

Company: Aruba Networks, Inc.

Test of: APIN0314 & APIN0315  
To: FCC CFR 47 Part 15.247 (DTS) & IC RSS-247

Report No.: ARUB204-U5\_Master Draft #2

**CONDUCTED, RADIATED TEST REPORT**



# CONDUCTED, RADIATED TEST REPORT



Test of: Aruba Networks, Inc. APIN0314 & APIN0315

to

To: FCC CFR 47 Part 15 15.247 (DTS) & IC RSS-247

Test Report Serial No.: ARUB204-U5\_Master Rev A

This report supersedes: NONE

As a result of the 6 Mbyte FCC file size limitation potentially large test reports require to be split into smaller components. This document is the Master document controlling Addendum reports as listed below. This Master document combined with the Addendums demonstrate compliance with the standard

| Master Document Number | Addendum Reports                      |
|------------------------|---------------------------------------|
| ARUB204-U5_Master      | ARUB204-U5_Conducted                  |
|                        | ARUB204-U5_Radiated                   |
|                        | ARUB204-U17 (FCC Part 15B & ICES-003) |

Applicant: Aruba Networks, Inc.  
1344 Crossman Ave.  
Sunnyvale, California 94089  
USA

Product Function: Wireless Access Point

Issue Date: 8<sup>th</sup> April 2016

## **This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**  
575 Boulder Court  
Pleasanton California 94566  
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**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**



**Title:** Aruba Networks, Inc. APIN0314 & APIN0315  
**To:** FCC CFR 47 Part 15.247 (DTS) & IC RSS-247  
**Serial #:** ARUB204-U5\_Master Rev A  
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## 1. ACCREDITATION, LISTINGS & RECOGNITION

### 1.1. Testing Accreditation

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



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## 1.2. Recognition

MiCOM Labs, Inc. has widely recognized wireless testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

| Country   | Recognition Body                                                                                 | Status | Phase      | Identification No.                      |
|-----------|--------------------------------------------------------------------------------------------------|--------|------------|-----------------------------------------|
| USA       | Federal Communications Commission (FCC)                                                          | TCB    | -          | US0159<br>Listing #: 102167             |
| Canada    | Industry Canada (IC)                                                                             | FCB    | APEC MRA 2 | US0159<br>Listing #: 4143A-2<br>4143A-3 |
| Japan     | MIC (Ministry of Internal Affairs and Communication)                                             | CAB    | APEC MRA 2 | RCB 210                                 |
|           | VCCI                                                                                             | --     | --         | A-0012                                  |
| Europe    | European Commission                                                                              | NB     | EU MRA     | NB 2280                                 |
| Australia | Australian Communications and Media Authority (ACMA)                                             | CAB    | APEC MRA 1 | US0159                                  |
| Hong Kong | Office of the Telecommunication Authority (OFTA)                                                 | CAB    | APEC MRA 1 |                                         |
| Korea     | Ministry of Information and Communication Radio Research Laboratory (RRL)                        | CAB    | APEC MRA 1 |                                         |
| Singapore | Infocomm Development Authority (IDA)                                                             | CAB    | APEC MRA 1 |                                         |
| Taiwan    | National Communications Commission (NCC)<br>Bureau of Standards, Metrology and Inspection (BSMI) | CAB    | APEC MRA 1 |                                         |
| Vietnam   | Ministry of Communication (MIC)                                                                  | CAB    | APEC MRA 1 |                                         |

EU MRA – European Union Mutual Recognition Agreement.

NB – Notified Body

APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. Recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

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### 1.3. Product Certification

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



United States of America – Telecommunication Certification Body (TCB)  
Industry Canada – Certification Body, CAB Identifier – US0159  
Europe – Notified Body (NB), NB Identifier - 2280  
Japan – Recognized Certification Body (RCB), RCB Identifier - 210



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## 2. DOCUMENT HISTORY

| Draft History |                             |          |
|---------------|-----------------------------|----------|
| Revision      | Date                        | Comments |
| Draft         | 23 <sup>rd</sup> March 2016 | Initial  |
| Draft #2      | 7 <sup>th</sup> April 2016  |          |

| Released Document History |                   |                            |                 |
|---------------------------|-------------------|----------------------------|-----------------|
| Master Revision           | Addendum Revision | Date                       | Comments        |
| Rev A                     | Rev A Conducted   | 8 <sup>th</sup> April 2016 | Initial Release |
|                           | Rev A Radiated    | 8 <sup>th</sup> April 2016 |                 |
|                           |                   |                            |                 |
|                           |                   |                            |                 |
|                           |                   |                            |                 |
|                           |                   |                            |                 |
|                           |                   |                            |                 |

In the above table the latest report revision will replace all earlier versions.

