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**16740 Peters Road**  
**Middlefield, Ohio 44062**  
**United States of America**  
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## **CERTIFICATION TEST REPORT**

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**Manufacturing Address:** Perfect Electronics  
Room 1307, Lu Plaza  
2 Wing Yip Street  
Kwun Tong, Kowloon, HK

**Applicant:** oNotes  
1 Broadway, 14<sup>th</sup> Floor  
Cambridge, Massachusetts 02142 USA

**Product Name:** Cyrano

**Product Description:** The Cyrano is a step forward in Air Control devices. It allows consumers to control the air they breathe with a smart phone or tablet. The device is portable and battery-operated. It can be recharged via a supplied USB cable. It contains three scent chips and each chip can hold up to 4 individual scents for a total of 12 for the device. Consumers connect to the device via Bluetooth from an iPhone or iPad using our oNotes app. Users simply tap on a scent image to play an individual scent like "Suntan" or Coconut." Consumers can also create a track of scents to play one after the other.

**Power Source:** Battery; 120V, 60 Hz

**Model:** CYR171

**FCC ID:** 2AHYTCYR171

**Testing Commenced:** May 10, 2017

**Testing Ended:** May 10, 2017

**Summary of Test Results:** In Compliance, with Modifications

The EUT complies with the FCC requirements when manufactured identically as the unit tested in this report, including any required modifications. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.

**Standards:**

- **FCC Part 15 Subpart C, Section 15.209**
- **FCC Part 15 Subpart C, Section 15.207 - Conducted Limits**



**Evaluation Conducted by:**

Joe Knepper, EMC Proj. Eng.

**Report Reviewed by:**

Ken Littell, Director of EMC & Wireless Operations

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## **1 ADMINISTRATIVE INFORMATION**

### **1.1 Measurement Location:**

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

### **1.2 Measurement Procedure:**

All measurements were performed according to the 2013 version of ANSI C63.10 and recommended FCC procedure of measurement of equipment operating under Section 15.209. A list of the measurement equipment can be found in Section 6.

### 1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data, and are expressed with a 95% confidence factor using a coverage factor of  $k=2$ . The Uncertainty for a laboratory are referred to as  $U_{lab}$ . For Radiated and Conducted Emissions, the Expanded Uncertainty is compared to the  $U_{cispr}$  values to determine if a specific margin is required to deem compliance.

#### $U_{lab}$

| Measurement Range                                   | Combined Uncertainty | Expanded Uncertainty |
|-----------------------------------------------------|----------------------|----------------------|
| Radiated Emissions <1 GHz @ 3m                      | 2.54                 | 5.07dB               |
| Radiated Emissions <1 GHz @ 10m                     | 2.55                 | 5.09dB               |
| Radiated Emissions 1 GHz to 2.7 GHz                 | 1.81                 | 3.62dB               |
| Radiated Emissions 2.7 GHz to 18 GHz                | 1.55                 | 3.10dB               |
| AC Power Line Conducted Emissions, 150kHz to 30 MHz | 1.38                 | 2.76dB               |
| AC Power Line Conducted Emissions, 9kHz to 150kHz   | 1.66                 | 3.32dB               |

#### $U_{cispr}$

| Measurement Range                                   | Expanded Uncertainty |
|-----------------------------------------------------|----------------------|
| Radiated Emissions <1 GHz @ 3m                      | 5.2dB                |
| Radiated Emissions <1 GHz @ 10m                     | 5.2dB                |
| Radiated Emissions 1 GHz to 2.7 GHz                 | Under Consideration  |
| Radiated Emissions 2.7 GHz to 18 GHz                | Under Consideration  |
| AC Power Line Conducted Emissions, 150kHz to 30 MHz | 3.6dB                |
| AC Power Line Conducted Emissions, 9kHz to 150kHz   | 4.0dB                |

If  $U_{lab}$  is less than or equal to  $U_{cispr}$ , then:

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  in table 1, then:

- compliance is deemed to occur if no measured disturbance, increased by ( $U_{lab} - U_{cispr}$ ), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by ( $U_{lab} - U_{cispr}$ ), exceeds the disturbance limit.

| Measurement                                             | Uncertainty |
|---------------------------------------------------------|-------------|
| Radiated RF Immunity 80 MHz to 1 GHz                    | 2.12dB      |
| Conducted Common Mode RF Immunity, CDN 150kHz to 80 MHz | 1.72dB      |
| Conducted Common Mode RF Immunity, BCI 150kHz to 80 MHz | 2.06dB      |
| Harmonic Emissions                                      | 6.25%       |
| Flicker                                                 | .63%        |

Note: Only measurements listed in the tables above that relate to tests included in this Test Report are applicable.



