

*FCC PART 15, SUBPART B and C; RSS-210 and RSS-GEN
TEST REPORT*

for

MULTIFAMILY

MODEL: UNT1-1000-1100

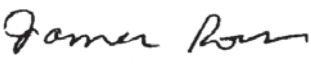
HVIN: UNT1-1000-1100

Prepared for

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DATE: MAY 5, 2023

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
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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: N/A

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 during the testing.

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

Test Dates: April 11, 12, and 13, 2023

Test Specifications covered by accreditation:

Emissions requirements

FCC Standard: CFR Title 47, Part 15, Subpart B and Subpart C

ISED Standard: RSS-210, Issue 10 and RSS-GEN, Issue 5



Test Procedure: ANSI C63.4:2014, ANSI C63.10: 2013

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

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Spurious Radiated RF Emissions, 9 kHz – 25000 MHz (Transmitter and Digital portion)	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 15.205, 15.209 and 15.225; RSS-210 clause B.6 and RSS-GEN
2	Temperature Testing, -20°C - 50°C (AC mode and Battery)	Complies with the limits of FCC 15.225 and RSS-210.
3	Conducted RF Emissions, 150 kHz – 30 MHz	This test was not performed because the EUT operates on battery power only.

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; and Subpart C, sections 15.205, 15.209, and 15.225; RSS-210 and RSS-GEN.

This test report covers the FCC 15.225 portion of the EUT. The FCC 15.247 portion is covered under the Compatible Electronics, Inc. test report **B30428X1**.

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 and 20621 Pascal Way Lake Forest, California 92630.

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 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.

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
BLE	Bluetooth Low Energy
USB	Universal Serial Bus

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
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 of Procedures for Compliance Testing of Unlicensed Wireless Devices
EN 50147-2 1997	Anechoic chambers, Alternative test site suitability with respect to site attenuation
RSS-210 Issue 10: 2017 + Amendment: April 2010	Licence-Exempt Radio Apparatus: Category I Equipment
RSS Gen Issue 5: 2018 + Amendment 1: 2019 + Amendment 2: 2021	General Requirements for Compliance of Radio Apparatus

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration

External Deadbolt Enclosure: The Multifamily, Model: UNT1-1000-1100 (EUT) was mounted in the External Deadbolt Enclosure. The EUT was transmitting 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 transmitting 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 transmitting 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	FCC ID
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_C C2652R7_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

Emissions Test Equipment (continued)

EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. DUE DATE
FREQUENCY TOLERANCE OF CARRIER SIGNAL TEST EQUIPMENT					
Temperature Chamber	Despatch Industries, Inc.	16212A	149857	March 27, 2023	March 27, 2024
Digital Multimeter	Fluke	115	Asset #: 4168	November 21, 2021	November 21, 2023
EMI Receiver, 20 Hz – 26.5 GHz	Keysight Technologies, Inc.	N9038A	MY51210150	September 17, 2021	September 17, 2023

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

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

6.3 Measurement Uncertainty

Compatible Electronics' U_{lab} value is less than U_{cisprr} , 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_{cisprr}	$U_{lab} = 2 u_c(y)$
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 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 a 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 final qualification data is located in Appendix E.

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 (Spurious and Harmonics) Test – Lab A

The EMI Receiver was used as a measuring meter. The measurement meter was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the measurement meter records the highest measured reading over all the sweeps. The following antenna and measurement bandwidths were used as specified in the following table.

The resolution bandwidths and transducers used for this 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

An open field, non-ground plane test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4. Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The portable turntable supporting the EUT is remote controlled using a motor. The portable turntable permits EUT rotation of 360 degrees in order to maximize emissions. Data was collected in the worst case (highest emission) configuration of the EUT. At the transmit frequency band, the antenna height was 1 meter; the EUT was rotated 360 degrees; and the antenna was positioned in three orthogonal positions and the position with the highest emission level was recorded (for H field radiated field strength).

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. The EUT was tested at a 10-meter test distance to obtain final test data. The final qualification data is located in Appendix E.

The corrected spec limit at 10 meters is based on the following formula: $[(40) \text{ Log (spec test distance / actual test distance)}] + \text{spec limit}$. This is based on by using the square of an inverse linear distance extrapolation factor of 40 dB/decade per FCC 15.31 (f)(2).

The final qualification data sheets are located in Appendix E.

The e-field factor is derived from the magnetic field factor plus 51.5, which is the characteristic impedance of the medium. Please see Appendix D for a table of magnetic and electric field factors.

Test Results:

The EUT complies with the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.225; the limits of RSS-210 clause B.6; and RSS-GEN for radiated emissions. Please see Appendix E for the data sheets.

7.1.3 Radiated Emissions (Spurious and Harmonics) Test – Lab D

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. 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 effective measurement bandwidth used for the radiated emissions test was according to the frequency measured (200 Hz for 9 kHz to 150 kHz, 9 kHz for 150 kHz to 30 MHz, 120 kHz for 30 MHz to 1 GHz and 1 MHz for 1 GHz to 25 GHz).

The frequencies above 1 GHz were averaged using the RMS detector function on 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 in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

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

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; Subpart C sections 15.205, 15.209 and 15.225; and the limits of RSS-GEN and RSS-210 clause B.6 for radiated emissions.

