



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.207 & 15.249 Test Data

for

EUT: Zwave Module in Simon 908.42 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 Number 2012331

March 1, 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

15.207

Mains conducted.

15.249

The data and limits (other than the fundamental limit, which is a QP limit) presented in this report are for peak emissions limiting per 15.249(e) which references 15.35(b), as procured by Resolution Engineering. No average data is presented in this report. The Equipment Under Test (EUT) was the Zwave Module in Simon 908.42 MHz (RTL Bar Codes host: 20845, power supply: 20846, host: 20863, module: 20864, module: 20865).

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

Mode: EUT Antenna - Horizontal

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
908.4	Peak	V	52.0	36.0	88.0	94.0	-6.0	Pass
1,816.8	Peak	V	37.1	4.3	41.4	74.0	-32.6	Pass
2,725.3	Peak	V	47.8	-18.8	29.0	74.0	-45.0	Pass
3,633.7	Peak	H	37.0	-16.8	20.2	74.0	-53.8	Pass
4,542.1	Peak	V	34.1	-11.6	22.5	74.0	-51.5	Pass
5,450.5	Peak	H	32.7	-9.2	23.5	74.0	-50.5	Pass
6,358.9	Peak	H	33.7	-9.5	24.2	74.0	-49.8	Pass
7,267.4	Peak	V	38.0	-8.6	29.4	74.0	-44.6	Pass
8,175.8	Peak	H	41.6	0.7	42.3	74.0	-31.7	Pass
9,084.2	Peak	H	40.1	-1.1	39.0	74.0	-35.0	Pass

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

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.

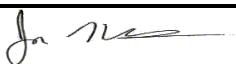
EUT Disposition

The EUT was adapted to continuously transmit for testing purposes.

Radiated Emissions Test Equipment

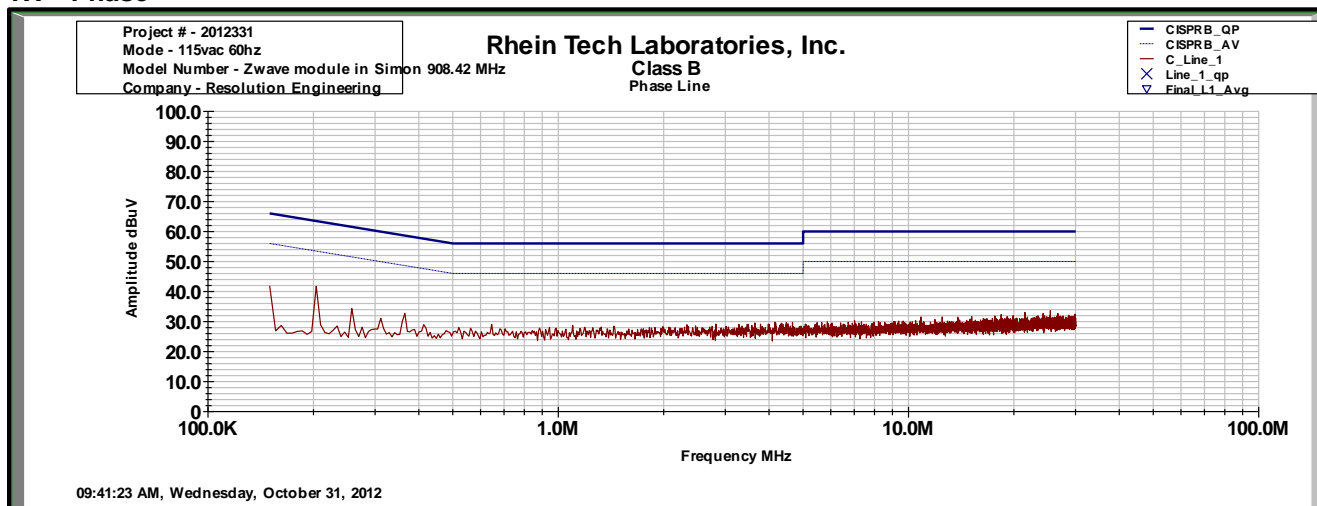
Part	Manufacturer	Model	Serial Number	RTL Bar Code	Calibration Due Date
Amplifier (20 MHz-2 GHz)	Rhein Tech Laboratories, Inc.	PR-1040	900905	900905	8/20/13
Bilog Periodic Antenna (25 MHz-2 GHz)	Schaffner Chase	CBL6112	2099	900791	2/02/14
EMI Receiver RF Section (9 kHz-6.5 GHz)	Hewlett Packard	85462A	3325A00159	900913	9/20/13
RF Filter Section (100 kHz-6.5 GHz)	Hewlett Packard	85460A	3330A00107	900914	9/20/13
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
Horn Antenna (8.2-12.4 GHz)	EMCO	3160-07	9605-1054	900323	4/20/15
Emissions Testing Software	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Rev. 14.0.2	N/A	N/A

