

**FCC PART 15, SUBPART B and C  
TEST REPORT**

**for**

**RF TRANSMITTER**

**MODEL NUMBER: MMI-ARM**

Prepared for

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SIMI VALLEY, CALIFORNIA 93065

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DATE: NOVEMBER 6, 2023

|       | REPORT<br>BODY | APPENDICES |   |   |    |    | TOTAL |
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## GENERAL REPORT SUMMARY

This electromagnetic emission report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form except in full, without the written permission of Compatible Electronics.

This report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the U.S. Government.

Device Tested: RF Transmitter  
Model: MMI-ARM  
S/N: None

Product Description: The MMI-ARM is a self-contained repeater (receiver/transmitter) which receives location data from compatible transmitting devices, consolidates the data and re-transmits the consolidated data to compatible receive devices. The MMI-ARM automatically activates when its removable rechargeable lithium-ion battery pack is connected and is deactivated by disconnecting the battery pack.  
Highest Frequency: 2476.25 MHz (Dimensions: 5.23622" x 5.23622" x 2.75591")

Modifications: The EUT was not modified during the testing in order to comply with the specifications.

Manufacturer: Microwave Monolithics Incorporated  
2263 Ward Ave.  
Simi Valley, CA 93065

Test Dates: October 30 & 31 and November 1, 2 & 3 ,2023



Test Specifications covered by accreditation:

Emissions requirements  
CFR Title 47, Part 15, Subpart B and C, sections  
15.205, 15.207, 15.209 and 15.247  
Test Procedure: ANSI C63.4: 2014, ANSI C63.10:  
2013 and KDB 558074 D01 v05r02

### SUMMARY OF TEST RESULTS - DTS

| TEST | DESCRIPTION                                                                                  | RESULTS                                                                                                                                                       |
|------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Conducted RF Emissions, 150 kHz – 30 MHz                                                     | This test was not performed because the EUT is battery powered only.                                                                                          |
| 2    | Spurious Radiated RF Emissions, 30 MHz – 24762.50 MHz                                        | The EUT complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; the limits of CFR Title 47, Part 15, Subpart C, section 15.209 and 15.247 |
| 3    | Spurious Radiated RF Emissions, 9 kHz – 30 MHz and 1000 MHz – 24762.50 MHz                   | The EUT complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B; CFR Title 47, Part 15, Subpart C, section 15.247(d).                     |
| 4    | Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 24762.50 MHz | Complies with the requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)                                                                         |
| 5    | Emissions produced by the intentional radiator in restricted bands, 9 kHz – 24762.50 MHz     | Complies with the requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, section 15.247 (d)                                                |
| 6    | DTS Bandwidth                                                                                | Complies with the requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(2)                                                                     |
| 7    | Maximum Conducted Output Power                                                               | Complies with the requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3)                                                                     |
| 8    | RF Conducted Antenna Test                                                                    | Complies with the requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d).                                                                       |
| 9    | Power Spectral Density from the Intentional Radiator to the Antenna                          | Complies with the requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e)                                                                        |
| 10   | Occupied Bandwidth                                                                           | The results of this test were used in the measurement procedures for Maximum Conducted Output Power and Power Spectral Density.                               |
| 11   | Spurious Radiated RF Emissions, 30 MHz – 9280 MHz (Receive mode only)                        | The EUT complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; the limits of CFR Title 47, Part 15, Subpart B, section 15.109.           |

## 1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the RF Transmitter, Model Number: MMI-ARM. The emissions measurements were performed according to the measurement procedure described in ANSI C63.10 and ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B and Subpart C, sections 15.107, 15.205, 15.207, 15.209, and 15.247.

### 1.1 DECISION RULE & RISK

If a measured value exceeds a specification limit it implies non-compliance. If the value is below a specification limit it implies compliance. Measurement uncertainty of the laboratory is reported with all measurement results but generally not taken into consideration unless a standard, rule or law requires it to be considered.

Qualification test reports are only produced for products that are in compliance with the test requirements, therefore results are always in conformity. Otherwise, an engineering report or just the data is provided to the customer.

When performing a measurement and making a statement of conformity, in or out-of-specification to manufacturer's specifications or Pass/Fail against a requirement, there are two possible outcomes:

- The result is reported as conforming with the specification
- The result is reported as not conforming with the specification

The decision rule is defined below.

When the test result is found to be below the limit but within our measurement uncertainty of the limit, it is our policy that the final acceptance decision is left to the customer, after discussing the implications and potential risks of the decision.

When the test result is found to be exactly on the specification, it is our policy, in the case of unwanted emissions measurements to consider the result non-compliant, however, the final decision is left to the customer, after discussing the implications and potential risks of the decision.

When the test result is found to be over the specification limit under any condition, it is our policy to consider the result non-compliant.

In terms of uncertainty of measurement, the laboratory is a calibrated and tightly controlled environment and generally exceptionally stable, the measurement uncertainties are evaluated without the consideration of the test sample. When it comes to the test sample however, as most testing is performed on a single sample rather than a sample population, and that sample is often a pre-production representation of the final product, that test sample represents a significantly higher source of measurement uncertainty. We advise our customers of this and that when in doubt (small test to limit margins), they may wish to perform statistical sampling on a population to gain a higher confidence in the results. All lab reported results are that of a single sample in any event.

## **2. ADMINISTRATIVE DATA**

### **2.1 Location of Testing**

The emissions tests described herein were performed at the test facility of Compatible Electronics, 1050 Lawrence Drive, Newbury Park, California 91320.

### **2.2 Traceability Statement**

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

### **2.3 Cognizant Personnel**

Microwave Monolithics Incorporated

Daniel Siu

Director, Research

Compatible Electronics Inc.

Reynald O. Ramirez  
Ruby Hall

Sr. Test Engineer  
Lab Manager

### **2.4 Date Test Sample Was Received**

The test sample was received on October 30, 2023. Received as described in product description.

### **2.5 Disposition of the Test Sample**

The test sample remains at Compatible Electronics.

### **2.6 Abbreviations and Acronyms**

The following abbreviations and acronyms may be used in this document.

|      |                                      |
|------|--------------------------------------|
| RF   | Radio Frequency                      |
| EMI  | Electromagnetic Interference         |
| EUT  | Equipment Under Test                 |
| P/N  | Part Number                          |
| S/N  | Serial Number                        |
| HP   | Hewlett Packard                      |
| ITE  | Information Technology Equipment     |
| CML  | Corrected Meter Limit                |
| LISN | Line Impedance Stabilization Network |
| N/A  | Not Applicable                       |
| NCR  | No Calibration Required              |

### 3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this emissions Test Report.

| SPEC                            | TITLE                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC Title 47, Part 15 Subpart C | FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators                                                                                                             |
| ANSI C63.4 2014                 | Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz                                                                |
| ANSI C63.10 2013                | American National Standard for Testing Unlicensed Wireless Devices                                                                                                                                  |
| FCC Title 47, Part 15 Subpart B | FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators                                                                                                           |
| KDB 558074 D01 v05r02           | Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules |
| EN 50147-2: 1997                | Anechoic chambers. Alternative test site suitability with respect to site attenuation                                                                                                               |

#### **4. DESCRIPTION OF TEST CONFIGURATION**

##### **4.1 Description of Test Configuration – Emissions**

The EUT was tested in a tabletop configuration. The EUT was transmitting at 2401.25 MHz, 2441.75 MHz and 2476.25 MHz. The EUT was tested in both transmit and receives modes of operation. The EUT was utilizing software FB11C4.

The EUT also contains multiple TX/RX module that receives frequencies from 902-928 MHz. band. According to the client the transmit functionality requires specific instructions that are absent from the control code so the transmission at 900 MHz would not happen. During testing the modules were setup to receive the entire range simultaneously.

All three orthogonal axis were tested in transmit and receive modes of operation.

**For direct measurement portion of the test** – The EUT was directly connected to the EMI receiver. A special program was used to control the channel of the transmitter.

The radiated final data for the EUT was taken in the worst-case configuration described above. Please see Appendix E for the data sheets.

##### **4.1.1 Cable Construction and Termination**

The EUT has no cables.

**5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT****5.1 EUT and Accessory List**

| EQUIPMENT            | MANUFACTURER                       | MODEL NUMBER | SERIAL NUMBER | FCC ID              |
|----------------------|------------------------------------|--------------|---------------|---------------------|
| RF TRANSMITTER (EUT) | MICROWAVE MONOLITHICS INCORPORATED | MMI-ARM      | N/A           | FCC ID: RG6-MMI-ARM |

## 5.2 Emissions Test Equipment

| EQUIPMENT TYPE                     | MANUFACTURER           | MODEL NUMBER      | SERIAL NUMBER    | CAL. DATE     | CAL. DUE DATE |
|------------------------------------|------------------------|-------------------|------------------|---------------|---------------|
| TDK Emissions Lab Software         | TDK RF Solutions, Inc. | TDK Emissions Lab | Version: 10.78   | NCR           | NCR           |
| EMI Receiver                       | Agilent                | N9038A            | MY51100115       | Jan 11, 2023  | Jan 11, 2025  |
| Active Loop Antenna                | Com-Power              | AL-130R           | 10160065         | Aug. 14, 2023 | Aug. 14, 2025 |
| Combi-Log Antenna                  | Com-Power              | AC-220            | 10030030         | Jan. 29, 2022 | Jan. 29, 2024 |
| Horn Antenna                       | Com-Power              | AH-118            | 071370           | Jun. 20, 2022 | Jun. 20, 2024 |
| Horn Antenna                       | Com-Power              | AH-826            | 081081           | NCR           | NCR           |
| Antenna Cable                      | Belden                 | RG-214/U          | A/N: 6014        | Feb. 08, 2022 | Feb. 08, 2024 |
| High Freq. Antenna Cables          | SucoFlex               | 102_EA            | A/N: 6012 & 6013 | Feb. 07, 2022 | Feb. 07, 2024 |
| High Freq. Antenna Cables          | SucoFlex               | 102_EA            | A/N: 6012 & 6013 | Jan. 15, 2024 | Jan. 15, 2026 |
| Preamplifier                       | Com-Power              | PAM-118A          | 551015           | Jan. 20, 2022 | Jan. 20, 2024 |
| Preamplifier                       | Com-Power              | PAM-118A          | 551015           | Jan. 11, 2024 | Jan. 11, 2026 |
| Preamplifier                       | Com-Power              | PAM-118           | 443009           | Jan. 04, 2022 | Jan. 04, 2024 |
| Preamplifier(backup)               | Com-Power              | PA-840            | 711883           | Jan. 17, 2022 | Jan. 17, 2024 |
| Preamplifier                       | Com-Power              | PAM-840           | 461268           | Jan. 03, 2023 | Jan. 03, 2025 |
| Turntable                          | EMCO                   | 2088-2.03         | None             | NCR           | NCR           |
| Antenna Mast                       | EMCO                   | 2075-2            | None             | NCR           | NCR           |
| Multi-Device Controller            | ETS EMCO               | 2090              | 9511-1095        | NCR           | NCR           |
| Temperature and Humidity Indicator | Abbeon                 | HTAB169B          | 3428             | Sep. 08, 2023 | Sep. 08, 2024 |
| Barometer                          | Maximum                | Predictor         | 3429             | Jun. 19, 2023 | Jun. 19, 2024 |
| Computer                           | Dell                   | Vostro 3900       | Asset# 3423      | NCR           | NCR           |

## 6. TEST SITE DESCRIPTION

### 6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for emissions test location.

### 6.2 EUT Mounting, Bonding and Grounding

**For frequencies 1 GHz and below:** The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

**For frequencies above 1 GHz:** The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was not grounded.

### 6.3 Measurement Uncertainty

“Compatible Electronics’  $U_{lab}$  value is less than  $U_{cispr}$ , thus based on this – compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.

$$u_c(y) = \sqrt{\sum_i c_i^2 u^2(x_i)}$$

| Measurement                                                                                       |                      | $U_{cispr}$ | $U_{lab} = 2 u_c(y)$                       |
|---------------------------------------------------------------------------------------------------|----------------------|-------------|--------------------------------------------|
| Conducted disturbance (mains port)                                                                | (150 kHz – 30 MHz)   | 3.4 dB      | 2.73 dB                                    |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) | (30 MHz – 1 000 MHz) | 6.3 dB      | 3.12 dB (Vertical)<br>3.07 dB (Horizontal) |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) | (1 GHz - 6 GHz)      | 5.2 dB      | 3.13 dB                                    |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) | (6 GHz – 18 GHz)     | 5.5 dB      | 3.13 dB                                    |
| Radiated disturbance (electric field strength on an open area test site or alternative test site) | (18 GHz – 26 GHz)    | N/A         | 3.57 dB                                    |

## **7. CHARACTERISTICS OF THE TRANSMITTER**

### **7.1 Channel Description and Frequencies**

The EUT operates within the bands of 2401.25 to 2476.25 MHz. The low channel is 2401.25 MHz, the middle channel is 2441.75 MHz and the high channel is 2476.25 MHz. There are 51 possible transmitted frequencies. The nominal channel spacing is 1.5 MHz.

### **7.2 Antenna**

The antenna has a gain of 4.4 dBi.

## **8. TEST PROCEDURES**

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

### **8.1 RF Emissions**

#### **8.1.1 Conducted Emissions Test**

##### **Test Results:**

This test was not performed because the EUT operates on battery power only and cannot be connected internally or externally to the AC public mains.

Had this test been applicable it would have been performed as described below.

The EMI Receiver was used as a measuring meter. A 10 dB Attenuator was used for the protection of the EMI Receiver input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the EMI Receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by computer software. The six highest emissions are listed in Table 1.0.

### 8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as the measuring meter. Below 1 GHz, a built-in, internal preamplifier was used to increase the sensitivity of the instrument. At frequencies above 1 GHz, external preamplifiers were used. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit.

The frequencies above 1 GHz were averaged by using the linear average detector function on the EMI Receiver.

The measurement bandwidths and transducers used for the radiated emissions test were:

| FREQUENCY RANGE      | EFFECTIVE MEASUREMENT BANDWIDTH | TRANSDUCER       |
|----------------------|---------------------------------|------------------|
| 9 kHz to 150 kHz     | 200 Hz                          | Loop Antenna     |
| 150 kHz to 30 MHz    | 9 kHz                           | Loop Antenna     |
| 30 MHz to 1 GHz      | 120 kHz                         | Combilog Antenna |
| 1 GHz to 24.7625 GHz | 1 MHz                           | Horn Antenna     |

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.0.

#### Test Results:

The EUT complies with the **Class B** limits of Part 15, Subpart B; the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.247 (d) for radiated emissions. Please see Appendix E for the data sheets.

**8.1.3 RF Emissions Test Results**Table 1.0 RADIATED EMISSION RESULTS RF TRANSMITTER  
MODEL NUMBER: MMI-ARM

| Frequency<br>MHz | Corrected Reading*<br>dBuV/m | Specification Limit<br>dBuV/m | Delta<br>(Cor. Reading – Spec. Limit)<br>dB |
|------------------|------------------------------|-------------------------------|---------------------------------------------|
| 556.30           | 30.43#                       | 46.00                         | -15.57                                      |
| 560.30           | 33.41#                       | 46.00                         | -12.59                                      |
| 938.30           | 40.15#                       | 56.90                         | -16.75                                      |
| 14407.50         | 42.00A                       | 53.98                         | -11.98                                      |
| 14650.50         | 41.81A                       | 53.98                         | -12.17                                      |
| 14857.50         | 41.90A                       | 53.98                         | -12.08                                      |

## Notes:

- \* The complete emissions data is given in Appendix E of this report.
- \*\* The factors for the antenna and preamplifier gain are attached in Appendix D of this report.
- # Quasi-Peak Reading
- A Average Reading

#### 8.1.4 Sample Calculations

A correction factor for the antenna, cable and a distance factor (if any) must be applied to the meter reading before a true field strength reading can be obtained. This Corrected Meter Reading is then compared to the specification limit in order to determine compliance with the limits.

Conversion to logarithmic terms: Specification limit ( $\mu\text{V/m}$ )  $\log \times 20$  = Specification Limit in dBuV/m

To correct for distance when measuring at a distance other than the specification

For measurements below 30 MHz: (Specification distance / test distance)  $\log \times 40$  = distance factor

For measurements above 30 MHz: (Specification distance / test distance)  $\log \times 20$  = distance factor

Corrected Meter Reading = meter reading + F – A + C

Where: F = antenna factor

A = amplifier gain

C = cable loss

The correction factors for the antenna and the amplifier gain are attached in Appendix D of this report. The data sheets are attached in Appendix E.

The distance factor D is 0 when the test is performed at the required specification distance.

## 8.2 DTS Bandwidth

The DTS Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the EUT. The following steps were performed for measuring the DTS Bandwidth.

1. Set RBW = 100 kHz
2. Set the video bandwidth (VBW) to equal or greater than 3 times the RBW
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep = Auto Couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### Test Results:

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(2).

## 8.3 Maximum Conducted Output Power

The Maximum Conducted Output Power was measured using the EMI Receiver. The Maximum Conducted Output Power was measured using the procedure described in section 11.9.2.2.2 of ANSI C63.10. The Maximum Conducted Output Power was then taken. The cable loss was also added back into the reading using the reference level offset. The following steps were performed for measuring the Maximum Conducted Output Power.

- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
- c) Set VBW  $\geq [3 \times \text{RBW}]$ .
- d) Number of points in sweep  $\geq [2 \times \text{span} / \text{RBW}]$ . (This gives bin-to-bin spacing  $\leq \text{RBW} / 2$ , so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
- f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- g) If transmit duty cycle  $< 98\%$ , use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at the maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle  $\geq 98\%$ , and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode.
- i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

### Test Results:

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(3).

#### **8.4 Emissions in Non-Restricted Bands**

The emissions in the non-restricted frequency bands measurements were performed using the EMI receiver directly connected to the EUT. The reference level was established by setting the instrument center frequency to the DTS channel center frequency. The span was set to  $\geq 1.5$  times the DTS bandwidth. The RBW was set to 100 kHz and the VBW was set to 300 kHz. A peak detector was used with sweep set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the reference level. For emission level measurement, the center frequency and span were set to encompass the frequency range to be measured. The RBW was set to 100 kHz and the VBW was set to 300 kHz. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than the span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

##### **Test Results:**

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d).

#### **8.5 RF Band Edges**

The RF band edges were taken at the edges of the ISM spectrum (2401.25 MHz when the EUT was on the low channel and 2476.25 MHz when the EUT was on the high channel) using the EMI Receiver. The plots were taken in single channel mode at a 3-meter test distance. The radiated emissions test procedure as described in section 8.1.2 of this test report was used to maximize the emission.

##### **Test Results:**

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). Please see the data sheets located in Appendix E.

## 8.6 Power Spectral Density Test

The spectrum density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The following steps were performed for measuring the spectral density.

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set VBW  $\geq [3 \times \text{RBW}]$ .
- e) Detector = power averaging (rms) or sample detector (when rms not available).
- f) Ensure that the number of measurement points in the sweep  $\geq [2 \times \text{span} / \text{RBW}]$ .
- g) Sweep time = auto couple.
- h) Employ trace averaging (rms) mode over a minimum of 100 traces.
- i) Use the peak marker function to determine the maximum amplitude level.
- j) If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

### Test Results:

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (e).

## 8.7 Variation of the Input Power

### Test Results:

This test was not performed because the EUT operates on battery power only and cannot be connected internally or externally to the AC public mains.

Had this test been applicable it would have been performed as described below.

The variation of the input power test was performed using the EMI Receiver. The EUT input power was varied between 85% and 115% of the nominal rated supply voltage. The carrier frequency was monitored for any change in amplitude.

## 8.8 Occupied Bandwidth

The Occupied Bandwidth was measured using the EMI Receiver. The Occupied Bandwidth was measured using the procedure described in section 6.9.3 of ANSI C63.10. The Occupied Bandwidth was then taken. The cable loss was also added back into the reading using the reference level offset. The following steps were performed for measuring the Occupied Bandwidth.

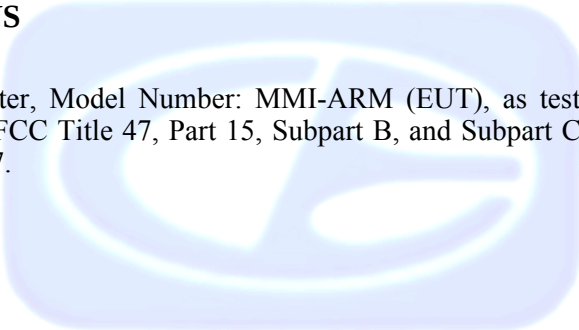
- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than  $[10 \log (OBW/RBW)]$  below the reference level. Specific guidance is given in 4.1.5.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
- h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data maybe reported in addition to the plot(s).

### Test Results:

The results of this test were used in the measurement procedures for Maximum Conducted Output Power and Power Spectral Density.

## 9 CONCLUSIONS

The RF Transmitter, Model Number: MMI-ARM (EUT), as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B, and Subpart C, sections 15.107, 15.205, 15.207, 15.209 and 15.247.





**APPENDIX A**

***LABORATORY ACCREDITATIONS AND RECOGNITIONS***

## LABORATORY ACCREDITATIONS AND RECOGNITIONS

For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025.

**For the most up-to-date version of our scopes and certificates please visit**

**<http://celectronics.com/quality/scope/>**



Quote from ISO-ILAC-IAF Communiqué on the Management Systems Requirements of ISO/IEC 17025, General Requirements for the competence of testing and calibration laboratories:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001"

Innovation, Science and Economic Development Canada Lab Code 22209



**APPENDIX B**

***MODIFICATIONS TO THE EUT***

## **MODIFICATIONS TO THE EUT**

There were no modifications made to the EUT.





**APPENDIX C**

***ADDITIONAL MODELS***

## ADDITIONAL MODELS

Device Tested

RF Transmitter  
Model: MMI-ARM  
S/N: None

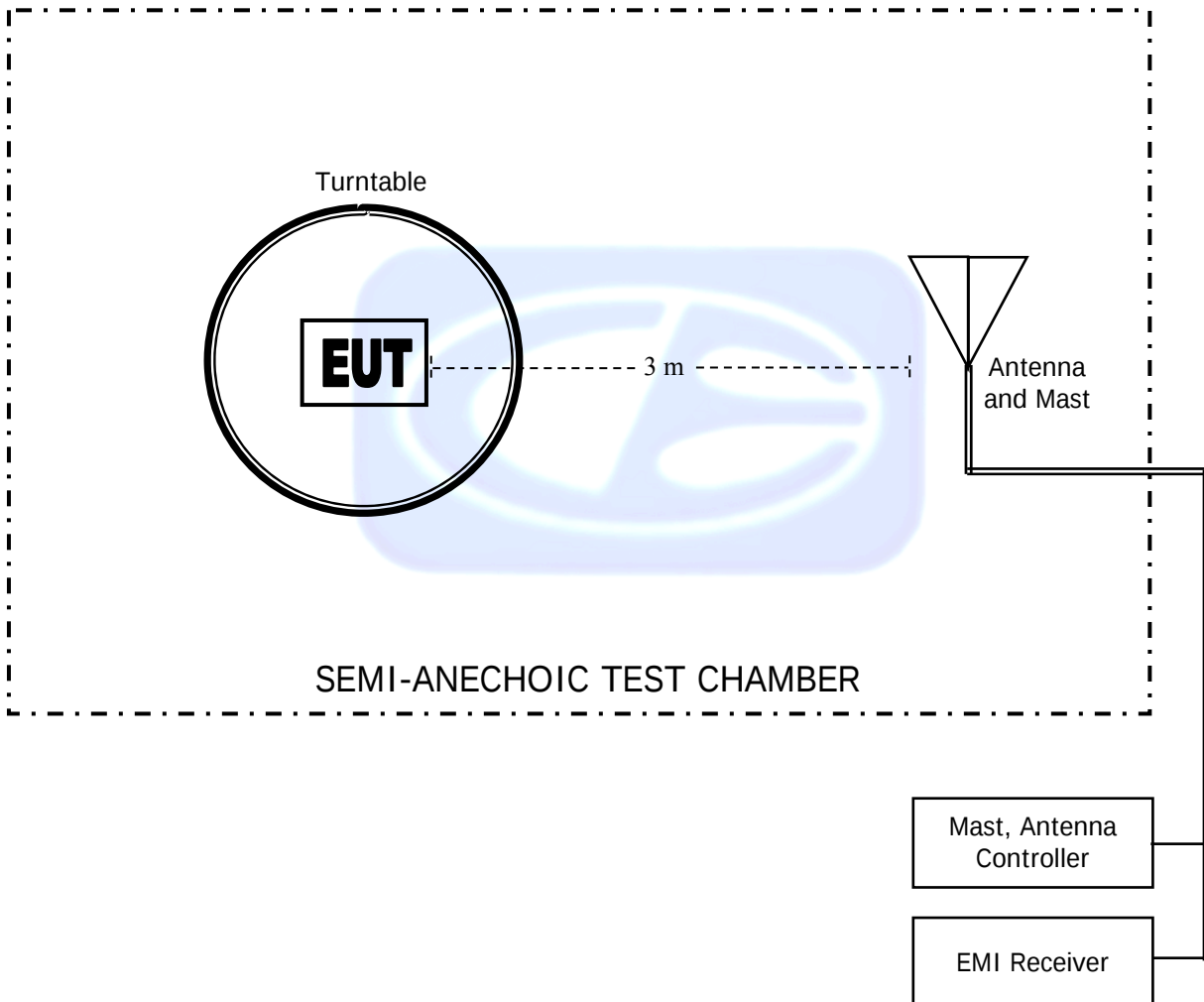
No Additional models.



