



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.249 Test Data

EUT: 908.42 MHz Panel Zwave Module 56-0064-00 RevB00

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: Dan Baltzell

RTL Project/Report Number: 2014215

December 12, 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.

15.207

Unintentional digital emissions, mains conducted.

The Equipment Under Test (EUT) was the **908.42 Panel Zwave Module 56-0064-00 RevB00 (RTL Bar Code 21545) with AC Adapter (RTL Bar Code 21548)**.

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

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
908.420	Peak	65.9	23.2	89.1	94.0	-4.9
1816.840	Peak	20.1	30.1	50.2	74.0	-23.8
2725.260	Peak	65.5	-9.1	56.4	74.0	-17.6
3633.680	Peak	55.1	-5.5	49.6	74.0	-24.4
4542.100	Peak	57.6	-1.4	56.2	74.0	-17.8
5450.520	Peak	52.5	-0.8	51.7	74.0	-22.3
6358.940	Peak	53.8	0.0	53.8	74.0	-20.2
7267.360	Peak	51.9	0.9	52.8	74.0	-21.2
8175.780	Peak	57.7	5.9	63.6	74.0	-10.4
9084.200	Peak	53.3	6.4	59.7	74.0	-14.3

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

15.209 Radiated Emissions Unintentional Test Data – FCC Limits/ 3m Distance

Temperature: 38°F					Humidity: 40%				
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
69.596	Qp	V	0	1.0	48.5	-25.1	23.4	40.0	-16.6
106.957	Qp	V	0	1.0	53.4	-20.5	32.9	43.5	-10.6
115.081	Qp	V	0	1.0	42.3	-20.1	22.2	43.5	-21.3
182.610	Qp	H	0	1.0	30.3	-21.9	8.4	43.5	-35.1
906.529	Qp	H	0	1.5	36.0	-5.8	30.2	46.0	-15.8
910.329	Qp	H	0	1.5	32.8	-5.8	27.0	46.0	-19.0
913.690	Qp	H	0	1.2	30.2	-5.9	24.3	46.0	-21.7
915.590	Qp	H	0	1.0	30.6	-5.9	24.7	46.0	-21.3

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.

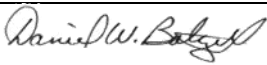
EUT Disposition

The EUT was adapted to continuously transmit for testing purposes.

Radiated Emissions Test Equipment

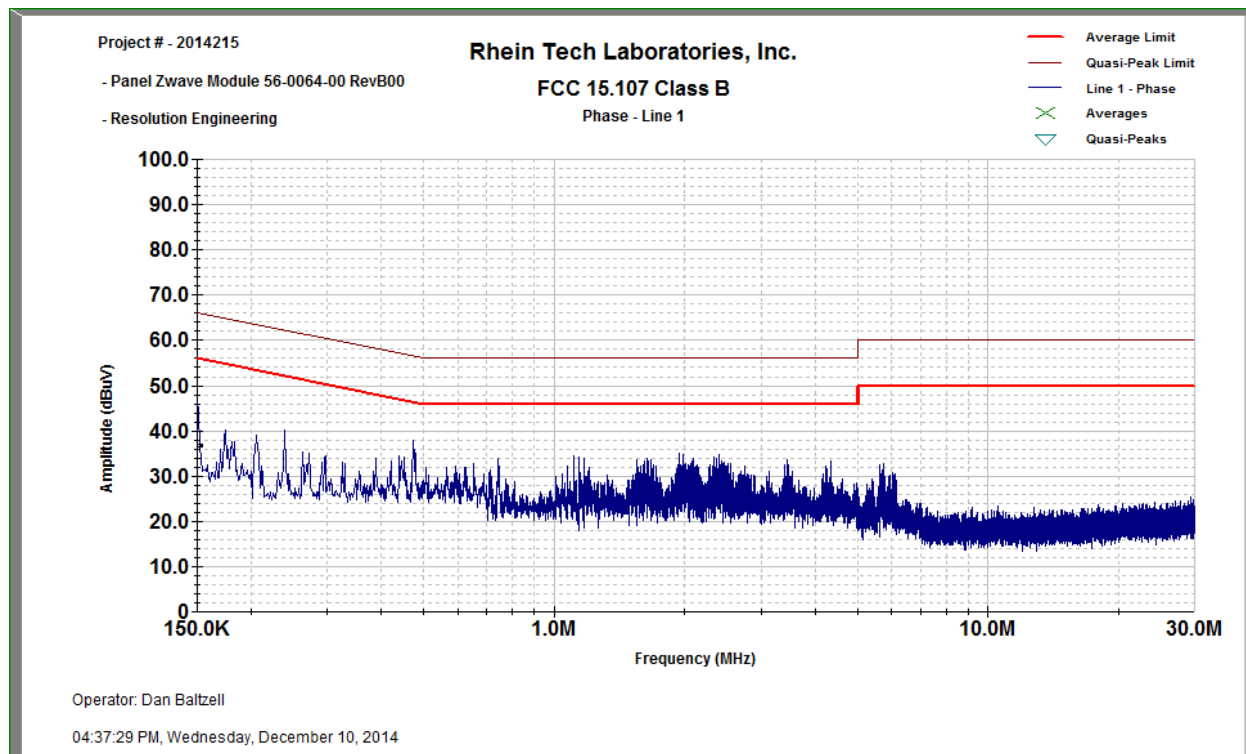
RTL Bar Code	Manufacturer	Model	Part	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	11/13/15
900791	Chase	CBL6111B	Bilog antenna (30 MHz – 2000 MHz)	N/A	6/11/17
900932	Hewlett Packard	8449B OPT H02	Preamplifier 1-26.5 GHz	3008A00505	9/5/15
900772	EMCO	3161-02	Horn Antenna (2.0-4.0 GHz)	9804-1044	4/20/15
900321	EMCO	3161-03	Horn Antenna (4.0-8.0 GHz)	9508-1020	4/20/17
900323	EMCO	3160-07	Horn Antenna (8.0-12.4 GHz)	9605-1054	4/20/17
900356	EMCO	3160-08	Horn Antenna (12.4-18.0 GHz)	9607-1044	4/20/17
901218	EMCO	RA42-K-F-43_C	Horn Antenna (18.0-26.5 GHz)	960281-003	4/20/17
N/A	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Emissions Testing Software	Rev. 14.0.2	N/A
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	9/3/15
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	9/3/15
900905	Rhein Tech Laboratories, Inc.	PR-1040	Amplifier (20 MHz-2 GHz)	900905	9/5/15

