Test of AP-175AC / MSR2K23N1 /
AP-175DC / MSR2K23N2 802.11a/b/g/n Wireless AP

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

Test Report Serial No.: ARUB86-U1 Rev B

TEST REPORT

FROM

Test of: Aruba Networks, Inc AP-175AC / MSR2K23N1
AP-175DC / MSR2K23N2 802.11a/b/g/n Wireless AP

To: FCC 47 CFR Part 15.247 & IC RSS 210

Test Report Serial No.: ARUB86-U1 Rev B

This report supersedes: ARUB86-U1 Rev A

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

Product Function: Wireless LAN Access Point

Copy No: pdf **Issue Date:** 2nd February 2012

This Test Report is Issued Under the Authority of;

MiCOM Labs, Inc.
440 Boulder Court, Suite 200
Pleasanton, CA 94566 USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

ACCREDITED
TESTING CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

TABLE OF CONTENTS

1 ACCREDITATION, LISTINGS & RECOGNITION

1.1 ACCREDITATION

MiCOM Labs, Inc. an accredited laboratory complies with the international standard EN ISO/IEC 17025. The company is accredited by the American Association for Laboratory Accreditation (A2LA) 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 Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

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

Presented this 14th day of April 2010.

President & CEO
For the Accreditation Council
Certificate Number 2381.01
Valid to March 31, 2012
Revised January 20, 2012

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

1.2 LISTINGS

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

1.3 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 test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-02.pdf


The American Association for Laboratory Accreditation
World Class Accreditation

Accredited Product Certification Body

A2LA has accredited

MICOM LABS

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 24th day of June 2010.

President & CEO
For the Accreditation Council
Certificate Number 2381.02
Valid to March 31, 2012
Revised January 20, 2012

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

United States of America – Telecommunication Certification Body (TCB)
TCB Identifier – US0159

Industry Canada – Certification Body
CAB Identifier – US0159

Europe – Notified Body
Notified Body Identifier - 2280

Japan – Recognized Certification Body (RCB)
RCB Identifier - 210

2 DOCUMENT HISTORY

Document History		
Revision	**Date**	**Comments**
Draft		
Rev A	22nd December 2011	Initial Release Product initially released as AP-175P, 1st November 2010 see MiCOM Labs test report ARUB61-U1 (FCC CFR 47 Part 15, Subpart 15.247 & IC RSS-210 Annex 8). Product development modified the front end power supply to accept 120 Vac 60 Hz only (no dc). No changes were made to the 802.11 a/b/g/n wireless module also no changes were made to the selected antenna's. Product now released AP-175AC As a result of changes to the power supply this test program tested Radiated Emissions below 1 GHz (see Section 7.4) and ac Wireline Emissions (see Section 7.5).
Rev B	2nd Feb 2011	Included data for access point AP-175DC (48Vdc powered version) Updated Section 7.4 Radiated Spurious Emissions – Digital Apparatus

3 TEST RESULT CERTIFICATE

Applicant:	Aruba Networks, Inc 1344 Crossman Avenue Sunnyvale California , 94089, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT	802.11a/b/g/n Wireless AP	Tel:	+1 925 462 0304
Model	AP-175AC / MSR2K23N1 AP-175DC / MSR2K23N2	Fax:	+1 925 462 0306
S/No's:	25A02102800027 (AP-175AC) AY0009995 (AP-175DC)		
Test Date(s)	21st January 2012 (AP-175DC)23rd 21st - 29th Nov 2011 (AP-175AC) Sept – 7th Oct 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:

ACCREDITED
TESTING CERTIFICATE #2381.01

Graeme Grieve
Quality Manager MiCOM Labs,

Gordon Hurst
President & CEO MiCOM Labs, Inc.

4 REFERENCES AND MEASUREMENT UNCERTAINTY

4.1 Normative References

Ref.	Publication	Year	Title
i.	47 CFR Part 15, SubPart 15.247	2009	For Digitally Modulated Intentional Radiators
ii.	Industry Canada RSS-210 Annex 8	Issue 8 Dec 2010	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
iii.	Industry Canada RSS-Gen	Issue 3 Dec 2010	General Requirements and Information for the Certification of Radiocommunication Equipment
iv.	ANSI C63.4	2009	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
v.	CISPR 22/ EN 55022	2008	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
vi.	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
vii.	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
viii.	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
ix.	A2LA	9th June 2010	Reference to A2LA Accreditation Status – A2LA Advertising Policy

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:

Standard Section(s)	Test Description	Condition	Result	Test Report Section
15.247 (b) (3) RSS-210 A8	Maximum Conducted Power & EIRP	Conducted	Compliant	7.1
1.1310 RSS-GEN §5.5	Maximum Permissible Exposure	Calculated	Compliant	7.2
(d), 15.205, 15.209	Transmitter Radiated Spurious Emissions	Radiated	Compliant	7.3
(d), 15.205, 15.209	Transmitter Band-Edge Emissions	Radiated	Compliant	
RSS-GEN	Transmitter Peak Emissions	Radiated	Compliant	
RSS-GEN	Transmitter Receiver Emissions	Radiated	Compliant	
15.205	Radiated (Digital) Emissions	Radiated	Compliant	7.4

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

6 PRODUCT DETAILS AND TEST CONFIGURATIONS

6.1 EUT Details

Detail	Description
Purpose:	Test of the Aruba Networks, Inc AP-175AC / MSR2K23N1, AP-175DC / MSR2K23N2 802.11a/b/g/n Wireless Access Point for compliance against FCC 47 CFR Part 15, SubPart 15.247 and Industry Canada RSS-210 regulations.
Applicant:	Aruba Networks, Inc 1344 Crossman Avenue Sunnyvale , CA 94089 USA
Manufacturer:	As manufacturer
Test Laboratory:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	ARUB86-U1 Rev B
Date EUT received:	AP-175DC: 12th January 2012 AP-175AC: 23rd September 2010
Dates of test (from - to):	AP-175DC: 21st January 2012 AP-175AC: 23rd Sept – 7th Oct 2010, 21st - 29th Nov '11
No of Units Tested:	2
Product Name:	AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2
Manufacturers Trade Name:	Wireless Access Point
Equipment Primary Function:	802.11a/b/g/n Wireless Access Point, 2x2 Spatial Multiplexing MIMO configuration
Type of Technology:	802.11a/b/g/n
Installation type:	Fixed
Construction/Location for Use:	Outdoor only
Software/Firmware Release:	Build# 75568 Version: 5.0.7.1
Transmit/Receive Operation:	TDD (Time Div Duplex)
Output Power Type	Stepped _
Rated Input Voltage and Current:	120 VAC, 60Hz
Operating Temperature Range:	Nominal: 20 ºC Max: 50 ºC Min: 0 ºC
ITU Emission Designator(s):	2400 – 2483.5 MHz 802.11b 15M6G1D 2400 – 2483.5 MHz 802.11g 16M5D1D 2400 – 2483.5 MHz 802.11n – HT-20 17M8D1D 2400 – 2483.5 MHz 802.11n – HT-40 35M9D1D 5725 – 5850 MHz 802.11a 16M6D1D 5725 – 5850 MHz 802.11n – HT-20 17M8D1D 5725 – 5850 MHz 802.11n – HT-40 36M4D1D
Long Term Frequency Stability:	±20 ppm
Equipment Dimensions:	10.2“ x 10.2” x 4.0” (25.9cm x 25.9cm x 10.2cm)
Weight:	7ibs (3.25 kgs)
Primary function of equipment:	Wireless Access Point for transmitting data and voice

6.2 Scope of Test Program

The scope of the compliance program was to test the Aruba Networks Inc AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2 802.11 a/b/g/n AP wireless 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 for Radiated Emissions.

The Aruba Networks AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2 has external antennas with N-type connectors. The device has two radios with two transmit and receive antennae. The antennas used with the AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2 are detailed in section 6.4 “Antenna Details”.

The Aruba Networks AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2 contains two WLAN 802.11a/b/g/n MiniPCI modules model DNMA-H92. The results for conducted testing for compliance to the requirements of FCC Pt 15.247 & IC RSS-210 Annex 8 are reported in Sporton International Inc test report No. FR9N1919-01AB.

Product Differences

The AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2 is connected directly to AC mains supply 100Vac – 240Vac

The AP-175AC/MSR2K23N1, AP-175DC/ MSR2K23N2 is powered directly by 48 Vdc

As a result only Radiated Emissions were performed in order to prove compliance with this regulation.

6.3 Equipment Model(s) and Serial Number(s)

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	802.11 a/b/g/n Wireless Access Point	Aruba Networks Inc	AP-175DC	AY0009995
EUT	802.11 a/b/g/n Wireless Access Point	Aruba Networks Inc	AP-175AC	25A02102800027
Support	Laptop PC – ThinkPad	IBM	T60	-
Support	Laptop PC – ThinkPad	IBM	T30	-
Support	Switch Controller	Aruba Networks Inc	620	AE0000949

6.4 Antenna Details

The following is a description of the EUT antennas.

Antenna Type:	Manufacturer	Model	Gain (dBi)	Frequency Range (MHz)
Dipole	Aruba	AP-ANT-80D	8	2400 – 2500 MHz
Dipole	Aruba	AP-ANT-86	9	5150 – 5875 MHz
Directional	Aruba	AP-ANT-85	15	2400 – 2500 MHz
Directional	Aruba	AP-ANT-89	13.25	5470 – 5875 MHz

6.5 Cabling and I/O Ports

Number and type of I/O ports on supporting wireless access point

1. 1000/100/10 Ethernet.
2. USB Local maintenance terminal (LMT) x 1.

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

Legacy – data rates for 802.11a/b/g products

Results for the above configurations are provided in this report

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

7 TEST RESULTS

7.1 Maximum Transmit Power (EIRP)

Output power measurements were taken from the EUT various power settings for each operational mode. An output power V's antenna gain matrix has been generated for worst case conditions. Power levels for each frequency and operational mode has been taken into consideration in the generation of the following matrix.

The quoted EIRP is the maximum allowable for the antenna gain.

2,400 – 2483.5 MHz Operation

Antenna Gains

Antenna Type:	Manufacturer	Model	Gain (dBi)	Frequency Range (MHz)
Dipole	Aruba	AP-ANT-80D	8	2400 – 2500 MHz
Directional	Aruba	AP-ANT-85	15	2400 – 2500 MHz

Frequency Band 2400-2483.5 MHz

Power Setting	Port A (dBm)	Port B (dBm)	Calculated Combined Power Level (dBm)	EIRP V's Antenna Gain (dBm/EIRP)	
				8 dBi	15 dBi
4	1.39	1.59	4.5	+12.5	+19.5
8	4.86	7.21	9.2	+17.2	+24.2
9	5.77	8.63	10.4	+18.4	+25.4
10	6.54	9.61	11.4	+19.4	+26.4
17	16.58	16.83	19.7	+27.7	+34.7
18	17.64	17.85	20.7	+28.7	+35.7
19	18.75	18.91	21.8	+29.8	
20	19.56	19.83	22.7	+30.7	

Note: Maximum transmit EIRP = +36 dBm. The conducted power level setting for a particular antenna is restricted to boxes with an EIRP value in the above table.

5,725 – 5,850 MHz Operation

Antenna Gains

Antenna Type:	Manufacturer	Model	Gain (dBi)	Frequency Range (MHz)
Dipole	Aruba	AP-ANT-86	9	5150 – 5875 MHz
Directional	Aruba	AP-ANT-89	13.25	5470 – 5875 MHz

Frequency Band 5725-5850

Power Setting	Port A (dBm)	Port B (dBm)	Calculated Combined Power Level (dBm)	EIRP V's Antenna Gain (dBm/EIRP)	
				9 dBi	13.25 dBi
9	8.05	8.92	11.6	+20.6	+24.8
10	8.72	10.06	12.5	+21.5	+25.7
11	10.51	11.04	13.8	+22.8	+27.1
12	12.39	11.78	15.1	+24.1	+28.4
13	13.34	12.65	16.1	+25.1	+29.3
14	14.62	13.92	17.4	+26.4	+30.6
15	15.71	15.06	18.5	+27.5	+31.7
16	16.51	15.93	19.3	+28.3	+32.6
17	17.72	16.36	20.1	+29.1	+33.4
18	18.47	17.85	21.2	+30.2	+34.5
19	19.83	18.92	22.5	+31.5	+35.7
20	21.07	20.03	23.7	+32.7	

Note: Maximum transmit EIRP = +36 dBm. The conducted power level setting for a particular antenna is restricted to boxes with an EIRP value in the above table.

Specification

Limits

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following

(3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

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.

Laboratory Uncertainty for Power Measurement(s)

Measurement uncertainty	±1.33dB

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0070, 0075, 0116, 0156, 0193, 0252, 0313, 0314

7.2 Maximum Permissible Exposure

FCC, Part 15 Subpart C §15.247(i)
Industry Canada RSS-Gen §5.5

Calculations for Maximum Permissible Exposure Levels

Power Density = Pd (mW/cm^2) = EIRP/(4πd^2)
EIRP = P * G * 2
P = Peak output power (mW)
G = Antenna numeric gain (numeric)
d = Separation distance (cm)
Numeric Gain = 10 ^ (G (dBi)/10)

The Aruba AP-175P / MSR2K23N0-XX has two transmitters. The peak power used in the table below is the highest conducted level used to meet the EIRP requirements.

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

Freq. Band (MHz)	Antenna Gain (dBi)	Antenna Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ 1mW/cm^2 Limit(cm)	Minimum Separation Distance (cm)
2400 – 2500	15.0	31.62	+20.7	117.5	17.2	20.00
5725 - 5850	13.25	21.10	+22.1	162.2	16.5	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^2 from 1.310 Table 1

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

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB

7.3 Radiated Spurious Emissions - Radio Device

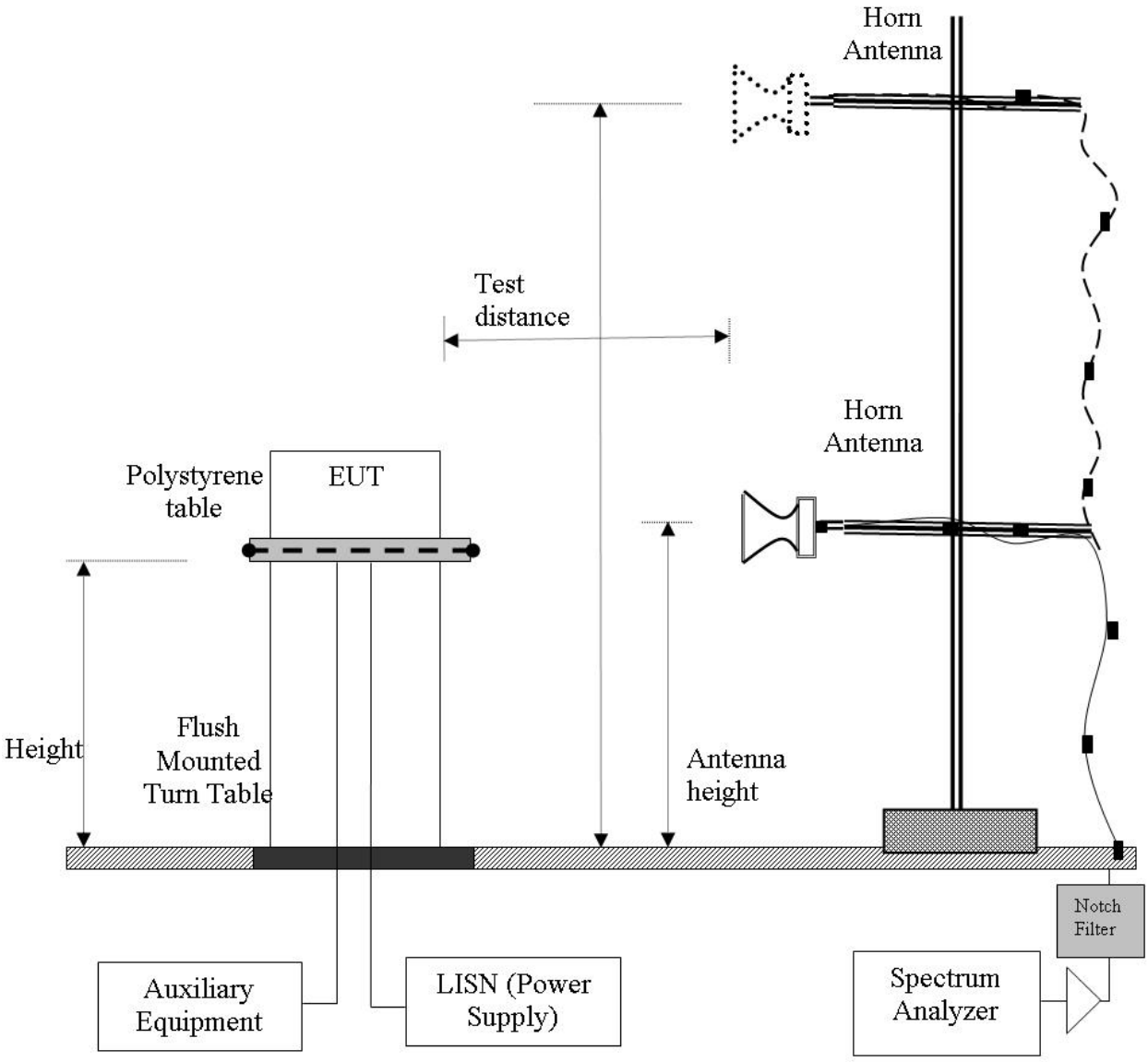
Test Procedure

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.

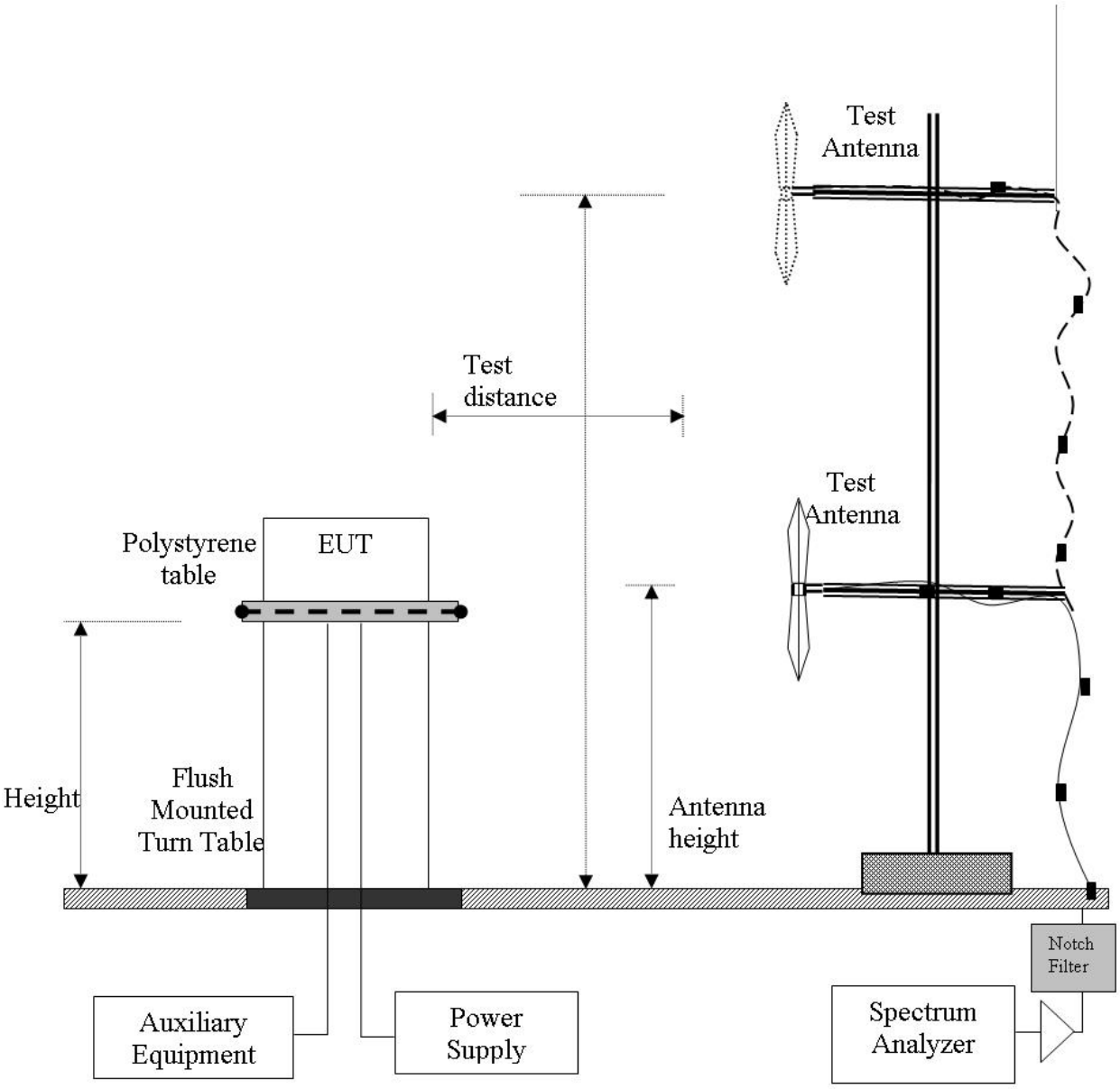
Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR Compliant receiver. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Emissions from 30 MHz – 1000 MHz are measured utilizing 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 emissions above 1 GHz



Radiated emissions 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

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 dBμV; 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 dBμV/m

Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

Level (dBμV/m) = 20 * Log (level (μV/m))

40 dBμV/m = 100 μV/m
48 dBμV/m = 250 μV/m

Specification

Transmitter 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.

Receiver Spurious Emissions

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 hall comply with the limits of Table 1.

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

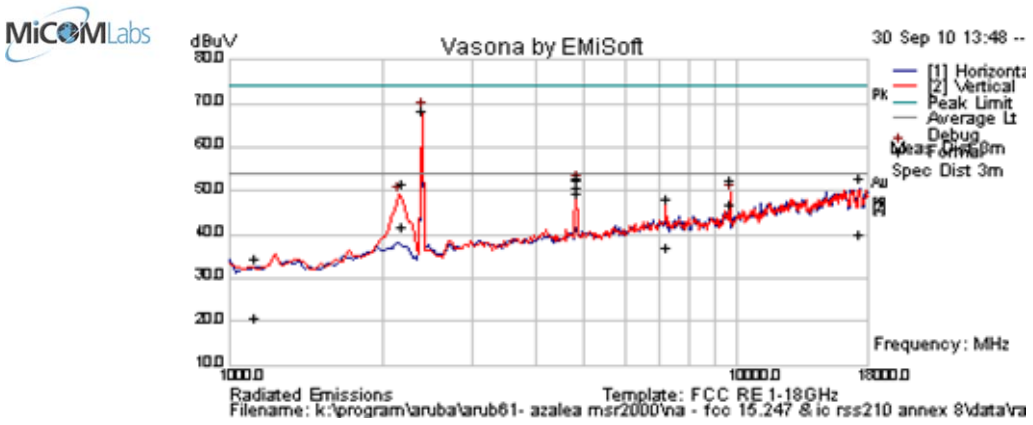
Measurement Uncertainty	+5.6/ -4.5 dB

Traceability:

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

7.3.1 AP-ANT-80D 2.4GHz - Transmitter Radiated Spurious Emissions – Above 1 GHz

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	18.5	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

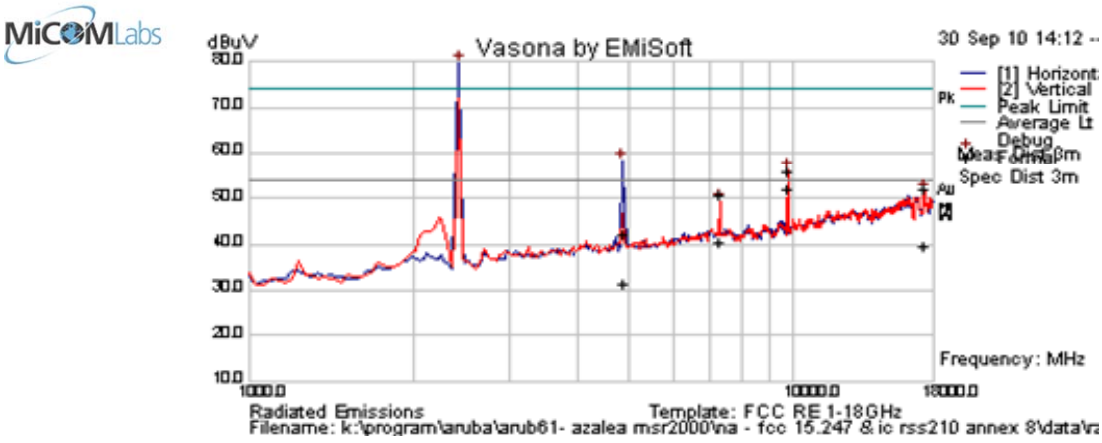


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
4824.033	57.3	4.5	-9.4	52.3	Peak Max	V	118	150	74.0	-21.7	Pass	RB
17320.24	42.4	8.7	1.8	52.9	Peak Max	H	> 20dB below fundamental				Pass	NRB
9647.916	49.6	6.3	-3.3	52.6	Peak Max	V	> 20dB below fundamental				Pass	NRB
2184.128	60.2	2.9	-11.5	51.6	Peak Max	V	> 20dB below fundamental				Pass	NRB
1127.172	47.9	2.1	-15.7	34.3	Peak Max	V	169	37	74	-39.7	Pass	RB
7240.599	47.7	5.4	-5.0	48.0	Peak Max	V	> 20dB below fundamental				Pass	NRB
4823.961	58.0	4.5	-9.4	53.1	Peak Max	V	118	147	74	-20.9	Pass	RB
4824.033	54.4	4.5	-9.4	49.4	Average Max	V	118	150	54	-4.6	Pass	RB
17320.240	29.7	8.7	1.8	40.2	Average Max	H	> 20dB below fundamental				Pass	NRB
9647.916	44.0	6.3	-3.3	46.9	Average Max	V	> 20dB below fundamental				Pass	NRB
2184.128	50.3	2.9	-11.5	41.7	Average Max	V	> 20dB below fundamental				Pass	NRB
1127.172	34.4	2.1	-15.7	20.8	Average Max	V	169	37	54	-33.3	Pass	RB
7240.599	36.6	5.4	-5.0	37.0	Average Max	V	> 20dB below fundamental				Pass	NRB
4823.961	55.8	4.5	-9.4	50.8	Average Max	V	118	147	54	-3.2	Pass	RB
2396.794	76.5	3.0	-11.2	68.3	Peak [Scan]	V	100	--	--	--	n/a	Fund

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	20	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

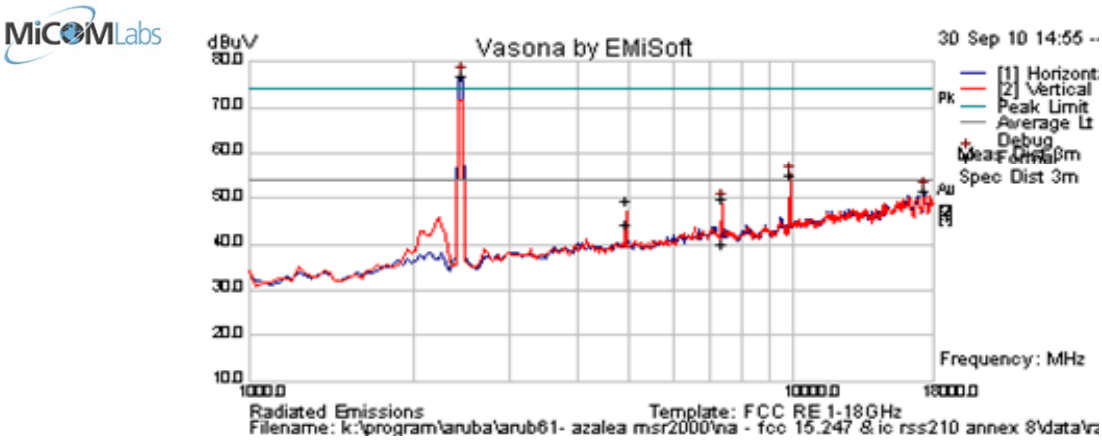


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
4873.953	47.2	4.5	-9.3	42.3	Peak Max	H	107	239	74.0	-31.7	Pass	RB
9747.916	53.2	6.4	-3.6	55.9	Peak Max	V	> 20dB below fundamental				Pass	NRB
7313.006	50.4	5.4	-5.0	50.9	Peak Max	V	184	242	74	-23.1	Pass	RB
17420.842	41.3	8.7	1.9	52.0	Peak Max	V	> 20dB below fundamental				Pass	NRB
4873.953	36.5	4.5	-9.3	31.7	Average Max	H	107	239	54	-22.3	Pass	RB
9747.916	49.4	6.4	-3.6	52.2	Average Max	V	> 20dB below fundamental				Pass	NRB
7313.006	40.2	5.4	-5.0	40.7	Average Max	V	184	242	54	-13.3	Pass	RB
17420.842	28.9	8.7	1.9	39.5	Average Max	V	> 20dB below fundamental				Pass	NRB
2430.862	87.7	3.0	-11.1	79.5	Peak [Scan]	H	150	--	--	--	n/a	Fund

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

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	19.5	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

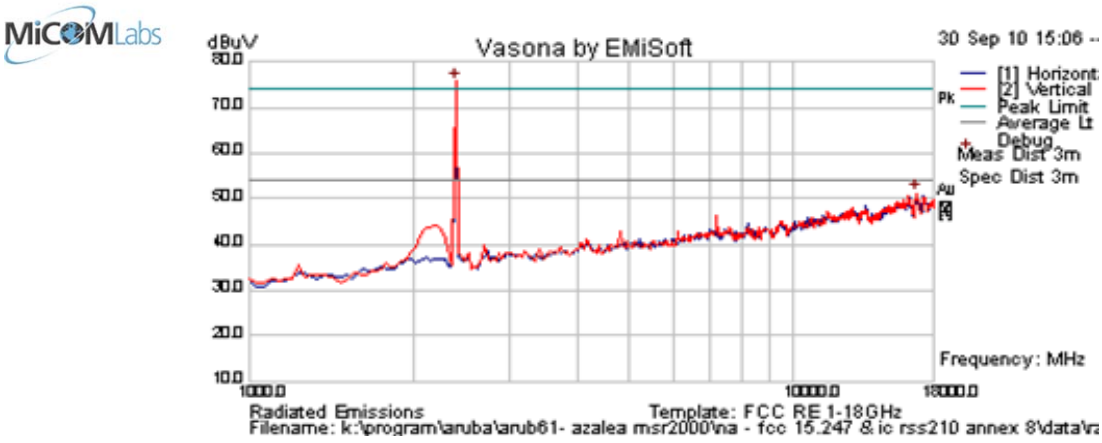


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7389.579	49.1	5.5	-4.8	49.8	Peak Max	V	130	345	74.0	-24.2	Pass	RB
4923.998	53.9	4.6	-9.1	49.3	Peak Max	V	117	77	74.0	-24.7	Pass	RB
7389.579	39.5	5.5	-4.8	40.2	Average Max	V	130	345	54	-13.8	Pass	RB
4923.998	49.0	4.6	-9.1	44.5	Average Max	V	117	77	54	-9.5	Pass	RB
9857.715	51.9	6.4	-3.3	55.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17352.705	40.8	8.7	2.0	51.5	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
2464.930	85.0	3.0	-11.1	76.9	Peak [Scan]	H	100	--	--	--	n/a	Fund

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

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	15.5	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

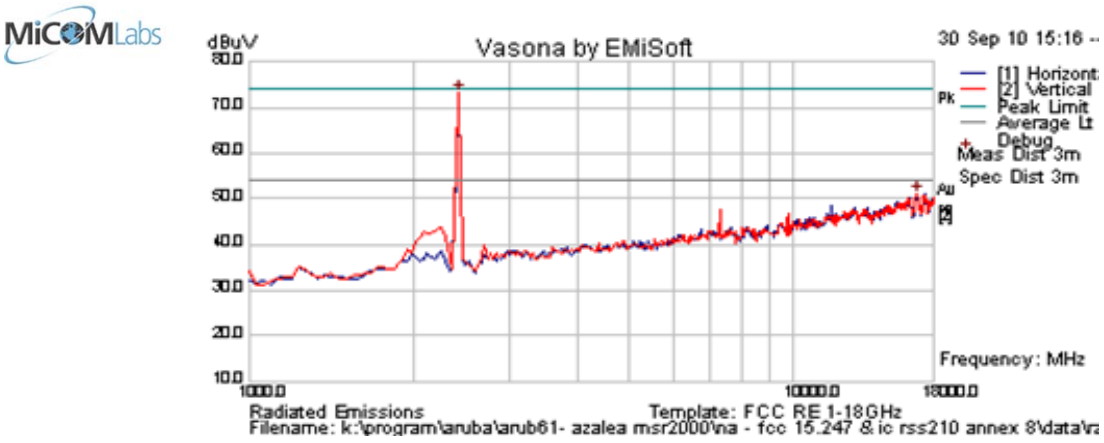


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2396.794	84.0	3.0	-11.2	75.8	Peak [Scan]	V	150	--	--	--	n/a	Fund
16807.615	40.9	8.6	1.6	51.1	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	20	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

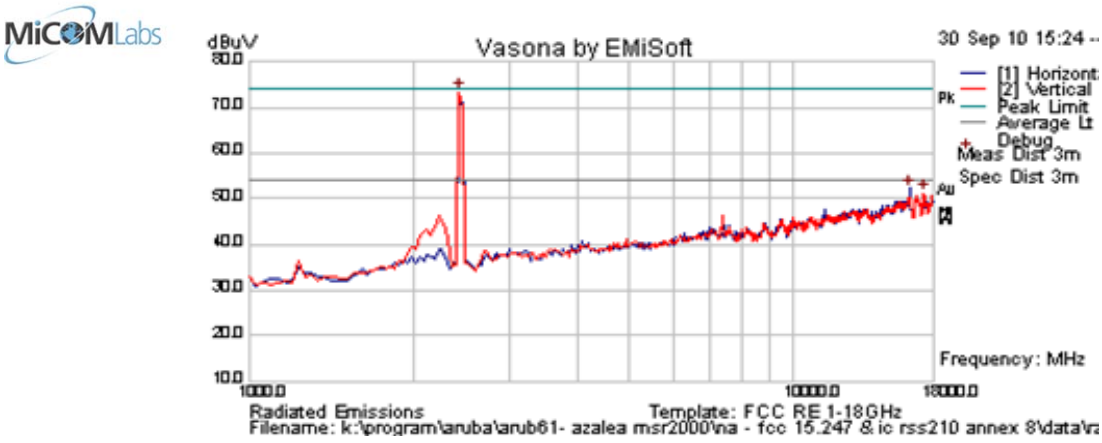


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2430.862	81.3	3.0	-11.1	73.2	Peak [Scan]	V	150	--	--	--	n/a	Fund
16841.683	40.7	8.6	1.8	51.0	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	15.5	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

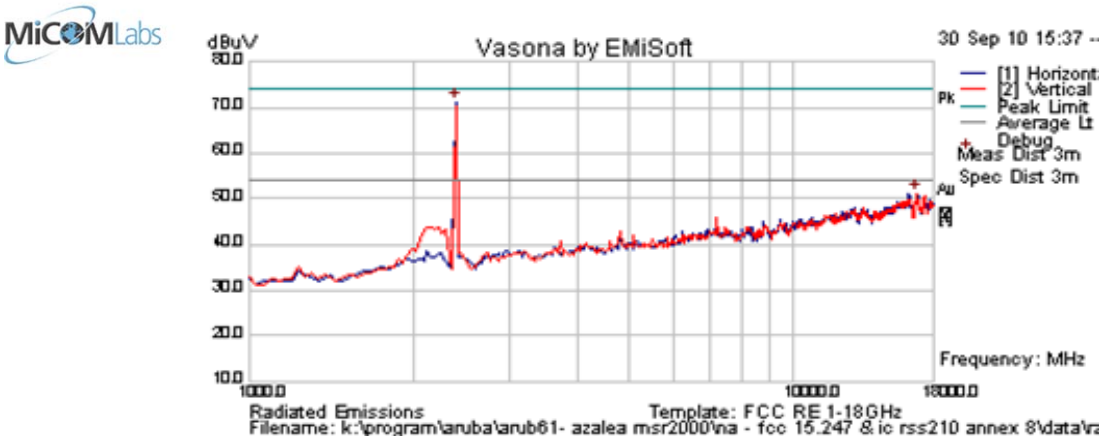


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2430.862	81.6	3.0	-11.1	73.5	Peak [Scan]	V	150	--	--	--	n/a	Fund
16364.729	43.0	8.9	0.4	52.3	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
17318.637	40.7	8.7	1.7	51.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	15	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

