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ELECTROMAGNETIC COMPATIBILITY TEST REPORT

PREPARED FOR ION DIGITAL LLP CANADA
BY QAI LABORATORIES

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Laboratory Accreditations (per ISO/IEC 17025:2005):

American Association for Laboratory Accreditation Certificate Number: 3657.02

EMC Client:	Ion Digital LLP Canada
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Phone:	(800) 407-4389
Applicable Test Standards:	FCC Title 47 CFR Part 15: Subpart C 15.231 RSS-210 Issue 9 RSS-Gen Issue 4
Equipment Tested:	Verilock RbA DG Sensor
Model Number(s):	0116149
FCC ID:	WVJ-CB000116149
IC Certification Number:	10511A-0116149
Applicant:	Andersen Corporation
Address:	100 4th Ave. N. Bayport, MN 55003, USA

REVISION HISTORY

Date	Report Number	Rev #	Details	Author's Initials
January 19, 2018	E10379-1703_Ion-Verilock RbA DG Sensor	1.0	Signed Release	RR
April 24, 2018	E10379-1703_Ion-Verilock RbA DG Sensor	2.0	Updated as per the feedbacks	RR
May 11, 2018	E10379-1703_Ion-Verilock RbA DG Sensor	2.1	Updated as per the feedbacks	RR
All previous versions of this report have been superseded by the latest dated revision as listed in the above table. Please dispose of all previous electronic and paper printed revisions accordingly.				

REPORT AUTHORIZATION

The data documented in this report is for the test equipment provided by Ion Digital LLP Canada. The tests were conducted on the sample equipment as requested by Ion Digital LLP Canada for the purpose of demonstrating compliance with FCC Title 47 CFR Part 15: Subpart C, 15.231, RSS-210 Issue 9, and RSS-Gen Issue 4 as agreed upon by Ion Digital LLP Canada as per Quote 17SH10313.

Ion Digital LLP Canada is responsible for the tested product configuration, continued product compliance, and for the appropriate auditing of subsequent products as required. This report may comprise partial list of tests that are required for FCC or IC Declaration of Conformity and can only be produced by the manufacturer.

This is to certify that the following report is true and correct to the best of our knowledge.

Tested by Jack Qin
EMC Division Project Manager

Report Prepared by Raksha Rawat
EMC Technical Writer

Approved by Parminder Singh
Director for the EMC Department

QAI FACILITIES

Founded in 1994 by a group of experienced certification and testing experts, QAI is an independent third-party testing, inspection and certification organization which serves the building industry, government and individuals with cost effective solutions through our in-house capabilities / services, and an established world-wide network of qualified affiliates. To help get your product to market, trust the provider that many leading global manufacturers do: QAI.

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QAI EMC ACCREDITATION

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EMC Laboratory Location	FCC Designation (3m SAC)	IC Registration (3m SAC)	A2LA Certificate
Burnaby, BC, Canada	CA9543	21146-1	3657.02

Headquarters & EMC Laboratory in Burnaby, BC

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Section I: EXECUTIVE SUMMARY

1.1 Purpose

The purpose of this report is to demonstrate and document the compliance of "Verilock RbA DG Sensor" as per Sections 1.2 & 1.3 of this report.

1.2 Scope

The information documented in this report is based on the test methods and levels as per Quote 17SH10313:

- **FCC Title 47 CFR Part 15** – Radio Frequency Devices, Subpart C - Intentional Radiators
  - §15.231 - Periodic Operation in the band 40.66-40.70 MHz and above 70 MHz
- **RSS-210 Issue 9** – License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
  - Annex 1 - Momentarily Operated Devices and Remote Control
- **RSS-Gen Issue 4** – General Requirements and Information for the Certification of Radio Apparatus

1.3 Summary of Results

The following tests demonstrate the testimony to "FCC and IC" Mark Electromagnetic compatibility radio testing for the "Verilock RbA DG Sensor" device manufactured by Ion Digital LLP Canada.

The following testing was performed pursuant to FCC & IC Radio and RF Emissions Standards

Test Description	Applicable FCC Test Standard	Applicable IC Test Standard	Test Method	Result
Antenna Requirement	Title 47 CFR Part 15: Subpart C §15.203	N/A	N/A	Pass
Transmission Time	Title 47 CFR Part 15: Subpart C §15.231 (a)	RSS-210 Issue 9	N/A	Pass
Intentional Spurious Emissions	Title 47 CFR Part 15: Subpart C §15.231 (b)	RSS-210 Issue 9 RSS-Gen Issue 4	ANSI C63.10-2013	Pass
20dB Occupied Bandwidth	Title 47 CFR Part 15: Subpart C §15.231 (c)	N/A	ANSI C63.10-2013	Pass
99% Occupied Bandwidth	N/A	RSS-210 Issue 9 RSS-Gen Issue 4	ANSI C63.10-2013	Pass
Receiver Radiated Emissions	N/A	RSS-Gen Issue 4	ANSI C63.4-2014	Pass

Section II: EQUIPMENT UNDER TEST (EUT) INFORMATION

2.1 Product Description

The information provided in this section is for the Equipment Under Test (EUT) and the corresponding Auxiliary Equipment needed to perform the tests as a complete system.

EUT – Verilock RbA DG Sensor

Equipment Under Test (EUT) Information

EUT	Verilock RbA DG Sensor
Description	Intrusion Detector
FCC ID	WVJ-CB000116149
IC Number	10511A-0116149
Manufacturer	Ion Digital LLP Canada
Model No.	0116149
Serial No.	N/A
Operating Frequency	344.94 MHz
Transmit Power	-20 dBm, 75dBuv/m at 3meters
Modulation Type	ASK-OOK
Test Channels	1
Data Rate	3.7 Kbits/sec.
Antenna Type	Monopole whip antenna
Antenna Gain	0 dBi
Input Power	CR2032, Coin Cell Battery,3VDC

GENERAL INFORMATION

3.1 Environmental Conditions

The equipment under test was operated and tested under the following environmental conditions:

Parameter	Conditions
Location	Indoors
Temperature	22-28ºC
Relative Humidity	39.7 - 54.4%

3.2 Measurement Uncertainty

Parameter	Uncertainty
Radiated Emissions, 30MHz-1GHz	± 2.40 dB
Radiated Emissions, 1GHz-40GHz	± 2.48 dB
Radio Frequency	±1.5 x 10-5 MHz
Total RF Power Conducted	±1.36 dB
Spurious Emissions, Conducted	±1.36 dB
RF Power Density, Conducted	±1.36 dB
Temperature	±1ºC
Humidity	±5 %
DC and low frequency voltages	±3 %

3.3 Worst Test Case

Worst-case orientation was determined during the preliminary testing. The final radiated emissions were performed in the worst-case orientation.

