Testing Tomorrow's Technology

Application

For

Title 47 USC Part 2, Subpart J, Paragraph 2.907 Equipment Authorization of Certification for an Intentional Radiator per Part 15, Subpart C, Paragraphs 15.207 and 15.209

And

Industry Canada, Radio Standards Specifications: RSS Gen (I5) and RSS-216 (I2)

For the

Aro Technology, Inc

ARO

Model: ARO5-001

FCC ID: 2A7ZV-ARO5-001
IC: 28625-ARO5-001

Issue Date: August 31, 2022

Test Dates: August 8-15, 2022

UST Project No.: 22-0212

Total Pages in This Report: 34

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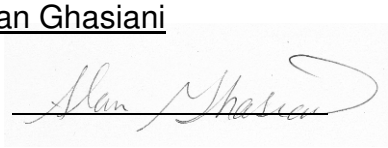
Testing Tomorrow's Technology

I, Alan Ghasiani, certify that I am authorized to sign for the Test Agency and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

US TECH (Agent Responsible For Test):

Name: Alan Ghasiani

Signature: 

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MEASUREMENT TECHNICAL REPORT

COMPANY NAME: Aro Technology, Inc
MODEL: ARO5-001
FCC ID: 2A7ZV-ARO5-001
IC ID: 28625-ARO5-001
ISSUE DATE: August 31, 2022

This report concerns (check one):
☒Supply Declaration of Conformity ☐Certification

Equipment type: Wireless Power Transfer device

Transmitter details:
Frequency of operation: 110 kHz to 145 kHz
Type of modulation: FSK, ASK
Data/Bit Rate: N/A
Antenna Gain: N/A, integral coil antenna
Charging Power: 15W max
Software used to program EUT: ESP32_RF_TEST
EUT firmware number: V1.3.9
Power setting: Maximum setting

Summary of Test Results

FCC & ISED Rule	Description of Test	Result
RSS-Gen 6.7	99% Occupied Bandwidth	PASS
15.209 & RSS-Gen 6.13	Spurious Radiated Emissions	PASS
ISED-001, CISRP 11	Spurious Radiated Emissions	PASS
15.207 & RSS-Gen 8.8, ISED-001, CISPR 11	Power line Conducted Emissions	PASS

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1 General Information

1.1 Purpose of this Report

This report is prepared as a means of conveying test results and information concerning the suitability of this exact product for public distribution according to the FCC Rules and Regulations Part 15, Sections 207 and 209, and IC RSS 210 Issue 10.

1.2 Characterization of Test Sample

The sample used for testing was received by US Tech on March 3, 2022 in good operating condition.

1.3 Product Description

The Equipment under Test (EUT) is the Aro Technology, Inc. Model ARO5-001. The ARO5-001 is a smart box which consumers place their mobile devices into to facilitate mindful phone use, family, and focus time away from devices. A consumer would place their iPhone into the box and close the lid. Using Bluetooth Low Energy, the mobile application connects to the Aro smart box to track usage time. The EUT also has a wireless charging pad that allows the user to charge one smart phone at a time. Optionally, the consumer can use the USB-C ports available in the box to charge their iPhone while they are away from them.

The EUT operates either on an AC/DC adaptor operates with an input of 100-240V, 50/60Hz, and 1A max and output of 12V, 3A.

1.4 Configuration of Tested System

The Test Sample was tested per *ANSI C63.4:2014, Methods of Measurement of Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (2014)* for FCC subpart B Unintentional Radiators requirements and per *ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices* for FCC subpart C Intentional Radiators.

A list of EUT and Peripherals is found in Table 1 below. A test configuration diagram of the tested system is shown in Figure 1. Test configuration photographs are provided in separate appendices.

1.5 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA 30004. This site has been fully described and registered with the FCC. Its designation number is US5301. Additionally, this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number 9900A-1.

1.6 Related Submittals

The EUT is subject to the additional following FCC authorizations:

a) SDoC under Section 15 Subpart B as an Unintentional Radiator; this report is provided under separate cover.

Table 1. EUT and Peripherals

EUT/ MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC/ IC ID	CABLES P/D
EUT/ Aro Technology, Inc.	ARO5-001	Engineering Sample	(Pending) FCC ID: 2A7ZV-ARO5-001 IC: 28625-ARO5-001	P
PERIPHERAL/ MANUFACTURER	**MODEL NUMBER**	**SERIAL NUMBER**	**FCC/ IC ID**	**CABLES P/D**
iPhone 7	MN9E2LL/A	F4GT8JJBHG7G	FCC ID: BCG-E3091A	P
iPhone 12 Pro Max	MGCF3LL/A	F2LF9PTE0D3Y	FCC ID: BCG-E3548A	P
iPhone 12 Mini	MG8J3LL/A	F4GDMA8N0GRG	FCC ID: BCG-E3539A	P
iPhone 11	MWGF2LL/A	FK1ZCDYZN10C	FCC ID: BCG-E3309A	P
AC Adaptor Tensility International Corporation	TSAA3601A-1203000US	16-00217	N/A	p
AC Adaptor Channel Well Technology	2AEC054F	Engineering Sample	N/A	P
Laptop Hewlett-Packard	15-da0012dx	CND8397BJW	FCC ID: TX2-RTL8723DE IC: 6317A-RTL8723DE	P/D
Antenna See antenna details	--	--	--	--

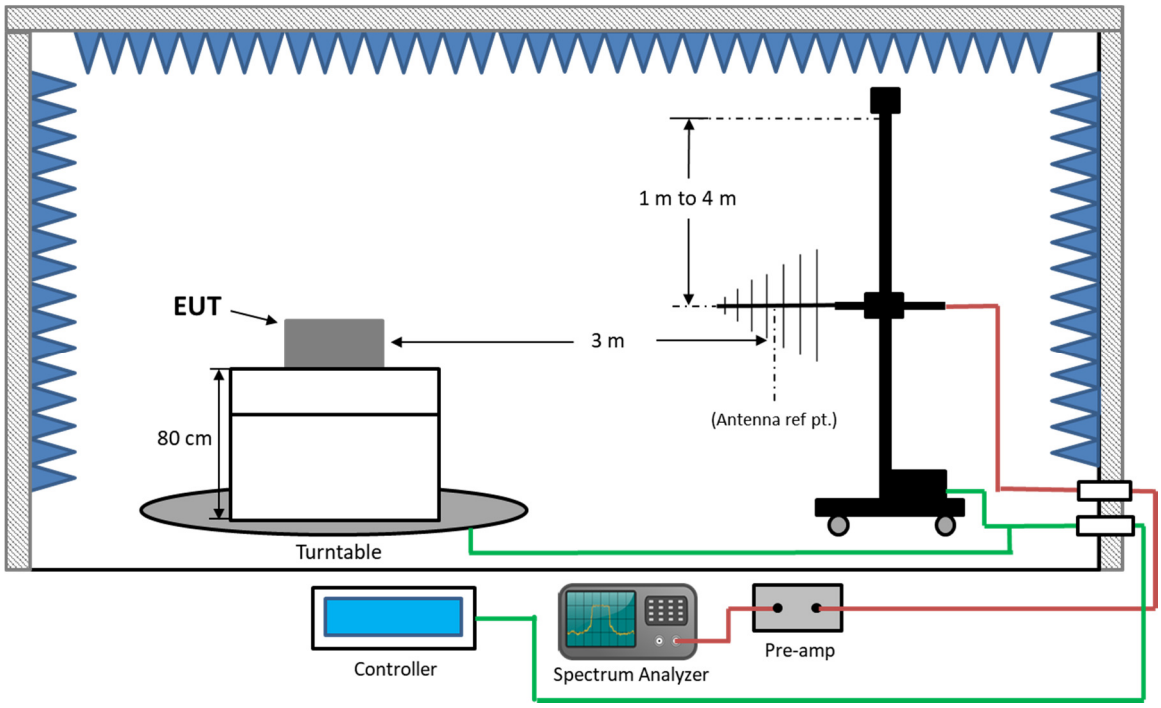


Figure 1. EUT Test Configuration – Radiated Emissions

2 Tests and Measurements

2.1 Test Equipment

The table below lists test equipment used to evaluate this product. Model numbers, serial numbers and their calibration status are indicated.

