COMPATIBLE ELECTRONICS

FCC PART 15, SUBPART B and C; FCC 15.247; RSS-247 and RSS-GEN TEST REPORT

for

MULTIFAMILY

MODEL: UNT1-1000-1100

HVIN: UNT1-1000-1100

Prepared for

SPECTRUM BRANDS, INC.
19701 DAVINCI
LAKE FOREST, CALIFORNIA 92610

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	REPORT BODY	APPENDICES					TOTAL
		A	*B*	*C*	*D*	*E*	
PAGES	25	2	2	2	21	84	**136**

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TABLE OF CONTENTS

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Accreditations and Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams and Charts • Test Setup Diagrams • Antenna and Effective Gain Factors
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Layout of the Semi-Anechoic Test Chamber

LIST OF TABLES

TABLE	TITLE
1	Radiated Emissions Test Results

GENERAL REPORT SUMMARY

This electromagnetic emission test 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 without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: Multifamily
Model: UNT1-1000-1100
S/N: D39D7129004B1200

Product Description: The EUT is a RFID / BLE lock that consists can be put into three different enclosures. The same electronics are used in each enclosure.

The transmit frequency is 2402 MHz to 2480 MHz and 13.56 MHz.
The clock oscillator is 32.7680 kHz and 48 MHz.
Dimensions: 5 inches (L) x 2.75 inches (W) x 2.5 inches (H).

Modifications: The EUT was not modified to meet the specifications.

Customer: Spectrum Brands, Inc.
19701 Davinci
Lake Forest, California 92610

Test Dates: April 11, 12, and 13 2023

Test Specifications covered by accreditation:

Test Specifications: Emissions requirements
CFR Title 47, Part 15, Subpart B;
CFR Title 47, Part 15, Subpart C, sections 15.205, 15.207, 15.209, and 15.247;
RSS-247 and RSS-Gen

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Test Procedures: ANSI C63.4 and ANSI C63.10

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	This test was not performed because the EUT operates on battery power only and cannot be plugged into the AC public mains.
2	Spurious Radiated RF Emissions, 30 MHz – 25000 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; RSS-247 and RSS-GEN Highest reading in relation to spec limit 41.96 dBuV/m (AVG) @ 4804 MHz (*U = 4.06 dB)
3	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d); RSS-247 and RSS-GEN
4	Emissions produced by the intentional radiator in restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, section 15.247 (d); RSS-247 and RSS-GEN
5	DTS Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(2); RSS-247
6	Maximum Peak Conducted Output Power	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3); RSS-247
7	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d); RSS-247
8	Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e); RSS-247
9	Variation of the Input Power	This test was not performed because the EUT operates on battery power only and cannot be plugged into the AC public mains.
10	99% Bandwidth	This test was performed to obtain the emission designator required by Innovation, Science and Economic Development Canada.

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Multifamily, Model: UNT1-1000-1100. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4 and ANSI C63.10. 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, section 15.109; and Subpart C, sections 15.205, 15.207, 15.209 and 15.247; and the specifications limits defined by RSS-247 and RSS-Gen.

This test report covers the FCC 15.247 portion of the EUT. The FCC 15.225 portion is covered under the Compatible Electronics, Inc. test report **B30428X2**.

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 considering 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, 114 Olinda Drive, Brea, California 92823.

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

Spectrum Brands, Inc.

Johanis Hashim	Technical Project Manager
Jackson Davis	Electronics Engineer

Compatible Electronics Inc.

Kyle Fujimoto	Sr. Test Engineer
James Ross	Sr. Test Engineer

2.4 Date Test Sample was Received

The test sample was received on prior to the initial test date.

2.5 Disposition of the Test Sample

The test sample has not been returned to Spectrum Brands, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

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

EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
FCC	Federal Communications Commission
DoC	Declaration of Conformity
N/A	Not Applicable
Tx	Transmit
Rx	Receive
Inc.	Incorporated
RF	Radio Frequency
BLE	Bluetooth Low Energy
CFR	Code of Federal Regulations
Sr.	Senior
DC	Direct Current
RSS	Radio Standards Specification

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
FCC Title 47, Part 15 Subpart B	FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators
558074 D01 DTS Meas Guidance v05 r02	Guidance for Performing Compliance Measurements on Digital Transmissions Systems (DTS) Operating Under Section 15.247
EN 50147-2: 1997	Anechoic chambers. Alternative test site suitability with respect to site attenuation
ANSI C63.4 2014	American National Standard for 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
RSS-Gen Issue 5: 2018 + Amendment 1: 2019 + Amendment 2: 2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2 February 2017	Digital Transmissions Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

4. DESCRIPTION OF TEST CONFIGURATION

External Deadbolt Enclosure: The Multifamily, Model: UNT1-1000-1100 (EUT) was mounted in the External Deadbolt Enclosure. The EUT was transmtting BLE (2402 MHz to 2480 MHz) and also at 13.56 MHz.

4.5 Inch Interconnect Enclosure: The Multifamily, Model: UNT1-1000-1100 (EUT) was mounted in the 4.5 Inch Interconnect Enclosure. The EUT was transmtting BLE (2402 MHz to 2480 MHz) and also at 13.56 MHz.

5.5 Inch Interconnect Enclosure: The Multifamily, Model: UNT1-1000-1100 (EUT) was mounted in the 5.5 Inch Interconnect Enclosure. The EUT was transmtting BLE (2402 MHz to 2480 MHz) and also at 13.56 MHz.

The firmware inside the EUT allowed the EUT to continuously transmit or receive BLE and to transmit 13.56 MHz on a continuous basis.

The same electronics are used in each enclosure.

The firmware is stored on the company's servers.

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

4.1.1 Cable Construction and Termination

The EUT has no external cables.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	IDENTIFICATIONS
MULTIFAMILY (EUT)	SPECTRUM BRANDS, INC.	UNT1-1000-1100	D39D7129004B1200	FCC: NUL-UNT1 IC: 3022A-UNT1
EXTERNAL DEADBOLT ENCLOSURE	SPECTRUM BRANDS, INC.	N/A	N/A	N/A
4.5 INCH INTERCONNECT ENCLOSURE	SPECTRUM BRANDS, INC.	N/A	N/A	N/A
5.5 INCH INTERCONNECT ENCLOSURE	SPECTRUM BRANDS, INC.	N/A	N/A	N/A
FIRMWARE	SPECTRUM BRANDS, INC.	rfCarrierWave_LP_CC2652R7_tirtos7_ccs_250-kHz-dev_24XX-mHz_5-dBm	N/A	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
RF RADIATED AND AC CONDUCTED EMISSIONS TEST EQUIPMENT					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Keysight Technologies, Inc.	N9038A	MY51210150	September 17, 2021	September 17, 2023
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A
Loop Antenna	Com-Power	AL-130R	121090	February 10, 2022	February 10, 2025
CombiLog Antenna	Com-Power	AC-220	61093	December 14, 2021	December 14, 2023
Horn Antenna	Com-Power	AH-118	10050113	December 16, 2021	December 16, 2023
Preamplifier	Com-Power	PA-118	181653	March 7, 2022	March 7, 2024
Preamplifier	Com-Power	PA-840	711013	April 8, 2022	April 8, 2024
Horn Antenna	Com-Power	AH-826	0071957	NCR	NCR
Below 1 GHz Conducted Cable	N/A	N/A	Asset #: 0009	October 3, 2022	October 3, 2023
Below 1 GHz Radiated Cable	N/A	N/A	Asset #: 0006	October 3, 2022	October 3, 2023
Above 1 GHz Cable	Suhner	Sucoflex 102EA	2291	August 2, 2021	August 2, 2023
Above 1 GHz Cable	Suhner	Sucoflex 102EA	501393	August 2, 2021	August 2, 2023
Above 1 GHz Cable	Suhner	Sucoflex 102EA	501394	August 2, 2021	August 2, 2023
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 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 0.6 by 1.2 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 0.6 by 1.2 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	2.72 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(30 MHz – 1 000 MHz)	6.3 dB	3.32 dB (Vertical) 3.30 dB (Horizontal)
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(1 GHz - 6 GHz)	5.2 dB	4.06 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(6 GHz – 18 GHz)	5.5 dB	4.06 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(18 GHz – 26.5 GHz)	N/A	4.43 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(26.5 GHz – 40 GHz)	N/A	4.57 dB

7. TEST PROCEDURES

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

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. 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 63:4. 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 final qualification data is located in Appendix E.

The six highest emissions are listed in Table 1.

Test Results:

This test was not performed because the EUT operates on battery power only and cannot be plugged into the AC public mains.

7.1.2 Radiated Emissions Test

The EMI Receiver was used as the measuring meter. An internal preamplifier was used to increase the sensitivity of the instrument during emissions tests up to 1000 MHz, and an external preamplifier was used to increase the sensitivity of the instrument during emissions tests above 1 GHz. 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 considers the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured.

The frequencies below 1 GHz were quasi-peaked using the quasi-peak detector of the EMI Receiver.

The frequencies above 1 GHz were averaged using the RMS detector of the EMI Receiver.

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 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 to ensure accurate results.

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.

Radiated Emissions Test (Continued)

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 25 GHz	1 MHz	Horn Antenna

Test Results:

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 sections 15.205, 15.209 and 15.247; and the limits of RSS-247 and RSS-Gen for radiated emissions.

7.1.3 RF Emissions Test Results

Table 1 RADIATED EMISSION RESULTS
Multifamily, Model: UNT1-1000-1100

Frequency MHz	Corrected Reading* dBµV/m	Specification Limit dBµV/m	Delta (Cor. Reading – Spec. Limit) dB
4804 (H) (5.5 Inch Enclosure)	41.96 (AV)	53.97	-12.01
712.30 (V) (External Deadbolt Enclosure)	33.12 (QP)	46.00	-12.88
712.70 (V) (4.5 Inch Enclosure)	32.78 (QP)	46.00	-13.22
707.50 (V) (4.5 Inch Enclosure)	32.73 (QP)	46.00	-13.27
709.20 (V) (4.5 Inch Enclosure)	32.71 (QP)	46.00	-13.29
4804 (V) (External Deadbolt Enclosure)	40.02 (QP)	53.97	-13.95

Notes:

* The complete emissions data is given in Appendix E of this report.
(V) Vertical
(H) Horizontal
(BL) Black Lead
(WL) White Lead
(Rx) Receiving
(Tx) Transmitting
(AV) Average
(QP) Quasi-Peak

7.1.4 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 (μV/m) log x 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 x 40 = distance factor
For measurements above 30 MHz: (Specification distance / test distance) log x 20 = distance factor
Note: When using an Active Antenna, the Antenna factor shall be subtracted due to the combination of the internal amplification and antenna loss.

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.
When the limit is in terms of magnetic field, the following equation applies:

$$H[dB(\mu A/m)] = V[dB(\mu V)] + L_C\,[dB] - G_{PA}\,[dB] + AF^H\,[dB(S/m)]$$

where: *H* is the magnetic field strength (to be compared with the limit),
V is the voltage level measured by the receiver or spectrum analyzer,
L_C is the cable loss,
G_{PA} is the gain of the preamplifier (if used), and
AF^H is the magnetic antenna factor.

The G_{PA} term is only included in the equation when an external preamplifier is used in the measurement chain, in front of the receiver or spectrum analyzer. An external preamplifier is not usually necessary (or even advisable, due to risk of saturating the input mixer of the receiver) when an active loop antenna is used. In that case, the antenna factor of the loop already includes the gain of its built-in preamplifier.

Sample Calculations (Continued)

If the "electrical" antenna factor is used instead, the above equation becomes:

$$H[dB(\mu A/m)] = V[dB(\mu V)] + L_C\,[dB] - G_{PA}[dB] + AF^E\,[dB(m^{-1})\,] - 51.5\,[dB\Omega]$$

where: AF^E is the "electric" antenna factor, as provided by the antenna calibration laboratory.

When the limit is in terms of electric field, the following equation applies:

$$E[dB(\mu V/m)] = V[dB(\mu V)] + L_C[dB] - G_{PA}[dB] + AF^E\,[dB(m^{-1})\,]$$

or, if the magnetic antenna factor is used:

$$E[dB(\mu V/m)] = V[dB(\mu V)] + L_C[dB] - G_{PA}[dB] + AF^H\,[dB(S/m)] + 51.5[dB\Omega]$$

The display of the receiver (or spectrum analyzer) **shall not** be configured in units of current, e.g. µA or dB(µA). That conversion is calculated inside the receiver (or spectrum analyzer) using its input impedance, which is 50 Ω, while the magnetic field calculation is based on the free-space impedance of 377 Ω.

7.2 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 relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(2); and RSS-247.

7.3 Maximum Peak Conducted Output Power

The maximum peak conducted output power was measured using the EMI Receiver. The following steps were performed for measuring the maximum peak conducted output power.

1. Set the RBW ≥ DTS Bandwidth
2. Set the VBW ≥ [3 X RBW]
3. Set span ≥ [3 X RBW]
4. Sweep time = auto couple
5. Detector = peak
6. Trace mode = max hold
7. Allow trace to fully stabilize
8. Use the peak marker function to determine the peak amplitude level

Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C Section 15.247 (b)(3); and RSS-247.

7.4 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 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 level and 20 dB below that was 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 relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d); and RSS-247.

7.5 RF Band Edges

Non-Restricted Band Edges: The RF band edge was measured using the EMI Receiver. The RF band edge 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 RF band edge.

The RF band edge was taken at 2400 MHz when the EUT was on the low using the EMI Receiver.

The following steps were performed for measuring the band edge at 2400 MHz:

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span wide enough to cover the band edges.
3. Set the RBW to 100 kHz
4. Set the VBW ≥ 3 X RBW
5. Detector = Peak
6. Sweep time = auto couple
7. Allow the trace to stabilize
8. Use the peak marker function to determine the maximum amplitude level

Restricted Band Edges: The RF band edges were taken at 2390 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 7.1.2 of this test report was used to maximize the emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d); and RSS-247. The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz also meet the limits of section 15.209. Please see the data sheets located in Appendix E.

7.6 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.

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span to at least 1.5 times the OBW.
3. Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz
4. Set the VBW ≥ [3 X RBW]
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the peak marker function to determine the maximum amplitude level within the RBW
10. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (e); and RSS-247.

7.7 99 % Bandwidth

The 99 % bandwidth was measured using an EMI Receiver.

The following steps were performed for measuring the 99 % bandwidth per RSS-GEN, Issue 5, clause 6.7:

1. Set RBW to 1 % to 5 % of the actual occupied bandwidth.
2. Set VBW to greater than 3 times the RBW.
3. Set the EMI Receiver to the occupied bandwidth Function set at 99 %
4. Set the peak detector to max hold.
5. Set the sweep time to auto
6. Allow the trace to stabilize.

Please note that this was only used to determine the emission bandwidth and that there are no limits or pass/fail criteria for this test. Please see the data sheets located in Appendix E.

7.8 Variation of the Input Power

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.

Test Results:

This test was not performed because the EUT operates on battery power only and cannot be plugged into the AC public mains.

8. CONCLUSIONS

The Multifamily, Model: UNT1-1000-1100, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247; RSS-GEN and RSS-247.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP® TESTING
NVLAP LAB CODE 200528-0

ilac-MRA

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 17025:
"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 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 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

ISED Test Site Registration Number: 2154A

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247; RSS-GEN and RSS-247 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.

APPENDIX C

MODELS COVERED UNDER THIS REPORT

MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Multifamily
Model: UNT1-1000-1100
S/N: D39D7129004B1200

There are no additional models covered under this report.

APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

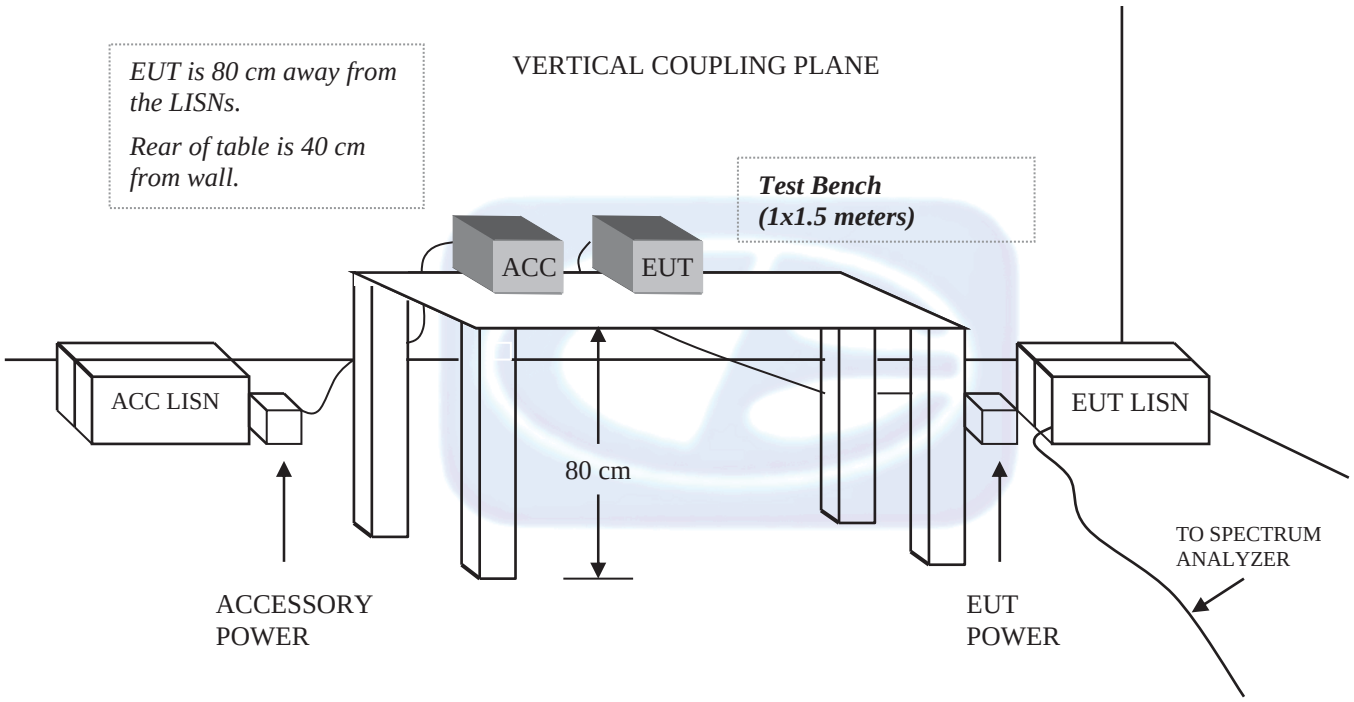
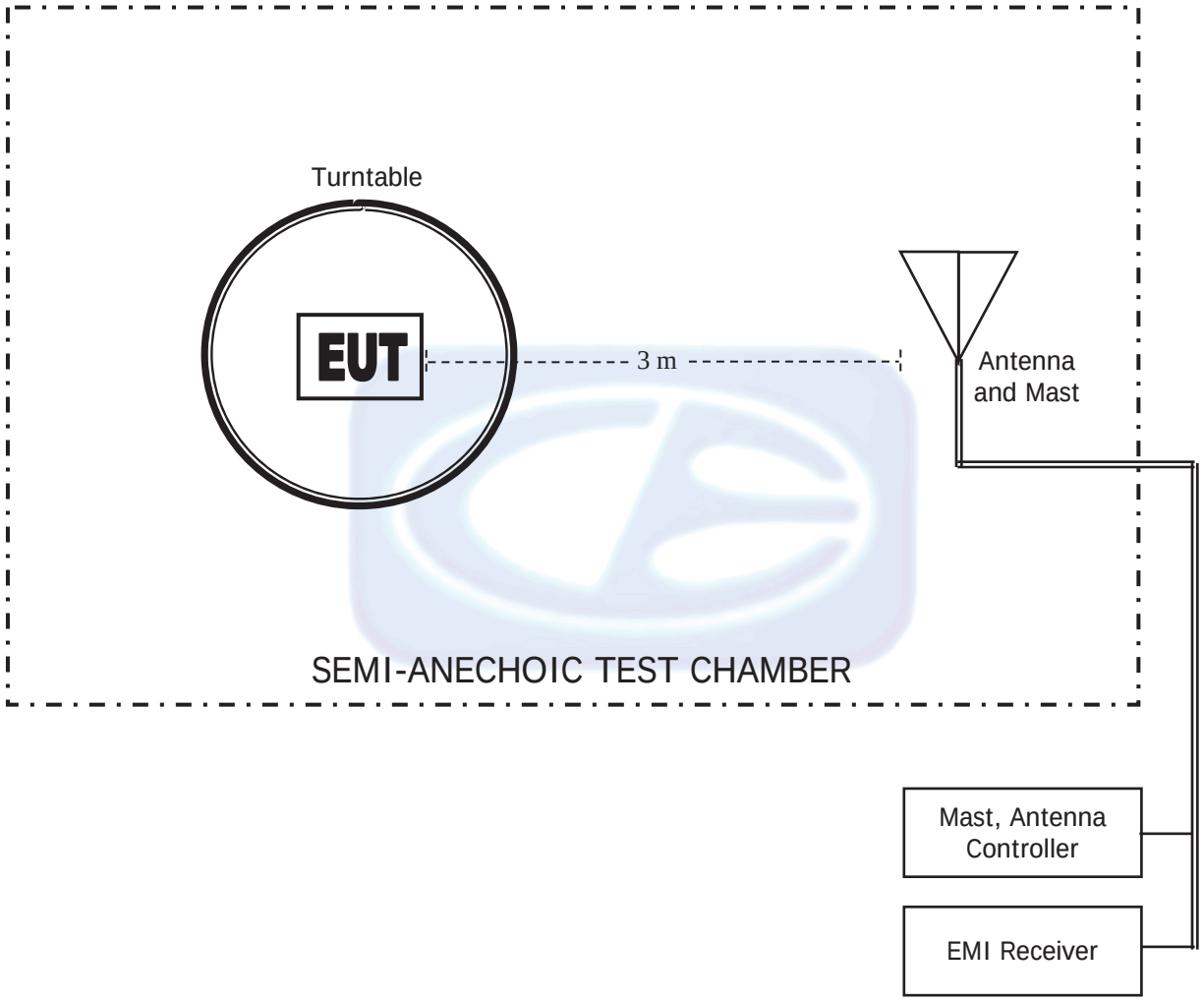


FIGURE 2: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



COM-POWER AL-130R

LOOP ANTENNA

S/N: 121090

CALIBRATION DATE: FEBRUARY 10, 2022

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	15.6	-35.8
0.01	15.8	-35.6
0.02	14.8	-36.6
0.03	15.6	-35.9
0.04	15.0	-36.5
0.05	14.4	-37.1
0.06	14.6	-36.9
0.07	14.3	-37.2
0.08	14.3	-37.2
0.09	14.4	-37.0
0.10	14.1	-37.4
0.20	14.1	-37.4
0.30	14.0	-37.5
0.40	13.9	-37.6
0.50	14.1	-37.3
0.60	14.1	-37.3
0.70	14.2	-37.3
0.80	14.2	-37.3
0.90	14.2	-37.2
1.00	14.4	-37.0
2.00	14.6	-36.9
3.00	14.6	-36.8
4.00	14.9	-36.6
5.00	14.9	-36.7
6.00	14.8	-36.7
7.00	14.6	-36.8
8.00	14.5	-37.0
9.00	14.3	-37.2
10.00	14.5	-37.0
11.00	14.6	-36.9
12.00	14.7	-36.7
13.00	14.9	-36.6
14.00	15.0	-36.5
15.00	14.9	-36.6
16.00	14.9	-36.6
17.00	14.6	-36.8
18.00	14.4	-37.1
19.00	14.5	-37.0
20.00	14.5	-37.0
21.00	14.2	-37.3
22.00	13.9	-37.5
23.00	13.9	-37.5
24.00	13.8	-37.7
25.00	13.4	-38.0
26.00	13.2	-38.2
27.00	13.2	-38.3
28.00	12.7	-38.7
29.00	12.7	-38.8
30.00	12.4	-39.0

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61093

CALIBRATION DATE: DECEMBER 14, 2021

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	22.50	200	16.00
35	21.40	250	17.40
40	21.00	300	19.70
45	20.60	350	20.00
50	19.70	400	22.20
60	16.10	450	22.40
70	12.80	500	23.10
80	12.50	550	23.40
90	14.20	600	24.90
100	15.40	650	25.30
120	16.50	700	25.40
125	16.80	750	26.40
140	15.90	800	26.70
150	16.60	850	27.10
160	18.50	900	27.90
175	15.90	950	28.00
180	15.50	1000	28.00

COM POWER AH-118

HORN ANTENNA

S/N: 10050113

CALIBRATION DATE: DECEMBER 16, 2021

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.86	10.0	38.91
1.5	25.67	10.5	39.94
2.0	28.25	11.0	39.10
2.5	29.17	11.5	39.70
3.0	29.78	12.0	40.29
3.5	30.88	12.5	41.93
4.0	31.21	13.0	41.34
4.5	32.96	13.5	40.57
5.0	33.30	14.0	40.23
5.5	34.24	14.5	42.25
6.0	34.57	15.0	43.63
6.5	35.61	15.5	39.96
7.0	36.60	16.0	40.38
7.5	37.49	16.5	40.56
8.0	37.44	17.0	40.93
8.5	37.98	17.5	42.27
9.0	38.01	18.0	43.77
9.5	38.53		

COM-POWER PAM-118

PREAMPLIFIER

S/N: 181653

CALIBRATION DATE: MARCH 7, 2022

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	40.02	6.0	38.84
1.1	39.72	6.5	39.20
1.2	39.93	7.0	39.46
1.3	39.98	7.5	39.67
1.4	39.99	8.0	39.28
1.5	40.20	8.5	38.63
1.6	40.05	9.0	38.96
1.7	40.15	9.5	39.33
1.8	40.20	10.0	39.58
1.9	40.33	11.0	38.25
2.0	40.33	12.0	40.03
2.5	40.60	13.0	40.55
3.0	40.76	14.0	40.36
3.5	40.87	15.0	39.34
4.0	40.39	16.0	37.34
4.5	39.55	17.0	42.14
5.0	40.34	18.0	42.54
5.5	39.45		

COM-POWER AH-826

HORN ANTENNA

S/N: 71957

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: APRIL 8, 2022

FREQUENCY (GHz)	FACTOR (dB)
18.0	24.85
19.0	24.25
20.0	22.69
21.0	22.17
22.0	22.78
23.0	23.23
24.0	23.72
25.0	24.13
26.0	24.28
26.5	25.06

FRONT VIEW

WITH EXTERNAL DEADBOLT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

WITH EXTERNAL DEADBOLT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

WITH EXTERNAL DEADBOLT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

WITH EXTERNAL DEADBOLT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

WITH 4.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

WITH 4.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

WITH 4.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

WITH 4.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

WITH 5.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

WITH 5.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

WITH 5.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

WITH 5.5 INCH INTERCONNECT ENCLOSURE

SPECTRUM BRANDS, INC.
MULTIFAMILY
MODEL: UNT1-1000-1100
FCC SUBPART B AND C; RSS-247 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

