



# REPORT

For

## Guard RFID Solutions Inc.

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

Date: 04 March 2019  
Report No.: 17680-1E  
Revision No.: 2  
Project No.: 17680  
Equipment: RFID TAG  
Model No.: PT-3BLF  
FCC ID: VZKPT3  
IC ID.: 9937A-PT3




### ONE STOP GLOBAL CERTIFICATION SOLUTIONS



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TEST REPORT_FCC 15.231 & RSS-210	
Licence-Exempt Radio Apparatus: Category I Equipment	
Report Reference No.....:	17680-1E
Report Revision History.....:	✓ Rev. 0: 29 January 2019 ✓ Rev. 1: 27 February 2019, Corrected on Page 11. ✓ Rev. 2: 04 March 2019, Re-measured PRF & Peak Level.
Compiled by (+ signature).....	Jeremy Lee 
Approved by (+ signature).....	David Johanson 
Date of issue .....	04 March 2019
Total number of pages .....	30
FCC Site Registration No.:	CA5970
IC Site Registration No.:	5970A-2
Testing Laboratory.....:	LabTest Certification Inc.
Address .....	Unit 205 – 8291 92ST. Delta, B.C. V4G 0A4, Canada
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
<b>Test specification:</b>	
Standards .....	➤ FCC Part 15, Subpart C; December 20, 2018 ➤ IC RSS-210 Issue 9 August 2016
Test procedure .....	➤ ANSI C63.10:2013 ➤ ANSI C63.4:2014 ➤ RSS-Gen, Issue 5, April 2018
Non-standard test method.....:	N/A
Test Report Form(s) Originator .....	Jeremy Lee
Master TRF .....	1036_Rev2 – RF Report Template
<b>Test item description :</b>	
Trade Mark .....	

Model/Type reference .....	PT-3BLF
Serial Number .....	000121 without Modification 000114 modified as turned on every 1 Second.
FCC ID .....	VZKPT3
IC ID .....	9937A-PT3
<b>Possible test case verdicts:</b>	
- 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)
<b>Testing:</b>	
Date of receipt of test item .....	24 January 2019
Date (s) of performance of tests.....	25 to 28 January 2019

## Revision History

Revision	Date	Reason For Change	Author(s)
0	29 Jan. 2019	First version	Jeremy Lee
1	27 Feb. 2019	Corrected on Page 11, marked N/A for FCC 15.231(a)(1) and FCC 15.231(a)(2).	Jeremy Lee
2	04 March 2019	Re-measured PRF and Peak Level	Jeremy Lee

## Device Under Test Description

Application for .....	RFID TAG
Operating Transmit Frequency .....	433.92MHz
Operating Receive Frequency .....	125kHz
Number of Channels .....	1
Beacon Interval .....	12 Seconds
Equipment mobility .....	Yes
Operating condition .....	-10 to +50 °C
Mass of equipment (g) .....	6.62
Dimension	28 mm X 14.5 mm
<b>Nominal Voltages for:</b>	<input checked="" type="checkbox"/> stand-alone equipment <input type="checkbox"/> combined (or host) equipment

Supply Voltage:	_____ AC _____ Amps _ 3.0V_ DC _____ Amps
If DC Power:	____ Internal Power Supply ____ External Power Supply or AC/DC adapter _X_ Battery <input type="checkbox"/> Nickel Cadmium <input type="checkbox"/> Alkaline, 4 X AA <input type="checkbox"/> Nickel-Metal Hydride <input checked="" type="checkbox"/> Lithium-Ion <input type="checkbox"/> Other

## Program details

<b>Testing Facility by procedure:</b>		
<input checked="" type="checkbox"/>	<b>All Testing:</b>	LabTest Certification Inc.
Testing location/ address .....		Unit 3128-20800 Westminster HWY, Richmond, B.C. V6V 2W3 Canada

<b>Summary of testing:</b>	
<b>Tests performed (name of test and test clause):</b> <b>Radiated Field strength and Emissions</b>	<b>Testing location:</b> <b>In SAC, Richmond</b>
<p>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.</p> <p>Based on the results of our investigation, we have concluded the product tested <b>complies</b> 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.</p>	

## Description of Equipment Under Test and Variant Models

<b>Description:</b> The PT-3BLF is an Active Tag for use on Patients. The tag transmits periodic Beacon messages used for tracking and location of the Tag in real time, and additionally includes a Low Frequency Receiver to be able to detect signals from Guard RFID's Tag Exciters. The Tag can instantly detect a Tag Exciter at egress points, enabling Guard RFID's SafeGuard system to control doors so as to protect a tagged patient from leaving the perimeter. The PT-3BLF has a battery life of 12 months, and is waterproof so that patients can continue to wear them even when taking a bath, for example. The Tag is designed to be mounted on the patient's wrist, using a standard patient band.
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#### 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
433.92	CC1150	26.0	Y2, Clock
0.032768	Y1, Clock	n/a	

### Client Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Comments
n/a				

### Software and Firmware

Use*	Description	Version
n/a		

### 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
1	3.0	n/p	n/p	DC	n/a	Internal Battery, New

## EUT Operation Modes

Mode #	Description
1	<p>Normal Mode (Outside 125kHz Field)</p> <p>In this mode the PT3 tag is sending out a periodic beacon bursts. Each beacon message is approximately 800 <math>\mu</math>s long and consists of the tag's serial number and current status. Each burst is made up of 3 - 800 <math>\mu</math>s beacon messages (mentioned above) randomly spread over a 1 second period. The period between bursts is approximately 12 seconds. When transmitting at the 12 second rate the plain beacon will occasionally be replaced by longer messages that contain firmware revision information, temperature data, or additional tag status information.</p>
2	<p>In Field Mode (Inside 125kHz Field)</p> <p>The tag only operates in this mode when a Tag Exciter LF field can be seen by the LF receiver in the tag. In this mode the transmitted message becomes longer (approximately 1 mS) and the ID transmitted by the Tag Exciter gets added to the tag serial number and status data to form the data portion of the message. Other parameters with respect to burst length and randomization stay the same as in the normal mode transmissions, but the period between bursts is shortened to 12 seconds. The "In Field" mode transmissions are categorized into three distinct messages:</p> <p>1.) Entering Field – Immediately upon detecting the Tag Exciter transmission the PT3 Tag indicates it has entered the Tag Exciter field by transmitting this message.</p> <p>2.) Staying in Field- Once the entering field message has been sent the tag operates much like it does in normal mode. The beacon bursts continue at 12second intervals, while it is still in the field, the tag sends the staying in field message.</p> <p>3.) Exiting Field – When the tag can no longer hear the Tag Exciter field (LF reception quiet for 2 seconds) it sends an "exiting field" message. The "Normal Mode" beacon periods (12 second periods) are re-synchronized to this event. This marks the point at which the tag returns to the normal mode of operation.</p> <p>In general the "In Field Mode" is a special case of the "Normal Mode". The transmissions remain periodic, but are synchronized to the entry and exit events. The entering and exiting messages are asynchronous to the tag's internal timers.</p>
3	The EUT was modified to transmit the RF signal every 1 second for FCC/ISED testing.

## EUT Configuration Modes

Mode #	Description
1	<p>Orthogonal X. Please see beside Photo.</p> 

2	Orthogonal Y. Please see beside Photo.	
3	Orthogonal Z. Please see beside Photo.	

### Test Equipment Verified for function

Model #	Description	Checked Function	Results
N9038A	Spectrum Analyzer	Frequency and Amplitude	Ref_siganl and checked OK.
SAS-542	Antenna, 30 to 300MHz	Checked structure	Normal – no damage.
SAS-510-2	Antenna, 300 to 1000MHz	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.
JB1	Antenna, 30 to 2000MHz	Checked structure	Normal – no damage.

