



## **MET Laboratories, Inc.** *Safety Certification - EMI - Telecom Environmental Simulation*

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February 15, 2017

Intelligent Automation, Inc.  
15400 Calhoun Place Suite 400  
Rockville, MD 20855

Dear Eric van Doorn,

Enclosed is the EMC Wireless test report for compliance testing of the Intelligent Automation, Inc. ARGUS Modular as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), FCC Part 15 Subpart C, Issue 8, December 2010 for Intentional Radiators.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,  
MET LABORATORIES, INC.

Joel Huna  
Documentation Department

Reference: (Intelligent Automation, Inc.)EMC92310-FCC249 Rev. 1)

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## Electromagnetic Compatibility Criteria Test Report

for the

**Intelligent Automation, Inc.  
Model ARGUS Modular**

**Verified under**  
the FCC Certification Rules  
contained in  
Title 47 of the CFR, Part 15.249 Subpart C

**MET Report: EMC92310-FCC249 Rev. 1**

February 15, 2017

### **Prepared For:**

**Intelligent Automation, Inc.  
15400 Calhoun Place Suite 400  
Rockville, MD 20855**

**Prepared By:**  
**MET Laboratories, Inc.**  
914 West Patapsco Avenue,  
Baltimore, MD 21230

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Title 47 of the CFR, Part 15.249 Subpart C  
for Intentional Radiators



Donald Salguero, Project Engineer  
Electromagnetic Compatibility Lab



Joel Huna  
Documentation Department

**Engineering Statement:** The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Part 15.249 and under normal use and maintenance.



Asad Bajwa, Director  
Electromagnetic Compatibility Lab



Intelligent Automation, Inc.  
ARGUS Modular

Electromagnetic Compatibility  
Report Status  
CFR Title 47, Part 15.249

## Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	December 15, 2016	Initial Issue.
1	February 15, 2017	TCB Review

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## List of Terms and Abbreviations

<b>AC</b>	Alternating Current
<b>ACF</b>	Antenna Correction Factor
<b>Cal</b>	Calibration
<i>d</i>	Measurement Distance
<b>dB</b>	Decibels
<b>dB<sub>μ</sub>A</b>	Decibels above one <b>microamp</b>
<b>dB<sub>μ</sub>V</b>	Decibels above one <b>microvolt</b>
<b>dB<sub>μ</sub>A/m</b>	Decibels above one <b>microamp per meter</b>
<b>dB<sub>μ</sub>V/m</b>	Decibels above one <b>microvolt per meter</b>
<b>DC</b>	Direct Current
<b>E</b>	Electric Field
<b>DSL</b>	Digital Subscriber Line
<b>ESD</b>	Electrostatic Discharge
<b>EUT</b>	Equipment Under Test
<i>f</i>	Frequency
<b>FCC</b>	Federal Communications Commission
<b>GRP</b>	Ground Reference Plane
<b>H</b>	Magnetic Field
<b>HCP</b>	Horizontal Coupling Plane
<b>Hz</b>	Hertz
<b>IEC</b>	International Electrotechnical Commission
<b>kHz</b>	Kilohertz
<b>kPa</b>	Kilopascal
<b>kV</b>	Kilovolt
<b>LISN</b>	Line Impedance Stabilization Network
<b>MHz</b>	Megahertz
<b>μH</b>	Microhenry
<b>μF</b>	Microfarad
<b>μs</b>	Microseconds
<b>PRF</b>	Pulse Repetition Frequency
<b>RF</b>	Radio Frequency
<b>RMS</b>	Root-Mean-Square
<b>TWT</b>	Traveling Wave Tube
<b>V/m</b>	Volts per meter
<b>VCP</b>	Vertical Coupling Plane

## I. Executive Summary

## A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Intelligent Automation, Inc. ARGUS Modular, with the requirements of Part 15, §15.249. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the ARGUS Modular. Intelligent Automation, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the ARGUS Modular, has been **permanently** discontinued.

## B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.249 in accordance with Intelligent Automation, Inc., purchase order number 2248161004-001. All tests were conducted using measurement procedure ANSI C63.4-2014.

FCC Reference	Description	Results
§15.203	Antenna Requirement	Compliant
§15.207	AC Power Line Conducted Emissions	Not Applicable
§15.249 (a)(1)	Field Strength of Fundamental	Compliant
§15.249	Field Strength of Harmonics	Compliant
§15.249	20dB Bandwidth	Compliant
§15.249	Duty Cycle	Compliant
§15.249(a)(d), §15.209	Spurious Emissions	Compliant

**Table 1. Executive Summary of EMC Compliance Testing**

## II. Equipment Configuration

## A. Overview

MET Laboratories, Inc. was contracted by Intelligent Automation, Inc. to perform testing on the ARGUS Modular, under Intelligent Automation, Inc.'s purchase order number 2248161004-001.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Intelligent Automation, Inc., ARGUS Modular.

The results obtained relate only to the item(s) tested.

<b>Model(s) Tested:</b>	ARGUS Modular
<b>EUT Specifications:</b>	Primary Power: 2.1-3.6VDC FCC ID: 2AI6Y-GRIDLOCKMOD Equipment Code: DXX Highest Fundamental Field Strength: 90.69 dBuV/m (average) EUT Frequency Ranges: 905-925 MHz
<b>Analysis:</b>	The results obtained relate only to the item(s) tested.
<b>Environmental Test Conditions:</b>	Temperature (15-35° C) Relative Humidity (30-60%) Barometric Pressure (860-1060 mbar)
<b>Evaluated by:</b>	Donald Salguero
<b>Report Date(s):</b>	February 15, 2017

**Table 2. EUT Specifications**

## B. References

<b>CFR 47, Part 15, Subpart C</b>	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
<b>ANSI C63.4:2014</b>	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
<b>ISO/IEC 17025:2005</b>	General Requirements for the Competence of Testing and Calibration Laboratories
<b>ANSI C63.10-2013</b>	American National Standard for Testing Unlicensed Wireless Devices