**APPENDIX D**

***DIAGRAMS AND CHARTS***

**FIGURE 1: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER**



COM-POWER AL-130R

ACTIVE LOOP ANTENNA

S/N: 10160065

CALIBRATION DATE: AUGUST 14, 2023

| FREQUENCY<br>(MHz) | FACTOR<br>(dB) | FREQUENCY<br>(MHz) | FACTOR<br>(dB) |
|--------------------|----------------|--------------------|----------------|
| 0.009              | 15.08          | 1                  | 14.15          |
| 0.01               | 15.24          | 2                  | 14.26          |
| 0.02               | 14.36          | 3                  | 14.37          |
| 0.03               | 15.15          | 4                  | 14.57          |
| 0.04               | 14.72          | 5                  | 14.56          |
| 0.05               | 14.03          | 6                  | 14.48          |
| 0.06               | 14.28          | 7                  | 14.40          |
| 0.07               | 14.07          | 8                  | 14.20          |
| 0.08               | 13.93          | 9                  | 14.00          |
| 0.09               | 14.14          | 10                 | 14.20          |
| 0.1                | 13.78          | 15                 | 14.71          |
| 0.2                | 13.77          | 20                 | 13.75          |
| 0.3                | 13.64          | 25                 | 13.36          |
| 0.4                | 13.63          | 30                 | 11.78          |
| 0.5                | 13.85          |                    |                |
| 0.6                | 13.86          |                    |                |
| 0.7                | 13.85          |                    |                |
| 0.8                | 13.82          |                    |                |
| 0.9                | 13.98          |                    |                |

**COM-POWER AC-220****COMBI-LOG ANTENNA****S/N: 10030030****ASSET: 6037****CALIBRATION DATE: JANUARY 29, 2022**

| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|----------------------------|------------------------|
| 30                         | 22.3                   | 450                        | 21.5                   |
| 35                         | 21.3                   | 500                        | 22.1                   |
| 40                         | 20.5                   | 550                        | 22.8                   |
| 45                         | 19.7                   | 600                        | 24.3                   |
| 50                         | 18.6                   | 650                        | 24.4                   |
| 60                         | 14.9                   | 700                        | 24.4                   |
| 70                         | 11.8                   | 750                        | 26.1                   |
| 80                         | 11.8                   | 800                        | 26.3                   |
| 90                         | 13.6                   | 850                        | 26.0                   |
| 100                        | 14.4                   | 900                        | 27.6                   |
| 120                        | 15.6                   | 950                        | 28.5                   |
| 140                        | 14.2                   | 1000                       | 28.3                   |
| 160                        | 14.1                   |                            |                        |
| 180                        | 14.8                   |                            |                        |
| 200                        | 15.3                   |                            |                        |
| 225                        | 15.8                   |                            |                        |
| 250                        | 16.7                   |                            |                        |
| 275                        | 18.4                   |                            |                        |
| 300                        | 18.5                   |                            |                        |
| 350                        | 19.5                   |                            |                        |
| 400                        | 20.7                   |                            |                        |

**BELDEN ANTENNA CABLE****RG-214/U****A/N: 6014****CALIBRATION DATE: FEBRUARY 8, 2022**

| <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> |
|----------------------------|-------------------|----------------------------|-------------------|
| 0.01                       | 0.3               | 200                        | 1.7               |
| 0.02                       | 0.3               | 225                        | 1.7               |
| 0.05                       | 0.3               | 250                        | 1.8               |
| 0.1                        | 0.3               | 275                        | 2.0               |
| 0.2                        | 0.3               | 300                        | 2.1               |
| 0.5                        | 0.3               | 350                        | 2.2               |
| 1                          | 0.3               | 400                        | 2.4               |
| 2                          | 0.3               | 450                        | 2.3               |
| 5                          | 0.3               | 500                        | 2.8               |
| 10                         | 0.5               | 550                        | 3.1               |
| 20                         | 0.5               | 600                        | 2.8               |
| 30                         | 0.7               | 650                        | 3.2               |
| 40                         | 0.7               | 700                        | 3.6               |
| 50                         | 0.8               | 750                        | 3.5               |
| 60                         | 0.8               | 800                        | 3.3               |
| 70                         | 1.0               | 850                        | 3.6               |
| 80                         | 1.0               | 900                        | 3.8               |
| 90                         | 1.1               | 950                        | 3.8               |
| 100                        | 1.1               | 1000                       | 3.9               |
| 125                        | 1.3               |                            |                   |
| 150                        | 1.3               |                            |                   |
| 175                        | 1.6               |                            |                   |

AH-118

DOUBLE RIDGE HORN ANTENNA

S/N: 071370

CALIBRATION DATE: JUNE 20, 2022

| FREQUENCY<br>(MHz) | FACTOR<br>(dB) | FREQUENCY<br>(MHz) | FACTOR<br>(dB) |
|--------------------|----------------|--------------------|----------------|
| 1000               | 24.06          | 10000              | 39.24          |
| 1500               | 25.16          | 10500              | 39.47          |
| 2000               | 28.25          | 11000              | 39.21          |
| 2500               | 28.54          | 11500              | 39.96          |
| 3000               | 29.67          | 12000              | 40.49          |
| 3500               | 30.58          | 12500              | 40.04          |
| 4000               | 31.56          | 13000              | 40.25          |
| 4500               | 32.17          | 13500              | 40.19          |
| 5000               | 33.40          | 14000              | 40.72          |
| 5500               | 33.88          | 14500              | 42.04          |
| 6000               | 34.29          | 15000              | 41.29          |
| 6500               | 34.89          | 15500              | 39.52          |
| 7000               | 36.92          | 16000              | 39.58          |
| 7500               | 37.40          | 16500              | 39.31          |
| 8000               | 37.65          | 17000              | 41.01          |
| 8500               | 37.97          | 17500              | 43.31          |
| 9000               | 37.92          | 18000              | 45.26          |
| 9500               | 38.63          |                    |                |

AH-826

HORN ANTENNA

S/N: 081081

| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|
| 18000                      | 36.6                   |
| 18500                      | 36.0                   |
| 19000                      | 36.1                   |
| 19500                      | 19.0                   |
| 20000                      | 38.6                   |
| 20500                      | 37.2                   |
| 21000                      | 37.6                   |
| 21500                      | 37.6                   |
| 22000                      | 37.4                   |
| 22500                      | 37.9                   |
| 23000                      | 37.4                   |
| 23500                      | 36.7                   |
| 24000                      | 37.4                   |
| 24500                      | 37.7                   |
| 25000                      | 38.3                   |
| 25500                      | 38.0                   |
| 26000                      | 38.2                   |
| 26500                      | 38.1                   |

**SUCOFLEX ANTENNA CABLES**

102\_EA

A/N: 6012 &amp; 6013

CALIBRATION DATE: FEBRUARY 7, 2022

| <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> |
|----------------------------|-------------------|----------------------------|-------------------|
| 1000                       | 5.2               | 6750                       | 14.7              |
| 1100                       | 5.3               | 7000                       | 14.5              |
| 1200                       | 5.4               | 7250                       | 15.0              |
| 1300                       | 5.8               | 7500                       | 14.9              |
| 1400                       | 6.0               | 7750                       | 14.8              |
| 1500                       | 6.2               | 8000                       | 15.2              |
| 1600                       | 6.4               | 8250                       | 15.3              |
| 1700                       | 6.5               | 8500                       | 15.4              |
| 1800                       | 6.6               | 8750                       | 15.5              |
| 1900                       | 6.9               | 9000                       | 15.8              |
| 2000                       | 7.0               | 9250                       | 15.7              |
| 2250                       | 7.5               | 9500                       | 16.0              |
| 2500                       | 7.9               | 9750                       | 16.3              |
| 2750                       | 8.5               | 10000                      | 16.3              |
| 3000                       | 8.8               | 10500                      | 16.9              |
| 3250                       | 9.2               | 11000                      | 17.0              |
| 3500                       | 9.6               | 11500                      | 17.6              |
| 3750                       | 9.9               | 12000                      | 18.1              |
| 4000                       | 10.3              | 12500                      | 18.4              |
| 4250                       | 10.6              | 13000                      | 18.7              |
| 4500                       | 10.9              | 13500                      | 19.2              |
| 4750                       | 11.3              | 14000                      | 19.5              |
| 5000                       | 11.7              | 14500                      | 19.7              |
| 5250                       | 12.1              | 15000                      | 20.6              |
| 5500                       | 12.5              | 15500                      | 20.7              |
| 5750                       | 12.9              | 16000                      | 20.9              |
| 6000                       | 13.3              | 16500                      | 21.4              |
| 6250                       | 13.8              | 17000                      | 22.0              |
| 6500                       | 14.3              | 17500                      | 21.8              |

**SUCOFLEX ANTENNA CABLES**  
**CONTINUED**  
**102\_EA**

**A/N: 6012 & 6013**

**CALIBRATION DATE: FEBRUARY 7, 2022**

| <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> |
|----------------------------|-------------------|----------------------------|-------------------|
| 18000                      | 22.5              | 26500                      | 28.1              |
| 18500                      | 22.7              | 27000                      | 27.9              |
| 19000                      | 23.0              | 28000                      | 28.8              |
| 19500                      | 24.0              | 29000                      | 29.3              |
| 20000                      | 24.6              | 30000                      | 29.7              |
| 20500                      | 24.7              | 31000                      | 30.5              |
| 21000                      | 25.1              | 32000                      | 31.0              |
| 21500                      | 25.1              | 33000                      | 31.2              |
| 22000                      | 25.1              | 34000                      | 32.3              |
| 22500                      | 25.7              | 35000                      | 33.0              |
| 23000                      | 26.4              | 36000                      | 33.3              |
| 23500                      | 26.1              | 37000                      | 34.0              |
| 24000                      | 26.8              | 38000                      | 35.1              |
| 24500                      | 27.2              | 40000                      | 36.3              |
| 25000                      | 27.0              |                            |                   |
| 26000                      | 27.5              |                            |                   |

## SUCOFLEX ANTENNA CABLES

102\_EA

A/N: 6012 & 6013

CALIBRATION DATE: JANUARY 15, 2024

| FREQUENCY<br>(MHz) | CABLE LOSS | FREQUENCY<br>(MHz) | CABLE LOSS |
|--------------------|------------|--------------------|------------|
| 1000               | 4.8        | 6750               | 16.1       |
| 1100               | 5.1        | 7000               | 17.7       |
| 1200               | 5.2        | 7250               | 17.2       |
| 1300               | 5.4        | 7500               | 15.7       |
| 1400               | 5.7        | 7750               | 14.9       |
| 1500               | 6.1        | 8000               | 15.2       |
| 1600               | 6.4        | 8250               | 15.0       |
| 1700               | 6.6        | 8500               | 14.9       |
| 1800               | 6.6        | 8750               | 15.1       |
| 1900               | 6.7        | 9000               | 15.5       |
| 2000               | 6.9        | 9250               | 15.6       |
| 2250               | 7.3        | 9500               | 15.9       |
| 2500               | 7.8        | 9750               | 16.0       |
| 2750               | 8.3        | 10000              | 16.1       |
| 3000               | 8.6        | 10500              | 16.6       |
| 3250               | 9.0        | 11000              | 16.9       |
| 3500               | 9.5        | 11500              | 17.2       |
| 3750               | 9.8        | 12000              | 17.9       |
| 4000               | 10.0       | 12500              | 18.4       |
| 4250               | 10.5       | 13000              | 18.5       |
| 4500               | 10.8       | 13500              | 19.0       |
| 4750               | 11.1       | 14000              | 19.5       |
| 5000               | 11.4       | 14500              | 19.7       |
| 5250               | 11.7       | 15000              | 20.8       |
| 5500               | 12.0       | 15500              | 20.9       |
| 5750               | 12.4       | 16000              | 20.6       |
| 6000               | 12.9       | 16500              | 21.3       |
| 6250               | 13.3       | 17000              | 22.0       |
| 6500               | 14.5       | 17500              | 21.8       |

**SUCOFLEX ANTENNA CABLES**  
Continued  
102\_EA

A/N: 6012 & 6013

**CALIBRATION DATE: JANUARY 15, 2024**

| <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>CABLE LOSS</b> |
|----------------------------|-------------------|----------------------------|-------------------|
| 18000                      | 22.5              | 26500                      | 27.6              |
| 18500                      | 22.7              | 27000                      | 27.9              |
| 19000                      | 22.9              | 28000                      | 28.4              |
| 19500                      | 23.5              | 29000                      | 29.8              |
| 20000                      | 23.9              | 30000                      | 30.1              |
| 20500                      | 24.3              | 31000                      | 31.3              |
| 21000                      | 24.1              | 32000                      | 31.5              |
| 21500                      | 24.5              | 33000                      | 31.7              |
| 22000                      | 24.8              | 34000                      | 31.8              |
| 22500                      | 25.2              | 35000                      | 32.2              |
| 23000                      | 25.5              | 36000                      | 33.3              |
| 23500                      | 25.6              | 37000                      | 34.1              |
| 24000                      | 26.0              | 38000                      | 33.5              |
| 24500                      | 26.6              | 40000                      | 35.4              |
| 25000                      | 26.5              |                            |                   |
| 26000                      | 27.4              |                            |                   |

**COM-POWER PAM-118A****PREAMPLIFIER****S/N: 551015****CALIBRATION DATE: JANUARY 20, 2022**

| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|----------------------------|------------------------|
| 500                        | 39.86                  | 7500                       | 37.03                  |
| 1000                       | 39.80                  | 8000                       | 36.06                  |
| 1100                       | 40.25                  | 8500                       | 36.09                  |
| 1200                       | 39.77                  | 9000                       | 35.68                  |
| 1300                       | 40.12                  | 9500                       | 37.53                  |
| 1400                       | 39.93                  | 10000                      | 36.66                  |
| 1500                       | 40.05                  | 11000                      | 36.94                  |
| 1600                       | 40.00                  | 12000                      | 37.06                  |
| 1700                       | 40.03                  | 13000                      | 36.88                  |
| 1800                       | 40.40                  | 14000                      | 36.33                  |
| 1900                       | 40.02                  | 15000                      | 37.06                  |
| 2000                       | 39.74                  | 16000                      | 38.32                  |
| 2500                       | 39.95                  | 17000                      | 38.32                  |
| 3000                       | 39.99                  | 18000                      | 38.17                  |
| 3500                       | 39.92                  |                            |                        |
| 4000                       | 39.58                  |                            |                        |
| 4500                       | 39.00                  |                            |                        |
| 5000                       | 38.28                  |                            |                        |
| 5500                       | 37.42                  |                            |                        |
| 6000                       | 37.18                  |                            |                        |
| 6500                       | 37.00                  |                            |                        |
| 7000                       | 36.95                  |                            |                        |

**COM-POWER PAM-118A  
PREAMPLIFIER**

S/N: 551015

CALIBRATION DATE: JANUARY 11, 2024

| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|----------------------------|------------------------|
| 500                        | 39.0                   | 7500                       | 37.2                   |
| 1000                       | 39.8                   | 8000                       | 36.6                   |
| 1100                       | 39.6                   | 8500                       | 36.4                   |
| 1200                       | 39.5                   | 9000                       | 36.6                   |
| 1300                       | 39.7                   | 9500                       | 37.4                   |
| 1400                       | 39.7                   | 10000                      | 37.6                   |
| 1500                       | 40.0                   | 11000                      | 36.8                   |
| 1600                       | 39.9                   | 12000                      | 37.1                   |
| 1700                       | 39.9                   | 13000                      | 36.8                   |
| 1800                       | 39.8                   | 14000                      | 35.9                   |
| 1900                       | 40.0                   | 15000                      | 37.3                   |
| 2000                       | 39.9                   | 16000                      | 38.0                   |
| 2500                       | 40.2                   | 17000                      | 37.8                   |
| 3000                       | 40.3                   | 18000                      | 38.0                   |
| 3500                       | 40.3                   |                            |                        |
| 4000                       | 39.7                   |                            |                        |
| 4500                       | 39.0                   |                            |                        |
| 5000                       | 38.3                   |                            |                        |
| 5500                       | 37.4                   |                            |                        |
| 6000                       | 36.6                   |                            |                        |
| 6500                       | 37.2                   |                            |                        |
| 7000                       | 36.8                   |                            |                        |

**COM-POWER PAM-118****PREAMPLIFIER**

S/N: 443009

CALIBRATION DATE: JANUARY 4, 2022

| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|----------------------------|------------------------|
| 500                        | 25.6                   | 9500                       | 21.5                   |
| 1000                       | 24.0                   | 10000                      | 21.8                   |
| 1100                       | 24.3                   | 11000                      | 21.3                   |
| 1200                       | 25.0                   | 12000                      | 21.0                   |
| 1300                       | 25.2                   | 13000                      | 19.8                   |
| 1400                       | 24.9                   | 14000                      | 19.0                   |
| 1500                       | 24.5                   | 15000                      | 19.8                   |
| 1600                       | 24.8                   | 16000                      | 20.1                   |
| 1700                       | 24.8                   | 17000                      | 19.3                   |
| 1800                       | 24.5                   | 18000                      | 18.5                   |
| 1900                       | 25.2                   |                            |                        |
| 2000                       | 24.9                   |                            |                        |
| 2500                       | 24.9                   |                            |                        |
| 3000                       | 24.9                   |                            |                        |
| 3500                       | 24.7                   |                            |                        |
| 4000                       | 24.6                   |                            |                        |
| 4500                       | 23.8                   |                            |                        |
| 5000                       | 23.6                   |                            |                        |
| 5500                       | 22.5                   |                            |                        |
| 6000                       | 21.5                   |                            |                        |
| 6500                       | 20.6                   |                            |                        |
| 7000                       | 20.3                   |                            |                        |
| 7500                       | 20.7                   |                            |                        |
| 8000                       | 21.4                   |                            |                        |
| 8500                       | 22.1                   |                            |                        |
| 9000                       | 22.5                   |                            |                        |

**COM-POWER PAM-840****PREAMPLIFIER**

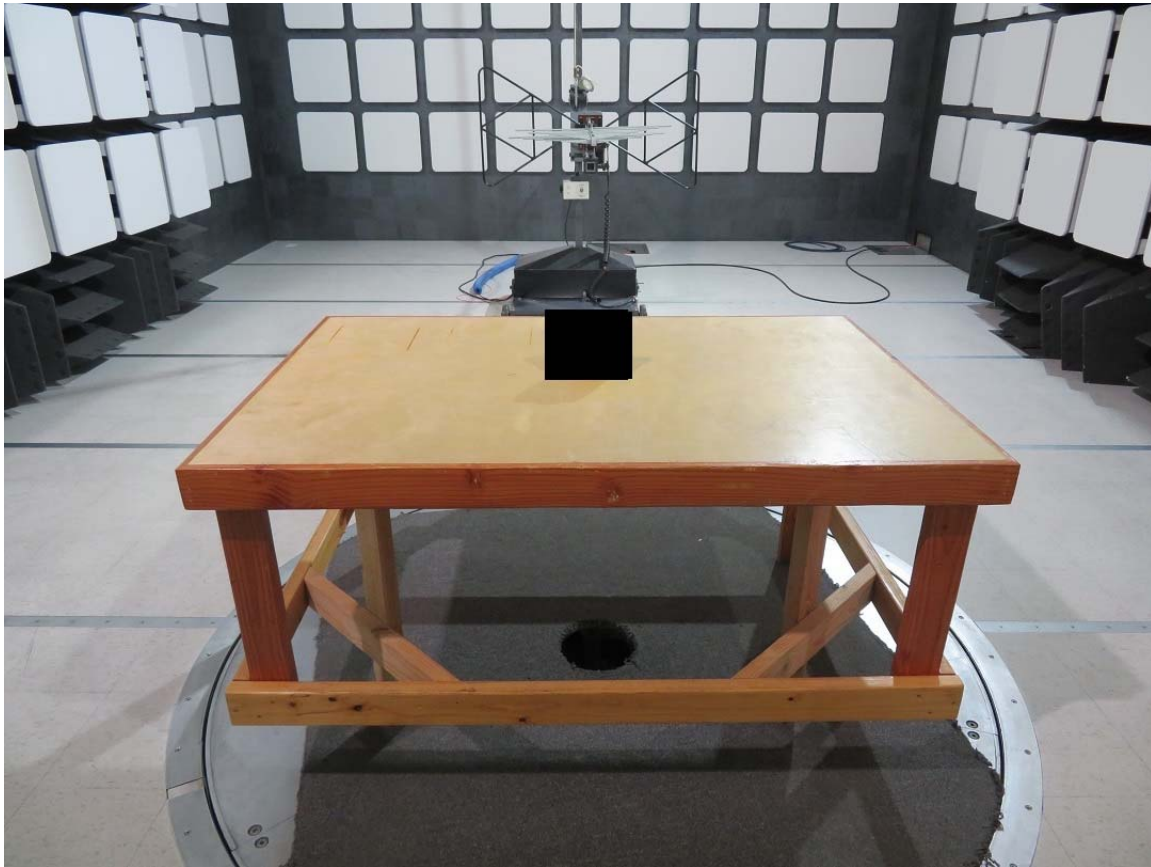
S/N: 461268

CALIBRATION DATE: JANUARY 3, 2023

| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|----------------------------|------------------------|
| 18000                      | 24.13                  | 31500                      | 22.71                  |
| 19000                      | 24.2                   | 32000                      | 22.52                  |
| 20000                      | 25.67                  | 32500                      | 21.74                  |
| 21000                      | 26.25                  | 33000                      | 21.96                  |
| 22000                      | 26.23                  | 33500                      | 21.9                   |
| 23000                      | 26.39                  | 34000                      | 20.28                  |
| 24000                      | 26.07                  | 34500                      | 21.49                  |
| 25000                      | 25.19                  | 35000                      | 21.6                   |
| 26000                      | 23.8                   | 35500                      | 21.05                  |
| 26500                      | 22.5                   | 36000                      | 20.94                  |
| 27000                      | 22.42                  | 36500                      | 21.55                  |
| 27500                      | 22.25                  | 37000                      | 21.94                  |
| 28000                      | 22.58                  | 37500                      | 22.73                  |
| 28500                      | 23.25                  | 38000                      | 22.19                  |
| 29000                      | 22.86                  | 38500                      | 21.23                  |
| 29500                      | 23.24                  | 39000                      | 22.04                  |
| 30000                      | 22.61                  | 39500                      | 22.03                  |
| 30500                      | 22.45                  | 40000                      | 20.44                  |
| 31000                      | 22.48                  |                            |                        |
|                            |                        |                            |                        |
|                            |                        |                            |                        |

