HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

July 15, 2022

Perigon Health 360, LLC
340 N. Main St., Ste. 300
Plymouth, MI 48170

Dear Justin Gauvin,

Enclosed is the EMC test report for compliance testing of the Perigon Health 360, LLC, Medesto Pill Dispenser, tested to the requirements of:

- Title 47 of the CFR, Part 15.225, Subpart C for Certification as an Intentional Radiator.
- RSS-210: Issue 10, License-Exempt Radio Apparatus: Category 1 Equipment

Thank you for using the services of Eurofins E&E North America. If you have any questions regarding these results or if we can be of further service to you, please feel free to contact me.

Sincerely,

Nancy LaBrecque
Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: WIRA118651-FCC225-RSS210 – Medesto Pill Dispenser

Electromagnetic Compatibility Criteria
Test Report

for the

Perigon Health 360, LLC
Medesto Pill Dispenser

Tested under
the FCC Certification Rules
contained in
15.225 Subpart C and
RSS-210: Issue 10
for Intentional Radiators

Report: WIRA118651-FCC225-RSS210 – Medesto Pill Dispenser

July 15, 2022

Prepared For:

Perigon Health 360, LLC
340 N. Main St., Ste. 300
Plymouth, MI 48170

Prepared By:
Eurofins E&E North America
13501 McCallen Pass,
Austin, TX 78753

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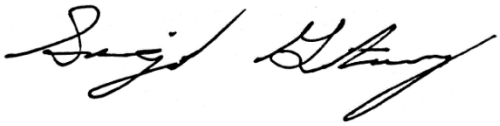

Sergio Gutierrez,
EMC Test Engineer

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Part 15.225 and RSS-210 Issue 10 under normal use and maintenance.

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	July 15, 2022	Initial Issue.

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Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Perigon Health 360, LLC Medesto Pill Dispenser, with the requirements of Part 15, §15.225 and RSS-210 Issue10, Annex B, B.6. All references are to the most current version of Title 47 of the Code of Federal Regulations and RSS-210 in effect. The following data is presented in support of the Certification of the Medesto Pill Dispenser. Perigon Health 360, LLC should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Medesto Pill Dispenser, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.225 and RSS-210, in accordance with Perigon Health 360, LLC, under purchase order number EUR033022. All tests were conducted using measurement procedures ANSI C63.4-2014 and C63.10-2013.

FCC Reference	ISED Reference	Description	Compliance
Part 15 §15.203	---	Antenna Requirement	Compliant
Part 15 §15.207(a)	RSS-Gen (8.8)	Conducted Emission Limits	Compliant
Part 15 §15.215	---	20dB Occupied Bandwidth	Compliant
---	RSS-Gen (6.7)	99% Occupied Bandwidth	Compliant
Part 15 §15.225(a)	RSS-210 (B.6.a.i)	Field Strength emissions within the band 13.553 – 13.567 MHz	Compliant
Part 15 §15.225(b)	RSS-210 (B.6.a.ii)	Field Strength emissions within the band 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	Compliant
Part 15 §15.225(c)	RSS-210 (B.6.a.iii)	Field Strength emissions within the band 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	Compliant
Part 15 §15.225(d)	RSS-210 (B.6.a.iv)	Outside-Band Field Strength emissions per 15.209 - 13.110 – 14.010 MHz	Compliant
Part 15 §15.225(e)	RSS-210 (B.6.b)	Frequency Tolerance of the Carrier	Compliant

Table 1. Executive Summary

Equipment Configuration

A. Overview

Eurofins E&E North America was contracted by Perigon Health 360, LLC to perform testing on the Medesto Pill Dispenser.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Perigon Health 360, LLC, Medesto Pill Dispenser.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	Medesto Pill Dispenser	
Model(s) Covered:	Medesto Pill Dispenser	
EUT Specifications:	Primary Power: 24 VDC (via AC power adapter)	
	Type of Modulation(s):	ASK
	Equipment Code:	DXX
	Maximum field Strength:	49.16 dBµV/m
	Antenna Type:	Near Field Coupling (coil)
	Antenna Model Number:	Molex 1462362001
	Firmware Version:	N/A
	EUT Frequency Ranges:	13.56 MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Sergio Gutierrez	
Report Date(s):	July 15, 2022	

Table 2. EUT Summary Table

B. References

CFR 47, Part 15, Subpart C	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
ANSI C63.4:2014	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Table 3. References

C. Test Site

Eurofins MET Laboratories Inc. (Eurofins E&E North America) is part of the Eurofins Electrical & Electronics (E&E) global compliance network.

All testing was performed at Eurofins E&E North America, 13501 McCallen Pass, Austin, TX 78753. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 10 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

Correlation between semi-anechoic chamber and OATS:

Two calibrated Loop antennas were used on an OATS. One antenna was driven by a signal generator with a known power. The receive antenna was initially placed 1m away from the transmit antenna. The two antennas were placed parallel to each other. The receive antenna was in turn connected to a calibrated spectrum analyzer. The emissions were swept from 9 kHz to 30 MHz. The receive antenna was then rotated 90 degrees and measurements re-taken. Additional measurements were taken when the receive antenna was placed at 3meters.
This same setup was taken to inside the semi-anechoic chamber and the measurements repeated.

The data was used to correlate the semi-anechoic chamber and OATS.

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.97 dB	2	95%
RF Power Radiated Emissions	±2.95 dB	2	95%
Radiated Emissions, (30 MHz – 1 GHz)	±2.95	2	95%
Radiated Emissions, (1 GHz – 18 GHz)	±3.54	2	95%
Conducted Emission Voltage	±2.97	2	95%

Table 4. Uncertainty Calculations Summary

E. Description of Test Sample

Name of EUT/Model:	Medesto Pill Dispenser
Description of EUT and its intended use:	The Medesto dispenser is intended to: Issue solid (pills) medication Provide alerts to patients or caregivers for pre-determined medication dosing schedules Device interaction: Device requires the pod containing pills to be replaced once the pills are emptied. When the medication is scheduled to be taken, the device alerts through the Medesto mobile app and the Medesto dispenser. User/Caregiver (if one is required by the user) presses the dispenser button to dispense the pills. Use condition: This device is intended for single user only. This is used in indoor living area. Device is unsterile. Reusable Medical Device. Device can be used to few times in a week to multiple times in a day based on the patient dosing schedule. This device is for external use only.

Selected Operation Mode(s):	1. Verifying - Test Firmware Step 1 - With no pod in the dispenser, plug in the Medesto Pill Dispenser using the power plug supplied Verify: Audio sound plays when plugged Step 2 - Ensure Wi-Fi network that was shared is turned on Verify: Wi-Fi Light is green The 3 center LEDs are red The upper right LED is off The center button is flashing purple Verify: A second chime will play (same chime as when the dispenser was plugged in) within 1 to 2 minutes indicating the cellular network is connected. Step 3 - Insert the Pod into the Pod Tray Step 4 - Close the Lid Step 5 - Remove cup if there is one Verify: Center LEDs turn off Step 6 - Press center button Verify: LED in cup area flashes red Pod rotates and starts a piercing cycle During piercing cycle Center Button and Cup LED flash blue After piercing cycle is complete, and Audio File will play indicating the servings remaining and the center Button is flashing a Teal color Step 7 - Insert Cup Verify: Piercing cycle automatically continues At the beginning of the next piercing cycle the CUP LED flashes Green Step 8 - Lift the lid in the middle of a piercing cycle Verify: Dispenser should reset its self and go back to the initial testing state. 2. <!--[endif]--->Verifying NFC Reading cycle Step 1 - With no pod in the dispenser, plug in the Medesto Pill Dispenser using the power plug supplied Step 2 - Ensure Wi-Fi network that was shared is turned on Step 3 - Insert the Pod into the Pod Tray Step 4 - Close the Lid Step 5 - While purple button is flashing, hold the left button (Up Arrow) for 2 seconds Verify: The center button should flash purple and orange. This ensures that the NFC reading cycle will be active for 5 minutes Step 6 - Press the right button (Down Arrow) for 2 seconds to terminate the NFC reading cycle. 3. Verifying Green Wi-Fi Light Indication Step 1 - Plug in the Medesto Pill Dispenser using the power plug supplied Step 2 - Switch on Home Wi-Fi signal Step 3 - Switch on Wi-Fi and Bluetooth and Location Signal in mobile device Step 4 - Open Medesto mobile application Step 5 - In the Sign In tab, enter mobile number that was supplied to the pharmacy Step 6 - Enter valid password Step 7 - Click on Log In button Step 8 - Enter patients health information Step 9 - Click the Next button Step 10 - Agree to consent form and sign the indicated box Step 11 - Click the I Consent button Step 12 - Select the Menu icon in the upper left corner Step 13 - Select Dispensers icon Step 14 - Click on Add a new dispenser Step 15 - Click on continue button Step 16 - Click on the Connect button next to the dispenser your wish to setup Step 17 - Select your network Step 18 - Enter valid password Step 19 - Click on Login button and the application displays "Dispenser is connected" Step 20 - Click the Get Started button Verify: The Wi-Fi LED turns Green indicating the dispenser Wi-Fi signal has successfully connected to user's home Wi-Fi signal and the app has connected to Dispenser 4. Verifying Wrong Wi-Fi password / No Wi-Fi connected. The Dispenser shall stay Red Wi-Fi Light indicating Wi-Fi signal was unable to get connected or lost when previously connected, the Wi-Fi LED shall stay RED until connected. 5. Verifying - Pod reads and Pod Ready for Use - No Cup / Cup Inserted. Step 1 - Open the Medesto Dispenser Clear Lid. Step 2 - Insert the Pod into the Pod Tray. Step 3 - Close the Lid Step 4 - No Cup Inserted into the dispenser. Once the lid is shut, the pod will rotate clockwise; reading to the dispenser, the pod has indicators to be read by the dispenser. Dispenser reads the home position flag on the foil side of pod (black 5mm rectangle). Dispenser then reads the doses punctured on the foil side of pod. Dispenser then reads the pods NFC Tag on the topside of the pod) Verify: Wi-Fi LEDs display GREEN Doses Remaining display GREEN Top Right LED display GREEN Button LED display Green (No Cup) Step 5 - Press center button on top of dispenser Verify: Audio alert at time of button press that there is no cup found Center button LEDs change from Green to Blue. Step 6 - Insert cup into dispenser Verify: Center button LED turns from Blue to Green. 6. Verifying - Dispensing dose Step 1 - Open the Medesto Dispenser Clear Lid. Step 2 - Insert the Pod into the Pod Tray Step 3 - Close the Lid Step 4 - Place the cup into the dispenser. Step 5 - Press the dispenser button. Verify: All pills were dispensed in the cup.
Rationale for the selection of the Operation Mode(s):	Above "Selected Operation Modes" also contain the rationale for the selection
Monitoring Method(s):	Above "Selected Operation Modes" also contain the Monitoring methods captured with the help of different color LED light.

