



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.231 Test Data

433 MHz Keyfob

**Model: 56-0079-03 RevC03
for**

**Resolution Engineering, Inc.
1402 Heggen Street
Hudson, WI 54016
Contact: Josh Gathje**

**Testing Conducted By
Rhein Tech Laboratories, Inc.
360 Herndon Parkway, Suite 1400
Herndon, VA 20170
RTL Test Engineer: Dan Baltzell**

RTL Project/Report Number: 2016173

July 22, 2016

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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 MHz Keyfob (RTL Bar Code 21952)**.

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; 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 120 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 Spurious Harmonics Emissions Test Data – Peak

Emission Frequency (MHz)	Antenna Polarity (H/V)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
433.0	V	70.4	18.2	88.6	100.8	-12.2	Pass
866.0	V	27.3	23.2	50.5	80.8	-30.3	Pass
1299.0	H	14.3	26.4	40.7	74.0	-33.3	Pass
1732.0	V	1.6	30.5	32.1	80.8	-48.7	Pass
2165.0	H	10.7	25.1	35.8	80.8	-45.0	Pass
2598.0	H	11.4	25.9	37.3	80.8	-43.5	Pass
3031.0	V	4.2	26.5	30.7	80.8	-50.1	Pass
3464.0	H	14.6	27.4	42.0	80.8	-38.8	Pass
3897.0	H	1.8	28.1	29.9	74.0	-44.1	Pass
4330.0	V	-1.9	33.4	31.5	74.0	-42.5	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
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	9/4/16
900791	Chase	CBL6112	Antenna (30 MHz – 2 GHz)	2099	6/11/17
900772	EMCO	3161-02	Horn Antenna 2 - 4 GHz	9804-1044	4/9/18
900321	EMCO	3161-03	Horn Antenna 4.0-8.2 GHz	9508-1020	4/9/18

Test Personnel:

Dan Baltzell		July 21, 2016
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 (Less Than 1 GHz)



Radiated Emissions (Greater Than 1 GHz)

Appendix B: EUT Photographs