#### 1.4 Document History

| Document Number | Description | Issue Date   | Approved By |
|-----------------|-------------|--------------|-------------|
| F2LQ9607A-02E   | First Issue | May 17, 2017 | K. Littell  |
|                 |             |              |             |
|                 |             |              |             |

**2 SUMMARY OF TEST RESULTS**

| Test Name                | Standard(s)                                            | Results   |
|--------------------------|--------------------------------------------------------|-----------|
| Radiated Emissions       | FCC Part 15 Subpart C, Section 15.209                  | Complies* |
| Conducted Emissions      | FCC Part 15 Subpart C, Section 15.207                  | Complies  |
| Variation of input power | 15.31(e) was met by using a new fully charged battery. | Complies  |

*\*Complies with modifications.*

| Modifications Made to the Equipment                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The following modifications were made to the EUT to meet Radiated Emissions requirements:</p> <ul style="list-style-type: none"><li>• EUT shut off RFID module when charging current was active.</li><li>• EUT enclosure is a metal canister</li></ul> |



### 3 **ENGINEERING STATEMENT**

This report has been prepared on behalf of oNotes to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.209 of the FCC Rules using ANSI C63.10 2013 and Part 15 standards. The test results found in this test report relate only to the items tested.

### 4 **EUT INFORMATION AND DATA**

#### 4.1 **Equipment Under Test:**

Product: Cyrano

Model: CYR171

Serial Number: None Specified

FCC ID: **2AHYTCYR171**

#### 4.2 **Trade Name:**

oNotes

#### 4.3 **Power Supply:**

Battery Powered; (120V, 60 Hz for charging battery only. Transmitter is disabled when charging.)

#### 4.4 **Applicable Rules:**

CFR 47, Part 15.209, subpart C

#### 4.5 **Equipment Category:**

RFID (13.56 MHz)

#### 4.6 **Antenna:**

Internal board Antenna

#### 4.7 **Accessories:**

N/A

#### 4.8 **Test Item Condition:**

The equipment to be tested was received in good condition.

#### 4.9 **Testing Algorithm:**

EUT was tested in a constantly transmitting state for the RFID and the Bluetooth. While charging, the RFID module was switched off. The highest emissions were recorded in the data tables.

**5 LIST OF MEASUREMENT INSTRUMENTATION**

| Equipment Type                  | Asset Number           | Manufacturer       | Model                           | Serial Number | Calibration Due Date |
|---------------------------------|------------------------|--------------------|---------------------------------|---------------|----------------------|
| Shielded Chamber                | CL166-E                | AlbatrossProjects  | B83117-DF435-T261               | US140023      | Nov. 14, 2017        |
| Temp/Hum. Recorder              | CL137                  | Extech             | RH520                           | CH16992       | June 3, 2017         |
| Receiver                        | CL151                  | Rohde & Schwarz    | ESU40                           | 100319        | Nov. 28, 2017        |
| Bilog Antenna                   | CL211                  | Sunol Sciences     | JB1                             | A021017       | Mar. 2, 2018         |
| Amplifier w/Monopole & 18" Loop | CL163                  | A.H. Systems, Inc. | EHA-52B                         | 100           | May 2, 2018          |
| Amplifier w/Monopole & 18" Loop | CL163                  | A.H. Systems, Inc. | EHA-52B                         | 100           | May 2, 2018          |
| Horn Antenna                    | CL098                  | Emco               | 3115                            | 9809-5580     | Dec. 28, 2018        |
| Software:                       | Tile Version 1.0       |                    | Software Verified: May 10, 2017 |               |                      |
| Software:                       | EMC 32, Version 5.20.2 |                    | Software Verified: May 10, 2017 |               |                      |



## 6 RADIATED EMISSIONS

### 6.1 Requirements

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009-0.490     | 2400/F(kHz)                       | 300                           |
| 0.490-1.705     | 24000/F(kHz)                      | 30                            |
| 1.705-30.0      | 30                                | 30                            |
| 30-88           | 100**                             | 3                             |
| 88-216          | 150**                             | 3                             |
| 216-960         | 200**                             | 3                             |
| Above 960       | 500                               | 3                             |

### 6.2 Test Procedure

The EUT was tested at a distance of 3 meters. The limits shown are extrapolated from the above table. The emissions were maximized by rotating the table and raising/lowering the antenna mounted on a 4 meter mast. Cable and peripheral positions were also varied to produce maximum emissions. Both horizontal and vertical polarities were measured for frequencies above 30MHz, and all three orientations of the loop antenna were scanned to determine worst case emission. The output of the antenna was connected to the input of the receiver and emissions were measured in the range 9 kHz to 13 GHz. The values up to 13 GHz with a resolution bandwidth of 1, 9, and 120 kHz are quasi-peak readings made at 3 meters. The values from 1 to 13 GHz with a resolution bandwidth of 1 MHz are peak and average readings. The raw measurements were corrected to allow for antenna factor and cable loss.

