



Engineering Solutions & Electromagnetic Compatibility Services

**FCC Part 15.209 & Industry Canada RSS-210  
Certification Application Report**

<b>Test Lab:</b>  Rhein Tech Laboratories, Inc.      Tel: 703-689-0368 360 Herndon Parkway              Fax: 703-689-2056 Suite 1400                              www.rheintech.com Herndon, VA 20170 E-Mail: atcbinfo@rheintech.com		<b>Applicant:</b>  Medeco Security Locks 3625 Alleghany Drive Salem, VA 24153 Contact: David Smith	
<b>FCC/IC ID</b>	VR3-101501X 7465A-101501X	<b>Test Report Date</b>	July 1, 2014
<b>Platform</b>	N/A	<b>RTL Work Order #</b>	2014065
<b>Model #</b>	10-15013	<b>RTL Quote #</b>	QRTL14-065A
<b>American National Standard Institute</b>	ANSI C63.4-2003: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz		
<b>FCC Classification</b>	DXX – Part 15 Low Power Communication Device Transmitter		
<b>FCC Rule Part(s)/Guidance</b>	FCC Rules Part 15.209: Radiated Emission Limits: General Requirements (10-01-13)		
<b>Industry Canada</b>	RSS-210 Issue 8: License-Exempt Radio Apparatus (All Frequency Bands): Category 1 Equipment RSS-Gen: Issue 3; 2010 General Requirements and Information for the Certification of Radio Apparatus		
<b>Digital Interface Information</b>	Digital Interface was found to be compliant		
<b>Frequency Range (MHz)</b>	<b>Output Power (W)</b>	<b>Frequency Tolerance</b>	<b>Emission Designator</b>
0.125	N/A	N/A	14K6FXD

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, RSS-210, and ANSI C63.4.

Signature: 

Date: July 1, 2014

Typed/Printed Name: Desmond A. Fraser

Position: President

*This report may not be reproduced, except in full, without the written approval of Rhein Tech Laboratories, Inc. and Medeco Security Locks, Inc. The test results relate only to the item(s) tested.*

*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.*

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## 1 General Information

### 1.1 Scope

This is an original certification application request for the Medeco Security Locks, Inc., Model # 10-15013.

Applicable Standards:

- FCC Part 15.209: Radiated Emission Limits: General Requirements
- Industry Canada RSS-210: Low Power License-Exempt Communications Devices

### 1.2 Description of EUT

<b>Equipment Under Test</b>	Transceiver
<b>Model #</b>	10-15013
<b>Power Supply</b>	3 VDC "CR2" size lithium cell
<b>Modulation Type</b>	FSK
<b>Frequency Range</b>	0.125 MHz
<b>Antenna Connector Type</b>	Internal
<b>Antenna Type</b>	Internal dipole 2.15 dBi

### 1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4-2003).

### 1.4 Related Submittal(s)/Grant(s)

This is an original certification application for Medeco Security Locks, Inc., Model #: 10-15013, FCC ID: VR3-101501X, IC: 7465A-101501X. The IC certification application will be a family certification that includes Model #'s 10-15013 and 10-15015.

### 1.5 Modifications

No modifications were made to the equipment during testing in order to achieve compliance with these standards.

## 2 Test Information

### 2.1 Description of Test Modes

**Table 2-1: Channels Tested**

Frequency (MHz)
0.125

### 2.2 Exercising the EUT

The EUT was supplied with test firmware preprogrammed to transmit once the battery was inserted and the cover placed a passive RFID card was used to activate transmit. The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The carrier was also checked to verify that information was being transmitted.

