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# Attenti US Inc. TEST REPORT

## SCOPE OF WORK

EMC TESTING – AT1 1-PIECE GPS TRACKING DEVICE

## REPORT NUMBER

103788844LEX-002

## ISSUE DATE

1/11/2018

## PAGES

21

## DOCUMENT CONTROL NUMBER

Non-Specific EMC Report Shell Rev. December 2017  
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## EMC TEST REPORT (PARTIAL COMPLIANCE)

**Report Number:** 103788844LEX-002

**Project Number:** G103788844

**Report Issue Date:** 1/11/2018

**Model(s) Tested:** AT1 1-Piece GPS Tracking Device

**Standards:** FCC Part 15.247  
FCC Part 27  
Limited to RSE Verification

Tested by:  
Intertek Testing Services NA, Inc.  
731 Enterprise Dr.  
Lexington, KY 40510  
USA

Client:  
Attenti US Inc.  
1838 Gunn Highway

Report prepared by



Brian Daffin,  
Engineer

Report reviewed by



Bryan Taylor,  
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## 1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining 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. Intertek does not make any claims of compliance for samples or variants which were not tested.

## 2 Test Summary

| Section | Test full name  | Result    |
|---------|---|-----------|
| 6       | Radiated Spurious Emissions<br>FCC Part 15.247, RSE Verification Only | Compliant |
| 7       | Radiated Spurious Emissions<br>FCC Part 27, RSE Verification Only     | Compliant |

Note: Testing was limited to radiated spurious emissions only due to the integration of certified radio modules.



### 3 Client Information

This product was tested at the request of the following:

| Client Information           |                          |
|------------------------------|--------------------------|
| <b>Client Name:</b>          | Attenti US Inc.          |
| <b>Address:</b>              | 1838 Gunn Hihgway        |
| <b>Contact:</b>              | Stanley DuPont           |
| <b>Telephone:</b>            | 813 749 5454             |
| <b>Email:</b>                | sdupont@attentigroup.com |
| Manufacturer Information     |                          |
| <b>Manufacturer Name:</b>    | Attenti US Inc.          |
| <b>Manufacturer Address:</b> | 1838 Gunn Hihgway        |



#### 4 Description of Equipment under Test and Variant Models

| Equipment Under Test                                      |                                 |
|---|---------------------------------|
| Product Name  | AT1 1-Piece GPS Tracking Device |
| Model Number  | 14024VL                         |
| Serial Number   | 34477985                        |
| Receive Date  | 12/13/2018                      |
| Test Start Date   | 12/14/2018                      |
| Test End Date   | 12/21/2018                      |
| Device Received Condition                                 | Good                            |
| Test Sample Type  | Production                      |
| Rated Voltage   | 12 VDC via AC/DC Adapter        |
| Rated Current   | <2 A DC                         |
| Rated Frequency   | DC                              |
| Description of Equipment Under Test (provided by client)  |                                 |
| Attenti 1Piece GPS Offender Tracking Device Model 14024VL |                                 |

##### 4.1 Variant Models:

There were no variant models covered by this evaluation.



## 5 System Setup and Method

### 5.1 Method:

Configuration as required by ANSI C63.4:2014.

| No. | Descriptions of EUT Exercising                                      |
|-----|---|
| 1   | Transmitting via wifi radio on various channels at max power        |
| 2   | Transmitting via LTE bands 4 or 13 on various channels at max power |

| Cables |                |            |           |          |             |
|--------|----------------|------------|-----------|----------|-------------|
| Qty    | Description    | Length (m) | Shielding | Ferrites | Termination |
| 1      | Charging Cable | 2          | No        | No       | AC Plug     |

| Support Equipment    |              |              |               |
|----------------------|--------------|--------------|---------------|
| Description          | Manufacturer | Model Number | Serial Number |
| No Support Equipment | ---          | ---          | ---           |



## 5.2 EUT Photo (Front):



## 5.3 EUT Photo (Back):







## 6 Radiated Spurious Emissions, FCC Part 15.247

### 6.1 Method

Tests are performed in accordance with ANSI C63.10:2013.