7.1.4 RF Emissions Test ResultsTable 1.0 RADIATED EMISSION RESULTS
Multifamily, Model: UNT1-1000-1100

Frequency MHz	Corrected Reading* dBuV/m	Specification Limit dBuV/m	Delta (Cor. Reading – Spec. Limit) dB
27.12 (Antenna X) (5.5 Inch Interconnect)	24.24	29.54	-5.30
27.12 (Antenna X) (4.5 Inch Interconnect)	19.73	29.54	-9.81
27.12 (Antenna Y) (4.5 Inch Interconnect)	19.45	29.54	-10.09
27.12 (Antenna Z) (External Deadbolt)	18.62	29.54	-10.92
27.12 (Antenna Y) (5.5 Inch Interconnect)	18.18	29.54	-11.36
27.12 (Antenna X) (External Deadbolt)	17.58	29.54	-11.96

7.1.5 Sample Calculations

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

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

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

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

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

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

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:

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

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:

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

or, if the magnetic antenna factor is used:

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

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

7.1.6 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:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart A section 15.31 (e). The variation of the input voltage was varied from 85% to 115% on the laptop providing the power to the EUT in USB mode. It was determined that this did not change the amplitude nor the frequency of the fundamental emissions.

This test was not performed when the EUT was in battery mode.

7.2 Frequency Tolerance of Carrier Signal

The EUT was placed in a temperature chamber and set to +50 degrees Celsius. The EUT was exposed to this temperature for a period of 10 minutes. The temperature was subsequently decreased at 10 degree increments down to -20 degrees Celsius with a 30 minute acclimation period between each temperature. At each temperature, the EUT's fundamental emission was measured with an EMI Receiver to determine whether the carrier signal was within 0.01% of the fundamental frequency at startup, 2 minutes, 5 minutes, and 10 minutes after removal from the temperature chamber.

Also, at +20 degrees Celsius, the EUT's input voltage was varied between 85% and 115% using a variable auto transformer and the fundamental of the EUT was measured with an EMI Receiver to determine whether the carrier signal was within 0.01% of the fundamental frequency.

A data sheet of the Frequency Tolerance testing is located in Appendix E.

Test Results:

The EUT complies with the requirements of FCC Title 47, Part 15, Subpart, C, section 15.225 [e]; RSS-GEN and RSS-210 Clause B.6. Please see Appendix E for the data sheets.

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, 15.209, and 15.225; RSS-GEN and RSS-210.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS



NVLAP LAB CODE 200528-0



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."



APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B, FCC 15.225, RSS-GEN, and RSS-210 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

ADDITIONAL MODELS

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

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

ADDITIONAL MODELS COVERED UNDER THIS REPORT:

There were no additional models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE
LAB A

