



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.231 Test Data

**433.92 MHz Door Window Sensor
Part # 56-0003-03 RevB00**

for

**Resolution Engineering, Inc.
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Hudson, WI 54016
Contact: Josh Gathje**

**Testing Conducted By
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RTL Project/Report Number: 2015135

July 17, 2015

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 ANAB. 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 **433.9 MHz Door Window Sensor, Part # 56-0003-03 RevB00 (RTL Bar Code 21636)**.

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.

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
433.920	Peak	V	79.3	18.2	97.5	100.8	-3.3	Pass
867.840	Peak	V	54.5	-2.4	52.1	80.8	-28.7	Pass
1301.763	Peak	H	55.5	3.3	58.8	74.0	-15.2	Pass
1735.688	Peak	H	52.2	7.0	59.2	80.8	-21.6	Pass
2169.590	Peak	H	50.2	-0.4	49.8	80.8	-31.0	Pass
2603.510	Peak	V	61.1	1.3	62.4	80.8	-18.4	Pass
3037.430	Peak	H	51.1	1.8	52.9	80.8	-27.9	Pass
3471.350	Peak	V	53.9	2.3	56.2	80.8	-24.6	Pass
3905.270	Peak	V	44.8	4.0	48.8	74.0	-25.2	Pass
4339.190	Peak	V	45.3	4.9	50.2	74.0	-23.8	Pass

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

Radiated Emissions Test Equipment

RTL Bar Code	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	4/21/16
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	4/21/16
900932	Rhein Tech Laboratories	8449B OPT H02	Amplifier (1 - 26.5 GHz)	3008A00505	9/5/15
900905	Rhein Tech Laboratories	PR-1040	Amplifier (30 - 2000 MHz)	N/A	9/5/15
901650	ETS Lindgren	3117	Double Ridge-Guide Horn Antenna	00152091	9/24/16
900791	Chase	CBL6112	Antenna (30 MHz - 2 GHz)	2099	6/11/17

Test Personnel:

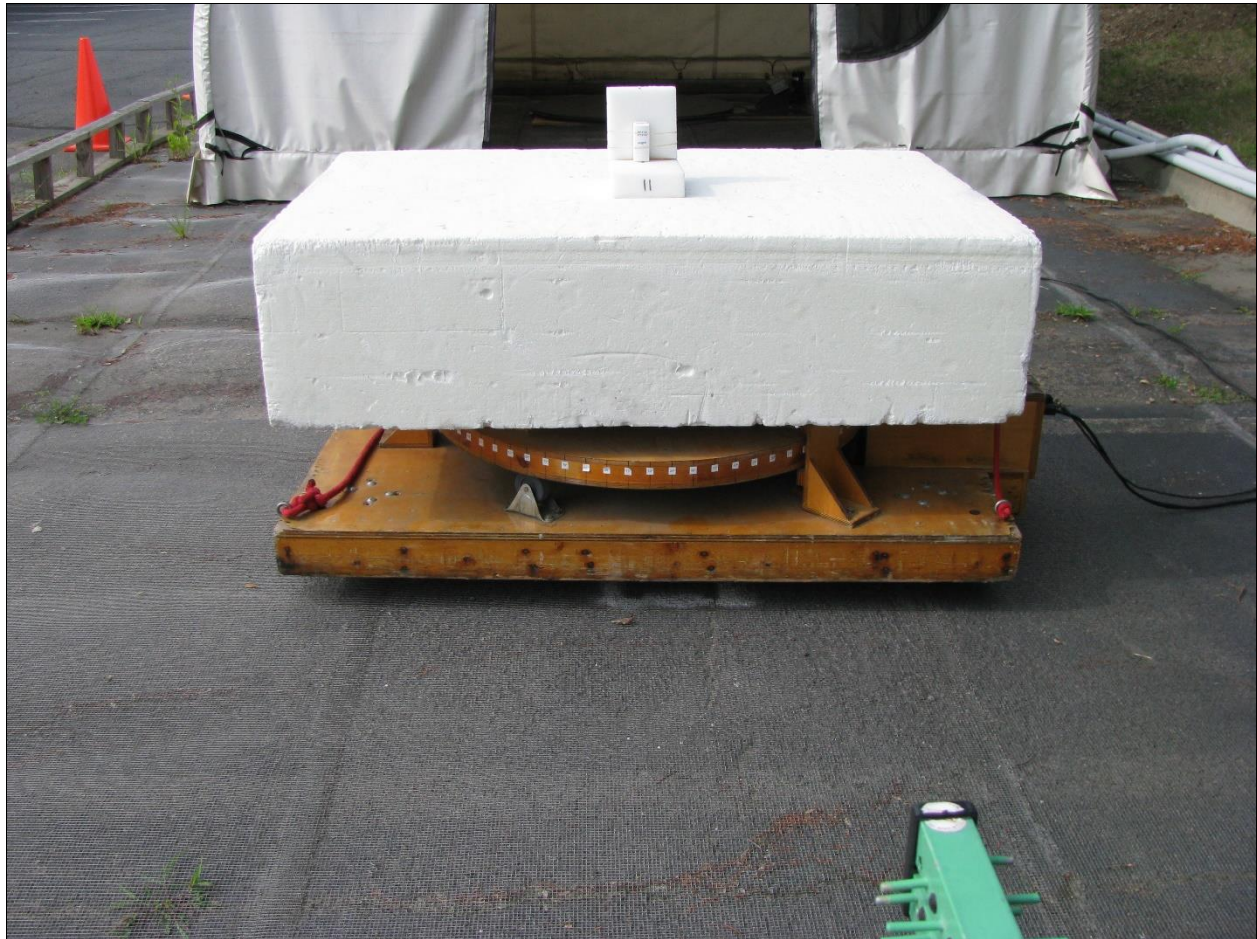
Jon Wilson		July 17, 2015
Test Engineer	Signature	Date of Test

