

TEST REPORT

OF

FCC Part 15 Subpart B&C §15.209
FCC ID: 2AARW-IS5000

Equipment Under Test : Digital Door Lock
Model Name : FCC: IS5000 SERIES
Serial No. : N/A
Applicant : Secuway Inc.
Manufacturer : WILLTRONICS Co., Ltd.
Date of Test(s) : 2013.07.30 ~ 2013.08.14
Date of Issue : 2013.09.11

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Hyunchoe You

Date:

2013.09.11

Approved By:



Feel Jeong

Date:

2013.09.11

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 400-2, Gomae-Dong, Giheung-Gu, Yongin-Shi, Kyungki-Do, South Korea 446-901
- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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1.2. Details of Applicant

Applicant : Secuway Inc.

Address : 4860 Irvine Blvd, Suite 207, Irvine, CA 92620

Contact Person : Lee, Nicholas

Phone No. : +1 650 922 7376

1.3. Description of EUT

Kind of Product	Digital Door Lock
Model Name	FCC: IS5000 SERIES
Serial Number	N/A
Power Supply	DC 7.5 V
Frequency Range	125.00 kHz
Modulation Technique	ASK
Number of Channels	1
Operating Conditions	-20 °C ~ 60 °C
Antenna Type	Internal type (Loop Antenna)

1.4. Declarations by the manufacturer

- Operation temperature: -20 °C ~ 60 °C

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A4(210mm x 297mm)

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due.
Spectrum Analyzer	R&S	FSV30	101004	Jul. 05, 2013	Annual	Jul. 05, 2014
Loop Antenna	SCHWARZBECK	FMZB 1519	1519-039	Jul. 09, 2013	Biennial	Jul. 09, 2015
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	9163-390	Apr. 19, 2013	Biennial	Apr. 19, 2015
DC Power Supply	Agilent	U8002A	MY48490027	Jan. 08, 2013	Annual	Jan. 08, 2014
Test Receiver	R&S	ESCI7	100778	Feb. 15, 2013	Annual	Feb. 15, 2014
Antenna Master	INN-CO	MM4000	N/A	N/A	N/A	N.C.R.
Turn Table	INN-CO	DS 1200 S	N/A	N/A	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (21.5 m x 13.0 m x 9.0 m)	N/A	N.C.R.	N.C.R.	N.C.R.

1.6. Test Report Revision

Revision	Report number	Description
0	F690501/RF-RTL006854	Initial
1	F690501/RF-RTL006854-1	Modified manufacturer information

1.7. Summary of Test Results

The EUT has been tested according to the following specifications:

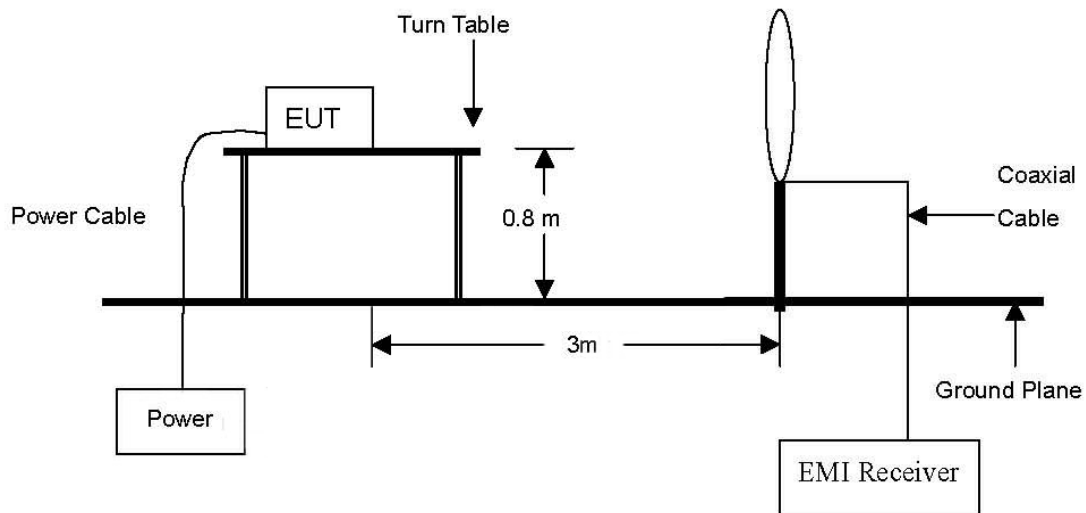
APPLIED STANDARD: FCC Part 15 Subpart B&C 15.209/ IC RSS-210 Issue8, RSS-Gen Issue3			
Section in FCC 15 Subpart B&C §15.209	Section in IC RSS-210 Issue8, RSS-Gen Issue 3	Test Item	Result
15.209(a)	RSS-210 Issue8, 2.5.1 RSS-Gen Issue3, 7.2.5 Table 6	Radiated emission, Spurious Emission and Field Strength of Fundamental	Complied
-	RSS-Gen Issue3, 4.6.1	Occupied Bandwidth	Complied