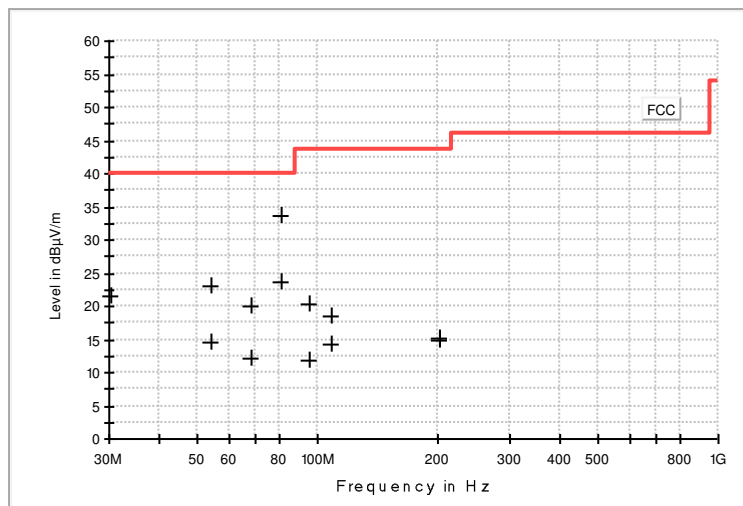


## 6.3 Test Data

|               |                   |                    |            |
|---------------|-------------------|--------------------|------------|
| Test Date(s): | May 10, 2017      | Test Engineer:     | J. Knepper |
| Standards:    | FCC CFR 47 15.209 | Air Temperature:   | 22.0°C     |
| Results:      | Complies*         | Relative Humidity: | 45%        |

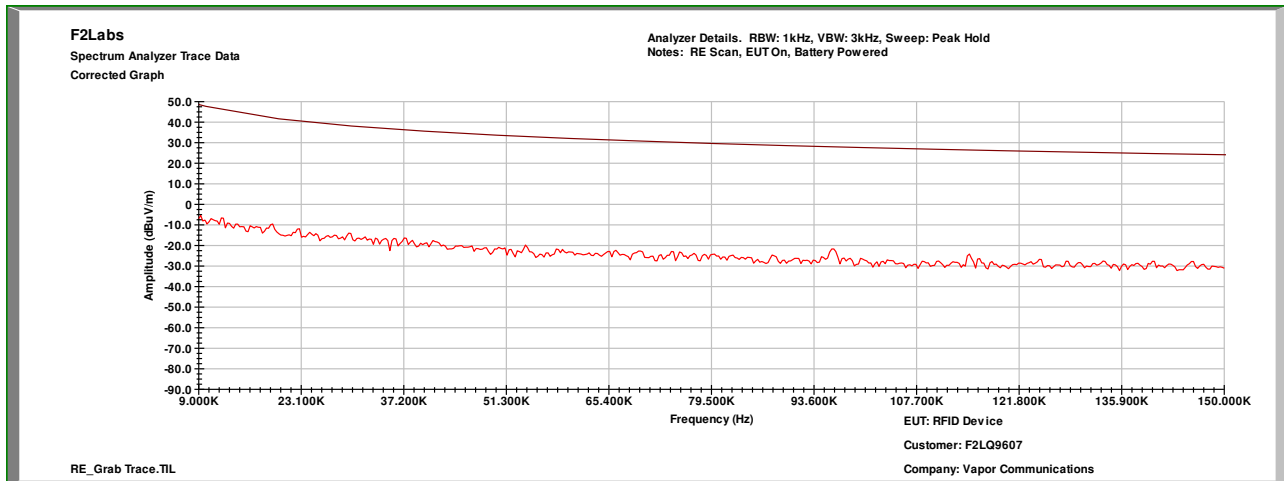
\*Complies with modifications per Section 2.0 of this Test Report.

| Frequency (MHz) | Antenna Polarization | Antenna Height (cm) | Azimuth (degrees) | Reading (dBμV) | Cable Loss & Antenna Factor (dB) | Emission (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------------|---------------------|-------------------|----------------|----------------------------------|-------------------|----------------|-------------|
| 30.373077       | H                    | 100.00              | 0.00              | -2.0           | 23.5                             | 21.50             | 40.0           | -18.5       |
| 54.240000       | H                    | 250.00              | 185.00            | 4.5            | 9.9                              | 14.40             | 40.0           | -25.6       |
| 54.240000       | V                    | 100.00              | 250.00            | 13.0           | 9.9                              | 22.90             | 40.0           | -17.1       |
| 67.800000       | H                    | 250.00              | 185.00            | 1.5            | 10.6                             | 12.10             | 40.0           | -27.9       |
| 67.800000       | V                    | 100.00              | 250.00            | 9.4            | 10.6                             | 20.00             | 40.0           | -20.0       |
| 81.360000       | H                    | 250.00              | 185.00            | 13.2           | 10.5                             | 23.70             | 40.0           | -16.3       |
| 81.360000       | V                    | 100.00              | 250.00            | 23.0           | 10.5                             | 33.50             | 40.0           | -6.5        |
| 94.920000       | V                    | 100.00              | 250.00            | 8.7            | 11.5                             | 20.20             | 43.5           | -23.3       |
| 94.920000       | H                    | 250.00              | 185.00            | 0.3            | 11.5                             | 11.80             | 43.5           | -31.7       |
| 108.480000      | V                    | 100.00              | 250.00            | 3.1            | 15.5                             | 18.60             | 43.5           | -24.9       |
| 108.480000      | H                    | 250.00              | 185.00            | -1.4           | 15.5                             | 14.10             | 43.5           | -29.4       |
| 200.869231      | H                    | 250.00              | 185.00            | -2.8           | 17.6                             | 14.80             | 43.5           | -28.7       |
| 200.869231      | V                    | 100.00              | 0.00              | -2.4           | 17.6                             | 15.20             | 43.5           | -28.3       |