**TEST SITE:** 10m ALSE

**Site Designation:** 10m Chamber

#### Measurement Uncertainty

| Measurement             | Frequency Range | Expanded Uncertainty (k=2) | U <sub>CISPR</sub> |
|-------------------------|-----------------|----------------------------|--------------------|
| Radiated Emissions, 10m | 30-1000 MHz     | 3.9dB                      | 6.3 dB             |
| Radiated Emissions, 3m  | 30-1000 MHz     | 4.0dB                      | 6.3 dB             |
| Radiated Emissions, 3m  | 1-6 GHz         | 4.7dB                      | 5.2 dB             |
| Radiated Emissions, 3m  | 6-15 GHz        | 4.7dB                      | 5.5 dB             |
| Radiated Emissions, 3m  | 15-18 GHz       | 4.7dB                      | 5.5 dB             |
| Radiated Emissions, 3m  | 18-40 GHz       | 4.7dB                      | 5.5 dB             |

As shown in the table above our radiated emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.



## 6.2 Sample Calculation

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

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

RA = 52.0 dB $\mu$ V  
AF = 7.4 dB/m  
CF = 1.6 dB  
AG = 29.0 dB  
FS = 32 dB $\mu$ V/m

To convert from dB $\mu$ V to  $\mu$ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

NF = Net Reading in dB $\mu$ V

### Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$
$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

**6.3 Test Equipment Used:**

| Description                        | Asset | Manufacturer    | Model   | Cal Date                 | Cal Due                  |
|------------------------------------|-------|-----------------|---------|--------------------------|--------------------------|
| EMI Test Receiver                  | 3900  | Rohde & Schwarz | ESU40   | 9/18/2018                | 9/18/2019                |
| Bilog Antenna                      | 7088  | SunAR           | JB6     | 7/24/2018                | 7/24/2019                |
| Horn Antenna                       | 3780  | ETS Lindgren    | 3117    | 6/11/2018                | 6/11/2019                |
| System Controller                  | 4096  | ETS Lindgren    | 2090    | Verify at<br>Time of Use | Verify at<br>Time of Use |
| System Controller                  | 3957  | Sunol Sciences  | SC99V   | Verify at<br>Time of Use | Verify at<br>Time of Use |
| 3m Cable<br>Antenna→Preamp         | 3074  |                 |         | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Preamplifier           | 3918  | Rohde & Schwarz | TS-PR18 | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Preamp→Chamber         | 2588  |                 |         | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Chamber→Control Room   | 2593  |                 |         | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Control Room→Receiver  | 2592  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Antenna→Preamp        | 3339  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Preamplifier          | 7019  | Rohde & Schwarz | TS-PR3  | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Preamp→Chamber        | 3172  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Chamber→Control Room  | 2590  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Control Room→Receiver | 2589  |                 |         | 11/26/2018               | 11/26/2019               |

