REPORT

For

Guard RFID Solutions Inc.

#140 – 766 Cliveden Place
Delta, British Columbia
V3M 6C7, Canada

Date:	05 March 2018
Report No.:	16702-3E
Revision No.:	1
Project No.:	16702
Model No.:	AT-5BLF
FCC ID:	VZKAT5
IC ID.:	9937A-AT5

ONE STOP GLOBAL CERTIFICATION SOLUTIONS

Unit 205 – 8291 92 ST., Delta, BC
V4G 0A4, Canada
Phone: 604-247-0444
Fax: 604-247-0442
www.labtestcert.com

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TEST REPORT_FCC 15.231 & RSS-210		
Periodic operation in the band 40.66-40.70 MHz and above 70 MHz / License-Exempt Radio Apparatus: Category I Equipment		
Report Reference No. .....:	16702-3E	
Report Revision History. .....:	✓ Rev. 0: 06 February 2018 ✓ Rev. 1: 05 March 2018, corrected information.	
Compiled by (+ signature).....	Jeremy Lee	
Approved by (+ signature).....	David Johanson	
Date of issue .....:	05 March 2018	
Total number of pages	30	
FCC Site Registration No.:	CA5970	
IC Site Registration No.:	5970A	
Testing Laboratory.....:	LabTest Certification Inc.	
Address .....:	3128 – 20800 Westminster Hwy, Richmond, B.C. V6V2W3	
Applicant's name.....:	Guard RFID Solutions Inc.	
Address .....:	#140-766 Cliveden Place, Delta, BC, V3M 6C7, Canada	
Manufacture's Name .....:	Same as Applicant	
Address .....:	Same as Applicant	
Test specification:		
Standards.....:	FCC15.231:2018 / RSS-210, Issue 9, August 2016	
Test procedure .....:	➢ ANSI C63.4:2014 ➢ ANSI C63.10:2013 ➢ RSS-Gen, Issue 4, November 2014	
Non-standard test method……..:	N/A	
Test Report Form(s) Originator .....:	Jeremy Lee	
Master TRF .....:	1036_Rev2 – RF Report Template	
Test item description :		
Trade Mark.....:	guard RFID	
Model/Type reference .....:	AT-5BLF	

Serial Number .....:	000127 & 100103
FCC ID .....:	VZKAT5
IC ID .....:	9937A-AT5
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement .....:	F (Fail)
Testing:	
Date of receipt of test item .....:	11 January 2018
Date (s) of performance of tests.....:	11 January 2018

Device Under Test Description

Application for .....:	Radio Frequency Identification (RFID)
Operating Transmit Frequency .....:	433.92MHz
Operating Receive Frequency .....:	125kHz
Beacon Interval .....:	10 minutes static, 12 sec. during motion
Equipment mobility .....:	Yes
Operating condition.....:	-20 to +60 °C
Mass of equipment (g) .....:	8
Dimension	41 mm X 33 mm X 7 mm
Nominal Voltages for:	_X_ stand-alone equipment ___ combined (or host) equipment
Supply Voltage:	_____ AC _____ Amps __3V___ DC with Battery
If DC Power:	___ Internal Power Supply ___ External Power Supply or AC/DC adapter _X_ Battery ☐ Nickel Cadmium ☐ Alkaline ☐ Nickel-Metal Hydride ☒ Lithium-Ion ☐ Other

Program details

Testing procedure and testing location:		
☒	**Testing Laboratory**:	LabTest Certification Inc.
Testing location/ address.....:		3128-20800 Westminster HWY, Richmond, B.C. V6V 2W3 Canada

Summary of testing:	
Tests performed (name of test and test clause): **Radiated Field strength and Emissions**	**Testing location:** **In SAC, Richmond**

The tests indicated in Test Summary were performed on the product constructed as described below. The test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.
Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. LabTest does not make any claims of compliance for samples or variants which were not tested.

Description of Equipment Under Test and Variant Models

Description:

The EUT, AT-5BLF, is an active RFID tag for tracking, locating, and protecting equipment and other assets that require a low profile tag with a small footprint.

The tags have Ultra-High Frequency (UHF) Beacon message capability for presence-detection and long-range location using Guard RFID's Tag Readers. They also include a Low Frequency (LF) Receiver that instantly detects entry into critical security zones or other locations of interest that are equipped with Guard RFID's Tag Exciters. This proximity location technology can instantly secure doors to protect a tagged article from leaving the perimeter, and can support numerous applications where better granularity of tag location is required.

The Tag has an integrated motion sensor that can be used to alarm on movement, and which increases the Beacon rate when the tag is in motion. A temperature sensor allows monitoring of ambient temperature between -20º to +60º Celcius with accuracy of ±2º after stabilization has been achieved.

Guard RFID's industry-leading tag communication protocol allows hundreds of tags to be detected simultaneously at security or detection points and enables a high density of tags within the system coverage. The Article Tag can be directly applied to an object using an extremely strong peel-and-stick adhesive label at the back of the tag.

Variant Models: The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.
None

EUT Internal Operating Frequencies

Frequency (MHz)	Description	Frequency (MHz)	Description
0.032768	Y1, Ref. Clock for CC1150	26	Y2, RF Clock for CC1150
433.92	CC1150, Transmitting Radio	-	-

Client Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Comments
EUT	RFID	Guard RFID	AT5	-
Abbreviations: EUT - Equipment Under Test, SIM - Simulator (Not Subjected to Test)				

Software and Firmware

Use*	Description	Version
EUT	Hardware	n/p
EUT	Firmware	n/p
Abbreviations: EUT - Equipment Under Test,		

Input/Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
	n/a				

Power Interface

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
0	3	-	-	DC	-	Li-ion Battery, New

EUT Operation Modes

Mode #	Description
1	Keep transmitting Beacon Signal with new Batteries.

EUT Configuration Modes

Mode #	Description
1	Orthogonal X 
2	Orthogonal Y 
3	Orthogonal Z 

Test Equipment Verified for function

Model #	Description	Checked Function	Results

N9038A	Spectrum Analyzer	Frequency and Amplitude	Checked 433.92MHz and 0dBm Reference Signal from Signal Generator and both Freq. and Level were OK.
JB1	Antenna, 30 to 2000MHz	Checked structure	Normal – no damage.
SAS-571	Antenna, 1 to 18GHz	Checked structure	Normal – no damage.
AL-130	Antenna, 9kHz to 30MHz	Checked structure	Normal – no damage.
8449B	Pre-Amplifier, 1 to 26.5GHz	Gain at 1 to 26.5GHz	Gains were normal.

Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests:

Parameter	Uncertainty
Radiated Emission, 30 to 6,000MHz	± 4.95 dB

Uncertainty figures are valid to a confidence level of 95%.

Result Summary

The Compliance Status is a judgment based on the direct measurements and calculated highest emissions to appropriate standard limits. Measurement uncertainty values, provided on calibration certificates, were not be used in the judgment of the final status of compliance.

