

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

To: FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: ARUB74-U1 Rev A



# TEST REPORT

FROM



**Test of:** Aruba Networks, Inc AP-93H 802.11a/b/g/n Wireless AP

**To:** FCC 47 CFR Part 15.247 & IC RSS 210

**Test Report Serial No.:** ARUB74-U1 Rev A

Note: this report contains data with regard to the 2400 to 2483.5 MHz and 5725 to 5850 MHz bands for the Aruba Networks, Inc AP-93H Wireless LAN Access Point. 5,150 to 5,250 MHz test data are reported in MiCOM Labs test report ARUB74-U2.

This report supersedes: NONE

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

**Product Function:** Wireless LAN Access Point

**Copy No:** pdf      **Issue Date:** 21<sup>st</sup> December 2011

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

**MiCOM Labs, Inc.**  
440 Boulder Court, Suite 200  
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CERTIFICATE #2381.01

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



**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74 –U1 Rev A  
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## 1 ACCREDITATION, LISTINGS & RECOGNITION

### ACCREDITATION - TESTING

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

World Class Accreditation

### *Accredited Product Certification Body*

A2LA has accredited

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*Pleasanton, CA*

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.), Japan (MIC), and IC (Canada) requirements.



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

*Pete Meyer*

President & CEO  
For the Accreditation Council  
Certificate Number 2381.02  
Valid to January 31, 2012  
Revised September 2, 2011

*For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification 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) 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

### Accredited Laboratory

A2LA has accredited

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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 January 31, 2012  
Revised September 2, 2011

*For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical 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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## **2 DOCUMENT HISTORY**

| Document History |                                |                 |
|------------------|--------------------------------|-----------------|
| Revision         | Date                           | Comments        |
| Draft            |                                |                 |
| Rev A            | 21 <sup>st</sup> December 2011 | Initial Release |
|                  |                                |                 |
|                  |                                |                 |

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### 3 TEST RESULT CERTIFICATE

|              |                                                                                                   |            |                                                                                            |
|--------------|---------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|
| Applicant:   | Aruba Networks, Inc<br>1344 Crossman Avenue<br>Sunnyvale<br>California , 94089, USA               | Tested By: | MiCOM Labs, Inc.<br>440 Boulder Court<br>Suite 200<br>Pleasanton<br>California, 94566, USA |
| EUT          | Wireless LAN Access Point                                                                         | Tel:       | +1 925 462 0304                                                                            |
| Model        | AP-93H                                                                                            | Fax:       | +1 925 462 0306                                                                            |
| S/No's:      | AN0000049 (Conducted)<br>AN0000064 (Radiated)                                                     |            |                                                                                            |
| Test Date(s) | 8 <sup>th</sup> Oct to 5 <sup>th</sup> Dec 2011<br>3 <sup>rd</sup> to 28 <sup>th</sup> April 2010 | Website:   | www.micomlabs.com                                                                          |

| STANDARD(S)                        | TEST RESULTS       |
|------------------------------------|--------------------|
| FCC 47 CFR Part 15, SubPart 15.247 | EQUIPMENT COMPLIES |

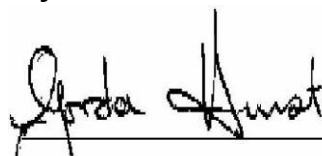
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

#### 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.



CERTIFICATE #2381.01

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## **4 REFERENCES AND MEASUREMENT UNCERTAINTY**

### **4.1 Normative References**

| <b>Ref.</b>  | <b>Publication</b>             | <b>Year</b>                           | <b>Title</b>                                                                                                                                                         |
|--------------|--------------------------------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>i.</b>    | 47 CFR Part 15, SubPart 15.247 | 2009                                  | For Digitally Modulated Intentional Radiators                                                                                                                        |
| <b>ii.</b>   | Industry Canada RSS-210        | Issue 7<br>June 2007                  | Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment                                                                      |
| <b>iii.</b>  | Industry Canada RSS-Gen        | Issue 2<br>June 2007                  | General Requirements and Information for the Certification of Radiocommunication Equipment                                                                           |
| <b>iv.</b>   | ANSI C63.4                     | 2003                                  | 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 |
| <b>v.</b>    | CISPR 22/<br>EN 55022          | 2005                                  | Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment                                                          |
| <b>vi.</b>   | M 3003                         | Edition 1<br>Dec. 1997                | Expression of Uncertainty and Confidence in Measurements                                                                                                             |
| <b>vii.</b>  | LAB34                          | Edition 1<br>Aug 2002                 | The expression of uncertainty in EMC Testing                                                                                                                         |
| <b>viii.</b> | ETSI TR 100 028                | 2001                                  | Parts 1 and 2<br>Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics          |
| <b>ix.</b>   | A2LA                           | 14 <sup>th</sup><br>September<br>2005 | Reference to A2LA Accreditation Status – A2LA Advertising Policy                                                                                                     |

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## **4.2 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.



## 5 TEST SUMMARY

**List of Measurements:** The following table represents the list of measurements required under **FCC 47 CFR Part 15**, SubPart 15.247

| Standard Section(s) | Test Description                        | Condition   | Result    | Test Report Section |
|---------------------|-----------------------------------------|-------------|-----------|---------------------|
| (a)(2)              | 6 dB Occupied Bandwidth                 | Conducted   | Compliant | 7.1                 |
| (b)(3), (b)(4)      | Peak Output Power                       | Conducted   | Compliant | 7.2                 |
| (e)                 | Peak Power Spectral Density             | Conducted   | Compliant | 7.3                 |
| (i)                 | Maximum Permissible Exposure            | Calculation | Compliant | 7.4                 |
| (d)                 | Spurious Emissions                      | Conducted   | Compliant | 7.5                 |
| (d), 15.205, 15.209 | Transmitter Radiated Spurious Emissions | Radiated    | Compliant | 7.6                 |
| (d), 15.205, 15.209 | Radiated Band-Edge                      | Radiated    | Compliant | 7.6                 |
| 15.205, 15.210      | Radiated (Digital) Emissions            | Radiated    | Compliant | 7.6                 |
| 15.207              | AC Wireline Emissions 0.15 – 30 MHz     | Conducted   | Compliant | 7.7                 |

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 6.7 Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix



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## 6 PRODUCT DETAILS AND TEST CONFIGURATIONS

### 6.1 EUT Details

| Detail                              | Description                                                                                                                                                                                                                                                                               |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Purpose:                            | Test of the Aruba Networks, Inc AP-93H 802.11a/b/g/n Wireless LAN Access Point for compliance against FCC 47 CFR Part 15, SubPart 15.247 and Industry Canada RSS-210 regulations.                                                                                                         |
| Applicant:                          | Aruba Networks, Inc<br>1344 Crossman Avenue<br>Sunnyvale , CA<br>94089 USA                                                                                                                                                                                                                |
| Manufacturer:                       | As manufacturer                                                                                                                                                                                                                                                                           |
| Test Laboratory:                    | MiCOM Labs, Inc.<br>440 Boulder Court, Suite 200<br>Pleasanton, California 94566 USA                                                                                                                                                                                                      |
| Test report reference number:       | ARUB51-U1 Rev A                                                                                                                                                                                                                                                                           |
| Date EUT received:                  | 6 <sup>th</sup> October 2011                                                                                                                                                                                                                                                              |
| Dates of test (from - to):          | 8th Oct to 5th Dec 2011 & 3 <sup>rd</sup> to 28 <sup>th</sup> April 2010                                                                                                                                                                                                                  |
| No of Units Tested:                 | 2                                                                                                                                                                                                                                                                                         |
| Product Name:                       | AP-93H (Integral antenna)                                                                                                                                                                                                                                                                 |
| Manufacturers Trade Name:           | Aruba Networks, Inc                                                                                                                                                                                                                                                                       |
| Equipment Primary Function:         | 802.11a/b/g/n Wireless LAN Access Point, 2x2 Spatial Multiplexing MIMO configuration                                                                                                                                                                                                      |
| Type of Technology:                 | 802.11                                                                                                                                                                                                                                                                                    |
| Installation type:                  | Fixed                                                                                                                                                                                                                                                                                     |
| Construction/Location for Use:      | Indoor only                                                                                                                                                                                                                                                                               |
| Software/Firmware Release:          | 5.0.1.0 ART v0_9-b16ALL                                                                                                                                                                                                                                                                   |
| Transmit/Receive Operation:         | TDD (Time Div Duplex)                                                                                                                                                                                                                                                                     |
| Output Power Type                   | Stepped                                                                                                                                                                                                                                                                                   |
| Rated Input Voltage and Current DC: | 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(s):         | 2400 – 2483.5 MHz 802.11b 15M8G1D<br>2400 – 2483.5 MHz 802.11g 17M7D1D<br>2400 – 2483.5 MHz 802.11n – HT-20 18M7D1D<br>2400 – 2483.5 MHz 802.11n – HT-40 36M6D1D<br>5725 – 5850 MHz 802.11a 17M8D1D<br>5725 – 5850 MHz 802.11n – HT-20 18M4D1D<br>5725 – 5850 MHz 802.11n – HT-40 36M6D1D |
| Long Term 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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## 6.2 Scope of Test Program

### Testing

Per manufactures declaration: The AP-93H contains an AP-93 Access Point with the addition of 4 Ethernet port LAN switch functionality to the main board (digital portion modification only). The RF part of the device is not modified.

The scope of the compliance program was to test the Aruba AP-93H wireless LAN access point, 2x2 Spatial Multiplexing MIMO configurations in the frequency ranges 2400 – 2483.5 MHz and 5725-5850 MHz for compliance against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications. This report contains data previous reported in MiCOM Labs test report ARUB51-U1 Rev A Aruba AP-92\_93 FCC Part 15.247.

### AP-93H Access Point

The AP-93 is a 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-93H delivers 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 right sized, 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-93H 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-93H 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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### 6.3 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-93H    | AN0000049 (Conducted)<br>AN0000064 (Radiated) |
| Support            | Laptop PC                                    | IBM                 | Thinkpad  | None                                          |

### 6.4 Antenna Details

| Antenna Type: | Manufacturer        | Model | Gain (dBi) | Frequency Range (MHz) |
|---------------|---------------------|-------|------------|-----------------------|
| Integral      | Aruba Networks, Inc | PIFA  | 2.5        | 2400 - 2500           |
| Integral      | Aruba Networks, Inc | PIFA  | 5.8        | 4900 - 5875           |

### 6.5 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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## 6.6 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.

| Operational Mode(s)<br>(802.11a/b/g/n) | Variant | Data Rate with Highest<br>Power | Frequencies<br>(MHz) |
|----------------------------------------|---------|---------------------------------|----------------------|
| b                                      | Legacy  | 1 MBit/s                        | 2,412                |
| g                                      | Legacy  | 6 MBit/s                        | 2,437                |
| n                                      | HT-20   | 6.5 MCS                         | 2,462                |
|                                        | HT-40   | 13.5 MCS                        | 2,422                |
|                                        |         |                                 | 2,437                |
|                                        |         |                                 | 2,452                |
| a                                      | Legacy  | 6 MBit/s                        | 5,745                |
| n                                      | HT-20   | 6.5 MCS                         | 5,785                |
|                                        | HT-40   | 13.5 MCS                        | 5,825                |
|                                        |         |                                 | 5,755                |
|                                        |         |                                 | 5,785                |
|                                        |         |                                 | 5,815                |

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report



## Antenna Test Configurations for Radiated Emissions

### Spurious Emission and Band-Edge Test Strategy

When testing radiated spurious emissions and band-edge two identical antennae were connected to the EUT at all times. Transmission during this test process simulated a typical installation. Results for the following configurations are provided in this report.

2,400 – 2483.5 MHz

| 15.247  |             |
|---------|-------------|
|         | Integral    |
| 802.11b | b SE 2412   |
|         | b SE 2437   |
|         | b SE 2462   |
|         | BE b 2390   |
|         | b Pk 2412   |
|         | b Pk 2437   |
|         | b Pk 2462   |
|         | BE b 2483.5 |
| 802.11g | g SE 2412   |
|         | g SE 2437   |
|         | g SE 2462   |
|         | BE g 2390   |
|         | g Pk 2412   |
|         | g Pk 2437   |
|         | g Pk 2462   |
|         | BE g 2483.5 |
| HT-20 n | g SE 2412   |
|         | g SE 2437   |
|         | g SE 2462   |
|         | BE g 2390   |
|         | PK g 2412   |
|         | PK g 2437   |
|         | PK g 2462   |
|         | BE g 2483.5 |
| HT-40 n | g SE 2422   |
|         | g SE 2437   |
|         | g SE 2452   |
|         | BE g 2390   |
|         | PK g 2422   |
|         | PK g 2437   |
|         | PK g 2452   |
|         | BE g 2483.5 |

KEY:-

SE – Spurious Emission  
BE – Band-Edge  
PK - Peak Emission

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5,725 – 5850 MHz

| 15.247  |           |
|---------|-----------|
|         | Integral  |
| Legacy  |           |
| 802.11a | a SE 5745 |
|         | a SE 5785 |
|         | a SE 5825 |
|         | Pk a 5745 |
|         | Pk a 5785 |
|         | Pk a 5825 |
|         | BE a 5460 |
| HT-20   | a SE 5745 |
|         | a SE 5785 |
|         | a SE 5825 |
|         | Pk a 5745 |
|         | Pk a 5785 |
|         | Pk a 5825 |
|         | BE a 5460 |
| HT-40   | a SE 5755 |
|         | a SE 5785 |
|         | a SE 5815 |
|         | Pk a 5755 |
|         | Pk a 5785 |
|         | Pk a 5815 |
|         | BE a 5460 |

KEY:-

SE – Spurious Emission  
BE – Band-Edge  
PK - Peak Emission

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---

## **6.7 Equipment Modifications**

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

1. NONE

## **6.8 Deviations from the Test Standard**

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

1. NONE

## **6.9 Subcontracted Testing or Third Party Data**

1. NONE

## 7 TEST RESULTS

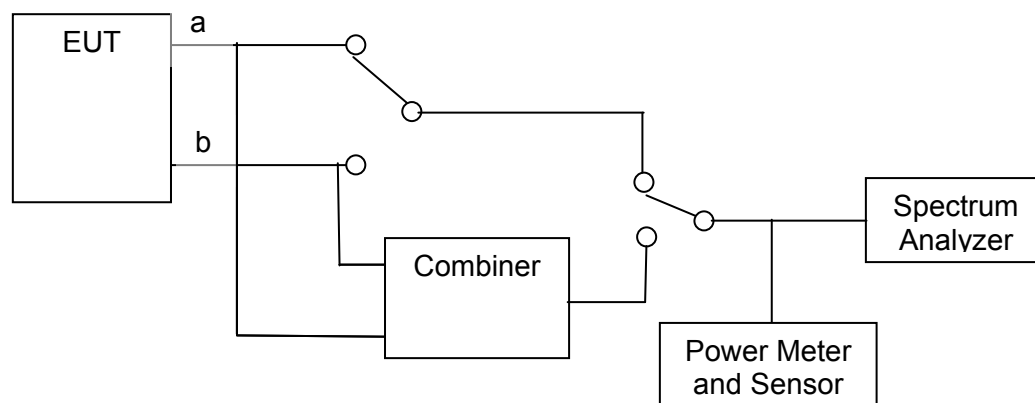
### 7.1 6 dB and 99% Bandwidth

#### Test Procedure

The test methodology and conditions utilized for each measurement is referenced in the following test results matrix. 6 dB and 99% bandwidth were measured per the Test Configuration identified below.

Testing was restricted to a single port.

#### Test Configuration



Test configuration for 6 dB & 99% Bandwidth

#### Specification

##### Limits

##### §15.247 (a)(2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

#### Traceability

| Method                                                                              | Test Equipment Used                            |
|-------------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask' | 0158, 0252, 0313, 0314, 0116, 0117, 0287, 0363 |

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### 7.1.1 6 dB and 99% Bandwidth Results: 802.11b

|                               |               |                            |             |
|-------------------------------|---------------|----------------------------|-------------|
| <b>Test Conditions:</b>       | 15.247 (a)(2) | <b>Rel. Humidity (%):</b>  | 35 to 42    |
| <b>Variant:</b>               | 802.11b       | <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>       | 2.5 dBi     |
| <b>Applied Voltage:</b>       | 55.00 Vdc     |                            |             |
| <b>Notes 1:</b>               |               |                            |             |
| <b>Notes 2:</b>               |               |                            |             |

#### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |    |    | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|----|----|-----------------------------|-----|------------|
|                | MHz            |           |    |    |                             |     |            |
| MHz            | a              | b         | c  | d  | kHz                         | MHz | MHz        |
| 2412.000       | 12.665000      | 12.585000 | -- | -- | 500                         | 0.5 | -12.085000 |
| 2437.000       | 12.184000      | 12.104000 | -- | -- |                             |     | -11.604000 |
| 2462.000       | 12.104000      | 12.184000 | -- | -- |                             |     | -11.604000 |

#### 99% Bandwidth

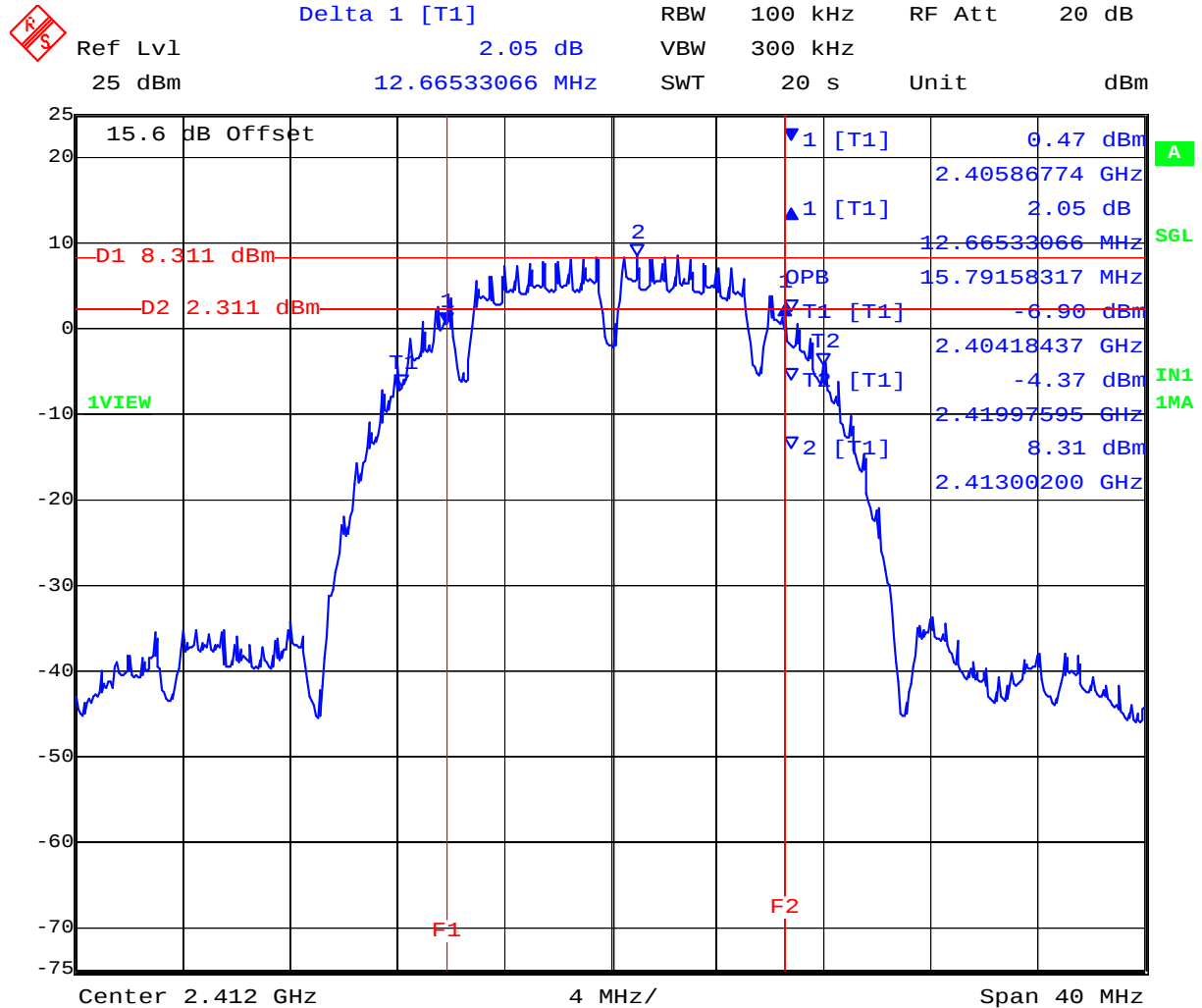
| Test Frequency | 99 % Bandwidth |           |    |    |  |  |  |
|----------------|----------------|-----------|----|----|--|--|--|
|                | MHz            |           |    |    |  |  |  |
| MHz            | a              | b         | c  | d  |  |  |  |
| 2412.000       | 15.792000      | 15.872000 | -- | -- |  |  |  |
| 2437.000       | 15.711000      | 15.792000 | -- | -- |  |  |  |
| 2462.000       | 15.792000      | 15.792000 | -- | -- |  |  |  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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CHAIN A



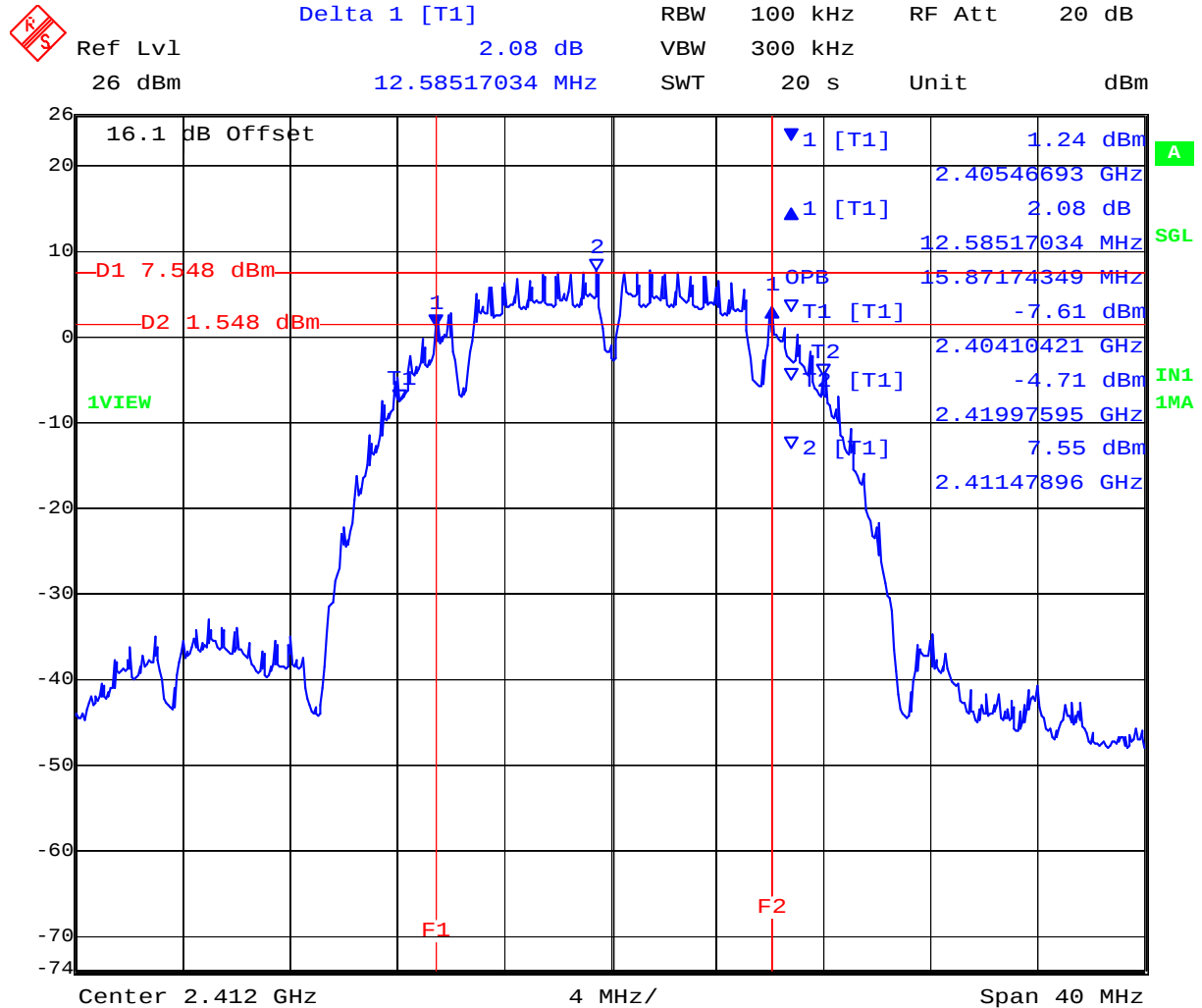
Date: 18.NOV.2011 10:29:06

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# CHAIN B

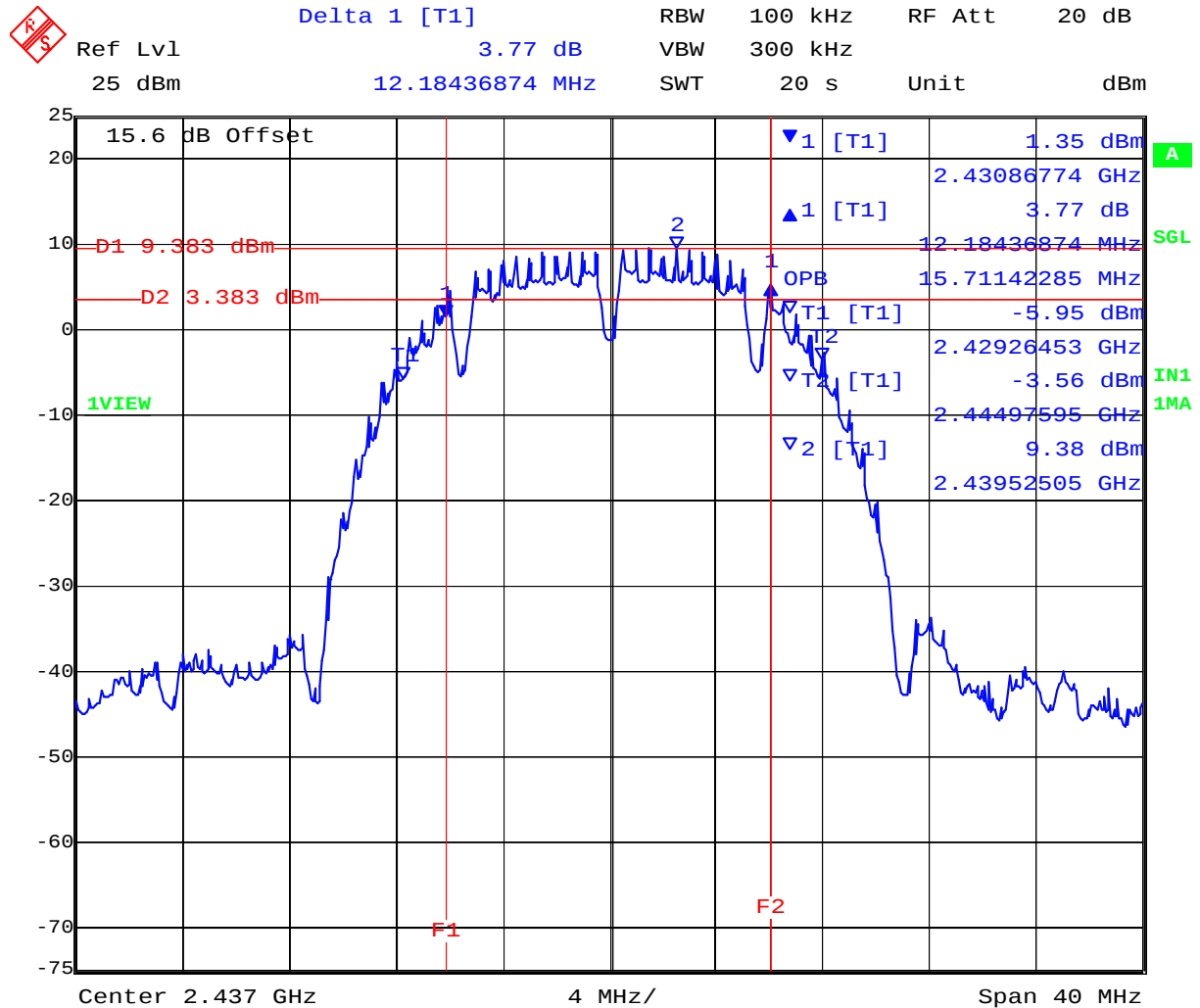


Date: 18.NOV.2011 10:30:12

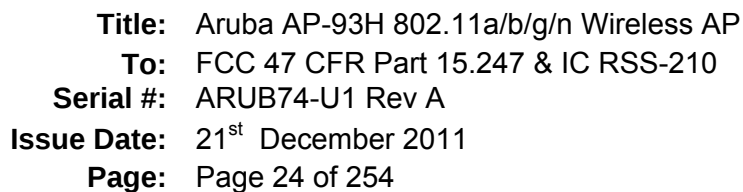
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CHAIN A



Date: 18.NOV.2011 11:09:51



Ref Lvl 26 dBm Delta 1 [T1] 1.39 dB RBW 100 kHz RF Att 20 dB  
 26 dBm 12.10420842 MHz VBW 300 kHz SWT 20 s Unit dBm

16.1 dB Offset

▼1 [T1] 3.17 dBm  
 ▲1 [T1] 1.39 dB  
 10PB 15.79158317 MHz  
 ▼T1 [T1] -6.50 dBm  
 ▼T2 2.42918437 GHz  
 ▼T3 [T1] -3.40 dBm  
 2.44497595 GHz  
 ▼2 [T1] 9.31 dBm  
 2.43647896 GHz

D1 9.307 dBm  
 D2 3.307 dBm

1VIEW

F1 F2

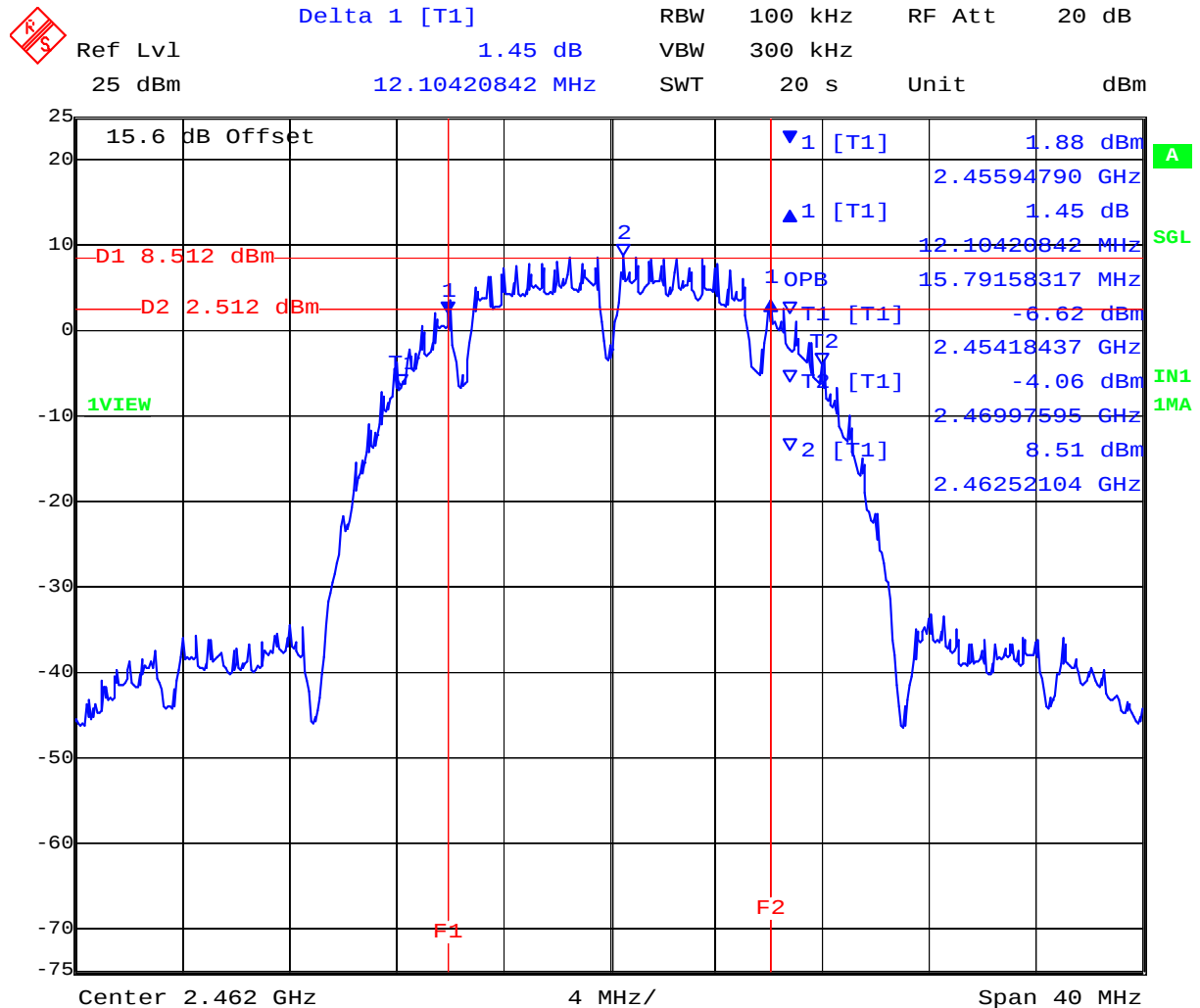
Center 2.437 GHz 4 MHz/ Span 40 MHz

Date: 18.NOV.2011 11:10:57

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CHAIN A

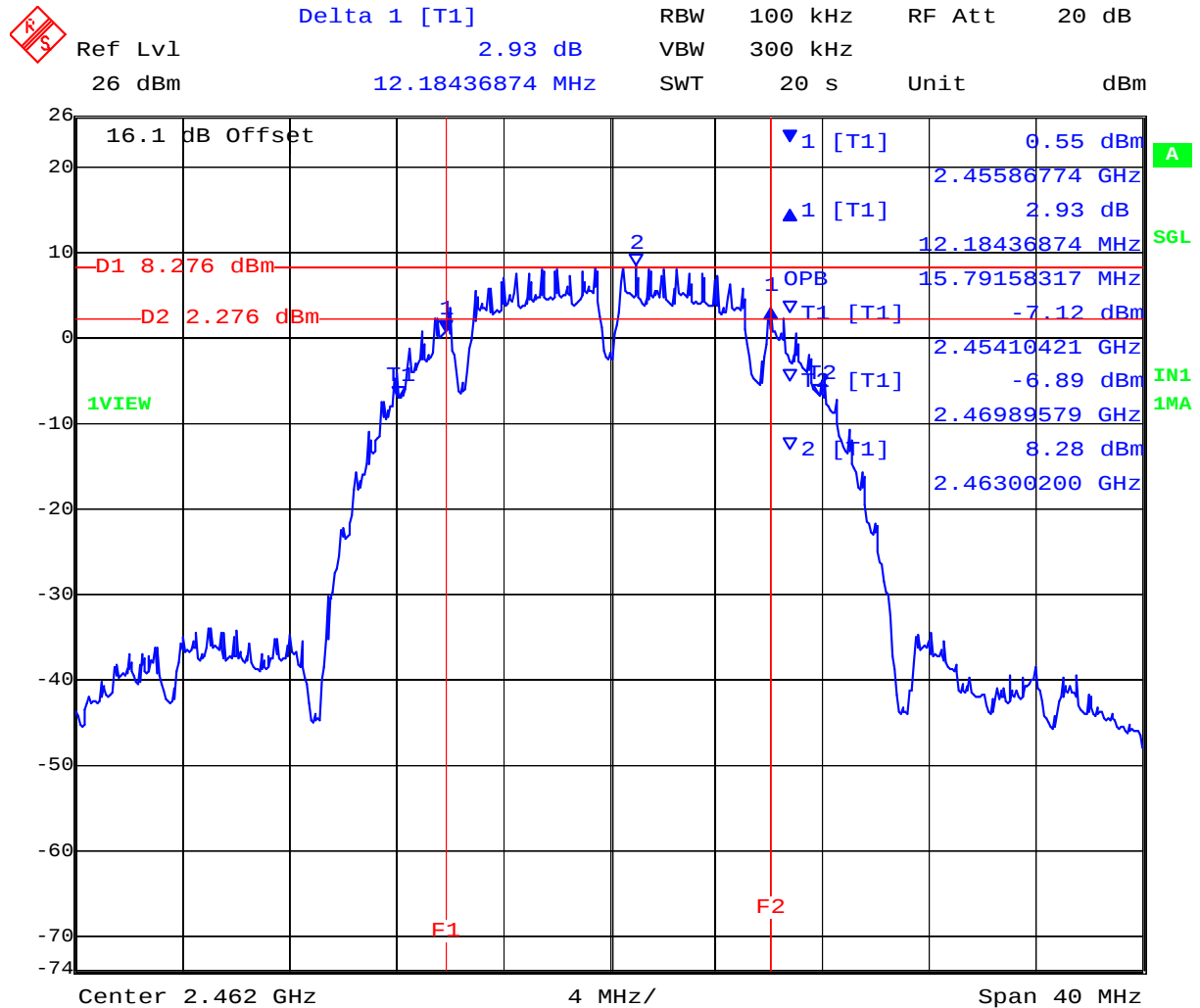


Date: 18.NOV.2011 11:29:47



Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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## CHAIN B



Date: 18.NOV.2011 11:30:55

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### 7.1.2 6 dB and 99% Bandwidth Results: 802.11g

|                               |               |                            |             |
|-------------------------------|---------------|----------------------------|-------------|
| <b>Test Conditions:</b>       | 15.247 (a)(2) | <b>Rel. Humidity (%):</b>  | 35 to 42    |
| <b>Variant:</b>               | 802.11g       | <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>       | 2.5 dBi     |
| <b>Applied Voltage:</b>       | 55.00 Vdc     |                            |             |
| <b>Notes 1:</b>               |               |                            |             |
| <b>Notes 2:</b>               |               |                            |             |

#### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |    |    | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|----|----|-----------------------------|-----|------------|
|                | MHz            |           |    |    |                             |     |            |
| MHz            | a              | b         | c  | d  | kHz                         | MHz | MHz        |
| 2412.000       | 16.433000      | 16.513000 | -- | -- | 500                         | 0.5 | -15.933000 |
| 2437.000       | 16.433000      | 16.433000 | -- | -- |                             |     | -15.933000 |
| 2462.000       | 16.433000      | 16.433000 | -- | -- |                             |     | -15.933000 |

#### 99% Bandwidth

| Test Frequency | 99 % Bandwidth |           |    |    |  |  |  |
|----------------|----------------|-----------|----|----|--|--|--|
|                | MHz            |           |    |    |  |  |  |
| MHz            | a              | b         | c  | d  |  |  |  |
| 2412.000       | 16.673000      | 16.673000 | -- | -- |  |  |  |
| 2437.000       | 16.994000      | 16.673000 | -- | -- |  |  |  |
| 2462.000       | 16.754000      | 16.593000 | -- | -- |  |  |  |

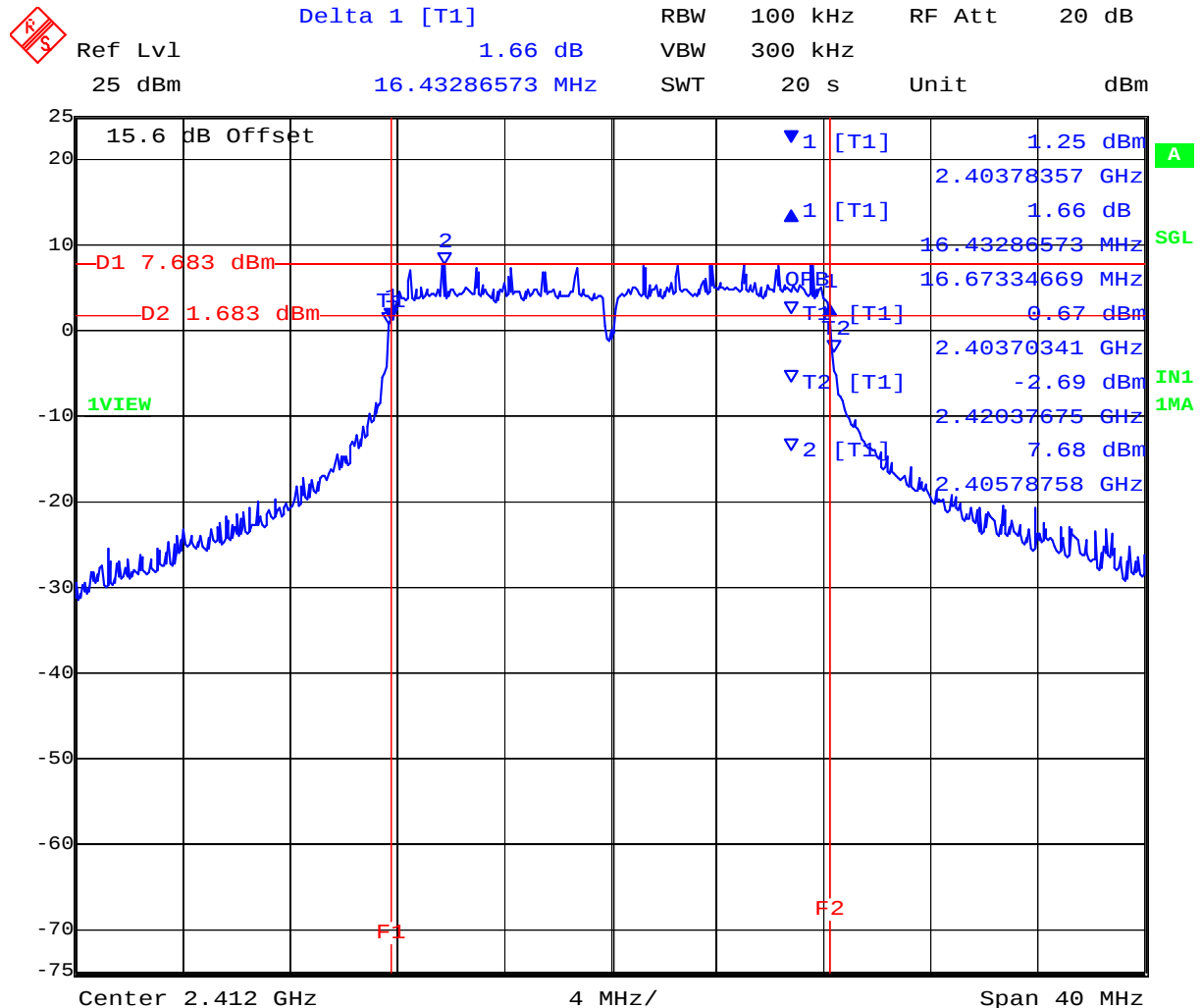
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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## CHAIN A

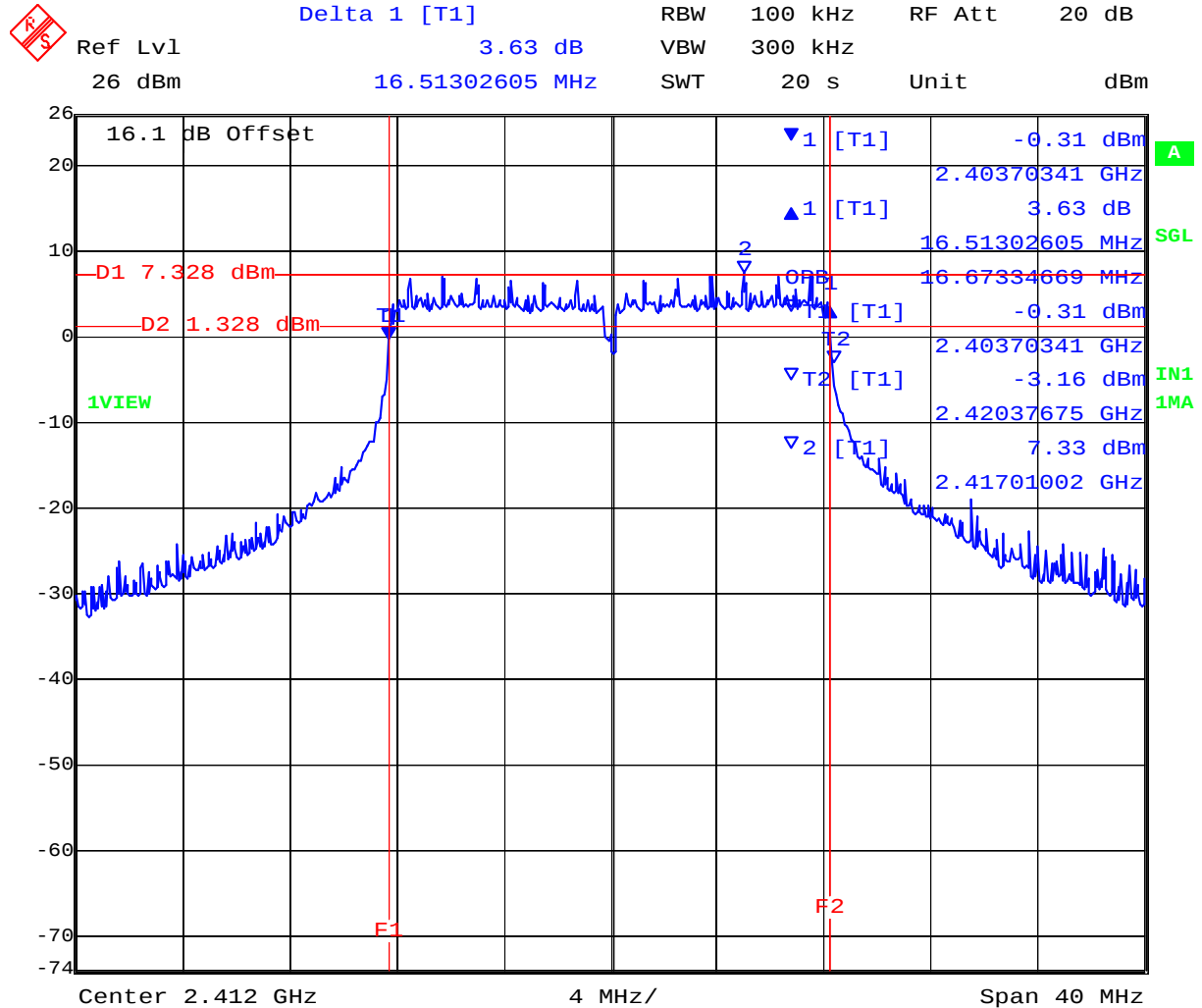


Date: 18.NOV.2011 12:11:46

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CHAIN B

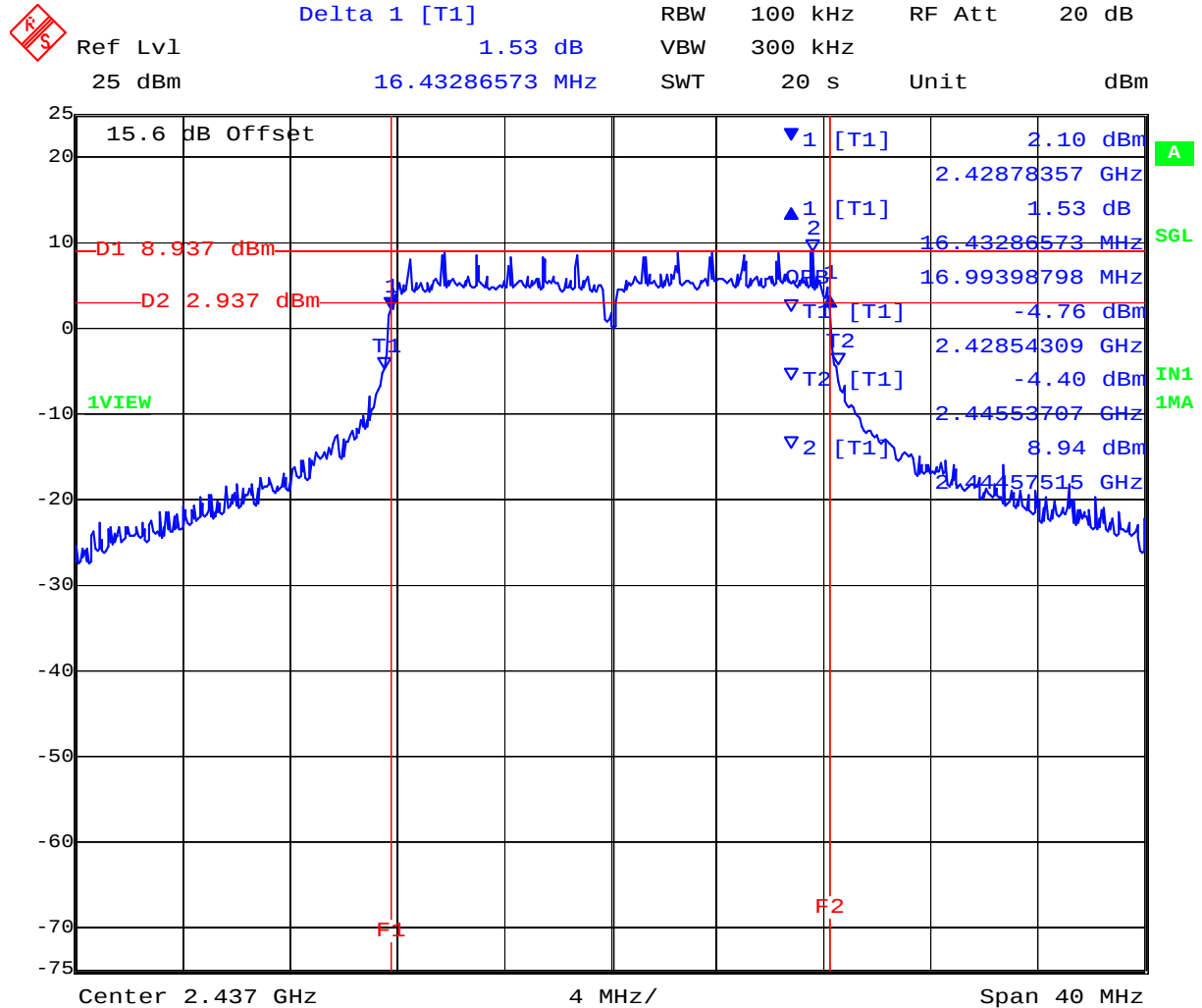


Date: 18.NOV.2011 12:12:52

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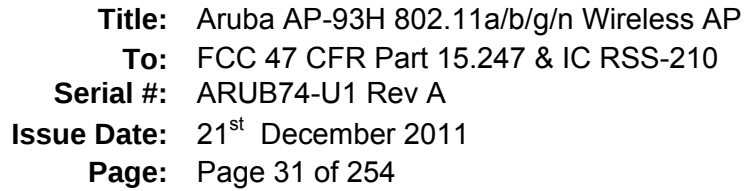


CHAIN A



Date: 18.NOV.2011 12:41:18

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Ref Lvl 26 dBm  
Delta 1 [T1] 2.95 dB  
RBW 100 kHz  
VBW 300 kHz  
SWT 20 s  
Unit dBm  
RF Att 20 dB

16.1 dB Offset

D1 8.583 dBm  
D2 2.583 dBm

1VIEW

▼1 [T1] 1.41 dBm  
▲1 [T1] 2.95 dB  
2 16.43286573 MHz  
OFF1 16.67334669 MHz  
▼T1 [T1] -0.40 dBm  
▼T2 [T1] 2.42870341 GHz  
2.44537675 GHz  
▼2 [T1] 8.58 dBm  
2.44201002 GHz

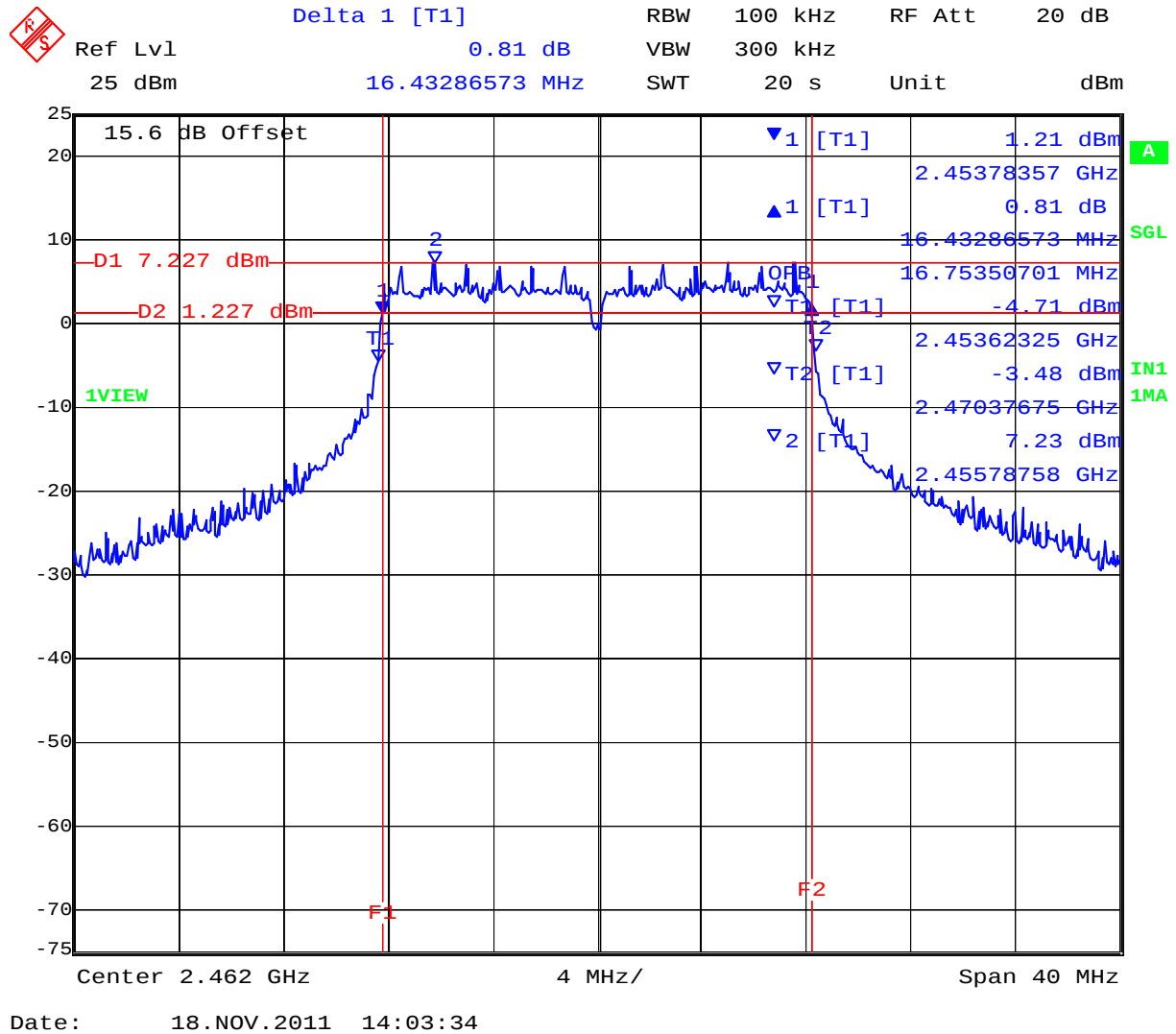
F1 F2

Center 2.437 GHz  
4 MHz/  
Span 40 MHz

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CHAIN A

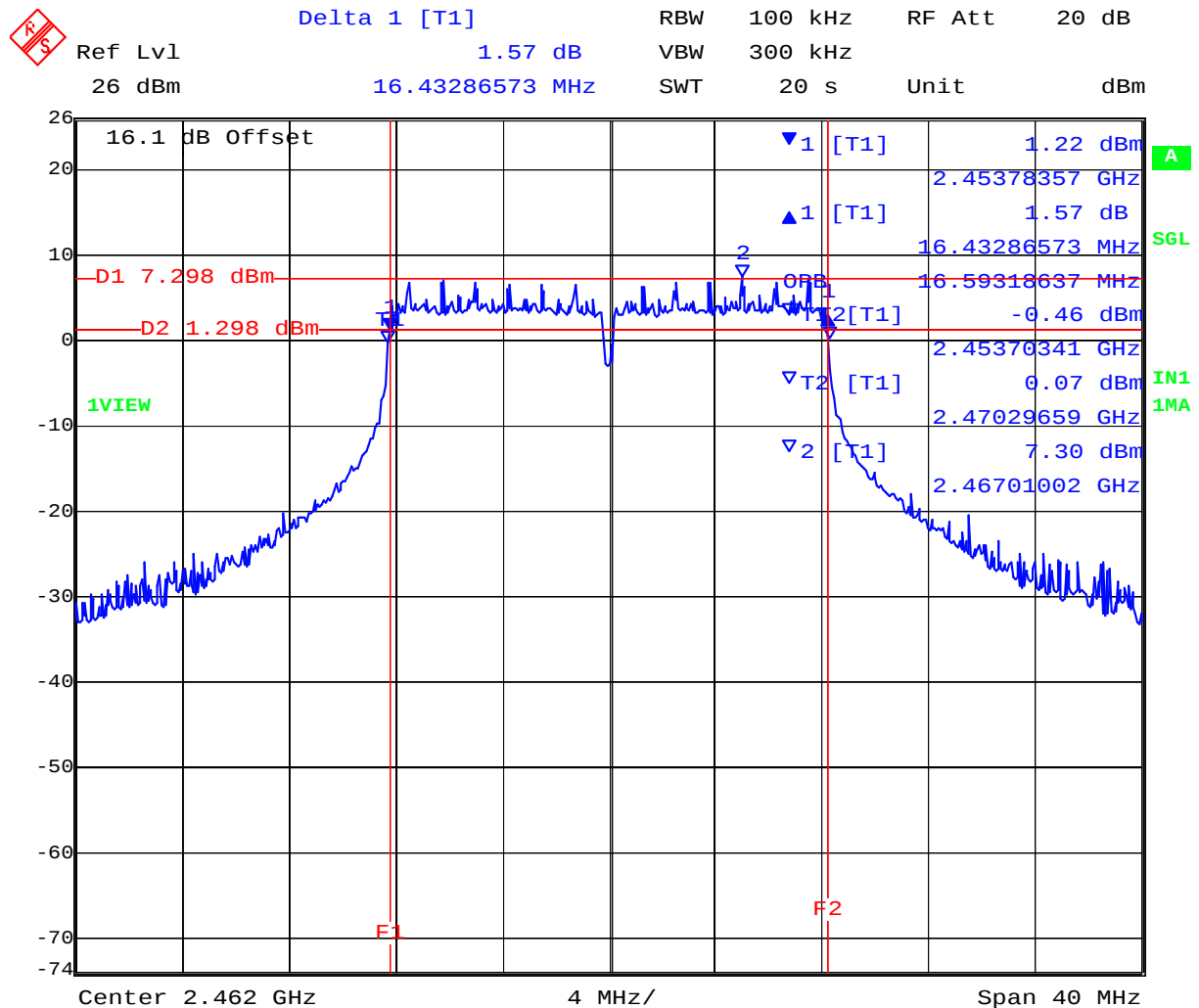


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## CHAIN B



Date: 18.NOV.2011 14:04:41

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### 7.1.3 6 dB and 99% Bandwidth Results: 802.11n HT-20

|                               |               |                            |         |    |      |
|-------------------------------|---------------|----------------------------|---------|----|------|
| <b>Test Conditions:</b>       | 15.247 (a)(2) | <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>       | 2.5 dBi |    |      |
| <b>Applied Voltage:</b>       | 55.00 Vdc     |                            |         |    |      |
| <b>Notes 1:</b>               |               |                            |         |    |      |
| <b>Notes 2:</b>               |               |                            |         |    |      |

#### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |    |    | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|----|----|-----------------------------|-----|------------|
|                | MHz            |           |    |    |                             |     |            |
| MHz            | a              | b         | c  | d  | kHz                         | MHz | MHz        |
| 2412.000       | 17.715000      | 17.635000 | -- | -- | 500                         | 0.5 | -17.135000 |
| 2437.000       | 17.635000      | 17.635000 | -- | -- |                             |     | -17.135000 |
| 2462.000       | 17.635000      | 17.635000 | -- | -- |                             |     | -17.135000 |

#### 99% Bandwidth

| Test Frequency | 99 % Bandwidth |           |    |    |  |  |  |
|----------------|----------------|-----------|----|----|--|--|--|
|                | MHz            |           |    |    |  |  |  |
| MHz            | a              | b         | c  | d  |  |  |  |
| 2412.000       | 17.956000      | 17.876000 | -- | -- |  |  |  |
| 2437.000       | 18.036000      | 17.796000 | -- | -- |  |  |  |
| 2462.000       | 17.876000      | 17.876000 | -- | -- |  |  |  |

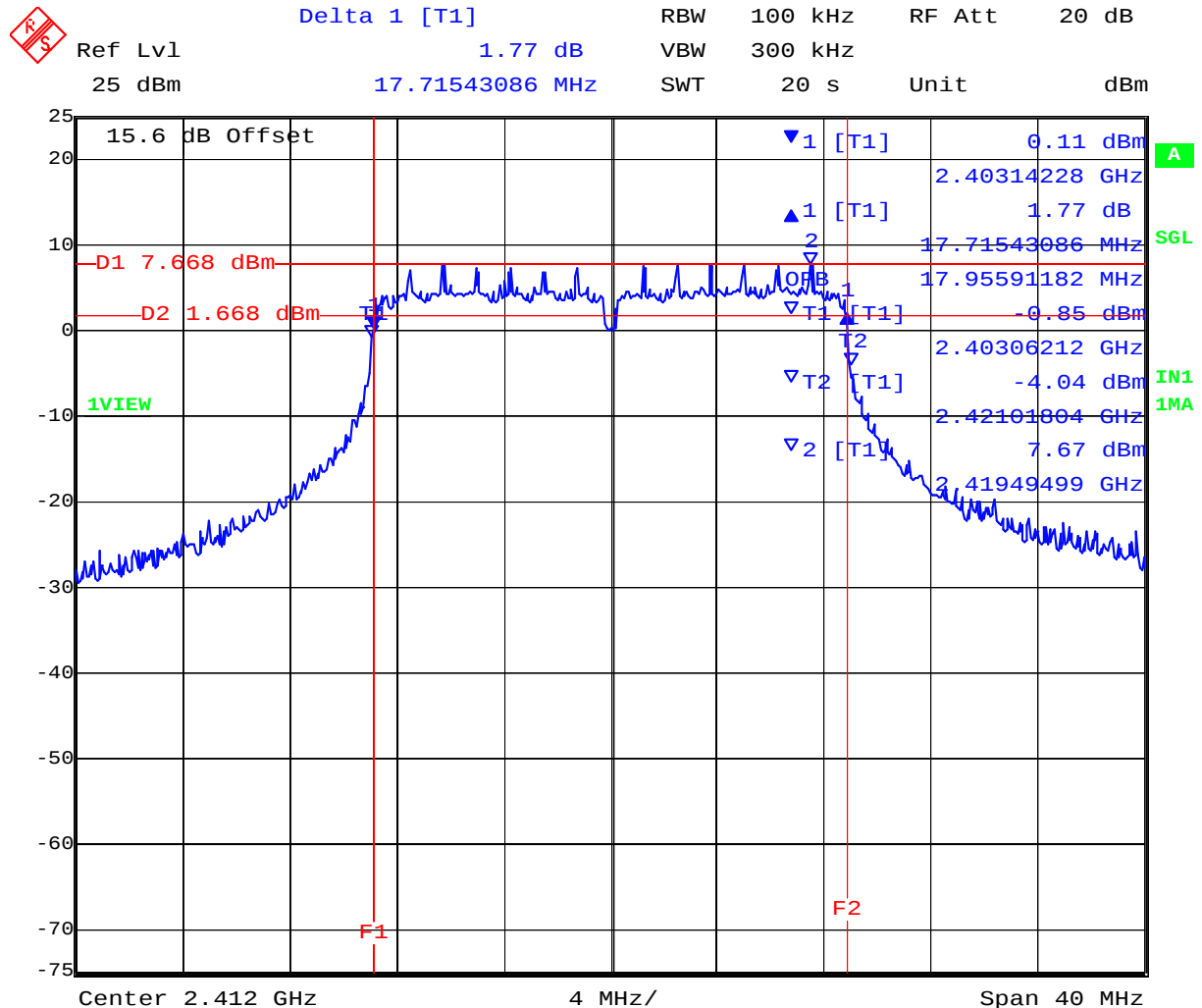
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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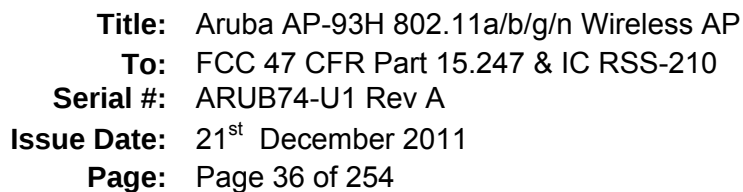
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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## CHAIN A



Date: 18.NOV.2011 14:50:23

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Ref Lvl 26 dBm  
 Delta 1 [T1] 2.82 dB  
 RBW 100 kHz  
 VBW 300 kHz  
 RF Att 20 dB  
 26 dBm  
 17.63527054 MHz  
 SWT 20 s  
 Unit dBm

16.1 dB Offset  
 D1 7.261 dBm  
 D2 1.261 dBm  
 1VIEW  
 F1  
 F2

| Point | Marker   | Frequency (GHz) | Amplitude (dBm) |
|-------|----------|-----------------|-----------------|
| 1     | ▽1 [T1]  | 2.40314228      | 0.06            |
| 2     | ▲1 [T1]  | 17.63527054     | 2.82            |
| 3     | ▽2 [T1]  | 2.41701002      | 7.26            |
| 4     | ▽T2 [T1] | 2.42093788      | 0.17            |
| 5     | ▽T1 [T1] | 2.40306212      | -1.67           |

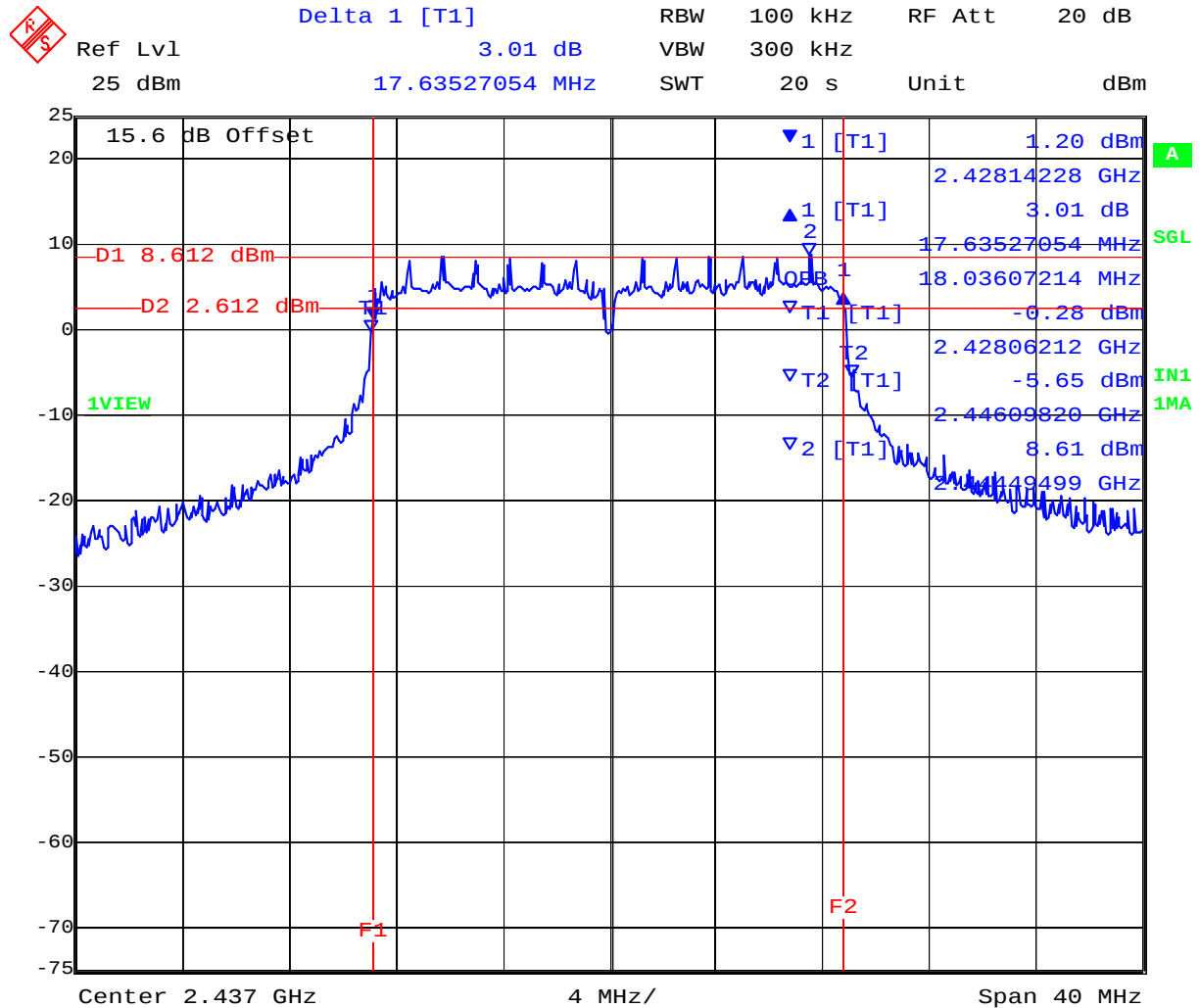
Center 2.412 GHz  
 4 MHz/  
 Span 40 MHz

Date: 18.NOV.2011 14:51:28

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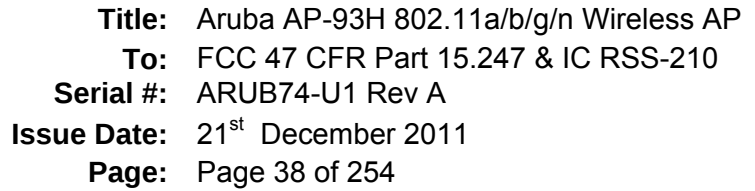


CHAIN A



Date: 18.NOV.2011 15:12:41

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Ref Lvl 26 dBm Delta 1 [T1] 3.44 dB RBW 100 kHz RF Att 20 dB  
 26 dBm 17.63527054 MHz VBW 300 kHz Unit dBm

16.1 dB Offset

▼1 [T1] 0.41 dBm  
 ▲1 [T1] 3.44 dB  
 2 17.63527054 MHz  
 D1 8.3 dBm  
 D2 2.3 dBm  
 1VIEW  
 IN1 1MA  
 2.42814228 GHz  
 17.79559118 MHz  
 0.41 dBm  
 2.42814228 GHz  
 1.20 dBm  
 2.44593788 GHz  
 8.30 dBm  
 2.44449499 GHz  
 F1 F2

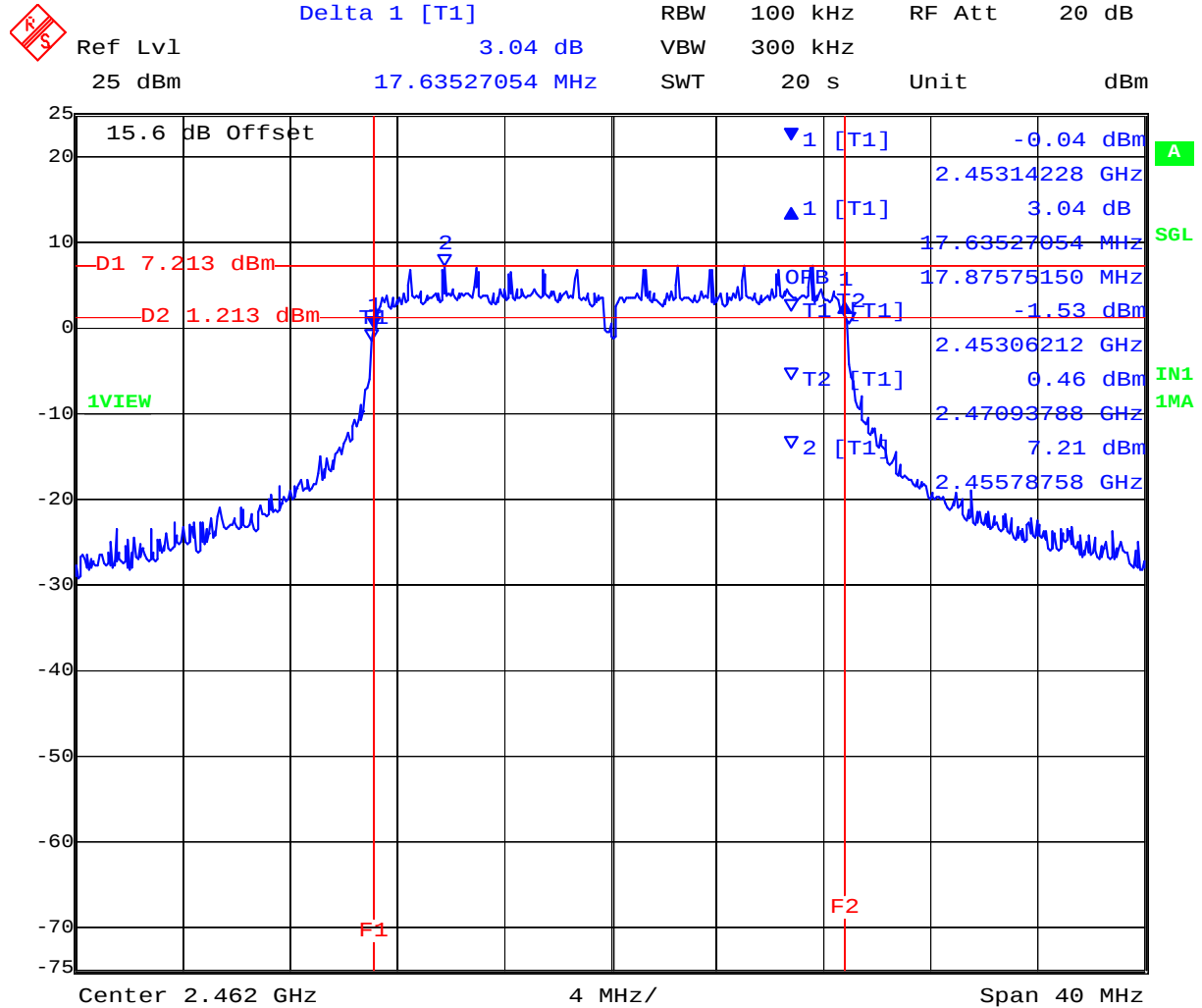
Center 2.437 GHz 4 MHz/ Span 40 MHz

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## CHAIN A

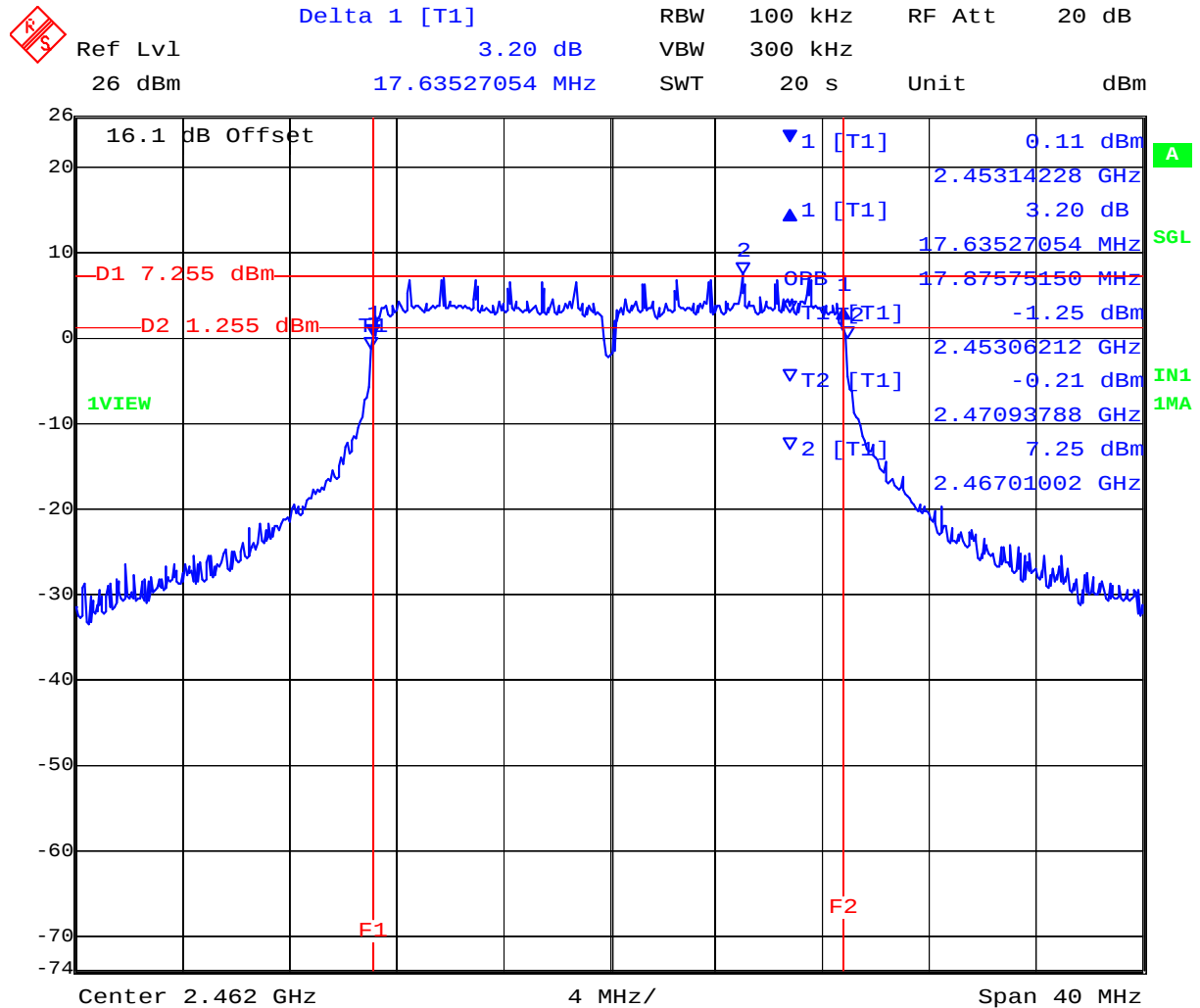


Date: 18.NOV.2011 15:32:24

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CHAIN B



Date: 18.NOV.2011 15:33:30

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#### 7.1.4 6 dB and 99% Bandwidth Results: 802.11n HT-40

|                               |               |                            |             |
|-------------------------------|---------------|----------------------------|-------------|
| <b>Test Conditions:</b>       | 15.247 (a)(2) | <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>       | 2.5 dBi     |
| <b>Applied Voltage:</b>       | 55.00 Vdc     |                            |             |
| <b>Notes 1:</b>               |               |                            |             |
| <b>Notes 2:</b>               |               |                            |             |

##### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |    |    | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|----|----|-----------------------------|-----|------------|
|                | MHz            |           |    |    |                             |     |            |
| MHz            | a              | b         | c  | d  | kHz                         | MHz | MHz        |
| 2422.000       | 36.553000      | 36.232000 | -- | -- | 500                         | 0.5 | -35.732000 |
| 2437.000       | 36.553000      | 36.232000 | -- | -- |                             |     | -35.732000 |
| 2452.000       | 36.393000      | 36.553000 | -- | -- |                             |     | -35.893000 |

##### 99% Bandwidth

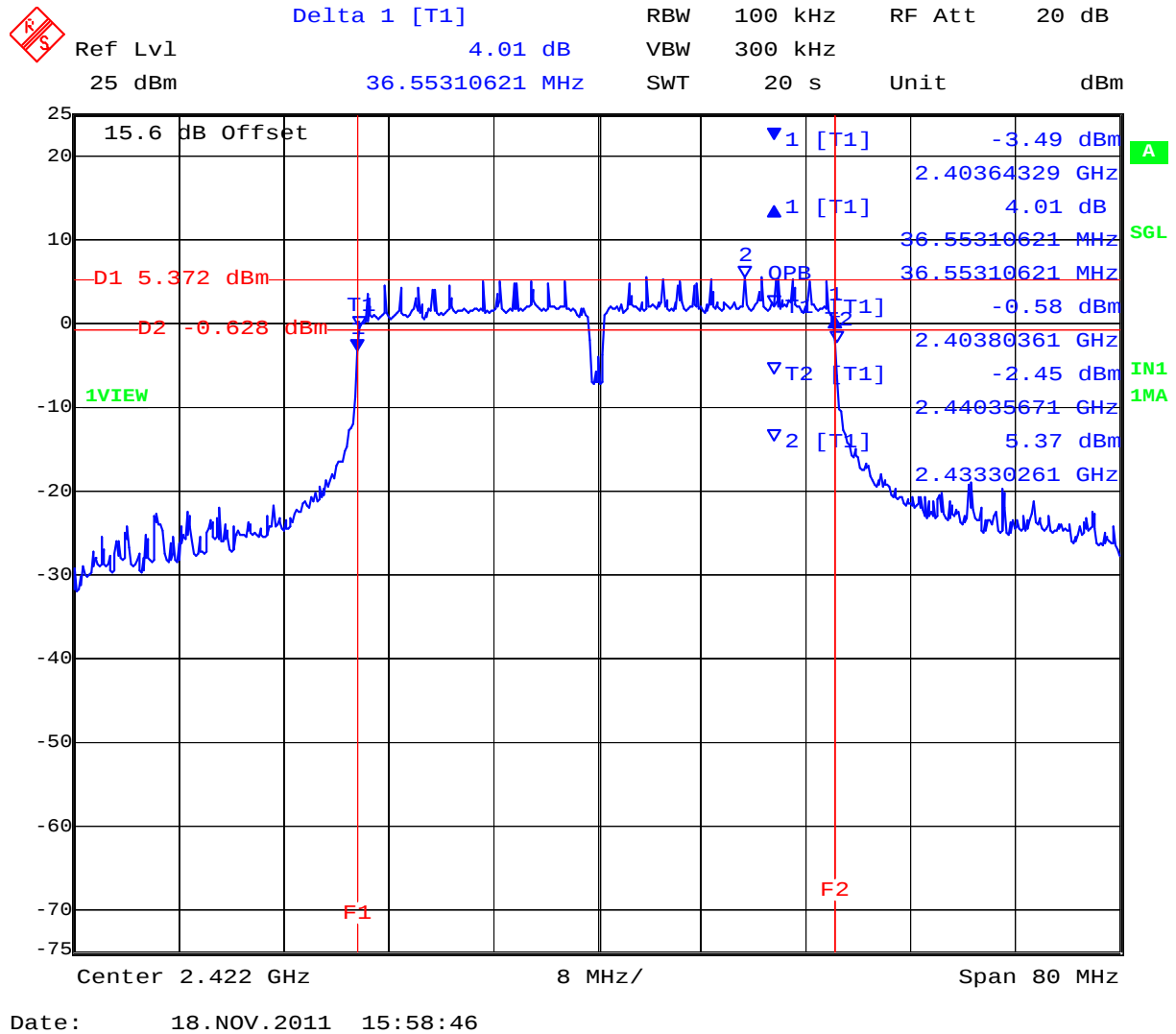
| Test Frequency | 99 % Bandwidth |           |    |    |  |  |  |
|----------------|----------------|-----------|----|----|--|--|--|
|                | MHz            |           |    |    |  |  |  |
| MHz            | a              | b         | c  | d  |  |  |  |
| 2422.000       | 36.553000      | 36.393000 | -- | -- |  |  |  |
| 2437.000       | 36.553000      | 36.393000 | -- | -- |  |  |  |
| 2452.000       | 36.393000      | 36.393000 | -- | -- |  |  |  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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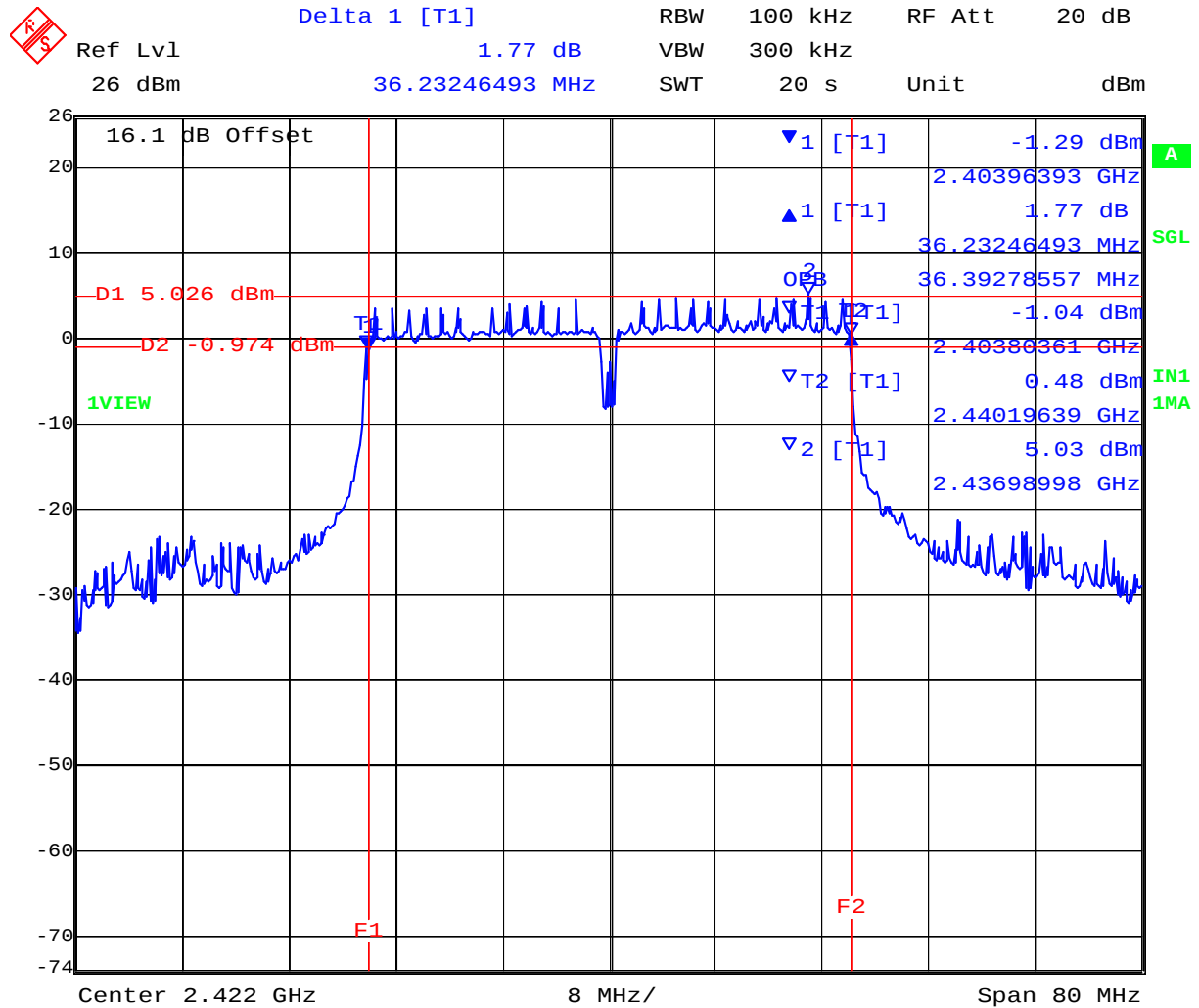
CHAIN A



