

Test of Wavion WBSn-2450 Wireless LAN Access Point

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

Test Report Serial No.: WAVI01-U1 Rev D



# TEST REPORT

FROM



Test of Wavion WBSn-2450-O/-S Wireless LAN Access Point

to

To FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: WAVI01-U1 Rev D

Note: this report contains data with regard to the 2400 to 2483.5 MHz and 5725 to 5850 MHz operational modes of the Wavion WBSn-2450 wireless LAN access point.

This report supersedes: WAVI01-U1 Rev C

Applicant:      Wavion Ltd  
                      15 Hamada Street  
                      Yoqneam Illit  
                      Israel 20692

Product Function: Wireless LAN Access Point

Copy No: pdf     Issue Date: 30th March 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  
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[www.micomlabs.com](http://www.micomlabs.com)



TEST CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 3 of 412

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 4 of 412

## TABLE OF CONTENTS

<b>ACCREDITATION, LISTINGS &amp; RECOGNITION .....</b>	<b>5</b>
TESTING ACCREDITATION .....	5
RECOGNITION .....	6
PRODUCT CERTIFICATION .....	7
<b>1. TEST RESULT CERTIFICATE .....</b>	<b>9</b>
<b>2. REFERENCES AND MEASUREMENT UNCERTAINTY.....</b>	<b>10</b>
2.1. Normative References .....	10
2.2. Test and Uncertainty Procedures .....	11
<b>3. PRODUCT DETAILS AND TEST CONFIGURATIONS .....</b>	<b>12</b>
3.1. Technical Details .....	12
3.2. Scope of Test Program .....	14
3.3. Equipment Model(s) and Serial Number(s) .....	17
3.4. Antenna Details .....	17
3.5. Cabling and I/O Ports .....	18
3.6. Test Configurations.....	18
3.7. Equipment Modifications.....	20
3.8. Deviations from the Test Standard .....	20
3.9. Subcontracted Testing or Third Party Data .....	20
<b>4. TEST SUMMARY .....</b>	<b>21</b>
<b>5. TEST RESULTS .....</b>	<b>23</b>
5.1. Device Characteristics .....	23
5.1.1. <i>6 dB and 99 % Bandwidth</i> .....	23
5.1.2. <i>Peak Output Power</i> .....	112
5.1.3. <i>Peak Power Spectral Density</i> .....	127
5.1.4. <i>Maximum Permissible Exposure</i> .....	216
5.1.5. <i>Conducted Spurious Emissions</i> .....	217
5.1.6. <i>Radiated Emissions</i> .....	316
5.1.7. <i>AC Wireline Conducted Emissions (150 kHz – 30 MHz)</i> .....	402
<b>6. PHOTOGRAPHS.....</b>	<b>405</b>
6.1. Conducted Test Setup .....	405
6.2. Radiated Test Setup > 1 GHz.....	406
<b>7. TEST EQUIPMENT DETAILS.....</b>	<b>411</b>

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 5 of 412

## ACCREDITATION, LISTINGS & RECOGNITION

### TESTING ACCREDITATION

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



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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 27<sup>th</sup> day of March 2012.

President & CEO  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to November 30, 2013



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

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 6 of 412

## 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-2
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	210
	VCCI	--	--	No. 2959
Europe	European Commission	NB	EU MRA	NB 2280
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	CAB	APEC MRA 1	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	CAB	APEC MRA 1	
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	CAB	APEC MRA 1	
Vietnam	Ministry of Communication (MIC)	CAB	APEC MRA 1	

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

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

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

N/A – Not Applicable

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

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

\*\*NB – Notified Body

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 7 of 412

## **PRODUCT CERTIFICATION**

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard EN ISO/IEC Guide 65. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



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## *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.

Presented this 27<sup>th</sup> day of March 2012.



President & CEO  
For the Accreditation Council  
Certificate Number 2381.02  
Valid to November 30, 2013

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

**USA Telecommunication Certification Body (TCB)** - TCB Identifier – US0159

**Industry Canada Certification Body** - CAB Identifier – US0159

**European Notified Body** - Notified Body Identifier - 2280

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

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 8 of 412

## DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	9 <sup>th</sup> March 2012	Initial release.
Rev B	12 <sup>th</sup> March 2012	Removing typo's and updating Section 5.1.3 "Peak power spectral density" margin for 2.4 GHz, HT-40 operational mode.
Rev C	14 <sup>th</sup> March 2012	Removal of typo's
Draft	21 <sup>st</sup> March 2012	Included 5 & 10 MHz operating modes
Rev D	30 <sup>th</sup> March 2012	Included 5 & 10 MHz operating modes

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 9 of 412

## 1. TEST RESULT CERTIFICATE

Manufacturer:	Wavion Ltd 15 Hamada Street Yoqneam Illit Israel 20692	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	802.11a/b/g/n Wireless LAN Access Point	Telephone:	+1 925 462 0304
Model:	WBSn-2450-O/-S	Fax:	+1 925 462 0306
S/N's:	1153R00131565, 1206R00144608, 1153R00131566		
Test Date(s):	5th July to 19th March 2012	Website:	<a href="http://www.micomlabs.com">www.micomlabs.com</a>

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.247 & IC RSS-210	EQUIPMENT COMPLIES

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

### Notes:

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

Approved & Released for MiCOM Labs, Inc. by:



TEST CERTIFICATE #2381.01

Graeme Grieve  
Quality Manager MiCOM Labs,

Gordon Hurst  
President & CEO MiCOM Labs, Inc.

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 10 of 412

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

### **2.1. Normative References**

REF.	PUBLICATION	YEAR	TITLE
i.	FCC 47 CFR Part 15, Subpart C	2010	Title 47: Telecommunication PART 15—RADIO FREQUENCY DEVICES Subpart C—Intentional Radiators
ii.	RSS-210 Annex 8	2010	Radio Standards Specification 210, Issue 8, Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment
iii.	FCC OET KDB 662911	4 <sup>th</sup> April 2011	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
iv.	DA 00-705	2000	FCC DA 00-705 “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” released March 30, 2000
v.	RSS-GEN	2010	Radio Standards Specification-Gen, Issue 3, General Requirements and Information for the Certification of Radiocommunication Equipment
vi.	FCC 47 CFR Part 15, Subpart B	2010	47 CFR Part 15, SubPart B; Unintentional Radiators
vii.	ICES-003	2004	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus; Issue 4
viii.	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
ix.	CISPR 22/ EN 55022	2008 2006+A1:2007	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
x.	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
xi.	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
xii.	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
xiii.	A2LA	9th June 2010	Reference to A2LA Accreditation Status – A2LA Advertising Policy

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 11 of 412

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## 2.2. Test and Uncertainty Procedures

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

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

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

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 12 of 412

### **3. PRODUCT DETAILS AND TEST CONFIGURATIONS**

#### **3.1. Technical Details**

Details	Description	
Purpose:	Test of the Wavion WBSn-2450-O/-S Wireless LAN Access Point to FCC Part 15.247 and Industry Canada RSS-210 regulations.	
Applicant:	Wavion Ltd 15 Hamada Street Yoqneam Illit, Israel 20692	
Manufacturer:	As applicant.	
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA	
Test report reference number:	WAVI01-U1 Rev D	
Date EUT received:	5 <sup>th</sup> July 2012	
Standard(s) applied:	FCC 47 CFR Part 15.247 & IC RSS-210	
Dates of test (from - to):	5th July to 19th March 2012	
No of Units Tested:	3 (2 * Conducted, 1 * Radiated)	
Type of Equipment:	802.11a/b/g/n Wireless Access Point, 3x3 Spatial Multiplexing MIMO configuration	
Manufacturers Trade Name:	Wireless Access Point	
Model(s):	WBSn-2450-O/-S	
Location for use:	Indoor/Outdoor	
Declared Frequency Range(s):	2400 - 2483.5 MHz; 5725 - 5850 MHz	
Software Release	NART	
Type of Modulation:	Per 802.11 -CCK, BPSK, QPSK, DSSS, OFDM	
Declared Nominal Average Output Power:	2.4 GHz 802.11b: +28 dBm 802.11g: Leg. +28 dBm 802.11 n HT-20: +28 dBm 802.11 n HT-40: +28 dBm	5.8 GHz 802.11a: +28 dBm 802.11 n HT-20: +28 dBm 802.11n HT-40: +28 dBm
EUT Modes of Operation:	Legacy 802.11a/b/g, 802.11n HT-20, HT-40	
Transmit/Receive Operation:	Time Division Duplex	
Rated Input Voltage and Current:	POE 55 Vdc	
Operating Temperature Range:	Declared range -40° to +55°C	

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 13 of 412

ITU Emission Designator:	2400 – 2483.5 MHz 802.11b 17M2G1D
	2400 – 2483.5 MHz 802.11g 27M9D1D
	2400 – 2483.5 MHz 802.11n – HT-20 27M8D1D
	2400 – 2483.5 MHz 802.11n – HT-40 51M3D1D
	5725 – 5850 MHz 802.11a 5 MHz 6M8D1D
	5725 – 5850 MHz 802.11a 10 MHz 15M8D1D
	5725 – 5850 MHz 802.11a 20 MHz 34M5D1D
	5725 – 5850 MHz 802.11n – HT-20 35M3D1D
	5725 – 5850 MHz 802.11n – HT-40 69M9D1D
Frequency Stability:	±20 ppm max
Equipment Dimensions:	38cm x 14cm x 43.5cm (Excluding Antenna's)
Weight:	3.75 Kg
Primary function of equipment:	Outdoor WiFi.

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### 3.2. Scope of Test Program

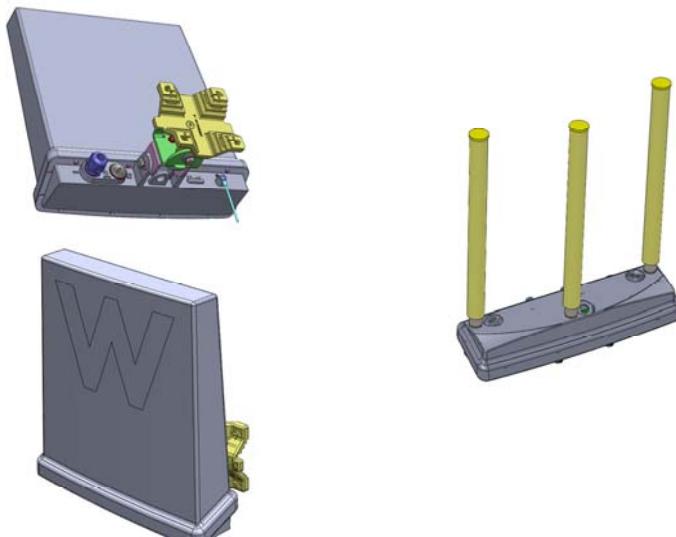
The scope of the test program was to test the Wavion WBSn-2450-O/-S Wireless LAN Access Point 3x3 Spatial Multiplexing MIMO configurations in the frequency ranges 2400 - 2483.5 MHz and 5725 – 5850 MHz for compliance against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications.

Models	Manufacturers Statement of Model Differences
WBSn-2450 Series	
<b>WBSn-2450-S</b>	Integral 3 directional dual band 120 degree sector antennas (SL/SR/V polarization)
<b>WBSn-2450-O</b>	3 omni-directional antennas (V polarization with vertical or mechanically tilted antennas, N-type) dual band Omni antenna:

As model differences were restricted to antenna types model WBSn-2450-O was chosen to prove compliance.

#### Selected Test Suite

- Left: WBSn-2450-S: Dual band sector antenna
- Right: WBSn-2450-O: Dual band Omni-directional antenna




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 15 of 412

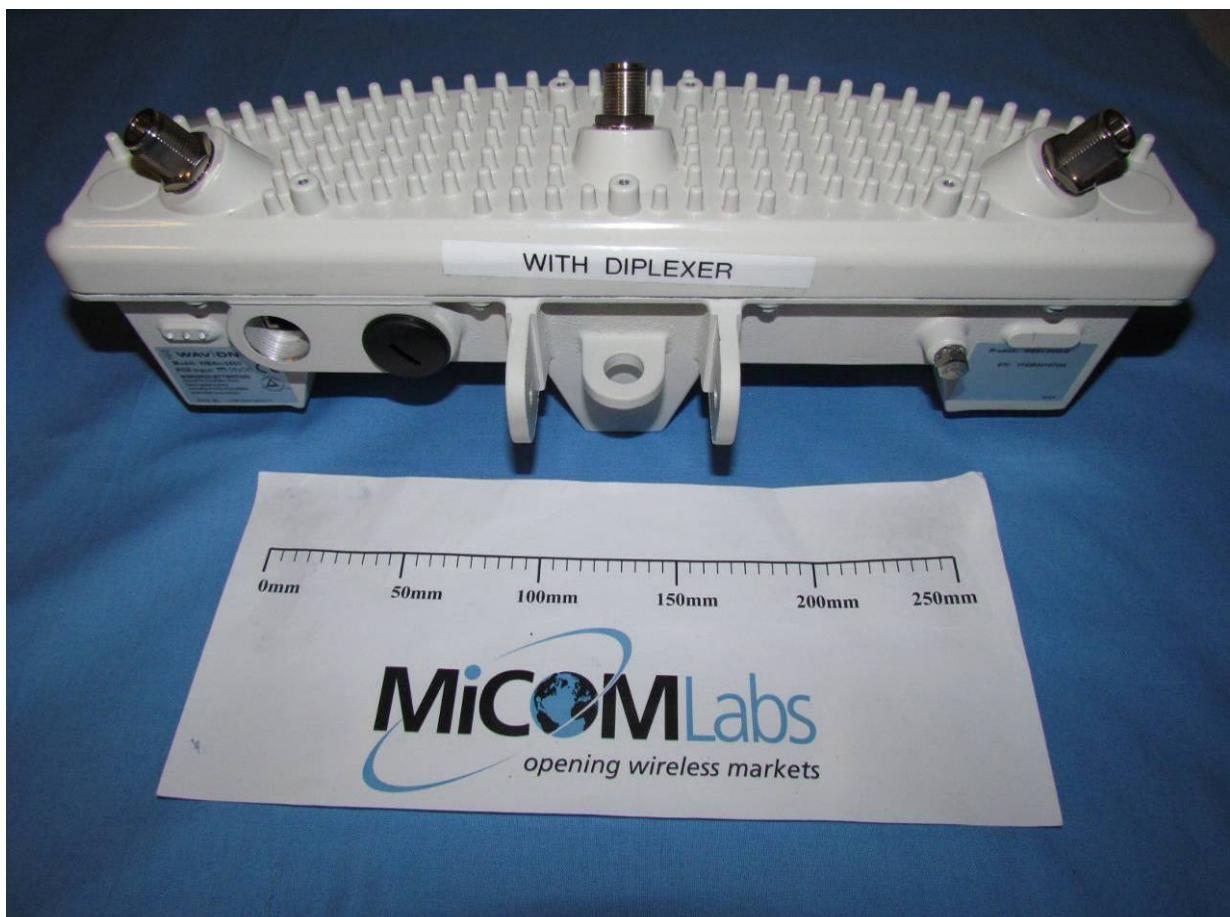
**Wavion Ltd**  
**WBSn-2450-O/-S 802.11 a/b/g/n Wireless Access Point**



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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 16 of 412

**Wavion Ltd**  
**WBSn-2450-O/-S 802.11 a/b/g/n Wireless Access Point**



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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 17 of 412

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

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	802.11a/b/g/n Wireless Access Point	Wavion	WBSn-2450-O	1153R00131565
EUT	802.11a/b/g/n Wireless Access Point	Wavion	WBSn-2450-O	1206R00144608
EUT	802.11a/b/g/n Wireless Access Point	Wavion	WBSn-2450-S	1153R00131566
Support	POE	PhiHong	POE61U-560DG	--
Support	Laptop PC	IBM	Thinkpad	None

### 3.4. Antenna Details

Antenna Type:	Manufacturer	Model No.	Type	Gain (dBi)	Frequency Range (MHz)
External	MTI Wireless Edge Ltd	MT-952021	Omni	7.4	2400 – 2483.5
Integral	Self	None	Sector	12.0	2400 – 2483.5
External	MTI Wireless Edge Ltd	MT-952021	Omni	8.5	4,900 - 5,900
Integral	Self	None	Sector	14.0	4,900 - 5,900

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 18 of 412

### 3.5. Cabling and I/O Ports

Number and type of I/O ports

- 1 x 10/100/1000 Ethernet, includes POE (+55 Vdc)

### 3.6. Test Configurations

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

Operational Mode(s) (802.11a/b/g/n)	Variant	Data Rate with Highest Power	Frequencies (MHz)
b	Legacy	1 MBit/s	2,412
g	Legacy	6 MBit/s	2,437
n	HT-20	6.5 (MCS 0)	2,462
	HT-40	13.5 (MCS 0)	2,422 2,437 2,452
a, 5 MHz	Legacy	6 MBit/s	5,730.5 5,790.5 5845.5
a, 10 MHz	Legacy	6 MBit/s	5,735 5,790 5,840
a, 20 MHz	Legacy	6 MBit/s	5,745 5,785 5,825
n	HT-20	6.5 (MCS 0)	5,755
	HT-40	13.5 (MCS 0)	5,795

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report.

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 19 of 412

## Antenna Test Configurations for Radiated Emissions

Results for the following configurations are provided in this report.

2,400 – 2483.5 MHz

5,725 – 5850 MHz

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

15.247	
802.11a, 5 MHz	a SE 5730.5
	a SE 5790.5
	a SE 5845.5
	BE a 5460
802.11a, 10 MHz	a SE 5735
	a SE 5790
	a SE 5840
	BE a 5460
802.11a, 20 MHz	a SE 5745
	a SE 5785
	a SE 5825
	BE a 5460
802.11n HT-20	n HT-20 SE 5745
	n HT-20 SE 5785
	n HT-20 SE 5825
	BE HT-20 5460
802.11n HT-40	n HT-40 SE 5755
	n HT-40 SE 5785
	n HT-40 SE 5815
	BE HT-40 5460

### KEY:-

SE – Spurious Emission  
BE – Band-Edge

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 20 of 412

---

### **3.7. Equipment Modifications**

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

NONE

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

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

1. NONE

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

1. NONE

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 21 of 412

## 4. TEST SUMMARY

### List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
<b>15.247(a)(2) A8.2(1) 4.4</b>	6 dB and 99 % Bandwidths	≥500 kHz	Conducted	Complies	5.1.1
<b>15.247(b)(3) 15.31(e) A8.4(4)</b>	Peak Output Power Voltage Variation	Shall not exceed 1W  Variation of supply voltage 85 % -115 %	Conducted	Complies	5.1.2
<b>15.247(e) A8.2</b>	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	5.1.3
<b>15.247(i) 5.5</b>	Maximum Permissible Exposure	Exposure to radio frequency energy levels	Conducted	Complies	5.1.4
<b>15.247(d) 15.205 / 15.209 A8.5 2.2 4.7</b>	Spurious Emissions	The radiated emission in any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density	Conducted	Complies	5.1.5

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 22 of 412

### List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247**, **Industry Canada RSS-210**, and **Industry Canada RSS-Gen.**

Section(s)	Test Items	Description	Condition	Result	Test Report Section
<b>15.247(d)</b> <b>15.205 /</b> <b>15.209</b> <b>A8.5</b> <b>2.2</b> <b>2.6</b> <b>4.7</b>	Radiated Emissions	Restricted Bands	Radiated	Complies	5.1.6
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	5.1.6.1
	Radiated Band Edge	Band-edge results Peak Emissions		Complies	5.1.6.2.
Industry Canada only <b>RSS-Gen §4.10, §6</b>	Receiver Radiated Spurious Emissions	Emissions above 1 GHz		Complies	5.1.6.3
<b>15.205 /</b> <b>15.209</b> <b>2.2</b>	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz)	Radiated	Complies	5.1.6.4
<b>15.207</b> <b>7.2.2</b>	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions	Conducted	Complies	5.1.7

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

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

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

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## 5. TEST RESULTS

### 5.1. Device Characteristics

#### 5.1.1. 6 dB and 99 % Bandwidth

FCC, Part 15 Subpart C §15.247(a)(2)

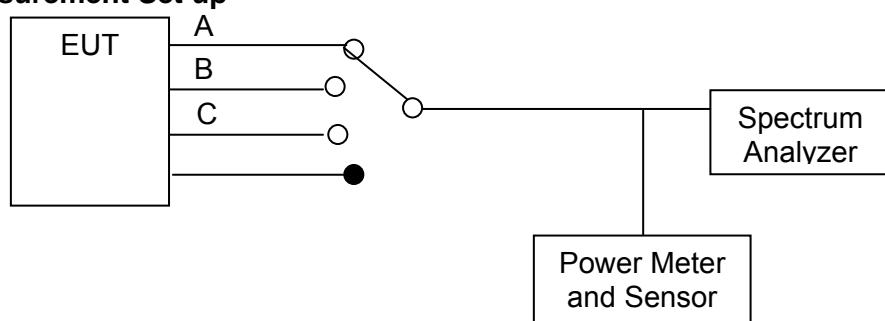
Industry Canada RSS-210 §A8.2

Industry Canada RSS-Gen §4.4

#### Test Procedure

The bandwidth at 6 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

#### Test Measurement Set up



Measurement set up for 6 dB and 99 % bandwidth test

#### Measurement Results for 6 dB & 99% Bandwidth

Ambient conditions.

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

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Default, Maximum Power

Test s/w: ART

---

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 24 of 412

Measurement Results for 6 dB Operational Bandwidth(s) Ambient conditions.

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

#### TABLE OF RESULTS – 802.11b Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A	<b>Antenna Gain:</b>	0	dBi	
<b>Applied Voltage:</b>	48.00	Vdc			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

#### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
2412.000	9.218	10.180	10.180	--	500	0.5	-8.718000
2437.000	10.100	10.180	11.142	--			-9.600000
2462.000	10.100	10.581	10.180	--			-9.600000

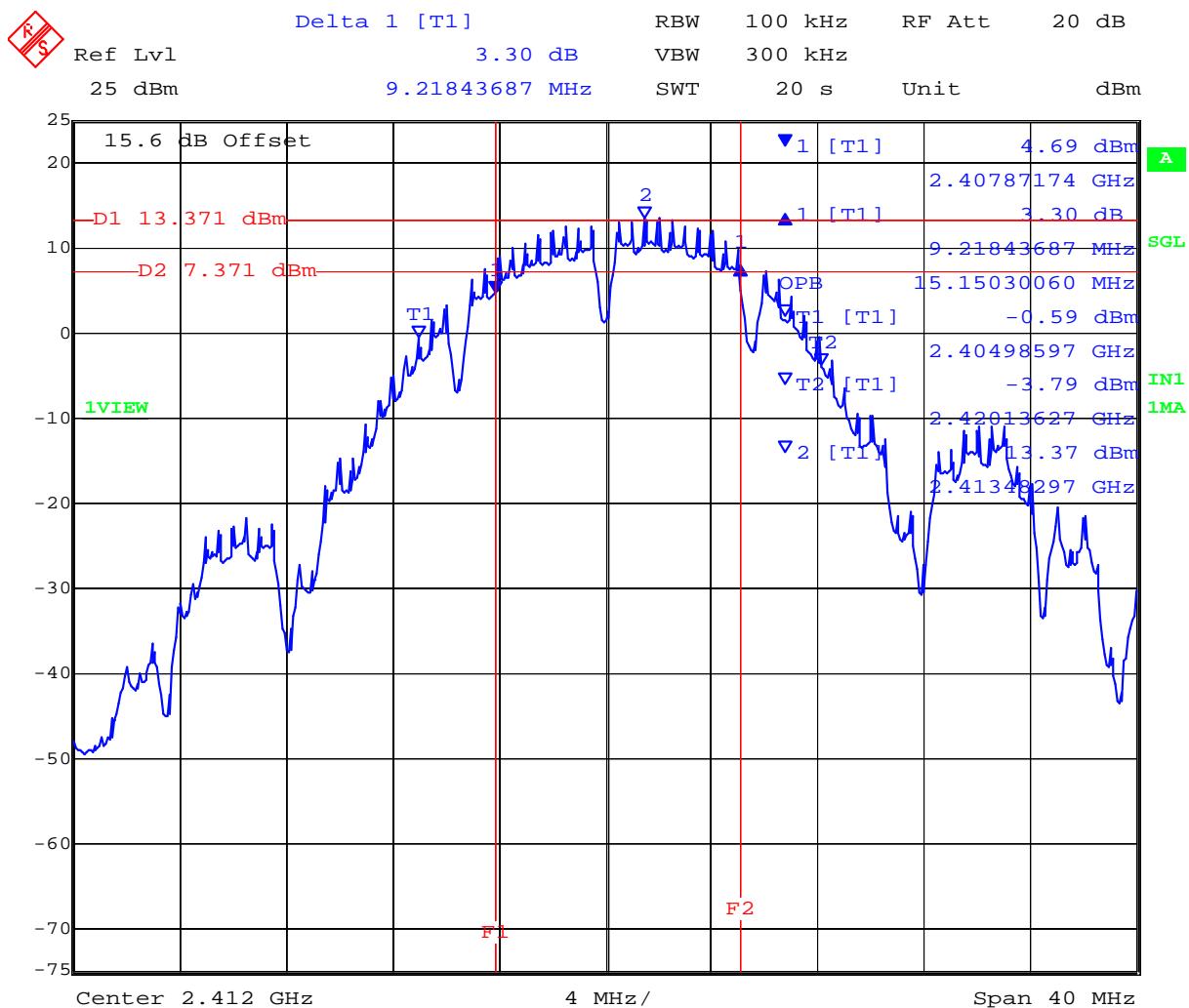
#### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
2412.000	15.150	14.990	15.311	--			
2437.000	14.589	14.108	14.910	--			
2462.000	15.711	15.070	17.234	--			

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

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### PORT A 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth

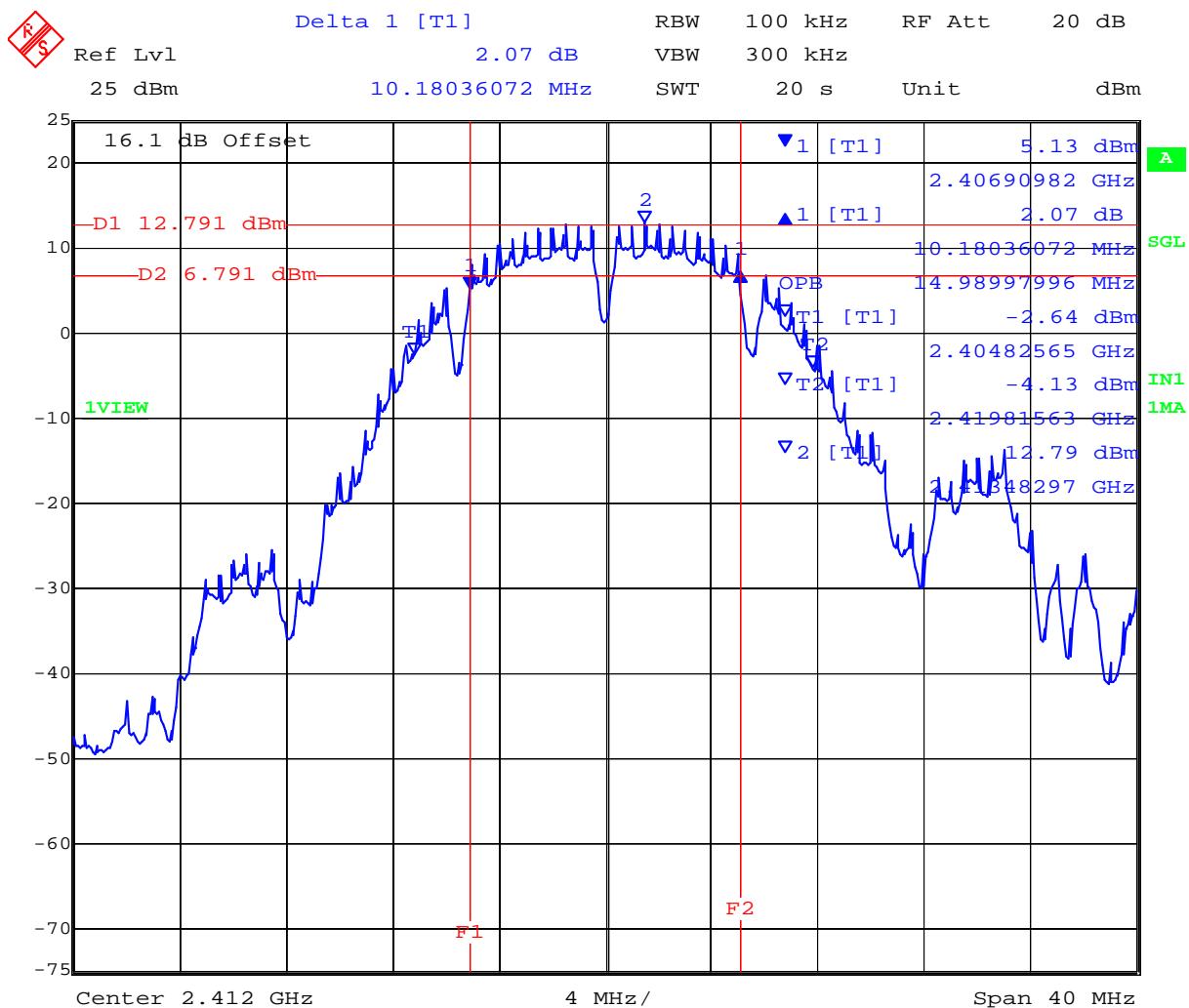


Date: 29.FEB.2012 12:59:15

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### PORT B 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth

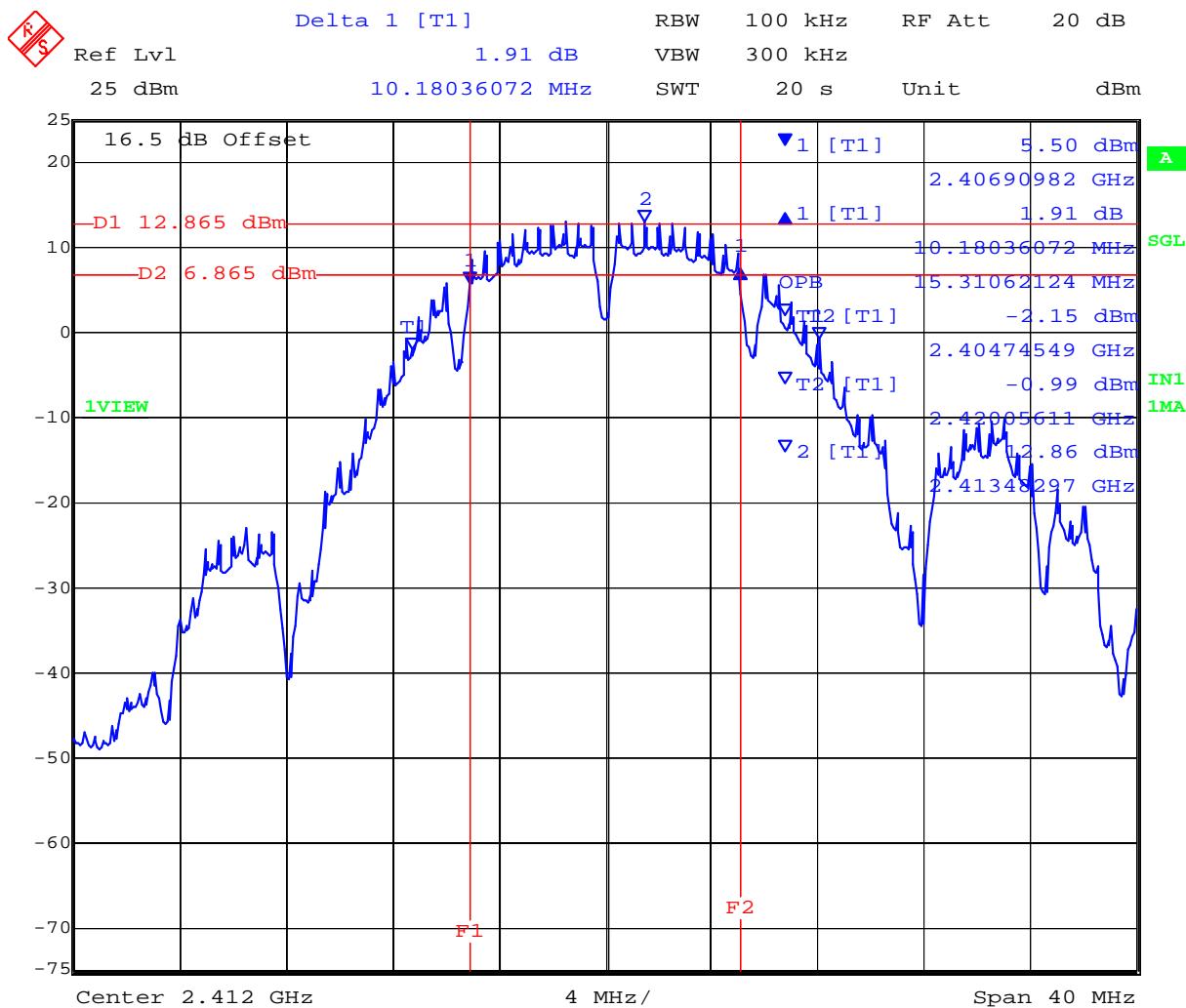


Date: 29.FEB.2012 13:00:20

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### PORT C 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth

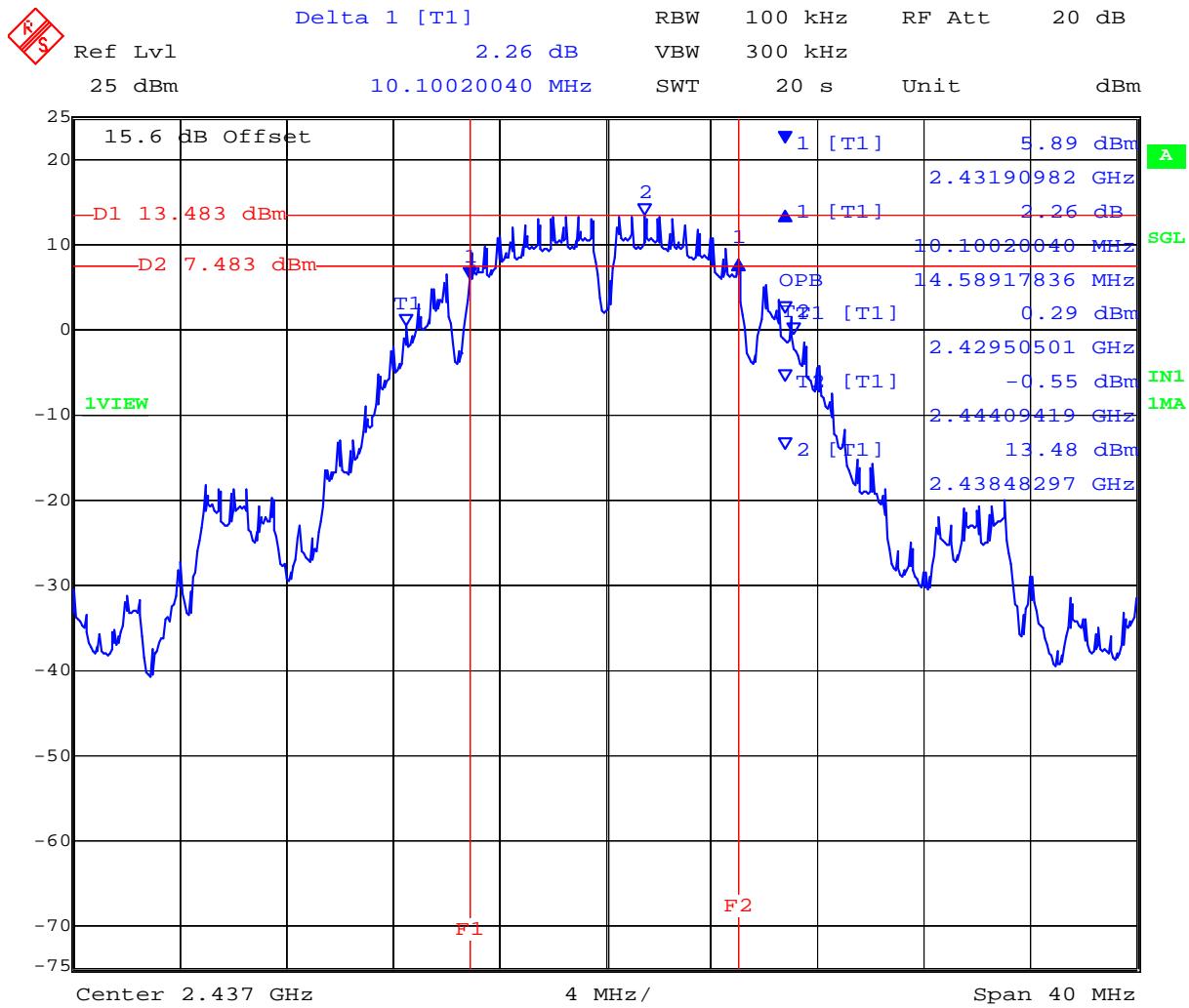


Date: 29.FEB.2012 13:01:22

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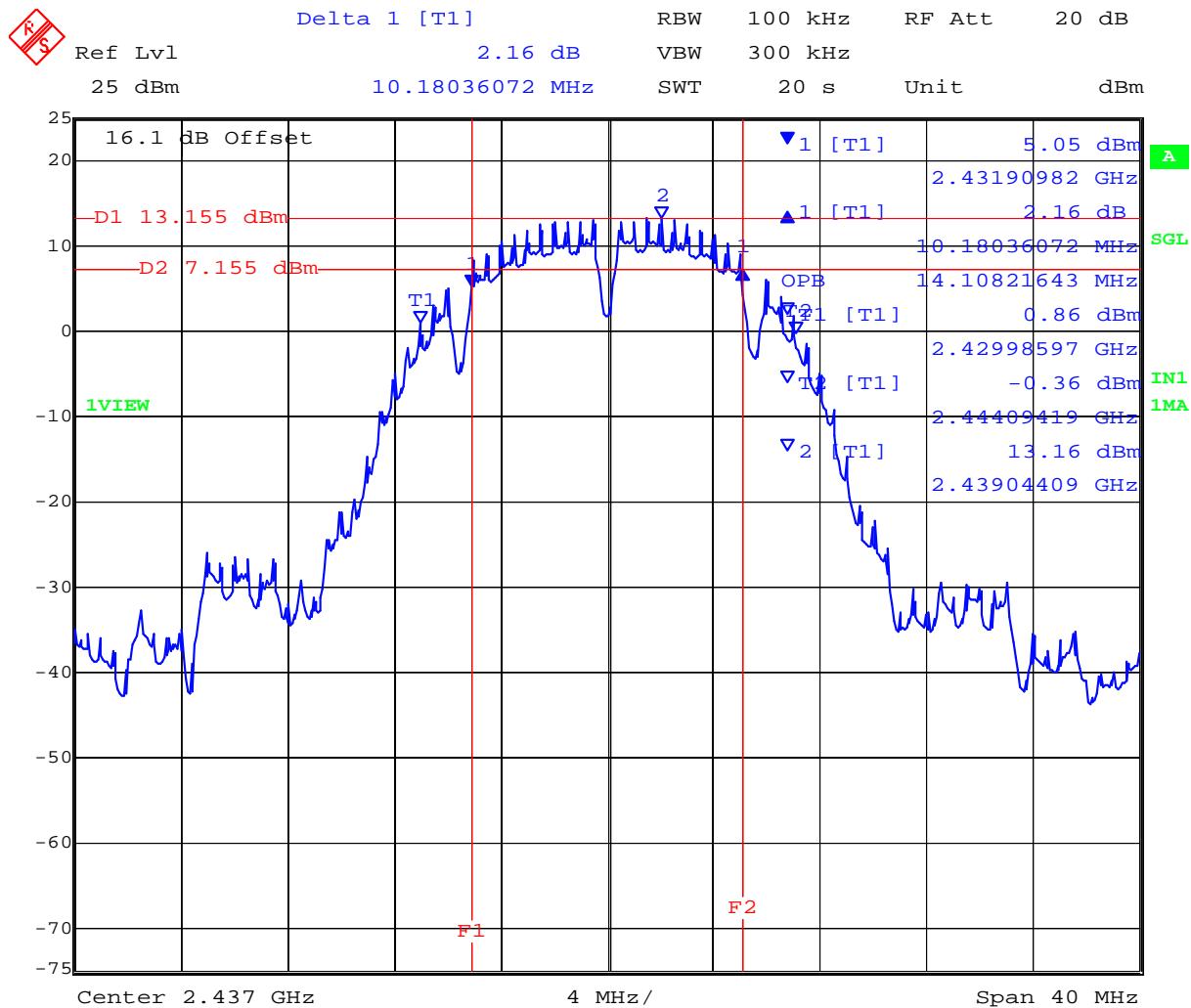
**PORT A 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 13:36:18

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### PORT B 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth

