



Engineering Solutions & Electromagnetic Compatibility Services

**FCC Part 15.231 Test Data**

**EUT: 56-0049-03 PINpad 433.92 MHz**

**for**

**Resolution Engineering, Inc.  
226 Locust Street, Suite 4  
Hudson, WI 54016  
Contact: Josh Gathje**

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

**RTL Test Engineer: Jon Wilson**

**RTL Project/Report Number: 2013094**

**April 30, 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 peak emissions limiting 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. The Equipment Under Test (EUT) was the **56-0049-03 PINpad 433.92 MHz (RTL Bar Code 20886)**.

### 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. 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
433.935	Peak	V	66.5	29.5	96.0	100.8	-4.8	Pass
867.855	Peak	V	41.4	-5.2	36.2	80.8	-44.6	Pass
1301.775	Peak	H	47.1	0.3	47.4	74.0	-26.6	Pass
1735.677	Peak	H	50.6	4.6	55.2	80.8	-25.6	Pass
2169.605	Peak	V	56.0	-18.6	37.4	80.8	-43.4	Pass
2603.525	Peak	V	54.2	-18.5	35.7	80.8	-45.1	Pass
3037.445	Peak	H	50.3	-18.6	31.7	80.8	-49.1	Pass
3471.365	Peak	H	66.0	-17.2	48.8	80.8	-32.0	Pass
3905.285	Peak	H	40.0	-16.8	23.2	74.0	-50.8	Pass
4339.205	Peak	V	47.0	-11.2	35.8	74.0	-38.2	Pass

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

**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	8/20/13
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	Rohde & Schwarz	FSU	1166.1660.50	901581	6/4/13
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
Horn Antenna (4.0 - 8.2 GHz)	EMCO	3161-03	9508-1020	900321	4/20/15
Emissions Testing Software	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Rev. 14.0.2	N/A	N/A

**Test Personnel:**

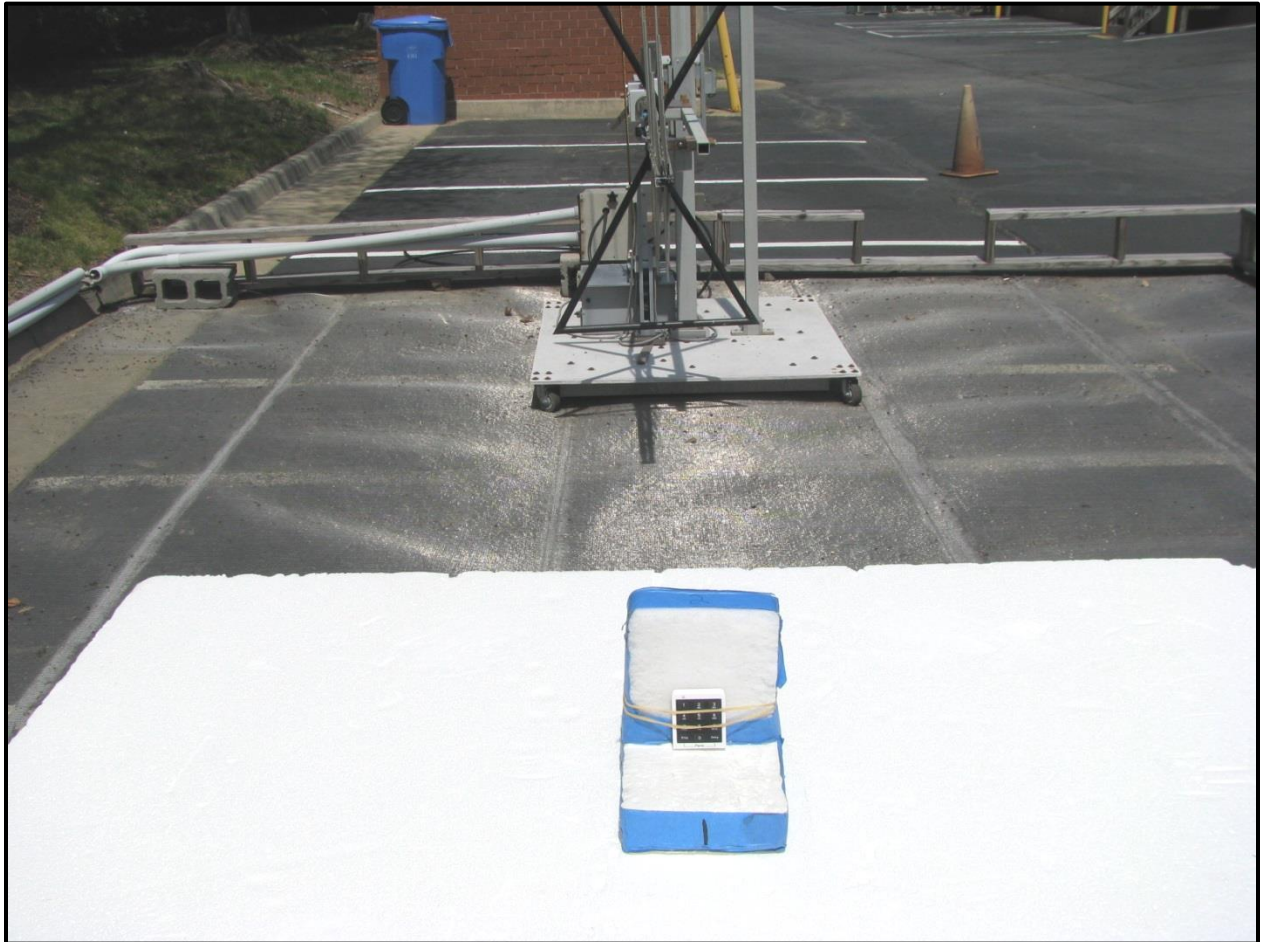
Jon Wilson		April 24-25, 2013
Test Engineer	Signature	Dates of Test

**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**