**Table 3. References**

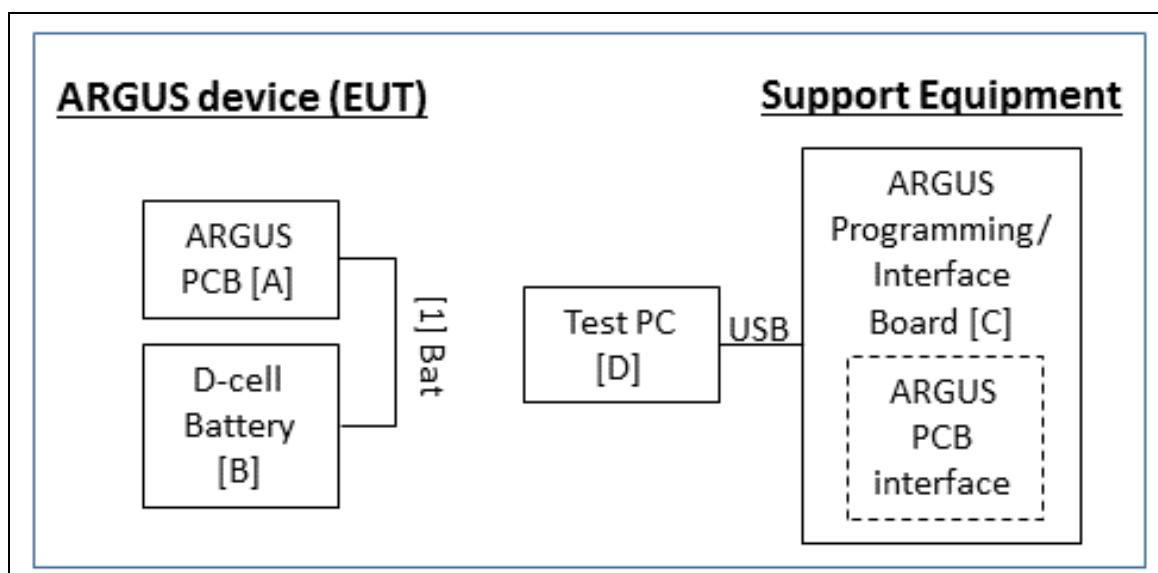
## C. Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

## D. Description of Test Sample

The Intelligent Automation, Inc. ARGUS Modular, Equipment Under Test (EUT), is a system of unattended ground sensors used for the purpose of perimeter intrusion detection, typically in outdoor wooded or open settings surrounding a building or other high valued asset needed protection. Each individual ARGUS sensor is comprised of two radio transceivers – one 2.4GHz transceiver for the purpose of networking and communications, and one 900MHz transceiver for the purpose of sending/receiving the transmissions that are actually used to detect the intruders.



**Figure 1. Block Diagram of EUT Configuration 1**

## E. Equipment Configuration

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
A		ARGUS PCB	IAI15001_ARGUSHS_X4			X4
B		D-cell battery	ER34615			

**Table 4. Equipment Configuration**

## F. Support Equipment

Ref. ID	Name / Description	Manufacturer	Model Number	*Customer Supplied Calibration Data
C	ARGUS PROGRAMMING/INTERFACE BOARD	INTELLIGENT AUTOMATION, INC.	IAI15001_DEV_X2	NOT APPLICABLE
D	TEST/CONFIGURATION PC	PANASONIC	TOUGHBOOK CF-31	NOT APPLICABLE

The 'Customer Supplied Calibration Data' column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.

**Table 5. Support Equipment**

## G. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	BAT	2 conductor, 26 awg	1	0.2		No	

**Table 6. Ports and Cabling Information**

## **H. Mode of Operation**

For testing purposes, we expect to operate either/both transceivers in a continuous modulation (CM) mode on a particular channel to represent a “worst-case” configuration for the device.

## **I. Method of Monitoring EUT Operation**

1. The EUT will blink its onboard LED green three times indicating that it has started up. After startup, no LED indication is present.
2. If directly connected to a PC USB port (via the separate configuration interface board), the EUT will print out statements indicating the test mode being used upon startup. This would be done only to confirm a configuration, but would not be used during actual testing.
3. The 2.4GHz and/or 900MHz transmissions can be observed on a spectrum analyzer.

## **J. Modifications**

### **a) Modifications to EUT**

No modifications were made to the EUT.

### **b) Modifications to Test Standard**

No modifications were made to the test standard.

## **K. Disposition of EUT**

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Intelligent Automation, Inc. upon completion of testing.

### III. Electromagnetic Compatibility Criteria for Intentional Radiators

## Electromagnetic Compatibility Criteria for Intentional Radiators

### §15.203 Antenna Requirement

**Test Requirement:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

- a.) Antenna must be permanently attached to the unit.
- b.) Antenna must use a unique type of connector to attach to the EUT.
- c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

**Test Results:** The EUT as tested is compliant the criteria of §15.203. The EUT has an integral antenna.

**Test Engineer(s):** Donald Salguero

**Test Date(s):** October 25, 2016

## Electromagnetic Compatibility Criteria for Intentional Radiators

### §15.207

### AC Power Line Conducted Emissions

**Test Requirement(s):**

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50  $\Omega$  line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dB $\mu$ V)	
	Quasi-Peak	Average
* 0.15- 0.45	66 - 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

**Table 7. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)**

**Test Procedure:**

The EUT was placed on a 0.8 m-high wooden table inside a screen room. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50  $\Omega$ /50  $\mu$ H Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with *ANSI C63.4-2014 "Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz"*. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50  $\Omega$ /50  $\mu$ H LISN as the input transducer to an EMC/field intensity meter. For the purpose of this testing, the transmitter was turned on. Scans were performed with the transmitter on.

**Test Results:**

The EUT as tested is not applicable with the criteria of §15.207. The EUT is battery powered.

## Electromagnetic Compatibility Criteria for Intentional Radiators

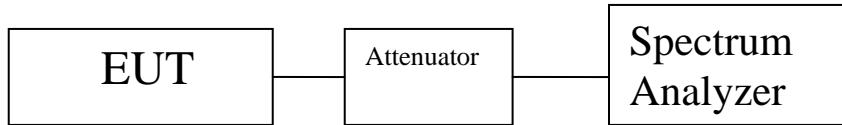
### 20 dB Bandwidth

**Test Procedure:** The transmitter was on and transmitting at the highest output power. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately 1% of the total emission bandwidth,  $VBW > RBW$ . The 20 dB Bandwidth was measured and recorded. The measurements were performed on the low, mid and high channels.