**6.4 Software Utilized:**

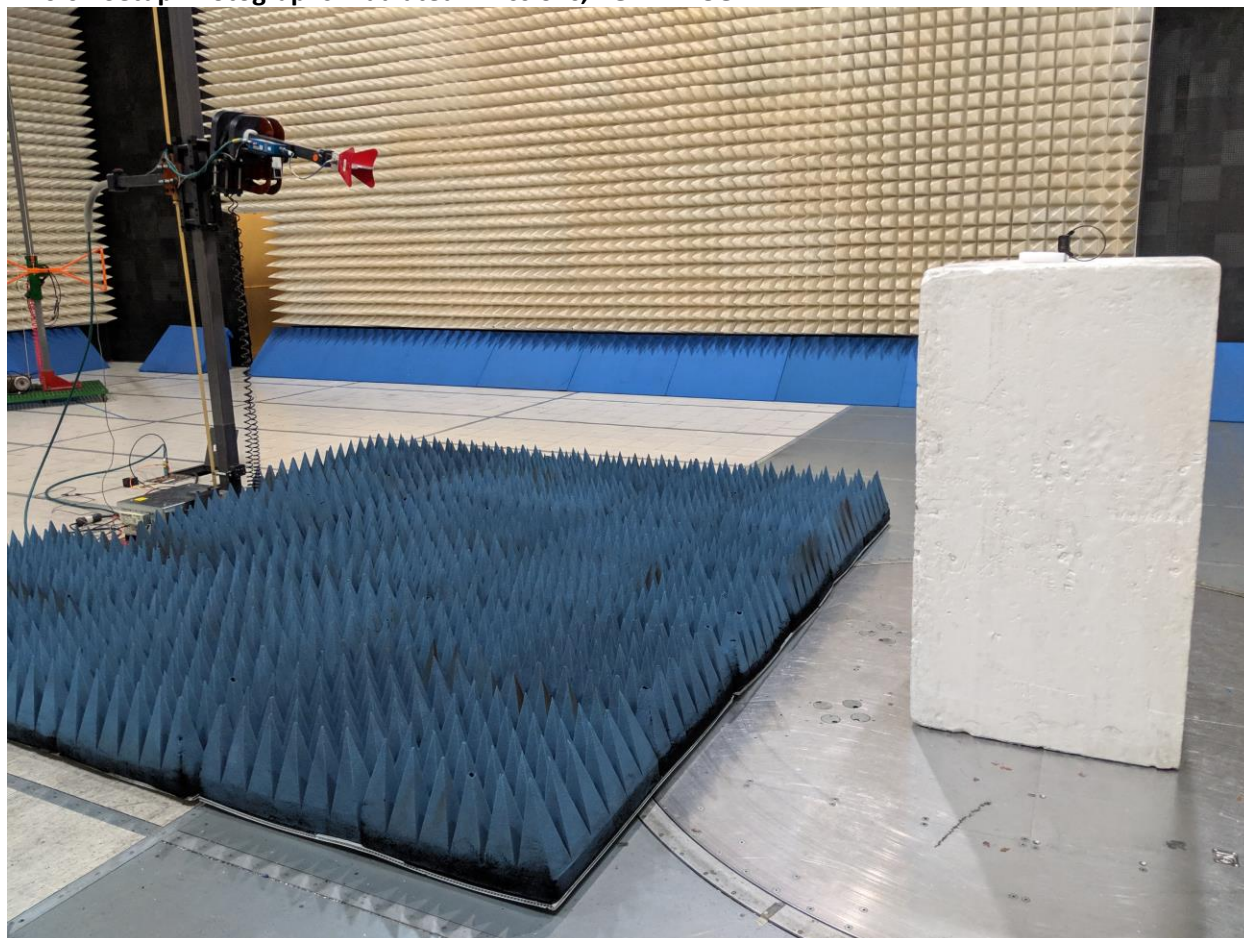
| Name  | Manufacturer    | Version         |
|-------|-----------------|-----------------|
| EMC32 | Rohde & Schwarz | Version 9.15.02 |

**6.5 Results:**

The sample tested was found to Comply. Data shown is from the worst case orientation after investigating emissions with the test sample in three orthogonal positions.



