

Test of Aruba AP-92/93 802.11a/b/g/n Wireless AP

To: FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: ARUB89-U2 Rev A





Test of Aruba Networks, Inc AP-92/93 802.11a/b/g/n Wireless AP  
to

To: FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: ARUB89-U2 Rev A

Note: this report contains data with regard to DFS Bands 5,250 to 5,350 MHz and 5,470 – 5,725 MHz bands. Data for the Aruba Networks, Inc AP-92 & AP-93 Wireless Access Point. 5.15 – 5.25 GHz are reported in MiCOM Labs test report ARUB51-U2. 2.4 and 5.8 GHz test data are reported in MiCOM Labs test report ARUB51-U1.

This report supersedes None

Applicant: Aruba Networks, Inc  
1344 Crossman Avenue  
Sunnyvale  
CA 94089, USA

Product Function: Wireless Access Point

Copy No: pdf Issue Date: 2nd September 2011

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

**MiCOM Labs, Inc.**  
440 Boulder Court, Suite 200  
Pleasanton, CA 94566 USA  
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TESTING CERTIFICATE #2381.01

**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**



**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
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## ACCREDITATION, LISTINGS & RECOGNITION

### TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard EN ISO/IEC 17025. 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>



The American Association for Laboratory Accreditation

### *Accredited Laboratory*

A2LA has accredited

**MICOM LABS**

*Pleasanton, CA*

for technical competence in the field of

**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Presented this 14<sup>th</sup> day of April 2010.



President & CEO  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to November 30, 2011

*For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

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## **RECOGNITION**

MiCOM Labs, Inc has widely recognized Electrical testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA\*\* countries. Our test reports are widely accepted for global type approvals.

| Country   | Recognition Body                                                                                 | Status | Phase      | Identification No. |
|-----------|--------------------------------------------------------------------------------------------------|--------|------------|--------------------|
| USA       | Federal Communications Commission (FCC)                                                          | TCB    | -          | Listing #: 102167  |
| Canada    | Industry Canada (IC)                                                                             | FCB    | APEC MRA 2 | Listing #: 4143A   |
| Japan     | MIC                                                                                              | CAB    | APEC MRA 2 | 210                |
|           | VCCI                                                                                             | --     | --         | No. 2959           |
| 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 |                    |

\*\*APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement.

Is a 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

N/A – Not Applicable

\*\*EU MRA – European Union Mutual Recognition Agreement.

Is a recognition agreement under which test lab is accredited to regulatory standards of the EU member countries.

\*\*NB – Notified Body

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## **PRODUCT CERTIFICATION**

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard EN ISO/IEC Guide 65. 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>



*The American Association for Laboratory Accreditation*

*World Class Accreditation*

### *Accredited Product Certification Body*

A2LA has accredited

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for technical competence as a

**Product Certification Body**

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC Guide 65:1996 *General requirements for bodies operating product certification systems*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system for a Telecommunications Certification Body (TCB) meeting FCC (U.S.), and IC (Canada) requirements.



Presented this 24<sup>th</sup> day of June 2010.

President & CEO  
For the Accreditation Council  
Certificate Number 2381.02  
Valid to November 30, 2011

*For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification Scope of Accreditation.*

### **United States of America – Telecommunication Certification Body (TCB)**

TCB Identifier – US0159

### **Industry Canada – Certification Body**

CAB Identifier – US0159

### **Europe – Notified Body**

Notified Body Identifier - 2280

### **Japan – Recognized Certification Body (RCB)**

RCB Identifier - 210

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## DOCUMENT HISTORY

| Document History |                                |                  |
|------------------|--------------------------------|------------------|
| Revision         | Date                           | Comments         |
| Draft            |                                |                  |
| Rev A            | 2 <sup>nd</sup> September 2011 | Initial release. |
|                  |                                |                  |
|                  |                                |                  |

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## 1. TEST RESULT CERTIFICATE

|               |                                                                                         |            |                                                                                            |
|---------------|-----------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|
| Applicant:    | Aruba Networks, Inc<br>1344 Crossman Avenue<br>Sunnyvale<br>CA 94089, USA               | Tested By: | MiCOM Labs, Inc.<br>440 Boulder Court<br>Suite 200<br>Pleasanton<br>California, 94566, USA |
| EUT:          | 802.11a/b/g/n Wireless Access Point                                                     | Tel:       | +1 925 462 0304                                                                            |
| Model:        | AP-92 & AP-93                                                                           | Fax:       | +1 925 462 0306                                                                            |
| S/N:          | AP-92 AN0000393 (Conducted)<br>AP-92 AN0000393 (Radiated)<br>AP-93 AN0000330 (Radiated) |            |                                                                                            |
| Test Date(s): | 3rd to 28th April 2010 & 29 <sup>th</sup> July                                          | Website:   | www.micomlabs.com                                                                          |

| STANDARD(S)                         | TEST RESULTS       |
|-------------------------------------|--------------------|
| FCC 47 CFR Part 15.407 & IC RSS-210 | EQUIPMENT COMPLIES |

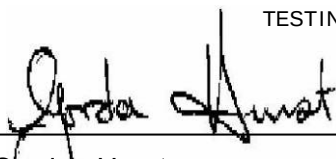
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

### 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,

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



TESTING CERTIFICATE #2381.01

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## **2. REFERENCES AND MEASUREMENT UNCERTAINTY**

### **2.1. Normative References**

| Ref.  | Publication                         | Year                | Title                                                                                                                                                                |
|-------|-------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i.    | FCC 47 CFR Part 15 SubPart E 15.407 | 2010                | Title 47: Telecommunication PART 15—RADIO FREQUENCY DEVICES Subpart E—Unlicensed National Information Infrastructure Devices                                         |
| ii.   | FCC KDB # 662911                    | 2011 V01            | Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g. MIMO, Smart Antenna, etc)                                                             |
| iii.  | RSS-210 Annex 9                     | 2010                | Radio Standards Specification 210, Issue 8, Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment,                         |
| iv.   | RSS-GEN                             | 2010                | Radio Standards Specification-Gen, Issue 3, General Requirements and Information for the Certification of Radiocommunication Equipment,                              |
| v.    | 47 CFR Part 15, SubPart B           | 2010                | 47 CFR Part 15, SubPart B; Unintentional Radiators                                                                                                                   |
| vi.   | ICES-003                            | 2004                | Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus; Issue 4                                                 |
| vii.  | ANSI C63.4                          | 2009                | 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 |
| viii. | CISPR 22/ EN 55022                  | 2008 2006+A1:2007   | Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment                                                          |
| ix.   | M 3003                              | Edition 1 Dec. 1997 | Expression of Uncertainty and Confidence in Measurements                                                                                                             |
| x.    | LAB34                               | Edition 1 Aug 2002  | The expression of uncertainty in EMC Testing                                                                                                                         |
| xi.   | ETSI TR 100 028                     | 2001                | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics             |
| xii.  | A2LA                                | 9th June 2010       | Reference to A2LA Accreditation Status – A2LA Advertising Policy                                                                                                     |



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## **2.2. Test and Uncertainty Procedures**

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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### 3. PRODUCT DETAILS AND TEST CONFIGURATIONS

#### 3.1. Technical Details

| Details                                           | Description                                                                                                                                                                   |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Purpose:                                          | Test of the Aruba AP-92/93 802.11a/b/g/n Wireless AP in the frequency ranges 5250 to 5350 MHz and 5470 - 5725 MHz to FCC Part 15.407 and Industry Canada RSS-210 regulations. |
| Applicant:                                        | Aruba Networks, Inc<br>1344 Crossman Avenue<br>Sunnyvale<br>CA 94089, USA                                                                                                     |
| Manufacturer:                                     | As applicant                                                                                                                                                                  |
| Laboratory performing the tests:                  | MiCOM Labs, Inc.<br>440 Boulder Court, Suite 200<br>Pleasanton, California 94566 USA                                                                                          |
| Test report reference number:                     | ARUB89-U2 Rev A                                                                                                                                                               |
| Date EUT received:                                | 5 <sup>th</sup> June 2011                                                                                                                                                     |
| Standard(s) applied:                              | FCC 47 CFR Part 15.407 & IC RSS-210                                                                                                                                           |
| Dates of test (from - to):                        | 5 <sup>th</sup> June - 12 <sup>th</sup> August 2011                                                                                                                           |
| No of Units Tested:                               | Two units; AP-92 radiated & conducted a AP-93 radiated                                                                                                                        |
| Type of Equipment:                                | 802.11a/b/g/n Wireless Access Point, 2x2 Spatial Multiplexing MIMO configuration                                                                                              |
| Applicants Trade Name:                            | Aruba Networks, Inc                                                                                                                                                           |
| Model(s):                                         | AP-92 (external antenna), AP-93 (integral antenna)                                                                                                                            |
| Software Release                                  | 6.1.2.2                                                                                                                                                                       |
| Location for use:                                 | Indoor                                                                                                                                                                        |
| Declared Frequency Range(s):                      | 5,250 to 5,350 MHz<br>5,470 to 5,725 MHz                                                                                                                                      |
| Type of Modulation:                               | Per 802.11 –CCK, BPSK, QPSK, DSSS, OFDM                                                                                                                                       |
| Declared Nominal Output Power:<br>(Average Power) | 802.11a: Legacy +17 dBm<br>802.11n: HT-20 +17 dBm<br>802.11n: HT-40 +17 dBm                                                                                                   |
| EUT Modes of Operation:                           | Legacy 802.11a/b/g, 802.11n HT-20, HT-40                                                                                                                                      |
| Transmit/Receive Operation:                       | Time Division Duplex                                                                                                                                                          |
| Rated Input Voltage and Current:                  | DC: Nominal: 12V DC Current: 1.25 A<br>ENET: Nominal: 48 V DC Current: 0.350 A                                                                                                |
| Operating Temperature Range:                      | Nominal: 20 °C Max: 50 °C Min: 0 °C                                                                                                                                           |
| ITU Emission Designator:                          | 802.11a 18M5D1D<br>802.11n HT-20 19M5D1D<br>802.11n HT-40 39M9D1D                                                                                                             |
| Frequency Stability:                              | ±20 ppm                                                                                                                                                                       |
| Equipment Dimensions:                             | 12.0 cm x 12.7 cm x 3.2 cm                                                                                                                                                    |
| Weight:                                           | 375 grams                                                                                                                                                                     |
| Primary function of equipment:                    | Wireless Access Point for transmitting data and voice                                                                                                                         |

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### **3.2. Scope of Test Program**

#### **RF Testing**

The scope of the compliance program was to test the Aruba AP-92 and AP-93 wireless Access Point, 2x2 Spatial Multiplexing MIMO configurations in the DFS frequency ranges 5250 - 5350 and 5470 – 5725 MHz for compliance against FCC 47 CFR Part 15.407 and Industry Canada RSS-210 specifications.

The Aruba Networks, Inc AP-92 has external reverse SMA connectors which utilize external antennas while the AP-93 has integral antenna(s). The antennas used with the AP-92 and AP-93 are detailed in section 3.4 "Antenna Details".

**NOTE:** FCC KDB 662911 vO1 Multiple Transmitter Output v01 has been incorporated into this test report.

#### **Aruba AP-92, AP-93 Access Point**

The AP-92 and AP-93 are high-speed, affordable, and reliable 802.11n access points for indoor environments. Designed for both ceiling and wall mounting, the compact AP-92 and AP-93 deliver wire-like performance at data rates up to 300Mbps. The AP-92 and AP-93 are built to deliver years of trouble-free operation and are backed by Aruba's limited lifetime warranty program.

Working in conjunction with Aruba's line of centralized Mobility Controllers, the AP-92 and AP-93 deliver high-speed, secure network services that let users finally move to a "wireless where possible, wired where necessary" network access model. The network can then be rightsized, with unnecessary ports eliminated to lower operating costs. The key to rightsizing is Aruba's unique Adaptive Radio Management technology, which manages channel, power, and wireless client behavior to deliver wire-like performance and reliability. By rightsizing network infrastructure, organizations significantly enhance user mobility and efficiency while lowering total cost of ownership.

The multifunction AP-92 and AP-93 can be configured through the controller to provide wireless LAN access, air monitoring, remote networking, secure enterprise mesh, and wireless intrusion detection and prevention over the 2.4GHz and 5GHz RF spectrum. The AP-92 and AP-93 feature a 100/1000Base-T Ethernet interface and operate from either standard 802.3af Power over Ethernet (PoE) sources or a 12VDC power supply.

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

| Type (EUT/Support) | Equipment Description (Including Brand Name) | Mfr                 | Model No.               | Serial No.                                                                                    |
|--------------------|----------------------------------------------|---------------------|-------------------------|-----------------------------------------------------------------------------------------------|
| EUT                | 802.11a/b/g/n Wireless Access Point          | Aruba Networks, Inc | AP-92<br>AP-92<br>AP-93 | AN0000393 (Conducted Testing)<br>AN0000393 (Radiated Testing)<br>AN0000330 (Radiated Testing) |
| Support            | Laptop PC                                    | IBM                 | Thinkpad                | None                                                                                          |

### 3.4. Antenna Details

| Antenna Type | Manufacturer        | Model            | Gain (dBi / dBd) | Frequency Range (MHz) |
|--------------|---------------------|------------------|------------------|-----------------------|
| Integral     | Aruba Networks, Inc | Integral Antenna | 5.8              | 4900 - 5875           |
| External     | Aruba Networks, Inc | AP-ANT-10        | 6                | 4900 - 5875           |
| External     | Aruba Networks, Inc | AP-ANT-12        | 14               | 4900 - 5875           |

### 3.5. Cabling and I/O Ports

Number and type of I/O ports

| Description | Type                | Length           | Additional Information                                                                                                                      |
|-------------|---------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| ENET        | RJ-45 Ethernet Port | Greater than 10m | Ethernet connection; Only non-shielded CAT-5 cable was used during testing. Port not connected to public utility/telecommunication network. |
| CONSOLE     | RJ-45 Serial Port   | Greater than 10m | For EUT setup only, not connected during typical EUT operation; Only non-shielded CAT-5 cable was used during testing.                      |
| DC Power    | DC Power Port       | Less than 3m     | AC adaptor with attached DC cable supplied with EUT                                                                                         |
| AC Power    | AC Adaptor          | Less than 3m     | AC adaptor and mains cable supplied with EUT                                                                                                |

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### 3.6. Test Configurations

Testing was performed to determine the highest power level versus bit rate. The variant with the highest power was used to exercise the product.

Matrix of test configurations

| Operational Mode(s)<br>(802.11) | Variant | Data Rates with Highest<br>Power | Frequencies<br>(MHz) |       |
|---------------------------------|---------|----------------------------------|----------------------|-------|
| a,n                             | Legacy  | 6 MBit/s                         | 5,260                | 5,500 |
|                                 | HT-20   | 6.5 MCS                          | 5,300                | 5,600 |
|                                 |         |                                  | 5,320                | 5,700 |
|                                 | HT-40   | 13.5 MCS                         | 5,270                | 5,510 |
|                                 |         |                                  | 5,310                | 5,590 |
|                                 |         |                                  |                      | 5,690 |

### Antenna Test Configurations for Radiated Emissions and Band-Edge

The following measurements were performed on all antenna configurations identified in Section 3.4 Antenna Details.

### Spurious Emission and Band-Edge Test Strategy

| 11a     | 11n HT-20 | 11n HT-40 |
|---------|-----------|-----------|
| SE 5260 | SE 5260   | SE 5270   |
| SE 5300 | SE 5300   |           |
| SE 5320 | SE 5320   | SE 5310   |
| BE 5350 | BE 5350   | BE 5350   |
| Pk 5260 | Pk 5260   | Pk 5270   |
| Pk 5300 | Pk 5300   |           |
| Pk 5320 | Pk 5320   | Pk 5310   |
| SE 5500 | SE 5500   | SE 5510   |
| SE 5600 | SE 5600   | SE 5590   |
| SE 5700 | SE 5700   | SE 5690   |
| BE 5460 | BE 5460   | BE 5460   |
| Pk 5500 | Pk 5500   | Pk 5510   |
| Pk 5600 | Pk 5600   | Pk 5590   |
| Pk 5700 | Pk 5700   | Pk 5690   |

KEY:-

SE – Spurious Emissions

BE – Band-Edge

PK - Peak Emission





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---

### **3.7. Equipment Modifications**

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

1. NONE

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

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

1. NONE

### **3.9. Subcontracted Testing or Third Party Data**

1. NONE



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## 4. TEST SUMMARY

### List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

| Section(s)                                                   | Test Items                         | Description                                                                   | Condition             | Result   | Test Report Section |
|--------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------|-----------------------|----------|---------------------|
| <b>15.407(a)</b><br><b>A9.2(2)</b><br><b>4.4</b>             | 26dB and 99% Emission BW           | Emission bandwidth measurement                                                | Conducted             | Complies | 5.1.1               |
| <b>15.407(a)</b><br><b>A9.2(2)</b><br><b>4.6</b>             | Transmit Output Power              | Power Measurement                                                             | Conducted             | Complies | 5.1.2               |
| <b>15.407(a)</b><br><b>A9.2(2)</b>                           | Peak Power Spectral Density        | PPSD                                                                          | Conducted             | Complies | 5.1.3               |
| <b>15.407(a)(6)</b>                                          | Peak Excursion Ratio               | <13dB in any 1MHz bandwidth                                                   | Conducted             | Complies | 5.1.4               |
| <b>15.407(g)</b><br><b>15.31</b><br><b>2.1</b><br><b>4.5</b> | Frequency Stability                | Limits: contained within band of operation at all times.                      | Applicant declaration | Complies | 5.1.5               |
| <b>15.407(f)</b><br><b>5.5</b>                               | Radio Frequency Radiation Exposure | Exposure to radio frequency energy levels, Maximum Permissible Exposure (MPE) | Conducted             | Complies | 5.1.6               |

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### List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

| Section(s)                                                             | Test Items                                        | Description                  | Condition | Result   | Test Report Section |
|------------------------------------------------------------------------|---------------------------------------------------|------------------------------|-----------|----------|---------------------|
| 15.407(b)(2)<br>15.205(a)<br>15.209(a)<br>2.2<br>2.6<br>A9.3(2)<br>4.7 | Radiated Emissions                                |                              | Radiated  |          | 5.1.7               |
|                                                                        | Transmitter Radiated Spurious Emissions           | Emissions above 1 GHz        |           | Complies | 5.1.7.1             |
|                                                                        | Radiated Band Edge                                | Band edge results            |           | Complies | 5.1.7.1             |
| Industry Canada only<br>RSS-Gen §4.10, §6                              | Receiver Radiated Spurious Emissions              | Emissions above 1 GHz        |           | Complies | 5.1.7.2             |
| 15.407(b)(6)<br>15.205(a)<br>15.209(a)<br>2.2                          | Radiated Emissions                                | Emissions <1 GHz (30M-1 GHz) |           | Complies | 5.1.7.3             |
| 15.407(b)(6)<br>15.207<br>7.2.2                                        | AC Wireline Conducted Emissions<br>150 kHz–30 MHz | Conducted Emissions          | Conducted | Complies | 5.1.8               |

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## List of Measurements (cont'd)

### Dynamic Frequency Selection (DFS)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407(h)(2)** and **FCC Memorandum Opinion and Order FCC 06-96 (Compliance Measurement procedures for Unlicensed National Information Infrastructure devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection)**.

### Tests performed on Master Device

| Section | Test Items                     | Description                                                                                             | Condition | Result   | Test Report Section |
|---------|--------------------------------|---------------------------------------------------------------------------------------------------------|-----------|----------|---------------------|
| 7.8.1   | Detection Bandwidth            | UNII Detection Bandwidth                                                                                | Conducted | Complies | 6.2.1               |
| 7.8.2.1 | Performance Requirements Check | Initial Channel Availability Check Time                                                                 | Conducted | Complies | 6.2.2               |
| 7.8.2.2 |                                | Radar Burst at the Beginning of the Channel Availability Check Time                                     | Conducted | Complies | 6.2.3               |
| 7.8.2.3 |                                | Radar Burst at the End of the Channel Availability Check Time                                           | Conducted | Complies | 6.2.4               |
| 7.8.3   | In-Service Monitoring          | In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period | Conducted | Complies | 6.2.5               |
| 7.8.4   | Radar Detection                | Statistical Performance Check                                                                           | Conducted | Complies | 6.2.6               |

Note 1: Test results reported in this document relate only to the items tested

Note 2: The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

Note 3: Section 3.7 Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

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## 5. TEST RESULTS

### 5.1. Device Characteristics

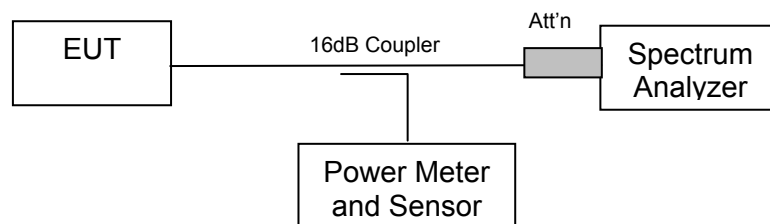
#### 5.1.1. 26 dB and 99 % Bandwidth

**FCC, Part 15 Subpart C §15.407(a)**  
**Industry Canada RSS-210 § A9.2(2)**  
**Industry Canada RSS-Gen 4.4**

#### Test Procedure

The bandwidth at 26 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

#### Test Measurement Set up



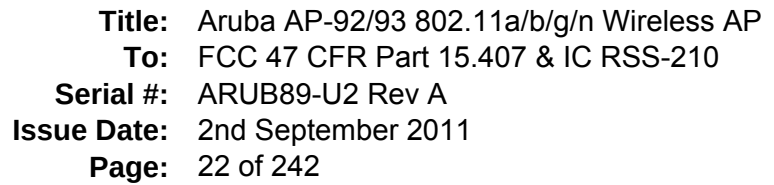
Measurement set up for 26 dB and 99 % bandwidth test

#### Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power



Temperature: 17 to 23 °C      Relative humidity: 31 to 57 %      Pressure: 999 to 1012 mbar

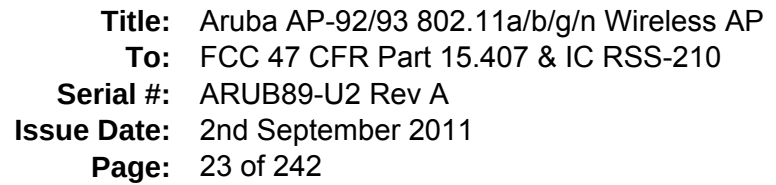
| Center Frequency<br>(MHz) | 26 dB Bandwidth<br>(MHz) | 99 % BW<br>(MHz) |
|---------------------------|--------------------------|------------------|
| 5,260                     | 24.850                   | 40.381           |
| 5,300                     | 24.048                   | 39.980           |
| 5,320                     | 24.248                   | 39.379           |

Delta 1 [T1] RBW 200 kHz RF Att 20 dB  
 Ref Lvl 1.25 dB VBW 300 kHz  
 22 dBm 40.38076152 MHz SWT 20 s Unit dBm

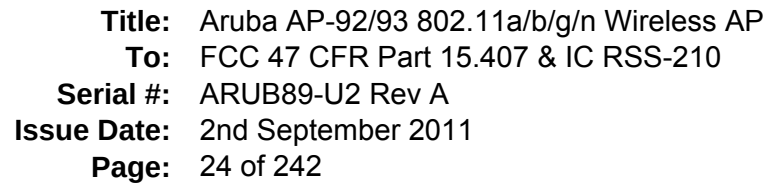
14.4 dB Offset  
 D1 9.932 dBm  
 1VIEW  
 D2 16.068 dBm  
 F1  
 F2  
 1 [T1] -16.93 dBm  
 5.23960922 GHz  
 1 [T1] 1.25 dB  
 40.38076152 MHz  
 24.84969940 MHz  
 T1 [T1] -9.21 dBm  
 5.24782565 GHz  
 T2 [T1] -9.30 dBm  
 5.27267535 GHz  
 2 [T1] -9.93 dBm  
 5.26495992 GHz  
 A  
 SGL  
 IN1  
 1MA

Center 5.26 GHz 5 MHz/ Span 50 MHz

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Delta 1 [T1] RBW 200 kHz RF Att 20 dB  
 Ref Lvl 1.23 dB VBW 300 kHz  
 22 dBm 39.37875752 MHz SWT 20 s Unit dBm

14.4 dB Offset  
 D1 9.676 dBm  
 D2 16.324 dBm  
 T1  
 T2  
 OPB  
 1 [T1] -17.05 dBm  
 1 [T1] 1.23 dB  
 39.37875752 MHz  
 24.24849699 MHz  
 5.30802605 GHz  
 5.3227455 GHz  
 5.31493988 GHz  
 5.3068 GHz  
 5.30802605 GHz  
 5.3227455 GHz  
 5.31493988 GHz  
 5.3068 GHz

1VIEW  
 A  
 SGL  
 IN1  
 1MA

F1 F2

Center 5.32 GHz 5 MHz/ Span 50 MHz



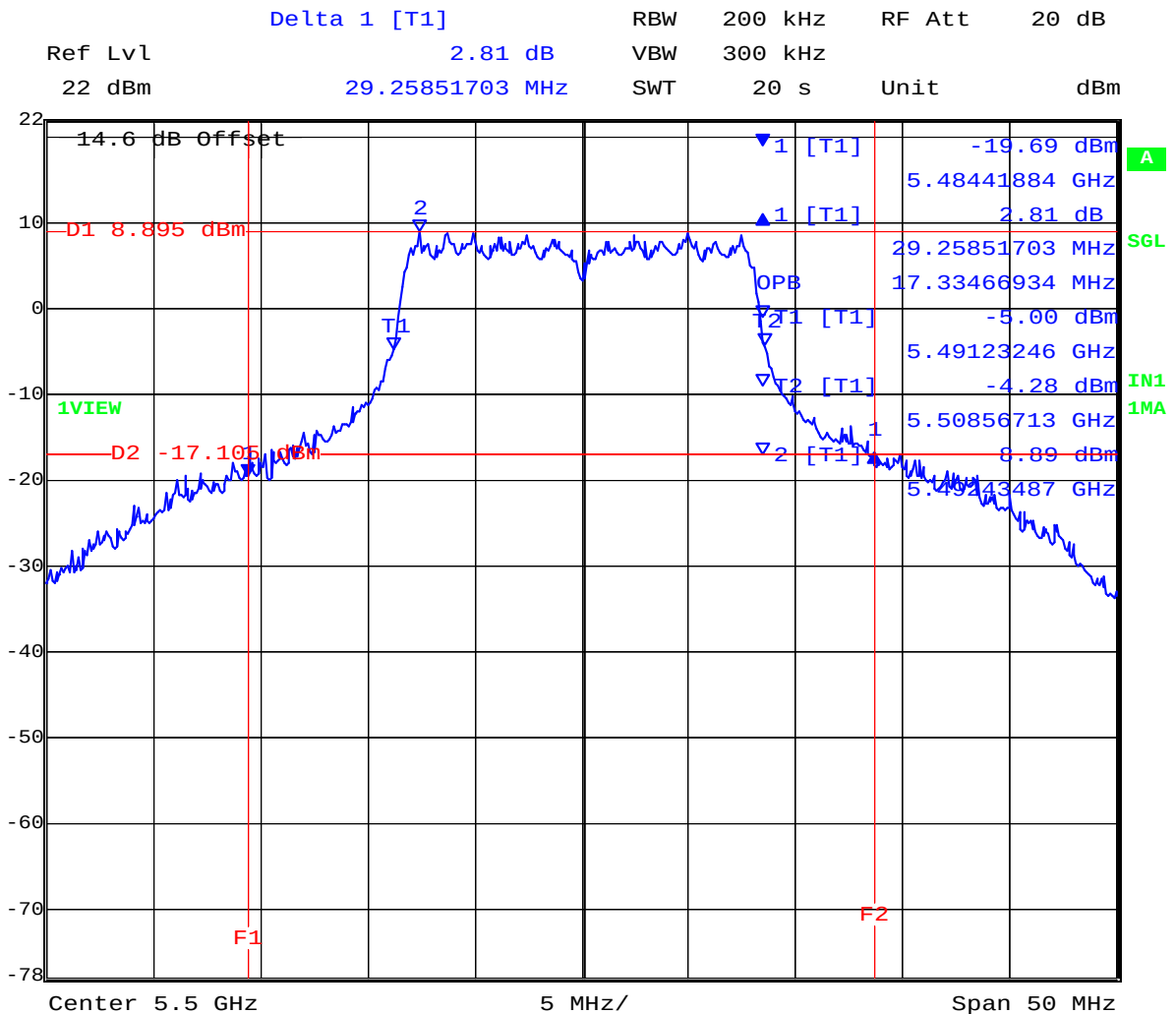


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# TABLE OF RESULTS – 802.11a Legacy

| Center Frequency (MHz) | 26 dB Bandwidth (MHz) | 99 % BW (MHz) |
|------------------------|-----------------------|---------------|
| 5,550                  | 17.335                | 29.259        |
| 5,600                  | 17.535                | 29.359        |
| 5,700                  | 19.138                | 34.870        |

## 5500 MHz 802.11a Legacy 26 dB and 99 % Bandwidth

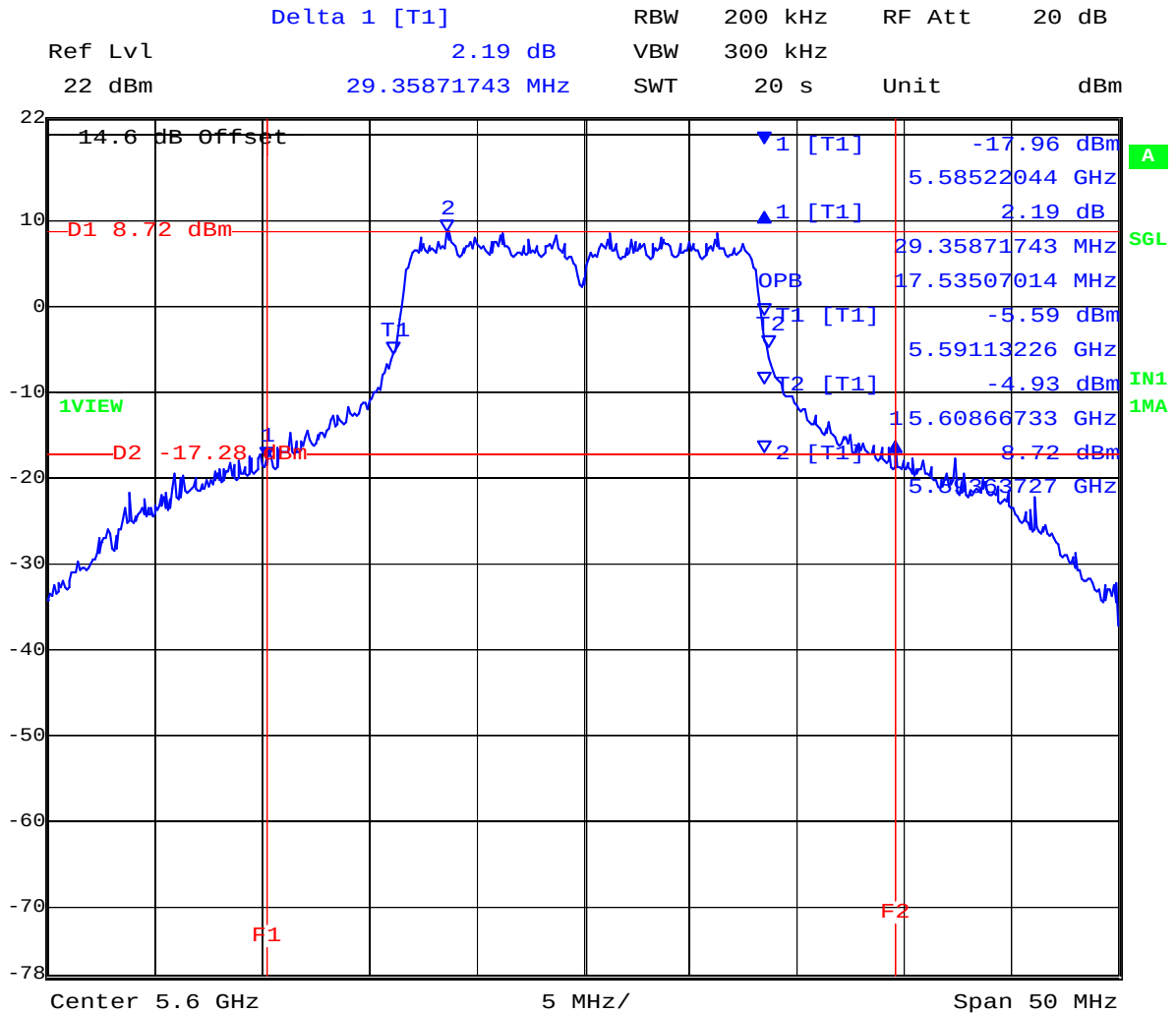


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### 5,600 MHz 802.11a Legacy 26 dB and 99 % Bandwidth

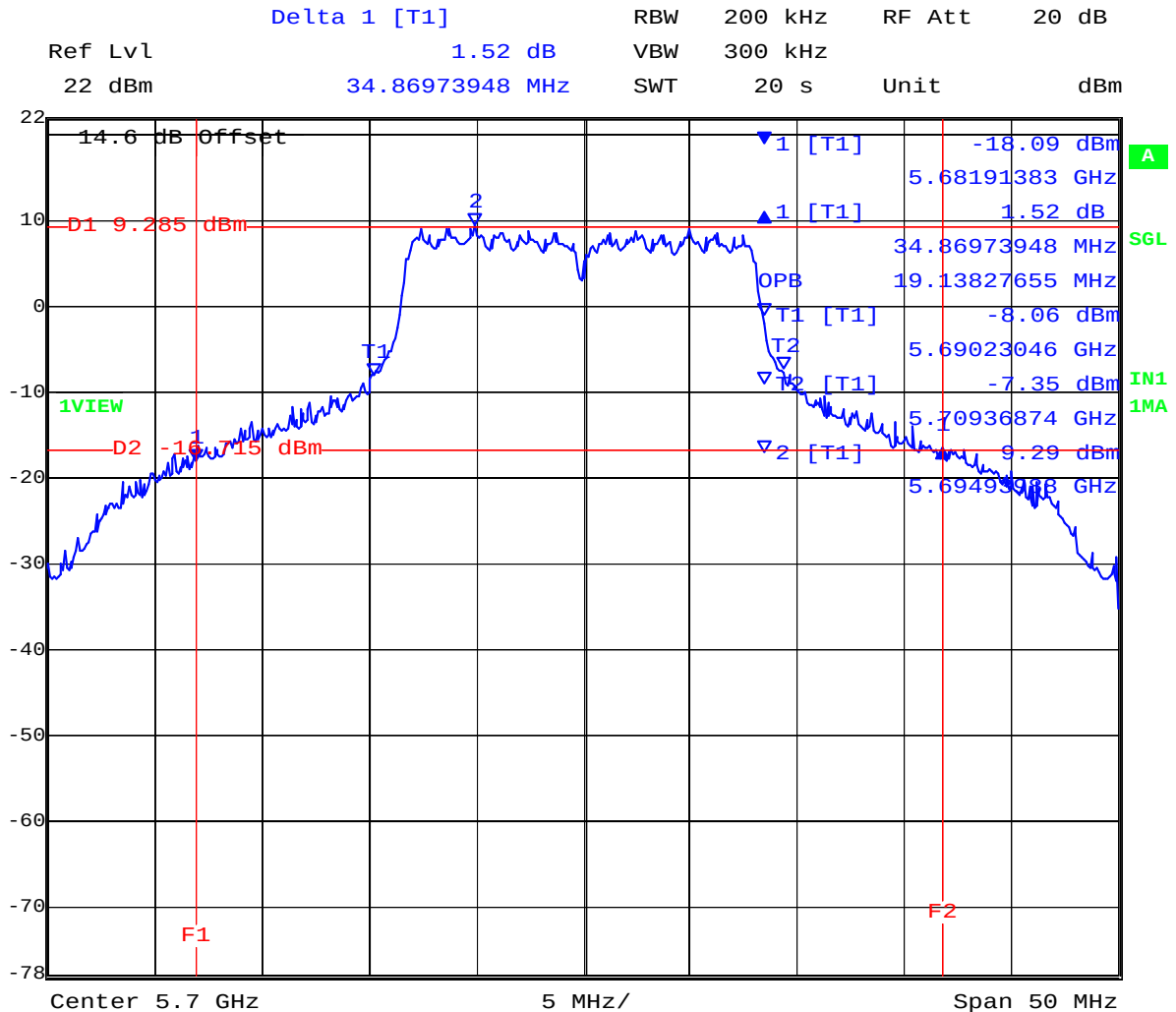


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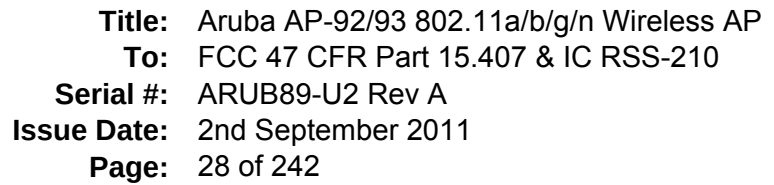


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### 5,700 MHz 802.11a Legacy 26 dB and 99 % Bandwidth



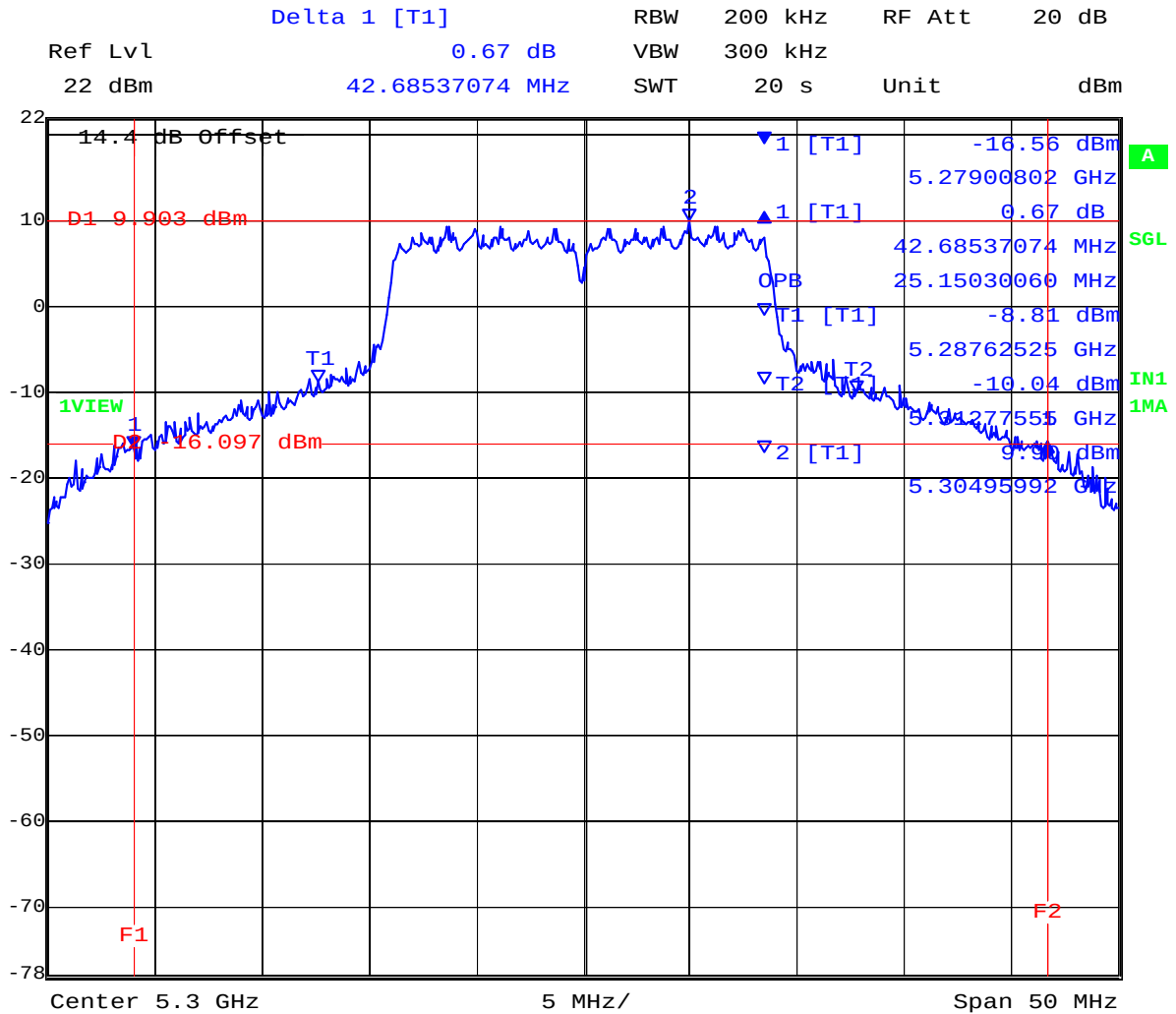
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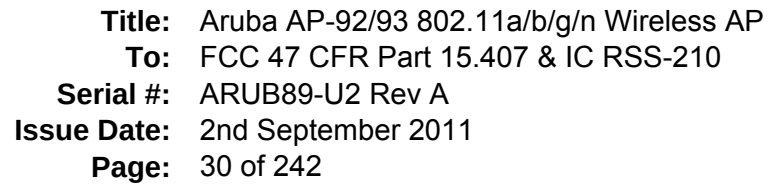


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### 5,300 MHz 802.11n HT20 26 dB and 99 % Bandwidth



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Delta 1 [T1] 0.38 dB RBW 200 kHz RF Att 20 dB  
 Ref Lvl 22 dBm 43.18637275 MHz VBW 300 kHz SWT 20 s Unit dBm

14.4 dB Offset

1 [T1] -16.30 dBm 5.29830661 GHz  
 1 [T1] 0.38 dB 43.18637275 MHz  
 OPB 25.25050100 MHz  
 T1 [T1] -9.26 dBm 5.30752505 GHz  
 T2 [T1] -8.51 dBm 5.3077555 GHz  
 2 [T1] -9.14 dBm 5.31493988 GHz

D1 0.769 dBm

1VIEW

F1 F2

Center 5.32 GHz 5 MHz/ Span 50 MHz



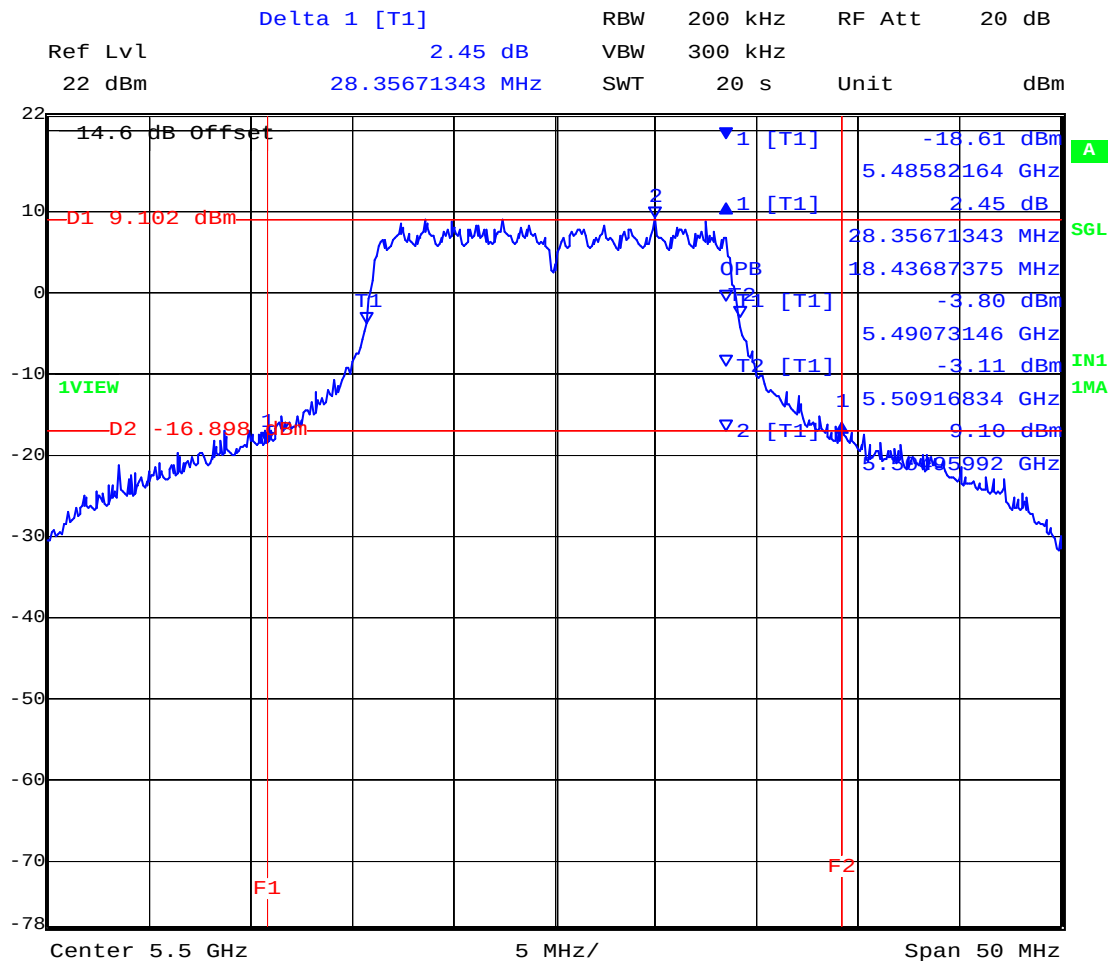
**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
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### Measurement Results for 26 dB and 99 % Operational Bandwidth(s) -Continue

TABLE OF RESULTS – 802.11n HT-20

| Center Frequency (MHz) | 26 dB Bandwidth (MHz) | 99 % BW (MHz) |
|------------------------|-----------------------|---------------|
| 5,550                  | 28.357                | 18.437        |
| 5,600                  | 32.966                | 18.537        |
| 5,700                  | 37.074                | 19.940        |

### 5500 MHz 802.11a HT-20 26 dB and 99 % Bandwidth

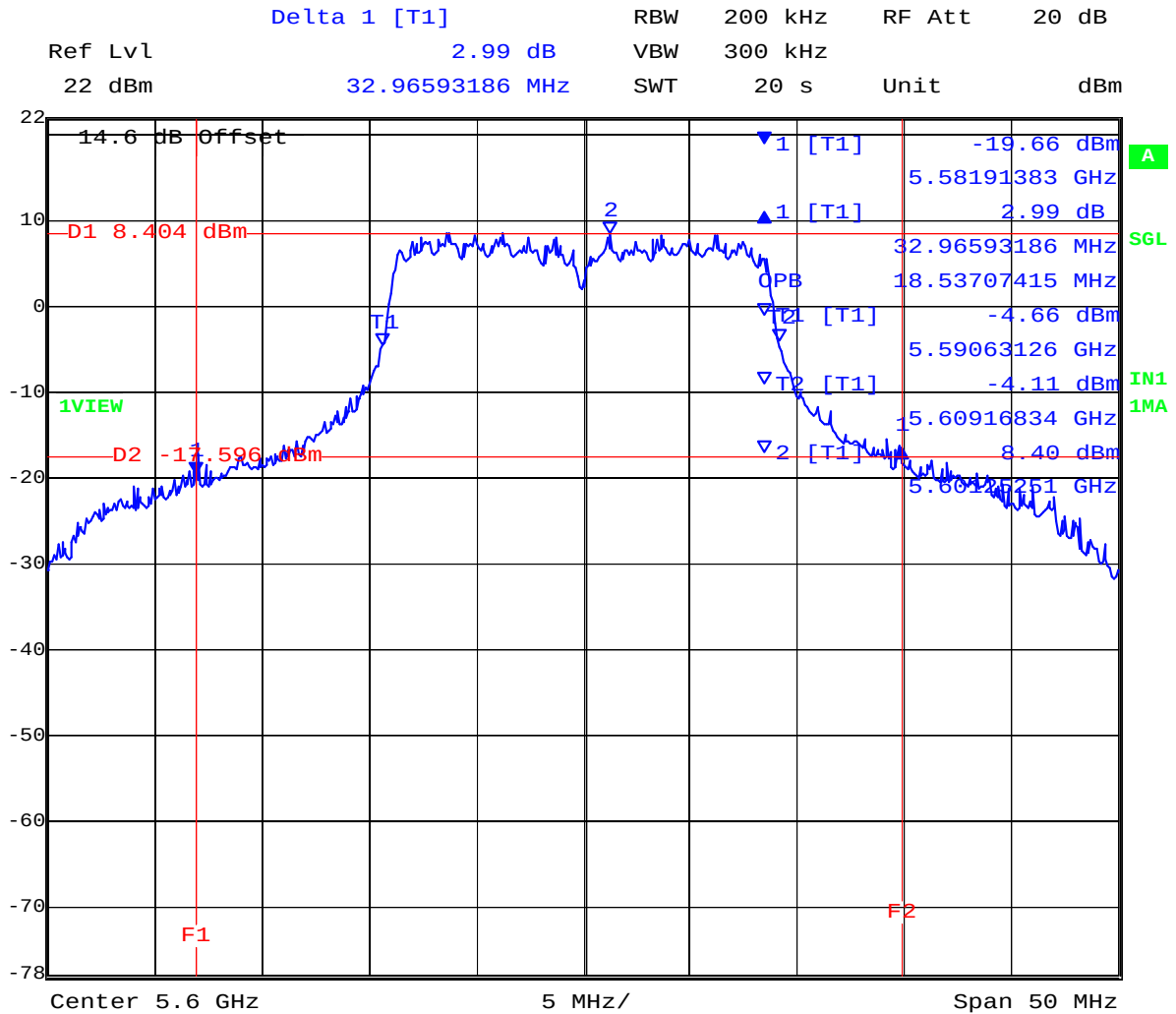


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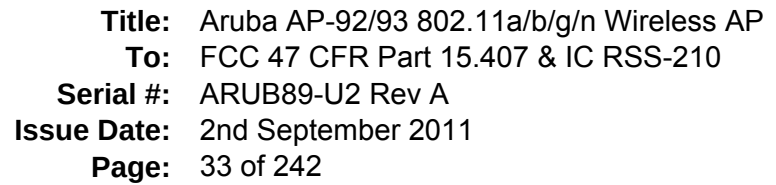
Title: Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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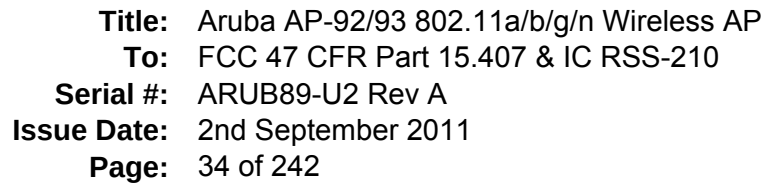
### 5,600 MHz 802.11a HT-20 26 dB and 99 % Bandwidth



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## TABLE OF RESULTS – 802.11n HT40

| Center Frequency<br>(MHz) | 26 dB Bandwidth<br>(MHz) | 99 % BW<br>(MHz) |
|---------------------------|--------------------------|------------------|
| 5,270                     | 94.790                   | 55.511           |
| 5,310                     | 92.986                   | 58.517           |

Delta 1 [T1] 1.61 dB

RBW 500 kHz VBW 1 MHz RF Att 20 dB

Ref Lvl 22 dBm Unit dBm

SWT 20 s

14.4 dB Offset

D1 10.347 dBm

1 [T1] -16.67 dBm

5.22340681 GHz

94.78957916 MHz

OPB

T1 [T1] -9.45 dBm

5.24364729 GHz

T2 [T1] -9.33 dBm

5.29915842 GHz

D2 -15.653 dBm

2 [T1] 10.35 dBm

5.26488978 GHz

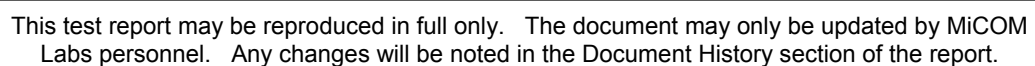
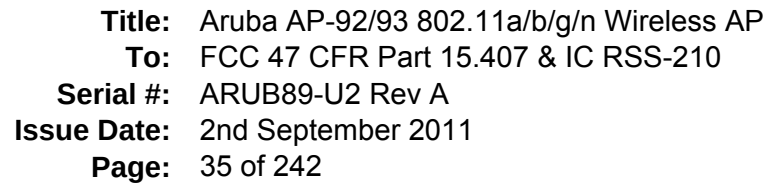
1VIEW

F1

F2

Center 5.27 GHz 10 MHz/ Span 100 MHz

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### Measurement Results for 26 dB and 99 % Operational Bandwidth(s) -Continued

TABLE OF RESULTS – 802.11n HT40

| Center Frequency (MHz) | 26 dB Bandwidth (MHz) | 99 % BW (MHz) |
|------------------------|-----------------------|---------------|
| 5,510                  | 71.343                | 38.076        |
| 5,590                  | 73.347                | 38.677        |
| 5,690                  | 81.764                | 40.281        |

### 5,510 MHz 802.11n HT40 26 dB and 99 % Bandwidth

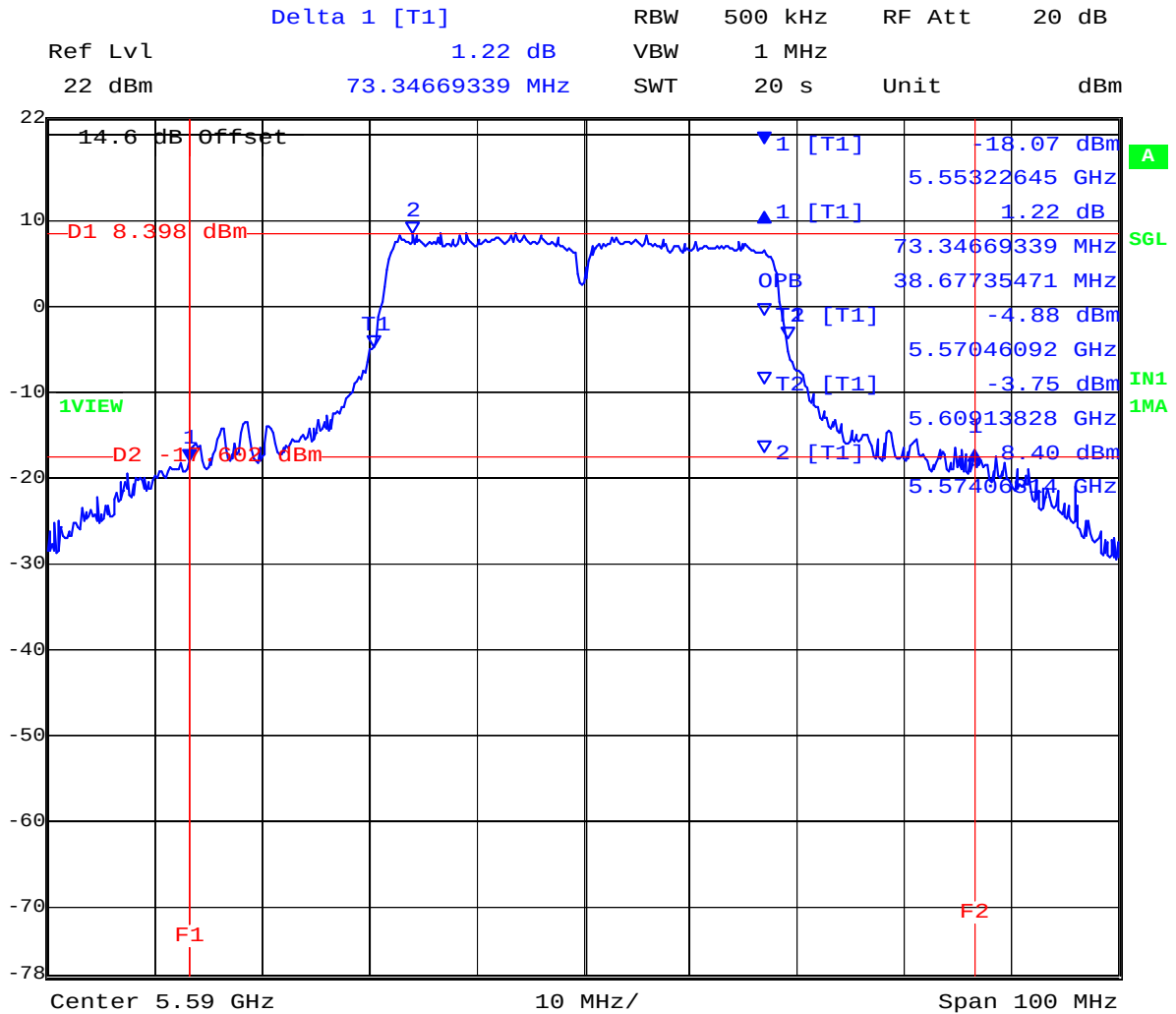


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### 5,590 MHz 802.11n HT40 26 dB and 99 % Bandwidth

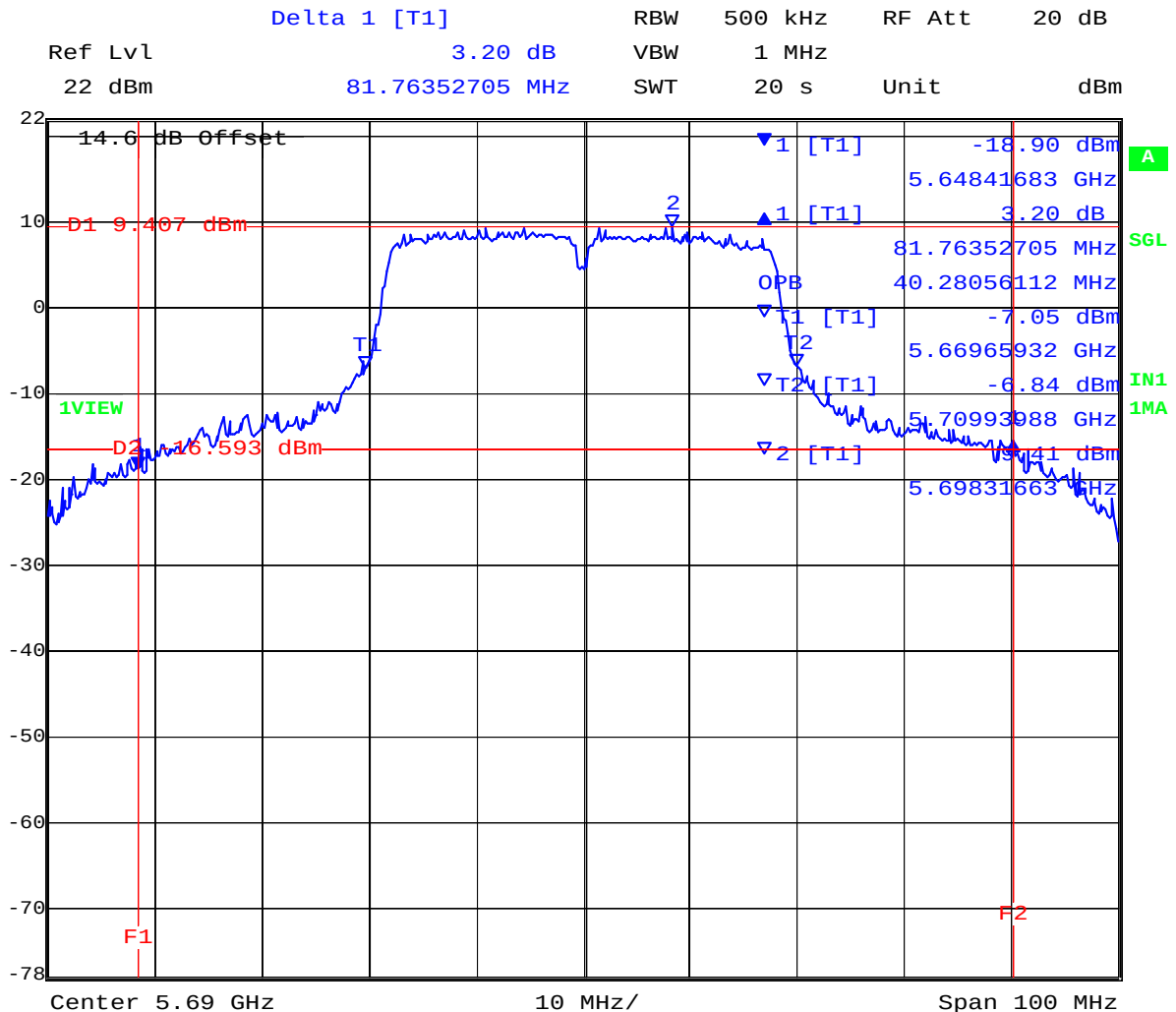


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### 5,690 MHz 802.11n HT40 26 dB and 99 % Bandwidth



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## Specification

### Limits

#### FCC, Part 15 §15.407 (a)(1), (a)(2) and Industry Canada RSS-210 § A9.2(2)

**(a)(1)** For the band 5.15-5.25 GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or +4 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

**(a)(2)** For the 5.25-5.35 GHz band the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or +11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

#### Industry Canada RSS-Gen 4.4

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

## Laboratory Measurement Uncertainty for Spectrum Measurement

|                         |          |
|-------------------------|----------|
| Measurement uncertainty | ±2.81 dB |
|-------------------------|----------|

## Traceability

| Method                                                                              | Test Equipment Used                            |
|-------------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask' | 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117 |

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### 5.1.2. Transmit Output Power

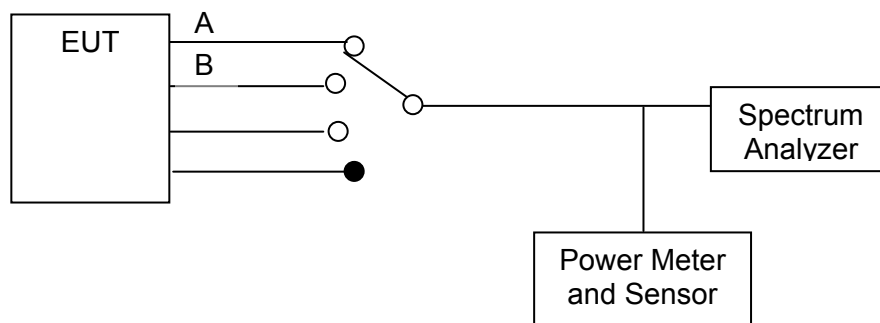
**FCC, Part 15 Subpart C §15.407(a)**  
**Industry Canada RSS-210 §9.9(2)**

#### **Test Procedure**

The transmitter terminal of EUT was connected to the input of the spectrum analyzer set to measure peak power. Output power was measured following the latest FCC KDB 662911 D01 Multiple Transmitter Output v01.

Power measurement results are provided for individual ports and a calculated power is provided taking all ports into consideration. All cable losses and offsets were taken into consideration in the final result.

#### **Test Measurement Set up**



Measurement set up for Transmitter Output Power

Ambient test conditions.

Temperature: 17 to 23 °C      Relative humidity: 31 to 57 %      Pressure: 999 to 1012 mbar

#### **Radio Parameters**

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

Calculated Power =  $A + G + 10 \log (1/x)$  dBm

A = Total Power [ $10 \log_{10} (10^{a/10} + 10^{b/10})$ ], G = Antenna Gain,  
x = Duty Cycle

**NOTE: KDB 662911 was implemented for In-band power measurements. The measure and sum technique was implemented in all cases.**





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### Maximum Transmit (Conducted) Power, FCC Limits and Industry Canada Limits

#### Bands 5250 – 5350 and 5470 – 5725 MHz

Limit lesser of: 250 mW or 11 dBm + 10 log (B) dBm

| Mode  | Frequency Range (MHz)      | Maximum 26 dB Bandwidth (MHz) | 11 + 10 Log (B) (dBm) | Limit (dBm) |
|-------|----------------------------|-------------------------------|-----------------------|-------------|
| a     | 5250 – 5350<br>5470 – 5725 | 24.850                        | +24.95                | +24.00      |
| HT-20 |                            | 43.186                        | +27.35                | +24.00      |
| HT-40 |                            | 94.790                        | +30.77                | +24.00      |

15. 407 (a)(1), (a) (2) Operation with directional antenna gains greater than 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Further FCC KDB 662911 D01 Multiple Transmitter Output v01 requires that the gain of antennas transmitting the same data (legacy 802.11a mode) must be increased by  $10 * \log(N)$  when N is the number of antenna elements.