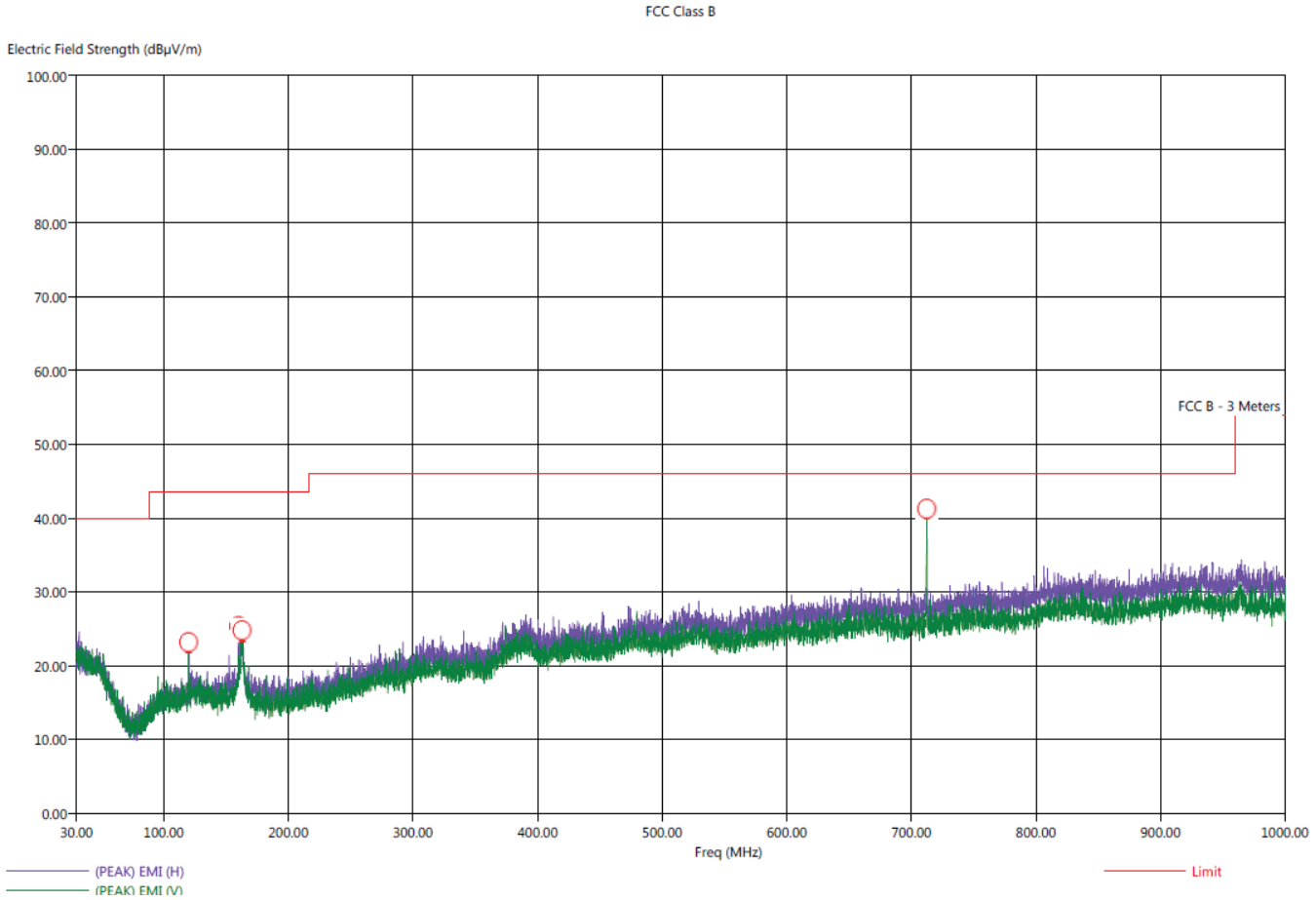
APPENDIX E

DATA SHEETS

RADIATED EMISSIONS DATA SHEETS

Title: Pre-Scan - FCC Class B
File: 1 - Keysight - Pre-Scan - Exterior Deadbolt - BLE at 2480 MHz - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting BLE at 2480 MHz - External Deadbolt Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

4/13/2023 9:07:15 AM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 1 - Keysight - Final Scan - Exterior Deadbolt - BLE at 2480 MHz - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting BLE at 2480 MHz - External Deadbolt Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

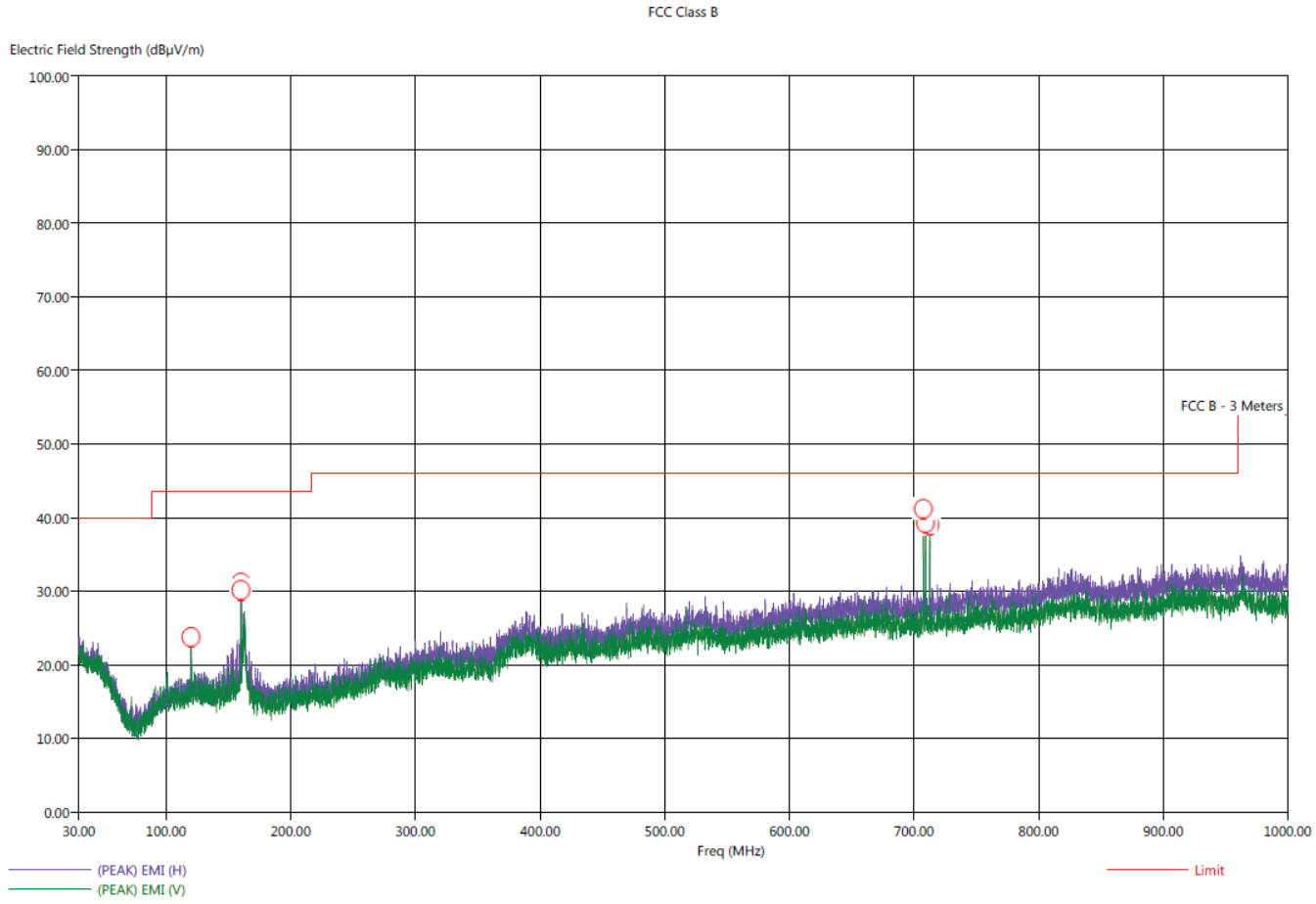
4/13/2023 9:18:14 AM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
120.00	V	24.18	19.53	-19.32	-23.97	43.50	16.50	0.79	349.75	350.97
160.00	H	31.75	26.58	-11.75	-16.92	43.50	18.61	0.93	330.50	111.38
162.20	H	31.64	26.58	-11.86	-16.92	43.50	22.93	0.94	290.00	191.08
162.80	V	31.63	26.72	-11.87	-16.78	43.50	22.56	0.94	97.75	191.32
163.40	V	30.22	24.65	-13.28	-18.85	43.50	20.85	0.94	319.00	159.08
712.30	V	39.01	33.12	-6.99	-12.88	46.00	25.60	2.20	14.75	190.73

Title: Pre-Scan - FCC Class B
File: 2 - Keysight - Pre-Scan - 4.5 Inch Interconnect - BLE at 2480 MHz - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting BLE at 2480 MHz - 4.5 Inch Interconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

4/12/2023 4:11:23 PM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 2 - Keysight - Final Scan - 4.5 Inch Interconnect - BLE at 2480 MHz - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting BLE at 2480 MHz - 4.5 Inch Interconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

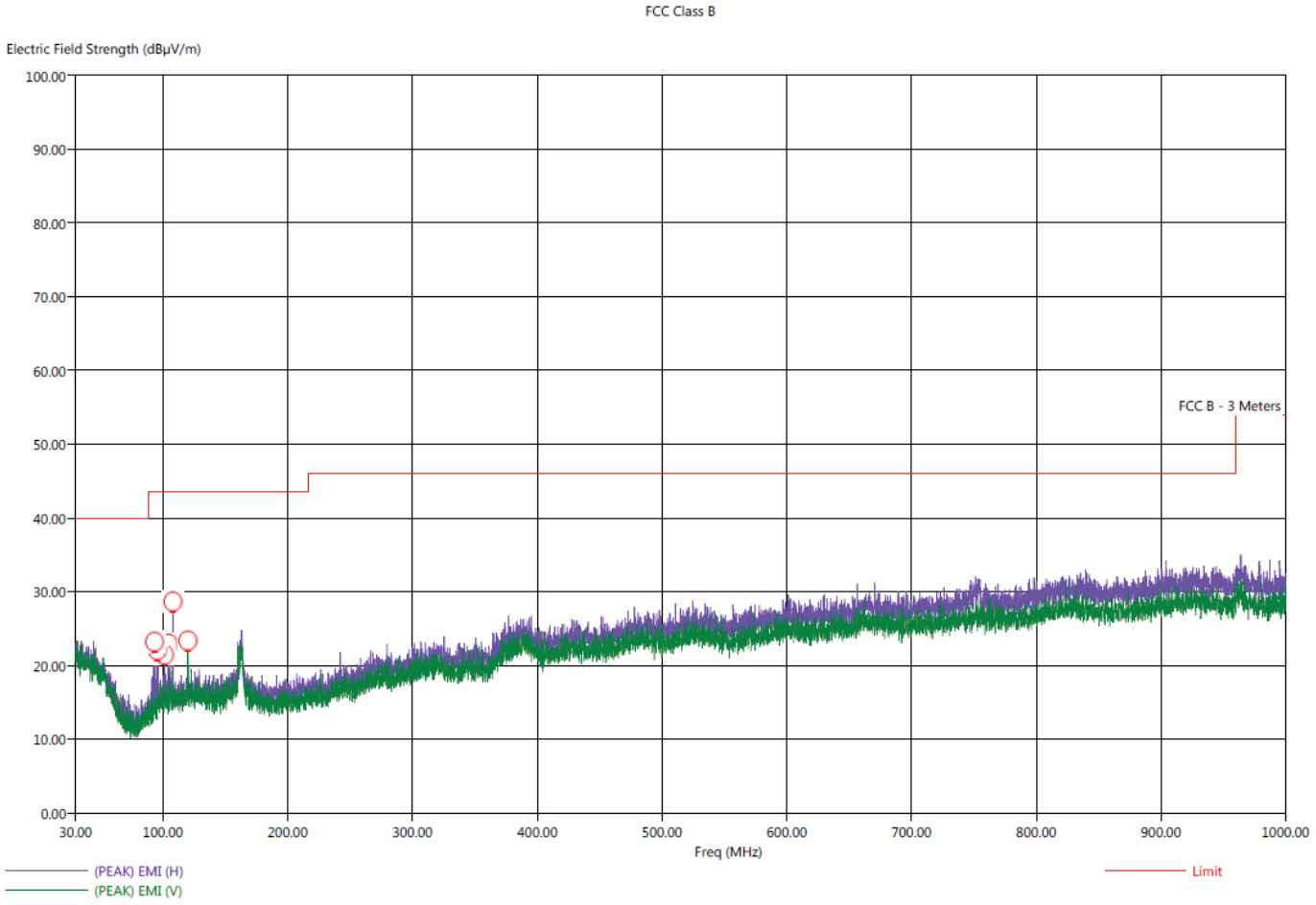
4/12/2023 4:22:51 PM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
120.00	V	27.89	24.71	-15.61	-18.79	43.50	16.50	0.79	26.75	111.26
160.10	H	33.96	29.21	-9.54	-14.29	43.50	18.58	0.93	184.00	127.80
160.10	V	33.30	29.13	-10.20	-14.37	43.50	18.52	0.93	47.75	111.14
707.50	V	38.23	32.73	-7.77	-13.27	46.00	25.57	2.19	165.50	143.14
709.20	V	37.95	32.71	-8.05	-13.29	46.00	25.60	2.19	158.75	127.26
712.70	V	38.41	32.78	-7.59	-13.22	46.00	25.60	2.20	216.75	318.07

Title: Pre-Scan - FCC Class B
File: 3 - Keysight - Pre-Scan - 5.5 Inch Interconnect - BLE at 2480 MHz - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting BLE at 2480 MHz - 5.5 Inch Interconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

4/13/2023 8:26:51 AM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 3 - Keysight - Final Scan - 5.5 Inch Interconnect - BLE at 2480 MHz - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting BLE at 2480 MHz - 5.5 Inch Inetconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

4/13/2023 8:38:36 AM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
93.10	H	21.78	15.97	-21.72	-27.53	43.50	14.70	0.67	291.75	143.14
95.50	H	21.28	16.45	-22.22	-27.05	43.50	14.97	0.68	101.75	382.67
101.10	H	22.07	16.64	-21.43	-26.86	43.50	15.50	0.69	113.50	191.14
104.30	H	23.21	16.98	-20.29	-26.52	43.50	15.60	0.71	34.75	366.67
108.00	H	23.71	18.57	-19.79	-24.93	43.50	15.70	0.73	179.25	366.79
120.00	V	28.07	25.18	-15.43	-18.32	43.50	16.50	0.79	296.75	111.14

FUNDAMENTAL AND HARMONICS

DATA SHEETS

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Low Channel - Y-Axis
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	47.24	V	73.97	-26.73	Peak	268.50	238.85	
4804.00	40.02	V	53.97	-13.95	Avg	268.50	238.85	
7206.00								**Not in Restricted Band**
7206.00								**Done via Conducted**
9608.00								**Not in Restricted Band**
9608.00								**Done via Conducted**
12010.00	47.12	V	73.97	-26.85	Peak	79.25	239.08	
12010.00	35.45	V	53.97	-18.52	Avg	79.25	239.08	
14412.00								**No Emission**
14412.00								**Detected**
16814.00								**No Emission**
16814.00								**Detected**
19216.00								**No Emission**
19216.00								**Detected**
21618.00								**No Emission**
21618.00								**Detected**
24020.00								**No Emission**
24020.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Low Channel - Y-Axis
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	46.07	H	73.97	-27.90	Peak	183.00	127.02	
4804.00	37.71	H	53.97	-16.26	Avg	183.00	127.02	
7206.00								**Not in Restricted Band**
7206.00								**Done via Conducted**
9608.00								**Not in Restricted Band**
9608.00								**Done via Conducted**
12010.00	47.20	H	73.97	-26.77	Peak	110.50	222.85	
12010.00	35.42	H	53.97	-18.55	Avg	110.50	222.85	
14412.00								**No Emission**
14412.00								**Detected**
16814.00								**No Emission**
16814.00								**Detected**
19216.00								**No Emission**
19216.00								**Detected**
21618.00								**No Emission**
21618.00								**Detected**
24020.00								**No Emission**
24020.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Middle Channel - Y-Axis
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	46.32	V	73.97	-27.65	Peak	163.25	249.95	
4880.00	38.62	V	53.97	-15.35	Avg	163.25	249.95	
7320.00	44.22	V	73.97	-29.75	Peak	239.75	111.20	
7320.00	32.62	V	53.97	-21.35	Avg	239.75	111.20	
9760.00								**Not in Restricted Band**
9760.00								**Done via Conducted**
12200.00	46.83	V	73.97	-27.14	Peak	247.75	191.08	
12200.00	35.40	V	53.97	-18.57	Avg	247.75	191.08	
14640.00								**No Emission**
14640.00								**Detected**
17080.00								**No Emission**
17080.00								**Detected**
19520.00								**No Emission**
19520.00								**Detected**
21960.00								**No Emission**
21960.00								**Detected**
24400.00								**No Emission**
24400.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Middle Channel - Y-Axis
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	44.95	H	73.97	-29.02	Peak	66.25	111.32	
4880.00	36.59	H	53.97	-17.38	Avg	66.25	111.32	
7320.00	45.88	H	73.97	-28.09	Peak	184.00	111.26	
7320.00	34.84	H	53.97	-19.13	Avg	184.00	111.26	
9760.00								**Not in Restricted Band**
9760.00								**Done via Conducted**
12200.00	47.33	H	73.97	-26.64	Peak	320.25	238.97	
12200.00	35.46	H	53.97	-18.51	Avg	320.25	238.97	
14640.00								**No Emission**
14640.00								**Detected**
17080.00								**No Emission**
17080.00								**Detected**
19520.00								**No Emission**
19520.00								**Detected**
21960.00								**No Emission**
21960.00								**Detected**
24400.00								**No Emission**
24400.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics High Channel - Y-Axis
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	45.67	V	73.97	-28.30	Peak	306.75	238.73	
4960.00	37.16	V	53.97	-16.81	Avg	306.75	238.73	
7440.00	44.41	V	73.97	-29.56	Peak	286.00	142.97	
7440.00	32.13	V	53.97	-21.84	Avg	286.00	142.97	
9920.00								**Not in Restricted Band**
9920.00								**Done via Conducted**
12400.00	47.93	V	73.97	-26.04	Peak	272.50	238.79	
12400.00	36.04	V	53.97	-17.93	Peak	272.50	238.79	
14880.00								**No Emission**
14880.00								**Detected**
17360.00								**No Emission**
17360.00								**Detected**
19840.00								**No Emission**
19840.00								**Detected**
22320.00								**No Emission**
22320.00								**Detected**
24800.00								**No Emission**
24800.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics High Channel - Y-Axis
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	45.18	H	73.97	-28.79	Peak	266.50	159.26	
4960.00	37.54	H	53.97	-16.43	Avg	266.50	159.26	
7440.00	46.93	H	73.97	-27.04	Peak	0.50	143.14	
7440.00	36.97	H	53.97	-17.00	Avg	0.50	143.14	
9920.00								**Not in Restricted Band**
9920.00								**Done via Conducted**
12400.00	47.72	H	73.97	-26.25	Peak	59.50	127.38	
12400.00	35.98	H	53.97	-17.99	Avg	59.50	127.38	
14880.00								**No Emission**
14880.00								**Detected**
17360.00								**No Emission**
17360.00								**Detected**
19840.00								**No Emission**
19840.00								**Detected**
22320.00								**No Emission**
22320.00								**Detected**
24800.00								**No Emission**
24800.00								**Detected**

FCC 15.247 and RSS-247

Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz
External Deadbolt Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								Investigated in the Y-Axis

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Low Channel - Y-Axis
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	43.94	V	73.97	-30.03	Peak	335.50	251.26	
4804.00	35.70	V	53.97	-18.27	Avg	335.50	251.26	
7206.00								**Not in Restricted Band**
7206.00								**Done via Conducted**
9608.00								**Not in Restricted Band**
9608.00								**Done via Conducted**
12010.00	47.06	V	73.97	-26.91	Peak	266.75	175.32	
12010.00	35.22	V	53.97	-18.75	Avg	266.75	175.32	
14412.00								**No Emission**
14412.00								**Detected**
16814.00								**No Emission**
16814.00								**Detected**
19216.00								**No Emission**
19216.00								**Detected**
21618.00								**No Emission**
21618.00								**Detected**
24020.00								**No Emission**
24020.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Low Channel - Y-Axis
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	44.16	H	73.97	-29.81	Peak	21.50	159.44	
4804.00	35.06	H	53.97	-18.91	Avg	21.50	159.44	
7206.00								**Not in Restricted Band**
7206.00								**Done via Conducted**
9608.00								**Not in Restricted Band**
9608.00								**Done via Conducted**
12010.00	47.22	H	73.97	-26.75	Peak	188.50	249.95	
12010.00	35.20	H	53.97	-18.77	Avg	188.50	249.95	
14412.00								**No Emission**
14412.00								**Detected**
16814.00								**No Emission**
16814.00								**Detected**
19216.00								**No Emission**
19216.00								**Detected**
21618.00								**No Emission**
21618.00								**Detected**
24020.00								**No Emission**
24020.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Middle Channel - Y-Axis
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	44.33	V	73.97	-29.64	Peak	17.50	223.08	
4880.00	35.62	V	53.97	-18.35	Avg	17.50	223.08	
7320.00	44.04	V	73.97	-29.93	Peak	333.75	142.97	
7320.00	32.12	V	53.97	-21.85	Avg	333.75	142.97	
9760.00								**Not in Restricted Band**
9760.00								**Done via Conducted**
12200.00	47.66	V	73.97	-26.31	Peak	263.50	143.14	
12200.00	35.59	V	53.97	-18.38	Avg	263.50	143.14	
14640.00								**No Emission**
14640.00								**Detected**
17080.00								**No Emission**
17080.00								**Detected**
19520.00								**No Emission**
19520.00								**Detected**
21960.00								**No Emission**
21960.00								**Detected**
24400.00								**No Emission**
24400.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Middle Channel - Y-Axis
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	43.86	H	73.97	-30.11	Peak	238.50	111.44	
4880.00	35.52	H	53.97	-18.45	Avg	238.50	111.44	
7320.00	46.39	H	73.97	-27.58	Peak	3.00	206.97	
7320.00	33.68	H	53.97	-20.29	Avg	3.00	206.97	
9760.00								**Not in Restricted Band**
9760.00								**Done via Conducted**
12200.00	47.83	H	73.97	-26.14	Peak	269.50	249.95	
12200.00	35.37	H	53.97	-18.60	Avg	269.50	249.95	
14640.00								**No Emission**
14640.00								**Detected**
17080.00								**No Emission**
17080.00								**Detected**
19520.00								**No Emission**
19520.00								**Detected**
21960.00								**No Emission**
21960.00								**Detected**
24400.00								**No Emission**
24400.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics High Channel - Y-Axis
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	44.01	V	73.97	-29.96	Peak	292.25	249.01	
4960.00	26.48	V	53.97	-27.49	Avg	292.25	249.01	
7440.00	45.40	V	73.97	-28.57	Peak	274.50	111.14	
7440.00	34.08	V	53.97	-19.89	Avg	274.50	111.14	
9920.00								**Not in Restricted Band**
9920.00								**Done via Conducted**
12400.00	48.86	V	73.97	-25.11	Peak	337.00	143.40	
12400.00	35.96	V	53.97	-18.01	Peak	337.00	143.14	
14880.00								**No Emission**
14880.00								**Detected**
17360.00								**No Emission**
17360.00								**Detected**
19840.00								**No Emission**
19840.00								**Detected**
22320.00								**No Emission**
22320.00								**Detected**
24800.00								**No Emission**
24800.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics High Channel - Y-Axis
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	44.86	H	73.97	-29.11	Peak	246.75	206.01	
4960.00	37.58	H	53.97	-16.39	Avg	246.75	206.01	
7440.00	46.44	H	73.97	-27.53	Peak	277.50	126.97	
7440.00	34.48	H	53.97	-19.49	Avg	277.50	126.97	
9920.00								**Not in Restricted Band**
9920.00								**Done via Conducted**
12400.00	47.69	H	73.97	-26.28	Peak	152.75	238.79	
12400.00	34.96	H	53.97	-19.01	Avg	152.75	238.79	
14880.00								**No Emission**
14880.00								**Detected**
17360.00								**No Emission**
17360.00								**Detected**
19840.00								**No Emission**
19840.00								**Detected**
22320.00								**No Emission**
22320.00								**Detected**
24800.00								**No Emission**
24800.00								**Detected**

FCC 15.247 and RSS-247

Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz
4.5 Inch Interconnect Enclosure

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								Investigated in the Y-Axis

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Low Channel - Y-Axis
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	47.15	V	73.97	-26.82	Peak	173.75	159.20	
4804.00	39.35	V	53.97	-14.62	Avg	173.75	159.20	
7206.00								**Not in Restricted Band**
7206.00								**Done via Conducted**
9608.00								**Not in Restricted Band**
9608.00								**Done via Conducted**
12010.00	47.26	V	73.97	-26.71	Peak	160.50	143.14	
12010.00	35.50	V	53.97	-18.47	Avg	160.50	143.14	
14412.00								**No Emission**
14412.00								**Detected**
16814.00								**No Emission**
16814.00								**Detected**
19216.00								**No Emission**
19216.00								**Detected**
21618.00								**No Emission**
21618.00								**Detected**
24020.00								**No Emission**
24020.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Low Channel - Y-Axis
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	48.67	H	73.97	-25.30	Peak	204.25	143.08	
4804.00	41.96	H	53.97	-12.01	Avg	204.25	143.08	
7206.00								**Not in Restricted Band**
7206.00								**Done via Conducted**
9608.00								**Not in Restricted Band**
9608.00								**Done via Conducted**
12010.00	47.74	H	73.97	-26.23	Peak	46.50	222.91	
12010.00	35.45	H	53.97	-18.52	Avg	46.50	222.91	
14412.00								**No Emission**
14412.00								**Detected**
16814.00								**No Emission**
16814.00								**Detected**
19216.00								**No Emission**
19216.00								**Detected**
21618.00								**No Emission**
21618.00								**Detected**
24020.00								**No Emission**
24020.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Middle Channel - Y-Axis
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	42.09	V	73.97	-31.88	Peak	250.00	207.02	
4880.00	32.71	V	53.97	-21.26	Avg	250.00	207.02	
7320.00	44.58	V	73.97	-29.39	Peak	275.00	111.08	
7320.00	32.26	V	53.97	-21.71	Avg	275.00	111.08	
9760.00								**Not in Restricted Band**
9760.00								**Done via Conducted**
12200.00	46.94	V	73.97	-27.03	Peak	90.50	238.91	
12200.00	35.36	V	53.97	-18.61	Avg	90.50	238.91	
14640.00								**No Emission**
14640.00								**Detected**
17080.00								**No Emission**
17080.00								**Detected**
19520.00								**No Emission**
19520.00								**Detected**
21960.00								**No Emission**
21960.00								**Detected**
24400.00								**No Emission**
24400.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics Middle Channel - Y-Axis
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	46.09	H	73.97	-27.88	Peak	244.25	143.20	
4880.00	36.66	H	53.97	-17.31	Avg	244.25	143.20	
7320.00	46.03	H	73.97	-27.94	Peak	272.75	111.14	
7320.00	32.89	H	53.97	-21.08	Avg	272.75	111.14	
9760.00								**Not in Restricted Band**
9760.00								**Done via Conducted**
12200.00	47.31	H	73.97	-26.66	Peak	47.00	249.95	
12200.00	35.57	H	53.97	-18.40	Avg	47.00	249.95	
14640.00								**No Emission**
14640.00								**Detected**
17080.00								**No Emission**
17080.00								**Detected**
19520.00								**No Emission**
19520.00								**Detected**
21960.00								**No Emission**
21960.00								**Detected**
24400.00								**No Emission**
24400.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics High Channel - Y-Axis
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	43.66	V	73.97	-30.31	Peak	287.75	249.91	
4960.00	35.27	V	53.97	-18.70	Avg	287.75	249.91	
7440.00	46.30	V	73.97	-27.67	Peak	262.25	111.26	
7440.00	34.16	V	53.97	-19.81	Avg	262.25	111.26	
9920.00								**Not in Restricted Band**
9920.00								**Done via Conducted**
12400.00	50.24	V	73.97	-23.73	Peak	260.25	127.20	
12400.00	37.39	V	53.97	-16.58	Peak	260.25	127.20	
14880.00								**No Emission**
14880.00								**Detected**
17360.00								**No Emission**
17360.00								**Detected**
19840.00								**No Emission**
19840.00								**Detected**
22320.00								**No Emission**
22320.00								**Detected**
24800.00								**No Emission**
24800.00								**Detected**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Harmonics High Channel - Y-Axis
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	44.54	H	73.97	-29.43	Peak	253.75	191.02	
4960.00	37.06	H	53.97	-16.91	Avg	253.75	191.02	
7440.00	48.11	H	73.97	-25.86	Peak	277.25	127.20	
7440.00	38.17	H	53.97	-15.80	Avg	277.25	127.20	
9920.00								**Not in Restricted Band**
9920.00								**Done via Conducted**
12400.00	48.20	H	73.97	-25.77	Peak	217.50	207.32	
12400.00	36.49	H	53.97	-17.48	Avg	217.50	207.32	
14880.00								**No Emission**
14880.00								**Detected**
17360.00								**No Emission**
17360.00								**Detected**
19840.00								**No Emission**
19840.00								**Detected**
22320.00								**No Emission**
22320.00								**Detected**
24800.00								**No Emission**
24800.00								**Detected**

