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**FCC PART 15.231(a) & RSS-210 (i9) ANNEX 1**  
**MOMENTARILY OPERATED TRANSMITTER**  
**COMBO TEST REPORT**

|                             |                                                                |
|-----------------------------|----------------------------------------------------------------|
| <b>Applicant</b>            | ADEMCO INC.                                                    |
| <b>Address</b>              | 2 CORPORATE CENTER DRIVE<br>SUITE 1009040<br>MELVILLE NY 11747 |
| <b>Product Model Number</b> | 5800PIR-OD2                                                    |
| <b>Product Description</b>  | Outdoor PIR Motion Detector                                    |
| <b>FCC ID</b>               | CFS8DL5800PIR-OD2                                              |
| <b>IC</b>                   | 573F-5800PIR-OD2                                               |
| <b>Date Sample Received</b> | 4/12/2019                                                      |
| <b>Date Tested</b>          | 4/12/2019                                                      |
| <b>Tested By</b>            | Tim Royer                                                      |
| <b>Approved By</b>          | Franklin Rose                                                  |

| Report Number     | Version Number | Description                | Issue Date |
|-------------------|----------------|----------------------------|------------|
| 857UT19TestReport | Rev1           | Initial Issue              | 04/12/2019 |
|                   | Rev1           | Revised Radiated Emissions | 05/22/2019 |

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

## TABLE OF CONTENTS

|                                                                              |          |
|------------------------------------------------------------------------------|----------|
| <b>GENERAL REMARKS .....</b>                                                 | <b>3</b> |
| GENERAL INFORMATION.....                                                     | 4        |
| TEST RESULTS SUMMARY .....                                                   | 5        |
| TEST SETUP.....                                                              | 5        |
| RADIATED SPURIOUS EMISSIONS .....                                            | 6        |
| RADIATED SPURIOUS EMISSIONS .....                                            | 7        |
| Test Data: Emissions from 9 KHz to the 10th harmonic of the Fundamental..... | 9        |
| OCCUPIED BANDWIDTH.....                                                      | 10       |
| Test Data: Occupied Bandwidth Measurement Table.....                         | 10       |
| Test Data: 20 dB Occupied Bandwidth Plot.....                                | 11       |
| Test Data: 99% Occupied Bandwidth Plot .....                                 | 12       |
| TEST EQUIPMENT LIST .....                                                    | 13       |
| State of the measurement Uncertainty.....                                    | 14       |

## GENERAL REMARKS

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## Summary

The device under test does:

- ☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.
- ☐ Not fulfill the general approval requirements as identified in this test report

## Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

**Timco Engineering Inc.**  
**849 NW State Road 45**  
**Newberry, FL 32669**

**Tested by:**



Sr. EMC Engineer  
EMC-003838-NE



Name and Title: Tim Royer, Project Manager/Testing Engineer

**Date: 4/18/2019**



**Reviewed and approved by:**

Name and Title: Franklin Rose, Project Manager/EMC Specialist

**Date: 4/19/2019**

Applicant: ADEMCO INC.  
FCC ID: CFS8DL5800PIR-OD2  
IC: 573F-5800PIR-OD2  
Report: 857UT19TestReport\_Rev2

