

TEST REPORT

of

FCC Part 15 Subpart C §15.249

FCC ID : WEK-SKR-02

Equipment Under Test : Screen Keeper Wireless Tag
Model Name : SKR-02
Serial No. : N/A
Applicant : Semilink Inc.
Manufacturer : Semilink Inc.
Date of Test(s) : 2011. 02. 17 ~ 2011. 02. 22
Date of Issue : 2011. 03. 02

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

Tested By:



Date

2011. 03. 02

Grant Lee

Approved By:



Date

2011. 03. 02

Charles Kim

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Table of contents

1. General information -----	3
2. Fundamental, Spurious emission and edge band radiated emission --	6

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SGS Testing Korea Co., Ltd.

8-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040

Tel. +82 31 428 5700 / Fax. +82 31 427 2371

www.electrolab.kr.sgs.com

1. General information

1.1 Testing laboratory

SGS Testing Korea Co., Ltd.

Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

www.electrolab.kr.sgs.com

Telephone : +82 +31 428 5700

FAX : +82 +31 427 2371

1.2 Details of applicant

1.3. Description of EUT

Kind of Product	Screen Keeper Wireless Tag
Model Name	SKR-02
Serial Number	N/A
Power Supply	DC 3 V (Lithium Battery)
Frequency Range	2 402 MHz ~ 2 480 MHz
Modulation Technique	GFSK
Number of Channels	79
Antenna Type	Fixed Type
Antenna Gain	-11.25 dBi

1.4 Details of modification

-N/A

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1.5. Test equipment list

Equipment	Manufacturer	Model	Cal Due.
Signal Generator	Agilent	E4438C	Mar 31, 2011
Power Meter	Agilent	E4416A	Mar. 31, 2011
Power Sensor	Agilent	E9327A	Apr. 01, 2011
Attenuator	Agilent	8495B	Apr. 02. 2011
High Pass Filter	Wainwright	WHK3.0/18G-10SS	Sep. 29, 2011
DC power Supply	Agilent	U8002A	Jan. 05, 2012
Preamplifier	H.P.	8447F	Jul. 05, 2011
Preamplifier	Agilent	8449B	Mar. 31, 2011
Test Receiver	R & S	ESU26	Apr. 08, 2011
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	Jul. 22, 2011
Horn Antenna	Rohde & Schwarz	HF 906	Oct. 08, 2011
Antenna Master	EMCO	1050	N.C.R
Turn Table	Daeil EMC	DI-1500	N.C.R
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.6 m)	N.C.R

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1.6. Summary of test results

The EUT has been tested according to the following specifications:

Applied Standard : FCC Part15, Subpart C		
Standard Section	Test Item	Result
15.209(a) 15.249(a) 15.249(d) 15.205	Fundamental, Spurious emission and edge band radiated emission	Complied

1.7. Test report revision

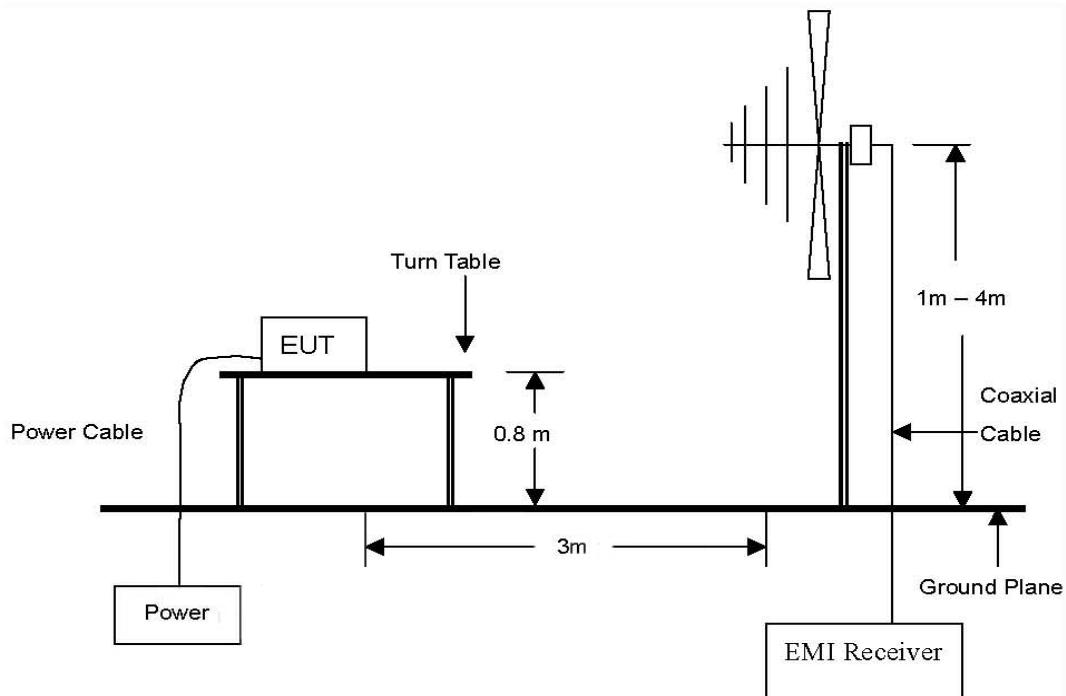
Revision	Report number	Description
0	F690501/RF-RTL004489	Initial
0	F690501/RF-RTL004489-1	Remove MPE Calculation