FCC 15.247 and RSS-247

Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/11/2023
Lab: D
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz
5.5 Inch Interconnect

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								Investigated in the Y-Axis

BAND EDGE DATA SHEETS

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/13/2023
Lab: D
Tested By: Kyle Fujimoto

Band Edges - Low Channel
External Deadbolt Enclosure

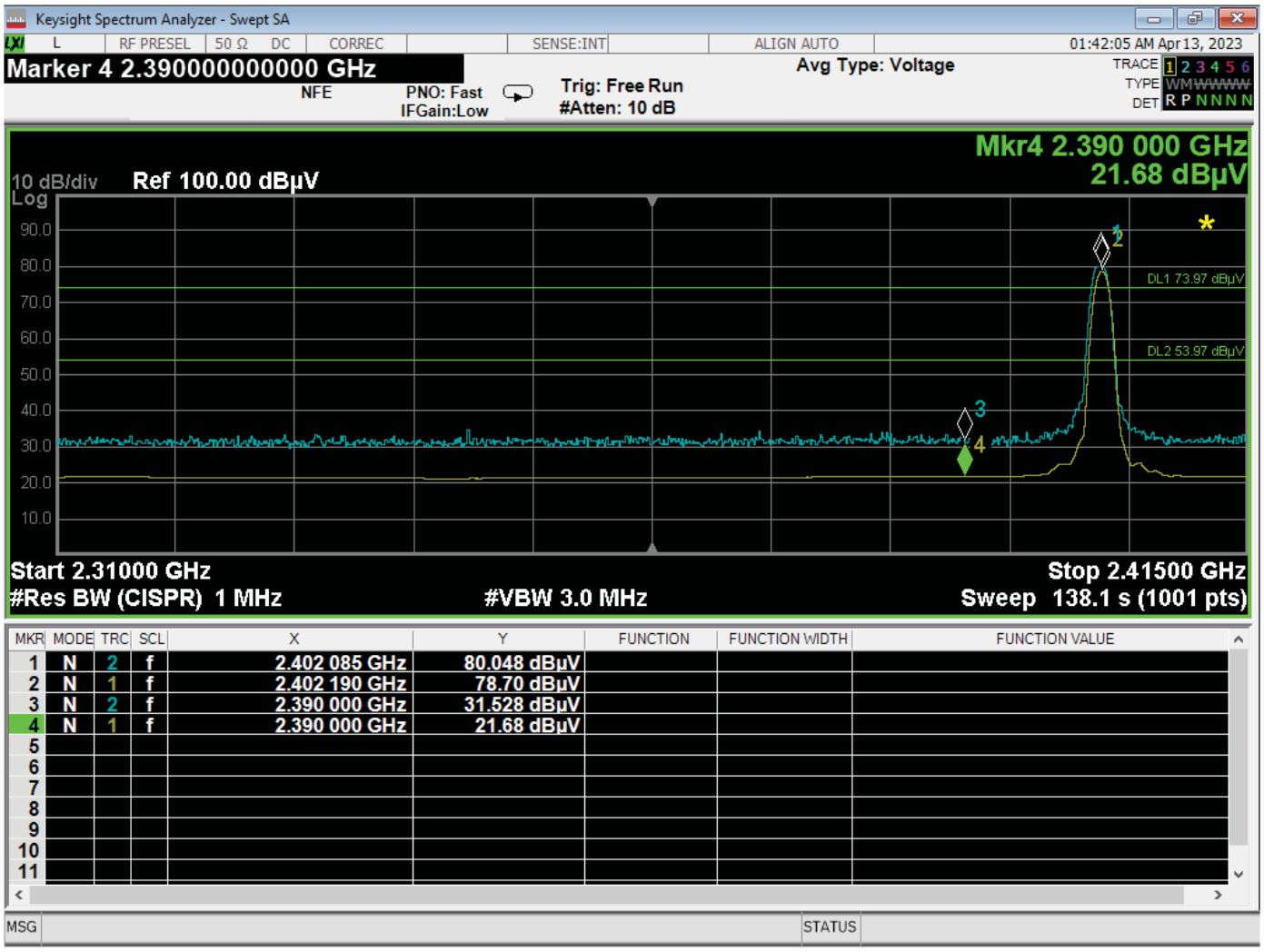
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2402.00	80.05	H	--	--	Peak	278.75	122.73	**Fundamental - Low Ch.**
2402.00	78.70	H	--	--	Avg	278.75	122.73	**Y-Axis**
2390.00	31.53	H	73.97	-42.44	Peak	278.75	122.73	**Band Edge**
2390.00	21.68	H	53.97	-32.29	Avg	278.75	122.73	**Y-Axis**
2402.00	78.47	V	---	--	Peak	173.25	140.58	**Fundamental - Low Ch.**
2402.00	77.05	V	--	--	Avg	173.25	140.58	**Y-Axis**
2390.00	32.23	V	73.97	-41.74	Peak	173.25	140.58	**Band Edge**
2390.00	21.41	V	53.97	-32.56	Avg	173.25	140.58	**Y-Axis**

FCC 15.247 and RSS-247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

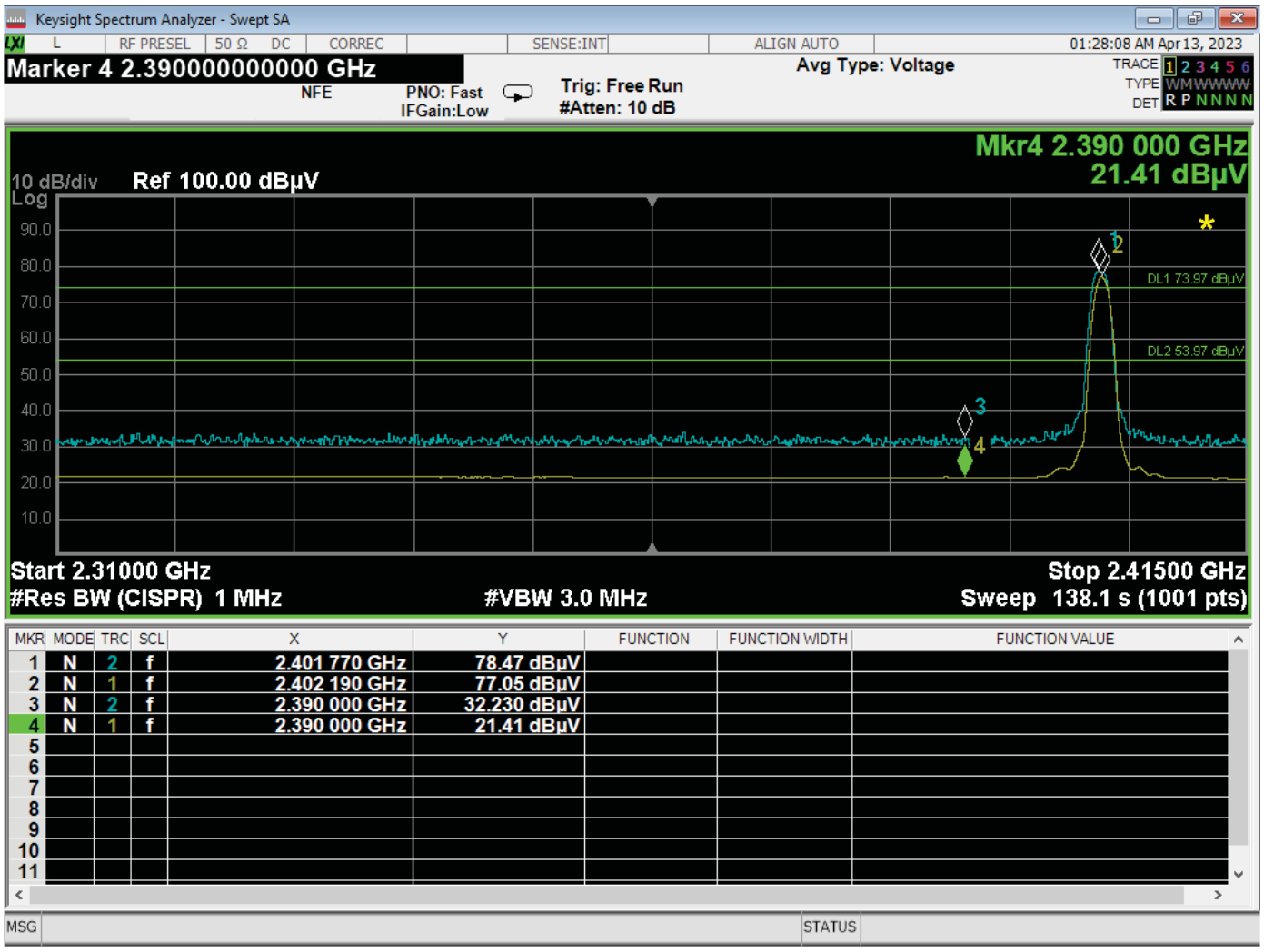
Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Band Edges - High Channel
External Deadbolt Enclosure

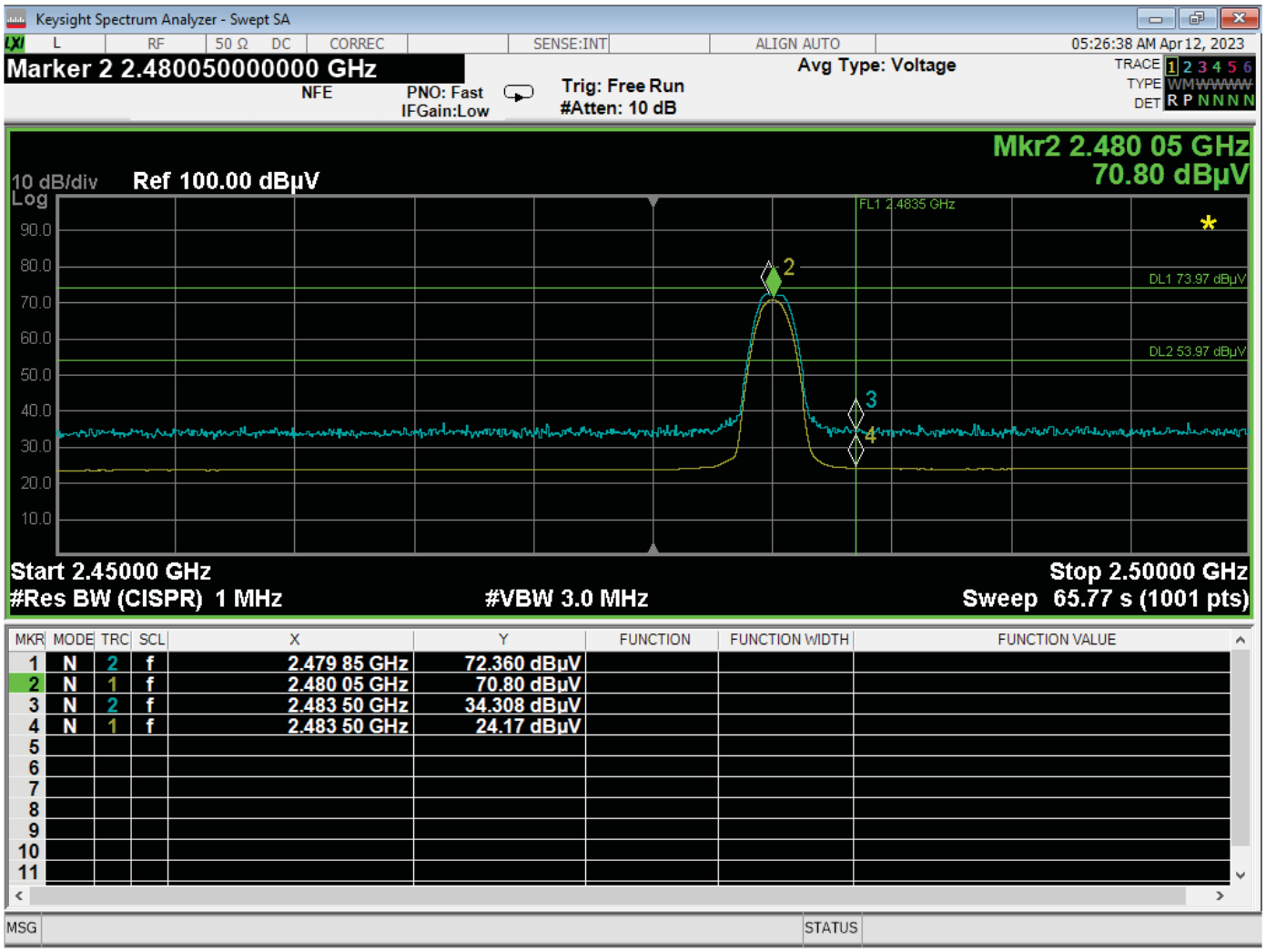
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480.00	72.36	H	---	--	Peak	42.50	169.53	**Fundamental - High Ch.**
2480.00	70.80	H	--	--	Avg	42.50	169.53	**Y-Axis**
2483.50	34.31	H	73.97	-39.66	Peak	42.50	169.53	**Band Edge**
2483.50	24.17	H	53.97	-29.80	Avg	42.50	169.53	**Y-Axis**
2480.00	82.52	V	---	--	Peak	358.00	147.44	**Fundamental - High Ch.**
2480.00	81.11	V	--	--	Avg	358.00	147.44	**Y-Axis**
2483.50	36.15	V	73.97	-37.82	Peak	358.00	147.44	**Band Edge**
2483.50	25.98	V	53.97	-27.99	Avg	358.00	147.44	**Y-Axis**



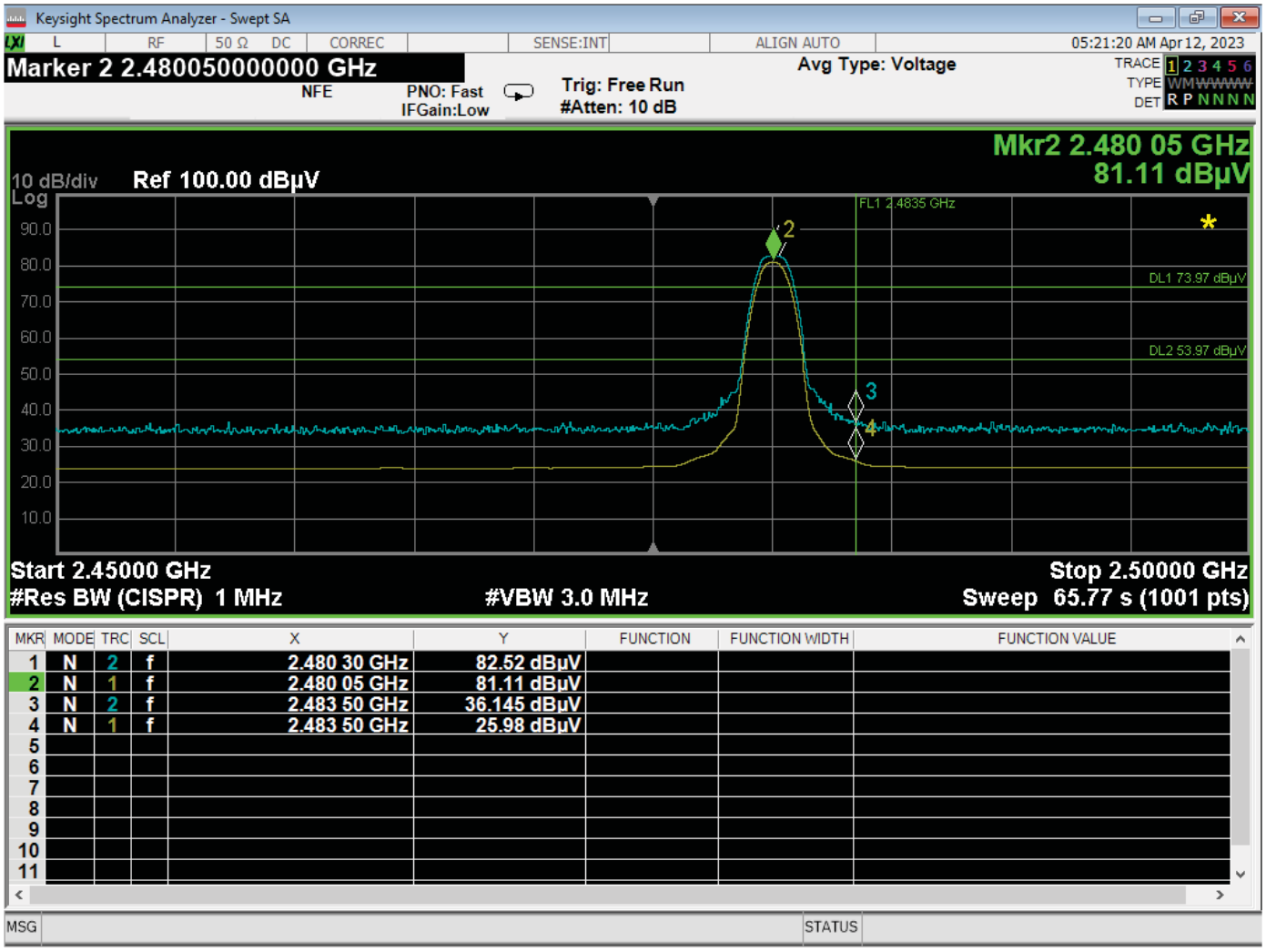
Band Edge – Low Channel – Horizontal Polarization – External Deadbolt Enclosure



Band Edge – Low Channel – Vertical Polarization – External Deadbolt Enclosure



Band Edge – High Channel – Horizontal Polarization – External Deadbolt Enclosure



Band Edge – High Channel – Vertical Polarization – External Deadbolt Enclosure

FCC 15.247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Band Edges - Low Channel
4.5 Inch Interconnect Enclosure

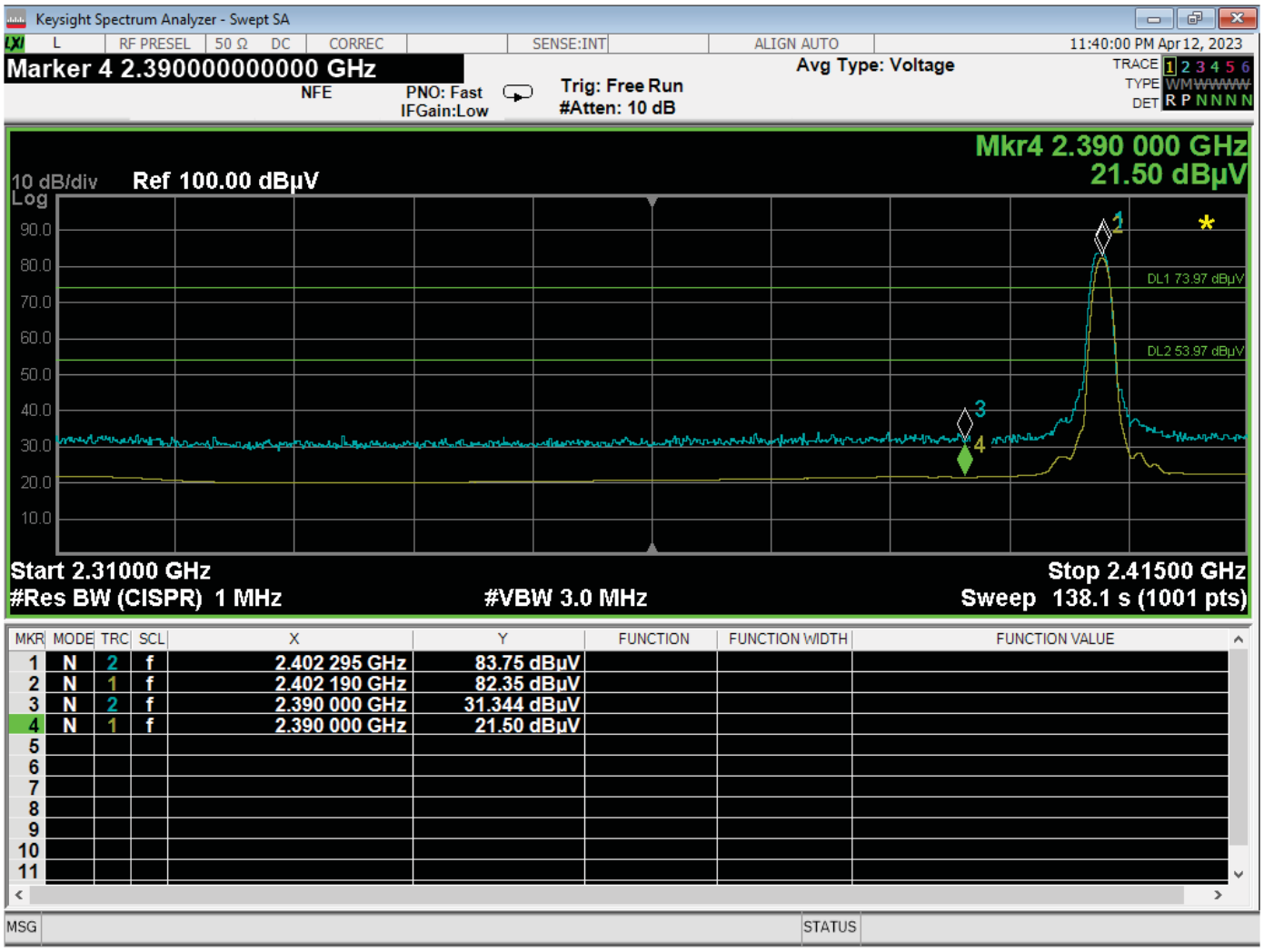
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2402.00	83.75	H	--	--	Peak	33.75	154.61	**Fundamental - Low Ch.**
2402.00	82.35	H	--	--	Avg	33.75	154.61	**Y-Axis**
2390.00	31.34	H	73.97	-42.63	Peak	33.75	154.61	**Band Edge**
2390.00	21.50	H	53.97	-32.47	Avg	33.75	154.61	**Y-Axis**
2402.00	79.53	V	---	--	Peak	306.75	198.79	**Fundamental - Low Ch.**
2402.00	78.14	V	--	--	Avg	306.75	198.79	**Y-Axis**
2390.00	31.68	V	73.97	-42.29	Peak	306.75	198.79	**Band Edge**
2390.00	21.39	V	53.97	-32.58	Avg	306.75	198.79	**Y-Axis**

FCC 15.247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

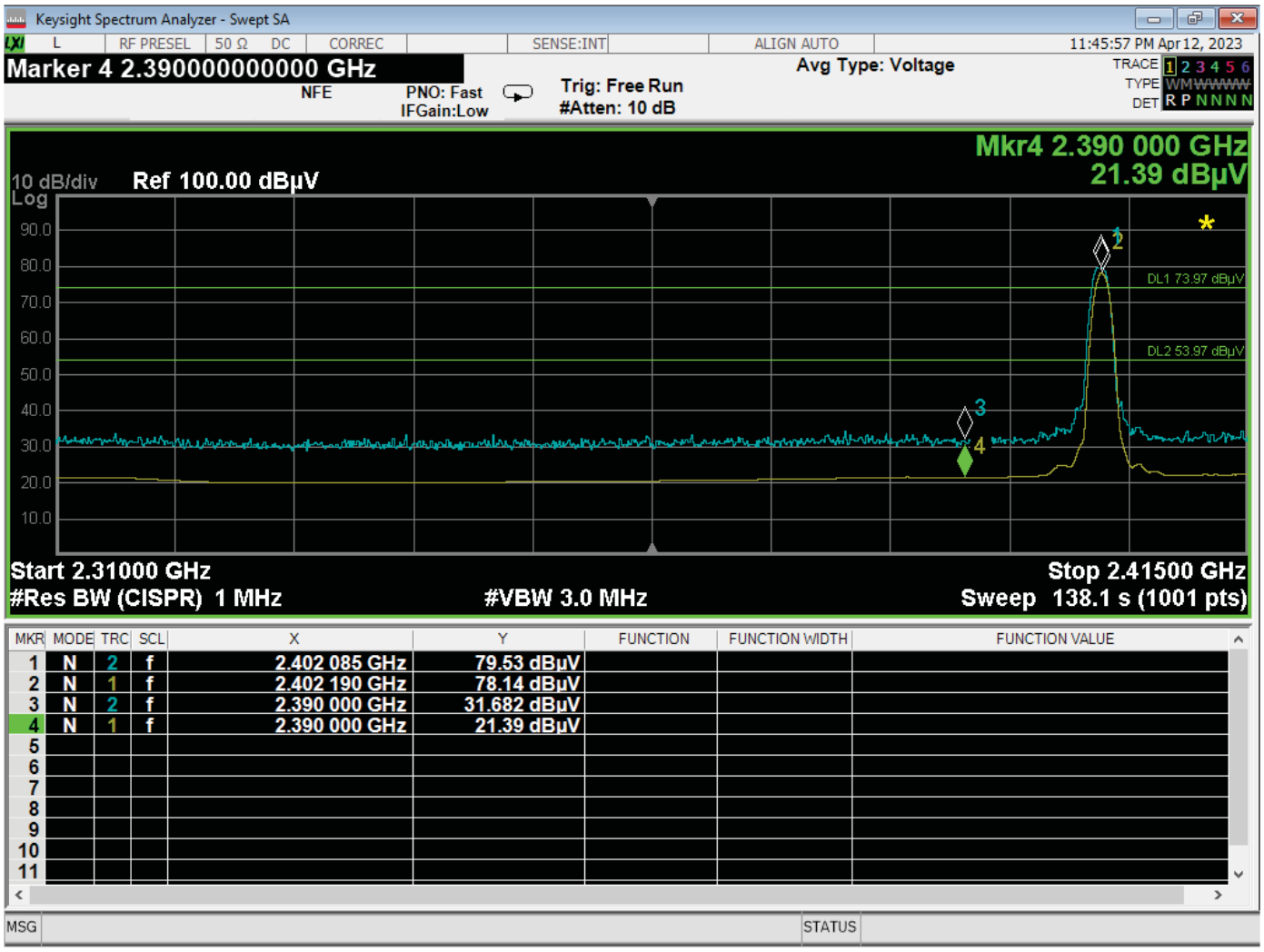
Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Band Edges - High Channel
4.5 Inch Interconnect Enclosure

