

**FCC PART 15, SUBPART B and C
TEST REPORT**
for
RF TRANSMITTER
MODEL NUMBER: MMI-TRAKR2

Prepared for

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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-TRAKR2
S/N: None

Product Description: The MMI-TRAKR2 is a self-contained transmitter which transmits its current location to compatible receiving devices. It transmits within 902-928 MHz.
Highest Frequency: 927.26 MHz (Dimensions: 3.25" x 2.5" x 1")

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: May 10, 2022 & June 6, 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	Complies with the limits in FCC CFR Title 47, Part 15 Subpart B, Section 15.107.
2	Spurious Radiated RF Emissions, 30 MHz – 9272.6 MHz	The EUT complies with the Class 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 – 9272.6 MHz	The EUT complies with the Class 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 – 9272.6 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 – 9272.6 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.

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the RF Transmitter, Model Number: MMI-TRAKR2. 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 Sr. Test Engineer
Ruby Hall Lab Manager

2.4 Date Test Sample Was Received

The test sample was received on May 10, 2022. 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 902.74 MHz, 915.74 MHz and 927.26 MHz. The EUT transmits only.

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 were taken in the worst-case configuration described above. Please see Appendix E for the data sheets.

According to the client, there is nothing running above 1.705 MHz during charging since the charger circuit is linear thus the AC conducted emissions test was only performed while charging.

4.1.1 Cable Construction and Termination

Cable 1

This is a 2-meter, foil shielded, round cable that connects the EUT to the charger. The cable has a USB-A connector at the charger end and a micro-USB connector at the EUT end.

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-TRAKR2	N/A	FCC ID: RG6-MMI-TRAKR2
EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
BATTERY CHARGER	FLYPOWER	PS10S050K2000UU	N/A	NONE

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	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. 25, 2021	Jan.25, 2023
EMI Receiver	Agilent	N9038A	MY51100115	Jan 11, 2023	Jan 11, 2025
LISN (EUT)	Com-Power	LI-215A	191989	Jan. 17, 2022	Jan. 17, 2023
LISN (ACC)	Com-Power	LI-215A	191983	Jan. 17, 2022	Jan. 17, 2023
10 dB Attenuator	Weinschel Corp.	2	BH8161	Jul. 21, 2021	Jul 21, 2022
Active Loop Antenna	Com-Power	AL-130R	10160065	Aug. 03, 2021	Aug. 03, 2023
Combi-Log Antenna	Com-Power	AC-220	10030030	Jan. 29, 2022	Jan. 29, 2024
Horn Antenna	Com-Power	AH-118	071370	Jun. 29, 2020	Jun. 29, 2022
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
Preamplifier	Com-Power	PAM-118A	551015	Jan. 20, 2022	Jan. 20, 2024
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. 02, 2021	Sep. 02, 2022
Barometer	Maximum	Predictor	3429	Jun. 21, 2021	Jun. 21, 2022
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) 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 902 to 928 MHz. The low channel is 902.74 MHz, the middle channel is 915.74 MHz and the high channel is 927.26 MHz. There are 26 possible transmitted frequencies. The nominal channel spacing is 0.960 MHz, except near 915 MHz, where the spacing is 1.480 MHz.

7.2 Antenna

The 900 MHz antenna has a gain of 0 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

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.

Test Results:

The EUT complies with the **Class B** limits of Part 15, Subpart B; the limits of CFR Title 47, Part 15, Subpart B, Sections 15.107. Please see Appendix E for the data sheets.

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 10 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 2.0.

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 CONDUCTED EMISSION RESULTS 120V AC CHARGING ADAPTER
 MODEL NUMBER: MMI-TRAKR2

Frequency MHz	Emission Level* dBuV	Average Specification Limit dBuV	Delta (Emission - Spec. limit) dB
0.18	32.80A	54.68	-21.88
0.23	34.65A	53.05	-18.40
0.33	28.70A	50.05	-21.34
1.03	19.21A	46.00	-26.79
1.14	21.40A	46.00	-24.60
1.55	19.48A	46.00	-26.52

 Table 2.0 RADIATED EMISSION RESULTS RF TRANSMITTER
 MODEL NUMBER: MMI-TRAKR2

Frequency MHz	Corrected Reading* dBuV/m	Specification Limit dBuV/m	Delta (Cor. Reading - Spec. Limit) dB
466.00	40.81#	46.00	-5.19
476.30	42.25#	46.00	-3.75
484.90	45.06#	46.00	-0.94
947.90	40.71#	46.00	-5.29
952.70	40.63#	46.00	-5.37
957.50	40.80#	46.00	-5.20

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 (μ V/m) $\log x 20$ = Specification Limit in dB μ V/m

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

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

For measurements above 30 MHz: (Specification distance / test distance) $\log x 20$ = 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 ≥ 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 (902.74 MHz when the EUT was on the low channel and 927.26 MHz when the EUT was on the high channel) using the EMI Receiver. The RBW was set to 100 kHz and the VBW was set to 300 kHz. Plots of the fundamental were taken to ensure the amplitude at the band edges were at least 20 dB down from the peak of the fundamental emission. The plots were taken in single channel mode.

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 $[10 \log (\text{OBW}/\text{RBW})]$ 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).

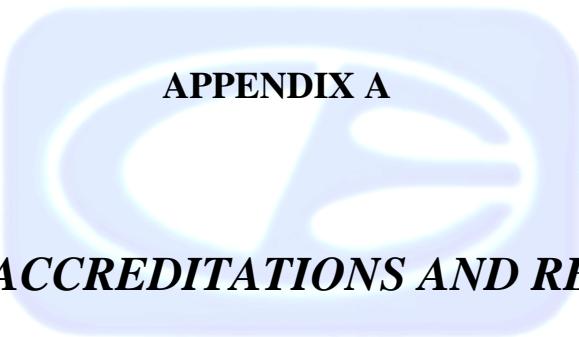
Test Results:

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-TRAKR2 (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-TRAKR2
S/N: None

No Additional models.



APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER

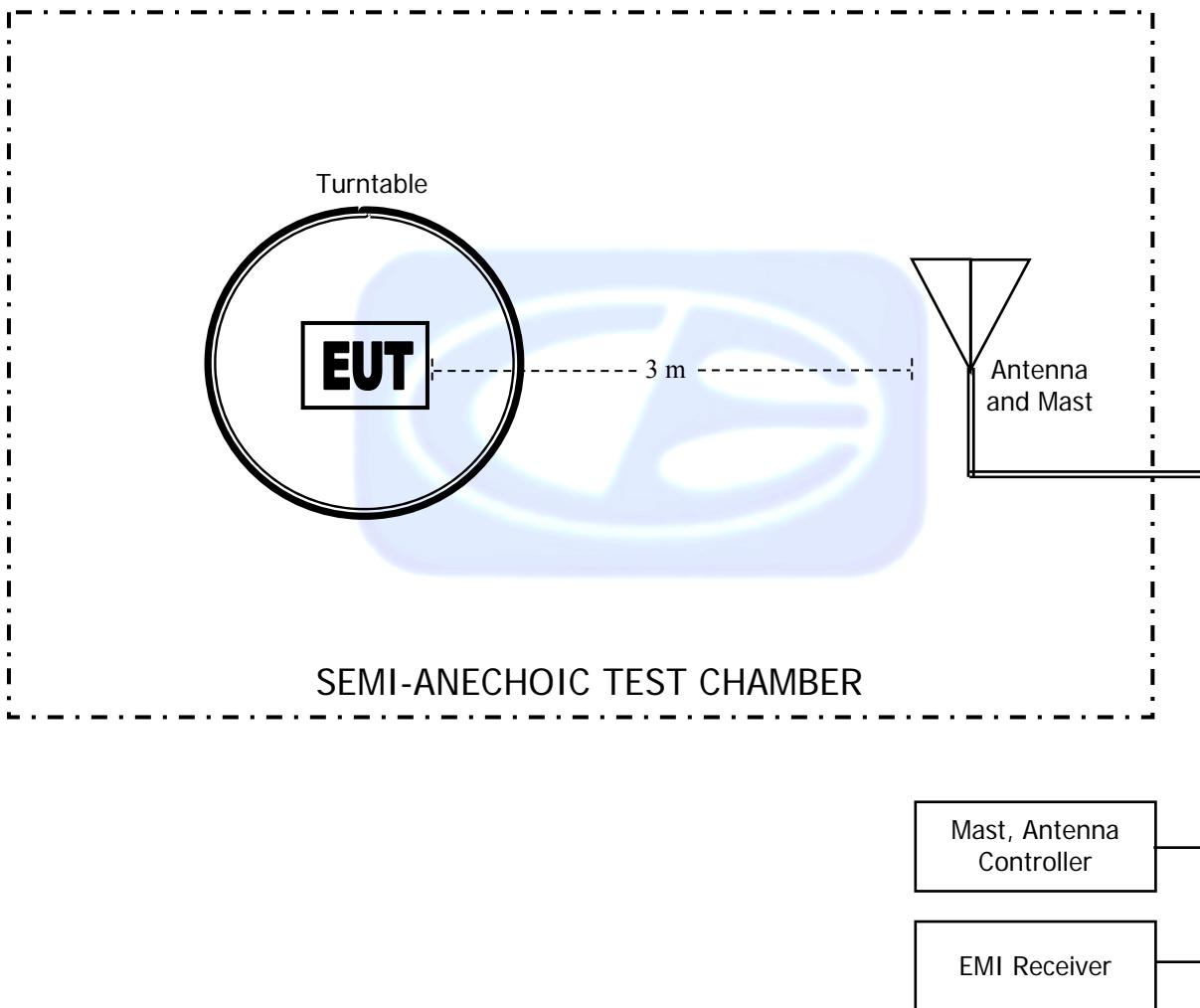
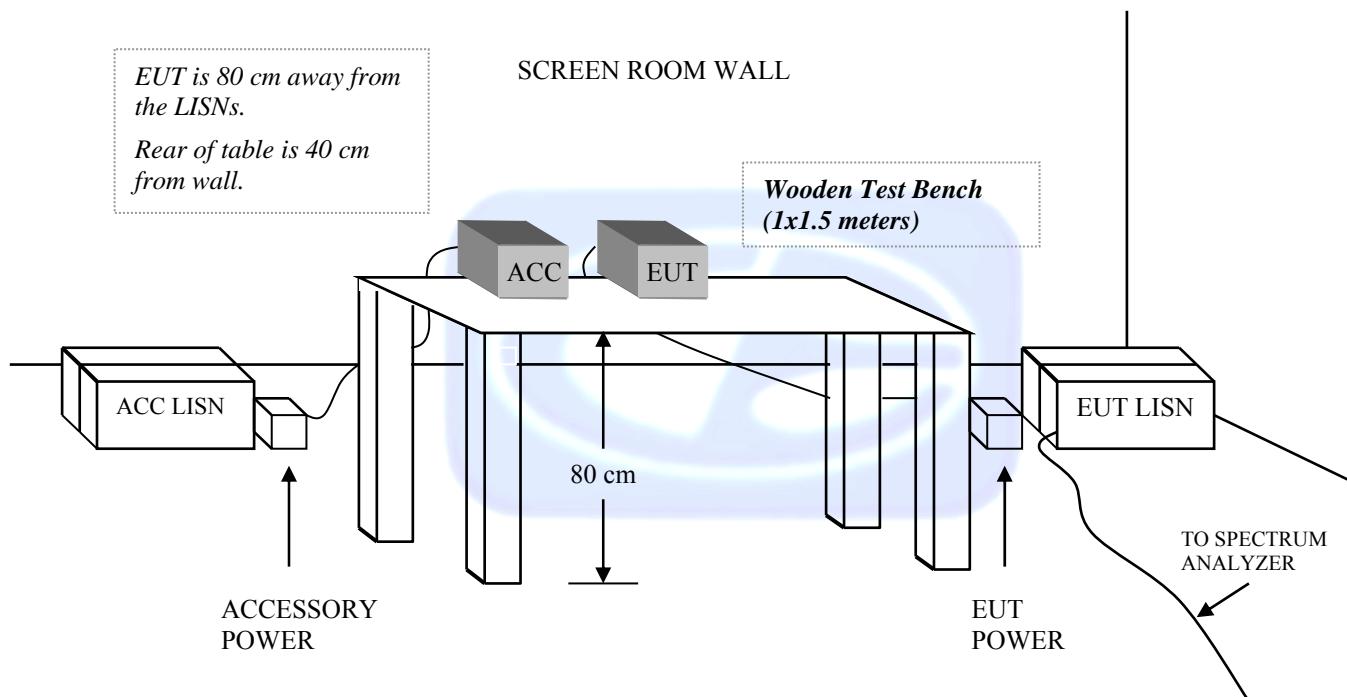


FIGURE 2: CONDUCTED EMISSIONS TEST SETUP


COM-POWER AL-130R**ACTIVE LOOP ANTENNA****S/N: 10160065****CALIBRATION DATE: AUGUST 3, 2021**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0.009	15.68	1	14.54
0.01	15.33	2	14.53
0.02	14.77	3	14.53
0.03	15.69	4	14.64
0.04	15.17	5	14.65
0.05	14.52	6	14.55
0.06	14.71	7	14.56
0.07	14.42	8	14.56
0.08	14.44	9	14.56
0.09	14.52	10	14.88
0.1	14.12	15	14.56
0.2	14.13	20	14.90
0.3	14.04	25	13.06
0.4	14.04	30	13.03
0.5	14.23		
0.6	14.23		
0.7	14.23		
0.8	14.14		
0.9	14.34		

COM-POWER AC-220

COMBI-LOG ANTENNA

S/N: 10030030

ASSET: 6037

CALIBRATION DATE: JANUARY 29, 2022

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
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

FREQUENCY (MHz)	CABLE LOSS	FREQUENCY (MHz)	CABLE LOSS
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 29, 2020

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	24.177	10000	39.425
1500	25.167	10500	39.679
2000	28.57	11000	39.435
2500	28.796	11500	40.078
3000	29.834	12000	40.509
3500	30.662	12500	40.308
4000	31.581	13000	40.259
4500	32.189	13500	40.394
5000	33.467	14000	40.695
5500	33.92	14500	42.451
6000	34.421	15000	41.913
6500	35.051	15500	39.324
7000	36.997	16000	39.617
7500	37.616	16500	39.303
8000	37.76	17000	41.265
8500	38.058	17500	43.367
9000	38.068	18000	45.279
9500	38.947		

SUCOFLEX ANTENNA CABLES

102_EA

A/N: 6012 & 6013

CALIBRATION DATE: FEBRUARY 7, 2022

FREQUENCY (MHz)	CABLE LOSS	FREQUENCY (MHz)	CABLE LOSS
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**

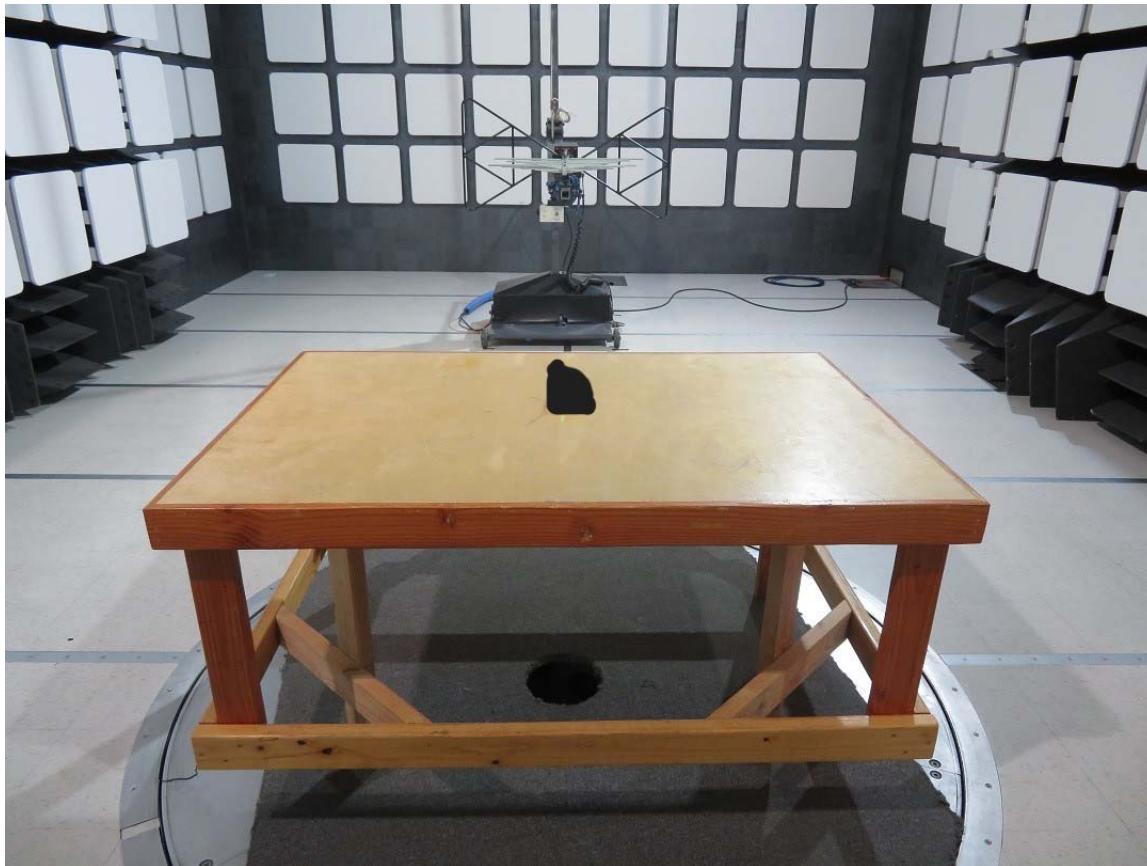
A/N: 6012 & 6013

CALIBRATION DATE: FEBRUARY 7, 2022

FREQUENCY (MHz)	CABLE LOSS	FREQUENCY (MHz)	CABLE LOSS
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		

