TEST REPORT

1. Applicant

Name	: SEGI LIMITED
Address	: Room 1808, 18/F, Tower 2, Admiralty Center, 18 Harcourt road, Hongkong City, 186, CHINA

2. Products

Name	: Security/Remote Control transceiver (Car Alarm System)
Model/Type	: ANT-2W900SH
Manufacturer	: SEGI LIMITED

3. Test Standard	: FCC CFR 47 Part 15, Subpart C section 15.249 IC RSS 210 Annex II - 2007
4. Test Method	: ANSI C63.4-2003
5. Test Result	: Positive
6. Date of Application	: August. 10, 2009
7. Date of Issue	: September. 17, 2009

Tested by

Sung-kyu Cho

Sung-kyu Cho
Telecommunication Center
Engineer

Approved by

Jeong-min Kim

Jeong-min Kim
Telecommunication Center
Manager

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1. GENERAL INFORMATIONS

1.1. Applicant (Client)

Name	SEGI LIMITED
Address	Room 1808, 18/F, Tower 2, Admiralty Center, 18 Harcourt road, Hongkong City,186, CHINA
Contact Person	Byung Joon , Ko
Telephone No.	82-32-623-5550 (#272)
Facsimile No.	82-32-623-6667
E-mail address	Byungjoon@magicar.com
Manufacturer Name	SEGI LIMITED
Manufacturer Address	Chenjiapucun, Liaobu Town, Dongguan City, Guangdong Province, P.R.China(523-408)

1.2. Equipment (EUT)

Type of equipment	Security/Remote Control transceiver (Car Alarm System)
Model Name	ANT-2W900SH
FCC ID	VA5JA800A915
IC Number	7087A-A800A915
Frequency Band	915 MHz
EUT Modes of Operation	Transceiver
Type of Modulation	ASK
Number of Channels	1 channels
Input power supply	DC 5V

1.3. Testing Laboratory

Testing Place	Korea Testing Labortory (KTL) 1271-12, Sa-Dong Sangnok-Gu, Ansan-si Gyunggi-Do , Korea
FCC registration number	408324
Industry Canada filing number	6298A-1
Test Engineer	Sung-kyu Cho
Telephone number	+82 31 5000 132
Facsimile number	+82 31 5000 147
E-mail address	skcho@ktl.re.kr
Other Comments	-

2. SUMMARY OF TEST RESULTS

Testing performed for : SEGI LIMITED

Equipment Under Test : ANT-2W900SH

Receipt of Test Sample : 2009. 08. 10

Test Start Date : 2009. 08. 28

Test End Date : 2009. 09. 15

The following table represents the list of measurements required under the FCC CFR 47 Part 15.249 and RSS 210 Annex I.

FCC Rules	IC Rules	Test Requirements	Result	Comments
15.249	RSS-210 A2.9	Field Strength measurement – Fundamental, Harmonic and Spurious	Pass	See Data sheets
15.215	RSS-210 2.2	Occupied Bandwidth emission	Pass	See Data sheets

Note1 : Test results reported in this document relate only to the items tested
Note2 : The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria
Note3 : Test results apply only to the item(s) tested

*** Modifications required for compliance**
No modifications were implemented by KTL.
All results in this report pertain to the un-modified sample provided to KTL.

3. TEST FACILITY

3.1. Korea Testing Laboratory Location

All tests were conducted at Korea Testing Laboratory. The site address is 516 Haean-ro, Sa-dong, Sangnok -gu, Ansan-si, Gyeonggi-do, 426-901, KOREA. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1:1993 and ANSI C63.4: 2003. For measure -ments, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters.

The FCC registration number is 408324. The Industry Canada filing number for this site is 6298A-1.

3.2. Test Equipment

No.	Equipment	Manufacturer	Model	S/N	Effective Cal.Duration
1	EMI Receiver	R&S	ESIB26	100280	09/08/2010
2	Pre-Amplifier	Agilent	83017A	MY39500982	05/18/2010
3	Biconi-Log Ant. (30 MHz ~ 1000 MHz)	Schwarzbeck	VULB9168	9168-179	04/06/2010
4	Horn Ant. (1 GHz ~ 18 GHz)	Agilent	E4448A	MY43360322	02/26/2010
5	Antenna Mast	Frankonia	FAM4	1101F4006	--
6	Spectrum Analyzer	Agilent	E4407B	US41443316	12/01/2009
7	Oscilloscope	Agilent	DSO44001104	MY44001104	03/16/2010

