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FCC Part 15, Subpart C
Test Report

On

RFID Module
FCC ID: ADG17688

Customer Name:	GAI-Tronics Corporation
Customer P.O:	4504977808
Date of Report:	December 2, 2019
Test Report No:	R-3132P-1a
Test Start Date:	October 17, 2019
Test Finish Date:	October 17, 2019
Test Technician:	M. Nowak
Approved By:	D. Rybicki
Report Prepared By:	P. Harris

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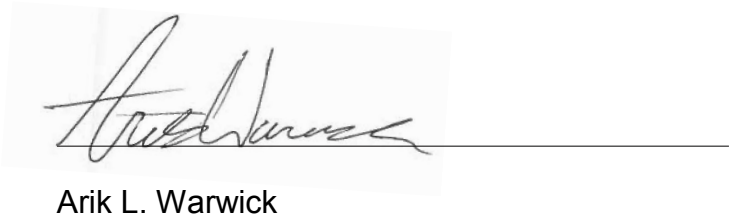
Certification and Signatures

We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.



Arik L. Warwick
EMC Test Engineer

David M. Rybicki
Laboratory Supervisor

Non-Warranty Provision
The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

Non-Endorsement
This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This test report may not be used by the client to claim product endorsement by ANSI National Accreditation Board (ANAB).

Technical Information

Report Number:	R-3132P-1a
Applicant:	GAI-Tronics Corporation
	3030 Kutztown Road
	Reading, PA 19605
Manufacturer:	GAI-Tronics Corporation
Manufacturer Address:	3030 Kutztown Road
	Reading, PA 19605
Test Sample:	RFID Module
Part Number:	69688-001
Model Number:	17688
Power Requirements:	5 VDC
Frequency of Operation:	125 kHz, 13.56 MHz
Antenna Type:	125 kHz – Wire Loop
Equipment Use:	RFID Tag Reader Module
Equipment Class:	DCD

Test Specification:
FCC Rules and Regulations Part 15, Subpart C, Section 15.209

Test Procedure:
ANSI C63.10: 2013

Test Facility:
Retlif Testing Laboratories
3131 Detwiler Road
Harleysville, PA 19438

FCC Registered Test Site Number: 98314

EUT Description/Installation:
The EUT is an RFID Module intended to be installed exclusively in GAI-Tronics HUBBCOM devices.

Tests Performed

The test method performed on the RFID Module is shown below:

Table 1 - Test Method Performed

FCC Part 15, Subpart C	Test Method
15.209	Field Strength of Spurious, Out of Band/Band Edge Emissions

General Test Requirements

1. The measurement procedures of ANSI C63.10:2013 were utilized as specified in FCC Part 15, Subpart C, Section 15.31(a)(3).
2. All measurements were performed at a 3 meter test distance.
3. The EUT was rotated 360 degrees for all radiated measurements.
4. All readily accessible EUT controls were adjusted in such a manner as to maximize the level of emissions in accordance with FCC Section 15.31(g).

Requirements and Test Results

Requirement:
FCC Section 15.209 - The field strength of any emission shall not exceed the general radiated limits of 15.209 as shown in Table 2 below.

Table 2 - Test Limits, Field Strength of Out of Band Emissions

Fundamental Frequency (MHz)	Field Strength of Fundamental microvolts/meter	Measurement Distance
0.009 to 0.490	2400/F(kHz)	300
0.490 to 1.705	24000/F(kHz)	30
1.705 to 30.0	30	30
30.0 to 88.0	100	3
88.0 to 216.0	150	3
216.0 to 960.0	200	3
Above 960.0	500	3

FCC Section 15.209, Radiated Emissions Measurement

The field strength of radiated emissions were measured with a spectrum analyzer or EMI Receiver. The EUT was placed on an 80cm high wooden test stand located 3 meters from the test antenna on a FCC listed open area test site. Emissions from the EUT were maximized by re-orientating the test sample, rotating the test sample 360 degrees, changing the polarization/orientation of the test antenna and raising and lowering the test antenna from 1 – 4 meters. The maximized field strength of each observed emission was measured, recorded and compared to the specified limits of 15.209. When necessary, the marker/delta method was used to verify bandedge compliance.

- **Results**: The maximized measured field strength of the radiated emissions were below the specified test limits of 15.209. See test data.