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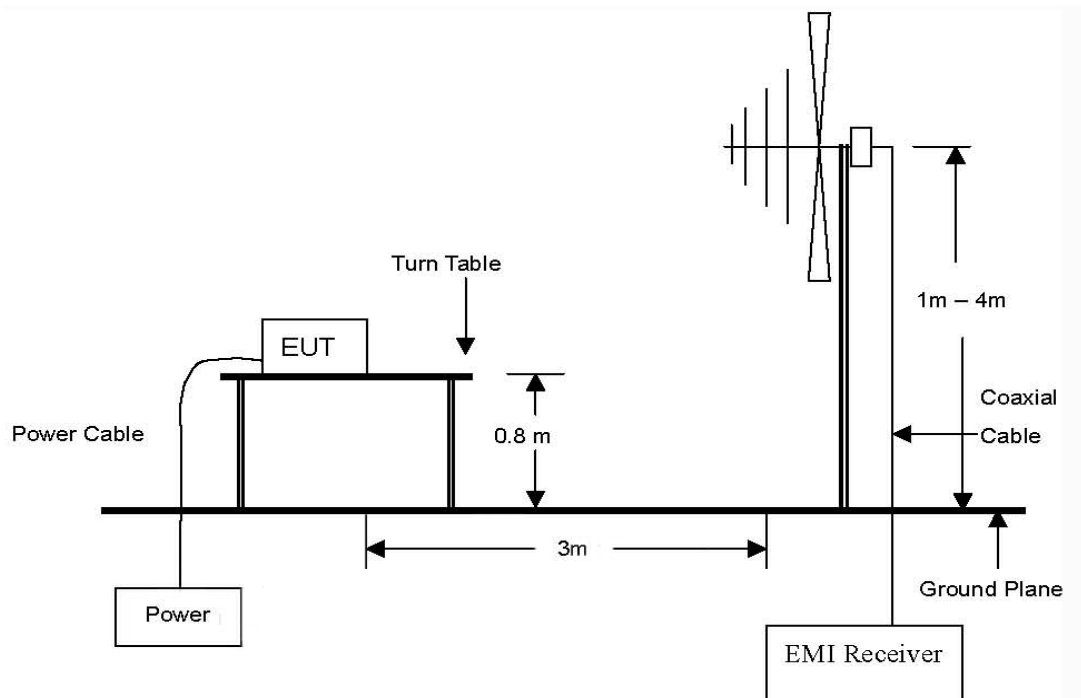
2. Field Strength of Fundamental

2.1. Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



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2.2. Limit

2.2.1. Radiated emission limits, general requirements

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241

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2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

2.3.1. Test Procedures for emission from 9 kHz to 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- d. The test-receiver system was set to average Detect Function and Specified Bandwidth with Maximum Hold Mode.

2.3.2. Test Procedures for emission from 30 MHz to 1000 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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2.4. Test Result

Ambient temperature : (23 ± 2) °C
Relative humidity : 47 % R.H.