Table 2. Test Instruments

TEST INSTRUMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
Spectrum Analyzer	Agilent	E4407B	US41442935	9/2/2022 2 yr.
Spectrum Analyzer	Rigol	DSA815	DSA8A180300 138	1/6/2024 2 yr.
Spectrum Analyzer	Hewlett-Packard	8593E	3205A00124	2/28/2024 2 yr.
Rf Preamp 100 kHz To 1.3 GHz	Hewlett-Packard	8447D	1937A02980	6/9/2023
Preamp 1.0 GHz To 26.0 GHz	Hewlett-Packard	8449B	3008A00914	2/11/2023
Loop Antenna	ETS Lindgren	6502	9810-3246	Calibrated before use
Biconical Antenna	EMCO	3110B	9306-1708	8/17/2023 2 yr.
Log Periodic Antenna	EMCO	3146	9305-3600	12/13/2023 2 yr.
Horn Antenna	EMCO	SAS-571	605	4/28/2024 2 yr. (extended)
High Pass Filter	Microwave Chircuits	H3R020G2	001DC9528	8/1/2023
LISN X 2	Solar Electronics	9247-50-TS-50-N	955824 and 955825	2/8/2023

Note: The calibration interval of the above test instruments are 12 months unless stated otherwise and all calibrations are traceable to NIST/USA.

2.2 Modifications to EUT Hardware

No modifications were made to the EUT during testing.

2.3 Number of Measurements for Intentional Radiators (15.31(m))

Measurements of intentional radiators or receivers shall be performed and reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in Table 3 below.

Table 3. Number of Test Frequencies for Intentional Radiators

Frequency Range over which the device operates	Number of Frequencies	Location in the Range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near the top 1 near the bottom
Greater than 10 MHz	3	1 near top 1 near middle 1 near bottom

2.4 Frequency Range of Radiated Measurements (Part 15.33)

2.4.1 Intentional Radiator

The spectrum shall be investigated for the intentional radiator from the lowest RF signal generated in the EUT, without going below 9 kHz to the 10th harmonic of the highest fundamental frequency generated or 40 GHz, whichever is the lowest.

2.4.2 Unintentional Radiator

For the digital device, an unintentional radiator, the frequency range shall be 30 MHz to 1000 MHz, or to 5 times the highest internal clock frequency.

2.5 Measurement Detector Function and Bandwidth (CFR 15.35)

The radiated and conducted emissions limits shown herein are based on the parameters described in the following sections.

2.5.1 Detector Function and Associated Bandwidth

On frequencies below 1000 MHz, the limits herein are based upon measurement equipment employing a CISPR Quasi-peak detector function and related measurement bandwidths (i.e., 9 kHz from 150 kHz to 30 MHz and 120 kHz from 30 MHz to 1000 MHz). Alternatively, measurements may be made with equipment employing a peak detector function as long as the same bandwidths specified for the quasi-peak device are used.

2.5.2 Corresponding Peak and Average Requirements

Above 1000 MHz, radiated limits are based on measuring instrumentation employing an average detector function. When average radiated emissions are specified, there is also a corresponding Peak requirement, as measured using a peak detector, of 20 dB greater than the average limit. For all measurements above 1000 MHz the Resolution Bandwidth shall be at least 1 MHz

2.5.3 Pulsed Transmitter Averaging

When the radiated emissions limit is expressed as an average value, and the transmitter is pulsed, the measured field strength shall be determined by applying a Duty Cycle Correction Factor based upon dividing the total ON time during the first 100 ms period by 100 ms (or by the period if less than 100 ms). The duty cycle may be expressed logarithmically in dB.

NOTE: If the transmitter was programmed to transmit at >98% duty cycle, then, wherever applicable (where the detection mode was AVG) the duty cycle factor calculated will be applied.

2.6 EUT Antenna Requirements (CFR 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. Only the antenna(s) listed in Table 4 will be used with this module.

Table 4. Allowed Antenna(s)

REPORT REFERENCE	MANUFACTURER	TYPE OF ANTENNA	MODEL	GAIN dB_i	TYPE OF CONNECTOR
Antenna	Wurth Electronic or equivalent	Coil	760308103102	--	solder

2.7 Restricted Bands of Operation (Part 15.205)

Only spurious emissions can fall in the frequency bands of CFR 15.205. The field strength of these spurious emissions cannot exceed the limits of 15.209. Radiated Harmonics and other Spurious Emissions are examined for this requirement; see paragraph 2.1.

2.8 Intentional Radiator, Power Line Conducted Emissions (CFR 15.207)

Power line conducted emissions testing was performed to ensure that with the EUT in operation (exercising all transmitter functions), the complete system continues to meet the applicable requirements for CFR 15.207. Results are displayed along with the 15.107 power line test data in the sections below.

2.9 Intentional Radiator, Radiated Emissions (CFR 15.209, (IC RSS 210))

Radiated Radio measurements: The EUT was placed into a continuous transmit mode of operation with an on time of 100 ms and a down time of 300 ms . A preliminary scan was performed on the EUT to find signal frequencies that were caused by the transmitter part of the product. To obtain the worst-case results, the EUT was placed on a table top of a non-conductive table, 80 cm above the ground floor. The EUT was positioned 3 meters away from the receiving antenna during testing (1 meter at frequencies above 6 GHz and if the emissions were less than 6 dB from the noise floor). The EUT was tested in X, Y and Z axes or the position of normal operation to determine the worst-case orientation. Radiated measurements below 30 MHz were tested with a RBW = 9 kHz; emissions below 1 GHz were tested with a RBW = 120 kHz and radiated measurements above 1 GHz were measured using a RBW =1 MHz VBW was set to three times the RBW value.

For radiated emissions, any emission that was greater than 20 dB from the applicable limit was not recorded. If radiated emissions above 1 GHz were measured at a distance of 1 meter, the measured value at 1 meter was extrapolated to the results at 3 meters using an inverse distance extrapolation factor of -20 dB/decade. Results are displayed along with the 15.109 test data in the sections below.

2.10 99% Occupied Bandwidth (RSS Gen, 6.7)

According to RSS-Gen, 6.7: 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.

The EUT tested in operational mode (No smart phone present). This mode of allows the EUT to transmit two signals, the charging signal and the communication/charge status signal. Both signals are evaluated and results presented below.