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CHAIN B

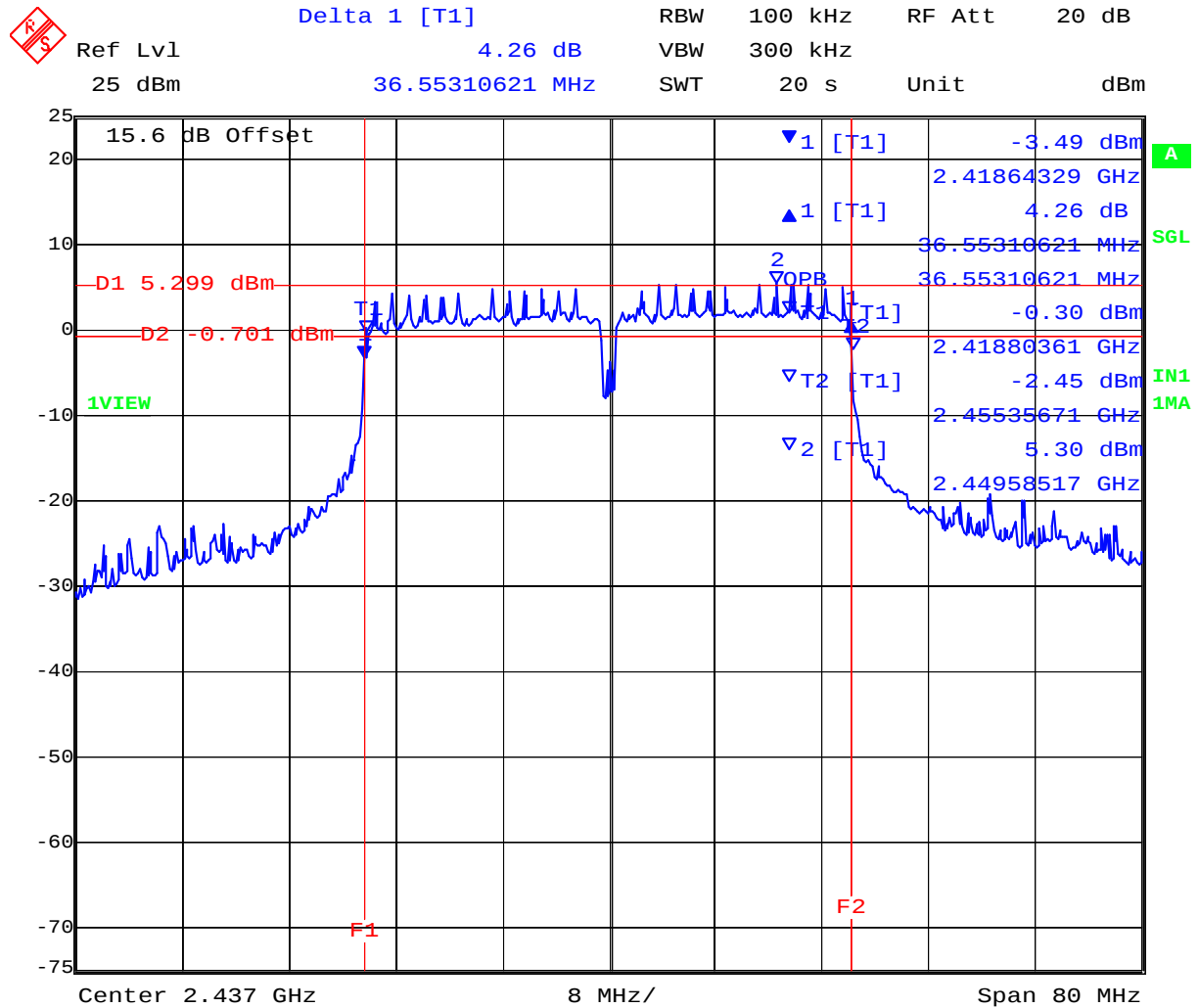


Date: 18.NOV.2011 15:59:52

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CHAIN A

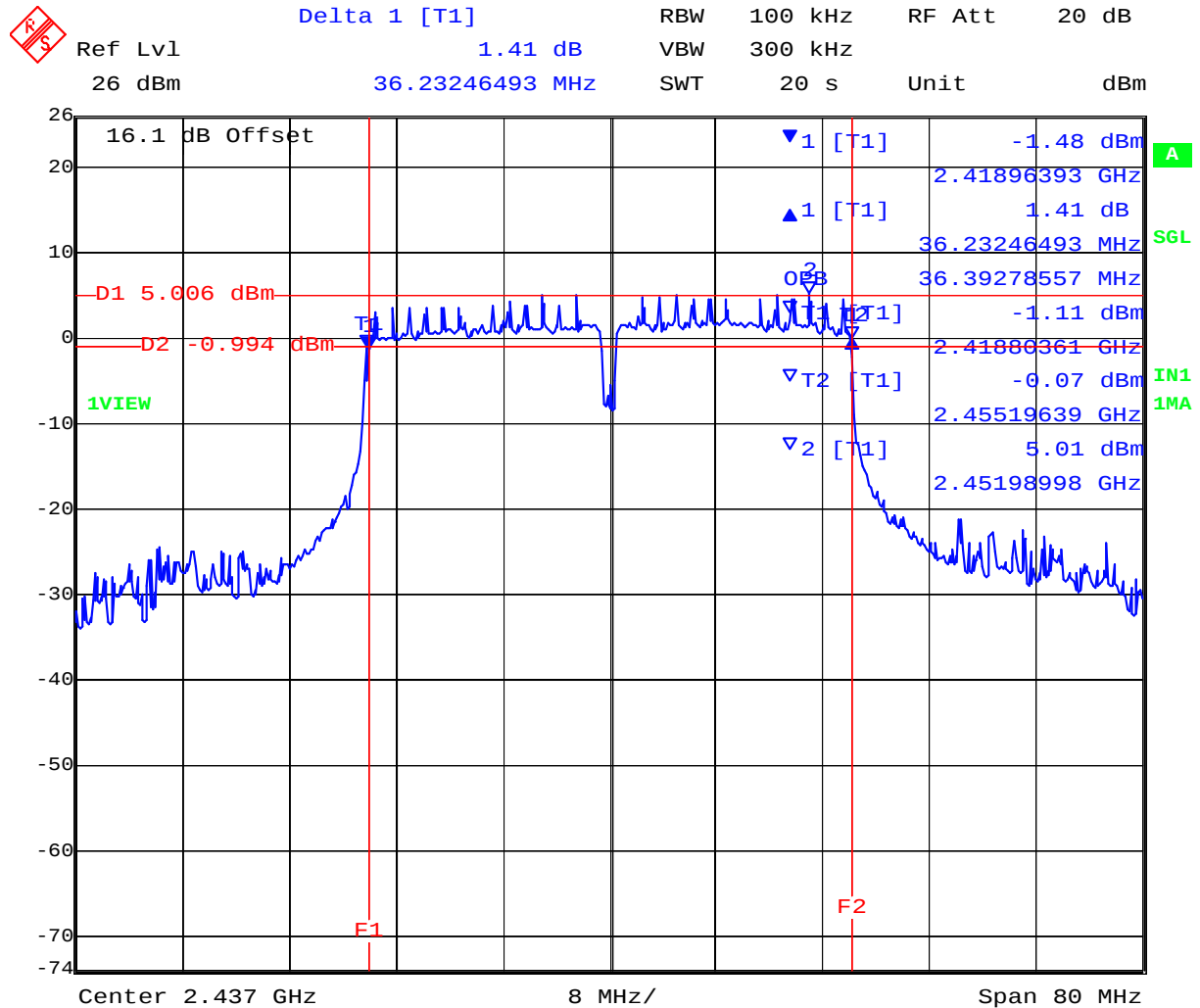


Date: 18.NOV.2011 16:24:35

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CHAIN B

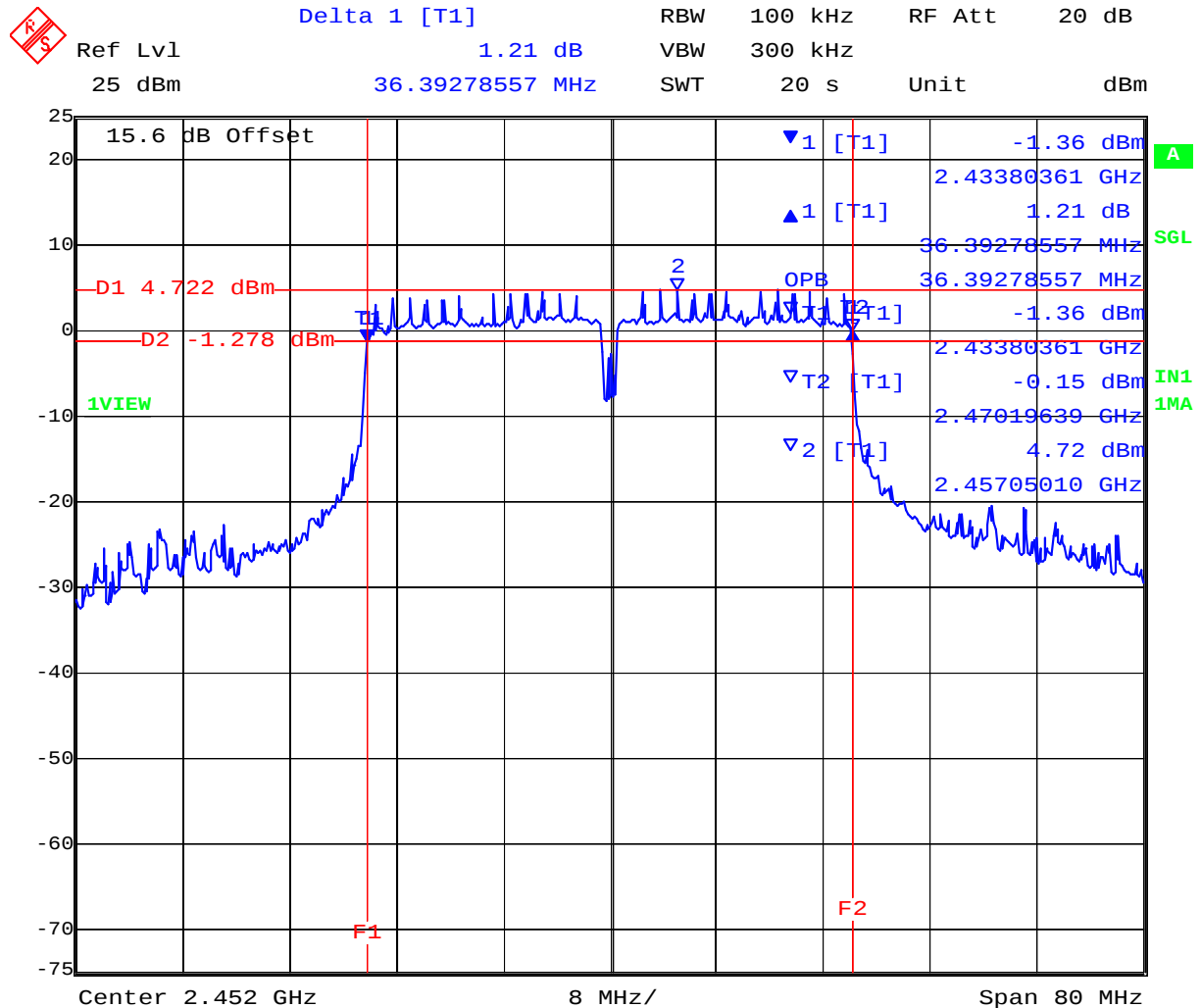


Date: 18.NOV.2011 16:25:41

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CHAIN A

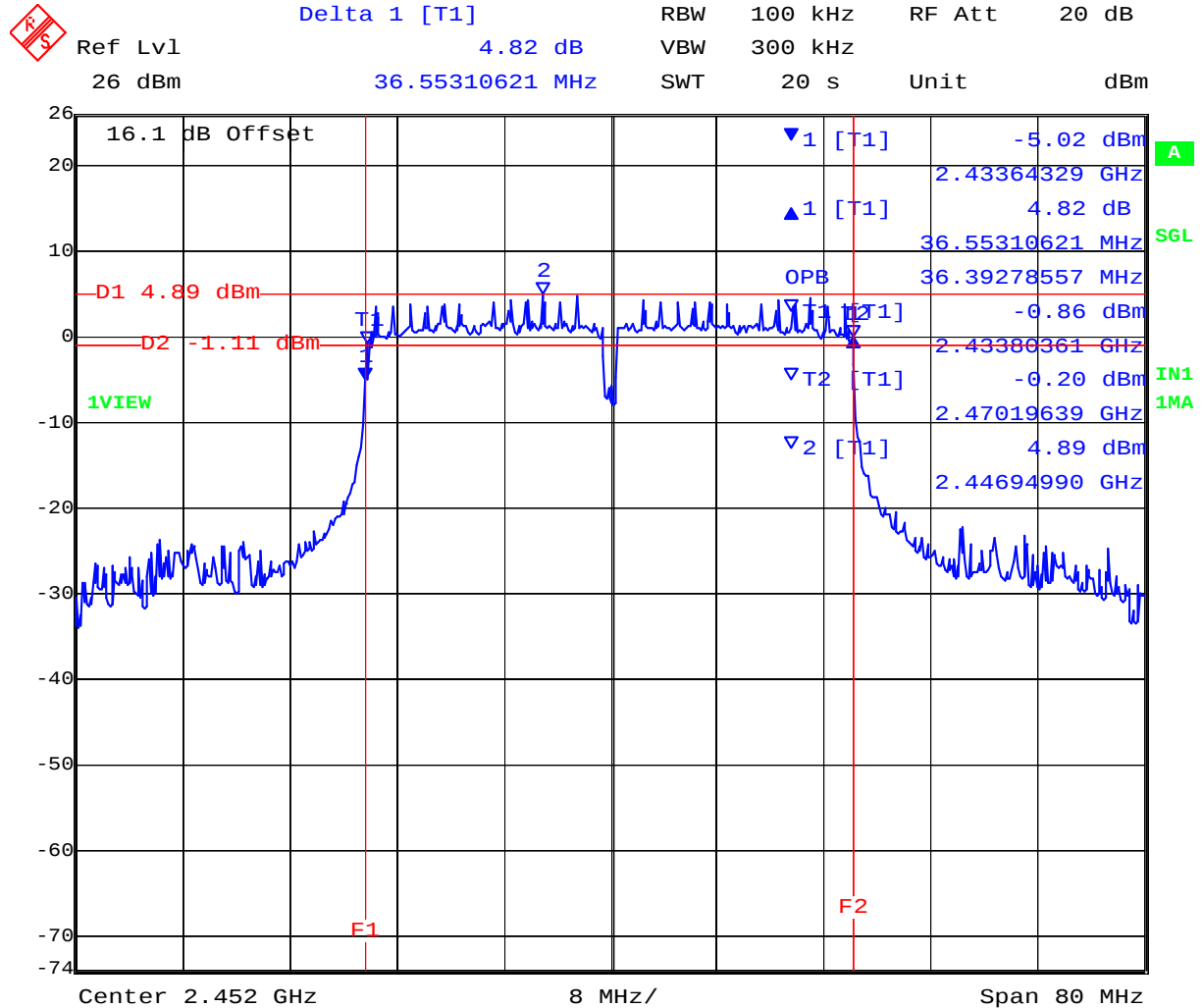


Date: 18.NOV.2011 16:51:33

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CHAIN B



Date: 18.NOV.2011 16:52:39

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### 7.1.5 6 dB and 99% Bandwidth Results: 802.11a

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <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</b> | N/A           | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b>  | 12.0          | Vdc                        |     |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |   |   | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|---|---|-----------------------------|-----|------------|
|                | MHz            |           |   |   |                             |     |            |
| MHz            | a              | b         | c | d | kHz                         | MHz | MHz        |
| 5745           | 16.433000      | 16.433000 |   |   | 500                         | 0.5 | -15.933000 |
| 5785           | 16.433000      | 16.433000 |   |   |                             |     | -15.933000 |
| 5825           | 16.433000      | 16.433000 |   |   |                             |     | -15.933000 |

#### 99% Bandwidth

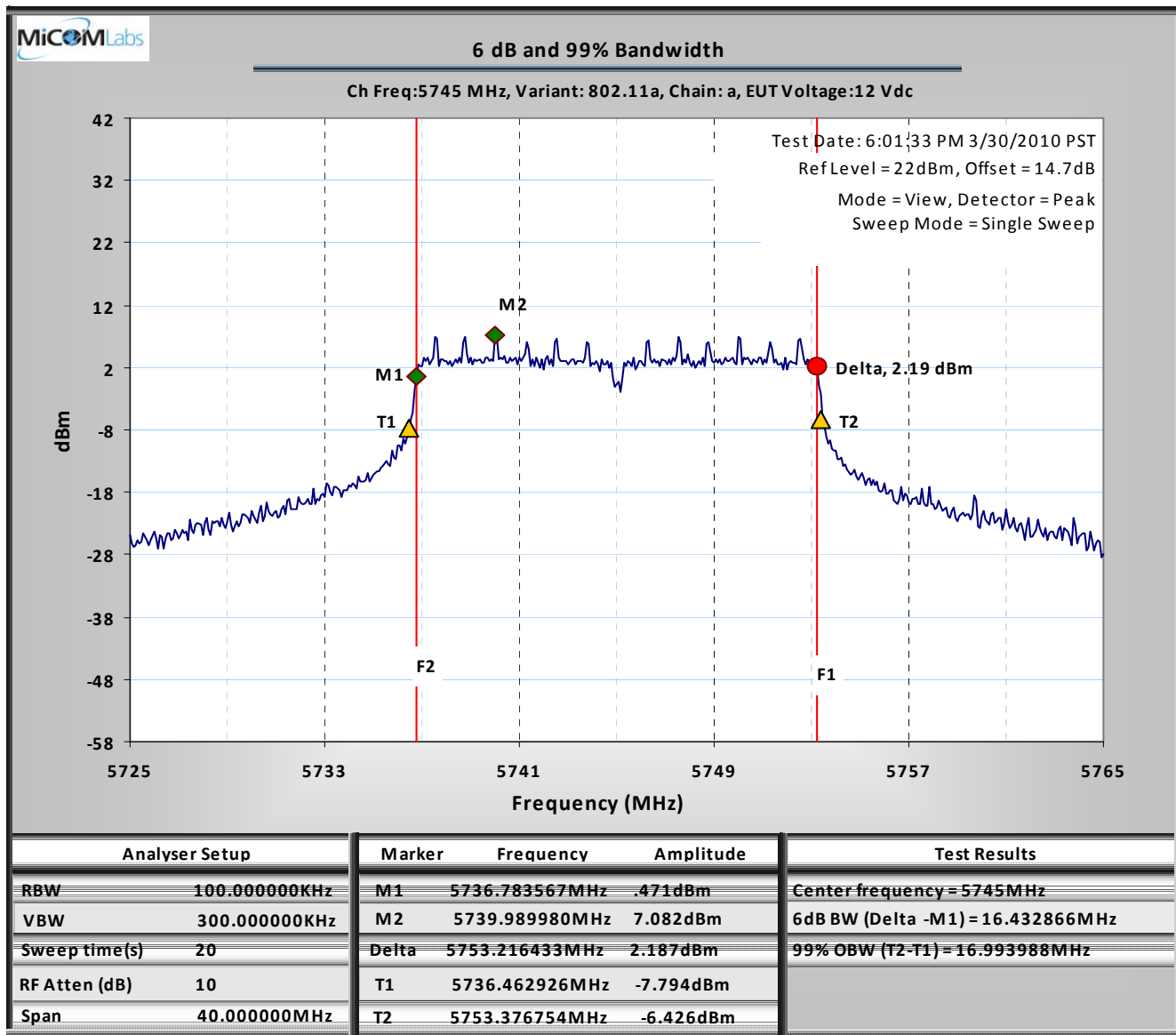
| Test Frequency | 99 % Bandwidth |           |   |   |  |  |  |
|----------------|----------------|-----------|---|---|--|--|--|
|                | MHz            |           |   |   |  |  |  |
| MHz            | a              | b         | c | d |  |  |  |
| 5745           | 16.994000      | 17.796000 |   |   |  |  |  |
| 5785           | 16.754000      | 16.754000 |   |   |  |  |  |
| 5825           | 16.673000      | 16.673000 |   |   |  |  |  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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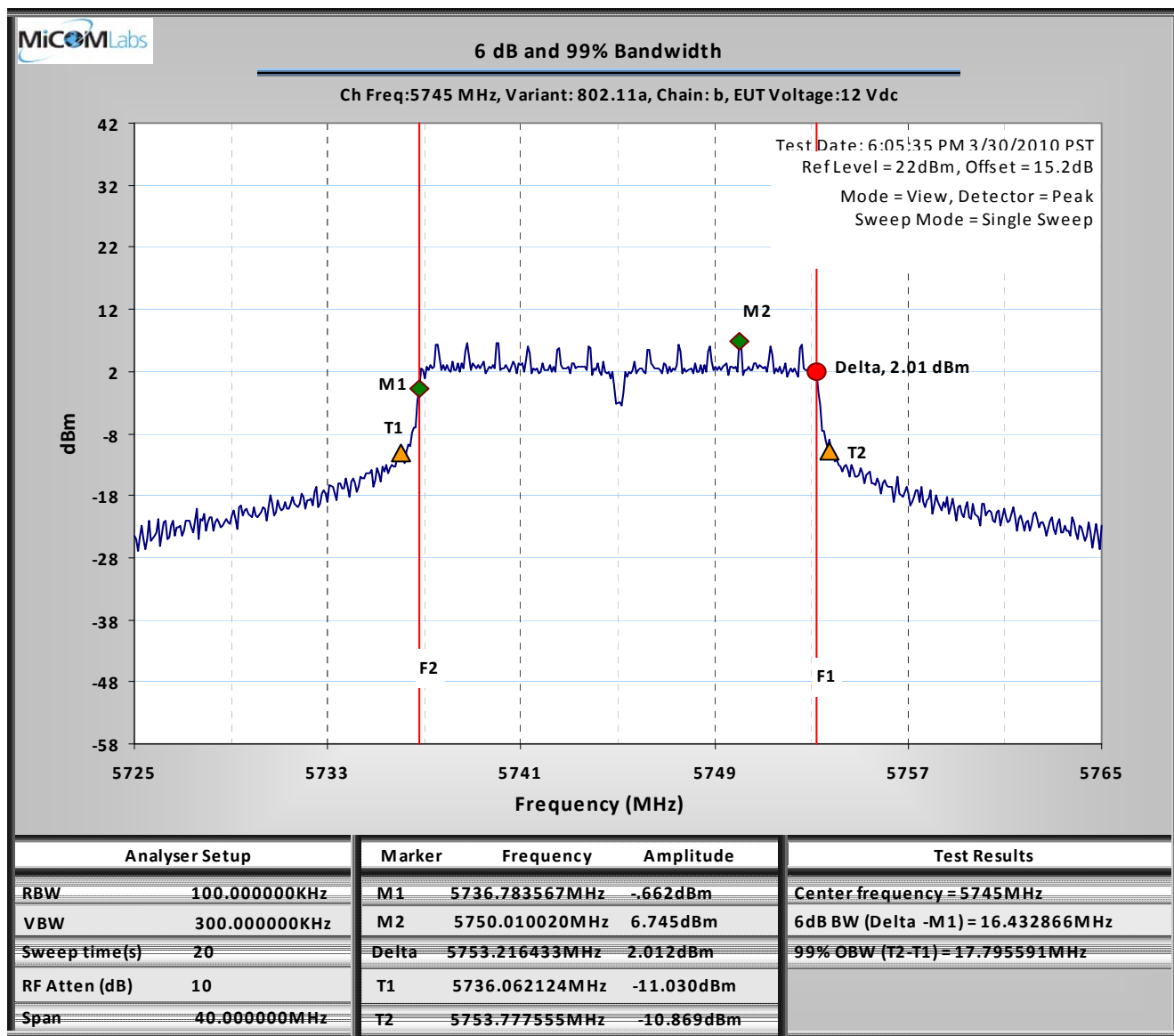
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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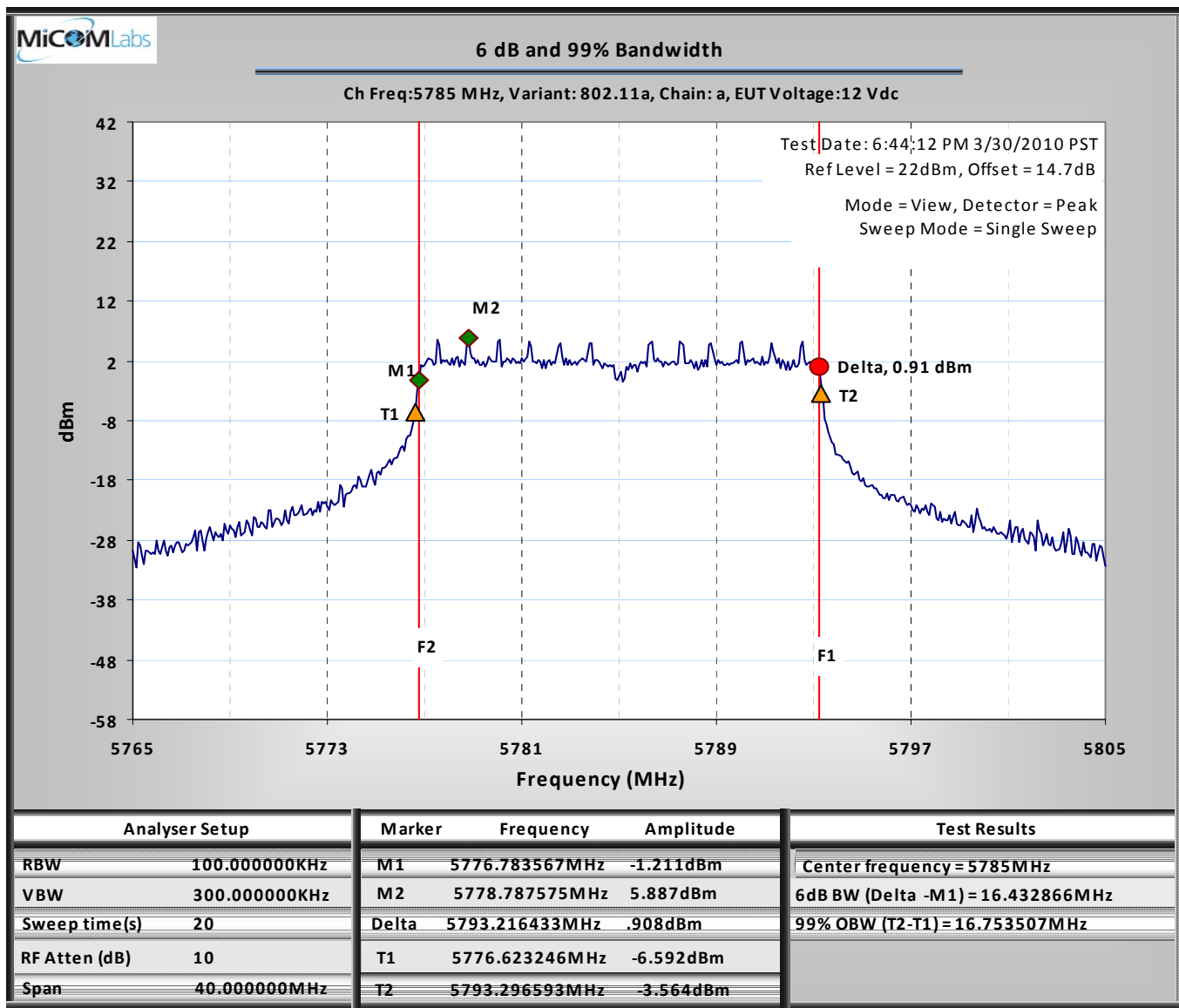
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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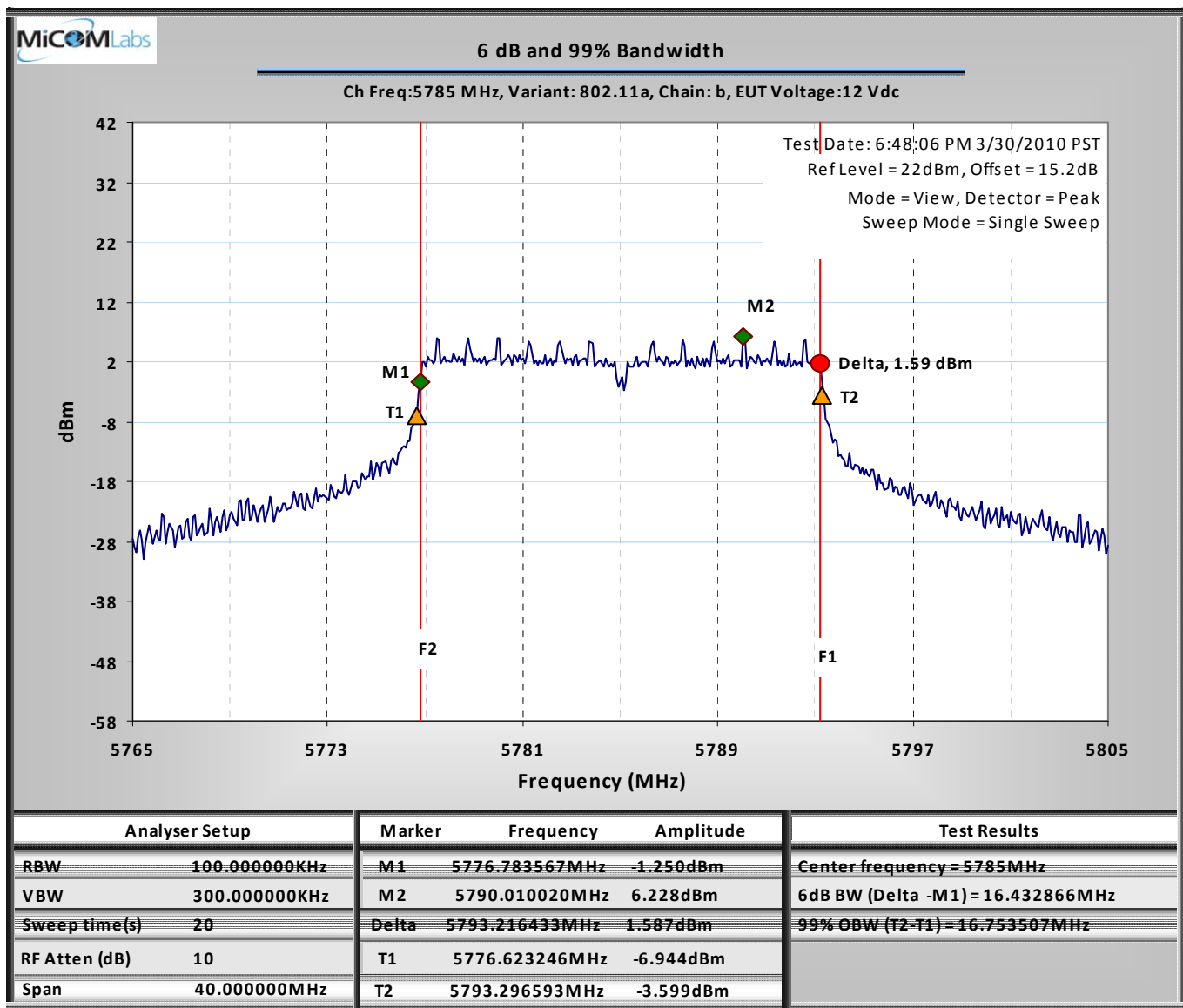
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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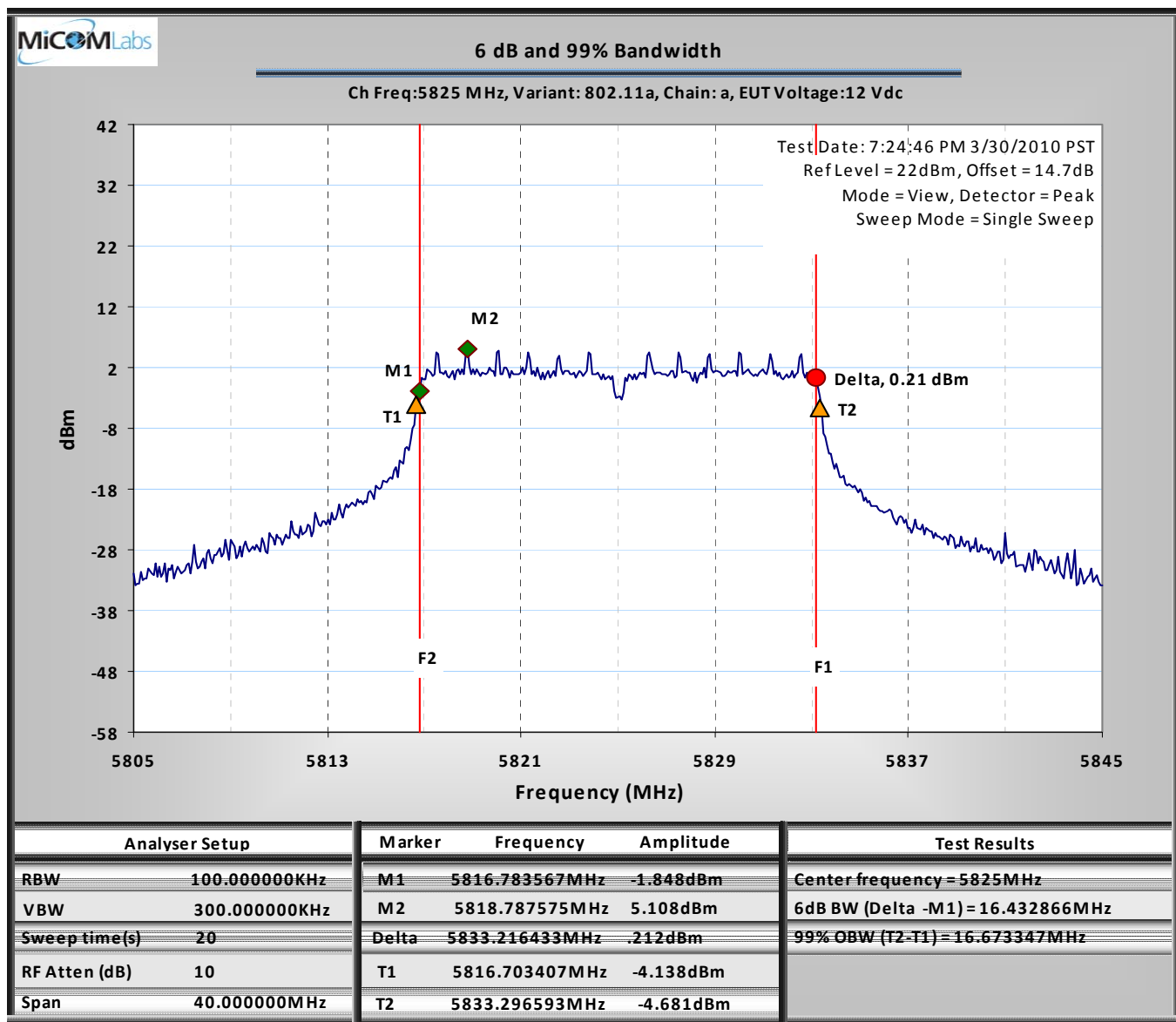
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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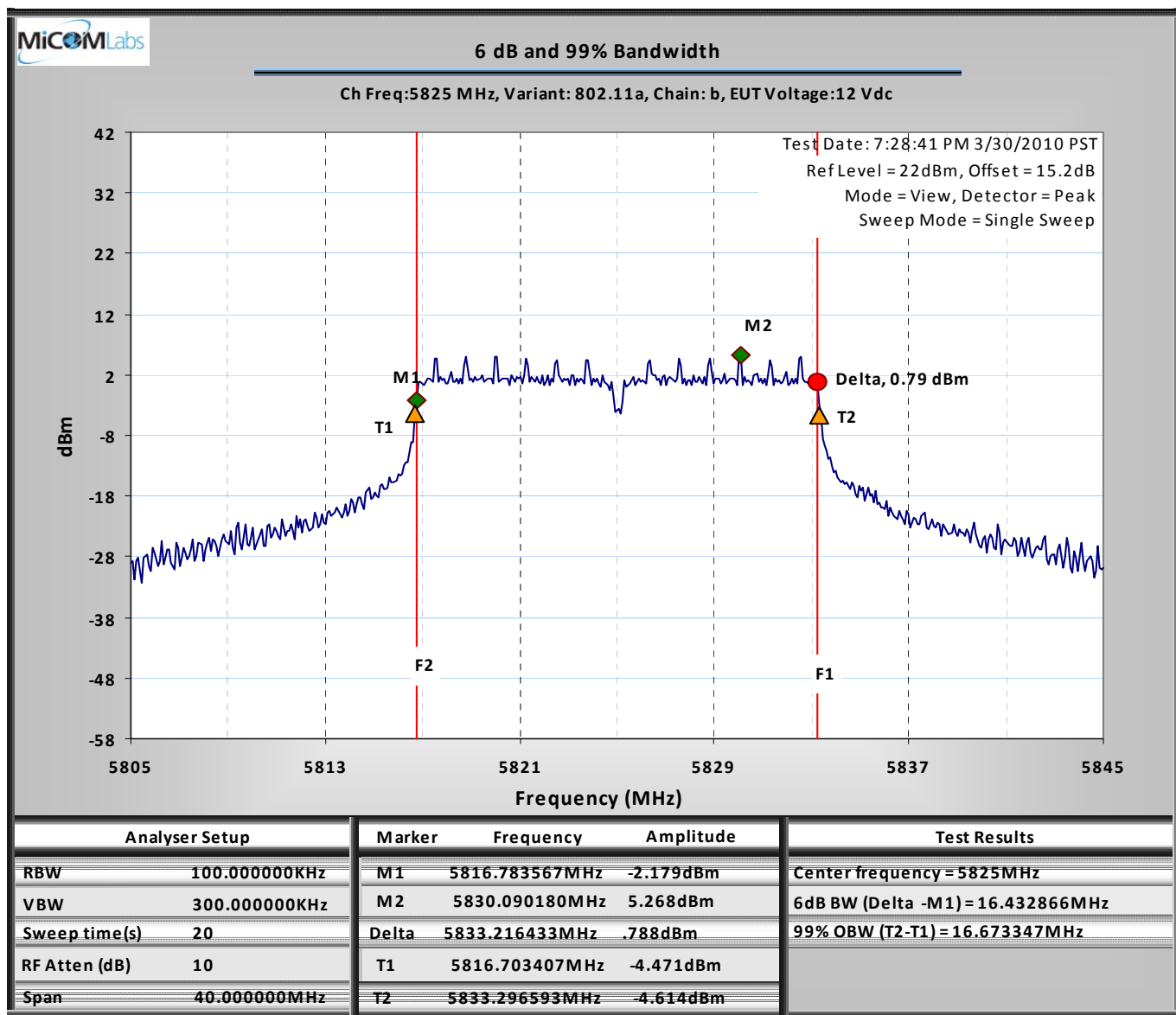
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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#### 7.1.6 6 dB and 99% Bandwidth Results: 802.11n HT20

|                               |               |                            |     |    |      |
|-------------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.247 (a)(2) | <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           | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0          |                            |     |    | Vdc  |
| <b>Notes 1:</b>               |               |                            |     |    |      |
| <b>Notes 2:</b>               |               |                            |     |    |      |

##### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |   |   | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|---|---|-----------------------------|-----|------------|
|                | MHz            |           |   |   |                             |     |            |
| MHz            | a              | b         | c | d | kHz                         | MHz | MHz        |
| 5745           | 17.715000      | 17.715000 |   |   | 500                         | 0.5 | -17.215000 |
| 5785           | 17.635000      | 17.715000 |   |   |                             |     | -17.135000 |
| 5825           | 17.635000      | 17.715000 |   |   |                             |     | -17.135000 |

##### 99% Bandwidth

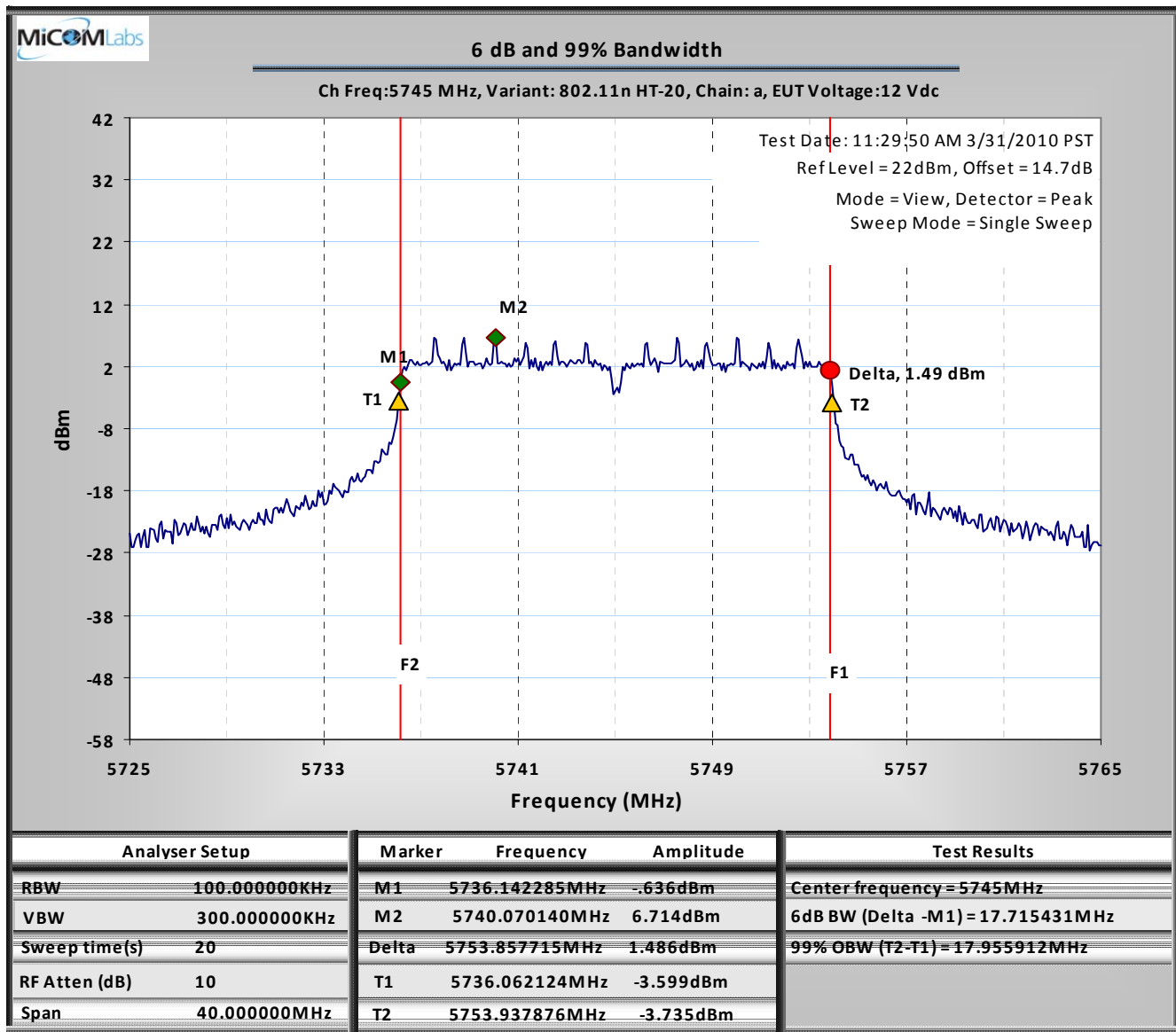
| Test Frequency | 99 % Bandwidth |           |   |   |  |  |  |
|----------------|----------------|-----------|---|---|--|--|--|
|                | MHz            |           |   |   |  |  |  |
| MHz            | a              | b         | c | d |  |  |  |
| 5745           | 17.956000      | 18.357000 |   |   |  |  |  |
| 5785           | 17.876000      | 17.956000 |   |   |  |  |  |
| 5825           | 17.796000      | 17.956000 |   |   |  |  |  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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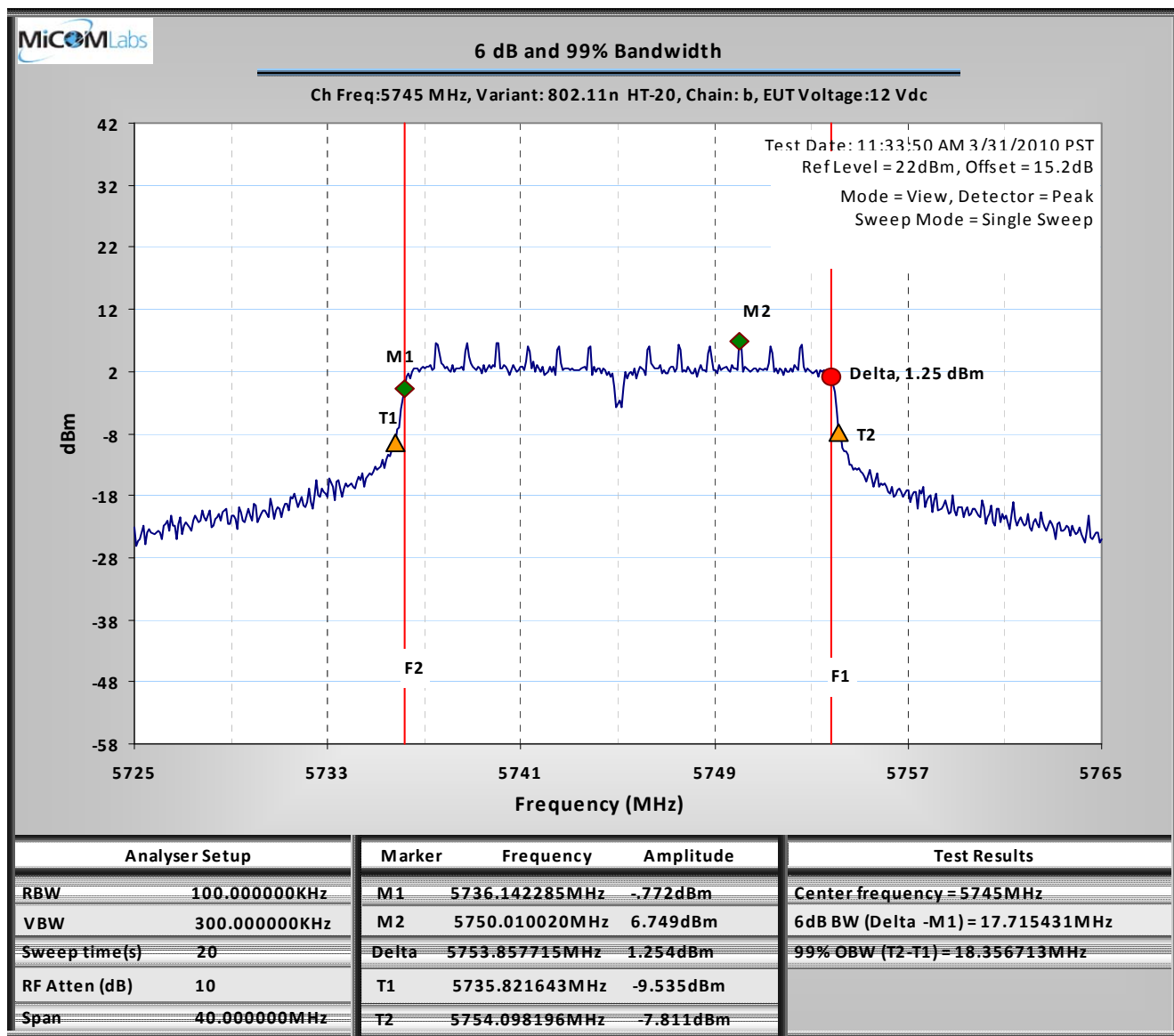
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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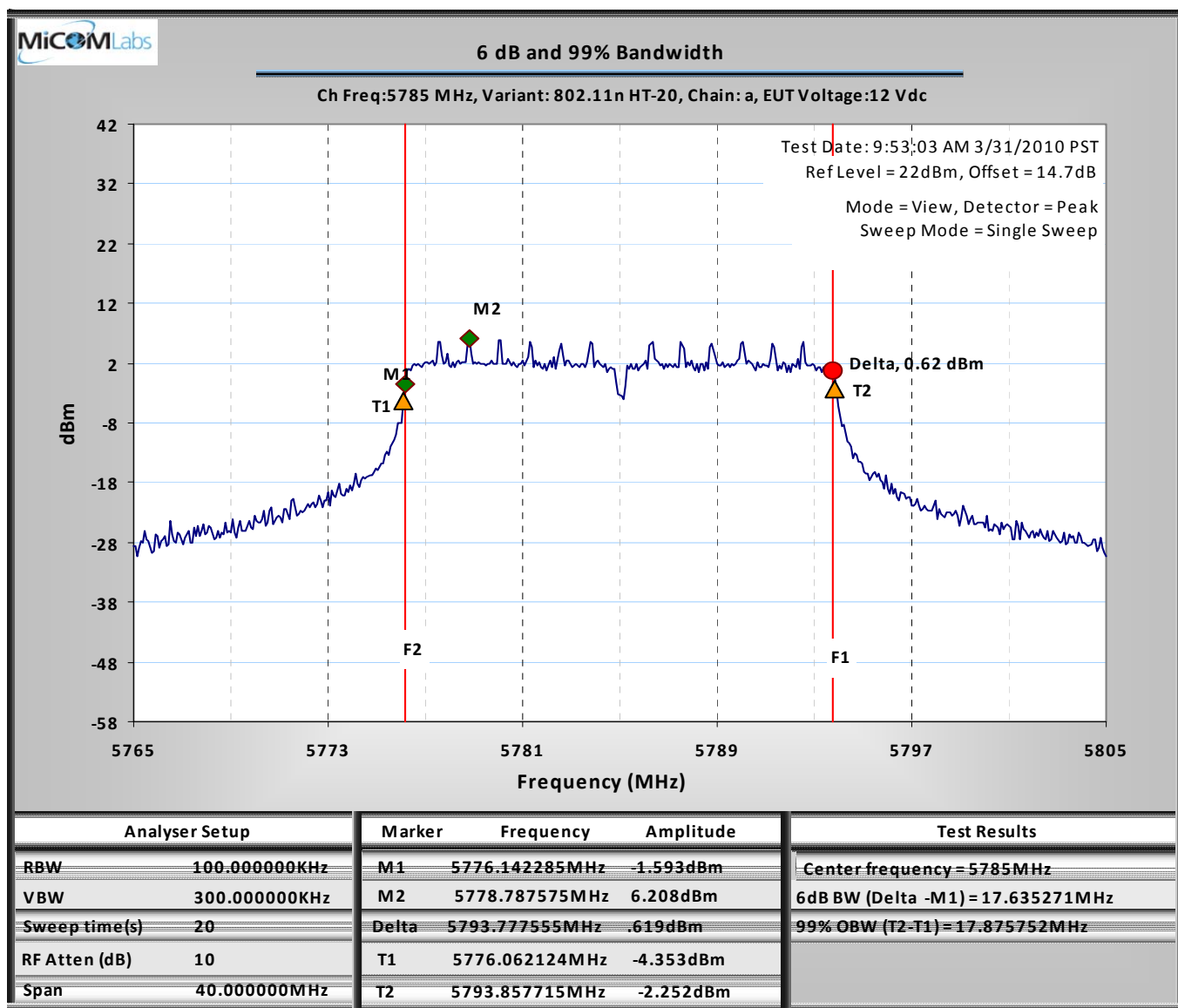
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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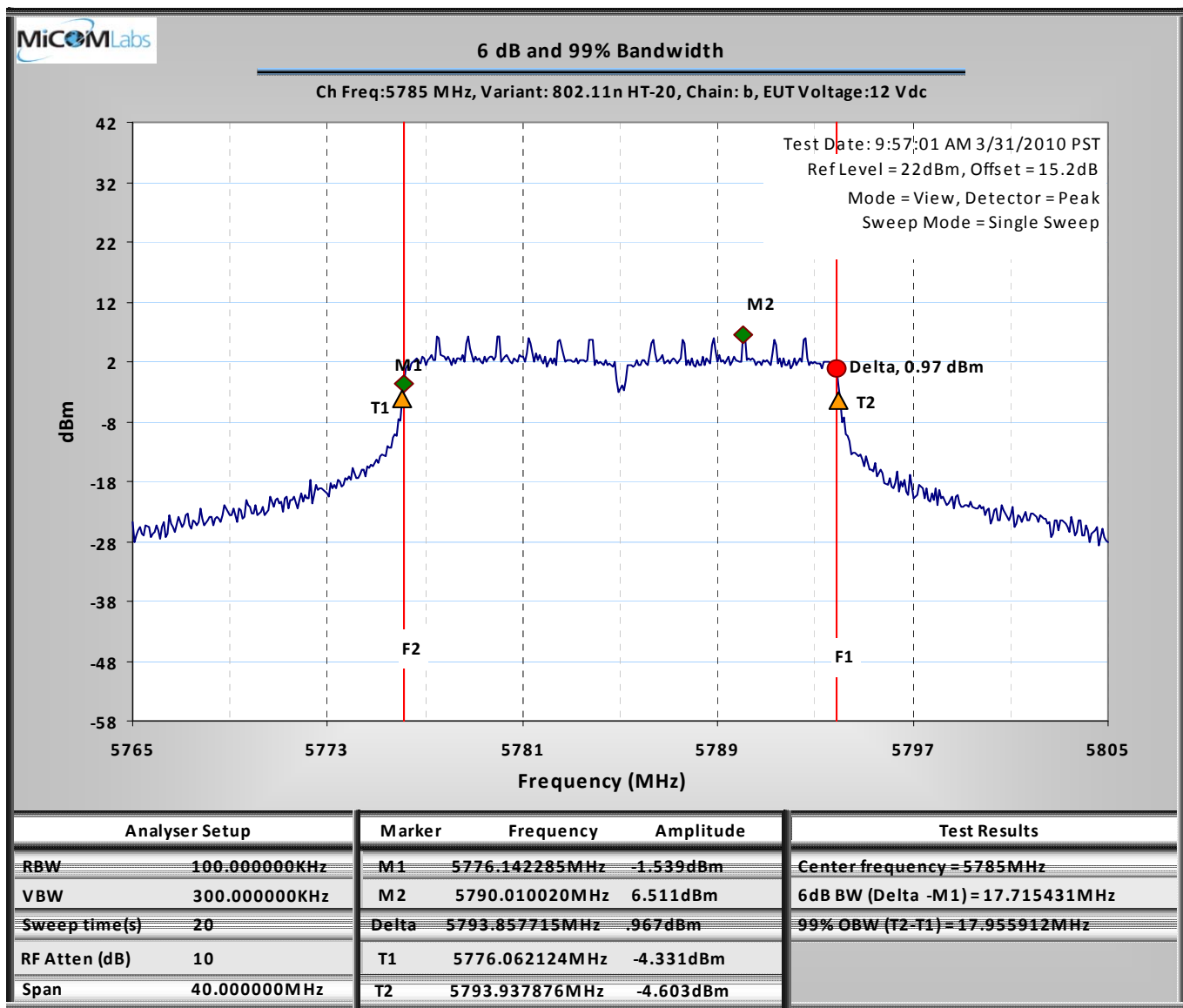
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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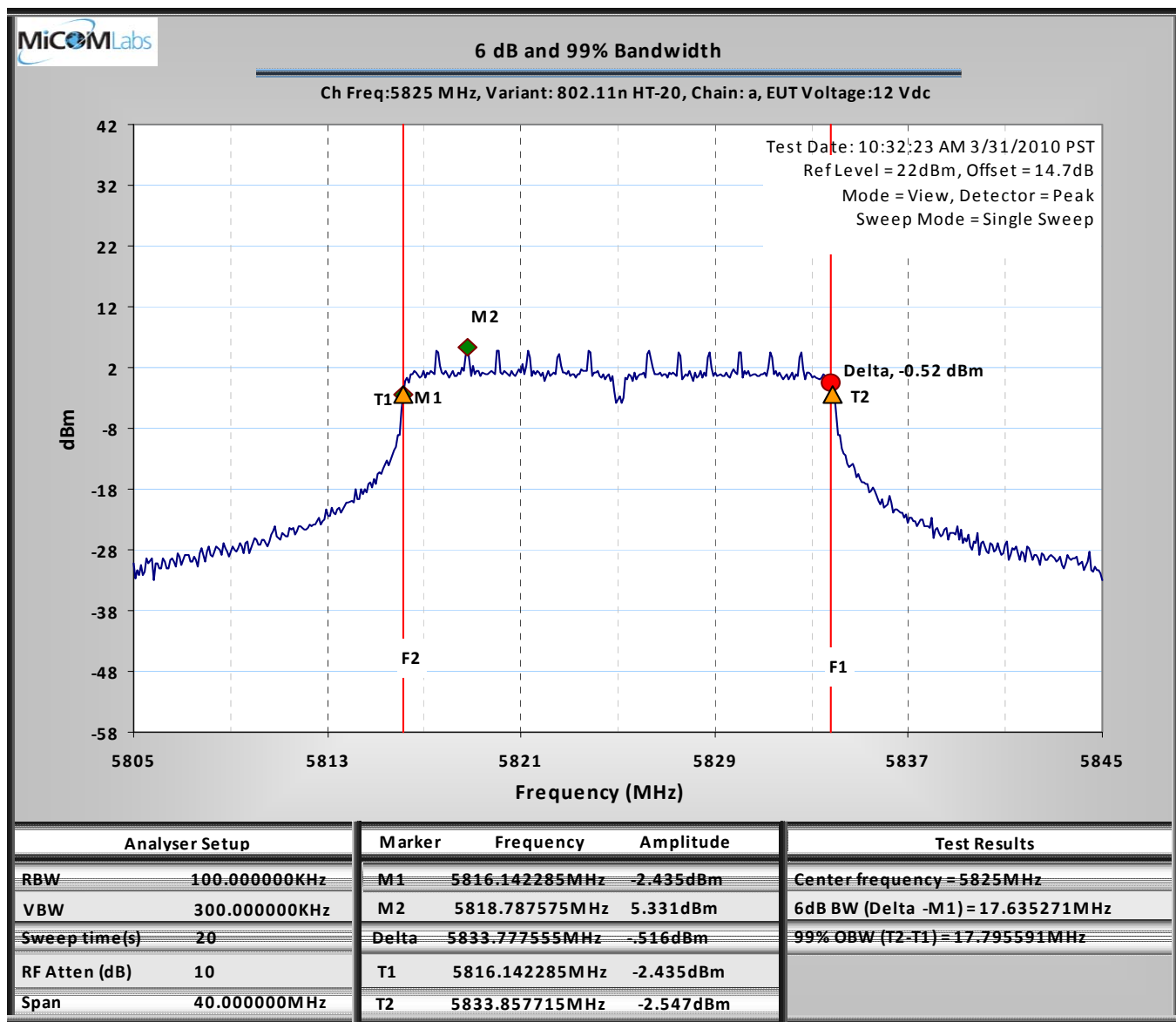
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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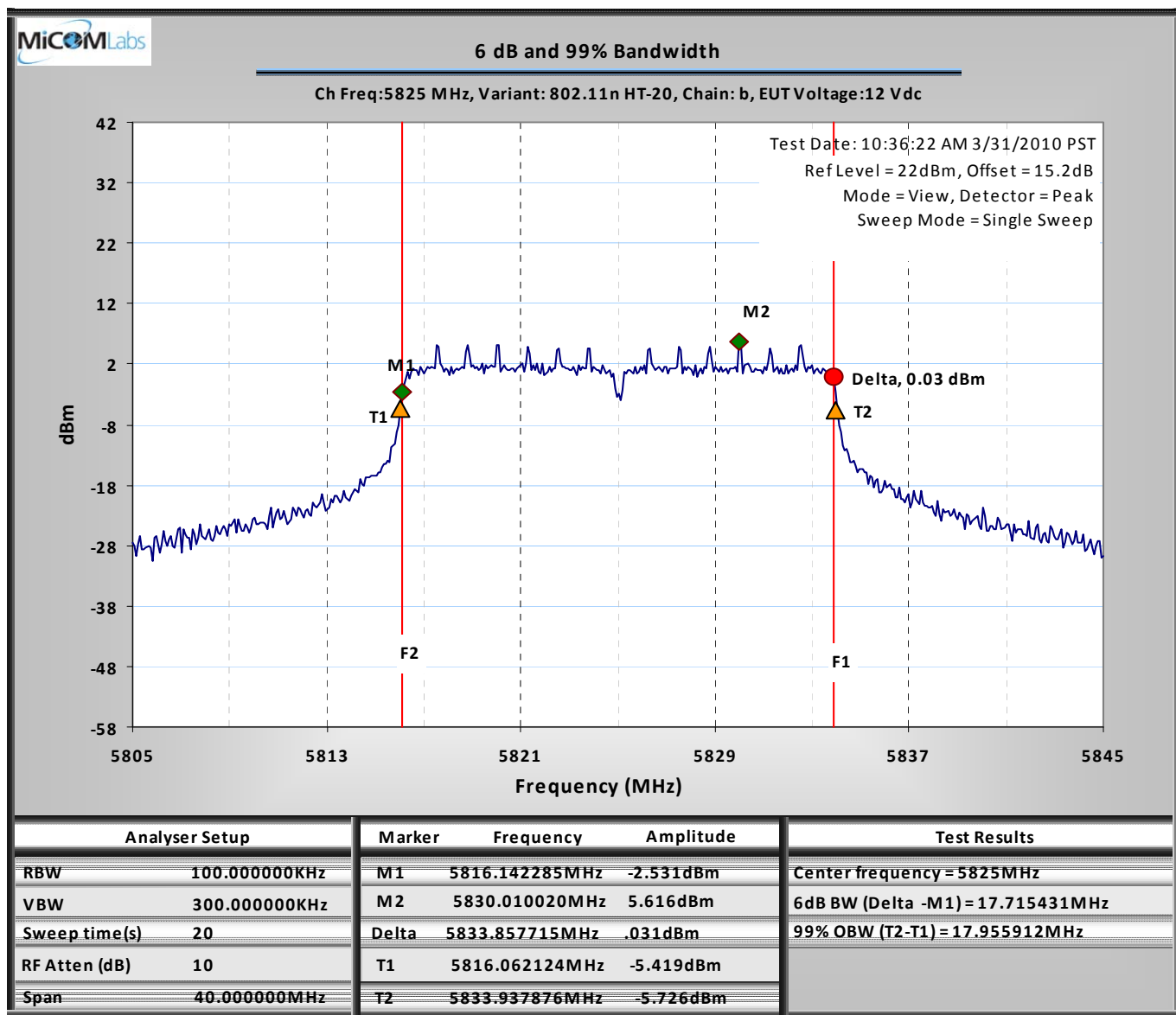
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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### 7.1.7 6 dB and 99% Bandwidth Results: 802.11n HT-40

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <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</b> | N/A           | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b>  | 12.0          |                            |     |    | Vdc  |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### 6 dB Bandwidth

| Test Frequency | 6 dB Bandwidth |           |   |   | Minimum 6dB Bandwidth Limit |     | Margin     |
|----------------|----------------|-----------|---|---|-----------------------------|-----|------------|
|                | MHz            |           |   |   | kHz                         | MHz | MHz        |
| MHz            | a              | b         | c | d |                             |     |            |
| 5755           | 36.232000      | 36.393000 |   |   | 500                         | 0.5 | -35.732000 |
| 5785           | 36.393000      | 36.232000 |   |   |                             |     | -35.732000 |
| 5815           | 36.393000      | 36.393000 |   |   |                             |     | -35.893000 |

#### 99% Bandwidth

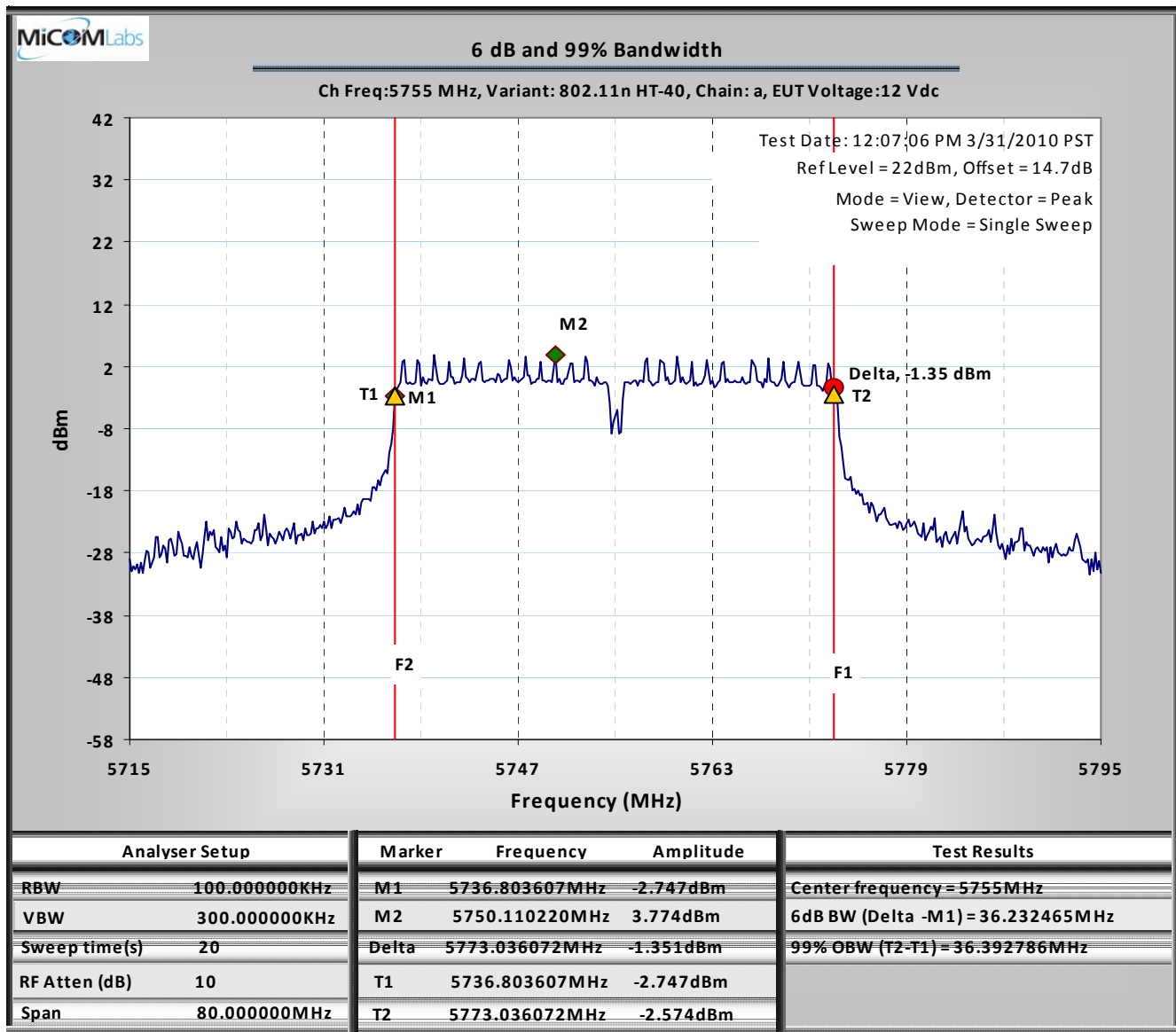
| Test Frequency | 99 % Bandwidth |           |   |   |  |  |  |
|----------------|----------------|-----------|---|---|--|--|--|
|                | MHz            |           |   |   |  |  |  |
| MHz            | a              | b         | c | d |  |  |  |
| 5755           | 36.393000      | 36.553000 |   |   |  |  |  |
| 5785           | 36.393000      | 36.393000 |   |   |  |  |  |
| 5815           | 36.393000      | 36.393000 |   |   |  |  |  |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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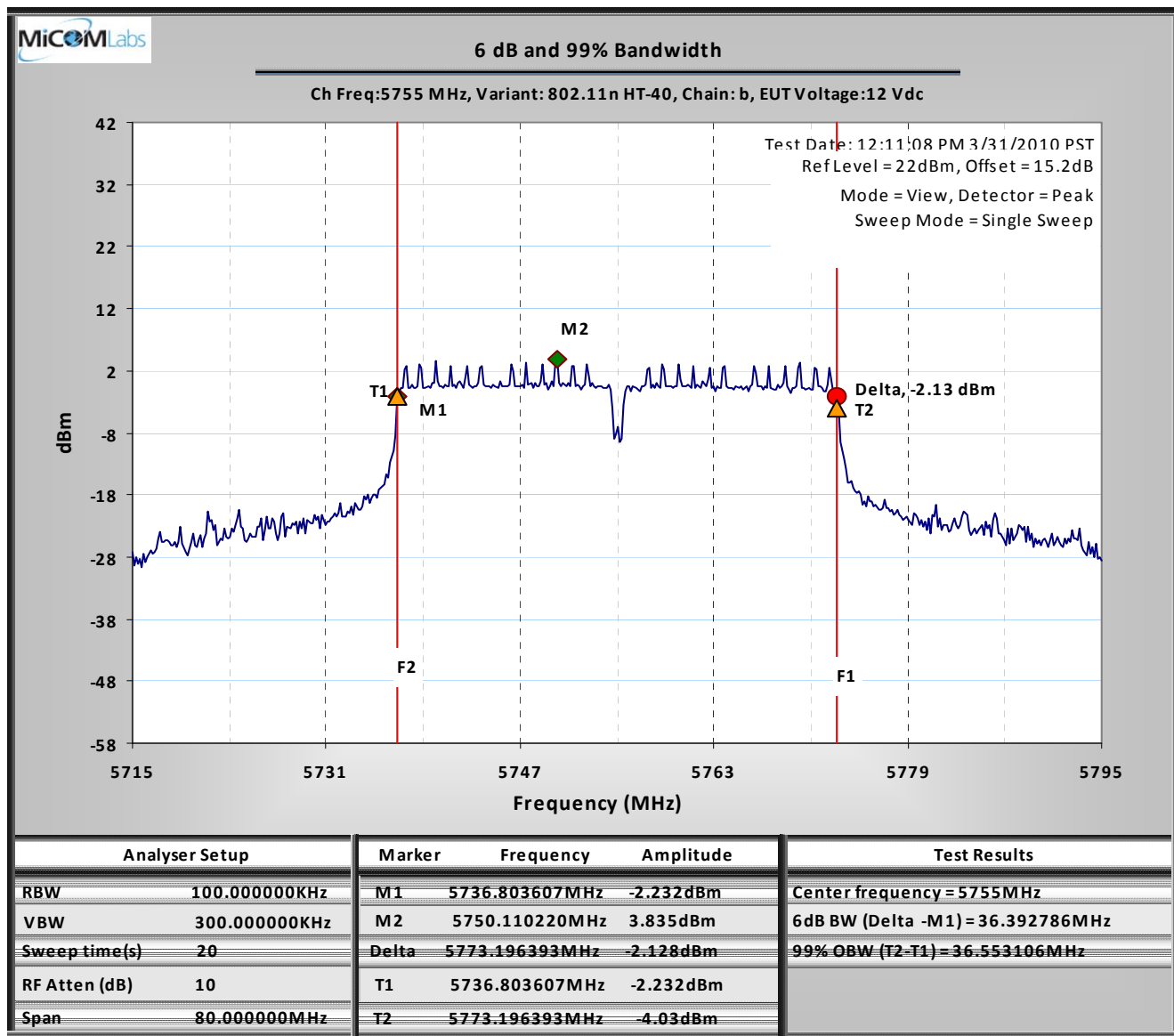
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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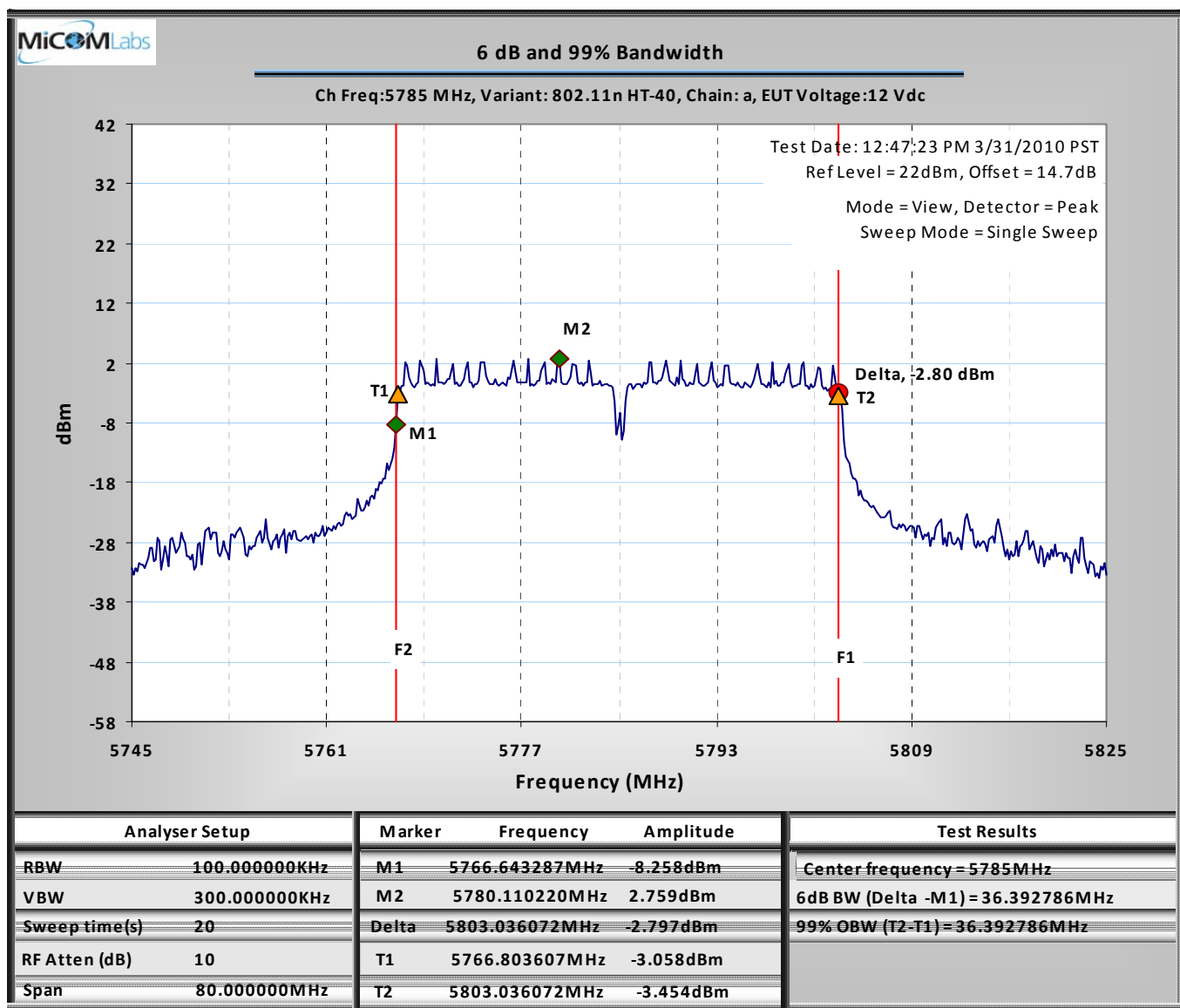
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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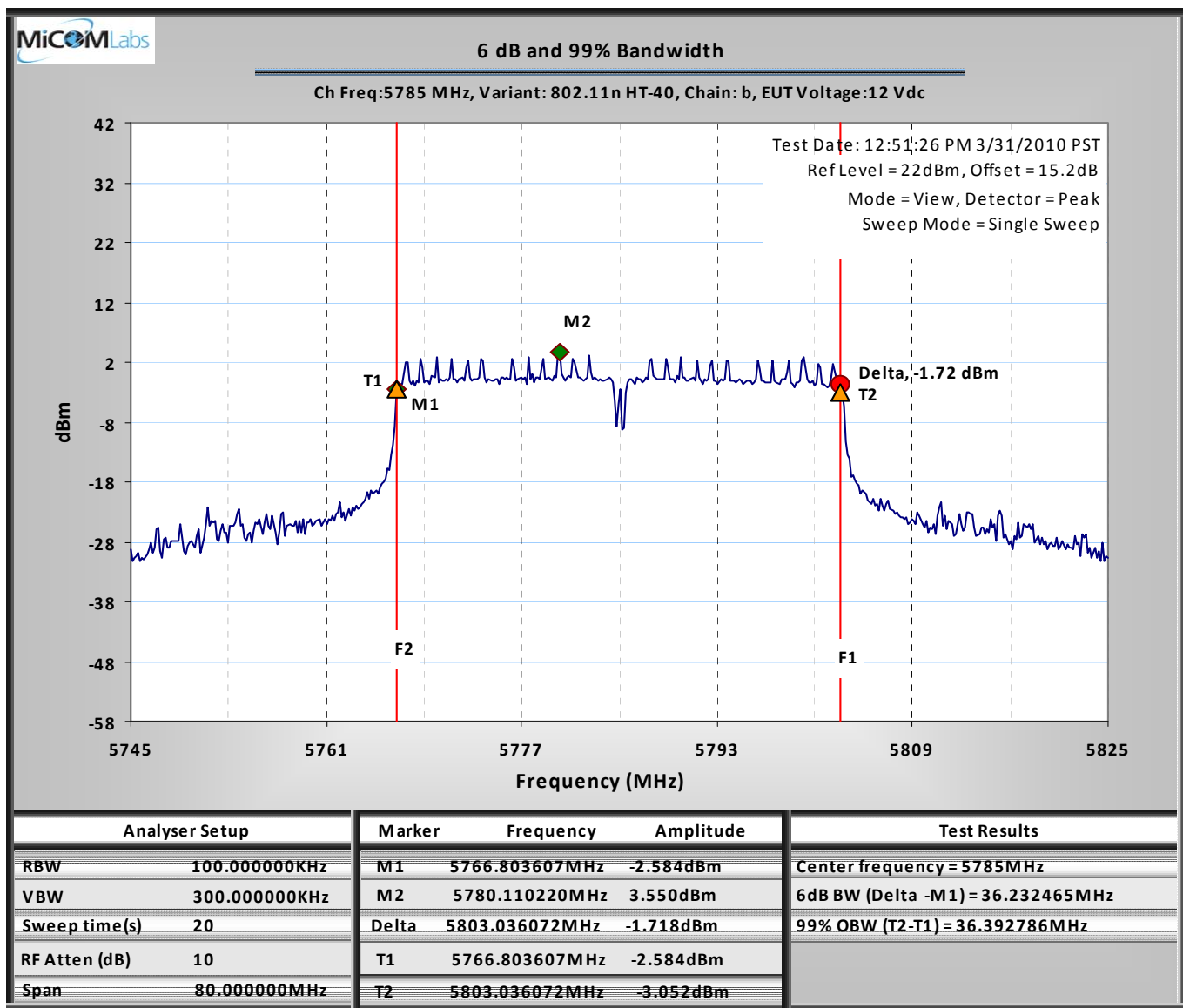
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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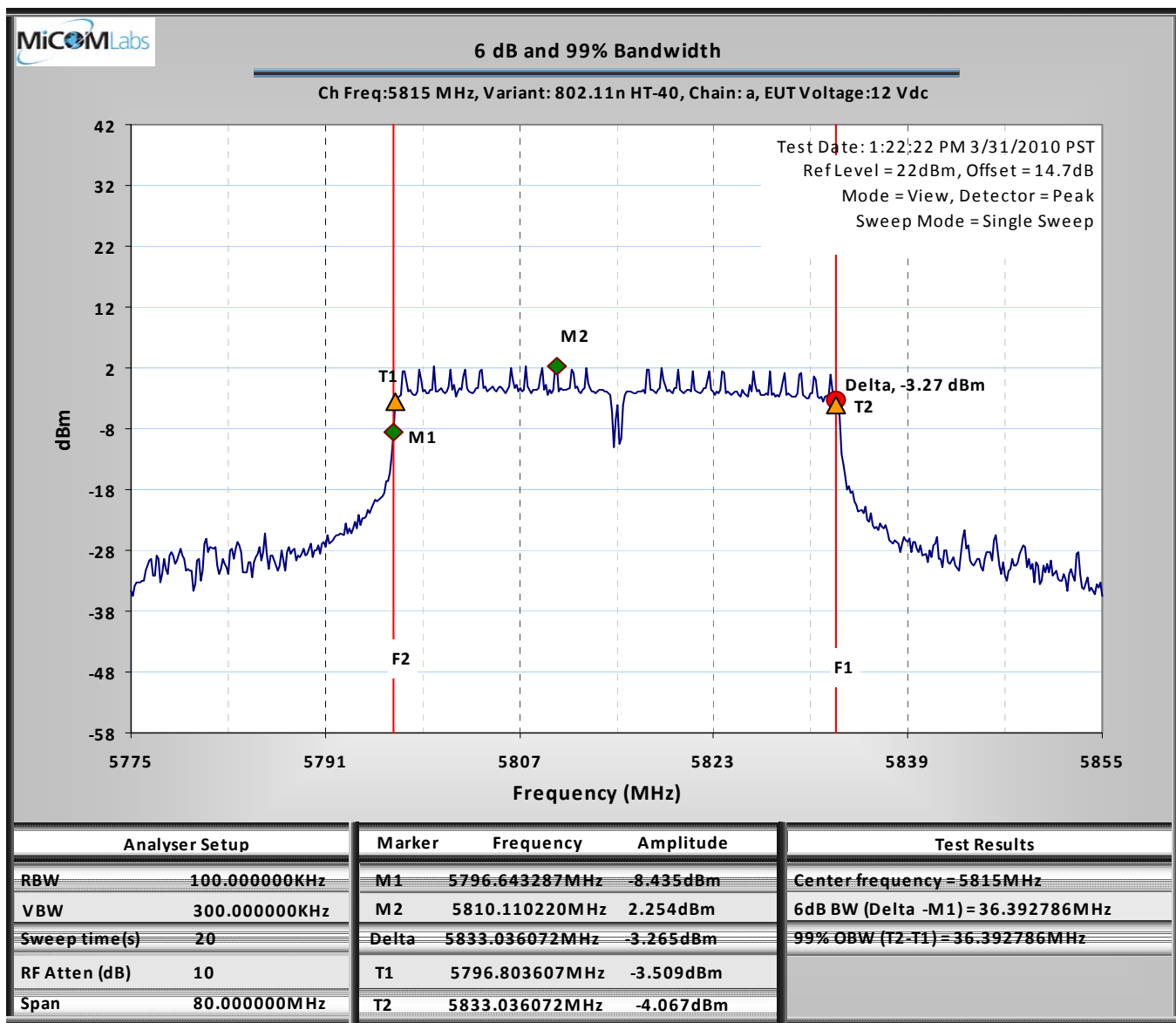
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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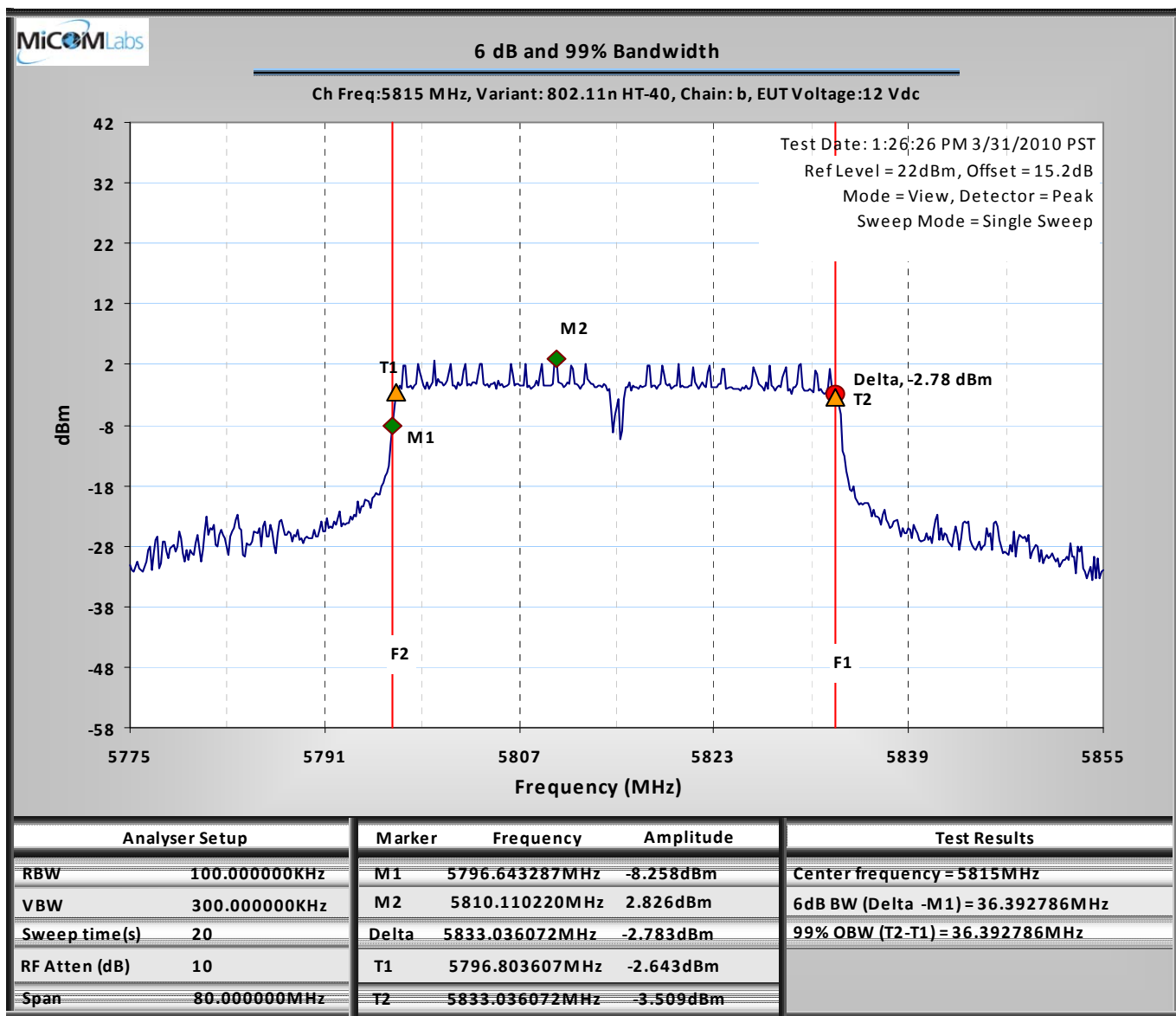
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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## 7.2 Peak Output Power

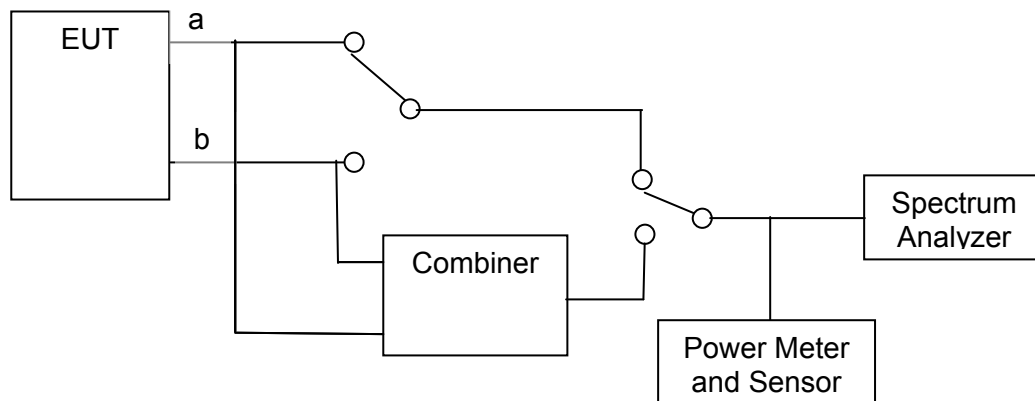
### Test Procedure

The test methodology and conditions utilized for each measurement is referenced in the test results matrix. The average output power was measured per the test configuration identified below.

Per the standard measurements were taken at ambient conditions, nominal voltage.