EUT Power Requirement:	Voltage: 24 V AC or DC: DC Frequency: N/A Number of phases: N/A Amperage: 1.5 A Uses an external AC/DC adapter: Yes Additional comments: none
Physical Description	EUT Arrangement (tabletop, floor standing or both): Tabletop System w/Multiple Chassis? (Yes/No): False Size: (HxWxD): 12x11x5 inches Weight: 5 lbs
Other Info:	Highest frequency used in device: 160 MHz EUT Software (internal to EUT): N/A Support Software (used by smartphone to support EUT): Medesto mobile application

Table 5. Equipment Overview and Test Configuration Information

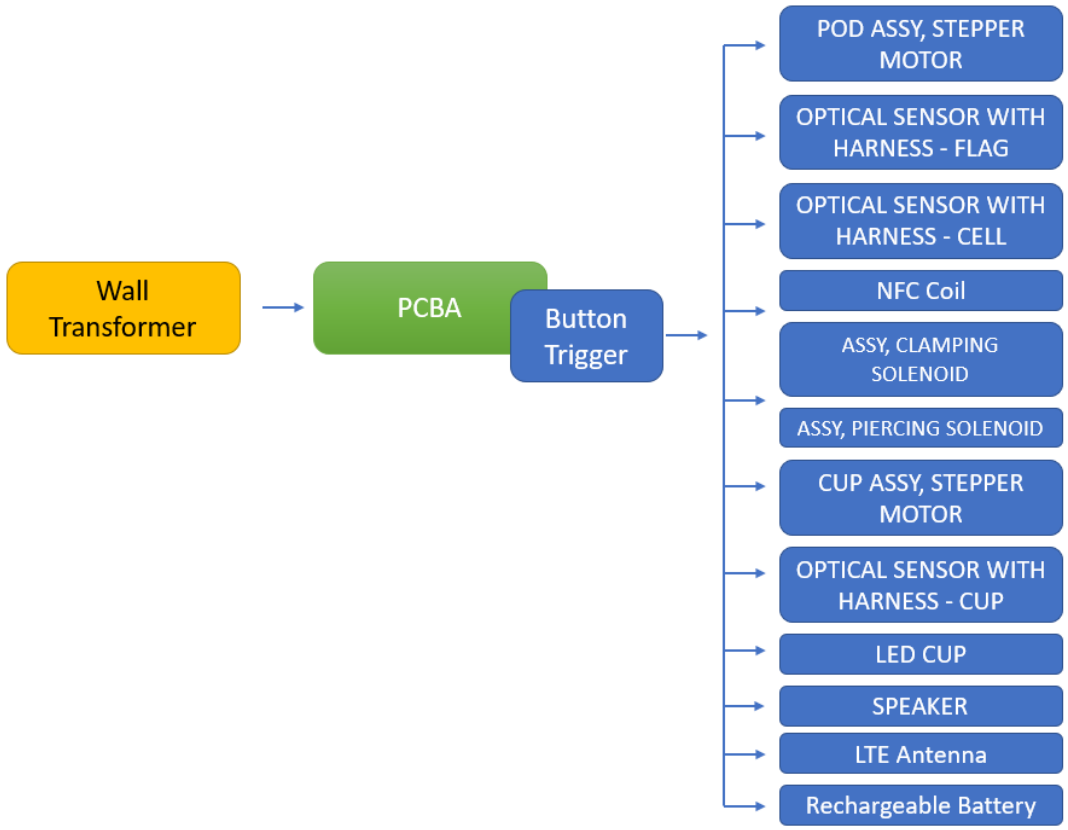


Figure 1. Block Diagram of Test Configuration

F. Equipment Configuration

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
1	--	PCBA 3.0	PCBA 3.0	LB100-3000-0A	METLABTEST	V3.2.1

Table 6. Equipment Configuration

G. Support Equipment

EUT does not have any support equipment.

H. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	Input power	AC-DC converter	1	1.5	1.5	No	

Table 7. Ports and Cabling Information

I. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

J. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Perigon Health 360, LLC upon completion of testing.

Antenna Requirements

§ 15.203 Antenna Requirement

Test Requirement: **§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

a.) Antenna must be permanently attached to the unit.

b.) Antenna must use a unique type of connector to attach to the EUT.

c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The Medesto Pill Dispenser as evaluated, was compliant as the antenna was permanently attached.

Test Engineer(s): Sergio Gutierrez

Test Date(s): 06/24/2022

Conducted Emissions

§ 15.207(a) Conducted Emissions Limits

Test Requirement(s): **§ 15.207 (a):** For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dBµV)	
	Quasi-Peak	Average
* 0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

Table 8. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Note: *Decreases with the logarithm of the frequency.

RSS-GEN (8.8) AC Power-Line Conducted Emissions Limits

Test Requirement(s): **RSS-GEN (8.8):** Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in the below figure, as measured using a 50 µH / 50 Ω line impedance stabilization network (LISN). This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in the below figure shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Frequency (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
* 0.15-0.5	66 to 56	56 to 46[1]
0.5-5	56	46
5-30	60	50

Table 9. AC Power Line Conducted Emissions Limits

Note: *Decreases with the logarithm of the frequency.

Test Procedure: The EUT was placed on a 0.8 m-high non-conducting table above a ground plane. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50 Ω/50 µH Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with *ANSI C63.10-2013 "Procedures for Compliance Testing of Unlicensed Wireless Devices"*. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω/50 µH LISN as the input transducer to an EMI receiver.

Test Results: The Medesto Pill Dispenser was compliant with this requirement.