**Test Results** The EUT was compliant with this requirement. No anomalies detected.

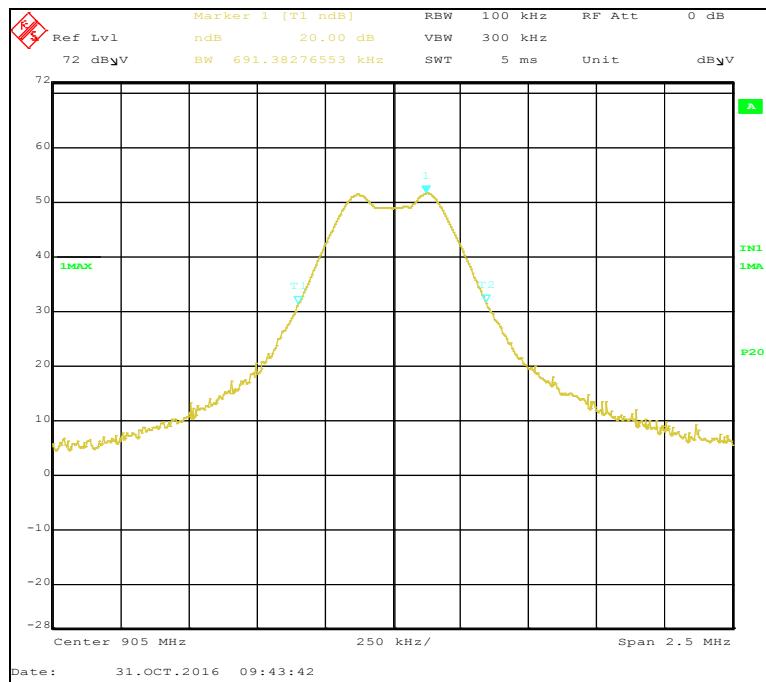
**Test Engineer(s):** Donald Salguero

**Test Date(s):** October 27, 2016

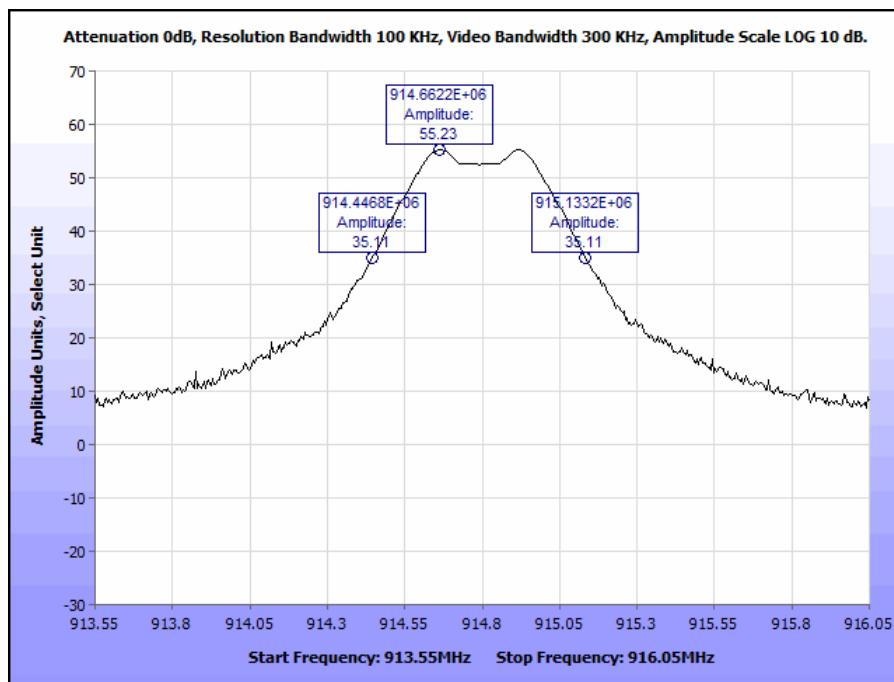


**Figure 2. Block Diagram, Occupied Bandwidth Test Setup**

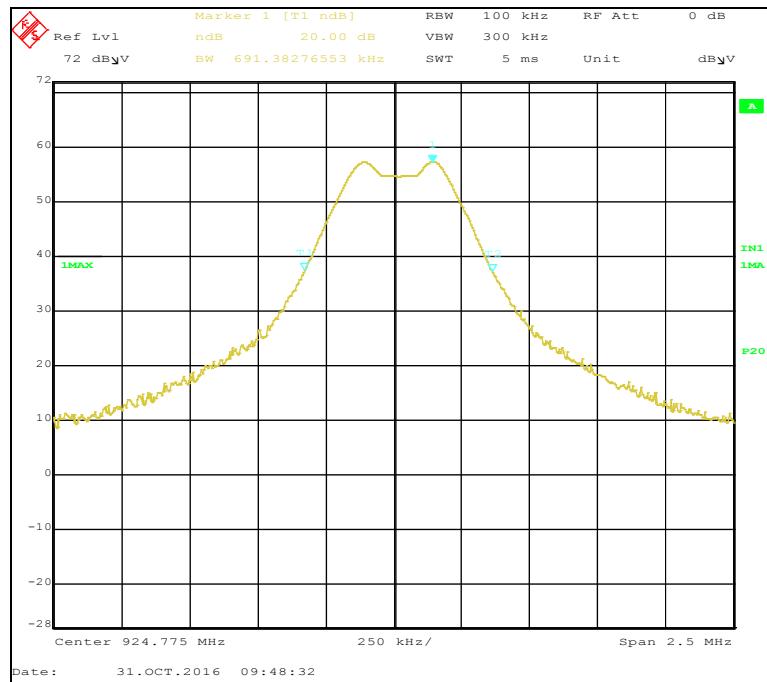
## 20 dB Occupied Bandwidth Test Results



Plot 1. 20 dB Occupied Bandwidth, Low Channel



Plot 2. 20 dB Occupied Bandwidth, Mid Channel



**Plot 3. 20 dB Occupied Bandwidth, High Channel**

## Electromagnetic Compatibility Criteria for Intentional Radiators

### §15.249 (a)(1) Radiated Field Strength of Fundamental

**Test Requirements:** Field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of fundamental (dB $\mu$ V /meter)
902-928 MHz	50	93.98
2400-2483.5 MHz	50	93.98
5725-5875 MHz	50	93.98
24.0-24.25 GHz	250	107.96

Fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band and the field strength of emissions in this band shall not exceed 2500 millivolts/meter (127.96 dB $\mu$ V /meter).

Field strength limits are specified at a distance of 3 meters.

As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits of §15.249 are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

**Test Procedure:** Measurements were performed with the EUT rotated 360 degrees and varying the adjustable antenna mast from 1 m to 4 m height to determine worst case orientation for maximum emissions. The antenna was placed 3m away from the EUT. The EUT was rotated about all three orthogonal axes.