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Radiated Emissions			Ant	Correction Factors		Total		FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. (dB/m)	Cable (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 300 m	Limit (dB μ V/m)	Margin (dB)
0.125	17.80	Average	H	20.04	0.03	37.87	-42.13	25.67	67.80

Note:

1. 300 m Result(dB μ V/m) = 3 m Result(dB μ V/m) – 40log(300/3) (dB μ V/m)

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A4(210mm x 297mm)

3. Spurious Emission

3.1. Test Setup

Same as section 2.1 of this report

3.2. Limit

Same as section 2.2 of this report

3.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

3.3.1. Test Procedures for emission from 9 kHz to 30 MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to quasi-peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.3.2. Test Procedures for emission from 30 MHz to 1000 MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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3.4. Test Result

Ambient temperature : (24 ± 2) °C
Relative humidity : 47 % R.H.

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Radiated Emissions			Ant	Correction Factors	Total		FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 300 m or 30 m	Limit (dB μ V/m)	Margin (dB)
0.250	16.34	Quasi	H	20.05	36.39	-43.61	22.67	66.28
17.774	-1.64	Quasi	H	20.64	19.00	-21.00	29.54	50.54

Note:

- 300 m Result(dB μ V/m) = 3 m Result(dB μ V/m) – 40log(300/3) (dB μ V/m)
- 30 m Result(dB μ V/m) = 3 m Result(dB μ V/m) – 40log(30/3) (dB μ V/m)

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4. Occupied Bandwidth

4.1. Test Setup



4.2. Limit

None; for reporting purposed only

4.3. Test Procedure

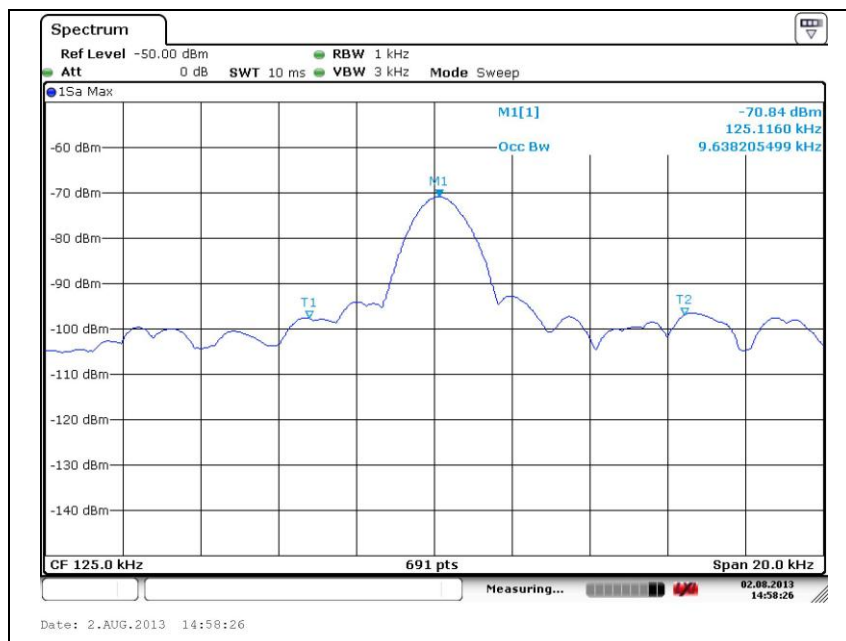
1. The Occupied Bandwidth is measured with a spectrum analyzer connected via a receiving antenna placed near the EUT.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW= 1 kHz, VBW= 3 kHz and Span= 20 kHz and detector mode= Sample.
3. The bandwidth of fundamental frequency was measured and recorded.

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4.4. Test Result

Ambient temperature : (24 ± 2) °C
Relative humidity : 47 % R.H.

Carrier Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Remark
0.125	9.638	-	99 % Occupied bandwidth



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