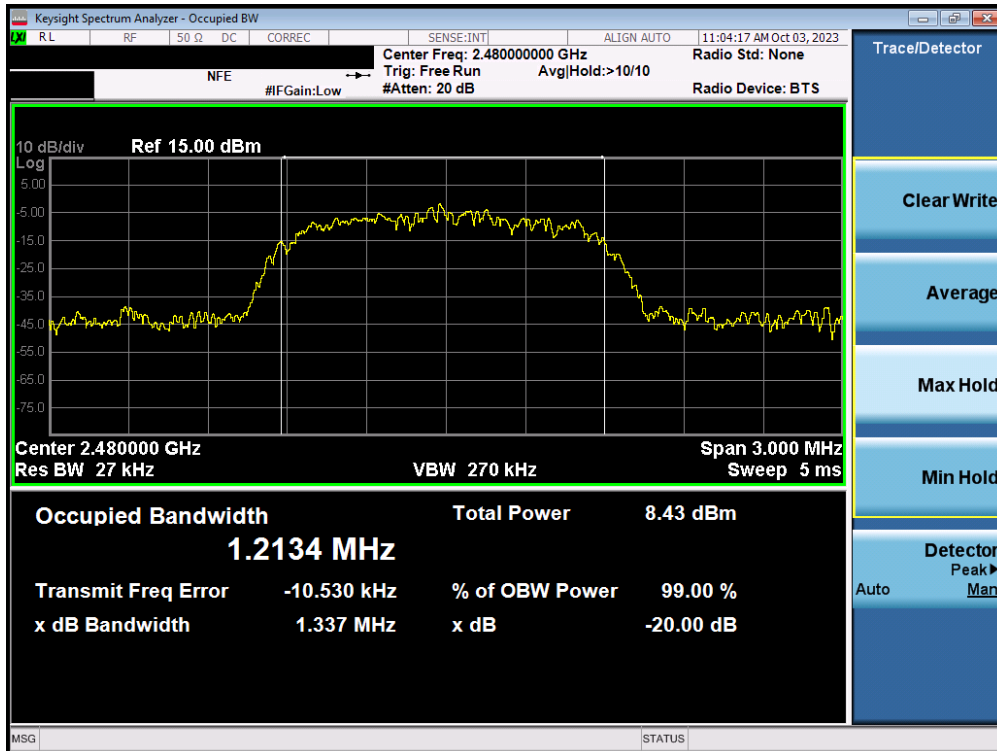


Plot 7-16. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 21 of 137



Plot 7-17. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39) – ANT2

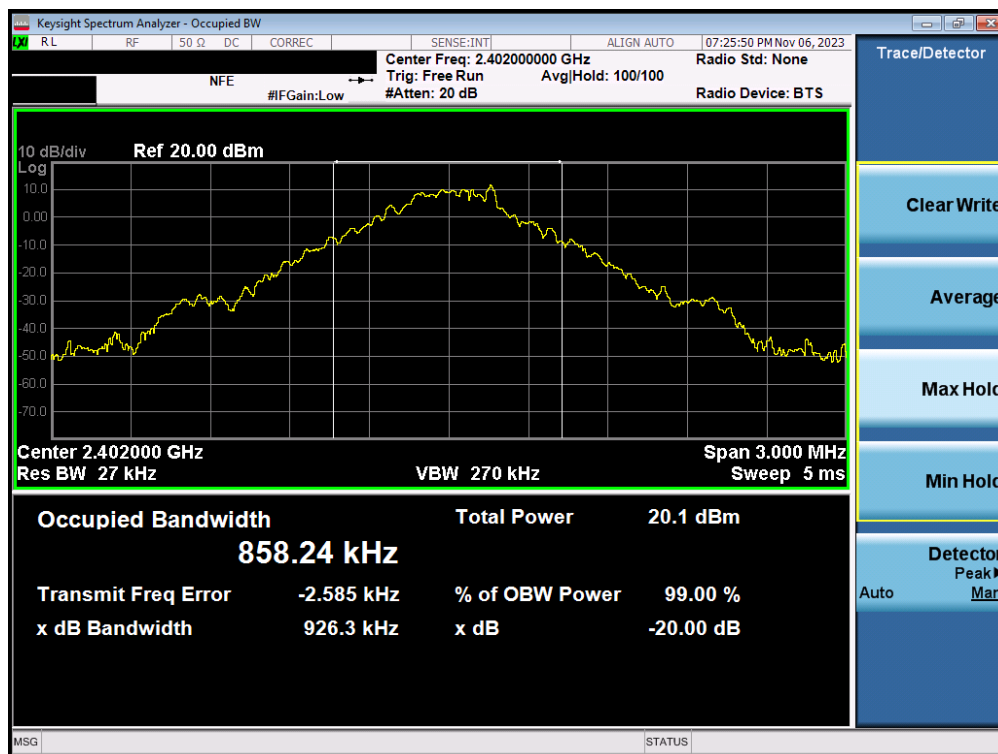


Plot 7-18. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 22 of 137

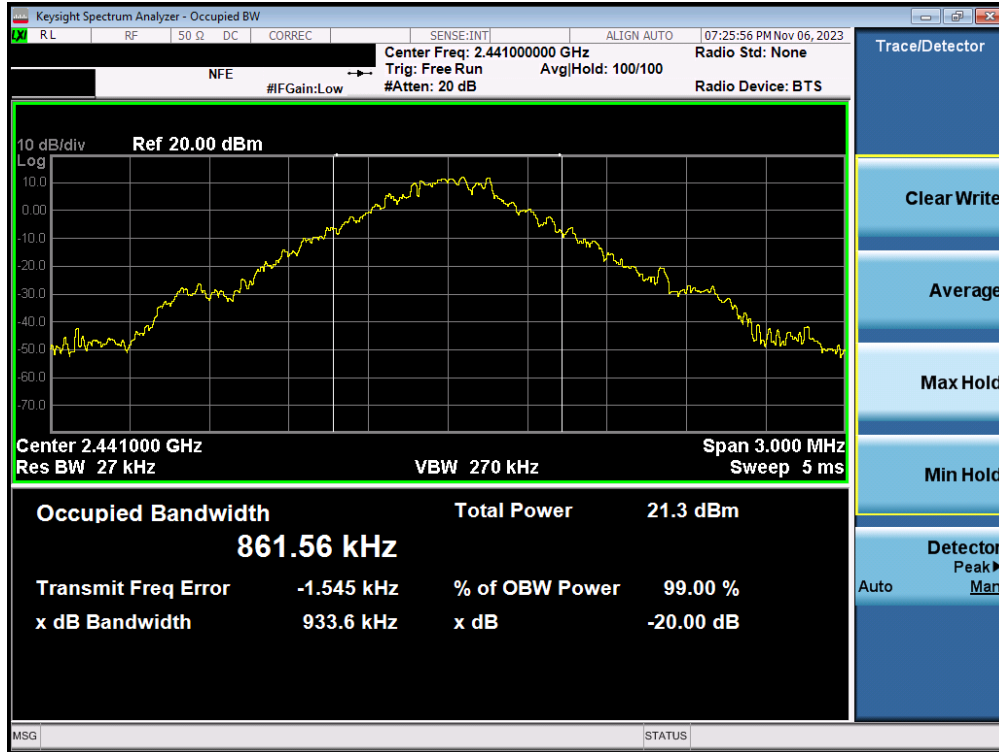
Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	20dB Bandwidth Test Results [kHz]
2402	1.0	GFSK	0	926.30
2441	1.0	GFSK	39	933.60
2480	1.0	GFSK	78	941.30
2402	2.0	$\pi/4$ -DQPSK	0	1358.00
2441	2.0	$\pi/4$ -DQPSK	39	1350.00
2480	2.0	$\pi/4$ -DQPSK	78	1319.00
2402	3.0	8DPSK	0	1279.00
2441	3.0	8DPSK	39	1338.00
2480	3.0	8DPSK	78	1313.00

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

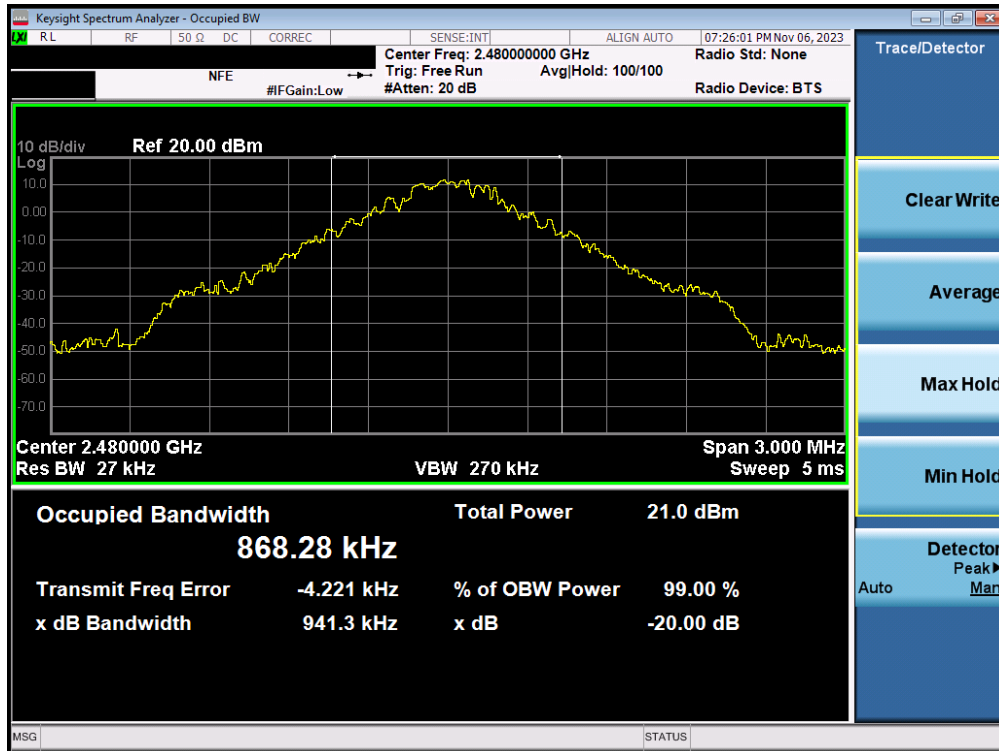


Plot 7-19. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0) – Dual ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 23 of 137	

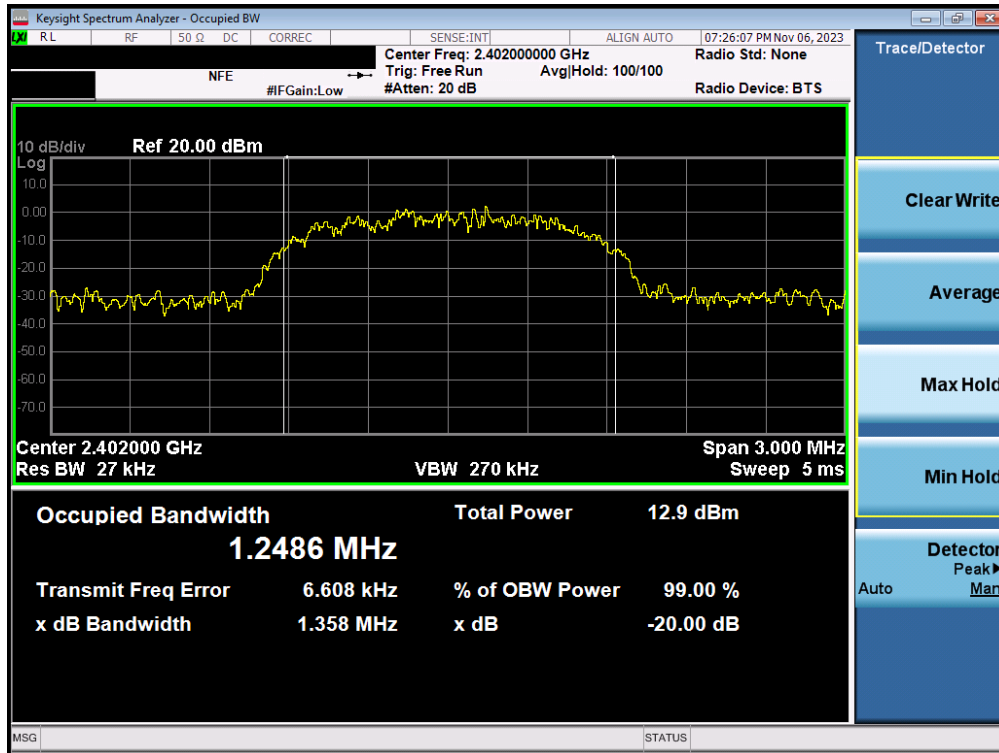


Plot 7-20. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39) – Dual ANT1

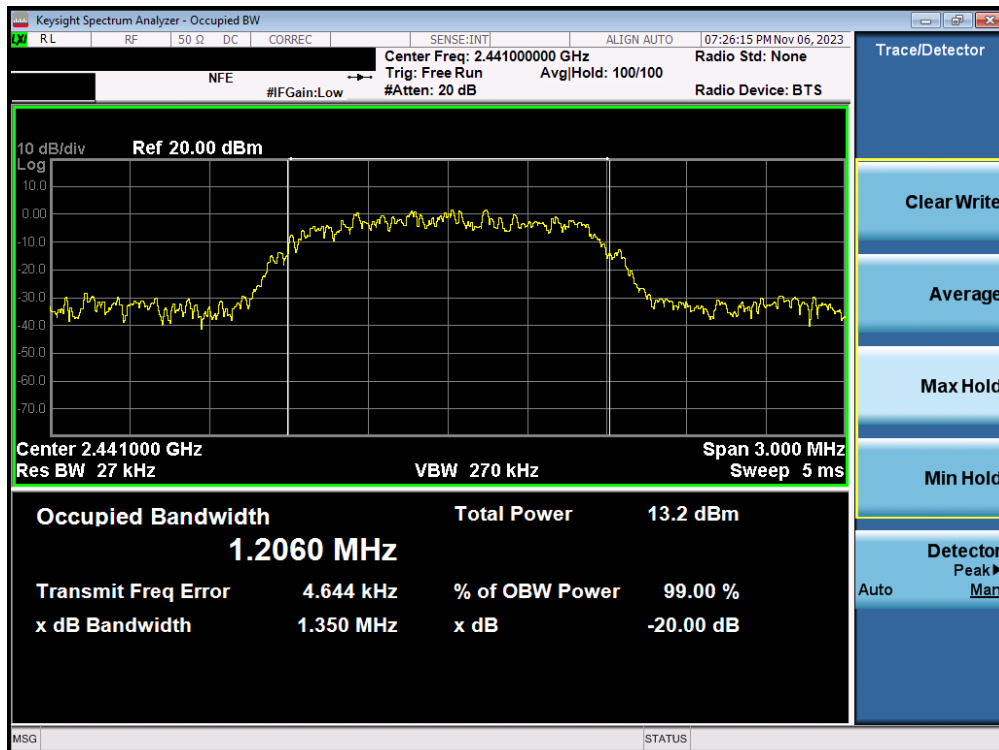


Plot 7-21. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 24 of 137

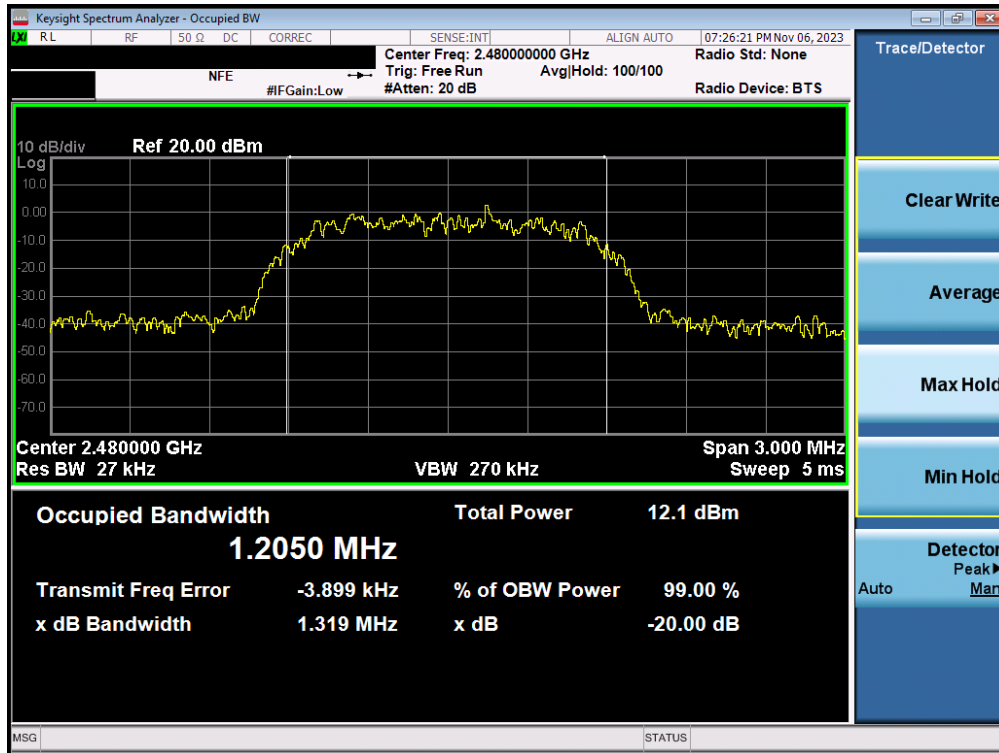


Plot 7-22. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0) – Dual ANT1

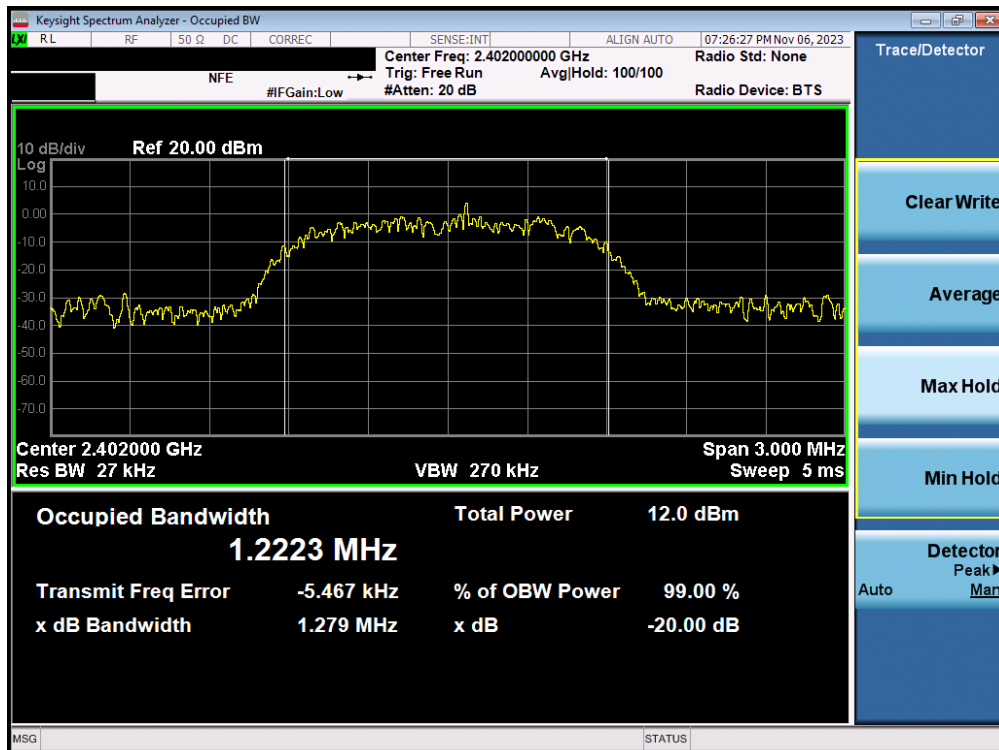


Plot 7-23. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 25 of 137

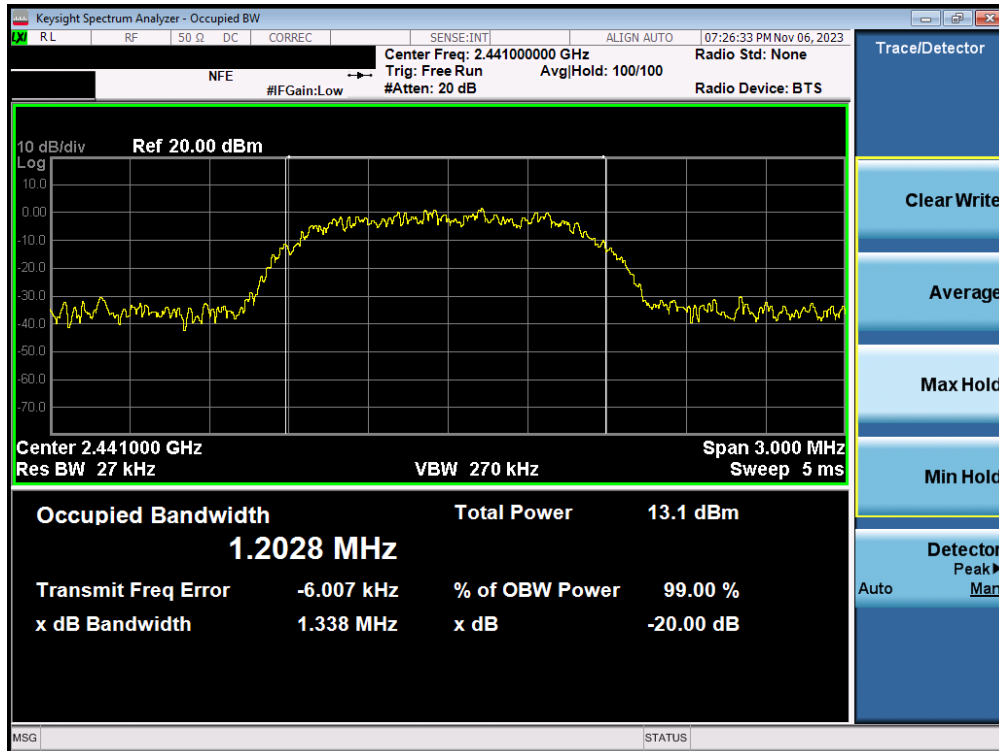


Plot 7-24. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78) – Dual ANT1

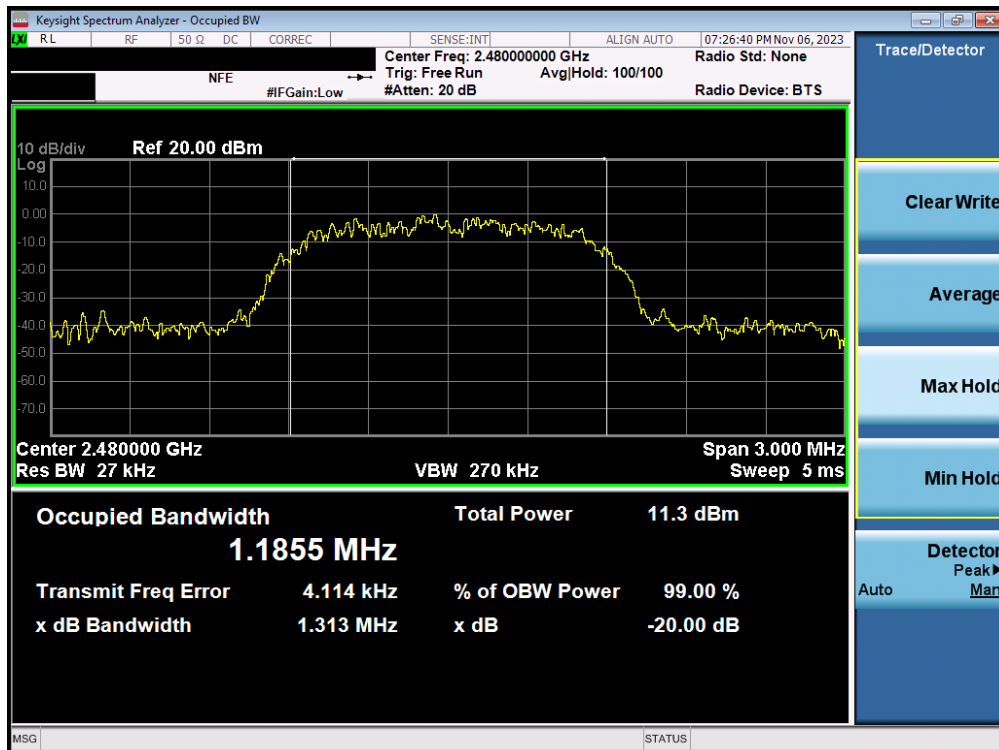


Plot 7-25. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 26 of 137



Plot 7-26. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39) – Dual ANT1

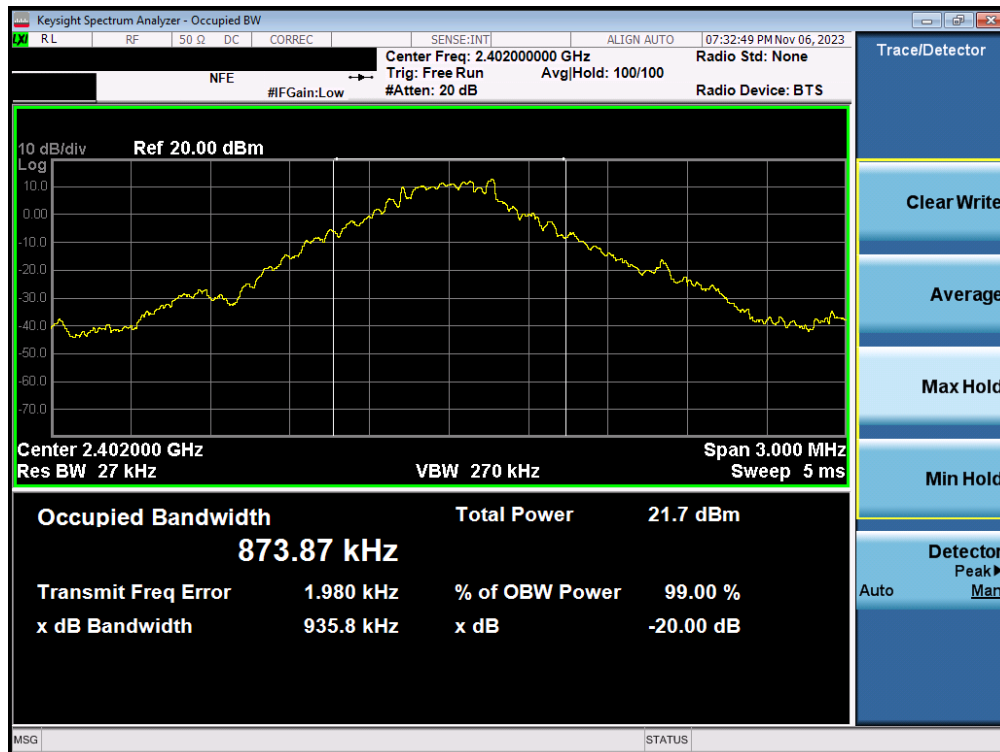


Plot 7-27. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78) – Dual ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 27 of 137

