

**Advanced
Compliance Laboratory**

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

SWF ROLLER SHADE RADIO ZWAVE
MODEL: RSZ1
FCC ID: DWNRSZ IC:12049A-RSZ

April 18, 2016

This report concerns (check one): Original grant ☒ Class II change ☐
Equipment type: Low Power Intentional Radiator

Test Specifications:
☐ FCC Part 15C Sec. 15.249
☐ Industry Canada RSS-210 (Issue 8) & RSS-Gen (Issue 3)

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes ☐ no ☒
If yes, defer until: _____ (date)
Company agrees to notify the Commission by _____ (date)
of the intended date of announcement of the product so that the grant can be
issued on that date.

Report prepared for:	SOMFY SYSTEMS INC.
Report prepared by:	Advanced Compliance Lab
Report number:	0048-160405-03



Lab Code: 200101

The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

1.1 Verification of Compliance

EUT: SWF ROLLER SHADE RADIO ZWAVE

Model: RSZ1

Applicant: SOMFY SYSTEMS INC.

Test Type: FCC Part 15.249 &
IC RSS-210 (Issue 8) A2.9 & RSS-Gen (Issue 4)

Result: PASS

Tested by: ADVANCED COMPLIANCE LABORATORY

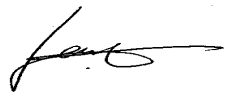
Test Date: April 18, 2016

Report Number: 0048-160405-03

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	± 2.36	± 2.99	± 1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date April 18, 2016

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC/IC ID	CABLE
Product	SWF ROLLER SHADE RADIO ZWAVE, Model: RSZ1	DWNRSZ (1) 12049A-RSZ	
Housing	PLASTICS		
Power Supply	AC/DC Adaptor, 12Vdc		
Operation Freq.	908.42/916.0MHz		
Receiver	RSZ1(Rx)	Verification	

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2014 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey, USA. This site is accepted by FCC to perform measurements under Part 15 or 18 (Registration # 90601) and also designated by IC as “site IC 3130”. This site The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Cal Due dd/mm/y
Hewlett-Packard	HP8546A	3448A00290	EMI Receiver	25/09/16
Agilent	E4440A	US40420700	3Hz-26.5GHz Spectrum Analyzer	17/06/16
Electro-Meterics	ALR-25M/30	289	10KHz-30MHz Active Loop Antenna	28/05/16
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/11/17
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	13/11/17
EMCO	3115	49225	Double Ridge Guide Horn Antenna	28/11/17
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	18/03/17
COM-POWER	L1215A	191994	Line Impedance Stabilization Networks	24/03/18

All Test Equipment Used are Calibrated Traceable to NIST Standards. Calibration interval: 2 year.

1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. & Canada Government.

2. PRODUCT LABELING

Somfy SWF Roller Shade Radio ZWave
Model No.: RSZ1
FCC ID: DWNRSZ IC: 12049A-RSZ

This device complies with part 15 of the FCC Rules and IC RSS-210 & RSS-Gen Rules.. Operating is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Figure 2.1 FCC/IC ID Label
(Only ID show on the EUT)

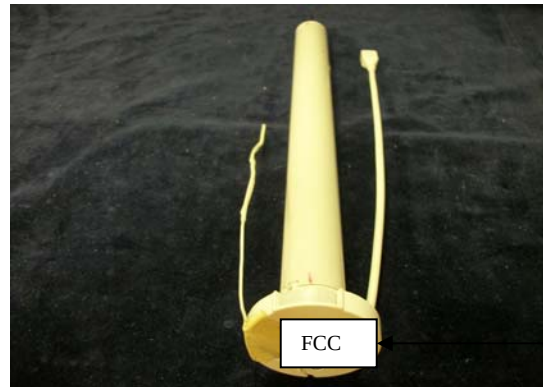


Figure 2.2 Location of the Label

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). Customized wire antenna was used.

Testing was performed as EUT was continuously operated at the following frequency channels:
Low=908.42MHz, High=916MHz

Fresh external battery was used for extended operating time. However, EUT was checked with the internal battery and it was confirmed that the readings obtained with the fresh external battery remain representative of the device as marketed.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.1 illustrate this system, which is tested standing along.