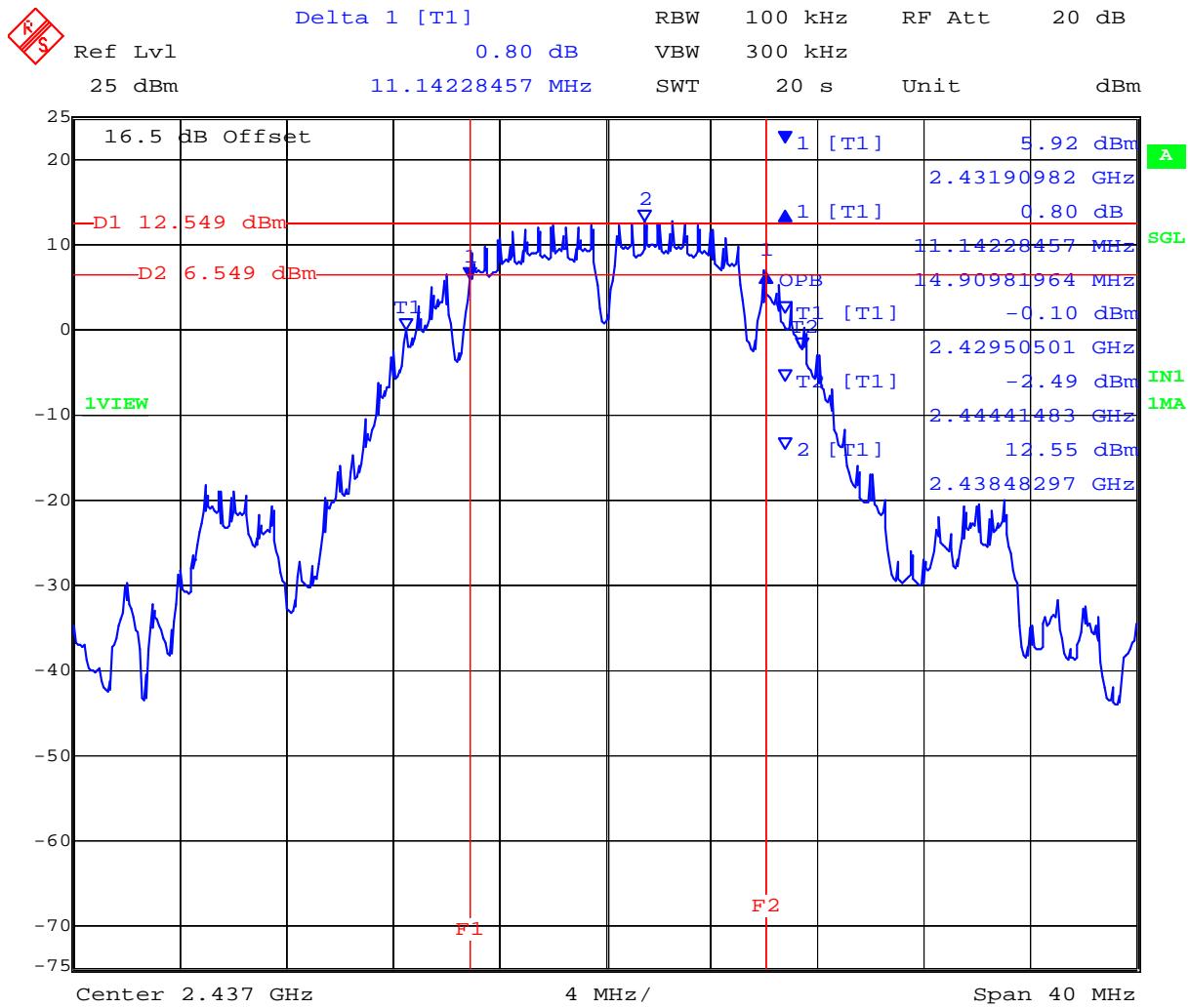


Date: 29.FEB.2012 13:37:25

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### PORT C 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth

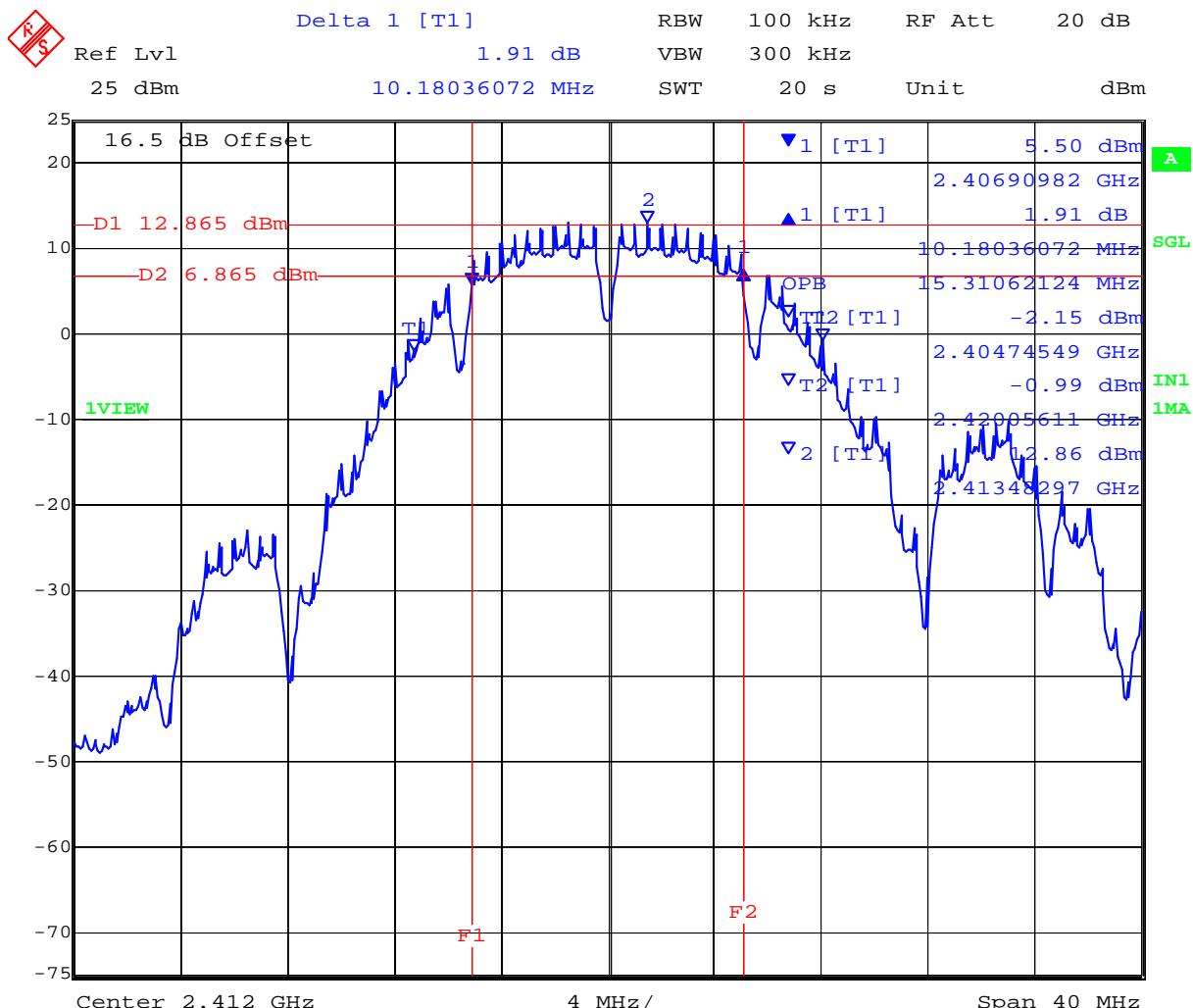


Date: 29.FEB.2012 13:38:28

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**PORT A 2,462 MHz 802.11b Legacy 6 dB and 99% Bandwidth**

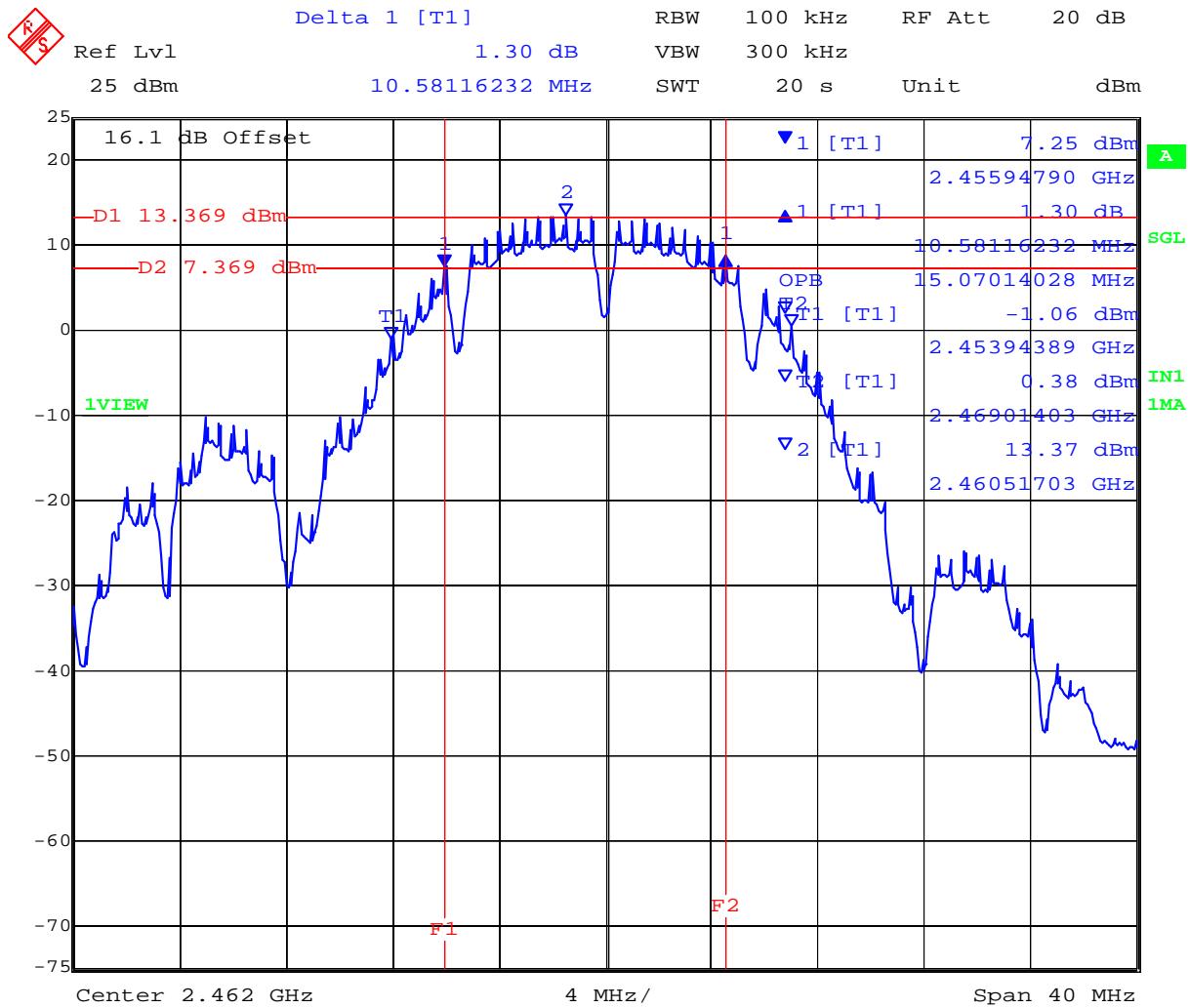


Date: 29.FEB.2012 13:01:22

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**PORT B 2,462 MHz 802.11b Legacy 6 dB and 99% Bandwidth**

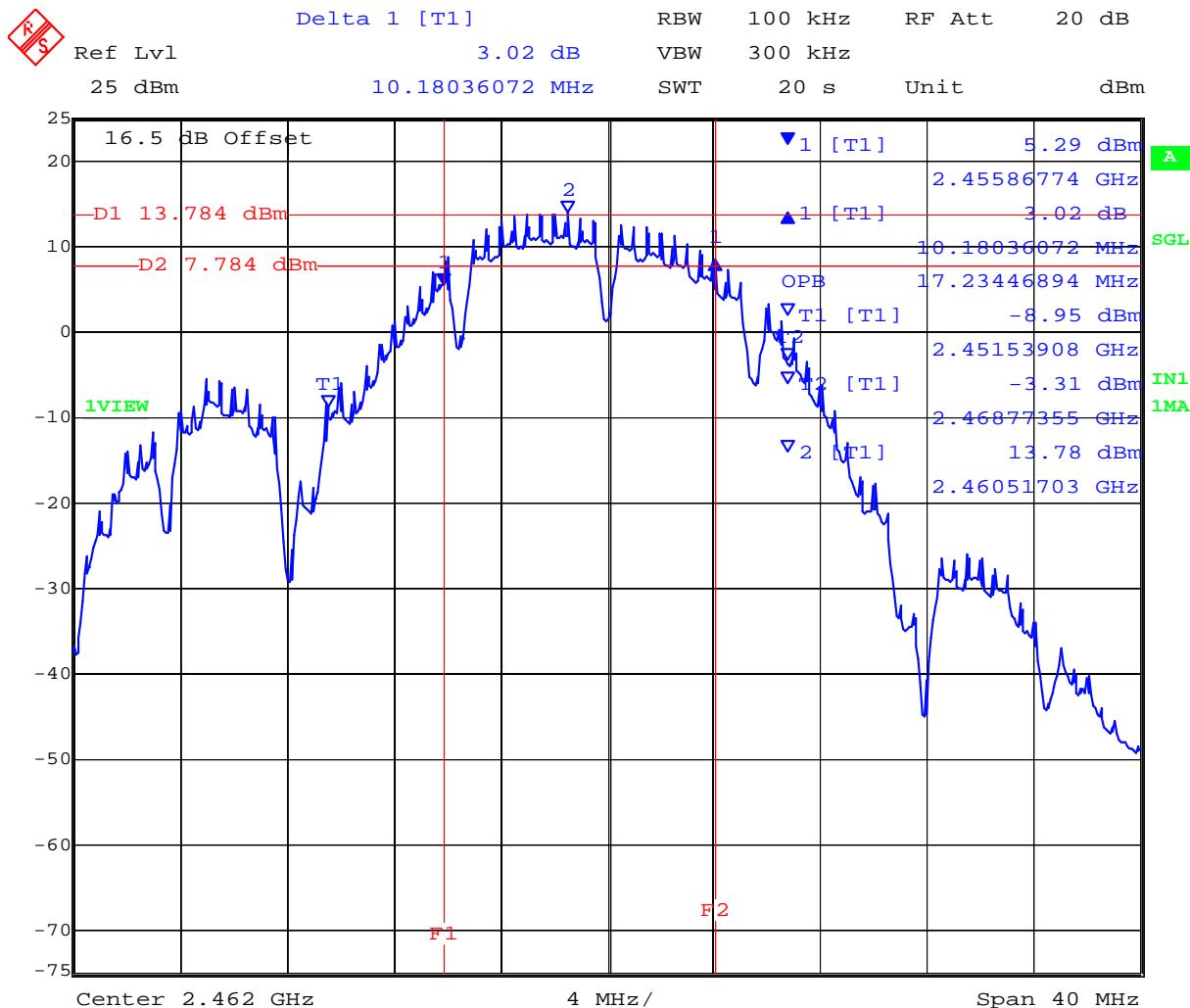


Date: 29.FEB.2012 14:06:21

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**PORT C 2,462 MHz 802.11b Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 14:07:26

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 34 of 412

## TABLE OF RESULTS – 802.11g Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A	<b>Antenna Gain:</b>	0	dBi	
<b>Applied Voltage:</b>	48.00	Vdc			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>	<b>Margin</b>	
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
2412.000	16.032	16.513	16.513	--	500	0.5	-15.532000
2437.000	16.593	16.593	16.673	--			-16.093000
2462.000	16.433	16.273	14.669	--			-14.169000

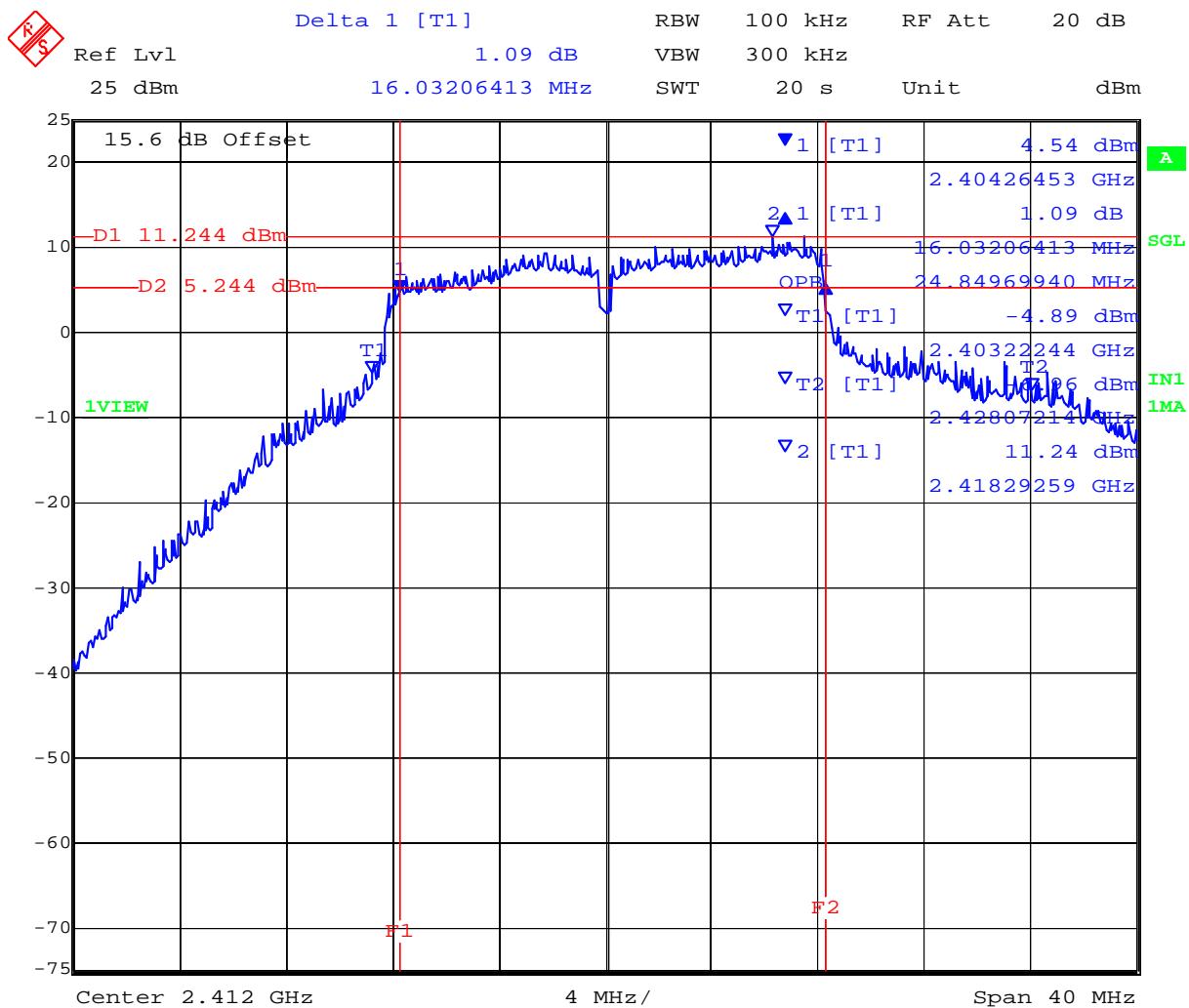
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
2412.000	24.850	24.369	25.491	--			
2437.000	27.896	23.968	27.174	--			
2462.000	24.208	24.529	25.331	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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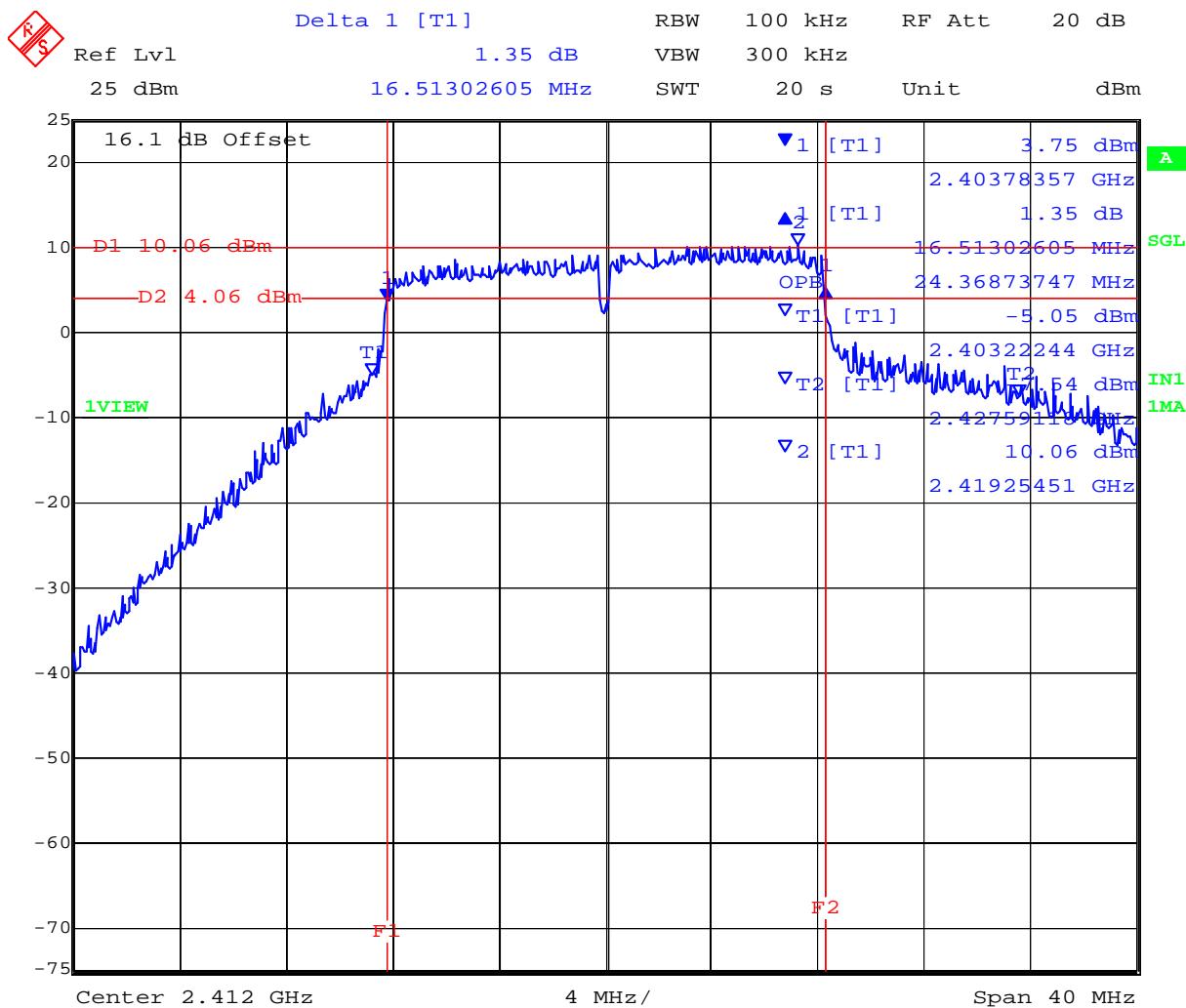
**PORT A 2.412 MHz 802.11g Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 11:16:54

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### PORT B 2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth

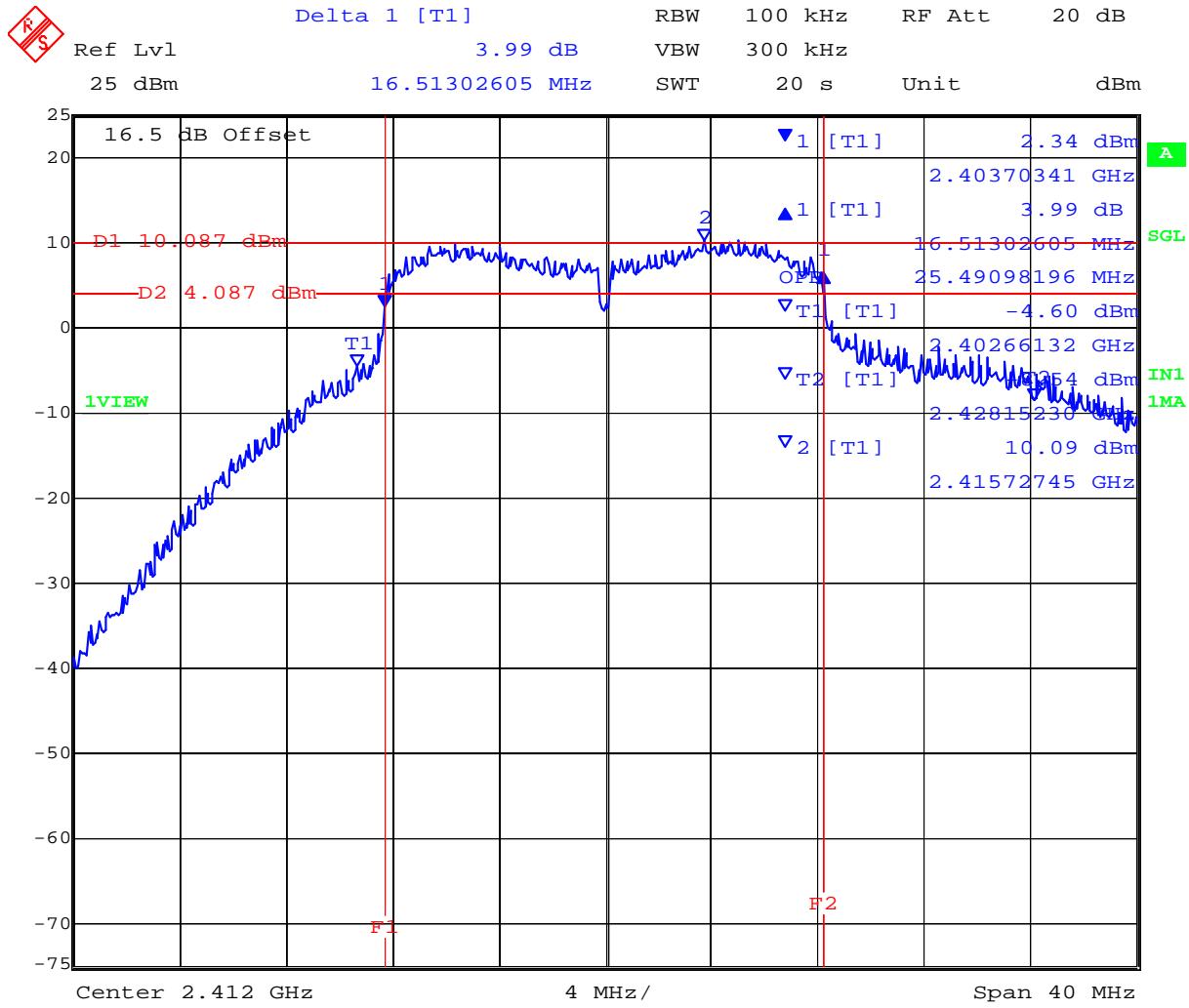


Date: 29.FEB.2012 11:17:58

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### PORT C 2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth

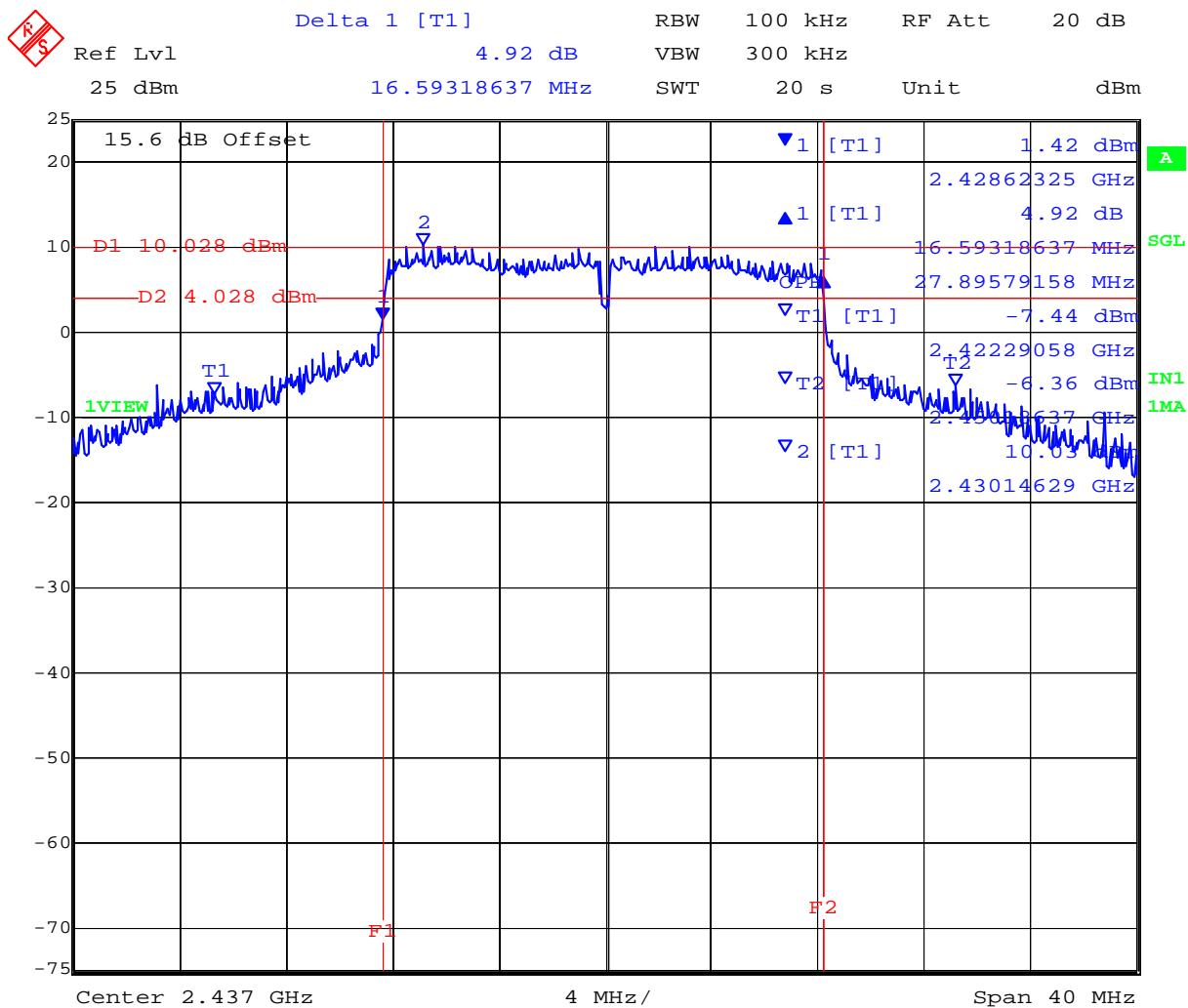


Date: 29.FEB.2012 11:19:01

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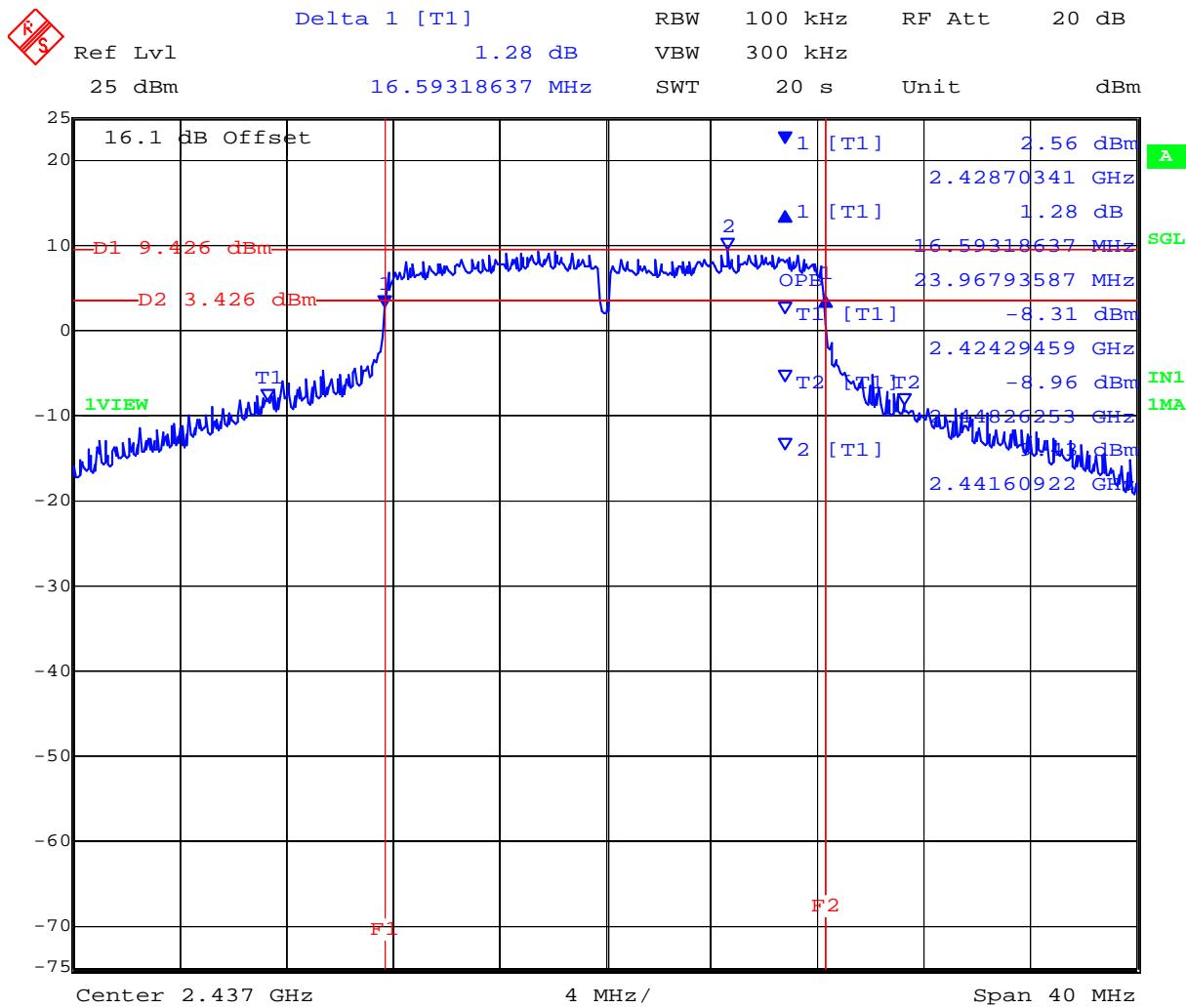
**PORT A 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 11:52:23

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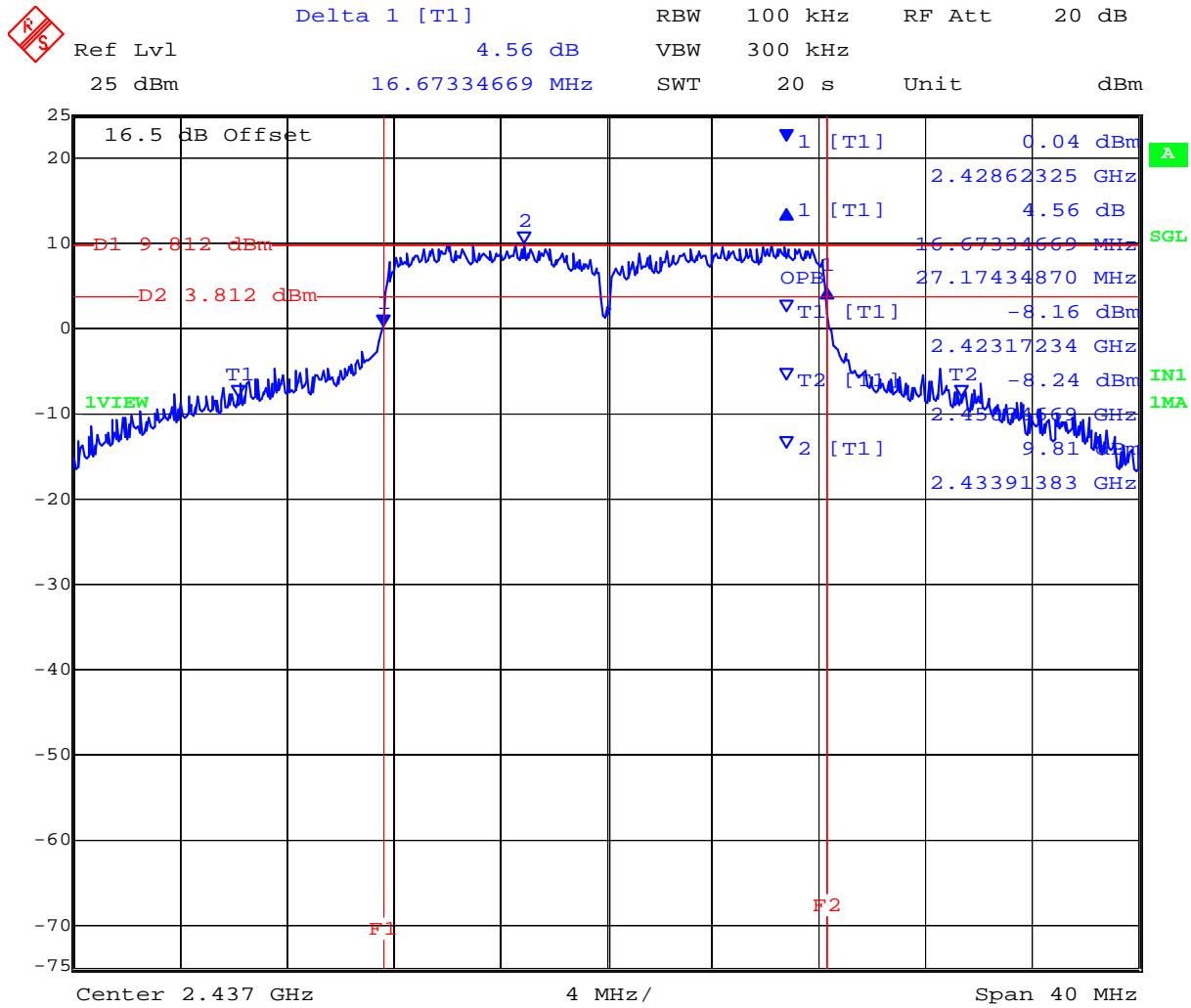
**PORT B 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 11:53:28

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### PORT C 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth

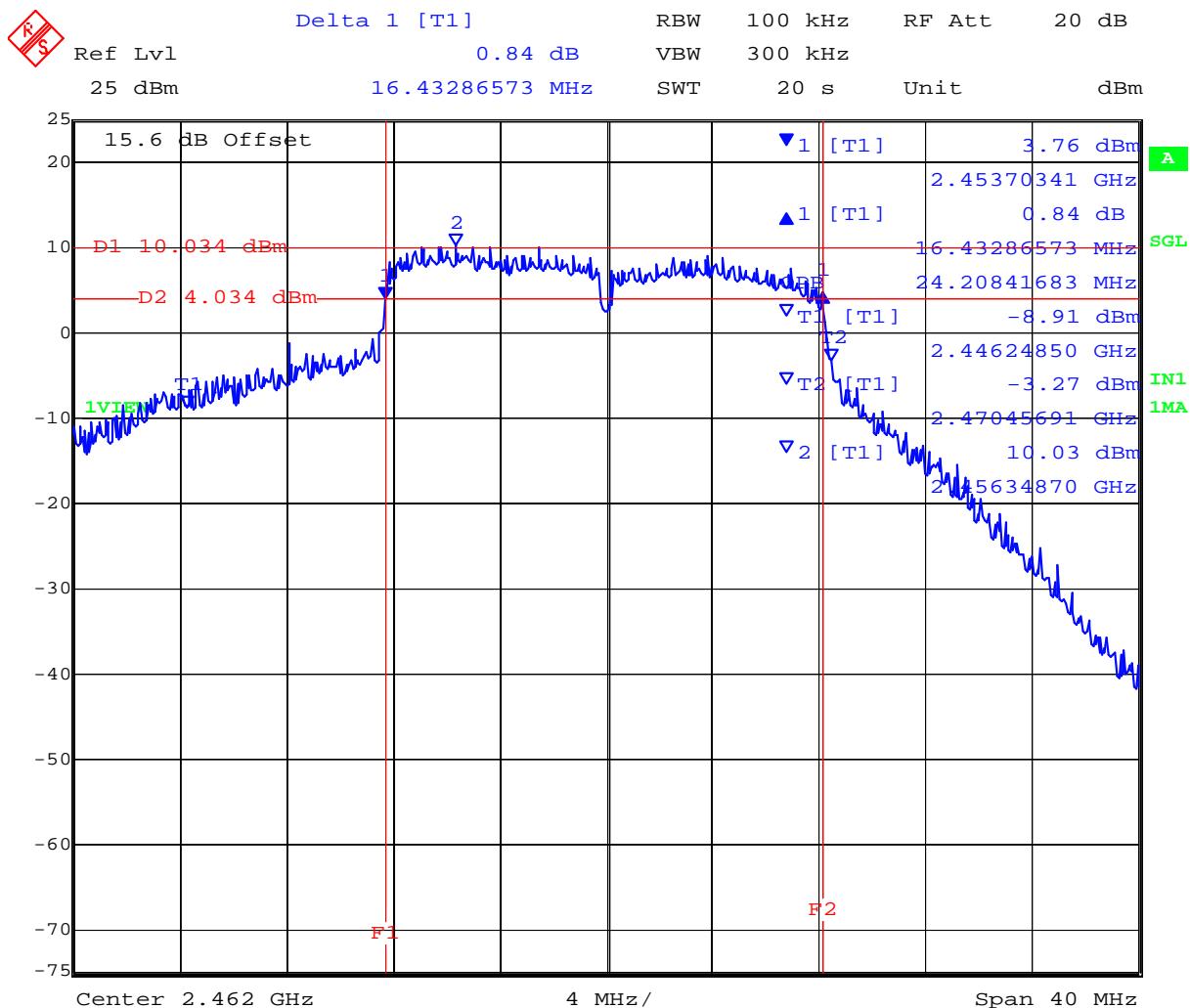


Date: 29.FEB.2012 11:54:31

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**PORT A 2,462 MHz 802.11g Legacy 6 dB and 99% Bandwidth**