#### MIMO Operation 5250-5350 and 5470 – 5725 MHz

| Antenna   | Gain  | Max. Allowable Conducted Peak Power (dBm) |              | Maximum EIRP |
|-----------|-------|-------------------------------------------|--------------|--------------|
| (dB)      | (dBi) | Non-Beam Forming                          | Beam Forming | (dBm)        |
| Integral  | +5.8  | +24.0                                     | N/A          | +30.0        |
| AP-ANT-10 | +6.0  | +24.0                                     |              | +30.0        |
| AP-ANT-12 | +14.0 | +16.0                                     |              | +30.0        |

#### Non-MIMO Operation (Legacy) 5250-5350 and 5470 – 5725 MHz

| Antenna   | Gain dBi | Increased Gain V's No. Antenna Ports |      | Total Gain | Max. Allowable Conducted Peak Power | Maximum EIRP |
|-----------|----------|--------------------------------------|------|------------|-------------------------------------|--------------|
| (dB)      |          | Ports                                | dB   | dBi        | (dBm)                               | (dBm)        |
| Integral  | +5.8     | 2                                    | 3.01 | 8.81       | +21.19                              | +30.0        |
| AP-ANT-10 | +6.0     | 2                                    | 3.01 | 9.01       | +20.99                              | +30.0        |
| AP-ANT-12 | +14.0    | 2                                    | 3.01 | 17.01      | +12.99                              | +30.0        |

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**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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#### 5250 - 5350 GHz 11a mode Conducted Power

|                               |               |                            |     |    |      |
|-------------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)(1) | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11 a      | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH          | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON            | <b>Duty Cycle (x):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A dB        | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0 Vdc      |                            |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    | Combined          | Calculated | dBm   | dB     |
| MHz            | a                   | b     | c  | d  |                   |            |       |        |
| 5260           | 19.02               | 17.42 | -- | -- | N/A               | 21.30      | 24.00 | -2.70  |
| 5300           | 19.45               | 16.65 | -- | -- | N/A               | 21.28      | 24.00 | -2.72  |
| 5320           | 19.84               | 16.73 | -- | -- | N/A               | 21.57      | 24.00 | -2.43  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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5250 - 5350 GHz HT-20 mode Conducted Power

|                               |                |                            |     |    |      |
|-------------------------------|----------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)(1)  | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11 n HT-20 | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH           | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON             | <b>Duty Cycle (x):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A            | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0           | Vdc                        |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5260.00        | 19.20               | 17.70 | -- | -- | N/A               | 21.52      | 24.00 | -2.48  |
| 5300.00        | 19.44               | 17.08 | -- | -- | N/A               | 21.43      | 24.00 | -2.57  |
| 5320.00        | 19.76               | 16.93 | -- | -- | N/A               | 21.58      | 24.00 | -2.42  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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#### 5250 - 5350 GHz HT-40 mode Conducted Power

|                               |                |                            |     |    |      |
|-------------------------------|----------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)(1)  | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11 n HT-40 | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH           | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON             | <b>Duty Cycle (x):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A            | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0           | Vdc                        |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5270.00        | 19.59               | 17.16 | -- | -- | N/A               | 21.55      | 24.00 | -2.45  |
| 5310.00        | 20.08               | 16.57 | -- | -- | N/A               | 21.68      | 24.00 | -2.32  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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5470 - 5725 GHz 11a mode Conducted Power

|                               |               |                            |     |    |       |
|-------------------------------|---------------|----------------------------|-----|----|-------|
| <b>Test Conditions:</b>       | 15.407 (a)(1) | <b>Rel. Humidity (%):</b>  | 35  | to | 42    |
| <b>Variant:</b>               | 802.11a       | <b>Ambient Temp. (°C):</b> | 19  | to | 22    |
| <b>TPC:</b>                   | HIGH          | <b>Pressure (mBars):</b>   | 998 | to | 1003  |
| <b>Modulation:</b>            | ON            | <b>Duty Cycle (x):</b>     | 100 |    |       |
| <b>Beam Forming Gain (Y):</b> | N/A           | <b>Antenna Gain:</b>       |     |    | 0 dBi |
| <b>Applied Voltage:</b>       | 12.0          | Vdc                        |     |    |       |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5500           | 16.55               | 16.10 | -- | -- | N/A               | 19.34      | 24.00 | -4.66  |
| 5600           | 17.70               | 16.18 | -- | -- | N/A               | 20.02      | 24.00 | -3.98  |
| 5700           | 17.58               | 15.99 | -- | -- | N/A               | 19.87      | 24.00 | -4.13  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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5470 - 5725 GHz HT-20 mode Conducted Power

|                               |               |                            |     |    |       |
|-------------------------------|---------------|----------------------------|-----|----|-------|
| <b>Test Conditions:</b>       | 15.407 (a)(1) | <b>Rel. Humidity (%):</b>  | 35  | to | 42    |
| <b>Variant:</b>               | 802.11n HT-20 | <b>Ambient Temp. (°C):</b> | 19  | to | 22    |
| <b>TPC:</b>                   | HIGH          | <b>Pressure (mBars):</b>   | 998 | to | 1003  |
| <b>Modulation:</b>            | ON            | <b>Duty Cycle (x):</b>     | 100 |    |       |
| <b>Beam Forming Gain (Y):</b> | N/A           | <b>Antenna Gain:</b>       |     |    | 0 dBi |
| <b>Applied Voltage:</b>       | 12.0 Vdc      |                            |     |    |       |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5500           | 17.96               | 18.07 | -- | -- | N/A               | 21.03      | 24.00 | -2.97  |
| 5600           | 18.39               | 18.60 | -- | -- | N/A               | 21.51      | 24.00 | -2.49  |
| 5700           | 18.28               | 19.02 | -- | -- | N/A               | 21.68      | 24.00 | -2.32  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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5470 - 5725 GHz HT-40 mode Conducted Power

|                               |               |                            |     |    |      |
|-------------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)(1) | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11n HT-40 | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH          | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON            | <b>Duty Cycle (x):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A           | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0          | Vdc                        |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5510.00        | 17.24               | 17.51 | -- | -- | N/A               | 20.39      | 24.00 | -3.61  |
| 5610.00        | 17.50               | 18.04 | -- | -- | N/A               | 20.79      | 24.00 | -3.21  |
| 5690.00        | 17.59               | 18.05 | -- | -- | N/A               | 20.84      | 24.00 | -3.16  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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## Specification

### Limits

#### **FCC, Part 15 §15.407 (a)(1), (a)(2) and Industry Canada RSS-210 § A9.2(2)**

**(a)(1)** For the band 5.15-5.25 GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or  $+4 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +4 dBm in any 1 megahertz band. If directional antennas greater than 6 dBi are used both the maximum conducted power and the peak power spectral density shall be reduced by the amount in dB that exceeds the directional gain.

**(a)(2)** For the 5.25-5.35 and 5.47–5.725 GHz band the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or  $+11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +11 dBm in any 1 megahertz band. If directional antennas greater than 6 dBi are used both the maximum conducted power and the peak power spectral density shall be reduced by the amount in dB that exceeds the directional gain.

#### **Industry Canada RSS-210 §A9.2(2)**

For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the band 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

### Laboratory Measurement Uncertainty for Power Measurements

|                         |                       |
|-------------------------|-----------------------|
| Measurement uncertainty | $\pm 1.33 \text{ dB}$ |
|-------------------------|-----------------------|

### Traceability

| Method                                                                        | Test Equipment Used                            |
|-------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made per work instruction WI-01 'Measuring RF Output Power' | 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117 |

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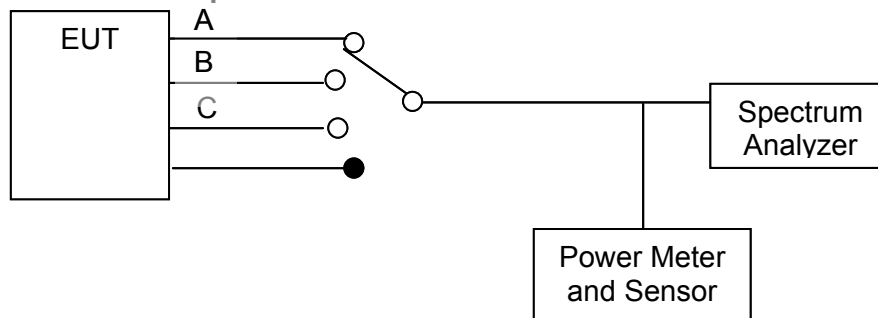
### 5.1.3. Peak Power Spectral Density

**FCC, Part 15 Subpart C §15.407(a)**  
**Industry Canada RSS-210 § A9.2(2)**

#### **Test Procedure**

The transmitter output was connected to a spectrum analyzer and the peak power spectral density measured. Method 2 Sample Detection and power averaging, specified in FCC document DA 02-2138 (Normative Reference (ix) Section 2.1 “Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices”) was used to determine the peak power spectral density of the emission. The Peak Power Spectral Density is the highest level found across the emission in a 1 MHz resolution bandwidth.

#### **Test Measurement Set up**



Measurement set up for Peak Power Spectral Density

#### **Measurement Results for Peak Power Spectral Density**

Ambient conditions.

Temperature: 17 to 23 °C      Relative humidity: 31 to 57 %      Pressure: 999 to 1012 mbar

#### **Radio Parameters**

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power



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**TABLE OF RESULTS – 802.11a**

|                               |            |                            |             |
|-------------------------------|------------|----------------------------|-------------|
| <b>Test Conditions:</b>       | 15.407 (a) | <b>Rel. Humidity (%):</b>  | 35 to 42    |
| <b>Variant:</b>               | 802.11 a   | <b>Ambient Temp. (°C):</b> | 19 to 22    |
| <b>TPC:</b>                   | HIGH       | <b>Pressure (mBars):</b>   | 998 to 1003 |
| <b>Modulation:</b>            | ON         | <b>Duty Cycle (%):</b>     | 100         |
| <b>Beam Forming Gain (Y):</b> | N/A dB     | <b>Antenna Gain:</b>       | 0 dBi       |
| <b>Applied Voltage:</b>       | 12.0 Vdc   | <b>Antenna Ports (N):</b>  | 2           |

| Test Frequency | Measured Peak Power |      |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|---------------------|------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)       |      |    |    |                   |                             |       |        |
| MHz            | a                   | b    | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 5260.00        | 6.21                | 4.30 | -- | -- | 3.01              | 6.21                        | 7.99  | -1.78  |
| 5300.00        | 6.67                | 3.93 | -- | -- | 3.01              | 6.67                        | 7.99  | -1.32  |
| 5320.00        | 6.50                | 3.68 | -- | -- | 3.01              | 6.50                        | 7.99  | -1.49  |

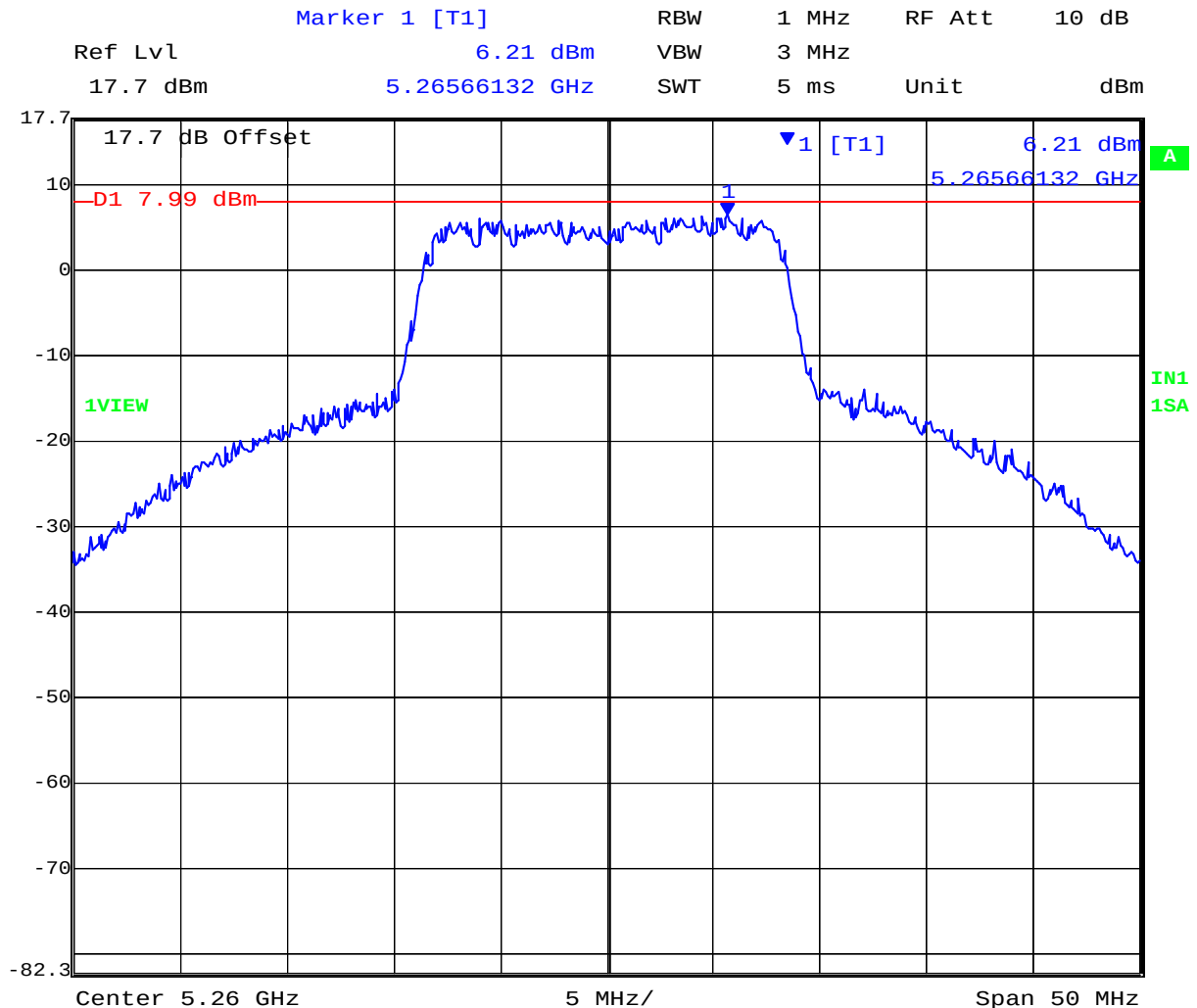
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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### 5,260 MHz 802.11a Port a Peak Power Spectral Density



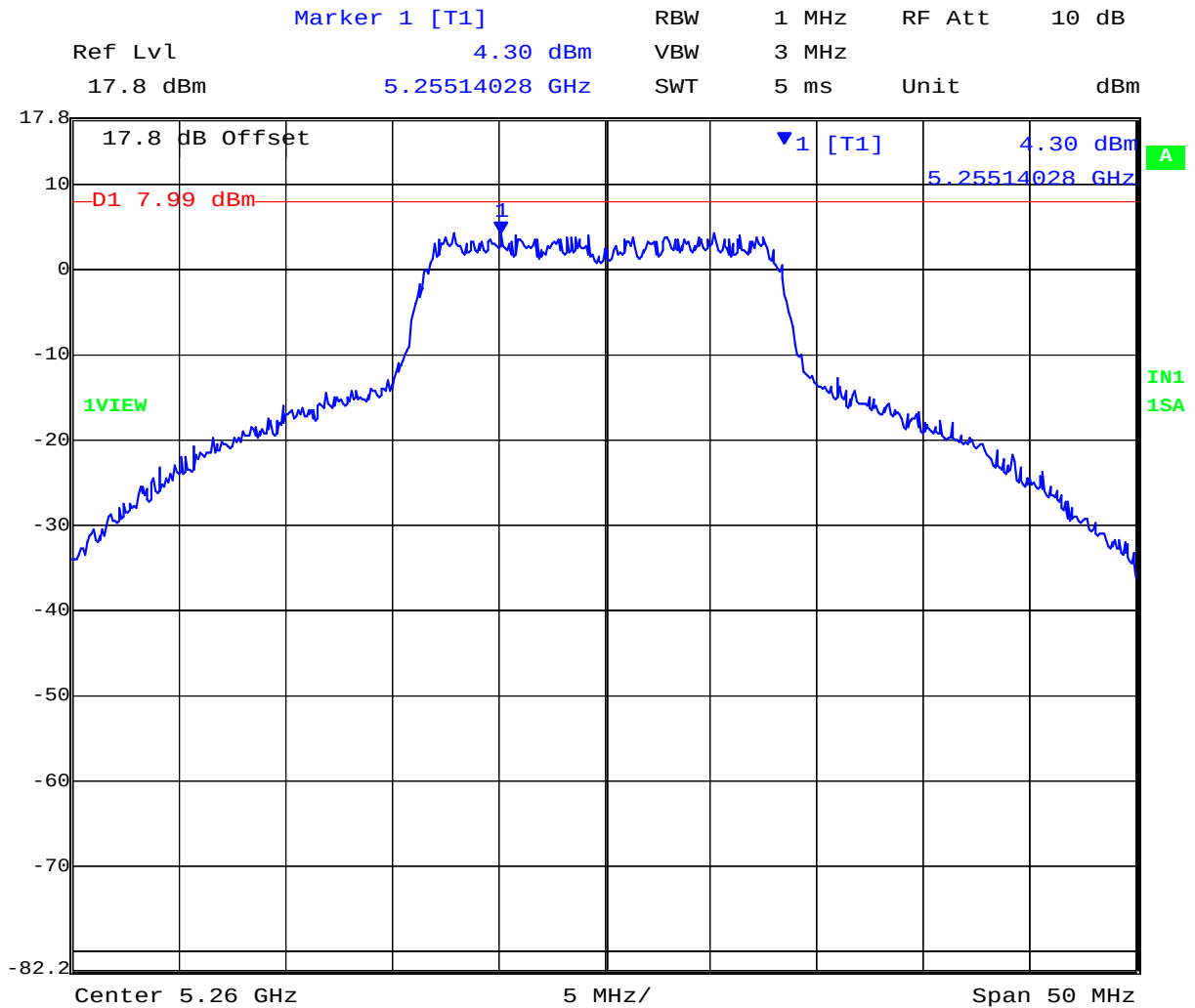
Date: 16.AUG.2011 08:54:58

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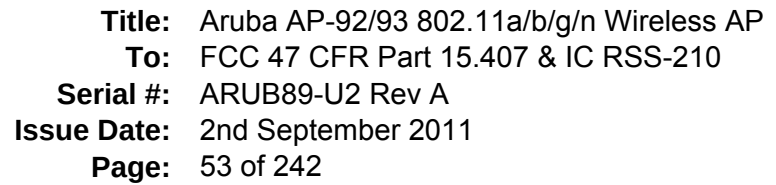
**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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### 5,260 MHz 802.11a Port b Peak Power Spectral Density



Date: 16.AUG.2011 08:55:51

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Marker 1 [T1] 6.67 dBm 5.30315631 GHz

Ref Lvl 17.7 dBm

RBW 1 MHz RF Att 10 dB

VBW 3 MHz

SWT 5 ms Unit dBm

17.7 dB Offset

D1 7.99 dBm

1VIEW

1 [T1]

IN1 1SA

Center 5.3 GHz 5 MHz/ Span 50 MHz

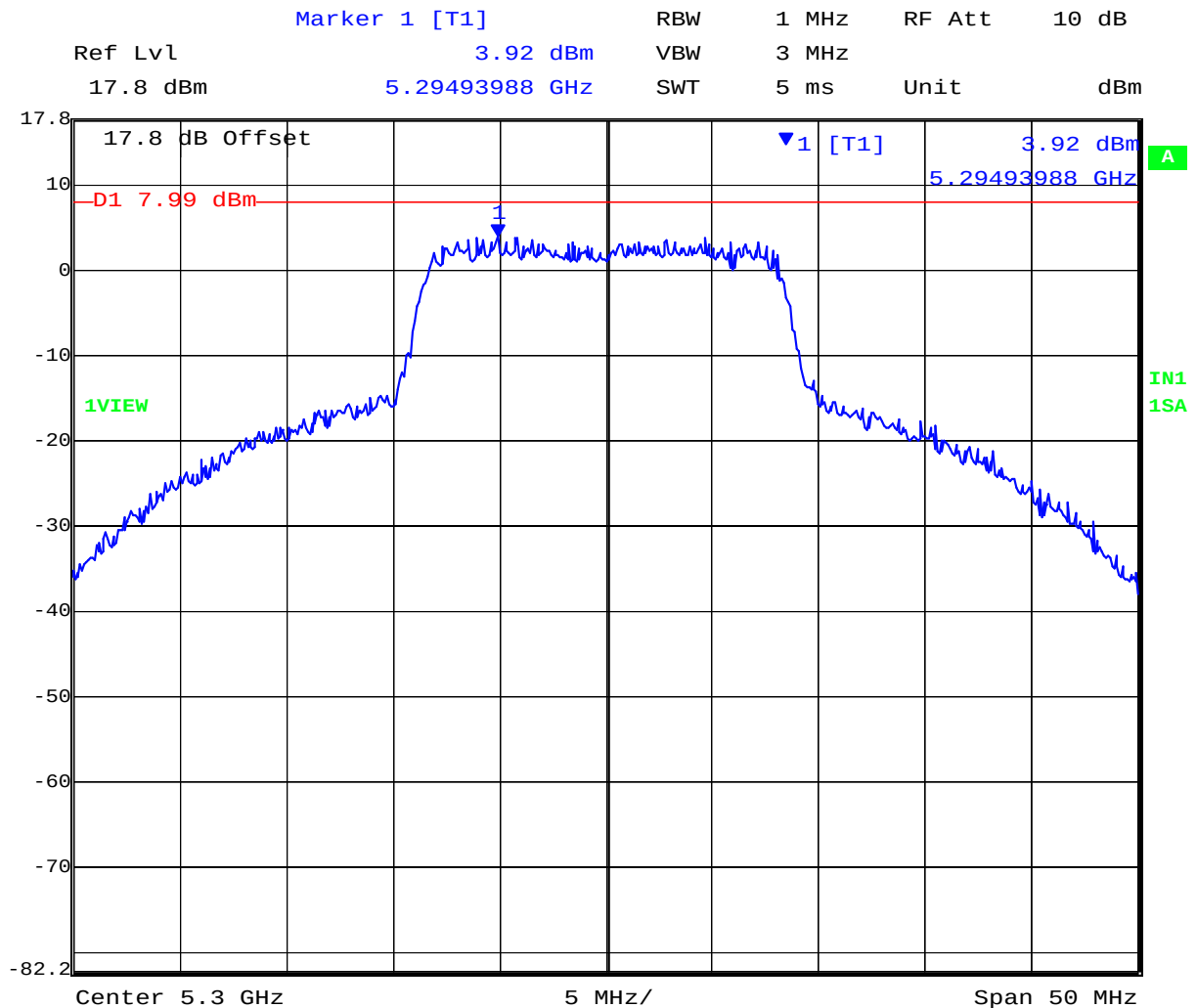
Date: 16.AUG.2011 08:58:53

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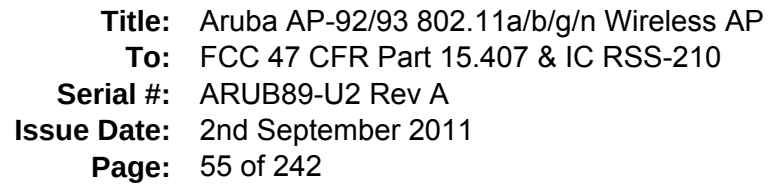
**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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### 5,300 MHz 802.11a Port b Peak Power Spectral Density



Date: 16.AUG.2011 08:59:46

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Ref Lvl 17.7 dBm Marker 1 [T1] 6.50 dBm RBW 1 MHz RF Att 10 dB  
 5.31794589 GHz VBW 3 MHz Unit dBm  
 17.7 dB Offset

1VIEW

1 [T1]

17.7 dBm

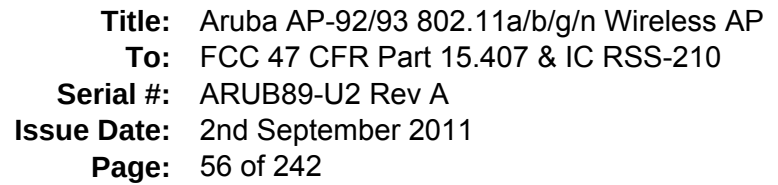
6.50 dBm

5.31794589 GHz

Center 5.32 GHz 5 MHz/ Span 50 MHz

Date: 16.AUG.2011 09:02:41

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)



Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
 Ref Lvl 3.68 dBm VBW 3 MHz  
 17.8 dBm 5.32686373 GHz SWT 5 ms Unit dBm

17.8 dB Offset

D1 7.99 dBm

1VIEW

IN1 1SA

▼1 [T1] 3.68 dBm 5.32686373 GHz

1

Center 5.32 GHz 5 MHz/ Span 50 MHz

Date: 16.AUG.2011 09:03:33

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)





**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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# TABLE OF RESULTS – 802.11a

|                               |            |                            |     |    |      |
|-------------------------------|------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a) | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11a    | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH       | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON         | <b>Duty Cycle (%):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A        | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0       | <b>Antenna Ports (N):</b>  | 2   |    |      |

| Test Frequency | Measured Peak Power |      |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|---------------------|------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)       |      |    |    |                   |                             |       |        |
| MHz            | a                   | b    | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 5500.00        | 3.58                | 3.26 | -- | -- | 3.01              | 3.58                        | 7.99  | -4.41  |
| 5600.00        | 4.94                | 4.08 | -- | -- | 3.01              | 4.94                        | 7.99  | -3.05  |
| 5700.00        | 4.70                | 3.07 | -- | -- | 3.01              | 4.70                        | 7.99  | -3.29  |

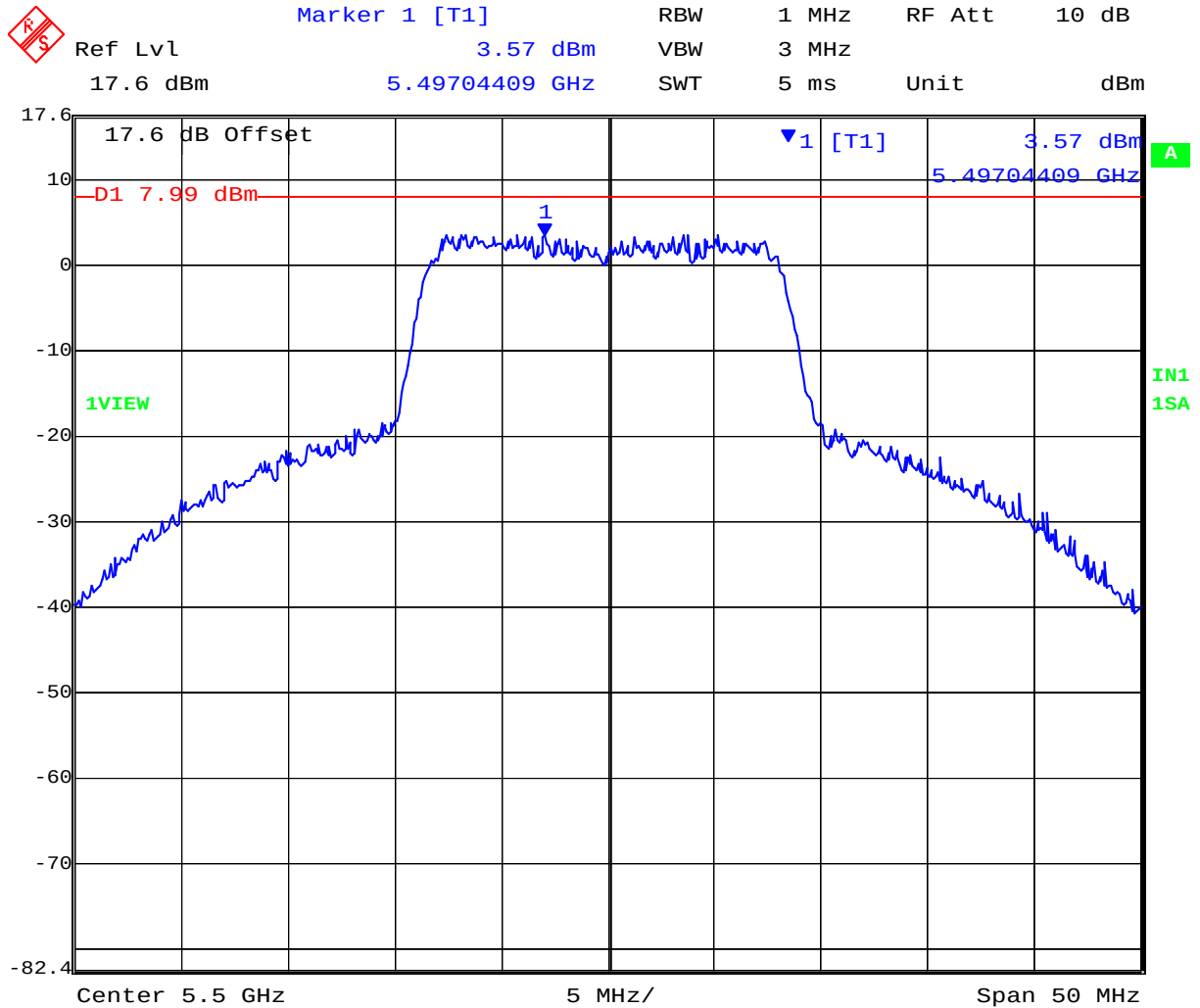
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
**Serial #:** ARUB89-U2 Rev A  
**Issue Date:** 2nd September 2011  
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### 5,500 MHz 802.11a Port a Peak Power Spectral Density



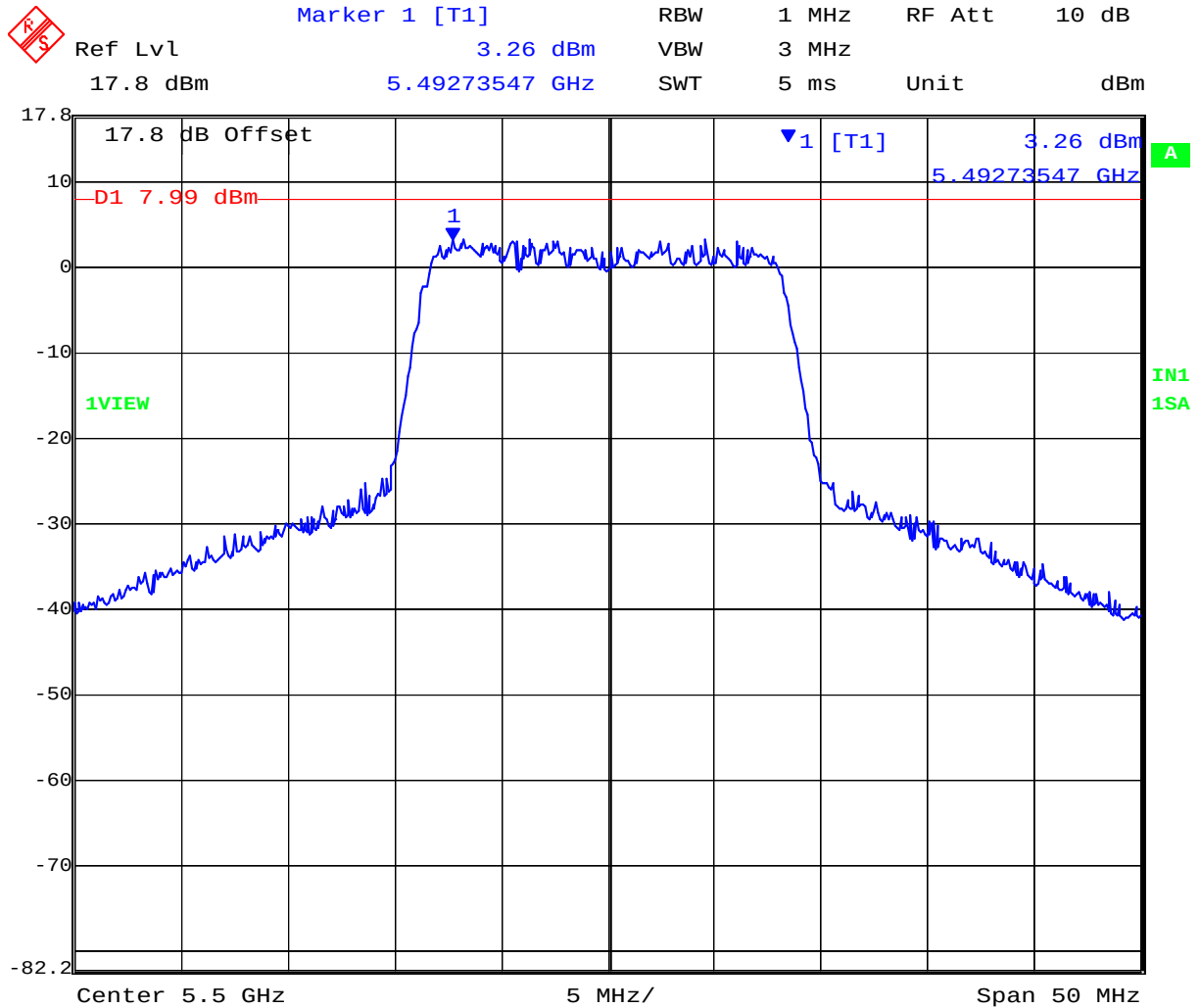
Date: 21.JUN.2011 13:02:02

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### 5,500 MHz 802.11a Port b Peak Power Spectral Density



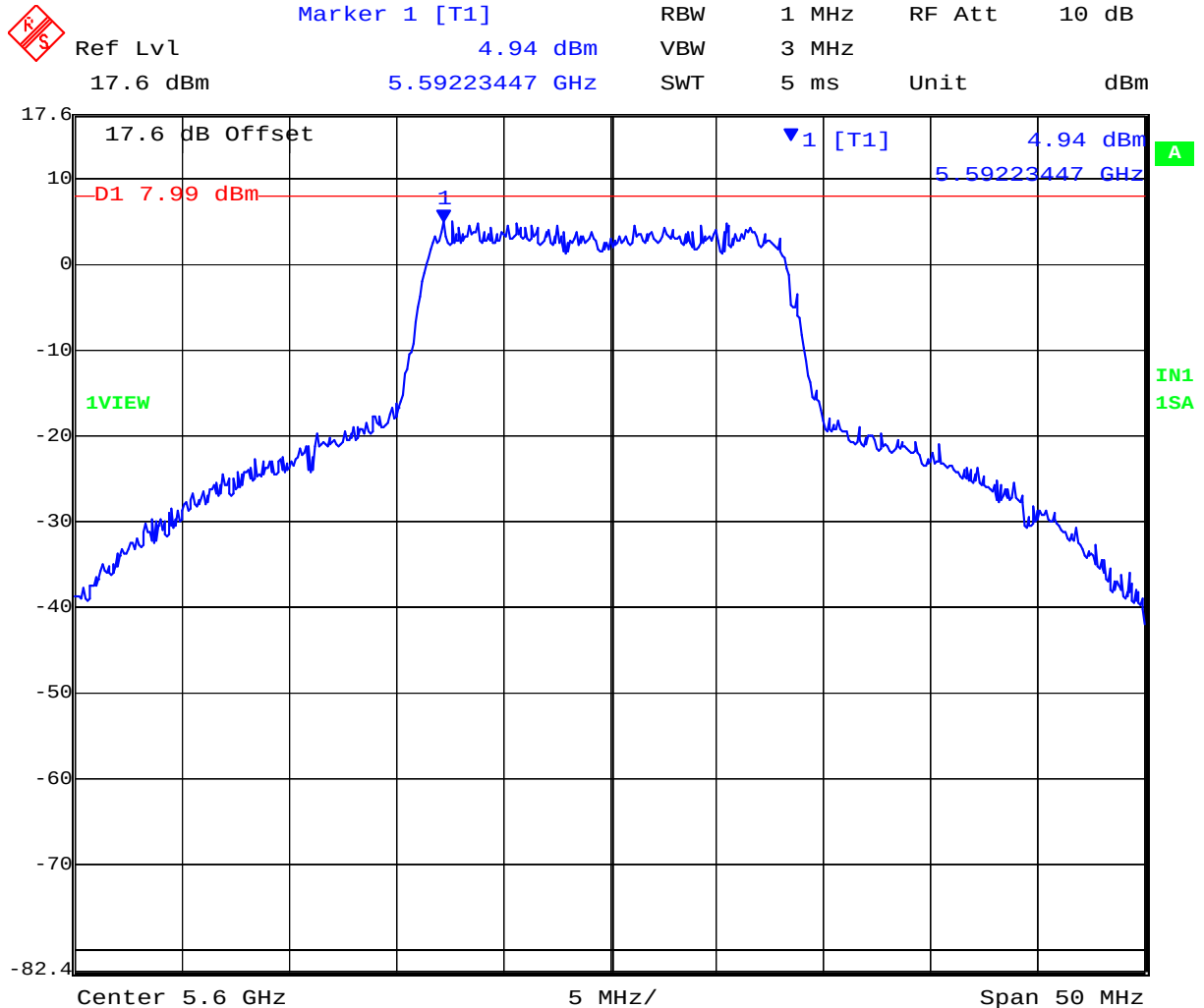
Date: 21.JUN.2011 13:02:57

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### 5,600 MHz 802.11a Port a Peak Power Spectral Density



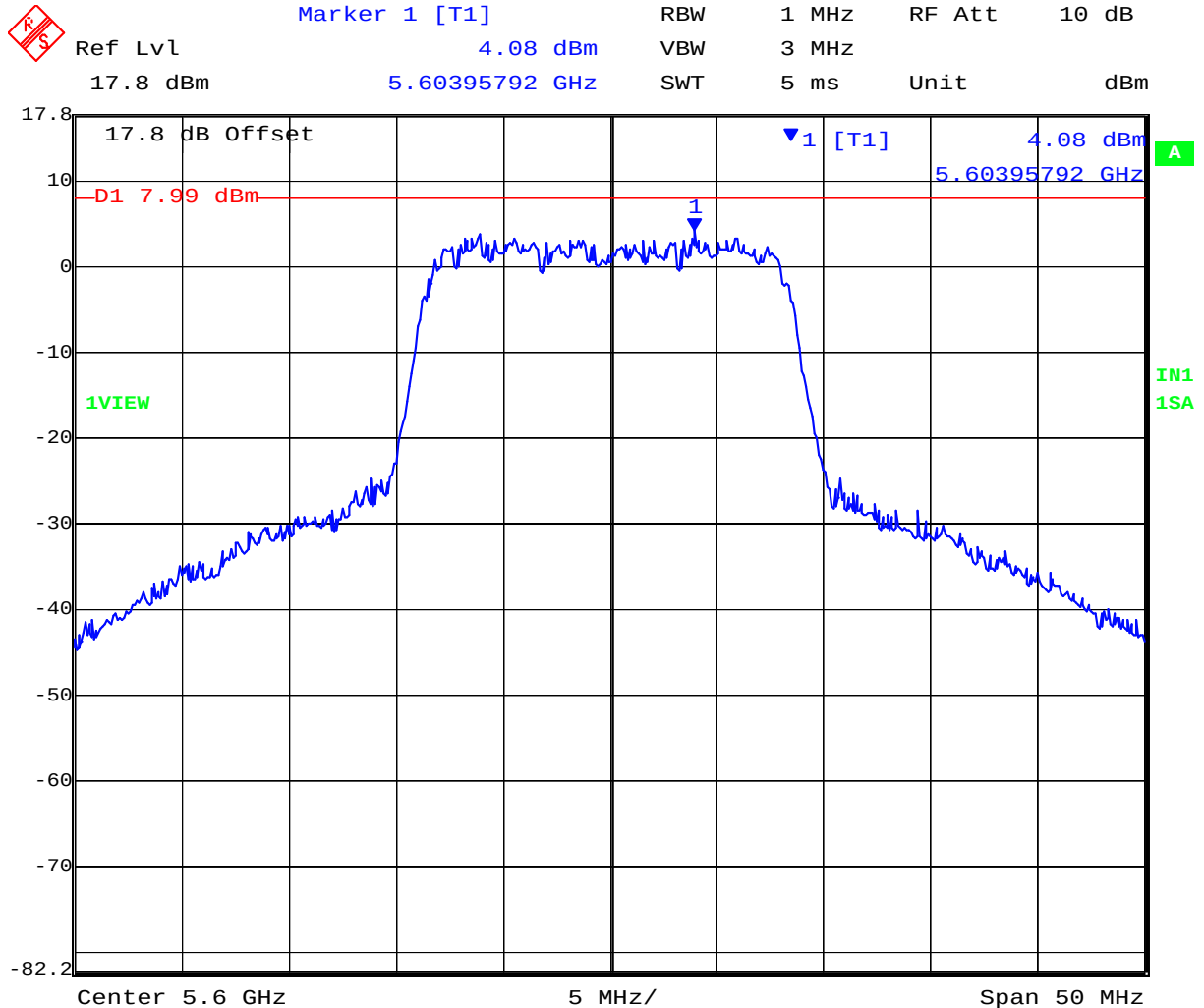
Date: 21.JUN.2011 13:04:32

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### 5,600 MHz 802.11a Port b Peak Power Spectral Density



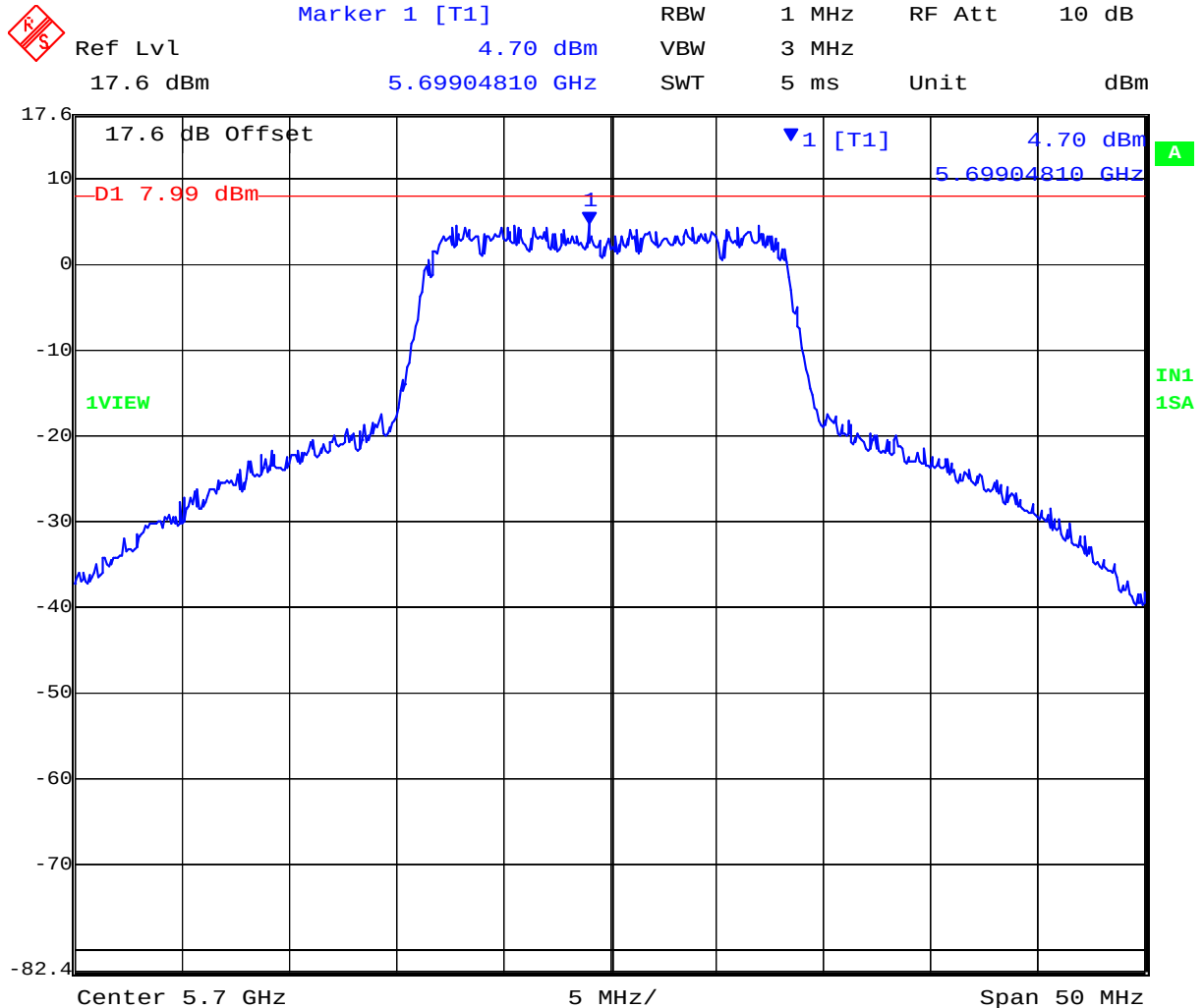
Date: 21.JUN.2011 13:05:26

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### 5,700 MHz 802.11a Port a Peak Power Spectral Density



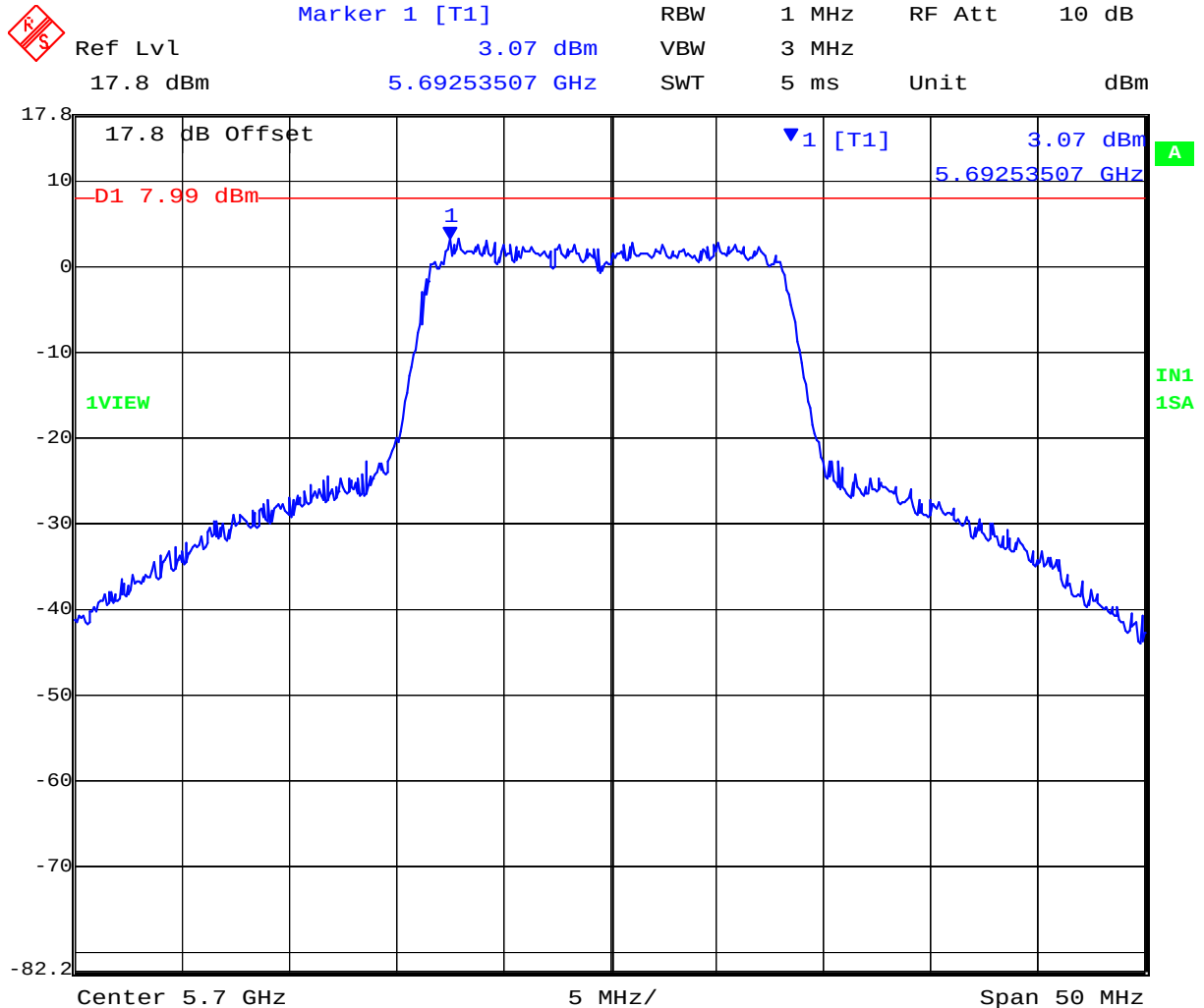
Date: 21.JUN.2011 13:06:55

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### 5,700 MHz 802.11a Port b Peak Power Spectral Density



Date: 21.JUN.2011 13:07:49

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# TABLE OF RESULTS – 802.11n HT20

|                               |                |                            |     |    |      |
|-------------------------------|----------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)     | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11 n HT-20 | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH           | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON             | <b>Duty Cycle (%):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A dB         | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0 Vdc       | <b>Antenna Ports (N):</b>  | 2   |    |      |

| Test Frequency | Measured Peak Power |      |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|---------------------|------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)       |      |    |    |                   |                             |       |        |
| MHz            | a                   | b    | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 5260.00        | 6.67                | 4.65 | -- | -- | 3.01              | 6.67                        | 7.99  | -1.32  |
| 5300.00        | 6.27                | 3.84 | -- | -- | 3.01              | 6.27                        | 7.99  | -1.72  |
| 5320.00        | 6.36                | 3.61 | -- | -- | 3.01              | 6.36                        | 7.99  | -1.63  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

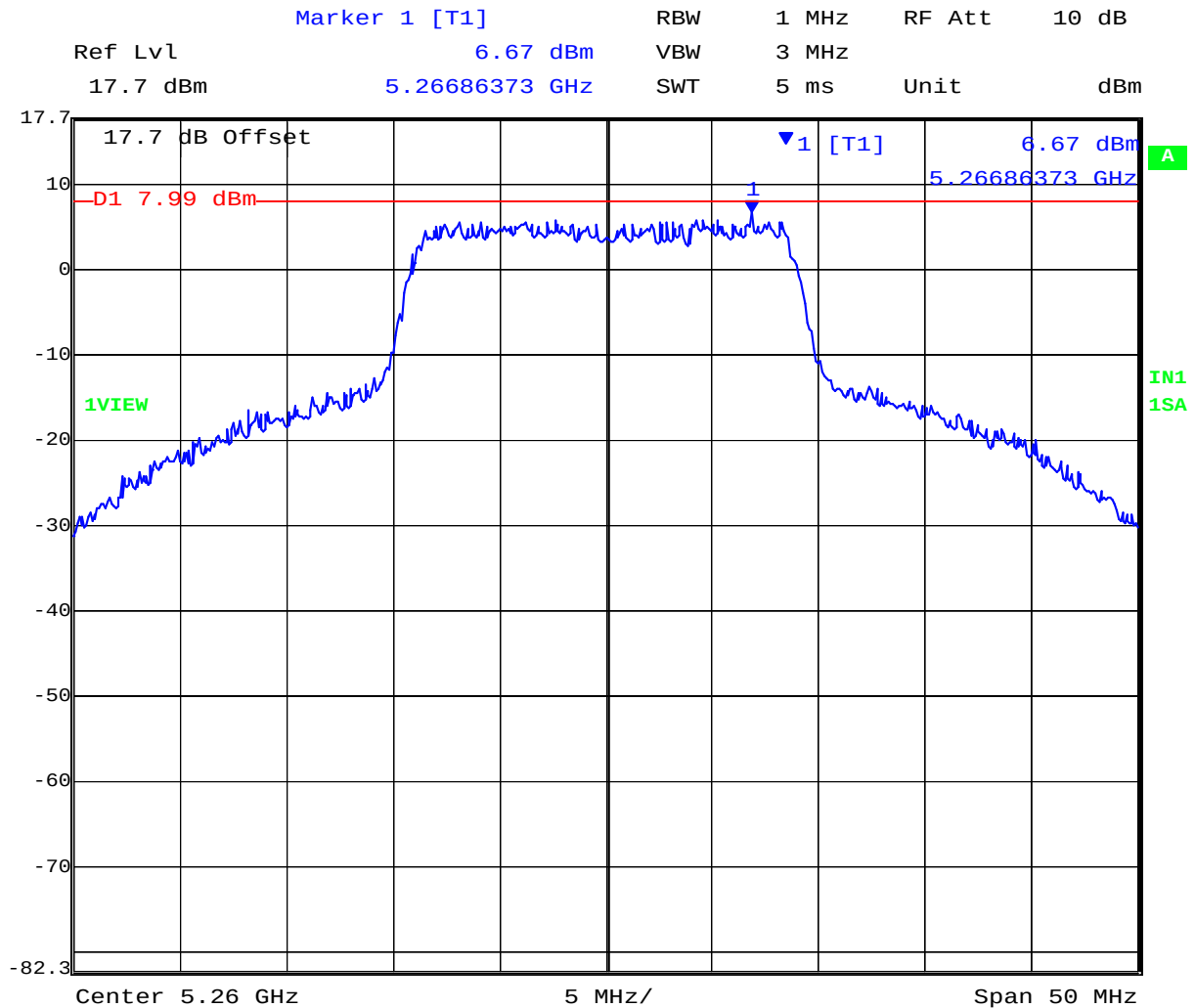
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### 5,260 MHz 802.11n HT20 Port a Peak Power Spectral Density



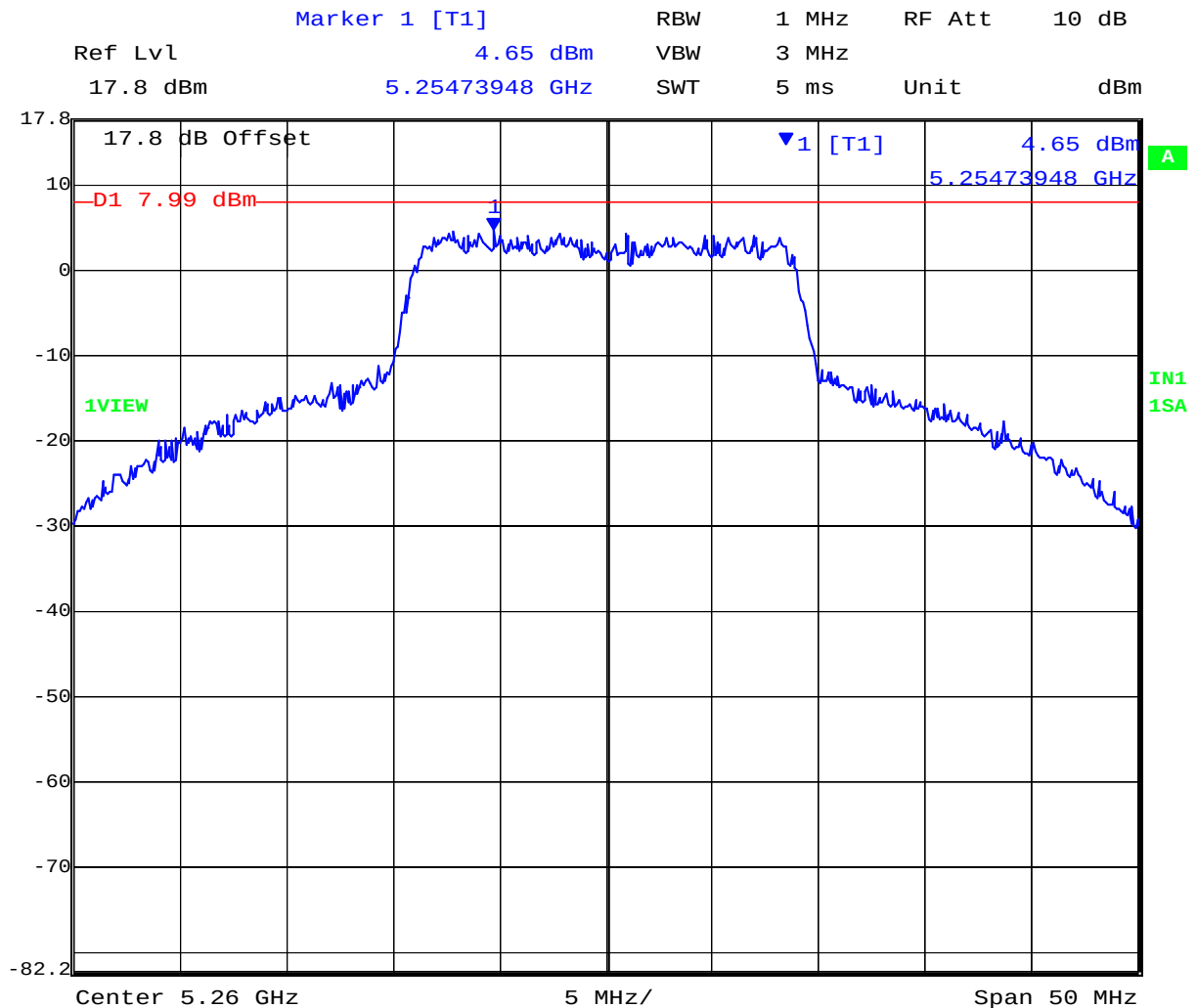
Date: 16.AUG.2011 09:17:44

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### 5,260 MHz 802.11n HT20 Port b Peak Power Spectral Density



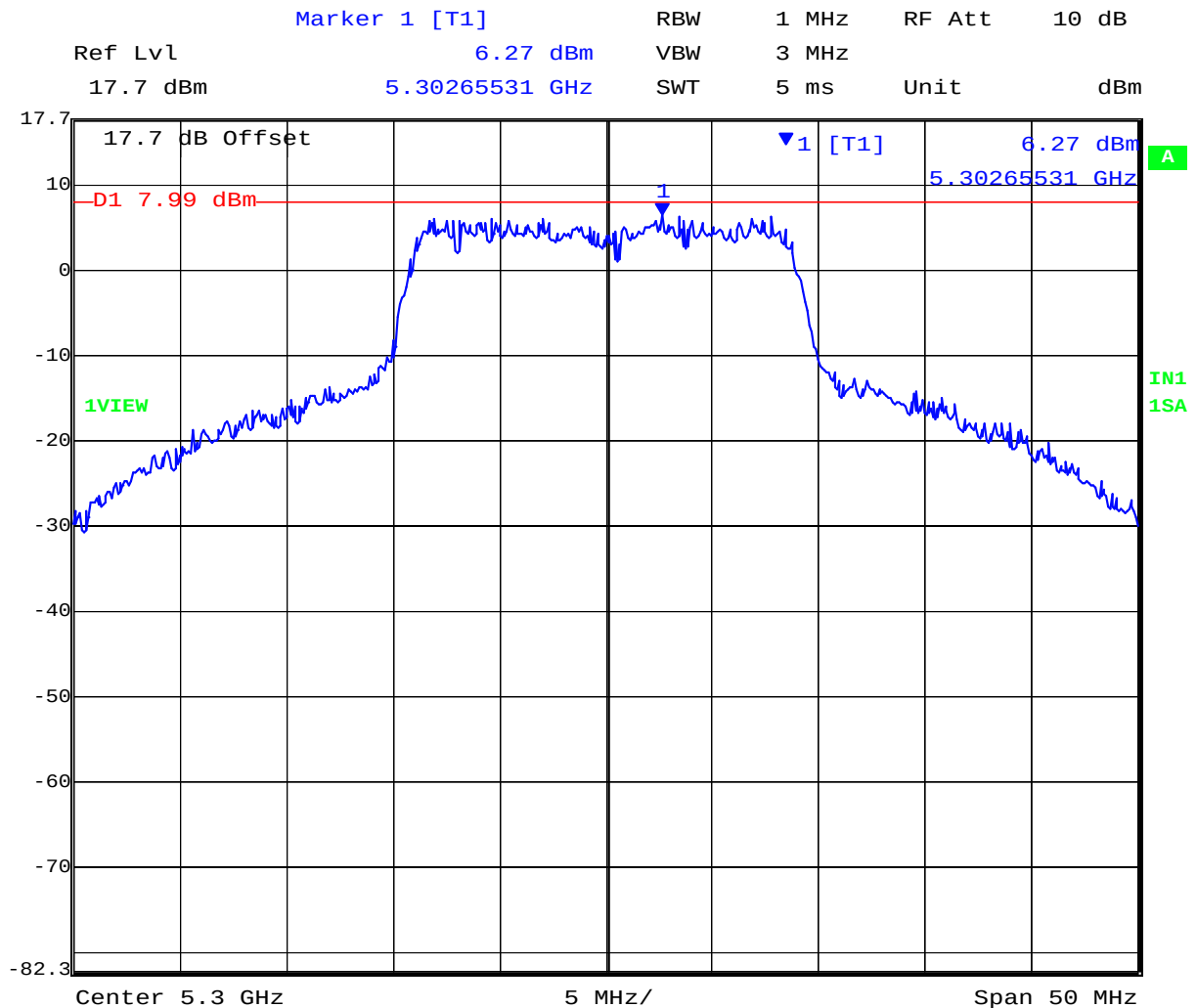
Date: 16.AUG.2011 09:18:37

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### 5,300 MHz 802.11n HT20 Port a Peak Power Spectral Density



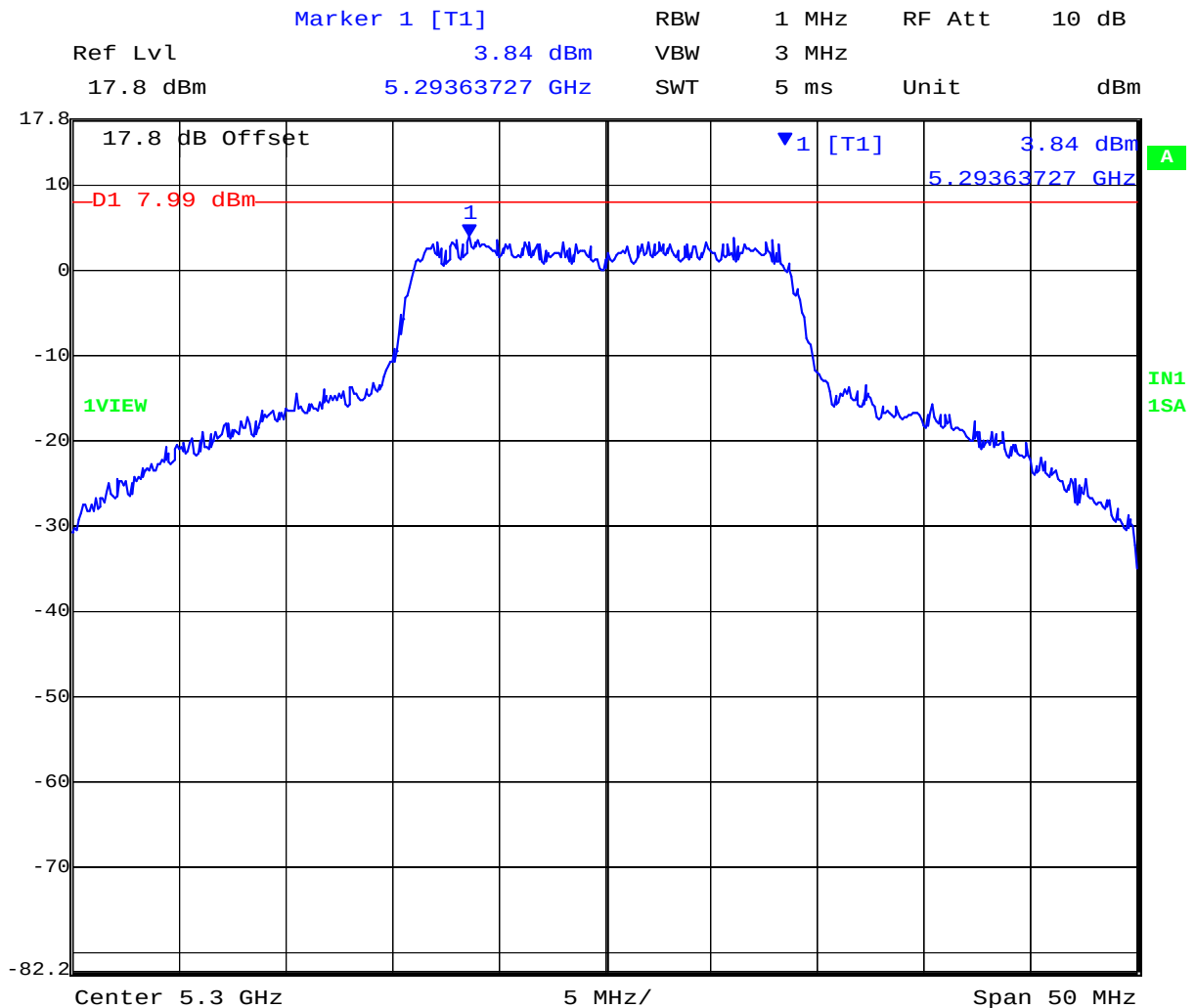
Date: 16.AUG.2011 09:35:07

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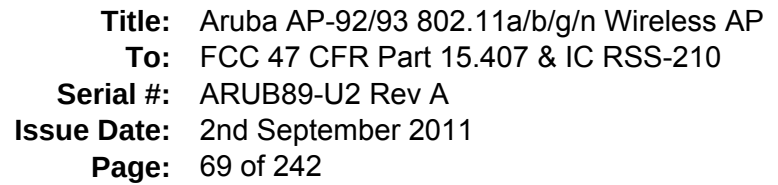
**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
**Serial #:** ARUB89-U2 Rev A  
**Issue Date:** 2nd September 2011  
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### 5,300 MHz 802.11n HT20 Port b Peak Power Spectral Density



Date: 16.AUG.2011 09:35:59

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Marker 1 [T1] RBW 1 MHz RF Att 10 dB  
 Ref Lvl 6.36 dBm VBW 3 MHz  
 17.7 dBm 5.32656313 GHz SWT 5 ms Unit dBm

17.7 dB Offset

▼1 [T1] 6.36 dBm  
 5.32656313 GHz

D1 7.99 dBm

1VIEW

IN1 1SA

Center 5.32 GHz 5 MHz/ Span 50 MHz

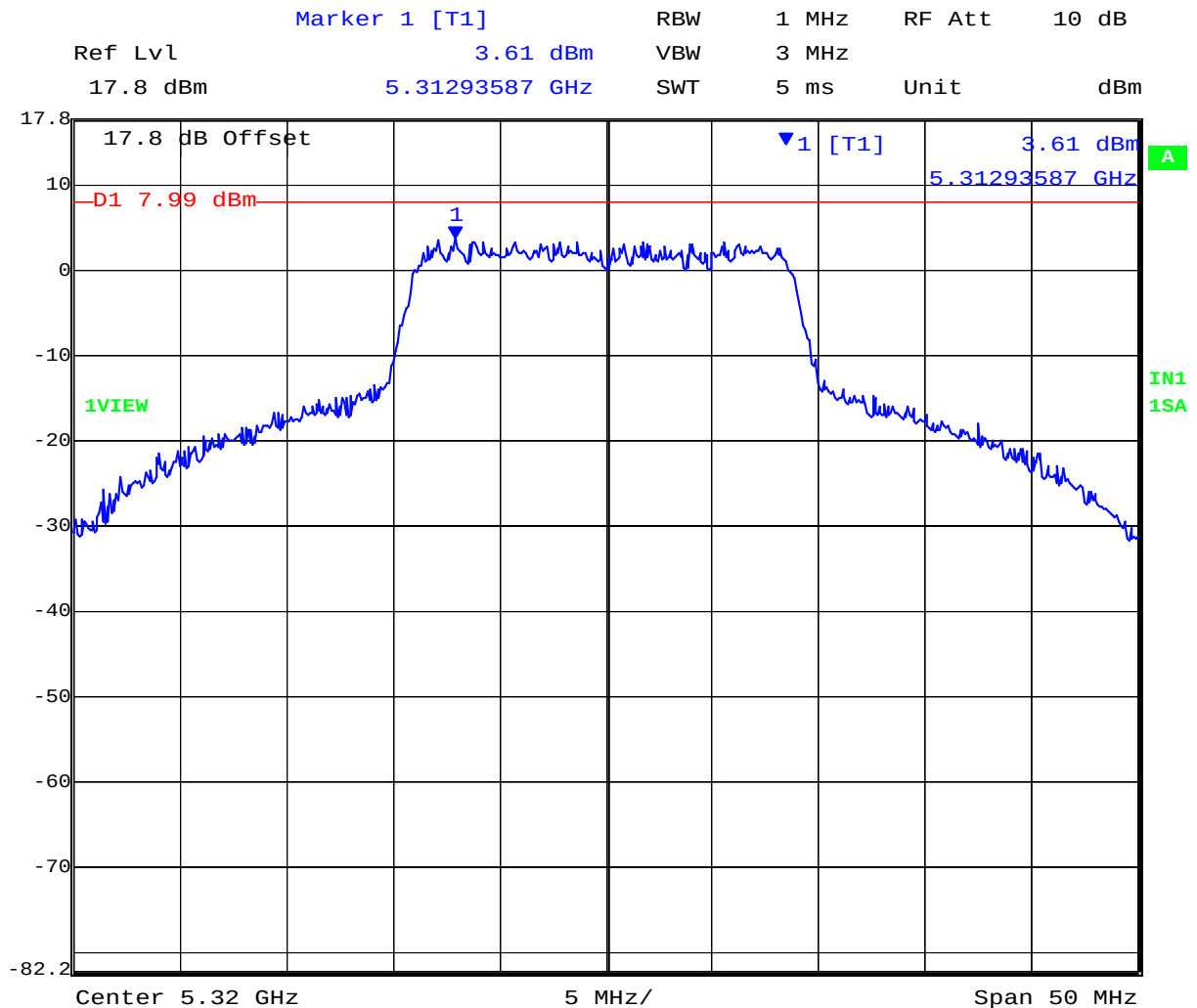
Date: 16.AUG.2011 09:40:50

MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, [www.micomlabs.com](http://www.micomlabs.com)



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### 5,320 MHz 802.11n HT20 Port b Peak Power Spectral Density



