



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.231 Test Data

EUT: 433 MHz Smoke Detector 56-0062-03 Rev B01

for

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

**Testing Conducted By
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RTL Test Engineer: Jon Wilson

RTL Project/Report Number: 2013173

August 27, 2013

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 **433 MHz Smoke Detector 56-0062-03 Rev B01 (RTL Bar Code 21240)**.

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
216.963	Qp	V	40.7	-20.2	20.5	46.0	-25.5	Pass
325.446	Qp	H	44.2	-13.3	30.9	46.0	-15.1	Pass
433.920*	Peak	V	65.6	29.6	95.2	100.8	-5.6	Pass
542.400	Qp	V	48.2	-5.9	42.3	46.0	-3.7	Pass
867.840	Peak	V	73.7	-6.3	67.4	80.8	-13.4	Pass
1301.763	Peak	V	60.0	-0.5	59.5	74.0	-14.5	Pass
1735.688	Peak	H	47.0	3.7	50.7	80.8	-30.1	Pass
2169.590	Peak	V	52.9	-18.7	34.2	80.8	-46.6	Pass
2603.510	Peak	V	55.1	-18.5	36.6	80.8	-44.2	Pass
3037.430	Peak	H	50.3	-18.6	31.7	80.8	-49.1	Pass
3471.350	Peak	H	54.6	-17.2	37.4	80.8	-43.4	Pass
3905.270	Peak	H	42.9	-16.8	26.1	74.0	-47.9	Pass
4339.190	Peak	H	30.8	-11.2	19.6	74.0	-54.4	Pass

* fundamental

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.

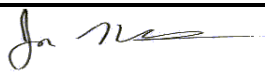
EUT Disposition

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	9/28/14
Bilog Periodic Antenna (25 MHz-2 GHz)	Schaffner Chase	CBL6112	2099	900791	2/2/14
EMI Receiver RF Section (9 kHz-6.5 GHz)	Hewlett Packard	85462A	3325A00159	900913	9/20/13
RF Filter Section (100 kHz-6.5 GHz)	Hewlett Packard	85460A	3330A00107	900914	9/20/13
Spectrum Analyzer	Hewlett Packard	8596EM	3826A00144	901215	3/15/14
Amplifier (1 GHz-26.0 GHz)	Rhein Tech Laboratories, Inc.	PR-1042	N/A	901364	9/28/13
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		August 20, 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 Photograph

Radiated Emissions



EUT Photograph