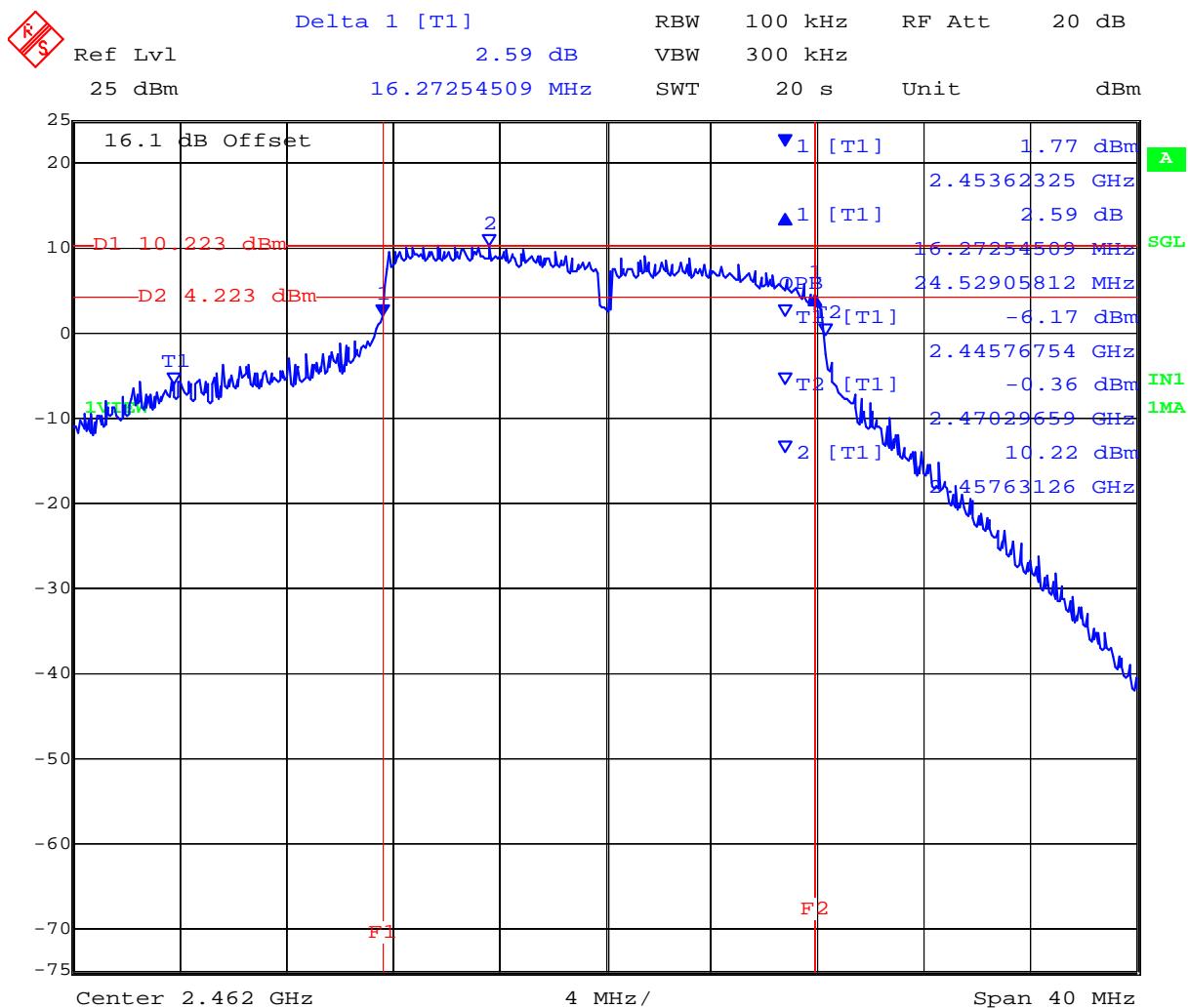


Date: 29.FEB.2012 12:23:59

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### PORT B 2,462 MHz 802.11g Legacy 6 dB and 99% Bandwidth

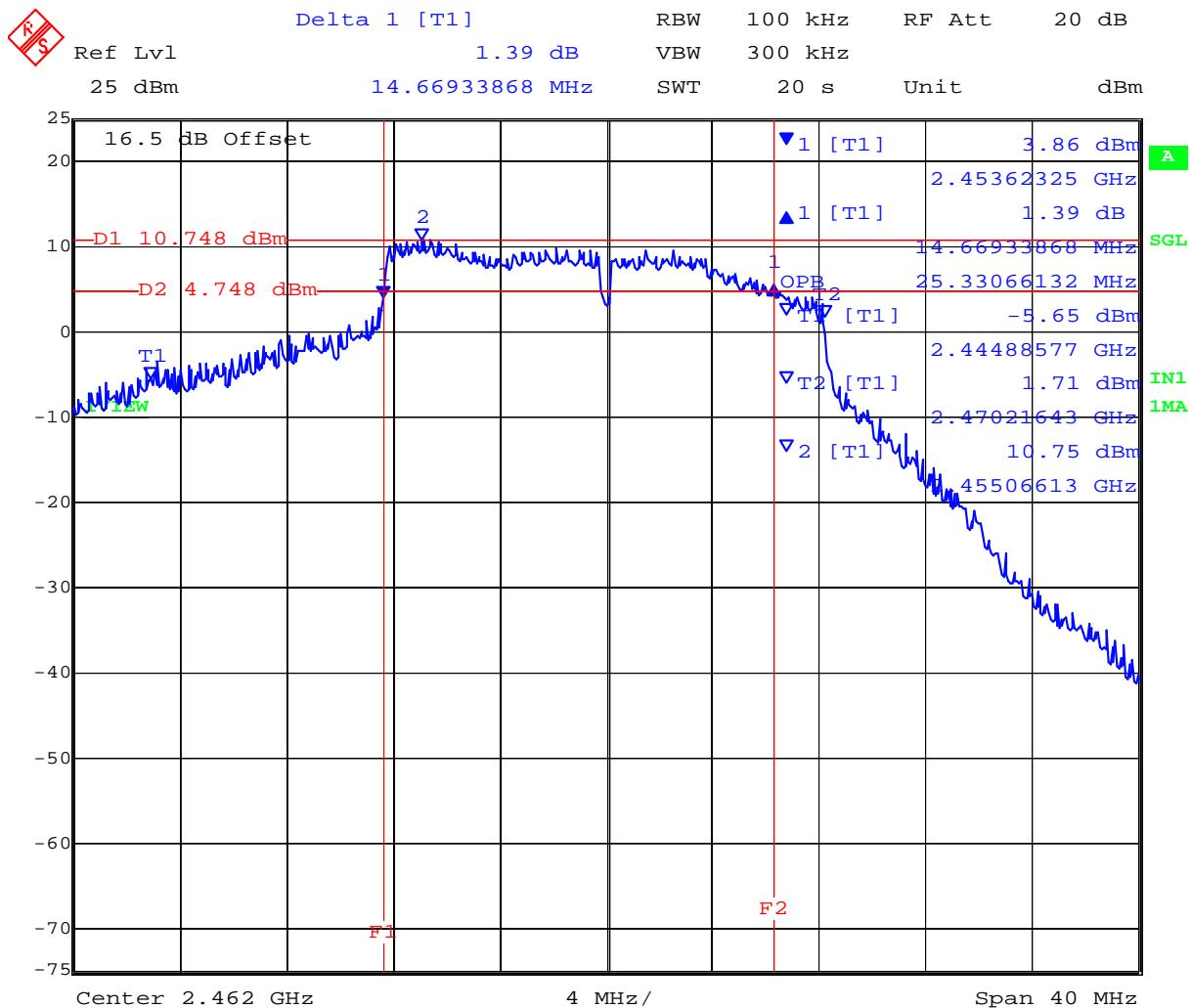


Date: 29.FEB.2012 12:25:06

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### PORT C 2,462 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 29.FEB.2012 12:26:08

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 44 of 412

## TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	0 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### 6 dB Bandwidth

<b>Test Frequency</b>	<b>6 dB Bandwidth</b>				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
2412.000	17.154000	17.796000	17.876000	--	500	0.5	-16.654000
2437.000	17.876000	17.796000	17.876000	--			-17.296000
2462.000	17.796000	17.154000	16.513000	--			-16.013000

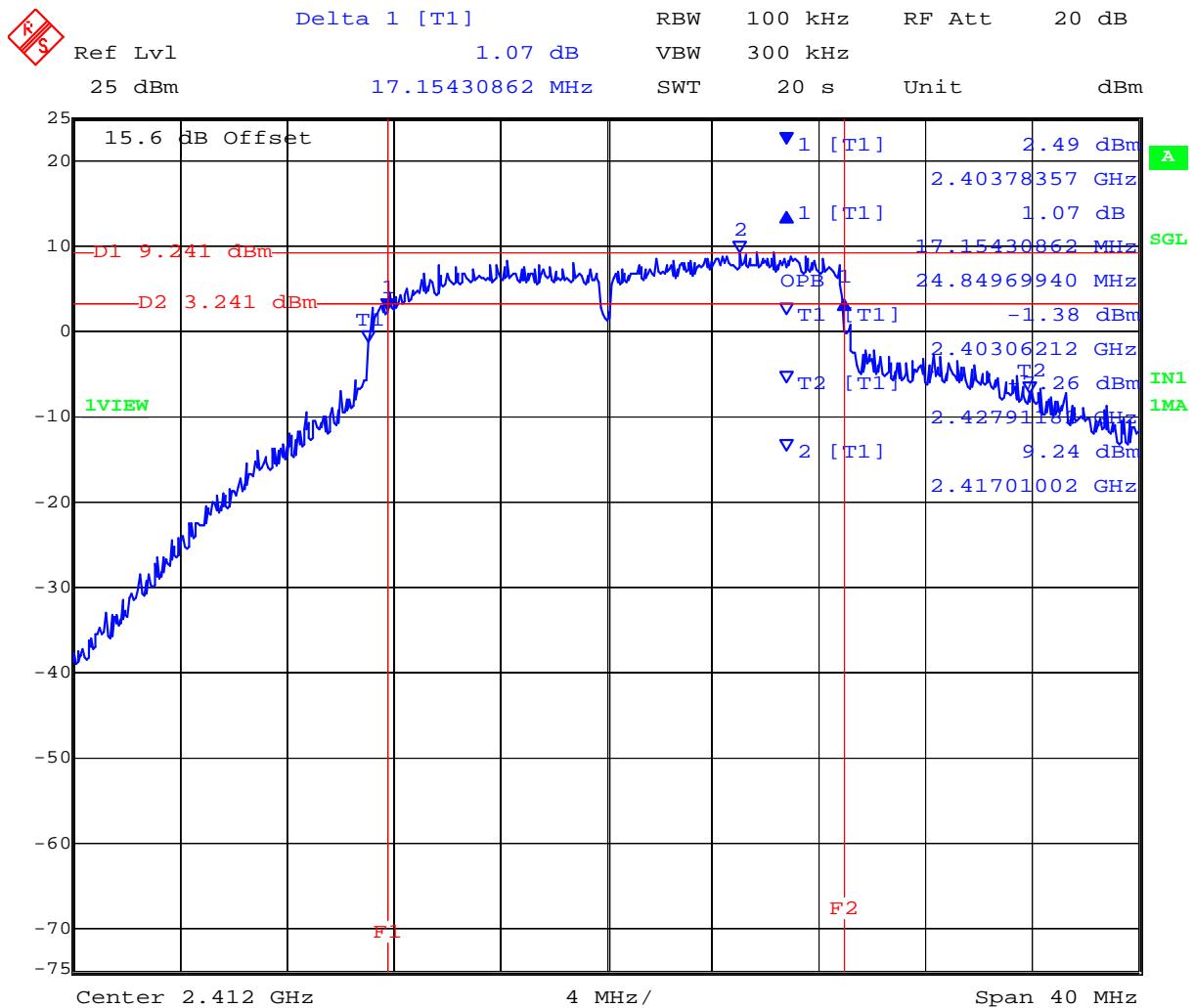
### 99% Bandwidth

<b>Test Frequency</b>	<b>99 % Bandwidth</b>						
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
2412.000	24.850000	24.609000	26.212000	--			
2437.000	27.816000	24.369000	27.655000	--			
2462.000	24.609000	25.651000	25.972000	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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**PORT A 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**

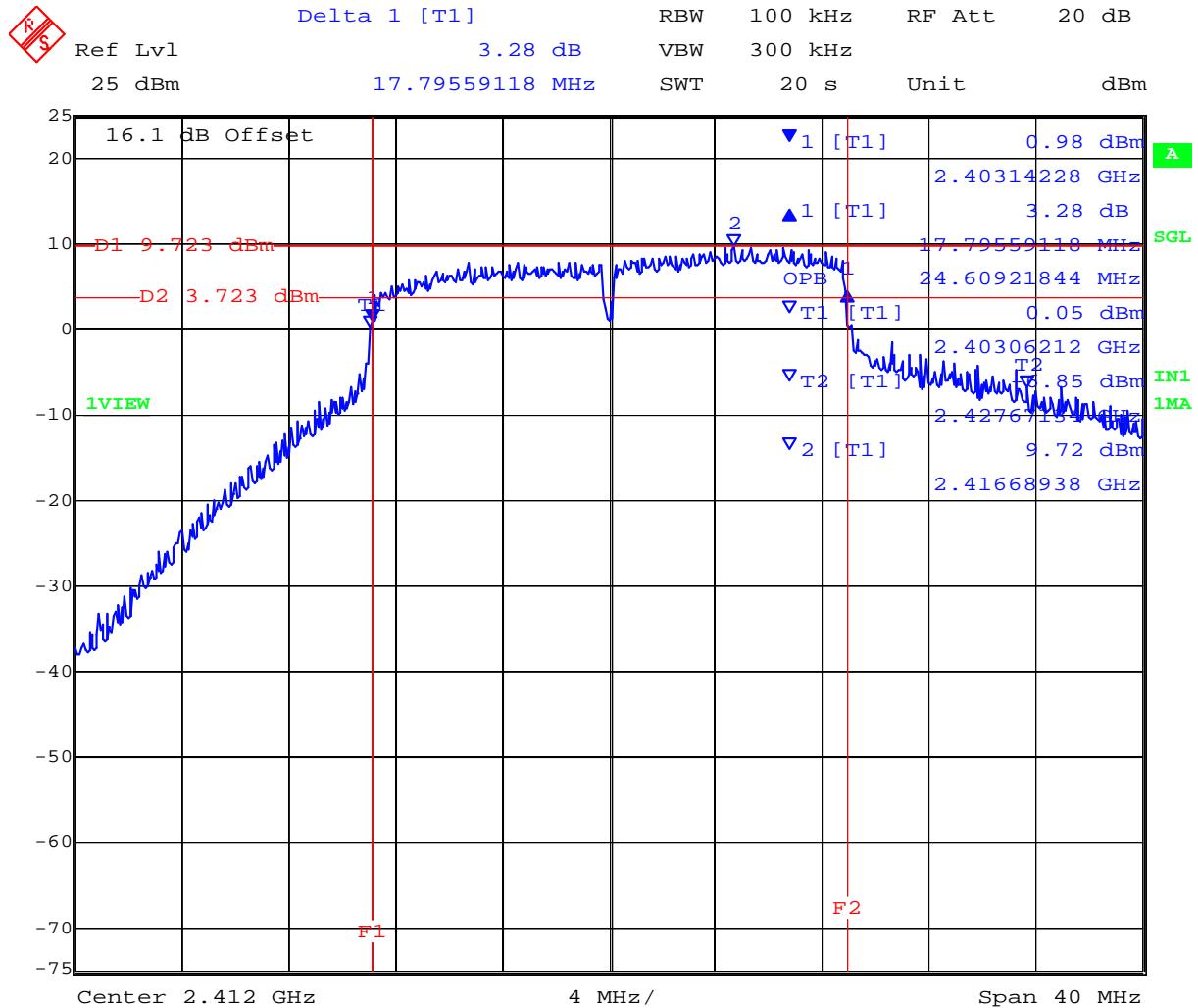


Date: 29.FEB.2012 15:16:42

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**PORT B 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**

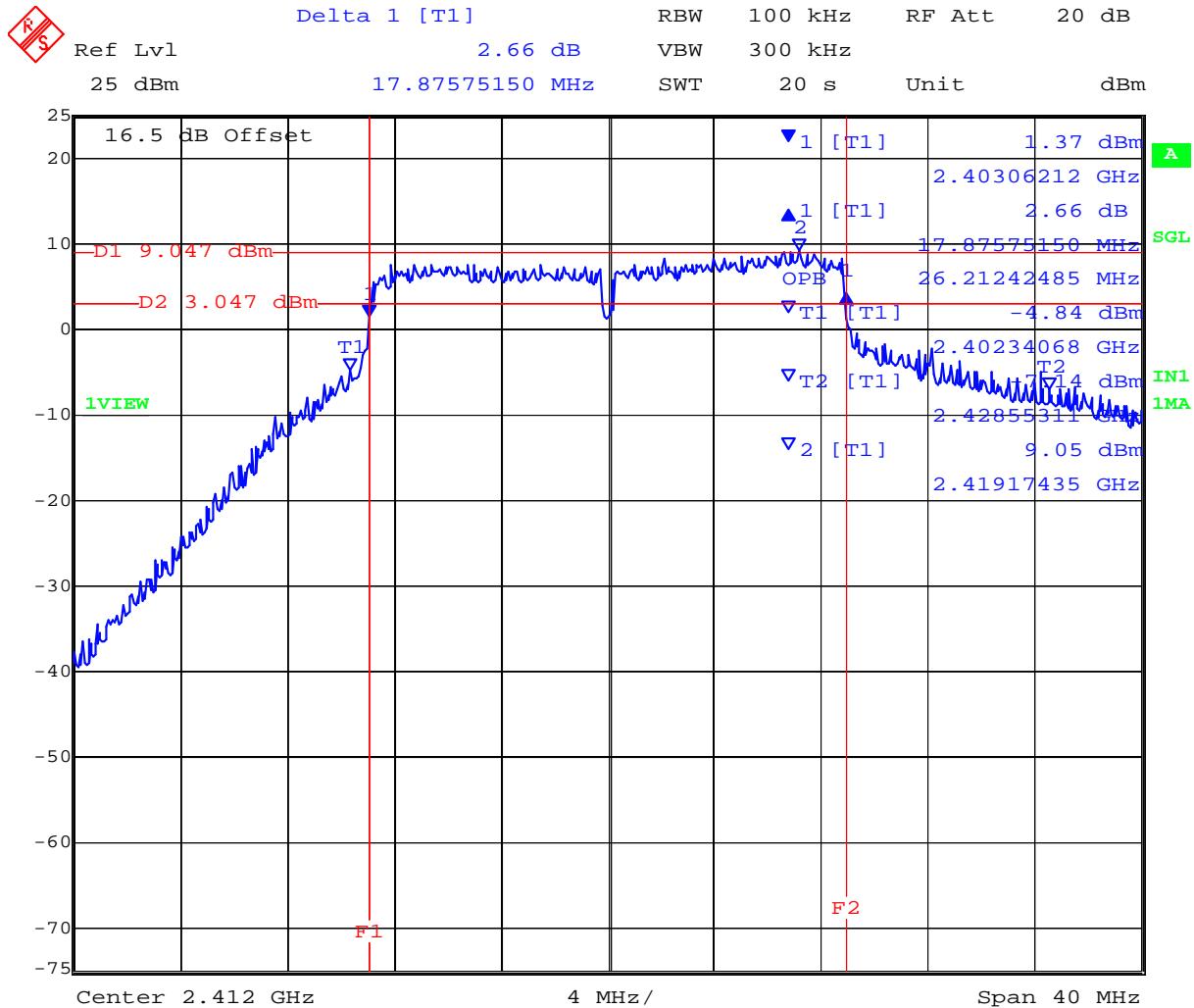


Date: 29.FEB.2012 15:17:47

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### PORT C 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth

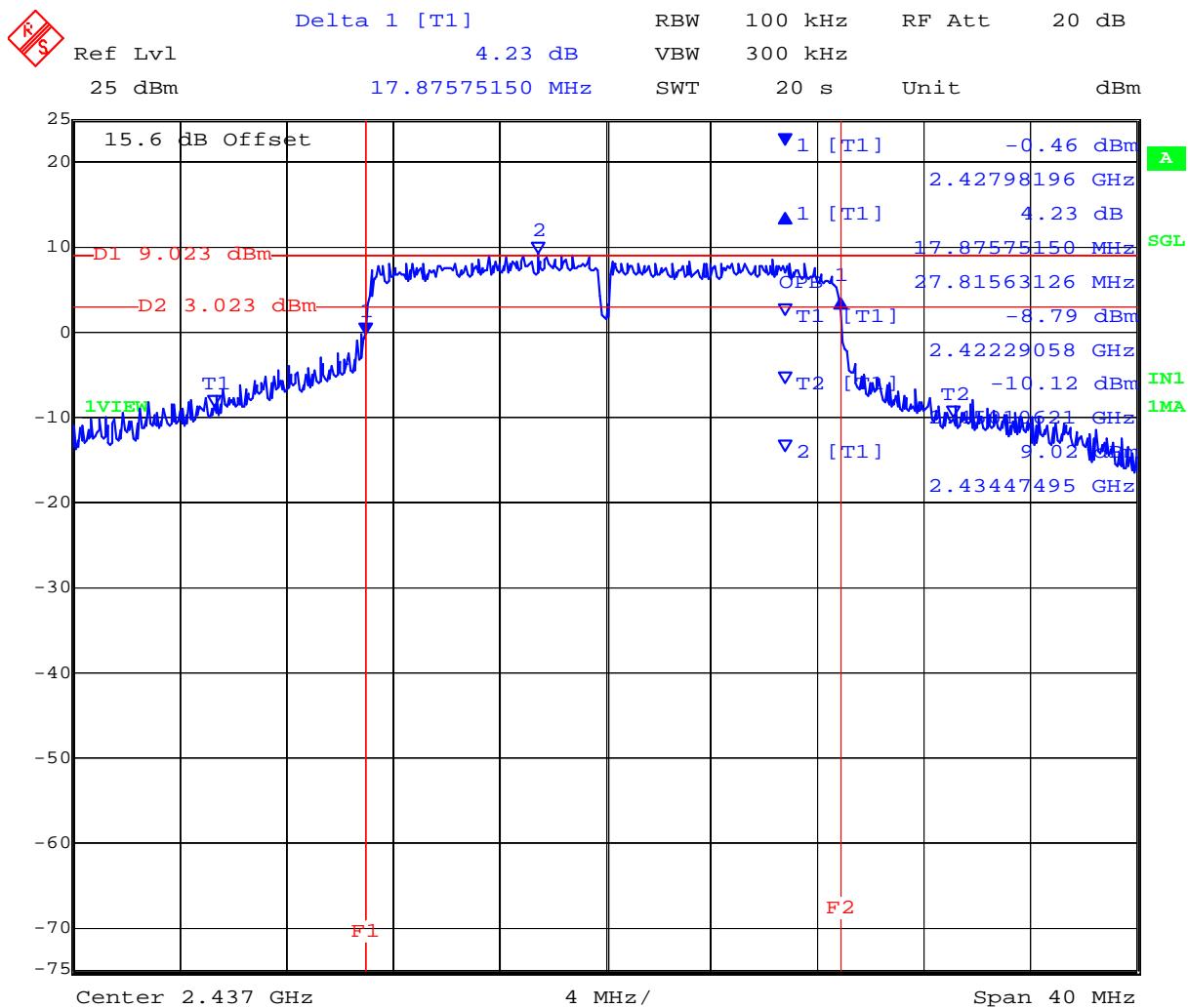


Date: 29.FEB.2012 15:18:49

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### PORT A 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth

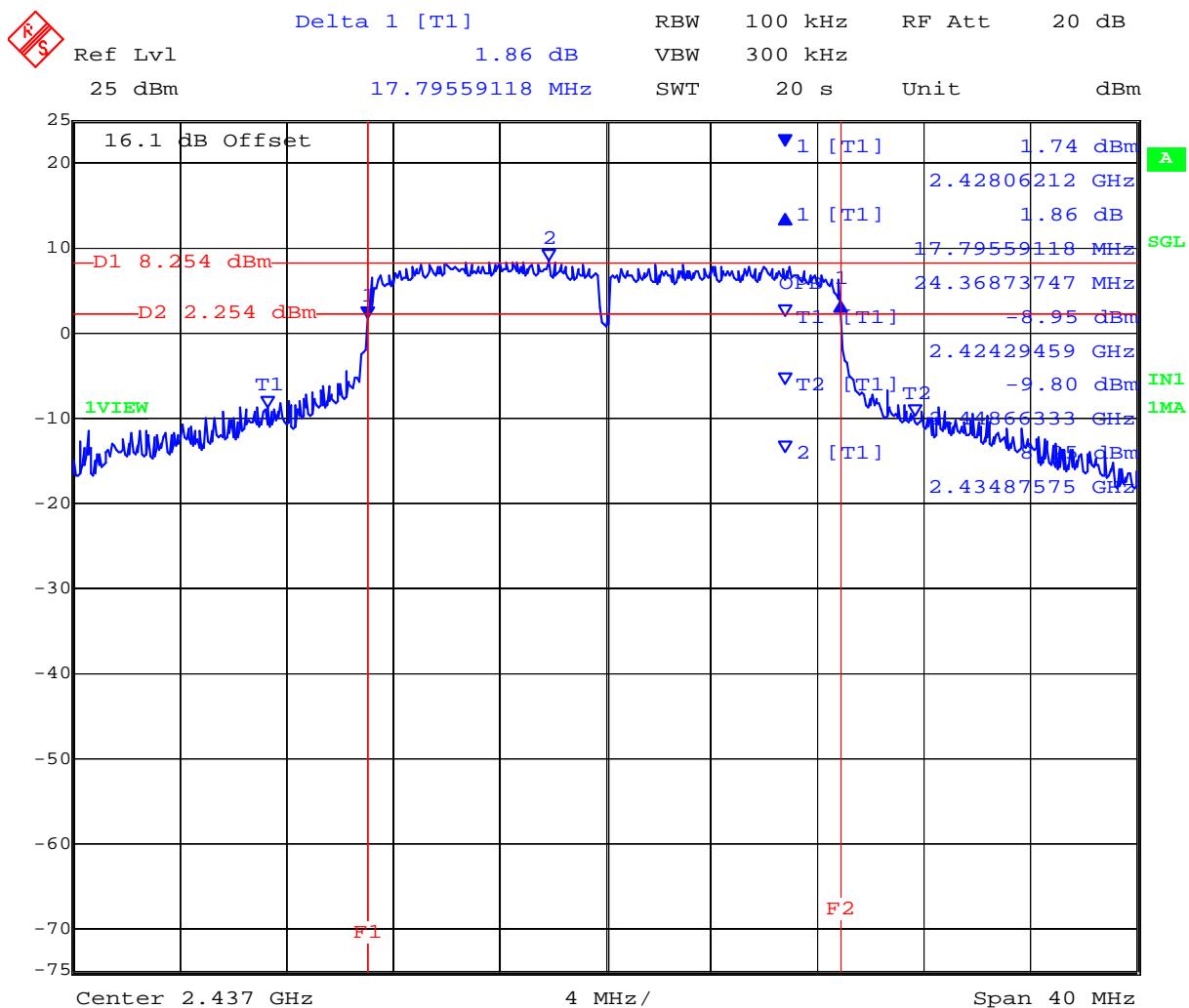


Date: 29.FEB.2012 15:29:51

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**PORT B 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**

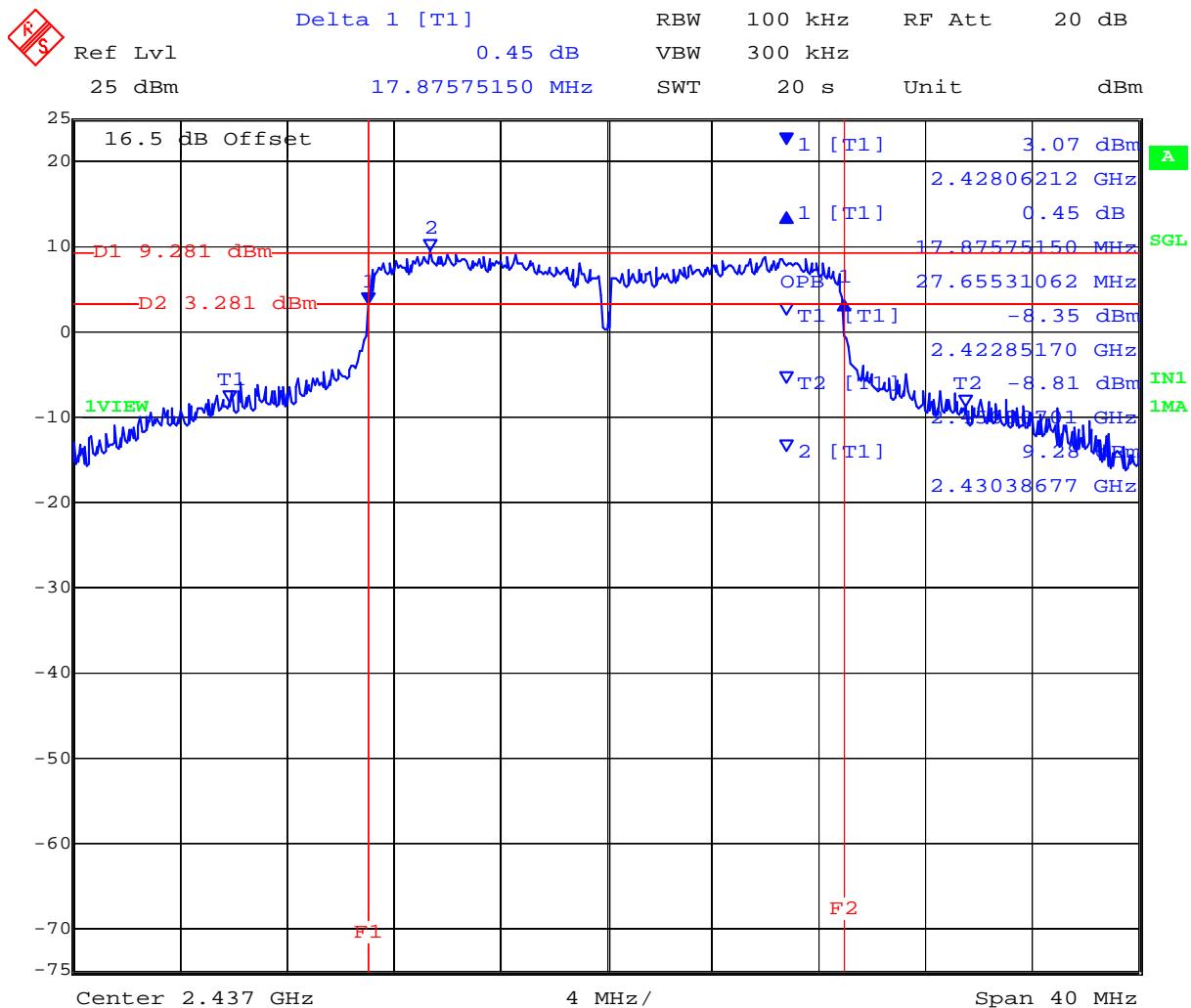


Date: 29.FEB.2012 15:30:57

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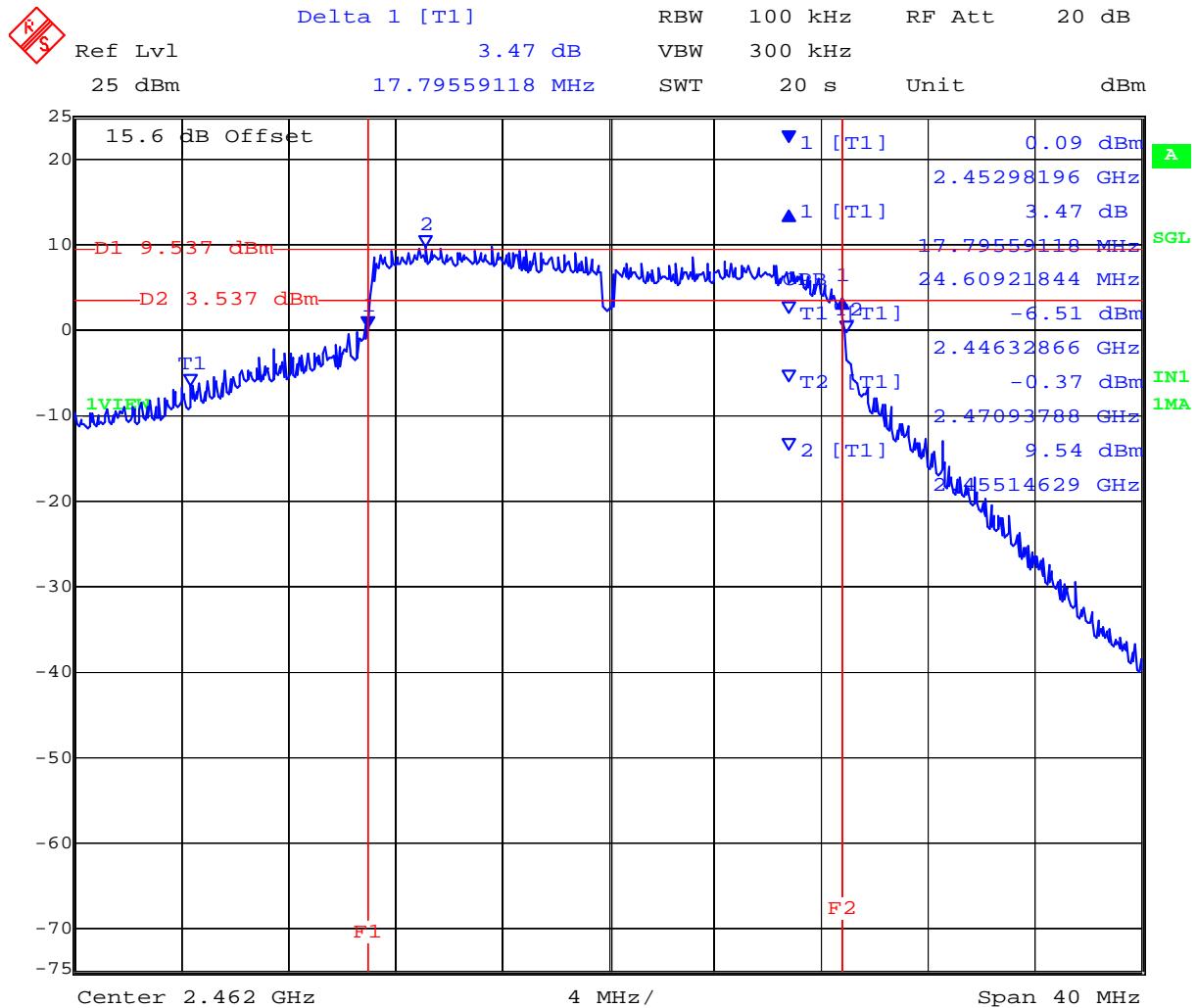
**PORT C 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 15:32:00

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### PORT A 2,462 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth

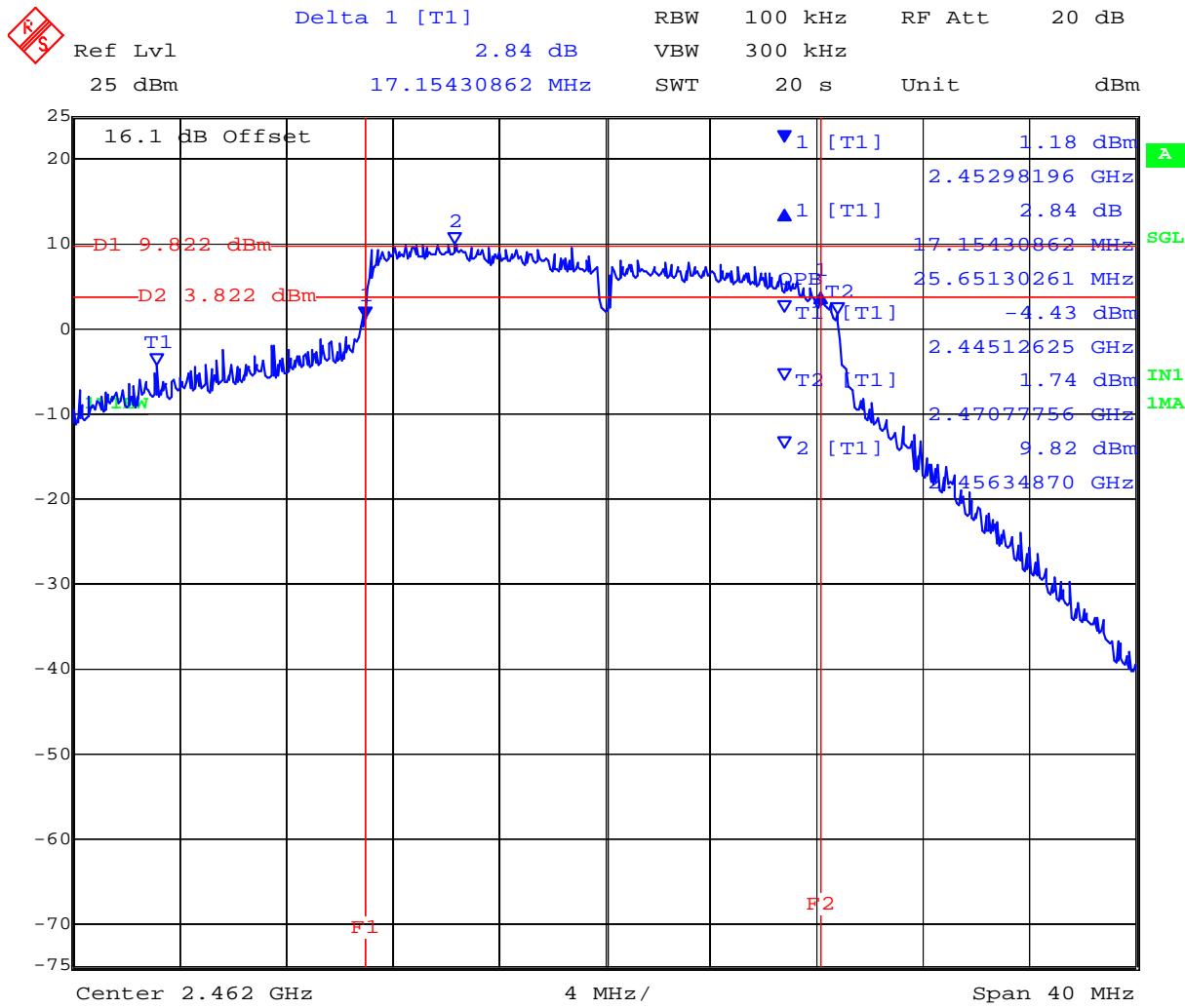


Date: 29.FEB.2012 15:58:44

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### PORT B 2,462 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth

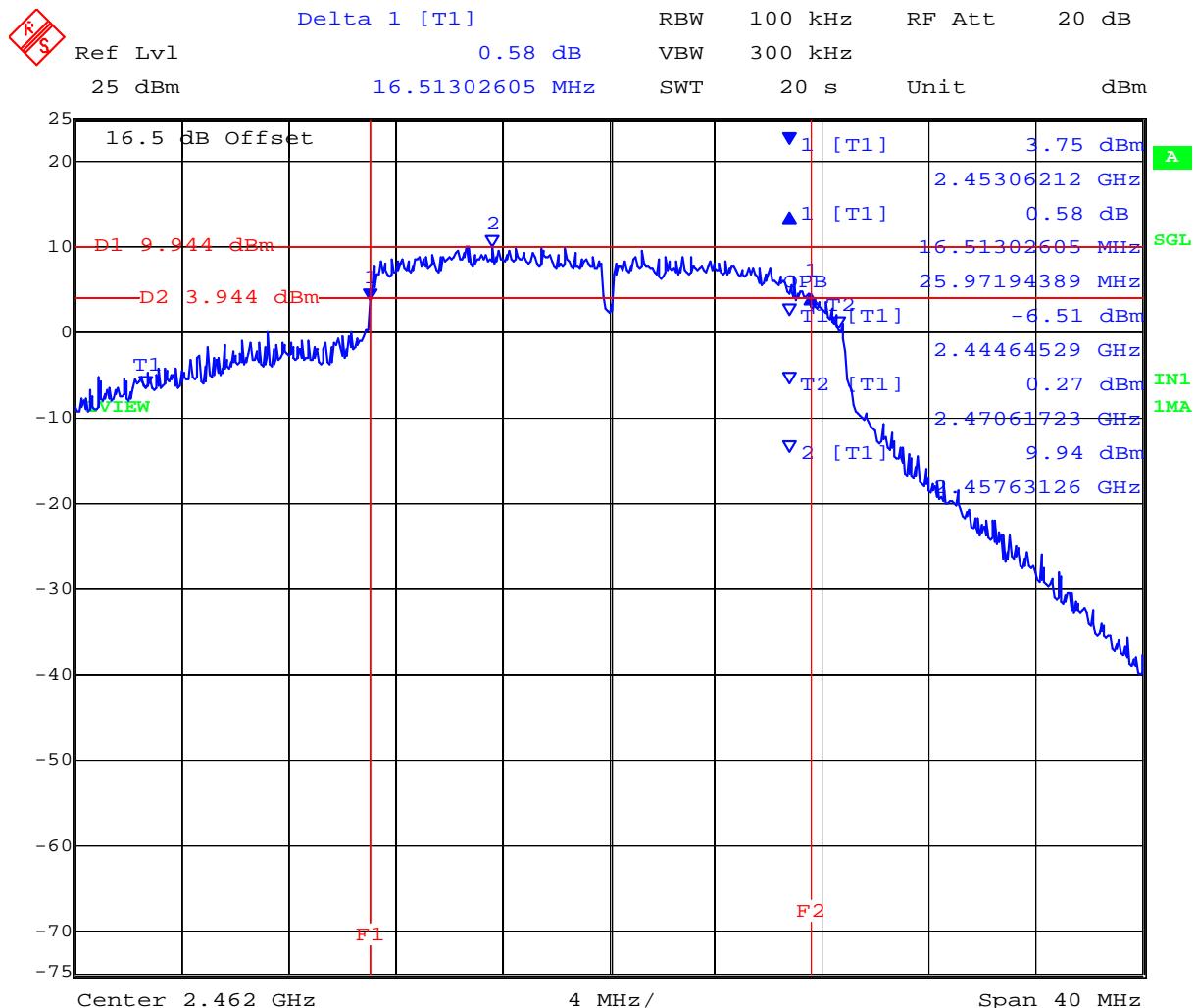


Date: 29.FEB.2012 15:59:50

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### PORT C 2,462 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 29.FEB.2012 16:00:54

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 54 of 412

## TABLE OF RESULTS – 802.11n HT-40

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A	<b>Antenna Gain:</b>	0	dBi	
<b>Applied Voltage:</b>	48.00	Vdc			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
2422.000	34.469000	36.232000	36.713000	--	500	0.5	-33.969000
2437.000	36.553000	36.553000	36.874000	--			-36.053000
2452.000	35.912000	34.790000	34.629000	--			-34.129000