**COM-POWER PA-840****PREAMPLIFIER****S/N: 711883****CALIBRATION DATE: JANUARY 17, 2022**

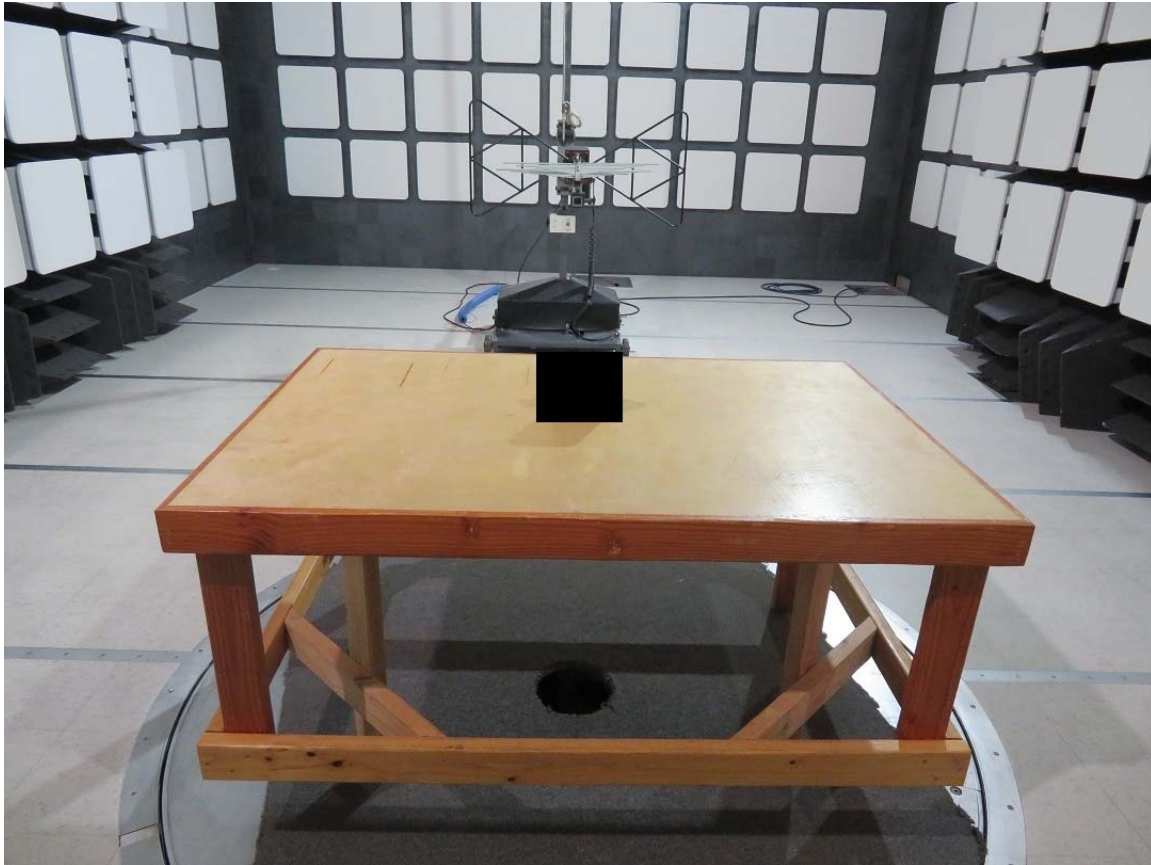
| <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> | <b>FREQUENCY<br/>(MHz)</b> | <b>FACTOR<br/>(dB)</b> |
|----------------------------|------------------------|----------------------------|------------------------|
| 18000                      | 28.9                   | 33500                      | 25.3                   |
| 19000                      | 29.0                   | 34000                      | 25.2                   |
| 20000                      | 28.7                   | 34500                      | 25.7                   |
| 21000                      | 27.4                   | 35000                      | 25.8                   |
| 22000                      | 26.8                   | 35500                      | 26.8                   |
| 23000                      | 27.0                   | 36000                      | 27.4                   |
| 24000                      | 27.3                   | 36500                      | 27.2                   |
| 25000                      | 28.8                   | 37000                      | 29.0                   |
| 26000                      | 28.9                   | 37500                      | 29.6                   |
| 26500                      | 28.3                   | 38000                      | 29.5                   |
| 27000                      | 28.4                   | 38500                      | 27.7                   |
| 27500                      | 27.9                   | 39000                      | 28.2                   |
| 28000                      | 27.7                   | 39500                      | 27.4                   |
| 28500                      | 27.8                   | 40000                      | 27.4                   |
| 29000                      | 27.8                   |                            |                        |
| 29500                      | 27.5                   |                            |                        |
| 30000                      | 26.8                   |                            |                        |
| 30500                      | 27.3                   |                            |                        |
| 31000                      | 26.1                   |                            |                        |
| 31500                      | 26.2                   |                            |                        |
| 32000                      | 26.4                   |                            |                        |
| 32500                      | 26.5                   |                            |                        |
| 33000                      | 25.0                   |                            |                        |



**FRONT VIEW**

MICROWAVE MONOLITHICS INCORPORATED  
RF TRANSMITTER  
MODEL NUMBER: MMI-ARM  
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

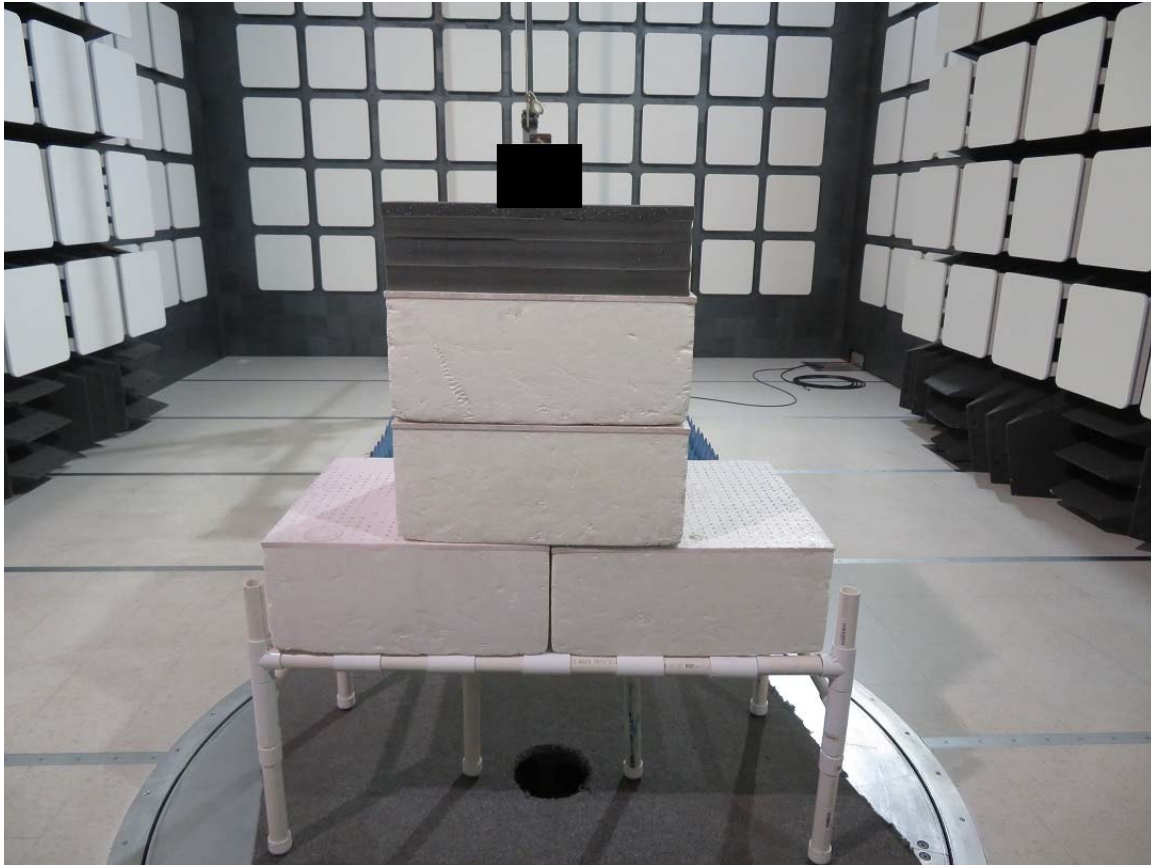
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**REAR VIEW**

MICROWAVE MONOLITHICS INCORPORATED  
RF TRANSMITTER  
MODEL NUMBER: MMI-ARM  
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

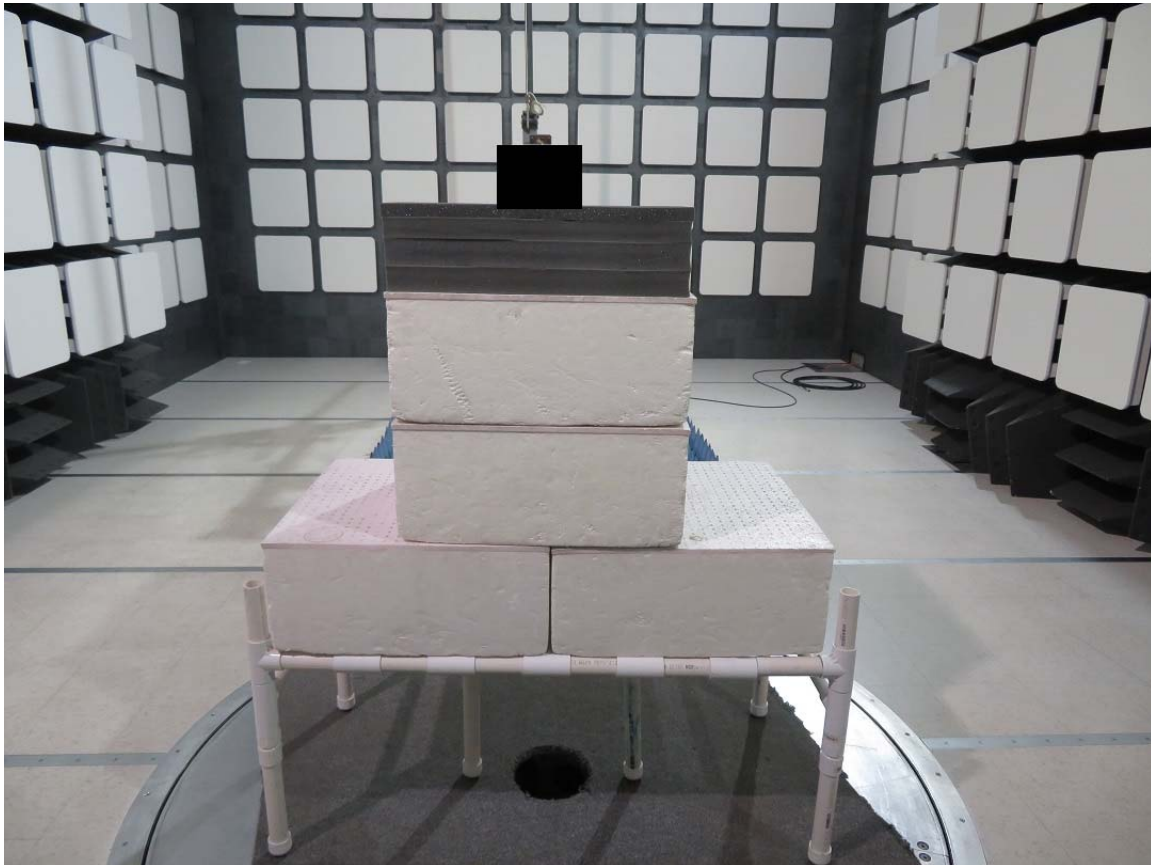
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**FRONT VIEW**

MICROWAVE MONOLITHICS INCORPORATED  
RF TRANSMITTER  
MODEL NUMBER: MMI-ARM  
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**



**REAR VIEW**

MICROWAVE MONOLITHICS INCORPORATED  
RF TRANSMITTER  
MODEL NUMBER: MMI-ARM  
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

**APPENDIX E**

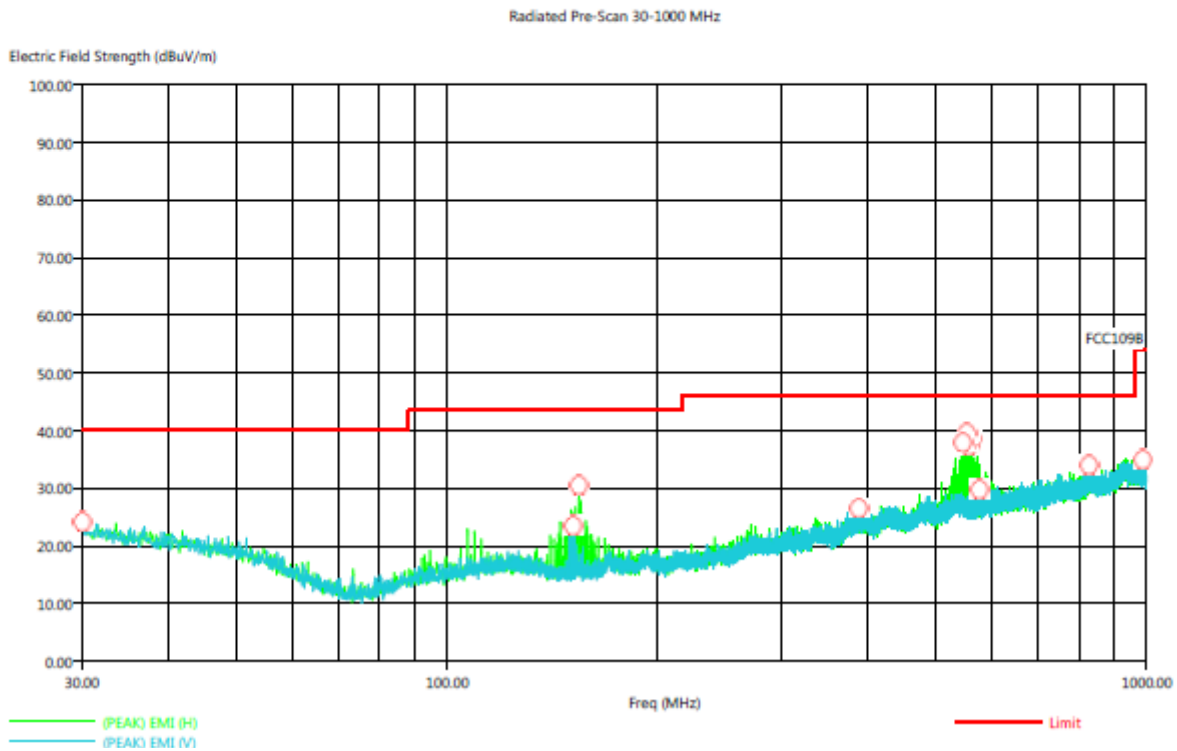
***DATA SHEETS***



***RADIATED EMISSIONS  
(TRANSMITTER)  
DATA SHEETS***

Title: Radiated Pre-Scan 30-1000 MHz  
File: Radiated Pre-Scan 30-1000 MHz z axis mid  
Operator: R. Ramirez  
EUT Type: RF Transmitter  
EUT Condition: Z Axis  
Comments: Lab T  
Clock Oscillators: 2441.75 MHz  
Company: Microwave Monolithics Incorporated  
Model: MMI-ARM  
Temperature: 60 F Humidity: 40 % Pressure: 29.4 inHg  
Tested to: 24.4175 GHz

10/31/2023 10:40:03 AM  
Sequence: Preliminary Scan



Title: Radiated Final 30-1000 MHz  
File: Radiated Final 30-1000 MHz z axis mid  
Operator: R. Ramirez  
EUT Type: RF Transmitter  
EUT Condition: Z Axis  
Comments: Lab T  
Clock Oscillators: 2441.75 MHz  
Company: Microwave Monolithics Incorporated  
Model: MMI-ARM  
Temperature: 60 F Humidity: 40 % Pressure: 29.4 inHg  
Tested to: 24.4175 GHz

10/31/2023 10:56:38 AM  
Sequence: Final Measurements

Data

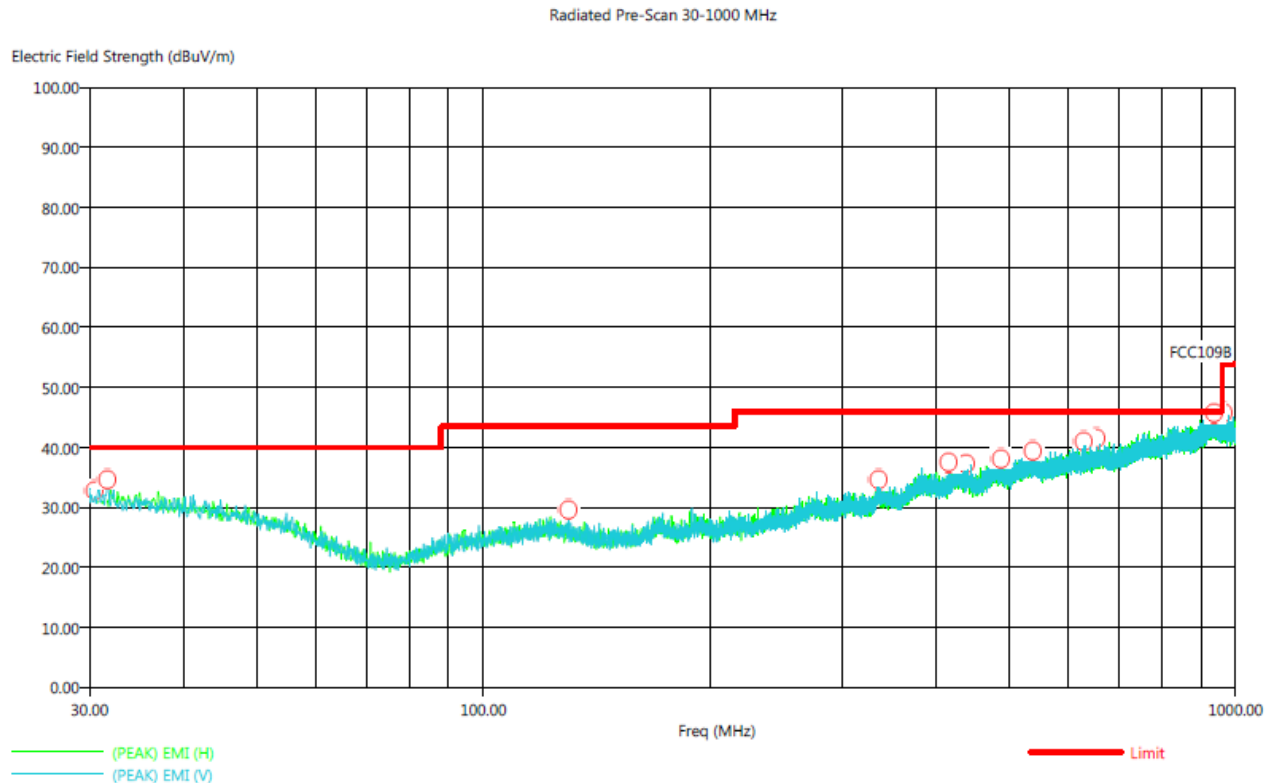
| Freq<br>(MHz) | Pol | (PEAK) Trace<br>(dBuV) | Cable<br>(dB) | Transducer<br>(dB) | (PEAK) EMI<br>(dBuV/m) | (QP) EMI<br>(dBuV/m) | Limit<br>(dBuV/m) | (QP) Margin<br>(dB) | Ttbi Aql<br>(deg) | Twr Hit<br>(cm) |
|---------------|-----|------------------------|---------------|--------------------|------------------------|----------------------|-------------------|---------------------|-------------------|-----------------|
| 30.10         | V   | 0.46                   | 0.72          | 21.85              | 23.03                  | 19.80                | 40.00             | -20.20              | 18.90             | 315.00          |
| 151.50        | V   | 0.45                   | 1.37          | 13.90              | 15.72                  | 12.60                | 43.52             | -30.92              | 40.90             | 185.60          |
| 154.30        | H   | 1.75                   | 1.39          | 13.97              | 17.11                  | 13.58                | 43.52             | -29.94              | 59.70             | 325.30          |
| 387.90        | V   | 2.41                   | 2.37          | 20.94              | 25.72                  | 22.94                | 46.00             | -23.06              | 317.40            | 180.10          |
| 546.20        | H   | 2.24                   | 3.07          | 22.90              | 28.21                  | 27.22                | 46.00             | -18.78              | 148.00            | 168.60          |
| 553.30        | H   | 3.00                   | 3.08          | 22.60              | 28.68                  | 23.50                | 46.00             | -22.50              | 144.70            | 201.30          |
| 556.30        | H   | 0.82                   | 3.05          | 22.60              | 26.47                  | 30.43                | 46.00             | -15.57              | 182.60            | 189.10          |
| 557.60        | H   | 1.28                   | 3.05          | 22.60              | 26.93                  | 26.57                | 46.00             | -19.43              | 190.90            | 225.30          |
| 560.30        | H   | 0.92                   | 3.03          | 22.60              | 26.55                  | 33.41                | 46.00             | -12.59              | 193.90            | 122.50          |
| 563.00        | H   | 0.78                   | 3.01          | 22.60              | 26.39                  | 23.58                | 46.00             | -22.42              | 163.50            | 230.00          |
| 577.30        | V   | 1.66                   | 2.91          | 23.10              | 27.67                  | 23.79                | 46.00             | -22.21              | 92.50             | 250.60          |
| 827.80        | V   | 2.25                   | 3.73          | 26.35              | 32.33                  | 27.95                | 46.00             | -18.05              | 215.70            | 210.20          |
| 988.60        | V   | 1.68                   | 3.87          | 27.18              | 32.74                  | 29.06                | 53.98             | -24.92              | 304.30            | 294.90          |



***RADIATED EMISSIONS  
(RECEIVER)  
DATA SHEETS***

Title: Radiated Pre-Scan 30-1000 MHz  
File: Radiated Pre-Scan 30-1000 MHz z axis final class b  
Operator: R. Ramirez  
EUT Type: RF Transmitter  
EUT Condition: Receiver only, RF transmitter turned off, Z axis  
Comments: Lab T  
Clock Oscillators: 16.368, 32, 40, 52, 902-928 MHz  
Company: Microwave Monolithics Incorporated  
Model: MMI-ARM  
Temperature: 60 F Humidity: 40 % Pressure: 29.4 inHg  
Tested to: 9.280 GHz (no frequencies found above 1 GHz)

10/30/2023 1:56:26 PM  
Sequence: Preliminary Scan



Title: Radiated Final 30-1000 MHz  
File: Radiated Final 30-1000 MHz final class b  
Operator: R. Ramirez  
EUT Type: RF Transmitter  
EUT Condition: Receiver only, RF transmitter turned off, Z axis  
Comments: Lab T  
Clock Oscillators: 16.368, 32, 40, 52, 902-928 MHz  
Company: Microwave Monolithics Incorporated  
Model: MMI-ARM  
Temperature: 60 F Humidity: 40 % Pressure: 29.4 inHg  
Tested to: 9.280 GHz (no frequencies found above 1 GHz)

10/30/2023 2:12:30 PM  
Sequence: Final Measurements

Data

| Freq<br>(MHz) | Pol | (PEAK) Trace<br>(dBuV) | Cable<br>(dB) | Transducer<br>(dB) | (PEAK) EMI<br>(dBuV/m) | (QP) EMI<br>(dBuV/m) | Limit<br>(dBuV/m) | (QP) Margin<br>(dB) | TtBl Aql<br>(deg) | Twr Ht<br>(cm) |
|---------------|-----|------------------------|---------------|--------------------|------------------------|----------------------|-------------------|---------------------|-------------------|----------------|
| 30.50         | H   | 9.97                   | 0.72          | 21.78              | 32.47                  | 28.91                | 40.00             | -11.09              | 315.00            | 211.10         |
| 31.70         | V   | 8.99                   | 0.72          | 21.43              | 31.14                  | 28.65                | 40.00             | -11.35              | 34.50             | 319.10         |
| 130.00        | V   | 9.81                   | 1.28          | 15.19              | 26.28                  | 23.02                | 43.52             | -20.05              | 81.50             | 213.50         |
| 335.50        | H   | 11.88                  | 2.21          | 19.75              | 33.84                  | 28.98                | 46.00             | -17.02              | 18.80             | 180.10         |
| 416.40        | V   | 11.09                  | 2.36          | 21.10              | 34.55                  | 30.86                | 46.00             | -15.14              | 8.00              | 304.20         |
| 438.70        | H   | 10.44                  | 2.28          | 21.72              | 34.44                  | 31.41                | 46.00             | -14.59              | 94.80             | 132.50         |
| 487.40        | V   | 11.36                  | 2.64          | 22.37              | 36.36                  | 32.68                | 46.00             | -13.32              | 248.90            | 228.20         |
| 539.10        | V   | 10.76                  | 3.03          | 23.10              | 36.89                  | 33.81                | 46.00             | -12.19              | 205.20            | 245.70         |
| 629.30        | H   | 11.76                  | 3.00          | 23.80              | 38.56                  | 34.64                | 46.00             | -11.36              | 342.80            | 332.40         |
| 653.70        | H   | 11.71                  | 3.19          | 24.00              | 38.90                  | 34.92                | 46.00             | -11.08              | 64.10             | 180.20         |
| 938.30        | V   | 11.32                  | 3.88          | 27.93              | 43.13                  | 40.15                | 46.00             | -5.85               | 332.30            | 166.90         |
| 963.70        | H   | 12.71                  | 3.90          | 27.55              | 44.16                  | 39.88                | 53.98             | -14.10              | 237.90            | 320.60         |



