



Engineering Solutions & Electromagnetic Compatibility Services

**FCC Part 15.231 Test Data**

**EUT: 345 MHz Micro Door Window Sensor**

**for**

**Resolution Engineering, Inc.  
1402 Heggen Street  
Hudson, WI 54016  
Contact: Jake Peterson**

**Testing Conducted By  
Rhein Tech Laboratories, Inc.  
360 Herndon Parkway, Suite 1400  
Herndon, VA 20170**

**RTL Test Engineer: Jon Wilson**

**RTL Project/Report Number: 2014073**

**April 21, 2014**

This report may not be reproduced, except in full, without the full written approval of Rhein Tech Laboratories, Inc. and Resolution Engineering. Test results relate only to the item tested.

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

## Testing Represented in Report

The data and limits presented in this report are for radiated emissions per 15.231(b)(2) which references 15.35(b), and peak limiting for restricted bands per 15.209(e), which again references 15.35(b)(2), as procured by Resolution Engineering. No average data is presented in this report. Data is also presented for spurious, non-harmonic radiated emissions per 15.209. The Equipment Under Test (EUT) was the **345 MHz Micro Door Window Sensor (RTL Bar Code 21427)**.

### 15.231 Radiated Emissions Test Data – FCC Limits/ 3m Distance

| Emission Frequency (MHz) | Test Detector | Antenna Polarity (H/V) | Analyzer Reading (dBuV) | Site Correction Factor (dB/m) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Pass/Fail |
|--------------------------|---------------|------------------------|-------------------------|-------------------------------|-------------------------|----------------|-------------|-----------|
| 345.000                  | Peak          | H                      | 76.0                    | 16.9                          | 92.9                    | 97.3           | -4.4        | Pass      |
| 689.995                  | Peak          | H                      | 64.4                    | -4.5                          | 59.9                    | 77.3           | -17.4       | Pass      |
| 1,034.993*               | Peak          | V                      | 48.3                    | -0.4                          | 47.9                    | 74.0           | -26.1       | Pass      |
| 1,379.991                | Peak          | V                      | 44.7                    | 3.4                           | 48.1                    | 74.0           | -25.9       | Pass      |
| 1,724.991                | Peak          | H                      | 41.0                    | 5.4                           | 46.4                    | 77.3           | -30.9       | Pass      |
| 2,070.027                | Peak          | H                      | 56.8                    | -11.3                         | 45.5                    | 77.3           | -31.8       | Pass      |
| 2,415.027                | Peak          | H                      | 47.7                    | -9.9                          | 37.8                    | 77.3           | -39.5       | Pass      |
| 2,760.027                | Peak          | H                      | 61.6                    | -9.2                          | 52.4                    | 74.0           | -21.6       | Pass      |
| 3,105.027                | Peak          | V                      | 53.0                    | -7.6                          | 45.4                    | 77.3           | -31.9       | Pass      |
| 3,450.027                | Peak          | V                      | 49.6                    | -7.0                          | 42.6                    | 77.3           | -34.7       | Pass      |

\*IC restricted band

*All spurious emissions in the applicable frequency range were investigated, only harmonic emissions were present as noted above*

## Test Procedure

Radiated fundamental and spurious emissions were tested at three meters. The EUT was tested in the three orthogonal planes with the receive antenna in both polarities. The emissions were maximized per ANSI C63.4:2003 8.3.1.2; that is, the measurement antenna height was varied between 1 and 4 m, and the EUT was rotated through 360° on a rotating turntable until the maximum emissions were found. Both horizontal and vertical measurement antenna polarizations were used. A resolution bandwidth of 100 kHz was used for frequencies less than 1000 MHz, and a resolution bandwidth of 1 MHz was used for frequencies greater than or equal to 1000 MHz. The video bandwidth was set to a value at least three times greater than the resolution bandwidth.

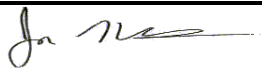
## EUT Disposition

The EUT was adapted to continuously transmit for testing purposes.

### Radiated Emissions Test Equipment

| Part                                     | Manufacturer                  | Model                     | Serial Number | RTL Bar Code | Calibration Due Date |
|------------------------------------------|-------------------------------|---------------------------|---------------|--------------|----------------------|
| Amplifier (20 MHz-2 GHz)                 | Rhein Tech Laboratories, Inc. | PR-1040                   | 900905        | 900905       | 8/20/14              |
| Spectrum Analyzer (10 Hz-26.5 GHz)       | Agilent                       | EXA N9010                 | MY51250846    | 901583       | 4/16/15              |
| Bilog Periodic Antenna (25 MHz-2000 MHz) | ARA                           | LPB-2520                  | 1037          | 900724       | 4/19/15              |
| Amplifier (1 GHz-26.5 GHz)               | Hewlett Packard               | 8449B OPT H02             | 3008A00505    | 900932       | 8/10/2014            |
| Horn Antenna (2.0-4.0 GHz)               | EMCO                          | 3161-02                   | 9804-1044     | 900772       | 4/20/15              |
| Emissions Testing Software               | Rhein Tech Laboratories, Inc. | Automated Emission Tester | Rev. 14.0.2   | N/A          | N/A                  |

