TEST REPORT

Report Number: 104449578MPK-003
Project Numbers: G104449578, G104274811
October 27, 2020

Testing performed on the
Mobile-Ready Contactless Smartcard Reader
Model Number: CSB 3500

FCC ID: T8I-CONEKT5
IC: 6504A-CONEKT5

to

FCC Part 15 Subpart C (15.225)
Industry Canada RSS-210 Issue 10
FCC Part 15, Subpart B
Industry Canada ICES-003

For

Farpointe Data, Inc.

Test Performed by:	Test Authorized by:
Intertek	Farpointe Data, Inc.
1365 Adams Court	2195 Zanker Road
Menlo Park, CA 94025 USA	San Jose, CA 95131 USA

Prepared by: _____ **Date:** October 27, 2020
Aaron Chang

Reviewed by: _____ **Date:** October 27, 2020
Krishna Vemuri

Report No. 104449578MPK-003	
Equipment Under Test:	MOBILE-READY CONTACTLESS SMARTCARD READER
Model Number:	CSB 3500
Applicant:	Farpointe Data, Inc.
Contact:	Kirk Bierach
Address:	Farpointe Data, Inc. 2195 Zanker Road San Jose, CA 95131
Country:	USA
Tel. Number:	(408) 731-8700
Email:	kirk.bierach@farpointedata.com
Applicable Regulation:	FCC Part 15 Subpart C (15.247) Industry Canada RSS-247 Issue 2
Date of Test:	March 15 – May 6, 2020 & October 5 – 23, 2020

We attest to the accuracy of this report:

Anderson Soungpanya
Project Engineer

Krishna K Vemuri
EMC Manager

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1.0 Summary of Tests

TEST	REFERENCE FCC 15.225	REFERENCE RSS-210	RESULTS
Field Strength of Fundamental	15.225(a)	B.6	Complies
Radiated Emissions Outside the band	15.225(b), 15.225(c), 15.225(d), 15.209	B.6	Complies
Frequency Tolerance of the Carrier	15.225(e)	B.6	Complies
Line Conducted Emissions	15.207	RSS-GEN	Complies
Occupied Bandwidth	15.215	RSS-GEN	Complies
Antenna requirement	15.203	RSS-GEN	Complies[1]

[1] The EUT utilizes an internal Antenna.

EUT receive date: March 15, 2020

EUT receive condition: The pre-production version of the EUT was received in good condition with no apparent damage. As declared by the Applicant, it is identical to the production units.

Test start date: March 15, 2020

Test completion date: October 23, 2020

The test results in this report pertain only to the item tested.

2.0 General Description

2.1 Product Description

Farpointe Data, Inc. supplied the following description of the EUT:

CONEKT® MOBILE-READY CONTACTLESS SMARTCARD READER AND KEYPAD

Overview of the EUT

Applicant name & address	Farpointe Data, Inc. 2195 Zanker Road San Jose, CA 95131 USA
Contact info / Email	Kirk Bierach / Kirkbierach@farpointedata.com
Model	CSB 3500
FCC Identifier	T8I-CONEKT5
IC Identifier	6504A-CONEKT5
Operating Frequency	13.56 MHz
Number of Channels	1
Type of Modulation	ASK Modulation
Antenna Type	Internal Antenna

2.2 Related Submittal(s) Grants

None

2.3 Test Methodology

Both AC mains line-conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4: 2014. Radiated tests were performed at an antenna to EUT distance of 10 meters, unless stated otherwise in this test report. All other measurements were made in accordance with the procedures in part 2 of CFR 47 7, ANSI C63.10: 2013, ANSI C63.4-2014 & RSS-GEN Issue 5.

2.4 Test Facility

The radiated emission test site and conducted measurement facility used to collect the data is 10m semi-anechoic chamber located in Menlo Park, California. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada (Site # 2042L-1).

2.5 Measurement Uncertainty

Compliance with the limits was based on the results of the measurements and doesn't take into account the measurement uncertainty.

Estimated Measurement Uncertainty

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 1 GHz	1 GHz – 2.5 GHz	> 2.5 GHz
RF Power and Power Density – antenna conducted	-	0.7 dB	-
Unwanted emissions - antenna conducted	1.1 dB	1.3 dB	1.9 dB
Bandwidth – antenna conducted	-	30 Hz	-

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 30MHz	30 MHz – 1 GHz	1 GHz – 18 GHz
Radiated emissions	-	4.7	5.1 dB
AC mains conducted emissions	2.1 dB	-	-

3.0 System Test Configuration

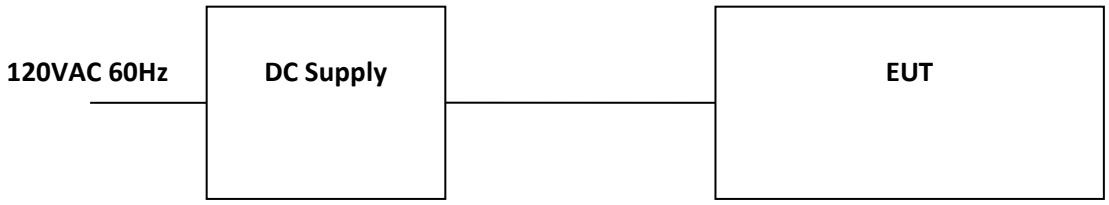
3.1 Support Equipment

Support Equipment		
Description	**Manufacturer**	**Model**
DC Power Supply	Exetech	D30030012

Equipment Under Test			
Description	**Manufacturer**	**Model**	**Serial Number**
Radiated Sample of MOBILE-READY CONTACTLESS SMARTCARD READERs	Farpointe Data, Inc.	CSB 3500	24010013

3.2 Block Diagram of Test Setup

The diagram shown below details the interconnection of the EUT and support equipment. For specific layout, refer to the test configuration photograph in the relevant section of this report.



S = Shielded **U** = Unshielded	**F** = With Ferrite **m** = Length in Meters

EUT Photo

3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table. The EUT was configured to continuously transmit.

13.56MHZ RFID Transmitter is identical to certification, FCC ID: T8I-CONEKT2 and IC: 6504A-CONEKT2. Test data in section 4.2 & 4.3 were borrowed from original report 104274811MPK-006. Radiated Emissions were remeasured to show compliance.

3.4 Software Exercise Program

None

3.5 Mode of Operation during test

The Mobile-Ready Contactless Smartcard Readers was set up to continuously transmitting at 13.56MHz.

3.6 Modifications required for Compliance

No modifications were made by the manufacturer to bring the EUT into compliance.

3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

4.0 Measurement Results

4.1 Field Strength of Fundamental and Radiated Emissions Outside the band

4.1.1 Requirements

FCC Rules 15.225

a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (84 dBuV) at 30 meters.

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.

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.

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.

§15.209 Radiated emission limits; general requirements.

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

4.1.2 Procedure

Radiated Measurements Below 30 MHz

During the test the EUT is rotated and the measuring antenna angles are varied during the search for maximum signal level.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for below 30 MHz were made at 10 meters. Data results below are corrected for distance back to 30 meters.

Radiated Measurements Above 30 MHz

During the test the EUT is rotated and the measuring antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for above 30 MHz were made at 10 meters.

Radiated emission measurements were performed from 9kHz to 1 GHz.
Analyzer resolution is:

200Hz or greater for 9kHz to 150kHz
9 kHz or greater for 150kHz to 30 MHz
120 kHz or greater for 30MHz to 1000 MHz
For those frequencies quasi-peak detector applies

Data includes of the worst-case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follows:

FS = RA + AF + CF – AG – DCF

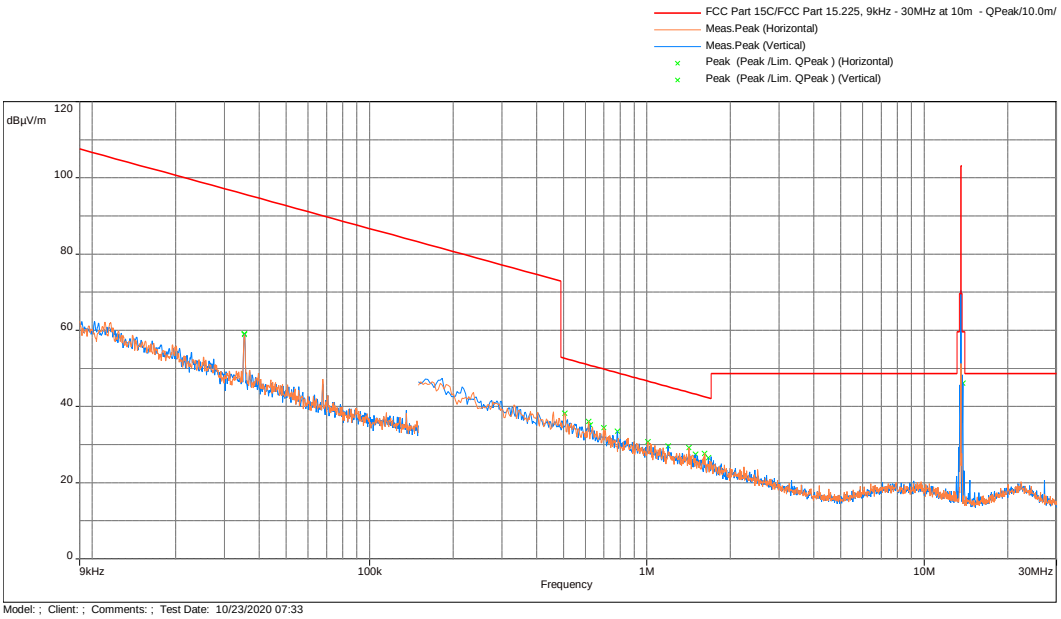
Where FS = Field Strength in dB (μV/m)

