



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.249 and 15.207 Test Data

**EUT: Siren Lite 2.4 GHz
Part # 56-0080-05 Rev C04**

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: Jon Wilson

RTL Project/Report Number: 2017060

March 16, 2017

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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

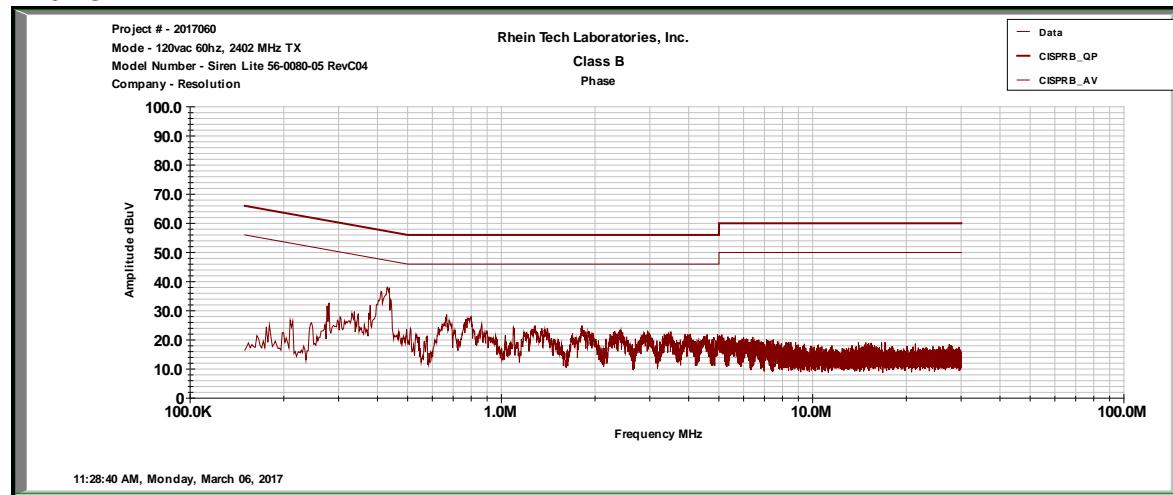
15.207 AC Power Line Conducted Emissions

Test Procedure

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was placed on a wooden table. Power was fed to the EUT through a 50-ohm/50 microhenry LISN. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 100 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 100 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB resolution bandwidth was set to 9 kHz. The video bandwidth was set to a value at least three times greater than the resolution bandwidth. Average measurements are performed in linear mode using a 9 kHz resolution bandwidth and a 1 Hz video bandwidth. The frequency spectrum was scanned from 150 kHz to 30 MHz.

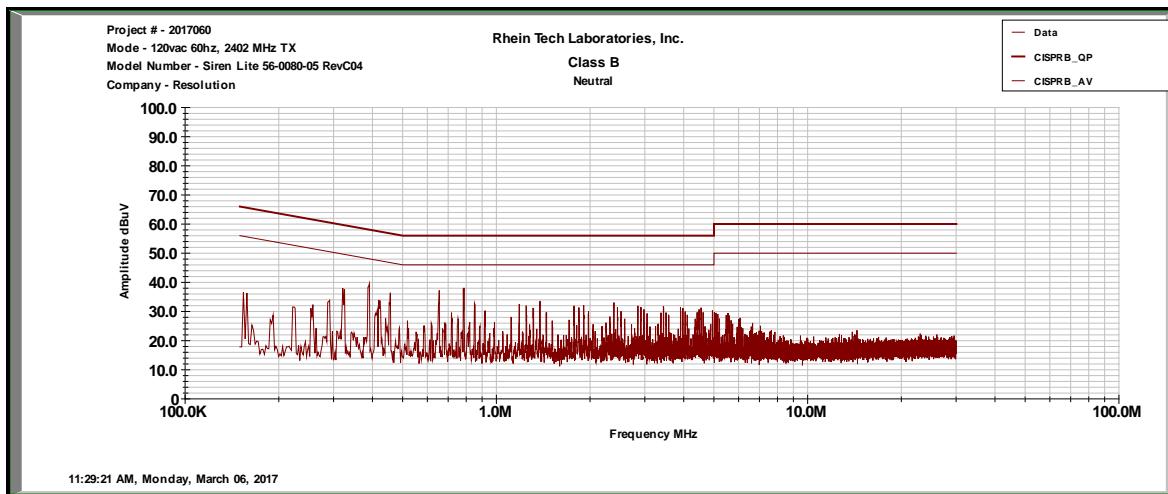
15.207 Conducted Line Emissions Test Data – FCC Limits