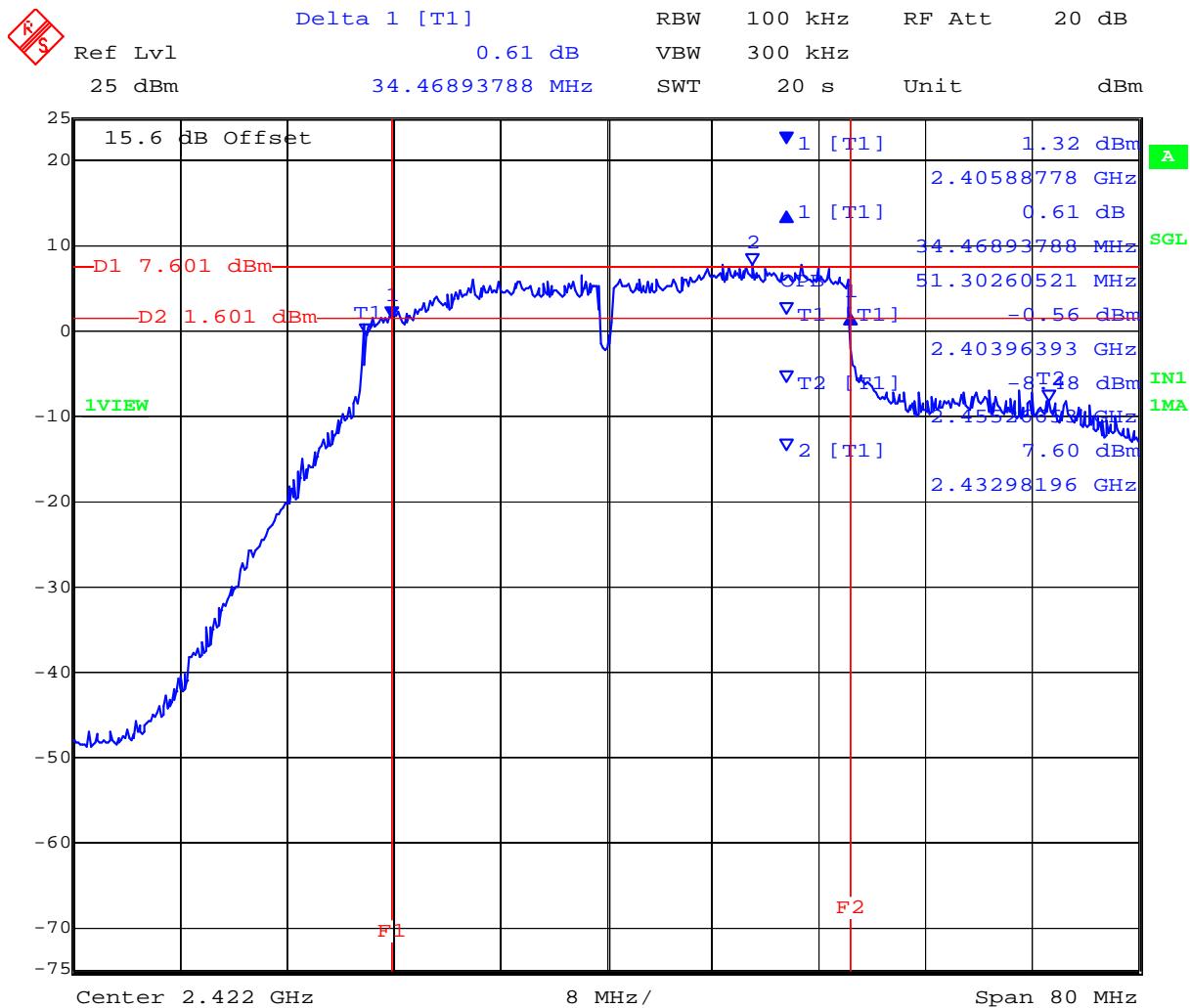
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
2422.000	51.303000	49.699000	47.134000	--			
2437.000	50.982000	45.371000	45.210000	--			
2452.000	49.699000	47.776000	48.737000	--			

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

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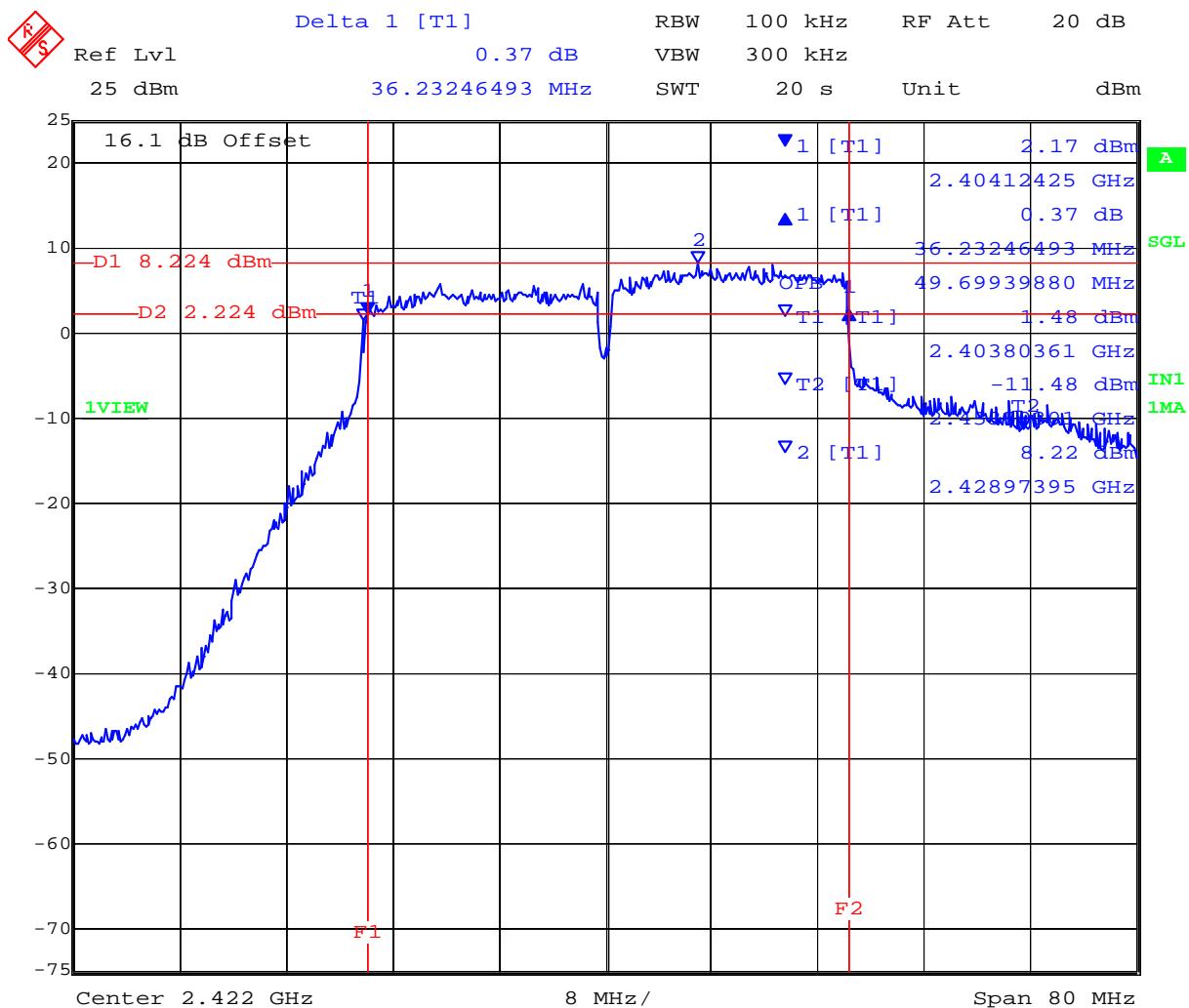
**PORT A 2,422 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 16:46:06

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### PORT B 2,422 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth

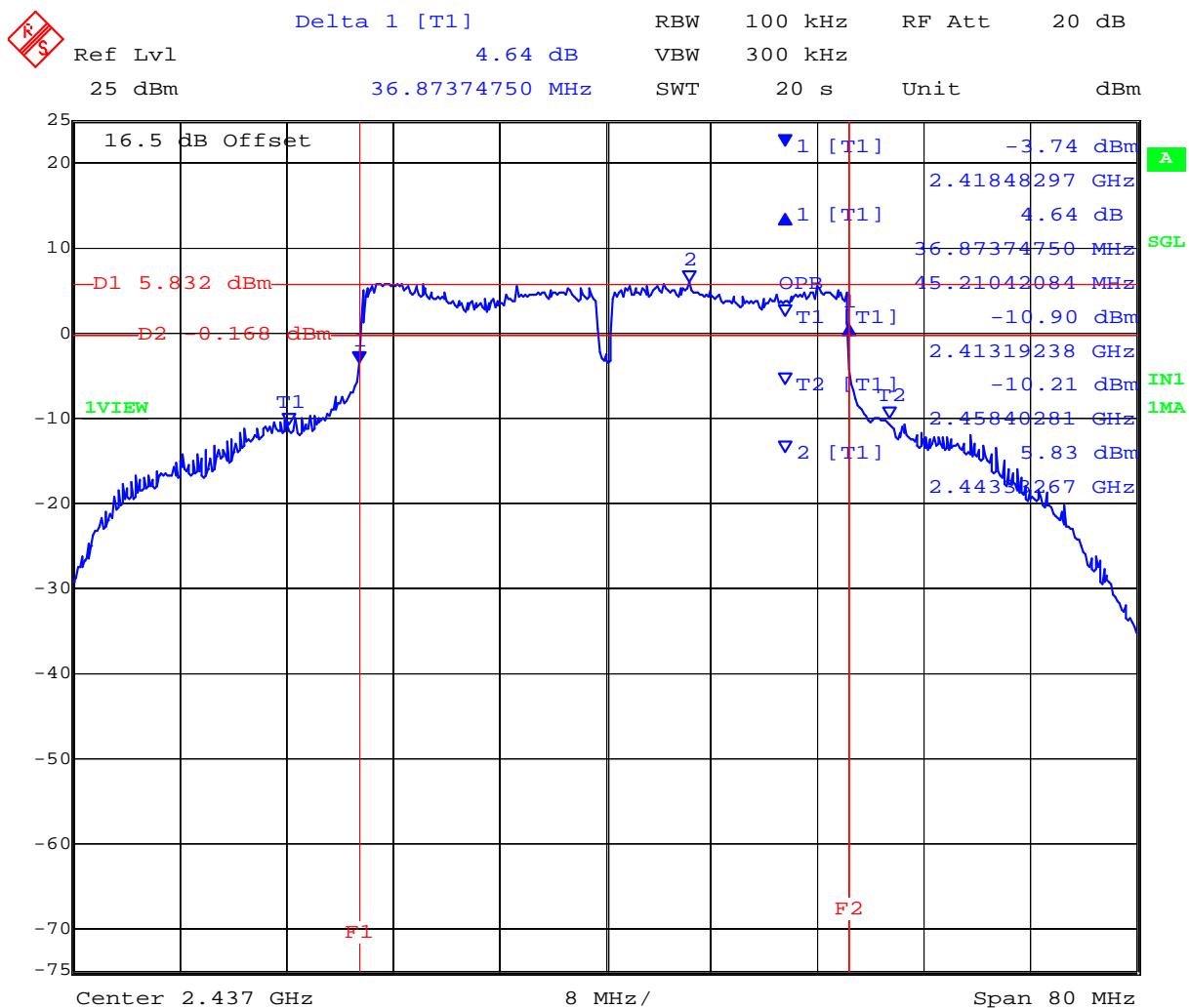


Date: 29.FEB.2012 16:47:12

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**PORT C 2,422 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth**

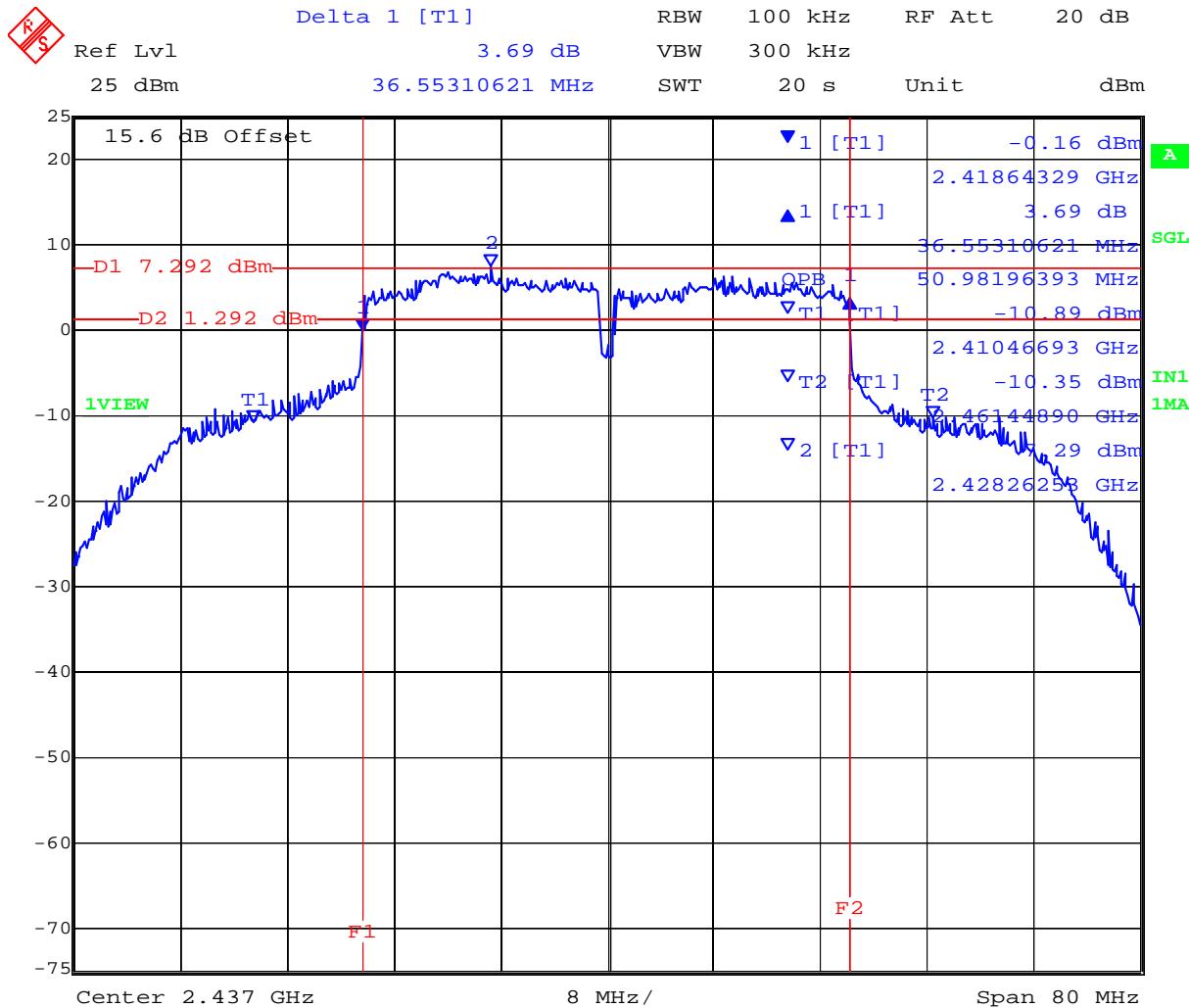


Date: 29.FEB.2012 17:20:55

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**PORT A 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**

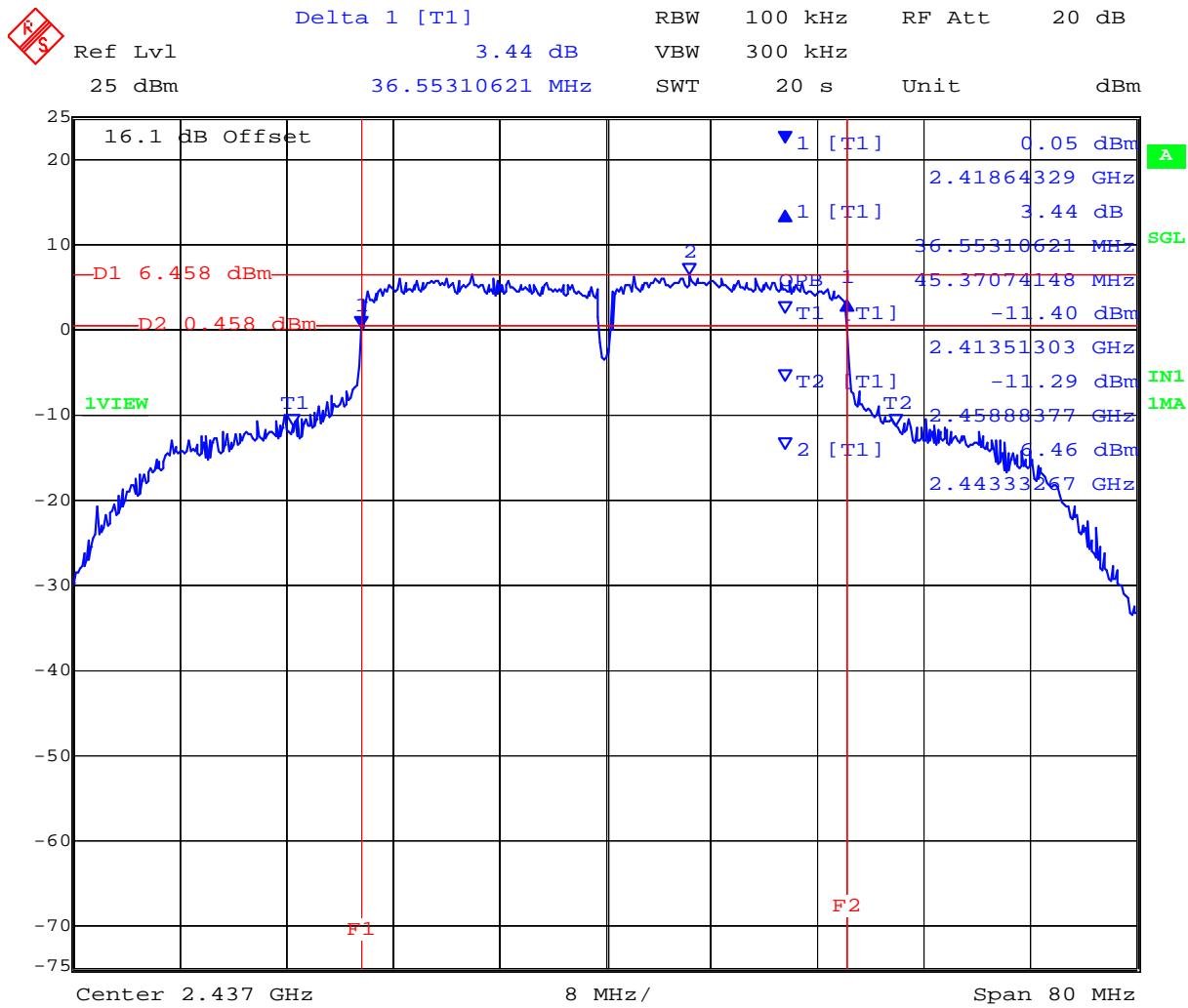


Date: 29.FEB.2012 17:18:48

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**PORT B 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**

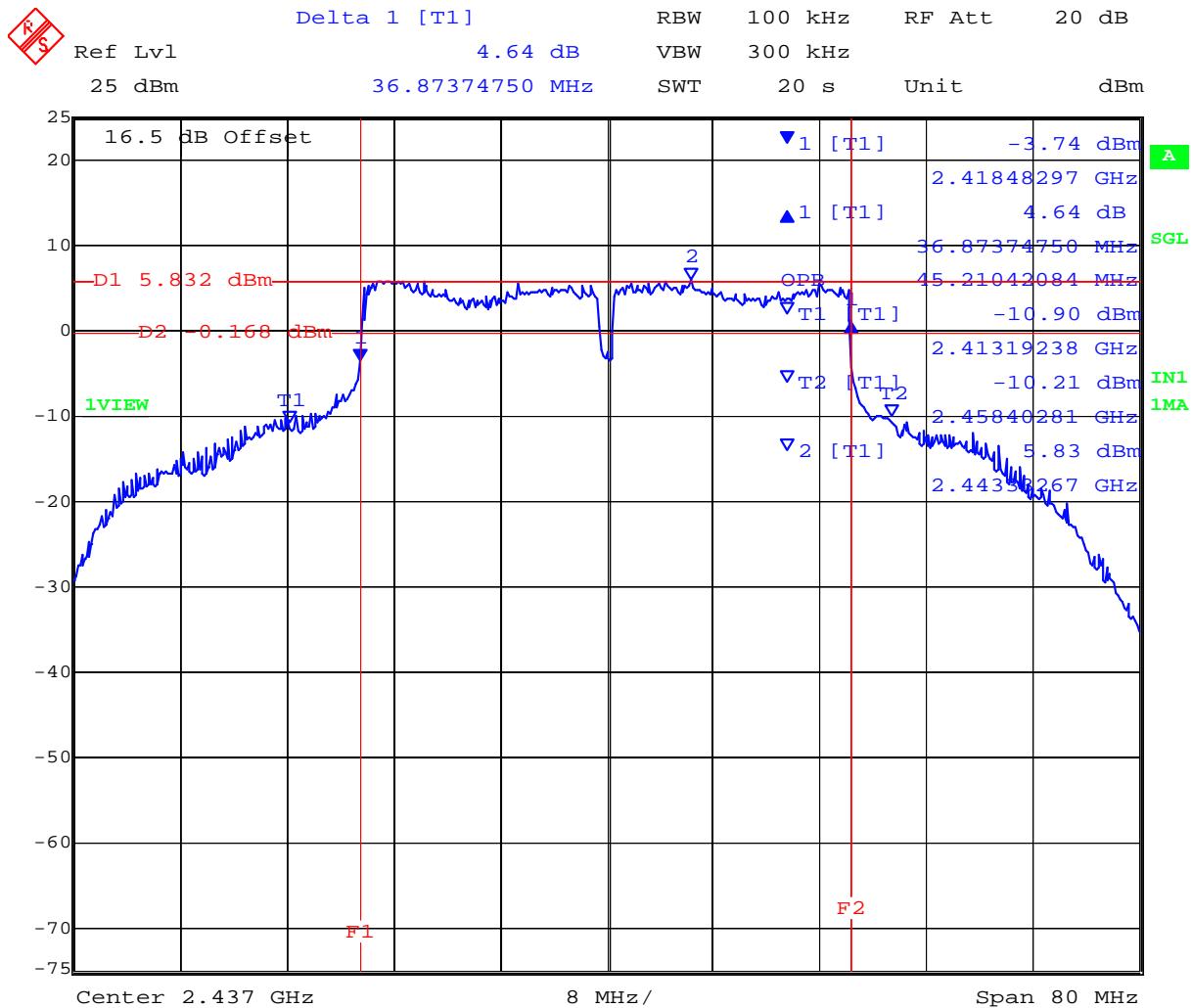


Date: 29.FEB.2012 17:19:53

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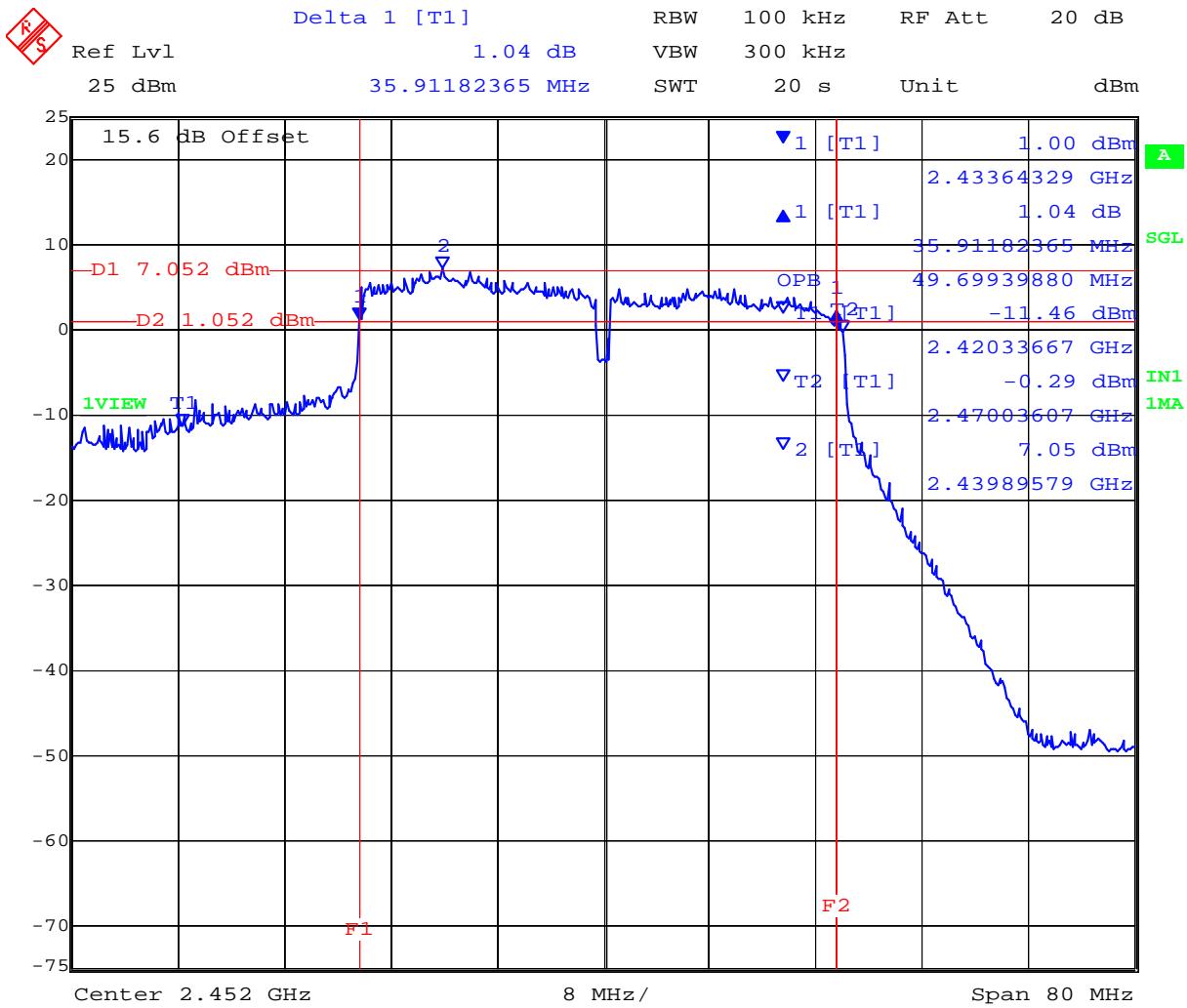
### PORT C 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 29.FEB.2012 17:20:55

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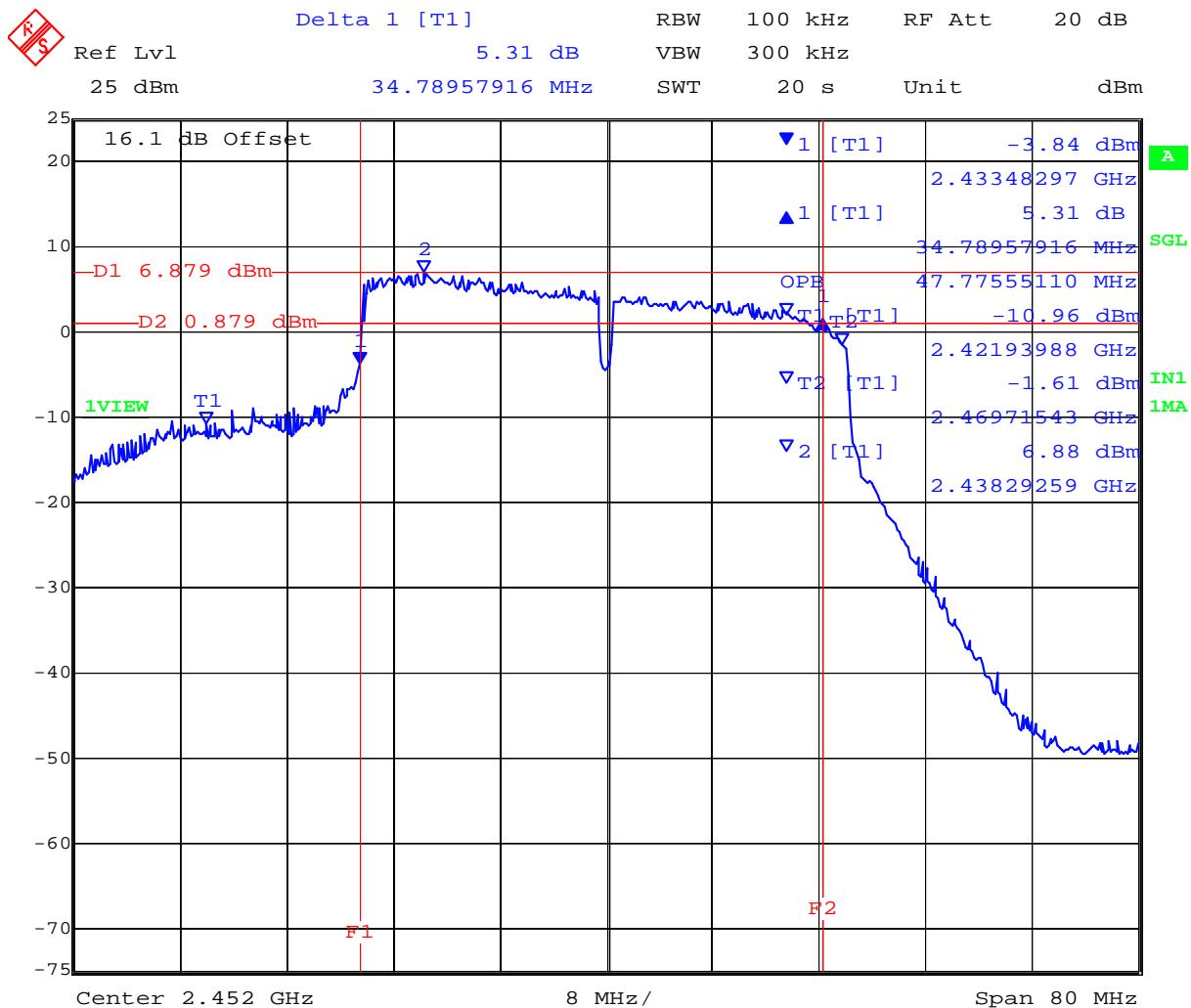
**PORT A 2,452 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 17:49:07

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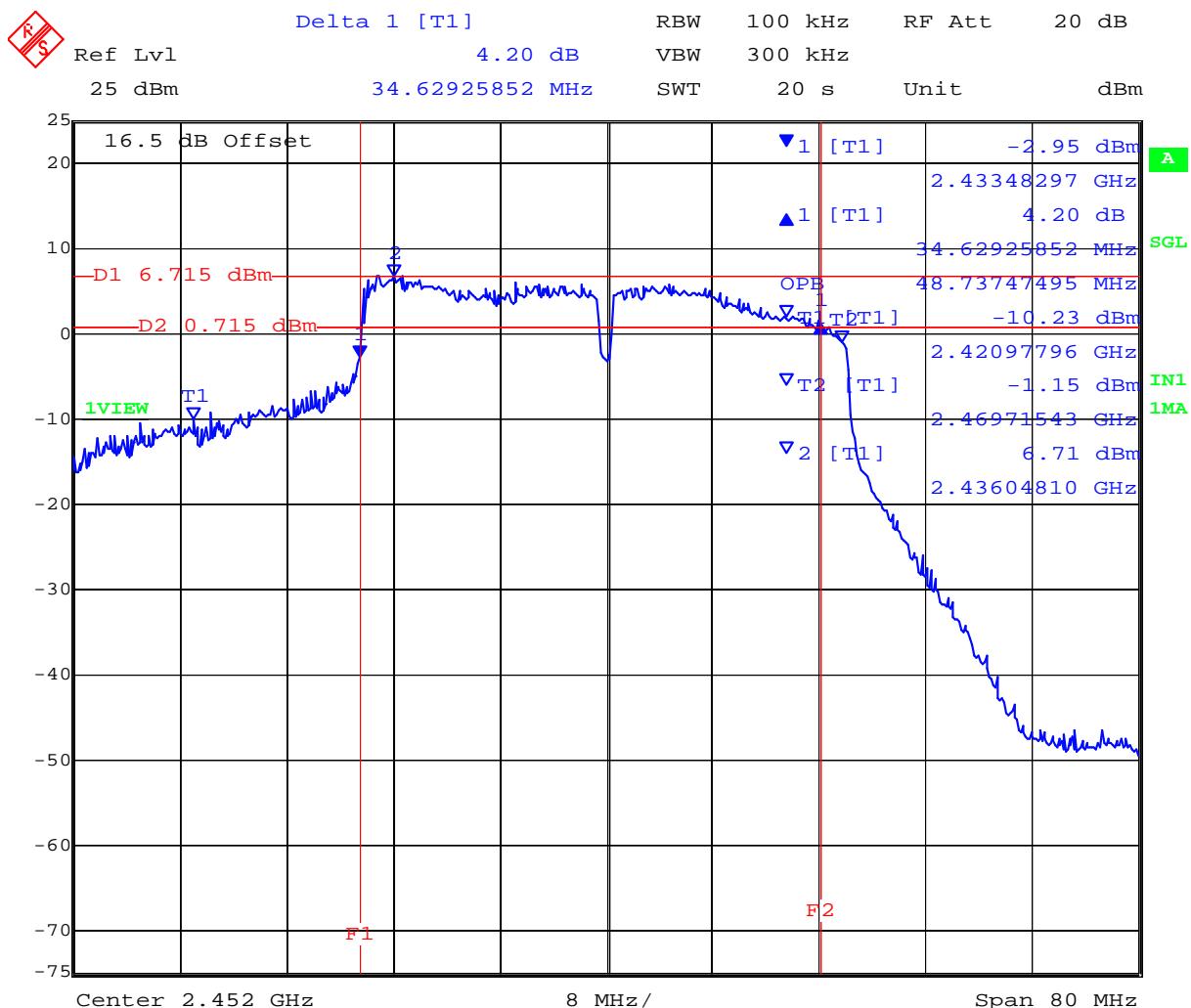
**PORT B 2,452 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 17:50:13

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**PORT C 2,452 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth**



Date: 29.FEB.2012 17:51:16

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 64 of 412

## 5.8 GHz

TABLE OF RESULTS – 802.11a – Legacy 5 MHz, 6 MBit/s

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	0 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
5730.500	4.168000	4.148000	4.148000	--	500	0.5	-3.648000
5790.500	4.168000	4.168000	4.168000	--			-3.668000
5845.500	4.188000	4.148000	4.148000	--			-3.648000

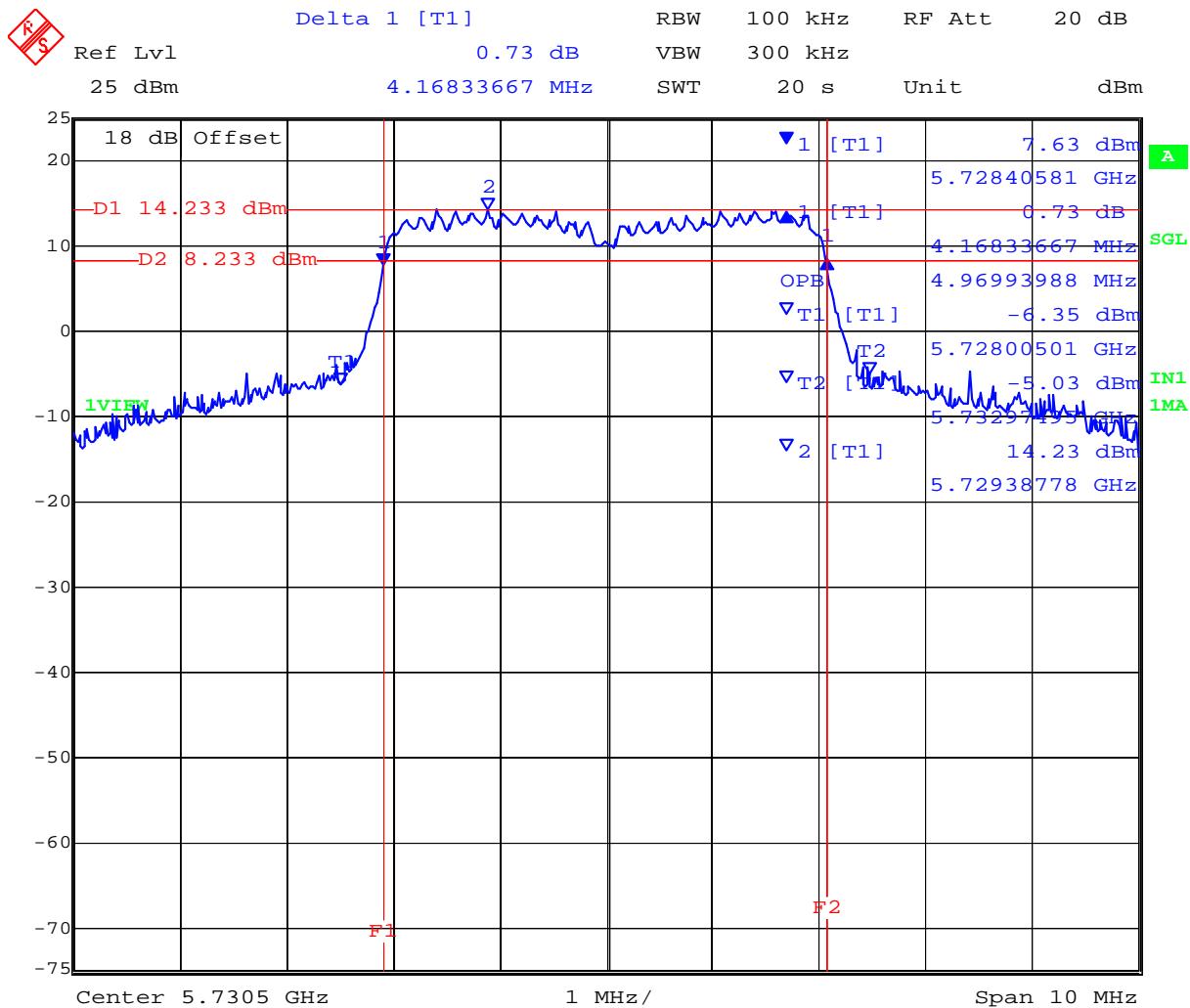
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5730.500	4.970000	6.754000	4.870000	--			
5790.500	4.208000	4.188000	4.489000	--			
5845.500	4.489000	4.269000	4.248000	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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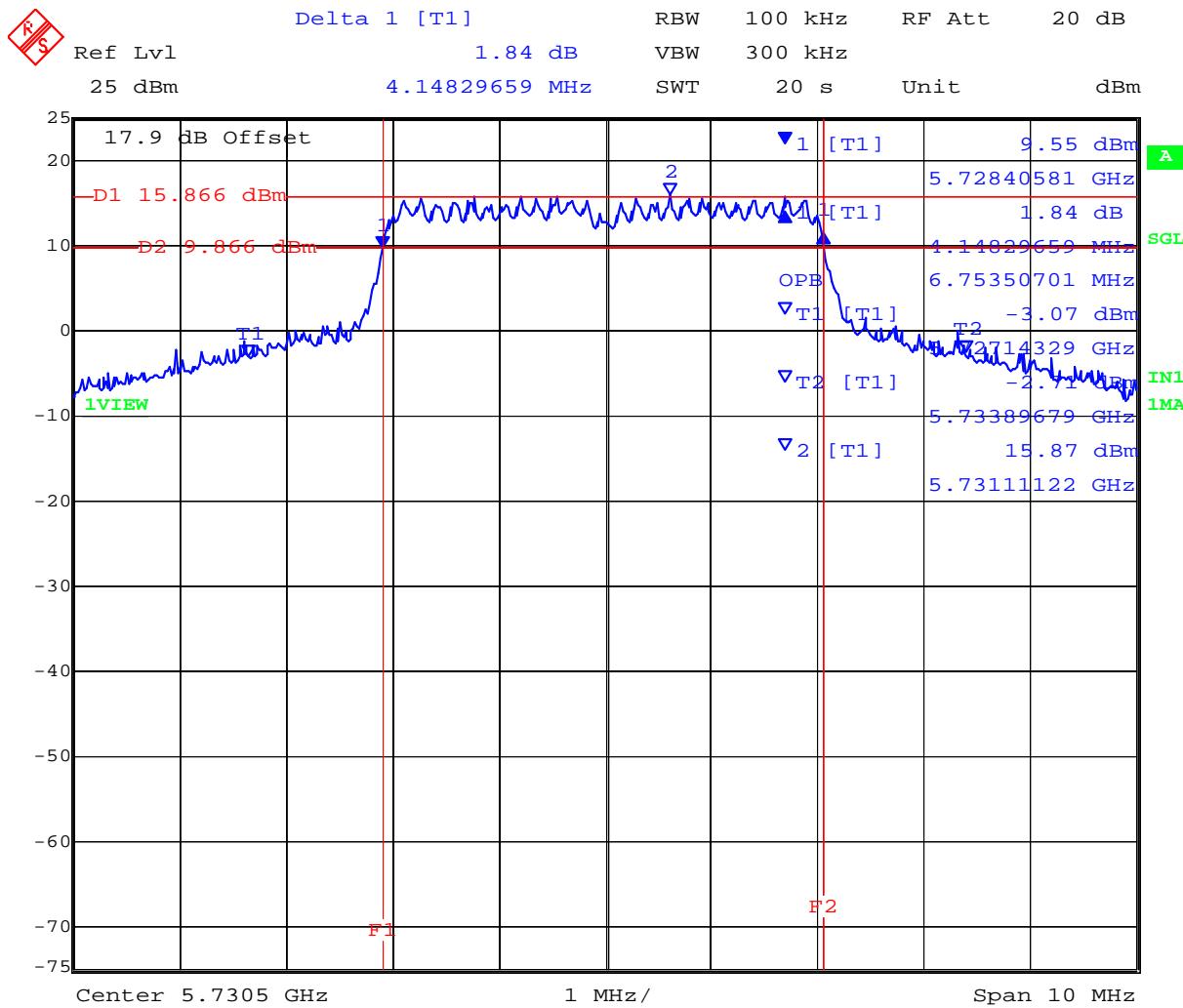
**5 MHz PORT A 5,730.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**



Date: 16.MAR.2012 10:43:38

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**5 MHz PORT B 5,730.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