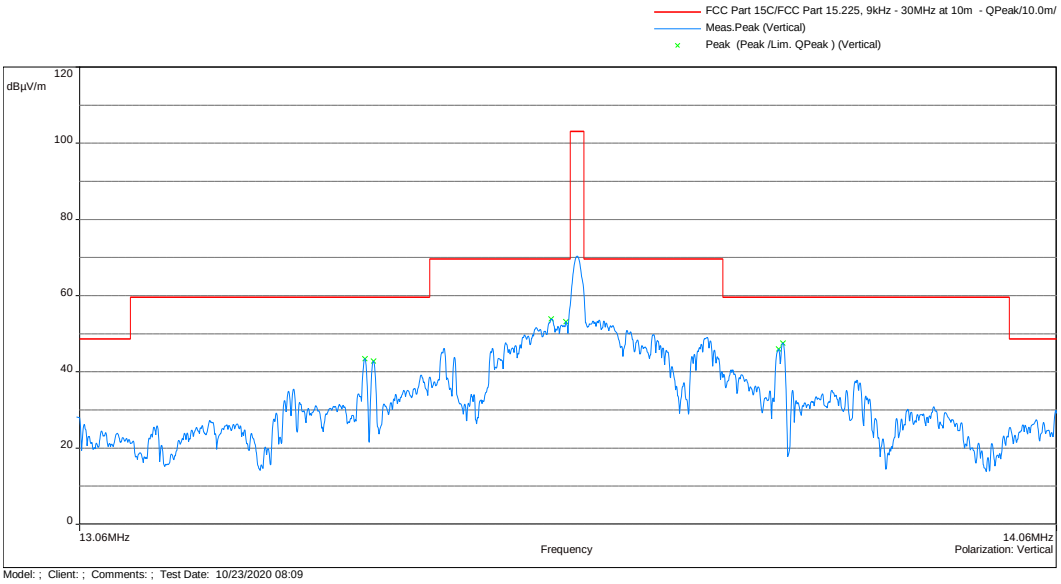
RA = Receiver Amplitude (including preamplifier) in dB (μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB (1/m)
AG = Amplifier Gain in dB
DCF = Distance Correction Factor

Note: FS was measured with loop antenna below 30MHz

4.1.3 Test Result 15.225 (a)(b)(c)

Radiated Spurious Emissions from 9 kHz to 30MHz



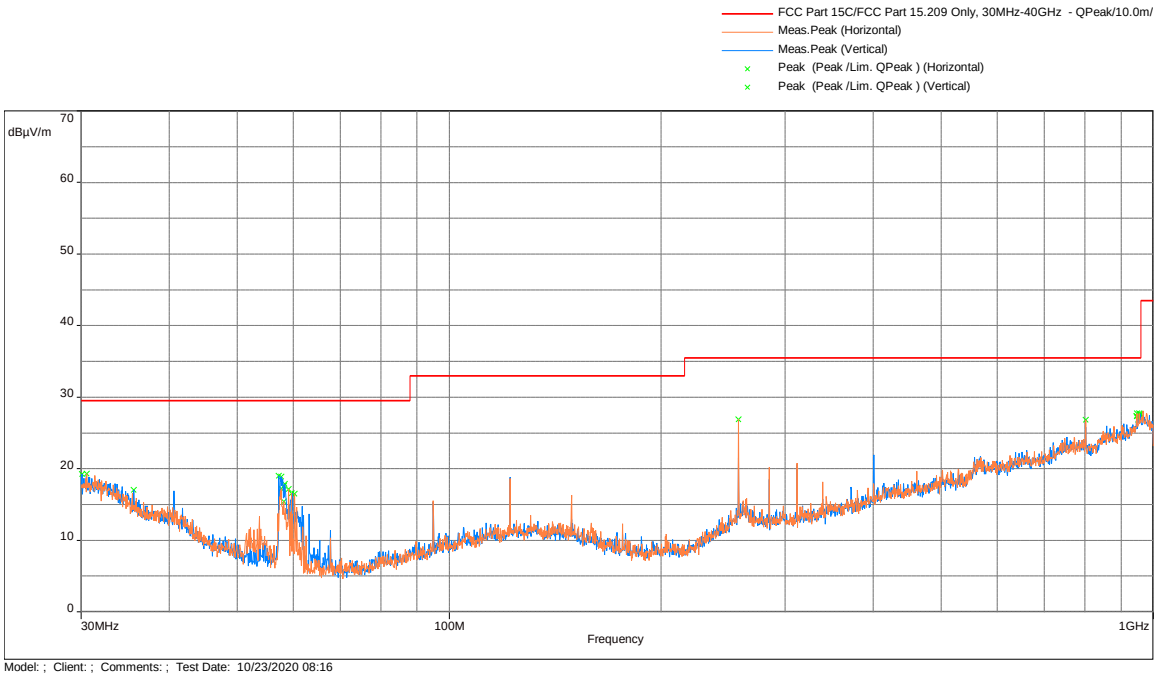


Frequency	Peak FS@10m	Limit@10m	Margin	Comment	Correction
(MHz)	dB(uV/m)	dB(uV/m)	dB		dB
13.56	70.35	103.1	-32.75	Perpendicular	2.55

Note: Correction = AF+CF–AG- distance correction factor
Distance correction factor=40*log$_{10}$(limit distance/measured distance)

4.1.4 Test Result 15.225 (d) and 15.209

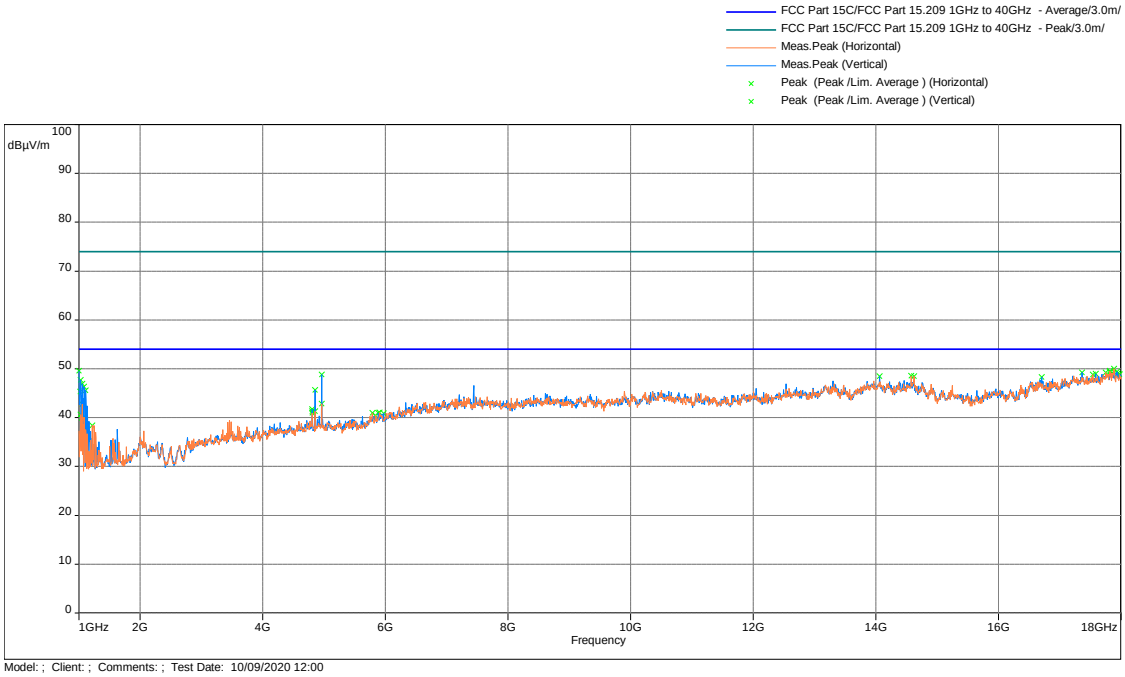
Radiated Spurious Emissions from 30 MHz to 1000 MHz



Freq (MHz)	FS@10m dB(uV/m)	Limit@10m dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	Correction (dB)
59.682	16.54	29.5	-12.96	2.02	155	Horizontal	-22.08
60.328	16.48	29.5	-13.02	2.02	81	Horizontal	-22.11
257.626	26.91	35.5	-8.59	3.02	204	Horizontal	-13.08
801.829	26.81	35.5	-8.69	2.02	28	Horizontal	-3.04
30.097	19.24	29.5	-10.26	1.98	273	Vertical	-8.92
35.658	17.05	29.5	-12.45	2.98	19	Vertical	-11.72
57.257	18.99	29.5	-10.51	3.98	86	Vertical	-21.85