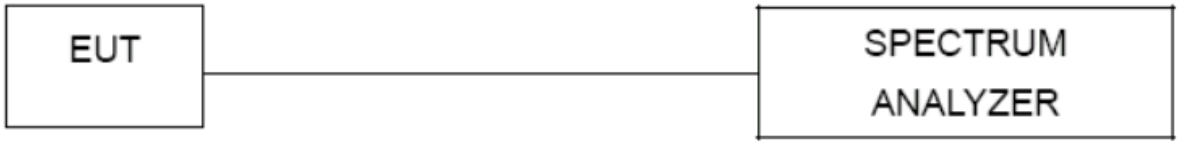
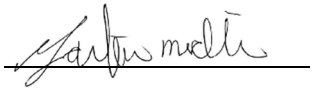


Figure 2. Conducted Bench measurement

Table 5. 99% Occupied Bandwidth

Frequency (kHz)	99% Occupied Bandwidth (kHz)
110.00	17.25
145.00	0.45

Test Date: August 12, 2022
Tested By:

Signature:  Name: Gabriel Medina

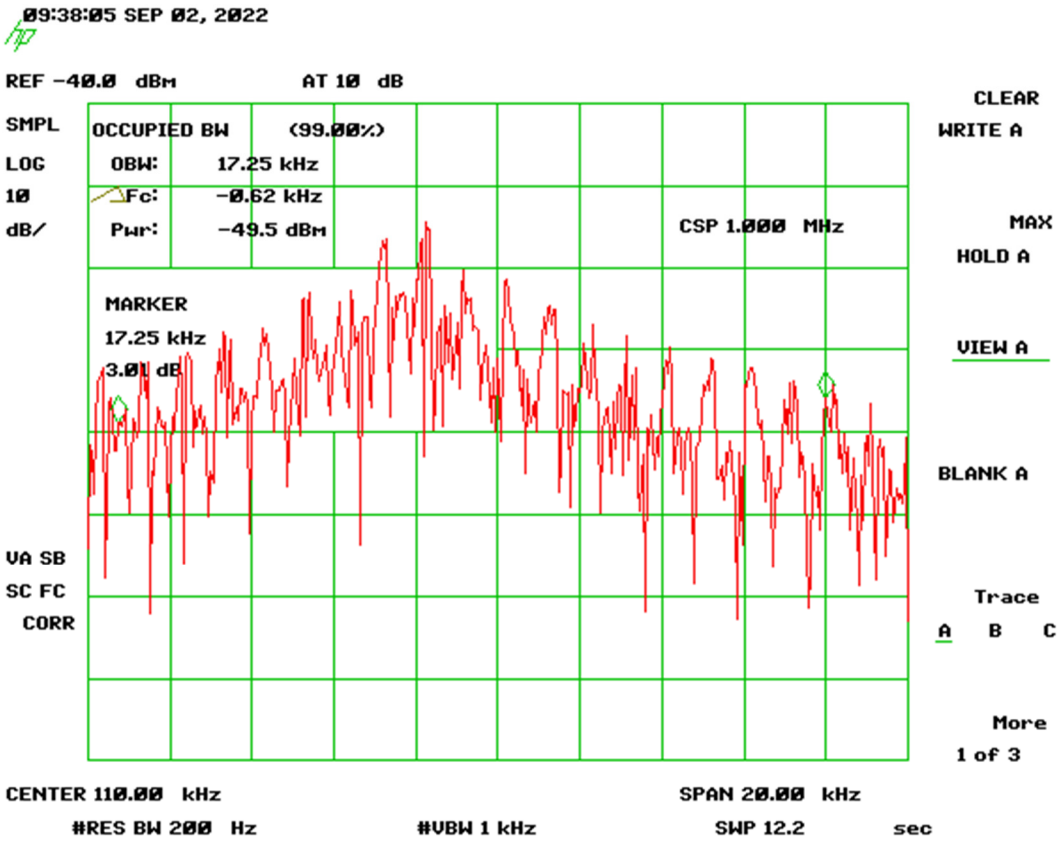


Figure 3. 99% Occupied Bandwidth, 110 kHz

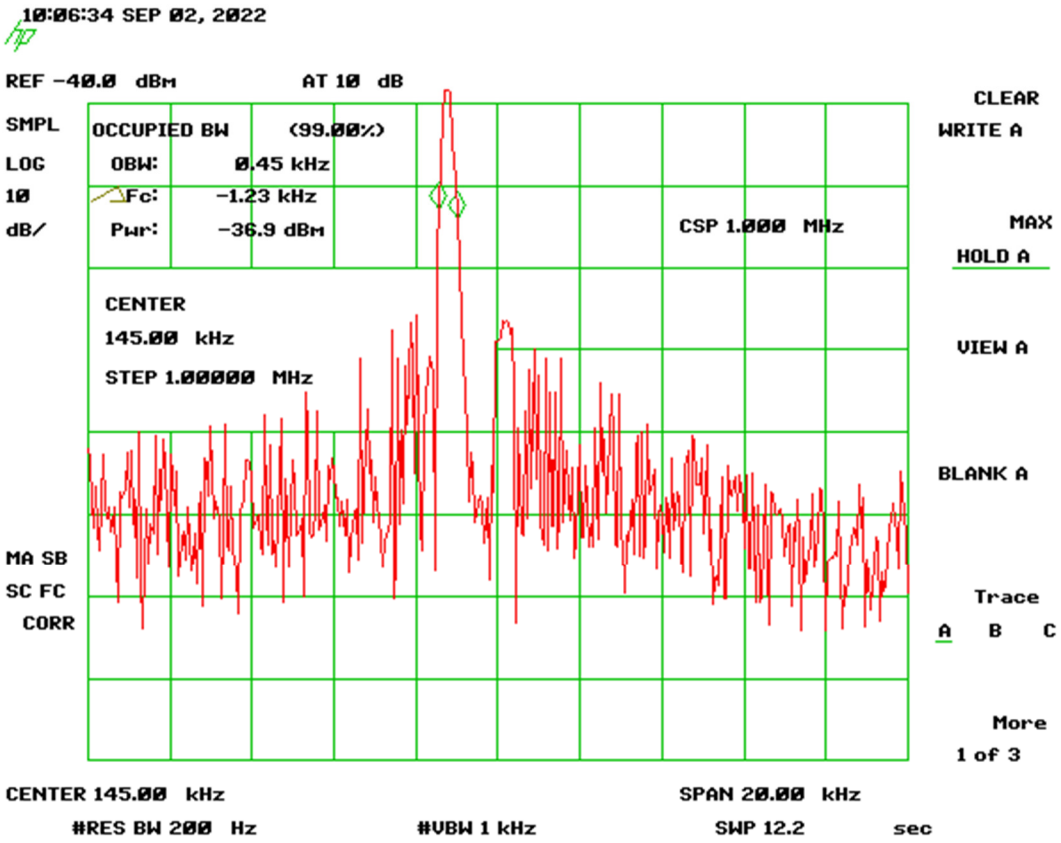


Figure 4. 99% Occupied Bandwidth, 145 kHz

2.11 Conducted Emissions Test Data (CFR 15.207, RSS-216 (6.2.2.1))

The worst-case line conducted emission for the EUT occurs when the EUT is operating in typical operation with smart phones populated and one smart phone charging on the wireless charging pad. The worst case emission was 2.2 dB below the limit at .4522 MHz on the phase lead. All other conducted emissions were at least 10.8 dB below the FCC Part 15 Class B limits. This worst-case emission is found in table 4.