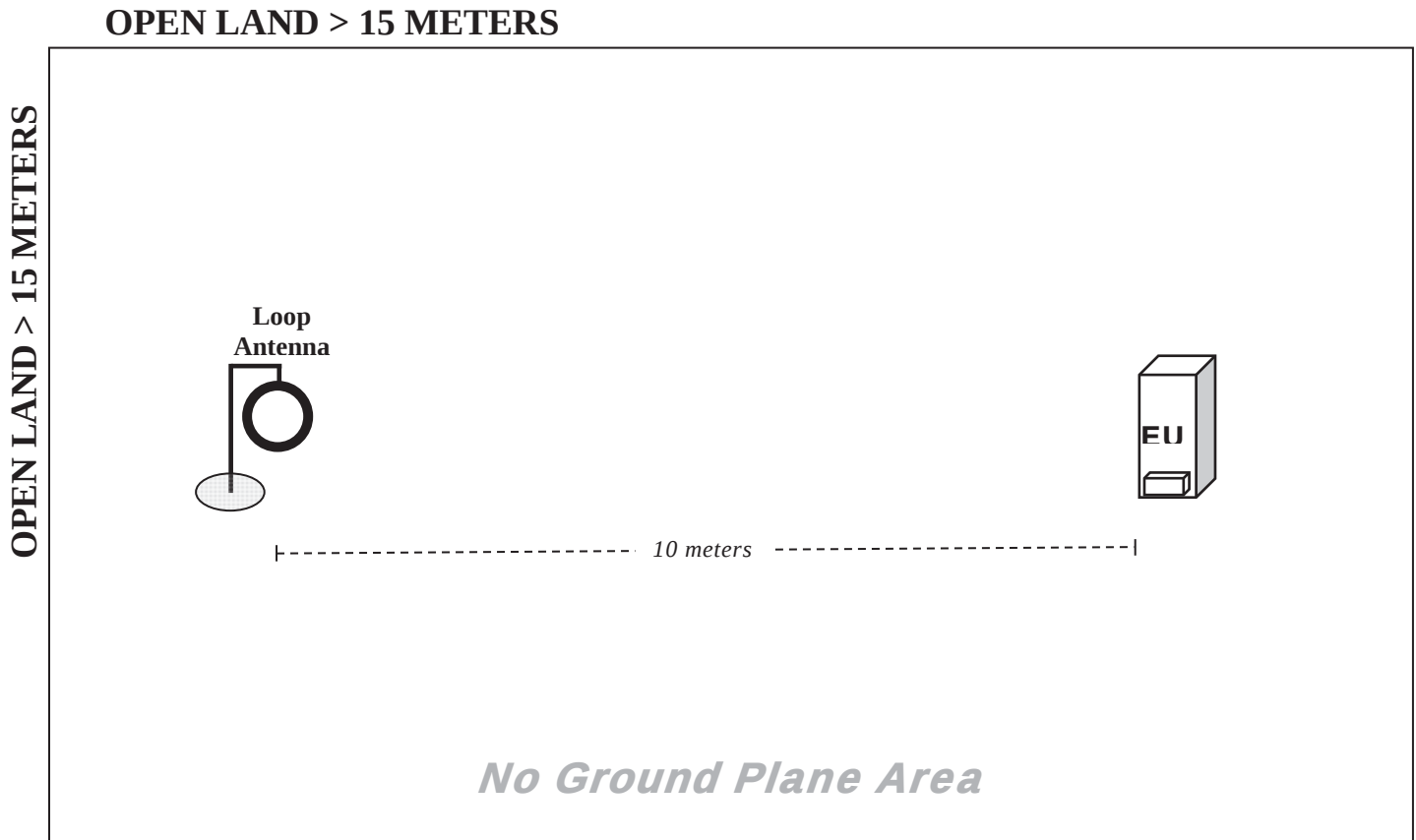


FIGURE 2: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER

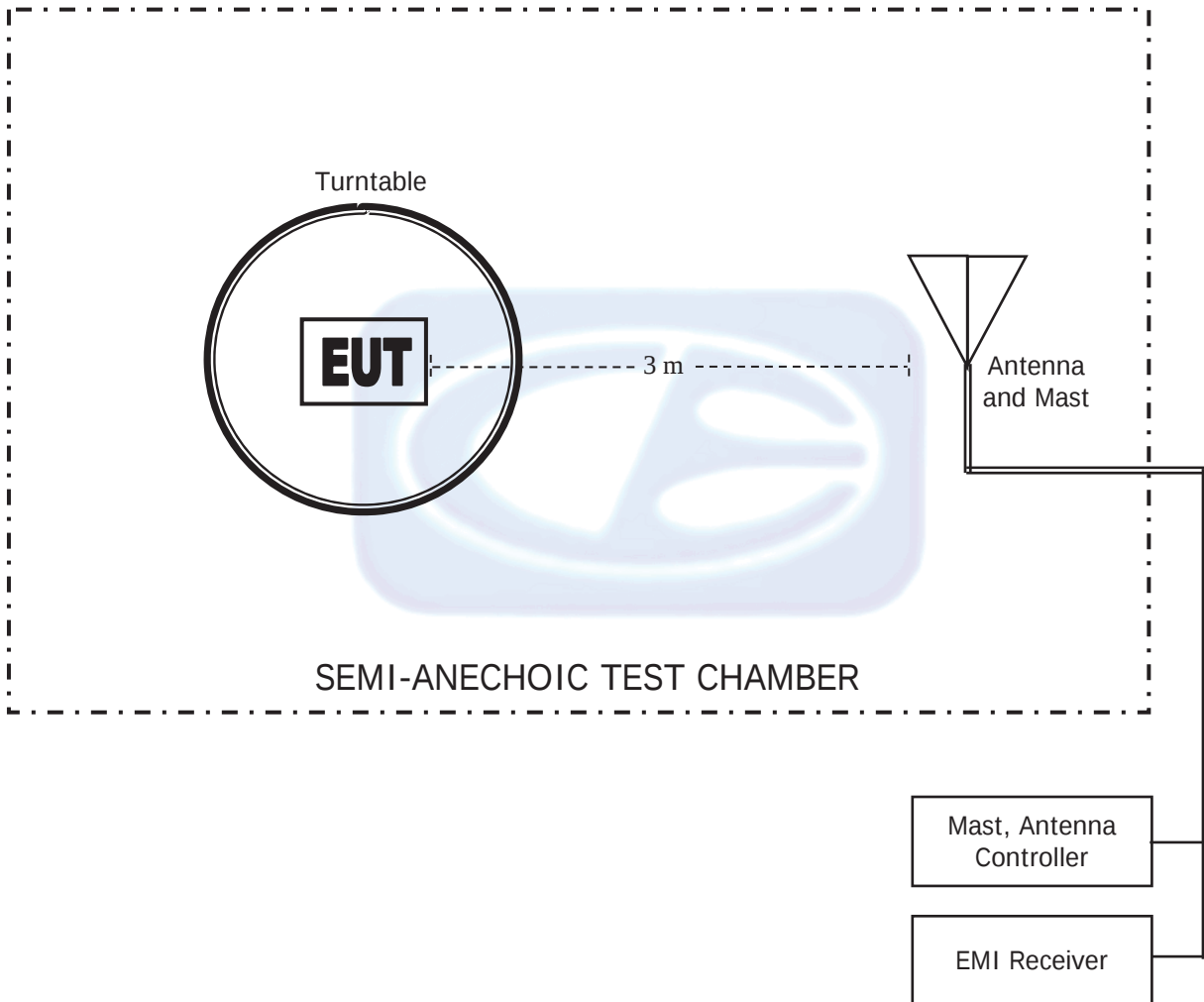
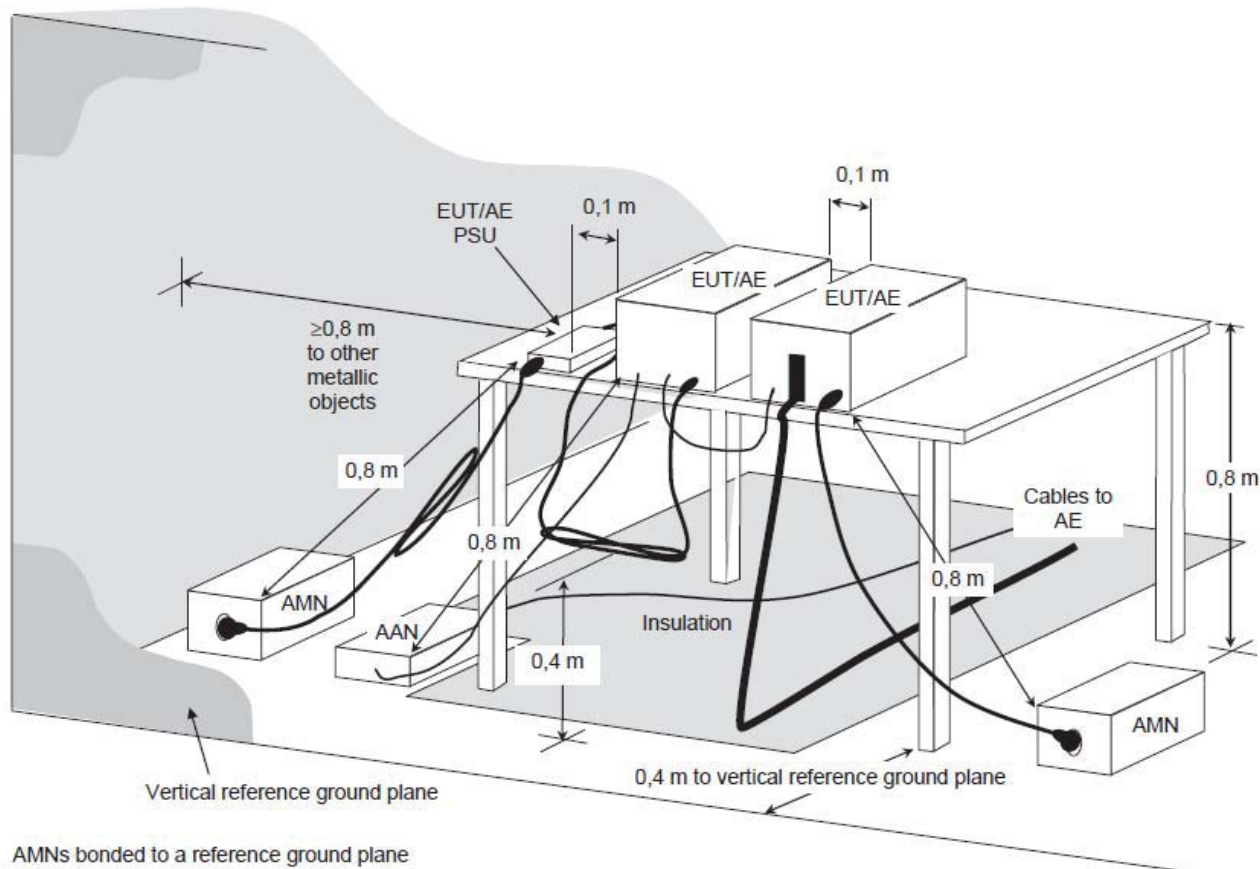


