


TEST REPORT

Report Number	RAPA13-O-340	
Type of Equipment	LF Transmitter	
Model Name	ANT-RFID-315	
FCC ID	VA5A900R-1A315	
IC Number	7087A-A900RA315	
Applicant	Name	SEGI LIMITED
	Logo	
	Address	1808, 18/F, Tower II, Admiralty Centre, 18 Harcourt Rd., Admiralty, Hong Kong
Manufacturer	Name	SEGI ELECTRONICS CO., LTD.
	Address	Chenjiapucun, Liaobu Town Dongguan City, Guangdong Province, 523-408, P.R.China
Test period	May 11, 2013 to May 12, 2013	
Issuing date of report	June 10, 2013	
Total page	9 pages (including this page)	

SUMMARY

The equipment complies with FCC CFR 47 Part 15 Subpart C Section 15.209 and IC RSS-Gen Issue3 and RSS-210 Issue8 2010.

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Date : June 10, 2013



Prepared and tested by Tae Yang, Yoon
Manager /TCL of RAPA

Date : June 10, 2013



Reviewed by Sukil Park
Executive Managing Director/TCL of RAPA

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1. GENERAL DESCRIPTION

1.1 Applicant

- Company name : SEGI LIMITED
- Address : 1808, 18/F, Tower 2, Admiralty Center, 18 Harcourt Rd., Admiralty, Hong kong
- Contact person : Eui Seok, Chung
- Phone/Fax : +82-32-623-5550 / +82-32-623-6667

1.2 Manufacturer

- Company name : SEGI ELECTRONICD CO., LTD
- Address : Chenjiapucun, Liaobu Town, Dongguan City, Guangdong Province, 523-408, P.R.China
- Contact person : Eui Seok, Chung
- Phone/Fax : +82-32-623-5550 / +82-32-623-6667

1.3 Basic description of EUT

- Product name : LF Transmitter
- Model name : ANT-RFID-315
- Serial number : N/A
- Frequency : TX : 20 kHz, RX : 315 MHz
- Output power : 1 Channel
- Modulation method : ASK
- FCC Rule Part(s) : FCC CFR47 Part 15 Subpart C Section 15.209
- IC Rule Part(s) : IC RSS-Gen Issue3 2010 & RSS-210 Issue8 2010
- FCC classification : DCD / Part 15 Low Power Transmitter Below 1 705 kHz
- IC classification : Licence-exempt Radio Apparatus(All Frequency Bands) Category II Equipment
- Test period : May 11, 2013 to May 22, 2013
- Issuing date of report : May 28, 2013
- Place of test : Head office
824, B104, Anyang Megavalley, 799, Gwanyang-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-767, Korea

Open area test site
80, Jeil-ri, Yangji-myun, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-825, Korea

(FCC Registration Number : 337229)
(FCC Conformity Assessment Body, Registration No: 608365)
(IC Submission Number : 143881)
(KCC Designation Number : KR0027)

1.4 Electrical specification

Item	Specifications
Product Name	LF Transmitter
Product Type	One Way Antenna
Size(mm)	115 x 38 x 15 (W x L x H)
Power	DC 12 V from Main Unit
Transmit Frequency	20 kHz by Ferrite coil and Mylar condenser for RFID
Receive Frequency	315 MHz by pattern antenna
Modulation Method	ASK

2. GENERAL INFORMATION OF TEST

2.1 Standard for measurement methods

Applied Standard : FCC CFR47 Part 15 Subpart C, IC RSS-310 Issue8 Annex 3-2010				
FCC	IC	Description of Test	Limit	Result
15.207	RSS-210	Conducted Emission(dB μ V/m)	See 15.207	N/A[<i>note 1</i>]
15.209	RSS-210	Radiated Emission(dB μ V/m)	See 15.209	Pass
-	RSS-Gen	Occupied Bandwidth	-	13.3 kHz

Note1 : This equipment is supplied DC from main unit.