Test Personnel:

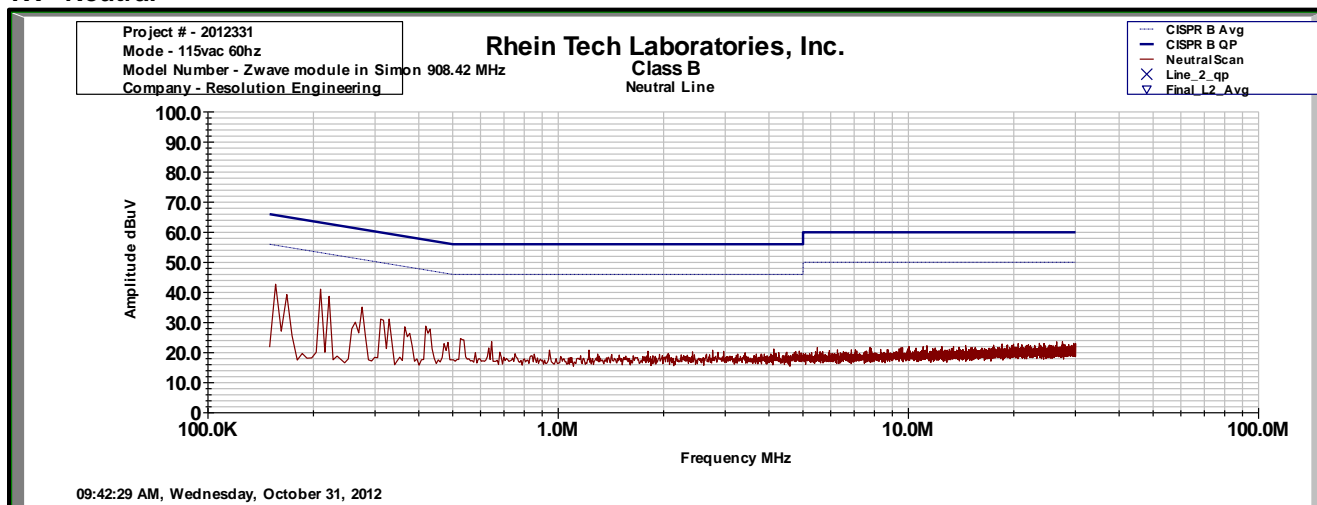
Jon Wilson		November 13, 2012 March 1, 2013
Test Engineer	Signature	Date of Test

15.207 Conducted Line Emissions Test Data – FCC Limits

TX – Phase



TX - Neutral



Result: Pass

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.


EUT Disposition

The EUT was adapted to continuously transmit for testing purposes.

Conducted Line Emissions Test Equipment

Part	Manufacturer	Model	Serial Number	RTL Bar Code	Calibration Due Date
Spectrum Analyzer (100 Hz-1.5GHz)	Hewlett Packard	8567A	2602A00160	900968	11/17/12
Spectrum Analyzer Display Section	Hewlett Packard	85662A	2542A11239	900970	11/17/12
Quasi-Peak Adapter	Hewlett Packard	85650A	2521A00743	900339	11/17/12
Filter	Solar	8130	947306	900728	3/1/13
16A LISN	AFJ International	LS16/110VAC	16010020080	901083	12/1/12
Test Software	Quantum Change	Tile!	4.0.A.8	N/A	N/A

Test Personnel:

Jon Wilson		October 31, 2012
Test Engineer	Signature	Date Of Test

Test Configuration Photographs

Radiated Emissions



EUT Photographs



Rhein Tech Laboratories, Inc.
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Client: Resolution Engineering
EUT: Zwave Module in Simon 908.42 MHz
Standards: FCC Parts 2, 15
Report #: 2012331