## GENERAL INFORMATION

|                                |                                                                                                                                                                                                        |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT Description</b>         | Outdoor PIR Motion Detector                                                                                                                                                                            |
| <b>FCC ID</b>                  | CFS8DL5800PIR-OD2                                                                                                                                                                                      |
| <b>Model Number</b>            | 5800PIR-OD2                                                                                                                                                                                            |
| <b>IC Certification</b>        | 573F-5800PIR-OD2                                                                                                                                                                                       |
| <b>Operating Frequency</b>     | 344.94 MHz                                                                                                                                                                                             |
| <b>Test Frequencies</b>        | 344.94 MHz                                                                                                                                                                                             |
| <b>EUT Power Source</b>        | <input type="checkbox"/> 110-120Vac/50- 60Hz                                                                                                                                                           |
|                                | <input type="checkbox"/> DC Power 12V                                                                                                                                                                  |
|                                | <input checked="" type="checkbox"/> Battery Operated Exclusively                                                                                                                                       |
| <b>Test Item</b>               | <input type="checkbox"/> Prototype                                                                                                                                                                     |
|                                | <input checked="" type="checkbox"/> Pre-Production                                                                                                                                                     |
|                                | <input type="checkbox"/> Production                                                                                                                                                                    |
| <b>Type of Equipment</b>       | <input type="checkbox"/> Fixed                                                                                                                                                                         |
|                                | <input checked="" type="checkbox"/> Mobile                                                                                                                                                             |
|                                | <input type="checkbox"/> Portable                                                                                                                                                                      |
| <b>Test Conditions</b>         | Temperature: 24-26°C<br>Relative humidity: 50-65%<br>Barometric Pressure: 1024mb                                                                                                                       |
| <b>Test Facility</b>           | Timco Engineering Inc. located at 849 NW State Road 45<br>Newberry, FL 32669 USA. Designation #: US1070, ISED 2056-A                                                                                   |
| <b>Modification to the EUT</b> | NONE                                                                                                                                                                                                   |
| <b>Test Exercise</b>           | For radiated emissions testing a continuously transmitting modulated carrier was used, for verification of duty cycle and compliance with periodic operation a normally operating transmitter was used |
| <b>Regulatory Standards</b>    | FCC CFR Title 47 Part 15C                                                                                                                                                                              |
| <b>Measurement Standards</b>   | ANSI C63.10: 2013<br>FCC CFR Title 47 Part 15.31, 15.33, 15.35<br>RSS-GEN (i4)                                                                                                                         |

## TEST RESULTS SUMMARY

| Requirement                         | FCC Rules Part No.                     | IC RSS §                          | RESULTS<br>Pass/Fail/NA |
|-------------------------------------|----------------------------------------|-----------------------------------|-------------------------|
| Spurious Emissions<br>and Harmonics | 15.231(b)<br>15.209(a)<br>15.205(a)(b) | 210 A1.1.2<br>GEN 8.9<br>GEN 8.10 | <b>Pass</b>             |
| Occupied<br>Bandwidth               | 15.231(c)<br>15.215(c)                 | 210 A1.1.3<br>GEN 6.6             | <b>Pass</b>             |

## TEST SETUP

|                                    |     |
|------------------------------------|-----|
| Supporting Peripheral<br>Equipment | N/A |
|------------------------------------|-----|

## RADIATED SPURIOUS EMISSIONS

**FCC Rules Part No.:** 15.231(b), 15.209 (a), 15.205(a) (b)

**IC RSS:** 210 § A1.1 Table A, RSS-Gen § 8.9, & 8.10

### Requirements:

| <b>Fundamental and Harmonics not in Restricted Bands</b> |                                              |                                                                        |
|----------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------|
| Fundamental Frequency (MHz)                              | Field Strength of Fundamental (dB $\mu$ V/m) | Field Strength of Harmonics and Spurious Emissions (dB $\mu$ V/m @ 3m) |
| 40.66 to 40.70                                           | 67.04                                        | 47.04                                                                  |
| 70 to 130                                                | 61.94                                        | 41.94                                                                  |
| 130 to 174                                               | 61.94 to 71.48                               | 41.94 to 51.48                                                         |
| 174 to 260                                               | 71.48                                        | 51.48                                                                  |
| 260 to 470                                               | 71.48 to 81.94                               | 51.48 to 61.94                                                         |
| 470 and above                                            | 81.94(12500)                                 | 61.94                                                                  |

| <b>Restricted Band Emissions</b> |                                         |
|----------------------------------|-----------------------------------------|
| Frequency (MHz)                  | Limits                                  |
| 9 – 490 kHz                      | 2400/F (kHz) $\mu$ V/m @ 300 meters     |
| 490 – 1705 kHz                   | 24000/F (kHz) $\mu$ V/m @ 30 meters     |
| 1705 – 30 MHz                    | 29.54 dB $\mu$ V/m measured @ 30 meters |
| 30 – 88                          | 40.0 dB $\mu$ V/m measured @ 3 meters   |
| 88 – 216                         | 43.5 dB $\mu$ V/m measured @ 3 meters   |
| 216 – 960                        | 46.0 dB $\mu$ V/m measured @ 3 meters   |
| Above 960                        | 54.0 dB $\mu$ V/m measured @ 3 meters   |

No fundamental frequency is allowed in the restricted bands.

