



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.249 Test Data

EUT: 2.4 GHz Pinger

for

**Resolution Engineering, Inc.
1402 Heggen Street
Hudson, WI 54016
Contact: Jake Peterson**

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

RTL Test Engineer: Jon Wilson

RTL Project/Report Number: 2014156

September 2, 2014

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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

15.249

The data and limits presented in this report are for radiated emissions per 15.249 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 **2.4 GHz Pinger (RTL Bar Code 21478)**.

15.249 Radiated Emissions Test Data – FCC Limits/ 3m Distance

2.402 GHz

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
2402.0	Peak	H	69.8	26.0	95.8	114.0	-18.2	Pass
4804.0	Peak	V	59.4	-0.3	59.1	74.0	-14.9	Pass
7206.0	Peak	H	46.2	2.9	49.1	74.0	-24.9	Pass
9608.0	Peak	V	45.9	10.7	56.6	74.0	-17.4	Pass
12010.0	Peak	V	45.8	10.0	55.8	74.0	-18.2	Pass
14412.0	Peak	V	45.3	15.7	61.0	74.0	-13.0	Pass
16814.0	Peak	V	45.0	17.4	62.4	74.0	-11.6	Pass
19216.0	Peak	H	43.4	21.4	64.8	74.0	-9.2	Pass
21618.0	Peak	H	45.4	22.6	68.0	74.0	-6.0	Pass
24020.0	Peak	H	39.9	27.1	67.0	74.0	-7.0	Pass

2.440 GHz

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
2440.0	Peak	H	67.3	26.0	93.3	114.0	-20.7	Pass
4880.0	Peak	V	58.3	0.1	58.4	74.0	-15.6	Pass
7320.0	Peak	V	45.5	2.9	48.4	74.0	-25.6	Pass
9760.0	Peak	V	46.2	9.9	56.1	74.0	-17.9	Pass
12200.0	Peak	V	45.7	10.2	55.9	74.0	-18.1	Pass
14640.0	Peak	H	46.0	15.7	61.7	74.0	-12.3	Pass
17080.0	Peak	H	47.0	18.2	65.2	74.0	-8.8	Pass
19520.0	Peak	V	43.2	21.6	64.8	74.0	-9.2	Pass
21960.0	Peak	H	45.1	23.9	69.0	74.0	-5.0	Pass
24400.0	Peak	H	39.8	26.3	66.1	74.0	-7.9	Pass

2.480 GHz

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
2480.0	Peak	H	67.9	26.0	93.9	114.0	-20.1	Pass
4960.0	Peak	H	53.8	0.0	53.8	74.0	-20.2	Pass
7440.0	Peak	V	45.6	2.9	48.5	74.0	-25.5	Pass
9920.0	Peak	H	46.3	9.0	55.3	74.0	-18.7	Pass
12400.0	Peak	H	45.9	13.5	59.4	74.0	-14.6	Pass
14880.0	Peak	V	46.2	15.8	62.0	74.0	-12.0	Pass
17360.0	Peak	V	47.0	18.7	65.7	74.0	-8.3	Pass
19840.0	Peak	H	43.6	21.9	65.5	74.0	-8.5	Pass
22320.0	Peak	H	42.9	26.0	68.9	74.0	-5.1	Pass
24800.0	Peak	H	39.7	27.6	67.3	74.0	-6.7	Pass

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

FCC/IC Cross Reference

FCC 15.249	RSS-210 Issue 8 A2.9
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 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

