

## 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:**

10/8/2021-10/20/2021

**Test Site/Location:**

PCTEST Lab. Morgan Hill, CA, USA

**Test Report Serial No.:**

1M2109090102-16.A3L

**FCC ID:**

**A3LSMS908U**

**APPLICANT:**

**Samsung Electronics Co., Ltd.**

**Application Type:**

Certification

**Model:**

SM-S908U

**Additional Model(s):**

SM-S908U1

**EUT Type:**

Portable Handset

**Max. RF Output Power:**

162.48mW (22.11dBm) Peak Conducted

**Frequency Range:**

2402 – 2480MHz

**Modulation Type:**

GFSK,  $\pi/4$ -DQPSK, 8DPSK

**FCC Classification:**

FCC Part 15 Spread Spectrum Transmitter (DSS)

**FCC Rule Part(s):**

Part 15 Subpart C (15.247)

**ISED Specification:**

RSS-247 Issue 2

**Test Procedure(s):**

ANSI C63.10-2013, KDB 558074 D01 v05r02,  
KDB 648474 D03 v01r04, KDB 662911 D01 v02r01

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.

  
Randy Ortanez  
President

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         |                                                                                       | Page 1 of 131                     |

## T A B L E O F C O N T E N T S

|      |                                                             |     |
|------|-------------------------------------------------------------|-----|
| 1.0  | INTRODUCTION .....                                          | 3   |
| 1.1  | Scope .....                                                 | 3   |
| 1.2  | PCTEST 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 .....                                   | 5   |
| 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.....                               | 23  |
| 7.4  | Conducted Authorized Band Edge .....                        | 81  |
| 7.5  | Carrier Frequency Separation .....                          | 86  |
| 7.6  | Time of Occupancy.....                                      | 89  |
| 7.7  | Number of Hopping Channels .....                            | 92  |
| 7.8  | Conducted Spurious Emissions.....                           | 95  |
| 7.9  | Radiated Spurious Emissions Measurements – Above 1GHz.....  | 102 |
| 7.10 | Radiated Restricted Band Edge Measurements.....             | 116 |
| 7.11 | Radiated Spurious Emissions Measurements – Below 1GHz ..... | 119 |
| 7.12 | AC Line Conducted Emissions Measurement .....               | 125 |
| 8.0  | CONCLUSION.....                                             | 131 |

|                                         |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
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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 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

### 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Morgan Hill, CA 95037, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 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.
- PCTEST 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 ISSED Standards (RSS).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISSED.

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         |                                                                                       | Page 3 of 131                     |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS908U**. 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 manufacturer 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.:** 0507M, 0579M, 0229M

### 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 WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, Ultra Wideband

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

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

| Data Rate [Mbps] | Power Scheme | Antenna 1 | Antenna 2 | Dual |
|------------------|--------------|-----------|-----------|------|
| 1.0              | ePA          | ✓         | ✓         | ✗    |
|                  | iPA          | ✓         | ✓         | ✓    |
| 2.0              | ePA          | ✓         | ✓         | ✗    |
|                  | iPA          | ✓         | ✓         | ✓    |
| 3.0              | ePA          | ✓         | ✓         | ✗    |
|                  | iPA          | ✓         | ✓         | ✓    |

**Table 2-2. Supported Data Rate and Power Scheme**

✓ = Supported  
✗ = Not Supported

**Notes:** 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: A3LSMS908U                             |  <b>MEASUREMENT REPORT (CERTIFICATION)</b> |  | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2109090102-16.A3L | <b>Test Dates:</b><br>10/8/2021-10/20/2021                                                                                    | <b>EUT Type:</b><br>Portable Handset                                                  | Page 4 of 131                            |

## 2.3 Antenna Description

Following antenna gains provided by manufacturer were used for the test.

| Frequency [MHz] | Antenna 1 Gain (dBi) | Antenna 2 Gain (dBi) | Directional Gain (dBi) |
|-----------------|----------------------|----------------------|------------------------|
| 2402            | -6.82                | -6.12                | -3.45                  |
| 2441            | -7.77                | -5.84                | -3.74                  |
| 2480            | -7.11                | -5.76                | -3.40                  |

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

## 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 wireless charging pad (WCP) EP-N5105 while EUT 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 firmware version S908USQU0AUJ9 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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| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         | Page 5 of 131                                                                         |                                   |

## 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 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 EPCOS 2X60A Power Line Filter (100dB Attenuation, 14kHz-18GHz) and the two EPCOs 2X48A filters (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. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.50.40.

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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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.

Per KDB 414788, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was rotated about its vertical axis while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

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.

### 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.

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         | Page 8 of 131                                                                         |                                   |

## 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. 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    | 1.65                             |
| Line Conducted Disturbance          | 2.75                             |
| Radiated Disturbance (<30MHz)       | 4.06                             |
| Radiated Disturbance (30MHz - 1GHz) | 4.30                             |
| Radiated Disturbance (1 - 18GHz)    | 4.78                             |
| Radiated Disturbance (>18GHz)       | 4.79                             |

|                                         |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                                                                                                                                          | EUT Type:<br>Portable Handset         |                                                                                       | Page 9 of 131                     |

## 6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements 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 |
|----------------------|------------|-------------------------------------------|-----------|--------------|-----------|---------------|
| Agilent Technologies | N4010A     | Wireless Connectivity Test Set            | N/A       |              |           | GB46170464    |
| Agilent Technologies | N9030A     | 3Hz-44GHz PXA Signal Analyzer             | 3/31/2021 | Annual       | 3/31/2022 | MY49430244    |
| ATM                  | 180-442-KF | 20dB Nominal Gain Horn Antenna (18-40GHz) | 12/9/2020 | Annual       | 12/9/2021 | T058701-01    |
| ETS-Lindgren         | 3142E      | BiConiLog Antenna (30MHz - 6GHz)          | 6/8/2021  | Annual       | 6/8/2022  | 224569        |
| ETS-Lindgren         | 3117       | Double Ridged Guide Antenna (1-18 GHz)    | 5/3/2021  | Annual       | 5/3/2022  | 205956        |
| Rohde & Schwarz      | TS-PR8     | Pre-Amplifier (30MHz - 8GHz)              | 12/3/2020 | Annual       | 12/3/2021 | 102327        |
| Rohde & Schwarz      | TS-PR18    | Pre-Amplifier (1GHz - 18GHz)              | 12/3/2020 | Annual       | 12/3/2021 | 101648        |
| Rohde & Schwarz      | TS-PR1840  | Pre-Amplifier (18GHz - 40GHz)             | 4/29/2021 | Annual       | 4/29/2022 | 100051        |
| Rohde & Schwarz      | FSV40      | Signal Analyzer (10Hz-40GHz)              | 3/16/2021 | Annual       | 3/16/2022 | 101619        |
| Rohde & Schwarz      | ESW26      | EMI Test Receiver                         | 6/11/2021 | Annual       | 6/11/2022 | 101299        |
| Rohde & Schwarz      | ESW44      | EMI Test Receiver                         | 11/9/2020 | Annual       | 11/9/2021 | 101570        |
| Rohde & Schwarz      | CMW500     | Wideband Radio Communication Tester       | 4/3/2021  | Annual       | 4/3/2022  | 166869        |
| Rohde & Schwarz      | HFH2-Z2    | Loop Antenna                              | 4/5/2021  | Annual       | 4/5/2022  | 100519        |
| Rohde & Schwarz      | ENV216     | Two-Line-V-Network (LISN)                 | 12/7/2020 | Annual       | 12/7/2021 | 101364        |

**Table 6-1. Test Equipment List**

### 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.

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         | Page 10 of 131                                                                        |                                   |

## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Samsung Electronics Co., Ltd.  
FCC ID: A3LSMS908U  
FCC Classification: 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(a)] | 20dB Bandwidth                                                                | N/A                                                                                             | CONDUCTED         | N/A         | Section 7.2                                 |
| 15.247(b)(1)        | RSS-247 [5.4(b)] | 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(b)] | 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(d)] | Time of Occupancy                                                             | < 0.4 sec in 31.6 sec period                                                                    |                   | PASS        | Section 7.6                                 |
| 15.247(a)(1)(iii)   | RSS-247 [5.1(d)] | Number of Channels                                                            | > 15 Channels                                                                                   |                   | PASS        | Section 7.7                                 |
| 15.247(d)           | RSS-247 [5.5]    | Band Edge / Out-of-Band Emissions                                             | Conducted > 20dBc                                                                               |                   | PASS        | Section 7.4<br>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) |                   | PASS        | Section 7.9<br>Section 7.10<br>Section 7.11 |
| 15.207              | RSS-Gen [8.8]    | AC Line Conducted Emissions 150kHz – 30MHz                                    | < FCC 15.207 limits (RSS-Gen [8.8] limits)                                                      | AC 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 and attenuators used as part of the system to connect the EUT to the analyzer 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 PCTEST "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 PCTEST "Chamber Automation," Version 1.3.2.
- 6) Due to ePA Conducted Power measurement is the worst case, all additional testing was done in ePA mode.

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         |                                                                                       | Page 11 of 131                    |

## 7.2 20dB Bandwidth Measurement

§2.1049; §15.247 (a.1); RSS-247 [5.1(a)]

### 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: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 12 of 131                    |

## Antenna 1

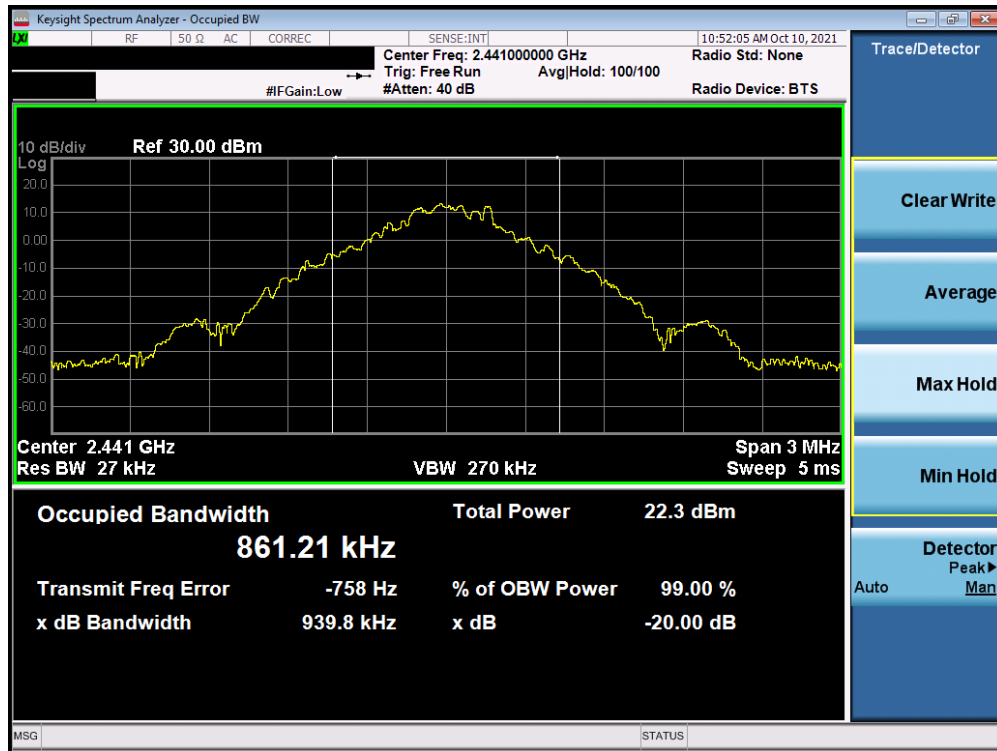
| Frequency [MHz] | Data Rate [Mbps] | Modulation     | Power Scheme | Channel No. | 20dB Bandwidth Test Results [kHz] |
|-----------------|------------------|----------------|--------------|-------------|-----------------------------------|
| 2402            | 1.0              | GFSK           | ePA          | 0           | 994.90                            |
| 2441            | 1.0              | GFSK           | ePA          | 39          | 939.80                            |
| 2480            | 1.0              | GFSK           | ePA          | 78          | 936.80                            |
| 2402            | 2.0              | $\pi/4$ -DQPSK | ePA          | 0           | 1342.00                           |
| 2441            | 2.0              | $\pi/4$ -DQPSK | ePA          | 39          | 1321.00                           |
| 2480            | 2.0              | $\pi/4$ -DQPSK | ePA          | 78          | 1329.00                           |
| 2402            | 3.0              | 8DPSK          | ePA          | 0           | 1302.00                           |
| 2441            | 3.0              | 8DPSK          | ePA          | 39          | 1309.00                           |
| 2480            | 3.0              | 8DPSK          | ePA          | 78          | 1297.00                           |

Table 7-2. Conducted 20dB Bandwidth Measurements Antenna 1

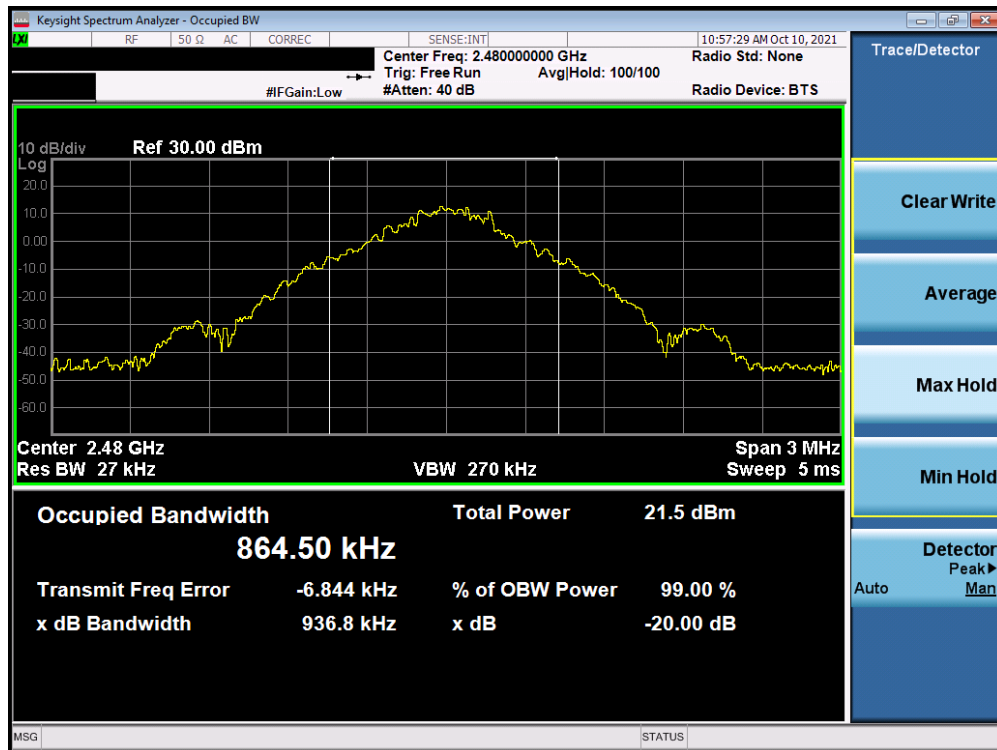


Plot 7-1. Conducted 20dB Plot (Bluetooth, 1Mbps– Ch. 0) Antenna 1

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 13 of 131                    |

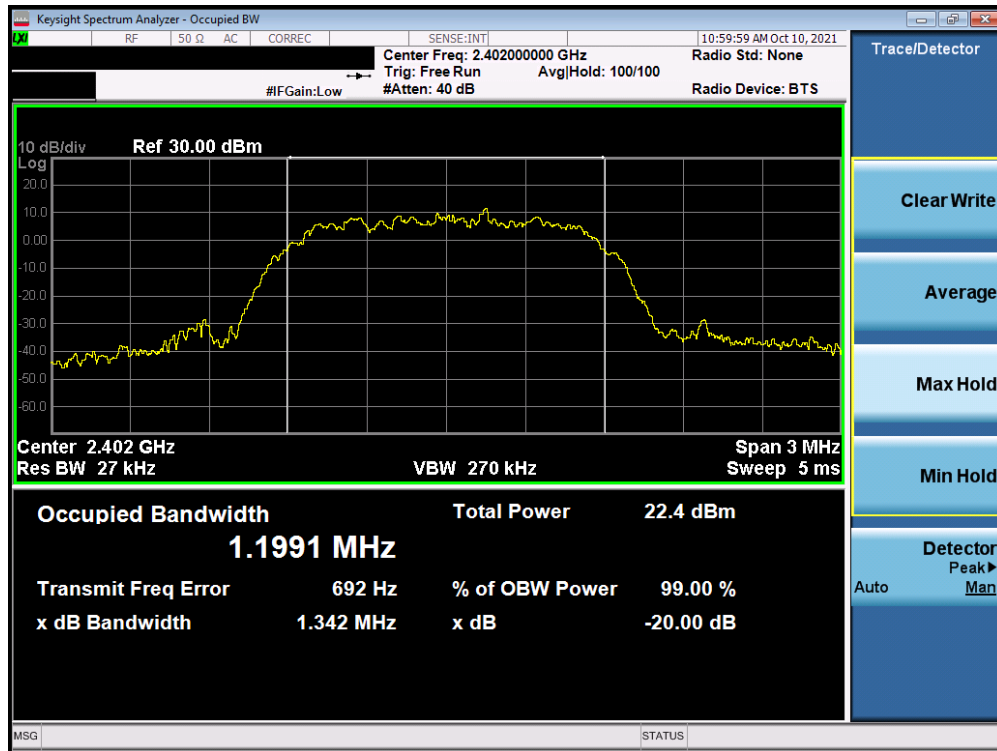


Plot 7-2. Conducted 20dB Plot (Bluetooth, 1Mbps– Ch. 39) Antenna 1

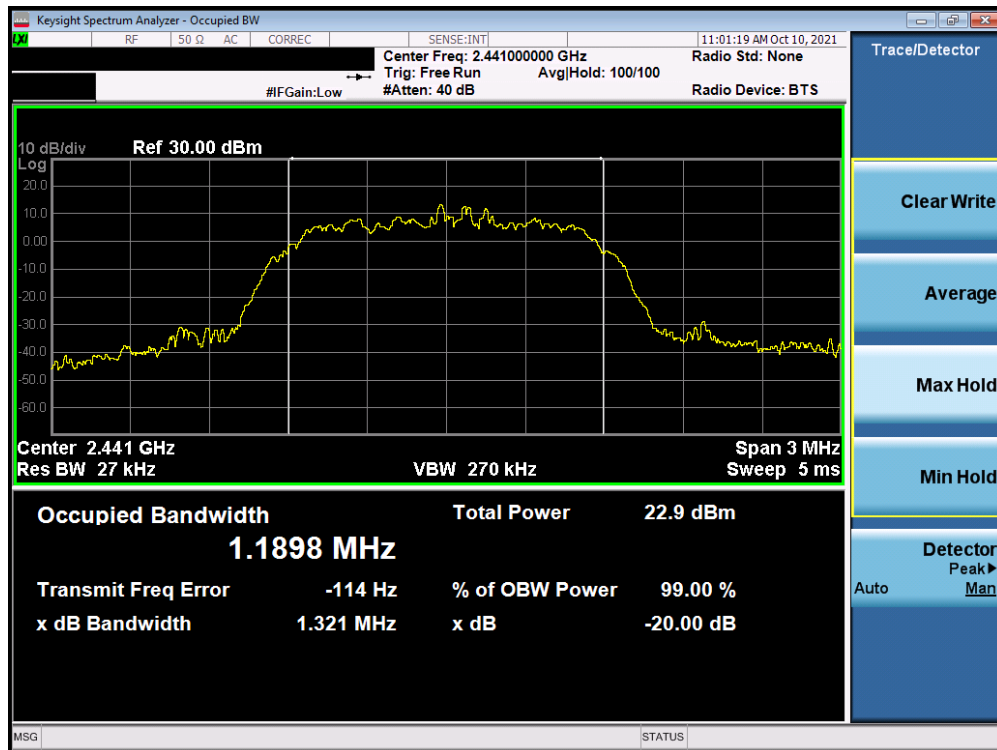


Plot 7-3. Conducted 20dB Plot (Bluetooth, 1Mbps– Ch. 78) Antenna 1

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         |                                                                                       | Page 14 of 131                    |

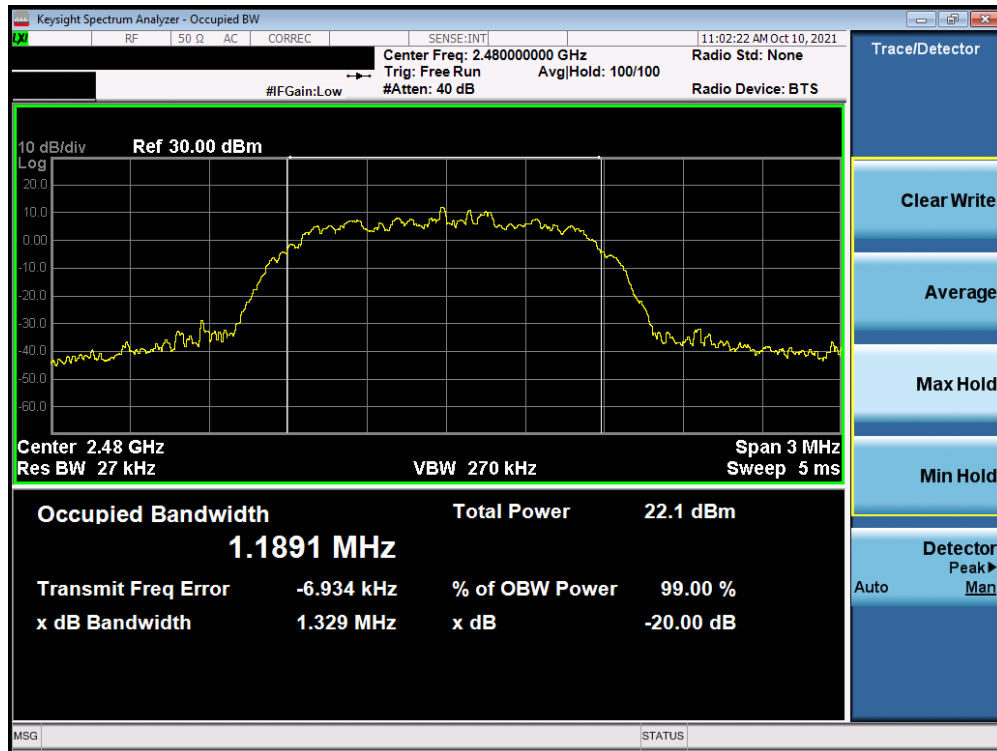


Plot 7-4. Conducted 20dB Plot (Bluetooth, 2Mbps– Ch. 0) Antenna 1

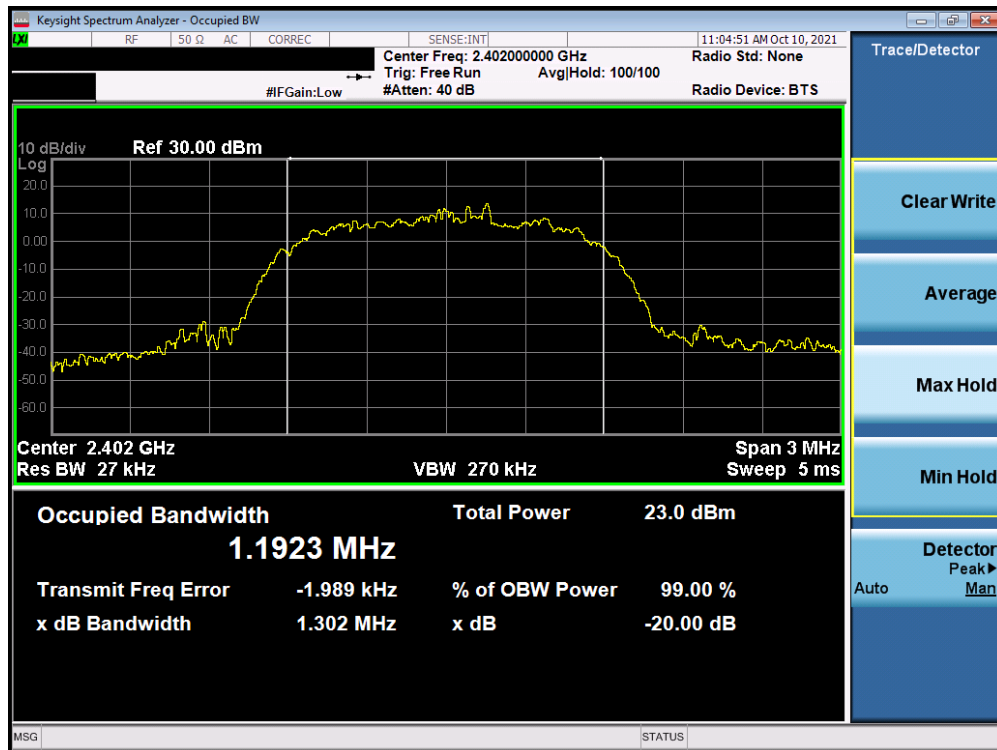


Plot 7-5. Conducted 20dB Plot (Bluetooth, 2Mbps – Ch. 39) Antenna 1

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 15 of 131                    |

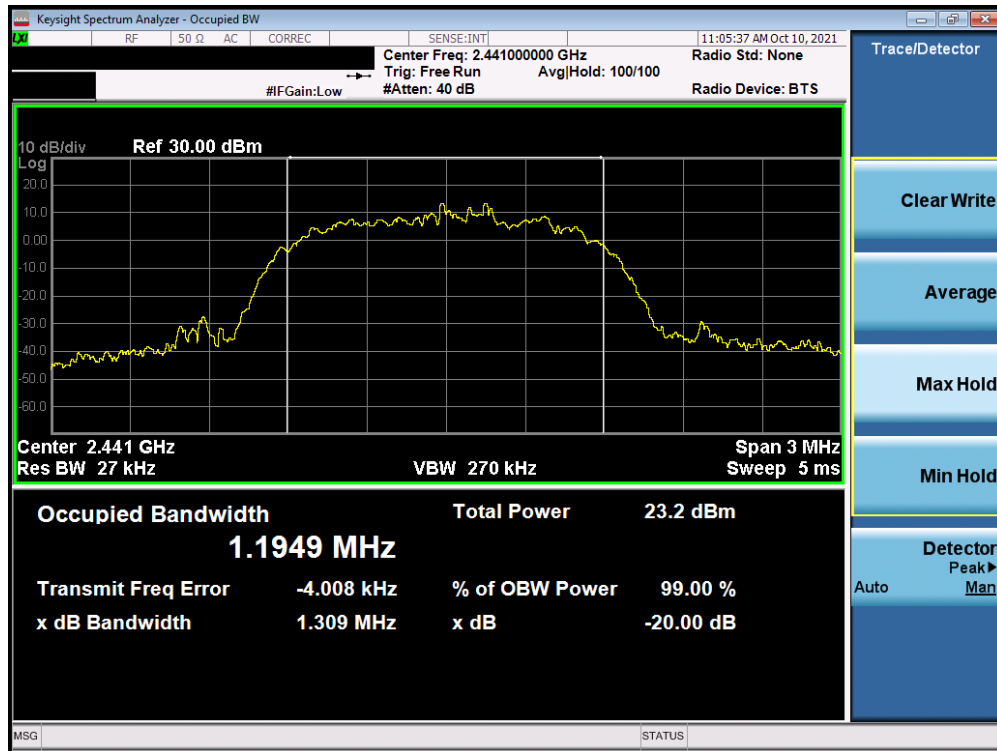


Plot 7-6. Conducted 20dB Plot (Bluetooth, 2Mbps – Ch. 78) Antenna 1

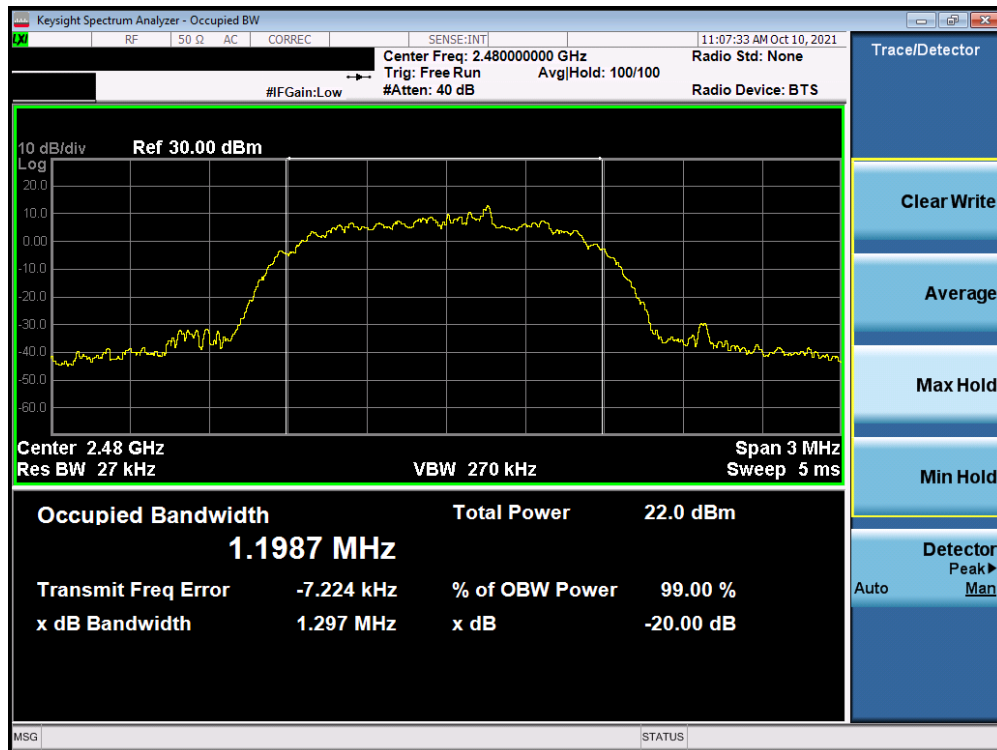


Plot 7-7. Conducted 20dB Plot (Bluetooth, 3Mbps– Ch. 0) Antenna 1

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 16 of 131                    |



Plot 7-8. Conducted 20dB Plot (Bluetooth, 3Mbps – Ch. 39) Antenna 1



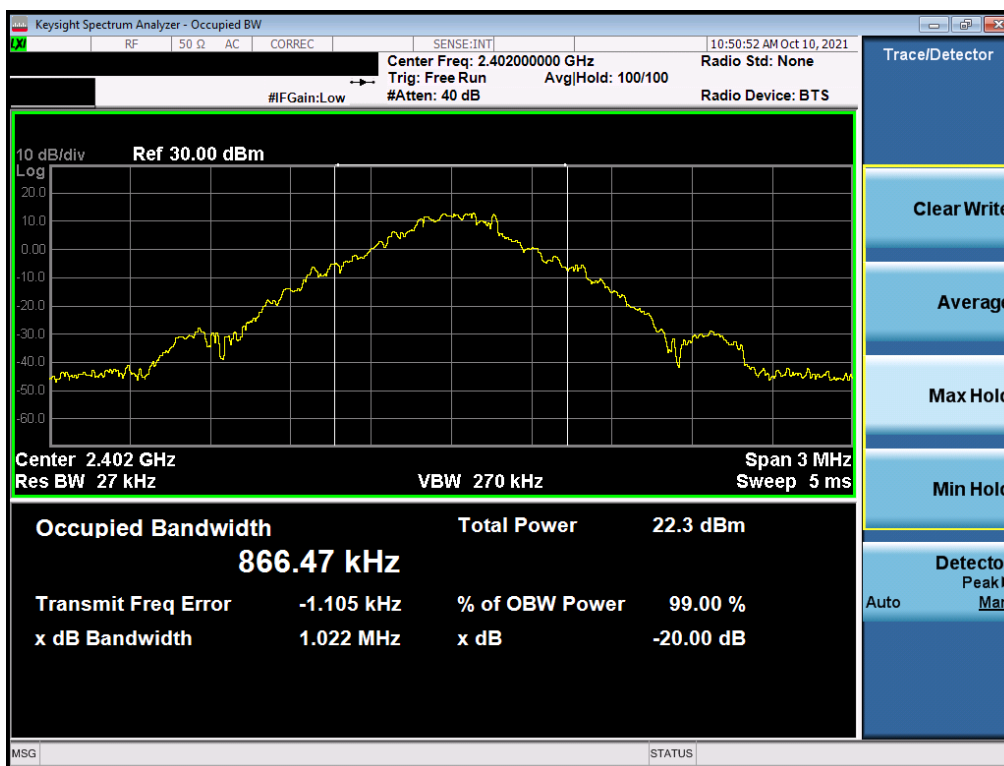
Plot 7-9. Conducted 20dB Plot (Bluetooth, 3Mbps – Ch. 78) Antenna 1

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 17 of 131                    |