### Test Configuration

Only Ports a and b were active



Measurement set-up for Peak Output Power

$$\text{Total Power} = A + G + Y + 10 \log (1/x) \text{ dBm}$$

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



## Specification

### Limits

**§15.247 (b)** The maximum peak output power of the intentional radiator shall not exceed the following:

**§15.247 (b) (3)** For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1.0 watt.

**15.247 (b) (4)** The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**15.247 (c)** Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

**§15.31 (e)** For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

### Traceability

| Method                                                                        | Test Equipment Used                                  |
|-------------------------------------------------------------------------------|------------------------------------------------------|
| Measurements were made per work instruction WI-01 'Measuring RF Output Power' | 0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363 |



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### 7.2.1 Measurement Results for 802.11b

|                        |            |                     |         |    |      |
|------------------------|------------|---------------------|---------|----|------|
| Test Conditions:       | 15.247 (b) | Rel. Humidity (%):  | 35      | to | 42   |
| Variant:               | 802.11b    | Ambient Temp. (°C): | 19      | to | 22   |
| TPC:                   | HIGH       | Pressure (mBars):   | 998     | to | 1003 |
| Modulation:            | ON         | Duty Cycle (%):     | 100     |    |      |
| Beam Forming Gain (Y): | N/A dB     | Antenna Gain:       | 2.5 dBi |    |      |
| Applied Voltage:       | 55.00 Vdc  |                     |         |    |      |
| Notes 1:               |            |                     |         |    |      |
| Notes 2:               |            |                     |         |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 2412           | 17.93               | 16.76 | -- | -- | N/A               | 20.39      | 30.00 | -9.61  |
| 2437           | 18.45               | 18.57 | -- | -- | N/A               | 21.52      | 30.00 | -8.48  |
| 2462           | 17.32               | 16.84 | -- | -- | N/A               | 20.10      | 30.00 | -9.90  |

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

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## 7.2.2 Measurement Results for 802.11g

|                               |            |                            |         |    |      |
|-------------------------------|------------|----------------------------|---------|----|------|
| <b>Test Conditions:</b>       | 15.247 (b) | <b>Rel. Humidity (%):</b>  | 35      | to | 42   |
| <b>Variant:</b>               | 802.11g    | <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>       | 2.5 dBi |    |      |
| <b>Applied Voltage:</b>       | 55.00 Vdc  |                            |         |    |      |
| <b>Notes 1:</b>               |            |                            |         |    |      |
| <b>Notes 2:</b>               |            |                            |         |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 2412           | 18.40               | 17.79 | -- | -- | N/A               | 21.12      | 30.00 | -8.88  |
| 2437           | 18.89               | 18.57 | -- | -- | N/A               | 21.74      | 30.00 | -8.26  |
| 2462           | 17.91               | 17.76 | -- | -- | N/A               | 20.85      | 30.00 | -9.15  |

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

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### 7.2.3 Measurement Results for 802.11n HT-20

|                        |               |                     |         |    |      |
|------------------------|---------------|---------------------|---------|----|------|
| Test Conditions:       | 15.247 (b)    | Rel. Humidity (%):  | 35      | to | 42   |
| Variant:               | 802.11n HT-20 | Ambient Temp. (°C): | 19      | to | 22   |
| TPC:                   | HIGH          | Pressure (mBars):   | 998     | to | 1003 |
| Modulation:            | ON            | Duty Cycle (%):     | 100     |    |      |
| Beam Forming Gain (Y): | N/A dB        | Antenna Gain:       | 2.5 dBi |    |      |
| Applied Voltage:       | 55.00 Vdc     |                     |         |    |      |
| Notes 1:               |               |                     |         |    |      |
| Notes 2:               |               |                     |         |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 2412           | 18.39               | 17.68 | -- | -- | N/A               | 21.06      | 30.00 | -8.94  |
| 2437           | 18.85               | 18.57 | -- | -- | N/A               | 21.72      | 30.00 | -8.28  |
| 2462           | 17.89               | 17.75 | -- | -- | N/A               | 20.83      | 30.00 | -9.17  |

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

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## 7.2.4 Measurement Results for 802.11n HT-40

|                        |               |                     |         |    |      |
|------------------------|---------------|---------------------|---------|----|------|
| Test Conditions:       | 15.247 (b)    | Rel. Humidity (%):  | 35      | to | 42   |
| Variant:               | 802.11n HT-40 | Ambient Temp. (°C): | 19      | to | 22   |
| TPC:                   | HIGH          | Pressure (mBars):   | 998     | to | 1003 |
| Modulation:            | ON            | Duty Cycle (%):     | 100     |    |      |
| Beam Forming Gain (Y): | N/A dB        | Antenna Gain:       | 2.5 dBi |    |      |
| Applied Voltage:       | 55.00 Vdc     |                     |         |    |      |
| Notes 1:               |               |                     |         |    |      |
| Notes 2:               |               |                     |         |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 2422           | 17.52               | 17.66 | -- | -- | N/A               | 20.60      | 30.00 | -9.40  |
| 2437           | 18.93               | 18.13 | -- | -- | N/A               | 21.56      | 30.00 | -8.44  |
| 2452           | 11.51               | 10.98 | -- | -- | N/A               | 14.26      | 30.00 | -15.74 |

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

The above results take into account the power reduction required to bring the product into compliance during radiated band-edge testing.

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### 7.2.5 Measurement Results for 802.11a

|                               |            |                            |     |    |      |
|-------------------------------|------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>       | 15.247 (b) | <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 dB     | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b>       | 12.0 Vdc   |                            |     |    |      |
| <b>Notes 1:</b>               |            |                            |     |    |      |
| <b>Notes 2:</b>               |            |                            |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5745           | 16.61               | 16.78 | -- | -- | 19.13             | 19.71      | 30.00 | -10.87 |
| 5785           | 16.30               | 16.82 | -- | -- | 19.50             | 19.58      | 30.00 | -10.50 |
| 5825           | 15.67               | 15.96 | -- | -- | 18.61             | 18.83      | 30.00 | -11.39 |

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

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#### 7.2.6 Measurement Results for 802.11n HT-20

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (b)    | <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</b> | N/A dB        | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b>  | 12.0 Vdc      |                            |     |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5745           | 16.84               | 16.97 | -- | -- | 19.15             | 19.92      | 30.00 | -10.85 |
| 5785           | 16.49               | 16.97 | -- | -- | 19.49             | 19.75      | 30.00 | -10.51 |
| 5825           | 15.84               | 16.10 | -- | -- | 18.82             | 18.98      | 30.00 | -11.18 |

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

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## 7.2.7 Measurement Results for 802.11n HT-40

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (b)    | <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</b> | N/A dB        | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b>  | 12.0 Vdc      |                            |     |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

| Test Frequency | Measured Peak Power |       |    |    | Total Power (dBm) |            | Limit | Margin |
|----------------|---------------------|-------|----|----|-------------------|------------|-------|--------|
|                | RF Port (dBm)       |       |    |    |                   |            |       |        |
| MHz            | a                   | b     | c  | d  | Combined          | Calculated | dBm   | dB     |
| 5755           | 16.39               | 16.61 | -- | -- | 19.11             | 19.51      | 30.00 | -10.89 |
| 5785           | 16.10               | 16.59 | -- | -- | 19.28             | 19.36      | 30.00 | -10.72 |
| 5815           | 15.61               | 15.93 | -- | -- | 18.55             | 18.78      | 30.00 | -11.45 |

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

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### 7.3 Peak Power Spectral Density

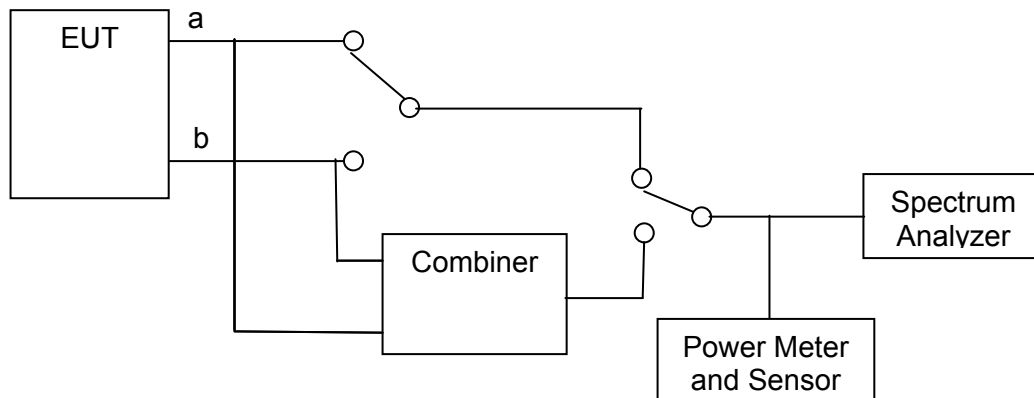
#### Test Procedure

The test methodology and conditions utilized for each measurement is referenced in the following test results matrix. RF output power, transmit power control and power density were measured per the Test Configuration identified below.

Testing was performed on the highest and lowest power settings of the equipment.

Per the standard measurements were taken at ambient and extreme temperature conditions at nominal and extreme voltage levels.

#### Test Configuration



Measurement set-up for Peak Power Spectral Density

#### Specification

##### Peak Power Spectral Density Limits

**§15.247 (e)** For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission

#### Traceability

| Method                                                                        | Test Equipment Used                                  |
|-------------------------------------------------------------------------------|------------------------------------------------------|
| Measurements were made per work instruction WI-01 'Measuring RF Output Power' | 0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363 |



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### 7.3.1 Measurement results for 802.11b

|                               |            |                            |         |    |      |
|-------------------------------|------------|----------------------------|---------|----|------|
| <b>Test Conditions:</b>       | 15.247 (e) | <b>Rel. Humidity (%):</b>  | 35      | to | 42   |
| <b>Variant:</b>               | 802.11b    | <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>       | 2.5 dBi |    |      |
| <b>Applied Voltage:</b>       | 55.00 Vdc  | <b>Antenna Ports (N):</b>  | 2       |    |      |
| <b>Notes 1:</b>               |            |                            |         |    |      |
| <b>Notes 2:</b>               |            |                            |         |    |      |

| Test Frequency | Measured Power Density |       |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|------------------------|-------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)          |       |    |    |                   |                             |       |        |
| MHz            | a                      | b     | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 2412.000       | -4.54                  | -5.54 | -- | -- | 3.01              | -1.53                       | 8.00  | -9.53  |
| 2437.000       | -3.97                  | -3.81 | -- | -- | 3.01              | -0.79                       | 8.00  | -8.79  |
| 2462.000       | -4.83                  | -5.18 | -- | -- | 3.01              | -1.82                       | 8.00  | -9.82  |

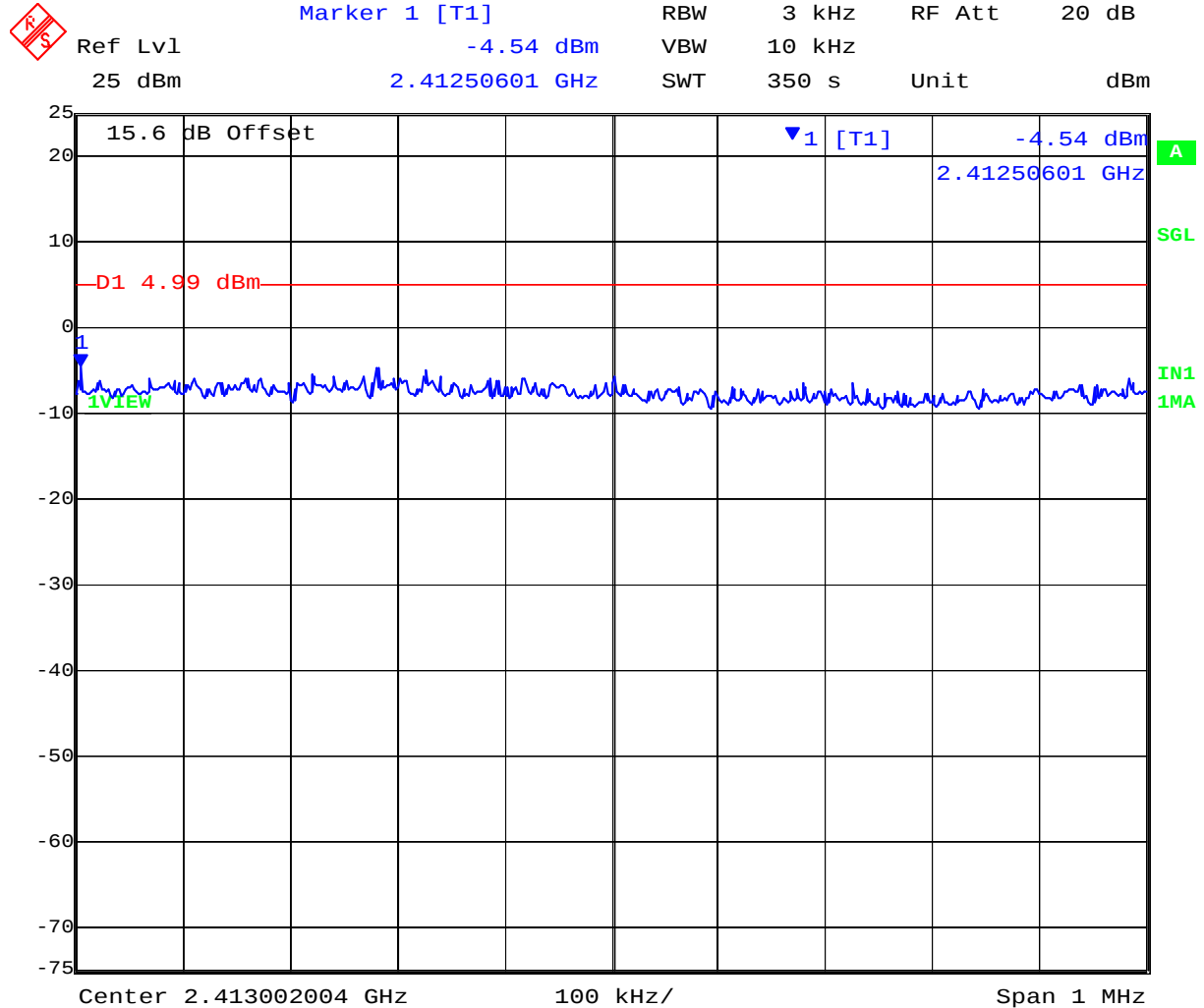
|                                 |           |
|---------------------------------|-----------|
| <b>Measurement uncertainty:</b> | ± 1.33 dB |
|---------------------------------|-----------|

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## CHAIN A



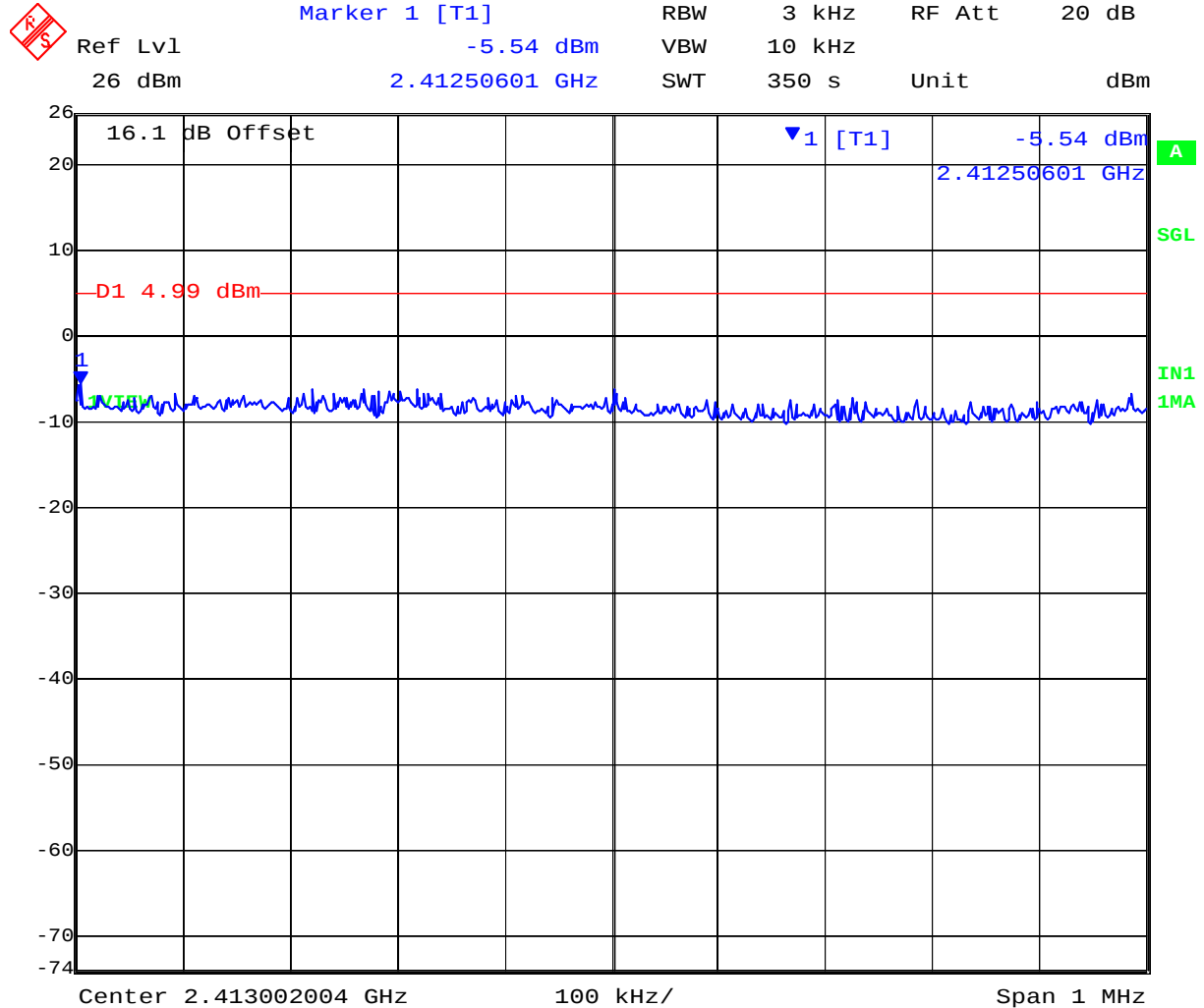
Date: 18.NOV.2011 10:39:23

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## CHAIN B



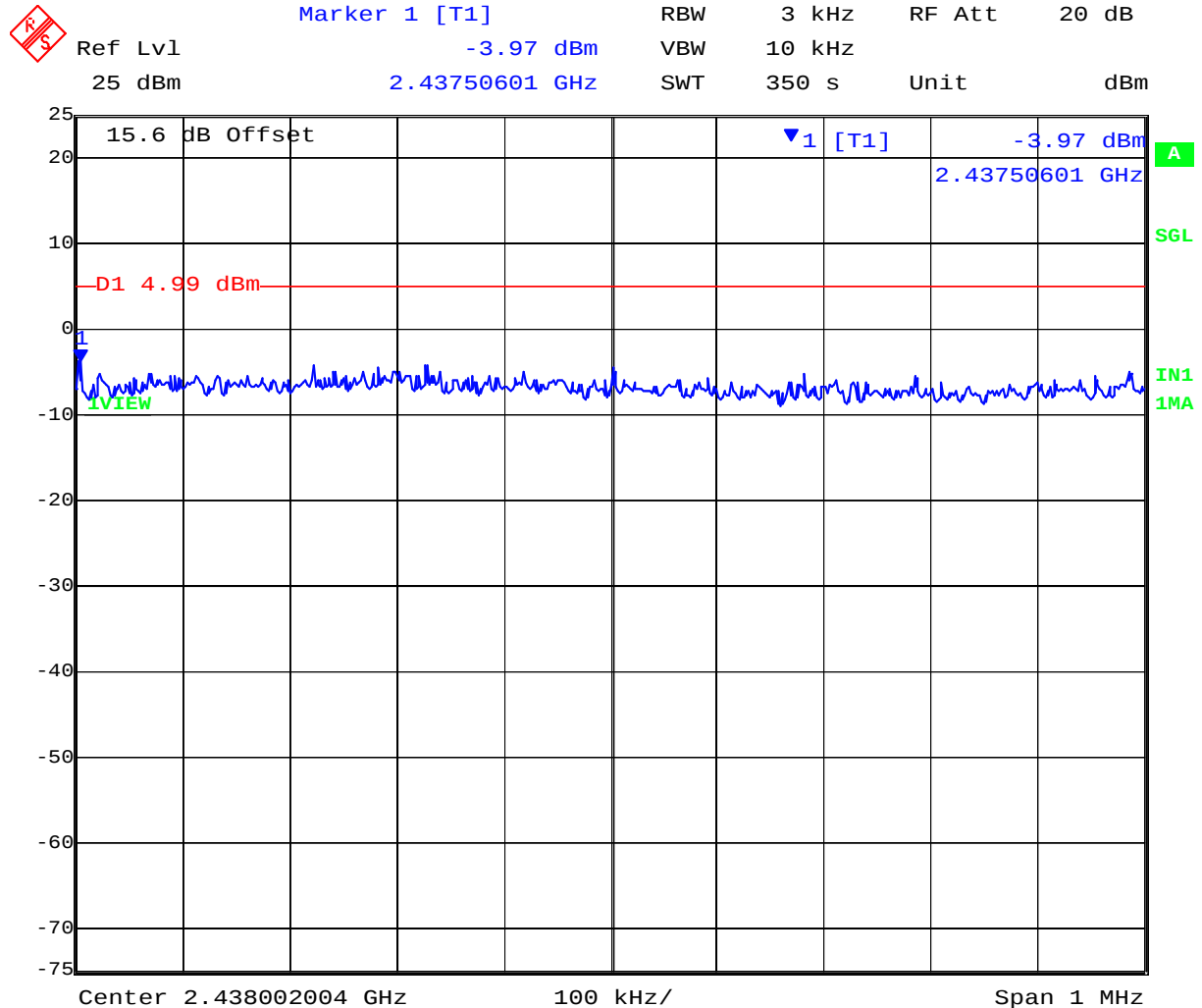
Date: 18.NOV.2011 10:45:55

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## CHAIN A



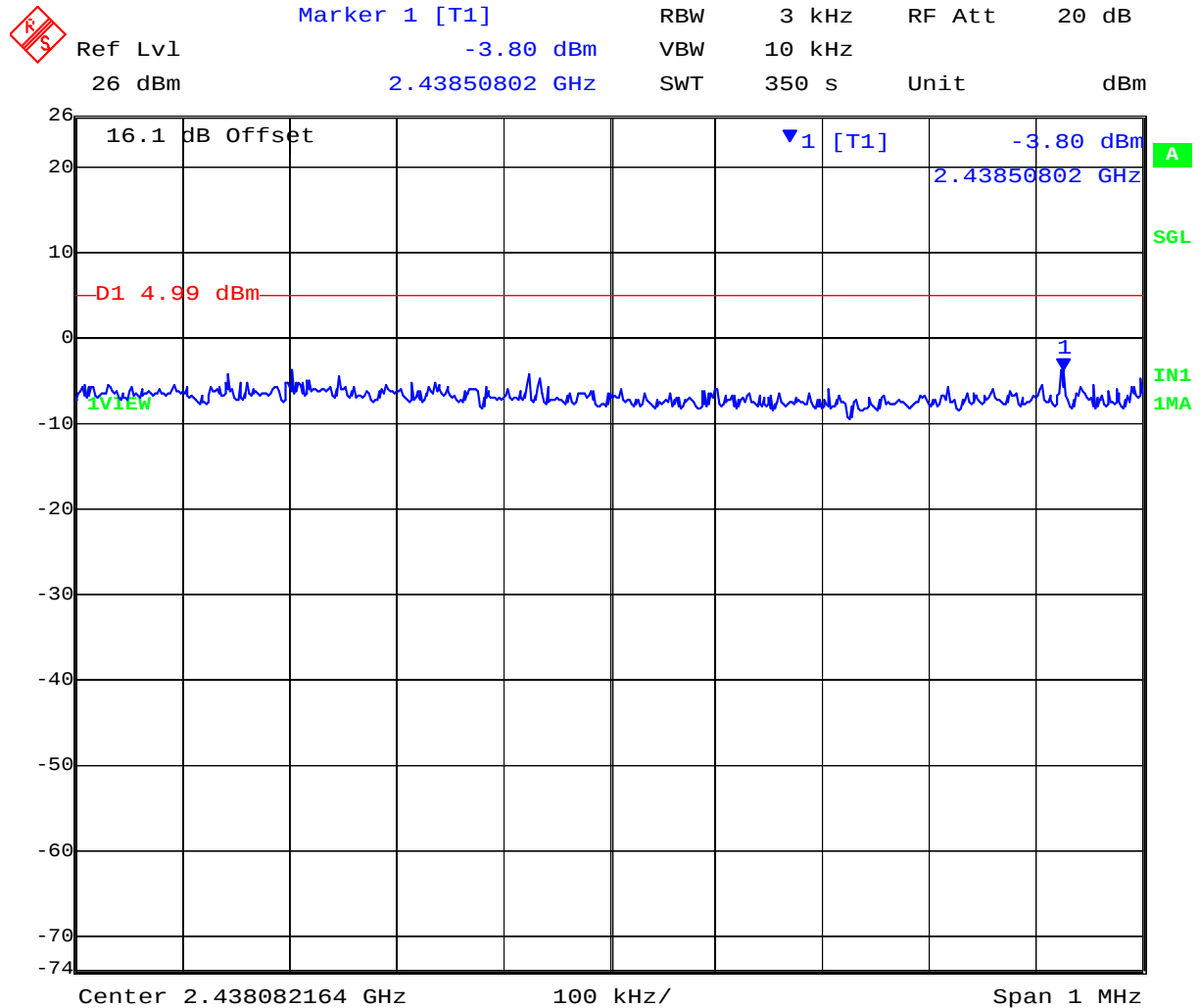
Date: 18.NOV.2011 11:17:31

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## CHAIN B



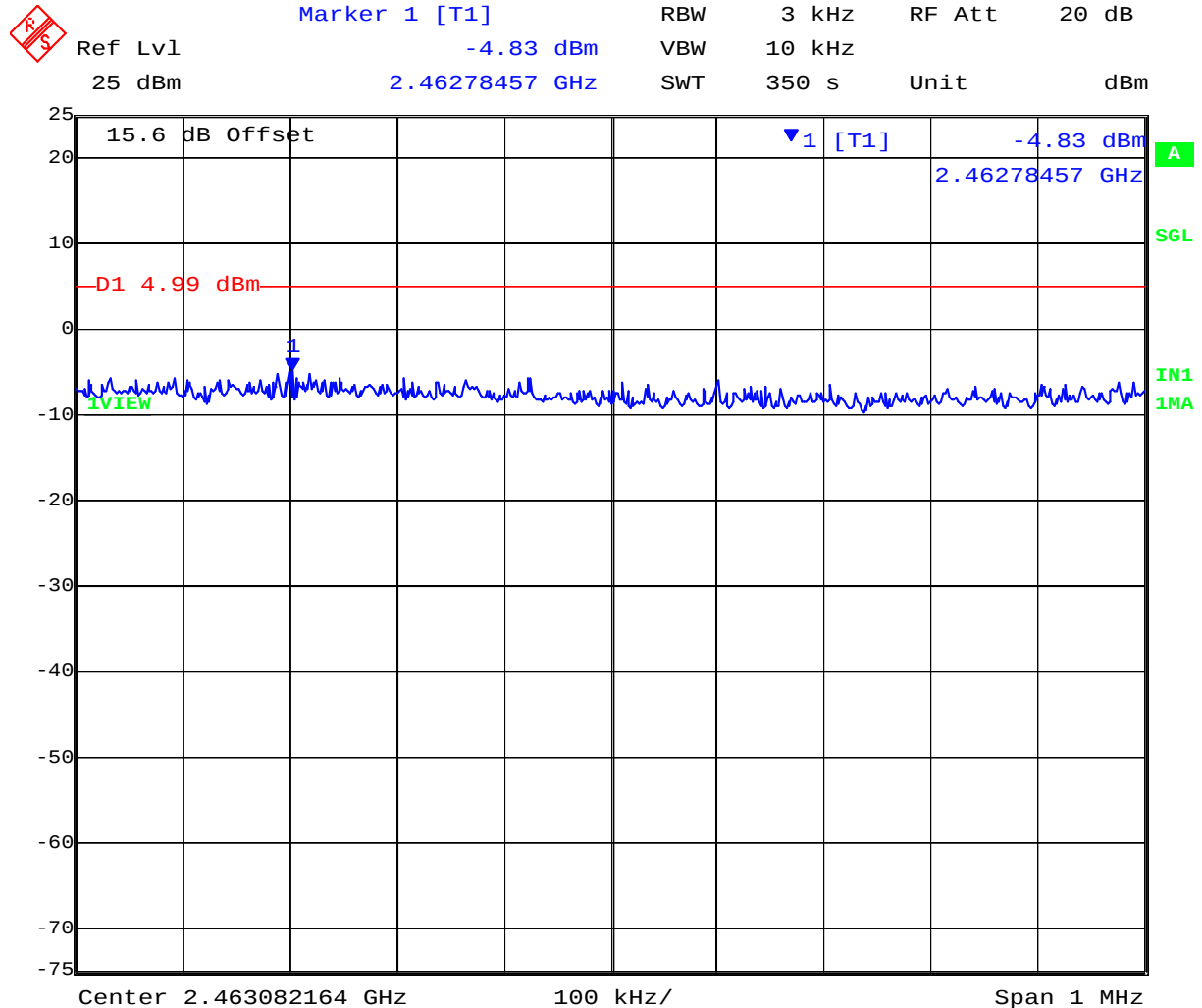
Date: 18.NOV.2011 11:24:03

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## CHAIN A



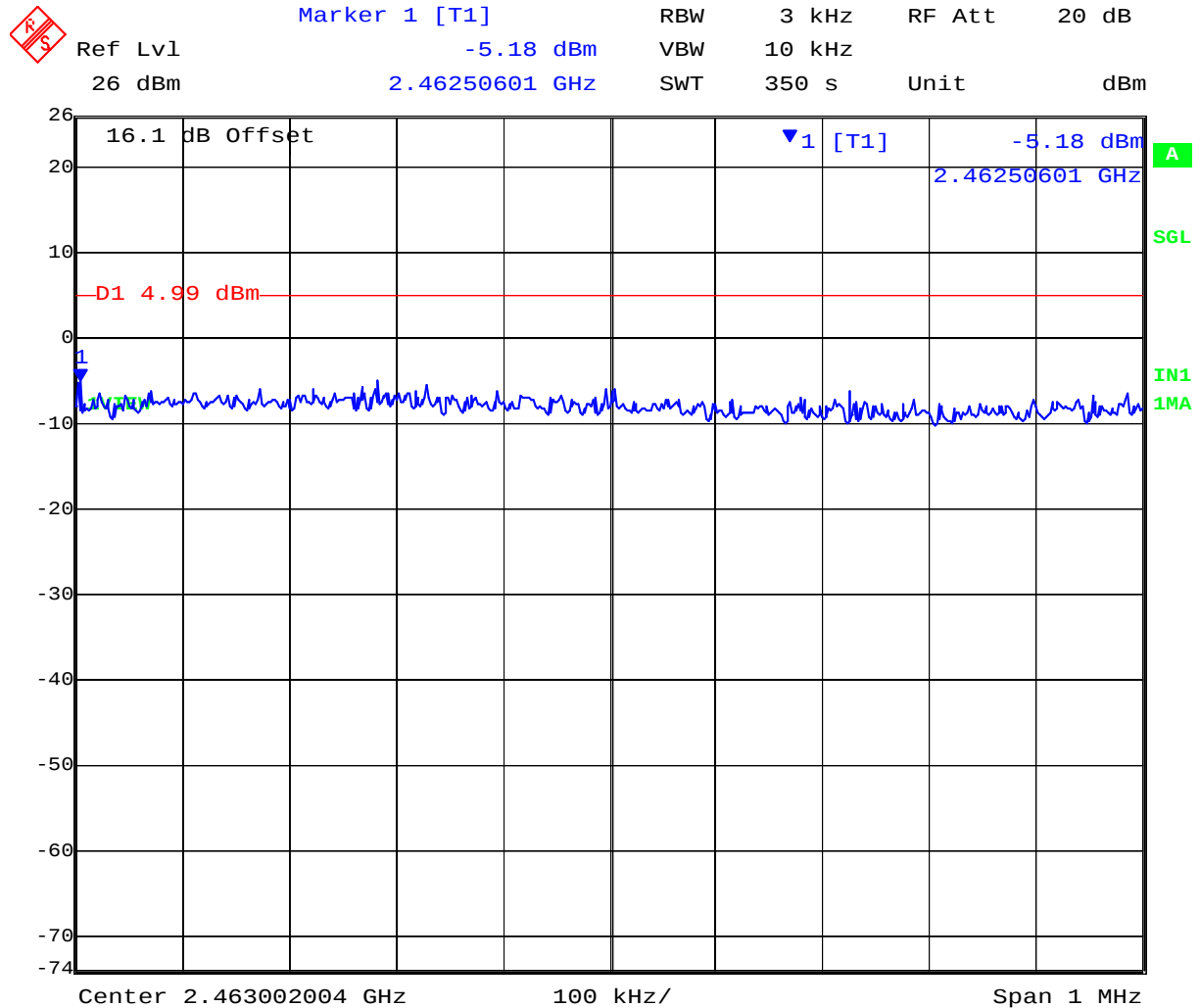
Date: 18.NOV.2011 11:40:12

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## CHAIN B



Date: 18.NOV.2011 11:46:45

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### 7.3.2 Measurement results for 802.11g

|                        |            |                     |         |    |      |
|------------------------|------------|---------------------|---------|----|------|
| Test Conditions:       | 15.247 (e) | Rel. Humidity (%):  | 35      | to | 42   |
| Variant:               | 802.11g    | Ambient Temp. (°C): | 19      | to | 22   |
| TPC:                   | HIGH       | Pressure (mBars):   | 998     | to | 1003 |
| Modulation:            | ON         | Duty Cycle (%):     | 100     |    |      |
| Beam Forming Gain (Y): | N/A dB     | Antenna Gain:       | 2.5 dBi |    |      |
| Applied Voltage:       | 55.00 Vdc  | Antenna Ports (N):  | 2       |    |      |
| Notes 1:               |            |                     |         |    |      |
| Notes 2:               |            |                     |         |    |      |

| Test Frequency | Measured Power Density |       |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|------------------------|-------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)          |       |    |    |                   |                             |       |        |
| MHz            | a                      | b     | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 2412.000       | -5.20                  | -5.63 | -- | -- | 3.01              | -2.19                       | 8.00  | -10.19 |
| 2437.000       | -4.60                  | -4.69 | -- | -- | 3.01              | -1.59                       | 8.00  | -9.59  |
| 2462.000       | -6.29                  | -5.83 | -- | -- | 3.01              | -2.82                       | 8.00  | -10.82 |

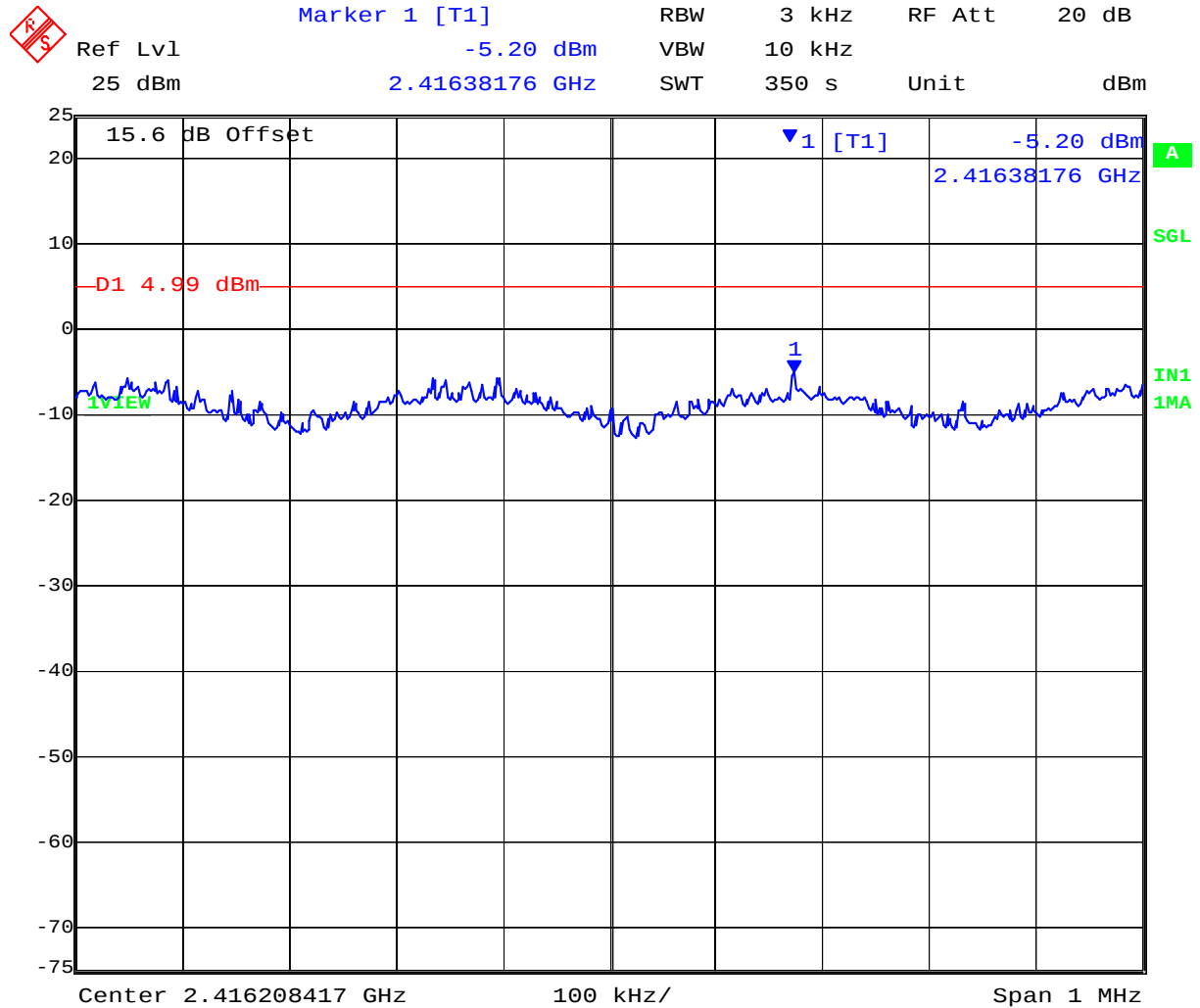
|                          |           |
|--------------------------|-----------|
| Measurement uncertainty: | ± 1.33 dB |
|--------------------------|-----------|

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Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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#### CHAIN A



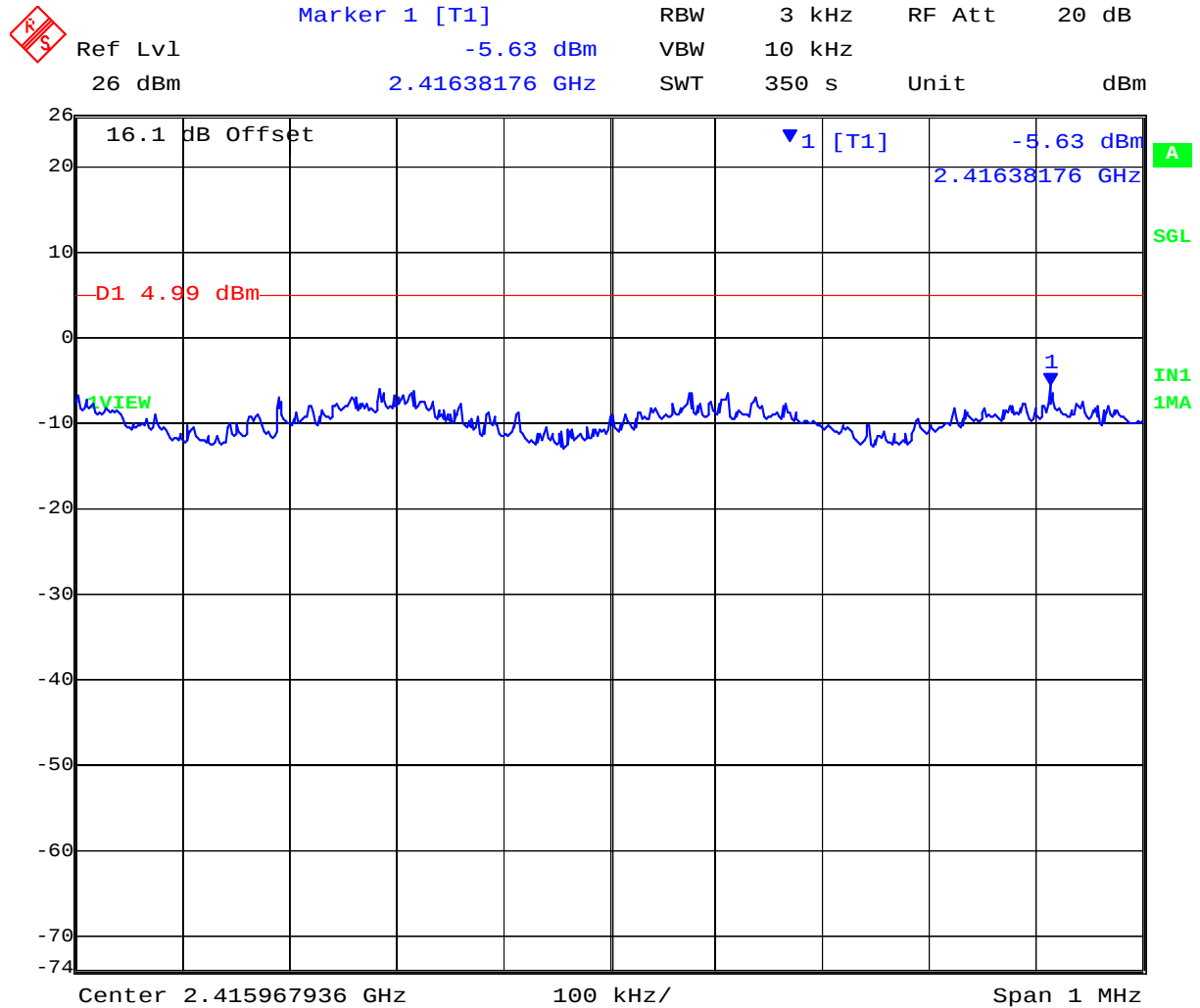
Date: 18.NOV.2011 12:22:03

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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CHAIN B



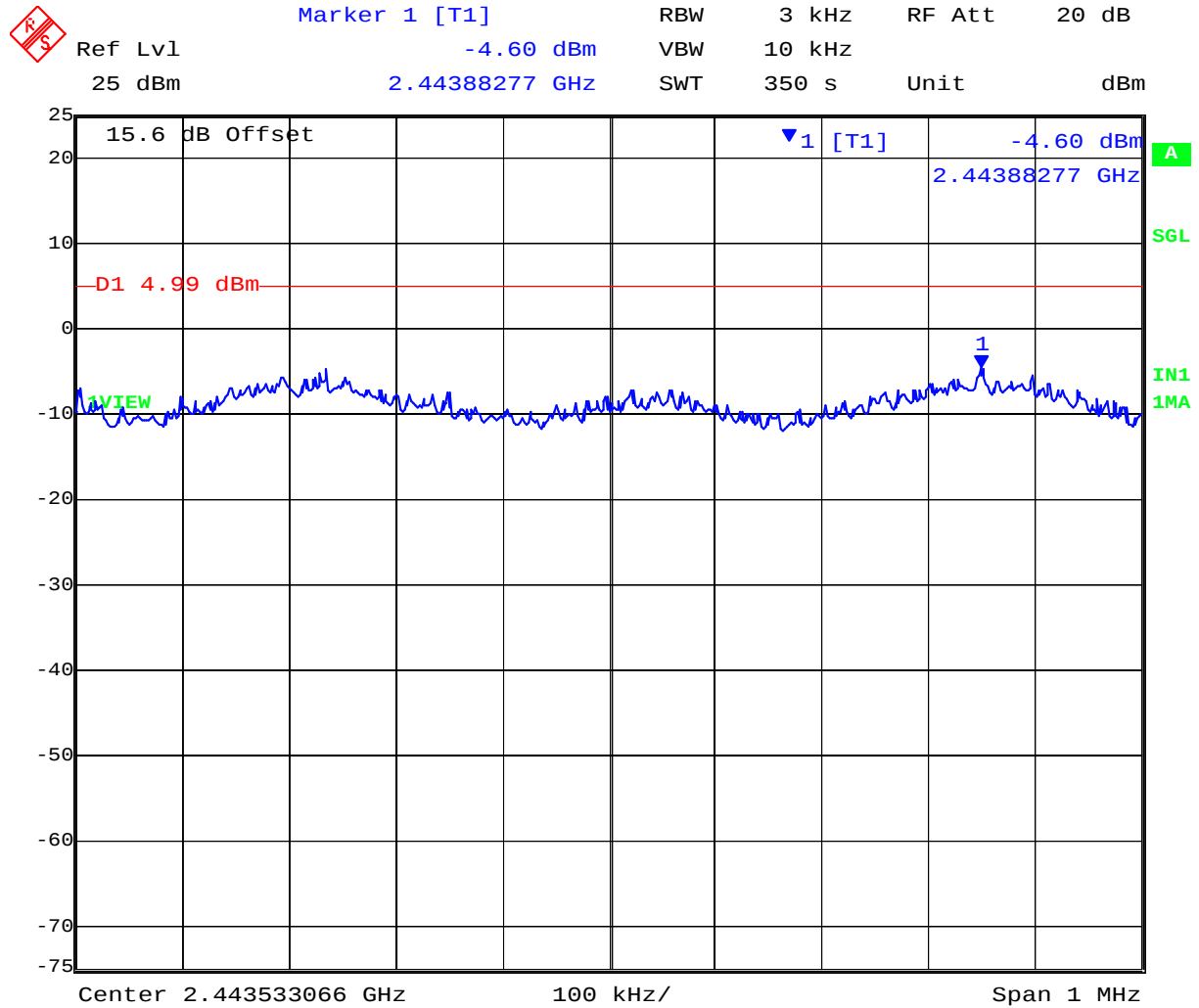
Date: 18.NOV.2011 12:28:35

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Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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CHAIN A



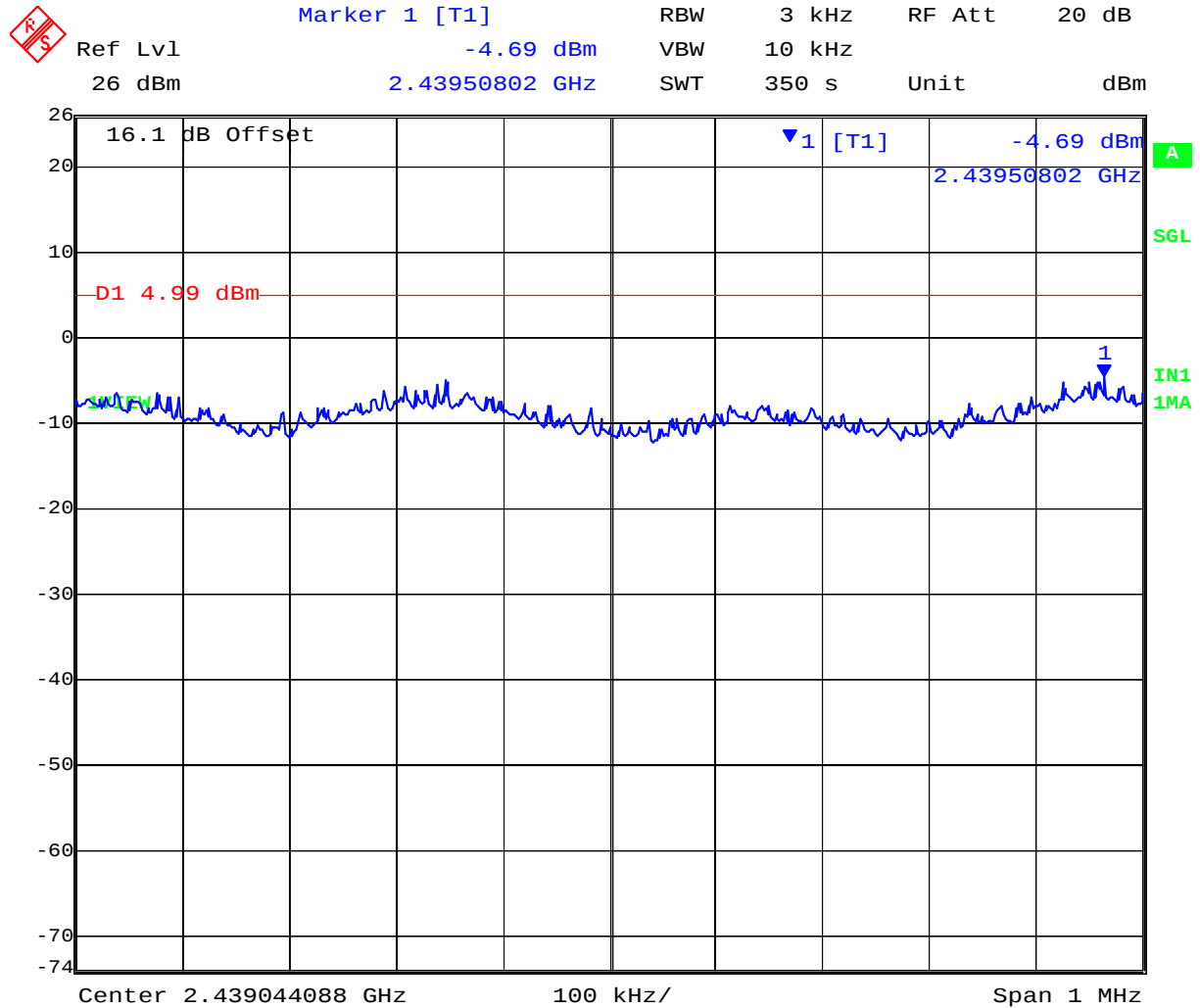
Date: 18.NOV.2011 12:48:59

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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CHAIN B



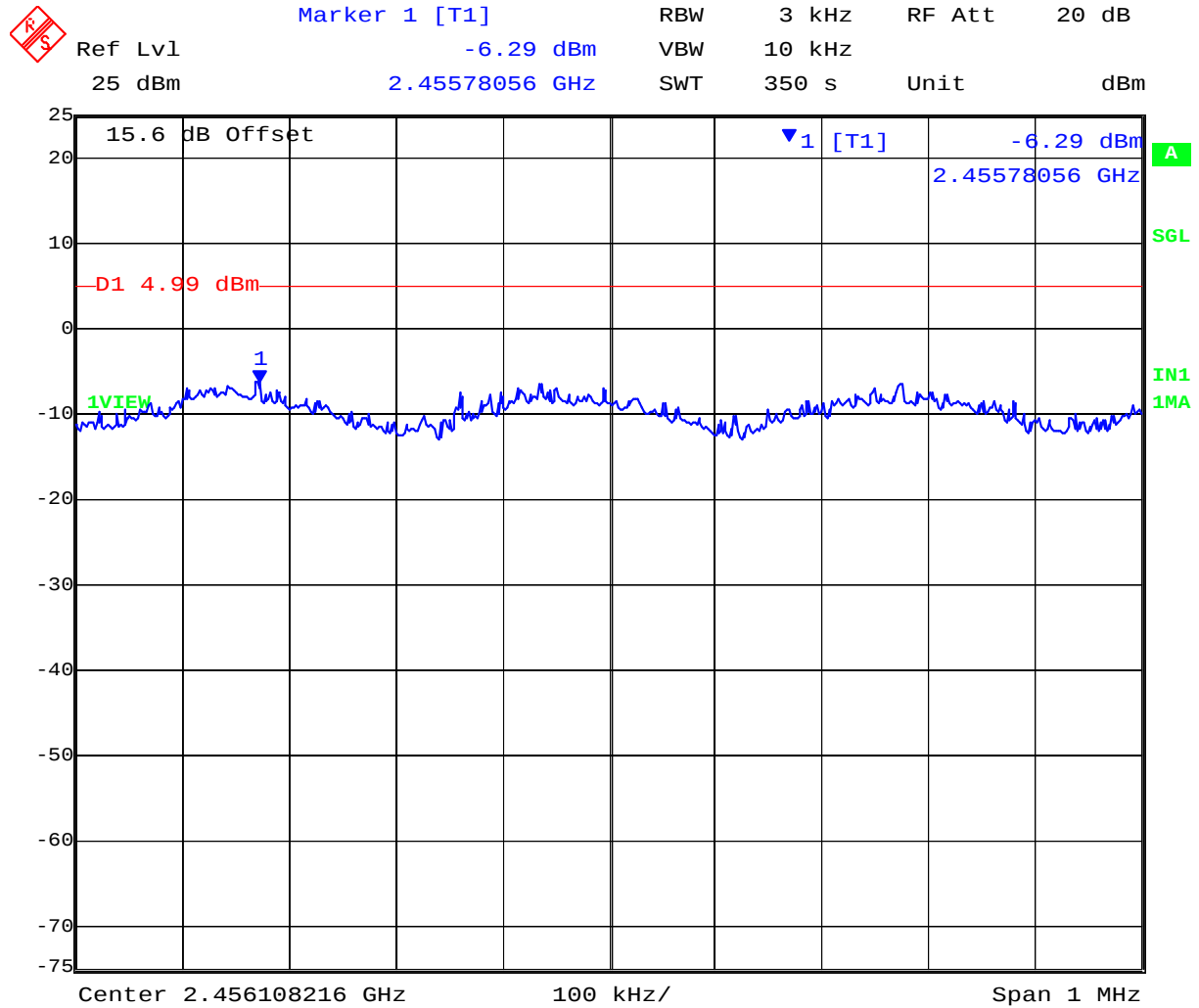
Date: 18.NOV.2011 12:55:32

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#### CHAIN A



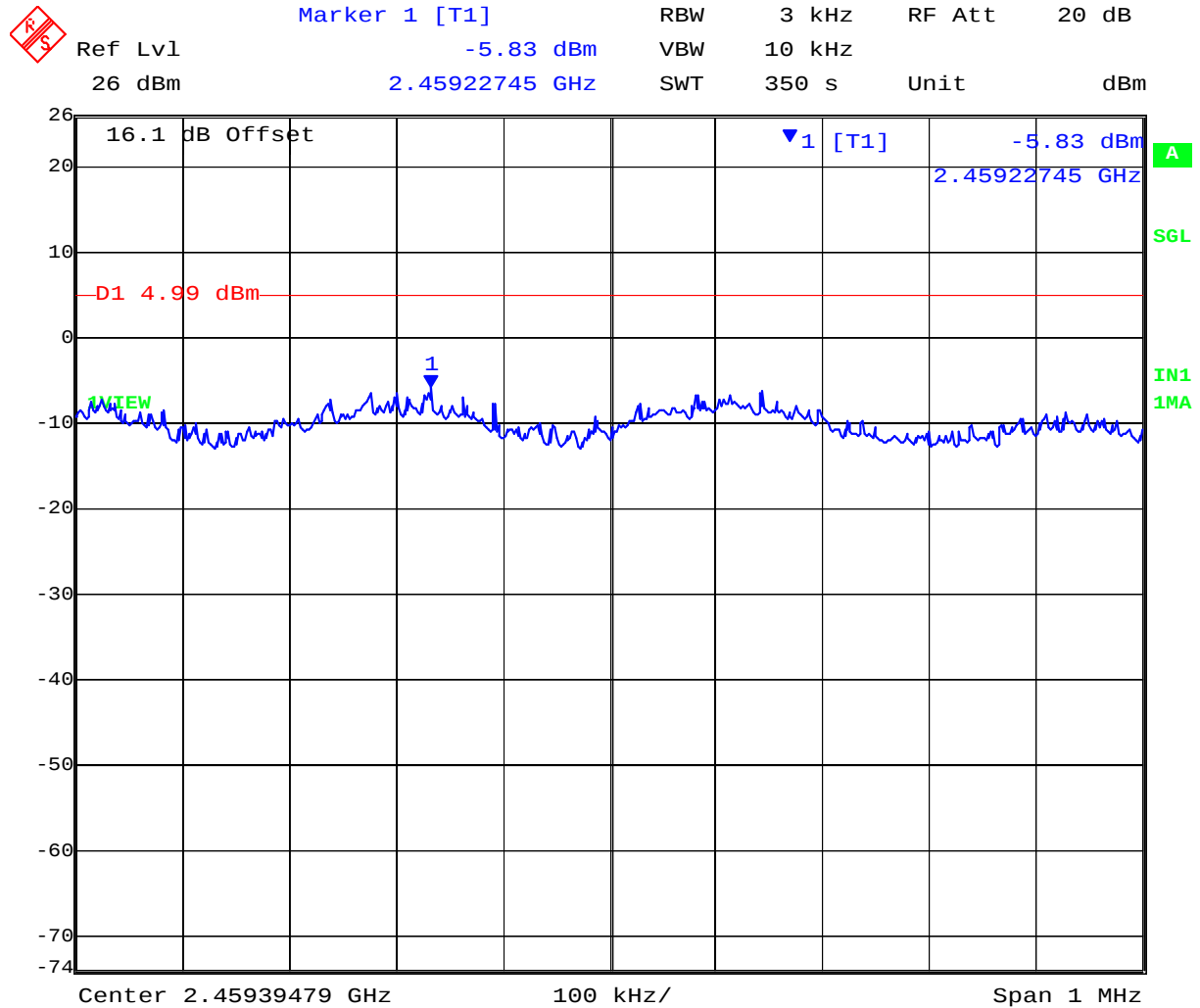
Date: 18.NOV.2011 14:13:59

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
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CHAIN B



Date: 18.NOV.2011 14:20:33

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**Serial #:** ARUB74-U1 Rev A  
**Issue Date:** 21<sup>st</sup> December 2011  
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### 7.3.3 Measurement results for 802.11n HT-20

|                               |               |                            |         |    |      |
|-------------------------------|---------------|----------------------------|---------|----|------|
| <b>Test Conditions:</b>       | 15.247 (e)    | <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>       | 2.5 dBi |    |      |
| <b>Applied Voltage:</b>       | 55.00 Vdc     | <b>Antenna Ports (N):</b>  | 2       |    |      |
| <b>Notes 1:</b>               |               |                            |         |    |      |
| <b>Notes 2:</b>               |               |                            |         |    |      |

| Test Frequency | Measured Power Density |       |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|------------------------|-------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)          |       |    |    |                   |                             |       |        |
| MHz            | a                      | b     | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 2412.000       | -5.53                  | -6.26 | -- | -- | 3.01              | -2.52                       | 8.00  | -10.52 |
| 2437.000       | -4.05                  | -5.31 | -- | -- | 3.01              | -1.04                       | 8.00  | -9.04  |
| 2462.000       | -6.89                  | -6.12 | -- | -- | 3.01              | -3.11                       | 8.00  | -11.11 |

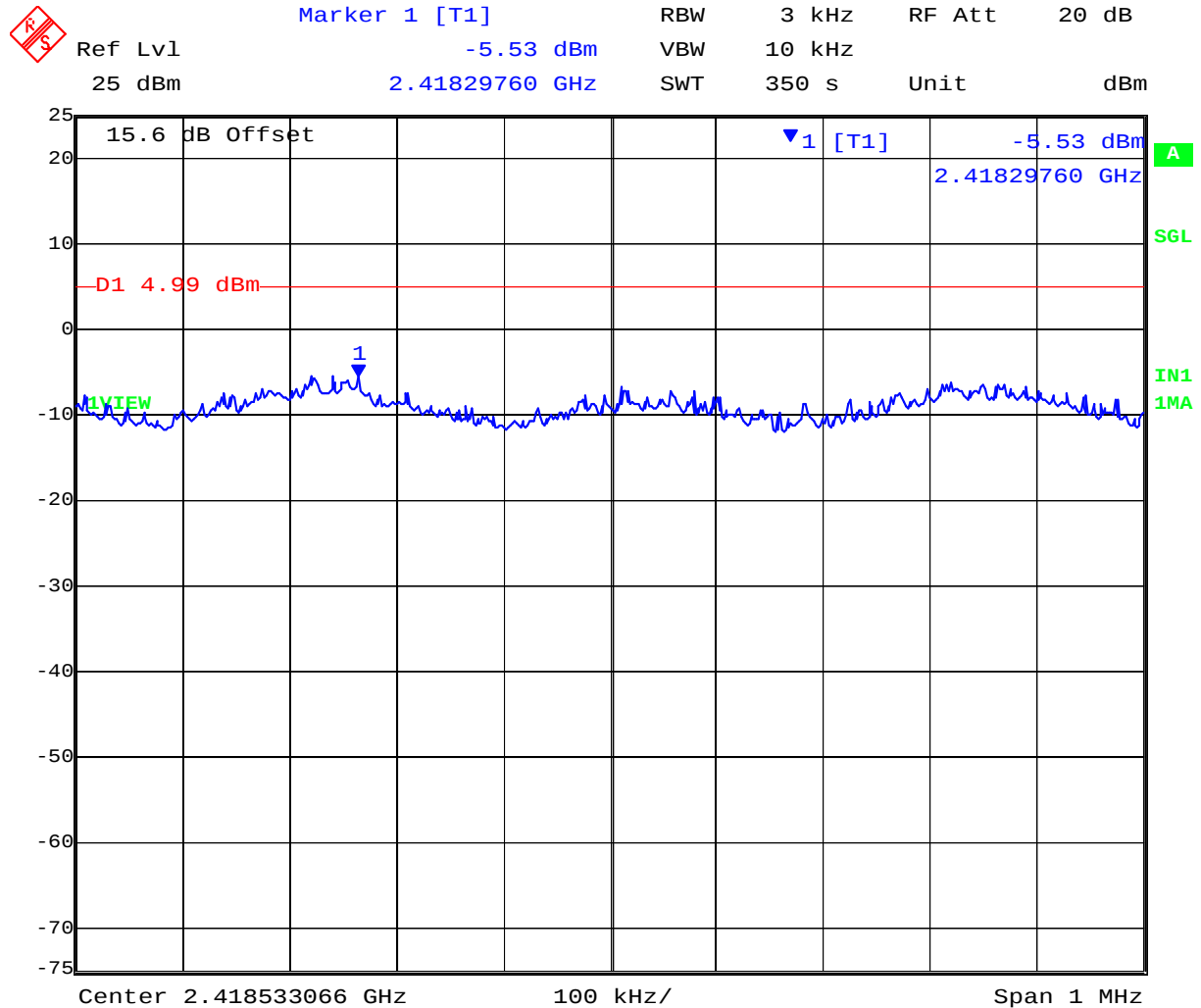
|                                 |           |
|---------------------------------|-----------|
| <b>Measurement uncertainty:</b> | ± 1.33 dB |
|---------------------------------|-----------|

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Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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CHAIN A



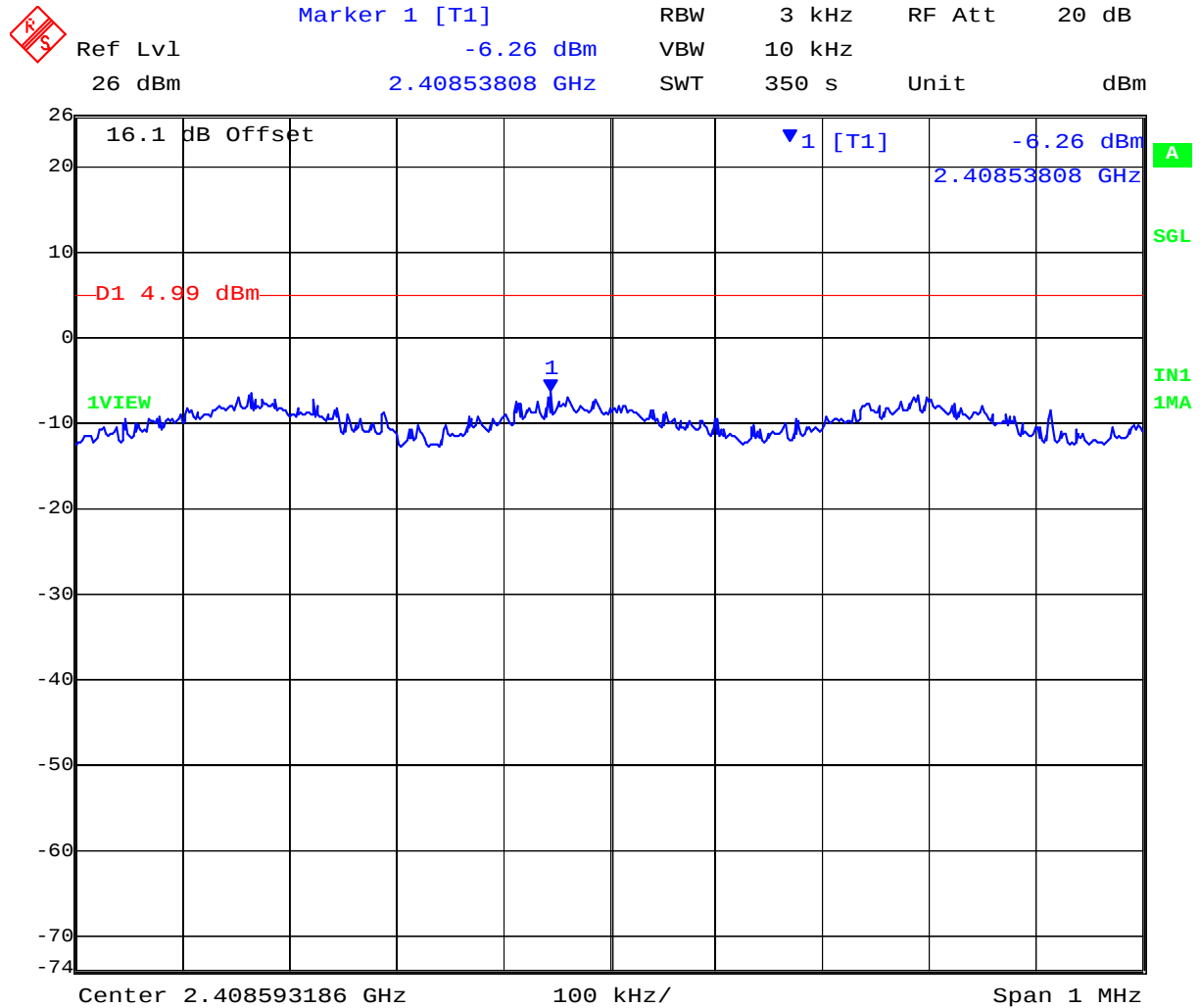
Date: 18.NOV.2011 15:00:40

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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CHAIN B



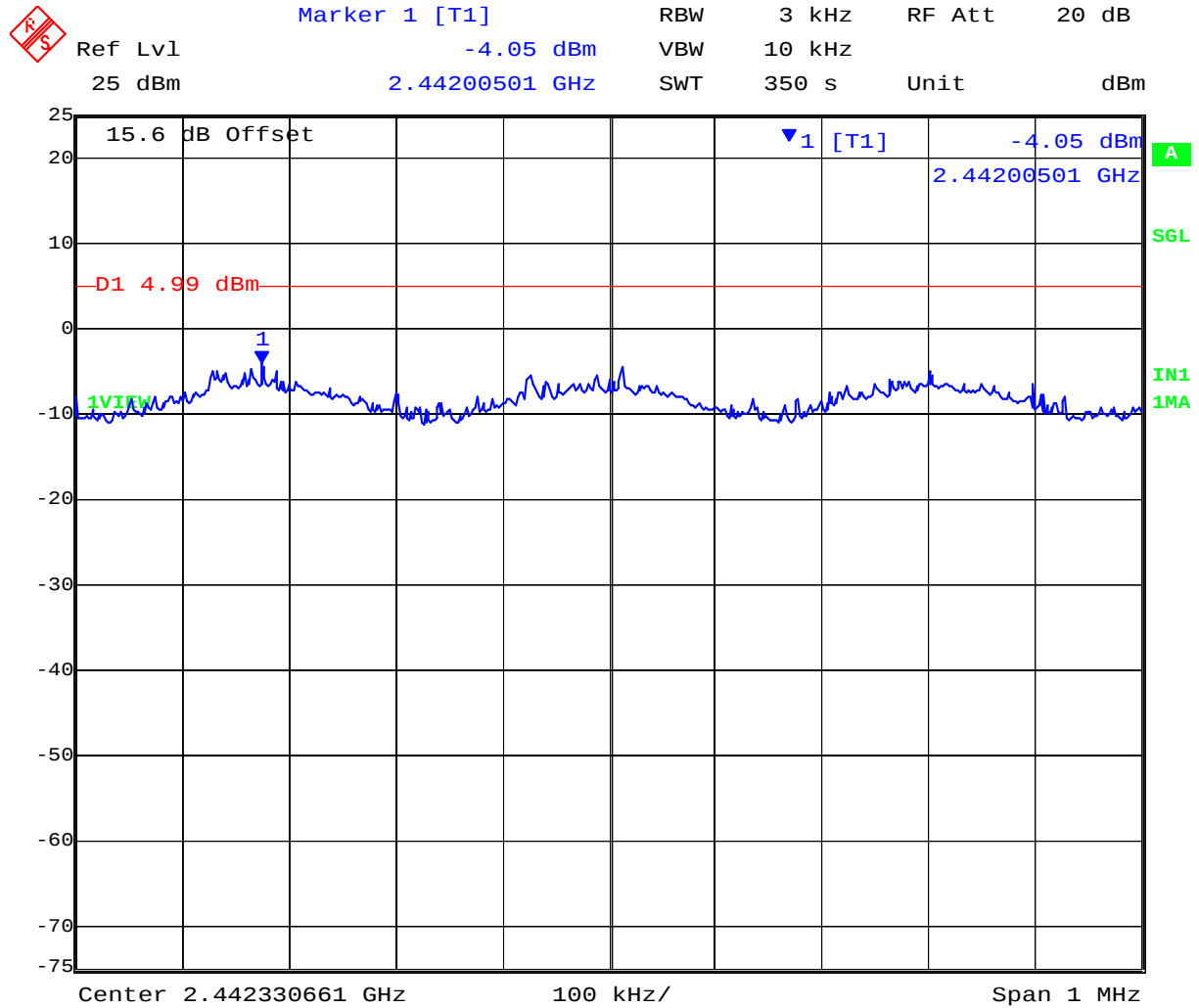
Date: 18.NOV.2011 15:07:12

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Issue Date: 21<sup>st</sup> December 2011  
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#### CHAIN A



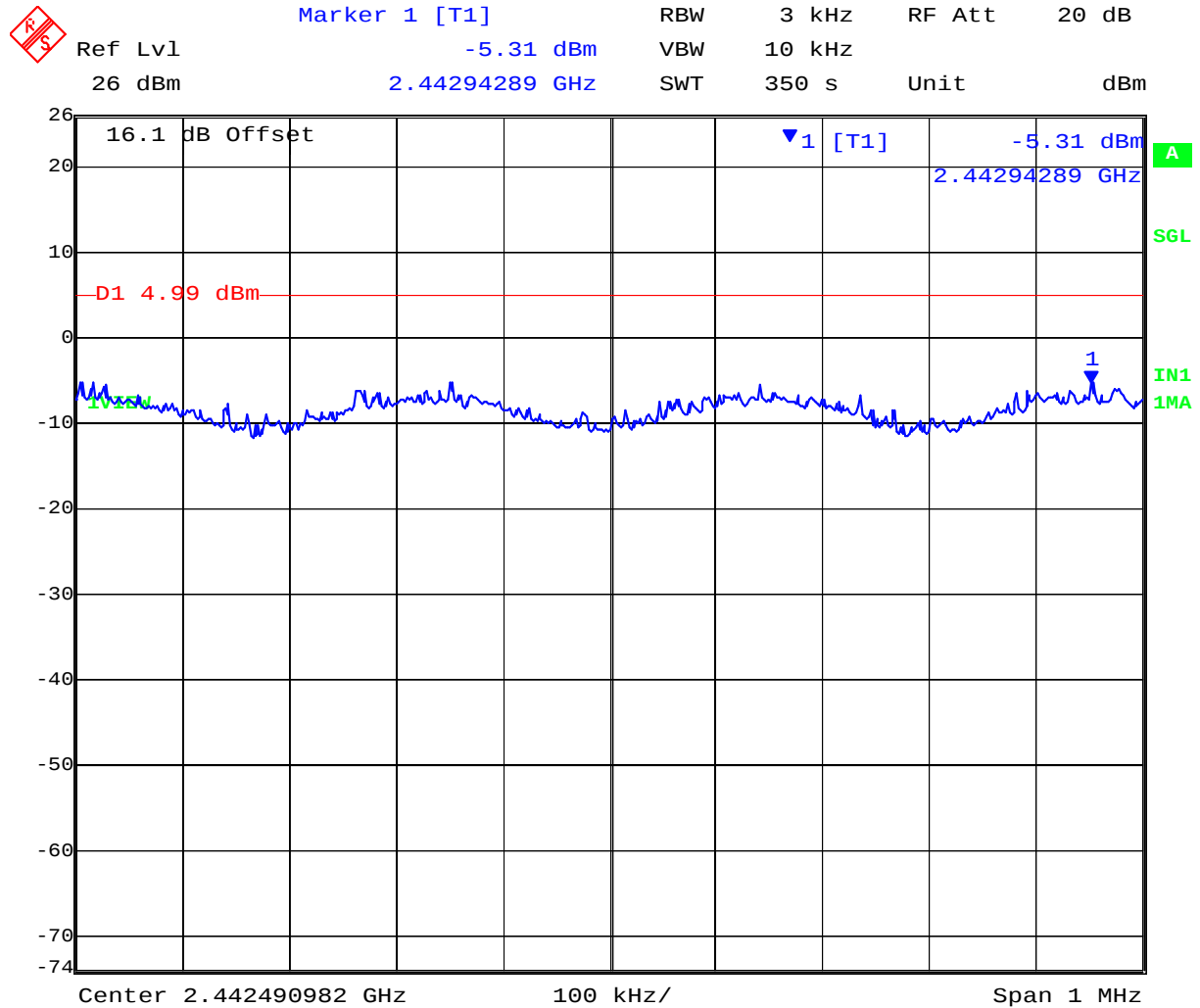
Date: 18.NOV.2011 15:20:21

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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# CHAIN B



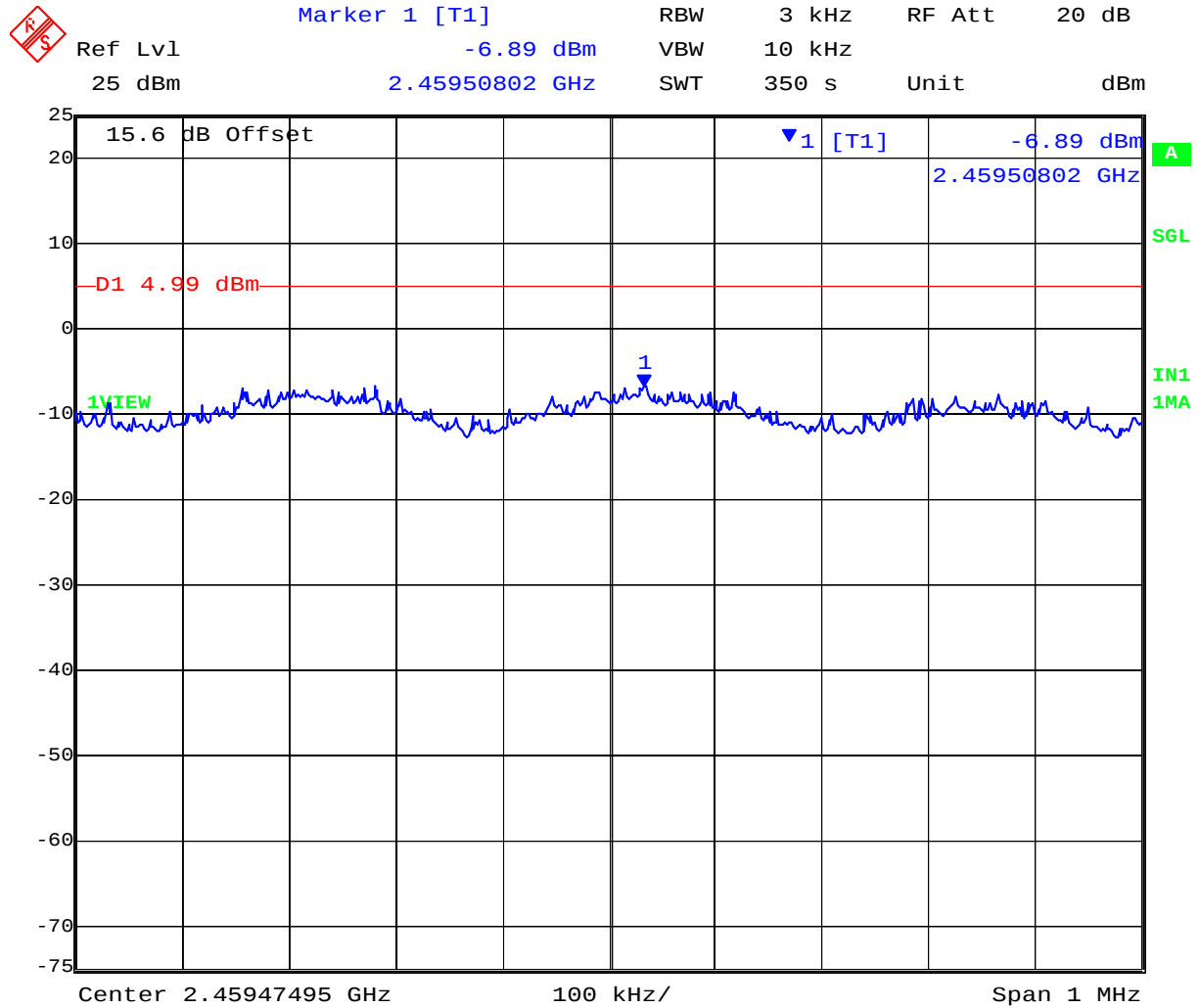
Date: 18.NOV.2011 15:26:54

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
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CHAIN A



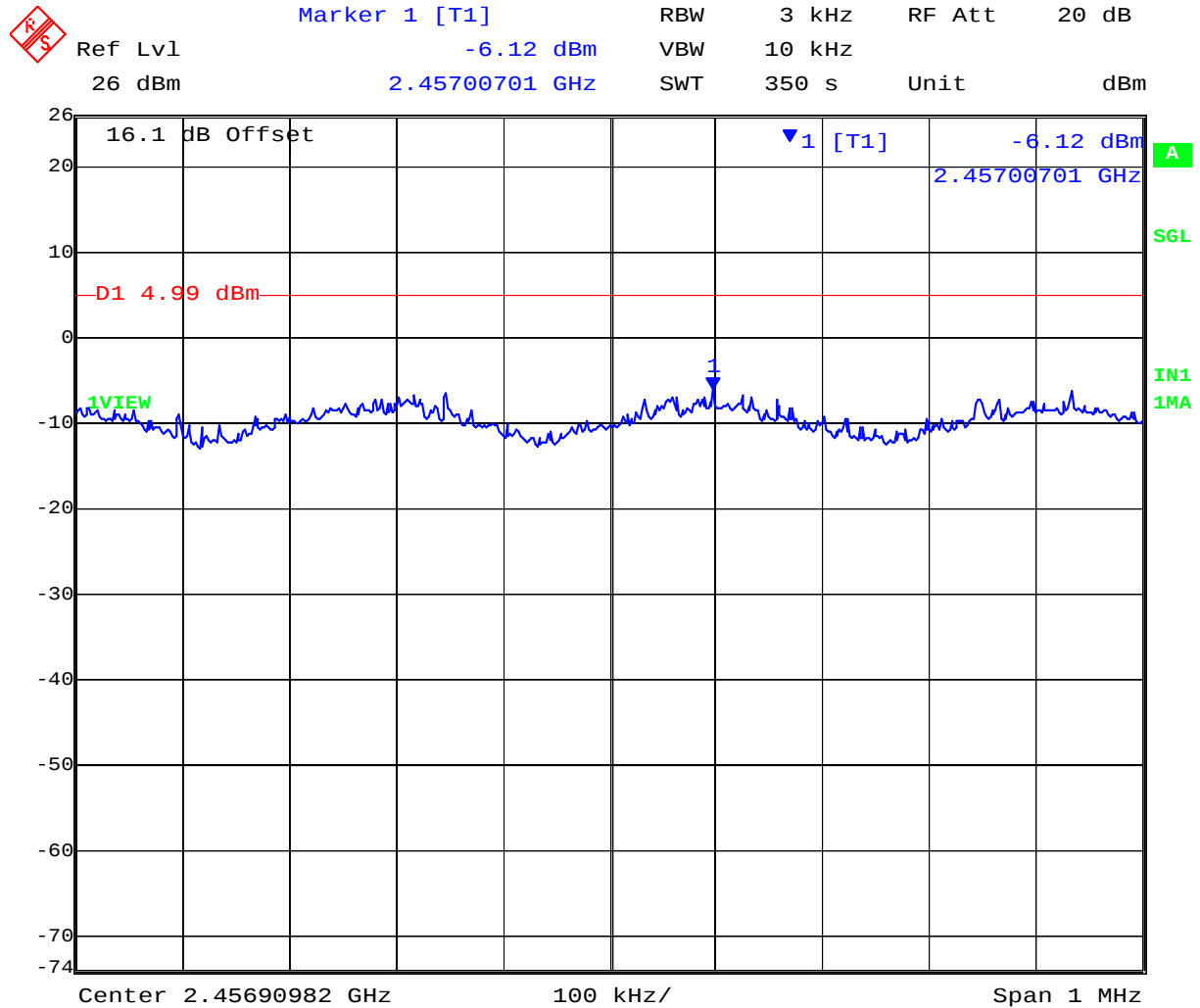
Date: 18.NOV.2011 15:42:49

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
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Issue Date: 21<sup>st</sup> December 2011  
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#### CHAIN B



Date: 18.NOV.2011 15:49:22

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**Serial #:** ARUB74-U1 Rev A  
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### 7.3.4 Measurement results for 802.11n HT-40

|                               |               |                            |         |    |      |
|-------------------------------|---------------|----------------------------|---------|----|------|
| <b>Test Conditions:</b>       | 15.247 (e)    | <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>       | 2.5 dBi |    |      |
| <b>Applied Voltage:</b>       | 55.00 Vdc     | <b>Antenna Ports (N):</b>  | 2       |    |      |
| <b>Notes 1:</b>               |               |                            |         |    |      |
| <b>Notes 2:</b>               |               |                            |         |    |      |

| Test Frequency | Measured Power Density |       |    |    | Correction factor | Peak Power Spectral Density | Limit | Margin |
|----------------|------------------------|-------|----|----|-------------------|-----------------------------|-------|--------|
|                | RF Port (dBm)          |       |    |    |                   |                             |       |        |
| MHz            | a                      | b     | c  | d  | 10Log(N)          | dBm                         | dBm   | dB     |
| 2422.000       | -7.92                  | -7.32 | -- | -- | 3.01              | -4.31                       | 8.00  | -12.31 |
| 2437.000       | -6.70                  | -6.93 | -- | -- | 3.01              | -3.69                       | 8.00  | -11.69 |
| 2452.000       | -7.14                  | -7.75 | -- | -- | 3.01              | -4.13                       | 8.00  | -12.13 |

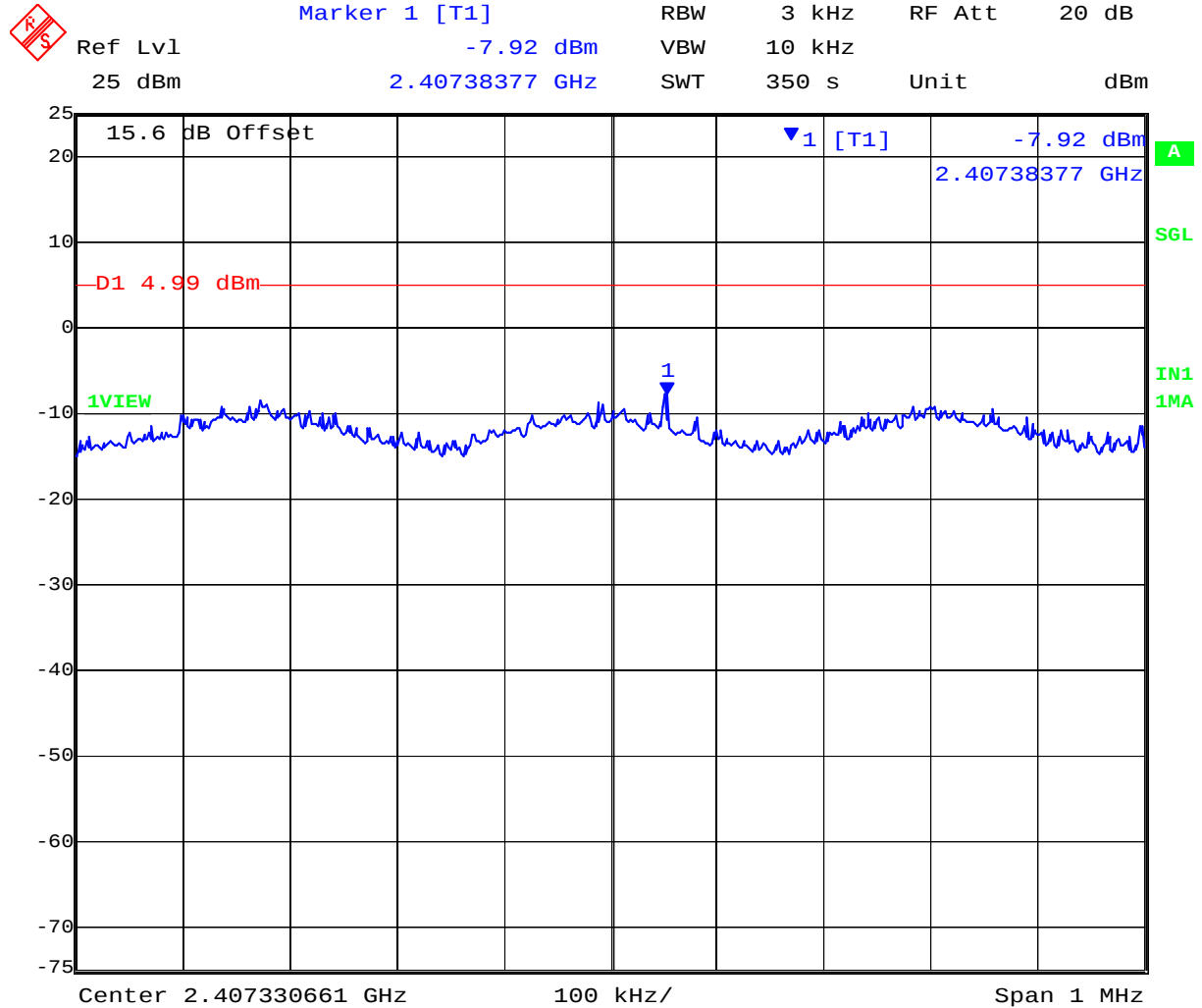
|                                 |           |
|---------------------------------|-----------|
| <b>Measurement uncertainty:</b> | ± 1.33 dB |
|---------------------------------|-----------|

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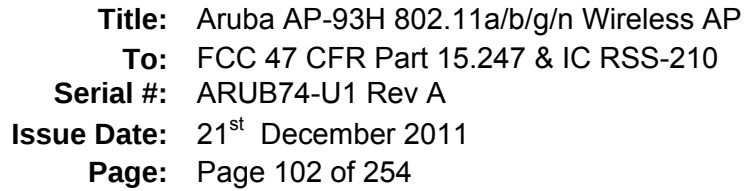
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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#### CHAIN A



Date: 18.NOV.2011 16:08:59

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Ref Lvl 26 dBm  
 Marker 1 [T1] -7.32 dBm  
 2.42763427 GHz  
 RBW 3 kHz  
 VBW 10 kHz  
 SWT 350 s  
 RF Att 20 dB  
 Unit dBm