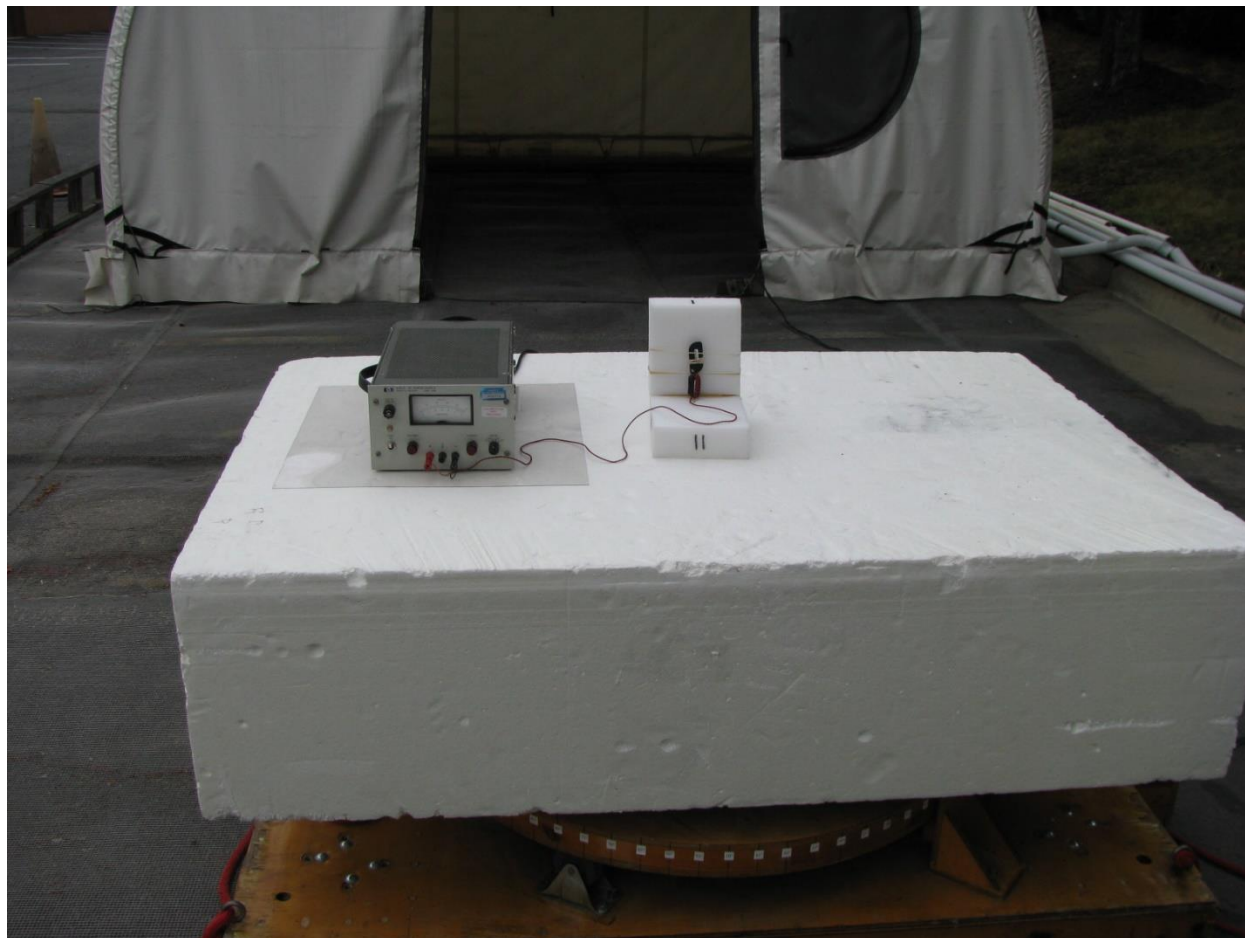
Part	Manufacturer	Model	Serial Number	RTL Bar Code	Calibration Due Date
Amplifier (20 MHz-2 GHz)	Rhein Tech Laboratories, Inc.	PR-1040	900905	900905	9/4/14
Spectrum Analyzer (10 Hz-26.5 GHz)	Agilent	EXA N9010	MY51250846	901583	4/16/15
Bilog Periodic Antenna (25 MHz-2000 MHz)	ARA	LPB-2520	1037	900724	4/19/15
Amplifier (1 GHz-26.5 GHz)	Hewlett Packard	8449B OPT H02	3008A00505	900932	8/27/2014
Horn Antenna (2.0-4.0 GHz)	EMCO	3161-02	9804-1044	900772	4/20/15
Horn Antenna (4.0-8.0 GHz)	EMCO	3161-03	9508-1020	900321	4/20/17
Horn Antenna (8.0-12.4 GHz)	EMCO	3160-07	9605-1054	900323	4/20/17
Horn Antenna (12.4-18.0 GHz)	EMCO	3160-08	9607-1044	900356	4/20/17
Horn Antenna (18.0-26.5 GHz)	EMCO	RA42-K-F-43_C	960281-003	901218	4/20/17
Emissions Testing Software	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Rev. 14.0.2	N/A	N/A