2.2 Description of EUT modification

During the test, there was no mechanical or circuitry modification to improve any RF specification including spurious characteristic, and any RF and spurious suppression device(s) were not added against the device tested.

2.3 Description of test system configuration

• Peripheral equipment used;

Description	Model name	Serial No.	Manufacturer	FCC ID	IC Number
EUT	ANT-RFID-315	N/A	SEGI	VA5JA900R-1A315	7087A-A900RA315
Main Unit	MM1090	N/A	SEGI	-	-

• Cables used

Device from	Device to	Type of cable	Type of connector	Length
Main Unit	EUT	Normal	-	1 m

3. MEASUREMENT DATA

3.1 Radiated emission

3.1.1 Definitions

A field strength emission is emission from the equipment when transmitting into a non-radiating load over fundamental frequency and frequencies that are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

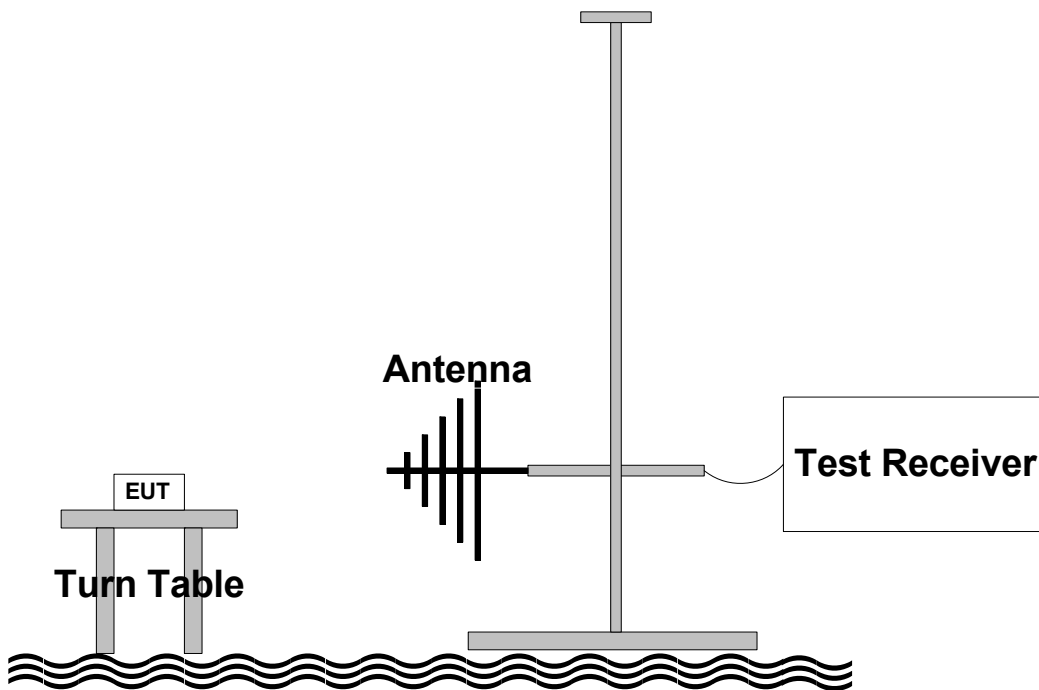
3.1.2 Specification

- FCC Rules Part 15 Subpart C Section 15.209
- IC Rules RSS-Gen issue3 and RSS-210 Issue8 2010

3.1.3 Measurement method

- ANSI Standard C63.4-2009 8.3

3.1.4 Set-up



3.1.5 Test equipment list

Equipment	Model name	Manufacturer
EUT	ANT-RFID-315	SEGI LIMITED
Spectrum Analyzer	FSV	R&S
Loop Antenna	EMCO 6502	EMCO
Bi-conical Antenna	VHA9103	Schwarzbeck
Log Periodic Antenna	VULP9118A	Schwarzbeck

3.1.6 Test procedure

The EUT is placed on a turntable, which is 0.8 meter high above ground.