## HARMONIC EMISSIONS LOW CHANNEL (X AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4802.50        | 41.17             | H         | 73.98 | -32.81 | Peak                  | 199.30                | 140.1                   | In Restricted Band |
| 4802.50        | 29.13             | H         | 53.98 | -24.85 | Avg                   | 199.30                | 140.1                   | In Restricted Band |
| 7203.75        | 46.12             | H         | 73.98 | -27.86 | Peak                  | 175.10                | 58.5                    |                    |
| 7203.75        | 35.76             | H         | 53.98 | -18.22 | Avg                   | 175.10                | 58.5                    |                    |
| 9605.00        | 51.56             | H         | 73.98 | -22.42 | Peak                  | 152.50                | 51.9                    |                    |
| 9605.00        | 39.89             | H         | 53.98 | -14.09 | Avg                   | 152.50                | 51.9                    |                    |
| 12006.25       | 50.33             | H         | 73.98 | -23.65 | Peak                  | 203.40                | 254.3                   | In Restricted Band |
| 12006.25       | 38.39             | H         | 53.98 | -15.59 | Avg                   | 203.40                | 254.3                   | In Restricted Band |
| 14407.50       | 52.62             | H         | 73.98 | -21.36 | Peak                  | 182.90                | 107.9                   |                    |
| 14407.50       | 41.36             | H         | 53.98 | -12.62 | Avg                   | 182.90                | 107.9                   |                    |
| 16808.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 16808.75       |                   |           |       |        |                       |                       |                         |                    |
| 19210.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19210.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21611.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21611.25       |                   |           |       |        |                       |                       |                         |                    |
| 24012.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24012.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS LOW CHANNEL (X AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4802.50        | 41.32             | V         | 73.98 | -32.66 | Peak                  | 243.7                 | 109.7                   | In Restricted Band |
| 4802.50        | 28.31             | V         | 53.98 | -25.67 | Avg                   | 243.7                 | 109.7                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 7203.75        | 47.58             | V         | 73.98 | -26.40 | Peak                  | 269.7                 | 202.9                   |                    |
| 7203.75        | 35.88             | V         | 53.98 | -18.10 | Avg                   | 269.7                 | 202.9                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 9605.00        | 51.30             | V         | 73.98 | -22.68 | Peak                  | 241.3                 | 114.7                   |                    |
| 9605.00        | 39.58             | V         | 53.98 | -14.40 | Avg                   | 241.3                 | 114.7                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 12006.25       | 50.10             | V         | 73.98 | -23.88 | Peak                  | 287.6                 | 352.3                   | In Restricted Band |
| 12006.25       | 38.71             | V         | 53.98 | -15.27 | Avg                   | 287.6                 | 352.3                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 14407.50       | 51.46             | V         | 73.98 | -22.52 | Peak                  | 150.1                 | 312.9                   |                    |
| 14407.50       | 40.95             | V         | 53.98 | -13.03 | Avg                   | 150.1                 | 312.9                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 16808.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 16808.75       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 19210.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19210.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 21611.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21611.25       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 24012.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24012.50       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |

Test distance

3 meter

## HARMONIC EMISSIONS MID CHANNEL (X AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4883.50        | 40.78             | H         | 73.98 | -33.20 | Peak                  | 264.80                | 80.9                    | In Restricted Band |
| 4883.50        | 30.00             | H         | 53.98 | -23.98 | Avg                   | 264.80                | 80.9                    | In Restricted Band |
| 7325.25        | 48.06             | H         | 73.98 | -25.92 | Peak                  | 300.00                | 89.7                    | In Restricted Band |
| 7325.25        | 36.19             | H         | 53.98 | -17.79 | Avg                   | 300.00                | 89.7                    | In Restricted Band |
| 9767.00        | 51.23             | H         | 73.98 | -22.75 | Peak                  | 234.50                | 51.5                    |                    |
| 9767.00        | 39.60             | H         | 53.98 | -14.38 | Avg                   | 234.50                | 51.5                    |                    |
| 12208.75       | 50.59             | H         | 73.98 | -23.39 | Peak                  | 205.40                | 336.5                   | In Restricted Band |
| 12208.75       | 39.60             | H         | 53.98 | -14.38 | Avg                   | 205.40                | 336.5                   | In Restricted Band |
| 14650.50       | 53.19             | H         | 73.98 | -20.79 | Peak                  | 151.80                | 124.5                   |                    |
| 14650.50       | 41.81             | H         | 53.98 | -12.17 | Avg                   | 151.80                | 124.5                   |                    |
| 17092.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17092.25       |                   |           |       |        |                       |                       |                         |                    |
| 19534.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19534.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21975.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21975.75       |                   |           |       |        |                       |                       |                         |                    |
| 24417.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24417.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS MID CHANNEL (X AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4883.50        | 40.83             | V         | 73.98 | -33.15 | Peak                  | 231.3                 | 262                     | In Restricted Band |
| 4883.50        | 29.59             | V         | 53.98 | -24.39 | Avg                   | 231.3                 | 262                     | In Restricted Band |
| 7325.25        | 47.09             | V         | 73.98 | -26.89 | Peak                  | 185.3                 | 28                      | In Restricted Band |
| 7325.25        | 35.96             | V         | 53.98 | -18.02 | Avg                   | 185.3                 | 28                      | In Restricted Band |
| 9767.00        | 50.43             | V         | 73.98 | -23.55 | Peak                  | 191                   | 357.5                   |                    |
| 9767.00        | 39.85             | V         | 53.98 | -14.13 | Avg                   | 191                   | 357.5                   |                    |
| 12208.75       | 49.40             | V         | 73.98 | -24.58 | Peak                  | 151.5                 | 232.1                   | In Restricted Band |
| 12208.75       | 37.98             | V         | 53.98 | -16.00 | Avg                   | 151.5                 | 232.1                   | In Restricted Band |
| 14650.50       | 52.65             | V         | 73.98 | -21.33 | Peak                  | 284.9                 | 106.1                   |                    |
| 14650.50       | 41.36             | V         | 53.98 | -12.62 | Avg                   | 284.9                 | 106.1                   |                    |
| 17092.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17092.25       |                   |           |       |        |                       |                       |                         |                    |
| 19534.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19534.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21975.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21975.75       |                   |           |       |        |                       |                       |                         |                    |
| 24417.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24417.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS HIGH CHANNEL (X AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4952.50        | 40.65             | H         | 73.98 | -33.33 | Peak                  | 170.6                 | 254.7                   | In Restricted Band |
| 4952.50        | 29.58             | H         | 53.98 | -24.40 | Avg                   | 170.6                 | 254.7                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 7428.75        | 46.60             | H         | 73.98 | -27.38 | Peak                  | 252                   | 51.8                    | In Restricted Band |
| 7428.75        | 36.12             | H         | 53.98 | -17.86 | Avg                   | 252                   | 51.8                    | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 9905.00        | 51.86             | H         | 73.98 | -22.12 | Peak                  | 182.8                 | 201.3                   |                    |
| 9905.00        | 40.02             | H         | 53.98 | -13.96 | Avg                   | 182.8                 | 201.3                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 12381.25       | 51.34             | H         | 73.98 | -22.64 | Peak                  | 289.8                 | 81.4                    | In Restricted Band |
| 12381.25       | 38.88             | H         | 53.98 | -15.10 | Avg                   | 289.8                 | 81.4                    | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 14857.50       | 51.53             | H         | 73.98 | -22.45 | Peak                  | 184.3                 | 336.7                   |                    |
| 14857.50       | 39.60             | H         | 53.98 | -14.38 | Avg                   | 184.3                 | 336.7                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 17333.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17333.75       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 19810.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19810.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 22286.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 22286.25       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 24762.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24762.50       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS HIGH CHANNEL (X AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4952.50        | 40.09             | V         | 73.98 | -33.89 | Peak                  | 191.6                 | 35.6                    | In Restricted Band |
| 4952.50        | 28.37             | V         | 53.98 | -25.61 | Avg                   | 191.6                 | 35.6                    | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 7428.75        | 46.52             | V         | 73.98 | -27.46 | Peak                  | 156.1                 | 13.9                    | In Restricted Band |
| 7428.75        | 35.70             | V         | 53.98 | -18.28 | Avg                   | 156.1                 | 13.9                    | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 9905.00        | 50.04             | V         | 73.98 | -23.94 | Peak                  | 194.7                 | 13.7                    |                    |
| 9905.00        | 39.35             | V         | 53.98 | -14.63 | Avg                   | 194.7                 | 13.7                    |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 12381.25       | 50.96             | V         | 73.98 | -23.02 | Peak                  | 162.8                 | 245.6                   | In Restricted Band |
| 12381.25       | 38.97             | V         | 53.98 | -15.01 | Avg                   | 162.8                 | 245.6                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 14857.50       | 50.37             | V         | 73.98 | -23.61 | Peak                  | 263.7                 | 108                     |                    |
| 14857.50       | 38.84             | V         | 53.98 | -15.14 | Avg                   | 263.7                 | 108                     |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 17333.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17333.75       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 19810.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19810.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 22286.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 22286.25       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 24762.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24762.50       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |

Test distance

3 meter

## HARMONIC EMISSIONS LOW CHANNEL (Y AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4802.50        | 40.65             | H         | 73.98 | -33.33 | Peak                  | 169.80                | 242                     | In Restricted Band |
| 4802.50        | 29.40             | H         | 53.98 | -24.58 | Avg                   | 169.80                | 242                     | In Restricted Band |
| 7203.75        | 46.50             | H         | 73.98 | -27.48 | Peak                  | 232.80                | 93.7                    |                    |
| 7203.75        | 35.16             | H         | 53.98 | -18.82 | Avg                   | 232.80                | 93.7                    |                    |
| 9605.00        | 51.00             | H         | 73.98 | -22.98 | Peak                  | 211.20                | 30.2                    |                    |
| 9605.00        | 39.23             | H         | 53.98 | -14.75 | Avg                   | 211.20                | 30.2                    |                    |
| 12006.25       | 48.94             | H         | 73.98 | -25.04 | Peak                  | 215.70                | 300                     | In Restricted Band |
| 12006.25       | 36.67             | H         | 53.98 | -17.31 | Avg                   | 215.70                | 300                     | In Restricted Band |
| 14407.50       | 52.69             | H         | 73.98 | -21.29 | Peak                  | 209.10                | 136.7                   |                    |
| 14407.50       | 41.37             | H         | 53.98 | -12.61 | Avg                   | 209.10                | 136.7                   |                    |
| 16808.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 16808.75       |                   |           |       |        |                       |                       |                         |                    |
| 19210.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19210.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21611.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21611.25       |                   |           |       |        |                       |                       |                         |                    |
| 24012.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24012.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS LOW CHANNEL (Y AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4802.50        | 40.12             | V         | 73.98 | -33.86 | Peak                  | 217.6                 | 234.5                   | In Restricted Band |
| 4802.50        | 27.61             | V         | 53.98 | -26.37 | Avg                   | 217.6                 | 234.5                   | In Restricted Band |
| 7203.75        | 46.44             | V         | 73.98 | -27.54 | Peak                  | 266.7                 | 201.9                   |                    |
| 7203.75        | 35.96             | V         | 53.98 | -18.02 | Avg                   | 266.7                 | 201.9                   |                    |
| 9605.00        | 50.72             | V         | 73.98 | -23.26 | Peak                  | 272                   | 124.1                   |                    |
| 9605.00        | 39.89             | V         | 53.98 | -14.09 | Avg                   | 272                   | 124.1                   |                    |
| 12006.25       | 50.28             | V         | 73.98 | -23.70 | Peak                  | 245.5                 | 167.9                   | In Restricted Band |
| 12006.25       | 38.89             | V         | 53.98 | -15.09 | Avg                   | 245.5                 | 167.9                   | In Restricted Band |
| 14407.50       | 51.51             | V         | 73.98 | -22.47 | Peak                  | 229.4                 | 354.8                   |                    |
| 14407.50       | 40.52             | V         | 53.98 | -13.46 | Avg                   | 229.4                 | 354.8                   |                    |
| 16808.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 16808.75       |                   |           |       |        |                       |                       |                         |                    |
| 19210.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19210.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21611.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21611.25       |                   |           |       |        |                       |                       |                         |                    |
| 24012.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24012.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS MID CHANNEL (Y AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated  
EUT: RF Transmitter  
Model: MMI-ARM

Date: 11/2/2023  
Lab: T  
Test  
Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4883.50        | 40.54             | H         | 73.98 | -33.44 | Peak                  | 232.50                | 98.5                    | In Restricted Band |
| 4883.50        | 29.62             | H         | 53.98 | -24.36 | Avg                   | 98.50                 | 98.5                    | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 7325.25        | 46.57             | H         | 73.98 | -27.41 | Peak                  | 283.00                | 188.6                   | In Restricted Band |
| 7325.25        | 35.16             | H         | 53.98 | -18.82 | Avg                   | 188.60                | 188.6                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 9767.00        | 50.18             | H         | 73.98 | -23.80 | Peak                  | 194.80                | 215.7                   |                    |
| 9767.00        | 39.15             | H         | 53.98 | -14.83 | Avg                   | 194.80                | 215.7                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 12208.75       | 50.28             | H         | 73.98 | -23.70 | Peak                  | 263.50                | 274.3                   | In Restricted Band |
| 12208.75       | 38.71             | H         | 53.98 | -15.27 | Avg                   | 263.50                | 274.3                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 14650.50       | 52.39             | H         | 73.98 | -21.59 | Peak                  | 277.10                | 124.3                   |                    |
| 14650.50       | 41.29             | H         | 53.98 | -12.69 | Avg                   | 277.10                | 124.3                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 17092.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17092.25       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 19534.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19534.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 21975.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21975.75       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 24417.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24417.50       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS MID CHANNEL (Y AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated  
EUT: RF Transmitter  
Model: MMI-ARM

Date: 11/2/2023  
Lab: T  
Test  
Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4883.50        | 40.35             | V         | 73.98 | -33.63 | Peak                  | 264                   | 36.9                    | In Restricted Band |
| 4883.50        | 29.38             | V         | 53.98 | -24.60 | Avg                   | 264                   | 36.9                    | In Restricted Band |
| 7325.25        | 47.01             | V         | 73.98 | -26.97 | Peak                  | 294.4                 | 162.5                   | In Restricted Band |
| 7325.25        | 35.74             | V         | 53.98 | -18.24 | Avg                   | 294.4                 | 162.5                   | In Restricted Band |
| 9767.00        | 50.78             | V         | 73.98 | -23.20 | Peak                  | 273.2                 | 244.8                   |                    |
| 9767.00        | 40.17             | V         | 53.98 | -13.81 | Avg                   | 273.2                 | 244.8                   |                    |
| 12208.75       | 50.59             | V         | 73.98 | -23.39 | Peak                  | 253.8                 | 2.8                     | In Restricted Band |
| 12208.75       | 38.87             | V         | 53.98 | -15.11 | Avg                   | 253.8                 | 2.8                     | In Restricted Band |
| 14650.50       | 53.63             | V         | 73.98 | -20.35 | Peak                  | 249.4                 | 110.9                   |                    |
| 14650.50       | 41.19             | V         | 53.98 | -12.79 | Avg                   | 249.4                 | 110.9                   |                    |
| 17092.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17092.25       |                   |           |       |        |                       |                       |                         |                    |
| 19534.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19534.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21975.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21975.75       |                   |           |       |        |                       |                       |                         |                    |
| 24417.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24417.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS HIGH CHANNEL (Y AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated  
EUT: RF Transmitter  
Model: MMI-ARM

Date: 11/1/2023  
Lab: T  
Test  
Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4952.50        | 39.31             | H         | 73.98 | -34.67 | Peak                  | 251.3                 | 322.2                   | In Restricted Band |
| 4952.50        | 28.47             | H         | 53.98 | -25.51 | Avg                   | 251.3                 | 322.2                   | In Restricted Band |
| 7428.75        | 47.32             | H         | 73.98 | -26.66 | Peak                  | 173                   | 146.6                   | In Restricted Band |
| 7428.75        | 36.28             | H         | 53.98 | -17.70 | Avg                   | 173                   | 146.6                   | In Restricted Band |
| 9905.00        | 50.90             | H         | 73.98 | -23.08 | Peak                  | 262.5                 | 209.3                   |                    |
| 9905.00        | 39.91             | H         | 53.98 | -14.07 | Avg                   | 262.5                 | 209.3                   |                    |
| 12381.25       | 50.77             | H         | 73.98 | -23.21 | Peak                  | 203.4                 | 201.4                   | In Restricted Band |
| 12381.25       | 28.98             | H         | 53.98 | -25.00 | Avg                   | 203.4                 | 201.4                   | In Restricted Band |
| 14857.50       | 50.05             | H         | 73.98 | -23.93 | Peak                  | 206.9                 | 144.7                   |                    |
| 14857.50       | 39.62             | H         | 53.98 | -14.36 | Avg                   | 206.9                 | 144.7                   |                    |
| 17333.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17333.75       |                   |           |       |        |                       |                       |                         |                    |
| 19810.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19810.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 22286.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 22286.25       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 24762.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24762.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS HIGH CHANNEL (Y AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/1/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4952.50        | 40.81             | V         | 73.98 | -33.17 | Peak                  | 171.2                 | 288.3                   | In Restricted Band |
| 4952.50        | 29.43             | V         | 53.98 | -24.55 | Avg                   | 171.2                 | 288.3                   | In Restricted Band |
| 7428.75        | 46.67             | V         | 73.98 | -27.31 | Peak                  | 219.6                 | 177.7                   | In Restricted Band |
| 7428.75        | 35.61             | V         | 53.98 | -18.37 | Avg                   | 219.6                 | 177.7                   | In Restricted Band |
| 9905.00        | 50.07             | V         | 73.98 | -23.91 | Peak                  | 293.3                 | 129.6                   |                    |
| 9905.00        | 39.01             | V         | 53.98 | -14.97 | Avg                   | 293.3                 | 129.6                   |                    |
| 12381.25       | 50.59             | V         | 73.98 | -23.39 | Peak                  | 175                   | 94.5                    | In Restricted Band |
| 12381.25       | 38.75             | V         | 53.98 | -15.23 | Avg                   | 175                   | 94.5                    | In Restricted Band |
| 14857.50       | 53.71             | V         | 73.98 | -20.27 | Peak                  | 287.7                 | 8.4                     |                    |
| 14857.50       | 41.90             | V         | 53.98 | -12.08 | Avg                   | 287.7                 | 8.4                     |                    |
| 17333.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17333.75       |                   |           |       |        |                       |                       |                         |                    |
| 19810.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19810.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 22286.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 22286.25       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 24762.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24762.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS LOW CHANNEL (Z AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4802.50        | 40.02             | H         | 73.98 | -33.96 | Peak                  | 268.90                | 114.3                   | In Restricted Band |
| 4802.50        | 29.34             | H         | 53.98 | -24.64 | Avg                   | 268.90                | 114.3                   | In Restricted Band |
| 7203.75        | 46.52             | H         | 73.98 | -27.46 | Peak                  | 202.10                | 179.5                   |                    |
| 7203.75        | 35.84             | H         | 53.98 | -18.14 | Avg                   | 202.10                | 179.5                   |                    |
| 9605.00        | 51.61             | H         | 73.98 | -22.37 | Peak                  | 190.10                | 221.5                   |                    |
| 9605.00        | 39.48             | H         | 53.98 | -14.50 | Avg                   | 190.10                | 221.5                   |                    |
| 12006.25       | 51.86             | H         | 73.98 | -22.12 | Peak                  | 237.90                | 101.1                   | In Restricted Band |
| 12006.25       | 39.75             | H         | 53.98 | -14.23 | Avg                   | 237.90                | 101.1                   | In Restricted Band |
| 14407.50       | 53.31             | H         | 73.98 | -20.67 | Peak                  | 150.00                | 168.1                   |                    |
| 14407.50       | 42.00             | H         | 53.98 | -11.98 | Avg                   | 150.00                | 168.1                   |                    |
| 16808.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 16808.75       |                   |           |       |        |                       |                       |                         |                    |
| 19210.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19210.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21611.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21611.25       |                   |           |       |        |                       |                       |                         |                    |
| 24012.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24012.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS LOW CHANNEL (Z AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4802.50        | 40.78             | V         | 73.98 | -33.20 | Peak                  | 281.7                 | 93.3                    | In Restricted Band |
| 4802.50        | 29.47             | V         | 53.98 | -24.51 | Avg                   | 281.7                 | 93.3                    | In Restricted Band |
| 7203.75        | 47.22             | V         | 73.98 | -26.76 | Peak                  | 201                   | 163.5                   |                    |
| 7203.75        | 36.29             | V         | 53.98 | -17.69 | Avg                   | 201                   | 163.5                   |                    |
| 9605.00        | 52.14             | V         | 73.98 | -21.84 | Peak                  | 279.2                 | 159.1                   |                    |
| 9605.00        | 39.84             | V         | 53.98 | -14.14 | Avg                   | 279.2                 | 159.1                   |                    |
| 12006.25       | 50.10             | V         | 73.98 | -23.88 | Peak                  | 239.9                 | 72.5                    | In Restricted Band |
| 12006.25       | 38.86             | V         | 53.98 | -15.12 | Avg                   | 239.9                 | 72.5                    | In Restricted Band |
| 14407.50       | 52.25             | V         | 73.98 | -21.73 | Peak                  | 299.1                 | 307.2                   |                    |
| 14407.50       | 40.38             | V         | 53.98 | -13.60 | Avg                   | 299.1                 | 307.2                   |                    |
| 16808.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 16808.75       |                   |           |       |        |                       |                       |                         |                    |
| 19210.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19210.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21611.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21611.25       |                   |           |       |        |                       |                       |                         |                    |
| 24012.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24012.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS MID CHANNEL (Z AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4883.50        | 41.66             | H         | 73.98 | -32.32 | Peak                  | 253.90                | 113.9                   | In Restricted Band |
| 4883.50        | 29.77             | H         | 53.98 | -24.21 | Avg                   | 253.90                | 113.9                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 7325.25        | 47.81             | H         | 73.98 | -26.17 | Peak                  | 275.70                | 105.1                   | In Restricted Band |
| 7325.25        | 36.31             | H         | 53.98 | -17.67 | Avg                   | 275.70                | 105.1                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 9767.00        | 51.08             | H         | 73.98 | -22.90 | Peak                  | 288.40                | 260.4                   |                    |
| 9767.00        | 39.84             | H         | 53.98 | -14.14 | Avg                   | 288.40                | 260.4                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 12208.75       | 49.09             | H         | 73.98 | -24.89 | Peak                  | 213.20                | 97.6                    | In Restricted Band |
| 12208.75       | 38.77             | H         | 53.98 | -15.21 | Avg                   | 213.20                | 97.6                    | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 14650.50       | 52.29             | H         | 73.98 | -21.69 | Peak                  | 222.30                | 106.9                   |                    |
| 14650.50       | 41.11             | H         | 53.98 | -12.87 | Avg                   | 222.30                | 106.9                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 17092.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17092.25       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 19534.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19534.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 21975.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21975.75       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 24417.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24417.50       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS MID CHANNEL (Z AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4883.50        | 41.34             | V         | 73.98 | -32.64 | Peak                  | 257.2                 | 190                     | In Restricted Band |
| 4883.50        | 29.52             | V         | 53.98 | -24.46 | Avg                   | 257.2                 | 190                     | In Restricted Band |
| 7325.25        | 47.68             | V         | 73.98 | -26.30 | Peak                  | 298.9                 | 160.5                   | In Restricted Band |
| 7325.25        | 36.25             | V         | 53.98 | -17.73 | Avg                   | 298.9                 | 160.5                   | In Restricted Band |
| 9767.00        | 50.93             | V         | 73.98 | -23.05 | Peak                  | 150                   | 234                     |                    |
| 9767.00        | 39.02             | V         | 53.98 | -14.96 | Avg                   | 150                   | 234                     |                    |
| 12208.75       | 49.46             | V         | 73.98 | -24.52 | Peak                  | 284.9                 | 83.1                    | In Restricted Band |
| 12208.75       | 38.33             | V         | 53.98 | -15.65 | Avg                   | 284.9                 | 83.1                    | In Restricted Band |
| 14650.50       | 52.99             | V         | 73.98 | -20.99 | Peak                  | 164.7                 | 131.3                   |                    |
| 14650.50       | 41.04             | V         | 53.98 | -12.94 | Avg                   | 164.7                 | 131.3                   |                    |
| 17092.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17092.25       |                   |           |       |        |                       |                       |                         |                    |
| 19534.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19534.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 21975.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 21975.75       |                   |           |       |        |                       |                       |                         |                    |
| 24417.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24417.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS HIGH CHANNEL (Z AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated

EUT: RF Transmitter

Model: MMI-ARM

Date: 11/2/2023

Lab: T

Test

ENG: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4952.50        | 39.17             | H         | 73.98 | -34.81 | Peak                  | 179.2                 | 171                     | In Restricted Band |
| 4952.50        | 28.69             | H         | 53.98 | -25.29 | Avg                   | 179.2                 | 171                     | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 7428.75        | 47.76             | H         | 73.98 | -26.22 | Peak                  | 236.8                 | 187.1                   | In Restricted Band |
| 7428.75        | 36.51             | H         | 53.98 | -17.47 | Avg                   | 236.8                 | 187.1                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 9905.00        | 50.45             | H         | 73.98 | -23.53 | Peak                  | 256.8                 | 359                     |                    |
| 9905.00        | 39.28             | H         | 53.98 | -14.70 | Avg                   | 256.8                 | 359                     |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 12381.25       | 49.82             | H         | 73.98 | -24.16 | Peak                  | 164.4                 | 190.2                   | In Restricted Band |
| 12381.25       | 39.13             | H         | 53.98 | -14.85 | Avg                   | 164.4                 | 190.2                   | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 14857.50       | 52.94             | H         | 73.98 | -21.04 | Peak                  | 290.5                 | 117.7                   |                    |
| 14857.50       | 41.88             | H         | 53.98 | -12.10 | Avg                   | 290.5                 | 117.7                   |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 17333.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17333.75       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |
| 19810.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19810.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 22286.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 22286.25       |                   |           |       |        |                       |                       |                         | In Restricted Band |
|                |                   |           |       |        |                       |                       |                         |                    |
| 24762.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24762.50       |                   |           |       |        |                       |                       |                         |                    |
|                |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

## HARMONIC EMISSIONS HIGH CHANNEL (Z AXIS)

**FCC 15.247**

Company: Microwave Monolithics Incorporated  
EUT: RF Transmitter  
Model: MMI-ARM

Date: 11/3/2023  
Lab: T  
Test  
Eng: R. Ramirez

**Compatible Electronics, Inc. ( Lab T )**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Pol (v/h) | Limit | Margin | Peak /<br>QP /<br>Avg | Ant.<br>Height<br>(m) | Table<br>Angle<br>(deg) | Comments           |
|----------------|-------------------|-----------|-------|--------|-----------------------|-----------------------|-------------------------|--------------------|
| 4952.50        | 41.58             | V         | 73.98 | -32.40 | Peak                  | 266.4                 | 146.3                   | In Restricted Band |
| 4952.50        | 30.33             | V         | 53.98 | -23.65 | Avg                   | 266.4                 | 146.3                   | In Restricted Band |
| 7428.75        | 47.24             | V         | 73.98 | -26.74 | Peak                  | 300                   | 203.8                   | In Restricted Band |
| 7428.75        | 36.46             | V         | 53.98 | -17.52 | Avg                   | 300                   | 203.8                   | In Restricted Band |
| 9905.00        | 51.35             | V         | 73.98 | -22.63 | Peak                  | 295                   | 97.5                    |                    |
| 9905.00        | 40.43             | V         | 53.98 | -13.55 | Avg                   | 295                   | 97.5                    |                    |
| 12381.25       | 51.17             | V         | 73.98 | -22.81 | Peak                  | 211.7                 | 359.1                   | In Restricted Band |
| 12381.25       | 39.55             | V         | 53.98 | -14.43 | Avg                   | 211.7                 | 359.1                   | In Restricted Band |
| 14857.50       | 50.92             | V         | 73.98 | -23.06 | Peak                  | 300.1                 | 17.8                    |                    |
| 14857.50       | 39.80             | V         | 53.98 | -14.18 | Avg                   | 300.1                 | 17.8                    |                    |
| 17333.75       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 17333.75       |                   |           |       |        |                       |                       |                         |                    |
| 19810.00       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 19810.00       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 22286.25       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 22286.25       |                   |           |       |        |                       |                       |                         | In Restricted Band |
| 24762.50       |                   |           |       |        |                       |                       |                         | No Frequency Found |
| 24762.50       |                   |           |       |        |                       |                       |                         |                    |