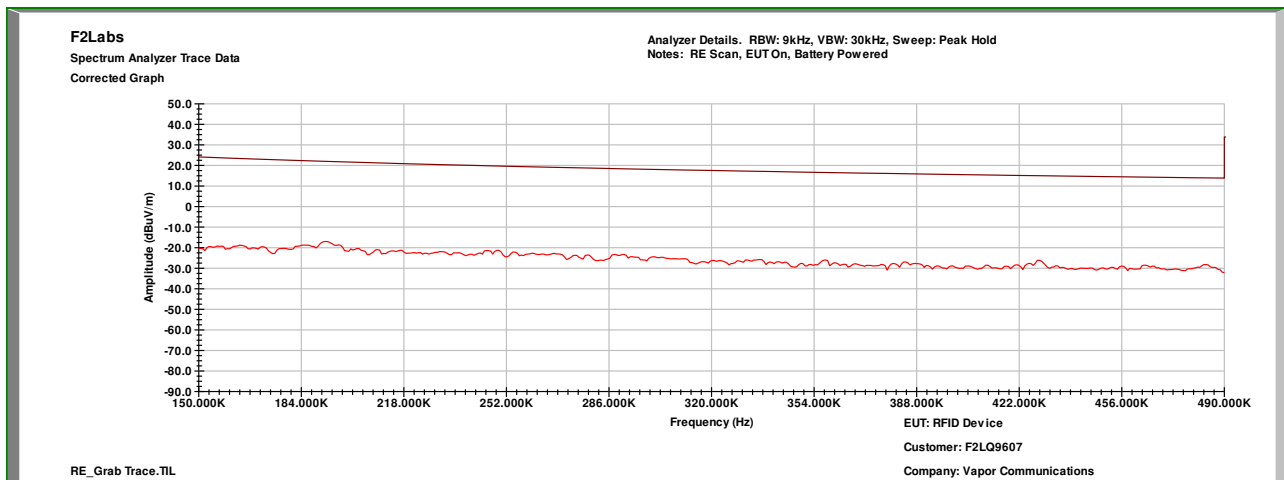




### Characterization Scan, 9kHz to 150 kHz

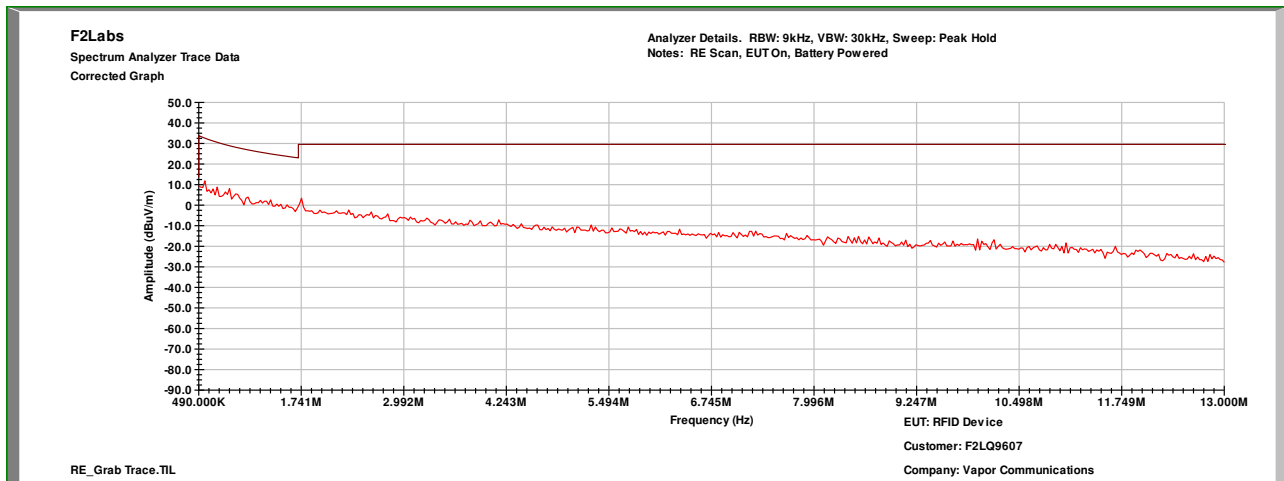


### Characterization Scan, 0.15 MHz to .49 MHz

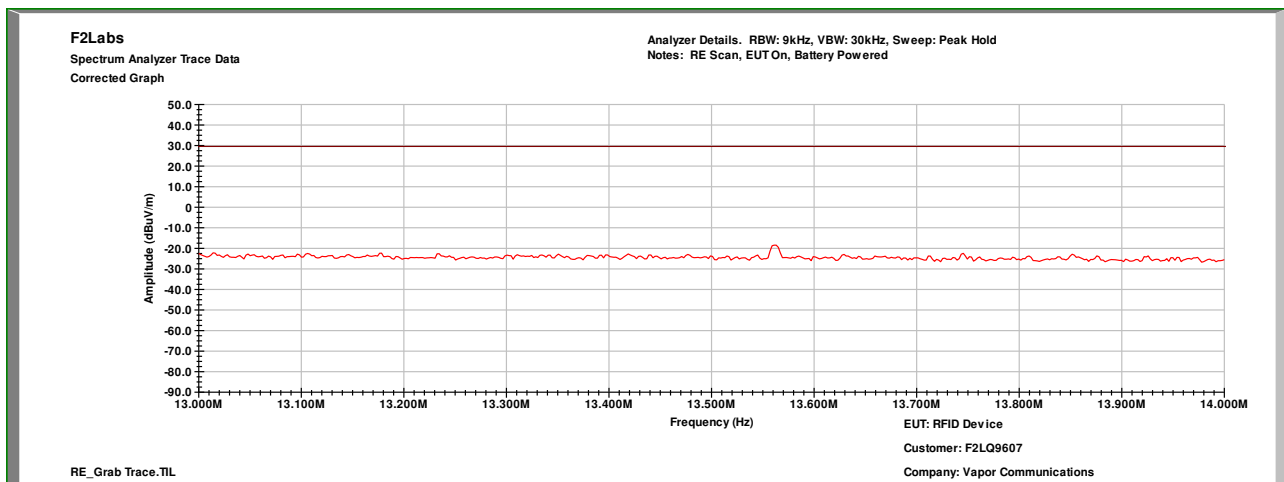




### Characterization Scan, .49 MHz to 13 MHz

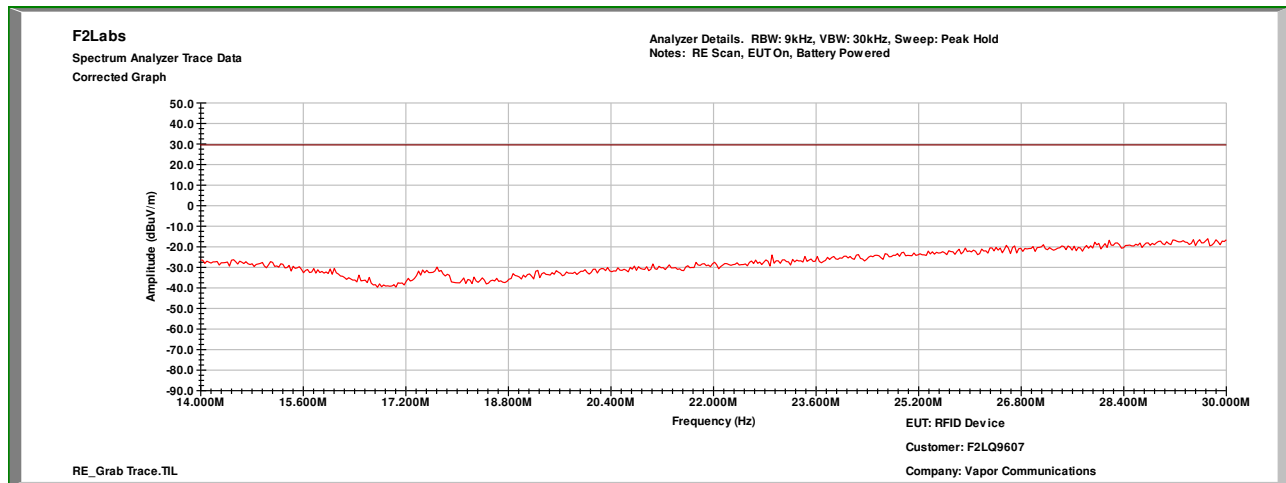