FCC Part 15.231 and IC RSS-210			
Test Type	**Regulation**	**Measurement Method**	**Result**
Antenna Requirement	15.203 & RSS-Gen	-	PASS
Summary of the operation of RF Transmission	15.231(a) & RSS-210, Annex A.1.1	-	PASS
Field Strength of Fundamental - Intentional radiator	15.231, 15.205, 15.209 & RSS-210	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5	PASS
Field Strength of Spurious Emissions - Intentional radiator	15.231, 15.205, 15.209 & RSS-210	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5 & 6.6	PASS
Radiated Emissions- Intentional radiators	15.209 and RSS-210	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5	PASS
The Bandwidth of the emission	15.231 and RSS-210	ANSI C63.10:2013, Clause 6.9	PASS
AC Power Line Conducted Emission	15.207(a) RSS-Gen	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.2	N/A[1)]

Note1): The EUT is operated by internal battery. This test was exempted by no connection to AC Power Line.

Antenna Requirement

Governing Doc	FCC 15.203 & RSS-GEN	Room Temperature (°C)	24.1
Basic Standard	-	Relative Humidity (%)	34.0
Test Location	Richmond	Barometric Pressure (kPa)	102.5
Test Engineer	Jeremy Lee	Date	12 January 2018
EUT Voltage	☒ Battery		
Compliant ☒	Non-Compliant ☐	Not Applicable ☐	

Results

According to §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 EUT has fixed antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.

Summary of the operation of RF Transmission

Governing Doc	FCC Part 15.231(a) & RSS-210, Annex A.1	Room Temperature (°C)	24.1
Basic Standard	-	Relative Humidity (%)	34.0
Test Location	Richmond	Barometric Pressure (kPa)	102.5
Test Engineer	Jeremy Lee	Date	12 January 2018
EUT Voltage	☒ Battery		

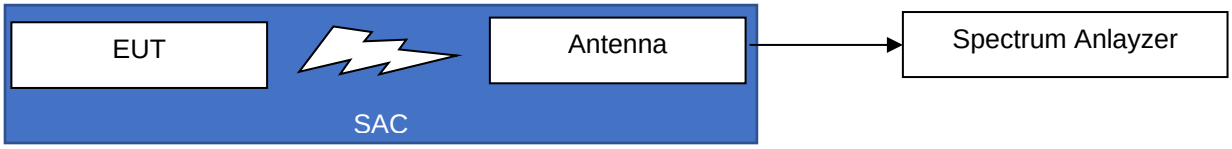
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	Keysight	N9038A	702	27-Apr-2017	27-Apr-2018
Broadband Antenna	Sunol	JB1	371	29-Mar-2016	29-Mar-2018
EMC Shielded Enclosure	USC	USC-26	374	NCR	NCR
Note) NCR = No Calibration Required					

Compliant ☒ Non-Compliant ☐ Not Applicable ☐

Test setup

Description of test set-up:

The EUT was placed on a 0.8 m non-conducting table above a Turn table in SAC.
The EUT was set to **Operation Mode #1 with configuration Mode #1.**



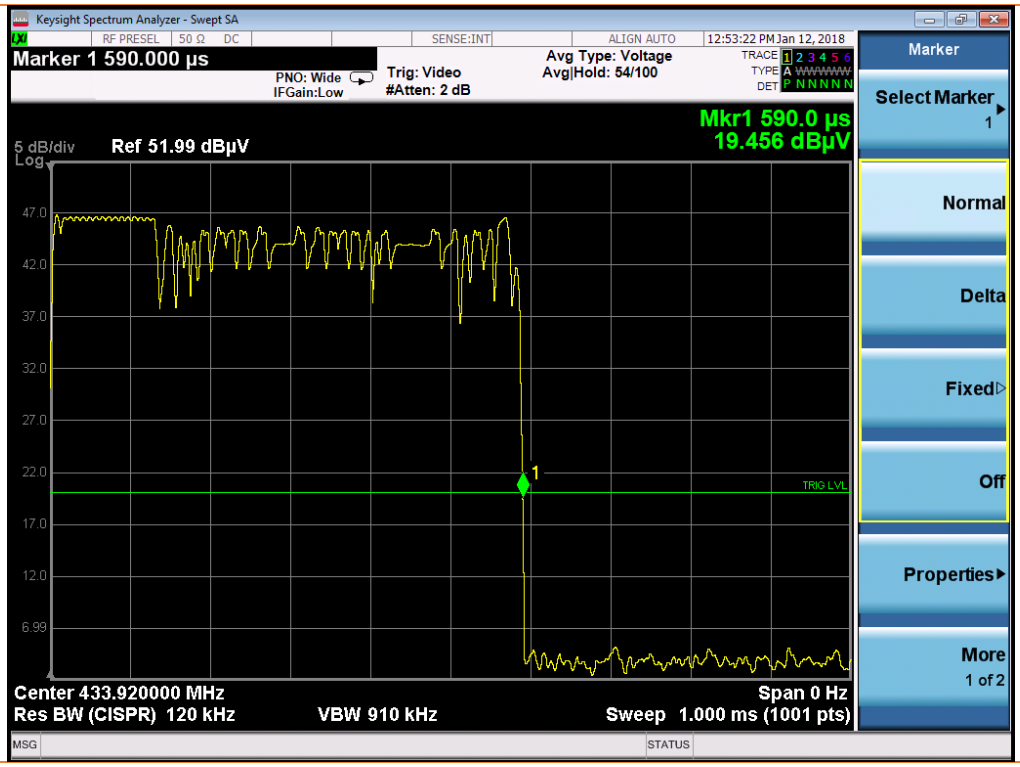
Reviewed Results

Rule Part No.	Description of Rule	Yes	No	N/A
FCC 15.231(a)	Continuous transmissions, voice, video and the radio control of toys are not permitted.	☐	☒	☐
FCC 15.231(a)	Data is permitted to be sent with a control signal.	☒	☐	☐
FCC 15.231(a)(1)	Manually operated	☐	☒	☐
	Automatically deactivate within 5 seconds of being released	☐	☐	☒
FCC 15.231(a)(2)[1]	Automatically operated	☒	☐	☐
	Deactivate within 5 seconds after activation	☒	☐	☐
FCC 15.231(a)(3)[2]	Periodic transmission at regular predetermined intervals	☒	☐	☐
	Polling or supervision transmission, including data, to determine system integrity or transmitters used in security or safety applications requires no total duration of transmission not exceeding 2s/hr.	☐	☒	☐
FCC 15.231(a)(4)	Radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition	☐	☒	☐
FCC 15.231(a)(5)	Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.	☐	☐	☒