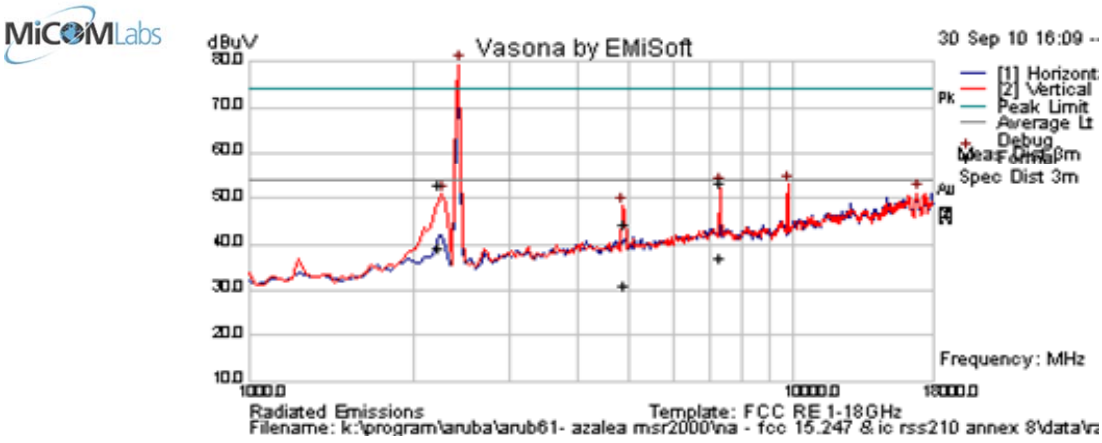


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2396.794	79.5	3.0	-11.2	71.3	Peak [Scan]	H	150	--	--	--	n/a	Fund
16807.615	40.9	8.6	1.6	51.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	20	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

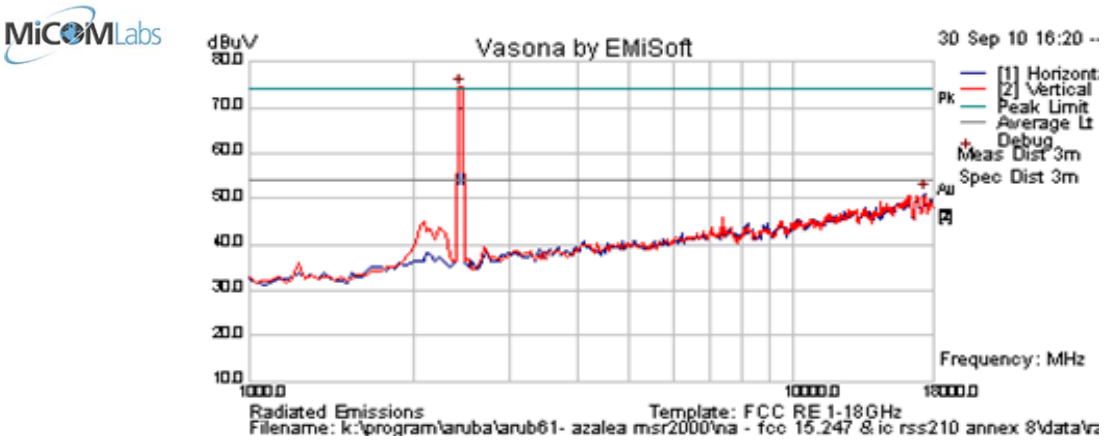


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7311.824	52.8	5.4	-4.9	53.3	Peak Max	V	192	242	74.0	-20.7	Pass	RB
2227.495	61.6	2.9	-11.4	53.1	Peak Max	V	113	77	74.0	-21.0	Pass	RB
4870.621	48.9	4.5	-9.3	44.1	Peak Max	V	126	175	74	-29.9	Pass	RB
7311.824	36.6	5.4	-4.9	37.1	Average Max	V	192	242	54	-16.9	Pass	RB
2227.495	47.5	2.9	-11.4	39.0	Average Max	V	113	77	54	-15.0	Pass	RB
4870.621	36.0	4.5	-9.3	31.2	Average Max	V	126	175	54	-22.8	Pass	RB
2430.862	87.6	3.0	-11.1	79.5	Peak [Scan]	V	150	--	--	--	n/a	Fund
16841.683	40.7	8.6	1.8	51.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
9755.511	50.3	6.4	-3.7	53.0	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	29
Power Setting	14.5	**Press. (mBars)**	993
Antenna	AP ANT-80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

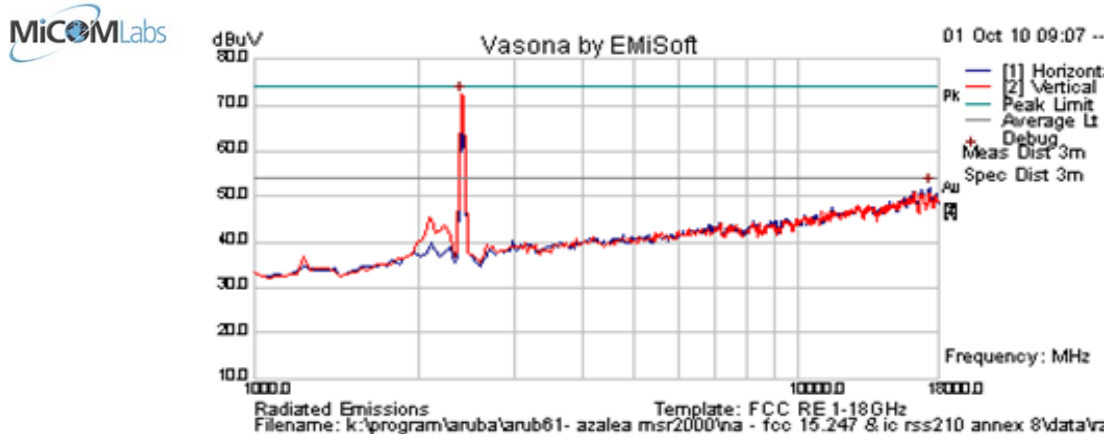


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2430.862	82.7	3.0	-11.1	74.5	Peak [Scan]	V	150	--	--	--	n/a	Fund
17352.705	40.5	8.7	2.0	51.2	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2422 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (°C)**	26.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	31
Power Setting	11	**Press. (mBars)**	996
Antenna	AP ANT 80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

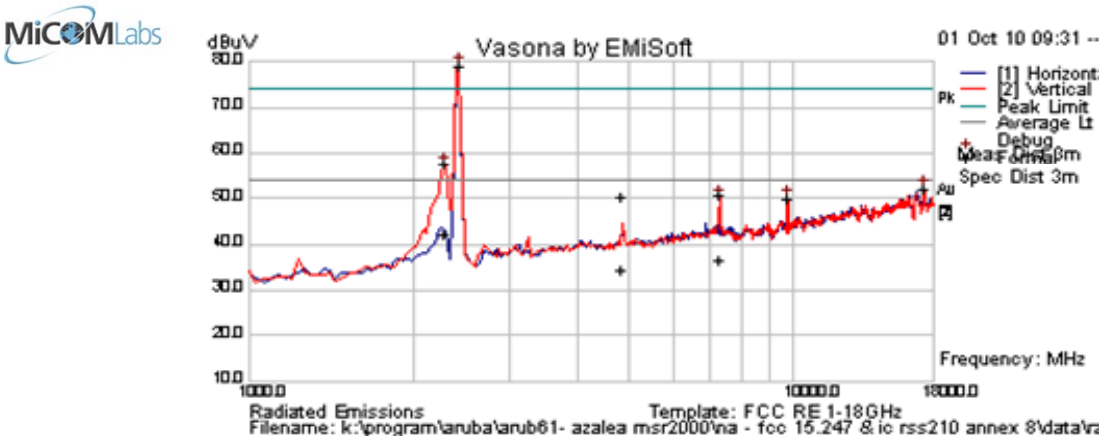


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass / Fail	Comments
2396.794	80.5	3.0	-11.2	72.3	Peak [Scan]	V	150	--	--	--	n/a	Fund
17352.705	41.3	8.7	2.0	52.0	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (°C)**	26.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	31
Power Setting	20	**Press. (mBars)**	996
Antenna	AP ANT 80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

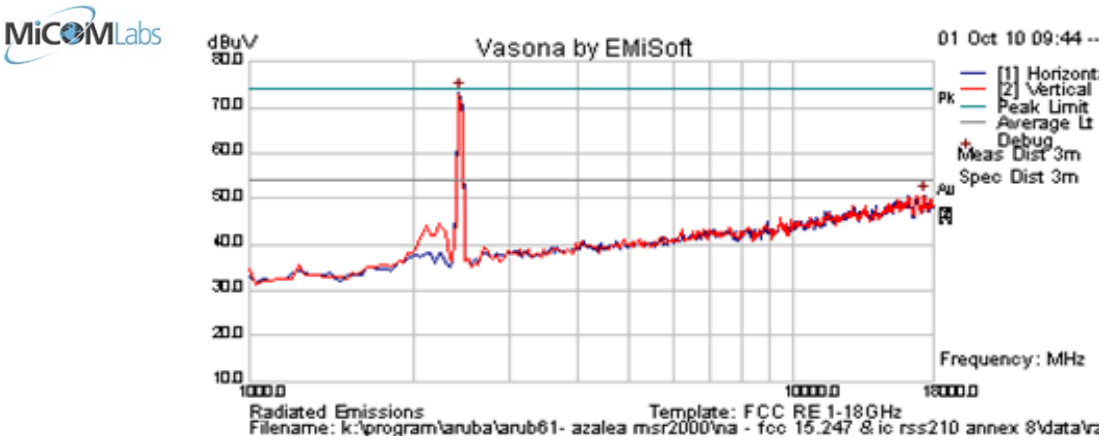


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2288.101	66.0	2.9	-11.3	57.7	Peak Max	V	106	86	74.0	-16.4	Pass	RB
7317.515	50.4	5.4	-5.0	50.8	Peak Max	V	98	241	74.0	-23.2	Pass	RB
4854.970	55.2	4.5	-9.3	50.4	Peak Max	V	114	145	74	-23.6	Pass	RB
2288.101	50.4	2.9	-11.3	42.1	Average Max	V	106	86	54	-11.9	Pass	RB
7317.515	36.0	5.4	-5.0	36.4	Average Max	V	98	241	54	-17.6	Pass	RB
4854.970	39.3	4.5	-9.3	34.4	Average Max	V	114	145	54	-19.6	Pass	RB
2430.862	87.4	3.0	-11.1	79.2	Peak [Scan]	H	150	--	--	--	n/a	Fund
17352.705	41.2	8.7	2.0	51.9	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
9721.443	46.9	6.3	-3.3	50.0	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	2452 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (°C)**	26.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	31
Power Setting	12	**Press. (mBars)**	996
Antenna	AP ANT 80D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			



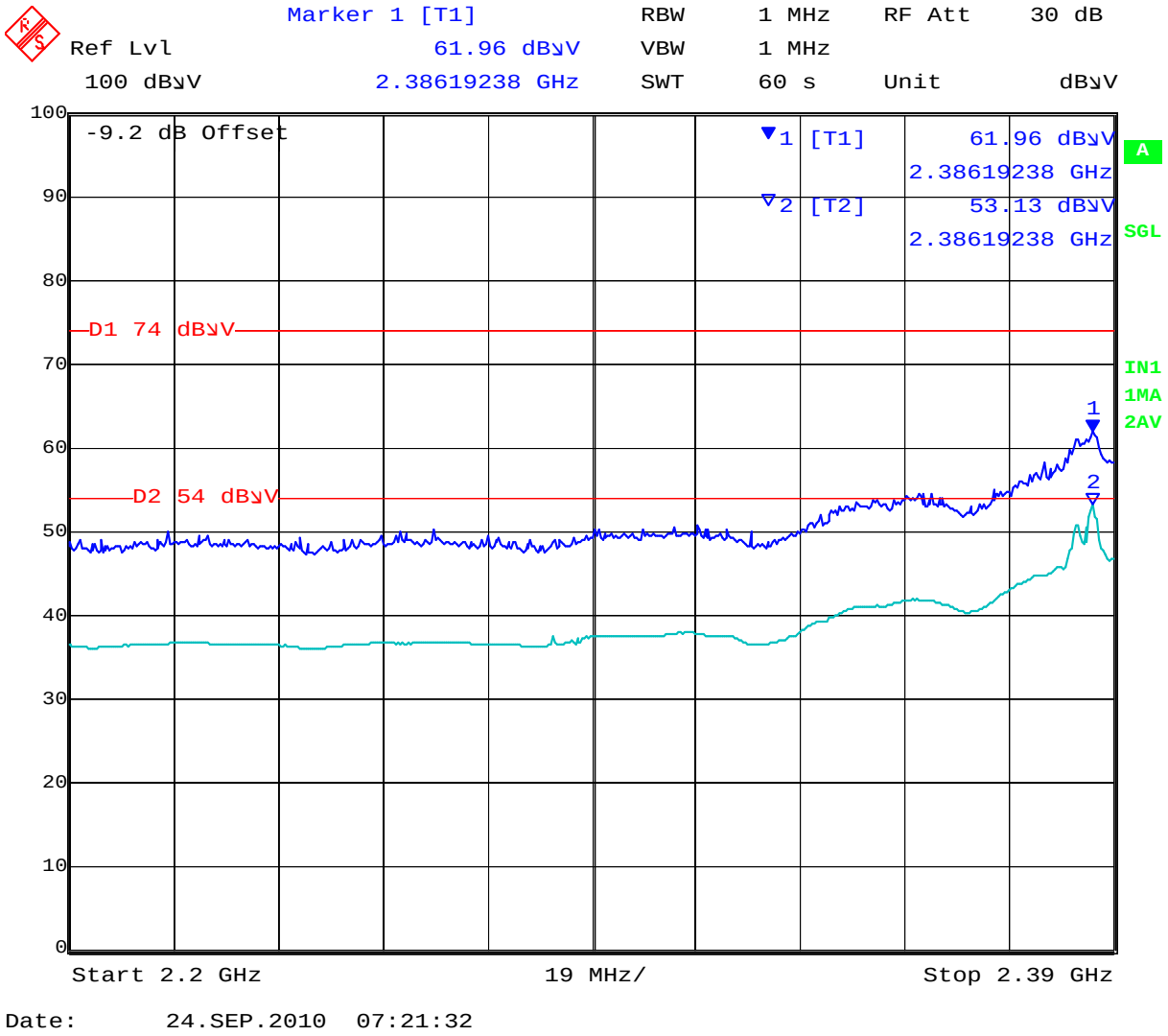
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2430.862	81.6	3.0	-11.1	73.4	Peak [Scan]	H	150	--	--	--	n/a	Fund
17284.569	40.5	8.6	1.6	50.7	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

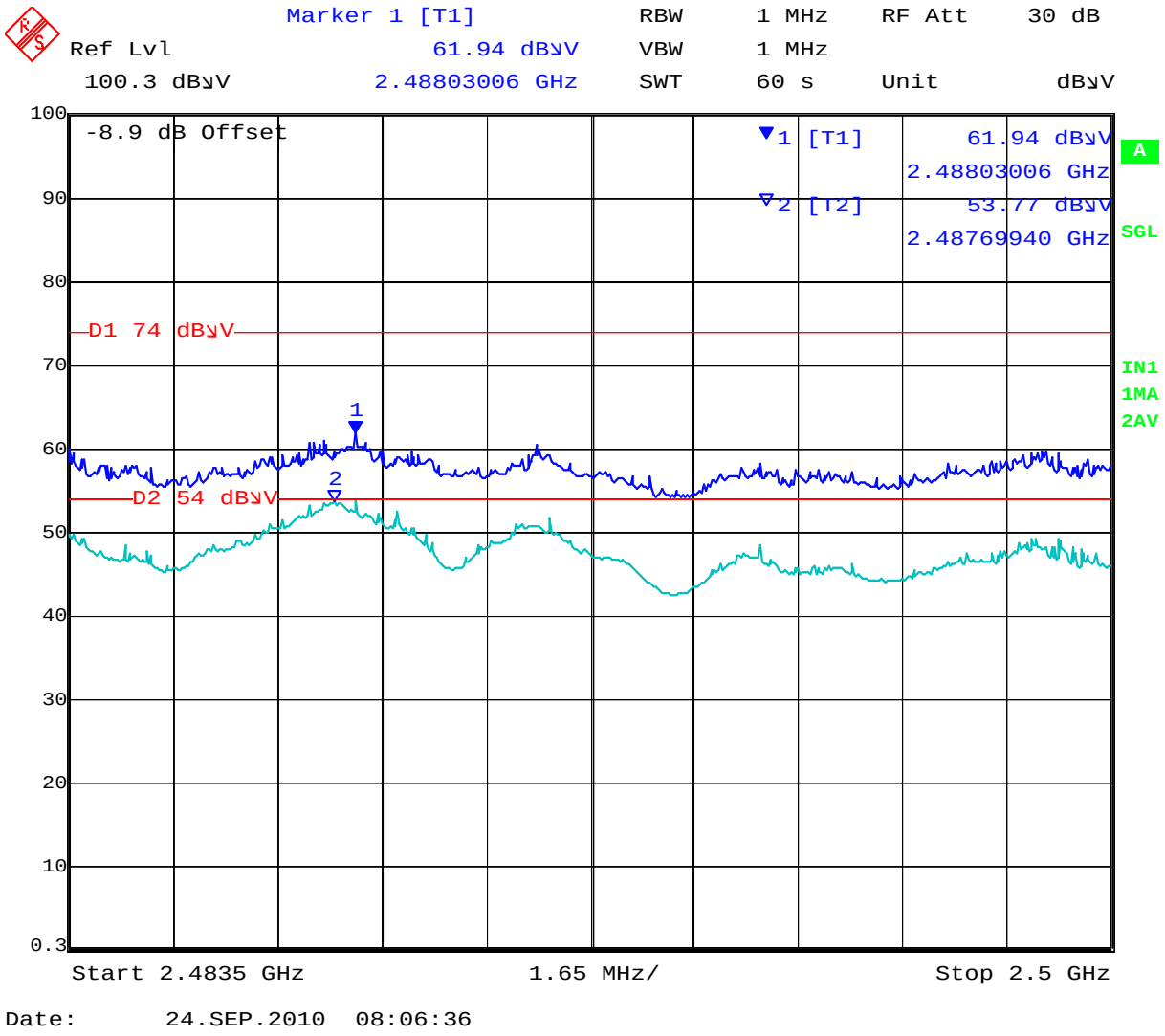
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

7.3.2 AP-ANT-80D 2.4GHz - Transmitter Band Edge Emissions

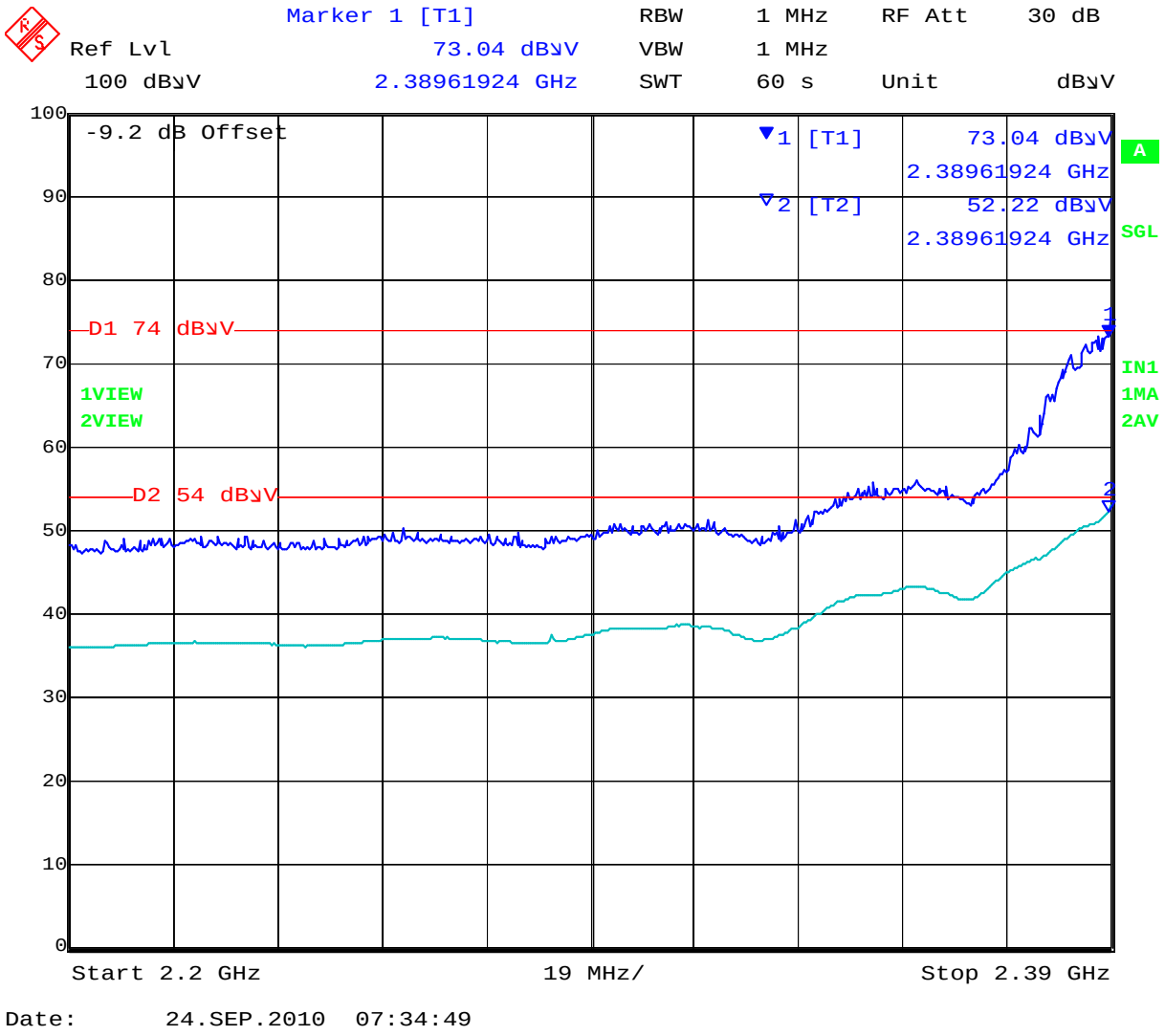
ARUB61 Band Edge 2412 MHz; 802.11b 2200-2390 MHz ART=18.5



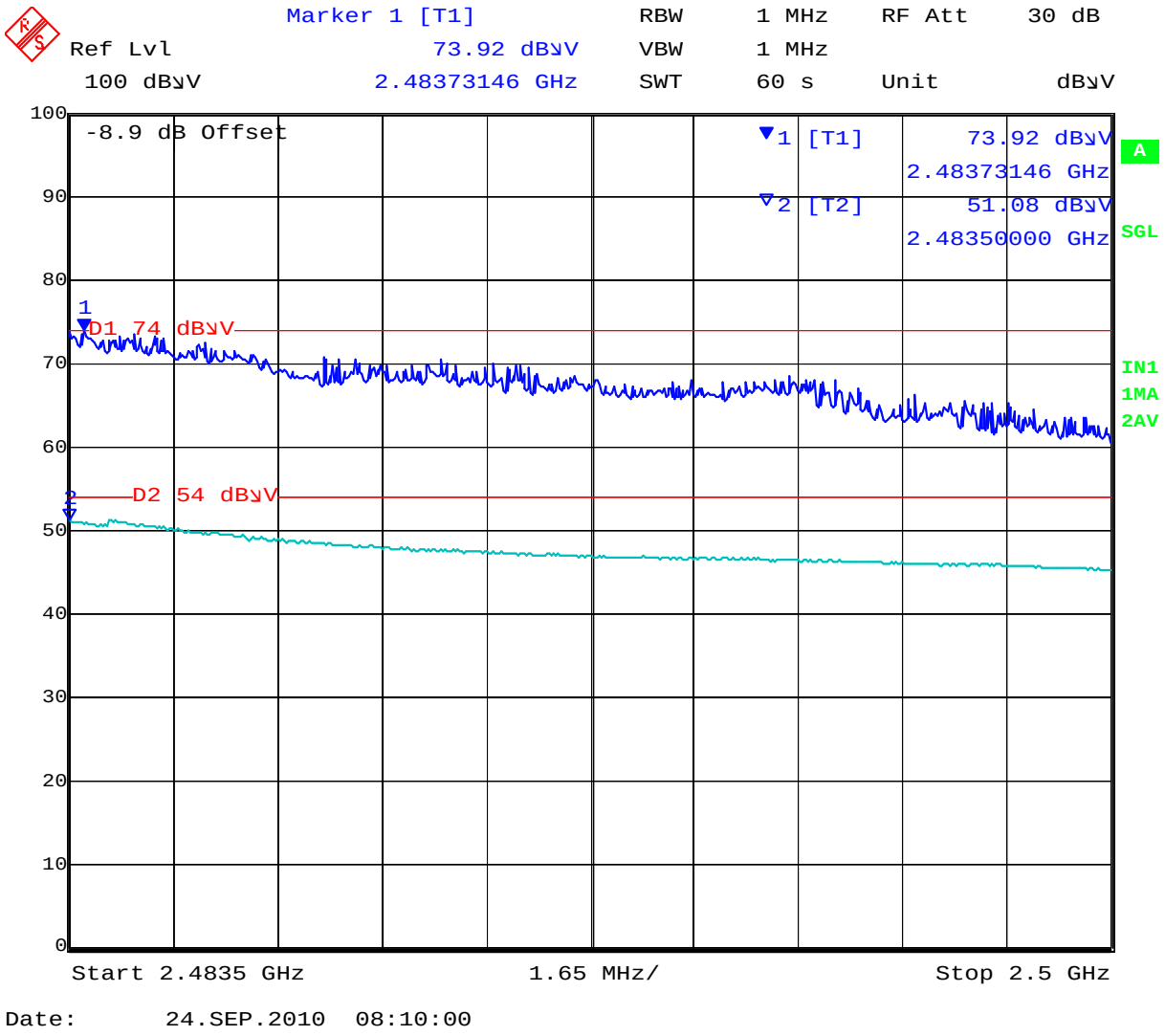
ARUB61 Band Edge 2462 MHz; 802.11b 2483.5-2500 MHz ART=19.5



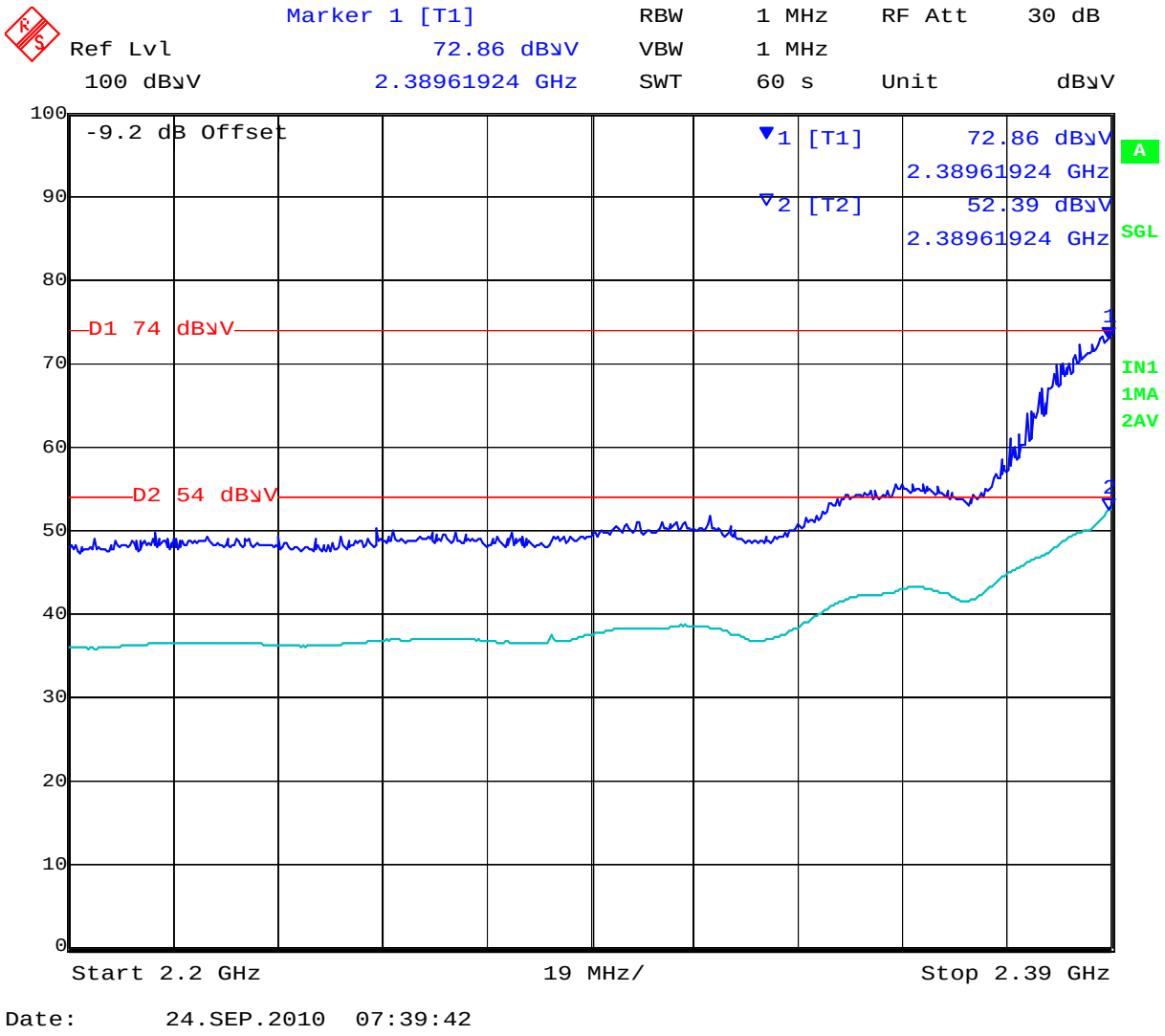
ARUB61 Band Edge 2412 MHz; 802.11g 2200-2390 MHz ART=15.5



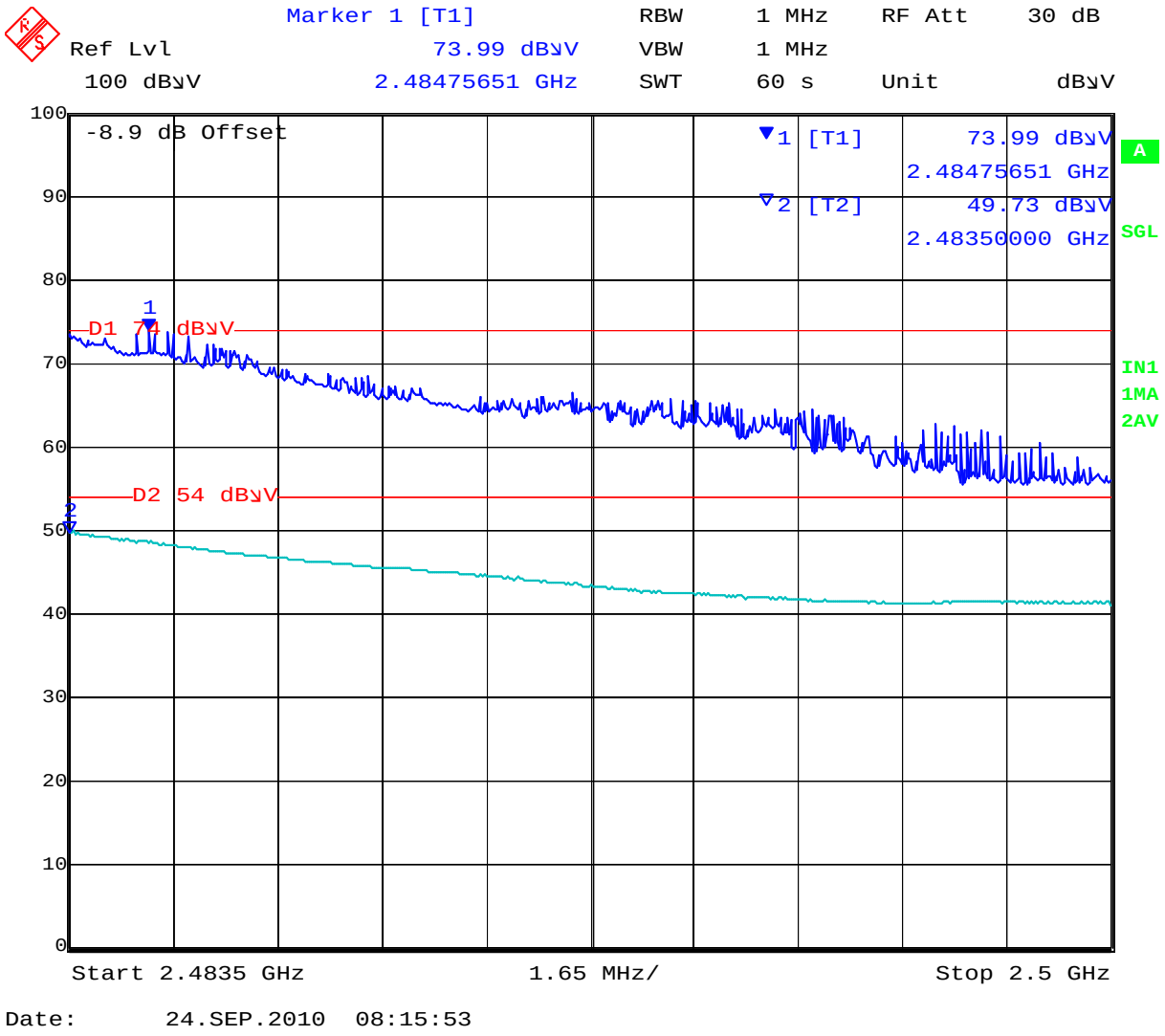
ARUB61 Band Edge 2462 MHz; 802.11g 2483.5-2500 MHz ART=15.5



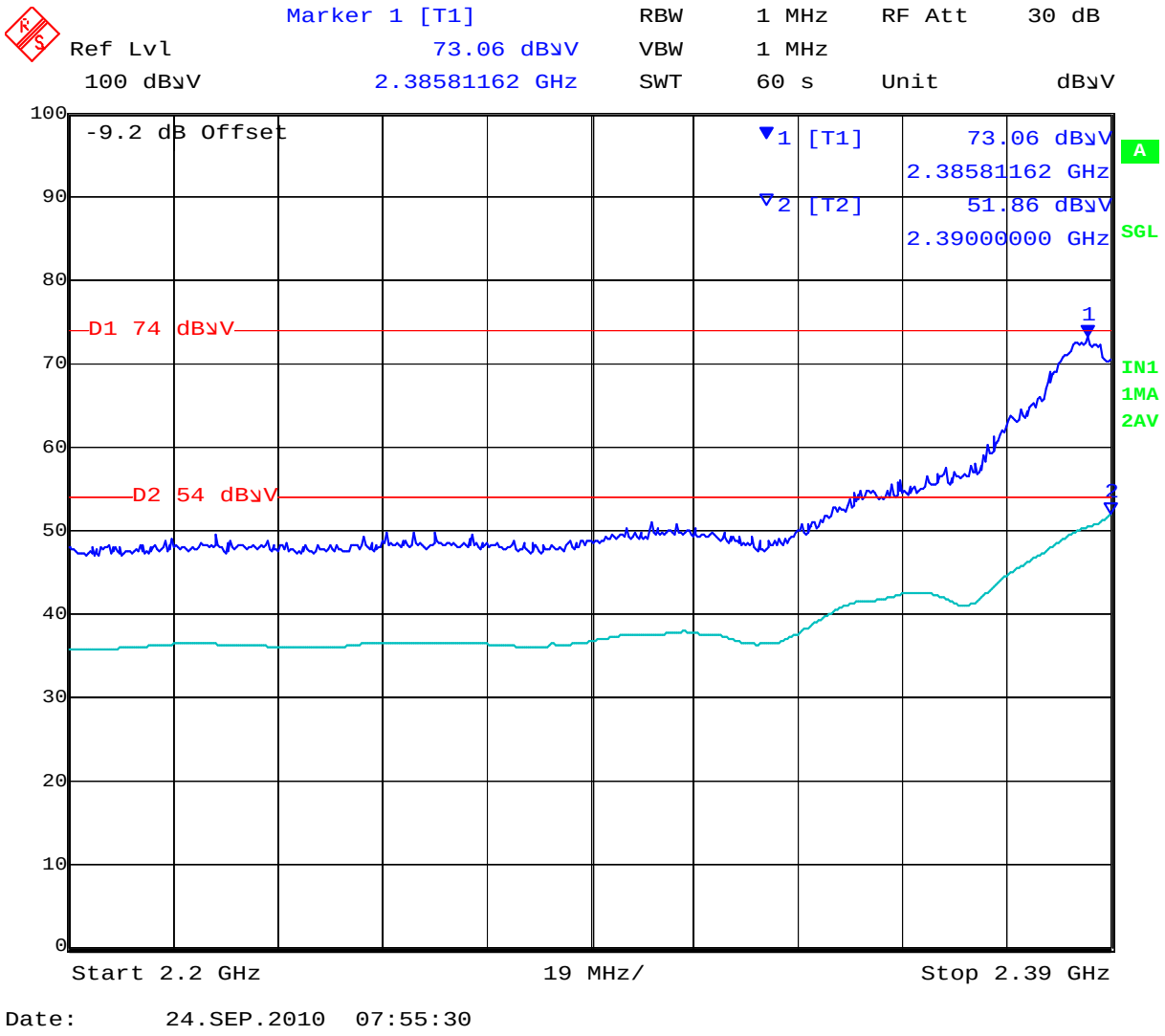
ARUB61 Band Edge 2412 MHz; 802.11n HT-20 2200-2390 MHz ART=15