### Characterization Scan, 13 MHz to 14 MHz



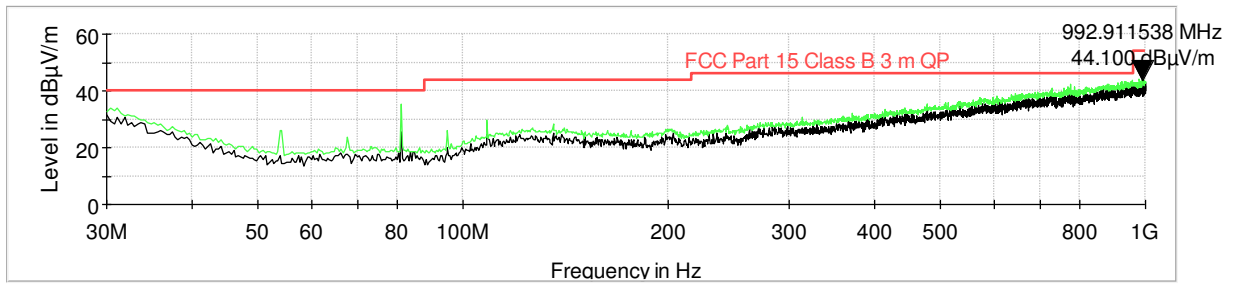


### Characterization Scan, 14 MHz to 30 MHz - Horizontal

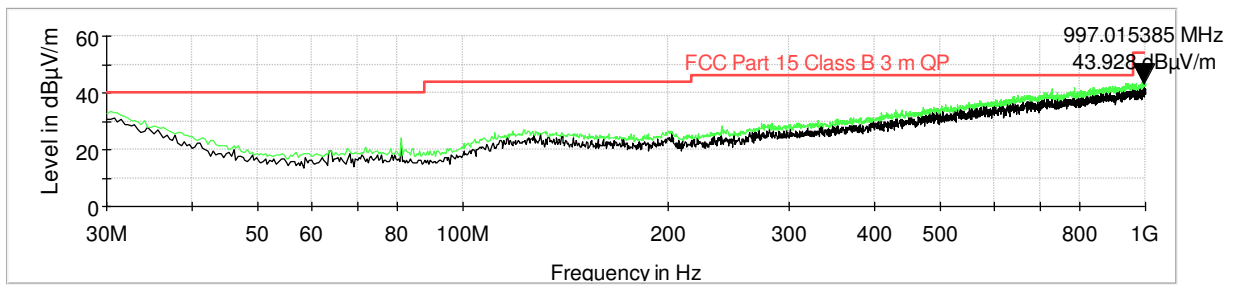




### Characterization Scan, 30 MHz to 1 GHz - Vertical

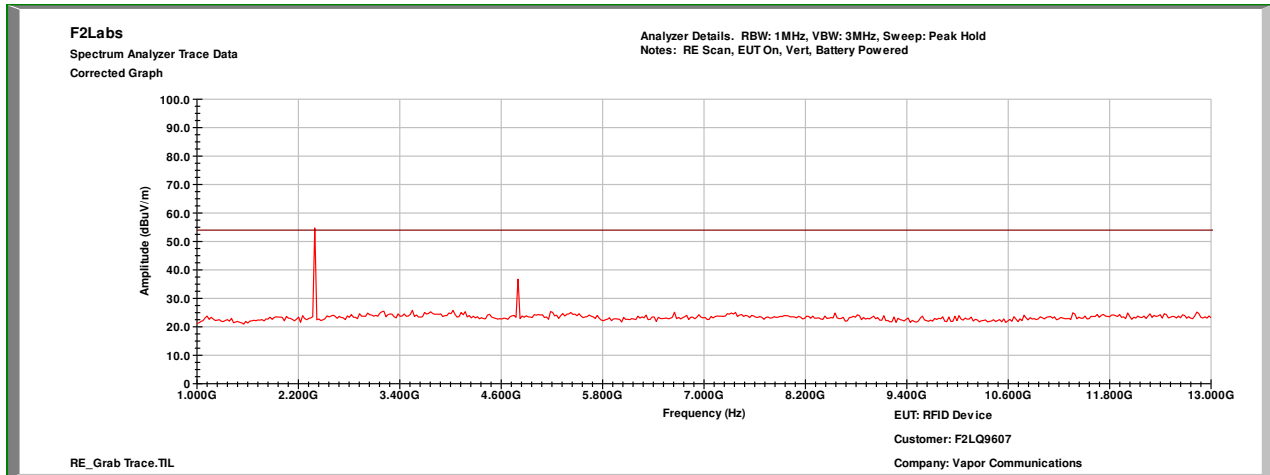


### Characterization Scan, 30 MHz to 1 GHz - Horizontal

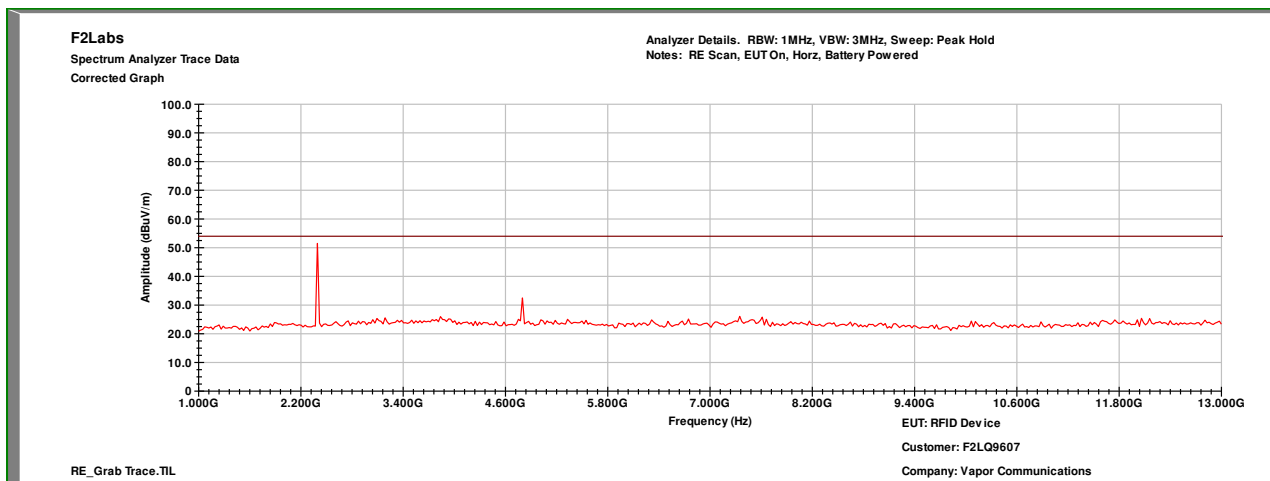