Note: Correction = AF + CF – Preamp

FCC Part 15 Subpart B and ICES-003, Radiated Disturbance, 1 – 18 GHz, Peak vs Avg Limits



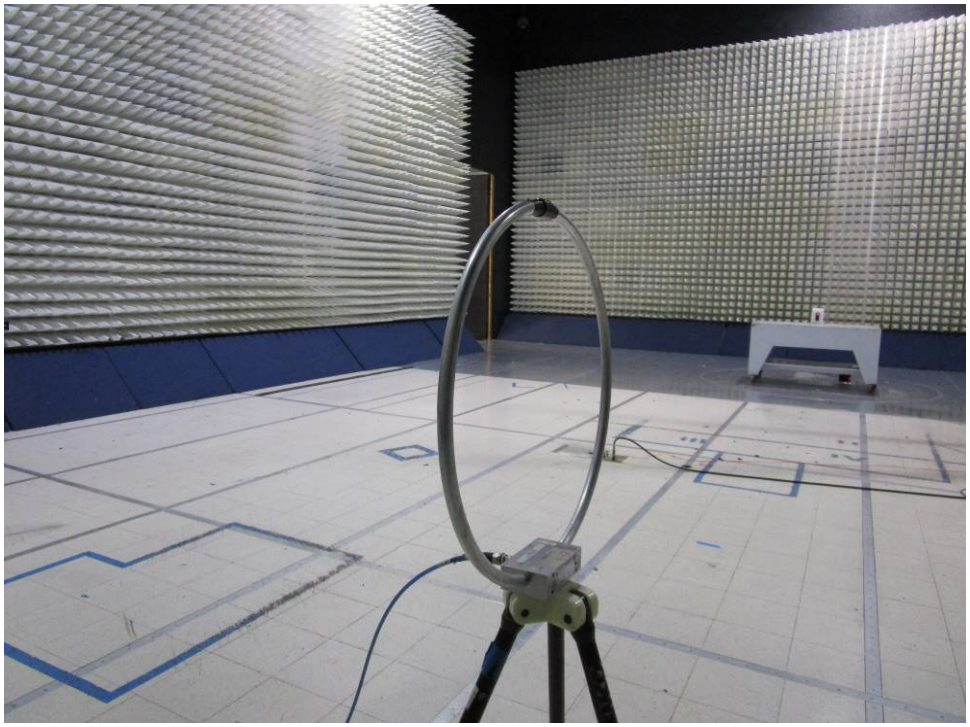
Frequency (MHz)	Peak FS@3m (dBµV/m)	Ave Limit@3m (dBµV/m)	Peak-Lim (dB)	Height (m)	Angle (°)	Comment	Correction (dB)
1003.400	49.56	54	-4.44	1.51	264	Vertical	-19.44
4849.933	45.63	54	-8.37	2.48	239	Vertical	-5.91
4957.600	48.81	54	-5.19	2.48	239	Vertical	-5.68

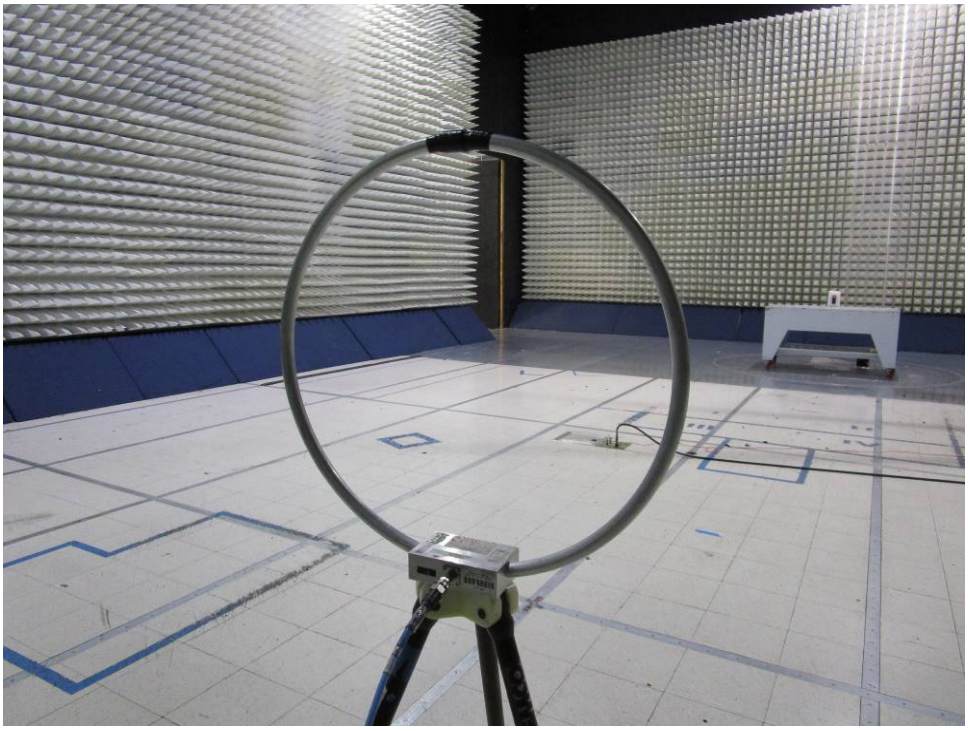
Note: Correction = AF + CF – Preamp

Result	**Complies** by 4.44 dB

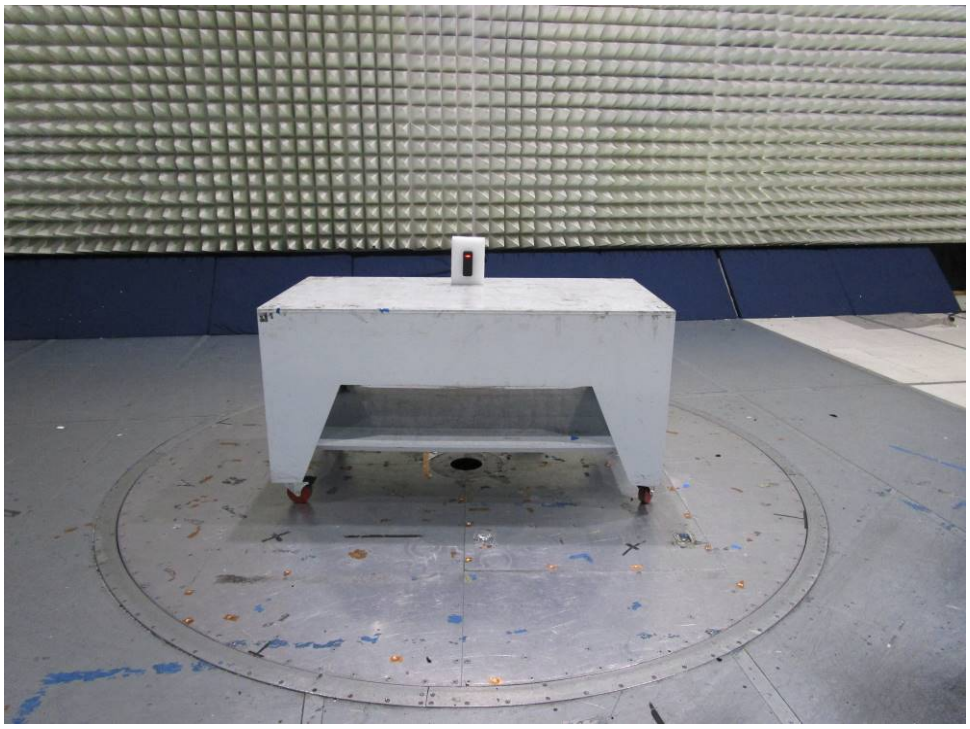
4.1.5 Test Configuration Photographs

The following photographs show the testing configurations used.