2.402 GHz

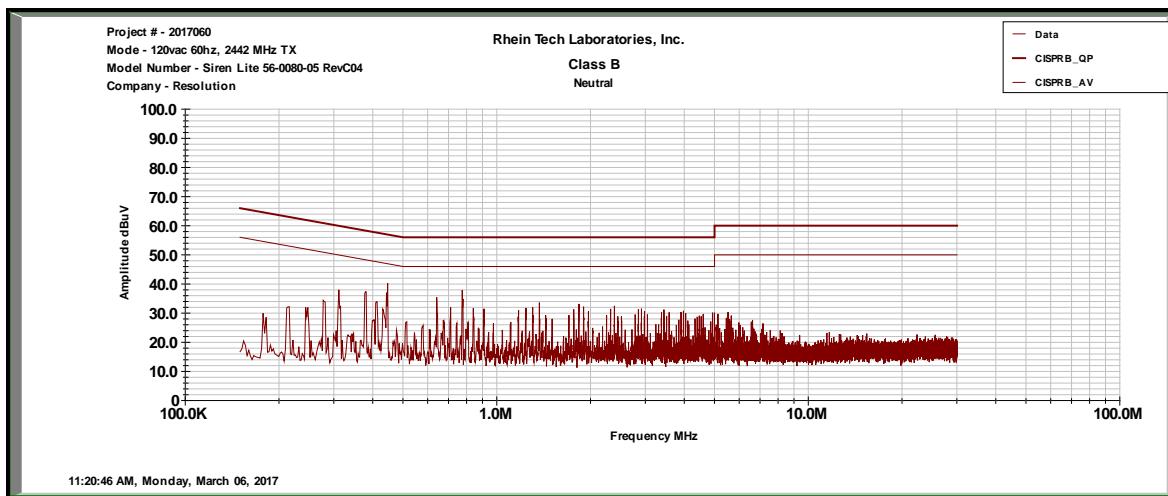
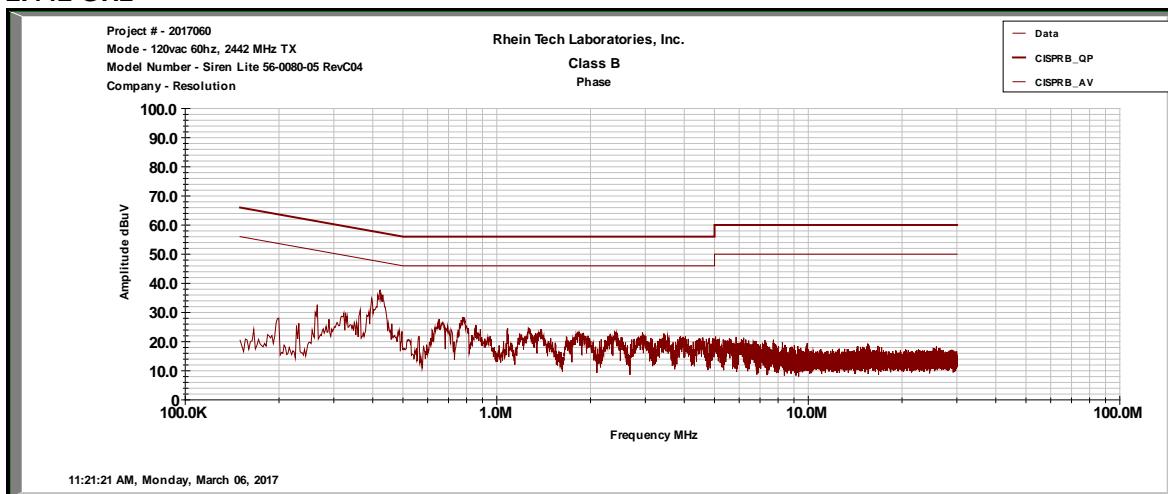