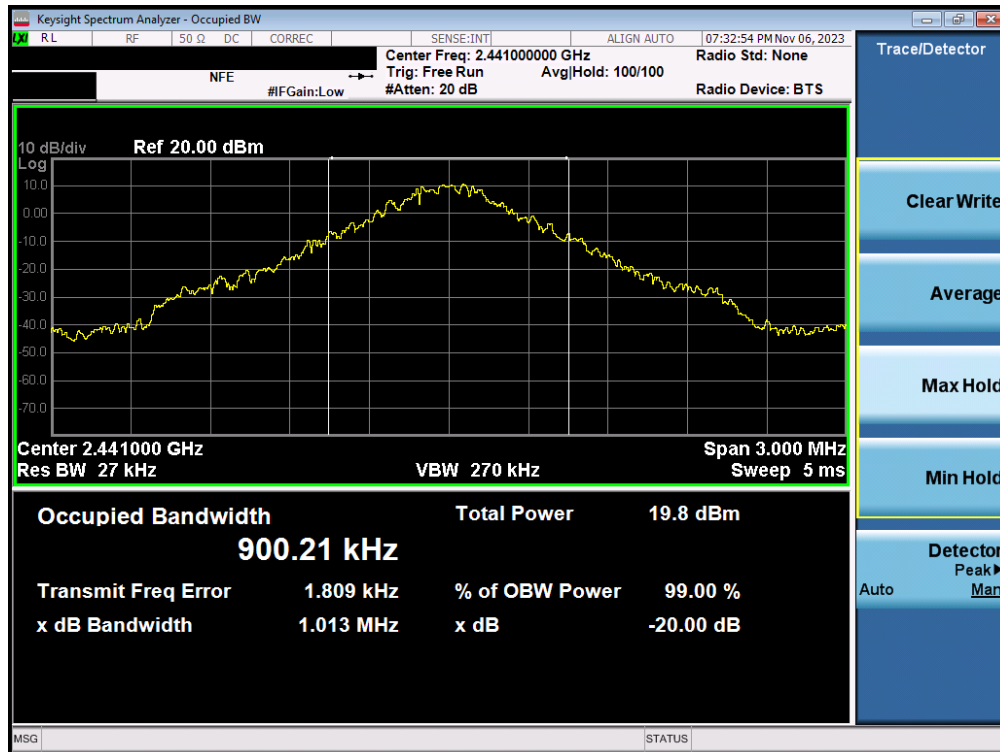
Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	20dB Bandwidth Test Results [kHz]
2402	1.0	GFSK	0	935.80
2441	1.0	GFSK	39	1013.00
2480	1.0	GFSK	78	970.20
2402	2.0	$\pi/4$ -DQPSK	0	1306.00
2441	2.0	$\pi/4$ -DQPSK	39	1320.00
2480	2.0	$\pi/4$ -DQPSK	78	1345.00
2402	3.0	8DPSK	0	1340.00
2441	3.0	8DPSK	39	1328.00
2480	3.0	8DPSK	78	1312.00

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

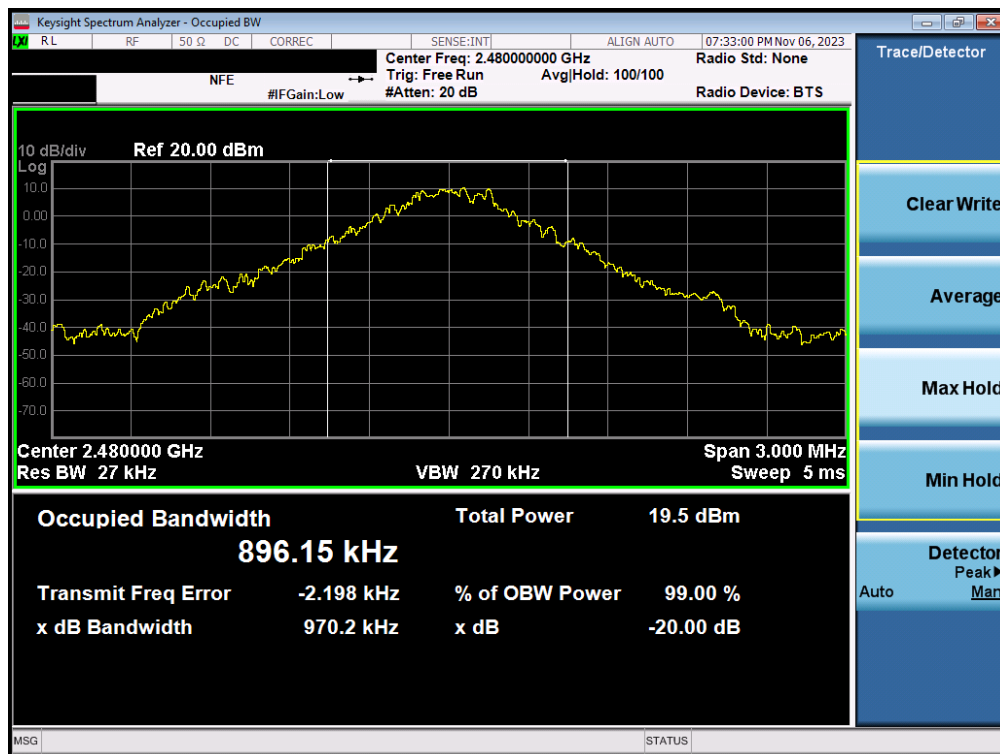


Plot 7-28. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 0) – Dual ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 28 of 137	

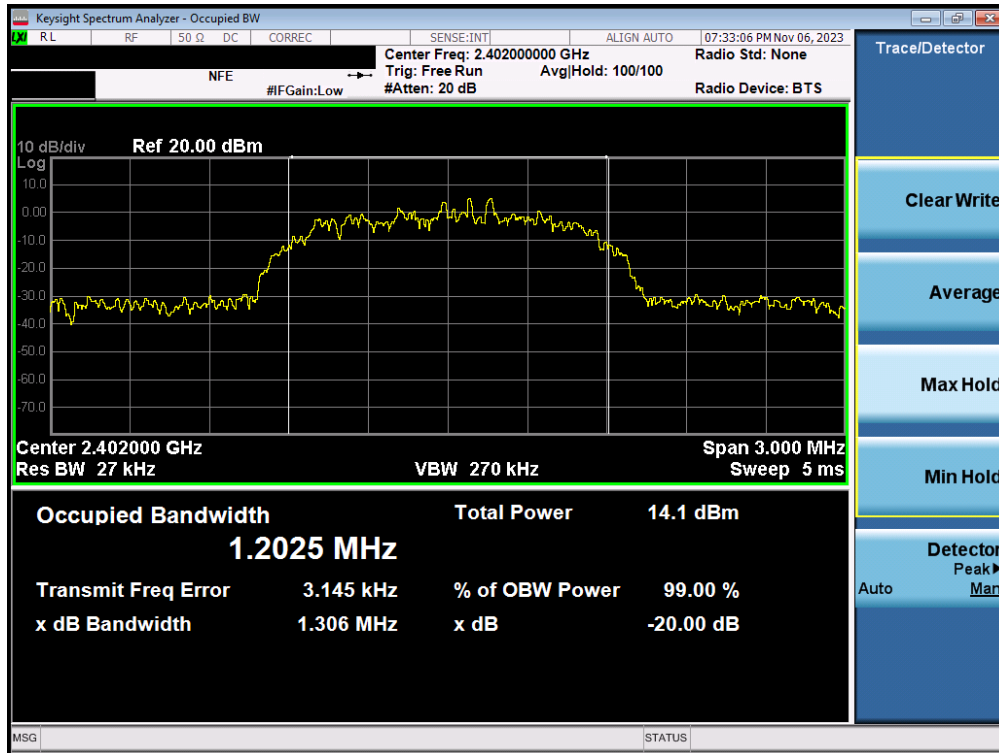


Plot 7-29. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 39) – Dual ANT2

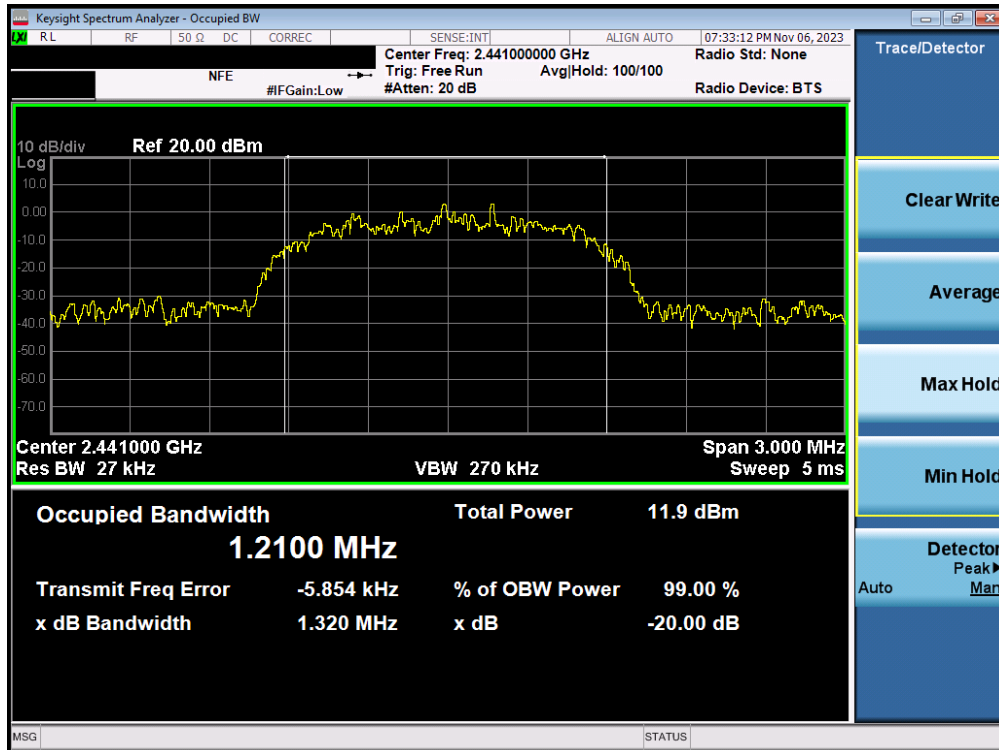


Plot 7-30. 20dB Bandwidth Plot (Bluetooth, 1Mbps – Ch. 78) – Dual ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 29 of 137

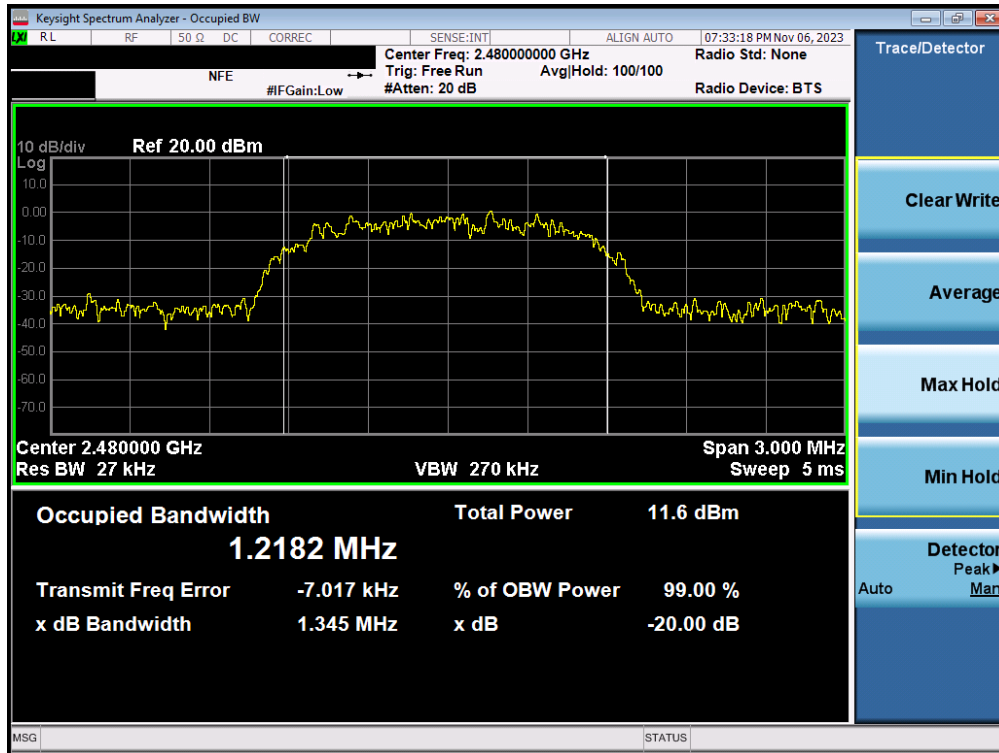


Plot 7-31. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 0) – Dual ANT2

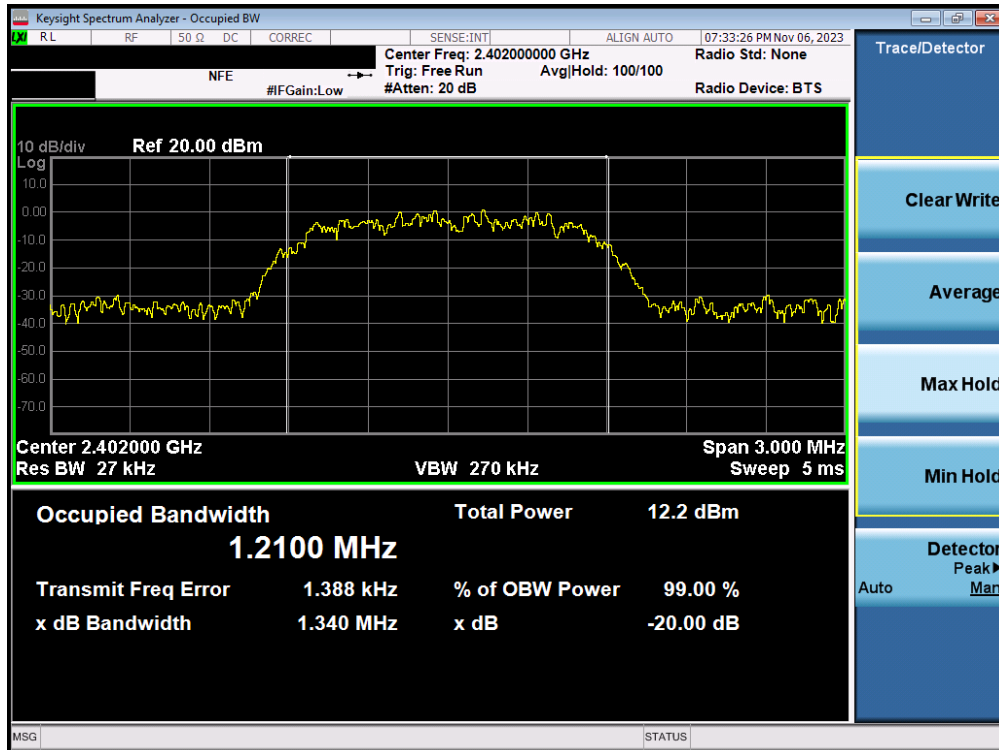


Plot 7-32. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 39) – Dual ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 30 of 137

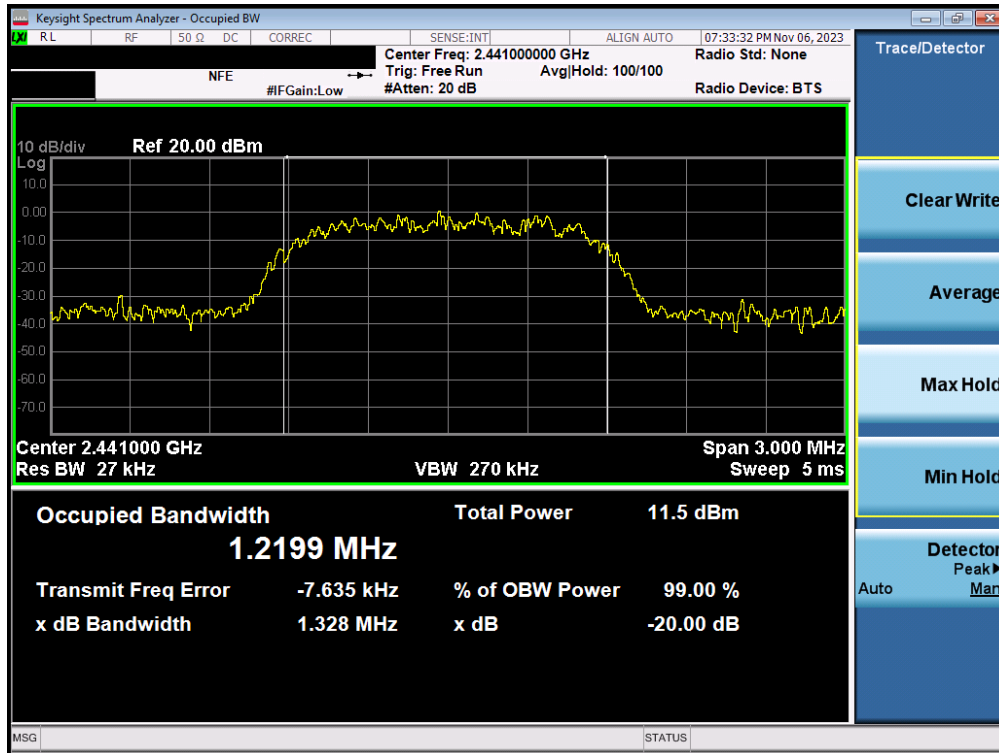


Plot 7-33. 20dB Bandwidth Plot (Bluetooth, 2Mbps – Ch. 78) – Dual ANT2

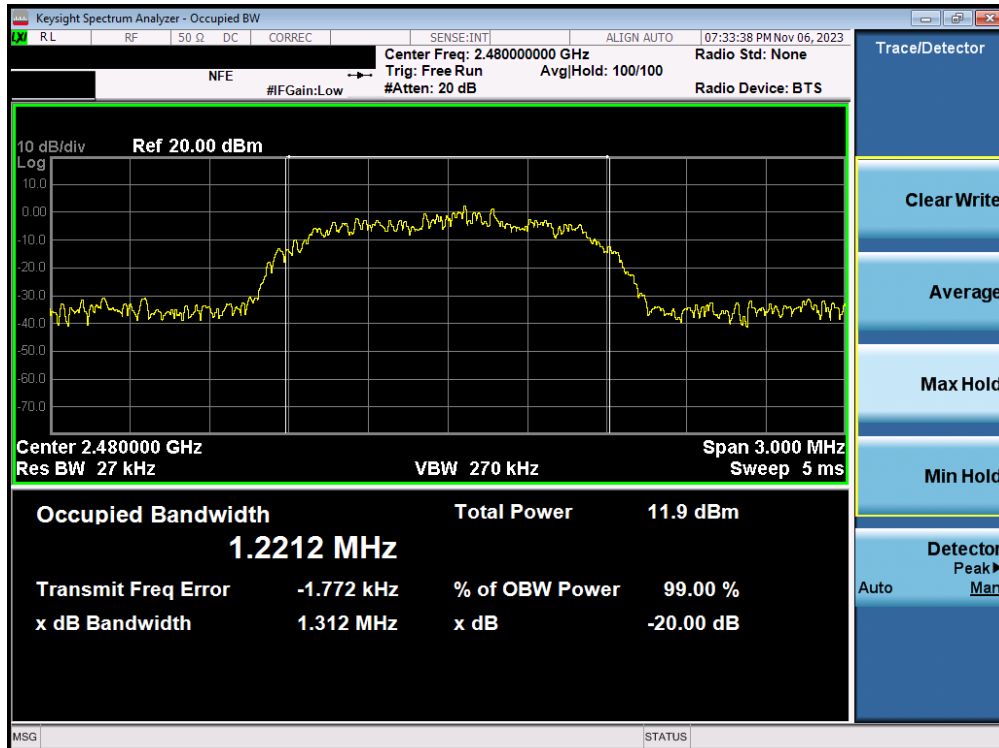


Plot 7-34. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 0) – Dual ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 31 of 137



Plot 7-35. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 39) – Dual ANT2



Plot 7-36. 20dB Bandwidth Plot (Bluetooth, 3Mbps – Ch. 78) – Dual ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	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.

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

Note

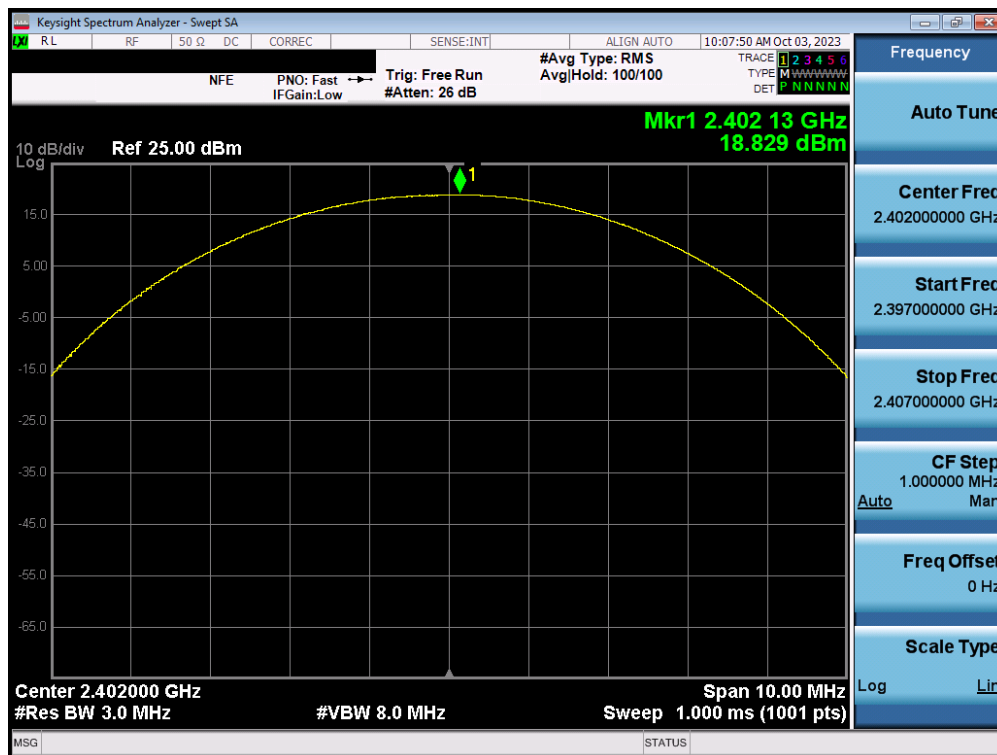
This unit was tested with all possible data rates and the highest peak power is reported with the unit transmitting at 1Mbps. Final results were obtained using calibrated couplers, attenuators and cables. The following formula was used:

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

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 33 of 137

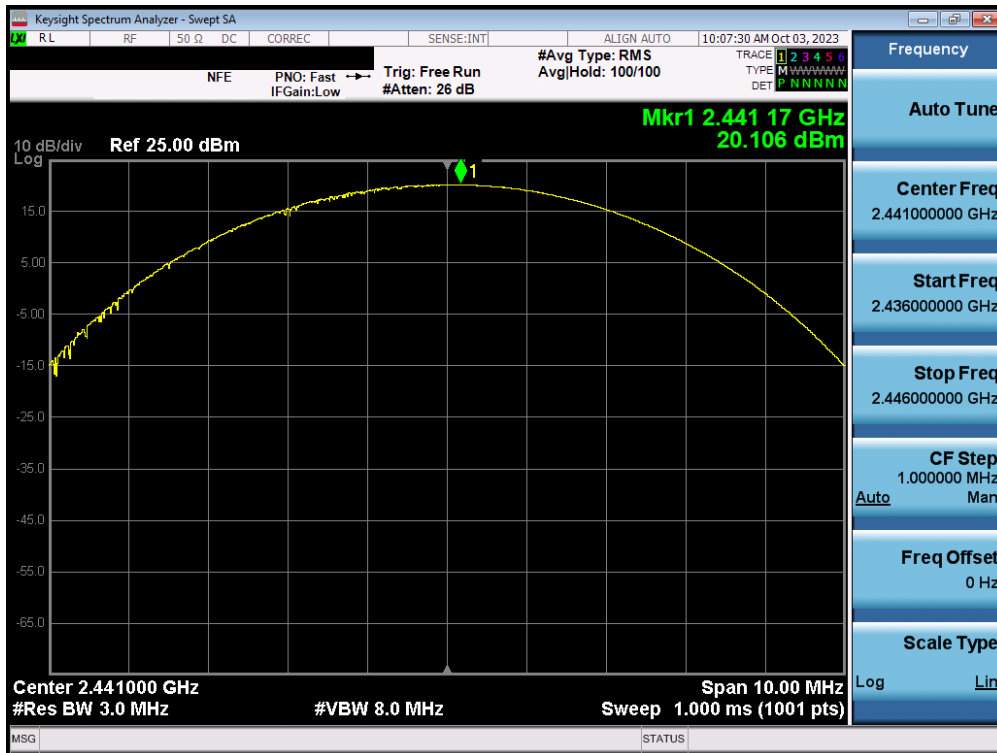
Frequency [MHz]	Data Rate [Mbps]	Channel No.	Peak Conducted Power		Avg Conducted Power	
			[dBm]	[mW]	[dBm]	[mW]
2402	1.0	0	18.83	76.366	18.08	64.239
2441	1.0	39	20.11	102.565	19.24	83.946
2480	1.0	78	18.92	77.893	18.38	68.881
2402	2.0	0	18.14	65.223	14.83	30.374
2441	2.0	39	19.39	86.816	15.95	39.319
2480	2.0	78	18.61	72.594	15.09	32.248
2402	3.0	0	18.76	75.093	14.80	30.186
2441	3.0	39	19.56	90.427	15.99	39.719
2480	3.0	78	18.82	76.243	15.36	34.380

Table 7-6. Conducted Output Power Measurements – ANT1

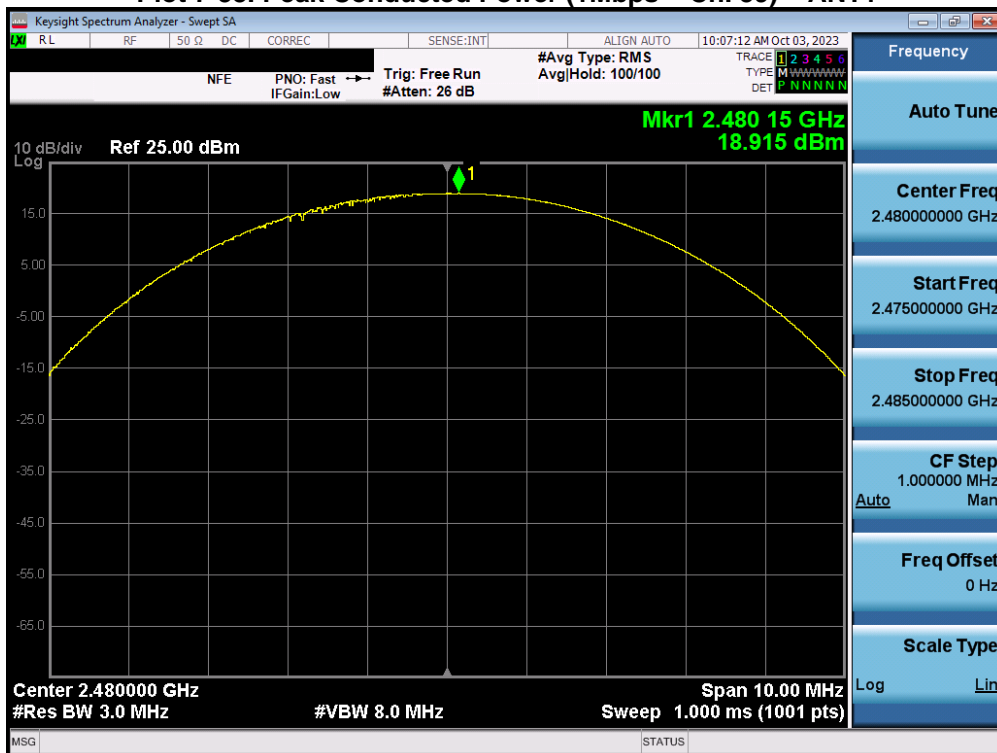


Plot 7-37. Peak Conducted Power (1Mbps – Ch. 0) – ANT1

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC ID: A3LSMS928U	Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset
Page 34 of 137			