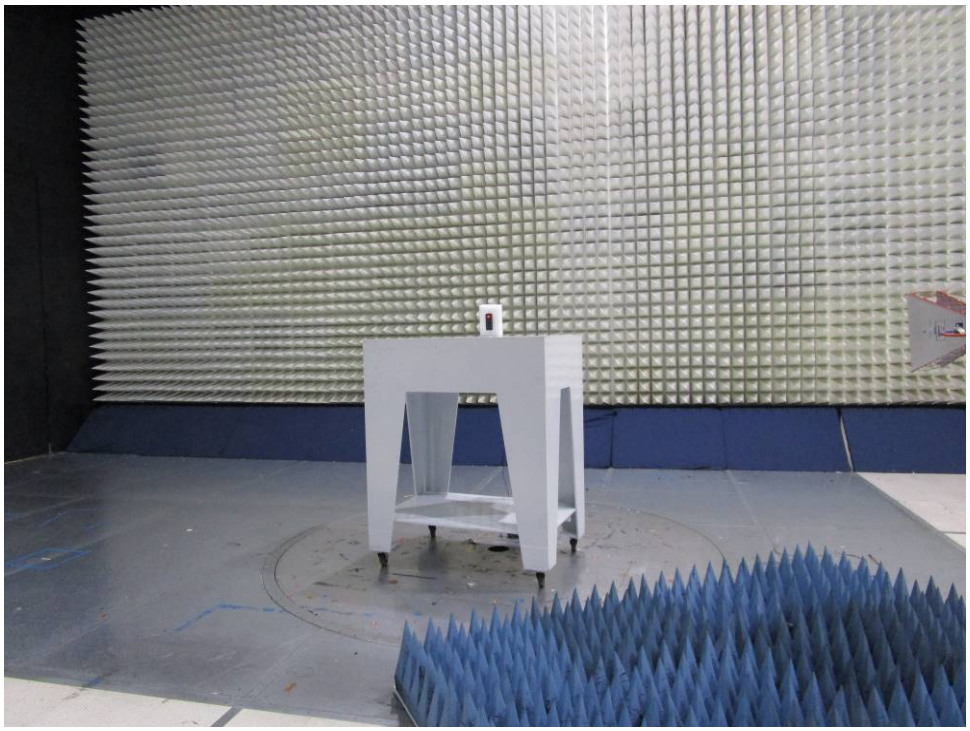


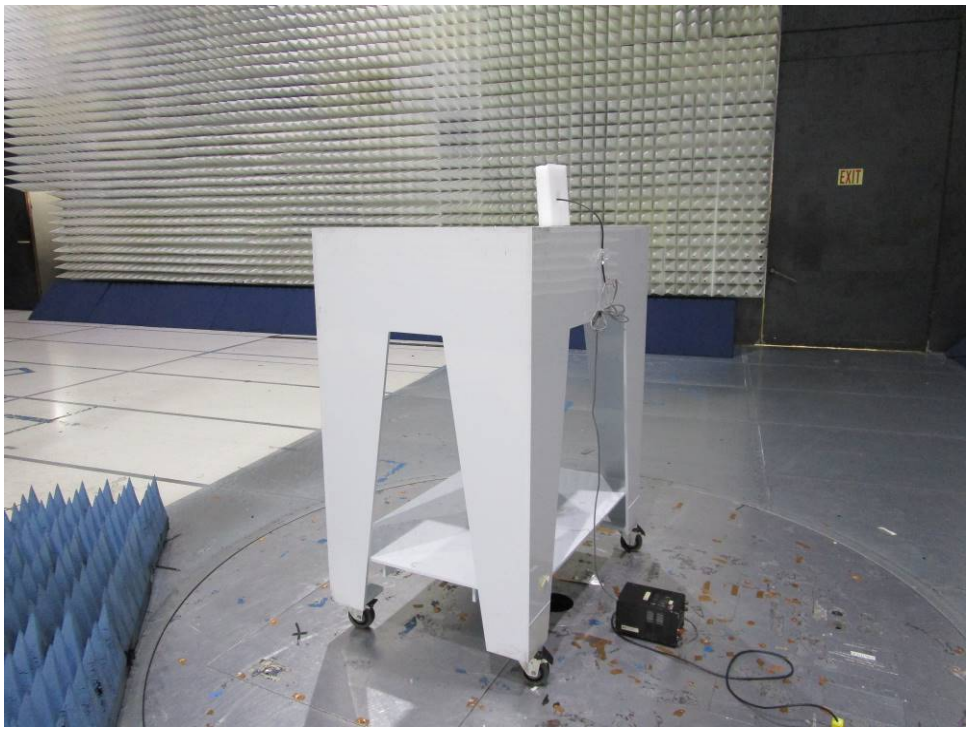
4.1.5 Test Configuration Photographs (Continued)



Electromagnetic Radiated Disturbance Setup Photograph

4.1.5 Test Configuration Photographs (Continued)





4.2 Frequency Tolerance

4.2.1 Requirement

FCC 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.

4.2.2 Procedure

The EUT was placed in the temperature chamber. The frequency counter was connected to the transmitter output. For each temperature, the carrier frequency was recorded. In addition, the carrier frequency was recorded when the power was set to 13.8 V DC (115% of 12V DC) and to 10.2 V DC (85% of 12V DC).

4.2.3 Test Results 15.225 (e)

Nominal Frequency: 13560000 Hz

Voltage (DC)	Temperature (C)	Measured Frequency (Hz)	Deviation from Reference (Hz)	Deviation (%)
12	-20	13559456	495	0.00365
12	-10	13559692	259	0.00191
12	0	13559372	579	0.00427
12	10	13559731	220	0.001622
12	20	13559951	0	0
12	30	13559372	579	0.00427
12	40	13559728	223	0.001645
12	50	13559728	223	0.001645
10.2	85%	13559951	0	0
13.8	115%	13559951	0	0

4.3 Occupied Bandwidth
FCC 15.215

4.3.1 Requirements

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257, 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. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

4.3.2 Procedure

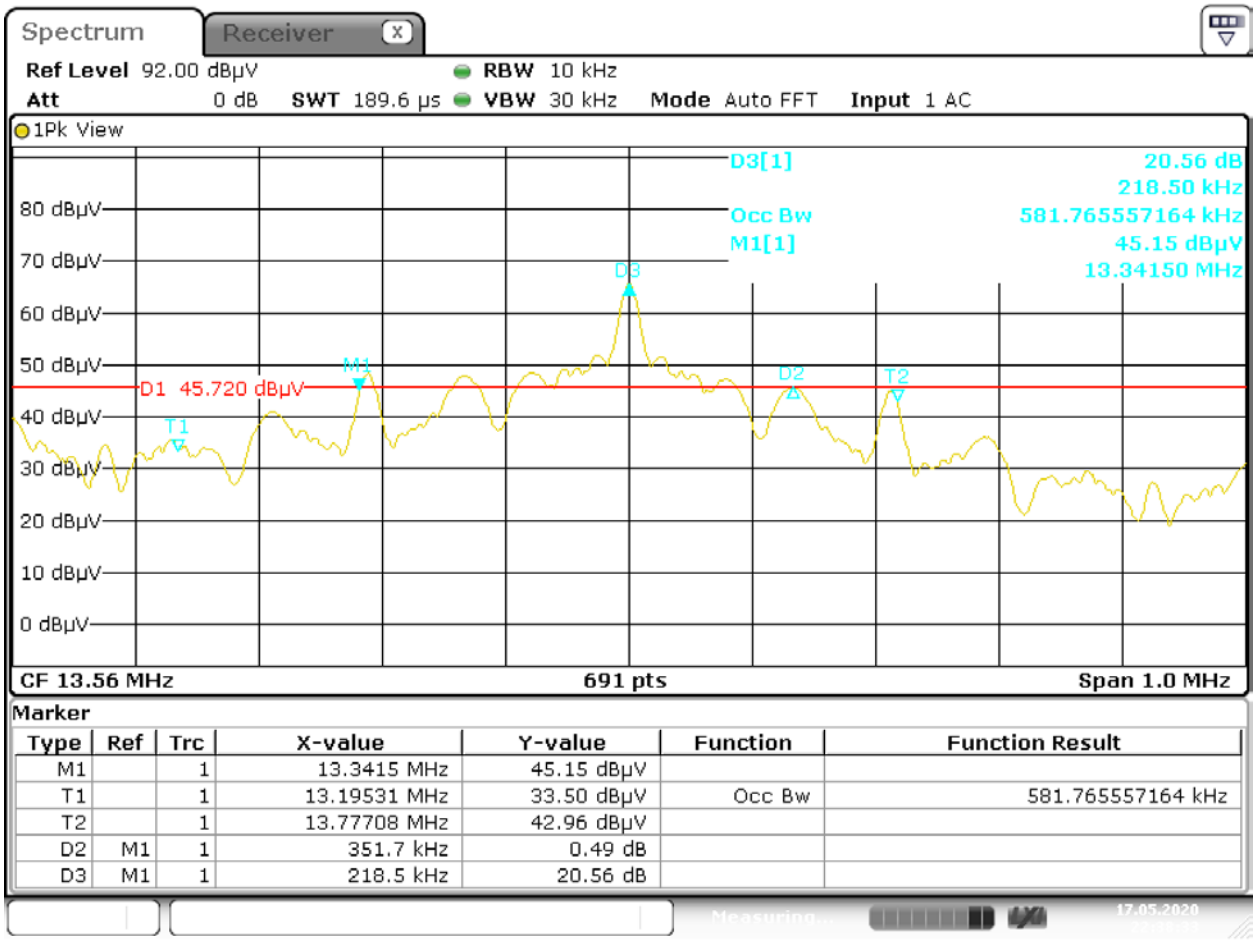
The EUT was setup to transmit in normal operating condition.

Measurements were made with the loop antenna in close proximity of the EUT. Following the procedures of ANSI 63.10: 2013, the 20dB bandwidth measurements were taken. The following plots show Occupied Bandwidth.