The turntable rotates 360 degrees to determine the position of the maximum emission level.

EUT is set 3.0 meters away from the receiving antenna, loop antenna and broadband antenna, which is mounted on an antenna mast.

The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level from the EUT. Both horizontal and vertical polarizations of the antenna are set on measurement.

In order to find out the maximum emission levels, all of the EUT location were manipulated according to ANSI 63.4 during the radiated emission measurement.

The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 200 Hz between 9 to 150 kHz, 9 kHz between 150 kHz to 30 MHz, and 120 kHz between 30 MHz to 1 GHz.

3.1.7 Test condition

- Test place : Open area test site
- Test environment : 18 °C, 59 % R.H.
- Test mode : Normal Operation

3.1.8 Test result

Frequency [MHz]	Detect Mode [Peak/QP/AVG]	Reading [dBμV]	Factor [dB/m]	Emission Level [dBμV]	Measurement Distance [m]	Limit [dBμV]	Margin [dB]
0.020	Peak	83.9	11.5	95.4	3	121.6	26.2
0.060	Peak	56.1	11.1	67.2	3	112.0	44.8
400.540	Peak	16.8	15.7	32.5	3	46.0	13.5
986.420	Peak	10.7	23.1	33.8	3	46.0	12.2

If the Peak mode measured value compliance with and lower than QP and Average mode limit, the EUT shall be deemed to meet QP and Average mode limits and then no additional QP and Average mode and measurement performed.

If measurement is executed at 3 m distance, then radiated emission limitation at 3 m distance is adjusted by using the formula of "Ld1 = Ld2 * (d2/d1)²".

Example:

Radiated emission limit at 30 m distance is 30 uV/m, then radiated emission limitation at 3m distance is adjusted as;

$$Ld1 = L1 = 30 \text{ uV/m} * (30/3)^2 = 100 * 30 \text{ uV/m}$$

3.1.9 Limit

Frequency (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	48.52 to 13.80	300
0.490 – 1.705	24000/F(kHz)	33.80 to 22.97	30
1.705 – 30.0	30	29.54	30
30 – 88	100	40.00	3
88 – 216	150	43.52	3
216 – 960	200	46.02	3
Above 960	500	53.98	3

3.2 Occupied bandwidth

3.2.1 Definitions

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable

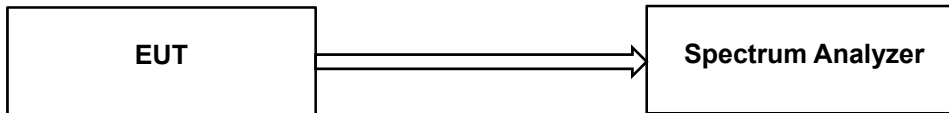
3.2.2 Specification

- IC Rules RSS-Gen Issue3 Section 4.6

3.2.3 Measurement method

- IC Rules RSS-Gen Issue3 Section 4.6.1

3.2.4 Set-up



Spectrum analyzer setting:

- Center Frequency : 20 kHz
- Span : 20 kHz
- RBW : 200 Hz
- VBW : 1 kHz
- Sweep time : Auto
- Detect Mode : RMS

3.2.5 Test equipment list

Equipment	Model name	Manufacturer
EUT	ANT-RFID-315	SEGI LIMITED
Spectrum Analyzer	ESPI	R&S