3.4 Sample Calculations of Emissions Data

Radiated and conducted emissions were performed using EMC32 software developed by Rohdes & Schwarz. Transducer factors like Antenna factors, Cable Losses and Amplifier gains were stored in the test templates which are used to perform the emissions measurements. After test is finished, data is generated from the EMC32 consisting of product details, emission plots and final data tables as shown below.

Frequency (MHz)	Q-Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Ant. Ht. (cm)	Pol	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
42.663900	33.0	1000.000	120.000	100.0	H	70.0	13.2	7.5	40.5

Quasi Peak reading shown in the table above is already corrected by the software using correction factor shown in column “Corr.” The correction factor listed under “Corr.” table calculated as:

Corr.(dB) = Antenna factor + Cable loss

Or

Corr. (dB) = Antenna factor + Cable Loss - Amp gain (if pre-amplifier was used)

The final Quasi-peak reading shown in the data is calculated by the software using following equation:

Corrected Quasi Peak (dBµV/m) = Raw Quasi-Peak Reading + Antenna factor + Cable loss

To obtain the final Quasi-Peak or Average reading during power line conducted emissions, transducer factors are included in the final measurement as shown below.

Frequency (MHz)	Q-Peak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	44.3	1000.000	9.000	GND	0.6	21.7	66.0

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150	27.2	1000.000	9.000	GND	0.6	28.8	56.0

Quasi-Peak or Average reading shown in above table is already corrected by the software using the correction factor shown in column "Corr." The correction factor listed under "Corr." table calculated as:

Corr.(dB) = Antenna factor + Cable loss

The final Quasi-peak or Average reading shown in the data is calculated by the software using following equation:

Corr. Quasi-Peak/Average Reading (dBµV) = Raw Quasi Peak/Average Reading + Antenna factor + Cable loss

The allowable margins from the limits, as per the standards, were calculated for both radiated and conducted emissions:

Margin (dB) = Limit – Quasi-Peak or Average reading

3.5 Test Equipment List

The tables below contain all the equipment used by QAI Laboratories in conducting all tests on the Equipment Under Test (EUT) as per Section 1.3.

Emissions Test Equipment

Manufacturer	Model	Description	Serial No.	Calibration Due Date
Sunol Sciences	SM46C	Turntable	051204-2	N/A
Sunol Sciences	TWR95	Mast	TREML0001	N/A
EMCO	6502	Loop Antenna	6502	11/13/2020
Sunol Sciences	JB1	Biconilog Antenna 30MHz – 2GHz	A070209	2020-Aug-16
Sunol Sciences	DRH-118	Horn Antenna 1GHz-18GHz	A050905	2019-Mar-10
ETS Lindgren	2165	Turntable	00043677	N/A
ETS Lindgren	2125	Mast	00077487	N/A
Rohde & Schwarz	ESU40	EMI Receiver	100011	2019-Dec-01
ETS Lindgren	S201	5-meter Semi-Anechoic Chamber	1030	N/A
WEINSCHEL ENGINEERING	44	6db attenuator	665	N/A
Insulated Wire Inc.	SPS-1753-1140-SPS	Yellow cable, 3m	102395	N/A
Insulated Wire Inc.	SPS-1753-2400-SPS	Yellow cable, 6m	091096	N/A
Hewlett-Packard	8449B	Pre-Amplifier	1237	N/A

Note: *Equipment listed above have 3 years calibration interval.*

Measurement Software List

Manufacturer	Model	Version	Description
Rhode & Schwarz	EMC 32	6.20.0	Emissions Test Software

Section III: TEST RESULTS

4.1 Antenna Requirement

Date Performed:

November 22, 2017

Test Standard:

- Title 47 CFR Part 15: Subpart C, §15.203

Test Method:

- N/A

Requirement(s):

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, 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.

Result:

A monopole whip antenna is integrate and permanently attached in the printed circuit board of the EUT.
The EUT meets the antenna requirement.

4.2 Transmission Time

Date Performed:

November 24, 2017

Test Standard:

- Title 47 CFR Part 15: Subpart C, §15.231 (a)
- RSS-210 Issue 9, A.1.1

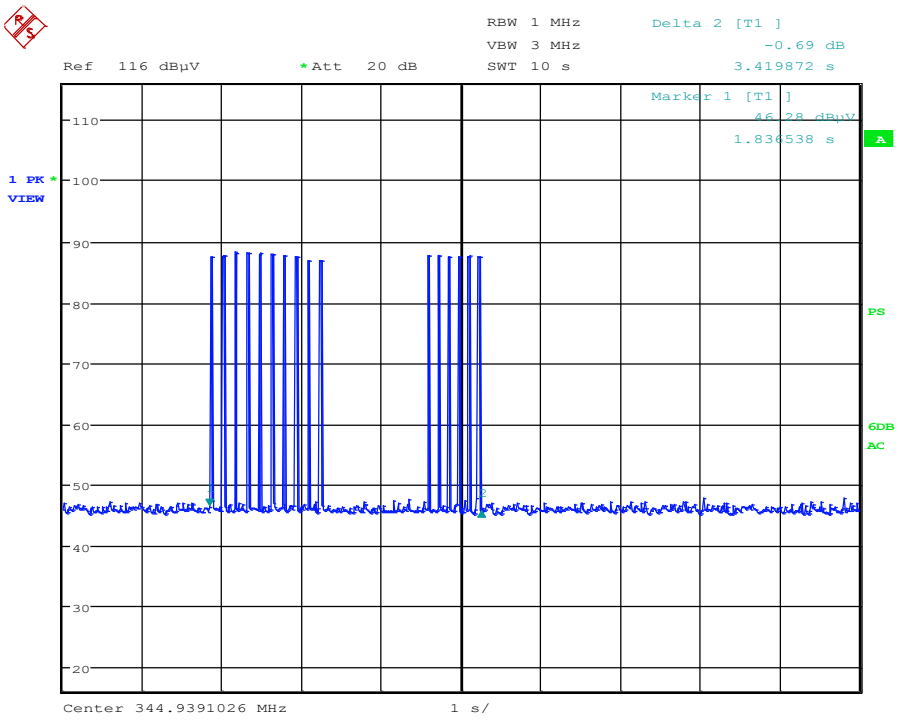
Requirement(s):

- A manually operated transmitter shall be equipped with a push-to-operate switch and be under manual control at all times during transmission. When released, the transmitter shall cease transmission within no more than 5 seconds of being released.
- A transmitter that has been activated automatically shall cease transmission within 5 seconds of activation.