**Test Results:** The EUT as tested is compliant with the criteria of §15.249. No anomalies detected.

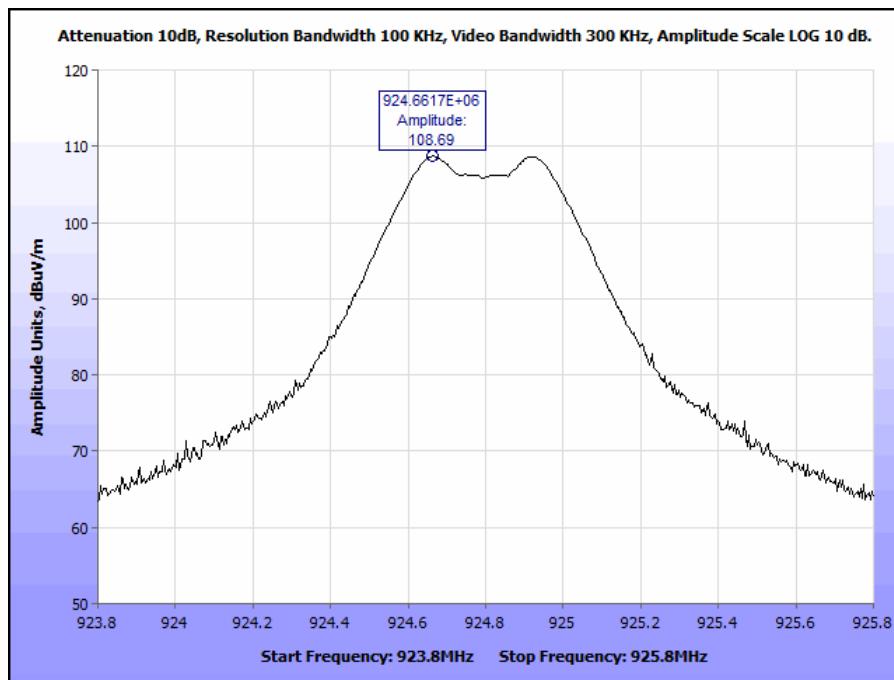
**Test Engineer(s):** Donald Salguero

**Test Date(s):** November 4, 2016

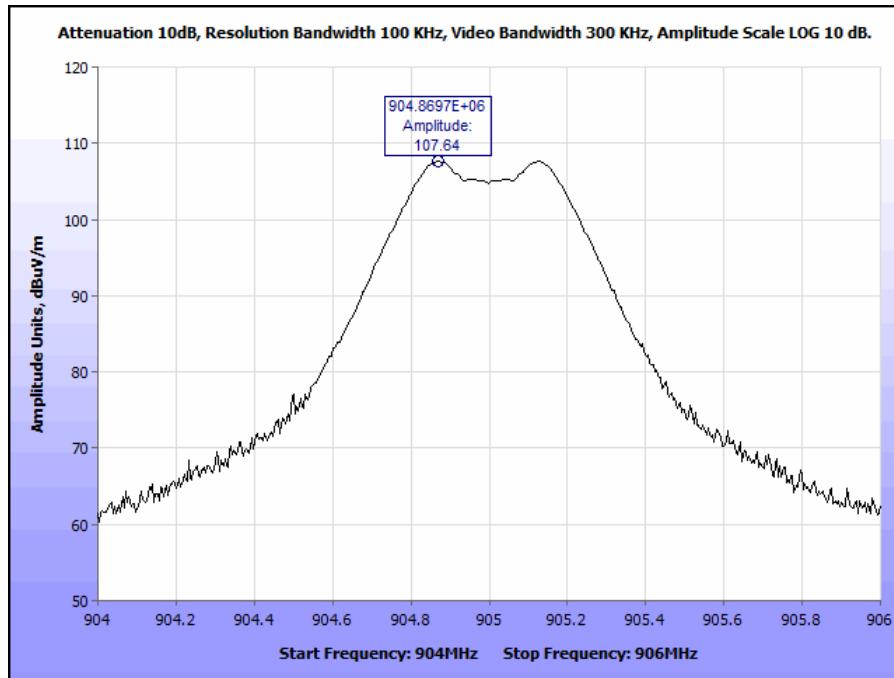
## Field Strength of Fundamental

Frequency MHz	Field Strength Peak dBuV/m	Duty Cycle dB	Field Strength Average dBuV/m	Average Limit dBuV	Margin
904.869	108.64	-18	90.64	94	-3.36
914.665	107.64	-18	89.64	94	-4.36
924.661	108.69	-18	90.69	94	-3.31

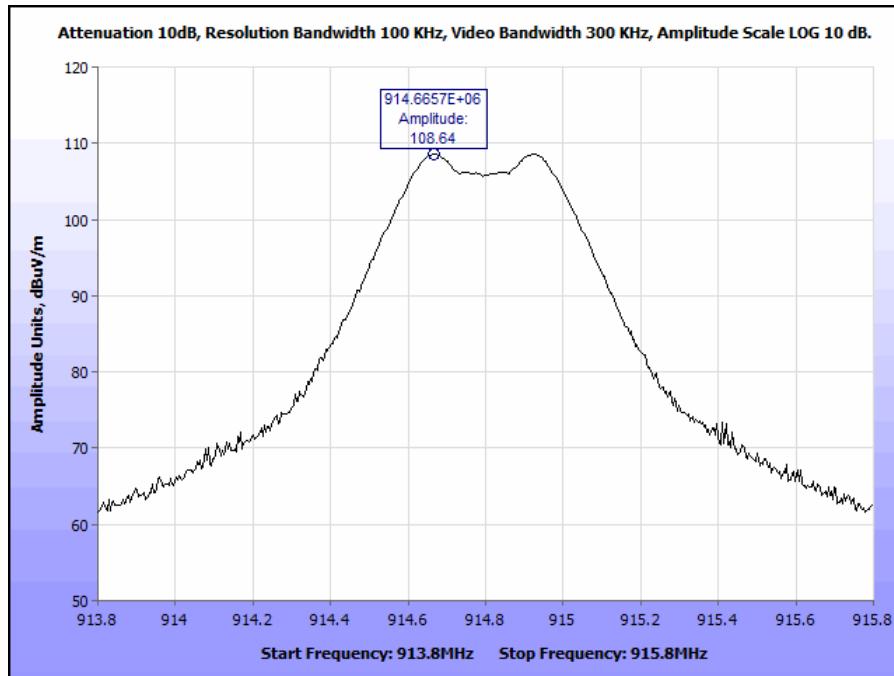
**Table 8. Field Strength Table, Test Results**



**Plot 4. Field Strength of Fundamental and Harmonics, High**



**Plot 5. Field Strength of Fundamental and Harmonics, Low**



**Plot 6. Field Strength of Fundamental and Harmonics, Mid**

## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.249 (d) Spurious Emissions

**Test Requirements:** Harmonics originating from devices that operate in the 900- 928 MHz band shall meet the 2500 microvolts/meter limit (i.e.68 dB $\mu$ V/m) with an average detector. In addition, emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

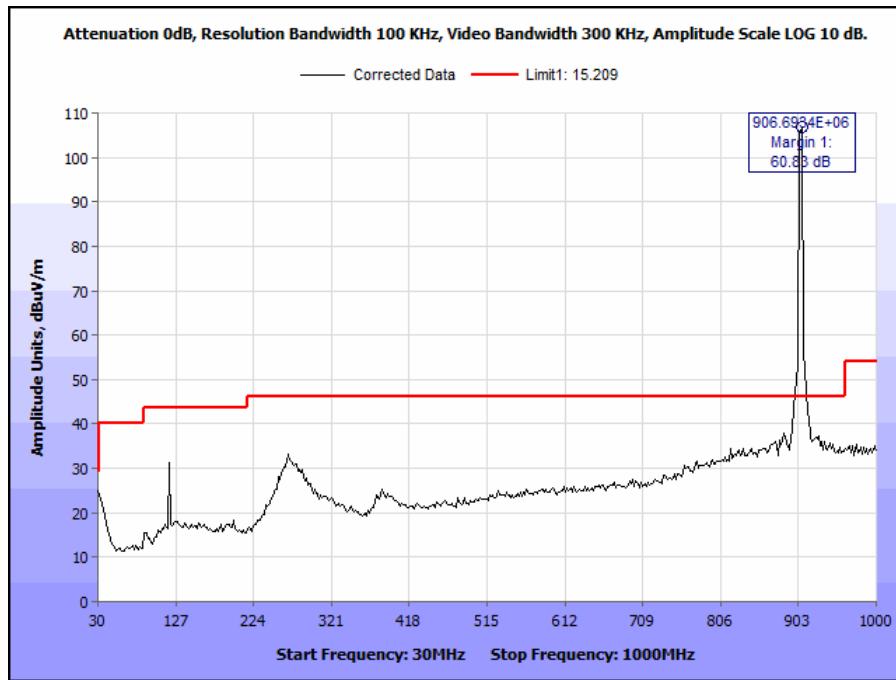
**Test Procedure:** Measurements were performed with the EUT rotated 360 degrees and varying the adjustable antenna mast with 1 m to 4 m height to determine worst case orientation for maximum emissions. Emissions below 1 GHz were performed with the antenna placed 3m away from EUT. For above 1 GHz, the measuring antenna was placed 1m away and accounted for distance correction. Measurements were performed from 30MHz to 18GHz.