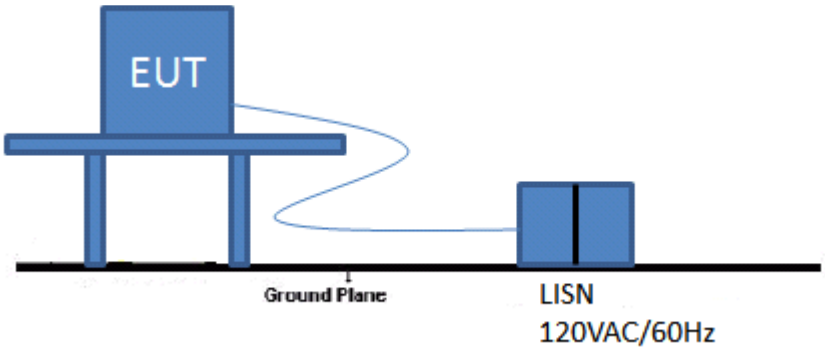


Figure 5. Powerline conducted Test Setup

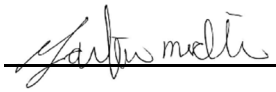
Table 6. Power Line Conducted Emissions

150KHz to 30MHz with 15.207 Limits						
Frequency (MHz)	**Test Data (dBuv)**	**LISN+CL-PA (dB)**	**Results (dBuV)**	**AVG Limits (dBuV)**	**Margin (dB)**	**Detector PK, QP, or AVG**
Phase @ 120 Vac / 60Hz						
0.1500	58.35	0.08	58.43	66.0*	7.6	**PK**
0.1500	38.32	0.08	38.40	56.0	17.6	**AVG**
2.4430	51.07	0.07	51.14	56.0*	4.9	**PK**
2.4430	24.38	0.07	24.45	46.0	21.6	**AVG**
10.2080	44.71	0.55	45.26	50.0	4.7	**PK**
Neutral @ 120 Vac / 60Hz						
0.1523	57.90	0.13	58.03	65.9*	7.8	**PK**
0.1523	38.75	0.13	38.88	55.9	17.0	**AVG**
0.5975	41.81	0.51	42.32	56.0*	13.7	**PK**
0.5975	30.29	0.51	30.80	46.0	15.2	**AVG**
9.7500	40.83	0.61	41.44	50.0	8.6	**PK**

Note: (*) Indicates that the limit used is Quasi-Peak (QP)

Sample Calculation at 0.150 MHz:

Magnitude of Measured Frequency	58.35	dBuV
+Correction Factors	0.08	dB
Corrected Result	58.43	dBuV

Test Date: August 5-8, 2022
Tested by
Signature:  Name: Gabriel Medina

2.12 Intentional Radiator, Spurious Radiated Emissions (CFR 15.209, RSS-216 (6.2.2.2))

Radiated emissions disturbance measurements were performed with EUT both in operational mode with and without a smart phone being wirelessly charged. The worst emissions levels are presented below. An instrument having both peak and quasi-peak detectors was used over the frequency range of 9 kHz to 1 GHz. Measurements of the radiated emissions were made with the receiver antenna at a distance of 3 m from the boundary of the test unit.

The antenna polarization and test sample azimuth were varied during the measurements to find the maximum field strength readings to record.

2.13 Radiated Emission Limits

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following tables:

Table 7. FCC Part 15.209(a)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

Table 8. ICES-001 and CISPR 11

Frequency Range (MHz)	Limits for a measuring distance D in m				
	Electric field				Magnetic Field
	D = 10 m		D = 3 m[b]		D = 3 m
	Quasi-peak	Average[a]	Quasi-peak	Average[a]	Quasi Peak (dB uA/m)
CISPR 11, Class B, Group 2					
0.009 to 0.070	--	--	--	--	69
0.070 to 0.1485	--	--	--	--	69 decreasing linearly with the logarithm of frequency to 39
0.1485 to 4.0	--	--	--	--	39 decreasing linearly with the logarithm of frequency to 3
4.0 to 30.0	--	--	--	--	3
CISPR 11, Class B, Group 2					
30-80.872	30	25	40	35	--
80.872-81.848	50	45	60	55	--
81.848-134.786	30	25	40	35	--
134.786-136.414	50	45	60	55	--
136.414-230	30	25	40	35	--
230-1000	37	32	47	42	--
On a test site, class B equipment can be measured at a nominal distance of 3m or 10m. In the frequency range 30 MHz to 1 GHz, a measuring distance less than 10m is allowed for equipment which complies with the following definition: Equipment either positioned on a table top or standing on the floor which, including its cables fits in an imaginary cylindrical test volume of 1.2m diameter and 1.5m height. Such equipment is defined as small size equipment.					
Note “a”= The average limits apply to magnetron driven equipment and microwave ovens only. If magnetron driven equipment or microwave oven exceed the quasi-peak limit at certain frequencies, then the measurement shall be repeated at these frequencies with the average detector and the average limits specified in this table apply.					
Note “b”= In the frequency range 30 MHz to 1 GHz, the 3m separation distance applies only to small size equipment meeting the size criterion defined above.					