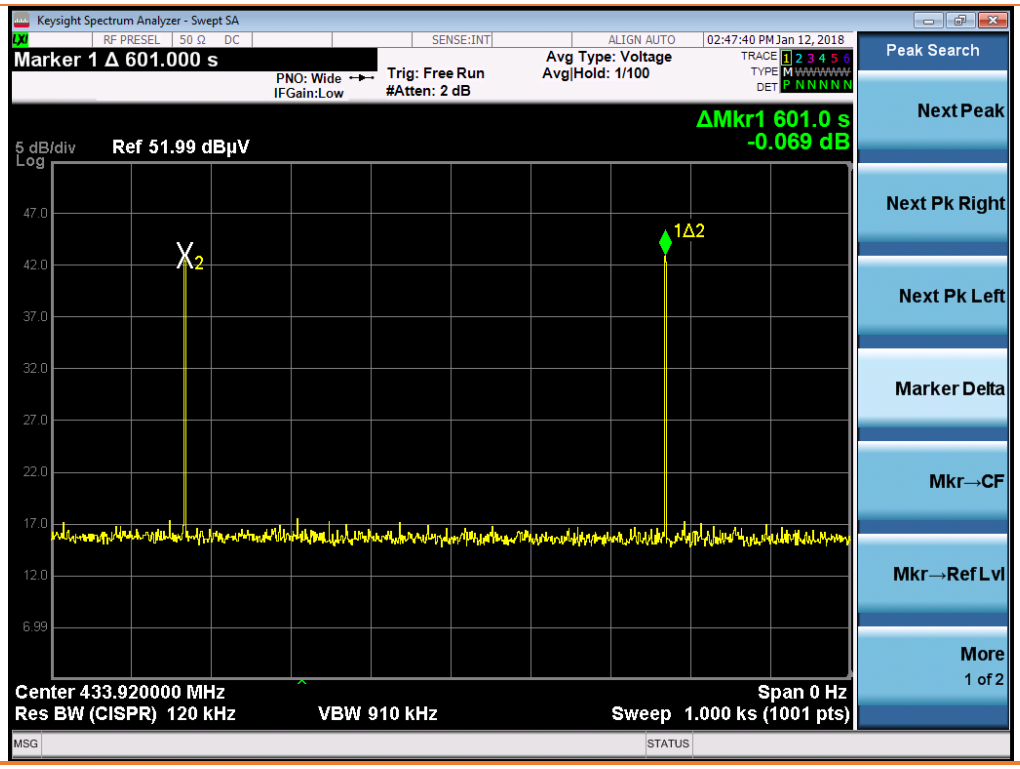
Note1)The EUT is operating as automatically when moved or detacted 125kHz Exiting Signal. When Activated Transmitter, the signal was deactivated after 590 μs.

Note2) Tag transmits one 590μs pulse every 10 minutes in static or every 12sec. in during motion.

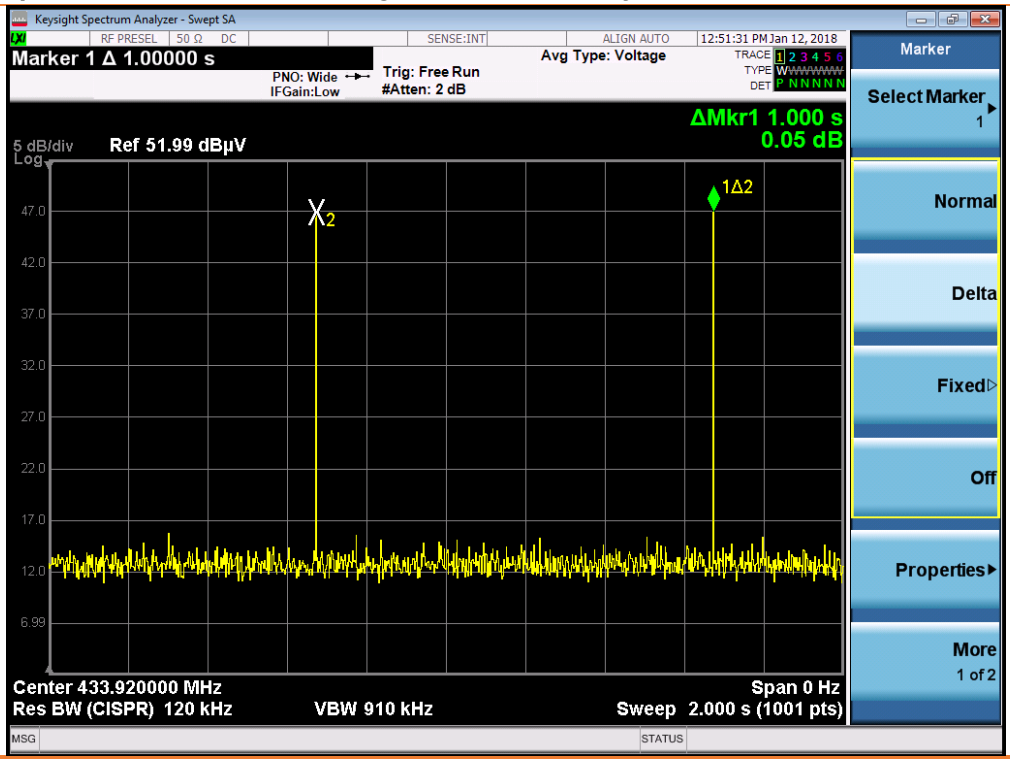
- **Screen Capture, Automatic turned on and off time**



- **Screen Capture, periodic for Automatic Turned -on period, in Static.**



- **Screen Capture, modified for RF testing as turned on every 1 second.**



Field Strengths

Governing Doc	15.231, 15.205, 15.209 & RSS-210	Room Temperature (°C)	24.1
Basic Standard	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5	Relative Humidity (%)	34.0
Test Location	Richmond	Barometric Pressure	102.5
Test Engineer	Jeremy Lee	Date	12 January 2018
EUT Voltage	☒ Battery, New		

Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	Keysight	N9038A	702	27-Apr-2017	27-Apr-2018
Broadband Antenna	Sunol	JB1	371	29-Mar-2016	29-Mar-2018
EMC Shielded Enclosure	USC	USC-26	374	NCR[1]	NCR[1]

Note1) NCR = No Calibration Required, but NSA was done at 2016.

Detector:	☒ Peak	☒ Quasi-Peak/AVG	
RBW/VBW:	☒120/300kHz	☐ 1/3MHz	
Type of Facility:	☒ SAC	☐ FSOATS	☐ *in-situ*
Distance:	☒ 3meter	☐ 10meter	☐ 1meter
Arrangement of EUT:	☒ Table-top only	☐ Floor-standing only	☐ Rack Mounted

Frequency (MHz)	Orthogonal	Detector	POL	Emissions (dBuV/m)	Limit (dB)	Margin (dB)	Comments
433.92	X	Peak	H	66.22	100.83	34.61	PASS
		AVG[1]	H	20.72	80.83[2]	60.11	PASS
		Peak	H	59.52	100.83	41.31	PASS
		AVG[1]	V	20.69	80.83[2]	60.14	PASS
	Y	**Peak**	**H**	**68.79**	**100.83**	**32.04**	**PASS**
		AVG[1]	H	21.36	80.83[2]	59.47	PASS
		Peak	H	65.53	100.83	35.30	PASS
		AVG[1]	V	22.27	80.83[2]	58.56	PASS
	Z	Peak	H	66.79	100.83	33.04	PASS
		AVG[1]	H	20.54	80.83[2]	60.29	PASS
		Peak	H	66.50	100.83	34.33	PASS
		AVG[1]	V	21.82	80.83[2]	59.01	PASS

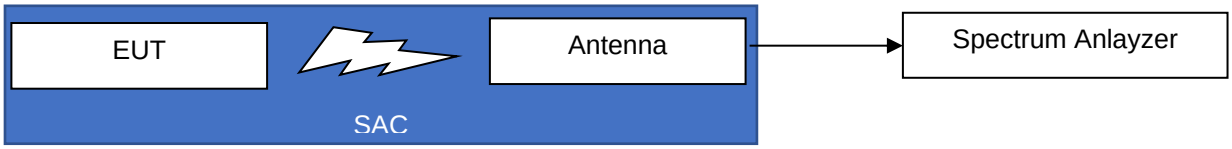
Note 1) Measued by CISPR Averaging detector.
Note 2) Cconverted from 11,000uV/m at 3 meter.