16.1 dB Offset  
 D1 4.99 dBm  
 1VIEW  
 1  
 IN1 1MA  
 A  
 SGL

Center 2.427210421 GHz  
 100 kHz/  
 Span 1 MHz

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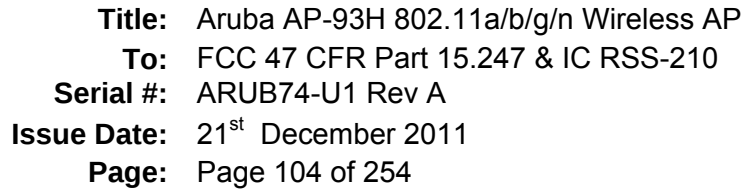
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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#### CHAIN A



Date: 18.NOV.2011 16:32:14

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Ref Lvl 26 dBm Marker 1 [T1] -6.93 dBm RBW 3 kHz RF Att 20 dB Unit dBm

16.1 dB Offset 1 [T1] -6.93 dBm 2.43388277 GHz

D1 4.99 dBm 1VIEW

A SGL IN1 1MA

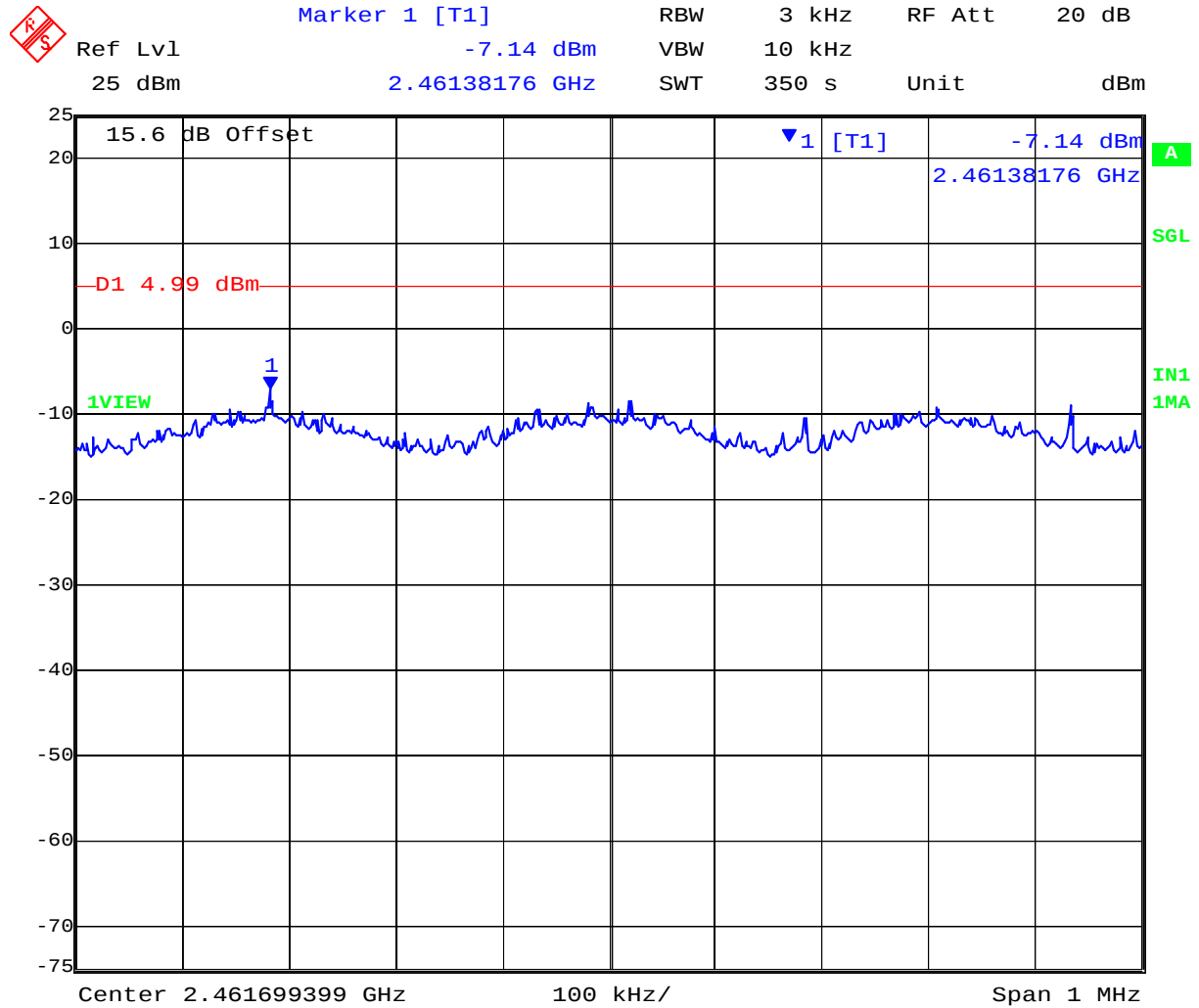
Center 2.434194389 GHz 100 kHz/ Span 1 MHz

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-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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CHAIN A



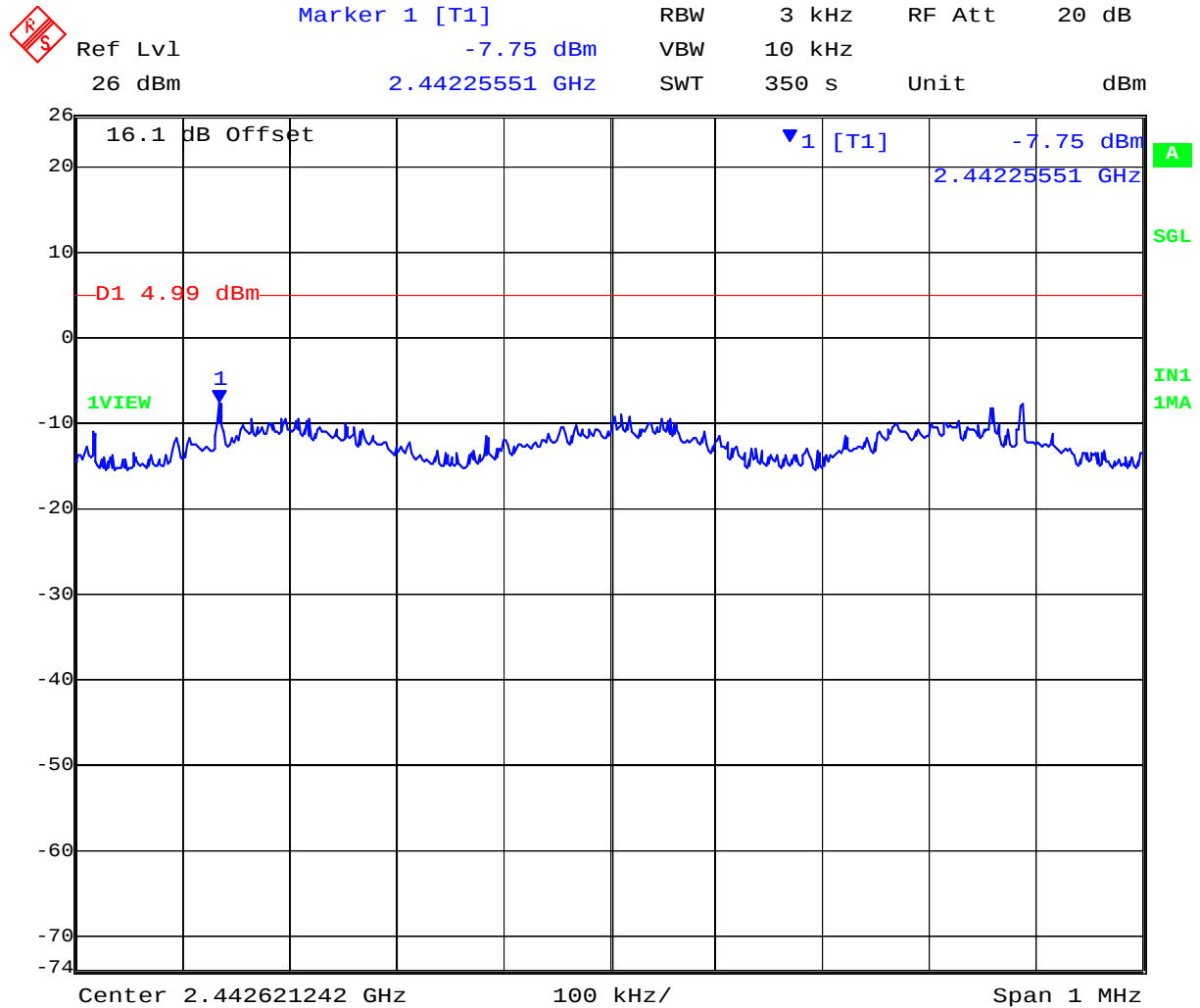
Date: 18.NOV.2011 17:01:53

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Serial #: ARUB74-U1 Rev A  
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# CHAIN B



Date: 18.NOV.2011 17:08:26

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**Issue Date:** 21<sup>st</sup> December 2011  
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### 7.3.5 Measurement results for 802.11a

|                         |            |                            |     |    |      |
|-------------------------|------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b> | 15.247 (e) | <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</b>     | N/A        | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b> | 12.0       |                            |     |    | Vdc  |
| <b>Notes 1:</b>         |            |                            |     |    |      |
| <b>Notes 2:</b>         |            |                            |     |    |      |

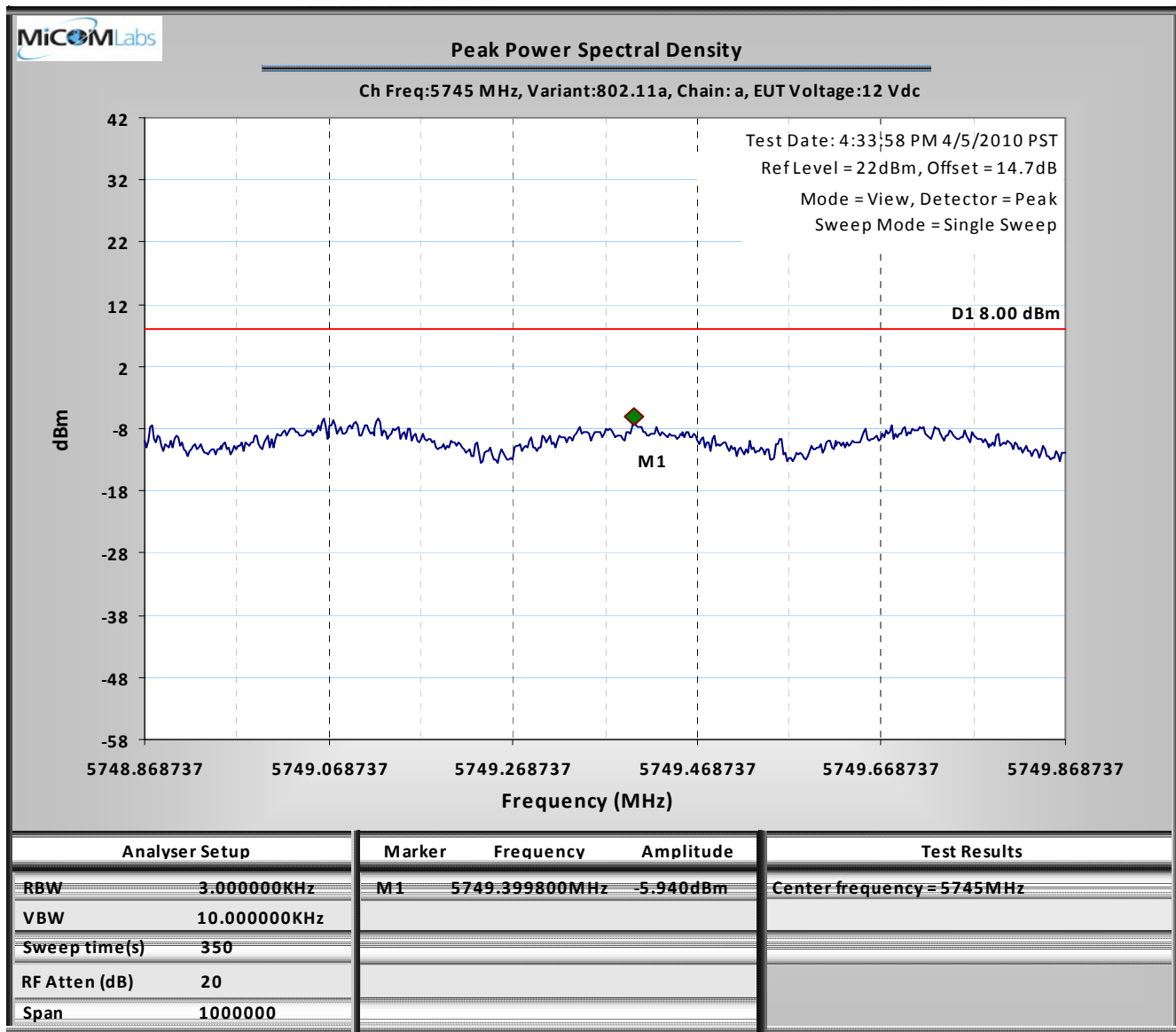
| Test Frequency | Measured Power Density |       |    |    | Total Peak Power Spectral Density (dBm) |            | Limit | Margin |
|----------------|------------------------|-------|----|----|-----------------------------------------|------------|-------|--------|
|                | RF Port (dBm)          |       |    |    |                                         |            |       |        |
| MHz            | a                      | b     | c  | d  | Combined                                | Calculated | dBm   | dB     |
| 5745           | -5.94                  | -8.02 | -- | -- | -2.66                                   | -3.84      | 8.00  | -10.66 |
| 5785           | -8.40                  | -8.31 | -- | -- | -2.84                                   | -5.35      | 8.00  | -10.84 |
| 5825           | -9.01                  | -7.66 | -- | -- | -3.29                                   | -5.27      | 8.00  | -11.29 |

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

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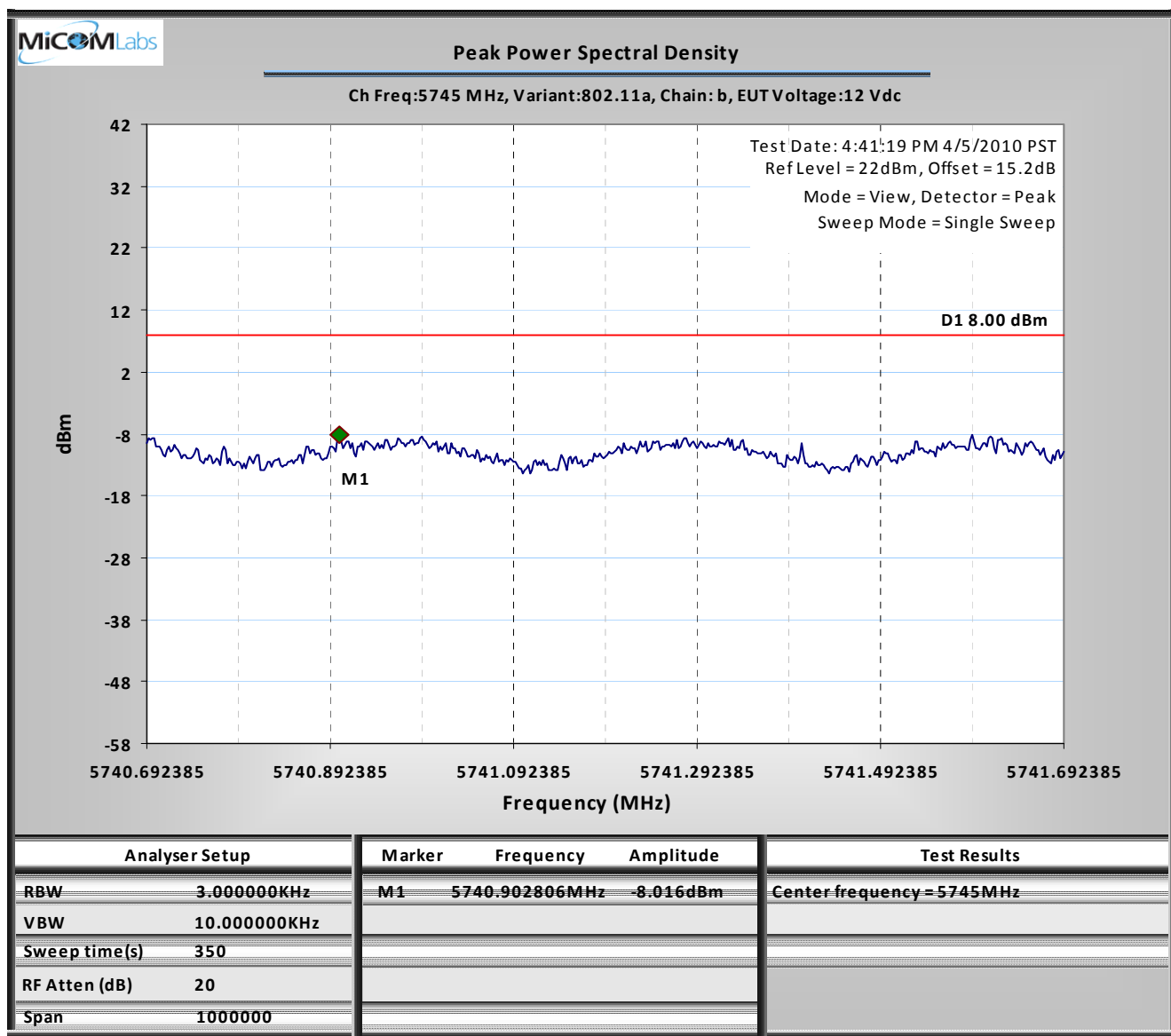
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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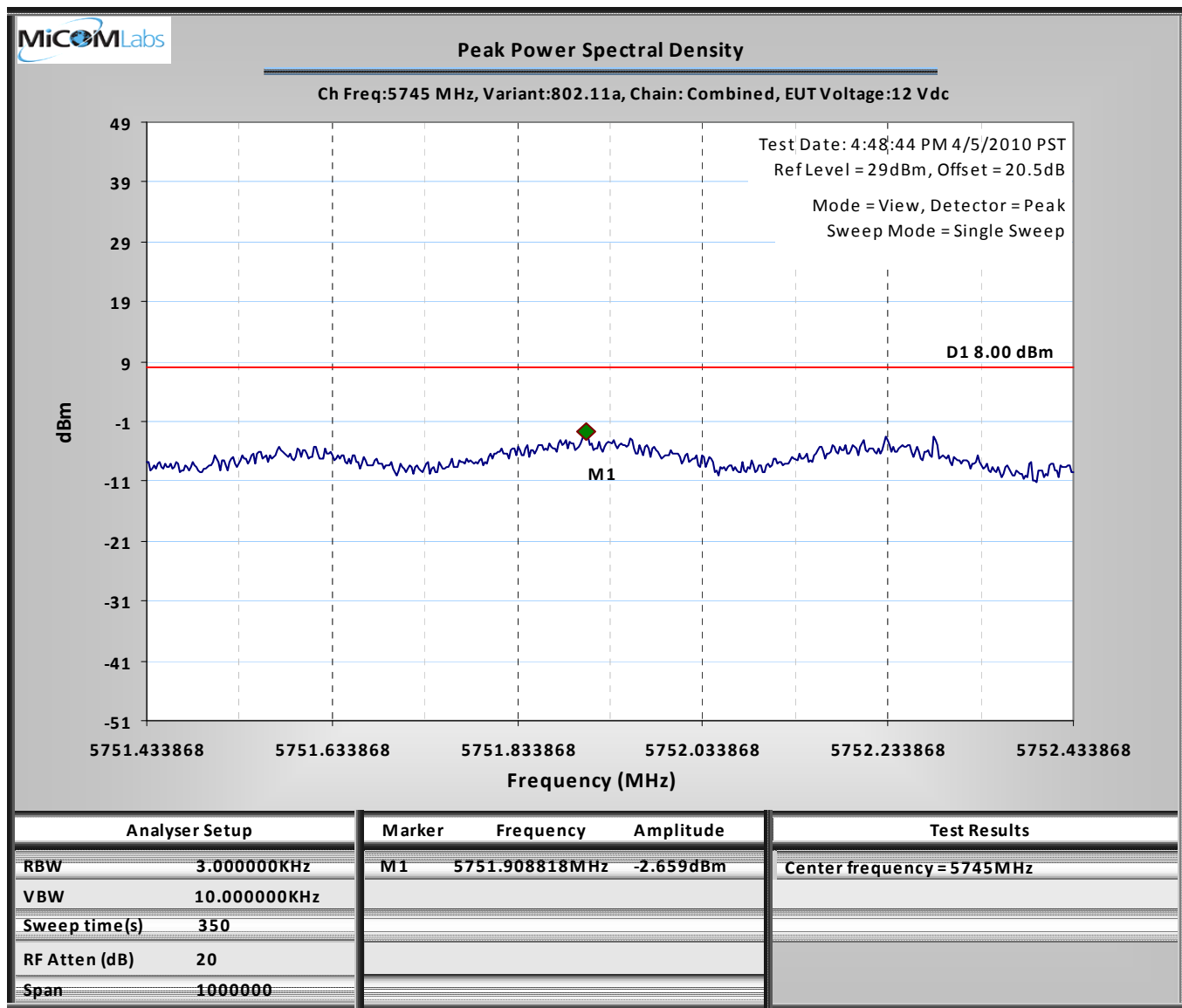
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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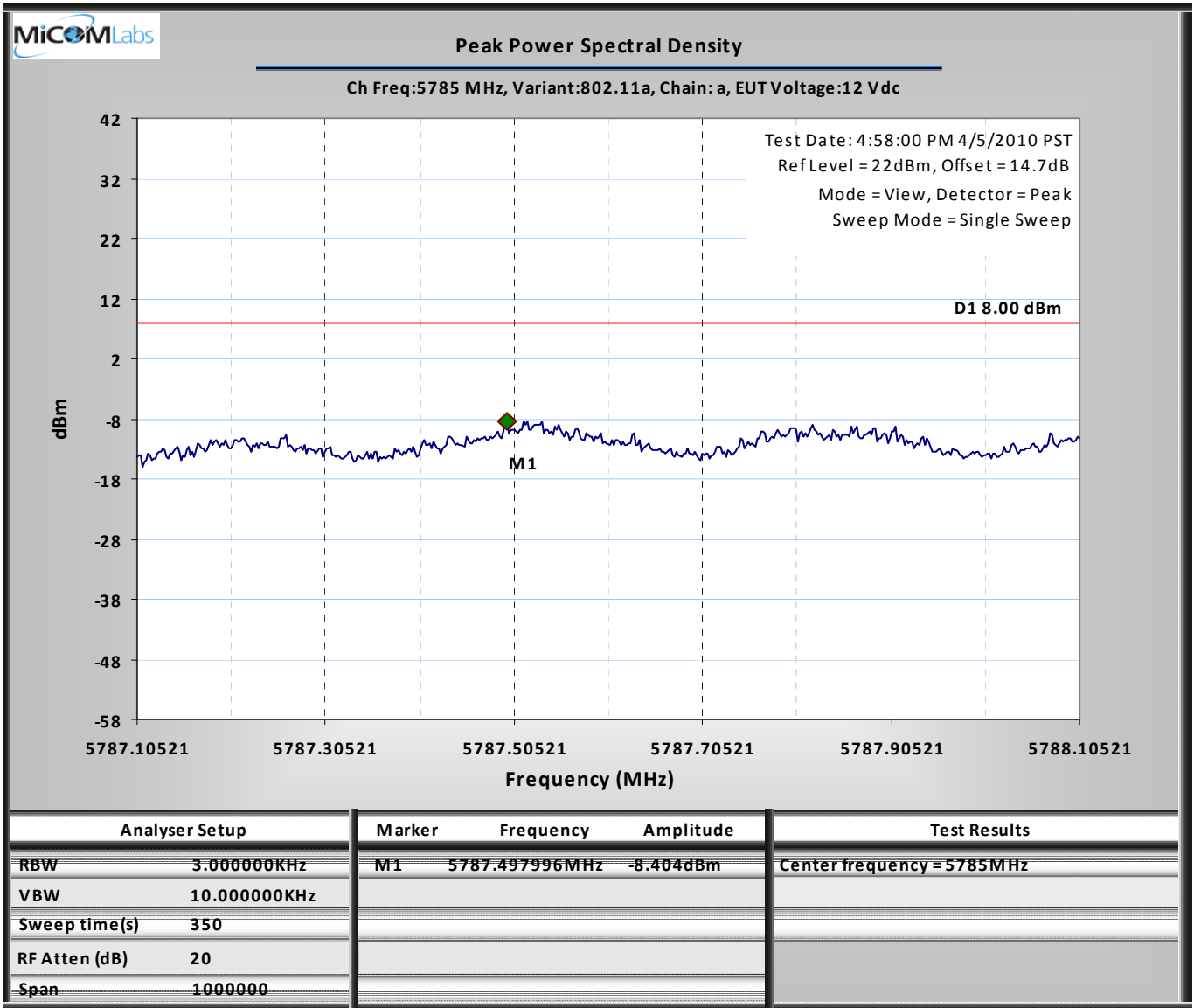
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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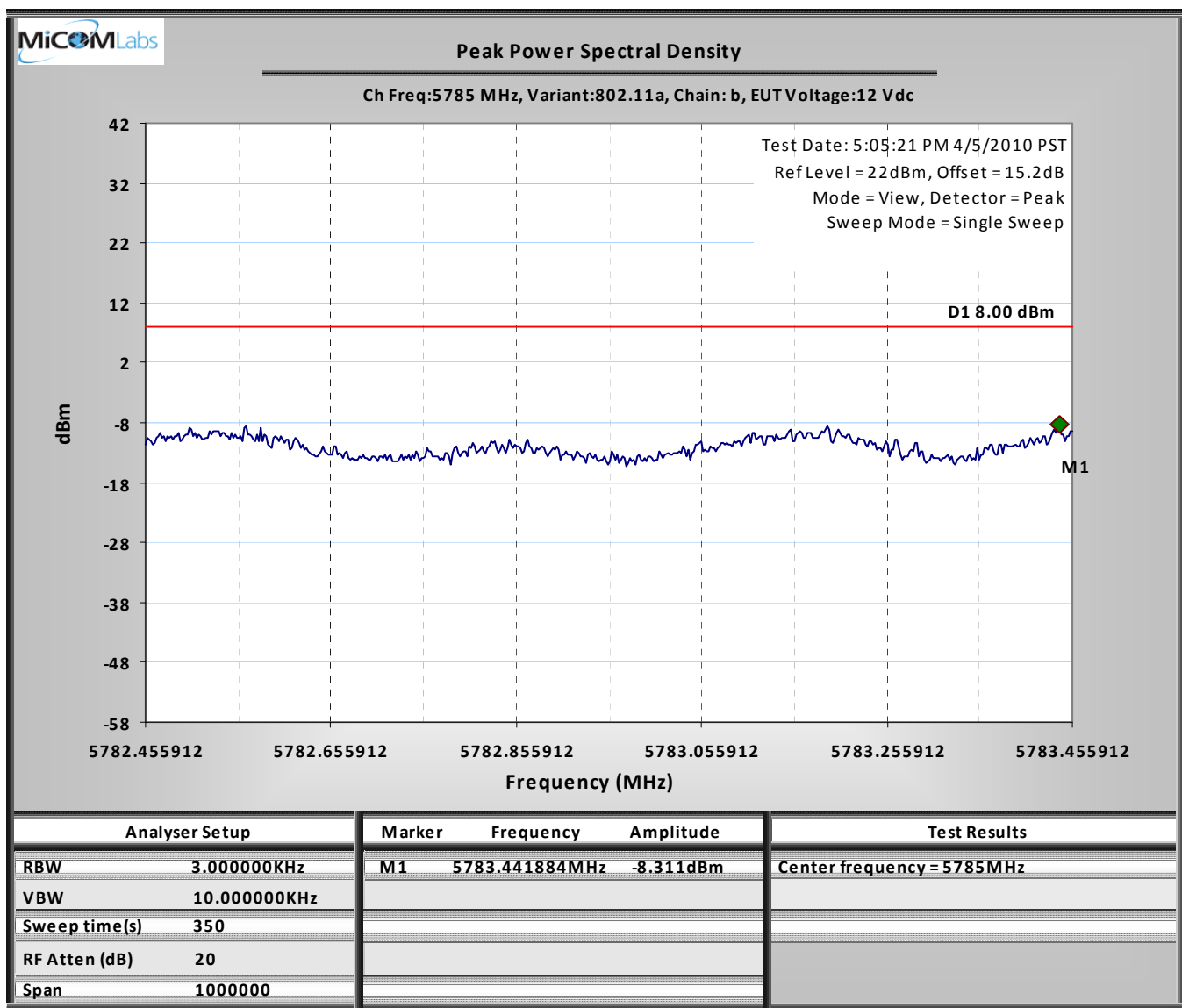
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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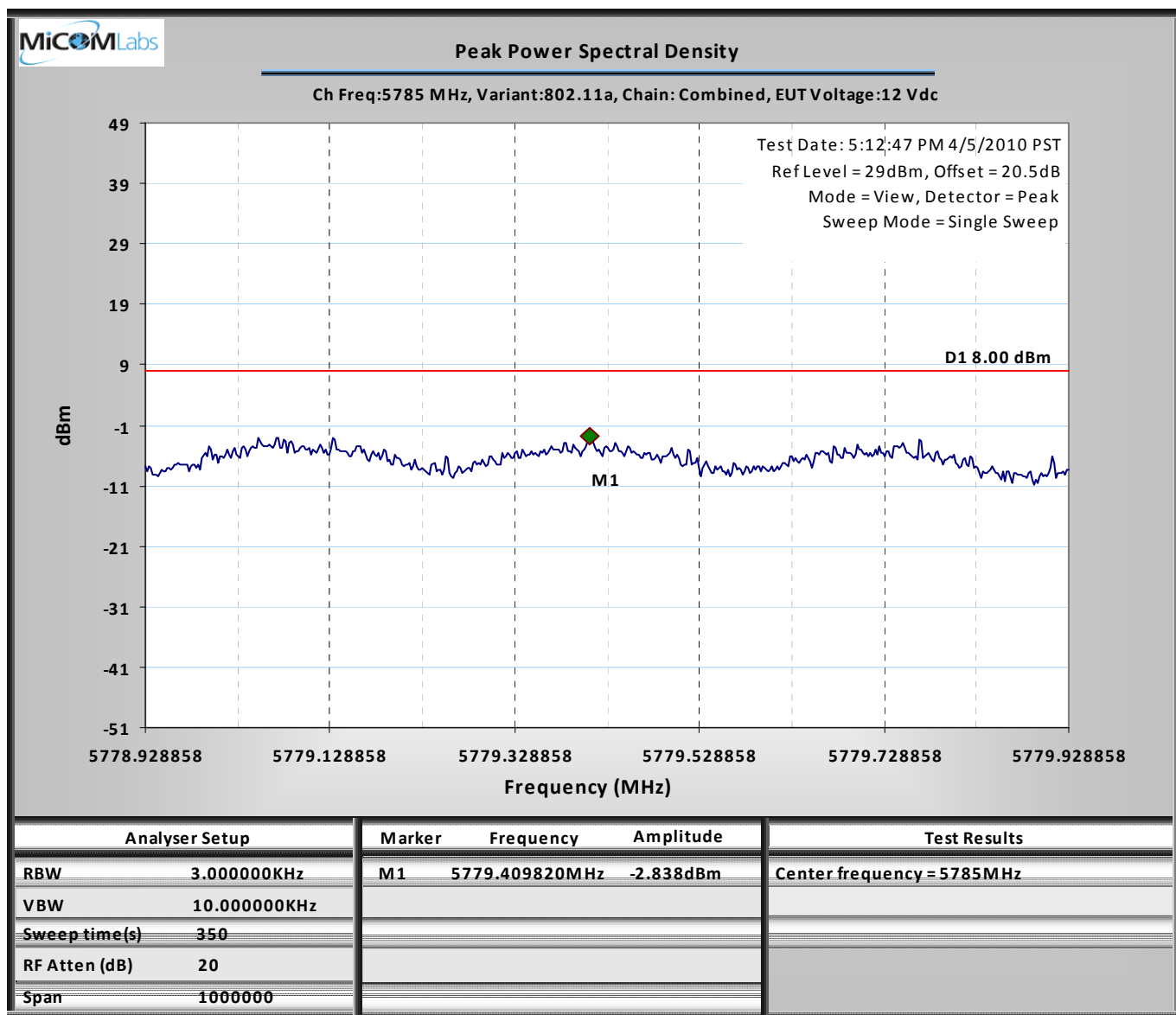
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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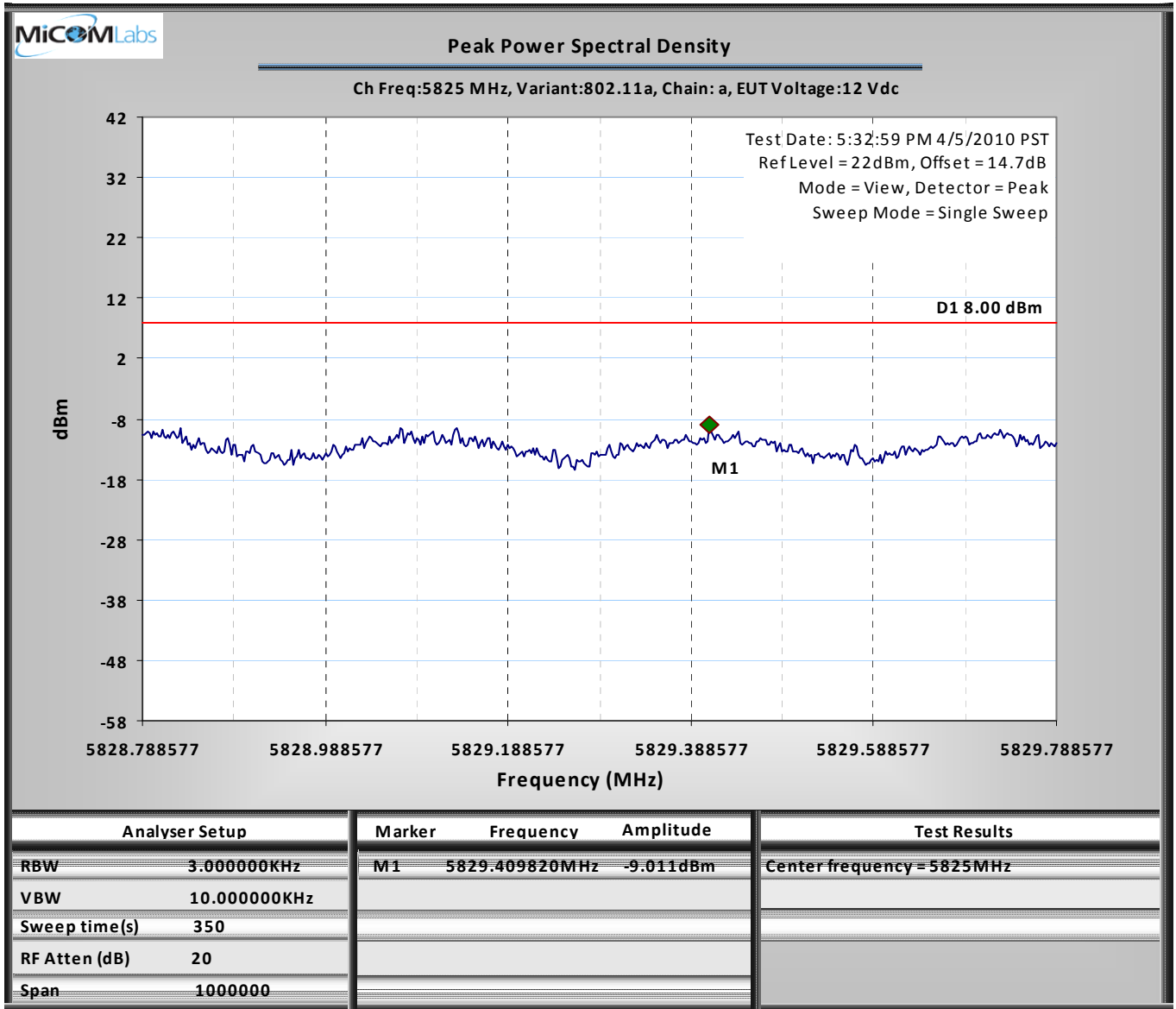
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
**Issue Date:** 21<sup>st</sup> December 2011  
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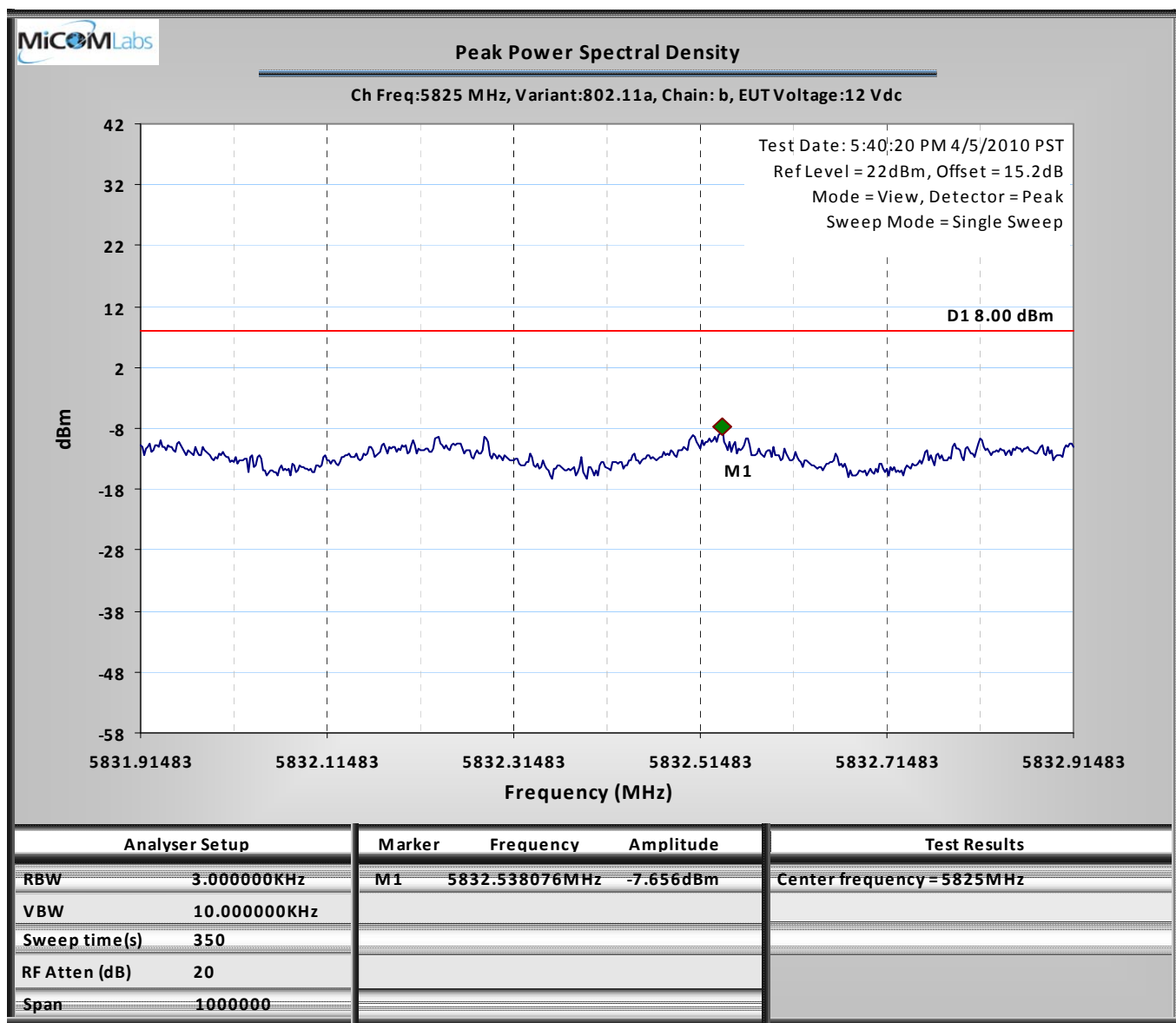
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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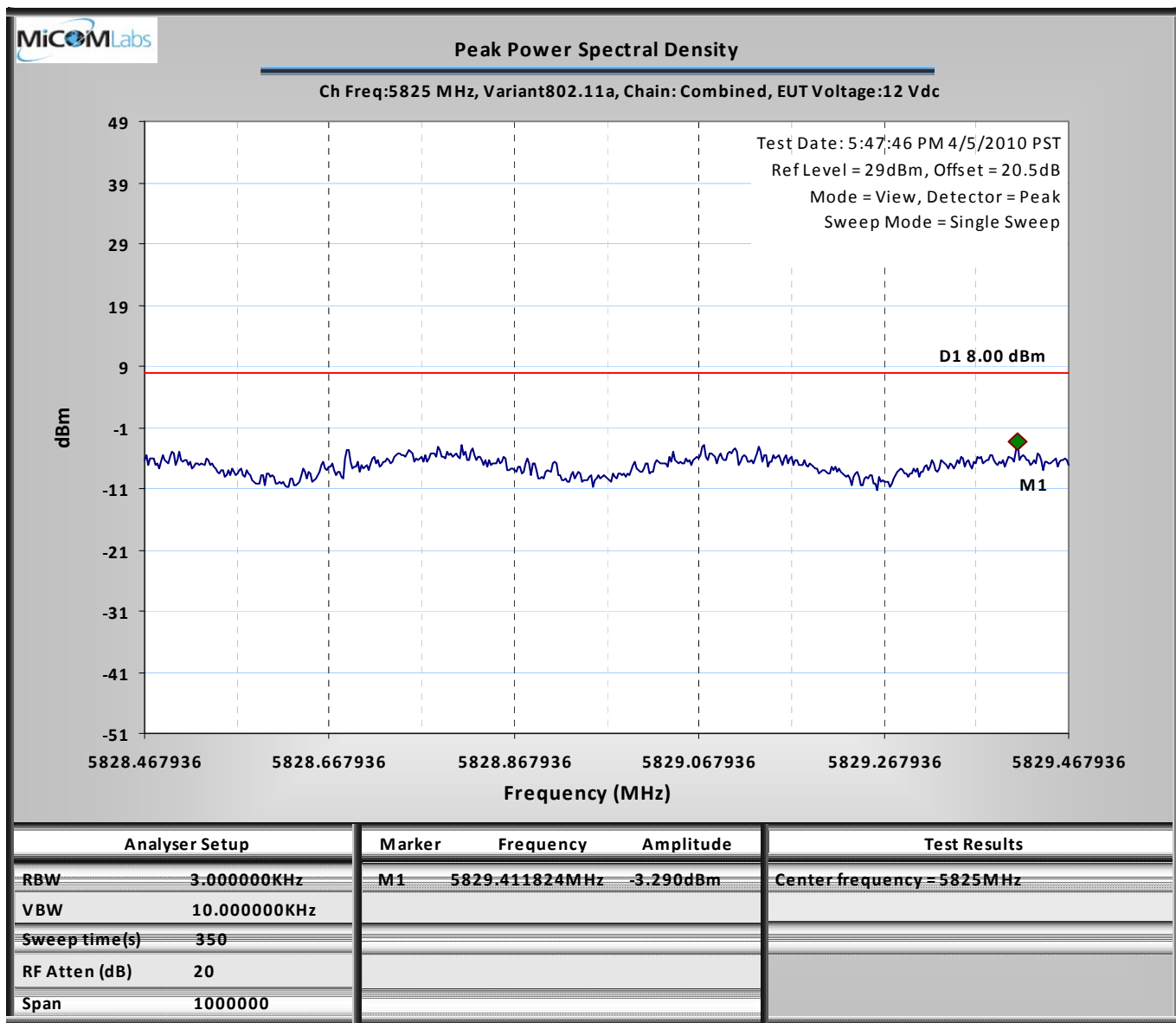
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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### 7.3.6 Measurement results for 802.11n HT-20

|                         |               |                            |     |    |      |
|-------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b> | 15.247 (e)    | <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</b>     | N/A           | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b> | 12.0          |                            |     |    | Vdc  |
| <b>Notes 1:</b>         |               |                            |     |    |      |
| <b>Notes 2:</b>         |               |                            |     |    |      |

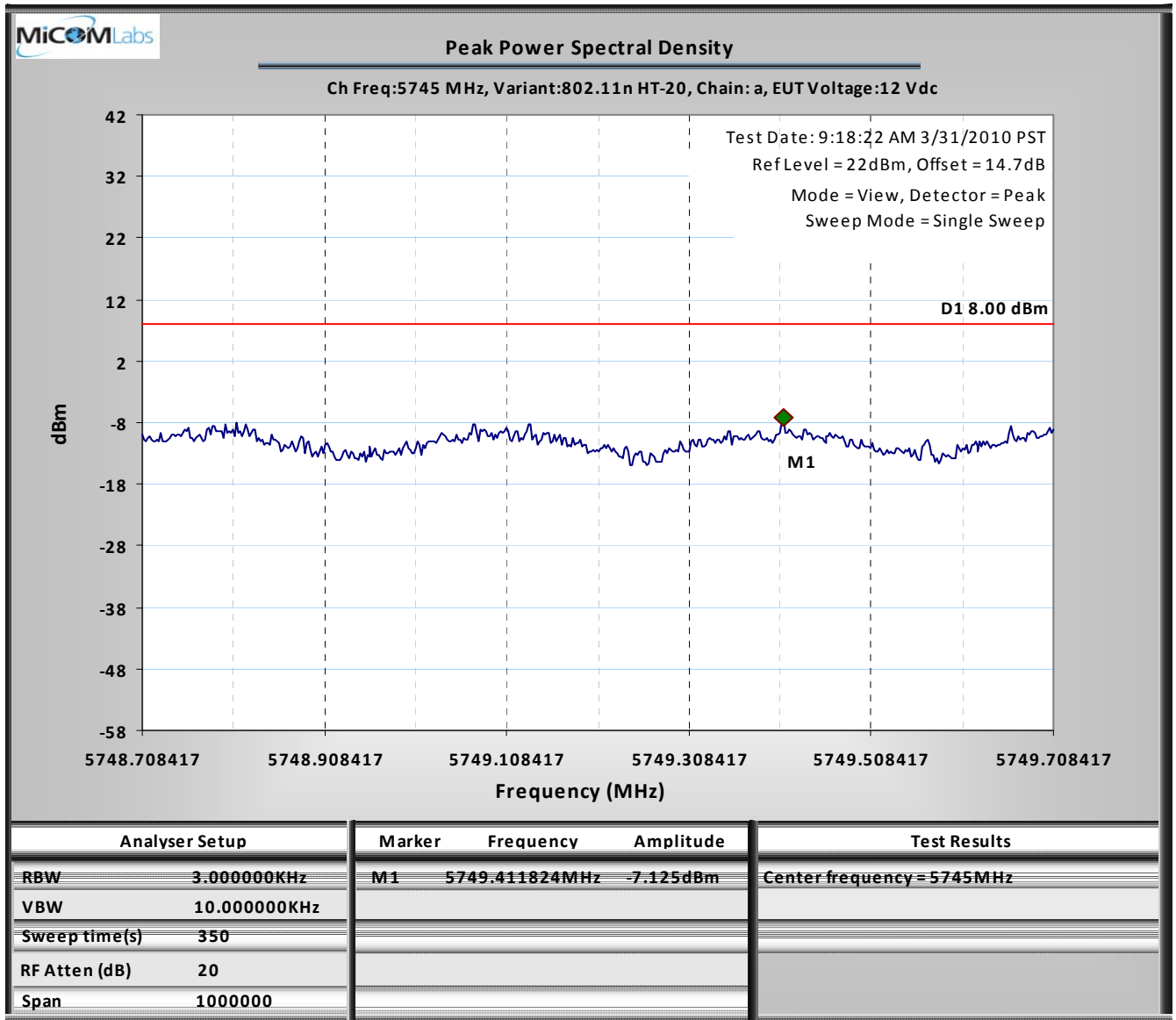
| Test Frequency | Measured Power Density |       |   |   | Total Peak Power Spectral Density (dBm) |             | Limit | Margin |
|----------------|------------------------|-------|---|---|-----------------------------------------|-------------|-------|--------|
|                | RF Port (dBm)          |       |   |   |                                         |             |       |        |
| MHz            | a                      | b     | c | d | Combined                                | Calculated  | dBm   | dB     |
| 5745           | -7.13                  | -6.89 |   |   | -1.83                                   | -3.99509718 | 8.00  | -9.83  |
| 5785           | -8.54                  | -7.52 |   |   | -2.06                                   | -4.99049858 | 8.00  | -10.06 |
| 5825           | -9.32                  | -9.09 |   |   | -3.13                                   | -6.19323012 | 8.00  | -11.13 |

|                                 |               |
|---------------------------------|---------------|
| <b>Measurement uncertainty:</b> | $\pm 1.33$ dB |
|---------------------------------|---------------|

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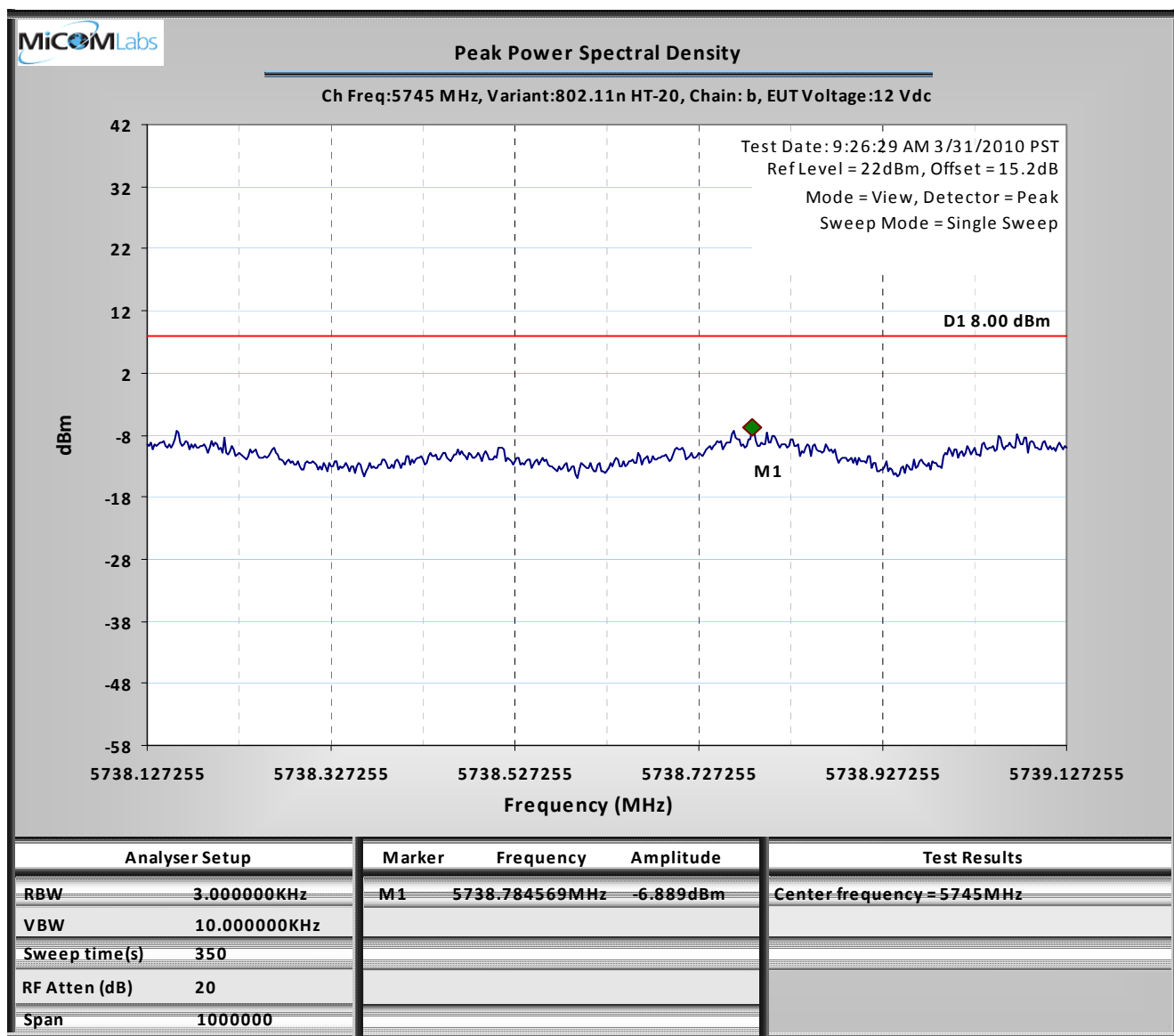
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
**Issue Date:** 21<sup>st</sup> December 2011  
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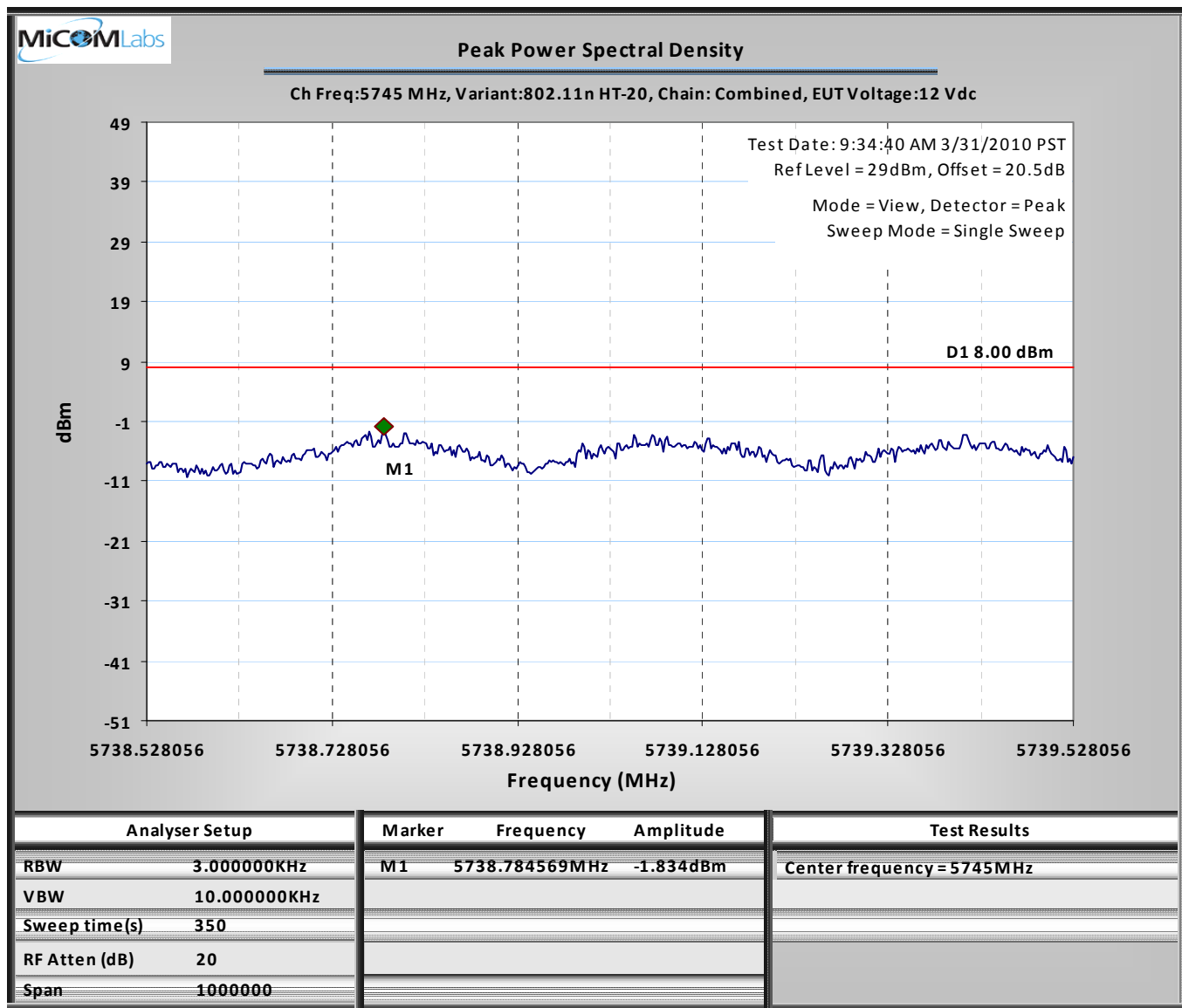
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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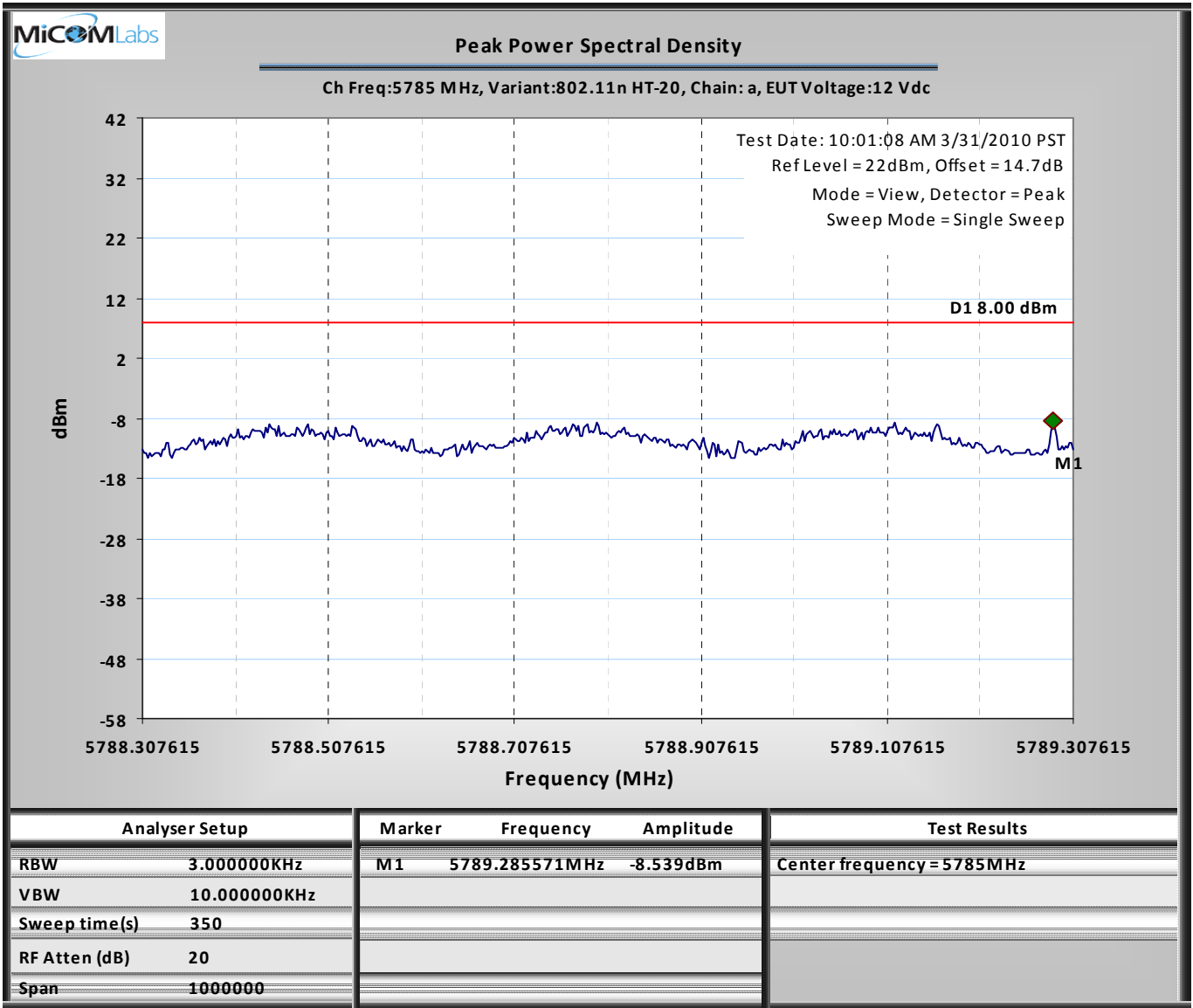
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
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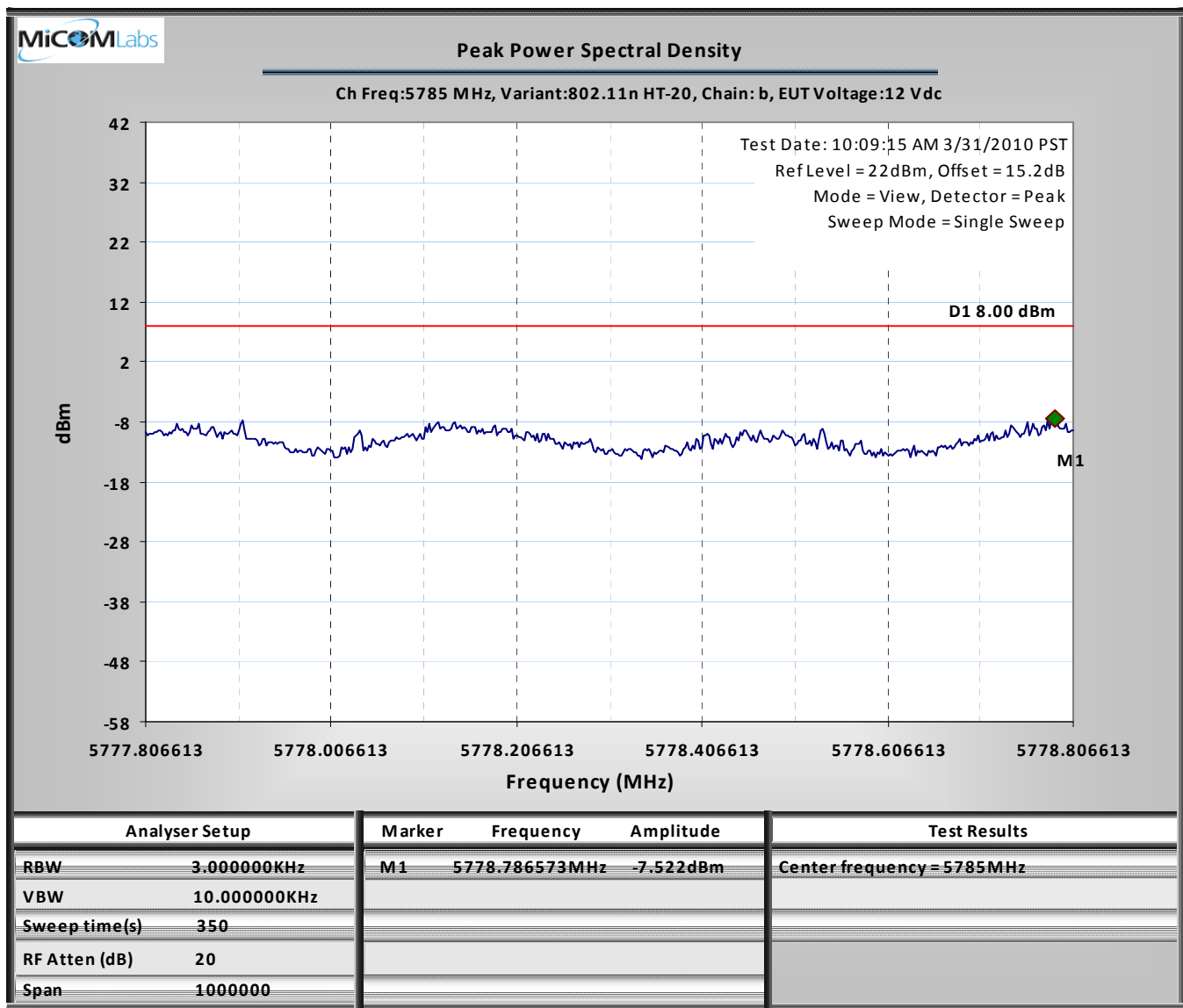
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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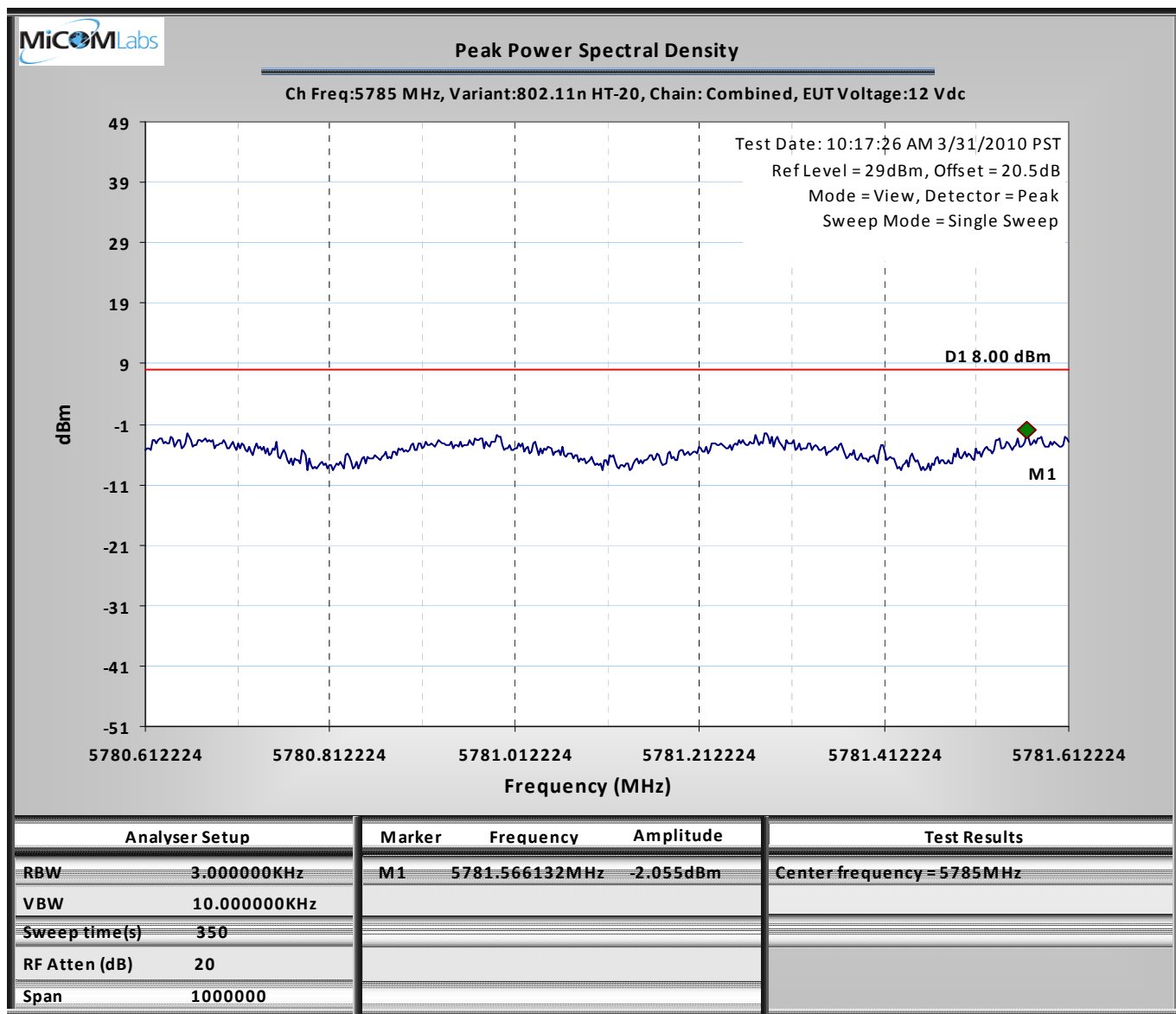
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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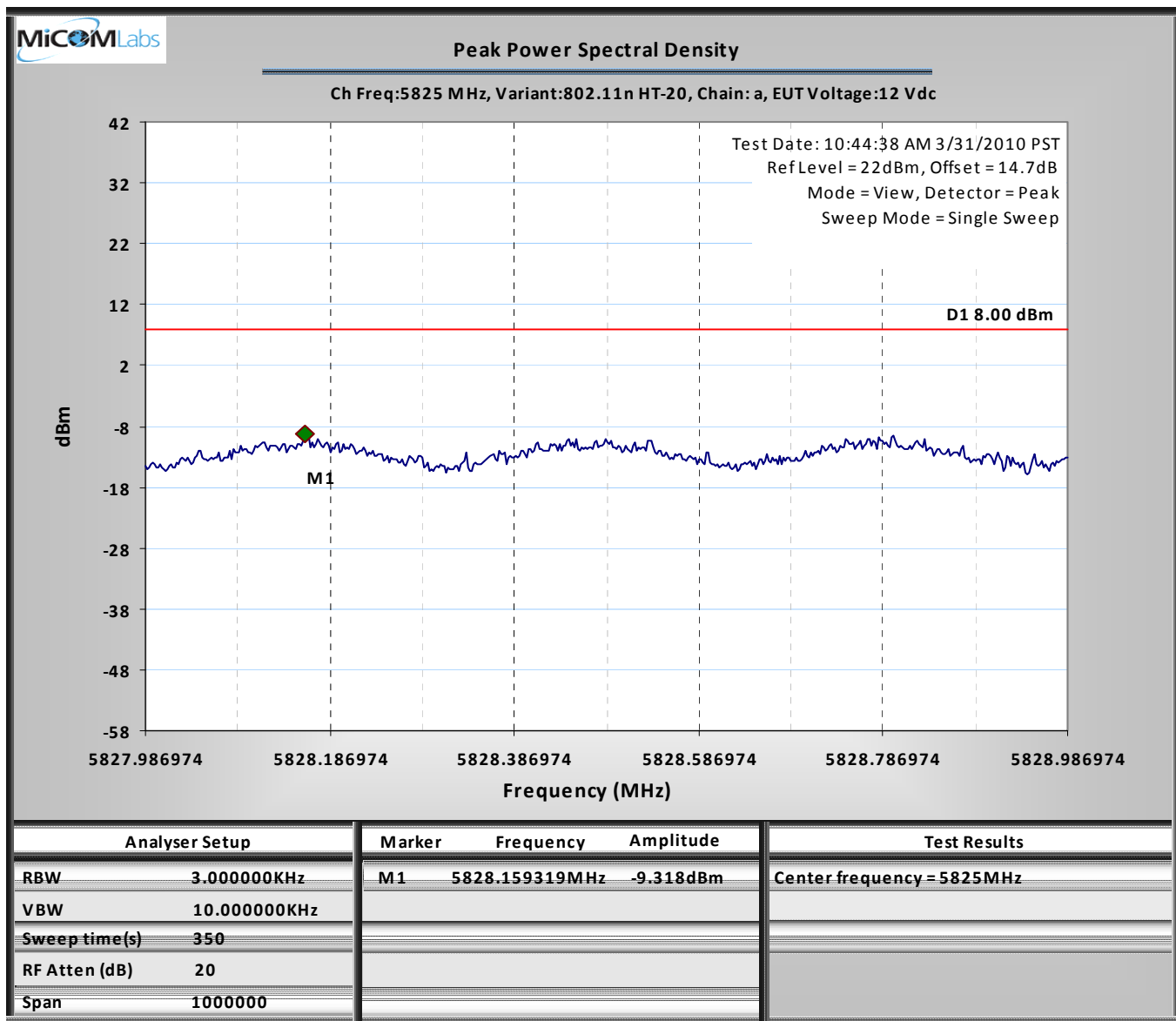
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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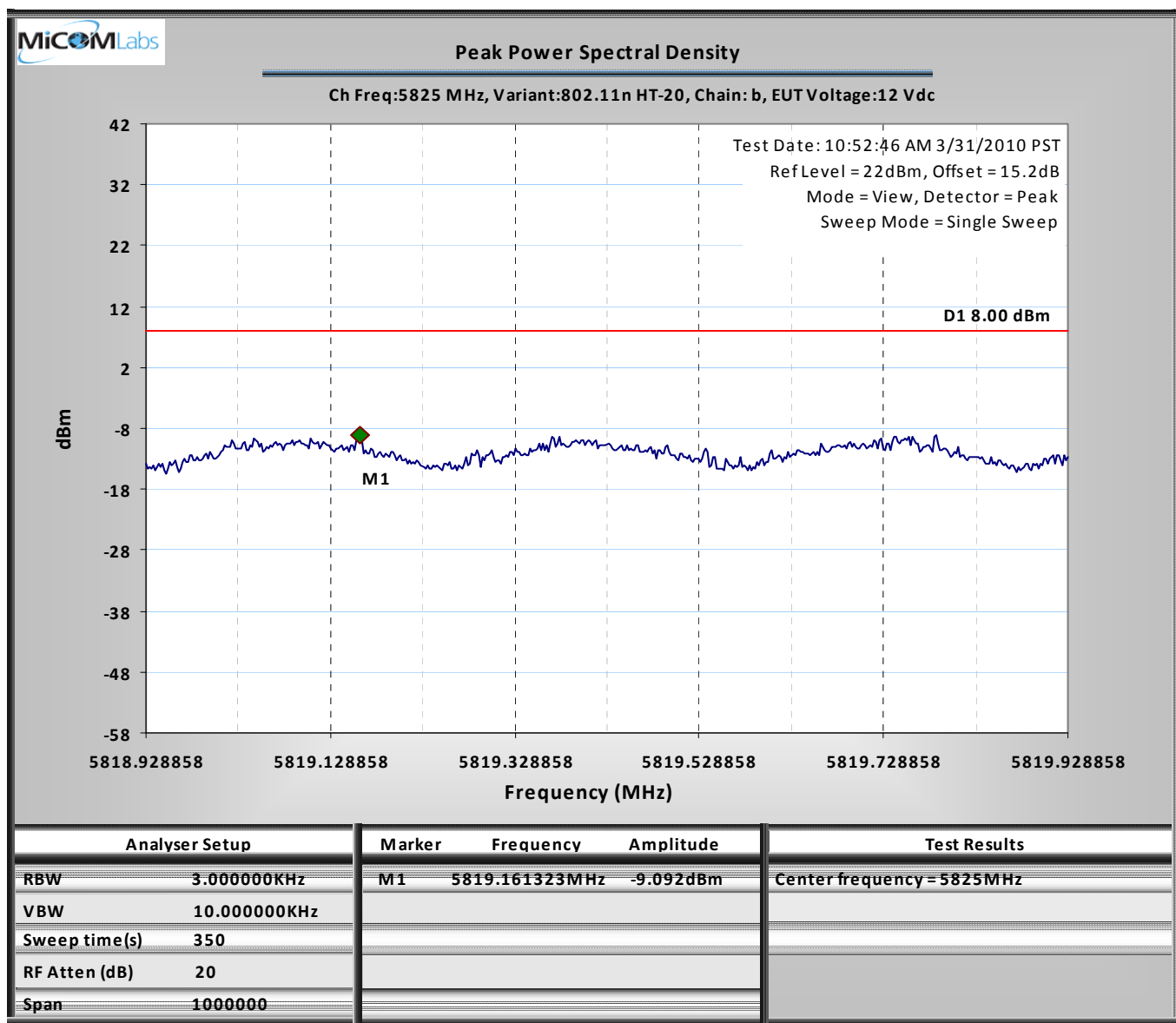
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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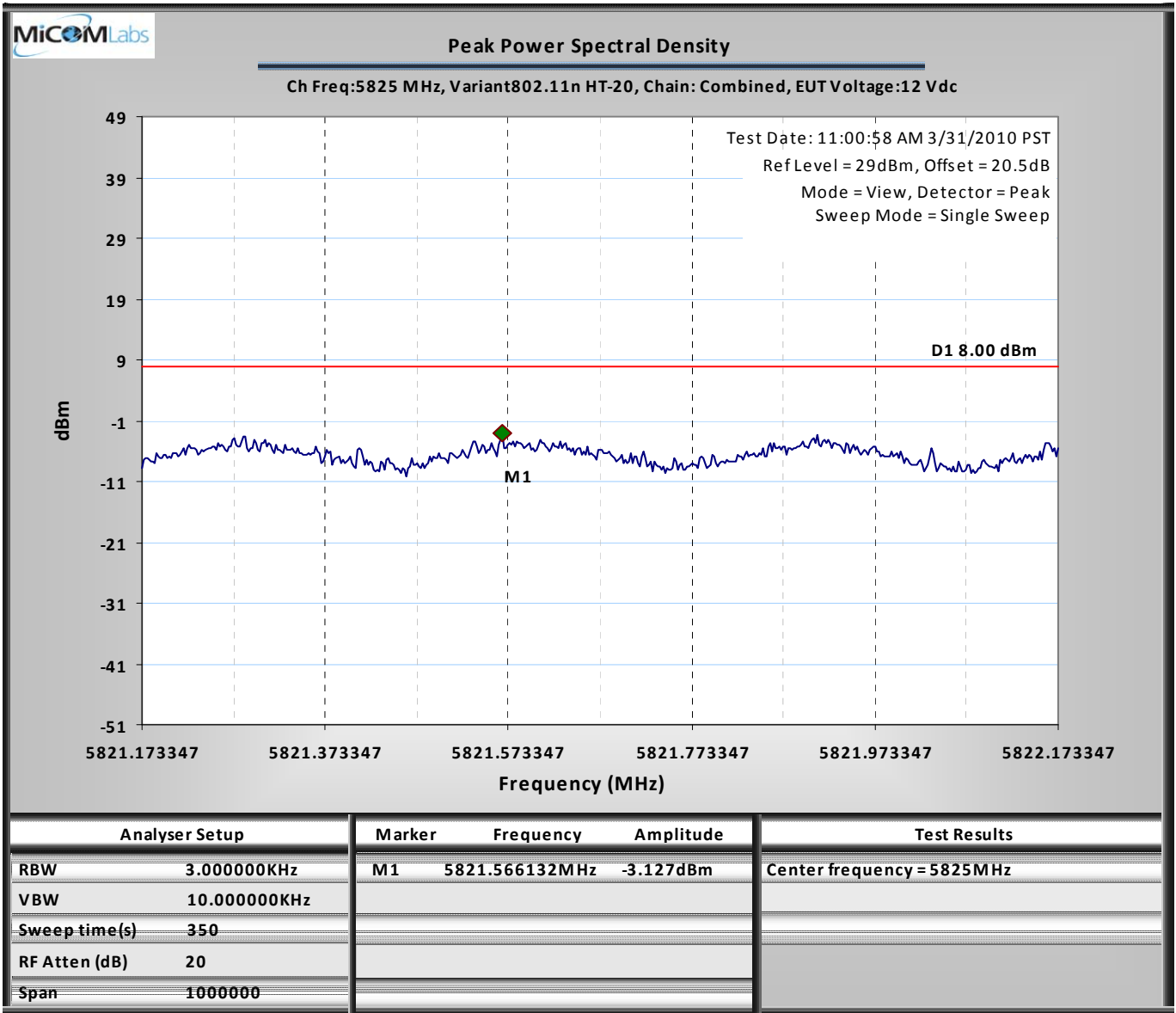
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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### 7.3.7 Measurement results for 802.11n HT-40

|                         |               |                            |     |    |      |
|-------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b> | 15.247 (e)    | <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</b>     | N/A           | <b>Antenna Gain:</b>       | 6   |    | dBi  |
| <b>Applied Voltage:</b> | 12.0          | Vdc                        |     |    |      |
| <b>Notes 1:</b>         |               |                            |     |    |      |
| <b>Notes 2:</b>         |               |                            |     |    |      |

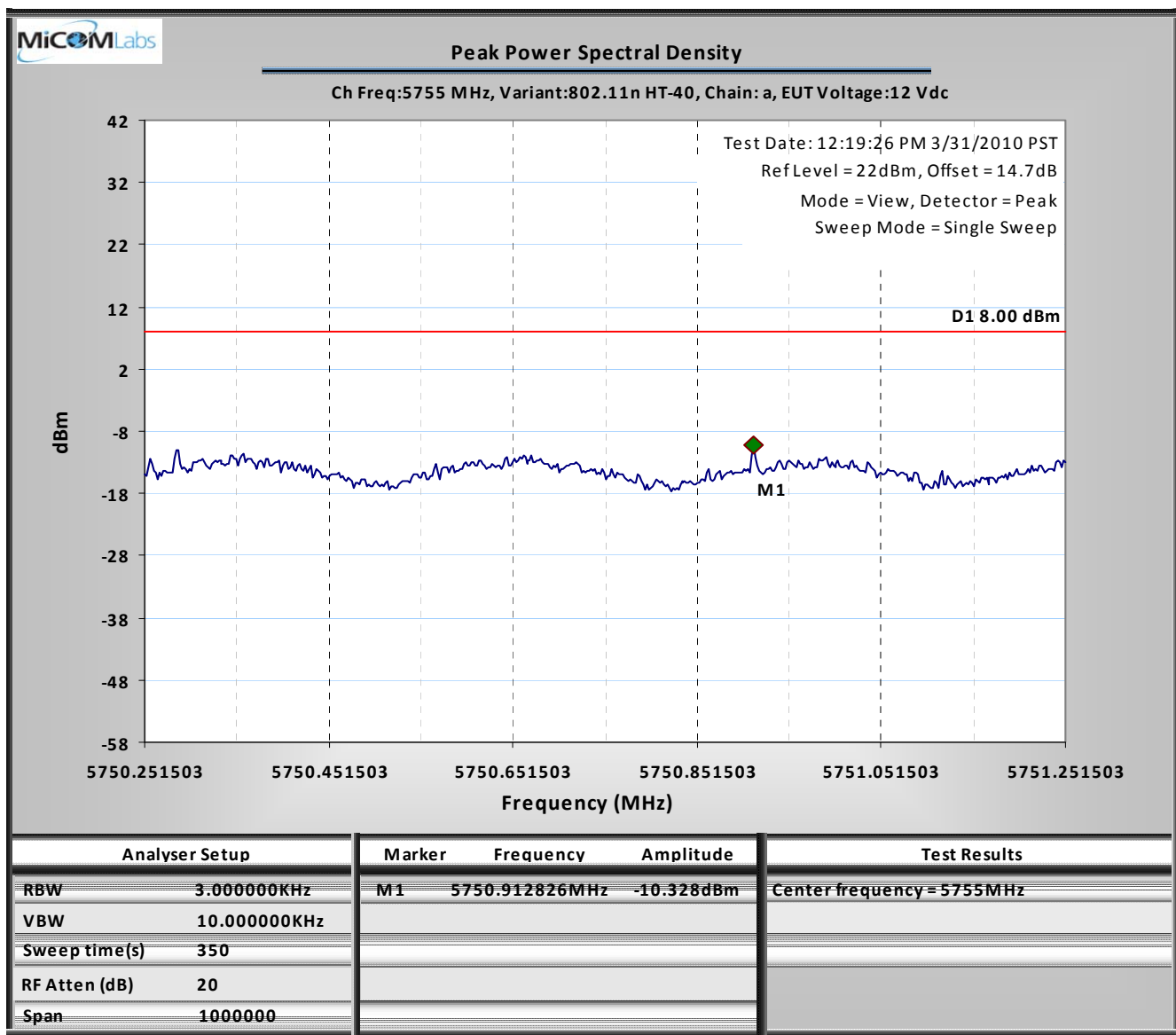
| Test Frequency | Measured Power Density |        |    |    | Total Peak Power Spectral Density (dBm) |            | Limit | Margin |
|----------------|------------------------|--------|----|----|-----------------------------------------|------------|-------|--------|
|                | RF Port (dBm)          |        |    |    |                                         |            |       |        |
| MHz            | a                      | b      | c  | d  | Combined                                | Calculated | dBm   | dB     |
| 5755           | -10.33                 | -9.74  | -- | -- | -4.38                                   | -7.01      | 8.00  | -12.38 |
| 5785           | -10.33                 | -10.15 | -- | -- | -4.49                                   | -7.23      | 8.00  | -12.49 |
| 5815           | -10.59                 | -9.70  | -- | -- | -5.47                                   | -7.11      | 8.00  | -13.47 |