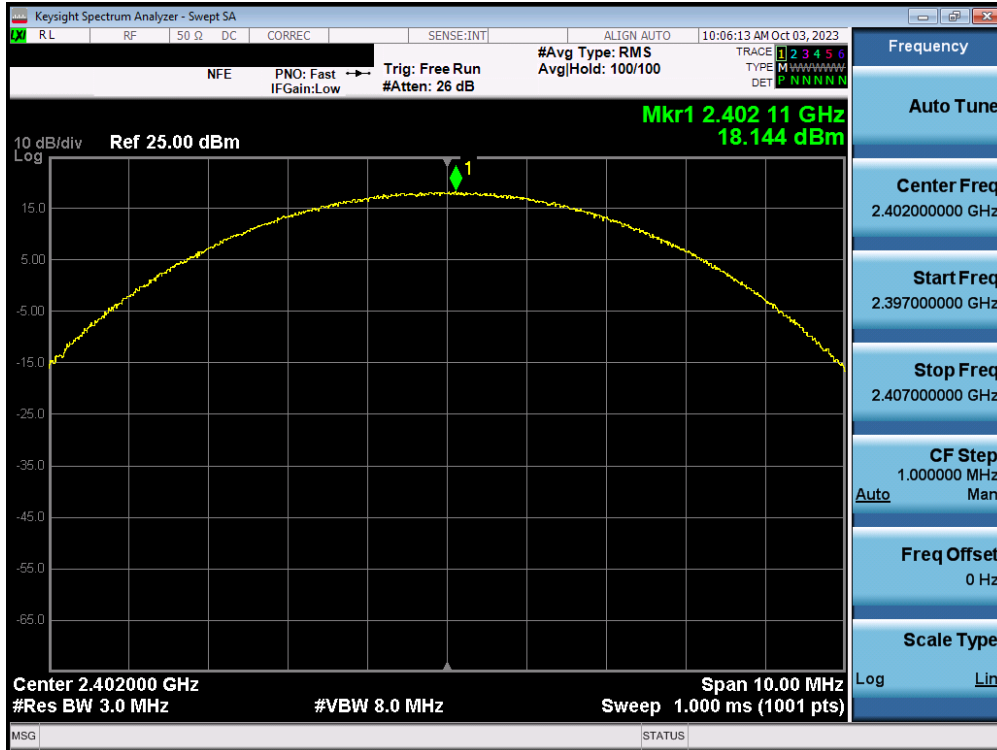


Plot 7-38. Peak Conducted Power (1Mbps – Ch. 39) – ANT1

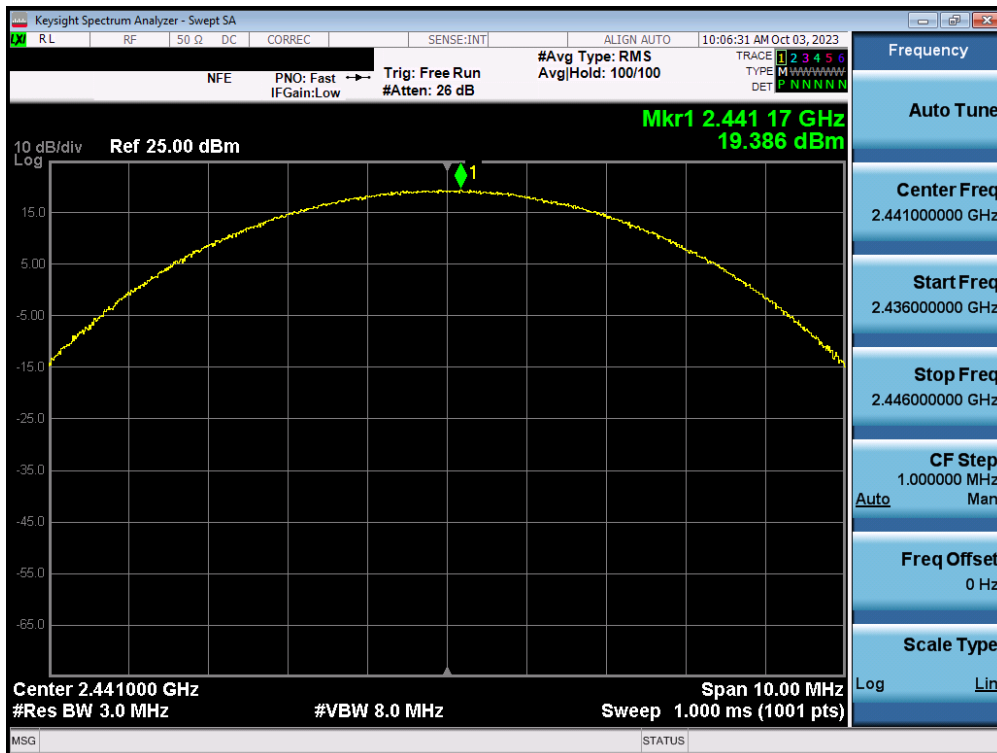


Plot 7-39. Peak Conducted Power (1Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 35 of 137

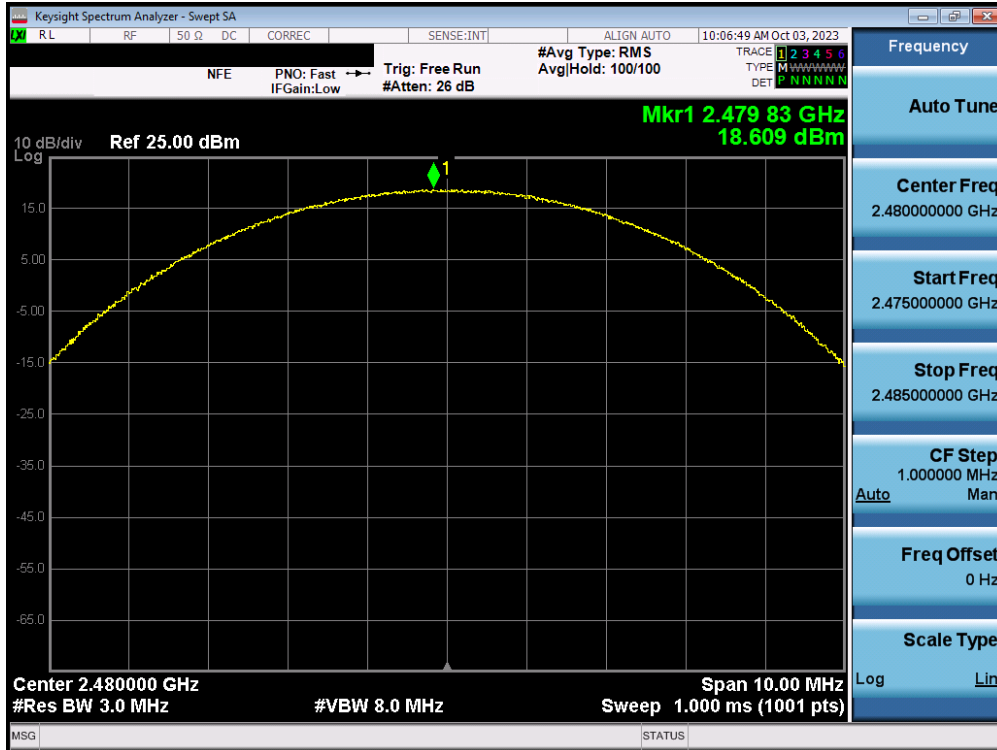


Plot 7-40. Peak Conducted Power (2Mbps – Ch. 0) – ANT1

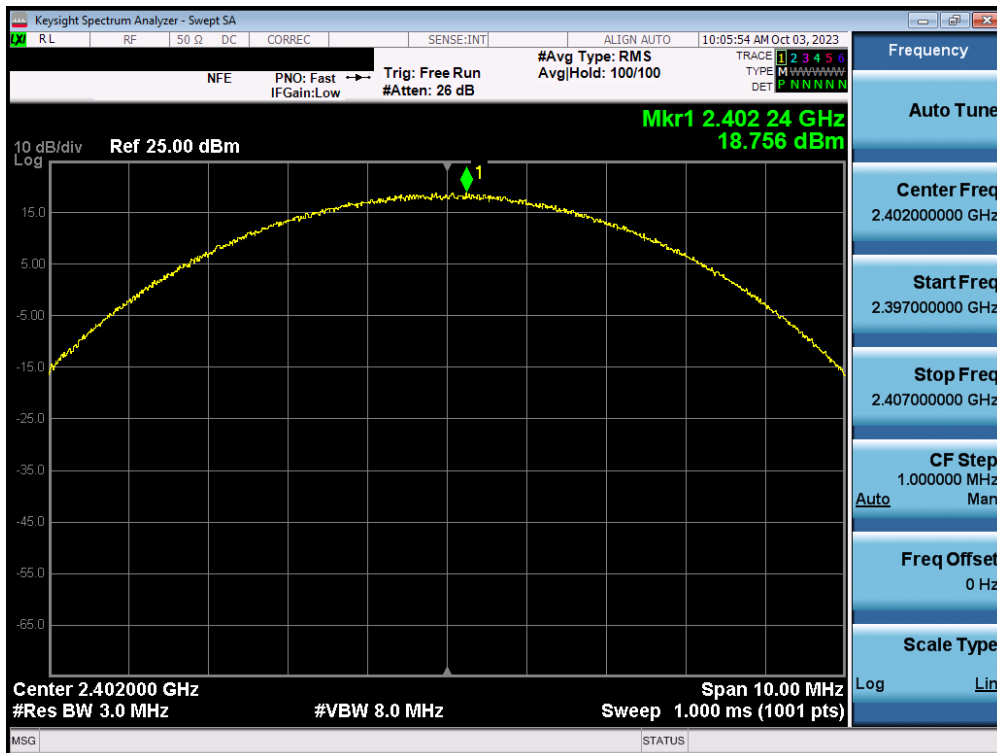


Plot 7-41. Peak Conducted Power (2Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 36 of 137

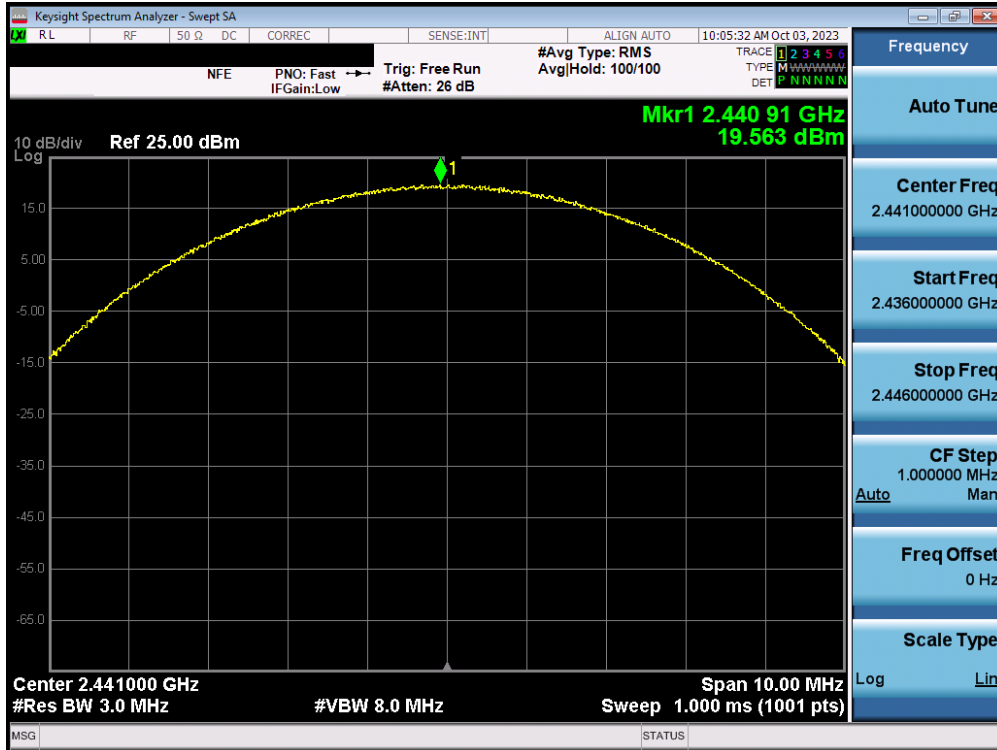


Plot 7-42. Peak Conducted Power (2Mbps – Ch. 78) – ANT1

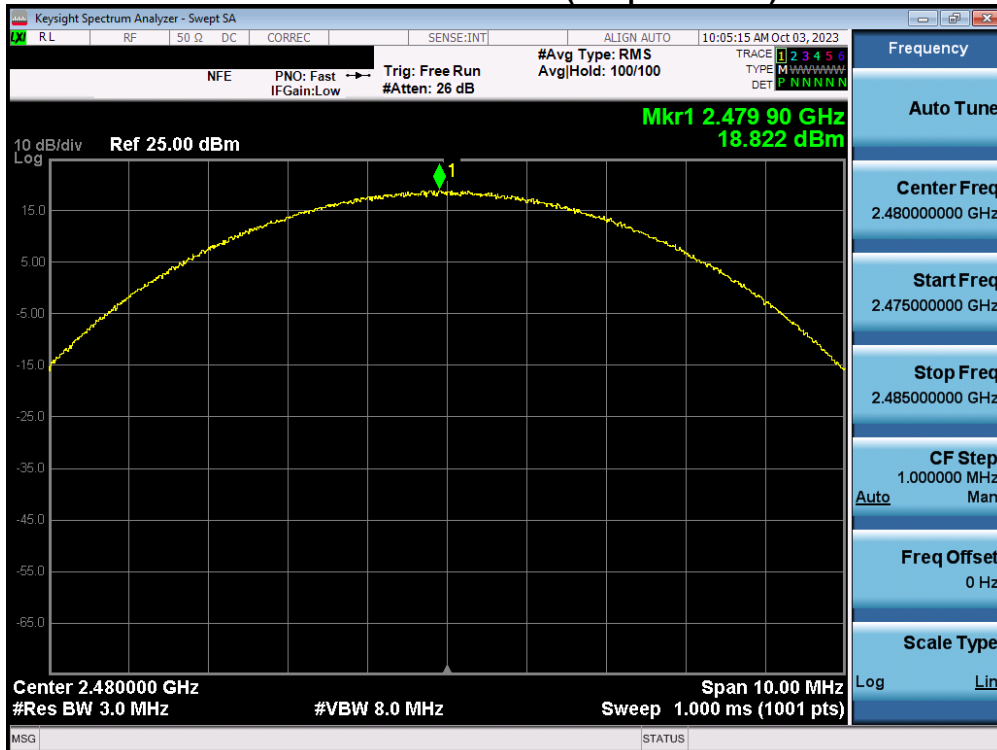


Plot 7-43. Peak Conducted Power (3Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 37 of 137

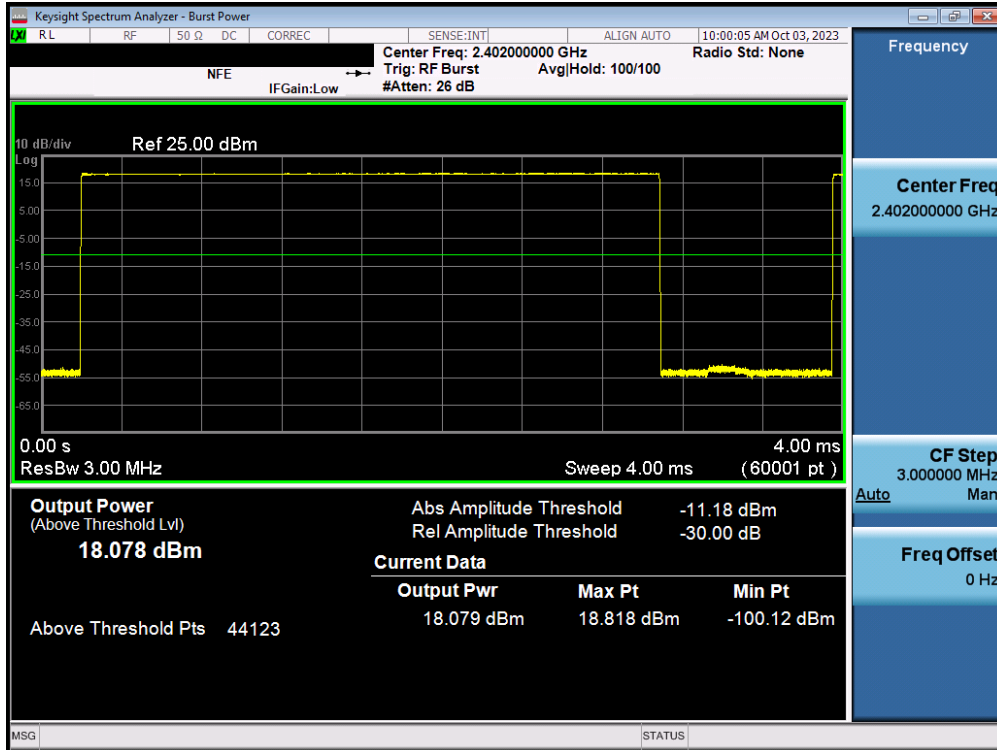


Plot 7-44. Peak Conducted Power (3Mbps – Ch. 39) – ANT1

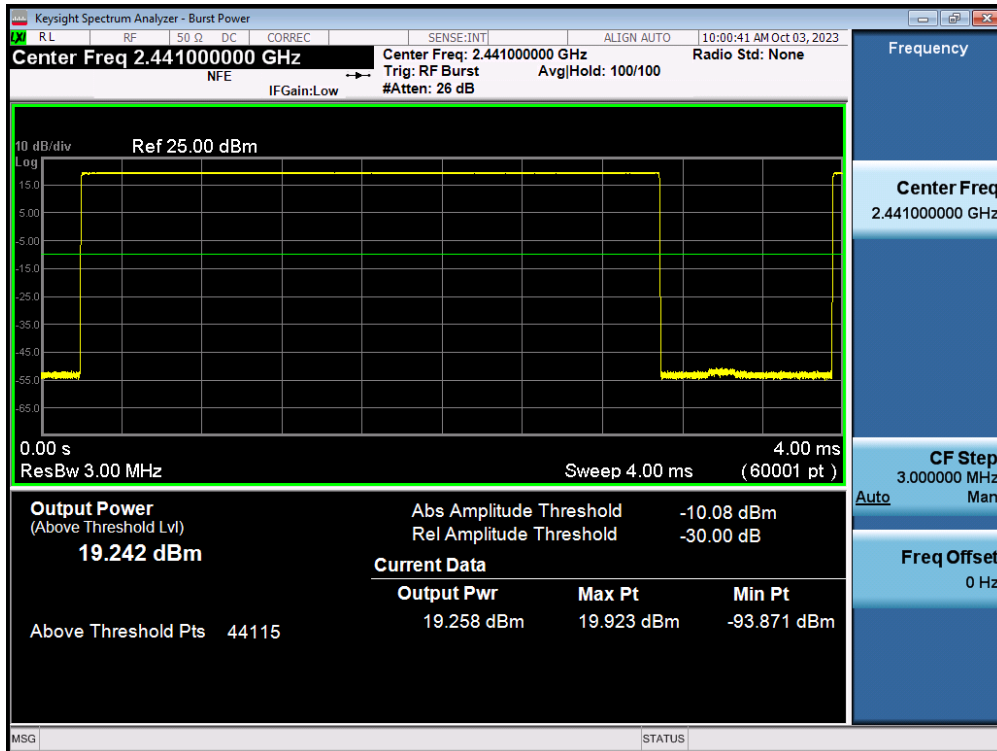


Plot 7-45. Peak Conducted Power (3Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 38 of 137

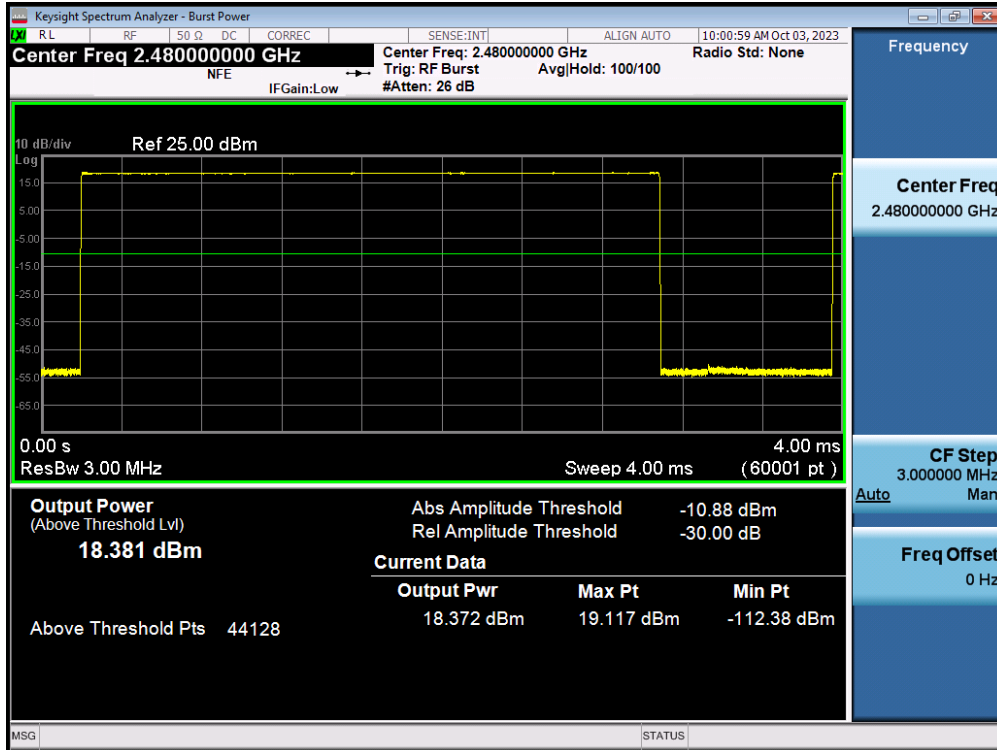


Plot 7-46. Average Conducted Power (1Mbps – Ch. 0) – ANT1

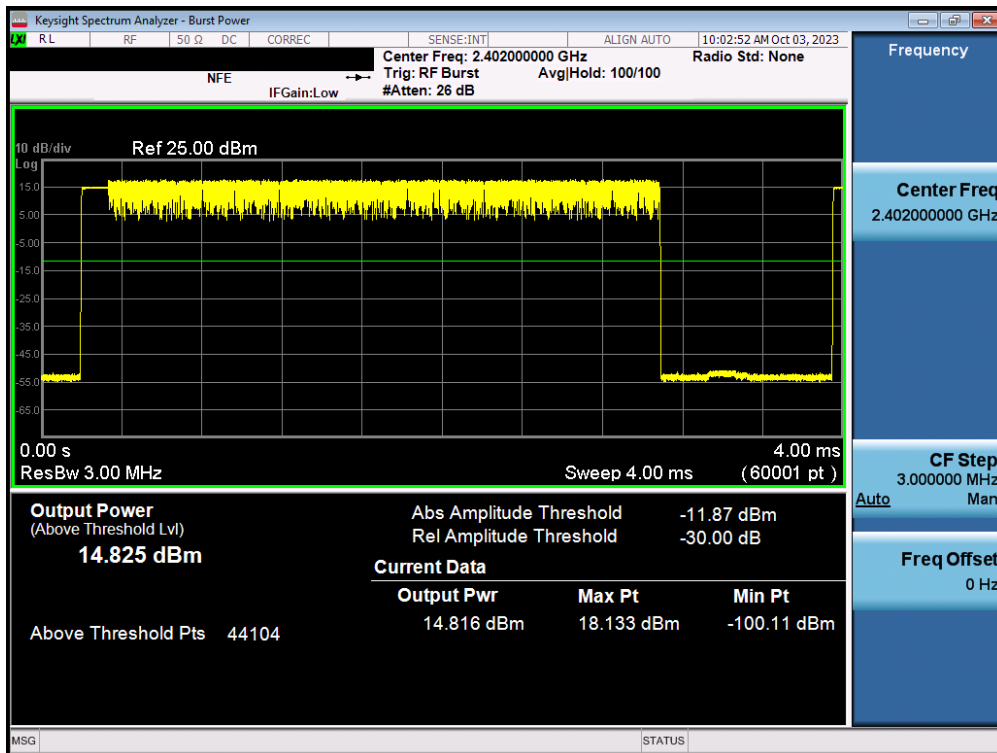


Plot 7-47. Average Conducted Power (1Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 39 of 137	