ARUB61 Band Edge 2462 MHz; 802.11n HT-20 2483.5-2500 MHz ART=14.5



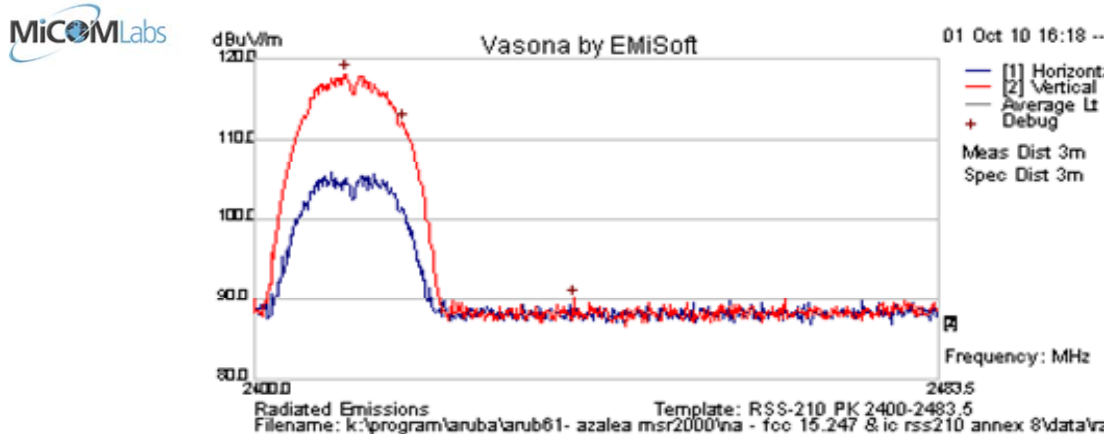
ARUB61 Band Edge 2422 MHz; 802.11n HT-40 2200-2390 MHz ART=11



ARUB61 Band Edge 2452 MHz; 802.11n HT-40 2483.5-2500 MHz ART=12

7.3.3 AP-ANT-80D 2.4GHz - Transmitter Peak Emissions

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	18.5	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

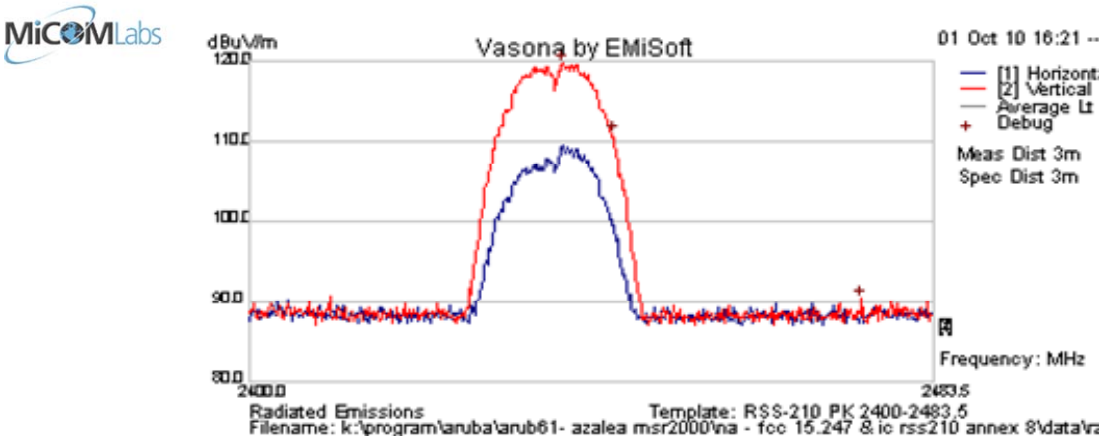


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2411.044	73.1	13.0	32.2	118.2	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	20	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

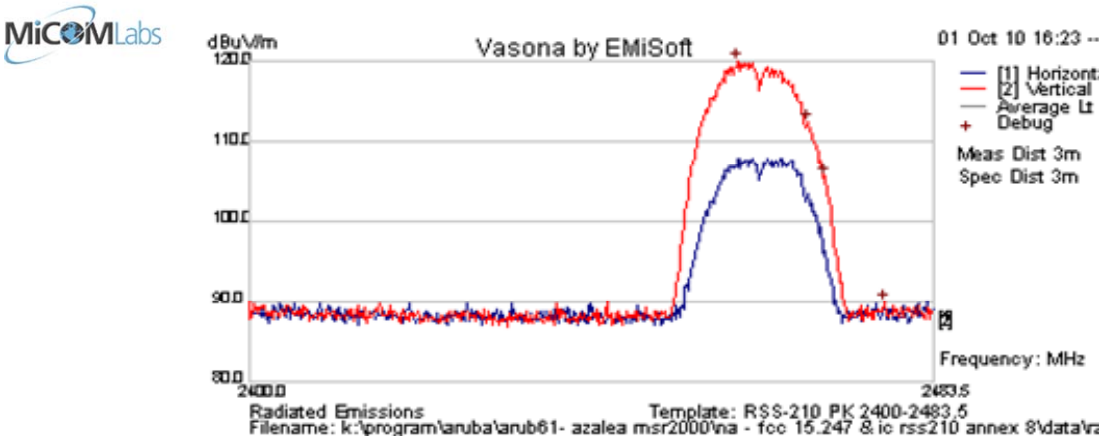


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2437.985	74.6	13.0	32.2	119.8	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	19.5	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

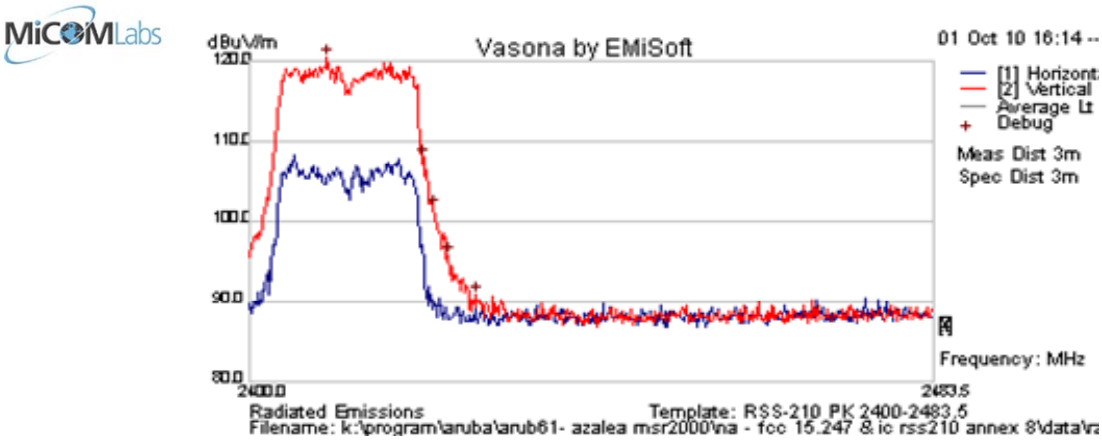


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2459.404	74.8	13.0	32.3	120.0	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	15.5	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

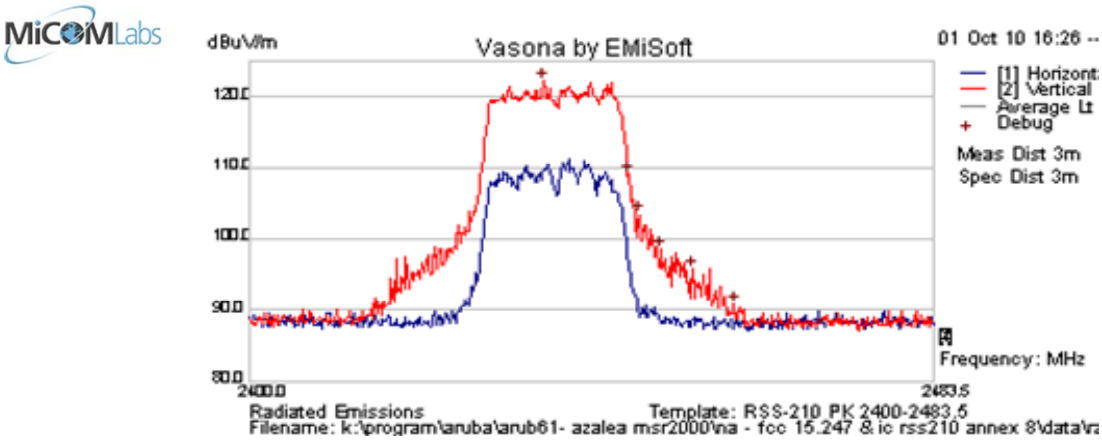


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2409.371	75.4	13.0	32.2	120.5	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	20	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

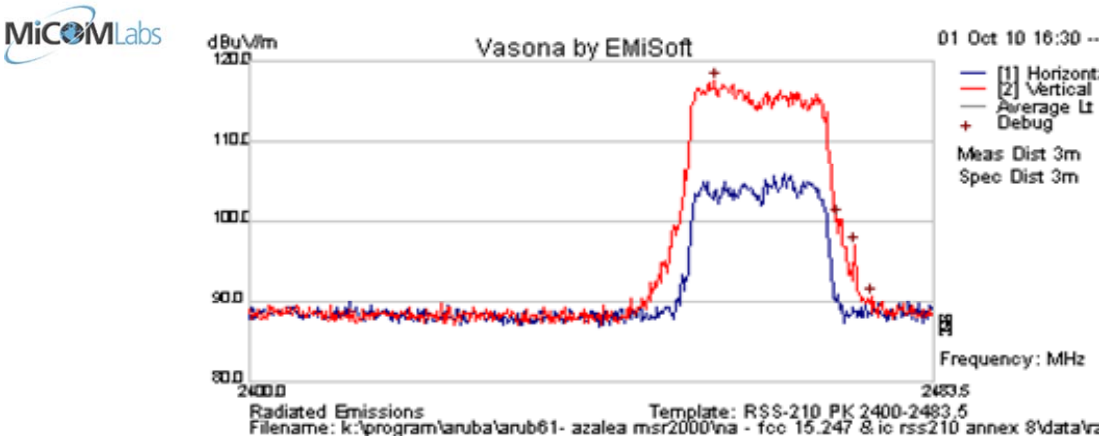


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2435.642	77.1	13.0	32.2	122.3	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	15.5	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

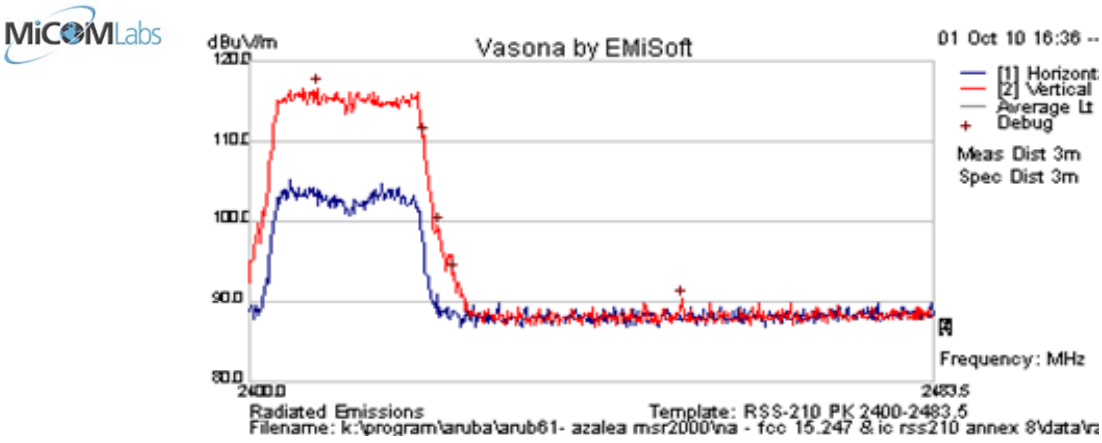


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2456.559	72.3	13.0	32.3	117.6	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	15	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

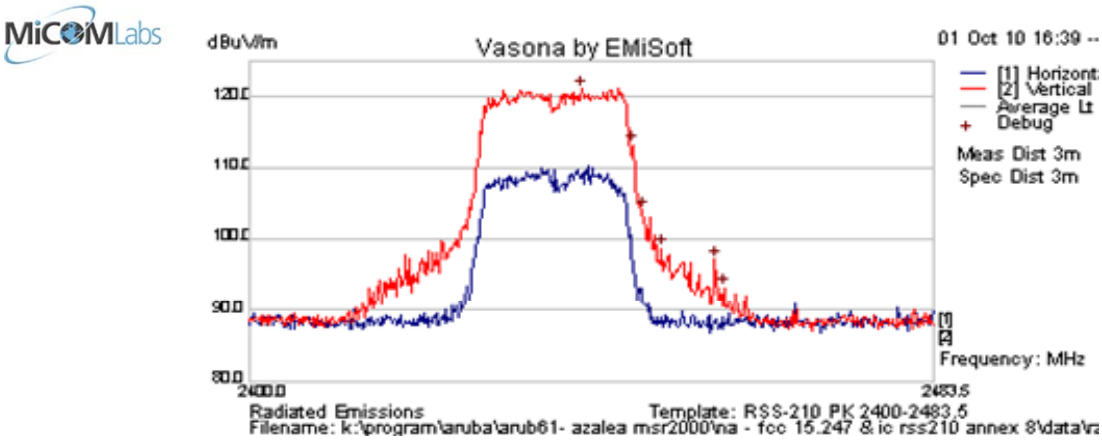


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2408.199	71.6	13.0	32.2	116.7	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	20	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

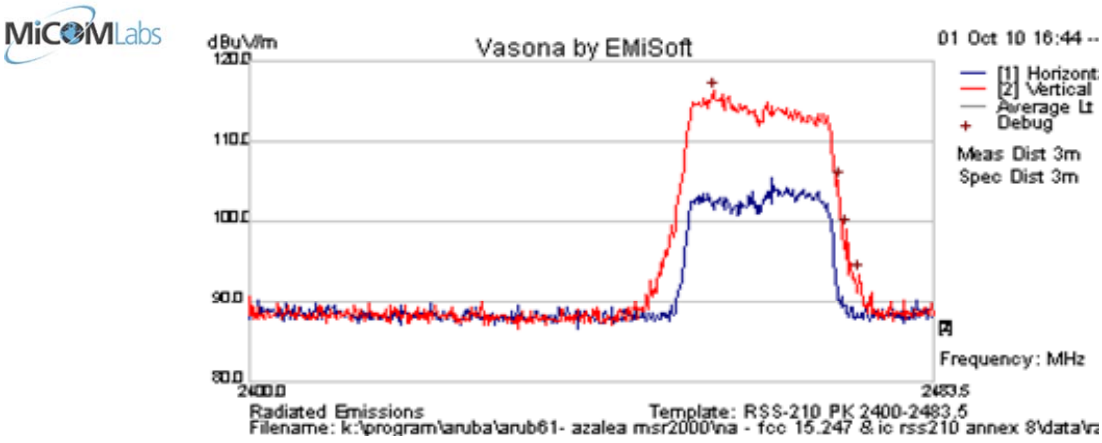


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2440.328	76.0	13.0	32.2	121.2	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	14.5	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

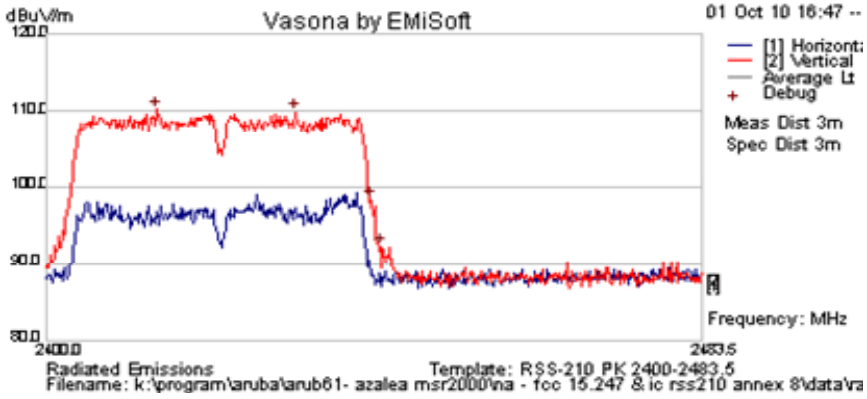


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2456.392	71.1	13.0	32.3	116.3	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2422 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	11	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

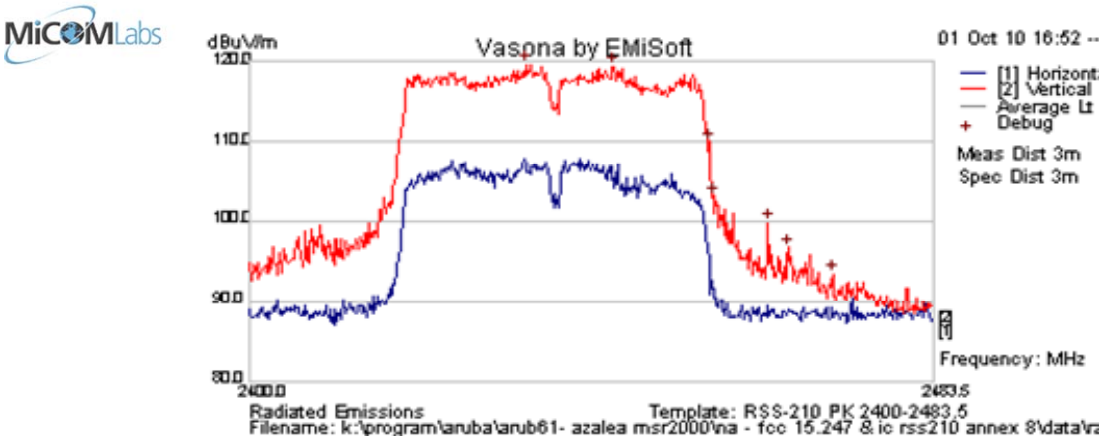


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2413.889	65.1	13.0	32.2	110.3	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	20	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

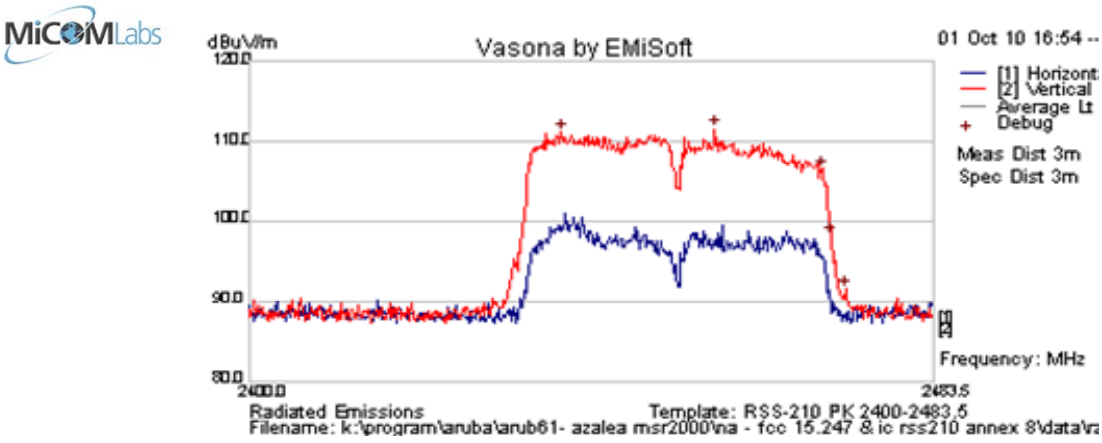


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2433.467	74.4	13.0	32.2	119.6	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2452 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (°C)**	27
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	31
Power Setting	12	**Press. (mBars)**	996
Antenna	AP-ANT-80D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



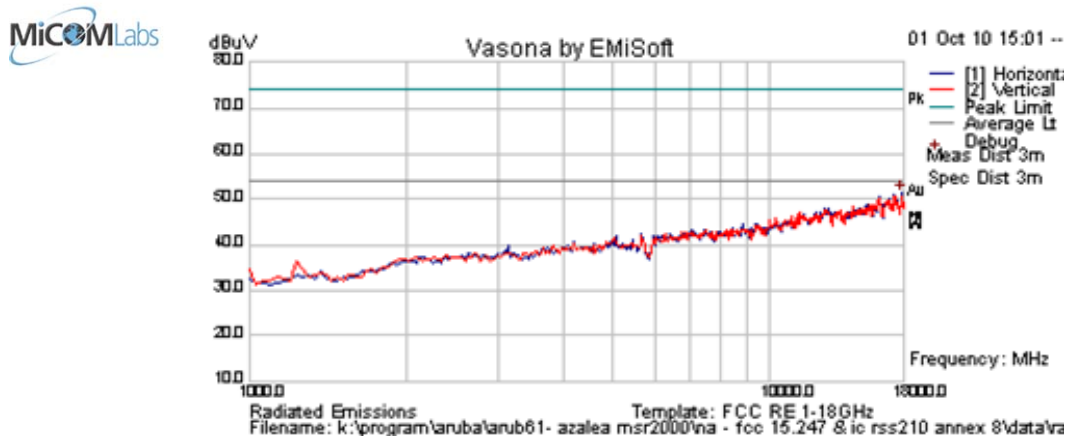
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2456.559	66.4	13.0	32.3	111.6	Peak [Scan]	V						Pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

7.3.4 AP-ANT-80D 2.4GHz - Receiver Emissions

Test Freq.	2437 MHz	**Engineer**	SB
Variant	Receive in Test Utility	**Temp (ºC)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	Not Applicable in Receive Mode	**Press. (mBars)**	998
Antenna	AP-ANT-80		
Test Notes 1			
Test Notes 2			



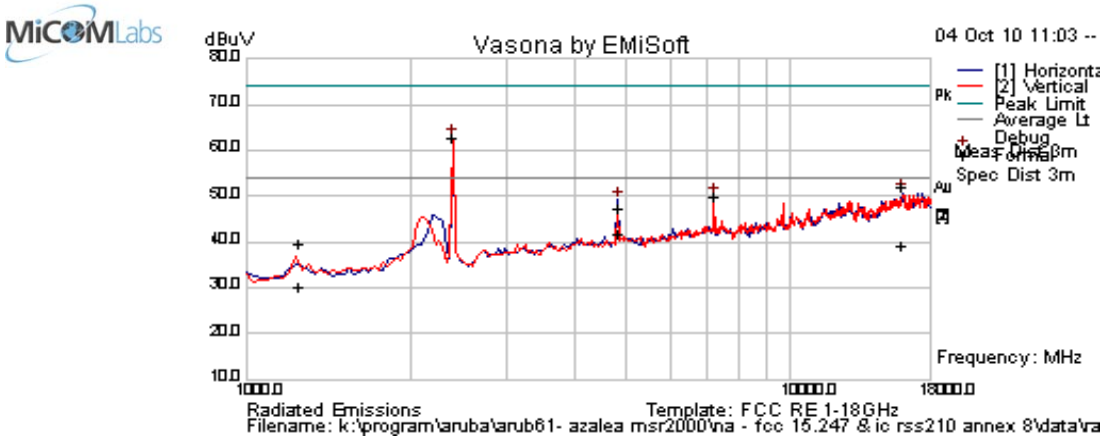
Formally measured emission peaks

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
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.

7.3.5 AP-ANT-85 2.4GHz - Transmitter Radiated Spurious Emissions – Above 1 GHz

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	17.5	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

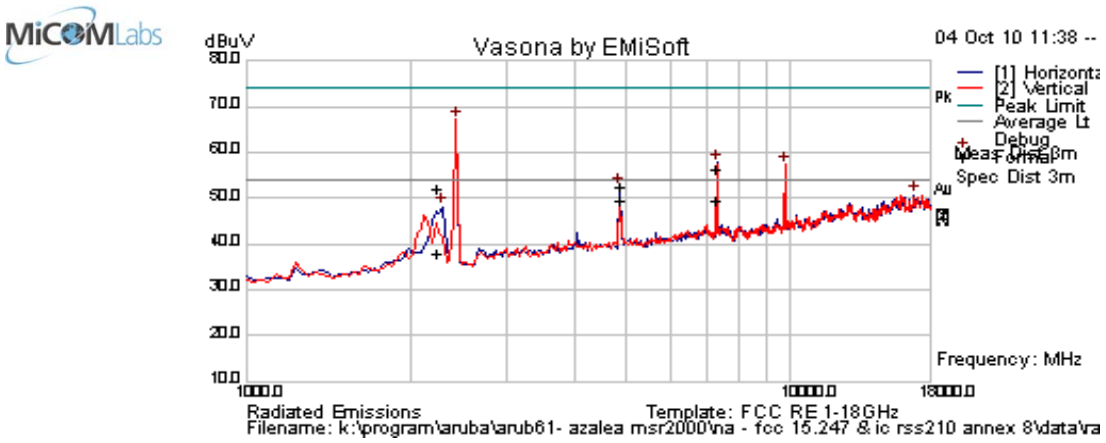


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
15957.515	42.7	9.0	0.4	52.0	Peak Max	V	110	0	74.0	-22.0	Pass	RB
4823.998	52.4	4.5	-9.4	47.4	Peak Max	V	144	26	74.0	-26.6	Pass	RB
1249.978	51.7	2.2	-14.1	39.8	Peak Max	V	98	198	74	-34.2	Pass	RB
15957.515	29.8	9.0	0.4	39.2	Average Max	V	110	0	54	-14.8	Pass	RB
4823.998	46.9	4.5	-9.4	42.0	Average Max	V	144	26	54	-12.0	Pass	RB
1249.978	42.3	2.2	-14.1	30.4	Average Max	V	98	198	54	-23.6	Pass	RB
2396.794	70.9	3.0	-11.2	62.7	Peak [Scan]	V	--	--	--	--	n/a	FUND
7234.469	49.7	5.4	-5.2	49.9	Peak [Scan]	H	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	21	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

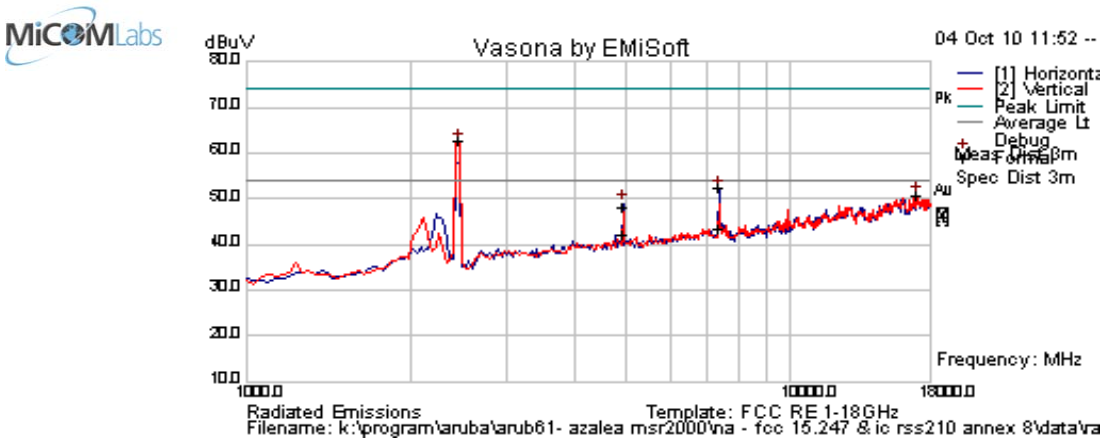


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7306.613	55.6	5.4	-4.9	56.2	Peak Max	H	98	1	74.0	-17.8	Pass	RB
4873.998	57.1	4.5	-9.3	52.3	Peak Max	H	98	341	74.0	-21.7	Pass	RB
2246.333	60.8	2.9	-11.4	52.3	Peak Max	H	114	21	74	-21.7	Pass	RB
7306.613	48.9	5.4	-4.9	49.5	Average Max	H	98	1	54	-4.6	Pass	RB
4873.998	54.3	4.5	-9.3	49.4	Average Max	H	98	341	54	-4.6	Pass	RB
2246.333	46.6	2.9	-11.4	38.1	Average Max	H	114	21	54	-15.9	Pass	RB
9755.511	54.7	6.4	-3.7	57.4	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
2430.862	75.4	3.0	-11.1	67.3	Peak [Scan]	H	--	--	--	--	n/a	FUND
16841.683	40.4	8.6	1.8	50.8	Peak [Scan]	H	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	17.5	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

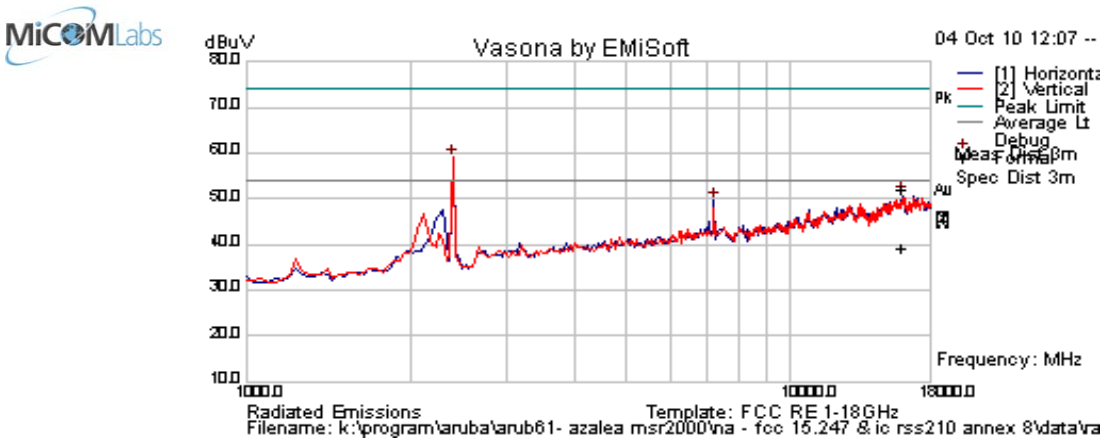


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7382.525	51.7	5.5	-4.8	52.3	Peak Max	H	98	63	74.0	-21.7	Pass	RB
4923.958	52.8	4.6	-9.1	48.2	Peak Max	H	188	341	74.0	-25.8	Pass	RB
7382.525	42.9	5.5	-4.8	43.5	Average Max	H	98	63	54	-10.5	Pass	RB
4923.958	46.8	4.6	-9.1	42.2	Average Max	H	188	341	54	-11.8	Pass	RB
2464.930	70.7	3.0	-11.1	62.6	Peak [Scan]	V	--	--	--	--	n/a	FUND
17114.228	41.4	8.5	0.8	50.7	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	13.5	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

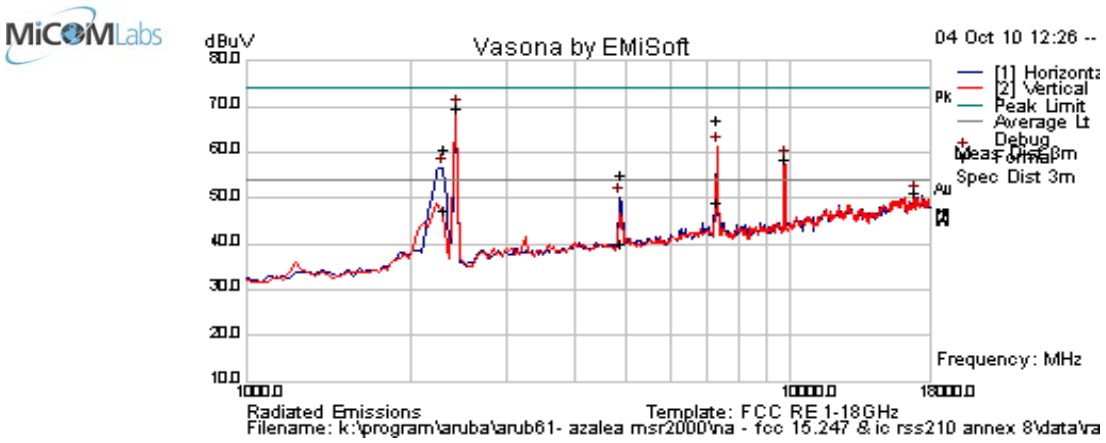


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16025.060	42.7	9.0	0.5	52.1	Peak Max	H	174	210	74.0	-21.9	Pass	RB
16025.06	29.7	9.0	0.5	39.2	Average Max	H	174	210	54.0	-14.8	Pass	RB
2396.794	67.2	3.0	-11.2	59.0	Peak [Scan]	V	--	--	--	--	n/a	FUND
7234.469	49.5	5.4	-5.2	49.7	Peak [Scan]	H	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	22	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

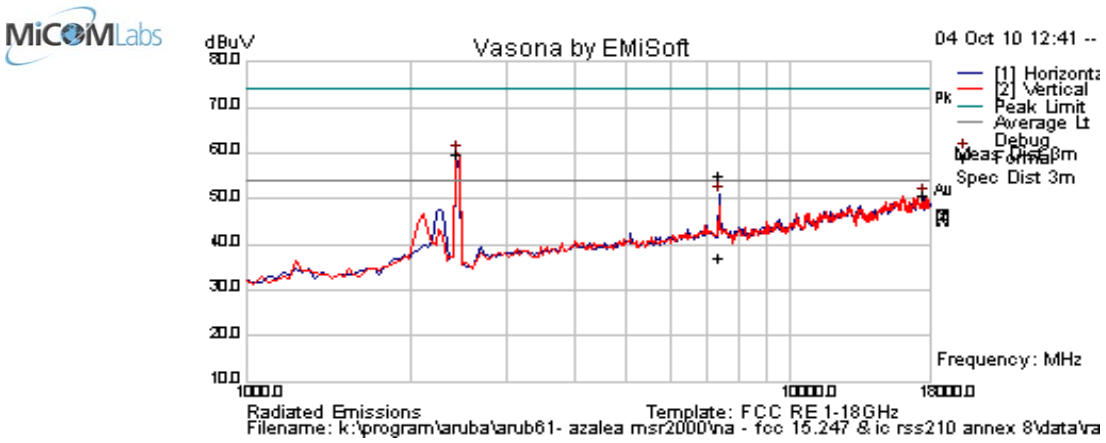


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7305.892	66.4	5.4	-4.9	66.9	Peak Max	V	129	18	74.0	-7.1	Pass	RB
2307.255	68.8	2.9	-11.1	60.6	Peak Max	H	106	0	74.0	-13.4	Pass	RB
4869.098	59.7	4.5	-9.3	54.9	Peak Max	H	98	340	74	-19.2	Pass	RB
7305.892	48.5	5.4	-4.9	49.1	Average Max	V	129	18	54	-4.9	Pass	RB
2307.255	55.6	2.9	-11.1	47.4	Average Max	H	106	0	54	-6.6	Pass	RB
4869.098	44.9	4.5	-9.3	40.1	Average Max	H	98	340	54	-13.9	Pass	RB
16841.683	40.7	8.6	1.8	51.0	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
9721.443	55.4	6.3	-3.3	58.4	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
2430.862	77.6	3.0	-11.1	69.5	Peak [Scan]	H	--	--	--	--	n/a	FUND

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

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	13.5	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