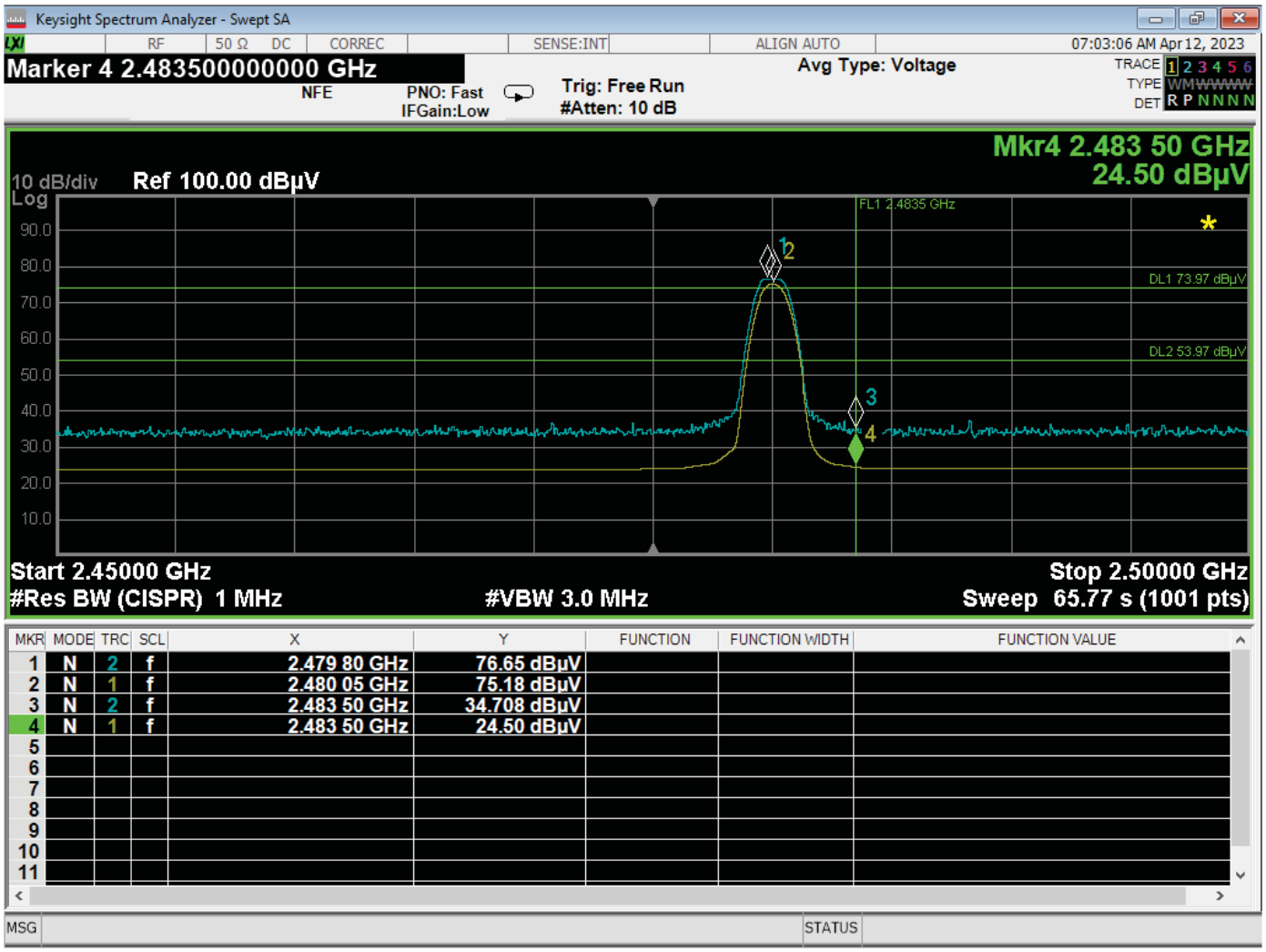
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480.00	76.65	H	---	--	Peak	275.00	100.01	**Fundamental - High Ch.**
2480.00	75.18	H	--	--	Avg	275.00	100.01	**Y-Axis**
2483.50	34.71	H	73.97	-39.26	Peak	275.00	100.01	**Band Edge**
2483.50	24.50	H	53.97	-29.47	Avg	275.00	100.01	**Y-Axis**
2480.00	75.62	V	---	--	Peak	357.75	132.10	**Fundamental - High Ch.**
2480.00	74.19	V	--	--	Avg	357.75	132.10	**Y-Axis**
2483.50	35.71	V	73.97	-38.26	Peak	357.75	132.10	**Band Edge**
2483.50	24.48	V	53.97	-29.49	Avg	357.75	132.10	**Y-Axis**



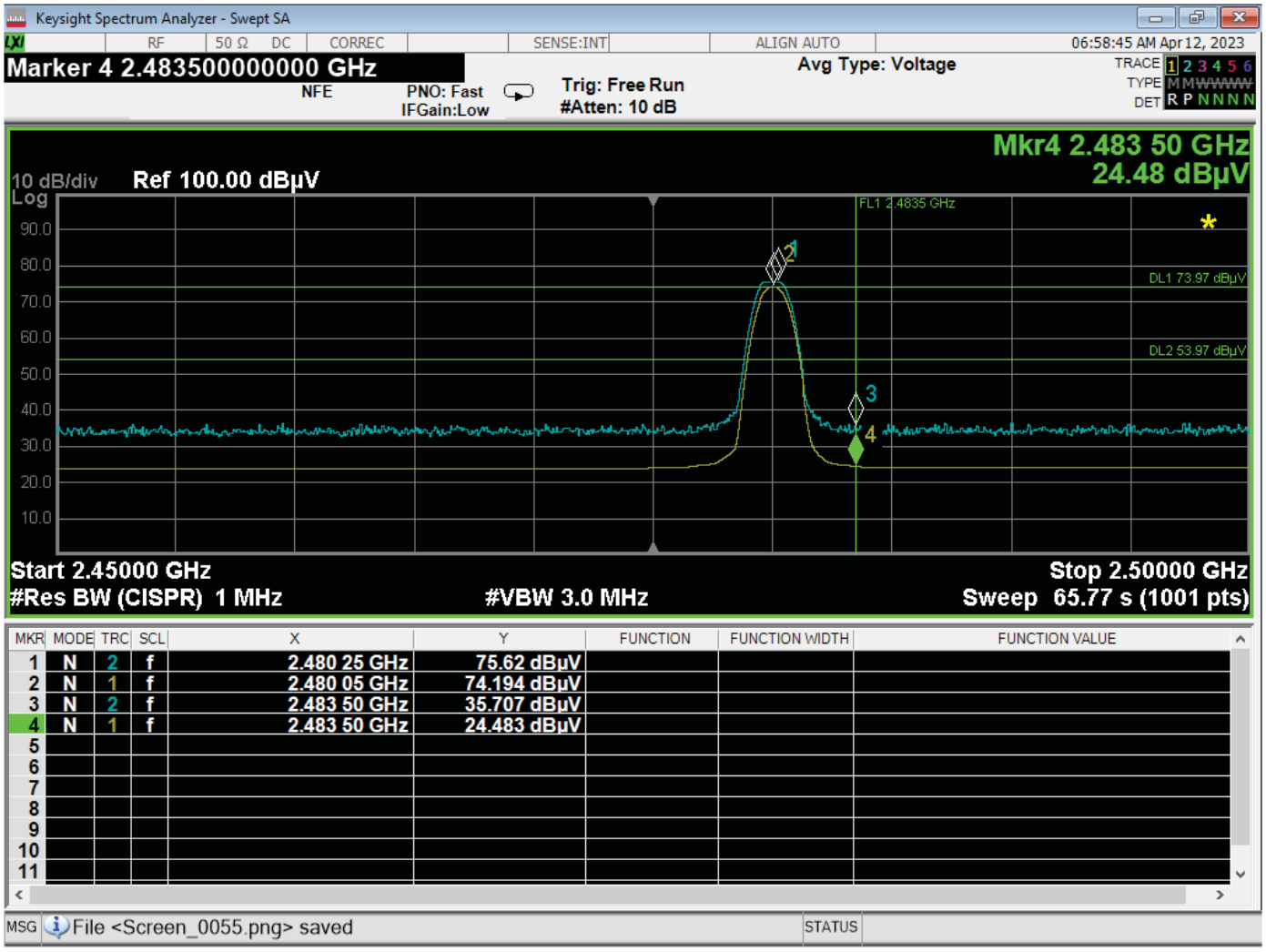
Band Edge – Low Channel – Horizontal Polarization – 4.5 Inch Interconnect Enclosure



Band Edge – Low Channel – Vertical Polarization – 4.5 Inch Interconnect Enclosure



Band Edge – High Channel – Horizontal Polarization – 4.5 Inch Interconnect Enclosure



Band Edge – High Channel – Vertical Polarization – 4.5 Inch Interconnect Enclosure

FCC 15.247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

Date: 04/13/2023
Lab: D
Tested By: Kyle Fujimoto

Band Edges - Low Channel
5.5 Inch Interconnect

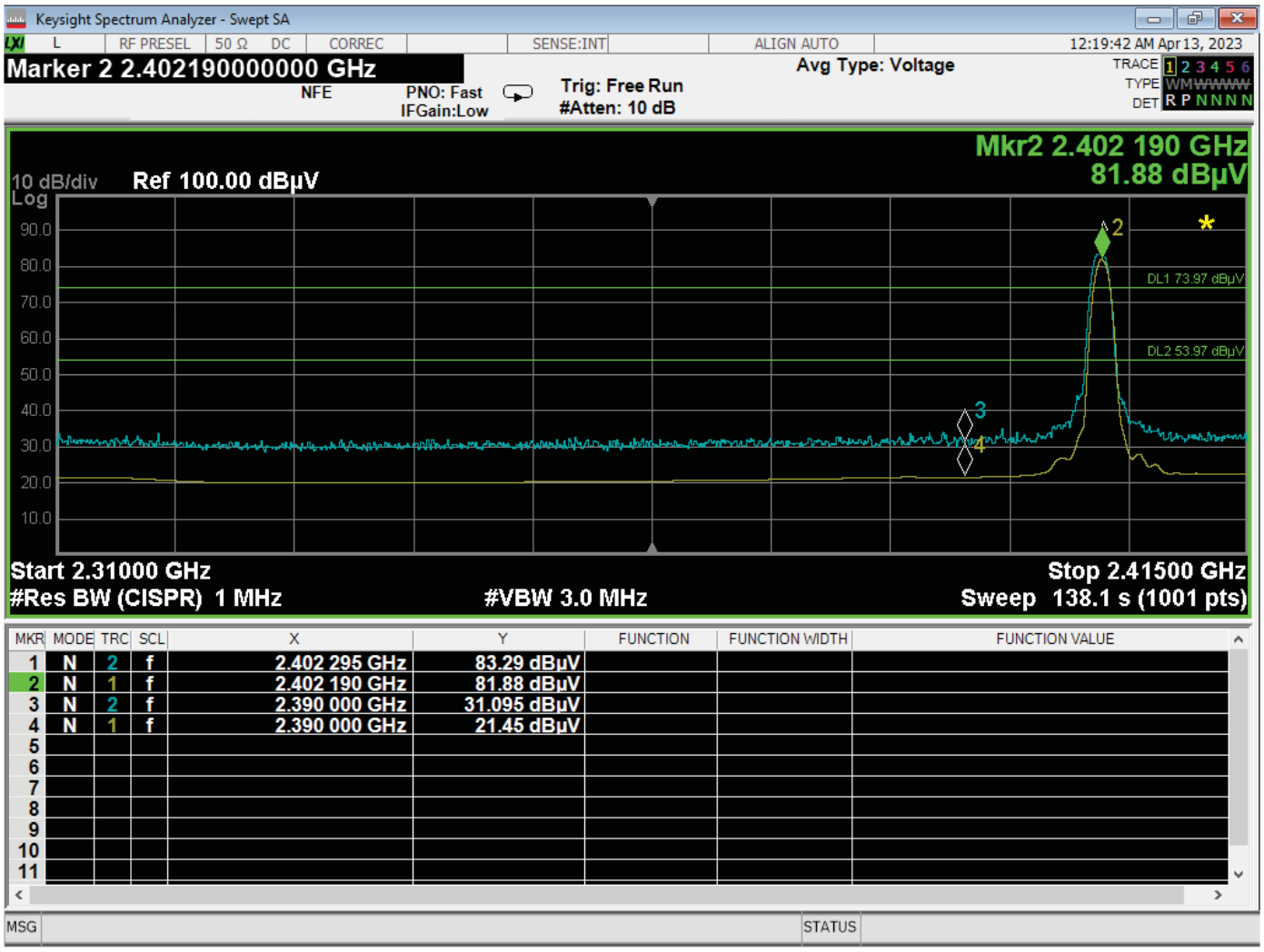
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2402.00	83.29	H	--	--	Peak	204.50	163.62	**Fundamental - Low Ch.**
2402.00	81.88	H	--	--	Avg	204.50	163.62	**Y-Axis**
2390.00	31.10	H	73.97	-42.87	Peak	204.50	163.62	**Band Edge**
2390.00	21.45	H	53.97	-32.52	Avg	204.50	163.62	**Y-Axis**
2402.00	80.06	V	---	--	Peak	161.25	124.40	**Fundamental - Low Ch.**
2402.00	78.72	V	--	--	Avg	161.25	124.40	**Y-Axis**
2390.00	31.03	V	73.97	-42.94	Peak	161.25	124.40	**Band Edge**
2390.00	21.29	V	53.97	-32.68	Avg	161.25	124.40	**Y-Axis**

FCC 15.247
Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100

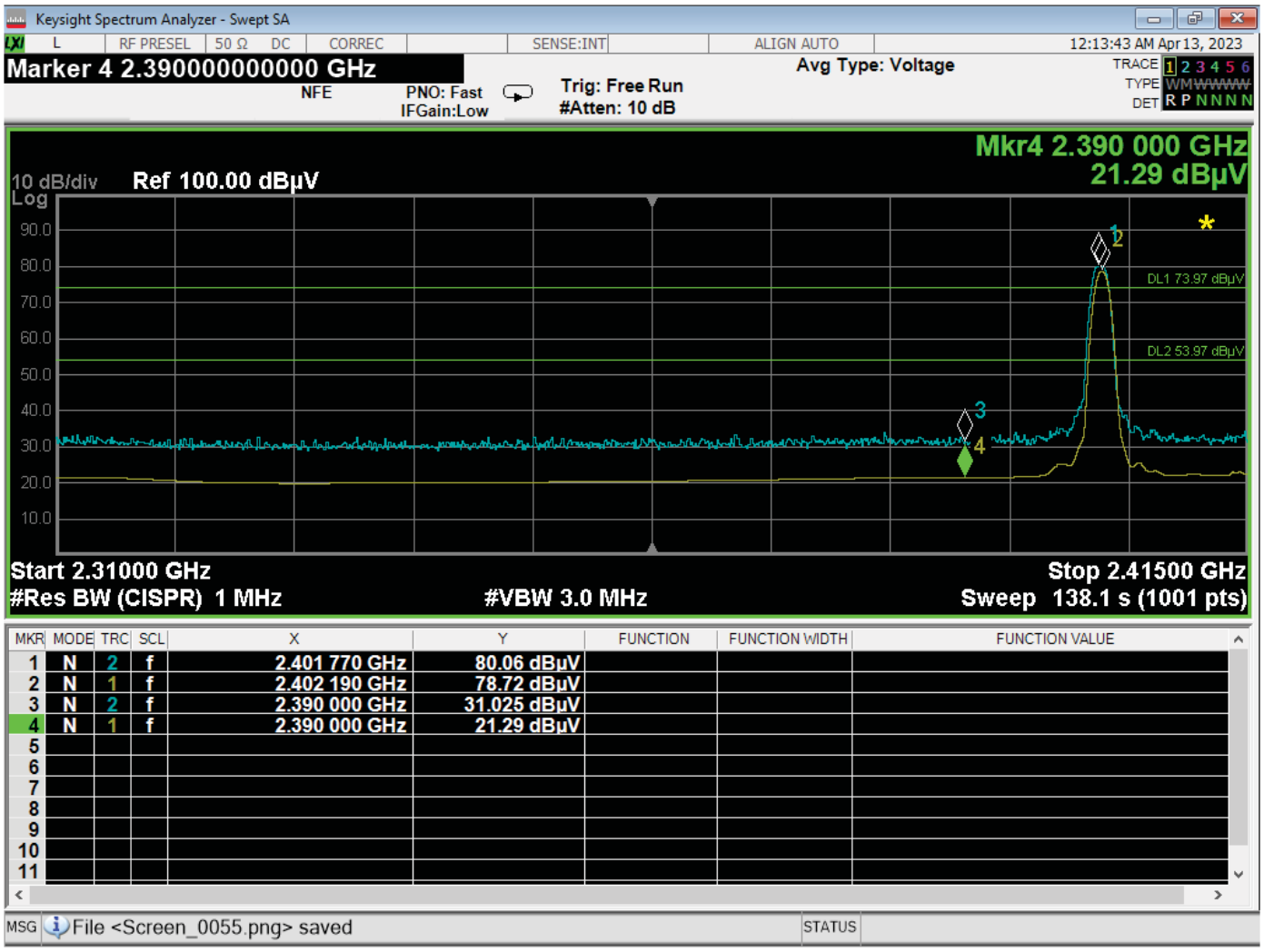
Date: 04/12/2023
Lab: D
Tested By: Kyle Fujimoto

Band Edges - High Channel
5.5 Inch Interconnect

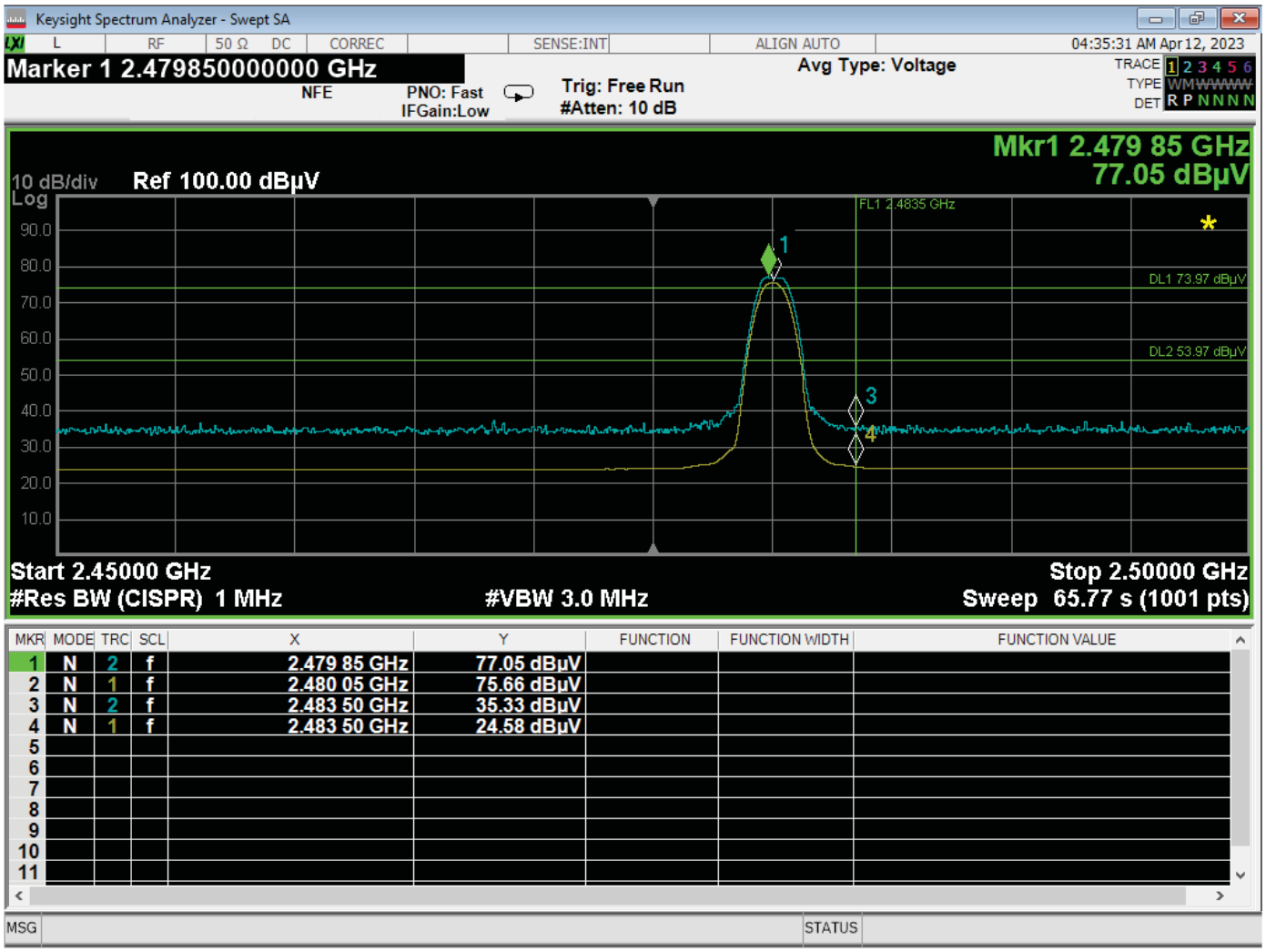
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480.00	77.05	H	---	--	Peak	16.25	252.28	**Fundamental - High Ch.**
2480.00	75.66	H	--	--	Avg	16.25	252.28	**Y-Axis**
2483.50	35.33	H	73.97	-38.64	Peak	16.25	252.28	**Band Edge**
2483.50	24.58	H	53.97	-29.39	Avg	16.25	252.28	**Y-Axis**
2480.00	78.49	V	---	--	Peak	308.50	137.71	**Fundamental - High Ch.**
2480.00	77.09	V	--	--	Avg	308.50	137.71	**Y-Axis**
2483.50	34.65	V	73.97	-39.32	Peak	308.50	137.71	**Band Edge**
2483.50	24.86	V	53.97	-29.11	Avg	308.50	137.71	**Y-Axis**



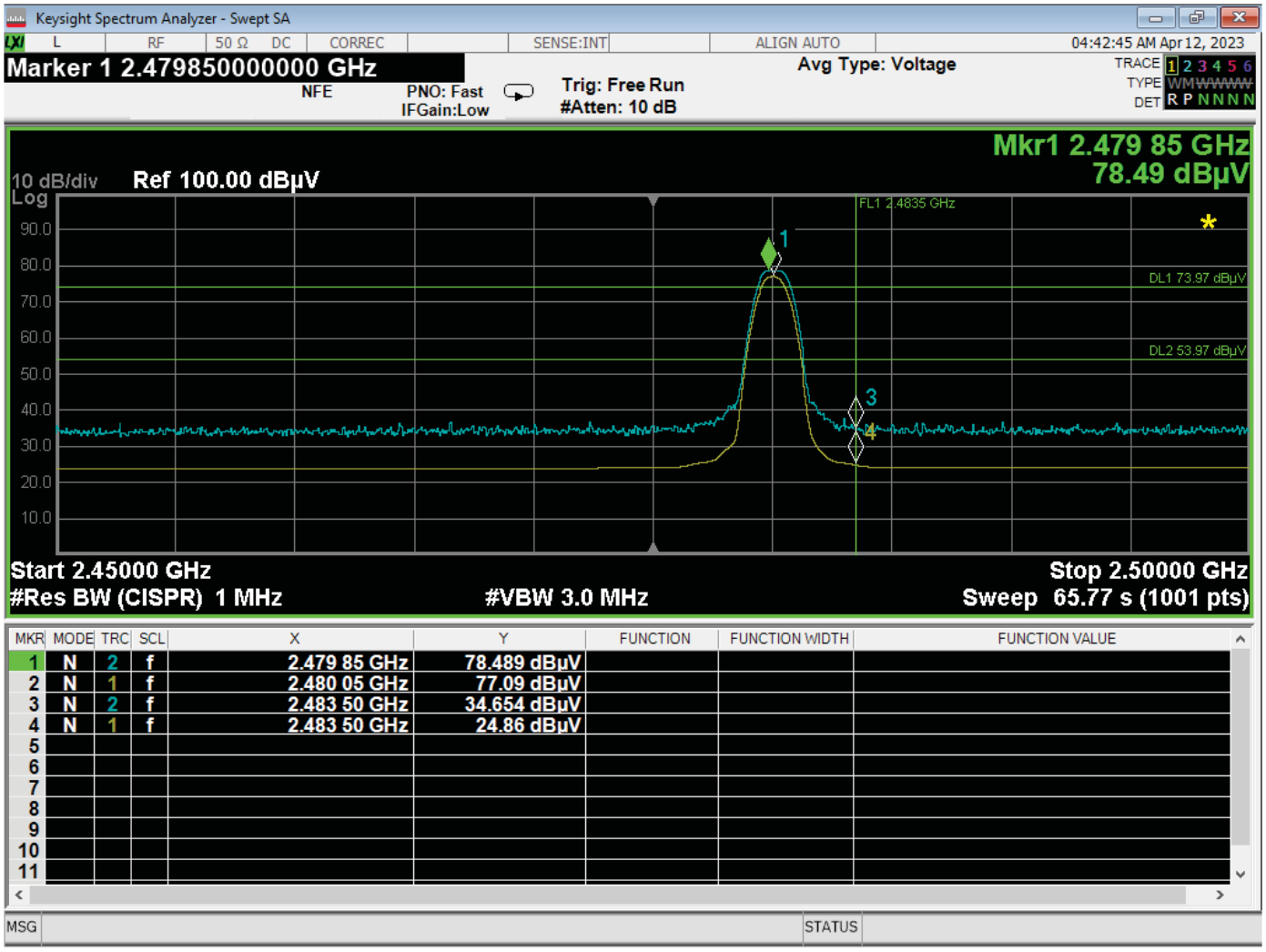
Band Edge – Low Channel – Horizontal Polarization – 5.5 Inch Interconnect Enclosure



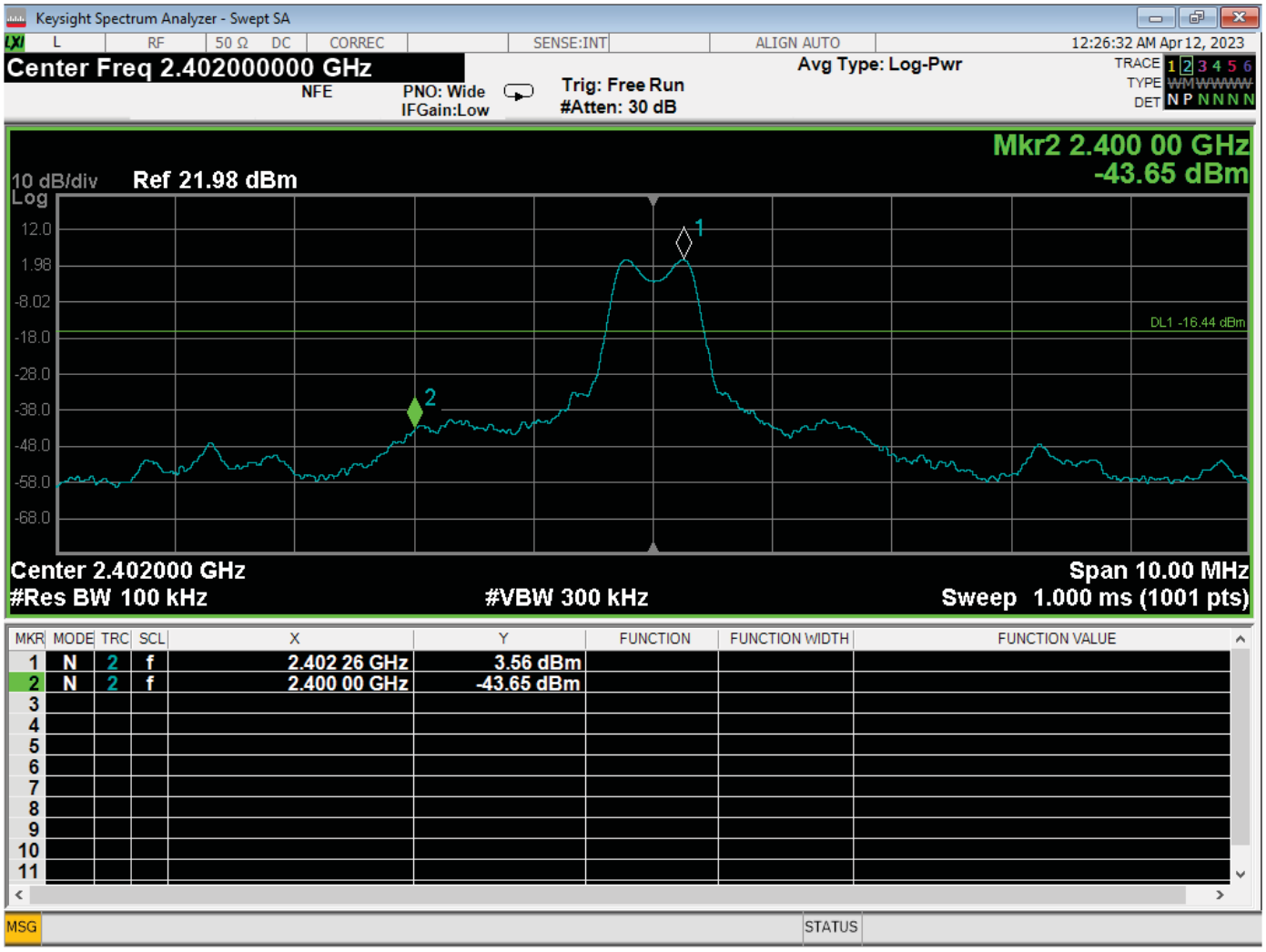
Band Edge – Low Channel – Vertical Polarization – 5.5 Inch Interconnect Enclosure