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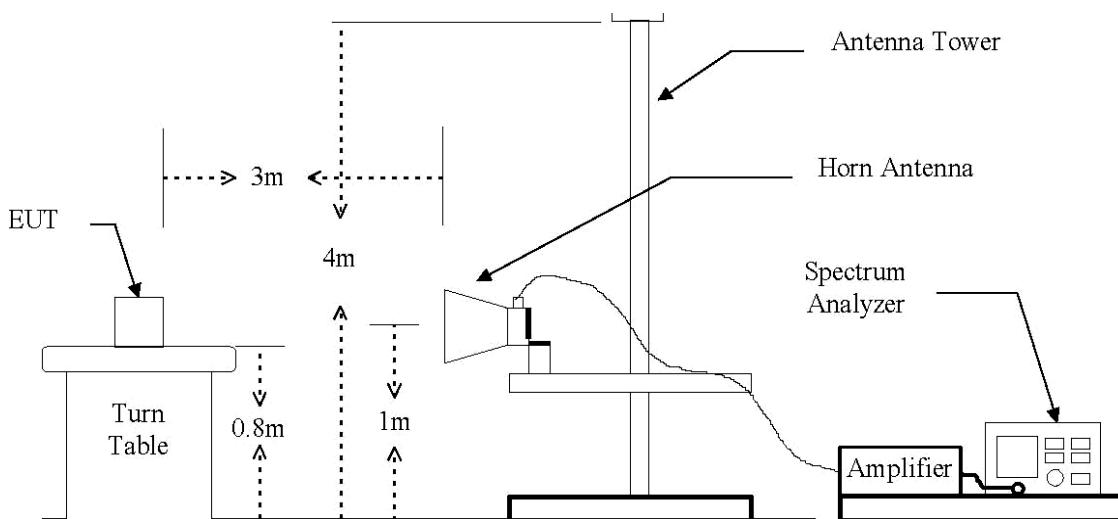
2. Fundamental, Spurious emission and edge band radiated emission

2.1. Test setup

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



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 24 GHz Emissions.



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2.2. Test procedures

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

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic Chamber The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. 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 polarization of the antenna are set to make the measurement.
4. 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.
5. 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.

Note :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 GHz.

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2.3. Limit

In the section 15.249(a) :

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (mV/m)	Field strength of harmonics (μV/m)
902 ~ 928 MHz	50	500
2 400 ~ 2 483.5 MHz	50	500
5 725 ~ 5 875 MHz	50	500
24.0 ~ 24.25 GHz	250	2 500

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:

Fundamental frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
30 ~ 88	100*	3
88 ~ 216	150*	3
216 ~ 960	200*	3
Above 960	500	3

Remark:

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.

In the above emission table, the tighter limit applies at the band edges.

Fundamental frequency (MHz)	Field strength (μV/m at 3 meter)	Field strength (dBμV/m at 3 meter)
30 ~ 88	100	40
88 ~ 216	150	43.5
216 ~ 960	200	46
Above 960	500	54

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2.4. Test result

Ambient temperature : (23 ± 2) °C
Relative humidity : 46 % R.H.

2.4.1. Below 1 GHz

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP + CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
536.763	37.74	Peak	H	16.01	-25.85	27.90	46.00	18.10
Below 600.000	Not Detected	-	-	-	-	-	-	-

Remark

1. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes.(Worst case is XZ-plane)
2. All spurious emission at channels are almost the same below 1 GHz, so that the channel was chosen at representative in final test.

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2.4.2. Above 1 GHz

A. Low Channel (2 402 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2 402.000	54.71	Peak	H	28.07	4.87	87.64	114.00	26.36
*2 390.000	25.73	Peak	H	28.09	4.84	58.66	74.00	15.34
*2 390.000	12.65	Average	H	28.09	4.84	45.58	54.00	8.42

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
4 804.212	47.01	Peak	H	32.59	-27.78	51.82	74.00	22.18
4 804.212	46.81	Average	H	32.59	-27.78	51.62	54.00	2.38
Above 4 900.000	Not Detected	-	-	-	-	-	-	-

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B. Middle Channel (2 439 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2 439.000	53.22	Peak	H	28.00	4.82	86.04	114.00	27.96

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ N)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ N/m)	Limit (dB μ N/m)	Margin (dB)
4 878.080	50.80	Peak	H	32.88	-27.59	56.09	74.00	17.91
4 878.080	42.37	Average	H	32.88	-27.59	47.66	54.00	6.34
Above 4 900.000	Not Detected	-	-	-	-	-	-	-

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C. High Channel (2 480 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2 480.000	51.66	Peak	H	28.08	4.78	84.52	114.00	29.48
*2 483.500	25.37	Peak	H	28.09	4.78	58.24	74.00	15.76
*2 483.500	11.26	Average	H	28.09	4.78	44.13	54.00	9.87

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dB μ N)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ N/m)	Limit (dB μ N/m)	Margin (dB)
4 959.782	50.04	Peak	H	33.22	-27.41	55.85	74.00	18.15
4 959.782	43.88	Average	H	33.22	-27.41	49.69	54.00	4.31
Above 5 000.000	Not Detected	-	-	-	-	-	-	-

Remarks :

1. “*” means the restricted band.
2. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes. (Worst case is XZ-plane)
3. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental Frequency.
4. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
5. Average test would be performed if the peak result were greater than the average limit.
6. Actual = Reading + AF - Amp Gain + CL

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