FIGURE 3: CONDUCTED EMISSIONS TEST SETUP



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-GEN; and RSS-210 – RADIATED EMISSIONS – BELOW 30 MHz

**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-GEN; and RSS-210 – RADIATED EMISSIONS – BELOW 30 MHz

**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-GEN; and RSS-210 – RADIATED EMISSIONS – BELOW 30 MHz

**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-GEN; and RSS-210 – RADIATED EMISSIONS – BELOW 30 MHz

**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-GEN; and RSS-210 – RADIATED EMISSIONS – BELOW 30 MHz

**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-GEN; and RSS-210 – RADIATED EMISSIONS – BELOW 30 MHz

**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-210 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-210 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-210 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-210 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-210 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-210 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-210 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-210 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-210 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-210 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-210 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-210 AND RSS-GEN – RADIATED EMISSIONS – ABOVE 1 GHz

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

APPENDIX E
DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**External Deadbolt Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	47.67	38.13	X	83.99	-45.86	Peak	1.00	180.00	
27.12	27.12	17.58	X	29.54	-11.96	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 – 13.553 MHz and 13.567 – 13.710 MHz

13.110 – 13.410 MHz and 13.710 – 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**External Deadbolt Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	53.20	43.66	Y	83.99	-40.33	Peak	1.00	180.00	
27.12	26.89	17.35	Y	29.54	-12.19	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 – 13.553 MHz and 13.567 – 13.710 MHz

13.110 – 13.410 MHz and 13.710 – 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**External Deadbolt Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	40.80	31.26	Z	83.99	-52.73	Peak	1.00	180.00	
27.12	28.16	18.62	Z	29.54	-10.92	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**4.5 Inch Interconnect Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	32.25	22.70	X	83.99	-61.29	Peak	1.00	180.00	
27.12	29.27	19.73	X	29.54	-9.81	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**4.5 Inch Interconnect Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	54.17	44.63	Y	83.99	-39.36	Peak	1.00	180.00	
27.12	28.99	19.45	Y	29.54	-10.09	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**4.5 Inch Interconnect Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	33.74	24.19	Z	83.99	-59.80	Peak	1.00	180.00	
27.12	26.27	16.73	Z	29.54	-12.81	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