Result:

The EUT complies with the applicable standard.

Data/Plot:



Plot 1: Transmission Time Measurement

Table 1: Transmission time measurement data

Measured TX Transmission Time	Limit	Result
3.06 s	< 5 s	Pass

4.3 Intentional Spurious Emissions

Date Performed:

November 22, 2017

Test Standard:

- Title 47 CFR Part 15: Subpart C, §15.231 (b)
- RSS-210 Issue 9, A.1.2
- RSS-Gen Issue 4, 8.9 & 8.10

Test Method:

- ANSI C63.10-2013

Required Limit(s):

The field strength of emissions from intentional radiators operated under this section (§15.231) shall not exceed the following:

Fundamental Frequency, *f* (MHz)	Field strength of Fundamental (µV/m)	Field strength of Fundamental (dBµV/m)	Field strength of Spurious Emissions (µV/m)	Field strength of Spurious Emissions (dBµV/m)
40.66 – 40.70	2250	67.0	225	47.0
70 – 130	1250	62.0	125	62.0
130 – 174	1250 – 3750*****	62.0 – 71.5*****	125 – 375*****	42.0 – 51.5*****
174 – 260	3750	71.5	375	51.5
260 – 470	3750 – 12500*****	71.5 – 82.0*****	375 – 1250*****	51.5 – 62.0*****
above 470	12500	82.0	1250	62.0
***** - Linear interpolation with frequency, *f*, in MHz: For 130-174 MHz: Field Strength (µV/m) = (56.82 x *f*) – 6136 For 260-470 MHz: Field Strength (µV/m) = (41.67 x *f*) – 7083				
Note 1: The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.				

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

Frequency, *f* (MHz)	Field strength (dBµV/m)
0.009 – 0.490	(20*log(2400/*f* (kHz))) + 40 dB
0.490 – 1.705	(20*log(24000/*f* (kHz))) + 20 dB
1.705 – 30.0	49.5
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
above 960	54.0
Note 1: The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges. **Note 2:** The emissions limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.	

Unwanted emissions that fall into the restricted bands specified on the table below shall comply with the limits specified on the table limits above as per §15.209 and Clause 8.9 of RSS-Gen.

FCC Restricted Bands:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

IC/RSS Restricted Bands:

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		

Method of Measurement:

The EUT was tested in our 3 m SAC and was positioned on the center of the turntable. The transmitter was set for continuous transmission. The operating frequency of the device was measured for all radiated emissions 10 kHz to 4 GHz up to the 10th harmonic of the highest fundamental frequency. The EUT was pre-scanned in 3 different orthogonal orientations and was found to radiate highest when placed flat on the table top as indicated in the test photos.

Modifications:

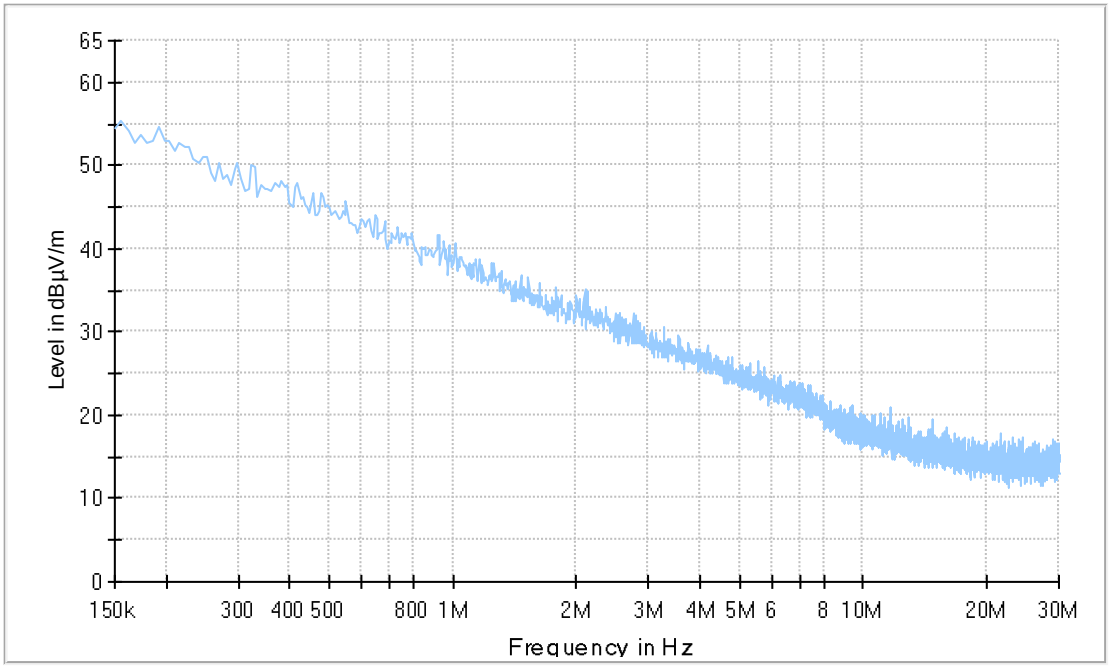
No modification was required to comply for this test.

Result:

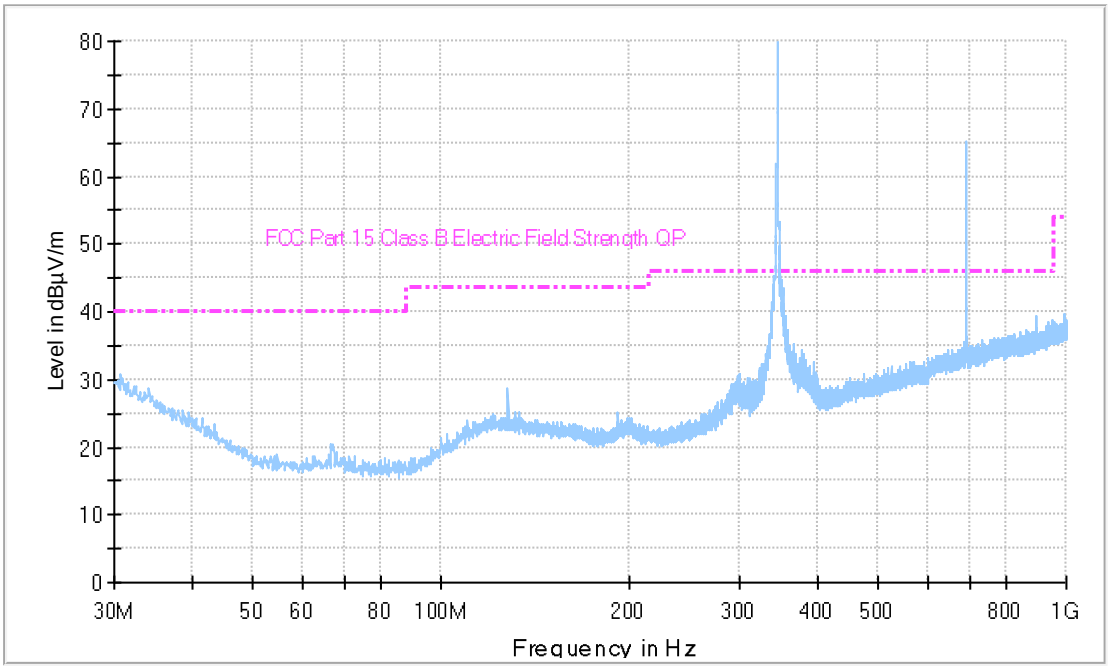
The intentional spurious emissions signals at frequency range 9 kHz to 30 MHz were 20 dB below the required limit therefore need not necessary to include in the report (§15.31(o)).

The EUT complies with the applicable standard.

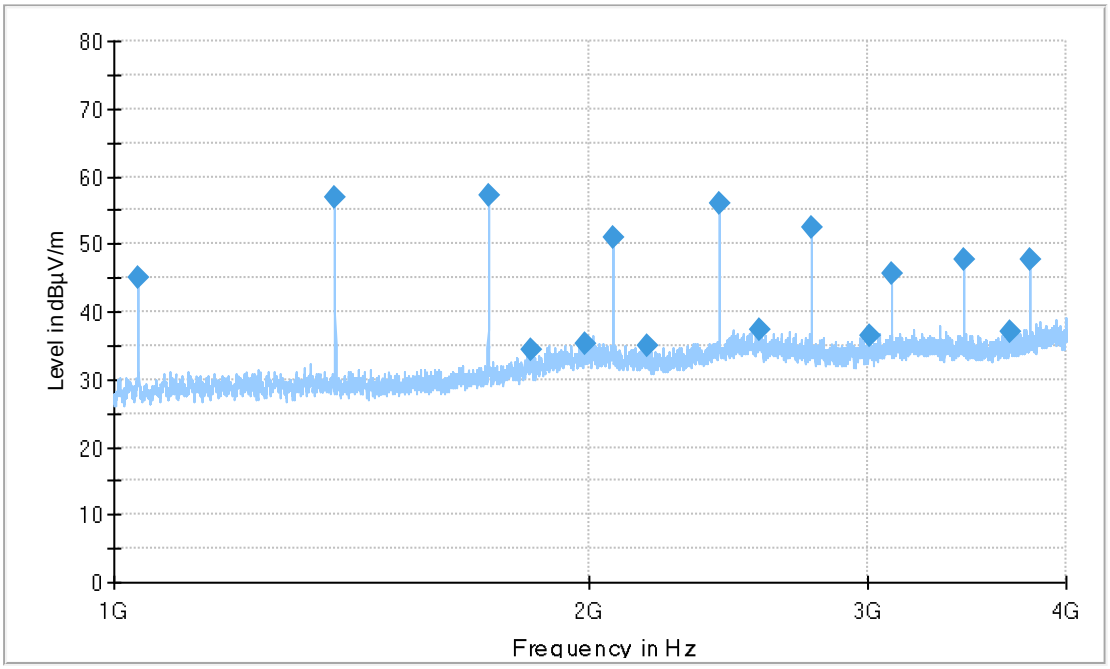
Data/Plot:



Plot 2: Radiated Emissions (150 kHz-30MHz) scanned at 3m SAC



Plot 3: Radiated Emissions (30MHz-1GHz) scanned at 3m SAC



Plot 4: Radiated Emissions (1GHz-4GHz) scanned at 3m SAC

Table 2: Fundamental and spurious emissions measurement data

Freq.	Raw Peak	Turntable	Ant.	Ant.	System Loss	Antenna Factor	Corr. Peak	Duty Cycle Corr. Factor	Avg FS	Limit Avg	Margin	EUT Orientation	
MHz	dBuV	degree	cm	V or H	dB	dB/m	dBuV/m	dB	dBuV/m	dBuV/m	dB		
344.94	71	0	120	V	9.5	14.2	94.7	-21.7	73	77.25	4.25	Vertical	
344.94	54	0	200	H	9.5	14.2	77.7	-21.7	56	77.25	21.25	Vertical	
344.94	60.5	280	300	V	9.5	14.2	84.2	-21.7	62.5	77.25	14.75	Flat	
344.94	73	0	100	H	9.5	14.2	96.7	-21.7	**75**	77.25	2.25	Flat	
689.88	37.2	0	120	V	11	20.1	68.3	-21.7	46.6	57.25	10.65	Vertical	
689.88	37	0	120	H	11	20.1	68.1	-21.7	46.4	57.25	10.85	Vertical	
689.88	30	230	100	V	11	20.1	61.1	-21.7	39.4	57.25	17.85	Flat	
689.88	39.5	0	130	H	11	20.1	70.6	-21.7	**48.9**	57.25	8.35	Flat	
1034.8	47	0	200	V	-15.73	24	55.27	-21.7	33.57	54	20.43	Horizontal	Restricted Band
1034.8	47	2	200	H	-15.73	24	55.27	-21.7	33.57	54	20.43	Horizontal	
1379.7	57	90	100	V	-29.8	25	52.2	-21.7	30.5	54	23.5	Horizontal	
1379.7	64.5	15	150	H	-29.8	25	59.7	-21.7	38	54	16	Horizontal	
1724.7	54.7	120	150	V	-29	27	52.7	-21.7	31	57.25	26.25	Horizontal	
1724.7	64	320	150	H	-29	27	62	-21.7	40.3	57.25	16.95	Horizontal	
2069.7	48.4	0	150	V	-27.8	27.4	48	-21.7	26.3	57.25	30.95	Horizontal	
2069.7	54	50	150	H	-27.8	27.4	53.6	-21.7	31.9	57.25	25.35	Horizontal	
2414.5	54	270	150	V	-27.11	28.5	55.39	-21.7	33.69	57.25	23.56	Horizontal	
2414.5	60	310	120	H	-27.11	28.5	61.39	-21.7	39.69	57.25	17.56	Horizontal	
2759.9	53	0	150	V	-26.01	28.8	55.79	-21.7	34.09	54	19.91	Horizontal	Restricted Band
2759.9	56	300	200	H	-26.01	28.8	58.79	-21.7	37.09	54	16.91	Horizontal	
3104.4	50	270	180	V	-25.5	30.8	55.3	-21.7	33.6	57.25	23.65	Horizontal	
3104.4	53	330	150	H	-25.5	30.8	58.3	-21.7	36.6	57.25	20.65	Horizontal	
3449	50	270	200	V	-23.9	31.2	57.3	-21.7	35.6	57.25	21.65	Horizontal	
3449	52	300	200	H	-23.9	31.2	59.3	-21.7	37.6	57.25	19.65	Horzontal	