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

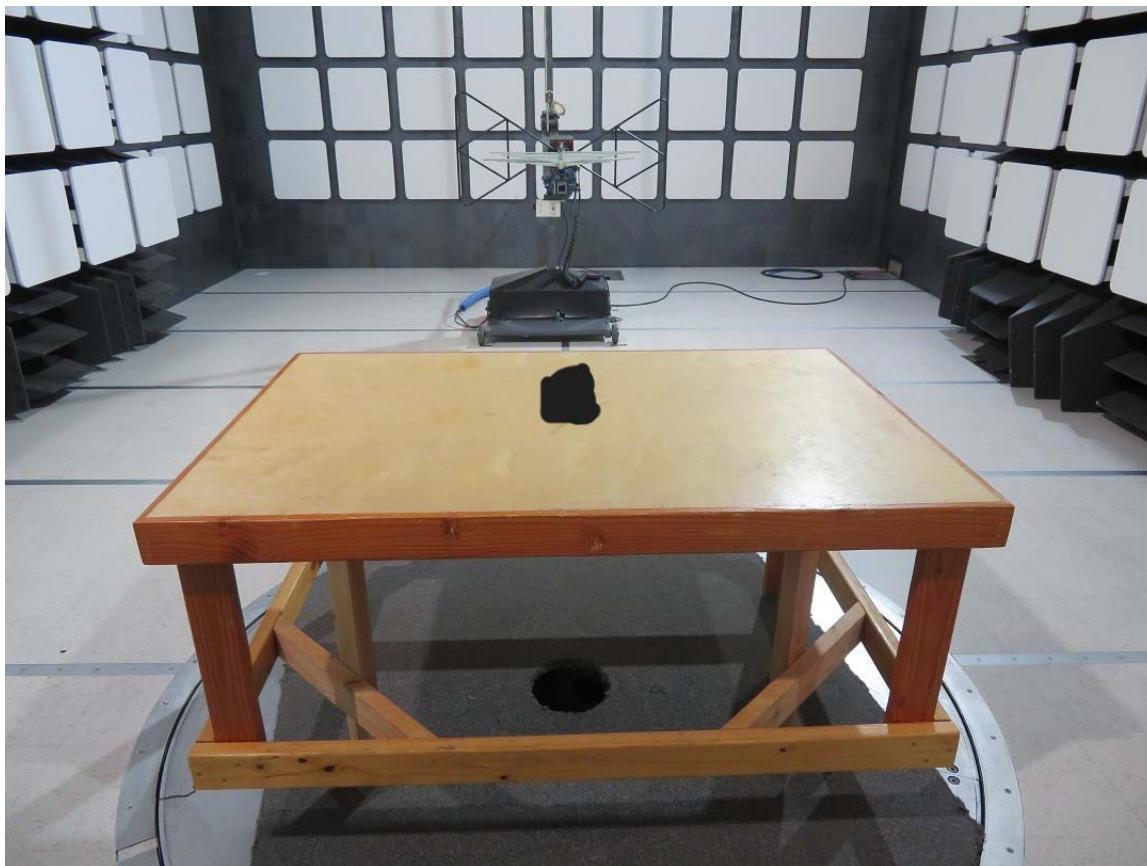
FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
500	39.86	7500	37.03
1000	39.80	8000	36.06
1100	40.25	8500	36.09
1200	39.77	9000	35.68
1300	40.12	9500	37.53
1400	39.93	10000	36.66
1500	40.05	11000	36.94
1600	40.00	12000	37.06
1700	40.03	13000	36.88
1800	40.40	14000	36.33
1900	40.02	15000	37.06
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		



FRONT VIEW

MICROWAVE MONOLITHICS INCORPORATED
RF TRANSMITTER
MODEL NUMBER: **MMI-TRAKR2**
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-TRAKR2
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-TRAKR2**
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-TRAKR2
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

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



FRONT VIEW

MICROWAVE MONOLITHICS INCORPORATED
RF TRANSMITTER
MODEL NUMBER: **MMI-TRAKR2**
FCC SUBPART B- CONDUCTED EMISSIONS

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



REAR VIEW

MICROWAVE MONOLITHICS INCORPORATED
RF TRANSMITTER
MODEL NUMBER: **MMI-TRAKR2**
FCC SUBPART B- CONDUCTED EMISSIONS

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

APPENDIX E

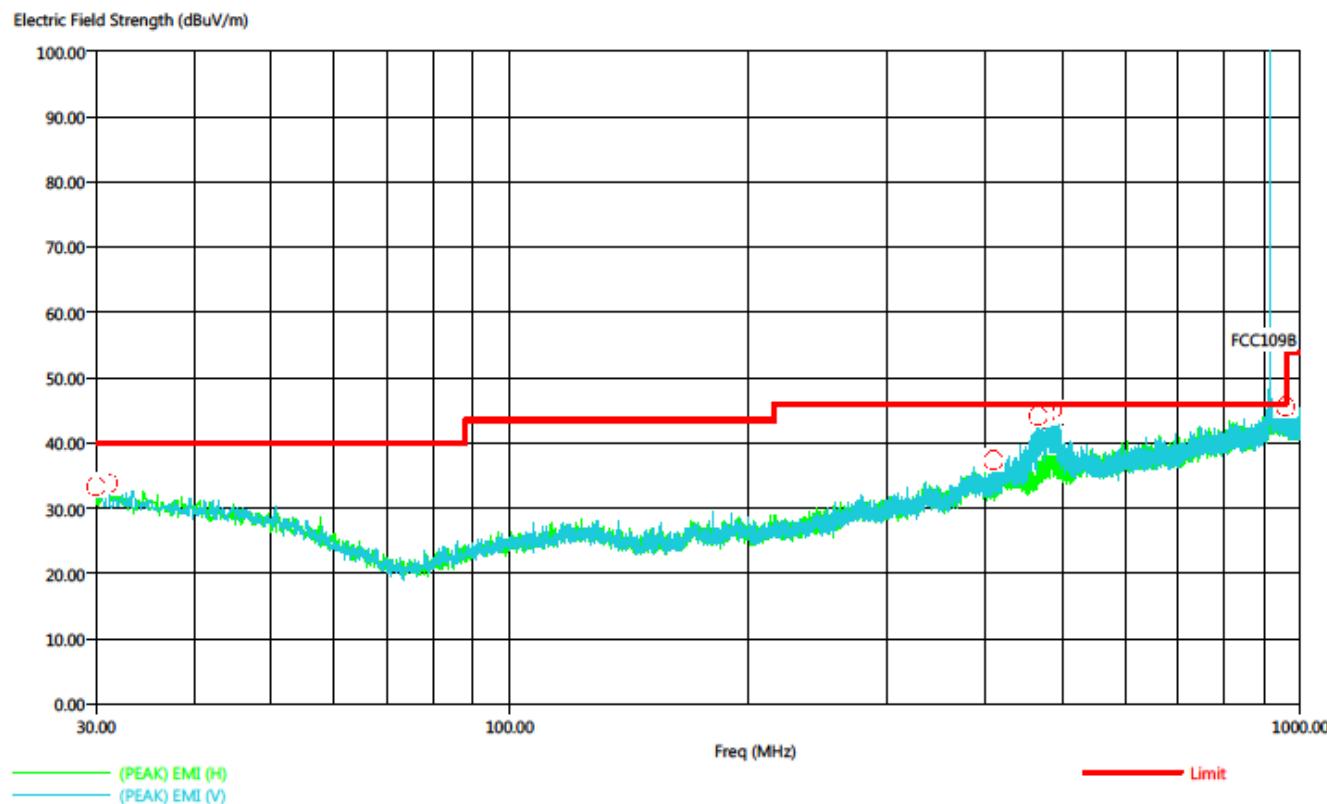
DATA SHEETS

RADIATED EMISSIONS AND CONDUCTED EMISSIONS
DATA SHEETS

Title: Radiated Pre-Scan 30-1000 MHz
 File: Radiated Pre-Scan 30-1000 MHz 915.74
 Operator: R. Ramirez
 EUT Type: RF Transmitter
 EUT Condition: TX 915.74 (worst case channel)
 Comments: Lab T
 Clock Oscillators: 915.74
 Company: Microwave Monolithics Incorporated
 Model: MMI-TRAKR2
 Temperature: 65 F Humidity: 60 % Pressure: 29.3 inHg
 Tested to: 915.74 MHz

5/9/2022 9:15:55 AM
 Sequence: Preliminary Scan

Radiated Pre-Scan 30-1000 MHz



Title: Radiated Final 30-1000 MHz
 File: Radiated Final 30-1000 MHz 915.74
 Operator: R. Ramirez
 EUT Type: RF Transmitter
 EUT Condition: TX 915.74 (worst case channel)
 Comments: Lab T
 Clock Oscillators: 915.74
 Company: Microwave Monolithics Incorporated
 Model: MMI-TRAKR2
 Temperature: 65 F Humidity: 60 % Pressure: 29.3 inHg
 Tested to: 9157.4 MHz

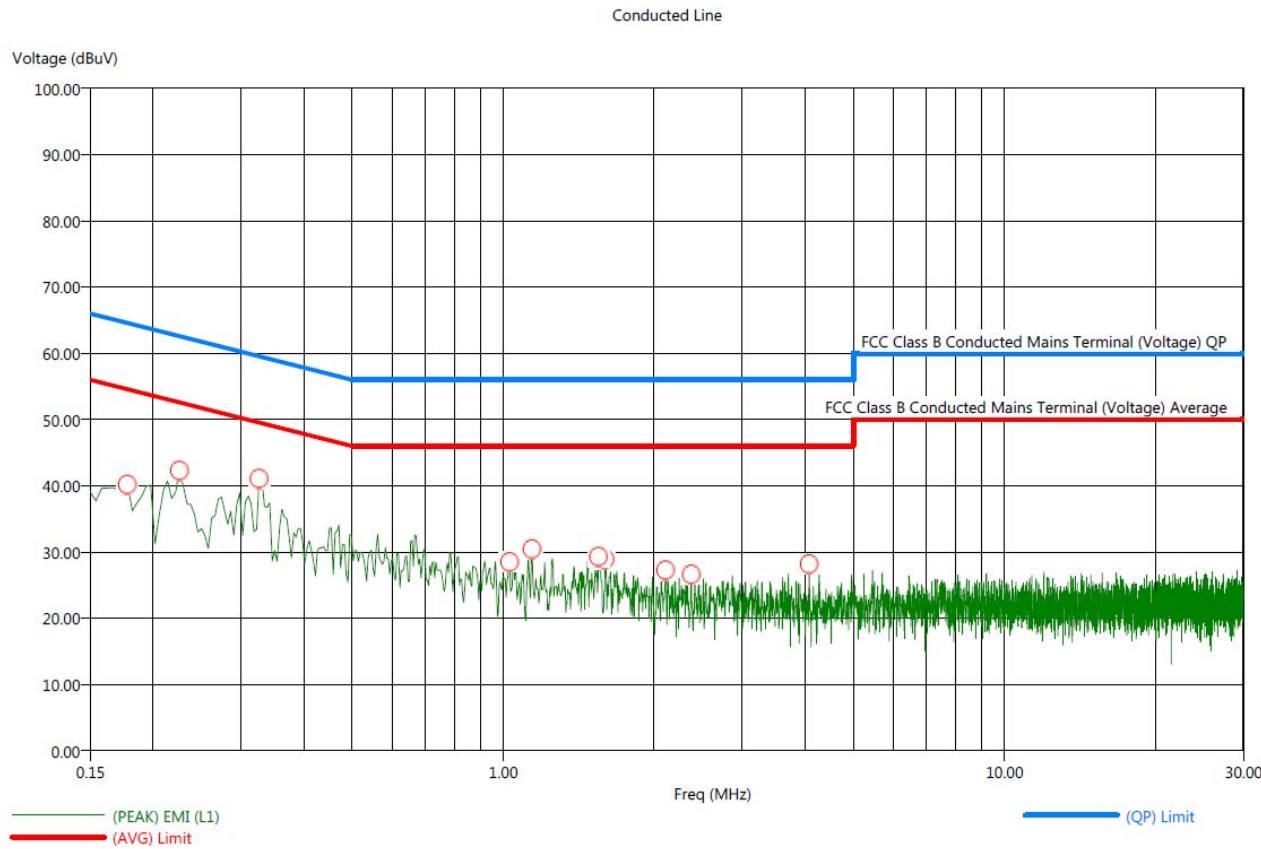
5/9/2022 9:33:50 AM
 Sequence: Final Measurements

Data

Freq (MHz)	Pol	(PEAK) Trace (dBuV)	Cable (dB)	Transducer (dB)	(PEAK) EMI (dBuV/m)	(QP) EMI (dBuV/m)	Limit (dBuV/m)	(QP) Margin (dB)	Twr Ht (cm)	Ttbl Aql (deg)
30.00	V	9.60	0.72	22.30	32.62	29.27	40.00	-10.73	243.70	355.40
31.10	H	9.74	0.72	22.27	32.74	29.24	40.00	-10.76	333.80	315.70
409.10	V	13.43	2.38	20.70	36.51	31.47	46.00	-14.53	103.40	98.50
466.00	V	21.42	2.42	22.00	45.84	40.81	46.00	-5.19	137.00	64.20
476.30	V	21.71	2.52	22.91	47.14	42.25	46.00	-3.75	126.80	132.60
480.30	H	11.99	2.57	22.95	37.51	33.25	46.00	-12.75	153.80	122.10
483.10	H	11.68	2.60	22.87	37.14	34.03	46.00	-11.97	151.00	0.10
484.90	V	19.13	2.61	22.80	44.54	45.06	46.00	-0.94	108.60	132.70
485.90	H	11.56	2.62	22.80	36.98	32.96	46.00	-13.04	104.20	87.50
947.90	H	11.17	3.91	28.60	43.68	40.71	46.00	-5.29	362.50	146.90
952.70	H	11.68	3.92	28.50	44.10	40.63	46.00	-5.37	192.10	37.50
957.50	V	12.46	3.91	28.30	44.67	40.80	46.00	-5.20	117.30	42.10

Title: Conducted Emissions - Line
 File: Conducted - Pre-Test - Line 120
 Operator: R. Ramirez
 EUT Type: RF Transmitter
 EUT Condition: Charging
 Comments: Lab T
 Company: Microwave Monolithics Incorporated
 Model: MMI-TRAKR2
 Voltage: 120

5/10/2022 2:23:41 PM
 Sequence: Preliminary Scan



Title: Conducted Emissions - Line
 File: Conducted - Final Test - Line 120
 Operator: R. Ramirez
 EUT Type: RF Transmitter
 EUT Condition: Charging
 Comments: Lab T
 Company: Microwave Monolithics Incorporated
 Model: MMI-TRAKR2
 Voltage: 120