No harmonic or spurious emissions may exceed the level of the fundamental carrier frequency.

## **RADIATED SPURIOUS EMISSIONS**

### **Fundamental Emission Limit Formula:**

- 1) For the band 130-174 MHz,  $\mu\text{V/m}$  at 3 meters =  $56.81818(F)-6136.3636$ ;
- 2) For the band 260-470 MHz,  $\mu\text{V/m}$  at 3 meters =  $41.6667(F)-7083.3333$ .

Where F is the fundamental emission frequency in MHz

Example Calculation of limit @ 433.92 MHz:

$$41.6667 (433.9) - 7083.3333 = 10,995.85 \text{ } \mu\text{V/m}$$

$$20\log (10,995.85) = 80.82 \text{ dBuV/m}$$

### **Harmonics and Spurious Emissions Limit:**

- 1) 20 dBc for all emissions outside of restricted bands
- 2) General limits of 15.209(a) & RSS-Gen for emissions inside restricted bands

### **3 Meter Field Strength Limit for this EUT:**

| Fund Freq<br>(MHz) | Fund Limit<br>(dBuV/m) | Harm & Spur<br>(dBuV/m) | Restricted<br>Bands |
|--------------------|------------------------|-------------------------|---------------------|
| 344.94             | 77.25                  | 57.25                   | Limit of 15.209     |

## **RADIATED SPURIOUS EMISSIONS**

**Test Method:** ANSI C63.10 § 6.3 – 6.6 Radiated Emissions Unlicensed Devices

The EUT was placed on a table with dimensions of 1m by 1.5m, 80 cm high below 1 GHz and 150 cm high above 1 GHz. The EUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 9 KHz or the lowest frequency generated to the 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes when necessary and the highest readings were converted to average readings based on the duty cycle.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

### **Formula of Conversion Factors:**

The field strength at 3m was established by adding the meter reading of the spectrum analyzer to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB/m. The gain of the preselector was accounted for in the spectrum analyzer reading.

Example:

| Freq.<br>MHz | Meter Reading<br>dB $\mu$ V | ACF<br>dB/m | Cable Loss<br>dB | Field Strength<br>dB $\mu$ V/m @ 3 m |
|--------------|-----------------------------|-------------|------------------|--------------------------------------|
| 33           | 20                          | +10.36      | +1.2             | = 31.56                              |