4.3.1 Duty Cycle Correction Factor Calculation

Date Performed:

November 24, 2017

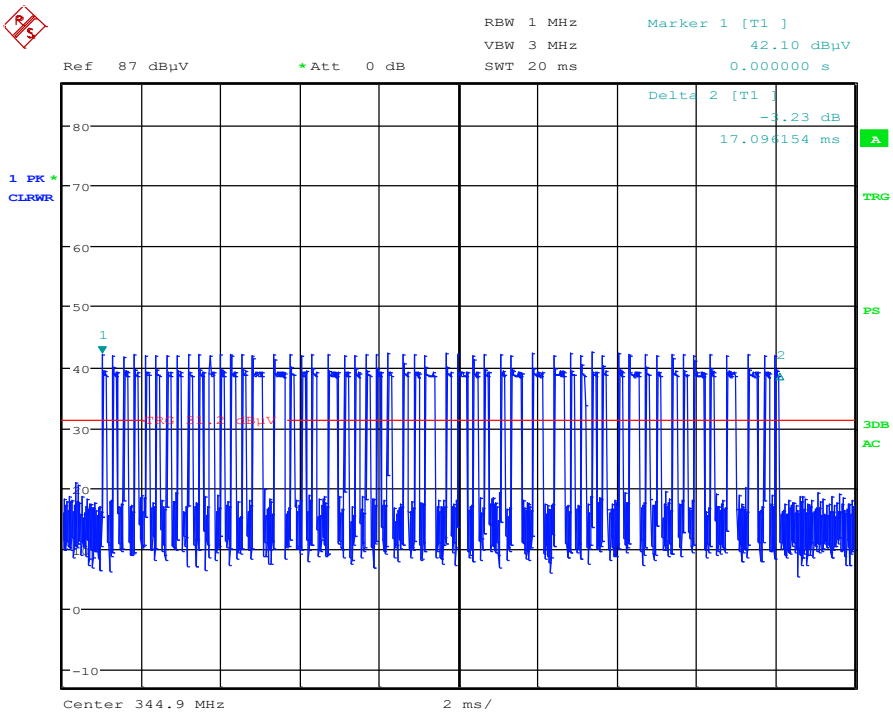
Requirement(s):

- *§ 15.35(c)* - Unless otherwise specified, e.g. § 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

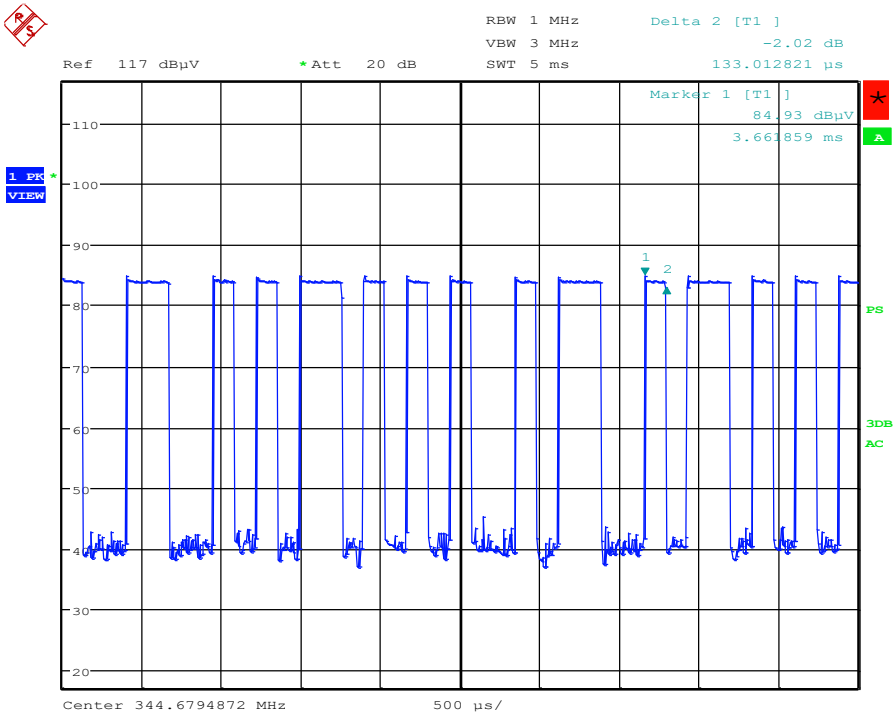
Method of Measurement:

- As called in the ANSI C63.10-2013 standard.

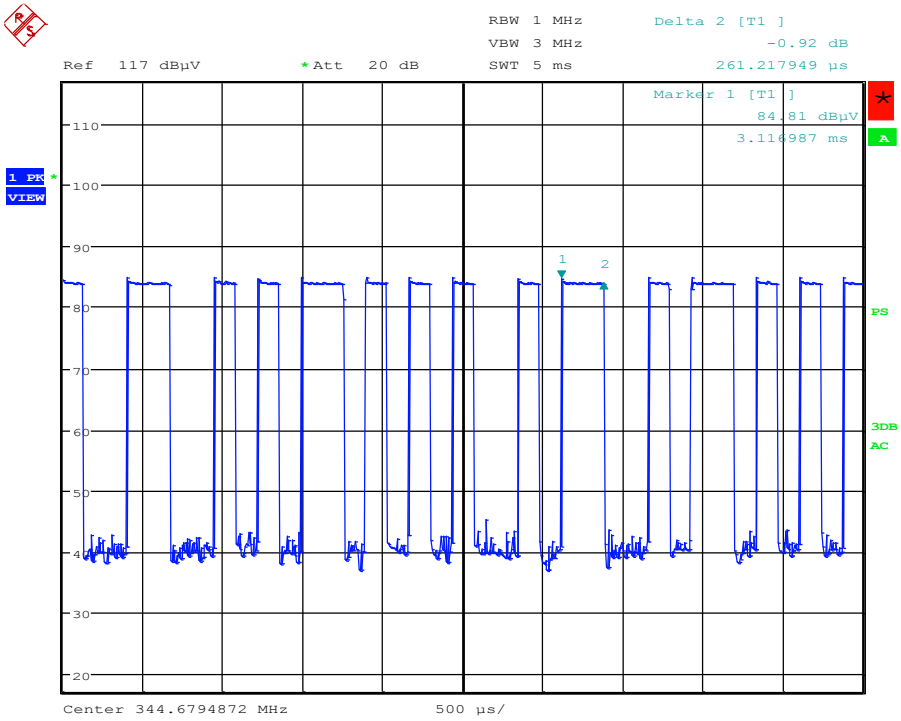
Data/Plot:



Plot 5: Transmissions Burst Duration



Plot 6: Short Time Pulses



Plot 7: Long Time Pulses

Table 3: Duty Cycle Correction Factor Calculation

Data Transmissions		Number of pulses
Transmissions Burst Duration	17.1 msec	
Long Pulse Duration	0.261msec	11
Short pulse Duration	0.133 msec	40
Total Transmissions Duration	(40x0.133) + (11x0.261) = 8.191msec	
On Time within 100 msec	8.191 msec	
Duty Cycle Correction factor	**20log (8.191/100) = -21.7dB**	

4.4 20 dB Occupied Bandwidth

Date Performed:

November 23, 2017

Test Standard:

- Title 47 CFR Part 15: Subpart C, §15.231 (c)

Test Method:

- ANSI C63.10-2013

Required Limit(s):

- The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

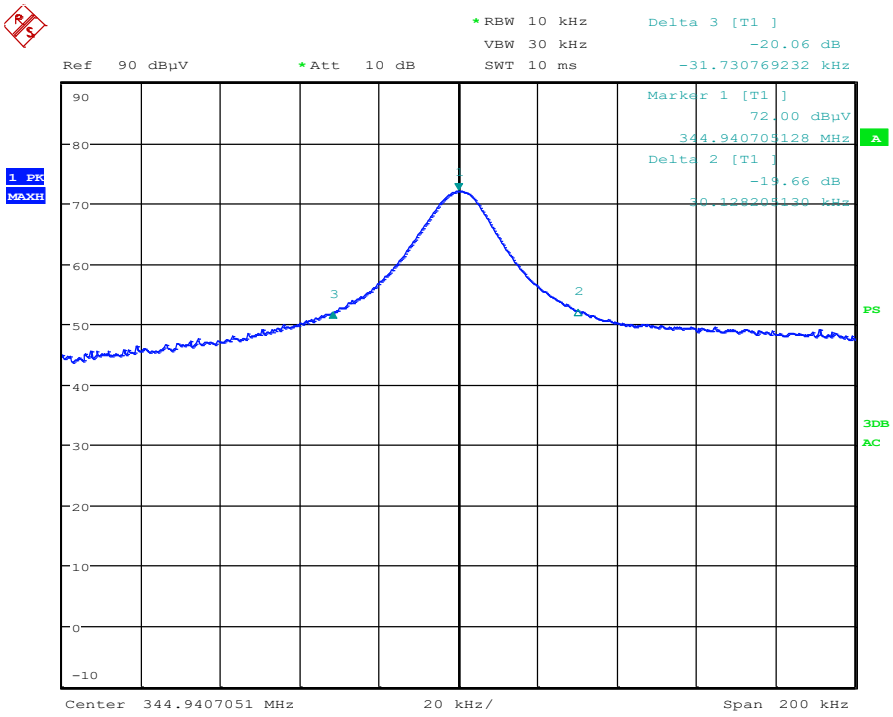
Method of Measurement:

- As called in the ANSI C63.10-2013 standard.

Result:

The EUT complies with the applicable standard.

Data & Plot:



Plot 8: 20 dB Occupied Bandwidth

Table 4: 20 dB OBW Data

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)
344.94	61.8	862.4

4.5 99% Occupied Bandwidth

Date Performed:

November 23, 2017

Test Standard:

- Title 47 CFR Part 15: Subpart C, §15.231 (c)
- RSS-210 Issue 9, A.1.3
- RSS-Gen Issue 4, 6.6

Test Method:

- ANSI C63.10-2013

Required Limit(s):

- The 99% bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% bandwidth shall be less or equal to 0.5% of the centre frequency.

Method of Measurement:

- As called in the ANSI C63.10-2013 standard.

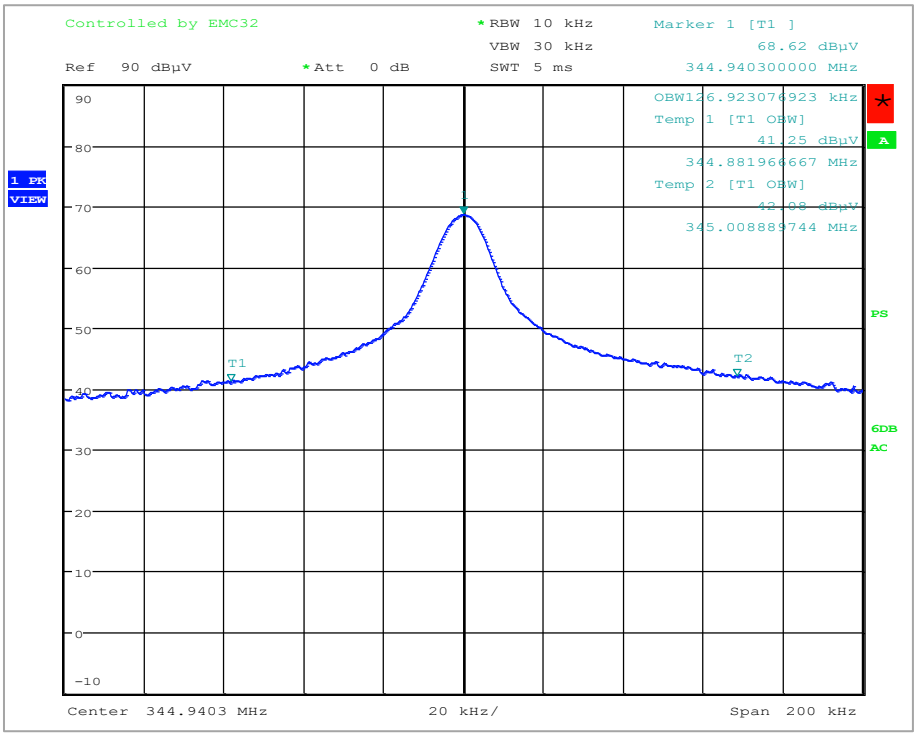
Modifications:

No modification was required to comply for this test.