Test Engineer(s): Sergio Gutierrez

Test Date(s): 06/21/2022

Conducted Emissions Voltage Test Setup

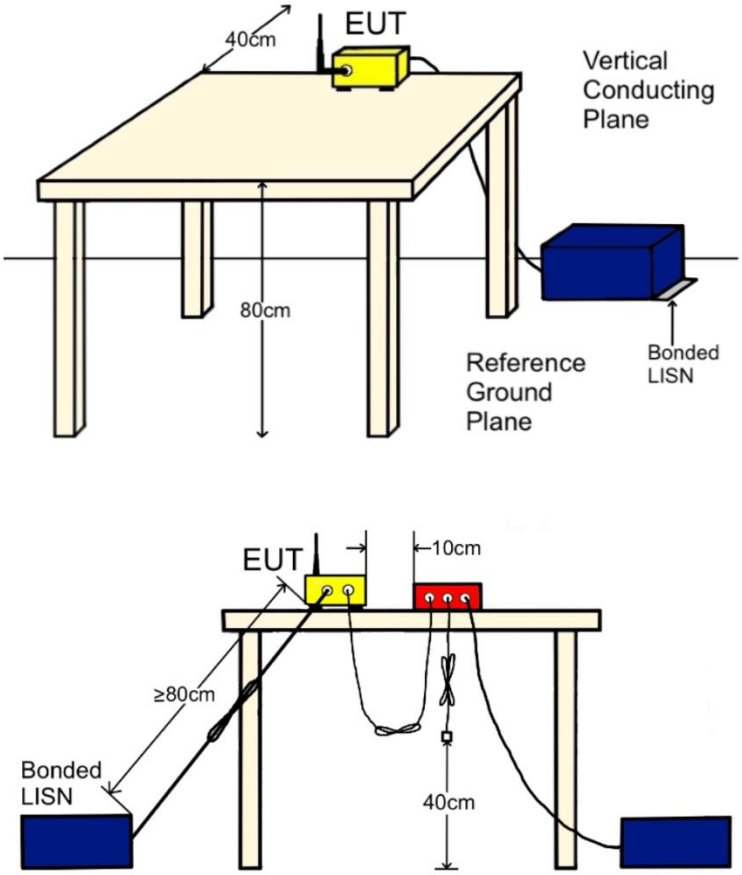
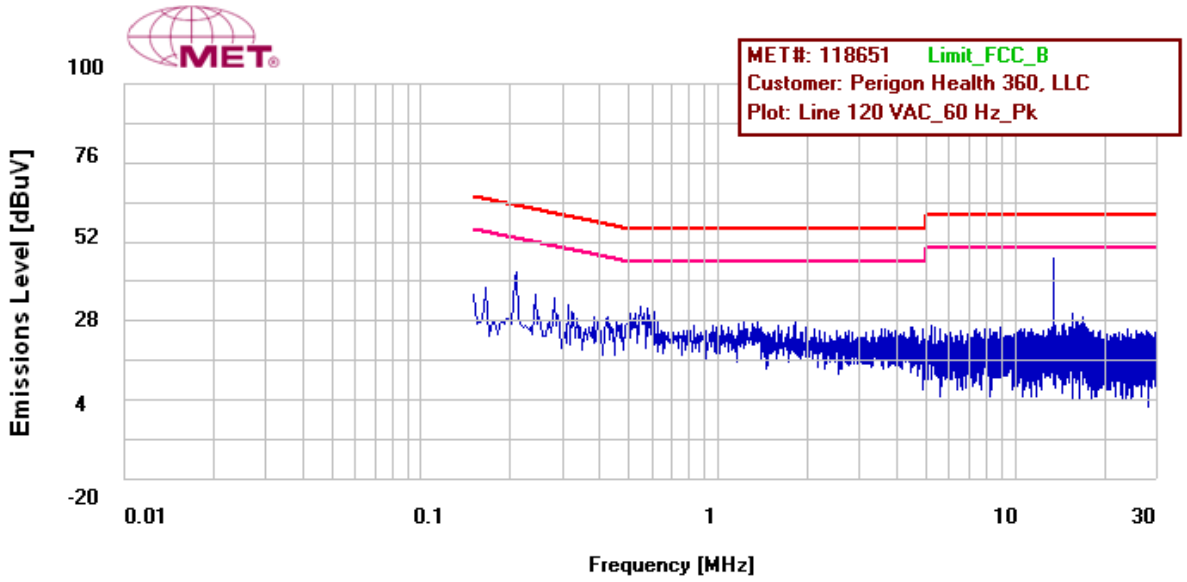


Figure 2. CEV Test Setup

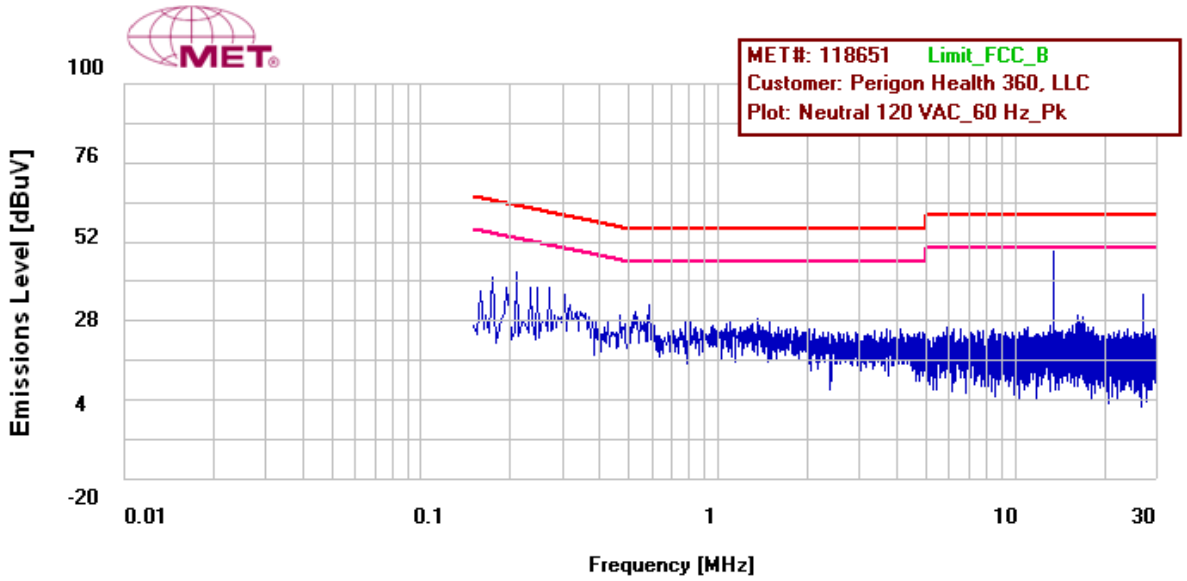
Measurement Location	Measurement	Limit	Result
Bonding measurement from LISN ground to ground plane	1.45 mΩ	< 2.5 mΩ	Pass

Line	Freq (MHz)	QP Amplitude (dBµV)	QP Limit (dBµV)	Margin (dB)	Result	Average Amplitude (dBµV)	Average Limit (dBµV)	Margin (dB)	Result
Line 120 VAC_60 Hz	13.562	49.97	60.000	-10.030	Pass	47.06	50.000	-2.940	Pass
Line 120 VAC_60 Hz	0.210	39.26	63.213	-23.953	Pass	25.12	53.213	-28.093	Pass
Line 120 VAC_60 Hz	0.166	45.68	65.160	-19.480	Pass	27.81	55.160	-27.350	Pass
Line 120 VAC_60 Hz	0.242	37.38	62.038	-24.658	Pass	25.23	52.038	-26.808	Pass
Line 120 VAC_60 Hz	0.150	46.50	66.000	-19.500	Pass	28.44	56.000	-27.560	Pass
Line 120 VAC_60 Hz	0.282	33.64	60.771	-27.131	Pass	25.04	50.771	-25.731	Pass
Neutral 120 VAC_60 Hz	13.562	47.35	60.000	-12.650	Pass	47.49	50.000	-2.510	Pass
Neutral 120 VAC_60 Hz	0.210	38.72	63.213	-24.493	Pass	24.93	53.213	-28.283	Pass
Neutral 120 VAC_60 Hz	0.174	42.19	64.771	-22.581	Pass	26.85	54.771	-27.921	Pass
Neutral 120 VAC_60 Hz	0.270	34.07	61.131	-27.061	Pass	24.41	51.131	-26.721	Pass
Neutral 120 VAC_60 Hz	0.234	37.44	62.317	-24.877	Pass	24.13	52.317	-28.187	Pass
Neutral 120 VAC_60 Hz	0.194	40.93	63.869	-22.939	Pass	27.98	53.869	-25.889	Pass

Table 10. Conducted Emissions Test Results



Plot 1. Conducted Emissions, Line Plot



Plot 2. Conducted Emissions, Neutral Plot

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: CEV				**Test Date(s):**	**06/21/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1065	EMI Test Receiver	Rohde & Schwarz	ESCI	07/01/2021	07/01/2022
1A1087	Pulse Limiter	Rohde & Schwarz	ESH3Z2	06/30/2021	06/30/2022
1A1149	DC Milliohm Meter	GW Instek	GOM-802	07/08/2021	07/08/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1122	LISN	TESEQ	NNB 51	09/13/2021	09/13/2022
1A1079	Conducted Comb Generator	COM-Power Corp	CGC-255	See Note	
1A1123	LISN	TESEQ	NNB 51	11/29/2021	11/29/2022
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 11. Conducted Emissions Test Equipment List

Occupied Bandwidth Measurements

§ 15.215(c) 20 dB Occupied Bandwidth

Test Requirement(s): **§ 15.215 (c)** Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure: The transmitter was on and transmitting at the highest output power. The bandwidth of the fundamental frequency was measured with the spectrum analyzer. Per ANSI C63.10: 2020 the RBW should be between 1% and 5% of the occupied bandwidth. Due to the nature of the fundamental transmission being very "CW like" it was not possible to meet the RBW requirement. During the measurement the RBW was therefore set as narrow as possible. The 20 dB Bandwidth was measured and recorded.