**Test Results:** The EUT is compliant with the harmonics and Spurious Emissions Requirements of §15.249(a)(d). No anomalies detected. Only noise floor was detected above 18GHz.

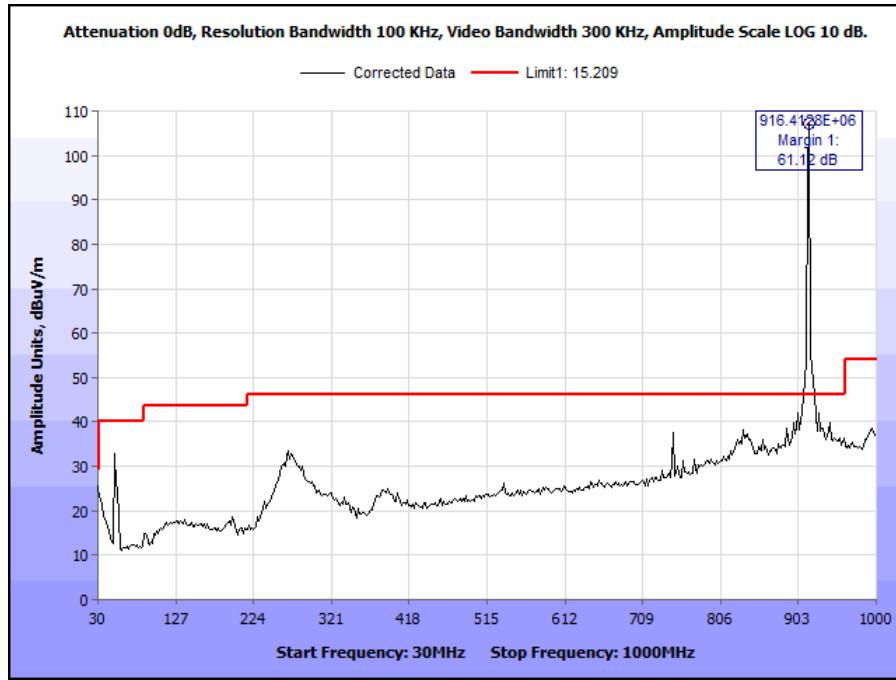
**Test Engineer(s):** Donald Salguero

**Test Date(s):** October 31, 2016

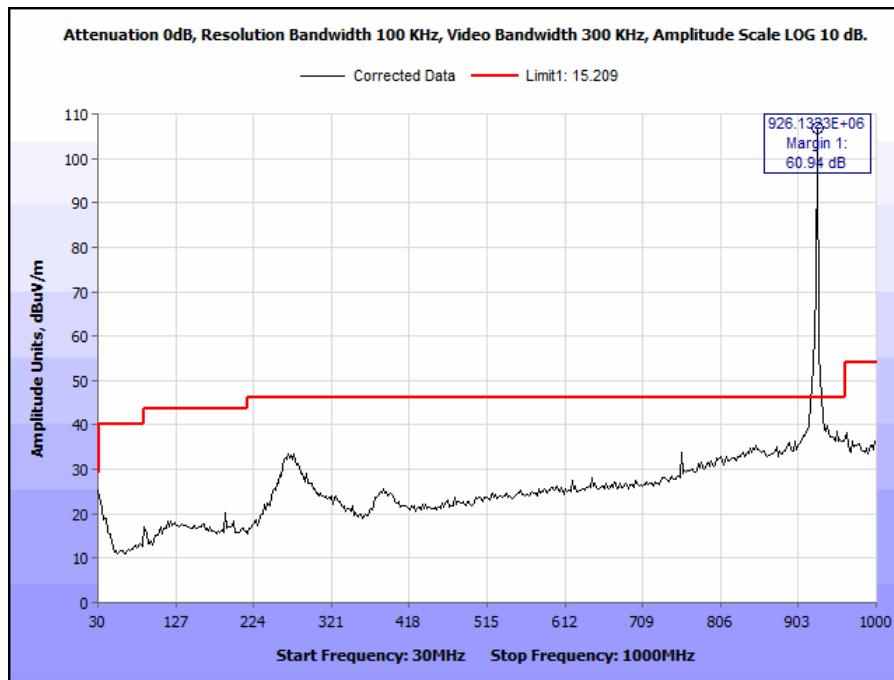
## Radiated Spurious Emissions



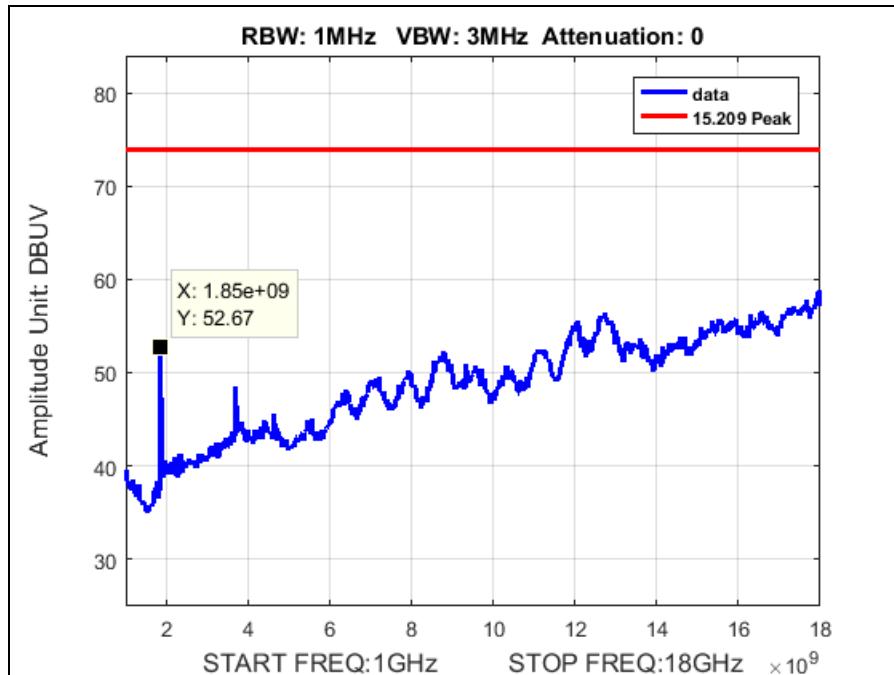
Plot 7. Radiated Spurious Emission, 30MHz-1GHz, Low Channel