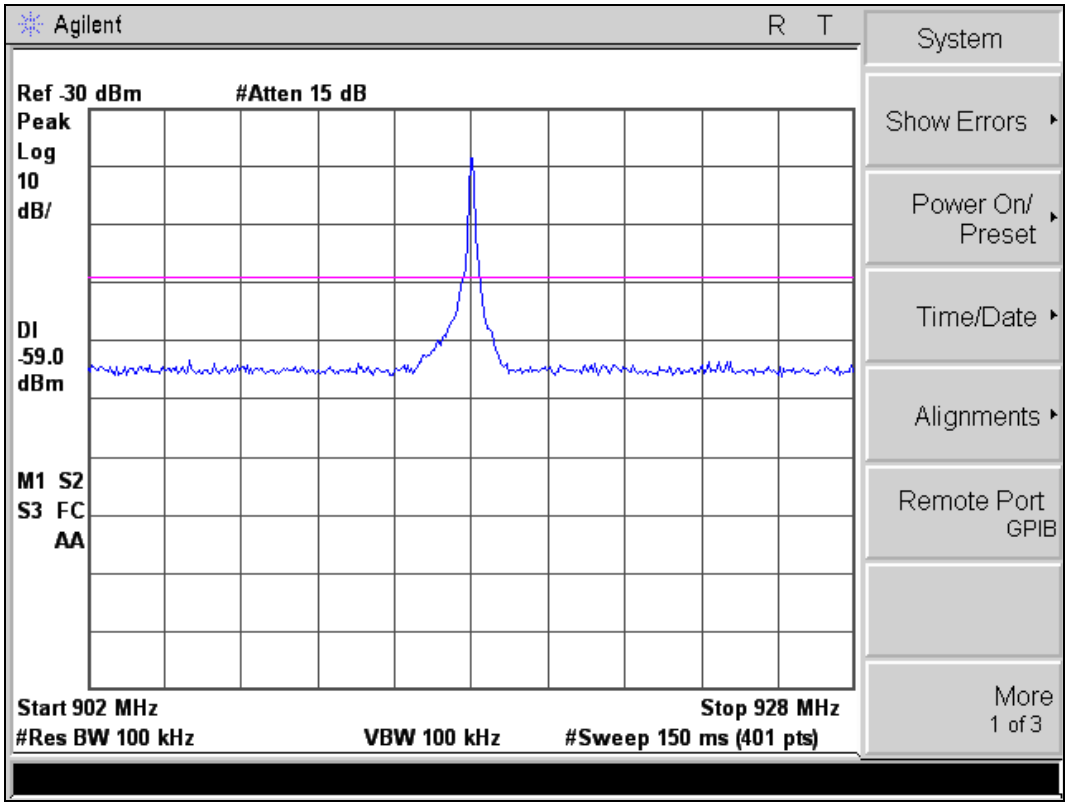
4. TEST RESULTS

4.1. Occupied Bandwidth measurement

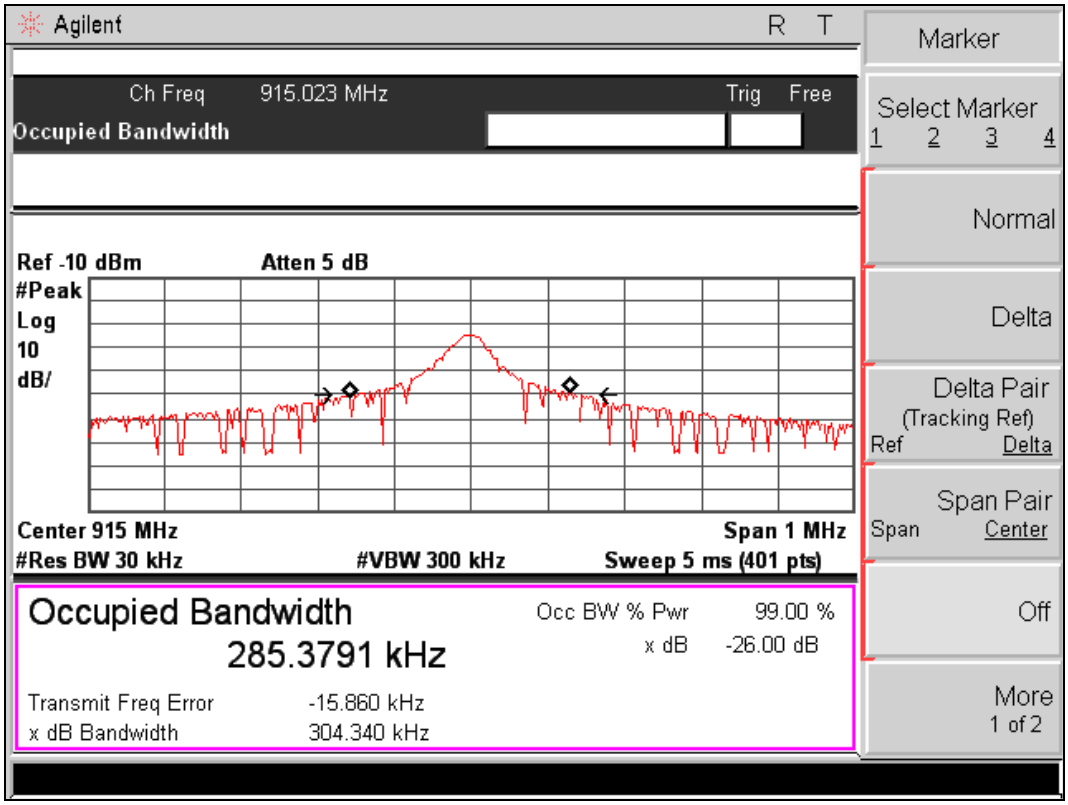
4.1.1. Requirements of Bandwidth

The fundamental emission be kept with at least the central 80% of the permitted band.

4.1.2. Test Results



– Occupied Bandwidth plot (modulated mode) –



– 99% Occupied Bandwidth plot (modulated mode) –

4.2. Radiated Spurious Emissions

4.2.1. Test Procedure

4.2.1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Biconi-Log antenna : 30 to 1000 MHz or Horn Antenna : 1 to 40 GHz) was placed at the distance of 3 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT. Emission levels from the EUT with various configurations were examined on a spectrum analyzer connected with a RF amplifier and graphed.