Test Personnel:

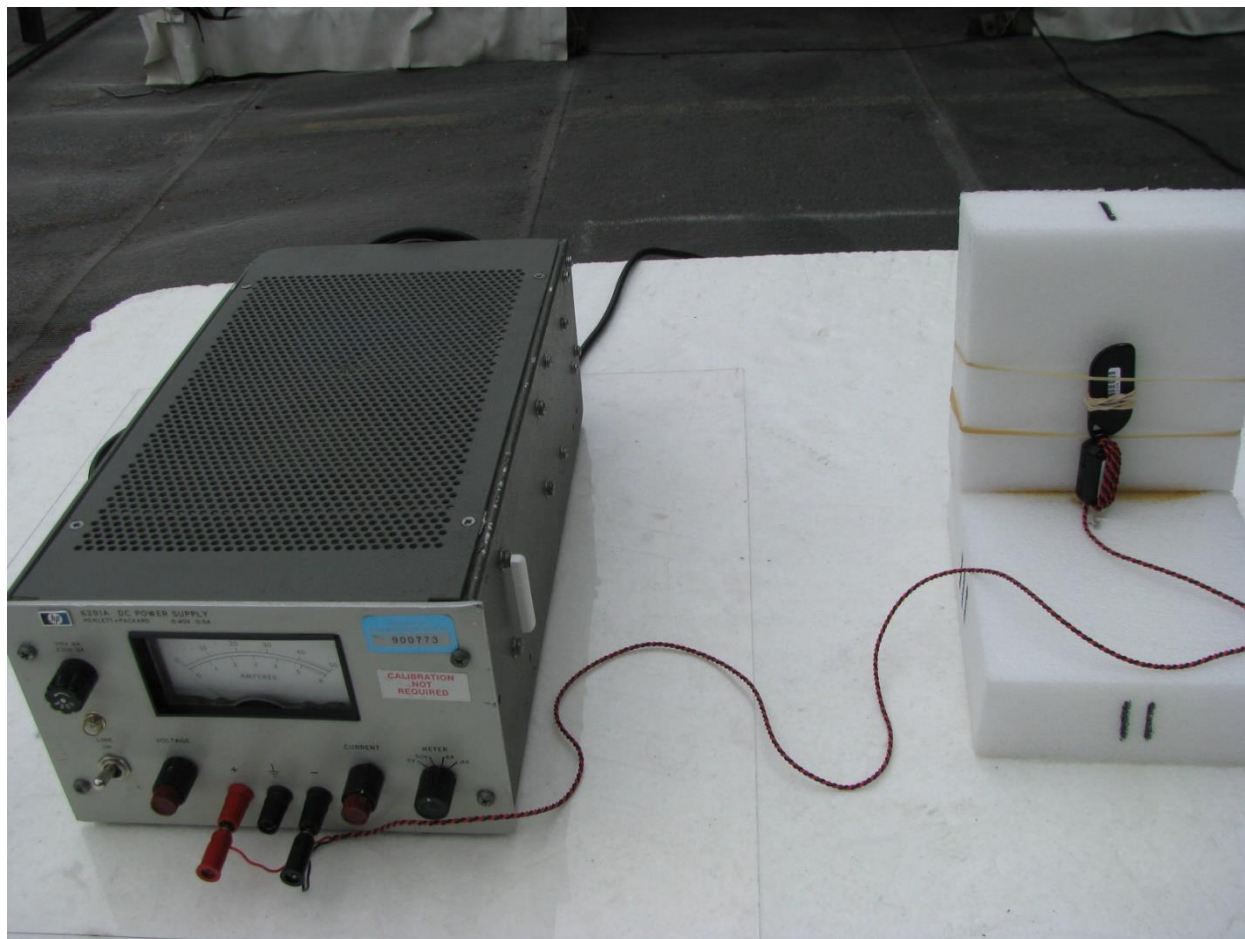
Jon Wilson		August 21, 2014
Test Engineer	Signature	Date of Test