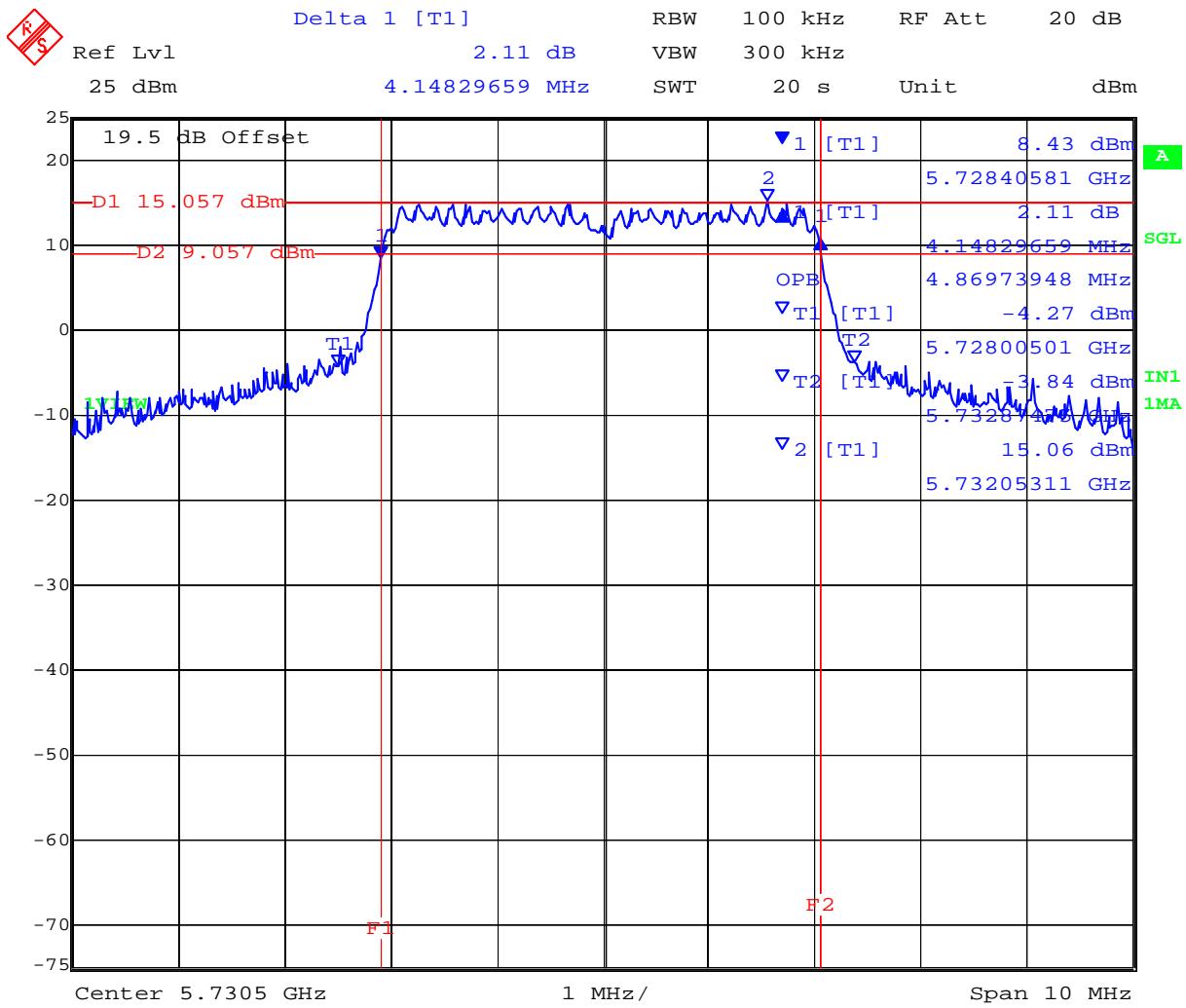


Date: 16.MAR.2012 10:44:44

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**5 MHz PORT C 5,730.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

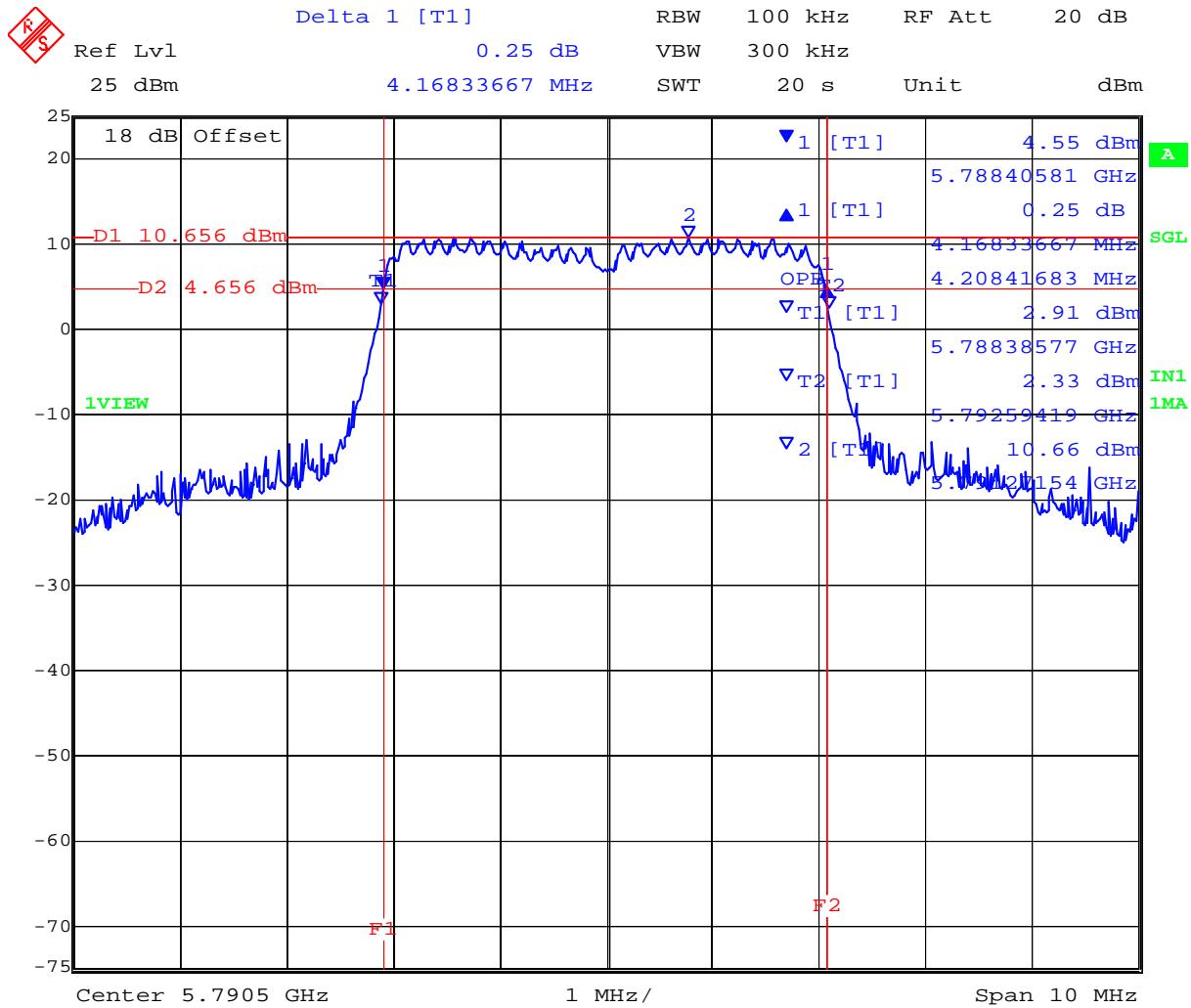


Date: 16.MAR.2012 10:45:46

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**5 MHz PORT A 5,790.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

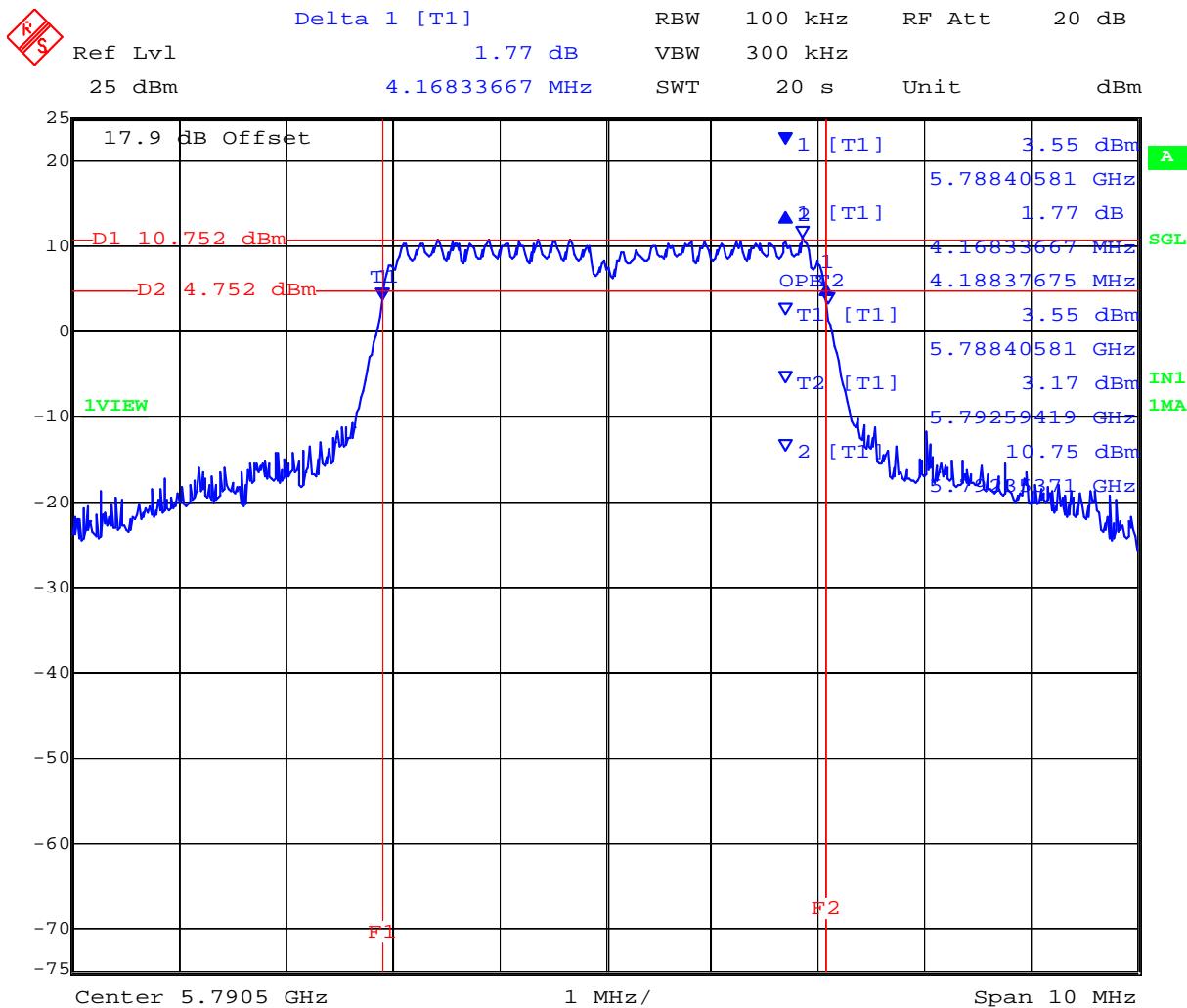


Date: 16.MAR.2012 11:28:11

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**5 MHz PORT B 5,790.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

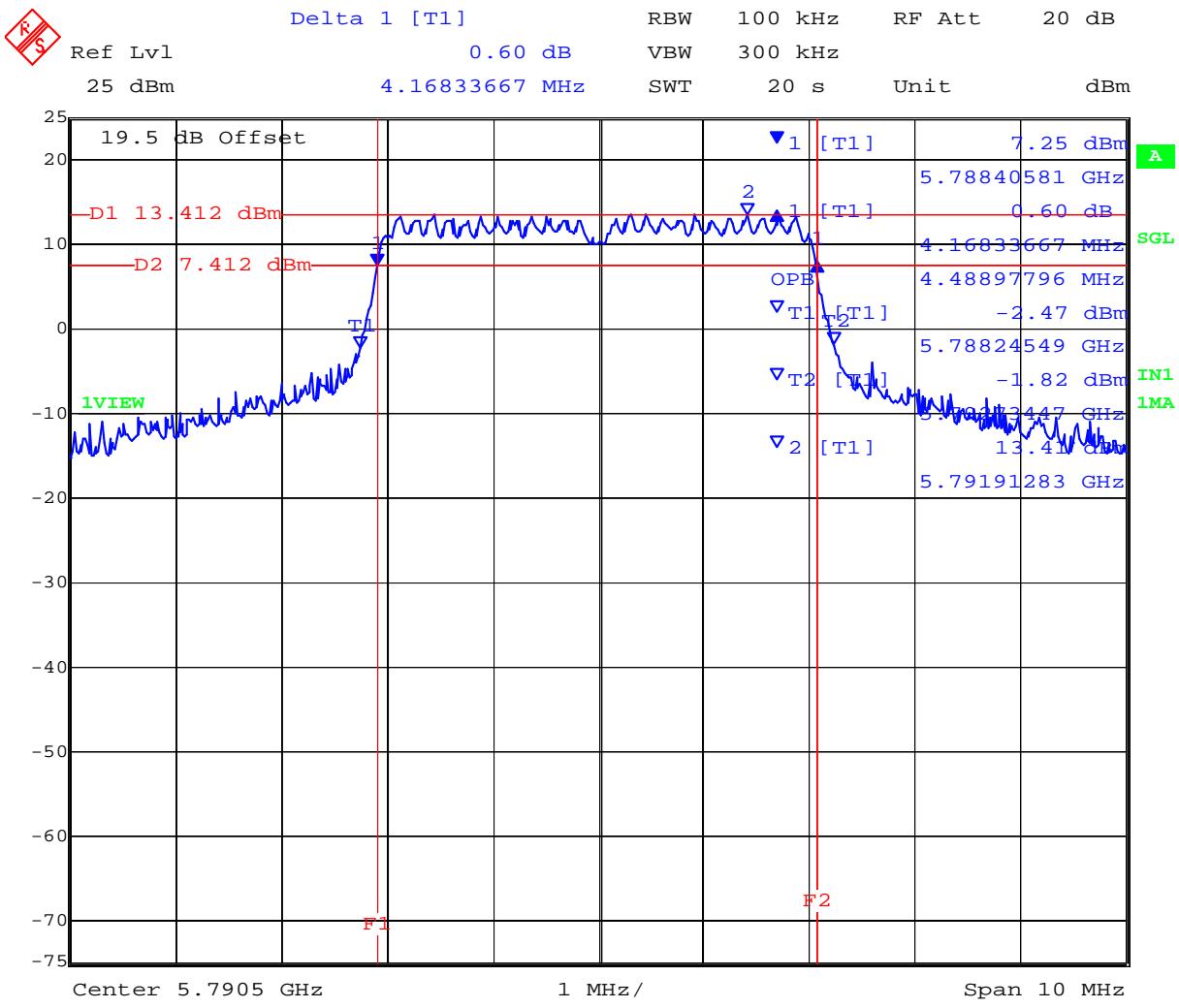


Date: 16.MAR.2012 11:29:17

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**5 MHz PORT C 5,790.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

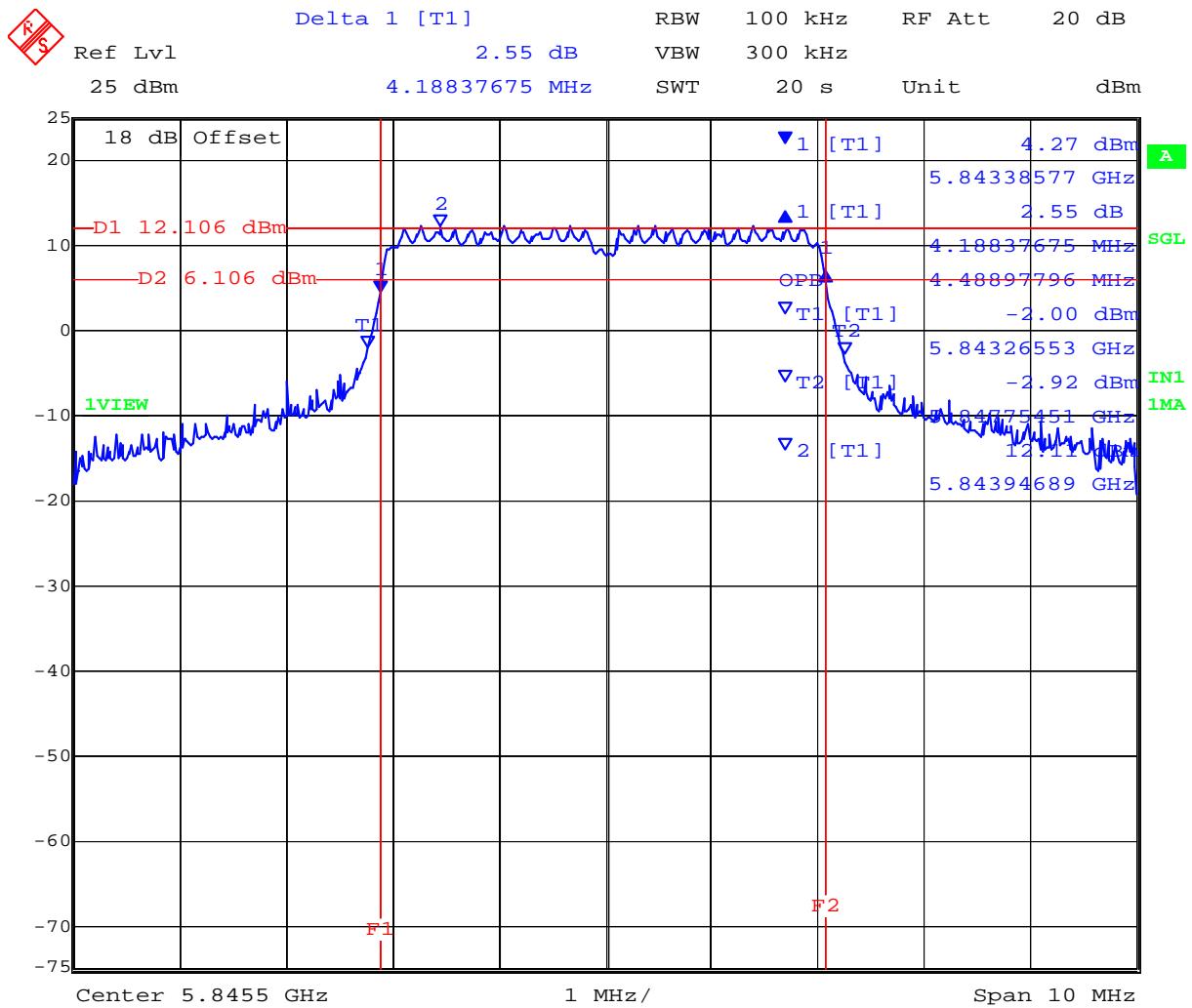


Date: 16.MAR.2012 11:30:20

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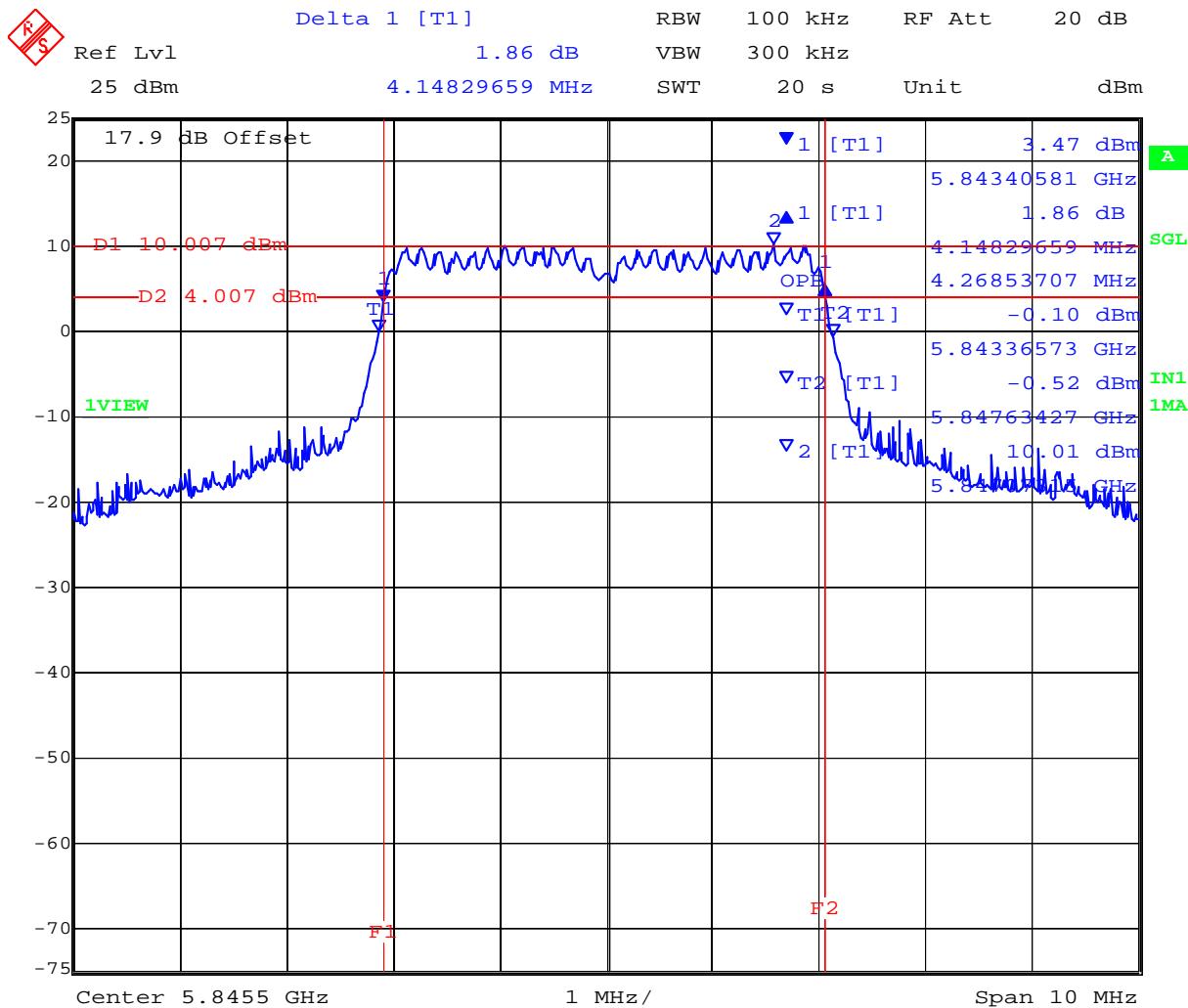
**5 MHz PORT A 5,845.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**



Date: 16.MAR.2012 12:04:53

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**5 MHz PORT B 5,845.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

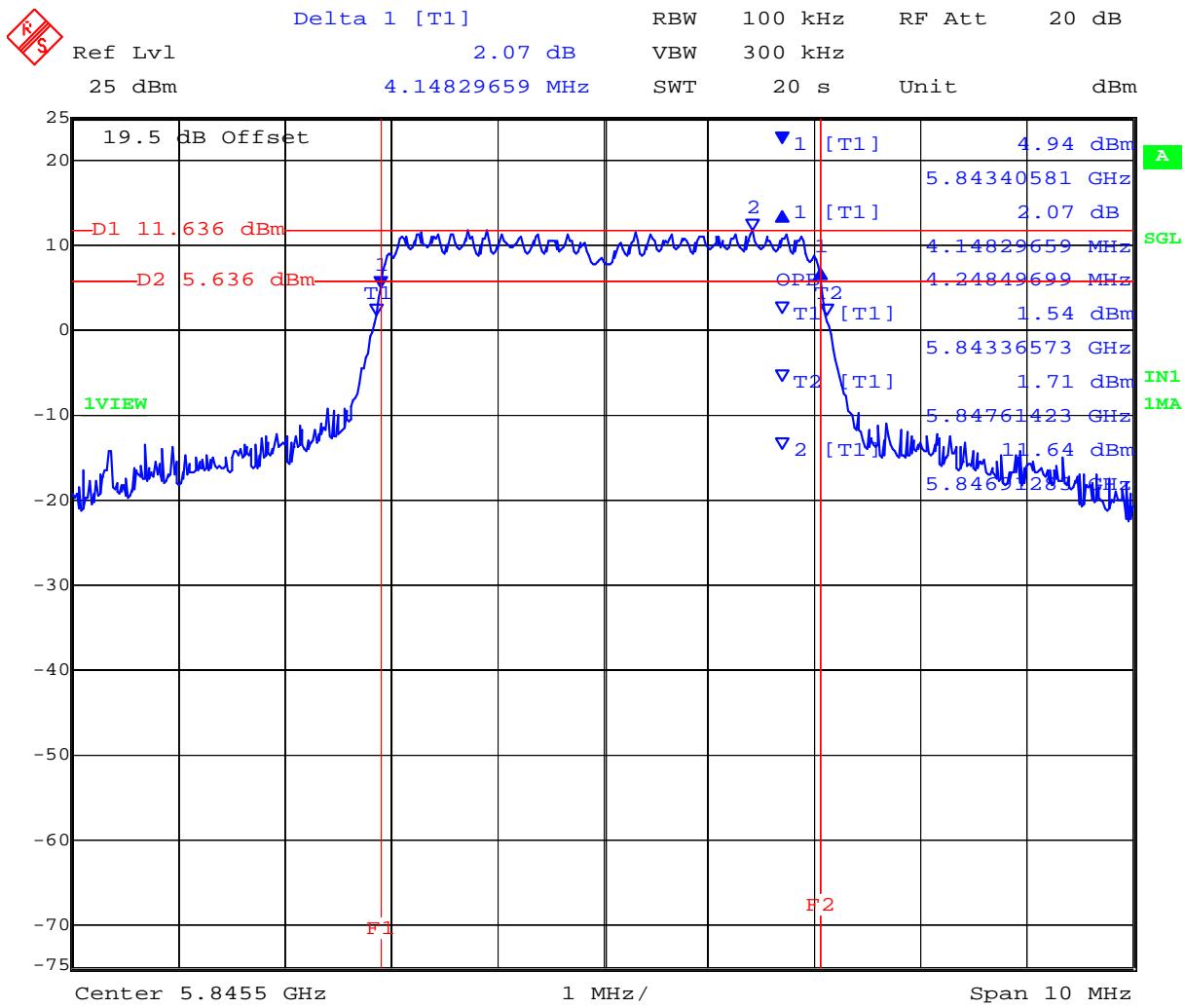


Date: 16.MAR.2012 12:05:59

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**5 MHz PORT C 5,845.5 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**



Date: 16.MAR.2012 12:07:01

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 74 of 412

## TABLE OF RESULTS – 802.11a – Legacy 10 MHz, 6 MBit/s

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	0 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
5735.000	8.257000	8.297000	8.257000	--	500	0.5	-7.757000
5790.000	8.297000	8.297000	8.257000	--			-7.757000
5840.000	8.297000	8.297000	8.297000	--			-7.797000

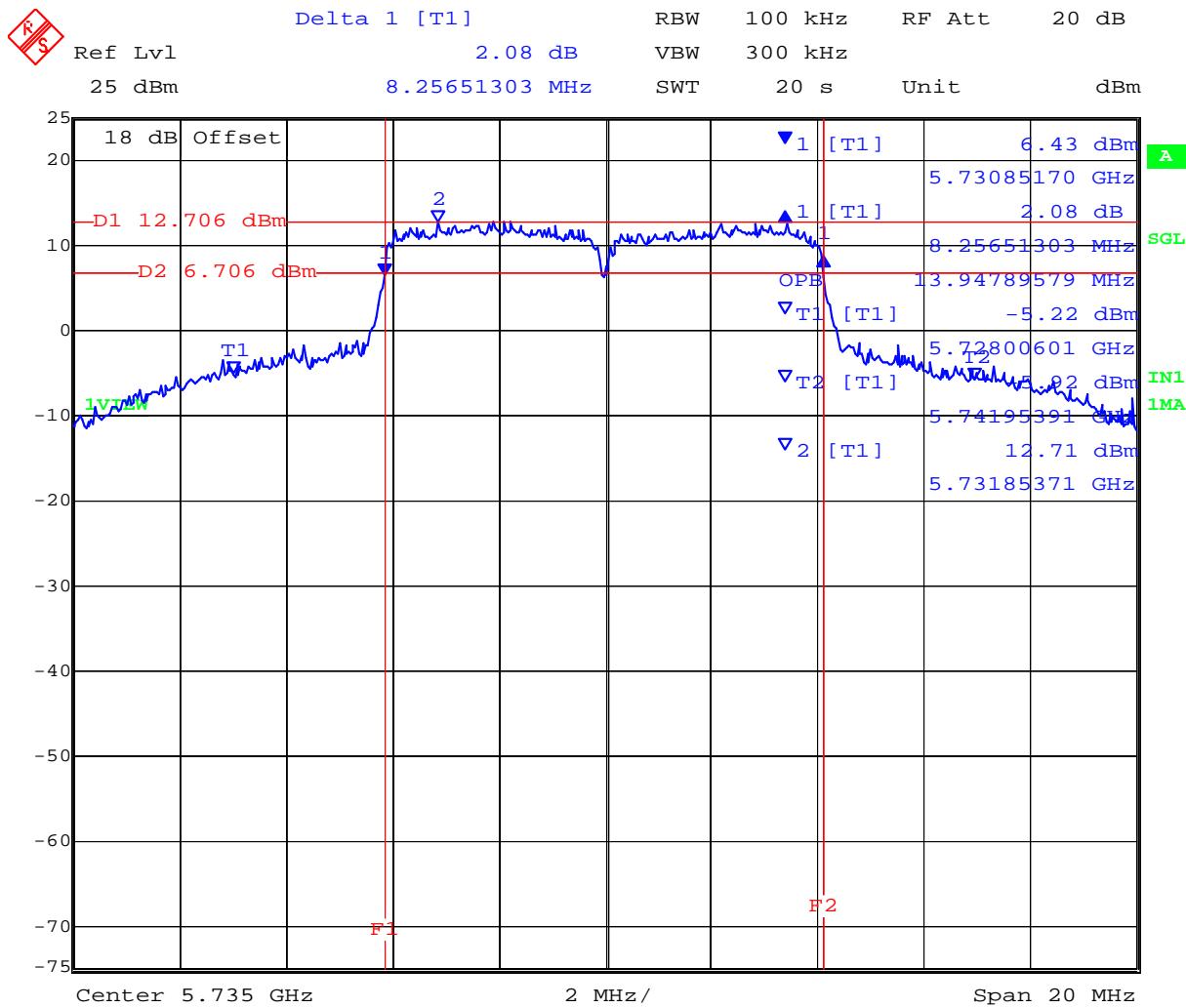
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5735.000	13.948000	15.110000	13.547000	--			
5790.000	12.625000	12.465000	14.990000	--			
5840.000	15.832000	14.990000	15.150000	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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**10 MHz PORT A 5,735 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

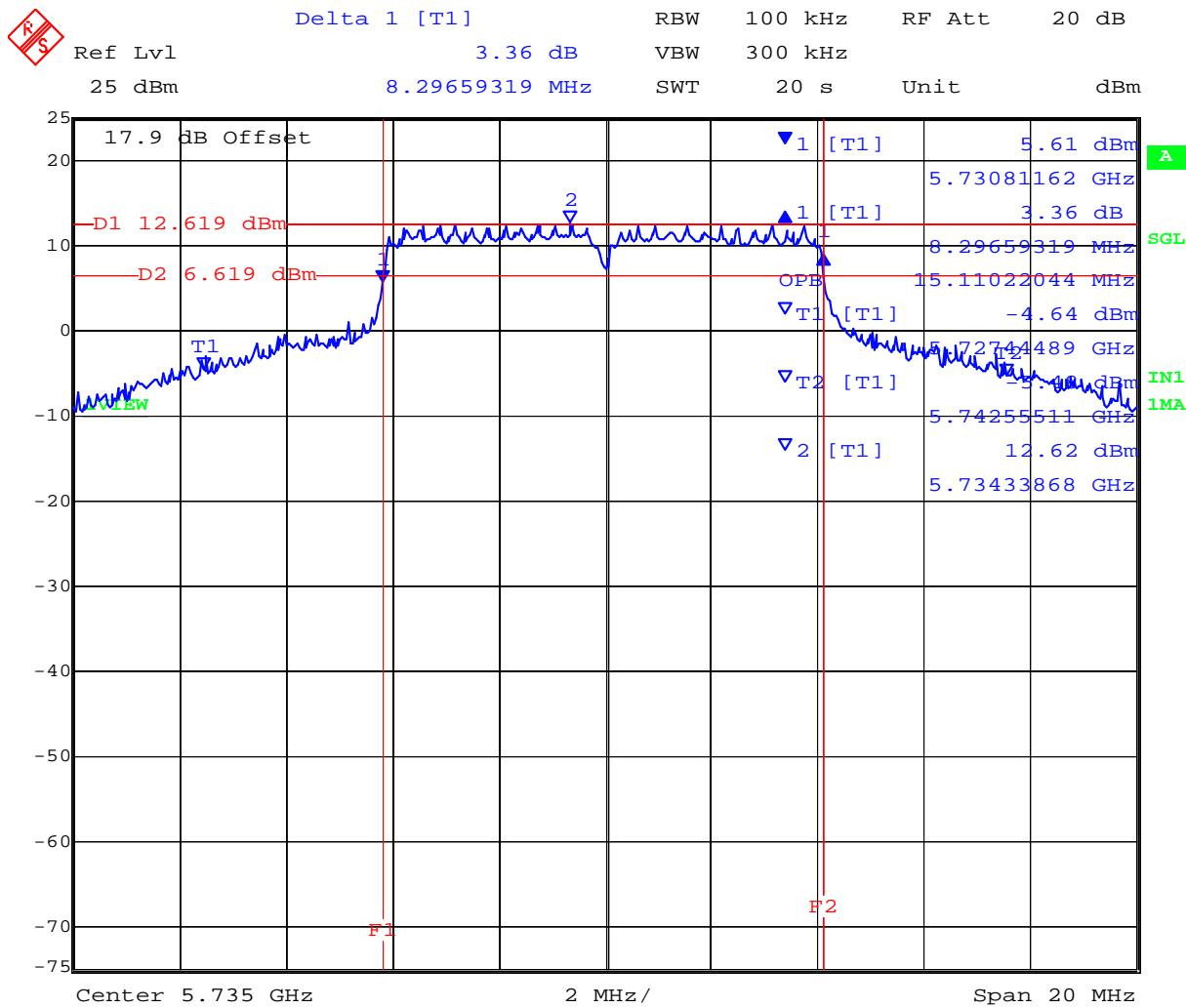


Date: 16.MAR.2012 14:23:43

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**10 MHz PORT B 5,735 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

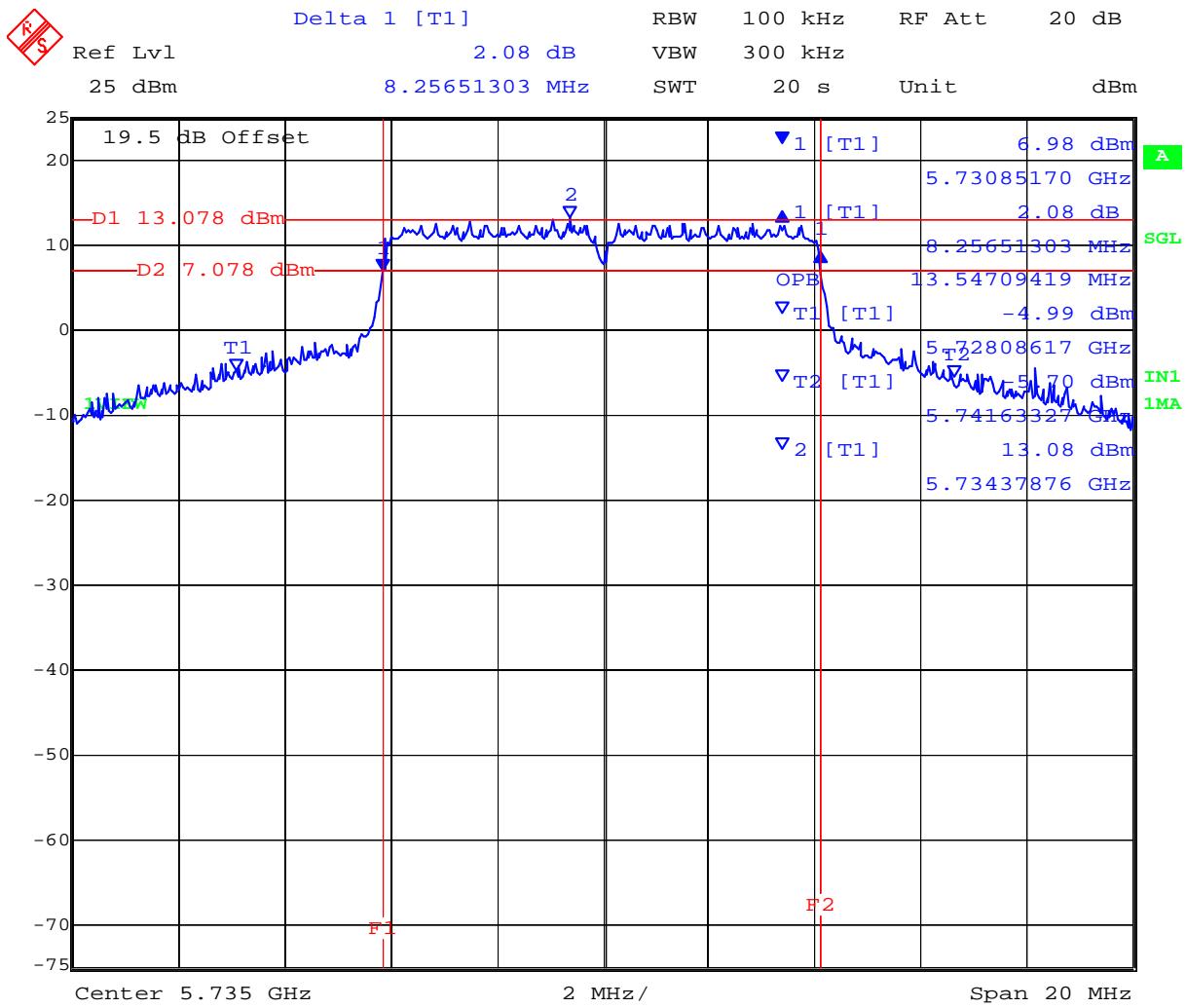


Date: 16.MAR.2012 14:24:49

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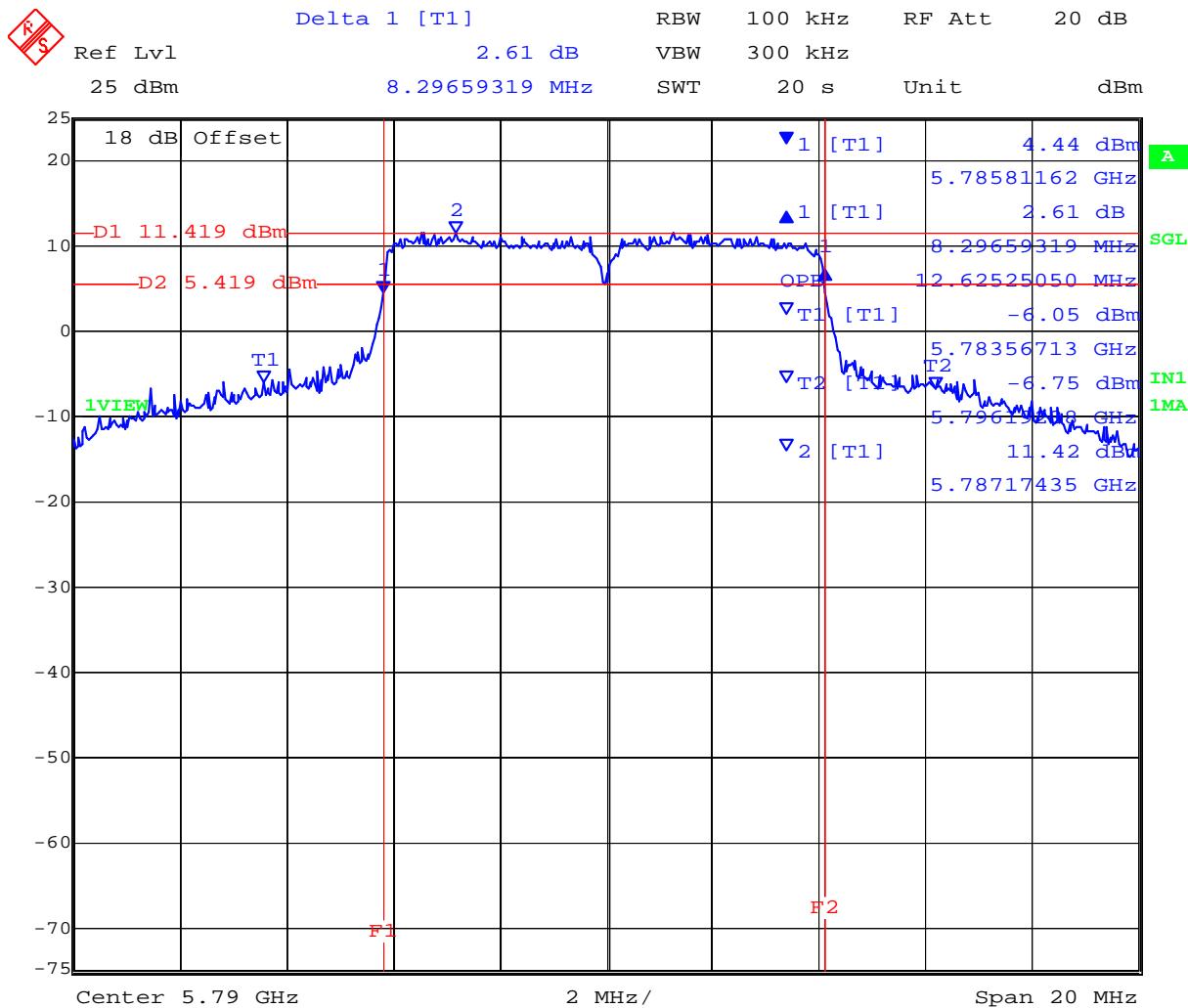
**10 MHz PORT C 5,735 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**




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**10 MHz PORT A 5,790 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