## 6.6 Setup Photographs: Radiated Emissions, 1GHz – 18GHz



**6.7 Plots/Data: Radiated Emissions, 1GHz – 18GHz****1 Mbps, Channel 1****Final\_Result\_PK+**

| Frequency (MHz) | MaxPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 4809.500000     | 42.77            | 74.00          | 31.23       | 1000.000        | 410.0       | H   | 311.0         | 7.1        |
| 7237.000000     | 50.51            | 74.00          | 23.49       | 1000.000        | 100.0       | V   | 66.0          | 11.2       |
| 9648.000000     | 48.57            | 74.00          | 25.43       | 1000.000        | 100.0       | V   | 87.0          | 13.4       |
| 14471.500000    | 53.99            | 74.00          | 20.01       | 1000.000        | 410.0       | V   | 122.0         | 19.4       |
| 16852.000000    | 56.65            | 74.00          | 17.35       | 1000.000        | 100.0       | V   | 68.0          | 24.1       |

**Final\_Result\_AVG**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 4809.500000     | 29.57            | 54.00          | 24.43       | 1000.000        | 410.0       | H   | 311.0         | 7.1        |
| 7237.000000     | 42.71            | 54.00          | 11.29       | 1000.000        | 100.0       | V   | 66.0          | 11.2       |
| 9648.000000     | 37.53            | 54.00          | 16.47       | 1000.000        | 100.0       | V   | 87.0          | 13.4       |
| 14471.500000    | 41.70            | 54.00          | 12.30       | 1000.000        | 410.0       | V   | 122.0         | 19.4       |
| 16852.000000    | 43.27            | 54.00          | 10.73       | 1000.000        | 100.0       | V   | 68.0          | 24.1       |

**1 Mbps, Channel 6****Final\_Result\_PK+**

| Frequency (MHz) | MaxPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 4844.000000     | 42.96            | 74.00          | 31.04       | 1000.000        | 410.0       | H   | 222.0         | 7.1        |
| 7311.500000     | 47.88            | 74.00          | 26.12       | 1000.000        | 232.0       | V   | 123.0         | 10.9       |
| 9748.000000     | 49.87            | 74.00          | 24.13       | 1000.000        | 100.0       | V   | 85.0          | 13.3       |
| 12199.000000    | 51.32            | 74.00          | 22.68       | 1000.000        | 326.0       | V   | 14.0          | 17.9       |
| 14622.000000    | 54.40            | 74.00          | 19.60       | 1000.000        | 383.0       | H   | 312.0         | 19.7       |

**Final\_Result\_AVG**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 4844.000000     | 29.77            | 54.00          | 24.23       | 1000.000        | 410.0       | H   | 222.0         | 7.1        |
| 7311.500000     | 37.19            | 54.00          | 16.81       | 1000.000        | 232.0       | V   | 123.0         | 10.9       |
| 9748.000000     | 40.51            | 54.00          | 13.49       | 1000.000        | 100.0       | V   | 85.0          | 13.3       |
| 12199.000000    | 37.34            | 54.00          | 16.66       | 1000.000        | 326.0       | V   | 14.0          | 17.9       |
| 14622.000000    | 42.99            | 54.00          | 11.01       | 1000.000        | 383.0       | H   | 312.0         | 19.7       |



## 1 Mbps, Channel 11

## Final Result PK+

| Frequency (MHz) | MaxPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 4927.000000     | 42.72            | 74.00          | 31.28       | 1000.000        | 157.0       | H   | 0.0           | 7.2        |
| 7387.500000     | 47.01            | 74.00          | 26.99       | 1000.000        | 257.0       | V   | 211.0         | 11.0       |
| 9848.000000     | 50.38            | 74.00          | 23.62       | 1000.000        | 293.0       | V   | 183.0         | 13.6       |
| 12315.000000    | 51.66            | 74.00          | 22.34       | 1000.000        | 100.0       | H   | 313.0         | 18.7       |
| 14772.000000    | 54.26            | 74.00          | 19.74       | 1000.000        | 410.0       | V   | 133.0         | 19.4       |

## Final Result AVG

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 4927.000000     | 29.46            | 54.00          | 24.54       | 1000.000        | 157.0       | H   | 0.0           | 7.2        |
| 7387.500000     | 36.41            | 54.00          | 17.59       | 1000.000        | 257.0       | V   | 211.0         | 11.0       |
| 9848.000000     | 41.45            | 54.00          | 12.55       | 1000.000        | 293.0       | V   | 183.0         | 13.6       |
| 12315.000000    | 38.42            | 54.00          | 15.58       | 1000.000        | 100.0       | H   | 313.0         | 18.7       |
| 14772.000000    | 43.71            | 54.00          | 10.29       | 1000.000        | 410.0       | V   | 133.0         | 19.4       |