Band Edge – High Channel – Horizontal Polarization – 5.5 Inch Interconnect Enclosure

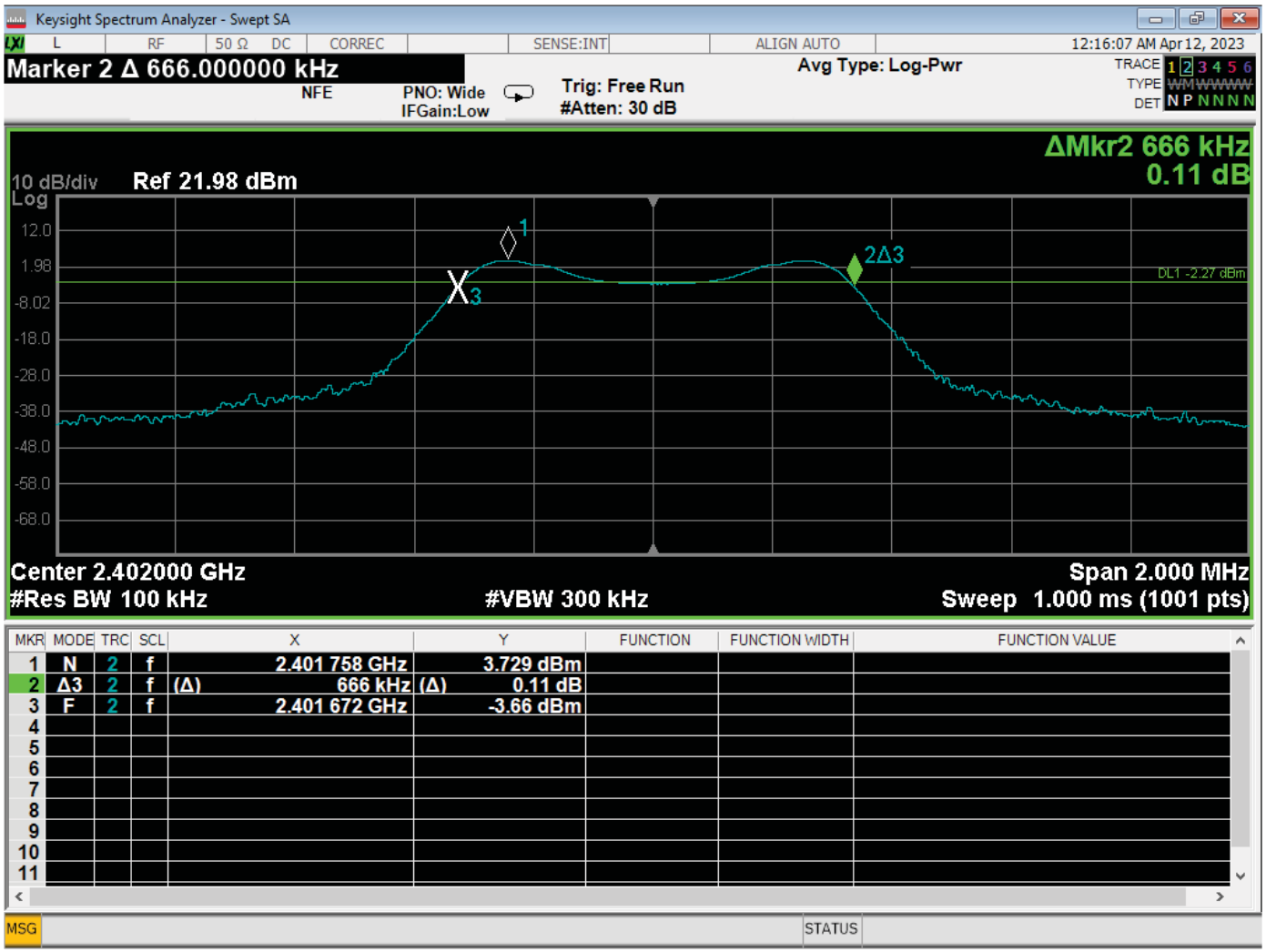


Band Edge – High Channel – Vertical Polarization – 5.5 Inch Interconnect Enclosure