## Antenna 2

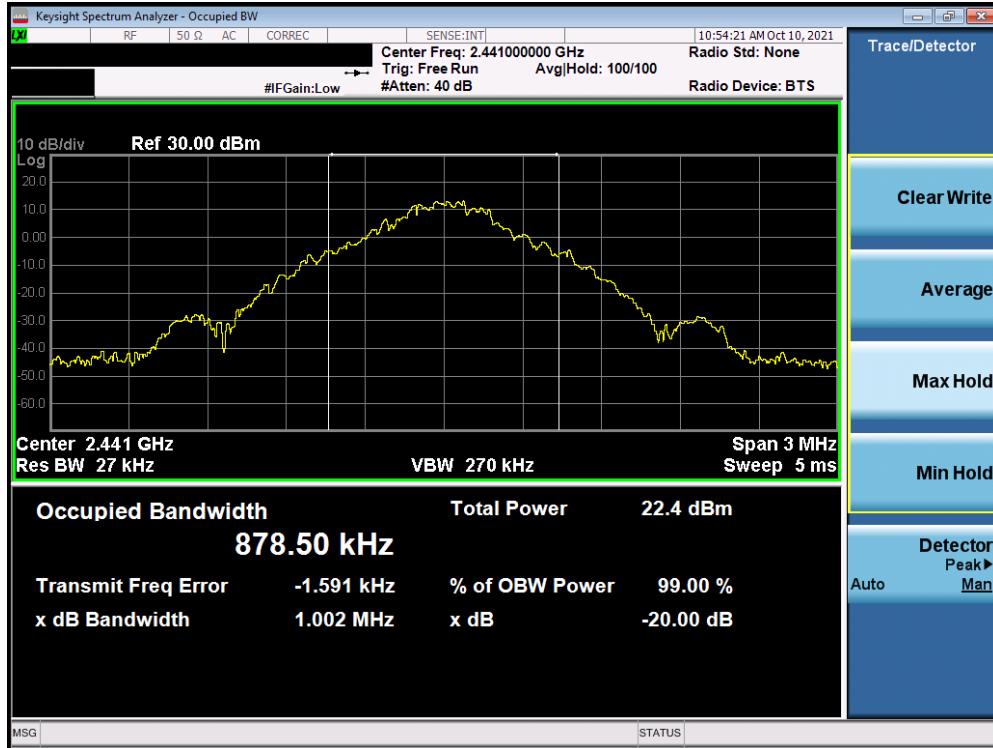
| Frequency [MHz] | Data Rate [Mbps] | Modulation     | Power Scheme | Channel No. | 20dB Bandwidth Test Results [kHz] |
|-----------------|------------------|----------------|--------------|-------------|-----------------------------------|
| 2402            | 1.0              | GFSK           | ePA          | 0           | 1022.00                           |
| 2441            | 1.0              | GFSK           | ePA          | 39          | 1002.00                           |
| 2480            | 1.0              | GFSK           | ePA          | 78          | 993.60                            |
| 2402            | 2.0              | $\pi/4$ -DQPSK | ePA          | 0           | 1322.00                           |
| 2441            | 2.0              | $\pi/4$ -DQPSK | ePA          | 39          | 1323.00                           |
| 2480            | 2.0              | $\pi/4$ -DQPSK | ePA          | 78          | 1337.00                           |
| 2402            | 3.0              | 8DPSK          | ePA          | 0           | 1311.00                           |
| 2441            | 3.0              | 8DPSK          | ePA          | 39          | 1322.00                           |
| 2480            | 3.0              | 8DPSK          | ePA          | 78          | 1308.00                           |

Table 7-3. Conducted 20dB Bandwidth Measurements Antenna 2

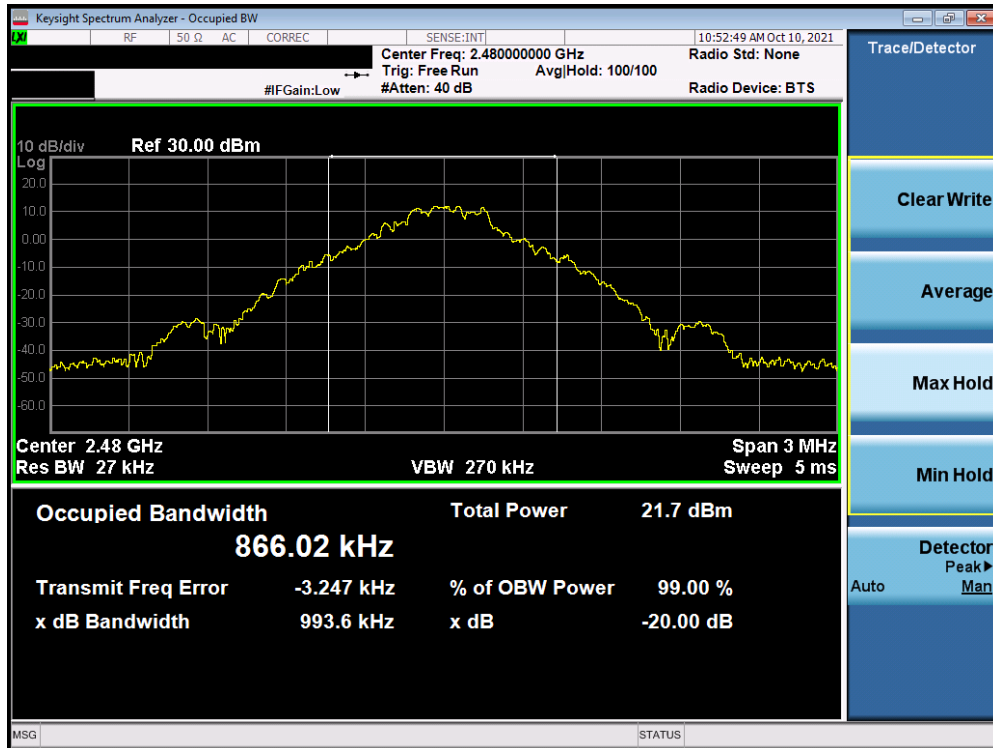


Plot 7-10. Conducted 20dB Plot (Bluetooth, 1Mbps– Ch. 0) Antenna 2

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 18 of 131                    |

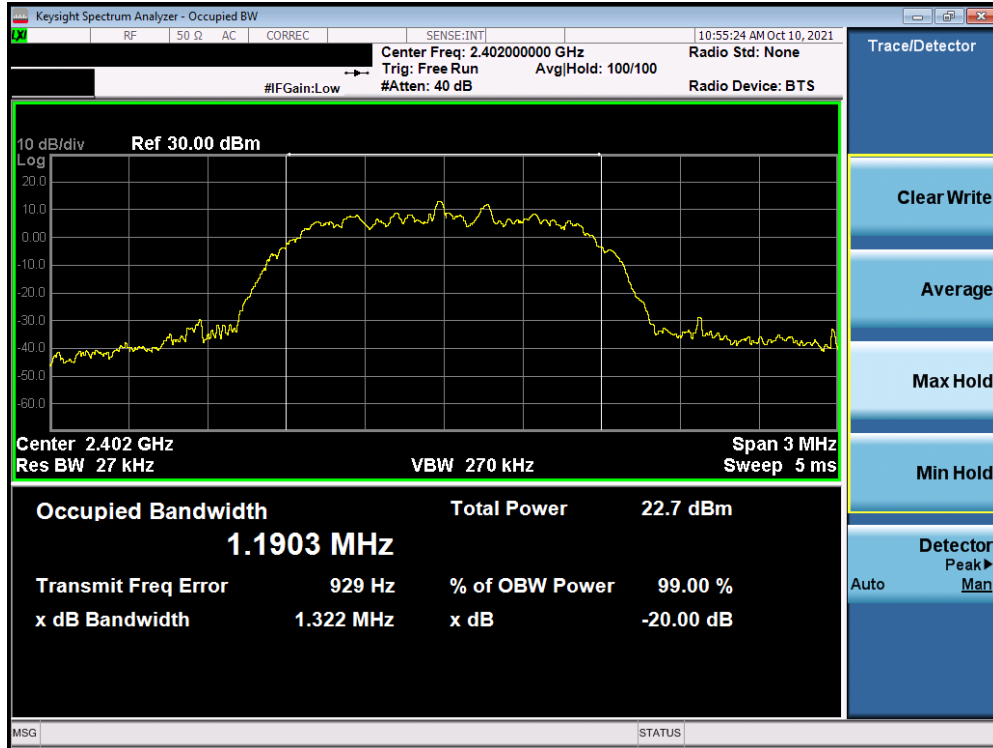


Plot 7-11. Conducted 20dB Plot (Bluetooth, 1Mbps– Ch. 39) Antenna 2

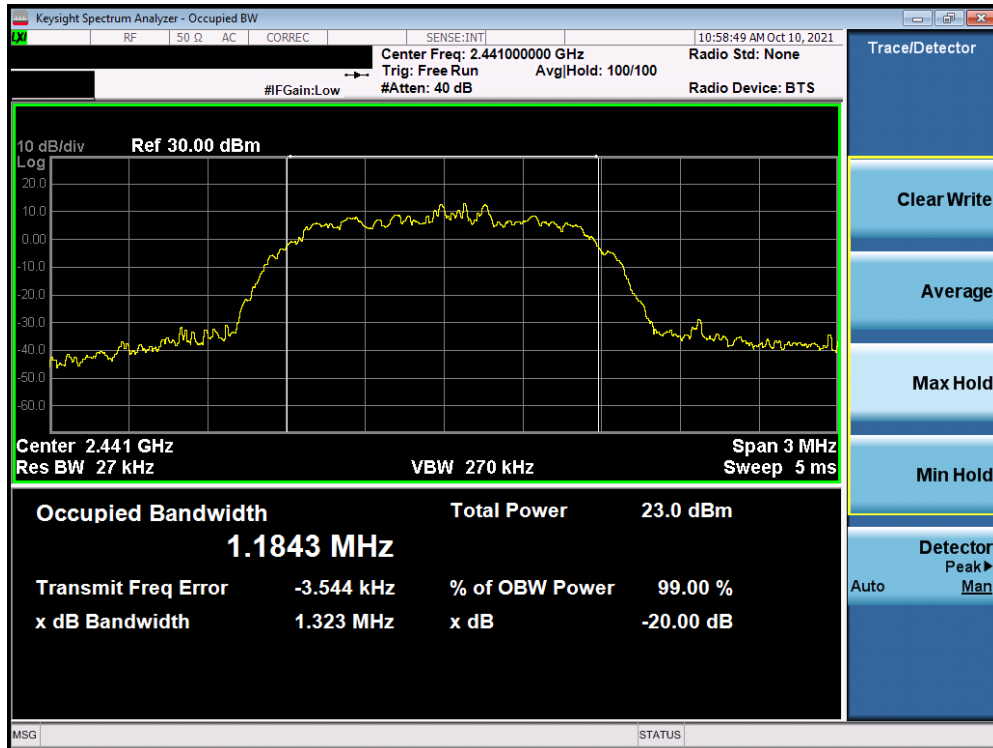


Plot 7-12. Conducted 20dB Plot (Bluetooth, 1Mbps– Ch. 78) Antenna 2

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 19 of 131                    |

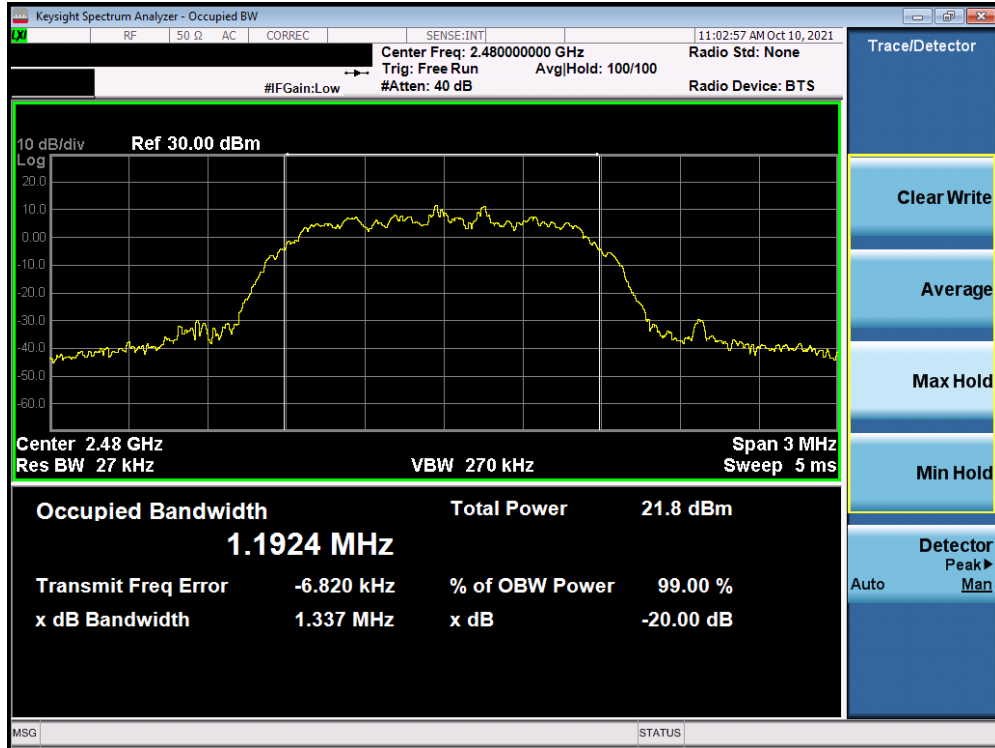


Plot 7-13. Conducted 20dB Plot (Bluetooth, 2Mbps– Ch. 0) Antenna 2

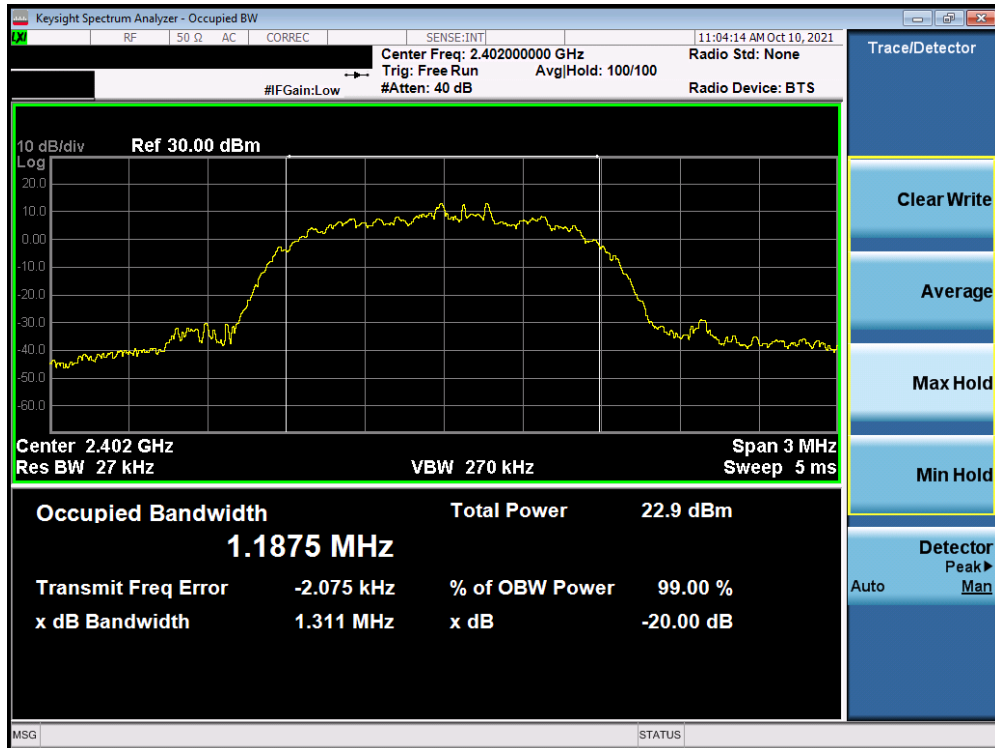


Plot 7-14. Conducted 20dB Plot (Bluetooth, 2Mbps – Ch. 39) Antenna 2

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 20 of 131                    |

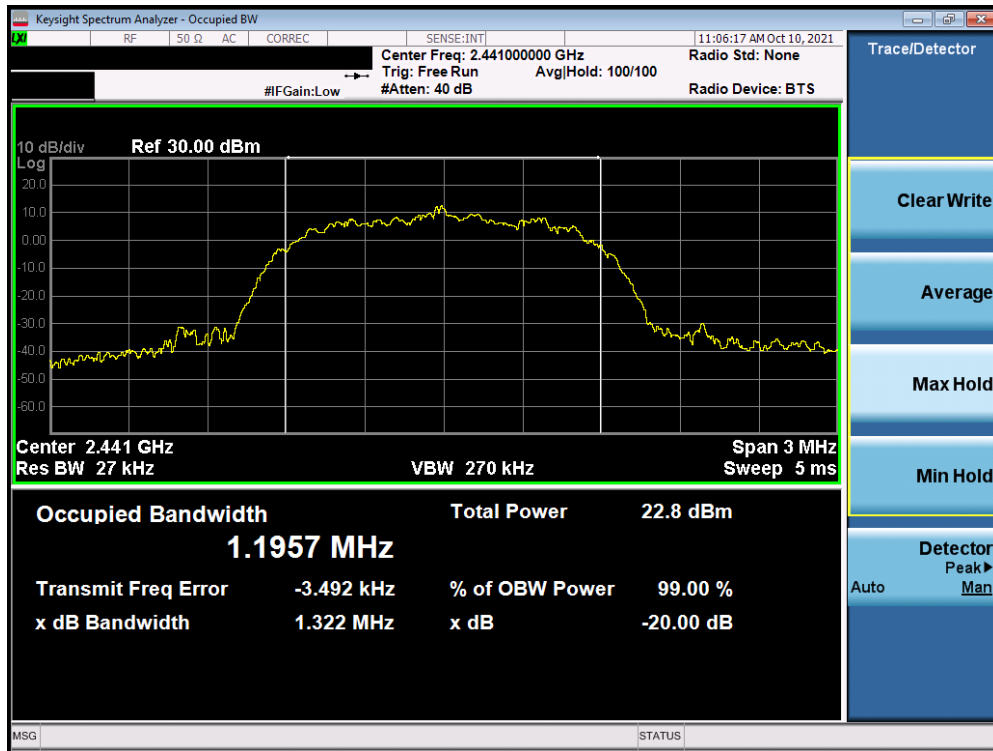


Plot 7-15. Conducted 20dB Plot (Bluetooth, 2Mbps – Ch. 78) Antenna 2

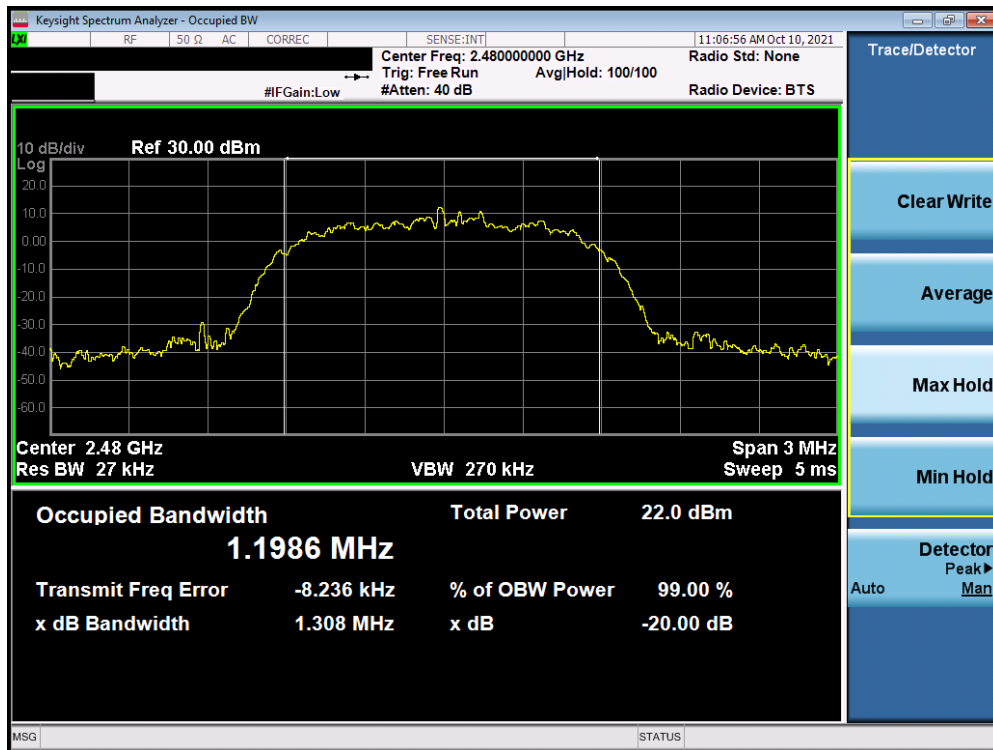


Plot 7-16. Conducted 20dB Plot (Bluetooth, 3Mbps– Ch. 0) Antenna 2

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 21 of 131                    |



Plot 7-17. Conducted 20dB Plot (Bluetooth, 3Mbps – Ch. 39) Antenna 2



Plot 7-18. Conducted 20dB Plot (Bluetooth, 3Mbps – Ch. 78) Antenna 2

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 22 of 131                    |

### 7.3 Output Power Measurement

**§15.247 (b.1); RSS-247 [5.4(b)]**

#### **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 14.2 Measure-and-Sum Technique

#### **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 and Average Power Measurement**

#### **Note**

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

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

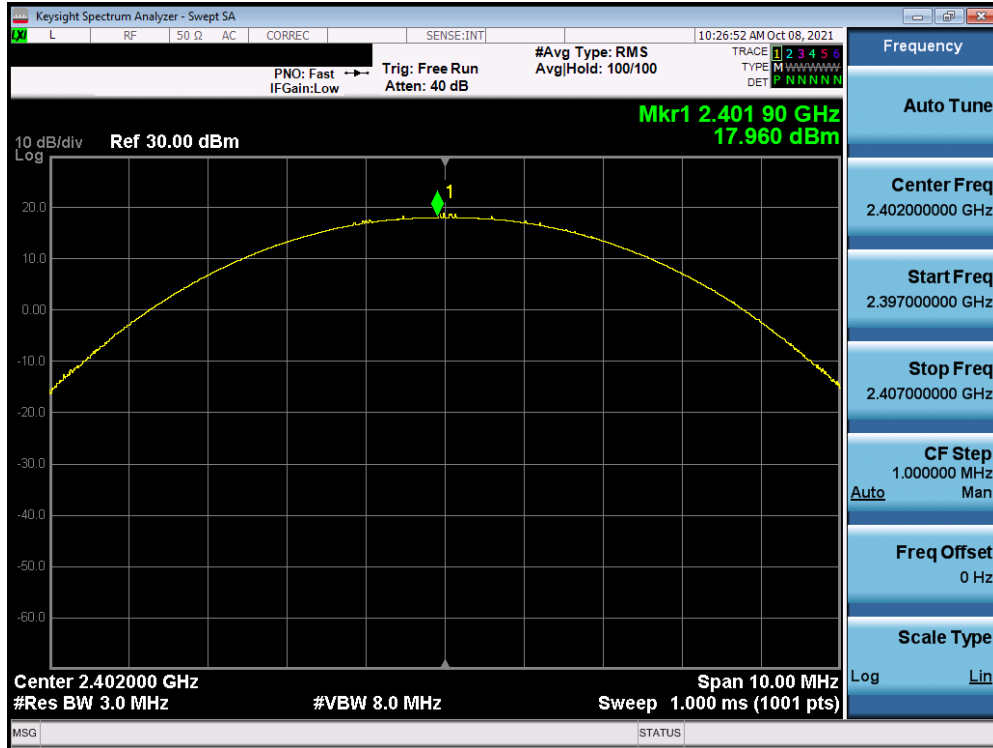
|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 23 of 131                    |

## Antenna 1

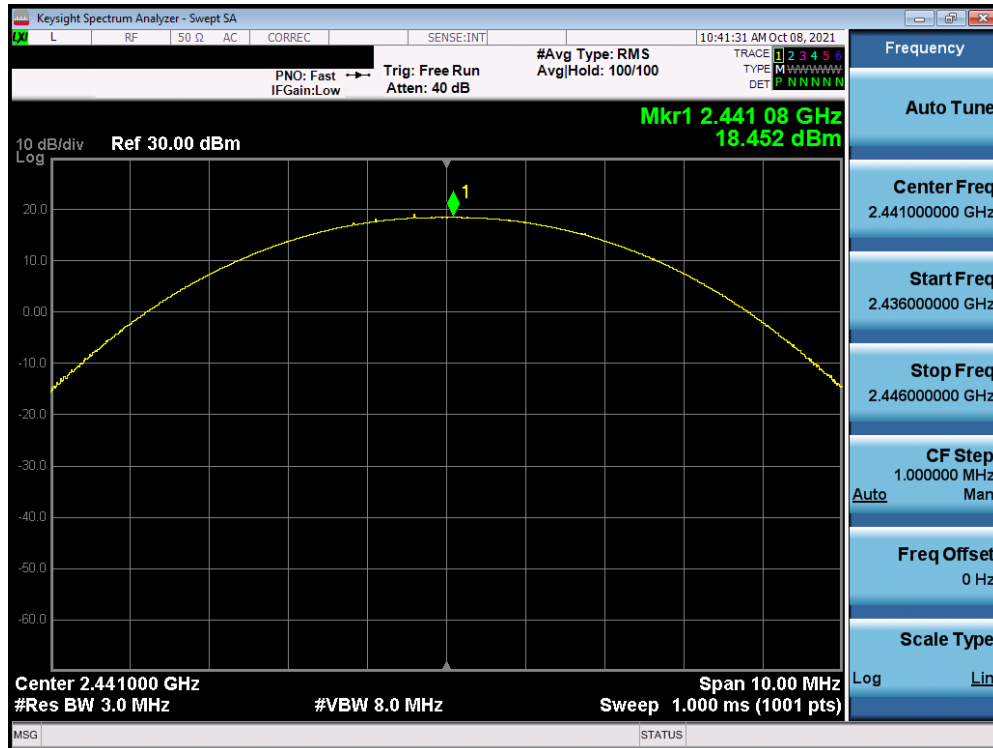
| Frequency [MHz] | Data Rate [Mbps] | Modulation     | Power Scheme | Channel No. | Peak Conducted Power |         | Avg Conducted Power |        |
|-----------------|------------------|----------------|--------------|-------------|----------------------|---------|---------------------|--------|
|                 |                  |                |              |             | [dBm]                | [mW]    | [dBm]               | [mW]   |
| 2402            | 1.0              | GFSK           | ePA          | 0           | 17.96                | 62.517  | 17.11               | 51.428 |
| 2441            | 1.0              | GFSK           | ePA          | 39          | 18.45                | 70.016  | 17.47               | 55.898 |
| 2480            | 1.0              | GFSK           | ePA          | 78          | 17.70                | 58.817  | 16.73               | 47.130 |
| 2402            | 1.0              | GFSK           | iPA          | 0           | 13.42                | 21.953  | 12.13               | 16.334 |
| 2441            | 1.0              | GFSK           | iPA          | 39          | 13.79                | 23.955  | 12.63               | 18.302 |
| 2480            | 1.0              | GFSK           | iPA          | 78          | 12.96                | 19.774  | 12.17               | 16.497 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | ePA          | 0           | 21.70                | 148.013 | 18.00               | 63.023 |
| 2441            | 2.0              | $\pi/4$ -DQPSK | ePA          | 39          | 20.87                | 122.039 | 17.73               | 59.252 |
| 2480            | 2.0              | $\pi/4$ -DQPSK | ePA          | 78          | 19.65                | 92.321  | 17.14               | 51.785 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | iPA          | 0           | 12.22                | 16.680  | 9.49                | 8.883  |
| 2441            | 2.0              | $\pi/4$ -DQPSK | iPA          | 39          | 12.60                | 18.214  | 9.75                | 9.446  |
| 2480            | 2.0              | $\pi/4$ -DQPSK | iPA          | 78          | 11.52                | 14.204  | 9.16                | 8.248  |
| 2402            | 3.0              | 8DPSK          | ePA          | 0           | 22.11                | 162.480 | 17.81               | 60.353 |
| 2441            | 3.0              | 8DPSK          | ePA          | 39          | 21.15                | 130.377 | 17.69               | 58.749 |
| 2480            | 3.0              | 8DPSK          | ePA          | 78          | 20.34                | 108.218 | 17.15               | 51.904 |
| 2402            | 3.0              | 8DPSK          | iPA          | 0           | 12.48                | 17.701  | 9.49                | 8.883  |
| 2441            | 3.0              | 8DPSK          | iPA          | 39          | 12.87                | 19.369  | 9.86                | 9.676  |
| 2480            | 3.0              | 8DPSK          | iPA          | 78          | 11.78                | 15.080  | 9.00                | 7.946  |

**Table 7-4. Conducted Output Power Measurements Antenna 1**

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         | Page 24 of 131                                                                        |                                   |

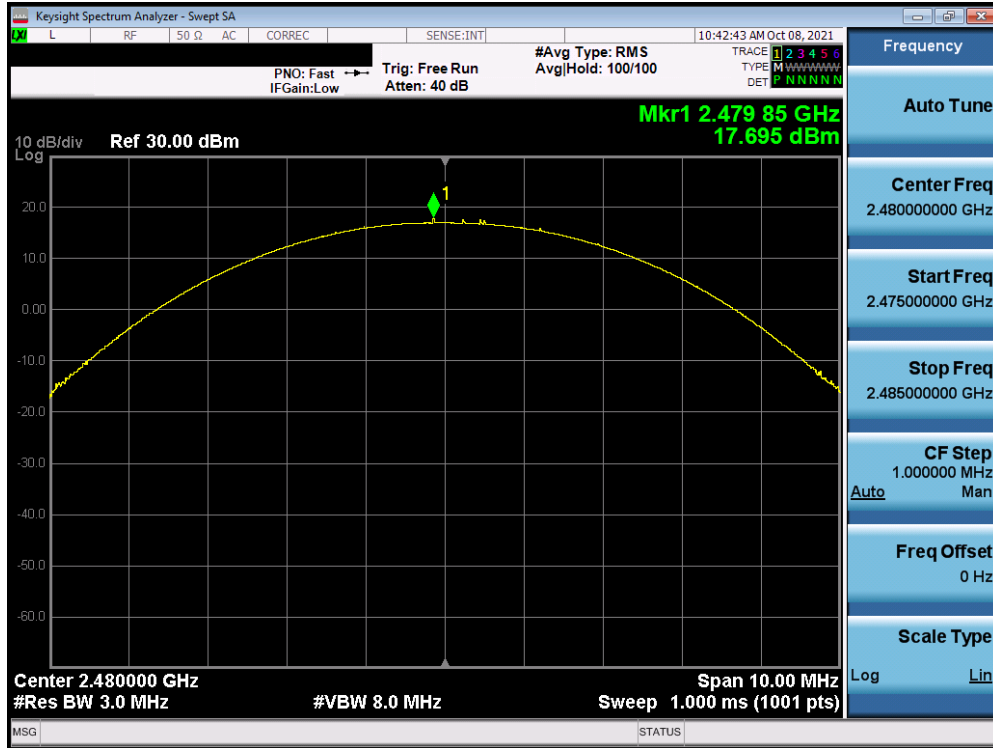


Plot 7-19. Peak Conducted Power (1Mbps – Ch. 0) Antenna 1 ePA

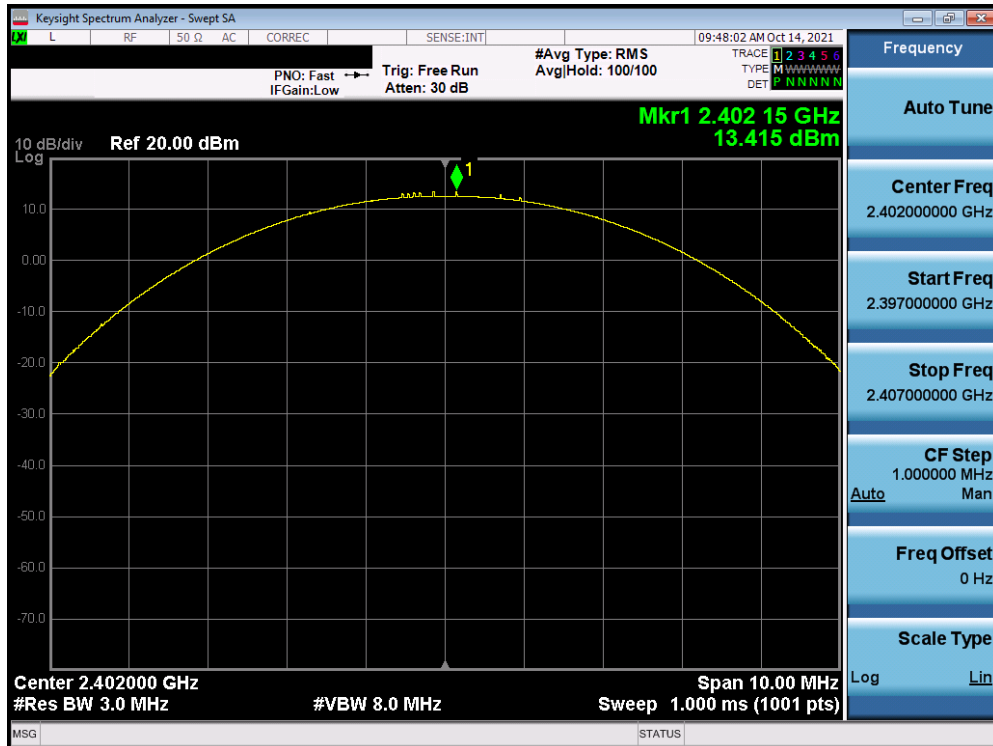


Plot 7-20. Peak Conducted Power (1Mbps – Ch. 39) Antenna 1 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 25 of 131                    |