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### 3. TEST RESULT CERTIFICATE

|                                                                                                      |                                                                                               |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Manufacturer:</b> Aruba Networks, Inc.<br>1344 Crossman Ave.<br>Sunnyvale California 94089<br>USA | <b>Tested By:</b> MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566<br>USA |
| <b>Model:</b> APIN0314 & APIN0315<br><b>Type Of Equipment:</b> 802.11 a/b/g/n/ac                     | <b>Telephone:</b> +1 925 462 0304<br><b>Fax:</b> +1 925 462 0306                              |
| <b>S/N's:</b> DW0000199                                                                              |                                                                                               |
| <b>Test Date(s):</b> 21 <sup>st</sup> January – 2 <sup>nd</sup> March 2016                           | <b>Website:</b> www.micomlabs.com                                                             |

| STANDARD(S)                               | TEST RESULTS       |
|-------------------------------------------|--------------------|
| FCC CFR 47 Part 15 Subpart C 15.247 (DTS) | EQUIPMENT COMPLIES |

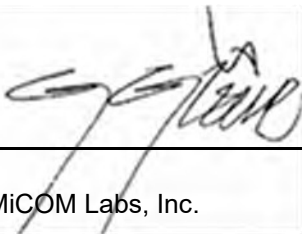
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

#### Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

**Approved & Released for MiCOM Labs, Inc. by:**



  
\_\_\_\_\_  
Graeme Grieve  
Quality Manager MiCOM Labs, Inc.

  
\_\_\_\_\_  
Gordon Hurst  
President & CEO MiCOM Labs, Inc.

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## 4. REFERENCES AND MEASUREMENT UNCERTAINTY

### 4.1. Normative References

| REF. | PUBLICATION            | YEAR                | TITLE                                                                                                                                                                                                 |
|------|------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I    | KDB 662911             | Oct 31 2013         | Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band |
| II   | KDB 558074 D01 v03r04  | 7th Jan 2016        | Guidance for performing compliance measurements on Digital Transmission Systems (DTS) operating under section 15.247.                                                                                 |
| III  | A2LA                   | June 2015           | R105 - Requirement's When Making Reference to A2LA Accreditation Status                                                                                                                               |
| IV   | ANSI C63.10            | 2013                | American National Standard for Testing Unlicensed Wireless Devices                                                                                                                                    |
| V    | ANSI C63.4             | 2014                | American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz                                  |
| VI   | CISPR 22               | 2008                | Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement                                                                                              |
| VII  | ETSI TR 100 028        | 2001-12             | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics                                              |
| VIII | FCC 47 CFR Part 15.247 | 2014                | Radio Frequency Devices; Subpart C – Intentional Radiators                                                                                                                                            |
| IX   | ICES-003 Issue 6       | Jan 2016            | Spectrum Management and Telecommunications; Interference-Causing Equipment Standard. Information Technology Equipment (ITE) – Limits and methods of measurement.                                      |
| X    | M 3003                 | Edition 3 Nov. 2012 | Expression of Uncertainty and Confidence in Measurements                                                                                                                                              |
| XI   | RSS-247 Issue 1        | May 2015            | Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices                                                                           |
| XII  | RSS-Gen Issue 4        | November 2014       | General Requirements and Information for the Certification of Radiocommunication Equipment                                                                                                            |
| XIII | KDB 644545 D03 v01     | August 14th 2014    | Guidance for IEEE 802.11ac New Rules                                                                                                                                                                  |
| XIV  | FCC 47 CFR Part 2.1033 | 2014                | FCC requirements and rules regarding photographs and test setup diagrams.                                                                                                                             |



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#### **4.2. Test and Uncertainty Procedure**

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.