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

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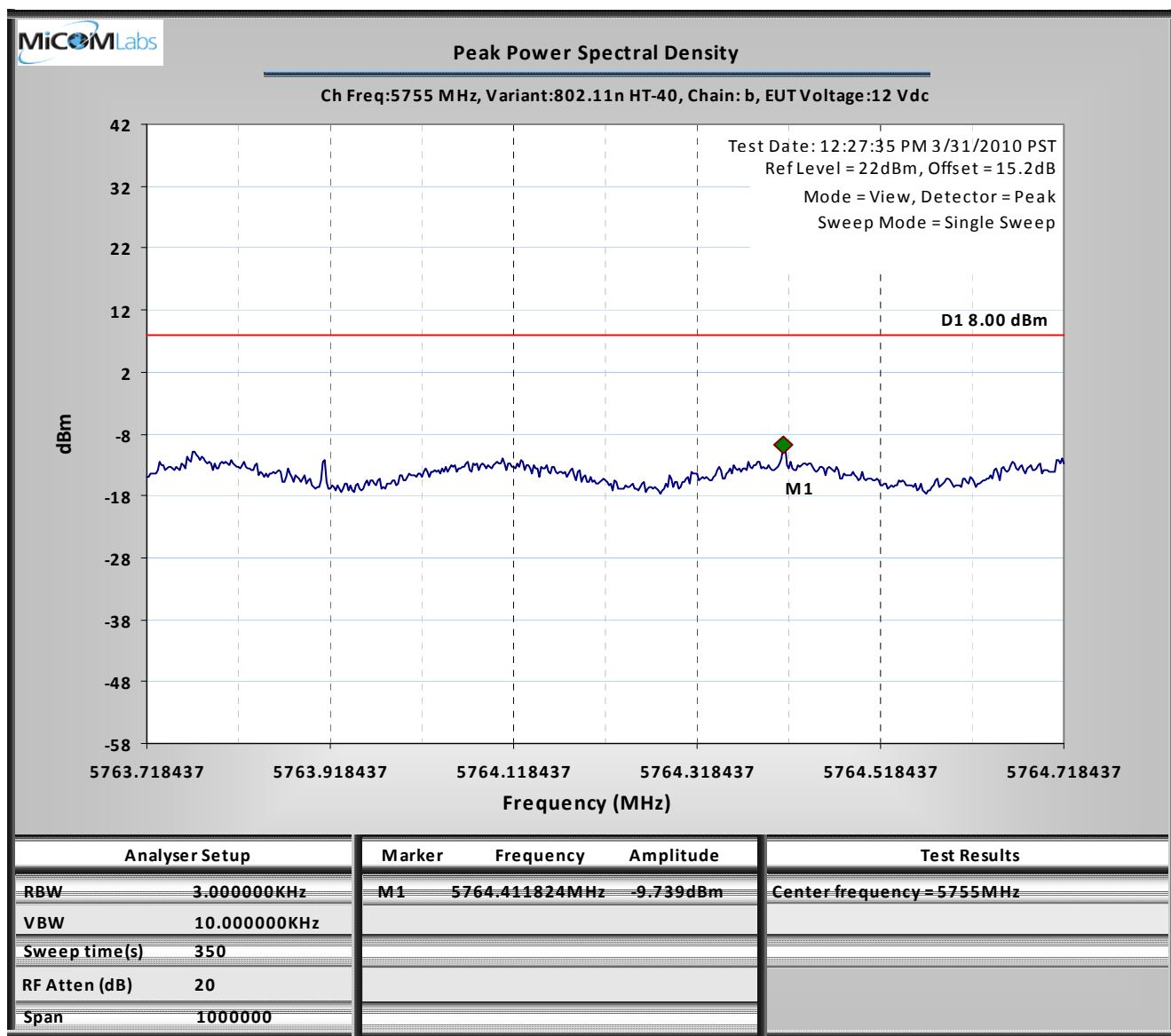
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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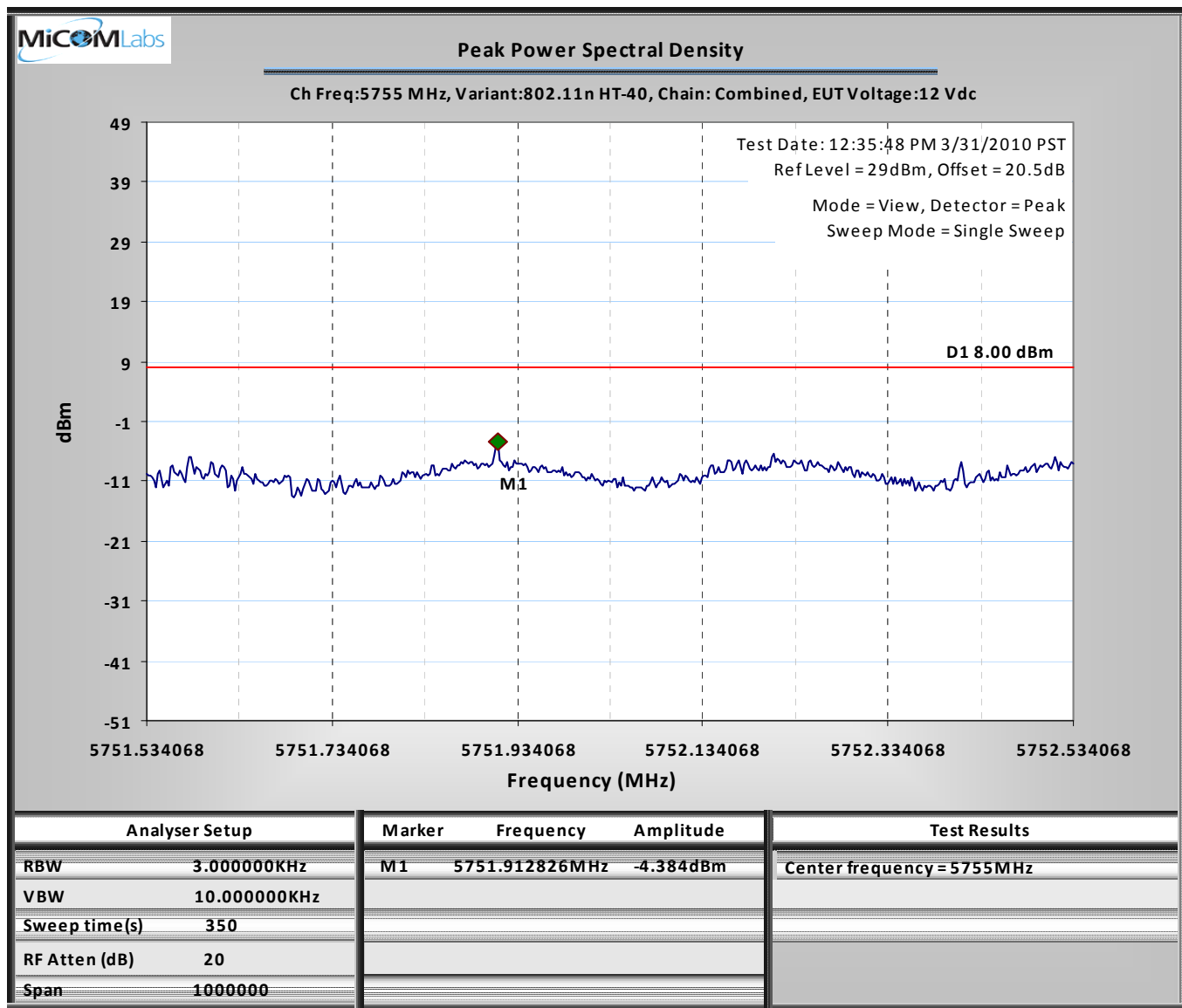
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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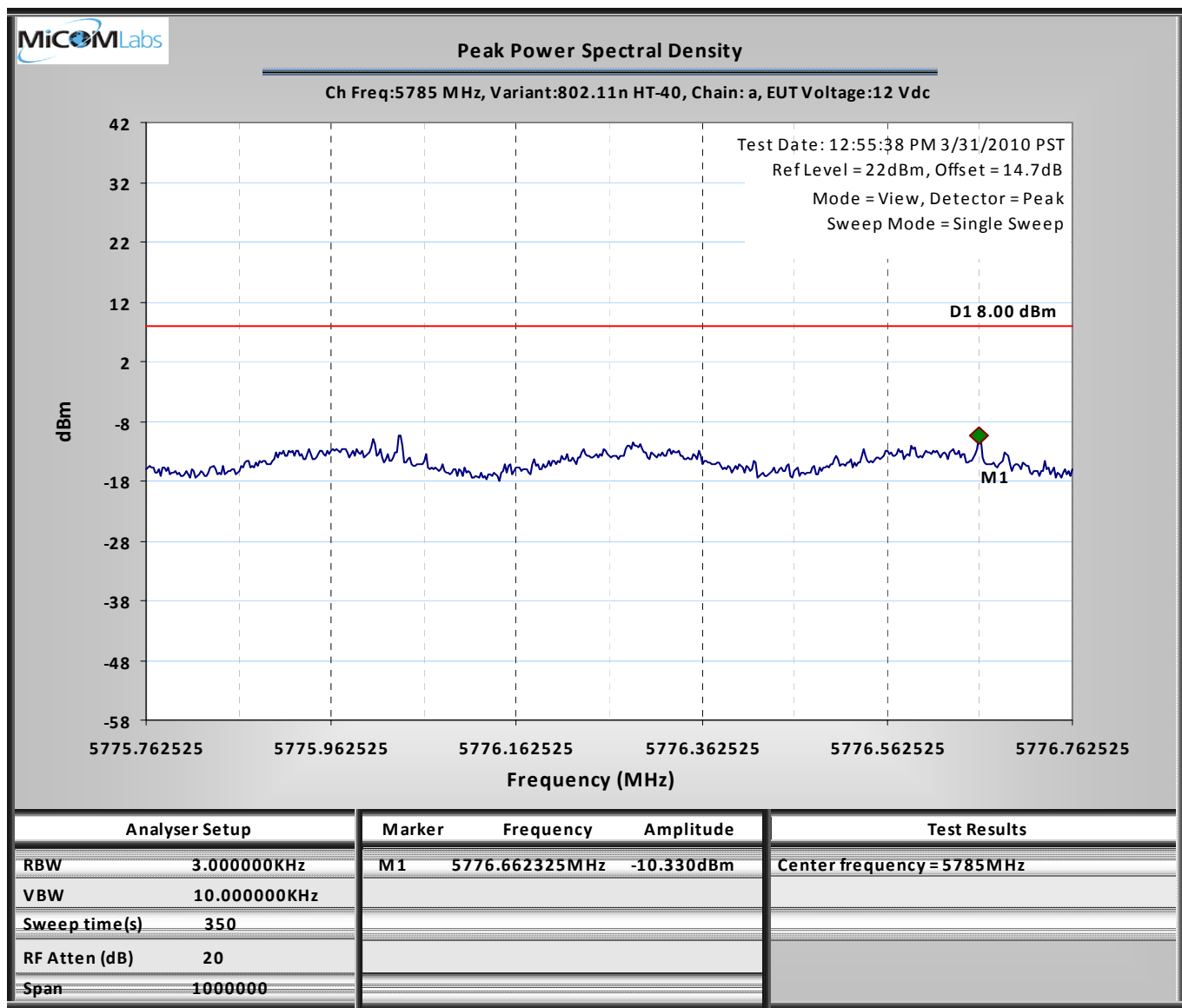
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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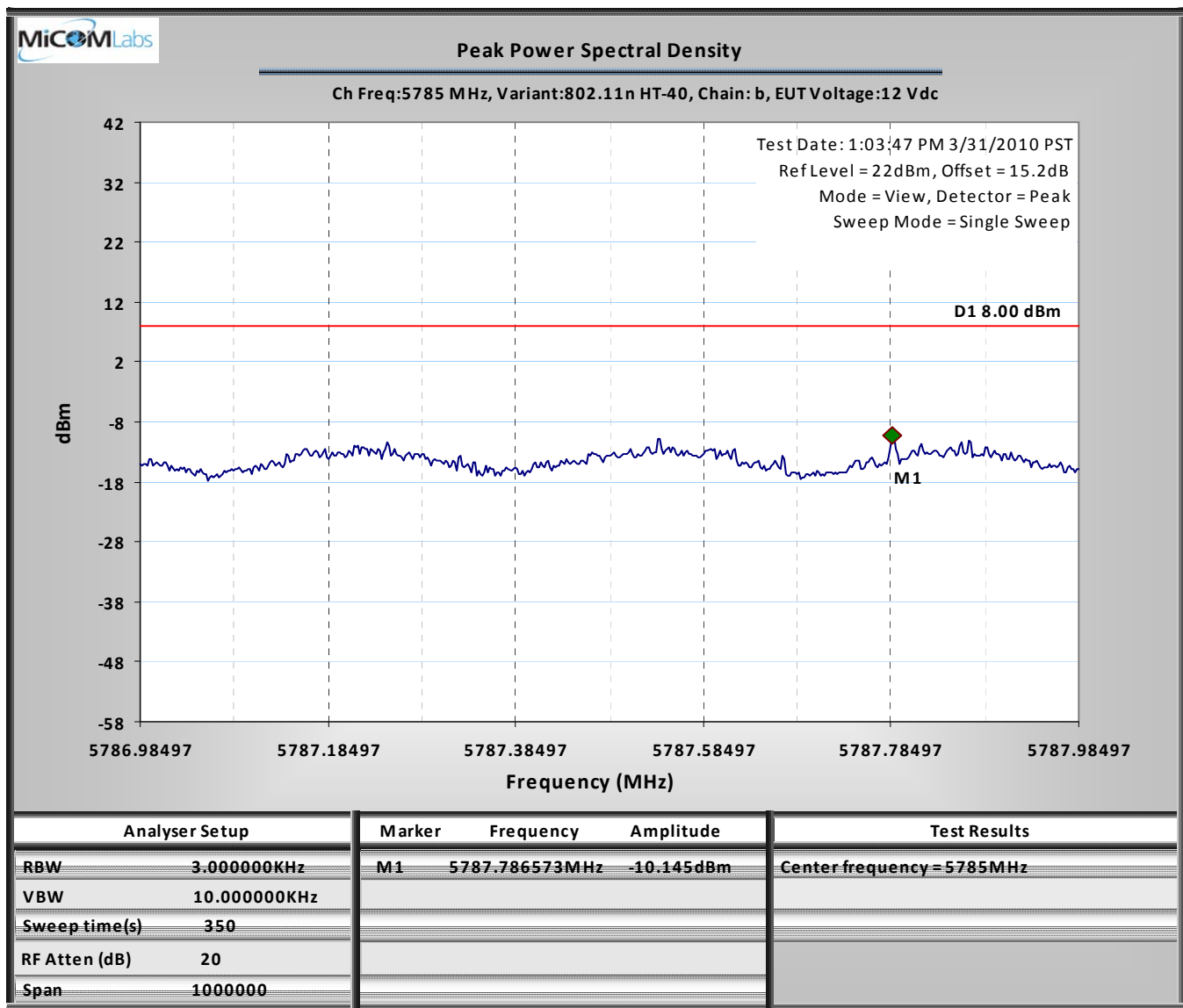
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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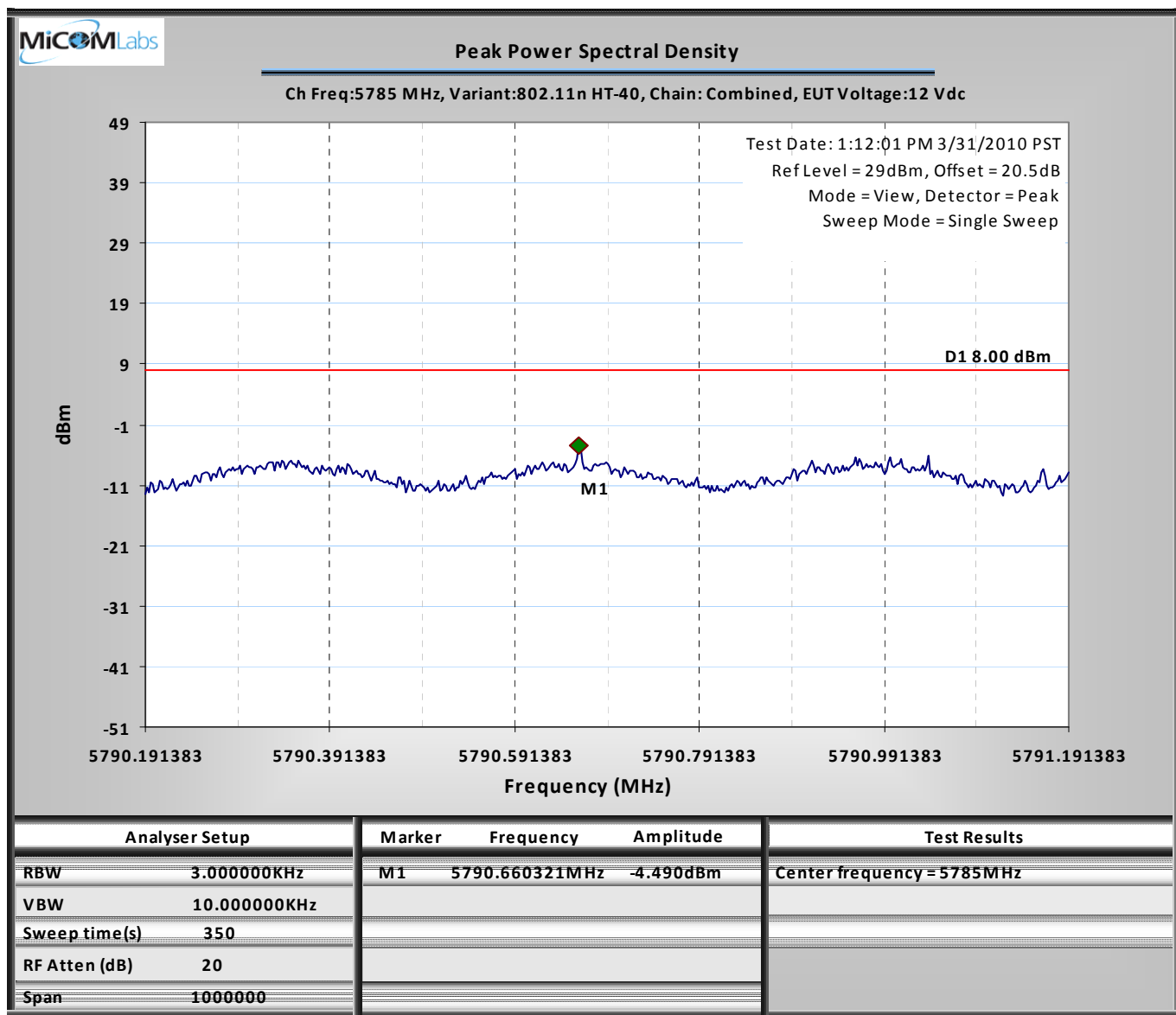
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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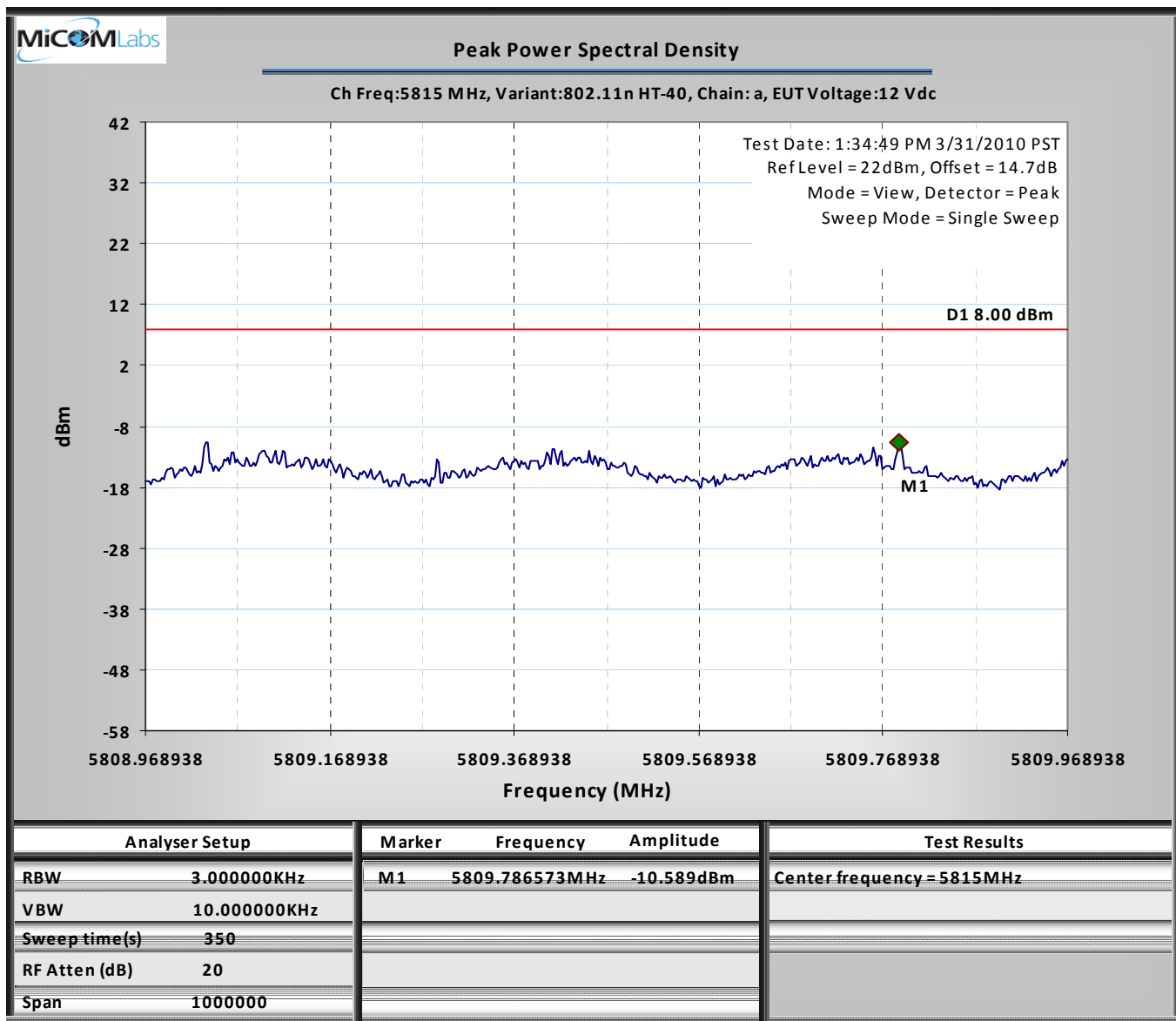
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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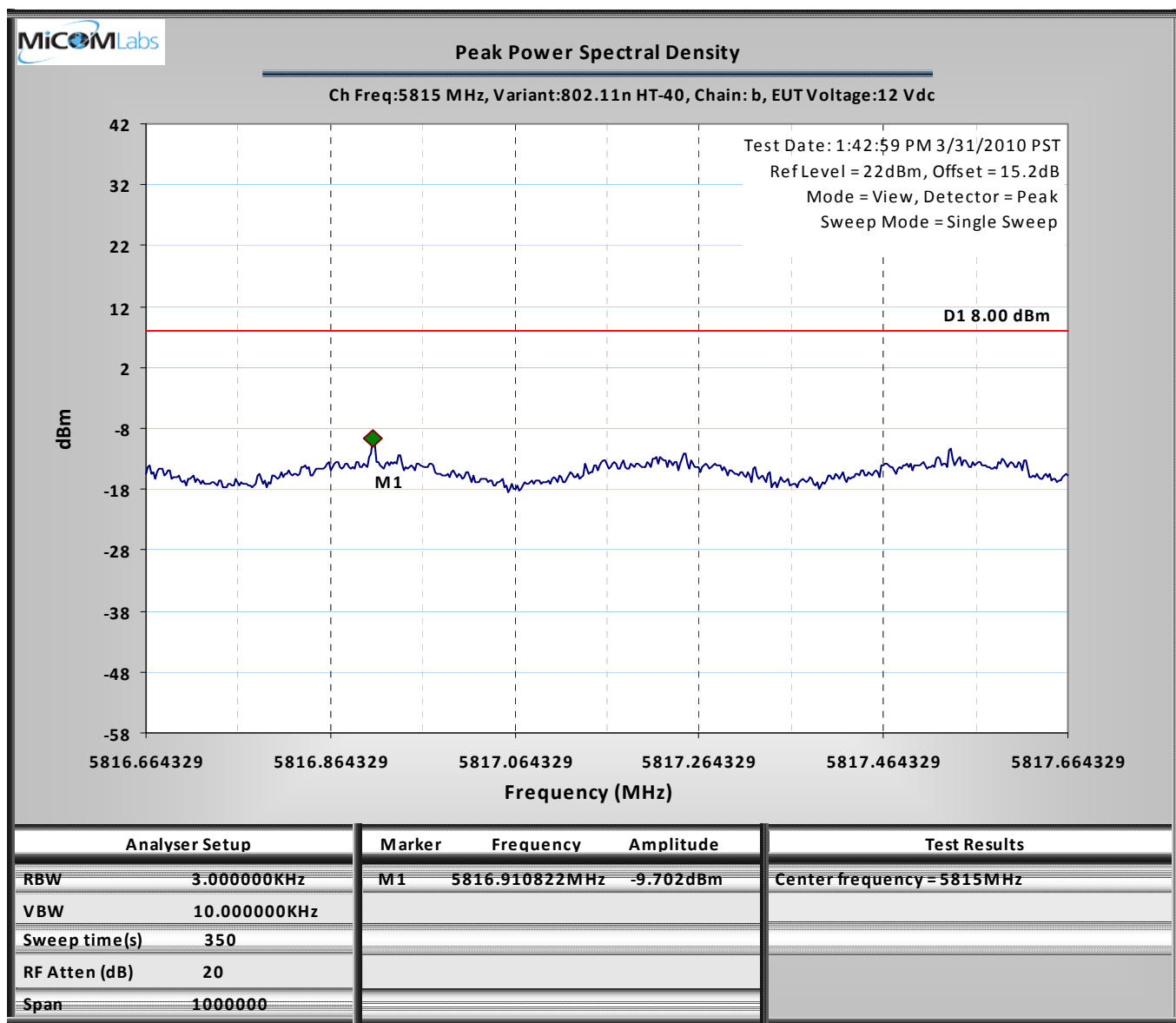
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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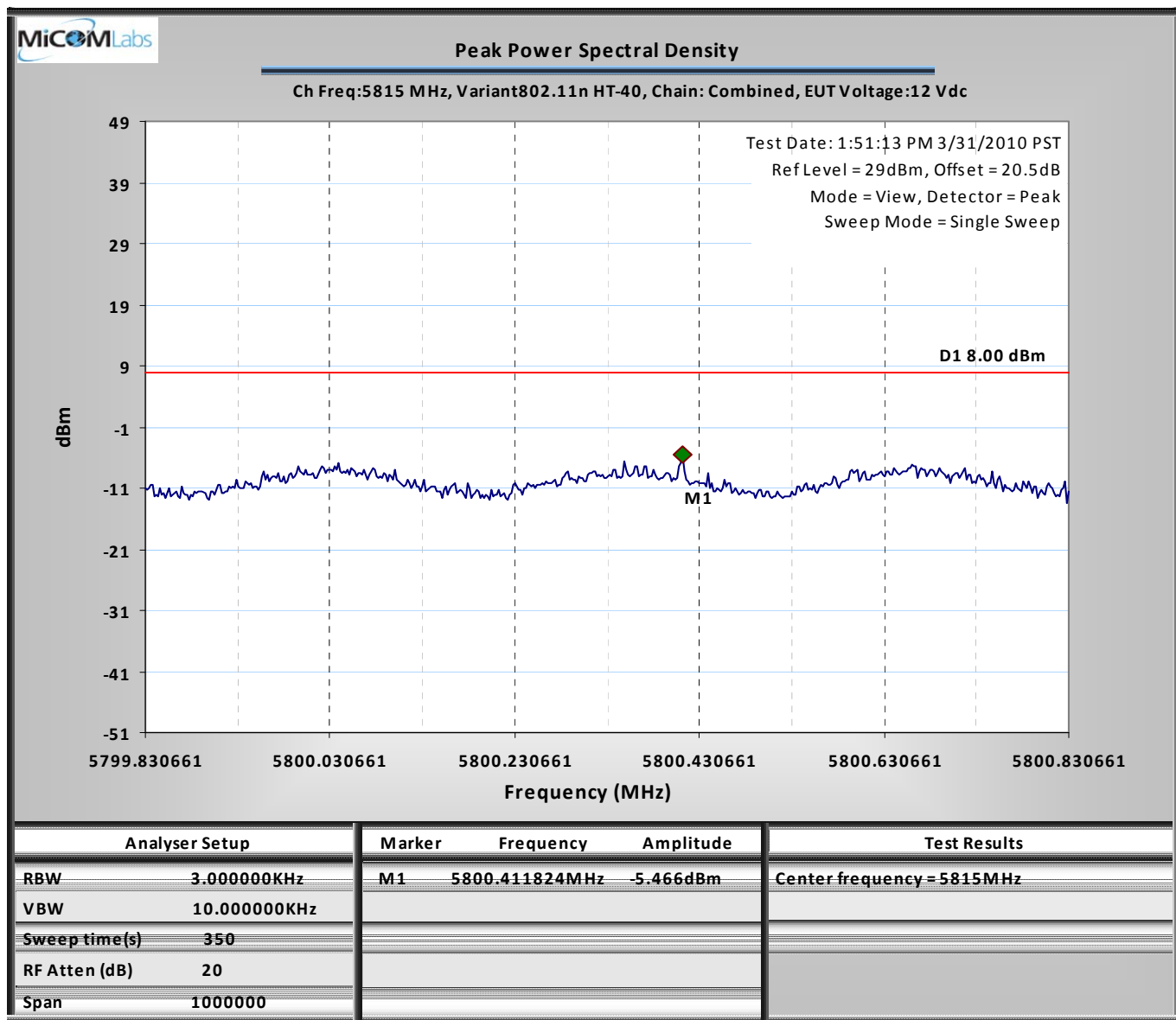
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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## 7.4 Maximum Permissible Exposure

### FCC, Part 15 Subpart C §15.407(f)

### Industry Canada RSS-Gen §5.5

#### Calculations for Maximum Permissible Exposure Levels

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

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

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

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

The Aruba AP-93H 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 conducted power measured in each band and multiplying by 2.

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm<sup>2</sup>

| Freq. Band (MHz) | Antenna Gain (dBi) | Numeric Gain (numeric) | Peak Output Power (dBm) | Peak Output Power x 2 (mW) | Calculated Safe Distance @ 1mW/cm <sup>2</sup> Limit(cm) | Minimum Separation Distance (cm) |
|------------------|--------------------|------------------------|-------------------------|----------------------------|----------------------------------------------------------|----------------------------------|
| 2400 – 2500      | 2.5                | 1.78                   | +18.93                  | 78.2                       | 3.33                                                     | 20.00                            |
| 5725 - 5850      | 5.8                | 3.8                    | +16.97                  | 49.8                       | 3.88                                                     | 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 = 1mW / cm<sup>2</sup> 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

±1.33 dB

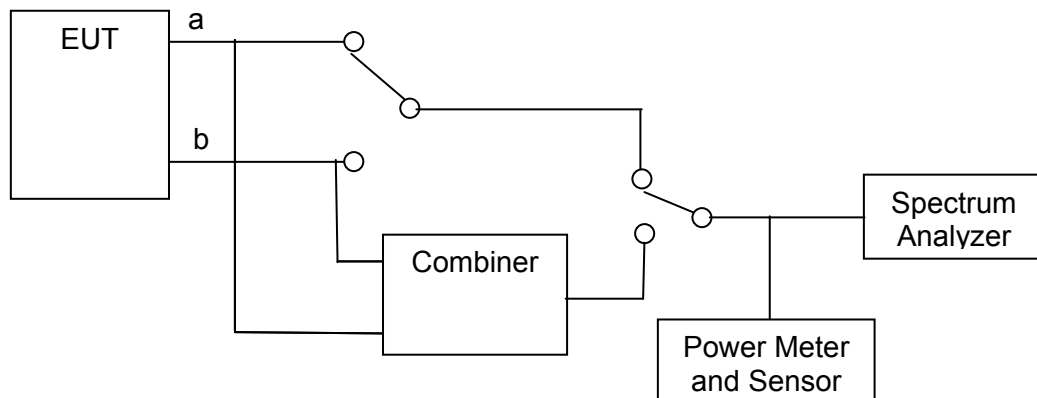
## 7.5 Conducted Spurious Emissions

### Test Procedure

Conducted emissions were measured at a limit of 20 dB below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Emissions at the band edge were measured and recorded. Measurements were made while EUT was operating in transmit mode of operation at the appropriate center frequency.

Measurements were made using a combiner with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the peak emission.

### Test Measurement Set up



Conducted Spurious Emission measurement test configuration



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## Specification

### Limits Band-Edge

| Lower Limit Band-edge | Upper Limit Band-edge | Limit below highest level of desired power |
|-----------------------|-----------------------|--------------------------------------------|
| 2,400 MHz             | 2,483.5 MHz           | ≥ 20 dB                                    |
| 5725 MHz              | 5850 MHz              |                                            |

**§15.247(d)** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### §15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

## Traceability

| Method                                                                                | Test Equipment Used                                   |
|---------------------------------------------------------------------------------------|-------------------------------------------------------|
| Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions' | 0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363. |

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### 7.5.1 Measurement results for 802.11b

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>          | 802.11b       | <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</b> | N/A dB        | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b>  | 55.00 Vdc     | <b>Antenna Ports (N):</b>  | 2   |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### *Conducted Spurious Measurement*

| Test Freq. | Start Freq. | Stop Freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-------------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz         | MHz        | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm |
| 2412.000   | 30.00       | 26000.00   | -43.71 | -12.76    | -42.26 | -12.33    |        |           |        |           |
| 2437.000   | 30.00       | 26000.00   | -43.53 | -11.87    | -41.36 | -12.39    |        |           |        |           |
| 2462.000   | 30.00       | 26000.00   | -43.06 | -13.30    | -43.59 | -13.26    |        |           |        |           |

SE: Maximum spurious emission found

#### *Band-edge Measurement*

| Test Freq. | Band-edge freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-----------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz             | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm |
| 2412.000   | 2400.00         | -35.97 | -11.70    | -35.58 | -12.63    |        |           |        |           |
| 2462.000   | 2483.50         | -46.77 | -11.48    | -46.80 | -11.80    |        |           |        |           |

BE: Maximum Band edge emission found

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

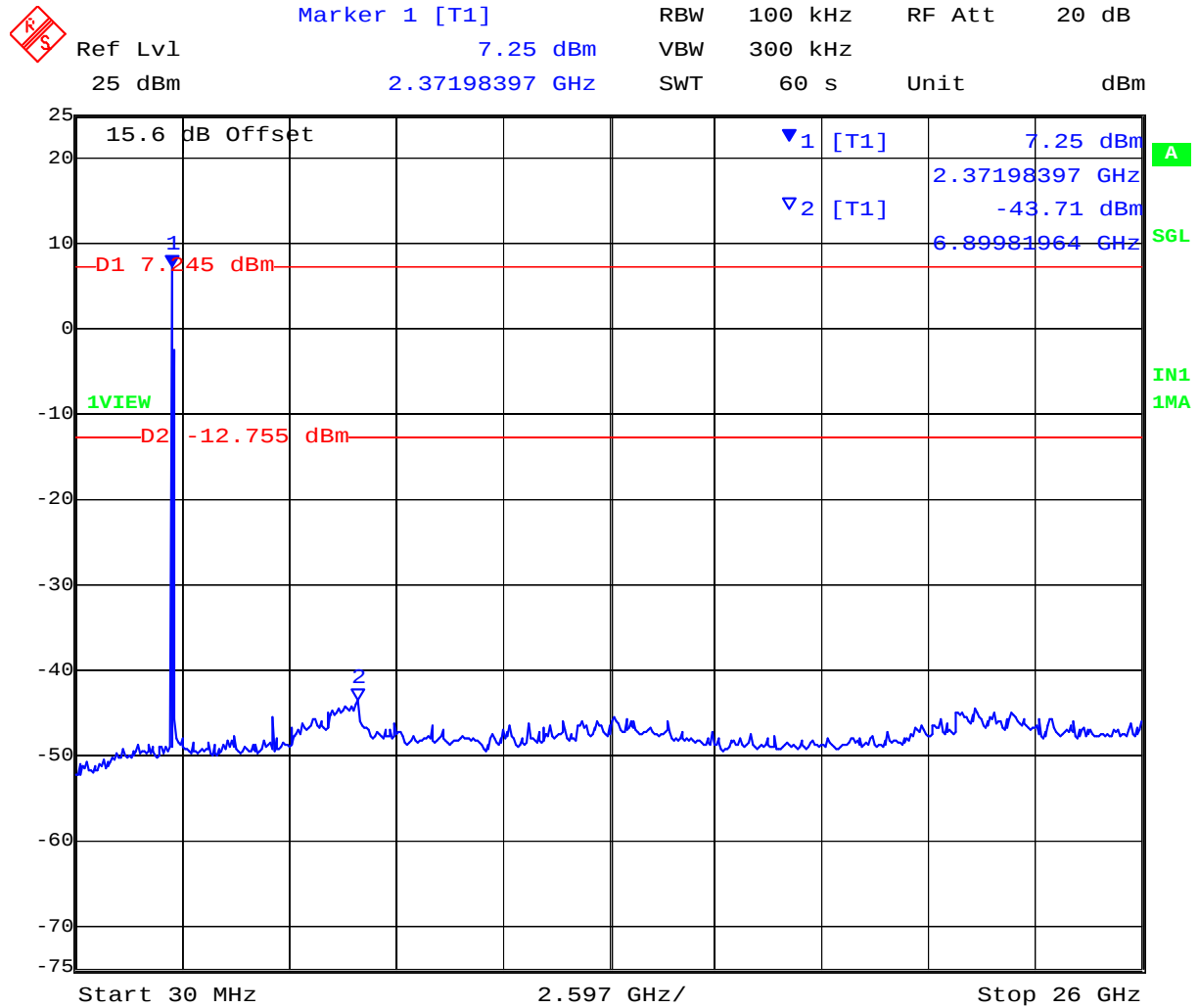
Note: Limit is based on 20dB down from fundamental emissions

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CHAIN A



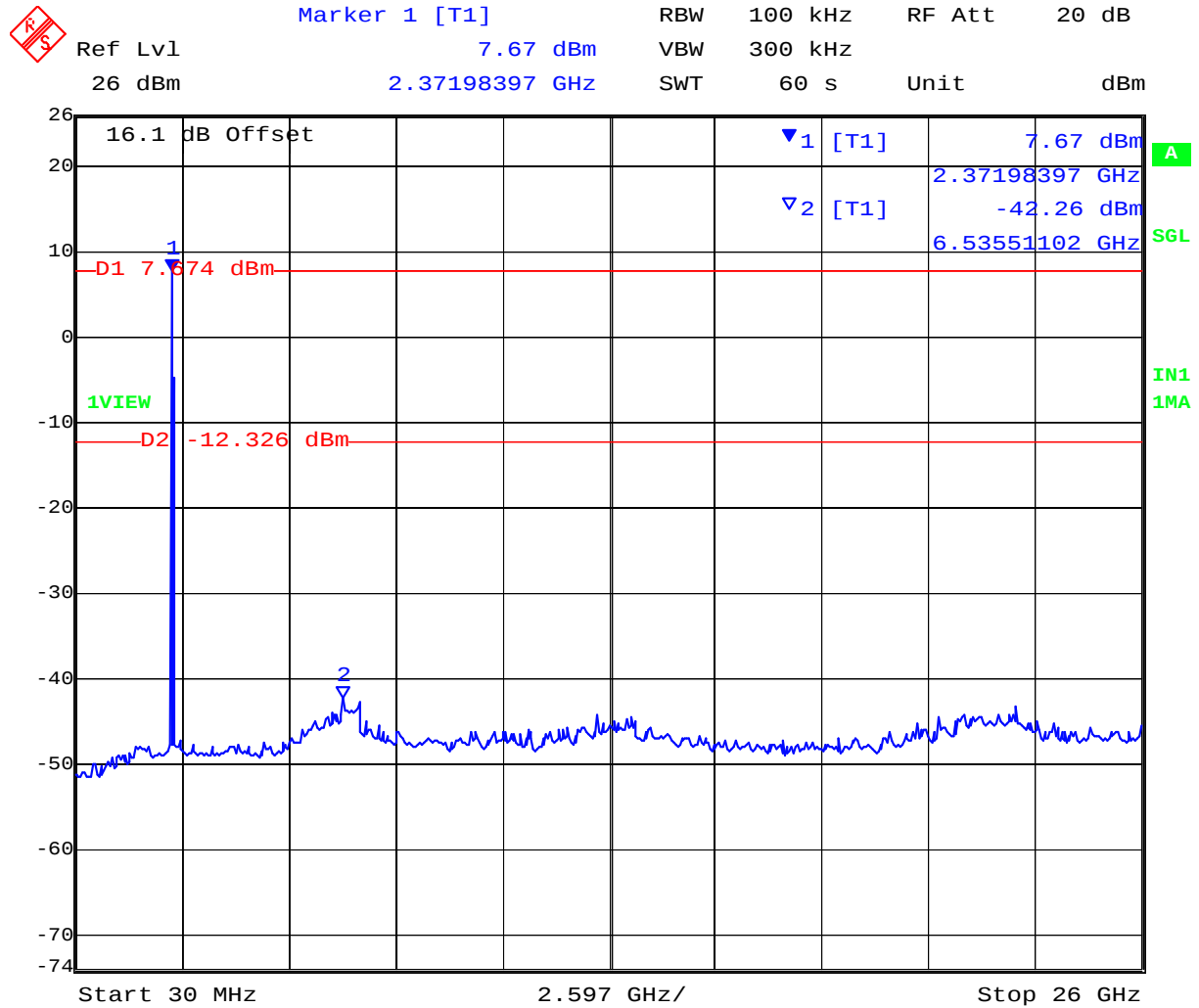
Date: 18.NOV.2011 10:48:12

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## CHAIN B



Date: 18.NOV.2011 10:49:54

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# CHAIN A



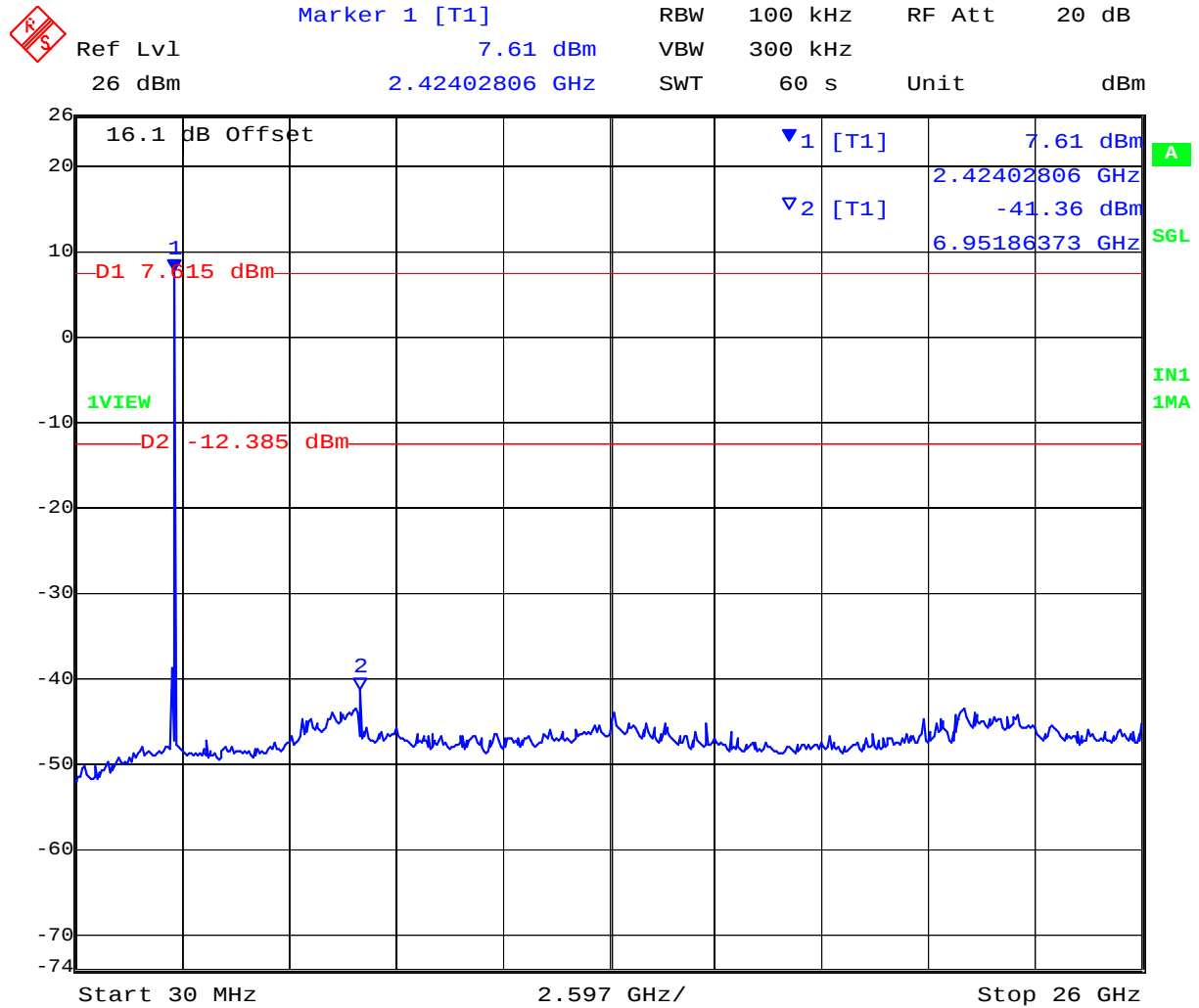
Date: 18.NOV.2011 11:26:20

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## CHAIN B



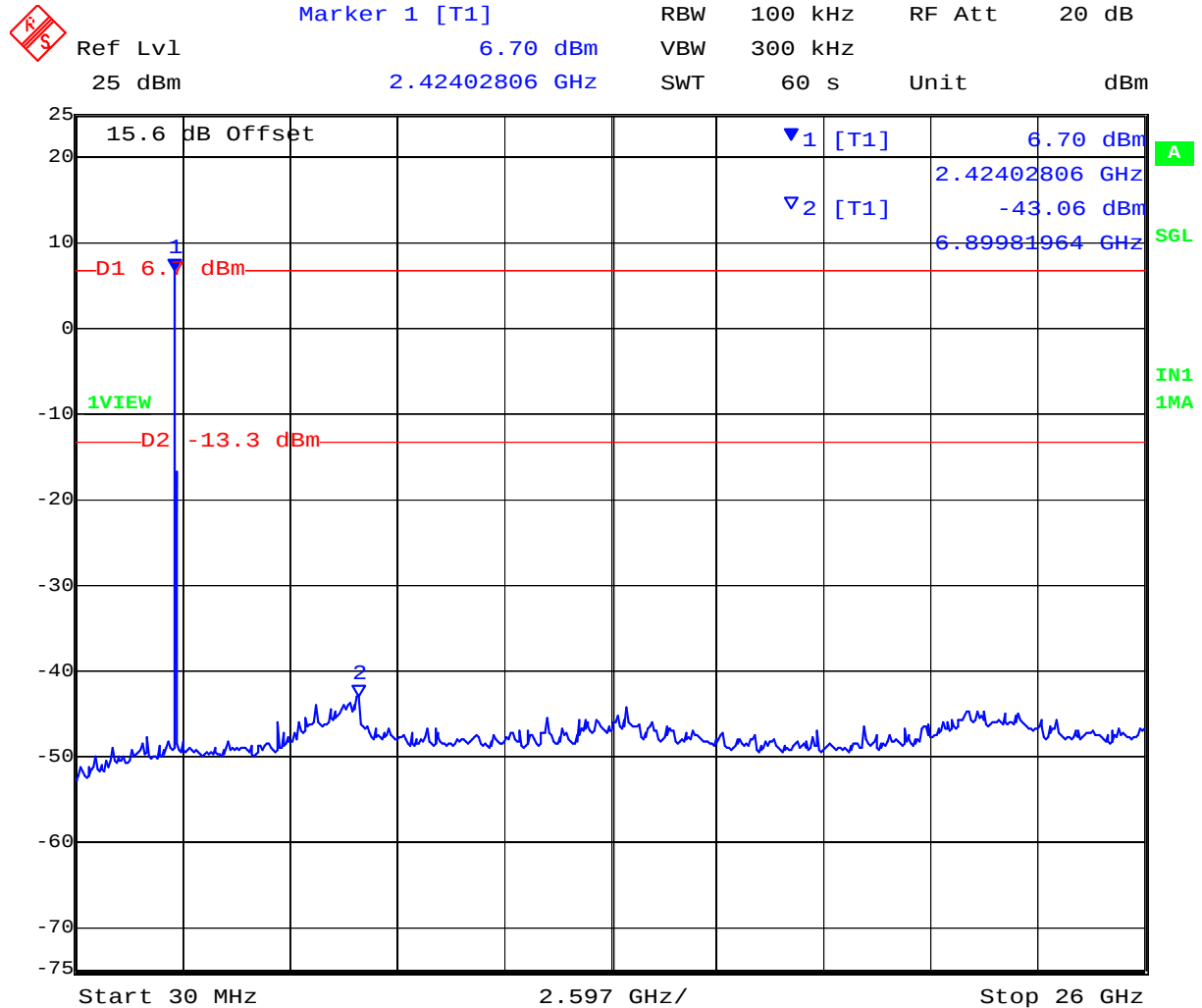
Date: 18.NOV.2011 11:28:04

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
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Issue Date: 21<sup>st</sup> December 2011  
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## CHAIN A



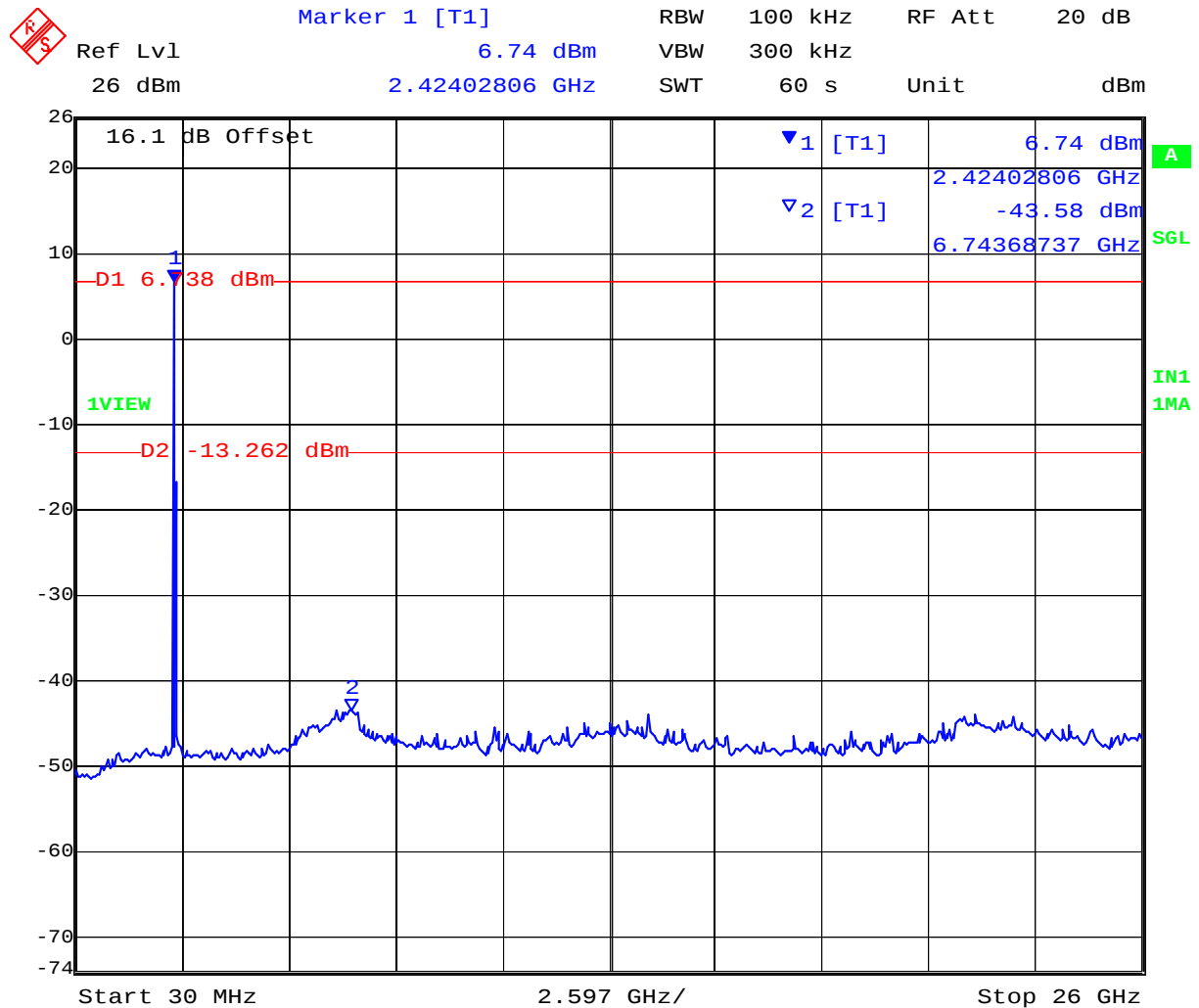
Date: 18.NOV.2011 11:49:07

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
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CHAIN B



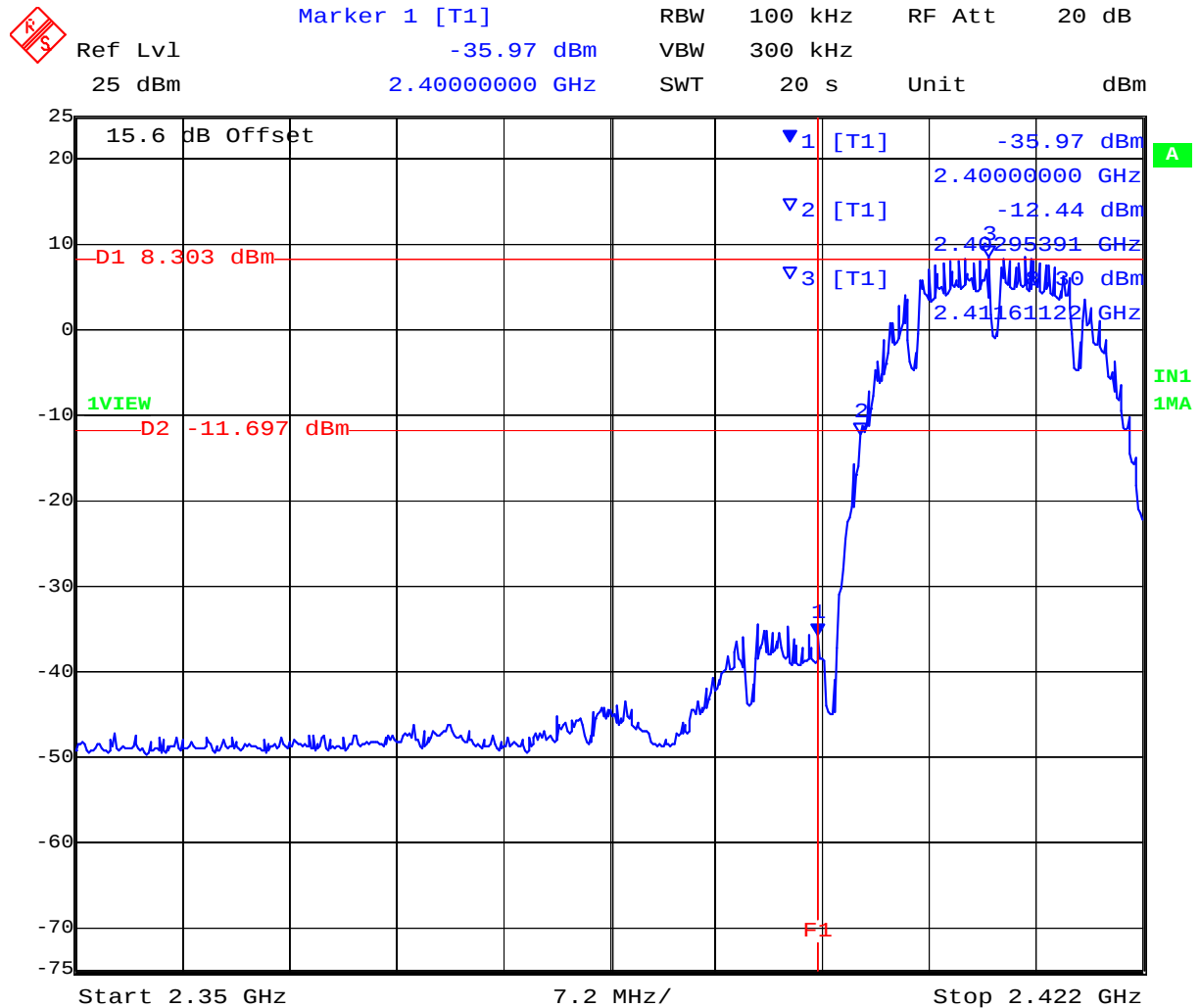
Date: 18.NOV.2011 11:51:11

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## CHAIN A



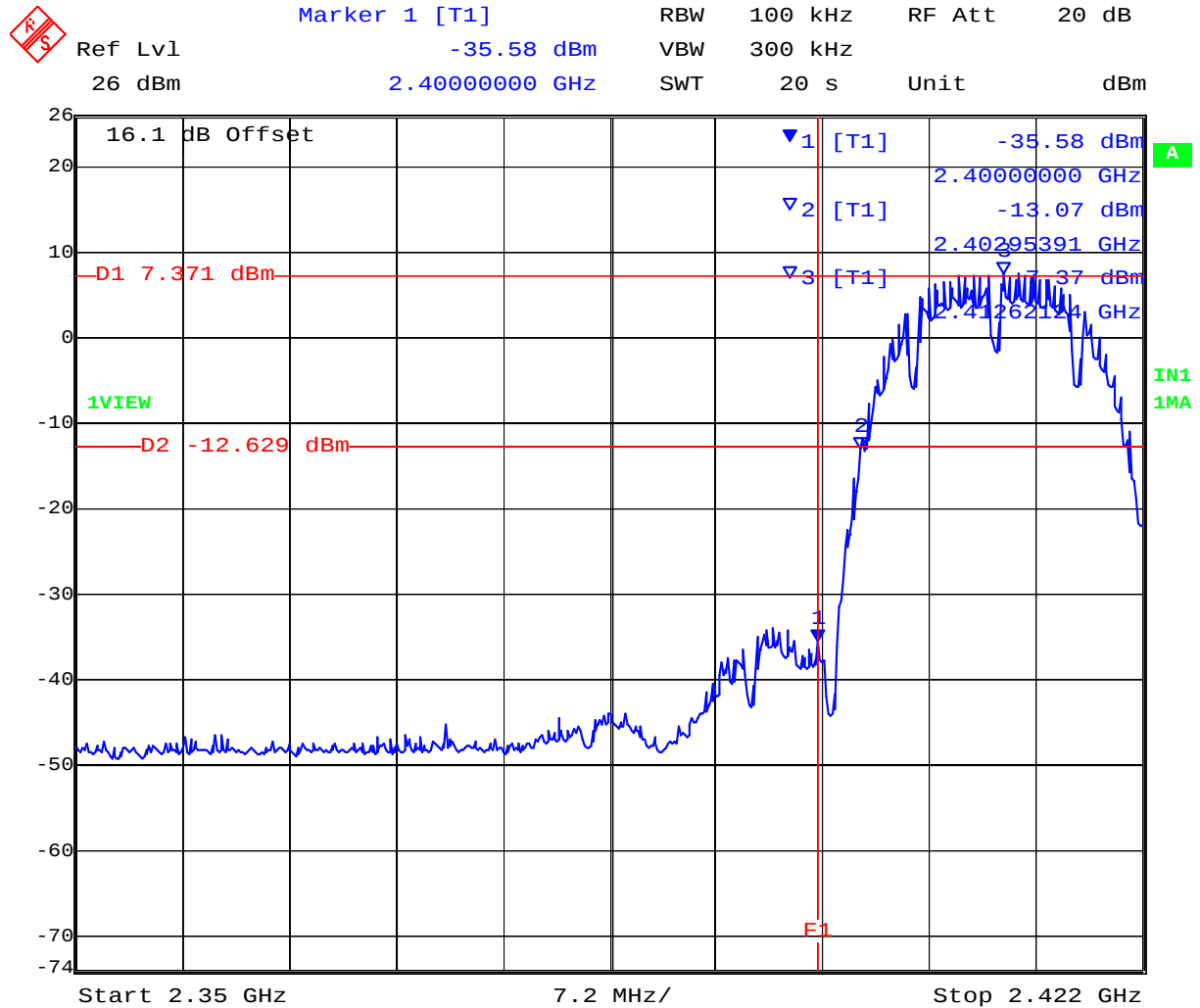
Date: 18.NOV.2011 10:31:32

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# CHAIN B



Date: 18.NOV.2011 10:32:51

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## CHAIN A



Date: 18.NOV.2011 11:32:17

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## CHAIN B



Date: 18.NOV.2011 11:33:39

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### 7.5.2 Measurement Results: 802.11g

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <b>Rel. Humidity (%):</b>  | 35  | to | 42   |
| <b>Variant:</b>          | 802.11g       | <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</b> | N/A dB        | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b>  | 55.00 Vdc     | <b>Antenna Ports (N):</b>  | 2   |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### *Conducted Spurious Measurement*

| Test Freq. | Start Freq. | Stop Freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-------------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz         | MHz        | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm |
| 2412.000   | 30.00       | 26000.00   | -43.41 | -12.78    | -42.21 | -13.99    |        |           |        |           |
| 2437.000   | 30.00       | 26000.00   | -43.46 | -13.00    | -41.65 | -12.58    |        |           |        |           |
| 2462.000   | 30.00       | 26000.00   | -43.21 | -13.39    | -42.93 | -14.11    |        |           |        |           |

SE: Maximum spurious emission found

#### *Band-edge Measurement*

| Test Freq. | Band-edge freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-----------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz             | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm |
| 2412.000   | 2400.00         | -20.04 | -12.32    | -22.22 | -12.78    |        |           |        |           |
| 2462.000   | 2483.50         | -30.66 | -12.78    | -33.41 | -12.63    |        |           |        |           |

BE: Maximum Band edge emission found

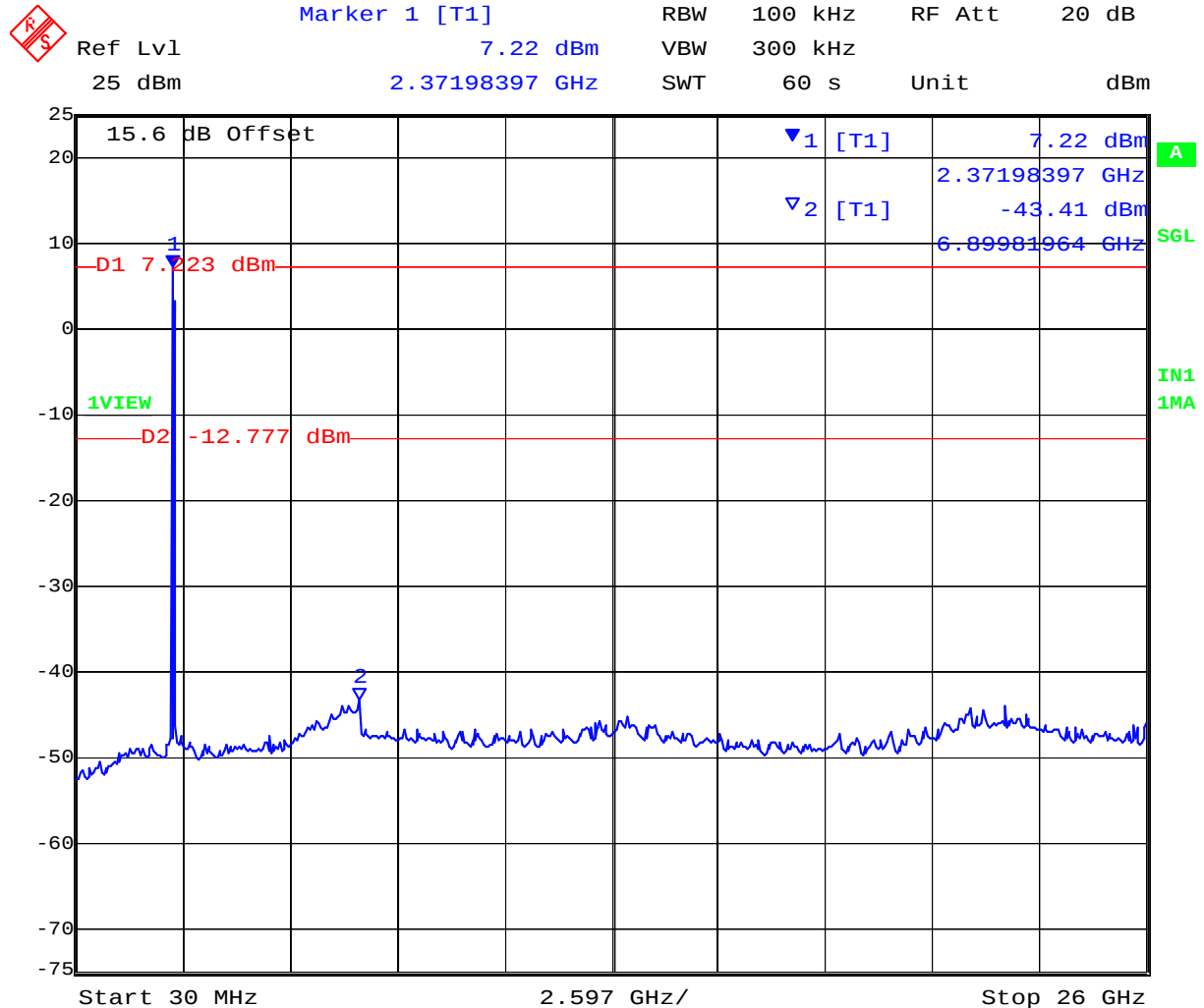
|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

Note: Limit is based on 20dB down from fundamental emissions



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## CHAIN A



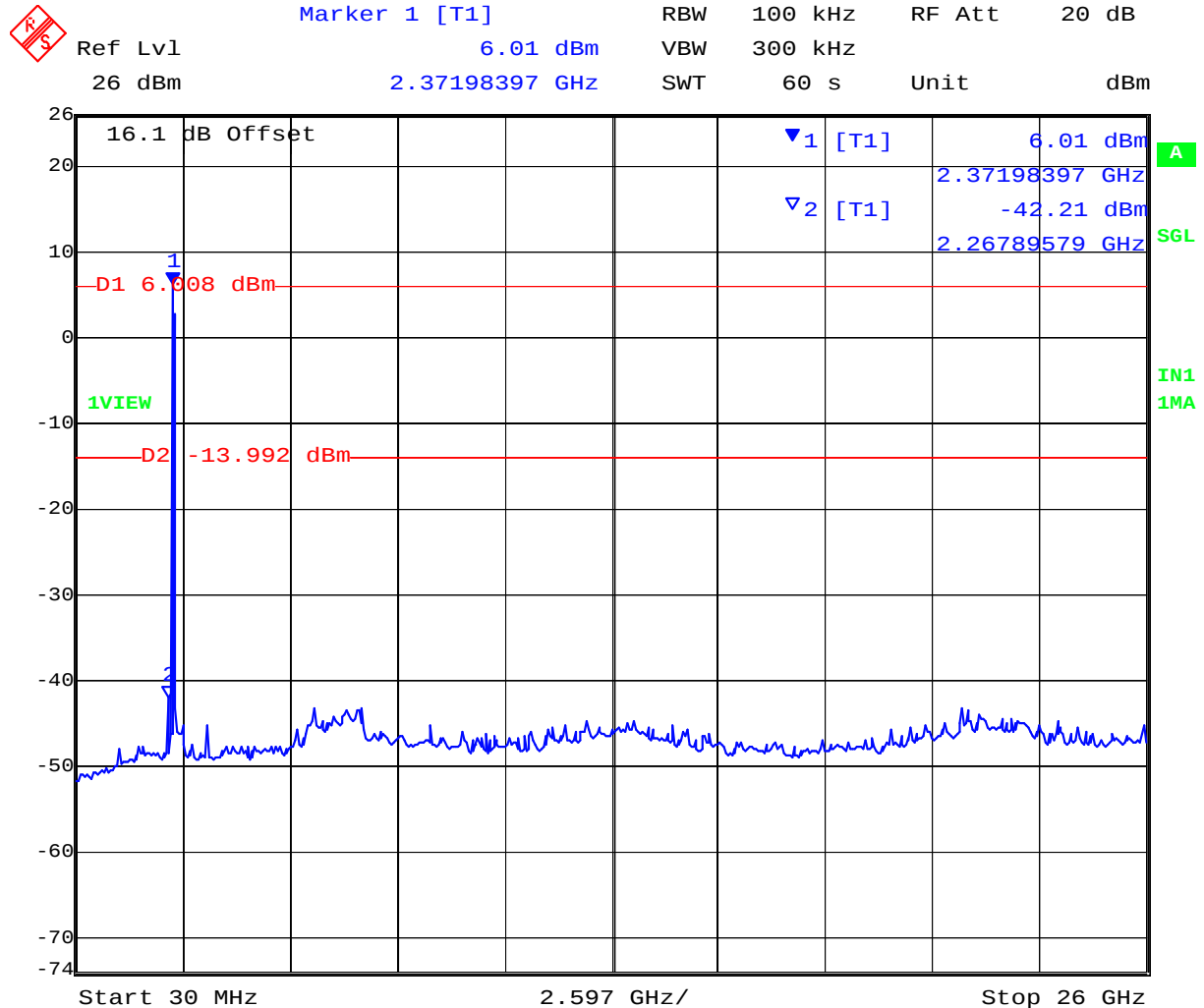
Date: 18.NOV.2011 12:30:52

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## CHAIN B



Date: 18.NOV.2011 12:32:34

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## CHAIN A



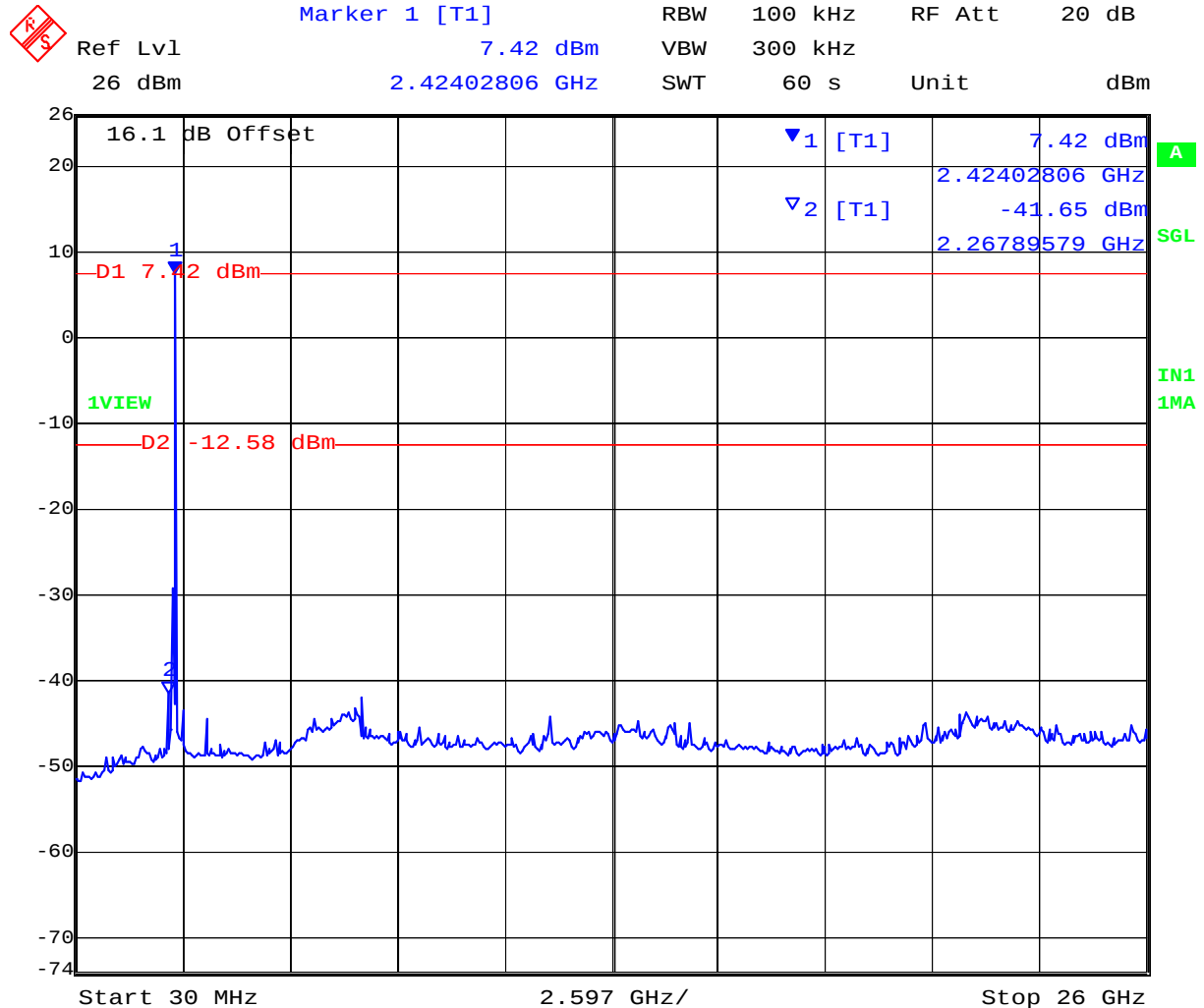
Date: 18.NOV.2011 12:57:48

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Serial #: ARUB74-U1 Rev A  
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## CHAIN B



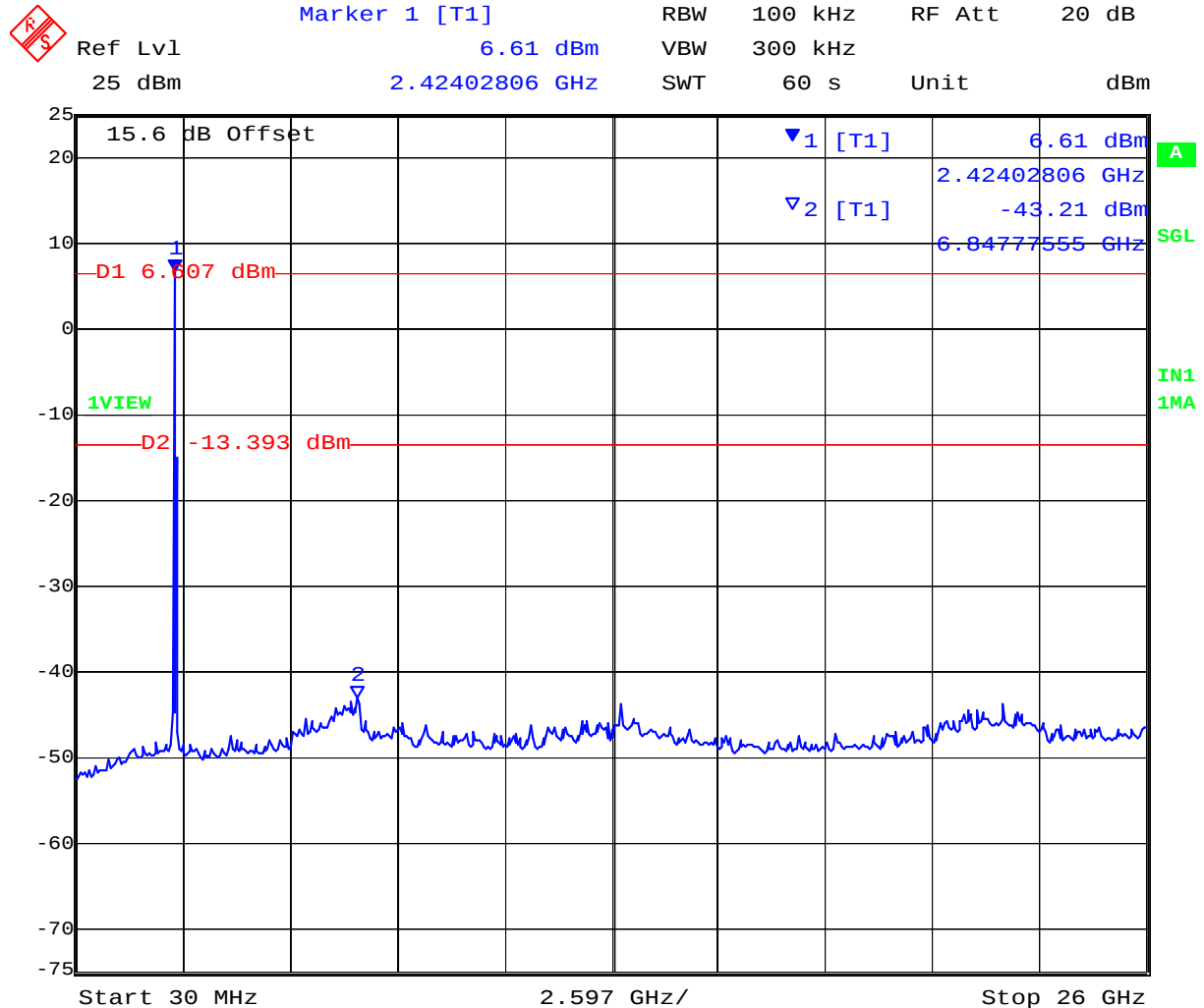
Date: 18.NOV.2011 12:59:31

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## CHAIN A



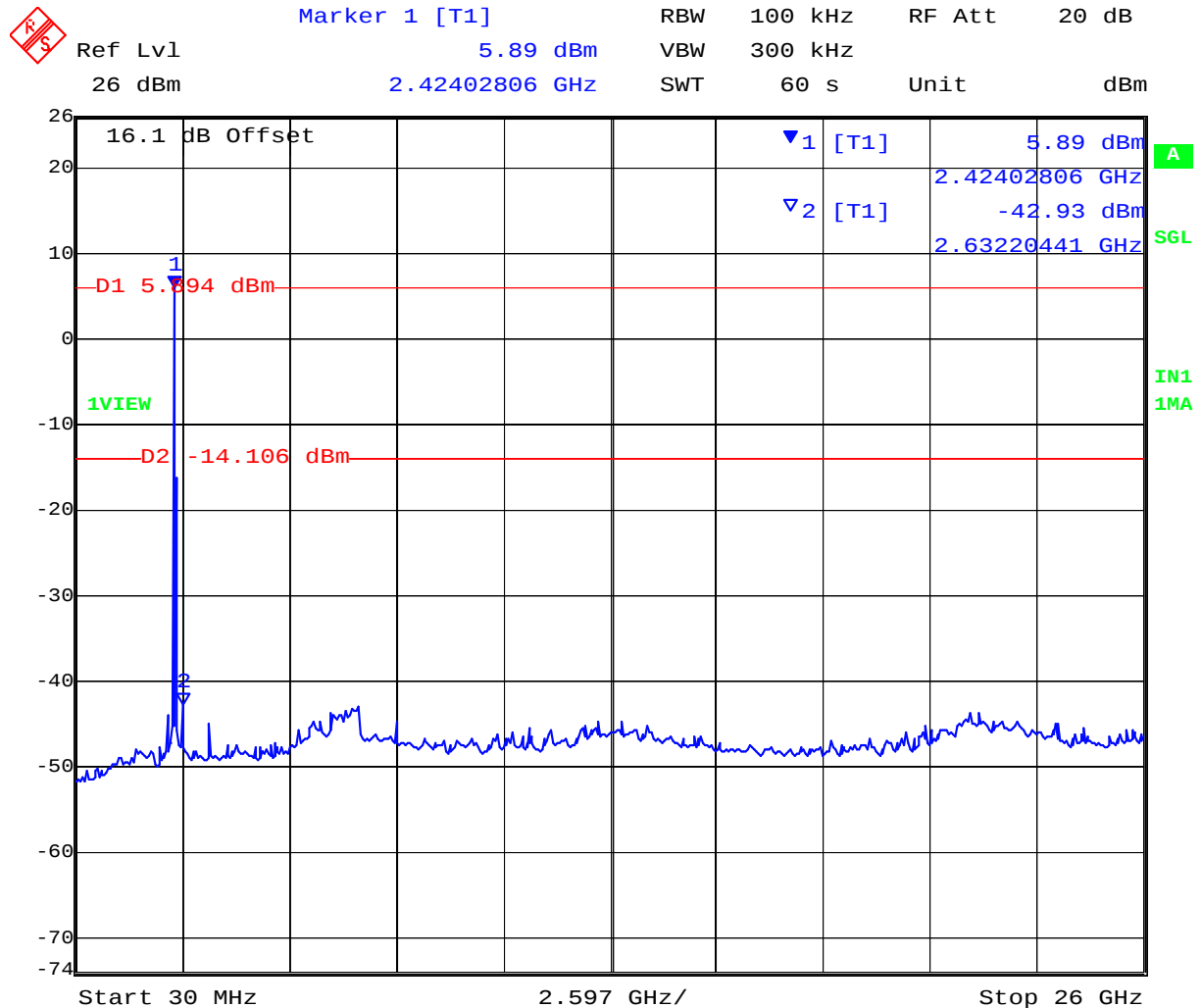
Date: 18.NOV.2011 14:22:52

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Serial #: ARUB74-U1 Rev A  
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## CHAIN B



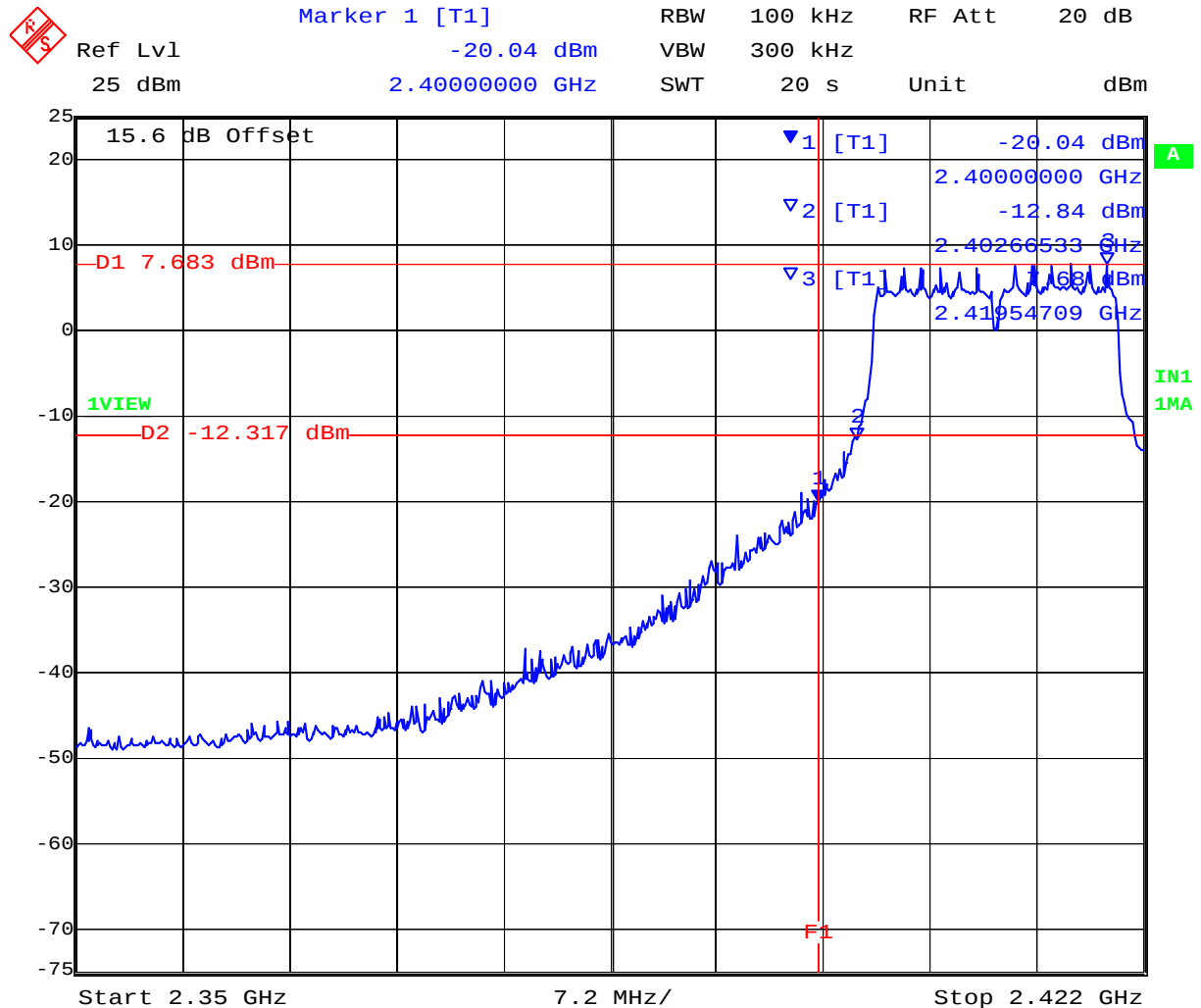
Date: 18.NOV.2011 14:24:37

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## CHAIN A



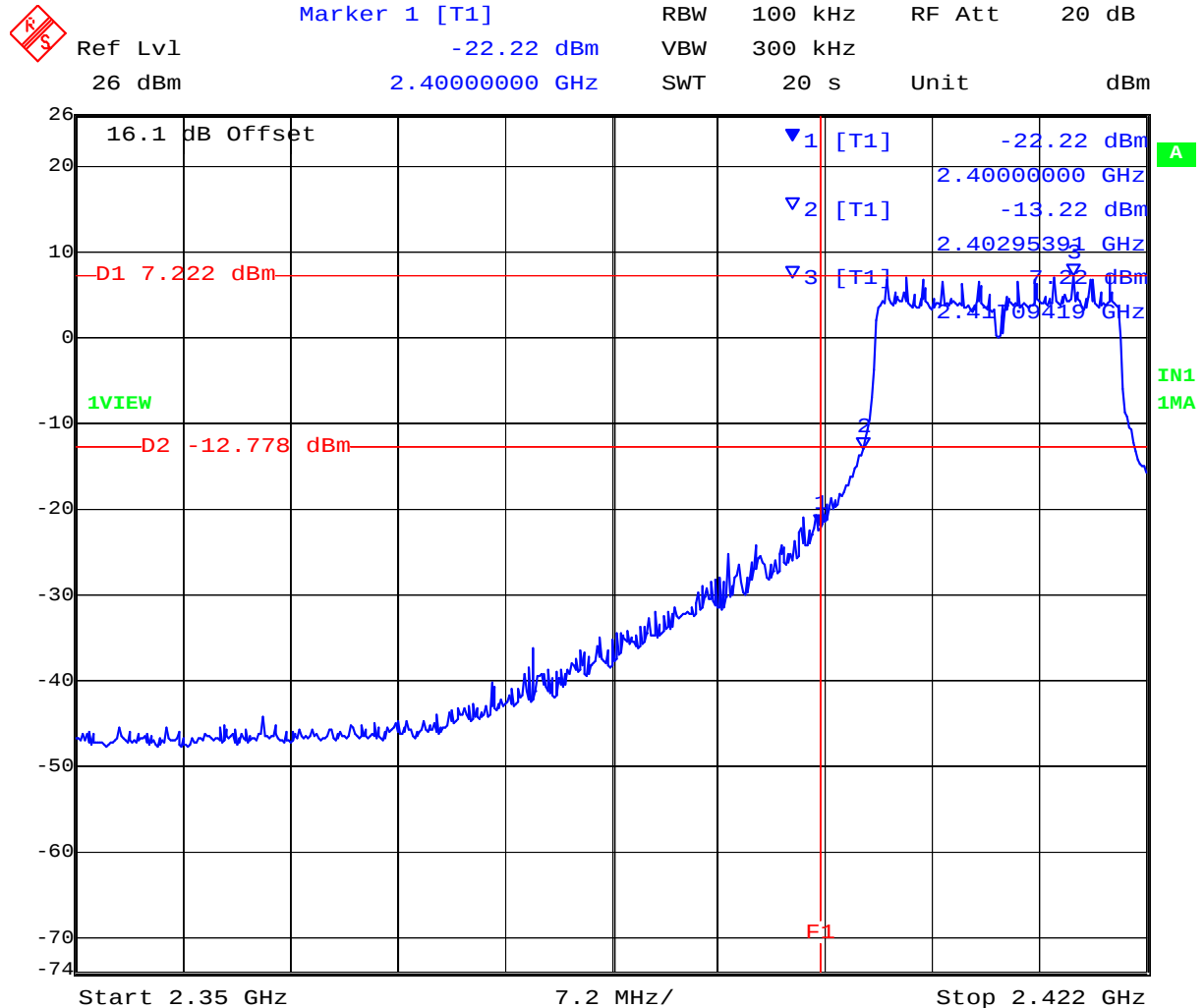
Date: 18.NOV.2011 12:14:12

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## CHAIN B

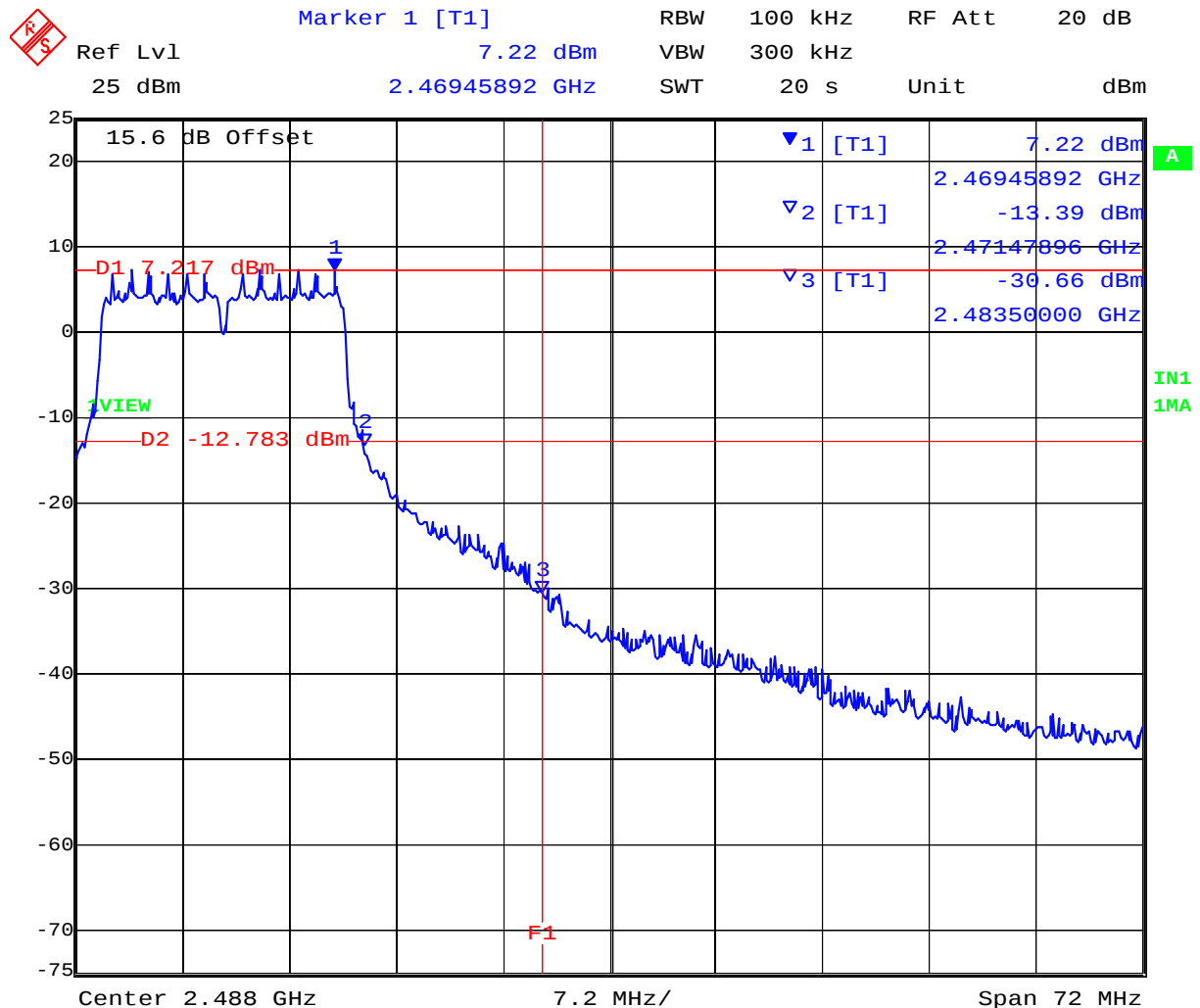


Date: 18.NOV.2011 12:15:30

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CHAIN A

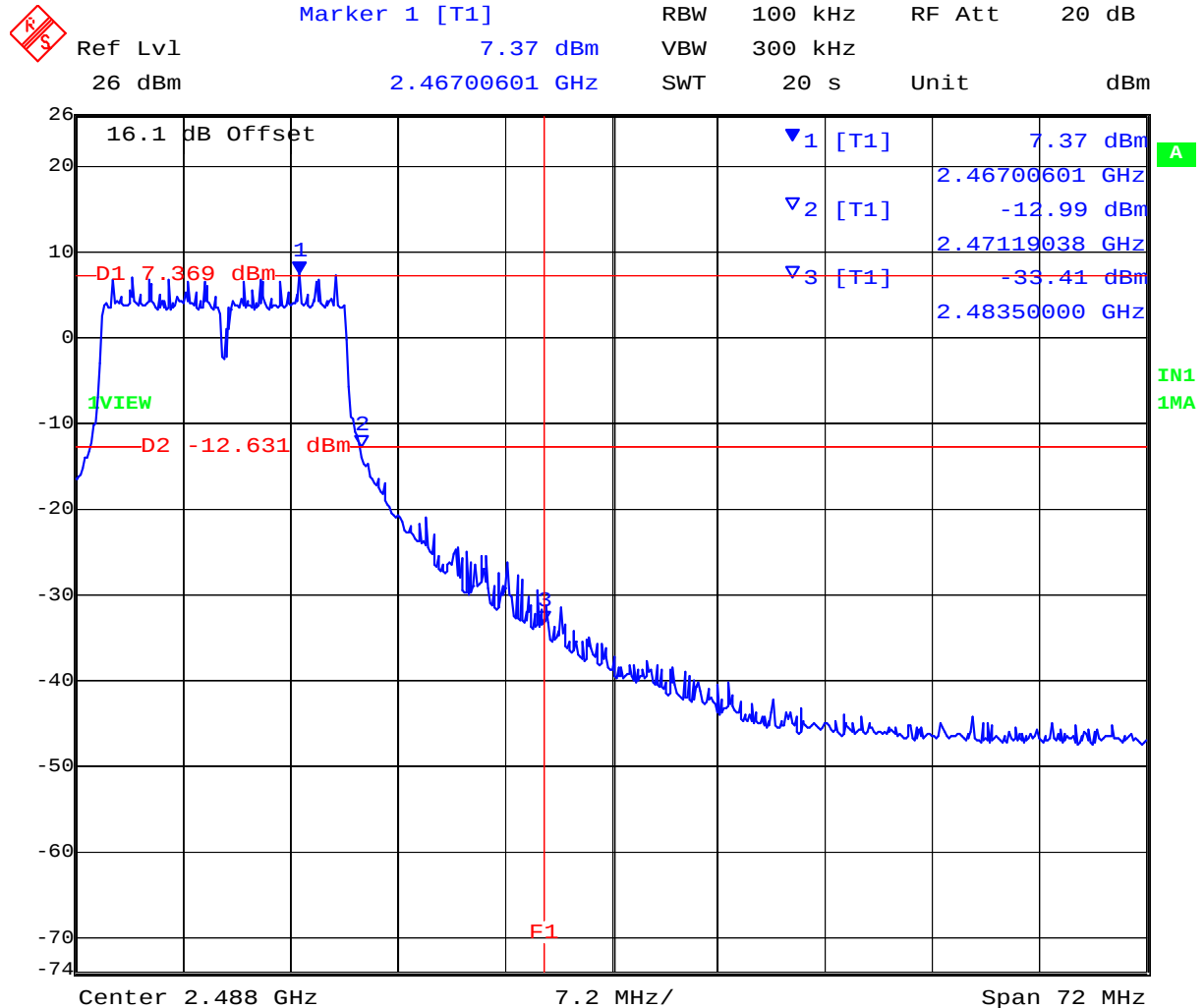


Date: 18.NOV.2011 14:06:04



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## CHAIN B



Date: 18.NOV.2011 14:07:25

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### 7.5.3 Measurement Results for 802.11n HT-20