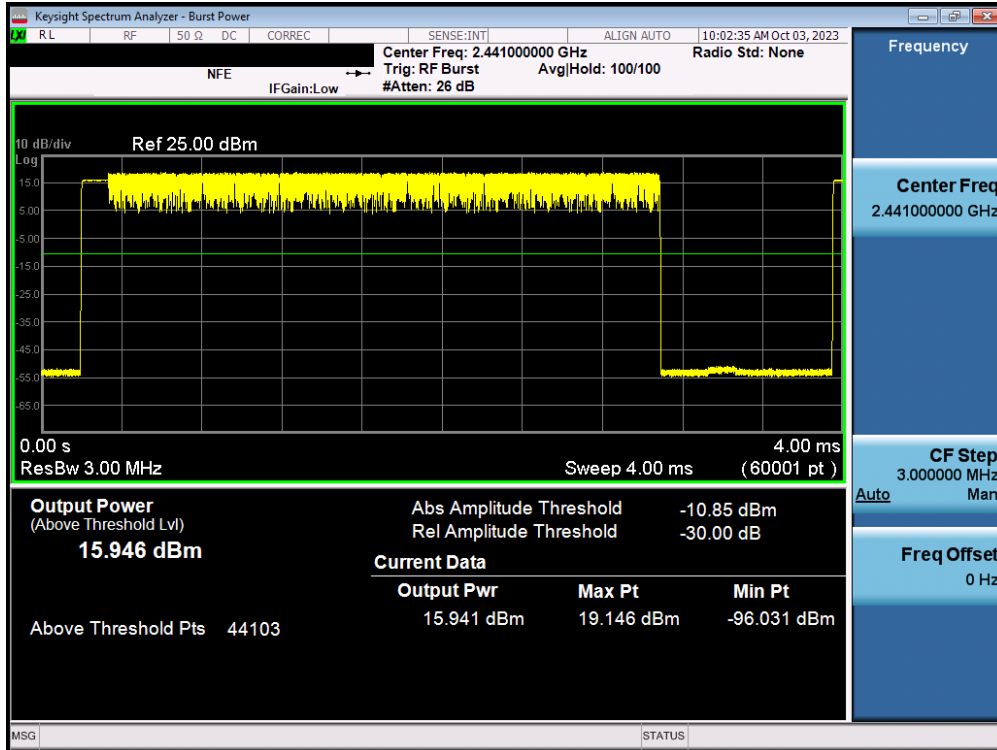


Plot 7-48. Average Conducted Power (1Mbps – Ch. 78) – ANT1

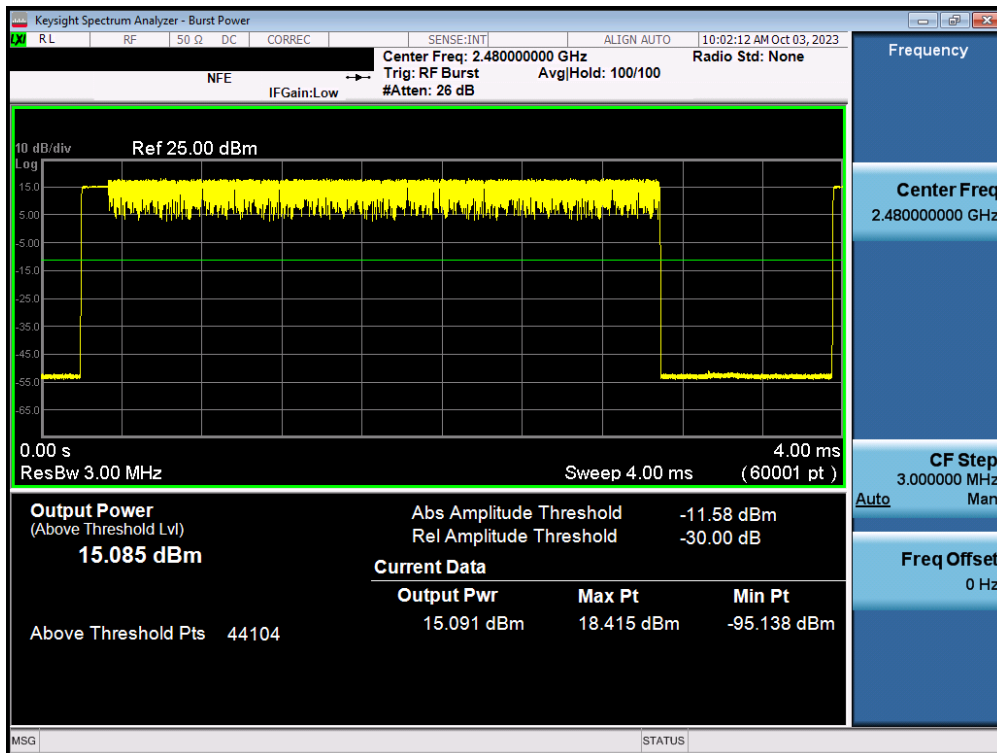


Plot 7-49. Average Conducted Power (2Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 40 of 137	

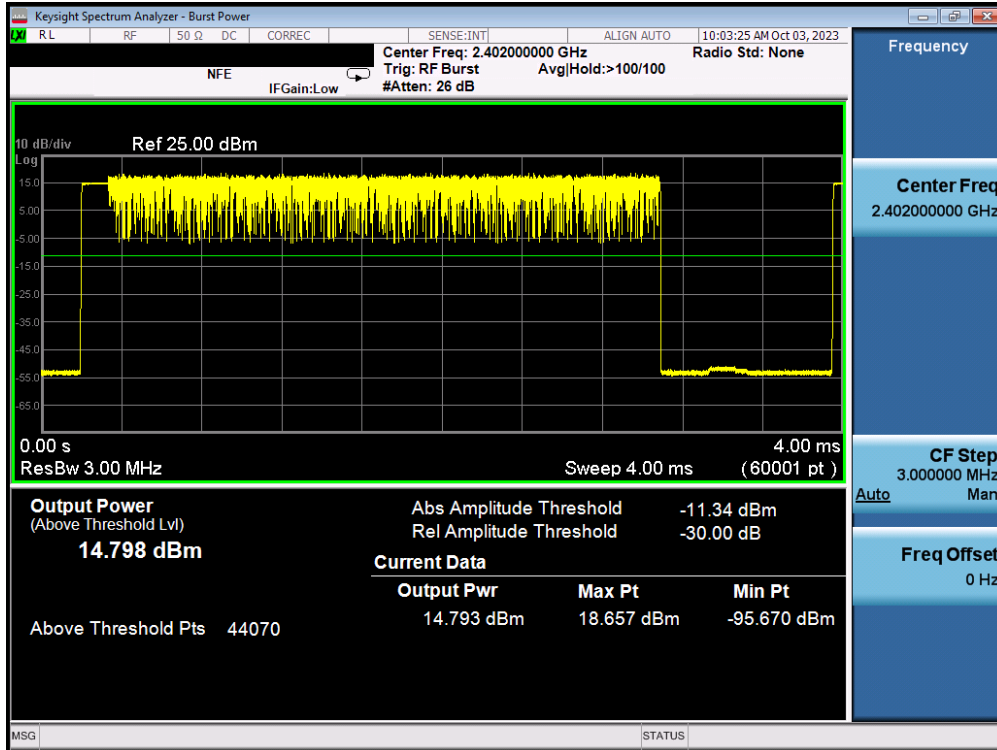


Plot 7-50. Average Conducted Power (2Mbps – Ch. 39) – ANT1

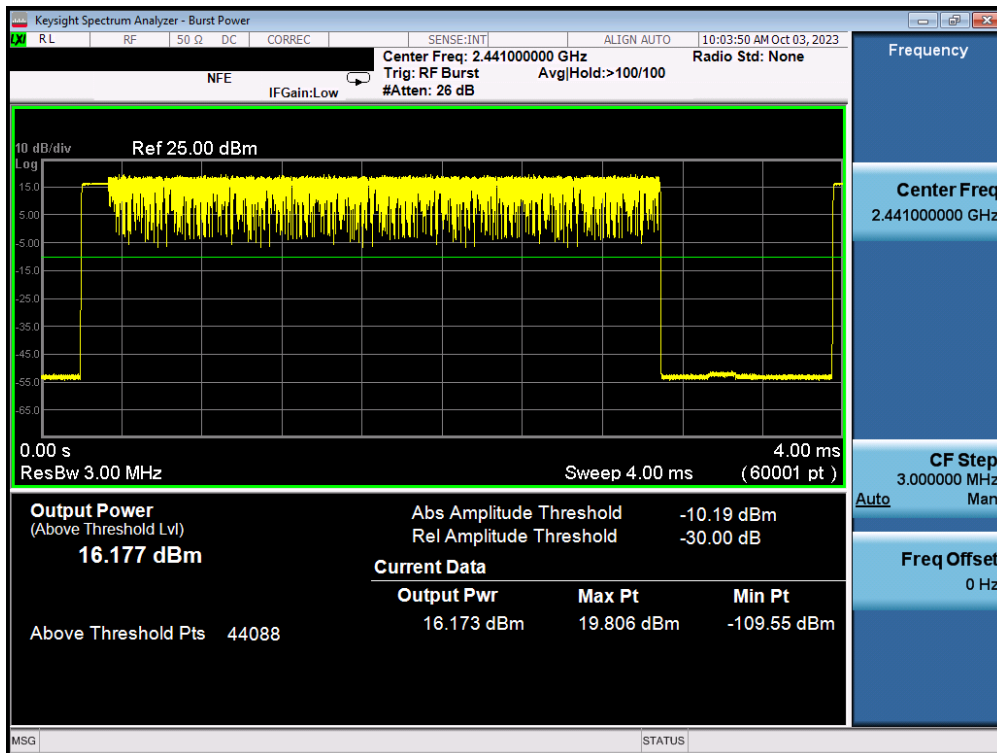


Plot 7-51. Average Conducted Power (2Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 41 of 137

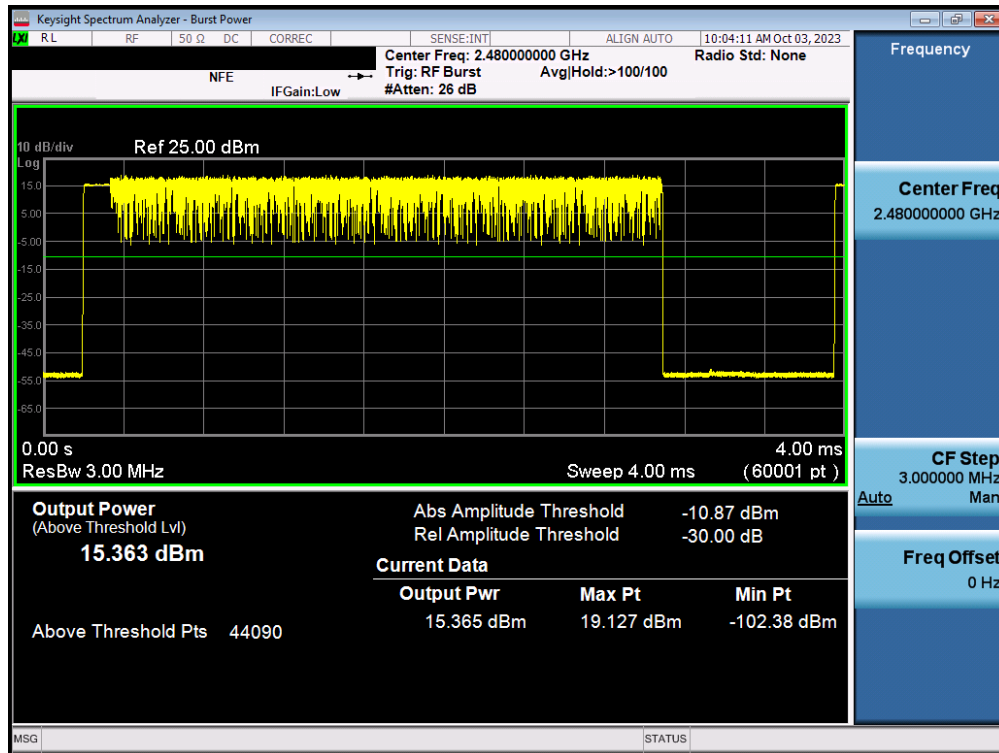


Plot 7-52. Average Conducted Power (3Mbps – Ch. 0) – ANT1



Plot 7-53. Average Conducted Power (3Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 42 of 137	

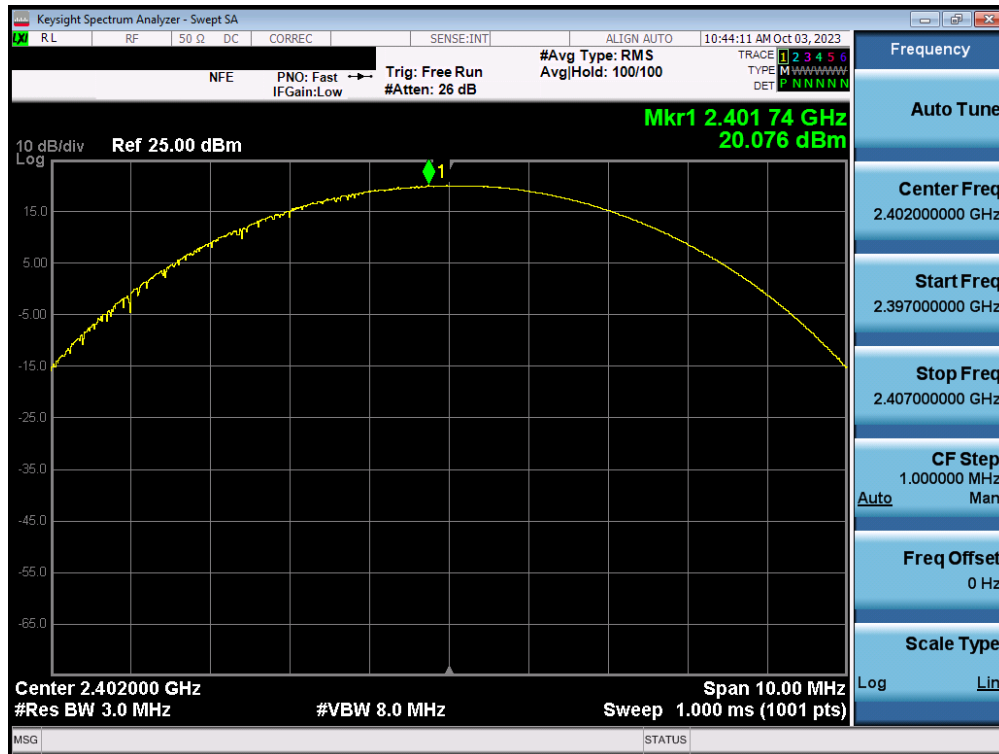


Plot 7-54. Average Conducted Power (3Mbps – Ch. 78) – ANT1

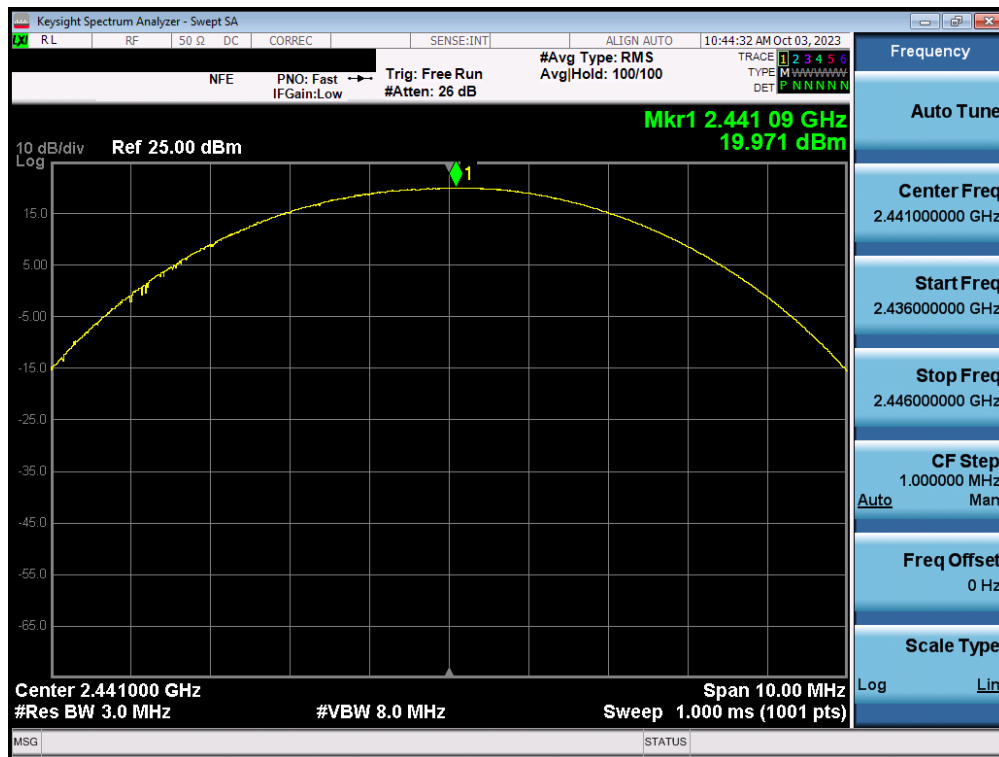
Frequency [MHz]	Data Rate [Mbps]	Channel No.	Peak Conducted Power		Avg Conducted Power	
			[dBm]	[mW]	[dBm]	[mW]
2402	1.0	0	19.97	99.334	19.29	84.898
2441	1.0	39	20.08	101.765	19.24	83.849
2480	1.0	78	19.39	86.936	18.79	75.701
2402	2.0	0	18.89	77.428	15.95	39.364
2441	2.0	39	19.09	81.115	15.86	38.521
2480	2.0	78	18.40	69.135	15.48	35.326
2402	3.0	0	19.68	92.939	15.74	37.454
2441	3.0	39	19.57	90.594	15.85	38.450
2480	3.0	78	19.17	82.509	15.50	35.481

Table 7-7. Conducted Output Power Measurements – ANT2

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC ID: A3LSMS928U	Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset
Page 43 of 137			

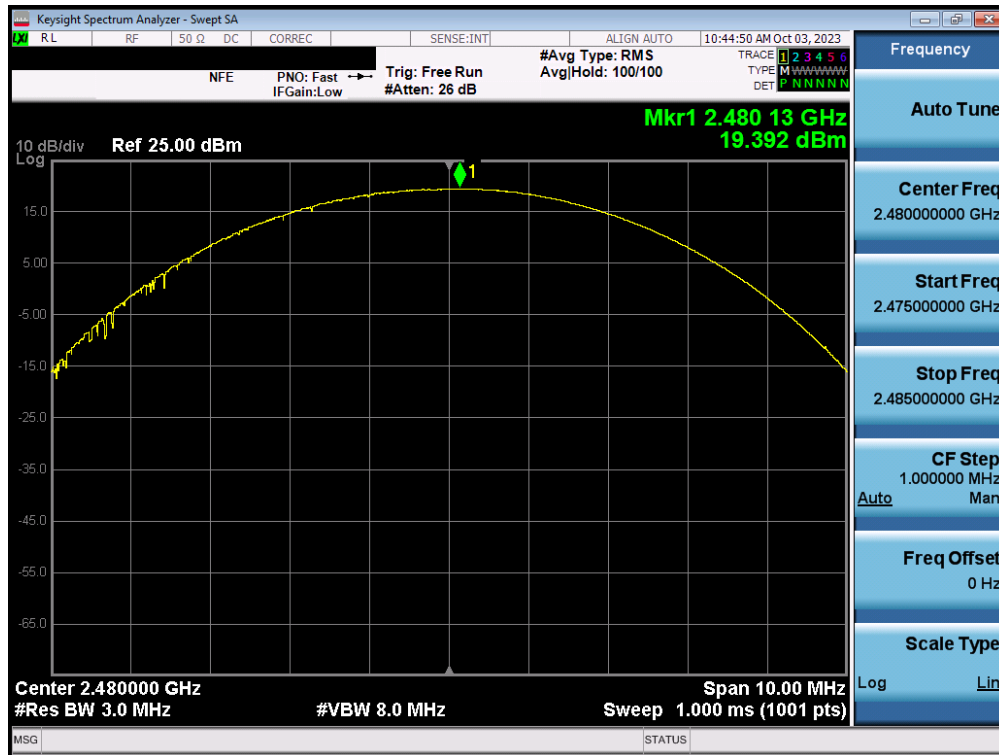


Plot 7-55. Peak Conducted Power (1Mbps – Ch. 0) – ANT2

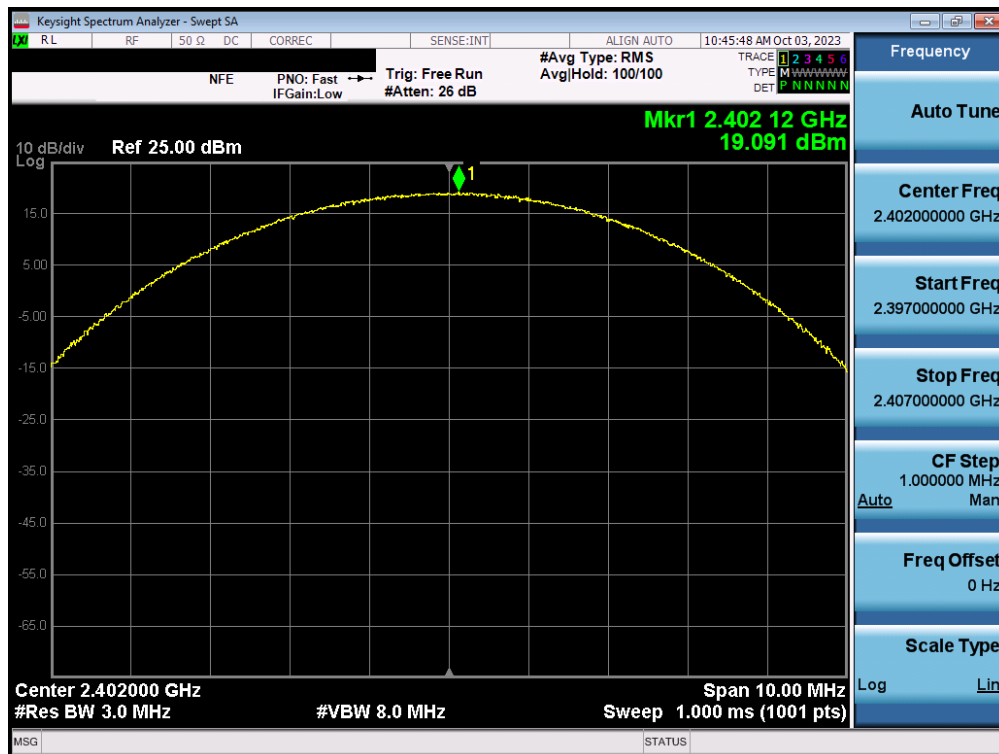


FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 44 of 137

Plot 7-56. Peak Conducted Power (1Mbps – Ch. 39) – ANT2



Plot 7-57. Peak Conducted Power (1Mbps – Ch. 78) – ANT2

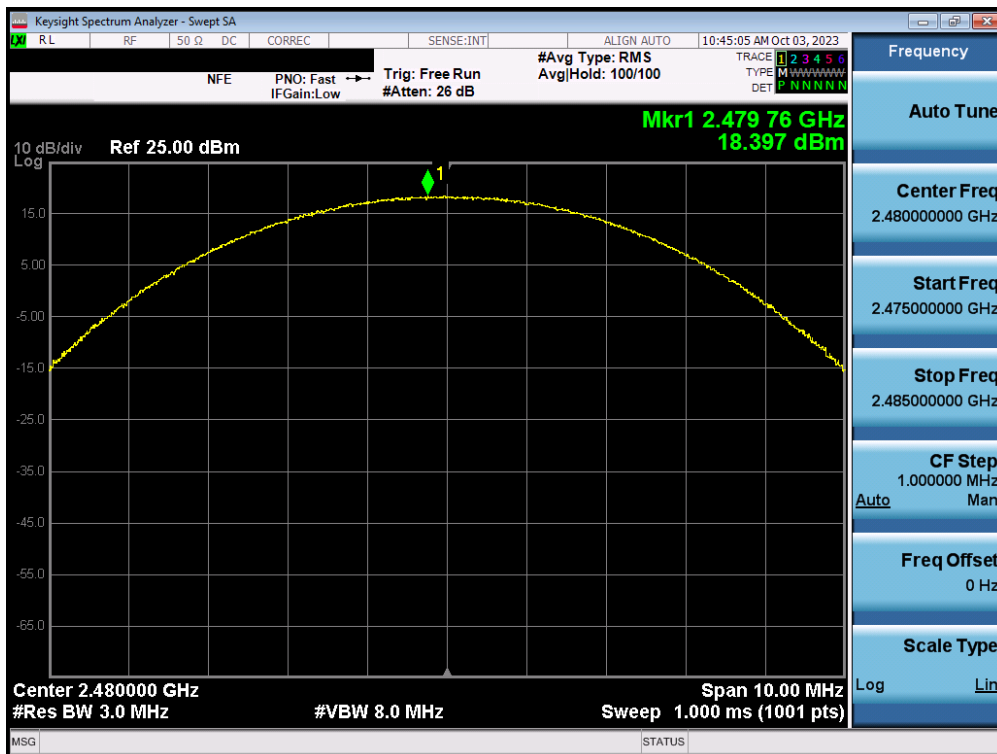


Plot 7-58. Peak Conducted Power (2Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 45 of 137

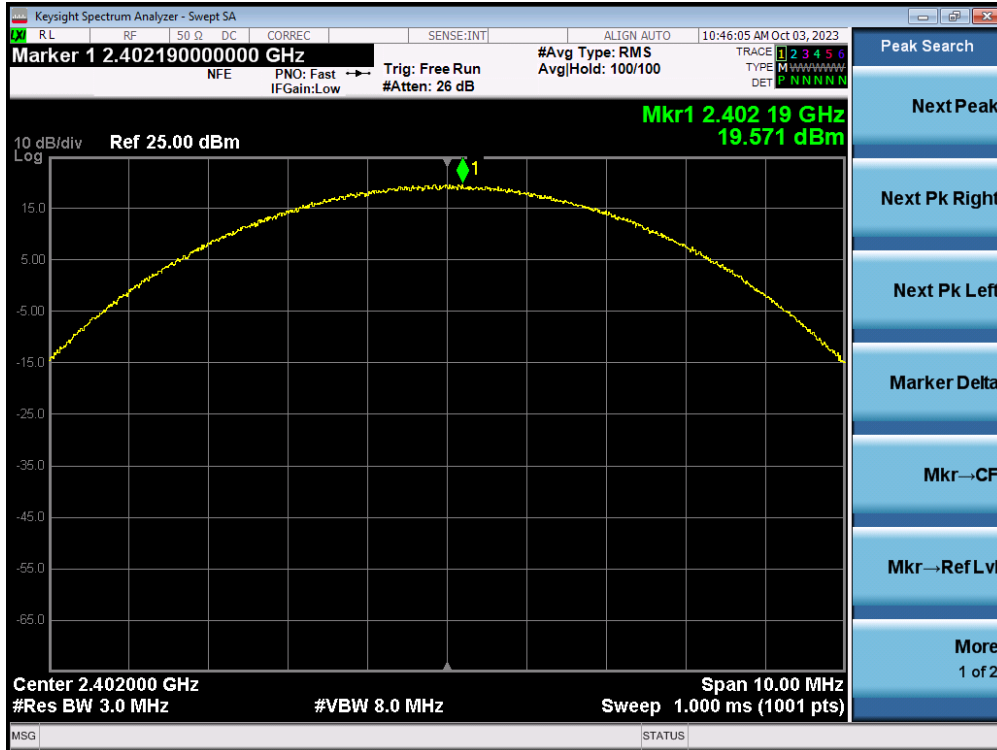


Plot 7-59. Peak Conducted Power (2Mbps – Ch. 39) – ANT2

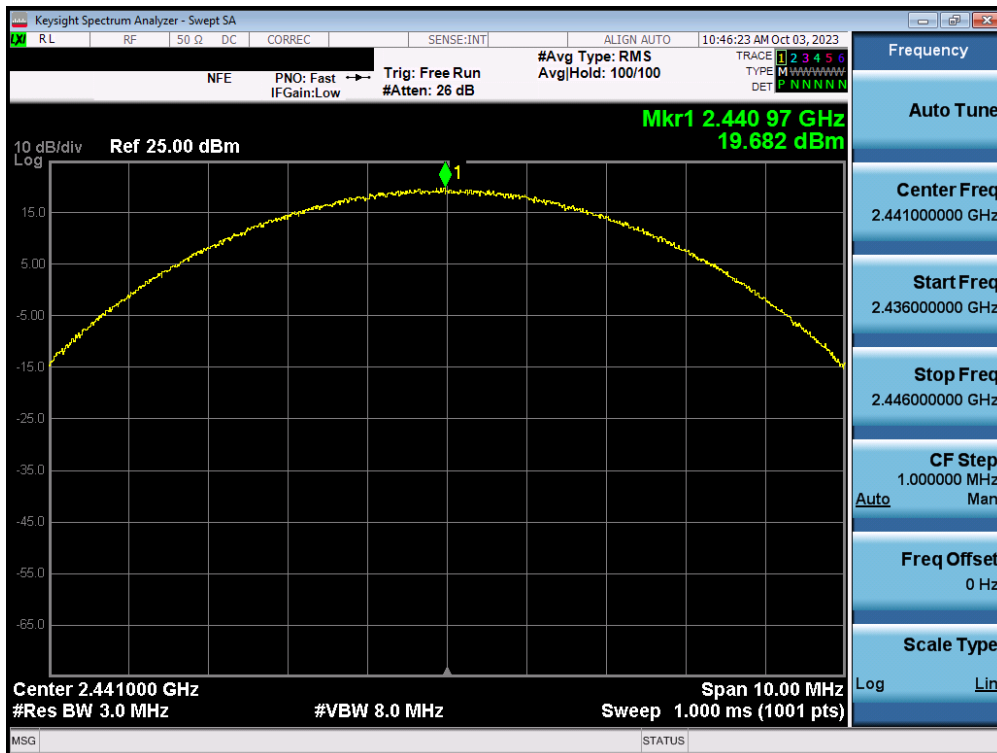


Plot 7-60. Peak Conducted Power (2Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 46 of 137