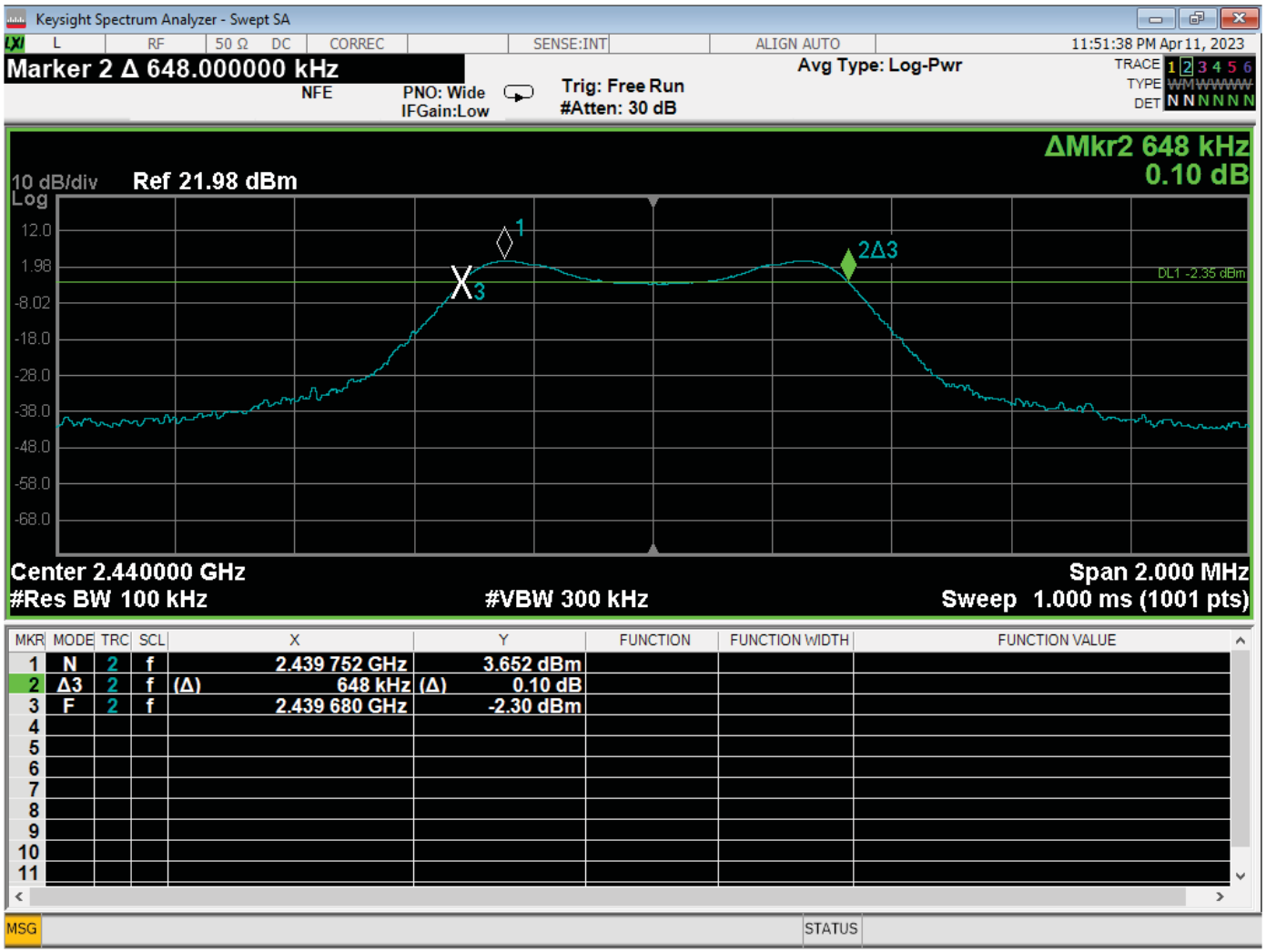


Band Edge – Low Channel – at 2400 MHz – Conducted Measurement

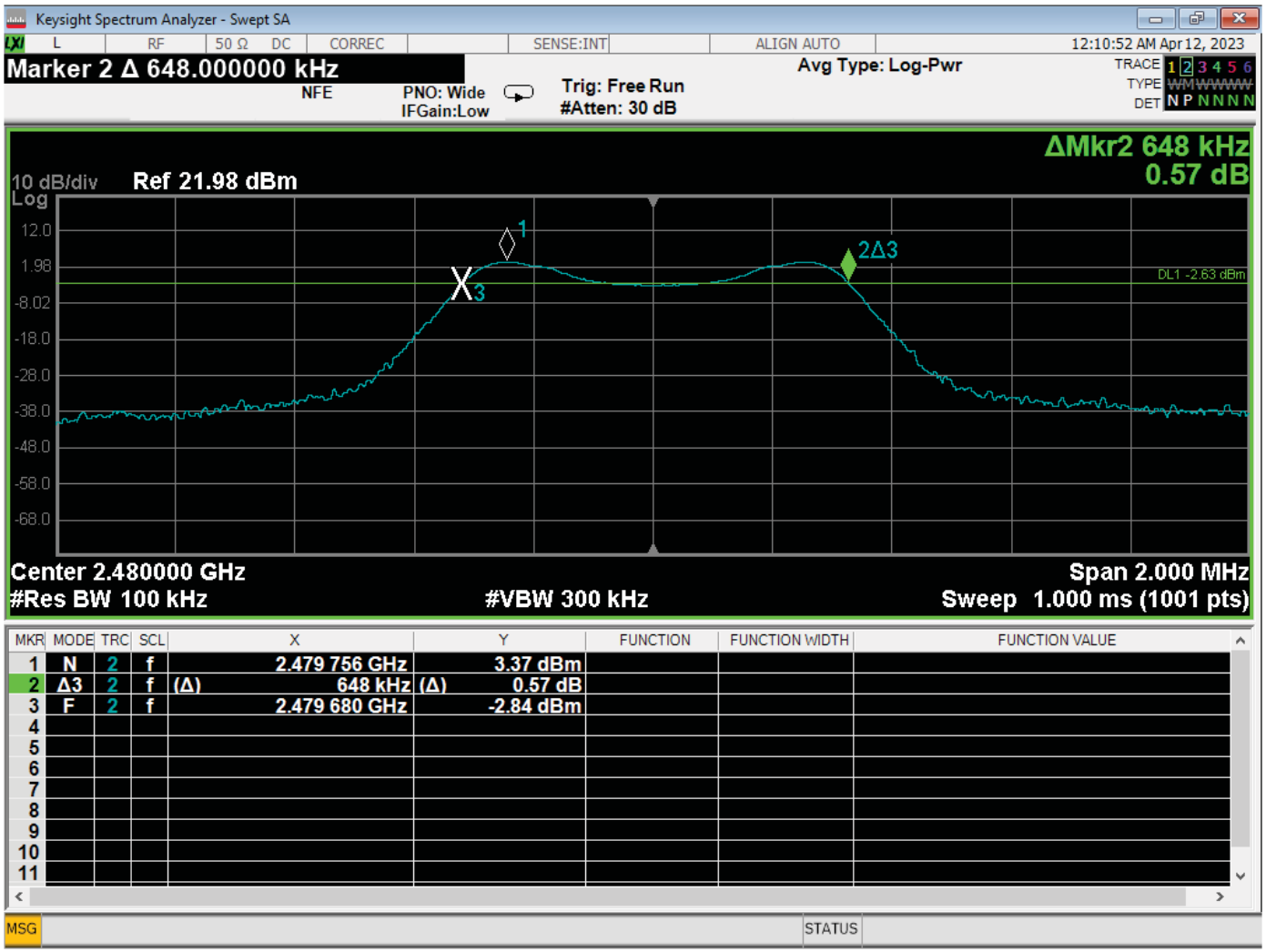
-6 dB BANDWIDTH DATA SHEETS



-6 dB Bandwidth – Low Channel

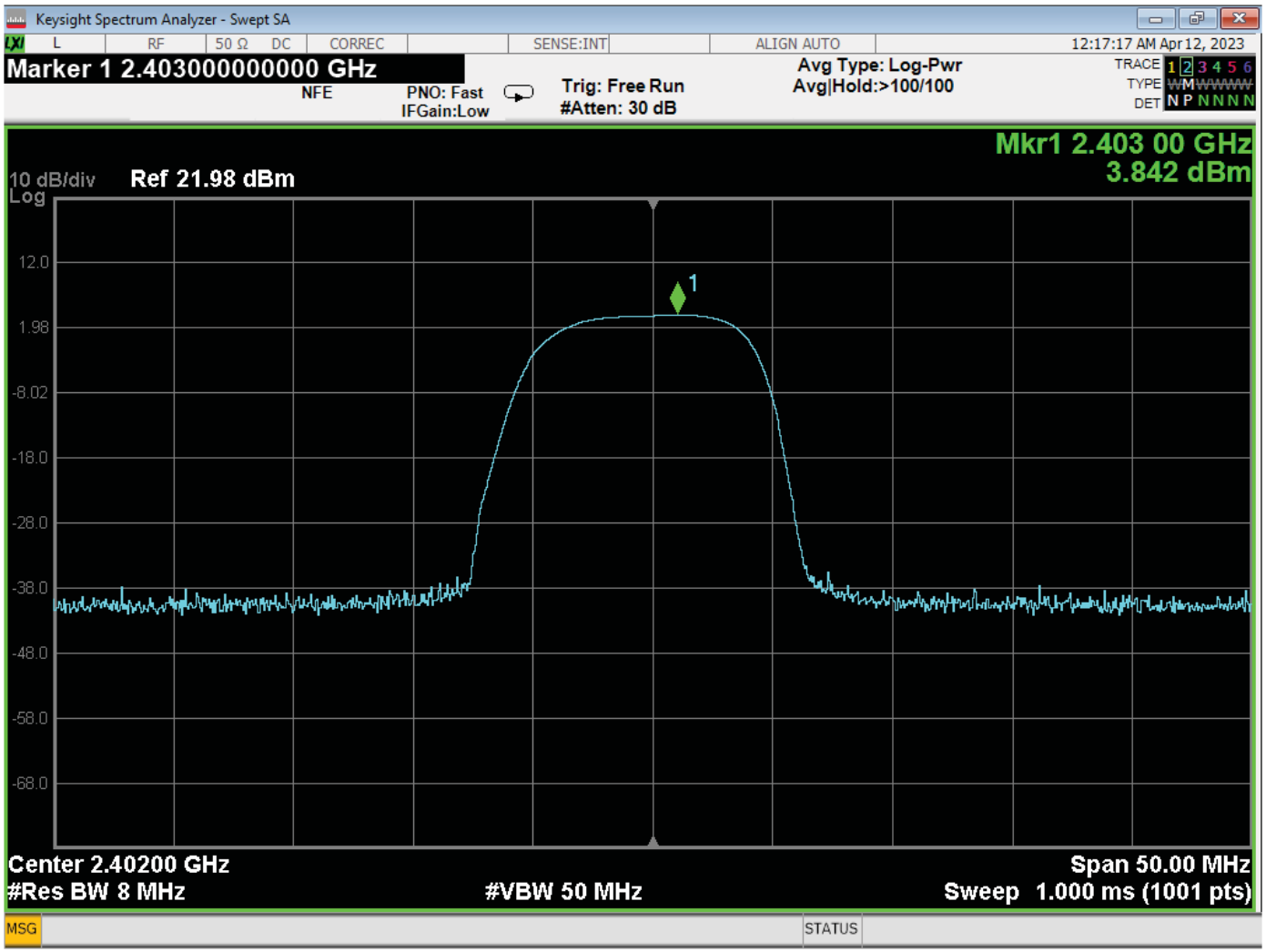


-6 dB Bandwidth – Middle Channel

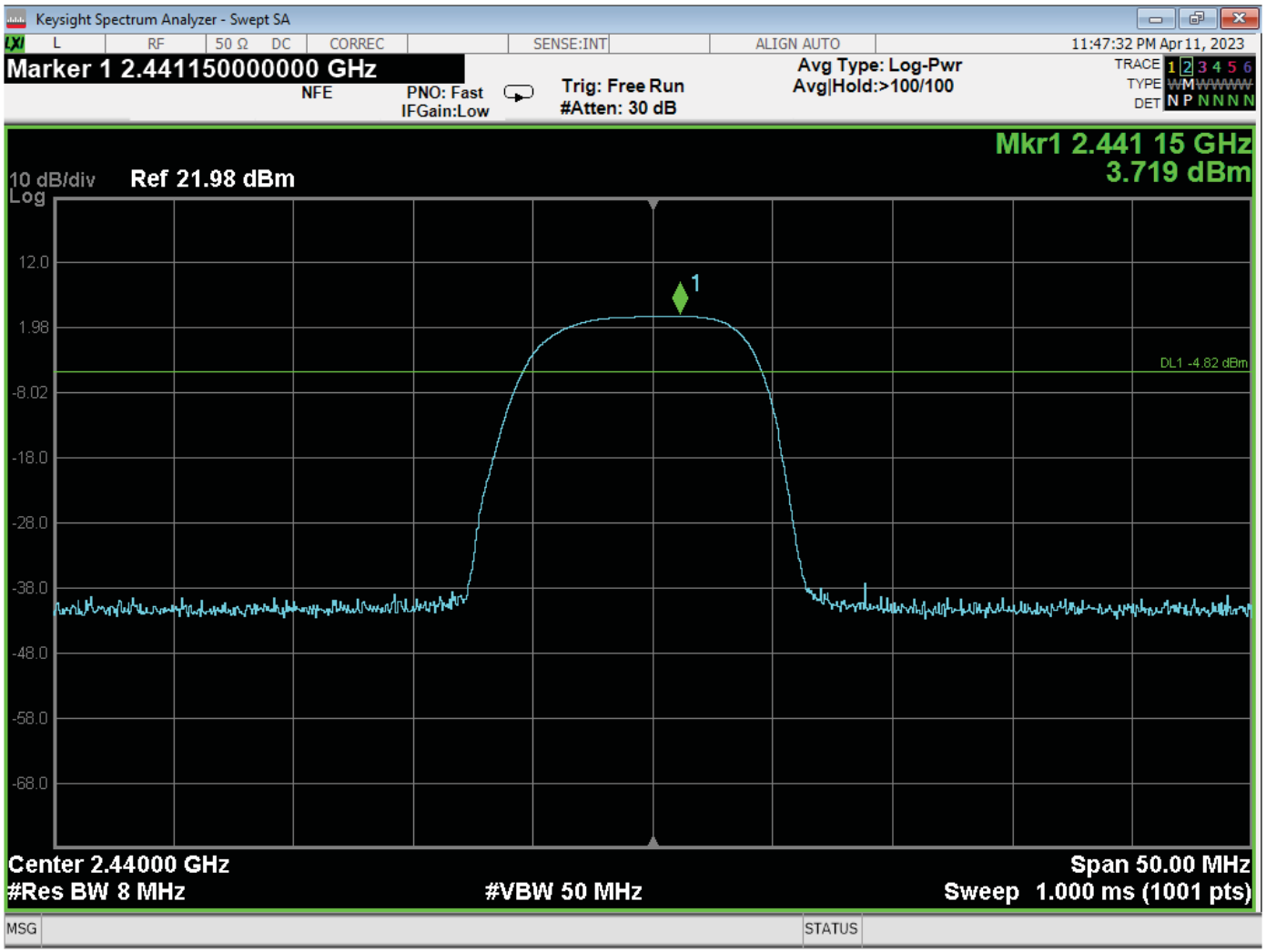


-6 dB Bandwidth – High Channel

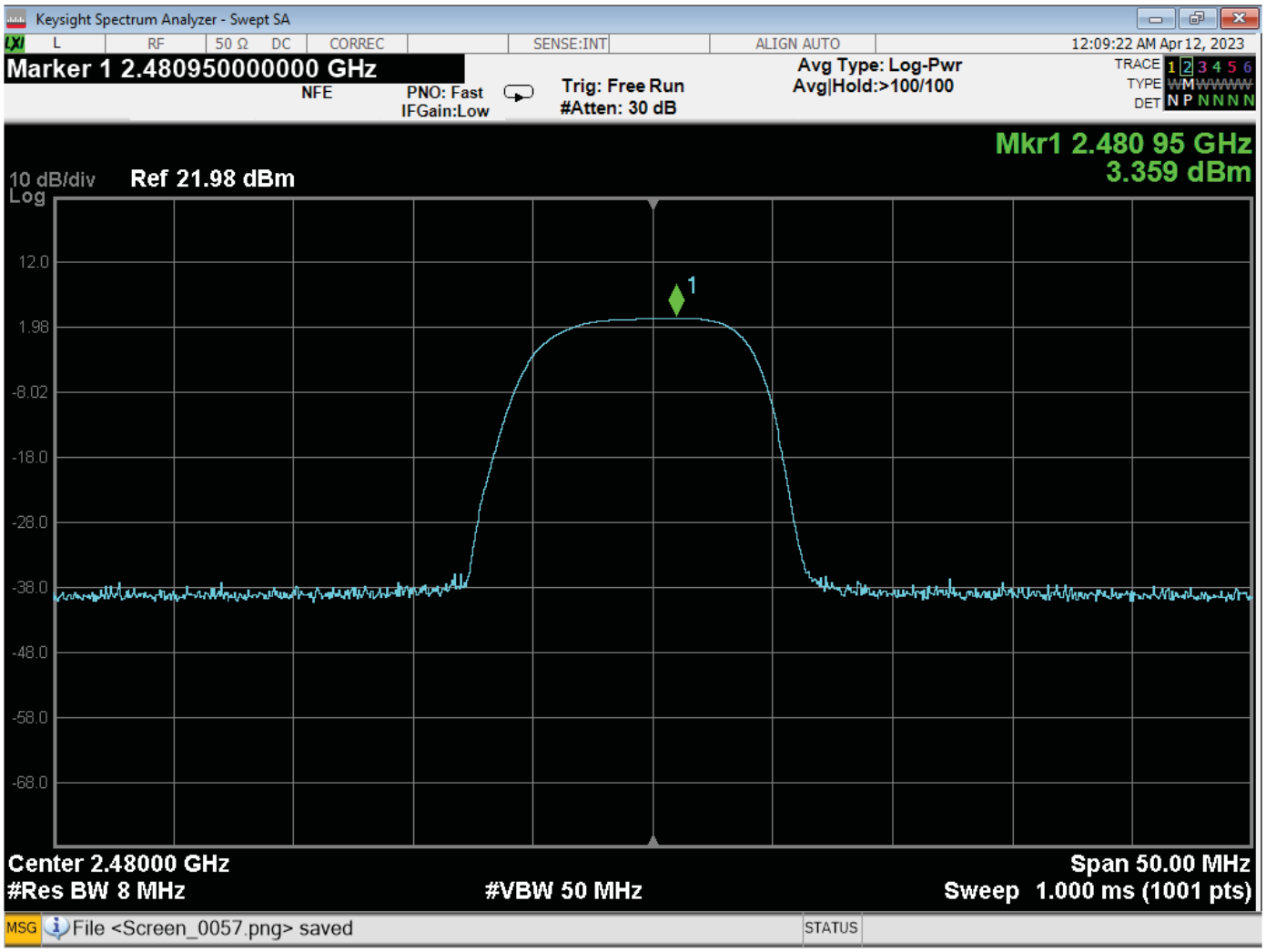
PEAK POWER OUTPUT DATA SHEETS



Peak Power Output – Low Channel



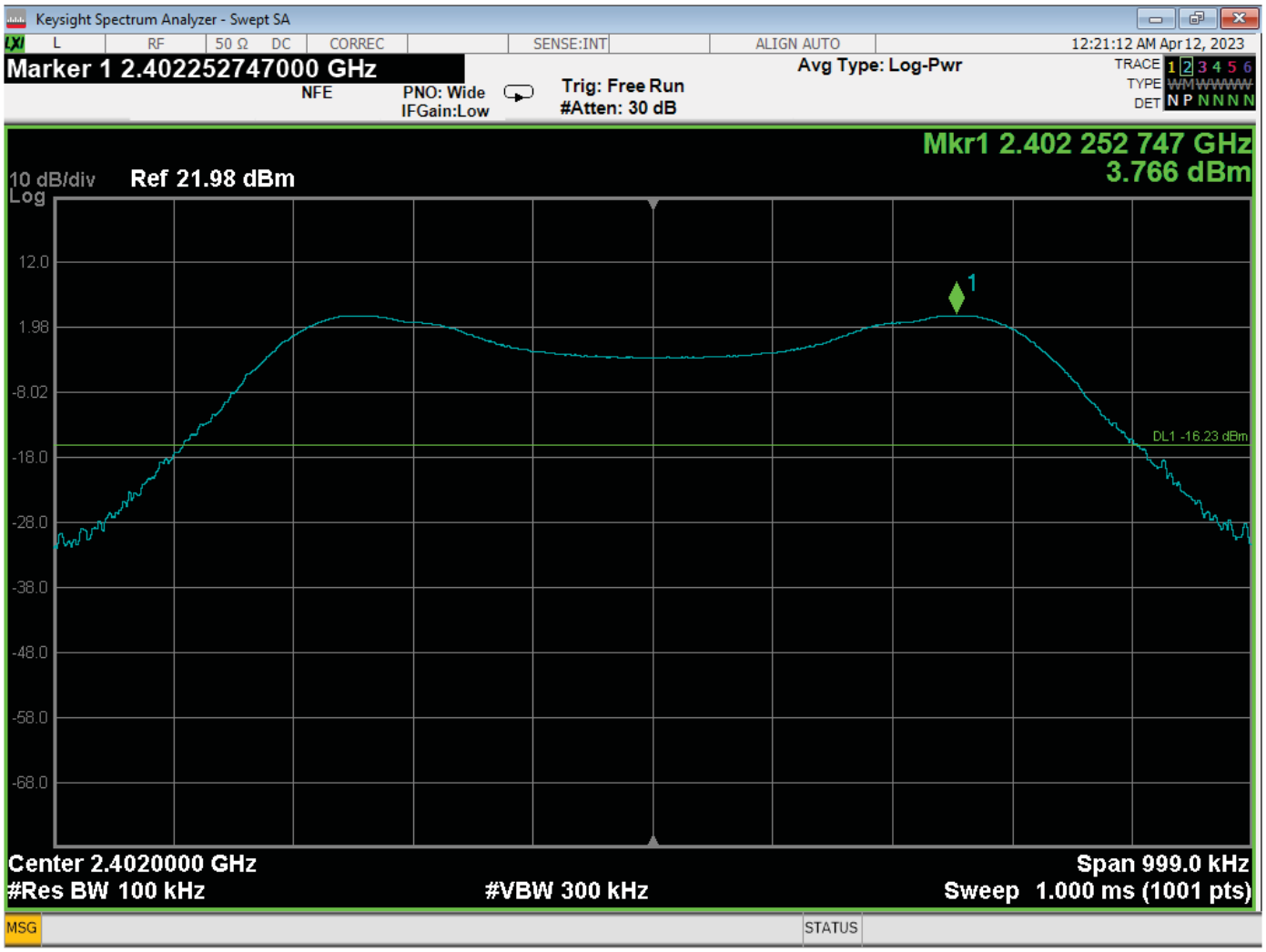
Peak Power Output – Middle Channel



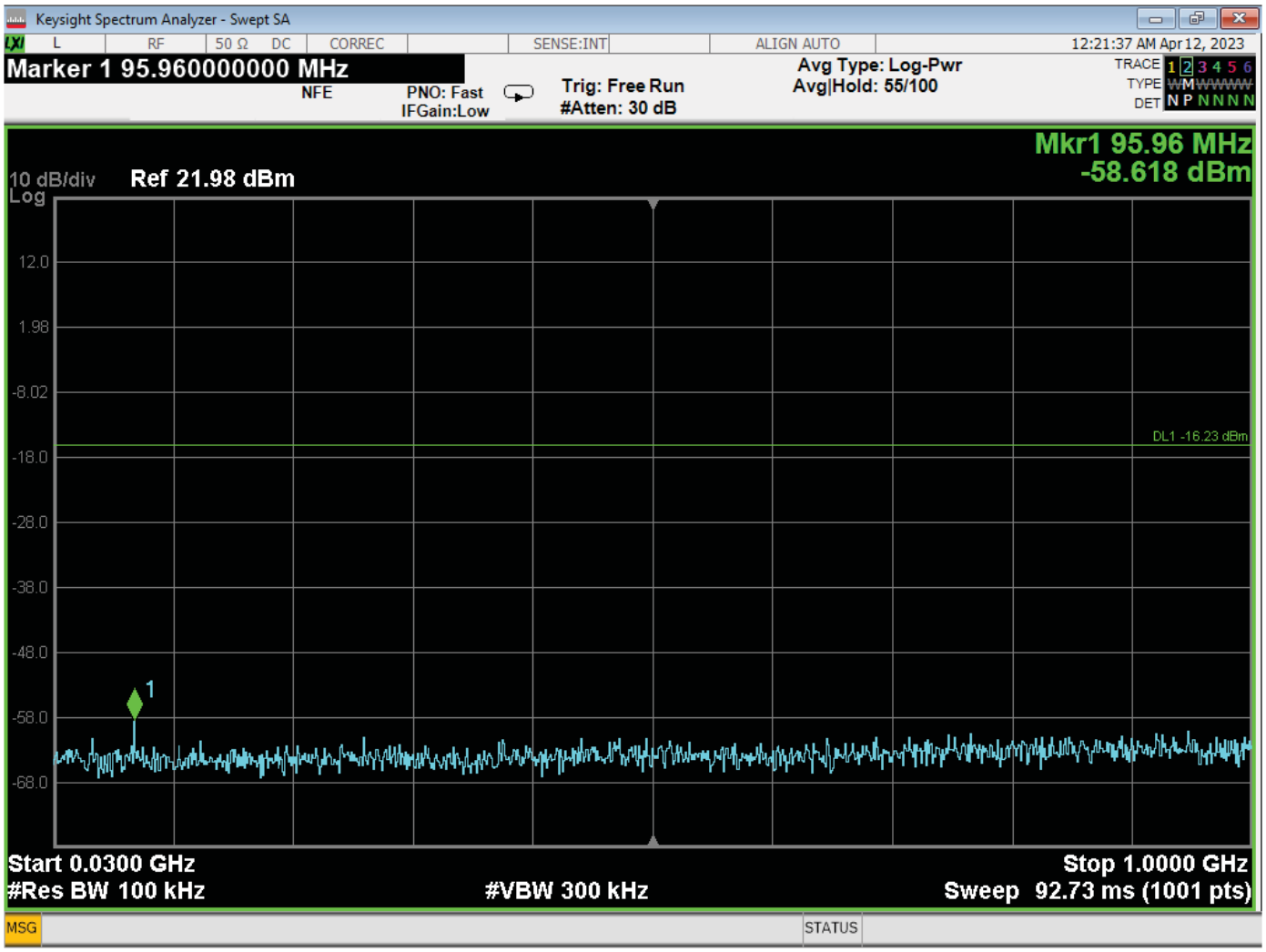
Peak Power Output – High Channel

RF ANTENNA CONDUCTED

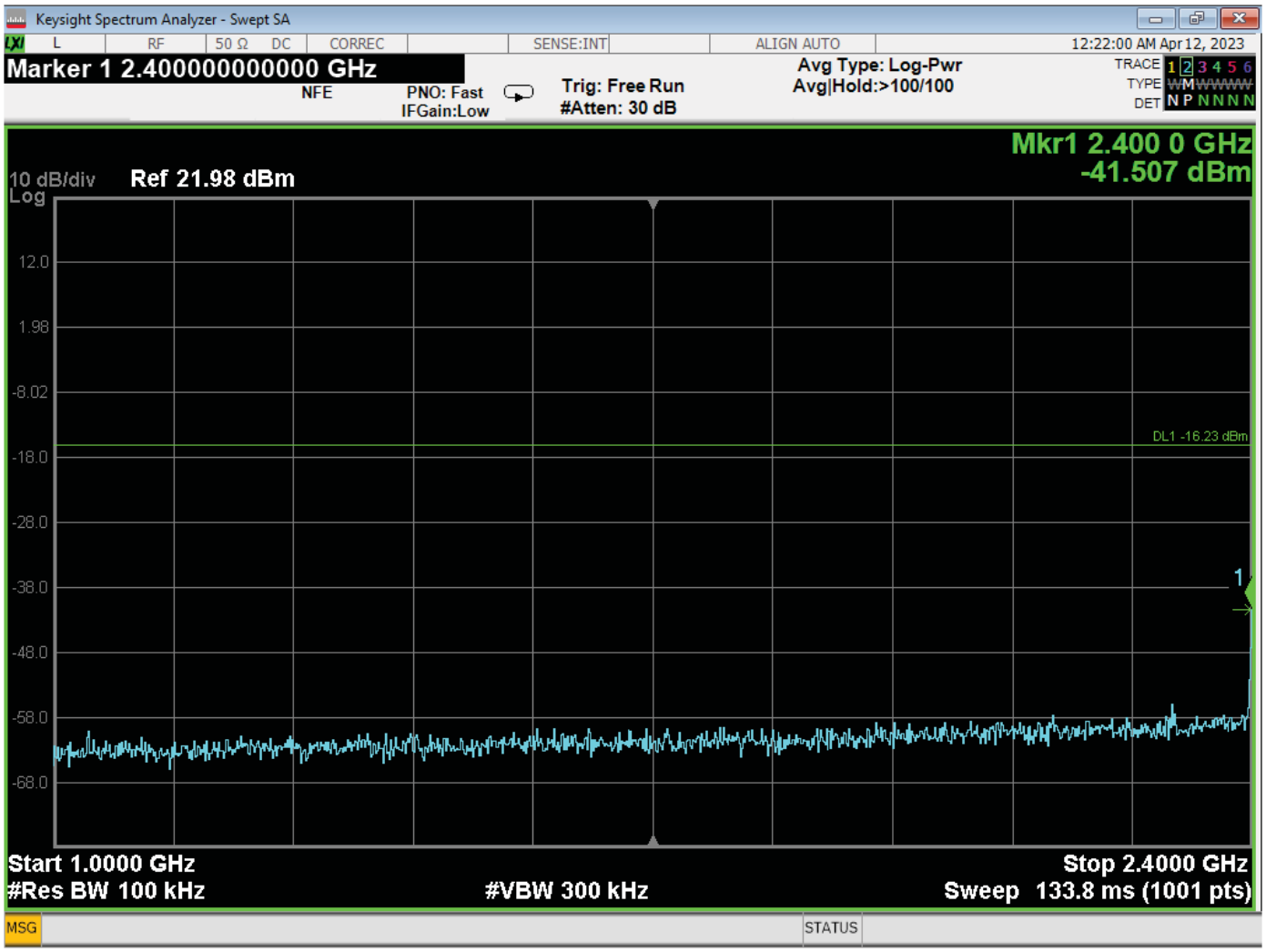
DATA SHEETS



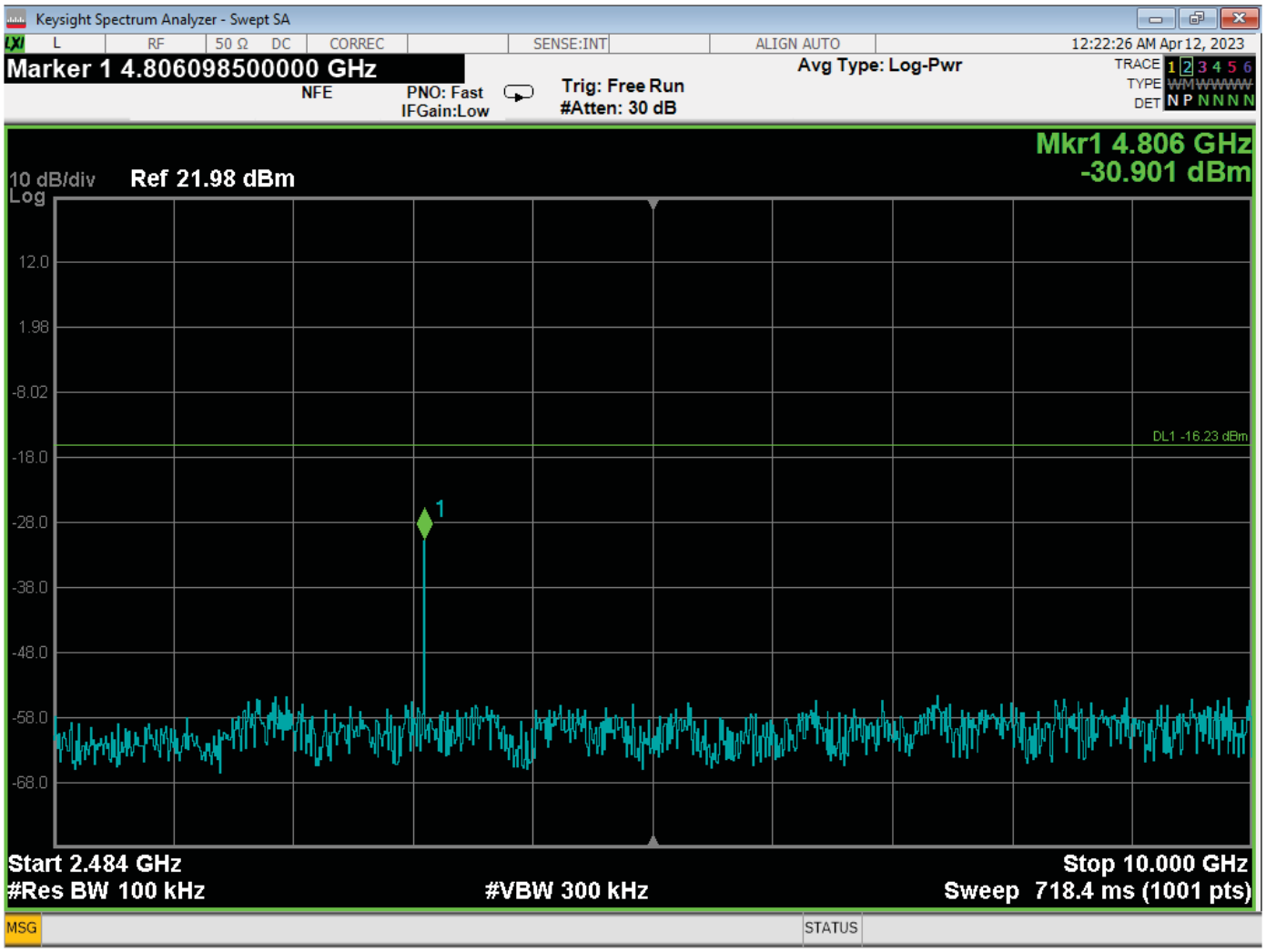
RF Antenna Conducted – Low Channel – Reference Level



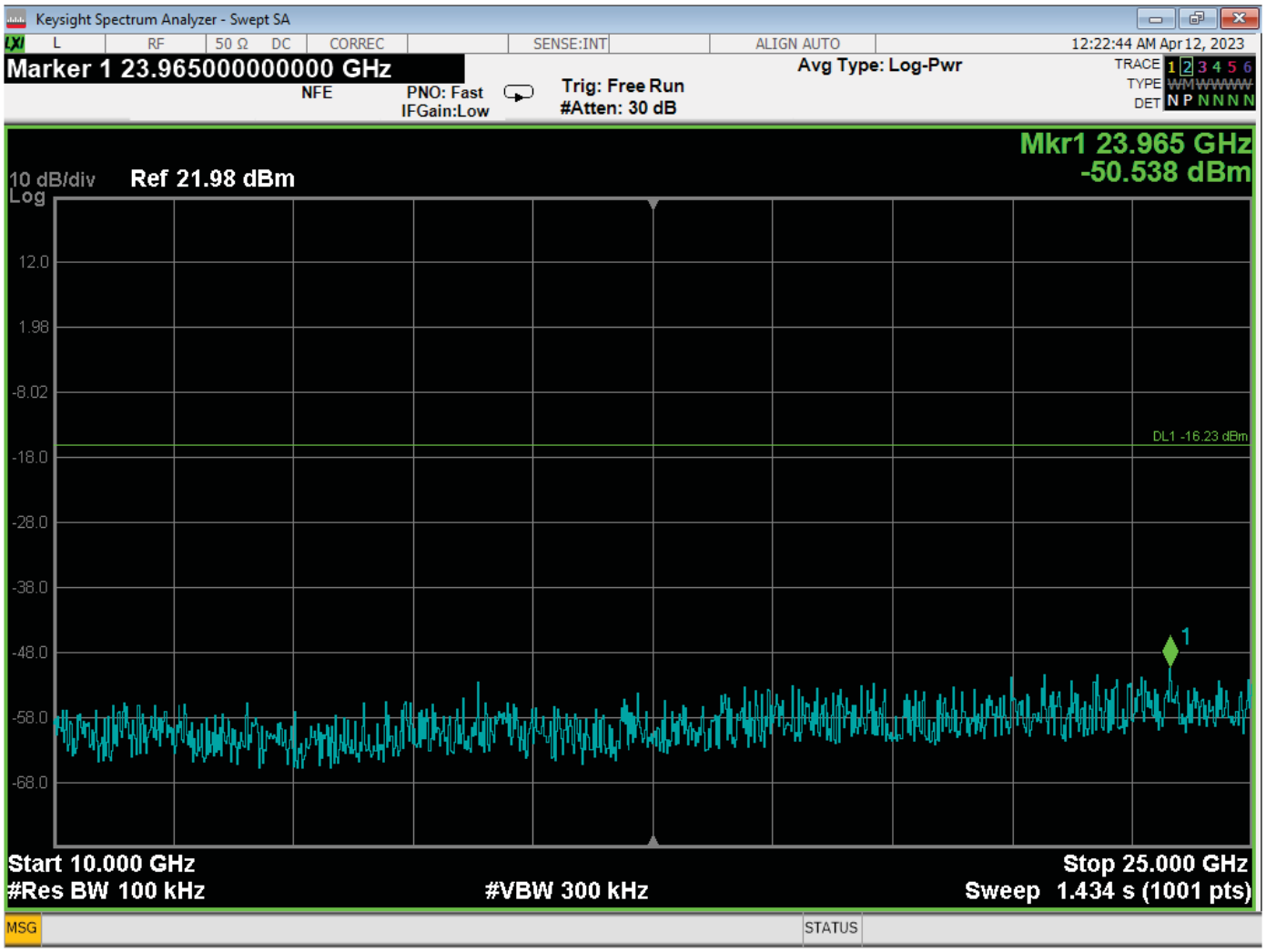
RF Antenna Conducted – Low Channel – 30 MHz to 1 GHz



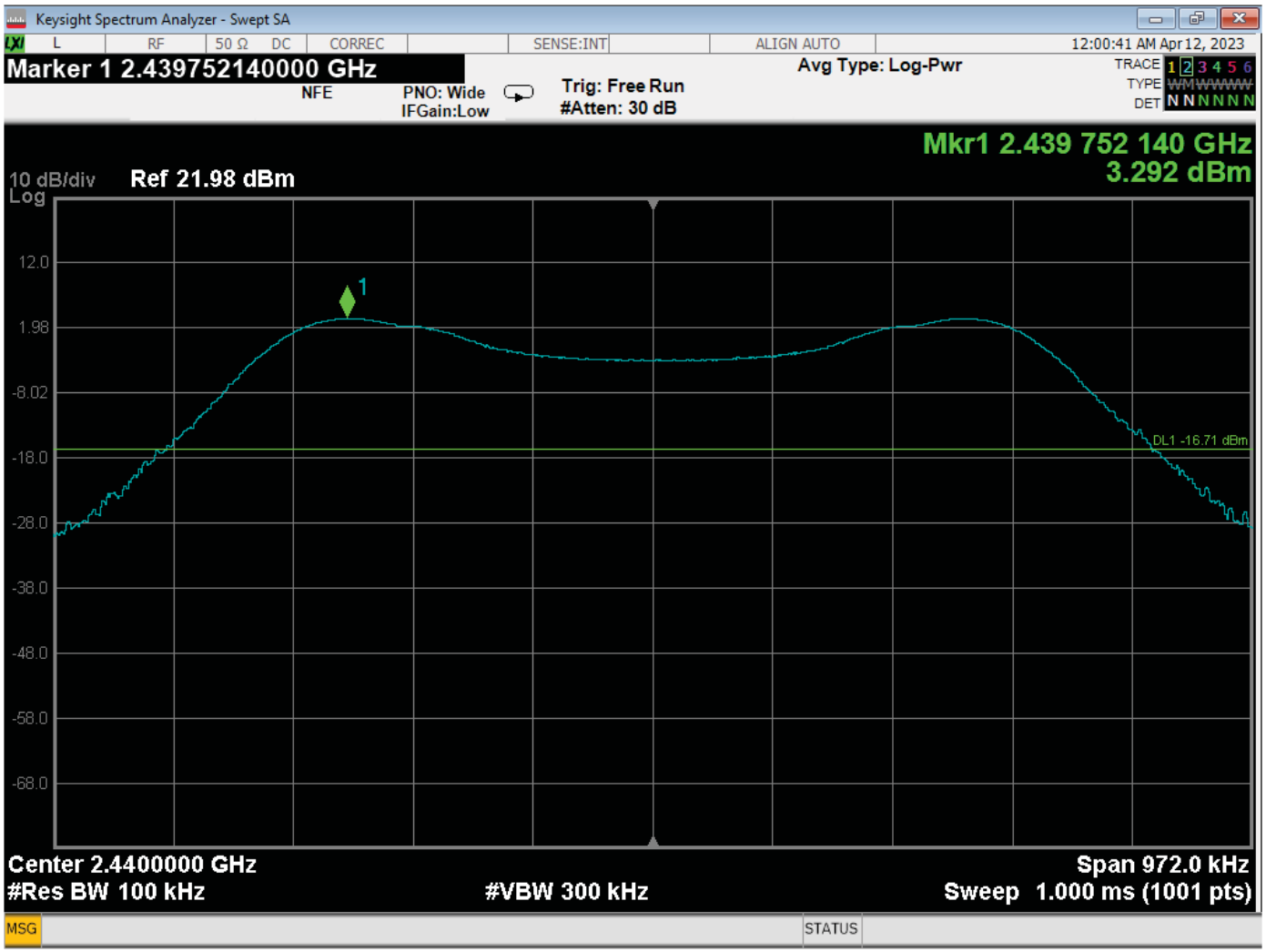
RF Antenna Conducted – Low Channel – 1 GHz to 2.4 GHz



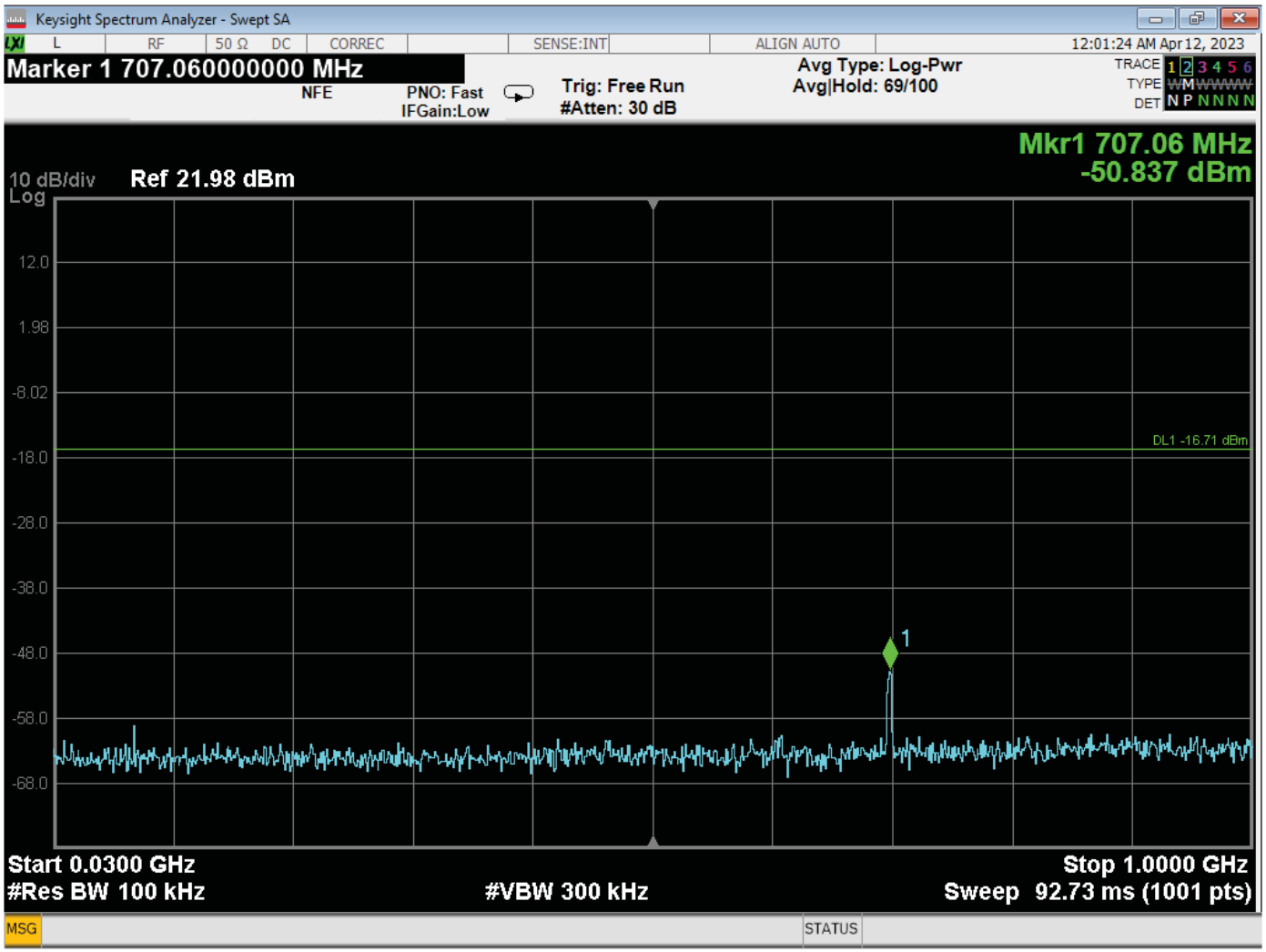
RF Antenna Conducted – Low Channel – 2.4835 MHz to 10 GHz



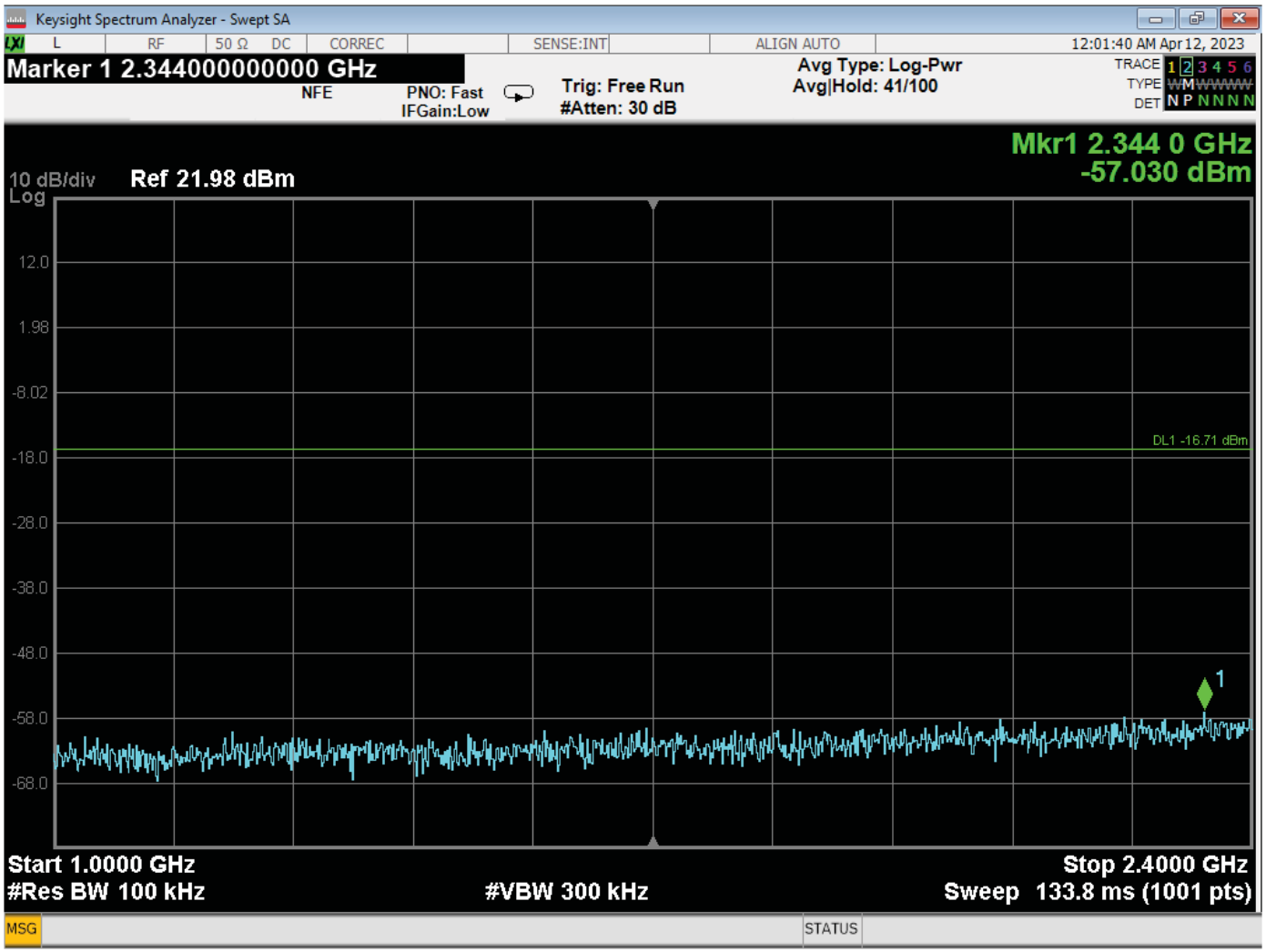
RF Antenna Conducted – Low Channel – 10 GHz to 25 GHz