4.3.3 Test Results

Frequency (MHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
13.56	351.700	581.766

-20dB & 99% Channel Bandwidth Plot



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4.4 AC Line Conducted Emission
FCC Rule 15.207, FCC 15.107

4.4.1 Requirement

Frequency Band MHz	Class B Limit dB(µV)		Class A Limit dB(µV)	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15-0.50	66 to 56 *	56 to 46 *	79	66
0.50-5.00	56	46	73	60
5.00-30.00	60	50	73	60

*Note: *Decreases linearly with the logarithm of the frequency. At the transition frequency the lower limit applies.*

4.4.2 Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

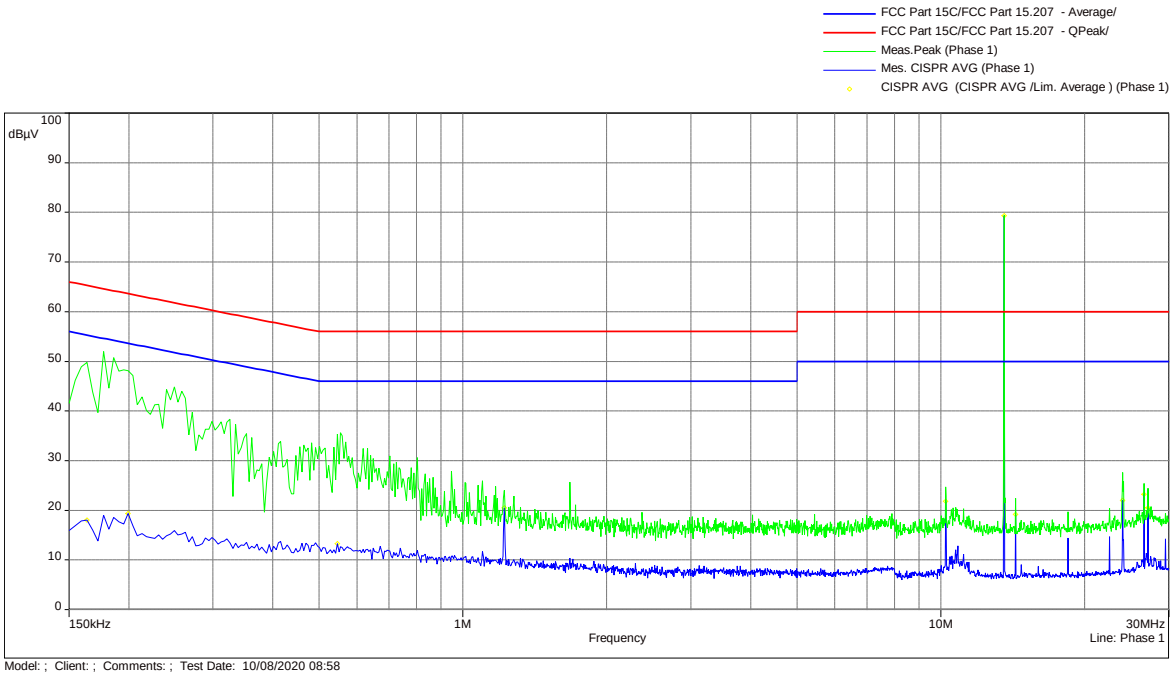
Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

EUT was placed in transmission mode then tested for conducted emissions per 15.207 to ensure the device complies with 15.207. After, the EUT RF was powered off and was measured to show compliance with the 15.107 limits.

4.4.3 Test Result

15.207, 120VAC 60Hz with BLE Transmitter On & 13.56 MHz Transmitter On

Phase 1



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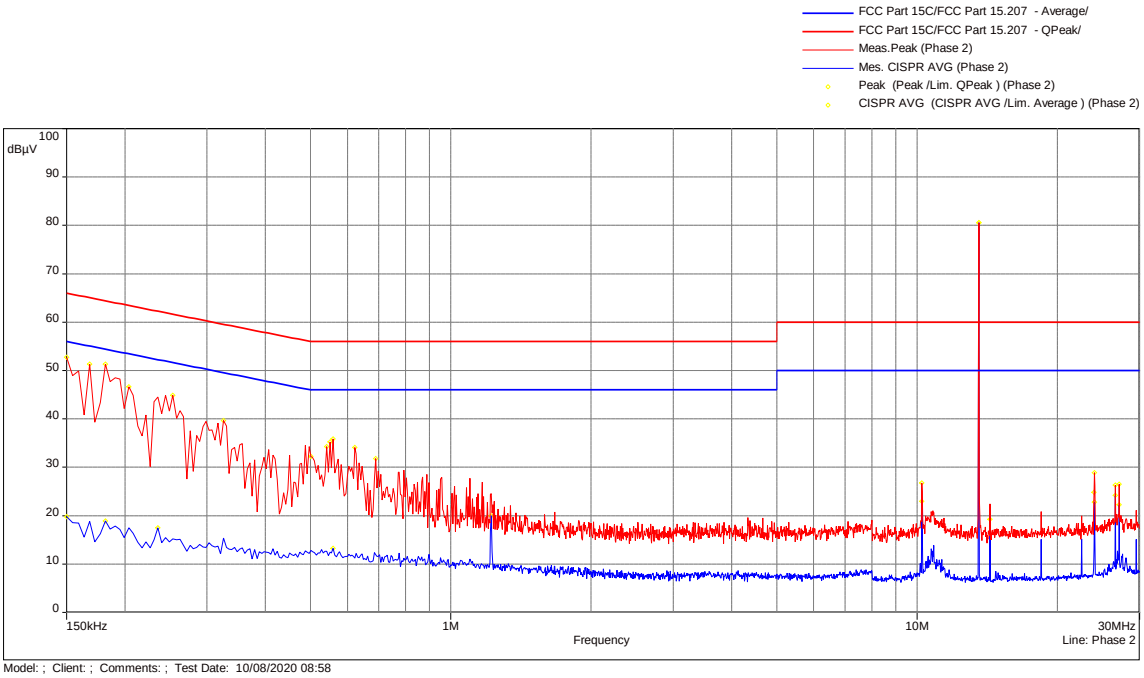
Phase 2



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Quasi Peak Table

Frequency (MHz)	Peak (dBµV)	Lim. QPeak (dBµV)	Peak-Lim (dB)	Comment	Correction (dB)
0.150	52.75	66.00	-13.25	Phase 2	20.98
0.164	49.75	65.28	-15.53	Phase 1	20.97
0.168	51.29	65.06	-13.77	Phase 2	20.98
0.177	51.96	64.63	-12.66	Phase 1	20.97
0.182	51.34	64.42	-13.07	Phase 2	20.98
0.186	50.72	64.21	-13.50	Phase 1	20.97
0.204	46.62	63.45	-16.82	Phase 2	20.98
0.249	44.89	61.79	-16.90	Phase 1	20.97
0.254	44.92	61.64	-16.72	Phase 2	20.97
0.272	39.76	61.07	-21.31	Phase 1	20.97
0.326	39.63	59.57	-19.94	Phase 2	20.97
0.326	38.33	59.57	-21.23	Phase 1	20.98
0.501	32.87	56.00	-23.13	Phase 1	20.98
0.501	32.21	56.00	-23.79	Phase 2	20.97
0.537	32.71	56.00	-23.29	Phase 1	20.99
0.542	34.32	56.00	-21.68	Phase 2	20.99
0.546	35.35	56.00	-20.65	Phase 1	21.00
0.551	35.23	56.00	-20.77	Phase 2	20.99
0.555	35.63	56.00	-20.37	Phase 1	21.00
0.560	35.85	56.00	-20.15	Phase 2	20.99
0.618	32.49	56.00	-23.51	Phase 1	21.01
0.623	34.15	56.00	-21.85	Phase 2	21.01
0.632	32.48	56.00	-23.52	Phase 1	21.02
0.690	31.82	56.00	-24.18	Phase 2	21.03
10.239	24.74	60.00	-35.26	Phase 1	21.18
10.239	26.74	60.00	-33.26	Phase 2	21.18
23.955	24.81	60.00	-35.19	Phase 2	21.66
23.991	28.85	60.00	-31.15	Phase 2	21.66
24.000	27.61	60.00	-32.39	Phase 1	21.67
24.081	25.87	60.00	-34.13	Phase 1	21.68
26.624	25.41	60.00	-34.59	Phase 1	21.83
26.624	26.37	60.00	-33.63	Phase 2	21.81
27.119	26.47	60.00	-33.53	Phase 2	21.83
27.119	24.42	60.00	-35.58	Phase 1	21.84