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

Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto

5.5 Inch Interconnect Enclosure

Transmit Mode

Test Distance: 10 Meters

Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	36.34	26.80	X	83.99	-57.19	Peak	1.00	180.00	
27.12	33.78	24.24	X	29.54	-5.30	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**5.5 Inch Interconnect Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Ant. Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	53.52	43.98	Y	83.99	-40.01	Peak	1.00	180.00	
27.12	27.72	18.18	Y	29.54	-11.36	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

FCC 15.225Spectrum Brands, Inc.
Multifamily
Model: UNT1-1000-1100Date: 04/24/2023
Lab: D
Tested By: Kyle Fujimoto**5.5 Inch Interconnect Enclosure****Transmit Mode****Test Distance: 10 Meters****Corrected Level at 30 Meters = (Level at 10 Meters) - [20 Log (spec test dist./actual test dist.)]**

Freq. (MHz)	Level at 10 Meters (dBuV/m)	Level at 30 Meters (dBuV/m)	Axis (x/y/z)	Spec Limit (at 30 Meters)	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
13.56	42.05	32.51	Z	83.99	-51.48	Peak	1.00	180.00	
27.12	26.98	17.44	Z	29.54	-12.10	Peak	1.00	180.00	

Limit in uV/m = 15848 at 30 Meters per FCC 15.225 (a)

Limit in uV/m = 30 at 30 Meters from 1705 kHz to 30 MHz for Harmonics

dBuV/m = 20 Log (uV/m)

Note #1: Corrected Level at 30 Meters is based on equation (3) of ANSI C63.10: 2013 section 6.4.4.2

Note #2: No Emissions detected in the following bands below

13.410 - 13.553 MHz and 13.567 - 13.710 MHz

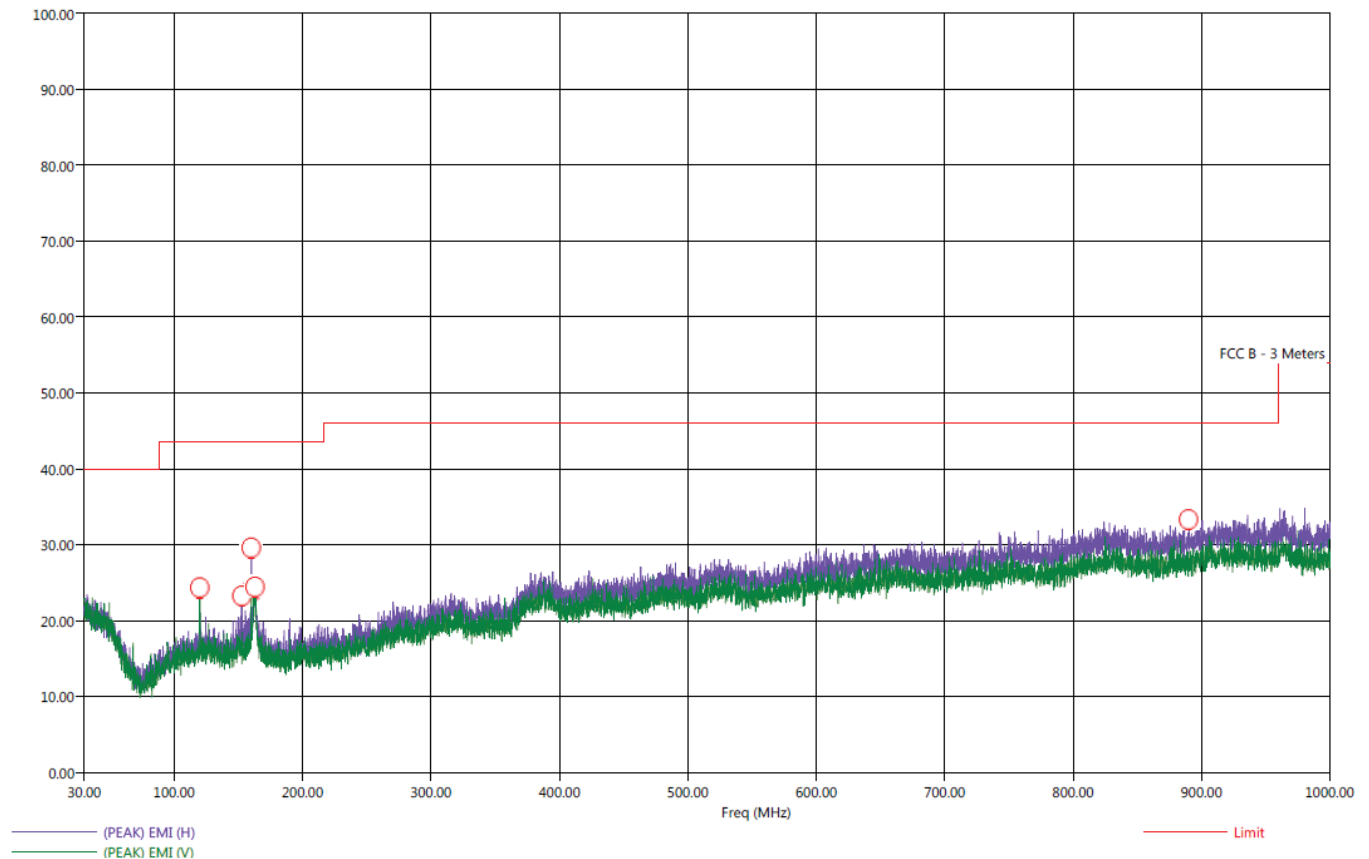
13.110 - 13.410 MHz and 13.710 - 14.010 MHz