### Measurement Uncertainty

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

Parameter	Uncertainty
Radiated Emission, 300 to 1000MHz w SAS-510-2	± 3.92 dB
Radiated Emission, 1 to 5GHz w SAS-571	± 5.19 dB
Radiated Emission, 30 to 1,000MHz w JB-1	± 4.13 dB
Temperature	± 0.94°C
Humidity	± 4.38%

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
15.231			
Summary of the operation of RF Transmission	FCC Part 15.231(a) & IC RSS-210, A 1.1	N/A	P
Field Strength	FCC Part 15.231(b) & IC RSS-210, A 1.2	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5 & 6.6	P
Spurious Emissions (Unwanted Emissions)	FCC Part 15.231(b) & IC RSS-210, A 1.2	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5 & 6.6	P
The Bandwidth of the emission	FCC Part 15.231(c) & IC RSS-210, A 1.3	ANSI C63.10:2013, Clause 6.9	P
General			
AC Power Line Conducted Emissions	FCC 15.207(a) & RSS-Gen	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.2	N/A <sup>1)</sup>
Radiated Emissions-Intentional radiators	FCC 15.209(a) & RSS-Gen	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5	P
Antenna Requirement	FCC 15.203 & RSS-Gen	-	P

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

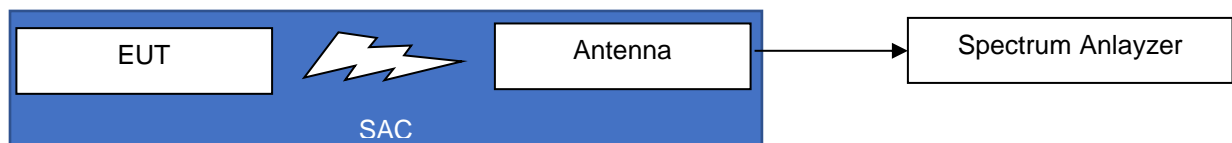
## Summary of the operation of RF Transmission

Governing Doc	FCC Part 15.231(a) & IC RSS-210, A 1.1	Room Temperature (°C)	21.6 °C		
Basic Standard	n/a	Relative Humidity (%)	35.1 %		
Test Location	Richmond	Barometric Pressure (kPa)	103.4 kPa		
Test Engineer	Jeremy Lee	Date	25 January 2019		
EUT Voltage	<input checked="" type="checkbox"/> 3VDC, Internal Battery, New <input type="checkbox"/> 120VAC @ 60Hz				
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	Keysight	N9038A	702	26-Apr-2018	26-Apr-2019
LPDA Antenna	A.H.Systems	SAS-510-2	227B	07-Feb-2018	07-Feb-2020
Motion Controller	Sunol	SC104V	235A	IHC <sup>1</sup>	IHC <sup>1</sup>
Antenna Tower	Sunol	TWR95-4	235B	IHC <sup>1</sup>	IHC <sup>1</sup>
Turn Table	Sunol	SM46C	235C	IHC <sup>1</sup>	IHC <sup>1</sup>
EMC Shielded Enclosure	USC	USC-26	374	IHC <sup>1</sup>	IHC <sup>1</sup>
RF Cable	MRO	n/a	n/a	IHC <sup>2</sup>	IHC <sup>2</sup>
Note1) In House Calibration Ref. # 4 Note2) In House Calibration Ref. # 6					
Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>					

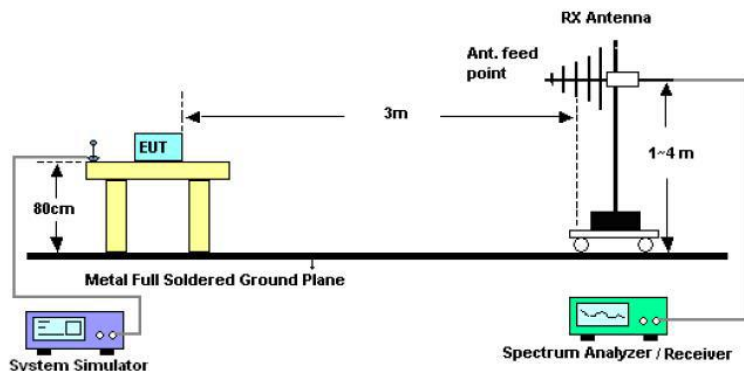
## Test setup

### 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.**



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

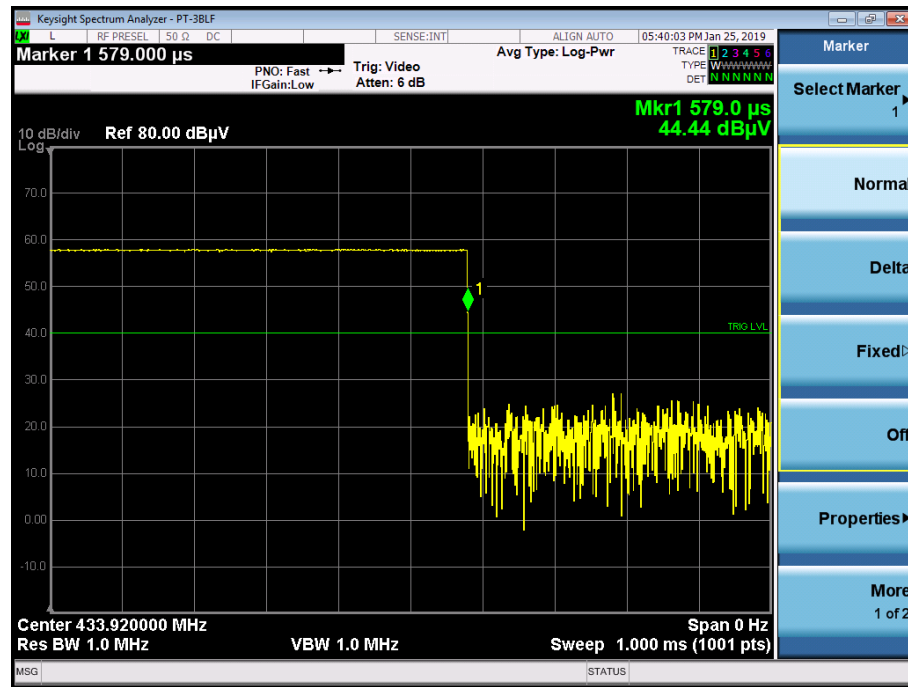


## Reviewed Results

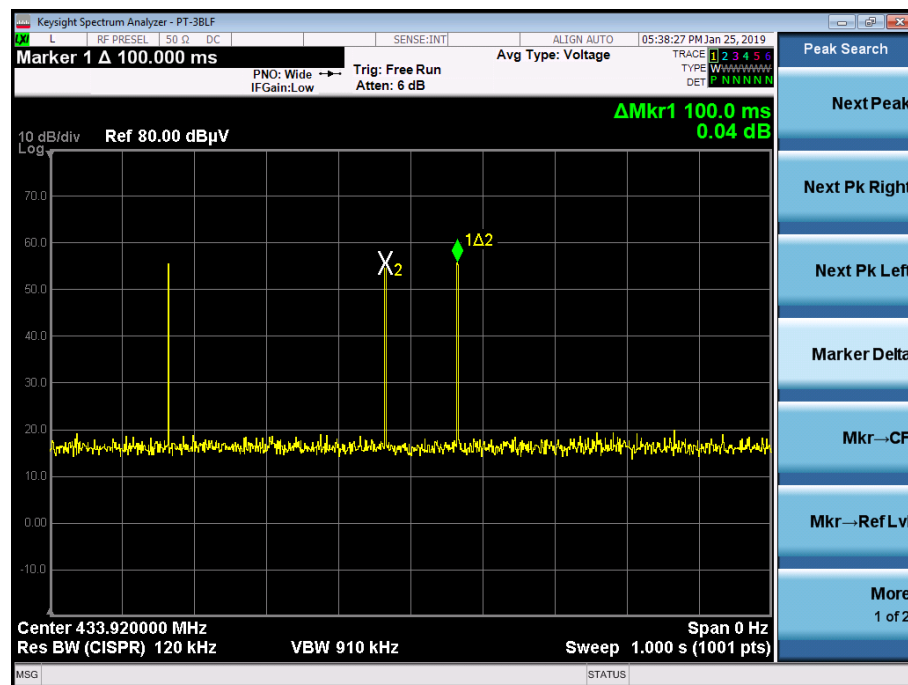
Rule Part No.	Description of Rule	Yes	No	N/A
FCC 15.231(a)	Continuous transmissions, voice, video and the radio control of toys are not permitted.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FCC 15.231(a)	Data is permitted to be sent with a control signal.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FCC 15.231(a)(1)	Manually operated	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Automatically deactivate within 5 seconds of being released	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FCC 15.231(a)(2)	Automatically operated	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Deactivate within 5 seconds after activation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FCC 15.231(a)(3)	Periodic transmission at regular predetermined intervals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	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. <sup>1)2)3)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note1) The EUT was transmitted 579  $\mu$ s as one of Beacon Signal. Ideally, the maximum turning on time is 800  $\mu$ s.  
Note2) The EUT was turned on every 12sec.  
Note3) The measured total duration of transmission is 521.1ms/hour. (579  $\mu$ s $\times$ 3) $\times$ 300 times=521.1ms.  
Ideally, the maximum total duration of transmission in normal mode is 720ms/hour, which is less than 2s/hr.