Date: 16.AUG.2011 09:41:43

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**Serial #:** ARUB89-U2 Rev A  
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# TABLE OF RESULTS – 802.11n HT20

|                               |               |                            |     |    |      |
|-------------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)    | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>               | 802.11n HT-20 | <b>Ambient Temp. (°C):</b> | 19  | to | 22   |
| <b>TPC:</b>                   | HIGH          | <b>Pressure (mBars):</b>   | 998 | to | 1003 |
| <b>Modulation:</b>            | ON            | <b>Duty Cycle (%):</b>     | 100 |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A dB        | <b>Antenna Gain:</b>       | 0   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0 Vdc      | <b>Antenna Ports (N):</b>  | 2   |    |      |

| Test Frequency | Measured Peak Power |      |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|---------------------|------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)       |      |    |    |                   |                             |       |        |
| MHz            | a                   | b    | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 5500.00        | 3.59                | 3.67 | -- | -- | 3.01              | 3.67                        | 7.99  | -4.32  |
| 5600.00        | 4.47                | 2.98 | -- | -- | 3.01              | 4.47                        | 7.99  | -3.52  |
| 5700.00        | 4.59                | 2.85 | -- | -- | 3.01              | 4.59                        | 7.99  | -3.40  |

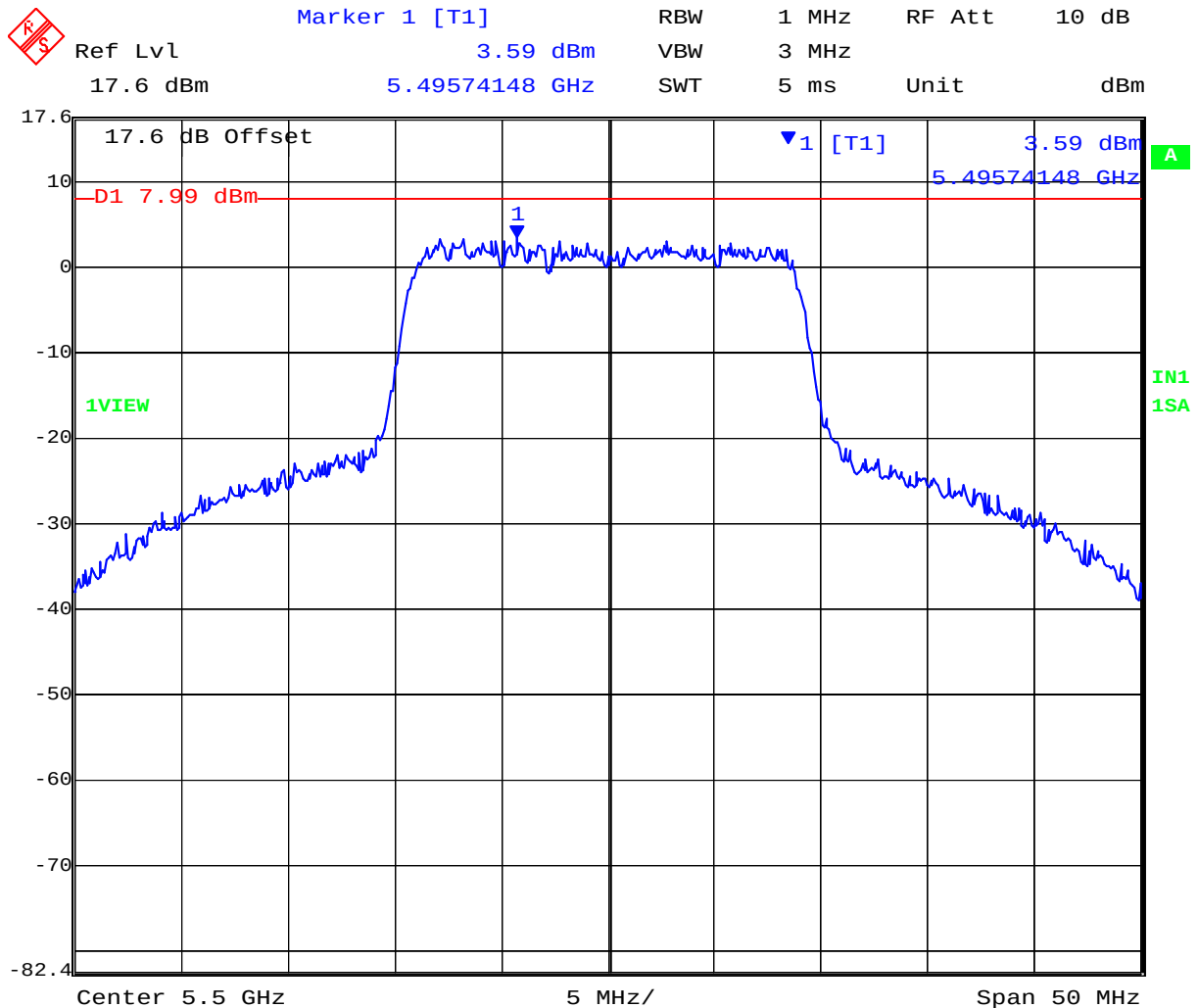
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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### 5,500 MHz 802.11n HT20 Port a Peak Power Spectral Density



Date: 23.JUN.2011 09:41:52

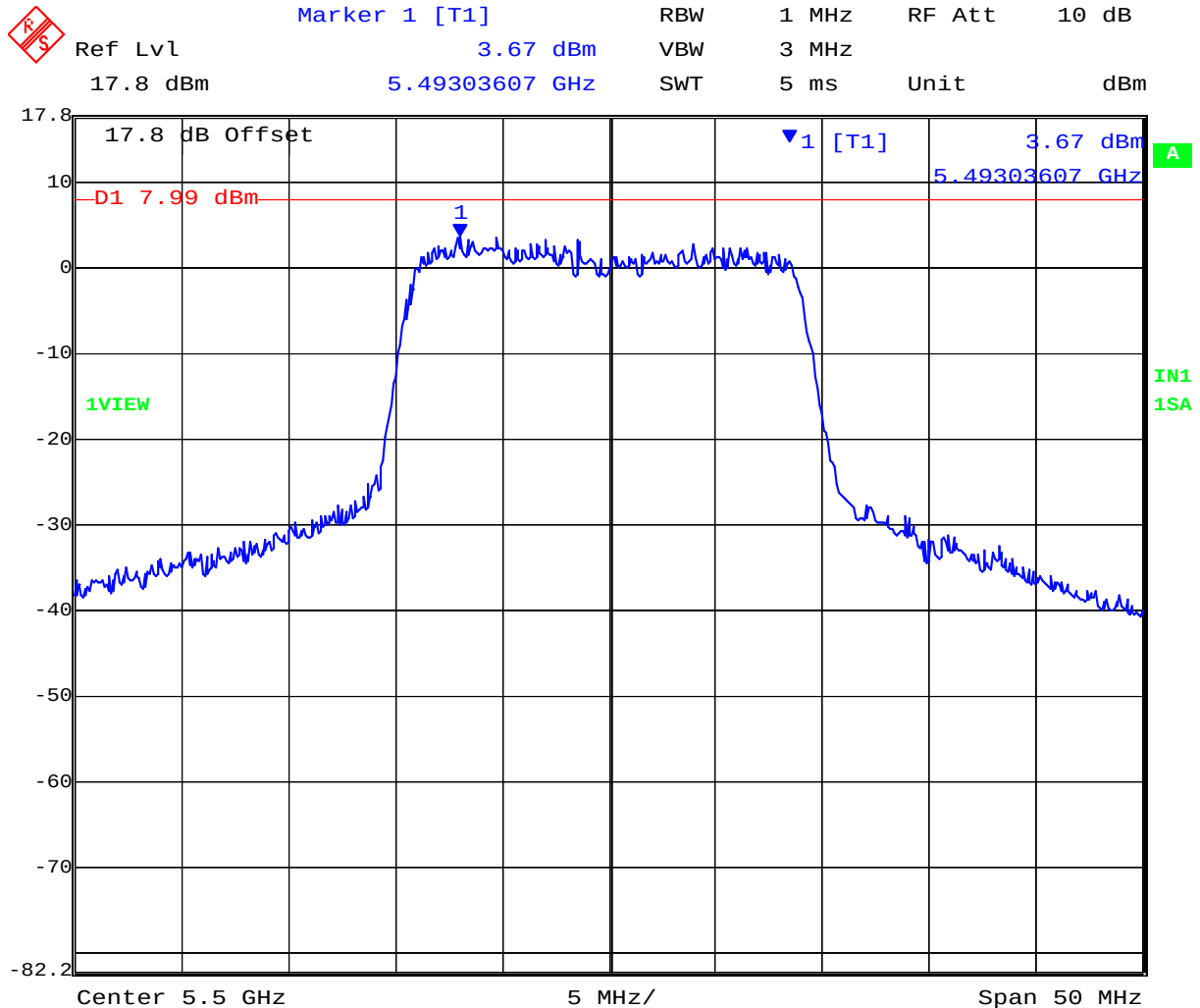
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### 5,500 MHz 802.11n HT20 Port b Peak Power Spectral Density



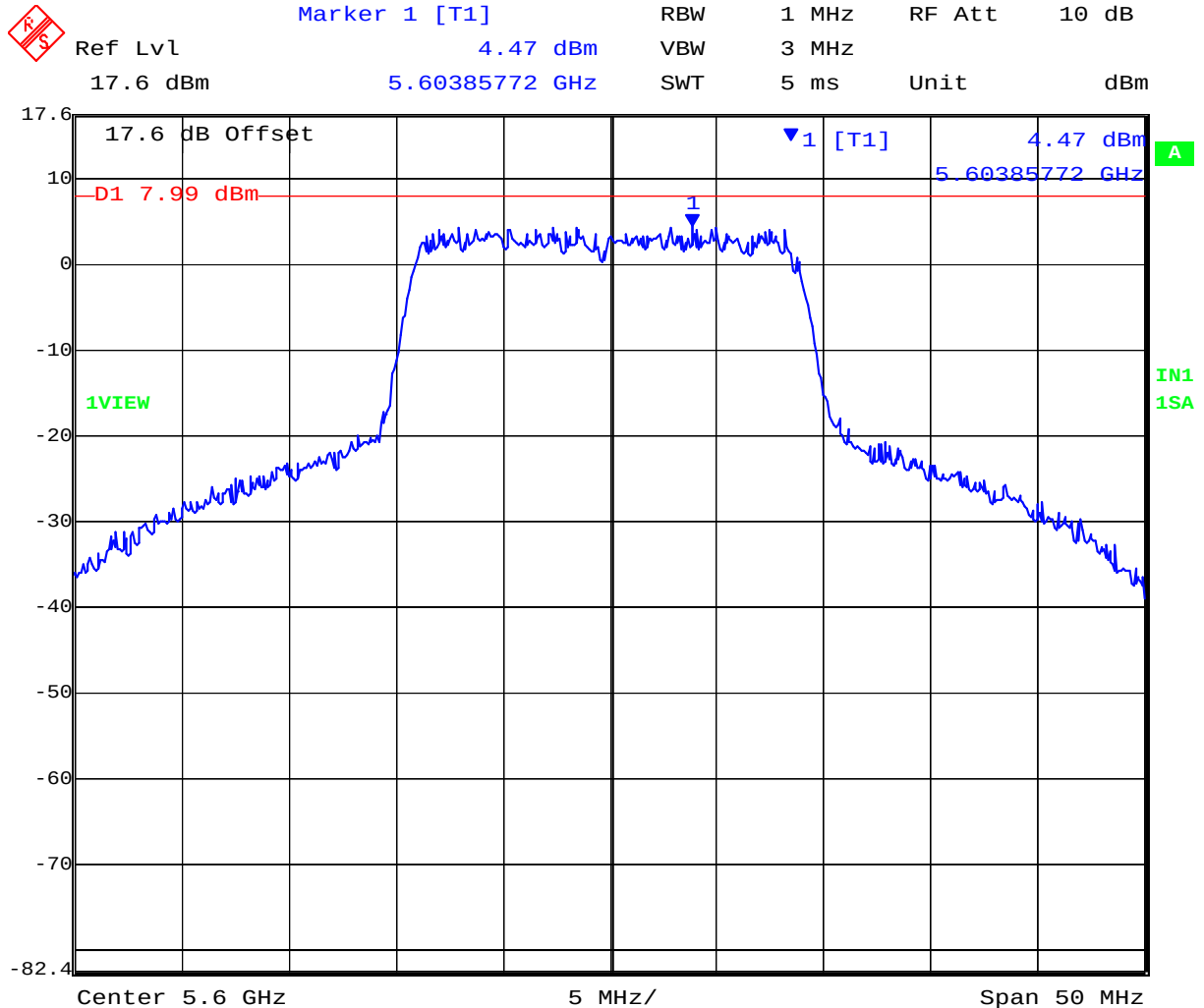
Date: 22.JUN.2011 09:42:42

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### 5,600 MHz 802.11n HT20 Port a Peak Power Spectral Density



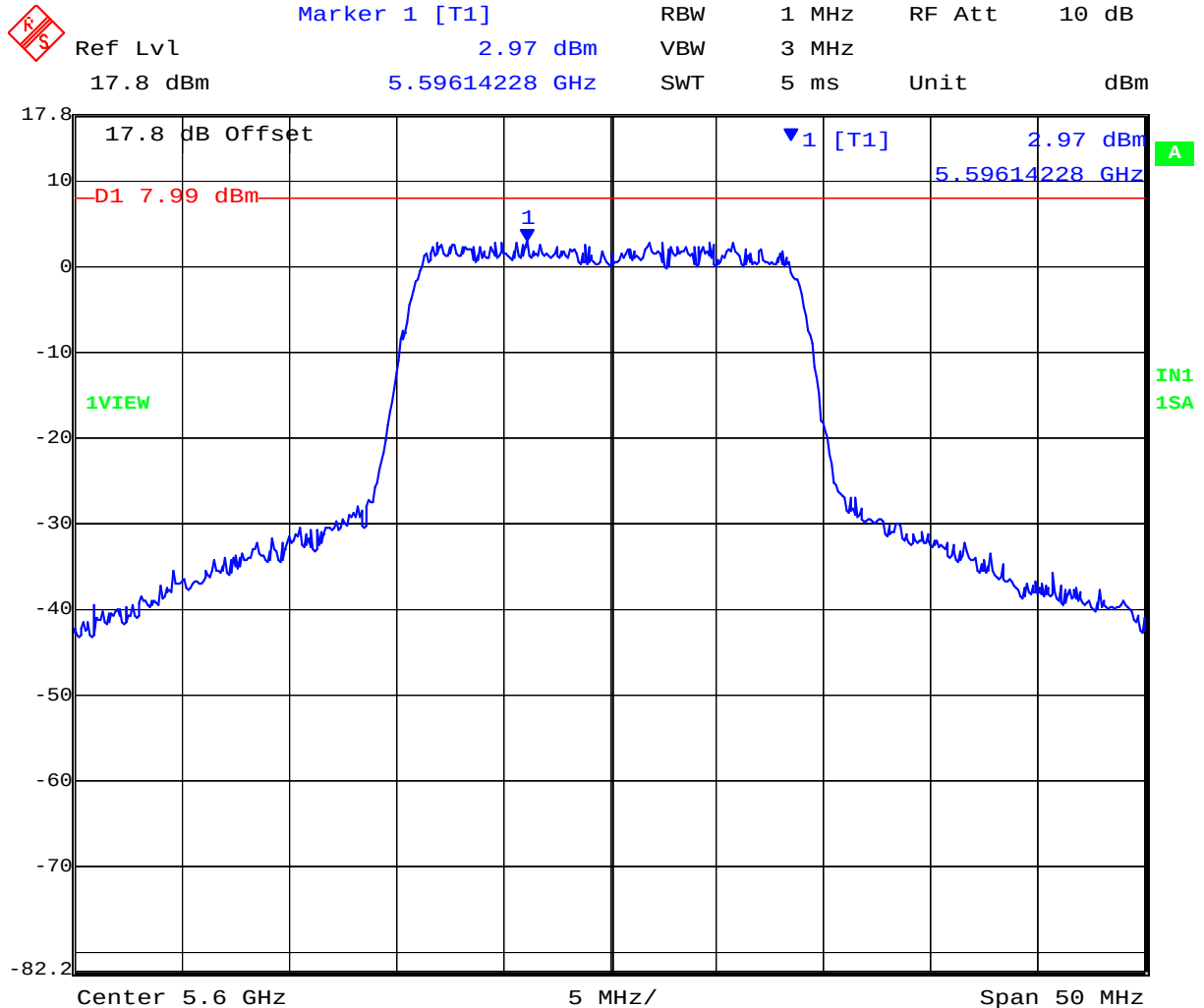
Date: 22.JUN.2011 09:44:15

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### 5,600 MHz 802.11n HT20 Port b Peak Power Spectral Density



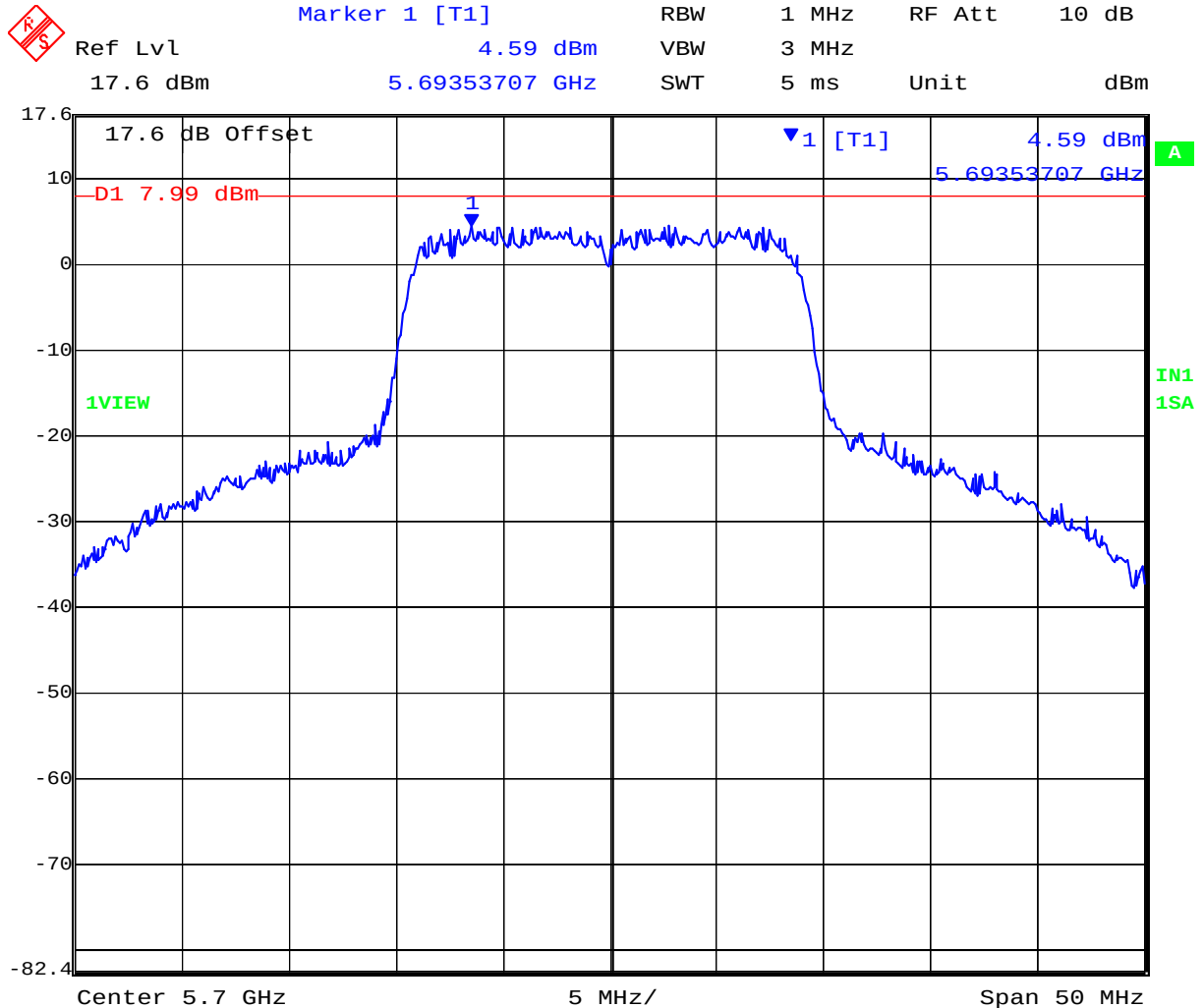
Date: 22.JUN.2011 09:45:05

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### 5,700 MHz 802.11n HT20 Port a Peak Power Spectral Density



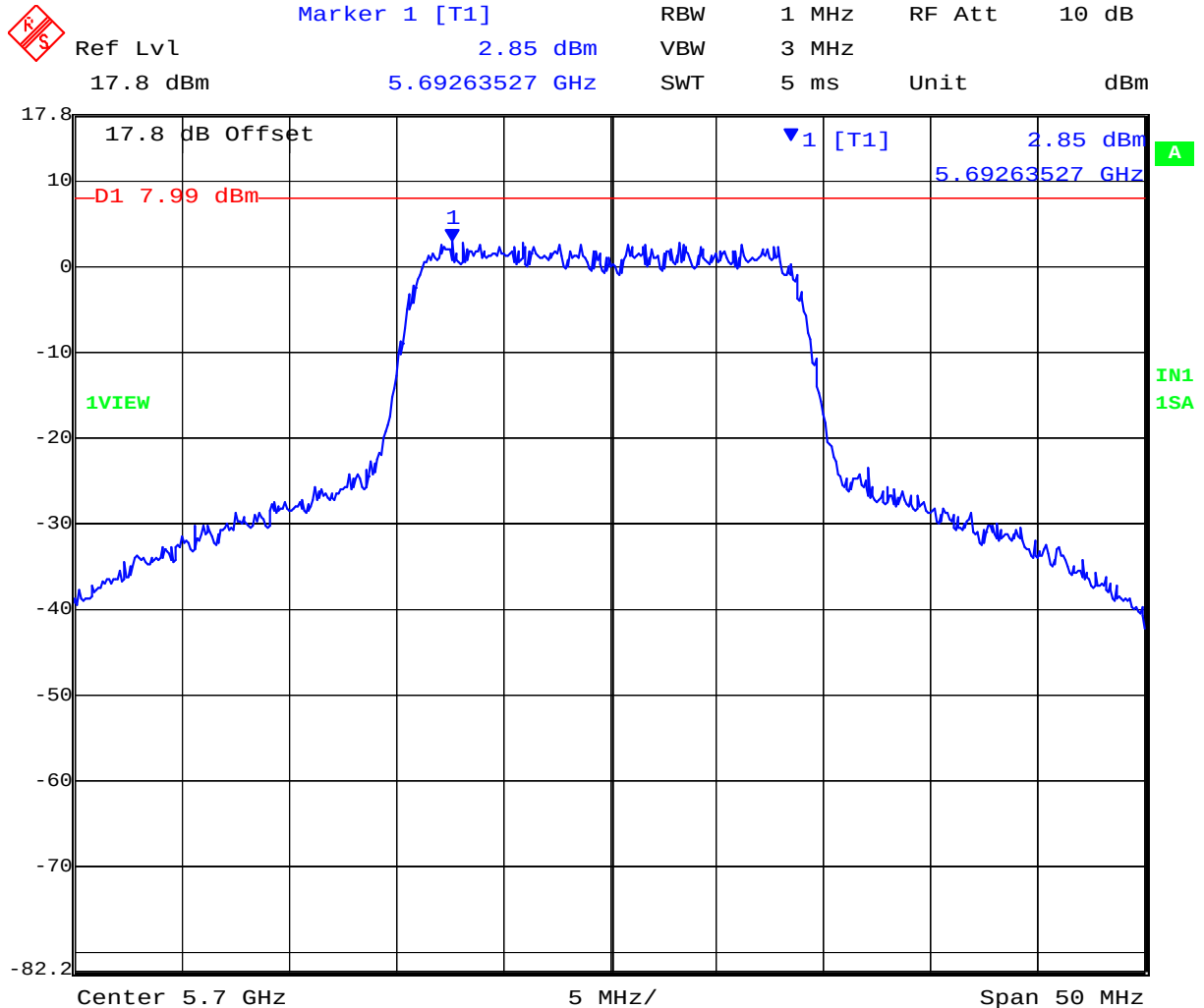
Date: 22.JUN.2011 09:46:28

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### 5,700 MHz 802.11n HT20 Port b Peak Power Spectral Density



Date: 22.JUN.2011 09:47:17

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#### TABLE OF RESULTS – 802.11n HT40

|                               |                |                            |       |    |      |
|-------------------------------|----------------|----------------------------|-------|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)     | <b>Rel. Humidity (%):</b>  | 35    | to | 42   |
| <b>Variant:</b>               | 802.11 n HT-40 | <b>Ambient Temp. (°C):</b> | 19    | to | 22   |
| <b>TPC:</b>                   | HIGH           | <b>Pressure (mBars):</b>   | 998   | to | 1003 |
| <b>Modulation:</b>            | ON             | <b>Duty Cycle (%):</b>     | 100   |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A dB         | <b>Antenna Gain:</b>       | 0 dBi |    |      |
| <b>Applied Voltage:</b>       | Vdc            | <b>Antenna Ports (N):</b>  | 2     |    |      |

| Test Frequency | Measured Peak Power |      |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|---------------------|------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)       |      |    |    |                   |                             |       |        |
| MHz            | a                   | b    | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 5270.00        | 3.20                | 0.91 | -- | -- | 3.01              | 3.20                        | 7.99  | -4.79  |
| 5310.00        | 3.64                | 0.47 | -- | -- | 3.01              | 3.64                        | 7.99  | -4.35  |

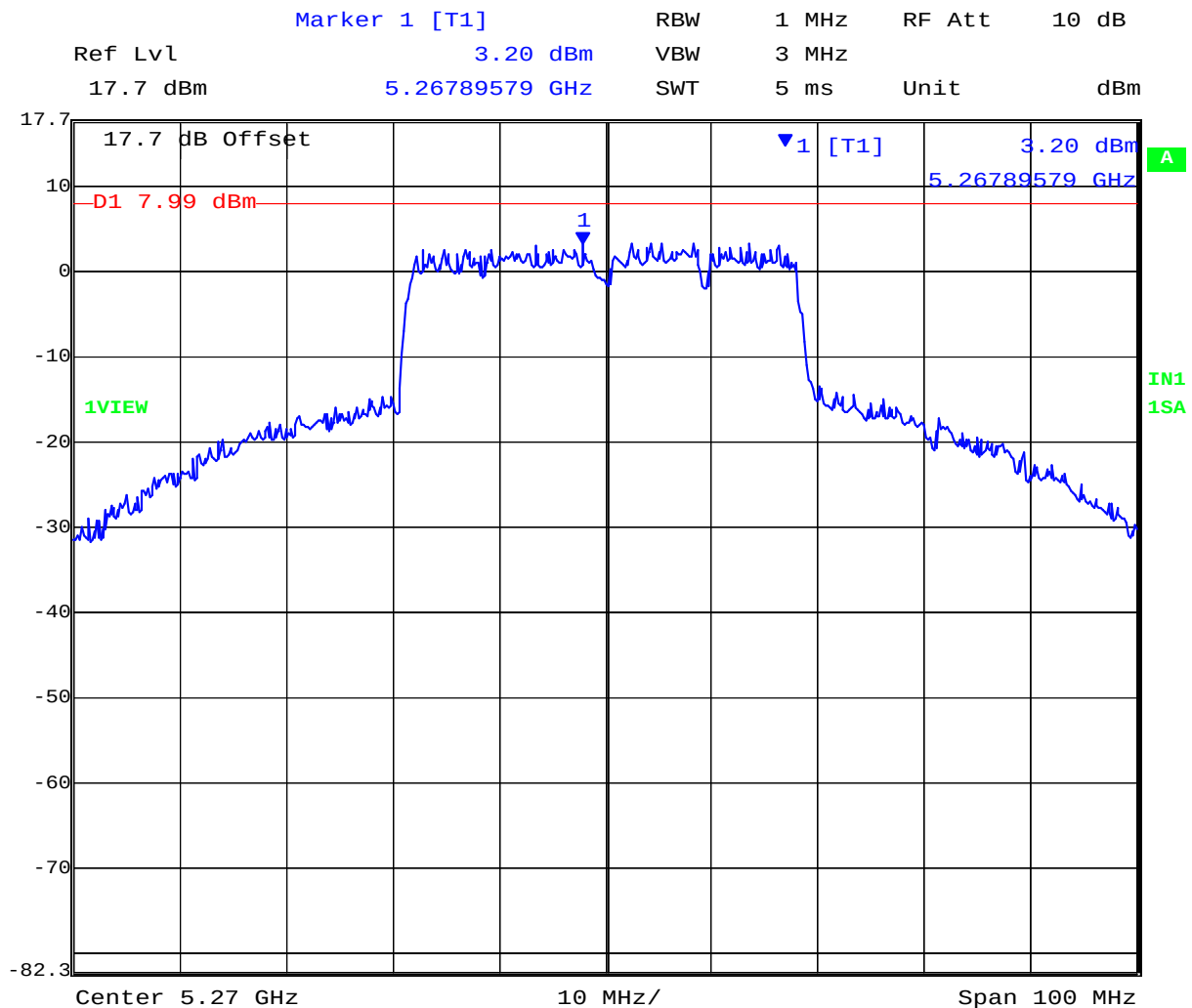
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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### 5,270 MHz 802.11n HT40 Port a Peak Power Spectral Density



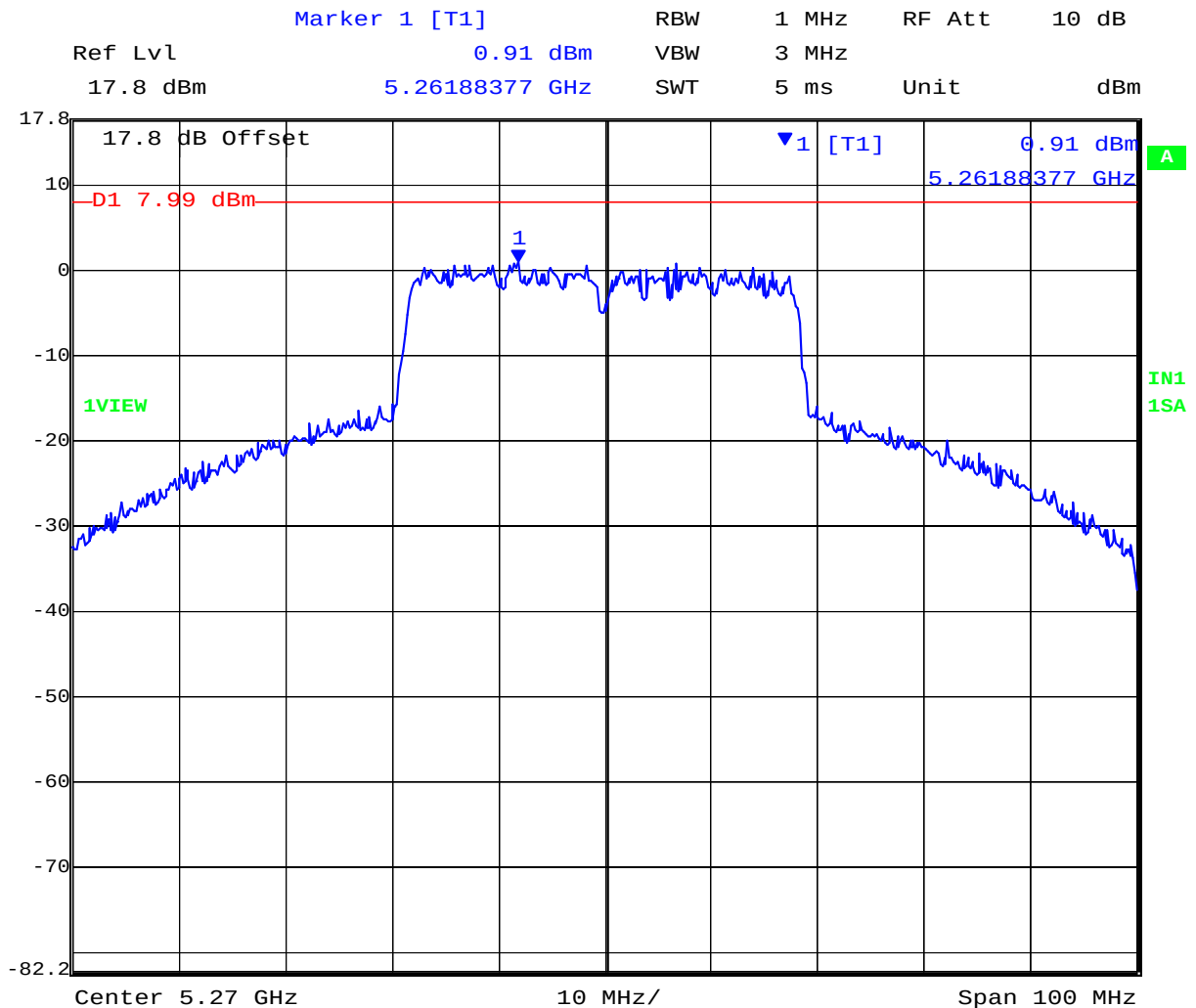
Date: 16.AUG.2011 09:53:52

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### 5,270 MHz 802.11n HT40 Port b Peak Power Spectral Density



Date: 16.AUG.2011 09:54:45

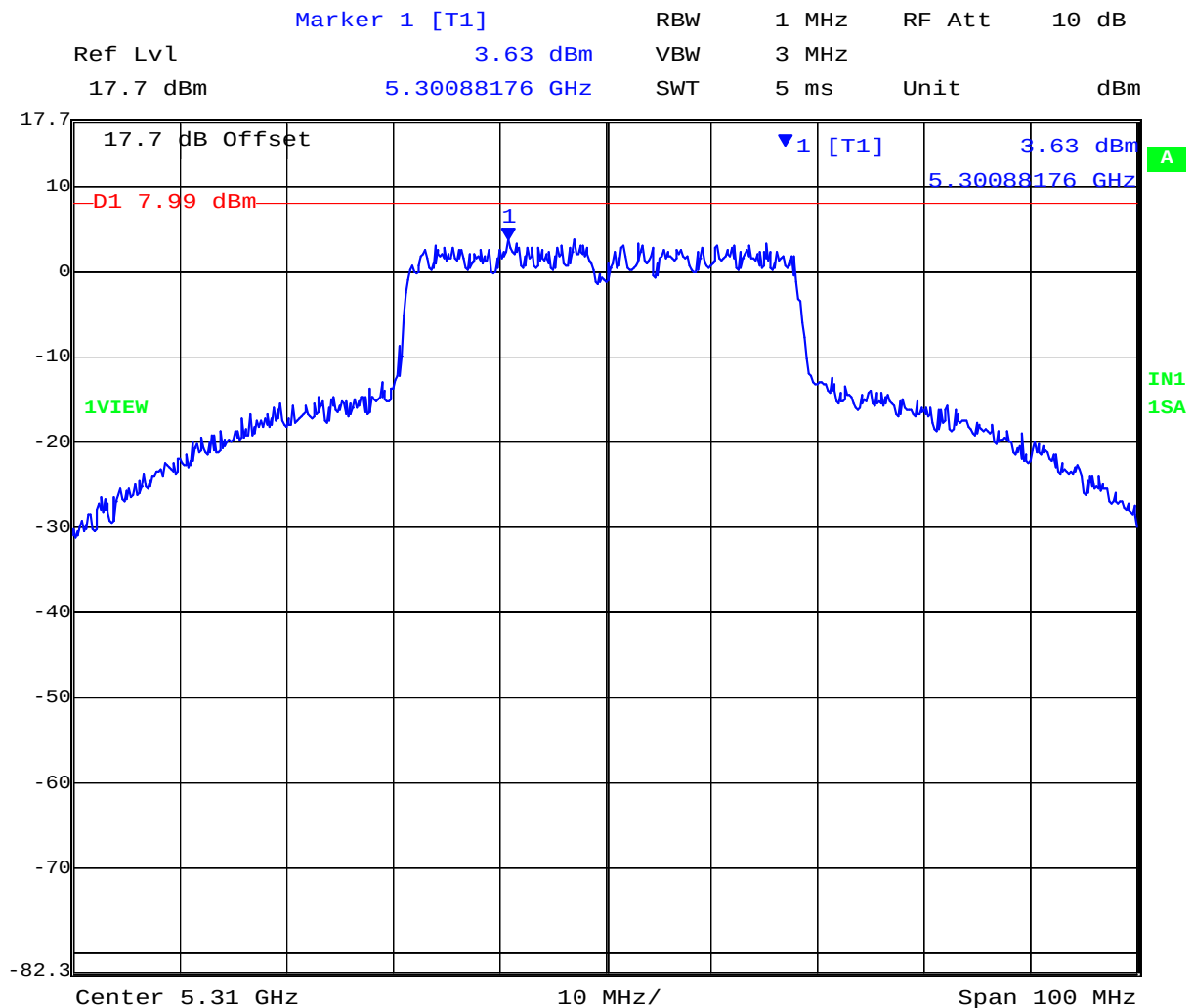
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**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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**Serial #:** ARUB89-U2 Rev A  
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### 5,310 MHz 802.11n HT40 Port a Peak Power Spectral Density



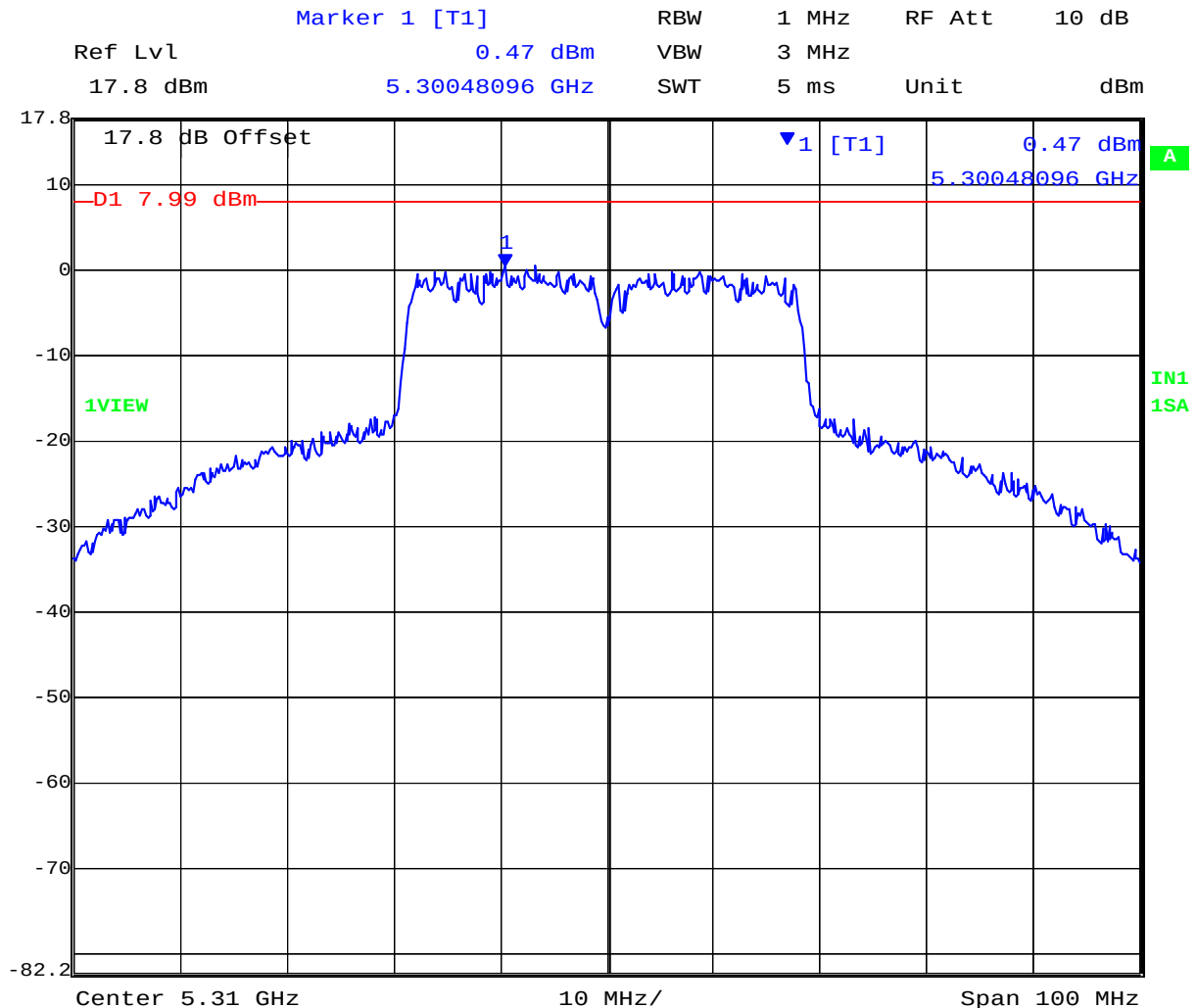
Date: 16.AUG.2011 09:57:24

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### 5,310 MHz 802.11n HT40 Port b Peak Power Spectral Density



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#### TABLE OF RESULTS – 802.11n HT40

|                               |               |                            |       |    |      |
|-------------------------------|---------------|----------------------------|-------|----|------|
| <b>Test Conditions:</b>       | 15.407 (a)    | <b>Rel. Humidity (%):</b>  | 35    | to | 42   |
| <b>Variant:</b>               | 802.11n HT-40 | <b>Ambient Temp. (°C):</b> | 19    | to | 22   |
| <b>TPC:</b>                   | HIGH          | <b>Pressure (mBars):</b>   | 998   | to | 1003 |
| <b>Modulation:</b>            | ON            | <b>Duty Cycle (%):</b>     | 100   |    |      |
| <b>Beam Forming Gain (Y):</b> | N/A dB        | <b>Antenna Gain:</b>       | 0 dBi |    |      |
| <b>Applied Voltage:</b>       | 12.0 Vdc      | <b>Antenna Ports (N):</b>  | 2     |    |      |

| Test Frequency | Measured Peak Power |      |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|---------------------|------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)       |      |    |    |                   |                             |       |        |
| MHz            | a                   | b    | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 5510.00        | 3.55                | 2.78 | -- | -- | 3.01              | 3.55                        | 7.99  | -4.44  |
| 5610.00        | 3.65                | 3.09 | -- | -- | 3.01              | 3.65                        | 7.99  | -4.34  |
| 5690.00        | 2.31                | 1.96 | -- | -- | 3.01              | 2.31                        | 7.99  | -5.68  |

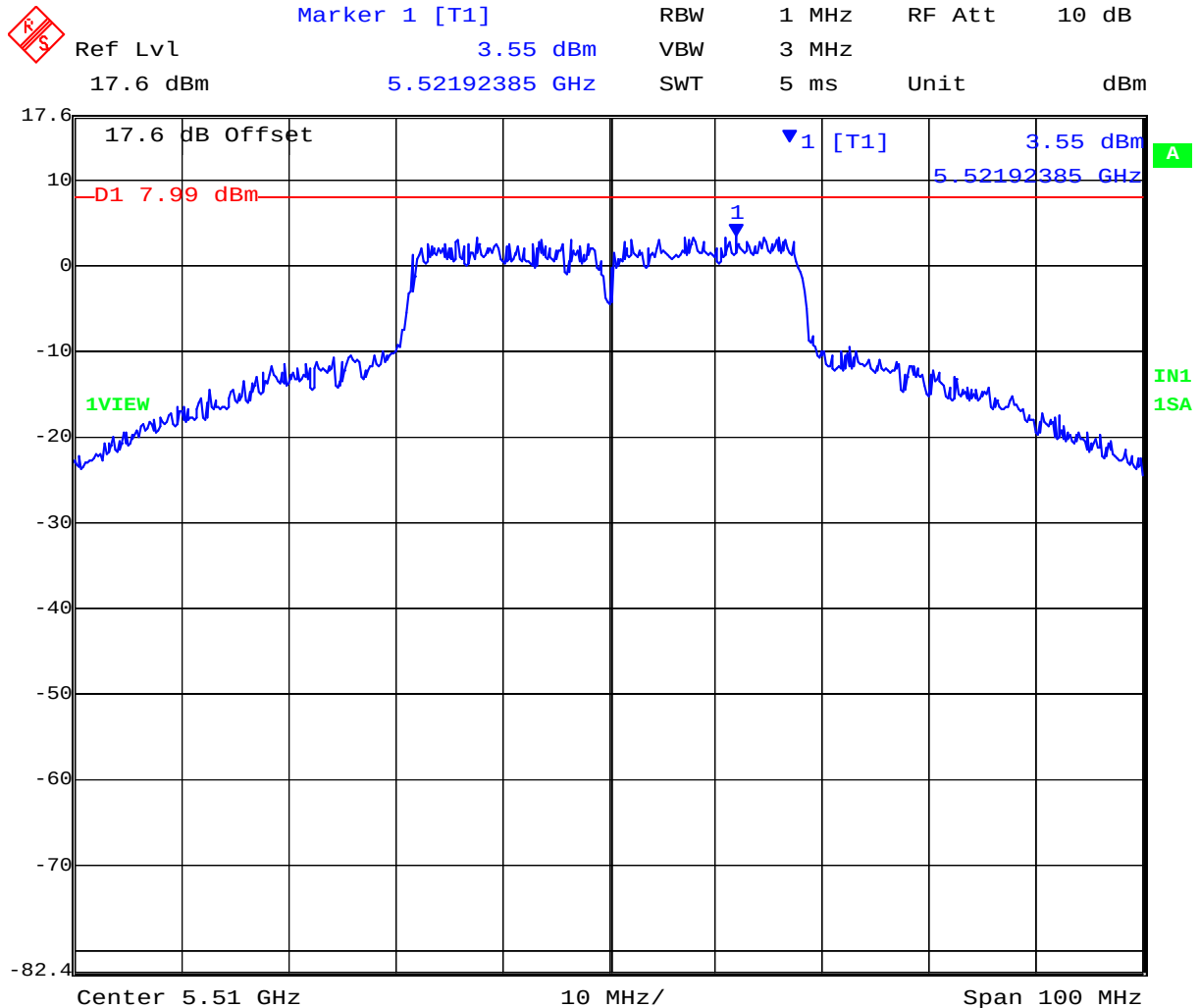
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±1.33 dB |
|---------------------------------|----------|

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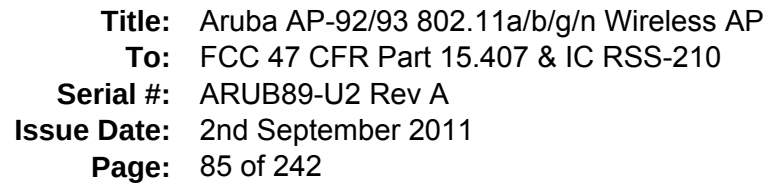
**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
**Serial #:** ARUB89-U2 Rev A  
**Issue Date:** 2nd September 2011  
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### 5,510 MHz 802.11n HT40 Port a Peak Power Spectral Density



Date: 22.JUN.2011 09:52:19

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Ref Lvl 17.8 dBm

Marker 1 [T1] 2.78 dBm

RBW 1 MHz

VBW 3 MHz

SWT 5 ms

Unit dBm

17.8 dB Offset

D1 7.99 dBm

1 [T1]

2.78 dBm

5.49767535 GHz

1VIEW

IN1 1SA

Center 5.51 GHz

10 MHz/

Span 100 MHz

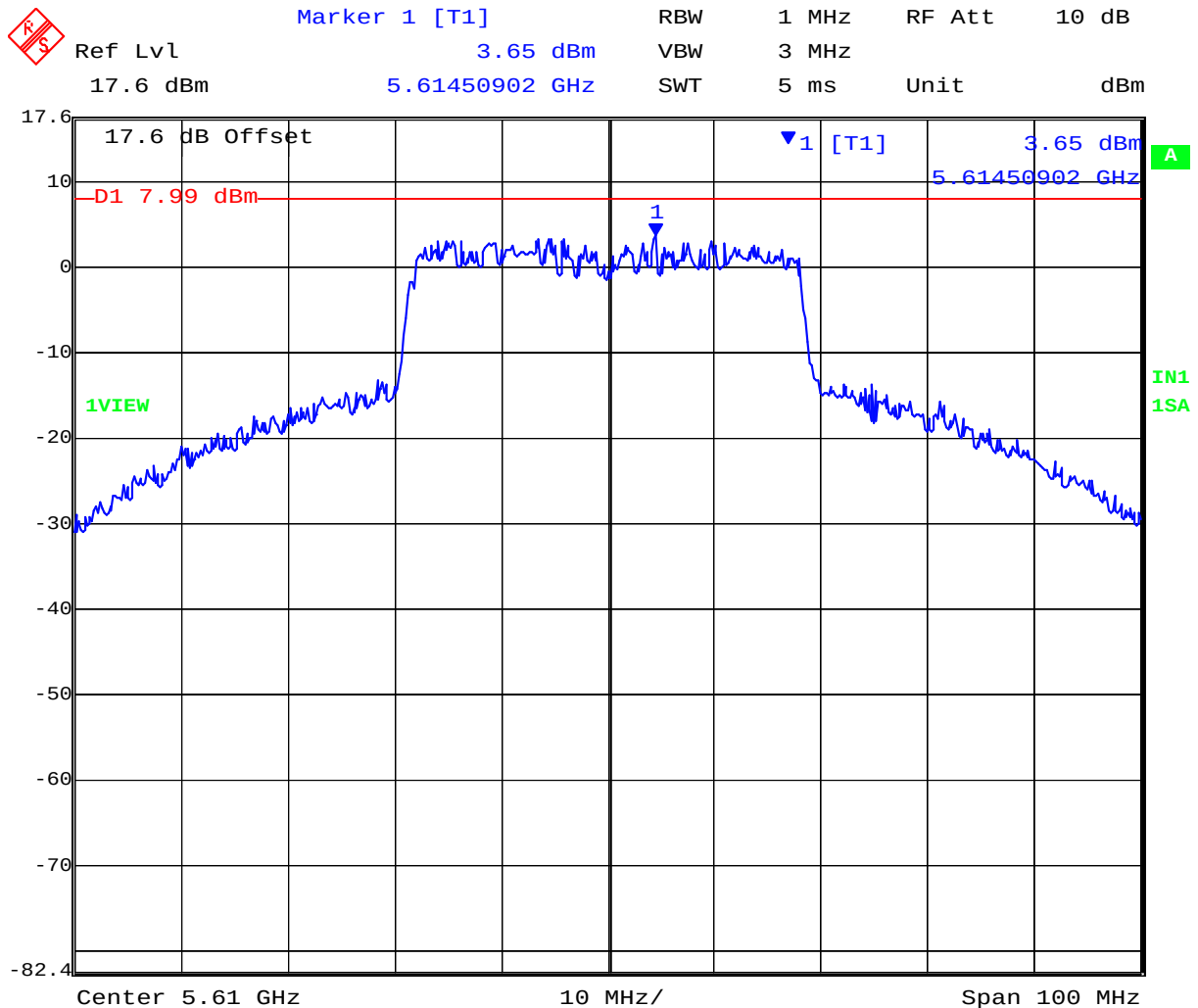
Date: 22.JUN.2011 09:53:07

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### 5,610 MHz 802.11n HT40 Port a Peak Power Spectral Density



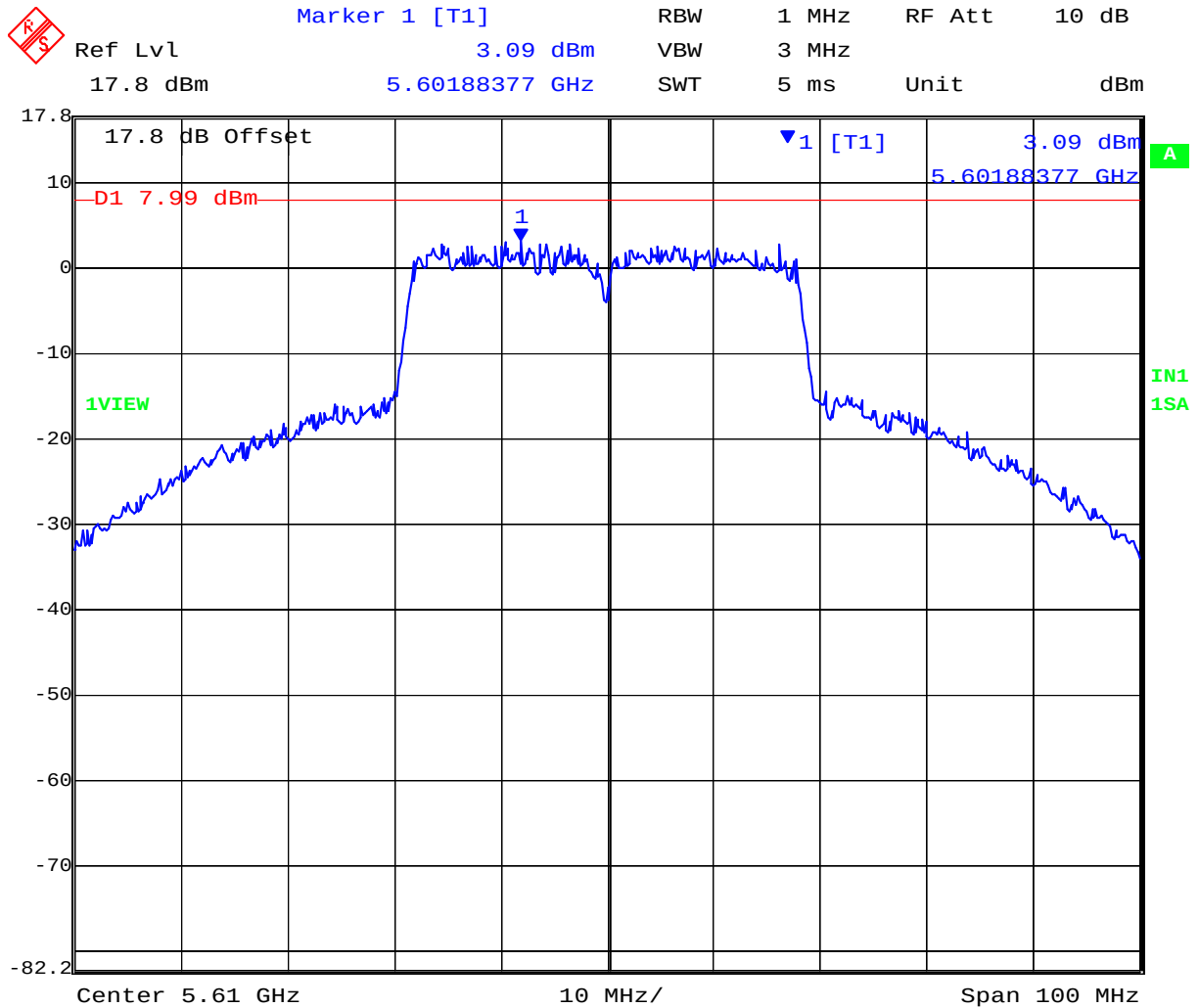
Date: 22.JUN.2011 10:41:35

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### 5,610 MHz 802.11n HT40 Port b Peak Power Spectral Density



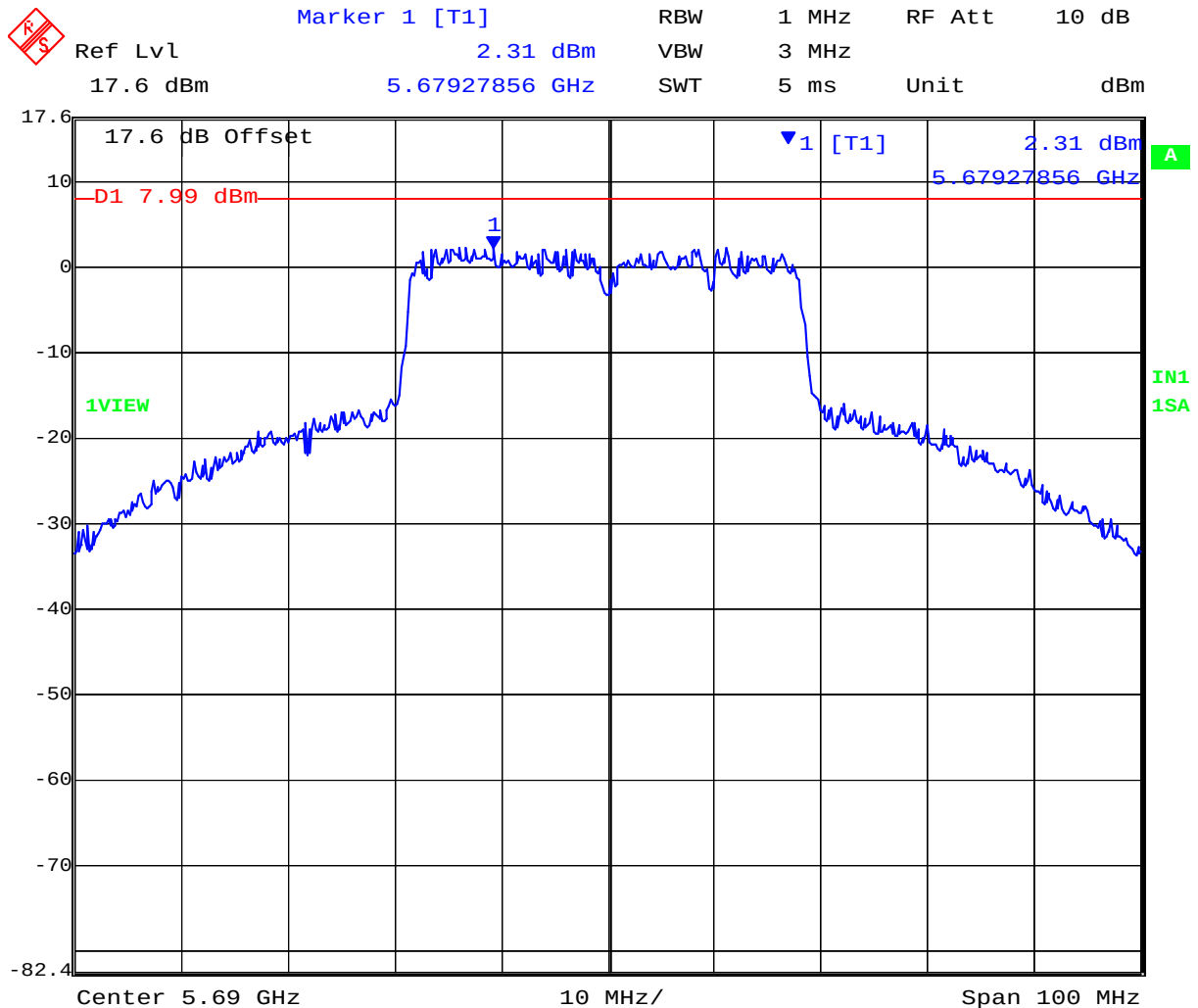
Date: 22.JUN.2011 10:42:26

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**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
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### 5,690 MHz 802.11n HT40 Port a Peak Power Spectral Density



Date: 22.JUN.2011 10:45:13

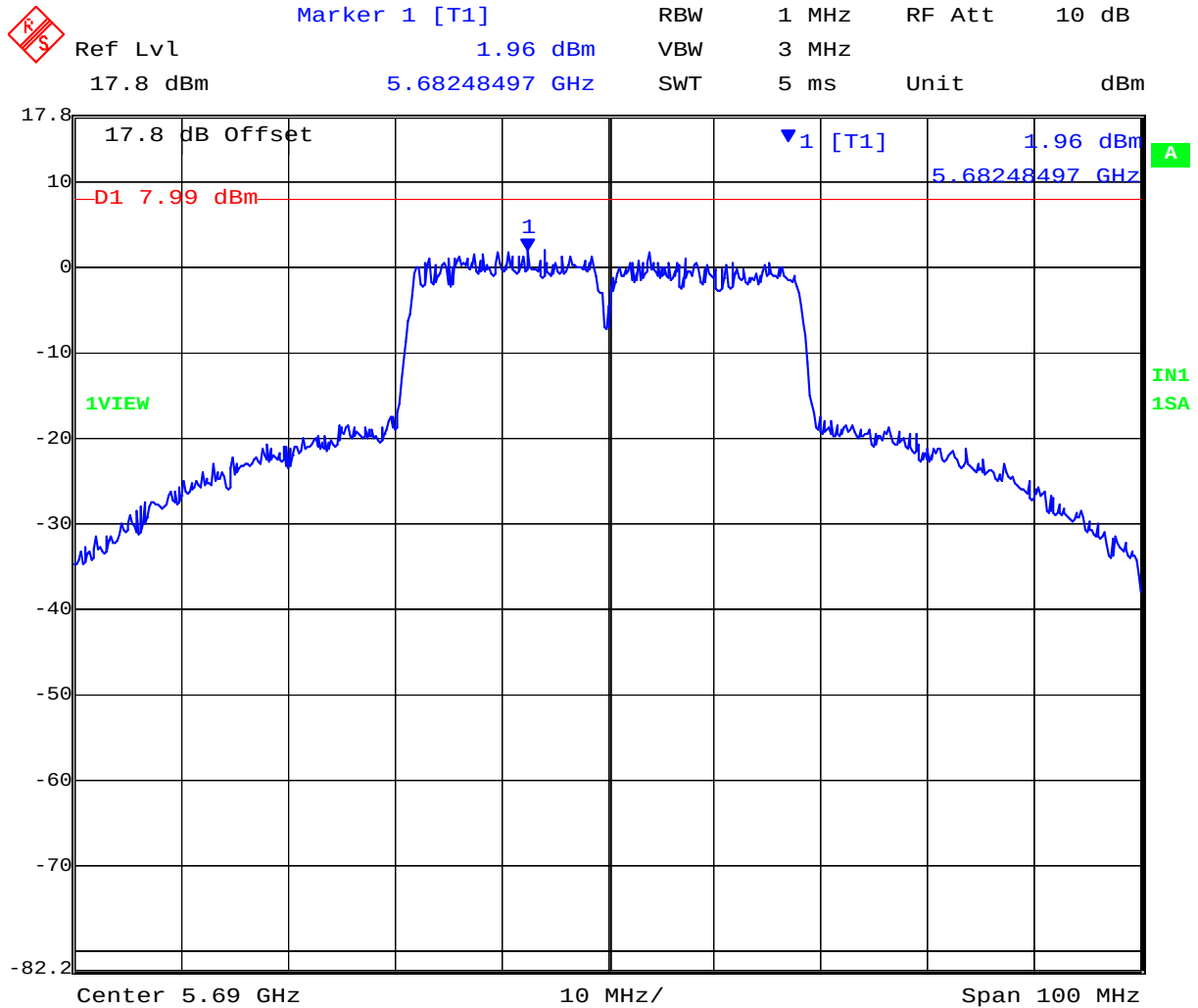
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### 5,690 MHz 802.11n HT40 Port b Peak Power Spectral Density



Date: 22.JUN.2011 10:46:03

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## Specification

### FCC, Part 15 §15.407 (a)(1), (a)(2)

#### 5250 – 5350 MHz & 5470 – 5725 MHz

(a)(2) The peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

### Industry Canada RSS-210 § A9.2(1), A9.2(2)

#### 5250 – 5350 MHz & 5470 – 5725 MHz

§ A9.2(2) The power spectral density shall not exceed +11 dBm in any 1 MHz band

## Laboratory Measurement Uncertainty for Spectral Density

|                         |          |
|-------------------------|----------|
| Measurement uncertainty | ±1.33 dB |
|-------------------------|----------|

## Traceability

| Method                                                                        | Test Equipment Used                            |
|-------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made per work instruction WI-01 'Measuring RF Output Power' | 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117 |

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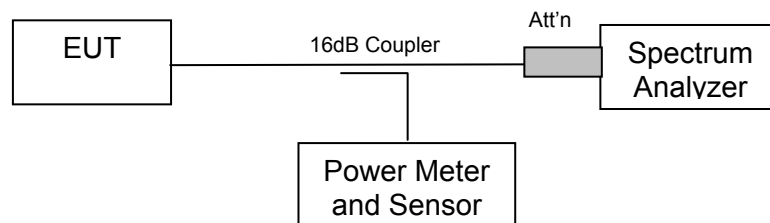
#### **5.1.4. Peak Excursion Ratio**

##### **FCC, Part 15 Subpart C §15.407(a)(6)**

#### **Test Procedure**

Normative Reference (xi) Section 2.1 Measurement Procedure DA 02-2138 "Measurement Procedure Updated for Peak Transmit Power in the UNII Bands" was implemented to determine the Peak Excursion Ratio. This is a conducted measurement using a spectrum analyzer. The Peak Excursion Ratio is the difference in amplitude (dB) between the two traces.

#### **Test Measurement Set up**



Measurement set up for Peak Excursion Ratio

#### **Measurement Results for Peak Excursion Ratio**

Ambient conditions.