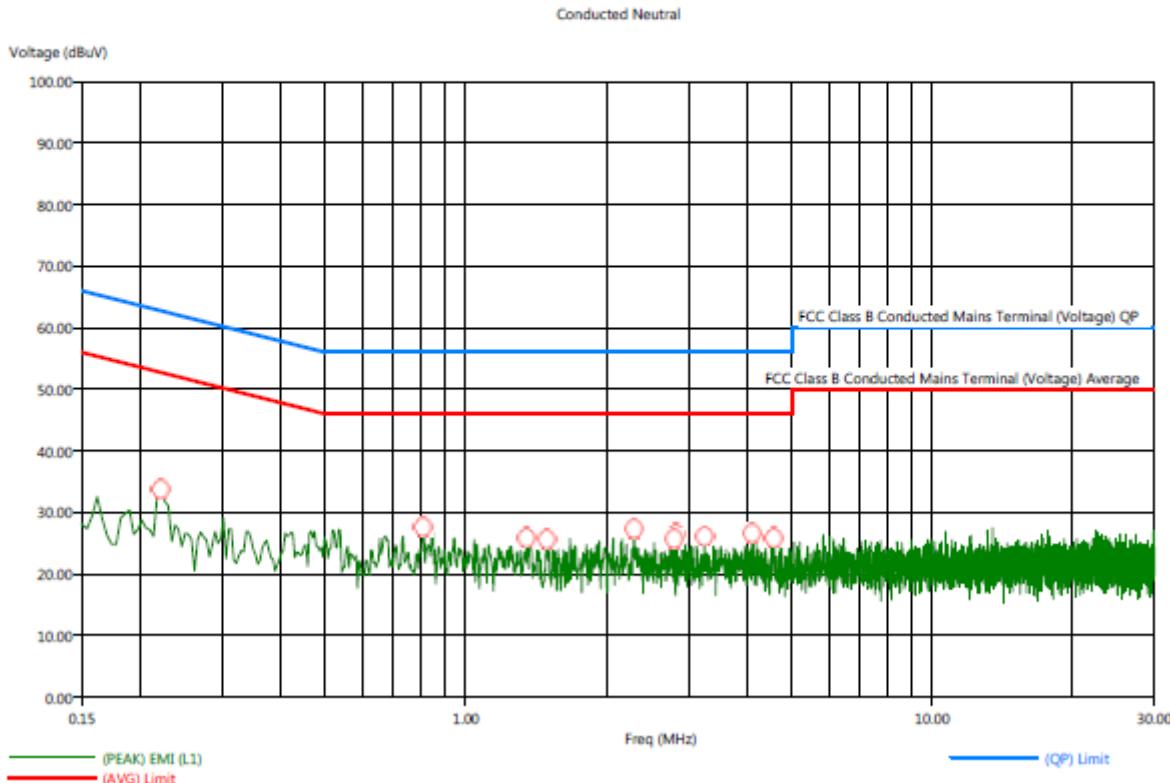
5/10/2022 2:26:54 PM
 Sequence: Final Measurements

Data

Freq (MHz)	(PEAK) EMI (dBuV)	(AVG) EMI (dBuV)	(QP) EMI (dBuV)	(AVG) Limit (dBuV)	(QP) Limit (dBuV)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)
0.18	41.28	32.80	41.00	54.68	64.68	-21.88	-23.68
0.23	40.56	34.65	39.24	53.05	63.05	-18.40	-23.81
0.33	35.60	28.70	35.84	50.05	60.05	-21.34	-24.20
1.03	29.45	19.21	26.74	46.00	56.00	-26.79	-29.26
1.14	26.66	21.40	25.95	46.00	56.00	-24.60	-30.05
1.55	25.66	19.48	25.21	46.00	56.00	-26.52	-30.79
1.60	25.85	18.14	24.77	46.00	56.00	-27.86	-31.23
2.11	25.28	16.93	23.74	46.00	56.00	-29.07	-32.26
2.37	23.63	18.98	23.21	46.00	56.00	-27.02	-32.79
4.08	24.23	16.63	22.50	46.00	56.00	-29.37	-33.50

Title: Conducted Emissions - Neutral
 File: Conducted - Pre-Test - Neutral 120
 Operator: R. Ramirez
 EUT Type: RF Transmitter
 EUT Condition: Charging
 Comments: Lab T
 Company: Microwave Monolithics Incorporated
 Model: MMI-TRAKR2
 Voltage: 120

5/10/2022 2:32:51 PM
 Sequence: Preliminary Scan



Title: Conducted Emissions - Neutral
 File: Conducted - Final Test - Neutral 120
 Operator: R. Ramirez
 EUT Type: RF Transmitter
 EUT Condition: Charging
 Comments: Lab T
 Company: Microwave Monolithics Incorporated
 Model: MMI-TRAKR2
 Voltage: 120

5/10/2022 2:35:22 PM
 Sequence: Final Measurements

Data

Freq (MHz)	(PEAK) EMI (dBuV)	(AVG) EMI (dBuV)	(QP) EMI (dBuV)	(AVG) Limit (dBuV)	(QP) Limit (dBuV)	(AVG) Margin AVL (dB)	(QP) Margin QPL (dB)
0.22	28.59	21.69	30.76	53.24	63.24	-31.55	-32.48
0.81	24.44	17.79	23.14	46.00	56.00	-28.21	-32.86
1.35	24.39	17.63	22.13	46.00	56.00	-28.37	-33.87
1.49	24.57	16.74	22.12	46.00	56.00	-29.26	-33.88
2.30	25.15	16.30	21.81	46.00	56.00	-29.70	-34.19
2.80	24.39	16.57	21.64	46.00	56.00	-29.43	-34.36
2.83	25.62	17.18	21.68	46.00	56.00	-28.82	-34.32
3.25	23.27	17.23	21.19	46.00	56.00	-28.77	-34.81
4.12	25.90	16.04	21.44	46.00	56.00	-29.96	-34.56
4.59	24.07	15.94	21.07	46.00	56.00	-30.06	-34.93

FCC 15.247

Microwave Monolithics Incorporated.
RF Transmitter
M/N: MMI-TRAKR2

Date: 05/9/2022
Lab: T
Tested By: Rev Ramirez

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz

Non Harmonic Emissions from the Tx and Digital Portion – 1000 MHz to 9272.6 MHz

HARMONIC EMISSIONS LOW CHANNEL

FCC 15.247

Company: Microwave Monolithics Incorporated

Date: 5/9/2022

EUT: RF Transmitter

Lab: T

Model: MMI-TRAKR2

Test

ENG:

R. Ramirez

Compatible Electronics, Inc. (Lab T)

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.48	50.59	H	73.98	-23.39	Peak	3.00	55.1	
1805.48	39.18	H	53.98	-14.80	Avg	3.00		
2708.22	52.78	H	73.98	-21.20	Peak	2.39	351.7	In Restricted Band
2708.22	41.35	H	53.98	-12.63	Avg	2.39	351.7	In Restricted Band
3610.96	51.35	H	73.98	-22.63	Peak	2.83	356.4	In Restricted Band
3610.96	39.43	H	53.98	-14.55	Avg	2.83	356.4	In Restricted Band
4513.70		H						No Frequency Found
4513.70		H						In Restricted Band
5416.44		H						No Frequency Found
5416.44		H						In Restricted Band
6319.18		H						No Frequency Found
6319.18		H						
7221.92		H						No Frequency Found
7221.92		H						
8124.66		H						No Frequency Found
8124.66		H						In Restricted Band
9027.40		H						No Frequency Found
9027.40		H						In Restricted Band

 Test distance
 3 meter

HARMONIC EMISSIONS LOW CHANNEL

FCC 15.247

Company: Microwave Monolithics Incorporated
 EUT: RF Transmitter
 Model: MMI-TRAKR2

Date: 5/9/2022
 Lab: T
 Test
 ENG: R. Ramirez

Compatible Electronics, Inc. (Lab T)

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1805.48	50.20	V	73.98	-23.78	Peak	2.12	97.3	
1805.48	38.64	V	53.98	-15.34	Avg	2.12	97.3	
2708.22	53.56	V	73.98	-20.42	Peak	1.89	173.7	In Restricted Band
2708.22	42.31	V	53.98	-11.67	Avg	1.89	173.7	In Restricted Band
3610.96	58.48	V	73.98	-15.50	Peak	2.2	350.5	In Restricted Band
3610.96	47.44	V	53.98	-6.54	Avg	2.2	350.5	In Restricted Band
4513.70	53.51	V	73.98	-20.47	Peak	1.95	175	In Restricted Band
4513.70	43.10	V	53.98	-10.88	Avg	1.95	175	In Restricted Band
5416.44		V						No Frequency Found
5416.44		V						In Restricted Band
6319.18		V						No Frequency Found
6319.18		V						
7221.92		V						No Frequency Found
7221.92		V						
8124.66		V						No Frequency Found
8124.66		V						In Restricted Band
9027.40		V						No Frequency Found
9027.40		V						In Restricted Band

Test distance
3 meter

HARMONIC EMISSIONS MID CHANNEL

FCC 15.247

Company: Microwave Monolithics Incorporated

Date: 5/9/2022

EUT: RF Transmitter

Lab: T

Model: MMI-TRAKR2

Test ENG: R. Ramirez

Compatible Electronics, Inc. (Lab T)

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1831.48	50.63	H	73.98	-23.35	Peak	2.50	341.8	
1831.48	38.71	H	53.98	-15.27	Avg	2.50	341.8	
2747.22	53.59	H	73.98	-20.39	Peak	2.13	288.8	In Restricted Band
2747.22	42.07	H	53.98	-11.91	Avg	2.13	288.8	In Restricted Band
3662.96	50.28	H	73.98	-23.70	Peak	2.76	215.5	In Restricted Band
3662.96	39.50	H	53.98	-14.48	Avg	2.76	215.5	In Restricted Band
4578.70		H						No Frequency Found
4578.70		H						In Restricted Band
5494.44		H						No Frequency Found
5494.44		H						
6410.18		H						No Frequency Found
6410.18		H						
7325.92		H						No Frequency Found
7325.92		H						In Restricted Band
8241.66		H						No Frequency Found
8241.66		H						In Restricted Band
9157.40		H						No Frequency Found
9157.40		H						In Restricted Band

Test distance

3 meter

HARMONIC EMISSIONS MID CHANNEL

FCC 15.247

Company: Microwave Monolithics Incorporated

Date: 5/9/2022

EUT: RF Transmitter

Lab: T

Model: MMI-TRAKR2

Test ENG: R. Ramirez

Compatible Electronics, Inc. (Lab T)

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1831.48	50.06	V	73.98	-23.92	Peak	2.69	90.9	
1831.48	38.85	V	53.98	-15.13	Avg	2.69	90.9	
2747.22	54.37	V	73.98	-19.61	Peak	1.8	153	In Restricted Band
2747.22	42.23	V	53.98	-11.75	Avg	1.8	153	In Restricted Band
3662.96	52.29	V	73.98	-21.69	Peak	2.12	237.1	In Restricted Band
3662.96	39.68	V	53.98	-14.30	Avg	2.12	237.1	In Restricted Band
4578.70		V						No Frequency Found
4578.70		V						In Restricted Band
5494.44		V						No Frequency Found
5494.44		V						
6410.18		V						No Frequency Found
6410.18		V						
7325.92		V						No Frequency Found
7325.92		V						In Restricted Band
8241.66		V						No Frequency Found
8241.66		V						In Restricted Band
9157.40		V						No Frequency Found
9157.40		V						In Restricted Band

Test distance

3 meter

HARMONIC EMISSIONS HIGH CHANNEL

FCC 15.247

Company: Microwave Monolithics Incorporated
 EUT: RF Transmitter
 Model: MMI-TRAKR2

Date: 5/9/2022
 Lab: T
 Test
 ENG: R. Ramirez

Compatible Electronics, Inc. (Lab T)

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1854.52	50.64	H	73.98	-23.34	Peak	2.97	46.3	
1854.52	38.47	H	53.98	-15.51	Avg	2.97	46.3	
2781.78	53.61	H	73.98	-20.37	Peak	1.94	243.4	In Restricted Band
2781.78	42.05	H	53.98	-11.93	Avg	1.94	243.4	In Restricted Band
3709.04	49.92	H	73.98	-24.06	Peak	1.9	91.2	In Restricted Band
3709.04	39.40	H	53.98	-14.58	Avg	1.9	91.2	In Restricted Band
4636.30		H						No Frequency Found
4636.30		H						In Restricted Band
5563.56		H						No Frequency Found
5563.56		H						
6490.82		H						No Frequency Found
6490.82		H						
7418.08		H						No Frequency Found
7418.08		H						In Restricted Band
8345.34		H						No Frequency Found
8345.34		H						In Restricted Band
9272.60		H						No Frequency Found
9272.60		H						

Test distance
3 meter

HARMONIC EMISSIONS HIGH CHANNEL

FCC 15.247

Company: Microwave Monolithics Incorporated

Date: 5/9/2022

EUT: RF Transmitter

Lab: T

Model: MMI-TRAKR2

Test ENG: R. Ramirez

Compatible Electronics, Inc. (Lab T)

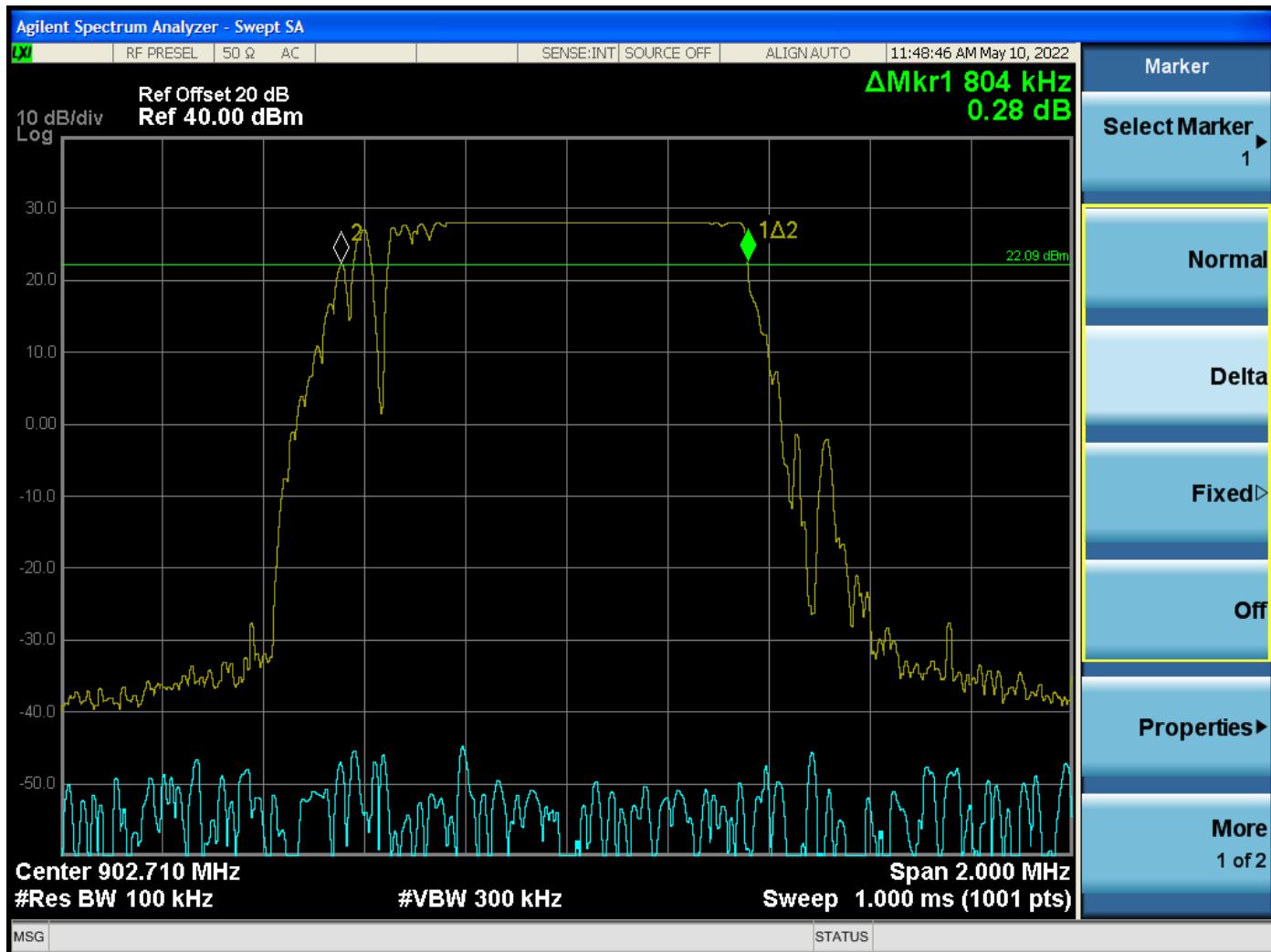
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1854.52	49.49	V	73.98	-24.49	Peak	2.18	102	
1854.52	38.92	V	53.98	-15.06	Avg	2.18	102	
2781.78	53.64	V	73.98	-20.34	Peak	3	225.3	In Restricted Band
2781.78	41.96	V	53.98	-12.02	Avg	3	225.3	In Restricted Band
3709.04	50.79	V	73.98	-23.19	Peak	1.79	136.5	In Restricted Band
3709.04	39.56	V	53.98	-14.42	Avg	1.79	136.5	In Restricted Band
4636.30		V						No Frequency Found
4636.30		V						In Restricted Band
5563.56		V						No Frequency Found
5563.56		V						
6490.82		V						No Frequency Found
6490.82		V						
7418.08		V						No Frequency Found
7418.08		V						In Restricted Band
8345.34		V						No Frequency Found
8345.34		V						In Restricted Band
9272.60		V						No Frequency Found
9272.60		V						