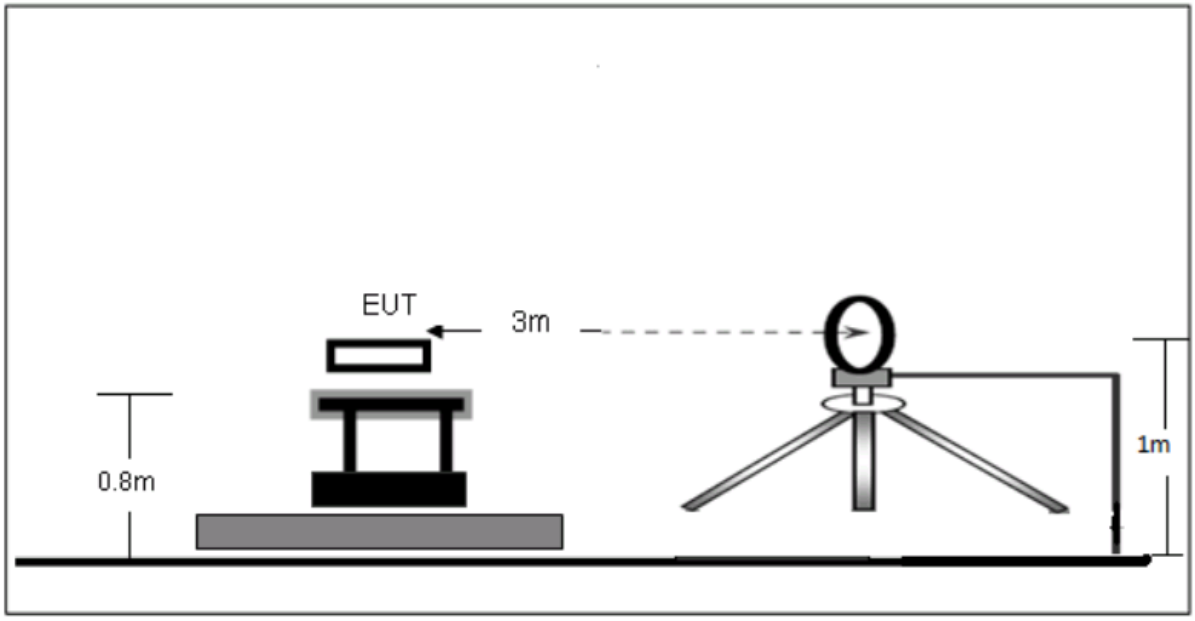


Figure 6. Test Configuration below 30 MHz

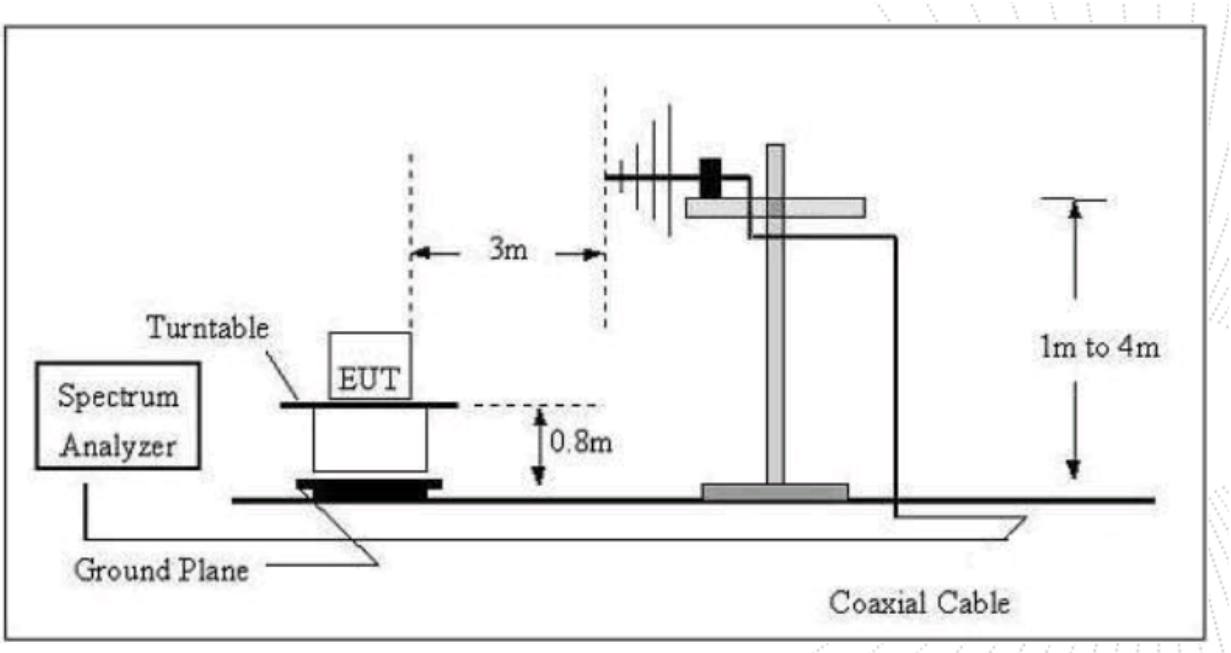


Figure 7. Test Configuration below 1000 MHz

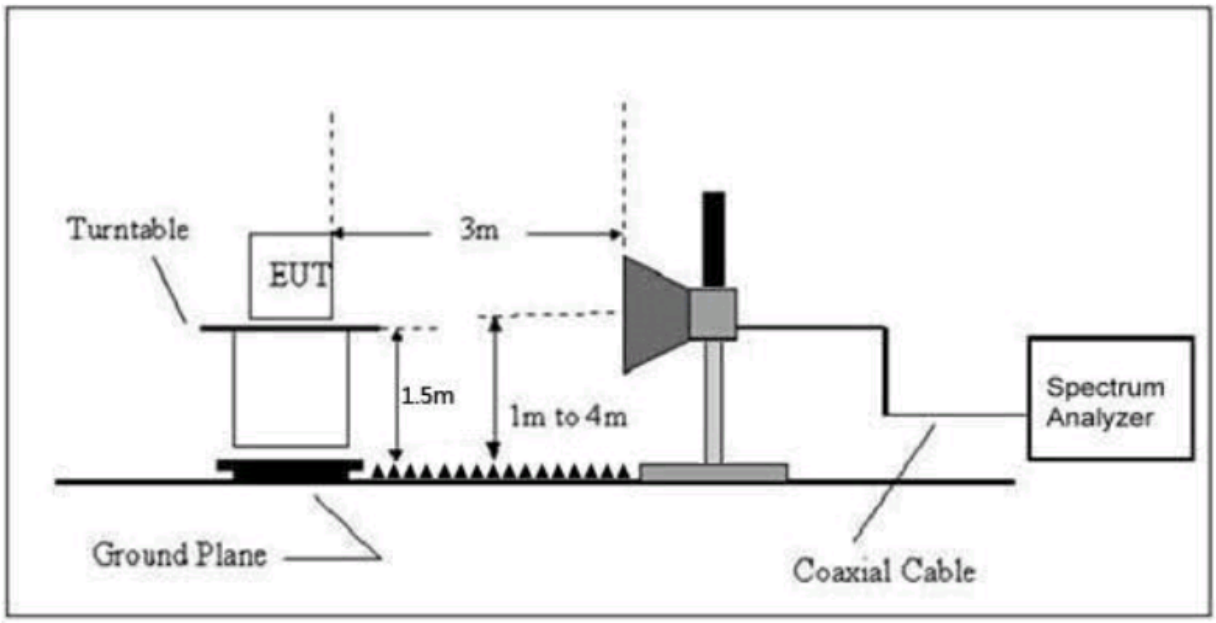


Figure 8. Test Configuration above 1000 MHz

2.14 Spurious Radiated Emissions

2.14.1 Spurious Radiated Emissions below 30 MHz

Table 9. Radiated Emissions 9 kHz to 30MHz (15.209)

Test: FCC Part 15, Part 15.209							
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector Mode**
Loop X							
EUT Charging							
0.145	53.57	12.38	65.95	104.4	m./meters.	38.5	**PK**
0.150	54.81	12.17	66.98	104.0	m./meters.	37.0	**PK**
0.570	37.53	11.67	49.20	72.5	m./meters.	23.3	**PK**
2.600	32.47	11.35	43.82	69.5	m./meters.	25.7	**PK**
EUT in operational mode							
0.110	41.82	12.38	54.20	106.8	m./meters.	52.6	**PK**
0.145	74.21	12.38	86.59	104.4	m./meters.	17.8	**PK**
Loop Y							
EUT Charging							
0.145	53.98	12.38	66.36	104.4	m./meters.	38.0	**PK**
0.150	52.91	12.17	65.08	104.0	m./meters.	39.0	**PK**
0.550	37.52	11.59	49.11	72.8	m./meters.	23.7	**PK**
3.030	31.03	11.06	42.09	69.5	m./meters.	27.5	**PK**
EUT in Operational mode							
0.110	45.78	12.37	58.15	106.4	m./meters.	48.3	**PK**
0.145	69.83	12.38	82.21	104.4	m./meters.	22.2	**PK**
Loop Z							
EUT Charging							
0.110	47.82	12.37	60.19	106.7	m./meters.	46.5	**PK**
0.150	51.55	12.17	63.72	104.1	m./meters.	40.4	**PK**
0.600	37.03	11.53	48.56	72.0	m./meters.	23.5	**PK**
2.600	32.08	11.35	43.43	69.5	m./meters.	26.1	**PK**
EUT in Operational mode							
0.110	44.58	12.38	56.96	106.9	m./meters.	49.9	**PK**
0.145	66.36	12.38	78.74	104.4	m./meters.	25.7	**PK**
All emission were more than 20 dB below the applicable limit.							