Temperature: 17 to 23 °C    Relative humidity: 31 to 57%    Pressure: 999 to 1012 mbar

#### **Radio Parameters**

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

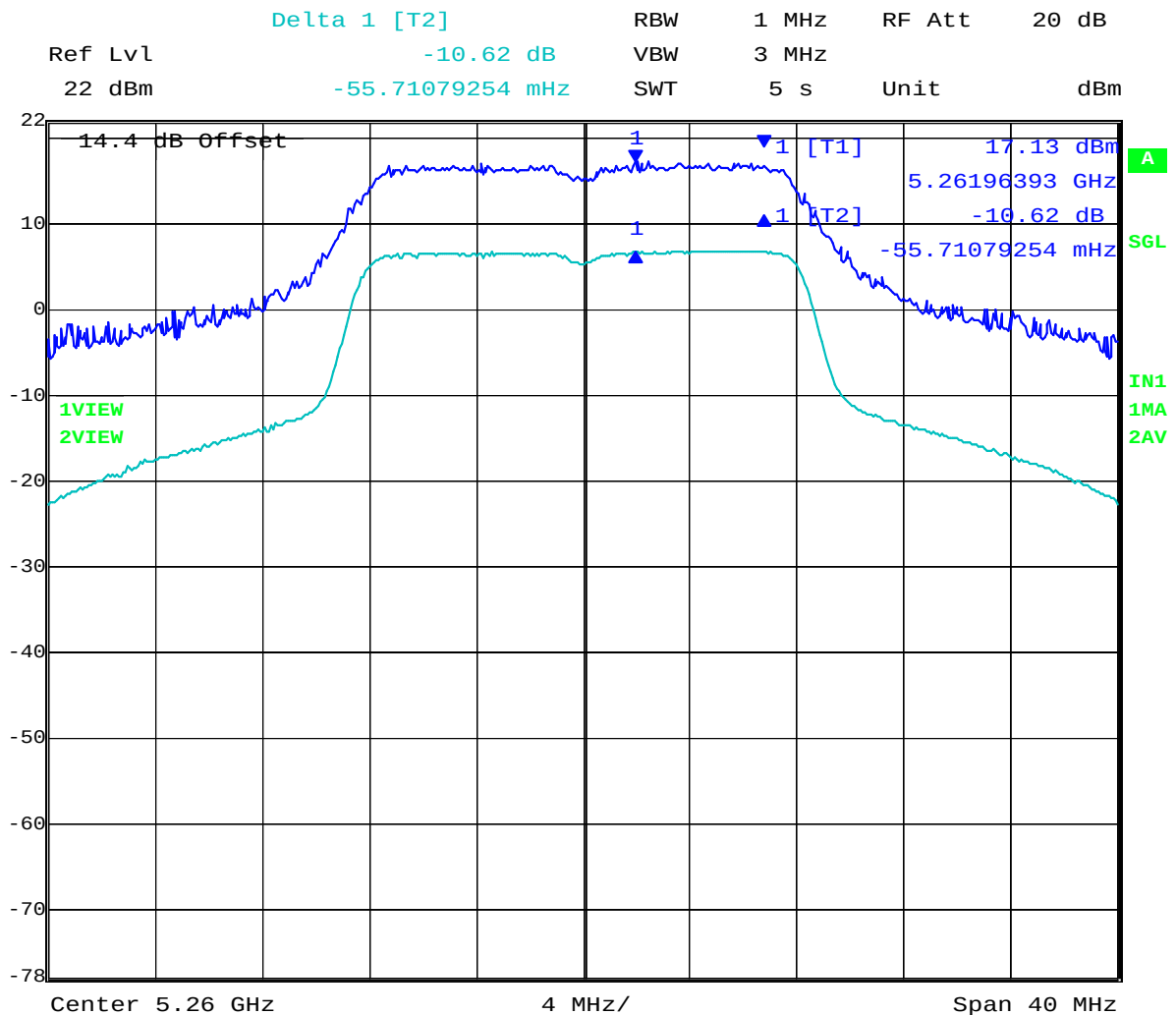


**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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TABLE OF RESULTS – 802.11a

| Centre Frequency (MHz) | Peak Excursion Ratio (dB) | Margin (dB) |
|------------------------|---------------------------|-------------|
| 5,260                  | -10.62                    | -2.38       |
| 5,300                  | -10.33                    | -2.67       |
| 5,320                  | -10.74                    | -2.26       |

5,260 MHz 802.11a Legacy - Peak Excursion Ratio

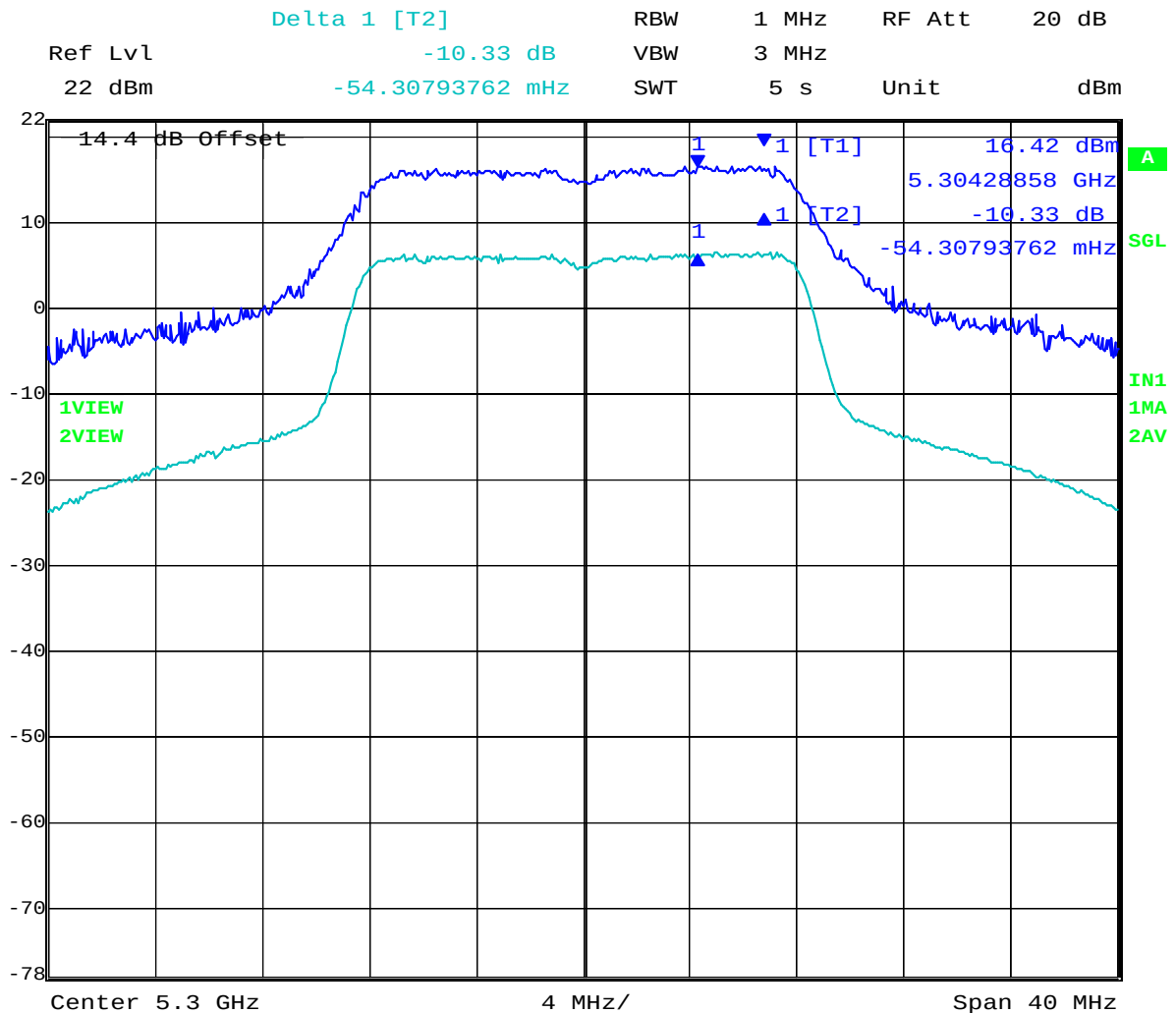


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### 5,300 MHz 802.11a Legacy - Peak Excursion Ratio

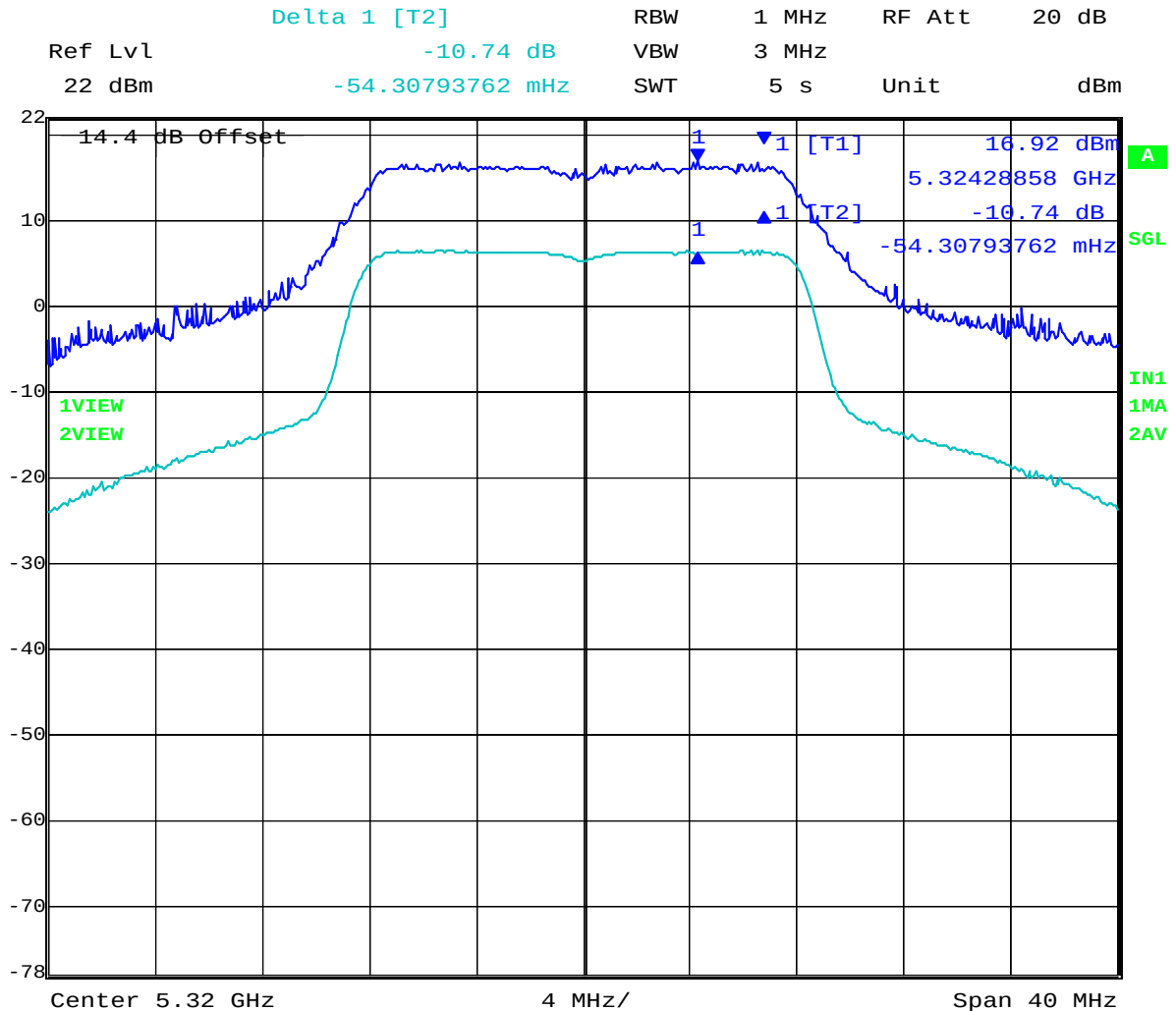


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### 5,320 MHz 802.11a Legacy - Peak Excursion Ratio



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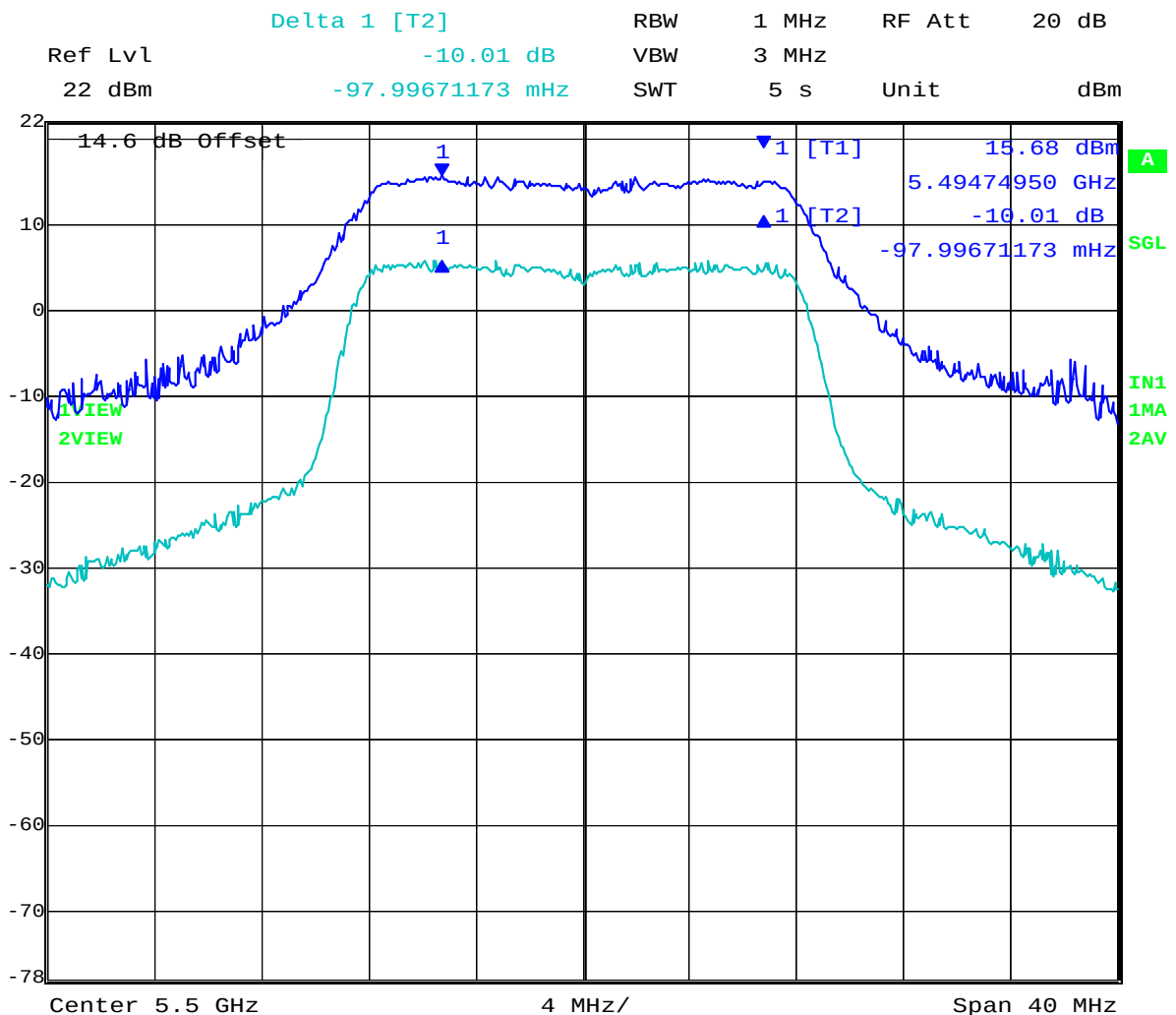


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**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
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TABLE OF RESULTS – 802.11a Legacy

| Centre Frequency (MHz) | Peak Excursion Ratio (dB) | Margin (dB) |
|------------------------|---------------------------|-------------|
| 5,500                  | -10.01                    | -2.99       |
| 5,600                  | -10.03                    | -2.97       |
| 5,700                  | -10.54                    | -2.46       |

5,500 MHz 802.11a Legacy - Peak Excursion Ratio

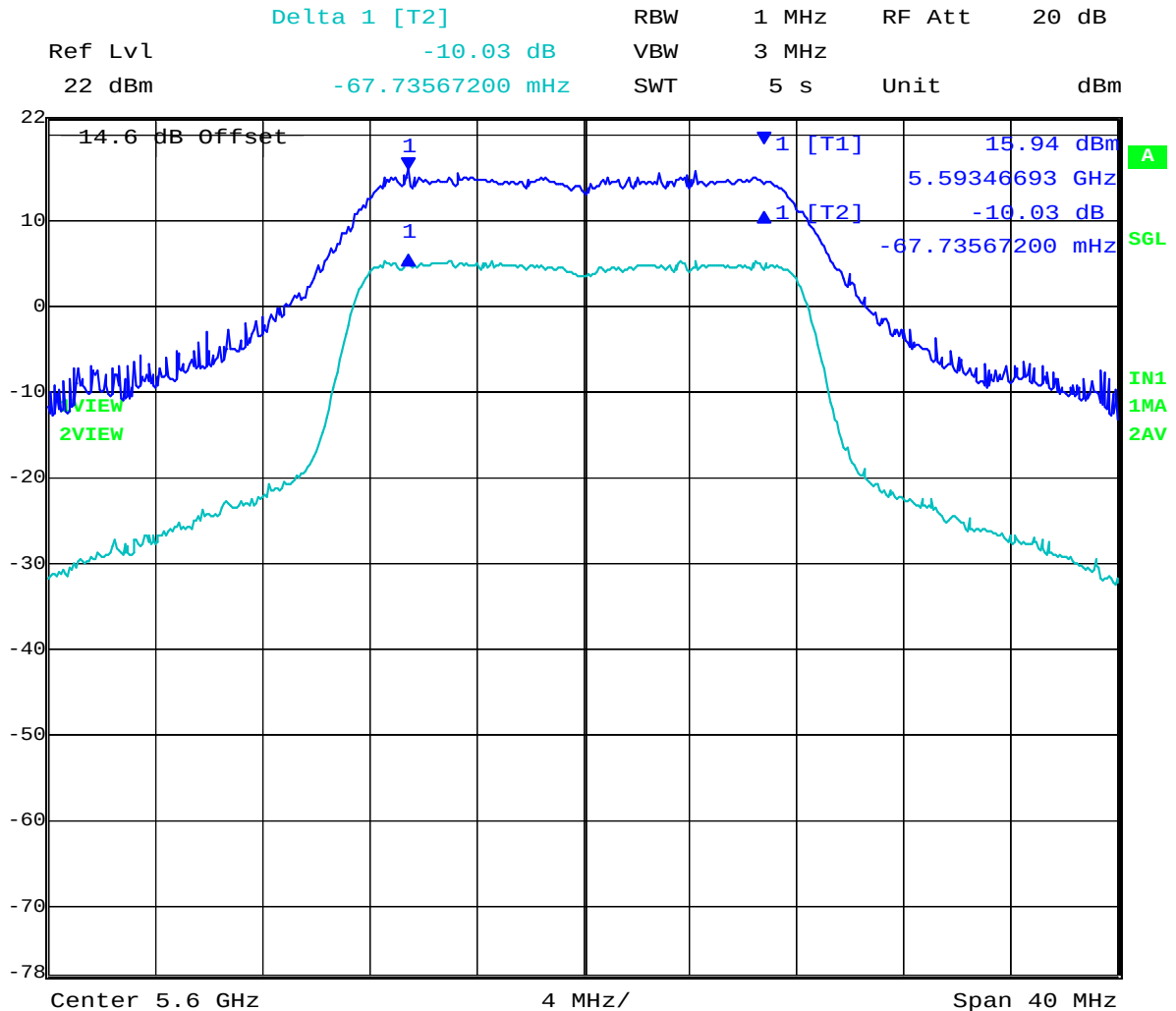


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### 5,600 MHz 802.11a Legacy - Peak Excursion Ratio



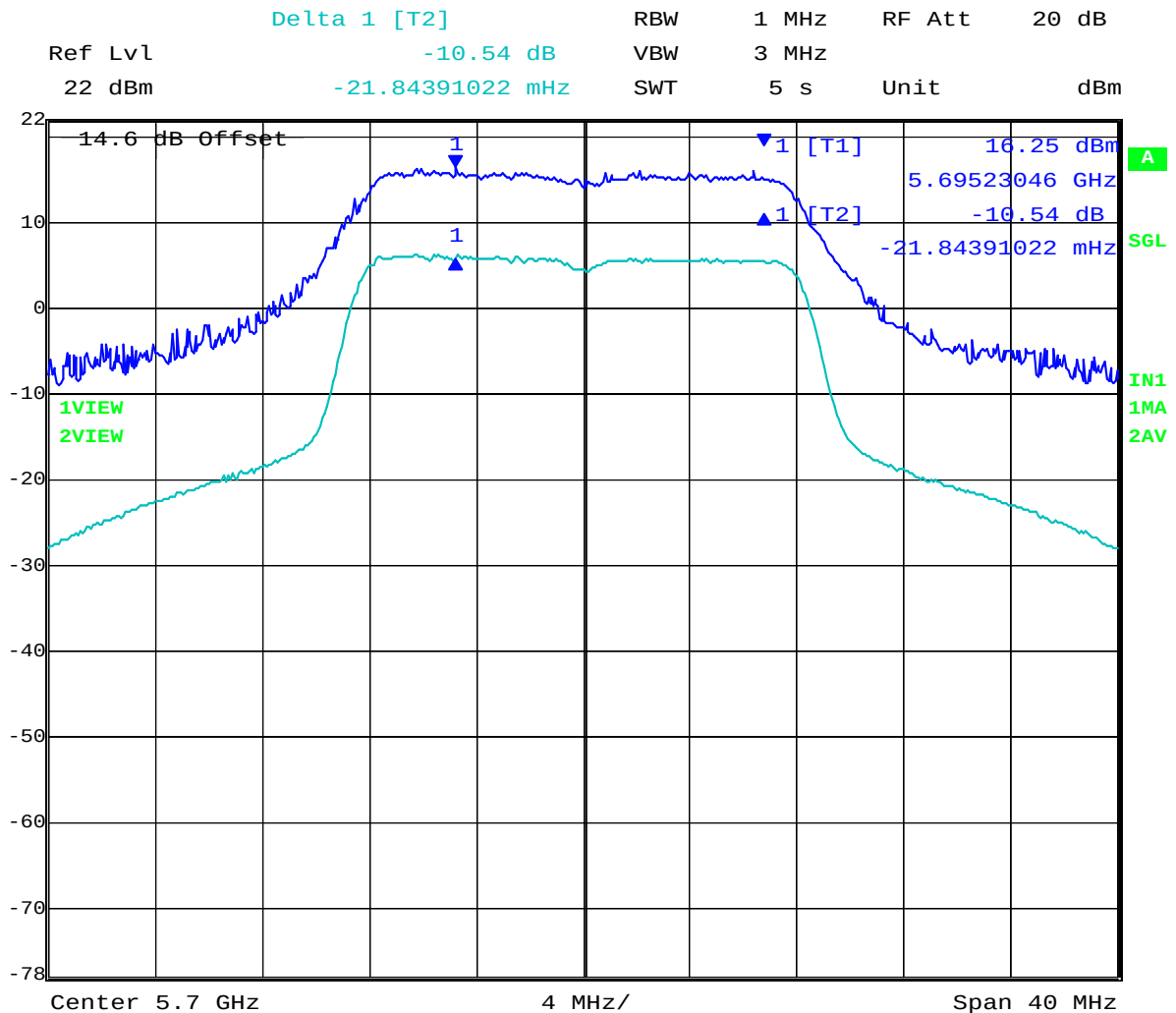
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**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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### 5,700 MHz 802.11a Legacy - Peak Excursion Ratio



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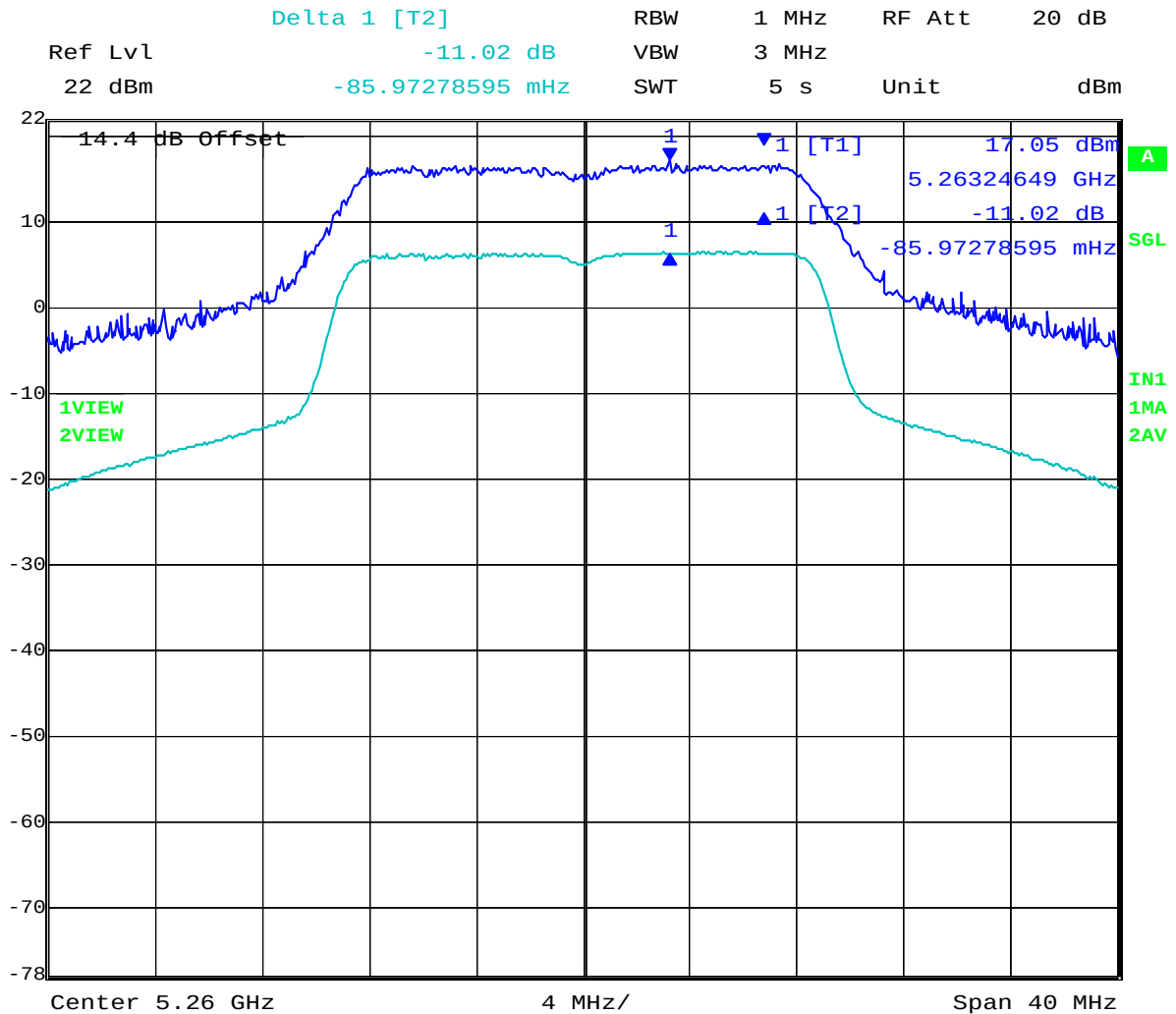


**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
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TABLE OF RESULTS – 802.11n HT20

| Centre Frequency (MHz) | Peak Excursion Ratio (dB) | Margin (dB) |
|------------------------|---------------------------|-------------|
| 5,260                  | -11.02                    | -1.98       |
| 5,300                  | -10.51                    | -2.49       |
| 5,320                  | -10.61                    | -2.39       |

5,260 MHz 802.11n HT20 - Peak Excursion Ratio

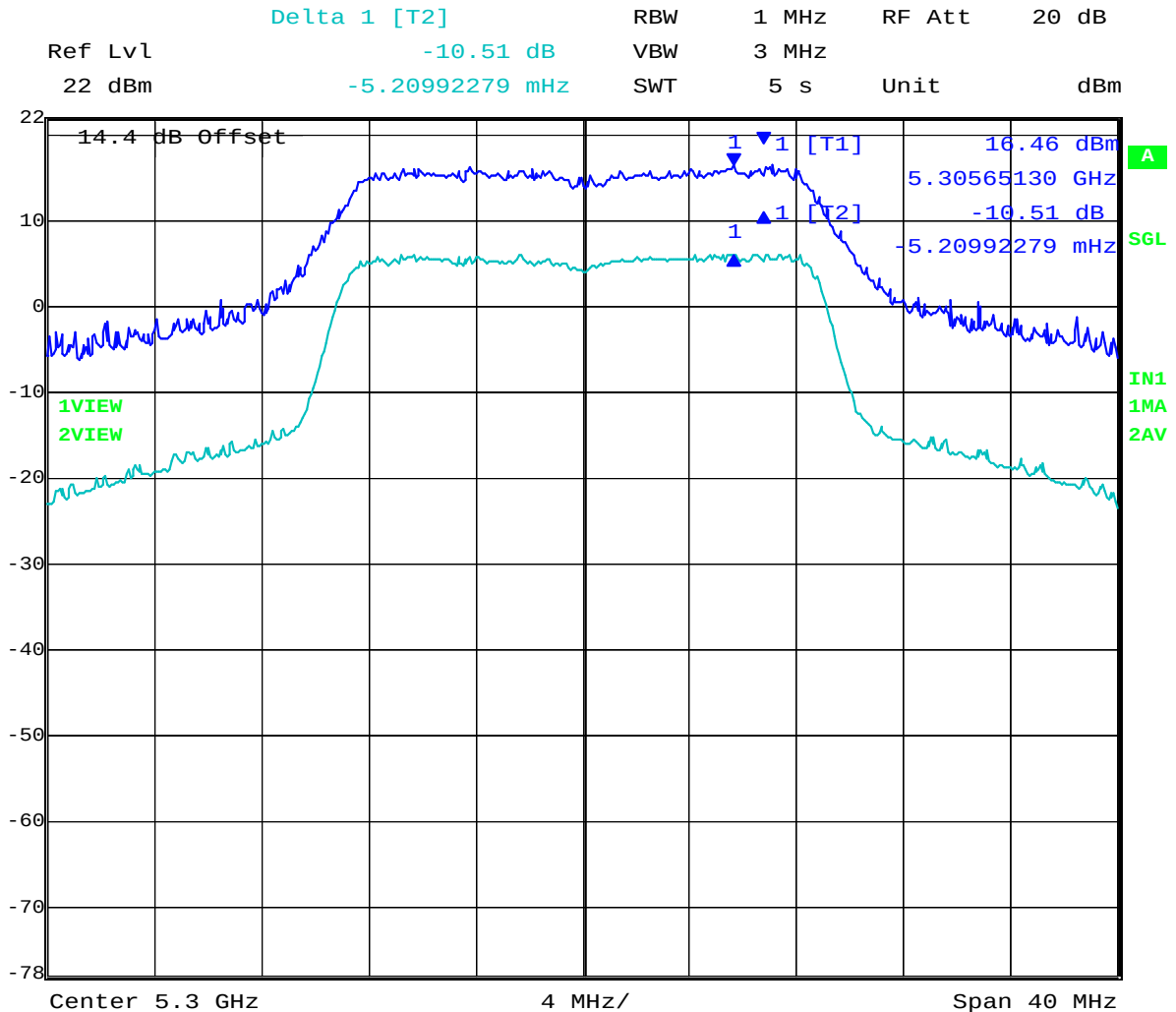


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To: FCC 47 CFR Part 15.407 & IC RSS-210  
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### 5,300 MHz 802.11n HT20 - Peak Excursion Ratio

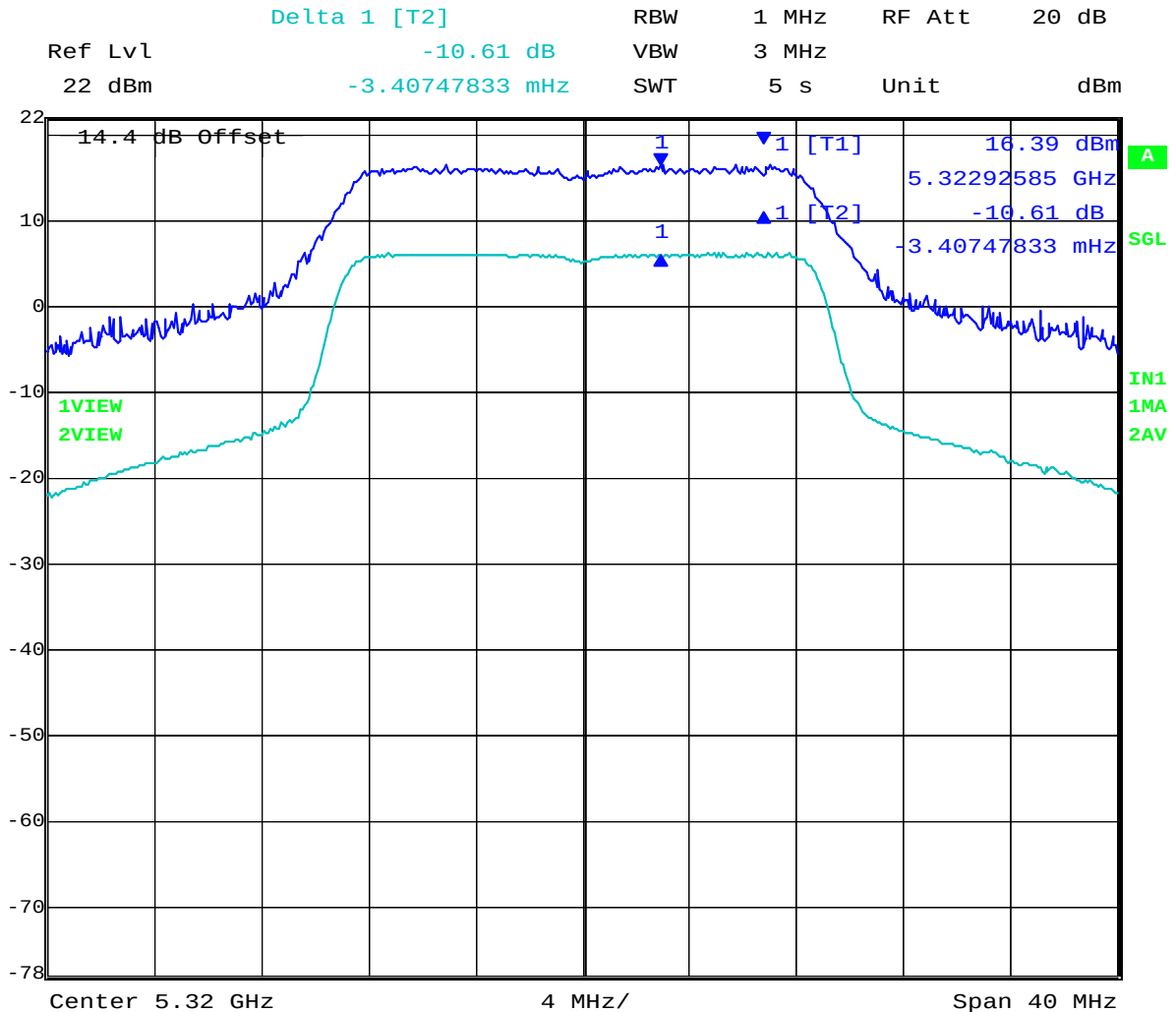


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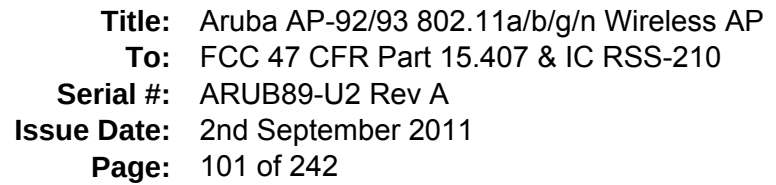


Title: Aruba AP-92/93 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.407 & IC RSS-210  
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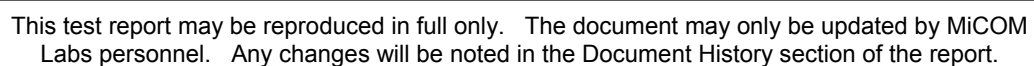
### 5,320 MHz 802.11n HT20 - Peak Excursion Ratio



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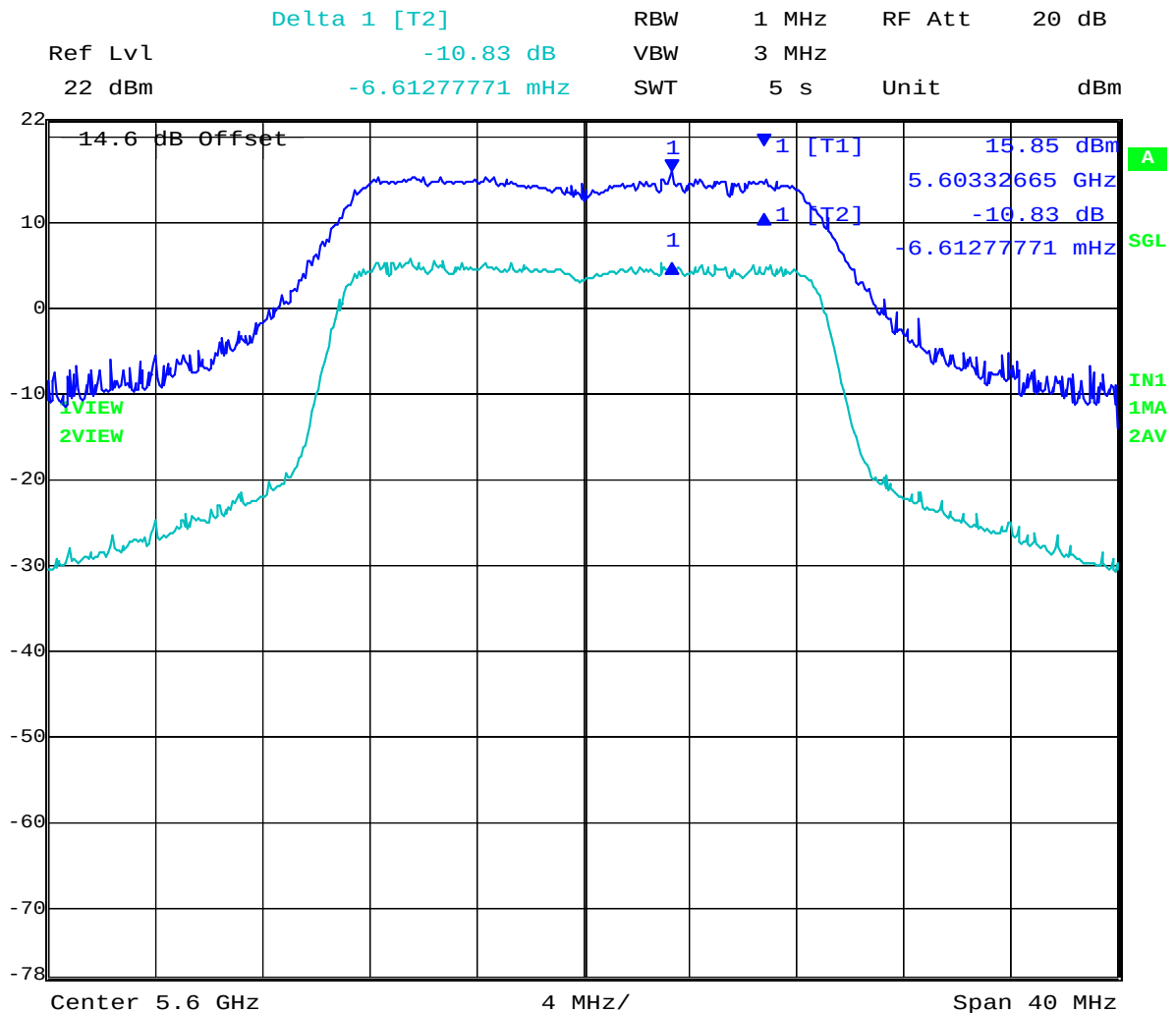
| Centre Frequency (MHz) | Peak Excursion Ratio (dB) | Margin (dB) |
|------------------------|---------------------------|-------------|
| 5,500                  | -11.23                    | -1.77       |
| 5,600                  | -10.83                    | -2.17       |
| 5,700                  | -10.73                    | -2.27       |





Title: Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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### 5,600 MHz 802.11n HT20 - Peak Excursion Ratio

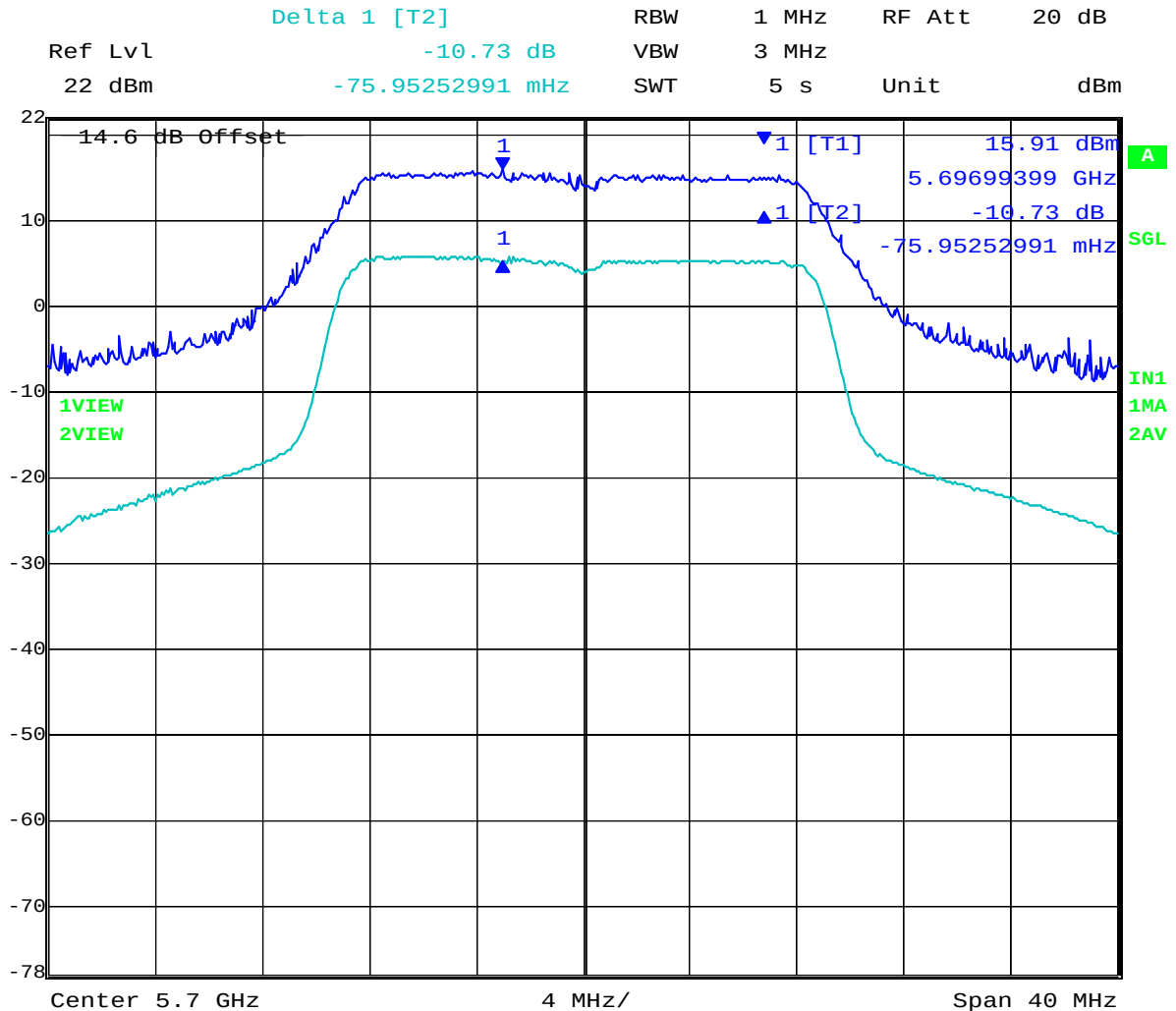


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### 5,700 MHz 802.11n HT20 - Peak Excursion Ratio



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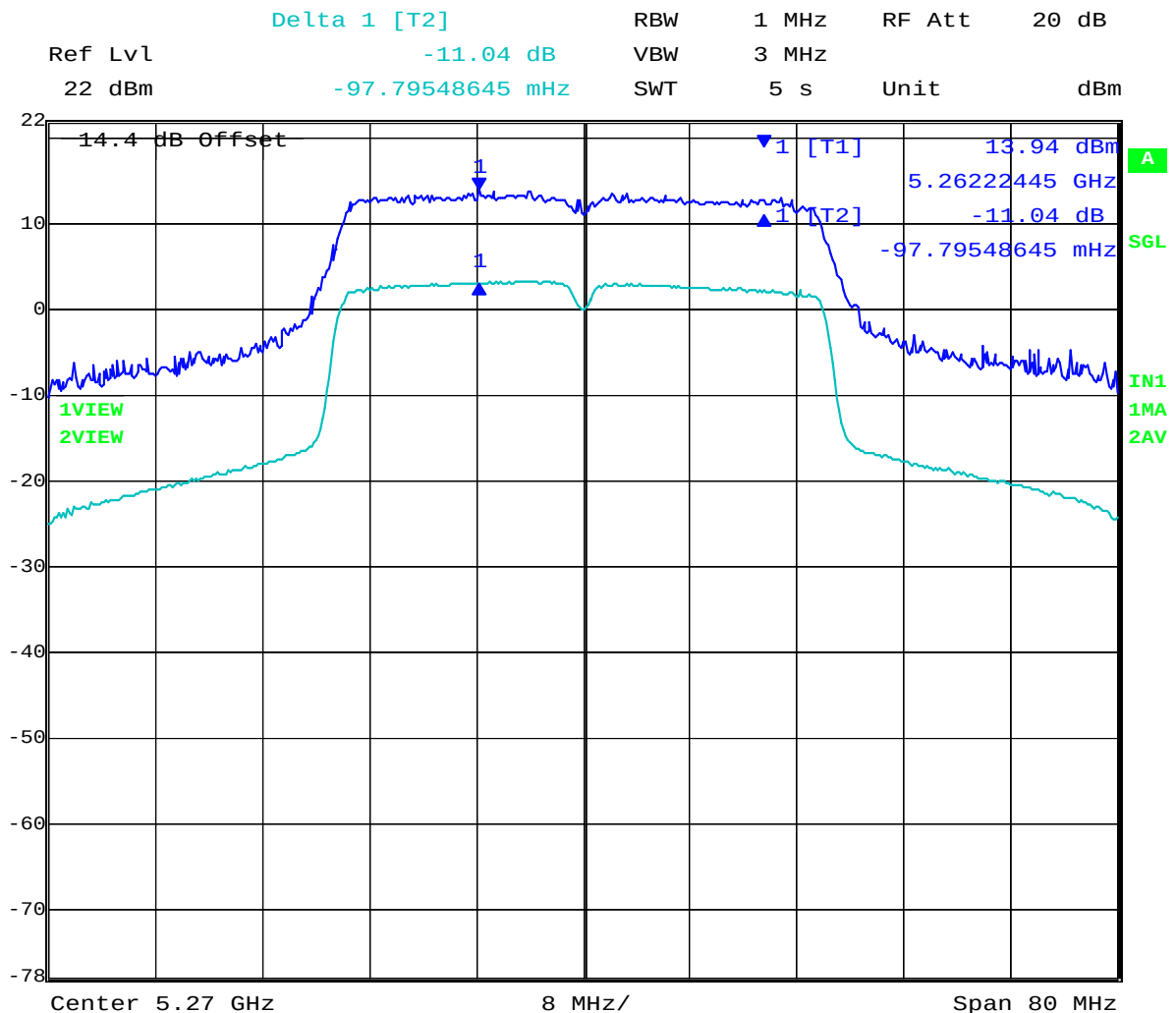


**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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TABLE OF RESULTS – 802.11n HT40

| Centre Frequency (MHz) | Peak Excursion Ratio (dB) | Margin (dB) |
|------------------------|---------------------------|-------------|
| 5,270                  | -11.04                    | -1.96       |
| 5,310                  | -10.90                    | -2.10       |

5,270 MHz 802.11n HT40 - Peak Excursion Ratio



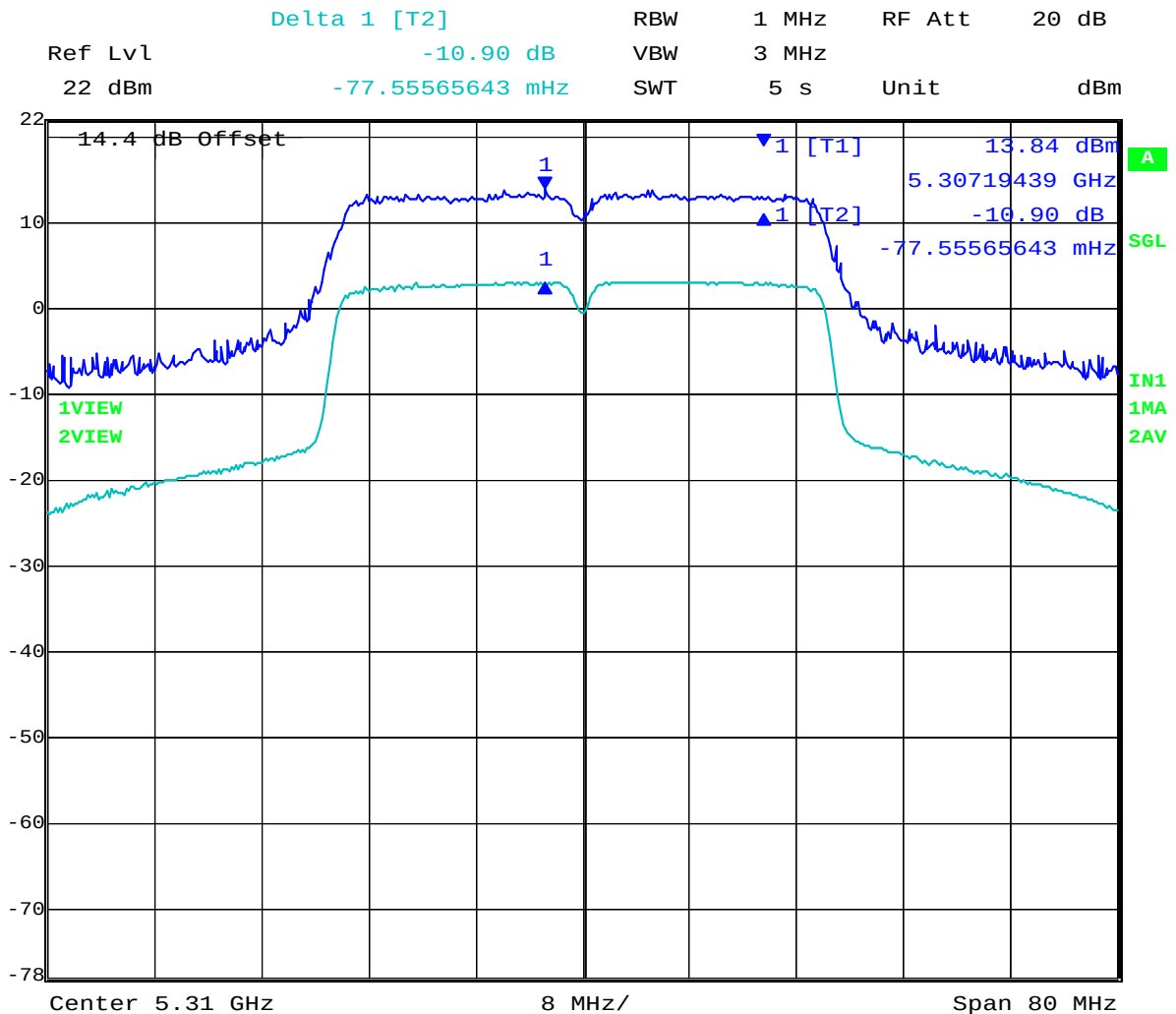
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### 5,310 MHz 802.11n HT40 - Peak Excursion Ratio



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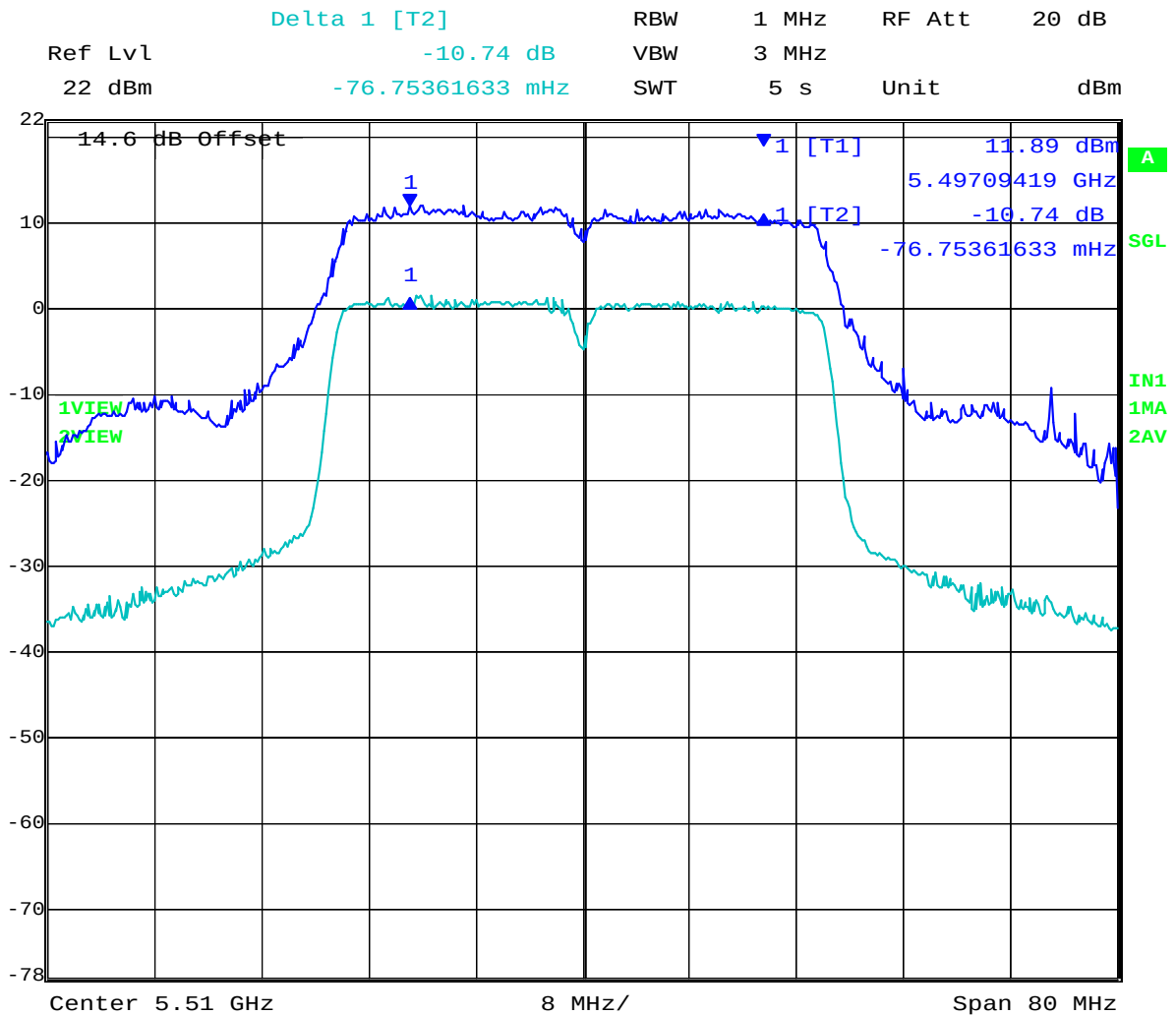


**Title:** Aruba AP-92/93 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.407 & IC RSS-210  
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TABLE OF RESULTS – 802.11n HT40

| Centre Frequency (MHz) | Peak Excursion Ratio (dB) | Margin (dB) |
|------------------------|---------------------------|-------------|
| 5,510                  | -10.74                    | -2.26       |
| 5,590                  | -10.70                    | -2.30       |
| 5,690                  | -10.62                    | -2.38       |

5,510 MHz 802.11n HT40 - Peak Excursion Ratio

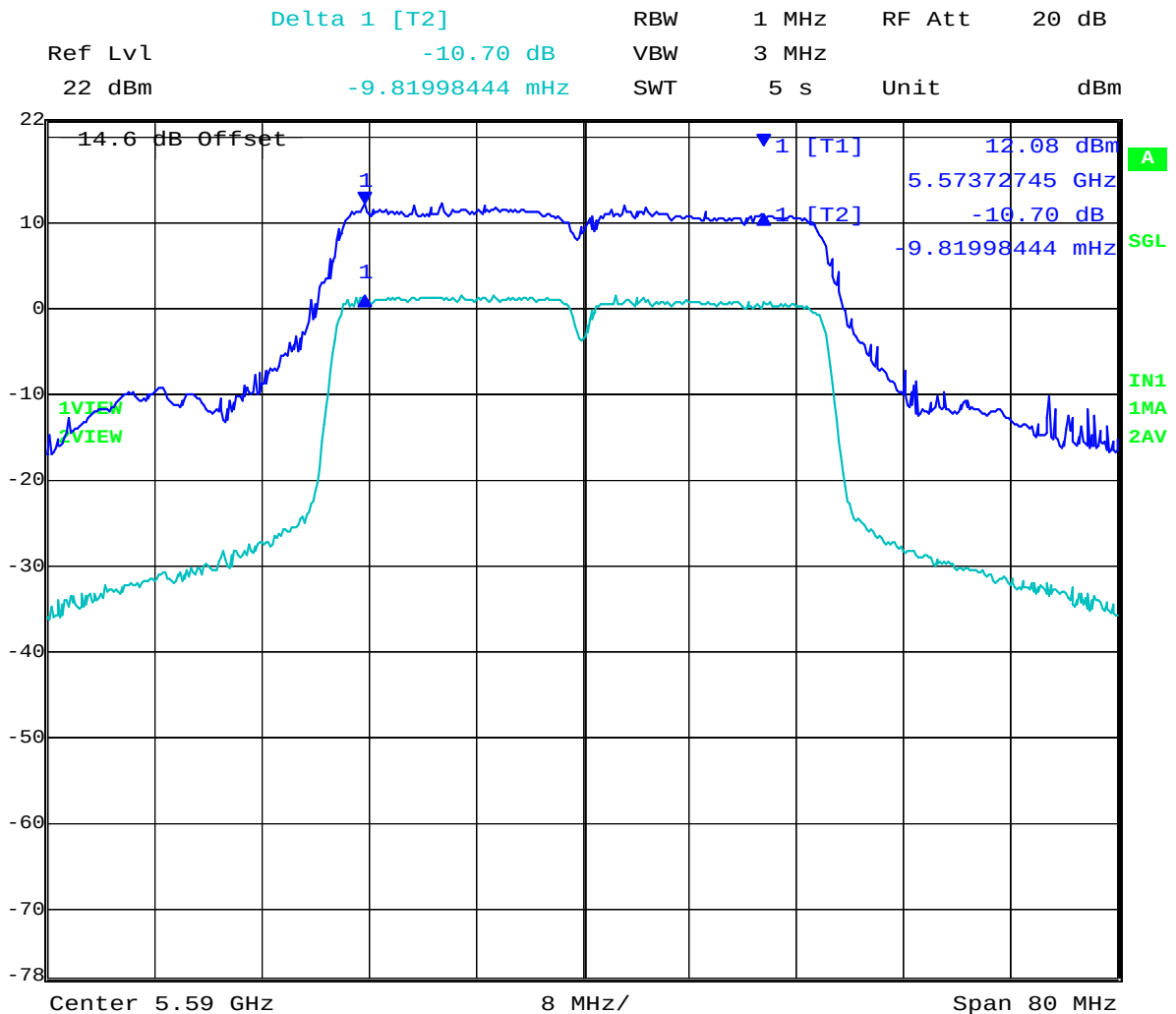


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### 5,590 MHz 802.11n HT40 - Peak Excursion Ratio

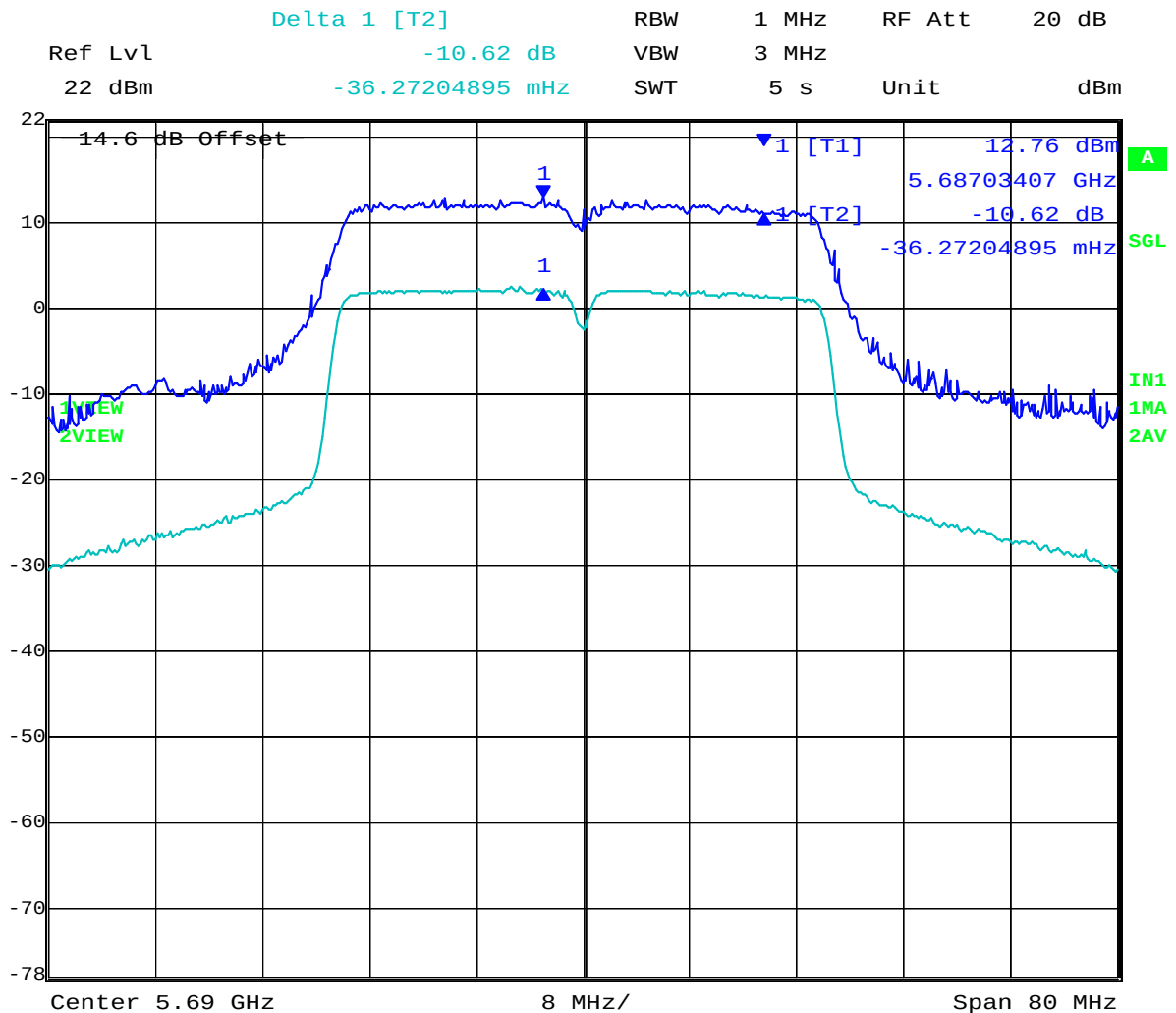


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### 5,690 MHz 802.11n HT40 - Peak Excursion Ratio



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## Specification

### Limits

|                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>§15.407 (a)(6)</b> The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified in this paragraph) shall not exceed 13dB across any 1MHz bandwidth or the emission bandwidth whichever is less</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Laboratory Measurement Uncertainty for Spectrum Measurement

|                         |                     |
|-------------------------|---------------------|
| Measurement uncertainty | $\pm 2.81\text{dB}$ |
|-------------------------|---------------------|

### Traceability

| Method                                                                              | Test Equipment Used                            |
|-------------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask' | 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117 |

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#### **5.1.5. Frequency Stability**

**FCC, Part 15 Subpart C §15.407(g)**  
**Industry Canada RSS-210 §2.1**

#### **Test Procedure**

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions.

#### **Manufacturer Declaration**

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signals should have  $\pm 20$ ppm stability.

This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

$\pm 20$ ppm at 5.250 GHz translates to a maximum frequency shift of  $\pm 105$  KHz. As the edge of the channels is at least one MHz from either of the band edges,  $\pm 105$  KHz is more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the EUT.

#### **Specification**

#### **Limits**

**§15.407 (g)** Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.



#### 5.1.6. Maximum Permissible Exposure

**FCC, Part 15 Subpart C §15.407(f)**

**Industry Canada RSS-Gen §5.5**

#### Calculations for Maximum Permissible Exposure Levels

Power Density =  $P_d$  ( $\text{mW}/\text{cm}^2$ ) =  $\text{EIRP}/(4\pi d^2)$

$\text{EIRP} = P * G * 2$

$P$  = Peak output power (mW)

$G$  = Antenna numeric gain (numeric)

$d$  = Separation distance (cm)

Numeric Gain =  $10^{(G(\text{dBi})/10)}$

The Aruba AP92 / AP93 has two transmitters. The peak power in the table below is calculated by assuming a worst case scenario where the two transmitters are operating simultaneously in the same band. The Peak Power in mW is calculated by taking the maximum allowable conducted power for each antenna to meet the EIRP requirements.

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is  $1.0 \text{ mW}/\text{cm}^2$

| Antenna Gain (dBi) | Numeric Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Calculated Safe Distance @ $1\text{mW}/\text{cm}^2$ Limit(cm) | Minimum Separation Distance (cm) |
|--------------------|------------------------|-------------------------|------------------------|---------------------------------------------------------------|----------------------------------|
| 5.8                | 3.8                    | +21.19                  | 131.5                  | 6.3                                                           | 20.00                            |
| 6.0                | 4.0                    | +20.99                  | 125.6                  | 6.3                                                           | 20.00                            |
| 14.0               | 25.1                   | +12.99                  | 19.9                   | 6.3                                                           | 20.00                            |

**Note:** for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

#### Specification

##### Maximum Permissible Exposure Limits

**FCC §1.1310** Limit =  $1\text{mW} / \text{cm}^2$  from 1.310 Table 1

**RSS-Gen §5.5** Before equipment certification is granted, the application requirements of RSS-102 shall be met.

#### Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty

$\pm 1.33 \text{ dB}$

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#### 5.1.7. Radiated Emissions

**FCC, Part 15 Subpart C §15.407(b)(2), §15.205(a)/15.209(a)**  
**Industry Canada RSS-210 §A9.3(2); §2.2; §2.6; RSS-Gen §4.7**

#### **Test Procedure**

Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak hold mode. Depending on the frequency band spanned a notch filter and/or waveguide filter was used to remove the fundamental frequency.

Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR compliant receiver. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Emissions from 30 MHz – 1000 MHz are measured utilizing a CISPR compliant quasi-peak detector with a tuned receiver, using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed.

#### **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

$$FS = R + AF + CORR$$

where:

FS = Field Strength

R = Measured Receiver Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

For example:

Given a Receiver input reading of 51.5dB $\mu$ V; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3\text{dB}\mu\text{V/m}$$

Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (}\mu\text{V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100\mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250\mu\text{V/m}$$

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The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dB $\mu$ V/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

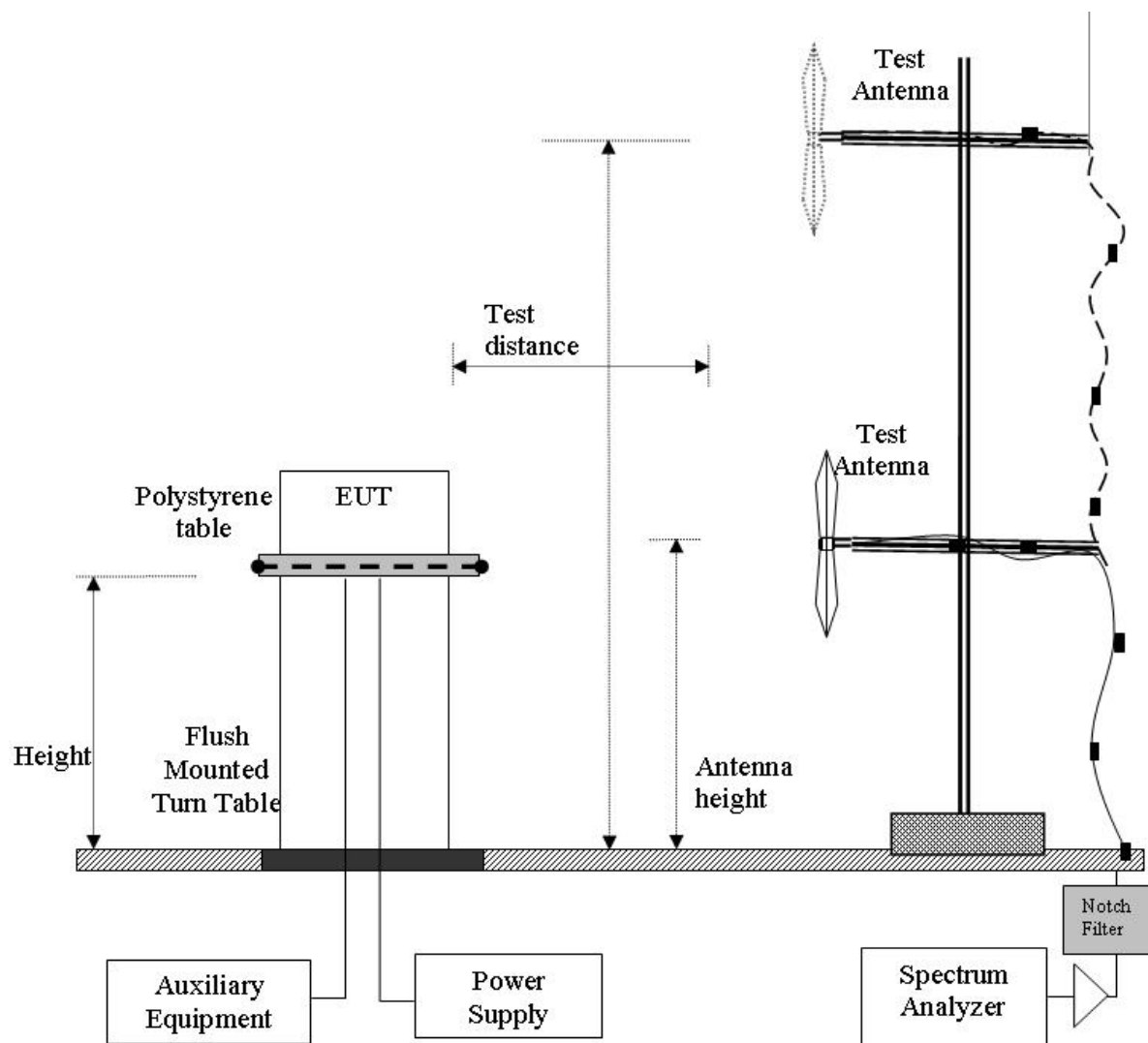
Therefore: -27 dBm/MHz = 68.23 dB $\mu$ V/m

**Note:** The data in this Section identifies that the EUT is in compliance with the -27dBm/MHz EIRP limit (68.23 dB $\mu$ V/m) for out of band emissions. All out of band emissions are less than 68.23 dB  $\mu$ V/m.