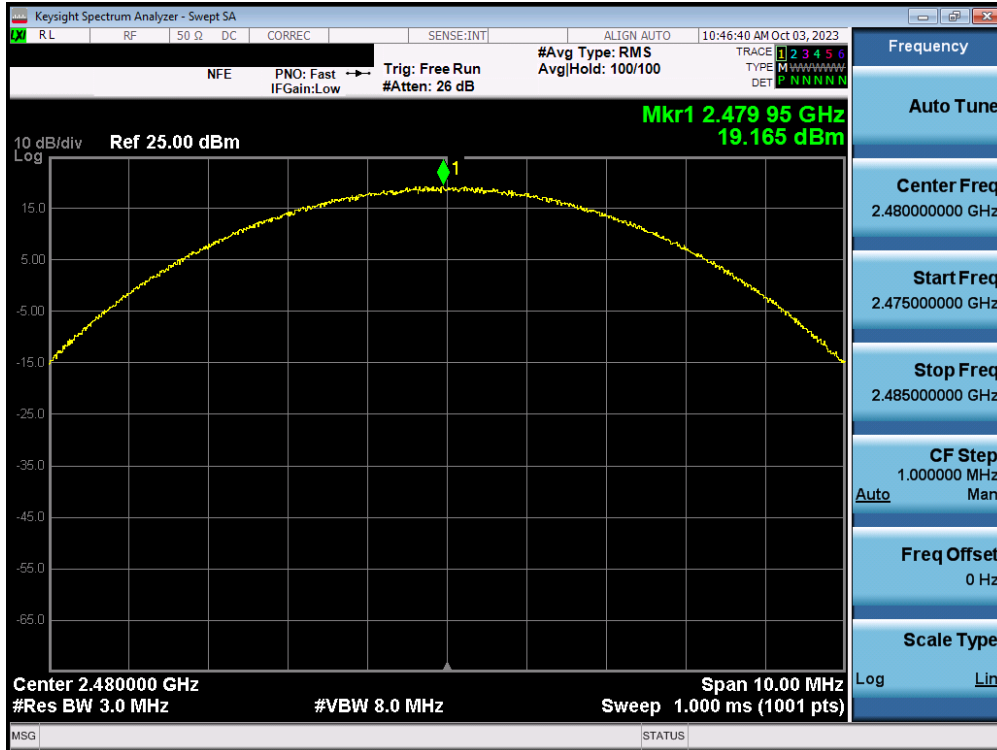


Plot 7-61. Peak Conducted Power (3Mbps – Ch. 0) – ANT2

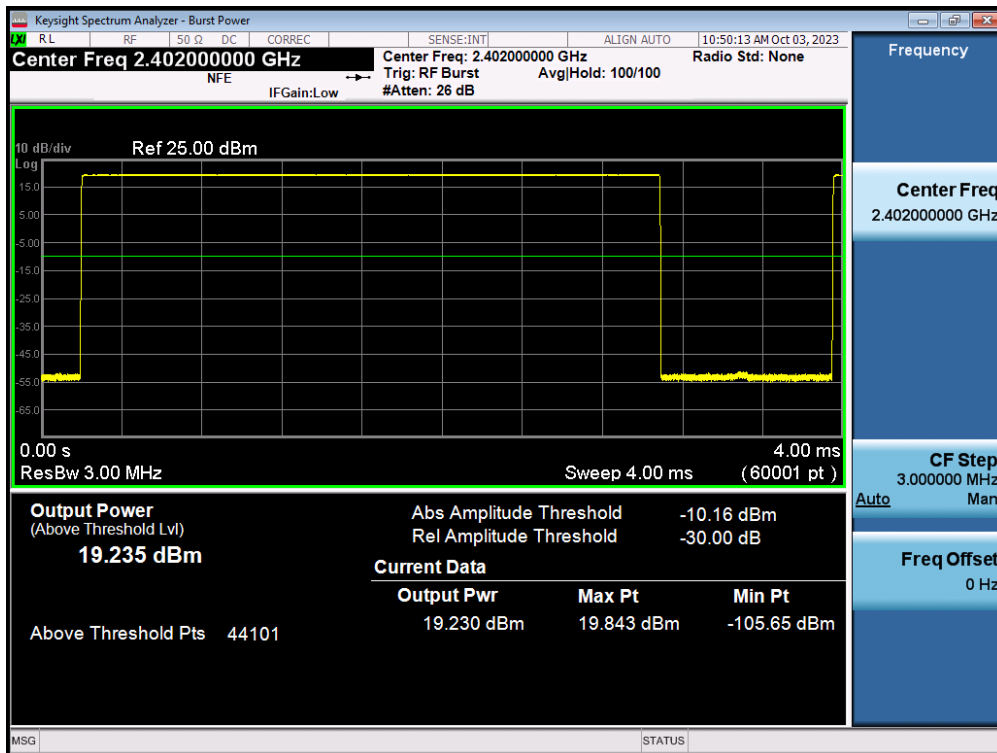


Plot 7-62. Peak Conducted Power (3Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 47 of 137

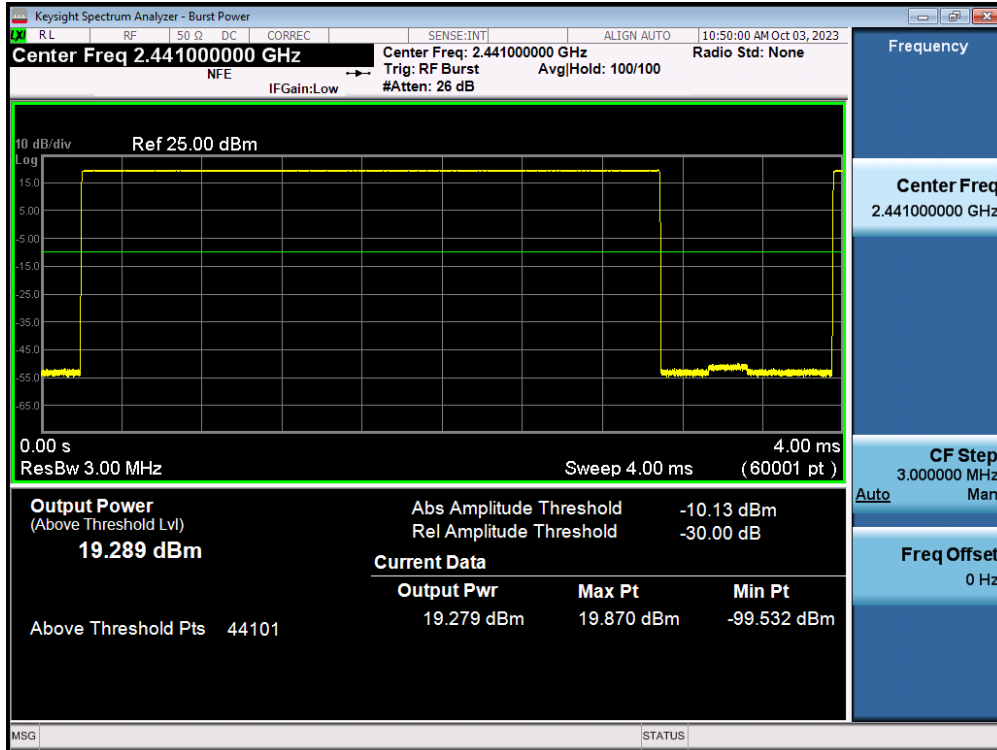


Plot 7-63. Peak Conducted Power (3Mbps – Ch. 78) – ANT2

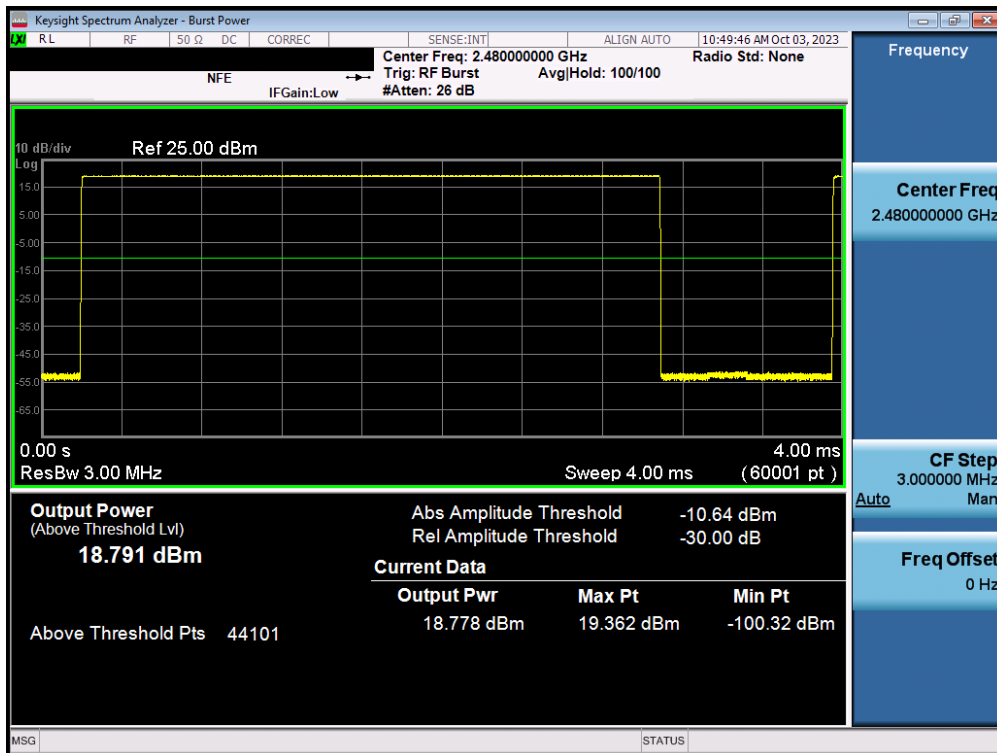


Plot 7-64. Average Conducted Power (1Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 48 of 137

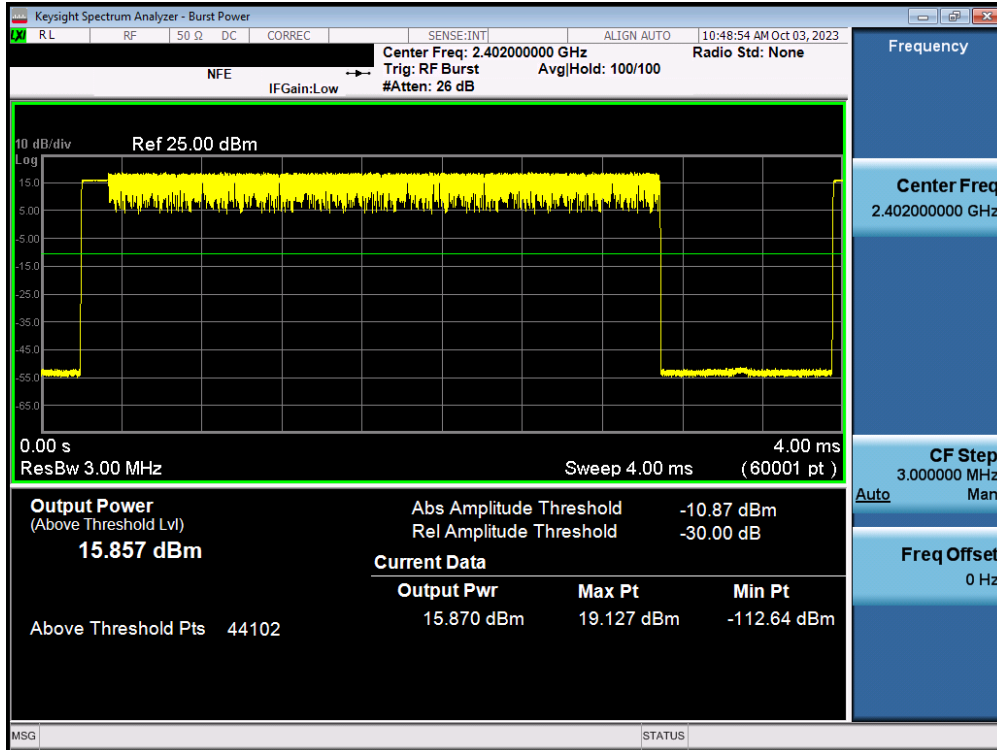


Plot 7-65. Average Conducted Power (1Mbps – Ch. 39) – ANT2

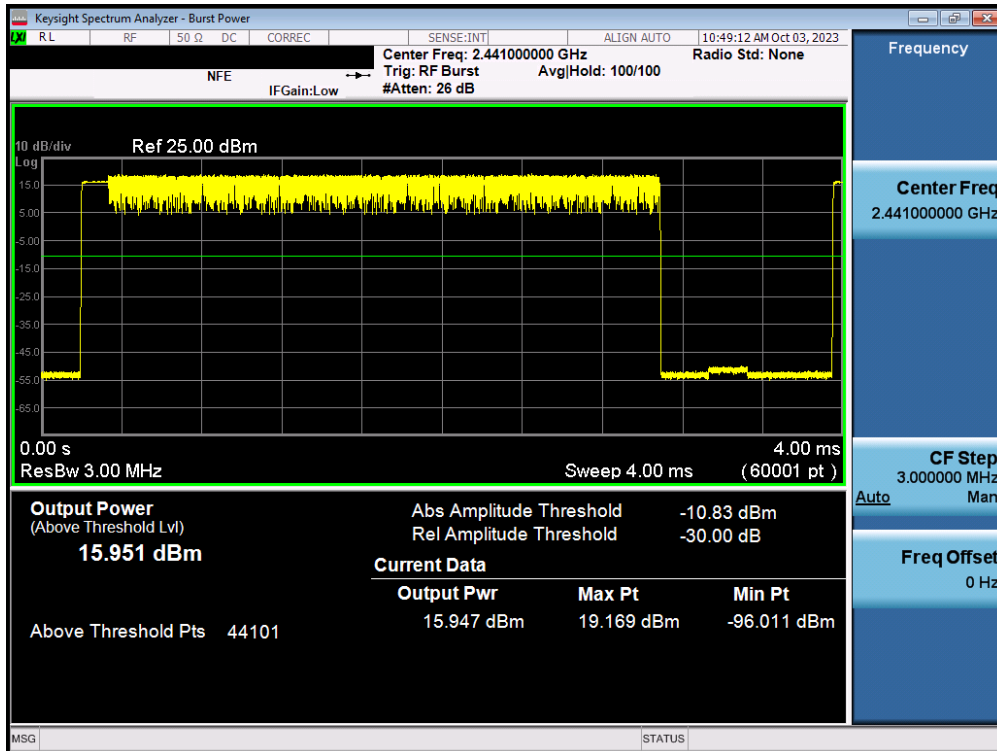


Plot 7-66. Average Conducted Power (1Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 49 of 137	

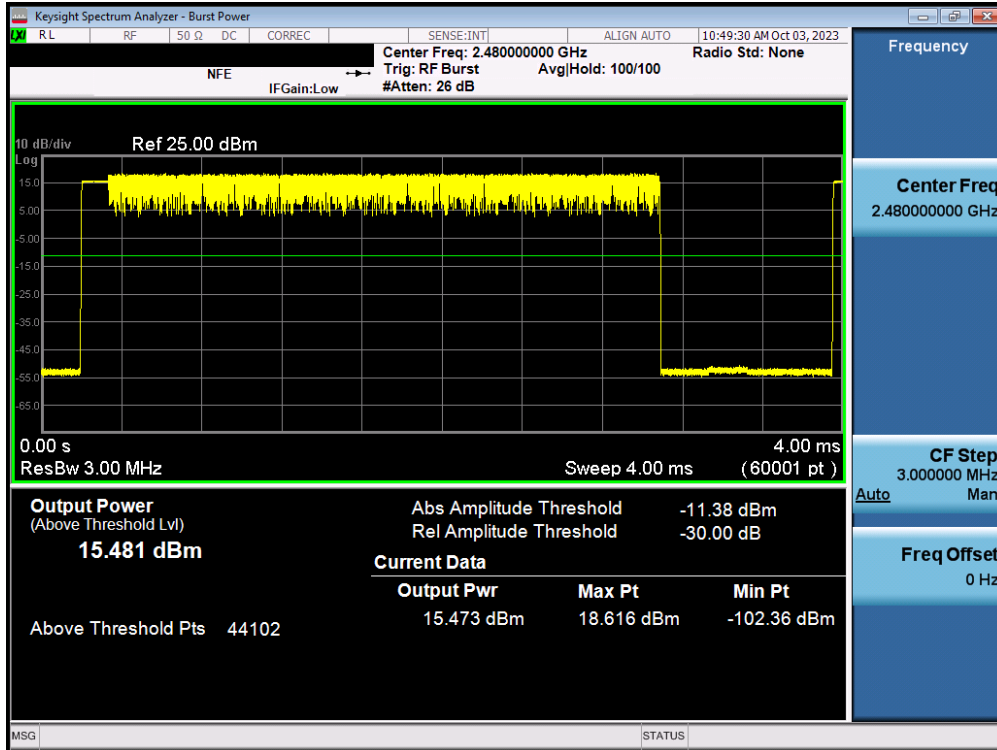


Plot 7-67. Average Conducted Power (2Mbps – Ch. 0) – ANT2

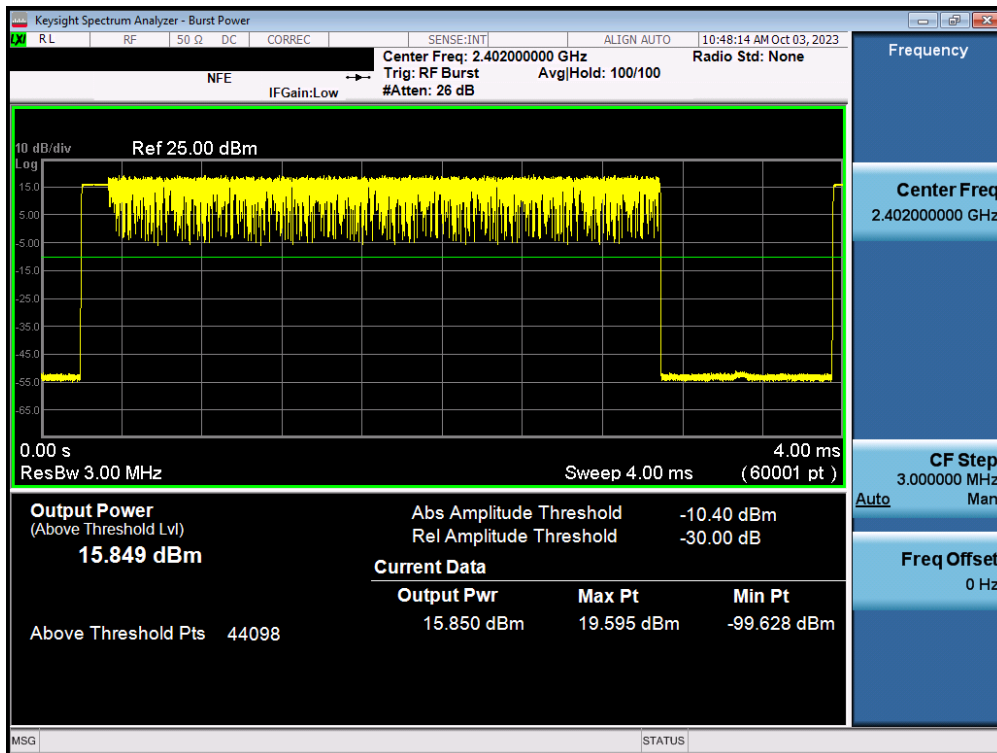


Plot 7-68. Average Conducted Power (2Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 50 of 137	

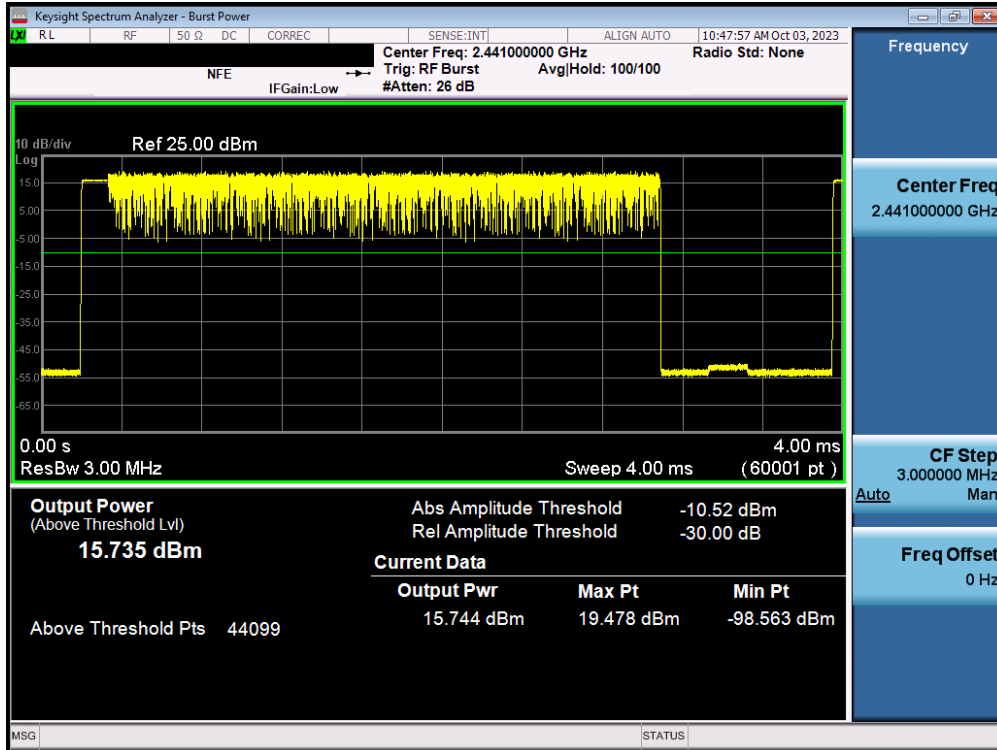


Plot 7-69. Average Conducted Power (2Mbps – Ch. 78) – ANT2

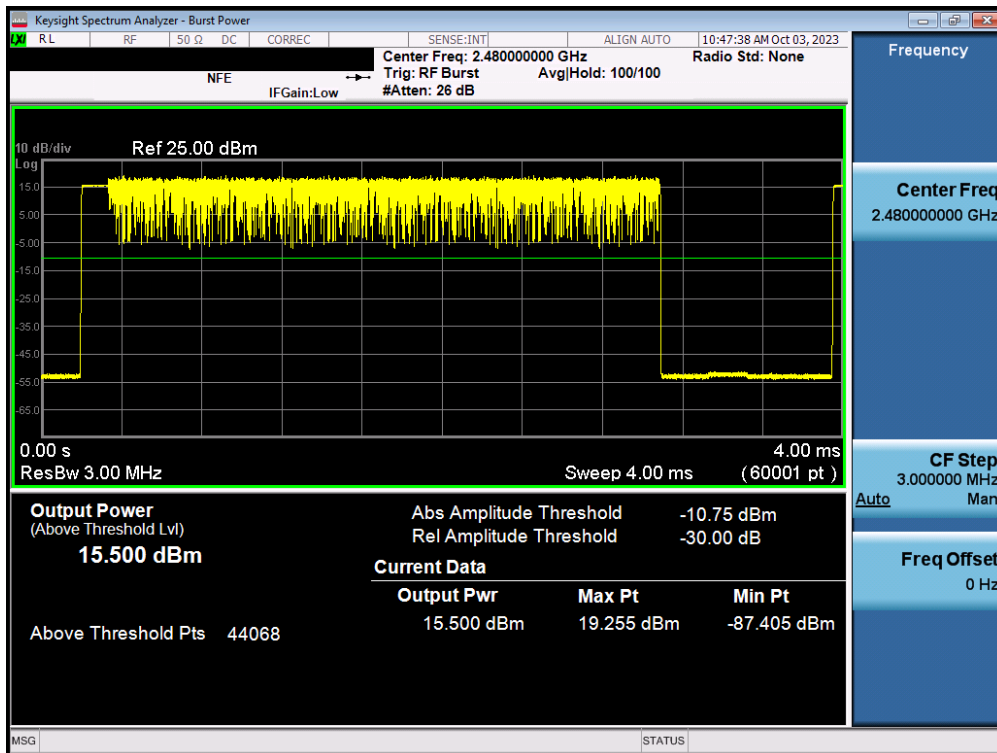


Plot 7-70. Average Conducted Power (3Mbps – Ch. 0) – ANT2

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC ID: A3LSMS928U	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 51 of 137
Test Report S/N: 1M2308210092-09.A3L			



Plot 7-71. Average Conducted Power (3Mbps – Ch. 39) – ANT2



Plot 7-72. Average Conducted Power (3Mbps – Ch. 78) – ANT2

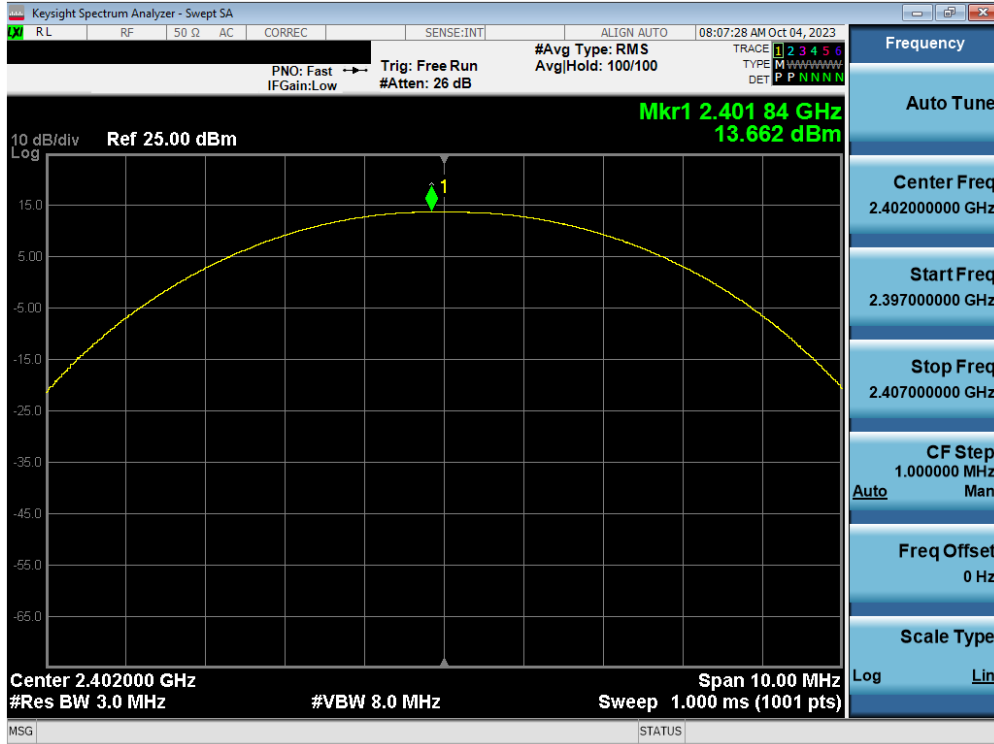
FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 52 of 137	