## RADIATED SPURIOUS EMISSIONS

### Test Data: Emissions from 9 KHz to the 10th harmonic of the Fundamental

| Tuned Freq MHz | Emission Frequency MHz |   | Meter Reading dBu V | Antenna Polarity | Coax Loss Db | Duty Cycle | Filter Insertion Loss | Correction Factor dB/M | Field Strength dBu V/M | Margin | Limit |
|----------------|------------------------|---|---------------------|------------------|--------------|------------|-----------------------|------------------------|------------------------|--------|-------|
| 344.94         | 689.90                 |   | 33.34               | V                | 3.07         | 20.00      | 3.00                  | 20.89                  | 40.30                  | 16.95  | 57.25 |
| 344.94         | 689.90                 |   | 26.61               | H                | 3.07         | 20.00      | 3.00                  | 20.89                  | 33.57                  | 23.68  | 57.25 |
| 344.94         | 344.94                 |   | 67.17               | V                | 2.12         | 20.00      | 2.00                  | 14.10                  | 65.39                  | 11.86  | 77.25 |
| 344.94         | 344.94                 |   | 60.48               | H                | 2.12         | 20.00      | 2.00                  | 14.10                  | 58.70                  | 18.55  | 77.25 |
| 344.94         | 1034.80                | * | 32.86               | V                | 3.75         | 20.00      | 4.00                  | 27.24                  | 47.85                  | 6.15   | 54    |
| 344.94         | 1034.80                | * | 34.17               | H                | 3.75         | 20.00      | 4.00                  | 27.24                  | 49.16                  | 4.84   | 54    |
| 344.94         | 1379.80                | * | 19.07               | H                | 4.31         | 20.00      | 4.00                  | 29.23                  | 36.61                  | 17.39  | 54    |
| 344.94         | 1379.80                | * | 33.32               | V                | 4.31         | 20.00      | 4.00                  | 29.23                  | 50.86                  | 3.14   | 54    |
| 344.94         | 1724.70                |   | 18.24               | V                | 4.81         | 20.00      | 5.00                  | 29.42                  | 37.47                  | 19.78  | 57.25 |
| 344.94         | 1724.70                |   | 17.07               | H                | 4.81         | 20.00      | 5.00                  | 29.42                  | 36.30                  | 20.95  | 57.25 |
| 344.94         | 2069.60                |   | 28.83               | H                | 5.27         | 20.00      | 5.00                  | 31.51                  | 50.61                  | 6.64   | 57.25 |
| 344.94         | 2069.60                |   | 23.90               | V                | 5.27         | 20.00      | 5.00                  | 31.51                  | 45.68                  | 11.57  | 57.25 |
| 344.94         | 2414.60                |   | 20.29               | V                | 5.62         | 20.00      | 6.00                  | 32.11                  | 44.02                  | 13.23  | 57.25 |
| 344.94         | 2414.60                |   | 13.95               | H                | 5.62         | 20.00      | 6.00                  | 32.11                  | 37.68                  | 19.57  | 57.25 |
| 344.94         | 2759.50                | * | 14.54               | H                | 6.10         | 20.00      | 6.00                  | 32.45                  | 39.09                  | 14.91  | 54    |
| 344.94         | 2759.50                | * | 14.60               | V                | 6.10         | 20.00      | 6.00                  | 32.45                  | 39.15                  | 14.85  | 54    |
| 344.94         | 3104.50                |   | 14.54               | V                | 6.44         | 20.00      | 6.00                  | 33.40                  | 40.38                  | 16.87  | 57.25 |
| 344.94         | 3104.50                |   | 14.64               | H                | 6.44         | 20.00      | 6.00                  | 33.40                  | 40.48                  | 16.77  | 57.25 |
| 344.94         | 3449.40                |   | 16.63               | H                | 6.84         | 20.00      | 7.00                  | 32.93                  | 43.40                  | 13.85  | 57.25 |
| 344.94         | 3449.40                |   | 19.21               | V                | 6.84         | 20.00      | 7.00                  | 32.93                  | 45.98                  | 11.27  | 57.25 |

\* -Denotes restricted bands which must comply with limits 15.209

Note: Emissions that are 20 dB below the limit are not required to be reported.

## OCCUPIED BANDWIDTH

**FCC Rules Part No.:** 15.231(C), & 15.215(c)

**IC RSS:** 210 § A1.1.3, & GEN § 6.6

**Requirements:**

The bandwidth of the emission shall fall completely inside the band of operation, and be no wider than .25% of the center frequency for devices operating between 70 and 900 MHz.

For FCC compliance the Bandwidth is determined at the points 20 dB down from the modulated carrier.

For IC compliance the Bandwidth is determined as the 99% power bandwidth.

**Test Method:** ANSI C63.10 § 6.9.2 Occupied bandwidth Relative procedure  
ANSI C63.10 § 6.9.3 Occupied bandwidth 99% Power