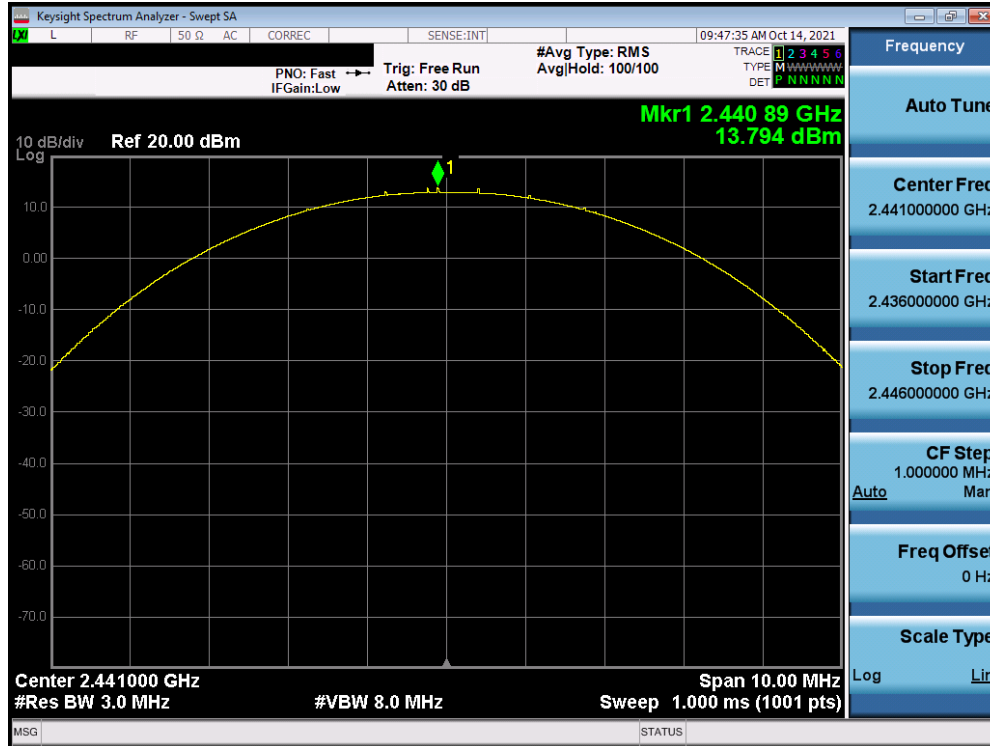


Plot 7-21. Peak Conducted Power (1Mbps – Ch. 78) Antenna 1 ePA

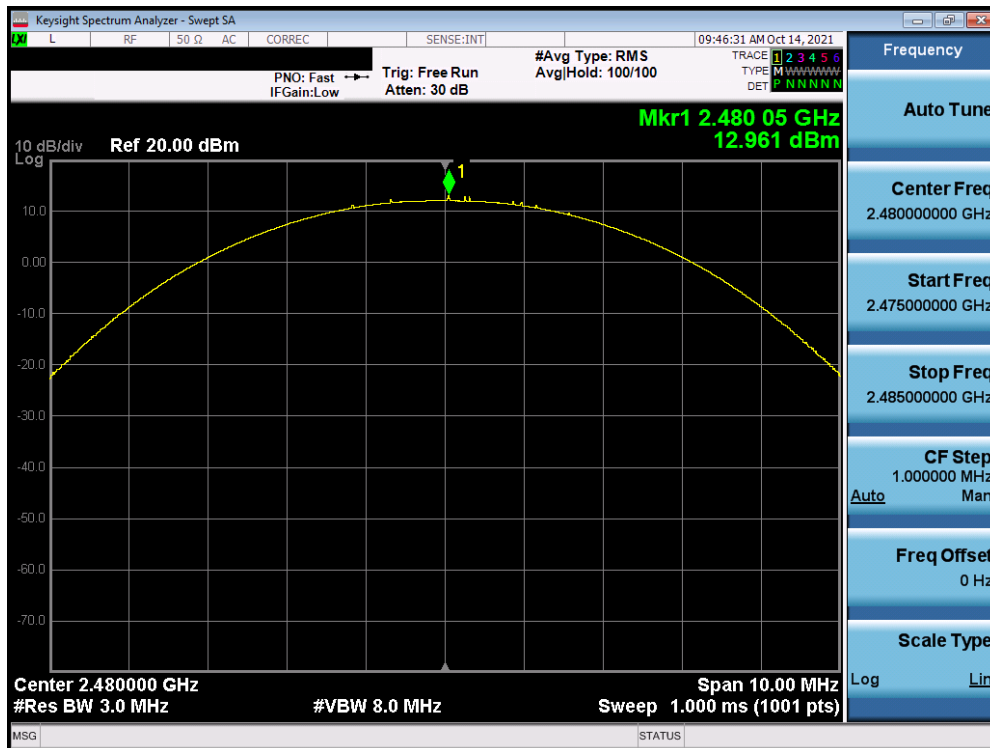


Plot 7-22. Peak Conducted Power (1Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 26 of 131                    |

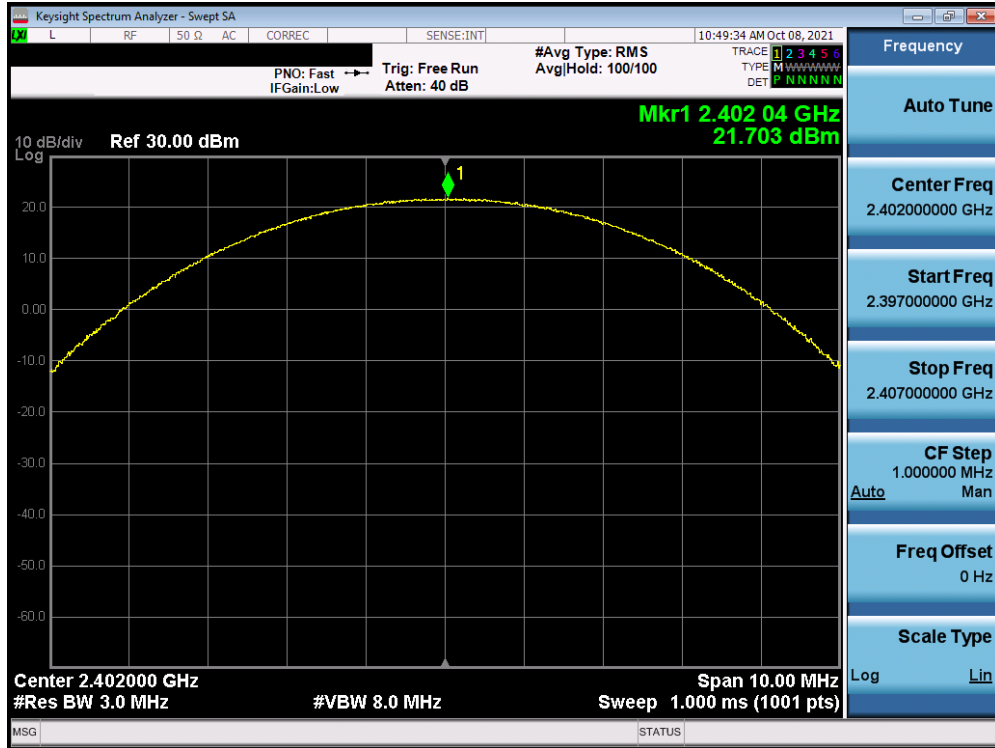


Plot 7-23. Peak Conducted Power (1Mbps – Ch. 39) Antenna 1 iPA

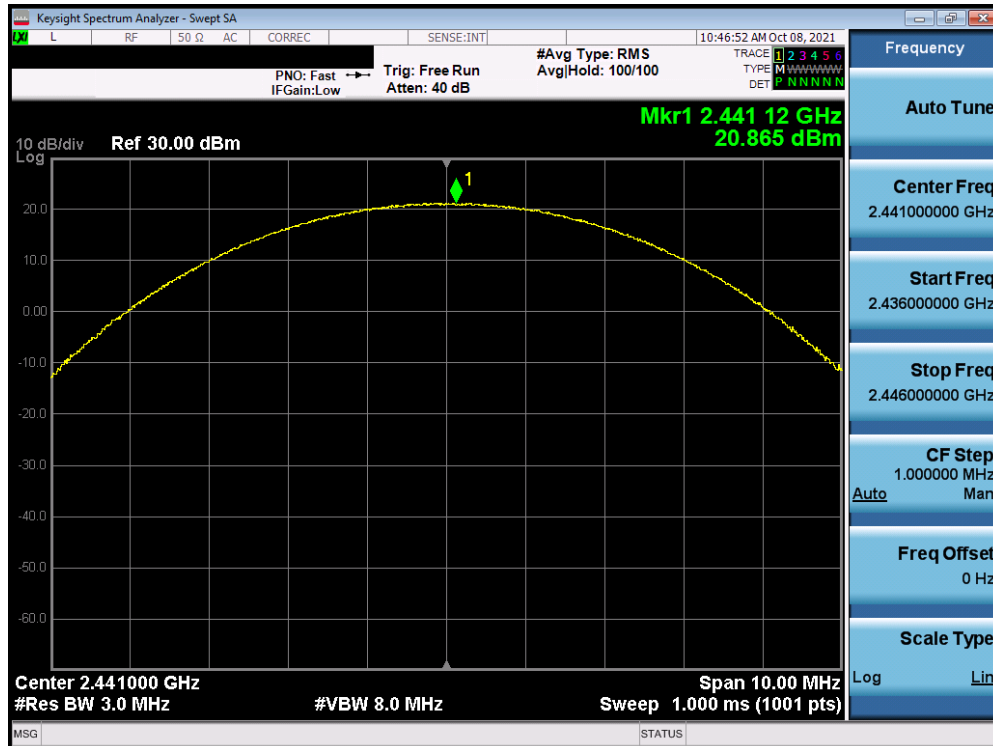


Plot 7-24. Peak Conducted Power (1Mbps – Ch. 78) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 27 of 131                    |

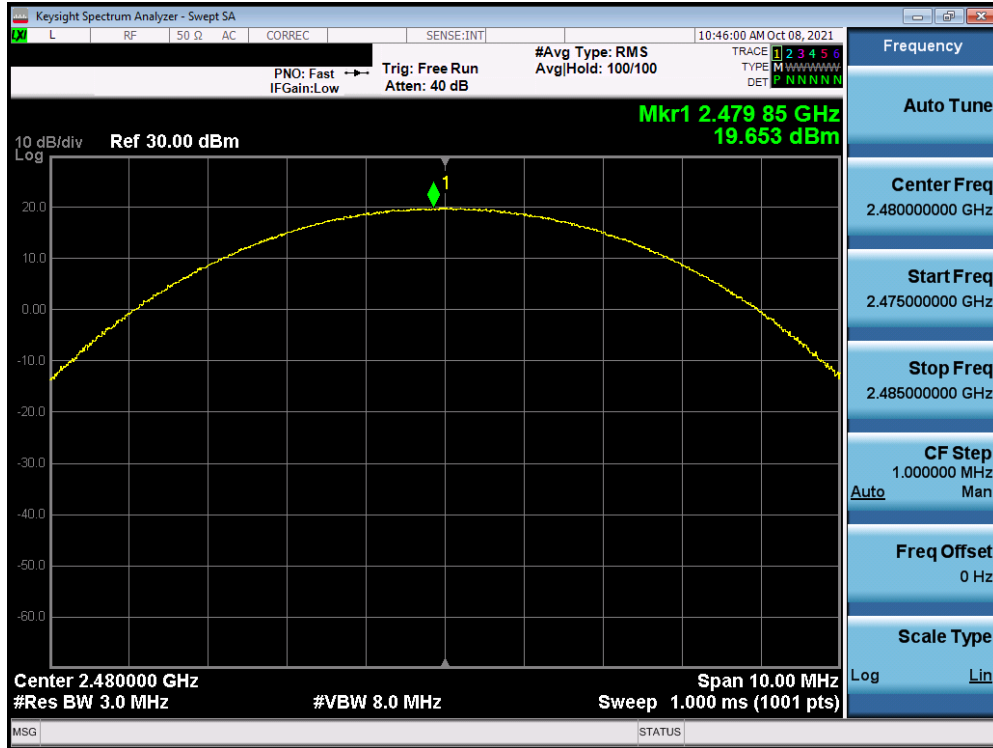


Plot 7-25. Peak Conducted Power (2Mbps – Ch. 0) Antenna 1 ePA

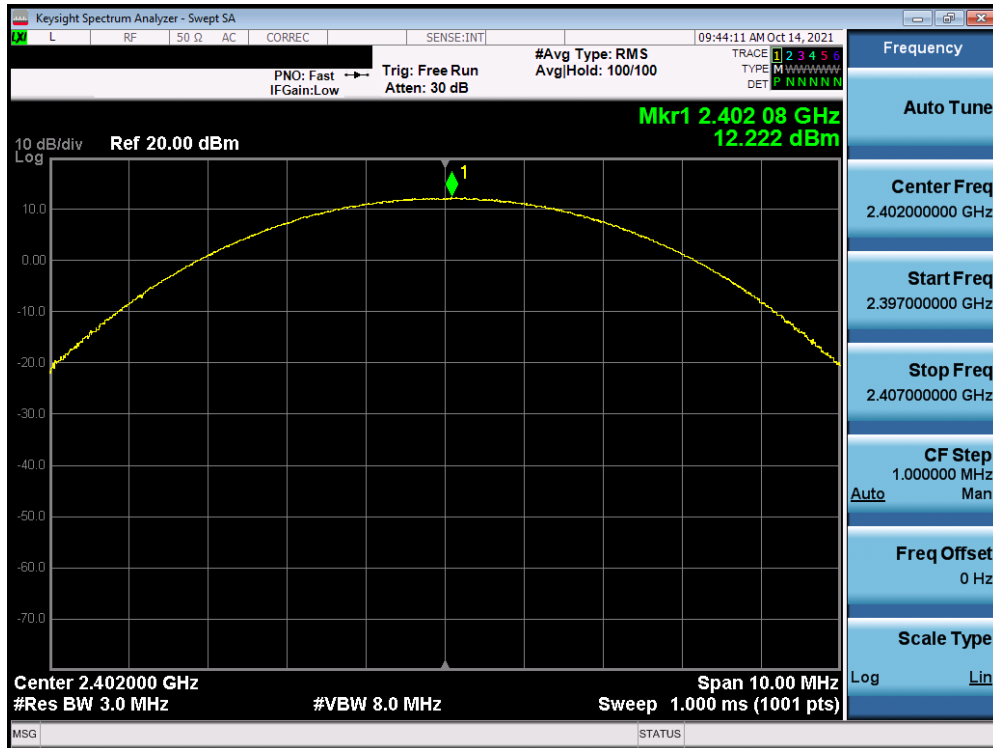


Plot 7-26. Peak Conducted Power (2Mbps – Ch. 39) Antenna 1 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 28 of 131                    |

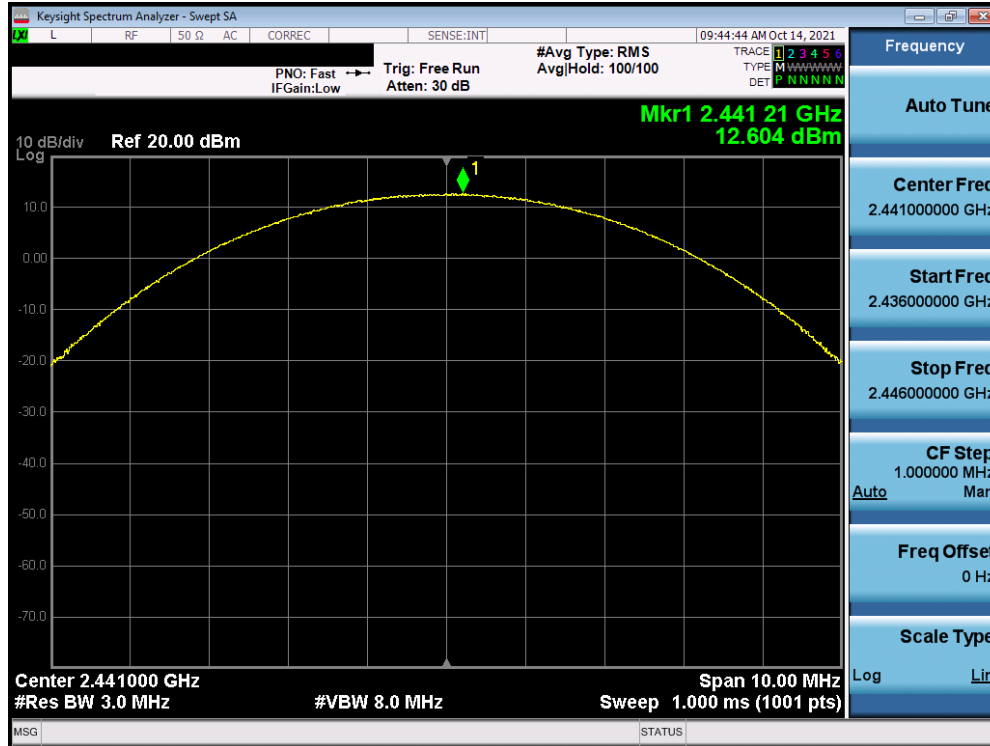


Plot 7-27. Peak Conducted Power (2Mbps – Ch. 78) Antenna 1ePA

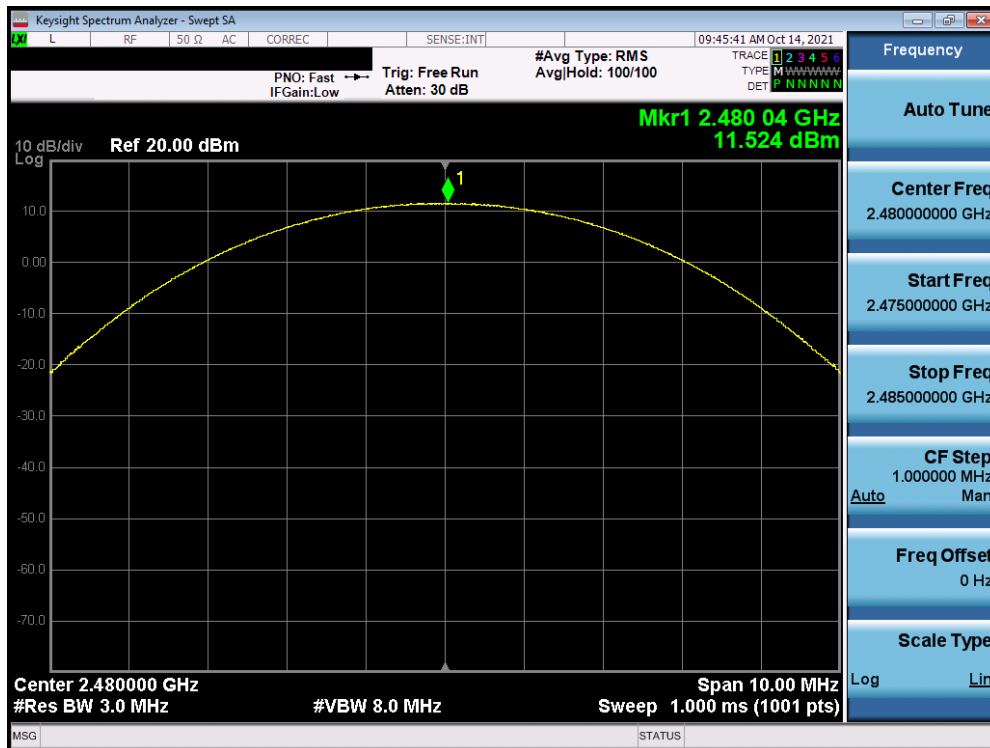


Plot 7-28. Peak Conducted Power (2Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 29 of 131                    |

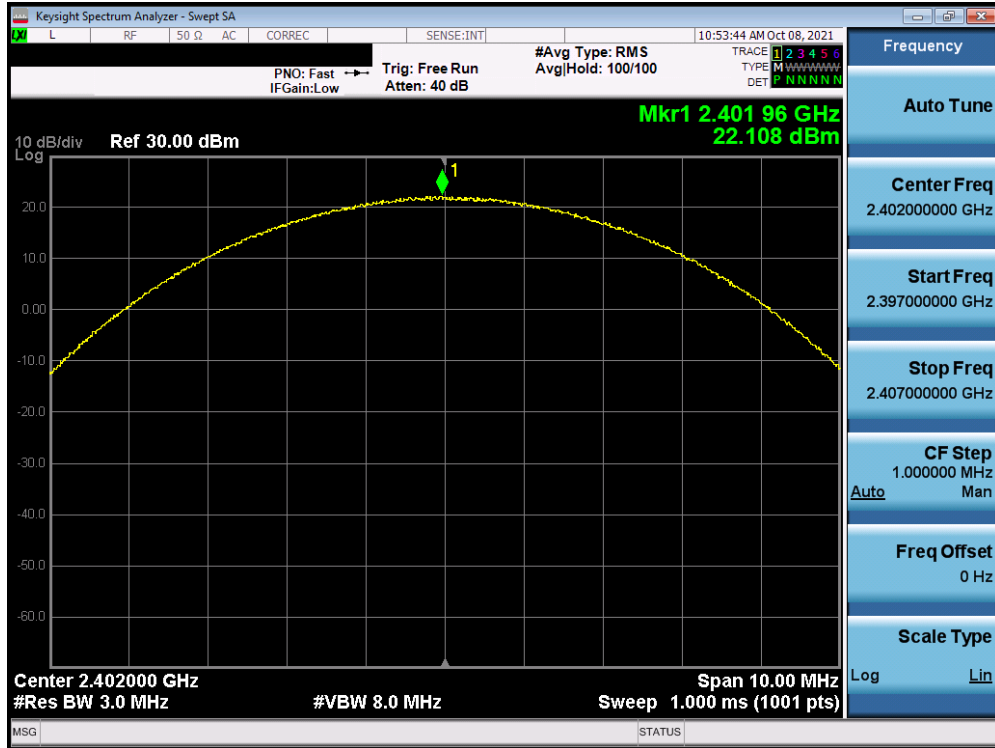


Plot 7-29. Peak Conducted Power (2Mbps – Ch. 39) Antenna 1 iPA

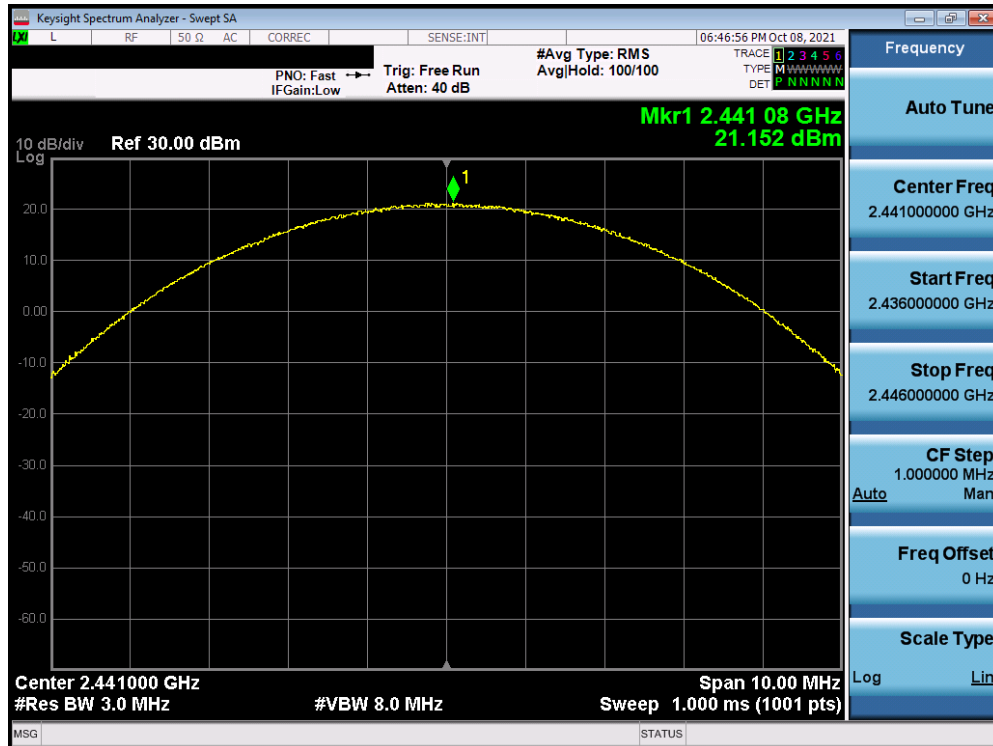


Plot 7-30. Peak Conducted Power (2Mbps – Ch. 78) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 30 of 131                    |

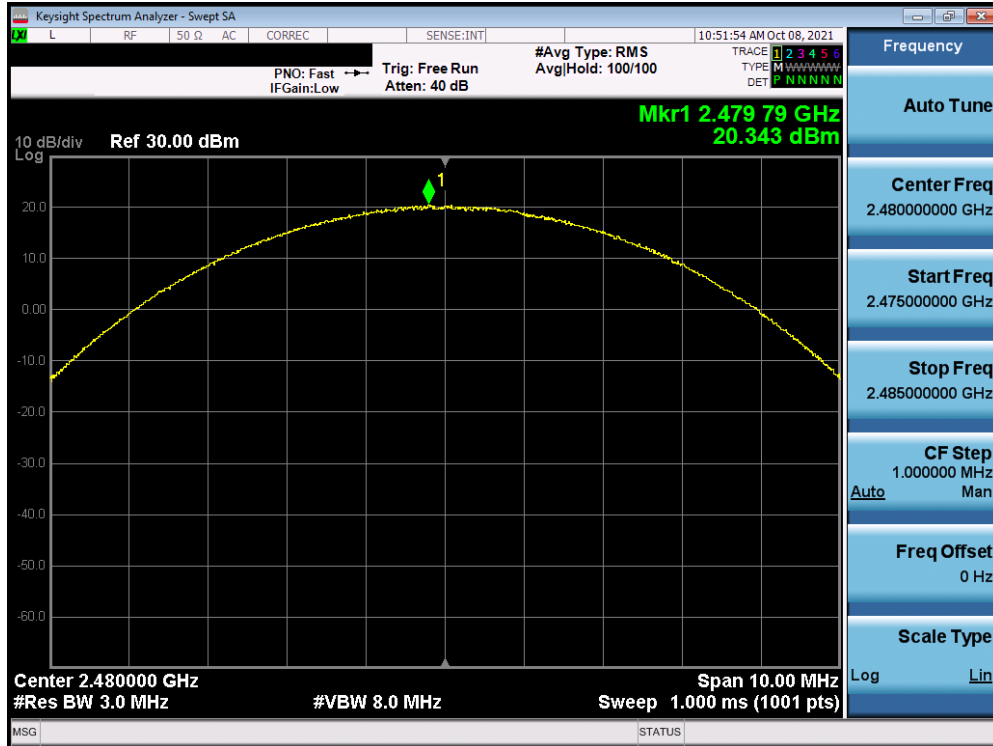


Plot 7-31. Peak Conducted Power (3Mbps – Ch. 0) Antenna 1 ePA

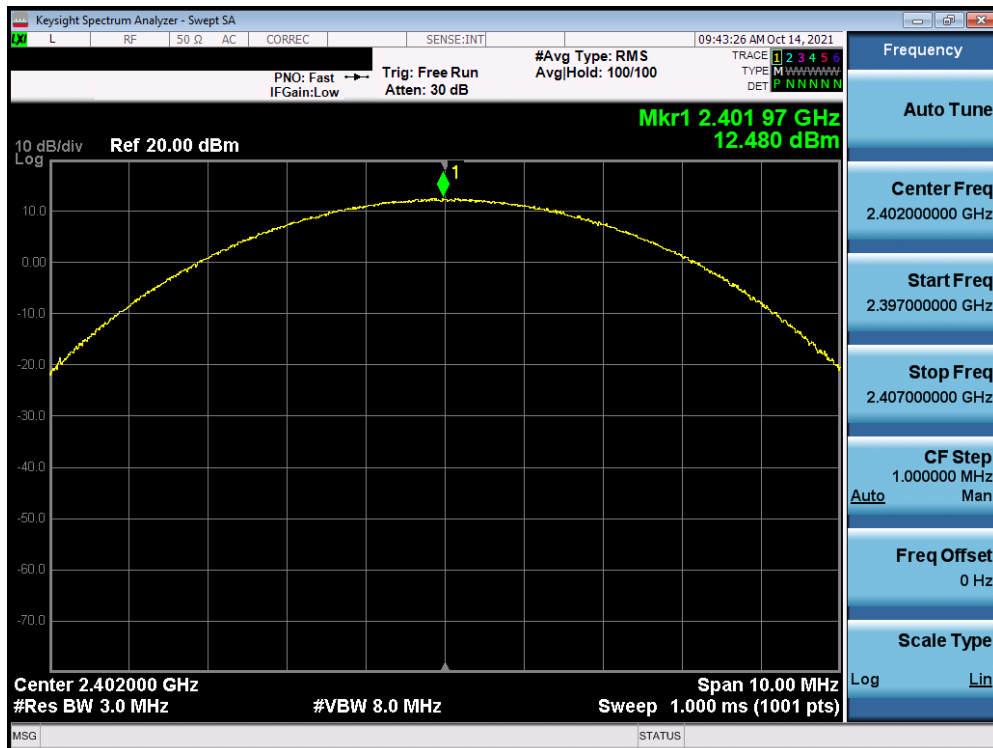


Plot 7-32. Peak Conducted Power 32Mbps – Ch. 39) Antenna 1 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 31 of 131                    |

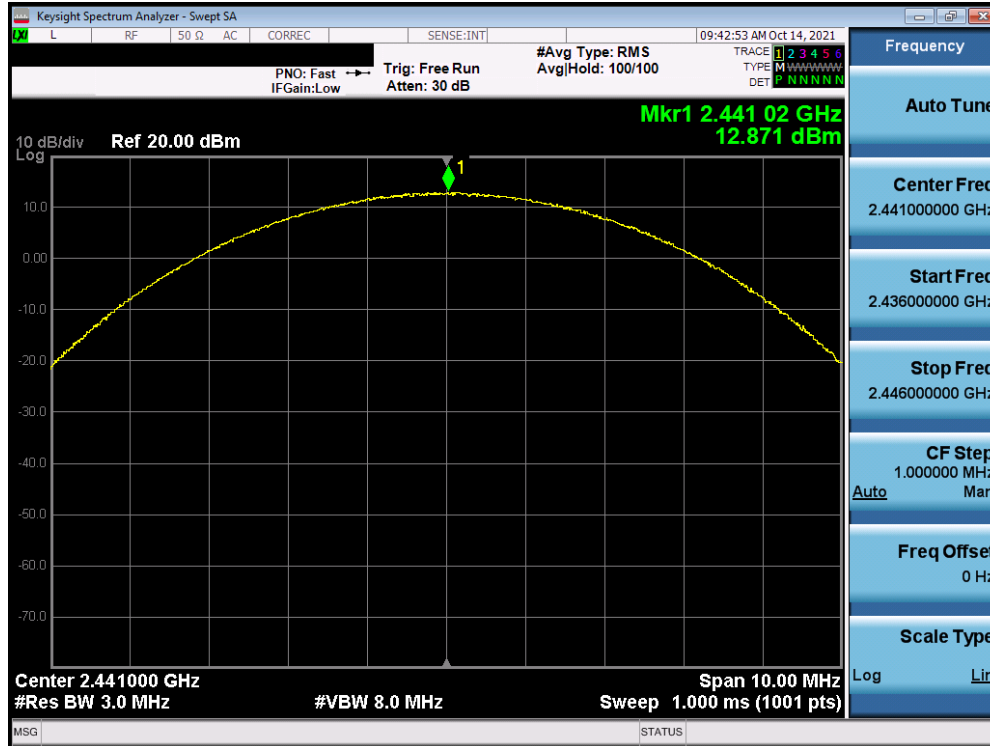


Plot 7-33. Peak Conducted Power (3Mbps – Ch. 78) Antenna 1 ePA

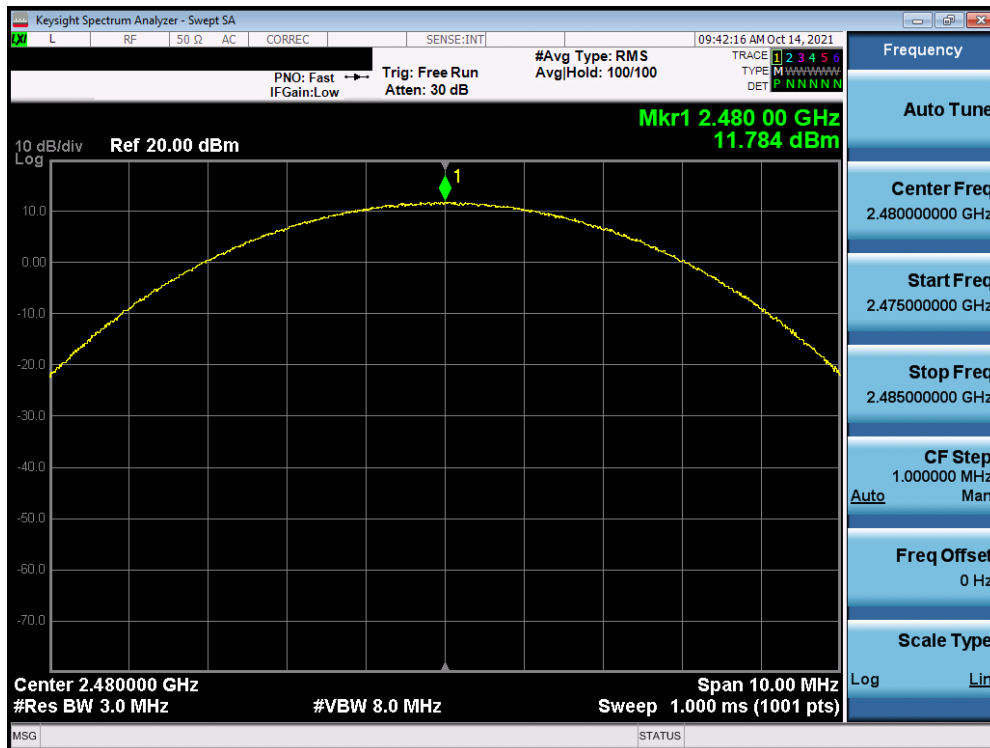


Plot 7-34. Peak Conducted Power (3Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 32 of 131                    |