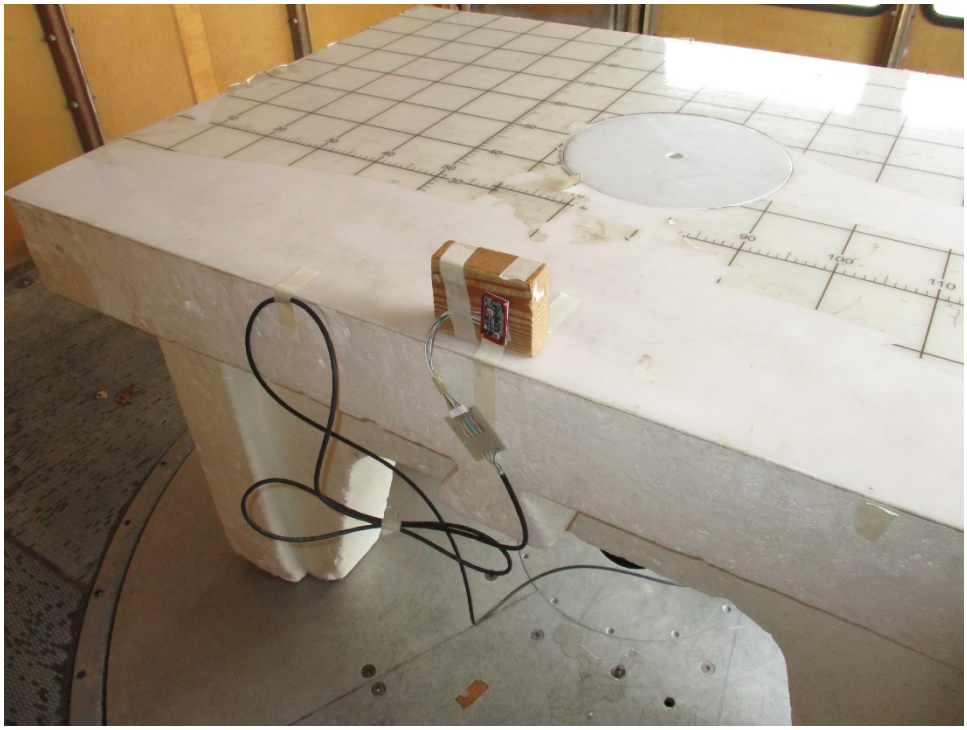
Equipment Lists

FCC Section 15.209 – Field Strength of Spurious and Out of Band Emissions

EN	Manufacturer	Description	Range	Model No.	Cal Date	Due Date
127A	ETS / EMCO	ANTENNA, BICONICAL	20 - 200 MHz	3104	5/6/2019	11/30/2020
3207	ETS / EMCO	ANTENNA, ACTIVE LOOP	9 kHz - 30 MHz	6502	5/13/2019	5/31/2020
8016	ETS / EMCO	ANTENNA, LOG PERIODIC	200 MHz - 1 GHz	3146	9/9/2019	3/31/2021
8047	CMT	PRE-AMPLIFIER	100 kHz - 1 GHz	LF51104N	3/28/2019	3/31/2020
8079	ROHDE & SCHWARZ	RECEIVER, EMI	9 kHz - 30 MHz	ESH3	6/19/2019	6/30/2020
8080	ROHDE & SCHWARZ	RECEIVER, EMI	20 - 1300 MHz	354-3000.56ESVP	10/30/2018	10/31/2019
8300	RETLIF	OPEN AREA TEST SITE, ATTENUATION	3/10 Meter OATS	RPA	3/28/2018	3/31/2020
8300C	UNKNOWN	CABLE, COAXIAL	3/10 METER	3 METER CABLE	8/15/2019	2/29/2020
8637	AGILENT/HP	ANALYZER, SPECTRUM	30 Hz - 26.5 GHz	8563E	7/9/2019	7/31/2020
8668	DIGI-SENSE	HYGROMETER	0 - 50 deg. c, 10 - 90 % RH	20250-31	9/24/2019	3/31/2020
8685	RETLIF	CABLE, COAXIAL	10 kHz - 18 GHz	3' TYPE N	2/15/2019	2/29/2020

Test Photographs
Field Strength of Spurious and Out of Band Emissions
FCC Part 15, Subpart C, Section 15.209