Figure 3.1 Radiated Test Setup

4. SYSTEM SCHEMATICS

See Attachment.

Figure 4.1 System Schematics

5. RADIATED EMISSION DATA

5.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB μ V/m

RA: Amplitude of EMI Receiver before correction in dB μ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

5.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 100KHz IF bandwidth / 100KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. The frequency range from 9KHz up to 10th harmonics were investigated.

5.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel:



Typed/Printed Name: Edward Lee

Date: April 18, 2016

Radiated Test Data (CH-908.42/916MHz)

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak /QP Reading at 3m (2) (dBuV/m)	FCC/IC 3m Peak Limit (3) (dBuV/m)	Difference To Peak Limit (dBuV/m)	Average Reading with Correction (>1GHz) (dBuV/m)	FCC/IC 3m QPI/Average Limit (1) (dBuV/m)	Difference To AVG Limit (dBuV/m)
908.4	V	1.1	090	81.5				94	-12.5
1816.8	V	1.1	090	43.4	74	-30.6	38.1	54	-15.9
2725.2	V	1.1	000	54.6	74	-19.4	52.8	54	-1.2
908.4	H	1.1	090	92.2				94	-1.8
1816.9	H	1.0	045	44.5	74	-29.5	39.6	54	-14.4
2725.5	H	1.0	180	49.2	74	-24.8	45.9	54	-8.1
916	V	1.1	045	90.4				94	-3.6
1832	V	1.1	090	46.4	74	-27.6	43.4	54	-10.6
2748	V	1.1	000	54.1	74	-19.9	52.5	54	-1.5
916	H	1.0	090	92.9				94	-1.1
1832	H	1.1	090	46.9	74	-27.1	43.6	54	-10.4
2748	H	1.1	000	55.2	74	-18.8	53.0	54	-1.0

(1) The limit for emissions within the 902-928MHz band is 50mV(94dB) per FCC Sec. 15.249 & IC RSS-210 Annex 2.9. The limit for its harmonics is 500uV (54dB). Other spurious emissions shall be lower than either its fundamental by 50dB or the limit defined in Sec. 15.209, whichever is higher.

(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/ calculated quasi-peak or average reading.

(3) For above 1GHz range, peak reading shall meet the limit: average Limit+20dB.