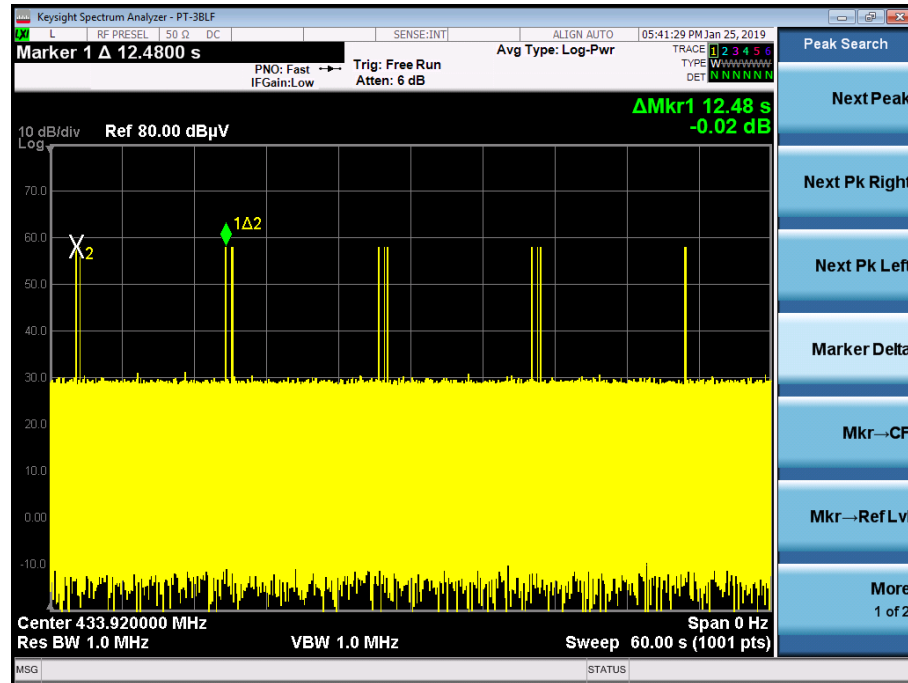
- Measured result of one Turned-on and off time for each Beacons.



- Measured result of the multiple turned on beacons in 1 second period.



**- Measured result of the period for Turned-on time of each pulse.**



**So, The PRF =  $1/PRT = 1/12.48\text{sec} = 0.08\text{Hz} (< 20\text{Hz})$**

**Duty Cycle =  $PW/T = 0.001737/12.48 = 1.392\text{e-}4$ .**

**where PW is the pulse width (pulse Active Time, 579us X 3 = 1.737ms.  
 T is the Total period of the signal, 12.48sec.**

**Duty Cycle Factor =  $20 \log \text{Duty Cycle} = 20\log 1.392\text{e-}4 = -77.13\text{dB}$**

## Field Strength

Governing Doc	FCC Part 15.231(b) & IC RSS-210, A 1.2		Room Temperature (°C)		20.4 °C		
Basic Standard	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5 & 6.6		Relative Humidity (%)		301 %		
Test Location	Richmond		Barometric Pressure (kPa)		102.5 kPa		
Test Engineer	Jeremy Lee		Date		04 March 2019		
EUT Voltage	<input checked="" type="checkbox"/> 3VDC, Internal Battery, New <input type="checkbox"/> 120VAC @ 60Hz						
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due		
Spectrum Analyzer	Keysight	N9038A	702	26-Apr-2018	26-Apr-2019		
LPDA Antenna	A.H.Systems	SAS-510-2	227B	07-Feb-2018	07-Feb-2020		
Motion Controller	Sunol	SC104V	235A	IHC <sup>1</sup>	IHC <sup>1</sup>		
Antenna Tower	Sunol	TWR95-4	235B	IHC <sup>1</sup>	IHC <sup>1</sup>		
Turn Table	Sunol	SM46C	235C	IHC <sup>1</sup>	IHC <sup>1</sup>		
EMC Shielded Enclosure	USC	USC-26	374	IHC <sup>1</sup>	IHC <sup>1</sup>		
RF Cable	MRO	n/a	n/a	IHC <sup>2</sup>	IHC <sup>2</sup>		
Used Software		<input checked="" type="checkbox"/> Tile 7! v7.3.0.6					
Used Template of Tile 7!		_FCC_PT3_FUND.TIL					
Note1) In House Calibration Ref. # 4							
Note2) In House Calibration Ref. # 6							
Detector:		<input checked="" type="checkbox"/> Peak/AVG <input type="checkbox"/> Quasi-Peak					
RBW/VBW:		<input checked="" type="checkbox"/> 120/300kHz <input type="checkbox"/> 1/3MHz					
Type of Facility:		<input checked="" type="checkbox"/> SAC <input type="checkbox"/> FSOATS <input type="checkbox"/> in-situ					
Distance:		<input checked="" type="checkbox"/> 3meter <input type="checkbox"/> 10meter <input type="checkbox"/> 1meter					
Arrangement of EUT:		<input checked="" type="checkbox"/> Table-top only <input type="checkbox"/> Floor-standing only <input type="checkbox"/> Rack Mounted					
Frequency (MHz)	Orthogonal	Detector	POL	Emissions (dBuV/m)	Limit <sup>3</sup> (dBuV/m)	Margin (dB)	Comments
433.92	X	Peak <sup>1</sup>	H	69.72	100.83	31.11	P
		AVG <sup>2</sup>		-7.41	80.83	88.24	P
		Peak <sup>1</sup>	V	75.11	100.83	25.72	P
		AVG <sup>2</sup>		-2.02	80.83	82.85	P
	Y	Peak <sup>1</sup>	H	75.98	100.83	24.85	P
		AVG <sup>2</sup>		-1.15	80.83	81.98	P
		Peak <sup>1</sup>	V	71.67	100.83	29.16	P
		AVG <sup>2</sup>		-5.46	80.83	86.29	P
	Z	Peak <sup>1</sup>	H	75.03	100.83	25.80	P
		AVG <sup>2</sup>		-2.10	80.83	82.93	P

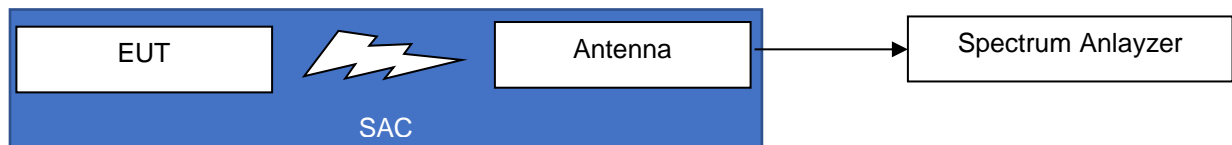
		Peak <sup>1</sup>	V	71.23	100.83	29.60	P
		AVG <sup>2</sup>		-5.90	80.83	86.73	P
Note 1) Measured by Peak detector.							
Note 2) Calculated AVG Level AV= PK + Duty Cycle Fxactor (-77.13dB)							
Note 3) Converted from 11,000uV/m at 3 meter.							
Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>							