9 kHz – 13.110 MHz and 14.010 – 30 MHz

Title: Pre-Scan - FCC Class B
File: 10 - Keysight - Pre-Scan - Exterior Deadbolt - RFID - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting at 13.56 MHz - External Deadbolt Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200
Note: No Emissions found above 1 GHz that are related to the 13.56 MHz Transmitter

4/13/2023 3:21:51 PM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dB μ V/m)

Title: Radiated Final - FCC Class B

File: 10 - Keysight - Final Scan - Exterior Deadbolt - RFID - 30 MHz to 1000 MHz.set

Operator: Kyle Fujimoto

EUT Type: Multifamily

EUT Condition: The EUT is continuously transmitting at 13.56 MHz - Exterior Deadbolt Enclosure

Company: Spectrum Brands, Inc.

Model: UNT1-1000-1100

S/N: D39D7129004B1200

4/13/2023 3:33:49 PM
Sequence: Final Measurements

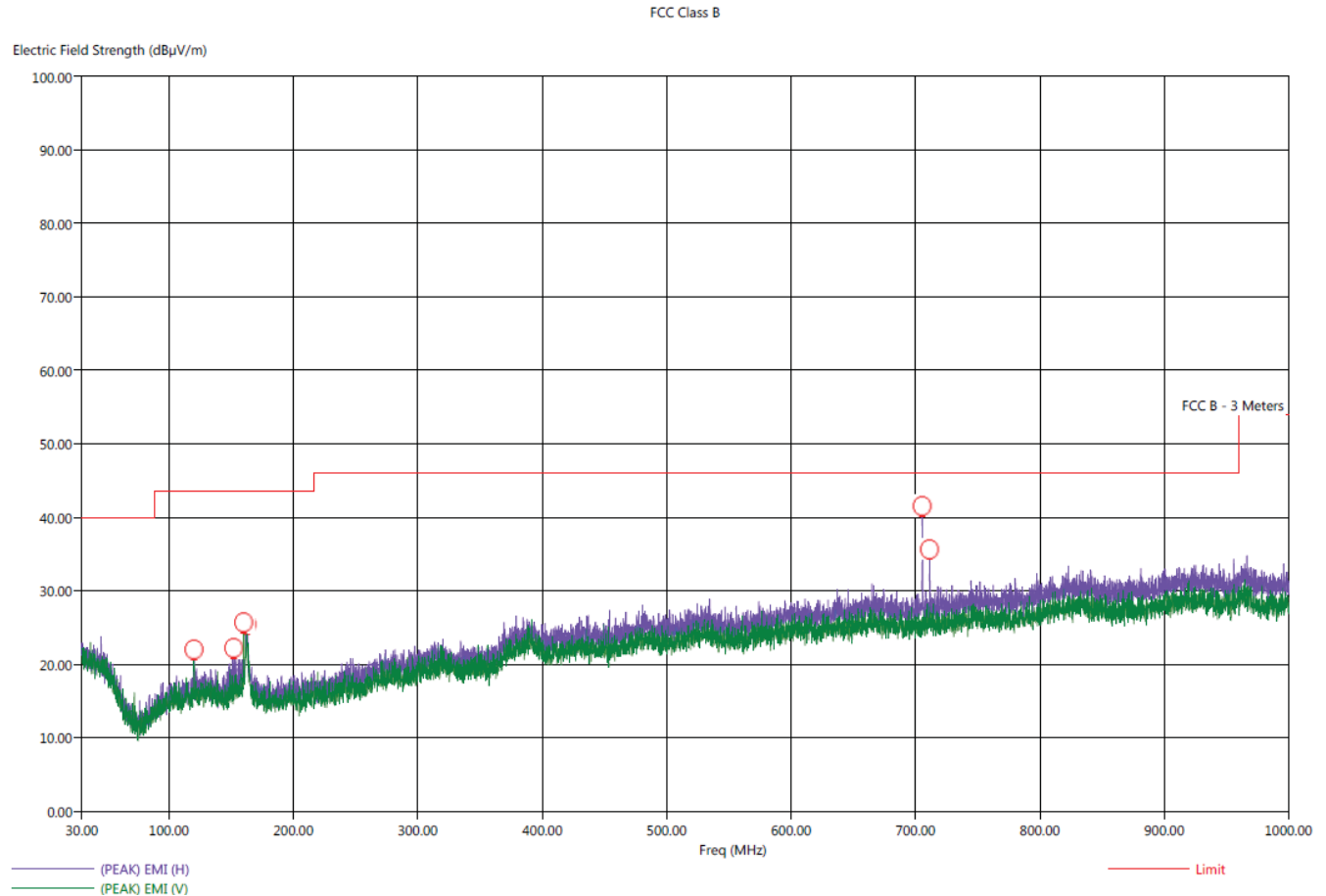
FCC Class B

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 (deq)	Twr Ht (cm)
152.40	H	22.30	17.64	-21.20	-25.86	43.50	16.73	0.90	166.50	381.95
156.10	H	23.48	18.81	-20.02	-24.69	43.50	16.90	0.91	35.75	143.08
160.10	H	34.68	29.42	-8.82	-14.08	43.50	18.50	0.93	285.00	111.32
162.60	H	31.36	26.97	-12.14	-16.53	43.50	22.56	0.94	119.75	175.20
163.20	H	29.36	24.59	-14.14	-18.91	43.50	21.60	0.94	170.50	365.89
163.60	H	29.54	24.33	-13.96	-19.17	43.50	21.34	0.94	71.75	286.73