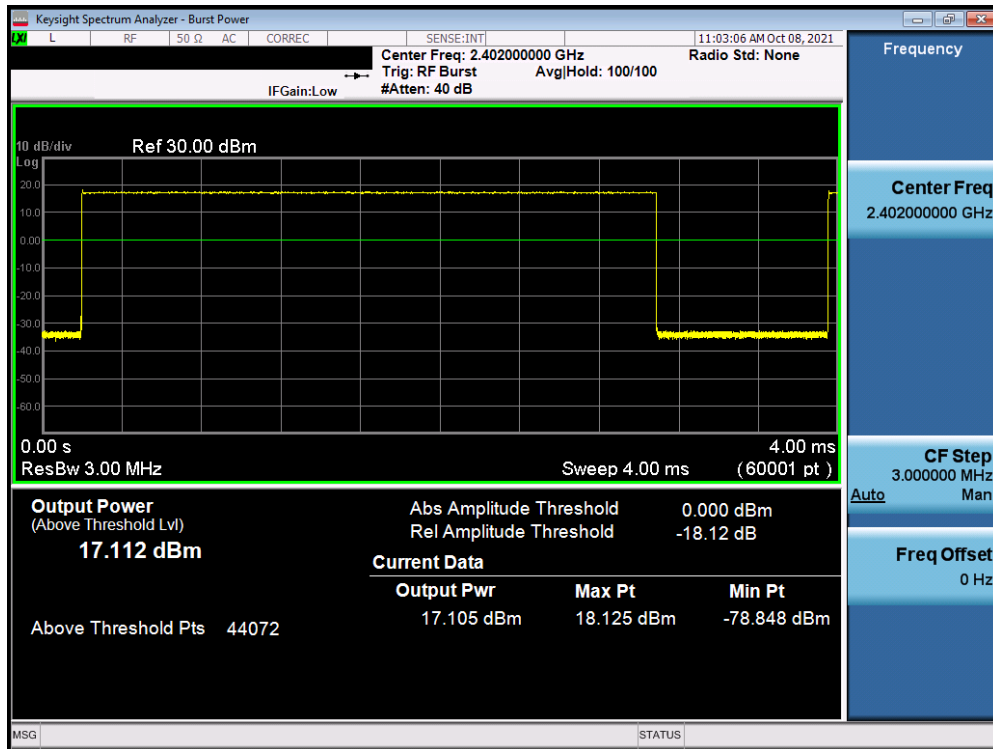


Plot 7-35. Peak Conducted Power (3Mbps – Ch. 39) Antenna 1 iPA

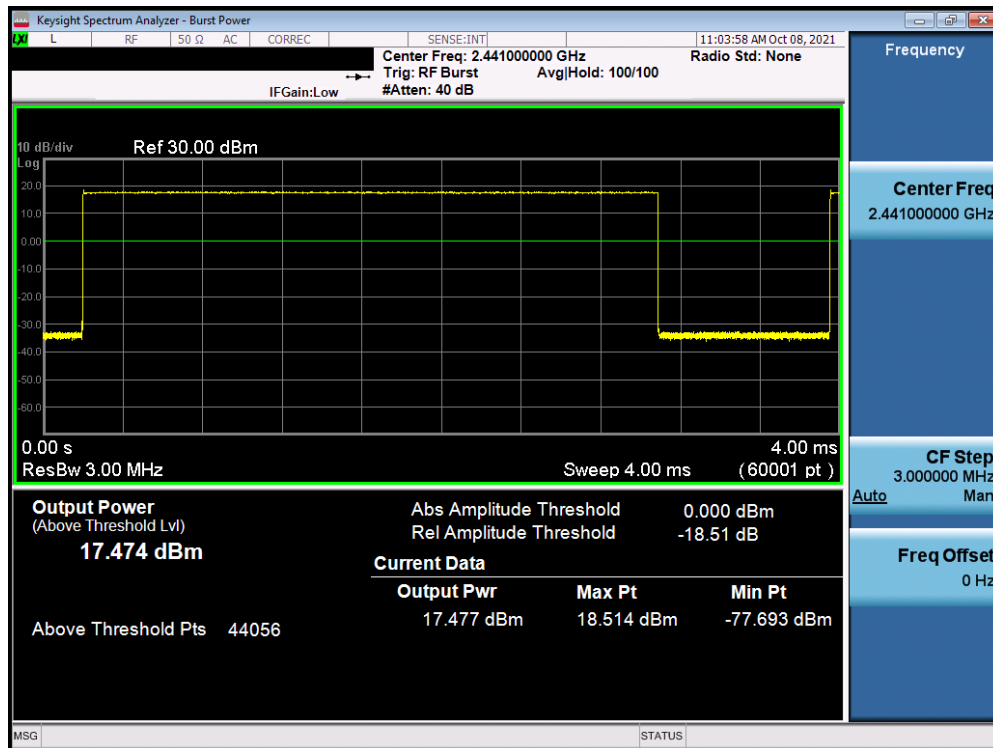


Plot 7-36. Peak Conducted Power (3Mbps – Ch. 78) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 33 of 131                    |

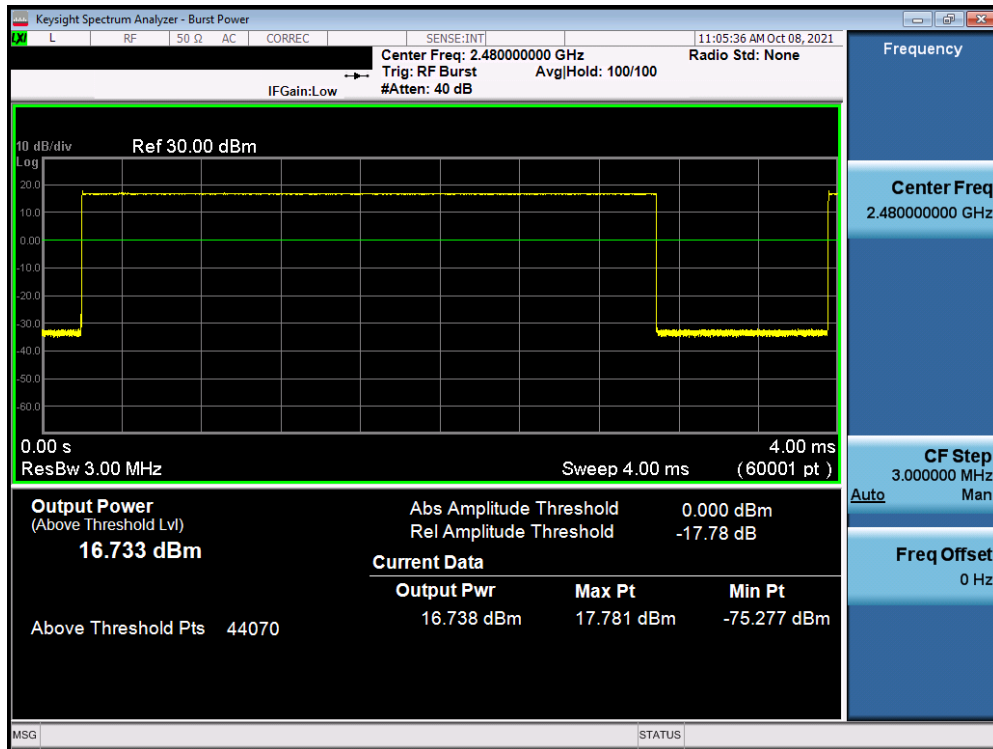


Plot 7-37. Average Conducted Power (1Mbps – Ch. 0) Antenna 1 ePA

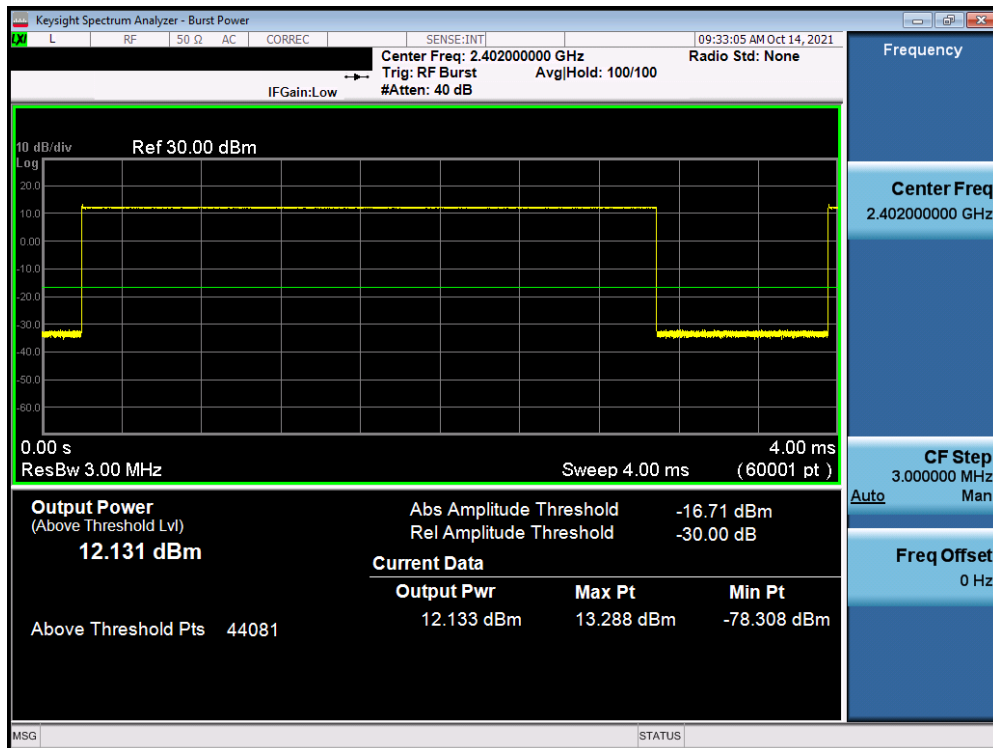


Plot 7-38. Average Conducted Power (1Mbps – Ch. 39) Antenna 1 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 34 of 131                    |

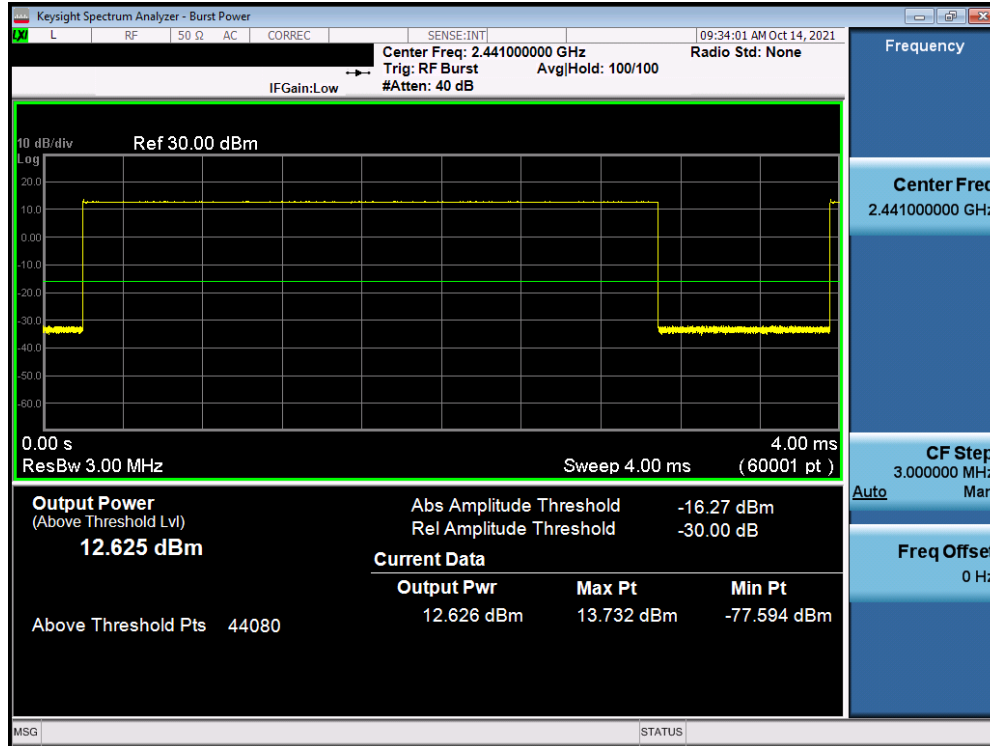


Plot 7-39. Average Conducted Power (1Mbps – Ch. 78) Antenna 1 ePA

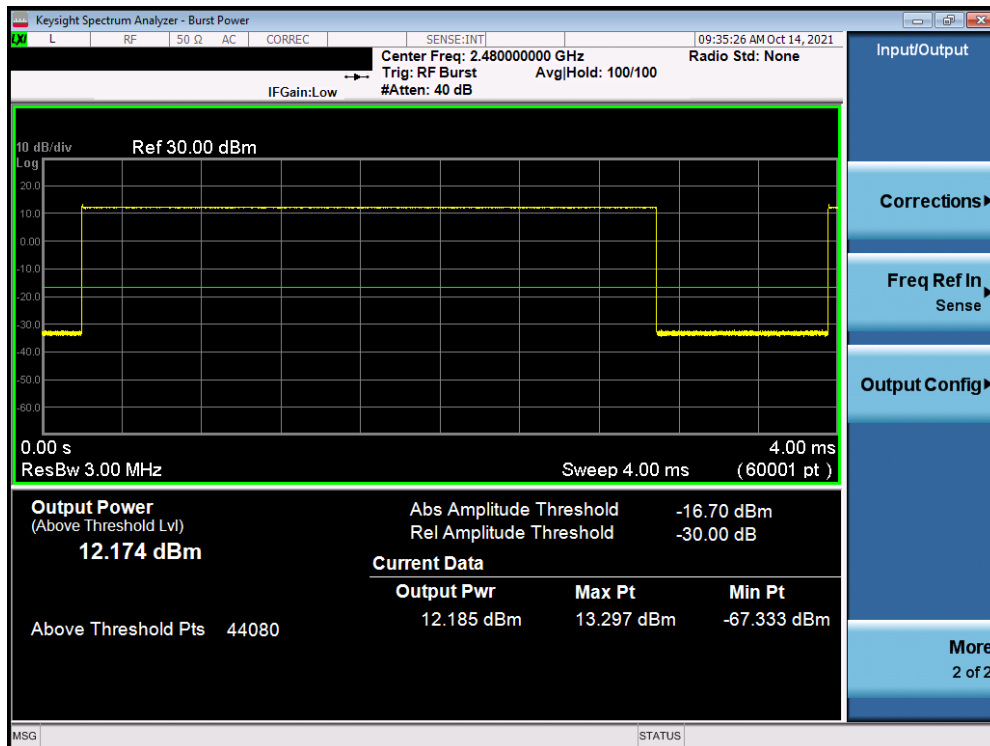


Plot 7-40. Average Conducted Power (1Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 35 of 131                    |

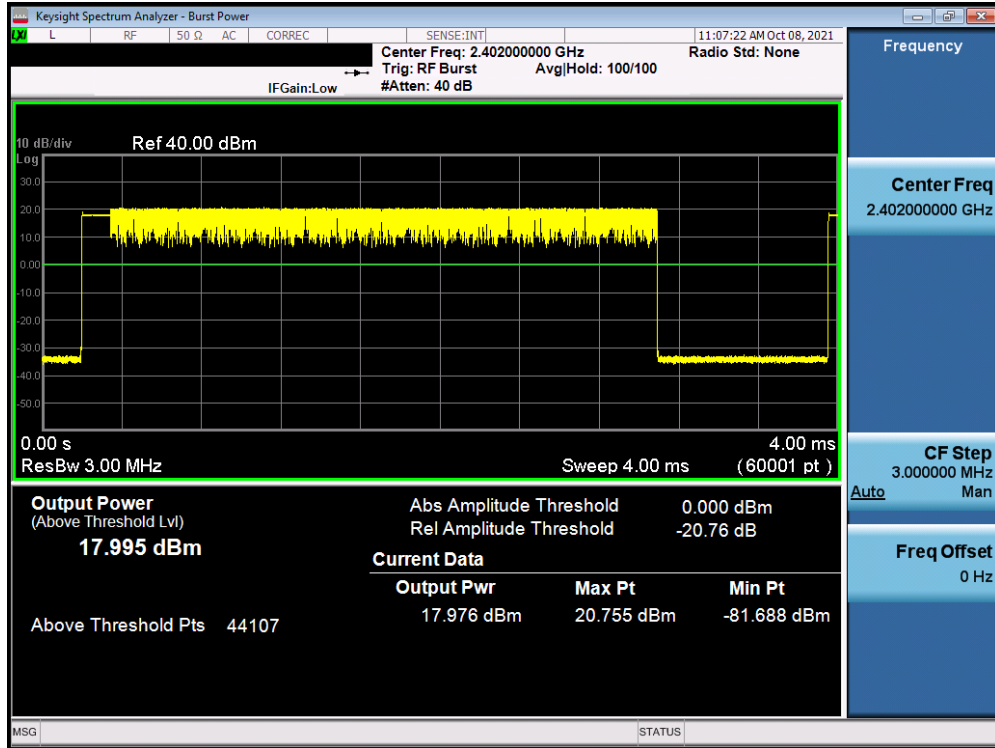


Plot 7-41. Average Conducted Power (1Mbps – Ch. 39) Antenna 1 iPA

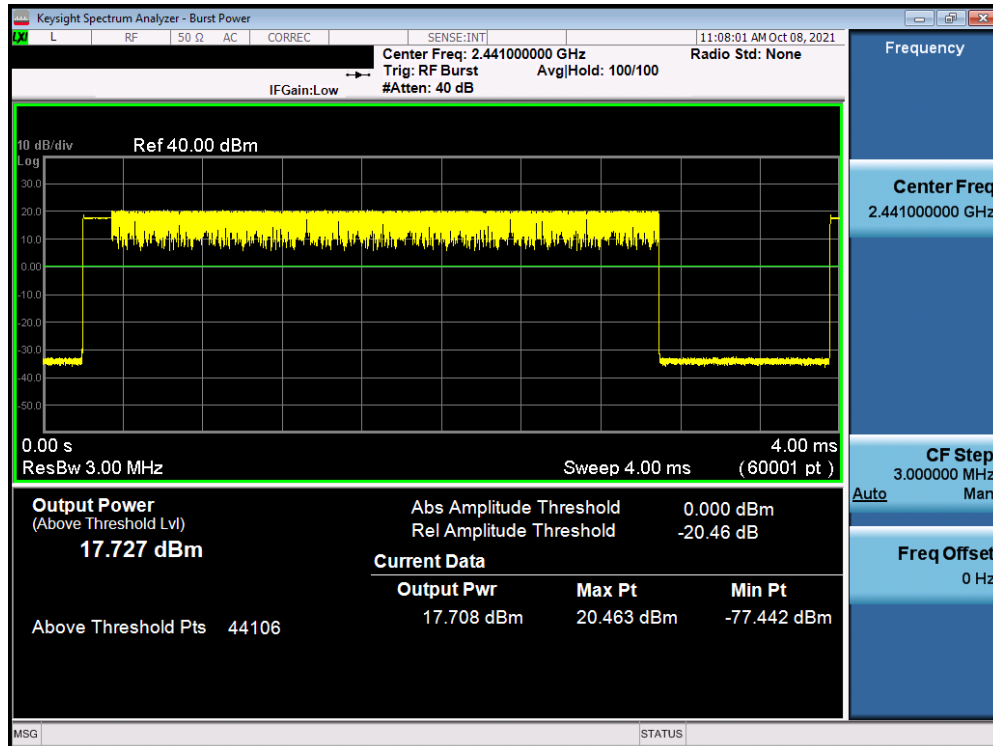


Plot 7-42. Average Conducted Power (1Mbps – Ch. 78) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 36 of 131                    |

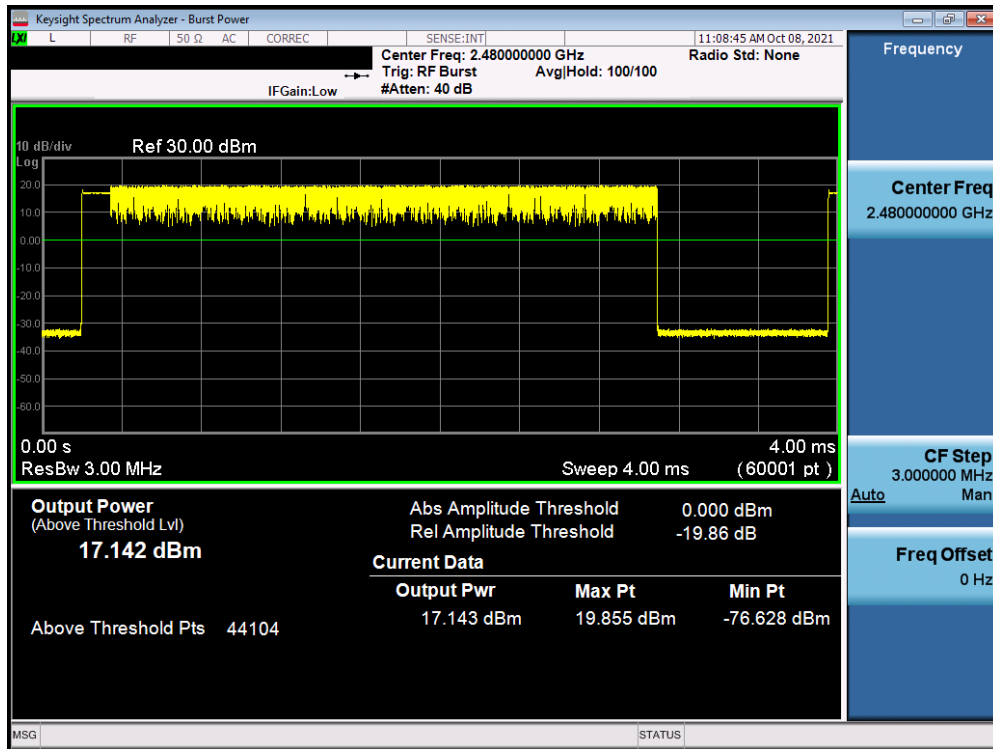


Plot 7-43. Average Conducted Power (2Mbps – Ch. 0) Antenna 1 ePA

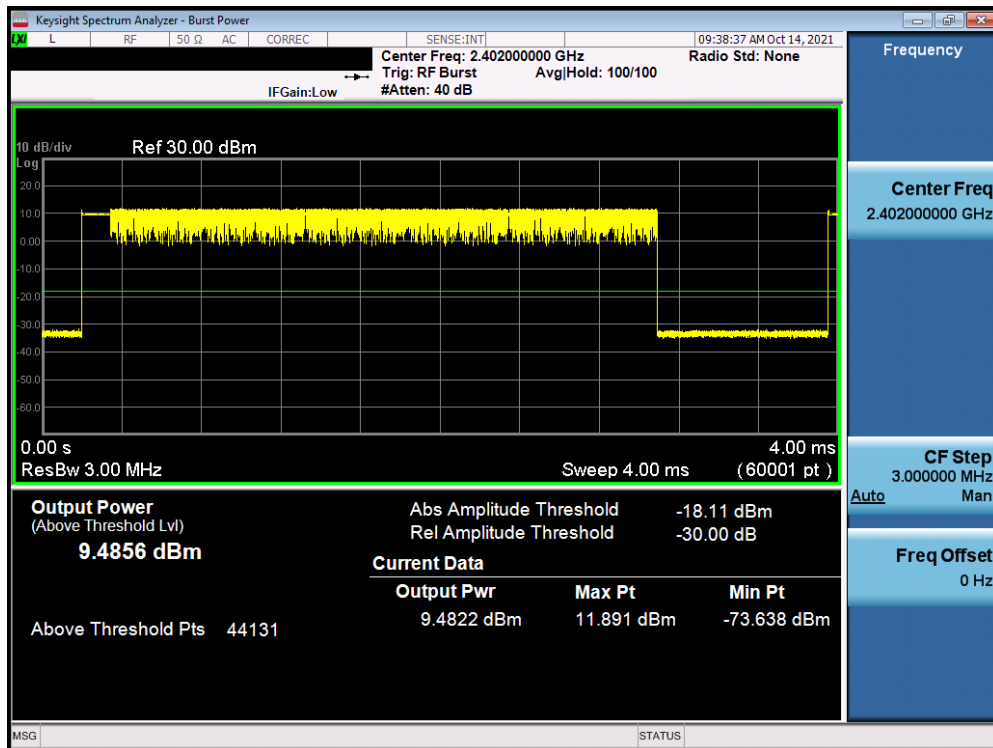


Plot 7-44. Average Conducted Power (2Mbps – Ch. 39) Antenna 1 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 37 of 131                    |

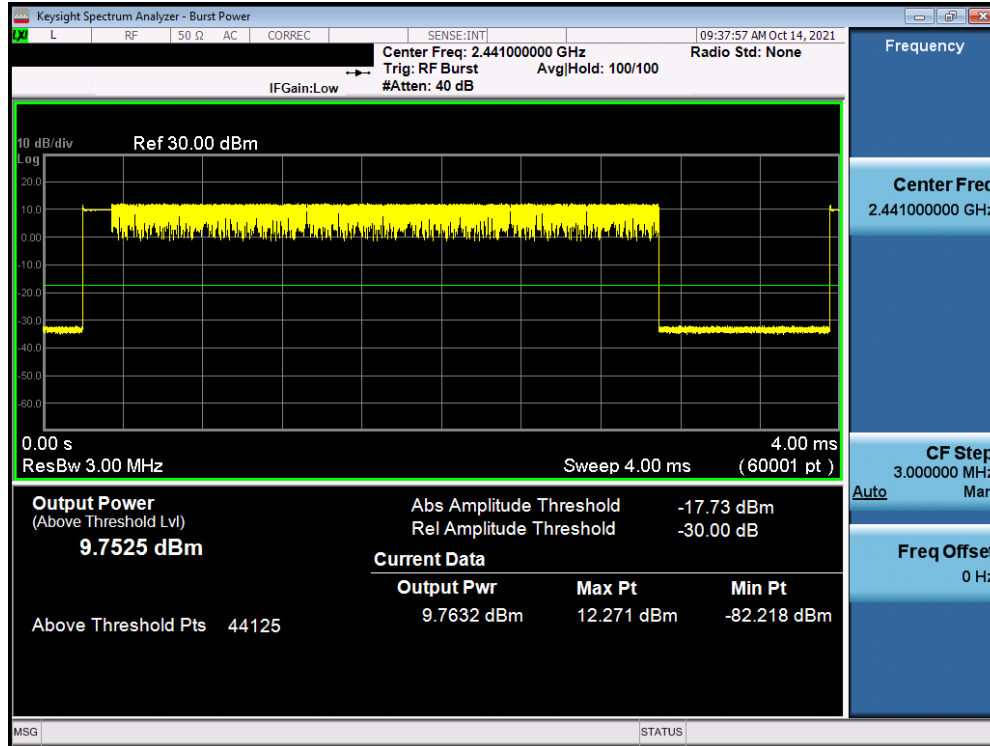


Plot 7-45. Average Conducted Power (2Mbps – Ch. 78) Antenna 1 ePA

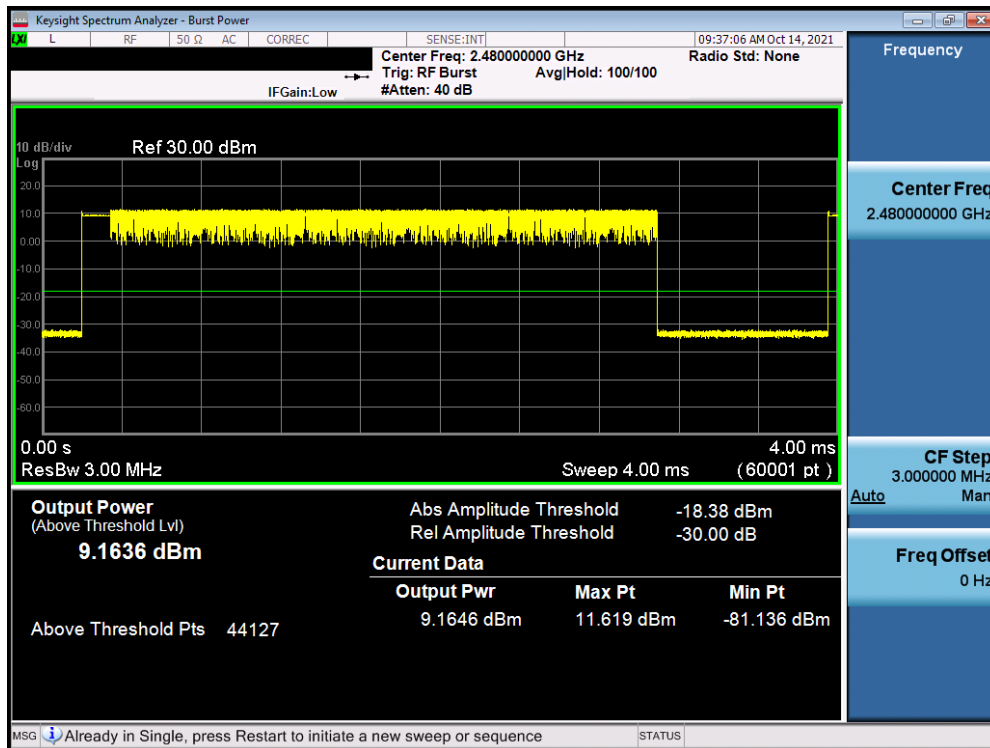


Plot 7-46. Average Conducted Power (2Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 38 of 131                    |