### Test setup

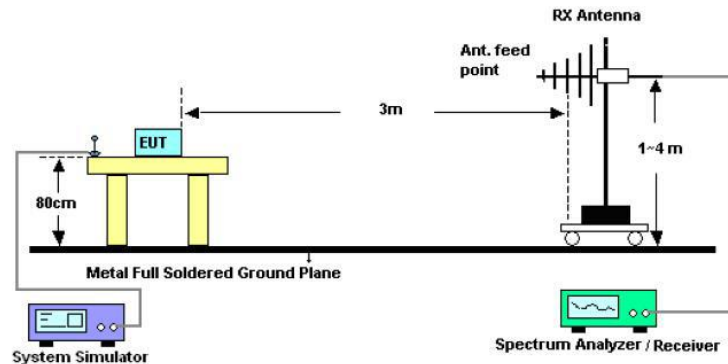
Description of test set-up:

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 #3 with configuration Mode #1, 2, 3.**



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



### Measurement Procedure

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. 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, 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 peak 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) & IC RSS-210, A 1.2	Room Temperature (°C)	19.6 °C				
Basic Standard	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5 & 6.6	Relative Humidity (%)	32.9 %				
Test Location	Richmond	Barometric Pressure (kPa)	102.9 kPa				
Test Engineer	Jeremy Lee	Date	28 January & 04 March 2019				
EUT Voltage	<input checked="" type="checkbox"/> 3VDC, Internal Battery, New <input type="checkbox"/> 120VAC @ 60Hz						
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due		
Spectrum Analyzer	Keysight	N9038A	702	26-Apr-2018	26-Apr-2019		
LPDA Antenna	A.H.Systems	SAS-510-2	227B	07-Feb-2018	07-Feb-2020		
Double-ridged Guide Horn Antenna	A.H.Systems	SAS-571	227C	18-Oct-2018	18-Oct-2020		
Motion Controller	Sunol	SC104V	235A	IHC <sup>1</sup>	IHC <sup>1</sup>		
Antenna Tower	Sunol	TWR95-4	235B	IHC <sup>1</sup>	IHC <sup>1</sup>		
Turn Table	Sunol	SM46C	235C	IHC <sup>1</sup>	IHC <sup>1</sup>		
EMC Shielded Enclosure	USC	USC-26	374	IHC <sup>1</sup>	IHC <sup>1</sup>		
RF Cable	MRO	n/a	n/a	IHC <sup>2</sup>	IHC <sup>2</sup>		
RF Cable	A.H. Systems	SAC-26G-3	227D	IHC <sup>2</sup>	IHC <sup>2</sup>		
RF Preamplifier	Agilent	8449B	273	IHC <sup>2</sup>	IHC <sup>2</sup>		
Used Software	<input checked="" type="checkbox"/> Tile 7! v7.3.0.6						
Used Template of Tile 7!	_FCC_PT3_2ND.TIL _FCC_PT3_SPURS.TIL						
Note1) In House Calibration Ref. # 4 & 5							
Note2) In House Calibration Ref. # 6							
Detector:	<input checked="" type="checkbox"/> Peak/AVG <input type="checkbox"/> Quasi-Peak						
RBW/VBW:	<input checked="" type="checkbox"/> 120/300kHz <input checked="" type="checkbox"/> 1/3MHz(over 1G)						
Type of Facility:	<input checked="" type="checkbox"/> SAC <input checked="" type="checkbox"/> FSOATS(over 1G) <input type="checkbox"/> in-situ						
Distance:	<input checked="" type="checkbox"/> 3meter <input type="checkbox"/> 10meter <input type="checkbox"/> 1meter						
Arrangement of EUT:	<input checked="" type="checkbox"/> Table-top only <input type="checkbox"/> Floor-standing only <input type="checkbox"/> Rack Mounted						
Frequency (MHz)	Orthogonal	Detector	POL	Emissions (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comments
867.84	X	Peak	V	48.48	80.83	32.25	P
		AVG	V	21.29	60.83	39.54	P

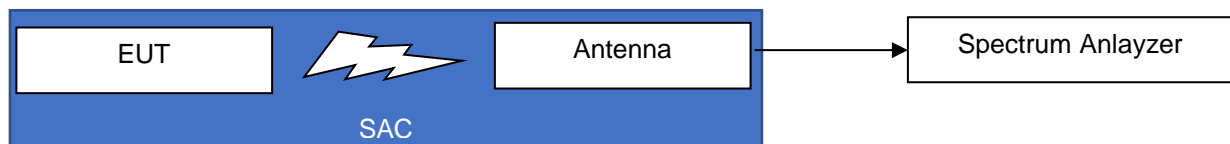
	Y	Peak	H	48.49	80.83	32.34	P
		AVG	H	21.30	60.83	39.53	P
	Z	Peak	V	48.18	80.83	32.65	P
		AVG	V	20.99	60.83	39.84	P
1301.76	Z	Peak	V	36.26	73.98	41.72	P
		AVG	V	20.74	53.98	20.74	P
1735.68	X	Peak	H	36.73	80.83	44.10	P
	X	AVG	H	23.06	60.83	37.77	P
2169.60	X	Peak	H	36.74	80.83	44.09	P
		AVG	H	24.36	60.83	36.47	P
2603.52	Z	Peak	V	36.73	80.83	44.10	P
		AVG	V	23.70	60.83	37.13	P
3037.44	X	Peak	H	63.11	80.83	17.72	P
	Z	AVG	V	27.00	60.83	33.83	P
3471.36	Z	Peak	V	37.27	80.83	43.56	P
	X	AVG	H	25.01	60.83	35.82	P
3905.28	X	Peak	H	39.68	73.98	34.30	P
		AVG	H	28.26	53.98	25.72	P
4339.20	Z	Peak	V	45.02	73.98	28.96	P
	X	AVG	H	25.58	53.98	28.40	P
Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>							

### Test setup

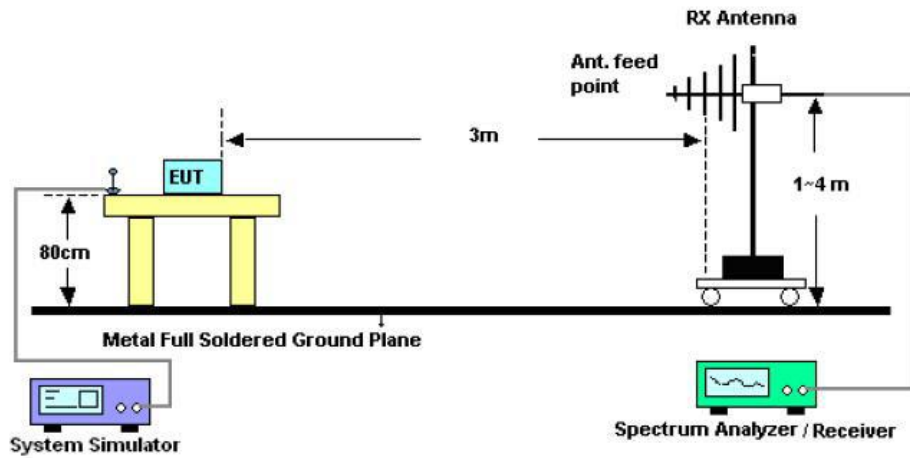
#### Description of test set-up:

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.