The emission was within the illumination area of the 3 dB beam width of the antenna so that the maximum emission from the EUT is measured.

4.2.1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level. Receiving antenna polarization was changed vertical and horizontal. The worst value was recorded.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

Tested in x, y, z axis and worst case results are reported .

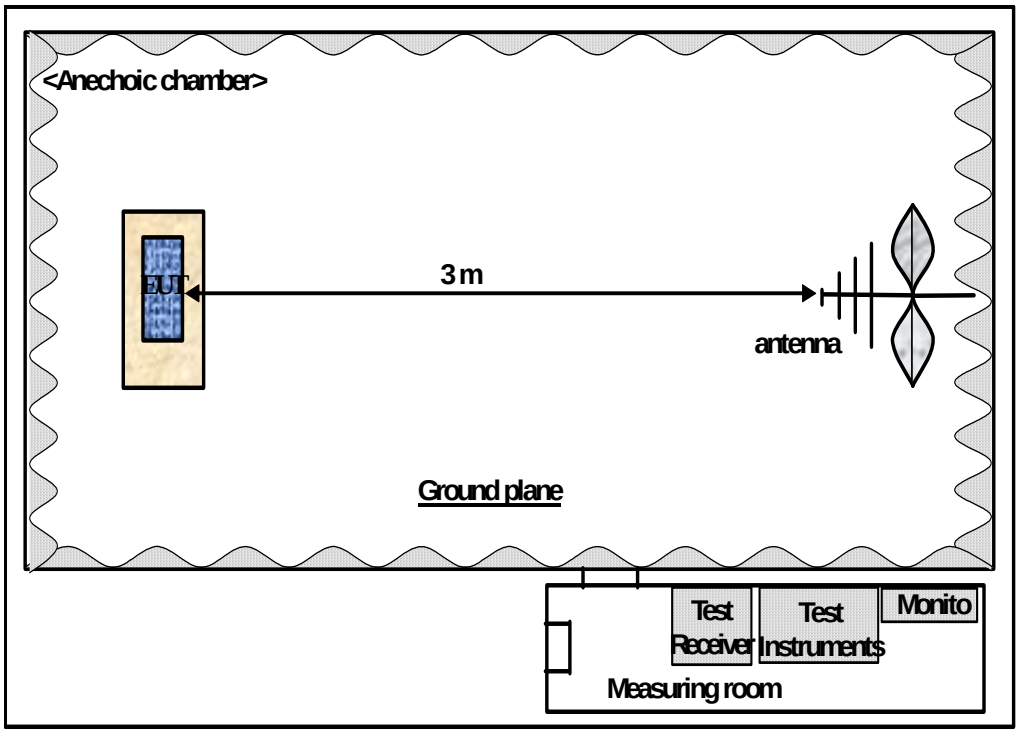
The maximum frequency range measuring with the spectrum from 30 MHz to 10th harmonic was investigated with the transmitter.