Other Spurious outside of the band 902-928MHz

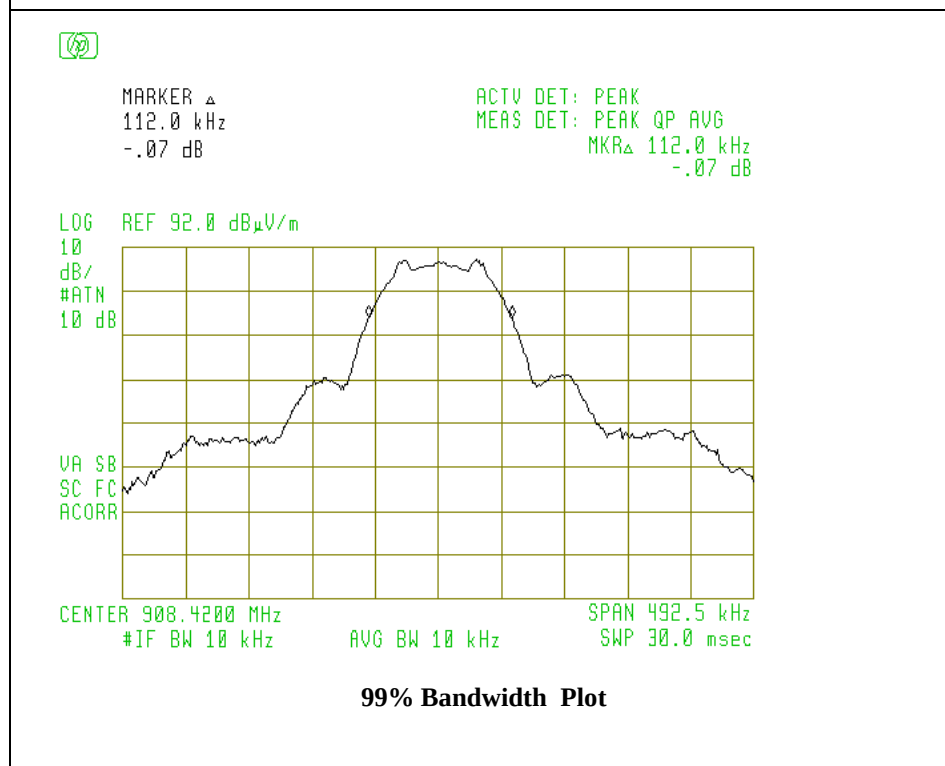
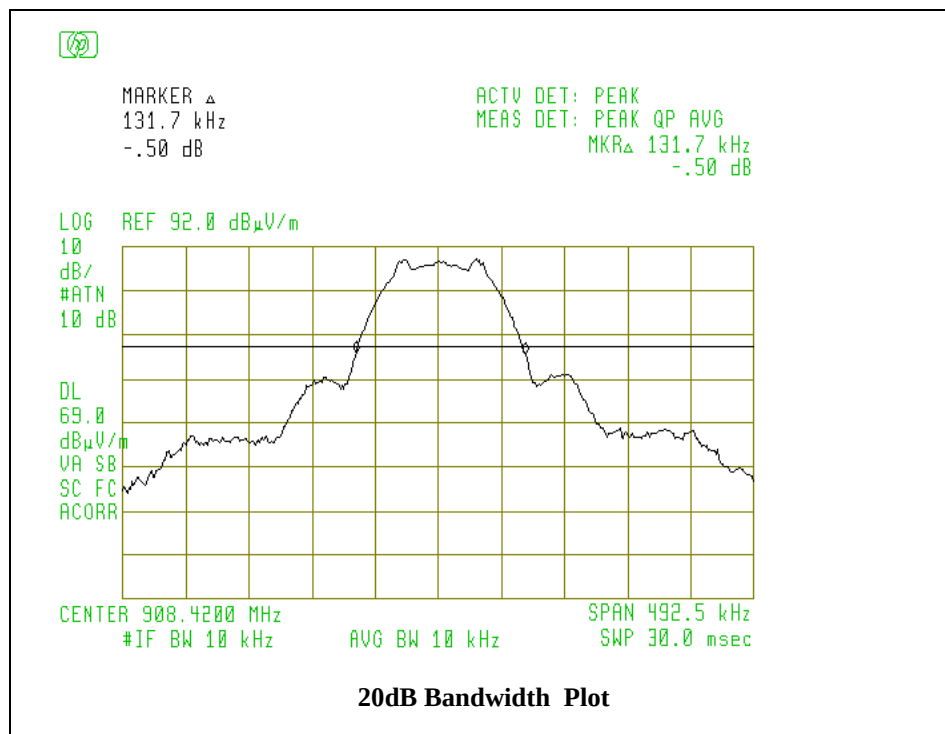
Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
160.2	H	1.8	045	32.7		43.5	-10.8
183.0	H	1.4	045	34.8		43.5	-8.7
785	H	1.0	135	40.0		46.5	-6.5
864	H	1.0	180	41.4		46.5	-5.1
39.4	V	1.8	270	32.4		40.0	-7.6
115.5	V	1.8	045	32.3		43.5	-11.2
762	V	1.1	180	39.4		46.5	-7.1
870	V	1.1	180	40.7		46.5	-5.8