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## 5. PRODUCT DETAILS AND TEST CONFIGURATIONS

### 5.1. Technical Details

| Details                          | Description                                                                                                              |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Purpose:                         | Test of the Aruba Networks, Inc. APIN0314 & APIN0315 to FCC CFR 47 Part 15 Subpart C 15.247 (DTS) & IC RSS-247           |
| Applicant:                       | Aruba Networks, Inc.<br>1344 Crossman Ave., Sunnyvale California 94089 USA                                               |
| Manufacturer:                    | As Applicant                                                                                                             |
| Laboratory performing the tests: | MiCOM Labs, Inc.<br>575 Boulder Court, Pleasanton California 94566 USA                                                   |
| Test report reference number:    | ARUB204-U5                                                                                                               |
| Date EUT received:               | 14 <sup>th</sup> January 2016                                                                                            |
| Standard(s) applied:             | FCC CFR 47 Part 15 Subpart C 15.247 (DTS) & IC RSS-247                                                                   |
| Dates of test (from - to):       | 21 <sup>st</sup> January – 2 <sup>nd</sup> March 2016                                                                    |
| No of Units Tested:              | 3                                                                                                                        |
| Type of Equipment:               | 802.11 a/b/g/n/ac                                                                                                        |
| Product Family Name:             | Wireless Access Point                                                                                                    |
| Model(s):                        | APIN0314 & APIN0315                                                                                                      |
| Location for use:                | Indoor                                                                                                                   |
| Declared Frequency Range(s):     | 2400 - 2483.5 MHz;                                                                                                       |
| Type of Modulation:              | OFDM                                                                                                                     |
| EUT Modes of Operation:          | 802.11b; 802.11g; 802.11n HT-20; 802.11n HT-40                                                                           |
| Transmit/Receive Operation:      | Transceiver - Half Duplex                                                                                                |
| Rated Input Voltage and Current: | POE (POE adaptor NOT sold with unit) 55Vdc<br>ac/dc adaptor 120 Vac 60Hz : +12 Vdc                                       |
| Operating Temperature Range:     | Declared Range 0°C to 40°C                                                                                               |
| ITU Emission Designator:         | 802.11b: 14M7G1D<br>802.11g: 18M0D1D<br>802.11n - HT20: 17M9D1D<br>802.11n - HT40: 41M7D1D                               |
| Equipment Dimensions:            | APIN0314: 181.6mm x 180.35mm x 48mm / 7.15" x 7.1" x 1.89"<br>APIN0315: 181.6mm x 180.35mm x 48mm / 7.15" x 7.1" x 1.89" |
| Weight:                          | APIN0314: 0.643 kg<br>APIN0315: 0.650 kg                                                                                 |
| Hardware Rev:                    | Rev. 1                                                                                                                   |
| Software Rev:                    | QSPR Version 5.0.0 RF Test Image used with QSPR:<br>boarddata_1_dquan_2G_GF_12082015.bin                                 |
| Primary function of equipment:   | Transmission of voice and/or data                                                                                        |
| Secondary function of equipment: | None Provided                                                                                                            |

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## **5.2. Scope Of Test Program**

### **Aruba Networks, Inc. APIN0314 & APIN0315**

The scope of the test program was to test the Aruba Networks, Inc. APIN0314 & APIN0315, 802.11 b/g/n configurations in the frequency ranges 2400 - 2483.5 MHz; for compliance against the following specification:

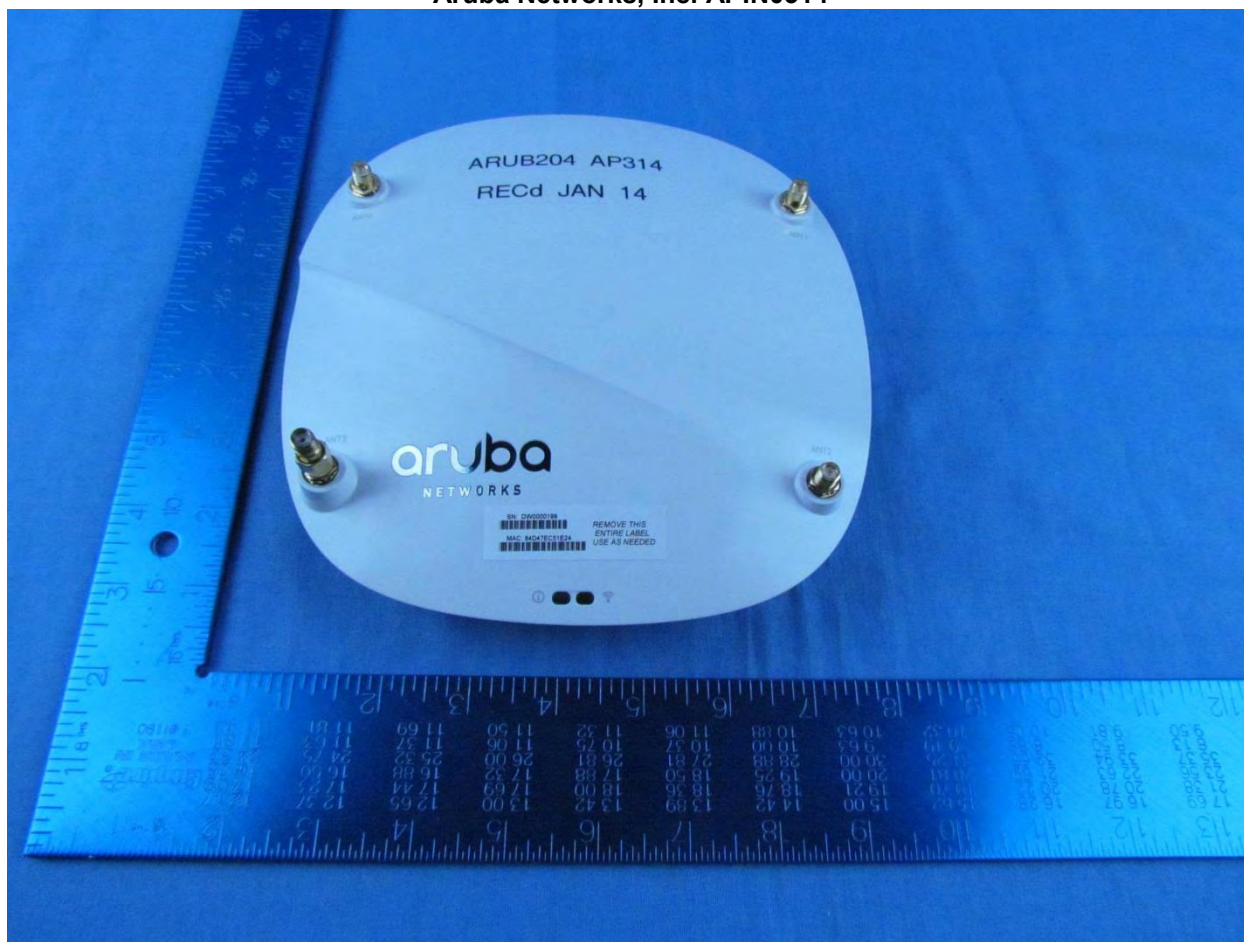
### **FCC CFR 47 Part 15 Subpart C 15.247 (DTS)**

Radio Frequency Devices; Subpart C – Intentional Radiators

### **Industry Canada RSS-247 Issue 1**

Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

### **Aruba Networks, Inc. APIN0314**



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**Aruba Networks, Inc. APIN0315**





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### 5.3. Equipment Model(s) and Serial Number(s)

| Type    | Description                           | Manufacturer       | Model    | Serial no. | Delivery Date             |
|---------|---------------------------------------|--------------------|----------|------------|---------------------------|
| EUT     | Wireless Access Point + Bluetooth BLE | Aruba Network Inc. | APIN0314 | DW0000199  | 14 <sup>th</sup> Jan 2016 |
| Support | Laptop PC                             | DELL               | E7450    | None       | N/A                       |

### 5.4. Antenna Details

| Type     | Manufacturer   | Model       | Family         | Gain (dBi) | BF Gain | Dir BW              | X-Pol | Frequency Band (MHz) |
|----------|----------------|-------------|----------------|------------|---------|---------------------|-------|----------------------|
| integral | Aruba Networks | Metal Sheet | OMNI           | 1.9        | 2.0     | 360                 | -     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-1W   | OMNI           | 3.8        | 6.0     | 360                 | -     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-13B  | Downtilt OMNI  | 4.4        | 6.0     | 360                 | -     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-19   | OMNI           | 3.0        | 6.0     | 360                 | -     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-20W  | OMNI           | 2.0        | 6.0     | 360                 | -     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-40   | Downtilt OMNI  | 3.9        | 3.0     | 360                 | -     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-45   | Multipolarized | 5.0        | 3.0     | 90° Hor<br>90° Vert | Y     | 2400 - 2483.5        |
| external | Aruba Networks | AP-ANT-48   | Multipolarized | 8.5        | 3.0     | 60° Hor<br>60° Vert | Y     | 2400 - 2483.5        |