### Test Personnel:

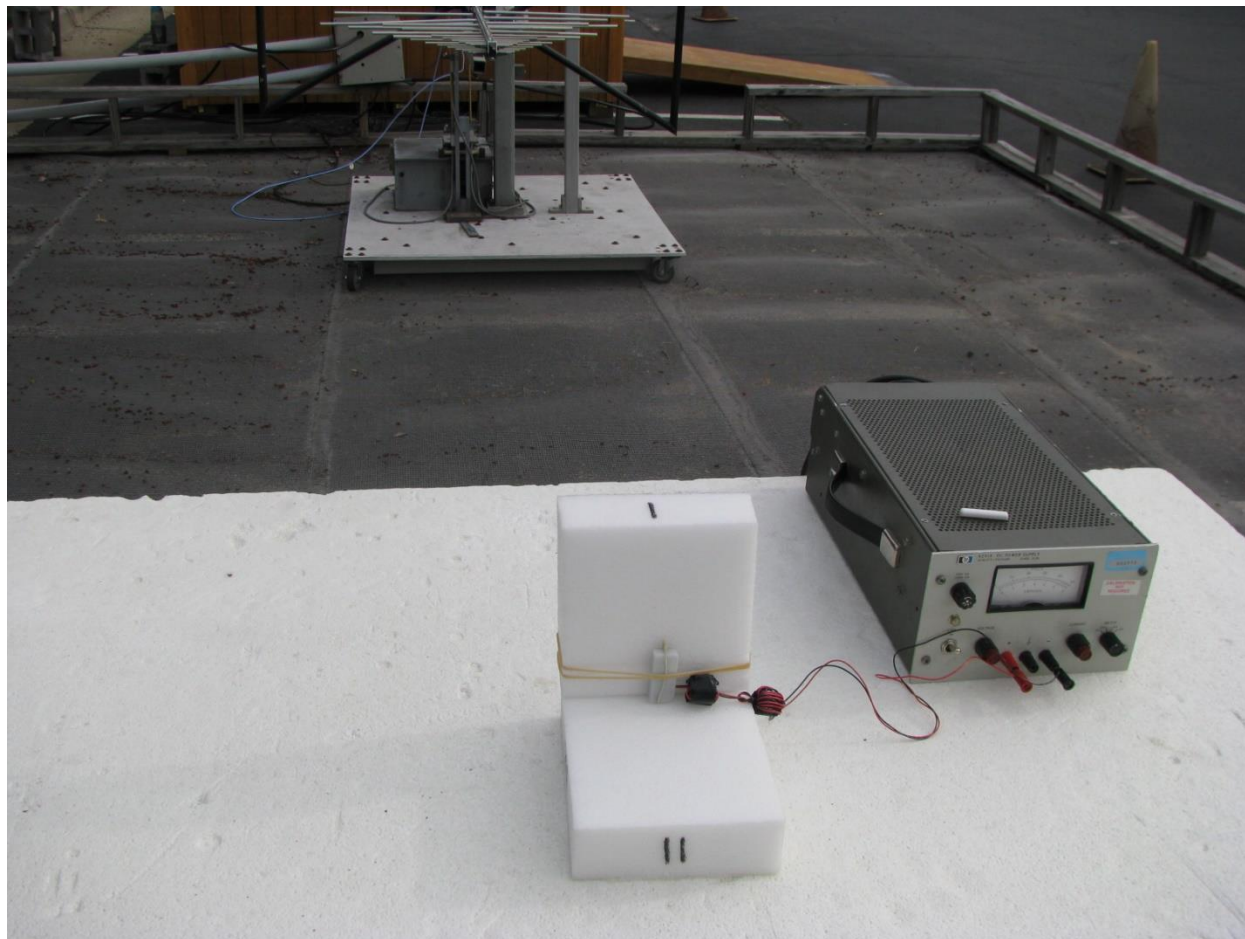
|               |                                                                                    |                |
|---------------|------------------------------------------------------------------------------------|----------------|
| Jon Wilson    |  | April 18, 2014 |
| Test Engineer | Signature                                                                          | Date of Test   |

### FCC/IC Cross Reference

|                  |                       |
|------------------|-----------------------|
| FCC 15.231(b)(2) | RSS-210 Issue 8 A1.1  |
| FCC 15.35(b)     | RSS-Gen Issue 3 7.2.3 |
| FCC 15.205       | RSS-Gen Issue 3 7.2.2 |
| FCC 15.209       | RSS-Gen Issue 3 7.2.5 |

## Test Configuration Photograph

### Radiated Emissions



**EUT Photographs**