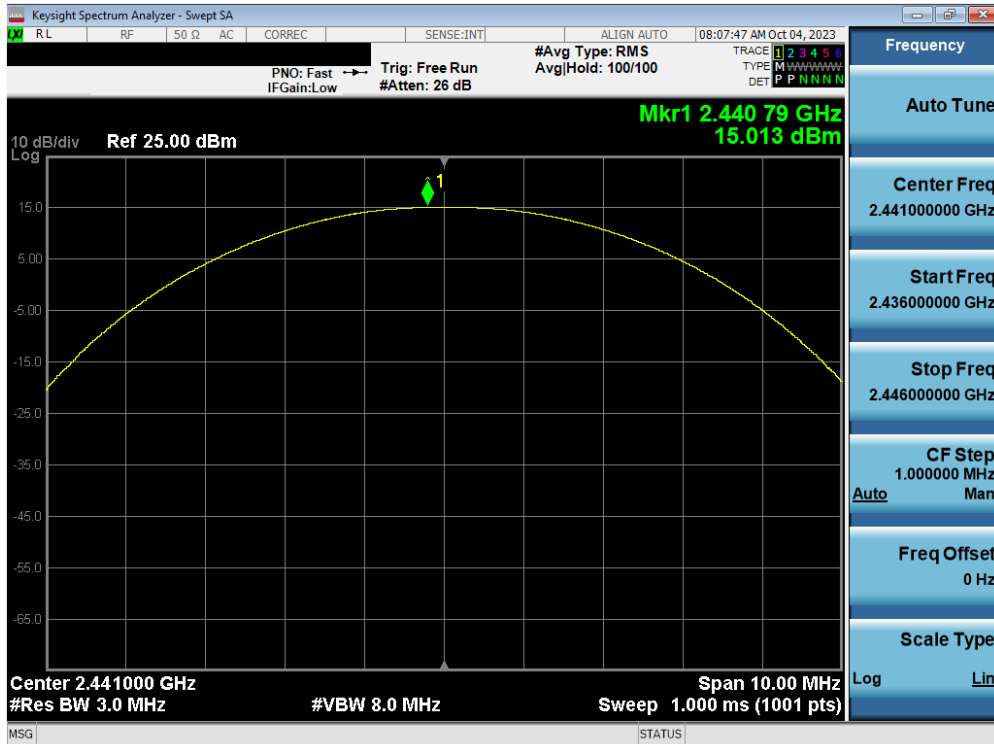
Frequency [MHz]	Data Rate [Mbps]	Channel No.	Ant1 Peak Cond. Power		Ant1. Avg Cond. Power		Ant2 Peak Cond. Power		Ant2. Avg Cond. Power		Dual Peak Cond. Power		Dual Avg Cond. Power	
			[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]
2402	1.0	0	13.66	23.238	13.21	20.946	14.55	28.484	14.37	27.328	17.14	51.722	16.84	48.273
2441	1.0	39	15.01	31.718	14.24	26.540	13.53	22.522	13.32	21.493	17.34	54.239	16.82	48.033
2480	1.0	78	14.79	30.123	13.81	24.016	13.28	21.281	13.07	20.286	17.11	51.405	16.46	44.302
2402	2.0	0	13.38	21.757	10.35	10.847	13.86	24.305	11.23	13.271	16.63	46.062	13.82	24.118
2441	2.0	39	14.43	27.714	11.70	14.805	12.74	18.802	9.92	9.820	16.68	46.516	13.91	24.625
2480	2.0	78	14.56	28.576	11.11	12.924	12.41	17.430	9.88	9.721	16.63	46.006	13.55	22.645
2402	3.0	0	13.40	21.888	10.32	10.775	14.04	25.357	11.22	13.237	16.74	47.245	13.80	24.012
2441	3.0	39	14.91	30.939	11.44	13.916	12.87	19.378	9.90	9.765	17.02	50.316	13.74	23.681
2480	3.0	78	14.96	31.340	11.10	12.882	12.54	17.956	9.85	9.671	16.93	49.296	13.53	22.553

Table 7-8. Conducted Output Power Measurements – Dual

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 53 of 137

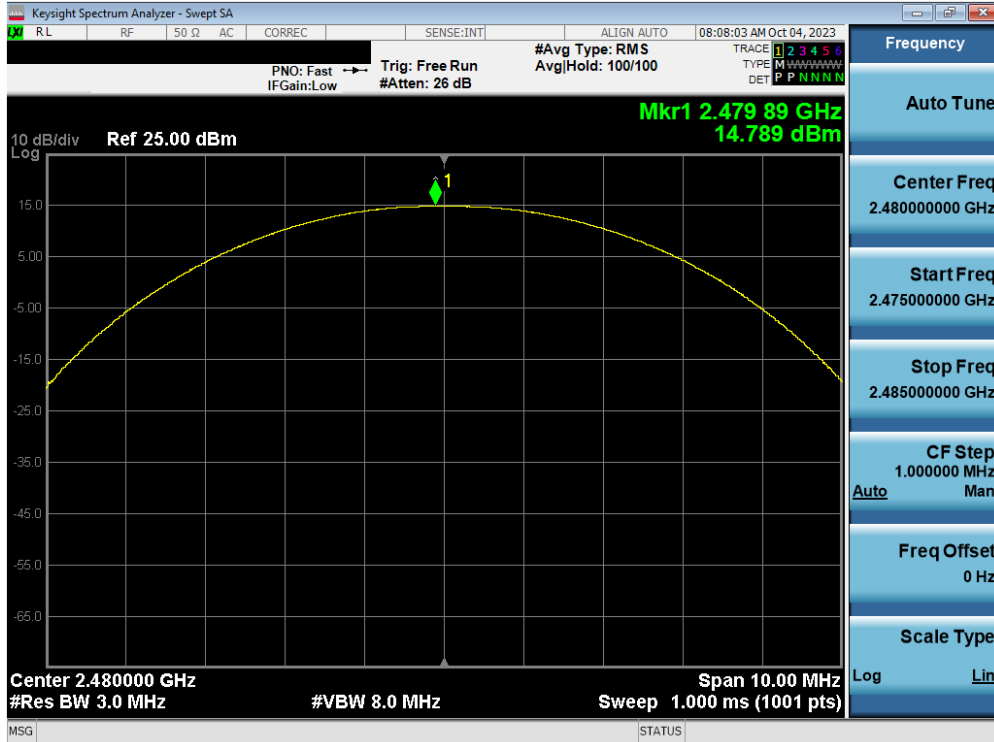


Plot 7-73. Peak Conducted Power (1Mbps – Ch. 0) – ANT1

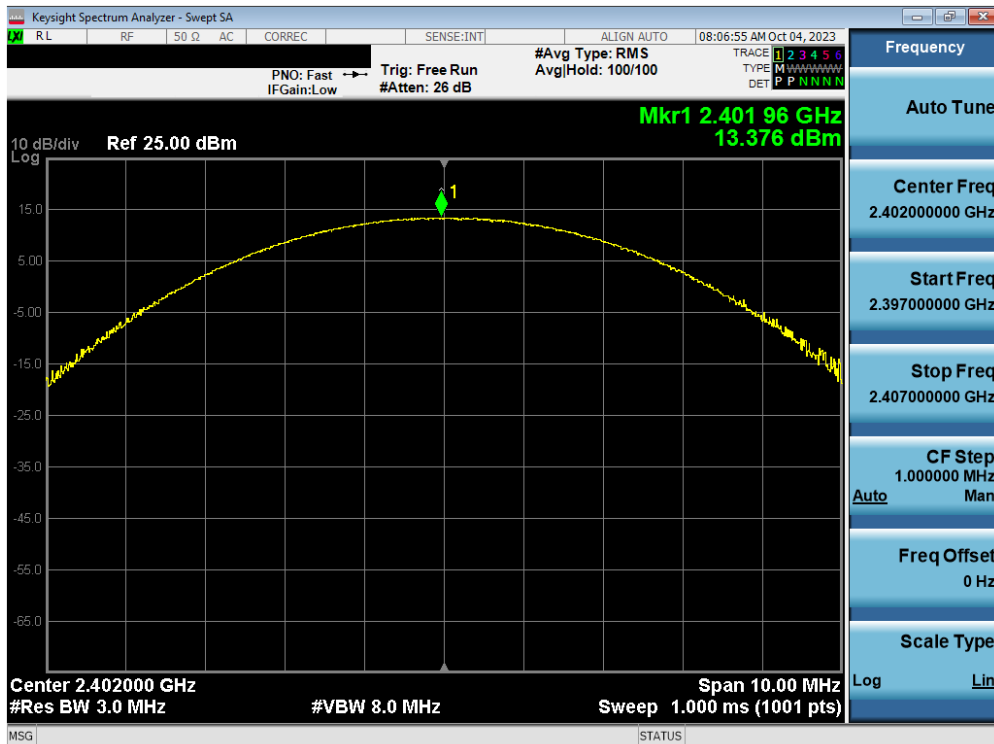


Plot 7-74. Peak Conducted Power (1Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 54 of 137

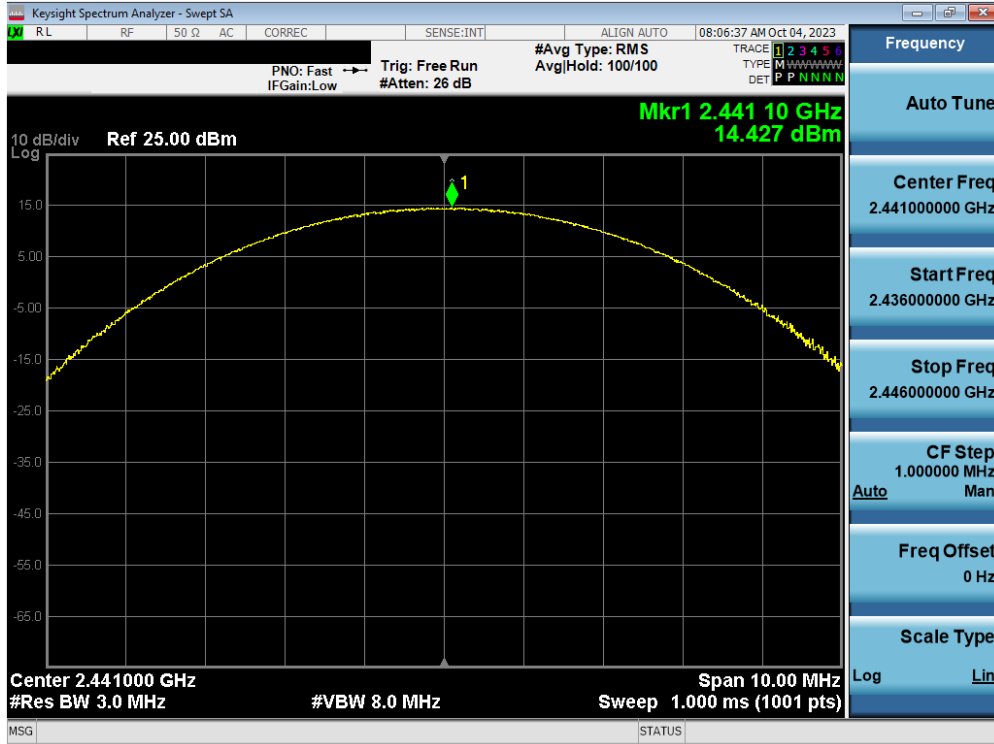


Plot 7-75. Peak Conducted Power (1Mbps – Ch. 78) – ANT1

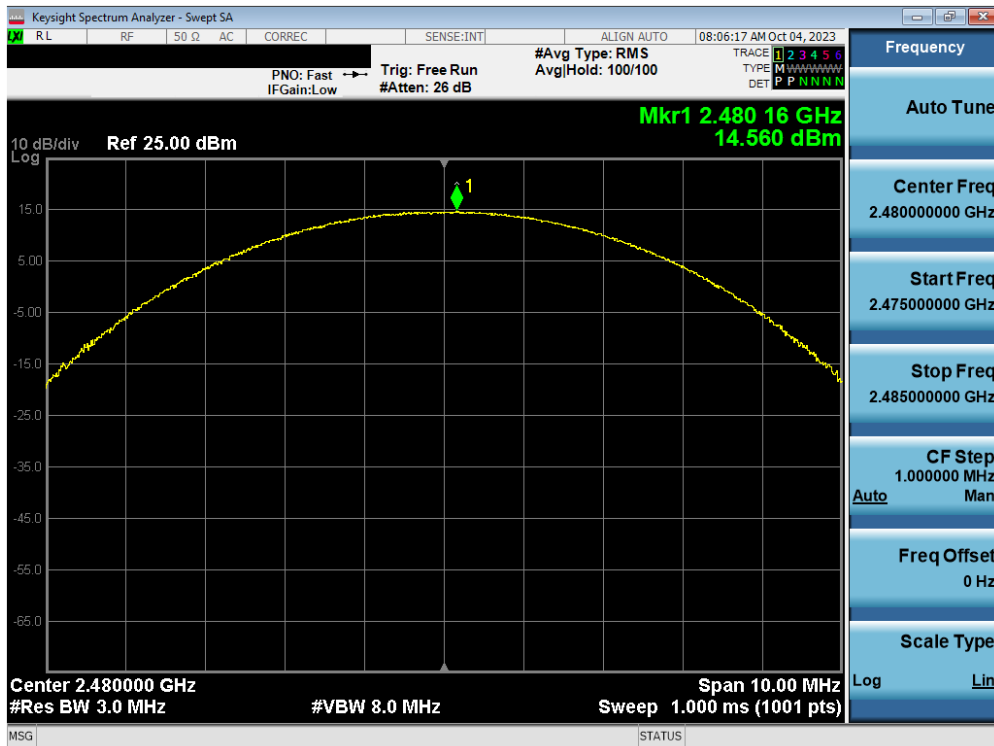


Plot 7-76. Peak Conducted Power (2Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 55 of 137

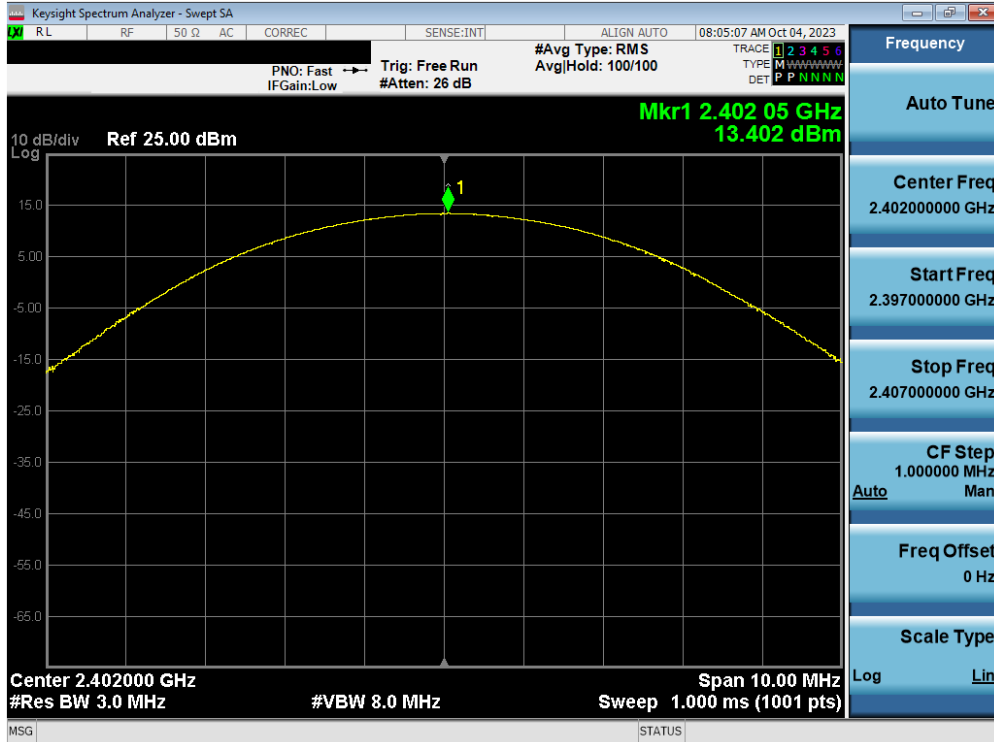


Plot 7-77. Peak Conducted Power (2Mbps – Ch. 39) – ANT1

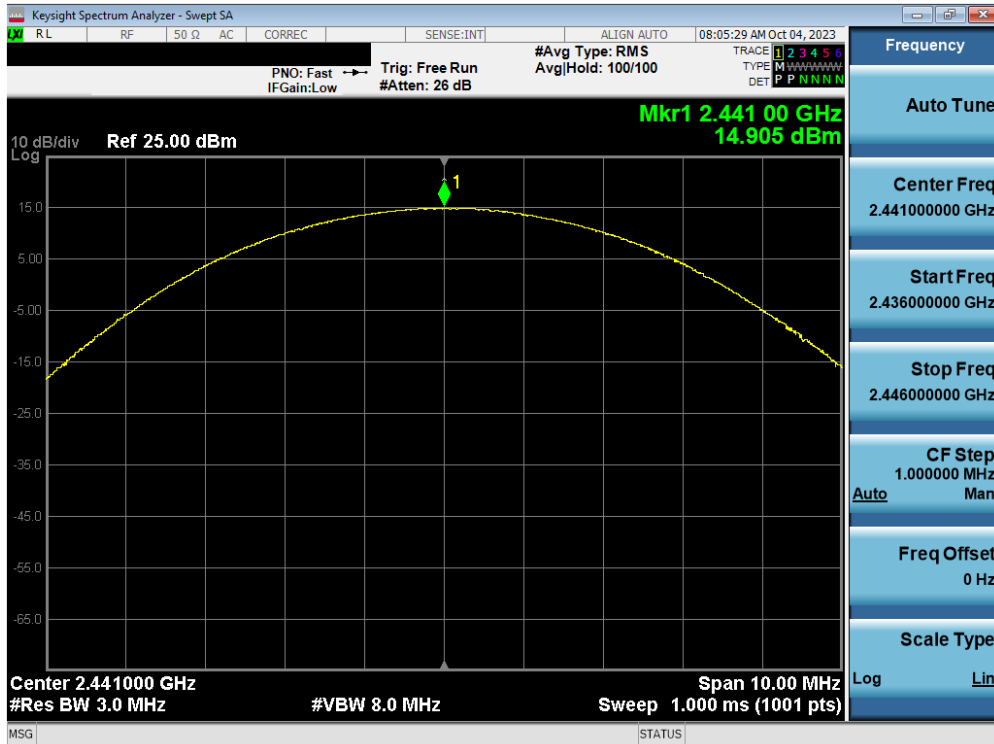


Plot 7-78. Peak Conducted Power (2Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 56 of 137

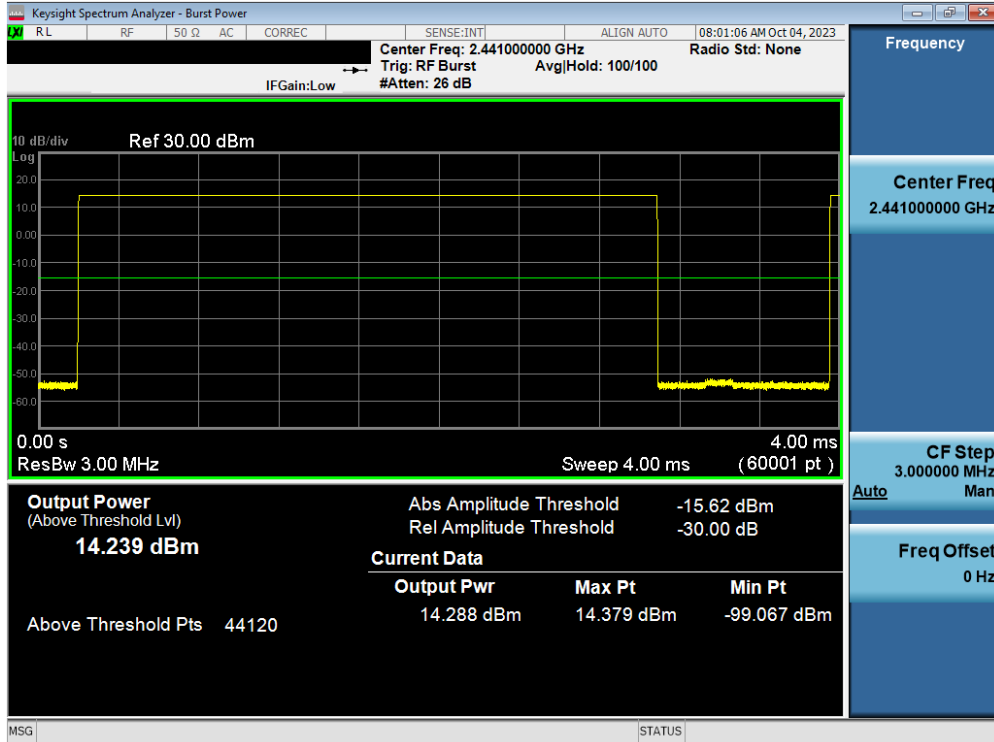


Plot 7-79. Peak Conducted Power (3Mbps – Ch. 0) – ANT1

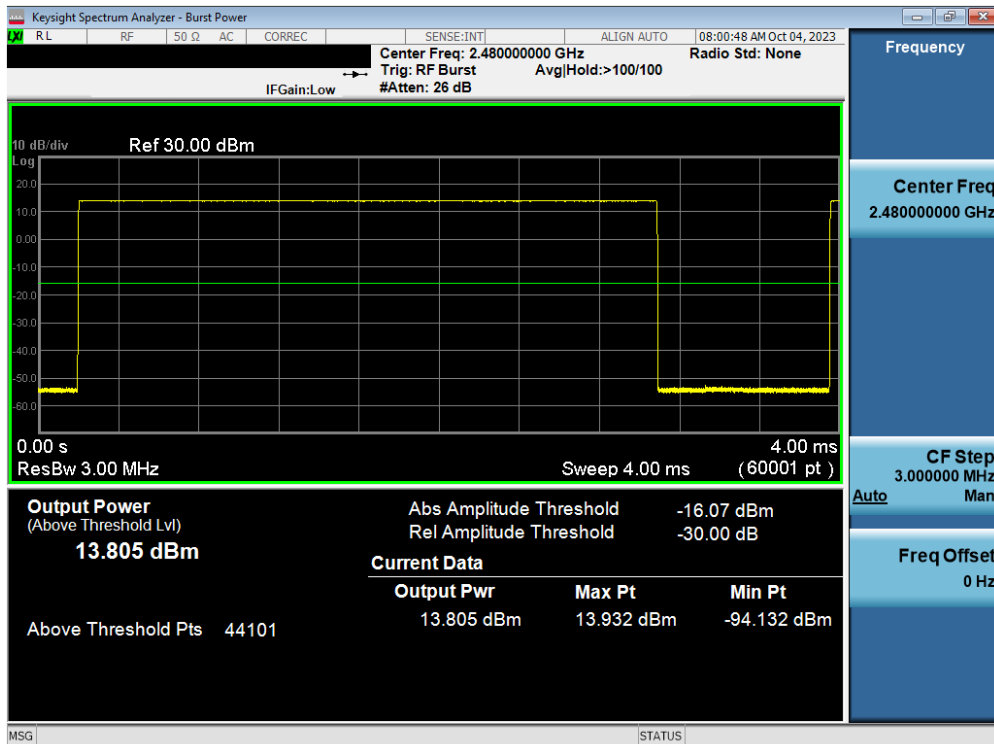


Plot 7-80. Peak Conducted Power (3Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 57 of 137

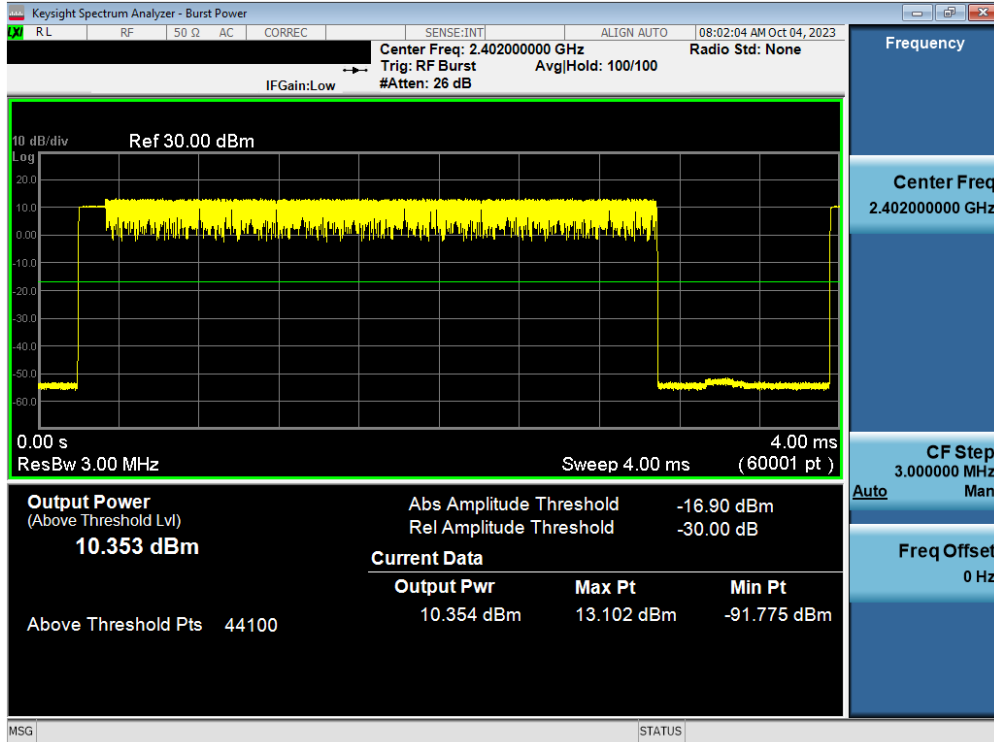


Plot 7-83. Average Conducted Power (1Mbps – Ch. 39) – ANT1

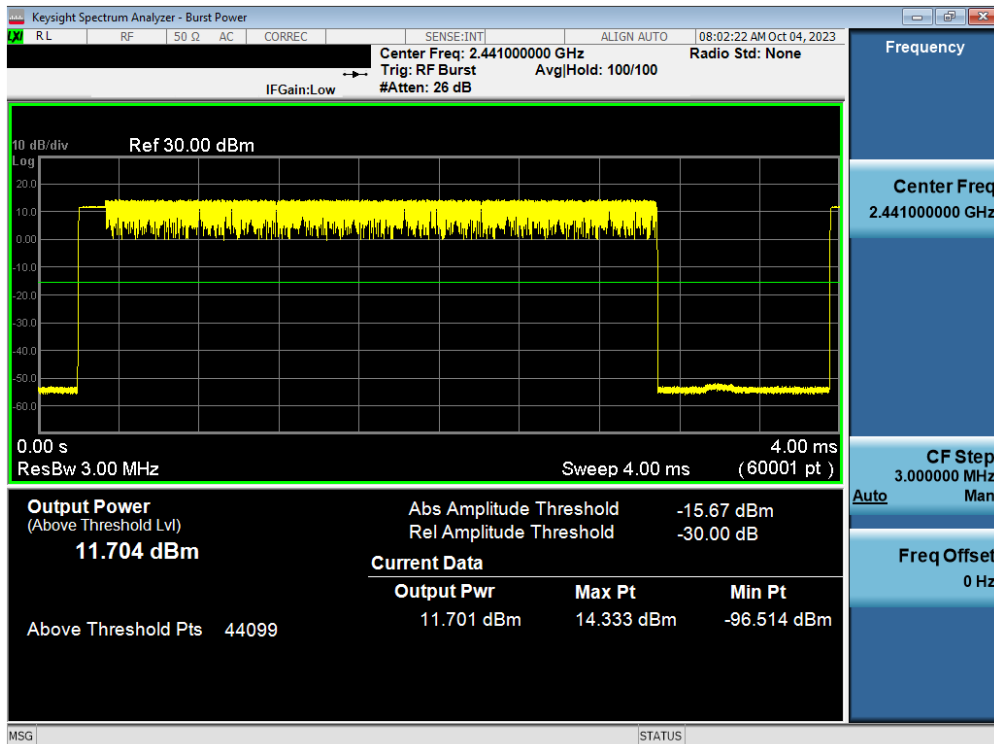


Plot 7-84. Average Conducted Power (1Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 59 of 137	