Test distance  
3 meter

***DTS BANDWIDTH***

***DATA SHEETS***



DTS Bandwidth – Low Channel



DTS Bandwidth – Middle Channel

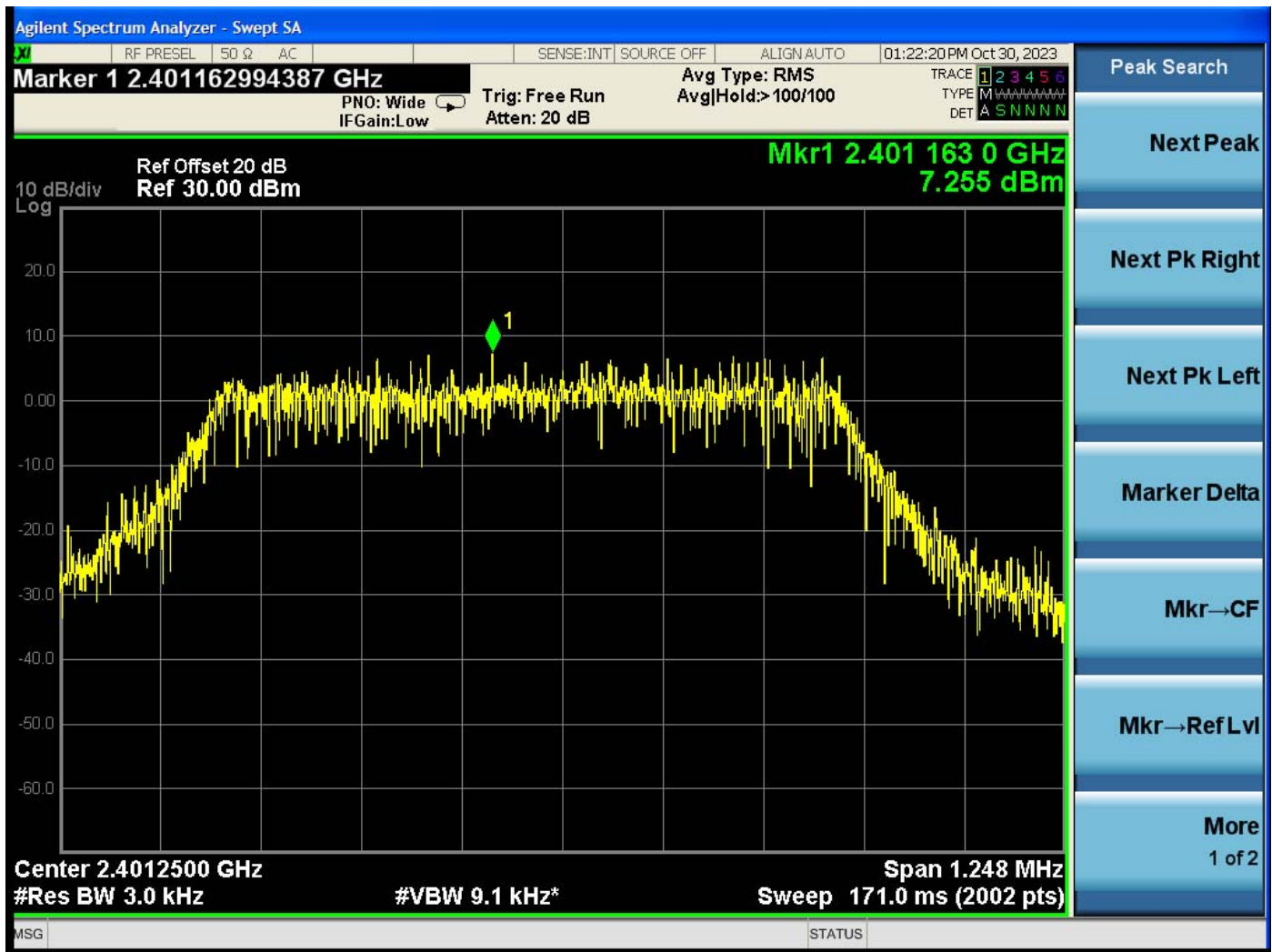


DTS Bandwidth – High Channel



***POWER SPECTRAL DENSITY OUTPUT***

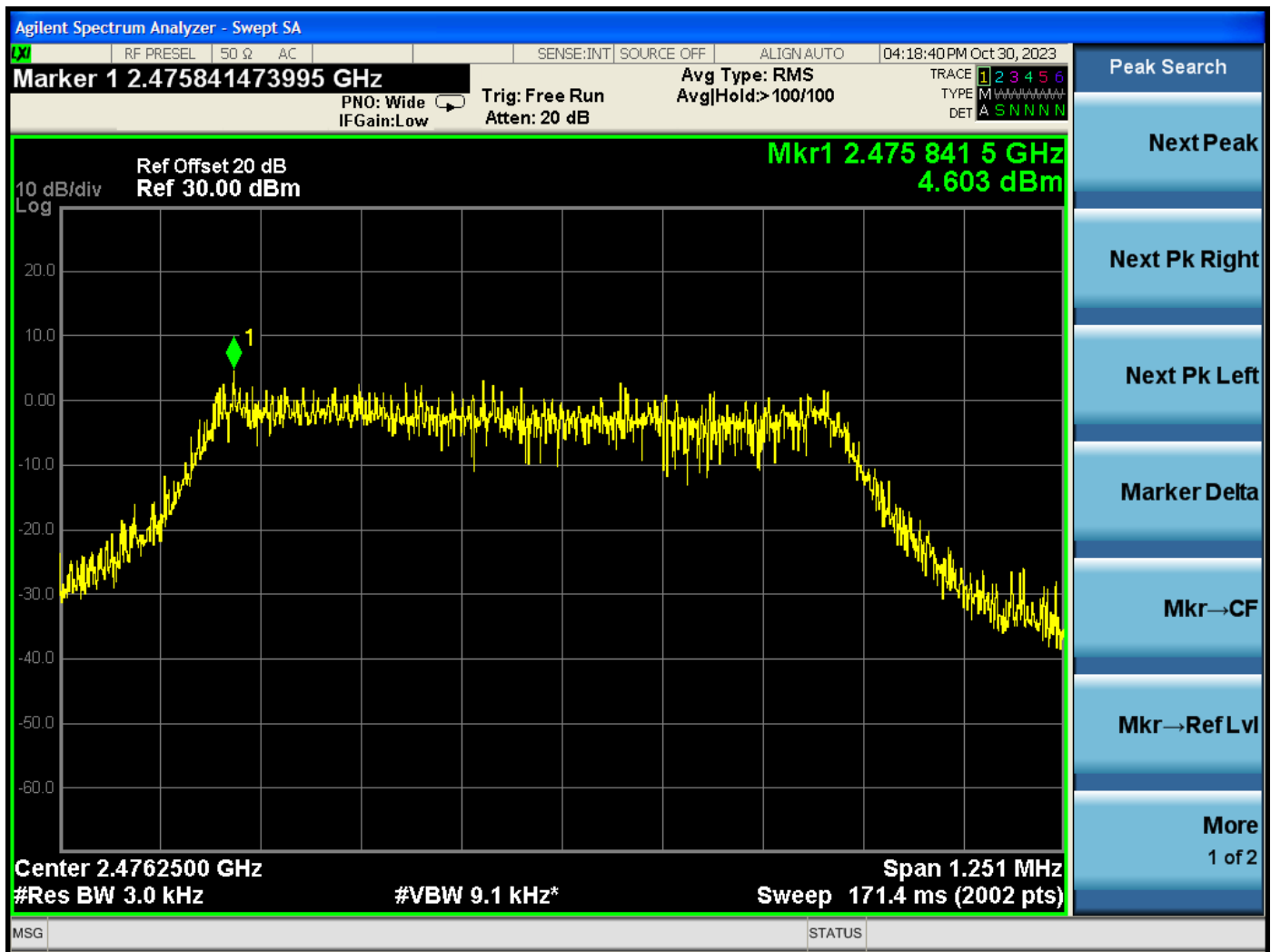
***DATA SHEETS***



Power Spectral Density – Low Channel



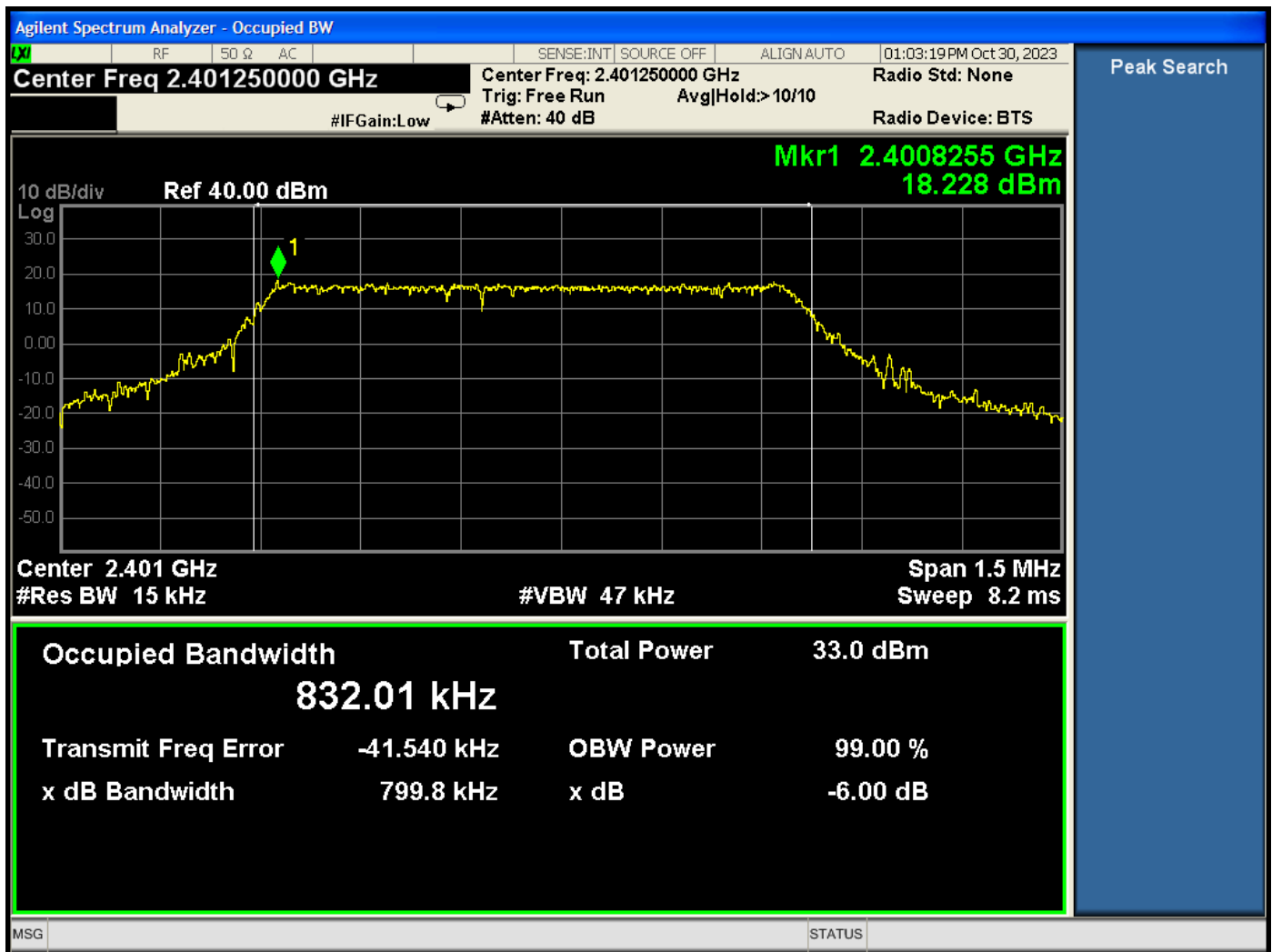
Power Spectral Density – Middle Channel



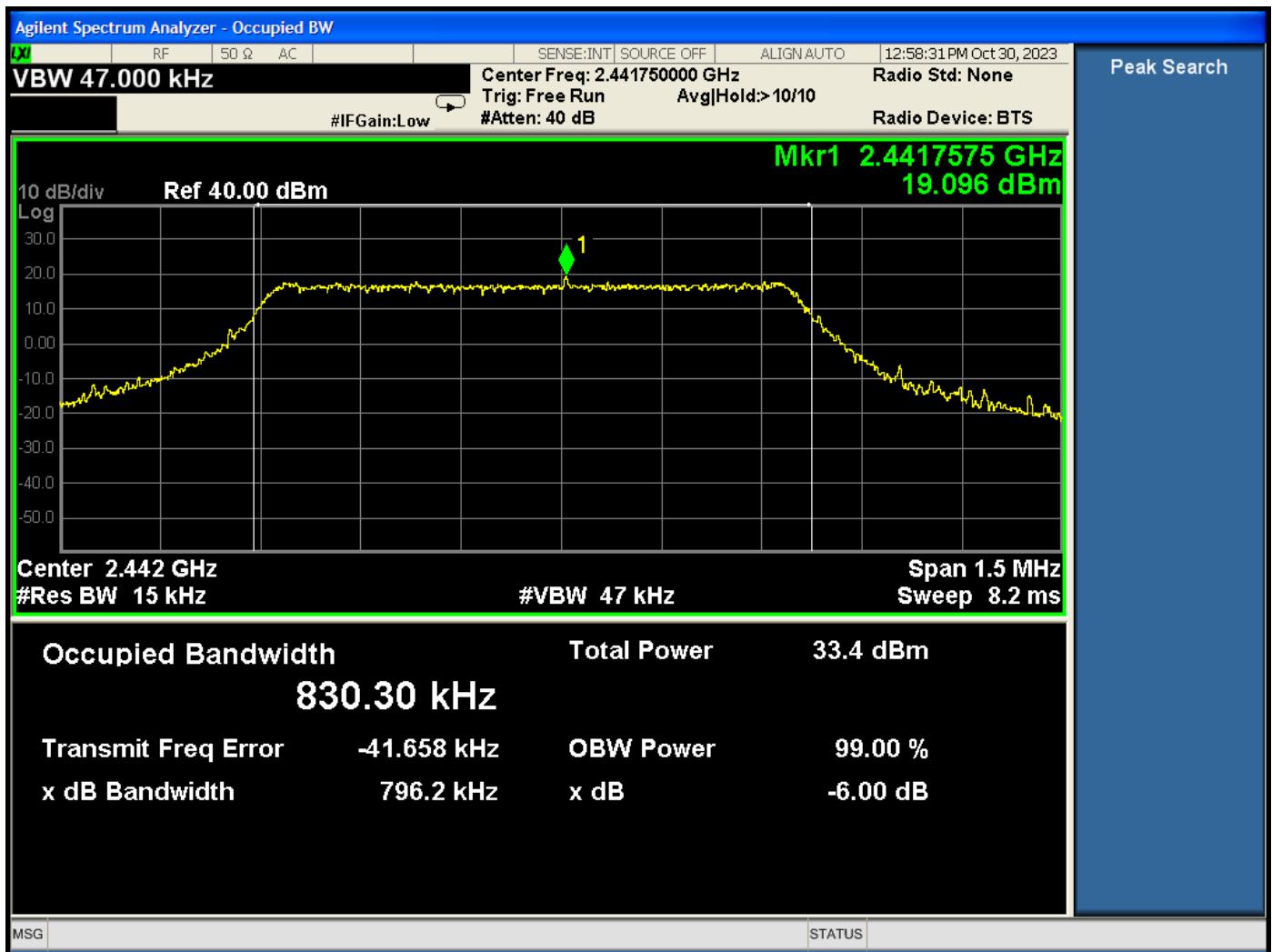
Power Spectral Density – High Channel

***OCCUPIED BANDWIDTH – POWER BANDWIDTH (99%)***

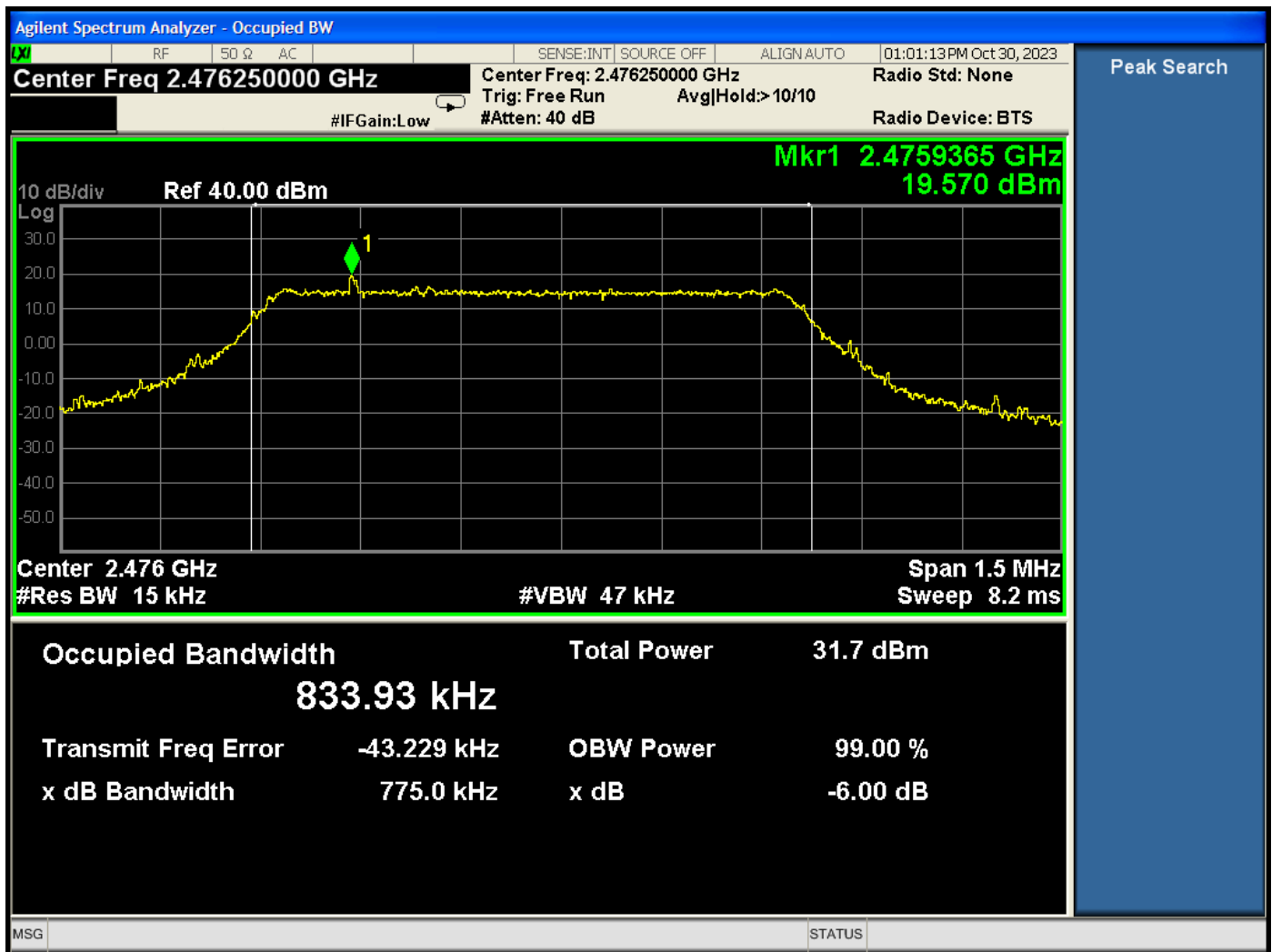
***DATA SHEETS***



Occupied Bandwidth – Power Bandwidth (99%) – Low Channel



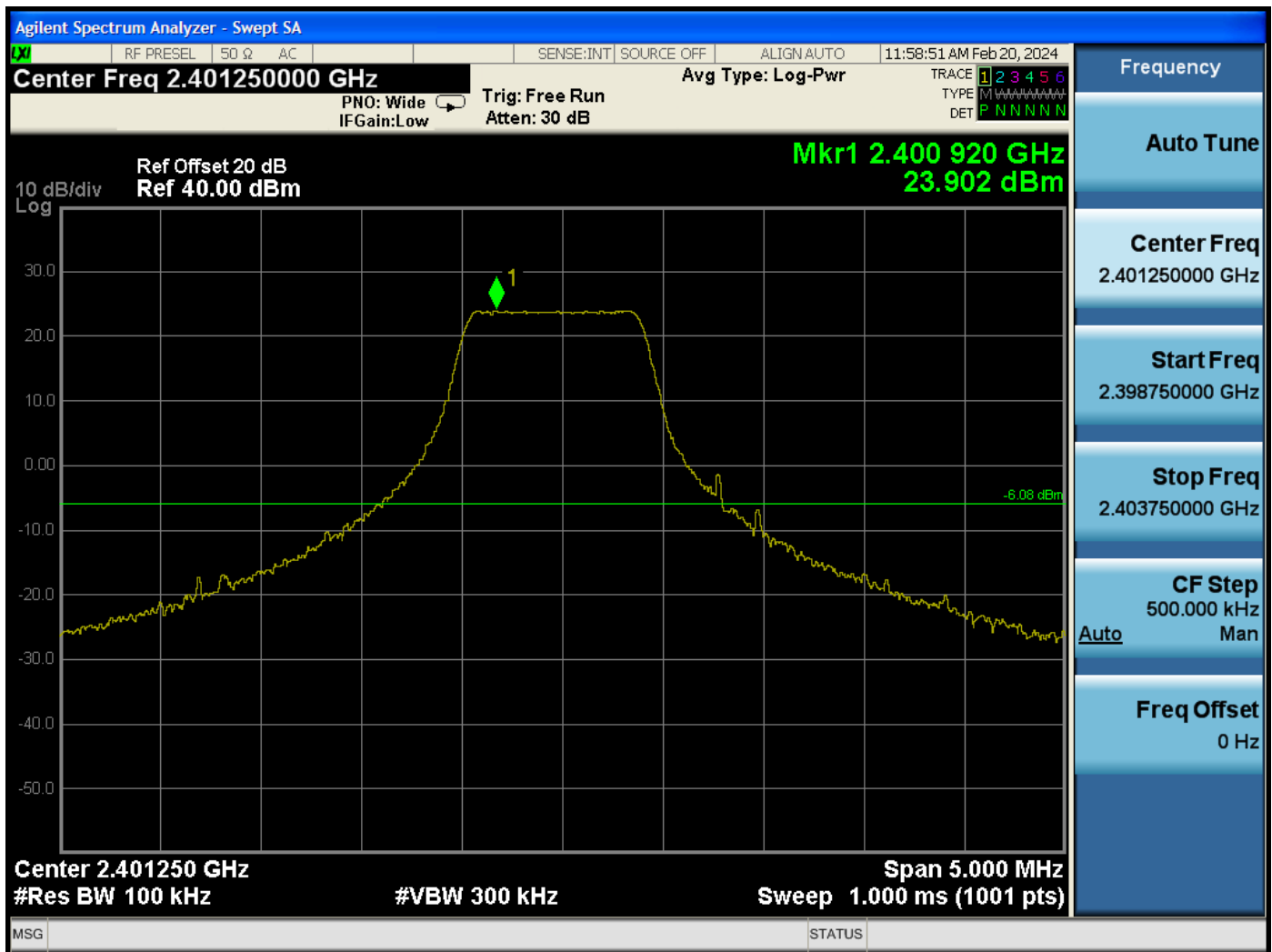
Occupied Bandwidth – Power Bandwidth (99%) – Middle Channel



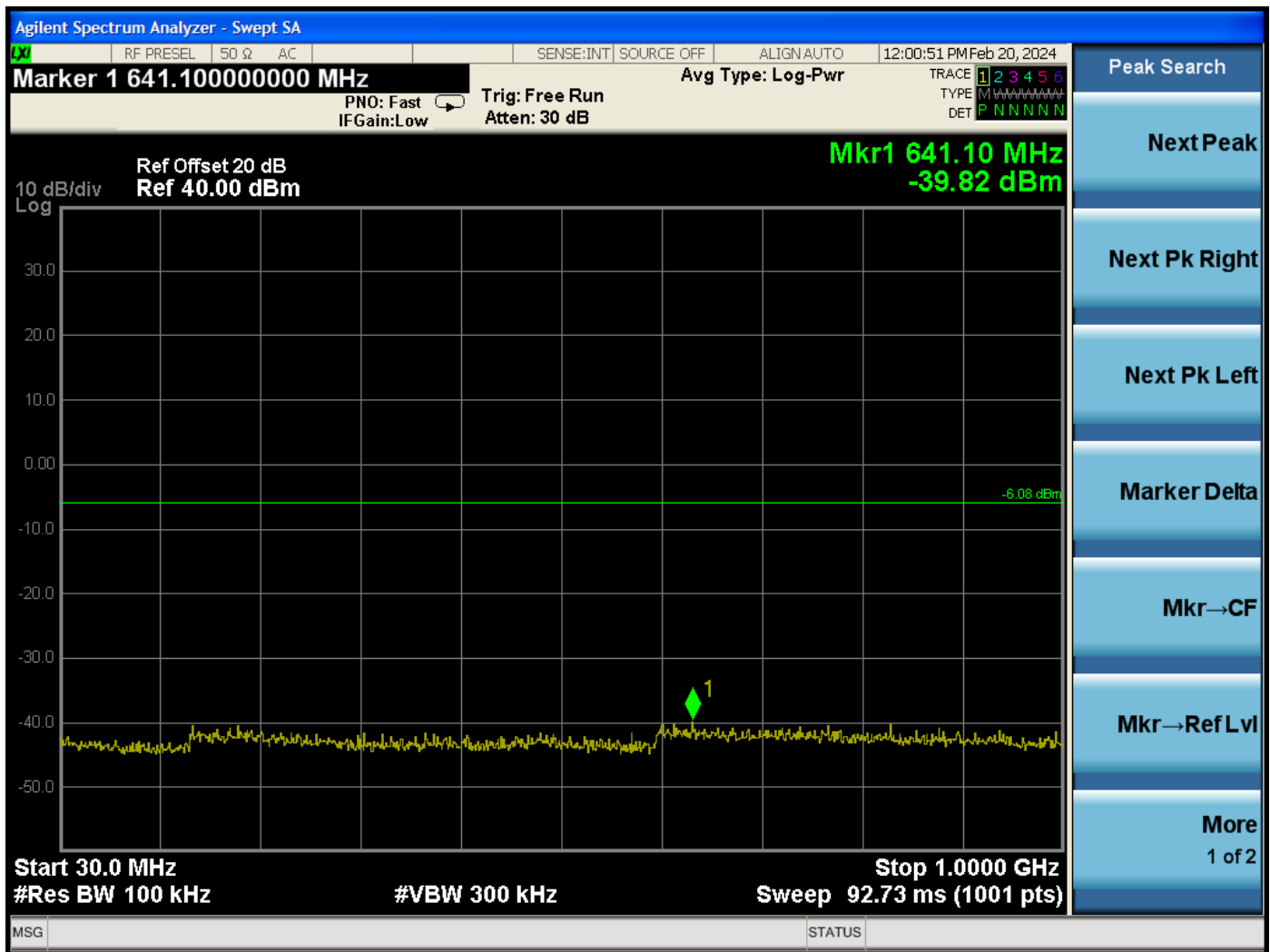
Occupied Bandwidth – Power Bandwidth (99%) – High Channel



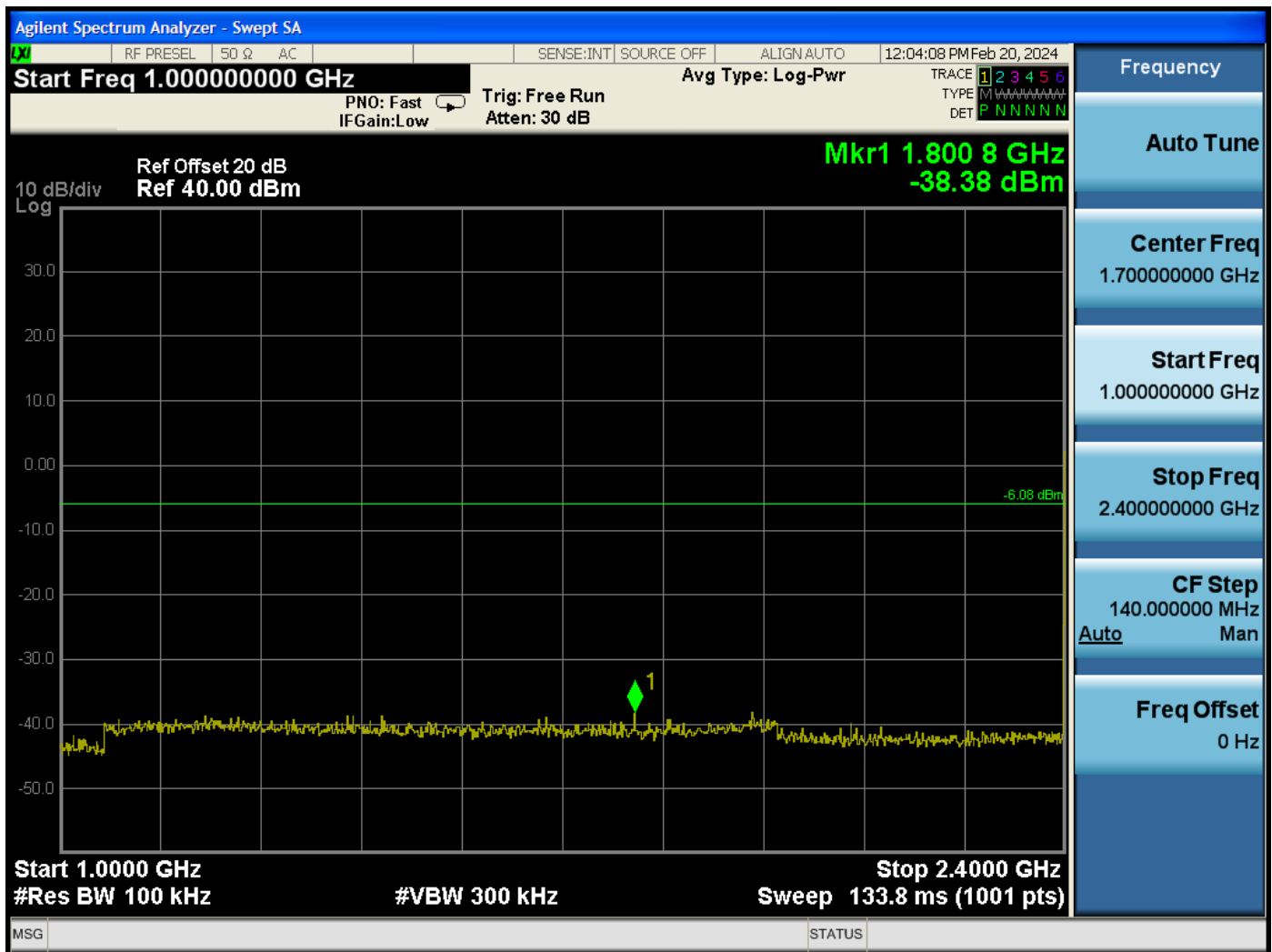
***RF ANTENNA CONDUCTED  
DATA SHEETS***



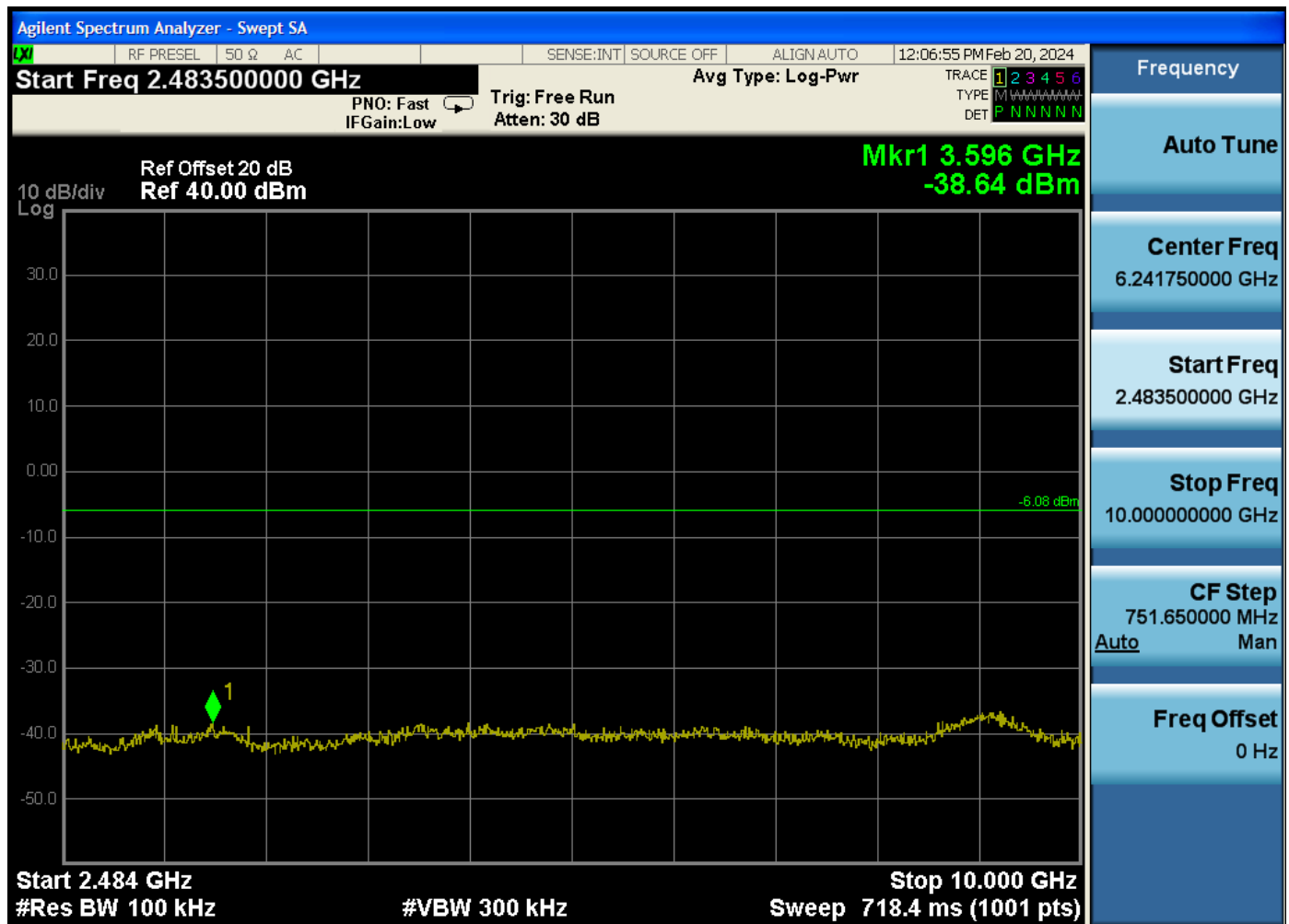
RF Antenna Conducted Test – Low Channel – Reference Level



RF Antenna Conducted Test – Low Channel – 30 MHz to 1 GHz



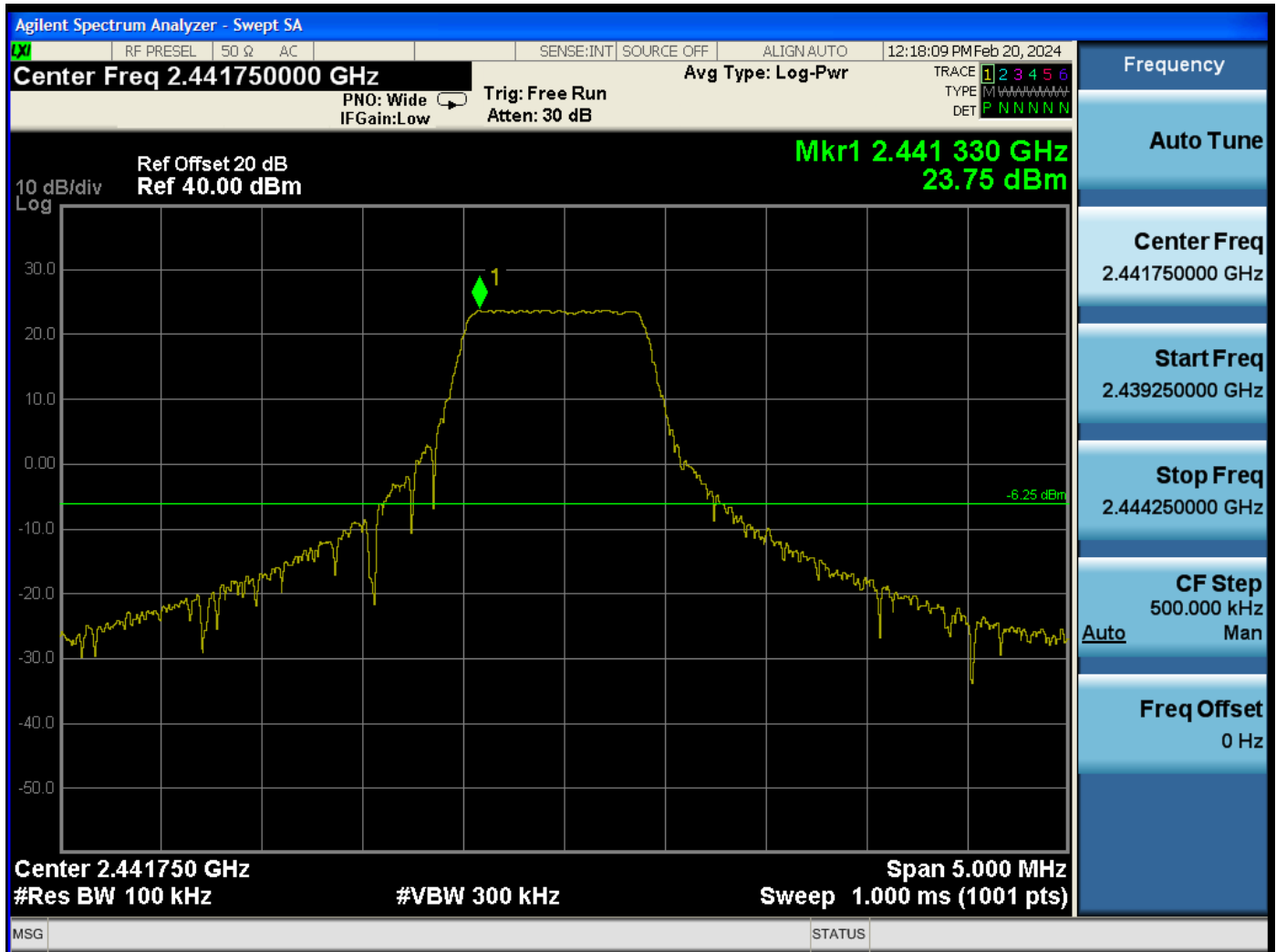
RF Antenna Conducted Test – Low Channel – 1 GHz to 2.4 GHz



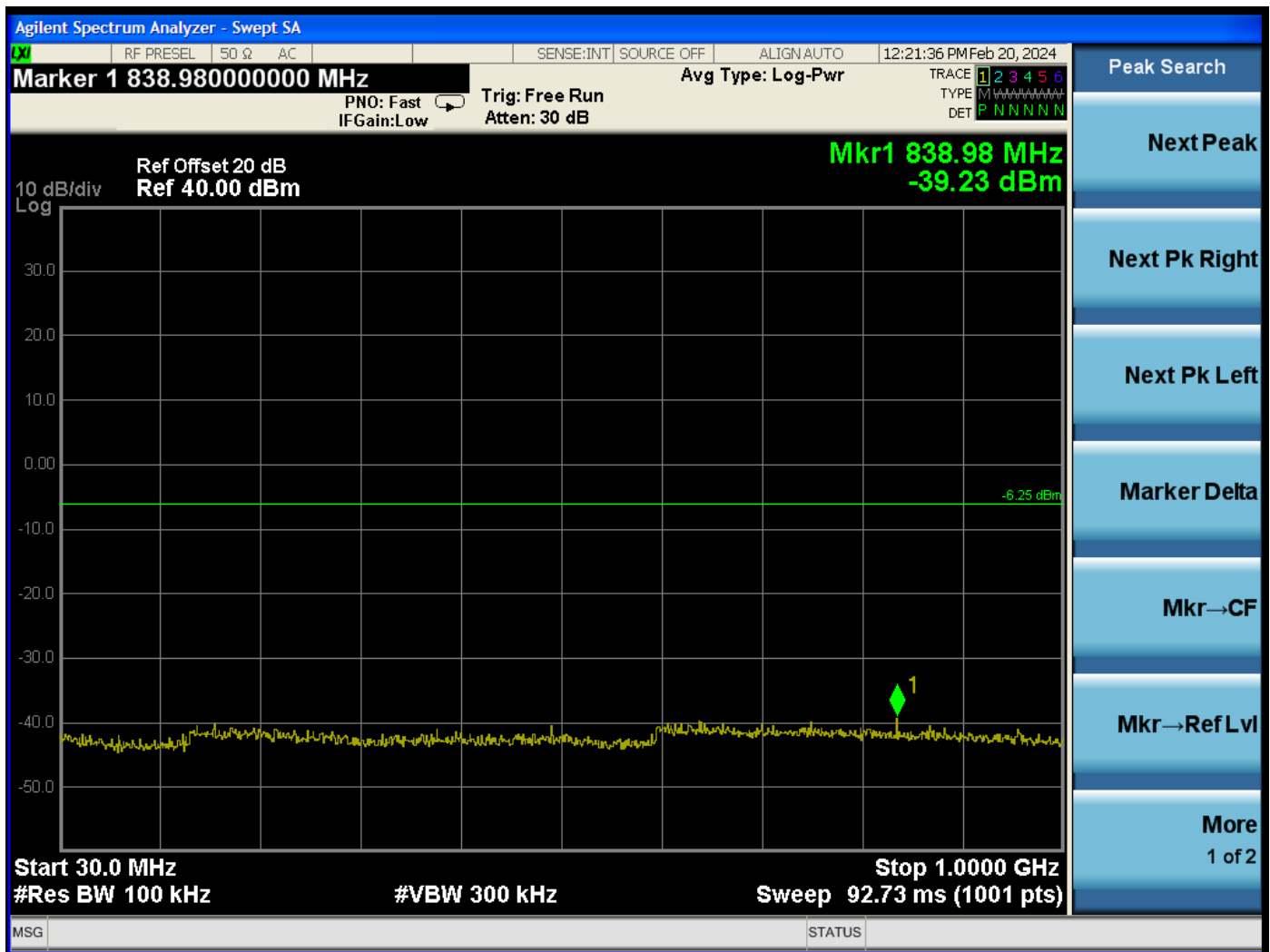
RF Antenna Conducted Test – Low Channel – 2483.5 MHz to 10 GHz