Compliant ☒ Non-Compliant ☐ Not Applicable ☐

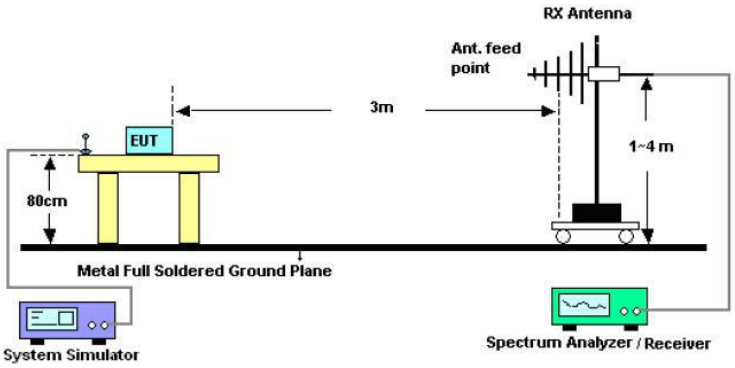
Test setup

Description of test set-up:

The EUT was placed on a 0.8 m non-conducting table above a Turn table in SAC.
The EUT was set to **Operation Mode #1 with configuration Mode #1, 2 & 3.**



- Tested with SAS-510-2, LPDA Antenna as followed by ANSI C63.10, Table 1



Measurement Procedure

This test measures the radiating levels from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Testing was performed in accordance with the test standard(s) referenced in the test summary section of this report. The Equipment Under Test (EUT) was configured based upon the requirements of the applicable test standard. Initially, the primary emission frequencies are identified by positioning a broadband receive antenna three meter from the EUT.

A test was made with an Spectrum Analyzer, controlled by Test Software, Tile7!, at 433.92MHz with the Analyzer in the peak mode. The IF bandwidth was 120 kHz. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to produce horizontal and vertical polarities while the turntable is rotated to determine the worst emitting configuration. Measurements were then made using CISPR Averaging detector at each orthogonals. It was repeated again for three different Orthogonals as described in configuration mode. The numerical results are included herein to demonstrate compliance.

Test Result

Emission level (dBuV/m) = Detected level (dBuV) +Cable Loss (dB) + Antenna Factor (dB/m)

Spurious Emissions (Unwanted Emissions)

Governing Doc	FCC Part 15.231(b), 15.205, 15.209 & RSS-210, Annex A.2	Room Temperature (°C)	23.5
Basic Standard	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5 & 6.6	Relative Humidity (%)	37.0
Test Location	Richmond	Barometric Pressure (kPa)	100.8
Test Engineer	Jeremy Lee	Date	23 January 2018
EUT Voltage	☒ Battery, New		

Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	Keysight	N9038A	702	27-Apr-2017	27-Apr-2018
Broadband Antenna	Sunol	JB1	371	29-Mar-2016	29-Mar-2018
Double-ridged Guide Horn Antenna	A.H.Systems	SAS-571	227C	22-Sep-2016	22-Sep-2018
Loop Antenna	ComPower	AL-130	241	11-Nov-2017	11-Nov-2019
EMC Shielded Enclosure	USC	USC-26	374	NCR[1]	NCR[1]
RF Preamplifier	Agilent	8449B	273	NCR	NCR

Note1) NCR = No Calibration Required, but NSA & sVSWR was done at 2016.

Detector:	☒ Peak	☒ Quasi-Peak/AVG	
RBW/VBW:	☒9/30kHz	☒120/300kHz	☒ 1/3MHz
Type of Facility:	☒ SAC(30kHz to 1GHz)	☒ FSOATS(1 to 5GHz)	☐ *in-situ*
Distance:	☒ 3meter	☐ 10meter	☐ 1meter
Arrangement of EUT:	☒ Table-top only	☐ Floor-standing only	☐ Rack Mounted

Frequency (MHz)	Orthogonal	Detector	POL	Emissions (dBuV/m)	Limit (dB)	Margin (dB)	Comments
867.84	Y	Peak	H	42.52	81.94	39.42	PASS
		AVG[1]	H	27.76	61.94	34.18	PASS
		Peak	V	42.20	81.94	39.74	PASS
		AVG[1]	V	28.00	61.94	33.94	PASS
1301.8	Y	AVG[1]	H	21.39	53.98	32.59	PASS
		AVG[1]	V	21.53	53.98	32.45	PASS
1735.7	Y	AVG[1]	H	23.23	61.94	38.71	PASS
		AVG[1]	V	23.70	61.94	38.24	PASS
2169.6	Y	AVG[1]	H	25.66	61.94	36.28	PASS
		AVG[1]	V	28.07	61.94	33.87	PASS
2603.5	Y	AVG[1]	H	25.57	61.94	36.37	PASS

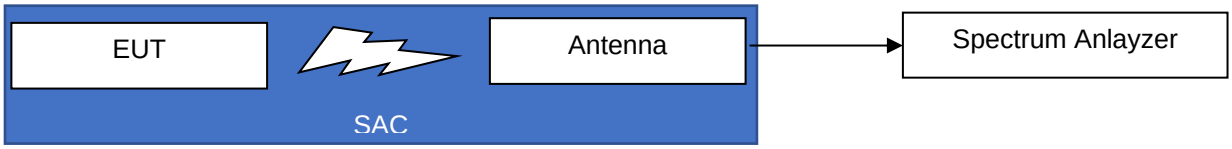
		AVG[1]	V	25.99	61.94	35.95	PASS
3037.4	Y	AVG[1]	H	29.07	61.94	32.87	PASS
		AVG[1]	V	28.84	61.94	33.10	PASS
3471.4	Y	AVG[1]	H	28.29	61.94	33.65	PASS
		AVG[1]	V	28.19	61.94	33.75	PASS
3905.3	Y	AVG[1]	H	32.83	53.98	21.15	PASS
		AVG[1]	V	32.88	53.98	21.10	PASS
4339.2	Y	AVG[1]	H	33.10	53.98	20.88	PASS
		AVG[1]	V	32.91	53.98	21.07	PASS
Note 1) Measued by CISPR Averaging detector, all emissions were under noise floor.							
Compliant ☒		Non-Compliant ☐			Not Applicable ☐		

Test setup

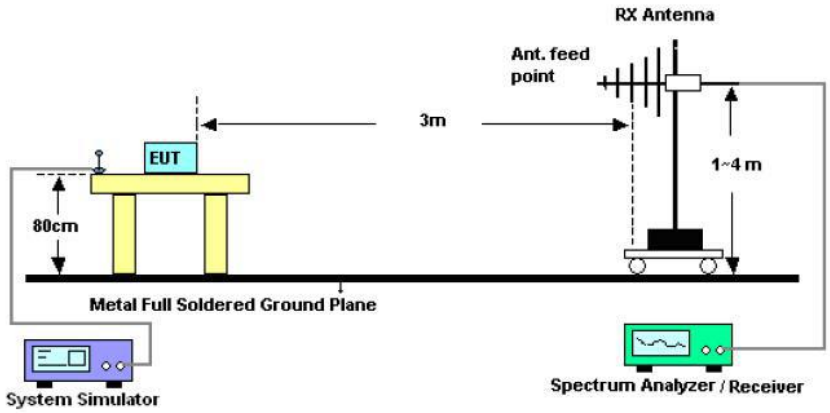
Description of test set-up:

The EUT was placed on a 0.8 m for under 1GHz and 1.5m for over 1GHz non-conducting table above a Turn table in SAC.