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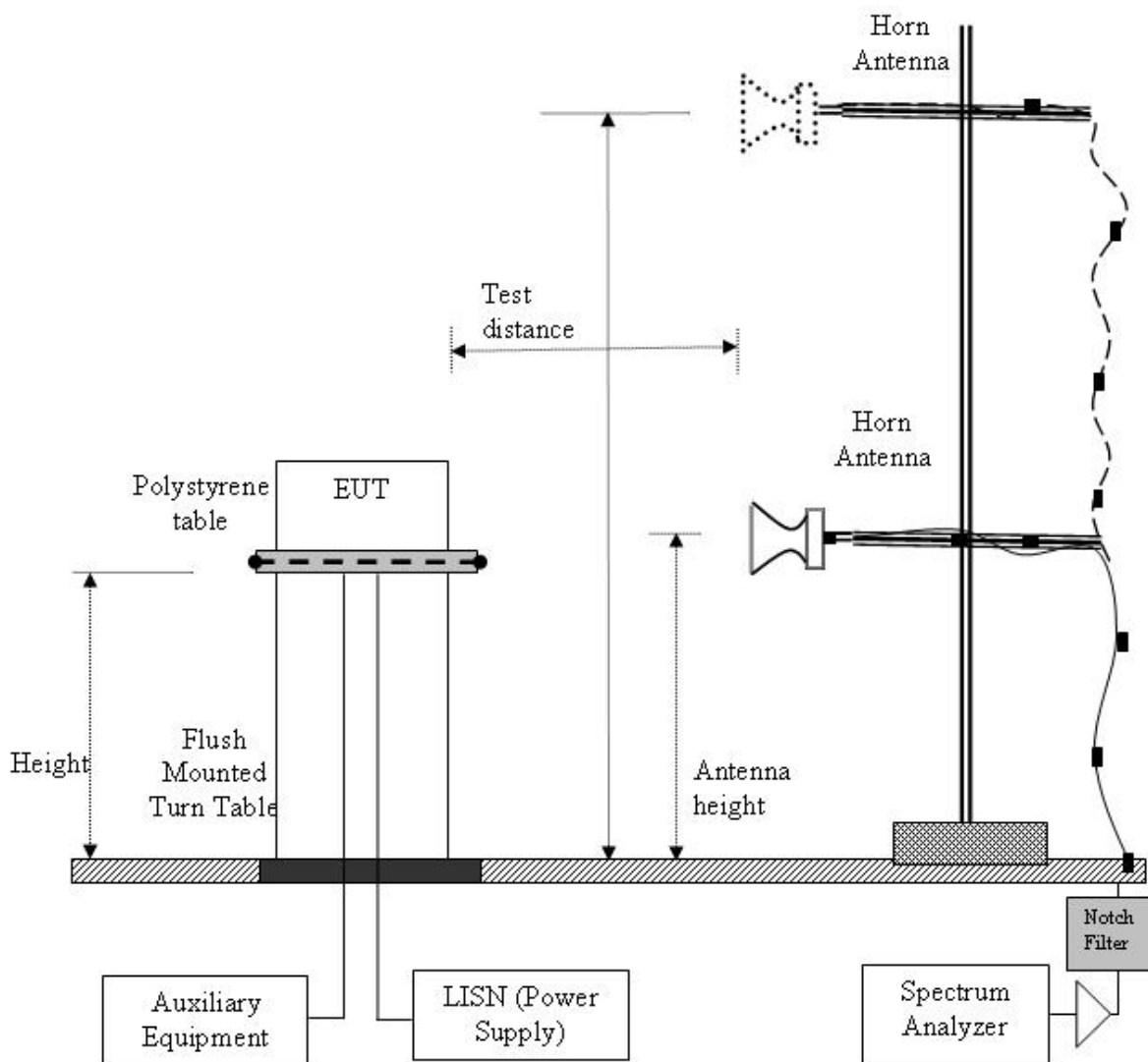
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### Test Measurement Set Up < 1 GHz



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### Test Measurement Set Up > 1 GHz



Transmitter Spurious Emission measurement test configuration



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## Specification

### Radiated Spurious Emissions

**15.407 (b)(2).** All emissions outside of the 5,150-5,350MHz band shall not exceed an EIRP of -27dBm/MHz.

**FCC §15.205 (a)** Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

**FCC §15.205 (a)** Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**FCC §15.209 (a)** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

**RSS-210 §A9.3(2)** For transmitters operating in the 5250-5350 MHz band, all emissions outside the 5150-5350 MHz band shall not exceed -27 dBm/MHz e.i.r.p. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band shall not exceed out of band emission limit of 27 dBm/MHz e.i.r.p. in the 5150-5250 MHz band in order to operate indoor/outdoor, or alternatively shall comply with the spectral power density for operation within the 5150-5250 MHz band and shall be labeled "for indoor use only".

**RSS-Gen §4.7** The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz, whichever is the lowest frequency, to the 5<sup>th</sup> harmonic of the highest frequency generated without exceeding 40 GHz.

#### **RSS-Gen §6** Receiver Spurious Emission Standard

If a radiated measurement is made, all spurious emissions shall comply with the limits of the following Table. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emission measurements below 1.0 GHz and 1.0 MHz for measurements above 1.0 GHz



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**Table 1: FCC 15.209 Spurious Emissions Limits**

| Frequency (MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance (meters) |
|-----------------|-----------------------|-------------------------|-------------------------------|
| 30-88           | 100                   | 40.0                    | 3                             |
| 88-216          | 150                   | 43.5                    | 3                             |
| 216-960         | 200                   | 46.0                    | 3                             |
| Above 960       | 500                   | 54.0                    | 3                             |

**Laboratory Measurement Uncertainty for Spectrum Measurement**

|                                |               |
|--------------------------------|---------------|
| <b>Measurement Uncertainty</b> | +5.6/ -4.5 dB |
|--------------------------------|---------------|

**Traceability:**

| Method                 | Test Equipment Used                            |
|------------------------|------------------------------------------------|
| Work instruction WI-03 | 0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312 |

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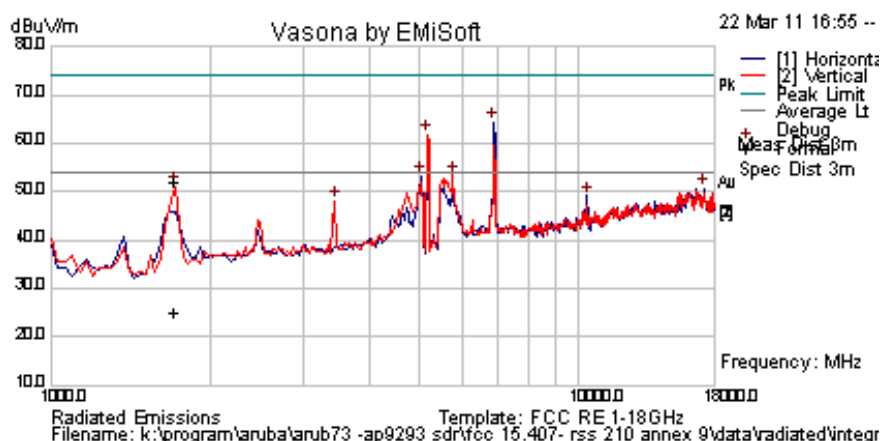
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### 5.1.7.1. Integral Antenna – Radiated Spurious Emissions – Above 1 GHz

|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5260 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbit/s    | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 37%  |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



### Formally measured emission peaks

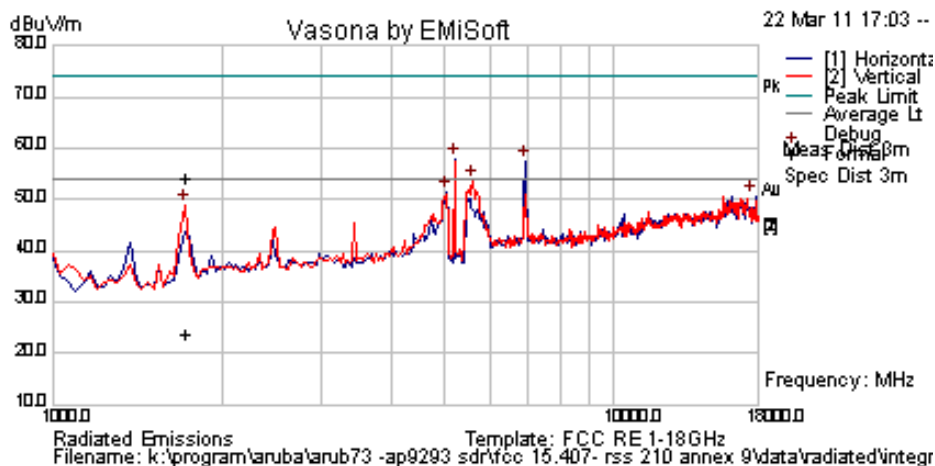
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 1720.100                                                                                                | 62.9     | 2.6        | -13.3 | 52.1         | Peak Max         | V   | 101    | 0       | 74.0         | -21.9     | Pass       | RB       |
| 1720.100                                                                                                | 35.8     | 2.6        | -13.3 | 25.0         | Average Max      | V   | 101    | 0       | 54.0         | -29.0     | Pass       | RB       |
| 6906.934                                                                                                | 64.7     | 5.3        | -5.5  | 64.5         | Peak [Scan]      | H   | 100    |         |              |           |            | NRB      |
| 5256.313                                                                                                | 66.2     | 4.6        | -9.0  | 61.9         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5769.539                                                                                                | 57.0     | 4.8        | -8.3  | 53.4         | Peak [Scan]      | V   | 100    | 0       | 54           | -0.6      | Pass       | NRB      |
| 5320.040                                                                                                | 57.8     | 4.6        | -9.1  | 53.3         | Peak [Scan]      | H   | 100    | 0       | 54           | -0.7      | Pass       | BE       |
| 17250.501                                                                                               | 40.5     | 8.6        | 1.6   | 50.7         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.3      | Pass       | NRB      |
| 10358.757                                                                                               | 44.4     | 6.7        | -2.1  | 49.1         | Peak [Scan]      | H   | 100    | 0       | 54           | -4.9      | Pass       | NRB      |
| 3447.986                                                                                                | 56.0     | 3.6        | -11.5 | 48.1         | Peak [Scan]      | V   | 100    | 0       | 54           | -6.0      | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5300 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbit/s    | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 1731.623      | 64.8     | 2.6        | -13.2 | 54.2         | Peak Max         | V   | 101    | 73      | 74.0         | -19.8     | Pass       | RB       |
| 1731.623      | 34.3     | 2.6        | -13.2 | 23.7         | Average Max      | V   | 101    | 73      | 54.0         | -30.4     | Pass       | RB       |
| 5290.381      | 62.5     | 4.6        | -9.2  | 58.0         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 6927.856      | 57.8     | 5.4        | -5.5  | 57.6         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5599.198      | 57.6     | 4.7        | -8.6  | 53.6         | Peak [Scan]      | V   | 100    | 0       | 54           | -0.4      | Pass       | NRB      |
| 5320.040      | 55.9     | 4.6        | -9.1  | 51.5         | Peak [Scan]      | H   | 100    | 0       | 54           | -2.5      | Pass       | BE       |
| 17497.796     | 40.6     | 8.8        | 1.4   | 50.7         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.3      | Pass       | NRB      |

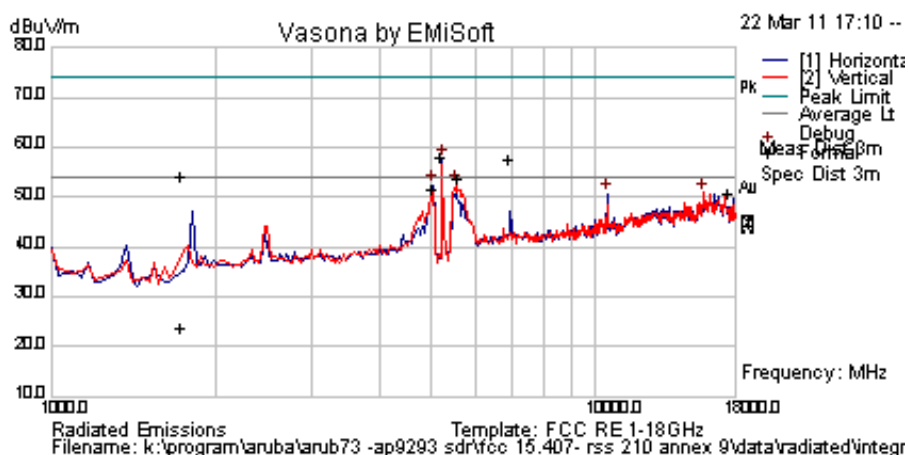
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5320 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbit/s    | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5304.449                                                                                                | 62.4     | 4.6        | -9.4  | 57.6         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 5531.06212                                                                                              | 56.6     | 4.6        | -8.7  | 52.6         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -1.4      | Pass       | NRB      |
| 5320.040                                                                                                | 56.8     | 4.6        | -9.1  | 52.3         | Peak [Scan]      | H   | 100    | 0       | 54           | -1.7      | Pass       | BE       |
| 17651.503                                                                                               | 41.3     | 8.8        | 0.8   | 50.8         | Peak [Scan]      | V   | 100    | 0       | 54           | -3.2      | Pass       | NRB      |
| 10470.942                                                                                               | 46.6     | 6.8        | -2.6  | 50.8         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.2      | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

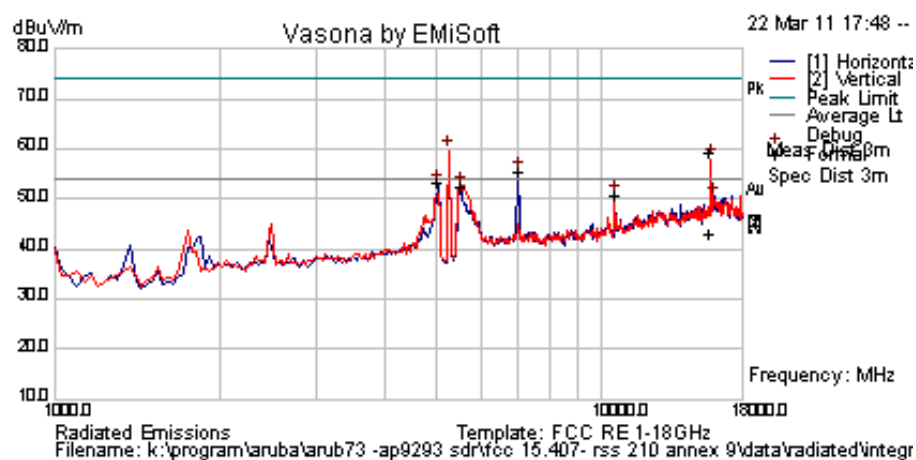
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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5260 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15789.739     | 50.7     | 8.7        | 0.1   | 59.5         | Peak Max         | V   | 101    | 1       | 74.0         | -14.5     | Pass       | RB       |
| 15789.739     | 34.1     | 8.7        | 0.1   | 42.9         | Average Max      | V   | 101    | 1       | 54.0         | -11.1     | Pass       | RB       |
| 7030.060      | 55.2     | 5.4        | -5.2  | 55.4         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5020.040      | 57.6     | 4.6        | -9.1  | 53.1         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5531.062      | 56.6     | 4.6        | -8.7  | 52.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 10539.078     | 46.6     | 6.8        | -2.6  | 50.9         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |

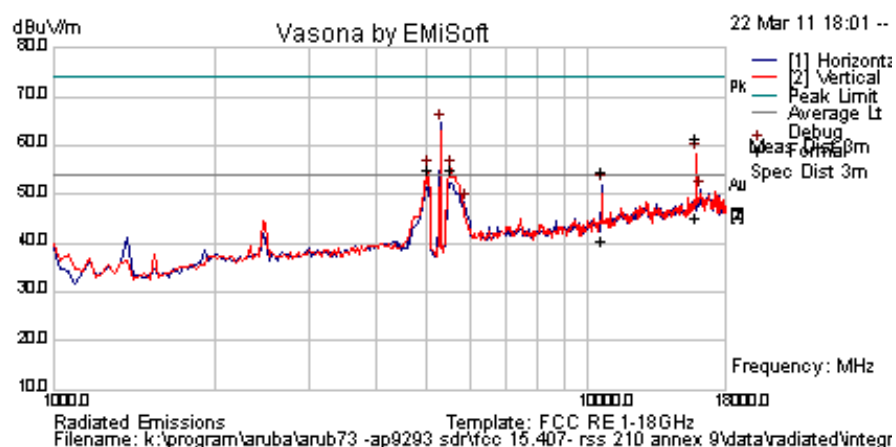
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5300 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

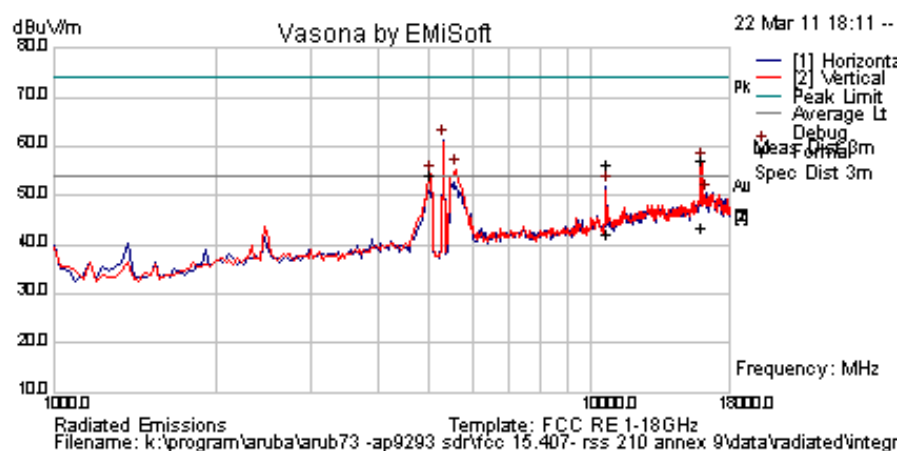
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15904.389                                                                                               | 52.9     | 8.9        | -0.2  | 61.5         | Peak Max         | V   | 101    | 0       | 74.0         | -12.5     | Pass       | RB       |
| 10602.705                                                                                               | 50.2     | 6.8        | -2.3  | 54.7         | Peak Max         | H   | 101    | 41      | 74.0         | -19.3     | Pass       | RB       |
| 15904.389                                                                                               | 36.4     | 8.9        | -0.2  | 45.0         | Average Max      | V   | 101    | 0       | 54           | -9.0      | Pass       | RB       |
| 10602.705                                                                                               | 36.0     | 6.8        | -2.3  | 40.5         | Average Max      | H   | 101    | 41      | 54           | -13.5     | Pass       | RB       |
| 5020.040                                                                                                | 59.4     | 4.6        | -9.1  | 55.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|---------------|-------------------------|----------------|------|
| Test Freq.    | 5320 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15958.099     | 47.8     | 9.0        | 0.4   | 57.1         | Peak Max         | V   | 101    | 1       | 74.0         | -16.9     | Pass       | RB       |
| 10642.796     | 51.9     | 6.8        | -2.2  | 56.5         | Peak Max         | H   | 101    | 1       | 74.0         | -17.5     | Pass       | RB       |
| 15958.099     | 34.0     | 9.0        | 0.4   | 43.4         | Average Max      | V   | 101    | 1       | 54           | -10.6     | Pass       | RB       |
| 10642.796     | 37.4     | 6.8        | -2.2  | 42.0         | Average Max      | H   | 101    | 1       | 54           | -12.0     | Pass       | RB       |
| 5020.040      | 58.7     | 4.6        | -9.1  | 54.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |

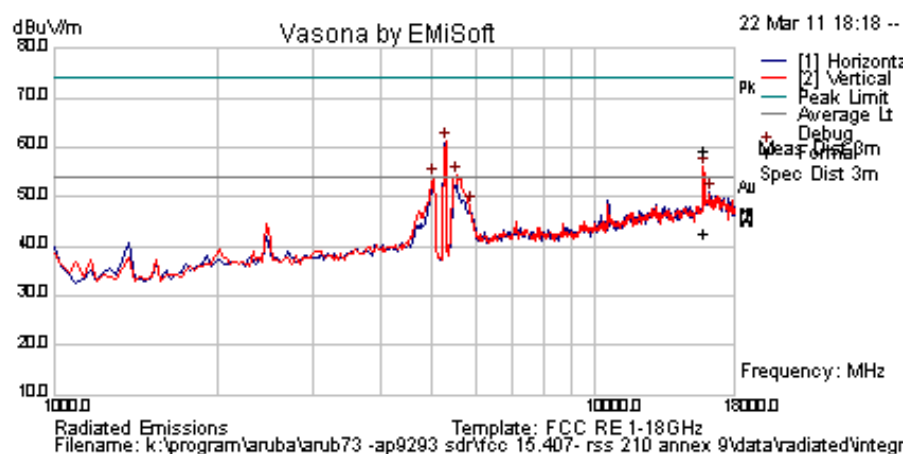
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5270 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

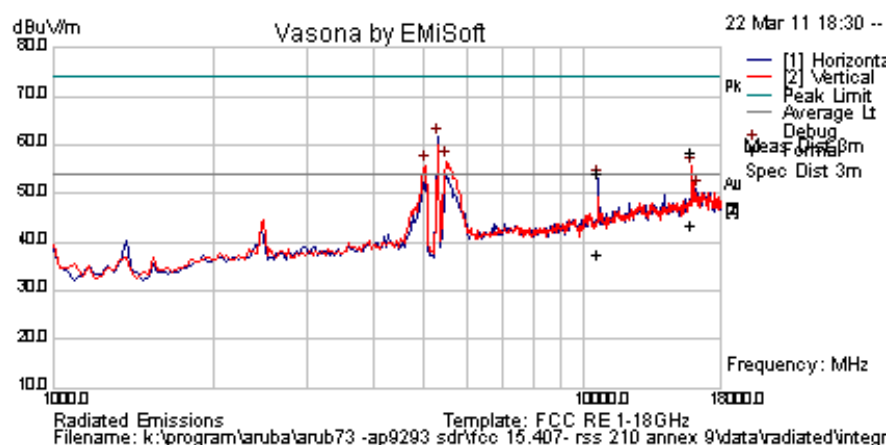
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15821.763                                                                                               | 50.8     | 8.7        | -0.2  | 59.4         | Peak Max         | V   | 101    | 3       | 74.0         | -14.6     | Pass       | RB       |
| 15821.763                                                                                               | 34.0     | 8.7        | -0.2  | 42.6         | Average Max      | V   | 101    | 3       | 54.0         | -11.4     | Pass       | RB       |
| 5020.040                                                                                                | 58.2     | 4.6        | -9.1  | 53.8         | Peak [Scan]      | V   | 100    | 0       | 54           | -0.3      | Pass       | BE       |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5310 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       |                          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

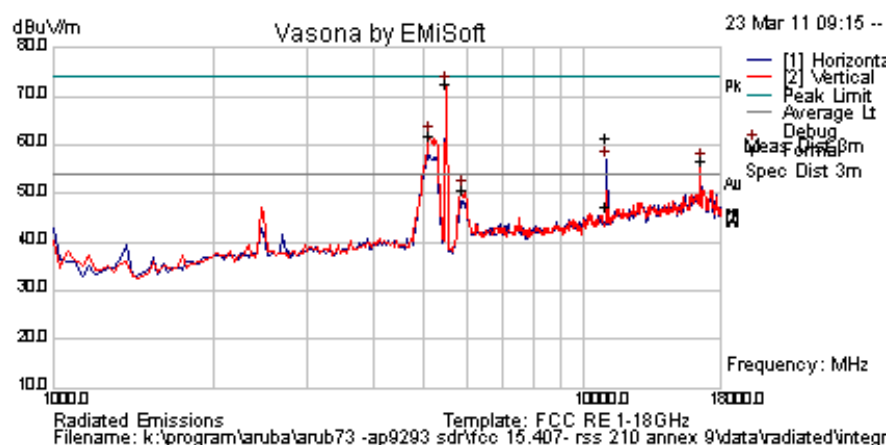
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15924.394                                                                                               | 49.6     | 8.9        | 0.1   | 58.6         | Peak Max         | V   | 101    | 0       | 74.0         | -15.4     | Pass       | RB       |
| 10610.814                                                                                               | 49.4     | 6.8        | -2.2  | 54.0         | Peak Max         | H   | 101    | 19      | 74.0         | -20.0     | Pass       | RB       |
| 15924.394                                                                                               | 34.5     | 8.9        | 0.1   | 43.4         | Average Max      | V   | 101    | 0       | 54           | -10.6     | Pass       | RB       |
| 10610.814                                                                                               | 32.9     | 6.8        | -2.2  | 37.5         | Average Max      | H   | 101    | 19      | 54           | -16.5     | Pass       | RB       |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5500 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 MBit/s    | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 37%  |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

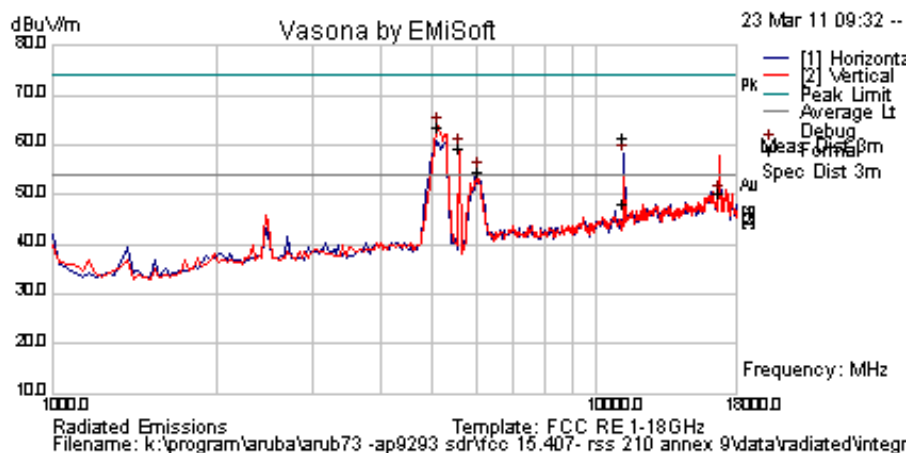
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11000.721                                                                                                                                                                                                        | 57.3     | 7.0        | -2.9  | 61.3         | Peak Max         | H   | 100    | 35      | 74.0         | -12.7     | Pass       | RB       |
| 11000.721                                                                                                                                                                                                        | 43.2     | 7.0        | -2.9  | 47.3         | Average Max      | H   | 100    | 35      | 54.0         | -6.7      | Pass       | RB       |
| 5496.994                                                                                                                                                                                                         | 76.6     | 4.6        | -8.7  | 72.4         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5162.244                                                                                                                                                                                                         | 66.1     | 4.6        | -9.0  | 61.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16535.070                                                                                                                                                                                                        | 47.3     | 8.8        | 0.4   | 56.6         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5871.743                                                                                                                                                                                                         | 54.6     | 4.8        | -8.6  | 50.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5600 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6.MBit/s    | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

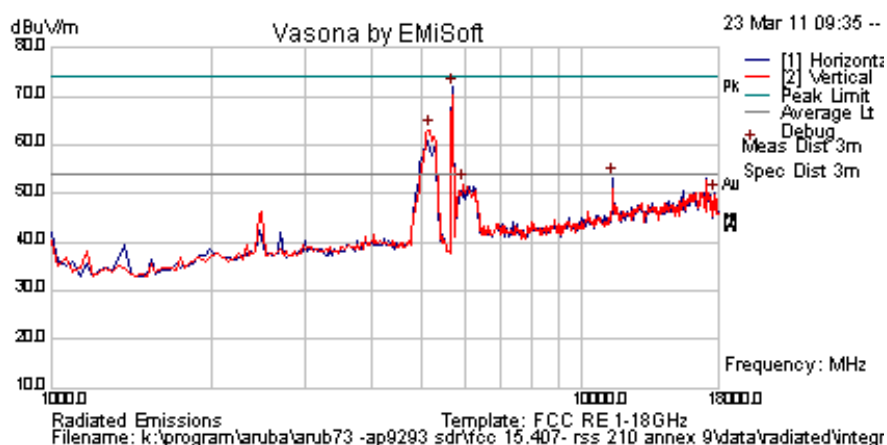
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11201.764                                                                                                                                                                                                        | 57.5     | 6.9        | -3.0  | 61.4         | Peak Max         | H   | 100    | 30      | 74.0         | -12.6     | Pass       | RB       |
| 11201.764                                                                                                                                                                                                        | 44.3     | 6.9        | -3.0  | 48.2         | Average Max      | H   | 100    | 30      | 54.0         | -5.8      | Pass       | RB       |
| 5162.244                                                                                                                                                                                                         | 67.9     | 4.6        | -9.0  | 63.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5599.198                                                                                                                                                                                                         | 63.2     | 4.7        | -8.6  | 59.3         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 6042.084                                                                                                                                                                                                         | 57.8     | 4.9        | -8.2  | 54.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16797.756                                                                                                                                                                                                        | 40.1     | 8.6        | 1.4   | 50.2         | Peak [Scan]      | V   | 100    | 0       | 54           | -3.8      | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5700 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 MBit/s    | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5701.403                                                                                                | 75.3     | 4.7        | -8.1  | 71.9         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 5156.31263                                                                                              | 67.4     | 4.6        | -9.0  | 63.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 11390.782                                                                                               | 47.9     | 6.8        | -1.6  | 53.2         | Peak [Scan]      | H   | 100    | 0       | 54           | -0.8      | Pass       | RB       |
| 5973.948                                                                                                | 55.3     | 4.9        | -8.2  | 51.9         | Peak [Scan]      | V   | 100    | 0       | 54           | -2.1      | Pass       | NRB      |
| 17693.387                                                                                               | 40.4     | 8.8        | 0.8   | 50.0         | Peak [Scan]      | H   | 100    | 0       | 54           | -4.0      | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

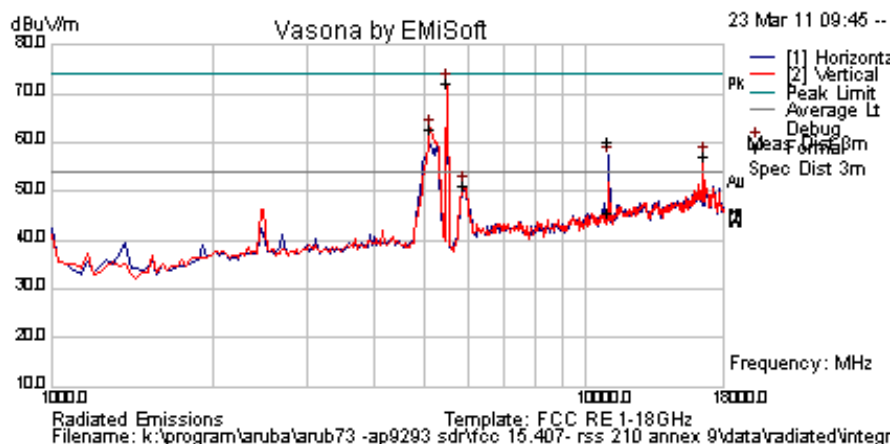
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|                      |                         |                       |      |
|----------------------|-------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5500 MHz                | <b>Engineer</b>       | SB   |
| <b>Variant</b>       | 802.11n; HT-20; 6.5 MCS | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz    | <b>Rel. Hum.(%)</b>   | 37   |
| <b>Power Setting</b> | 18                      | <b>Press. (mBars)</b> | 1002 |
| <b>Antenna</b>       | Integral 5.8 dBi        | <b>Duty Cycle (%)</b> | 100  |
| <b>Test Notes 1</b>  |                         |                       |      |
| <b>Test Notes 2</b>  |                         |                       |      |



#### Formally measured emission peaks

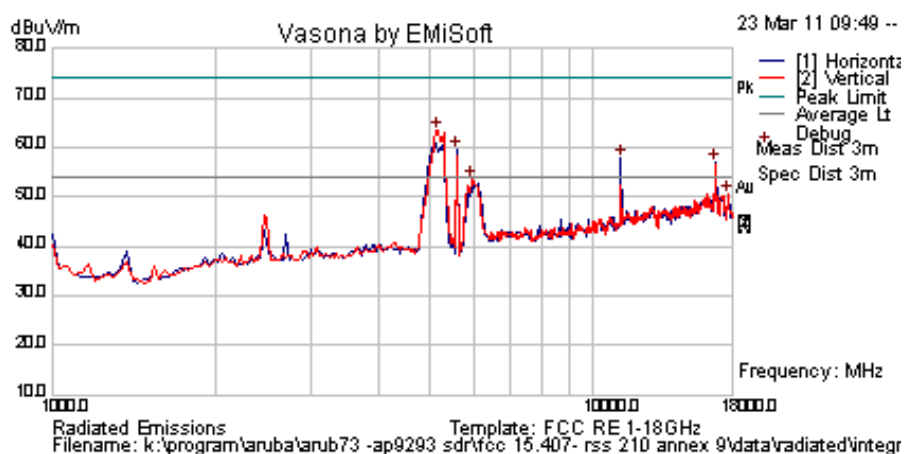
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11001.763                                                                                               | 56.3     | 7.0        | -2.9  | 60.3         | Peak Max         | H   | 100    | 44      | 74.0         | -13.7     | Pass       | RB       |
| 11001.763                                                                                               | 41.5     | 7.0        | -2.9  | 45.6         | Average Max      | H   | 100    | 44      | 54.0         | -8.4      | Pass       | RB       |
| 5496.994                                                                                                | 76.2     | 4.6        | -8.7  | 72.1         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5162.244                                                                                                | 67.2     | 4.6        | -9.0  | 62.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16535.070                                                                                               | 47.9     | 8.8        | 0.4   | 57.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5871.743                                                                                                | 55.2     | 4.8        | -8.6  | 51.4         | Peak [Scan]      | V   | 100    | 0       | 54           | -2.6      | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|                      |                         |                       |      |
|----------------------|-------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5600 MHz                | <b>Engineer</b>       | SB   |
| <b>Variant</b>       | 802.11n; HT-20; 6.5 MCS | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz    | <b>Rel. Hum.(%)</b>   | 37   |
| <b>Power Setting</b> | 18                      | <b>Press. (mBars)</b> | 1002 |
| <b>Antenna</b>       | Integral 5.8 dBi        | <b>Duty Cycle (%)</b> | 100  |
| <b>Test Notes 1</b>  |                         |                       |      |
| <b>Test Notes 2</b>  |                         |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11205.852     | 59.1     | 6.9        | -3.1  | 63.0         | Peak Max         | H   | 100    | 26      | 74.0         | -11.0     | Pass       | RB       |
| 11205.852     | 44.0     | 6.9        | -3.1  | 47.8         | Average Max      | H   | 100    | 26      | 54.0         | -6.2      | Pass       | RB       |
| 5156.313      | 67.8     | 4.6        | -9.0  | 63.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5599.198      | 63.4     | 4.7        | -8.6  | 59.5         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 16807.615     | 46.8     | 8.6        | 1.6   | 57.0         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5973.948      | 56.8     | 4.9        | -8.2  | 53.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

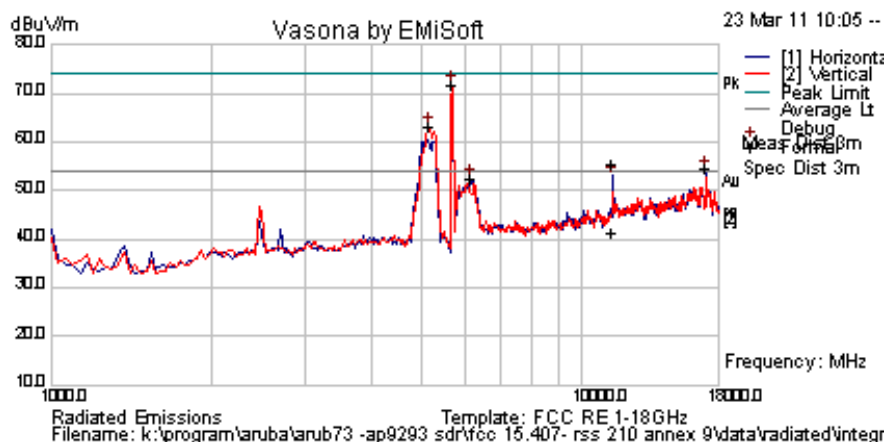
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|                      |                         |                       |      |
|----------------------|-------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5700 MHz                | <b>Engineer</b>       | SB   |
| <b>Variant</b>       | 802.11n; HT-20; 6.5 MCS | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz    | <b>Rel. Hum.(%)</b>   | 37   |
| <b>Power Setting</b> | 18                      | <b>Press. (mBars)</b> | 1002 |
| <b>Antenna</b>       | Integral 5.8 dBi        | <b>Duty Cycle (%)</b> | 100  |
| <b>Test Notes 1</b>  |                         |                       |      |
| <b>Test Notes 2</b>  |                         |                       |      |



#### Formally measured emission peaks

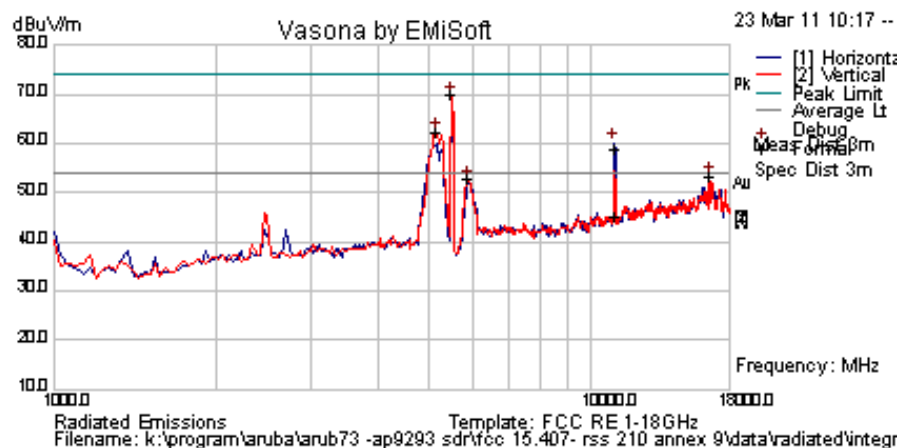
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11402.566                                                                                               | 50.5     | 6.8        | -1.6  | 55.7         | Peak Max         | H   | 100    | 34      | 74.0         | -18.4     | Pass       | RB       |
| 11402.566                                                                                               | 36.1     | 6.8        | -1.6  | 41.3         | Average Max      | H   | 100    | 34      | 54.0         | -12.7     | Pass       | RB       |
| 5701.403                                                                                                | 75.0     | 4.7        | -8.1  | 71.7         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5156.313                                                                                                | 67.4     | 4.6        | -9.0  | 63.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 17114.228                                                                                               | 45.1     | 8.5        | 0.8   | 54.4         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 6144.289                                                                                                | 54.9     | 5.0        | -7.3  | 52.6         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|                      |                          |                       |      |
|----------------------|--------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5510 MHz                 | <b>Engineer</b>       | SB   |
| <b>Variant</b>       | 802.11n; HT-40; 13.5 MCS | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz     | <b>Rel. Hum.(%)</b>   | 37   |
| <b>Power Setting</b> | 18                       | <b>Press. (mBars)</b> | 1002 |
| <b>Antenna</b>       | Integral 5.8 dBi         | <b>Duty Cycle (%)</b> | 100  |
| <b>Test Notes 1</b>  |                          |                       |      |
| <b>Test Notes 2</b>  |                          |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11024.850     | 54.7     | 7.0        | -2.9  | 58.8         | Peak Max         | H   | 100    | 40      | 74.0         | -15.2     | Pass       | RB       |
| 11024.85      | 41.0     | 7.0        | -2.9  | 45.1         | Average Max      | H   | 100    | 40      | 54.0         | -8.9      | Pass       | RB       |
| 5496.994      | 74.0     | 4.6        | -8.7  | 69.9         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5156.313      | 66.7     | 4.6        | -9.0  | 62.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16535.070     | 44.1     | 8.8        | 0.4   | 53.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5905.812      | 56.6     | 4.8        | -8.7  | 52.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

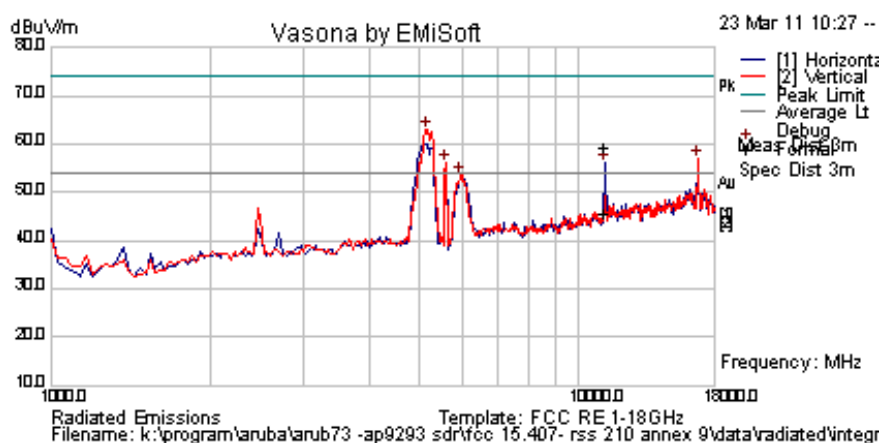
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|                      |                          |                       |      |
|----------------------|--------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5590 MHz                 | <b>Engineer</b>       | SB   |
| <b>Variant</b>       | 802.11n; HT-40; 13.5 MCS | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz     | <b>Rel. Hum.(%)</b>   | 37   |
| <b>Power Setting</b> | 18                       | <b>Press. (mBars)</b> | 1002 |
| <b>Antenna</b>       | Integral 5.8 dBi         | <b>Duty Cycle (%)</b> | 100  |
| <b>Test Notes 1</b>  |                          |                       |      |
| <b>Test Notes 2</b>  |                          |                       |      |



#### Formally measured emission peaks

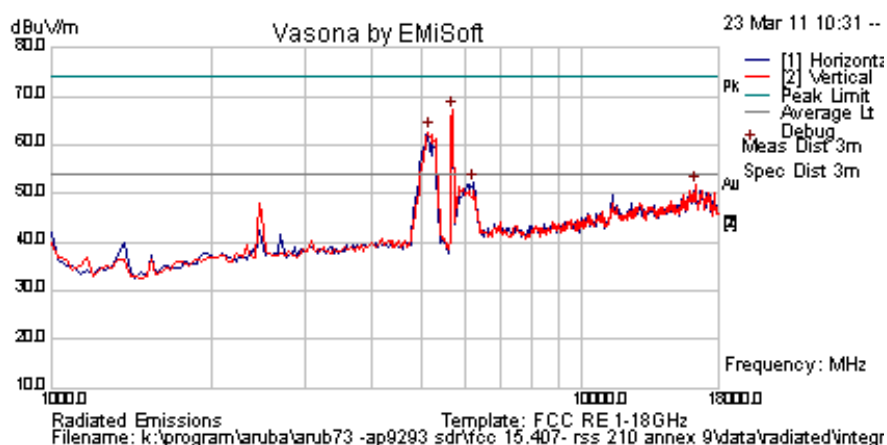
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11165.692                                                                                               | 55.6     | 6.9        | -3.4  | 59.2         | Peak Max         | H   | 100    | 30      | 74.0         | -14.8     | Pass       | RB       |
| 11165.692                                                                                               | 42.0     | 6.9        | -3.4  | 45.6         | Average Max      | H   | 100    | 30      | 54.0         | -8.4      | Pass       | RB       |
| 5162.244                                                                                                | 67.3     | 4.6        | -9.1  | 62.9         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16773.547                                                                                               | 46.5     | 8.6        | 1.7   | 56.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5599.198                                                                                                | 60.1     | 4.7        | -8.6  | 56.2         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5973.948                                                                                                | 56.9     | 4.9        | -8.2  | 53.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5690 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | Integral 5.8 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5701.403      | 70.7     | 4.7        | -8.1  | 67.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | FUND     |
| 5162.24449    | 67.1     | 4.6        | -9.1  | 62.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 6246.493      | 53.9     | 5.0        | -6.7  | 52.2         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 16364.729     | 42.4     | 8.9        | 0.4   | 51.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

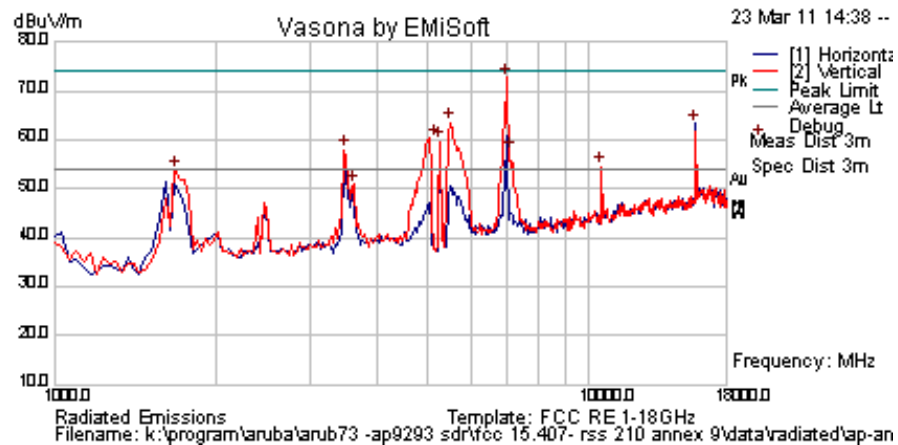
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#### 5.1.7.2. External Antenna AP-ANT-10 – Radiated Spurious Emissions – Above 1 GHz

|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5260 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 37%  |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi      | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15787.014     | 54.3     | 8.7        | 0.2   | 63.2         | Peak Max         | H   | 100    | 90      | 74.0         | -10.8     | Pass       | RB       |
| 1716.954      | 53.3     | 2.6        | -13.3 | 42.5         | Peak Max         | V   | 100    | 89      | 74.0         | -31.5     | Pass       | RB       |
| 3510.060      | 68.0     | 3.6        | -11.5 | 60.1         | Peak Max         | V   | 100    | 207     | 74           | -13.9     | Pass       | RB       |
| 15787.014     | 38.3     | 8.7        | 0.2   | 47.2         | Average Max      | H   | 100    | 90      | 54           | -6.8      | Pass       | RB       |
| 1716.954      | 44.8     | 2.6        | -13.3 | 34.0         | Average Max      | V   | 100    | 89      | 54           | -20.0     | Pass       | RB       |
| 3510.060      | 47.2     | 3.6        | -11.5 | 39.3         | Average Max      | V   | 100    | 207     | 54           | -14.7     | Pass       | RB       |
| 6995.992      | 72.5     | 5.4        | -5.1  | 6            | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5496.994      | 67.7     | 4.6        | -8.7  | 63.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5258.517      | 64.6     | 4.6        | -9.5  | 59.7         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 10520.641     | 50.3     | 6.8        | -2.6  | 54.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

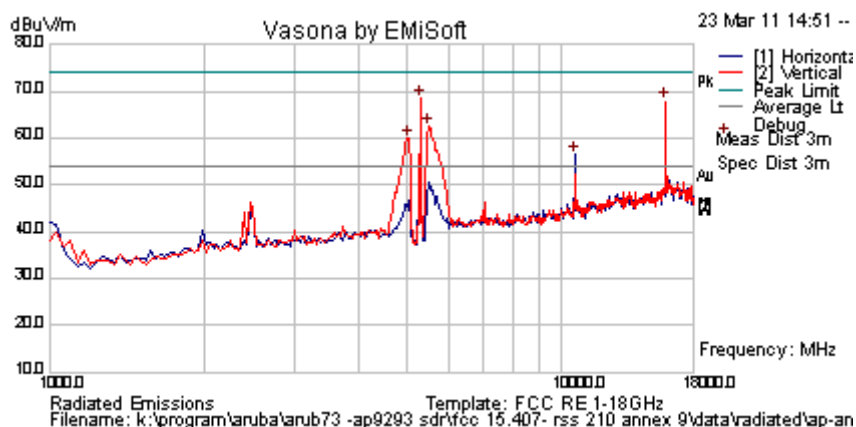
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5300 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi      | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Po l | Hgt cm | Azt Deg | Limit dBuV/m | Margi n dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|------|--------|---------|--------------|------------|------------|----------|
| 15890.581                                                                                               | 58.7     | 8.8        | -0.1  | 67.4         | Peak Max         | V    | 100    | 29      | 74.0         | -6.6       | Pass       | RB       |
| 5015.23                                                                                                 | 70.1     | 4.6        | -9.0  | 65.7         | Peak Max         | V    | 100    | 26      | 74.0         | -8.3       | Pass       | RB       |
| 10600.881                                                                                               | 56.0     | 6.8        | -2.4  | 60.5         | Peak Max         | H    | 100    | 1       | 74           | -13.5      | Pass       | RB       |
| 15890.581                                                                                               | 41.5     | 8.8        | -0.1  | 50.2         | Average Max      | V    | 100    | 29      | 54           | -3.8       | Pass       | RB       |
| 5015.230                                                                                                | 56.7     | 4.6        | -9.0  | 52.3         | Average Max      | V    | 100    | 26      | 54           | -1.7       | Pass       | RB       |
| 10600.881                                                                                               | 41.2     | 6.8        | -2.4  | 45.7         | Average Max      | H    | 100    | 1       | 54           | -8.3       | Pass       | RB       |
| 5292.585                                                                                                | 73.3     | 4.6        | -9.5  | 68.4         | Peak [Scan]      | V    | 100    |         |              |            |            | FUND     |
| 5496.994                                                                                                | 66.6     | 4.6        | -8.7  | 62.5         | Peak [Scan]      | V    | 100    |         |              |            | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |      |        |         |              |            |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |      |        |         |              |            |            |          |

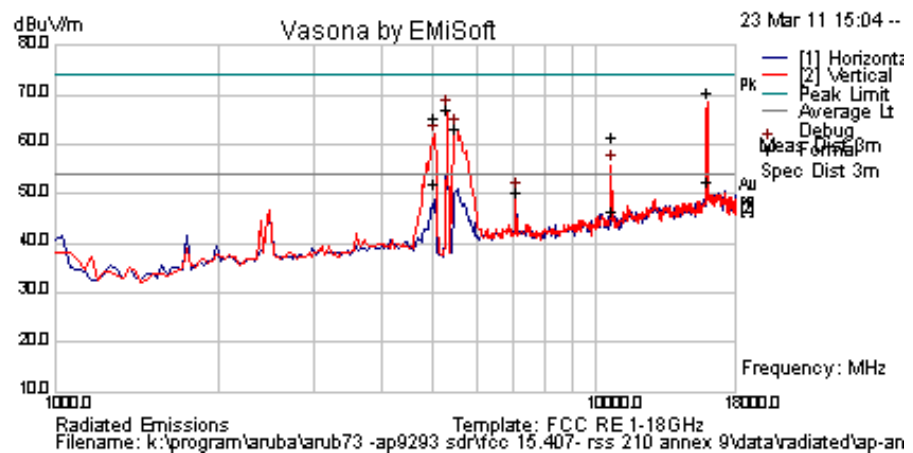
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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5320 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi      | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15967.375     | 61.3     | 9.0        | 0.3   | 70.6         | Peak Max         | V   | 100    | 79      | 74.0         | -3.4      | Pass       | RB       |
| 5018.437      | 70.0     | 4.6        | -9.1  | 65.5         | Peak Max         | V   | 100    | 26      | 74           | -8.5      | Pass       | RB       |
| 10641.043     | 56.8     | 6.8        | -2.2  | 61.4         | Peak Max         | H   | 100    | 1       | 74.0         | -12.6     | Pass       | RB       |
| 15967.375     | 43.2     | 9.0        | 0.3   | 52.4         | Average Max      | V   | 100    | 79      | 54           | -1.6      | Pass       | RB       |
| 5018.437      | 56.3     | 4.6        | -9.1  | 51.9         | Average Max      | V   | 100    | 26      | 54           | -2.2      | Pass       | RB       |
| 10641.043     | 42.0     | 6.8        | -2.2  | 46.6         | Average Max      | H   | 100    | 1       | 54           | -7.4      | Pass       | RB       |
| 5292.585      | 71.9     | 4.6        | -9.5  | 67.0         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5496.994      | 67.3     | 4.6        | -8.7  | 63.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 7098.196      | 50.3     | 5.4        | -5.2  | 50.5         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |

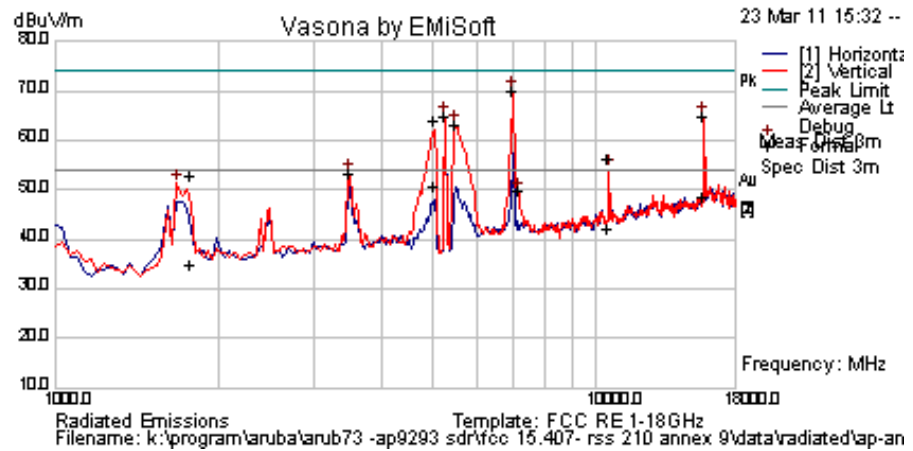
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5260 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15783.807     | 56.1     | 8.7        | 0.0   | 64.8         | Peak Max         | V   | 100    | 15      | 74           | -9.2      | Pass       | RB       |
| 5016.513      | 68.5     | 4.6        | -9.0  | 64.1         | Peak Max         | V   | 100    | 31      | 74           | -9.9      | Pass       | RB_      |
| 10524.248     | 52.3     | 6.8        | -2.6  | 56.5         | Peak Max         | V   | 100    | 21      | 74           | -17.5     | Pass       | RB       |
| 1783.647      | 63.1     | 2.6        | -12.9 | 52.8         | Peak Max         | V   | 100    | 0       | 74           | -21.2     | Pass       | RB       |
| 15783.807     | 39.8     | 8.7        | 0.0   | 48.5         | Average Max      | V   | 100    | 15      | 54           | -5.5      | Pass       | RB       |
| 5016.513      | 55.2     | 4.6        | -9.0  | 50.8         | Average Max      | V   | 100    | 31      | 54           | -3.2      | Pass       | RB       |
| 10524.248     | 38.2     | 6.8        | -2.6  | 42.4         | Average Max      | V   | 100    | 21      | 54           | -11.6     | Pass       | RB       |
| 1783.647      | 45.1     | 2.6        | -12.9 | 34.7         | Average Max      | V   | 100    | 0       | 54           | -19.3     | Pass       | RB       |
| 6995.992      | 69.8     | 5.4        | -5.1  | 67.9         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5258.517      | 69.7     | 4.6        | -9.5  | 64.8         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 5462.926      | 67.7     | 4.6        | -9.0  | 63.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 3486.974      | 61.3     | 3.6        | -11.6 | 53.310       | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

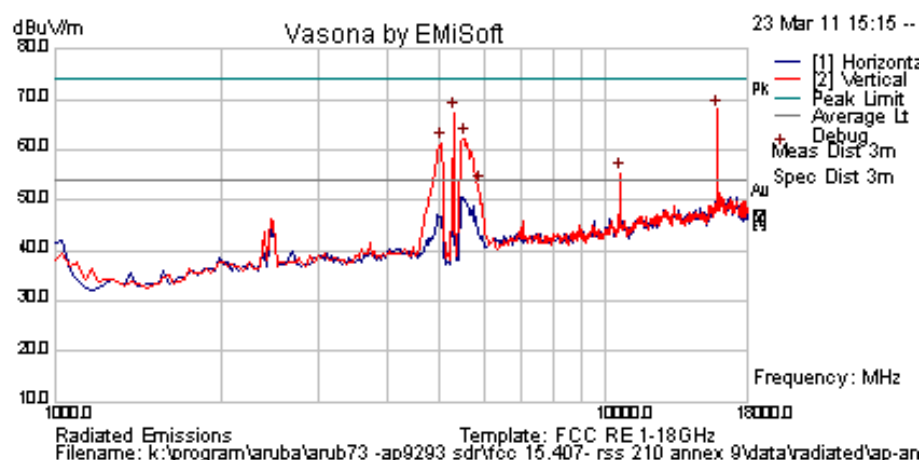
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5300 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15921.844     | 58.7     | 8.8        | -0.1  | 67.4         | Peak Max         | V   | 100    | 29      | 74.0         | -6.6      | Pass       | RB       |
| 5020.040      | 70.1     | 4.6        | -9.0  | 65.7         | Peak Max         | V   | 100    | 26      | 74.0         | -8.3      | Pass       | RB       |
| 10607.214     | 56.0     | 6.8        | -2.4  | 60.5         | Peak Max         | H   | 100    | 1       | 74           | -13.5     | Pass       | RB       |
| 15921.844     | 41.5     | 8.8        | -0.1  | 50.2         | Average Max      | V   | 100    | 29      | 54           | -3.8      | Pass       | RB       |
| 5020.040      | 56.7     | 4.6        | -9.0  | 52.3         | Average Max      | V   | 100    | 26      | 54           | -1.7      | Pass       | RB       |
| 10607.214     | 41.2     | 6.8        | -2.4  | 45.7         | Average Max      | H   | 100    | 1       | 54           | -8.3      | Pass       | RB       |
| 5292.58517    | 72.3     | 4.6        | -9.5  | 67.4         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5531.062      | 66.4     | 4.6        | -8.7  | 62.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5871.743      | 56.6     | 4.8        | -8.6  | 52.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

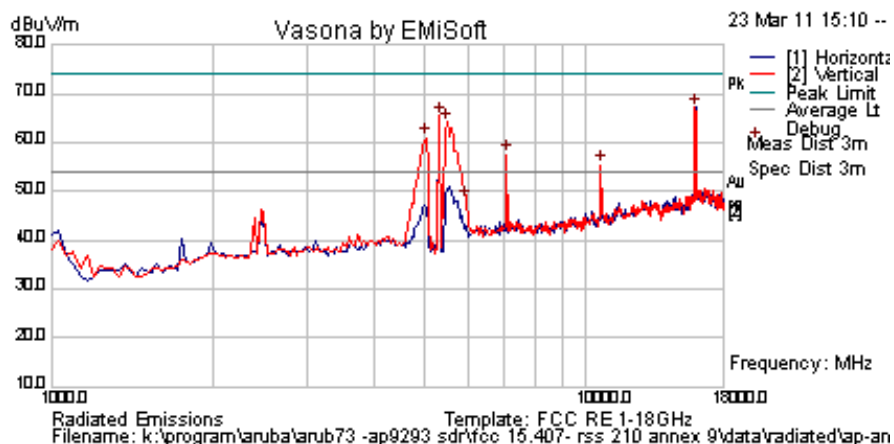
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5320 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15967.375     | 61.3     | 9.0        | 0.3   | 70.6         | Peak Max         | V   | 100    | 79      | 74.0         | -3.4      | Pass       | RB       |
| 5018.437      | 70.0     | 4.6        | -9.1  | 65.5         | Peak Max         | V   | 100    | 26      | 74           | -8.5      | Pass       | RB       |
| 15967.375     | 43.2     | 9.0        | 0.3   | 52.4         | Average Max      | V   | 100    | 79      | 54           | -1.6      | Pass       | RB       |
| 5018.437      | 56.3     | 4.6        | -9.1  | 51.9         | Average Max      | V   | 100    | 26      | 54           | -2.2      | Pass       | RB       |
| 7098.19639    | 57.4     | 5.4        | -5.2  | 57.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5496.994      | 68.3     | 4.6        | -8.7  | 64.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5326.653      | 70.5     | 4.6        | -9.5  | 65.6         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 10641.283     | 50.8     | 6.8        | -2.2  | 55.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5973.948      | 51.7     | 4.9        | -8.2  | 48.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

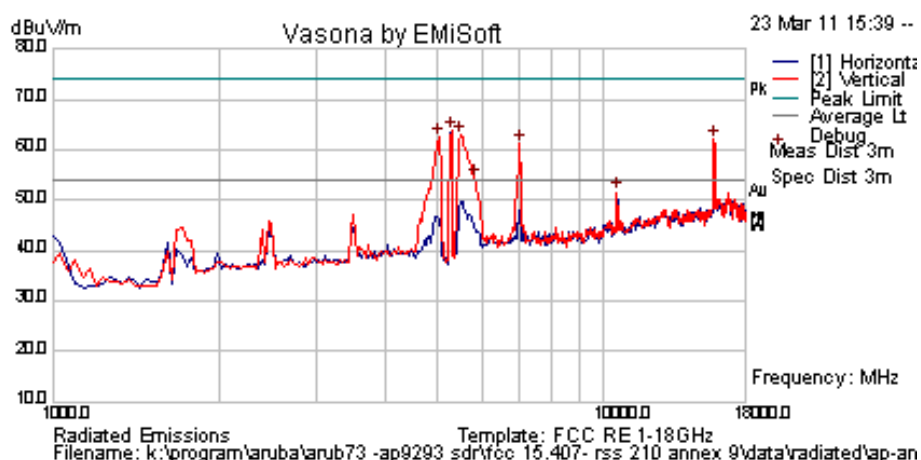
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5270 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

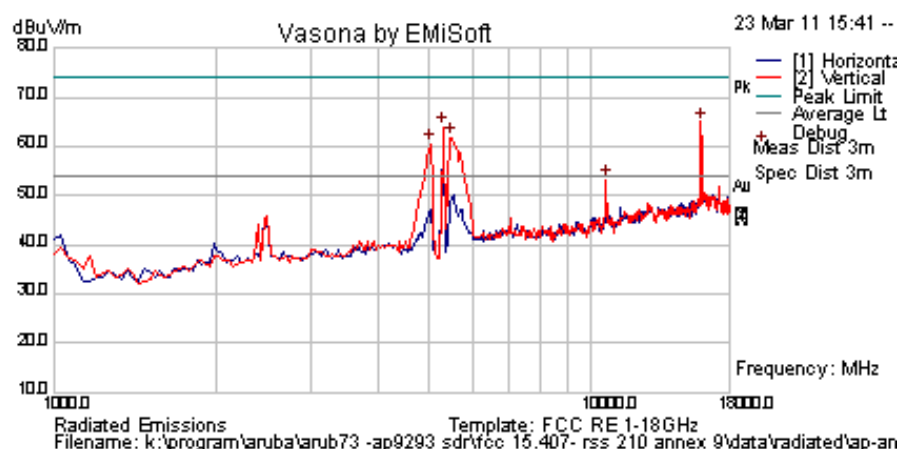
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15819.639                                                                                               | 56.1     | 8.7        | 0.0   | 64.8         | Peak Max         | V   | 100    | 15      | 74.0         | -9.2      | Pass       | RB       |
| 5020.040                                                                                                | 68.5     | 4.6        | -9.0  | 64.1         | Peak Max         | V   | 100    | 31      | 74.0         | -9.9      | Pass       | RB       |
| 10539.078                                                                                               | 52.3     | 6.8        | -2.6  | 56.5         | Peak Max         | V   | 100    | 21      | 74           | -17.5     | Pass       | RB       |
| 15819.639                                                                                               | 39.8     | 8.7        | 0.0   | 48.5         | Average Max      | V   | 100    | 15      | 54           | -5.5      | Pass       | RB       |
| 5020.040                                                                                                | 55.2     | 4.6        | -9.0  | 50.8         | Average Max      | V   | 100    | 31      | 54           | -3.2      | Pass       | RB       |
| 10539.078                                                                                               | 38.2     | 6.8        | -2.6  | 42.4         | Average Max      | V   | 100    | 21      | 54           | -11.6     | Pass       | RB       |
| 5292.585                                                                                                | 68.6     | 4.6        | -9.5  | 63.7         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5496.99399                                                                                              | 67.1     | 4.6        | -8.7  | 62.9         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 7030.060                                                                                                | 61.1     | 5.4        | -5.2  | 61.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5837.675                                                                                                | 58.0     | 4.8        | -8.6  | 54.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5310 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 15967.375     | 61.3     | 9.0        | 0.3   | 70.6         | Peak Max         | V   | 100    | 79      | 74.0         | -3.4      | Pass       | RB       |
| 5020.04       | 70.0     | 4.6        | -9.1  | 65.5         | Peak Max         | V   | 100    | 26      | 74           | -8.5      | Pass       | RB       |
| 10641.283     | 52.3     | 6.8        | -2.6  | 56.5         | Peak Max         | V   | 100    | 21      | 74           | -17.5     | Pass       | RB       |
| 15967.375     | 43.2     | 9.0        | 0.3   | 52.4         | Average Max      | V   | 100    | 79      | 54           | -1.6      | Pass       | RB       |
| 5020.04       | 56.3     | 4.6        | -9.1  | 51.9         | Average Max      | V   | 100    | 26      | 54           | -2.2      | Pass       | RB       |
| 10641.283     | 38.2     | 6.8        | -2.6  | 42.4         | Average Max      | V   | 100    | 21      | 54           | -11.6     | Pass       | RB       |
| 5292.58517    | 68.9     | 4.6        | -9.5  | 64.0         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 5478.858      | 66.2     | 4.6        | -9.0  | 61.9         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