Result:

The EUT complies with the applicable standard.

Data/Plot:



Plot 9: 99% Occupied Bandwidth

Table 5: 99% OBW Data

Frequency (MHz)	Measured 99% BW (MHz)	Limit (MHz)	Result
344.94	0.1269	0.25%344.94 = 0.862	Pass

4.6 Receiver Radiated Emissions

Date Performed:

November 22, 2017

Test Standard:

- RSS-Gen Issue 4, 7.1

Test Method:

- ANSI C63.4-2014

Required Limit(s):

Spurious emissions from receivers shall not exceed the radiated limits shown below

Frequency, *f* (MHz)	Field strength (dBµV/m)
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
above 960	54.0
Note 1: The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.	

Method of Measurement:

The EUT was tested in our 3 m SAC and was positioned on the center of the turntable. The transmitter was set for continuous transmission. The device was measured for all radiated emissions from 30 MHz to 1 GHz. The EUT was pre-scanned in 3 different orthogonal orientations and was found to radiate highest when placed flat on the table top as indicated in the test photos.

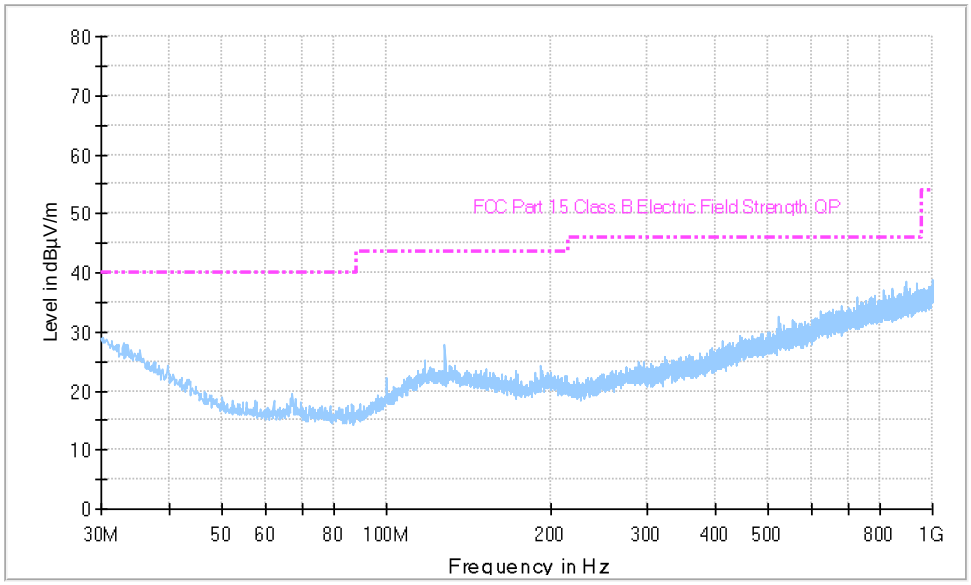
Modifications:

No modification was required to comply for this test.

Result:

The EUT complies with the applicable standard.

Data/Plot:



Plot 10: Radiated Emissions (below 1GHz) scanned at 3m SAC

Remark: All radiated emissions were at least 20dB below the required limit line.