Test Results: The Medesto Pill Dispenser was compliant with this requirement.

RSS-GEN (6.7) 99% Occupied Bandwidth

Test Requirements: The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

Test Procedure: The EUT was on and transmitting at the highest output power. The bandwidth of the fundamental frequency was measured with the spectrum analyzer. Per ANSI C63.10: 2020 the RBW should be between 1% and 5% of the occupied bandwidth. Due to the nature of the fundamental transmission being very "CW like" it was not possible to meet the RBW requirement. During the measurement the RBW was therefore set as narrow as possible. The 99% Bandwidth was measured and recorded.

Test Engineer(s): Sergio Gutierrez

Test Date(s): 06/24/2022

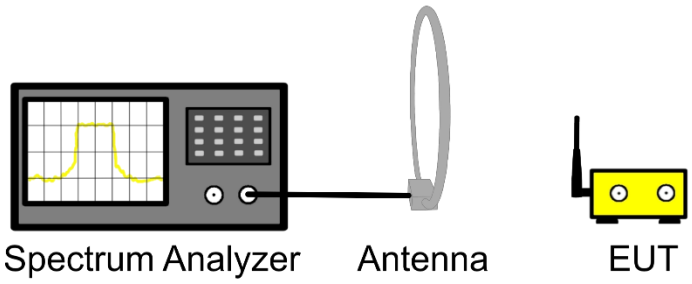
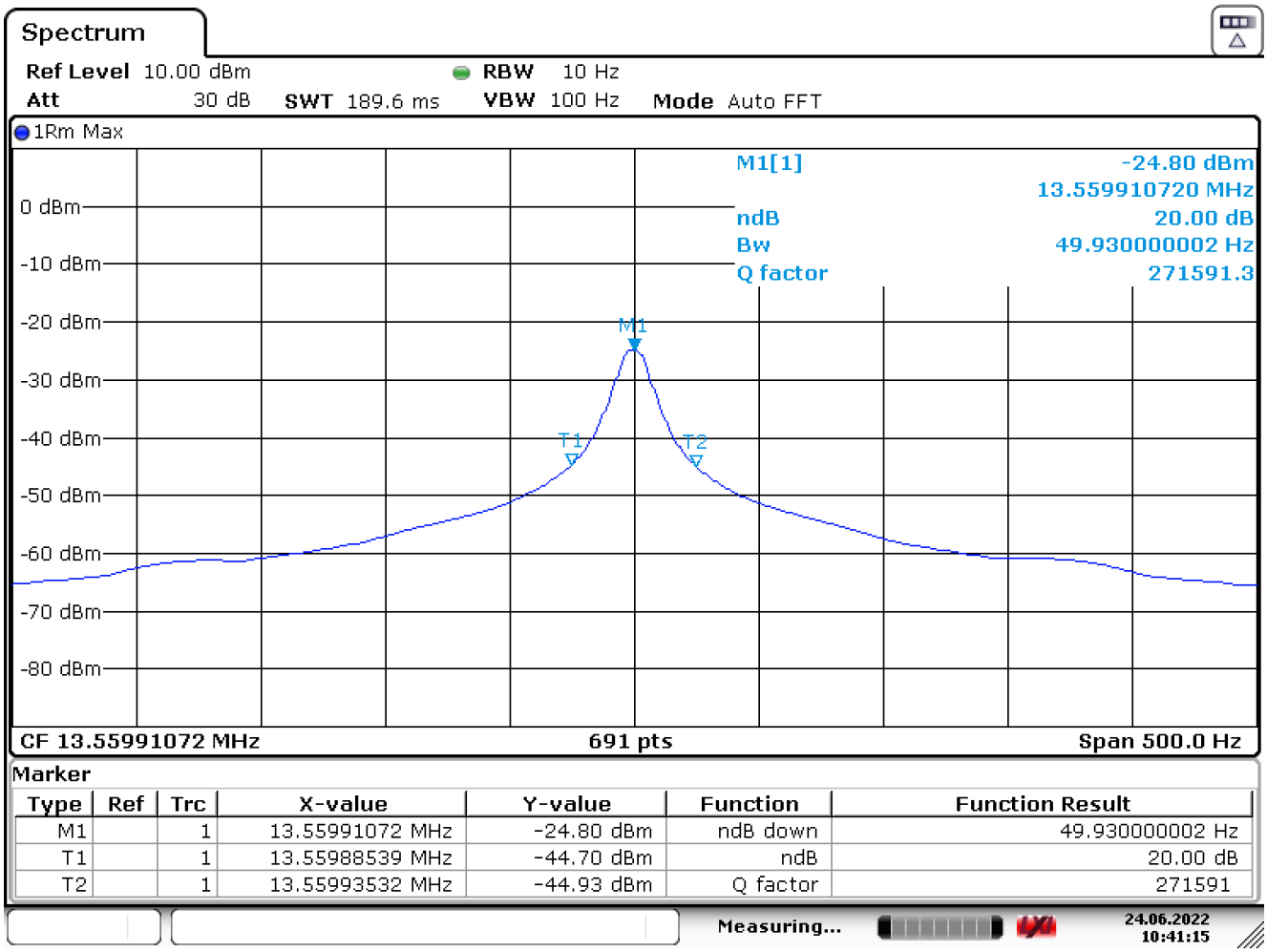


Figure 3. 20 dB Bandwidth and 99% Bandwidth Test Setup

Center Frequency (MHz)	20 dB Bandwidth of Emission (kHz)
13.559	0.04993

Table 12. 20 dB Emission Bandwidth Test Results



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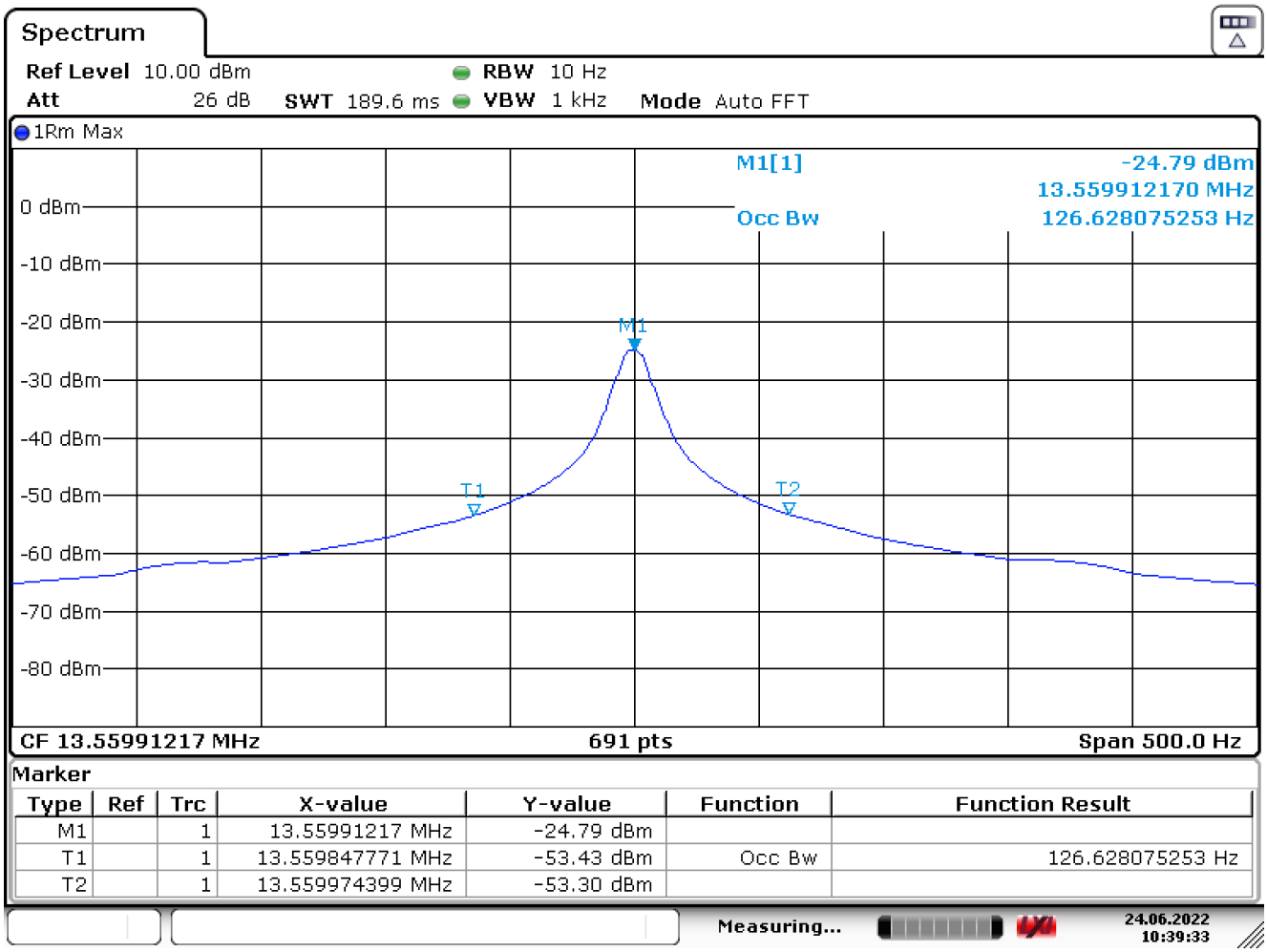
Plot 3. 20 dB Occupied Bandwidth Plot