### 2.3 Test Result Summary

**Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.209)**

Standard	Test	Pass/Fail or N/A
FCC 15.207	AC Power Conducted Emissions	N/A
FCC 15.209	Radiated Emissions	Pass
FCC 15.209	Field Strength of Fundamental and Harmonics	Pass
RSS-Gen	20 dB Bandwidth	Pass

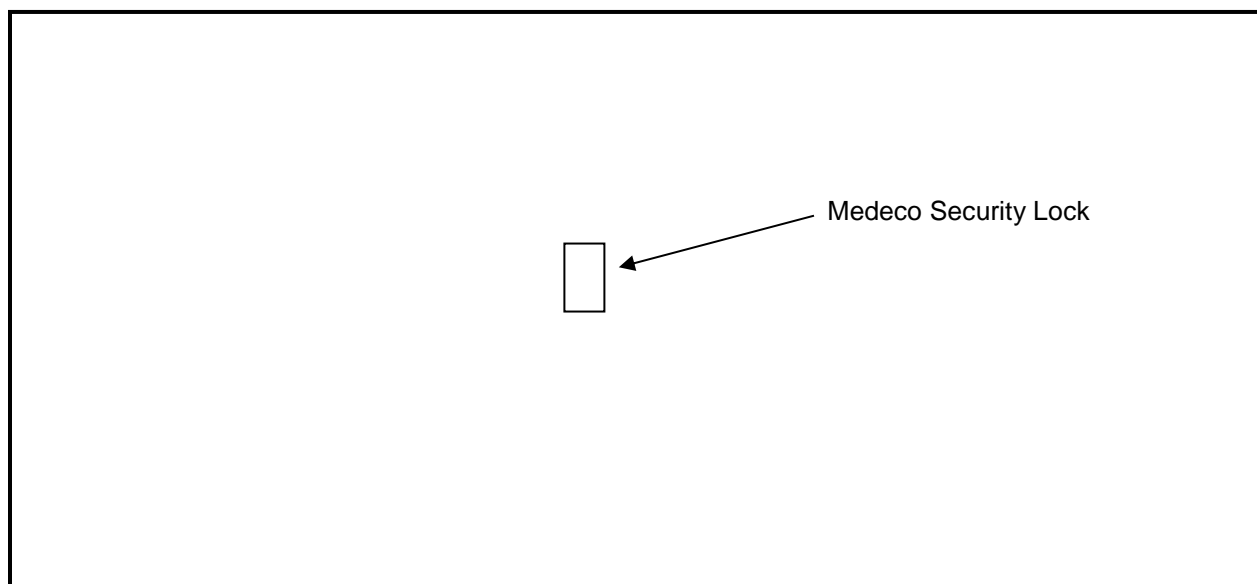
## 2.4 Test System Details

The test samples were received on May 5, 2014. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following table.

**Table 2-3: Equipment Under Test**

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Wireless Lock	Medeco Security Locks, Inc.	10-15013	N/A	VR3-101501X	N/A	21441

## 2.5 Configuration of Tested System



**Figure 2-1: Configuration of System Under Test**

### 3 Radiated Emissions – FCC §15.209; IC RSS-210 §A2.6; RSS-Gen

#### 3.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/f (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any circumstances of modulation.

Limit for 125 kHz (dBuV/m) =  $20\log(2400/125)$  at 300m

19.2 uV/m at 300m = 25.7 dBuV/m at 300m

Conversion to 1m =  $40\log(300)=99.1$  dB

Limit at 1m distance =  $25.7 + 99.1 = 124.8$  dBuV/m

#### 3.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10<sup>th</sup> harmonic of the highest fundamental transmitter frequency (1.25 MHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

**Table 3-1: Radiated Emissions Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900151	Rohde and Schwarz	HFH2-Z2	Loop Antenna (9 kHz - 30 MHz)	827525/019	3/4/15
901629	Teledyne Cougar	A4C2123	Amplifier	003-003	9/4/14
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	11/13/14
900724	Antenna Research Associates, Inc.	LPB-2520	BiLog Antenna (25 - 1000 MHz)	1037	4/19/15
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/27/14
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/27/14

### 3.3 Radiated Emissions Test Results

**Table 3-2: Radiated Emissions Test Data (Fundamental)**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Corrected (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
0.125	69.8	19.5	89.3	124.8	-35.5

\* testing performed at 1m.