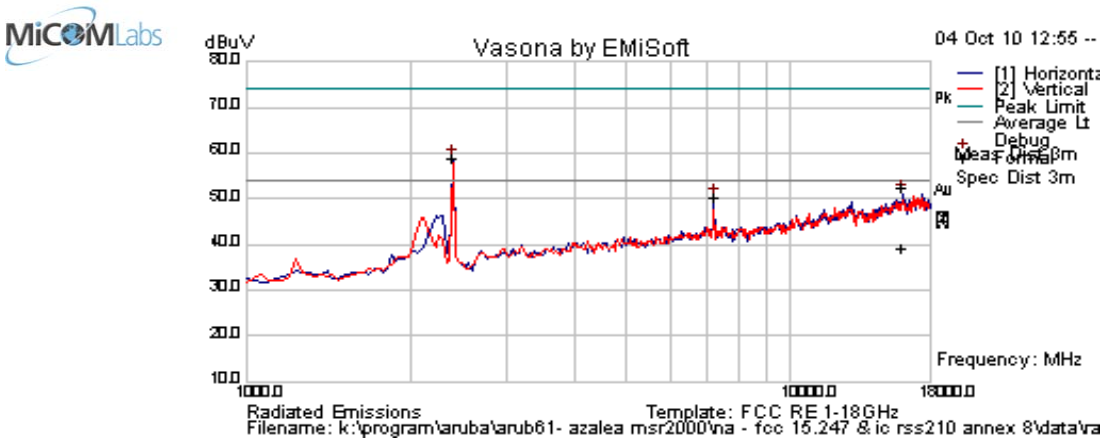


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7383.888	54.3	5.5	-4.8	54.9	Peak Max	H	98	54	74.0	-19.1	Pass	RB
7383.888	36.2	5.5	-4.8	36.9	Average Max	H	98	54	54.0	-17.1	Pass	RB
2430.862	68.0	3.0	-11.1	59.9	Peak [Scan]	V	--	--	--	--	n/a	FUND
17454.910	39.8	8.7	2.0	50.6	Peak [Scan]	H	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	14	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

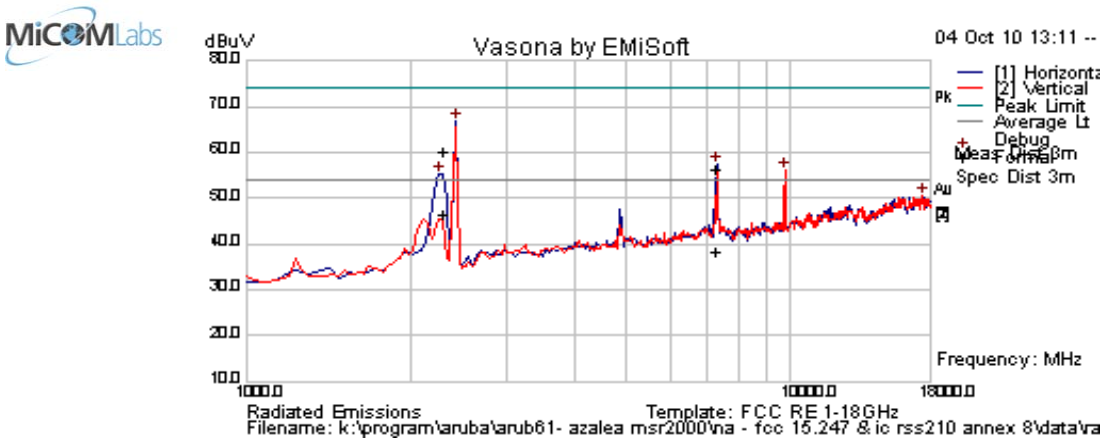


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16023.918	42.9	9.0	0.5	52.4	Peak Max	H	184	336	74.0	-21.6	Pass	RB
16023.918	29.8	9.0	0.5	39.2	Average Max	H	184	336	54.0	-14.8	Pass	RB
2396.794	67.1	3.0	-11.2	58.9	Peak [Scan]	H	--	--	--	--	n/a	FUND
7234.469	50.2	5.4	-5.2	50.4	Peak [Scan]	H	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

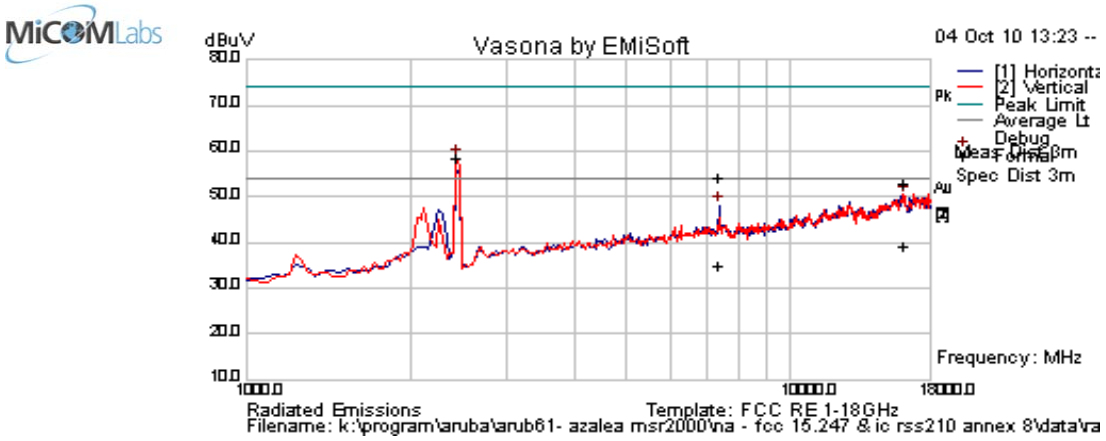


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7303.407	55.6	5.4	-4.9	56.1	Peak Max	H	154	42	74.0	-17.9	Pass	RB
2307.655	68.3	2.9	-11.1	60.1	Peak Max	H	106	12	74.0	-14.0	Pass	RB
7303.407	37.9	5.4	-4.9	38.4	Average Max	H	154	42	54	-15.6	Pass	RB
2307.655	54.9	2.9	-11.1	46.7	Average Max	H	106	12	54	-7.3	Pass	RB
2430.862	74.9	3.0	-11.1	66.8	Peak [Scan]	H	--	--	--	--	n/a	FUND
9755.511	53.4	6.4	-3.7	56.1	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
17454.910	39.7	8.7	2.0	50.5	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	12	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

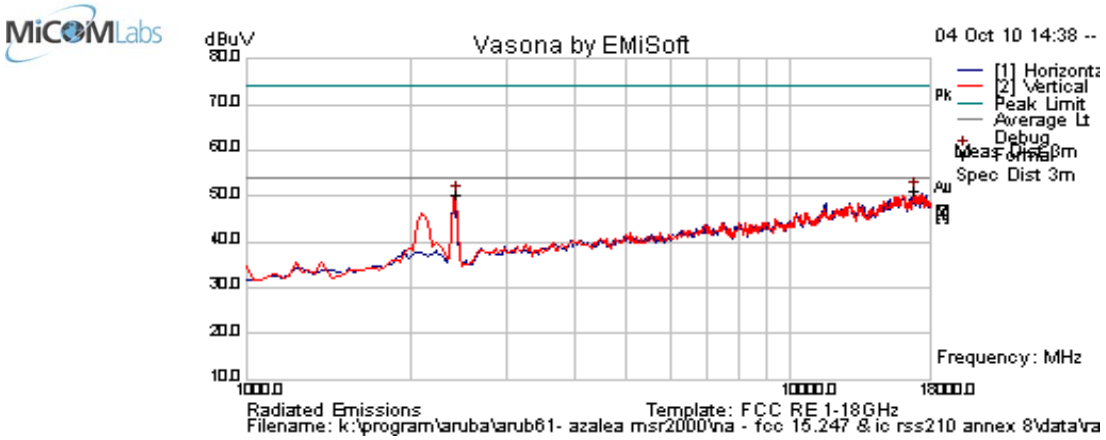


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16089.499	43.2	9.0	0.8	52.9	Peak Max	V	171	249	74.0	-21.1	Pass	RB
7382.124	53.5	5.5	-4.8	54.1	Peak Max	H	98	335	74.0	-19.9	Pass	RB
16089.499	29.6	9.0	0.8	39.3	Average Max	V	171	249	54	-14.7	Pass	RB
7382.124	34.3	5.5	-4.8	35.0	Average Max	H	98	335	54	-19.0	Pass	RB
2430.862	66.5	3.0	-11.1	58.4	Peak [Scan]	V	--	--	--	--	n/a	FUND

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

Test Freq.	2422 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	9	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

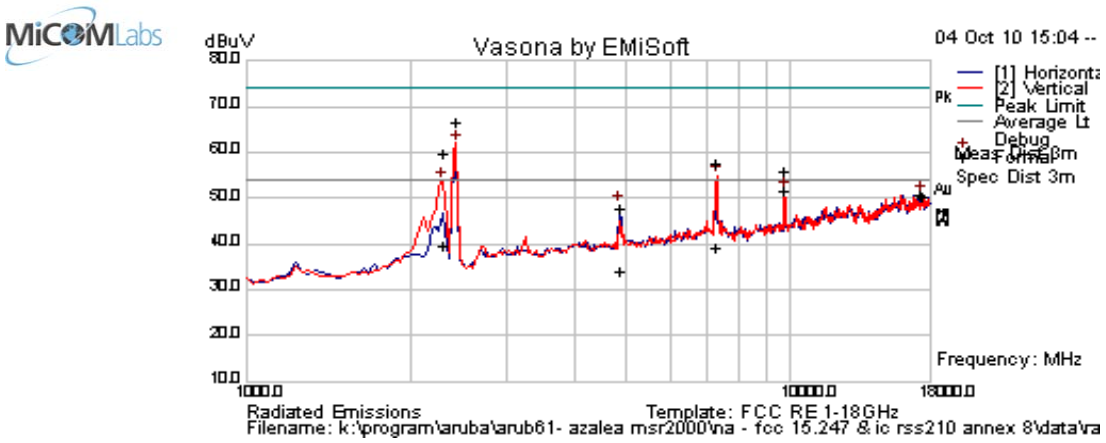


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16841.683	40.9	8.6	1.8	51.2	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
2430.86172	58.4	3.0	-11.1	50.3	Peak [Scan]	V	--	--	--	--	n/a	FUND

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

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			

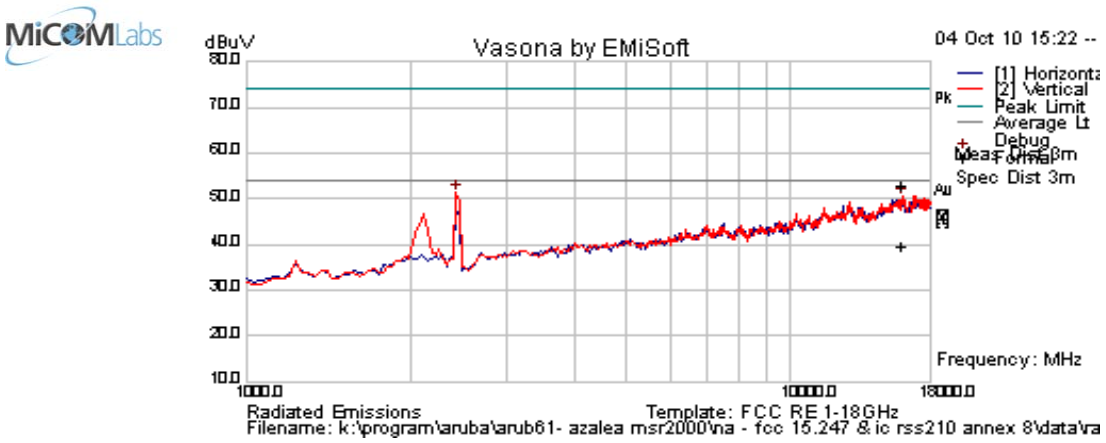


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
7303.888	56.9	5.4	-4.9	57.4	Peak Max	V	131	56	74.0	-16.6	Pass	RB
2310.701	68.0	2.9	-11.1	59.8	Peak Max	V	108	26	74.0	-14.2	Pass	RB
4871.182	52.6	4.5	-9.3	47.8	Peak Max	H	120	343	74	-26.2	Pass	RB
7303.888	38.5	5.4	-4.9	39.0	Average Max	V	131	56	54	-15.0	Pass	RB
2310.701	47.9	2.9	-11.1	39.7	Average Max	V	108	26	54	-14.3	Pass	RB
4871.182	38.7	4.5	-9.3	33.9	Average Max	H	120	343	54	-20.1	Pass	RB
2430.862	74.9	3.0	-11.1	66.8	Peak [Scan]	H	--	--	--	--	n/a	FUND
9755.511	53.4	6.4	-3.7	56.1	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
17454.910	39.7	8.7	2.0	50.5	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
9721.443	48.5	6.3	-3.3	51.6	Peak [Scan]	V	> 20 dB below FUND				Pass	NRB
17420.842	40.1	8.7	1.9	50.7	Peak [Scan]	H	> 20 dB below FUND				Pass	NRB

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

Test Freq.	2452 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	9	**Press. (mBars)**	1000
Antenna	AP-ANT-85	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band stop filter		
Test Notes 2			



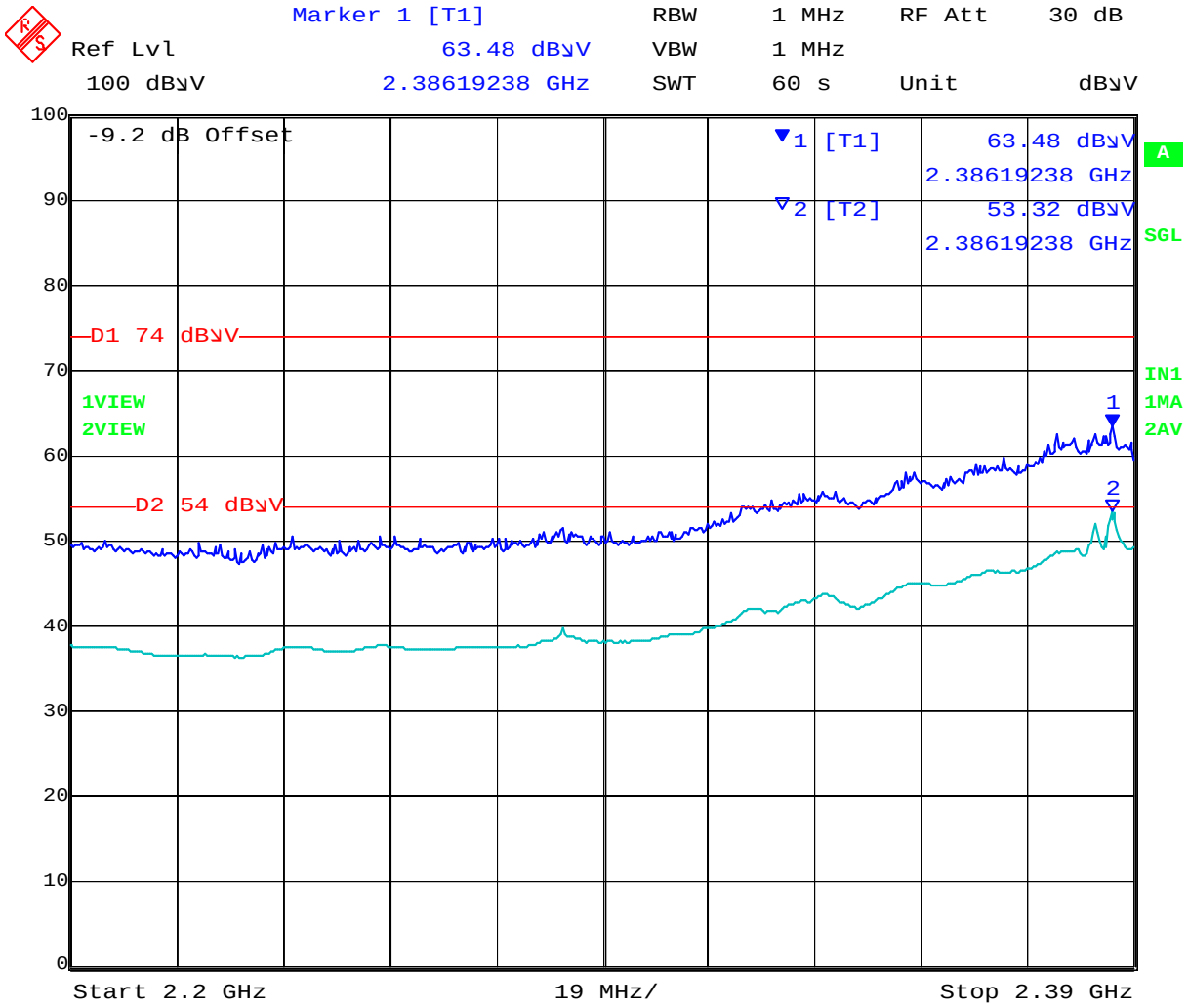
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16060.939	43.2	9.0	0.8	53.0	Peak Max	V	192	189	74.0	-21.0	Pass	RB
16060.939	29.7	9.0	0.8	39.5	Average Max	V	192	189	54.0	-14.5	Pass	RB
2430.862	59.4	3.0	-11.1	51.3	Peak [Scan]	V	--	--	--	--	n/a	FUND

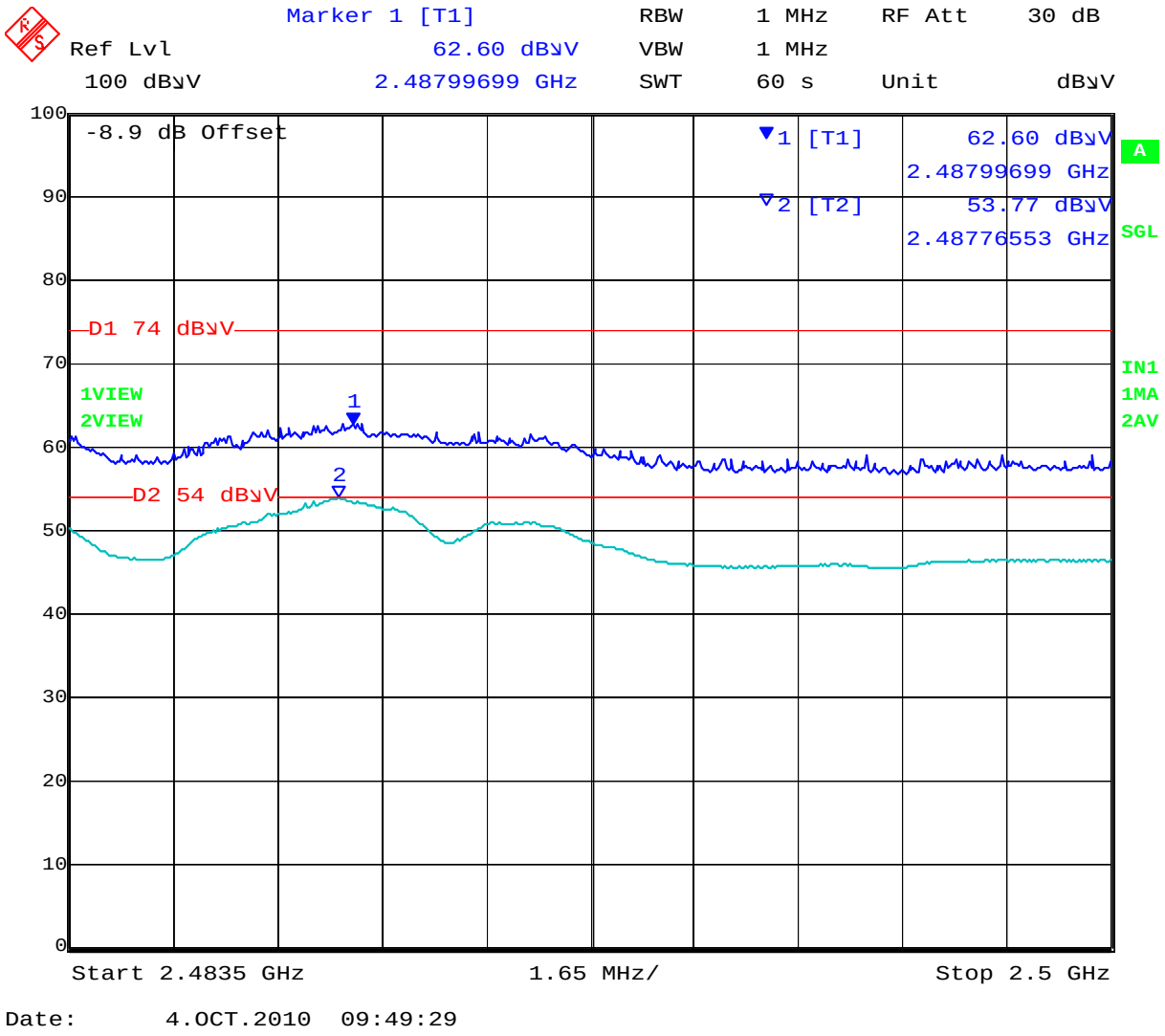
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