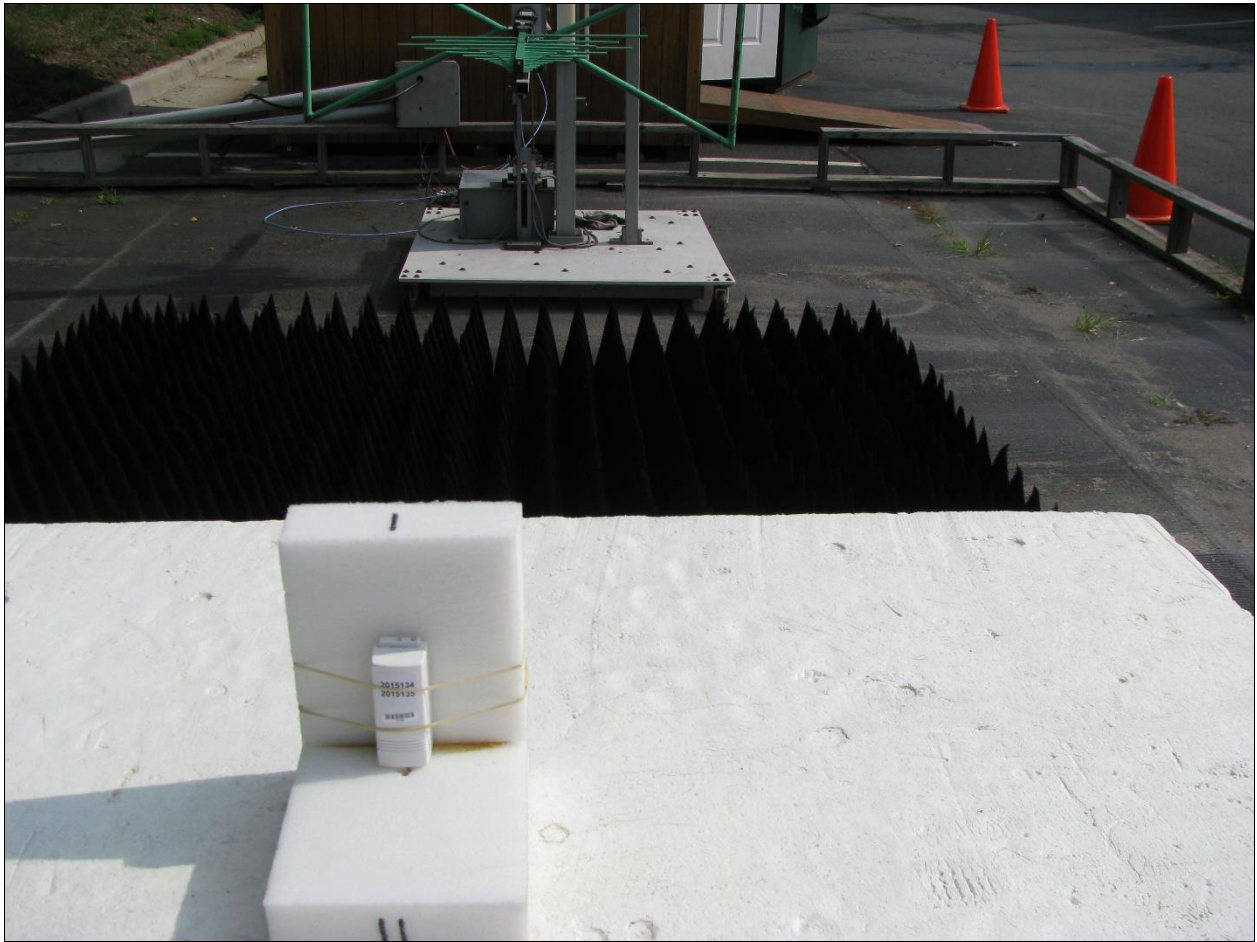
FCC/IC Cross Reference

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

Appendix A: Test Configuration Photographs

Radiated Emissions





Appendix B: EUT Photographs