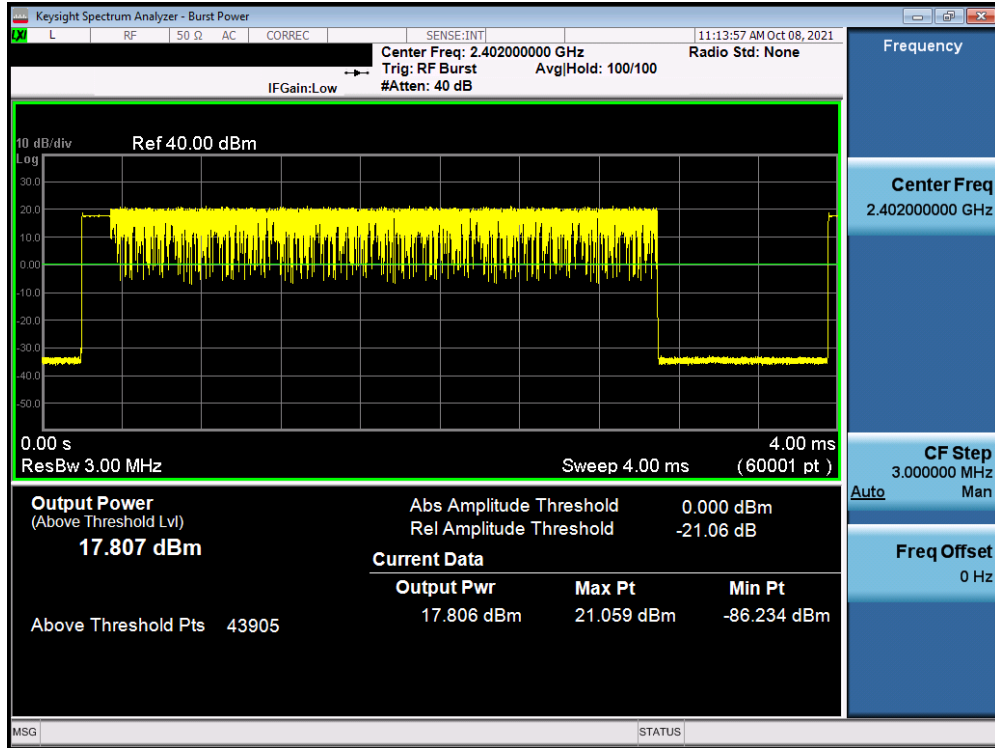


Plot 7-47. Average Conducted Power (2Mbps – Ch. 39) Antenna 1 iPA

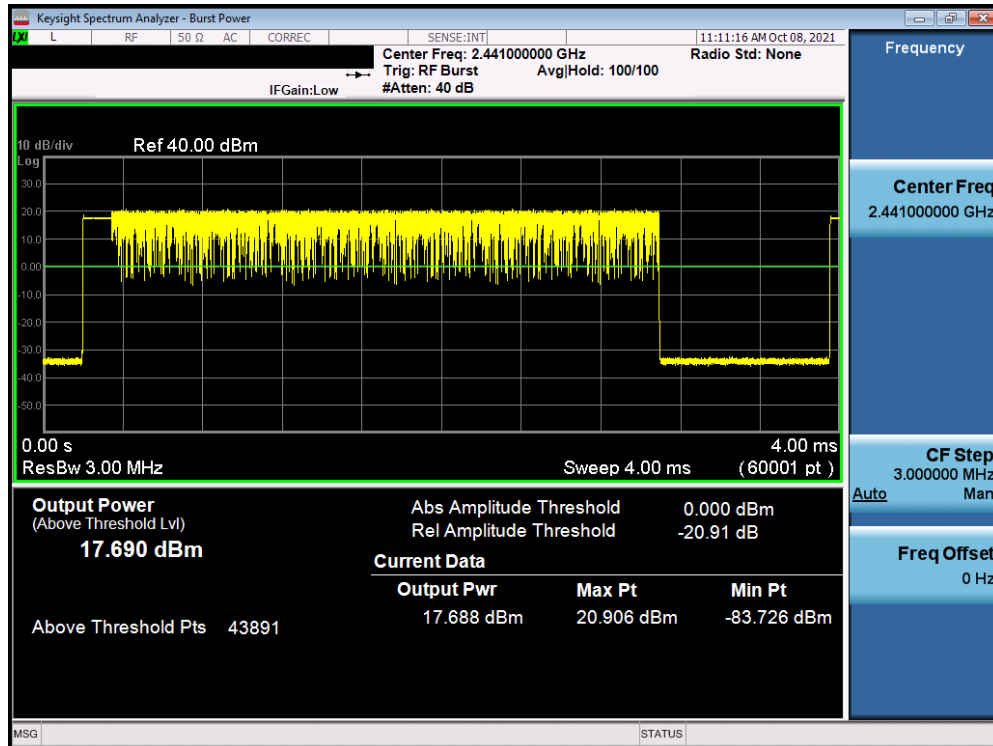


Plot 7-48. Average Conducted Power (2Mbps – Ch. 78) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 39 of 131                    |

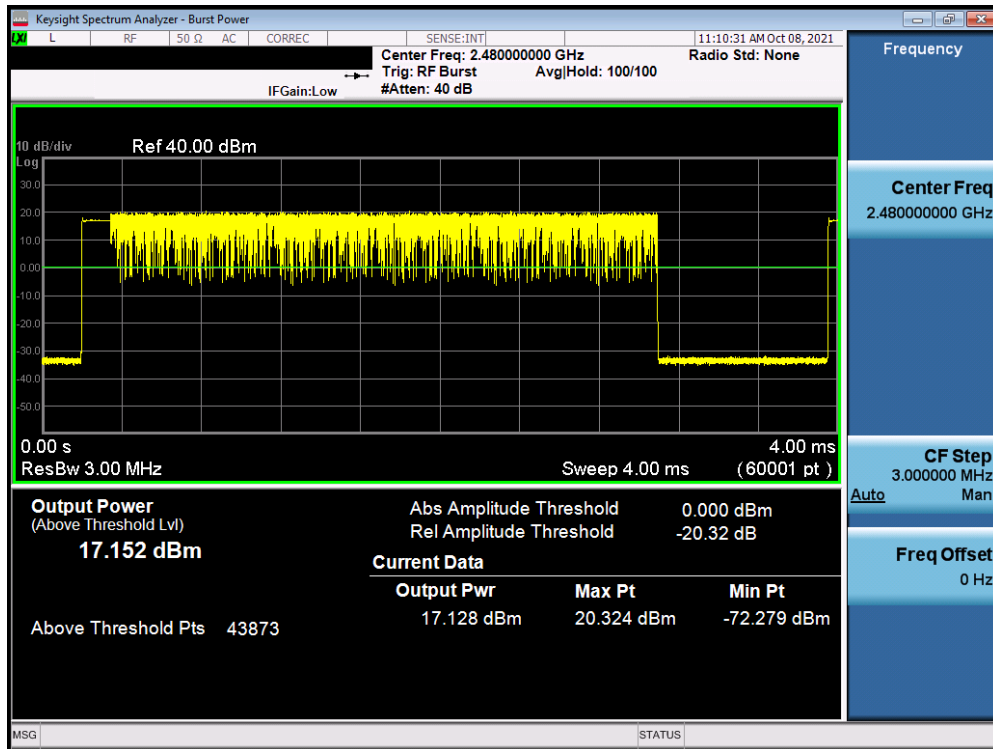


Plot 7-49. Average Conducted Power (3Mbps – Ch. 0) Antenna 1 ePA

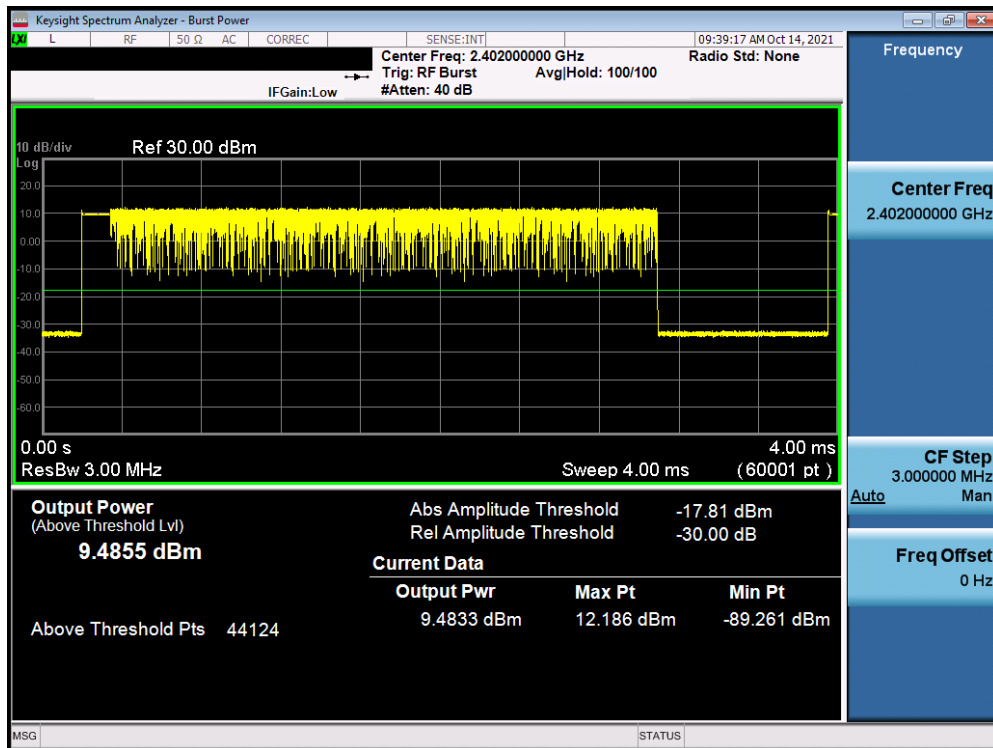


Plot 7-50. Average Conducted Power 32Mbps – Ch. 39) Antenna 1 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 40 of 131                    |

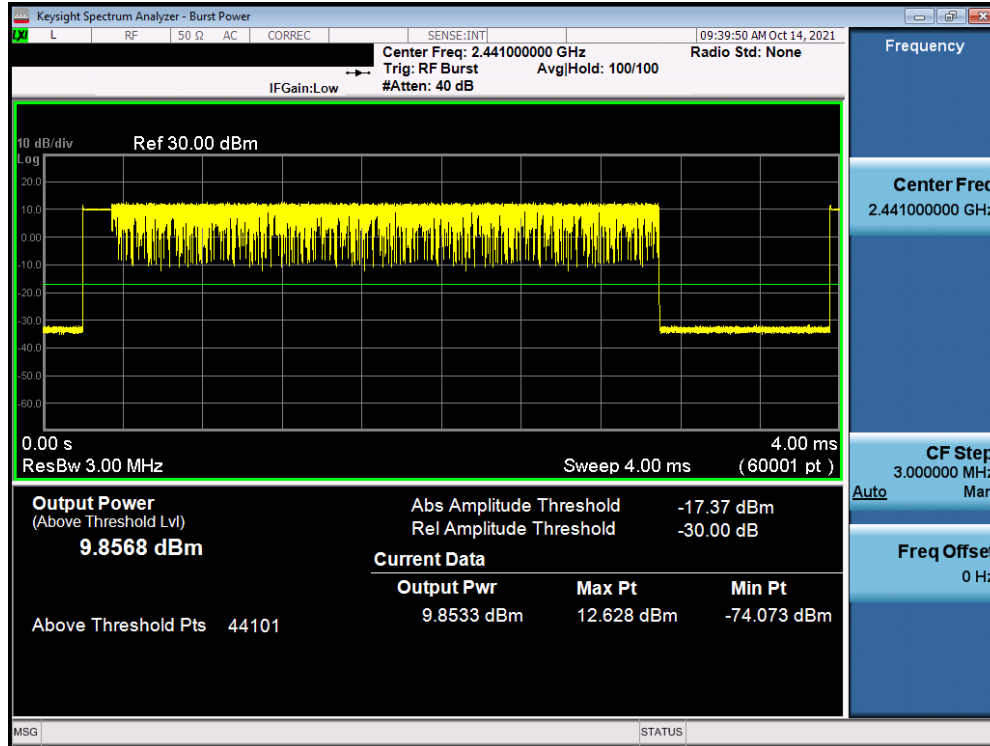


Plot 7-51. Average Conducted Power (3Mbps – Ch. 78) Antenna 1 ePA

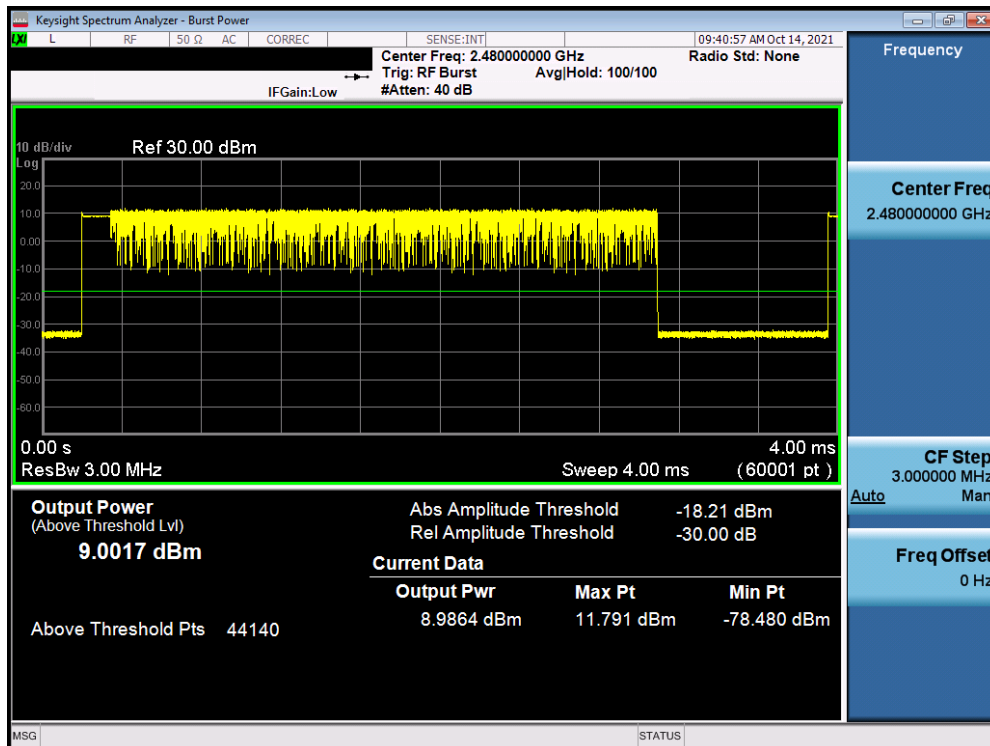


Plot 7-52. Average Conducted Power (3Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 41 of 131                    |



Plot 7-53. Average Conducted Power (3Mbps – Ch. 39) Antenna 1 iPA



Plot 7-54. Average Conducted Power (3Mbps – Ch. 78) Antenna 1 iPA

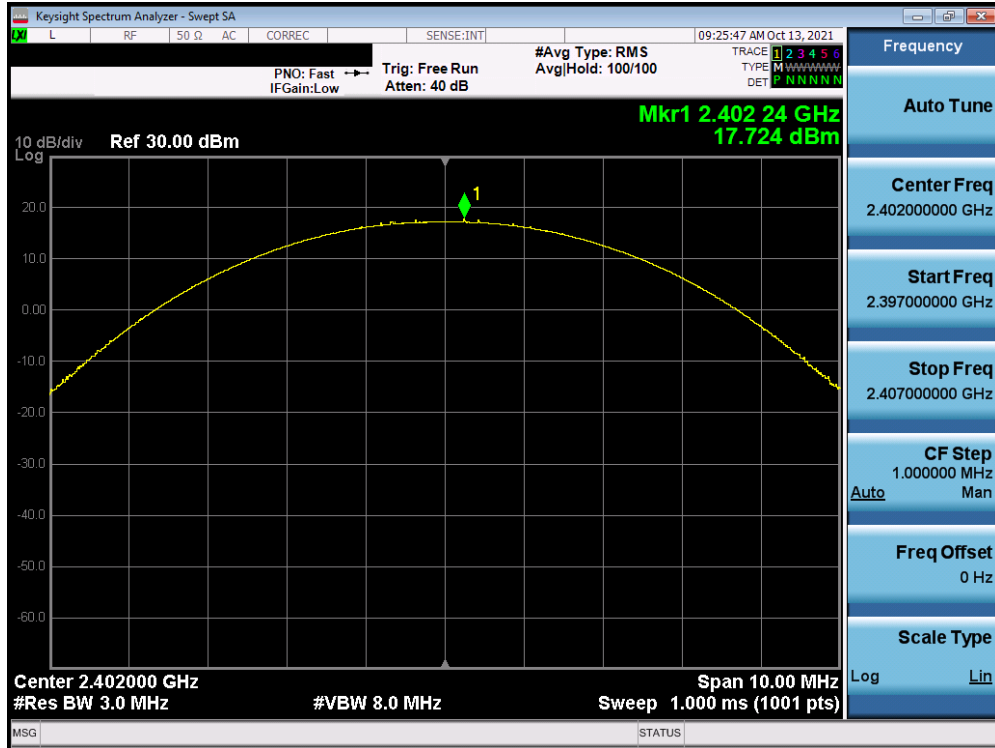
|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 42 of 131                    |

## Antenna 2

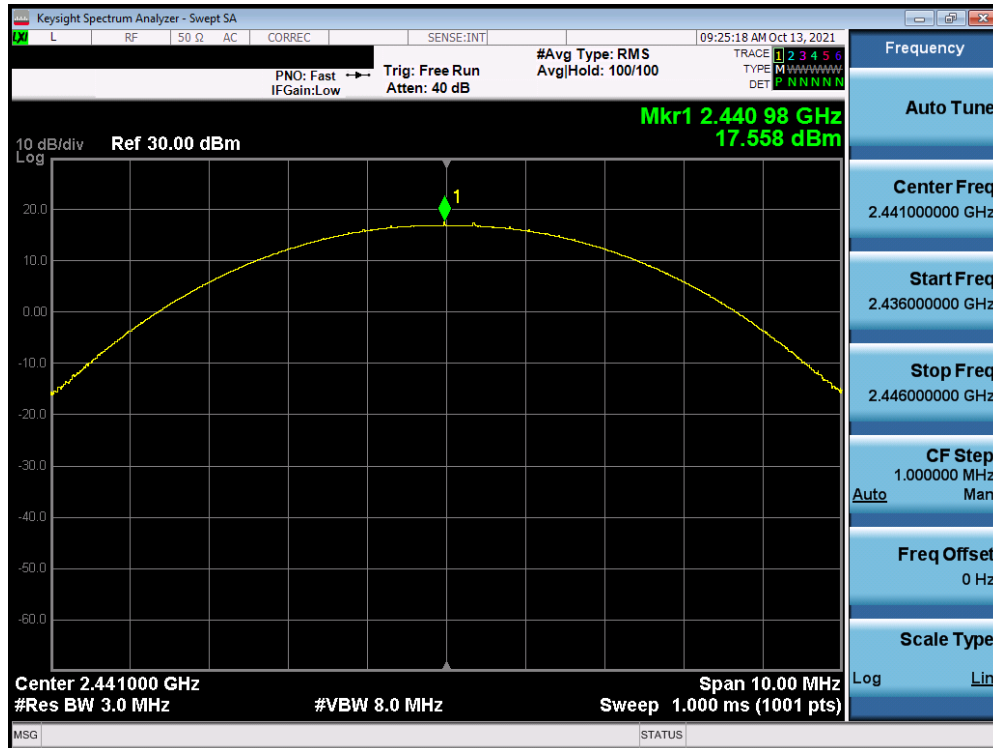
| Frequency [MHz] | Data Rate [Mbps] | Modulation     | Power Scheme | Channel No. | Peak Conducted Power |        | Avg Conducted Power |        |
|-----------------|------------------|----------------|--------------|-------------|----------------------|--------|---------------------|--------|
|                 |                  |                |              |             | [dBm]                | [mW]   | [dBm]               | [mW]   |
| 2402            | 1.0              | GFSK           | ePA          | 0           | 17.72                | 59.211 | 16.57               | 45.373 |
| 2441            | 1.0              | GFSK           | ePA          | 39          | 17.56                | 56.990 | 16.73               | 47.044 |
| 2480            | 1.0              | GFSK           | ePA          | 78          | 17.31                | 53.877 | 16.57               | 45.384 |
| 2402            | 1.0              | GFSK           | iPA          | 0           | 12.35                | 17.171 | 10.67               | 11.660 |
| 2441            | 1.0              | GFSK           | iPA          | 39          | 12.89                | 19.463 | 10.97               | 12.491 |
| 2480            | 1.0              | GFSK           | iPA          | 78          | 12.32                | 17.053 | 10.81               | 12.036 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | ePA          | 0           | 19.44                | 87.943 | 16.71               | 46.925 |
| 2441            | 2.0              | $\pi/4$ -DQPSK | ePA          | 39          | 19.17                | 82.642 | 16.51               | 44.802 |
| 2480            | 2.0              | $\pi/4$ -DQPSK | ePA          | 78          | 18.81                | 75.998 | 16.27               | 42.364 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | iPA          | 0           | 10.97                | 12.514 | 8.33                | 6.800  |
| 2441            | 2.0              | $\pi/4$ -DQPSK | iPA          | 39          | 11.75                | 14.966 | 8.77                | 7.535  |
| 2480            | 2.0              | $\pi/4$ -DQPSK | iPA          | 78          | 10.80                | 12.034 | 8.31                | 6.775  |
| 2402            | 3.0              | 8DPSK          | ePA          | 0           | 19.83                | 96.139 | 16.74               | 47.152 |
| 2441            | 3.0              | 8DPSK          | ePA          | 39          | 19.77                | 94.842 | 16.53               | 45.009 |
| 2480            | 3.0              | 8DPSK          | ePA          | 78          | 19.31                | 85.251 | 16.64               | 46.132 |
| 2402            | 3.0              | 8DPSK          | iPA          | 0           | 11.23                | 13.265 | 8.39                | 6.896  |
| 2441            | 3.0              | 8DPSK          | iPA          | 39          | 11.97                | 15.751 | 8.84                | 7.649  |
| 2480            | 3.0              | 8DPSK          | iPA          | 78          | 11.14                | 13.008 | 8.32                | 6.788  |

**Table 7-5. Conducted Output Power Measurements Antenna 2**

|                                         |                                                                                     |                                       |                                                                                       |                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                 | EUT Type:<br>Portable Handset         | Page 43 of 131                                                                        |                                   |

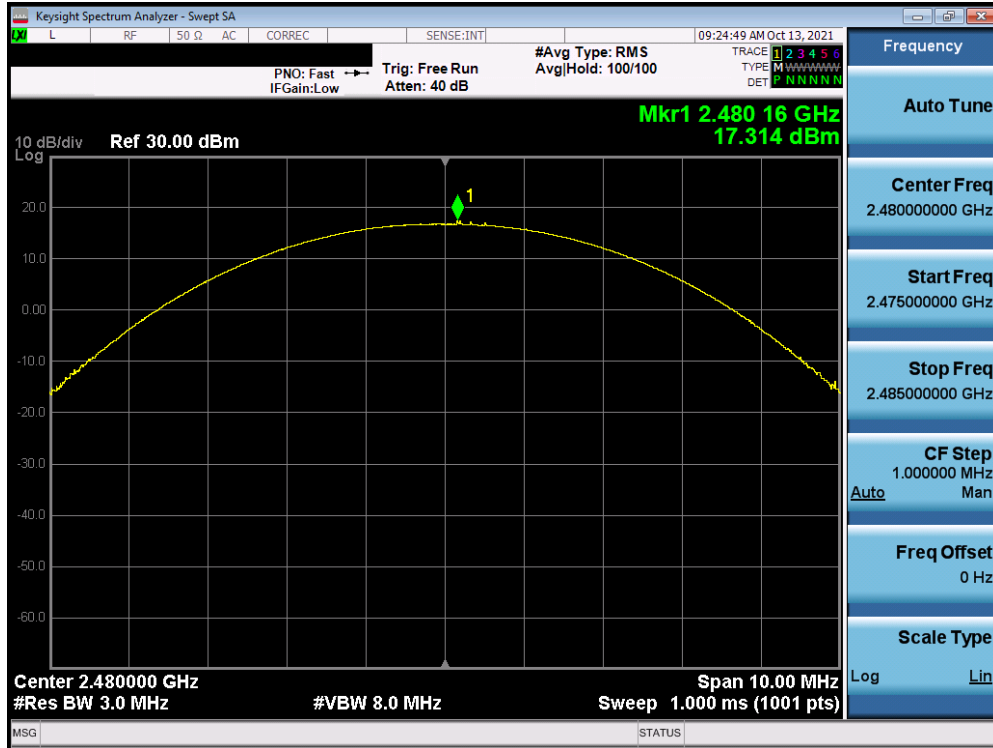


Plot 7-55. Peak Conducted Power (1Mbps – Ch. 0) Antenna 2 ePA

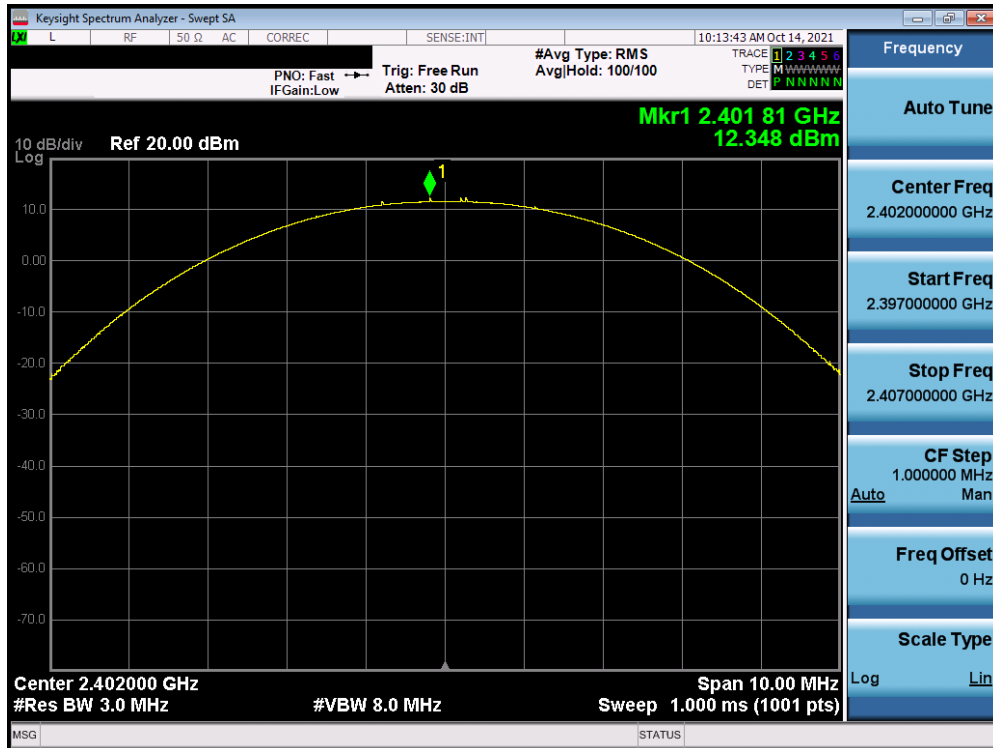


Plot 7-56. Peak Conducted Power (1Mbps – Ch. 39) Antenna 2 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 44 of 131                    |

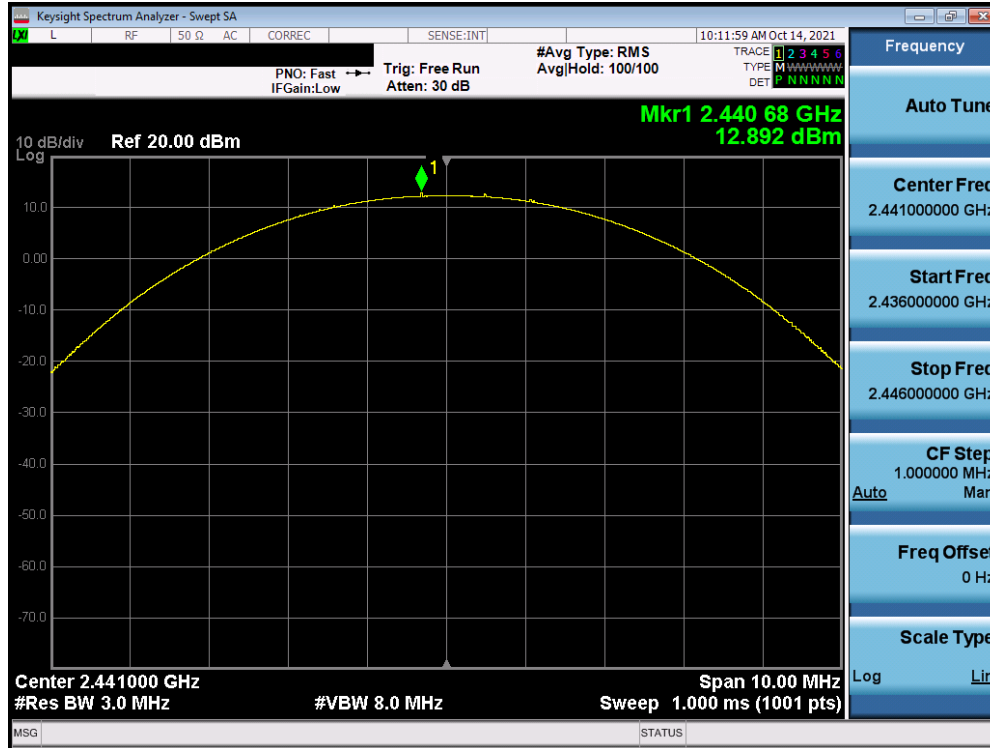


Plot 7-57. Peak Conducted Power (1Mbps – Ch. 78) Antenna 2 ePA

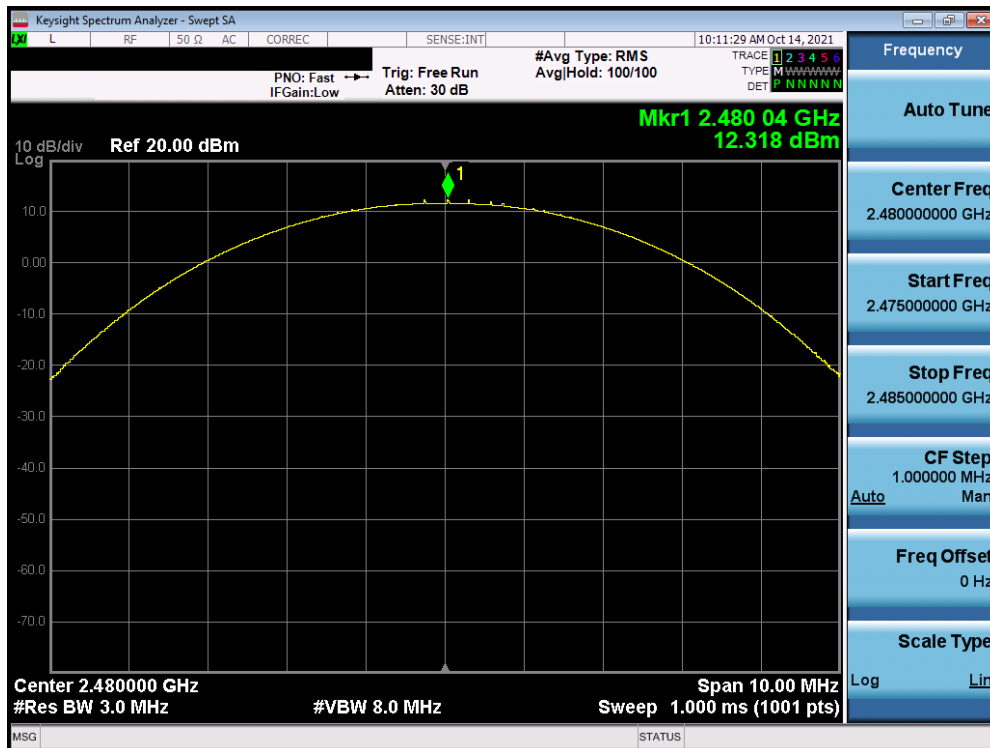


Plot 7-58. Peak Conducted Power (1Mbps – Ch. 0) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 45 of 131                    |