7.3.6 AP-ANT-85 2.4GHz - Transmitter Band Edge Emissions

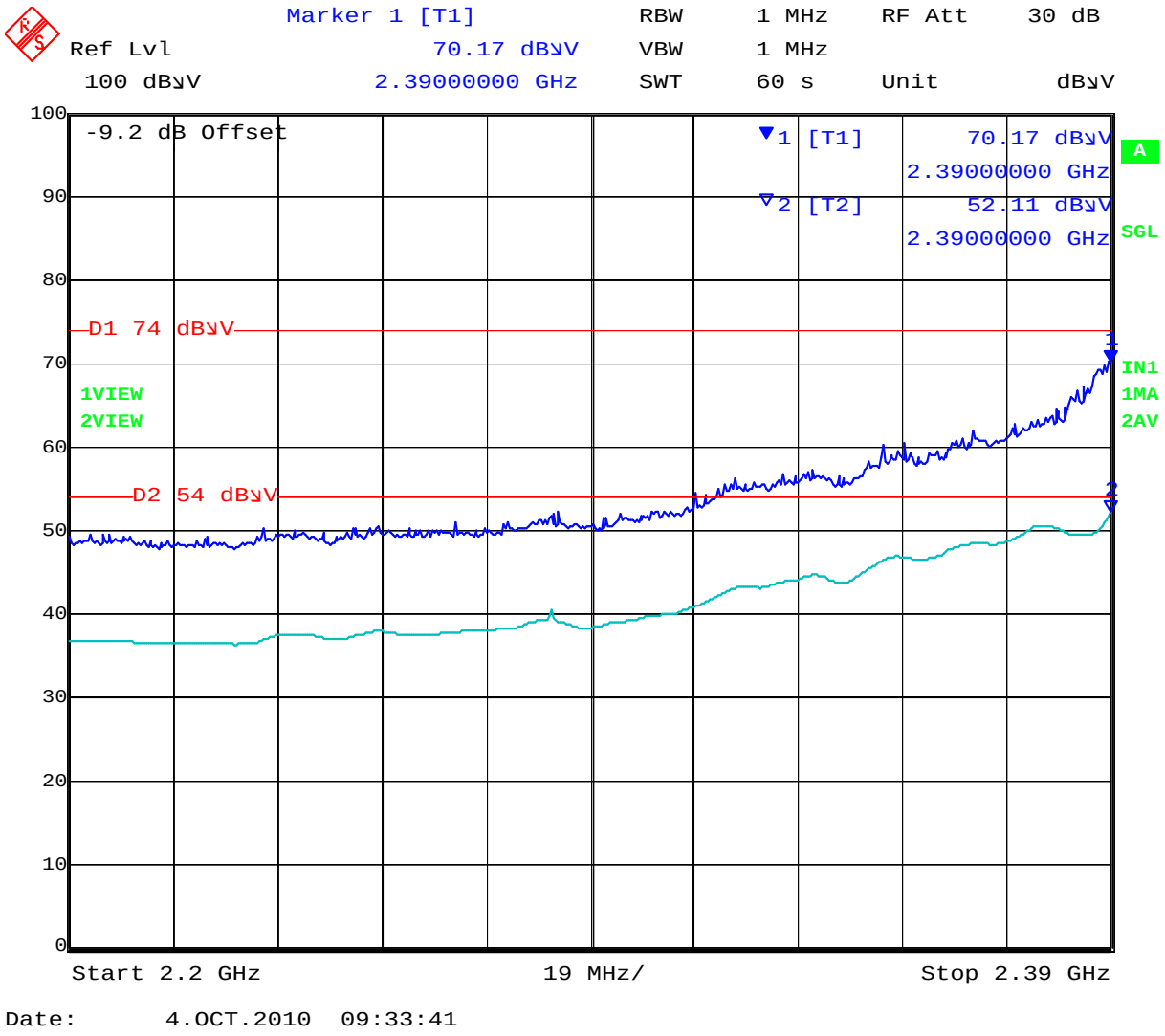
BE 802.11b 2412 MHz 2.2-2.39GHz



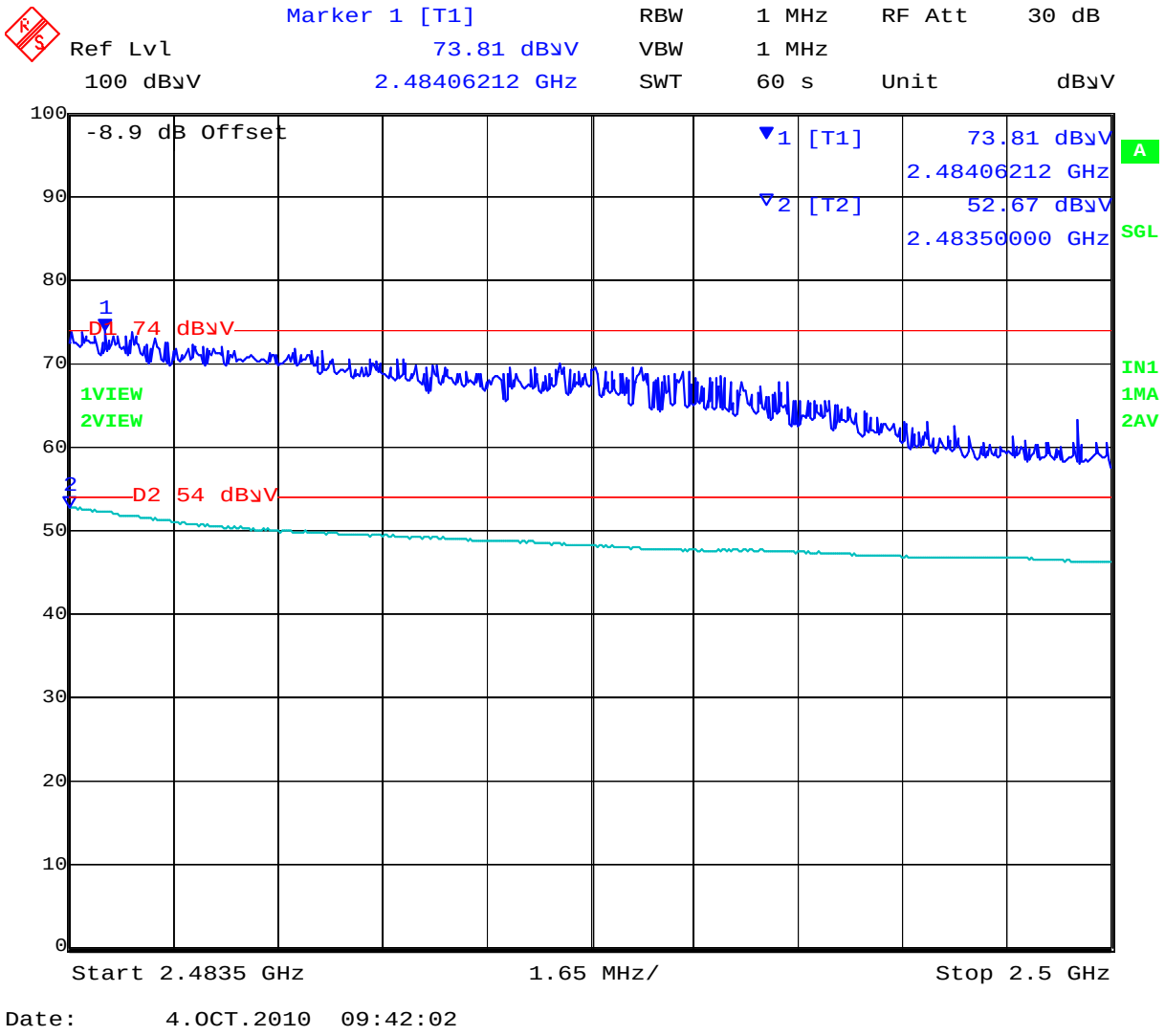
BE 802.11b 2462 MHz 2.4835-2.5GHz



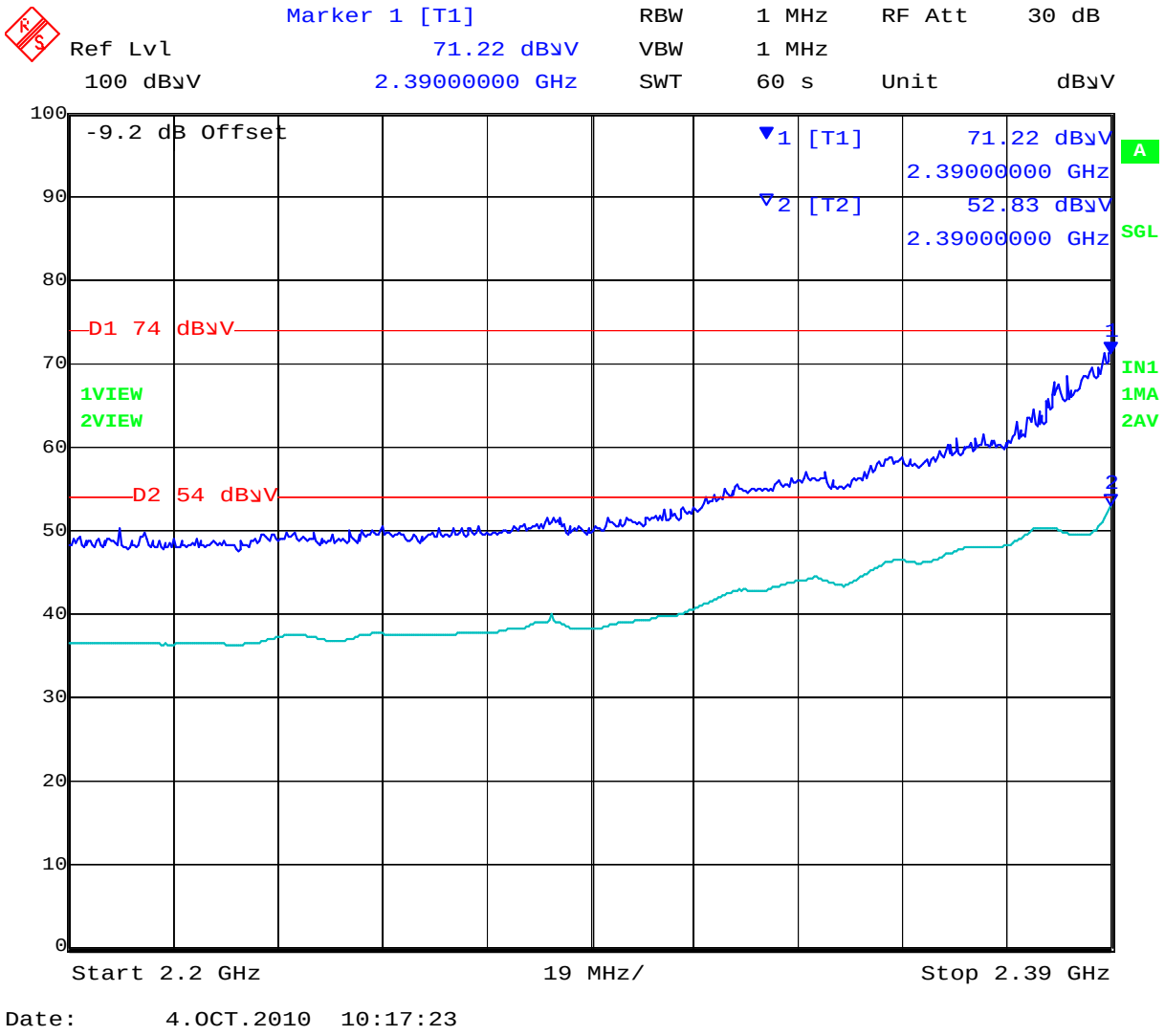
BE 802.11g 2412 MHz 2.2-2.39GHz



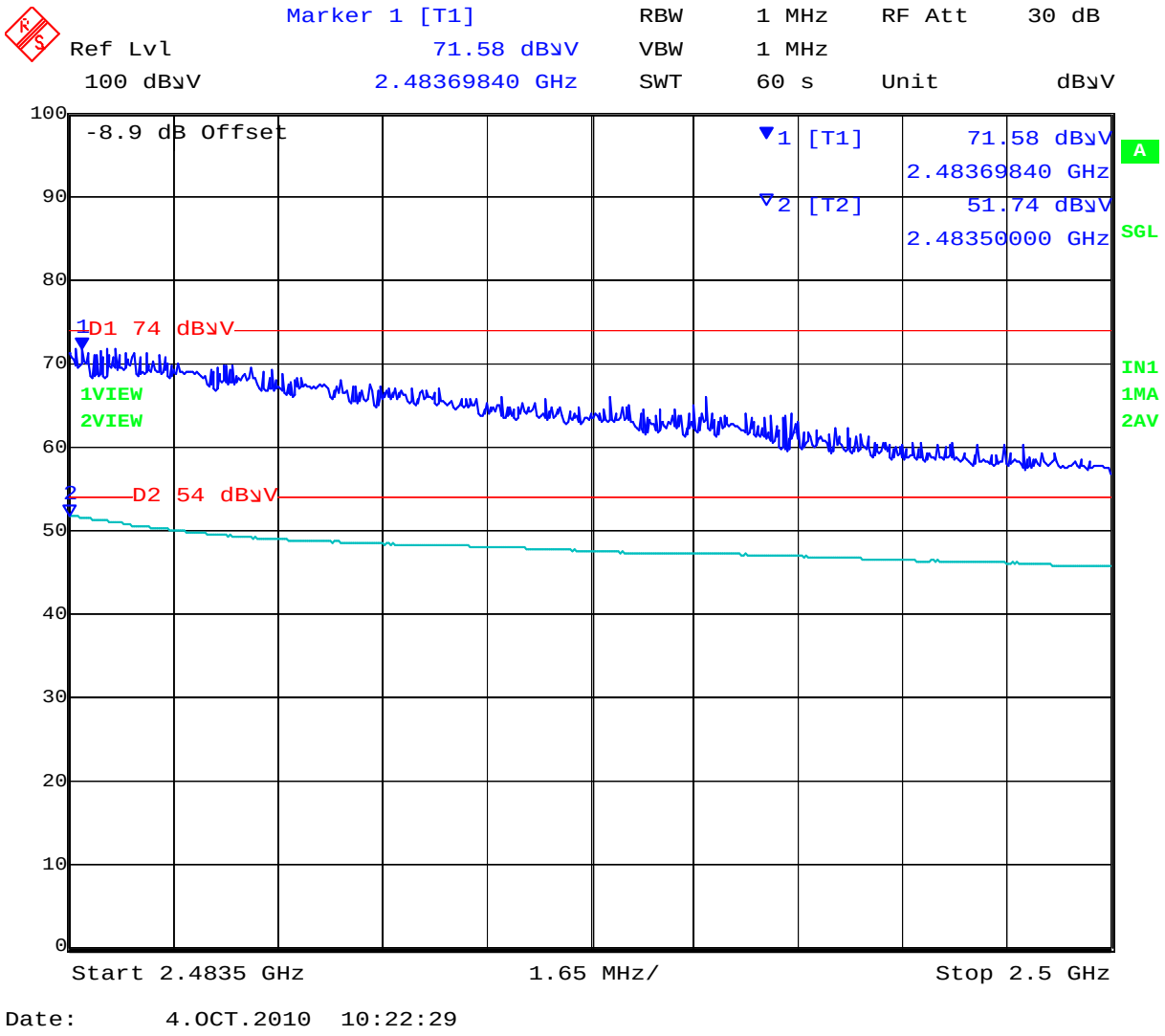
BE 802.11g 2462 MHz 2.4835-2.5GHz



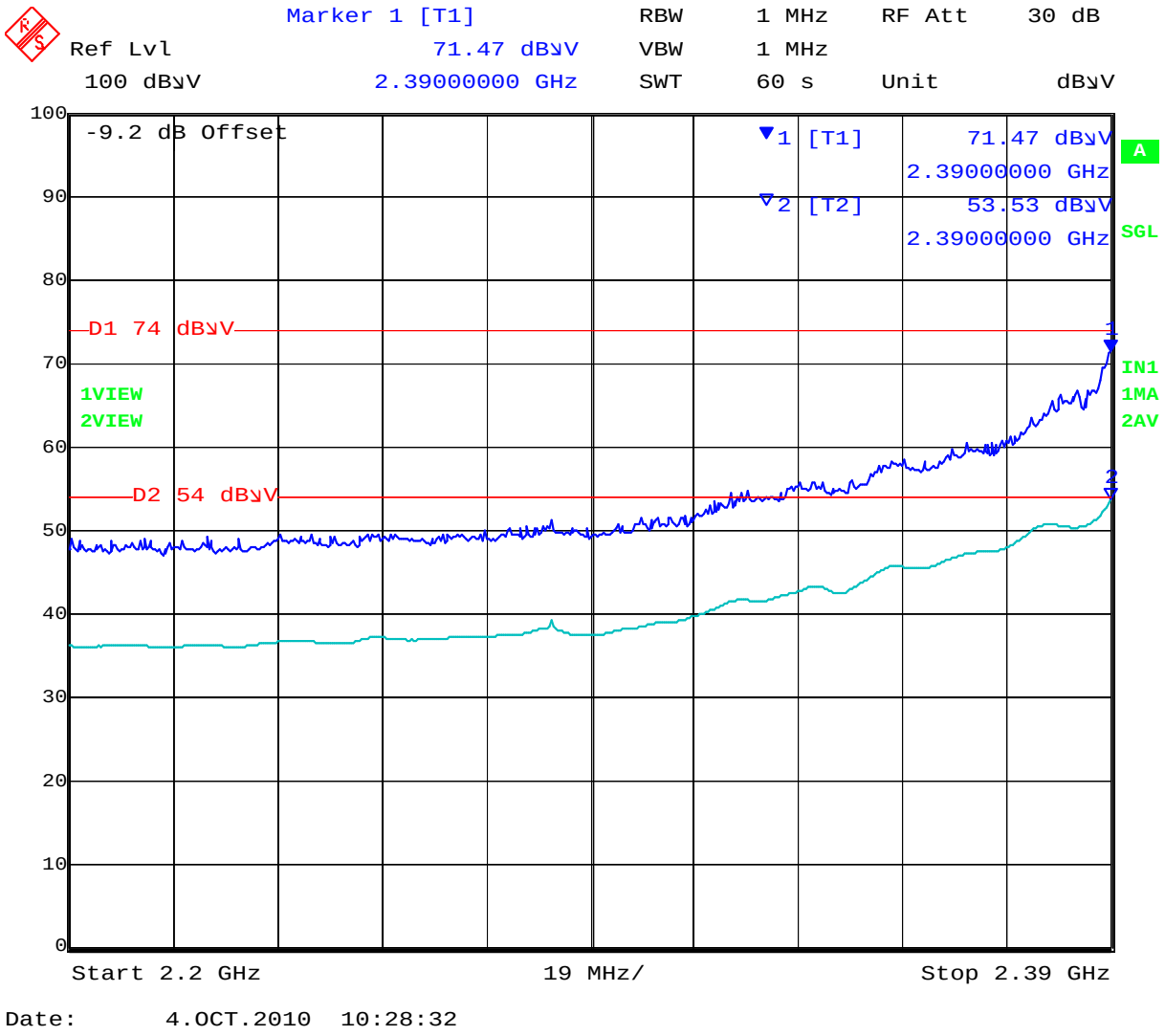
BE 802.11n HT20 2412 MHz 2.2-2.39GHz



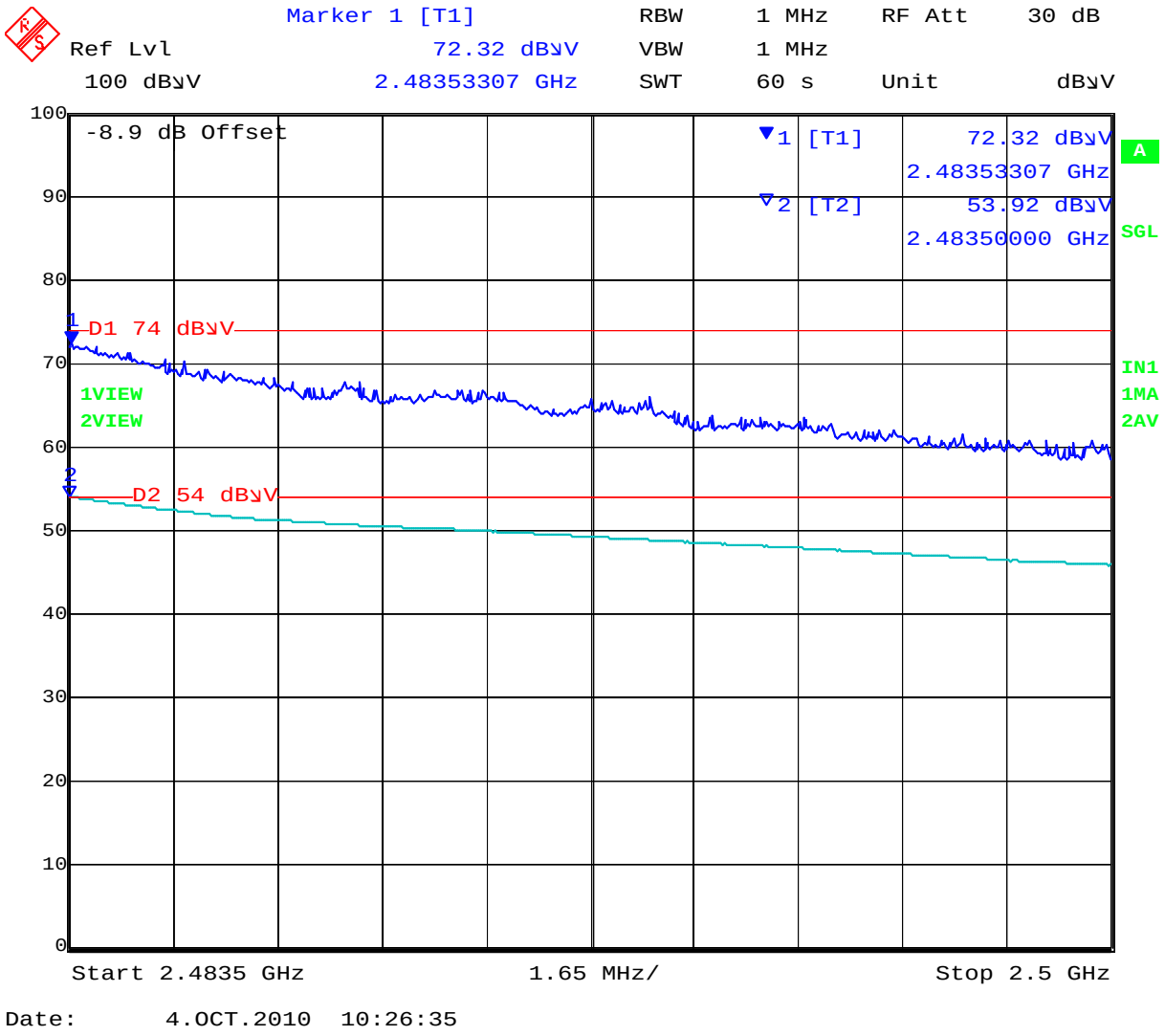
BE 802.11n HT20 2462 MHz 2.4835-2.5GHz



BE 802.11n HT40 2422 MHz 2.2-2.39GHz

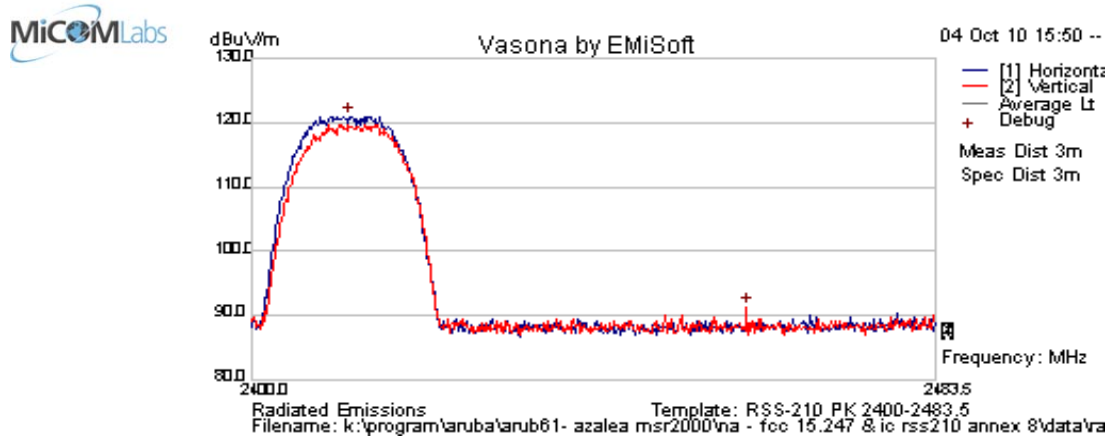


BE 802.11n HT40 2452 MHz 2.4835-2.5GHz



7.3.7 AP-ANT-85 2.4GHz - Transmitter Peak Emissions

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	17.5	**Press. (mBars)**	1000
Antenna	AP ANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

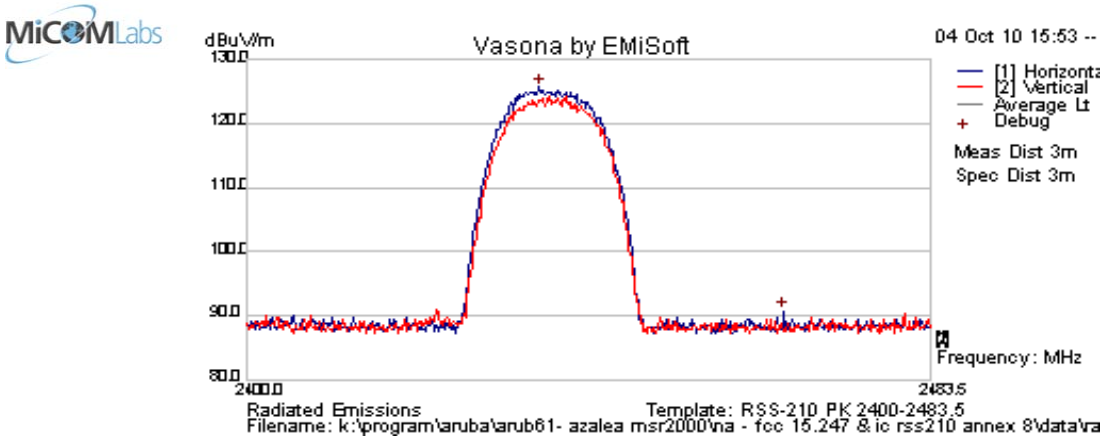


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2411.881	75.9	13.0	32.2	121.0	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	21	**Press. (mBars)**	1000
Antenna	AP ANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

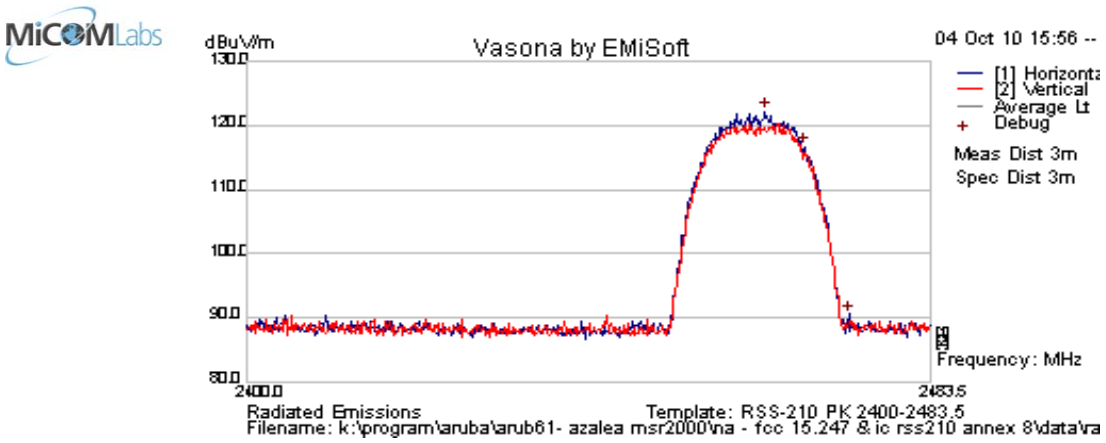


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2435.475	80.6	13.0	32.2	125.8	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11b; 1 Mbs	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	17.5	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

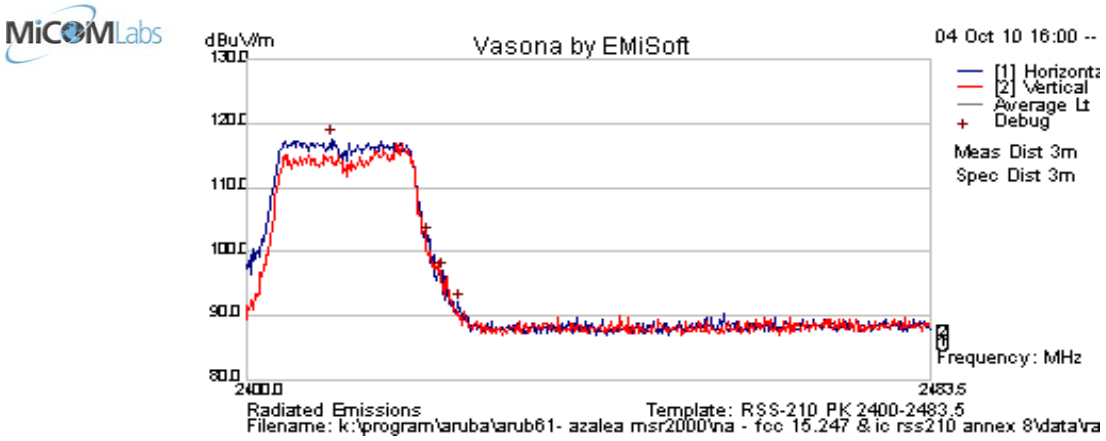


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2463.085	77.0	13.0	32.3	122.2	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	13.5	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

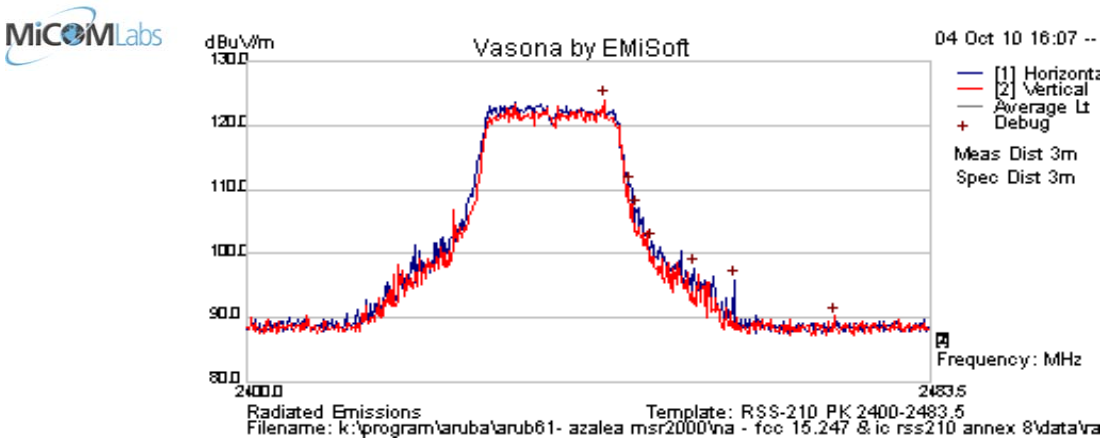


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2410.207	72.6	13.0	32.2	117.7	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1000
Antenna	AP ANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

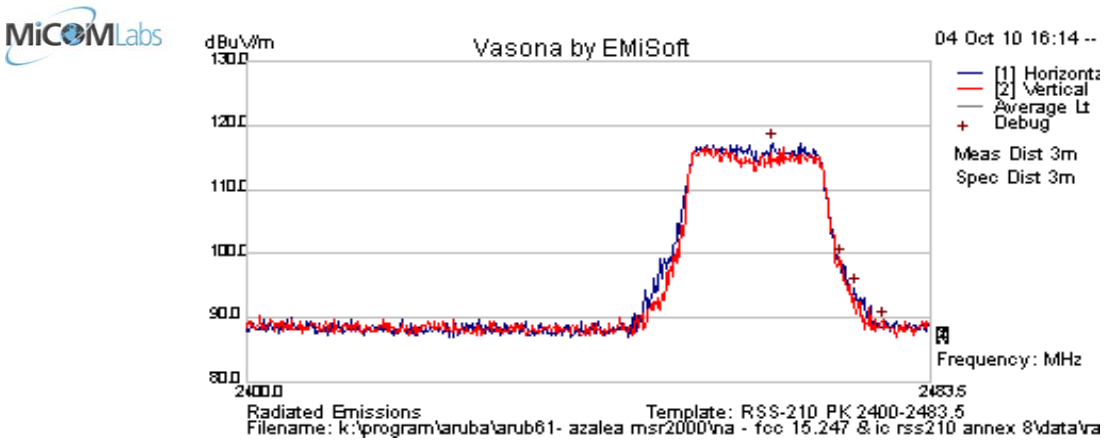


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2443.340	78.8	13.0	32.3	124.0	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11g; 6 Mbs	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	13.5	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

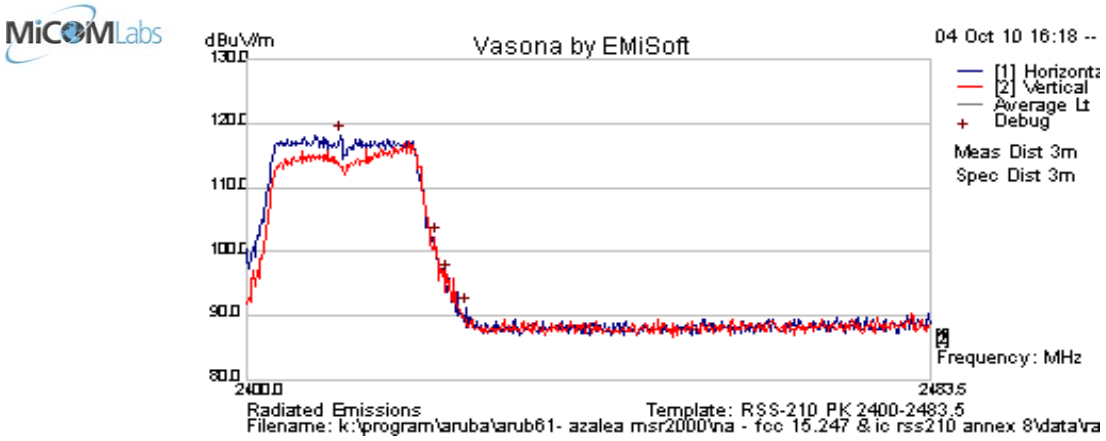


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2464.089	72.0	13.0	32.3	117.3	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2412 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	14	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

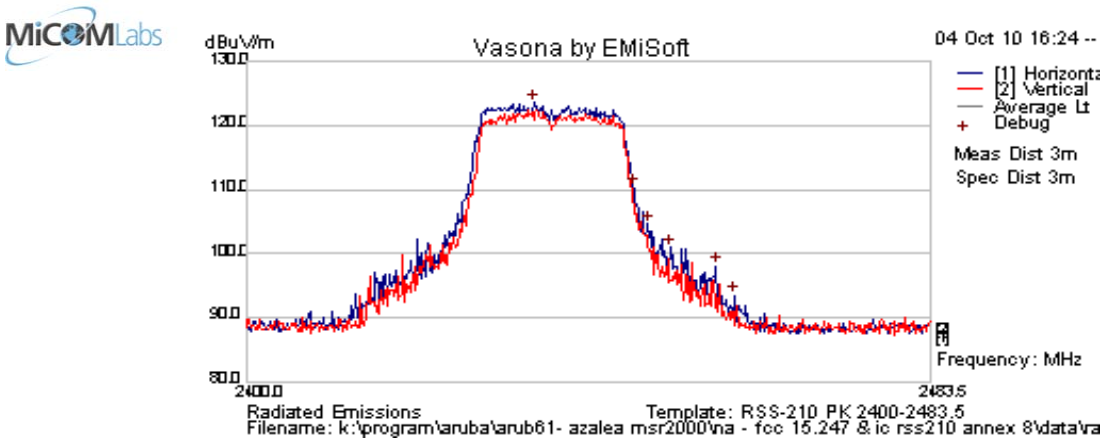


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2411.379	73.1	13.0	32.2	118.2	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

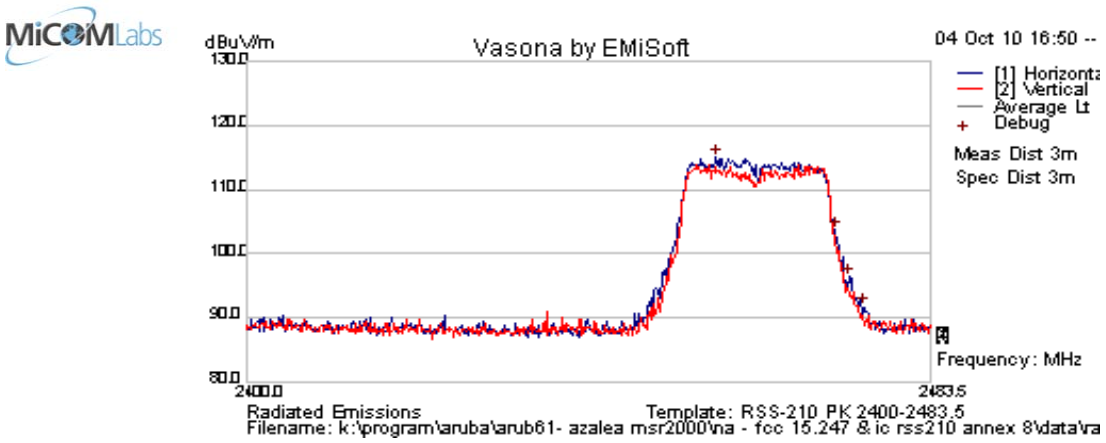


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2434.806	78.3	13.0	32.2	123.5	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2462 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	12	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

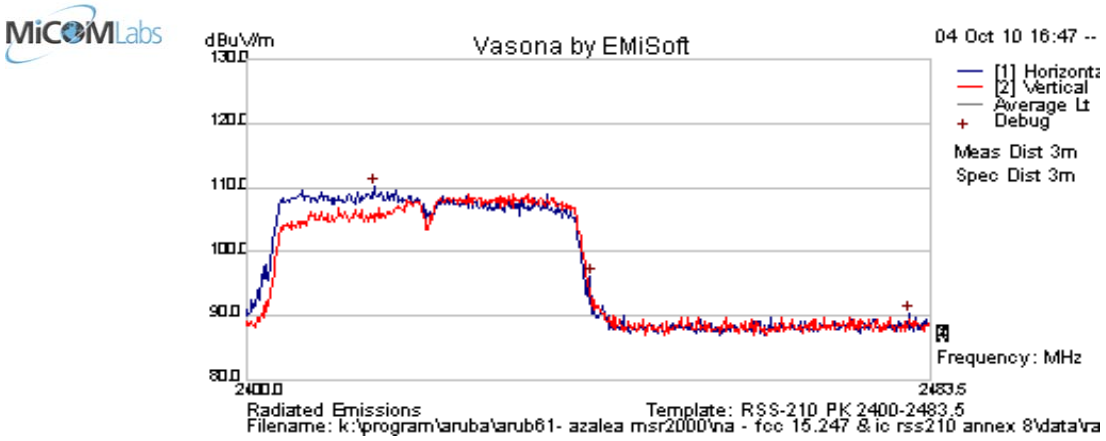


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2457.061	69.8	13.0	32.3	115.1	Peak [Scan]	H						

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2422 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	9	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

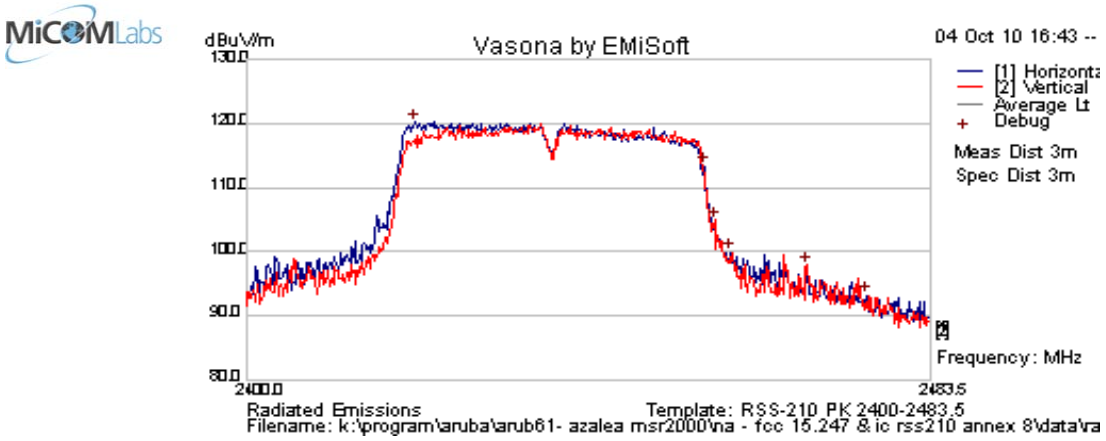


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2415.395	65.0	13.0	32.2	110.1	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2437 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1000
Antenna	AP ANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

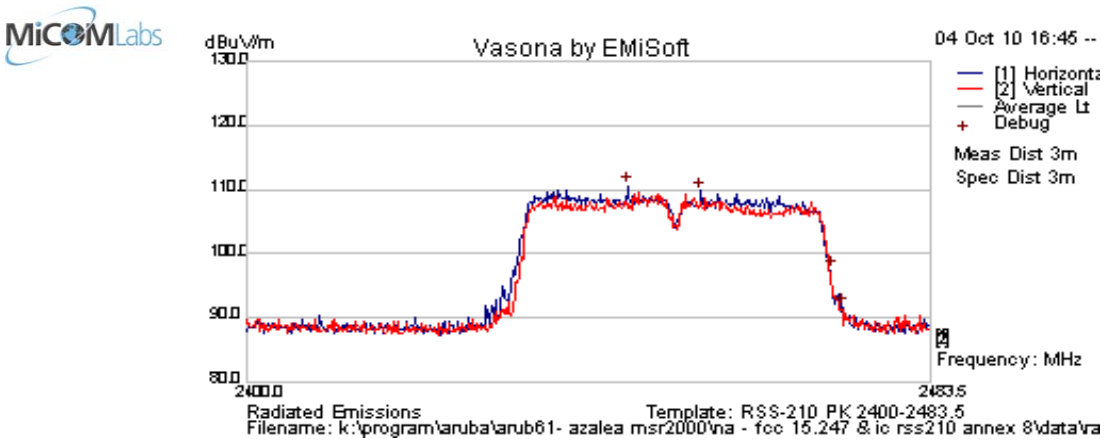


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2420.415	75.1	13.0	32.2	120.2	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	2452 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	2400 - 2483.5 MHz	**Rel. Hum.(%)**	32
Power Setting	9	**Press. (mBars)**	1000
Antenna	APANT 85	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



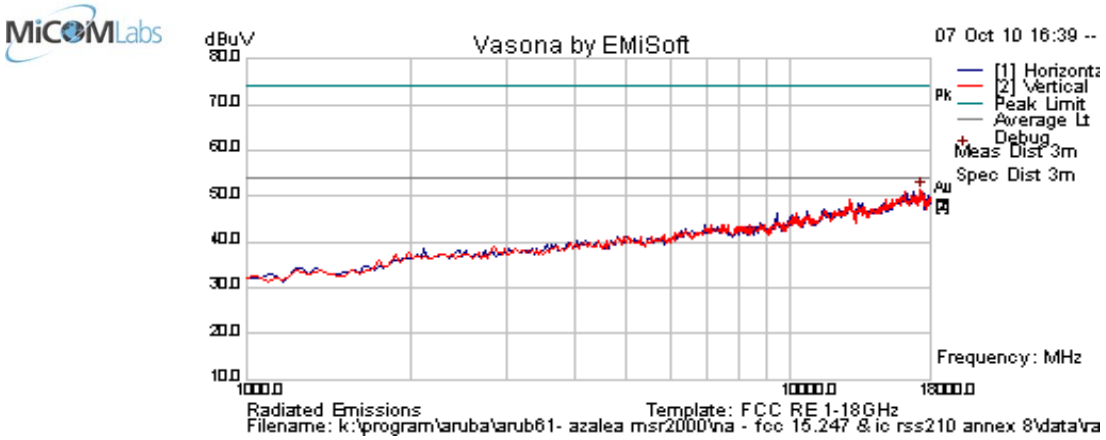
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2446.184	65.4	13.0	32.3	110.7	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

7.3.8 AP-ANT-85 2.4GHz - Receiver Emissions

Test Freq.	2437 MHz	**Engineer**	SB
Variant	Receive in Test Utility	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	Not Applicable in Receive Mode	**Press. (mBars)**	1003
Antenna	AP-ANT-85		
Test Notes 1			
Test Notes 2			



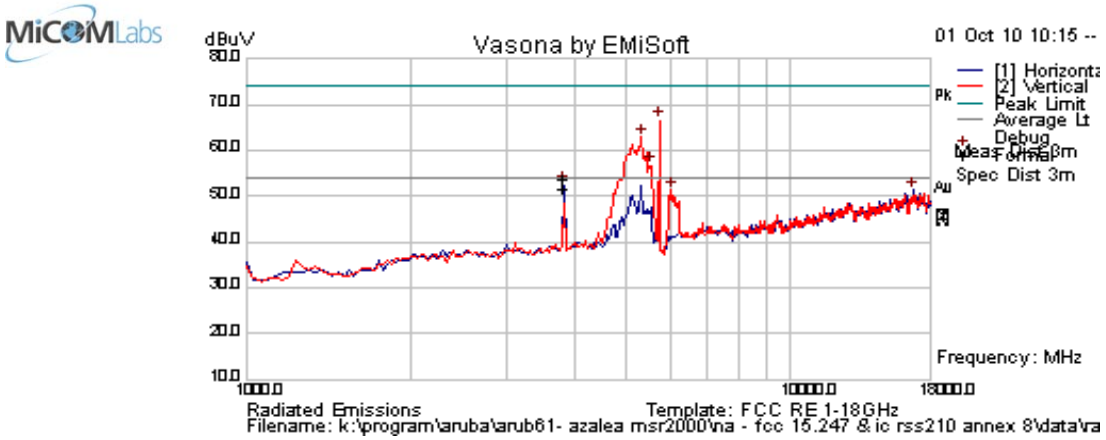
Formally measured emission peaks

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
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.

7.3.9 AP-ANT-86D 5.8GHz - Transmitter Radiated Spurious Emissions – Above 1 GHz

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11a; 6.5 Mbs	**Temp (ºC)**	27.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	31
Power Setting	16.5	**Press. (mBars)**	996
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

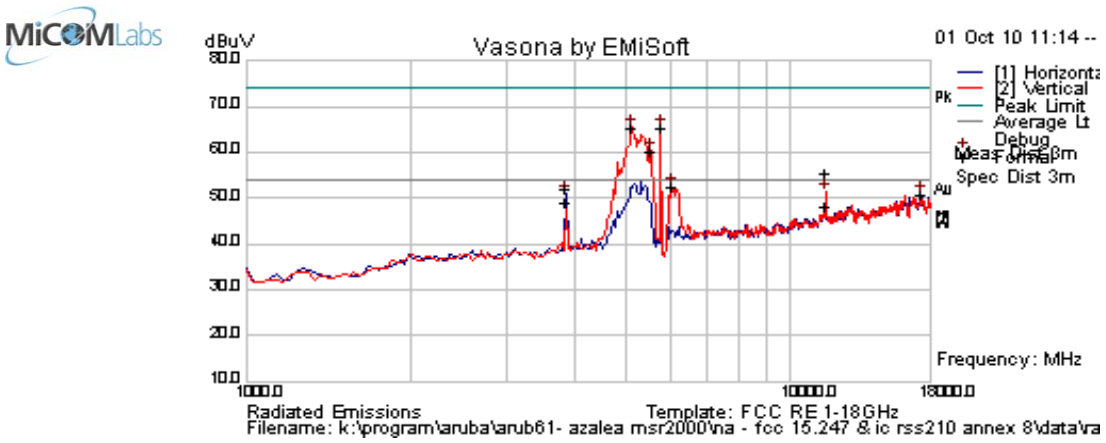


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3829.950	60.2	3.8	-10.1	53.9	Peak Max	H	98	275	74.0	-20.1	Pass	RB
3829.94996	58.1	3.8	-10.1	51.8	Average Max	H	98	275	54.0	-2.2	Pass	RB
5735.471	70.1	4.8	-8.2	66.6	Peak [Scan]	V	--	--	--	--	n/a	Fund
5326.653	67.7	4.6	-9.5	62.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5531.062	60.7	4.6	-8.7	56.7	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
16773.547	41.0	8.6	1.7	51.4	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6042.084	54.6	4.9	-8.2	51.3	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11a; 6.5 Mbs	**Temp (ºC)**	27.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	31
Power Setting	20.0	**Press. (mBars)**	996
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

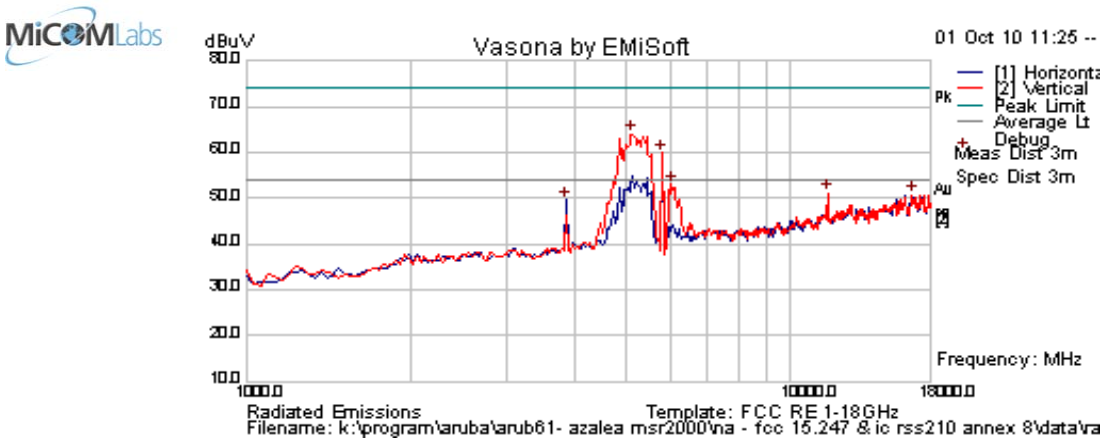


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11569.910	49.8	6.8	-1.2	55.4	Peak Max	V	101	341	74.0	-18.6	Pass	RB
3856.613	58.4	3.8	-10.2	52.1	Peak Max	H	99	338	74.0	-21.9	Pass	RB
11569.910	42.7	6.8	-1.2	48.3	Average Max	V	101	341	54	-5.7	Pass	RB
3856.613	55.4	3.8	-10.2	49.0	Average Max	H	99	338	54	-5.0	Pass	RB
5769.539	68.9	4.8	-8.3	65.4	Peak [Scan]	V	--	--	--	--	n/a	Fund
5531.062	64.3	4.6	-8.7	60.2	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6042.084	55.9	4.9	-8.2	52.6	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17318.637	40.4	8.7	1.7	50.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11a; 6.5 Mbs	**Temp (ºC)**	27.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	31
Power Setting	20.0	**Press. (mBars)**	996
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