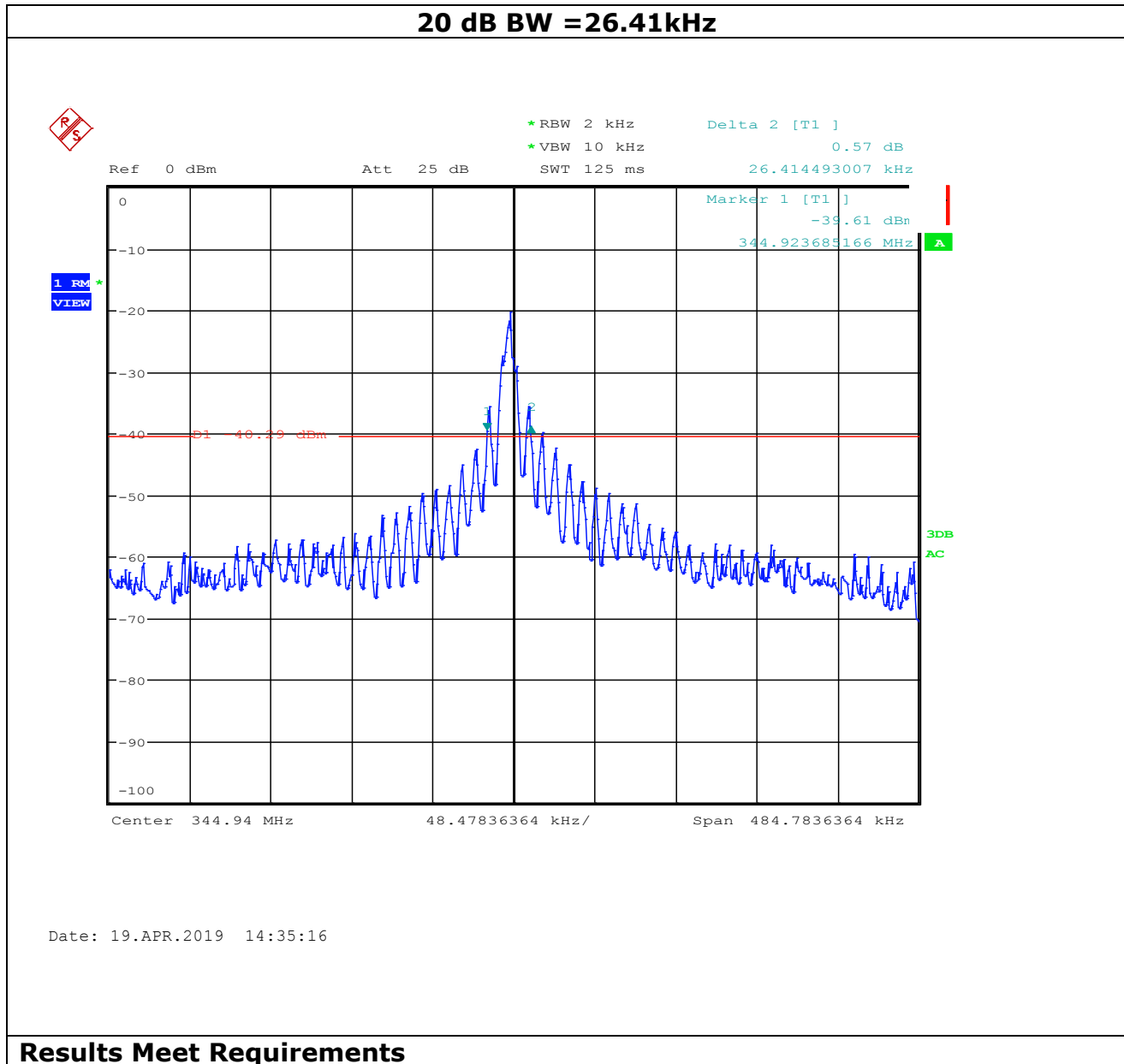
**Test Data:** **Occupied Bandwidth Measurement Table**

| Tuned Frequency (MHz) | Limit (KHz) | Measured 20 dB BW (KHz) | Measured 99% BW (KHz) |
|-----------------------|-------------|-------------------------|-----------------------|
| 344.94                | 862.35      | 26.41                   | 111.09                |
| Margin (KHz)          |             | 835.94                  | 751.26                |