Appendix A: TEST SETUP PHOTOS

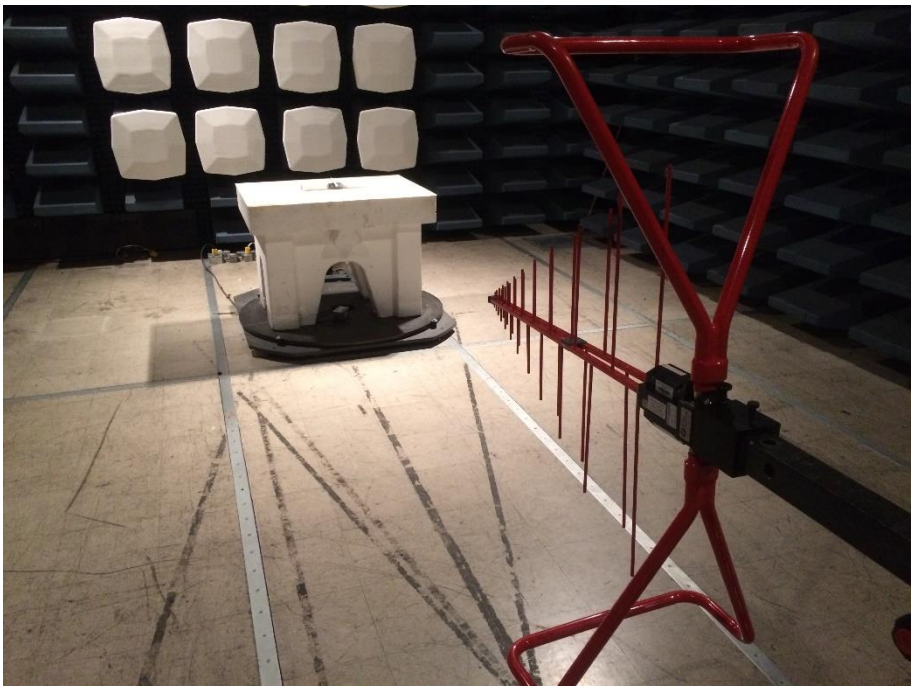


Figure 1: Radiated Spurious Emissions performed at the SAC Test Setup

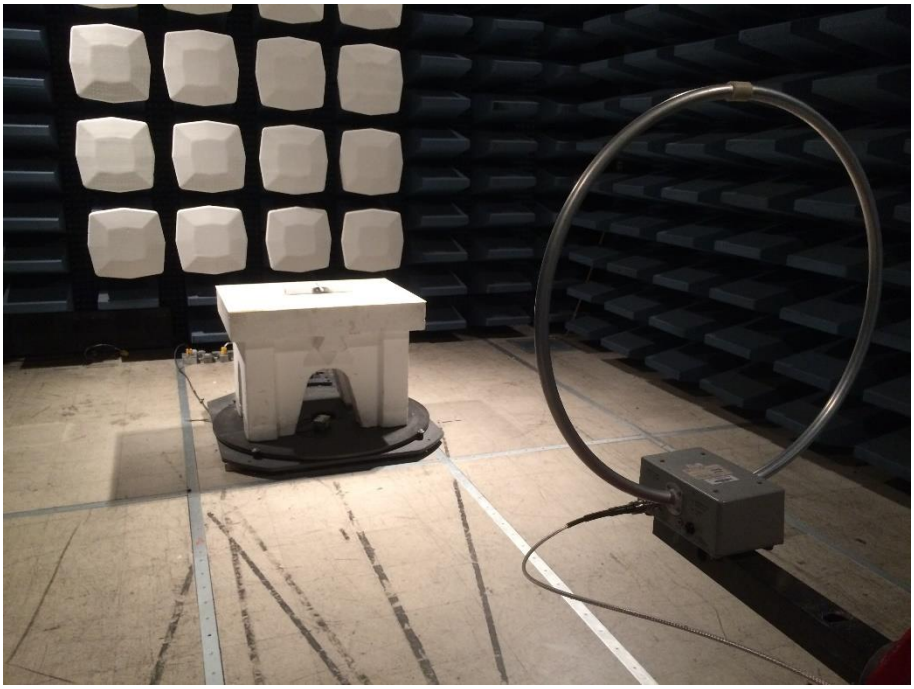


Figure 2: Radiated Spurious Emissions performed at the SAC Test Setup (Below 30MHz)

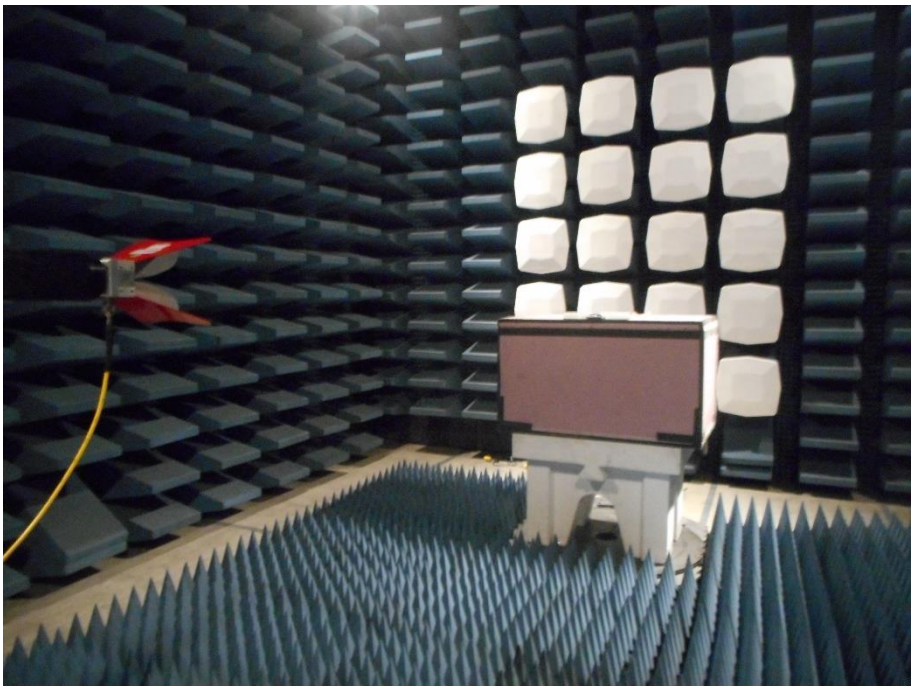


Figure 3: Radiated Spurious Emissions (above 1 GHz) performed at the SAC Test Setup

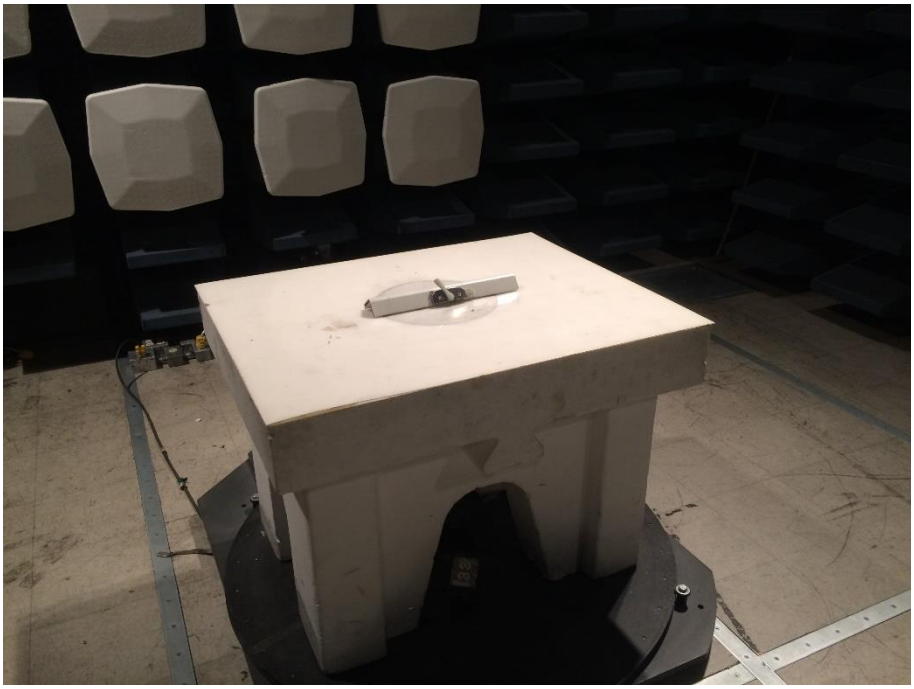


Figure 4: Radiated Spurious Emissions performed at the SAC Test Setup

Appendix B: ABBREVIATIONS

Abbreviation	Definition
AC	Alternating Current
AM	Amplitude Modulation
CE	European Conformity
CISPR	Comité International Spécial des Perturbations Radioélectriques
DC	Direct Current
EFT	Electrical Fast Transient
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
ESD	ElectroStatic Discharge
EUT	Equipment Under Test
FCC	Federal Communications Commission
IC	Industry Canada
ICES	Interference Causing Equipment Standard
IEC	International Electrotechnical Commission
LISN	Line Impedance Stabilizing Network
OATS	Open Area Test Site
RF	Radio Frequency
RMS	Root-Mean-Square
SAC	Semi-Anechoic Chamber

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END OF REPORT