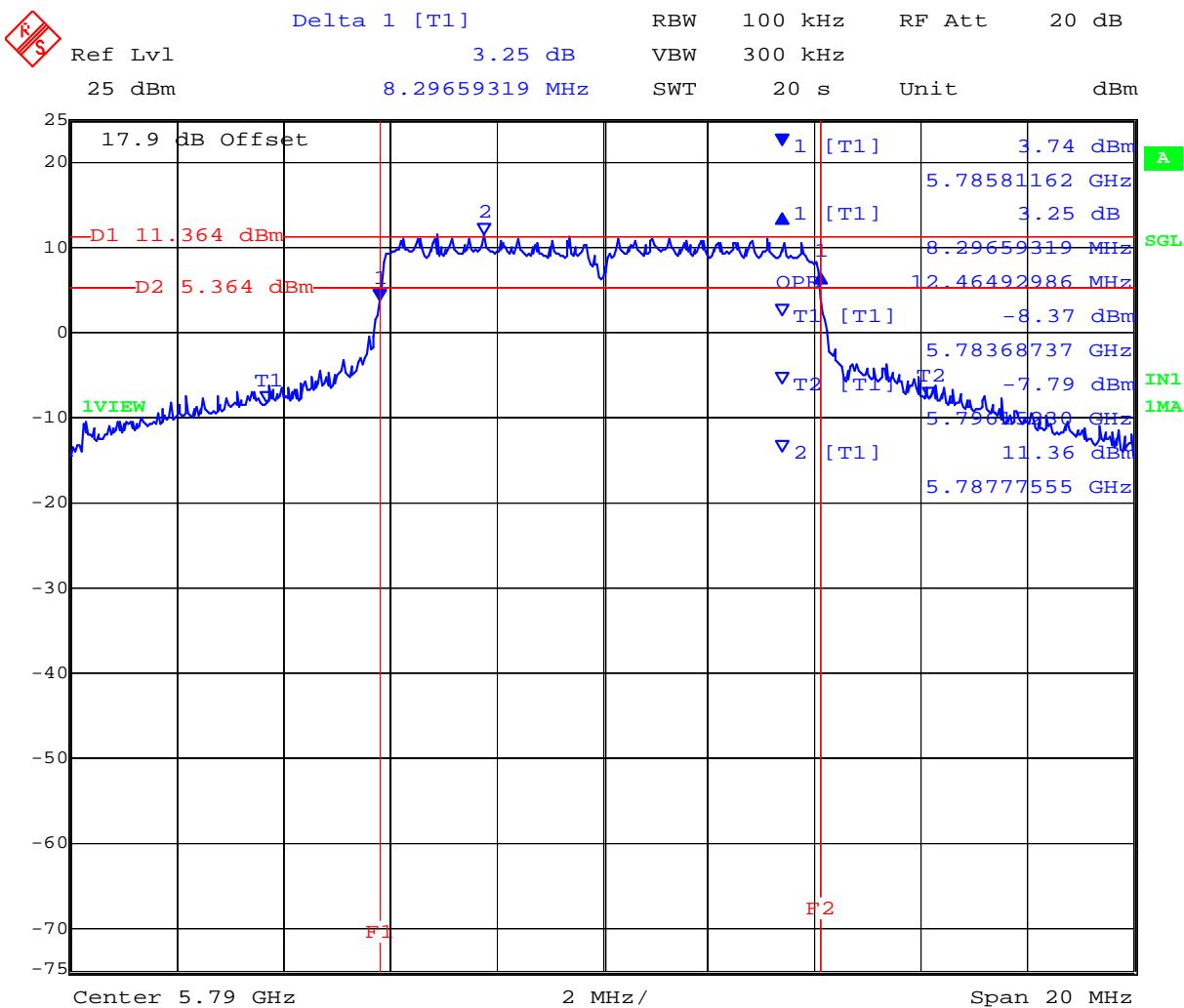


Date: 16.MAR.2012 14:57:06

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**10 MHz PORT B 5,790 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

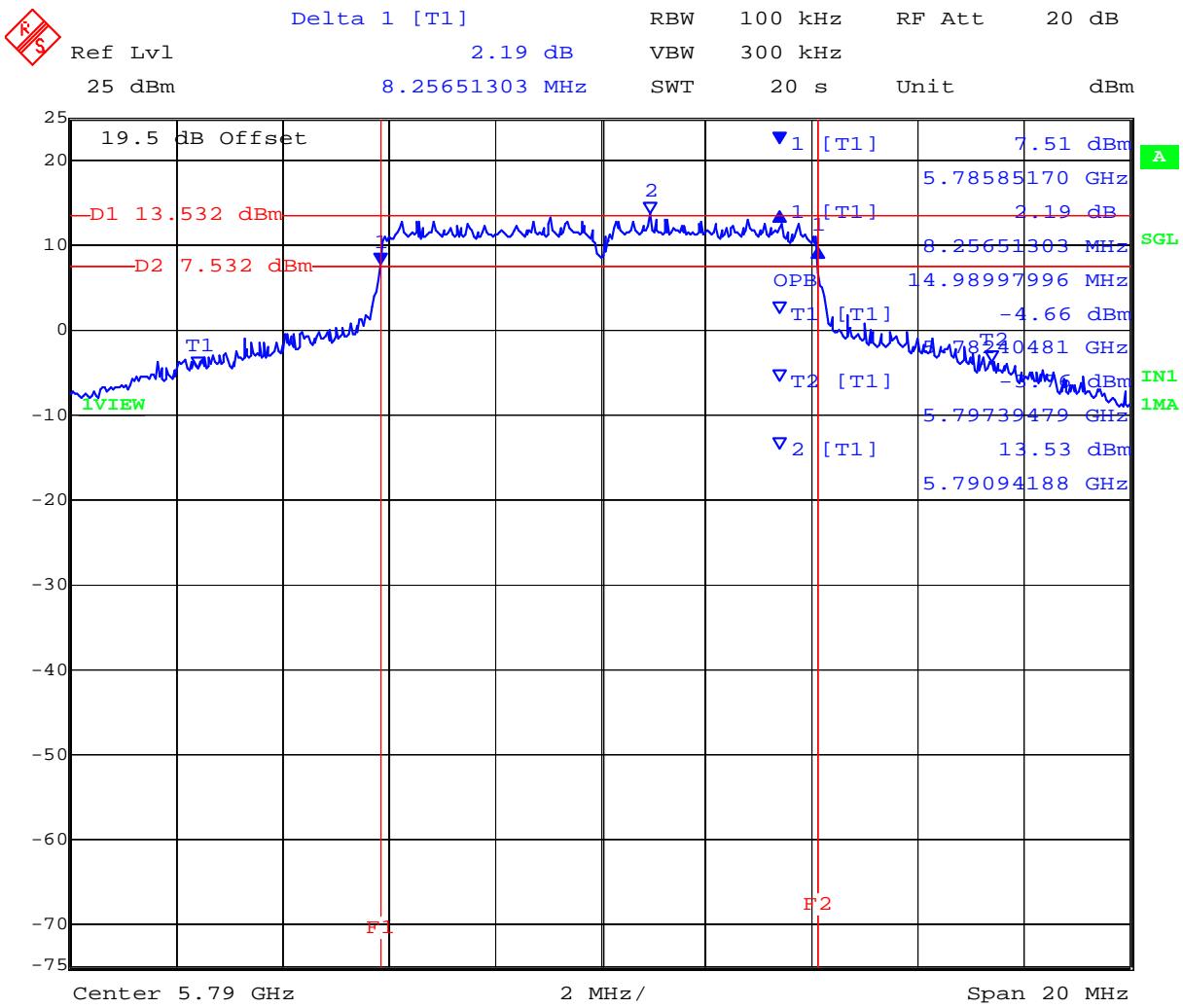


Date: 16.MAR.2012 14:58:11

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**10 MHz PORT C 5,790 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

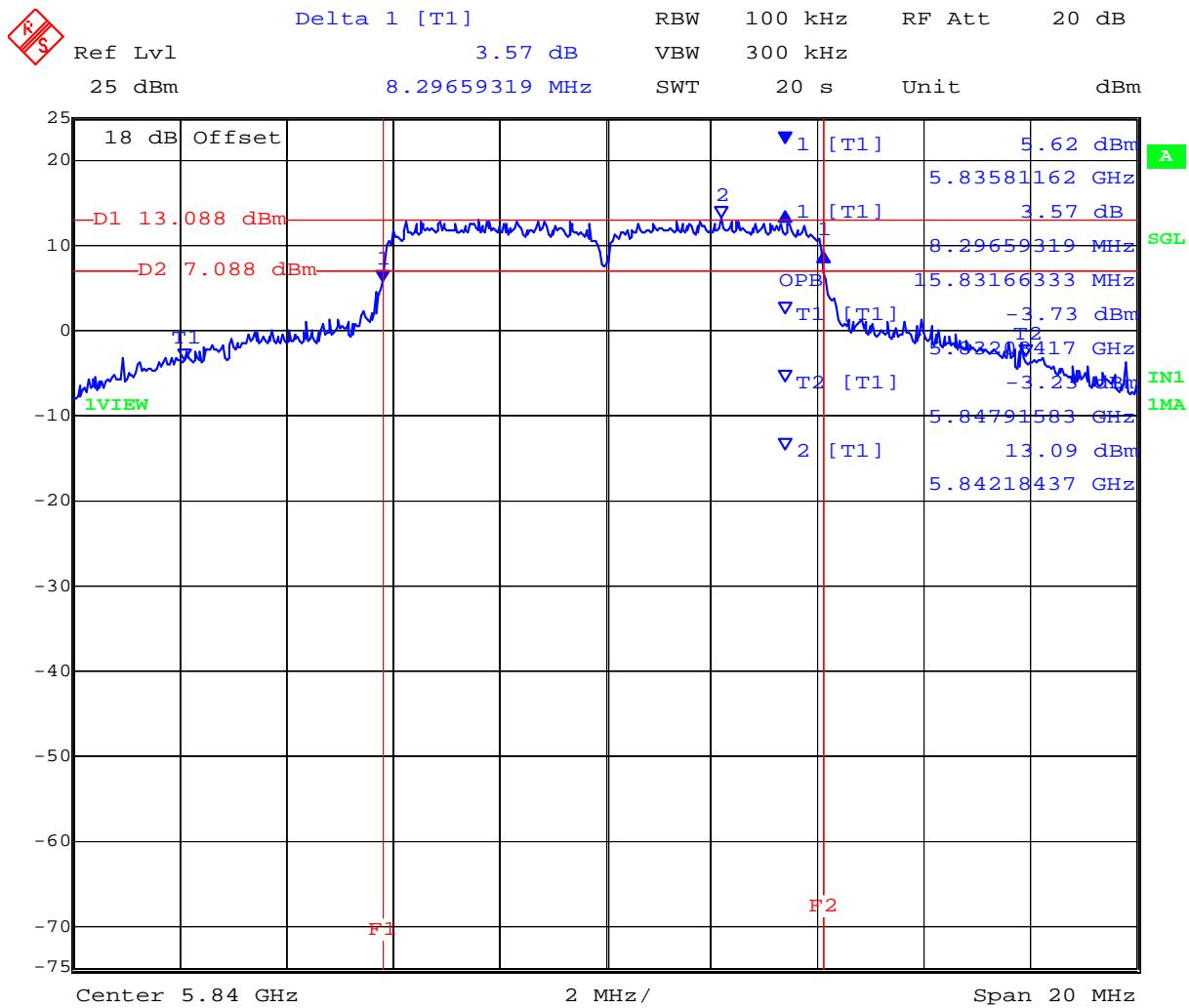


Date: 16.MAR.2012 14:59:14

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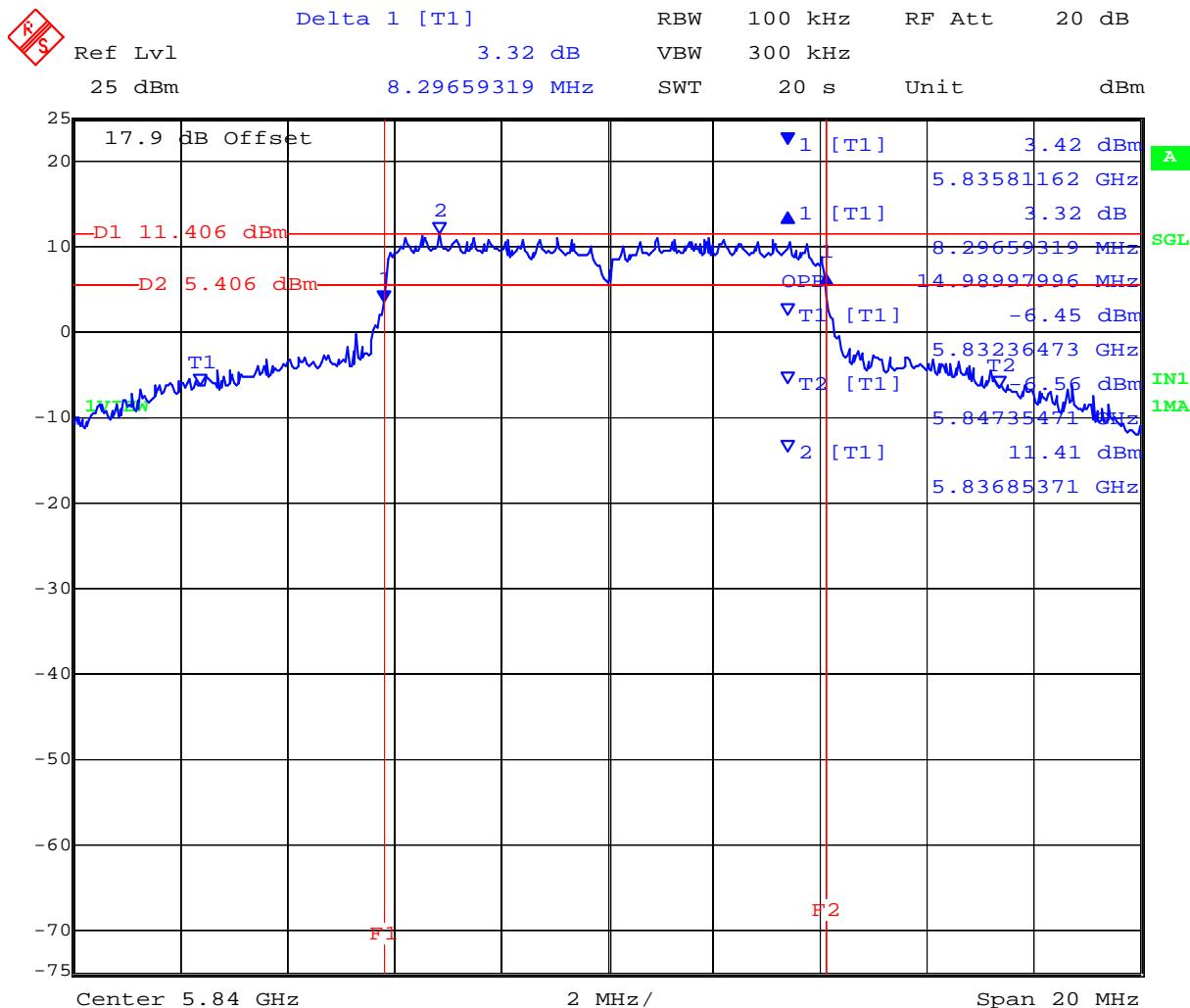
**10 MHz PORT A 5,840 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**



Date: 16.MAR.2012 15:38:14

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**10 MHz PORT B 5,840 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**

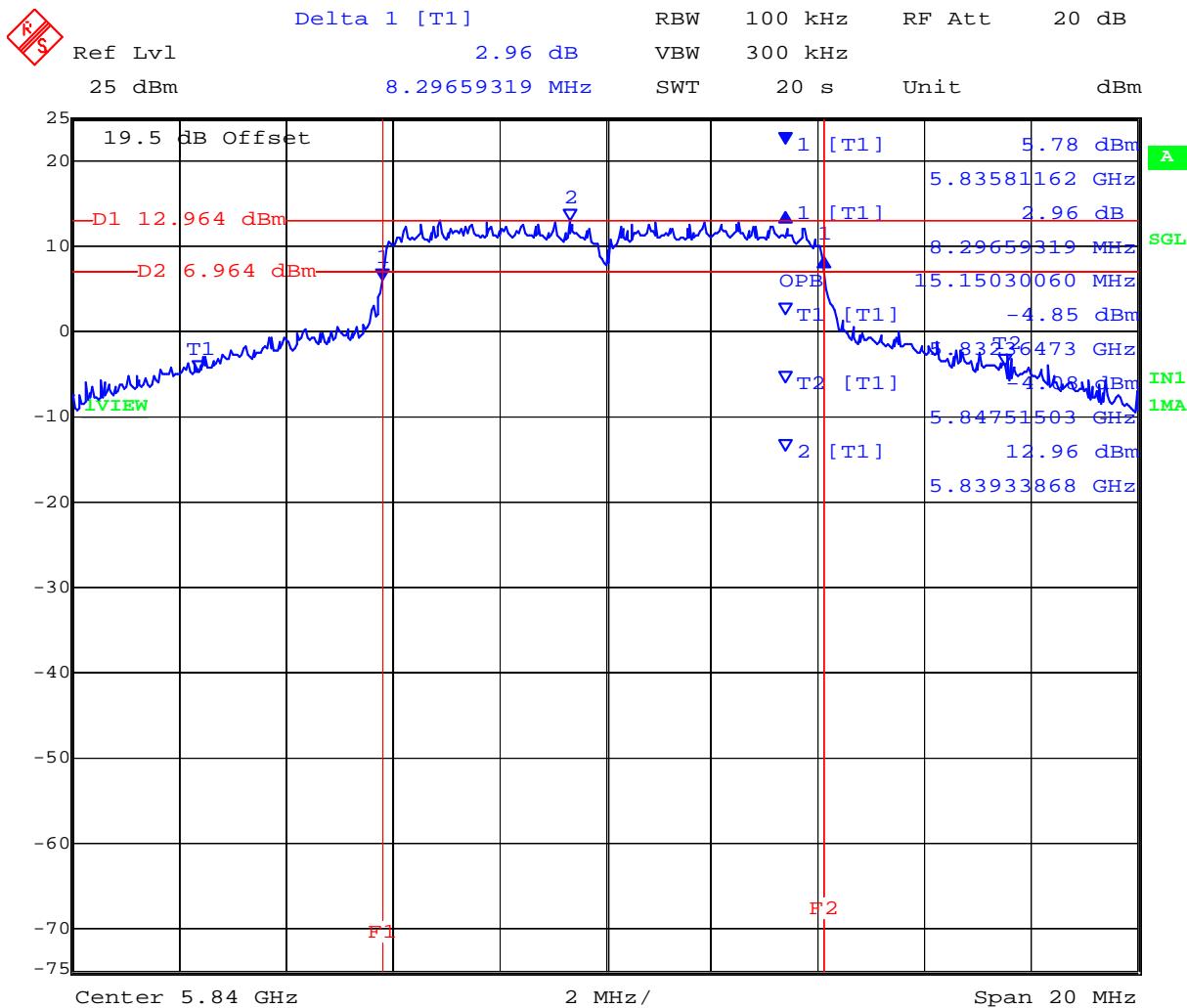


Date: 16.MAR.2012 15:39:20

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**10 MHz PORT C 5,840 MHz 802.11a 6 MBit/s Legacy 6 dB and 99% Bandwidth**



Date: 16.MAR.2012 15:40:23

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 84 of 412

## TABLE OF RESULTS – 802.11a – Legacy 20 MHz

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	0 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
5745.000	16.673000	16.673000	16.673000	--	500	0.5	-16.173000
5785.000	16.673000	16.673000	16.673000	--			-16.173000
5825.000	16.673000	16.914000	16.593000	--			-16.093000

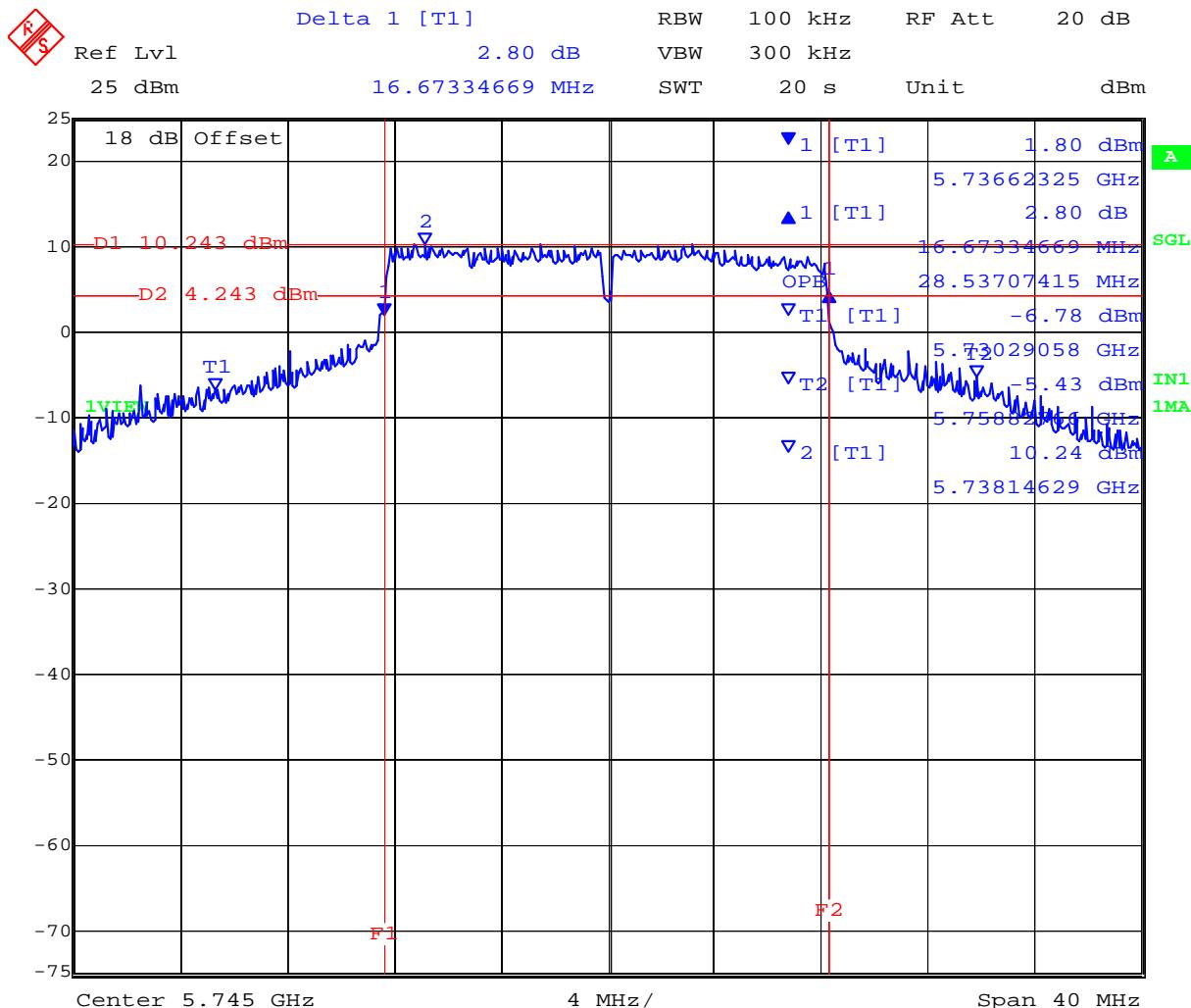
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5745.000	28.537000	31.743000	29.579000	--			
5785.000	33.587000	34.549000	33.026000	--			
5825.000	34.389000	34.389000	33.667000	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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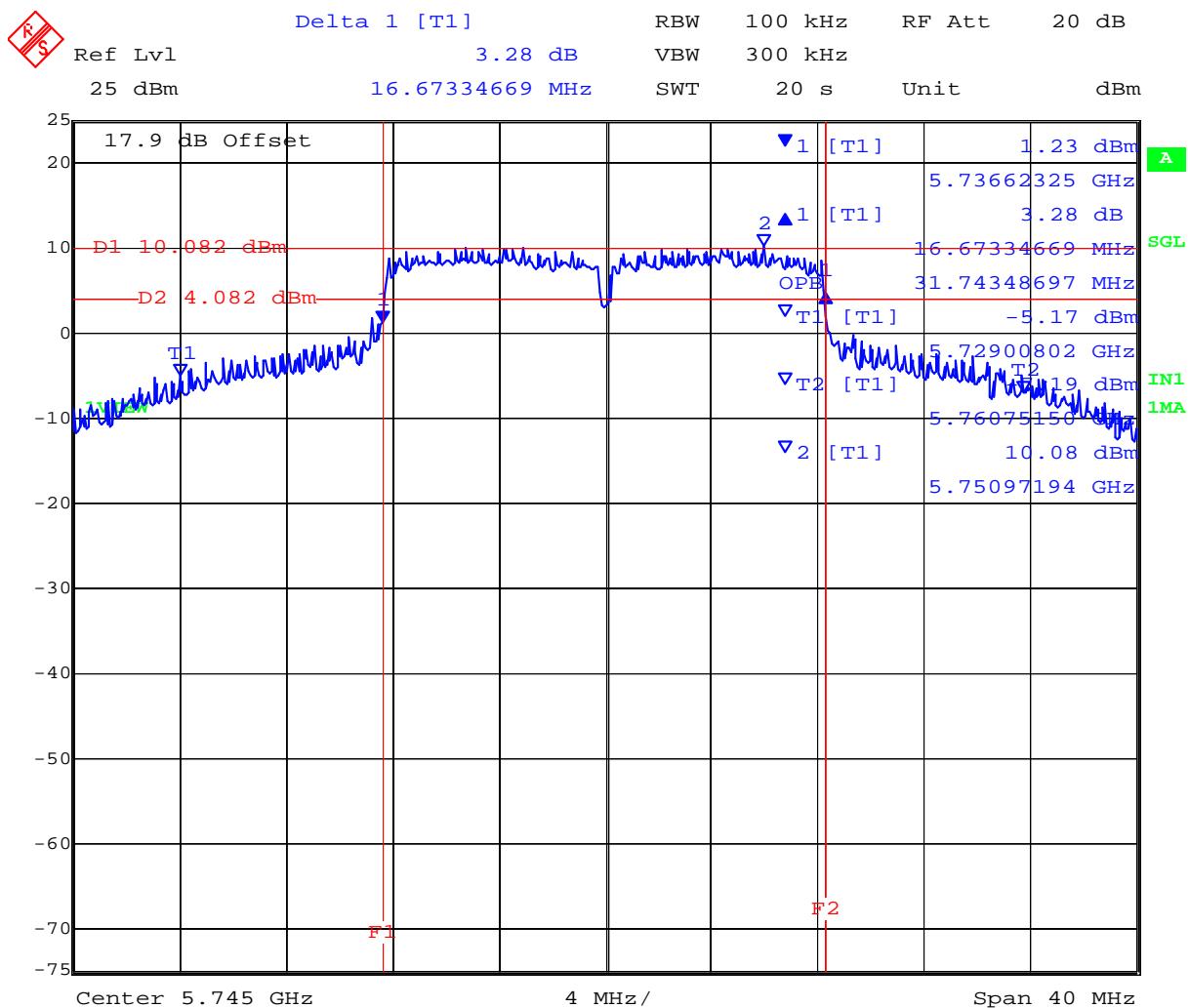
### PORT A 5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 28.FEB.2012 11:50:34

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### PORT B 5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth

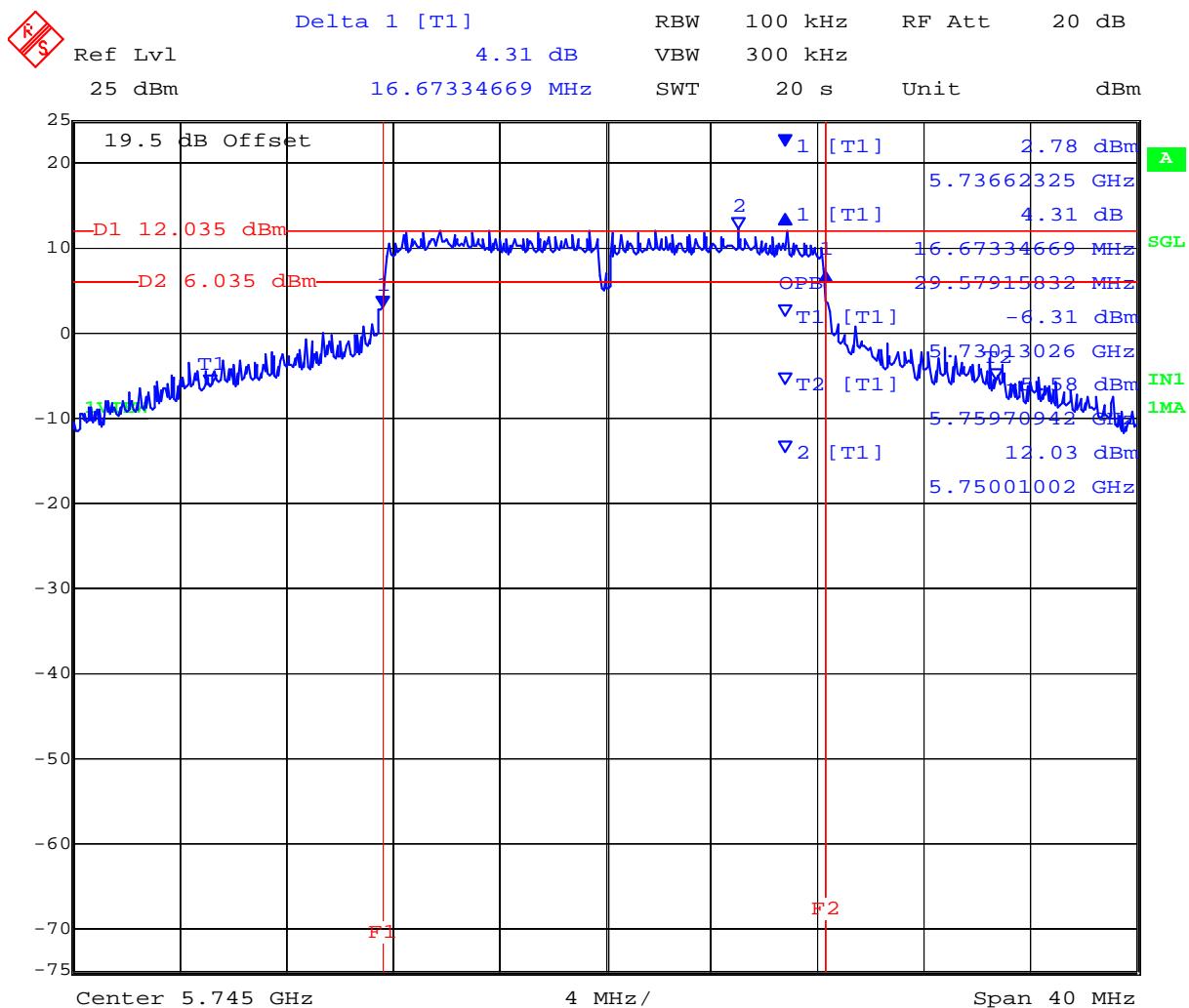


Date: 28.FEB.2012 11:51:42

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### PORT C 5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth

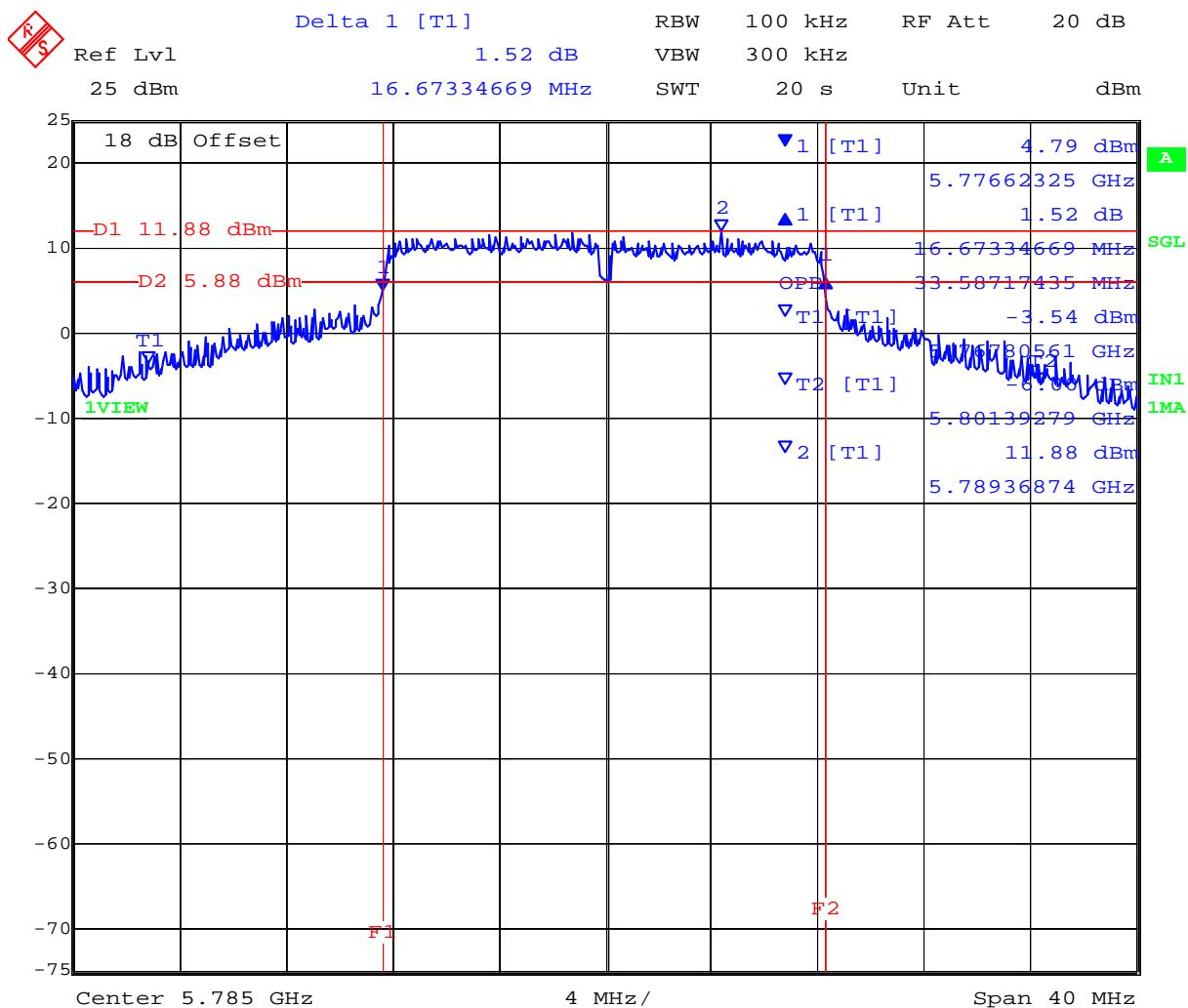


Date: 28.FEB.2012 11:52:48

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### PORT A 5,785 MHz 802.11a Legacy 6 dB and 99% Bandwidth

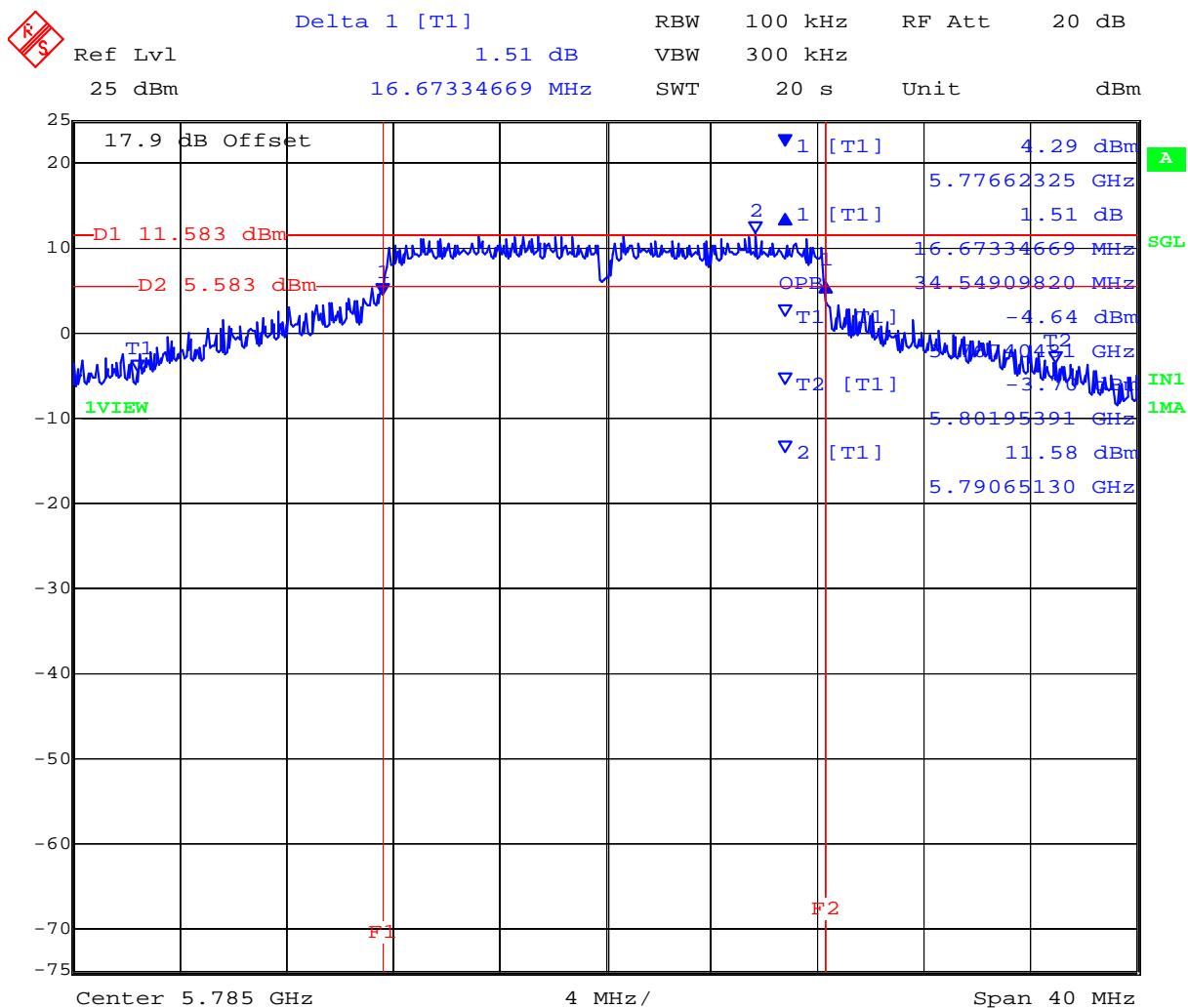


Date: 28.FEB.2012 12:24:01

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### PORT B 5,785 MHz 802.11a Legacy 6 dB and 99% Bandwidth

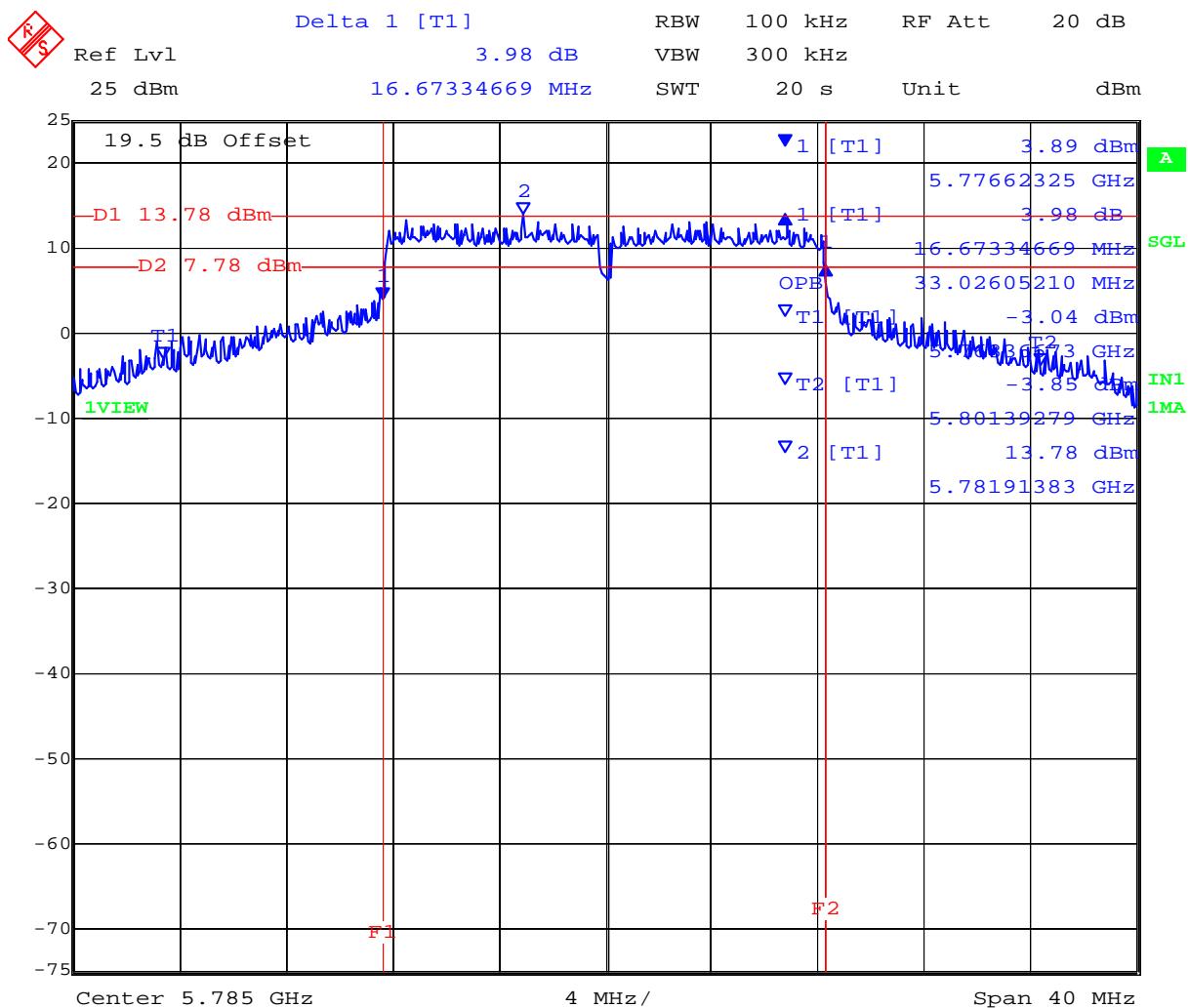


Date: 28.FEB.2012 12:25:10

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### PORT C 5,785 MHz 802.11a Legacy 6 dB and 99% Bandwidth