### 3.4 Radiated Emissions Harmonics/Spurious Test Data

**Table 3-3: Radiated Emissions Harmonics/Spurious Test Data**

Emission Frequency (MHz)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)
0.250	33.4	19.5	52.9	99.7	-46.8
0.375	39.7	19.4	59.1	96.1	-37.0
0.500	28.5	19.6	48.1	73.6	-25.5
0.625	22.0	19.6	41.6	71.7	-30.1
0.750	10.1	19.6	29.7	70.1	-40.4
0.875	20.9	19.9	40.8	68.8	-28.1
1.000	18.9	19.9	38.8	67.6	-28.8
1.125	13.9	19.5	33.4	66.6	-33.2
1.250	20.3	19.9	40.2	65.7	-25.5


\* testing performed at 1m, interpolated to 3m.

### 3.5 Radiated Emissions Digital Test Data

**Table 3-4: Digital Radiated Emissions Test Data**

Temperature: 89.1°F Humidity: 51%										
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
8.654	Qp	V	0	1.0	19.9	20.0	39.9	49.5	-9.6	Pass
36.699	Qp	V	0	1.0	31.8	-26.6	5.2	40.0	-34.8	Pass
74.599	Qp	V	0	1.0	26.1	-31.5	-5.4	40.0	-45.4	Pass
79.006	Qp	V	0	1.0	31.7	-31.2	0.5	40.0	-39.5	Pass
85.096	Qp	V	0	1.0	28.9	-30.9	-2.0	40.0	-42.0	Pass
195.032	Qp	V	0	1.0	34.1	-31.7	2.4	43.5	-41.1	Pass
241.106	Qp	V	0	1.0	28.9	-29.3	-0.4	46.0	-46.4	Pass
294.471	Qp	V	0	1.0	31.4	-27.8	3.6	46.0	-42.4	Pass
383.654	Qp	V	0	1.0	30.7	-25.3	5.4	46.0	-40.6	Pass
410.577	Qp	V	0	1.0	26.7	-24.7	2.0	46.0	-44.0	Pass

#### Test Personnel:

Daniel W. Baltzell		May 13, 2014
Test Engineer	Signature	Date of Test

#### 4 AC Conducted Emissions - FCC §15.207; IC RSS-Gen §7.2.4: Conducted Limits

No AC conducted tests are required since the device is powered solely by a 3 VDC "CR2" size cell.

#### 5 20 dB Bandwidth – IC RSS-Gen

##### 5.1 20 dB Bandwidth Test Procedure

The minimum 20 dB bandwidths per RSS-Gen were measured using a 50-ohm spectrum analyzer. The modulated carrier was adjusted on the analyzer so that it was displayed entirely on the spectrum analyzer. The sweep time was auto and allowed through several sweeps with the max hold function used in peak detector mode. The resolution bandwidth was set to 5 kHz, and the video bandwidth set to 50 kHz. The table below contains the bandwidth measurement results.