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <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</b> | N/A dB        | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b>  | 55.00 Vdc     | <b>Antenna Ports (N):</b>  | 2   |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### Conducted Spurious Measurement

| Test Freq. | Start Freq. | Stop Freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-------------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz         | MHz        | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm |
| 2412.000   | 30.00       | 26000.00   | -43.89 | -12.68    | -42.32 | -15.95    |        |           |        |           |
| 2437.000   | 30.00       | 26000.00   | -43.43 | -12.10    | -42.79 | -12.74    |        |           |        |           |
| 2462.000   | 30.00       | 26000.00   | -43.16 | -13.67    | -42.78 | -15.55    |        |           |        |           |

SE: Maximum spurious emission found

#### Band-edge Measurement

| Test Freq. | Band-edge freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-----------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz             | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm |
| 2412.000   | 2400.00         | -18.74 | -12.35    | -20.97 | -12.71    |        |           |        |           |
| 2462.000   | 2483.50         | -29.80 | -12.74    | -32.69 | -12.77    |        |           |        |           |

BE: Maximum Band edge emission found

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

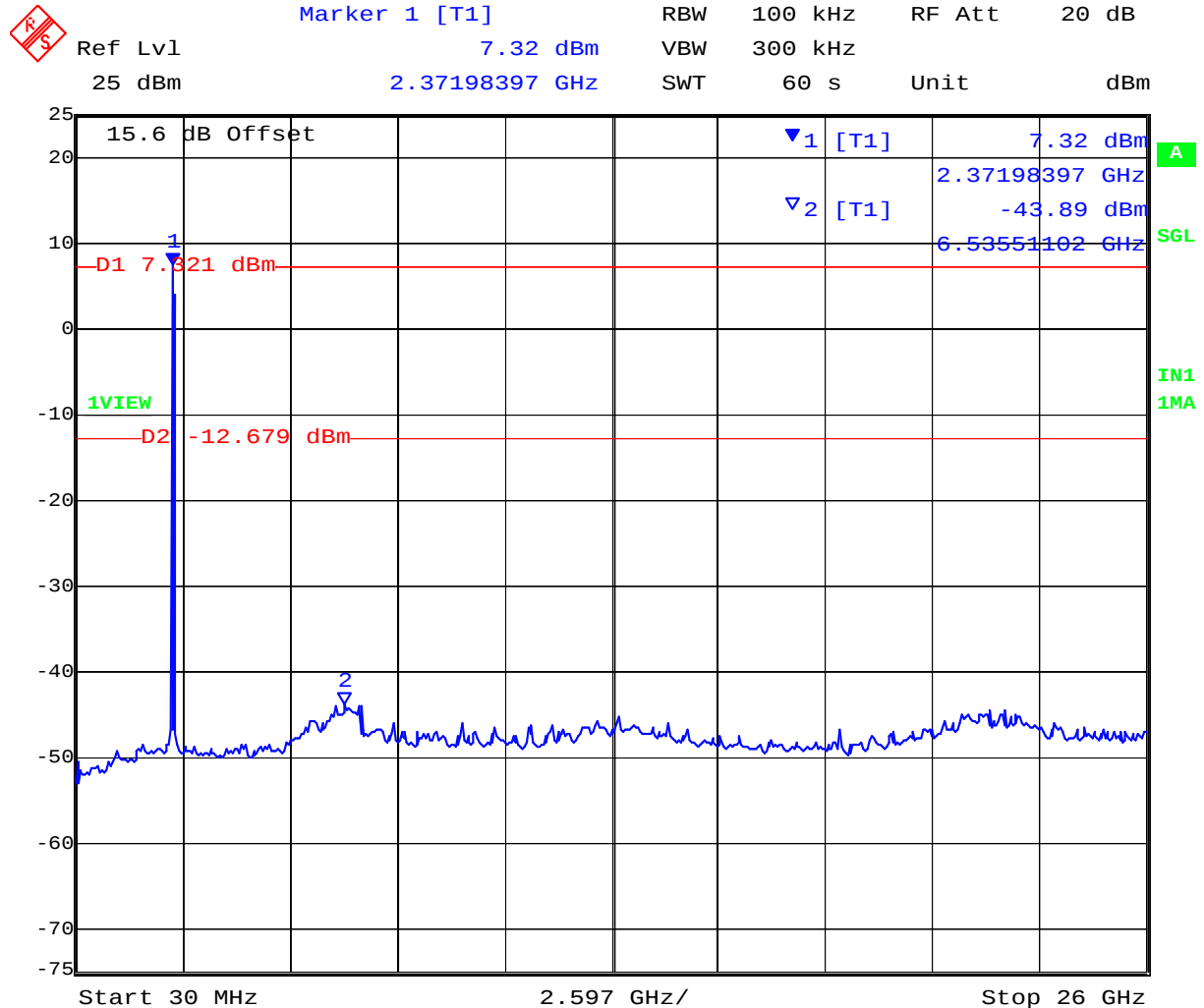
Note: Limit is based on 20dB down from fundamental emissions

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## CHAIN A



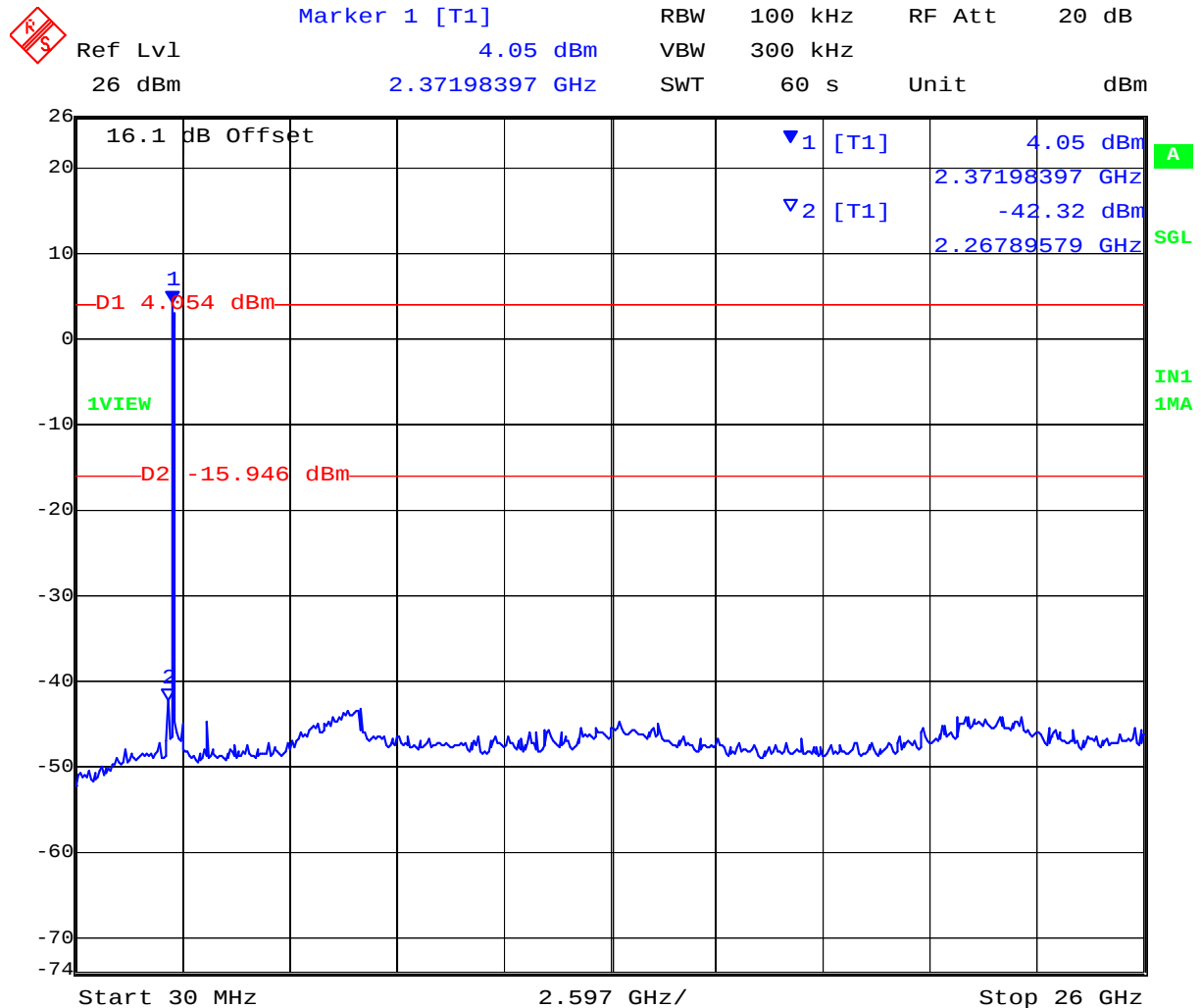
Date: 18.NOV.2011 15:09:28

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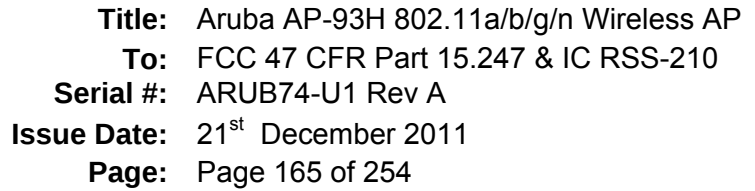
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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## CHAIN B



Date: 18.NOV.2011 15:11:11

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Ref Lvl 25 dBm

Marker 1 [T1] 7.90 dBm

RBW 100 kHz

VBW 300 kHz

RF Att 20 dB

SWT 60 s

Unit dBm

15.6 dB Offset

▼1 [T1] 7.90 dBm

▼2 [T1] -43.43 dBm

D1 7.898 dBm

D2 -12.102 dBm

1VIEW

IN1 1MA

Start 30 MHz

2.597 GHz/

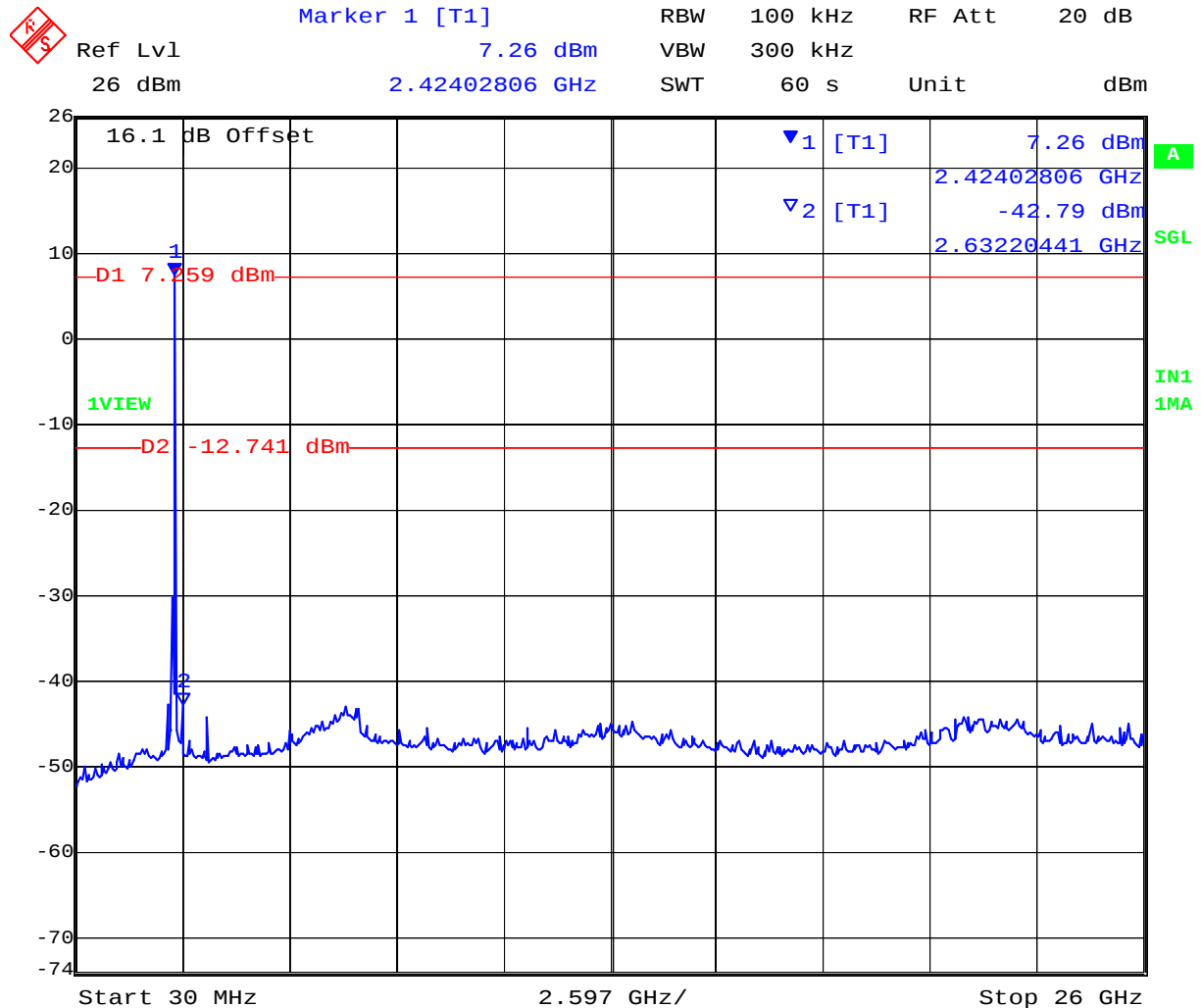
Stop 26 GHz

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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## CHAIN B



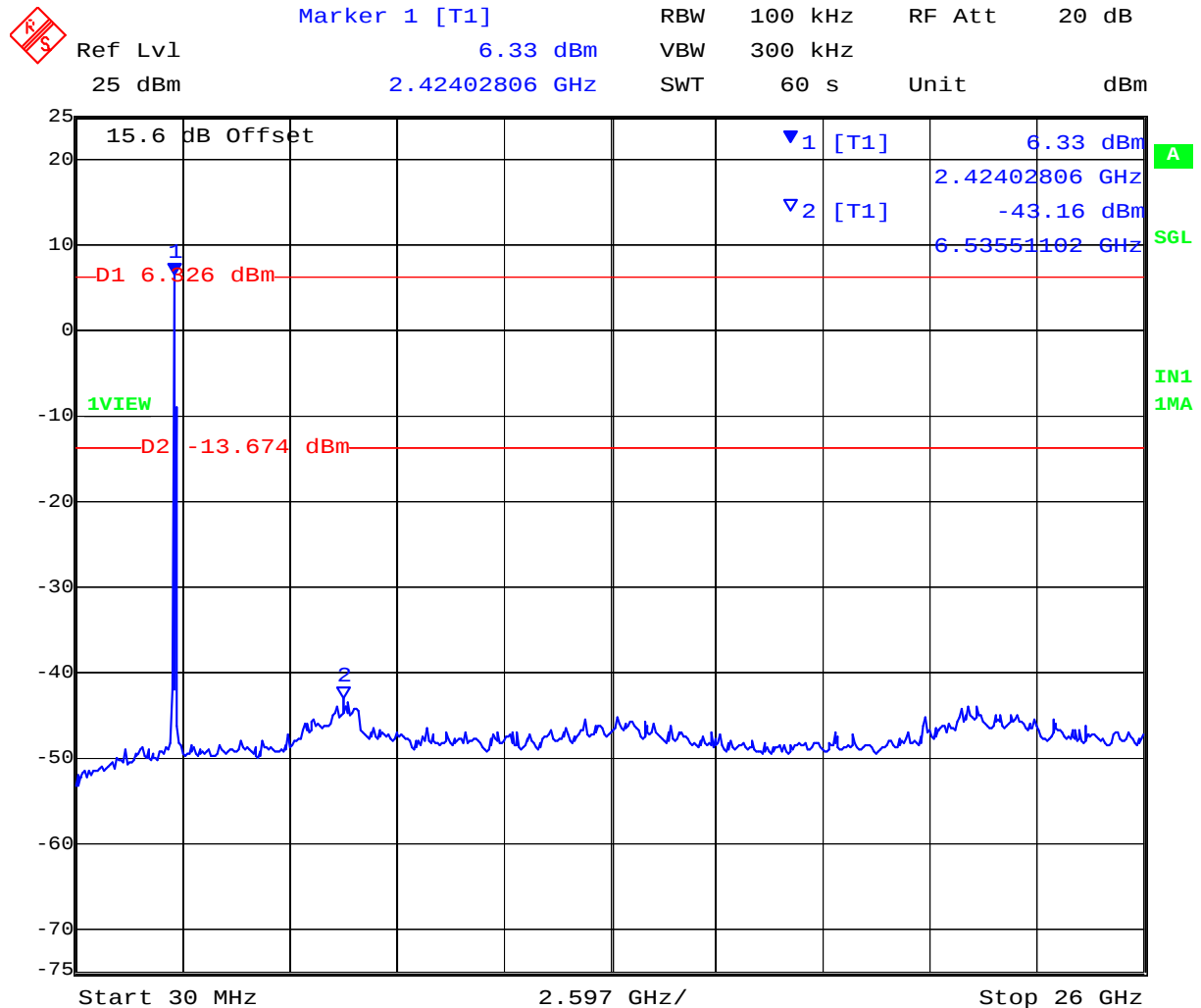
Date: 18.NOV.2011 15:30:54

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## CHAIN A



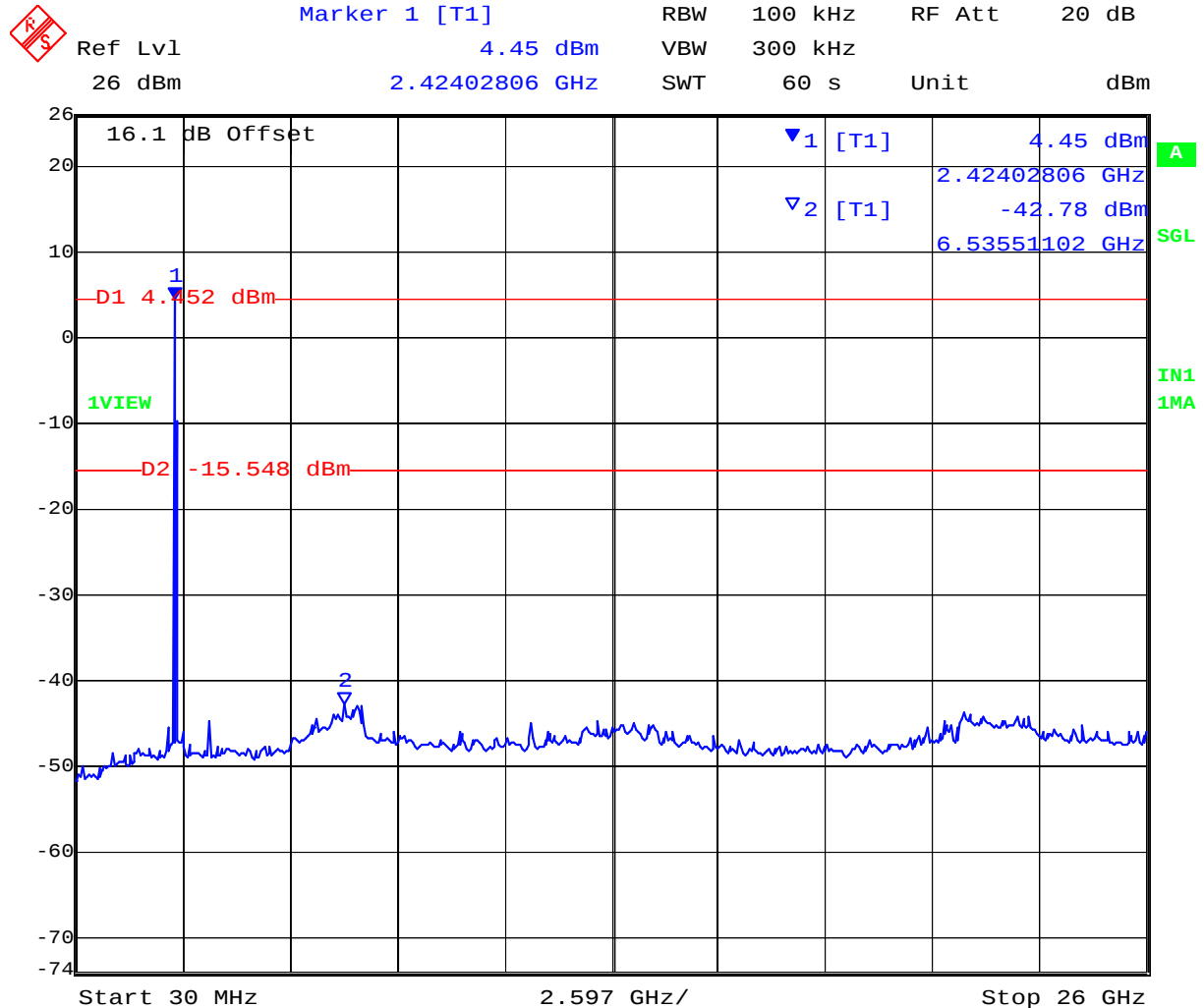
Date: 18.NOV.2011 15:51:40

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## CHAIN B



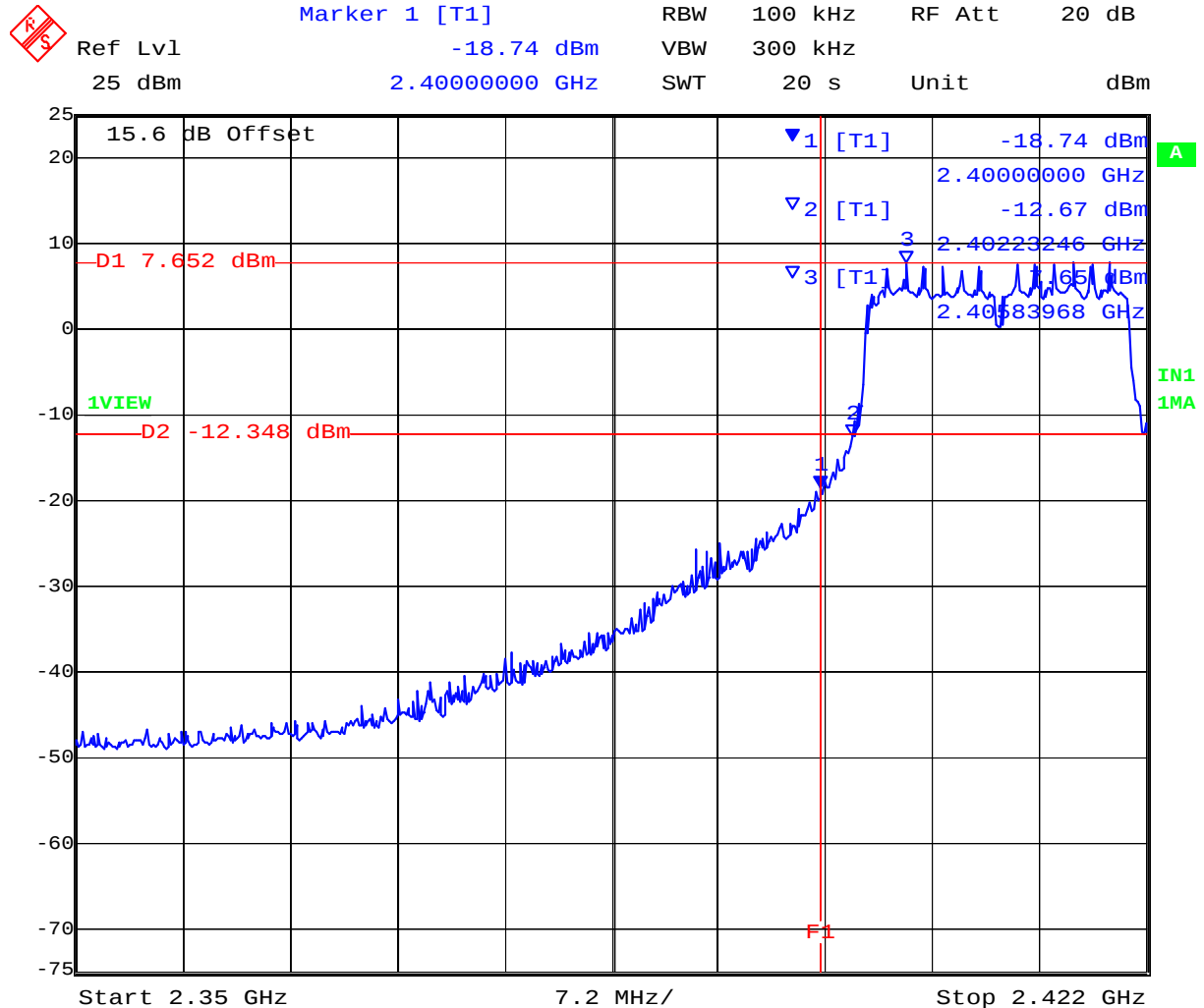
Date: 18.NOV.2011 15:53:26

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## CHAIN A



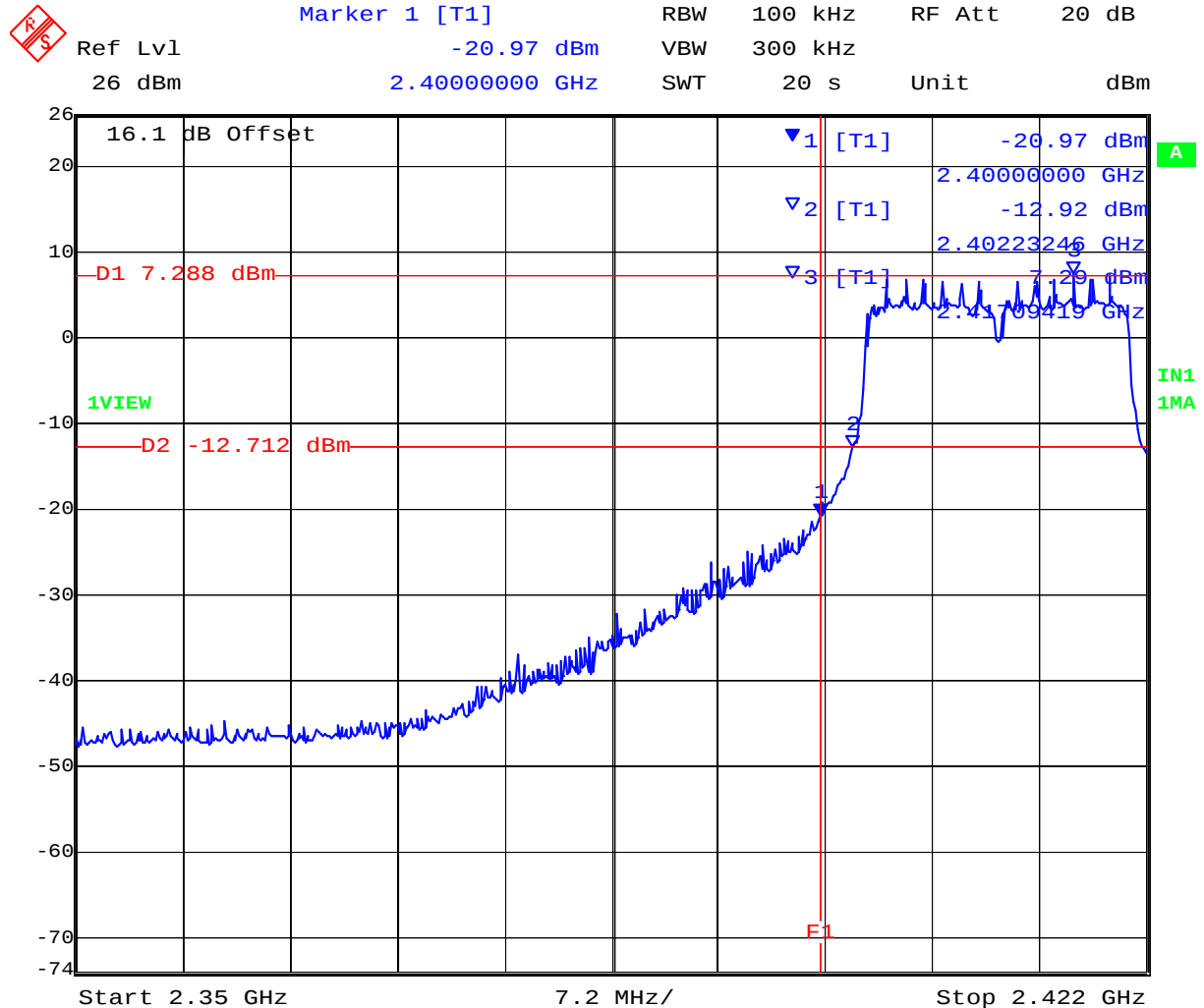
Date: 18.NOV.2011 14:52:48

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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## CHAIN B



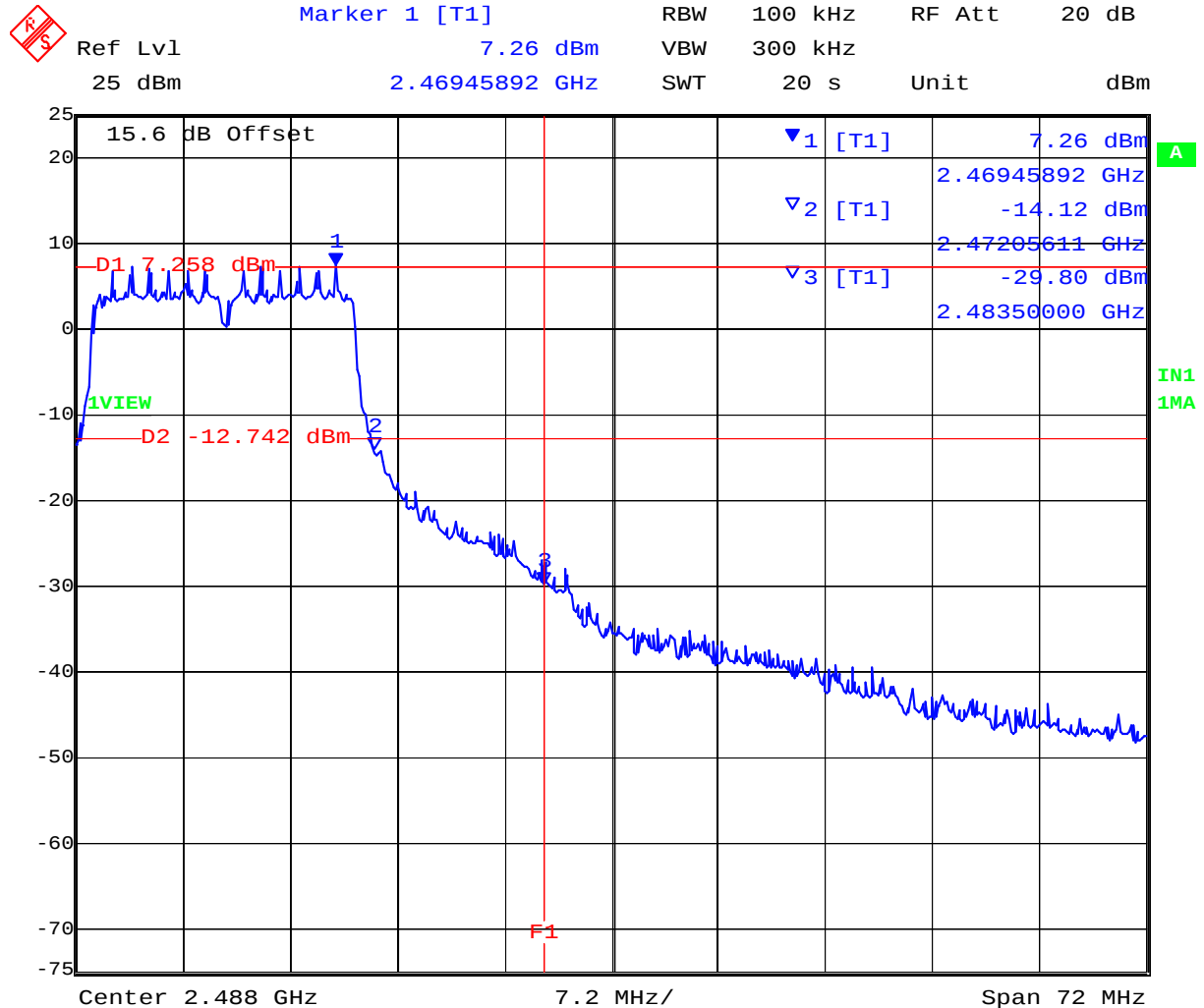
Date: 18.NOV.2011 14:54:07

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## CHAIN A



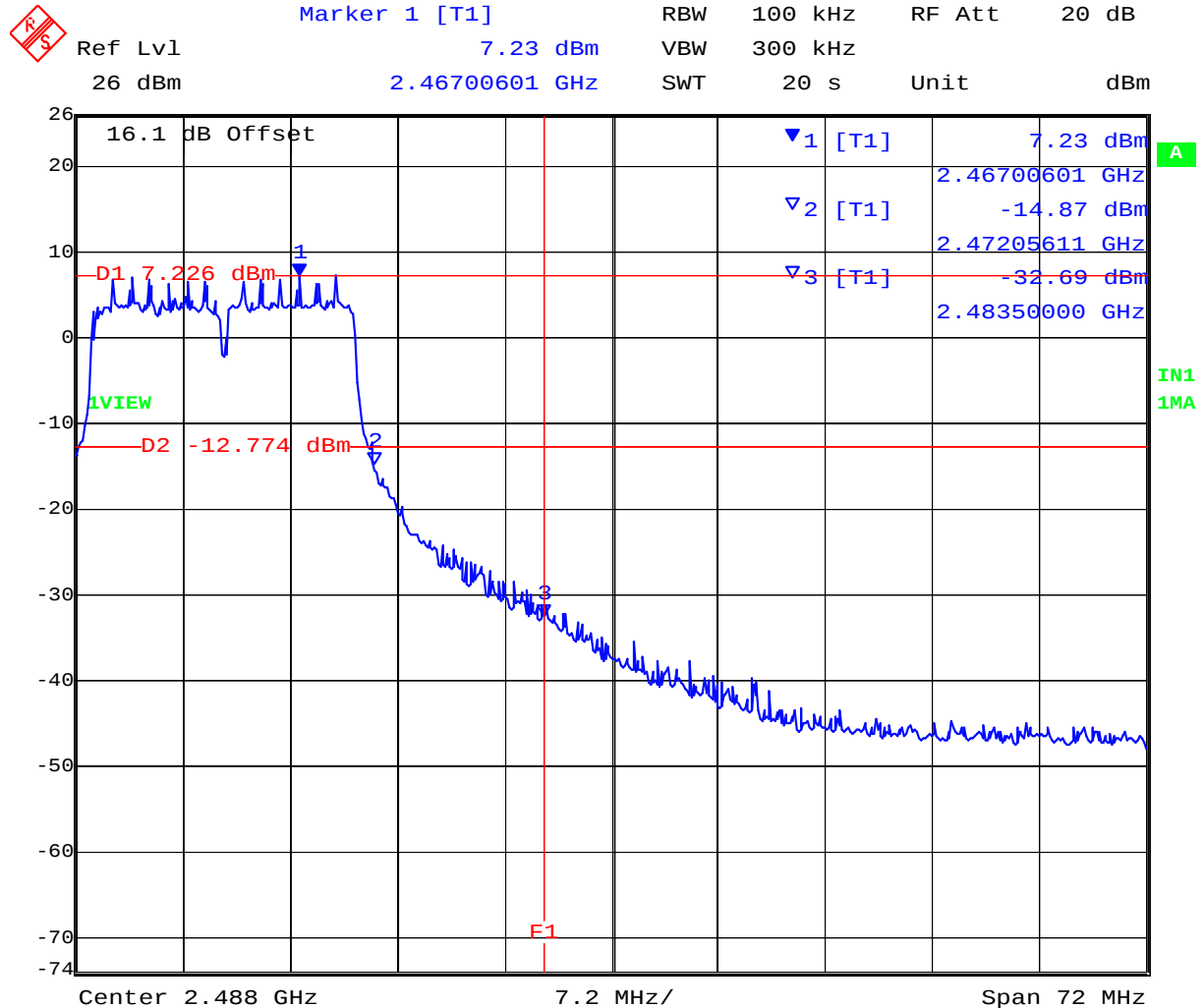
Date: 18.NOV.2011 15:34:53

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## CHAIN B



Date: 18.NOV.2011 15:36:14

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#### 7.5.4 Measurement Results for 802.11n HT-40

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <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</b> | N/A dB        | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b>  | 55.00 Vdc     | <b>Antenna Ports (N):</b>  | 2   |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### *Conducted Spurious Measurement*

| Test Freq. | Start Freq. | Stop Freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-------------|------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz         | MHz        | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm | SE dBm | Limit dBm |
| 2422.000   | 30.00       | 26000.00   | -43.28 | -17.62    | -43.30 | -18.36    |        |           |        |           |
| 2437.000   | 30.00       | 26000.00   | -43.52 | -17.03    | -43.30 | -17.86    |        |           |        |           |
| 2452.000   | 30.00       | 26000.00   | -43.54 | -17.96    | -43.49 | -15.23    |        |           |        |           |

SE: Maximum spurious emission found

#### *Band-edge Measurement*

| Test Freq. | Band-edge freq. | Port A |           | Port B |           | Port C |           | Port D |           |
|------------|-----------------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
| MHz        | MHz             | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm | BE dBm | Limit dBm |
| 2422.000   | 2400.00         | -21.71 | -14.75    | -23.76 | -14.93    |        |           |        |           |
| 2452.000   | 2483.50         | -24.45 | -15.33    | -26.38 | -15.17    |        |           |        |           |

BE: Maximum Band edge emission found

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

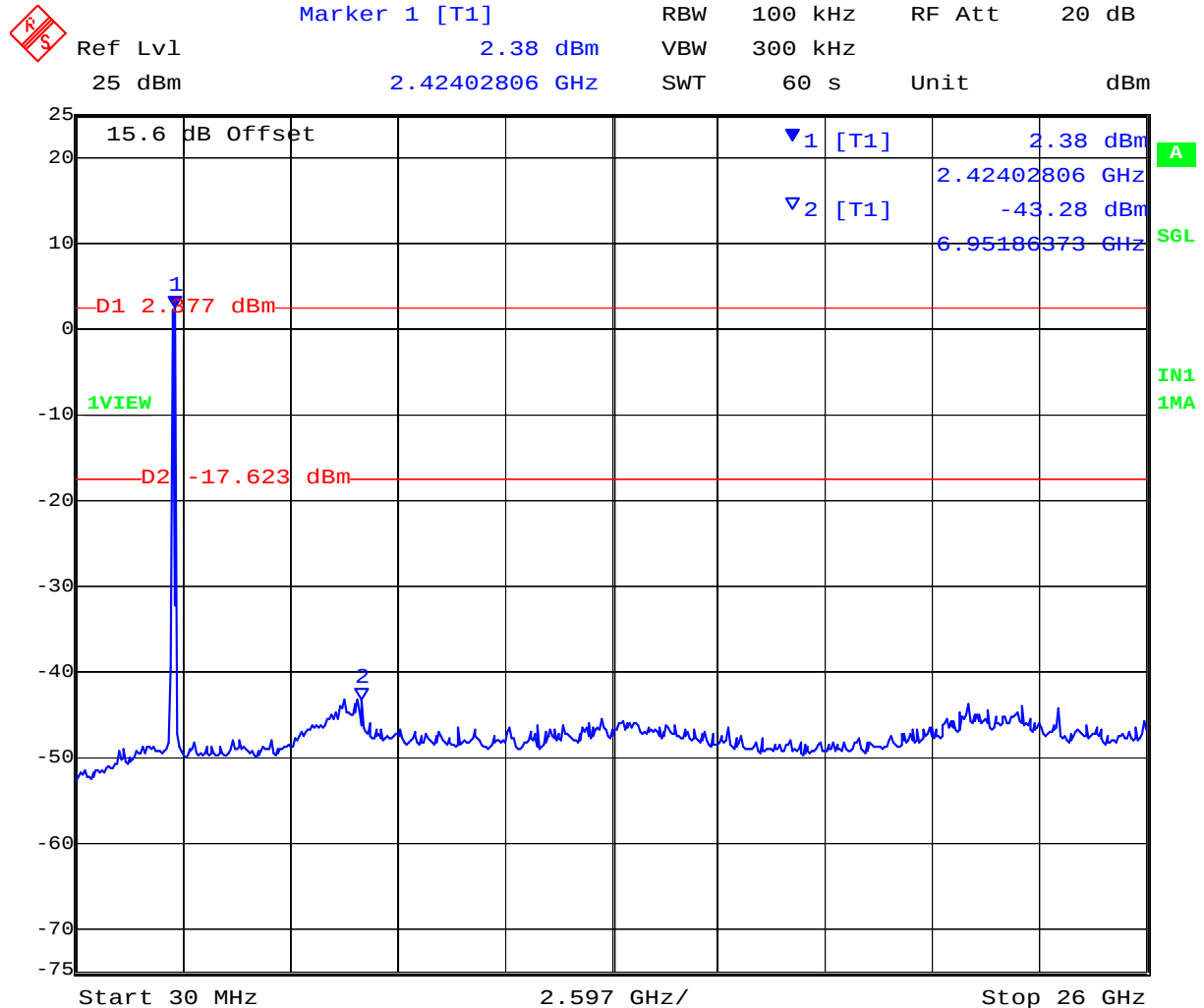
Note: Limit is based on 20dB down from fundamental emissions

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To: FCC 47 CFR Part 15.247 & IC RSS-210  
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Issue Date: 21<sup>st</sup> December 2011  
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## CHAIN A



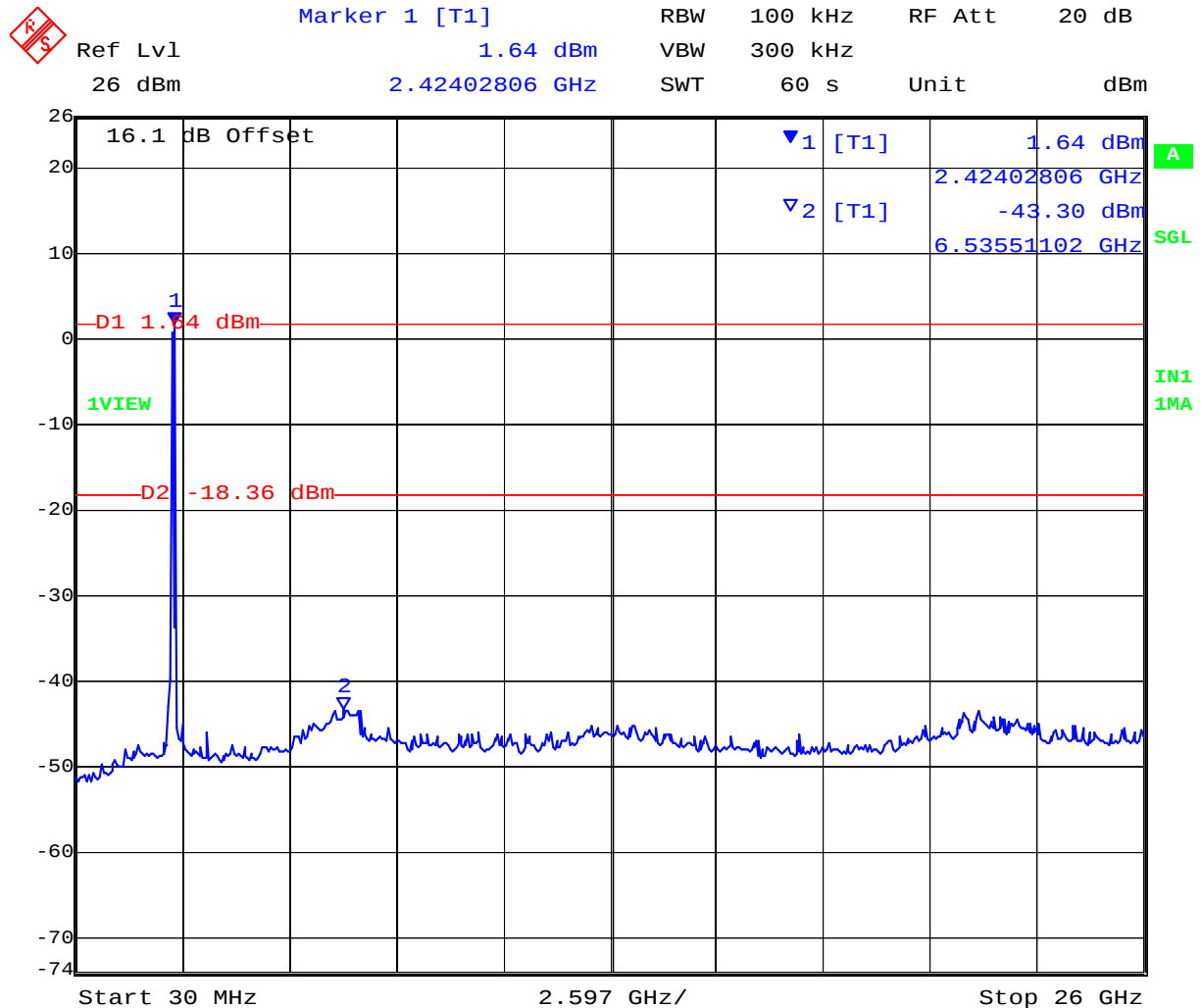
Date: 18.NOV.2011 16:17:48

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## CHAIN B



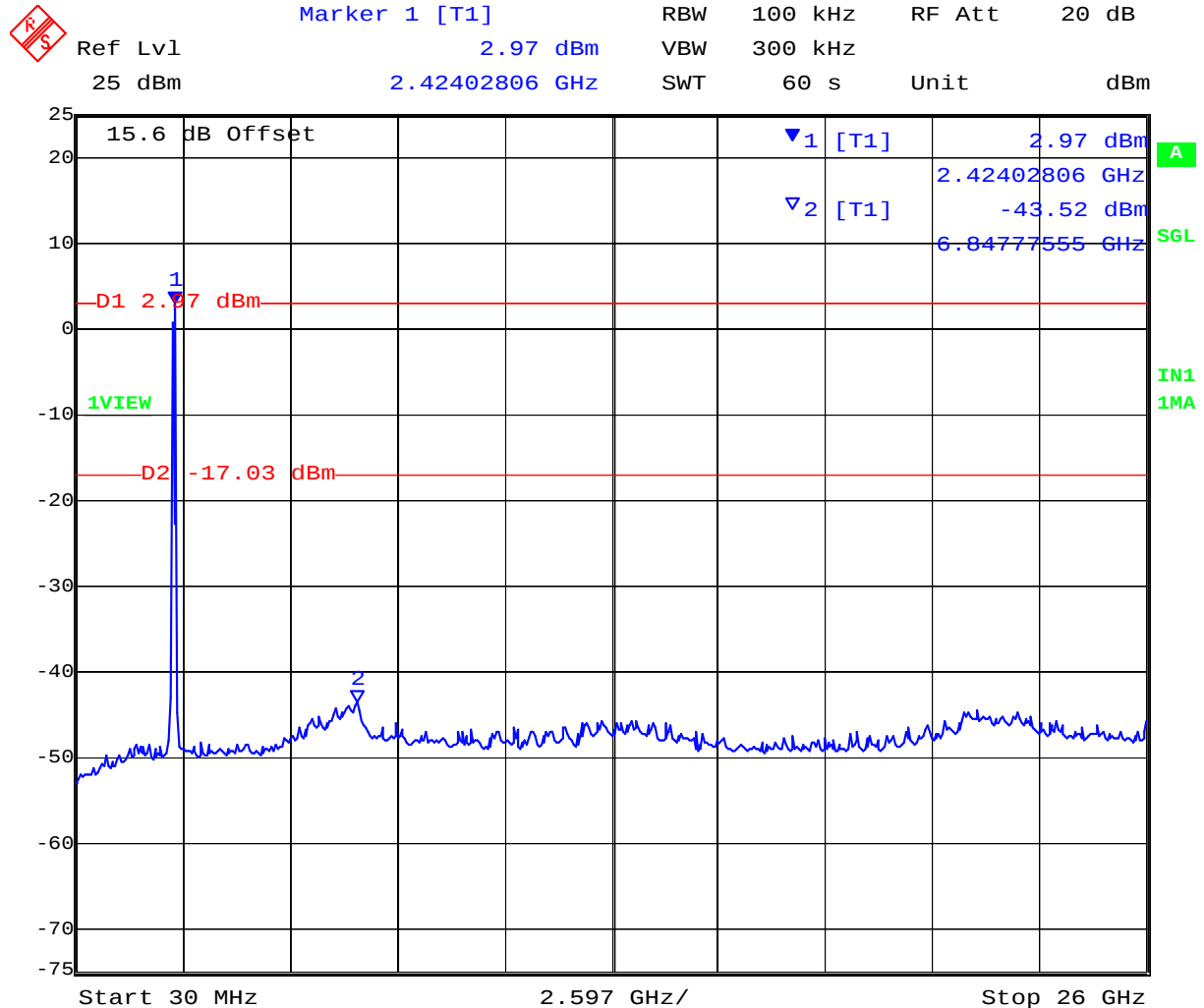
Date: 18.NOV.2011 16:19:31

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## CHAIN A



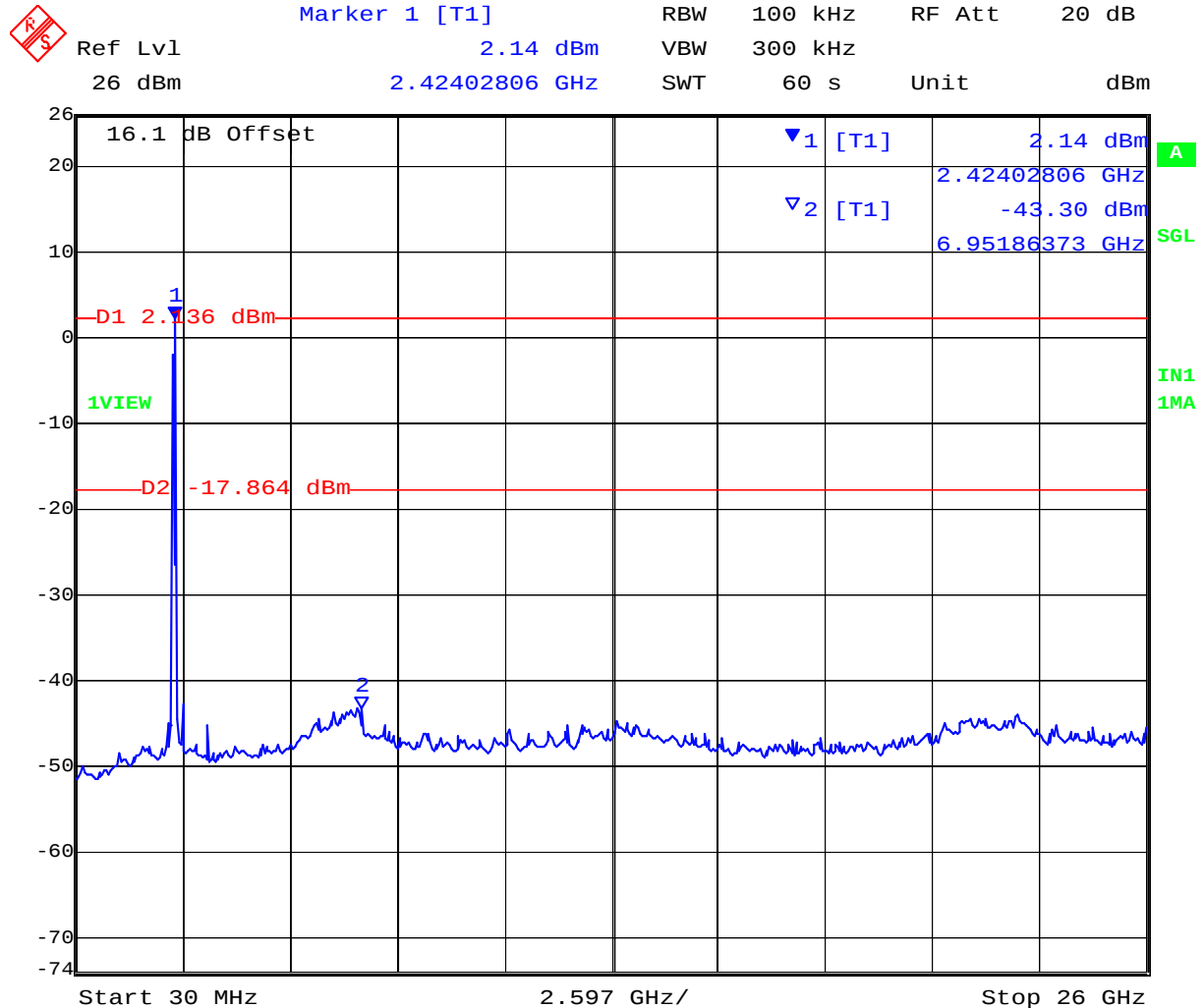
Date: 18.NOV.2011 16:41:04

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## CHAIN B



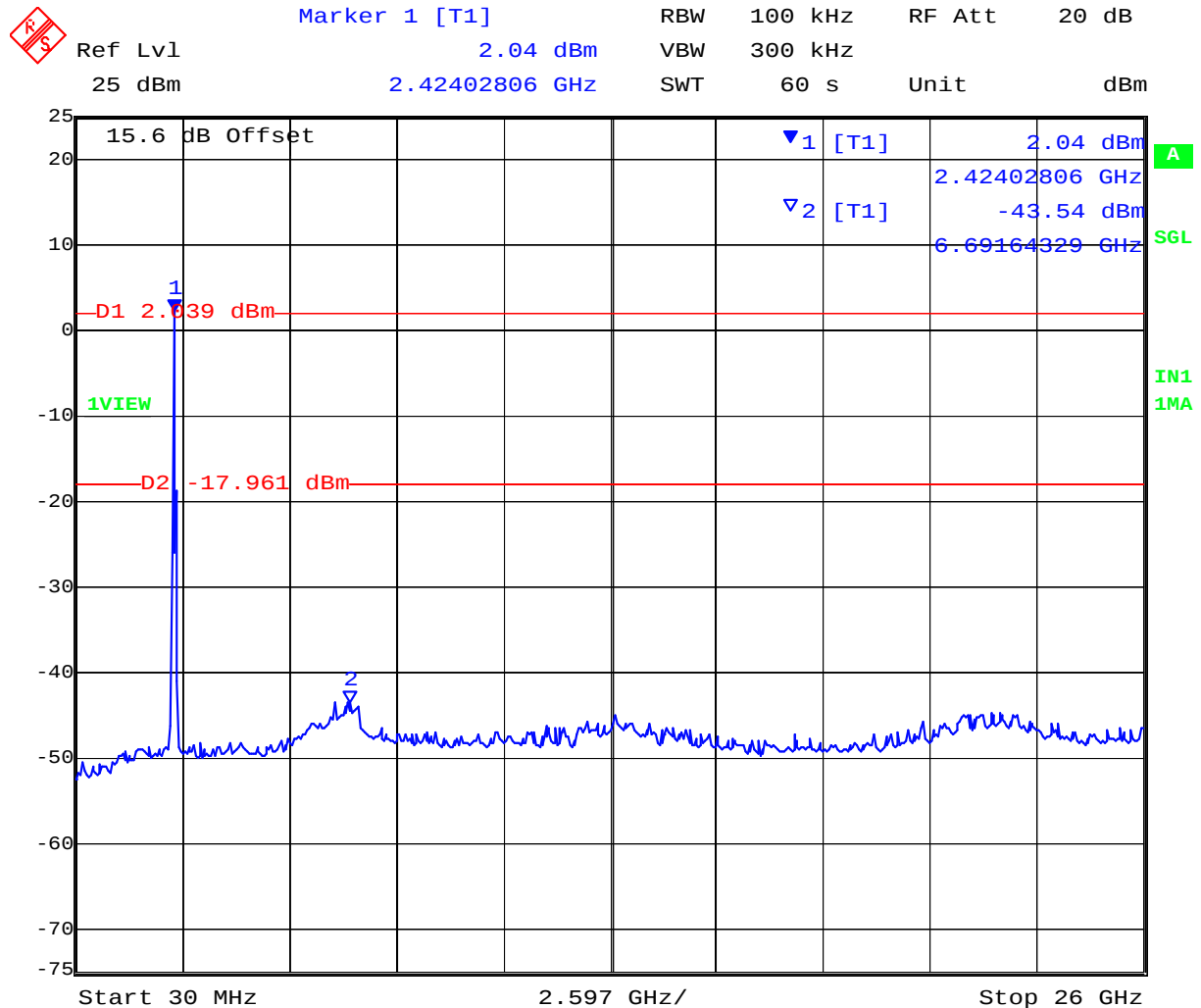
Date: 18.NOV.2011 16:42:48

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## CHAIN A



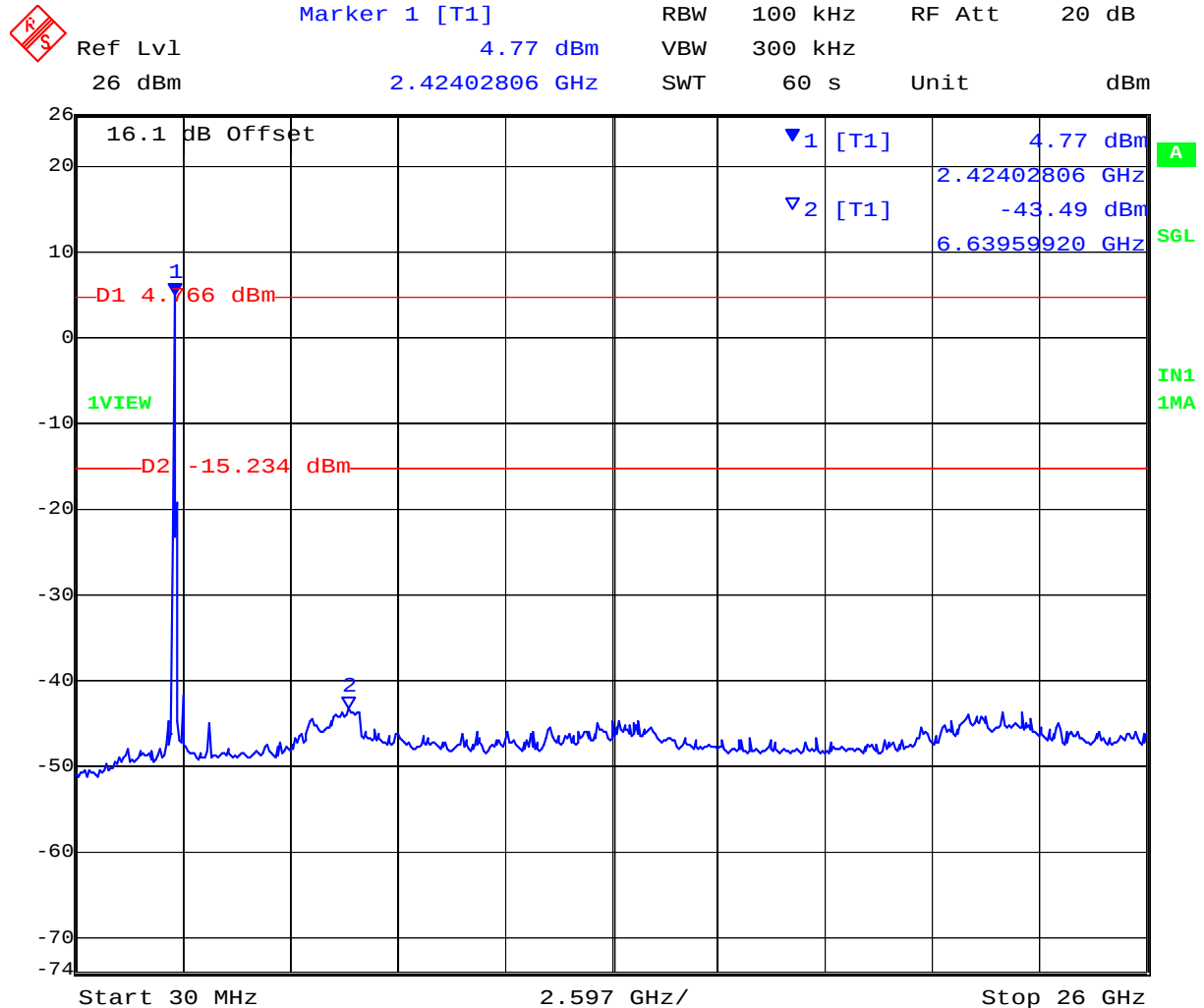
Date: 18.NOV.2011 17:10:45

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## CHAIN B



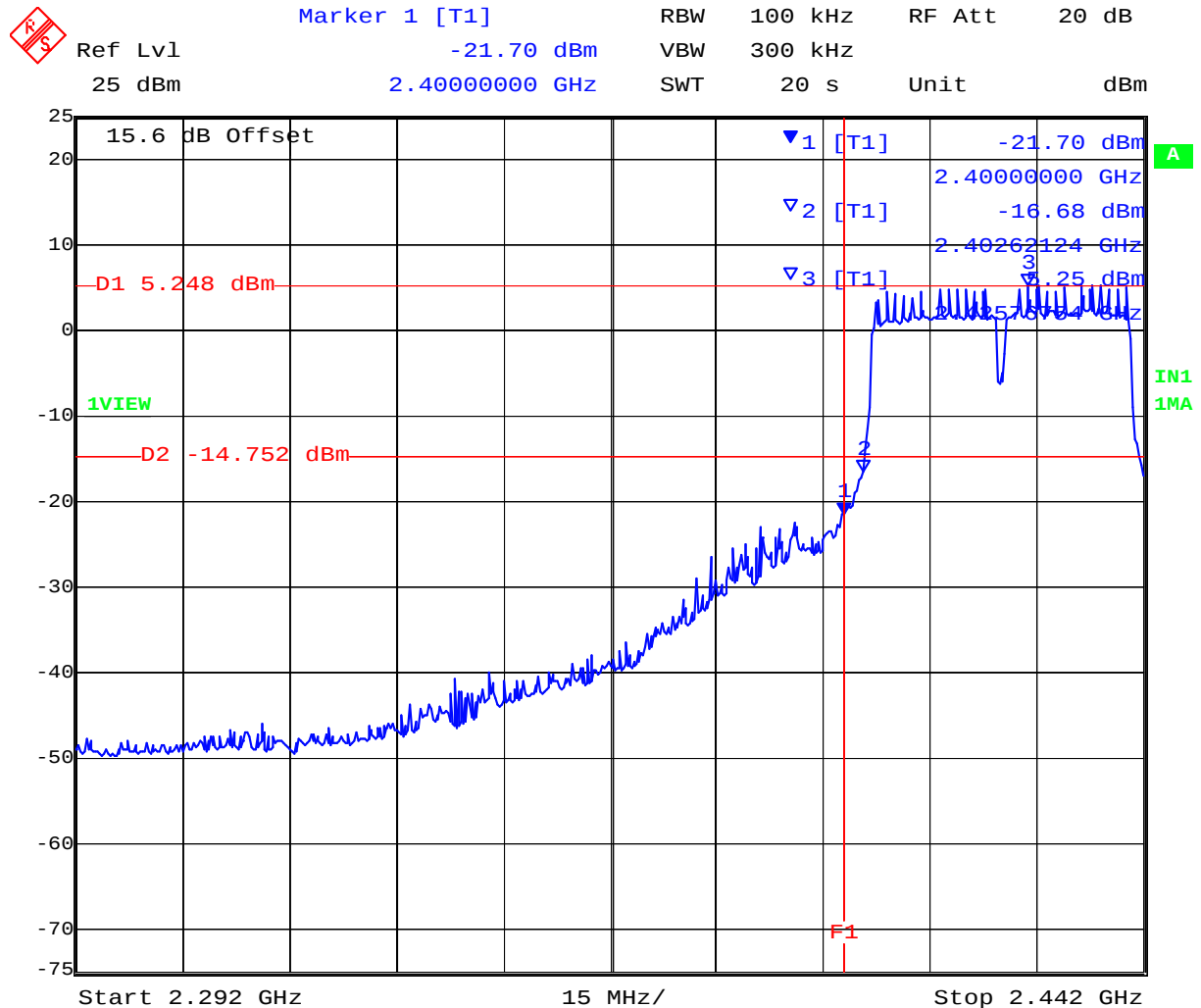
Date: 18.NOV.2011 17:12:29

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## CHAIN A



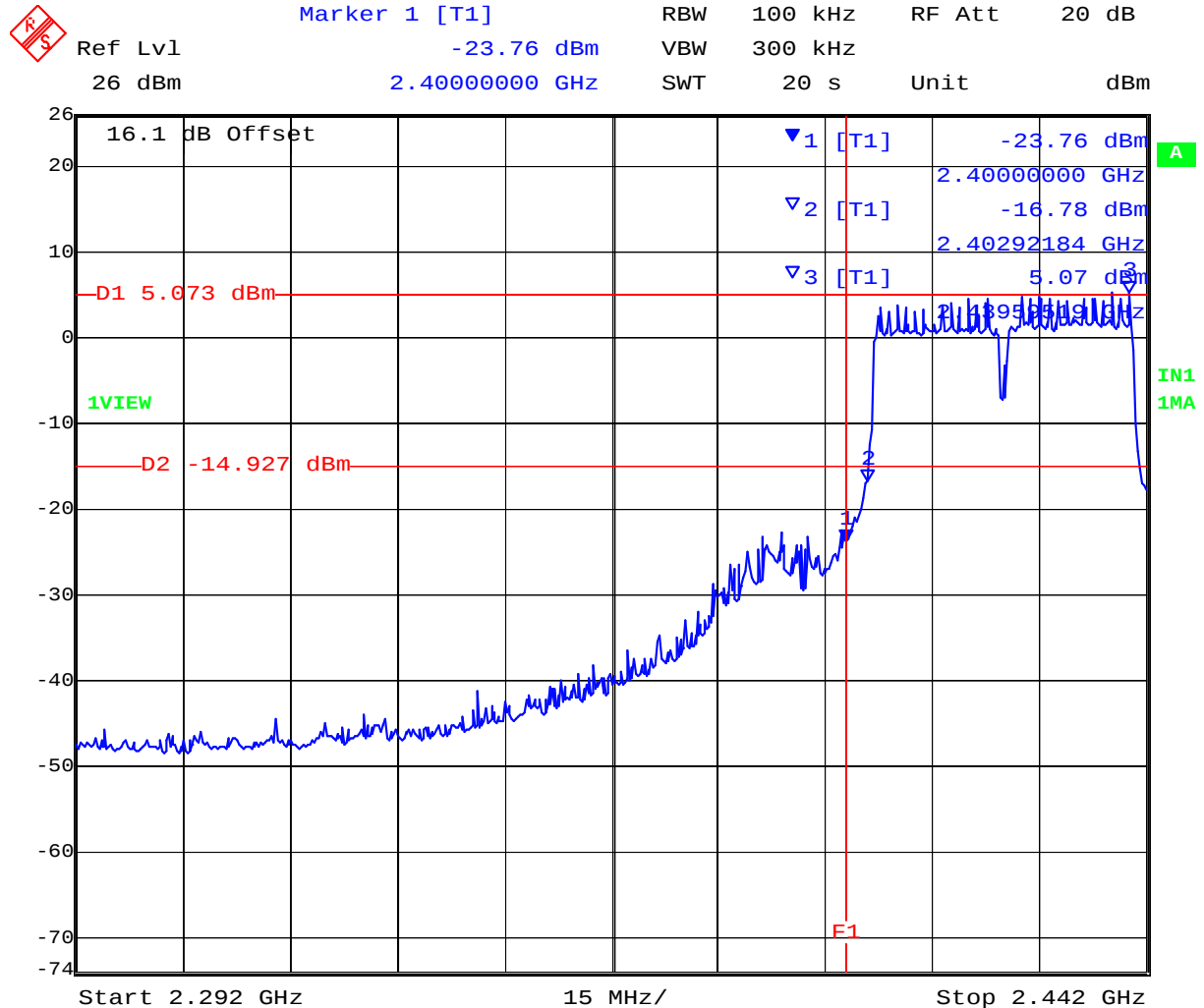
Date: 18.NOV.2011 16:01:10

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## CHAIN B



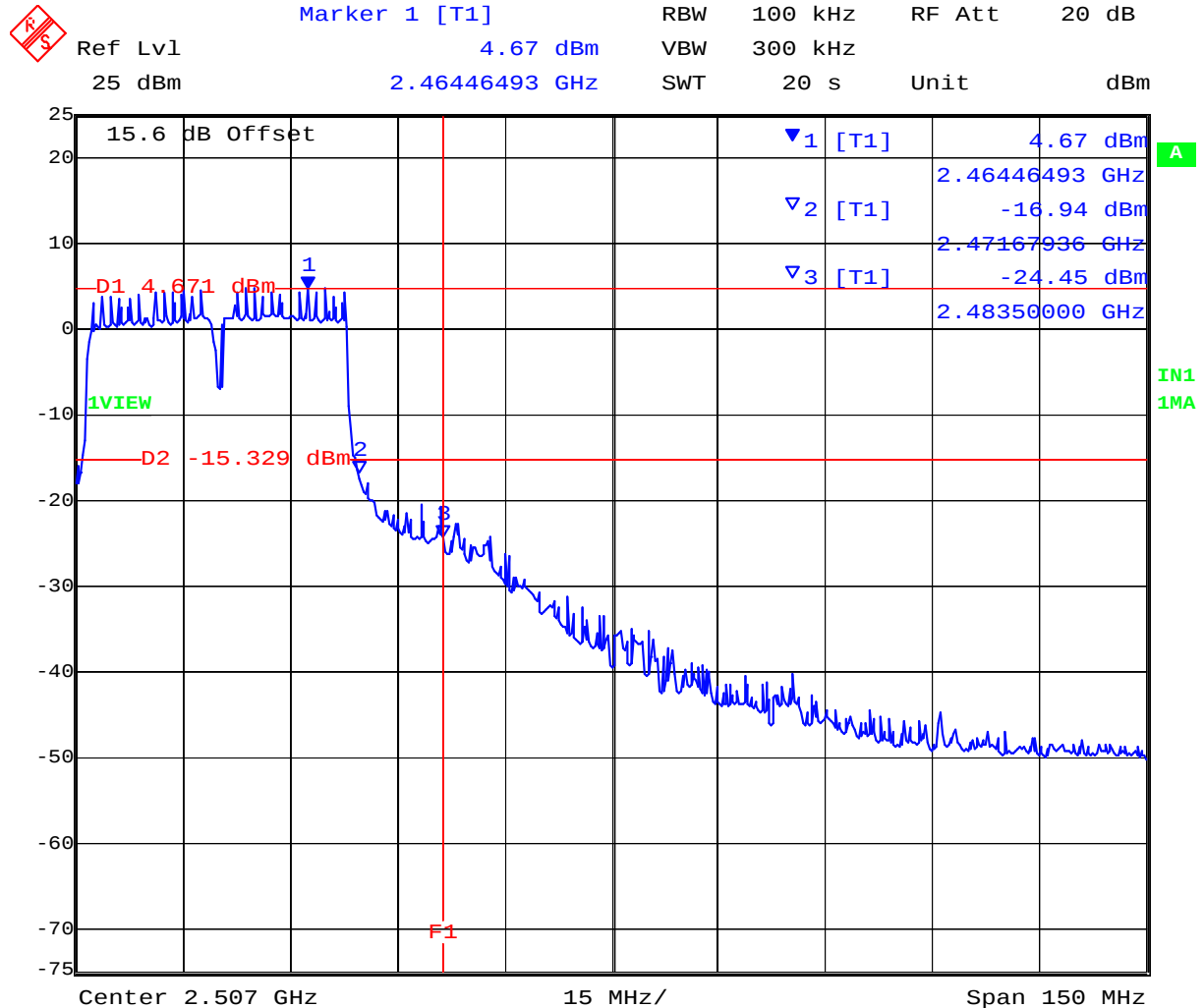
Date: 18.NOV.2011 16:02:27

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## CHAIN A



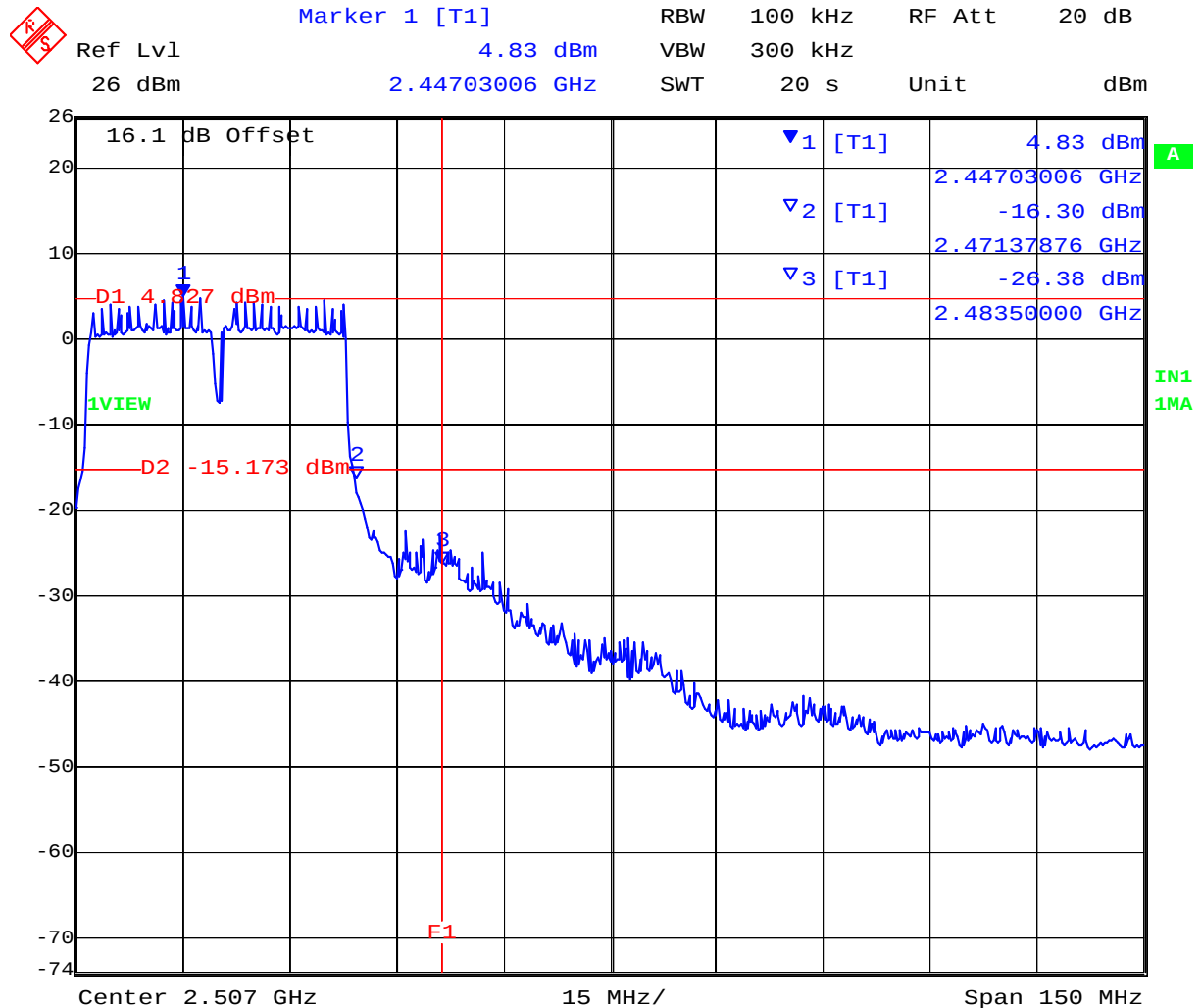
Date: 18.NOV.2011 16:53:59

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## CHAIN B



Date: 18.NOV.2011 16:55:19

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### 7.5.5 Measurement results for 802.11a

|                         |               |                            |     |    |      |
|-------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b> | 15.247 (a)(2) | <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</b>     | N/A           | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b> | 12.00         |                            |     |    | Vdc  |
| <b>Notes 1:</b>         |               |                            |     |    |      |
| <b>Notes 2:</b>         |               |                            |     |    |      |

#### *Conducted Spurious Measurement*

| Test Frequency | Start Frequency | Stop Frequency | Maximum Observed Emission | Limit (20 dB below peak of fundamental) |
|----------------|-----------------|----------------|---------------------------|-----------------------------------------|
| MHz            | MHz             | MHz            | dBm                       | dBm                                     |
| 5745           | 30.00           | 40000.00       | -40.22                    | -12.00                                  |
| 5785           | 30.00           | 40000.00       | -39.57                    | -13.55                                  |
| 5825           | 30.00           | 40000.00       | -39.87                    | -11.78                                  |