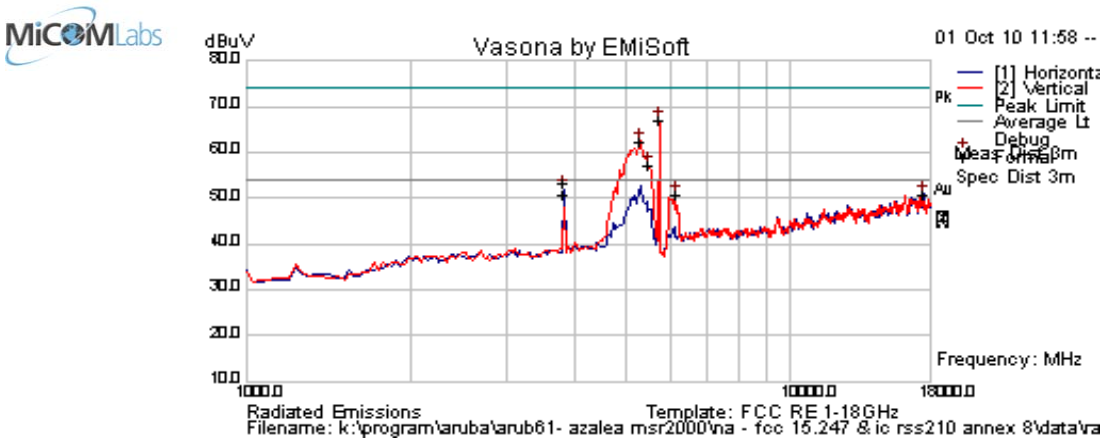


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11649.990	49.1	6.8	-1.9	54.0	Peak Max	V	113	158	74.0	-20.0	Pass	RB
3883.322	57.9	3.8	-10.4	51.4	Peak Max	H	98	321	74.0	-22.6	Pass	RB
11649.990	40.8	6.8	-1.9	45.7	Average Max	V	113	158	54	-8.3	Pass	RB
3883.322	55.0	3.8	-10.4	48.5	Average Max	H	98	321	54	-5.5	Pass	RB
5803.607	63.5	4.8	-8.3	60.0	Peak [Scan]	V	--	--	--	--	n/a	Fund
6042.084	56.3	4.9	-8.2	52.9	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
16705.411	40.7	8.7	1.4	50.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	28
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	16.5	**Press. (mBars)**	997
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

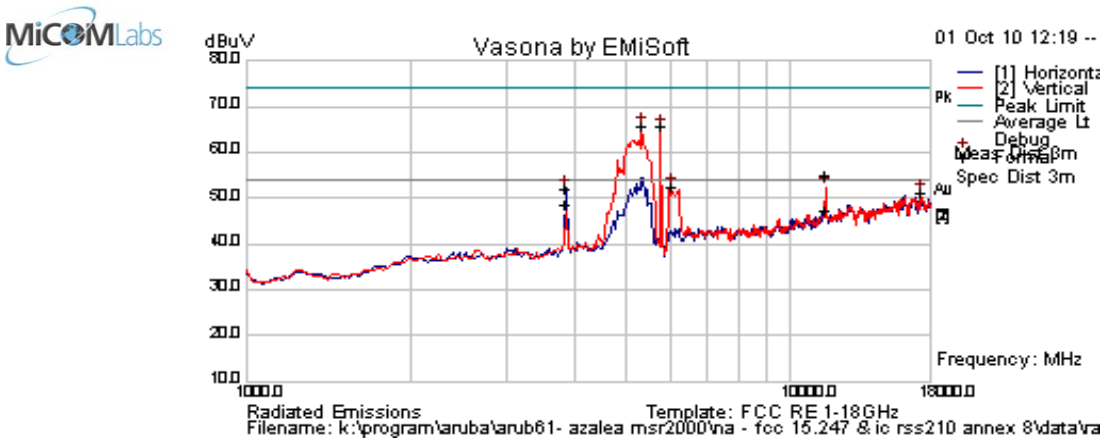


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3830.005	59.5	3.8	-10.1	53.2	Peak Max	H	98	277	74.0	-20.8	Pass	RB
3830.005	57.2	3.8	-10.1	50.9	Average Max	H	98	277	54.0	-3.1	Pass	RB
5735.471	70.4	4.8	-8.2	66.9	Peak [Scan]	V	--	--	--	--	n/a	Fund
5292.585	67.3	4.6	-9.5	62.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5496.994	61.2	4.6	-8.7	57.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17591.182	41.0	8.8	1.1	50.9	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6144.289	53.2	5.0	-7.3	50.9	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	28
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	997
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

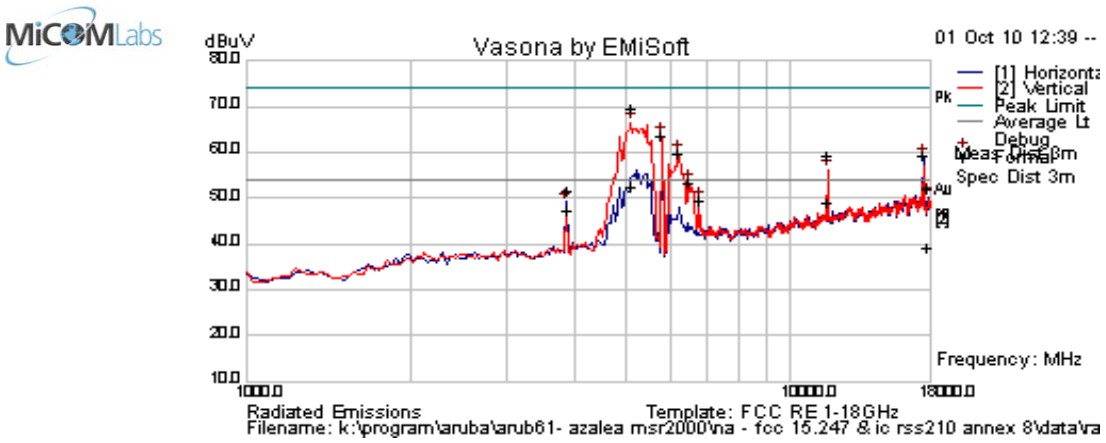


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11569.897	49.6	6.8	-1.2	55.2	Peak Max	V	102	342	74.0	-18.8	Pass	RB
3856.606	58.3	3.8	-10.2	51.9	Peak Max	H	100	344	74.0	-22.1	Pass	RB
11569.897	41.9	6.8	-1.2	47.5	Average Max	V	102	342	54	-6.5	Pass	RB
3856.606	55.1	3.8	-10.2	48.7	Average Max	H	100	344	54	-5.3	Pass	RB
5326.653	70.7	4.6	-9.5	65.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5769.539	69.1	4.8	-8.3	65.6	Peak [Scan]	V	--	--	--	--	n/a	Fund
6042.084	55.7	4.9	-8.2	52.4	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17284.569	40.9	8.6	1.6	51.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	28
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	997
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

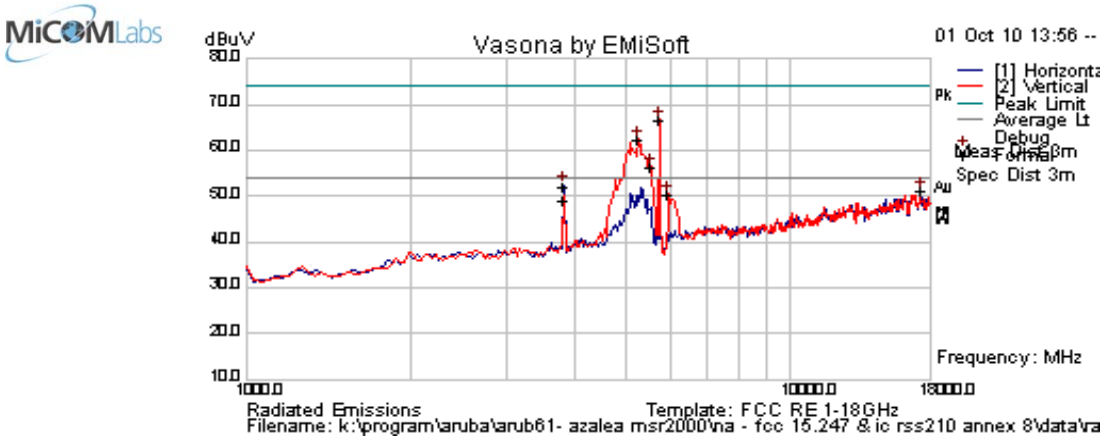


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5098.517	73.7	4.6	-8.8	69.6	Peak Max	V	98	247	74.0	-4.5	Pass	RB
11649.94	54.4	6.8	-1.9	59.4	Peak Max	V	151	329	74.0	-14.7	Pass	RB
17899.399	42.2	8.8	0.9	51.9	Peak Max	H	170	50	74	-22.2	Pass	RB
3883.342	58.2	3.8	-10.4	51.6	Peak Max	H	98	317	74	-22.4	Pass	RB
5098.517	56.7	4.6	-8.8	52.5	Average Max	V	98	247	54	-1.5	Pass	RB
11649.940	44.1	6.8	-1.9	49.0	Average Max	V	151	329	54	-5.0	Pass	RB
17899.399	29.5	8.8	0.9	39.2	Average Max	H	170	50	54	-14.8	Pass	RB
3883.342	53.8	3.8	-10.4	47.3	Average Max	H	98	317	54	-6.7	Pass	RB
5803.607	67.1	4.8	-8.3	63.6	Peak [Scan]	V	--	--	--	--	n/a	Fund
6246.493	61.4	5.0	-6.7	59.7	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17488.978	48.9	8.8	1.5	59.2	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6484.970	55.0	5.1	-6.6	53.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6791.583	50.2	5.3	-6.0	49.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5755 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	28.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	15	**Press. (mBars)**	998
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

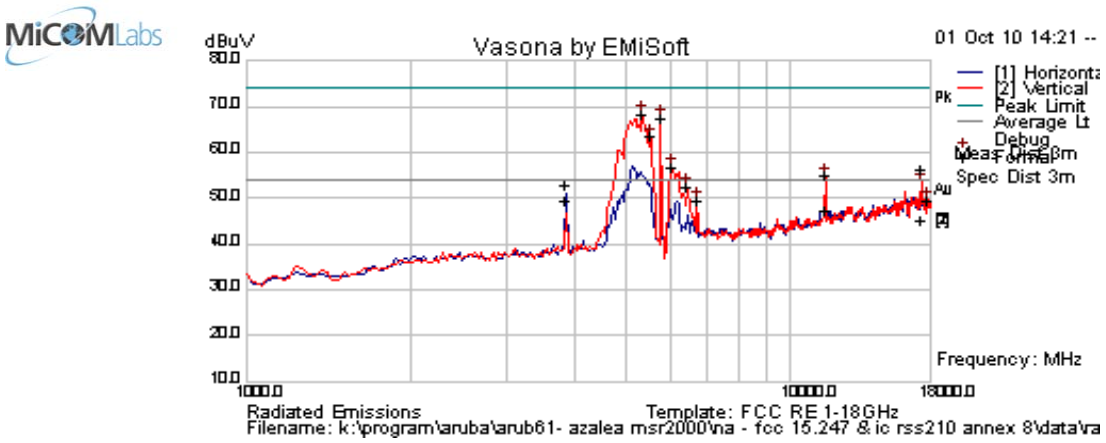


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3836.621	58.3	3.8	-10.2	51.9	Peak Max	H	101	373	74.0	-22.1	Pass	RB
3836.621	55.4	3.8	-10.2	49.0	Average Max	H	101	373	54.0	-5.0	Pass	RB
5735.471	70.2	4.8	-8.2	66.7	Peak [Scan]	V	--	--	--	--	n/a	Fund
5258.517	67.2	4.6	-9.5	62.4	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5531.062	60.5	4.6	-8.7	56.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17318.637	40.9	8.7	1.7	51.3	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
5973.948	53.8	4.9	-8.2	50.4	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	28.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	998
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

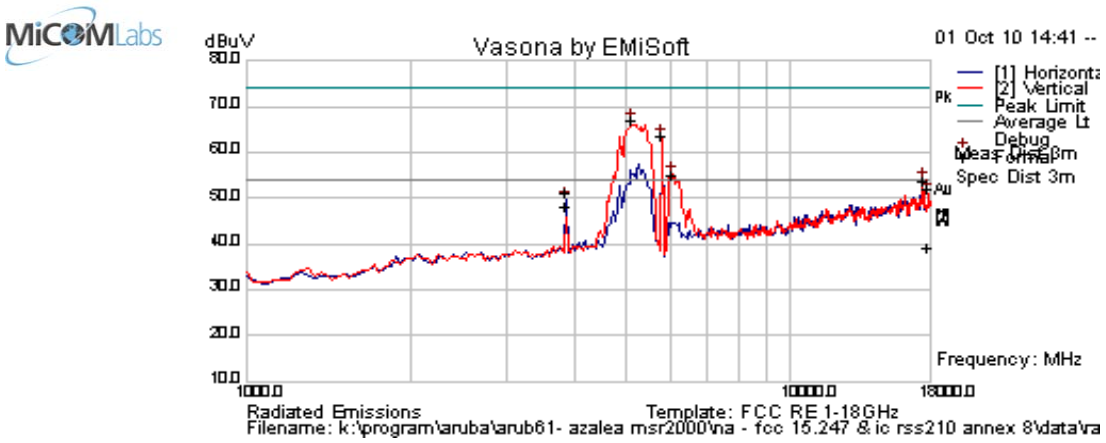


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11569.985	49.6	6.8	-1.2	55.2	Peak Max	V	149	158	74.0	-18.8	Pass	RB
3856.633	59.4	3.8	-10.2	53.0	Peak Max	H	98	323	74.0	-21.0	Pass	RB
17354.970	45.4	8.7	2.1	56.2	Peak Max	H	111	327	74	-17.8	Pass	RB
11569.985	41.6	6.8	-1.2	47.2	Average Max	V	149	158	54	-6.8	Pass	RB
3856.633	56.0	3.8	-10.2	49.6	Average Max	H	98	323	54	-4.4	Pass	RB
17354.970	34.2	8.7	2.1	45.0	Average Max	H	111	327	54	-9.0	Pass	RB
5344.962	76.0	4.6	-9.4	71.3	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5769.539	71.1	4.8	-8.3	67.6	Peak [Scan]	V	--	--	--	--	n/a	Fund
5531.062	67.5	4.6	-8.7	63.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6076.152	59.6	4.9	-7.9	56.6	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6450.902	54.2	5.1	-6.9	52.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17897.796	40.0	8.8	0.9	49.7	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6723.447	50.3	5.2	-5.9	49.6	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5815 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	28.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	998
Antenna	AP-ANT-86D	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			



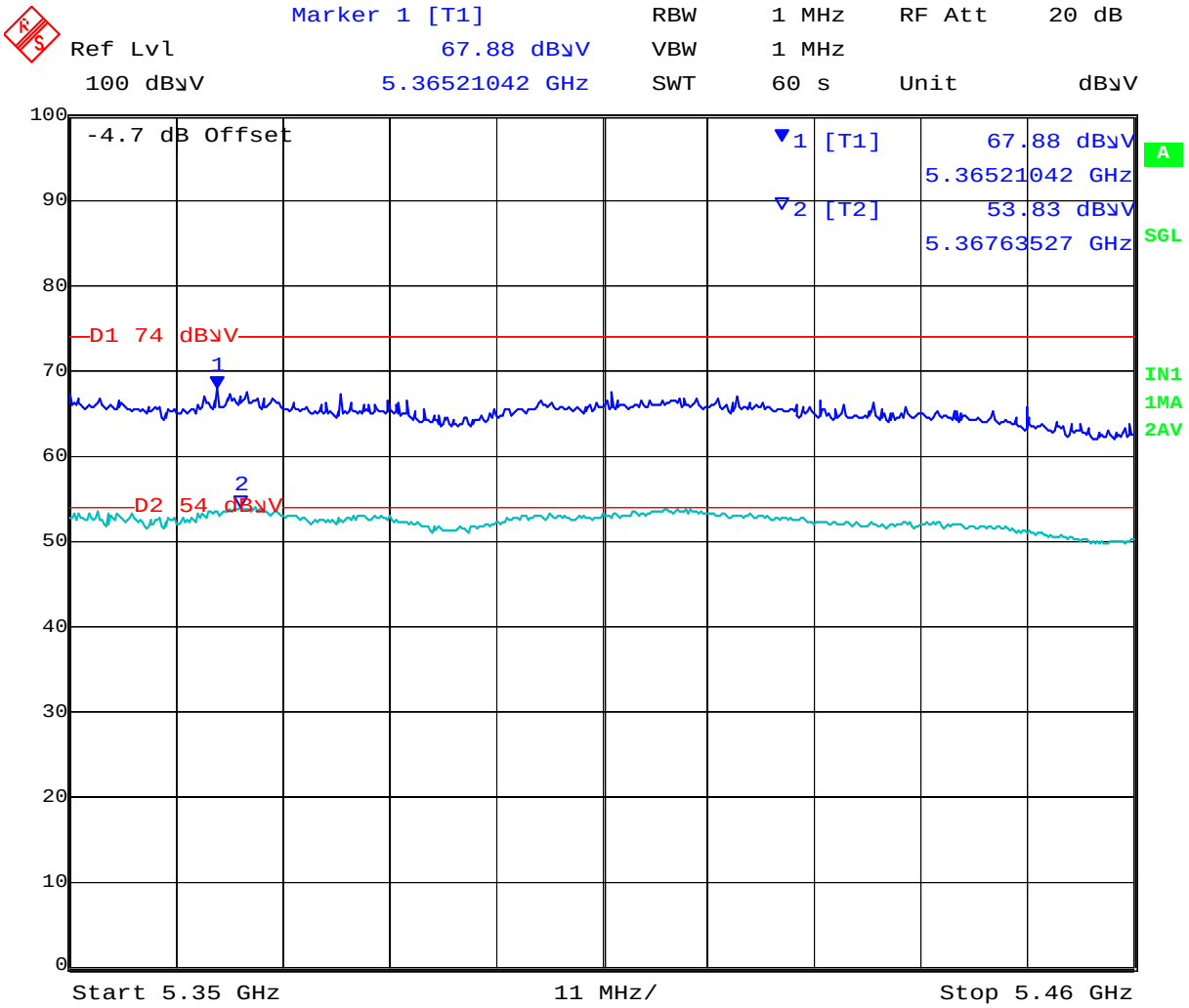
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
17867.845	42.4	8.8	0.9	52.1	Peak Max	V	141	254	74.0	-21.9	Pass	RB
3876.648	57.7	3.8	-10.3	51.2	Peak Max	H	98	314	74.0	-22.8	Pass	RB
17867.845	29.5	8.8	0.9	39.3	Average Max	V	141	254	54	-14.8	Pass	RB
3876.648	54.5	3.8	-10.3	48.0	Average Max	H	98	314	54	-6.0	Pass	RB
5088.176	71.0	4.6	-8.8	66.9	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5803.607	66.9	4.8	-8.3	63.4	Peak [Scan]	H	--	--	--	--	n/a	Fund
6076.152	58.2	4.9	-7.9	55.2	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17454.910	42.9	8.7	2.0	53.7	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

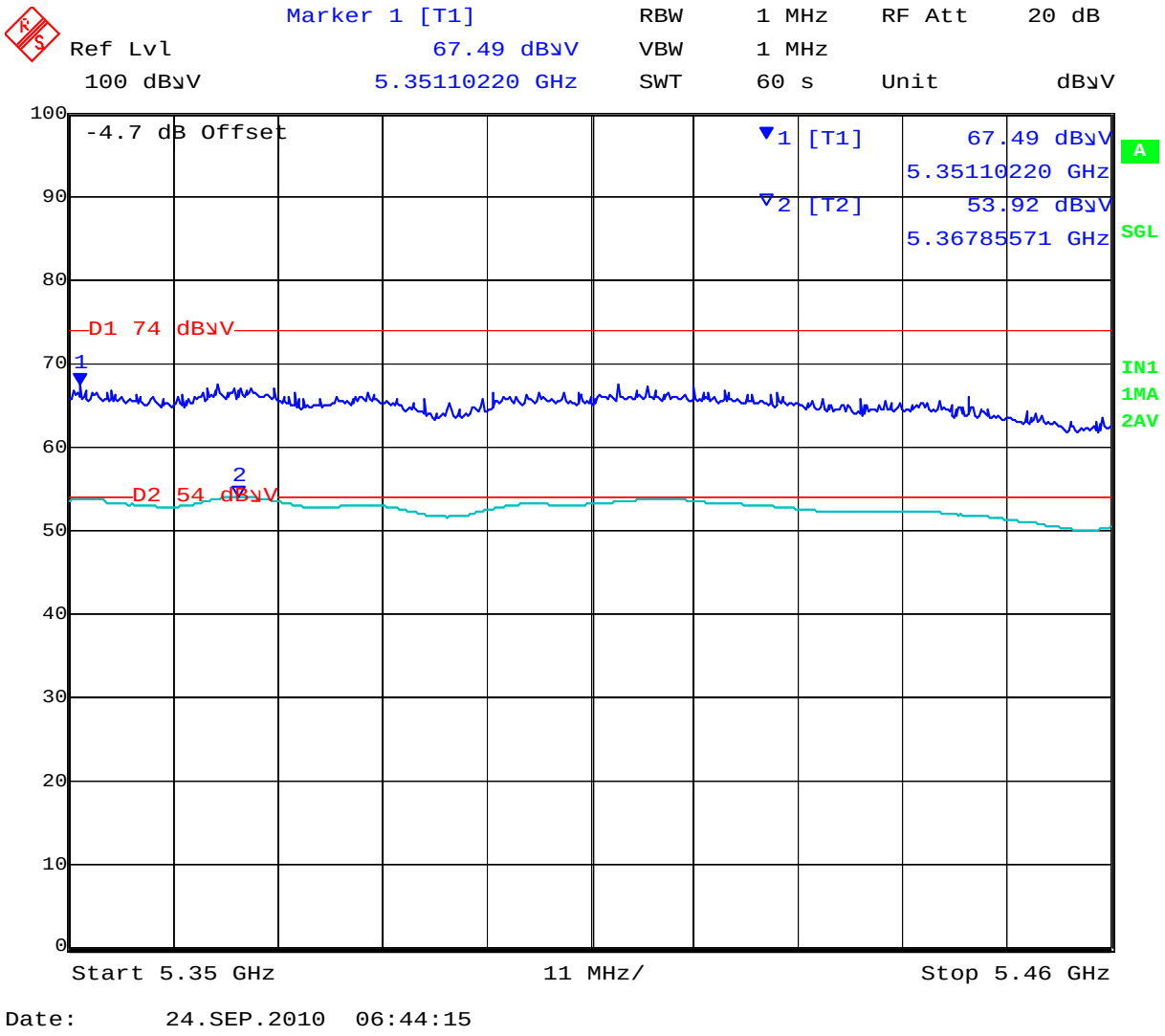
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

7.3.10 AP-ANT-86D 5.8GHz - Transmitter Band Edge Emissions

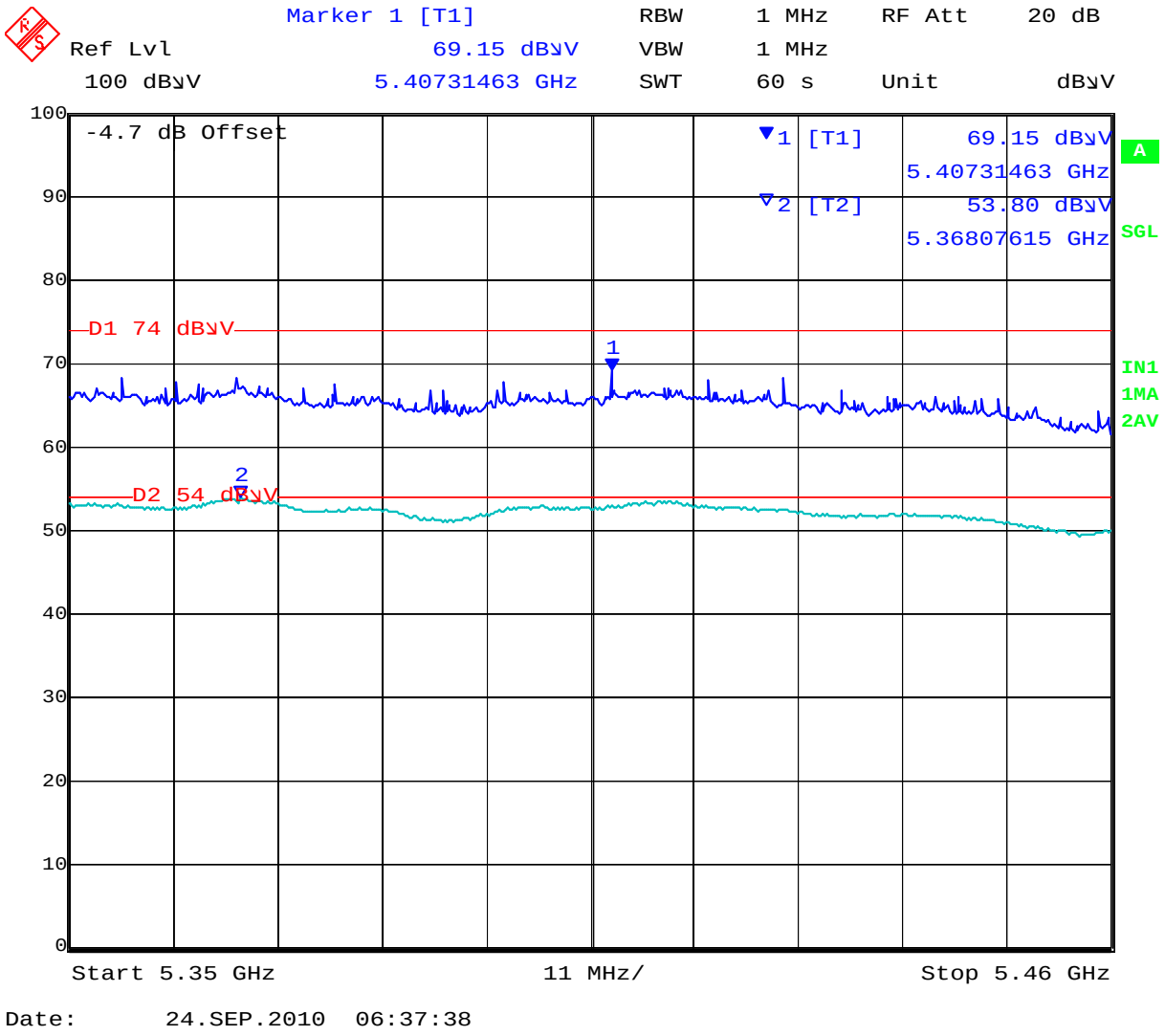
ARUB61 Band Edge 5745 MHz; 802.11a 5350-5460 MHz ART=16.5



ARUB61 Band Edge 5745 MHz; 802.11n HT-20 5350-5460 MHz ART=16.5

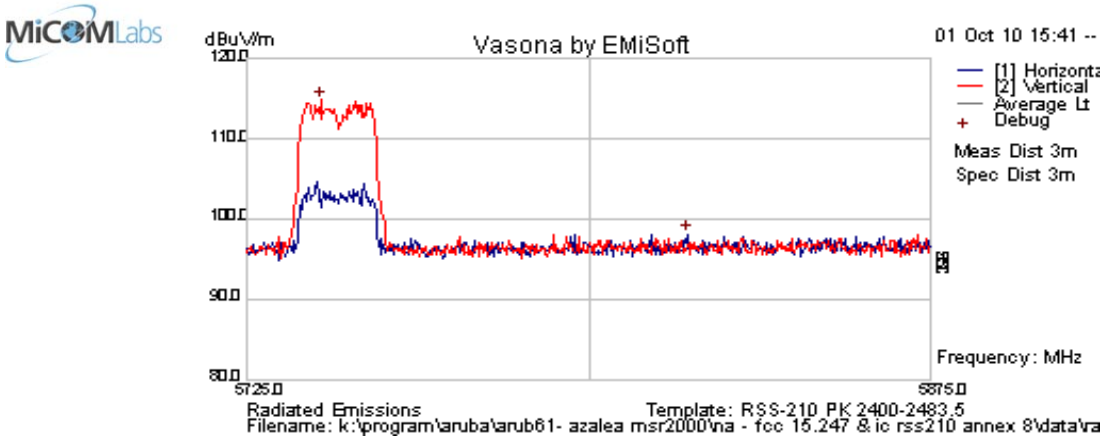


ARUB61 Band Edge 5755 MHz; 802.11n ht-40 5350-5460 MHz ART=15



7.3.11 AP-ANT-86D 5.8GHz - Transmitter Peak Emissions

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11a; 6 Mbs	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	16.5	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

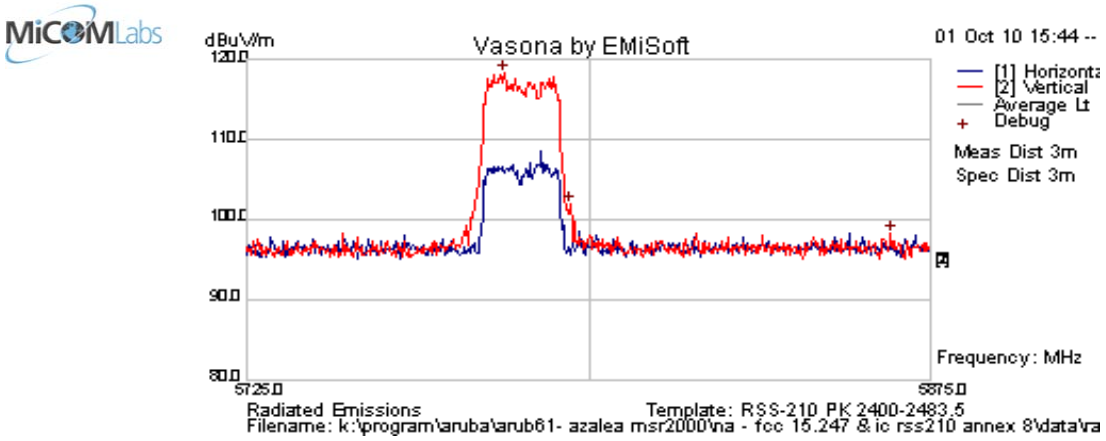


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5741.232	65.1	14.8	35.0	114.9	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11a; 6 Mbs	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

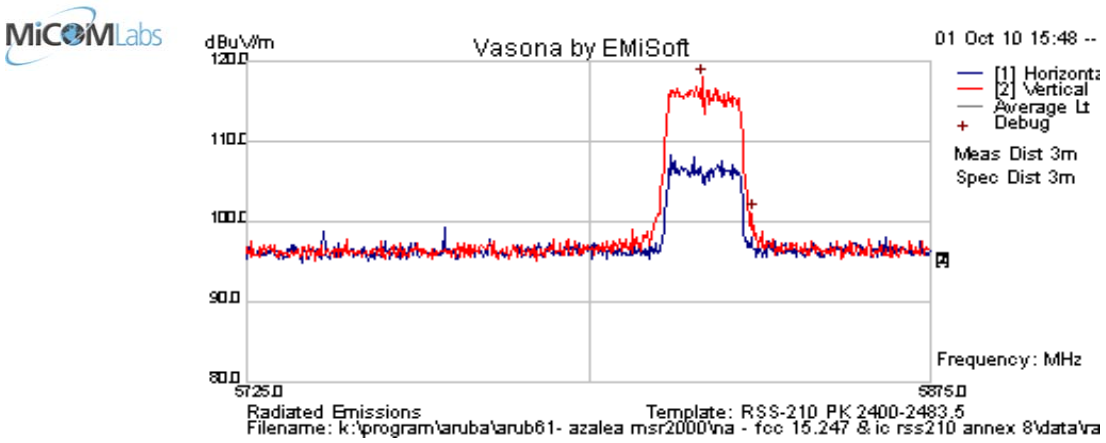


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5781.212	68.5	14.8	35.0	118.3	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11a; 6 Mbs	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

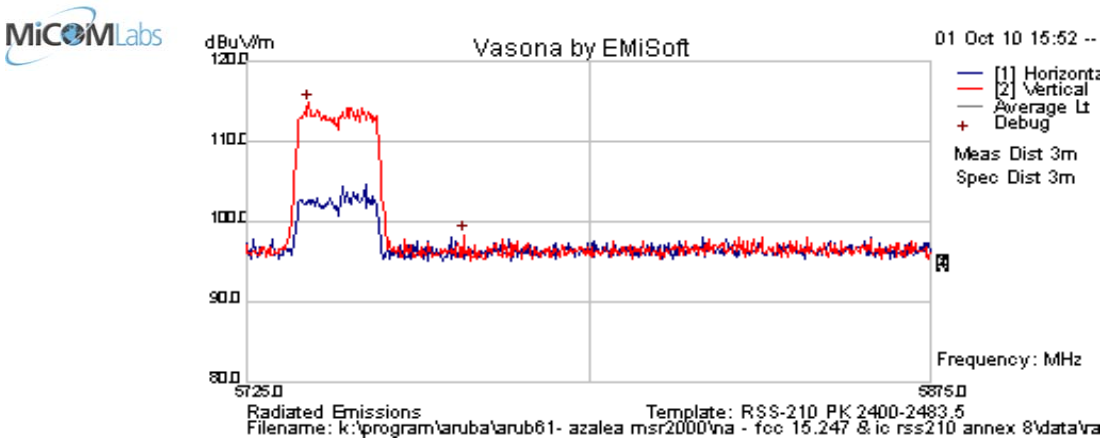


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5824.499	68.2	14.8	35.0	118.1	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	16.5	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

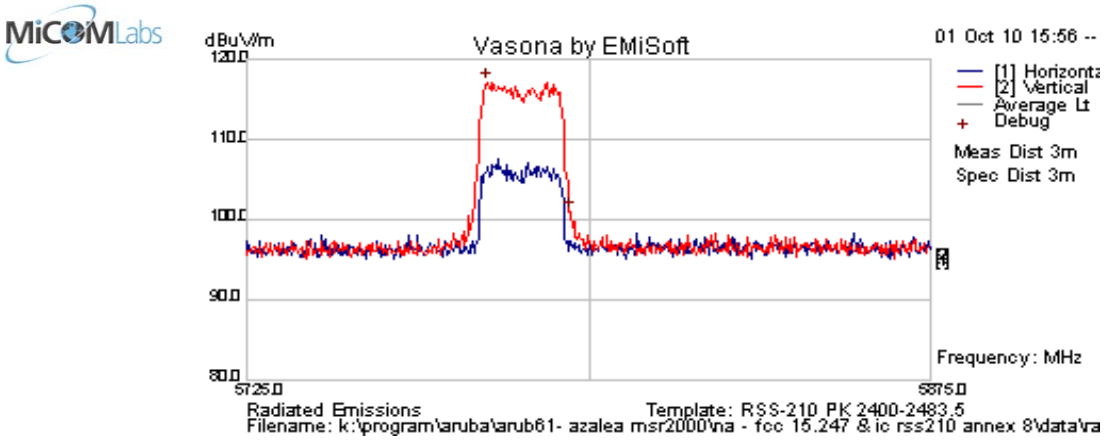


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5738.527	65.2	14.8	35.0	114.9	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

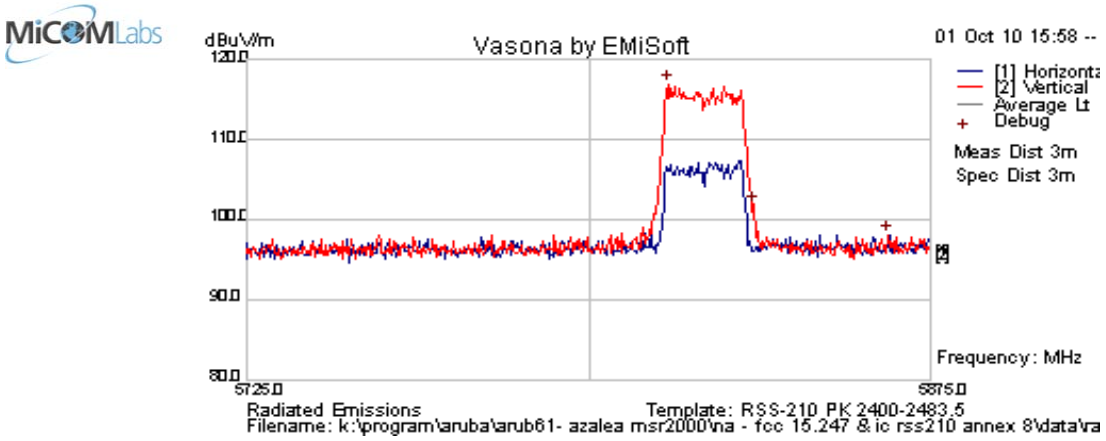


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5777.605	67.5	14.8	35.0	117.2	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