Title: Pre-Scan - FCC Class B
File: 11 - Keysight - Pre-Scan - 4.5 Inch Interconnect - RFID - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting at 13.56 MHz - 4.5 Inch Interconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200
Note: No Emissions found above 1 GHz that are related to the 13.56 MHz Transmitter

4/13/2023 4:02:29 PM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 11 - Keysight - Final Scan - 4.5 Inch Interconnect - RFID - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting at 13.56 MHz - 4.5 Inch Interconnect
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

4/13/2023 4:13:48 PM
Sequence: Final Measurements

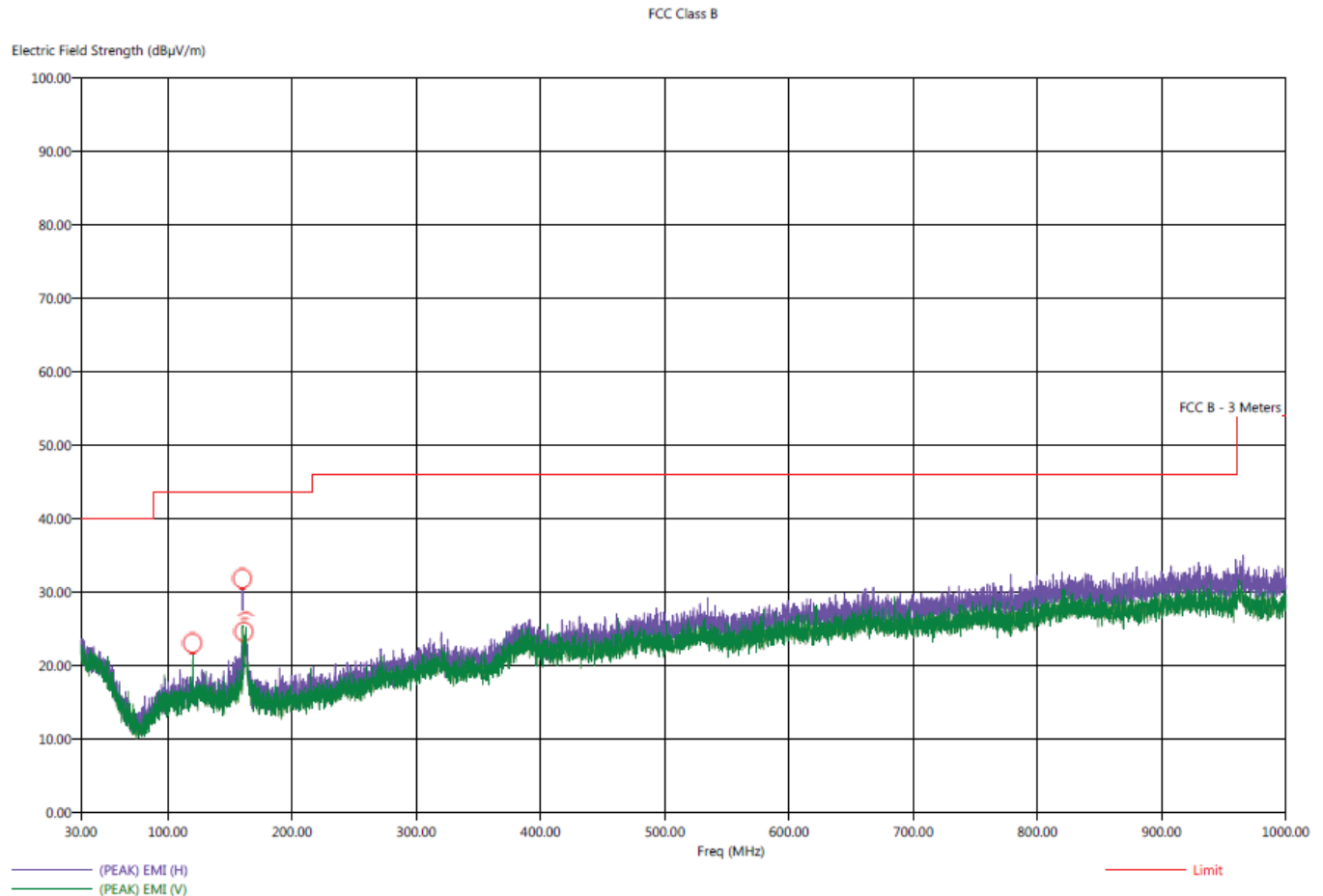
FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(OP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
120.10	V	28.29	24.89	-15.21	-18.61	43.50	16.50	0.79	36.25	111.26
152.00	H	23.05	18.05	-20.45	-25.45	43.50	16.70	0.90	132.00	143.02
160.00	V	29.35	24.69	-14.15	-18.81	43.50	18.56	0.93	115.00	190.91
162.60	H	30.74	25.66	-12.76	-17.84	43.50	22.71	0.94	92.25	206.91
705.40	H	38.04	32.65	-7.96	-13.35	46.00	25.50	2.18	198.25	286.49
711.40	H	38.10	32.76	-7.90	-13.24	46.00	25.60	2.20	97.50	127.32