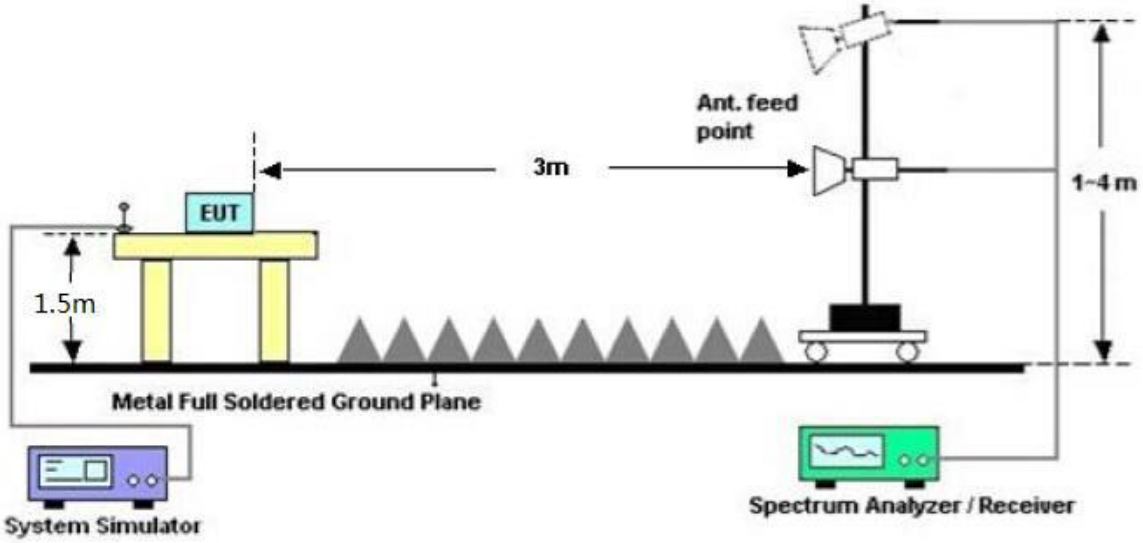
The EUT was set to **Operation Mode #1 with configuration Mode #1, 2 & 3.**



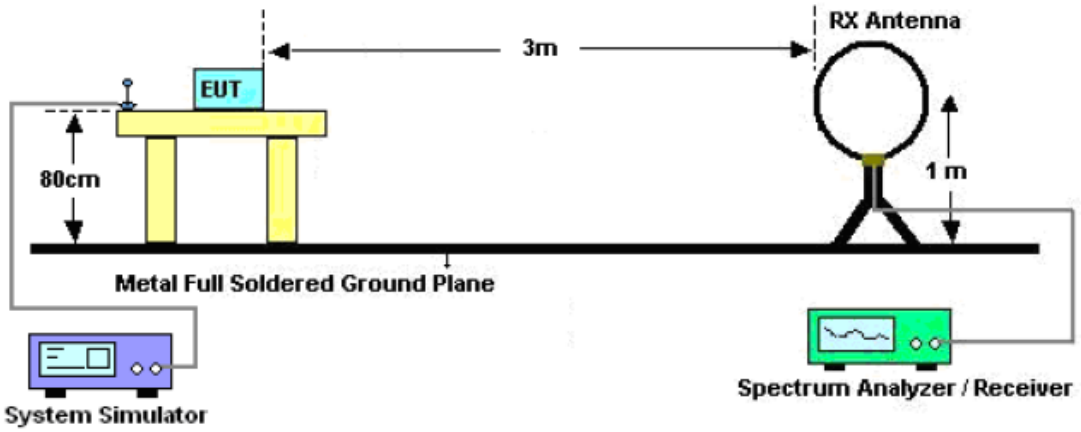
- Tested spurious with JB1



- Tested spurious with SAS-571 for over 1GHz



- Tested with AL-130, below 30MHz.



Measurement Procedure

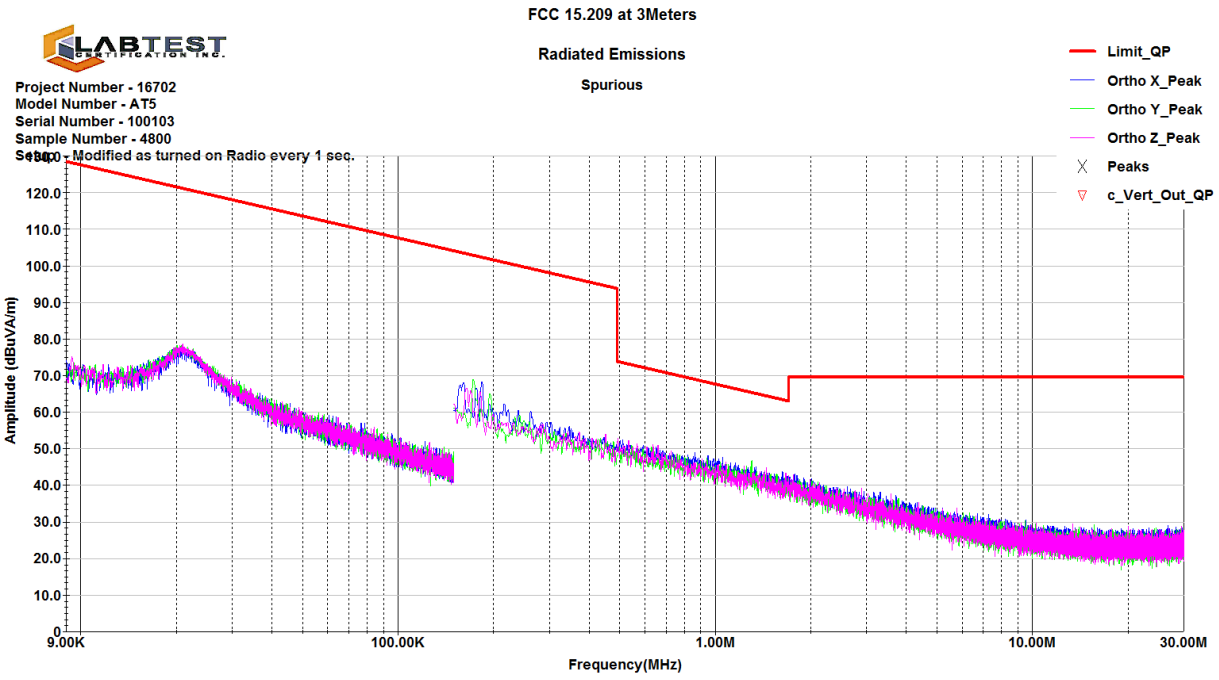
This test measures the radiating levels from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Testing was performed in accordance with the test standard(s) referenced in the test summary section of this report. The Equipment Under Test (EUT) was configured based upon the requirements of the applicable test standard. Initially, the primary emission frequencies are identified by positioning a broadband receive antenna three meter from the EUT.