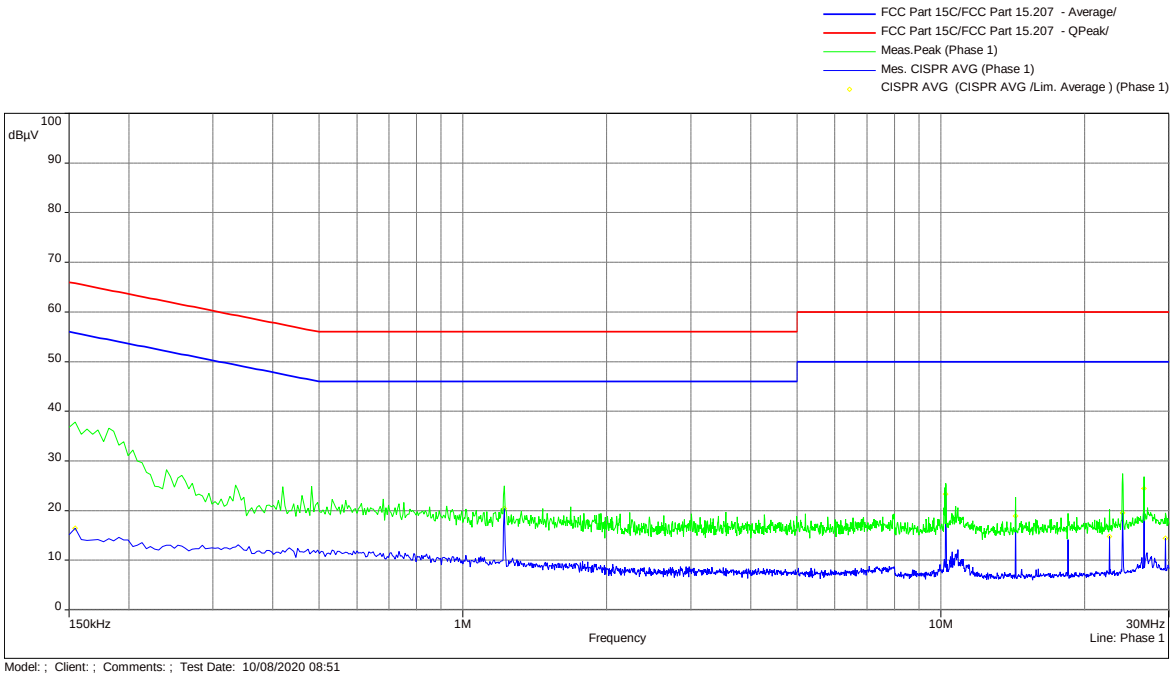
Average Table

Frequency (MHz)	CISPR AVG (dBµV)	Lim. Average (dBµV)	CISPR AVG-Lim (dB)	Comment	Correction (dB)
0.150	19.83	56.00	-36.17	Phase 2	20.98
0.164	18.05	55.28	-37.24	Phase 1	20.97
0.182	18.89	54.42	-35.52	Phase 2	20.98
0.200	19.32	53.63	-34.32	Phase 1	20.97
0.236	17.52	52.25	-34.73	Phase 2	20.97
0.546	13.31	46.00	-32.69	Phase 1	21.00
0.560	13.22	46.00	-32.78	Phase 2	20.99
1.221	20.52	46.00	-25.48	Phase 1	21.00
1.221	19.95	46.00	-26.05	Phase 2	21.00
10.239	21.81	50.00	-28.19	Phase 1	21.18
10.239	22.98	50.00	-27.02	Phase 2	21.18
14.334	19.20	50.00	-30.80	Phase 1	21.26
14.334	19.23	50.00	-30.77	Phase 2	21.26
24.000	21.98	50.00	-28.02	Phase 1	21.67
24.000	22.80	50.00	-27.20	Phase 2	21.66
26.624	23.20	50.00	-26.80	Phase 1	21.83
26.624	24.17	50.00	-25.83	Phase 2	21.81
27.119	22.29	50.00	-27.71	Phase 2	21.83
27.119	20.54	50.00	-29.46	Phase 1	21.84

Results	**Complies**

15.207/15.107, 120VAC 60Hz with BLE Transmitter On & 13.56 MHz Transmitter Off

Phase 1



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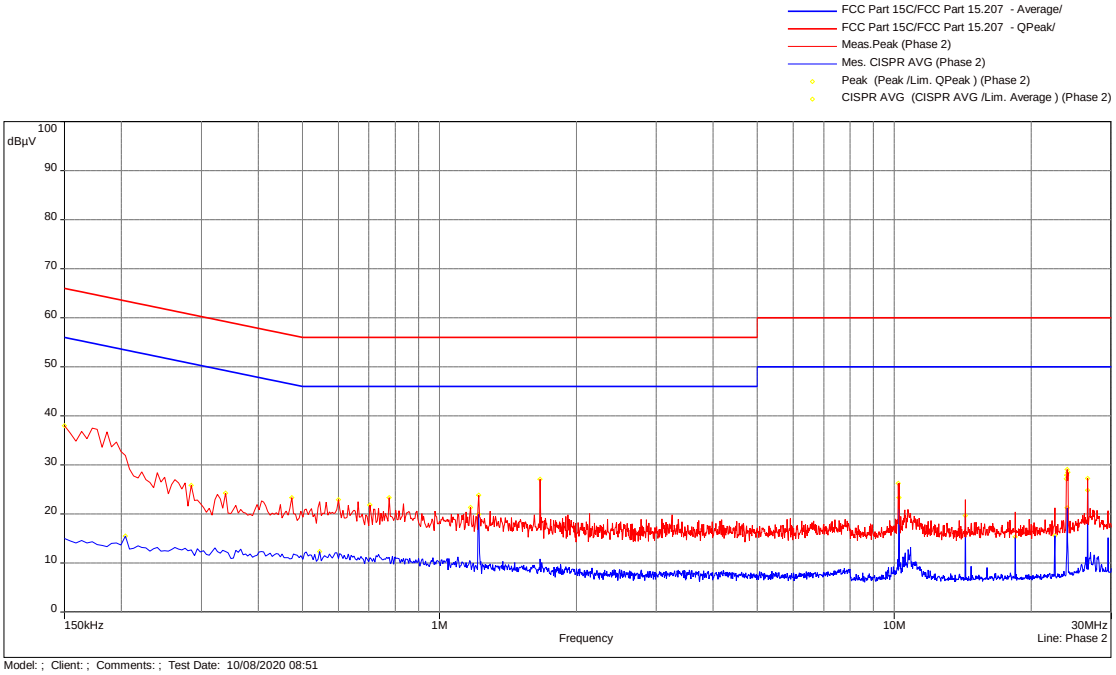
Phase 2



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Quasi Peak Table

Frequency (MHz)	Peak (dBµV)	Lim. QPeak (dBµV)	Peak-Lim (dB)	Comment	Correction (dB)
0.150	38.02	66.00	-27.98	Phase 2	20.98
0.155	37.83	65.75	-27.93	Phase 1	20.97
0.285	25.87	60.67	-34.80	Phase 2	20.97
0.335	25.17	59.34	-34.17	Phase 1	20.98
0.339	24.22	59.23	-35.01	Phase 2	20.97
0.420	24.83	57.45	-32.61	Phase 1	20.98
0.461	23.03	56.68	-33.66	Phase 1	20.98
0.474	23.35	56.44	-33.10	Phase 2	20.97
0.483	24.87	56.29	-31.41	Phase 1	20.98
0.600	22.90	56.00	-33.10	Phase 2	21.00
0.681	22.38	56.00	-33.62	Phase 1	21.03
0.704	21.84	56.00	-34.16	Phase 2	21.03
0.776	23.35	56.00	-32.65	Phase 2	21.01
1.172	21.32	56.00	-34.68	Phase 2	21.00
1.221	24.98	56.00	-31.02	Phase 1	21.00
1.221	23.87	56.00	-32.13	Phase 2	21.00
1.469	20.44	56.00	-35.56	Phase 1	21.00
1.667	27.09	56.00	-28.91	Phase 2	20.99
1.680	20.75	56.00	-35.25	Phase 1	21.00
2.234	19.64	56.00	-36.36	Phase 1	21.01
3.548	19.72	56.00	-36.28	Phase 1	21.11
10.181	24.66	60.00	-35.34	Phase 1	21.18
10.203	26.29	60.00	-33.71	Phase 2	21.18
10.239	25.51	60.00	-34.49	Phase 1	21.18
14.339	22.73	60.00	-37.27	Phase 1	21.26
23.919	27.14	60.00	-32.86	Phase 2	21.66
23.955	25.55	60.00	-34.45	Phase 1	21.67
23.960	27.94	60.00	-32.06	Phase 2	21.66
24.005	27.46	60.00	-32.54	Phase 1	21.67
24.005	29.07	60.00	-30.93	Phase 2	21.66
24.081	28.49	60.00	-31.51	Phase 2	21.66
26.624	26.85	60.00	-33.15	Phase 1	21.83
26.624	27.23	60.00	-32.77	Phase 2	21.81
0.150	38.02	66.00	-27.98	Phase 2	20.98