Test Photographs
Field Strength of Spurious and Out of Band Emissions



EUT Configuration

Test Photographs
Field Strength of Spurious and Out of Band Emissions

Test Setup, 9 kHz to 30 MHz, Parallel

Test Setup, 9 kHz to 30 MHz, Perpendicular

Test Photographs
Field Strength of Spurious and Out of Band Emissions

Horizontal Antenna Polarization, 30 to 200 MHz

Vertical Antenna Polarization, 30 to 200 MHz

Test Photographs
Field Strength of Spurious and Out of Band Emissions

Horizontal Antenna Polarization, 200 MHz to 1 GHz

Vertical Antenna Polarization, 200 MHz to 1 GHz

FCC Part 15, Subpart C, Section 15.209
Test Data, Field Strength of Spurious and Out of Band Emissions, 9 kHz to 1 GHz

EMISSIONS TEST DATA SHEET	
Test Specification:	FCC Part 15, Subpart C, Section 15.209, Radiated Emissions
Method:	ANSI C63.10, Section 6, Standard Test Methods, 9 kHz to 1 GHz
Job Number/Customer:	R – 3132P-1a / GAI-Tronics Corporation
Test Sample:	RFID Module
Part Number:	69688-001
Operating Mode:	Continuously Transmitting 125 kHz signal
Technician:	M. Nowak
Date(s):	10/17/19
Temperature:	11.0 ºC
Relative Humidity:	50 %
Detector:	Quasi-peak
Test Distance:	3m

Notes: The frequency range was scanned from 9 kHz to 30 MHz
The emissions observed from the EUT do not exceed the specified limits. The two highest readings relative to the limit are presented.
*Noise floor measurement, minimum sensitivity of measurement system.

Frequency	Antenna Position	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted to 300m	Converted Reading	Limit at 300m
MHz	(Par/Perp) / Height	Degrees	dBuV	dB	dBuV/m	dBuV/m	uV/m	uV/m
0.009								266.67
|								|
0.125	Par / 1.00	170.6	53.2	11.6	64.8	-40	17.38	19.2
0.125	Perp / 1.00	130.8	44.4	11.6	56.0	-40	6.31	19.2
|								|
0.490								4.89

Frequency	Antenna Position	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted to 30m	Converted Reading	Limit at 30m
MHz	(Par/Perp) / Height	Degrees	dBuV	dB	dBuV/m	dBuV/m	uV/m	uV/m
0.490								48.98
|								|
1.705								14.08
1.705								30.00
|								|
*14.80	Par / 1.00	180.0	13.5	10.5	24.0	-	15.85	|
|								|
*25.00	Par / 1.00	180.0	5.6	7.8	13.4	-	4.68	|
|								|
30.00								30.00

EMISSIONS TEST DATA SHEET

Test Specification:	FCC Part 15, Subpart C, Section 15.209, Radiated Emissions
Method:	ANSI C63.10, Section 6, Standard Test Methods, 9 kHz to 1 GHz
Job Number/Customer:	R – 3132P-1a / GAI-Tronics Corporation
Test Sample:	RFID Module
Part Number:	69688-001
Operating Mode:	Continuously Transmitting 125kHz signal
Technician:	M. Nowak
Date(s):	10/17/19
Temperature:	11.0 ºC
Relative Humidity:	50 %
Detector:	Quasi-peak
Test Distance:	3m

Notes: The frequency range was scanned from 30 MHz to 1 GHz
The emissions observed from the EUT do not exceed the specified limits. The six highest readings relative to the limit are presented.
*Noise floor measurement, minimum sensitivity of measurement system,

Frequency	Antenna Pol /Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading	Limit
MHz	(V/H) / (m)	Degrees	dBuV	dB	dBuV/m	uV/m	uV/m
30.00							100
*33.00	H / 1.00	180.0	4.6	12.3	16.9	7.00	
88.00							100
88.00							150
216.00							150
216.00							200
240.00	H / 1.60	153.1	23.0	14.1	37.1	71.62	
240.00	V / 1.00	173.0	28.4	14.1	42.5	133.36	
264.00	H / 1.34	182.5	19.4	15.2	34.6	53.71	
264.00	V / 1.87	224.2	20.6	15.2	35.8	61.66	
288.00	H / 1.27	199.1	19.6	16.5	36.1	63.83	
288.00	V / 1.36	156.0	22.6	16.5	39.1	90.16	
360.00	H / 1.84	193.3	18.9	17.7	36.6	67.61	
360.00	V / 1.00	138.6	15.0	17.7	32.7	43.16	
480.00	H / 1.00	163.5	14.9	21.1	36.0	63.10	
480.00	V / 1.51	131.8	14.3	21.1	35.4	58.89	
960.00							200
960.00							500
1000.00							500