Sample Calculation at 0.110 MHz:

Magnitude of Measured Frequency	44.58	dBuV
+ Antenna Factor + Cable Loss - Amplifier Gain	12.38	dB/m
Corrected Result	56.96	dBuV/m

Test Date: August 11, 2022
Tested By:

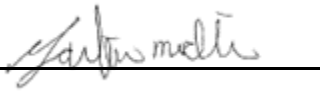
Signature:  Name: Gabriel Medina

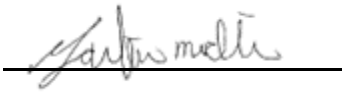
Table 10. Radiated Emissions 9 kHz to 30MHz (CISPR 11, ICES-001)

Test: FCC Part 15, Part 15.209							
Frequency (MHz)	**Test Data (dBuV)**	**AF+CA-AMP (dB/m)**	**Results (dBuA/m)**	**Limits (dBuA/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector Mode**
Charging							
Loop X							
EUT Charging							
0.145	53.57	-39.02	14.55	39.7	m./meters.	25.2	**PK**
0.150	54.81	-39.23	15.58	38.7	m./meters.	23.1	**PK**
0.570	37.53	-39.73	-2.20	14.1	m./meters.	16.3	**PK**
2.600	32.47	-40.15	-7.68	4.5	m./meters.	12.1	**PK**
EUT in operational mode							
0.110	41.82	-39.02	2.80	49.0	m./meters.	46.2	**PK**
0.145	74.21	-39.02	35.19	39.7	m./meters.	4.5	**PK**
Loop Y							
EUT Charging							
0.145	53.98	-39.02	14.96	39.7	m./meters.	24.8	**PK**
0.150	52.91	-39.23	13.68	38.7	m./meters.	25.0	**PK**
0.550	37.52	-39.81	-2.29	14.4	m./meters.	16.7	**PK**
3.030	31.03	-40.34	-9.31	4.0	m./meters.	13.3	**PK**
EUT in Operational mode							
0.110	45.78	-39.03	6.75	49.0	m./meters.	42.2	**PK**
0.145	69.83	-39.02	30.81	39.7	m./meters.	8.9	**PK**
Loop Z							
EUT Charging							
0.110	47.82	-39.03	8.79	39.7	m./meters.	30.9	**PK**
0.150	51.55	-39.23	12.32	38.7	m./meters.	26.4	**PK**
0.600	37.03	-39.87	-2.84	13.5	m./meters.	16.4	**PK**
2.600	32.08	-40.15	-8.07	4.4	m./meters.	12.5	**PK**
EUT in Operational mode							
0.110	44.58	-39.02	5.56	49.0	m./meters.	43.4	**PK**
0.145	66.36	-39.02	27.34	39.7	m./meters.	12.4	**PK**
All emission were more than 20 dB below the applicable limit.							

Sample Calculation at 0.110 MHz:

Magnitude of Measured Frequency	44.58	dBuV
+ Antenna Factor + Cable Loss - Amplifier Gain	-39.02	dB/m
Corrected Result	27.34	dBuV/m

Test Date: August 11, 2022
Tested By:

Signature:  Name: Gabriel Medina

2.14.2 Spurious Radiated Emissions above 30 MHz

The EUT was tested to FCC Part 15.209 and ICES-001/CISPR 11 Radiated emissions limits.

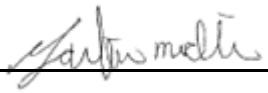
Table 11. Spurious Radiated Emissions (CFR 15.209), 30MHz - 1000MHz

30 MHz to 1000 MHz with Class B Limits							
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**QP Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or QP**
97.68	48.80	-17.54	31.26	43.5	3m./HORZ	12.2	**PK**
181.01	41.44	-12.62	28.82	43.5	3m./HORZ	14.7	**PK**
480.02	46.87	-7.73	39.14	46.0	3m./HORZ	6.9	**PK**
795.38	41.94	-3.42	38.52	46.0	3m./HORZ	7.5	**PK**
987.72	41.53	-2.81	38.72	54.0	3m./HORZ	15.3	**PK**
86.10	51.34	-17.85	33.49	40.0	3m./VERT	6.5	**PK**
181.12	41.87	-11.72	30.15	43.5	3m./VERT	13.4	**PK**
480.08	45.80	-9.13	36.67	46.0	3m./VERT	9.3	**PK**
501.26	42.00	-8.41	33.59	46.0	3m./VERT	12.4	**PK**
833.08	41.95	-4.55	37.40	46.0	3m./VERT	8.6	**PK**

Sample Calculation at 97.68 MHz:

Magnitude of Measured Frequency	48.80	dBuV
+ Antenna Factor + Cable Loss - Amplifier Gain	-17.54	dB/m
Corrected Result	31.26	dBuV/m

Test Date: August 3, 2022
Tested By:

Signature:  Name: Gabriel Medina

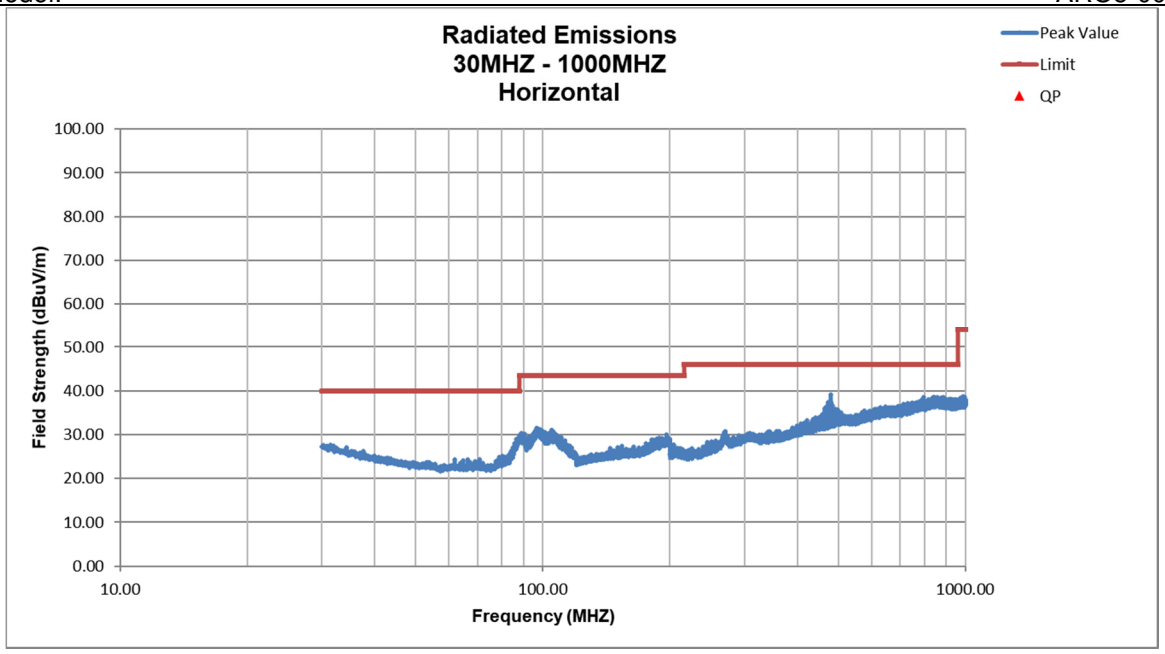


Figure 9. Radiated Emissions, Horizontal 30MHz – 1000MHz

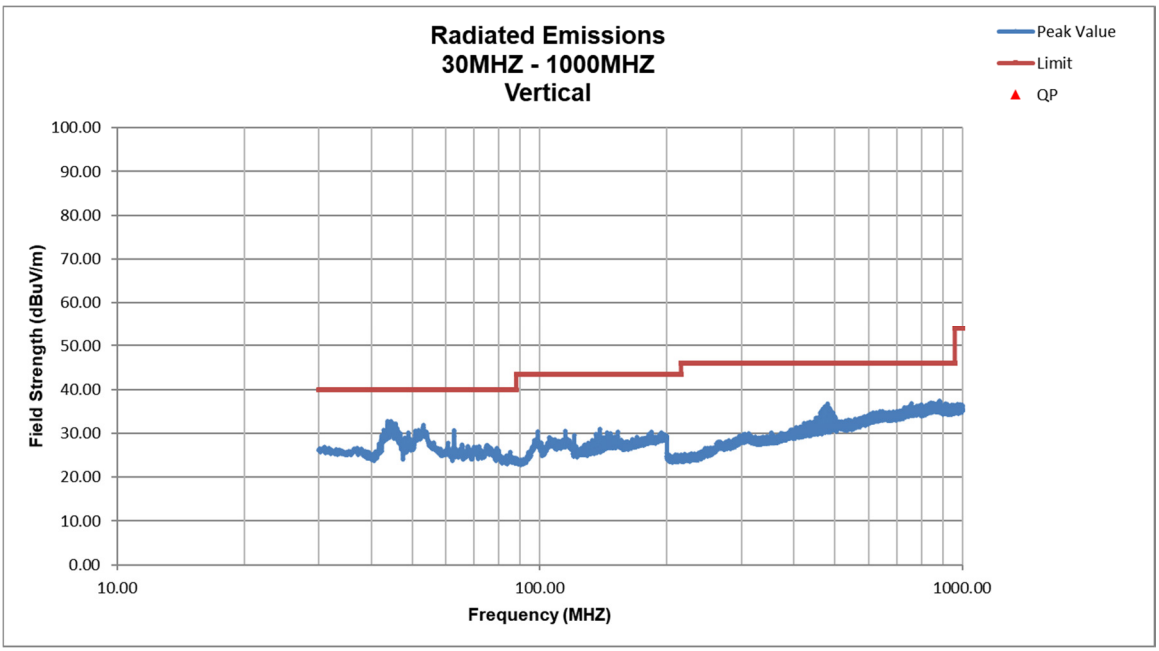
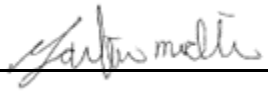


Figure 10. Radiated Emissions, Vertical 30MHz – 1000MHz

Table 12. Spurious Radiated Emissions (CFR 15.209), Above 1000MHz

Above 1000 MHz with Class B Limits							
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**AVG Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or AVG**
2442.00	52.00	-6.31	45.69	54.0	3.0m./HORZ	8.3	**PK**
2442.00	52.00	-6.22	45.78	54.0	3.0m./VERT	8.2	**PK**
All emissions were less than 6 dB above the noise floor beyond 6 GHz.							

Test Date: August 11, 2022
Tested By:

Signature:  Name: Gabriel Medina

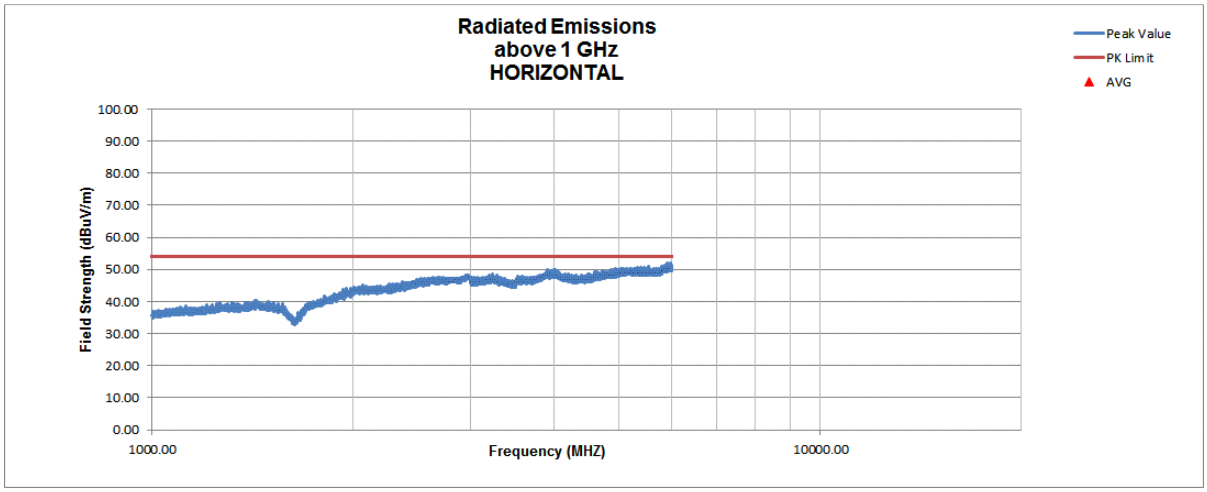


Figure 11. Radiated Emissions, Horizontal above 1 GHz

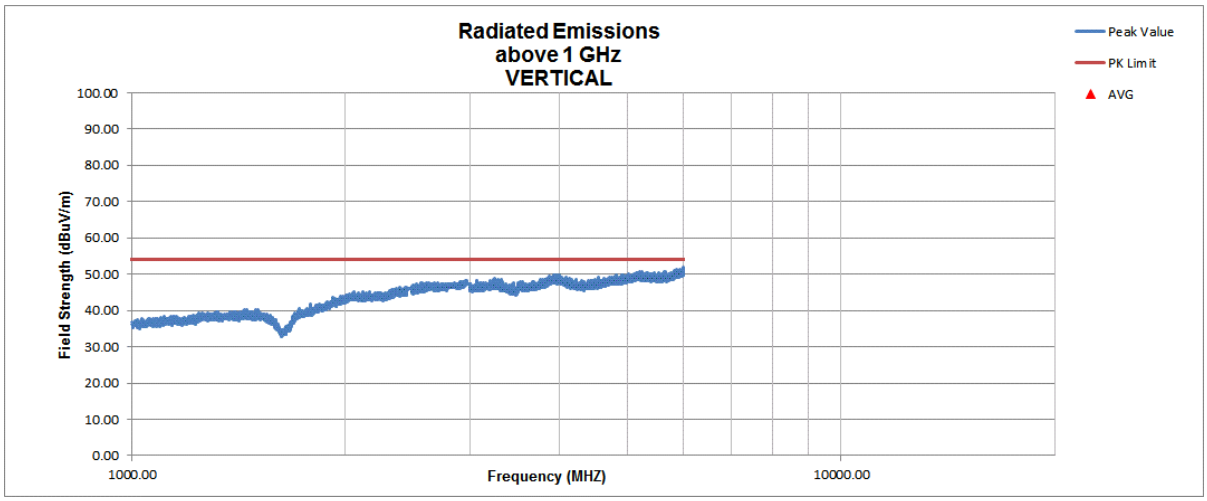


Figure 12. Radiated Emissions, Vertical above 1 GHz

Table 13. Spurious Radiated Emissions (CISPR 11), 30MHz - 1000MHz

30 MHz to 1000 MHz with Class B Limits							
Frequency (MHz)	**Test Data (dBuv)**	**AF+CA-AMP (dB/m)**	**Results (dBuV/m)**	**QP Limits (dBuV/m)**	**Antenna Distance/ Polarization**	**Margin (dB)**	**Detector PK, or QP**
97.68	48.80	-17.54	31.26	40.0	3m./HORZ	8.7	**PK**
181.01	41.44	-12.62	28.82	40.0	3m./HORZ	11.2	**PK**
480.02	46.87	-7.73	39.14	45.0	3m./HORZ	5.9	**PK**
795.38	41.94	-3.42	38.52	45.0	3m./HORZ	6.5	**PK**
987.72	41.53	-2.81	38.72	45.0	3m./HORZ	6.3	**PK**
86.10	51.34	-17.85	33.49	40.0	3m./VERT	6.5	**PK**
181.12	41.87	-11.72	30.15	40.0	3m./VERT	9.9	**PK**
480.08	45.80	-9.13	36.67	45.0	3m./VERT	8.3	**PK**
501.26	42.00	-8.41	33.59	45.0	3m./VERT	11.4	**PK**
833.08	41.95	-4.55	37.40	45.0	3m./VERT	7.6	**PK**

Sample Calculation at 97.68 MHz:

Magnitude of Measured Frequency	48.80	dBuV
+ Antenna Factor + Cable Loss - Amplifier Gain	-17.54	dB/m
Corrected Result	31.26	dBuV/m

Test Date: August 3, 2022
Tested By:

Signature:  Name: Gabriel Medina

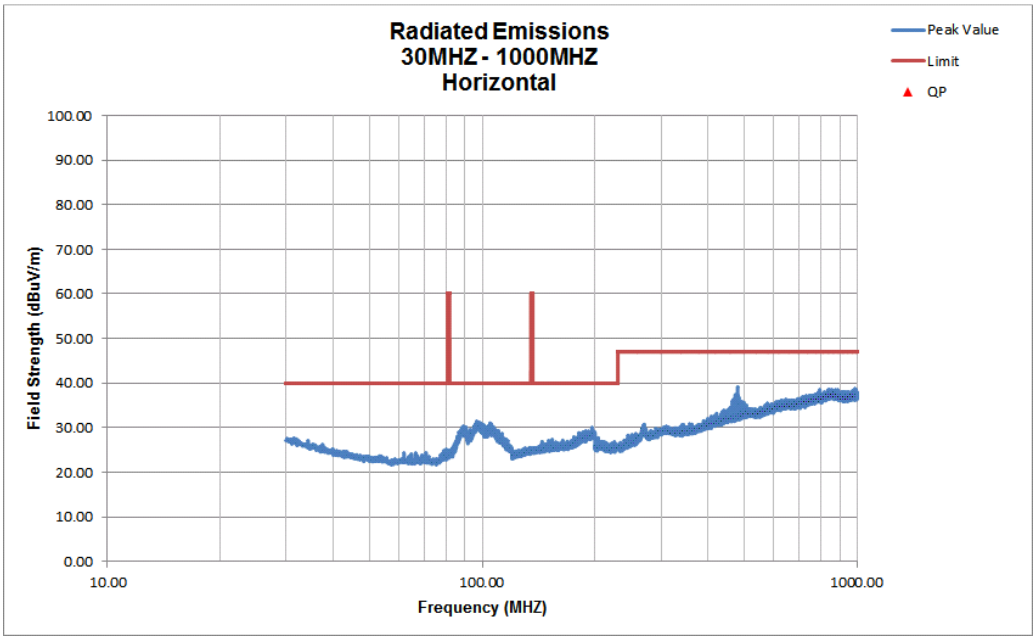


Figure 13. Radiated Emissions, Horizontal 30MHz – 1000MHz

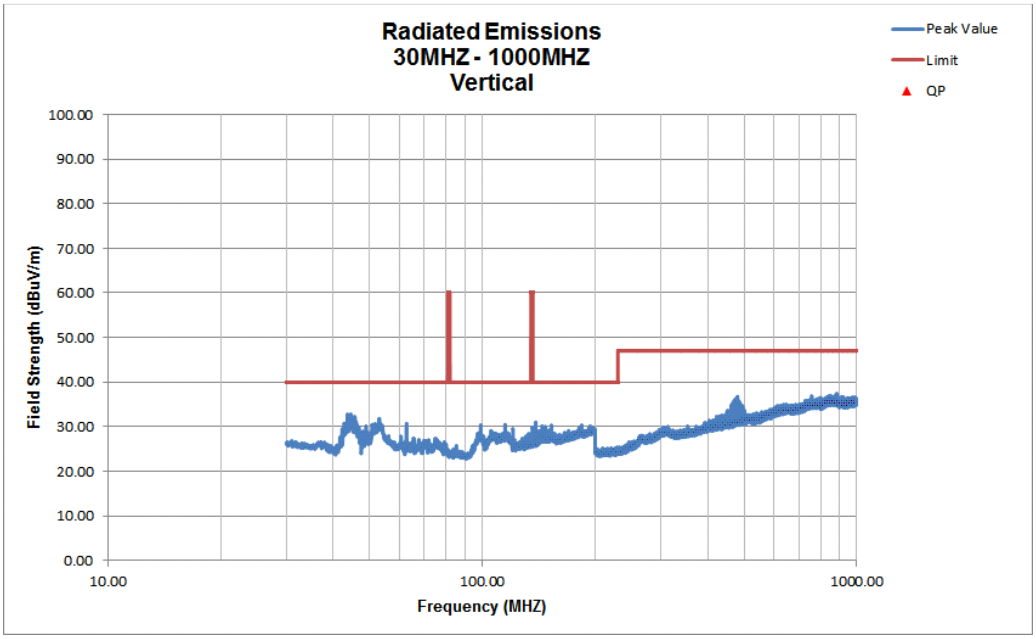


Figure 14. Radiated Emissions, Vertical 30MHz – 1000MHz

2.16 Measurement Uncertainty

The measurement uncertainties given were calculated using the method detailed in CISPR 16-4. A coverage factor of k=2 was used to give a level of confidence of approximately 95%.

2.16.1 Conducted Emissions Measurement Uncertainty

Measurement Uncertainty (within a 95% confidence level) for this test is ± 2.85 dB.

2.16.2 Radiated Emissions Measurement Uncertainty

30 MHz to 200 MHz at 3 m:

The measurement uncertainty (with a 95% confidence level) for this test using a Biconical Antenna is ± 5.40 dB.

200 MHz to 1000 MHz at 3 m:

The measurement uncertainty (with a 95% confidence level) for this test using a Log Periodic Antenna is ± 5.19 dB.

Above 1 GHz at 3 m:

The measurement uncertainty (with a 95% confidence level) for this test using a Horn Antenna is ± 5.08 dB.

3 Conclusions

The EUT meets the requirements of Part 15 C and RSS-216.