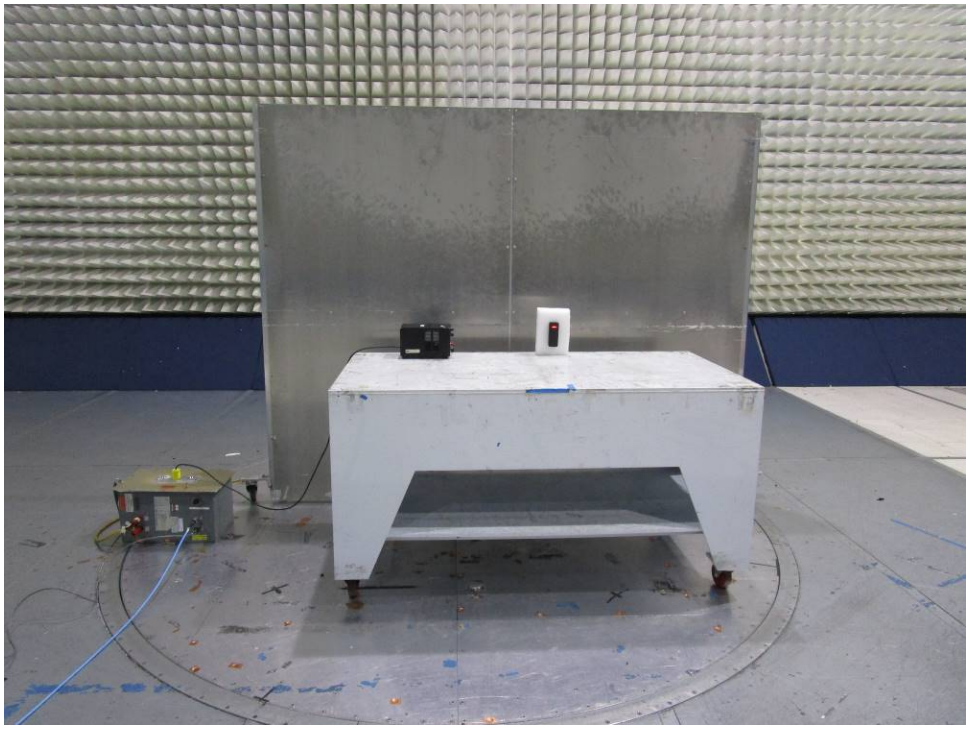
Average Table

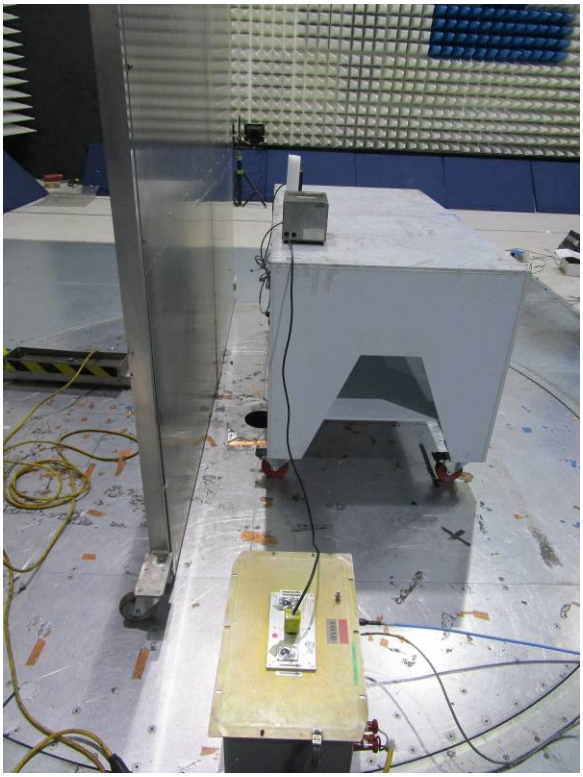
Frequency (MHz)	CISPR AVG (dBµV)	Lim. Average (dBµV)	CISPR AVG-Lim (dB)	Comment	Correction (dB)
0.155	16.47	55.75	-39.29	Phase 1	20.97
0.204	15.49	53.45	-37.96	Phase 2	20.98
0.546	12.37	46.00	-33.63	Phase 2	20.99
1.221	19.94	46.00	-26.06	Phase 2	21.00
1.221	20.39	46.00	-25.61	Phase 1	21.00
10.239	23.27	50.00	-26.73	Phase 1	21.18
10.239	23.34	50.00	-26.66	Phase 2	21.18
14.334	19.68	50.00	-30.32	Phase 2	21.26
14.334	18.94	50.00	-31.06	Phase 1	21.26
18.434	15.36	50.00	-34.64	Phase 2	21.46
22.529	15.63	50.00	-34.37	Phase 2	21.59
22.529	14.78	50.00	-35.22	Phase 1	21.60
24.000	21.23	50.00	-28.77	Phase 2	21.66
24.005	19.57	50.00	-30.43	Phase 1	21.67
26.624	24.82	50.00	-25.18	Phase 2	21.81
26.624	24.50	50.00	-25.50	Phase 1	21.83
29.490	14.39	50.00	-35.61	Phase 1	21.86

Results	**Complies**

4.4.4 Test Configuration Photographs

The following photographs show the testing configurations used.





4.5 Radiated Emissions on Digital Parts

FCC Ref: 15.109, ICES 003, RSS Gen

4.5.1 Test Limit

Limits for Electromagnetic Radiated Emissions FCC Section 15.109(b), ICES 003*, RSS GEN

Frequency (MHz)	Class A at 10m dB(µV/m)	Class B at 3m dB(µV/m)
30-88	39	40.0
88-216	43.5	43.5
216-960	46.4	46.0
Above 960	49.5	54.0

* According to FCC Part 15.109(g) an alternative to the radiated emission limits shown above, digital devices may be shown to comply with the limit of CISPR Pub. 22

4.5.2 Procedures

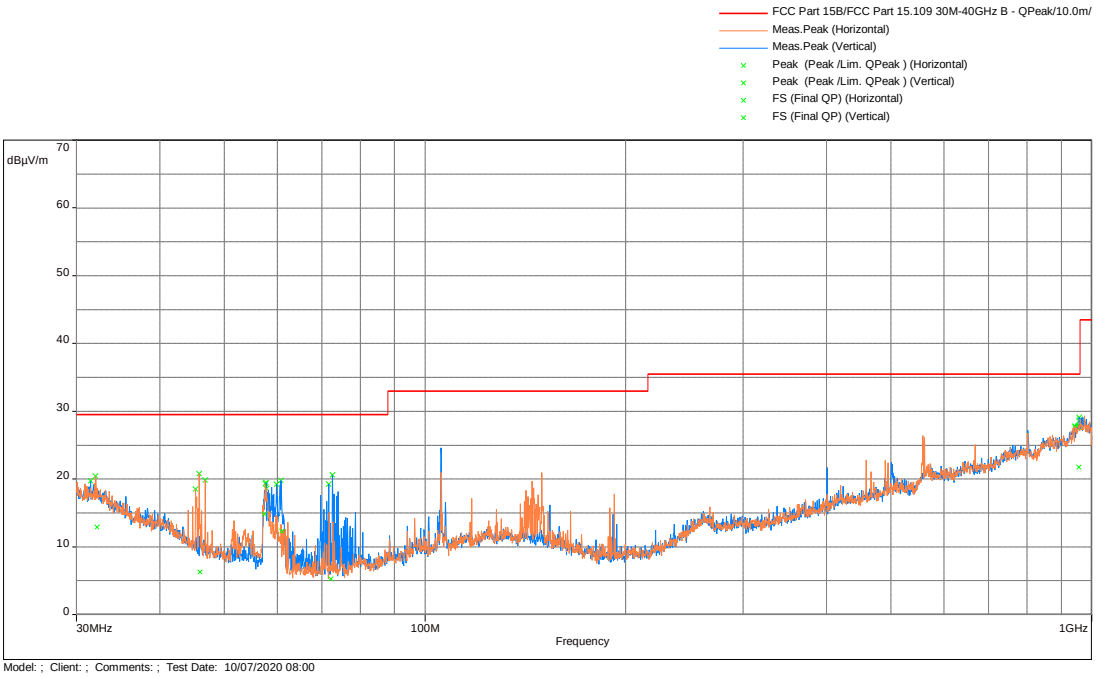
Radiated measurements were taken. 120 kHz resolution bandwidth was used from 30 MHz - 1 GHz. 1 MHz resolution bandwidth was used for measurements done above 1 GHz. All plots are corrected for cable loss, antenna factor, and preamp.

Radiated emission measurements were performed from 30 MHz to 18000 MHz. The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Measurements recorded in this section were made with the Transmitter in Tx mode.