EUT name: SWF Roller Shade Radio ZWave

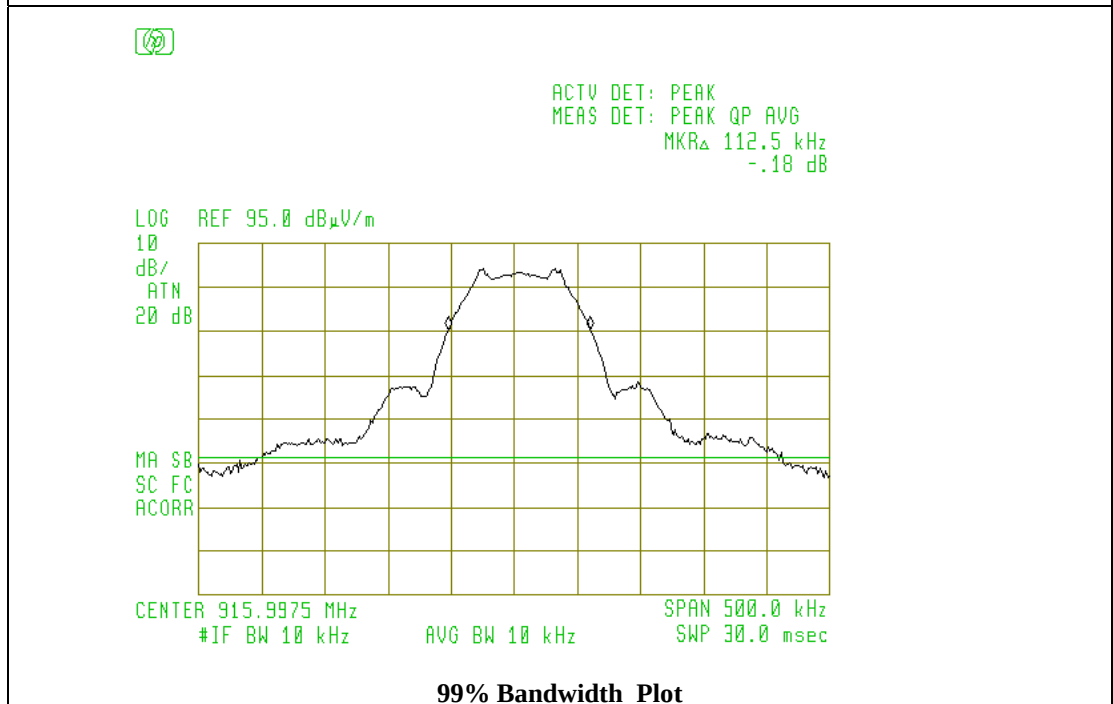
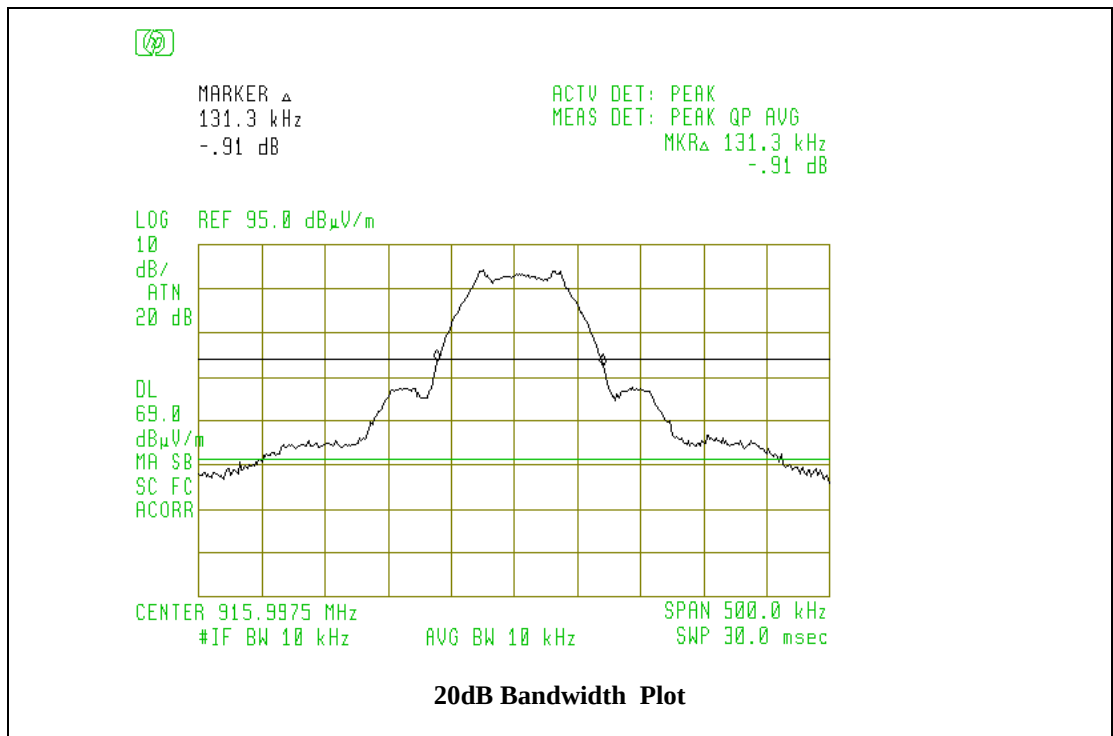
Model No. RSZ1
FCC ID: DWNRSZ, IC:12049A-RSZ

Comparing to the limit defined in FCC Sec. 15.209/IC RSS-Gen, emissions below the limit by 20dB were not recorded.