**Results Meet Requirement**

## OCCUPIED BANDWIDTH

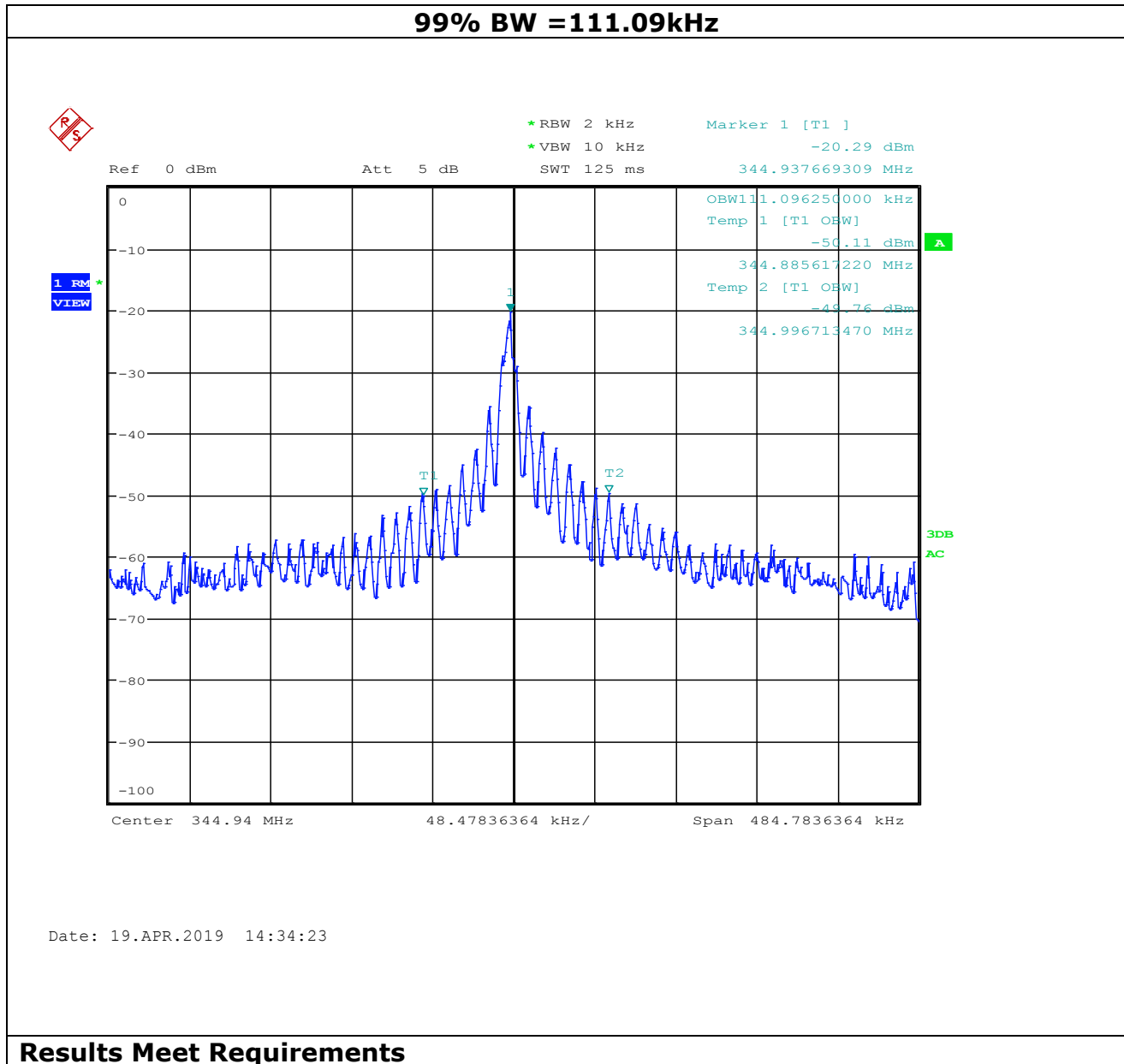
**Test Data:** 20 dB Occupied Bandwidth Plot



Applicant: ADEMCO INC.  
FCC ID: CFS8DL5800PIR-OD2  
IC: 573F-5800PIR-OD2  
Report: 857UT19TestReport\_Rev2