BF Gain - Beamforming Gain  
Dir BW - Directional BeamWidth  
X-Pol - Cross Polarization

### 5.5. Cabling and I/O Ports

| Port Type | Max Cable Length | # Of Ports | Screened | Conn Type | Data Type   |
|-----------|------------------|------------|----------|-----------|-------------|
| Ethernet  | 100m             | 1          | N        | RJ-45     | Packet Data |
| RS232     | 3m               | 1          | N        | RJ-45     | Digital     |

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## **5.6. Test Configurations**

Results for the following configurations are provided in this report:

| Operational Mode(s)<br>(802.11a/b/g/n/ac) | Data Rate with Highest Power<br>MBit/s | Channel Frequency (MHz) |         |         |
|-------------------------------------------|----------------------------------------|-------------------------|---------|---------|
|                                           |                                        | Low                     | Mid     | High    |
| 2400.0 - 2483.5 MHz                       |                                        |                         |         |         |
| 802.11b                                   | 1.00                                   | 2412.00                 | 2437.00 | 2462.00 |
| 802.11g                                   | 6.00                                   | 2412.00                 | 2437.00 | 2462.00 |
| 802.11n HT-20                             | 6.50                                   | 2412.00                 | 2437.00 | 2462.00 |
| 802.11n HT-40                             | 13.50                                  | 2422.00                 | 2437.00 | 2452.00 |

## **5.7. Equipment Modifications**

The following modifications were required to bring the equipment into compliance:

1. NONE

## **5.8. Deviations from the Test Standard**

The following deviations from the test standard were required in order to complete the test program:

1. NONE



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## 6. TEST SUMMARY

### List of Measurements

| Test Header                                 | Result                                     | Data Link |
|---------------------------------------------|--------------------------------------------|-----------|
| Conducted Results                           | See Report ARUB204-U5_Conducted            |           |
| 15.247(a)(2) 6 dB & 99% Bandwidth           | Complies                                   |           |
| 15.247(b), 15.31(e) Conducted Output Power  | Complies                                   |           |
| 15.247(d) Emissions                         | Complies                                   |           |
| (1) Conducted Emissions                     | Complies                                   |           |
| (i) Conducted Spurious Emissions            | Complies                                   |           |
| (ii) Conducted Band-Edge Emissions          | Complies                                   |           |
| 15.247(e) Power Spectral Density            | Complies                                   |           |
| Radiated Emissions                          | See Report ARUB204-U5_Radiated             |           |
| (i) 15.205 Restricted Band Emissions        | Complies                                   |           |
| (ii) 15.205 Restricted Band-Edge Emissions  | Complies                                   |           |
| Digital Emissions                           | See Report ARUB204-U17 Part 15B & ICES-003 |           |
| (3) 15.209 Digital Emissions (0.03 - 1 GHz) | Complies                                   |           |
| AC Wireline                                 | See Report ARUB204-U17 Part 15B & ICES-003 |           |
| 15.207 AC Wireline Emissions                | Complies                                   |           |