Test Personnel: Brian Daffin  
Supervising/Reviewing Engineer: N/A  
(Where Applicable)  
Product Standard: FCC Part 15.247  
Input Voltage: 12 VDC via AC DC Adapter  
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 12/17/2018  
Limit Applied: See table above  
Ambient Temperature: 21.7 °C  
Relative Humidity: 36.6 %  
Atmospheric Pressure: 985.4 mbar

Deviations, Additions, or Exclusions: None



## 7 Radiated Spurious Emissions, FCC Part 27

### 7.1 Method

Tests are performed in accordance with ANSI C63.26:2015.

**TEST SITE:** 10m ALSE

**Site Designation:** 10m Chamber

#### Measurement Uncertainty

| Measurement             | Frequency Range | Expanded Uncertainty (k=2) | U <sub>CISPR</sub> |
|-------------------------|-----------------|----------------------------|--------------------|
| Radiated Emissions, 10m | 30-1000 MHz     | 3.9dB                      | 6.3 dB             |
| Radiated Emissions, 3m  | 30-1000 MHz     | 4.0dB                      | 6.3 dB             |
| Radiated Emissions, 3m  | 1-6 GHz         | 4.7dB                      | 5.2 dB             |
| Radiated Emissions, 3m  | 6-15 GHz        | 4.7dB                      | 5.5 dB             |
| Radiated Emissions, 3m  | 15-18 GHz       | 4.7dB                      | 5.5 dB             |
| Radiated Emissions, 3m  | 18-40 GHz       | 4.7dB                      | 5.5 dB             |

As shown in the table above our radiated emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.



## 7.2 Limit Calculation

For any frequency outside of the operating band, the power of any emissions shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.

$$\text{Limit (dBm)} = P - 43 + 10 \log(P) \text{ dB}$$

$$P_{(\text{dBm})} = 10 \log(P_{(\text{Watts})}) + 30$$

$$\text{Limit}_{(\text{dBm})} = 10 \log(P_{(\text{Watts})}) + 30 - 43 - 10 \log(P_{(\text{Watts})})$$

$$\text{Limit}_{(\text{dBm})} = 30 - 43 = -13 \text{ dBm}$$

To convert this limit to a Field Strength limit in units of dB $\mu$ V/m, the following correction factor from ANSI C63.26

$$\text{Correction Factor} = 20 \log(D) - 104.8 \quad \text{where } D \text{ is the measurement distance}$$

$$\text{Correction Factor} = 20 \log(3) - 104.8 = -95.26 \text{ dB}$$

$$\text{Limit}_{(\text{dB}\mu\text{V/m})} = \text{Limit}_{(\text{dBm})} + 95.26$$

$$\text{Limit}_{(\text{dB}\mu\text{V/m})} = -13 + 95.26 = 82.26_{(\text{dB}\mu\text{V/m})}$$

## 7.3 Sample Field Strength Calculation

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

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB/m}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = 32 \text{ dB}\mu\text{V/m}$$

To convert from dB $\mu$ V to  $\mu$ V or mV the following was used:

$$UF = 10^{(NF / 20)} \quad \text{where } UF = \text{Net Reading in } \mu\text{V}$$
$$NF = \text{Net Reading in dB}\mu\text{V}$$

### Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$



**7.4 Test Equipment Used:**

| Description                        | Asset | Manufacturer    | Model   | Cal Date                 | Cal Due                  |
|------------------------------------|-------|-----------------|---------|--------------------------|--------------------------|
| EMI Test Receiver                  | 3900  | Rohde & Schwarz | ESU40   | 9/18/2018                | 9/18/2019                |
| Bilog Antenna                      | 7088  | SunAR           | JB6     | 7/24/2018                | 7/24/2019                |
| Horn Antenna                       | 3780  | ETS Lindgren    | 3117    | 6/11/2018                | 6/11/2019                |
| System Controller                  | 4096  | ETS Lindgren    | 2090    | Verify at<br>Time of Use | Verify at<br>Time of Use |
| System Controller                  | 3957  | Sunol Sciences  | SC99V   | Verify at<br>Time of Use | Verify at<br>Time of Use |
| 3m Cable<br>Antenna→Preamp         | 3074  |                 |         | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Preamplifier           | 3918  | Rohde & Schwarz | TS-PR18 | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Preamp→Chamber         | 2588  |                 |         | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Chamber→Control Room   | 2593  |                 |         | 11/26/2018               | 11/26/2019               |
| 3m Cable<br>Control Room→Receiver  | 2592  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Antenna→Preamp        | 3339  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Preamplifier          | 7019  | Rohde & Schwarz | TS-PR3  | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Preamp→Chamber        | 3172  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Chamber→Control Room  | 2590  |                 |         | 11/26/2018               | 11/26/2019               |
| 10m Cable<br>Control Room→Receiver | 2589  |                 |         | 11/26/2018               | 11/26/2019               |

**7.5 Software Utilized:**

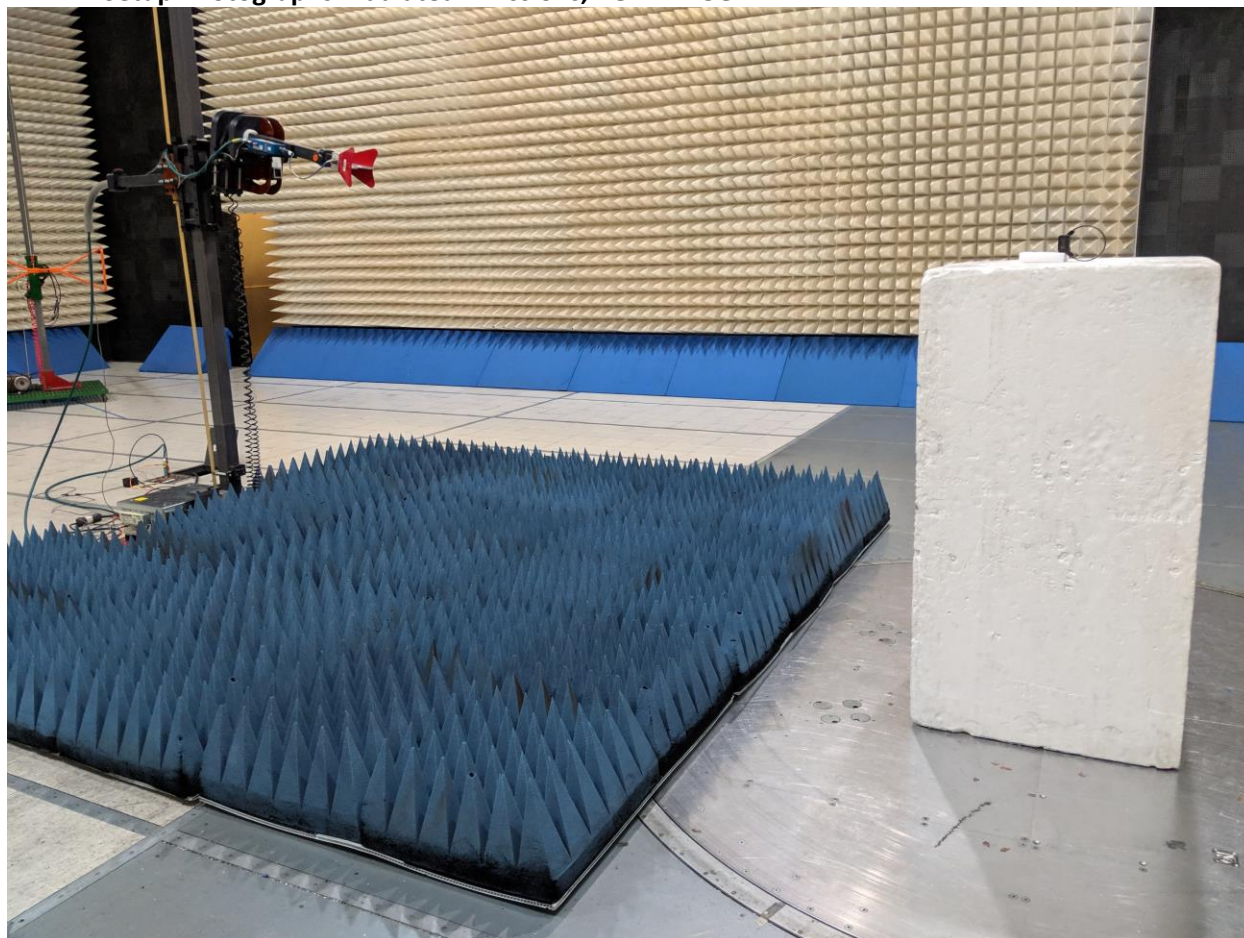
| Name  | Manufacturer    | Version         |
|-------|-----------------|-----------------|
| EMC32 | Rohde & Schwarz | Version 9.15.02 |