## OCCUPIED BANDWIDTH

**Test Data: 99% Occupied Bandwidth Plot**



Applicant: ADEMCO INC.  
 FCC ID: CFS8DL5800PIR-OD2  
 IC: 573F-5800PIR-OD2  
 Report: 857UT19TestReport\_Rev2

## TEST EQUIPMENT LIST

| Device                                                 | Manufacturer       | Model                               | Serial Number                                           | Cal/Char Date | Due Date |
|--------------------------------------------------------|--------------------|-------------------------------------|---------------------------------------------------------|---------------|----------|
| Antenna:<br>Biconical<br>1096                          | Eaton              | 94455-1                             | 1096                                                    | 08/01/17      | 08/01/19 |
| Antenna:<br>Log-Periodic<br>1122                       | Electro-Metrics    | LPA-25                              | 1122                                                    | 07/26/17      | 07/26/19 |
| CHAMBER                                                | Panashield         | 3M                                  | N/A                                                     | 12/31/17      | 12/31/19 |
| Antenna:<br>Double-<br>Ridged<br>Horn/ETS<br>Horn 2    | ETS-Lindgren       | 3117                                | 00041534                                                | 03/01/17      | 03/01/20 |
| Software:<br>Field<br>Strength<br>Program              | Timco              | N/A                                 | Version<br>4.10.7.0                                     | N/A           | N/A      |
| Antenna:<br>Active Loop                                | ETS-Lindgren       | 6502                                | 00062529                                                | 12/11/17      | 12/11/19 |
| EMI Test<br>Receiver R &<br>S ESU 40<br>Chamber        | Rohde &<br>Schwarz | ESU 40                              | 100320                                                  | 08/28/18      | 08/28/21 |
| Coaxial Cable<br>- Chamber 3<br>cable set<br>(Primary) | Micro-Coax         | Chamber 3<br>cable set<br>(Primary) | KMKM-0244-<br>01; KMKM-<br>0670-00;<br>KFKF-0198-<br>01 | 08/09/16      | 08/09/19 |
| Bore-sight<br>Antenna<br>Positioning<br>Tower          | Sunol Sciences     | TLT2                                | N/A                                                     | N/A           | N/A      |

### \*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

Applicant: ADEMCO INC.  
 FCC ID: CFS8DL5800PIR-OD2  
 IC: 573F-5800PIR-OD2  
 Report: 857UT19TestReport\_Rev2

## State of the measurement Uncertainty

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: “Uncertainty in EMC Measurements” and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device. Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

| Test Items                                                            | Measurement Uncertainty | Notes |
|-----------------------------------------------------------------------|-------------------------|-------|
| RF Frequency Accuracy                                                 | $\pm 49.5$ Hz           | (1)   |
| RF Conducted Power                                                    | $\pm 0.93$ dB           | (1)   |
| Conducted spurious emission of transmitter valid up to 40GHz          | $\pm 1.86$ dB           |       |
| Occupied Bandwidth                                                    | $\pm 2.65$ %            |       |
| Radiated RF Power                                                     | $\pm 1.4$ dB            |       |
| Maximum frequency deviation:<br>Within 300 Hz and 6kHz of audio freq. | $\pm 1.88$ %            |       |
| Within 6kHz and 25kHz of audio Freq.                                  | $\pm 2.04$ %            |       |
| Adjacent channel power                                                | $\pm 1.47$ dB           | (1)   |
| Transient Frequency Response                                          | $\pm 1.88$ %            |       |
| Temperature                                                           | $\pm 1.0$ °C            | (1)   |
| Humidity                                                              | $\pm 5.0$ %             |       |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