Test distance

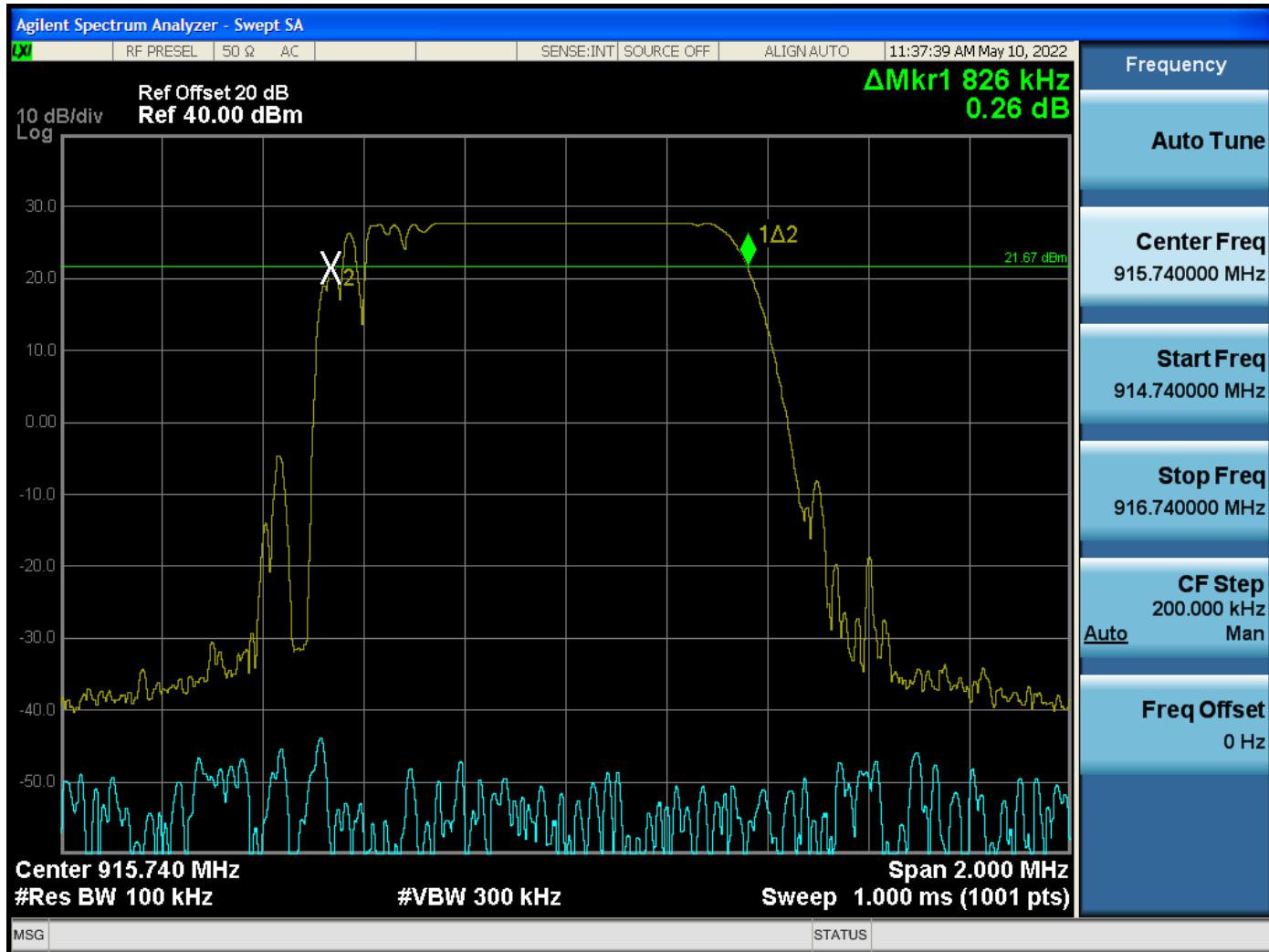
3 meter

DTS BANDWIDTH

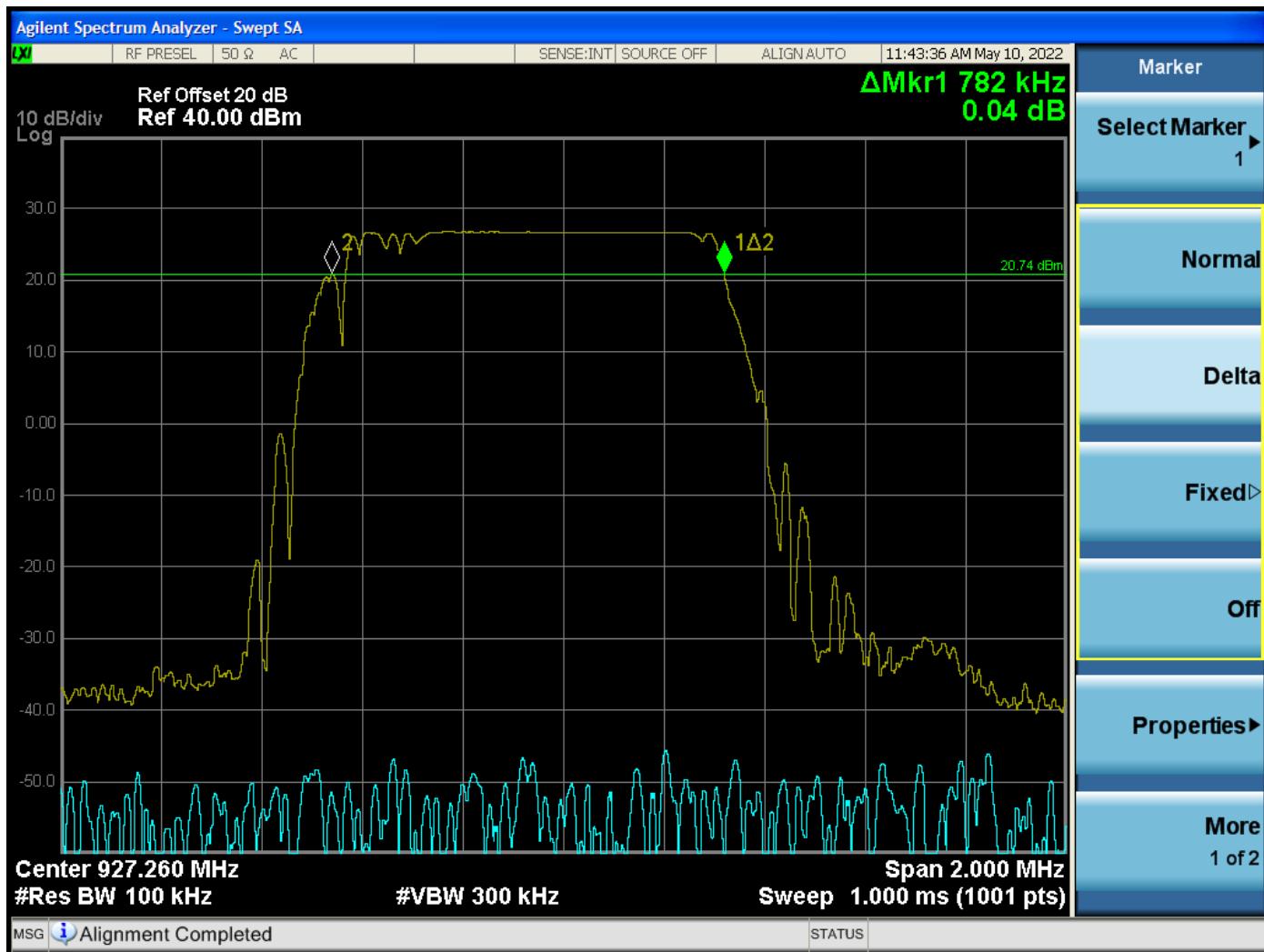
DATA SHEETS



DTS Bandwidth – Low Channel



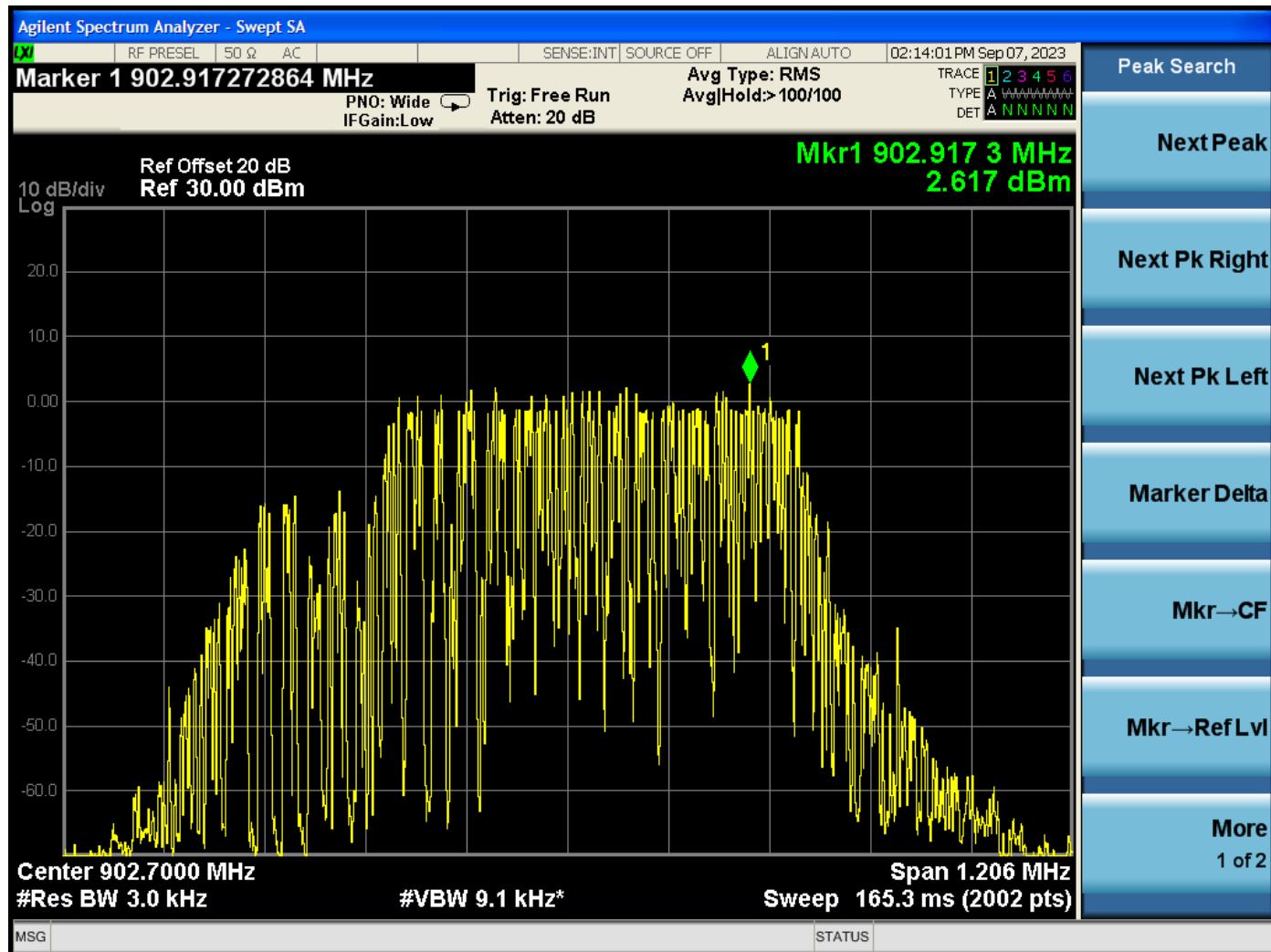
DTS Bandwidth – Middle Channel



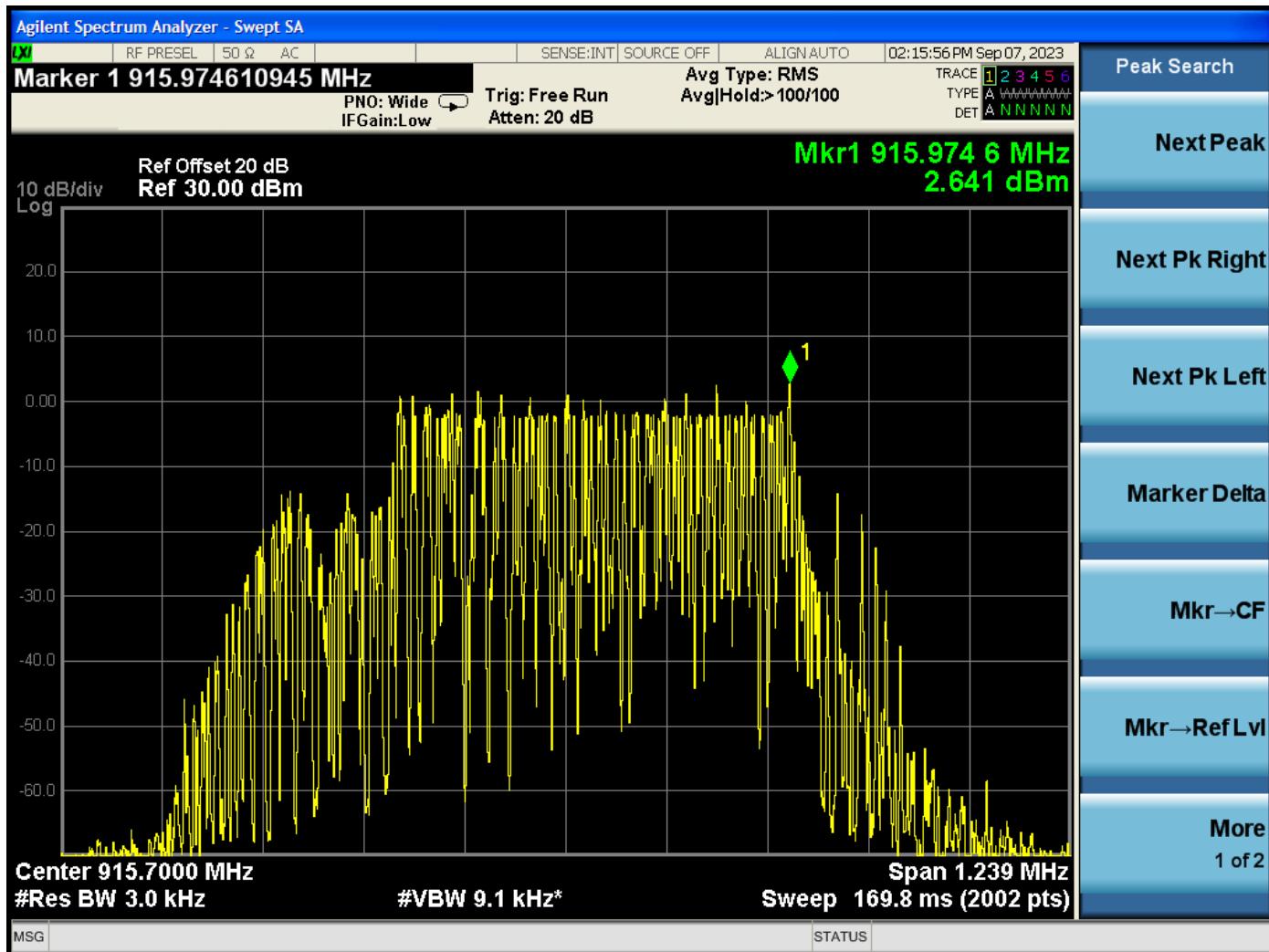
DTS Bandwidth – High Channel

POWER SPECTRAL DENSITY OUTPUT