### Characterization Scan, 1 GHz to 13 GHz - Vertical

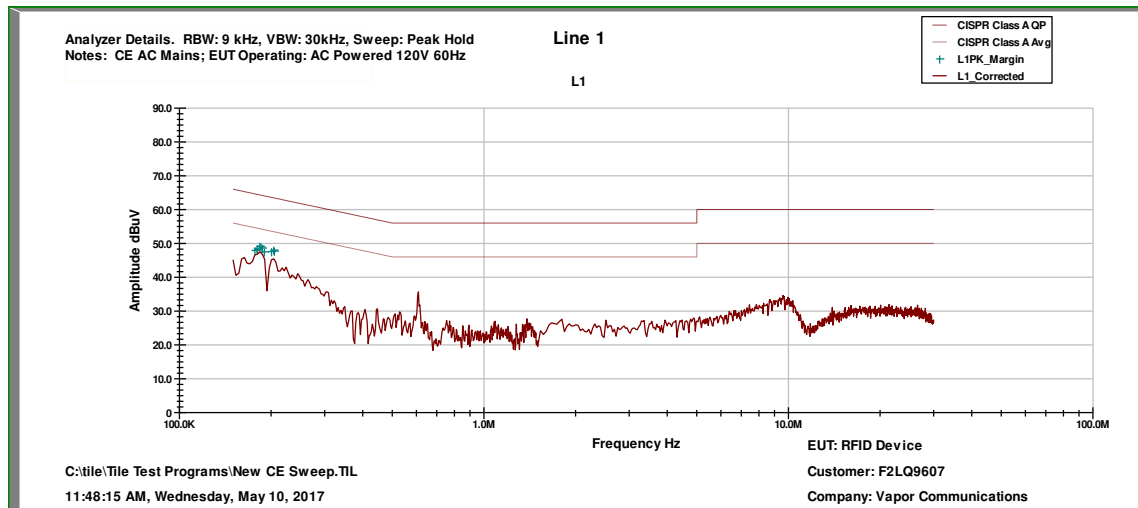


### Characterization Scan, 1 GHz to 13 GHz - Horizontal



**7 CONDUCTED EMISSIONS** (Charging mode only. Transmitter is turned off when charging)

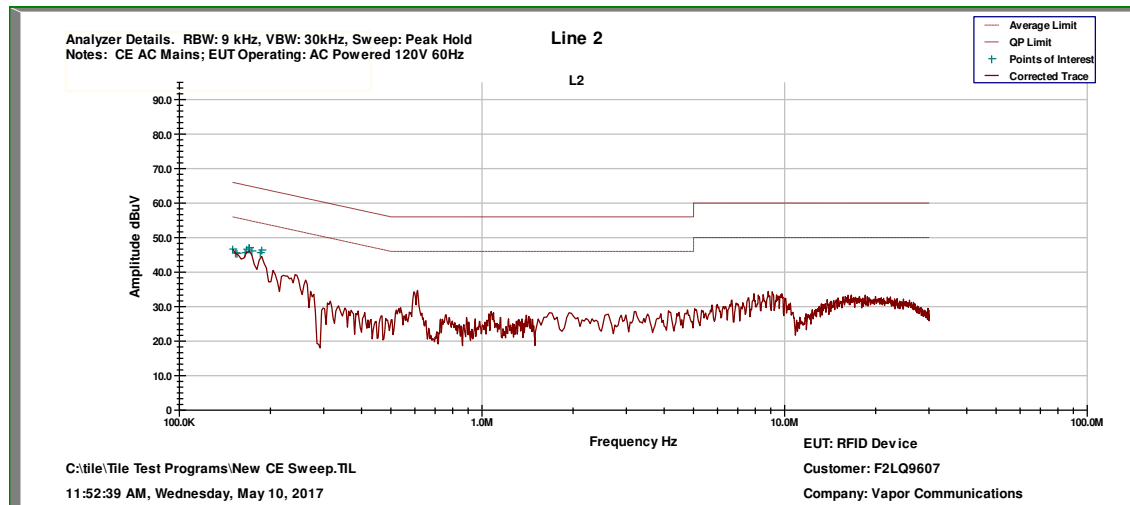
|                   |              |                           |            |
|-------------------|--------------|---------------------------|------------|
| <b>Test Date:</b> | May 10, 2017 | <b>Test Engineer:</b>     | J. Knepper |
| <b>Rule:</b>      | FCC 15.207   | <b>Air Temperature:</b>   | 21.6° C    |
| <b>Results:</b>   | Complies     | <b>Relative Humidity:</b> | 43%        |