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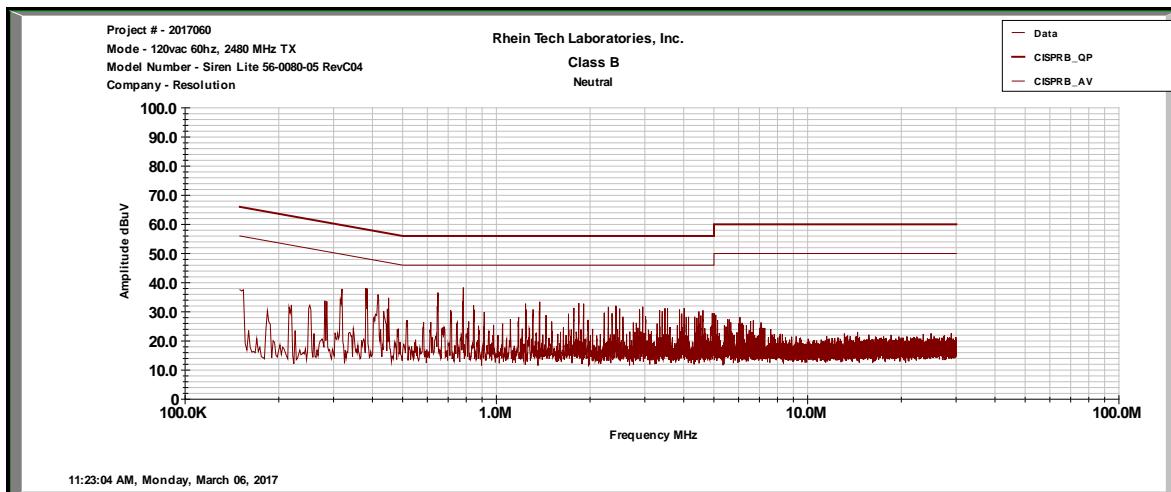
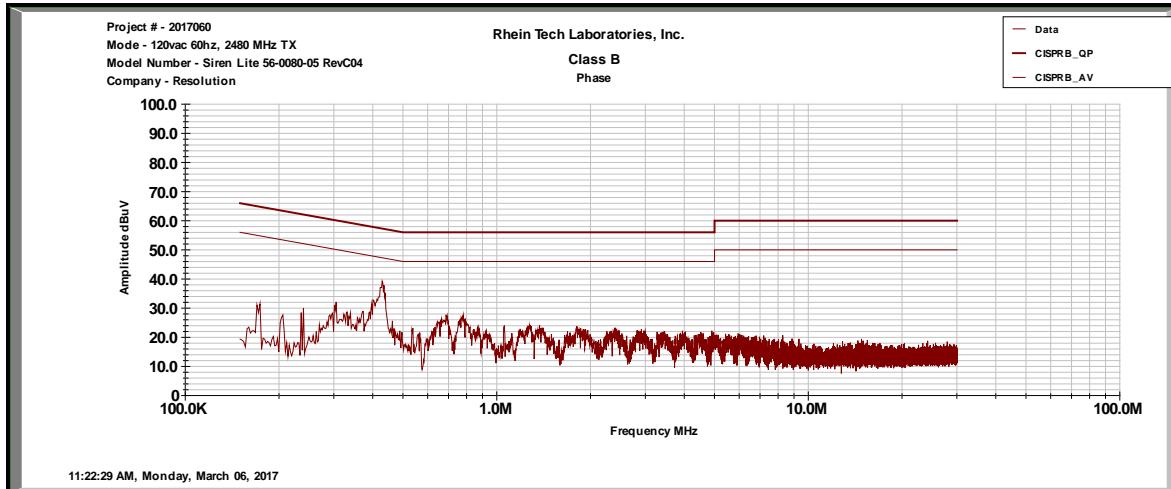
2.442 GHz