#### *Band-edge Measurement*

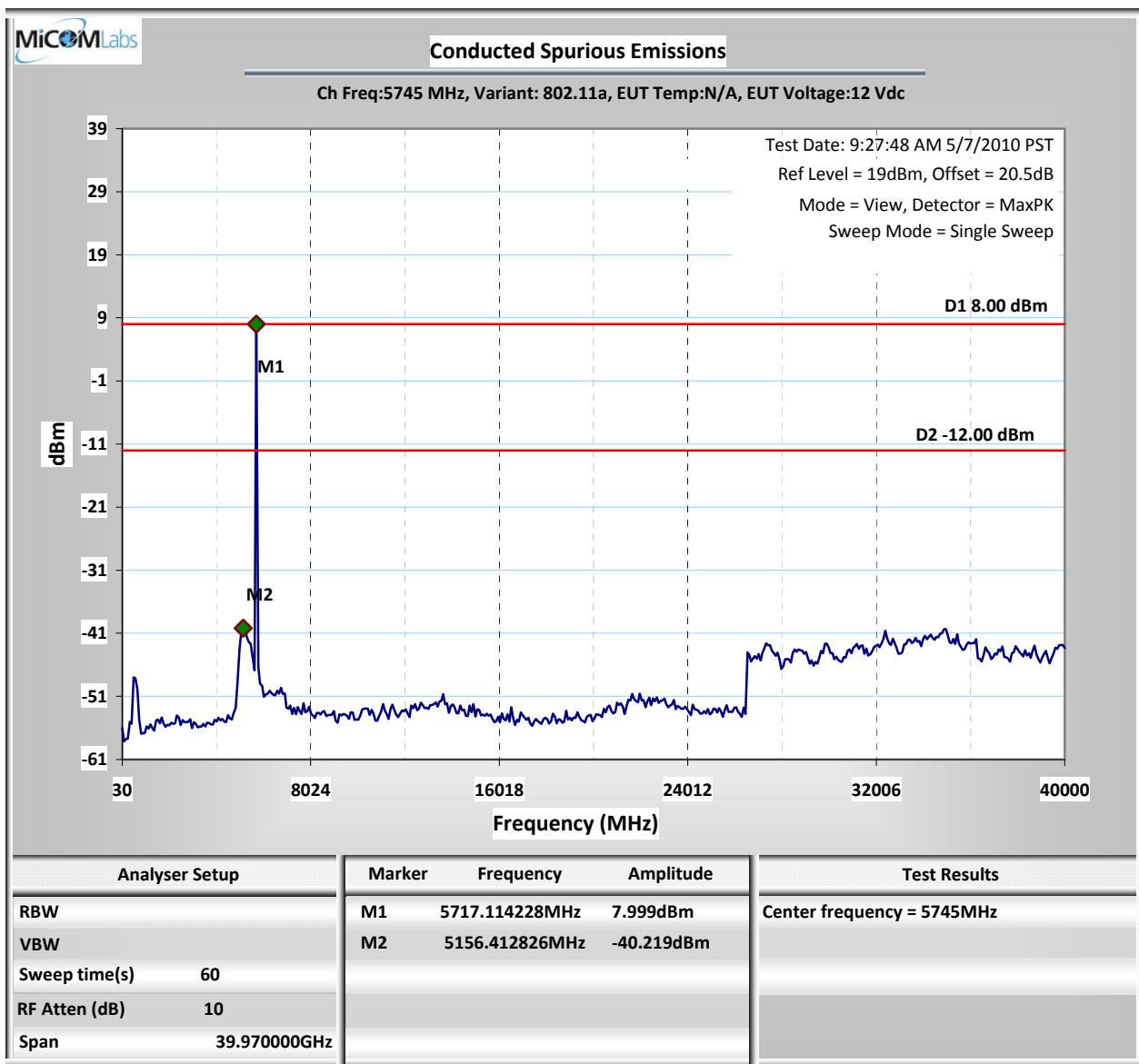
| Test Frequency | Band-edge Frequency | Emission Amplitude @ Band-edge | Limit (20 dB below peak of fundamental) | Margin |
|----------------|---------------------|--------------------------------|-----------------------------------------|--------|
| MHz            | MHz                 | dBm                            | dBm                                     | dB     |
| 5745.00        | 5725.00             | -25.51                         | -8.86                                   | -16.65 |
| 5825.00        | 5850.00             | -37.18                         | -10.35                                  | -26.84 |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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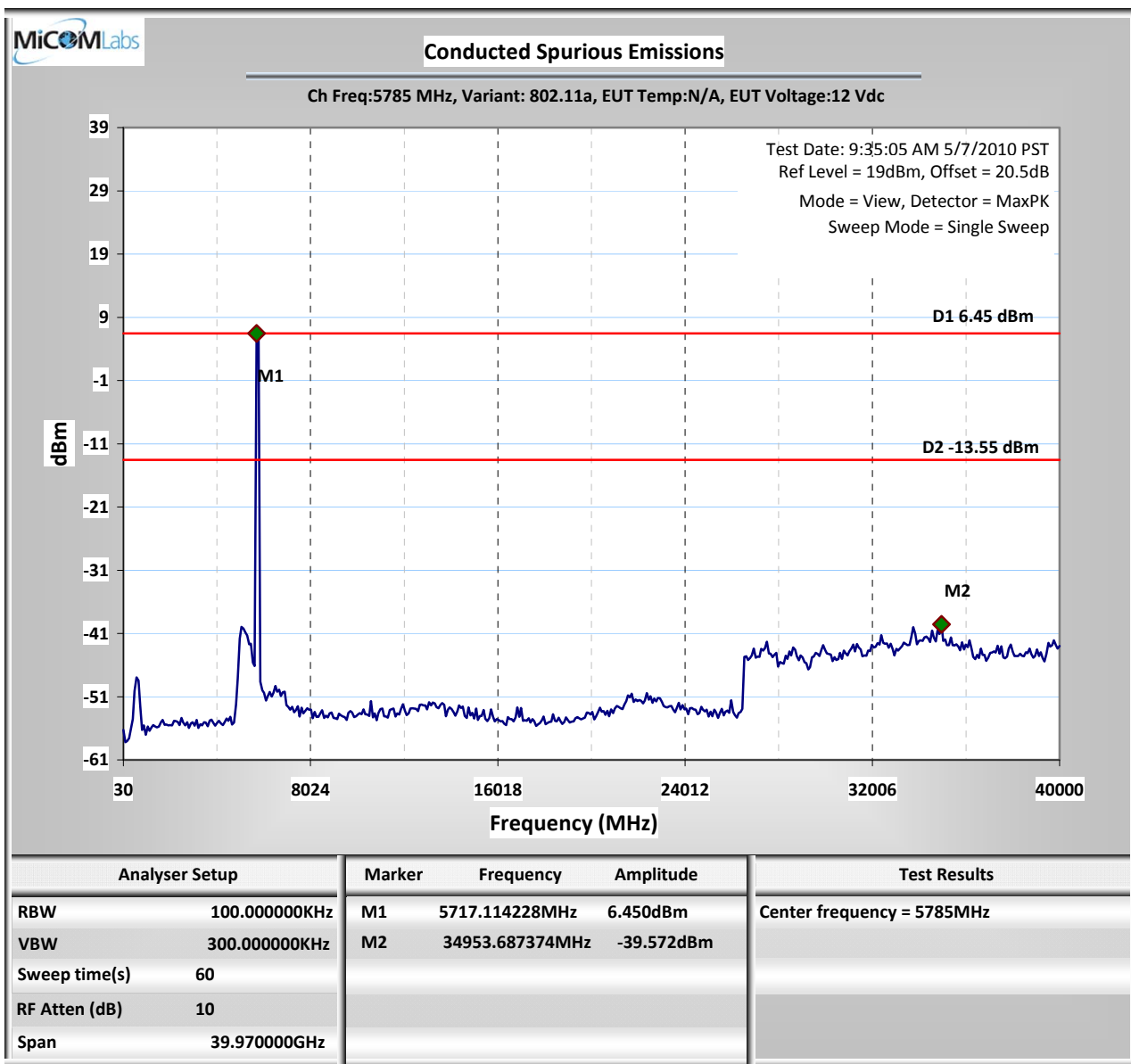
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** ARUB74-U1 Rev A  
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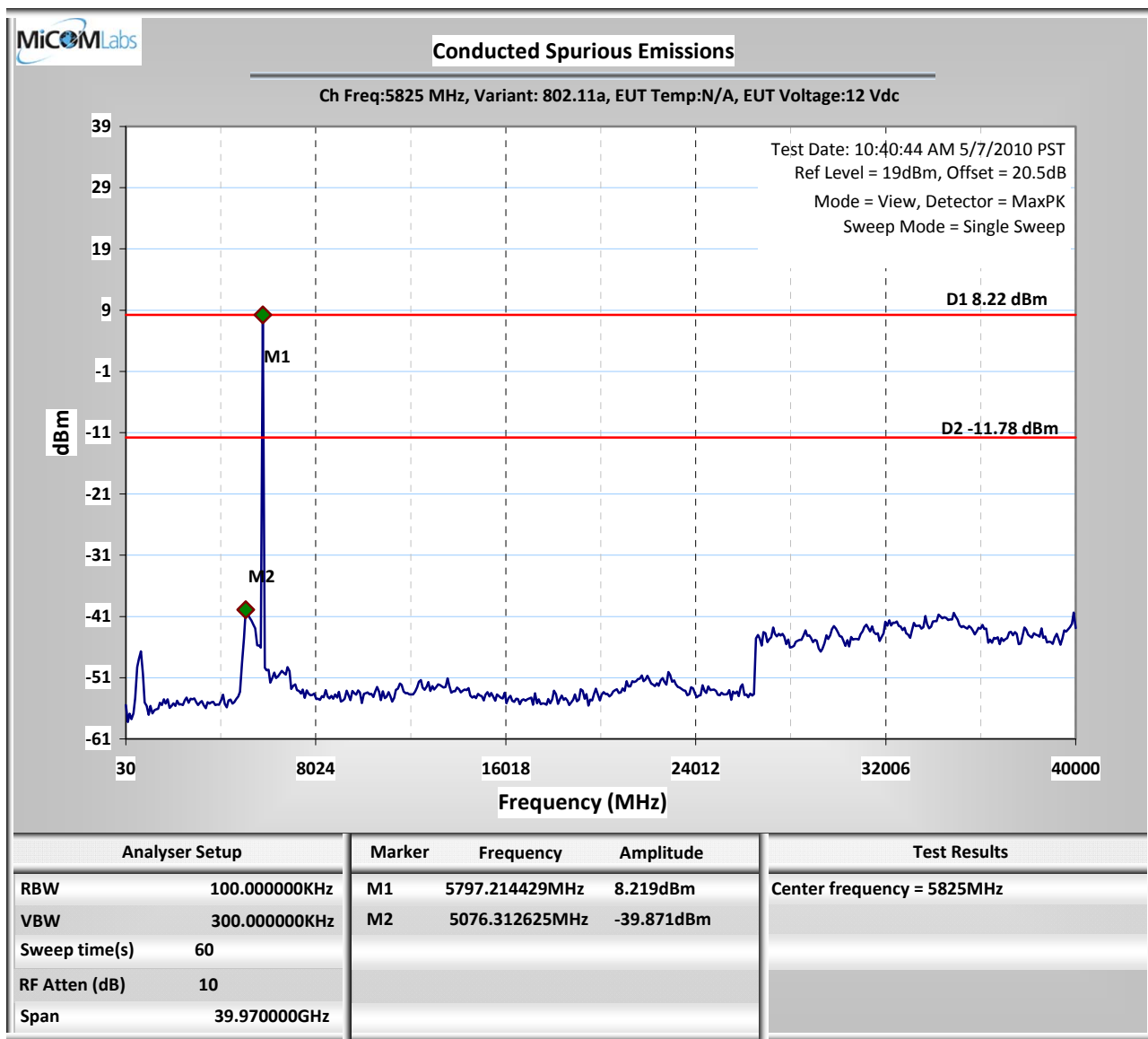
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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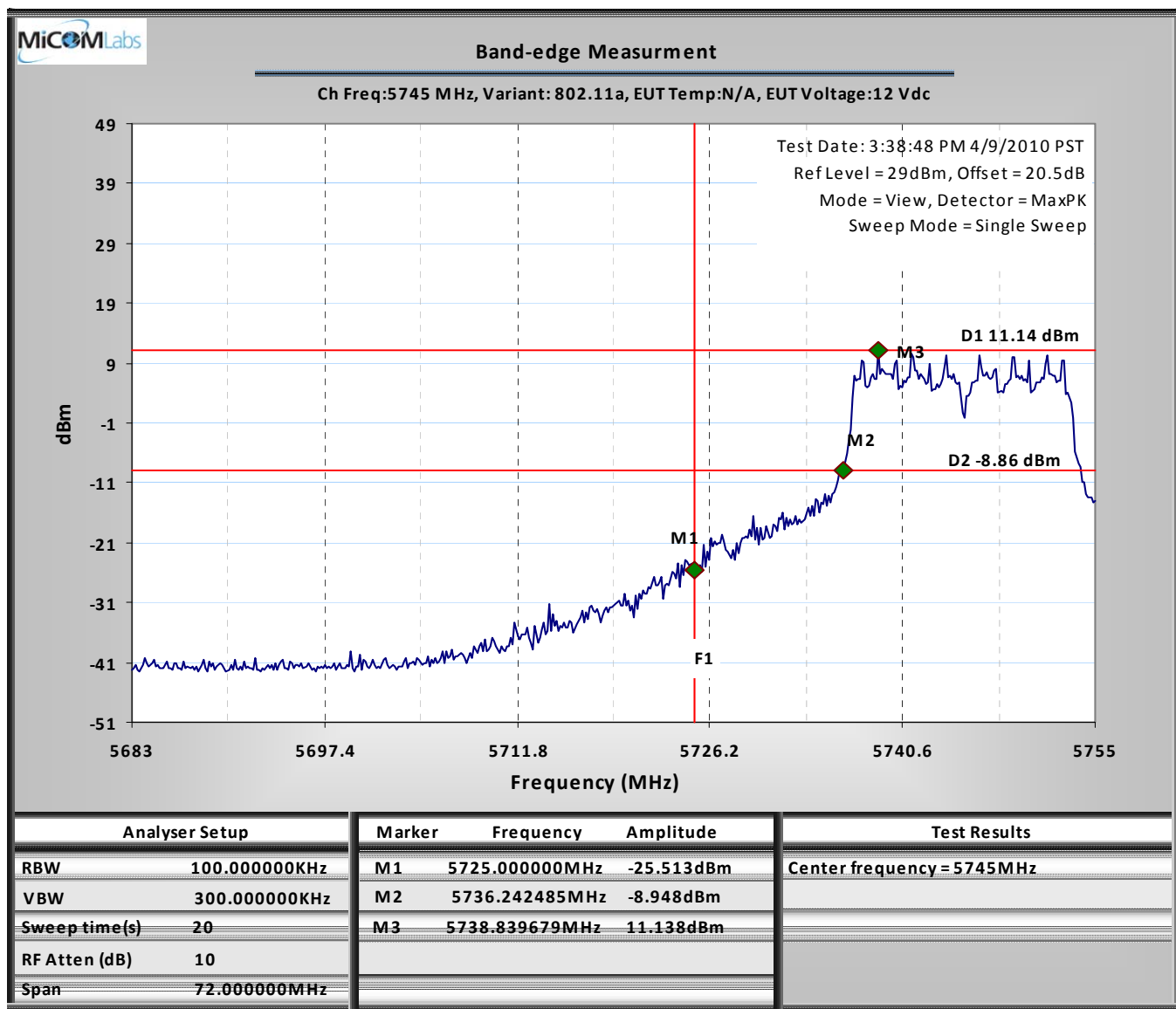
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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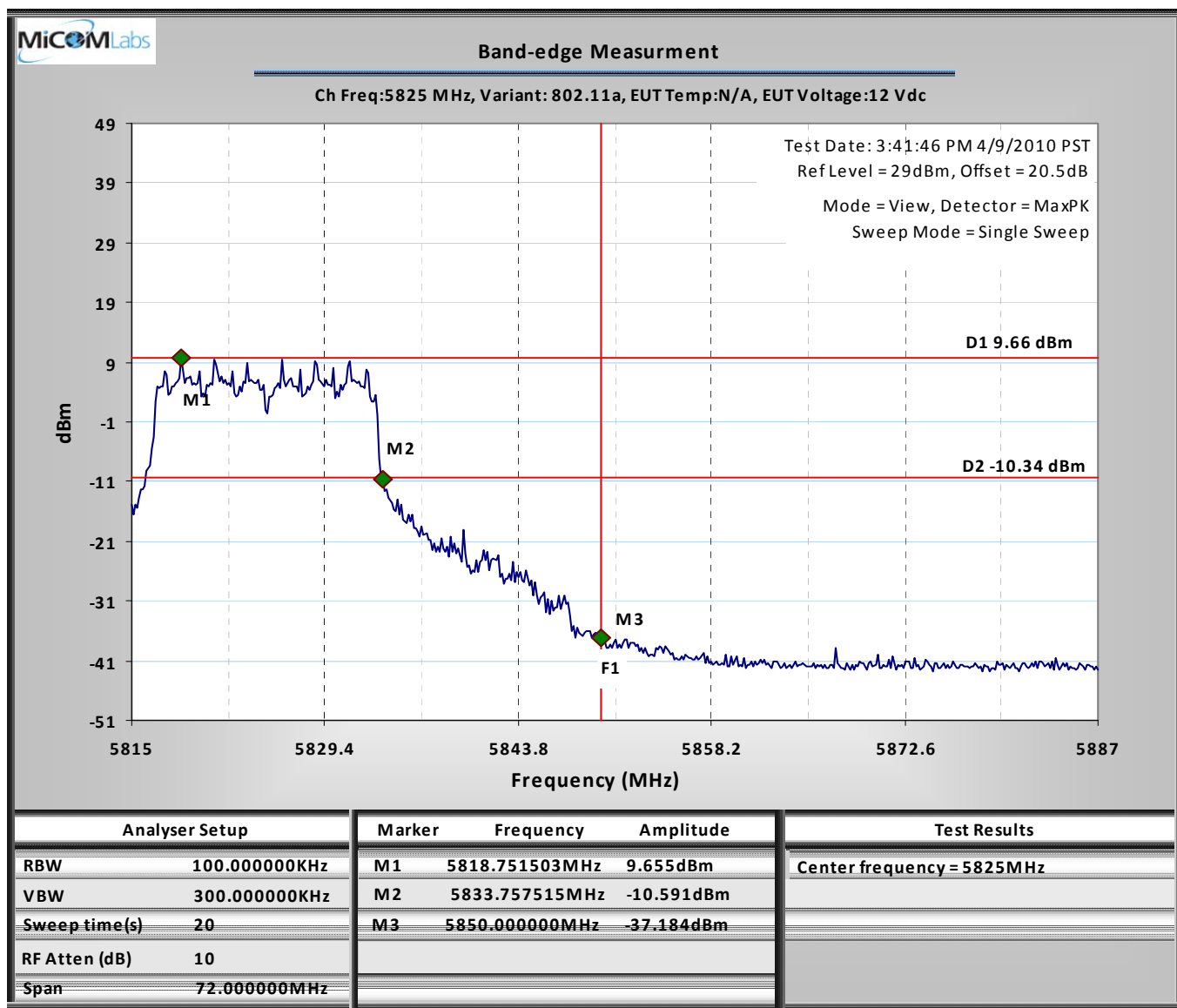
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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#### 7.5.6 Measurement Results for 802.11n HT-20

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <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</b> | N/A           | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b>  | 12.00         | Vdc                        |     |    |      |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### *Conducted Spurious Measurement*

| Test Frequency | Start Frequency | Stop Frequency | Maximum Observed Emission | Limit (20 dB below peak of fundamental) |
|----------------|-----------------|----------------|---------------------------|-----------------------------------------|
| MHz            | MHz             | MHz            | dBm                       | dBm                                     |
| 5745           | 30.00           | 40000.00       | -40.47                    | -14.82                                  |
| 5785           | 30.00           | 40000.00       | -40.55                    | -10.37                                  |
| 5825           | 30.00           | 40000.00       | -39.63                    | -14.65                                  |

#### *Band-edge Measurement*

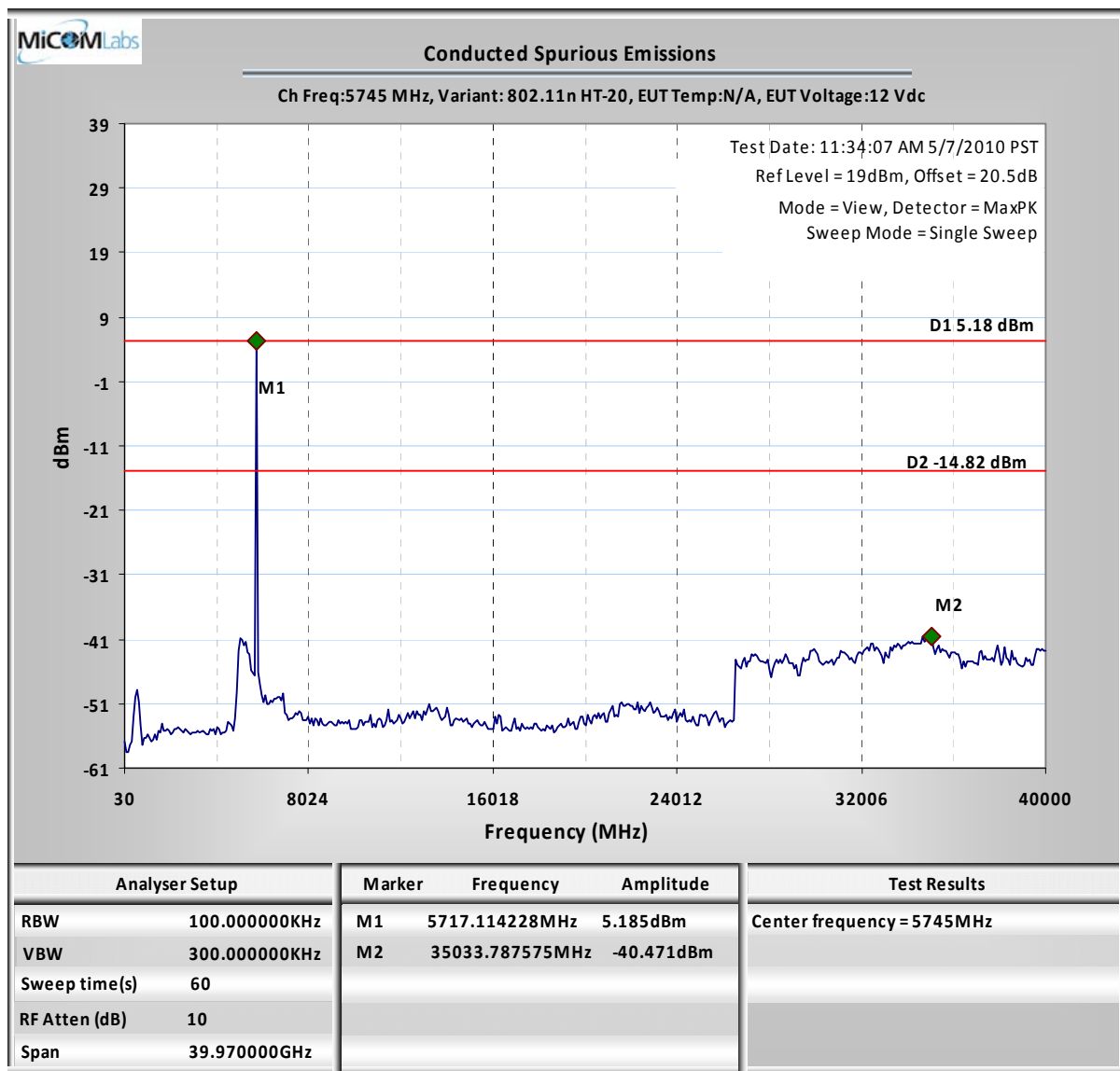
| Test Frequency | Band-edge Frequency | Emission Amplitude @ Band-edge | Limit (20 dB below peak of fundamental) | Margin |
|----------------|---------------------|--------------------------------|-----------------------------------------|--------|
| MHz            | MHz                 | dBm                            | dBm                                     | dB     |
| 5745.00        | 5725.00             | -24.27                         | -8.86                                   | -15.42 |
| 5825.00        | 5850.00             | -36.44                         | -10.05                                  | -26.39 |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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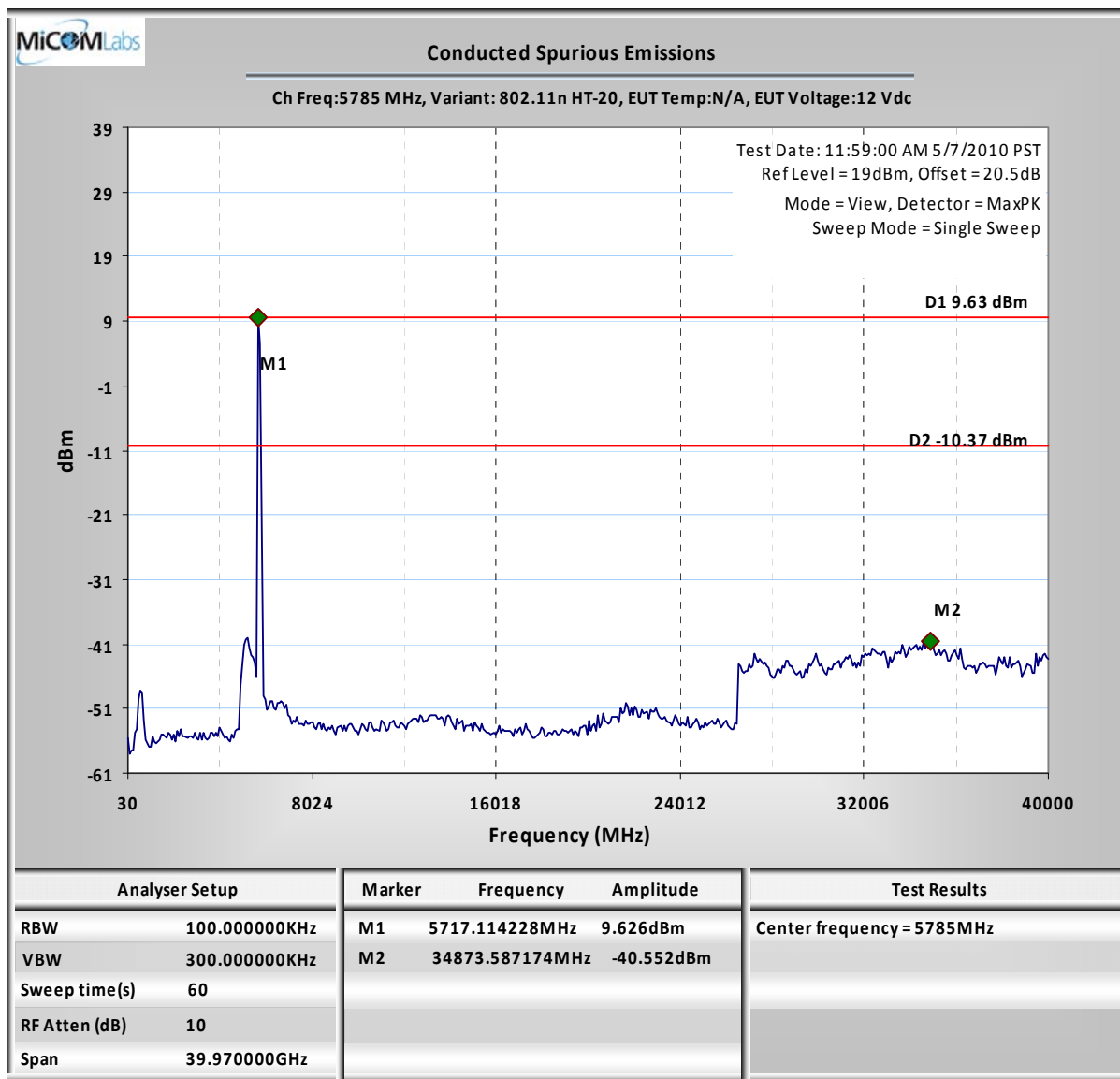
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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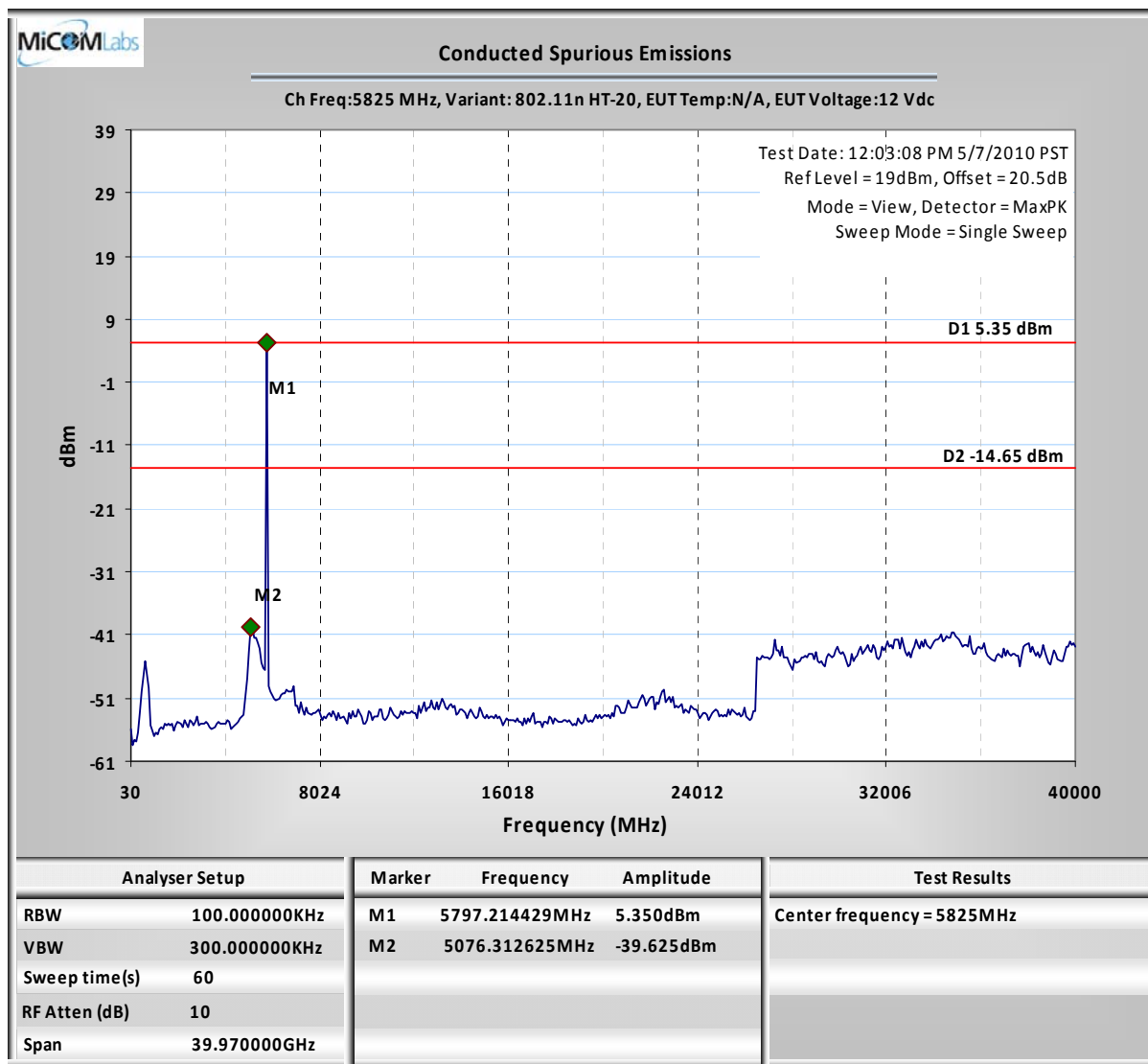
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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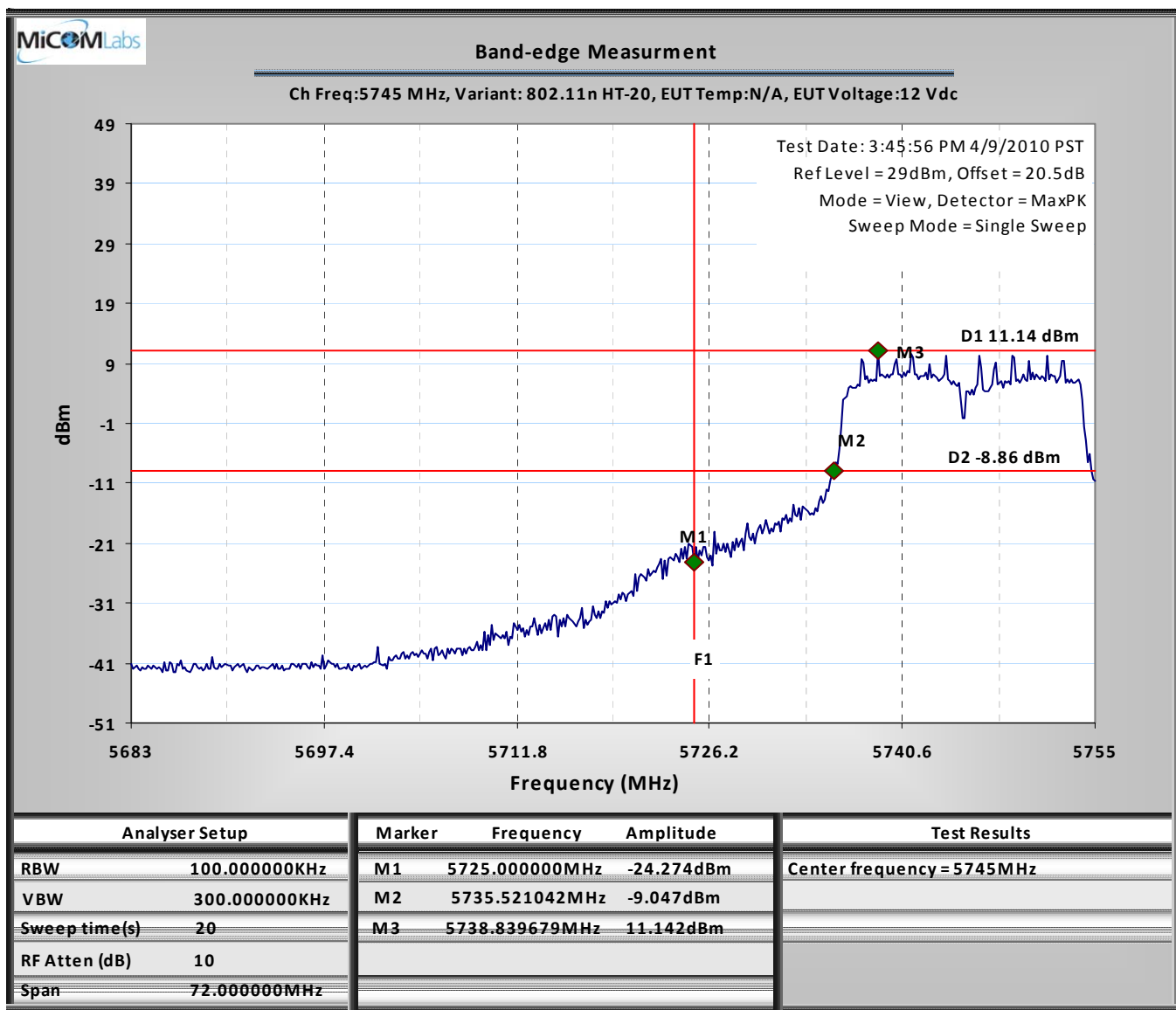
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
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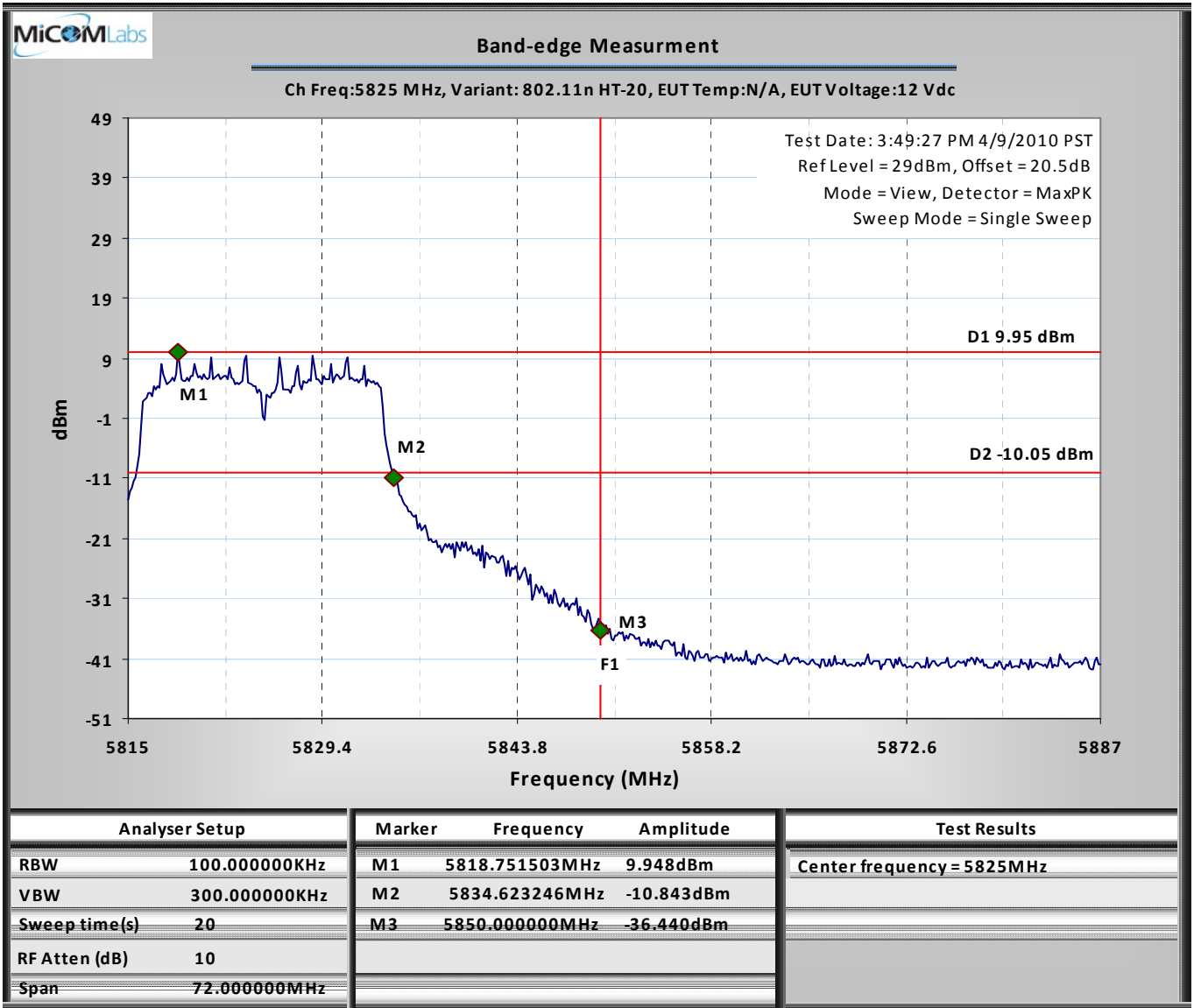
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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### 7.5.7 Measurement Results for 802.11n HT-40

|                          |               |                            |     |    |      |
|--------------------------|---------------|----------------------------|-----|----|------|
| <b>Test Conditions:</b>  | 15.247 (a)(2) | <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</b> | N/A           | <b>Antenna Gain:</b>       | N/A |    | dBi  |
| <b>Applied Voltage:</b>  | 12.00         |                            |     |    | Vdc  |
| <b>Notes 1:</b>          |               |                            |     |    |      |
| <b>Notes 2:</b>          |               |                            |     |    |      |

#### *Conducted Spurious Measurement*

| Test Frequency | Start Frequency | Stop Frequency | Maximum Observed Emission | Limit (20 dB below peak of fundamental) |
|----------------|-----------------|----------------|---------------------------|-----------------------------------------|
| MHz            | MHz             | MHz            | dBm                       | dBm                                     |
| 5755           | 30.00           | 40000.00       | -40.38                    | -14.06                                  |
| 5785           | 30.00           | 40000.00       | -39.43                    | -14.68                                  |
| 5815           | 30.00           | 40000.00       | -39.20                    | -15.73                                  |

#### *Band-edge Measurement*

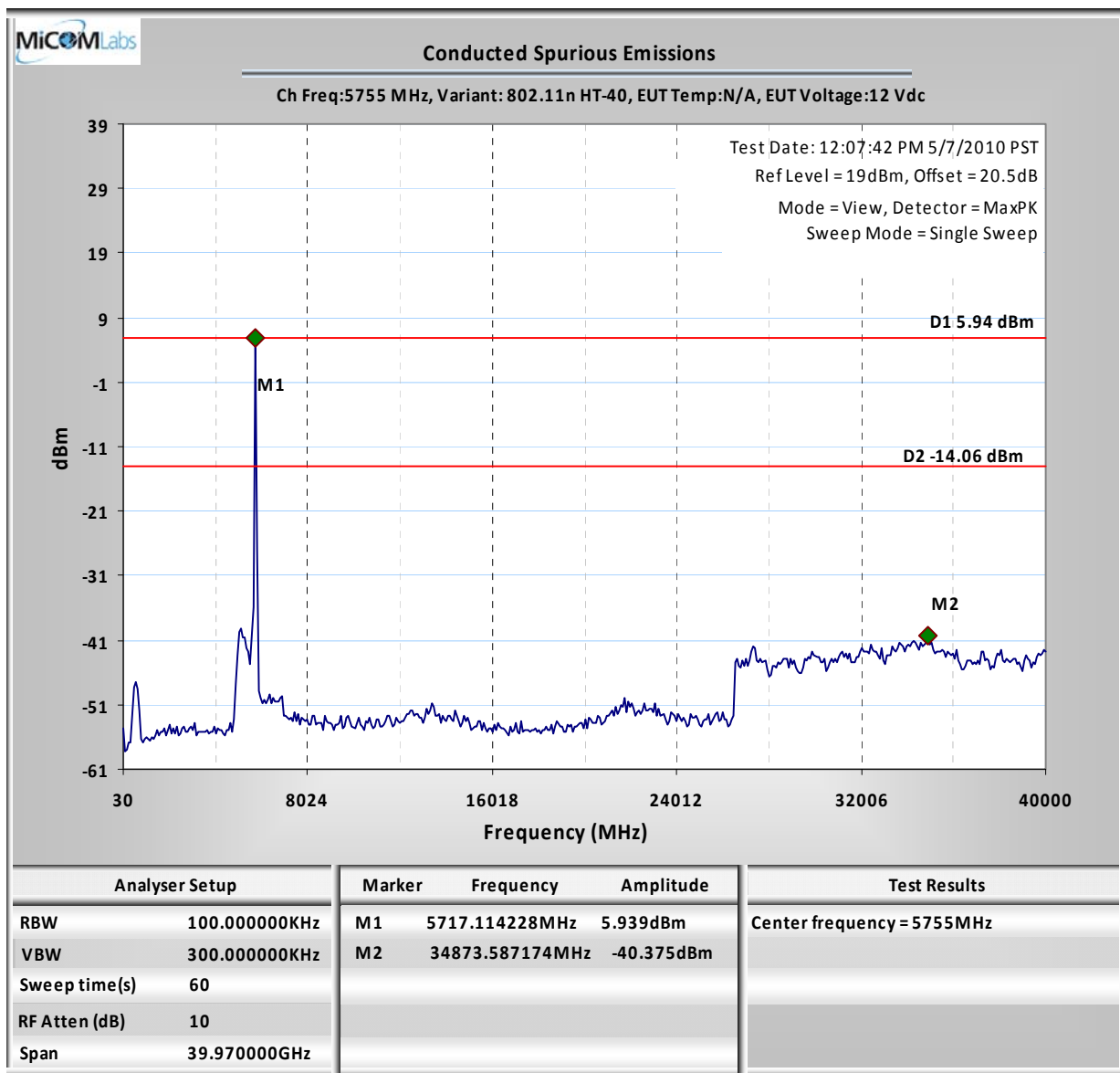
| Test Frequency | Band-edge Frequency | Emission Amplitude @ Band-edge | Limit (20 dB below peak of | Margin |
|----------------|---------------------|--------------------------------|----------------------------|--------|
| MHz            | MHz                 | dBm                            | dBm                        | dB     |
| 5755.00        | 5725.00             | -22.05                         | -11.97                     | -10.08 |
| 5815.00        | 5850.00             | -27.53                         | -12.57                     | -14.96 |

|                                 |          |
|---------------------------------|----------|
| <b>Measurement uncertainty:</b> | ±2.81 dB |
|---------------------------------|----------|

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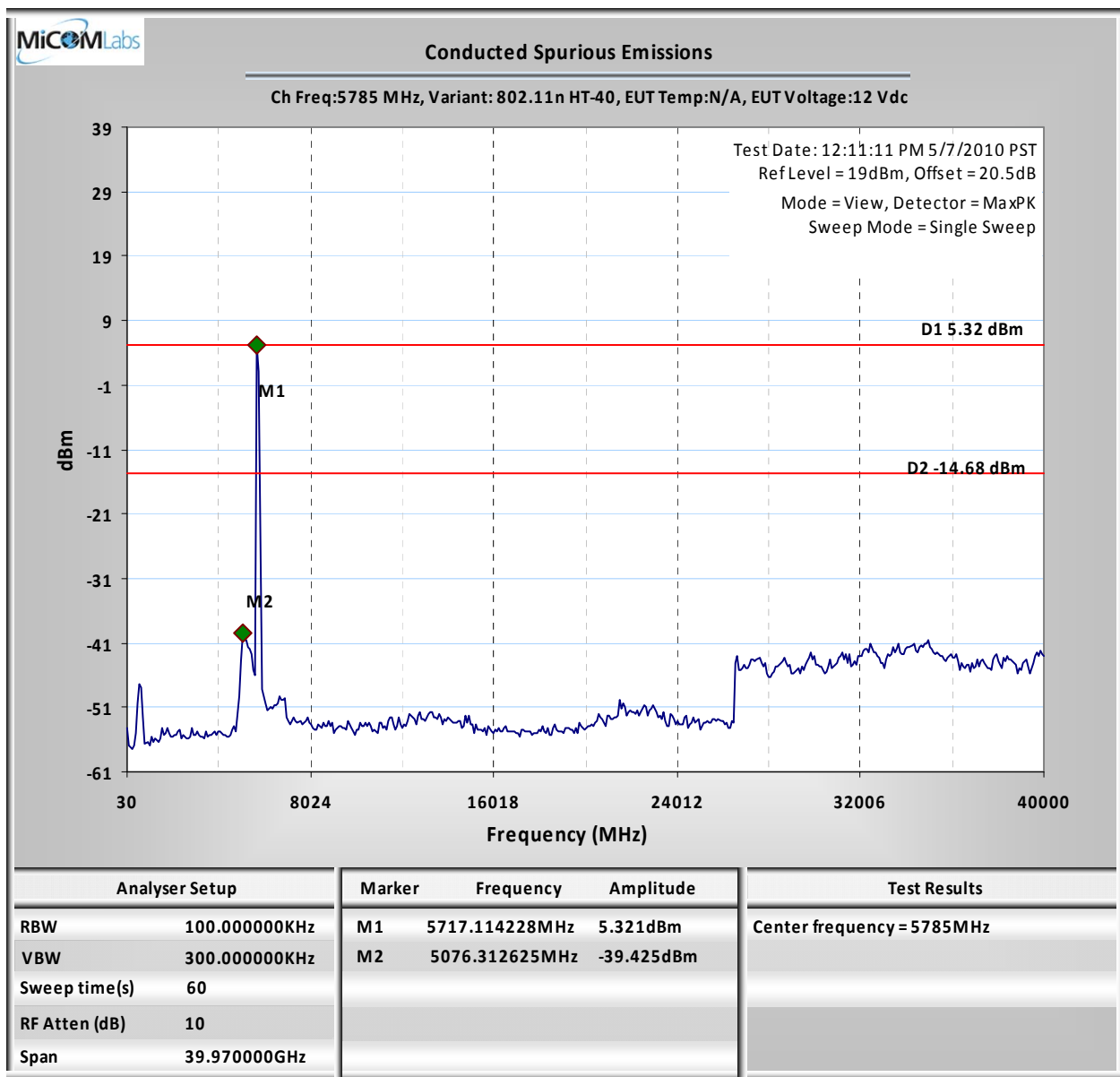
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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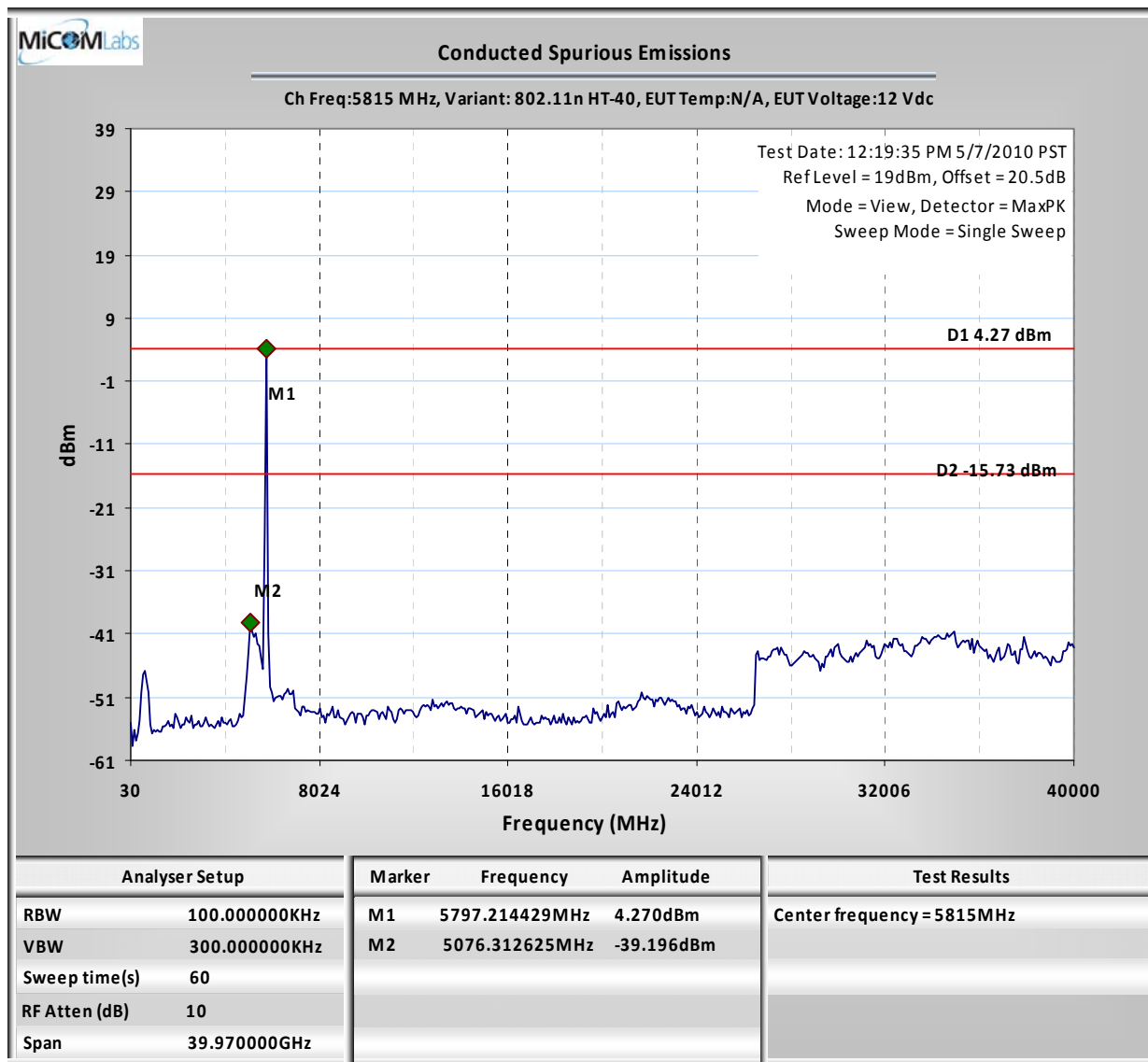
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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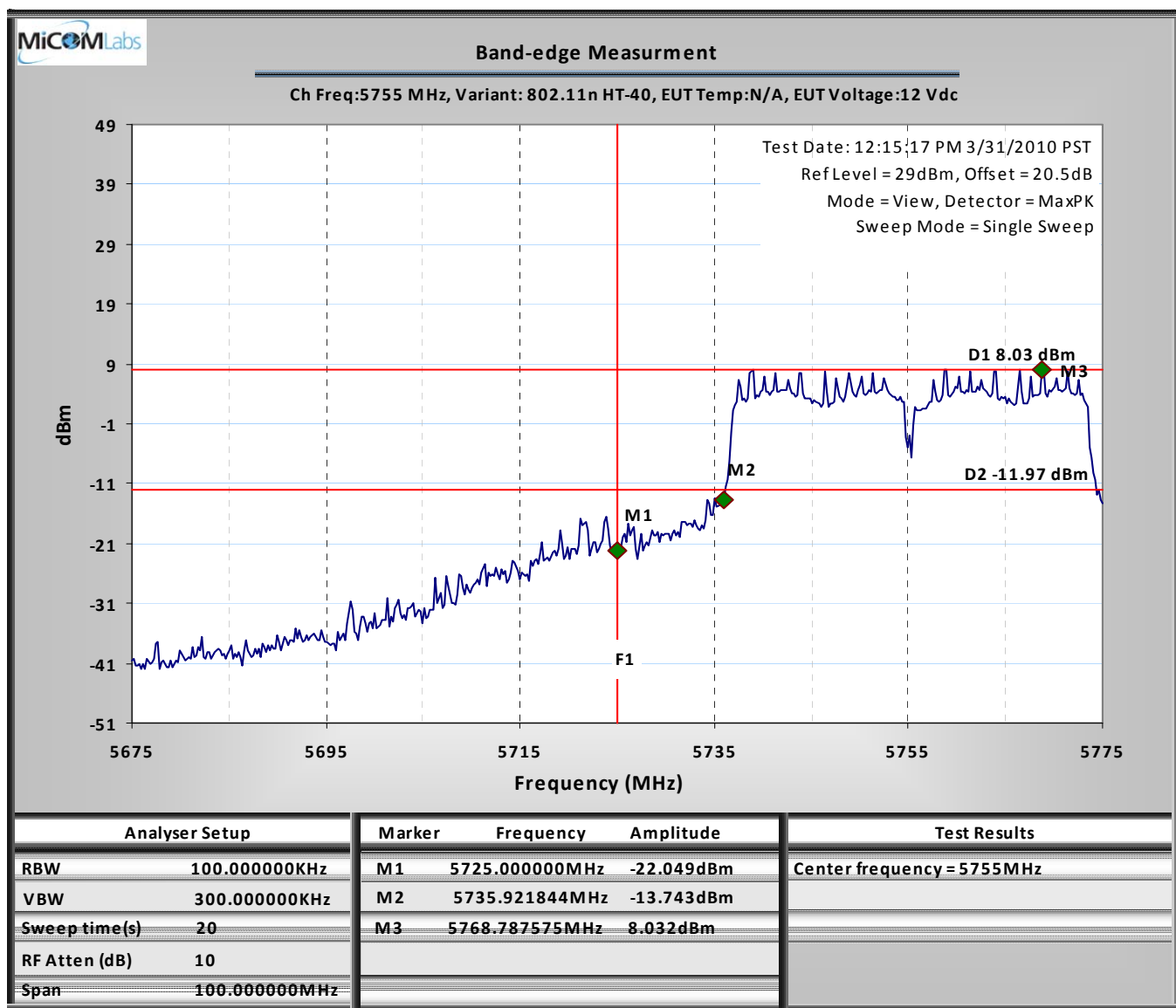
**Title:** Aruba AP-93H 802.11a/b/g/n Wireless AP  
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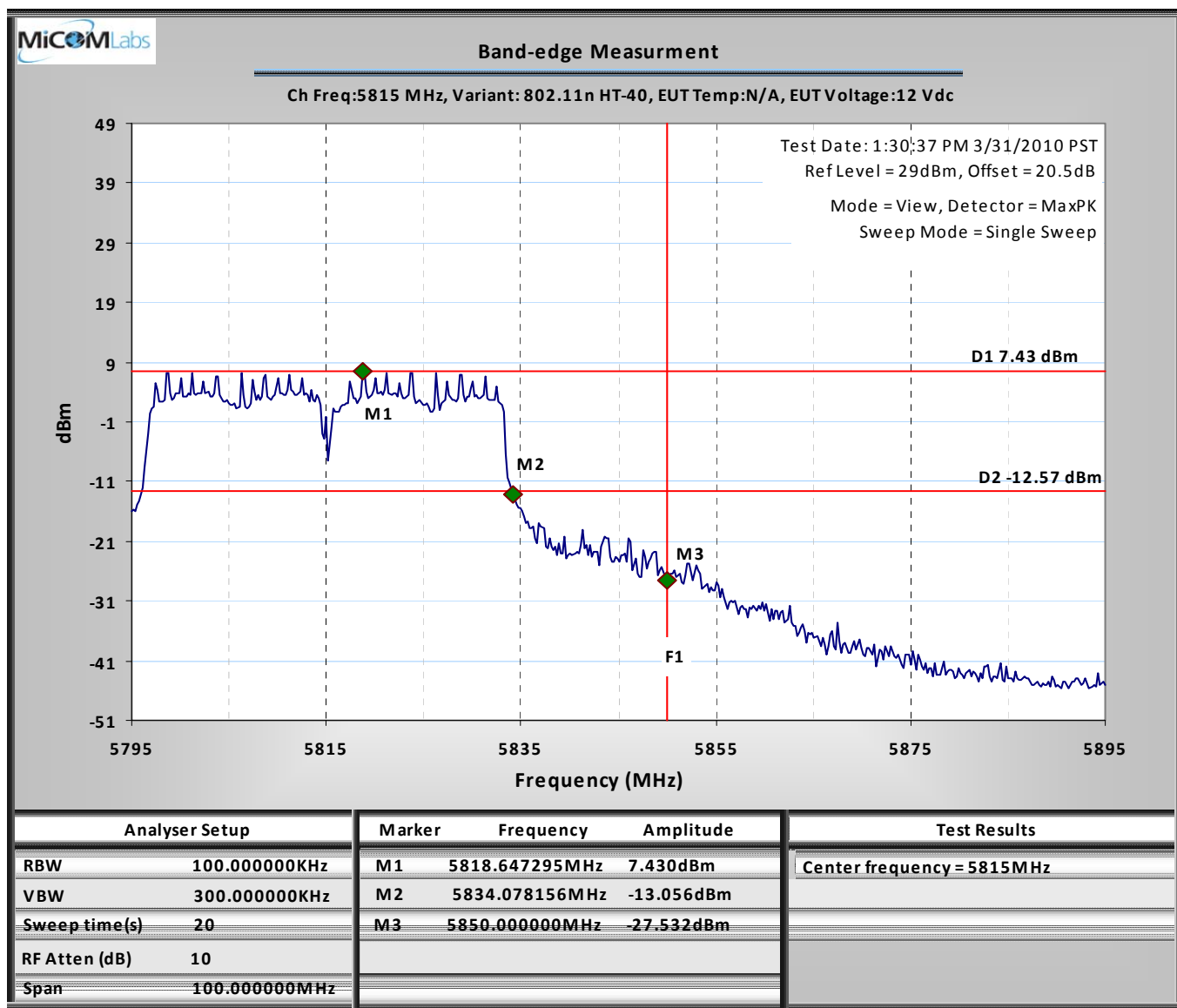
Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
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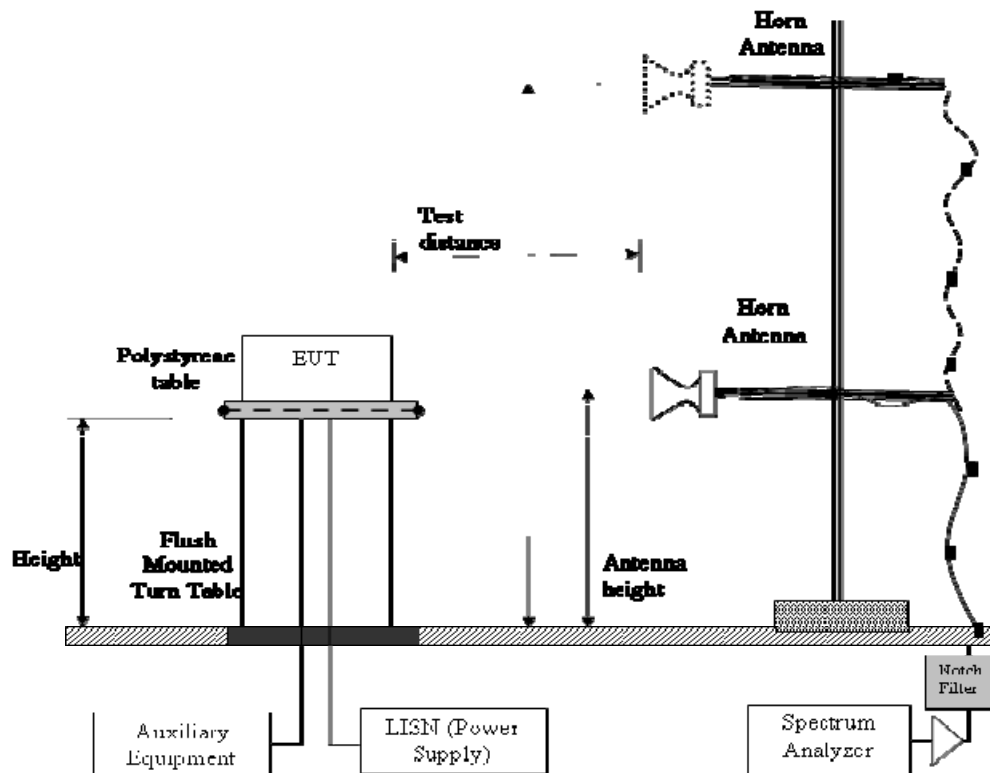
## 7.6 Radiated Spurious Emissions

### Test Procedure

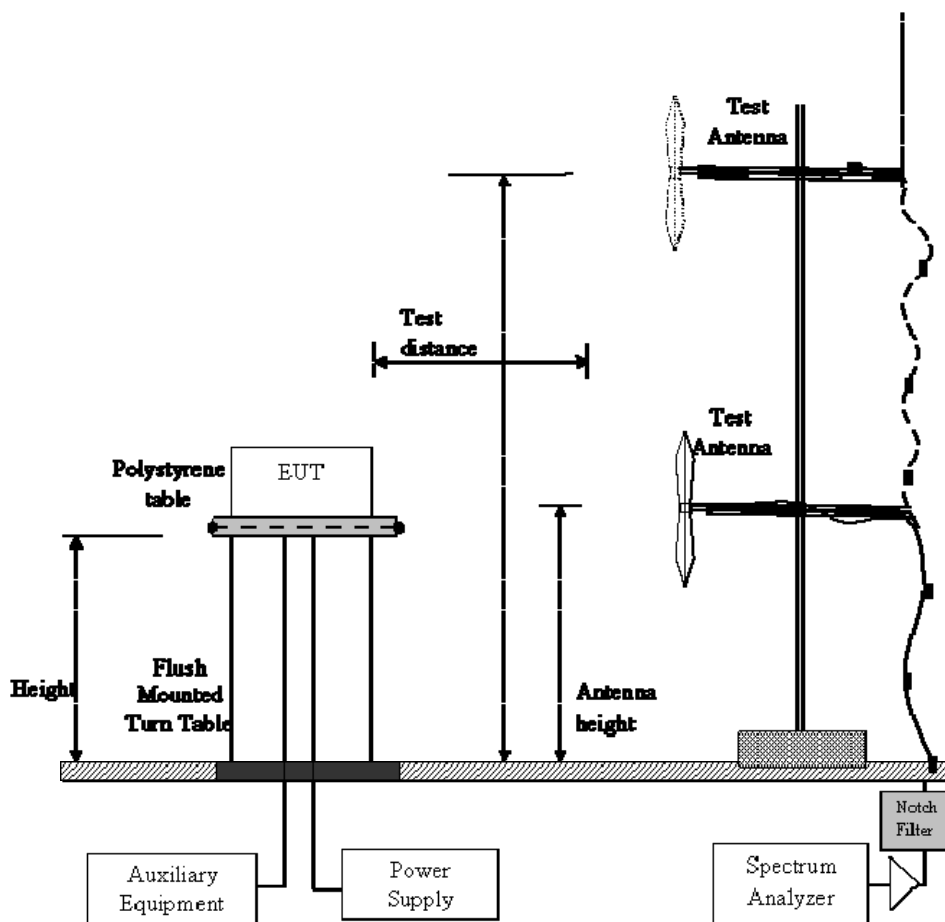
Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak hold mode.

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.

### Test Measurement Set Up



Radiated Emission Measurement Setup – Above 1 GHz



Radiated Emission Measurement Setup – Below 1 GHz

### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor



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**CORR = Correction Factor = CL – AG + NFL**

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

Field Strength Calculation Example:

Given receiver input reading of 51.5 dB $\mu$ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. 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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## Specification

### Radiated Spurious Emissions

**FCC §15.247(d)** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

**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.



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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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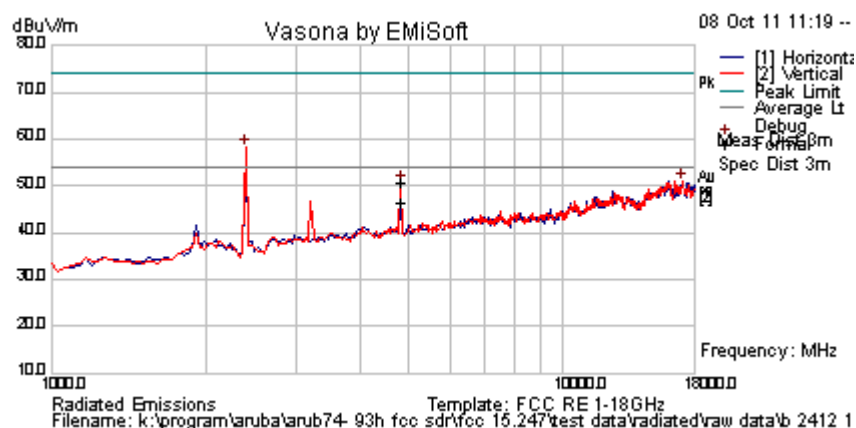


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## 7.6.1 Integral Antenna - Transmitter Radiated Spurious Emissions – Above 1 GHz

### 7.6.1.1 2400 – 2483.5 MHz

|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 2412 MHz             | Engineer       | GMH  |
| Variant       | 802.11b; 1 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



### Formally measured emission peaks

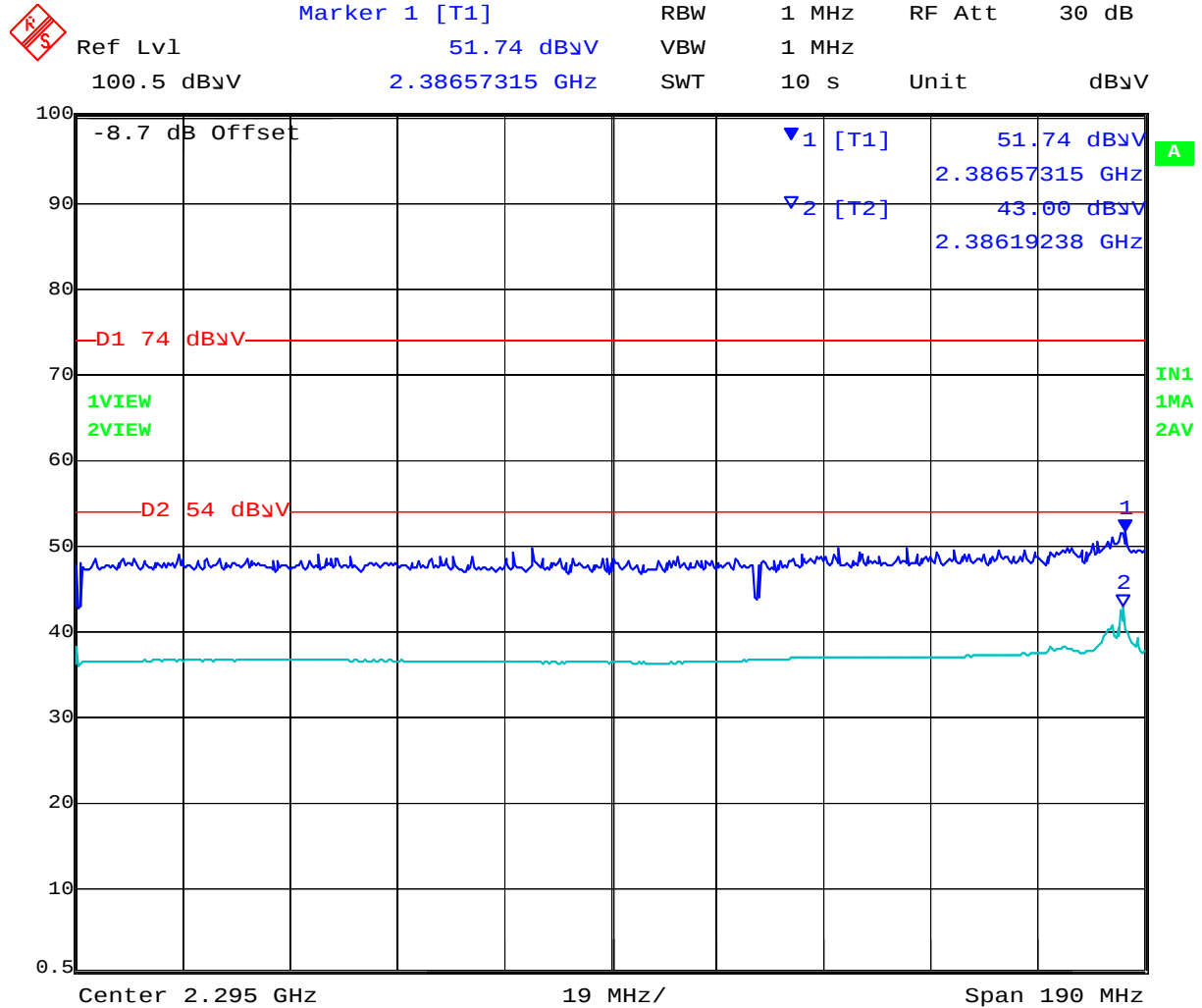
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 4824.018                                                                                                | 56.3     | 4.5        | -9.9  | 50.8         | Peak Max         | V   | 98     | 9       | 74.0         | -23.2     | Pass       | RB       |
| 4824.018                                                                                                | 52.0     | 4.5        | -9.9  | 46.5         | Average Max      | V   | 98     | 9       | 54.0         | -7.5      | Pass       | RB       |
| 2396.794                                                                                                | 66.8     | 3.0        | -11.6 | 58.2         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 17114.228                                                                                               | 41.9     | 8.5        | 0.5   | 50.9         | Peak [Scan]      | V   | 100    | 0       | 54           | -3.1      | Pass       | NOISE    |
| 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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Band-Edge 2390 802.11b Tx = 2412 MHz



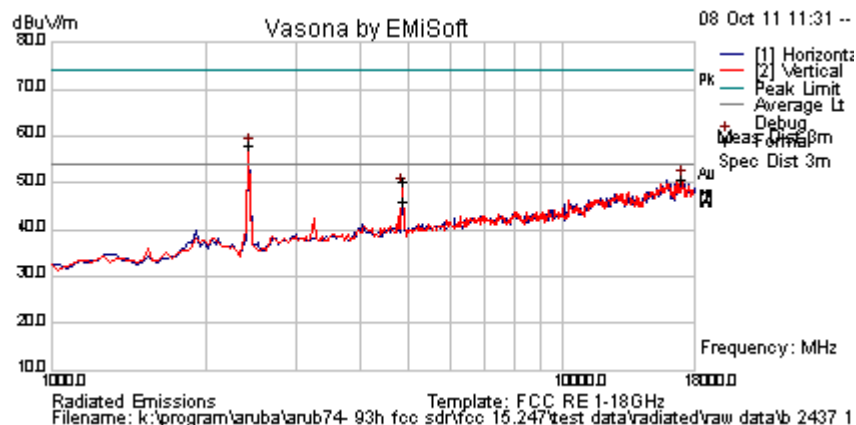
Date: 9.OCT.2011 10:44:52

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 2437 MHz             | Engineer       | GMH  |
| Variant       | 802.11b; 1 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| 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 |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 4873.987      | 55.8     | 4.5        | -10.0 | 50.3         | Peak Max         | V   | 98     | 26      | 74.0         | -23.7     | Pass       | RB       |
| 4873.987      | 51.4     | 4.5        | -10.0 | 45.9         | Average Max      | V   | 98     | 26      | 54.0         | -8.1      | Pass       | RB       |
| 2430.862      | 66.4     | 3.0        | -11.6 | 57.8         | Peak [Scan]      | H   |        |         |              |           |            | FUND     |
| 17114.228     | 41.7     | 8.5        | 0.5   | 50.7         | Peak [Scan]      | V   | 100    | 0       | 54           | -3.3      | Pass       | NOISE    |

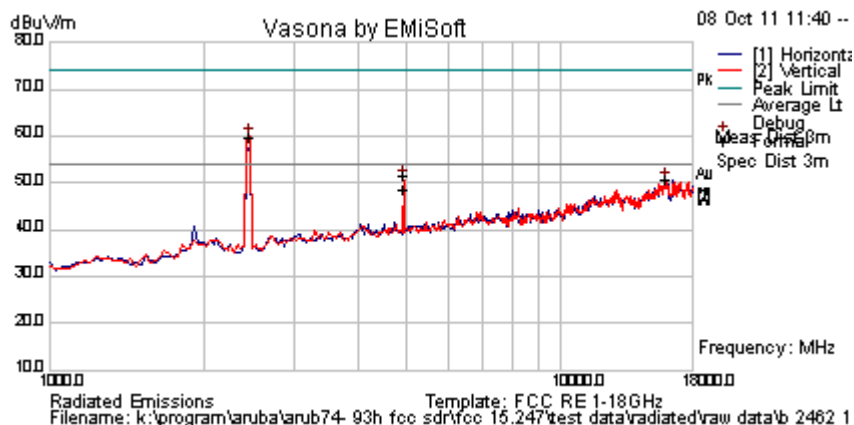
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 2462 MHz             | Engineer       | GMH  |
| Variant       | 802.11b; 1 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| 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 |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 4923.973      | 57.1     | 4.6        | -10.0 | 51.8         | Peak Max         | V   | 102    | 28      | 74.0         | -22.3     | Pass       | RB       |
| 4923.973      | 53.8     | 4.6        | -10.0 | 48.4         | Average Max      | V   | 102    | 28      | 54.0         | -5.6      | Pass       | RB       |
| 2464.930      | 68.5     | 3.0        | -11.6 | 59.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 15989.980     | 41.3     | 9.0        | 0.2   | 50.6         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.5      | Pass       | NOISE    |

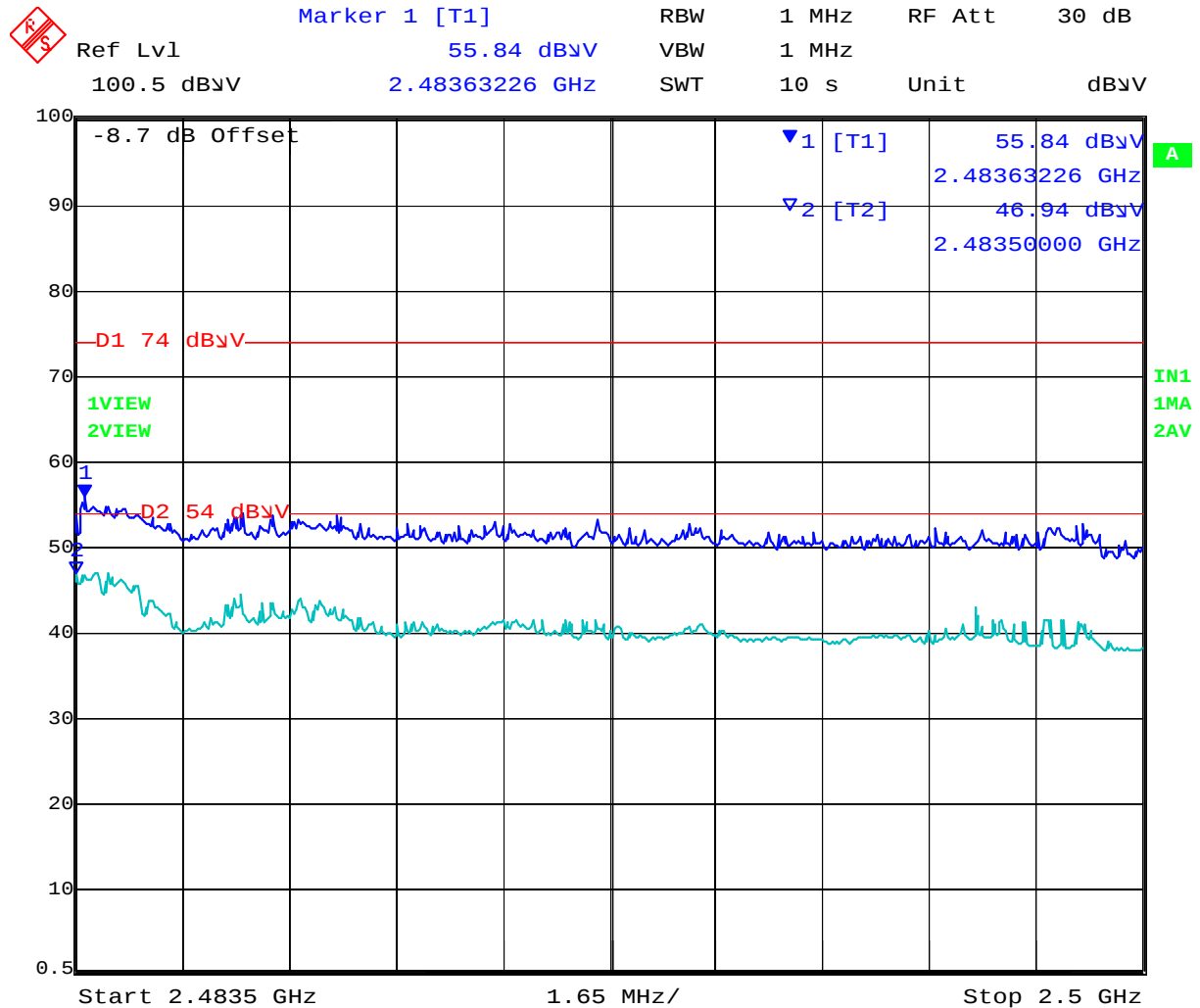
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Band-Edge 2483.5 802.11b Tx = 2462 MHz



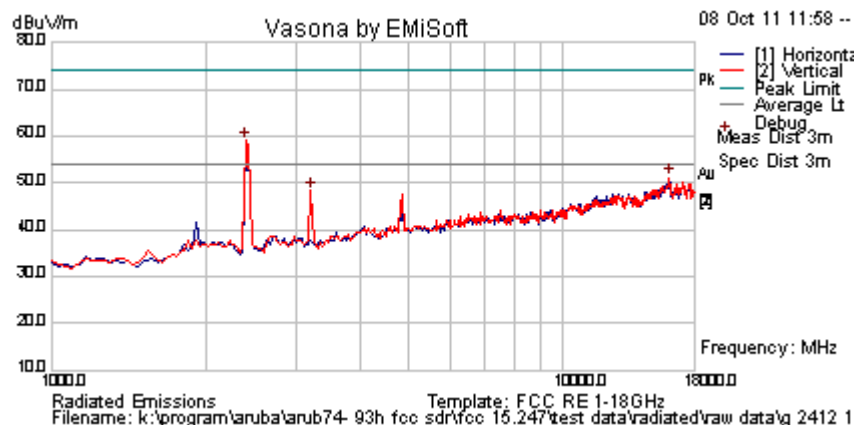
Date: 9.OCT.2011 11:15:50

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 2412 MHz             | Engineer       | GMH  |
| Variant       | 802.11g; 6 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



### Formally measured emission peaks

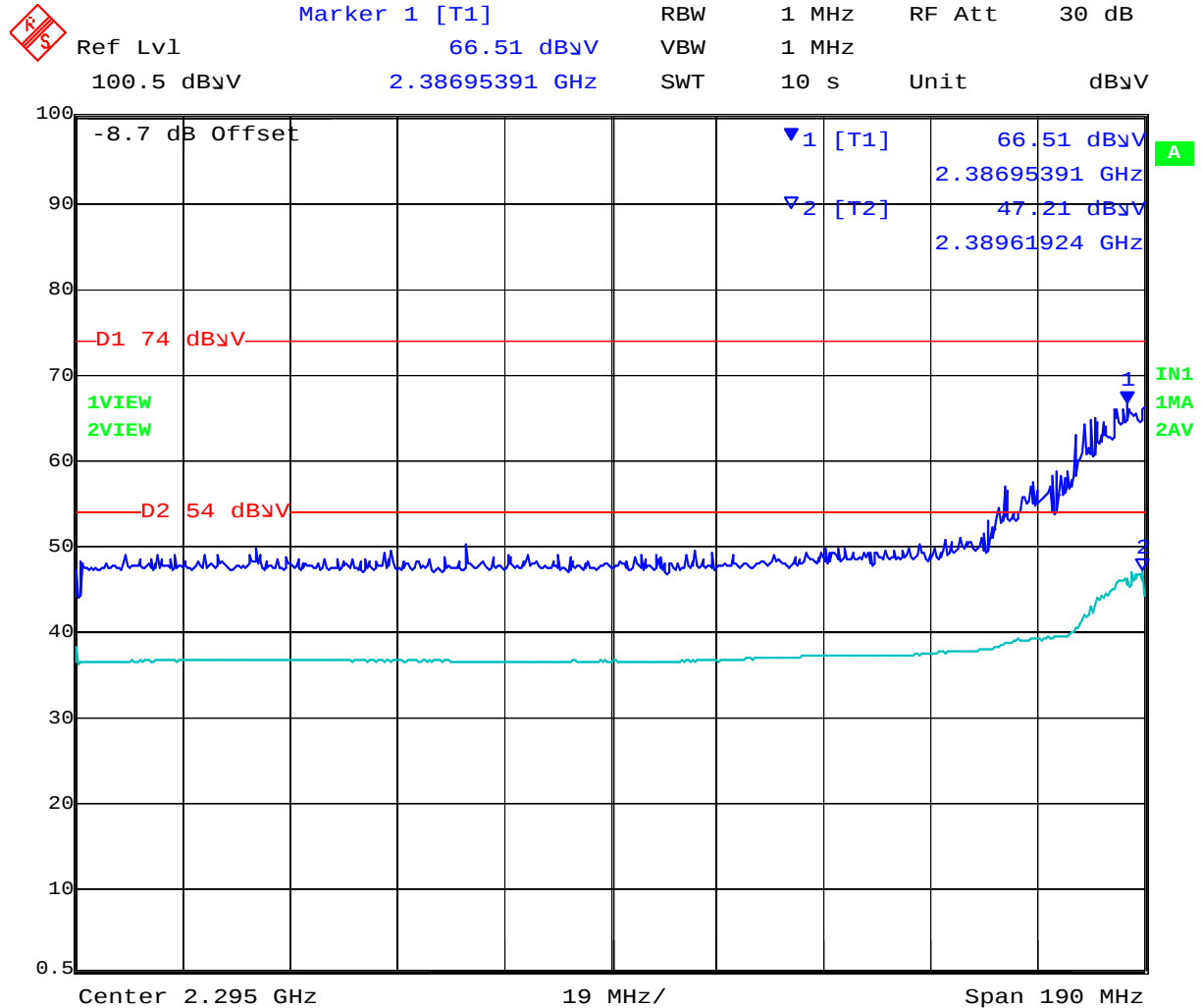
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2396.794                                                                                                                                                                                                         | 67.7     | 3.0        | -11.6 | 59.0         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 16092.184                                                                                                                                                                                                        | 41.9     | 9.0        | 0.3   | 51.2         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -2.8      | Pass       | NOISE    |
| 3214.429                                                                                                                                                                                                         | 56.3     | 3.5        | -11.6 | 48.2         | Peak [Scan]      | V   | 100    | 0       | 54           | -5.8      | 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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Band-Edge 2390 802.11g Tx = 2412 MHz



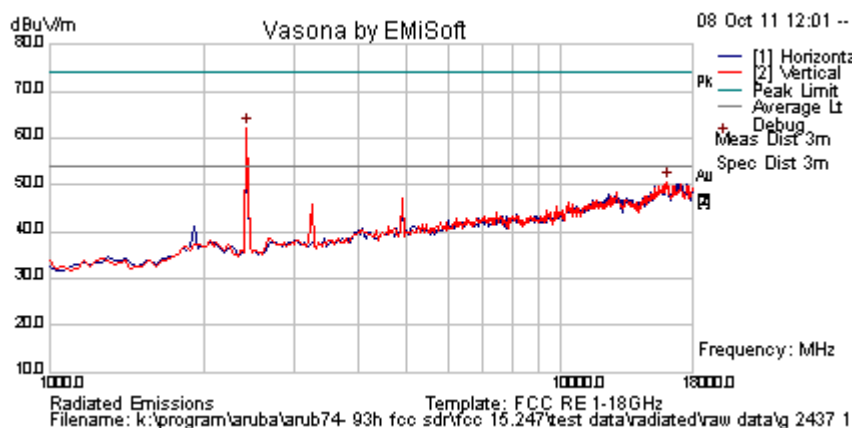
Date: 9.OCT.2011 10:52:21

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 2437 MHz             | Engineer       | GMH  |
| Variant       | 802.11g; 6 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

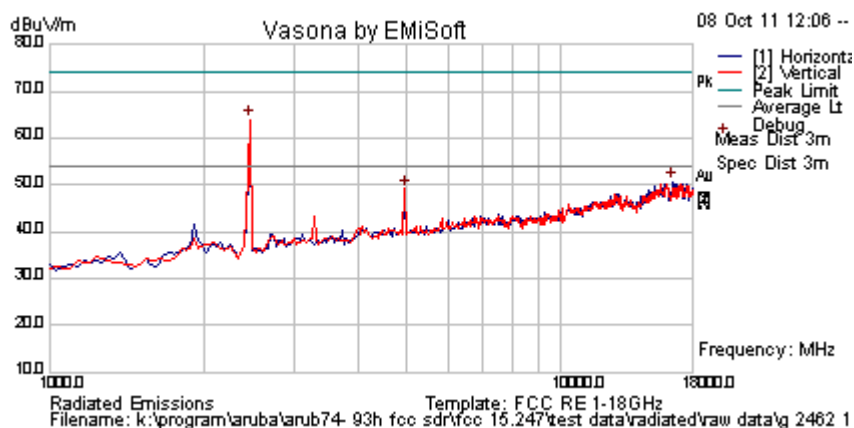
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2430.862                                                                                                | 69.9     | 3.0        | -11.6 | 61.3         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 17080.16                                                                                                | 42.0     | 8.5        | 0.4   | 50.9         | Peak [Scan]      | H   | 100    | 0       | 54.0         | -3.1      | Pass       | NOISE    |
| 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.    | 2462 MHz             | Engineer       | GMH  |
| Variant       | 802.11g; 6 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

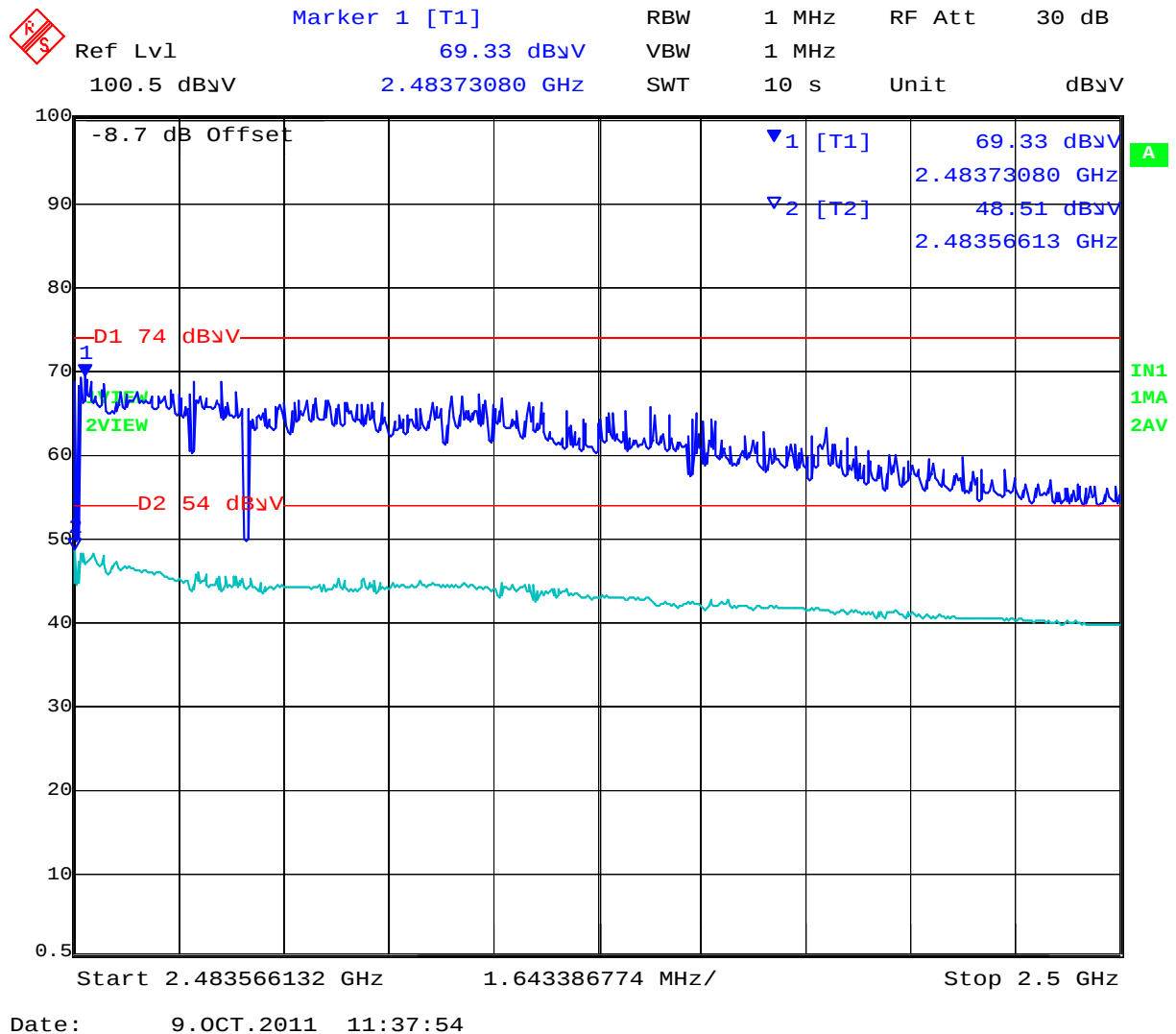
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2464.930                                                                                                                                                                                                         | 72.5     | 3.0        | -11.6 | 63.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 16501.002                                                                                                                                                                                                        | 41.6     | 8.8        | 0.2   | 50.6         | Peak [Scan]      | H   | 100    | 0       | 54.0         | -3.4      | Pass       | NOISE    |
| 4946.929                                                                                                                                                                                                         | 44.4     | 4.6        | -9.9  | 39.0         | Average Max      | V   | 120    | 1       | 54           | -15.0     | Pass       | RB       |
| 4946.929                                                                                                                                                                                                         | 59.1     | 4.6        | -9.9  | 53.8         | Peak Max         | V   | 120    | 1       | 74           | -20.2     | Pass       | RB       |
| 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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Band-Edge 2483.5 802.11b Tx = 2462 MHz

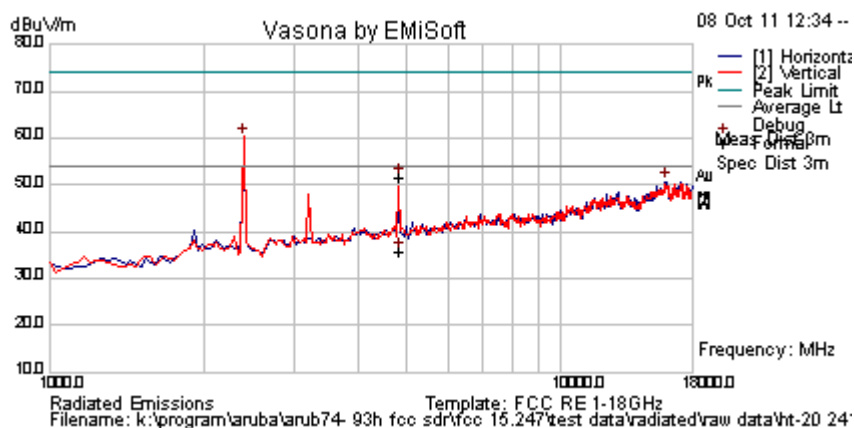


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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 2412 MHz                | Engineer       | GMH  |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 999  |
| Power Setting | 18                      | Press. (mBars) | 30.5 |
| Antenna       | Integral                | Duty Cycle (%) |      |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