**7.6 Results:**

The sample tested was found to Comply. Data shown is from the worst case orientation after investigating emissions with the test sample in three orthogonal positions.



### 7.7 Setup Photographs: Radiated Emissions, 1GHz – 18GHz



**7.8 Plots/Data: Radiated Emissions, 1GHz – 18GHz****LTE Band 4, Low**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 3422.500000     | 27.96            | 82.25          | 54.29       | 1000.000        | 295.0       | V   | 156.0         | 4.4        |
| 5137.500000     | 31.32            | 82.25          | 50.93       | 1000.000        | 355.0       | V   | 157.0         | 7.5        |
| 6850.000000     | 52.04            | 82.25          | 30.21       | 1000.000        | 410.0       | V   | 184.0         | 10.4       |
| 8558.000000     | 33.26            | 82.25          | 48.99       | 1000.000        | 243.0       | V   | 312.0         | 11.9       |
| 10277.000000    | 38.52            | 82.25          | 43.73       | 1000.000        | 210.0       | V   | 186.0         | 14.5       |
| 11987.500000    | 39.43            | 82.25          | 42.82       | 1000.000        | 192.0       | V   | 169.0         | 17.4       |
| 13700.000000    | 44.84            | 82.25          | 37.41       | 1000.000        | 357.0       | V   | 142.0         | 18.7       |

**LTE Band 4, Mid**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 3464.000000     | 28.13            | 82.25          | 54.12       | 1000.000        | 297.0       | V   | 160.0         | 4.8        |
| 5199.000000     | 31.50            | 82.25          | 50.75       | 1000.000        | 410.0       | V   | 346.0         | 7.7        |
| 6930.000000     | 51.63            | 82.25          | 30.62       | 1000.000        | 410.0       | V   | 179.0         | 10.7       |
| 8662.000000     | 35.43            | 82.25          | 46.82       | 1000.000        | 332.0       | V   | 326.0         | 11.8       |
| 10395.000000    | 38.45            | 82.25          | 43.80       | 1000.000        | 215.0       | V   | 149.0         | 14.8       |
| 12125.000000    | 39.96            | 82.25          | 42.29       | 1000.000        | 193.0       | V   | 169.0         | 17.9       |
| 13859.000000    | 41.81            | 82.25          | 40.44       | 1000.000        | 272.0       | V   | 173.0         | 18.7       |