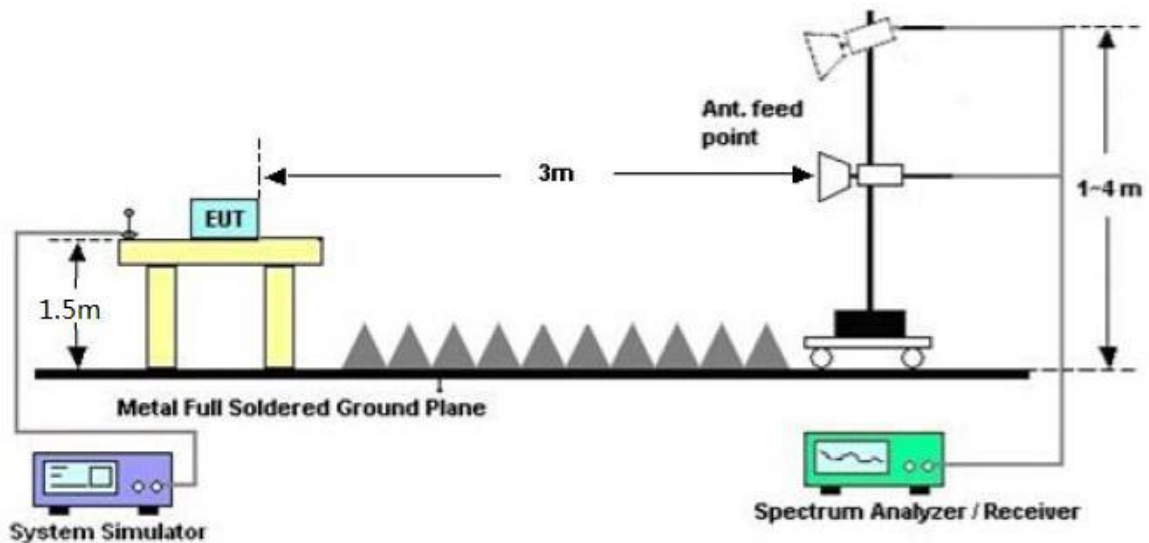
The EUT was set to **Operation Mode #3 with configuration Mode #1, 2 & 3.**



- Tested with SAS-510-2 for 867.84MHz, LPDA Antenna as followed by ANSI C63.10, Table 1



- Tested with SAS-571 for over 1GHz, Double-ridged Guided Horn 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!, for all Harmonics UP TO 10th 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 quasi peak(under 1GHz) and Averaging (over 1GHz). 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)

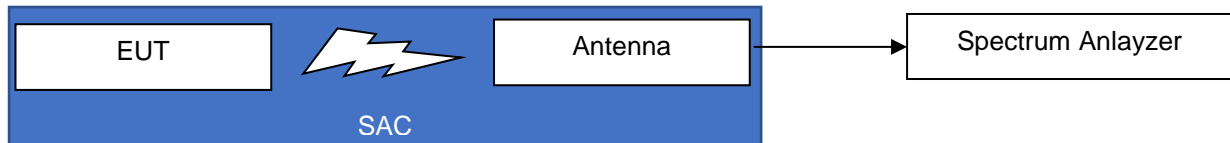
## The Bandwidth of the emission

Governing Doc	FCC Part 15.231(c) & IC RSS-210, A 1.3	Room Temperature (°C)	21.6 °C		
Basic Standard	ANSI C63.10:2013, Clause 6.9	Relative Humidity (%)	35.1 %		
Test Location	Richmond	Barometric Pressure	103.4 kPa		
Test Engineer	Jeremy Lee	Date	25 January 2019		
EUT Voltage	<input checked="" type="checkbox"/> 3VDC, Internal Battery, New <input type="checkbox"/> 120VAC @ 60Hz				
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	Keysight	N9038A	702	26-Apr-2018	26-Apr-2019
LPDA Antenna	A.H.Systems	SAS-510-2	227B	07-Feb-2018	07-Feb-2020
Motion Controller	Sunol	SC104V	235A	IHC <sup>1</sup>	IHC <sup>1</sup>
Antenna Tower	Sunol	TWR95-4	235B	IHC <sup>1</sup>	IHC <sup>1</sup>
Turn Table	Sunol	SM46C	235C	IHC <sup>1</sup>	IHC <sup>1</sup>
EMC Shielded Enclosure	USC	USC-26	374	IHC <sup>1</sup>	IHC <sup>1</sup>
RF Cable	MRO	n/a	n/a	IHC <sup>2</sup>	IHC <sup>2</sup>
Note1) In House Calibration Ref. # 4 Note2) In House Calibration Ref. # 6					
Frequency(MHz)	Test Method	Bandwidth(kHz)	Limit(kHz)	Margin(kHz)	Comments
433.92	20dB <sup>1</sup>	709.00	< 1084.8	375.80	P
	99% <sup>2</sup>	676.12	< 1084.8	408.68	P
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 <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>					

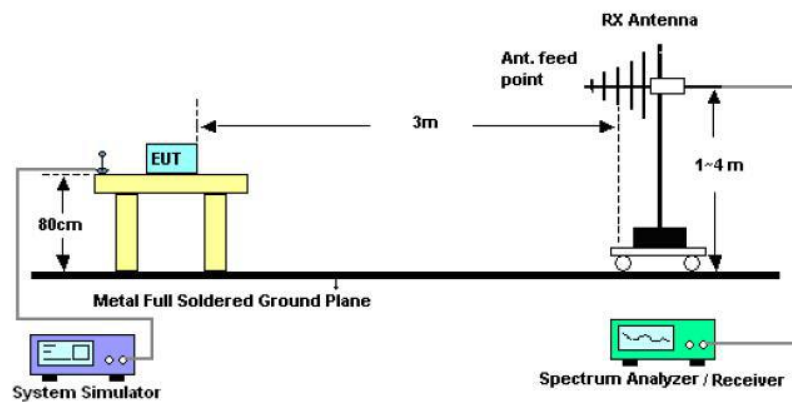
## Test setup

Description of test set-up:

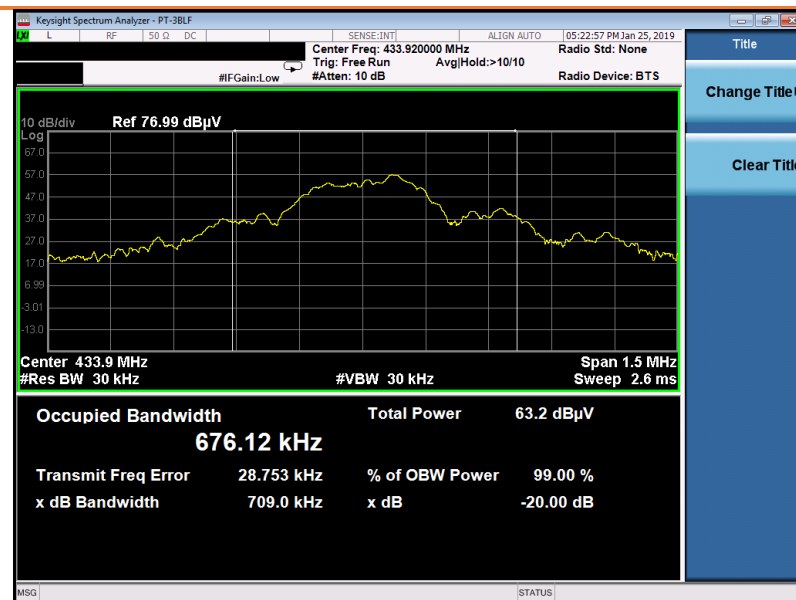
The EUT was placed on a 0.8 m non-conducting table above a Turn table in SAC.  
The EUT was set to **Operation Mode #3 with configuration Mode #1.**