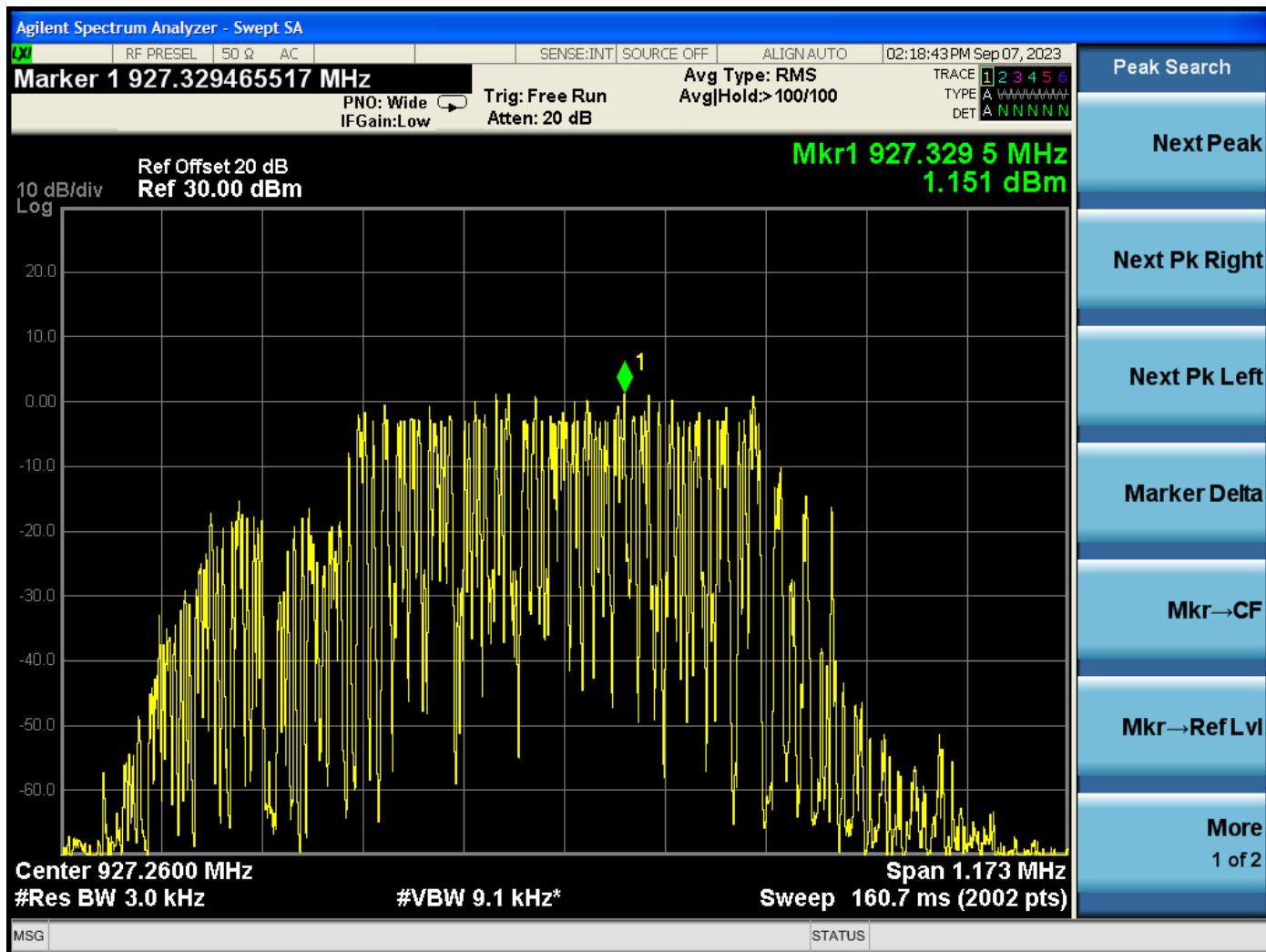
DATA SHEETS



Power Spectral Density – Low Channel

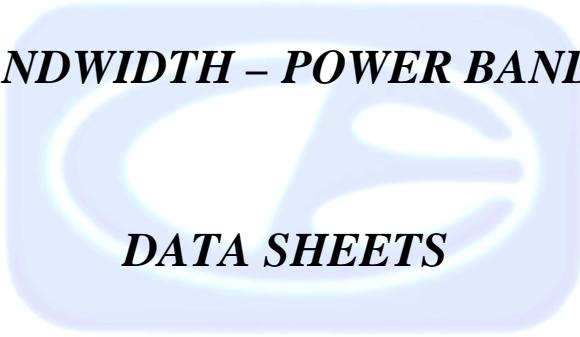


Power Spectral Density – Middle Channel

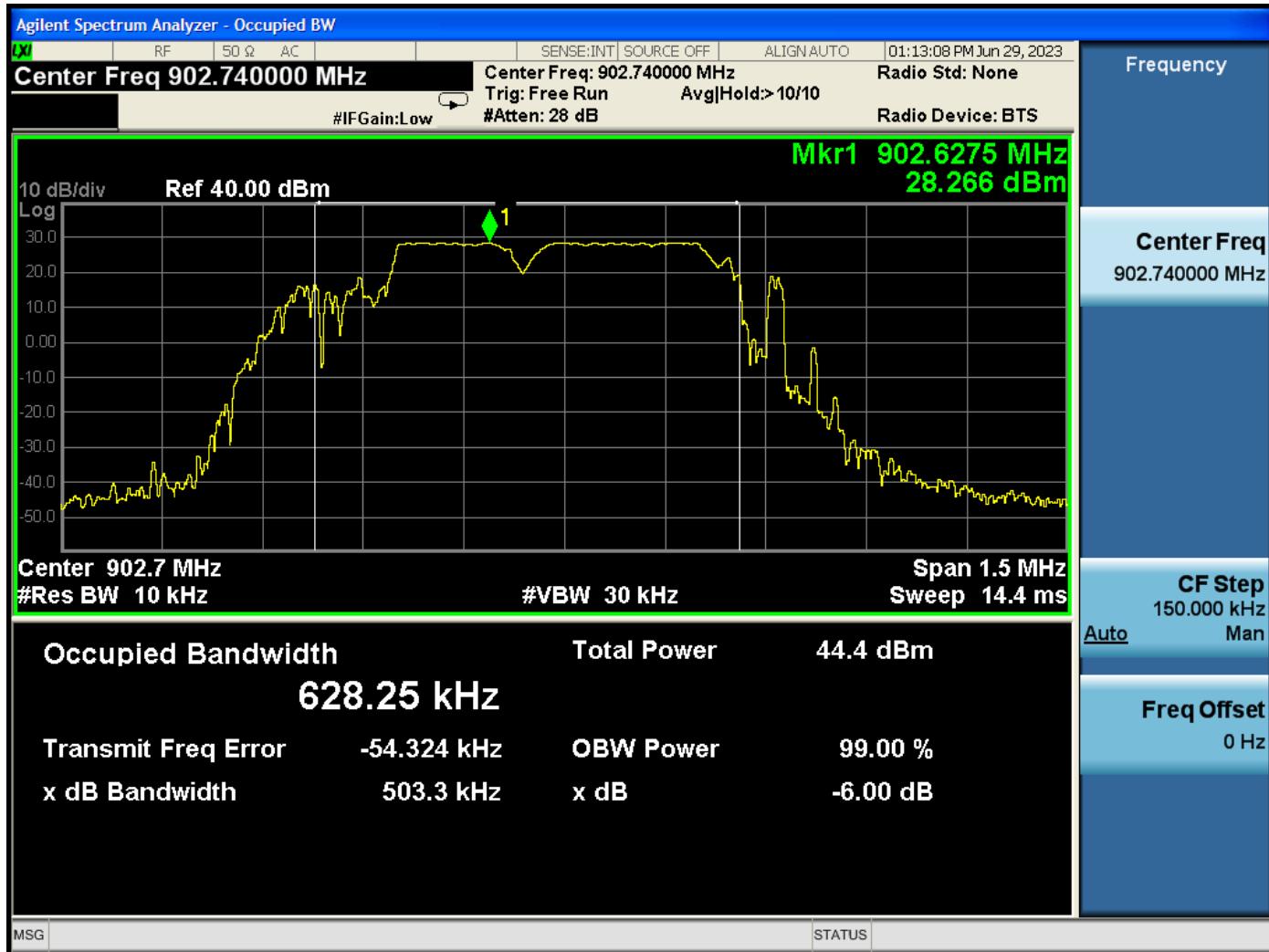


Power Spectral Density – High Channel

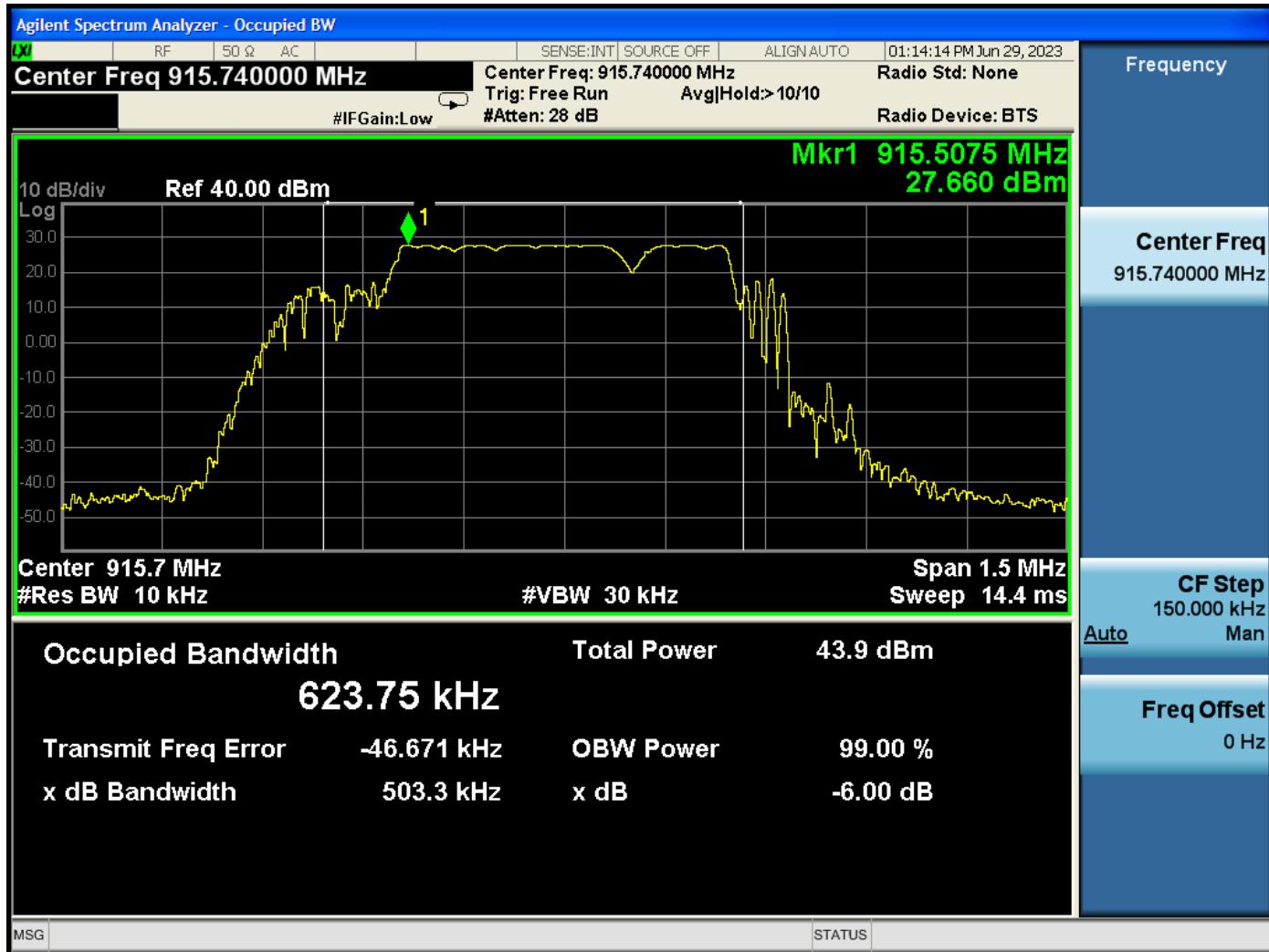
OCCUPIED BANDWIDTH – POWER BANDWIDTH (99%)