A test was made with an Spectrum Analyzer, controlled by Test Software, Tile7!, for all Harmonics with the Analyzer in the peak mode. The IF bandwidth was 120 kHz(under 1GHz) and 1MHz(over 1GHz). To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to produce horizontal and vertical polarities while the turntable is rotated to determine the worst emitting configuration. Measurements were then made using CISPR Averaging detector. It was repeated again for three different Orthogonals as described in configuration mode. The numerical results are included herein to demonstrate compliance. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Test Result

Emission level (dBuV/m) = Detected level (dBuV) +Cable Loss (dB) + Antenna Factor (dB/m)

Graphical Representation for Emission - Radiated 9kHz to 30MHz



Radiated Emissions for Digital Parts and Receiver

Governing Doc	FCC 15.109(a) & ICES-003	Room Temperature (°C)	21.5
Basic Standard	ANSI C63.4:2014	Relative Humidity (%)	39.0
Test Location	Richmond	Barometric Pressure (kPa)	100.9
Test Engineer	Jeremy Lee	Date	23 January 2018
EUT Voltage	☒ Battery, New		

Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	KeySight	N9038A	702	18-Apr-2017	18-Apr-2018
Broadband Antenna	Sunol	JB1	371	29-Mar-2016	29-Mar-2018
AC Power Source	California Instrument	5001i	059	NCR	NCR
EMC Shielded Enclosure	USC	USC-26	374	NCR[1]	NCR[1]

Note1) NCR = No Calibration Required, but NSA was done at 2016.

Frequency Range:	☒ 30kHz-30MHz	☒ 30-1000MHz	☐ 1-6GHz
Detector:	☒ Peak (for Prescan)	☒ Quasi-Peak(for Formal)	
RBW/VBW:	☒ 9/30kHz	☒ 120/300kHz	☐ 1/3MHz
Type of Facility:	☒ SAC	☐ FSOATS	☐ *in-situ*
Distance:	☒ 3meter	☐ 10meter	☐ 1meter
Arrangement of EUT:	☒ Table-top only	☐ Floor-standing only	☐ Rack Mounted
Classification:	☒ Class B	☐ Class A	

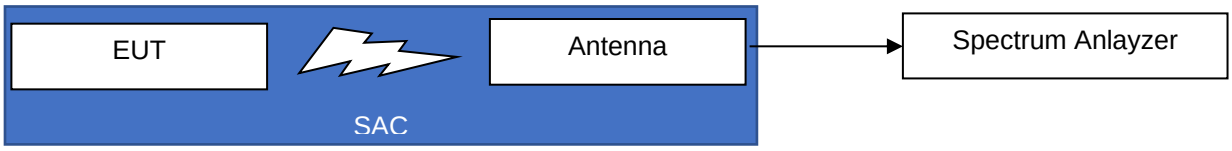
Compliant ☒ Non-Compliant ☐ Not Applicable ☐

Test setup

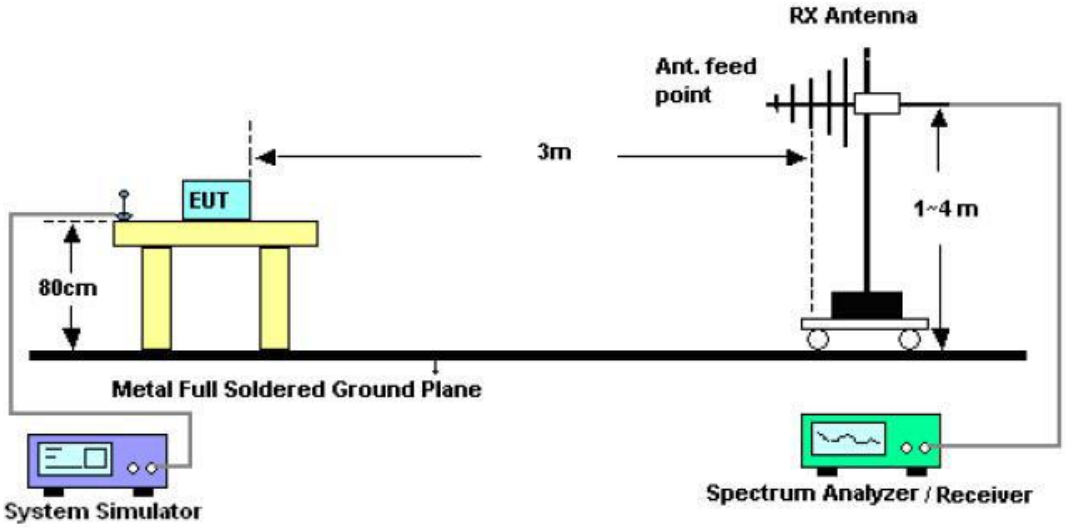
Description of test set-up:

The EUT was placed on a 0.8 m non-conducting table above a Turn table in SAC.

The EUT was set to **Operation Mode #1 with configuration Mode #1 for Battery Operated and Operation Mode #2 with configuration Mode #4 with AC/DC adapter.**



- Radiated Emission 30 to 1,000MHz, with JB-1



Measurement Results

This test measures the radiating levels from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Testing was performed in accordance with the test standard(s) referenced in the test summary section of this report. The Equipment Under Test (EUT) was configured based upon the requirements of the applicable test standard. Initially, the primary emission frequencies are identified by positioning a broadband receive antenna three meter from the EUT.