Test Personnel:

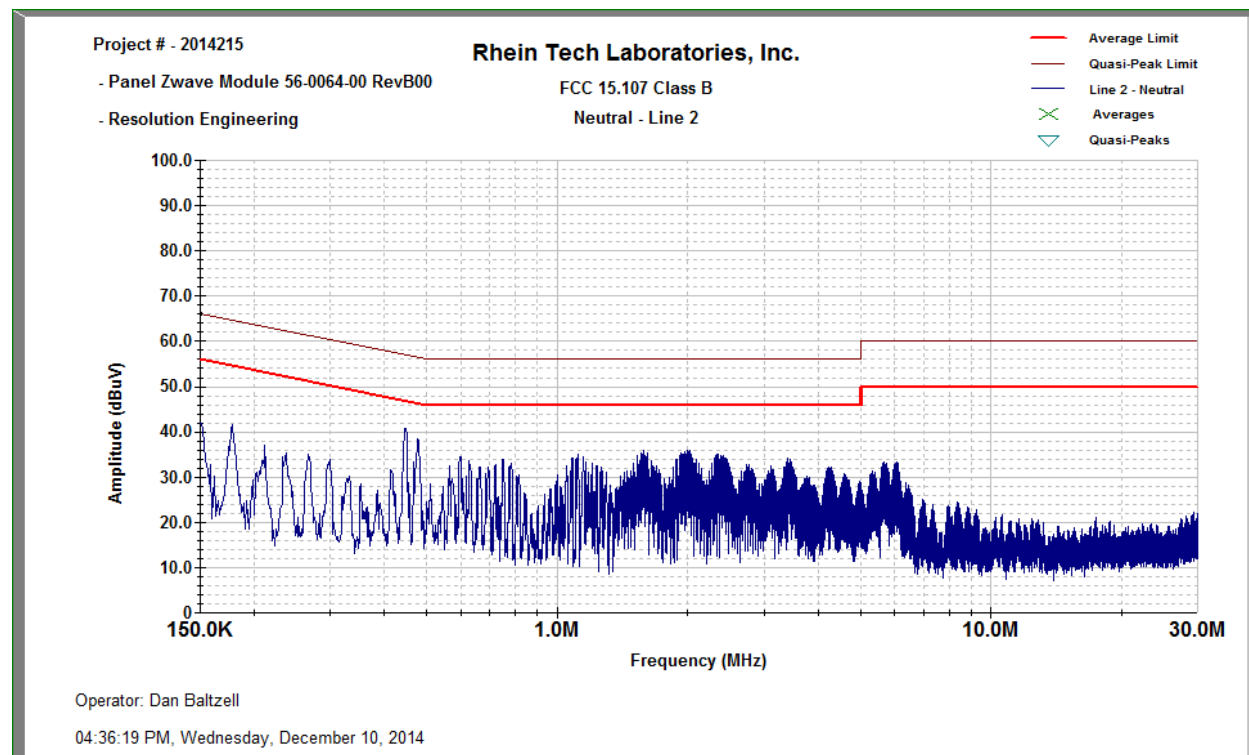
Dan Baltzell		December 10-11, 2014
Test Engineer	Signature	Date Of Test

15.207 Conducted Line Emissions Test Data – FCC Limits

Phase



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

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	11/13/15
901083	AFJ International	LS16	16A LISN	16010020080	8/27/15

Test Personnel:

Dan Baltzell		December 11, 2014
Test Engineer	Signature	Date Of Test

Test Configuration Photographs

Radiated Emissions





Conducted Emissions