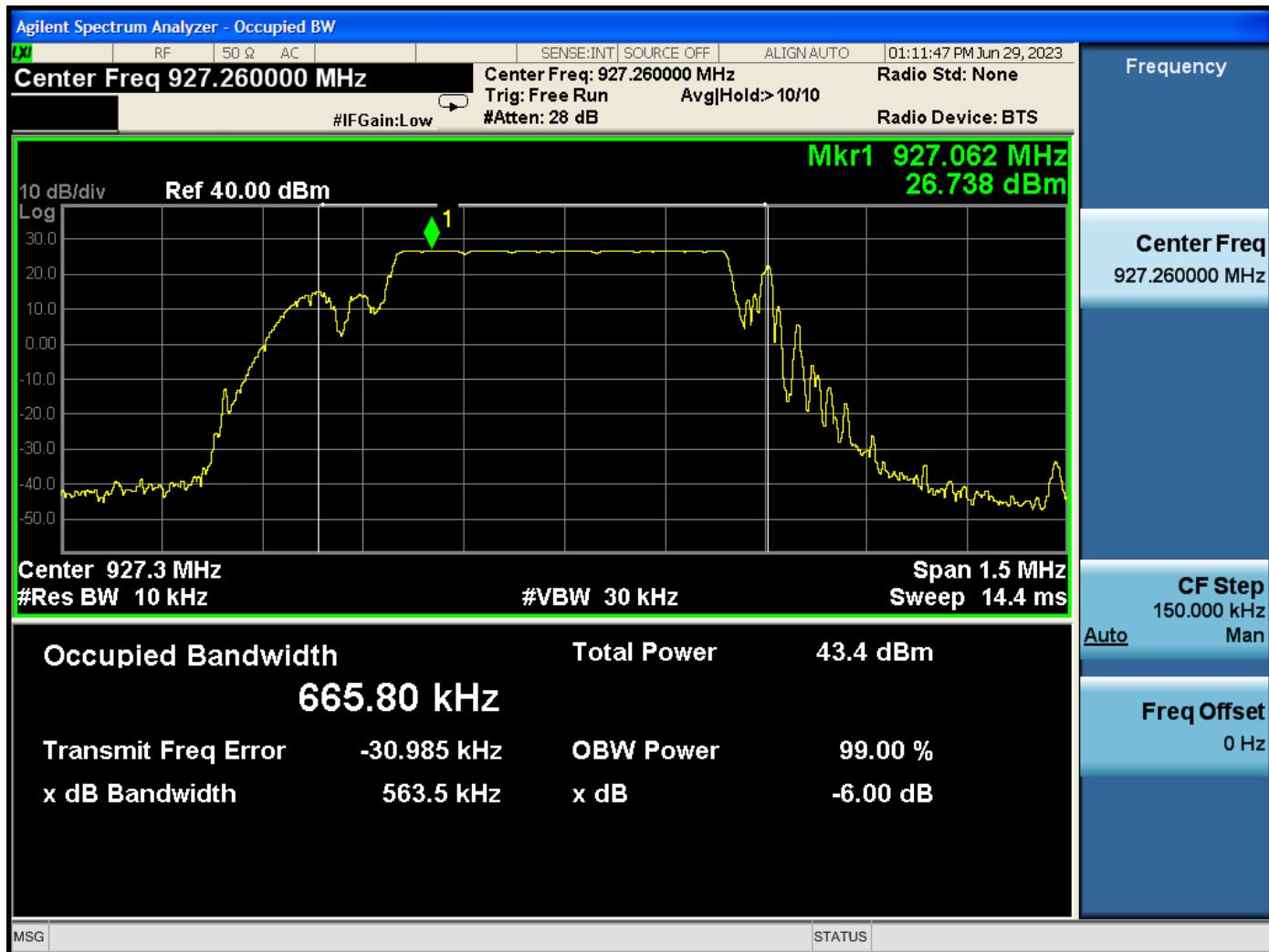
DATA SHEETS



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

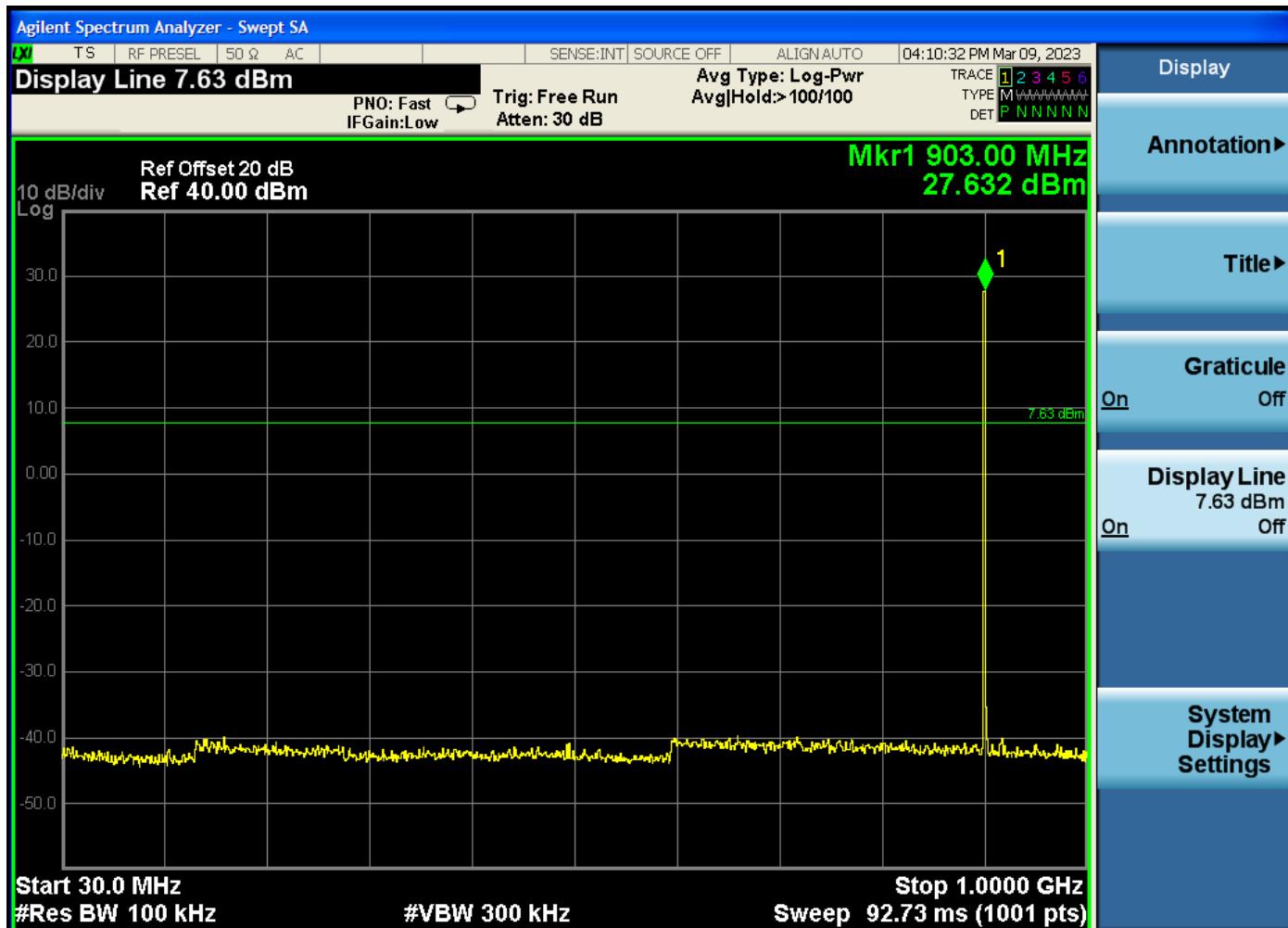


Occupied Bandwidth – Power Bandwidth (99%) – Middle Channel

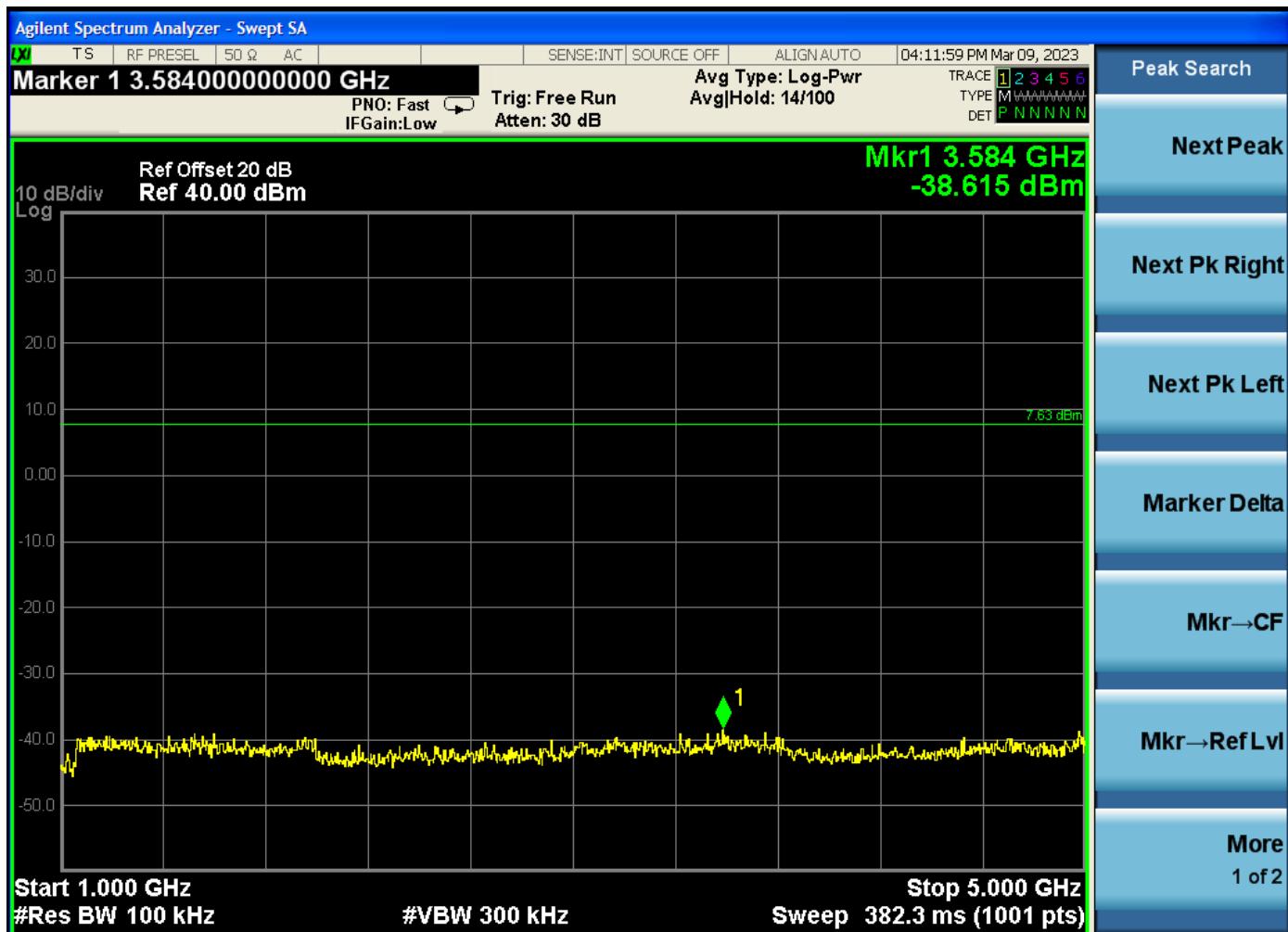


Occupied Bandwidth – Power Bandwidth (99%) – High Channel

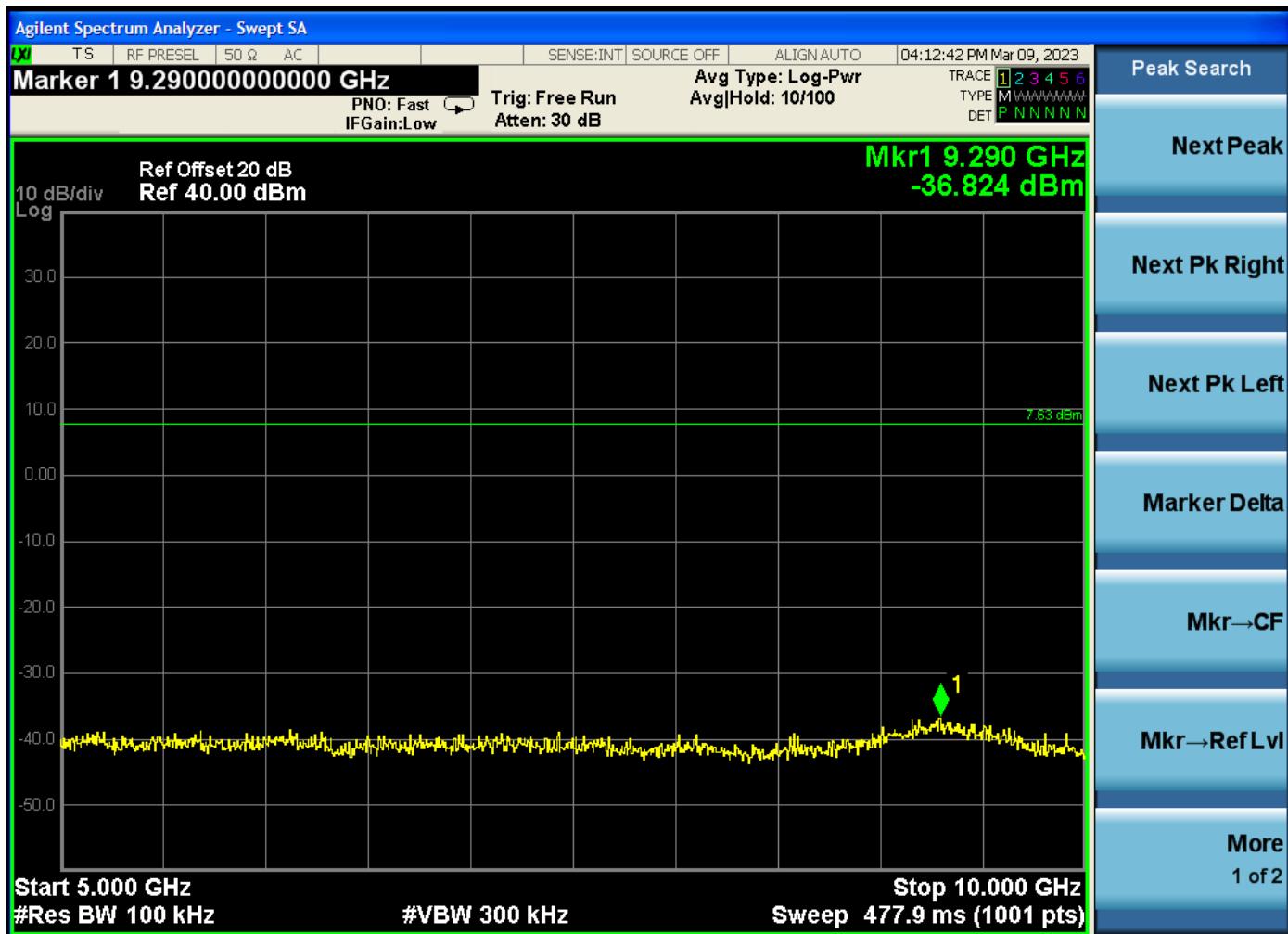
***RF ANTENNA CONDUCTED
DATA SHEETS***



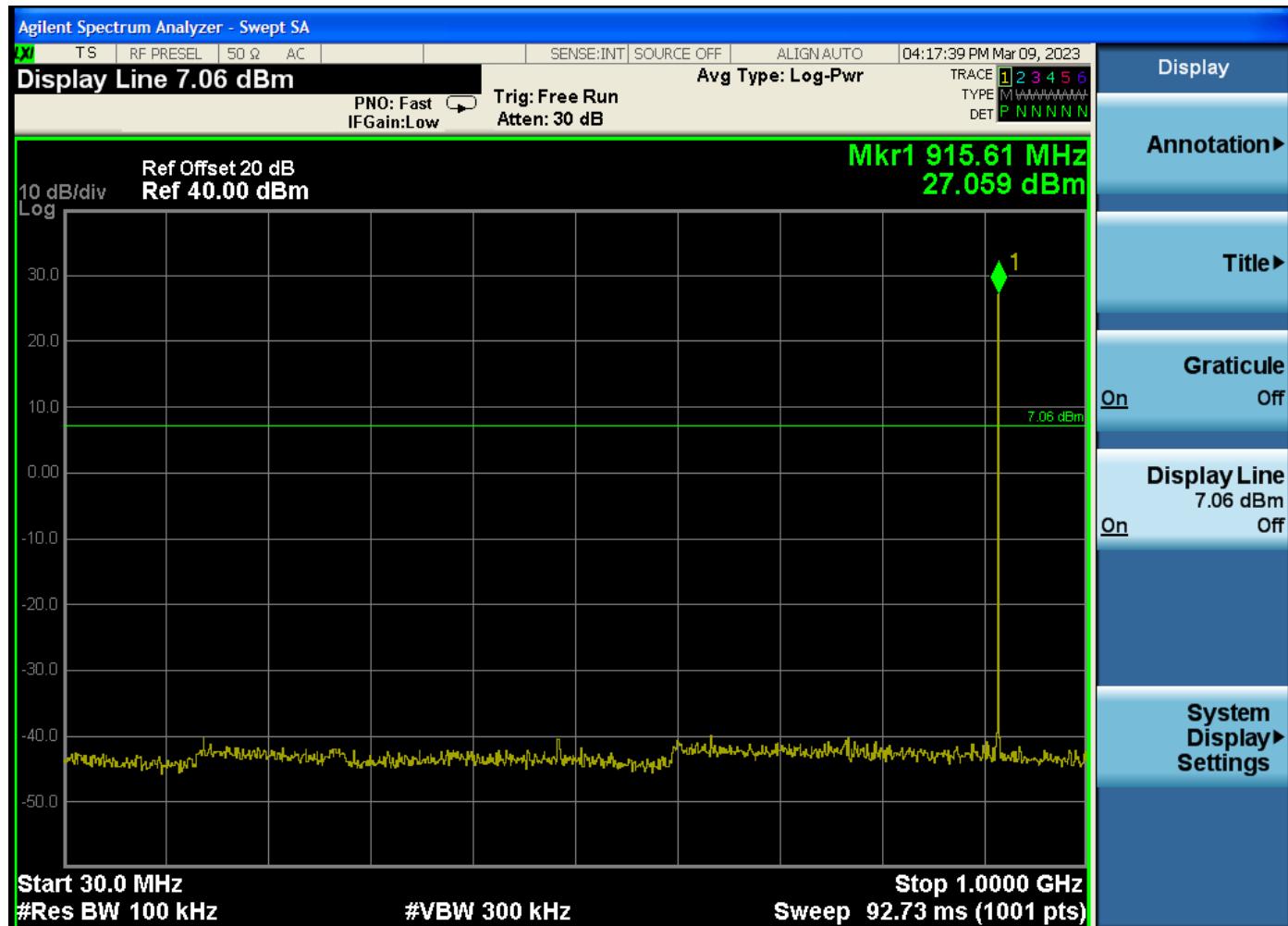
RF Antenna Conducted Test – Low Channel – 30 MHz to 1 GHz