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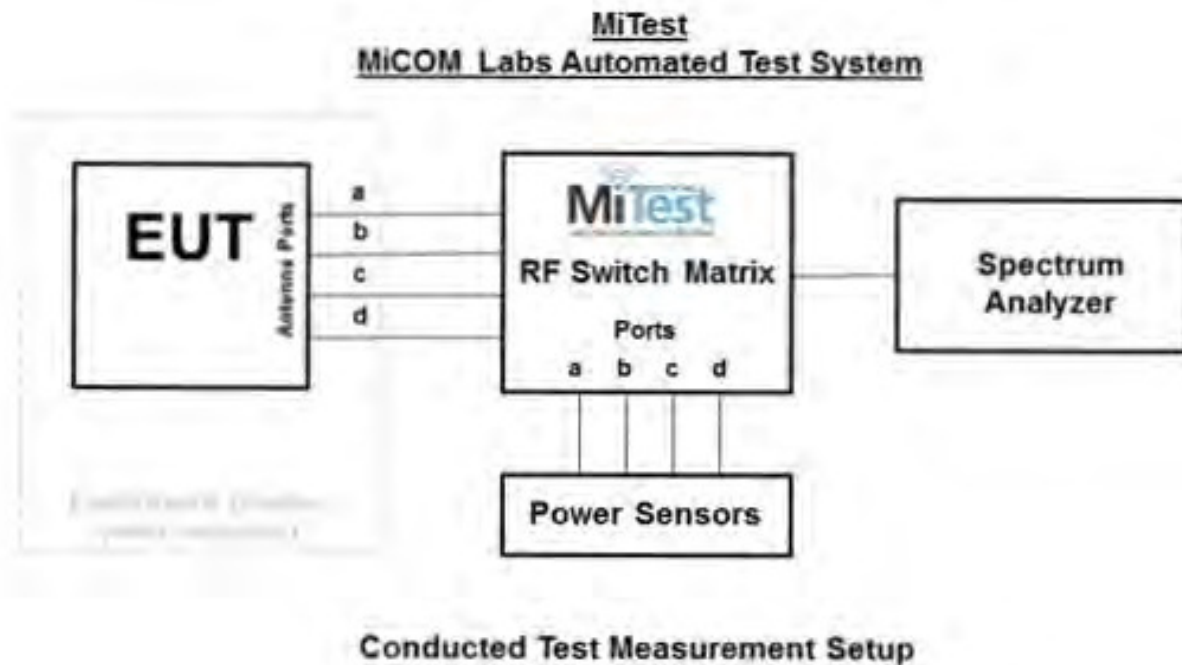
## **7. TEST EQUIPMENT CONFIGURATION(S)**

### **7.1. Conducted**

Conducted RF Emission Test Set-up(s)

The following tests were performed using the conducted test set-up shown in the diagram below.

1. 6 dB & 99% Bandwidth
2. Average Output Power
3. Power Spectral Density- Average
4. Conducted Low Band-Edge Emission - Average
5. Conducted Spurious Emissions - Average
6. Conducted High Band-Edge Emission - Average



A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.



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| Asset#      | Description                                    | Manufacturer         | Model#               | Serial#          | Calibration Due Date |
|-------------|------------------------------------------------|----------------------|----------------------|------------------|----------------------|
| 158         | Barometer/Thermometer                          | Control Company      | 4196                 | E2846            | 01 Dec 2016          |
| 249         | Resistance Thermometer                         | Thermotronics        | GR2105-02            | 9340 #2          | 23 Oct 2016          |
| 287         | Rohde & Schwarz 40 GHz Receiver                | Rhode & Schwarz      | ESIB40               | 100201           | 27 Aug 2016          |
| 361         | Desktop for RF#1, Labview Software installed   | Dell                 | Vostro 220           | WS RF#1          | Not Required         |
| 378         | Rohde & Schwarz 40 GHz Receiver with Generator | Rhode & Schwarz      | ESIB40               | 100107/040       | 04 Aug 2016          |
| 380         | 4x4 RF Switch Box                              | MiCOM Labs           | MiTest RF Switch Box | MIC001           | 18 Jun 2016          |
| 390         | USB Power Head 50MHz - 24GHz -60 to +20dBm     | Agilent              | U2002A               | MY50000103       | 17 Oct 2016          |
| 398         | Test Software                                  | MiCOM                | MiTest ATS           | Version 3.0.0.16 | Not Required         |
| 405         | DC Power Supply 0-60V                          | Agilent              | 6654A                | MY4001826        | Cal when used        |
| 408         | USB to GPIB interface                          | National Instruments | GPIB-USB HS          | 14C0DE9          | Not Required         |
| 436         | USB Wideband Power Sensor                      | Boonton              | 55006                | 8731             | 31 Jul 2016          |
| 437         | USB Wideband Power Sensor                      | Boonton              | 55006                | 8759             | 31 Jul 2016          |
| 445         | PoE Injector                                   | D-Link               | DPE-101GL            | QTAH1E2000625    | Not Required         |
| 461         | Spectrum Analyzer                              | Agilent              | E4440A               | MY46185537       | 13 Aug 2016          |
| 75          | Environmental Chamber                          | Thermatron           | SE-300-2-2           | 27946            | 24 Nov 2016          |
| RF#1 GPIB#1 | GPIB cable to Power Supply                     | HP                   | GPIB                 | None             | Not Required         |
| RF#1 SMA#1  | EUT to Mitest box port 1                       | Flexco               | SMA Cable port1      | None             | 18 Jun 2016          |
| RF#1 SMA#2  | EUT to Mitest box port 2                       | Flexco               | SMA Cable port2      | None             | 18 Jun 2016          |
| RF#1 SMA#3  | EUT to Mitest box port 3                       | Flexco               | SMA Cable port3      | None             | 18 Jun 2016          |
| RF#1 SMA#4  | EUT to Mitest box port 4                       | Flexco               | SMA Cable port4      | None             | 18 Jun 2016          |
| RF#1 USB#1  | USB Cable to Mitest Box                        | Dynex                | USB Cable            | None             | Not Required         |