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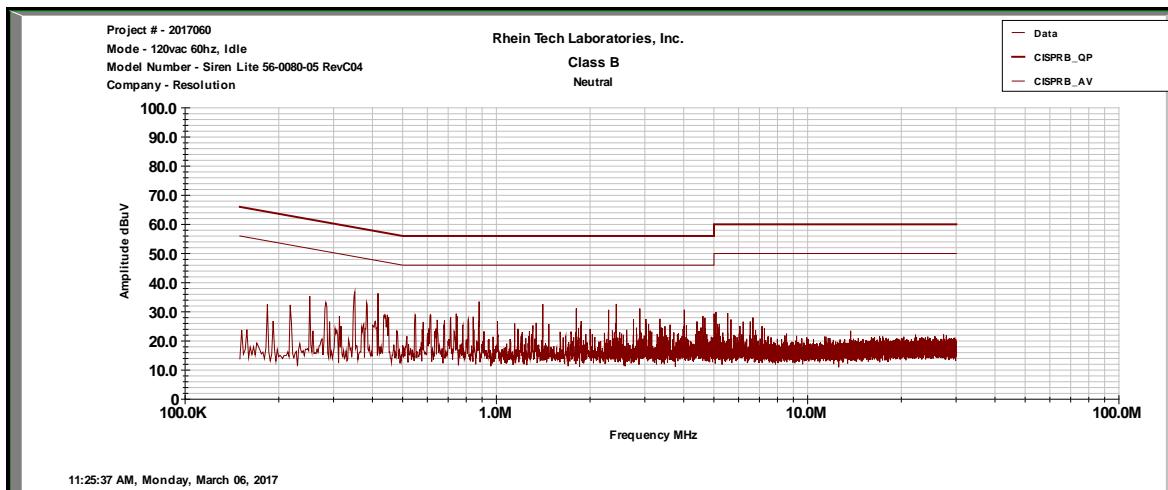
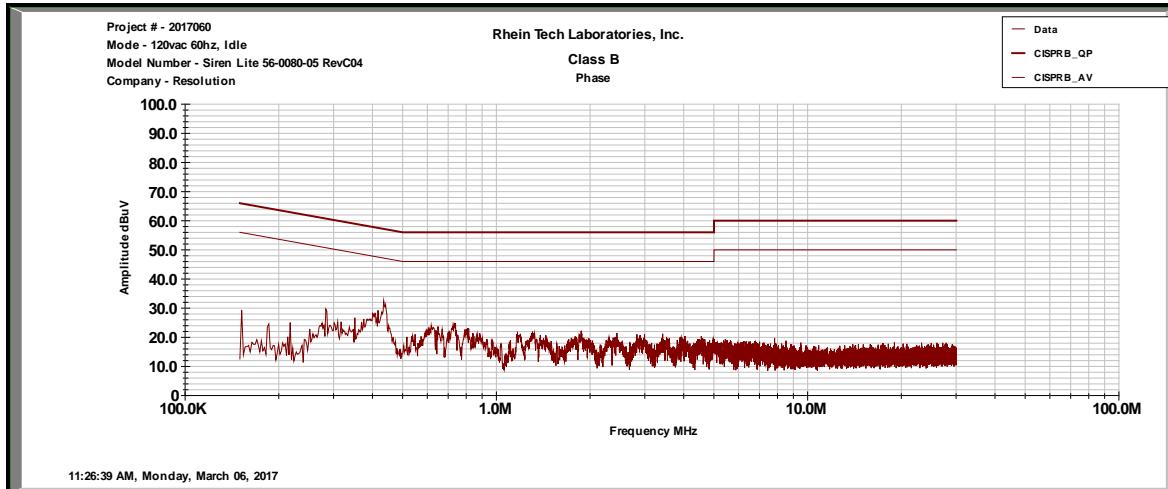
2.480 GHz



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Idle



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Conducted Line Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900339	Hewlett Packard	85650A	Quasi-Peak Adapter	2521A00743	3/08/2018
900930	Hewlett Packard	85662A	Spectrum Analyzer Display	3144A20839	4/21/2017
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	4/21/2017
901084	AFJ International	LS16	16A LISN	16010020082	3/24/2017
900728	Solar	Type 8130-7.0	Filter	N/A	4/9/2017

Test Personnel:

Jon Wilson		March 6, 2017
Test Engineer	Signature	Date of Test

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 **Siren Lite (RTL Bar Code 22376)**.