4.2.2. Limits

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following;

Fundamental Frequency (MHz)	Field Strength of Fundamental (milivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

4.2.3. Test configuration

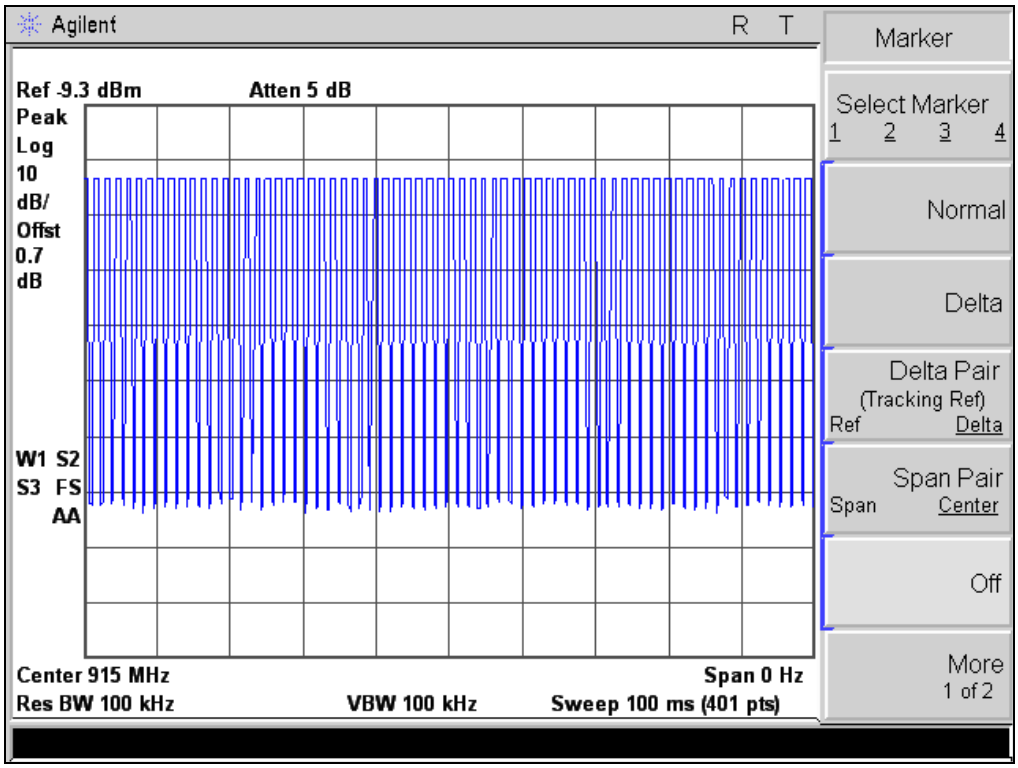


4.2.4. Calculation of Duty Cycle Correction Factor

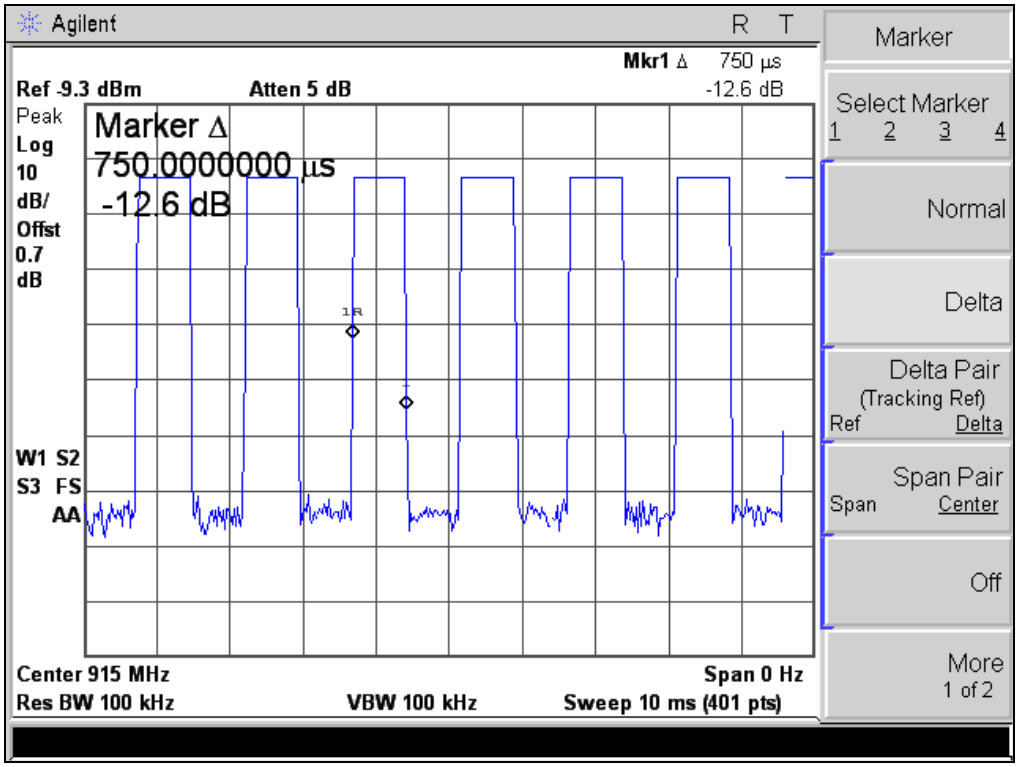
The period of the pulse train is determined by observing it on a spectrum analyzer with zero frequency span. A plot is then made of the pulse train with a sweep time of 100 milliseconds. This sweep determines the duration of the pulse train, which in this case is millisecond.

