



Engineering Solutions & Electromagnetic Compatibility Services

FCC 15.231 Test Data

for

EUT: 56-0046-01 Hidden Fob 319.5 MHz

(RTL barcode: 020309)

for

**Resolution Engineering, Inc.
1402 Heggen St.
Hudson, WI 54016**

RTL Project Number 2012002

Test Engineer: Jon Wilson

June 11, 2013

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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 FCC 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 for intentional emissions is presented in this report. Data is also presented for spurious, non-harmonics radiated emissions per 15.209.

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
319.525	Peak	H	58.0	26.4	84.4	95.9	-11.5	Pass
639.030	Peak	H	79.0	-5.2	73.8	75.9	-2.1	Pass
958.530	Peak	H	60.0	-1.8	58.2	75.9	-17.7	Pass
1278.030*	Peak	H	45.7	3.0	48.7	74.0	-25.3	Pass
1597.530	Peak	V	51.7	6.7	58.4	74.0	-15.6	Pass
1917.035	Peak	V	46.9	11.7	58.6	75.9	-17.3	Pass
2236.661	Peak	H	64.1	-8.3	55.8	74.0	-18.2	Pass
2556.184	Peak	H	64.4	-9.1	55.3	75.9	-20.6	Pass
2875.707	Peak	V	64.0	-8.0	56.0	74.0	-18.0	Pass
3195.230	Peak	H	55.1	-6.9	48.2	75.9	-27.7	Pass

* IC restricted band

Unintentional and Spurious Emissions – 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
239.628	Qp	H	35.8	-15.8	20.0	46.0	-26.0	Pass
333.984	Qp	V	34.0	1.0	35.0	46.0	-11.0	Pass
399.382	Qp	V	46.2	-9.2	37.0	46.0	-9.0	Pass
559.200	Qp	V	41.6	-8.8	32.8	46.0	-13.2	Pass
718.895	Qp	V	49.0	-8.3	40.7	46.0	-5.3	Pass
798.766	Qp	V	43.3	-6.8	36.5	46.0	-9.5	Pass
1118.275	Av	V	47.8	-2.6	45.2	54.0	-8.8	Pass

Test Procedure

Radiated emissions of the harmonics 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 Type	Manufacturer	Model	Serial Number	Barcode	Cal Due Date
Amplifier (20 MHz-2 GHz)	Rhein Tech Laboratories, Inc.	PR-1040	900905	900905	8/20/2013
Bilog Periodic Antenna (25 MHz-2 GHz)	Schaffner Chase	CBL6112	2099	900791	2/2/2014
EMI Receiver RF Section (9 KHz-6.5 GHz)	Hewlett Packard	85462A	3325A00159	900913	9/20/2013
RF Filter Section (100 KHz-6.5 GHz)	Hewlett Packard	85460A	3330A00107	900914	9/20/2013
Spectrum Analyzer	Hewlett Packard	8596EM	3826A00144	901215	3/15/2014
Amplifier (1 GHz – 26.4 GHz)	Rhein Tech Laboratories, Inc.	PR-1042	1003	901364	7/14/2013
Horn Antenna, 2.0-4.0 GHz	EMCO	3161-02	9804-1044	900772	4/20/2015
Horn Antenna, 4.0-8.2 GHz	EMCO	3161-03	9508-1020	900321	4/20/2015
Emissions Testing Software	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Rev. 14.0.2	N/A	N/A

Test Personnel:

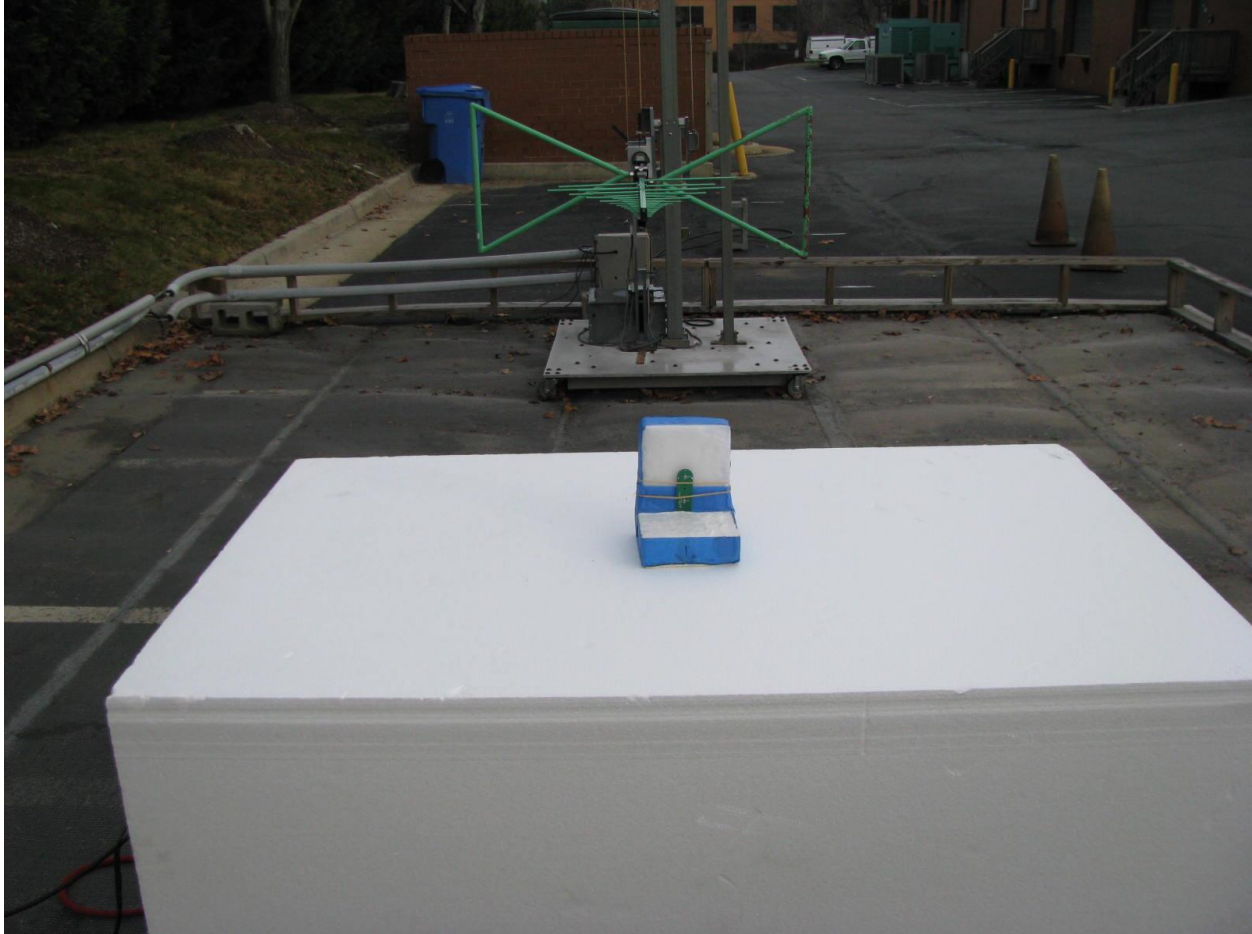
Jon Wilson		January 10-11, 2012 June 4, 2013
Test Engineer	Signature	Date of Test

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 Photographs

Radiated Emissions - Front





EUT Photograph