**Conducted Test – Line 1: 0.15 MHz to 30.0 MHz**

| Top Discrete Measurements |           |                 |            |              |                 |                |              |             |
|---------------------------|-----------|-----------------|------------|--------------|-----------------|----------------|--------------|-------------|
| No.                       | Conductor | Frequency (MHz) | Detector   | Level (dBμV) | Adjustment (dB) | Results (dBμV) | Limit (dBμV) | Margin (dB) |
| 1                         | Line 1    | 0.177           | Quasi-Peak | 33.220       | 11.379          | 44.599         | 64.6         | -20.027     |
|                           |           | 0.177           | Average    | 15.432       | 11.379          | 26.811         | 54.6         | -27.815     |
| 2                         | Line 1    | 0.18            | Quasi-Peak | 34.020       | 11.346          | 45.366         | 64.5         | -19.12      |
|                           |           | 0.18            | Average    | 16.465       | 11.346          | 27.811         | 54.5         | -26.675     |
| 3                         | Line 1    | 0.180375        | Quasi-Peak | 34.110       | 11.345          | 45.455         | 64.5         | -19.014     |
|                           |           | 0.180375        | Average    | 16.517       | 11.345          | 27.862         | 54.5         | -26.607     |
| 4                         | Line 1    | 0.18375         | Quasi-Peak | 33.700       | 11.333          | 45.033         | 64.3         | -19.28      |
|                           |           | 0.18375         | Average    | 15.360       | 11.333          | 26.693         | 54.3         | -27.622     |
| 5                         | Line 1    | 0.185           | Quasi-Peak | 32.330       | 11.328          | 43.658         | 64.3         | -20.600     |
|                           |           | 0.185           | Average    | 14.398       | 11.328          | 25.726         | 54.3         | -28.532     |
| 6                         | Line 1    | 0.187125        | Quasi-Peak | 30.520       | 11.320          | 41.840         | 64.2         | -22.324     |
|                           |           | 0.187125        | Average    | 13.813       | 11.320          | 25.133         | 54.2         | -29.031     |
| 7                         | Line 1    | 0.19            | Quasi-Peak | 31.020       | 11.310          | 42.330         | 64.0         | -21.707     |
|                           |           | 0.19            | Average    | 12.637       | 11.310          | 23.947         | 54.0         | -30.090     |
| 8                         | Line 1    | 0.200625        | Quasi-Peak | 31.130       | 11.165          | 42.295         | 63.6         | -21.290     |
|                           |           | 0.200625        | Average    | 11.397       | 11.165          | 22.562         | 53.6         | -31.023     |
| 9                         | Line 1    | 0.204           | Quasi-Peak | 29.310       | 11.141          | 40.451         | 63.4         | -22.996     |
|                           |           | 0.204           | Average    | 7.705        | 11.141          | 18.846         | 53.4         | -34.601     |
| 10                        | Line 1    | 0.205           | Quasi-Peak | 29.170       | 11.134          | 40.304         | 63.4         | -23.102     |
|                           |           | 0.205           | Average    | 10.765       | 11.134          | 21.899         | 53.4         | -31.507     |



## Conducted Test – Line 2: 0.15 MHz to 30.0 MHz



| Top Discrete Measurements |           |                 |            |              |                 |                |              |             |
|---------------------------|-----------|-----------------|------------|--------------|-----------------|----------------|--------------|-------------|
| No.                       | Conductor | Frequency (MHz) | Detector   | Level (dBμV) | Adjustment (dB) | Results (dBμV) | Limit (dBμV) | Margin (dB) |
| 1                         | Line 2    | 0.15            | Quasi-Peak | 37.140       | 11.722          | 48.862         | 66           | -17.138     |
|                           |           | 0.15            | Average    | 14.570       | 11.722          | 26.292         | 56           | -29.708     |
| 2                         | Line 2    | 0.153375        | Quasi-Peak | 33.940       | 11.669          | 45.609         | 65.816       | -20.207     |
|                           |           | 0.153375        | Average    | 14.825       | 11.669          | 26.494         | 55.816       | -29.322     |
| 3                         | Line 2    | 0.155           | Quasi-Peak | 30.720       | 11.643          | 42.363         | 65.728       | -23.365     |
|                           |           | 0.155           | Average    | 12.313       | 11.643          | 23.956         | 55.728       | -31.772     |
| 4                         | Line 2    | 0.165           | Quasi-Peak | 37.580       | 11.509          | 49.089         | 65.208       | -16.119     |
|                           |           | 0.165           | Average    | 7.770        | 11.509          | 19.279         | 55.208       | -35.929     |
| 5                         | Line 2    | 0.166875        | Quasi-Peak | 29.360       | 11.489          | 40.849         | 65.115       | -24.27      |
|                           |           | 0.166875        | Average    | 10.795       | 11.489          | 22.284         | 55.115       | -32.831     |
| 6                         | Line 2    | 0.17            | Quasi-Peak | 30.440       | 11.455          | 41.895         | 64.961       | -23.066     |
|                           |           | 0.17            | Average    | 14.148       | 11.455          | 25.603         | 54.961       | -29.358     |
| 7                         | Line 2    | 0.17025         | Quasi-Peak | 31.860       | 11.452          | 43.312         | 64.949       | -21.637     |
|                           |           | 0.17025         | Average    | 12.300       | 11.452          | 23.752         | 54.949       | -31.197     |
| 8                         | Line 2    | 0.173625        | Quasi-Peak | 29.290       | 11.415          | 40.705         | 64.8         | -24.081     |
|                           |           | 0.173625        | Average    | 11.115       | 11.415          | 22.530         | 54.8         | -32.256     |
| 9                         | Line 2    | 0.185           | Quasi-Peak | 28.680       | 11.328          | 40.008         | 64.3         | -24.250     |
|                           |           | 0.185           | Average    | 10.923       | 11.328          | 22.251         | 54.3         | -32.007     |
| 10                        | Line 2    | 0.187125        | Quasi-Peak | 29.200       | 11.320          | 40.520         | 64.2         | -23.644     |
|                           |           | 0.187125        | Average    | 8.140        | 11.320          | 19.460         | 54.2         | -34.704     |

8 PHOTOGRAPH(S)

3m Chamber, <1 GHz



3m Chamber, >1 GHz





## Conducted Emissions