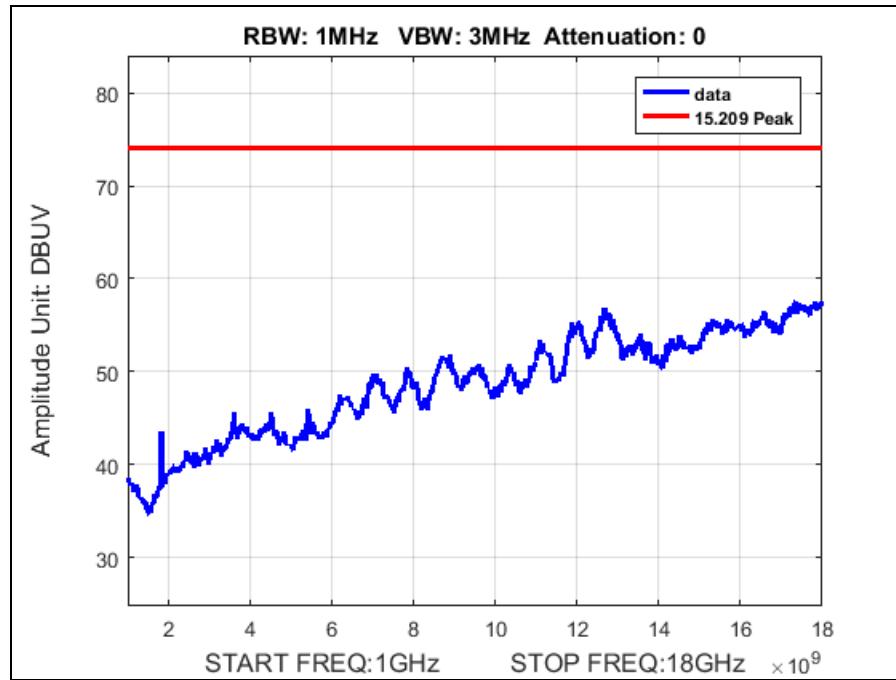
Plot 8. Radiated Spurious Emission, 30MHz-1GHz, Mid Channel



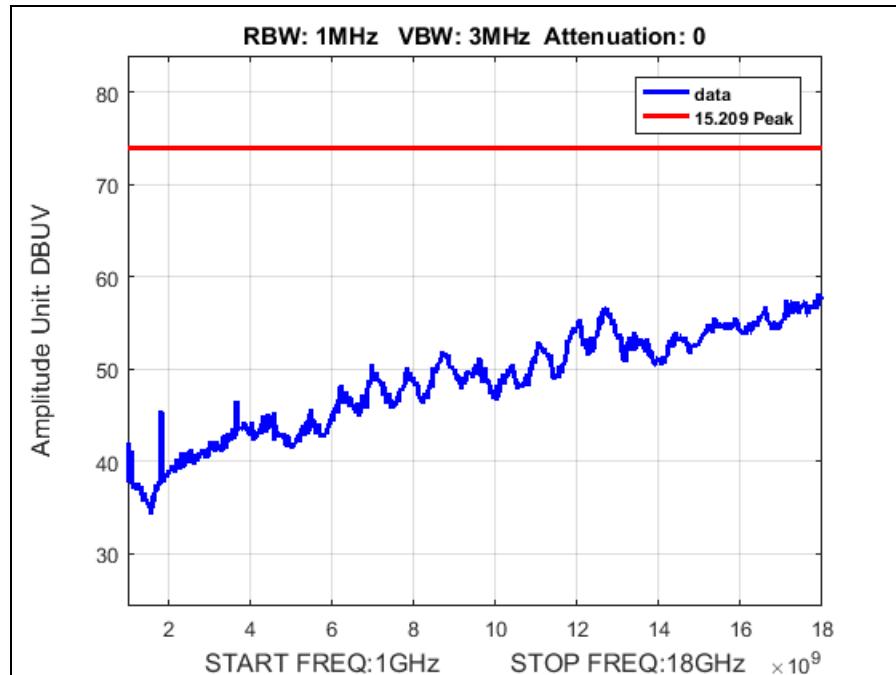
**Plot 9. Radiated Spurious Emission, 30MHz-1GHz, High Channel**



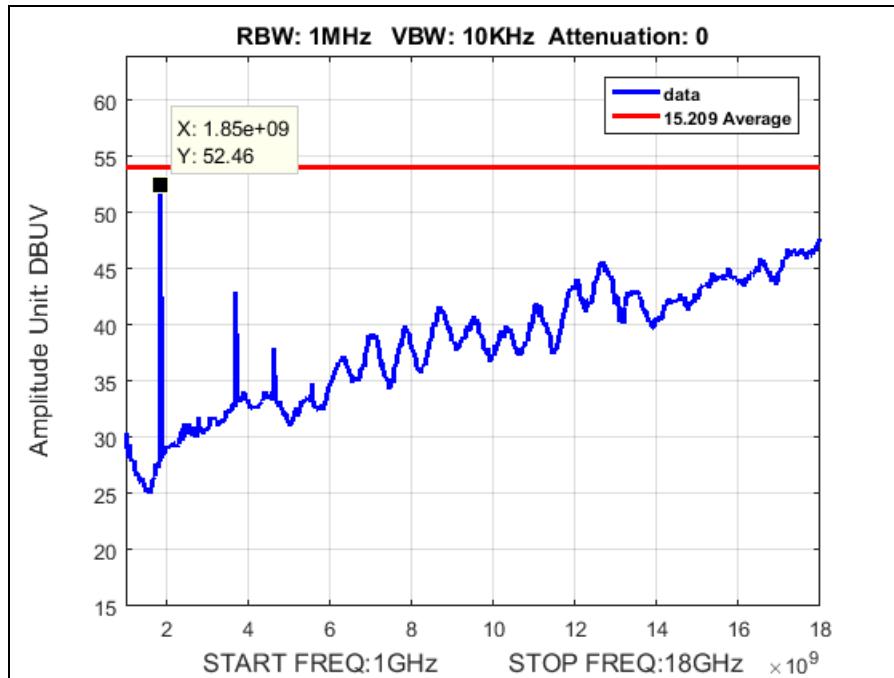
**Plot 10. Peak Radiated Spurious Emissions, 1-18GHz, High Channel**