Center Frequency (MHz)	99% Bandwidth of Emission (kHz)
13.559	0.12662

Table 13. 99% Occupied Bandwidth Test Results



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Plot 4. 99% Occupied Bandwidth Plot

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: Occupied Bandwidth				Test Date(s):	06/24/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1234	Spectrum Analyzer	Rohde & Schwarz	FSV 40	01/20/2022	01/20/2023
1T9586	Active Loop Antenna	ETS-Lindgren	6502	06/01/2021	12/01/2022
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 14. Occupied Bandwidth Test Equipment List

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.225(a-d) Field Strength of Radiated Emissions

Test Requirement(s):

15.225 (a) The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

15.225 (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

15.225 (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

15.225 (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

RSS-210 (B.6.a(ii - iv)) Field Strength of Radiated Emissions

Test Requirement(s):

RSS-210 (B.6.a(i)) The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15.848 mV/m (84 dBµV/m) at 30 meters.

RSS-210 (B.6.a(ii)) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 µV/m (50.5 dBµV/m) at 30 meters.

RSS-210 (B.6.a(iii)) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 µV/m (40.5 dBµV/m) at 30 meters.

RSS-210 (B.6.a(iv)) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in RSS-GEN Section 8.9.

Test Procedure:

The EUT was set to transmit and placed on a 0.8 m-high wooden stand inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.10: 2013 were used. For measurements below 30 MHz a loop antenna placed 3m away from the unit was used. For measurements above 30 MHz a biconalog antenna placed 10 m away from the unit was used. Measurements below 30 MHz were conducted with the loop antenna at coaxial (parallel) and planar (perpendicular) orientations. Measurements above 30 MHz were conducted with the biconalog antenna in the vertical and horizontal polarizations. A peak detector was used to perform a pre-scan from 9 kHz to 10 times the fundamental frequency. Spurious emissions within 20 dB of the applicable limit were measured using a quasi-peak detector and recorded in the subsequent section. Peak emissions that were observed over the appliable limit were determined to be digital emissions subject to the requirements of FCC Part 15 Subpart B and ICES-003 subsection 6.2 for Class A devices.

The measurements made at 3 m with the loop antenna (below 30MHz) were then extrapolated to 30m or 300 m using the following correction factors which were applied to the limit.

40log (3/30) = -40 dB
40log (3/300) = -80 dB

The measurements made at 10 m with the biconilog antenna (above 30MHz) were then extrapolated to the 3m using the following correction factor.

20log (10/3) = +10.46 dB

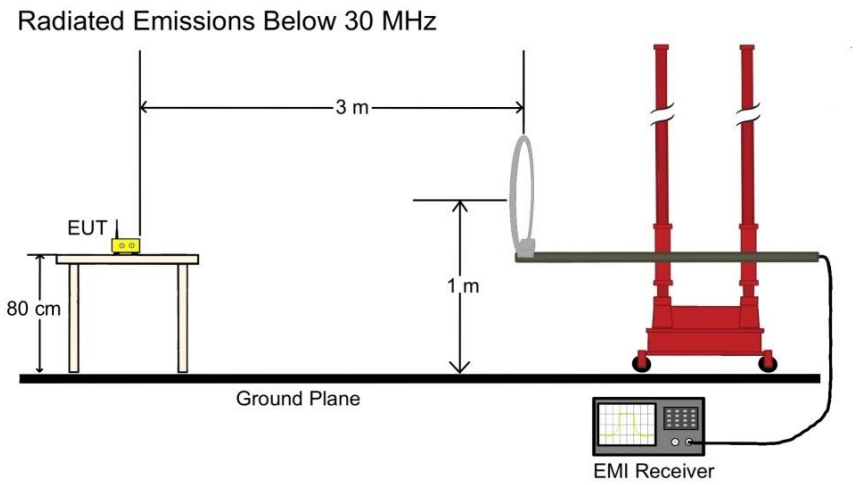


Figure 4: Radiated Emissions (Below 30MHz), Test Setup

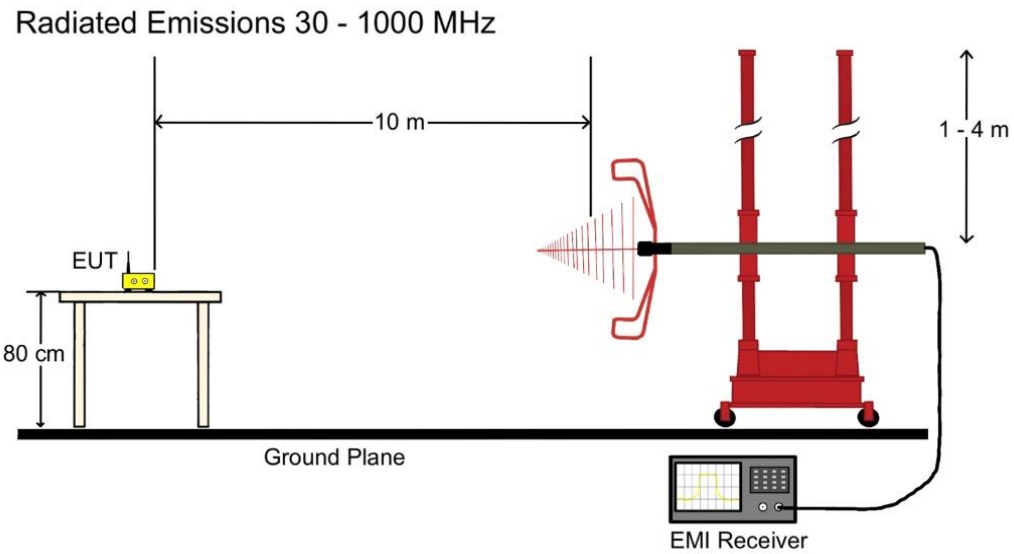
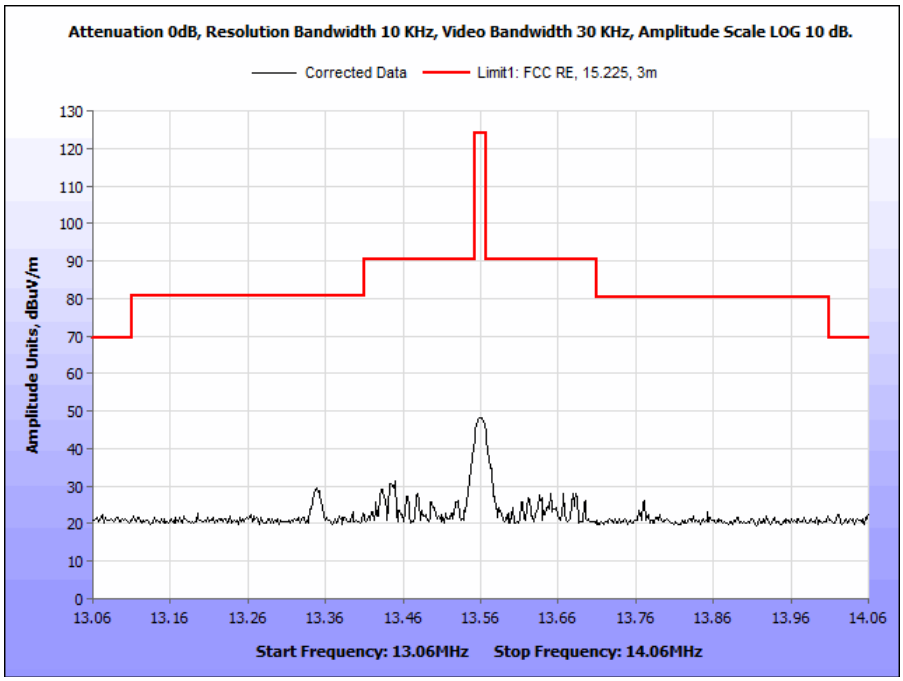