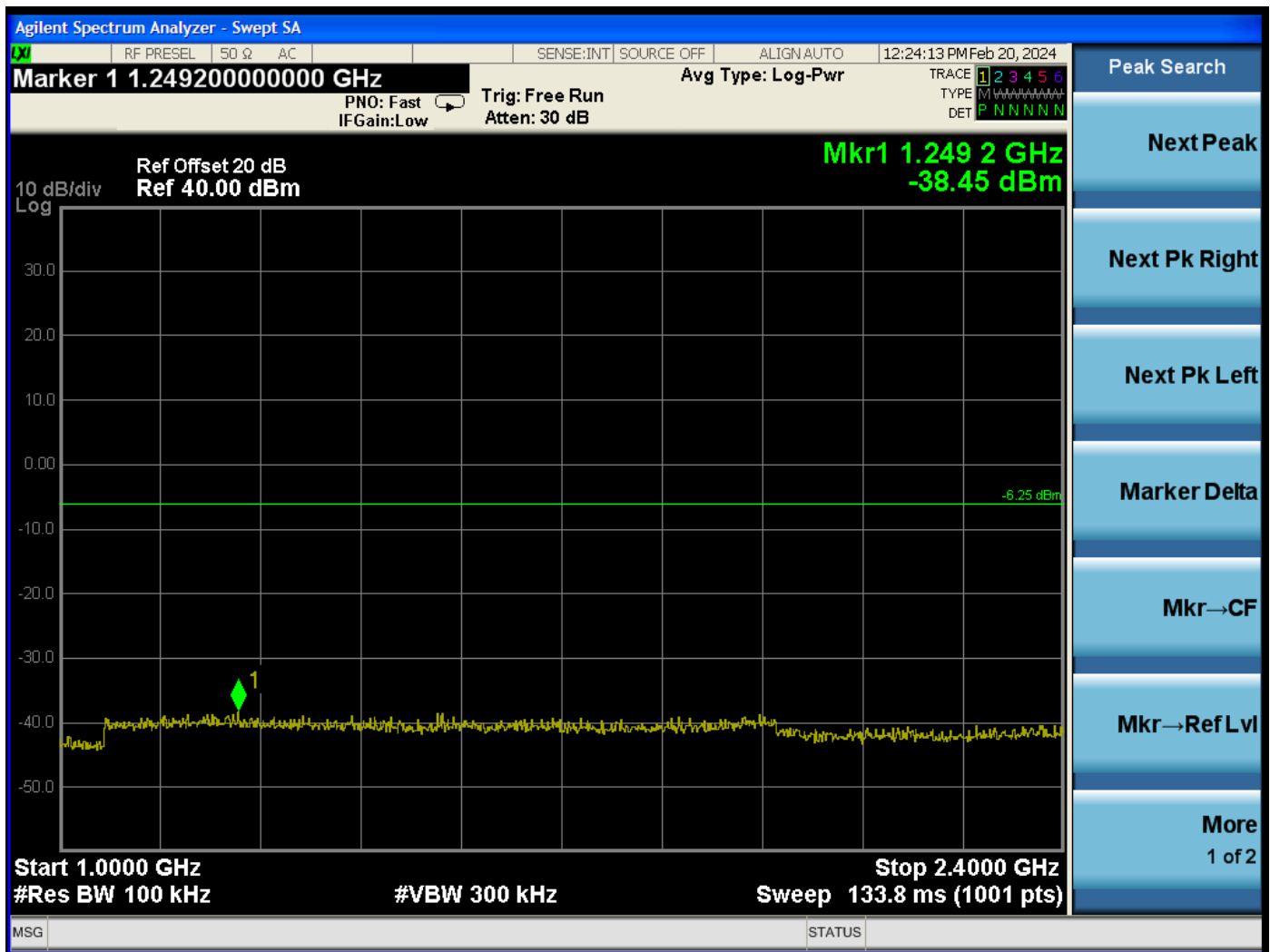
RF Antenna Conducted Test – Low Channel – 10 GHz to 25 GHz



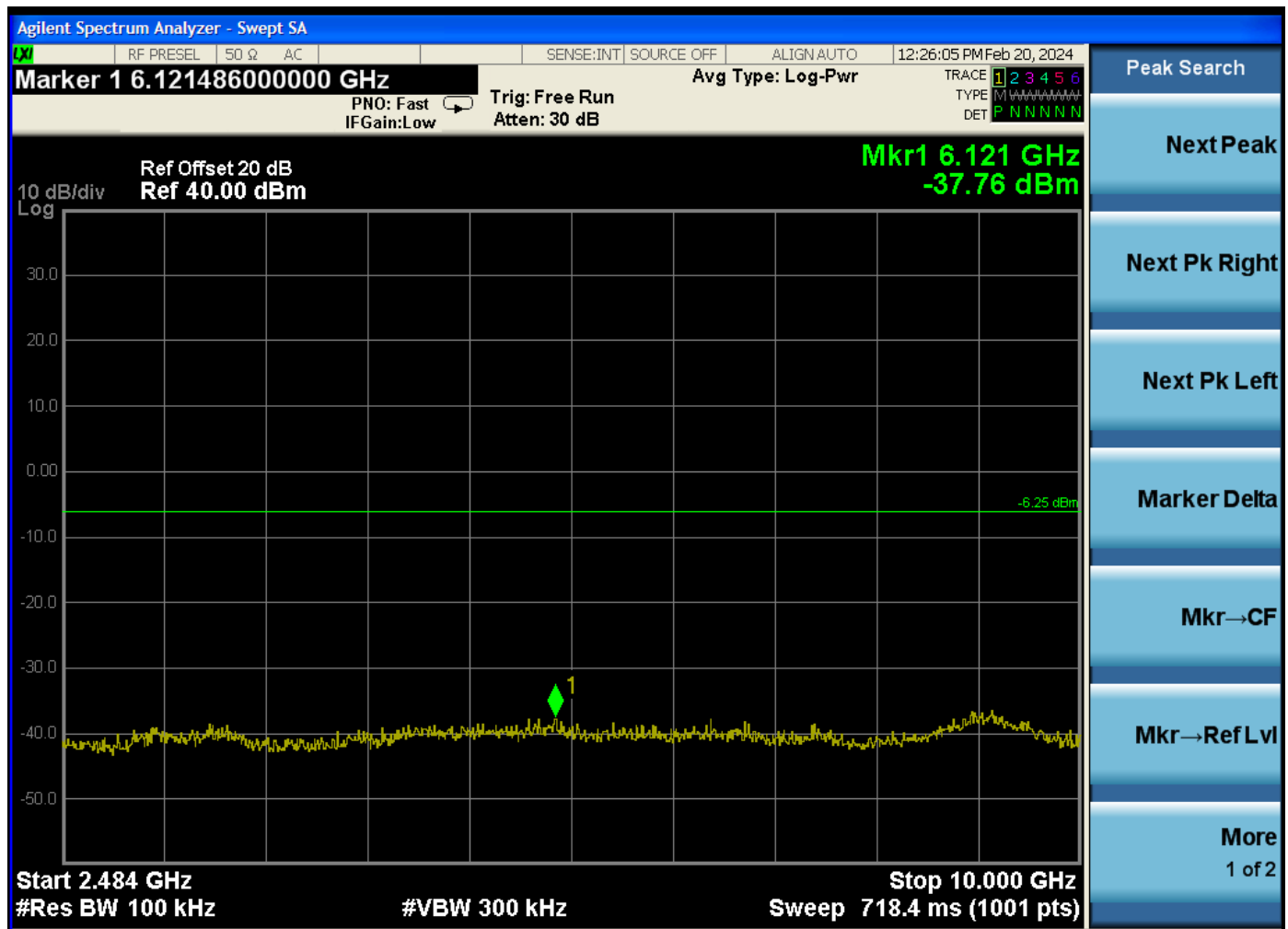
RF Antenna Conducted Test – Mid Channel – Reference Level



RF Antenna Conducted Test – Middle Channel – 30 MHz to 1 GHz



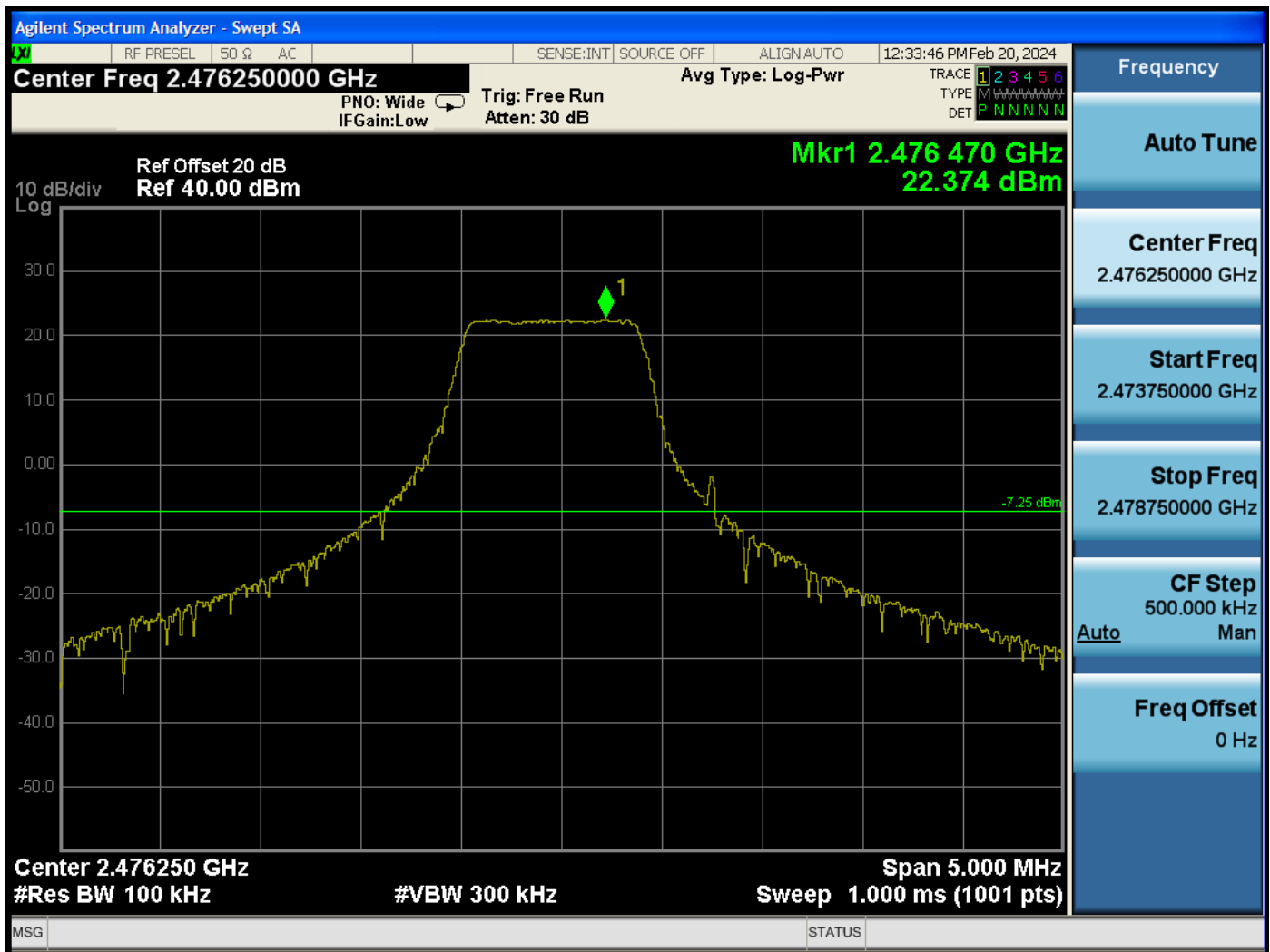
RF Antenna Conducted Test – Middle Channel – 1 GHz to 2.4 GHz



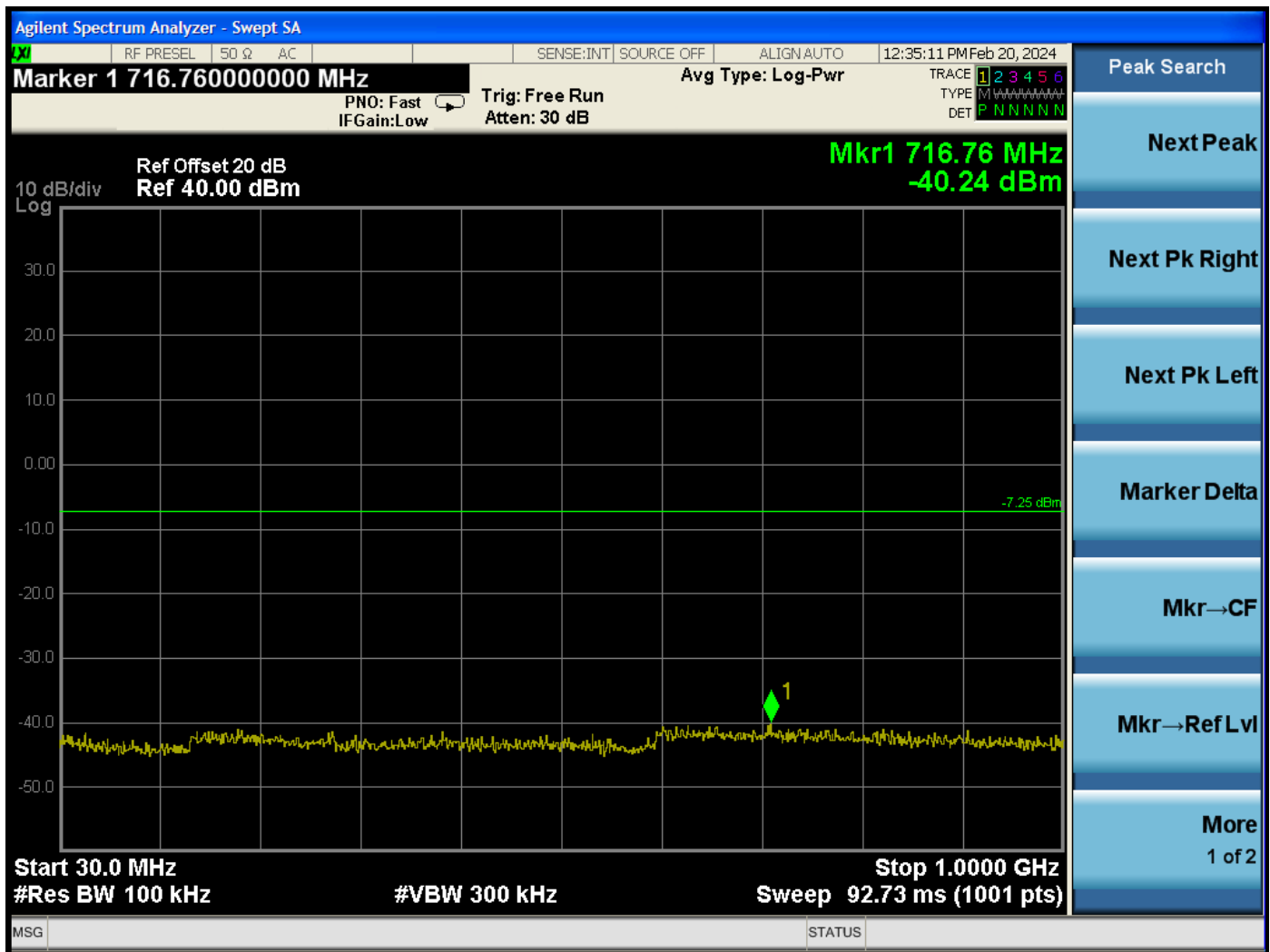
RF Antenna Conducted Test – Middle Channel – 2483.5 MHz to 10 GHz



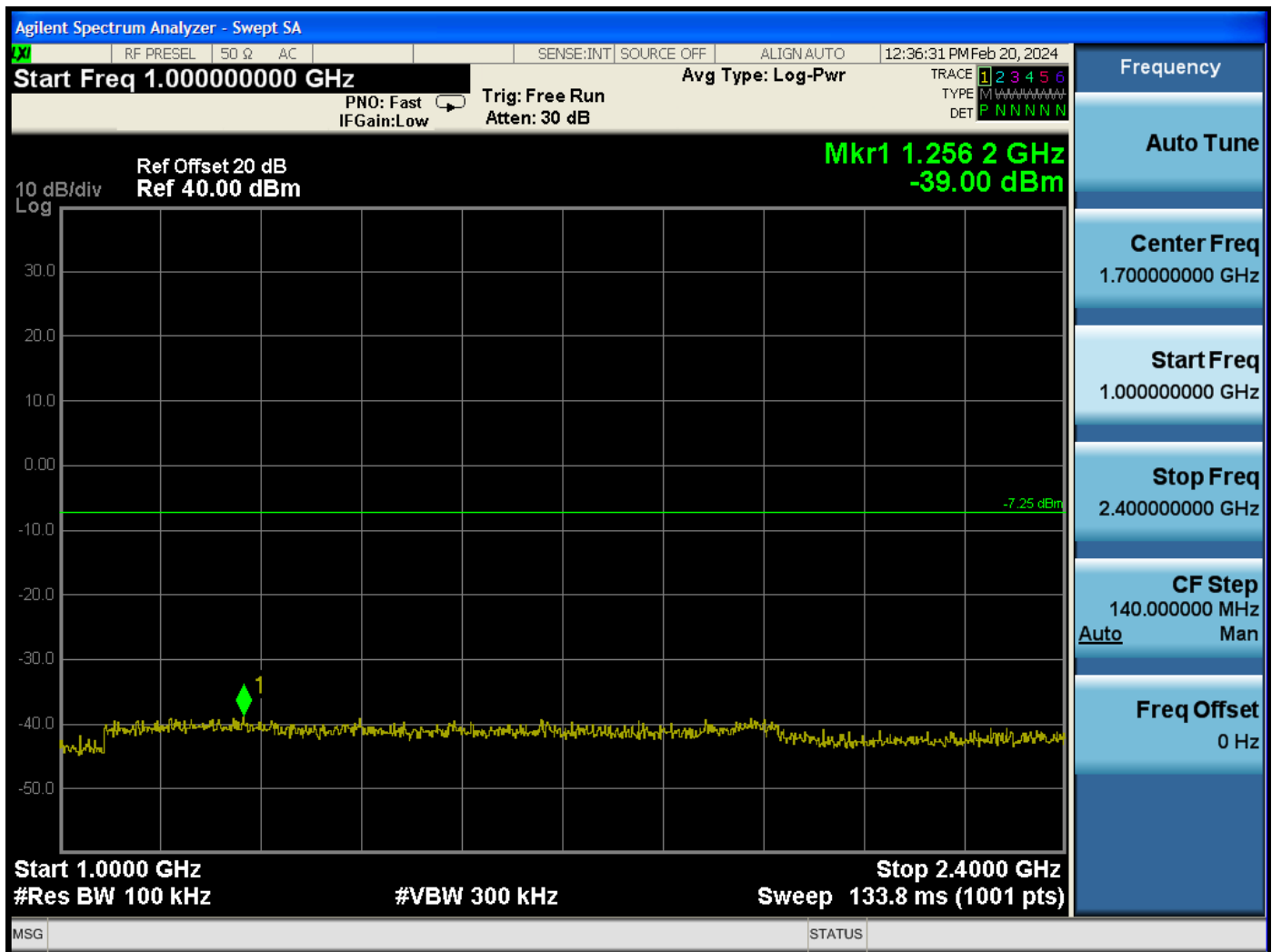
RF Antenna Conducted Test – Middle Channel – 10 GHz to 25 GHz



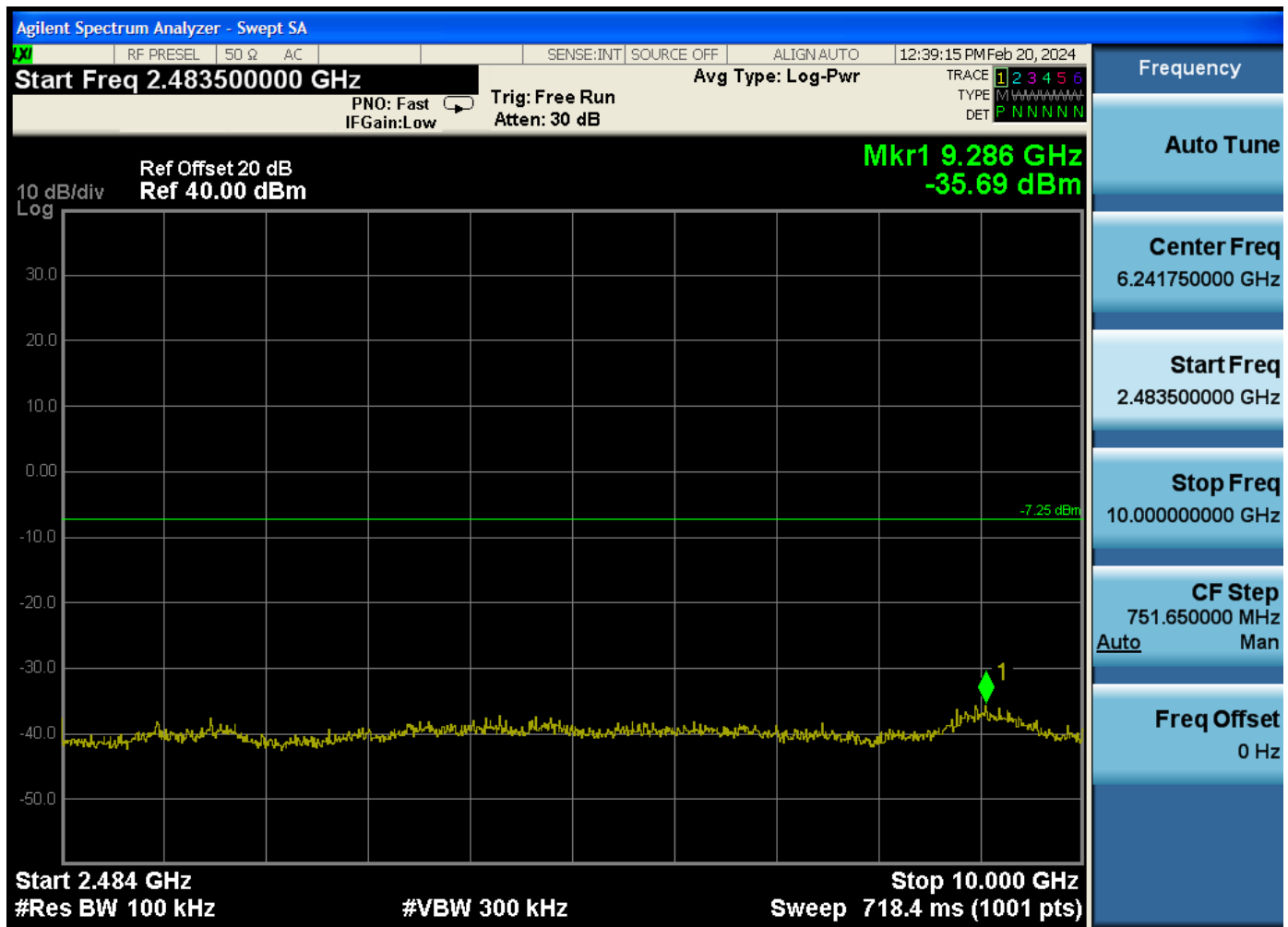
RF Antenna Conducted Test – High Channel – Reference Level



RF Antenna Conducted Test – High Channel – 30 MHz to 1 GHz



RF Antenna Conducted Test – High Channel – 1 GHz to 2.4 GHz



RF Antenna Conducted Test – High Channel – 2483.5 MHz to 10 GHz



RF Antenna Conducted Test – High Channel – 10 GHz to 25 GHz

## MICROWAVE MONOLITHICS

### RF TRANSMITTER

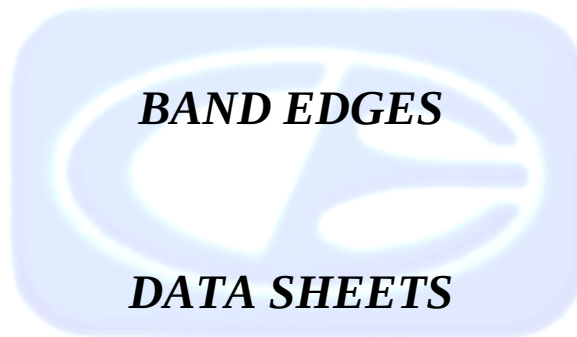
### MODEL: MMI-ARM

## HIGHEST EMISSIONS IN THE NON-RESTRICTED BANDS

| FREQUENCY<br>(GHZ) | LEVEL<br>(dBm) | Limit*<br>(dBm) | Margin<br>(dB) |
|--------------------|----------------|-----------------|----------------|
| 24.760             | -28.14         | -6.25           | -21.89         |
| 24.820             | -28.07         | -6.08           | -21.99         |
| 24.850             | -27.88         | -7.25           | -20.63         |