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



## Results



## Radiated Emissions

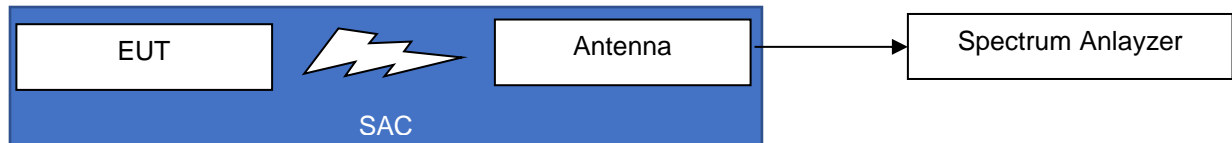
Governing Doc	FCC 15.209(a) & RSS-Gen	Room Temperature (°C)	20.4 to 21.4 °C		
Basic Standard	ANSI C63.4:2014 & ANSI C63.10:2013, Clause 6.5	Relative Humidity (%)	33.2 to 34.8 %		
Test Location	Richmond	Barometric Pressure (kPa)	102.8 to 103.5 kPa		
Test Engineer	Jeremy Lee	Date	25 & 28 January 2019		
EUT Voltage	<input checked="" type="checkbox"/> 3VDC, Internal Battery, New <input type="checkbox"/> 120VAC @ 60Hz				
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	Calibration due
Spectrum Analyzer	KeySight	N9038A	702	26-Apr-2018	26-Apr-2019
BiConical Antenna	A.H.Systems	SAS-542	227A	12-Mar-2018	12-Mar-2020
LPDA Antenna	A.H.Systems	SAS-510-2	227B	07-Feb-2018	07-Feb-2020
Double-ridged Guide Horn Antenna	A.H.Systems	SAS-571	227C	18-Oct-2018	18-Oct-2020
Broadband Antenna	Sunol	JB1	967	12-Oct-2018	12-Oct-2020
Loop Antenna	ComPower	AL-130	241	11-Nov-2017	11-Nov-2019
Motion Controller	Sunol	SC104V	235A	IHC <sup>1</sup>	IHC <sup>1</sup>
Antenna Tower	Sunol	TWR95-4	235B	IHC <sup>1</sup>	IHC <sup>1</sup>
Turn Table	Sunol	SM46C	235C	IHC <sup>1</sup>	IHC <sup>1</sup>
EMC Shielded Enclosure	USC	USC-26	374	IHC <sup>1</sup>	IHC <sup>1</sup>
RF Cable	MRO	n/a	n/a	IHC <sup>2</sup>	IHC <sup>2</sup>
Attenuator	Mini-circuit	UNAT-6+	n/a	IHC <sup>2</sup>	IHC <sup>2</sup>
RF Cable	A.H. Systems	SAC-26G-3	227D	IHC <sup>2</sup>	IHC <sup>2</sup>
RF Preamplifier	Agilent	8449B	273	IHC <sup>2</sup>	IHC <sup>2</sup>
Used Software	<input checked="" type="checkbox"/> Tile 7! v7.3.0.6				
Used Template of Tile 7!					
Note1) In House Calibration Ref. # 4 & 5					
Note2) In House Calibration Ref. # 6					
Frequency Range:	<input checked="" type="checkbox"/> 9kHz-30MHz	<input checked="" type="checkbox"/> 30-1000MHz	<input checked="" type="checkbox"/> 1-5GHz		
Detector:	<input checked="" type="checkbox"/> Peak (for Prescan)	<input type="checkbox"/> Quasi-Peak(for Formal)			
RBW/VBW:	<input checked="" type="checkbox"/> 9/30kHz	<input checked="" type="checkbox"/> 120/300kHz	<input type="checkbox"/> 1/3MHz		
Type of Facility:	<input checked="" type="checkbox"/> SAC	<input checked="" type="checkbox"/> FSOATS	<input type="checkbox"/> in-situ		
Distance:	<input checked="" type="checkbox"/> 3meter	<input type="checkbox"/> 10meter	<input type="checkbox"/> 1meter		
Arrangement of EUT:	<input checked="" type="checkbox"/> Table-top only	<input type="checkbox"/> Floor-standing only	<input type="checkbox"/> Rack Mounted		
Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>					

### Test setup

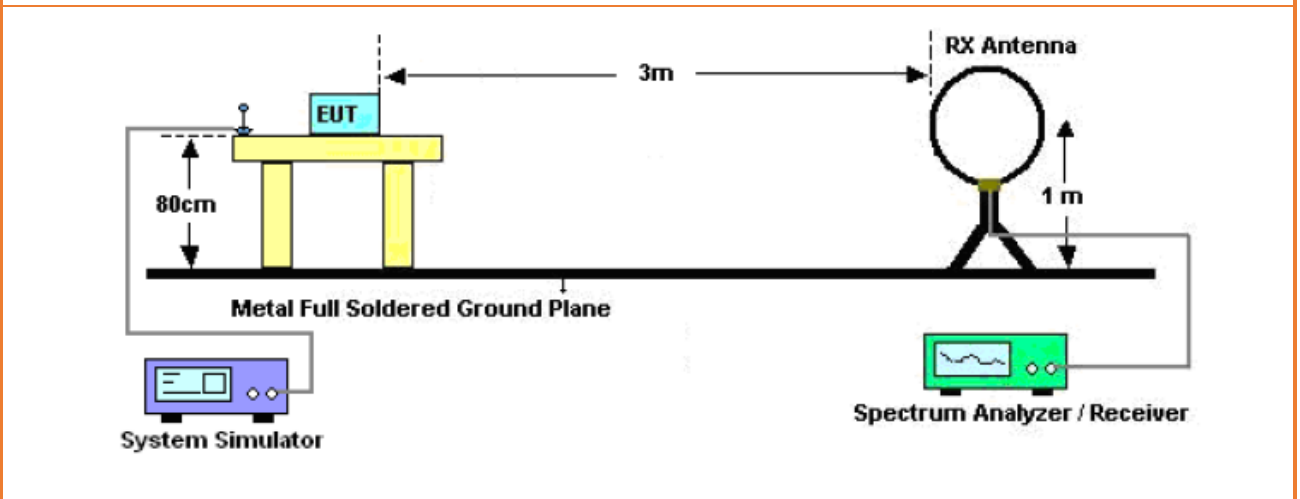
#### Description of test set-up:

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**.