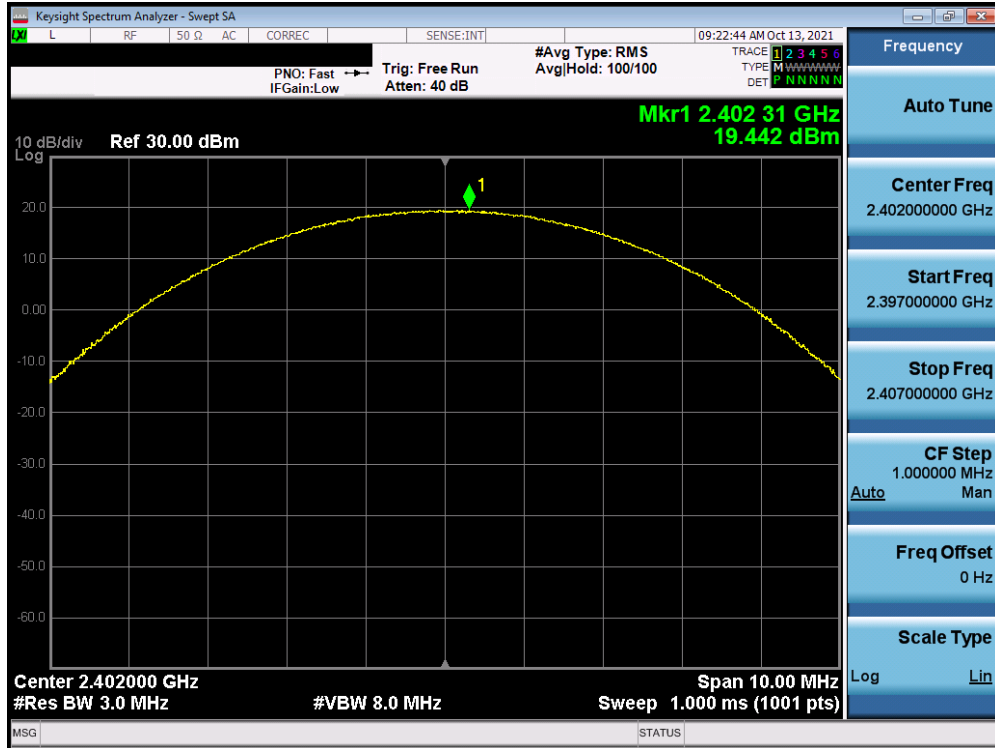


Plot 7-59. Peak Conducted Power (1Mbps – Ch. 39) Antenna 2 iPA

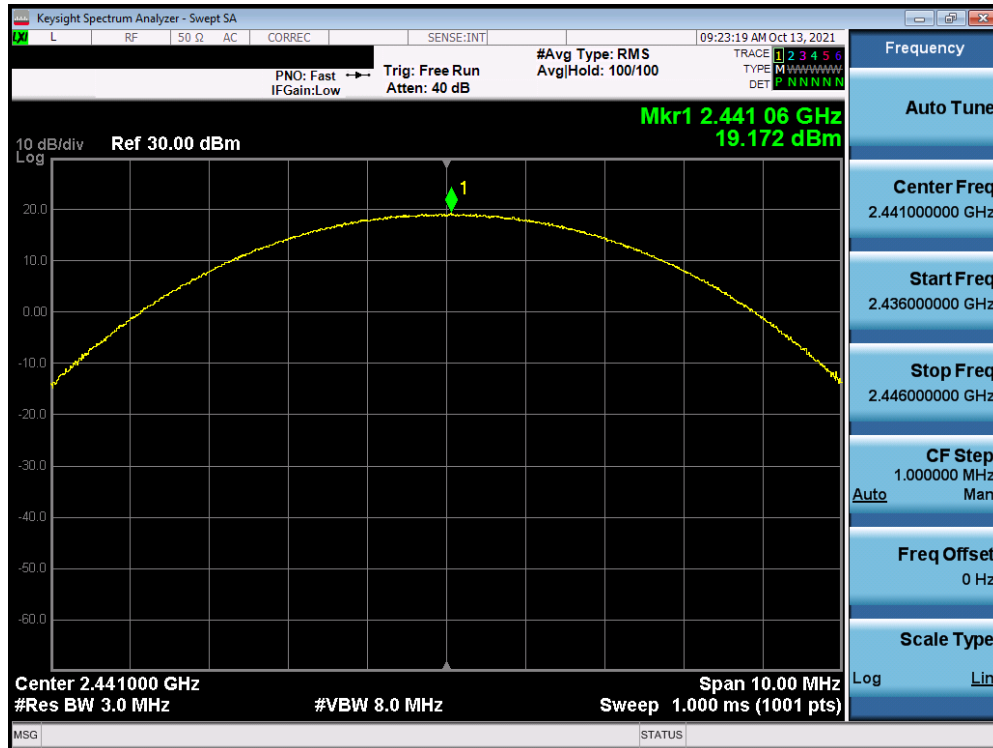


Plot 7-60. Peak Conducted Power (1Mbps – Ch. 78) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 46 of 131                    |

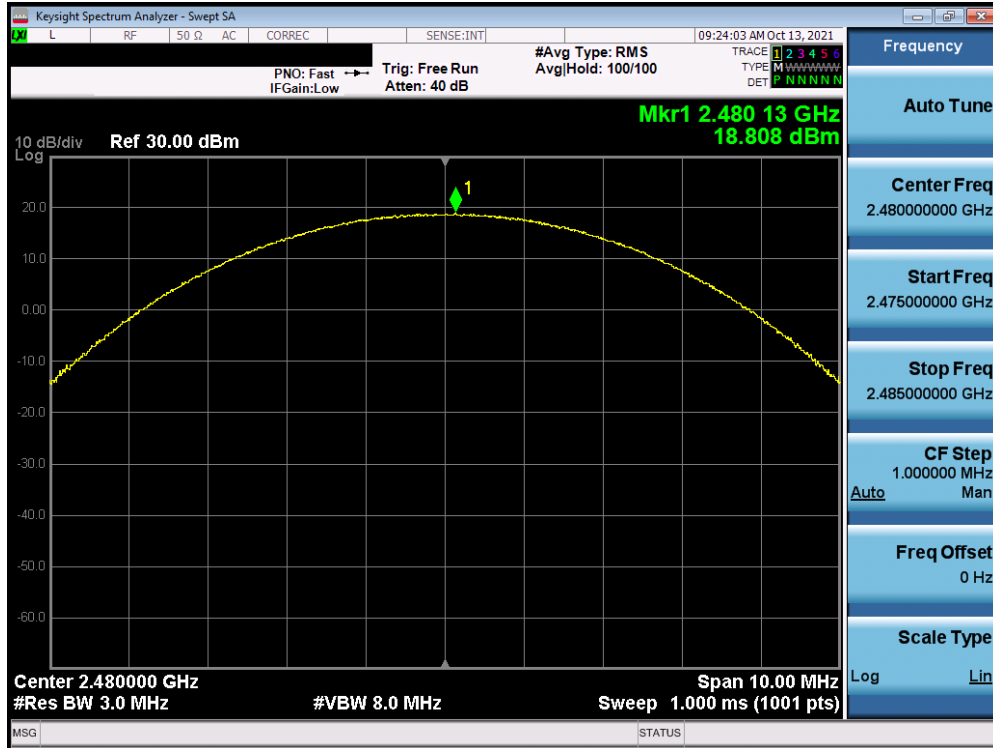


Plot 7-61. Peak Conducted Power (2Mbps – Ch. 0) Antenna 2 ePA

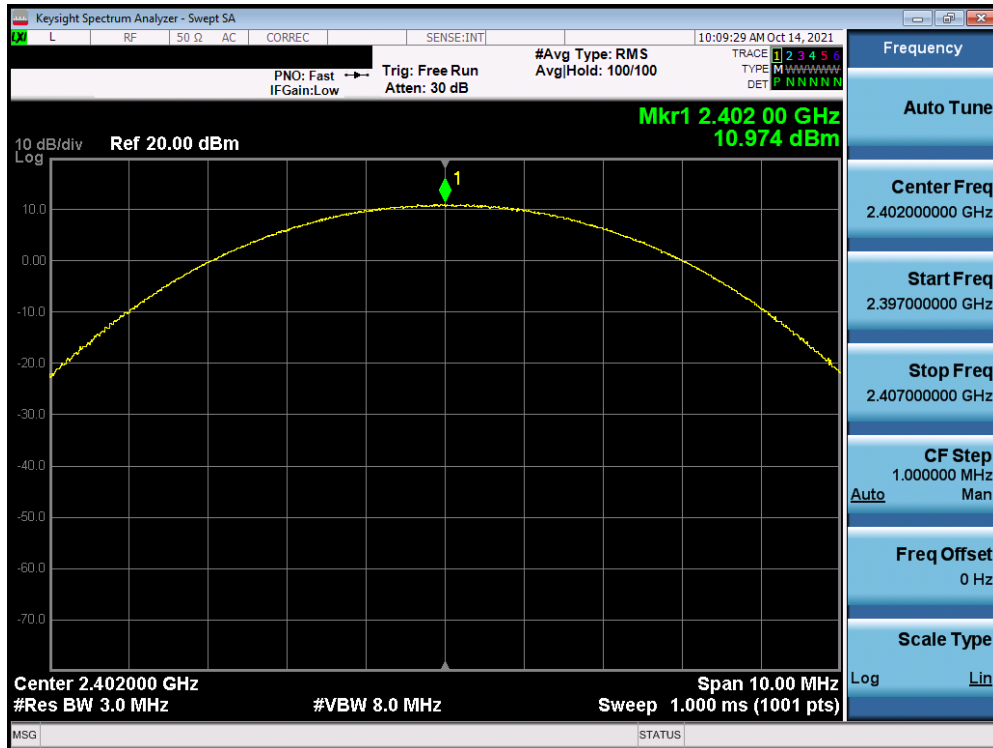


Plot 7-62. Peak Conducted Power (2Mbps – Ch. 39) Antenna 2 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 47 of 131                    |

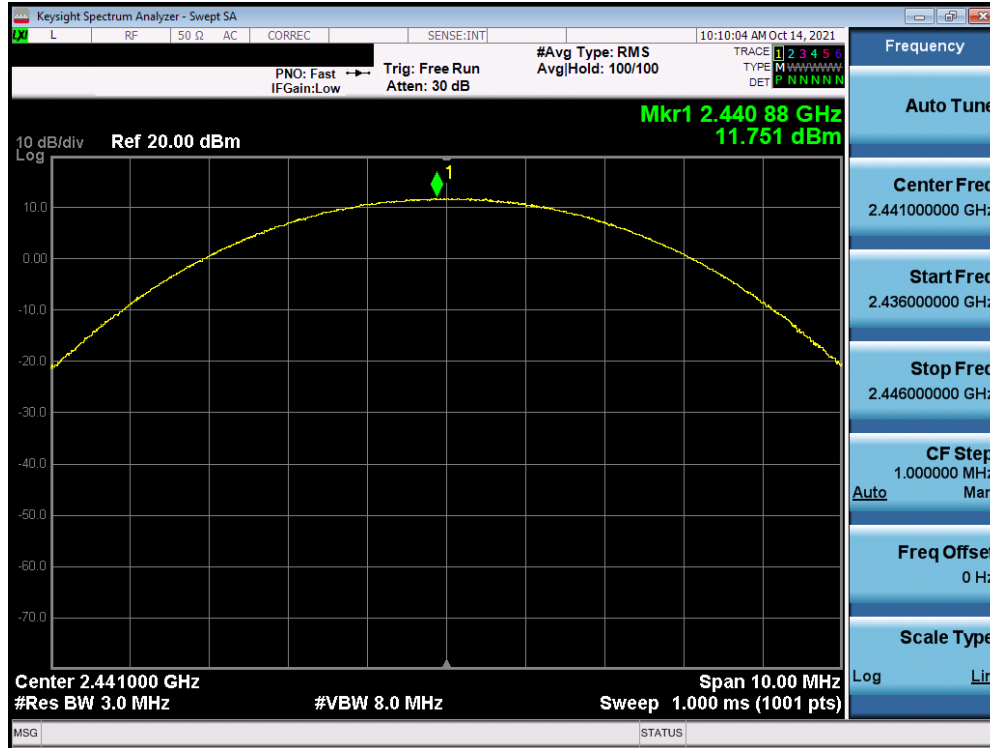


Plot 7-63. Peak Conducted Power (2Mbps – Ch. 78) Antenna 2 ePA

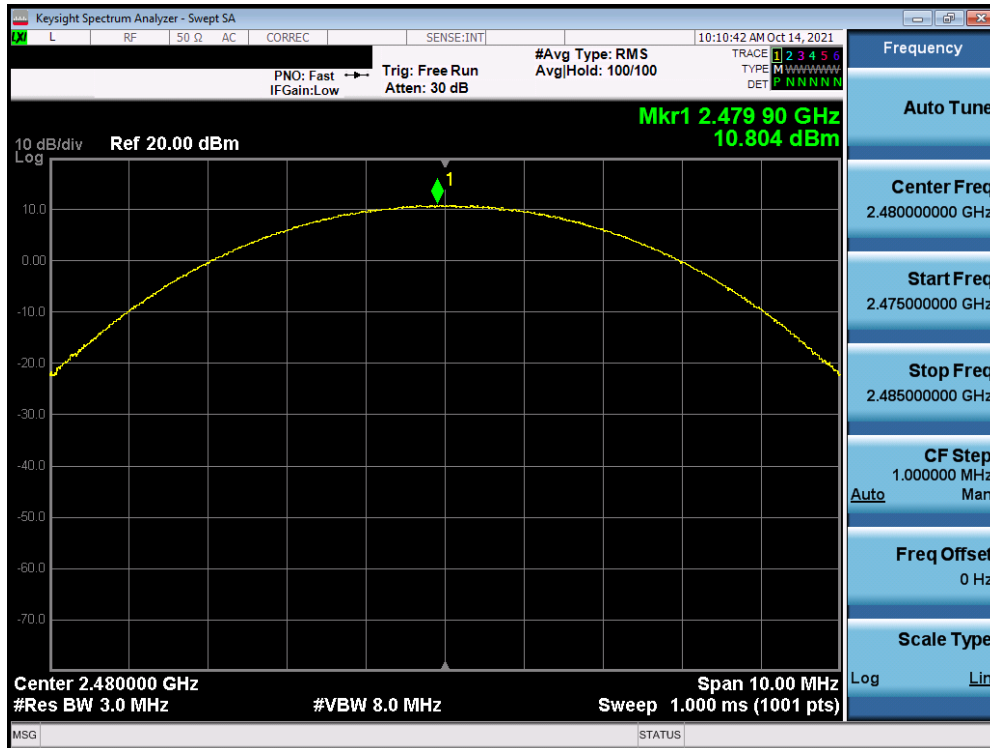


Plot 7-64. Peak Conducted Power (2Mbps – Ch. 0) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 48 of 131                    |

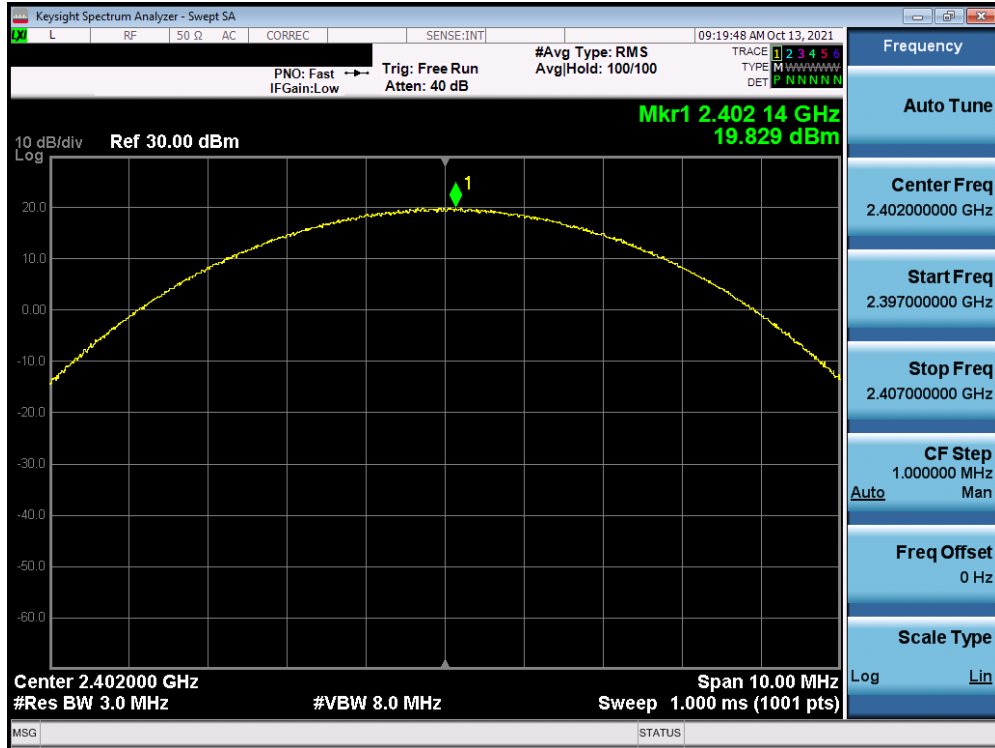


Plot 7-65. Peak Conducted Power (2Mbps – Ch. 39) Antenna 2 iPA

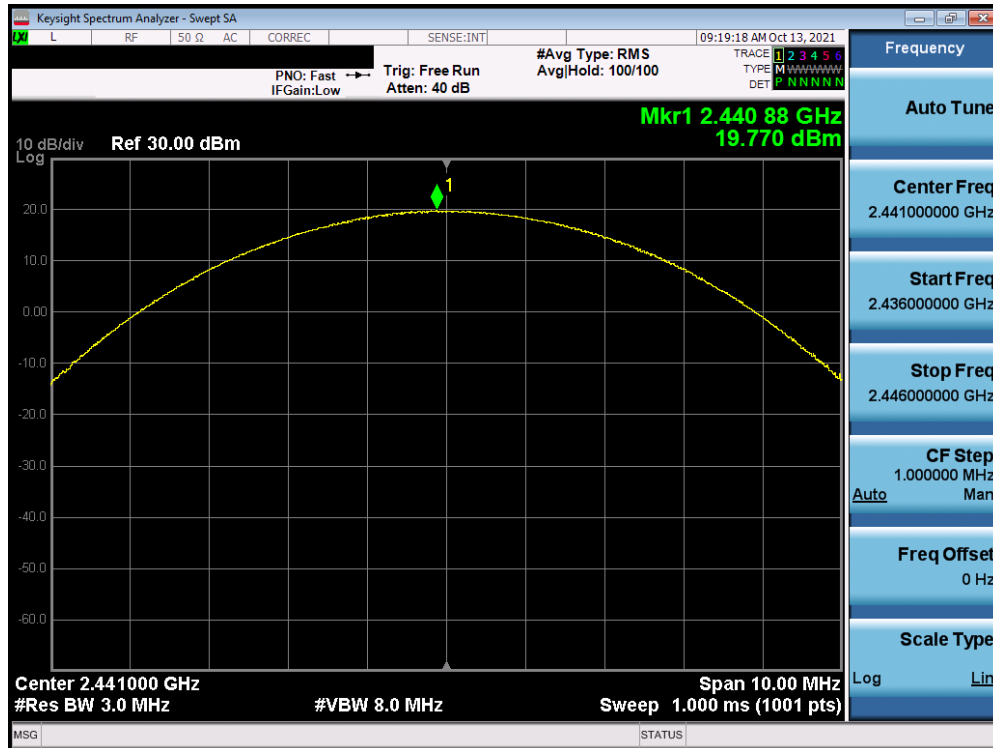


Plot 7-66. Peak Conducted Power (2Mbps – Ch. 78) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 49 of 131                    |

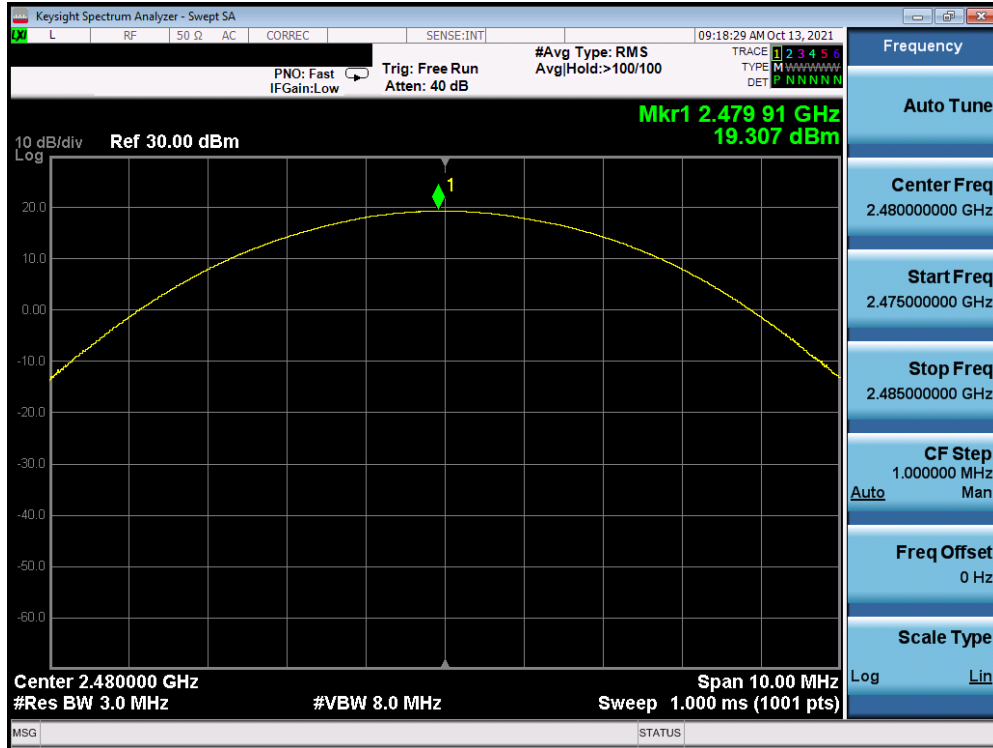


Plot 7-67. Peak Conducted Power (3Mbps – Ch. 0) Antenna 2 ePA

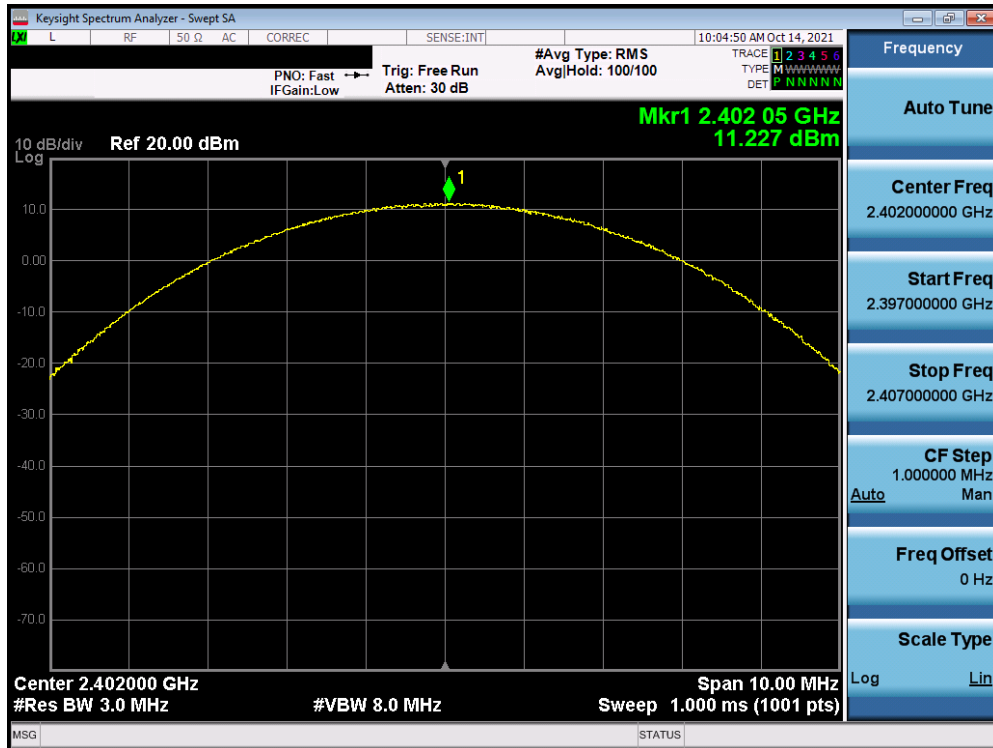


Plot 7-68. Peak Conducted Power 32Mbps – Ch. 39) Antenna 2 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 50 of 131                    |

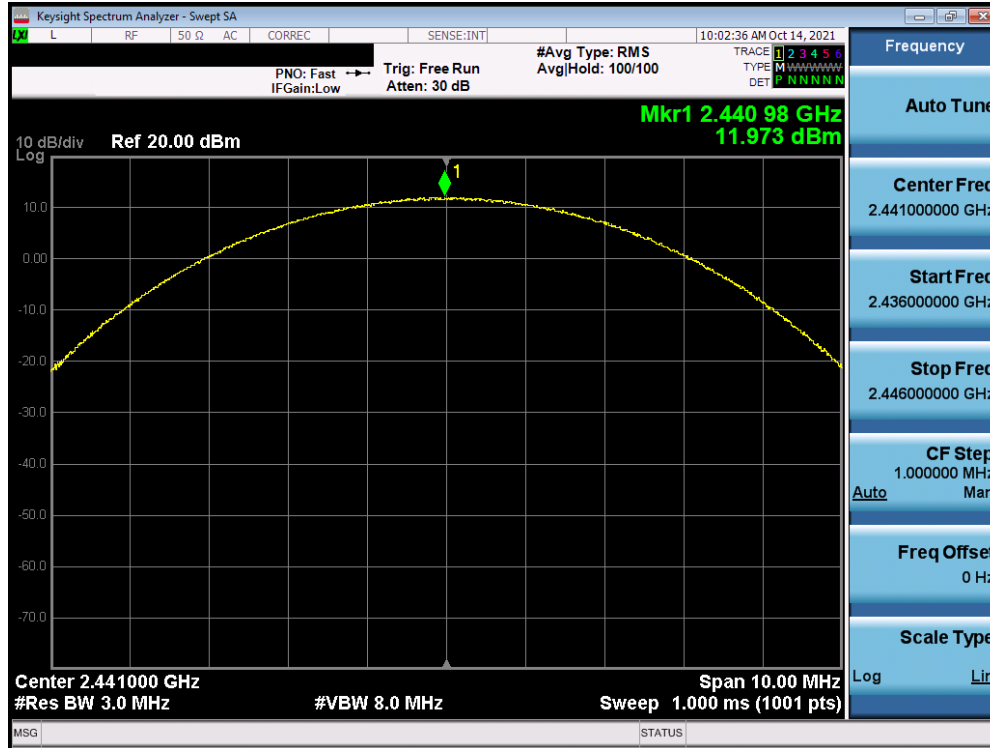


Plot 7-69. Peak Conducted Power (3Mbps – Ch. 78) Antenna 2 ePA

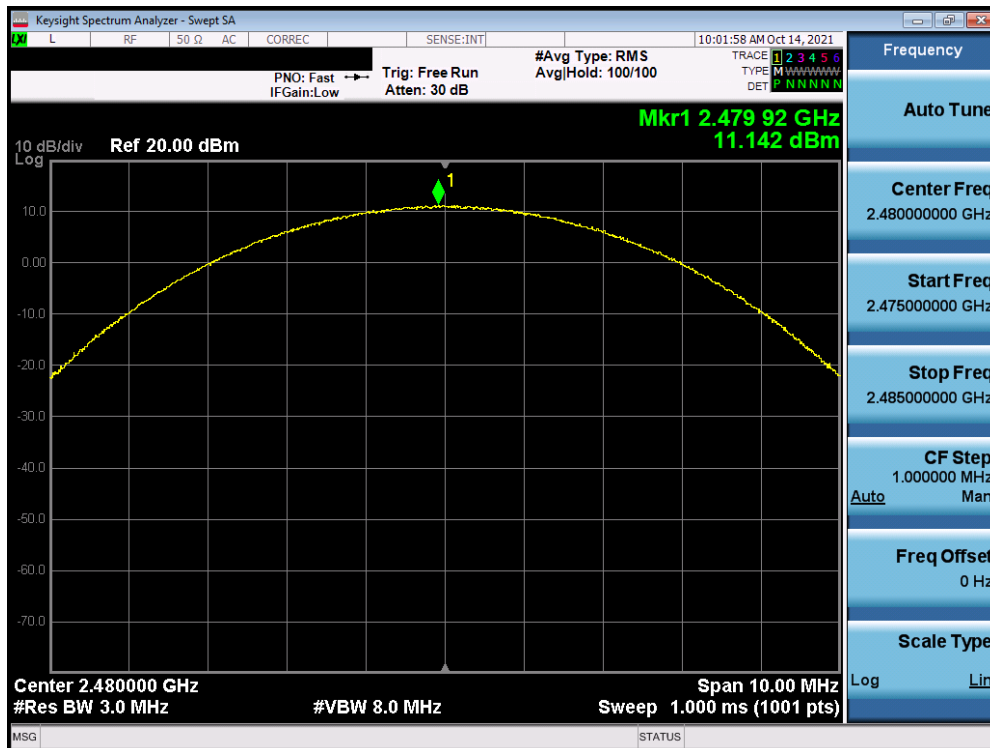


Plot 7-70. Peak Conducted Power (3Mbps – Ch. 0) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 51 of 131                    |

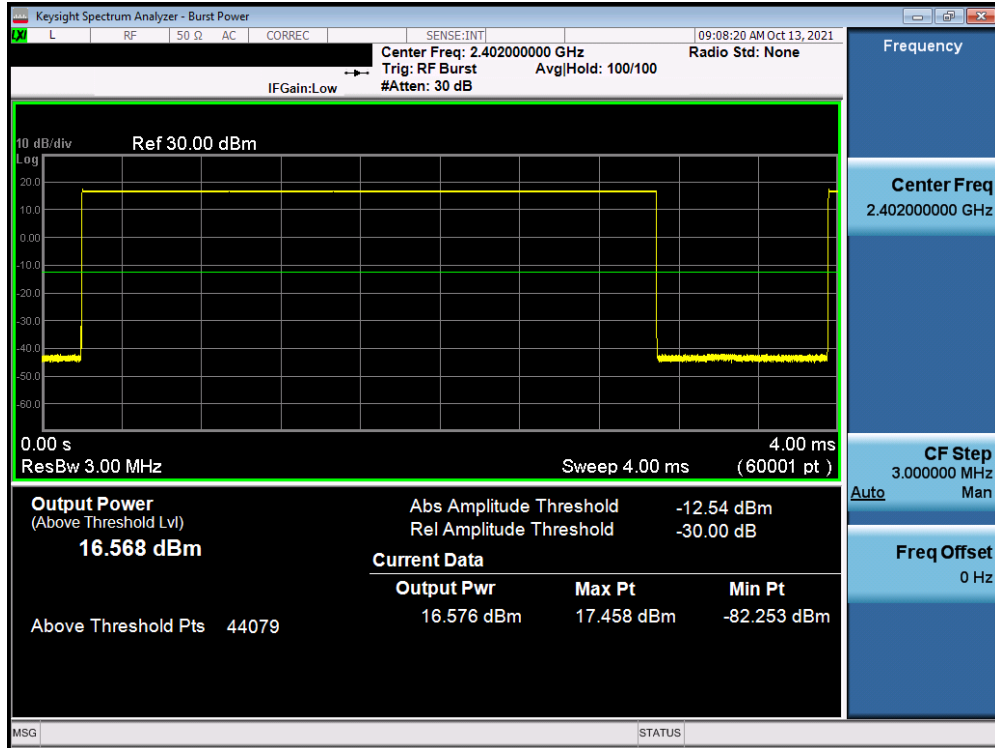


Plot 7-71. Peak Conducted Power (3Mbps – Ch. 39) Antenna 2 iPA

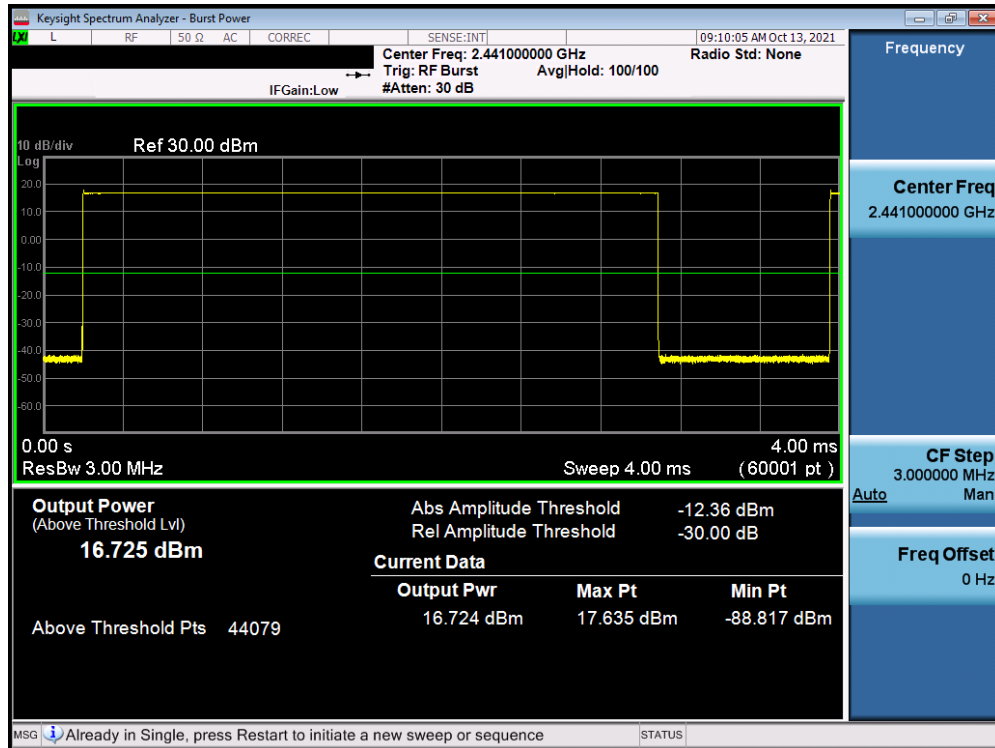


Plot 7-72. Peak Conducted Power (3Mbps – Ch. 78) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 52 of 131                    |