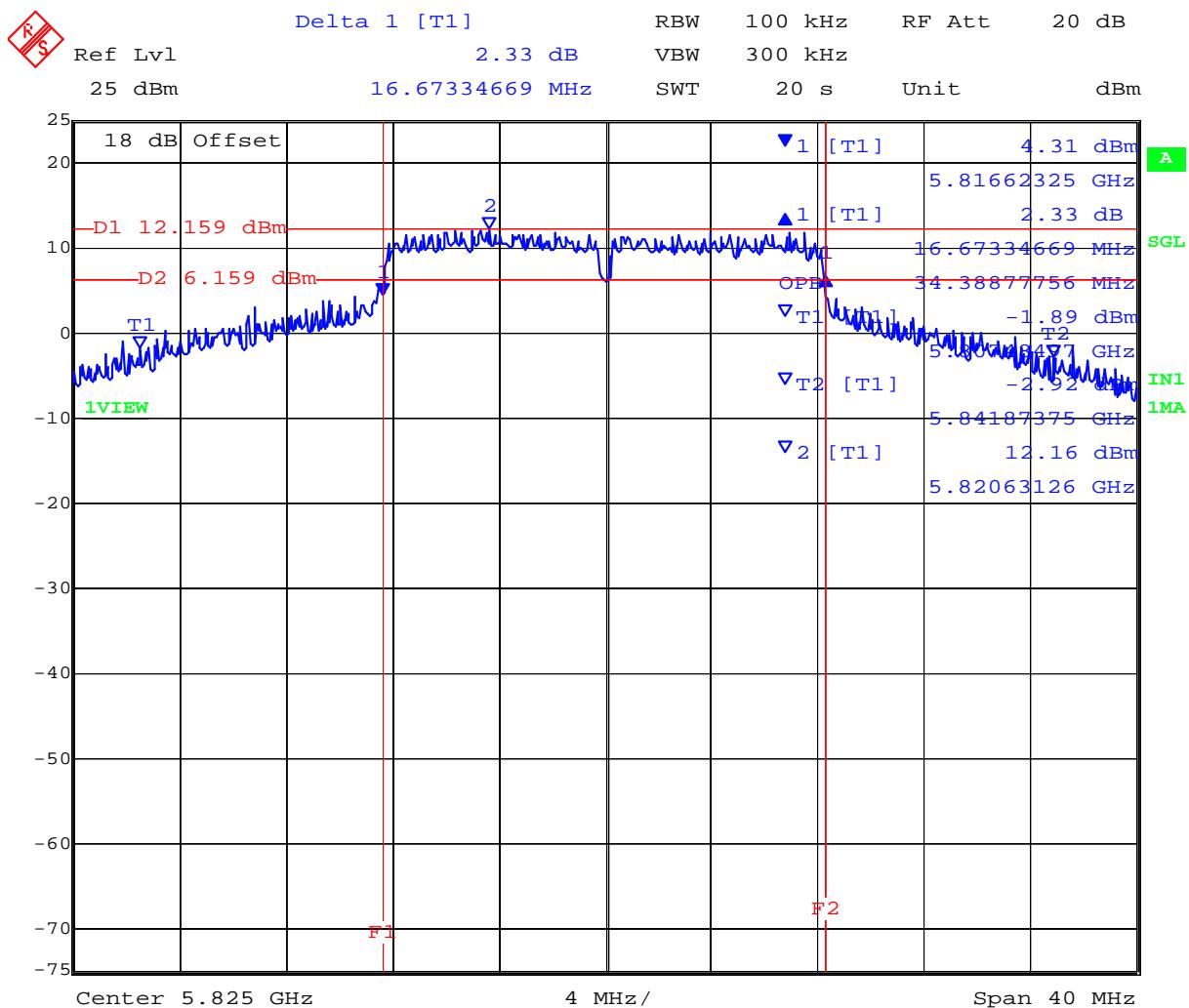


Date: 28.FEB.2012 12:26:15

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**PORT A 5.825 MHz 802.11a Legacy 6 dB and 99% Bandwidth**

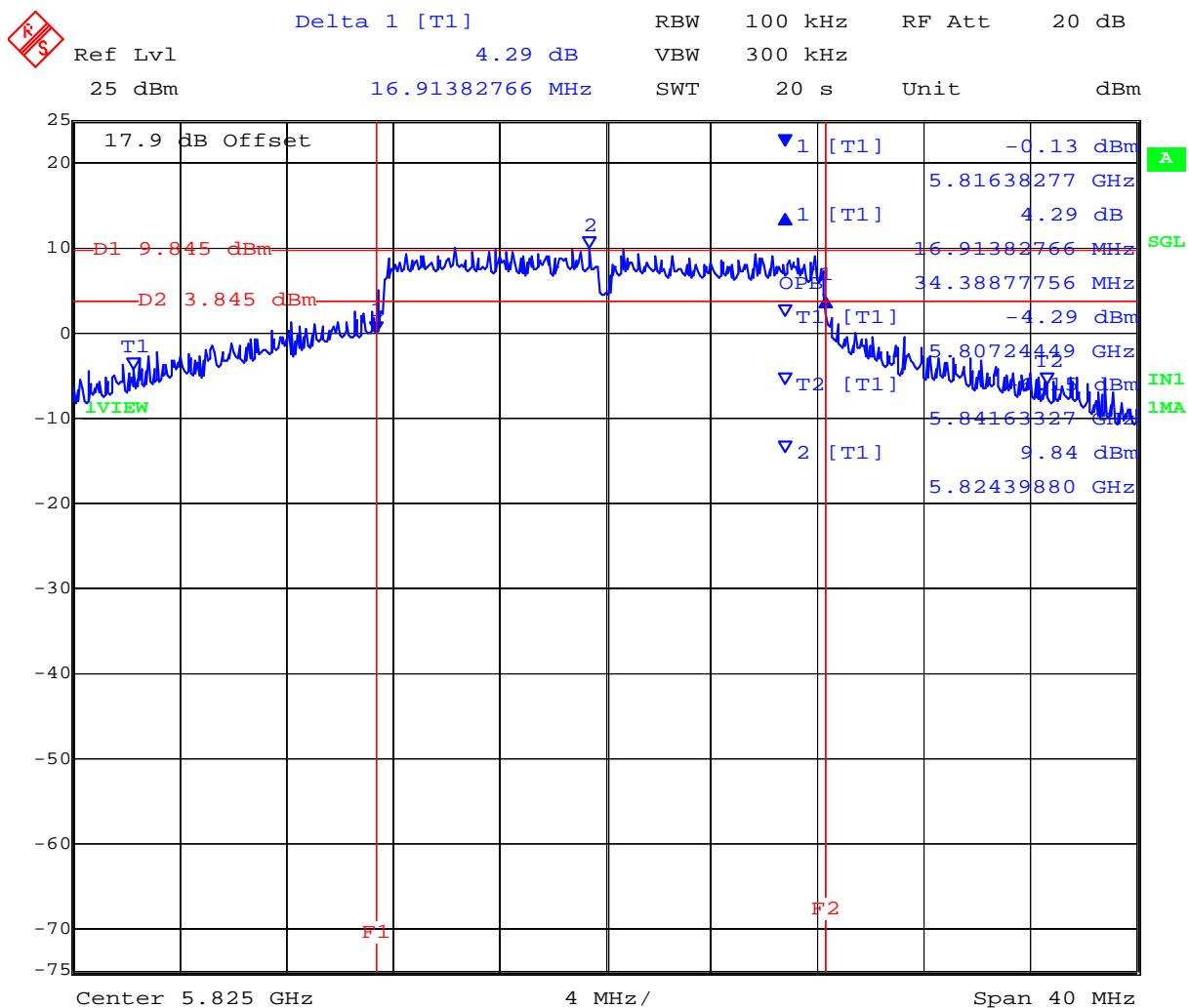


Date: 28.FEB.2012 12:54:23

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### PORT B 5,825 MHz 802.11a Legacy 6 dB and 99% Bandwidth

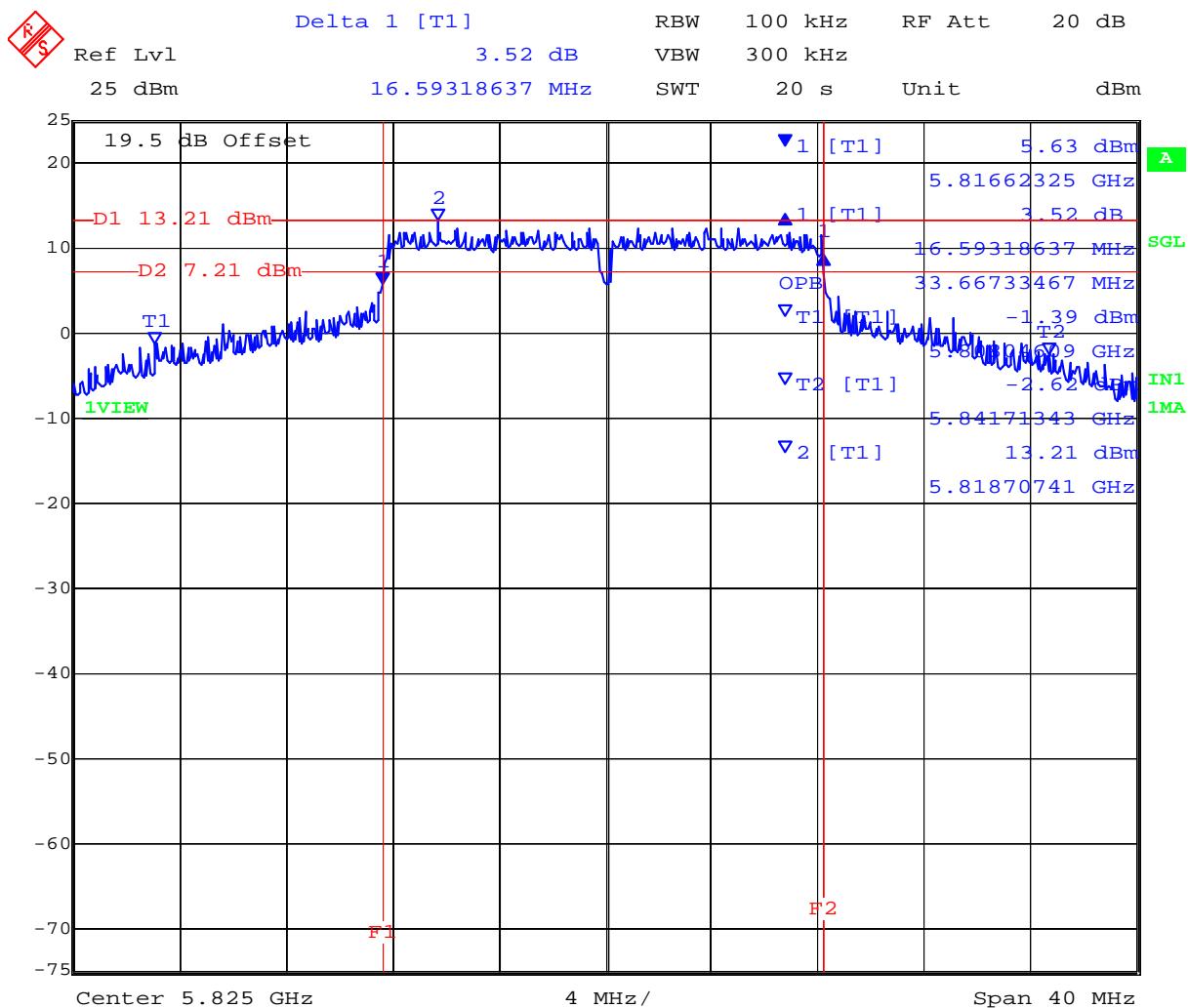


Date: 28.FEB.2012 12:55:34

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### PORT C 5,825 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 28.FEB.2012 12:56:39

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 94 of 412

## TABLE OF RESULTS – 802.11n HT-20, 20 MHz

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	0 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
5745.000	17.956000	17.956000	17.956000	--	500	0.5	-17.456000
5785.000	17.876000	18.116000	17.876000	--			-17.376000
5825.000	17.956000	17.876000	17.956000	--			-17.376000

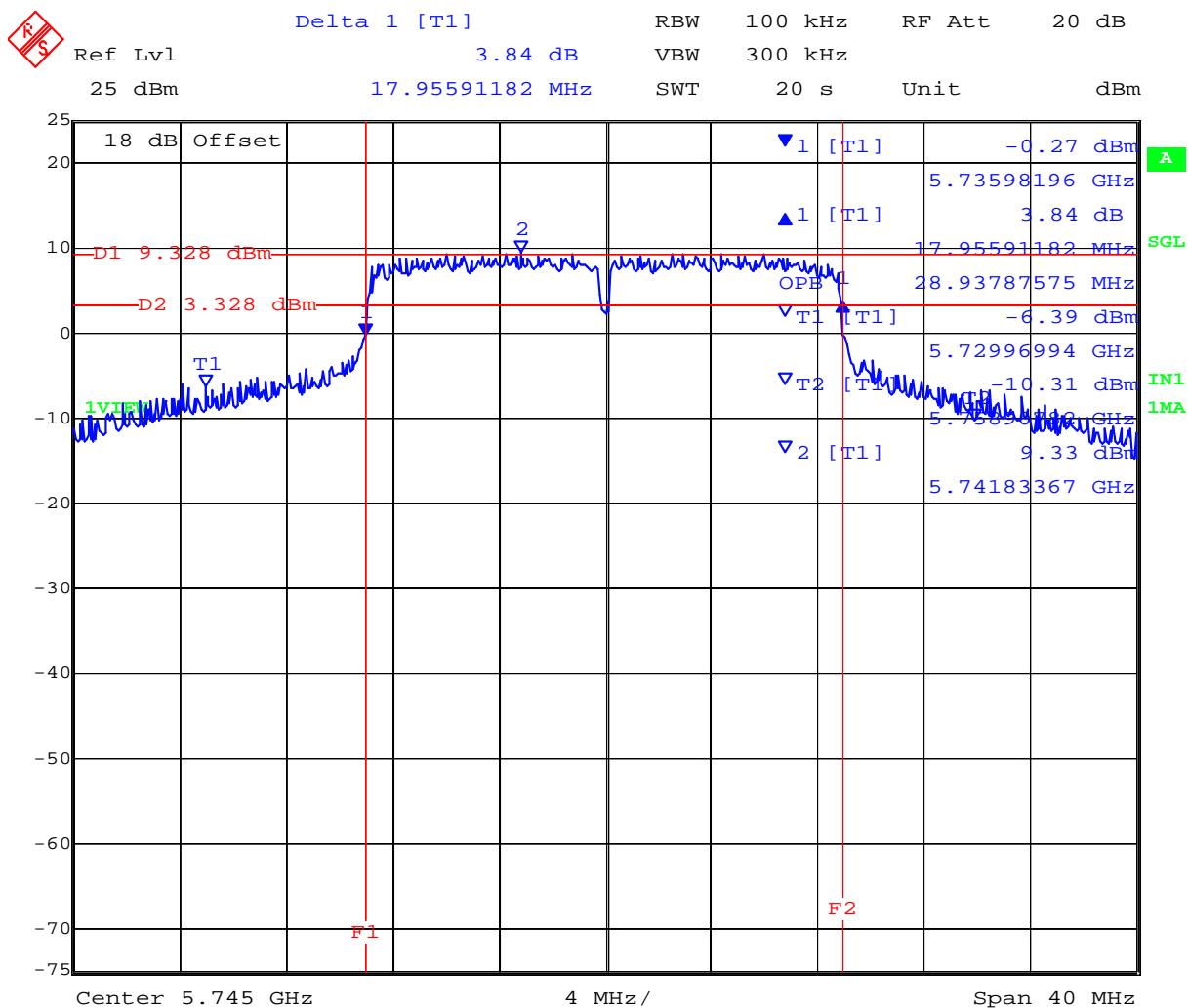
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5745.000	28.938000	31.663000	29.178000	--			
5785.000	34.309000	35.271000	33.587000	--			
5825.000	33.828000	34.148000	33.106000	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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### PORT A 5,745 MHz 802.11n HT-20 6 dB and 99% Bandwidth

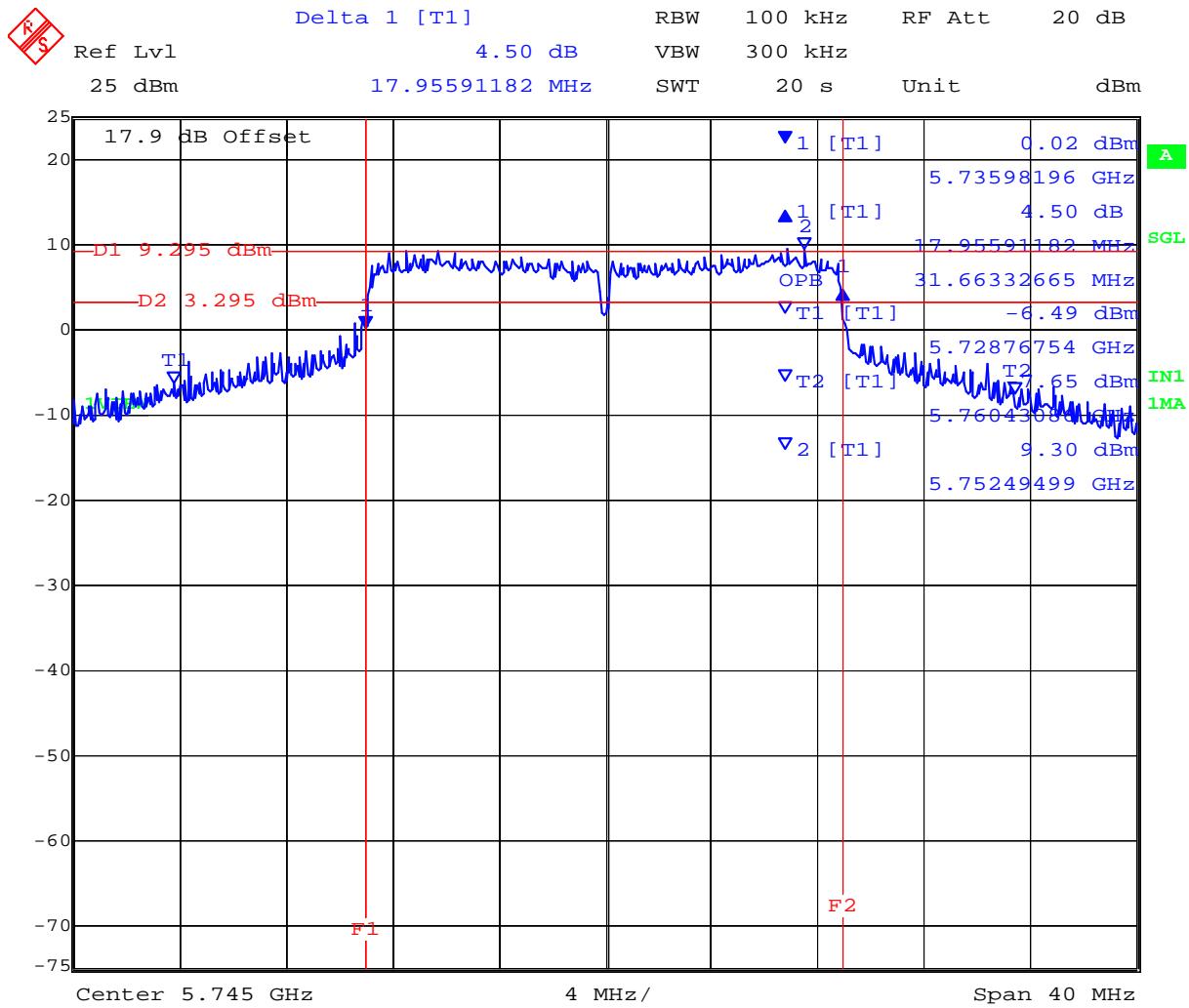


Date: 28.FEB.2012 13:36:12

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### PORT B 5,745 MHz 802.11n HT-20 6 dB and 99% Bandwidth

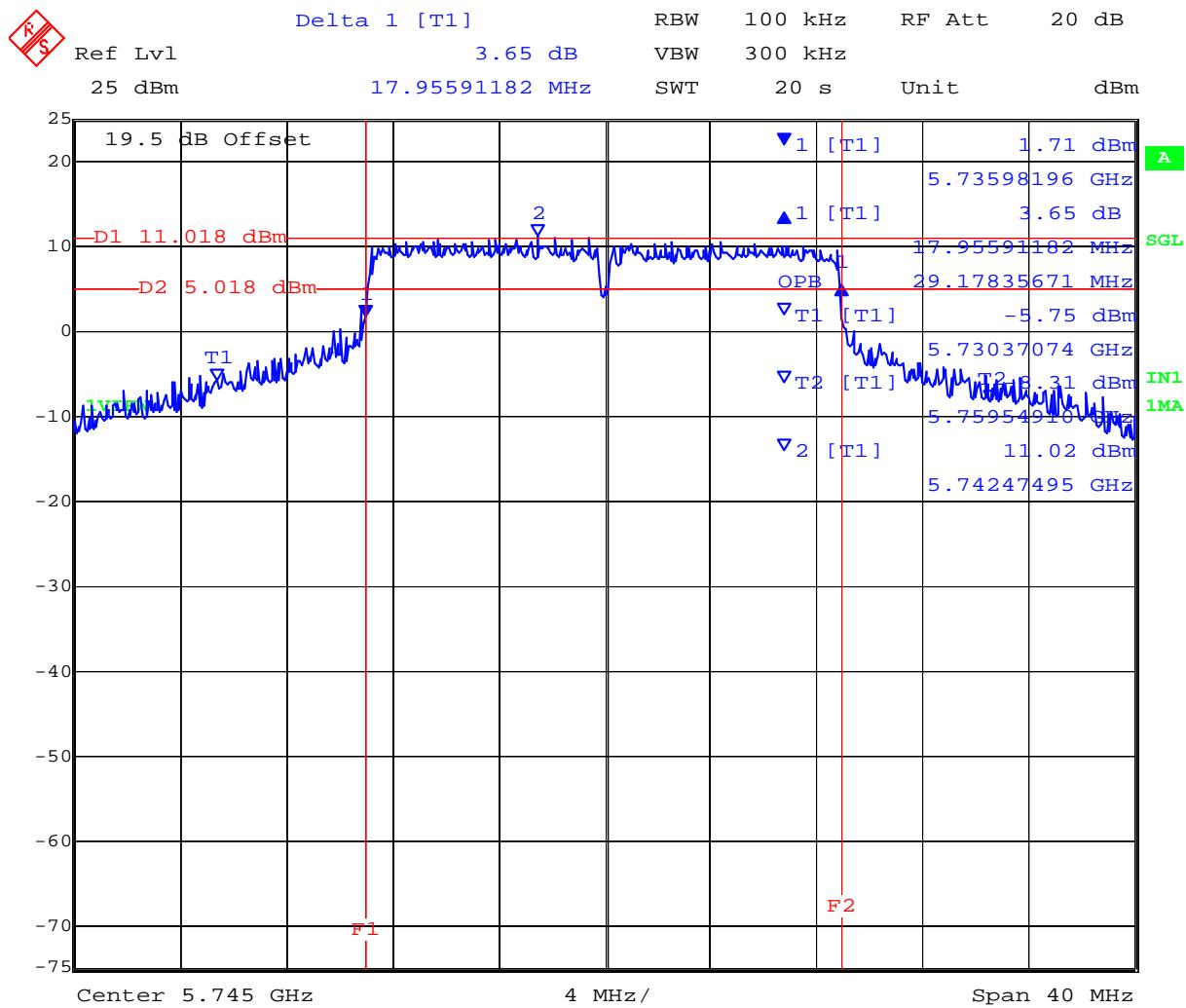


Date: 28.FEB.2012 13:37:19

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### PORT C 5.745 MHz 802.11n HT-20 6 dB and 99% Bandwidth

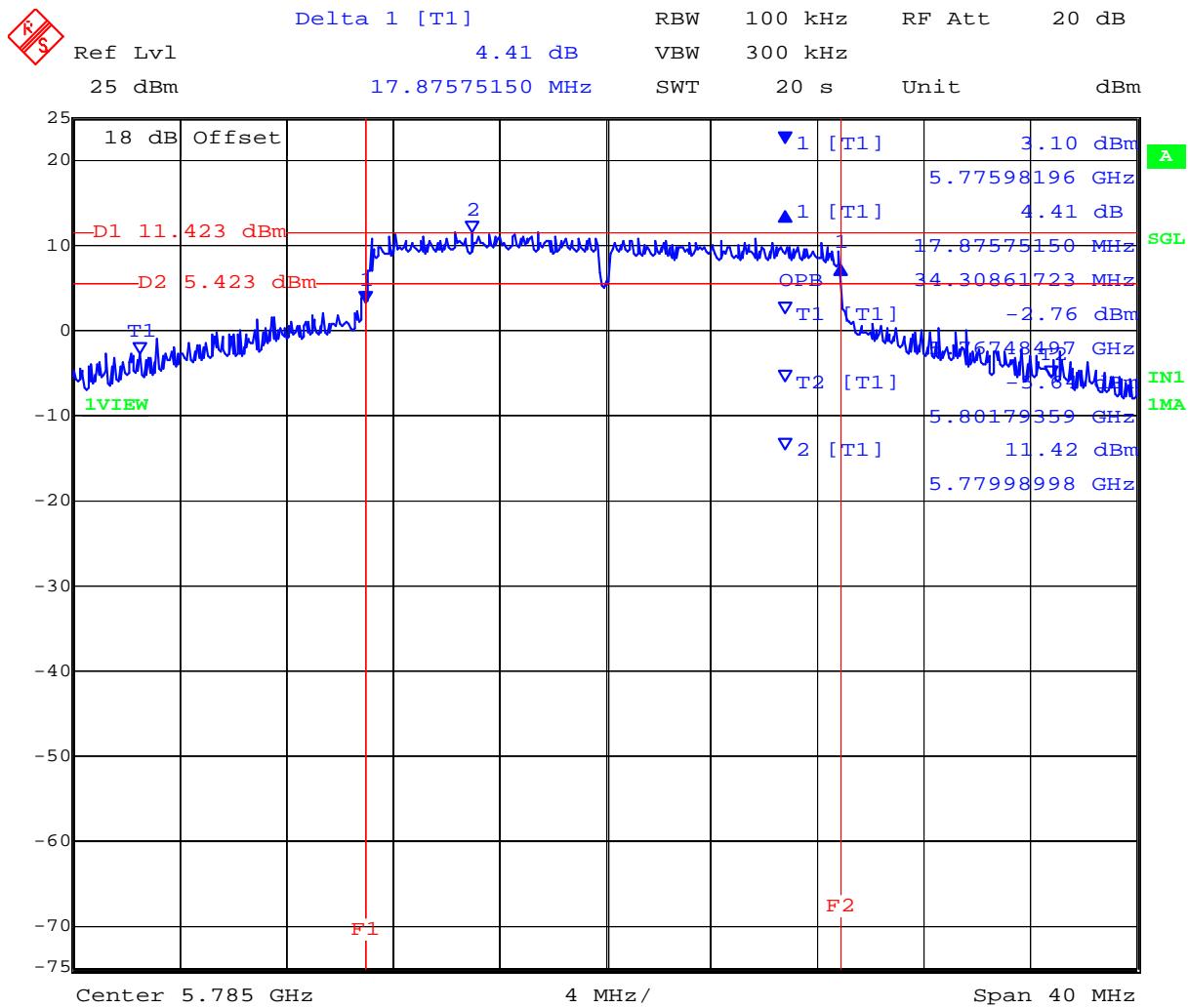


Date: 28.FEB.2012 13:38:24

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### PORT A 5.785 MHz 802.11n HT-20 6 dB and 99% Bandwidth

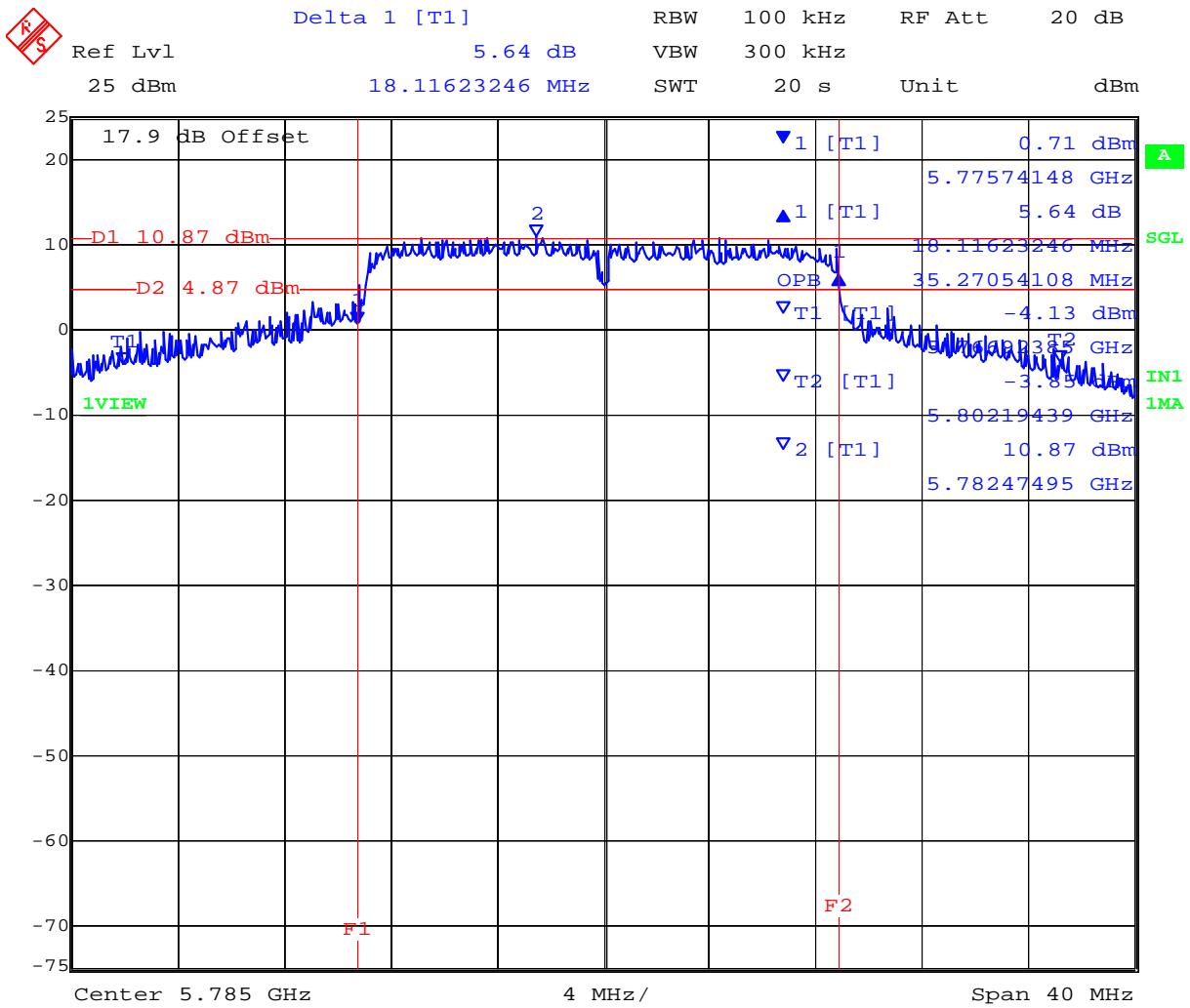


Date: 28.FEB.2012 14:10:57

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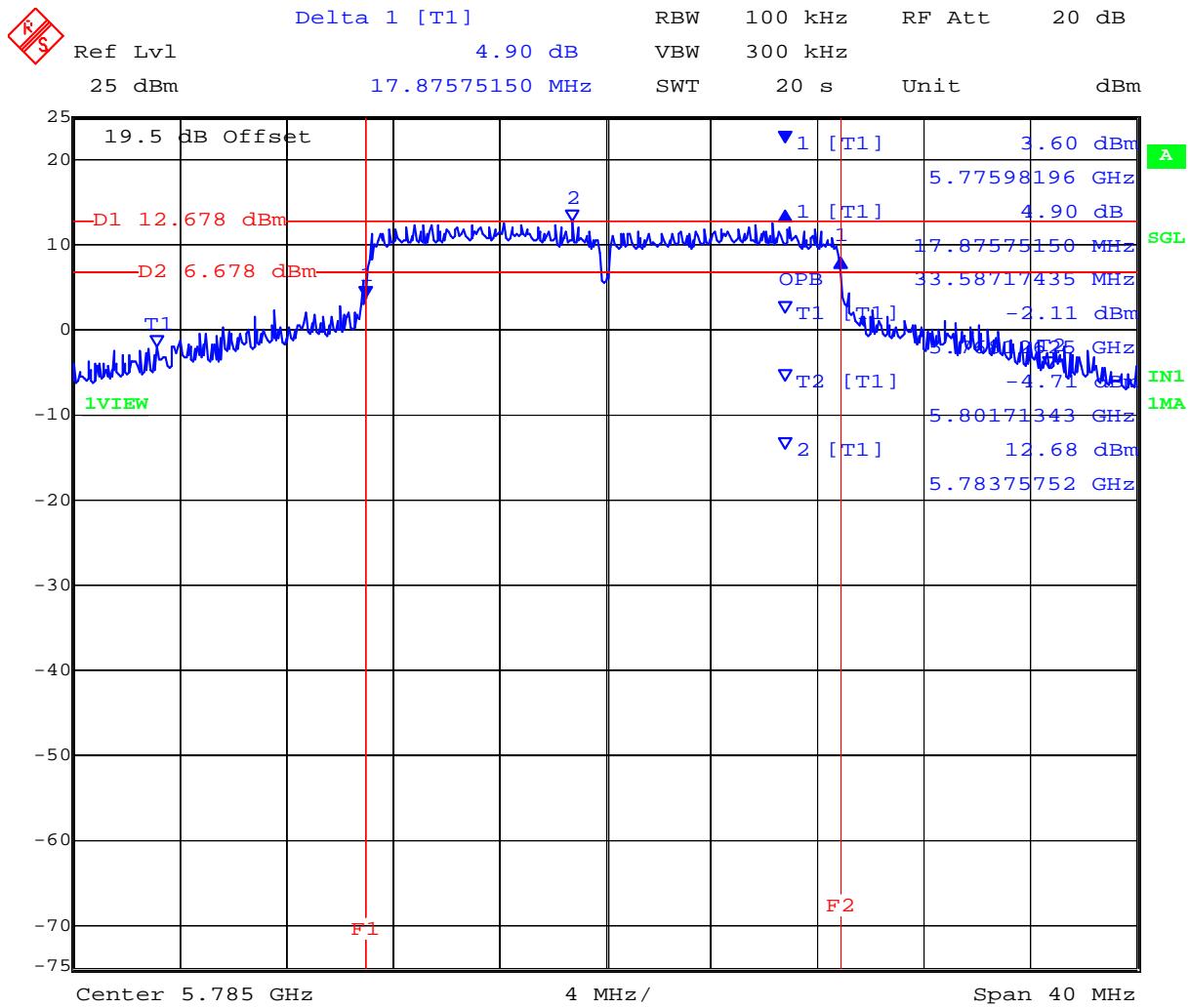
### PORT B 5,785 MHz 802.11n HT-20 6 dB and 99% Bandwidth




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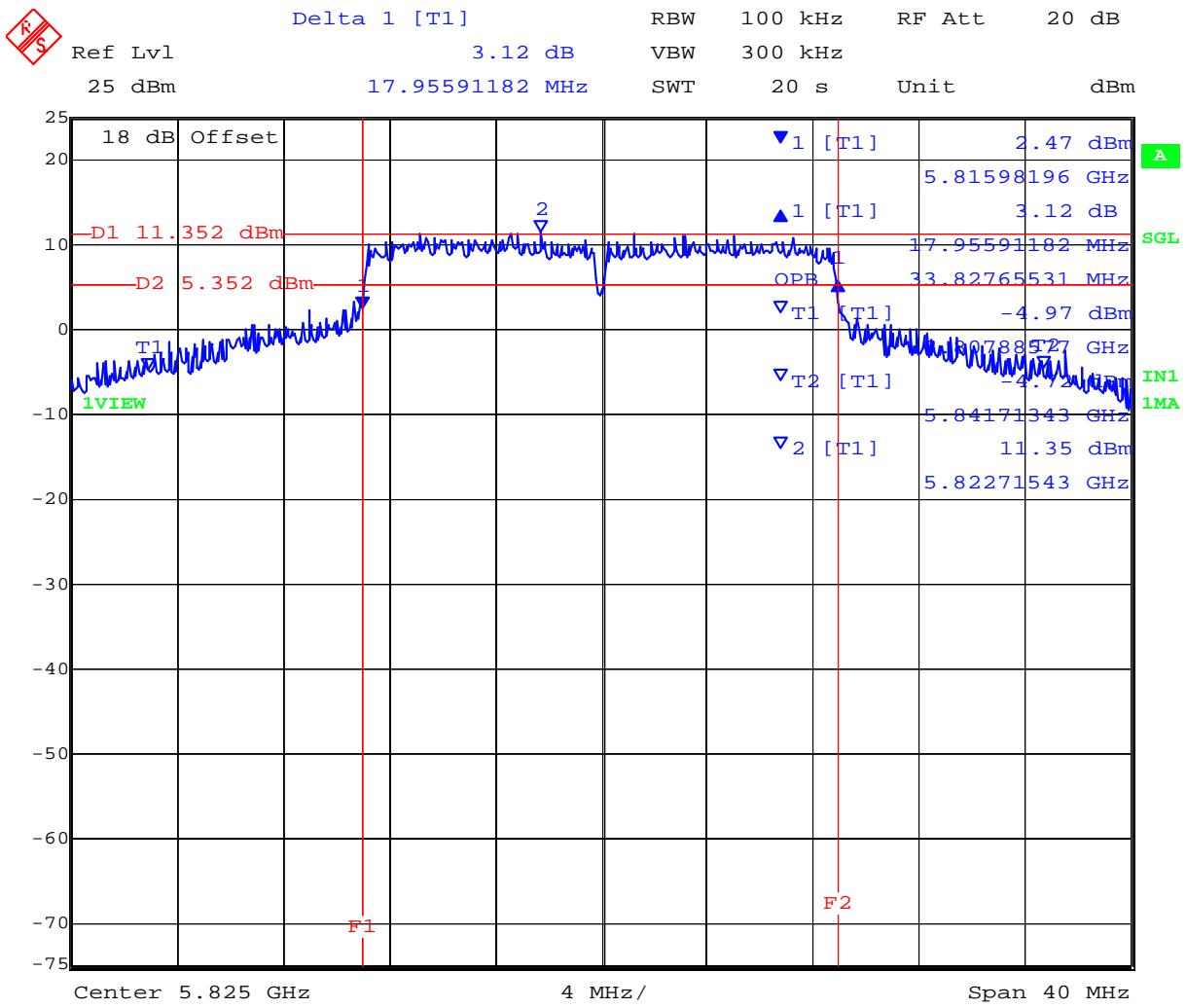
### PORT C 5.785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 28.FEB.2012 14:13:10

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**PORT A 5,825 MHz 802.11n HT-20 6 dB and 99% Bandwidth**

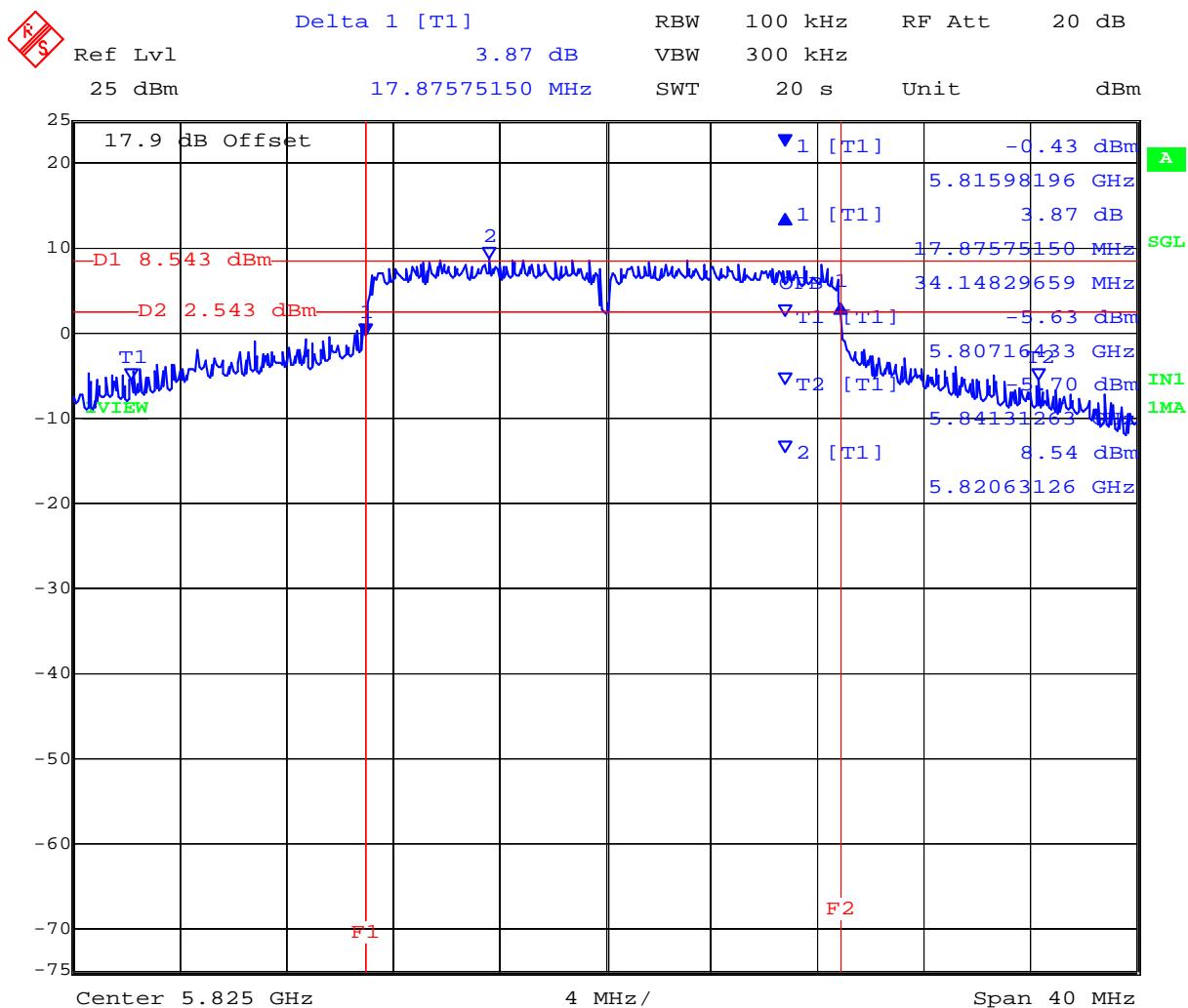


Date: 28.FEB.2012 14:48:07

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### PORT B 5,825 MHz 802.11n HT-20 6 dB and 99% Bandwidth