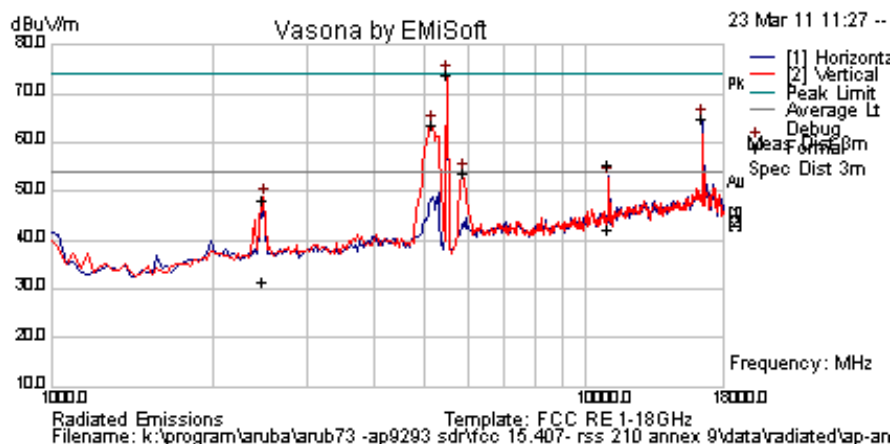
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq     | 5500 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 37%  |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi      | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11000.481     | 51.6     | 7.0        | -2.9  | 55.7         | Peak Max         | H   | 100    | 287     | 74.0         | -18.3     | Pass       | RB       |
| 2494.95       | 56.5     | 3.0        | -11.1 | 48.4         | Peak Max         | V   | 100    | 46      | 74.0         | -25.6     | Pass       | RB       |
| 11000.481     | 38.2     | 7.0        | -2.9  | 42.2         | Average Max      | H   | 100    | 287     | 54           | -11.8     | Pass       | RB       |
| 2494.950      | 39.4     | 3.0        | -11.1 | 31.3         | Average Max      | V   | 100    | 46      | 54           | -22.7     | Pass       | RB       |
| 5496.994      | 78.0     | 4.6        | -8.7  | 73.9         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 16501.002     | 55.7     | 8.8        | 0.3   | 64.9         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5162.244      | 68.1     | 4.6        | -9.1  | 63.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5871.743      | 57.7     | 4.8        | -8.6  | 53.9         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

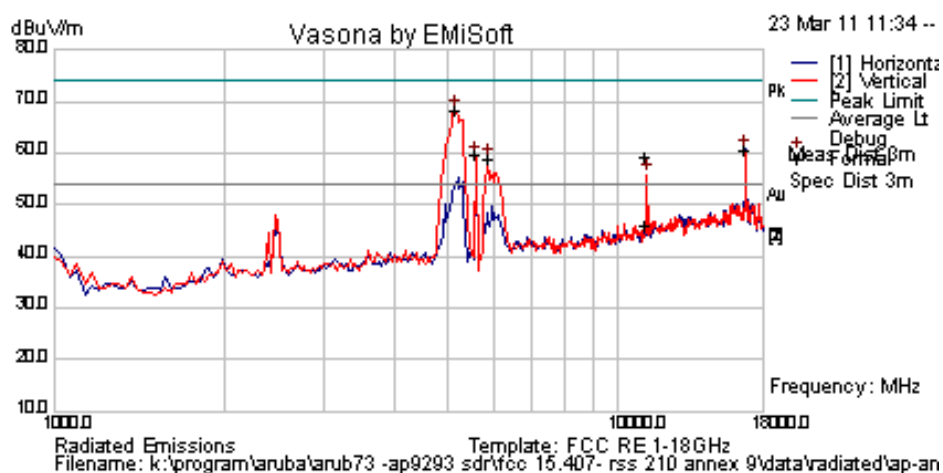
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5600 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi      | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11202.004     | 55.3     | 6.9        | -3.0  | 59.2         | Peak Max         | V   | 100    | 33      | 74.0         | -14.9     | Pass       | RB       |
| 11202.004     | 42.1     | 6.9        | -3.0  | 46.0         | Average Max      | V   | 100    | 33      | 54.0         | -8.0      | Pass       | RB       |
| 5162.244      | 73.0     | 4.6        | -9.1  | 68.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16807.615     | 50.5     | 8.6        | 1.6   | 60.7         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5599.198      | 63.5     | 4.7        | -8.6  | 57.9         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5871.743      | 62.7     | 4.8        | -8.6  | 58.9         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

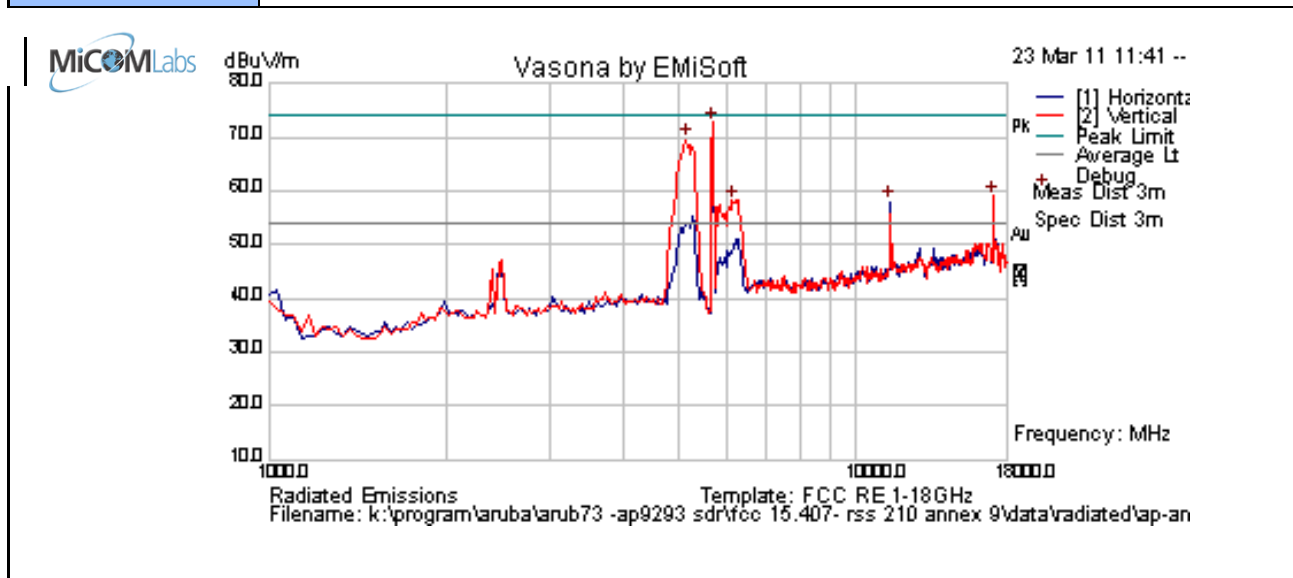
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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5700 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 18                   | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi      | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11020.481     | 51.6     | 7.0        | -2.9  | 55.7         | Peak Max         | H   | 100    | 287     | 74.0         | -18.3     | Pass       | RB       |
| 11020.481     | 38.2     | 7.0        | -2.9  | 42.2         | Average Max      | H   | 100    | 287     | 54           | -11.8     | Pass       | RB       |
| 5701.403      | 76.1     | 4.7        | -8.1  | 72.8         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5162.244      | 74.0     | 4.6        | -9.1  | 68.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 17114.228     | 49.8     | 8.5        | 0.8   | 59.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 6144.289      | 60.6     | 5.0        | -7.3  | 58.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

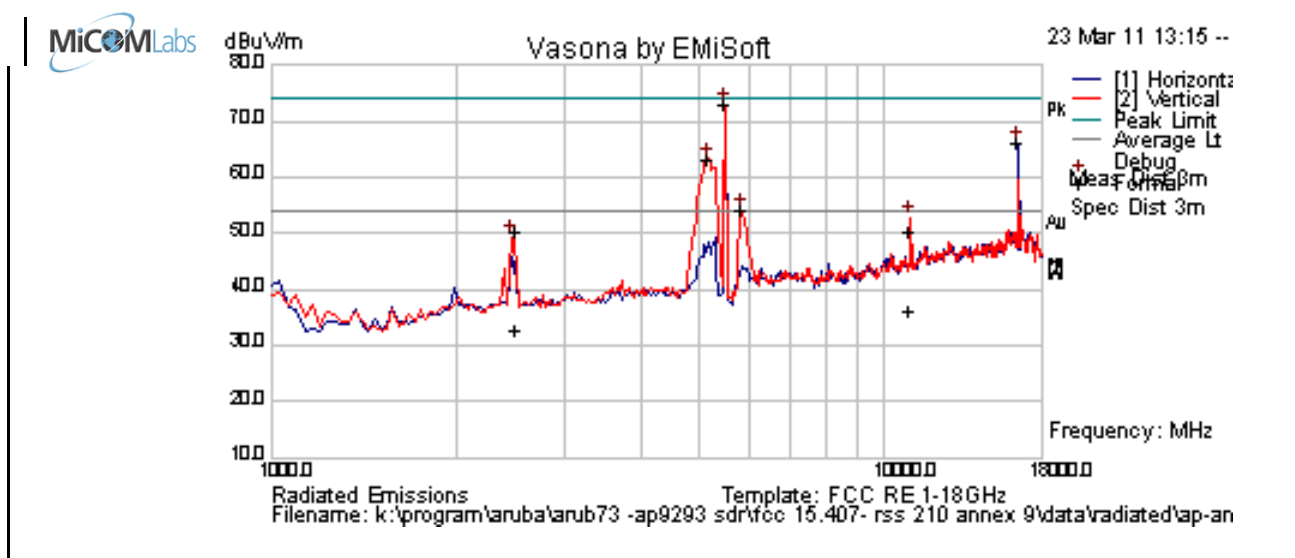
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5500 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11016.032     | 46.3     | 7.0        | -3.0  | 50.3         | Peak Max         | V   | 100    | 306     | 74.0         | -23.7     | Pass       | RB       |
| 2495.391      | 58.3     | 3.0        | -11.1 | 50.2         | Peak Max         | V   | 100    | 37      | 74.0         | -23.8     | Pass       | RB       |
| 11016.032     | 32.1     | 7.0        | -3.0  | 36.1         | Average Max      | V   | 100    | 306     | 54           | -17.9     | Pass       | RB       |
| 2495.391      | 40.8     | 3.0        | -11.1 | 32.6         | Average Max      | V   | 100    | 37      | 54           | -21.4     | Pass       | RB       |
| 5496.994      | 77.0     | 4.6        | -8.7  | 72.9         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 16501.002     | 57.1     | 8.8        | 0.3   | 66.2         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5162.244      | 67.7     | 4.6        | -9.1  | 63.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5837.675      | 57.8     | 4.8        | -8.6  | 54.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

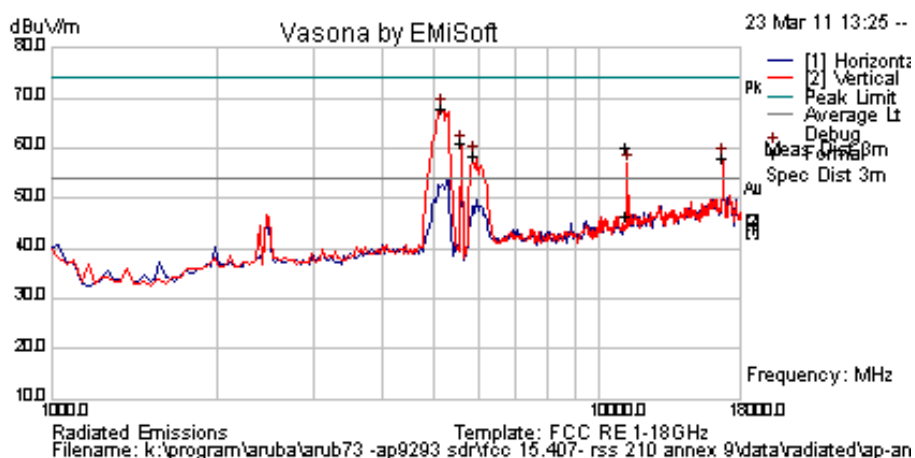
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5600 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

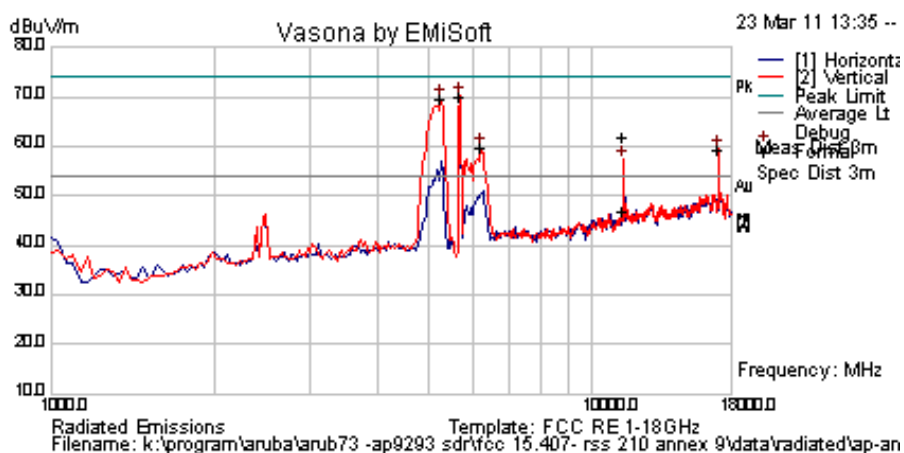
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11208.497                                                                                               | 56.3     | 6.9        | -3.1  | 60.1         | Peak Max         | V   | 100    | 31      | 74.0         | -13.9     | Pass       | RB       |
| 11208.497                                                                                               | 42.6     | 6.9        | -3.1  | 46.4         | Average Max      | V   | 100    | 31      | 54.0         | -7.6      | Pass       | RB       |
| 5162.244                                                                                                | 72.4     | 4.6        | -9.1  | 68.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5599.198                                                                                                | 64.8     | 4.7        | -8.6  | 60.8         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5871.743                                                                                                | 62.3     | 4.8        | -8.6  | 58.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16807.615                                                                                               | 47.8     | 8.6        | 1.6   | 58.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5700 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 18                      | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

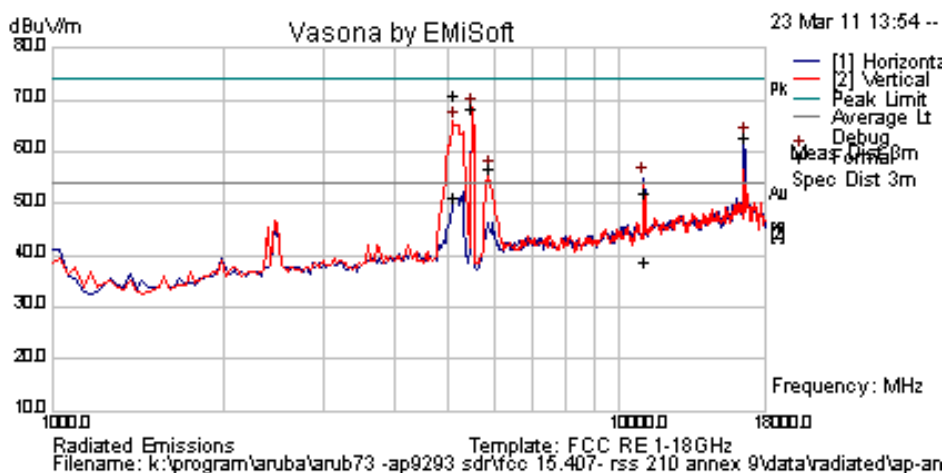
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11400.100                                                                                               | 56.5     | 6.8        | -1.6  | 61.7         | Peak Max         | V   | 100    | 22      | 74.0         | -12.3     | Pass       | RB       |
| 11400.1                                                                                                 | 41.6     | 6.8        | -1.6  | 46.8         | Average Max      | V   | 100    | 22      | 54.0         | -7.2      | Pass       | RB       |
| 5701.403                                                                                                | 73.6     | 4.7        | -8.1  | 70.3         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5258.517                                                                                                | 74.3     | 4.6        | -9.5  | 68.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 6212.425                                                                                                | 61.8     | 5.0        | -7.0  | 59.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 17114.228                                                                                               | 50.1     | 8.5        | 0.8   | 59.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5510 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5118.317      | 75.1     | 4.6        | -9.0  | 70.7         | Peak Max         | V   | 100    | 15      | 74.0         | -3.3      | Pass       | RB       |
| 11024.529     | 48.0     | 7.0        | -2.9  | 52.1         | Peak Max         | H   | 100    | 289     | 74.0         | -21.9     | Pass       | RB       |
| 5118.318      | 55.7     | 4.6        | -9.0  | 51.3         | Average          | V   | 100    | 289     | 54           | -2.7      | Pass       | RB       |
| 11024.529     | 34.9     | 7.0        | -2.9  | 38.9         | Average Max      | H   | 100    | 289     | 54           | -15.1     | Pass       | RB       |
| 5496.994      | 72.5     | 4.6        | -8.7  | 68.4         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 16535.070     | 53.4     | 8.8        | 0.4   | 62.7         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 5871.743      | 60.4     | 4.8        | -8.6  | 56.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

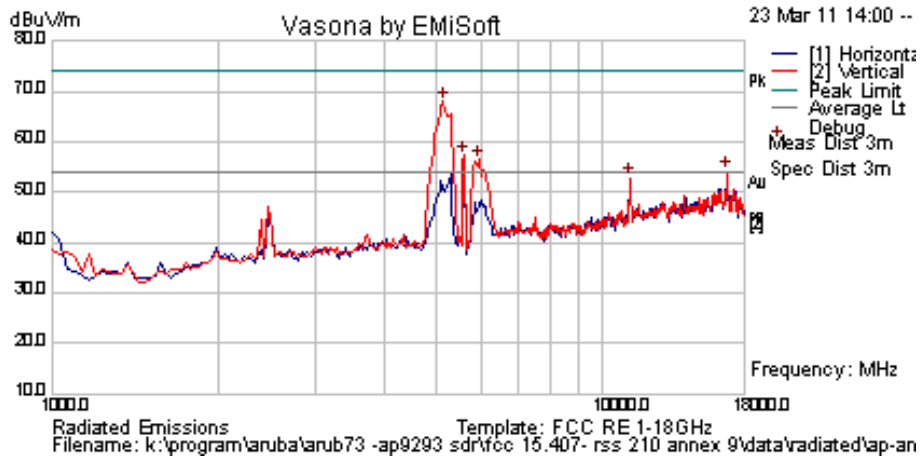
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5590 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

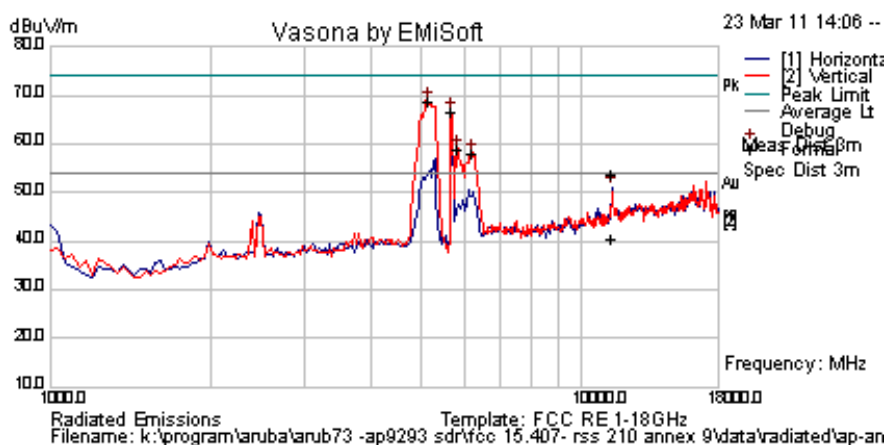
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11202.004                                                                                               | 55.3     | 6.9        | -3.0  | 59.2         | Peak Max         | V   | 100    | 33      | 74.0         | -14.9     | Pass       | RB       |
| 11202.004                                                                                               | 42.1     | 6.9        | -3.0  | 46.0         | Average Max      | V   | 100    | 33      | 54.0         | -8.0      | Pass       | RB       |
| 5162.244                                                                                                | 72.5     | 4.6        | -9.1  | 68.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5599.1984                                                                                               | 61.3     | 4.7        | -8.6  | 57.4         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5973.948                                                                                                | 59.8     | 4.9        | -8.2  | 56.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16773.547                                                                                               | 43.8     | 8.6        | 1.7   | 54.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5690 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 18                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 11368.578     | 48.8     | 6.8        | -1.8  | 53.8         | Peak Max         | H   | 100    | 301     | 74.0         | -20.2     | Pass       | RB       |
| 11368.578     | 35.6     | 6.8        | -1.8  | 40.6         | Average Max      | H   | 100    | 301     | 54.0         | -13.4     | Pass       | RB       |
| 5162.244      | 73.4     | 4.6        | -9.1  | 68.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5701.403      | 69.9     | 4.7        | -8.1  | 66.5         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5837.675      | 62.9     | 4.8        | -8.6  | 59.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 6246.493      | 59.8     | 5.0        | -6.7  | 58.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

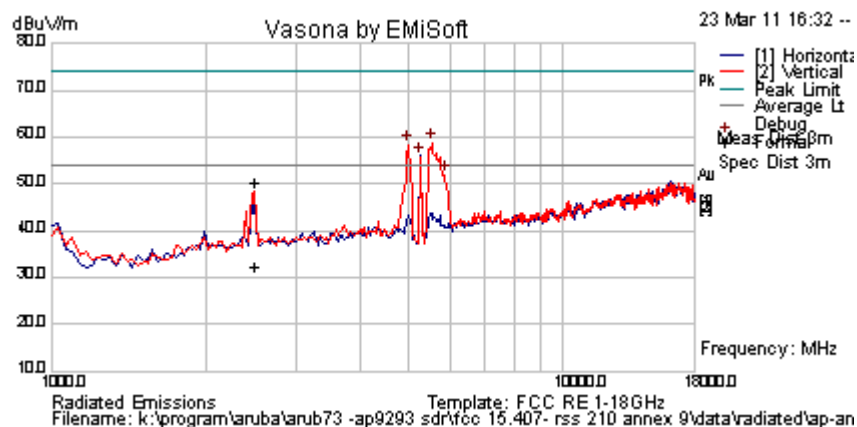
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### 5.1.7.3. External Antenna AP-ANT-12 – Radiated Spurious Emissions – Above 1 GHz

|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5260 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 37%  |
| Power Setting | 8                    | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5531.062      | 62.9     | 4.6        | -8.7  | 58.9         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | NRB      |
| 4985.97194    | 62.9     | 4.6        | -9.1  | 58.4         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | BE       |
| 5258.517      | 61.0     | 4.6        | -9.5  | 56.1         | Peak [Scan]      | H   | 100    | 0       |              |           |            | FUND     |
| 5871.743      | 55.9     | 4.8        | -8.6  | 52.0         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

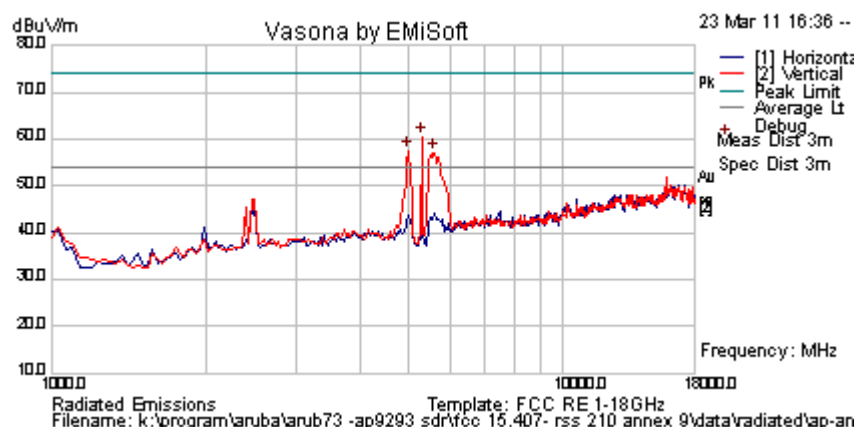
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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5300 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 8                    | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

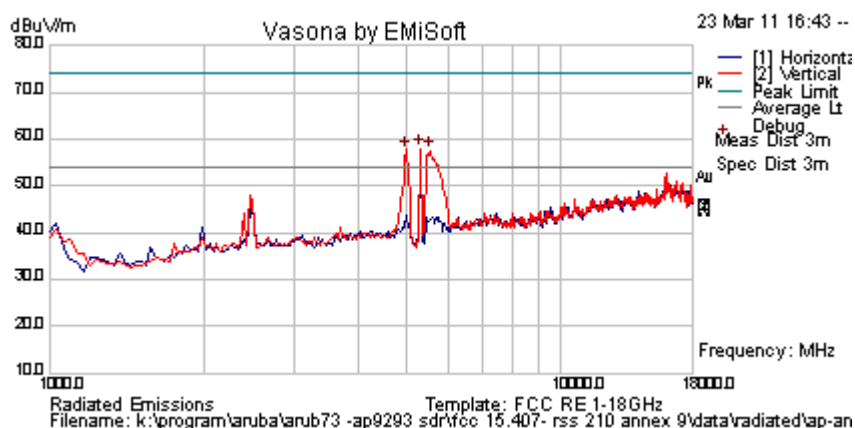
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5292.585                                                                                                                                                                                                         | 65.4     | 4.6        | -9.5  | 60.6         | Peak [Scan]      | V   | 100    | 0       |              |           |            | FUND     |
| 4985.97194                                                                                                                                                                                                       | 62.0     | 4.6        | -9.1  | 57.5         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | BE       |
| 5599.198                                                                                                                                                                                                         | 61.0     | 4.7        | -8.6  | 57.1         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5320 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 8                    | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

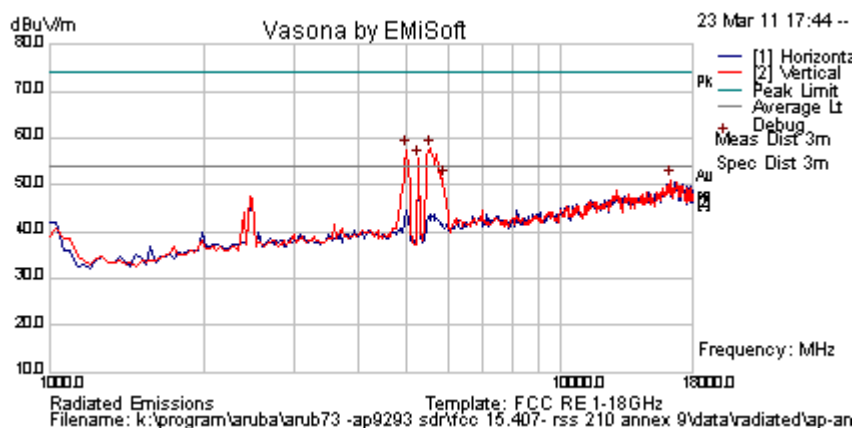
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5292.585                                                                                                | 62.8     | 4.6        | -9.5  | 58.0         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 4985.972                                                                                                | 62.4     | 4.6        | -9.1  | 57.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5531.062                                                                                                | 61.6     | 4.6        | -8.7  | 57.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5260 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 20.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 41   |
| Power Setting | 8                       | Press. (mBars) | 995  |
| Antenna       | AP-ANT-12 14 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

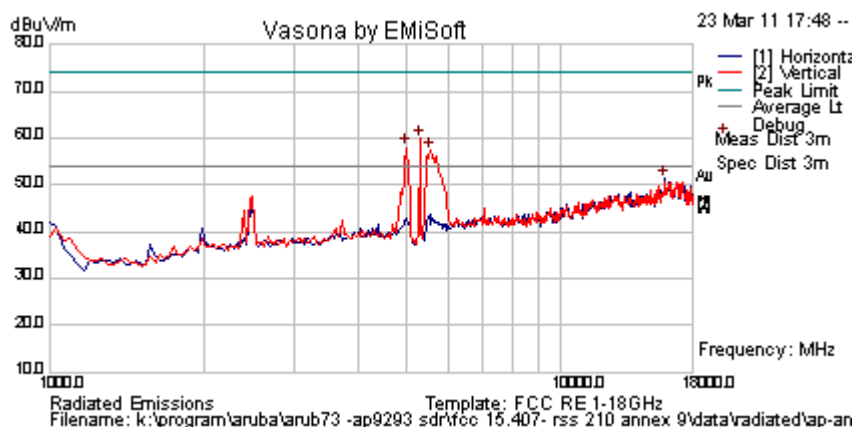
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5531.062                                                                                                | 61.8     | 4.6        | -8.7  | 57.8         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | BE       |
| 4985.97194                                                                                              | 62.1     | 4.6        | -9.1  | 57.6         | Peak [Scan]      | V   | 100    | 0       |              |           | Pass       | BE       |
| 5258.517                                                                                                | 60.4     | 4.6        | -9.5  | 55.5         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5300 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 20.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 41   |
| Power Setting | 8                       | Press. (mBars) | 995  |
| Antenna       | AP-ANT-12 14 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

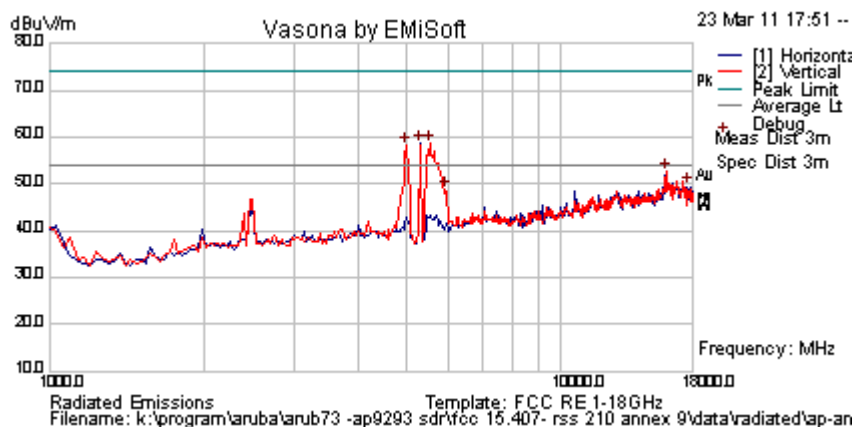
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5292.585                                                                                                                                                                                                         | 64.9     | 4.6        | -9.5  | 60.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | FUND     |
| 4985.972                                                                                                                                                                                                         | 62.5     | 4.6        | -9.1  | 58.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5320 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 20.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 41   |
| Power Setting | 8                       | Press. (mBars) | 995  |
| Antenna       | AP-ANT-12 14 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

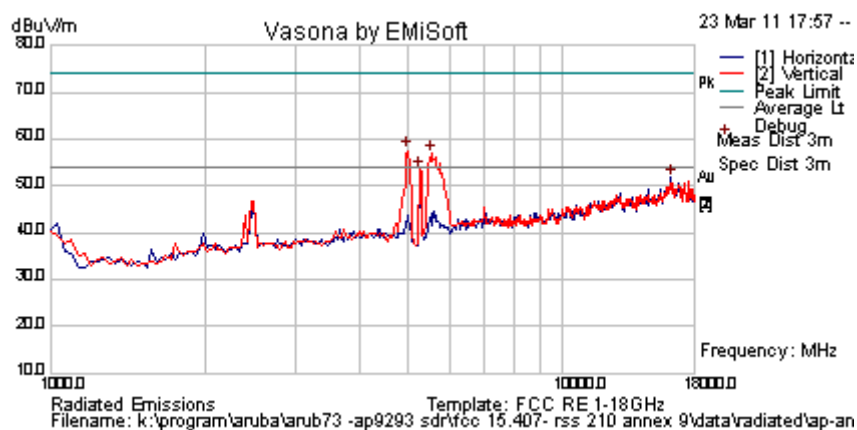
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5531.062                                                                                                                                                                                                         | 62.6     | 4.6        | -8.7  | 58.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5292.585                                                                                                                                                                                                         | 63.4     | 4.6        | -9.5  | 58.5         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | FUND     |
| 4985.972                                                                                                                                                                                                         | 62.7     | 4.6        | -9.1  | 58.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5270 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 8                        | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

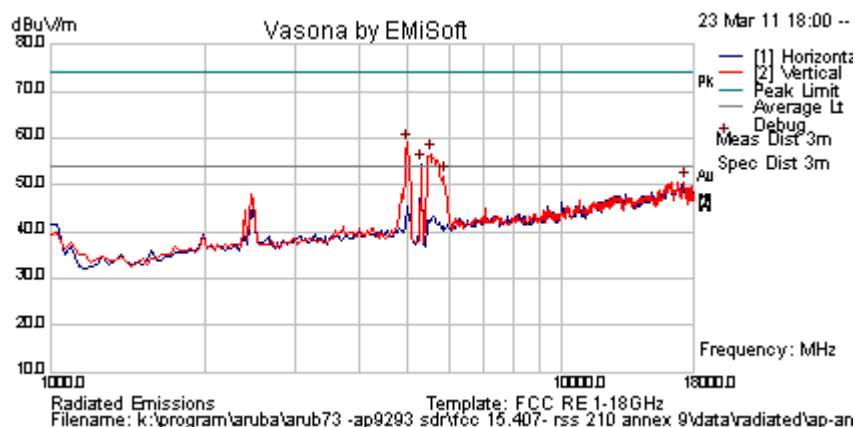
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 4985.972                                                                                                | 62.1     | 4.6        | -9.1  | 57.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5531.062                                                                                                | 60.8     | 4.6        | -8.7  | 56.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5258.517                                                                                                | 58.3     | 4.6        | -9.5  | 53.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | FUND     |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5310 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 8                        | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

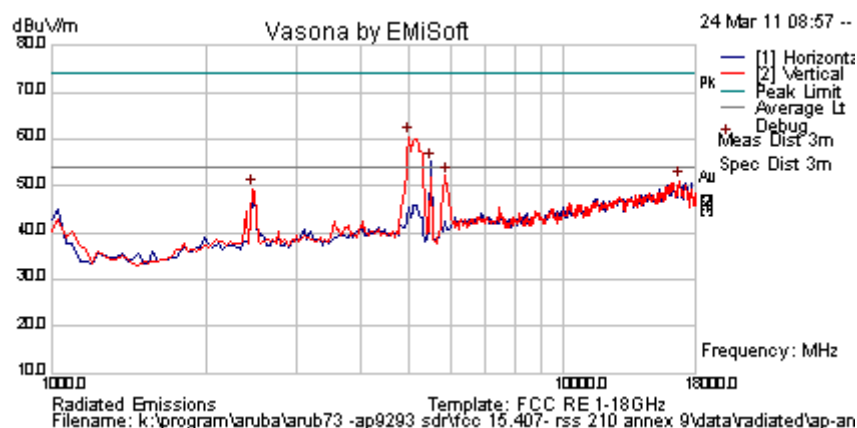
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 4985.972                                                                                                | 63.6     | 4.6        | -9.1  | 59.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5531.06212                                                                                              | 60.7     | 4.6        | -8.7  | 56.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5292.585                                                                                                | 59.4     | 4.6        | -9.5  | 54.6         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5500 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 37%  |
| Power Setting | 8                    | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 4985.972      | 65.1     | 4.6        | -9.1  | 60.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5496.99399    | 59.2     | 4.6        | -8.7  | 55.1         | Peak [Scan]      | H   | 100    |         |              |           |            | FUND     |
| 5871.743      | 56.0     | 4.8        | -8.6  | 52.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16773.547     | 40.7     | 8.6        | 1.7   | 51.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 2464.930      | 57.5     | 3.0        | -11.1 | 49.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

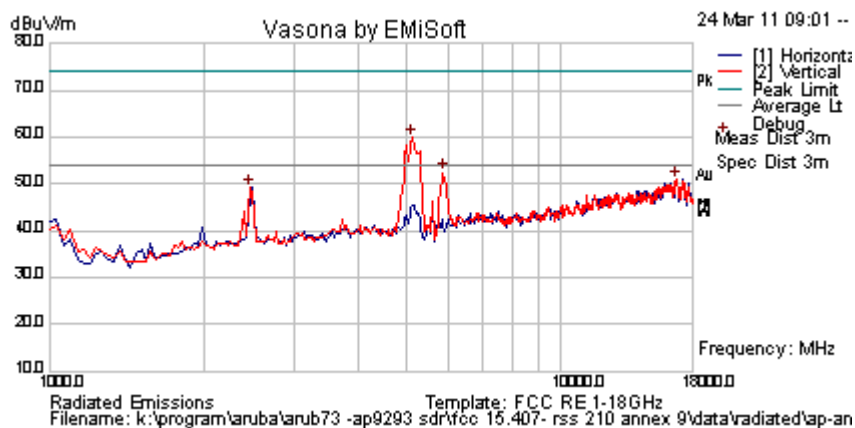
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|                      |                      |                       |      |
|----------------------|----------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5600 MHz             | <b>Engineer</b>       | SB   |
| <b>Variant</b>       | 802.11a; 6 Mbs       | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz | <b>Rel. Hum.(%)</b>   | 0.37 |
| <b>Power Setting</b> | 8                    | <b>Press. (mBars)</b> | 1002 |
| <b>Antenna</b>       | AP-ANT-12 14 dBi     | <b>Duty Cycle (%)</b> | 100  |
| <b>Test Notes 1</b>  |                      |                       |      |
| <b>Test Notes 2</b>  |                      |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5122.244      | 64.2     | 4.6        | -9.0  | 59.8         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5871.74349    | 56.2     | 4.8        | -8.6  | 52.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16807.615     | 40.8     | 8.6        | 1.6   | 51.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 2464.930      | 57.3     | 3.0        | -11.1 | 49.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

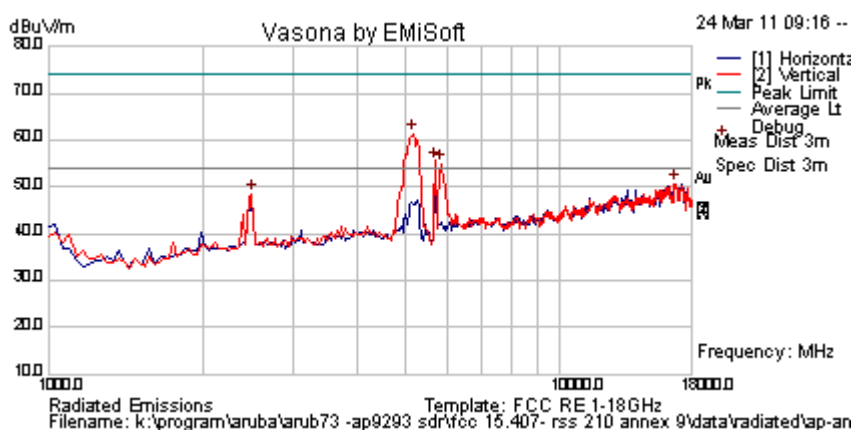
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5700 MHz             | Engineer       | SB   |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 0.37 |
| Power Setting | 8                    | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi     | Duty Cycle (%) | 100  |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2495.110      | 56.4     | 3.0        | -11.1 | 48.3         | Peak Max         | V   | 97     | 47      | 74.0         | -25.7     | Pass       | RB       |
| 2495.110      | 39.2     | 3.0        | -11.1 | 31.1         | Average Max      | V   | 97     | 47      | 54           | -22.9     | Pass       | RB       |
| 5156.313      | 65.8     | 4.6        | -9.0  | 61.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5701.403      | 59.0     | 4.7        | -8.1  | 55.7         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5837.675      | 58.7     | 4.8        | -8.6  | 55.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16739.479     | 40.5     | 8.7        | 1.5   | 50.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |

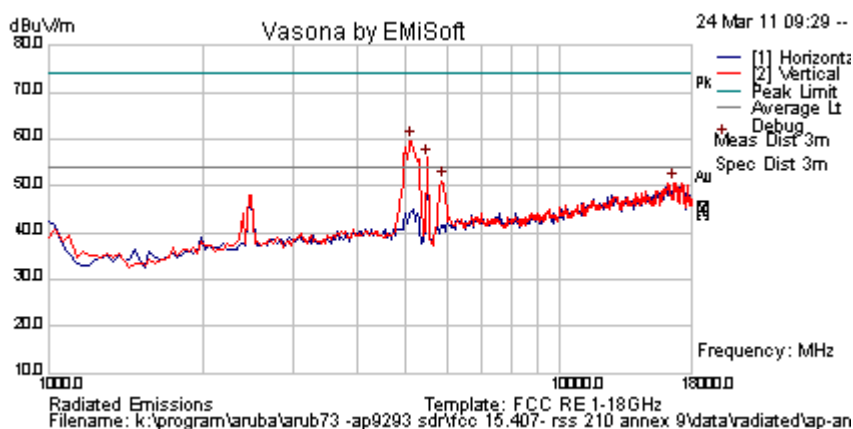
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5500 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 8                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

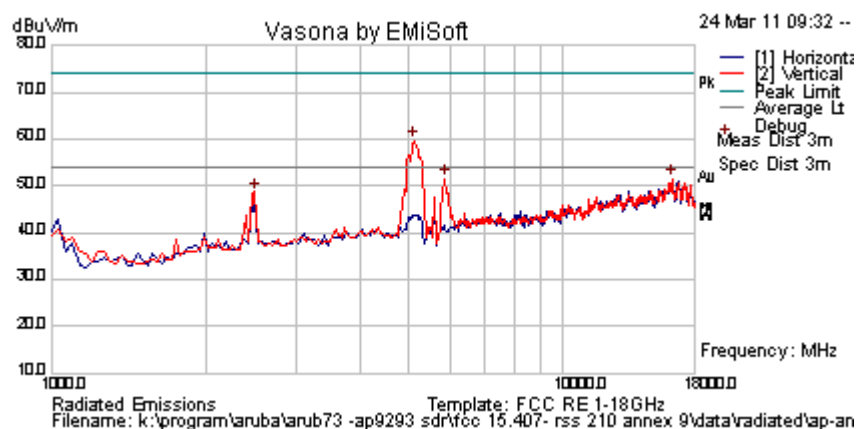
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5122.244                                                                                                                                                                                                         | 64.0     | 4.6        | -9.0  | 59.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5496.99399                                                                                                                                                                                                       | 60.2     | 4.6        | -8.7  | 56.0         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5871.743                                                                                                                                                                                                         | 55.0     | 4.8        | -8.6  | 51.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16671.343                                                                                                                                                                                                        | 40.3     | 8.7        | 1.7   | 50.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5600 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 8                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

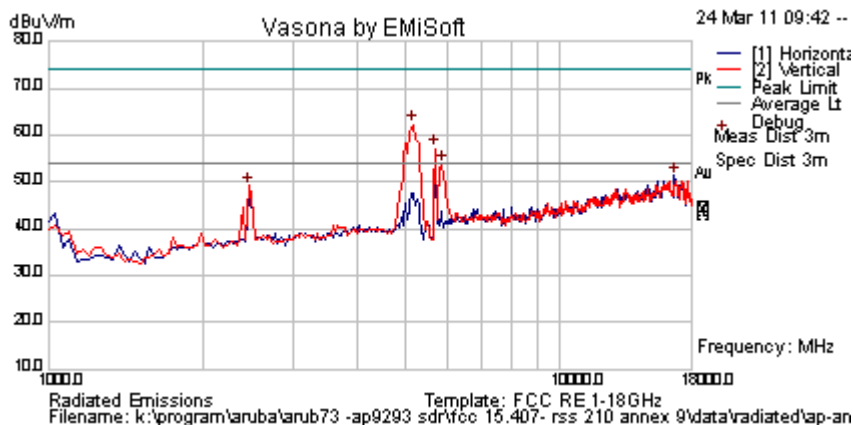
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2495.872                                                                                                | 59.0     | 3.0        | -11.1 | 50.9         | Peak Max         | V   | 97     | 33      | 74.0         | -23.2     | Pass       | RB       |
| 2495.872                                                                                                | 41.0     | 3.0        | -11.1 | 32.9         | Average Max      | V   | 97     | 33      | 54.0         | -21.1     | Pass       | RB       |
| 5122.244                                                                                                | 64.0     | 4.6        | -9.0  | 59.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5871.743                                                                                                | 55.4     | 4.8        | -8.6  | 51.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16296.593                                                                                               | 41.9     | 8.9        | 0.7   | 51.5         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5700 MHz                | Engineer       | SB   |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 37   |
| Power Setting | 8                       | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi        | Duty Cycle (%) | 100  |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

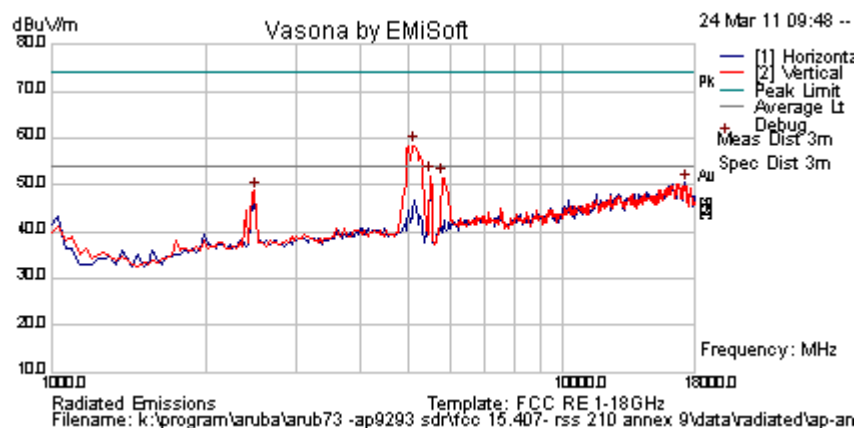
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5156.313                                                                                                                                                                                                         | 66.7     | 4.6        | -9.0  | 62.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5701.40281                                                                                                                                                                                                       | 60.6     | 4.7        | -8.1  | 57.2         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5871.743                                                                                                                                                                                                         | 57.5     | 4.8        | -8.6  | 53.7         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16705.411                                                                                                                                                                                                        | 41.2     | 8.7        | 1.4   | 51.3         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| 2464.930                                                                                                                                                                                                         | 57.2     | 3.0        | -11.1 | 49.1         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5510 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 8                        | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

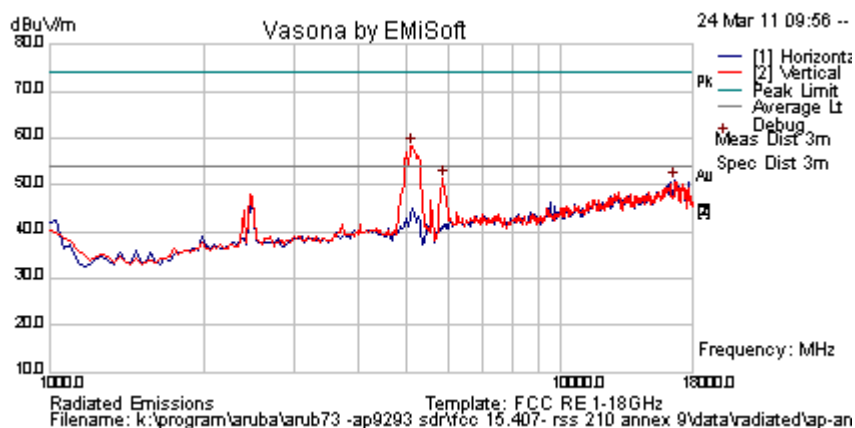
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2498.998                                                                                                | 56.4     | 3.0        | -11.1 | 48.3         | Peak Max         | V   | 97     | 47      | 74.0         | -25.7     | Pass       | RB       |
| 2498.998                                                                                                | 39.2     | 3.0        | -11.1 | 31.1         | Average Max      | V   | 97     | 47      | 54           | -22.9     | Pass       | RB       |
| 5088.176                                                                                                | 62.5     | 4.6        | -8.8  | 58.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5496.99399                                                                                              | 56.1     | 4.6        | -8.7  | 52.0         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 5803.607                                                                                                | 55.1     | 4.8        | -8.3  | 51.6         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 17284.569                                                                                               | 40.3     | 8.6        | 1.6   | 50.5         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5590 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 8                        | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-12 14 dBi         | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

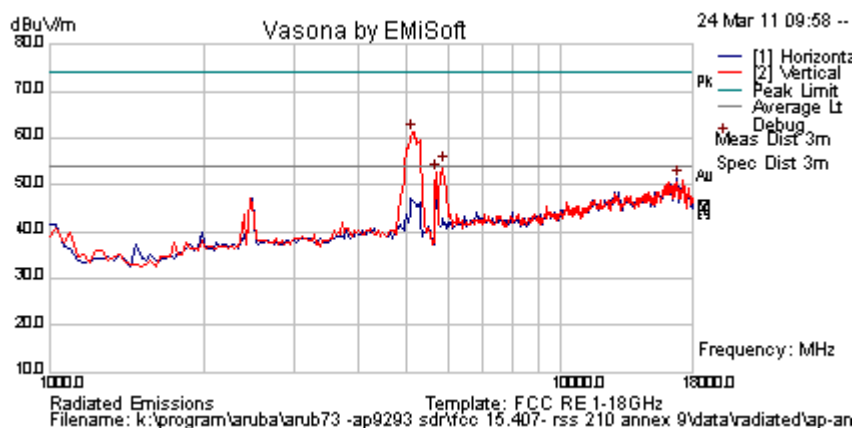
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5088.176                                                                                                | 62.4     | 4.6        | -8.8  | 58.2         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5871.74349                                                                                              | 55.3     | 4.8        | -8.6  | 51.4         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 16671.343                                                                                               | 40.4     | 8.7        | 1.7   | 50.8         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |          |
| RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak   |          |            |       |              |                  |     |        |         |              |           |            |          |

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5690 MHz                 | Engineer       | SB   |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 21.5 |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 37   |
| Power Setting | 8                        | Press. (mBars) | 1002 |
| Antenna       | AP-ANT-10 6 dBi          | Duty Cycle (%) | 100  |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5122.244      | 65.6     | 4.6        | -9.0  | 61.3         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | BE       |
| 5871.74349    | 57.9     | 4.8        | -8.6  | 54.0         | Peak [Scan]      | V   | 100    |         |              |           | Pass       | NRB      |
| 5701.403      | 56.1     | 4.7        | -8.1  | 52.7         | Peak [Scan]      | V   | 100    |         |              |           |            | FUND     |
| 16841.683     | 41.0     | 8.6        | 1.8   | 51.4         | Peak [Scan]      | H   | 100    |         |              |           | Pass       | NRB      |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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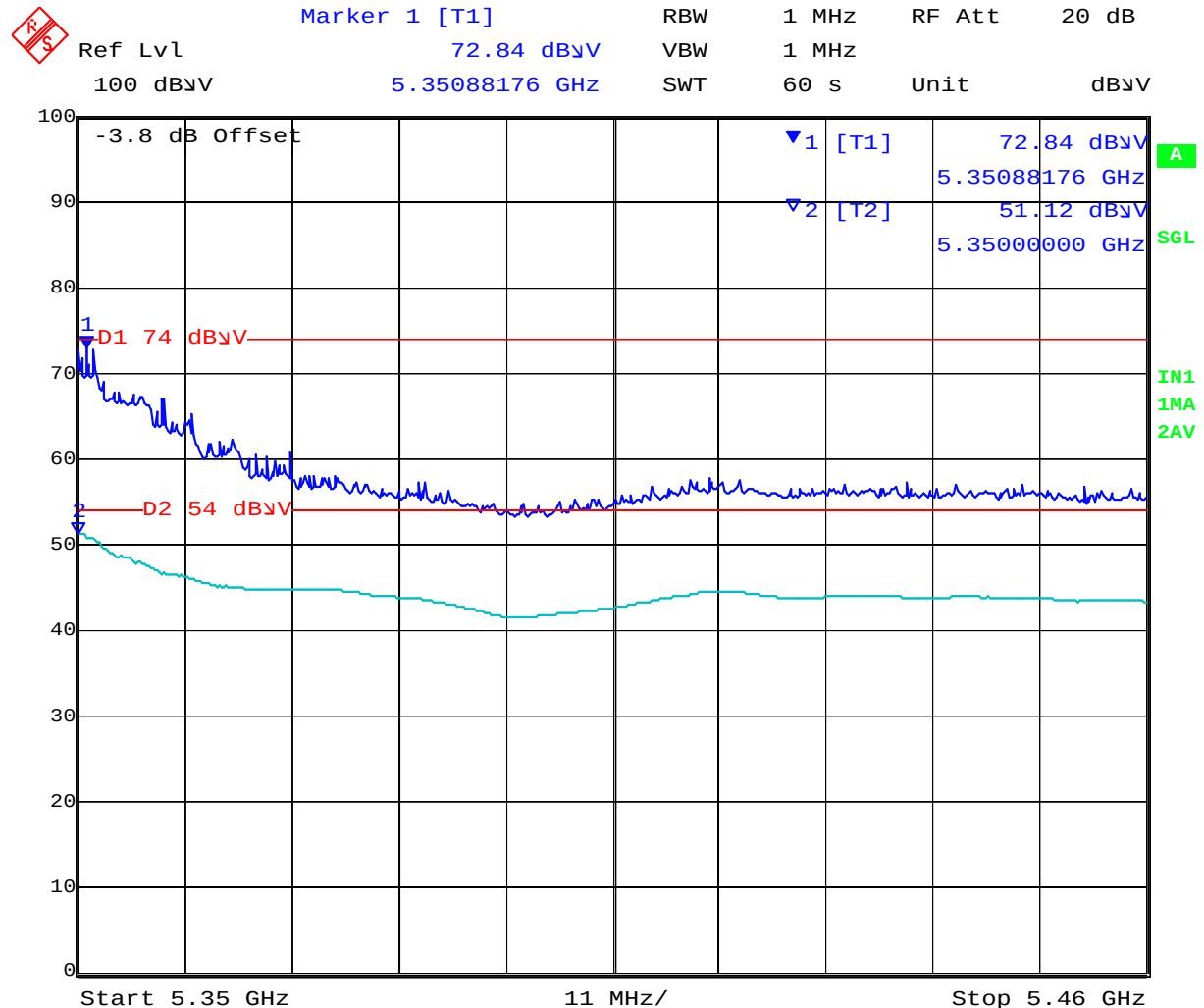




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#### 5.1.7.4. Integral Antenna – Radiated Band-Edge

Channel 5320: 5250 – 5350 MHz: 802.11a



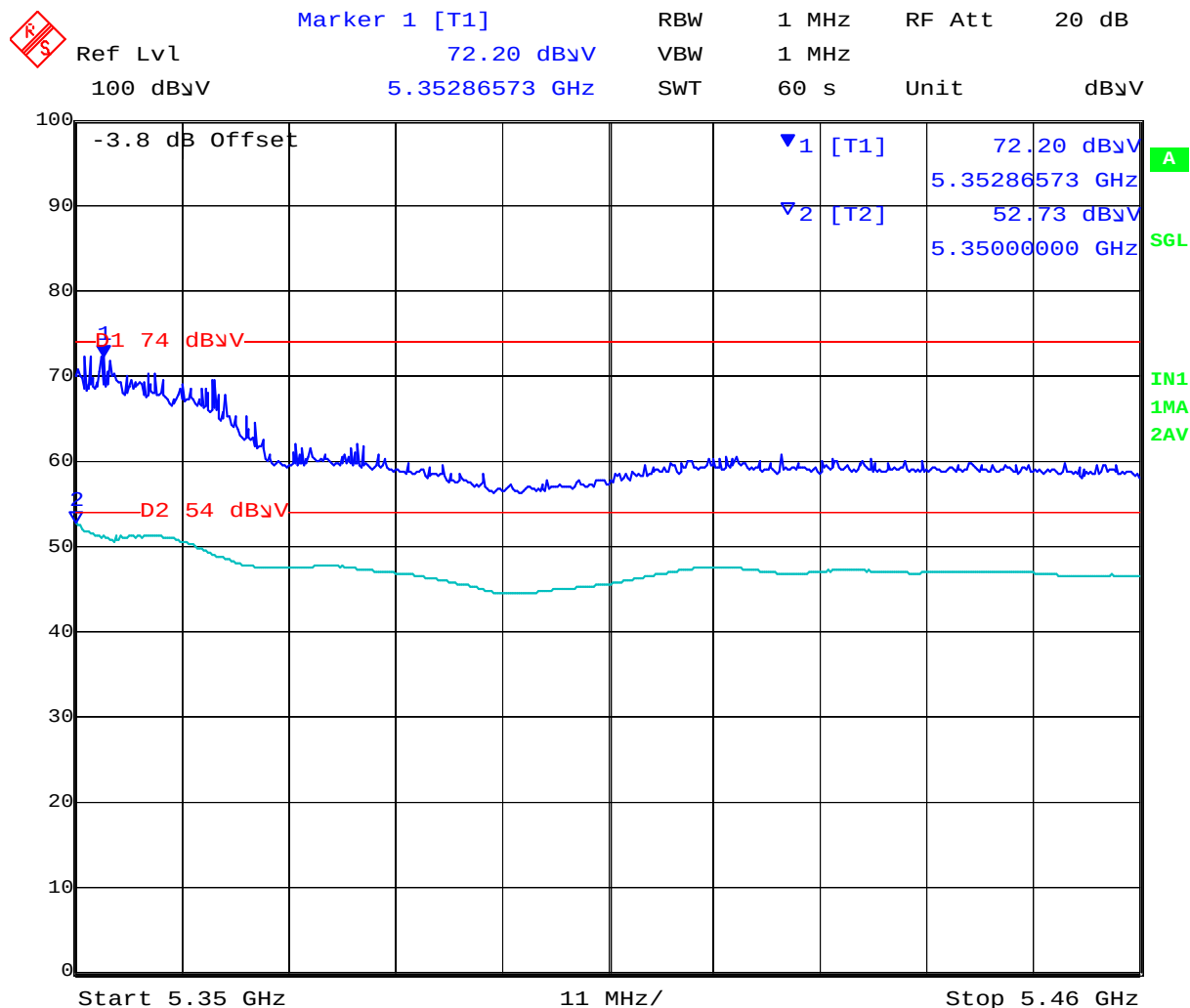
Date: 30.MAR.2010 13:03:58

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### Integral Antenna Channel 5320: 5250 – 5350 MHz: 802.11n HT-20



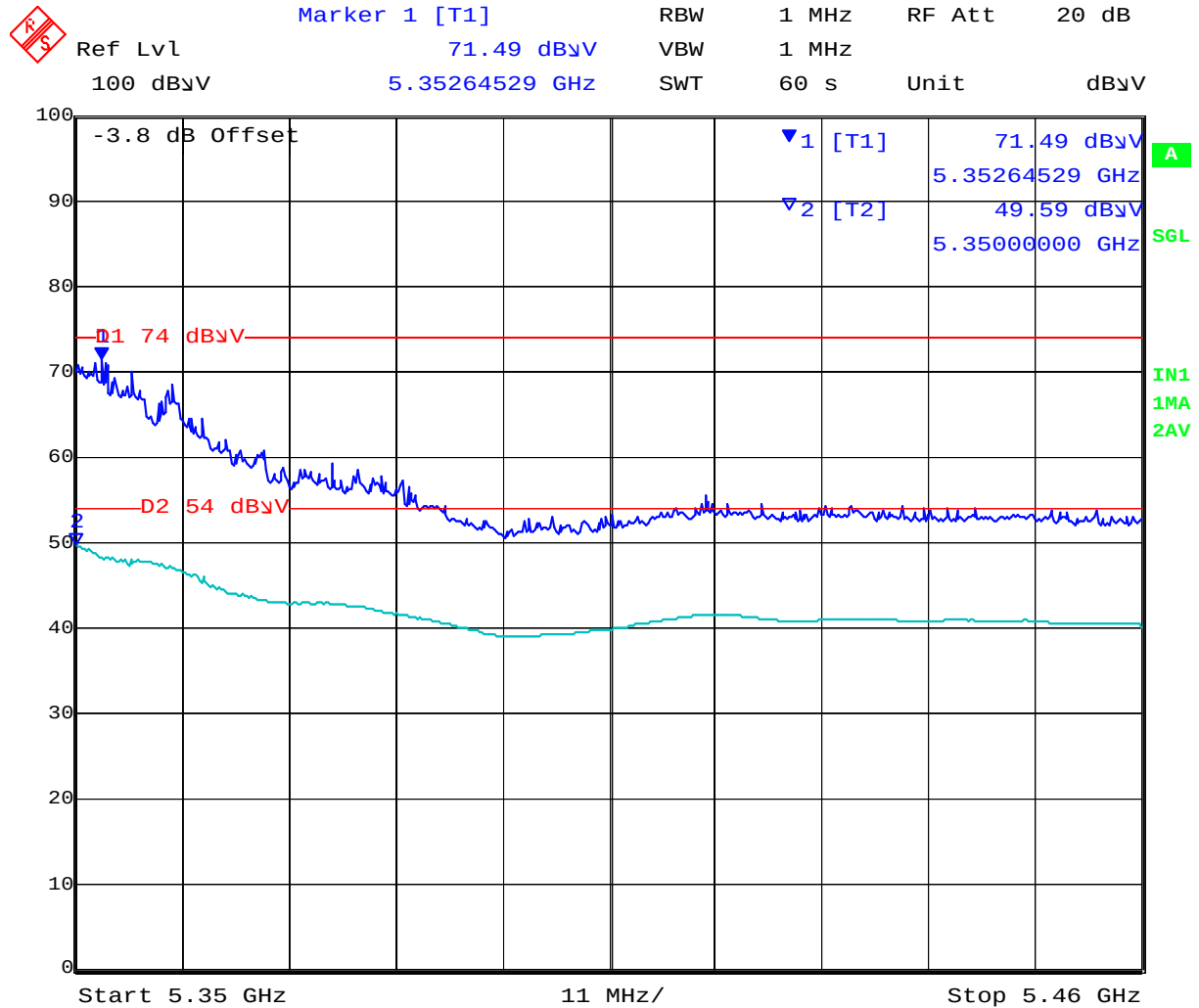
Date: 30.MAR.2010 13:11:06

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Integral Antenna Channel 5310: 5250 – 5350 MHz: 802.11n HT-40



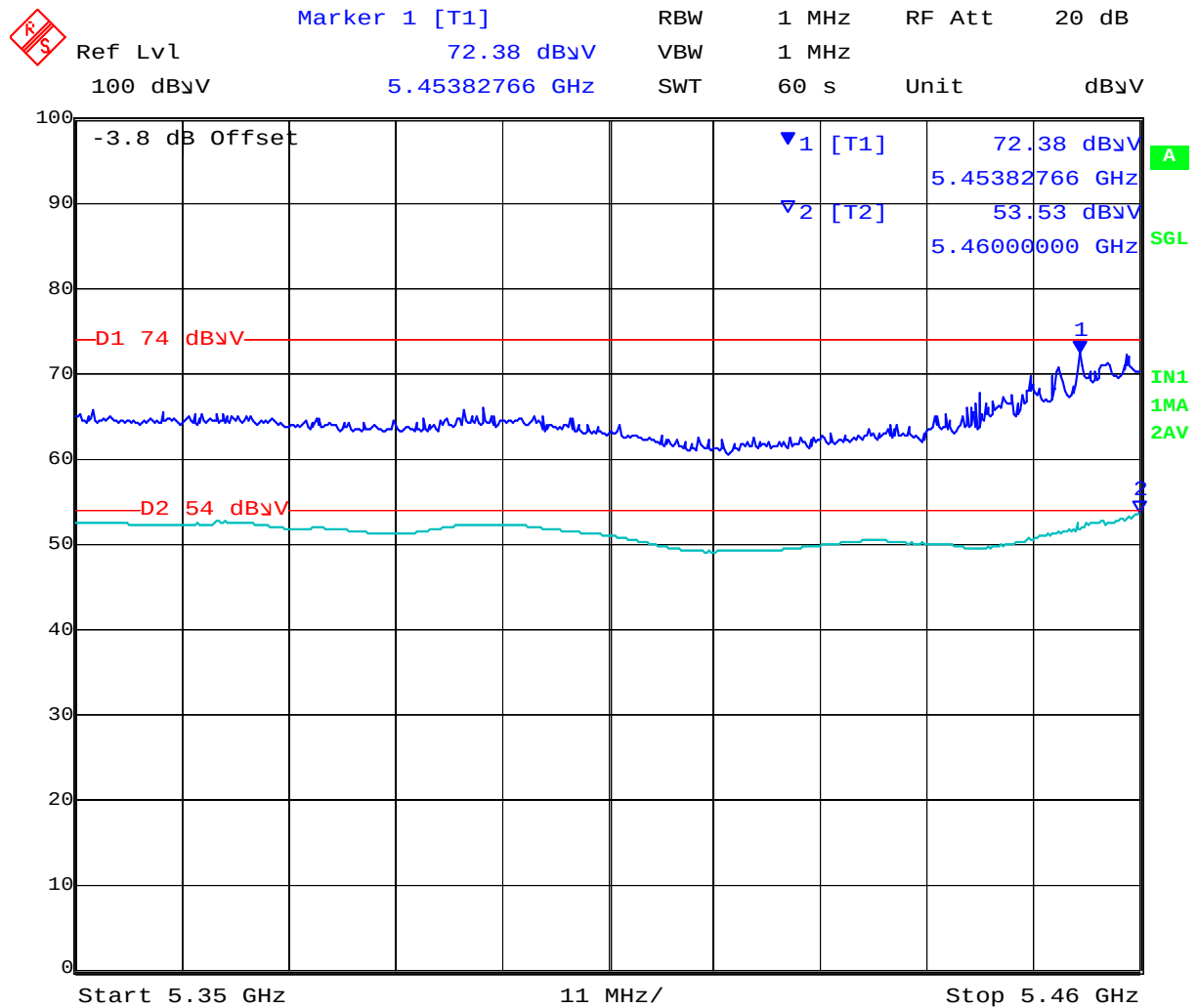
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To: FCC 47 CFR Part 15.407 & IC RSS-210  
Serial #: ARUB89-U2 Rev A  
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Integral Antenna Channel 5500: 5470 – 5725 MHz: 802.11a