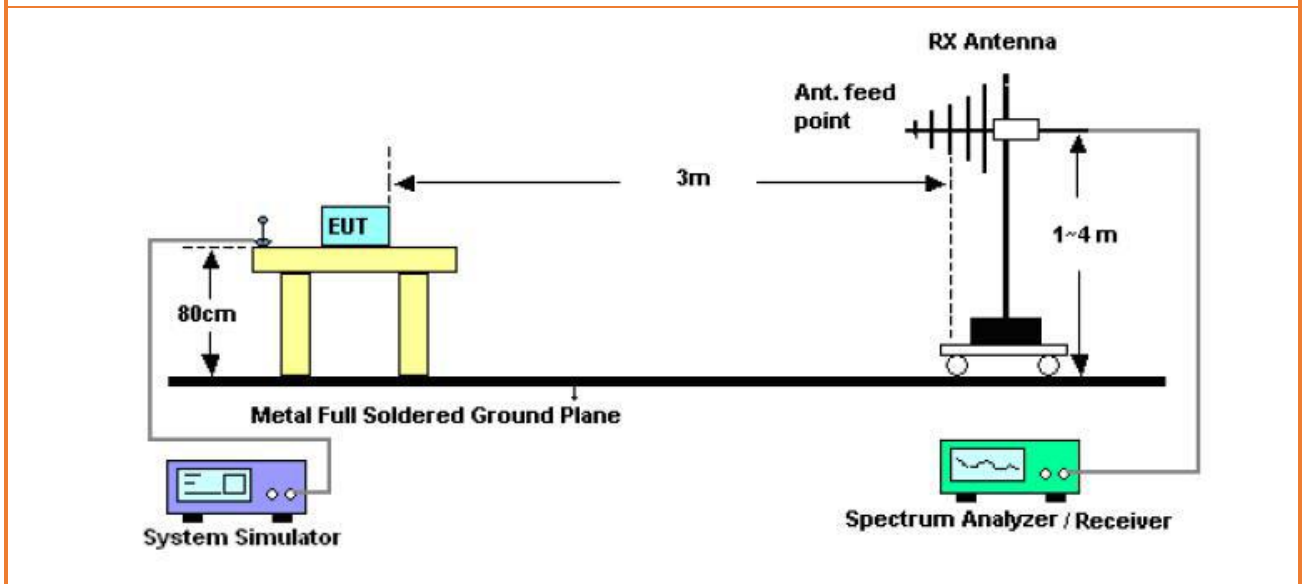


#### - Radiated Emission below 30MHz, with AL-130

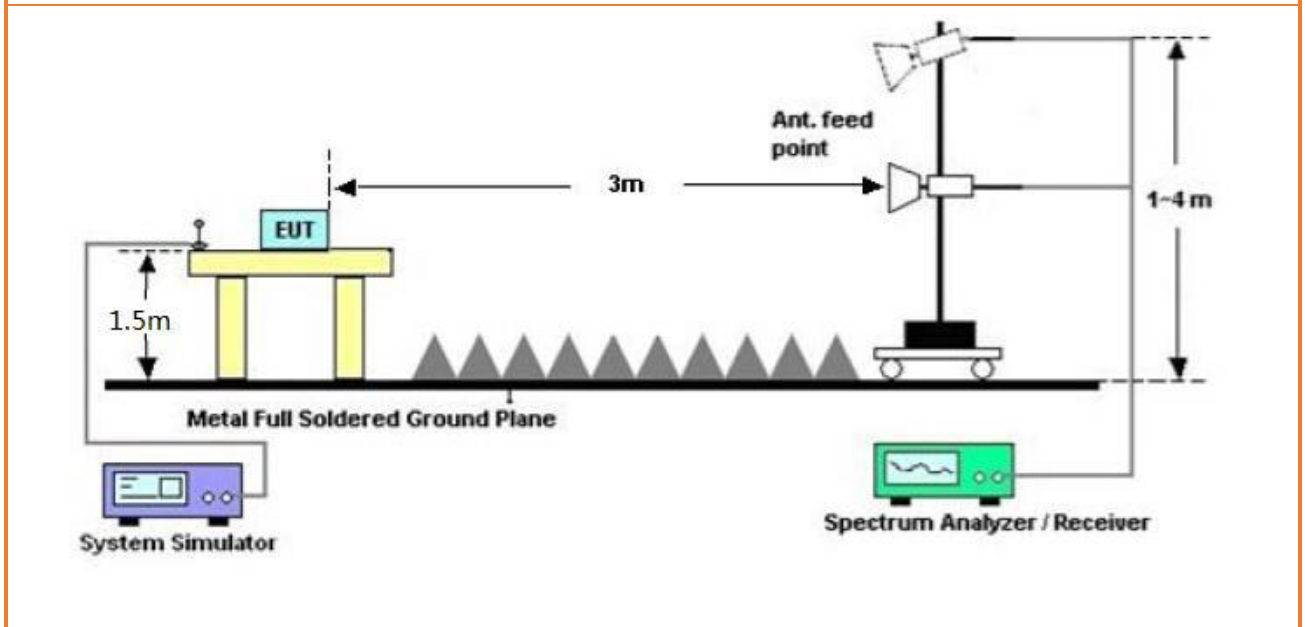




- Radiated Emission 30 to 1,000MHz, with JB-1



- Radiated Emission 1 to 18GHz, with SAS-571



## 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 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.

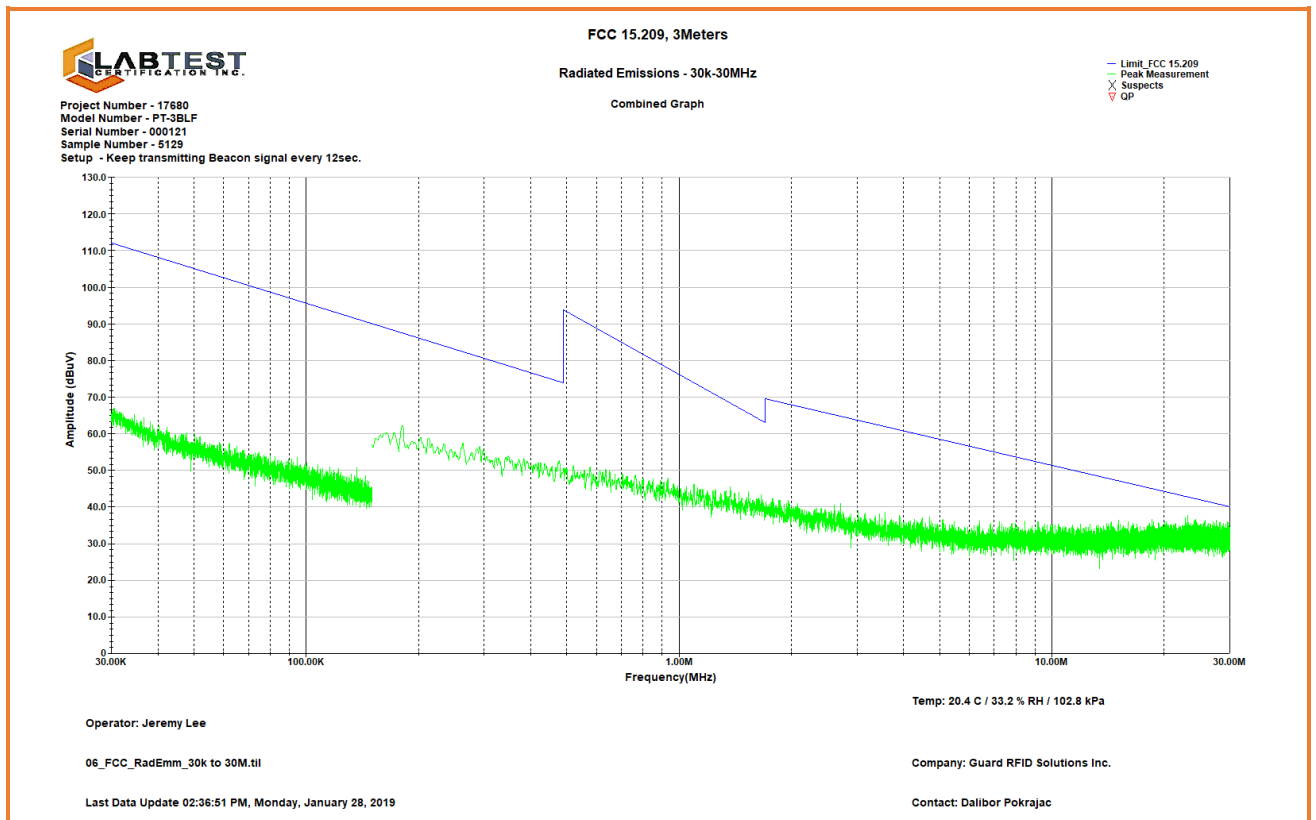
### *Test Result*

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

Prepared by: LabTest Certification Inc.  
Date Issued: 04 March 2019  
Project No.: 17680