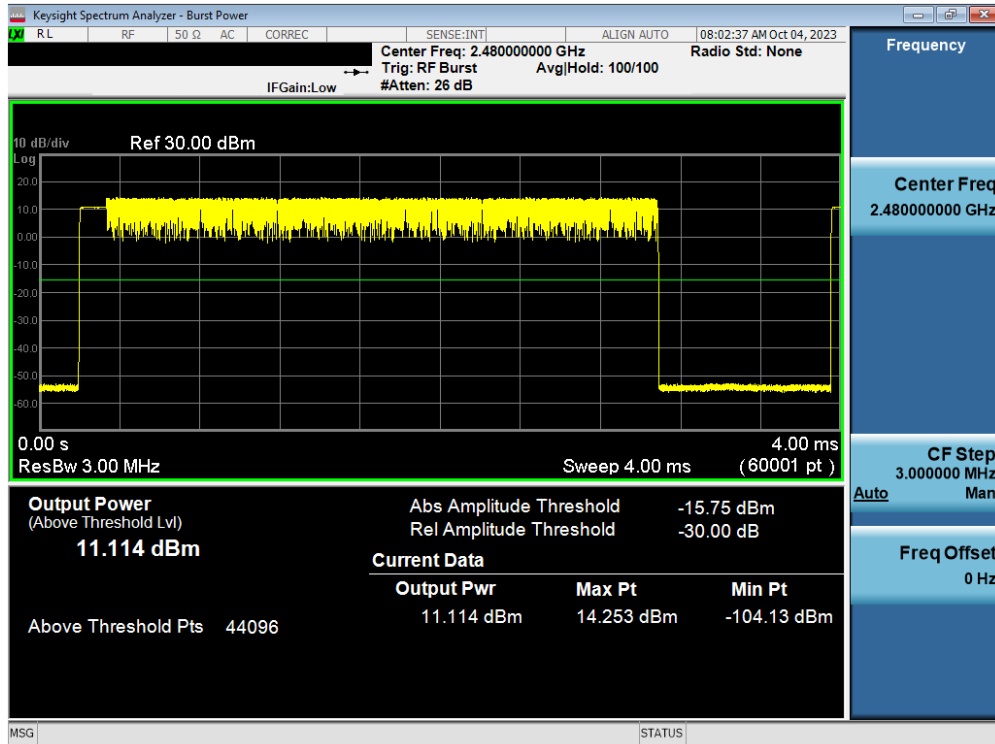


Plot 7-85. Average Conducted Power (2Mbps – Ch. 0) – ANT1

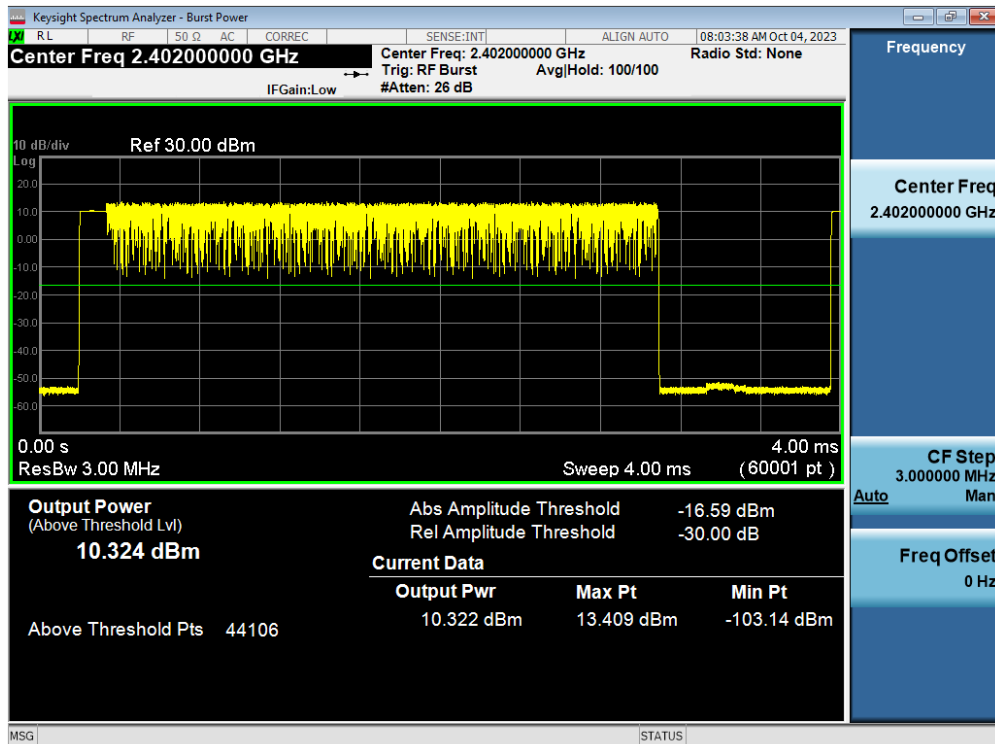


Plot 7-86. Average Conducted Power (2Mbps – Ch. 39) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 60 of 137	

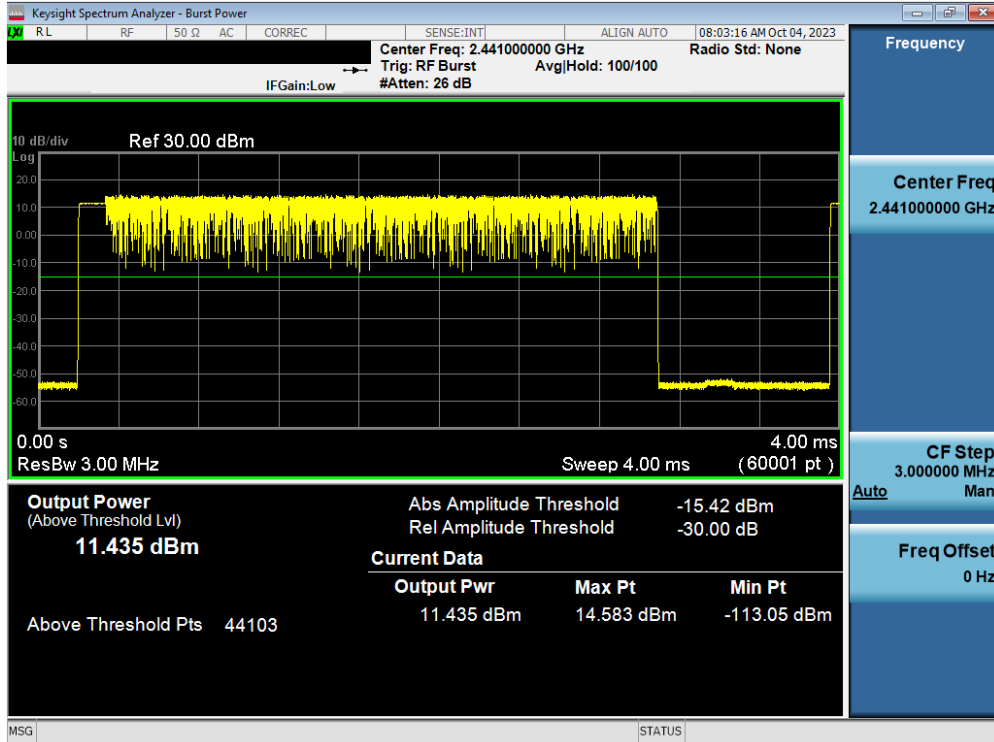


Plot 7-87. Average Conducted Power (2Mbps – Ch. 78) – ANT1

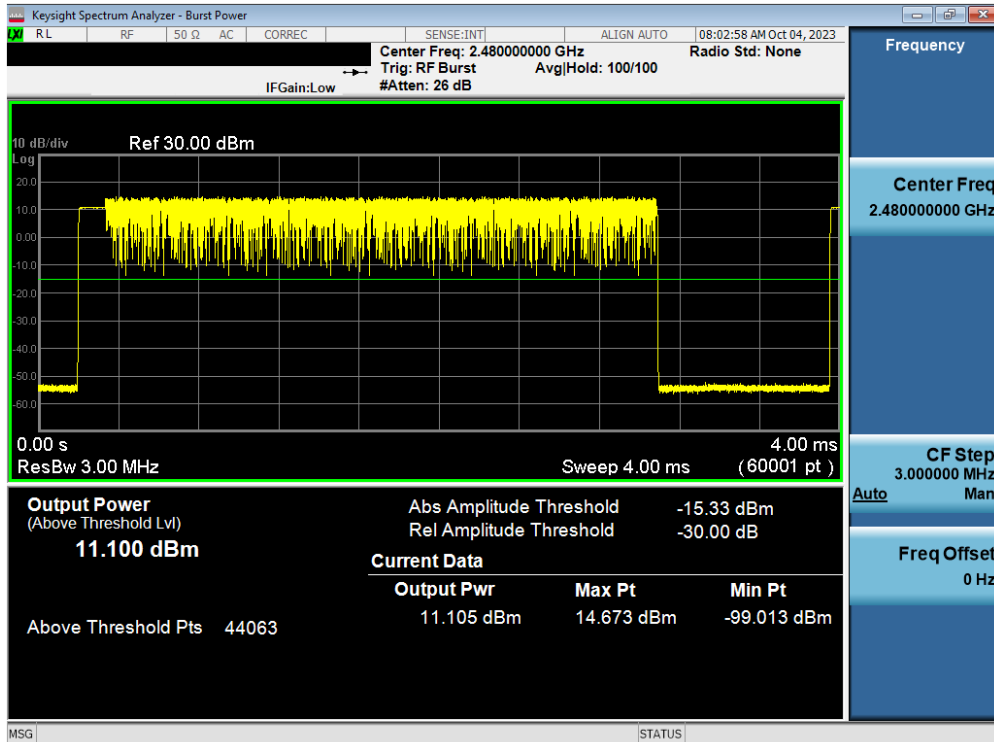


Plot 7-88. Average Conducted Power (3Mbps – Ch. 0) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 61 of 137	

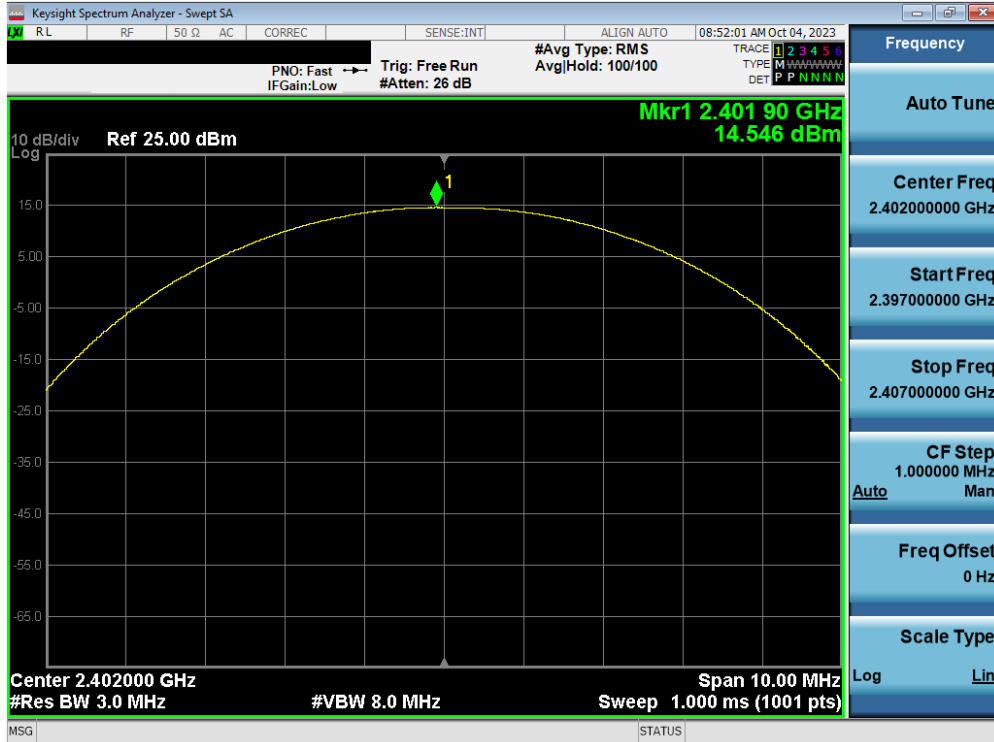


Plot 7-89. Average Conducted Power (3Mbps – Ch. 39) – ANT1

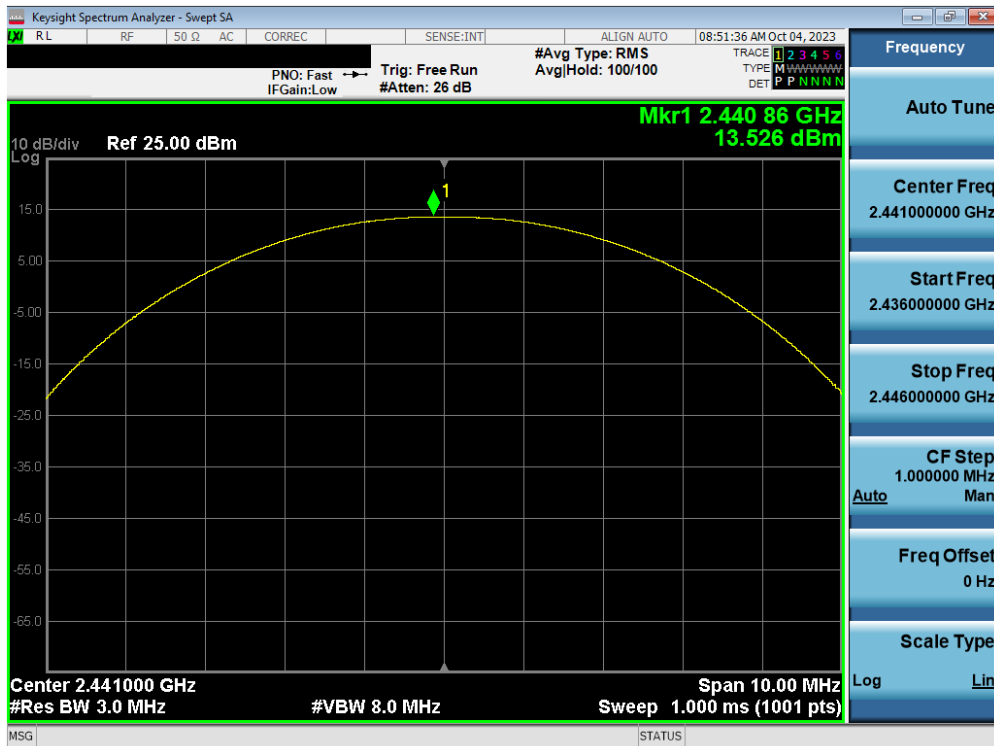


Plot 7-90. Average Conducted Power (3Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 62 of 137	

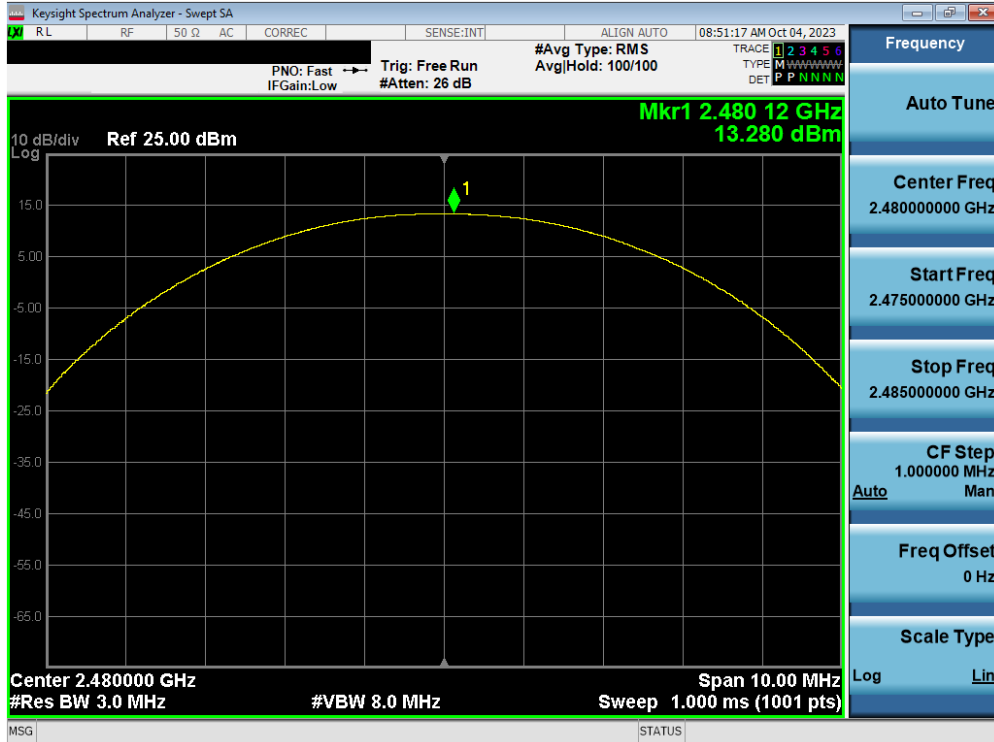


Plot 7-91. Peak Conducted Power (1Mbps – Ch. 0) – ANT2



Plot 7-92. Peak Conducted Power (1Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 63 of 137

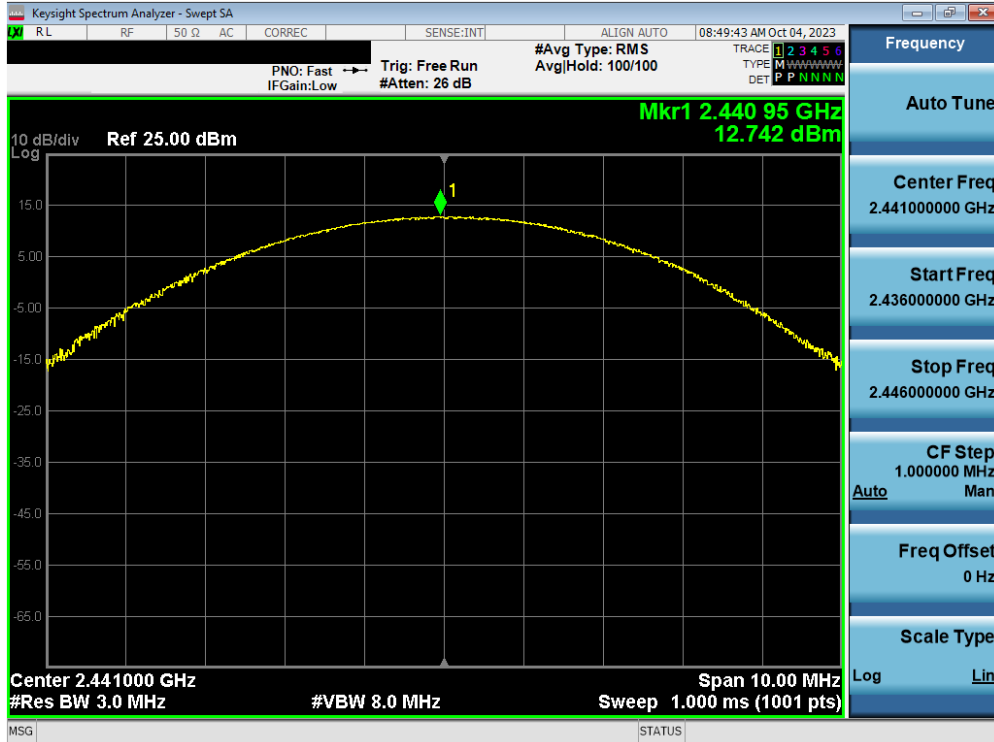


Plot 7-93. Peak Conducted Power (1Mbps – Ch. 78) – ANT2



Plot 7-94. Peak Conducted Power (2Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 64 of 137

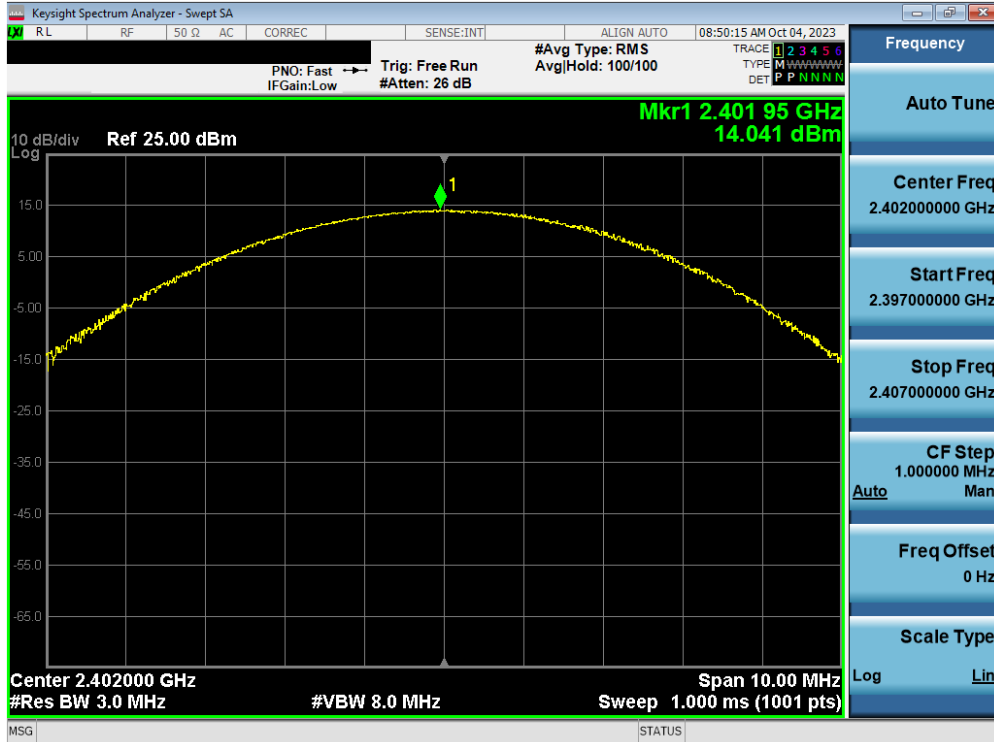


Plot 7-95. Peak Conducted Power (2Mbps – Ch. 39) – ANT2



Plot 7-96. Peak Conducted Power (2Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 65 of 137