4.5.3 Test Results

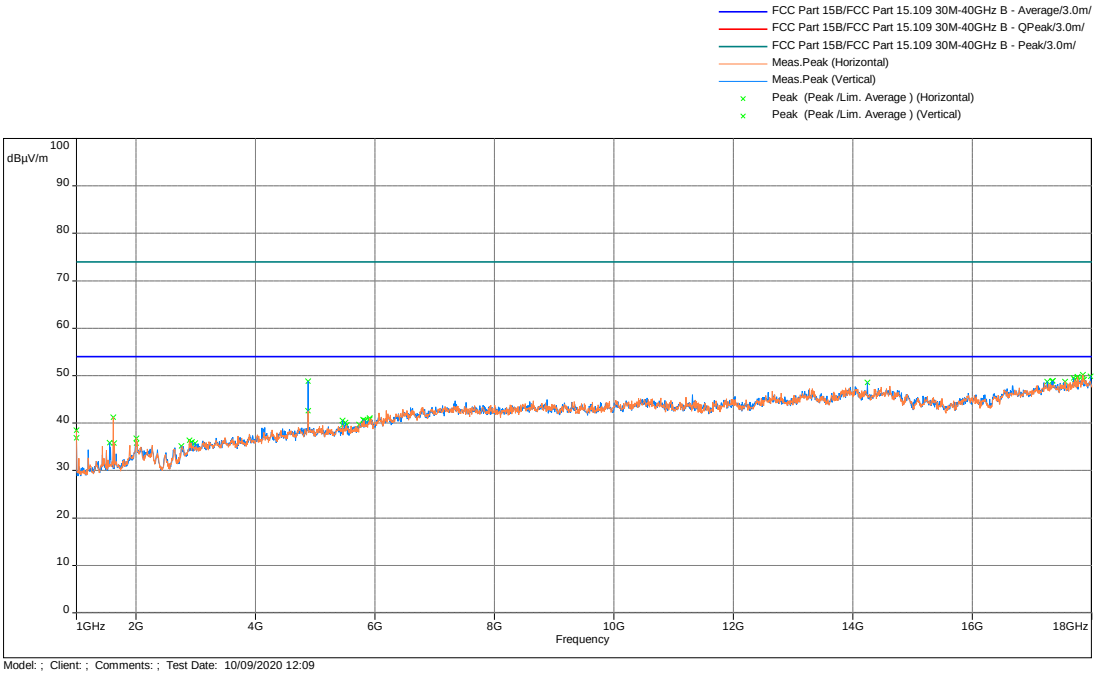
FCC Part 15 Subpart B and ICES-003, Radiated Disturbance, 30 MHz to 1000 MHz



Freq (MHz)	FS@10m dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	Correction (dB)
32.197	12.89	29.50	-16.61	153.00	1.65	Horizontal	-9.80
45.931	6.28	29.50	-23.22	137.50	3.54	Horizontal	-17.13
57.378	14.82	29.50	-14.68	146.00	3.88	Vertical	-21.71
60.932	12.33	29.50	-17.17	0.00	3.55	Vertical	-21.94
72.232	5.24	29.50	-24.26	30.75	3.29	Vertical	-20.76
956.854	21.72	35.50	-13.78	50.25	1.00	Vertical	1.93

Note: Correction = AF + CF – Preamp

FCC Part 15 Subpart B and ICES-003, Radiated Disturbance, 1 – 18 GHz, Peak vs Avg Limits

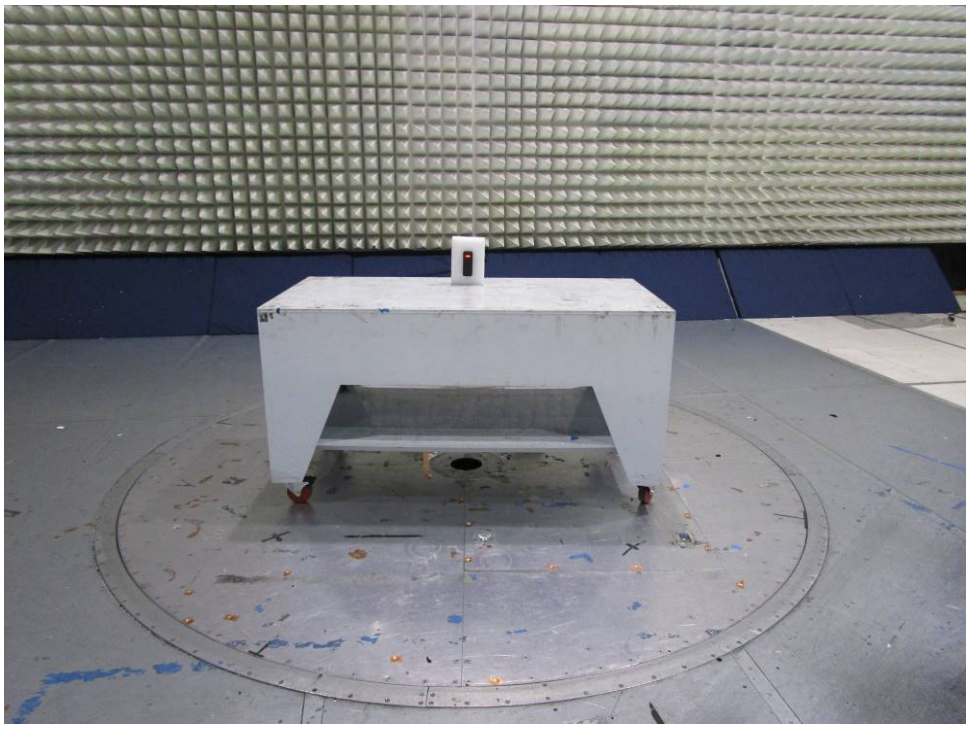


Frequency (MHz)	Peak@3m (dBµV/m)	Lim. Average (dBµV/m)	Peak-Lim (dB)	Height (m)	Angle (°)	Comment	Correction (dB)
4881.667	48.80	54	-5.20	2.48	280	Vertical	-5.84

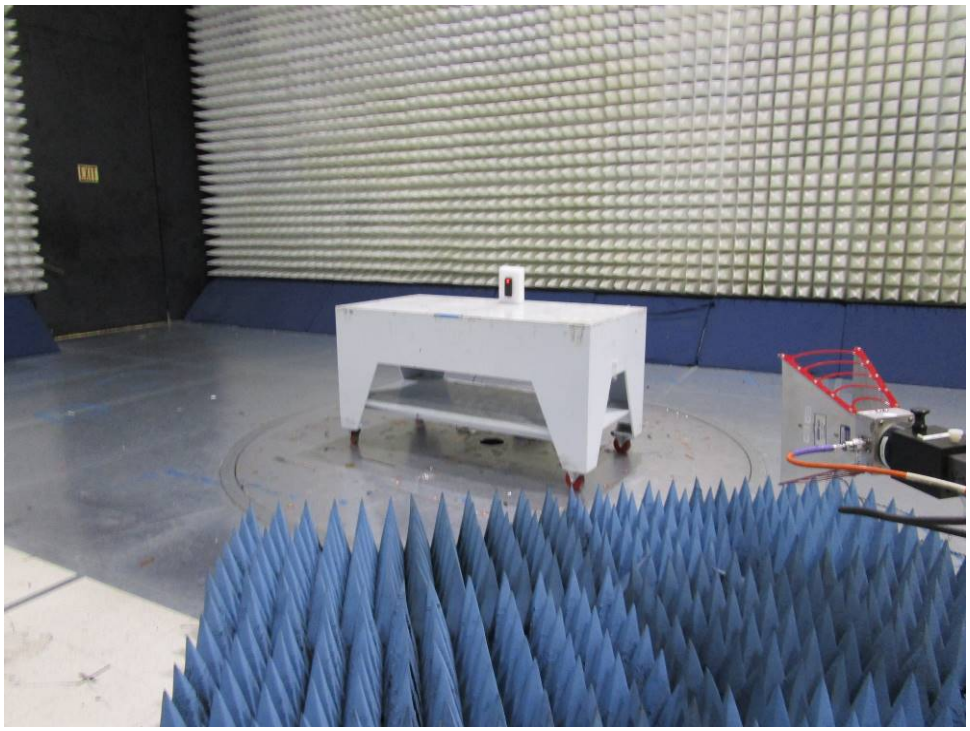
Note: Correction = AF + CF – Preamp

Results	**Complies** by 5.2 dB for FCC Part 15 Subpart B and ICES-003

4.4.4 Test Configuration Photographs



4.4.4 Test Configuration Photographs (Continued)



5.0 List of test equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Asset #	Cal Int	Cal Due
EMI Receiver	Rohde and Schwarz	ESR7	ITS 01607	12	10/23/20
EMI Receiver	Rohde and Schwarz	ESU40	ITS 00961	12	11/07/20
1-18GHz Preamplifier	uComp Nordic	MCN-40-001018002510P	ITS 01817	12	04/16/21
Horn Antenna	ETS-Lindgren	3115	ITS 00982	12	04/21/21
Loop Antenna	EMCO	6512	ITS 01598	12	10/22/20
BI-Log Antenna	Teseq	CBL611D	ITS 01058	12	10/19/20
Pre-Amplifier	Sonoma Instrument	310N	ITS 01493	12	02/07/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01462	12	09/01/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01465	12	09/01/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01470	12	09/01/21
RF Cable	TRU Corporation	TRU CORE 300	ITS 01342	12	09/01/21
Notch Filter	MICRO-TRONICS	BRM50702	ITS 01166	12	06/11/21
RF Cable	Mega Phase	EMC1-K1K1-236	ITS 01537	12	04/17/21
RF Cable	Mega Phase	TM40-K1K1-19	ITS 01155	12	04/17/21

Software used for emission compliance testing utilized the following:

Name	Manufacturer	Version	Template/Profile
BAT-EMC	Nexio	3.19.1.19	Farpointe_PB.bpp
RS Commander	Rohde Schwarz	1.6.4	Not Applicable (Screen grabber)

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewer Initials	Date	Change
1.0 / G104449578	AS	KV	October 27, 2020	Original document