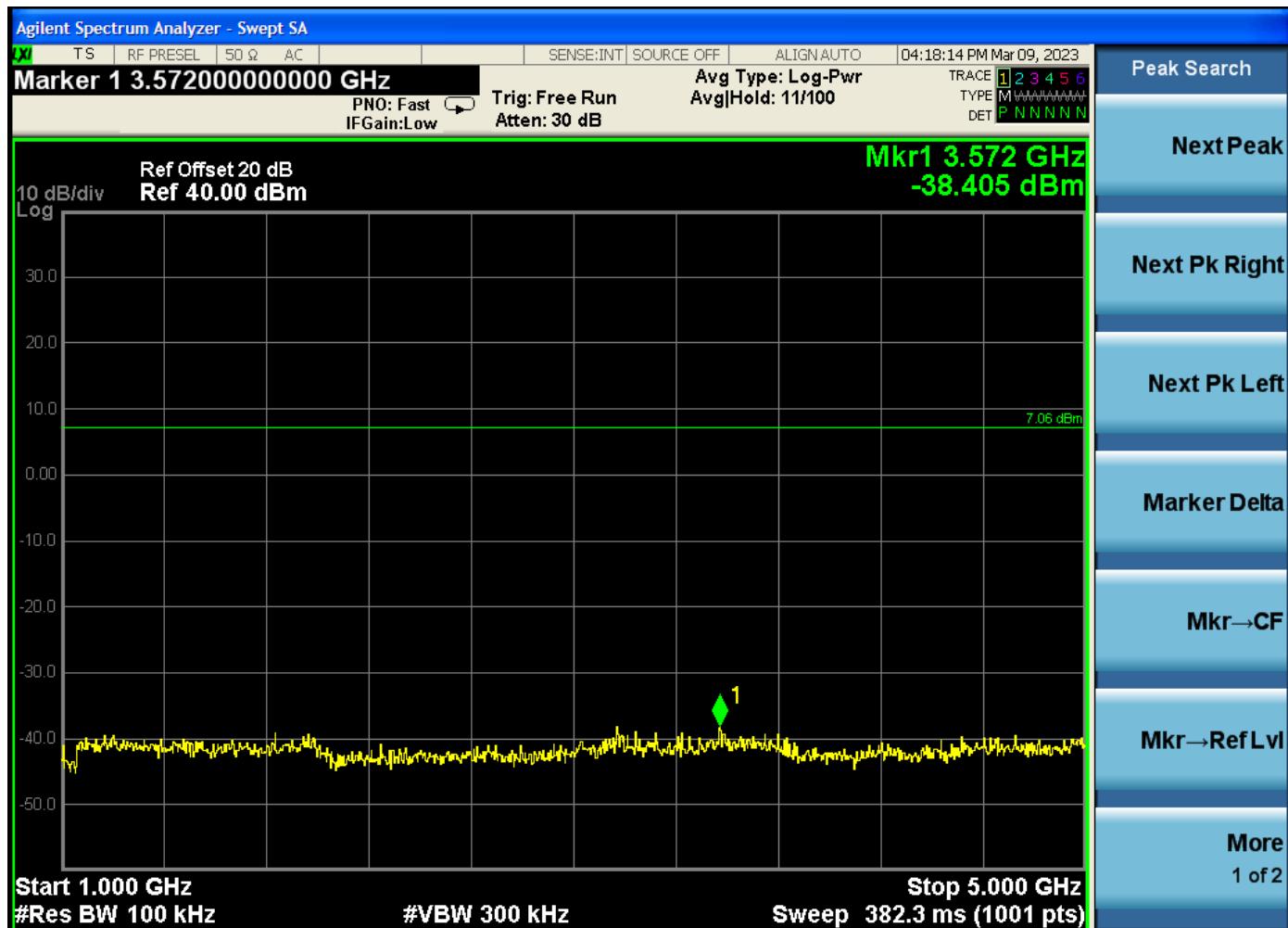
RF Antenna Conducted Test – Low Channel – 1 GHz to 5 GHz



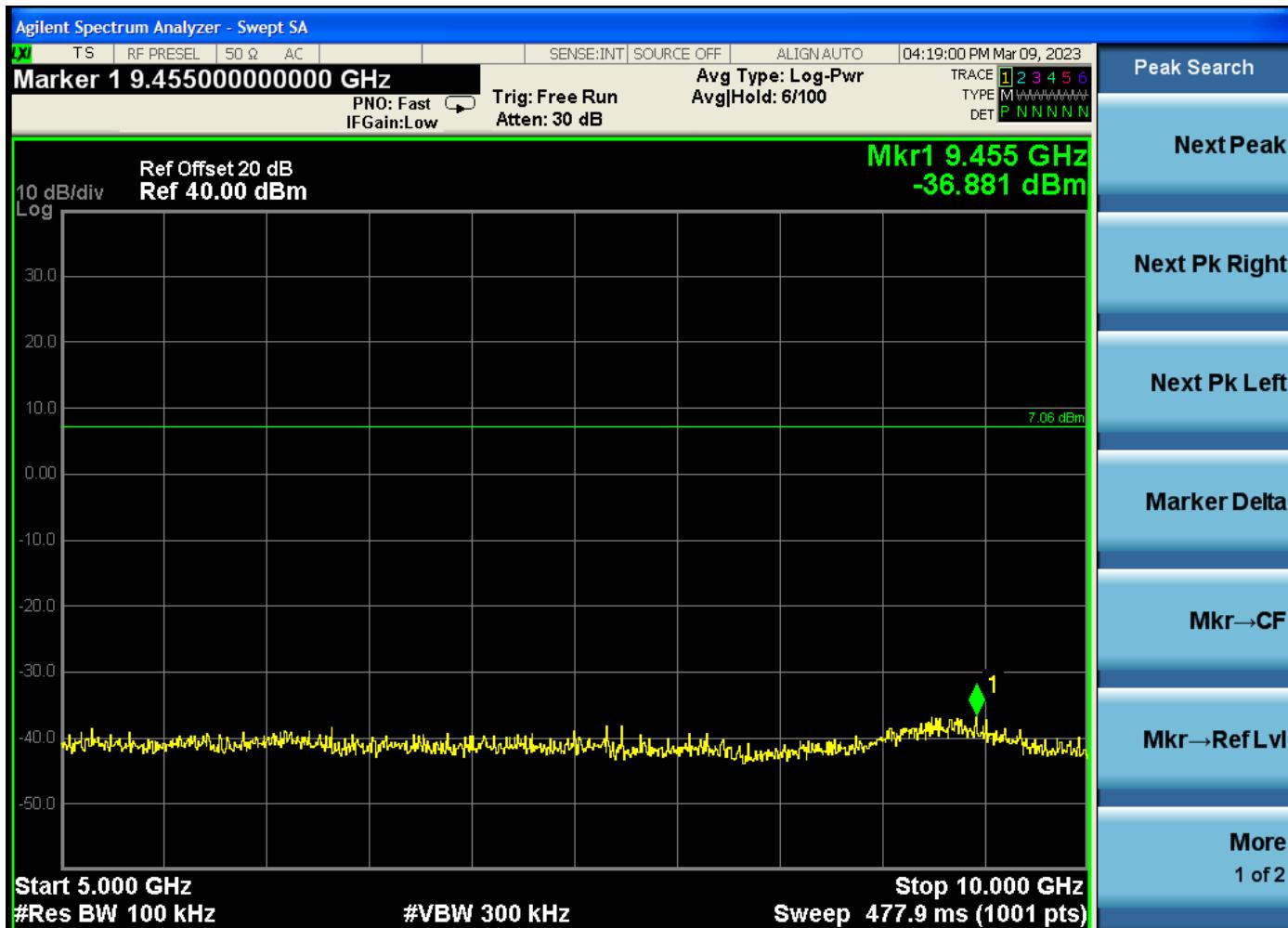
RF Antenna Conducted Test – Low Channel – 5 GHz to 10 GHz



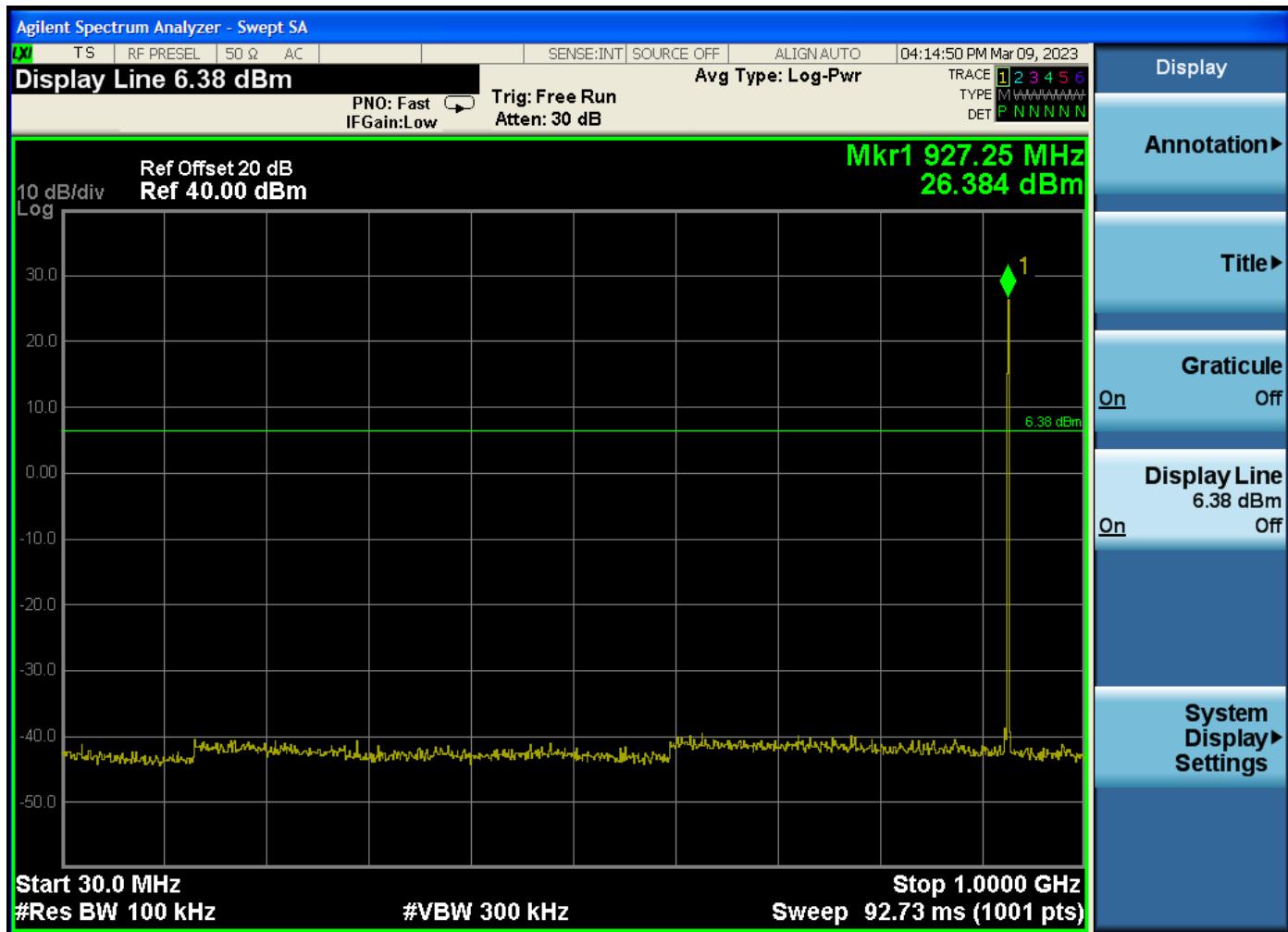
RF Antenna Conducted Test – Middle Channel – 30 MHz to 1 GHz



RF Antenna Conducted Test – Middle Channel – 1 GHz to 5 GHz



RF Antenna Conducted Test – Middle Channel – 5 GHz to 10 GHz



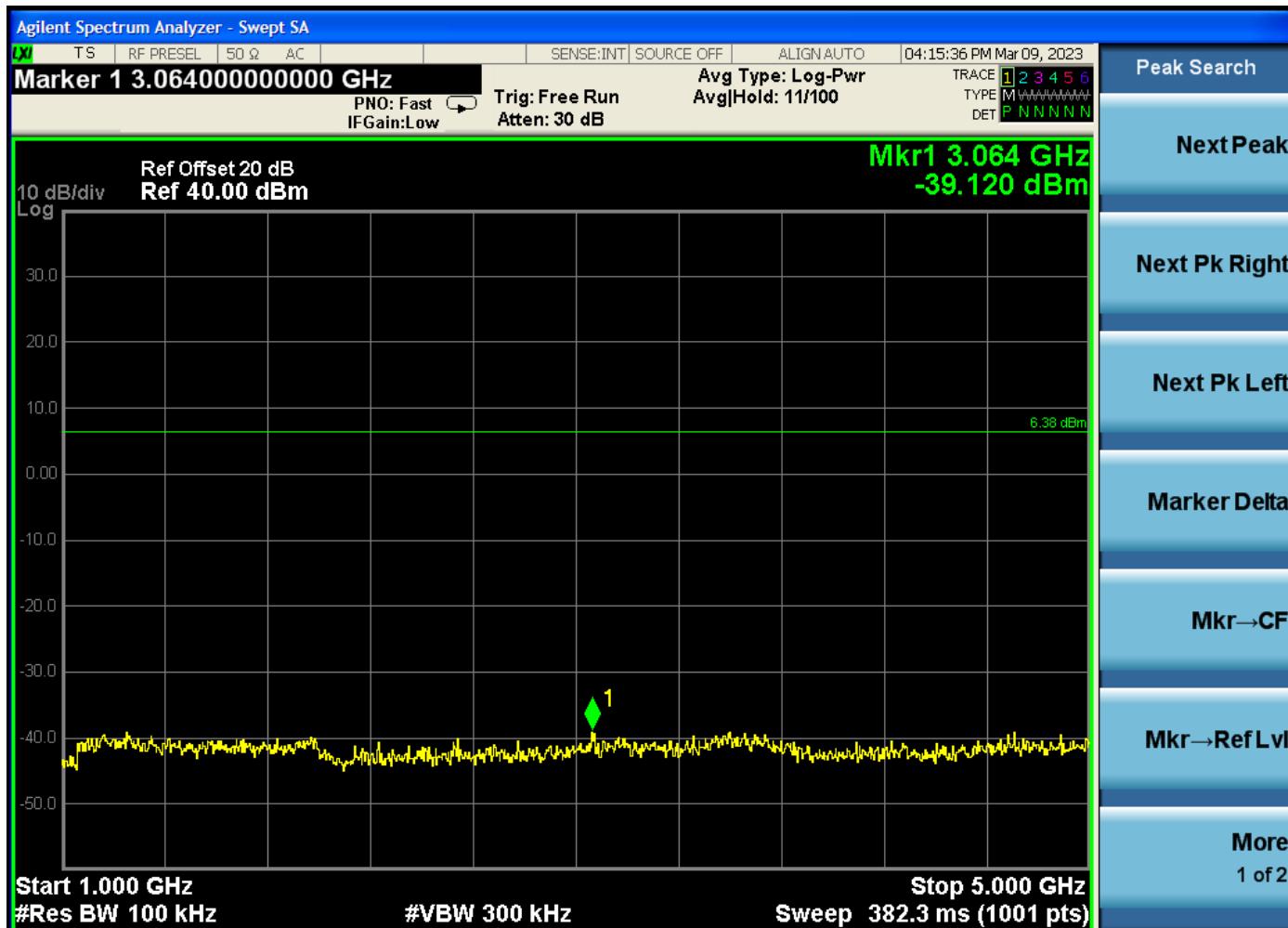
RF Antenna Conducted Test – High Channel – 30 MHz to 1 GHz



COMPATIBLE ELECTRONICS

Report Number: A20510T1
FCC Part 15 Subpart B and C Test Report
RF Transmitter
Model Number: MMI-TRAKR2