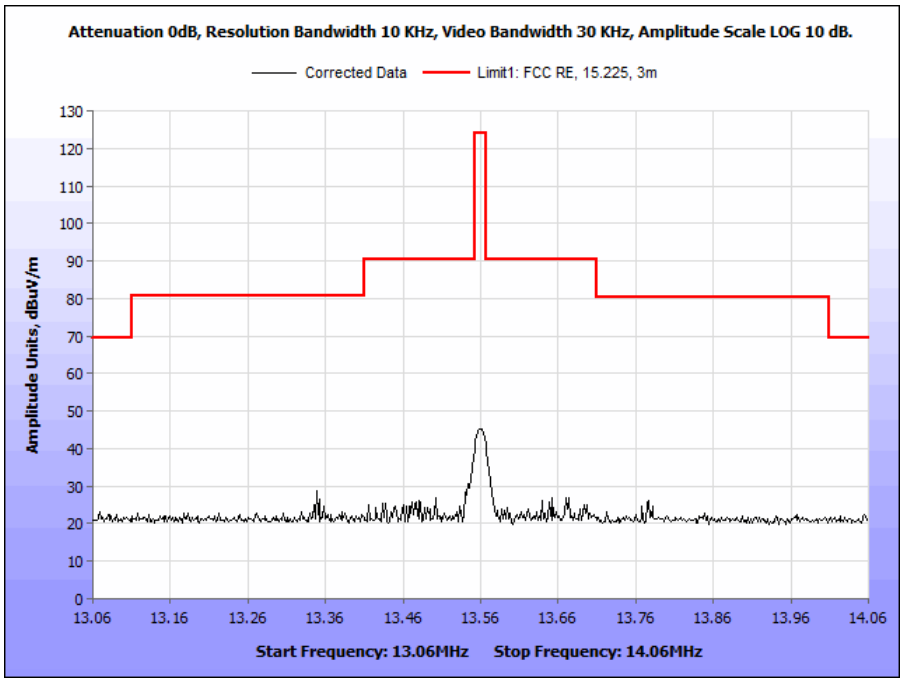
Figure 5. Radiated Emissions (Above 30MHz), Test Setup

Test Results:	The EUT was compliant with the requirements of **§15.225(a - d)** and **RSS-210 RSS-210 (B.6.a(i, ii, iii, and iv))**.
Test Engineer(s):	Sergio Gutierrez
Test Date(s):	06/21/2022

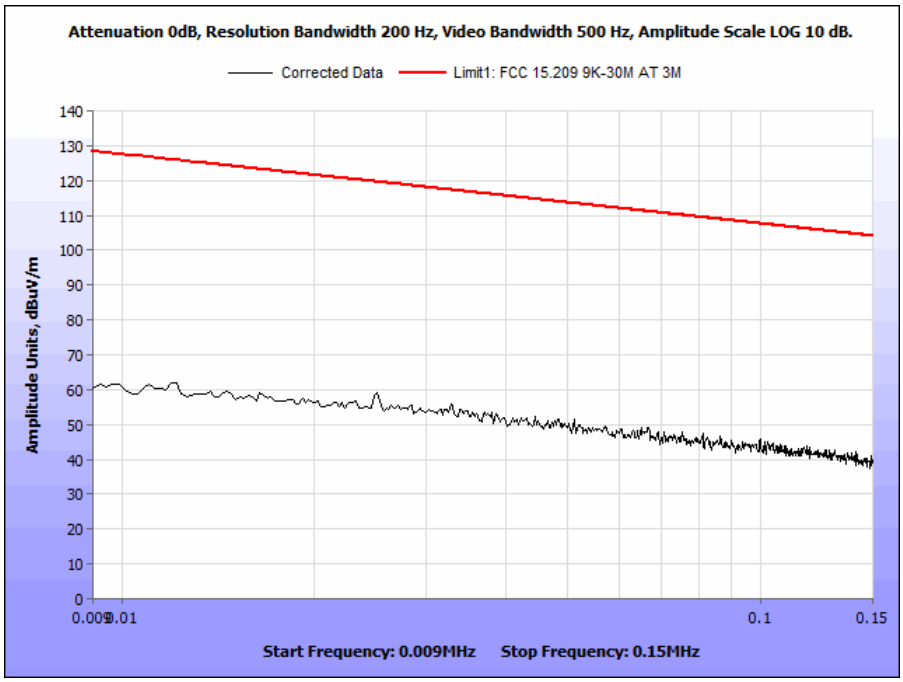
Radiated Field Strength



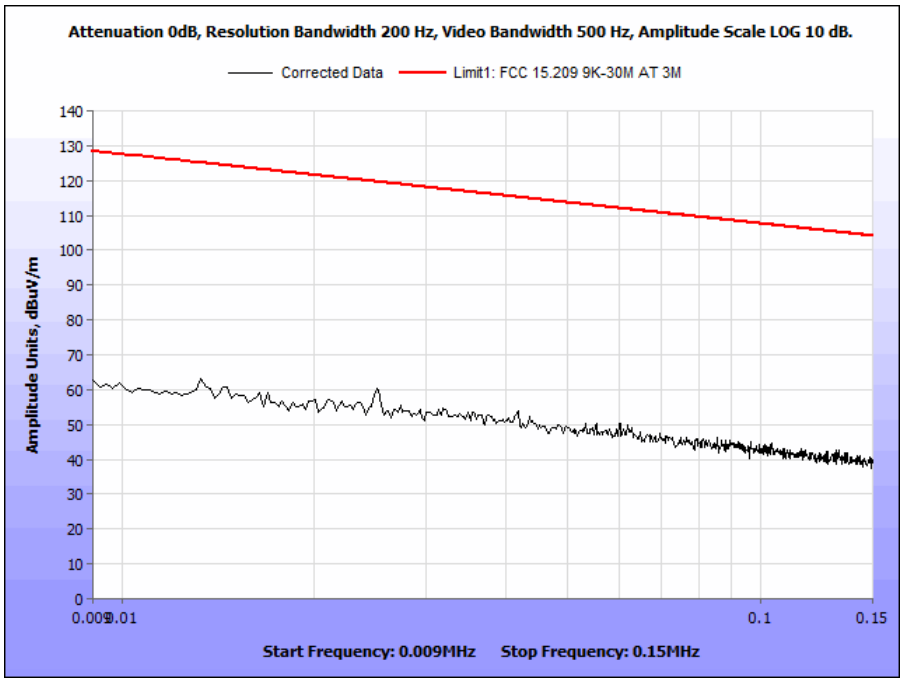
Plot 5. Spurious Emissions Within the Band 13.11 – 14.010 MHz, 0 degrees Antenna



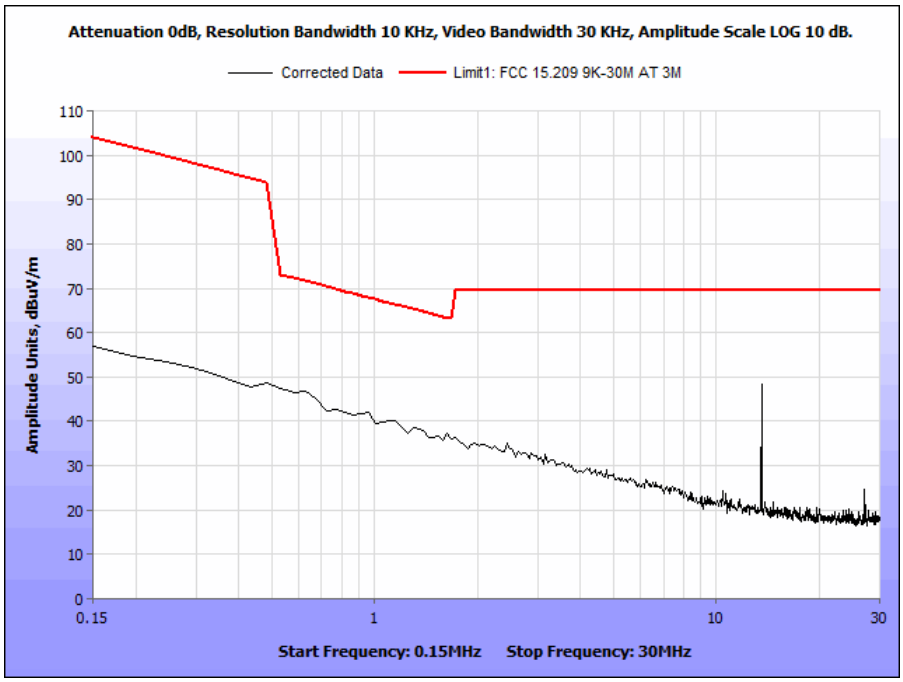
Plot 6. Spurious Emissions Within the Band 13.11 – 14.010 MHz, 90 degrees Antenna