Client: Guard RFID Solutions Inc.  
Report No.:17680-1E  
Revision No.:2

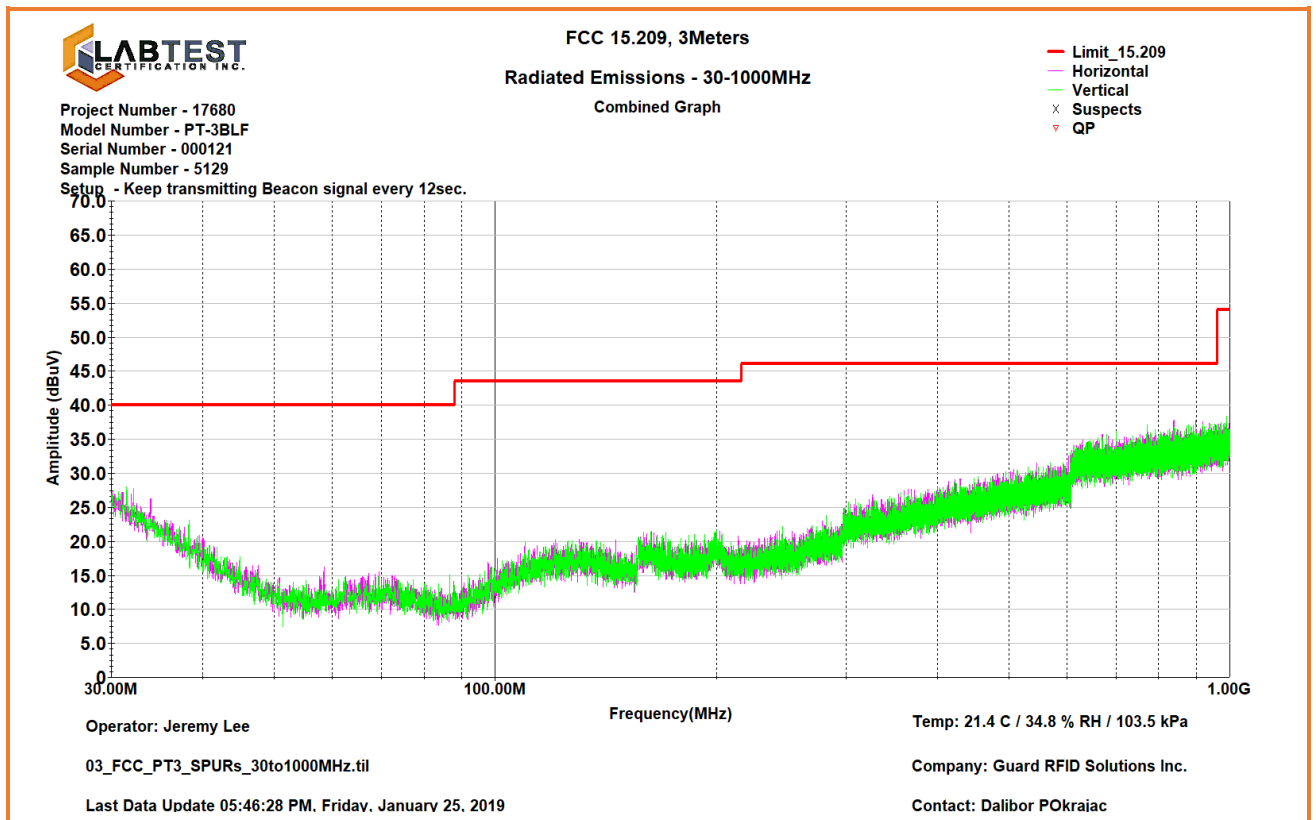
### Graphical Representation for Emission - Radiated 30kHz to 30MHz



Prepared by: LabTest Certification Inc.  
Date Issued: 04 March 2019  
Project No.: 17680

Client: Guard RFID Solutions Inc.  
Report No.:17680-1E  
Revision No.:2

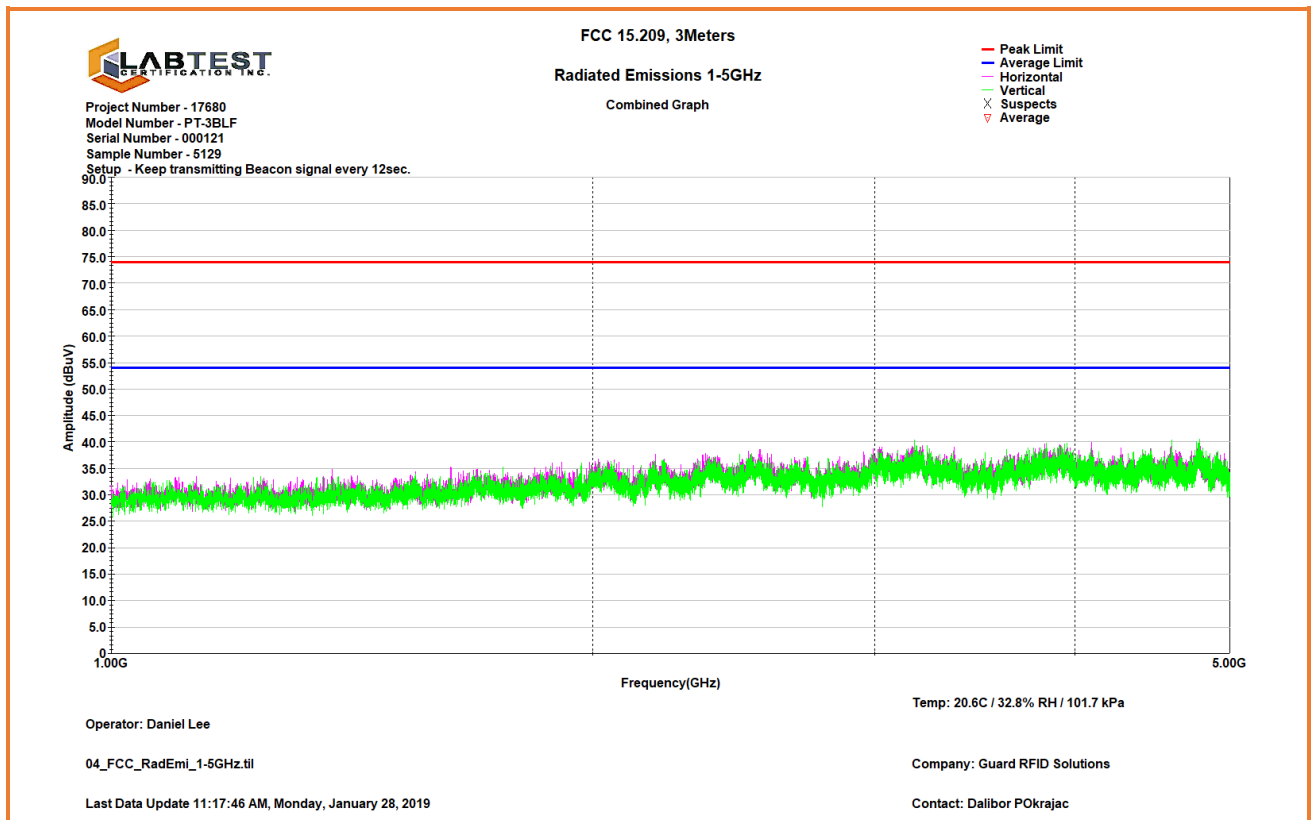
### Graphical Representation for Emission - Radiated 30MHz to 1GHz



Prepared by: LabTest Certification Inc.  
Date Issued: 04 March 2019  
Project No.: 17680

Client: Guard RFID Solutions Inc.  
Report No.:17680-1E  
Revision No.:2

### Graphical Representation for Emission - Radiated 1 to 5GHz



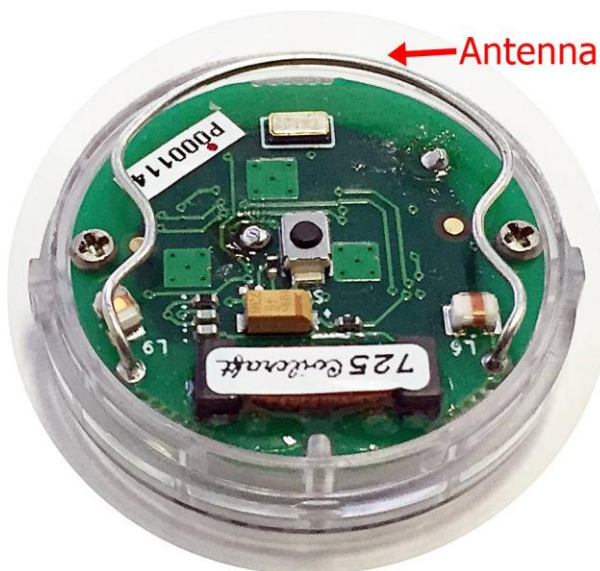
## Antenna Requirement

Governing Doc	FCC 15.203 & RSS-Gen	Room Temperature (°C)	21.6 °C
Basic Standard	N/A	Relative Humidity (%)	35.1 %
Test Location	Richmond	Barometric Pressure (kPa)	103.4 kPa
Test Engineer	Jeremy Lee	Date	25 January 2019
EUT Voltage	<input checked="" type="checkbox"/> 3VDC, Internal Battery, New <input type="checkbox"/> 120VAC @ 60Hz		
Compliant <input checked="" type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable <input type="checkbox"/>			

## 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 Internal antenna on PCB, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.



**END OF REPORT**