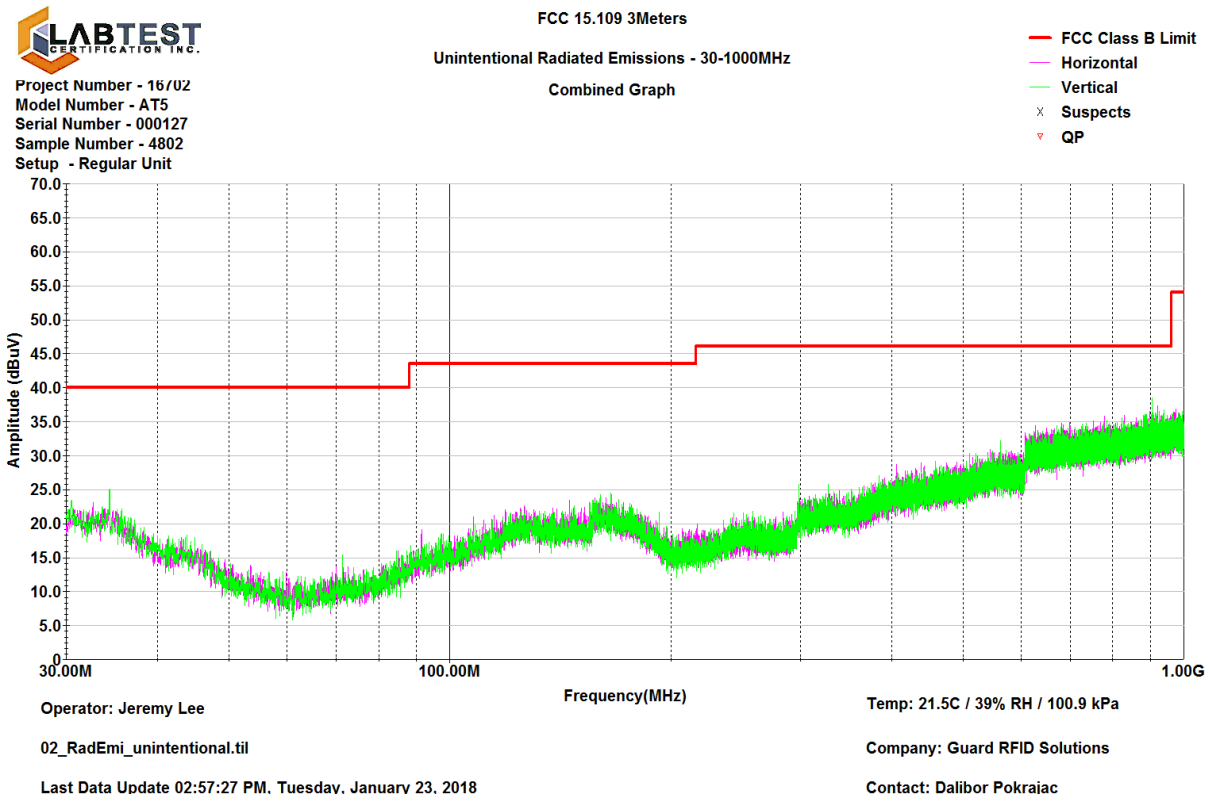
A scan was made with an EMC Analyzer, controlled by EMC Test Software, Tile7!, from 30kHz to 1,000 MHz with the receiver in the peak mode. The receiver IF bandwidth was 9/120 kHz and scan step was about 3/30kHz. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to produce horizontal and vertical polarities while the turntable is rotated to determine the worst emitting configuration. Under 30MHz was only tested at 1meter height and Antenna was changed both polarization, Horizontal and Vertical. Measurements were then made using CISPR quasi peak when the peak readings were within 10dB of the limit line. The numerical results are included herein to demonstrate compliance.

Test Result

Emission level (dBuV/m) = Quasi-Peak detected level (dBuV) +Cable Loss (dB) + Antenna Factor (dB/m)

Graphical Representation for Emission - Radiated 30MHz to 1GHz

- Radiated Emissions



The Bandwidth of the emission

Governing Doc	FCC Part 15.231(c) & RSS-210, Annex A.3	Room Temperature (°C)	24.0
Basic Standard	ANSI C63.10:2013, Clause 6.9	Relative Humidity (%)	35.0
Test Location	Richmond	Barometric Pressure	102.3
Test Engineer	Jeremy Lee	Date	12 January 2018
EUT Voltage	☒ Batteries, 4 X AA		

Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	Keysight	N9038A	702	27-Apr-2017	27-Apr-2018
Broadband Antenna	Sunol	JB1	371	29-Mar-2016	29-Mar-2018
EMC Shielded Enclosure	USC	USC-26	374	NCR	NCR

Note) NCR = No Calibration Required

Frequency(MHz)	Test Method	Bandwidth(kHz)	Limit(kHz)	Margin(kHz)	Comments
433.92	20dB[1]	576.6	1084.8	508.2	PASS
	99%[2]	549.7	1084.8	535.1	PASS

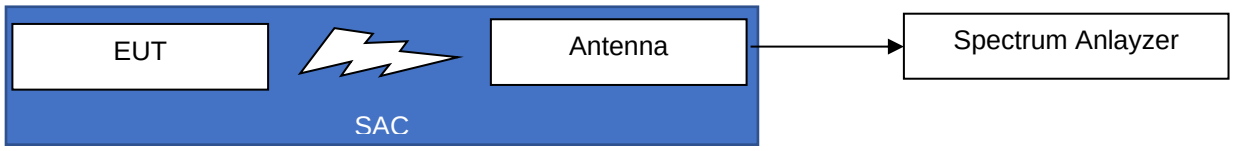
Note 1) referenced by FCC 15.231(c), " The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier."
Note 2) referenced by RSS-210, Annex A.3, " 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."

Compliant ☒ Non-Compliant ☐ Not Applicable ☐

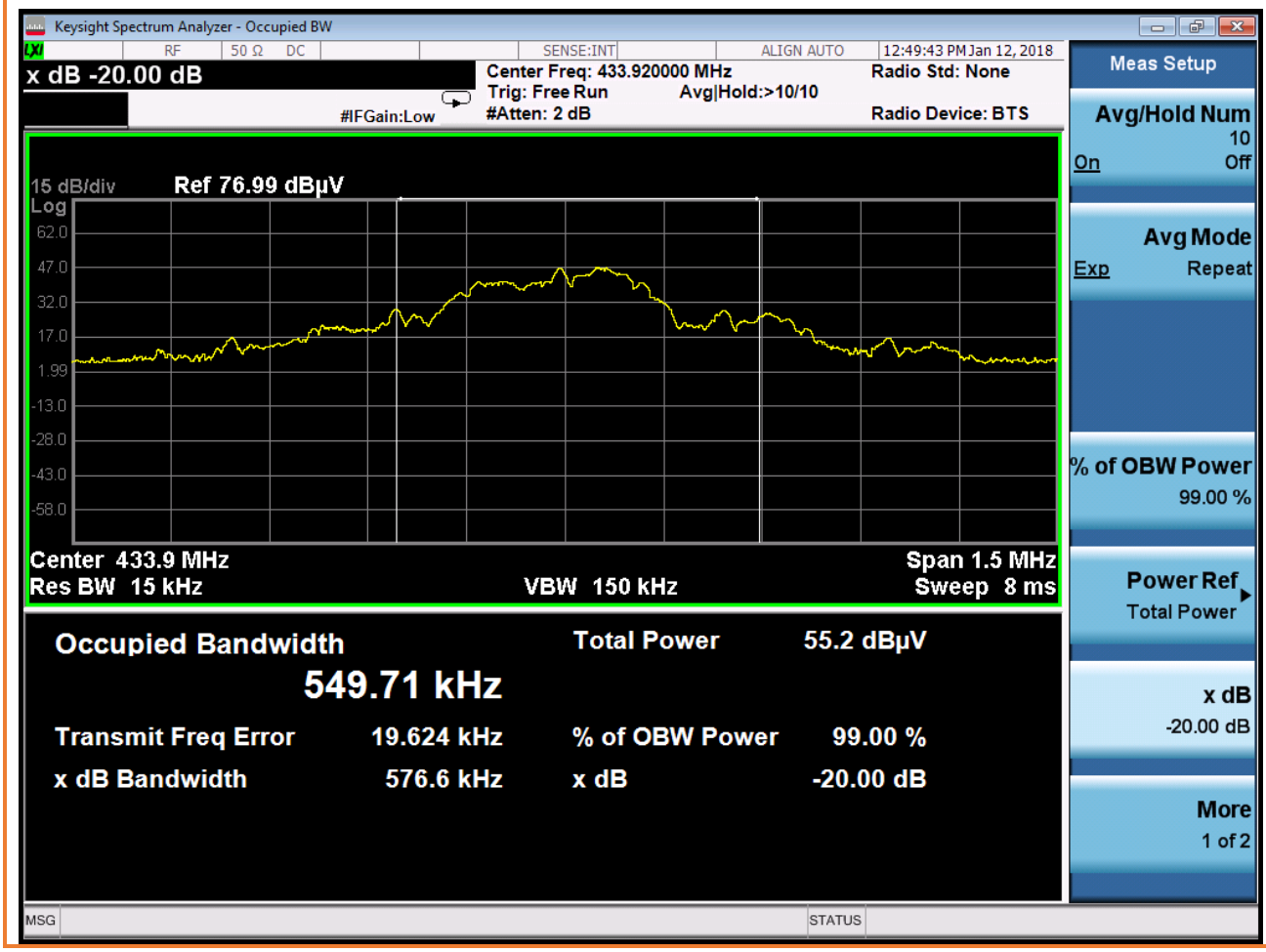
Test setup

Description of test set-up:

The EUT was placed on a 0.8 m non-conducting table above a Turn table in SAC.
The EUT was set to **Operation Mode #1 with configuration Mode #1.**



Results



APPENDIX A: ISO 17025:2005 Accreditation Certificate

CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board
500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

Labtest Certification, Inc.
3128, 20800 Westminster HWY
Richmond B.C. V6V 2W3

has been assessed by ANAB
and meets the requirements of international standard

ISO/IEC 17025:2005

while demonstrating technical competence in the field of

TESTING

Refer to the accompanying Scope of Accreditation for information regarding the types of tests to which this accreditation applies.

AT-2033
Certificate Number

ANAB Approval

Certificate Valid: 08/07/2017-03/04/2018
Version No. 004 Issued: 08/07/2017

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

ANSI-ASQ National Accreditation Board

ANAB

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Labtest Certification, Inc.
3128, 20800 Westminster HWY
Richmond, B.C. V6V 2W3
Kavinder Dhillon Ruben Ugarte Phone: 604-247-0444
kdhillon@labtestcert.com ruben.Ugarte@labtestcert.com
www.labtestcert.com

TESTING

Valid to: **March 4, 2018** Certificate Number: **AT-2033**

Testing performed in support of FCC DoC and Certification approval procedures

Type of Device Examples	Scope of Accreditation	Supporting FCC Guidance	Comments
Unintentional Radiators (FCC Part 15, Subpart B)	• ANSI C63.4-2014		
Industrial, Scientific, and Medical Equipment (FCC Part 18) • Consumer ISM equipment	• FCC MP-5, (February 1986)		
Intentional Radiators (FCC Part 15 Subpart C)	• ANSI C63.10-2013		
UPCS (FCC Part 15, Subpart D) •Unlicensed Personal Communication Systems devices	• ANSI C63.17-2013		
U-NII without DFS Intentional Radiators (FCC Part 15, Subpart E) •Unlicensed National Information Infrastructure Devices (U-NII without DFS)	• ANSI C63.10-2013	KDB Publication 789033	
U-NII with DFS Intentional Radiators (FCC Part 15 Subpart E) • Unlicensed National Information Infrastructure U-NII) Devices with Dynamic Frequency Selection (DFS)	• FCC KDB Publication 905462 D02 UNII DFS Compliance Procedures New Rules v01 (April 8, 2016)		
UWB Intentional Radiators (FCC Part 15, Subpart F) •Ultra-wideband Operation	• ANSI C63.10-2013		
BPL Intentional Radiators (FCC Part 15, Subpart G) •Access Broadband Over Power Line (Access BPL)	• ANSI C63.10-2013		
White Space Device Intentional Radiators (FCC Part 15, Subpart H) •White Space Devices	• ANSI C63.10-2013		

ANSI-ASQ National Accreditation Board

Testing performed in support of FCC DoC and Certification approval procedures

Type of Device Examples	Scope of Accreditation	Supporting FCC Guidance	Comments
Commercial Mobile Services (FCC Licensed Radio Service Equipment) •Part 22 (cellular) •Part 24 •Part 25 (non-microwave) •Part 27	• ANSI/TIA-603-D • TIA-102.CAAA-D	KDB Publication 971168	
General Mobile Radio Services (FCC Licensed Radio Service Equipment) •Part 22 (non-cellular) •Part 90 (non-microwave) •Part 95 •Part 97 •Part 101 (non-microwave)	• ANSI/TIA-603-D • TIA-102.CAAA-D		Microwave Frequencies, as used in this part, refers to frequencies of 890 MHz and above.
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) •Part 96	• ANSI/TIA-603-D • TIA-102.CAAA-D	KDB Publication 971168	
Maritime and Aviation Radio Services (FCC Licensed Radio Service Equipment) •Part 80 •Part 87	• ANSI/TIA-603-D		
Microwave and Millimeter Bands Radio Services (FCC Licensed Radio Service Equipment) •Part 25 •Part 74 •Part 90 (90Y, 90Z, DSRC) •Part 101	• ANSI/TIA-603-D • TIA-102.CAAA-D		
Broadcast Radio Services (FCC Licensed Radio Service Equipment) •Part 73 •Part 74 (non-microwave)	• ANSI/TIA-603-D • TIA-102.CAAA-D		
RF Exposure •Devices subject to SAR requirements	• IEEE Std 1528™-2013	KDB Publication 865664 KDB Publication 447498	
Hearing Aid Compatibility (Part 20) •HAC for Commercial mobile services	• ANSI C63.19-2007; or • ANSI C63.19-2011		

ANSI-ASQ National Accreditation Board
ANAB

Testing performed in support of FCC DoC and Certification approval procedures

Type of Device Examples	Scope of Accreditation	Supporting FCC Guidance	Comments
Signal Boosters (Part 20) •Wideband Consumer signal boosters •Provider-specific signal boosters •Industrial signal boosters	• FCC KDB Publication 935210 D03 Signal Booster Measurements v04(February 12,2016) • FCC KDB Publication 935210 D04 Provider Specific Booster Measurements v02 (February 12,2016) • FCC KDB Publication 935210 D05 Indus Booster Basic Meas v01r01 (February 12,2016)		

Electromagnetic Compatibility (EMC)

Test Method	Test Specification(s)	Range	Comments
Unintentional Radiators	ANSI C63.4-2003 ANSI C63.4-2009		
Radiated and Conducted Emissions	ANSI C63.4:2014; FCC OST/MP-05 (1986); ICES-001(2006); ICES-002(2013); ICES-003(2016); ICES-005(2009); CISPR 16-1-1(2015); CISPR 16-1-2(2014); CISPR 16-1-3(2006); CISPR 16-2-1(2014); CISPR 16-2-2(2010); CISPR 16-2-3(2014); CISPR 16-2-5(2008); CISPR 16-4-2(2014); EN 55016-1-1(2010); EN 55016-1-2(2014); EN 55016-1-3(2006); EN 55016-1-4(2010); EN 55016-2-1(2014); EN 55016-2-2(2011); EN 55016-2-3(2014); EN 55016-4-2(2014); CISPR 11(2012); EN 55011(2013); AS/NZS CISPR 11(2013); KN 11 (RRA Announce 2015-110, Dec, 03, 2015); VCCI V-3 (up to 6 GHz); VCCI V-5; CNS 13438	9 kHz to 40 GHz	

END OF REPORT