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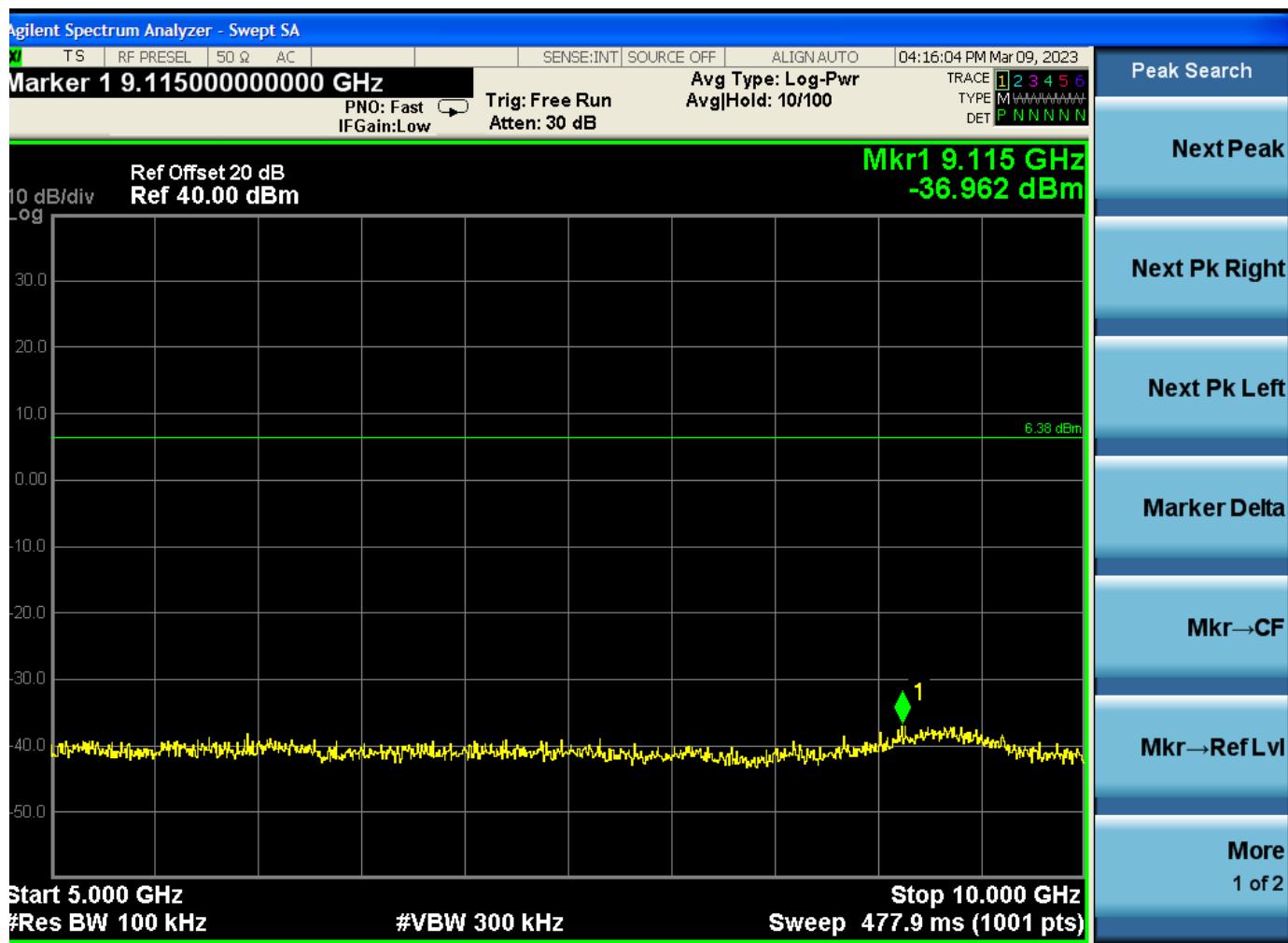
RF Antenna Conducted Test – High Channel – 1 GHz to 5 GHz



COMPATIBLE ELECTRONICS

Report Number: A20510T1
FCC Part 15 Subpart B and C Test Report
RF Transmitter
Model Number: MMI-TRAKR2

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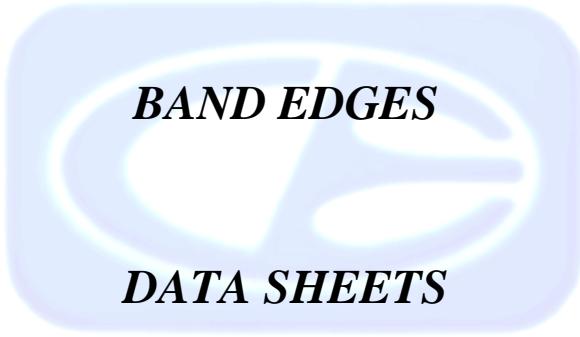


RF Antenna Conducted Test – High Channel – 5 GHz to 10 GHz

Highest Emissions in the non-restricted bands

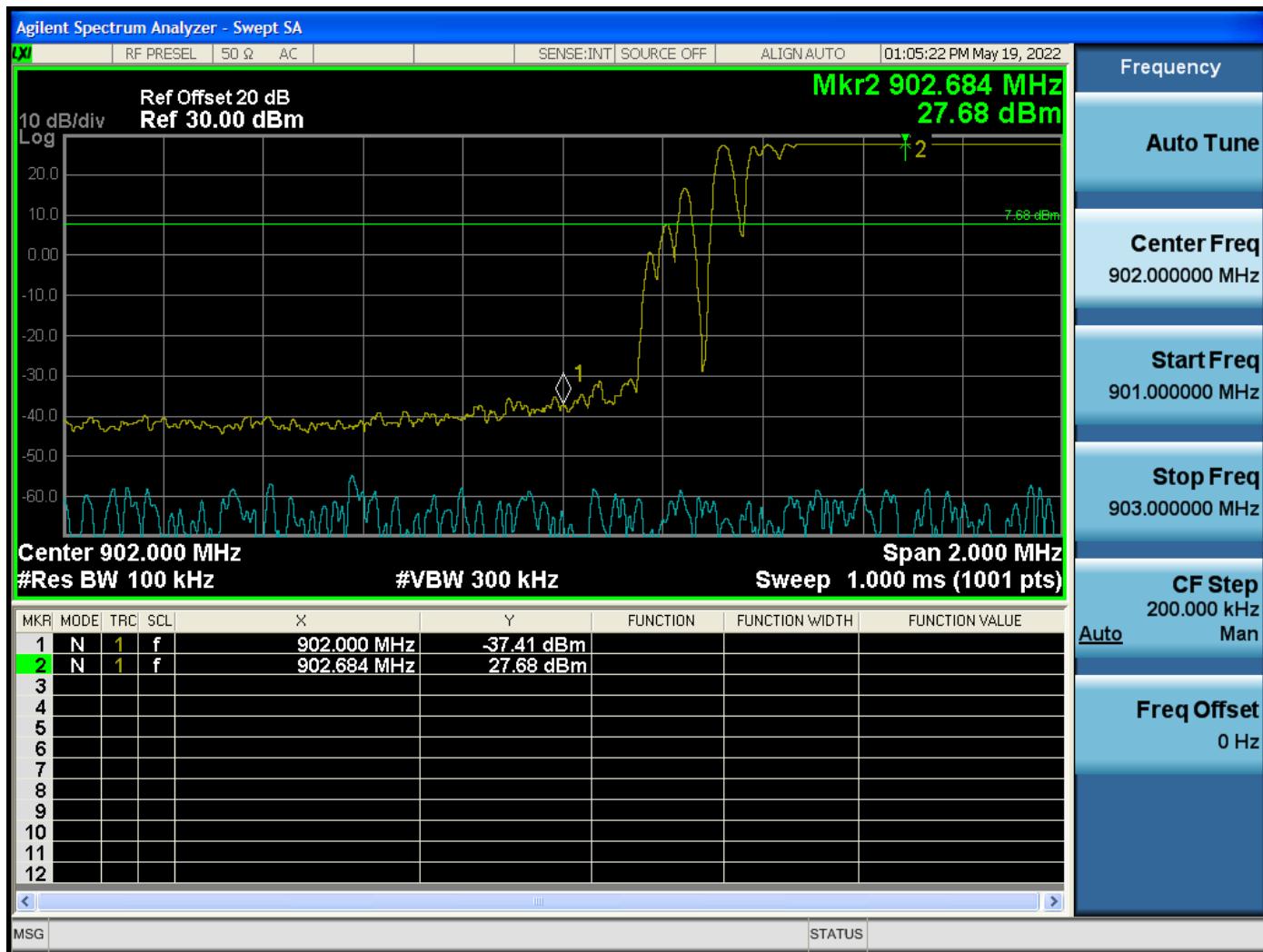
Frequency	Amplitude (dBm)
3.584 GHz (low channel)	-38.615
54 MHz (middle channel)	-40.000
3.064 GHz (high channel)	-39.120





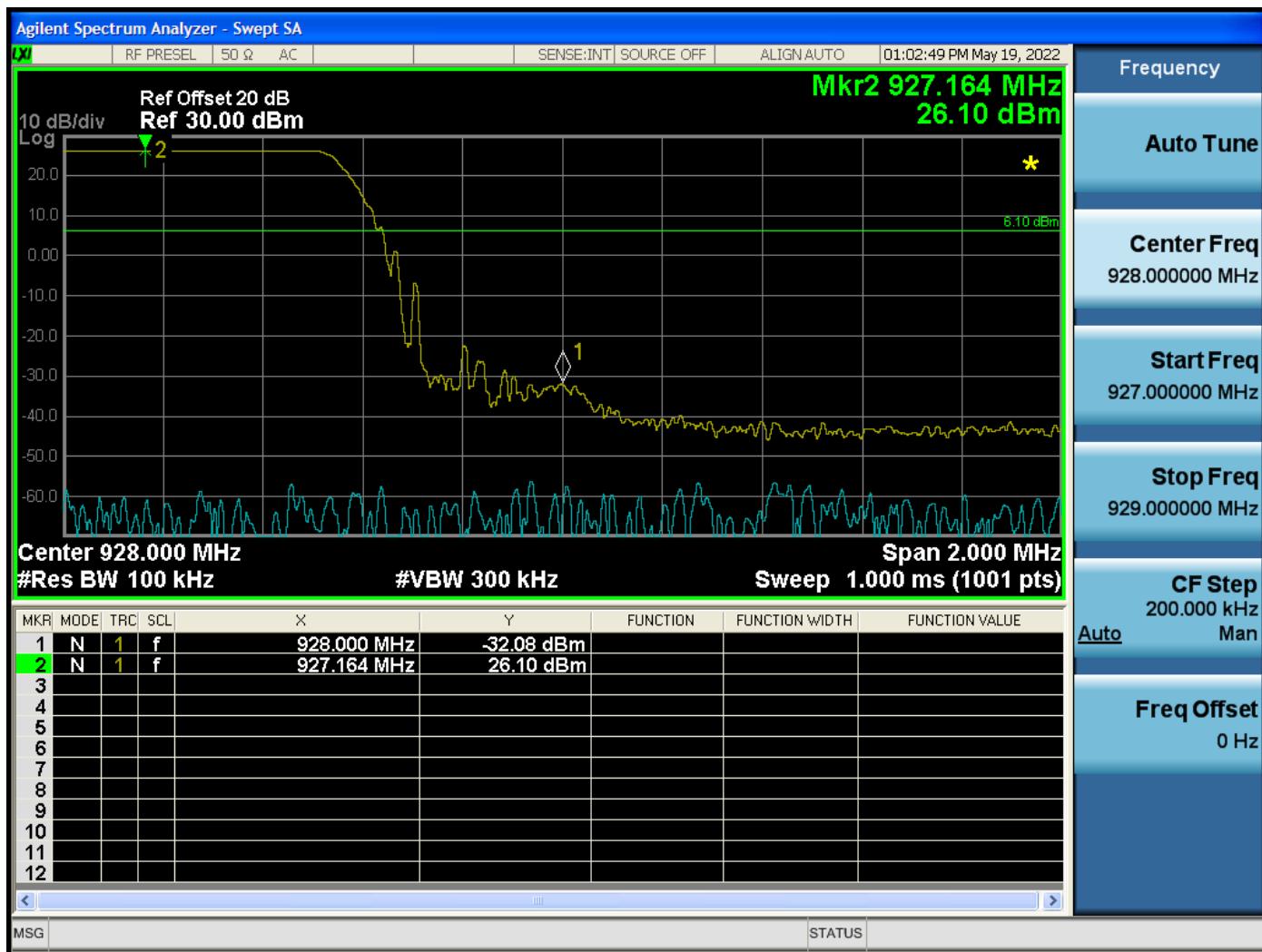
BAND EDGES

DATA SHEETS



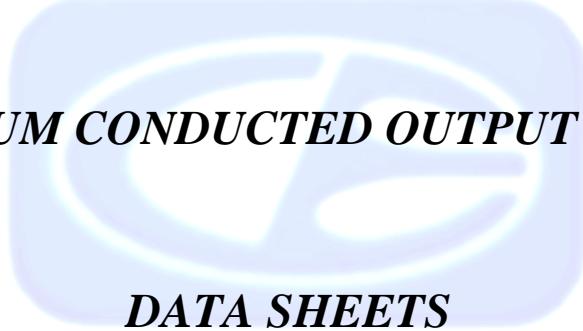
Band Edges – Low channel

Note: Radiated emissions which fall in the restricted bands were verified with the limits under 15.209.



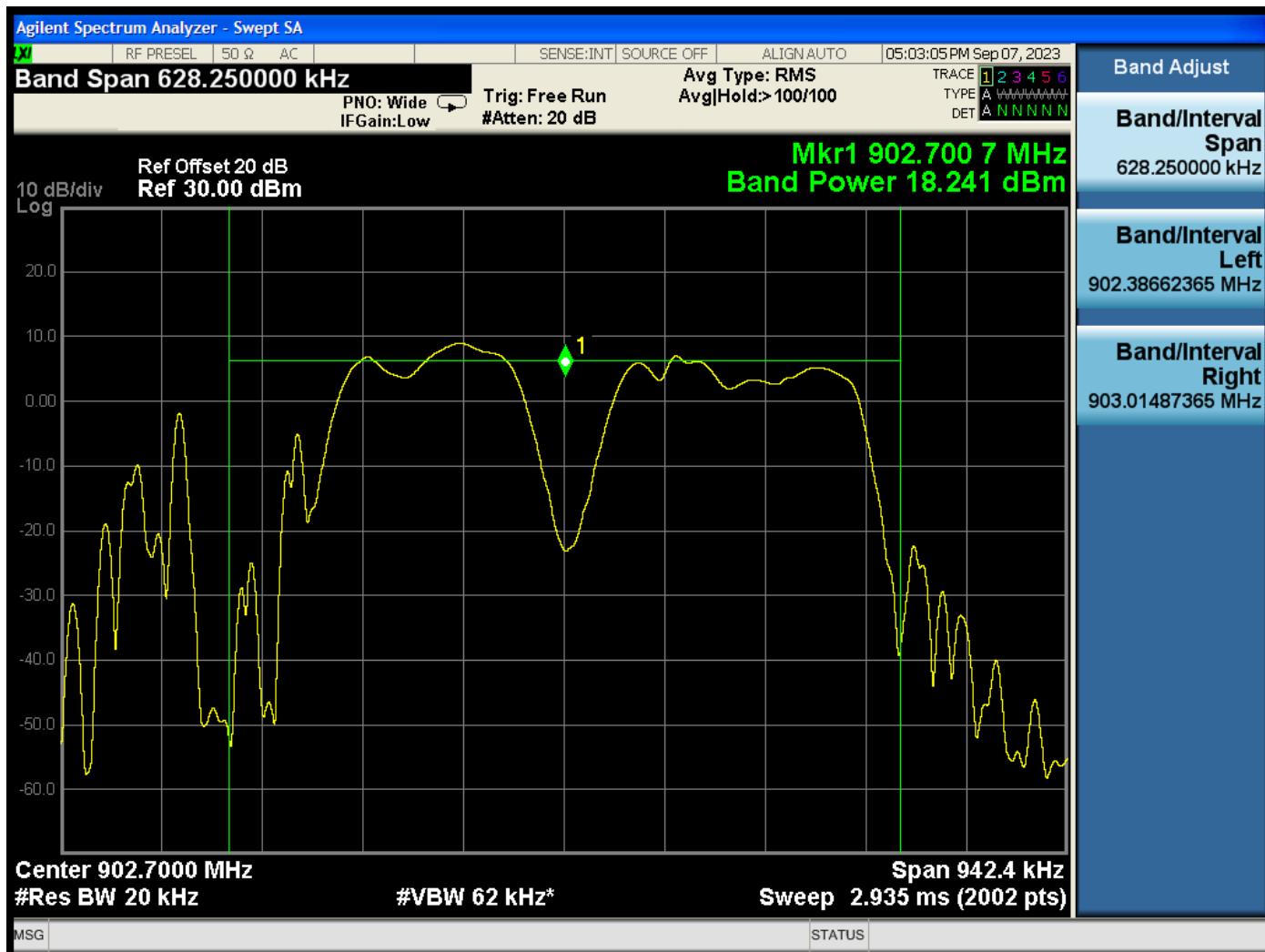
Band Edges – High channel

Note: Radiated emissions which fall in the restricted bands were verified with the limits under 15.209.



MAXIMUM CONDUCTED OUTPUT POWER

DATA SHEETS



Maximum Conducted Output Power - Low Channel



Maximum Conducted Output Power - Middle Channel



Maximum Conducted Output Power - High Channel