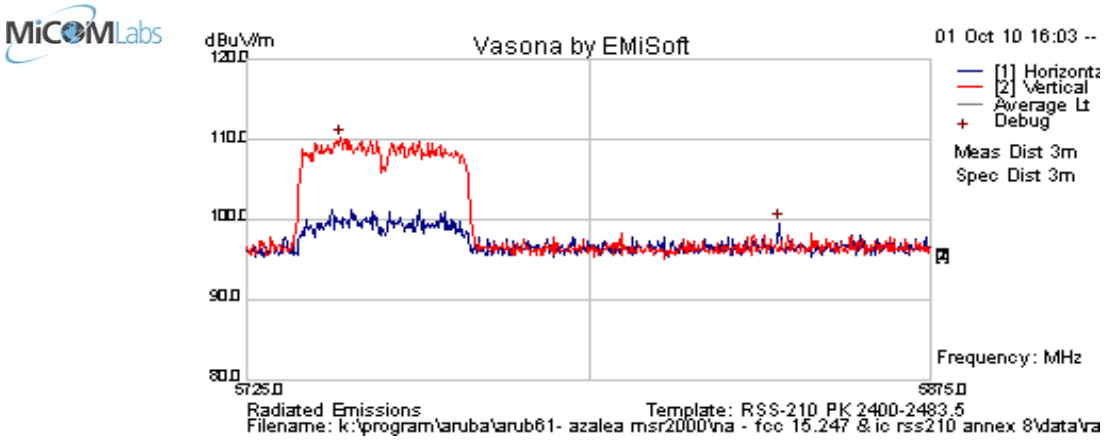


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5816.984	67.2	14.8	35.0	117.0	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5755 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	15	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

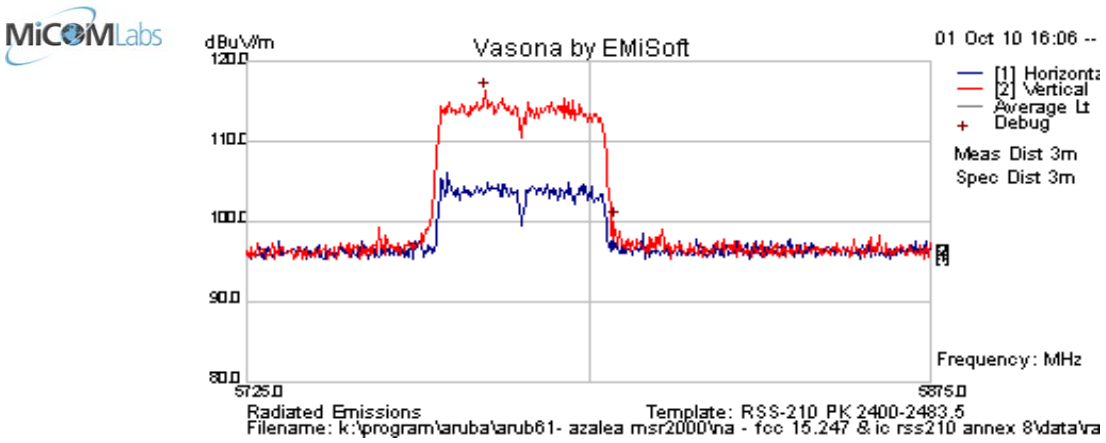


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5745.441	60.5	14.8	35.0	110.2	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

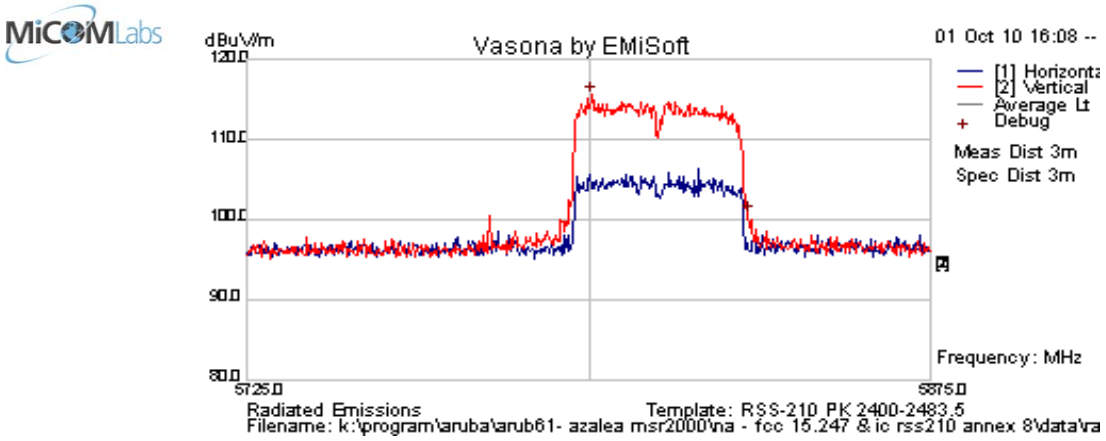


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5777.004	66.6	14.8	35.0	116.4	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5815 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	29
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	30
Power Setting	20	**Press. (mBars)**	999
Antenna	AP ANT-86D	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



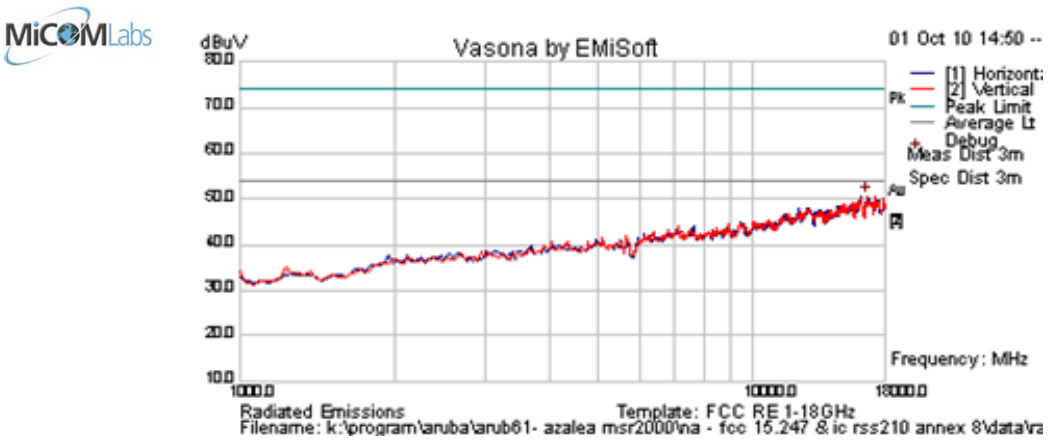
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5800.451	65.8	14.8	35.0	115.6	Peak [Scan]	V						pk

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

7.3.12 AP-ANT-86D 5.8GHz - Receiver Emissions

Test Freq.	5785 MHz	**Engineer**	SB
Variant	Receive in Test Utility	**Temp (°C)**	29
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	30
Power Setting	Not Applicable in Receive Mode	**Press. (mBars)**	998
Antenna	AP-ANT-86D		
Test Notes 1			
Test Notes 2			



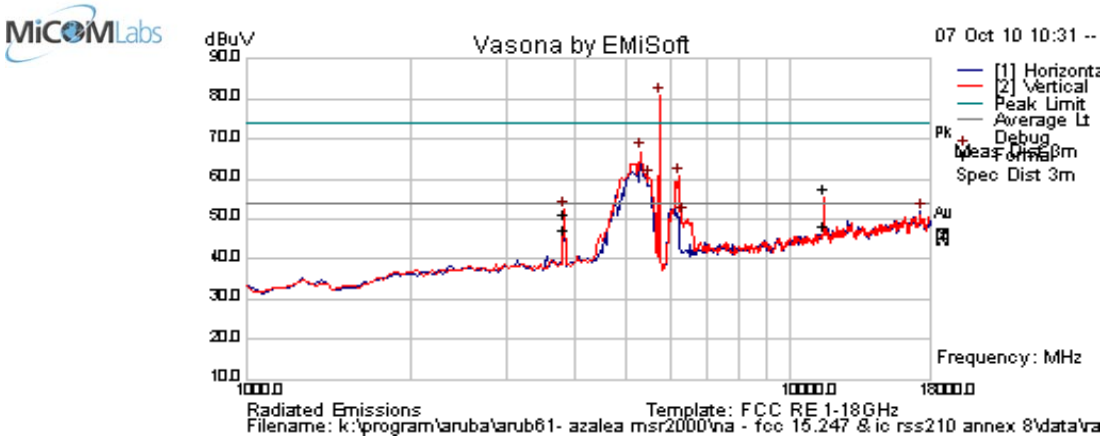
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	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.

7.3.13 AP-ANT-89 5.8GHz - Transmitter Radiated Spurious Emissions – Above 1 GHz

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11a; 6.5 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	18	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

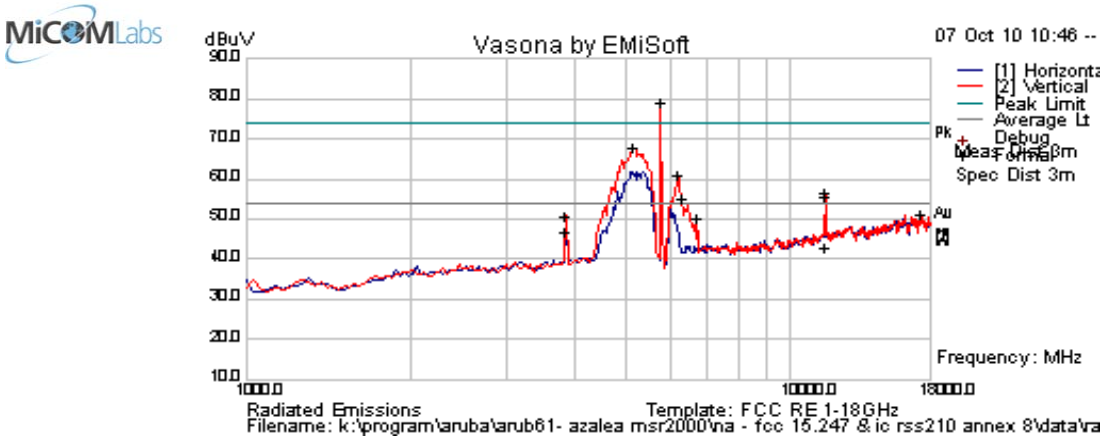


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11489.960	52.1	6.8	-1.1	57.8	Peak Max	V	194	356	74.0	-16.3	Pass	RB
3829.99	57.3	3.8	-10.1	51.0	Peak Max	V	100	362	74.0	-23.0	Pass	RB
11489.960	42.7	6.8	-1.1	48.3	Average Max	V	194	356	54	-5.7	Pass	RB
3829.990	53.6	3.8	-10.1	47.4	Average Max	V	100	362	54	-6.6	Pass	RB
5735.471	84.3	4.8	-8.2	80.8	Peak [Scan]	V	--	--	--	--	n/a	Fund
5292.585	71.6	4.6	-9.5	66.7	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6212.425	62.7	5.0	-7.0	60.7	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5496.994	64.4	4.6	-8.7	60.2	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17284.569	41.6	8.6	1.6	51.8	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6314.629	52.3	5.0	-6.8	50.6	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11a; 6.5 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

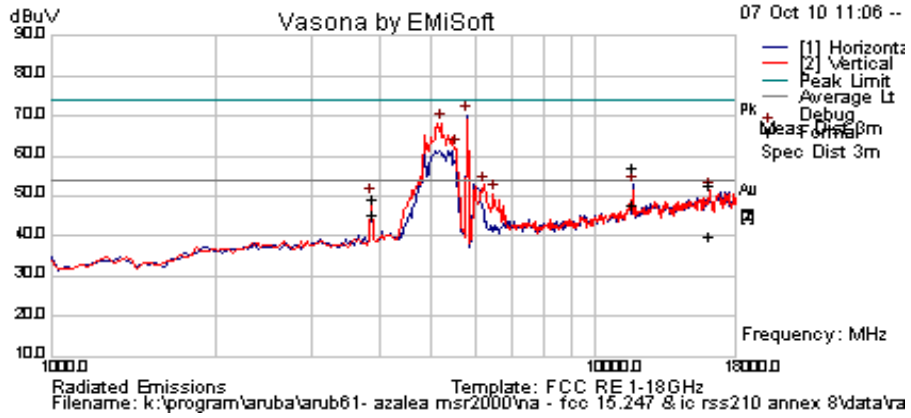


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11569.829	50.1	6.8	-1.2	55.7	Peak Max	V	174	0	74.0	-18.3	Pass	RB
3856.663	57.3	3.8	-10.2	50.9	Peak Max	V	176	0	74.0	-23.1	Pass	RB
11569.829	37.4	6.8	-1.2	43.1	Average Max	V	174	0	54	-11.0	Pass	RB
3856.663	53.3	3.8	-10.2	47.0	Average Max	V	176	0	54	-7.0	Pass	RB
5769.539	82.8	4.8	-8.3	79.3	Peak [Scan]	V	--	--	--	--	n/a	Fund
5156.313	72.1	4.6	-9.0	67.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6212.425	63.0	5.0	-7.0	60.9	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
11561.122	50.8	6.8	-1.2	56.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6314.629	57.0	5.0	-6.8	55.2	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17284.569	41.0	8.6	1.6	51.2	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
3861.723	57.1	3.8	-10.2	50.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6723.447	50.8	5.2	-5.9	50.1	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11a; 6.5 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

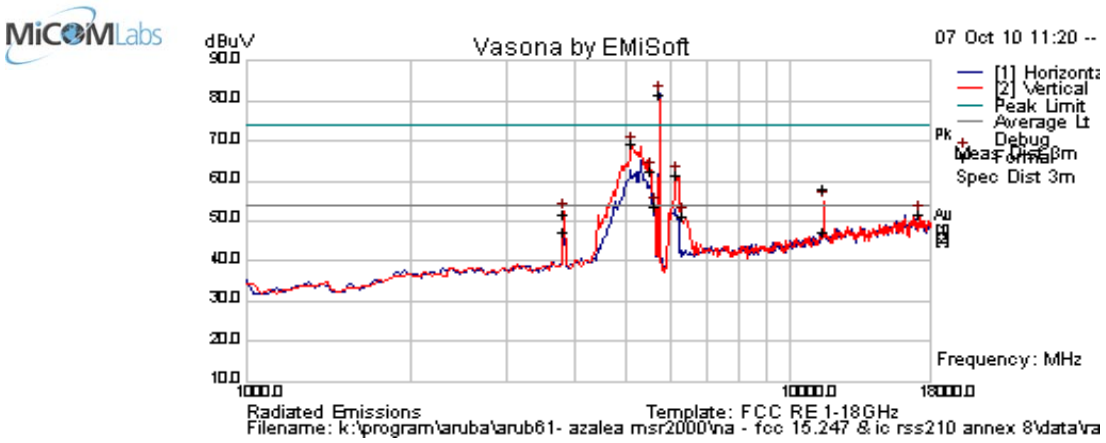


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11649.925	52.0	6.8	-1.9	56.9	Peak Max	H	105	20	74.0	-17.1	Pass	RB
16151.744	42.8	9.0	1.1	52.8	Peak Max	V	157	0	74.0	-21.2	Pass	RB
3883.332	55.9	3.8	-10.4	49.3	Peak Max	V	99	361	74	-24.7	Pass	RB
11649.925	42.7	6.8	-1.9	47.6	Average Max	H	105	20	54	-6.4	Pass	RB
16151.744	30.1	9.0	1.1	40.1	Average Max	V	157	0	54	-13.9	Pass	RB
3883.332	51.9	3.8	-10.4	45.3	Average Max	V	99	361	54	-8.7	Pass	RB
5803.607	73.7	4.8	-8.3	70.2	Peak [Scan]	H	--	--	--	--	n/a	Fund
5190.381	72.8	4.6	-9.2	68.3	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5531.062	65.8	4.6	-8.7	61.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6246.493	54.5	5.0	-6.7	52.8	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6484.970	52.0	5.1	-6.6	50.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	18	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

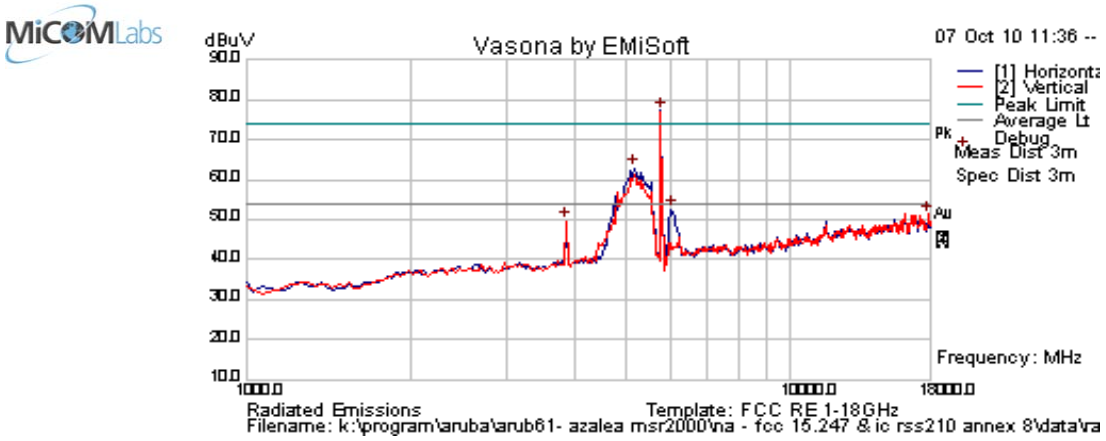


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11490.010	52.5	6.8	-1.1	58.2	Peak Max	V	103	352	74.0	-15.8	Pass	RB
3830.02	57.8	3.8	-10.1	51.5	Peak Max	V	133	7	74.0	-22.5	Pass	RB
11490.010	41.6	6.8	-1.1	47.2	Average Max	V	103	352	54	-6.8	Pass	RB
3830.020	53.5	3.8	-10.1	47.2	Average Max	V	133	7	54	-6.8	Pass	RB
5735.471	85.2	4.8	-8.2	81.7	Peak [Scan]	H	--	--	--	--	n/a	Fund
5531.062	66.5	4.6	-8.7	62.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6144.289	63.9	5.0	-7.3	61.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
5633.267	57.2	4.7	-8.4	53.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
17250.501	41.5	8.6	1.6	51.7	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6314.629	53.0	5.0	-6.8	51.3	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

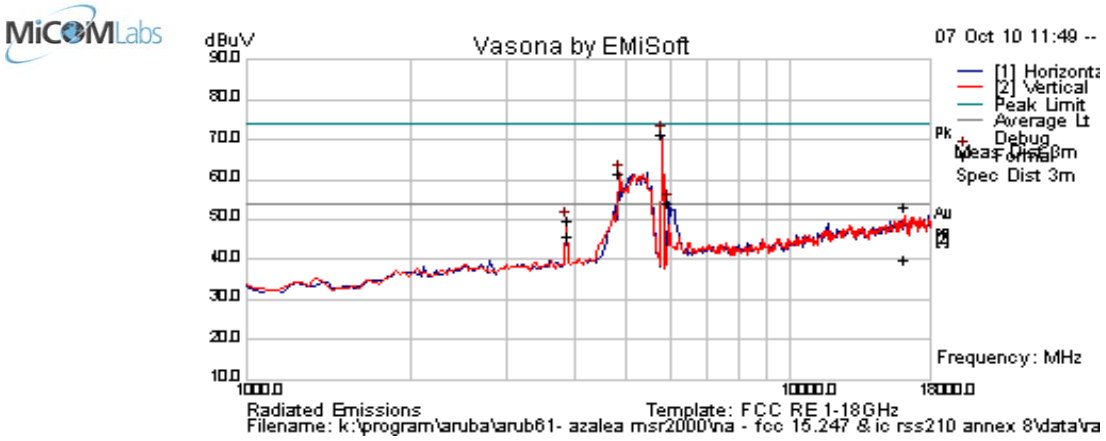


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
17842.966	42.7	8.8	0.6	52.1	Peak Max	V	138	7	74.0	-21.9	Pass	RB
3856.593	56.4	3.8	-10.2	50.0	Peak Max	V	196	0	74.0	-24.0	Pass	RB
17842.966	29.9	8.8	0.6	39.3	Average Max	V	138	7	54	-14.7	Pass	RB
3856.593	52.9	3.8	-10.2	46.5	Average Max	V	196	0	54	-7.5	Pass	RB
5769.539	80.8	4.8	-8.3	77.3	Peak [Scan]	H	--	--	--	--	n/a	Fund
6042.084	55.9	4.9	-8.2	52.6	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

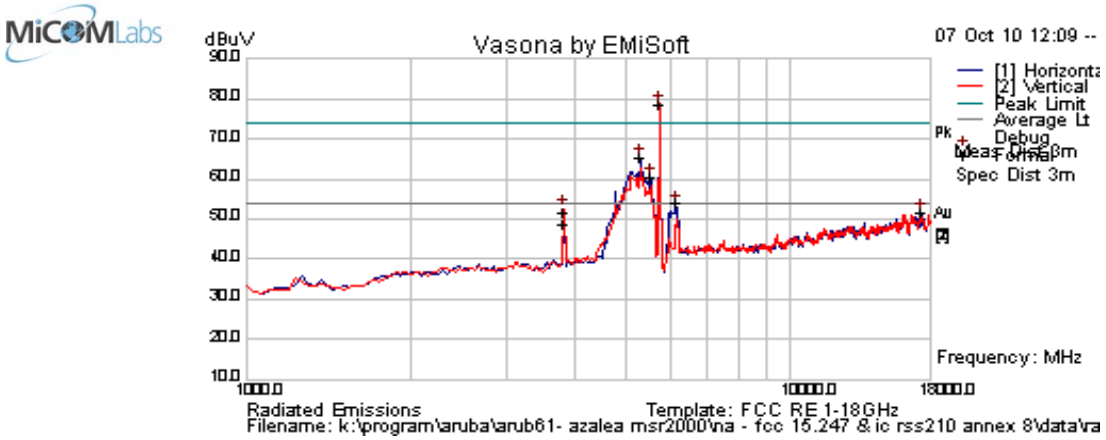


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16131.984	43.2	9.0	0.9	53.1	Peak Max	V	168	23	74.0	-20.9	Pass	RB
3883.339	56.1	3.8	-10.4	49.6	Peak Max	V	201	0	74.0	-24.4	Pass	RB
16131.984	29.9	9.0	0.9	39.8	Average Max	V	168	23	54	-14.2	Pass	RB
3883.339	52.6	3.8	-10.4	46.0	Average Max	V	201	0	54	-8.0	Pass	RB
5803.607	74.7	4.8	-8.3	71.2	Peak [Scan]	H	--	--	--	--	n/a	Fund
5939.880	57.8	4.9	-8.4	54.3	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5755 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	18	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

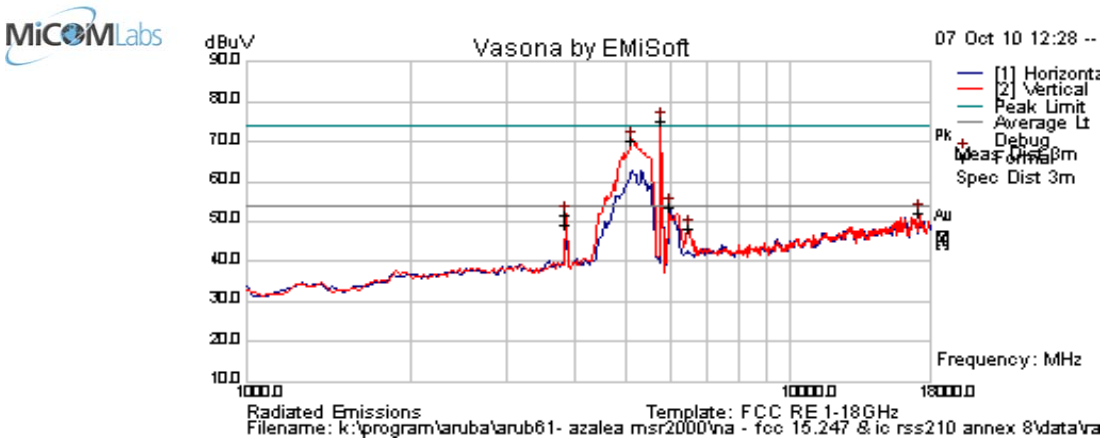


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3836.658	57.9	3.8	-10.2	51.5	Peak Max	V	197	361	74.0	-22.5	Pass	RB
3836.658	55.2	3.8	-10.2	48.8	Average Max	V	197	361	54.0	-5.2	Pass	RB
5735.471	82.3	4.8	-8.2	78.8	Peak [Scan]	V	--	--	--	--	n/a	Fund
5292.585	70.2	4.6	-9.5	65.3	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
5531.062	64.4	4.6	-8.7	60.4	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6144.289	56.3	5.0	-7.3	53.9	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
17318.637	41.2	8.7	1.7	51.6	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			

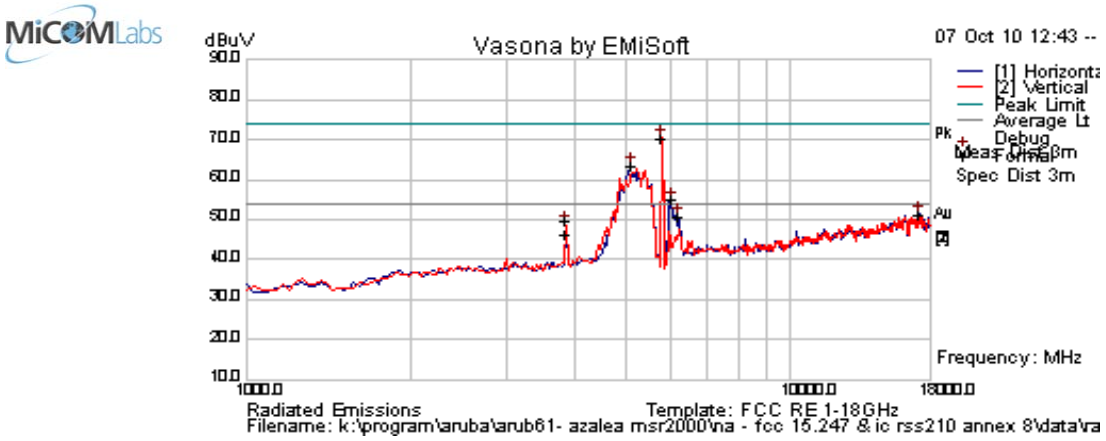


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3856.653	58.3	3.8	-10.2	51.9	Peak Max	V	148	0	74.0	-22.1	Pass	RB
3856.653	55.7	3.8	-10.2	49.3	Average Max	V	148	0	54.0	-4.7	Pass	RB
5769.539	78.8	4.8	-8.3	75.3	Peak [Scan]	V	--	--	--	--	n/a	Fund
6008.016	57.1	4.9	-8.3	53.7	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
17250.501	41.8	8.6	1.6	52.0	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB
6484.970	50.0	5.1	-6.6	48.5	Peak [Scan]	V	> 20dB below fundamental				Pass	NRB

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

Test Freq.	5815 MHz	**Engineer**	SB
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1	Fundamental attenuated by band-stop filter.		
Test Notes 2			



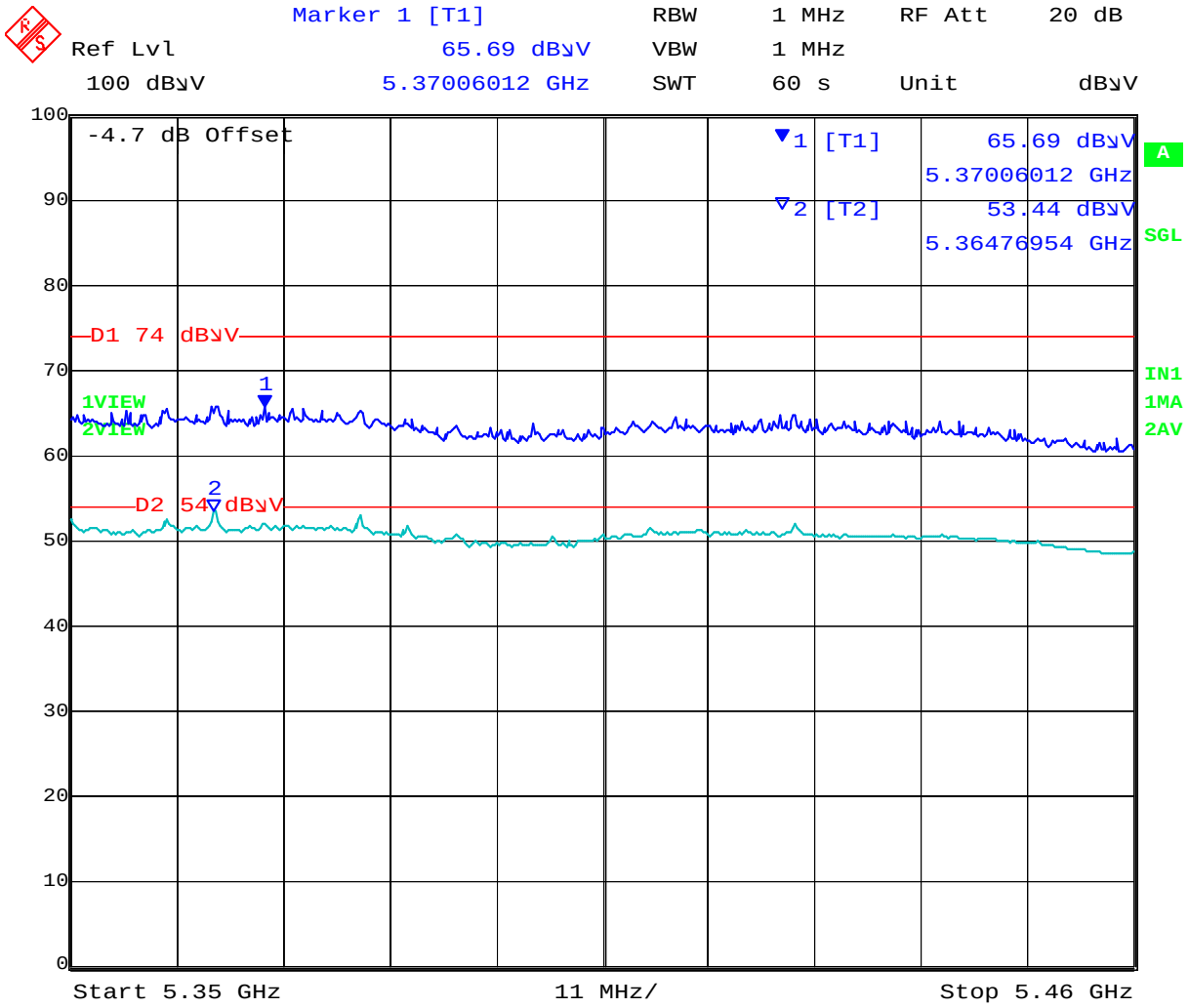
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
3876.623	56.2	3.8	-10.3	49.8	Peak Max	V	195	0	74.0	-24.2	Pass	RB
3876.623	52.6	3.8	-10.3	46.2	Average Max	V	195	0	54.0	-7.8	Pass	RB
5803.607	73.9	4.8	-8.3	70.4	Peak [Scan]	V	--	--	--	--	n/a	Fund
6042.084	58.2	4.9	-8.2	54.9	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
17250.501	41.1	8.6	1.6	51.3	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB
6212.425	52.6	5.0	-7.0	50.5	Peak [Scan]	H	> 20dB below fundamental				Pass	NRB

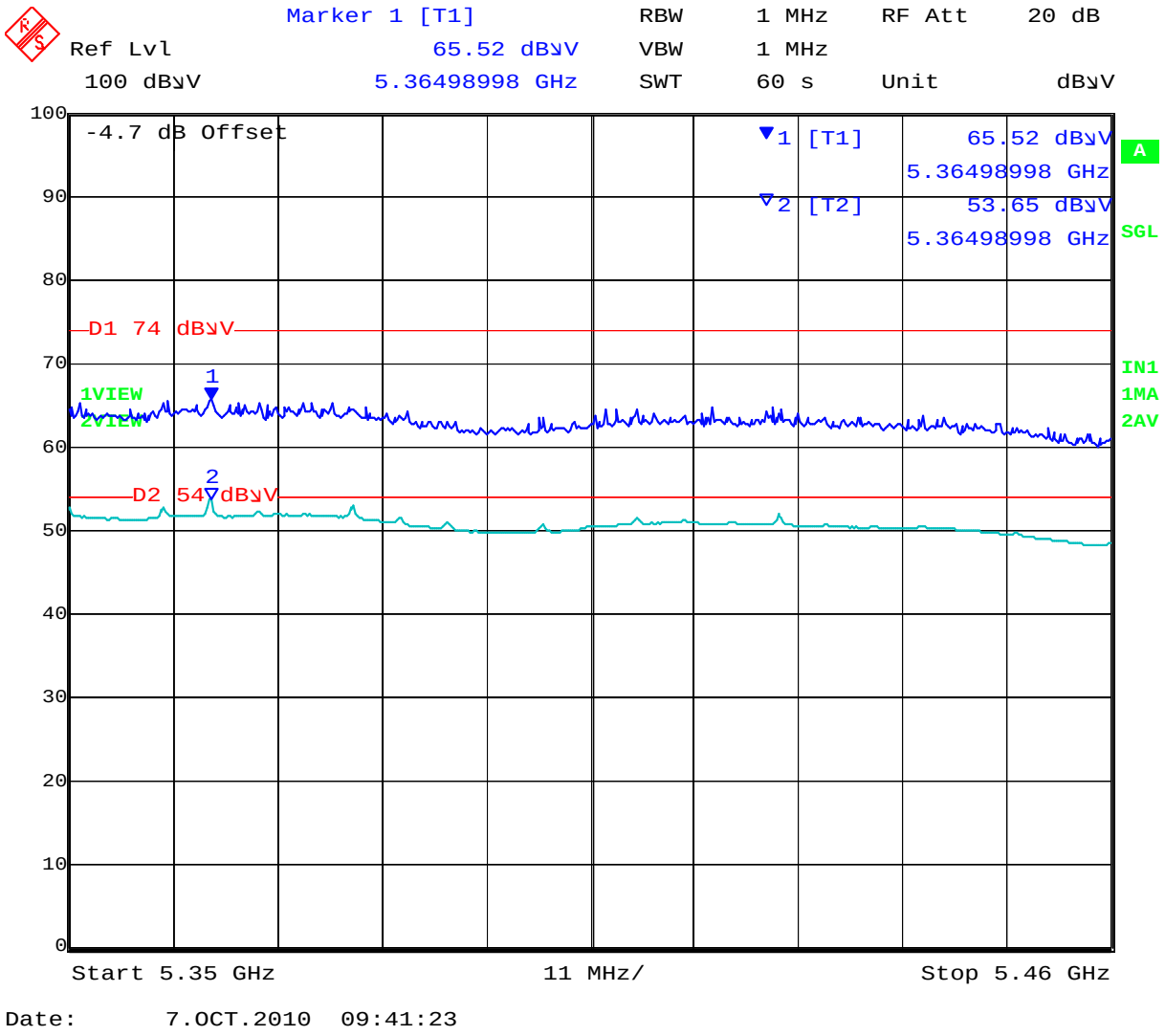
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