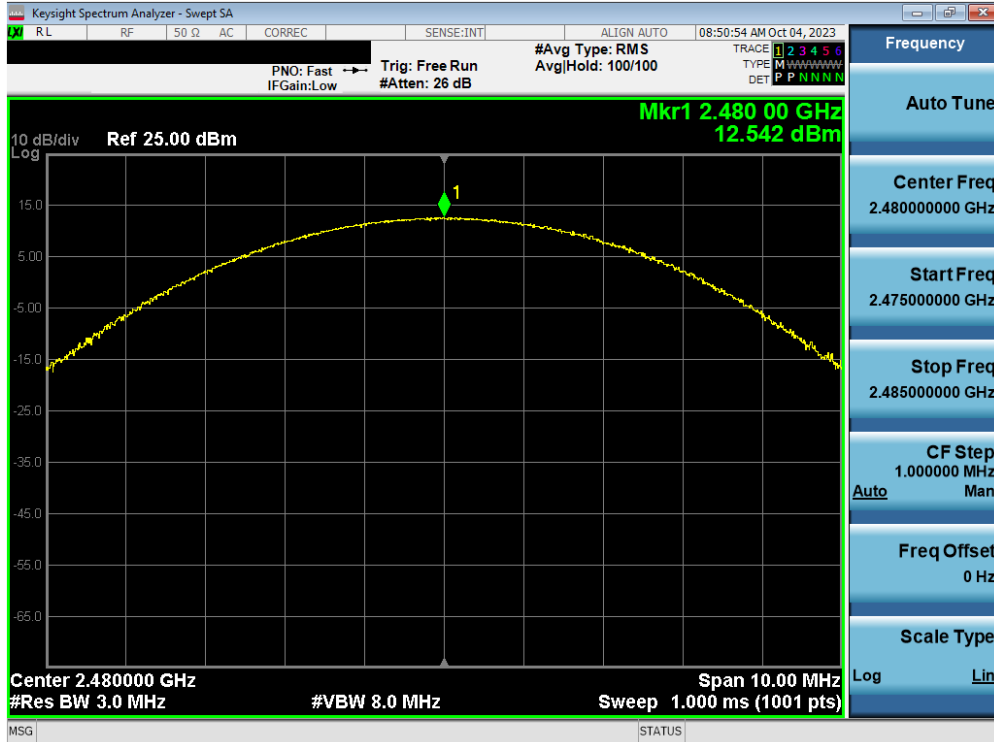


Plot 7-97. Peak Conducted Power (3Mbps – Ch. 0) – ANT2

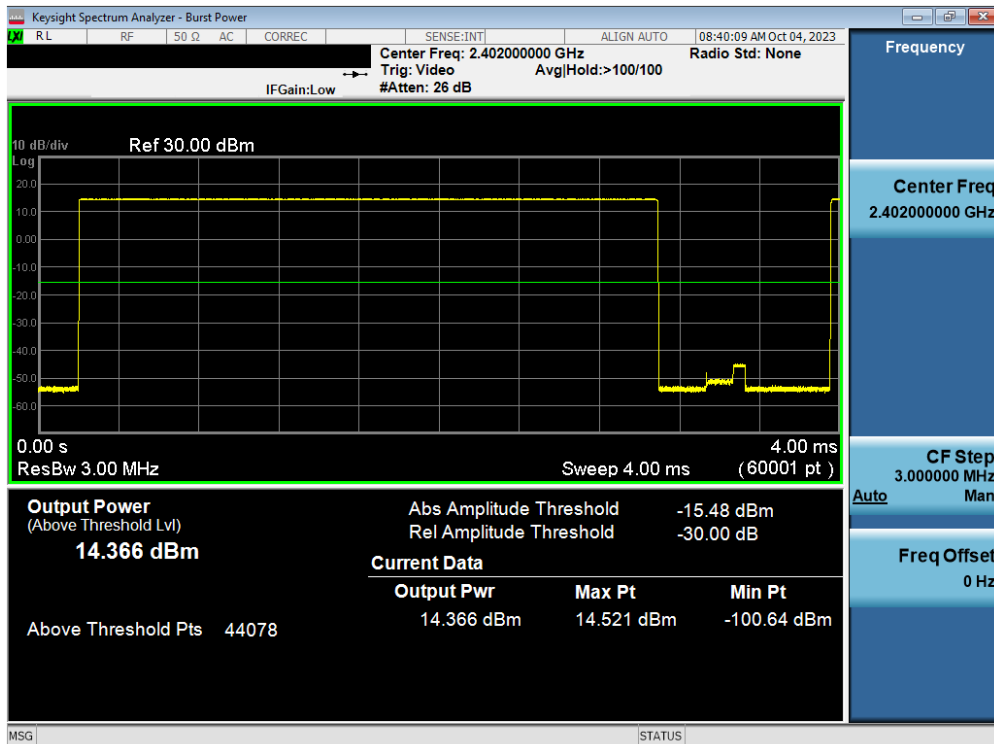


Plot 7-98. Peak Conducted Power (3Mbps – Ch. 39) – ANT2

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 66 of 137

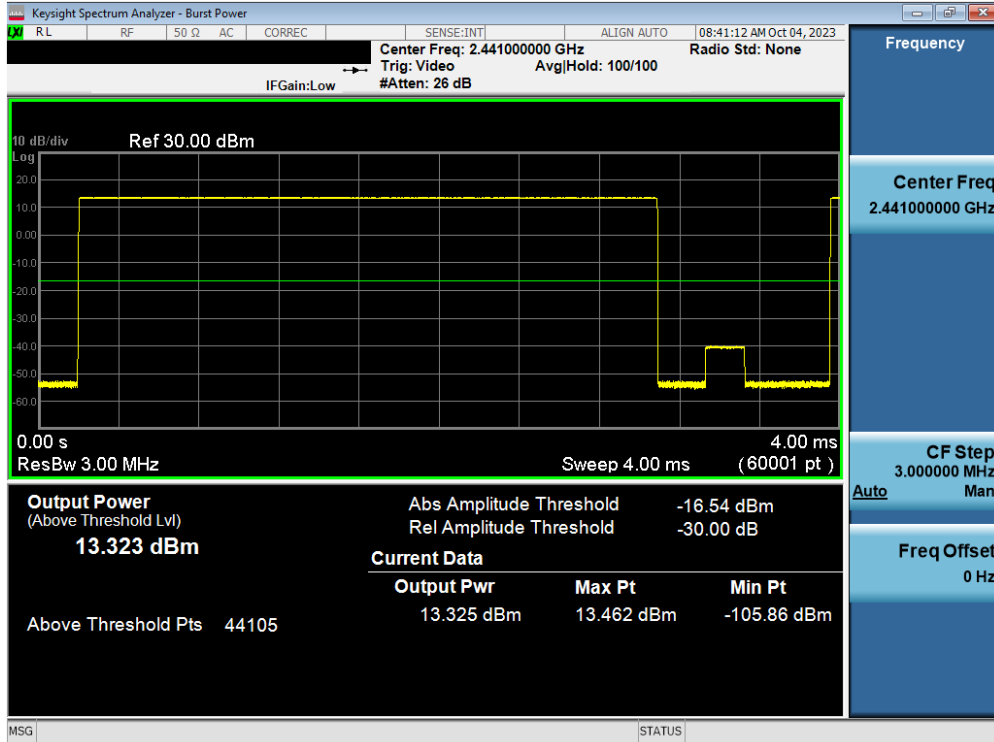


Plot 7-99. Peak Conducted Power (3Mbps – Ch. 78) – ANT2

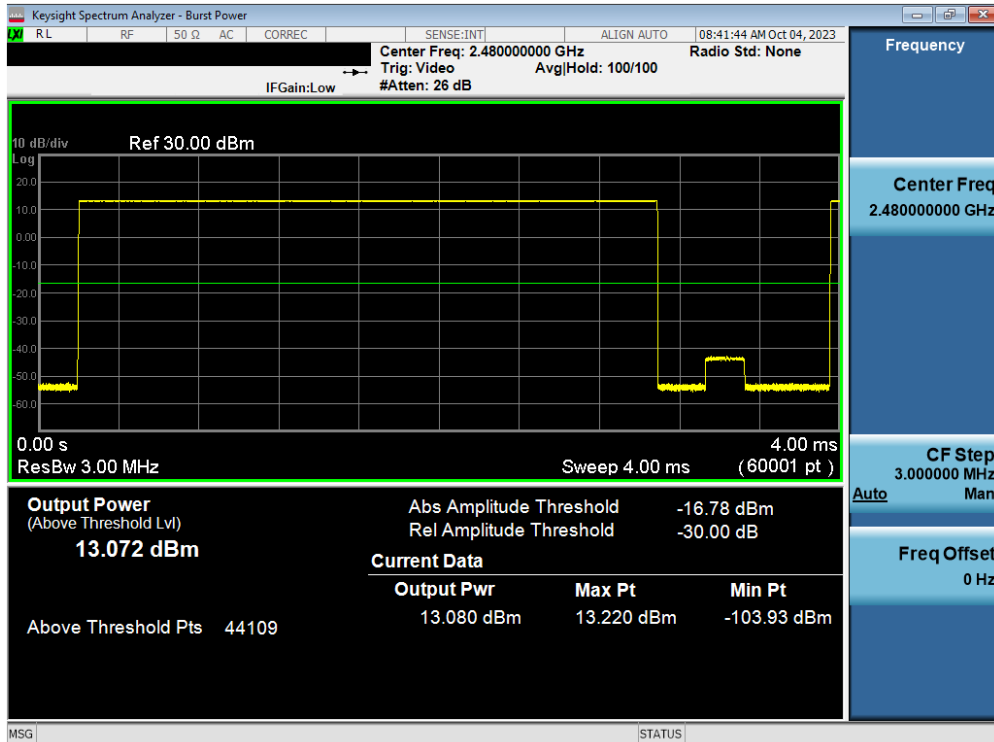


Plot 7-100. Average Conducted Power (1Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 67 of 137	

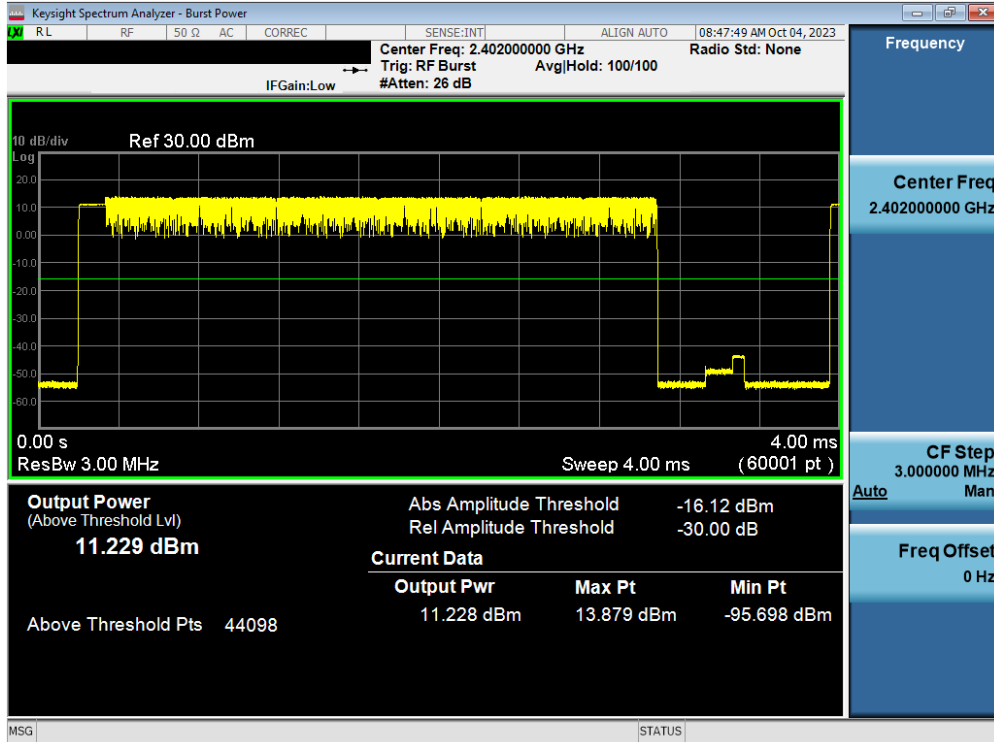


Plot 7-101. Average Conducted Power (1Mbps – Ch. 39) – ANT2

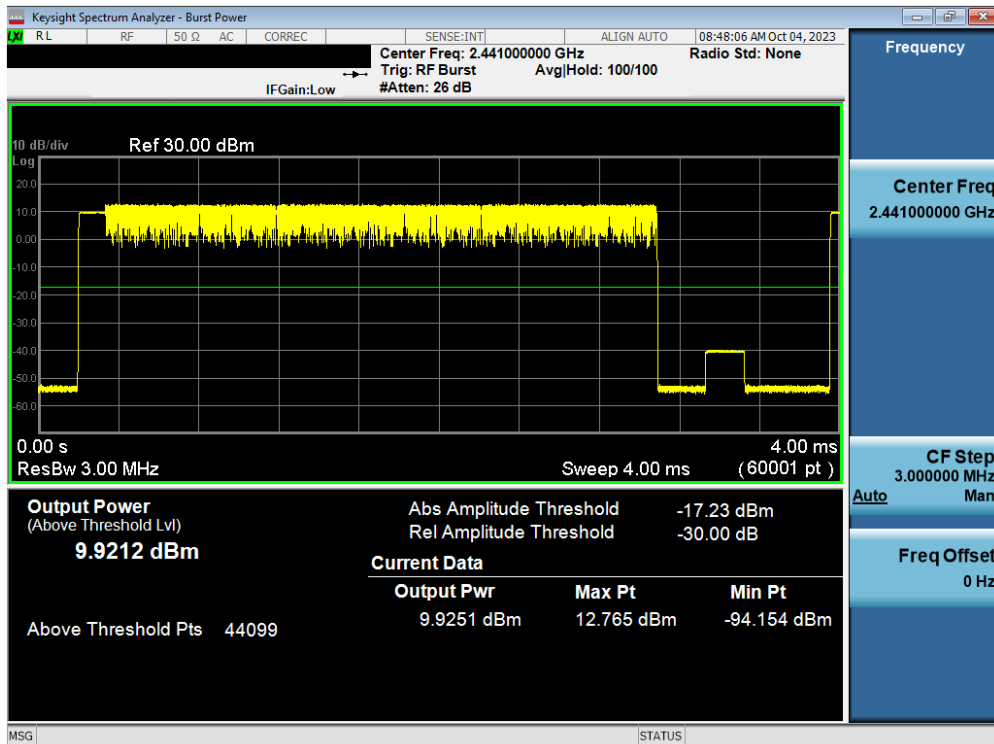


Plot 7-102. Average Conducted Power (1Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 68 of 137	

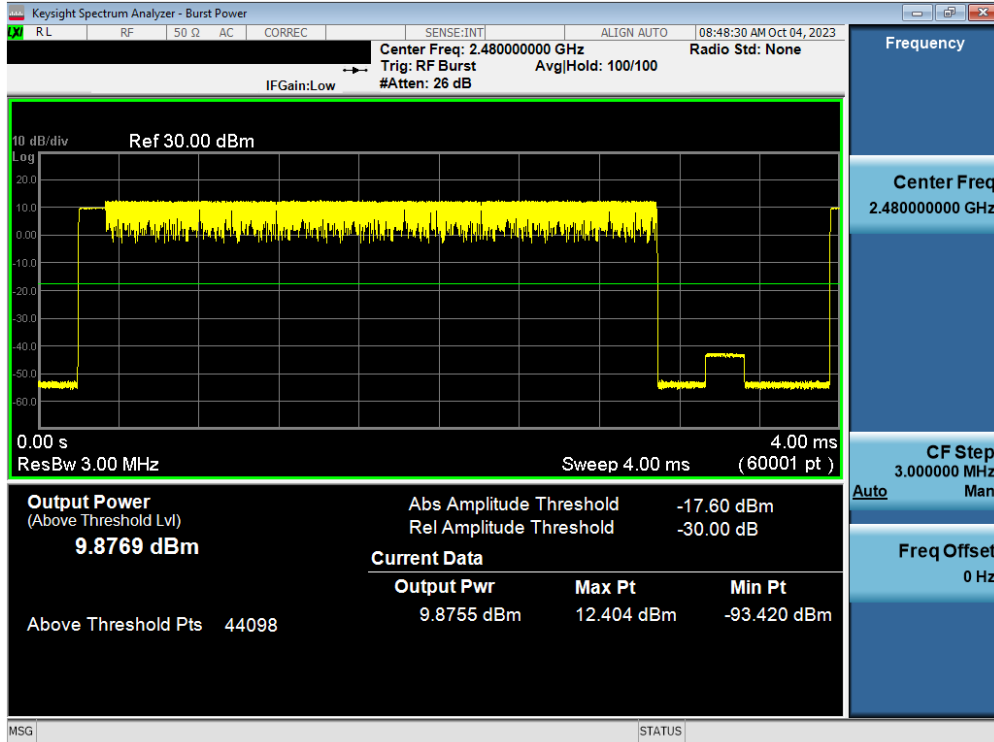


Plot 7-103. Average Conducted Power (2Mbps – Ch. 0) – ANT2

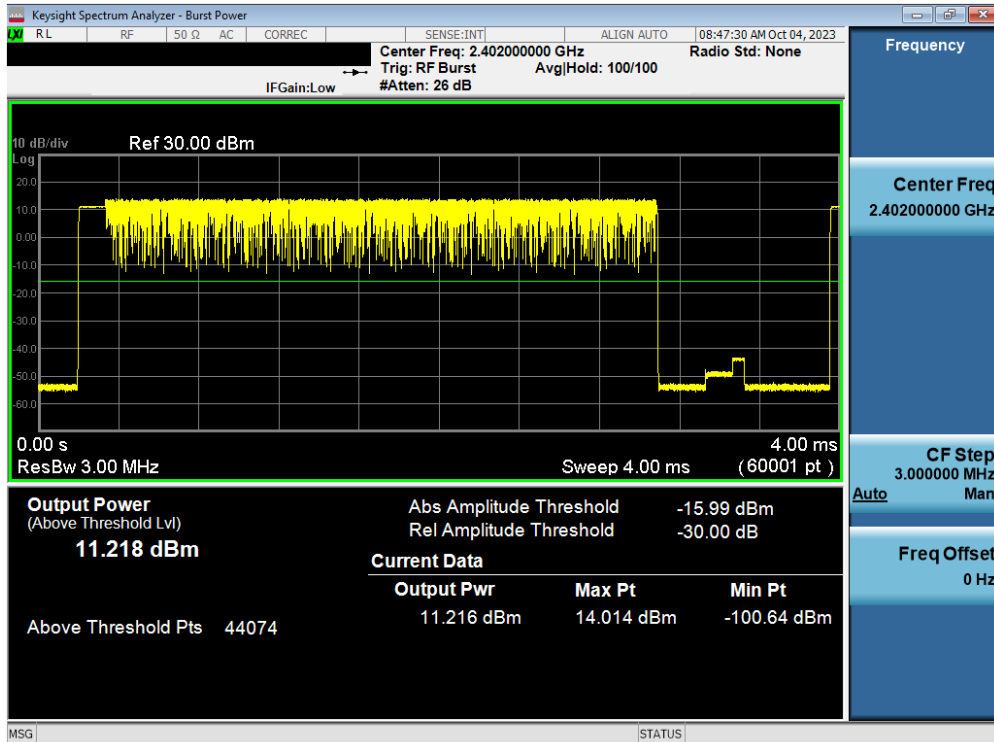


Plot 7-104. Average Conducted Power (2Mbps – Ch. 39) – ANT2

MEASUREMENT REPORT (CERTIFICATION)			Approved by: Technical Manager
FCC ID: A3LSMS928U	Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	Page 69 of 137
		EUT Type: Portable Handset	

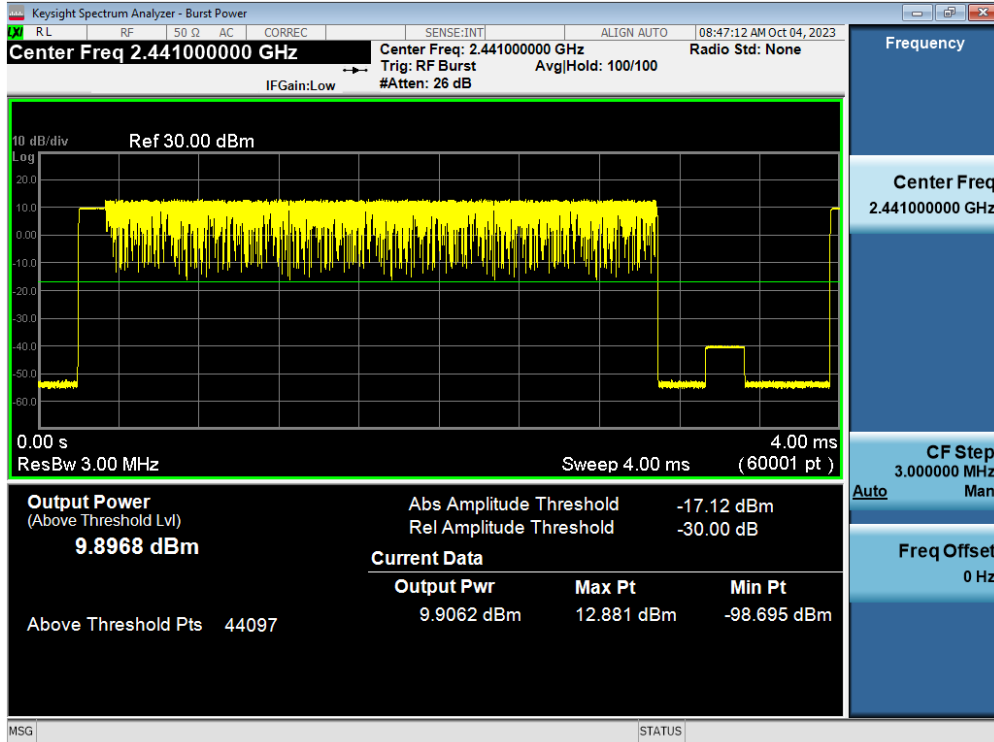


Plot 7-105. Average Conducted Power (2Mbps – Ch. 78) – ANT2

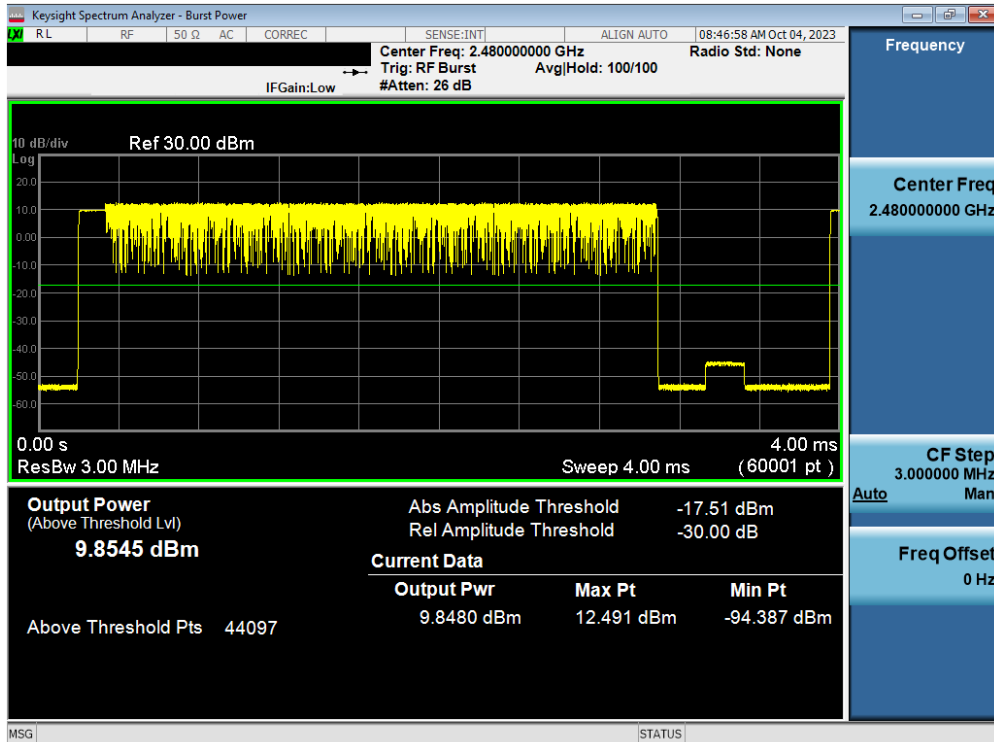


Plot 7-106. Average Conducted Power (3Mbps – Ch. 0) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 70 of 137	



Plot 7-107. Average Conducted Power (3Mbps – Ch. 39) – ANT2



Plot 7-108. Average Conducted Power (3Mbps – Ch. 78) – ANT2

FCC ID: A3LSMS928U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset		Page 71 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: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 72 of 137

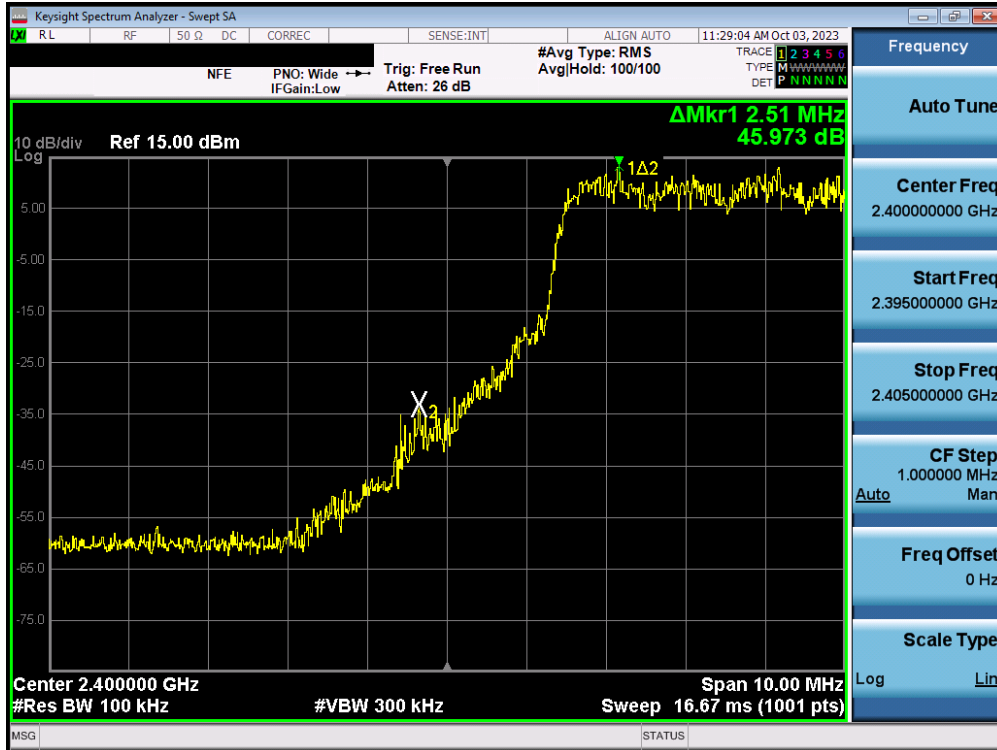


Plot 7-109. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 0) – ANT1

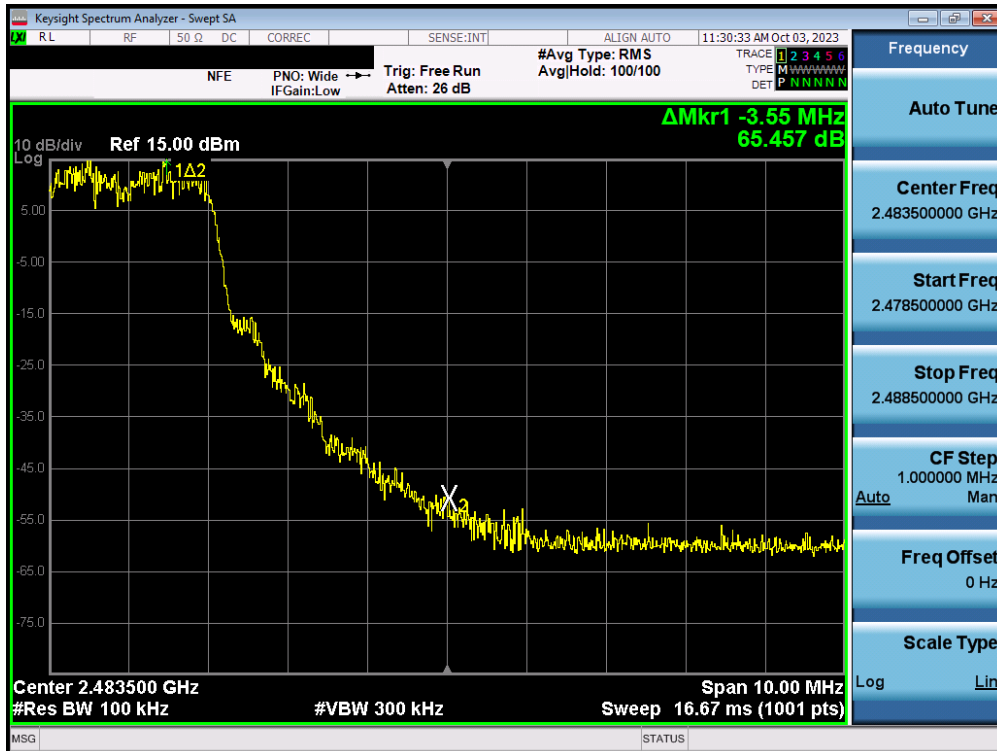


Plot 7-110. Band Edge Plot (Bluetooth with Hopping Disabled, 3 Mbps – Ch. 78) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 73 of 137



Plot 7-111. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) – ANT1



Plot 7-112. Band Edge Plot (Bluetooth with Hopping Enabled, 3 Mbps) – ANT1

FCC ID: A3LSMS928U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2308210092-09.A3L	Test Dates: 9/6/2023 - 11/06/2023	EUT Type: Portable Handset	Page 74 of 137