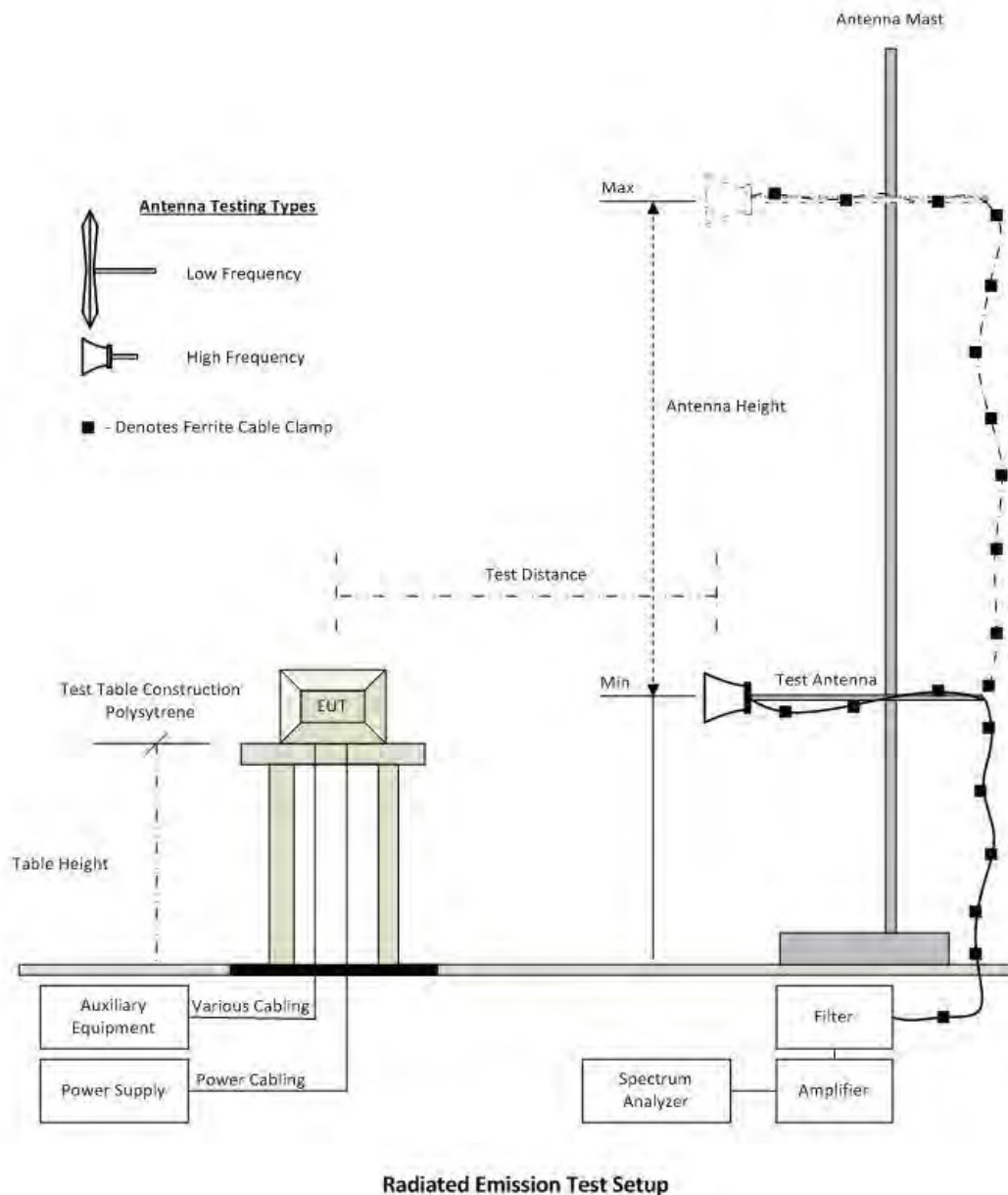
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## 7.2. Radiated Spurious Emission Test Set-up

The following tests were performed using the radiated test set-up shown in the diagram below.