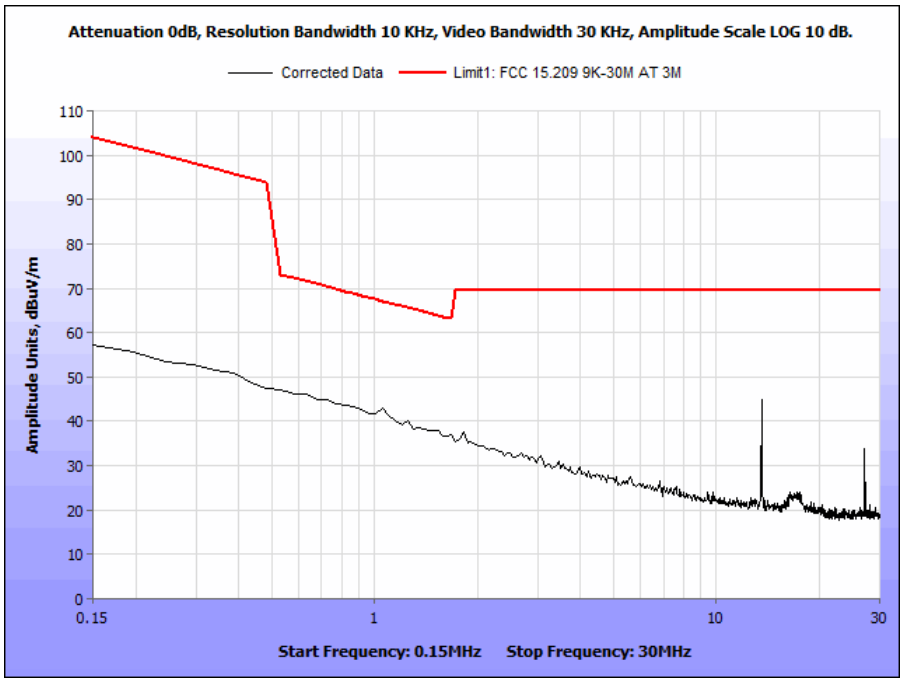
Plot 7. Spurious Emissions 9 kHz – 150 kHz, Out of Band, 0 degrees Antenna



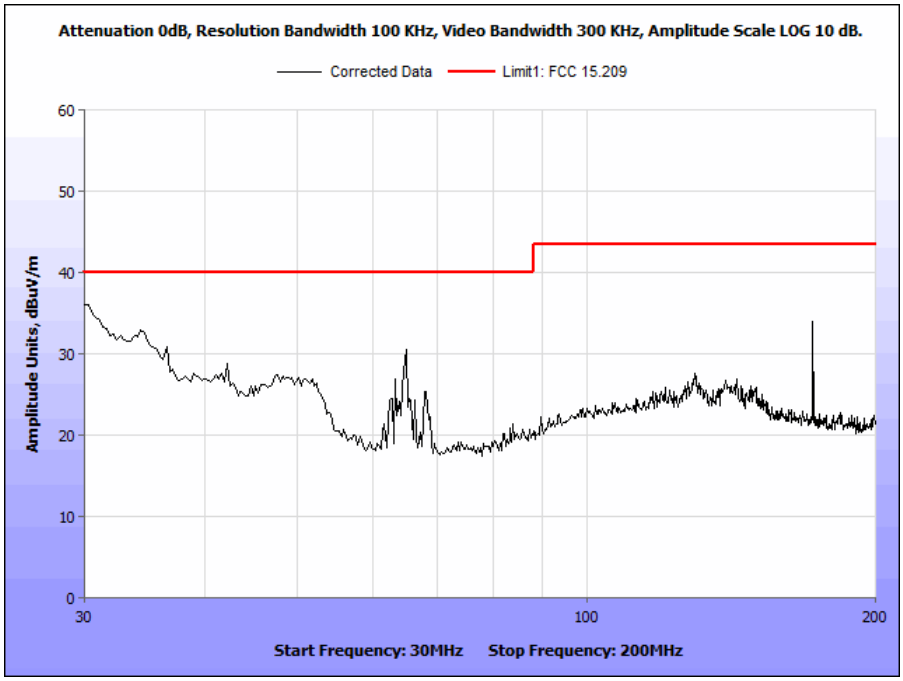
Plot 8. Spurious Emissions 9 kHz – 150 kHz, Out of Band, 90 degrees Antenna



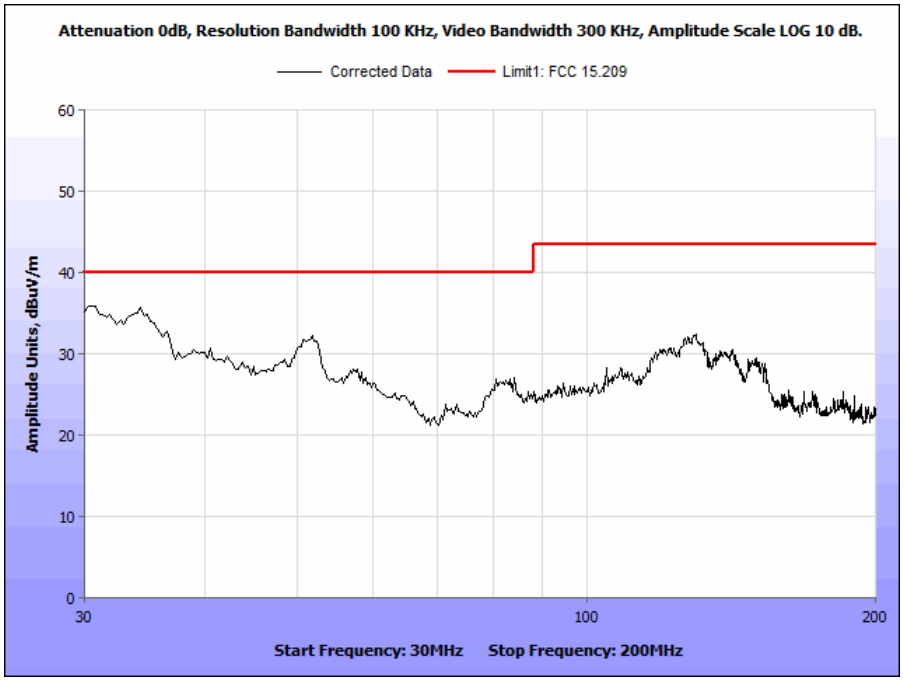
Plot 9. Spurious Emissions 150 kHz – 30 MHz, Out of Band, 0 degrees Antenna



Plot 10. Spurious Emissions 150 kHz – 30 MHz, Out of Band, 90 degrees Antenna



Plot 11. Spurious Emissions Above 30MHz, Out of Band, Horizontal Antenna



Plot 12. Spurious Emissions Above 30MHz, Out of Band, Vertical Antenna

Frequency (MHz)	Un-Corrected amplitude (dBµV)	Antenna Factor (dB/m)	Cable Factor (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
13.0904	11.11	10.69	0.88	22.68	69.54	-46.86	Pass
13.3485	18.94	10.67	0.88	30.49	80.51	-50.02	Pass
13.4494	20.90	10.66	0.88	32.44	90.47	-58.03	Pass
13.5600	37.63	10.64	0.89	49.16	124.00	-74.84	Pass
13.6786	17.47	10.63	0.89	28.99	90.47	-61.48	Pass
13.7699	14.73	10.62	0.89	26.24	80.50	-54.26	Pass
14.0215	11.77	10.60	0.89	23.26	69.54	-46.28	Pass

Table 15. Spurious Emissions Within the Band 13.11 – 14.010 MHz, 0 degrees Antenna

Frequency (MHz)	Un-Corrected amplitude (dBµV)	Antenna Factor (dB/m)	Cable Factor (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
13.0808	11.83	10.69	0.88	23.40	69.54	-46.14	Pass
13.3485	18.20	10.67	0.88	29.75	80.51	-50.76	Pass
13.5023	16.30	10.65	0.88	27.83	90.47	-62.64	Pass
13.5600	34.63	10.64	0.89	46.16	124.00	-77.84	Pass
13.6529	16.33	10.63	0.89	27.85	90.47	-62.62	Pass
13.7763	15.50	10.62	0.89	27.01	80.50	-53.49	Pass
14.0360	10.88	10.60	0.89	22.37	69.54	-47.17	Pass

Table 16. Spurious Emissions Within the Band 13.11 – 14.010 MHz, 90 degrees Antenna

Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m)	Pre-Amp Gain & CBL (dB)	DCF (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.272	H	101.7	326.0	20.17	22.64	23.95	10.46	29.32	40.00	-10.68
34.359	H	346.4	170.3	18.81	20.55	23.50	10.46	26.32	40.00	-13.68
36.538	H	120.8	245.0	16.38	19.13	23.79	10.46	22.18	40.00	-17.82
42.259	H	322.0	128.8	15.71	15.94	23.87	10.46	18.24	40.00	-21.76
64.871	H	75.3	175.4	14.78	10.4	23.54	10.46	12.10	40.00	-27.90
172.211	H	328.2	143.7	14.12	13.9	22.05	10.46	16.43	43.50	-27.07

Table 17. Spurious Emissions Above 30MHz, Out of Band, Horizontal Antenna

Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m)	Pre-Amp Gain & CBL (dB)	DCF (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.544	V	310.2	315.5	20.73	21.97	23.90	10.46	29.26	40.00	-10.74
34.359	V	62.1	205.8	21.58	19.68	23.50	10.46	28.22	40.00	-11.78
36.538	V	93.3	241.3	22.15	17.88	23.79	10.46	26.70	43.50	-16.80
51.794	V	333.7	100.0	28.42	11.58	23.70	10.46	26.76	43.50	-16.74
121.810	V	292.3	299.7	20.48	16	22.76	10.46	24.18	43.50	-19.32
129.984	V	130.1	147.3	22.76	15.6	22.63	10.46	26.19	43.50	-17.31

Table 18. Spurious Emissions Above 30MHz, Out of Band, Vertical Antenna

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: Radiated Emissions				Test Date(s):	06/21/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
9 kHz - 30 MHz					
1A1083	Test Receiver	Rohde & Schwarz	ESU40	10/12/2021	10/12/2022
1A1088	Preamplifier	Rohde & Schwarz	TS-PR1	See Note	
1A1050	Bi-Log Antenna	Schaffner	CBL 6112D	12/01/2020	12/01/2022
1T9586	Active Loop Antenna	ETS-Lindgren	6502	06/01/2021	12/01/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1073	Multi Device Controller	ETS EMCO	2090	See Note	
1A1106	10 M Semi-Anechoic Chamber (NSA)	ETS - Lindgren	04X07	01/06/2022	01/06/2025
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 19. Spurious Emissions Test Equipment List

Electromagnetic Compatibility Criteria for Intentional Radiators

Frequency Stability

Test Requirement(s):

15.225(e) The frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

RSS-210 (B.6.b) The frequency tolerance of the carrier signal shall be maintained within +/-0.01% (± 100 ppm) of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure: Measurements are in accordance with section 6.8 of ANSI C63.10. The EUT was placed in the Environmental Chamber and allowed to reach desired temperature. A spectrum analyzer was used to measure the frequency drift. The EUT was set to transmit in the operating frequency range. Frequency drift was investigated for the extreme temperatures and nominal temperature, until the unit is stabilized then recorded the reading in tabular format with the temperature range of -20º to 50ºC.

Test Results: The EUT was compliant with Part 15.225 (e) and RSS-210 (B.6.b) requirement(s) of this section.

Test Engineer(s): Sergio Gutierrez

Test Date(s): 06/23/2022 – 06/24/2022

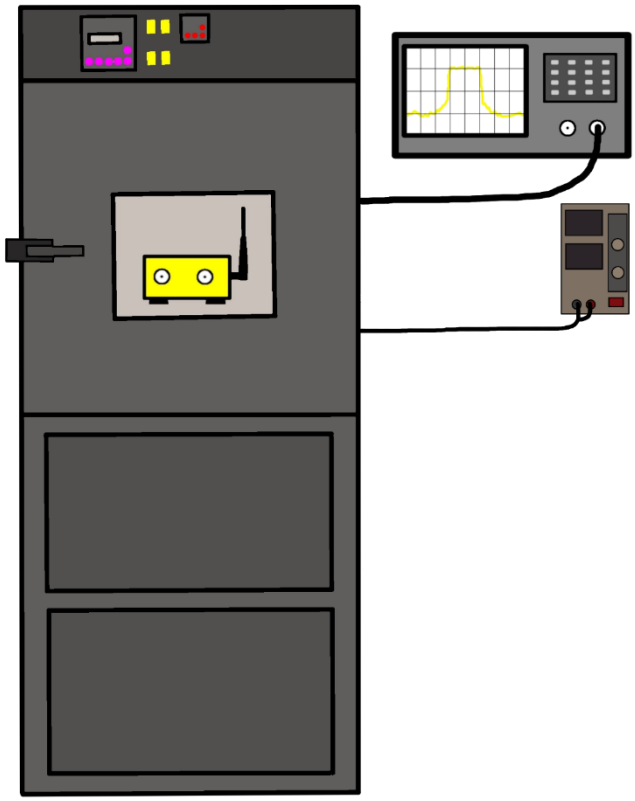
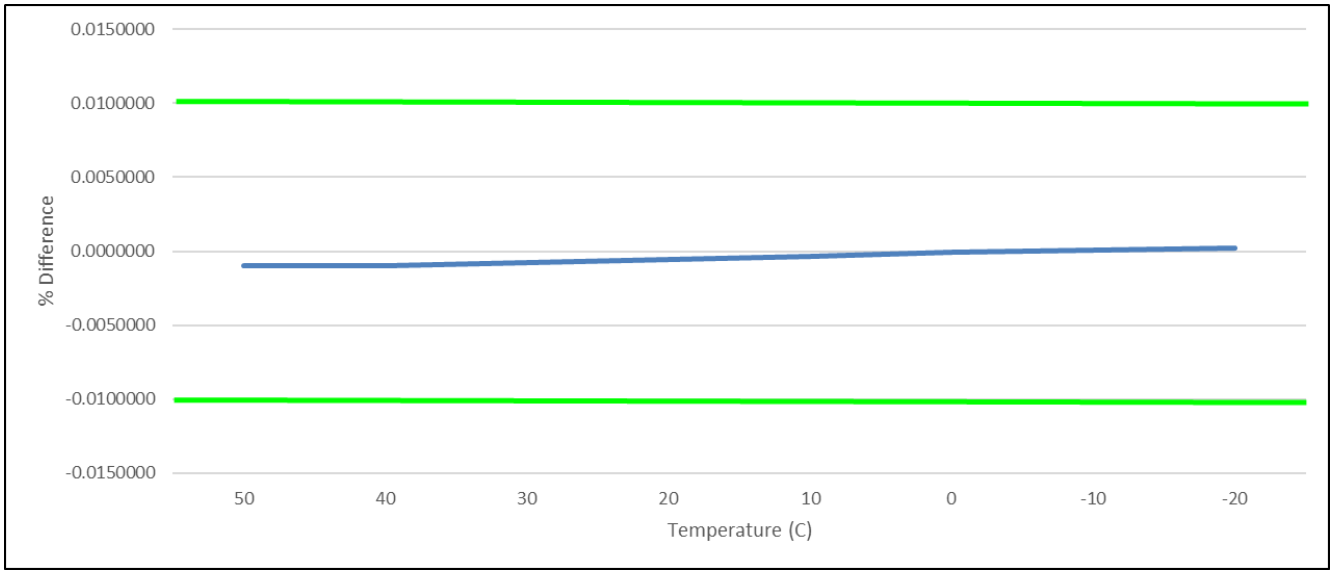


Figure 6. Temperature Stability Test Setup

FCC 15.225 (e)	120VAC 60Hz				
Voltage Variation (%)	**Temperature (°C)**	**Nominal Freq (MHz)**	**Result (MHz)**	**% Difference**	**Limit**
V_{NOM}	50	13.56	13.55986230	-0.0010155	**±0.01%**
	40	13.56	13.55986980	-0.0009602	
	30	13.56	13.55989120	-0.0008024	
	20	13.56	13.55992740	-0.0005354	
	10	13.56	13.55995640	-0.0003215	
	0	13.56	13.55999250	-0.0000553	
	-10	13.56	13.56001420	0.0001047	
	-20	13.56	13.56002870	0.0002117	
15	20	13.56	13.55992740	-0.0005354	
-15	20	13.56	13.55993470	-0.0004816	

Table 20. Frequency Stability, Test Results



Plot 13. Frequency Stability vs Temperature

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: Frequency Stability				Test Date(s):	06/23/2022 – 06/24/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
9 kHz - 30 MHz					
1T9586	Active Loop Antenna	ETS-Lindgren	6502	06/01/2021	12/01/2022
3A3009	Programable Power Supply	KIKUSUI	PCR2000L	See Note	
1A1234	Spectrum Analyzer	Rohde & Schwarz	FSV 40	01/20/2022	01/20/2023
1A1225	Environmental Chamber	Espec	EXP-2H/New	03/18/2022	03/18/2023
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Figure 7. Frequency Stability Test Equipment List

End of Report