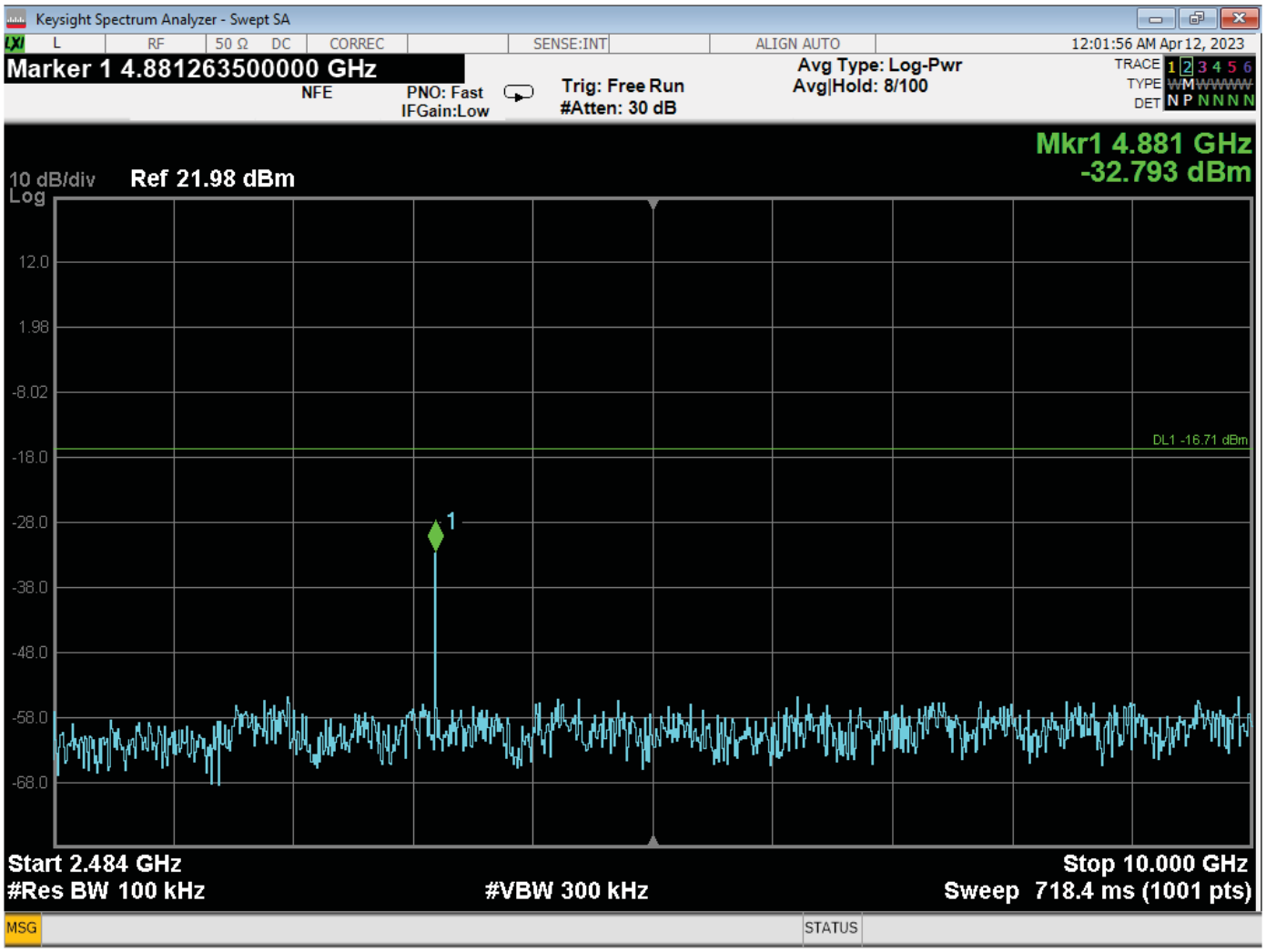
RF Antenna Conducted – Middle Channel – Reference Level



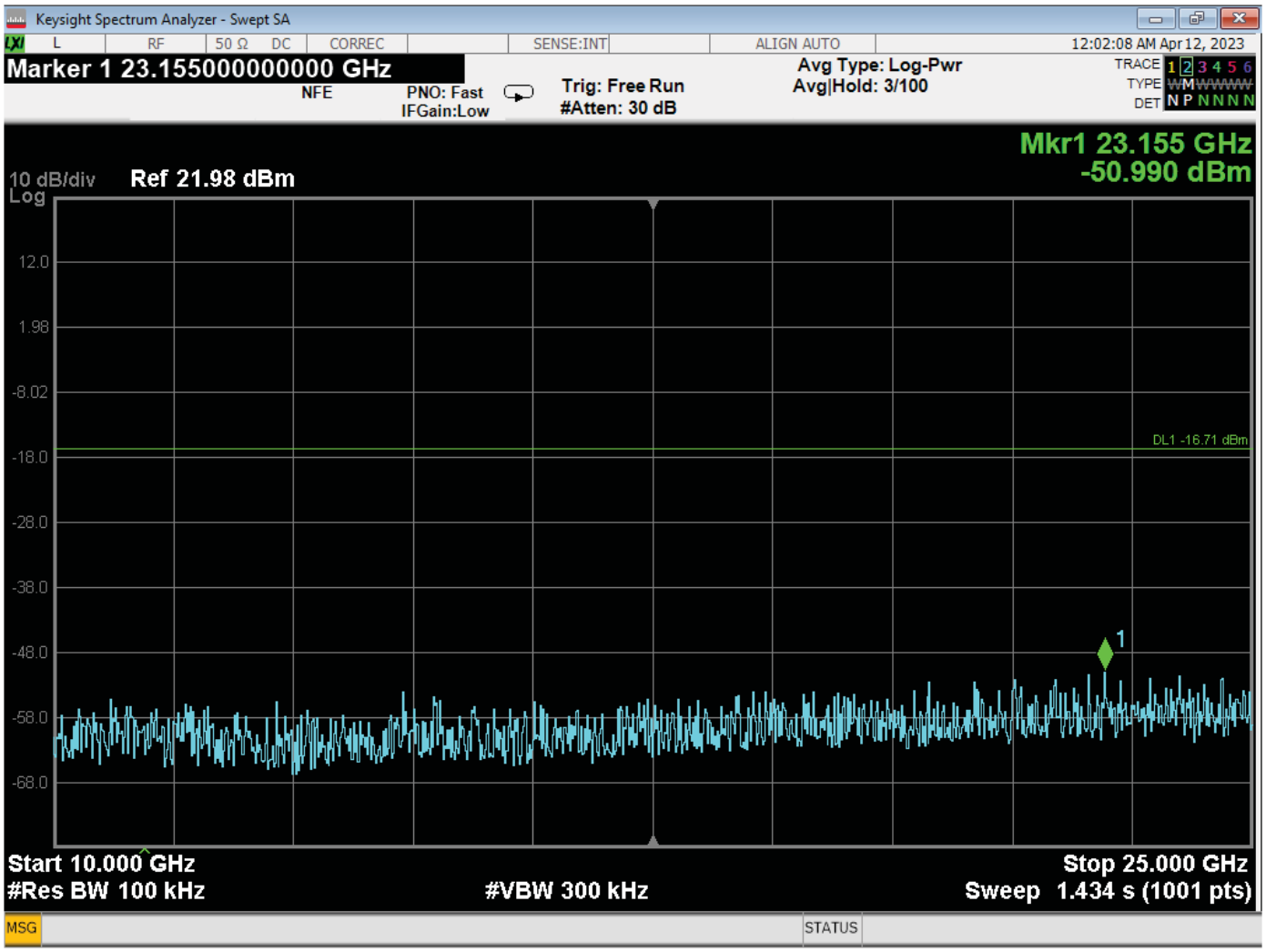
RF Antenna Conducted – Middle Channel – 30 MHz to 1 GHz



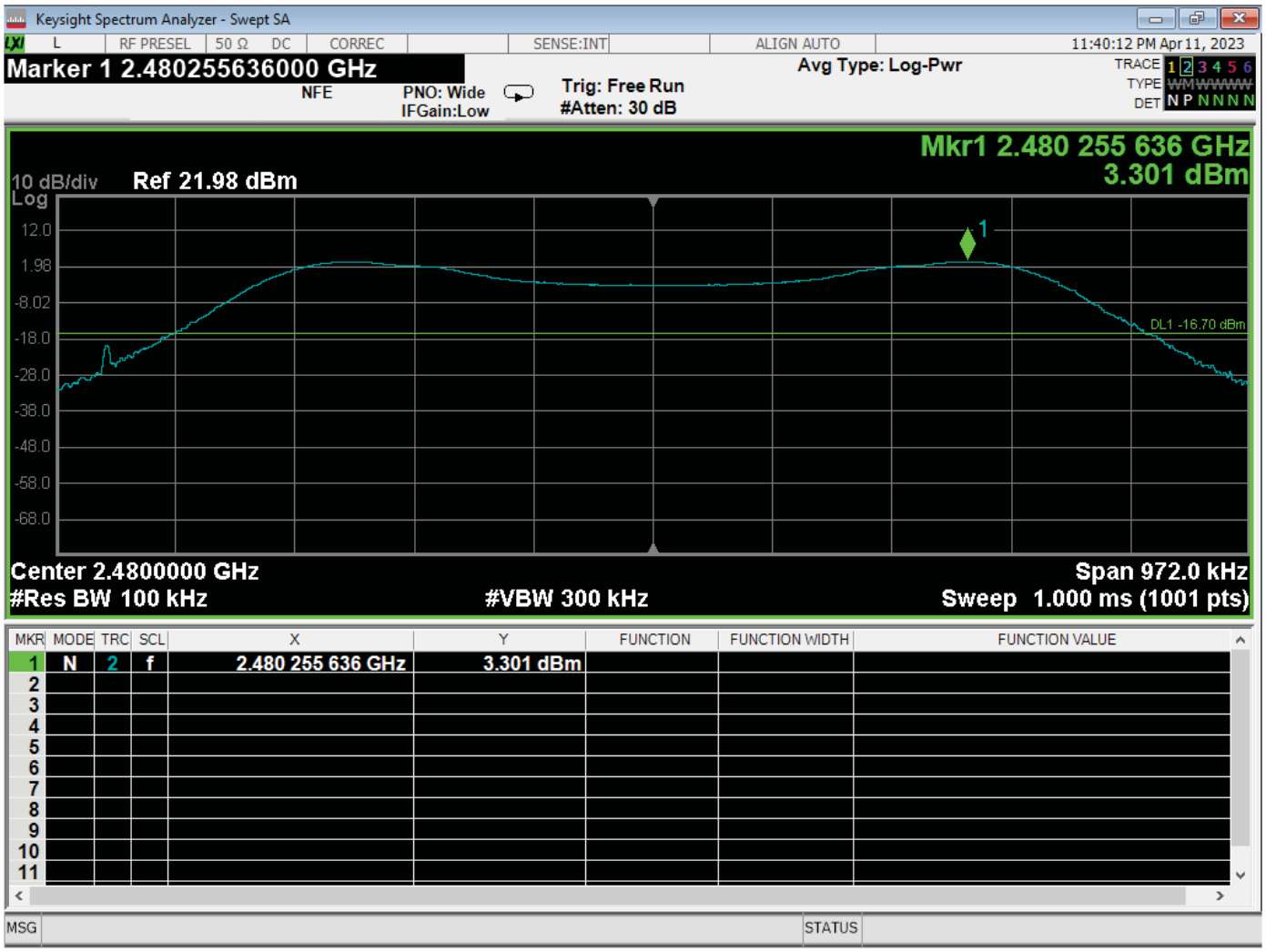
RF Antenna Conducted – Middle Channel – 1 GHz to 2.4 GHz



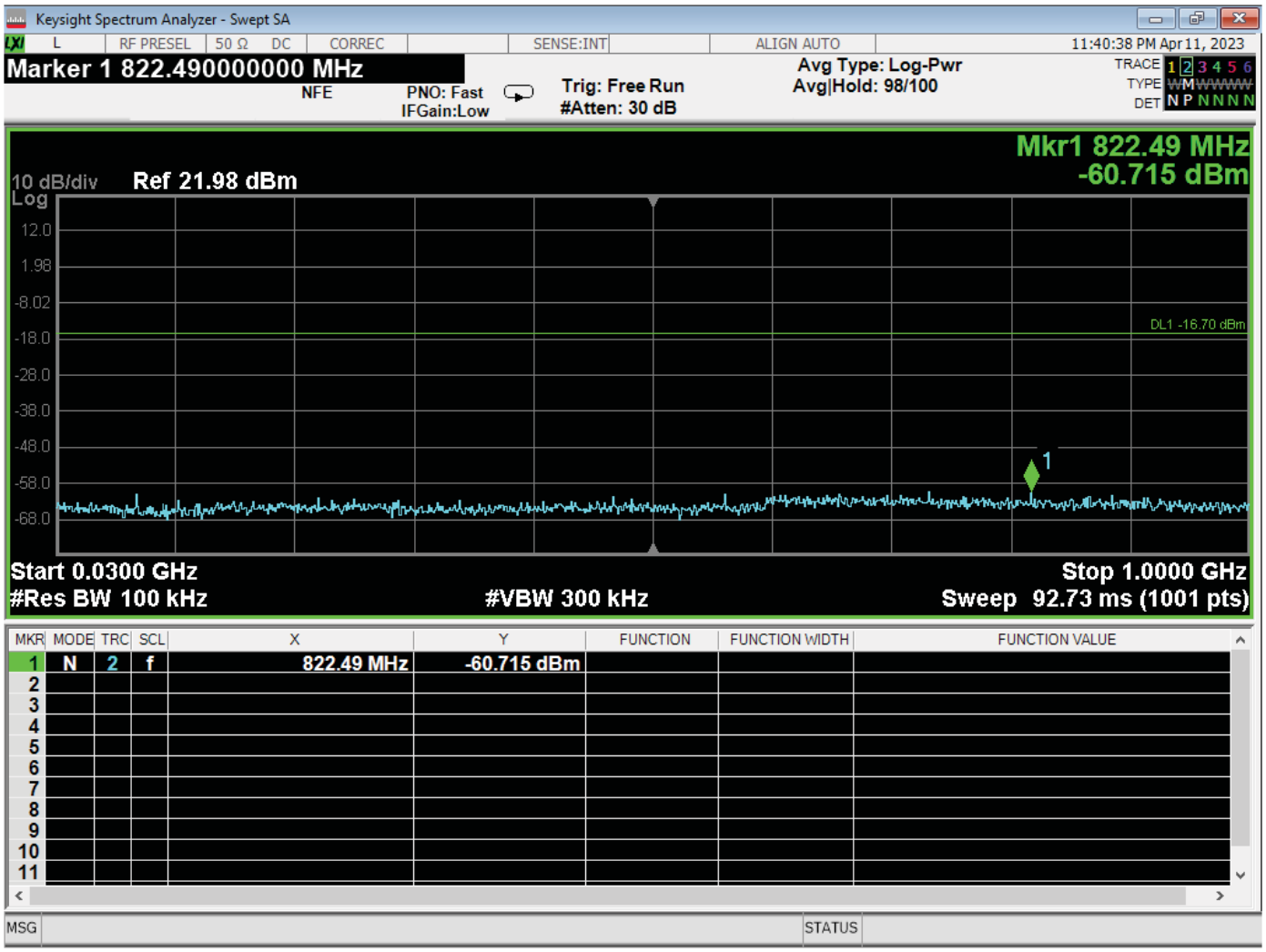
RF Antenna Conducted – Middle Channel – 2.4835 GHz to 10 GHz



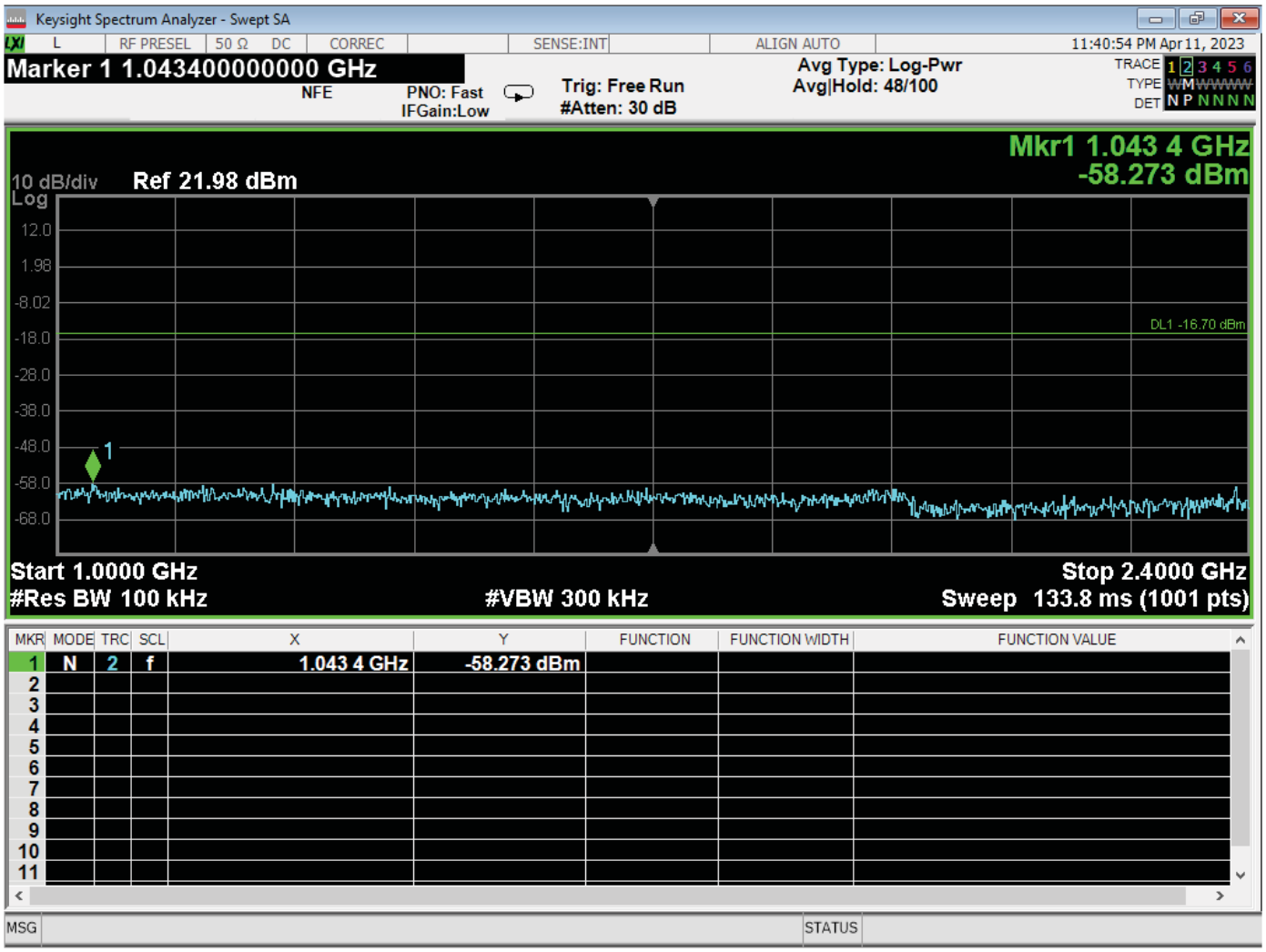
RF Antenna Conducted – Middle Channel – 10 GHz to 25 GHz



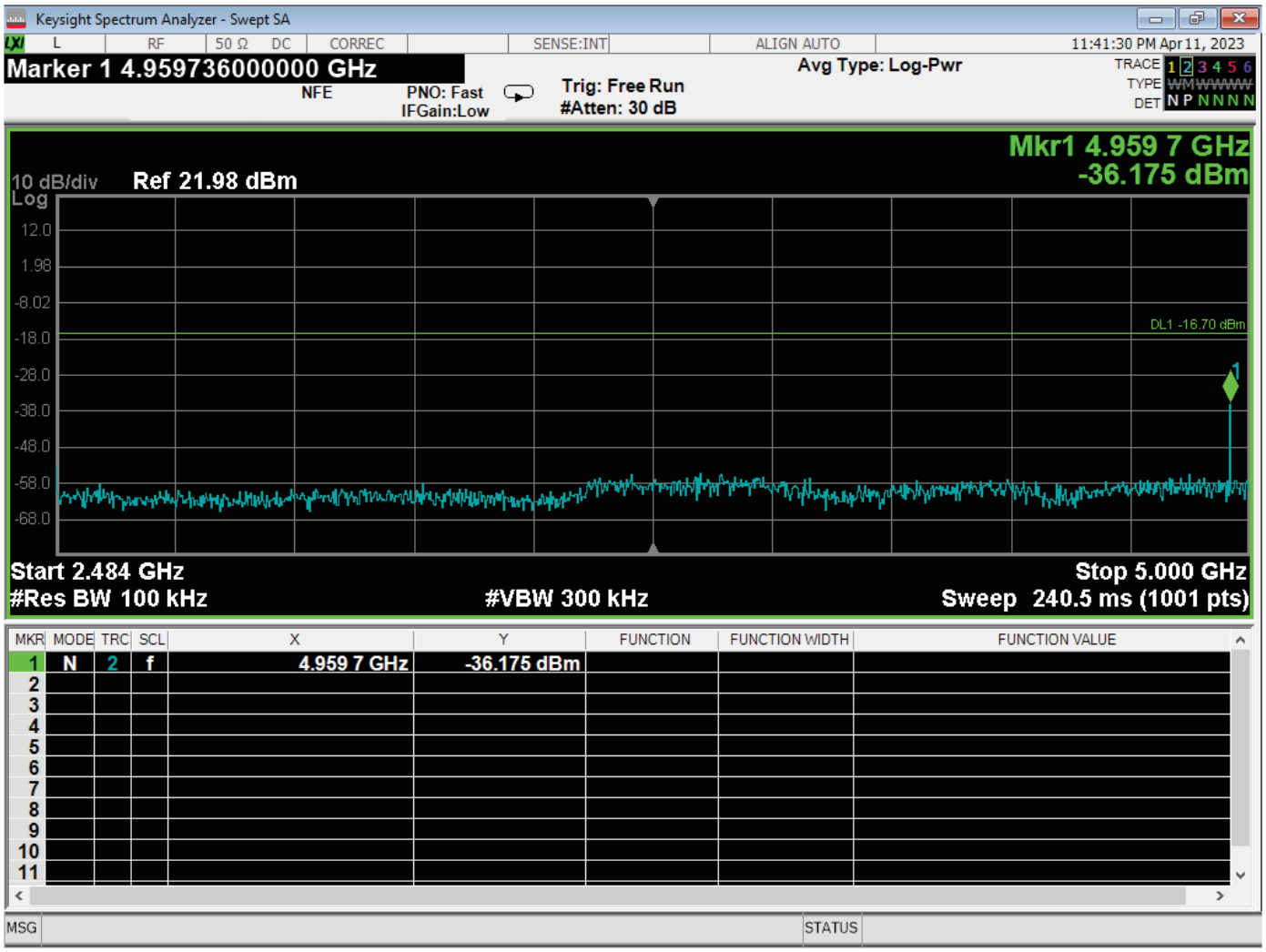
RF Antenna Conducted – High Channel – Reference Level



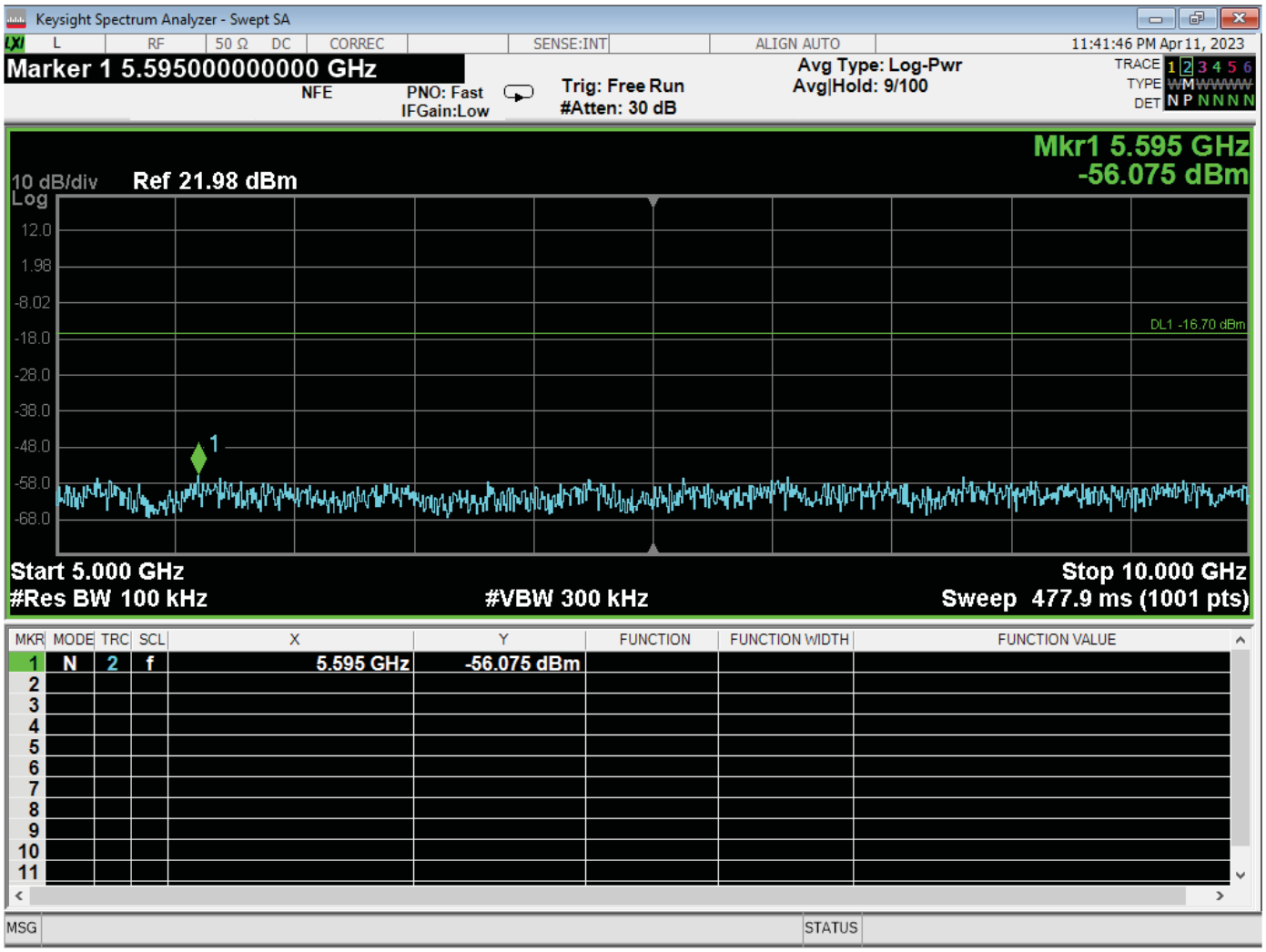
RF Antenna Conducted – High Channel – 30 MHz to 1 GHz



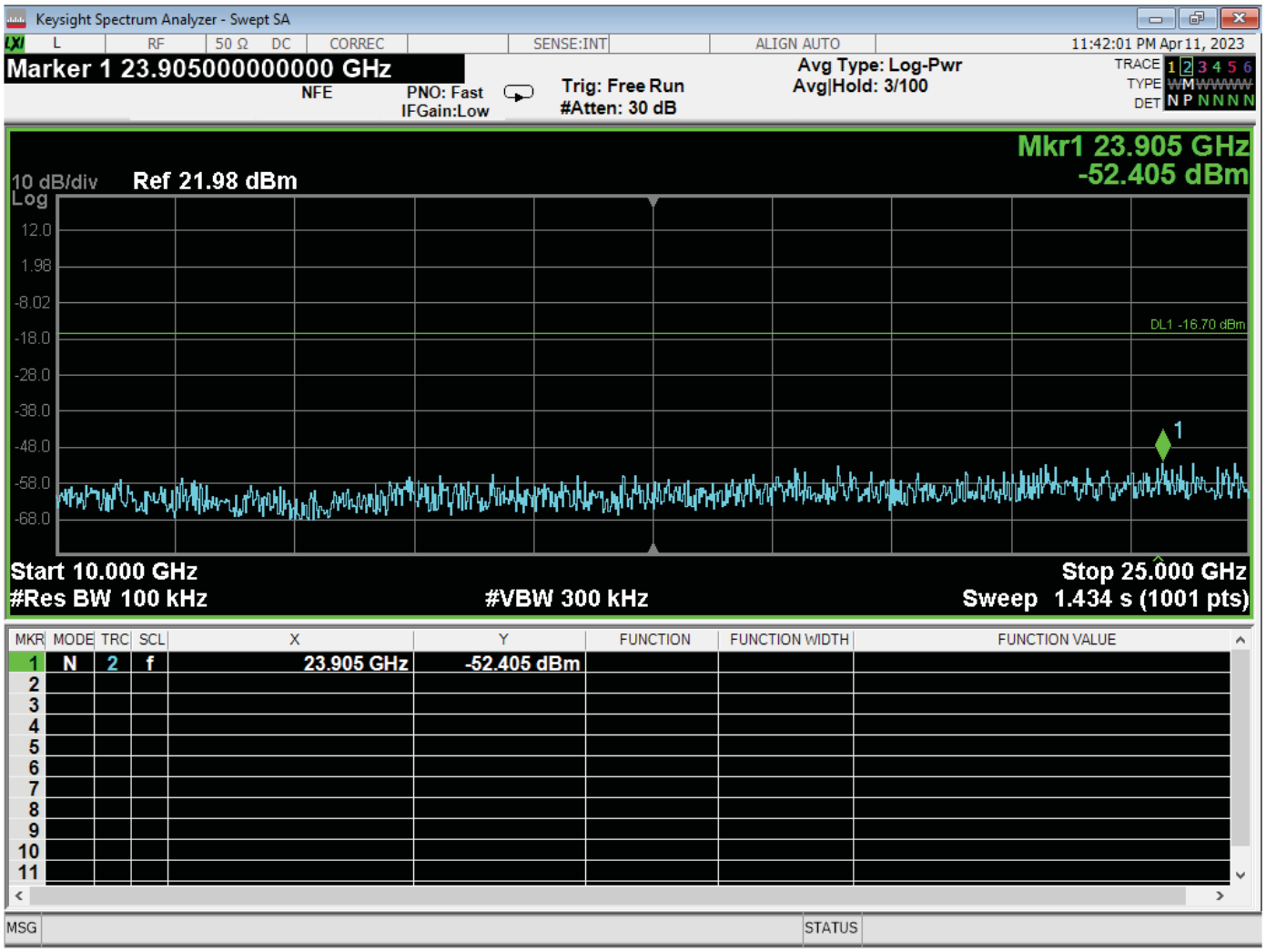
RF Antenna Conducted – High Channel – 1 GHz to 2.4 GHz



RF Antenna Conducted – High Channel – 2.4835 GHz to 5 GHz



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



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

SPECTRUM BRANDS, INC.