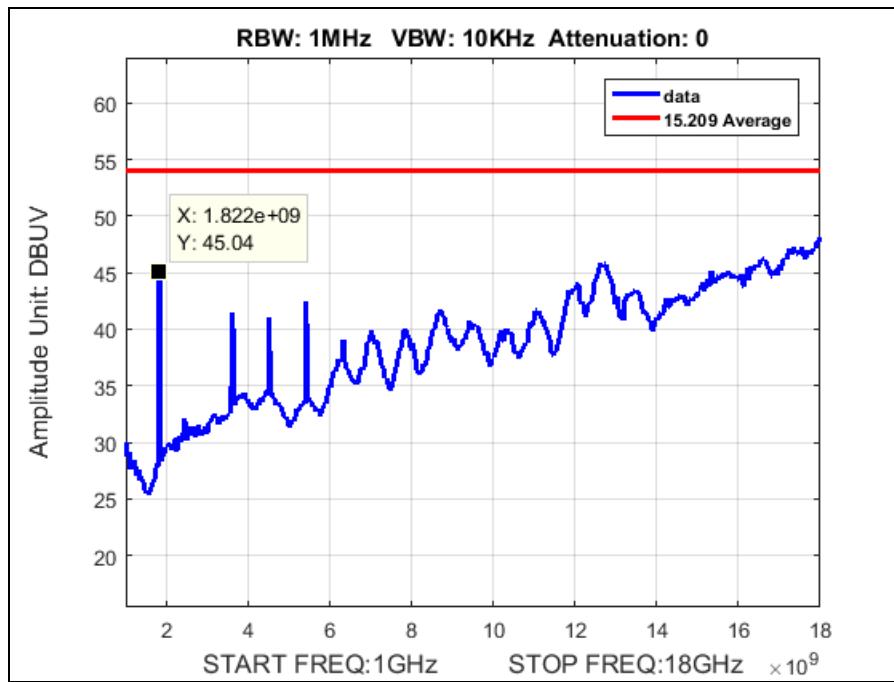
Plot 11. Peak Radiated Spurious Emissions, 1-18GHz, Low Channel



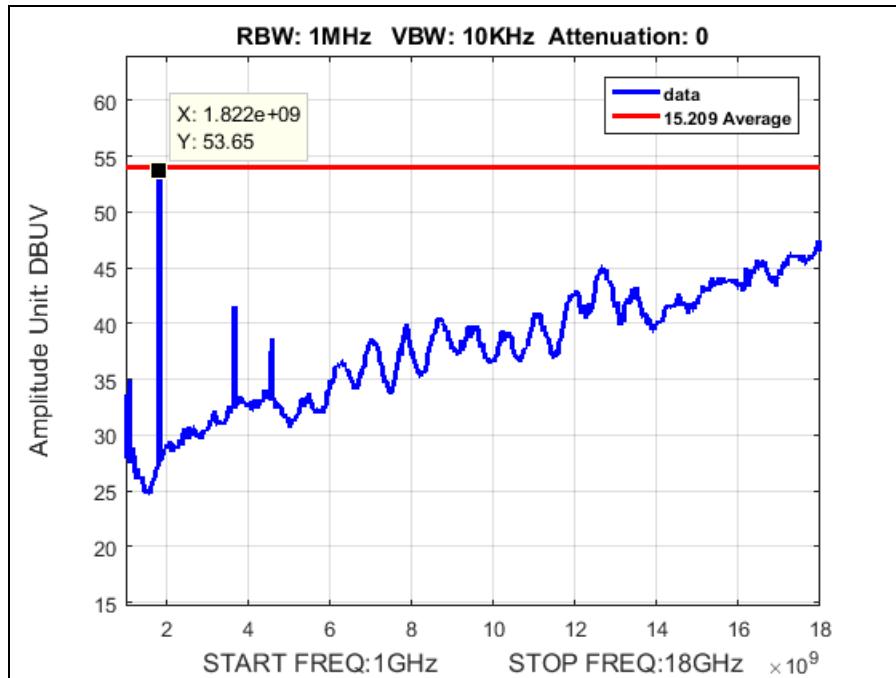
Plot 12. Peak Radiated Spurious Emissions, 1-18GHz, Mid Channel



Plot 13. Average Radiated Spurious Emissions, 1-18GHz, High Channel



Plot 14. Average Radiated Spurious Emissions, 1-18GHz, Low Channel

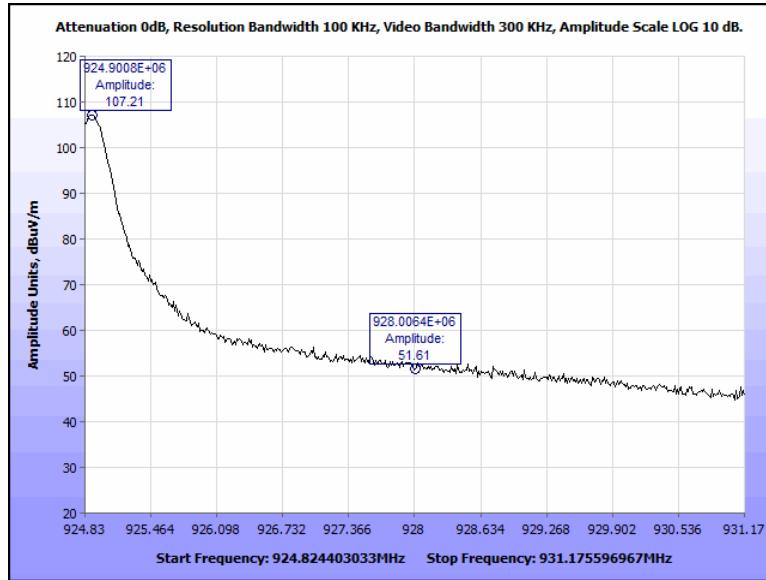


Plot 15. Average Radiated Spurious Emissions, 1-18GHz, Mid Channel

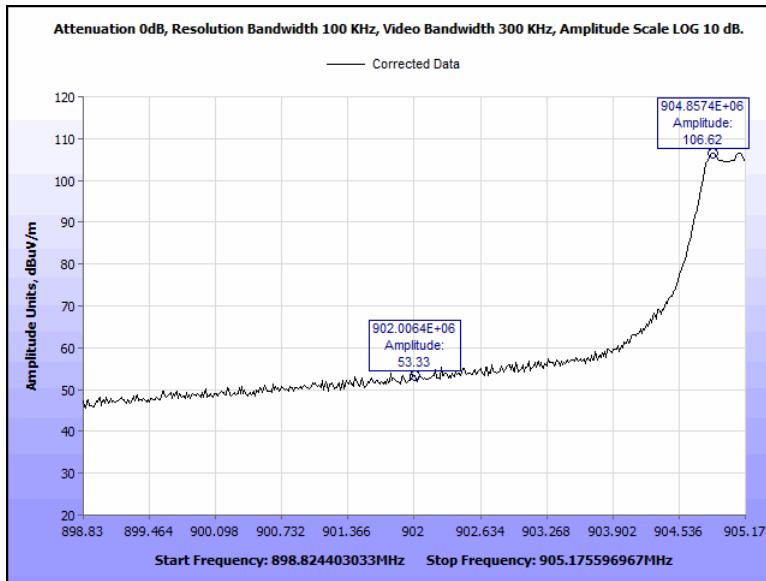
## Radiated Band Edge

**15.249(d):** Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by 50dB below the level of the fundamental or to the general radiated emission limits of 15.209, whichever is the lesser attenuation.