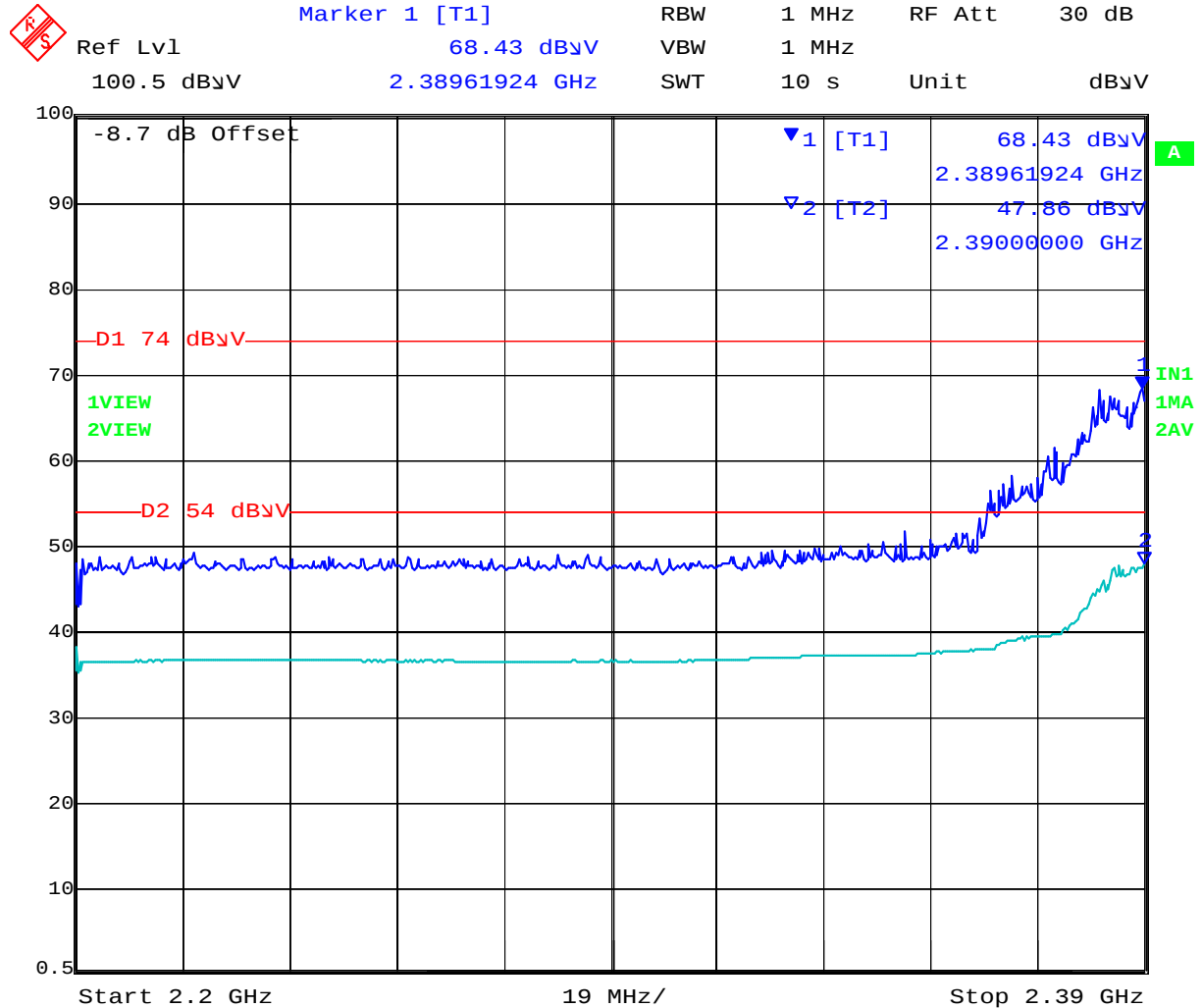
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2396.794                                                                                                | 69.0     | 3.0        | -11.6 | 60.3         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 16058.116                                                                                               | 41.2     | 9.0        | 0.4   | 50.6         | Peak [Scan]      | H   | 100    | 0       | 54.0         | -3.4      | Pass       | NOISE    |
| 4819.937                                                                                                | 57.0     | 4.5        | -9.9  | 51.6         | Peak Max         | V   | 141    | 0       | 74           | -22.4     | Pass       | RB       |
| 4819.937                                                                                                | 41.3     | 4.5        | -9.9  | 35.8         | Average Max      | V   | 141    | 0       | 54           | -18.2     | 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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Title: Aruba AP-93H 802.11a/b/g/n Wireless AP  
To: FCC 47 CFR Part 15.247 & IC RSS-210  
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Band-Edge 2390 802.11n HT-20 Tx = 2412 MHz



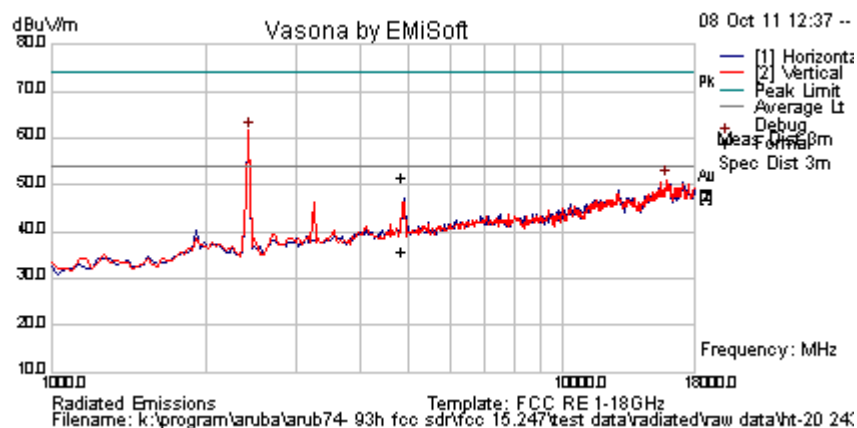
Date: 9.OCT.2011 10:53:58

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 2437 MHz                | Engineer       | GMH  |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 999  |
| Power Setting | 18                      | Press. (mBars) | 30.5 |
| Antenna       | Integral                | Duty Cycle (%) |      |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

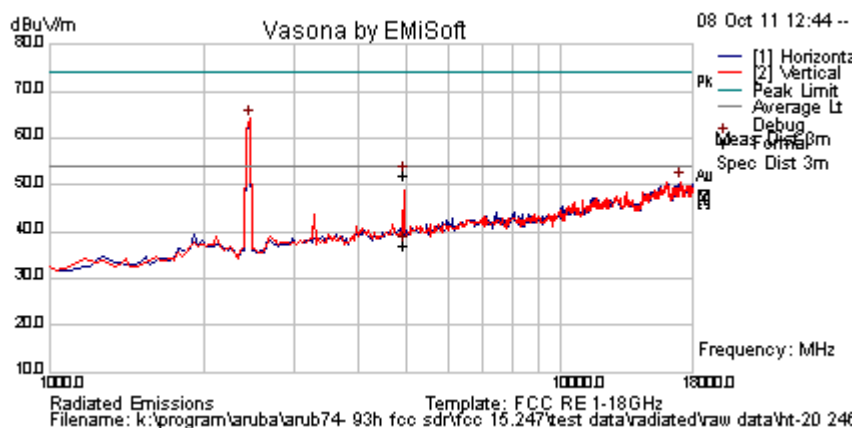
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2430.862                                                                                                | 70.3     | 3.0        | -11.6 | 61.7         | Peak [Scan]      | H   |        |         |              |           |            | FUND     |
| 15853.707                                                                                               | 42.6     | 8.8        | -0.3  | 51.1         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -2.9      | Pass       | NOISE    |
| 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.    | 2462 MHz                | Engineer       | GMH  |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 999  |
| Power Setting | 18                      | Press. (mBars) | 30.5 |
| Antenna       | Integral                | Duty Cycle (%) |      |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

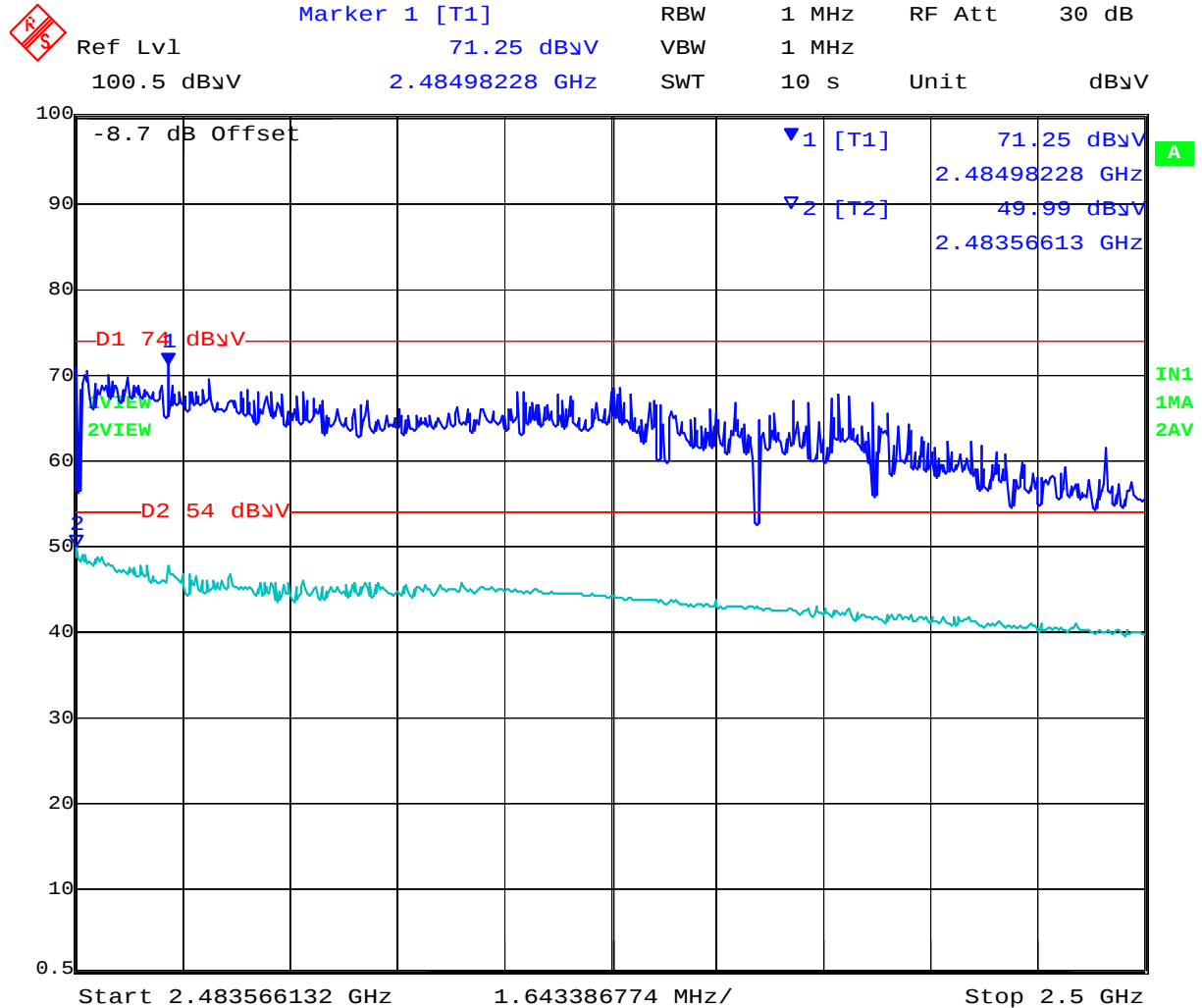
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2464.930                                                                                                | 72.7     | 3.0        | -11.6 | 64.1         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 17080.16                                                                                                | 41.8     | 8.5        | 0.4   | 50.7         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -3.3      | Pass       | NOISE    |
| 4918.727                                                                                                | 57.7     | 4.6        | -10.0 | 52.3         | Peak Max         | V   | 109    | 6       | 74           | -21.8     | Pass       | RB       |
| 4918.727                                                                                                | 42.3     | 4.6        | -10.0 | 36.9         | Average Max      | V   | 109    | 6       | 54           | -17.1     | 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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Band-Edge 2483.5 802.11n HT-20 Tx = 2462 MHz



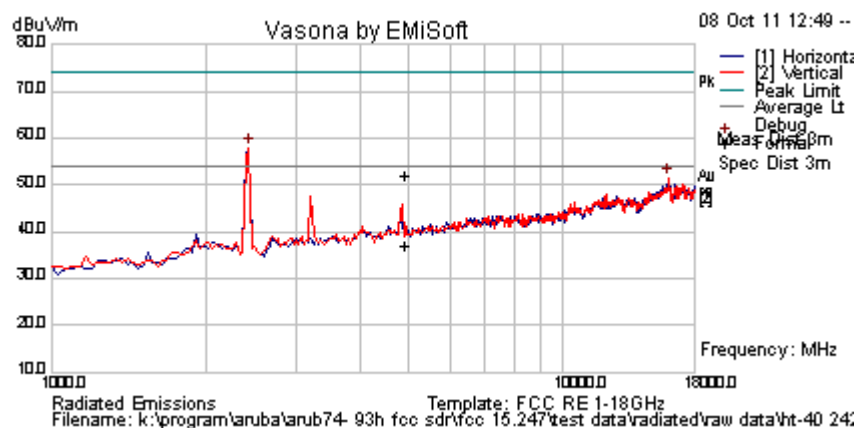
Date: 9.OCT.2011 11:39:01

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 2422 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 999  |
| Power Setting | 18                       | Press. (mBars) | 30.5 |
| Antenna       | Integral                 | Duty Cycle (%) |      |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

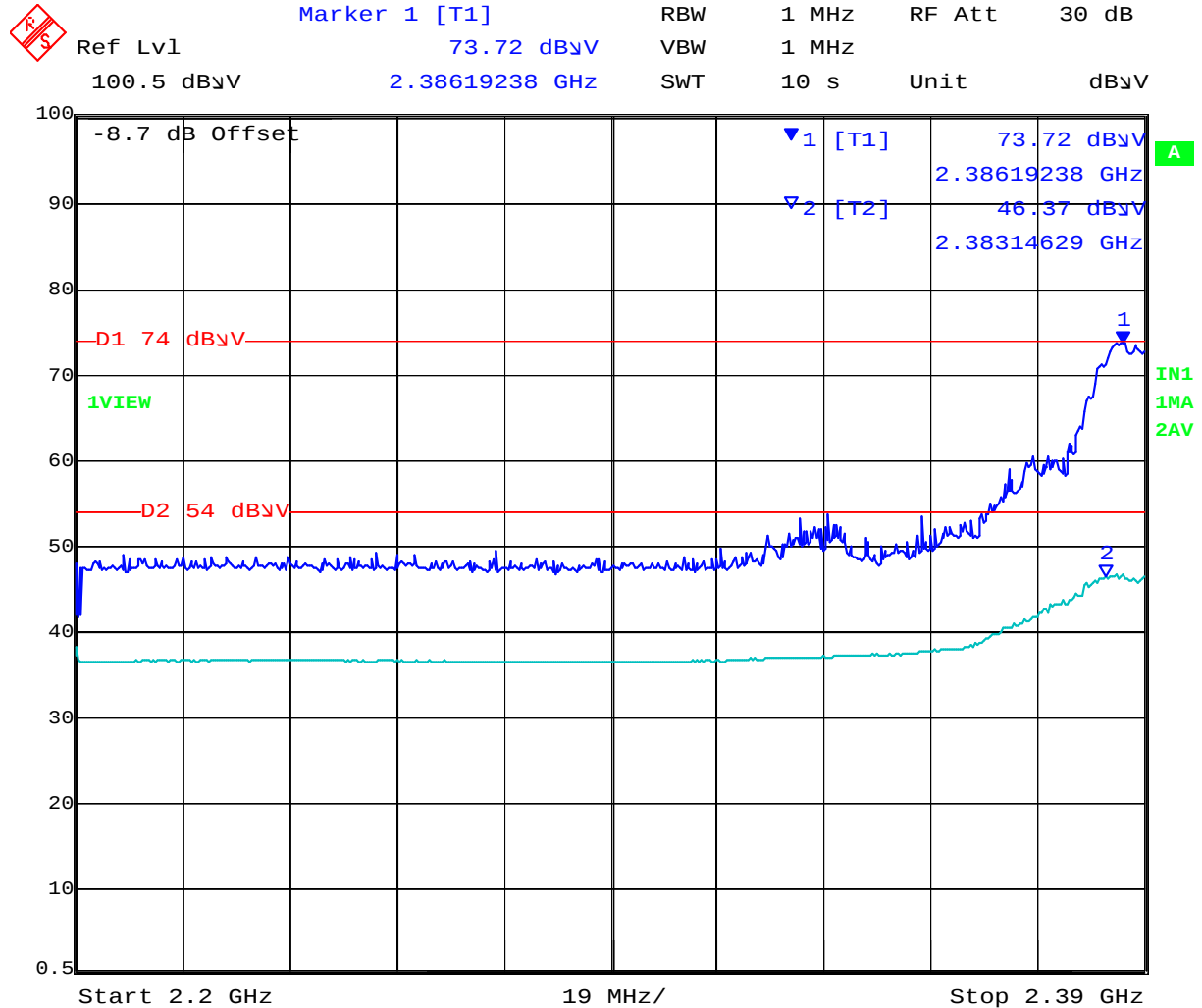
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2430.862                                                                                                | 66.5     | 3.0        | -11.6 | 57.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 16024.048                                                                                               | 42.1     | 9.0        | 0.4   | 51.5         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -2.5      | Pass       | NOISE    |
| 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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Band-Edge 2390 802.11n HT-40 Tx = 2422 MHz



Date: 9.OCT.2011 11:04:55

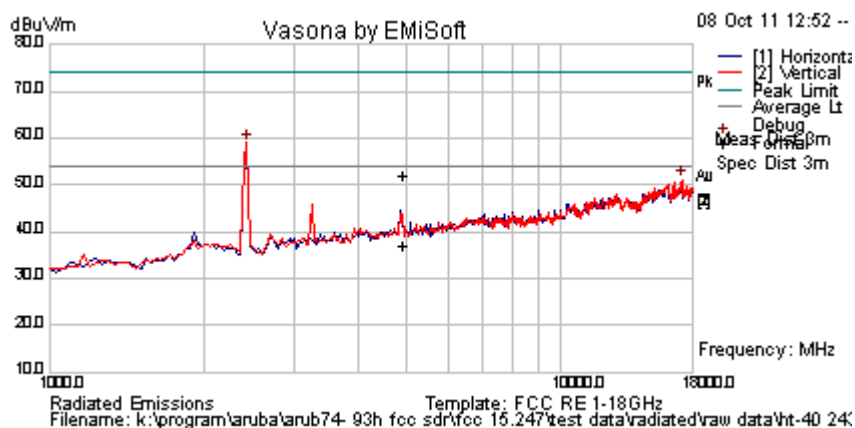
Power Reduction to ART = 16.5

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 2437 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 999  |
| Power Setting | 18                       | Press. (mBars) | 30.5 |
| Antenna       | Integral                 | Duty Cycle (%) |      |
| 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 |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2430.862      | 67.5     | 3.0        | -11.6 | 58.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 17182.365     | 41.7     | 8.6        | 0.8   | 51.1         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -2.9      | Pass       | NOISE    |

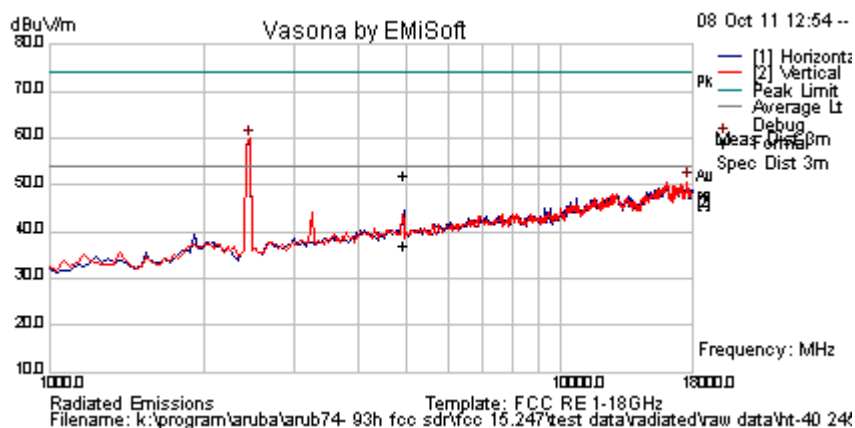
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 2452 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 999  |
| Power Setting | 18                       | Press. (mBars) | 30.5 |
| Antenna       | Integral                 | Duty Cycle (%) |      |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



#### Formally measured emission peaks

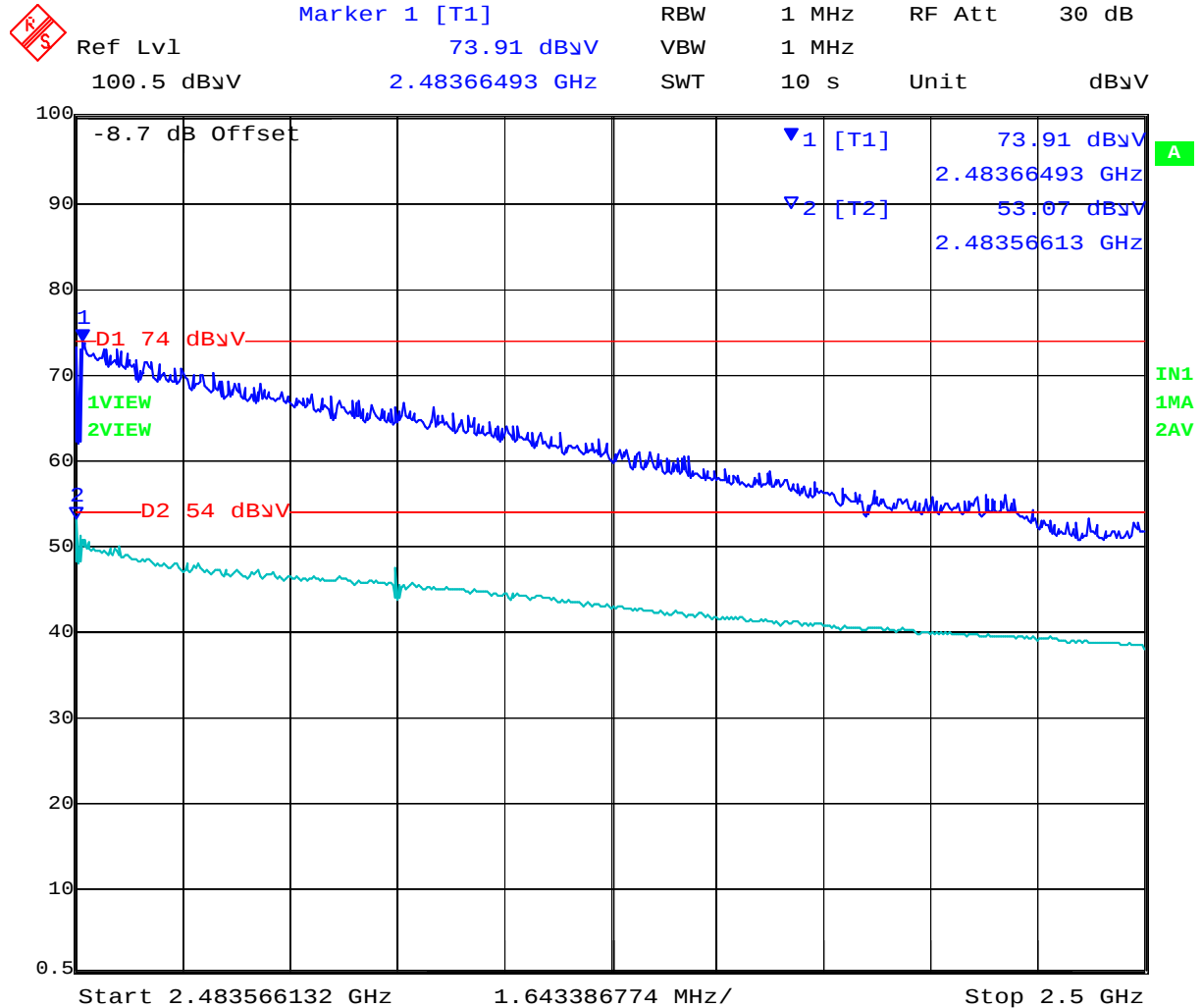
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 2464.930                                                                                                | 68.5     | 3.0        | -11.6 | 59.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 17625.251                                                                                               | 41.1     | 8.8        | 0.8   | 50.7         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -3.3      | Pass       | NOISE    |
| 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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Band-Edge 2483.5 802.11n HT-40 Tx = 2452 MHz



Date: 9.OCT.2011 11:41:33

Power Reduction to ART = 10.5

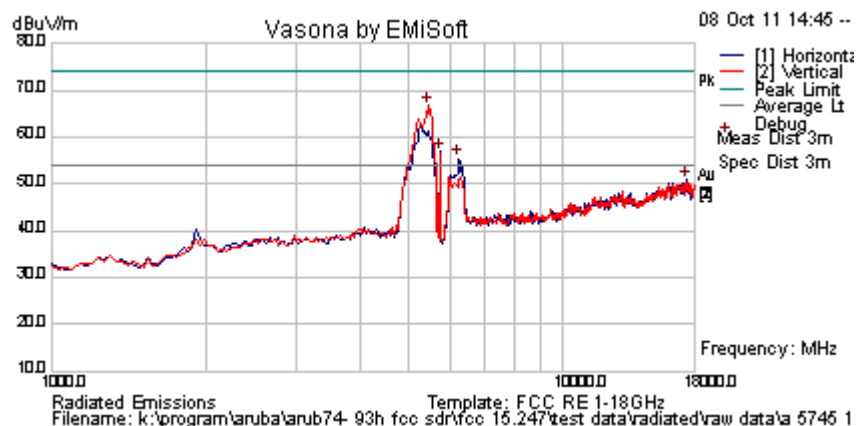
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### 7.6.1.2 5,725 – 5,850 MHz

|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5745 MHz             | Engineer       | GMH  |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



### Formally measured emission peaks

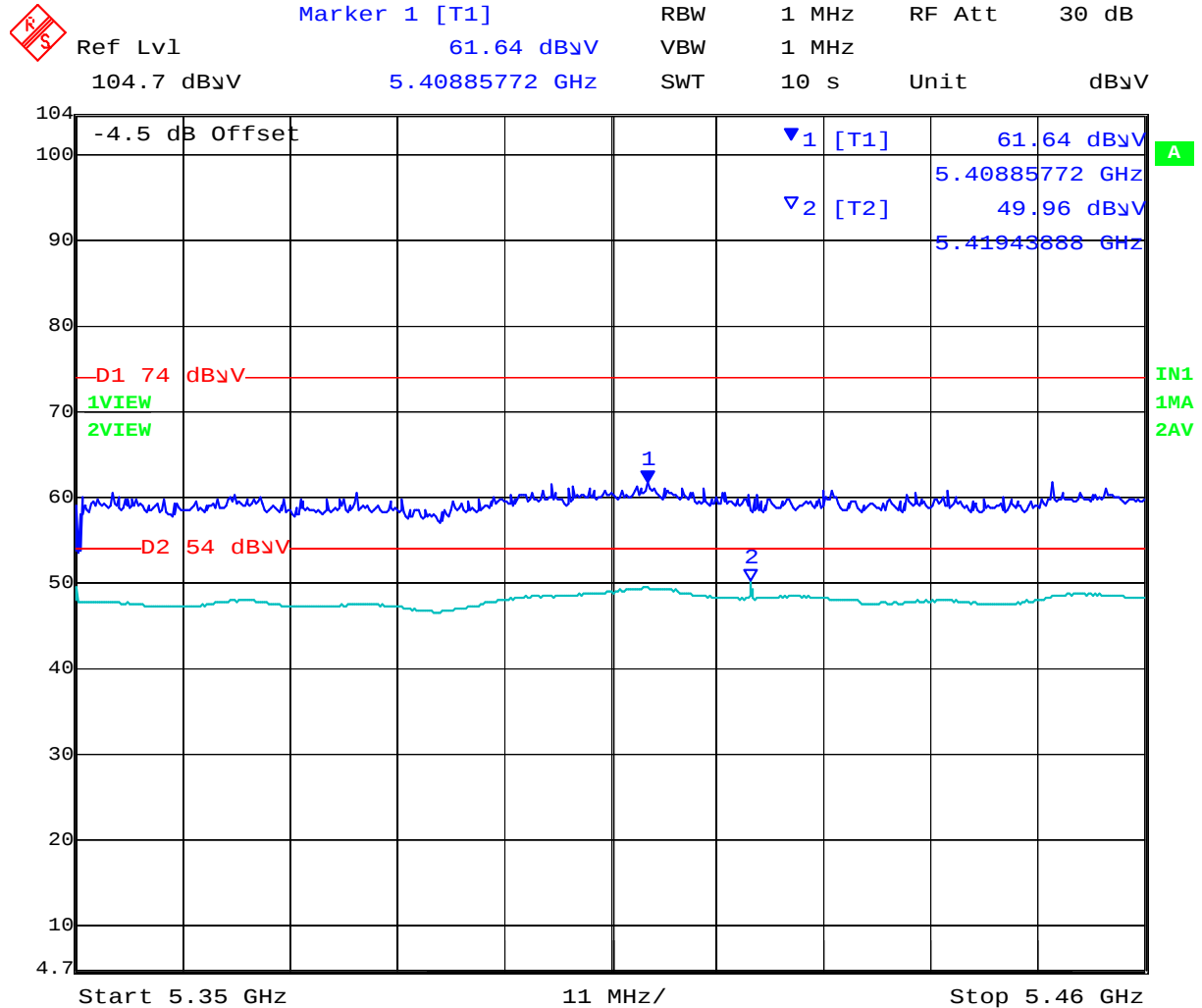
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5428.858                                                                                                                                                                                                         | 71.5     | 4.6        | -9.3  | 66.9         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 5735.47094                                                                                                                                                                                                       | 61.1     | 4.8        | -8.9  | 56.9         | Peak [Scan]      | H   |        |         |              |           |            | FUND     |
| 6246.493                                                                                                                                                                                                         | 57.9     | 5.0        | -7.5  | 55.4         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 17352.705                                                                                                                                                                                                        | 40.6     | 8.7        | 1.6   | 50.9         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.1      | Pass       | NOISE    |
| 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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Band-Edge 5470 802.11a Tx = 5745 MHz



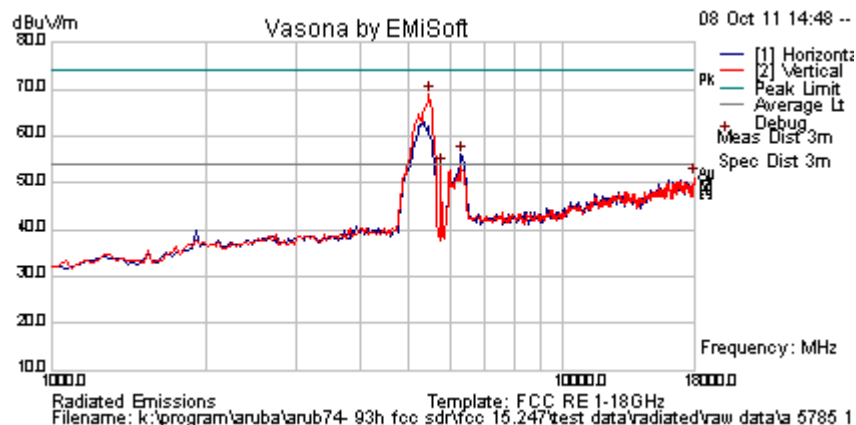
Date: 9.OCT.2011 13:15:19

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|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5785 MHz             | Engineer       | GMH  |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| Test Notes 1  |                      |                |      |
| Test Notes 2  |                      |                |      |



#### Formally measured emission peaks

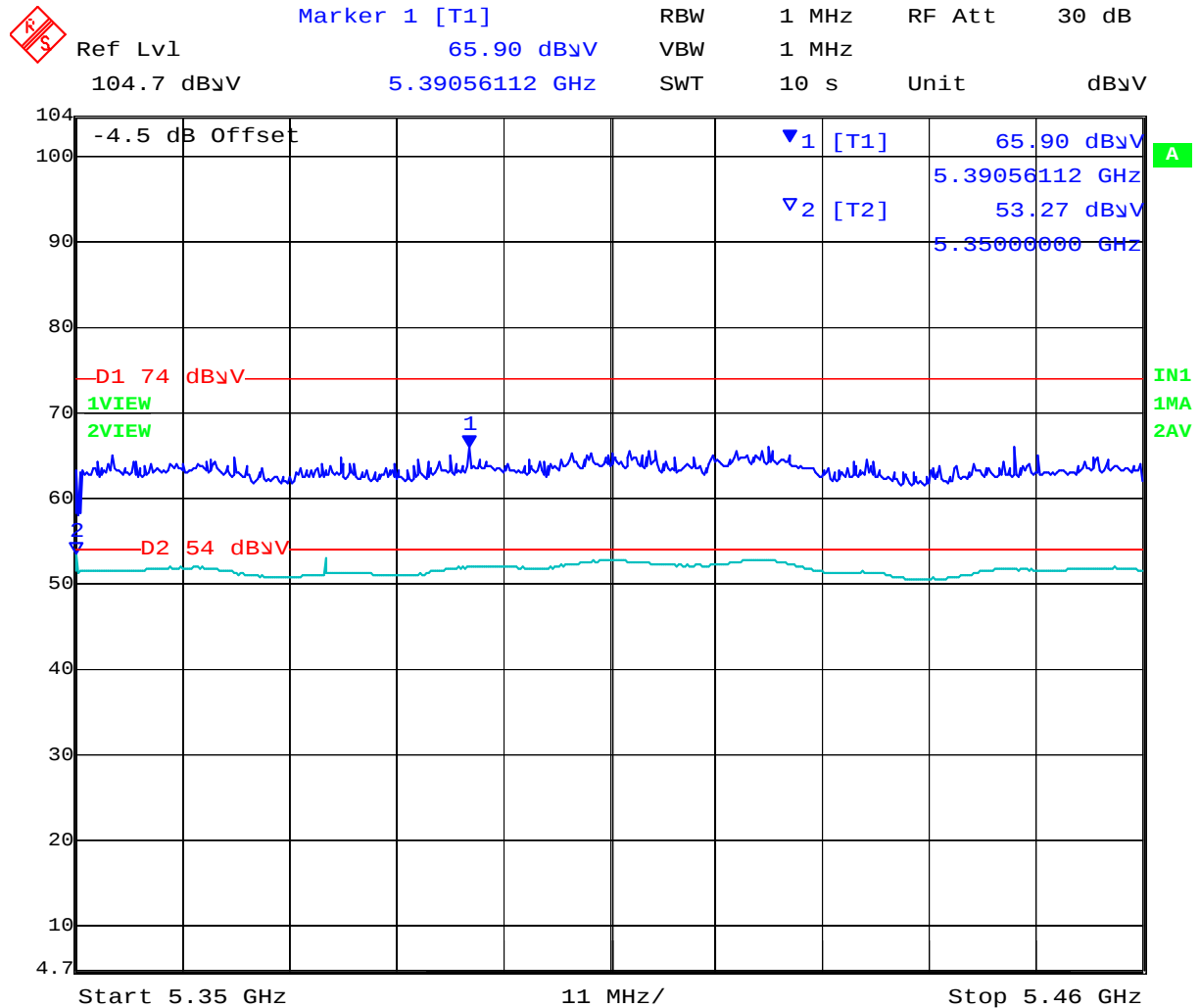
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5462.926                                                                                                                                                                                                         | 73.6     | 4.6        | -9.2  | 68.9         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 6314.62926                                                                                                                                                                                                       | 58.6     | 5.0        | -7.5  | 56.1         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 5769.539                                                                                                                                                                                                         | 57.6     | 4.8        | -8.9  | 53.5         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 18000.000                                                                                                                                                                                                        | 41.8     | 8.8        | 0.8   | 51.3         | Peak [Scan]      | V   | 100    | 0       | 54           | -2.7      | Pass       | NOISE    |
| 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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Band-Edge 5470 802.11a Tx = 5785 MHz



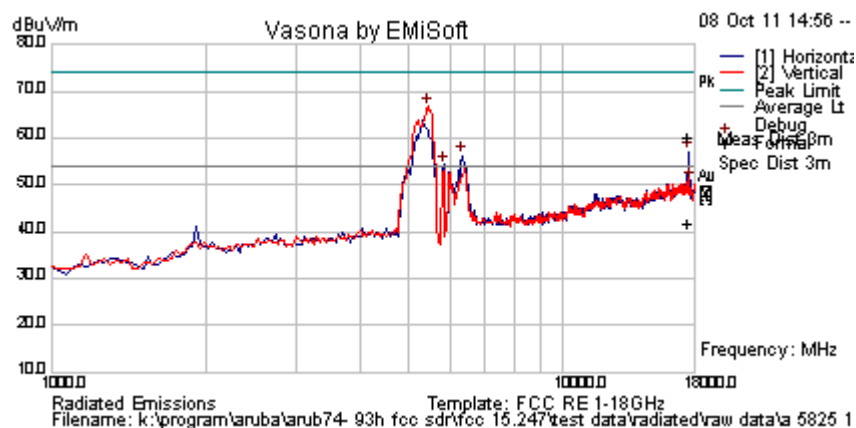
Date: 9.OCT.2011 13:37:29

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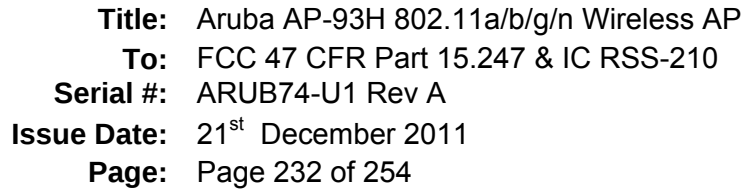
|               |                      |                |      |
|---------------|----------------------|----------------|------|
| Test Freq.    | 5825 MHz             | Engineer       | GMH  |
| Variant       | 802.11a; 6 Mbs       | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz | Rel. Hum.(%)   | 999  |
| Power Setting | 18                   | Press. (mBars) | 30.5 |
| Antenna       | Integral             | Duty Cycle (%) |      |
| 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 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5428.858                                                                                                                                                                                                         | 71.5     | 4.6        | -9.3  | 66.8         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 6348.6974                                                                                                                                                                                                        | 58.6     | 5.1        | -7.4  | 56.2         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 5837.675                                                                                                                                                                                                         | 58.3     | 4.8        | -8.8  | 54.2         | Peak [Scan]      | H   |        |         |              |           |            | FUND     |
| 17488.978                                                                                                                                                                                                        | 31.8     | 8.8        | 1.2   | 41.8         | Average Max      | H   | 98     | 20      | 54           | -12.2     | Pass       | NRB      |
| 17488.978                                                                                                                                                                                                        | 50.3     | 8.8        | 1.2   | 60.3         | Peak Max         | H   | 98     | 20      | 74           | -13.7     | 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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Ref Lvl 104.7 dBμV  
 Marker 1 [T1] 65.43 dBμV  
 RBW 1 MHz  
 VBW 1 MHz  
 SWT 10 s  
 RF Att 30 dB  
 Unit dBμV

-4.5 dB Offset  
 D1 74 dBμV  
 1VIEW  
 2VIEW  
 D2 54 dBμV  
 1  
 2

65.43 dBμV  
 5.42098196 GHz  
 52.71 dBμV  
 5.35000000 GHz

Start 5.35 GHz  
 11 MHz/  
 Stop 5.46 GHz

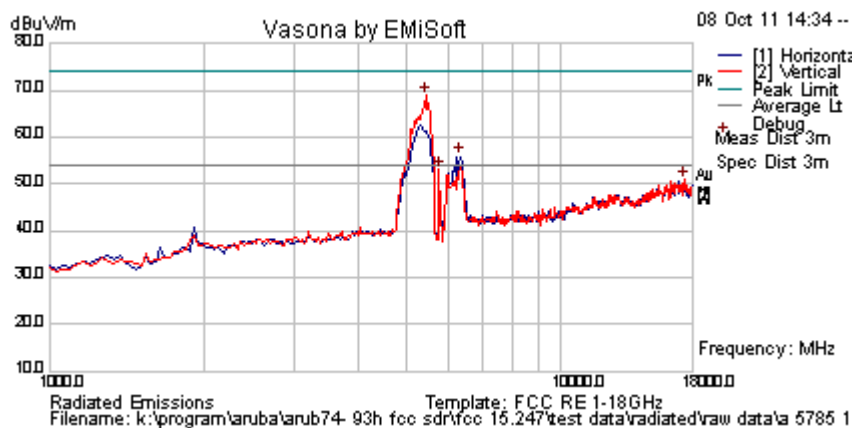
IN1  
 1MA  
 2AV

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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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5745 MHz                | Engineer       | GMH  |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 999  |
| Power Setting | 18                      | Press. (mBars) | 30.5 |
| Antenna       | Integral                | Duty Cycle (%) |      |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

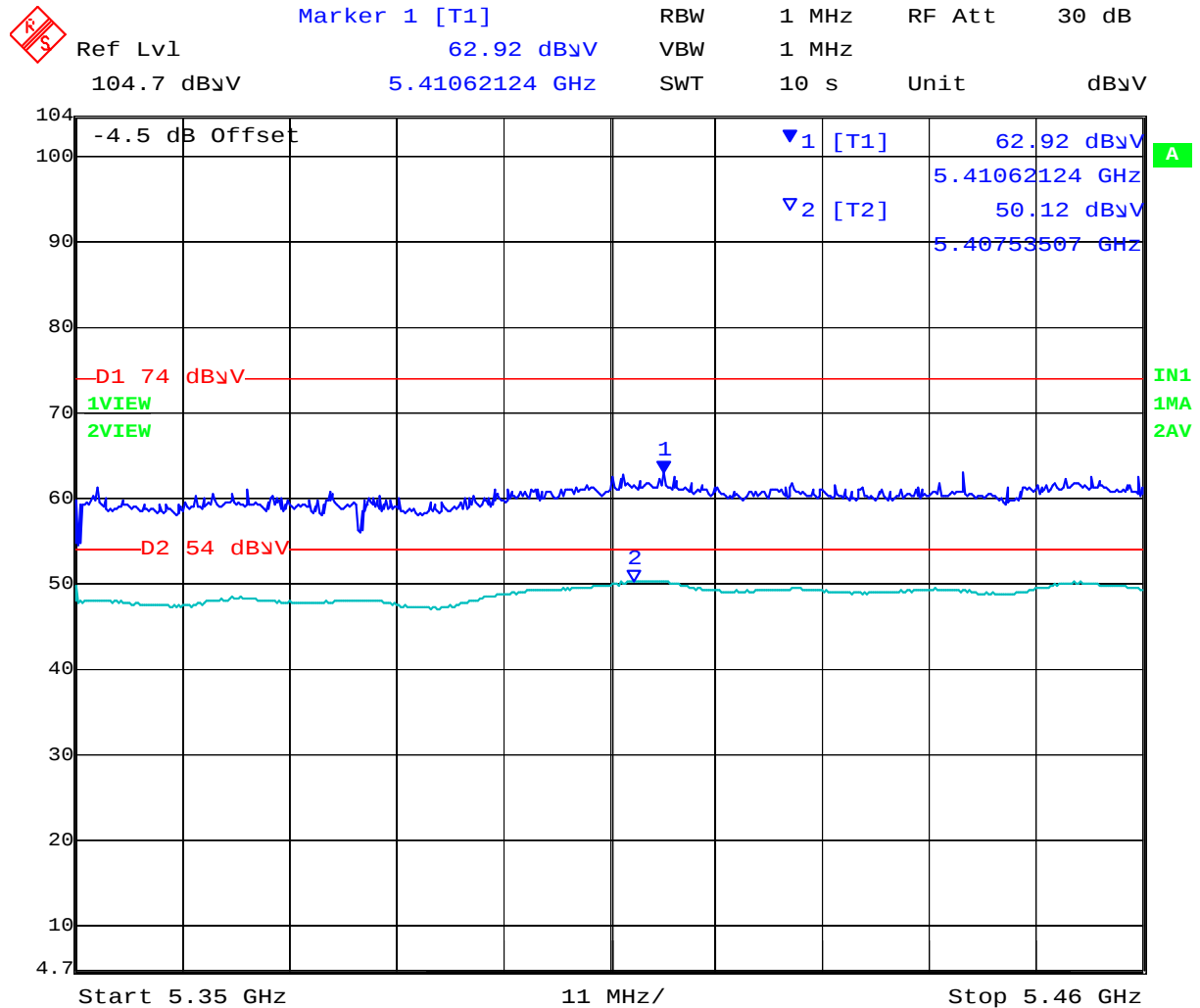
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5462.926                                                                                                | 70.4     | 4.6        | -9.2  | 65.8         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 5735.47094                                                                                              | 60.3     | 4.8        | -8.9  | 56.2         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 6246.493                                                                                                | 55.8     | 5.0        | -7.5  | 53.3         | Peak [Scan]      | H   | 100    | 0       | 54           | -0.8      | Pass       | BE       |
| 17216.433                                                                                               | 41.0     | 8.6        | 1.0   | 50.6         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.4      | Pass       | NOISE    |
| 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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To: FCC 47 CFR Part 15.247 & IC RSS-210  
Serial #: ARUB74-U1 Rev A  
Issue Date: 21<sup>st</sup> December 2011  
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Band-Edge 5470 802.11n HT-20 Tx = 5745 MHz



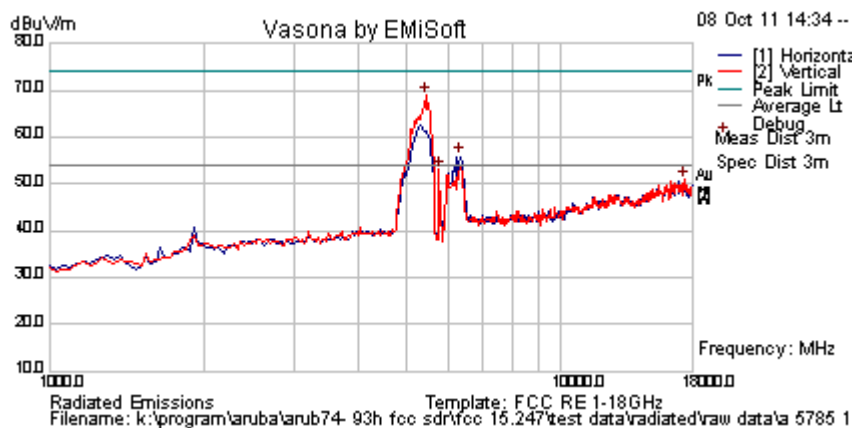
Date: 9.OCT.2011 13:17:32

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5785 MHz                | Engineer       | GMH  |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 999  |
| Power Setting | 18                      | Press. (mBars) | 30.5 |
| Antenna       | Integral                | Duty Cycle (%) |      |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

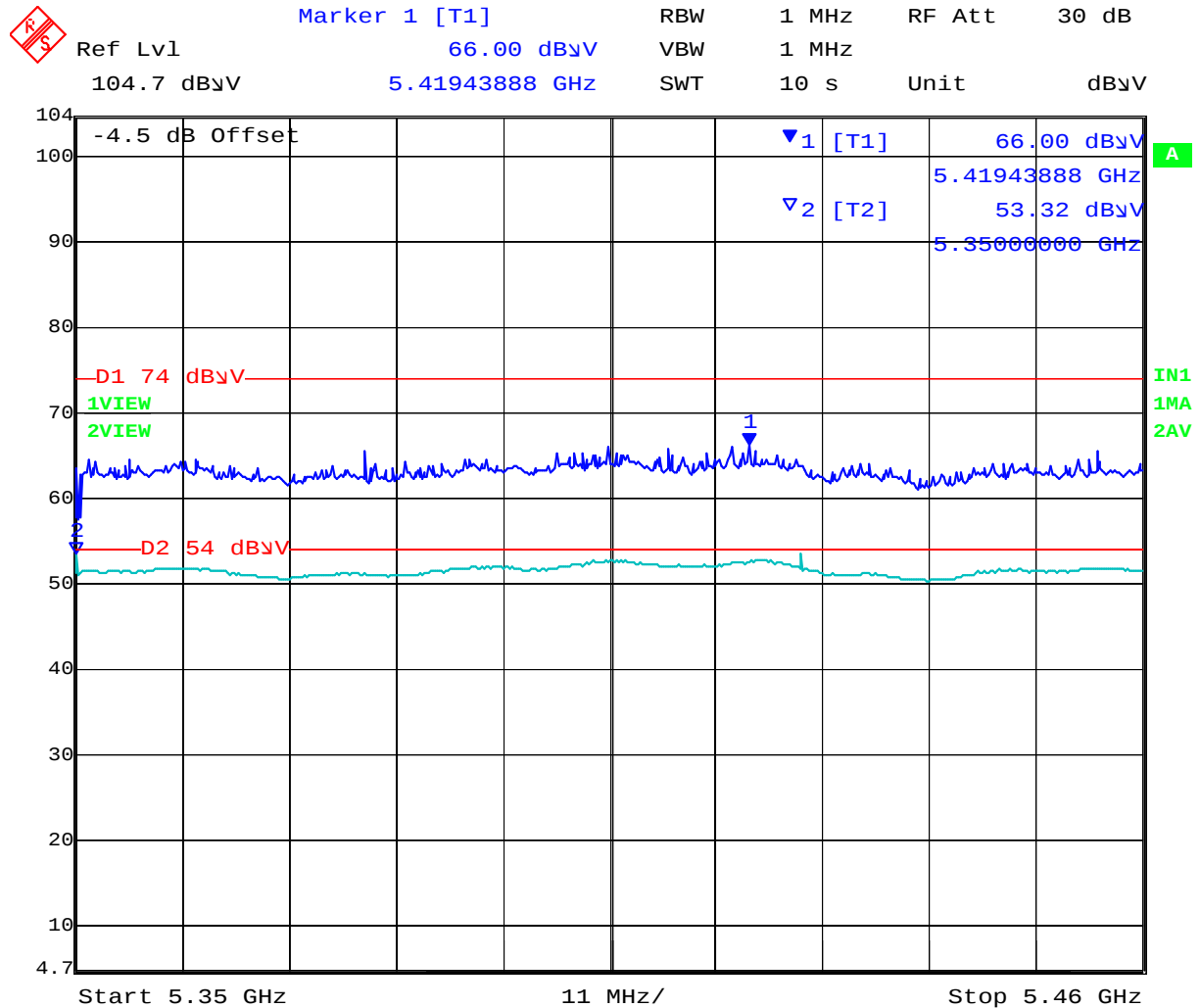
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5428.858                                                                                                | 73.5     | 4.6        | -9.3  | 68.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 6348.6974                                                                                               | 58.2     | 5.1        | -7.4  | 55.8         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 5769.539                                                                                                | 57.3     | 4.8        | -8.9  | 53.2         | Peak [Scan]      | V   | 100    | 0       | 54           | -0.9      | Pass       | BE       |
| 17352.705                                                                                               | 40.6     | 8.7        | 1.6   | 50.8         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.2      | Pass       | NOISE    |
| 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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Band-Edge 5470 802.11n HT-20 Tx = 5785 MHz



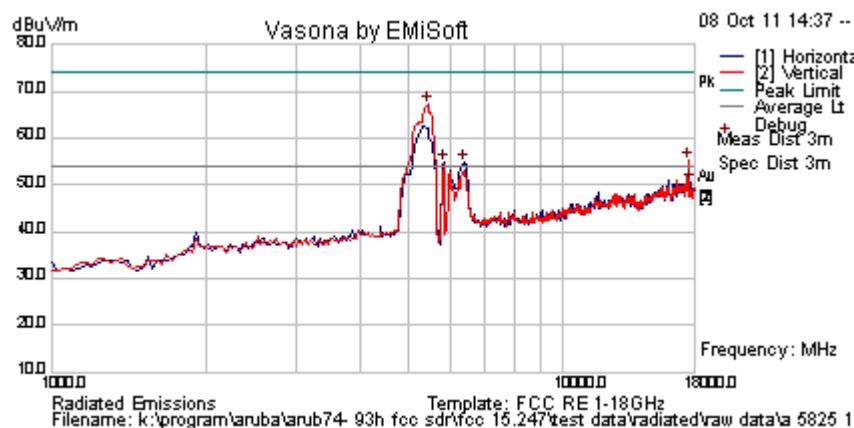
Date: 9.OCT.2011 13:38:33

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|               |                         |                |      |
|---------------|-------------------------|----------------|------|
| Test Freq.    | 5825 MHz                | Engineer       | GMH  |
| Variant       | 802.11n; HT-20; 6.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz    | Rel. Hum.(%)   | 999  |
| Power Setting | 18                      | Press. (mBars) | 30.5 |
| Antenna       | Integral                | Duty Cycle (%) |      |
| Test Notes 1  |                         |                |      |
| Test Notes 2  |                         |                |      |



#### Formally measured emission peaks

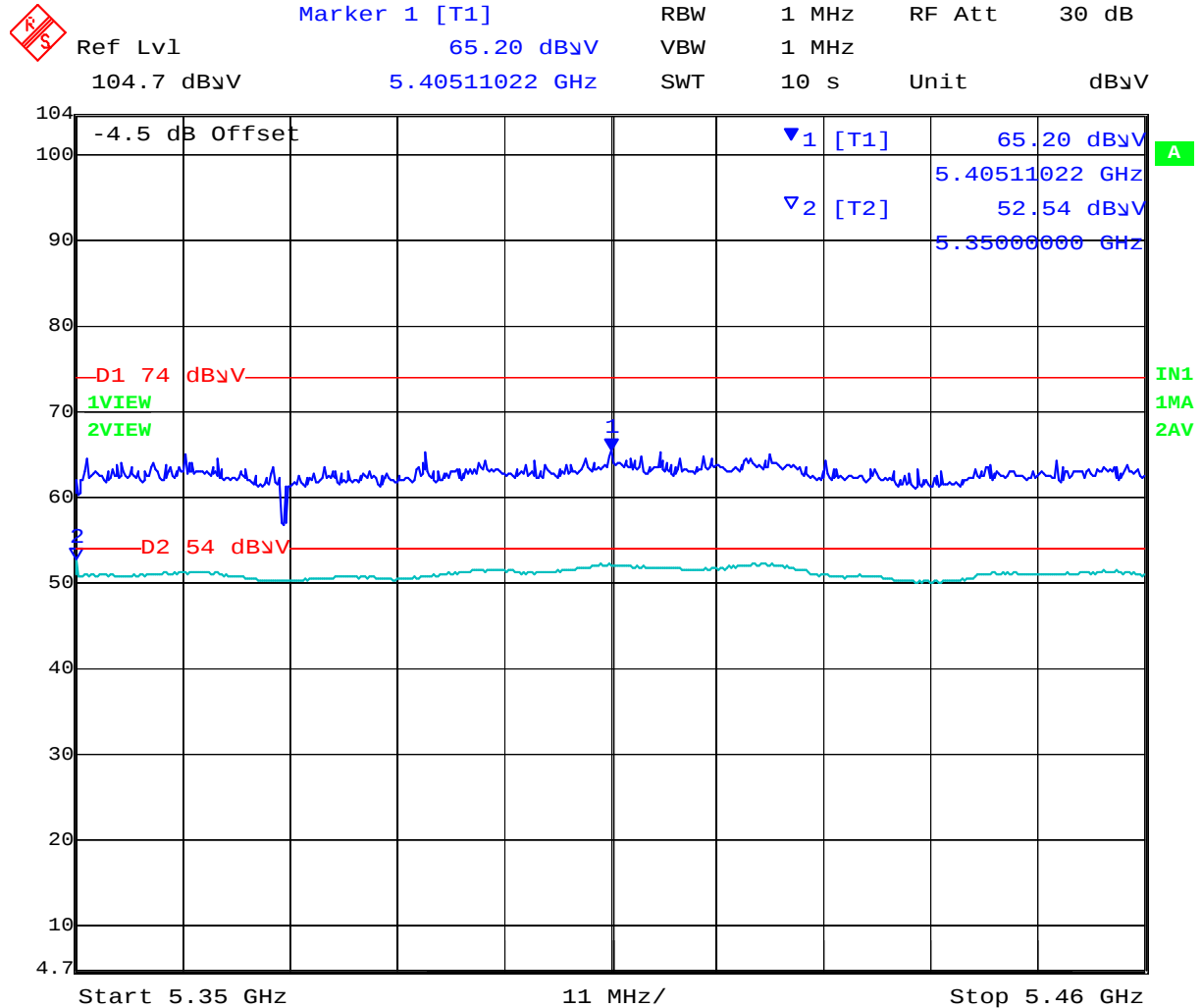
| Frequency MHz                                                                                                                                                                                                    | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5428.858                                                                                                                                                                                                         | 71.8     | 4.6        | -9.3  | 67.1         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 5837.675                                                                                                                                                                                                         | 58.8     | 4.8        | -8.8  | 54.8         | Peak [Scan]      | H   |        |         |              |           |            | FUND     |
| 6382.766                                                                                                                                                                                                         | 57.0     | 5.1        | -7.4  | 54.7         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 17659.319                                                                                                                                                                                                        | 41.0     | 8.8        | 0.8   | 50.5         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.5      | Pass       | NOISE    |
| 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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Band-Edge 5470 802.11n HT-20 Tx = 5825 MHz



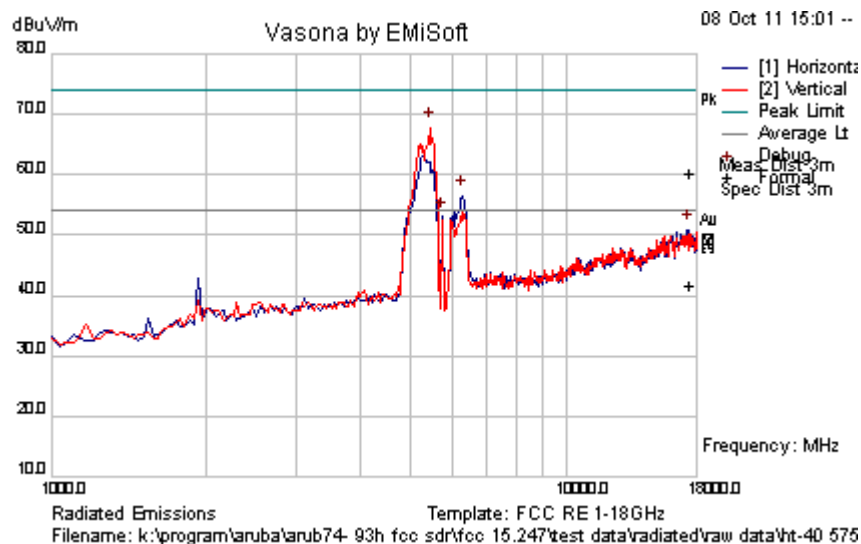
Date: 9.OCT.2011 13:41:58

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5755 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 999  |
| Power Setting | 18                       | Press. (mBars) | 30.5 |
| Antenna       | Integral                 | Duty Cycle (%) |      |
| Test Notes 1  |                          |                |      |
| Test Notes 2  |                          |                |      |



### Formally measured emission peaks

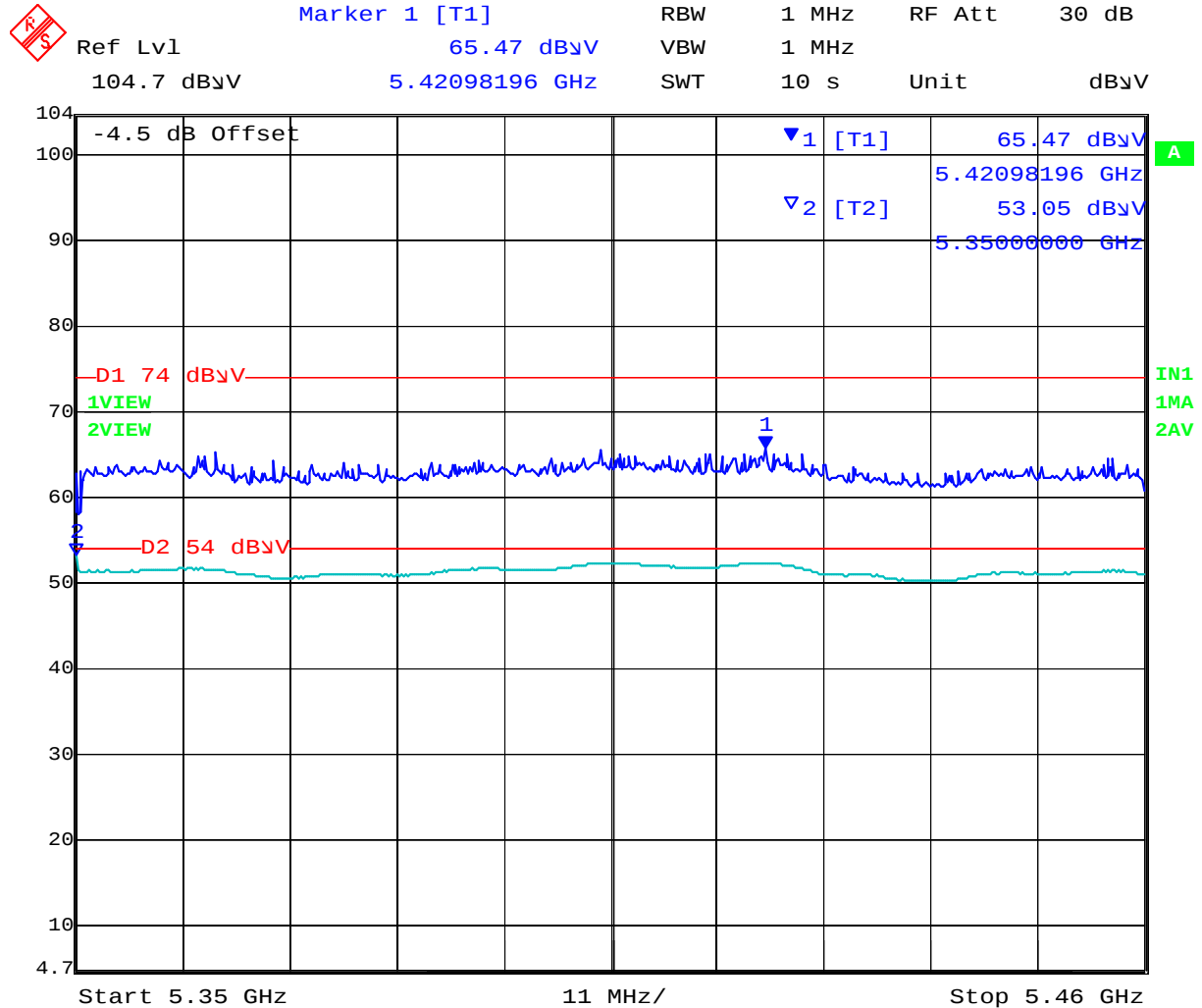
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5428.858                                                                                                | 72.3     | 4.6        | -9.3  | 67.7         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 6280.56112                                                                                              | 59.1     | 5.0        | -7.5  | 56.6         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 5735.471                                                                                                | 57.2     | 4.8        | -8.9  | 53.1         | Peak [Scan]      | H   |        |         |              |           |            | FUND     |
| 17216.433                                                                                               | 41.4     | 8.6        | 1.0   | 50.9         | Peak [Scan]      | H   | 100    | 0       | 54           | -3.1      | Pass       | NOISE    |
| 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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Band-Edge 5470 802.11n HT-40 Tx = 5755 MHz



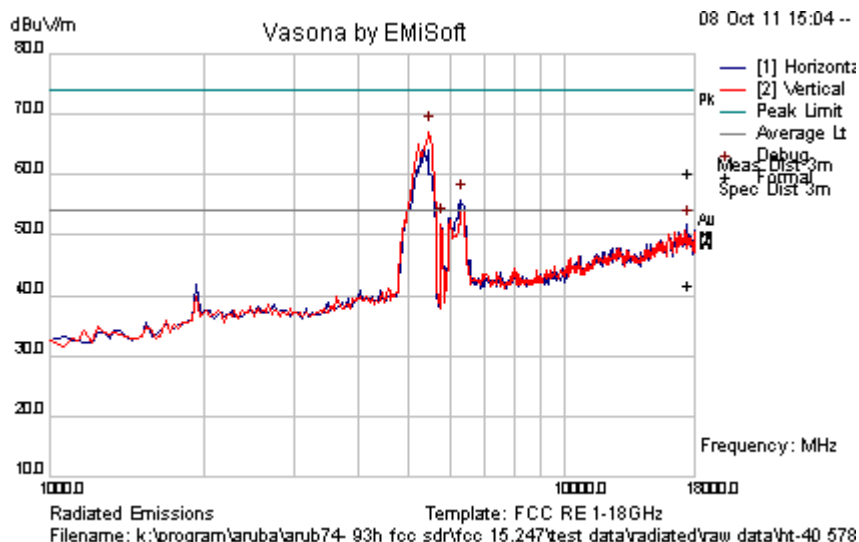
Date: 9.OCT.2011 13:35:43

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5785 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 999  |
| Power Setting | 18                       | Press. (mBars) | 30.5 |
| Antenna       |                          | Duty Cycle (%) |      |
| 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 |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5462.926      | 71.6     | 4.6        | -9.2  | 67.0         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 6314.62926    | 58.2     | 5.0        | -7.5  | 55.7         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 5769.539      | 56.0     | 4.8        | -8.9  | 51.8         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 17386.774     | 41.3     | 8.7        | 1.7   | 51.7         | Peak [Scan]      | H   | 100    | 0       | 54           | -2.3      | Pass       | NOISE    |

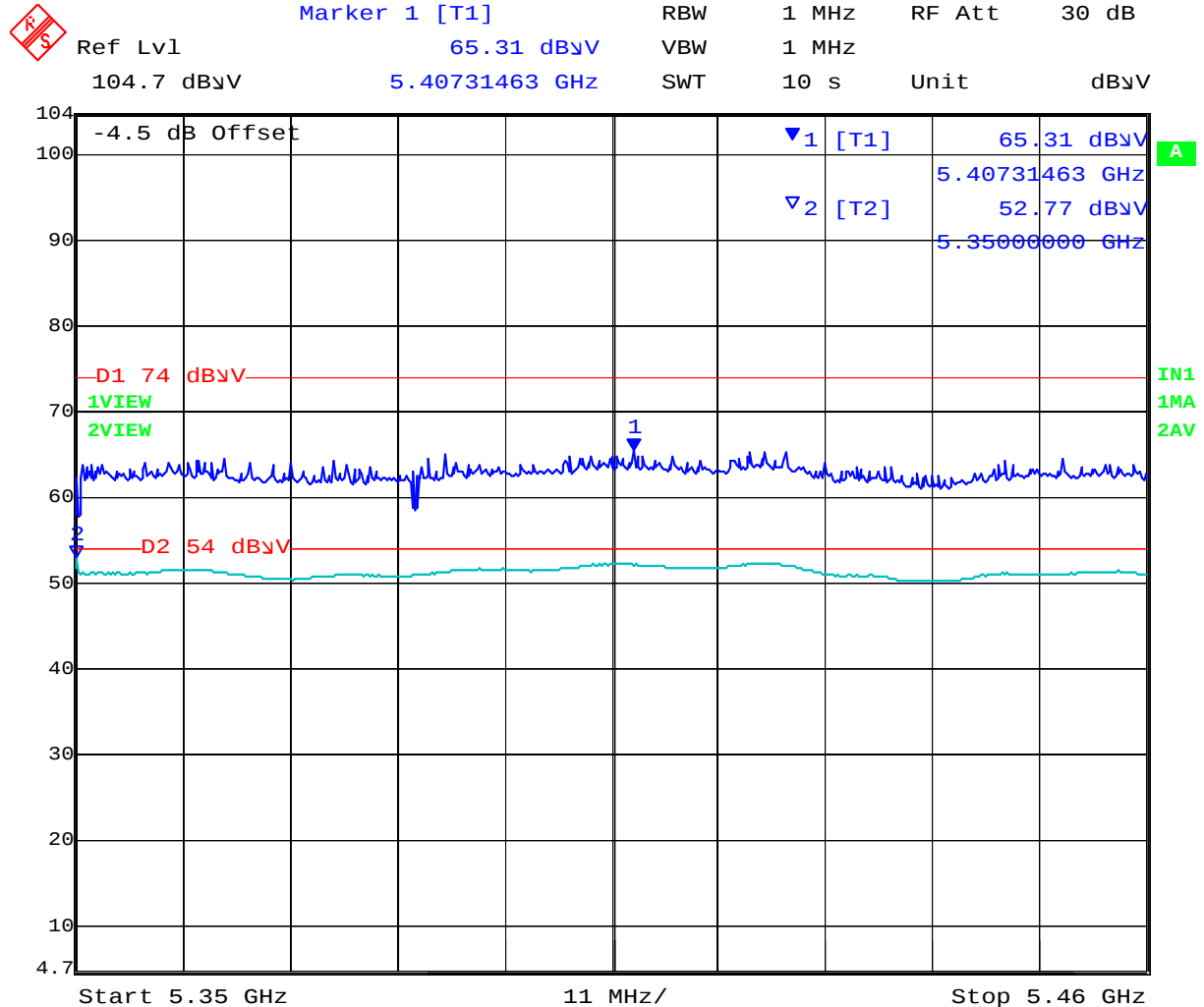
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Band-Edge 5470 802.11n HT-40 Tx = 5795 MHz



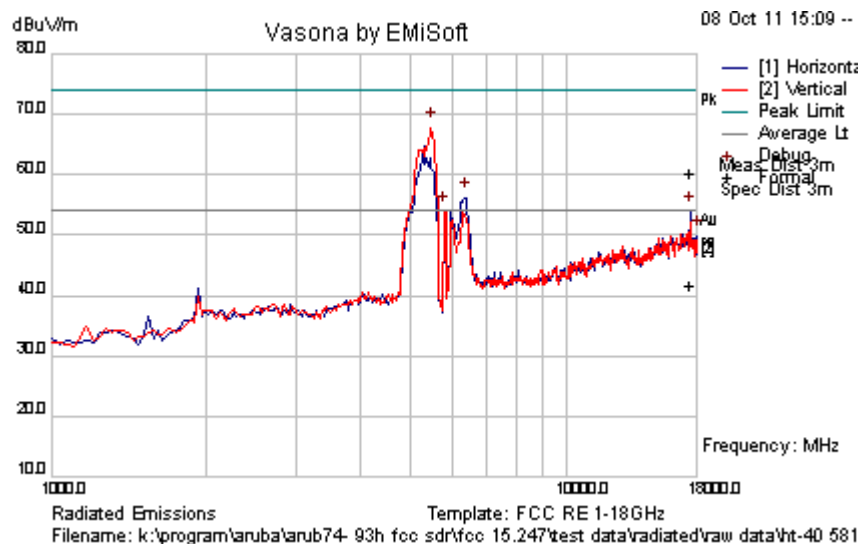
Date: 9.OCT.2011 13:39:45

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|               |                          |                |      |
|---------------|--------------------------|----------------|------|
| Test Freq.    | 5815 MHz                 | Engineer       | GMH  |
| Variant       | 802.11n; HT-40; 13.5 MCS | Temp (°C)      | 29   |
| Freq. Range   | 1000 MHz - 18000 MHz     | Rel. Hum.(%)   | 999  |
| Power Setting | 18                       | Press. (mBars) | 30.5 |
| Antenna       |                          | Duty Cycle (%) |      |
| 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 |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 5462.926      | 72.4     | 4.6        | -9.2  | 67.8         | Peak [Scan]      | V   |        |         |              |           | Pass       | BE       |
| 6382.76553    | 58.5     | 5.1        | -7.4  | 56.2         | Peak [Scan]      | H   |        |         |              |           | Pass       | BE       |
| 17454.910     | 43.9     | 8.7        | 1.4   | 54.0         | Peak [Scan]      | H   | 100    | 0       | 54           | 0.0       | Pass       | NRB      |
| 5803.607      | 58.0     | 4.8        | -8.9  | 53.9         | Peak [Scan]      | V   |        |         |              |           |            | FUND     |
| 18000.000     | 40.4     | 8.8        | 0.8   | 50.0         | Peak [Scan]      | H   | 100    | 0       | 54           | -4.0      | Pass       | NOISE    |

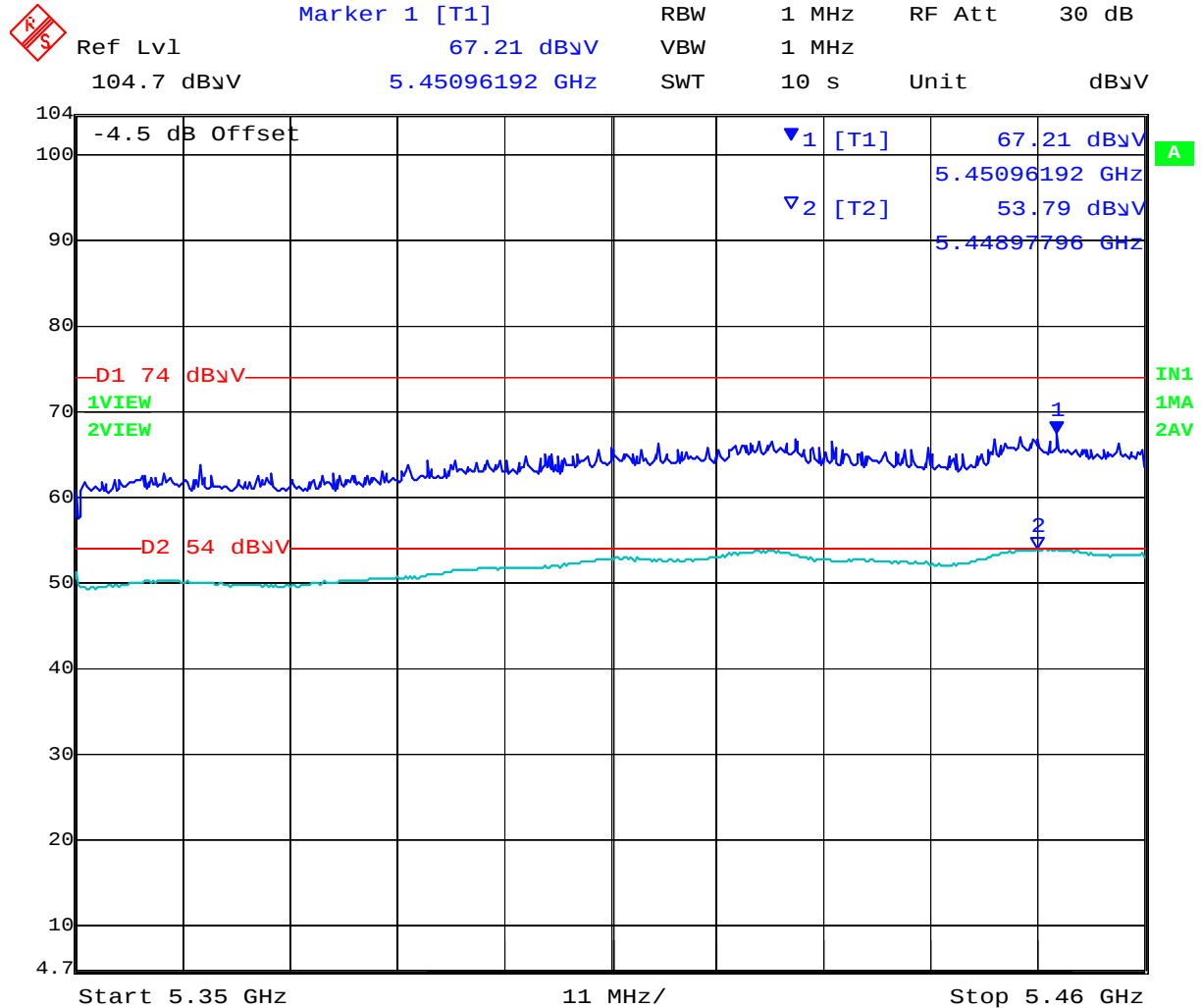
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Band-Edge 5470 802.11n HT-20 Tx = 5815 MHz



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## 7.6.2 Receiver Radiated Spurious Emissions

### Specification

#### Industry Canada RSS-Gen §4.10,

The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

#### RSS-Gen §6

The following receiver spurious emission limits shall be complied with;

(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

| Frequency<br>(MHz) | Field Strength<br>( $\mu\text{V/m}$ ) | Field Strength<br>(dB $\mu\text{V/m}$ ) | 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 |

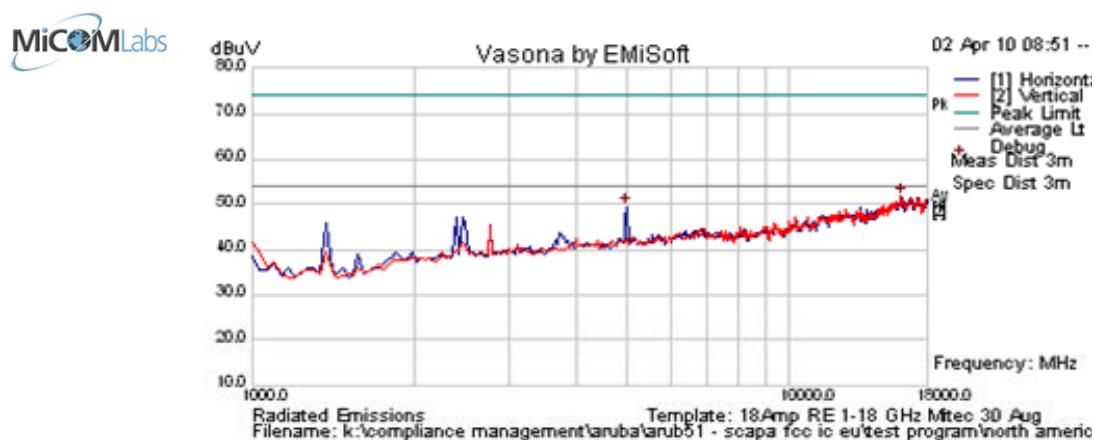
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## Measurement Results for Receiver Emissions

|                      |                                             |                       |      |
|----------------------|---------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2437 MHz                                    | <b>Engineer</b>       | CSB  |
| <b>Variant</b>       | Receive in Test Utility                     | <b>Temp (°C)</b>      | 19   |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz                        | <b>Rel. Hum.(%)</b>   | 35   |
| <b>Power Setting</b> | Not Applicable in Receive Mode              | <b>Press. (mBars)</b> | 1011 |
| <b>Antenna</b>       | Integral Antenna's connected during testing |                       |      |
| <b>Test Notes 1</b>  | AC Powered                                  |                       |      |
| <b>Test Notes 2</b>  |                                             |                       |      |



## Formally measured emission peaks

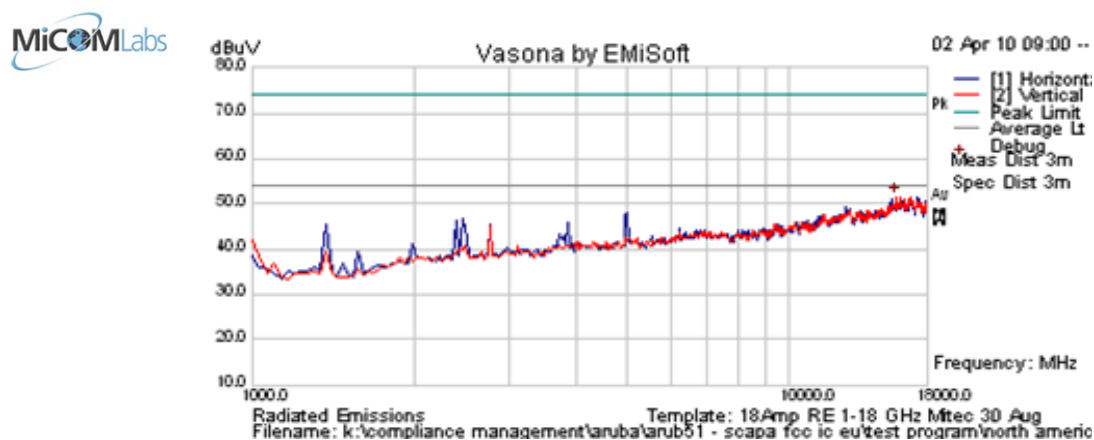
| Frequency MHz                                                                             | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|-------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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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|                      |                                             |                       |      |
|----------------------|---------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5785 MHz                                    | <b>Engineer</b>       | CSB  |
| <b>Variant</b>       | Receive in Test Utility                     | <b>Temp (°C)</b>      | 19   |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz                        | <b>Rel. Hum.(%)</b>   | 35   |
| <b>Power Setting</b> | Not Applicable in Receive Mode              | <b>Press. (mBars)</b> | 1011 |
| <b>Antenna</b>       | Integral Antenna's connected during testing |                       |      |
| <b>Test Notes 1</b>  | AC Powered                                  |                       |      |
| <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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### 7.6.3 Measurement Results: Radiated Spurious Emissions – Below 1 GHz

#### Specification

#### Limits

**§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.

#### **§15.209 (a)** and **RSS-Gen §2.2** Limit Matrix

| 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

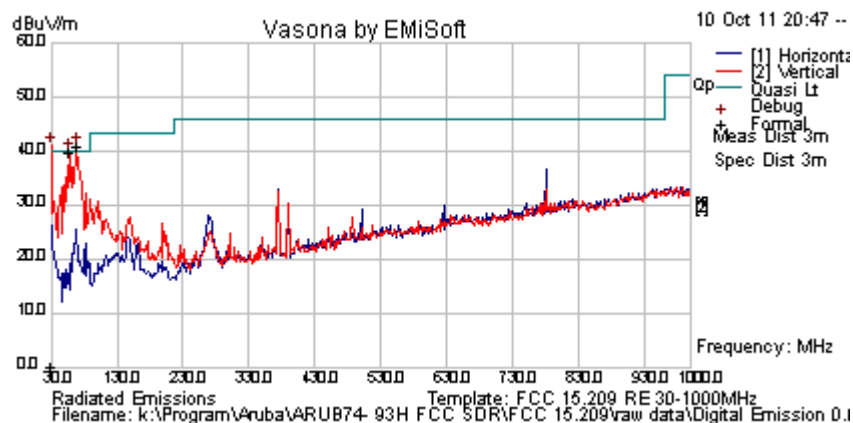
| Method                                                                                | Test Equipment Used                            |
|---------------------------------------------------------------------------------------|------------------------------------------------|
| Measurements were made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

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|               |                   |                |      |
|---------------|-------------------|----------------|------|
| Test Freq.    | 2442 MHz          | Engineer       | GMH  |
| Variant       | Digital Emissions | Temp (°C)      | 25   |
| Freq. Range   | 30 MHz - 1000 MHz | Rel. Hum.(%)   | 41   |
| Power Setting | Max               | Press. (mBars) | 1001 |
| Antenna       | integral          |                |      |
| 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 |
|------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 30.000                                                                                         | 41.1     | 3.4        | -9.2  | 35.3         | Quasi Max        | V   | 107    | 297     | 40           | -4.7      | Pass       |          |
| 57.214                                                                                         | 56.1     | 3.8        | -23.7 | 36.2         | Quasi Max        | V   | 98     | 176     | 40.0         | -3.8      | Pass       |          |
| 69.184                                                                                         | 58.2     | 3.9        | -23.0 | 39.1         | Quasi Peak       | V   | 130    | 201     | 40.0         | -0.9      | Pass       |          |
| 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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## 7.7 AC Wireline Conducted Emissions (150 kHz – 30 MHz)

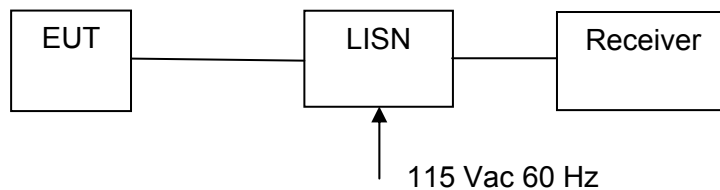
**FCC, Part 15 Subpart C §15.407(b)(6)/15.207**

**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 (dBμV) |           |
|-----------------------------|------------------------|-----------|
|                             | 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 | ±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 |

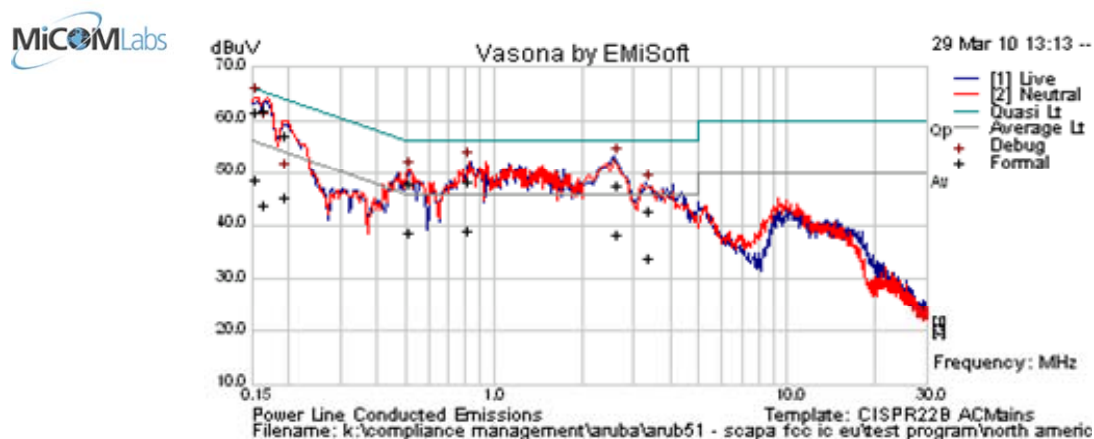
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### Measurement Results for AC Wireline Conducted Emissions (150 kHz – 30 MHz)

|                      |                           |                       |      |
|----------------------|---------------------------|-----------------------|------|
| <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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## 8 TEST EQUIPMENT DETAILS

| Asset # | Instrument                | Manufacturer     | Part #                    | Serial #    |
|---------|---------------------------|------------------|---------------------------|-------------|
| 0088    | Spectrum Analyzer         | Hewlett Packard  | 8564E                     | 3410A00141  |
| 0134    | Amplifier                 | Com Power        | PA 122                    | 181910      |
| 0158    | Barometer<br>/Thermometer | Control Co.      | 4196                      | E2846       |
| 0287    | EMI Receiver              | Rhode & Schwartz | ESIB 40                   | 100201      |
| 0252    | SMA Cable                 | Megaphase        | Sucoflex 104              | None        |
| 0310    | 2m SMA Cable              | Micro-Coax       | UFA210A-0-0787-<br>3G03G0 | 209089-001  |
| 0312    | 3m SMA Cable              | Micro-Coax       | UFA210A-1-1181-<br>3G0300 | 209092-001  |
| 0313    | Coupler                   | Hewlett Packard  | 86205A                    | 3140A01285  |
| 0314    | 30dB N-Type<br>Attenuator | ARRA             | N9444-30                  | 1623        |
| 0070    | Power Meter               | Hewlett Packard  | 437B                      | 3125U11552  |
| 0116    | Power Sensor              | Hewlett Packard  | 8485A                     | 3318A19694  |
| 0117    | Power Sensor              | Hewlett Packard  | 8487D                     | 3318A00371  |
| 0184    | Pulse Limiter             | Rhode & Schwartz | ESH3Z2                    | 357.8810.52 |
| 0190    | LISN                      | Rhode & Schwartz | ESH3Z5                    | 836679/006  |
| 0293    | BNC Cable                 | Megaphase        | 1689 1GVT4                | 15F50B001   |
| 0301    | 5.6 GHz Notch Filter      | Micro-Tronics    | RBC50704                  | 001         |
| 0302    | 5.25 GHz Notch Filter     | Micro-Tronics    | BRC50703                  | 002         |
| 0303    | 5.8 GHz Notch Filter      | Micro-Tronics    | BRC50705                  | 003         |
| 0304    | 2.4GHzHz Notch Filter     | Micro-Tronics    | --                        | 001         |
| 0307    | BNC Cable                 | Megaphase        | 1689 1GVT4                | 15F50B002   |
| 0335    | 1-18GHz Horn Antenna      | ETS- Lindgren    | 3117                      | 00066580    |
| 0337    | Amplifier                 | MiCOM Labs       | --                        | --          |
| 0338    | Antenna                   | Sunol Sciences   | JB-3                      | A052907     |

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