Frequency: 908.42MHz



Frequency: 916MHz



6. EUT RECEIVING MODE VERIFICATION

Radiated Test Data for Receiving Mode

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
200	H	1.1	000	34.2		43.5	-9.3
220	H	1.1	180	33.0		46.5	-13.5
250	H	1.0	180	37.1		46.5	-9.4
292	V	1.1	090	31.4		46.5	-15.1
334	V	1.1	235	33.2		46.5	-13.3
738	V	1.1	135	40.6		46.5	-5.9

- (1) Receiving mode spurious emissions shall be lower than the limit defined in FCC Sec. 15.209 & IC RSS-GEN.
(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/ calculated quasi-peak or average reading.

7. CONDUCTED EMISSIONS DATA

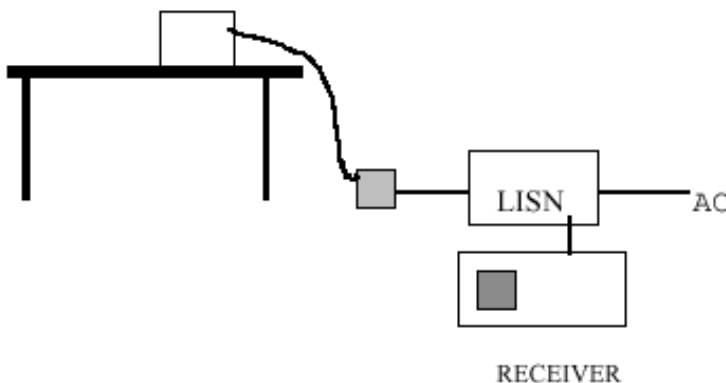
7.1 Test Methods and Conditions

The EUT exercise program was loaded during the conducted emission test. EMI Receiver was scanned from 150KHz to 30MHz with maximum hold mode for maximum emission. The IF Bandwidth is 9KHz. Recorded data was sent to the plotter to generate output in linear format. At the input of the spectrum analyzer, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 150KHz to 30MHz. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plots is using FCC Part 15 & CISPR22 Class B limit given as following:

Conducted Emission Technical Requirements				
Frequency Range	Class A		Class B	
	Quasi-Peak dBuV	Average dBuV	Quasi-Peak DBuV	Average dBuV
150kHz –0.5MHz	79 (8912uV)	66 (1995uV)	66-56	56-46
0.5MHz-30MHz	73 (4467uV)	60 (1000uV)	---	---
0.5MHz- 5MHz	---	---	56	46
5MHz-30MHz	---	---	60	50

Emissions that have peak values close to (or over) the specification limit (if any) are also measured in the quasi-peak mode to determine the compliance.

7.2 Measurement Instrument Configuration for Conducted Emission



7.3 Testing Data

The following plots show the neutral and line conducted emissions for the typical operation condition (Transmitting and receiving). The conducted test data shows the worst case emissions still below the FCC Part 15/CISPR22 Class B limits.

Operation Mode: AC/DC Adapter

Highest Data for AC Main Conducted Emissions						
Frequency (KHz)	200	250	310	430	540	
Peak /AVG Reading (dBuV) from Line*	39.16	42.68	42.98	48.93(Peak) 25.86(AVG)	45.58	
Frequency (KHz)	190	260	330	390	480	
Peak/AVG Reading(dBuV) from Neutral *	32.66	36.82	39.72	43.09	42.61	

* If each peak reading is less than the FCC average limit, it'll be not necessary to show the measured/ calculated Quasi-peak & average reading.

Test Personnel:

Tester Signature



Date 04/18/2016

Typed/Printed Name: Edward Lee