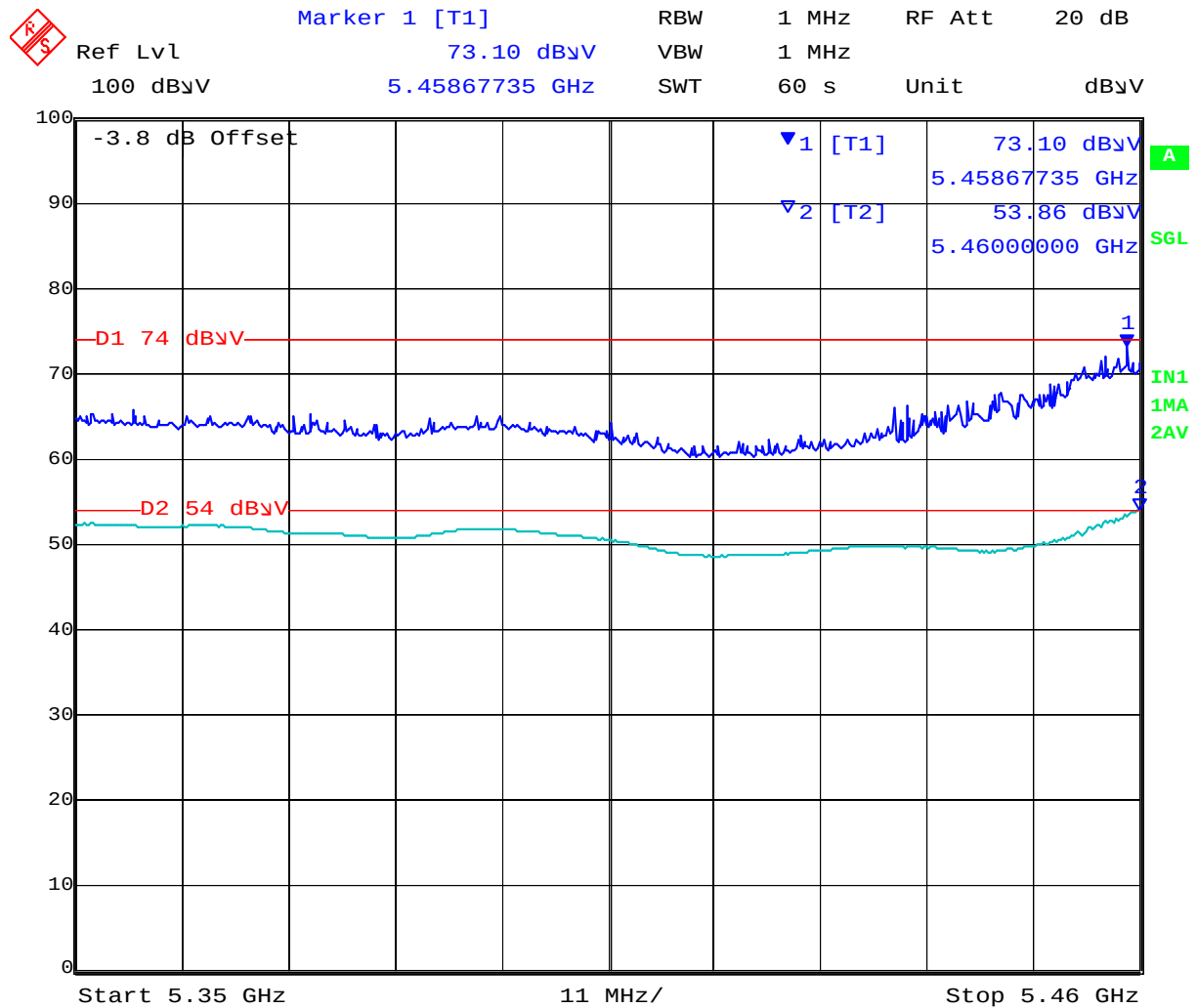
Date: 30.MAR.2010 12:45:54

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Integral Antenna Channel 5500: 5470 – 5725 MHz: 802.11n HT-20



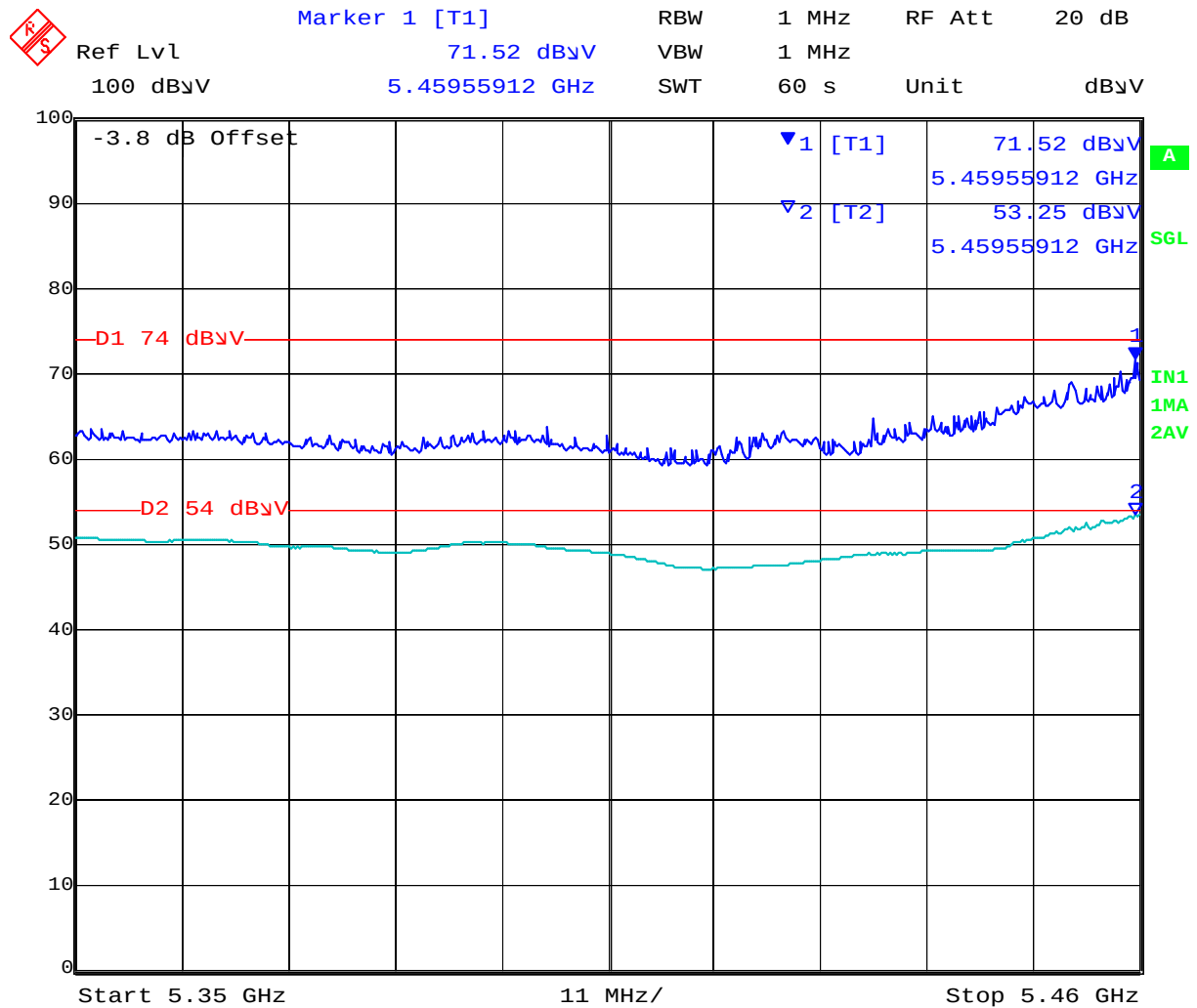
Date: 30.MAR.2010 12:51:24

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Integral Antenna Channel 5510: 5470 – 5725 MHz: 802.11n HT-40



Date: 30.MAR.2010 12:39:20

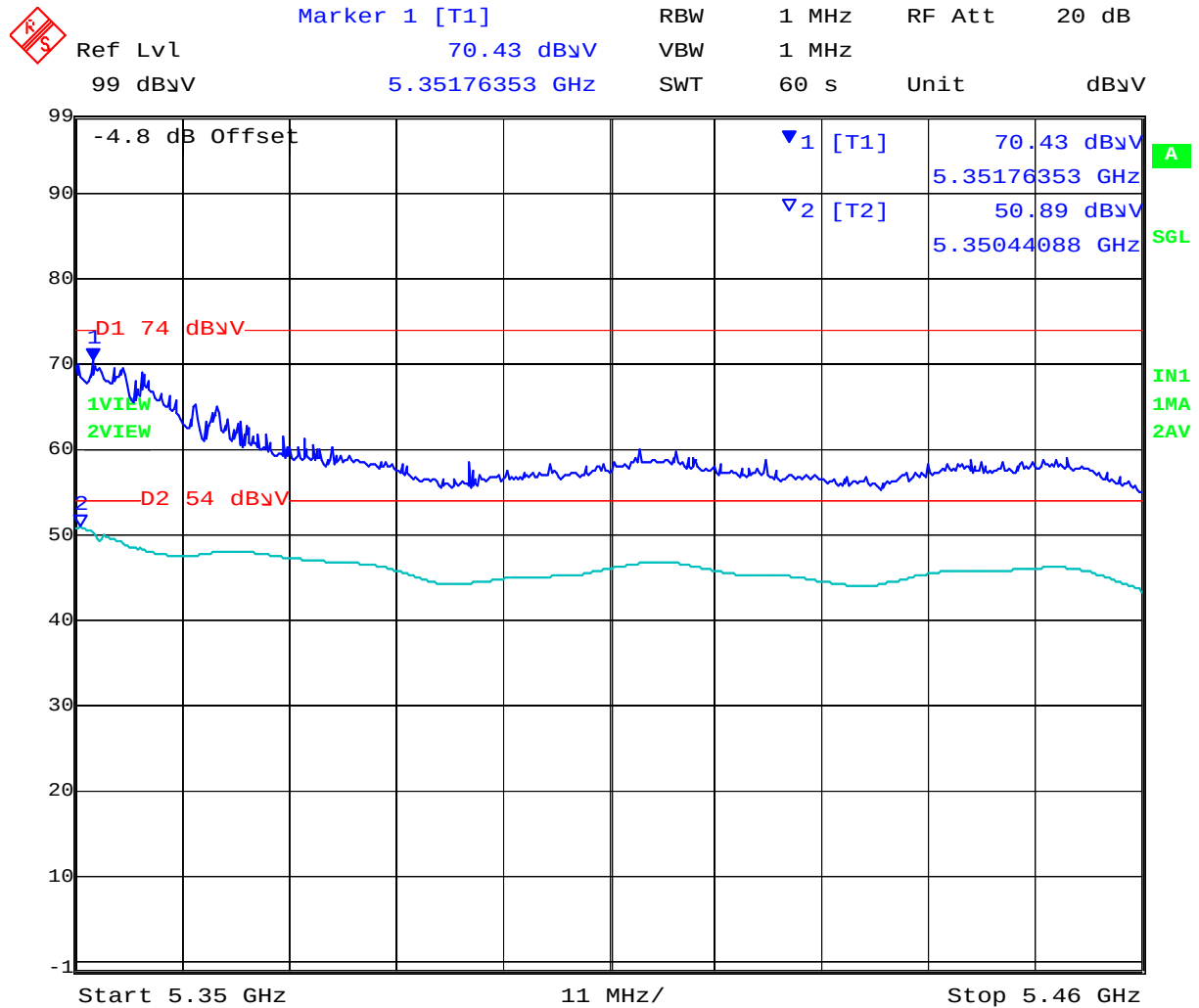
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### 5.1.7.5. AP-ANT-10 – Radiated Band-Edge

#### AP-ANT-10 Channel 5320: 5250 – 5350 MHz: 802.11a



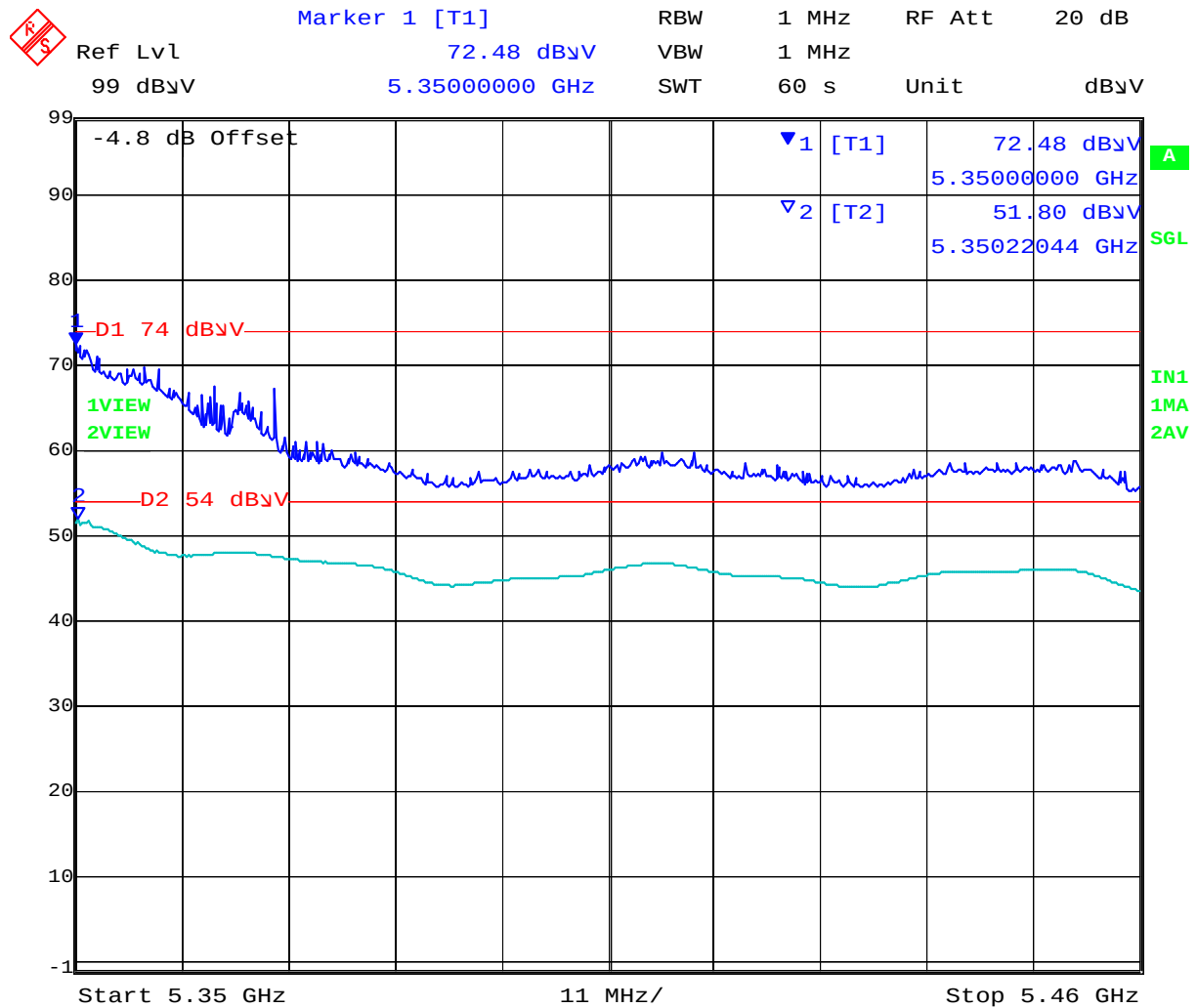
Date: 14. JUL. 2010 10:25:19

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AP-ANT-10 Channel 5320: 5250 – 5350 MHz: 802.11n HT-20



Date: 14.JUL.2010 10:30:37

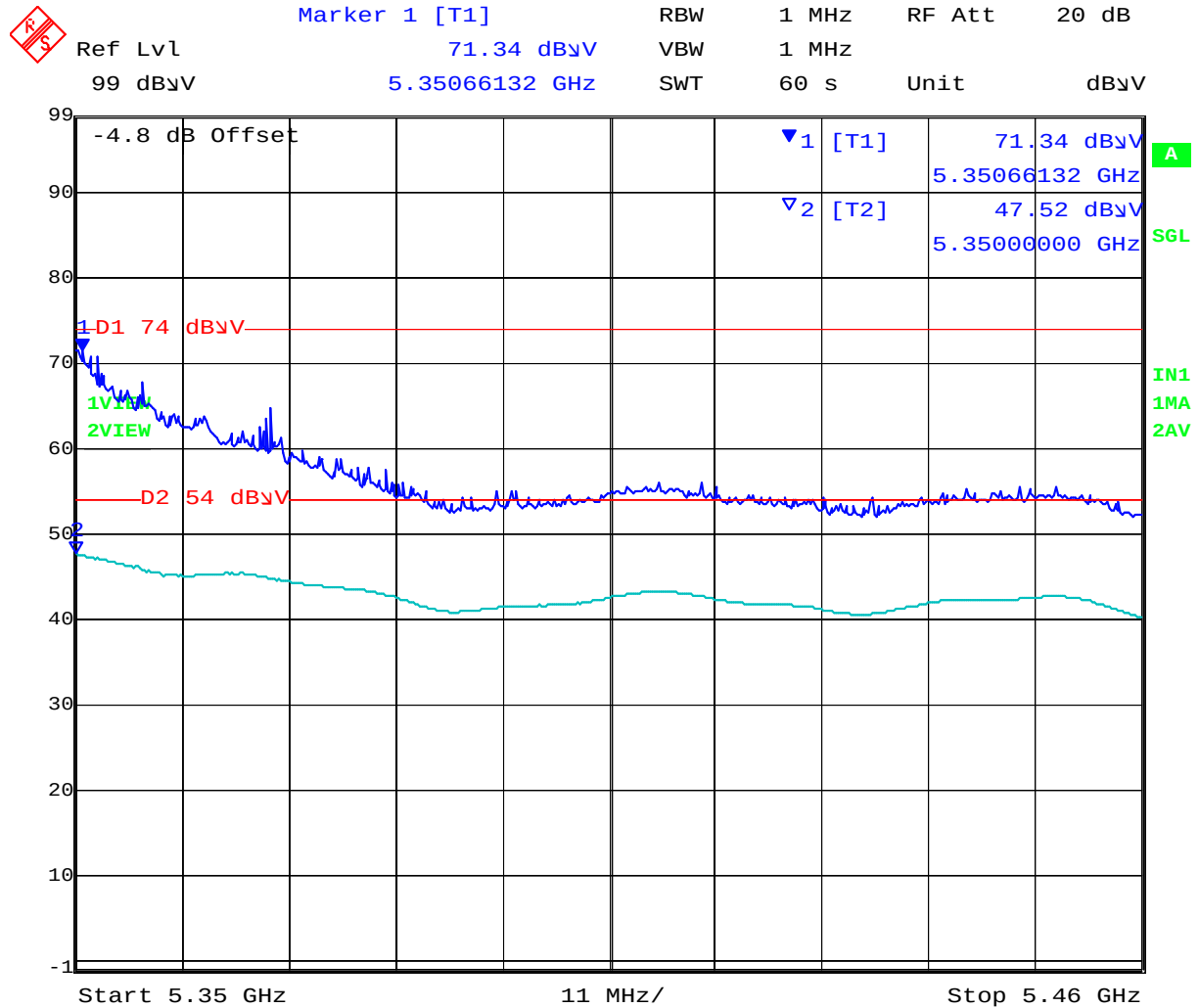
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AP-ANT-10 Channel 5310: 5250 – 5350 MHz: 802.11n HT-40



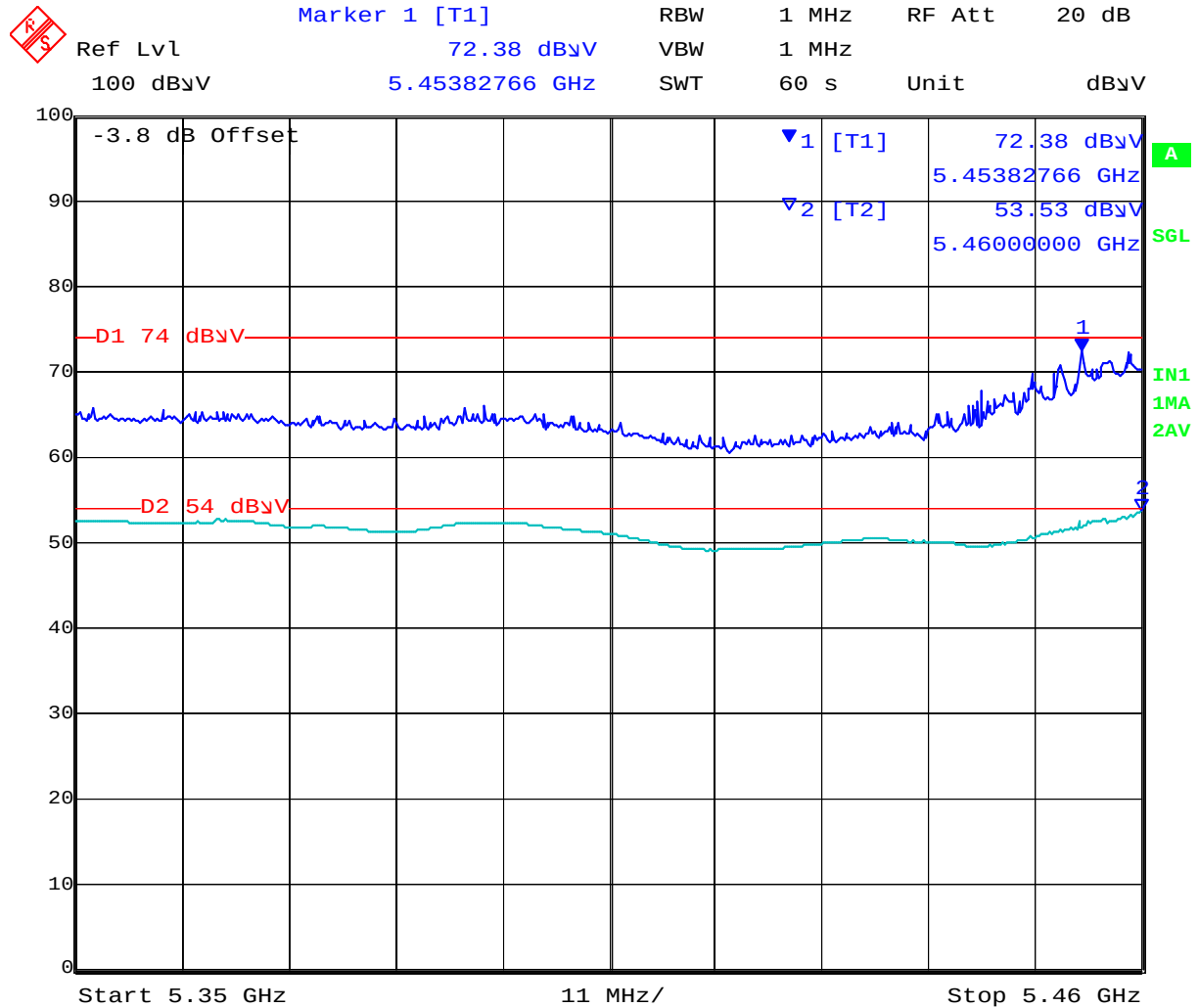
Date: 14.JUL.2010 10:45:41

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AP-ANT-10 Channel 5500: 5470 – 5725 MHz: 802.11a



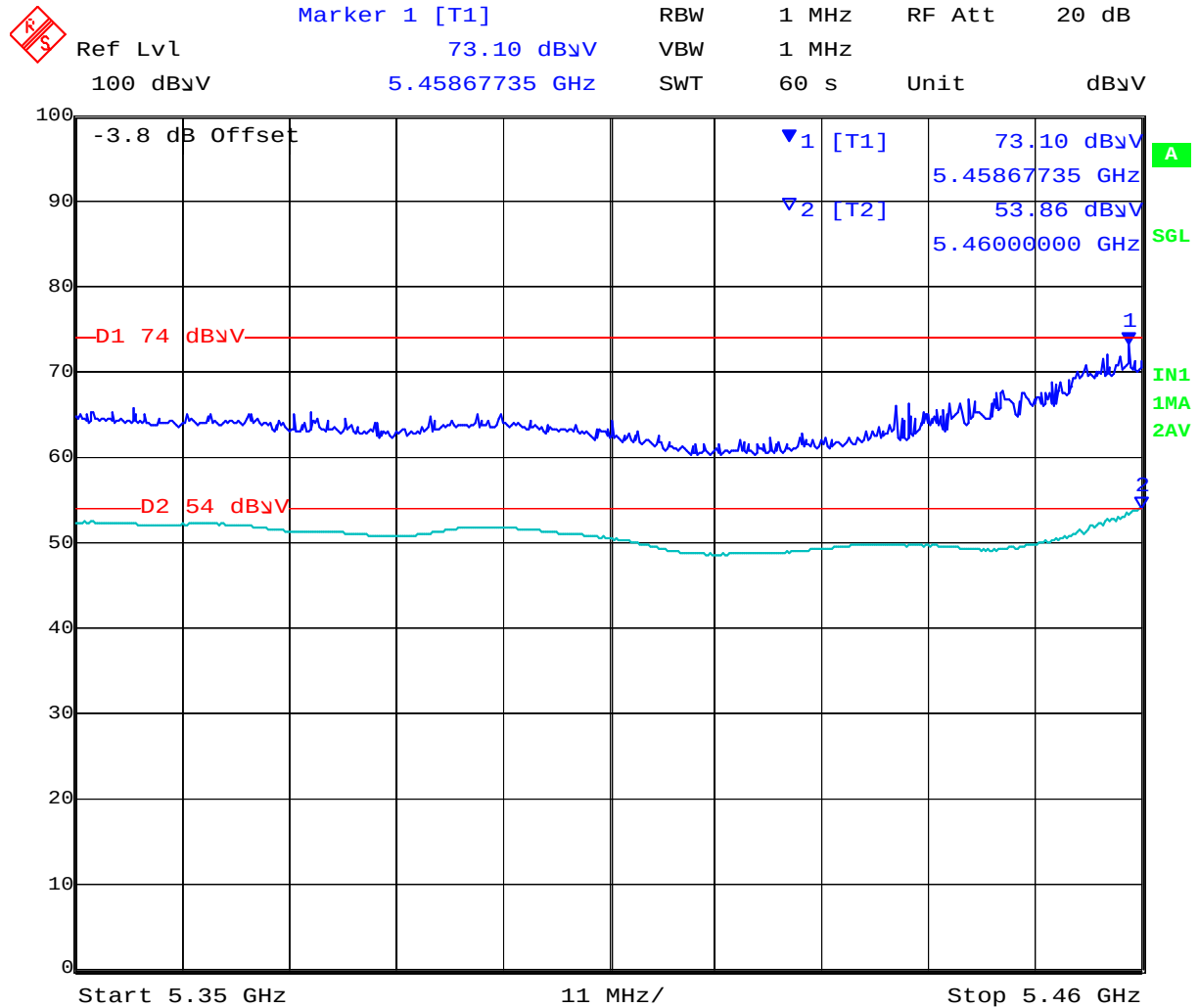
Date: 30.MAR.2010 12:45:54

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AP-ANT-10 Channel 5500: 5470 – 5725 MHz: 802.11n HT-20



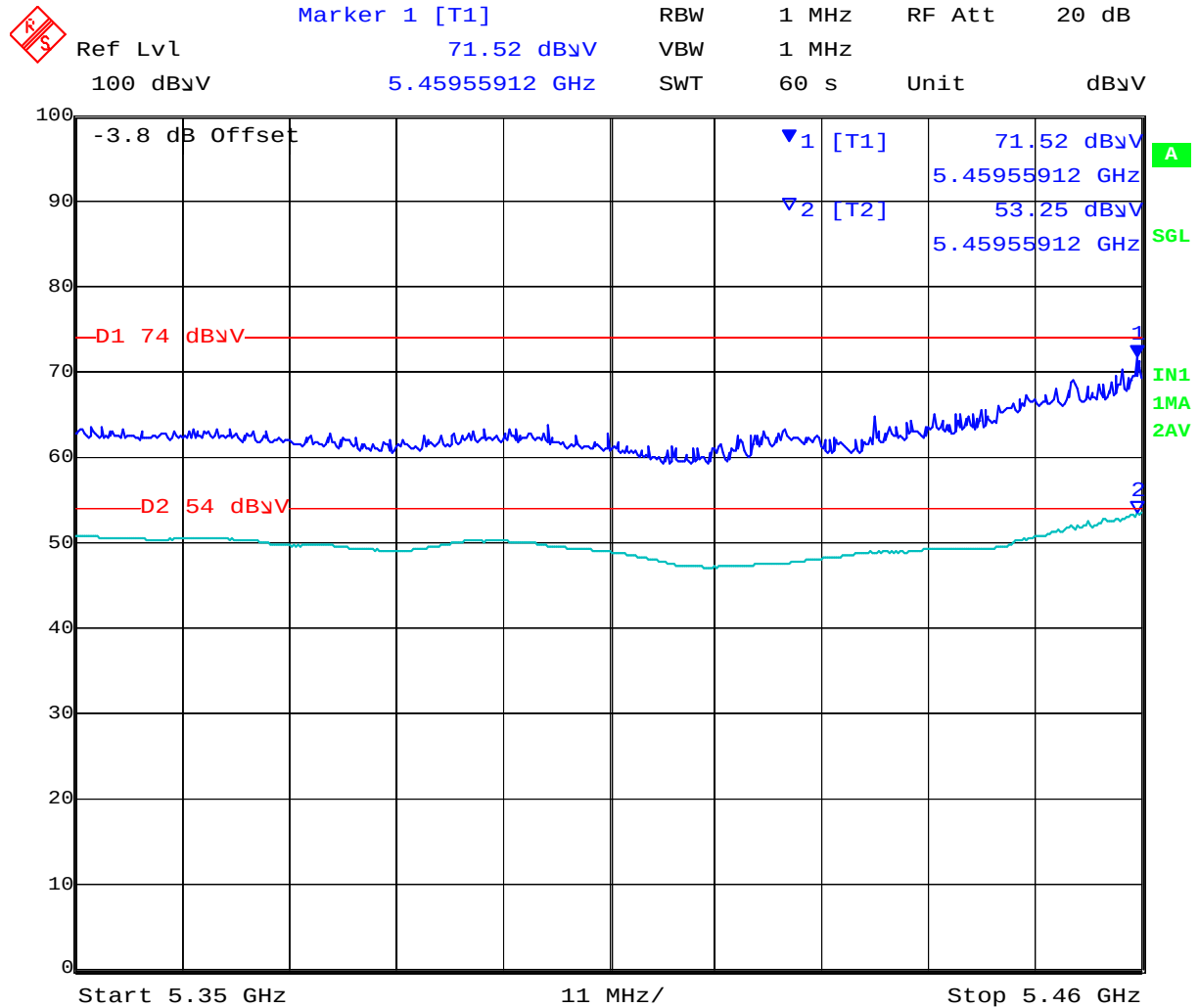
Date: 30.MAR.2010 12:51:24

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AP-ANT-10 Channel 5510: 5470 – 5725 MHz: 802.11n HT-40



Date: 30.MAR.2010 12:39:20

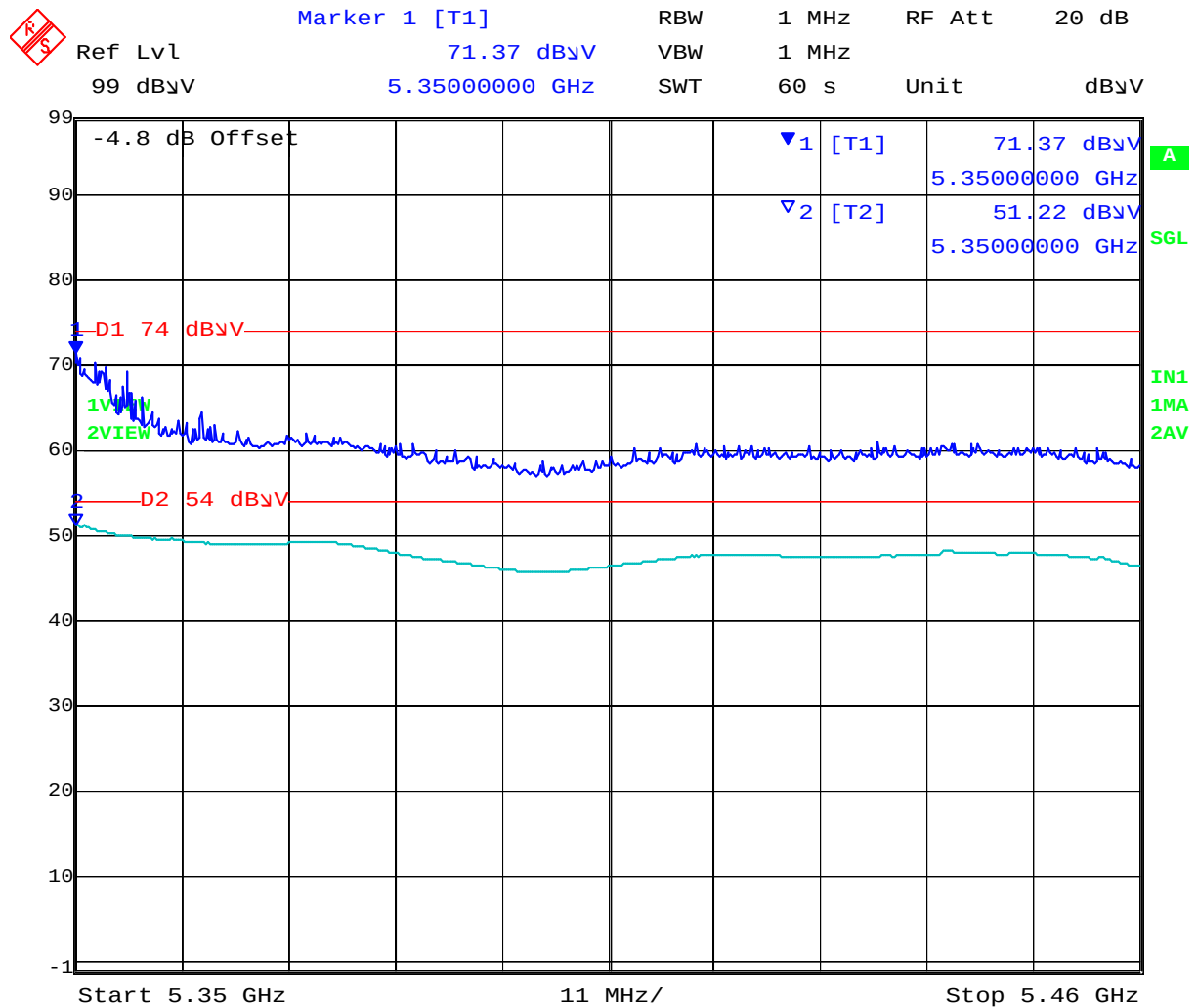
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#### 5.1.7.6. AP-ANT-12 – Radiated Band-Edge

##### AP-ANT-12 Channel 5320: 5250 – 5350 MHz: 802.11a



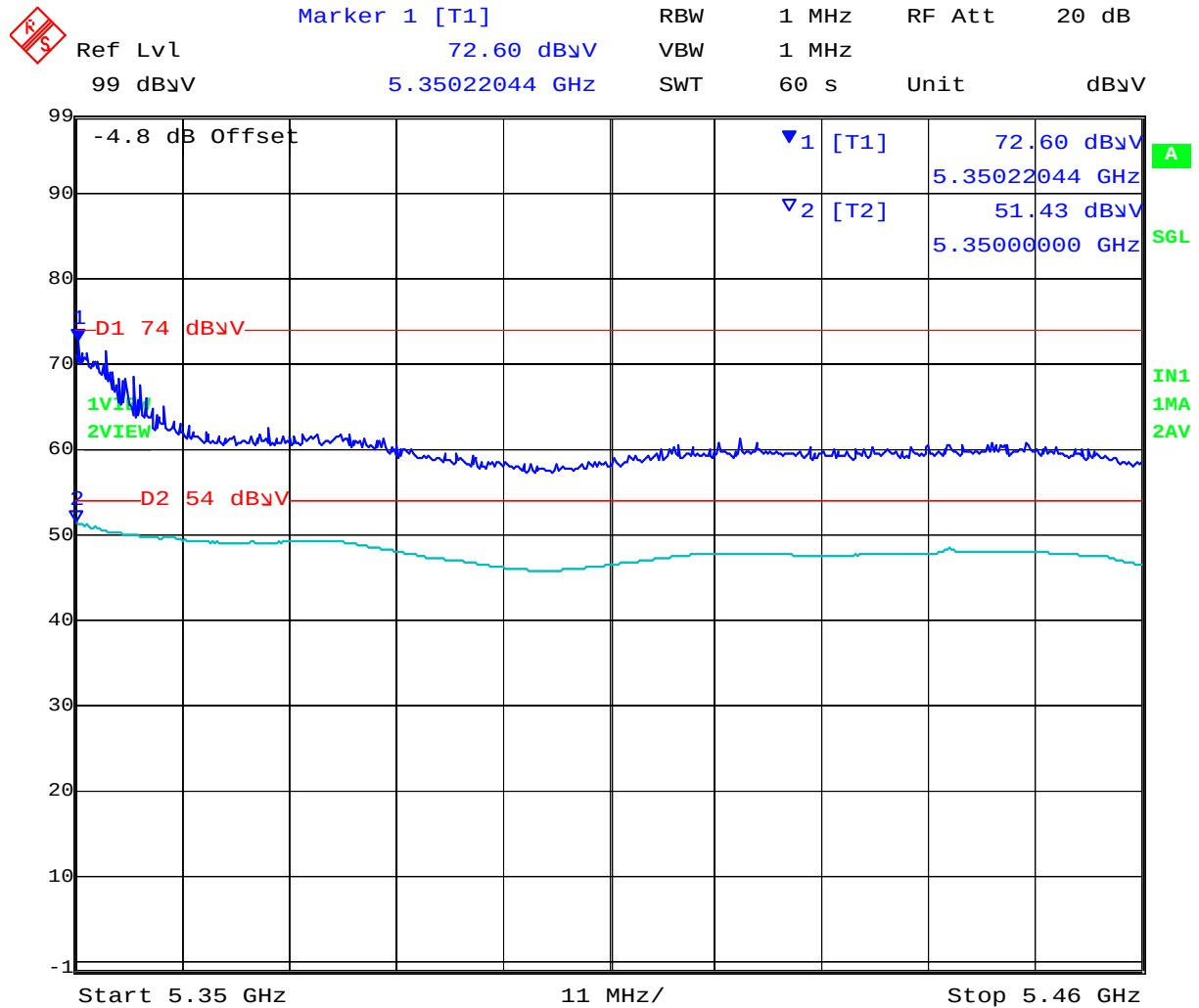
Date: 14. JUL. 2010 11:15:11

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Title: Aruba AP-92/93 802.11a/b/g/n Wireless AP  
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AP-ANT-12 Channel 5320: 5250 – 5350 MHz: 802.11n HT-20



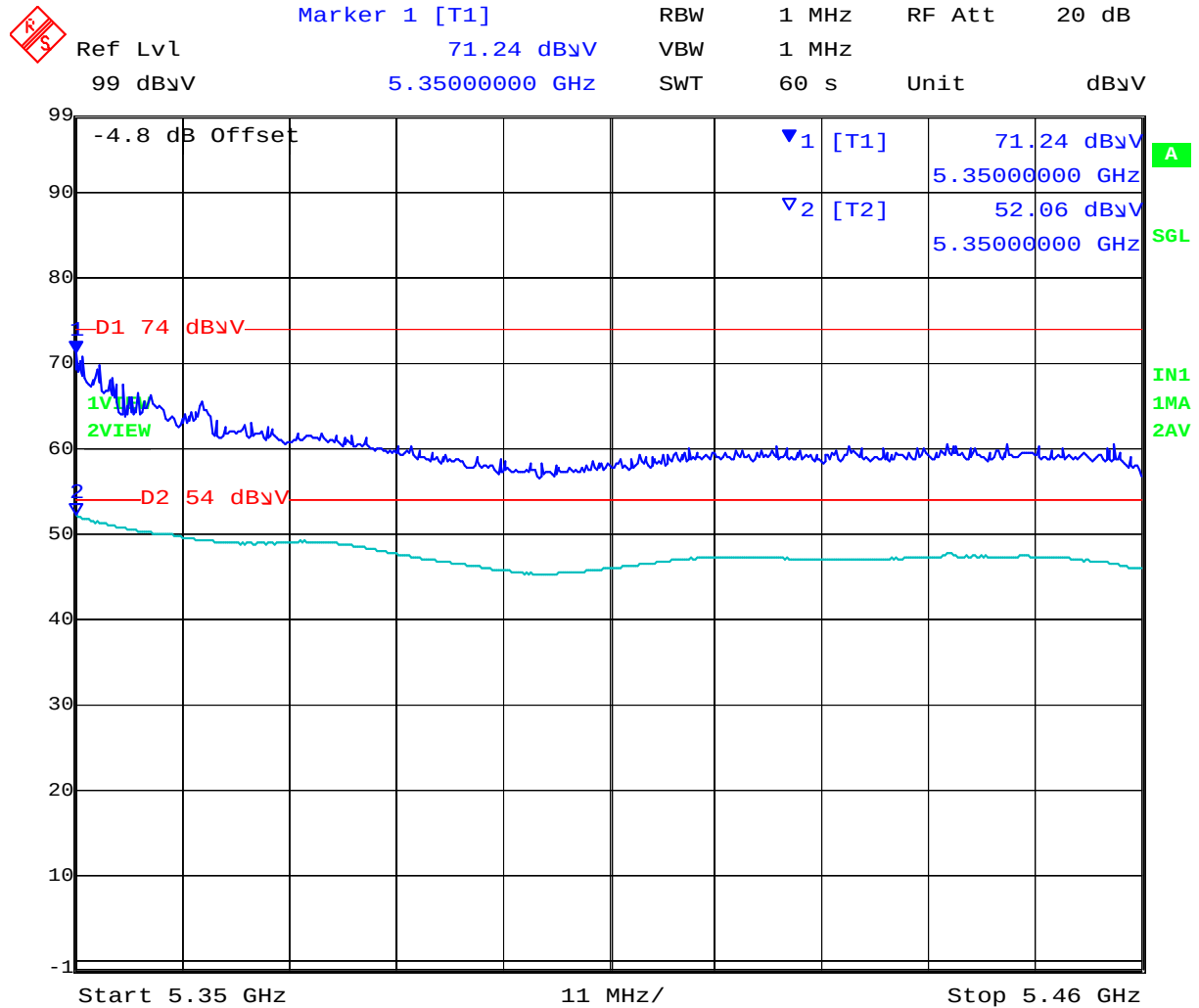
Date: 14.JUL.2010 11:41:36

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AP-ANT-12 Channel 5310: 5250 – 5350 MHz: 802.11n HT-40



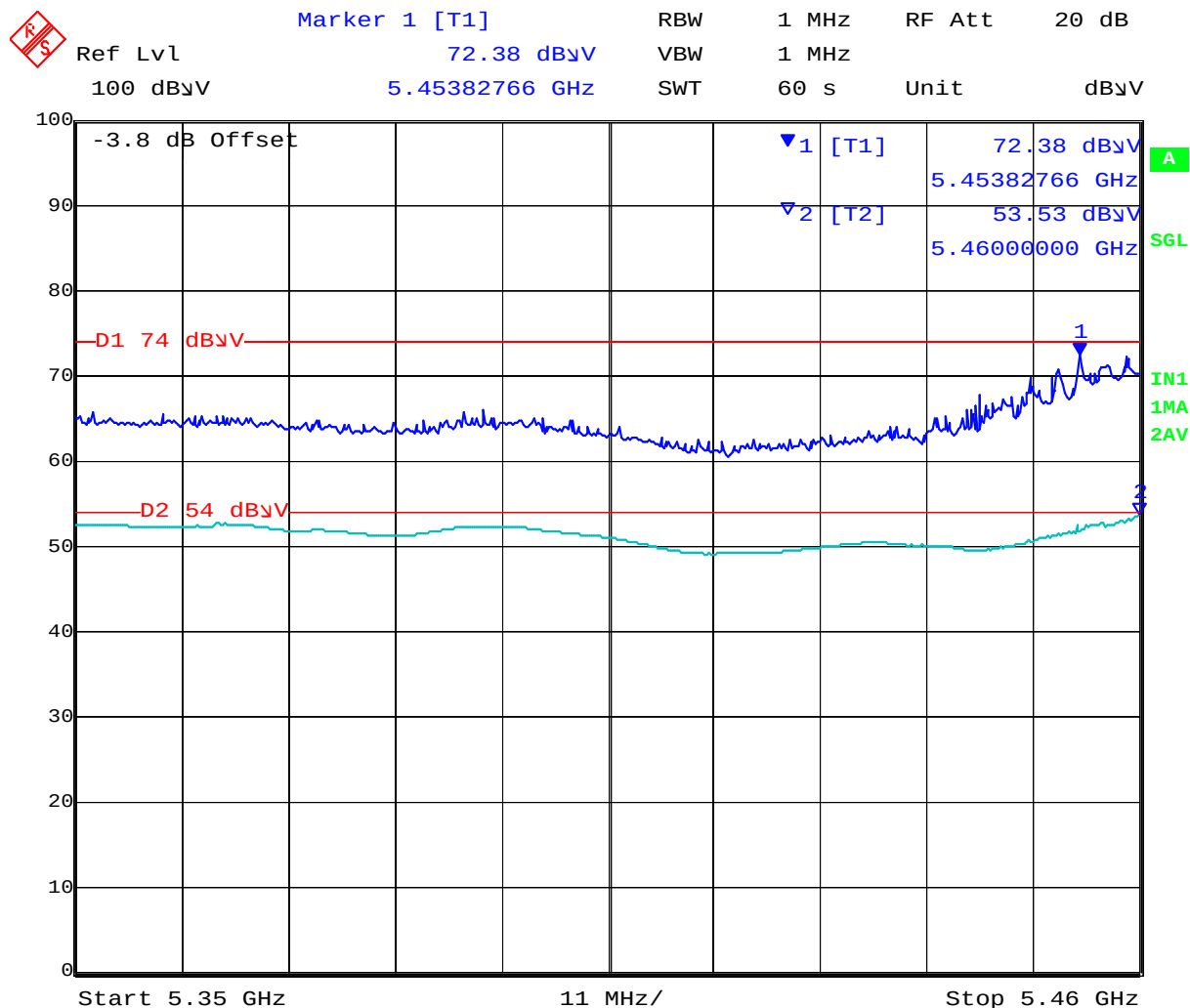
Date: 14.JUL.2010 11:47:11

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AP-ANT-12 Channel 5500: 5470 – 5725 MHz: 802.11a



Date: 30.MAR.2010 12:45:54

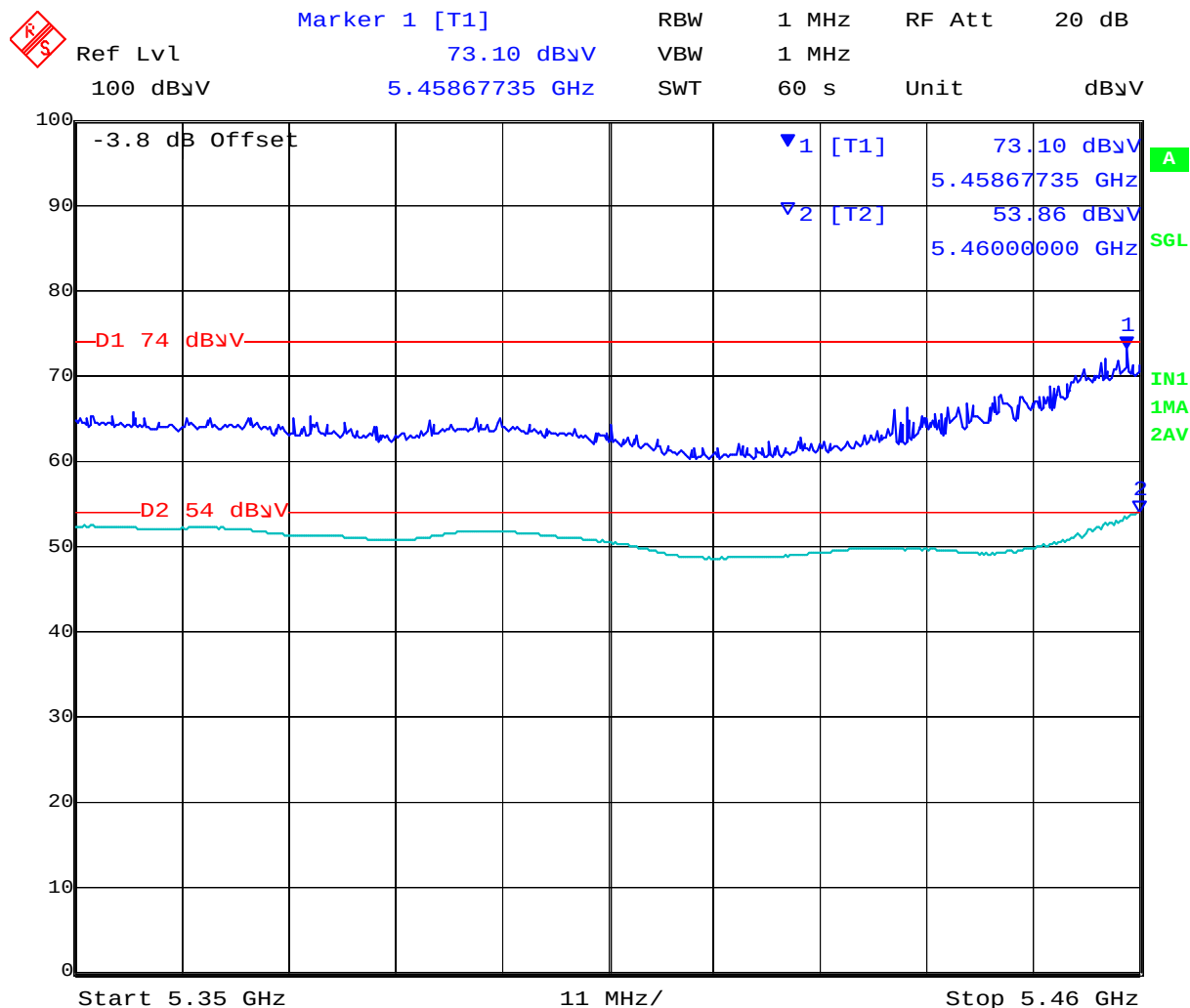
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AP-ANT-12 Channel 5500: 5470 – 5725 MHz: 802.11n HT-20



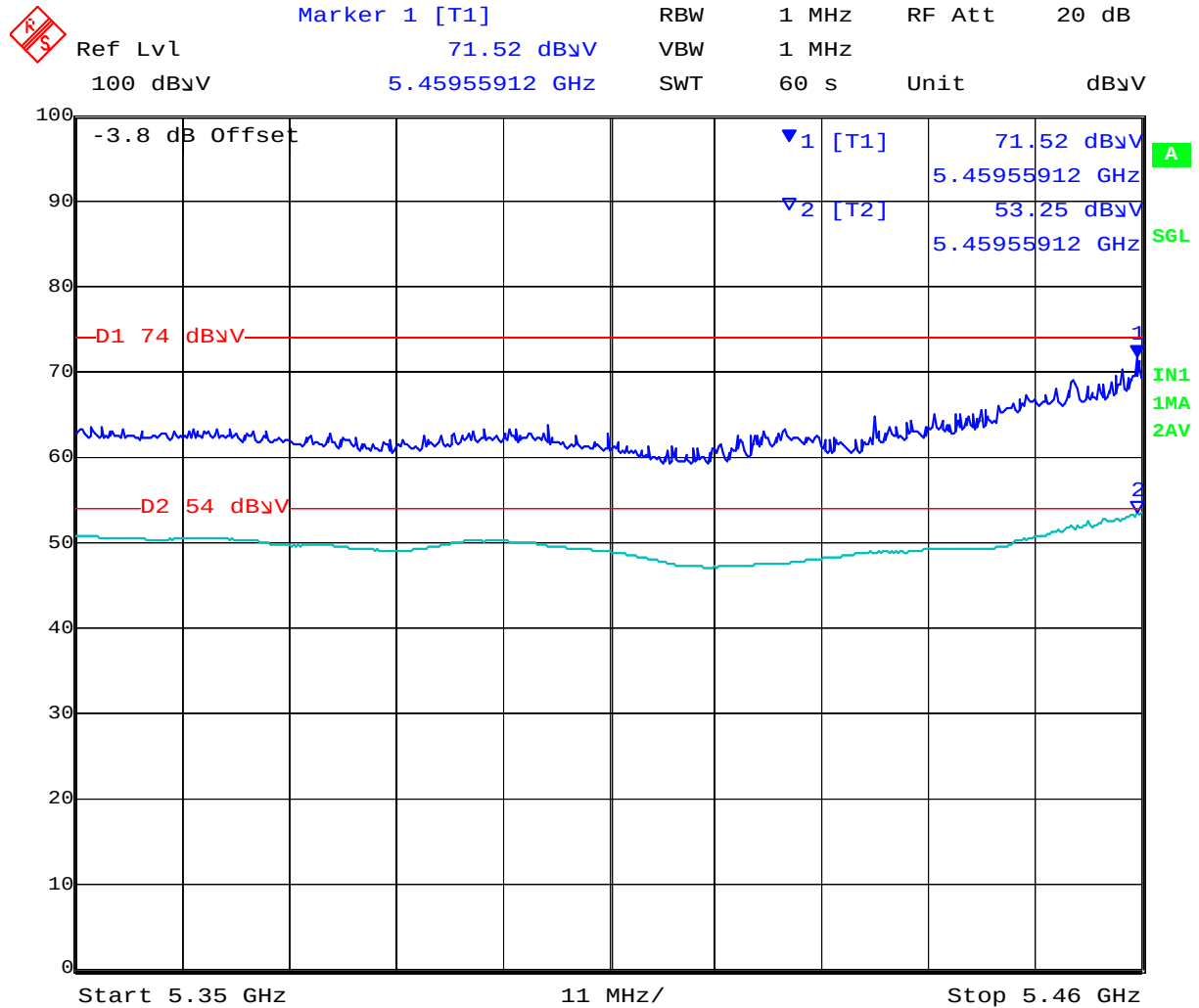
Date: 30.MAR.2010 12:51:24

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AP-ANT-12 Channel 5510: 5470 – 5725 MHz: 802.11n HT-40



Date: 30.MAR.2010 12:39:20

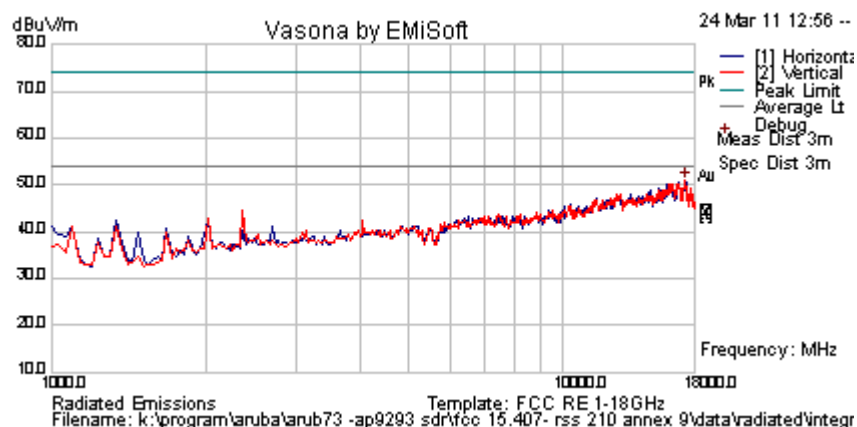
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#### 5.1.7.7. Receiver Radiated Spurious Emissions

|               |                                |                |      |
|---------------|--------------------------------|----------------|------|
| Test Freq.    | 5600 MHz                       | Engineer       | GMH  |
| Variant       | Receive in Test Utility        | Temp (°C)      | 19.5 |
| Freq. Range   | 1000 MHz - 18000 MHz           | Rel. Hum.(%)   | 38   |
| Power Setting | Not Applicable in Receive Mode | Press. (mBars) | 993  |
| Antenna       | Integral Antenna               |                |      |
| Test Notes 1  |                                |                |      |
| Test Notes 2  |                                |                |      |



#### Formally measured emission peaks

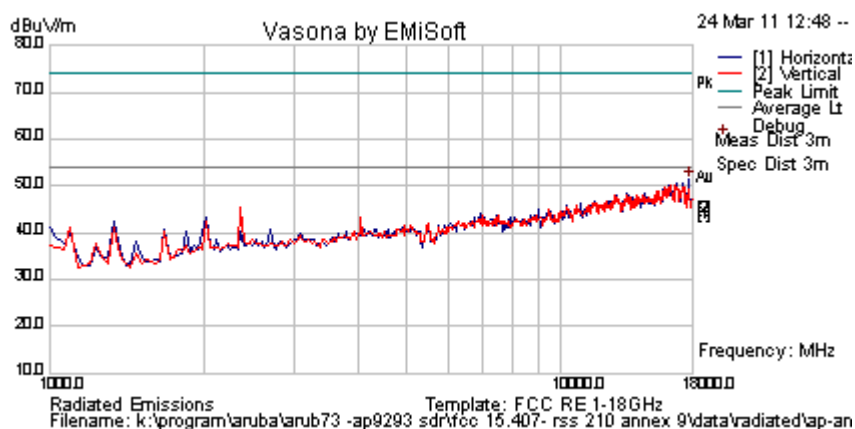
| Frequency<br>MHz                                                                          | Raw<br>dBuV | Cable<br>Loss | AF<br>dB | Level<br>dBuV/m | Measurement<br>Type | Pol | Hgt<br>cm | Azt<br>Deg | Limit<br>dBuV/m | Margin<br>dB | Pass<br>/Fail | Comments |
|-------------------------------------------------------------------------------------------|-------------|---------------|----------|-----------------|---------------------|-----|-----------|------------|-----------------|--------------|---------------|----------|
| No Receiver Emissions within 6dB of limit.                                                |             |               |          |                 |                     |     |           |            |                 |              |               |          |
| Legend: TRANS = Transient Emission; RB = Restricted Band; NRB = Non-Restricted Band;      |             |               |          |                 |                     |     |           |            |                 |              |               |          |
| BE = Emission in Restricted Band Nearest Transmission Band Edge; FUND = Fundamental Freq. |             |               |          |                 |                     |     |           |            |                 |              |               |          |

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|                      |                                |                       |      |
|----------------------|--------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5600 MHz                       | <b>Engineer</b>       | GMH  |
| <b>Variant</b>       | Receive in Test Utility        | <b>Temp (°C)</b>      | 19.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz           | <b>Rel. Hum.(%)</b>   | 38   |
| <b>Power Setting</b> | Not Applicable in Receive Mode | <b>Press. (mBars)</b> | 993  |
| <b>Antenna</b>       | AP-ANT-10 6dBi                 |                       |      |
| <b>Test Notes 1</b>  |                                |                       |      |
| <b>Test Notes 2</b>  |                                |                       |      |



#### Formally measured emission peaks

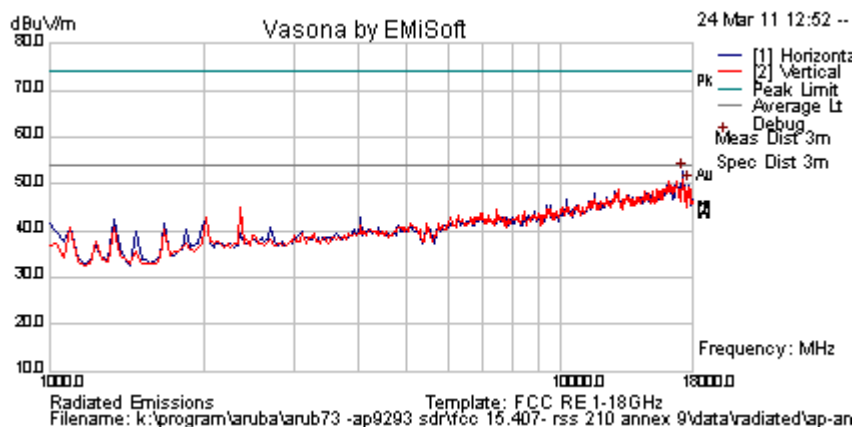
| Frequency<br>MHz                                                                          | Raw<br>dBuV | Cable<br>Loss | AF<br>dB | Level<br>dBuV/m | Measurement<br>Type | Pol | Hgt<br>cm | Azt<br>Deg | Limit<br>dBuV/m | Margin<br>dB | Pass<br>/Fail | Comments |
|-------------------------------------------------------------------------------------------|-------------|---------------|----------|-----------------|---------------------|-----|-----------|------------|-----------------|--------------|---------------|----------|
| No Receiver Emissions within 6dB of limit.                                                |             |               |          |                 |                     |     |           |            |                 |              |               |          |
| Legend: TRANS = Transient Emission; RB = Restricted Band; NRB = Non-Restricted Band;      |             |               |          |                 |                     |     |           |            |                 |              |               |          |
| BE = Emission in Restricted Band Nearest Transmission Band Edge; FUND = Fundamental Freq. |             |               |          |                 |                     |     |           |            |                 |              |               |          |

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|                      |                                |                       |      |
|----------------------|--------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5600 MHz                       | <b>Engineer</b>       | GMH  |
| <b>Variant</b>       | Receive in Test Utility        | <b>Temp (°C)</b>      | 19.5 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz           | <b>Rel. Hum.(%)</b>   | 38   |
| <b>Power Setting</b> | Not Applicable in Receive Mode | <b>Press. (mBars)</b> | 993  |
| <b>Antenna</b>       | AP-ANT-12 14 dBi               |                       |      |
| <b>Test Notes 1</b>  |                                |                       |      |
| <b>Test Notes 2</b>  |                                |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                             | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|-------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| No Receiver Emissions within 6dB of limit.                                                |          |            |       |              |                  |     |        |         |              |           |            |          |
| Legend: TRANS = Transient Emission; RB = Restricted Band; NRB = Non-Restricted Band;      |          |            |       |              |                  |     |        |         |              |           |            |          |
| BE = Emission in Restricted Band Nearest Transmission Band Edge; FUND = Fundamental Freq. |          |            |       |              |                  |     |        |         |              |           |            |          |

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## Specification

### Limits

**§15.407(b)(6)** Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209.

**§15.205 (a)** Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

**§15.205 (a)** Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**§15.209 (a)** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

**RSS-210 §2.2** refers to Section 2.7 Table 2 below;-

| Frequency(MHz) | Field Strength<br>( $\mu$ V/m) | Field Strength<br>(dB $\mu$ V/m) | Measurement Distance<br>(meters) |
|----------------|--------------------------------|----------------------------------|----------------------------------|
| 30-88          | 100                            | 40.0                             | 3                                |
| 88-216         | 150                            | 43.5                             | 3                                |
| 216-960        | 200                            | 46.0                             | 3                                |
| Above 960      | 500                            | 54.0                             | 3                                |

## Laboratory Measurement Uncertainty for Radiated Emissions

|                         |               |
|-------------------------|---------------|
| Measurement uncertainty | +5.6/ -4.5 dB |
|-------------------------|---------------|

## Traceability

| Method                                                                                | Test Equipment Used                            |
|---------------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions' | 0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312 |

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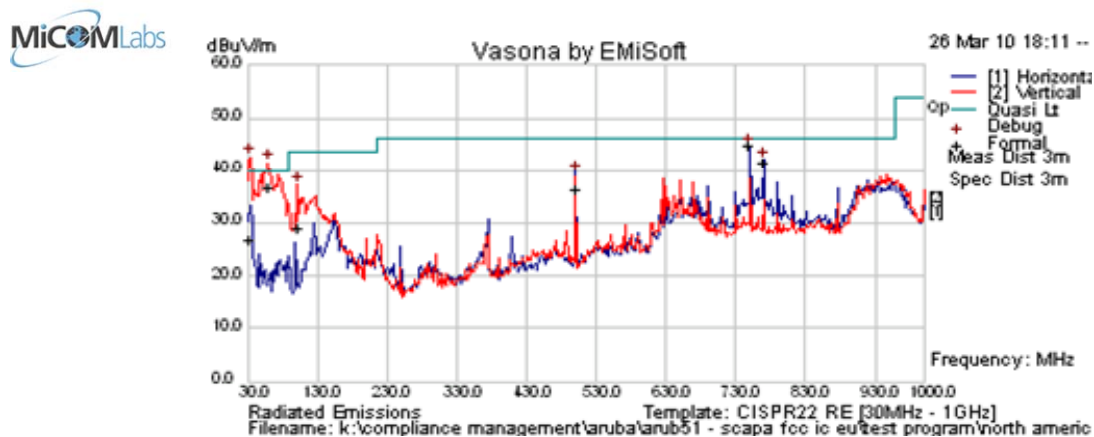


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#### 5.1.7.8. Radiated Spurious Emissions – 30MHz – 1000MHz

Note: No radio emissions were present below 1 GHz. Emissions were investigated while the unit was transmitting at maximum power and in receive mode for both AC Adaptor powered and POE (Power Over Ethernet) configuration.

|                      |                           |                       |      |
|----------------------|---------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2437 MHz                  | <b>Engineer</b>       | CSB  |
| <b>Variant</b>       | Digital Emissions         | <b>Temp (°C)</b>      | 23   |
| <b>Freq. Range</b>   | 30 MHz - 1000 MHz         | <b>Rel. Hum. (%)</b>  | 38   |
| <b>Power Setting</b> | N/A - Receive Mode        | <b>Press. (mBars)</b> | 1013 |
| <b>Antenna</b>       | Integral Antennas         |                       |      |
| <b>Test Notes 1</b>  | AC Power - 120V AC; 60 Hz |                       |      |
| <b>Test Notes 2</b>  |                           |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | PoI | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 33.051        | 35.2     | 3.4        | -11.8 | 26.8         | Quasi Max        | V   | 261    | 113     | 40           | -13.2     | Pass       | DIG      |
| 60.938        | 56.8     | 3.8        | -23.8 | 36.9         | Quasi Max        | V   | 134    | 77      | 40           | -3.1      | Pass       | DIG      |
| 103.311       | 44.8     | 4.2        | -19.9 | 29.1         | Quasi Max        | V   | 98     | 102     | 43.5         | -14.4     | Pass       | DIG      |
| 499.984       | 42.8     | 6.0        | -12.6 | 36.3         | Quasi Max        | H   | 98     | 142     | 46           | -9.8      | Pass       | DIG      |
| 749.984       | 46.9     | 6.9        | -9.0  | 44.8         | Quasi Max        | H   | 109    | 350     | 46           | -1.2      | Pass       | DIG      |
| 769.990       | 43.2     | 7.0        | -8.8  | 41.4         | Quasi Max        | H   | 109    | 353     | 46           | -4.6      | Pass       | DIG      |

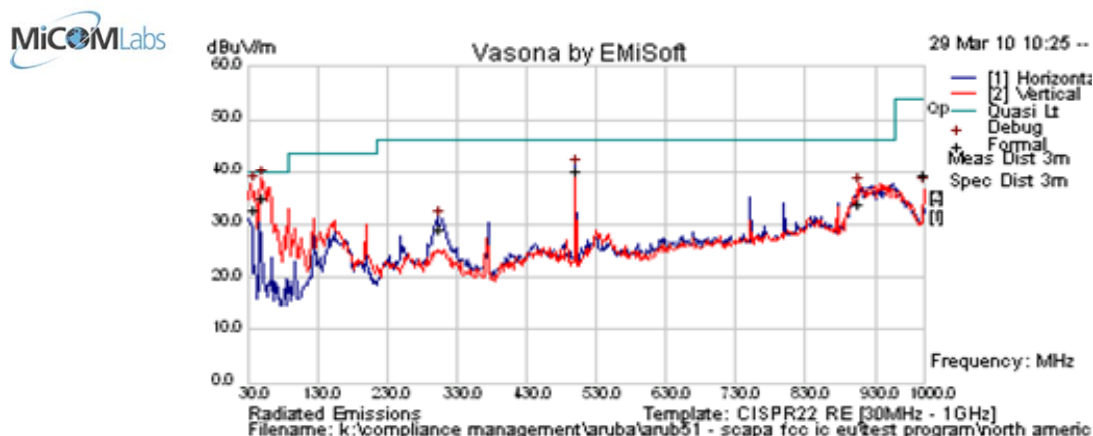
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency  
 NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2437 MHz - Rx Mode                                           | <b>Engineer</b>       | CSB  |
| <b>Variant</b>       | Digital Emissions                                            | <b>Temp (°C)</b>      | 21.5 |
| <b>Freq. Range</b>   | 30 MHz - 1000 MHz                                            | <b>Rel. Hum. (%)</b>  | 36   |
| <b>Power Setting</b> | N/A                                                          | <b>Press. (mBars)</b> | 1008 |
| <b>Antenna</b>       | Integral Antenna                                             |                       |      |
| <b>Test Notes 1</b>  | EUT powered via PoE (Power Over Ethernet) - PowerDsine 7001G |                       |      |
| <b>Test Notes 2</b>  |                                                              |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                  | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | PoI | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 40.261                                                                                         | 46.0     | 3.6        | -17.0 | 32.6         | Quasi Max        | V   | 101    | 176     | 40           | -7.4      | Pass       | DIG      |
| 50.782                                                                                         | 54.4     | 3.7        | -23.2 | 35.0         | Quasi Max        | V   | 98     | 113     | 40           | -5.0      | Pass       | DIG      |
| 305.043                                                                                        | 40.3     | 5.2        | -16.7 | 28.9         | Quasi Max        | H   | 99     | 48      | 46           | -17.1     | Pass       | DIG      |
| 499.989                                                                                        | 46.8     | 6.0        | -12.6 | 40.2         | Quasi Max        | V   | 116    | 228     | 46           | -5.8      | Pass       | DIG      |
| 906.845                                                                                        | 33.7     | 7.3        | -7.2  | 33.9         | Quasi Max        | V   | 132    | 14      | 46           | -12.1     | Pass       | DIG      |
| 999.988                                                                                        | 37.7     | 7.7        | -6.1  | 39.2         | Quasi Max        | V   | 108    | 353     | 54           | -14.8     | Pass       | DIG      |
| Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency |          |            |       |              |                  |     |        |         |              |           |            |          |
| NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band              |          |            |       |              |                  |     |        |         |              |           |            |          |

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#### 5.1.8. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

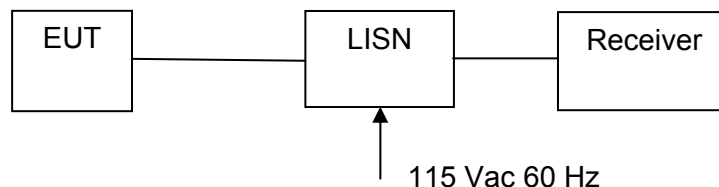
**FCC, Part 15 Subpart C §15.407(b)(6)/15.207**

**Industry Canada RSS-Gen §7.2.2**

##### **Test Procedure**

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

##### **Test Measurement Set up**



Measurement set up for AC Wireline Conducted Emissions Test

##### **Specification**

##### **Limit**

**§15.407 (b)(6);** Any U-NII devices using an AC power line are required to comply also with the limits set forth in Section 15.207.