FCC/IC Cross Reference

FCC 15.249	RSS-210 Issue 8 A2.9
FCC 15.35(b)	RSS-Gen Issue 4 8.1
FCC 15.205	RSS-Gen Issue 4 8.10
FCC 15.209	RSS-Gen Issue 4 8.9
FCC 15.207	RSS-Gen Issue 4 8.8

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 C63.10:2013; 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.

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	68.6	25.1	93.7	114.0	-20.3	Pass
4804.0	Peak	H	55.0	-1.3	53.7	74.0	-20.3	Pass
7206.0	Peak	H	51.1	0.5	51.6	74.0	-22.4	Pass
9608.0	Peak	H	47.3	7.7	55.0	74.0	-19.0	Pass
12010.0	Peak	H	37.1	9.6	46.7	74.0	-27.3	Pass
14412.0	Peak	V	39.6	16.1	55.7	74.0	-18.3	Pass
16814.0	Peak	V	39.5	16.0	55.5	74.0	-18.5	Pass
19216.0	Peak	H	36.8	21.8	58.6	74.0	-15.4	Pass
21618.0	Peak	H	37.0	19.8	56.8	74.0	-17.2	Pass

24020.0	Peak	H	38.7	20.8	59.5	74.0	-14.5	Pass
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2.442 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
2442.0	Peak	H	66.5	25.2	91.7	114.0	-22.3	Pass
4884.0	Peak	H	55.4	-1.4	54.0	74.0	-20.0	Pass
7326.0	Peak	V	50.1	0.8	50.9	74.0	-23.1	Pass
9768.0	Peak	V	46.9	7.7	54.6	74.0	-19.4	Pass
12210.0	Peak	V	36.9	9.6	46.5	74.0	-27.5	Pass
14652.0	Peak	H	33.7	16.2	49.9	74.0	-24.1	Pass
17094.0	Peak	H	33.3	16.7	50.0	74.0	-24.0	Pass
19536.0	Peak	H	36.6	20.1	56.7	74.0	-17.3	Pass
21978.0	Peak	H	35.9	20.7	56.6	74.0	-17.4	Pass
24420.0	Peak	V	38.8	24.8	63.6	74.0	-10.4	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	63.3	25.3	88.6	114.0	-25.4	Pass
4960.0	Peak	V	54.9	-1.4	53.5	74.0	-20.5	Pass
7440.0	Peak	V	49.5	1.0	50.5	74.0	-23.5	Pass
9920.0	Peak	H	46.6	7.6	54.2	74.0	-19.8	Pass
12400.0	Peak	H	36.6	14.0	50.6	74.0	-23.4	Pass
14880.0	Peak	H	33.4	14.2	47.6	74.0	-26.4	Pass
17360.0	Peak	H	33.2	16.9	50.1	74.0	-23.9	Pass
19840.0	Peak	V	36.8	22.2	59.0	74.0	-15.0	Pass
22320.0	Peak	V	36.2	23.1	59.3	74.0	-14.7	Pass
24800.0	Peak	H	39.0	22.3	61.3	74.0	-12.7	Pass

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

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Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901583	Agilent	EXA N9010A	Spectrum Analyzer	MY51250846	4/21/17
900932	Rhein Tech Laboratories	8449B OPT H02	Amplifier (1 – 26.5 GHz)	3008A00505	9/11/17
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
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	4/9/18
900356	EMCO	3160-08	Horn Antennas (12.4 – 18 GHz)	9607-1044	4/9/18
901218	EMCO	3160-09	Horn Antenna (18 - 26 GHz)	960281-003	4/14/18

Test Personnel:

Jon Wilson		March 14, 2017
Test Engineer	Signature	Date of Test

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Test Configuration Photographs

Conducted Emissions



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Radiated Emissions



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