Total ON Time during 100 ms = 0.75 ms x 67 = 50.25 ms
Duty cycle correction factor = 20 log (50.25 ms/100ms) = -5.98

Duty Cycle correction factor = -5.98 dB



– Duty cycle plot 1 –



– Duty cycle plot 2 –

4.2.5. Test Results

4.2.5.1 Spurious Radiated Emission

Frequncy (MHz)	Antenna Pol. H/V	D.M	Reading Level (dBμV)	Correction (AF+CL) dBμV/m	A.G	Duty Cycle Factor	Emission Level (dBμV/m)	Avg Limit (dBμV/m)	Margin +/-
915.0	H	Q	66.40	26.5	0	N/A	92.90	93.9	1.00
915.0	V	Q	58.95	26.5	0	N/A	85.45	93.9	8.45
1830.0	H	P	48.81	34.2	34.4	-5.98	42.63	54.0	11.37
1830.0	V	P	49.45	34.2	34.4	-5.98	43.27	54.0	10.73
2745.0	H	P	53.16	38.5	33.9	-5.98	51.78	54.0	2.22
2745.0	V	P	50.77	38.5	33.9	-5.98	49.39	54.0	4.61

Note : 1. Measurement was done over the frequency range from 30 MHz to 10th hramonic. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. The observed EMI Receiver (ESIB26) noise floor level was 2.0 dBμV. And all other emissions not reported on data were more than 40 dB below the permitted level.
3. Test was performed in x, y, z axis and the worst case was found in y axis.

* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)
Antenna Polarization (H : Horizontal, V : Vertical)
A.F. : Antenna Factor
C.L. : Cable Loss
A.G. : Amplifier Gain

Remark : Emission level (dBμV/m) = Reading level (dBμV) + Correction (dB/m) - Amplifier Gain (dB)
Margin (dB) = Limit (dBμV/m) – Emission level (dBμV/m)
The "+" sign of the margin means that emission level are within the limit and the "-" sign means over the limit.

4.2.5.2 Receiver Spurious Radiated Emission

Frequncy (MHz)	Antenna Pol. H/V	D.M	Reading Level (dBμV)	Correction (AF+CL) dBμV/m	A.G	Duty Cycle Factor	Emission Level (dBμV/m)	Avg Limit (dBμV/m)	Margin +/-
53.84	V	Q	18.45	14.3	0	0	32.75	40	7.25
77.84	H	Q	15.74	10.4	0	0	26.14	40	13.86
83.80	V	Q	20.83	9.8	0	0	30.63	40	9.37
86.80	H	Q	19.45	9.6	0	0	29.05	40	10.95
86.80	V	Q	22.44	9.6	0	0	32.04	40	7.96

Note : 1. Measurement was done over the frequency range from 30 MHz to 10th hramonic. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. The observed EMI Receiver (ESIB26) noise floor level was 2.0 dBμV. And all other emissions not reported on data were more than 40 dB below the permitted level.
3. Test was performed in x, y, z axis and the worst case was found in y axis.

* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)
Antenna Polarization (H : Horizontal, V : Vertical)
A.F. : Antenna Factor
C.L. : Cable Loss
A.G. : Amplifier Gain

Remark : Emission level (dBμV/m) = Reading level (dBμV) + Correction (dB/m) - Amplifier Gain (dB)
Margin (dB) = Limit (dBμV/m) – Emission level (dBμV/m)
The "+" sign of the margin means that emission level are within the limit and the "-" sign means over the limit.

Appendix.1 Test setup photo