**Table 5-1: 20 dB Bandwidth Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	11/13/14

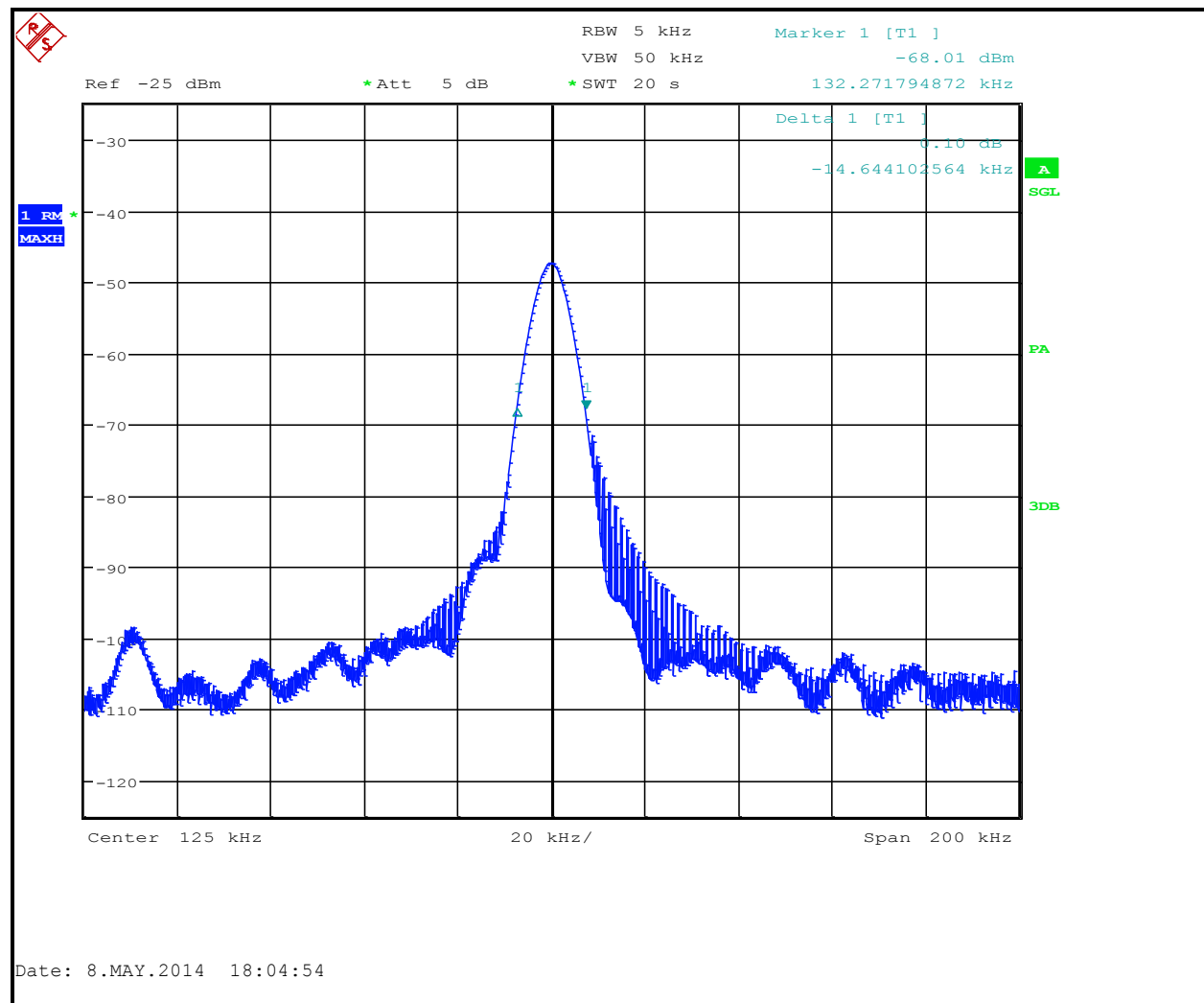
##### 5.2 20 dB Modulated Bandwidth Test Data

**Table 5-2: 20 dB Modulated Bandwidth Test Data**

Minimum 20 dB bandwidths	
Frequency (kHz)	20 dB Bandwidth (kHz)
125	14.64

### 5.3 20 dB Bandwidth Plots

Plot 5-1: 20 dB Bandwidth – 125 kHz



### Test Personnel:

Daniel W. Baltzell	<i>Daniel W. Baltzell</i>	May 8, 2014
Test Engineer	Signature	Date of Test

Rhein Tech Laboratories, Inc.  
360 Herndon Parkway  
Suite 1400  
Herndon, VA 20170  
<http://www.rheintech.com>

Client: Medeco Security Locks, Inc.  
Model #: 10-15013  
Standards: FCC 15.209/IC RSS-210  
ID's: VR3-101501X/7465A-101501X  
Report #: 2014065DXX

## **6 Conclusion**

The data in this measurement report shows that the EUT as tested, Medeco Security Locks, Inc., Model: Model # 10-15013, FCC ID: VR3-101501X, IC: 7465A-101501X, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules and Regulations and IC RSS-210 and RSS-Gen.