## END OF TEST REPORT

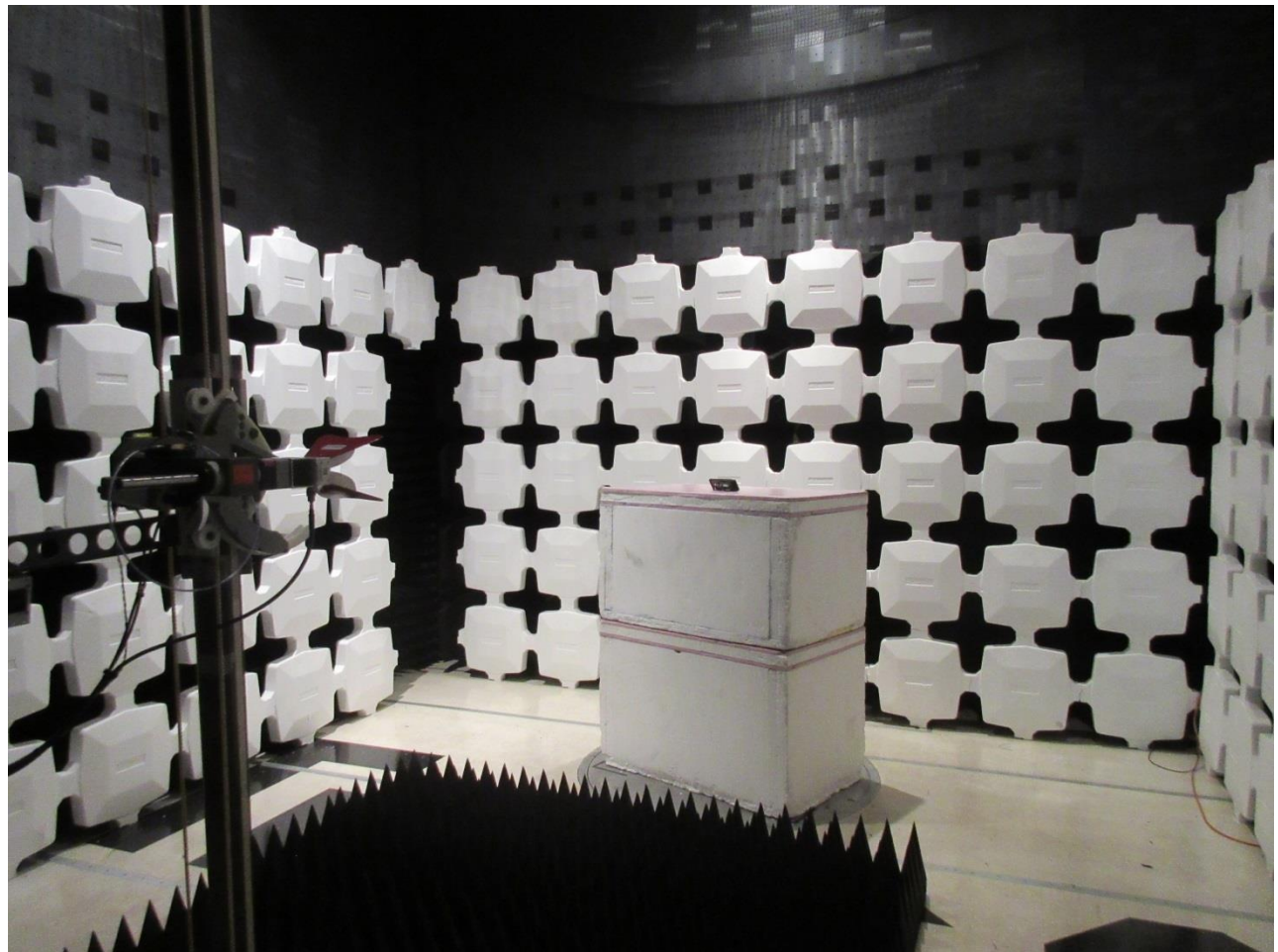
**ADEMCO INC.**

**FCC ID: CFS8DL5800PIR-OD2**

**IC: 573F-5800PIR-OD2**

**TEST SET UP PHOTOS**

**Radiated Emissions Above 1 GHz**



## Radiated Emissions Below 1 GHz



## Report Template Revision History

| Document Name                 | Description of Change              | Revision Date | Approved By |
|-------------------------------|------------------------------------|---------------|-------------|
| PT 15231a RSS210 Combo TX Rpt | Initial Issue                      | 160415        | SS Sanders  |
|                               | Added Document History to Template | 160920        | G Greene    |

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