**Result:** 15.249(d) 50dB below fundamental limit is compliant.

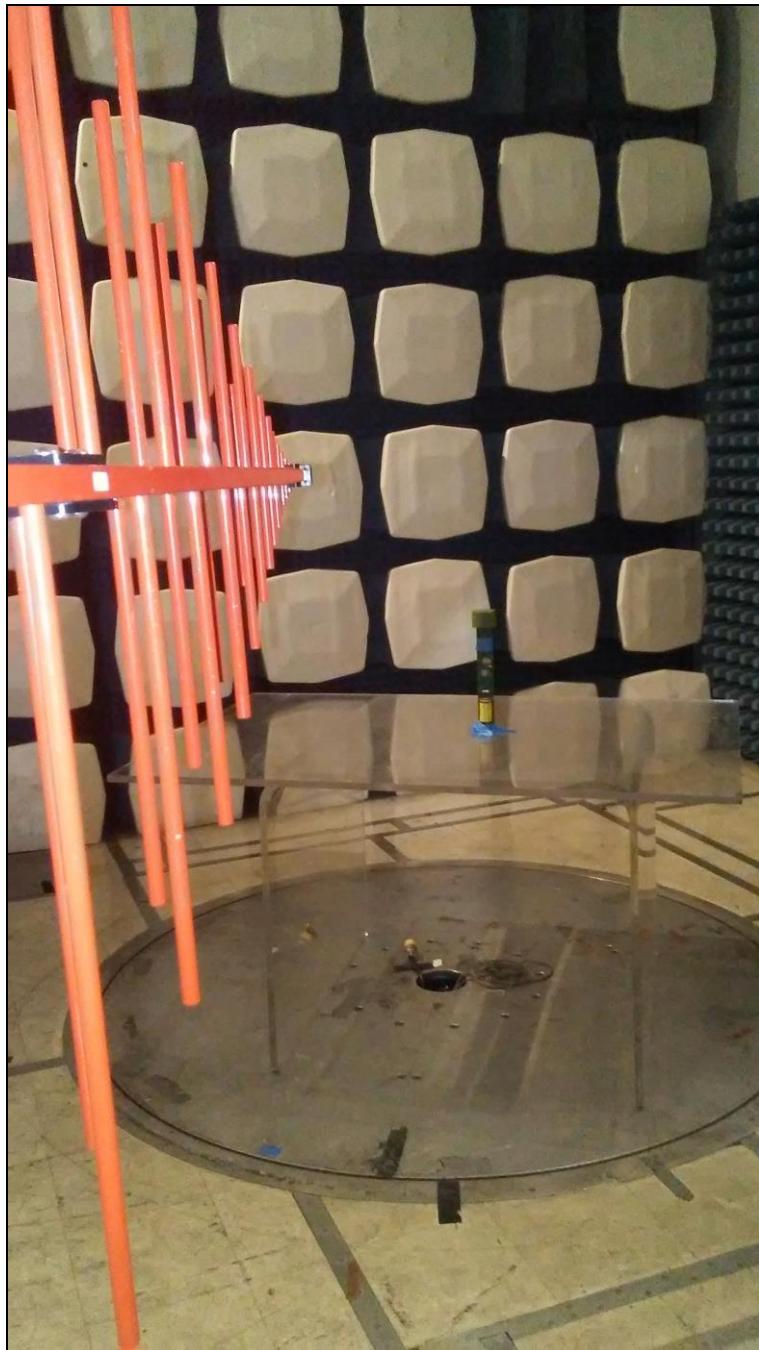


Plot 16. Radiated Spurious Band Edge, High Channel



Plot 17. Radiated Spurious Band Edge, Low Channel

## Test Setup



**Photograph 1. Radiated Spurious Emissions Setup, Below 1GHz**

## Test Setup



**Photograph 2. Radiated Spurious Emissions Setup, Above 1GHz**

## Electromagnetic Compatibility Criteria for Intentional Radiators

### Duty Cycle Calculation

**Test Engineer(s):** Donald Salguero

**Test Date(s):** November 4, 2016

Frequency Band	Period mS	On Time mS	Duty Cycle
902-928 MHz	7.25	0.896	-18.16059994

**Table 9. Duty Cycle, Test Results**

Note: Duty Cycle = On Time / Period  
In dB =  $20 \log(\text{Duty Cycle})$

#### 915MHz transceiver

For the 915MHz transceiver, in each timeslot the radio will do one of the following:

- 1) Remain inactive
- 2) Transmit a packet
- 3) Potentially receive a packet

When transmitting a packet, transmission duration fixed at 0.896 ms, which corresponds to a 28 byte packet sent at 250 kbps. The maximum possible duty cycle is obtained by transmitting in every timeslot. The maximum duty cycle is then:

$$\begin{aligned} \text{Max Tx duty cycle} &= 0.896 \text{ ms on} / 7.25 \text{ ms} \\ &= 12.359 \% \end{aligned}$$

Sincerely yours,



David Mayhew  
Principal Engineer  
Intelligent Automation, Inc.

**Photograph 3. Excerpt from ARGUS – Operational Description**

## IV. Test Equipment

## Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

Asset	Equipment	Manufacturer	Model	Calibration Date	Calibration Due Date
1T4149	HIGH-FREQUENCY ANECHOIC CHAMBER	RAY PROOF	81	NOT REQUIRED	
1T4300	SEMI-ANECHOIC CHAMBER # 1 (NSA)	EMC TEST SYSTEMS	NONE	2/6/2015	2/6/2018
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	11/29/2014	11/29/2016
1T4442	PRE-AMPLIFIER, MICROWAVE	MIITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T4483	ANTENNA; HORN	ETS-LINDGREN	3117	10/8/2015	4/8/2017
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	2/26/2016	8/26/2017
1T4771	PSA SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4446A	8/10/2016	2/10/2018

**Table 10. Test Equipment**

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.



Intelligent Automation, Inc.  
ARGUS Modular

Electromagnetic Compatibility  
Certification & User's Manual Information  
CFR Title 47, Part 15.249

## V. Certification & User's Manual Information



## Certification & User's Manual Information

### A. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

#### § 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of emitting radio-frequency energy by radiation, conduction, or other means. Radio-frequency devices include, but are not limited to:

- (a) The various types of radio communication transmitting devices described throughout this chapter.
- (b) *The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.*
- (c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.
- (d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

#### § 2.803 Marketing of radio frequency devices prior to equipment authorization.

- (a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:
  - (1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or
  - (2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.
- (d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.



(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

- (i) *Compliance testing;*
- (ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;
- (iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;
- (iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production stages; or
- (v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.



## Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

### § 2.901 Basis and Purpose

- (a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.<sup>1</sup> *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer,* be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.
- (b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

### § 2.907 Certification.

- (a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.
- (b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

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<sup>1</sup> In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.



## Certification & User's Manual Information

### § 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) *If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.*

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.



## Certification & User's Manual Information

### Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

#### § 15.19 Labeling requirements.

(a) *In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:*

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

*This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

#### § 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



## Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

### § 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# End of Report