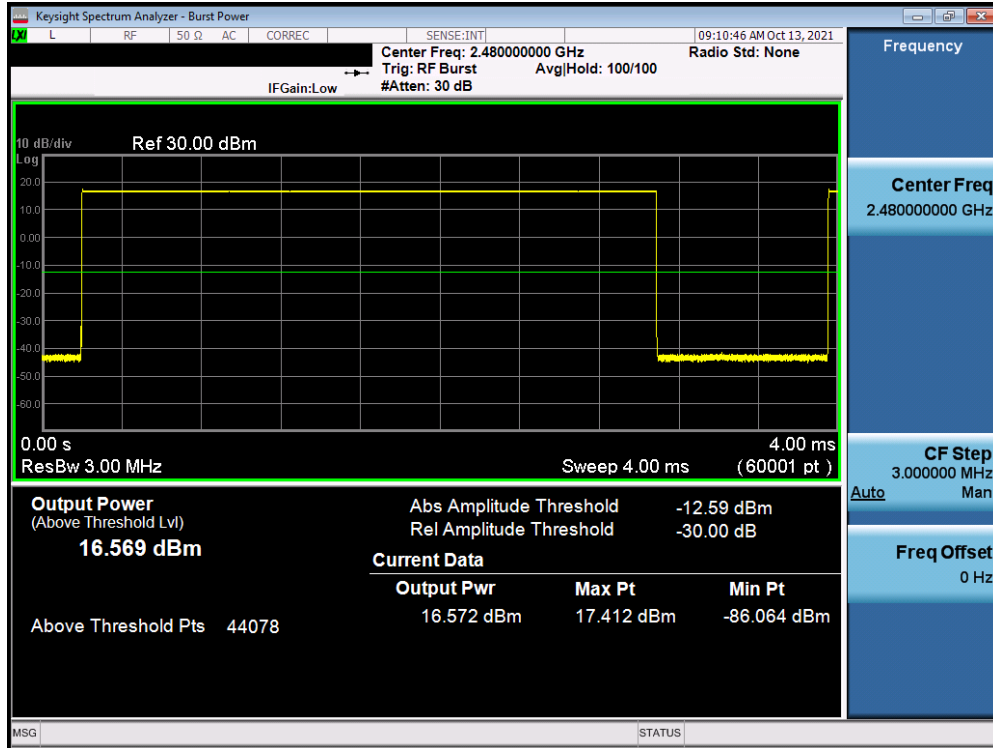


Plot 7-73. Average Conducted Power (1Mbps – Ch. 0) Antenna 2 ePA

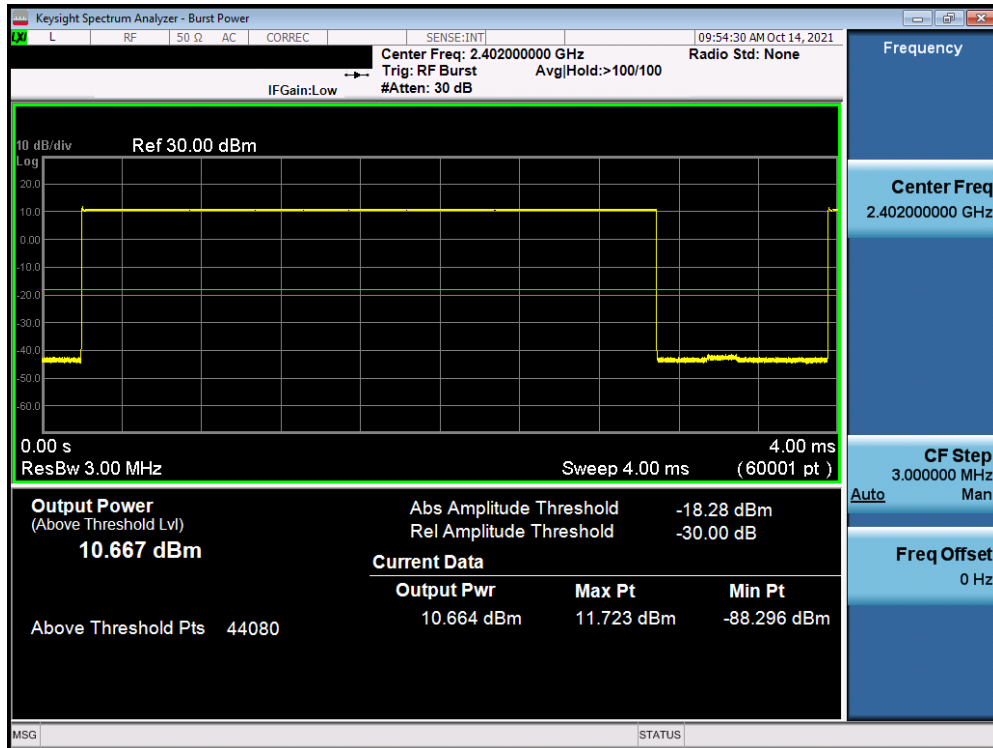


Plot 7-74. Average Conducted Power (1Mbps – Ch. 39) Antenna 2 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 53 of 131                    |

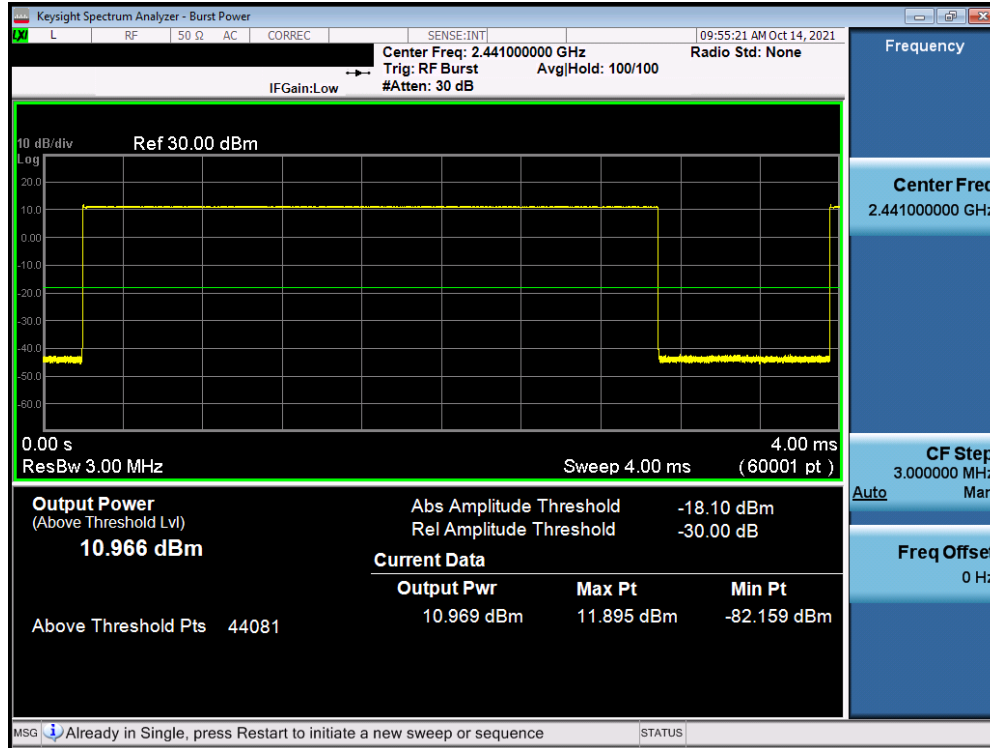


Plot 7-75. Average Conducted Power (1Mbps – Ch. 78) Antenna 2 ePA

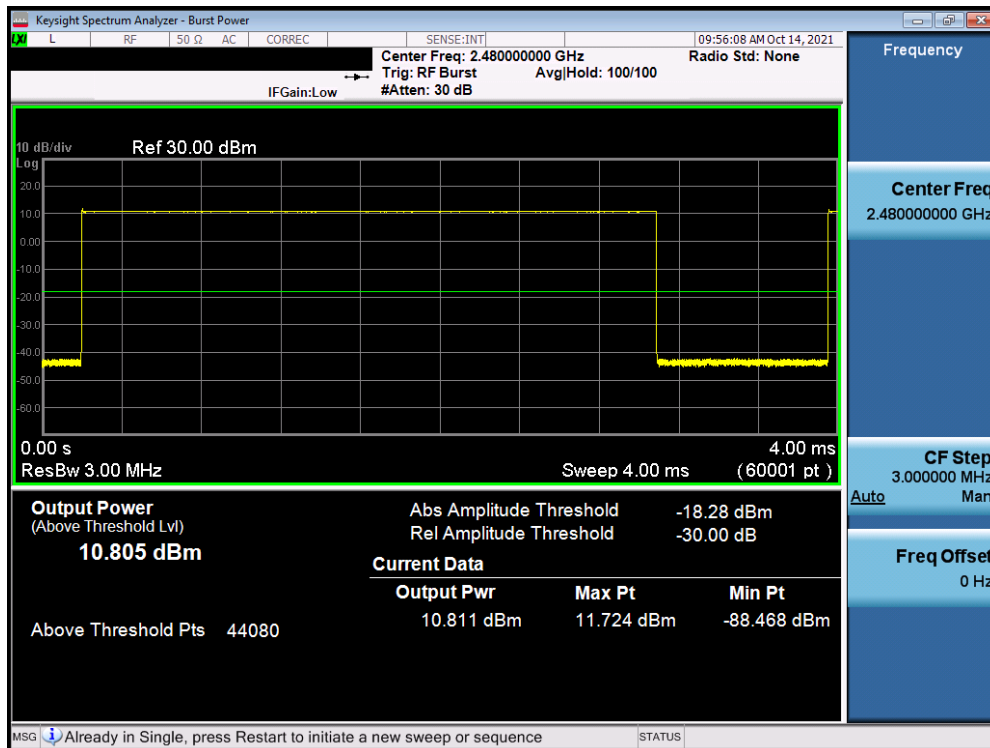


Plot 7-76. Average Conducted Power (1Mbps – Ch. 0) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 54 of 131                    |

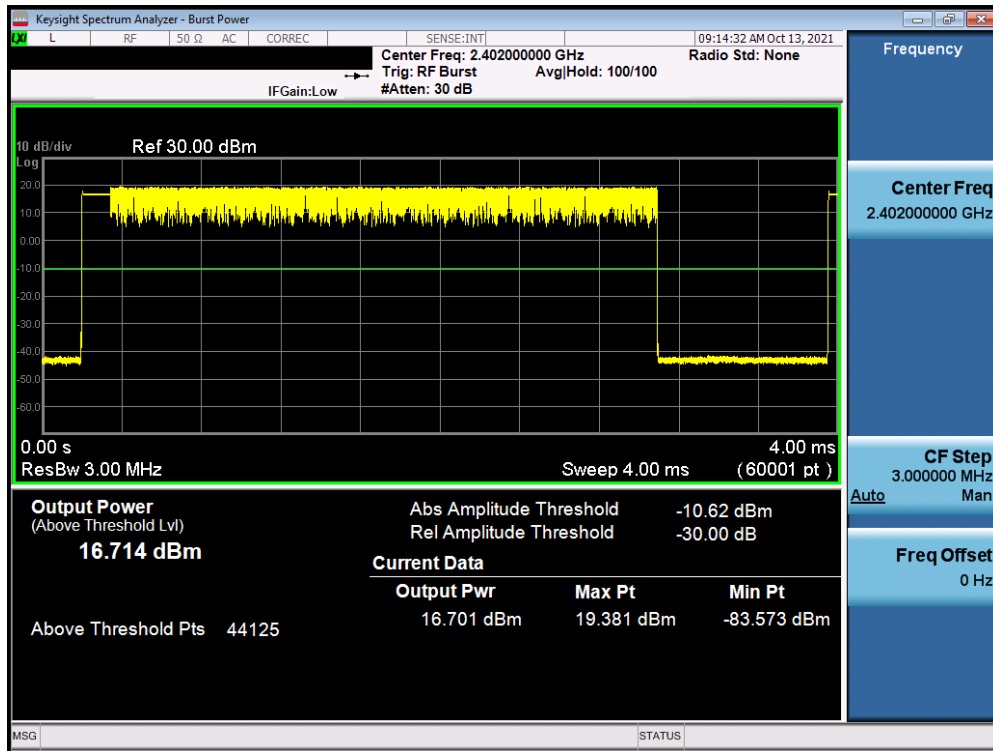


Plot 7-77. Average Conducted Power (1Mbps – Ch. 39) Antenna 2 iPA

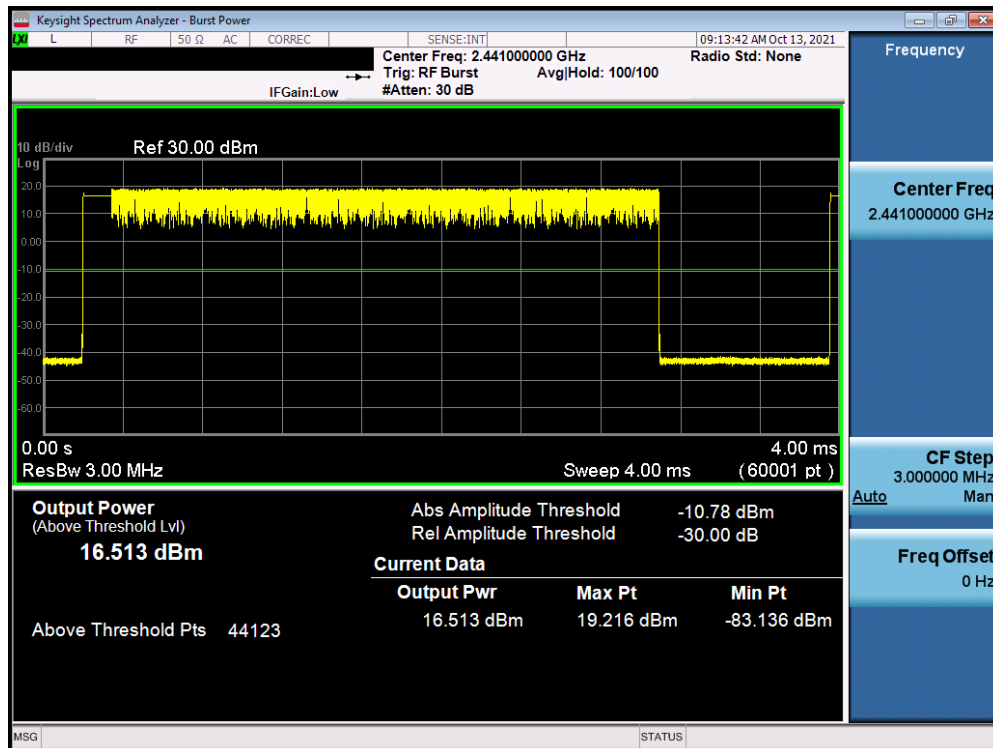


Plot 7-78. Average Conducted Power (1Mbps – Ch. 78) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 55 of 131                    |

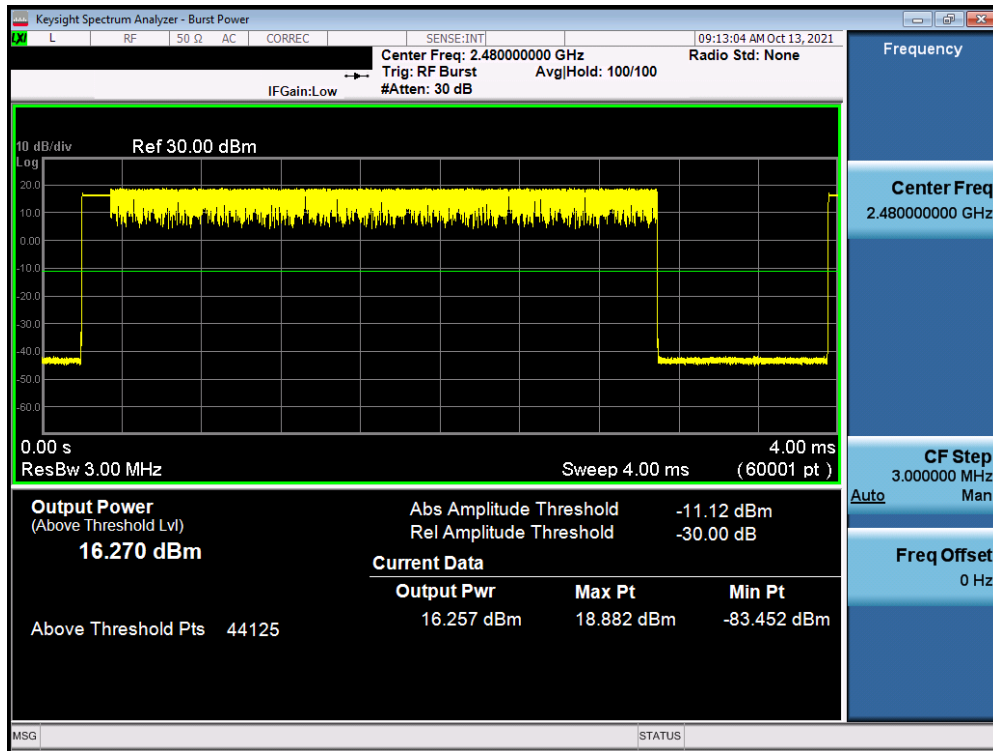


Plot 7-79. Average Conducted Power (2Mbps – Ch. 0) Antenna 2 ePA

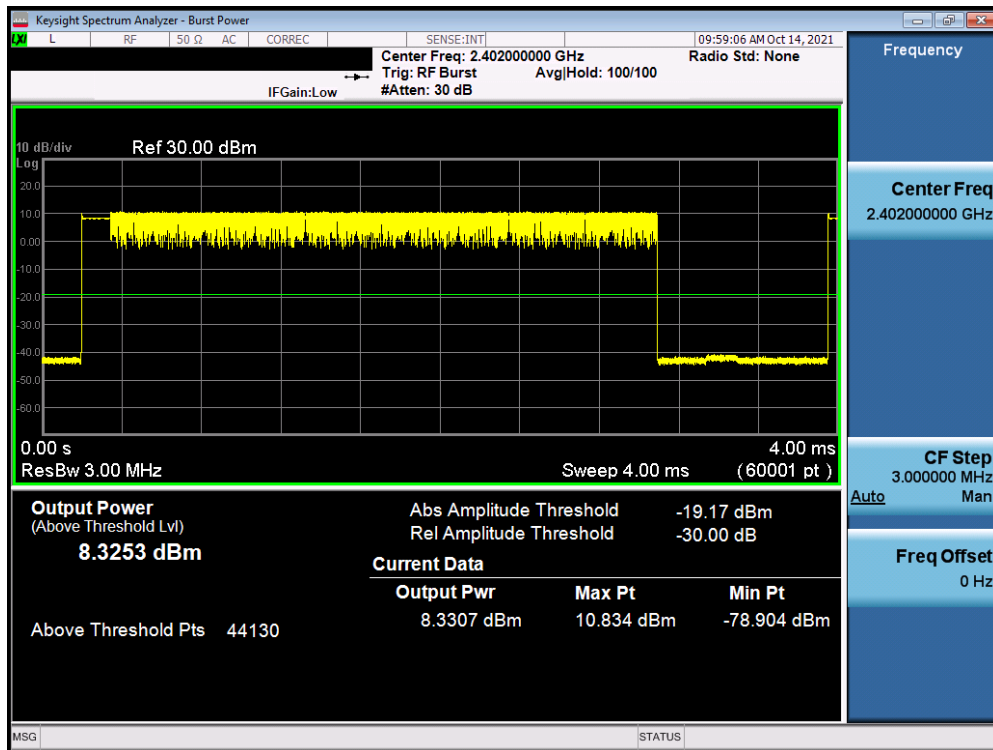


Plot 7-80. Average Conducted Power (2Mbps – Ch. 39) Antenna 2 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 56 of 131                    |

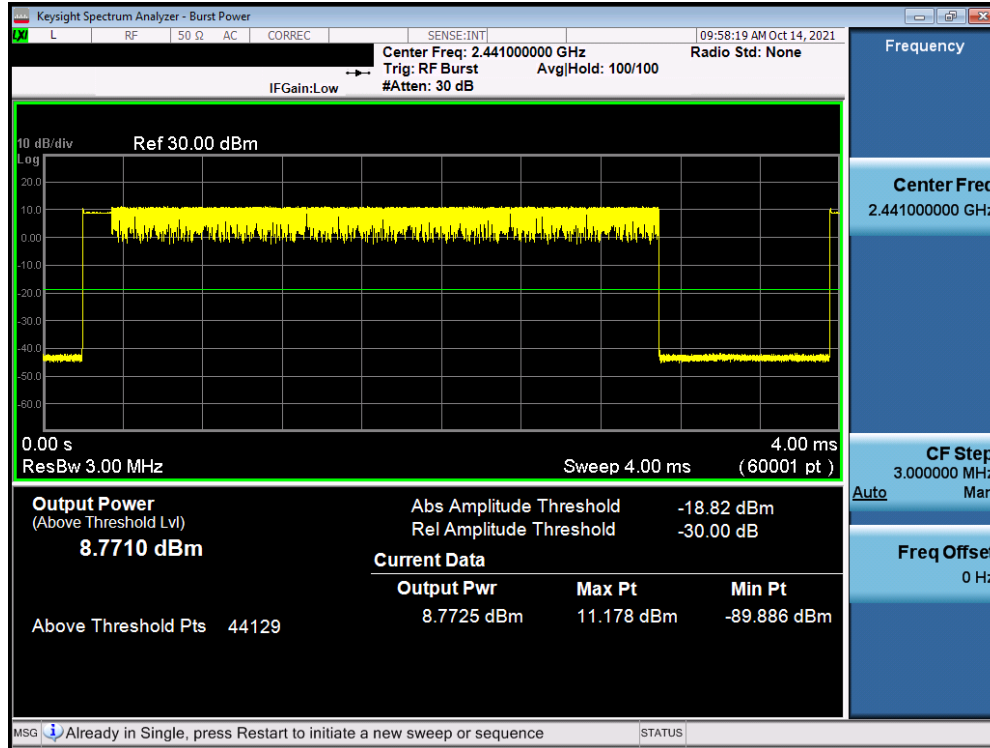


Plot 7-81. Average Conducted Power (2Mbps – Ch. 78) Antenna 2 ePA

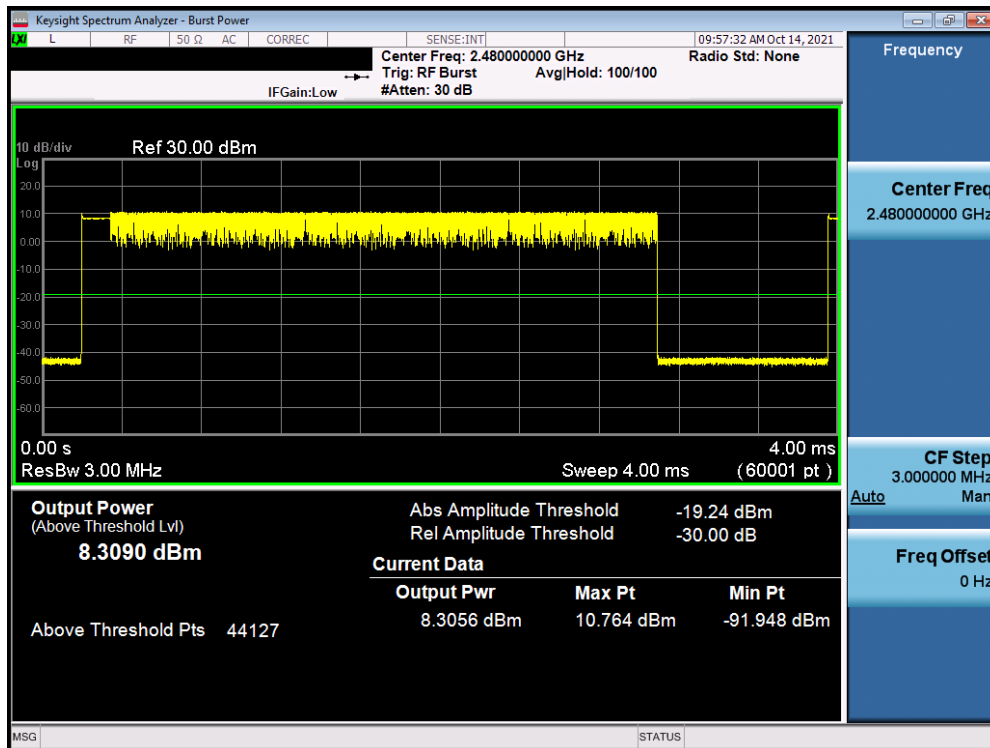


Plot 7-82. Average Conducted Power (2Mbps – Ch. 0) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 57 of 131                    |

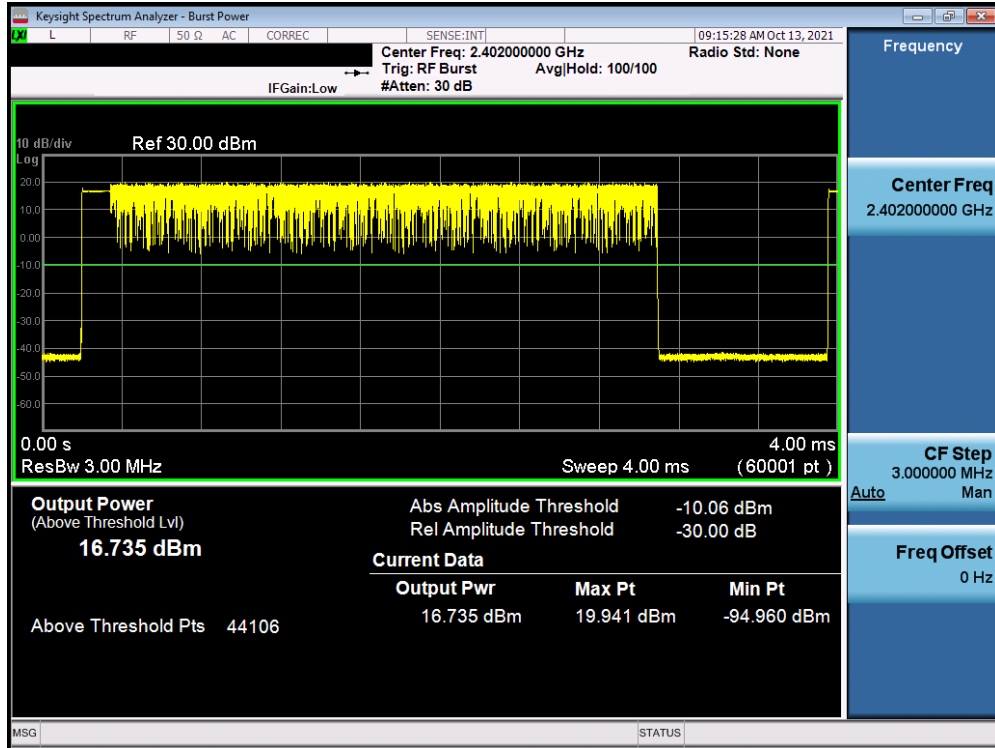


Plot 7-83. Average Conducted Power (2Mbps – Ch. 39) Antenna 2 iPA

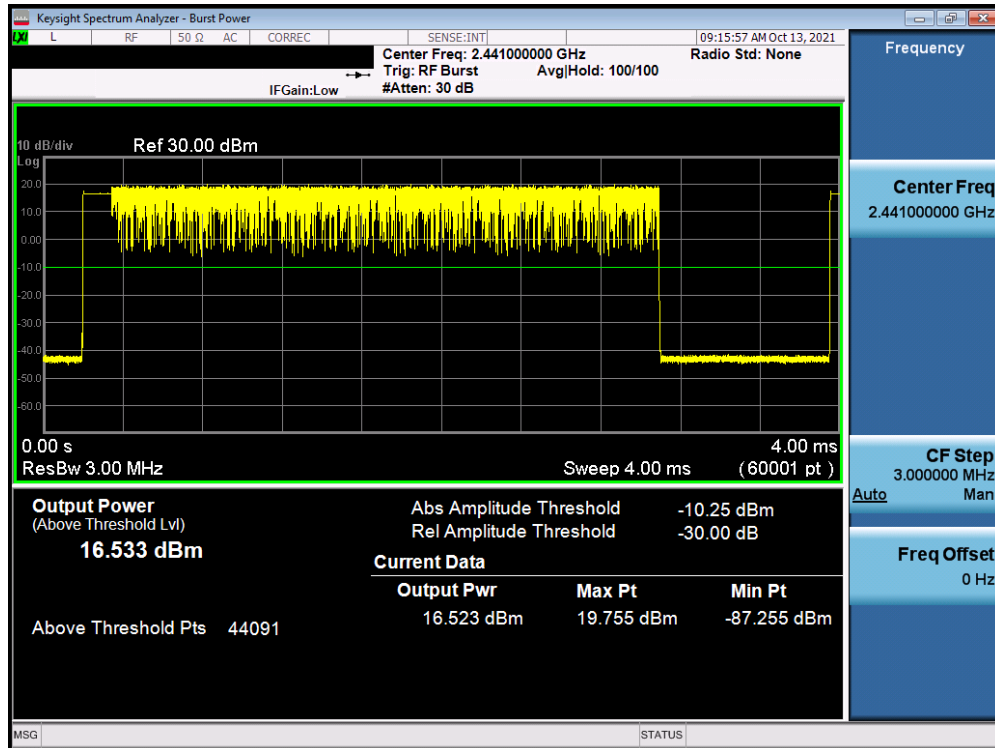


Plot 7-84. Average Conducted Power (2Mbps – Ch. 78) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 58 of 131                    |

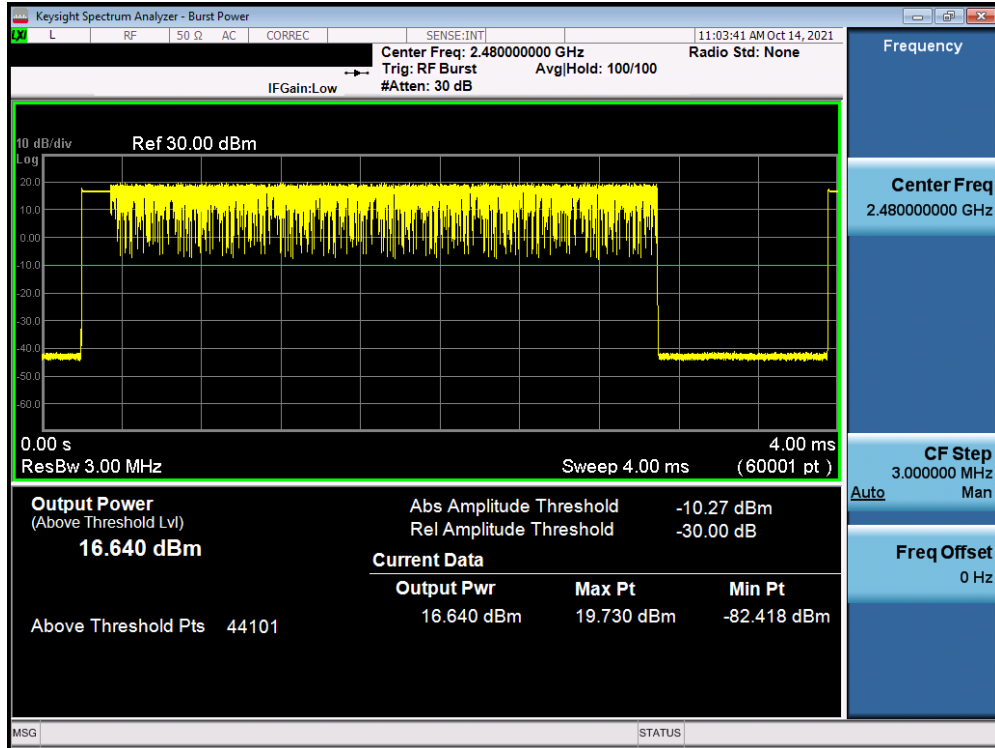


Plot 7-85. Average Conducted Power (3Mbps – Ch. 0) Antenna 2ePA

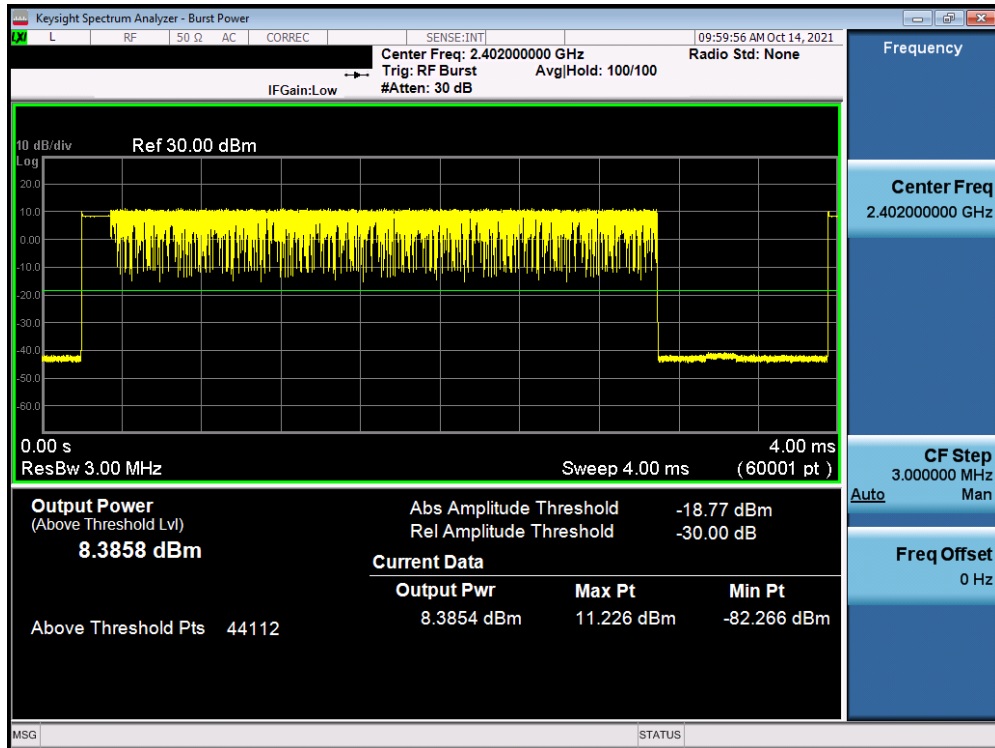


Plot 7-86. Average Conducted Power 32Mbps – Ch. 39) Antenna 2 ePA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 59 of 131                    |