**§15.207 (a)** Except as shown in paragraphs (b) and (c) of this section, 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 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu\Omega$  line impedance stabilization network (LISN), see §15.207 (a) matrix below. 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.

##### **RSS-Gen §7.2.2**

The radio frequency voltage that is conducted back into the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The tighter limit applies at the frequency range boundaries.



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**§15.207 (a) and RSS-Gen §7.2.2 Limit Matrix**

The lower limit applies at the boundary between frequency ranges

| Frequency of Emission (MHz) | Conducted Limit (dB $\mu$ V) |           |
|-----------------------------|------------------------------|-----------|
|                             | Quasi-peak                   | Average   |
| 0.15-0.5                    | 66 to 56*                    | 56 to 46* |
| 0.5-5                       | 56                           | 46        |
| 5-30                        | 60                           | 50        |

\* Decreases with the logarithm of the frequency

**Laboratory Measurement Uncertainty for Conducted Emissions**

|                         |               |
|-------------------------|---------------|
| Measurement uncertainty | $\pm 2.64$ dB |
|-------------------------|---------------|

**Traceability**

| Method                                                                                     | Test Equipment Used                |
|--------------------------------------------------------------------------------------------|------------------------------------|
| Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions' | 0158, 0184, 0287, 0190, 0293, 0307 |

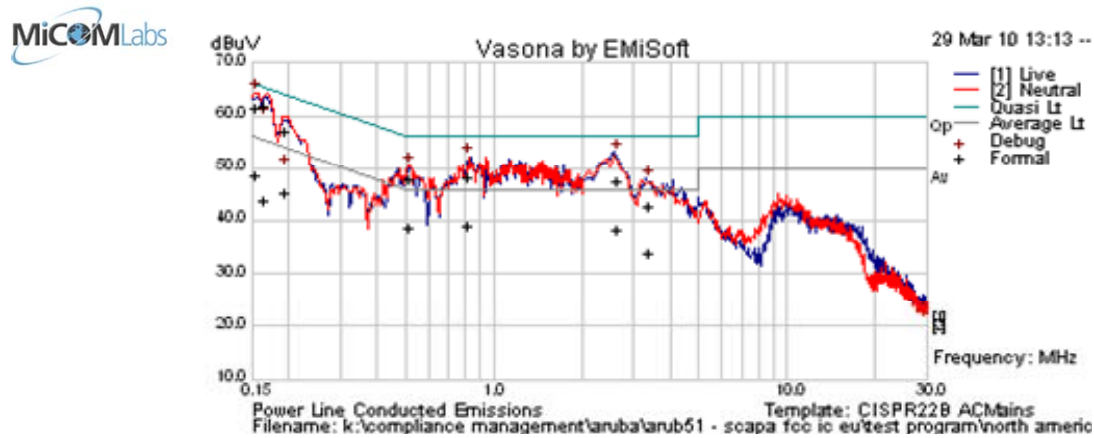
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### Measurement Results for AC Wireline Conducted Emissions (150 kHz – 30 MHz)

|                      |                           |                       |      |
|----------------------|---------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2437 - Rx Mode            | <b>Engineer</b>       | CSB  |
| <b>Variant</b>       | AC Line Emissions         | <b>Temp (°C)</b>      | 22   |
| <b>Freq. Range</b>   | 0.150 MHz - 30 MHz        | <b>Rel. Hum.(%)</b>   | 38   |
| <b>Power Setting</b> | N/A                       | <b>Press. (mBars)</b> | 1006 |
| <b>Antenna</b>       | Integral Antennas         |                       |      |
| <b>Test Notes 1</b>  | AC Powered - 120V AC 60Hz |                       |      |
| <b>Test Notes 2</b>  |                           |                       |      |



### Formally measured emission peaks

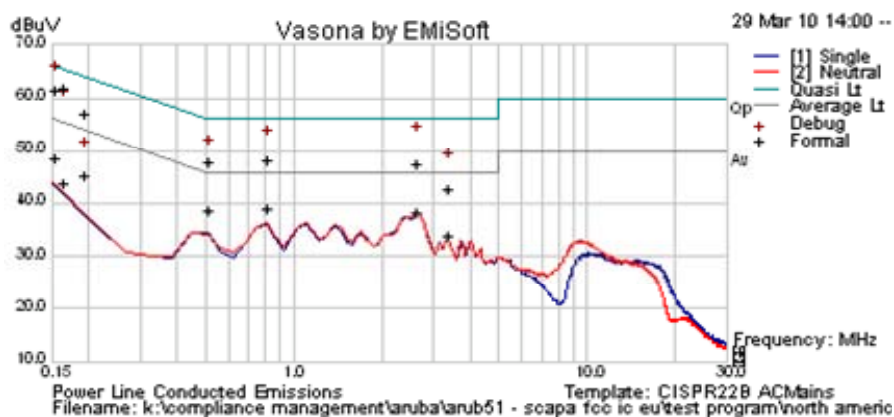
| Frequency MHz                                                                                  | Raw dBuV | Cable Loss | Factors dB | Level dBuV | Measurement Type | Line    | Limit dBuV | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------|----------|------------|------------|------------|------------------|---------|------------|-----------|------------|----------|
| 0.155                                                                                          | 38.8     | 9.9        | 0.1        | 48.8       | Average          | Neutral | 55.73      | -7.0      | Pass       | DIG      |
| 0.155                                                                                          | 51.6     | 9.9        | 0.1        | 61.6       | Quasi Peak       | Neutral | 65.73      | -4.2      | Pass       | DIG      |
| 0.167                                                                                          | 33.8     | 9.9        | 0.1        | 43.7       | Average          | Neutral | 55.11      | -11.4     | Pass       | DIG      |
| 0.167                                                                                          | 51.7     | 9.9        | 0.1        | 61.7       | Quasi Peak       | Neutral | 65.11      | -3.4      | Pass       | DIG      |
| 0.194                                                                                          | 35.4     | 9.9        | 0.1        | 45.3       | Average          | Neutral | 53.86      | -8.5      | Pass       | DIG      |
| 0.194                                                                                          | 47.2     | 9.9        | 0.1        | 57.1       | Quasi Peak       | Neutral | 63.86      | -6.7      | Pass       | DIG      |
| 0.516                                                                                          | 28.6     | 9.9        | 0.1        | 38.6       | Average          | Neutral | 46         | -7.4      | Pass       | DIG      |
| 0.516                                                                                          | 37.8     | 9.9        | 0.1        | 47.9       | Quasi Peak       | Neutral | 56         | -8.2      | Pass       | DIG      |
| 0.828                                                                                          | 38.4     | 9.9        | 0.1        | 48.4       | Quasi Peak       | Neutral | 56         | -7.6      | Pass       | DIG      |
| 0.828                                                                                          | 29.1     | 9.9        | 0.1        | 39.1       | Average          | Neutral | 46         | -6.9      | Pass       | DIG      |
| 2.661                                                                                          | 28.2     | 10.1       | 0.1        | 38.4       | Average          | Live    | 46         | -7.6      | Pass       | DIG      |
| 2.661                                                                                          | 37.3     | 10.1       | 0.1        | 47.6       | Quasi Peak       | Live    | 56         | -8.5      | Pass       | DIG      |
| Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency |          |            |            |            |                  |         |            |           |            |          |
| NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band              |          |            |            |            |                  |         |            |           |            |          |

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|               |                                                                     |  |      |
|---------------|---------------------------------------------------------------------|--|------|
| Test Freq.    | 2437 - Rx Mode                                                      |  | CSB  |
| Variant       | AC Line Emissions                                                   |  | 22   |
| Freq. Range   | 0.150 MHz - 30 MHz                                                  |  | 38   |
| Power Setting | N/A                                                                 |  | 1006 |
| Antenna       | Integral Antennas                                                   |  |      |
| Test Notes 1  | AC Powered - 120V AC 60Hz                                           |  |      |
| Test Notes 2  | Red trace = Neautral, AVG Detector; Blue trace = Live, AVG Detector |  |      |



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## 6. Dynamic Frequency Selection (DFS)

### 6.1. Test Procedure and Setup

FCC, Part 15 Subpart C §15.407(h)  
FCC 06-96 Memorandum Opinion and Order  
Industry Canada RSS-210 A9.4

#### 6.1.1. Interference Threshold values, Master or Client incorporating In-Service Monitoring

| Maximum Transmit Power                                                                  | Value<br>(see note) |
|-----------------------------------------------------------------------------------------|---------------------|
| ≥ 200 milliwatt                                                                         | -64 dBm             |
| < 200 milliwatt                                                                         | -62 dBm             |
| Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna |                     |

#### 6.1.2. DFS Response requirement values

| Parameter                                | Value                                                                                                     |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <i>Non-occupancy period</i>              | Minimum 30 minutes                                                                                        |
| <i>Channel Availability Check Time</i>   | 60 seconds                                                                                                |
| <i>Channel Move Time</i>                 | 10 seconds<br>See Note 1.                                                                                 |
| <i>Channel Closing Transmission Time</i> | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.<br>See Notes 1 and 2. |
| <i>U-NII Detection Bandwidth</i>         | Minimum 80% of the 99% power bandwidth See Note 3.                                                        |

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.



### 6.1.3. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

#### Short Pulse Radar Test Waveforms

| Radar Type                  | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Trials |
|-----------------------------|--------------------|------------|------------------|--------------------------------------------|----------------|
| 1                           | 1                  | 1428       | 18               | 60%                                        | 30             |
| 2                           | 1-5                | 150-230    | 23-29            | 60%                                        | 30             |
| 3                           | 6-10               | 200-500    | 16-18            | 60%                                        | 30             |
| 4                           | 11-20              | 200-500    | 12-16            | 60%                                        | 30             |
| Aggregate (Radar Types 1-4) |                    |            |                  | 80%                                        | 120            |

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

#### Long Pulse Radar Test Waveform

| Radar Type | Pulse Width (μsec) | Chirp Width (MHz) | PRI (μsec) | Number of Pulses per Burst | Number of Bursts | Minimum Percentage of Successful Detection | Minimum Trials |
|------------|--------------------|-------------------|------------|----------------------------|------------------|--------------------------------------------|----------------|
| 5          | 50-100             | 5-20              | 1000-2000  | 1-3                        | 8-20             | 80%                                        | 30             |

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.



Each waveform is defined as follows:

- 1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
- 2) There are a total of 8 to 20 *Bursts* in the 12 second period, with the number of *Bursts* being randomly chosen. This number is *Burst Count*.
- 3) Each *Burst* consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each *Burst* within the 12 second sequence may have a different number of pulses.
- 4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a *Burst* will have the same pulse width. Pulses in different *Bursts* may have different pulse widths.
- 5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a *Burst* will have the same chirp width. Pulses in different *Bursts* may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
- 6) If more than one pulse is present in a *Burst*, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a *Burst*, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
- 7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to *Burst\_Count*. Each interval is of length  $(12,000,000 / \textit{Burst\_Count})$  microseconds. Each interval contains one *Burst*. The start time for the *Burst*, relative to the beginning of the interval, is between 1 and  $[(12,000,000 / \textit{Burst\_Count}) - (\textit{Total Burst Length}) + (\textit{One Random PRI Interval})]$  microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each *Burst* is chosen independently.

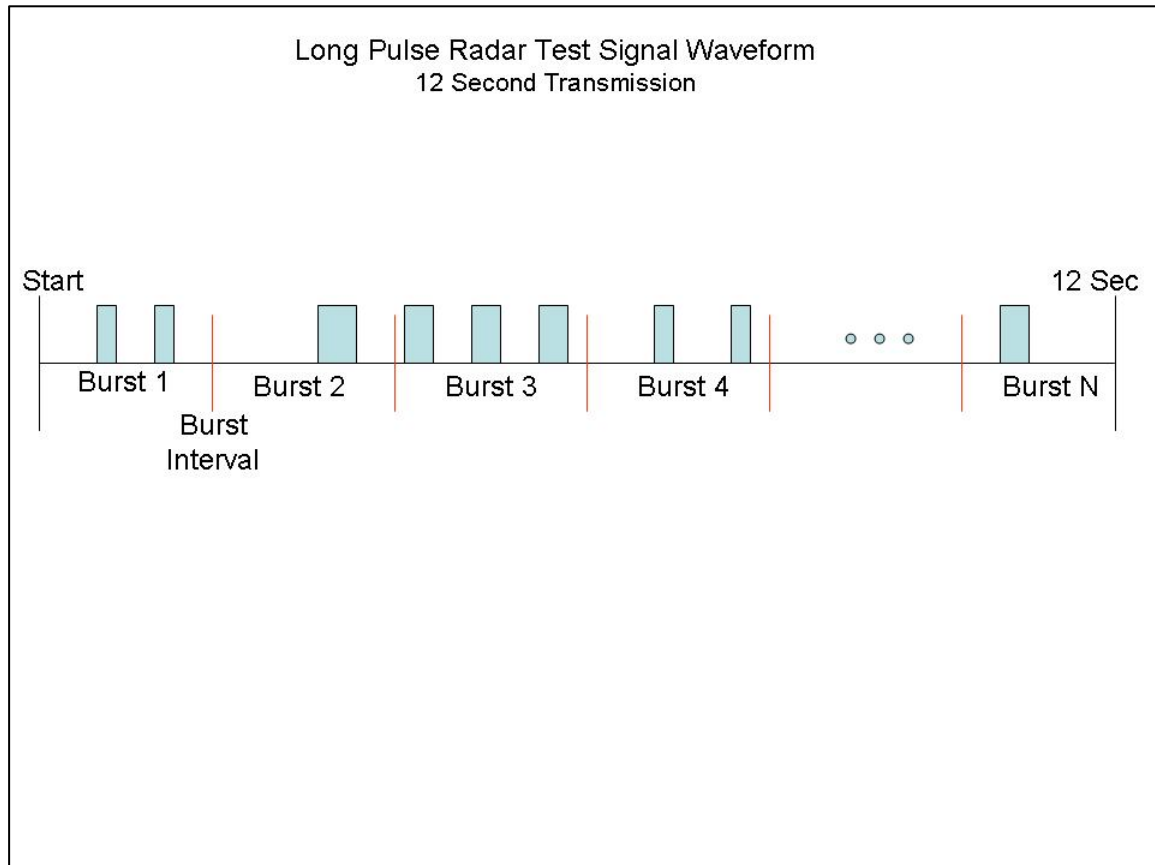




**A representative example of a Long Pulse radar test waveform:**

- 1) The total test signal length is 12 seconds.
- 2) 8 *Bursts* are randomly generated for the *Burst\_Count*.
- 3) *Burst* 1 has 2 randomly generated pulses.
- 4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
- 5) The PRI is randomly selected to be at 1213 microseconds.
- 6) *Bursts* 2 through 8 are generated using steps 3 – 5.
- 7) Each *Burst* is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, *Burst* 1 is randomly generated (1 to 1,500,000 minus the total *Burst* 1 length + 1 random PRI interval) at the 325,001 microsecond step. *Bursts* 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. *Burst* 2 falls in the 1,500,001 – 3,000,000 microsecond range).

**Graphical representation of the Long Pulse radar Test Waveform.**





#### 6.1.4. Frequency Hopping Radar Test Waveform

**Frequency Hopping Radar Test Waveform**

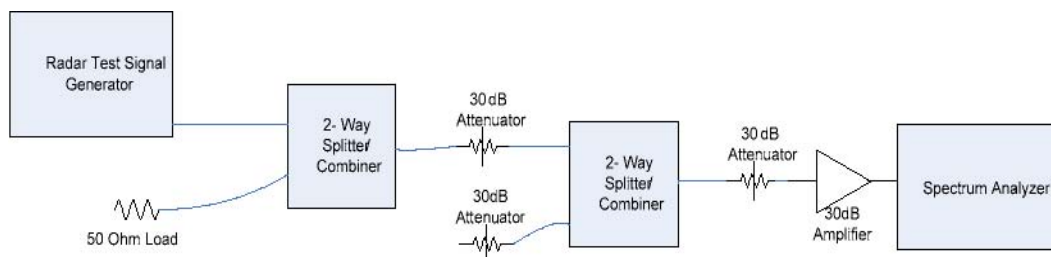
| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Minimum Percentage of Successful Detection | Minimum Trials |
|------------|--------------------|------------|----------------|--------------------|--------------------------------|--------------------------------------------|----------------|
| 6          | 1                  | 333        | 9              | .333               | 300                            | 70%                                        | 30             |

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

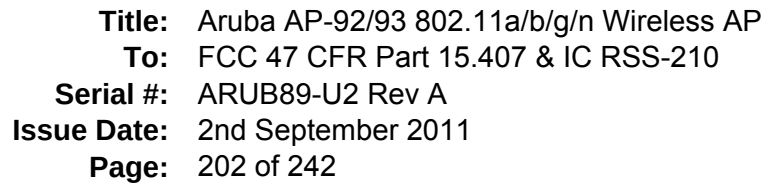
#### 6.1.5. Radar Waveform Calibration

The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz.

The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -61dBm (Ref Section 5.1). The 30dB amplifier gain was entered as an amplitude offset on the spectrum analyzer.



**Conducted Calibration Setup**

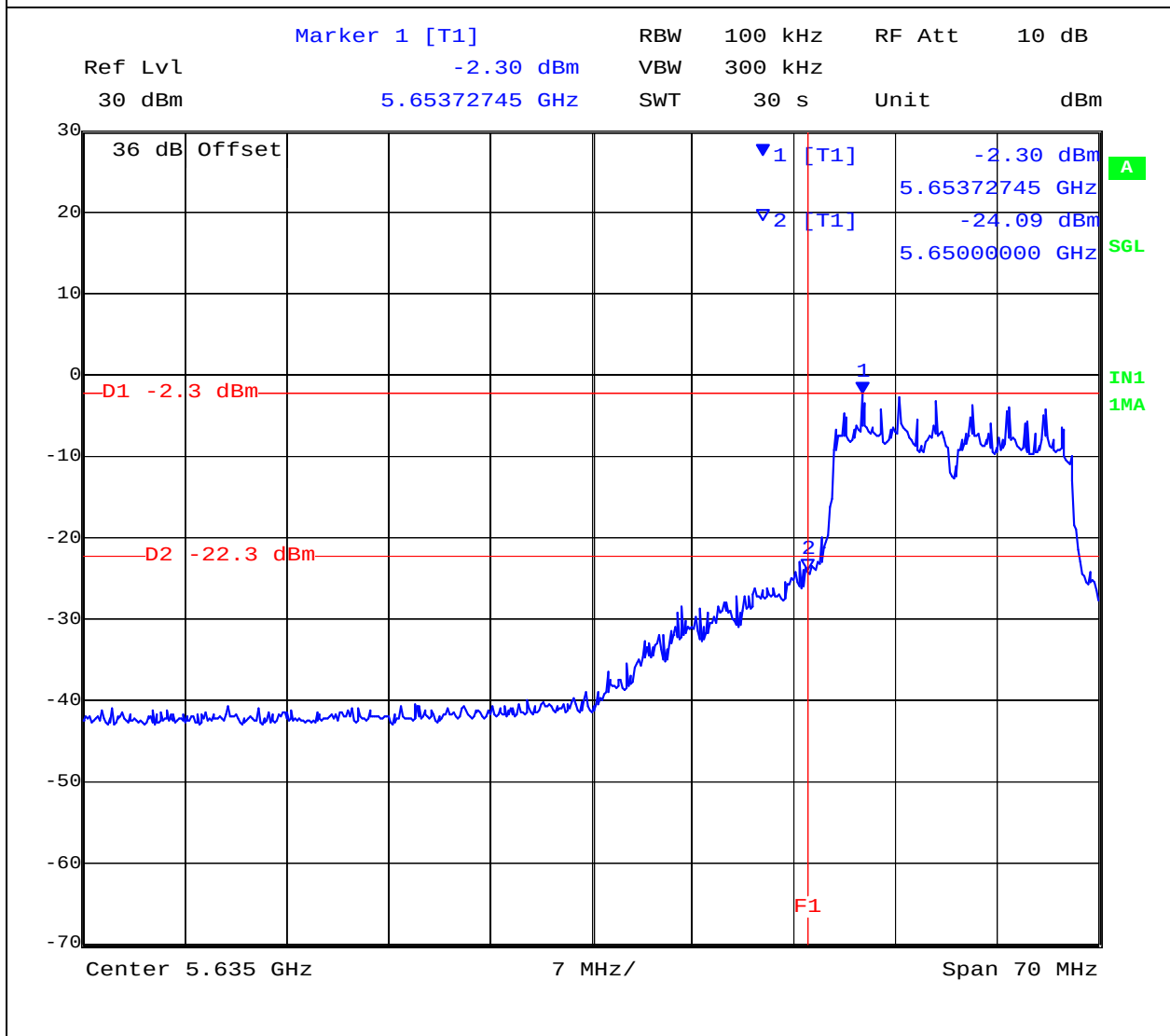




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### 5600 – 5650 MHz Upper Band Edge

#### 11a mode Ch 5,660 MHz



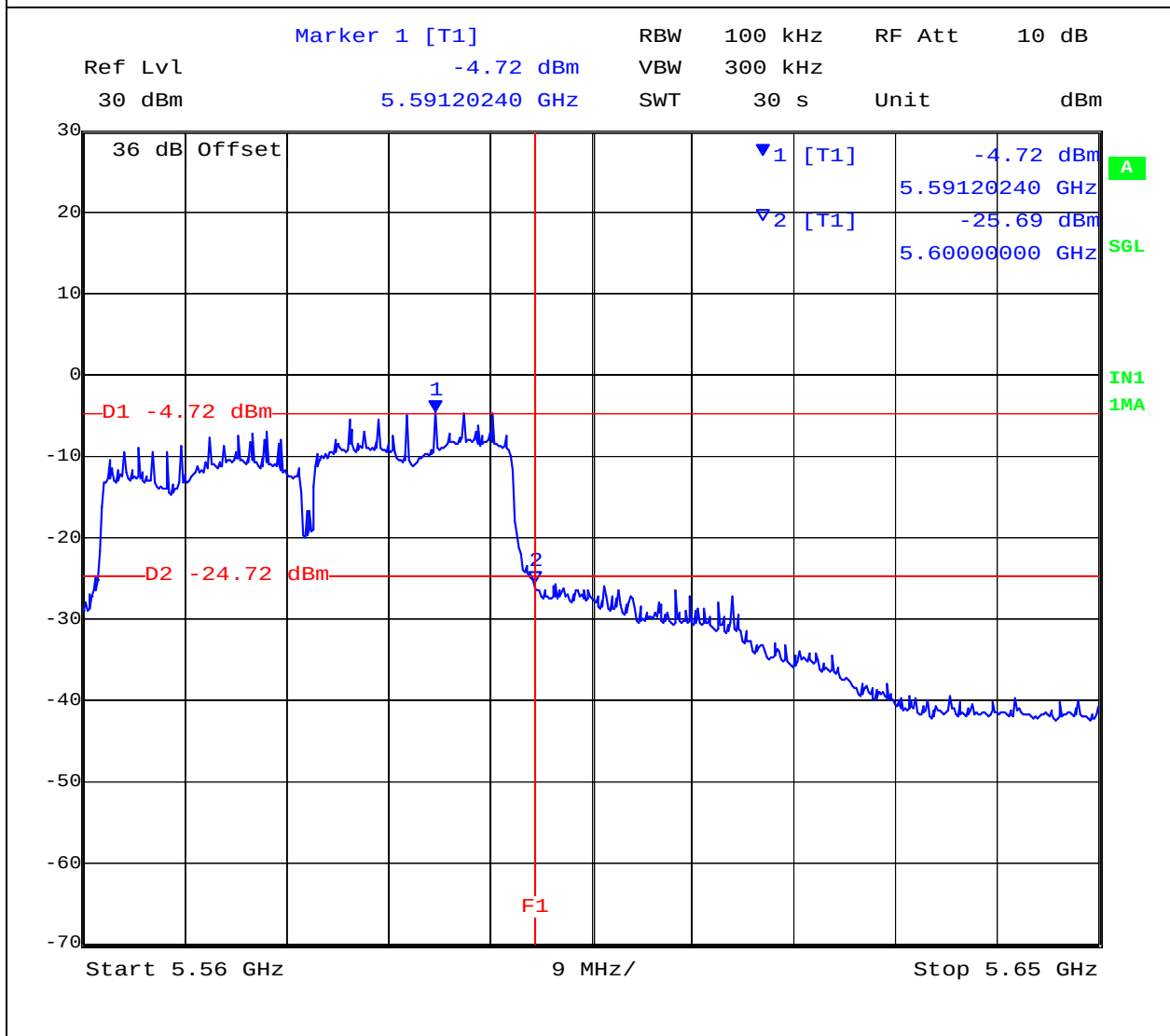
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### 5600 – 5650 MHz Lower Band Edge

#### 11n HT-40 mode Ch 5,580 MHz



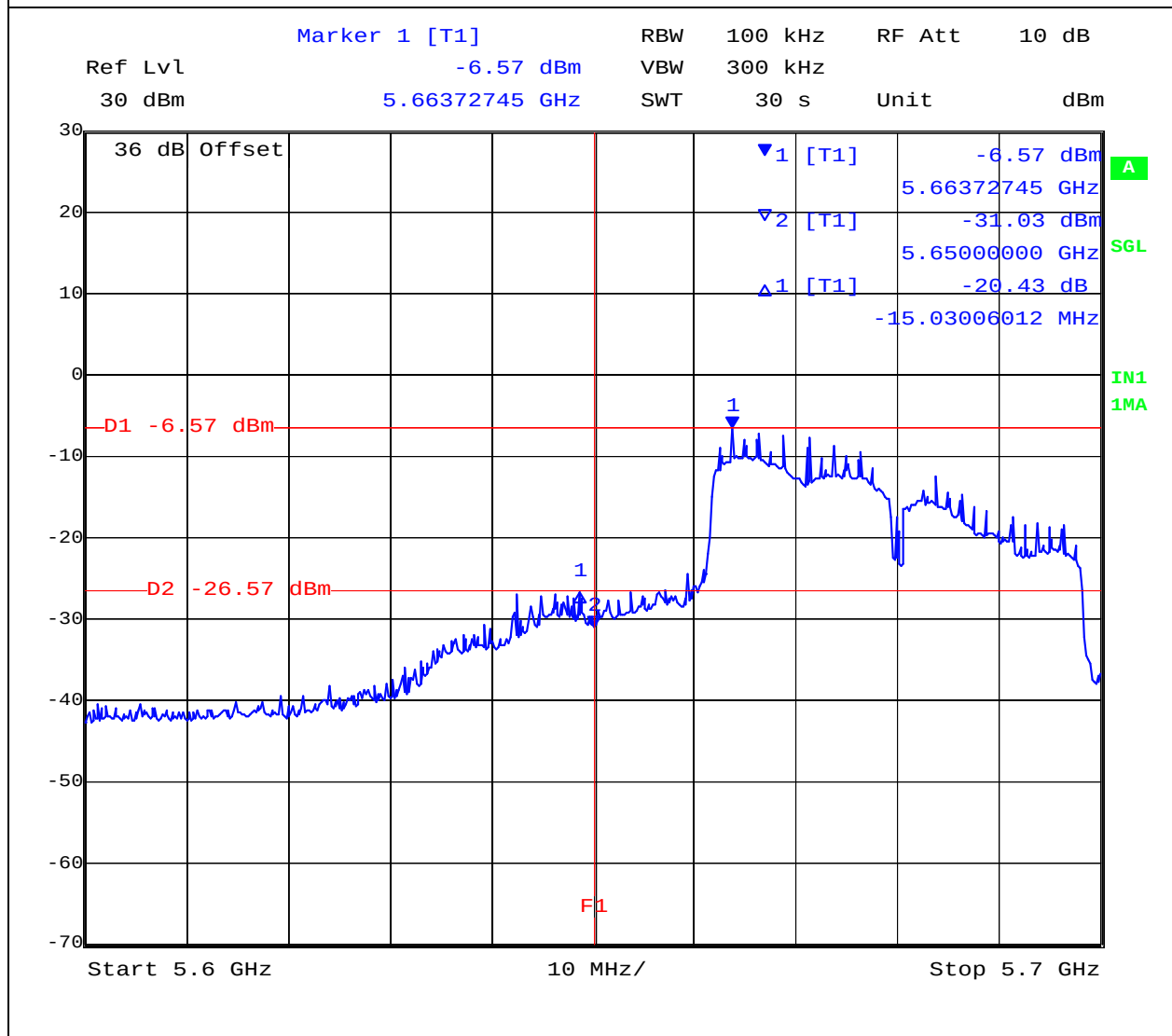
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### 5600 – 5650 MHz Upper Band Edge

#### 11n HT-40 mode Ch 5,680 MHz

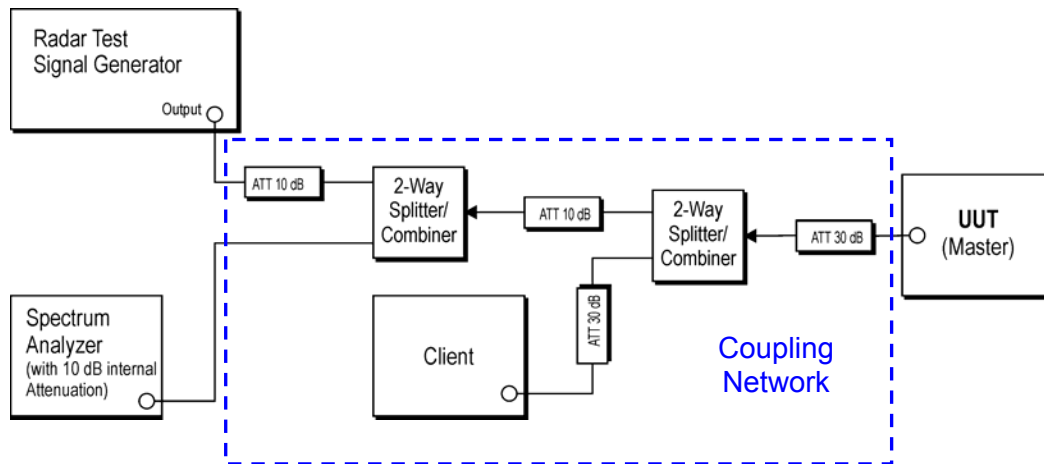


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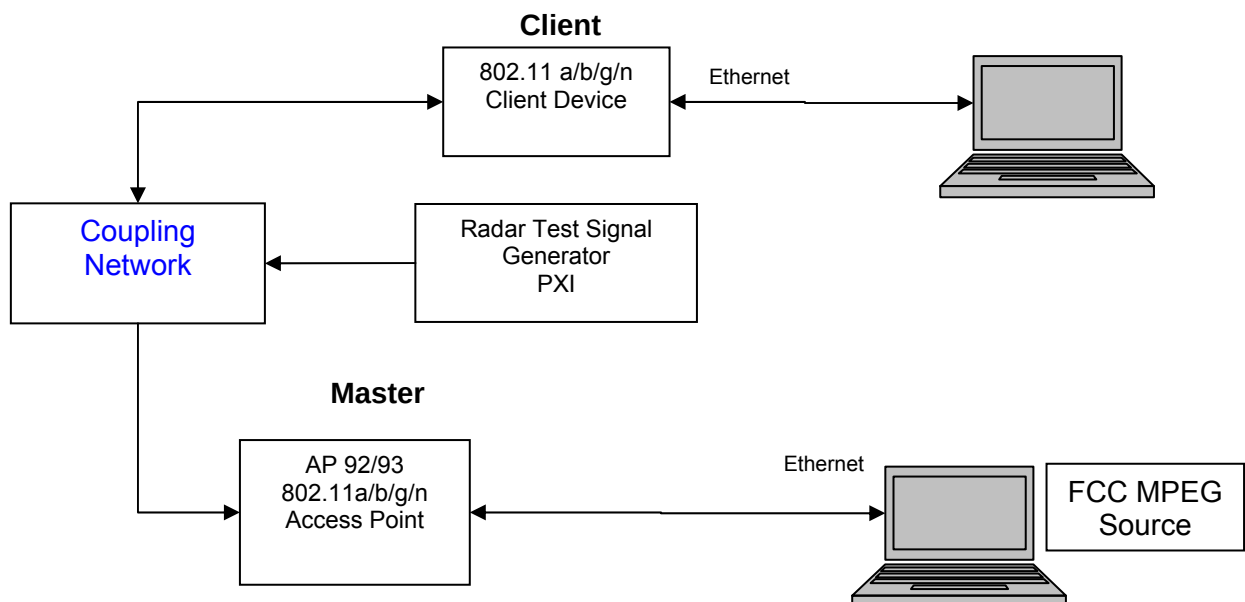
### 6.1.7. Test Set Up:

#### Block Diagram(s) of Test Setup

Setup for Conducted Measurements where the EUT is the Master with injection of Radar Test Waveforms at the Master.



#### Support Equipment Configuration





The EUT is a Master Device with radar detection.

**Applicability of DFS Requirements Prior to Use of a Channel**  
**(Ref Table 1 of FCC 06-96)**

| Requirement                            | Operational Mode |                                |                             |
|----------------------------------------|------------------|--------------------------------|-----------------------------|
|                                        | Master           | Client Without Radar Detection | Client With Radar Detection |
| <i>Non-Occupancy Period</i>            | Yes              | Not required                   | Yes                         |
| <i>DFS Detection Threshold</i>         | Yes              | Not required                   | Yes                         |
| <i>Channel Availability Check Time</i> | Yes              | Not required                   | Not required                |
| <i>Uniform Spreading</i>               | Yes              | Not required                   | Not required                |
| <i>U-NII Detection Bandwidth</i>       | Yes              | Not required                   | Yes                         |

**Applicability of DFS requirements during normal operation**  
**(Ref Table 2 of FCC 06-96)**

| Requirement                              | Operational Mode |                                |                             |
|------------------------------------------|------------------|--------------------------------|-----------------------------|
|                                          | Master           | Client Without Radar Detection | Client With Radar Detection |
| <i>DFS Detection Threshold</i>           | Yes              | Not required                   | Yes                         |
| <i>Channel Closing Transmission Time</i> | Yes              | Yes                            | Yes                         |
| <i>Channel Move Time</i>                 | Yes              | Yes                            | Yes                         |
| <i>U-NII Detection Bandwidth</i>         | Yes              | Not required                   | Yes                         |



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For the frequency band 5,470 – 5,725 MHz, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm. The EUT was tested in 11a and HT-40 modes.

Declared minimum antenna gain 0 dBi. ;

Radar receive signal level = -62 dBm + minimum antenna gain + 1 dB

$$= -62 + 0 + 1$$

Radar receive signal level = -61 dBm

### **Measurement Results - Dynamic Frequency Selection (DFS)**

Ambient conditions.

Temperature: 17 to 23 °C      Relative humidity: 31 to 57%      Pressure: 999 to 1012 mbar

Radio parameters.

Test methodology: Conducted

Device Type: Master

Transmit Power: Maximum

### **Operational Details - Dynamic Frequency Selection (DFS)**

Operational Modes: 802.11a and 802.11n HT40

Data Rates: 6mpbs 802.11a/ 0 MCS 802.11n

*Note; No video pixilation was observed during the video stream at these rates. Video frames per second were noted to be at 30fps.*

### **Video Streaming Method - Dynamic Frequency Selection (DFS)**

Using the VideoLan player a video stream was setup on the master laptop with the destination being the client laptop. The video profile chosen for the video stream is "MPEG-2 + MPGA (TS)". On the client laptop the VideoLan player was setup to listen to an incoming video stream from the master device.

The requisite MPEG video file ("TestFile.mpg" available on the NTIA website at the following link <http://ntiacsd.ntia.doc.gov/dfs/>) is used during this video stream.





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## **6.2. Dynamic Frequency Selection (DFS) Test Results**

### **6.2.1. UNII Detection Bandwidth:**

All UNII channels for this device have identical channel bandwidths and DFS testing was completed on channel 5,500 MHz (802.11a) and 5510MHz (HT40).

The generating equipment is configured as shown in the Conducted Test Setup above. A single Burst of the short pulse radar Type 1 through 6 was produced at 5,500 MHz (802.11a) and 5,510 MHz (802.11n HT40) at a level of -61 dBm (Ref Section 5.1). The EUT is set up as a standalone device (no associated Client and no traffic).

A single radar Burst is generated for a minimum of 10 trials, and the response of the EUT is noted. The EUT must detect the Radar Waveform 90% or more of the time.

The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted as  $F_H$ .

The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted as  $F_L$ .

The U-NII Detection Bandwidth is calculated as follows:

$$\text{U-NII Detection Bandwidth} = F_H - F_L$$

The U-NII Detection Bandwidth must be at least 80% of the EUT transmitter 99% power Table of results are continued on the next page.



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| EUT Frequency= 5,500 MHz 802.11a (Detection = √, No Detection = 0)        |   |   |   |   |   |   |   |   |   |    |                    |
|---------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|--------------------|
| Radar Frequency (MHz)                                                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Detection Rate (%) |
| -20                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -19                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -18                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -17                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -16                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -15                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -14                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -13                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -12                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| -11                                                                       | 0 | 0 |   |   |   |   |   |   |   |    | <90%               |
| -10                                                                       | √ | √ | √ | √ | √ | √ | 0 | √ | √ | 0  | <90%               |
| -9                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | 0 | 0  | <90%               |
| -8                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -7                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -6                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -5                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -4                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -3                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -2                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| -1                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| F <sub>0</sub>                                                            | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +1                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +2                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +3                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +4                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +5                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +6                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +7                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +8                                                                        | √ | √ | √ | √ | √ | √ | 0 | √ | √ | √  | 90%                |
| +9                                                                        | √ | √ | √ | √ | √ | √ | √ | √ | √ | √  | 100%               |
| +10                                                                       | √ | √ | √ | 0 | √ | √ | √ | √ | √ | 0  | <90%               |
| +11                                                                       | 0 | 0 | 0 | √ | √ | 0 |   |   |   |    | <90%               |
| +12                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| +13                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| +14                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| +15                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| +16                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| +17                                                                       |   |   |   |   |   |   |   |   |   |    | %                  |
| Detection Bandwidth = F <sub>H</sub> -F <sub>L</sub> = 5590-5510 = 20 MHz |   |   |   |   |   |   |   |   |   |    |                    |
| EUT 99% Bandwidth = 17.335 MHz (ref. bandwidth channel 5500 MHz)          |   |   |   |   |   |   |   |   |   |    |                    |
| 17.335 MHz *80% = 13.868 MHz                                              |   |   |   |   |   |   |   |   |   |    |                    |

For each frequency step the minimum percentage detection is 90%

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| EUT Frequency= 5,510 MHz 802.11n HT40 (Detection = $\sqrt{}$ , No Detection = 0) |           |           |           |           |           |           |           |           |           |           |                    |
|----------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------------|
| Radar Frequency (MHz)                                                            | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         | 9         | 10        | Detection Rate (%) |
| -21                                                                              | 0         | 0         |           |           |           |           |           |           |           |           | <90%               |
| -20                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -19                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -18                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -17                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -16                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -15                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -14                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -13                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -12                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -11                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -10                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -9                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -8                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -7                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -6                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -5                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -4                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -3                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -2                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| -1                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| F <sub>0</sub>                                                                   | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |

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| EUT Frequency= 5,510 MHz 802.11n HT40 (Detection = $\sqrt{}$ , No Detection = 0) |           |           |           |           |           |           |           |           |           |           |                    |
|----------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------------|
| Radar Frequency (MHz)                                                            | 1         | 2         | 3         | 4         | 5         | 6         | 7         | 8         | 9         | 10        | Detection Rate (%) |
| F <sub>0</sub>                                                                   | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +1                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +2                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +3                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +4                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +5                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +6                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +7                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +8                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +9                                                                               | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +10                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +11                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +12                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +13                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +14                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +15                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +16                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +17                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +18                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +19                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +20                                                                              | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | $\sqrt{}$ | 100%               |
| +21                                                                              | 0         | 0         |           |           |           |           |           |           |           |           | <90%               |
| Detection Bandwidth = F <sub>H</sub> -F <sub>L</sub> = 5590-5530 = 40 MHz        |           |           |           |           |           |           |           |           |           |           |                    |
| EUT 99% Bandwidth = 37.074 MHz (ref. bandwidth channel 5510 MHz)                 |           |           |           |           |           |           |           |           |           |           |                    |
| 37.074 MHz *80% = 29.659 MHz                                                     |           |           |           |           |           |           |           |           |           |           |                    |

For each frequency step the minimum percentage detection is 90%

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#### **6.2.2. Initial Channel Availability Check Time**

This test verifies that the EUT does not emit pulse, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms.

The U-NII device is powered on and be instructed to operate at 5,500 MHz 802.11a and 5510 802.11n HT40. At the same time the EUT is powered on, the spectrum analyzer is set for zero span with a 1 MHz resolution bandwidth at 5,500 & 5510 MHz with a 260 second sweep time. The analyzer's sweep will be started the same time power is applied to the U-NII device.

The EUT should not transmit any pulse or data transmissions until at least 1 minute after the completion of the power-on cycle.

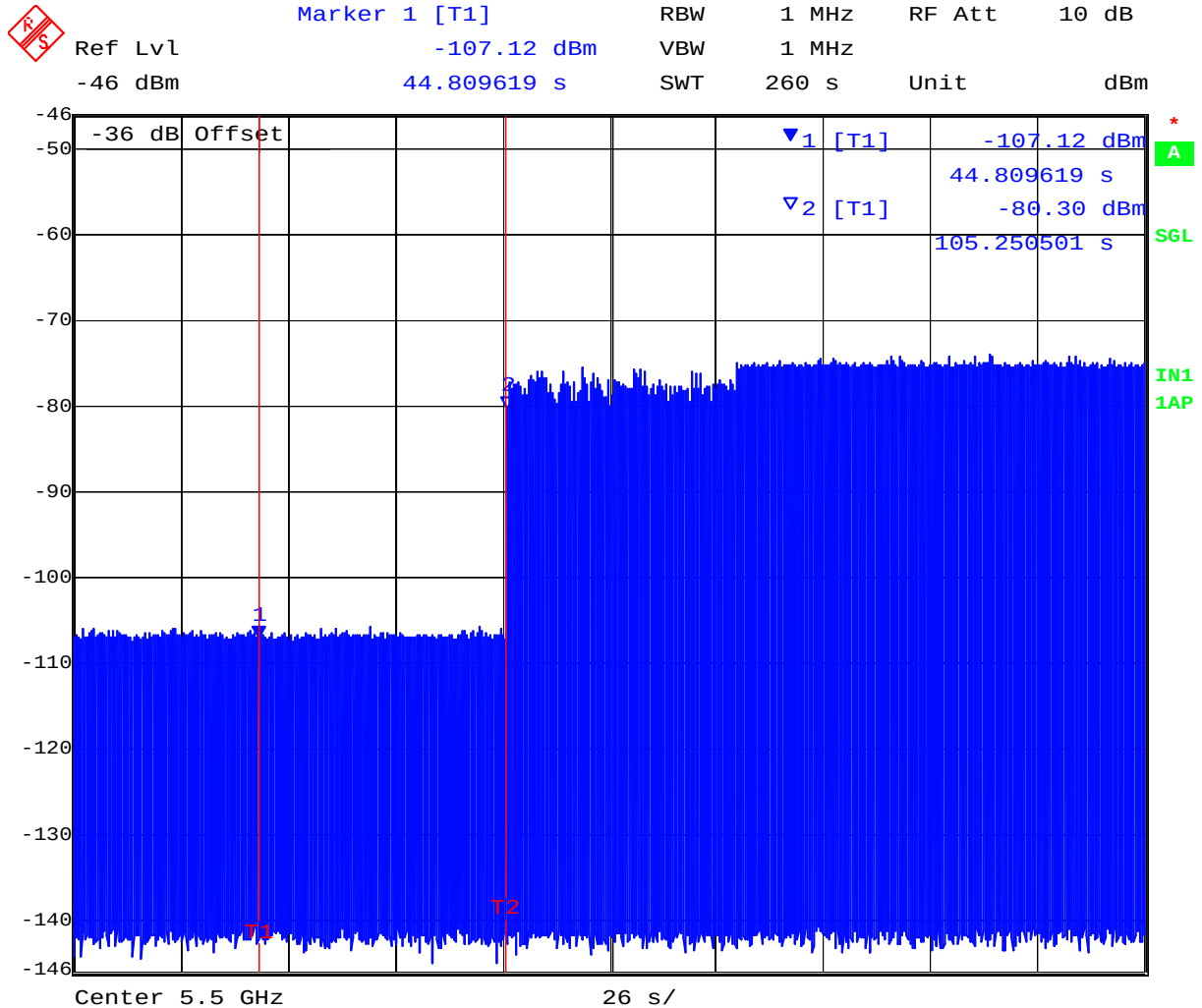
The first red marker line shown on the following plot denotes the instant when the EUT starts its power-up sequence i.e.  $T_0$  (as defined within the FCC's MO&O 06-96 Normative Reference 2 ). The power-up reference  $T_0$  is determined by the time it takes for the EUT to start "beaconing" i.e. initial beacon – 60 secs = end of power-up.

The Channel Availability Check Time commences at instant  $T_0$  and will end no sooner than  $T_0 + 60$  seconds.



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EUT power up and Initial Channel Availability Check Time  
5,500MHz 802.11a Power On = 105.25 Seconds



Date: 8.JUN.2011 12:42:38

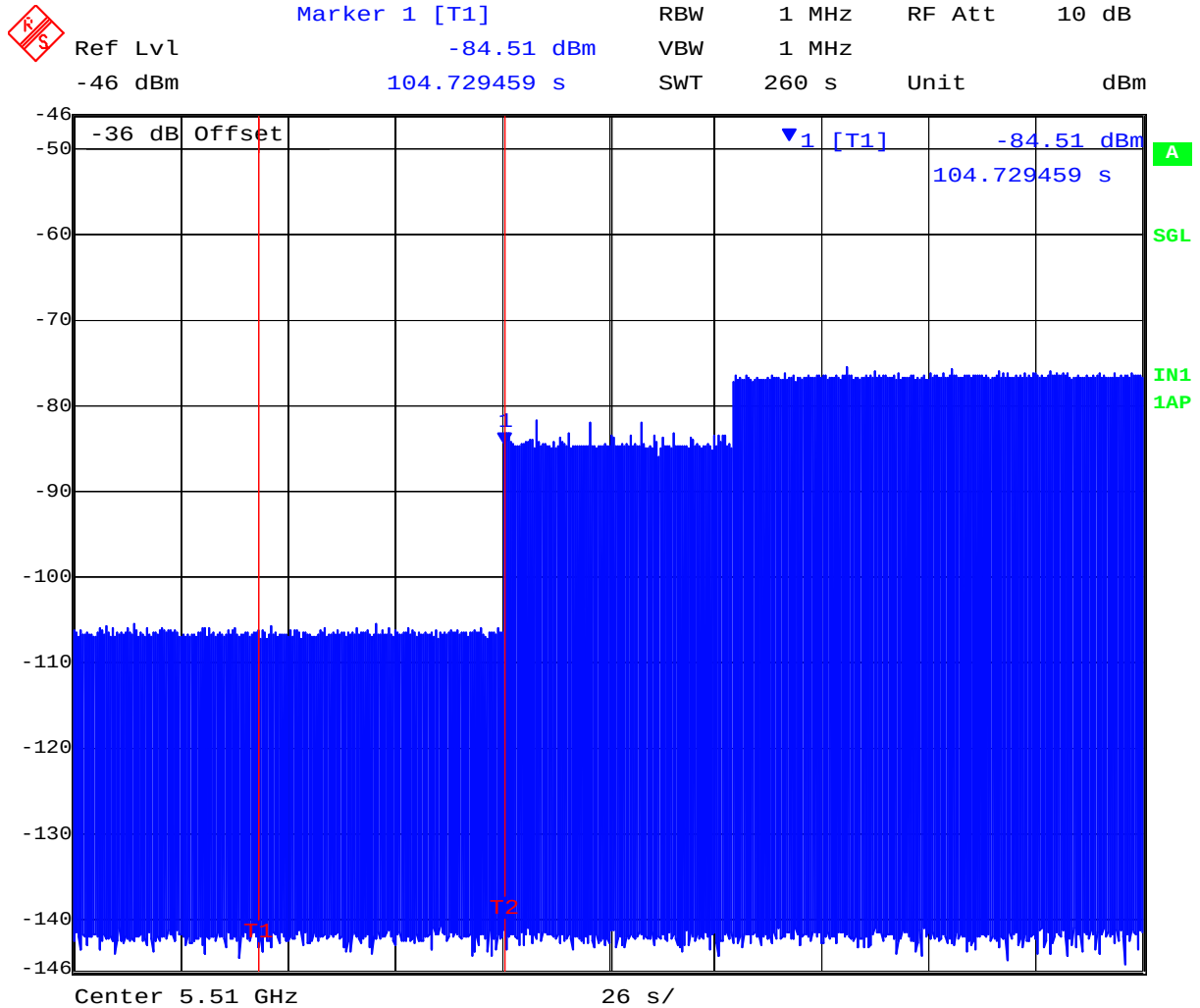
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### EUT power up and Initial Channel Availability Check Time

5,510MHz 802.11n HT40 Power On = 104.73 Seconds



Date: 8.JUN.2011 11:42:43

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### **6.2.3. Radar Burst at the Beginning of the Channel Availability Check Time:**

The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold +6 dB (-62 dBm Ref Section 5.1.7) occurs at the beginning of the Channel Availability Check Time.

A single Burst of short pulse of radar Type 1 will commence within a 6 second window starting at T0 (first red marker line on the following plot).

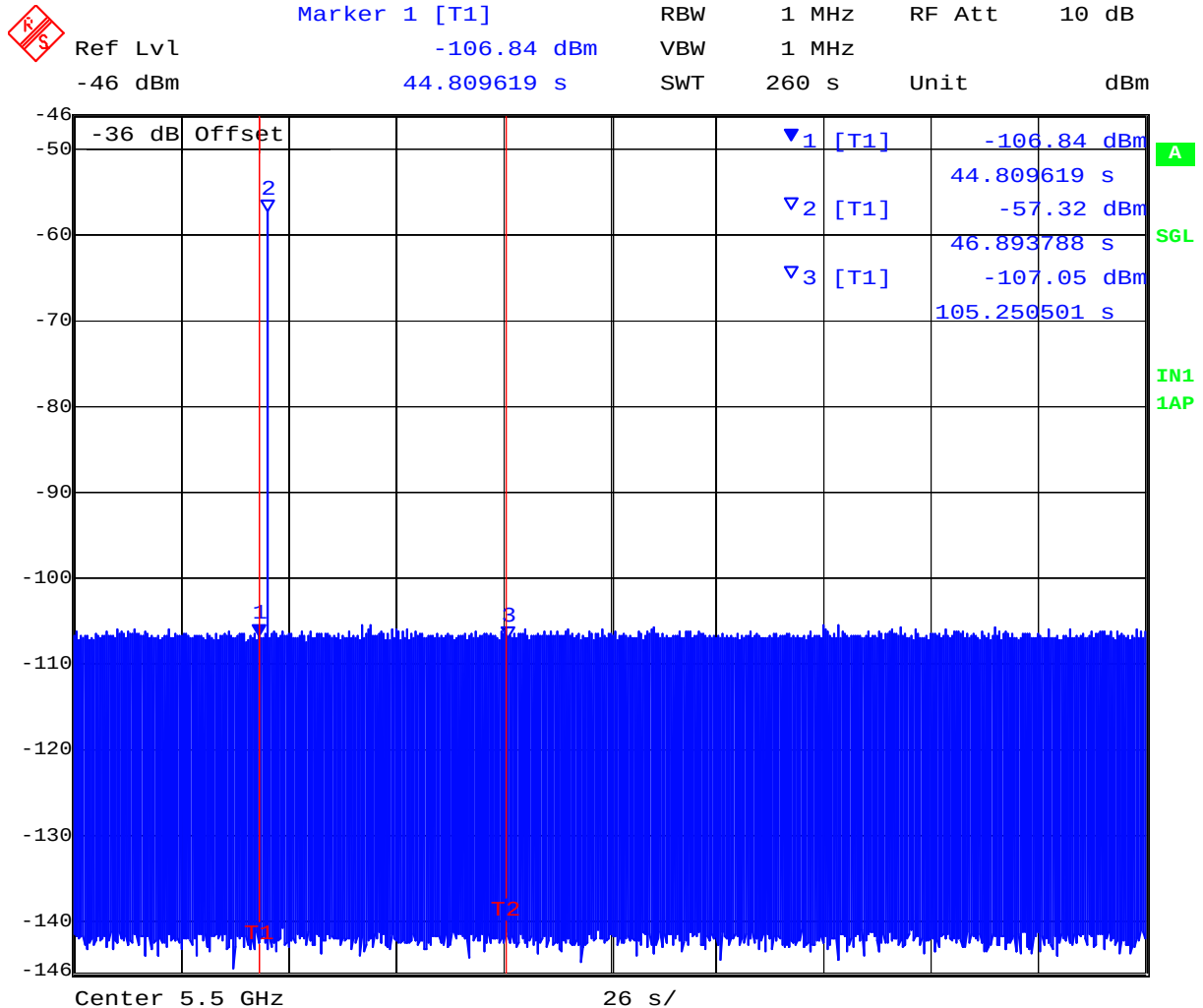
Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5,500MHz 802.11a & 5,510MHz 802.11n HT40 will continue for 2.5 minutes after the radar burst has been generated.





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Channel Availability Check Time at the start T0 + 6 seconds Check Time  
5,500MHz 802.11a



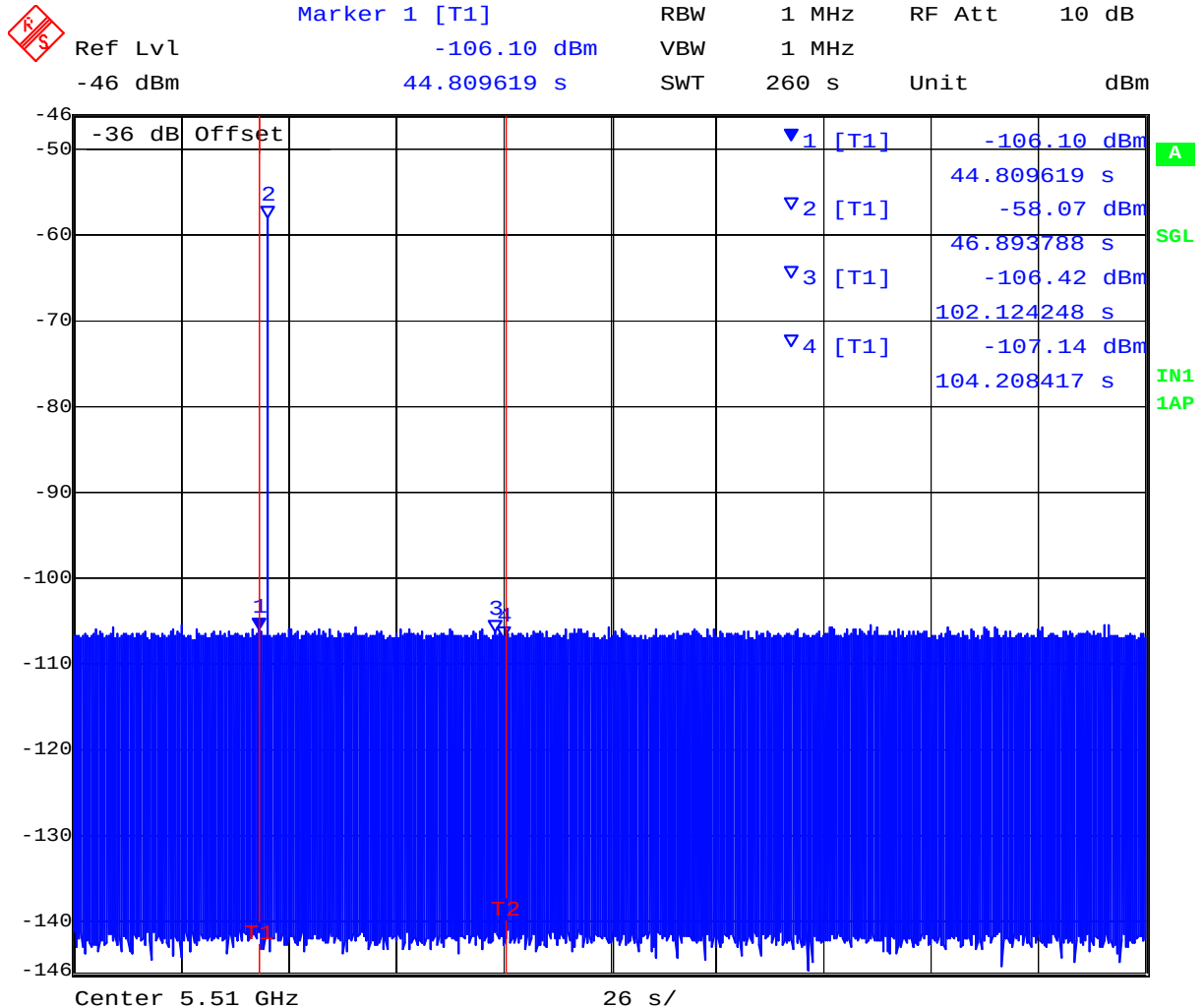
Date: 8.JUN.2011 12:49:42

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Channel Availability Check Time at the start T0 + 6 seconds Check Time  
5,510MHz 802.11n HT40



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#### **6.2.4. Radar Burst at the End of the Channel Availability Check Time:**

The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar burst with a level equal to the DFS Detection Threshold occurs at the end of the Channel Availability Check Time.

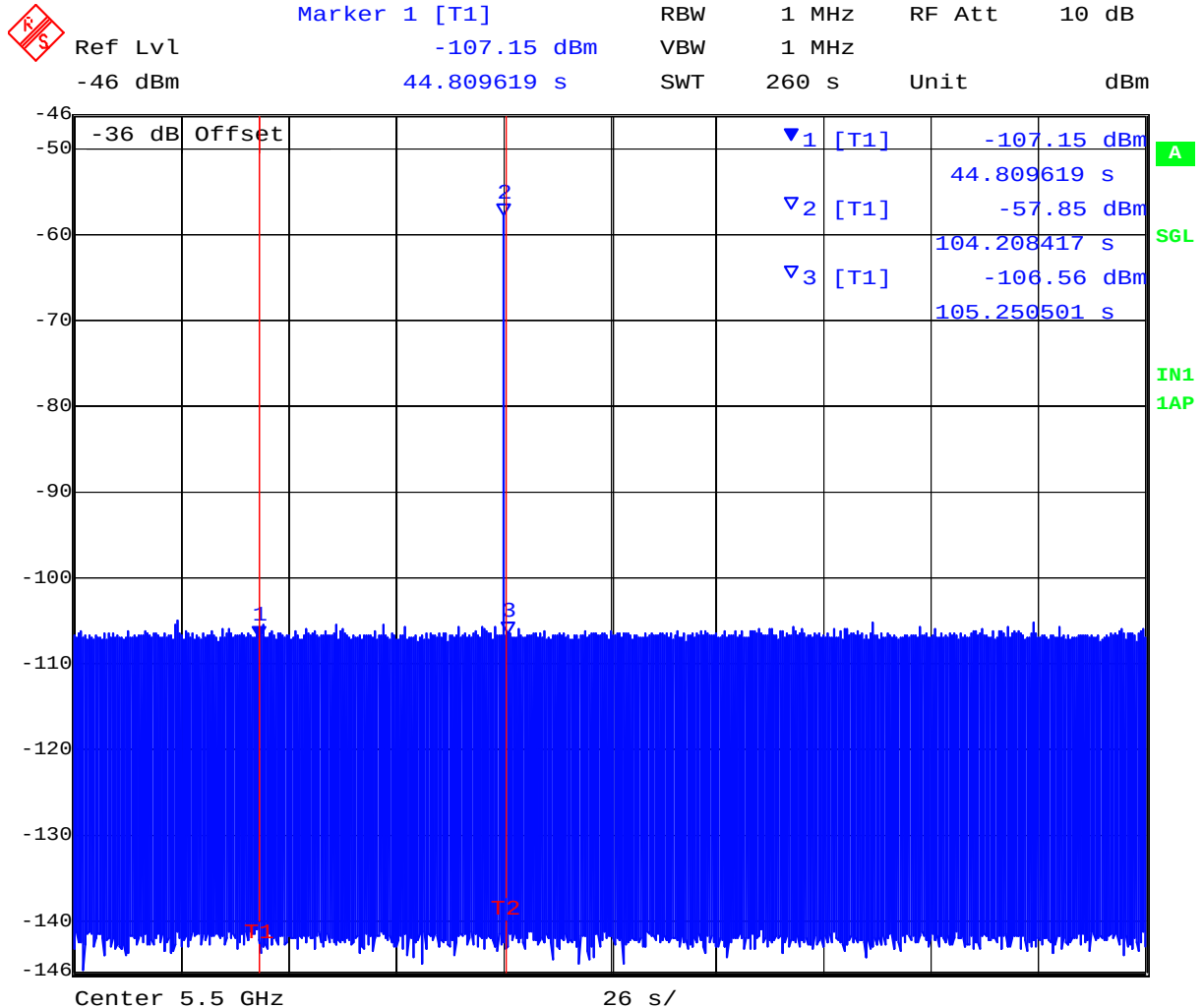
A single Burst of short pulse of radar type 1 will commence within a 6 second window starting at  $T_0 + 54$  seconds. The window will commence at marker 3 and end at the red line  $T_2$ .

Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5,500MHz 802.11a & 5510 MHz 802.11n HT40 will continue for 2.5 minutes after the radar burst has been generated.



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Channel Availability Check Time at T0 + 54 seconds Check Time  
5,500MHz 802.11a



Date: 8.JUN.2011 13:02:04

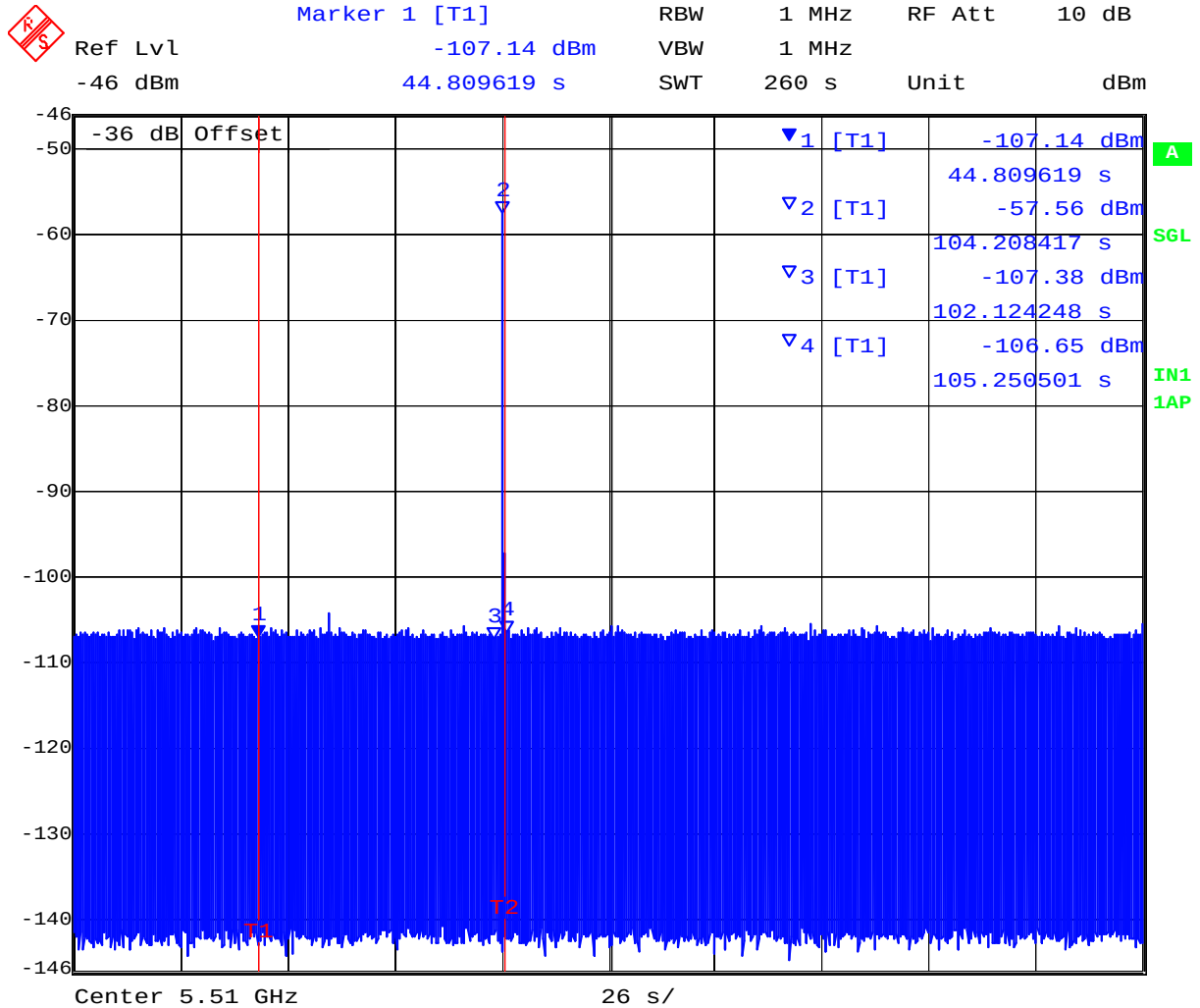
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### Channel Availability Check Time at T0 + 54 seconds Check Time

#### 5,510MHz 802.11n HT40



Date: 8.JUN.2011 12:19:25

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