7.3.14 AP-ANT-89 5.8GHz - Transmitter Band Edge Emissions

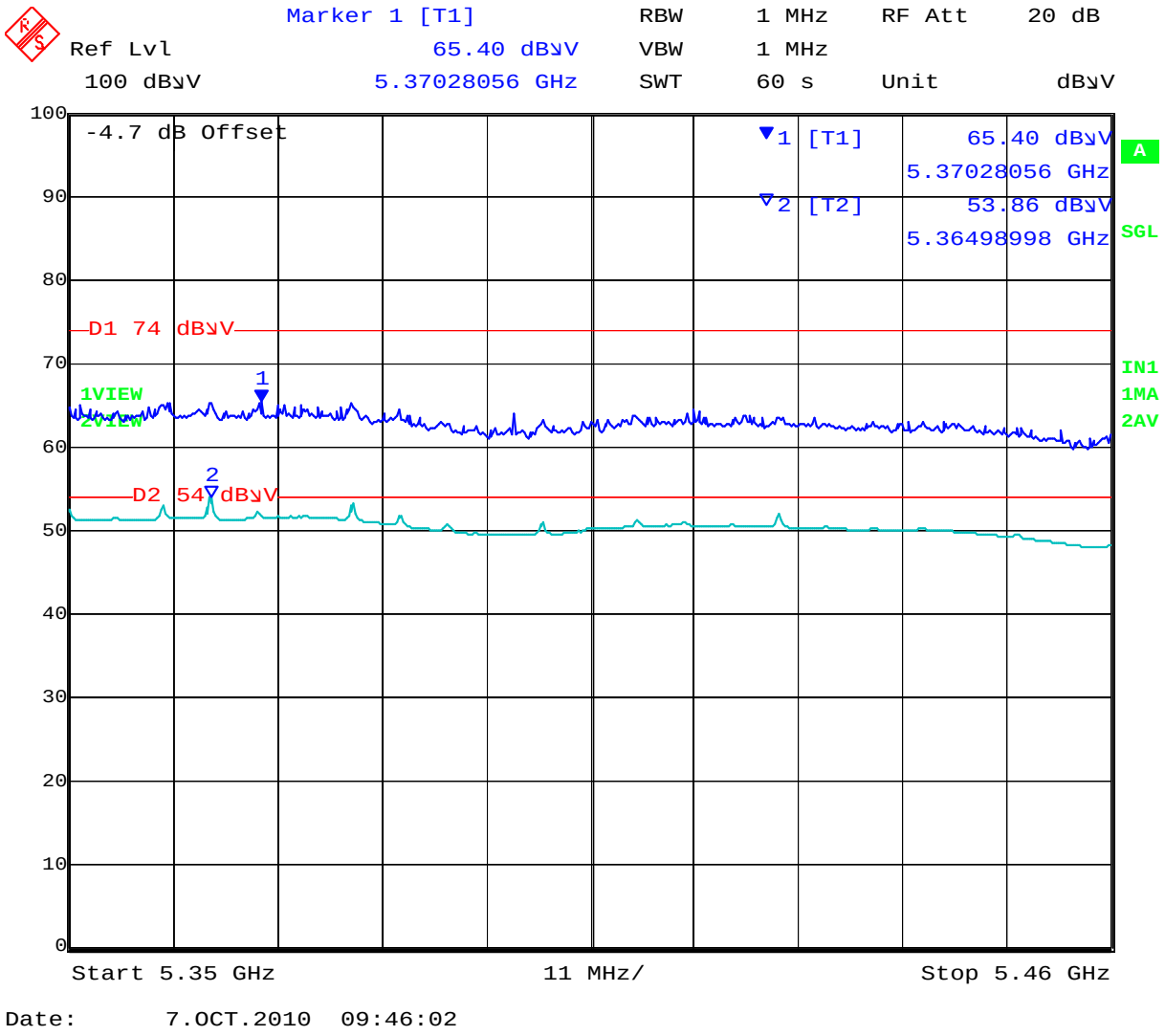
BE 5.35-5.46 GHz 802.11a 5745 MHz



BE 5.35-5.46 GHz 802.11n HT20 5745 MHz

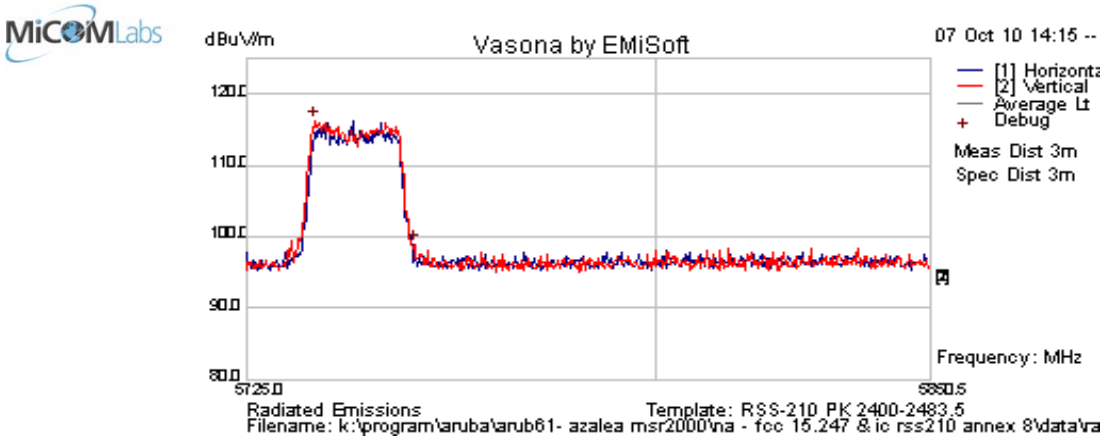


BE 5.35-5.46 GHz 802.11n HT40 5755 MHz



7.3.15 AP-ANT-89 5.8GHz - Transmitter Peak Emissions

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	18	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

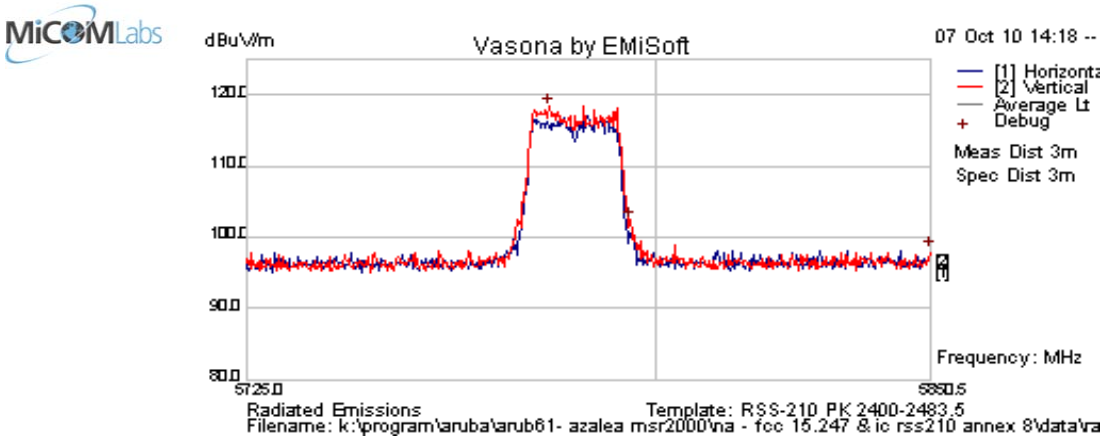


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5737.575	66.6	14.8	35.0	116.3	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

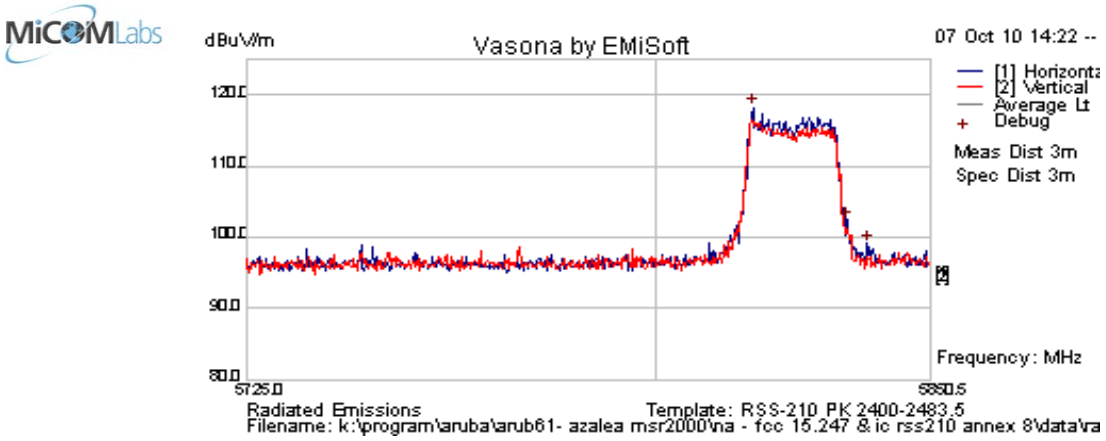


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5780.331	68.7	14.8	35.0	118.5	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

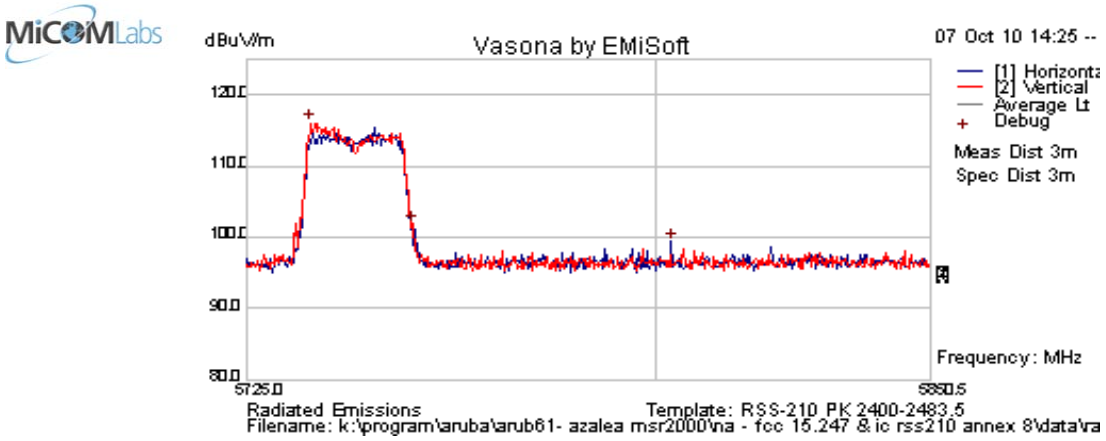


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5817.805	68.5	14.8	35.0	118.3	Peak [Scan]	H						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5745 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	18	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

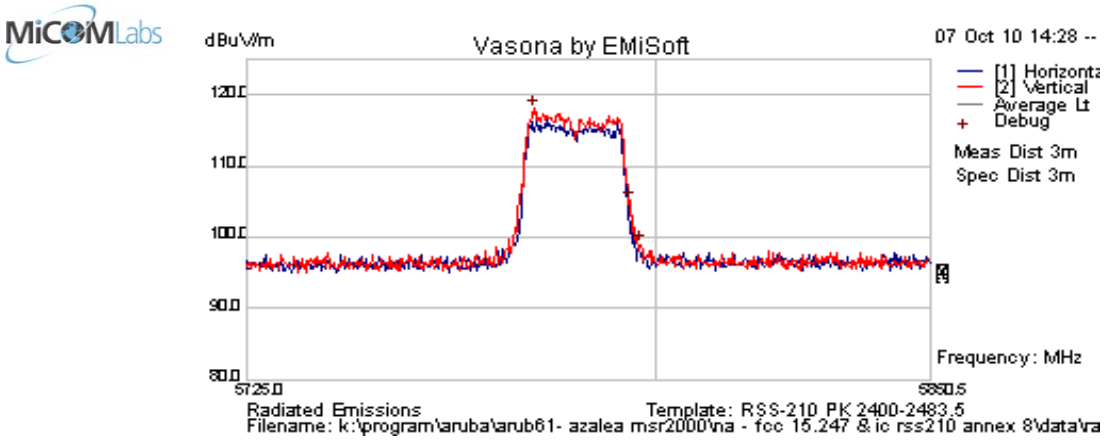


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5736.821	66.4	14.8	35.0	116.1	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

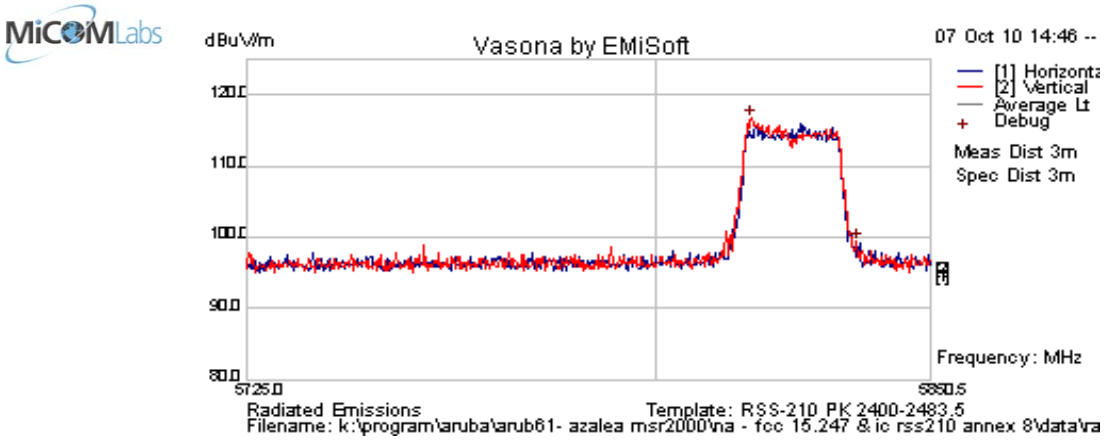


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5777.564	68.4	14.8	35.0	118.2	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5825 MHz	**Engineer**	SB
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

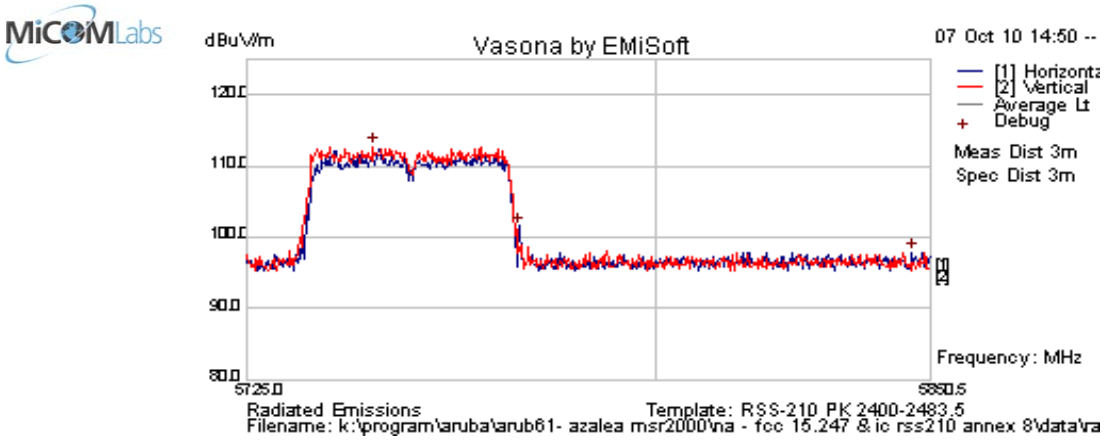


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5817.553	66.9	14.8	35.0	116.7	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5755 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	18	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

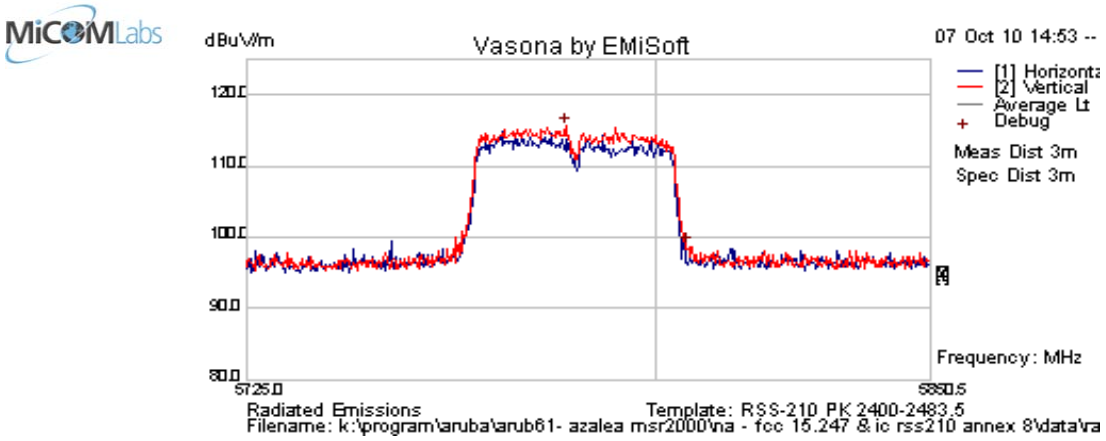


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5748.138	63.0	14.8	35.0	112.8	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5785 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

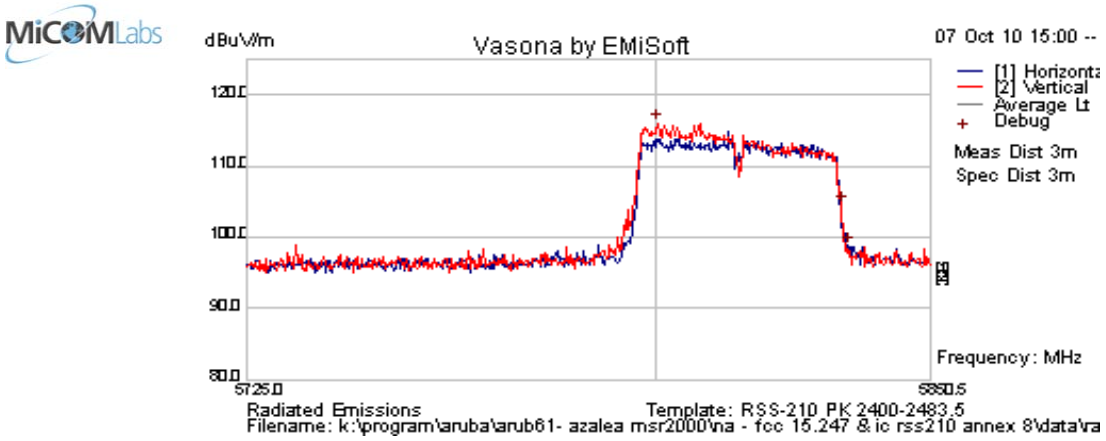


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5783.349	65.9	14.8	35.0	115.6	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

Test Freq.	5815 MHz	**Engineer**	SB
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	25
Freq. Range	5725 - 5850 MHz	**Rel. Hum.(%)**	32
Power Setting	20	**Press. (mBars)**	1003
Antenna	AP-ANT-89	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



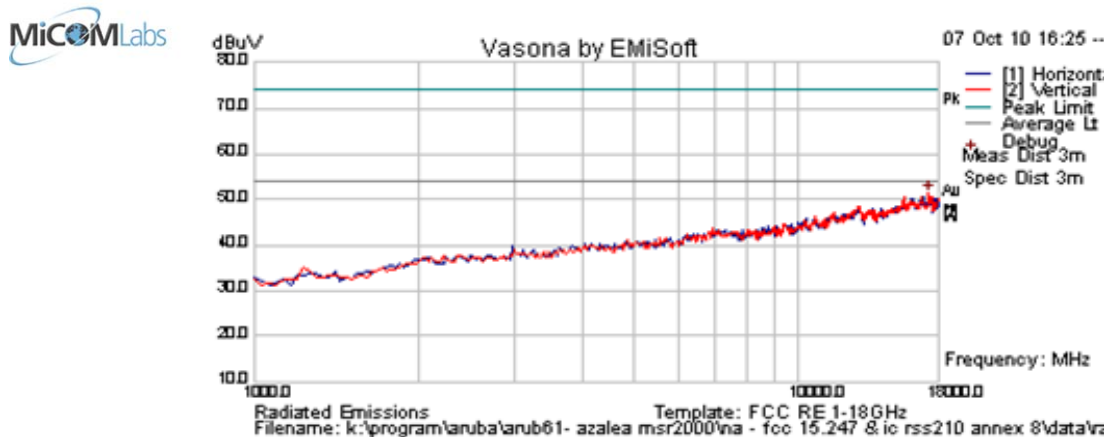
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5800.199	66.3	14.8	35.0	116.1	Peak [Scan]	V						PK

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	PK = Peak emissions of Fundamental

7.3.16 AP-ANT-89 5.8GHz - Receiver Emissions

Test Freq.	5785 MHz	**Engineer**	SB
Variant	Receive in Test Utility	**Temp (°C)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	Not Applicable in Receive Mode	**Press. (mBars)**	1003
Antenna	AP-ANT-89		
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
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.

7.4 Radiated Spurious Emissions – Digital Apparatus

Standard Reference

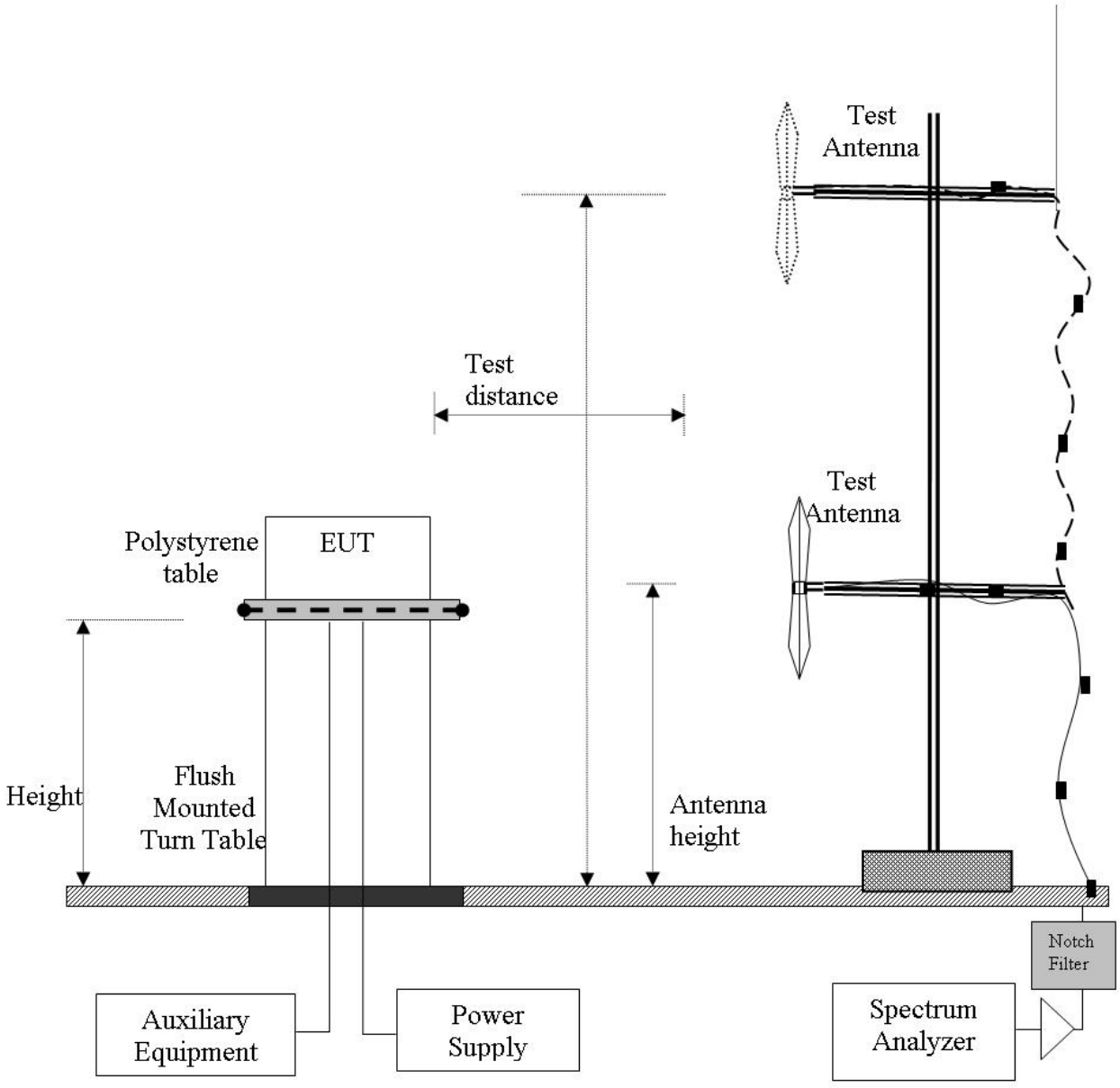
FCC, Part 15 Subpart B §15.109
Industry Canada ICES-003 §5

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

Test Measurement Set up



Measurement set up for Radiated Emission Test

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

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 dBμV; 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 dBμV/m

Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

Level (dBμV/m) = 20 * Log (level (μV/m))

40 dBμV/m = 100 μV/m
48 dBμV/m = 250 μV/m

Specification

Radiated Spurious Emissions – Digital Apparatus

FCC, Part 15 Subpart B §15.109
A representative type or model of each digital apparatus shall be tested in accordance with the
measurement methods described in FCC Part 15; Subpart A - General and FCC Subpart B – Unintentional Radiators.

Industry Canada ICES-003
A representative type or model of each digital apparatus shall be tested in accordance with the
measurement method described in the publication referred to in Section 7.1 [Canadian Standards Association Standard CAN/CSA-CEI/IEC CISPR 22:02, "Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment."].

FCC, Part 15 Subpart B §15.109 Spurious Emissions Limits

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values.

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

Field Strength of radiated emissions for a Class A digital device are as follows.

Frequency (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance (meters)
30-88	100	49.5	3
88-216	150	54.0	3
216-960	200	57.0	3
Above 960	500	60.0	3

RSS-ICES §5 Spurious Emissions Limits

Class A Digital Device: The field intensity of radio noise emissions that are radiated from a Class A digital apparatus shall not exceed the limits specified in Table 5 of the publication referred to in Section 7.1, within the indicated frequency range.

Frequency range MHz	Quasi-peak limits dB(µV/m) @ 10m	Quasi-peak limits dB(µV/m) @ 3m
30 to 230	40	50.5
230 to 1 000	47	57.5
NOTE 1	The lower limit shall apply at the transition frequency.	
NOTE 2	Additional provisions may be required for cases where interference occurs	

Class B Digital Device: The field intensity of radio noise emissions that are radiated from a Class B digital apparatus shall not exceed the limits specified in Table 6 of the publication referred to in Section 7.1, within the indicated frequency range.

Frequency range MHz	Quasi-peak limits dB(µV/m) @ 10m	Quasi-peak limits dB(µV/m) @ 3m
30 to 230	30	40.5
230 to 1 000	37	47.5
NOTE 1	The lower limit shall apply at the transition frequency.	
NOTE 2	Additional provisions may be required for cases where interference occurs	

Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement Uncertainty	+5.6/ -4.5 dB

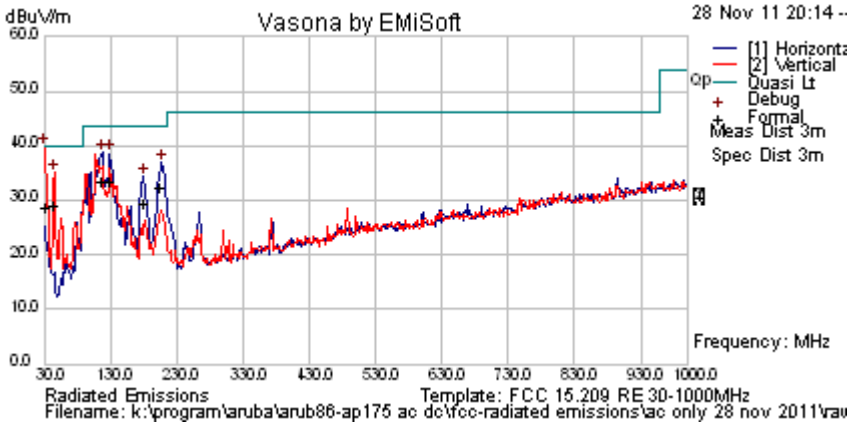
Traceability

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

7.4.1 Measurement Results for Radiated Digital Apparatus

Radiated Emissions from the modified AP-175AC device 28th November 2011

Test Freq.	N/A	**Engineer**	GMH
Variant	Digital Emissions	**Temp (ºC)**	20.5
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	40
Power Setting	120V AC 60Hz	**Press. (mBars)**	1007
Antenna	4 x 2' meter N-Type cable with 50 Ohm loads		
Test Notes 1	EUT grounded to turntable. Shielded Ethernet cable connected and terminated.		
Test Notes 2	AP-175AC powered via 120Vac 60 Hz: FCC Class B limit used		



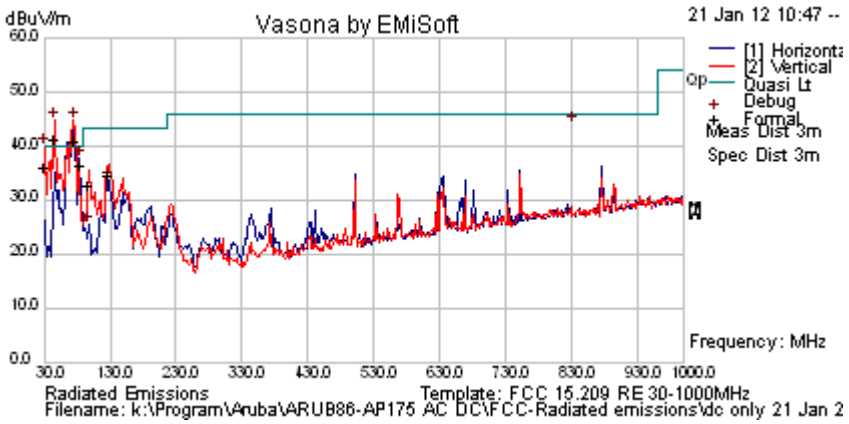
Formally measured emission peaks

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
32.243	35.9	3.4	-10.6	28.7	Quasi Max	V	98	211	40	-11.3	Pass	
116.775	46.6	4.3	-17.3	33.6	Quasi Max	H	357	287	43.5	-9.9	Pass	
45.655	46.4	3.6	-21.0	29.1	Quasi Max	V	179	13	40	-10.9	Pass	
130.140	45.9	4.4	-16.9	33.4	Quasi Max	H	230	70	43.5	-10.2	Pass	
205.348	46.9	4.8	-19.2	32.5	Quasi Max	H	148	110	43.5	-11.0	Pass	
180.796	44.3	4.7	-19.5	29.5	Quasi Max	H	207	113	43.5	-14.0	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

Radiated Emissions from the modified AP-175DC device 21st January 2012

Test Freq.	N/A	**Engineer**	GMH
Variant	AP-175DC	**Temp (ºC)**	18
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	43
Power Setting	48 Vdc	**Press. (mBars)**	1001
Antenna	4 x 1' meter N-Type cable with 50 Ohm loads terminates antenna port		
Test Notes 1	EUT grounded to turntable. Shielded Ethernet cable connected and terminated.		
Test Notes 2	AP-175DC powered via 48Vdc (The Beast): Class B limit used to prove compliance		

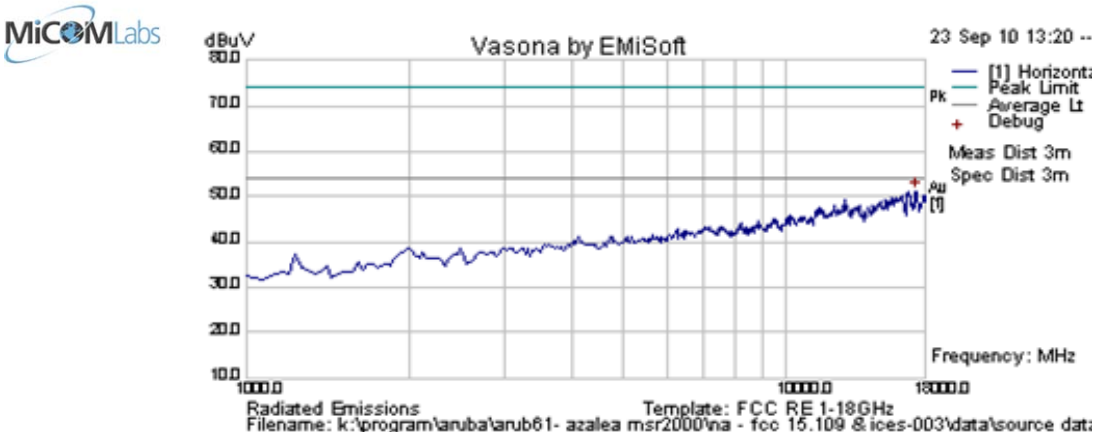


Formally measured emission peaks

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
46.920	57.3	3.7	-21.3	39.7	Quasi Max	V	101	235	40	-0.3	Pass	
76.236	58.3	3.9	-22.8	39.4	Quasi Max	V	184	305	40	-0.6	Pass	
30.091	41.8	3.4	-9.2	36.1	Quasi Max	V	100	188	40	-3.9	Pass	
84.807	56.0	4.0	-23.5	36.5	Quasi Max	H	362	123	40	-3.5	Pass	
127.540	47.1	4.4	-16.8	34.6	Quasi Max	V	100	252	43.5	-8.9	Pass	
98.125	49.8	4.1	-21.3	32.6	Quasi Max	V	98	82	43.5	-10.9	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

Test Freq.	2437 MHz	**Engineer**	CSB
Variant	Digital Emissions	**Temp (°C)**	26.5
Freq. Range	1000 MHz - 6000 MHz	**Rel. Hum.(%)**	33
Power Setting	Not Applicable for Digital Emissions	**Press. (mBars)**	1000
Antenna	1 meter cable terminated with 50 Ohm loads		
Test Notes 1	EUT placed in Receive mode for Digital Emissions testing		
Test Notes 2	Shielded Ethernet cable; Linear POE supply		



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 above 1 GHz.												

Legend: DIG = Digital Device Emission; RX = Receiver Emissions; FUND = Fundamental Frequency

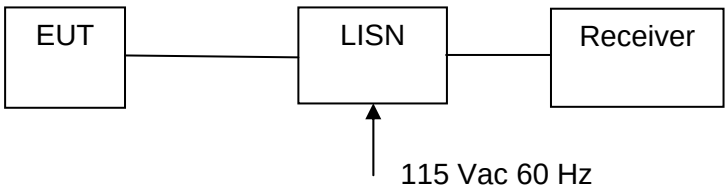
7.5 ac Wireline Emissions

FCC, Part 15 Subpart C §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



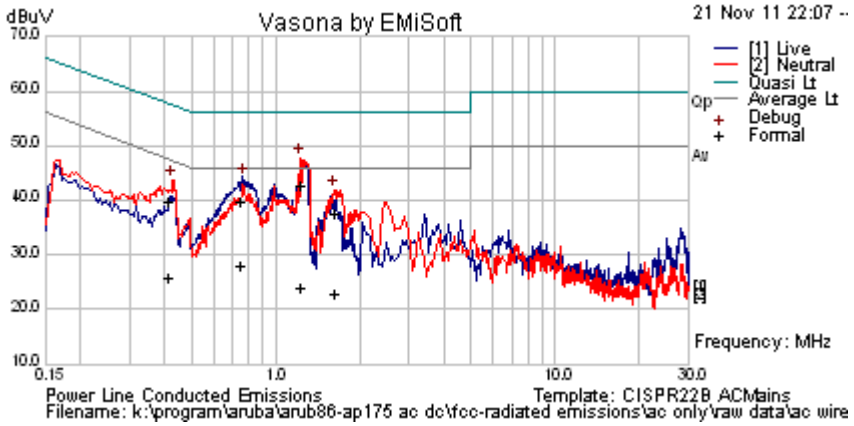
Measurement set up for AC Wireline Conducted Emissions Test

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

Only the AP-175AC / MSR2K23N1 was applicable for ac Wireline Testing

ac Wireline Emissions from the modified AP-175AC device 28th November 2011

Test Freq.	N/A	**Engineer**	GMH
Variant	AC Line Emissions	**Temp (ºC)**	21.5
Freq. Range	0.150 MHz - 30 MHz	**Rel. Hum.(%)**	37
Power Setting	120Vac 60 Hz	**Press. (mBars)**	1008
Antenna	4 x 2' meter N-Type cable with 50 Ohm loads		
Test Notes 1	Ethernet cable connected and terminated.		
Test Notes 2	AP-175AC powered via 230Vac 50Hz: CISPR Class B limit used		



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.763	29.65	9.96	0.09	39.69	Quasi Peak	Live	56.00	-16.31	Pass	
0.418	29.96	9.88	0.08	39.93	Quasi Peak	Neutral	57.49	-17.57	Pass	
1.243	32.62	9.95	0.10	42.67	Quasi Peak	Neutral	56.00	-13.33	Pass	
1.645	27.52	10.01	0.11	37.64	Quasi Peak	Neutral	56.00	-18.36	Pass	
0.763	18.06	9.96	0.09	28.11	Average	Live	46.00	-17.89	Pass	
0.418	15.72	9.88	0.08	25.68	Average	Neutral	47.49	-21.81	Pass	
1.243	13.90	9.95	0.10	23.95	Average	Neutral	46.00	-22.05	Pass	
1.645	12.82	10.01	0.11	22.93	Average	Neutral	46.00	-23.07	Pass	
1.626	31.89	10.01	0.11	42.00	Peak [Scan]	Neutral	46.00	-4.00	Pass	
2.499	29.50	10.10	0.10	39.73	Peak [Scan]	Live	46.00	-6.30	Pass	
0.165	37.40	9.90	0.10	47.35	Peak [Scan]	Live	55.20	-7.90	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

Specification

Limit

§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 μΩ 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.

§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

8 TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #
0134	Amplifier	Com Power	PA 122	181910
0158	Barometer /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-0-0787-3G03G0	209089-001
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001
0313	Coupler	Hewlett Packard	86205A	3140A01285
0314	30dB N-Type 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

440 Boulder Court, Suite 200
Pleasanton, CA 94566, USA
Tel: 1.925.462.0304
Fax: 1.925.462.0306
www.micomlabs.com