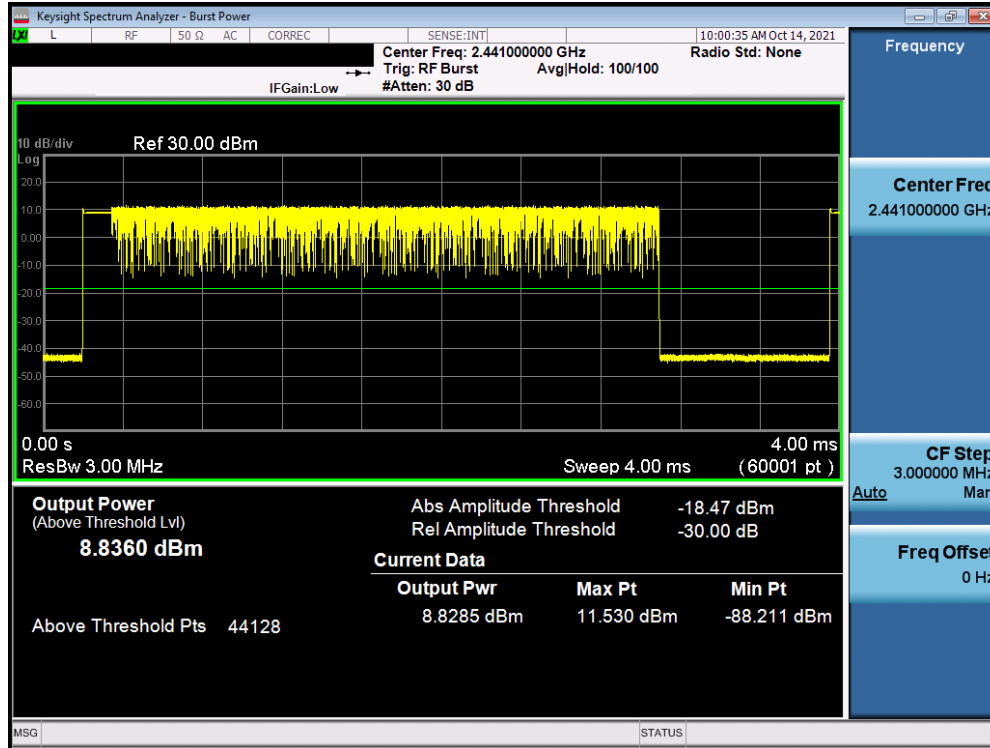


Plot 7-87. Average Conducted Power (3Mbps – Ch. 78) Antenna 2 ePA

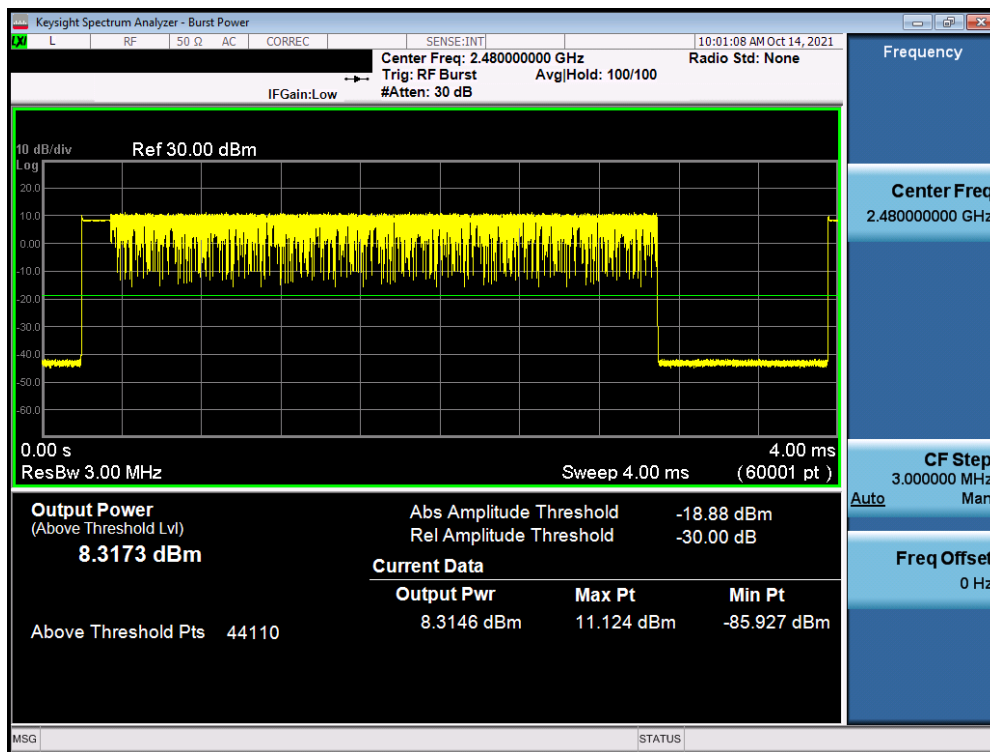


Plot 7-88. Average Conducted Power (3Mbps – Ch. 0) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 60 of 131                    |



Plot 7-89. Average Conducted Power (3Mbps – Ch. 39) Antenna 2 iPA



Plot 7-90. Average Conducted Power (3Mbps – Ch. 78) Antenna 2 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 61 of 131                    |

## Dual Antenna

| Frequency [MHz] | Data Rate [Mbps] | Modulation     | Power Scheme | Channel No. | Peak Conducted Power ANT 1 |        | Peak Conducted Power ANT 2 |        | Peak Conducted Power Dual |        |
|-----------------|------------------|----------------|--------------|-------------|----------------------------|--------|----------------------------|--------|---------------------------|--------|
|                 |                  |                |              |             | [dBm]                      | [mW]   | [dBm]                      | [mW]   | [dBm]                     | [mW]   |
| 2402            | 1.0              | GFSK           | iPA          | 0           | 13.07                      | 20.272 | 10.65                      | 11.614 | 15.04                     | 31.915 |
| 2441            | 1.0              | GFSK           | iPA          | 39          | 13.28                      | 21.267 | 11.47                      | 14.028 | 15.48                     | 35.318 |
| 2480            | 1.0              | GFSK           | iPA          | 78          | 12.32                      | 17.065 | 10.48                      | 11.179 | 14.51                     | 28.249 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | iPA          | 0           | 12.46                      | 17.620 | 9.80                       | 9.552  | 14.34                     | 27.164 |
| 2441            | 2.0              | $\pi/4$ -DQPSK | iPA          | 39          | 12.87                      | 19.382 | 10.61                      | 11.497 | 14.90                     | 30.903 |
| 2480            | 2.0              | $\pi/4$ -DQPSK | iPA          | 78          | 11.75                      | 14.966 | 9.56                       | 9.026  | 13.80                     | 23.988 |
| 2402            | 3.0              | 8DPSK          | iPA          | 0           | 12.79                      | 19.002 | 9.98                       | 9.963  | 14.62                     | 28.973 |
| 2441            | 3.0              | 8DPSK          | iPA          | 39          | 13.09                      | 20.347 | 10.87                      | 12.226 | 15.13                     | 32.584 |
| 2480            | 3.0              | 8DPSK          | iPA          | 78          | 12.13                      | 16.315 | 9.94                       | 9.870  | 14.18                     | 26.182 |

**Table 7-6. Dual Bluetooth Conducted Output Power – Peak Measurements**

| Frequency [MHz] | Data Rate [Mbps] | Modulation     | Power Scheme | Channel No. | Avg Conducted Power ANT 1 |        | Avg Conducted Power ANT 2 |        | Avg Conducted Power Dual |        |
|-----------------|------------------|----------------|--------------|-------------|---------------------------|--------|---------------------------|--------|--------------------------|--------|
|                 |                  |                |              |             | [dBm]                     | [mW]   | [dBm]                     | [mW]   | [dBm]                    | [mW]   |
| 2402            | 1.0              | GFSK           | iPA          | 0           | 12.33                     | 17.096 | 9.96                      | 9.920  | 14.32                    | 27.040 |
| 2441            | 1.0              | GFSK           | iPA          | 39          | 12.44                     | 17.535 | 10.08                     | 10.186 | 14.43                    | 27.733 |
| 2480            | 1.0              | GFSK           | iPA          | 78          | 12.10                     | 16.214 | 9.65                      | 9.224  | 14.05                    | 25.410 |
| 2402            | 2.0              | $\pi/4$ -DQPSK | iPA          | 0           | 10.24                     | 10.575 | 8.09                      | 6.435  | 12.31                    | 17.022 |
| 2441            | 2.0              | $\pi/4$ -DQPSK | iPA          | 39          | 10.63                     | 11.553 | 9.00                      | 7.935  | 12.90                    | 19.498 |
| 2480            | 2.0              | $\pi/4$ -DQPSK | iPA          | 78          | 10.26                     | 10.624 | 8.05                      | 6.378  | 12.31                    | 17.022 |
| 2402            | 3.0              | 8DPSK          | iPA          | 0           | 10.55                     | 11.340 | 7.58                      | 5.724  | 12.32                    | 17.061 |
| 2441            | 3.0              | 8DPSK          | iPA          | 39          | 10.75                     | 11.890 | 8.50                      | 7.084  | 12.78                    | 18.967 |
| 2480            | 3.0              | 8DPSK          | iPA          | 78          | 10.18                     | 10.411 | 7.52                      | 5.649  | 12.06                    | 16.069 |

**Table 7-7. Dual Bluetooth Conducted Output Power – Average Measurements**

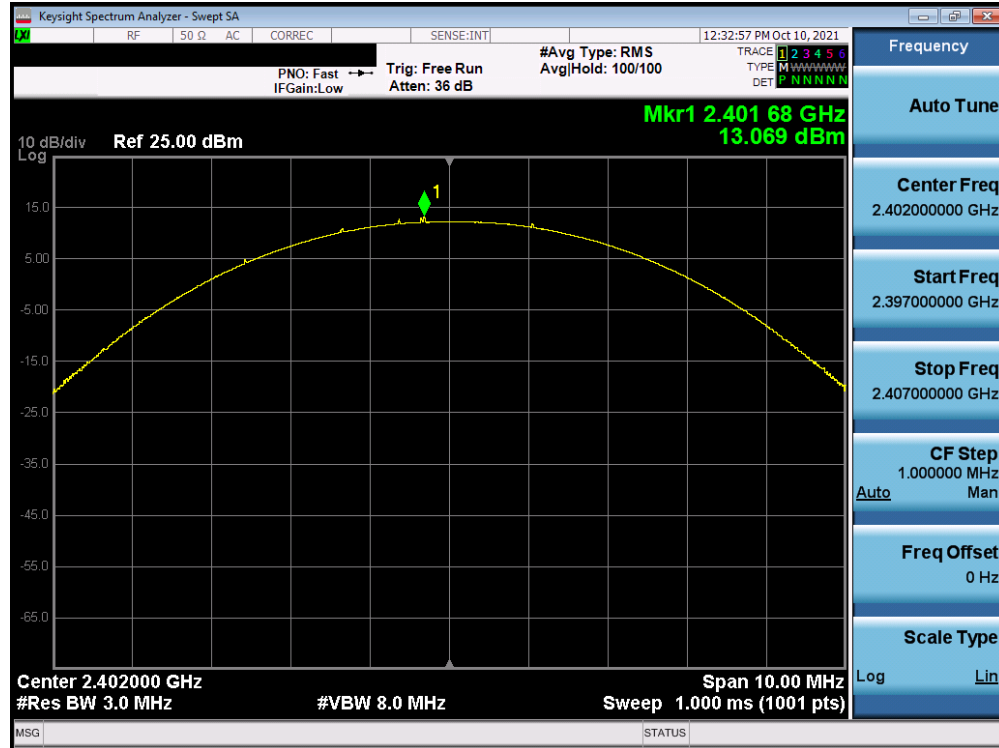
### Note:

This device can operate simultaneously on two antennas. The directional gains are shown in Table 2-2 in Section 2.3 of this report. The directional gain from the operation of two antennas is shown to operate at less than 6dBi per the calculation below:

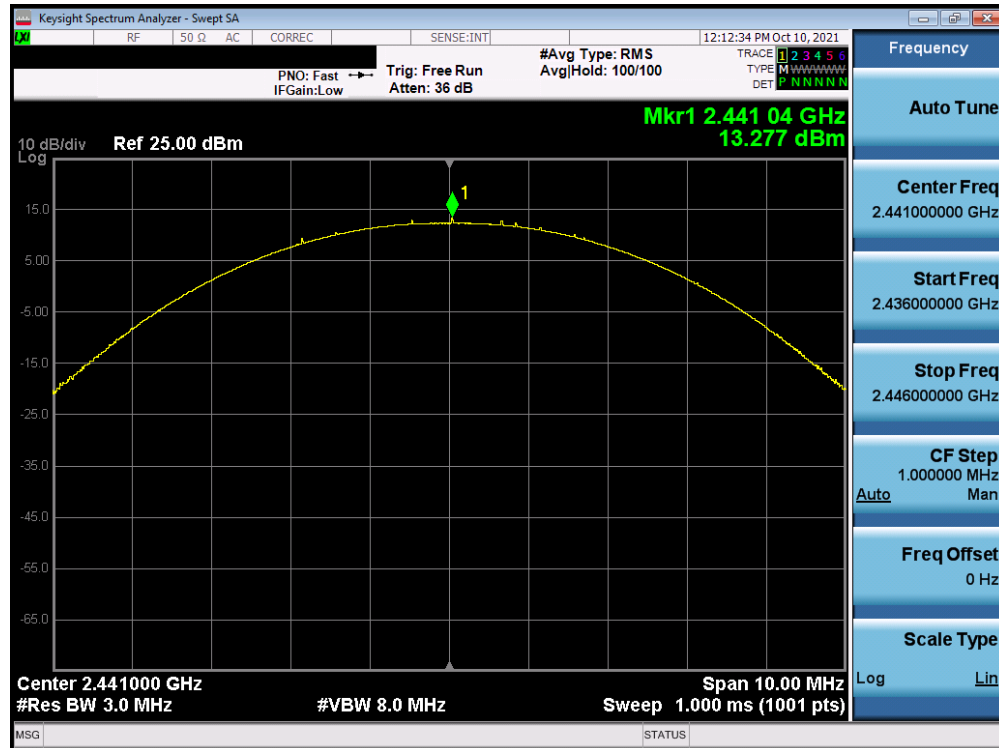
$$\begin{aligned}
 \text{Directional gain} &= 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi} \\
 &= 10 \log[(10^{-6.82/20} + 10^{-6.12/20})^2 / 2] \text{ dBi} \\
 &= -3.45 \text{ dBi}
 \end{aligned}$$

where  $G_N$  is the gain of the nth antenna and  $N_{ANT}$  is the total number of antennas used.

|                                         |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMS908U                      |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021                                                                                                                                                                          | EUT Type:<br>Portable Handset         |                                                                                       | Page 62 of 131                    |



Plot 7-91. Dual Bluetooth Peak Conducted Power (1Mbps – Ch. 0) Antenna 1 iPA



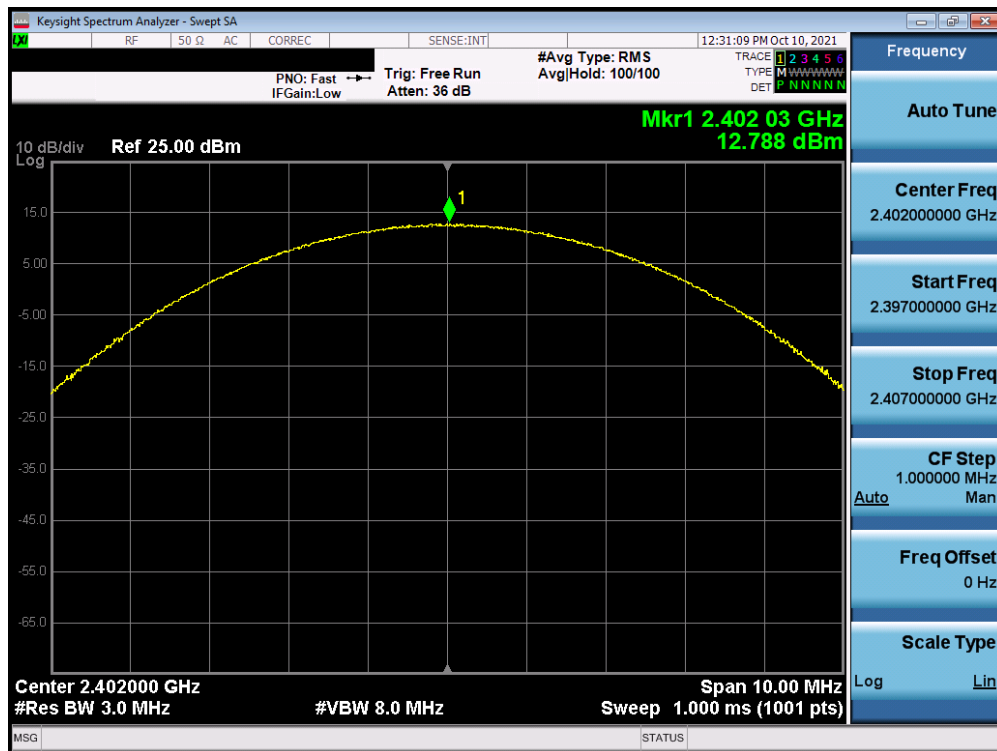
Plot 7-92. Dual Bluetooth Peak Conducted Power (1Mbps – Ch. 39) Antenna 1 iPA

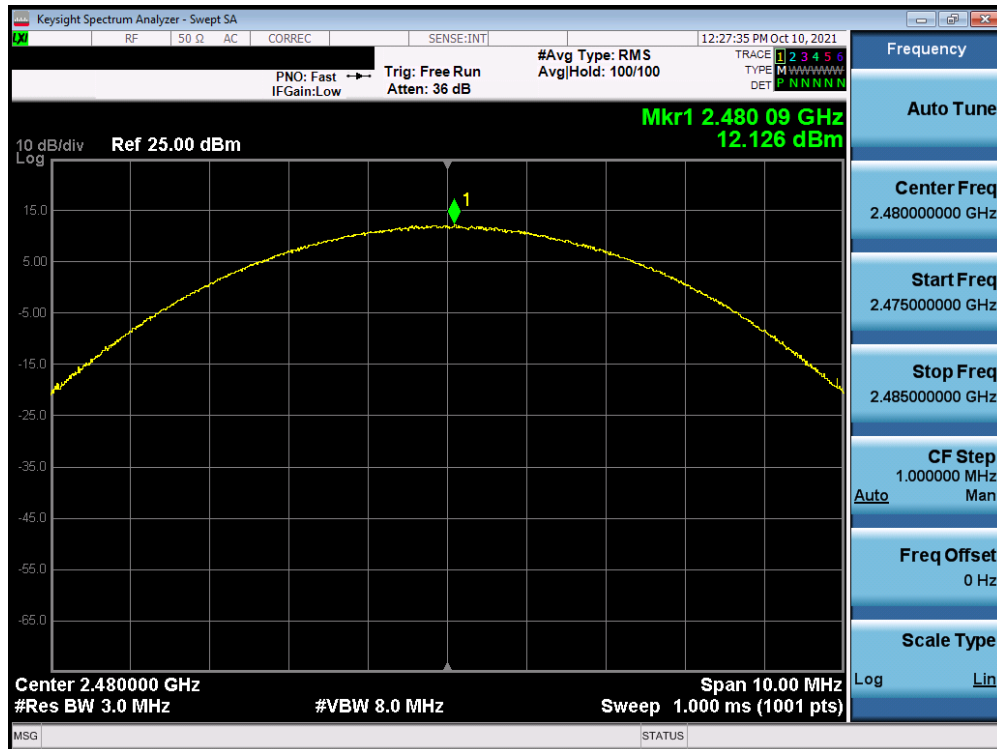
|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 63 of 131                    |



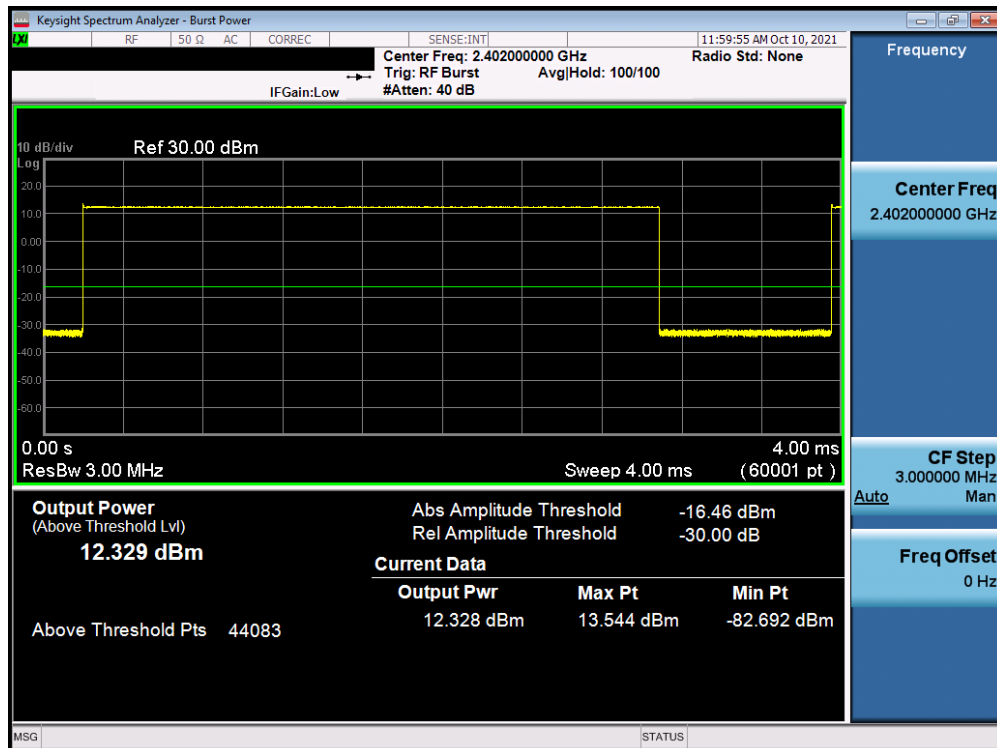
© 2021 PCTEST





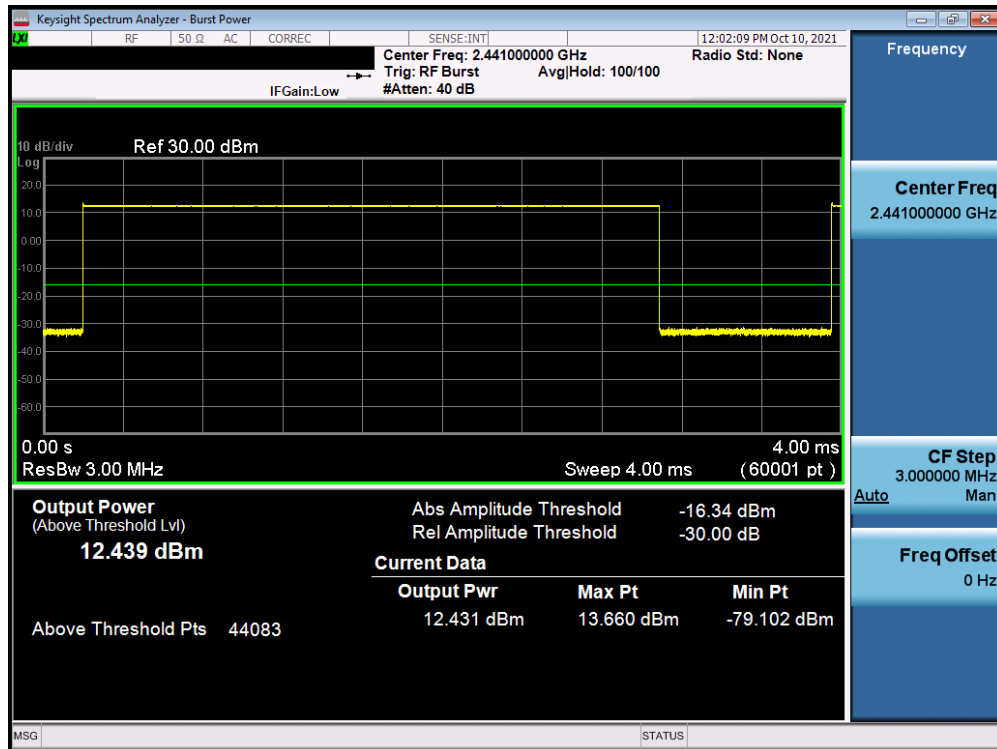


Plot 7-99. Dual Bluetooth Peak Conducted Power (3Mbps – Ch. 78) Antenna 1 iPA

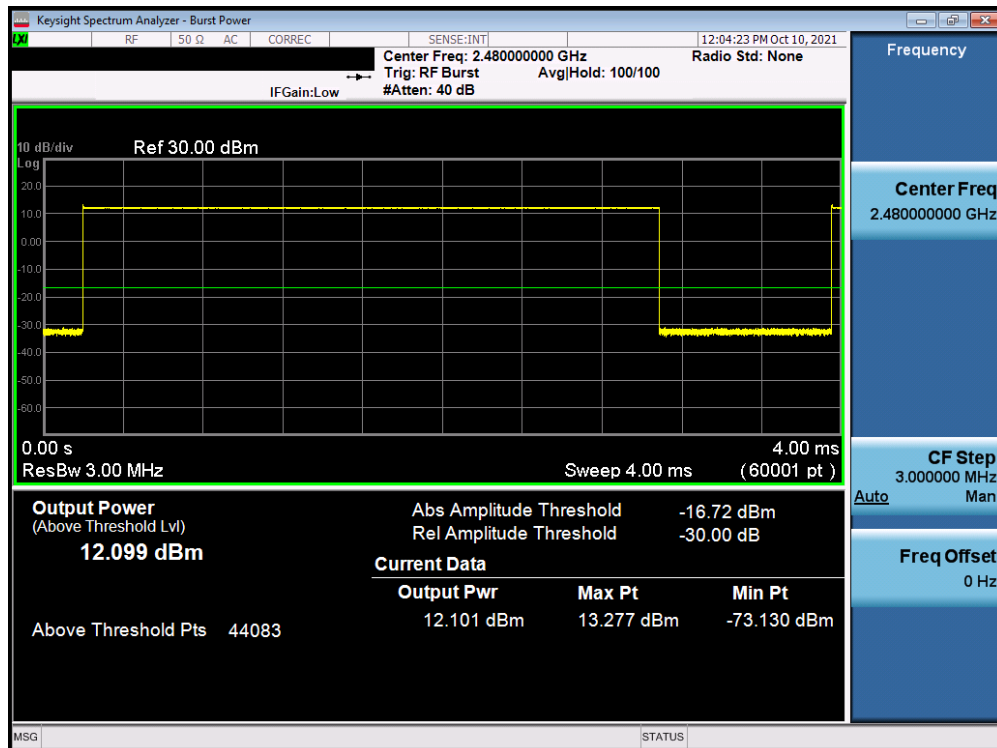


Plot 7-100. Dual Bluetooth Average Conducted Power (1Mbps – Ch. 0) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 67 of 131                    |

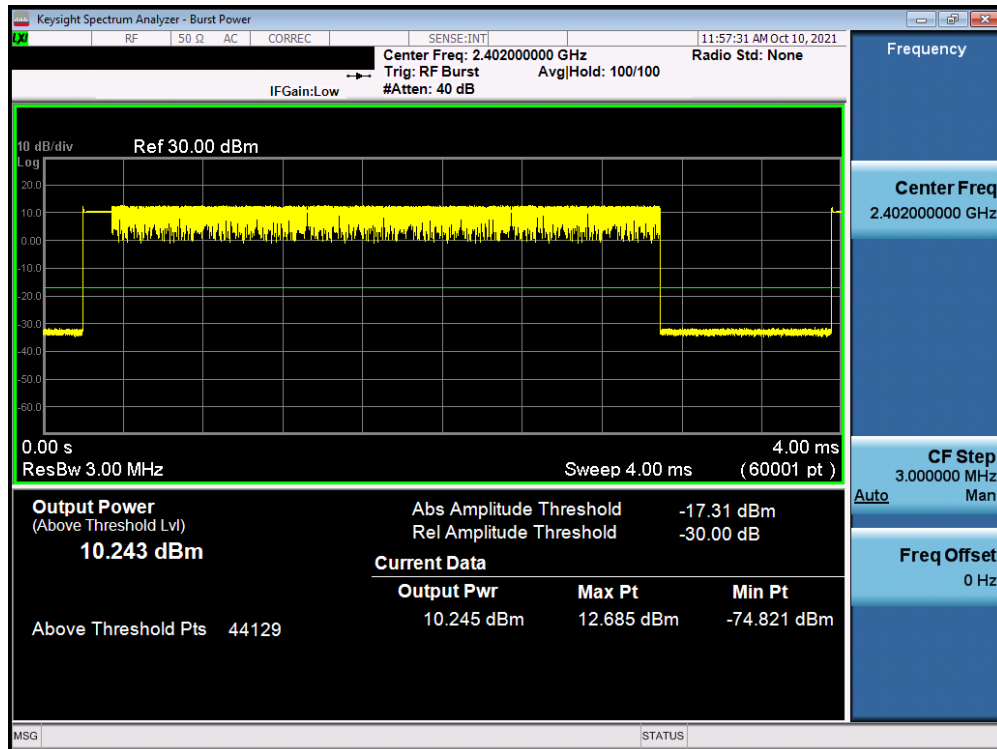


Plot 7-101. Dual Bluetooth Average Conducted Power (1Mbps – Ch. 39) Antenna 1 iPA

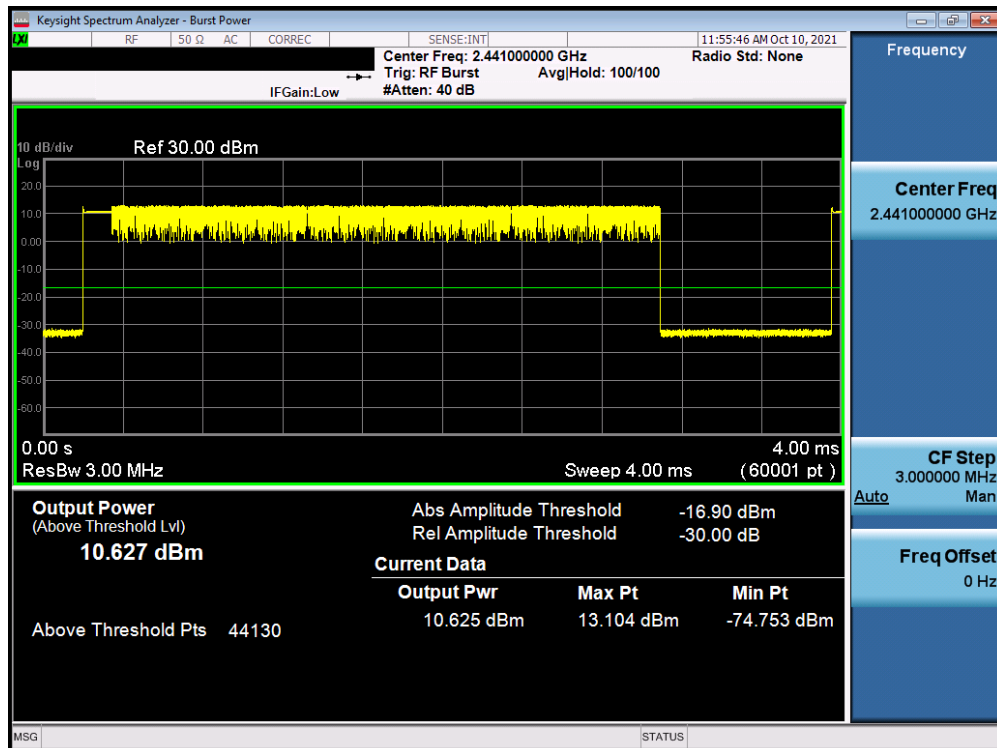


Plot 7-102. Dual Bluetooth Average Conducted Power (1Mbps – Ch. 78) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 68 of 131                    |



Plot 7-103. Dual Bluetooth Average Conducted Power (2Mbps – Ch. 0) Antenna 1 iPA



Plot 7-104. Dual Bluetooth Average Conducted Power (2Mbps – Ch. 39) Antenna 1 iPA

|                                         |                                              |                                       |                |                                   |
|-----------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMS908U                      | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2109090102-16.A3L | Test Dates:<br>10/8/2021-10/20/2021          | EUT Type:<br>Portable Handset         |                | Page 69 of 131                    |