MULTIFAMILY

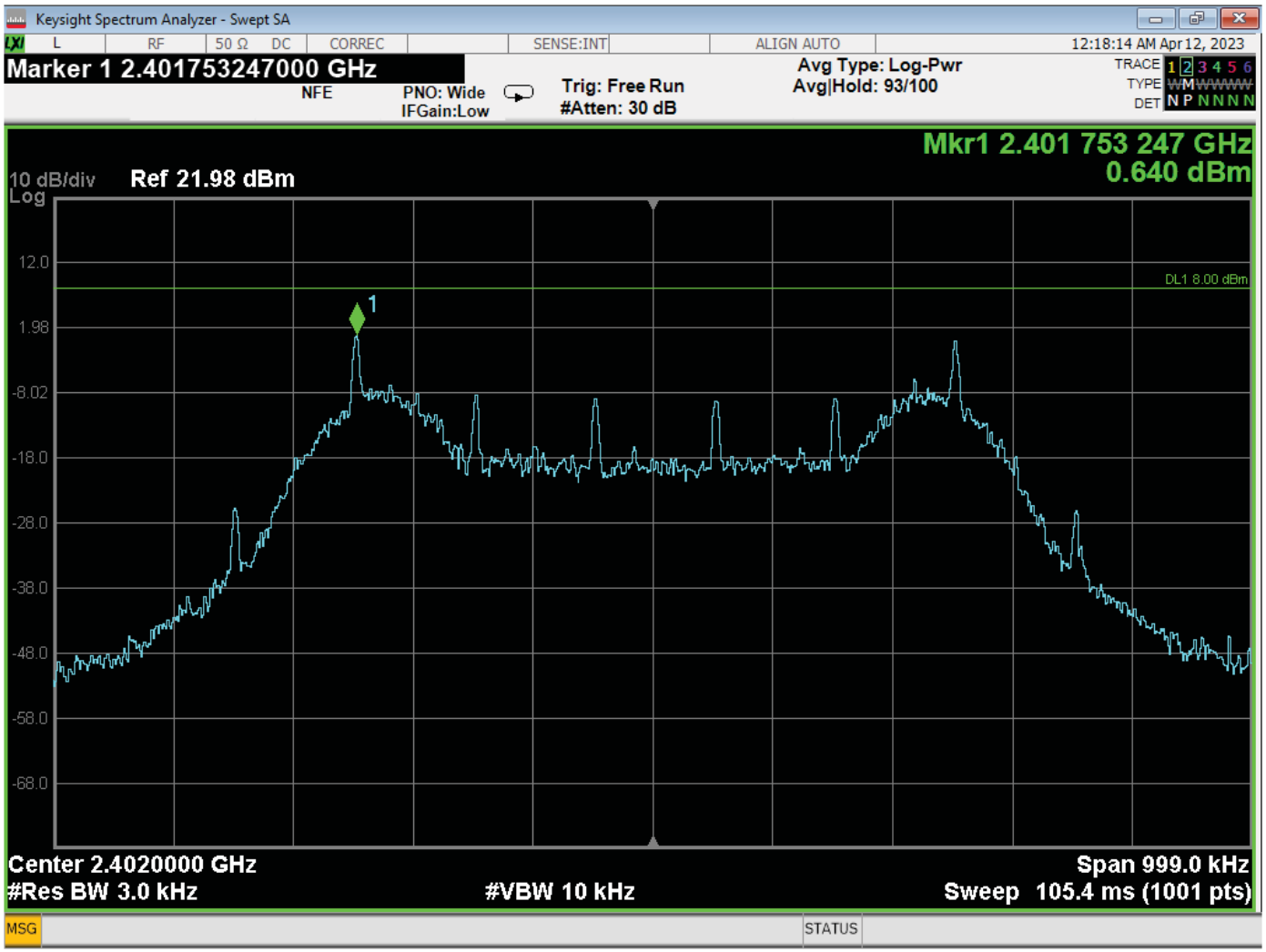
MODEL: UNT1-1000-1100

EMISSIONS IN NON-RESTRICTED BANDS

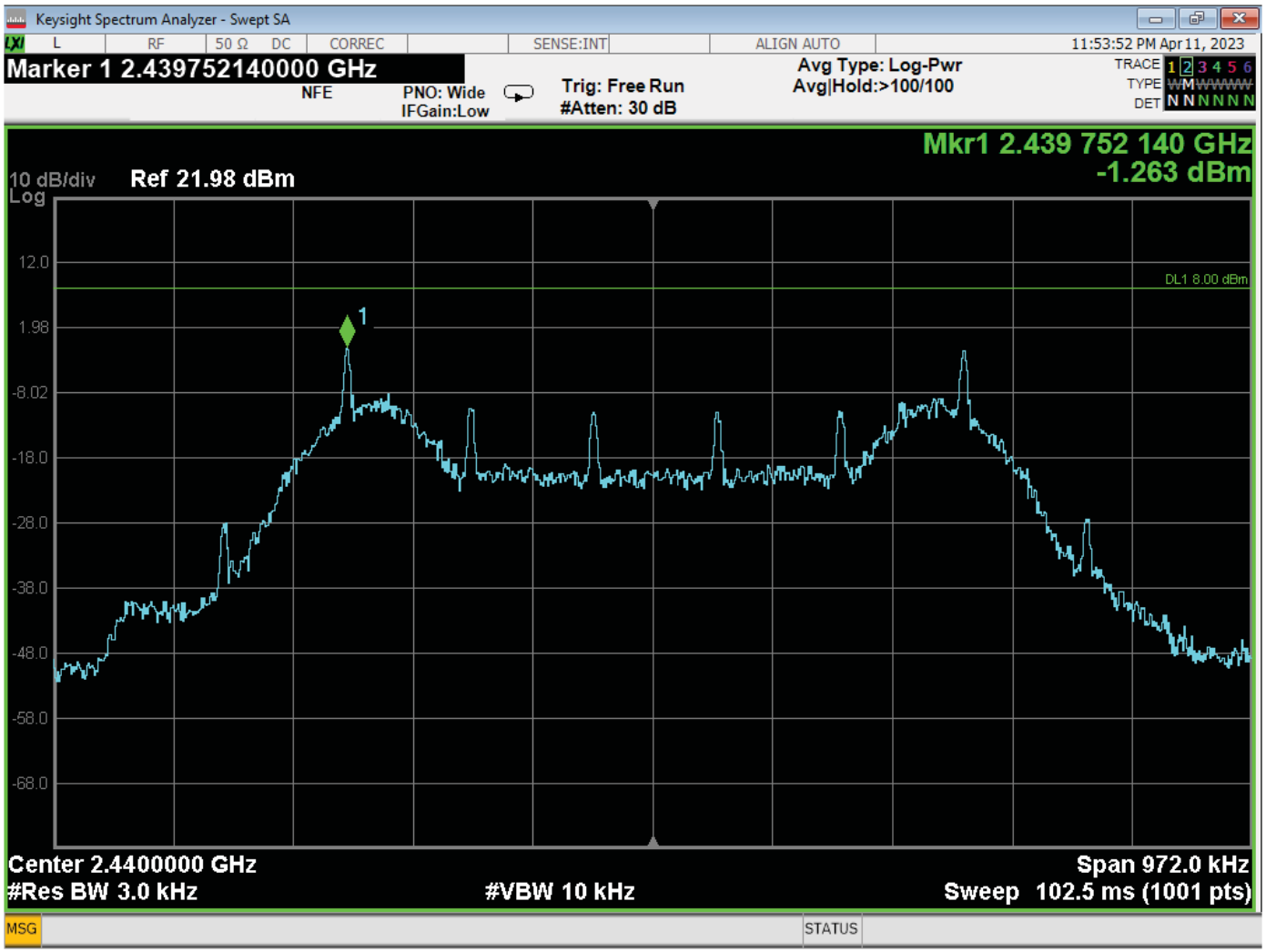
FREQUENCY (MHz)	LEVEL (dBm)	Limit* (dBm)	Margin (dB)
707.06	-50.837	-16.708	-34.129
23155.00	-50.990	-16.708	-34.282
5595.00	-56.075	-16.699	-39.376

PEAK POWER SPECTRAL DENSITY

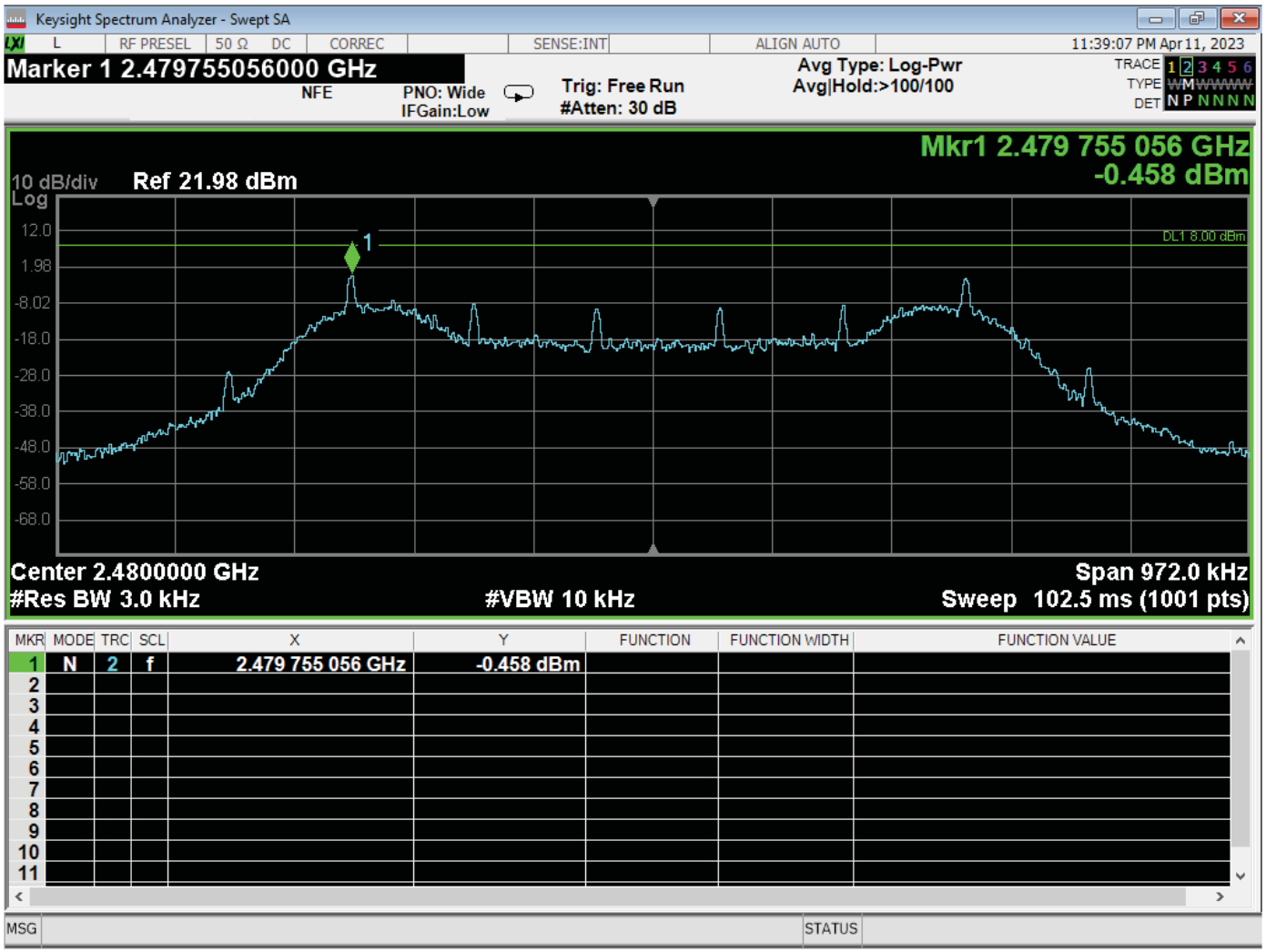
DATA SHEETS



Peak Power Spectral Density – Low Channel



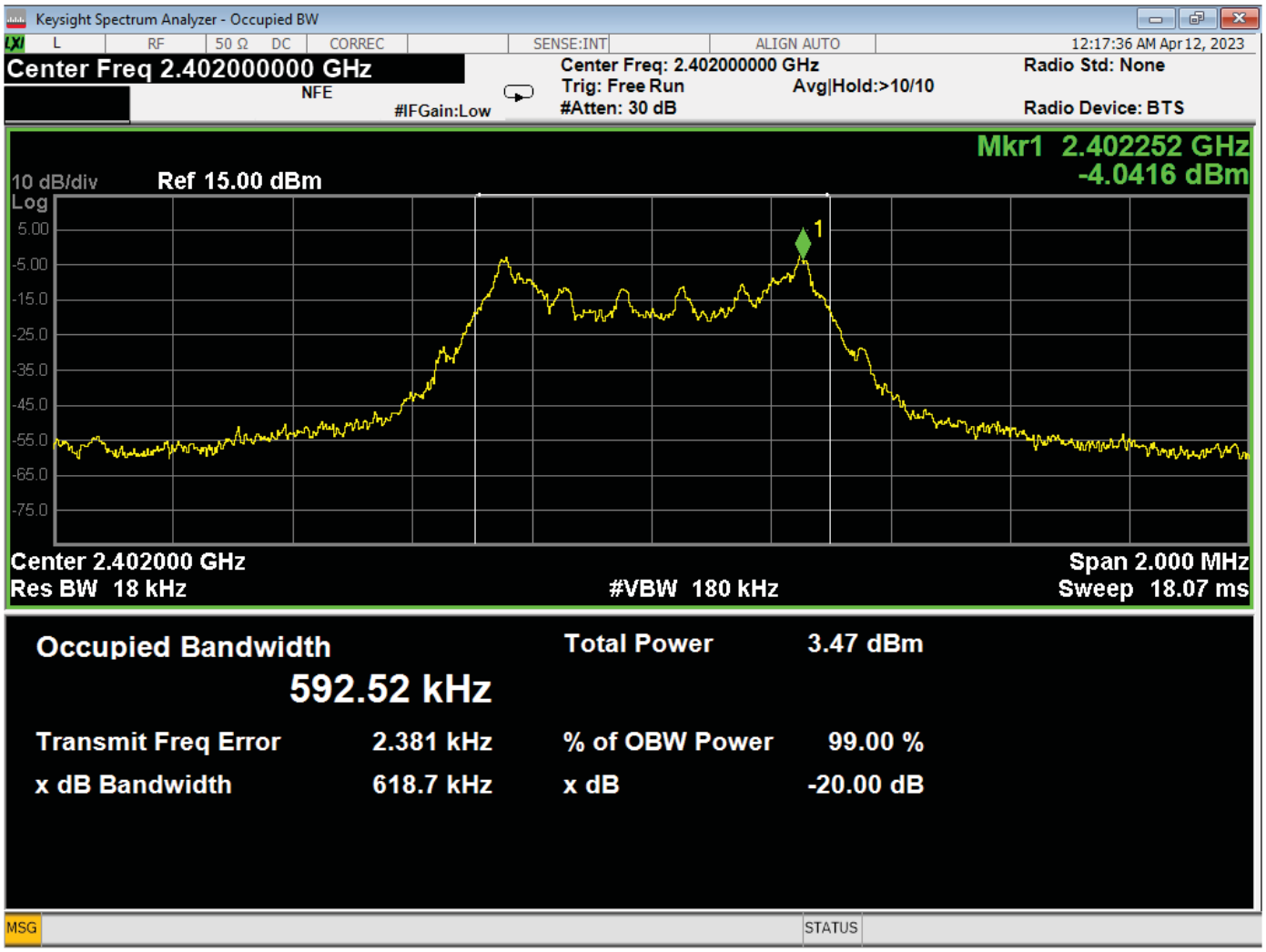
Peak Power Spectral Density – Middle Channel



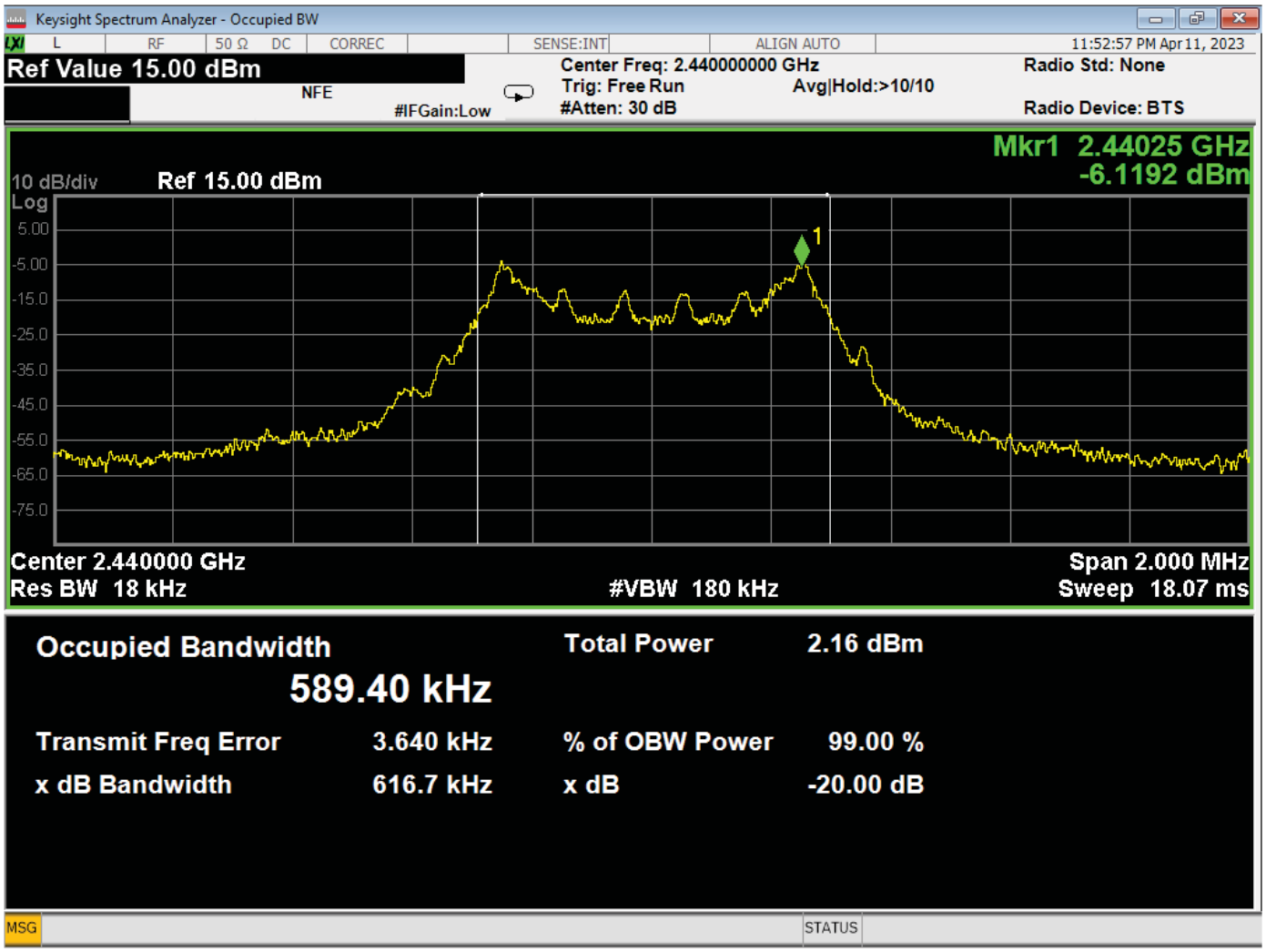
Peak Power Spectral Density – High Channel

99% BANDWIDTH

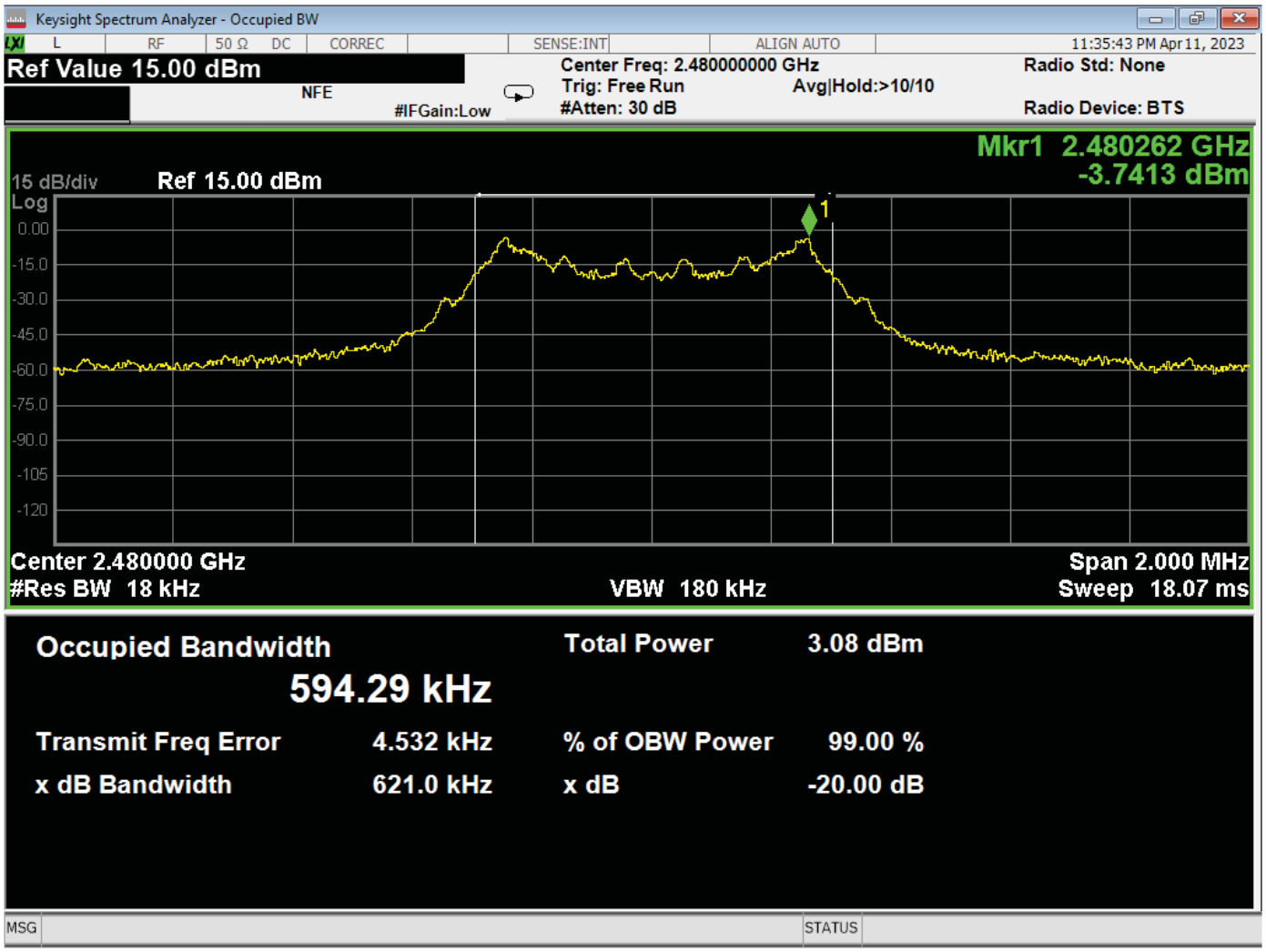
DATA SHEETS



99% Bandwidth Plot – Low Channel



99% Bandwidth Plot – Middle Channel



99% Bandwidth Plot – High Channel