Title: Pre-Scan - FCC Class B
File: 12 - Keysight - Pre-Scan - 5.5 Inch Interconnect - RFD - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting at 13.56 MHz - 5.5 Inch Interconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200
Note: No Emissions found above 1 GHz that are related to the 13.56 MHz Transmitter

4/14/2023 8:23:51 AM
Sequence: Preliminary Scan



Title: Radiated Final - FCC Class B
File: 12 - Keysight - Final Scan - 5.5 Inch Interconnect - RFID - 30 MHz to 1000 MHz.set
Operator: Kyle Fujimoto
EUT Type: Multifamily
EUT Condition: The EUT is continuously transmitting at 13.56 MHz - 5.5 Inch Interconnect Enclosure
Company: Spectrum Brands, Inc.
Model: UNT1-1000-1100
S/N: D39D7129004B1200

4/14/2023 8:34:43 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)	Ttbt Aql (deg)	Twr Ht (cm)
120.00	V	28.20	24.72	-15.30	-18.78	43.50	16.50	0.79	28.50	111.32
160.10	H	34.76	30.47	-8.74	-13.03	43.50	18.59	0.93	212.75	127.26
161.20	H	28.83	23.91	-14.67	-19.59	43.50	20.88	0.93	235.25	351.02
161.90	H	30.81	25.94	-12.69	-17.56	43.50	22.93	0.94	145.25	270.61
162.20	H	31.19	25.84	-12.31	-17.66	43.50	22.86	0.94	146.00	320.04
162.80	H	30.82	26.41	-12.68	-17.09	43.50	22.58	0.94	8.75	222.97



TEMPERATURE TESTING EXTERNAL DEADBOLT

Note: The Nominal Frequency is 13.56 MHz

Temp. Degrees C.	Freq. at 0 Min. (MHz)	Freq. at 2 Min. (MHz)	Freq. at 5 Min. (MHz)	Freq. at 10 Min. (MHz)	Max %	Min %
50	13.559840	13.559850	13.559836	13.559832	-0.001239	-0.001106
40	13.559834	13.559826	13.559838	13.559856	-0.001283	-0.001062
30	13.559858	13.559864	13.559864	13.559866	-0.001047	-0.000988
20	13.560000	13.560000	13.560000	13.560000	0.000000	0.000000
10	13.559914	13.559906	13.559918	13.559916	-0.000693	-0.000605
0	13.559934	13.559920	13.559942	13.559934	-0.000590	-0.000428
-10	13.559926	13.559924	13.559938	13.559926	-0.000560	-0.000546
-20	13.559900	13.559896	13.559990	13.559896	-0.000767	-0.000737

Test Requirements: Limit is 100 ppm or $\pm 0.01\%$ deviation

Note #1: Max % is the maximum percent change from nominal

Note #2: Min % is the minimum percent change from nominal

Note #3: The limit is 13.558644 MHz to 13.561356 MHz

TEMPERATURE TESTING 4.5 INCH INTERCONNECT

Note: The Nominal Frequency is 13.56 MHz

Temp. Degrees C.	Freq. at 0 Min. (MHz)	Freq. at 2 Min. (MHz)	Freq. at 5 Min. (MHz)	Freq. at 10 Min. (MHz)	Max %	Min %
50	13.559840	13.559842	13.559840	13.559822	-0.001313	-0.001165
40	13.559820	13.559842	13.559822	13.559842	-0.001327	-0.001165
30	13.559858	13.559856	13.559866	13.559870	-0.001062	-0.000959
20	13.560000	13.560000	13.560000	13.560000	0.000000	0.000000
10	13.559922	13.559918	13.559912	13.559922	-0.000649	-0.000575
0	13.559924	13.559934	13.559944	13.559938	-0.000560	-0.000413
-10	13.559934	13.559936	13.559924	13.559930	-0.000560	-0.000472
-20	13.559902	13.559900	13.559902	13.559908	-0.000737	-0.000678

Test Requirements: Limit is 100 ppm or $\pm 0.01\%$ deviation
Note #1: Max % is the maximum percent change from nominal
Note #2: Min % is the minimum percent change from nominal
Note #3: The limit is 13.558644 MHz to 13.561356 MHz

TEMPERATURE TESTING 5.5 INCH INTERCONNECT

Note: The Nominal Frequency is 13.56 MHz

Temp. Degrees C.	Freq. at 0 Min. (MHz)	Freq. at 2 Min. (MHz)	Freq. at 5 Min. (MHz)	Freq. at 10 Min. (MHz)	Max %	Min %
50	13.559840	13.559850	13.559838	13.559826	-0.001283	-0.001106
40	13.559840	13.559840	13.559838	13.559852	-0.001195	-0.001091
30	13.559886	13.559876	13.559862	13.559874	-0.001018	-0.000841
20	13.560000	13.560000	13.560000	13.560000	0.000000	0.000000
10	13.559910	13.559914	13.559918	13.559906	-0.000693	-0.000605
0	13.559940	13.559922	13.559928	13.559924	-0.000575	-0.004425
-10	13.559930	13.559932	13.559934	13.559938	-0.000516	-0.000457
-20	13.559906	13.559902	13.559902	13.559902	-0.000723	-0.000693

Test Requirements: Limit is 100 ppm or $\pm 0.01\%$ deviation
Note #1: Max % is the maximum percent change from nominal
Note #2: Min % is the minimum percent change from nominal
Note #3: The limit is 13.558644 MHz to 13.561356 MHz