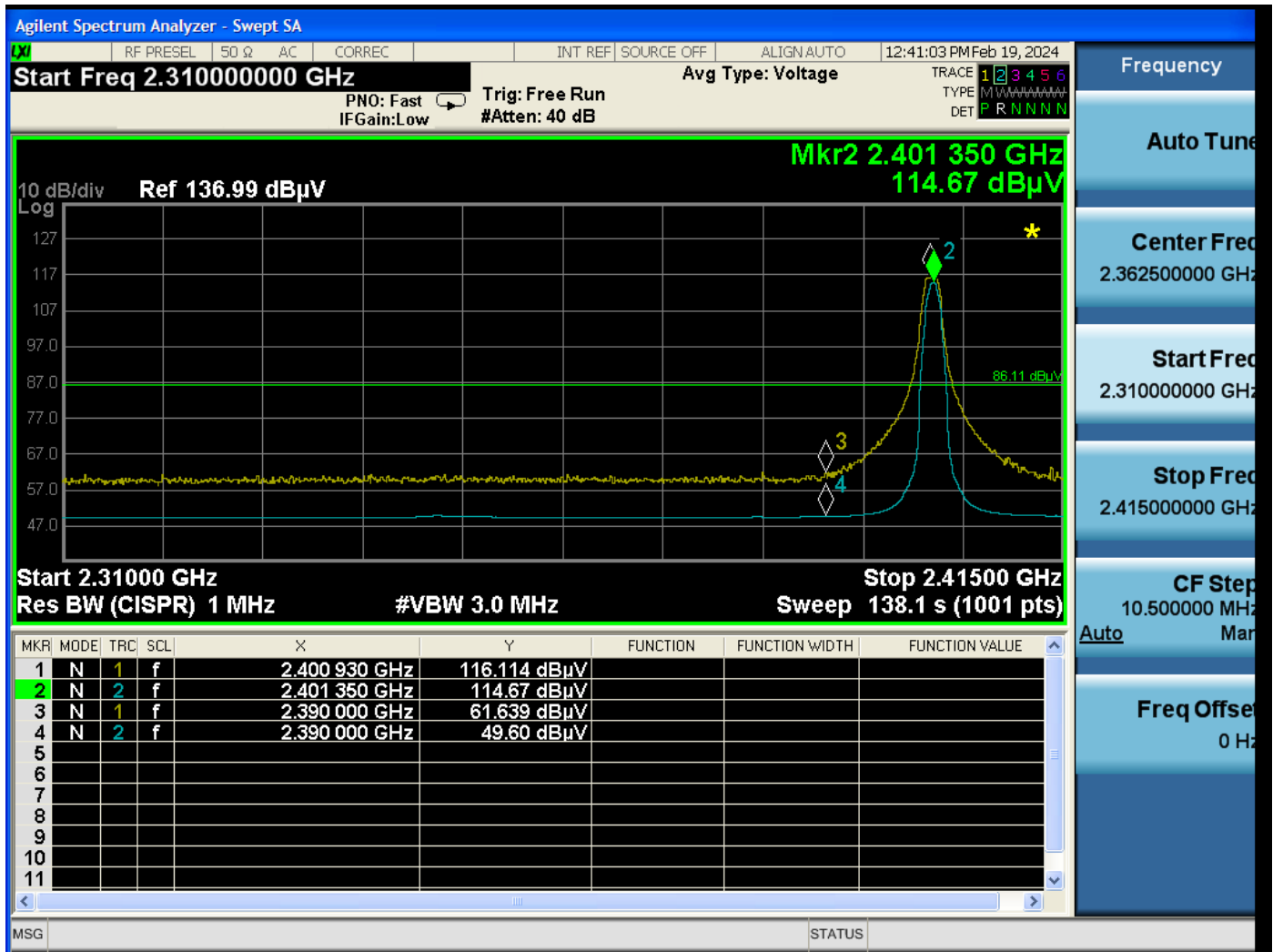
Note: The highest non-restricted emissions are reported.

\*The Limit is based on 30 dB below the highest reference level obtained on the previous pages.

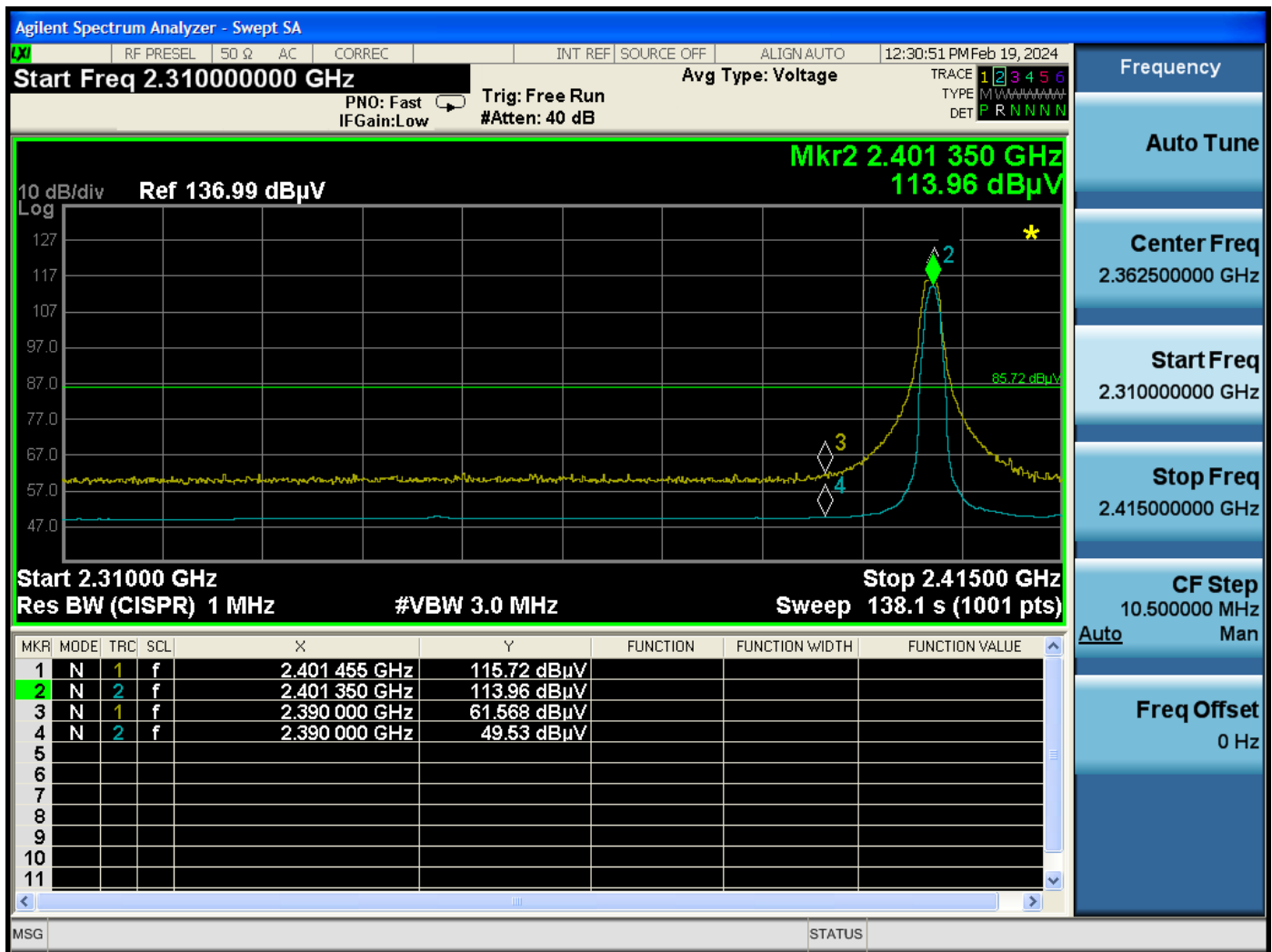




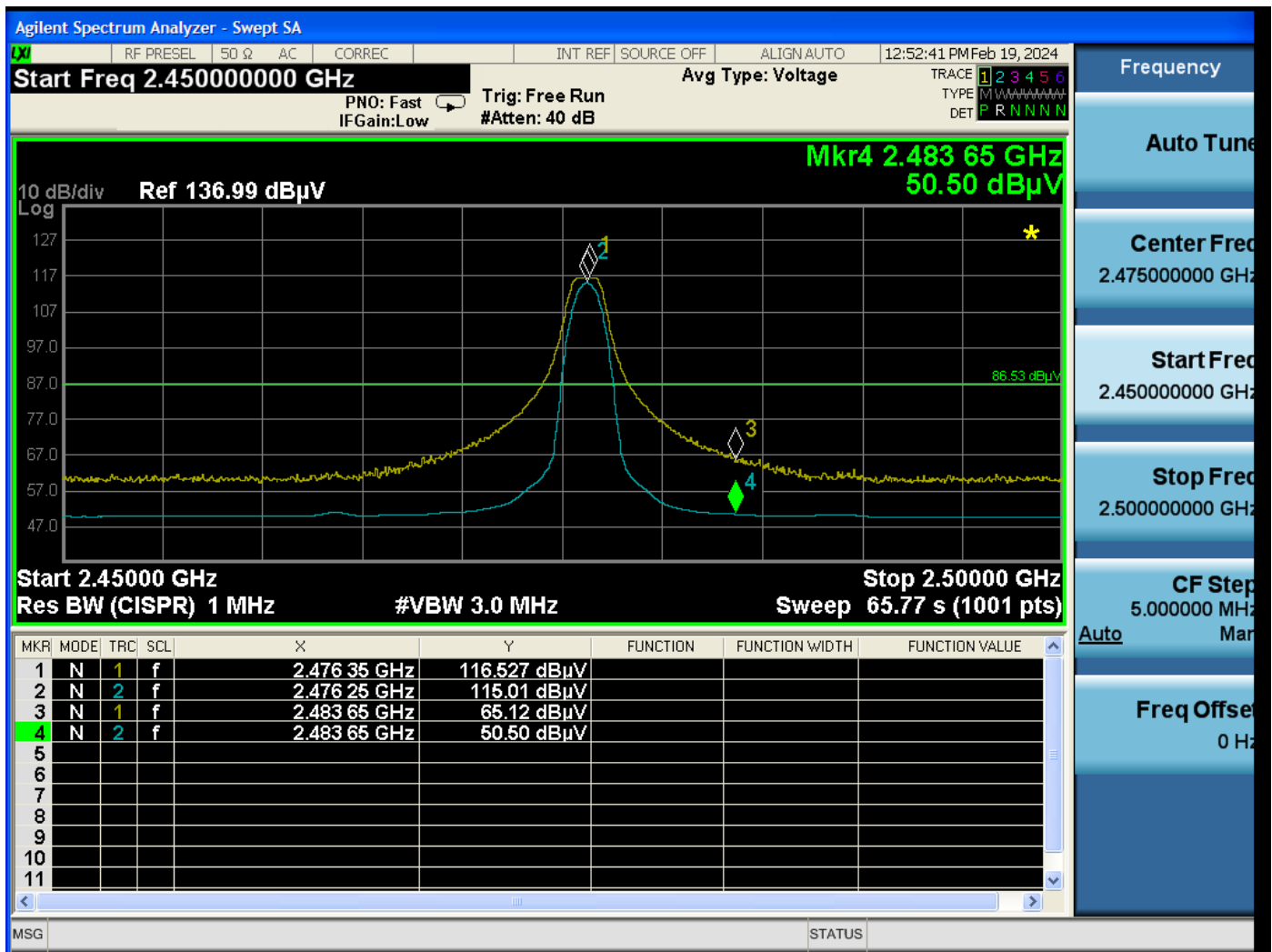




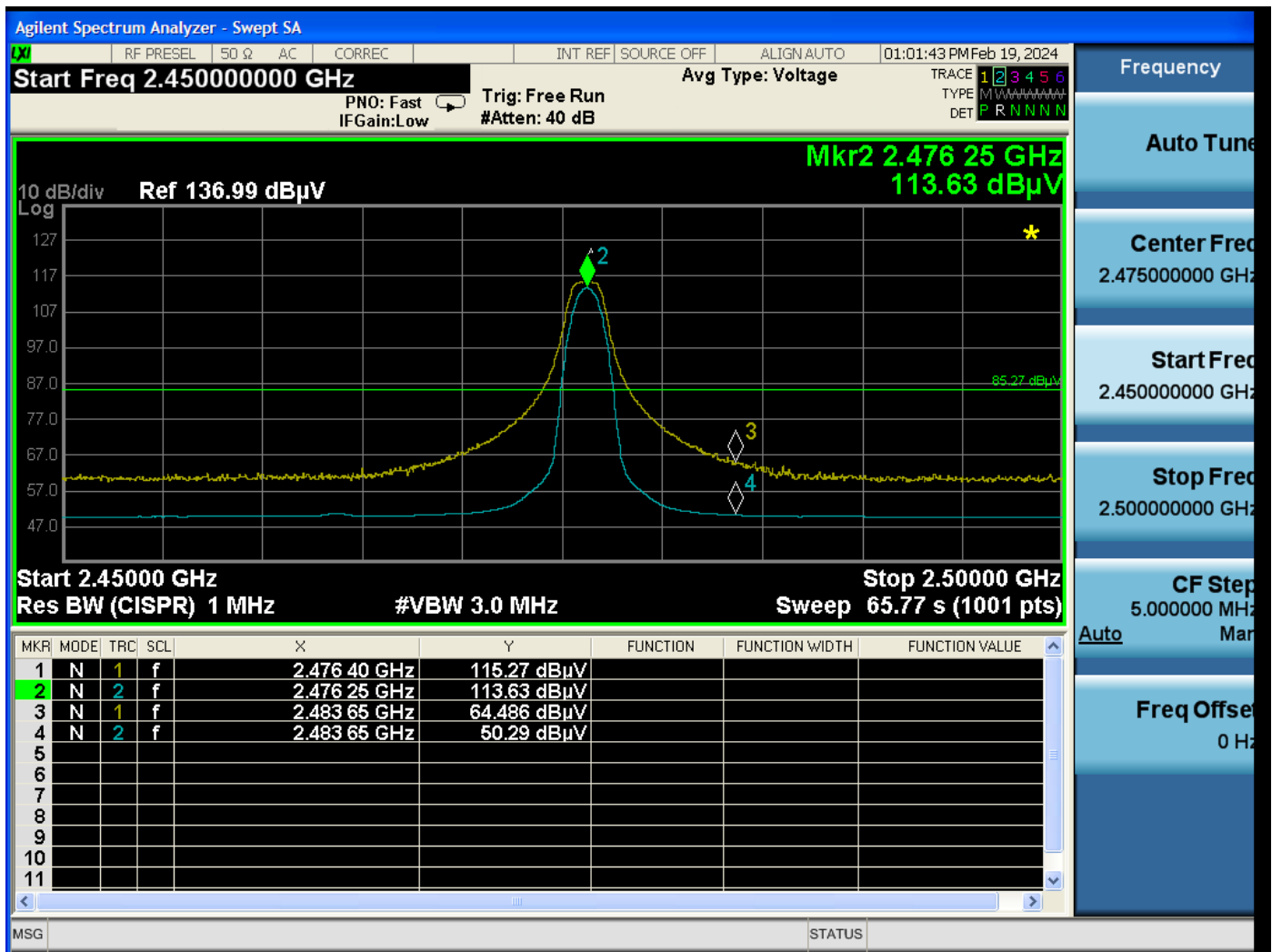
Band Edge – 2401.25 MHz – Vertical – Y Axis



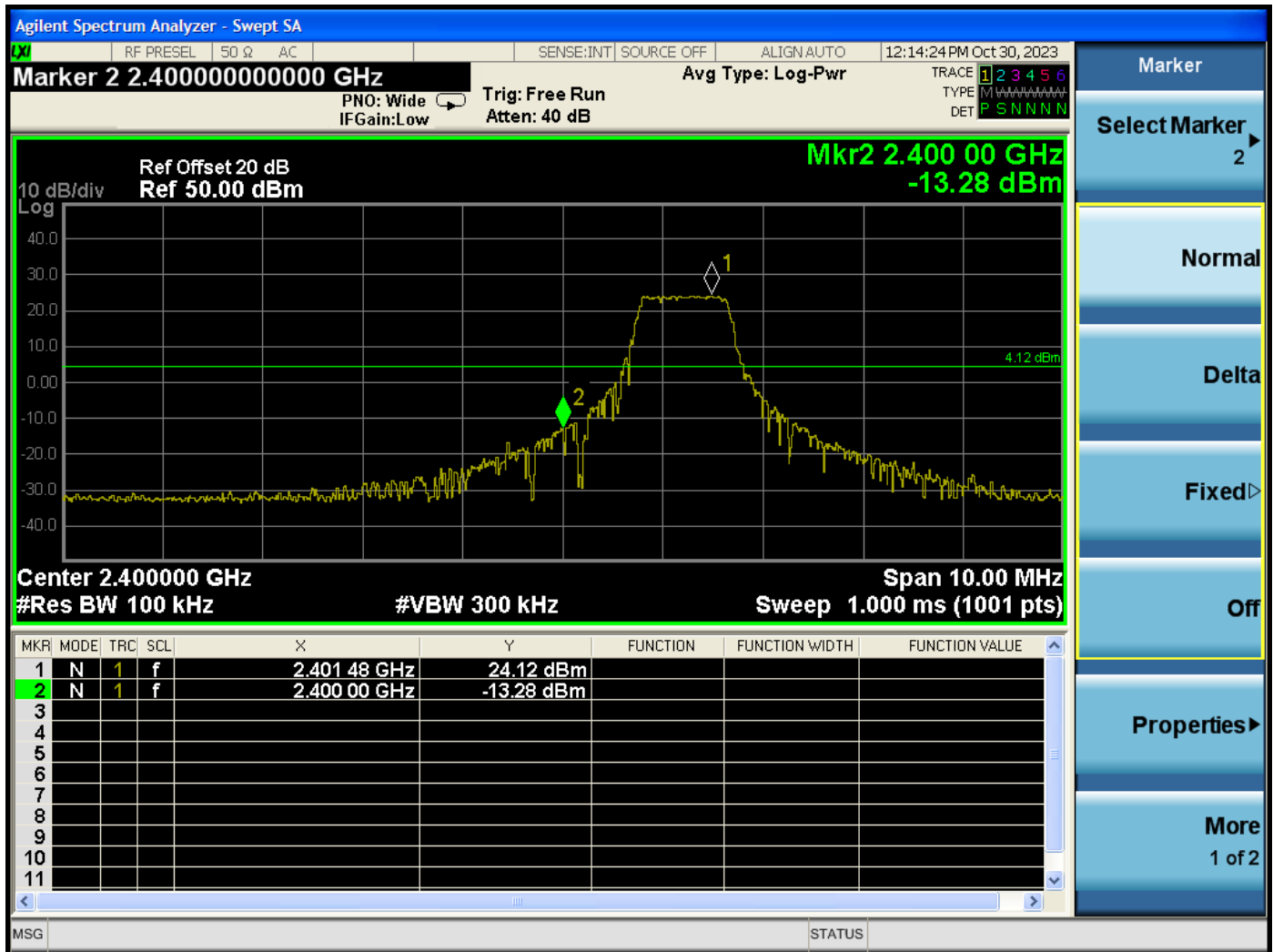
Band Edge – 2401.25 MHz – Horizontal – Y Axis



Band Edge – 2476.25 MHz – Vertical – Z Axis



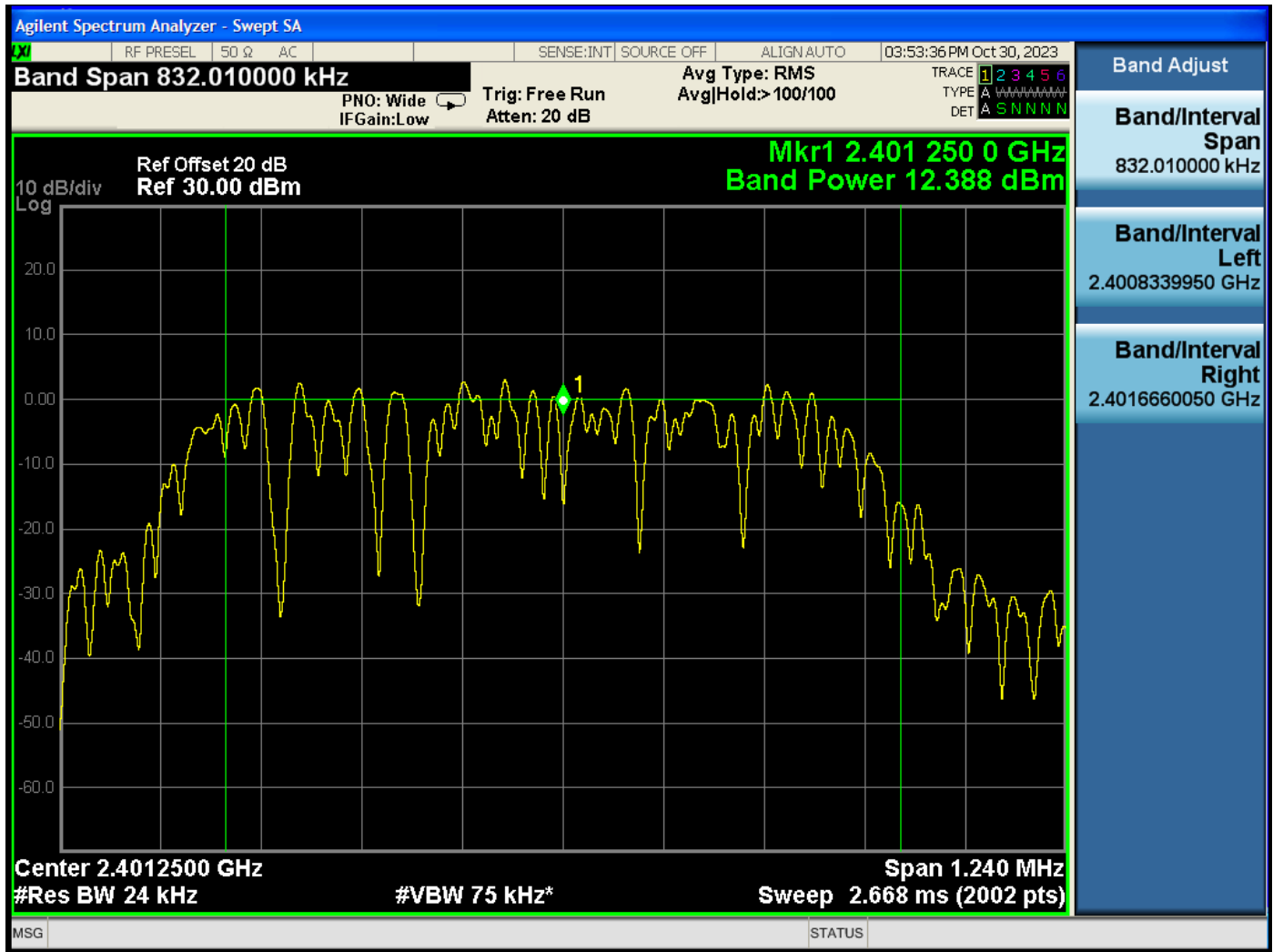
Band Edge – 2476.25 MHz – Horizontal– Z Axis



Band Edges – Low channel

***MAXIMUM CONDUCTED OUTPUT POWER***

***DATA SHEETS***



Maximum Conducted Output Power - Low Channel



Maximum Conducted Output Power - Middle Channel



Maximum Conducted Output Power - High Channel