### 10.7 Radiated Spurious Emissions

#### Radiated Emission Measurement Setup



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**Title:** Aruba Networks, Inc. APIN0314 & APIN0315  
**To:** FCC CFR 47 Part 15.247 (DTS) & IC RSS-247  
**Serial #:** ARUB204-U5\_Master Rev A  
**Issue Date:** 8<sup>th</sup> April 2016  
**Page:** 20 of 22

| Asset# | Description                                       | Manufacturer         | Model#                                     | Serial#     | Calibration Due Date      |
|--------|---------------------------------------------------|----------------------|--------------------------------------------|-------------|---------------------------|
| 158    | Barometer/Thermometer                             | Control Company      | 4196                                       | E2846       | 04 Dec 2016               |
| 170    | Video System Controller for Semi Anechoic Chamber | Panasonic            | WV-CY101                                   | 04R08507    | Not Required              |
| 287    | Rohde & Schwarz 40 GHz Receiver                   | Rhode & Schwarz      | ESIB40                                     | 100201      | 27 Aug 2016               |
| 338    | Sunol 30 to 3000 MHz Antenna                      | Sunol                | JB3                                        | A052907     | 15 Aug 2016               |
| 396    | 2.4 GHz Notch Filter                              | Microtronics         | BRM50701                                   | 001         | 18 Aug 2016               |
| 397    | Amp 10 - 2500MHz                                  | MiCOM Labs           | Amp 10 - 2500 MHz                          | NA          | 24 Apr 2016               |
| 399    | ETS 1-18 GHz Horn Antenna                         | ETS                  | 3117                                       | 00154575    | 18 <sup>th</sup> Oct 2016 |
| 406    | Amplifier for Radiated Emissions                  | MiCOM Labs           | 40dB 1 to 18GHz Amp                        | 0406        | 28 May 2016               |
| 410    | Desktop Computer                                  | Dell                 | Inspiron 620                               | WS38        | Not Required              |
| 411    | Mast/Turntable Controller                         | Sunol Sciences       | SC98V                                      | 060199-1D   | Not Required              |
| 412    | USB to GPIB Interface                             | National Instruments | GPIB-USB HS                                | 11B8DC2     | Not Required              |
| 413    | Mast Controller                                   | Sunol Science        | TWR95-4                                    | 030801-3    | Not Required              |
| 415    | Turntable Controller                              | Sunol Sciences       | Turntable Controller                       | None        | Not Required              |
| 447    | Rad Emissions Test Software                       | MiCOM                | Rad Emissions Test Software Version 1.0.73 | 447         | Not Required              |
| 462    | Schwarzbeck cable from Antenna to Amplifier.      | Schwarzbeck          | AK 9513                                    | 462         | 25 Apr 2016               |
| 463    | Schwarzbeck cable from Amplifier to Bulkhead.     | Schwarzbeck          | AK 9513                                    | 463         | 25 Apr 2016               |
| 464    | Schwarzbeck cable from Bulkhead to Receiver       | Schwarzbeck          | AK 9513                                    | 464         | 25 Apr 2016               |
| 465    | Low Pass Filter DC-1000 MHz                       | Mini-Circuits        | NLP-1200+                                  | VUU01901402 | 18 Aug 2016               |
| 480    | Cable - Bulkhead to Amp                           | SRC Haverhill        | 157-157-3050360                            | 480         | 11 Aug 2016               |
| 481    | Cable - Bulkhead to Receiver                      | SRC Haverhill        | 151-151-3050787                            | 481         | 11 Aug 2016               |
| 482    | Cable - Amp to Antenna                            | SRC Haverhill        | 157-157-3051574                            | 482         | 11 Aug 2016               |

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## 8. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by [MiTest](#). [MiTest](#) is an automated test system developed by MiCOM Labs. [MiTest](#) is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.



The MiCOM Labs "[MiTest](#)" Automated Test System" (Patent Pending)

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