**LTE Band 4, High**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 3503.500000     | 27.75            | 82.25          | 54.50       | 1000.000        | 410.0       | V   | 161.0         | 5.3        |
| 5258.000000     | 32.38            | 82.25          | 49.87       | 1000.000        | 237.0       | V   | 0.0           | 7.7        |
| 7010.000000     | 48.35            | 82.25          | 33.90       | 1000.000        | 367.0       | V   | 174.0         | 10.9       |
| 8763.500000     | 36.59            | 82.25          | 45.66       | 1000.000        | 254.0       | V   | 321.0         | 12.3       |
| 10515.000000    | 38.01            | 82.25          | 44.24       | 1000.000        | 197.0       | V   | 137.0         | 14.8       |
| 12267.500000    | 40.86            | 82.25          | 41.39       | 1000.000        | 296.0       | V   | 114.0         | 18.4       |
| 14019.500000    | 43.07            | 82.25          | 39.18       | 1000.000        | 410.0       | V   | 173.0         | 18.9       |

**LTE Band 13, Low**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 1558.500000     | 33.37            | 82.25          | 48.88       | 1000.000        | 358.0       | H   | 220.0         | -2.6       |
| 2335.000000     | 31.60            | 82.25          | 50.65       | 1000.000        | 100.0       | H   | 99.0          | 2.5        |
| 3118.000000     | 30.19            | 82.25          | 52.06       | 1000.000        | 288.0       | H   | 102.0         | 4.5        |
| 3896.500000     | 28.78            | 82.25          | 53.47       | 1000.000        | 312.0       | V   | 170.0         | 5.7        |

**LTE Band 13, Mid**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 1564.000000     | 31.55            | 82.25          | 50.70       | 1000.000        | 357.0       | V   | 150.0         | -2.1       |
| 2349.500000     | 31.95            | 82.25          | 50.30       | 1000.000        | 325.0       | V   | 149.0         | 2.7        |
| 3128.000000     | 31.90            | 82.25          | 50.35       | 1000.000        | 304.0       | V   | 151.0         | 4.5        |
| 3911.500000     | 28.61            | 82.25          | 53.64       | 1000.000        | 410.0       | H   | 32.0          | 5.8        |

**LTE Band 13, High**

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB) |
|-----------------|------------------|----------------|-------------|-----------------|-------------|-----|---------------|------------|
| 1564.500000     | 24.78            | 82.25          | 57.47       | 1000.000        | 357.0       | V   | 150.0         | -2.1       |
| 2356.500000     | 33.14            | 82.25          | 49.11       | 1000.000        | 371.0       | H   | 99.0          | 2.6        |
| 3138.000000     | 32.23            | 82.25          | 50.02       | 1000.000        | 333.0       | V   | 147.0         | 4.6        |
| 3923.000000     | 28.44            | 82.25          | 53.81       | 1000.000        | 100.0       | H   | 124.0         | 5.8        |

Test Personnel: Brian Daffin  
Supervising/Reviewing Engineer: N/A  
(Where Applicable)  
Product Standard: FCC Part 27  
Input Voltage: 12 VDC via AC DC Adapter  
Pretest Verification w / Ambient  
Signals or BB Source: Yes

Test Date: 12/16/2018  
Limit Applied: See table above  
Ambient Temperature: 22.6 °C  
Relative Humidity: 28.2 %  
Atmospheric Pressure: 985.4 mbar

Deviations, Additions, or Exclusions: None

**8 Revision History**

| Revision Level | Date      | Report Number    | Prepared By | Reviewed By | Notes          |
|----------------|-----------|------------------|-------------|-------------|----------------|
| 0              | 1/11/2018 | 103788844LEX-002 | BD          | BCT         | Original Issue |
|                |           |                  |             |             |                |
|                |           |                  |             |             |                |
|                |           |                  |             |             |                |
|                |           |                  |             |             |                |
|                |           |                  |             |             |                |