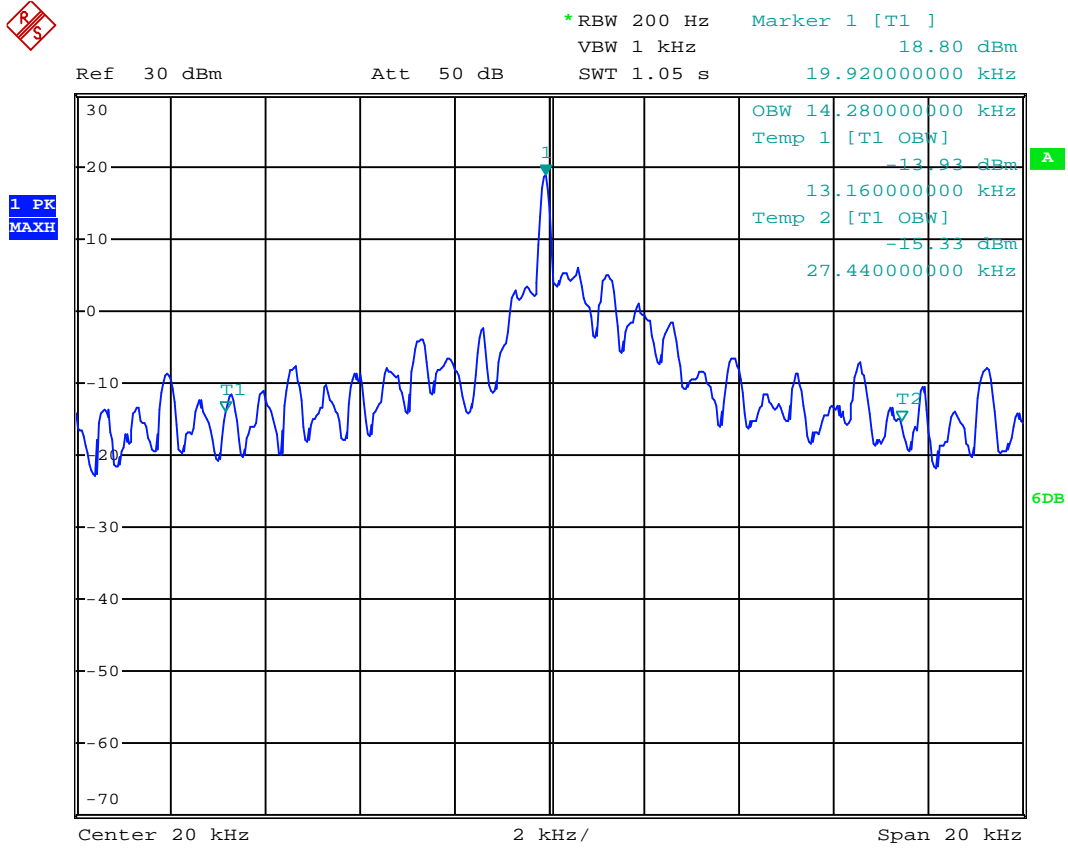
3.2.6 Test condition

- Test place : Open area test site
- Test environment : 18 °C, 59 % R.H.
- Test mode : Normal Operation

3.2.7 Test result

Frequency (MHz)	99% Bandwidth (kHz)
0.020	14.28

3.2.8 Plots of 99% bandwidth



Date: 18.JUN.2013 11:26:18

4. TEST EQUIPMENT LIST

The listing below denotes the test equipment for the test(s).

No.	Equipment	Model	Manufacturer	Serial Number	Calibration Due date
1	Spectrum Analyzer	FSV	R&S	101673	02/09/14
2	Test Receiver	ESPI	R&S	101002	09/26/13
3	Power Supply	E3633A	Agilent	SG400022272	01/29/14
4	Loop Antenna	6502	EMCO	9609-9087	02/13/14
5	Biconical Antenna	BBAK9137	Schwarzbeck	2217	11/23/13
6	Log-Periodic Antenna	VULP9118A	Schwarzbeck	382	11/23/13
7	Horn Antenna	BBHA 9120 D	Schwarzbeck	395	08/13/13
8	Pre-Amplifier	JS4-00102600-26-5	Miteq	383521	01/29/14
9	Turn Table	N/A	Daeil EMC	N/A	N/A
10	Antenna Mast	EAM4.5	Daeil EMC	N/A	N/A
11	Controller	DE200	Daeil EMC	AAA69813111	N/A