Test Configuration Photographs

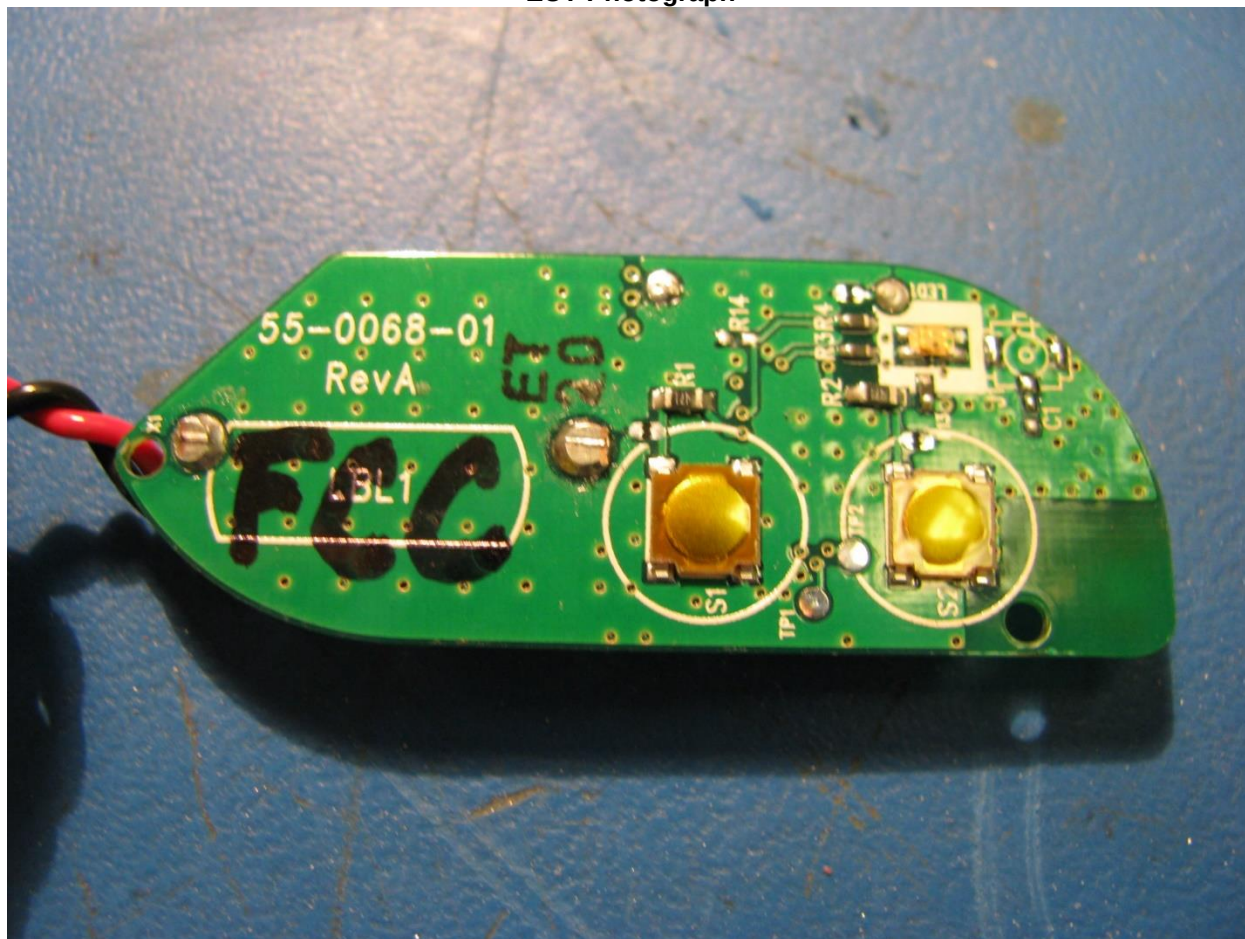
Radiated Emissions



Radiated Emissions



EUT Photograph



EUT Photograph