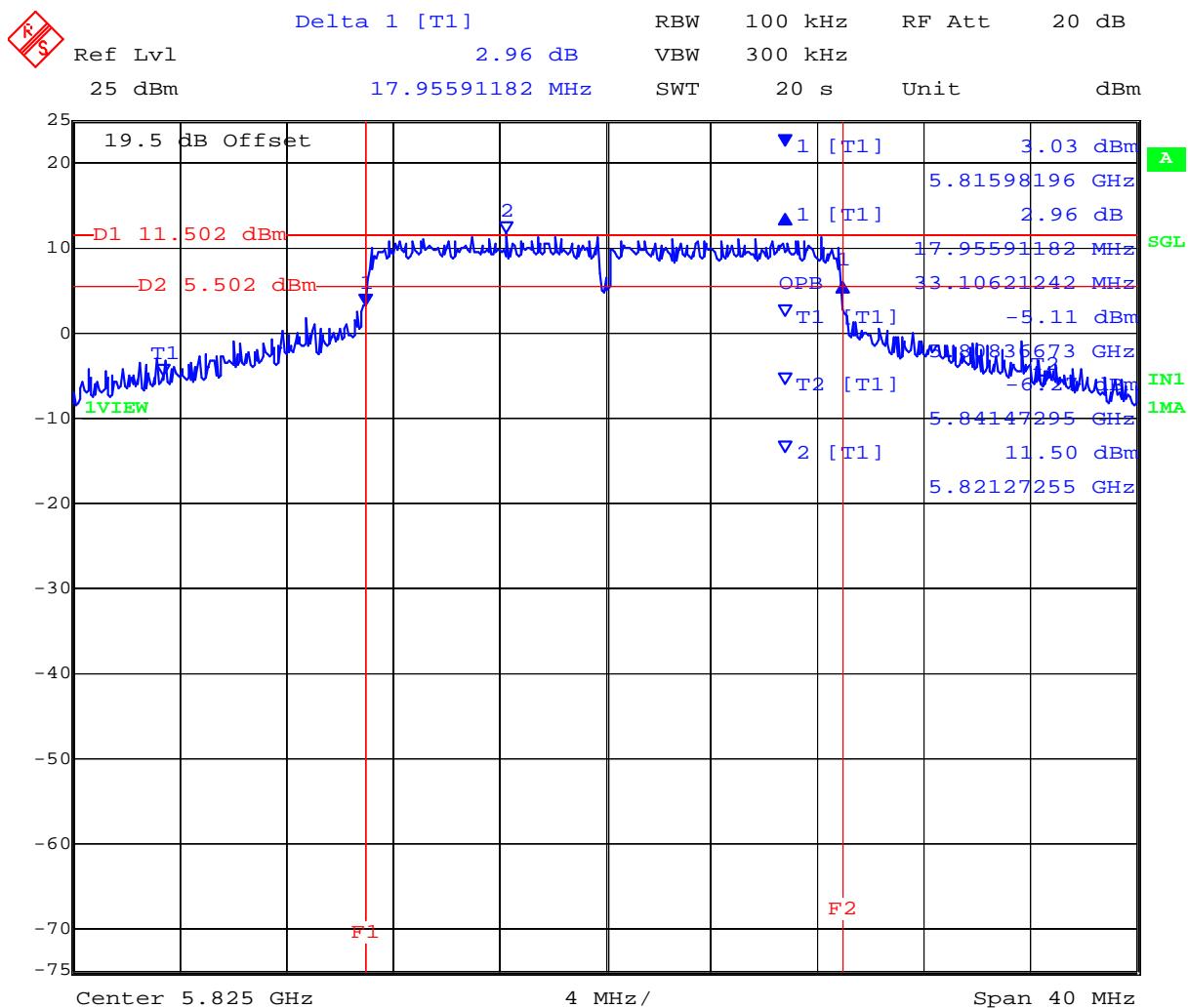


Date: 28.FEB.2012 14:49:15

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### PORT C 5,825 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 28.FEB.2012 14:50:21

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 104 of 412

## TABLE OF RESULTS – 802.11n - HT-40, 20 MHz

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	0 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### 6 dB Bandwidth

<b>Test Frequency</b>	6 dB Bandwidth				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
5755.000	36.713000	36.713000	36.713000	--	500	0.5	-36.213000
5795.000	36.713000	36.713000	36.713000	--			-36.213000

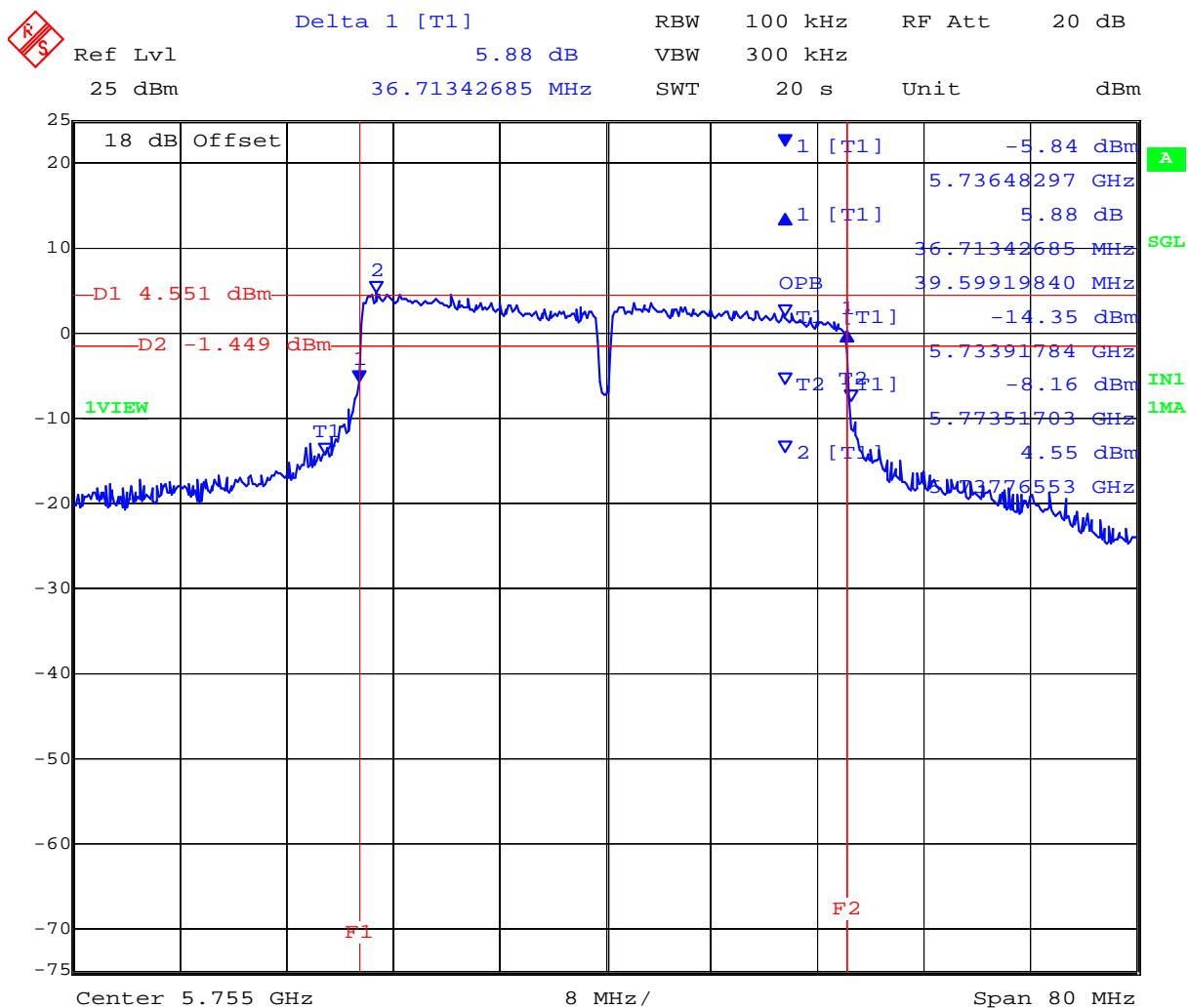
### 99% Bandwidth

<b>Test Frequency</b>	99 % Bandwidth						
	MHz						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5755.000	39.599000	54.830000	42.966000	--			
5795.000	69.098000	69.900000	67.976000	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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### POR TA 5,755 MHz 802.11n HT-40 6 dB and 99% Bandwidth

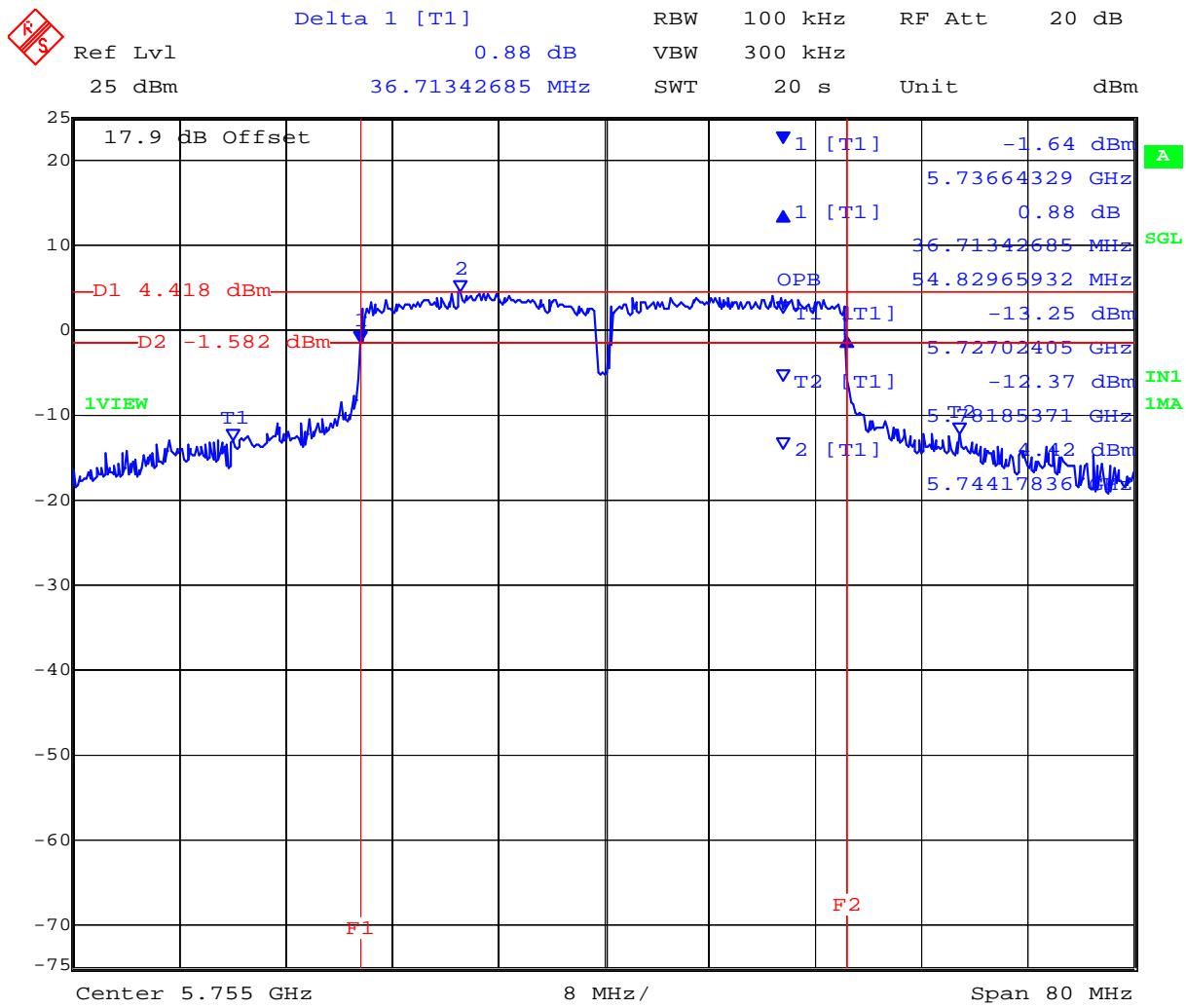


Date: 28.FEB.2012 15:43:48

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### PORTB 5,755 MHz 802.11n HT-40 6 dB and 99% Bandwidth

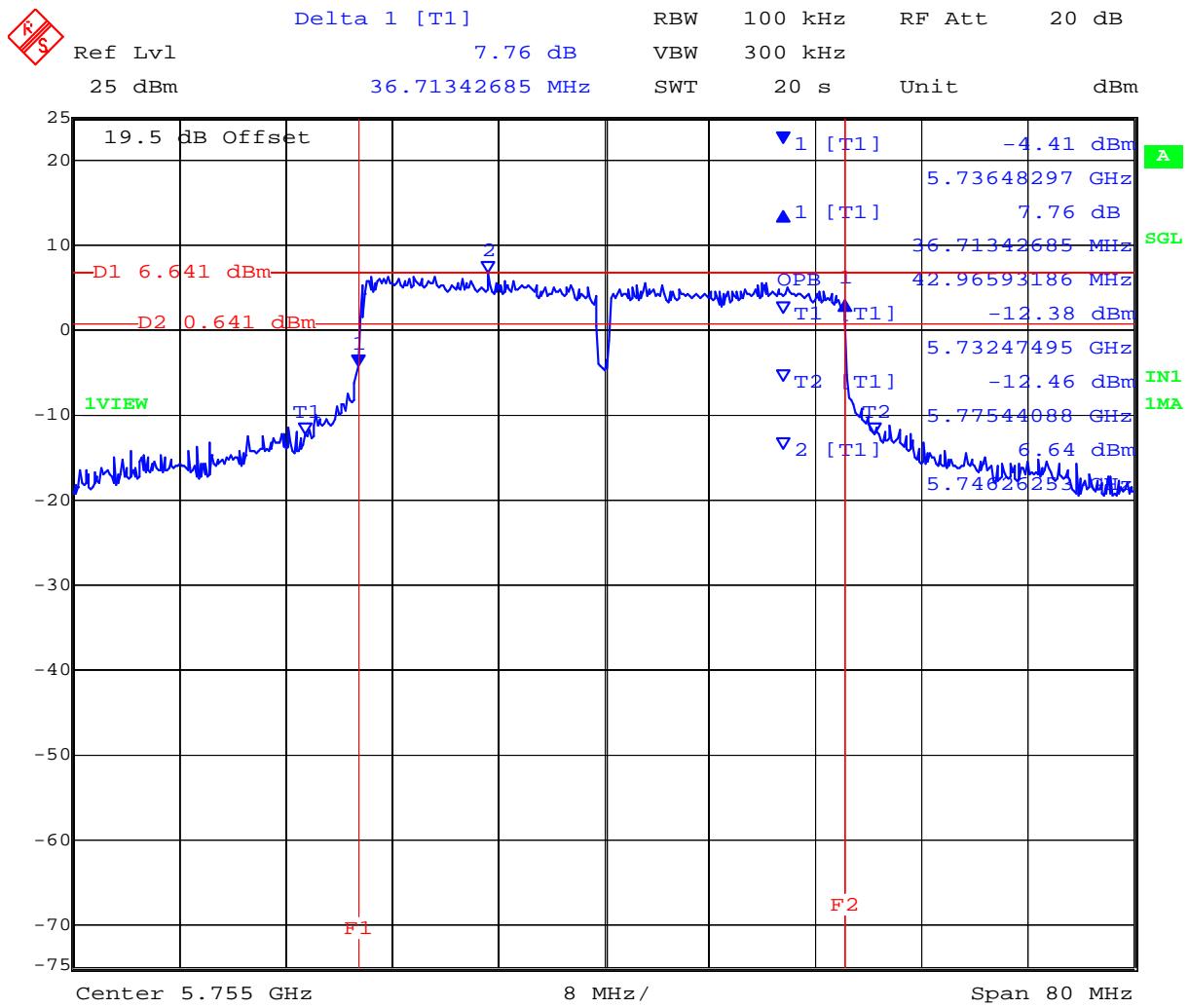


Date: 28.FEB.2012 15:44:55

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### PORT C 5,755 MHz 802.11n HT-40 6 dB and 99% Bandwidth

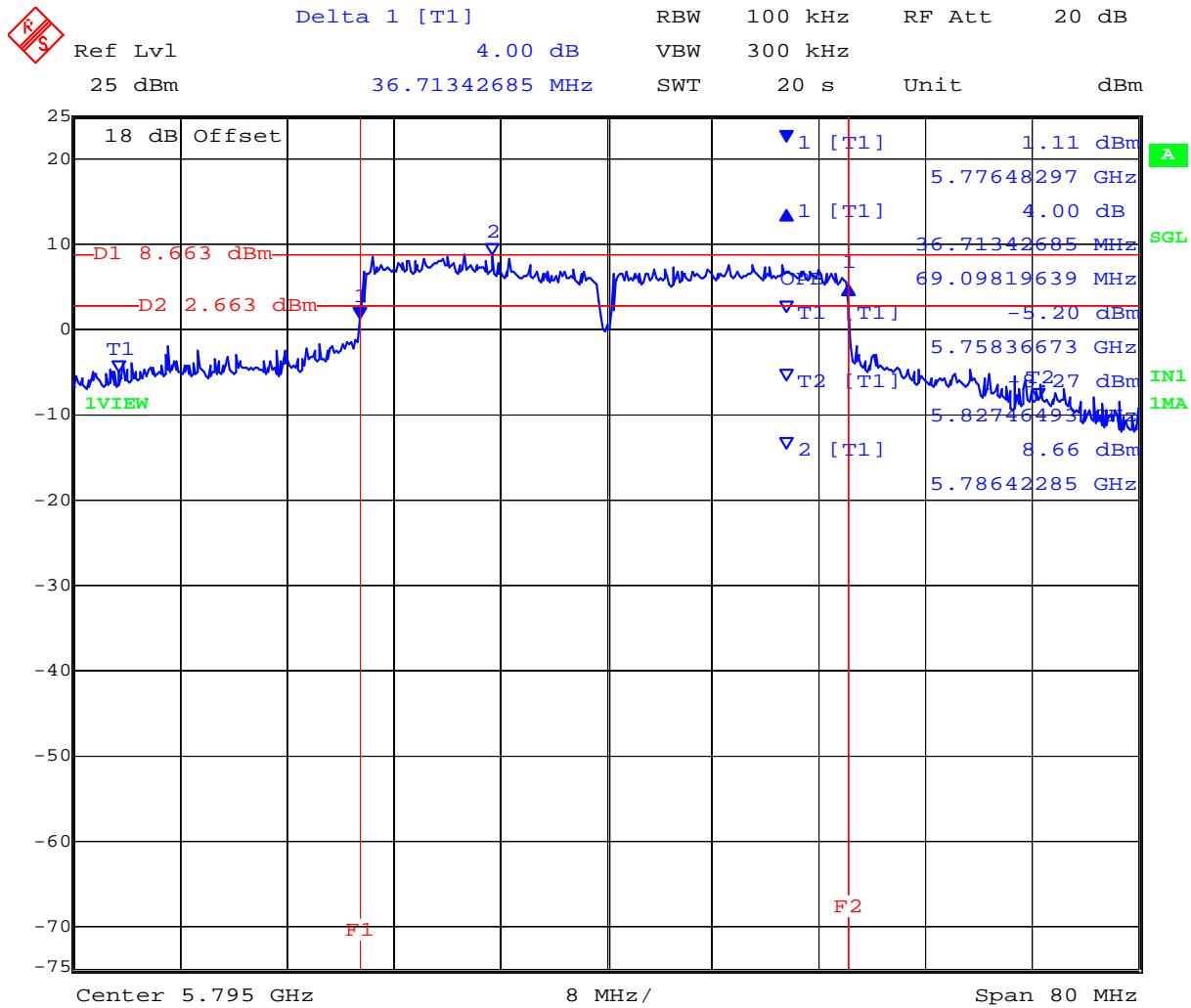


Date: 28.FEB.2012 15:45:58

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**PORT A 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth**

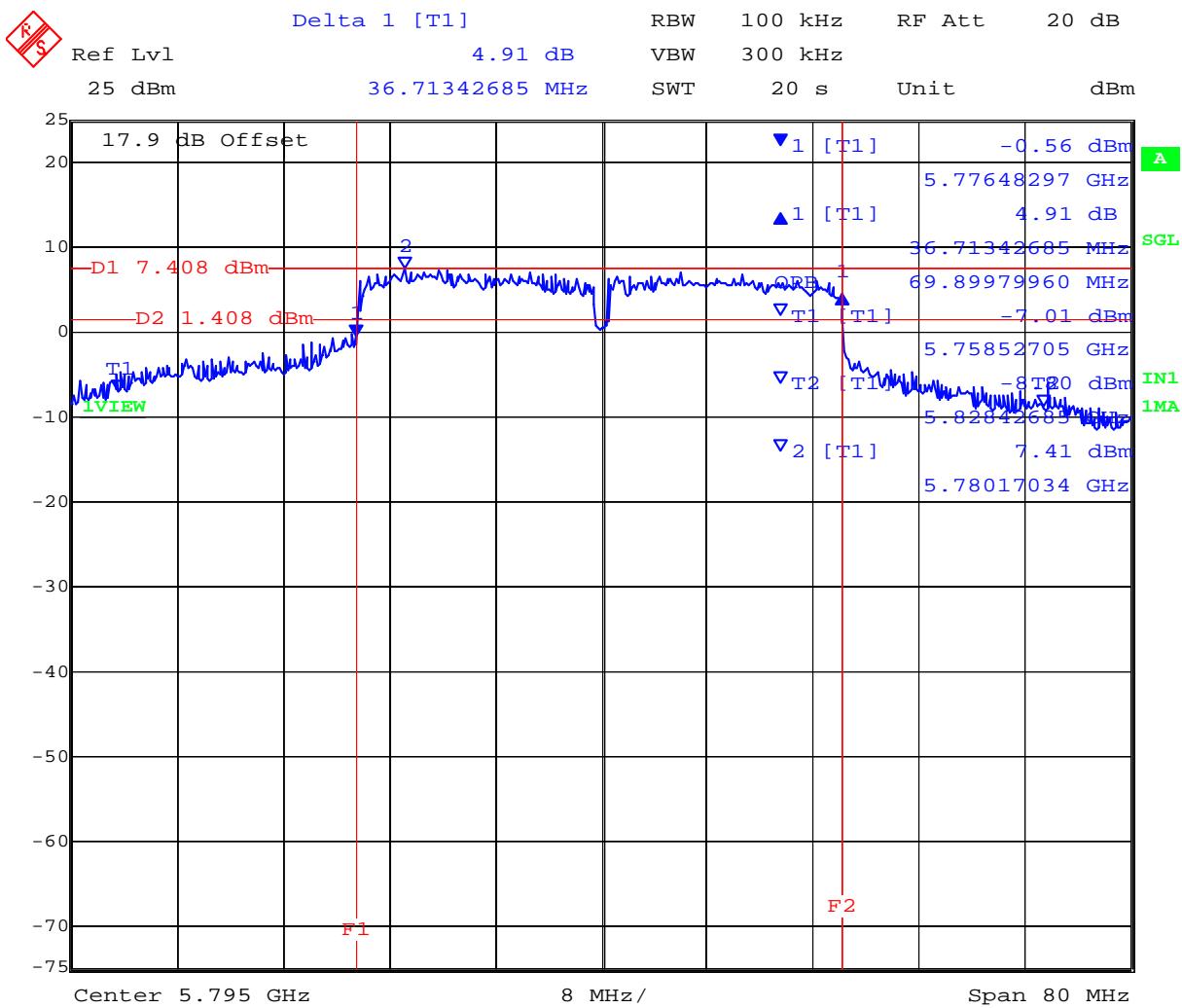


Date: 28.FEB.2012 16:17:03

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### PORT B 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth

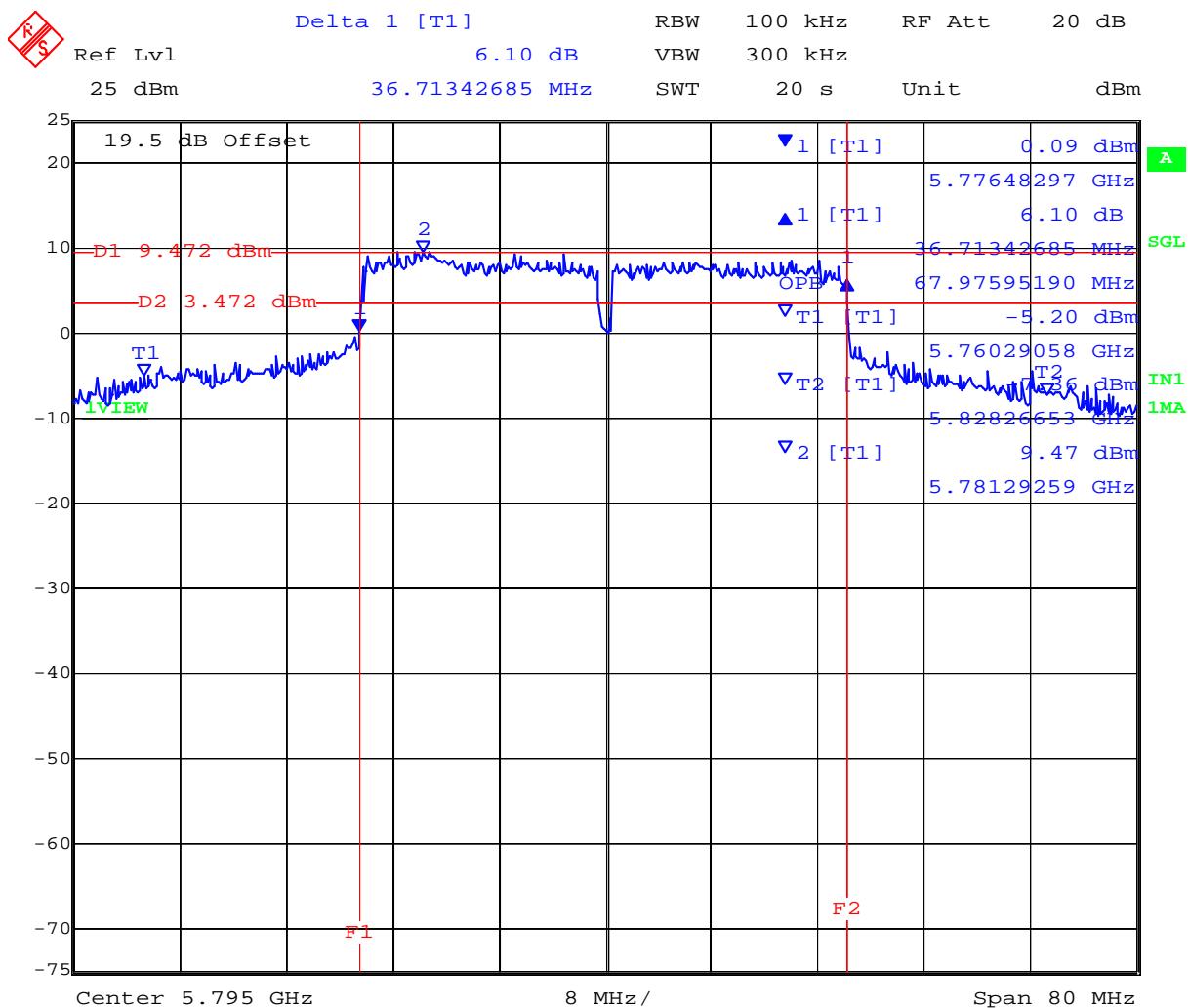


Date: 28.FEB.2012 16:18:12

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### PORT C 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 28.FEB.2012 16:19:17

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 111 of 412

## Specification

### Limits

#### **§15.247 (a)(2) & RSS-210 §A8.2(1)**

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

**§ IC RSS-Gen 4.4.1 Occupied Bandwidth** When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

**§ IC RSS-Gen 4.4.2 6 dB Bandwidth** Where indicated, the 6 dB bandwidth is measured at the points when the spectral density of the signal is 6 dB down from the in –band spectral density of the modulated signal, with the transmitter modulated by a representative signal.

### Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement uncertainty	±2.81 dB
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### Traceability

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

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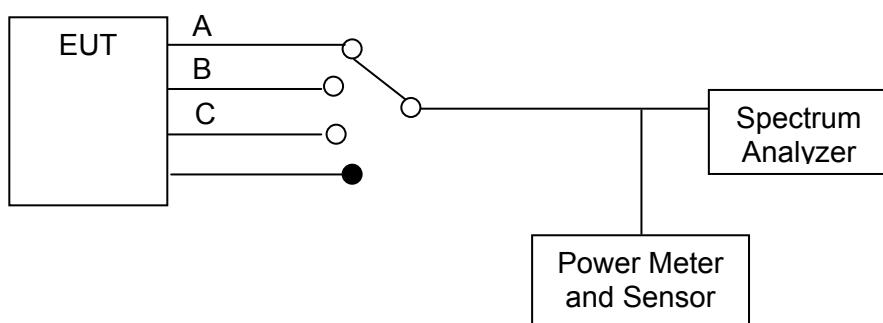
### 5.1.2. Peak Output Power

**FCC, Part 15 Subpart C §15.247(b)(3), §15.31(e)**  
**Industry Canada RSS-210 §A8.4(4)**

#### Test Procedure

The transmitter terminal of EUT was connected to the input of the spectrum analyzer set to measure peak power. The resolution filter bandwidth was set to 6 dB, peak detector selected and the analyzer built-in power function was used to measure peak power over the 99 % bandwidth.

#### Test Measurement Set up



Measurement set up for Transmitter Peak Output Power

Ambient conditions.

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

#### Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

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

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

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

### 5.1.2.1. Limits Peak Output Power

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

(3) For systems using digital modulation in the 2400–2483.5 MHz, and band: 1 Watt. As an alternative to a peak power measurement, compliance with the 1 Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

(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), 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)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

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

(iii) Fixed, point-to-point operation, as used in paragraphs (b)(3)(i) of this section, excludes the use of point-to-multipoint systems, omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

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

(1) Fixed point-to-point operation:

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



**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 114 of 412

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

(iii) Fixed, point-to-point operation, as used in paragraphs (c)(1)(i) of this section, excludes the use of point-to-multipoint systems, omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum or digitally modulated intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

(2) In addition to the provisions in paragraphs (b)(3), (b)(4) and (c)(1)(i) of this section, transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams, simultaneously or sequentially, for the purpose of directing signals to individual receivers or to groups of receivers provided the emissions comply with the following:

(i) Different information must be transmitted to each receiver.

(ii) If the transmitter employs an antenna system that emits multiple directional beams but does not do emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device, i.e., the sum of the power supplied to all antennas, antenna elements, staves, etc. and summed across all carriers or frequency channels, shall not exceed the limit specified in paragraph (b)(3) of this section, as applicable. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as follows:

(A) The directional gain shall be calculated as the sum of  $10 \log$  (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.

(B) A lower value for the directional gain than that calculated in paragraph (c)(2)(ii)(A) of this section will be accepted if sufficient evidence is presented, e.g., due to shading of the array or coherence loss in the beam-forming.

(iii) If a transmitter employs an antenna that operates simultaneously on multiple directional beams using the same or different frequency channels, the power supplied to each emission beam is subject to the power limit specified in paragraph (c)(2)(ii) of this section. If transmitted beams overlap, the power shall be reduced to ensure that their aggregate power does not exceed the limit specified in paragraph (c)(2)(ii) of this section. In addition, the aggregate power transmitted simultaneously on all beams shall not exceed the limit specified in paragraph (c)(2)(ii) of this section by more than 8 dB.

(iv) Transmitters that emit a single directional beam shall operate under the provisions of paragraph (c)(1) of this section.

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 115 of 412

WBSn-2450 - 802.11a/b/g/n Wireless Access Point, 3x3 Spatial Multiplexing MIMO configuration

#### 2.4 GHz Operation

Antenna	Gain (dBi)	Maximum Total Conducted Peak Power (dBm)	
		Total	Per Chain
OMNI	7.4	+28.0	+23.23
SECTOR	12.0	+26.4	+21.63

Per chain value = Maximum Total Conducted Peak Power – 4.77 dB

#### 5.8 GHz Operation

Antenna	Gain (dBi)	Maximum Total Conducted Peak Power (dBm)	
		Total	Per Chain
OMNI	8.5	+30.0	+25.23
SECTOR	14.0	+30.0	+25.23

Per chain value = Maximum Total Conducted Peak Power – 4.77 dB

#### Power Reduction Required

It was found that power reduction was required on some operational modes. The following matrix takes this criteria into consideration and reports both individual chain power and total summed power for the reduced levels where required.

Output power measurements were performed on the OMNI (N-Type connector) device. Assumption: both the OMNI and SECTOR (integral antenna) power settings were identical.

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 116 of 412

### 5.1.2.2. 2.4 GHz 802.11b

#### TABLE OF RESULTS – 802.11b – Legacy OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	7.4 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412	21.68	21.44	21.59	--	N/A	26.34	28.00	-1.66
2437	22.01	21.55	21.45	--	N/A	26.45	28.00	-1.55
2462	21.24	21.40	21.27	--	N/A	26.08	28.00	-1.92

<b>Measurement uncertainty:</b>	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	12 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412	19.71	20.17	19.11	--	N/A	24.46	26.40	-1.94
2437	21.04	21.23	20.53	--	N/A	25.71	26.40	-0.69
2462	20.60	21.43	20.69	--	N/A	25.69	26.40	-0.71

<b>Measurement uncertainty:</b>	±1.33 dB
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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 117 of 412

### 5.1.2.3. 2.4 GHz 802.11g

#### TABLE OF RESULTS – 802.11g – Legacy OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	7.4 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412	20.85	20.95	20.83	--	N/A	25.65	28.00	-2.35
2437	20.97	20.94	21.53	--	N/A	25.93	28.00	-2.07
2462	20.73	20.98	21.03	--	N/A	25.69	28.00	-2.31

<b>Measurement uncertainty:</b>	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	12 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412	20.84	21.14	20.68	--	N/A	25.66	26.40	-0.74
2437	21.23	21.16	20.70	--	N/A	25.81	26.40	-0.59
2462	21.01	21.13	20.96	--	N/A	25.81	26.40	-0.59

<b>Measurement uncertainty:</b>	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 118 of 412

#### 5.1.2.4. 2.4 GHz 802.11n HT-20

##### TABLE OF RESULTS – 802.11n – HT-20 OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	7.4 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	20.82	20.95	20.55	--	N/A	25.55	28.00	-2.45
2437	21.17	20.94	21.21	--	N/A	25.88	28.00	-2.12
2462	21.08	21.74	21.36	--	N/A	26.17	28.00	-1.83

Measurement uncertainty:	±1.33 dB
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##### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	12 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	20.81	21.16	20.55	--	N/A	25.62	26.40	-0.78
2437	21.21	20.95	20.64	--	N/A	25.71	26.40	-0.69
2462	20.11	20.48	20.12	--	N/A	25.01	26.40	-1.39

Measurement uncertainty:	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 119 of 412

### 5.1.2.5. 2.4 GHz 802.11n HT-40

#### TABLE OF RESULTS – 802.11n – HT-40

#### OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	7.4 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2422	22.18	21.86	22.16	--	N/A	26.84	28.00	-1.16
2437	21.74	21.75	21.27	--	N/A	26.36	28.00	-1.64
2452	21.10	20.87	21.00	--	N/A	25.76	28.00	-2.24

Measurement uncertainty:	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	12 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2422	21.51	20.78	21.22	--	N/A	25.95	26.40	-0.45
2437	21.45	21.04	21.11	--	N/A	25.97	26.40	-0.43
2452	20.64	20.93	20.36	--	N/A	25.42	26.40	-0.98

Measurement uncertainty:	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 120 of 412

### 5.1.2.6. 5.8 GHz 802.11a 5 MHz

#### TABLE OF RESULTS – 802.11a – Legacy 5 MHz OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a, 5 MHz	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	8.5 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5730.5	18.15	19.66	18.66	--	N/A	23.64	30.00	-6.36
5790.5	17.17	16.90	18.81	--	N/A	22.48	30.00	-7.52
5845.5	17.88	15.10	16.53	--	N/A	21.42	30.00	-8.58

Measurement uncertainty:	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a, 5 MHz	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	14 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5730.5	18.15	19.66	18.66	--	N/A	23.64	30.00	-6.36
5790.5	17.17	16.90	18.81	--	N/A	22.48	30.00	-7.52
5845.5	18.17	15.33	17.00	--	N/A	21.76	30.00	-8.24

Measurement uncertainty:	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 121 of 412

### 5.1.2.7. 5.8 GHz 802.11a 10 MHz

#### TABLE OF RESULTS – 802.11a – Legacy 10 MHz

#### OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a, 10 MHz	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	8.5 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5735.0	21.63	21.46	21.90	--	N/A	26.44	30.00	-3.56
5790.0	21.20	20.79	22.08	--	N/A	26.16	30.00	-3.84
5840.0	21.56	19.88	20.45	--	N/A	25.46	30.00	-4.54

Measurement uncertainty:	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a, 10 MHz	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	14 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5735.0	21.63	21.46	21.90	--	N/A	26.44	30.00	-3.56
5790.0	21.20	20.79	22.08	--	N/A	26.16	30.00	-3.84
5840.0	22.14	20.29	21.96	--	N/A	26.31	30.00	-3.69

Measurement uncertainty:	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 122 of 412

### 5.1.2.8. 5.8 GHz 802.11a 20 MHz

#### TABLE OF RESULTS – 802.11a – Legacy OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	8.5 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5745	21.77	21.24	23.16	--	N/A	26.91	30.00	-3.09
5785	22.94	22.30	24.20	--	N/A	27.99	30.00	-2.01
5825	23.17	20.64	23.61	--	N/A	27.43	30.00	-2.57

Measurement uncertainty:	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	14 dBi
<b>Applied Voltage:</b>	48.00 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5745	21.34	21.10	23.24	--	N/A	26.77	30.00	-3.23
5785	22.29	21.93	23.69	--	N/A	27.48	30.00	-2.52
5825	22.48	20.16	23.19	--	N/A	26.89	30.00	-3.11

Measurement uncertainty:	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 123 of 412

### 5.1.2.9. 5.8 GHz 802.11n HT-20

#### TABLE OF RESULTS – 802.11n – HT-20 OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)		<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20		<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH		<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON		<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB		<b>Antenna Gain:</b>	8.5 dBi
<b>Applied Voltage:</b>	48.00 Vdc			
<b>Notes 1:</b>				
<b>Notes 2:</b>				

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5745	20.70	20.30	22.15	--	N/A	25.90	30.00	-4.10
5785	22.89	22.21	24.14	--	N/A	27.93	30.00	-2.07
5825	22.95	20.30	23.20	--	N/A	27.10	30.00	-2.90

<b>Measurement uncertainty:</b>	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)		<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20		<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH		<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON		<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB		<b>Antenna Gain:</b>	14 dBi
<b>Applied Voltage:</b>	48.00 Vdc			
<b>Notes 1:</b>				
<b>Notes 2:</b>				

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5745	20.70	20.30	22.15	--	N/A	25.90	30.00	-4.10
5785	22.15	22.11	23.57	--	N/A	27.44	30.00	-2.56
5825	22.37	20.36	22.71	--	N/A	26.70	30.00	-3.30

<b>Measurement uncertainty:</b>	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 124 of 412

### 5.1.2.10.5.8 GHz 802.11n HT-40

#### TABLE OF RESULTS – 802.11n – HT-40 OMNI ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)		<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40		<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH		<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON		<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB		<b>Antenna Gain:</b>	8.5 dBi
<b>Applied Voltage:</b>	48.00 Vdc			
<b>Notes 1:</b>				
<b>Notes 2:</b>				

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5755	17.70	18.57	19.57	--	N/A	23.45	30.00	-6.55
5795	22.97	21.91	23.97	--	N/A	27.80	30.00	-2.20

<b>Measurement uncertainty:</b>	±1.33 dB
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#### SECTOR ANTENNA MEASUREMENT RESULTS

<b>Test Conditions:</b>	15.247 (b)		<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40		<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH		<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON		<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain (Y):</b>	N/A dB		<b>Antenna Gain:</b>	14 dBi
<b>Applied Voltage:</b>	48.00 Vdc			
<b>Notes 1:</b>				
<b>Notes 2:</b>				

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5755	17.70	18.57	19.57	--	N/A	23.45	30.00	-6.55
5795	22.42	21.76	23.69	--	N/A	27.47	30.00	-2.53

<b>Measurement uncertainty:</b>	±1.33 dB
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 125 of 412

## Specification

### Limits

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

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

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

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

(1) Fixed point-to-point operation:

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

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

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

**§ RSS-210 A8.4(4)** For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands the maximum peak conducted power shall not exceed 1 watt.

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 126 of 412

#### Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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#### Traceability

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

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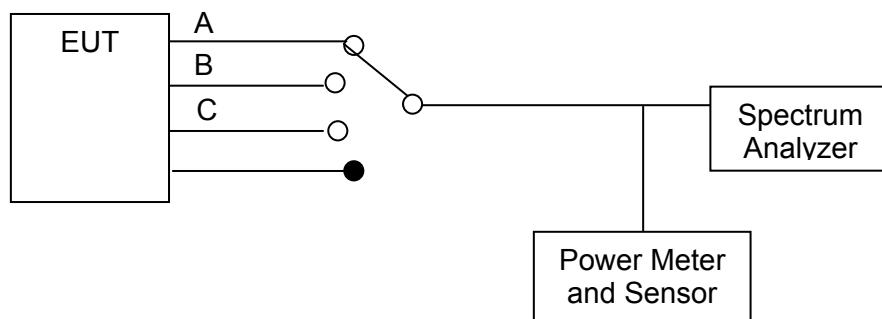
### 5.1.3. Peak Power Spectral Density

FCC, Part 15 Subpart C §15.247(e)  
Industry Canada RSS-210 §A8.2

#### Test Procedure

The transmitter output was connected to a spectrum analyzer and the maximum level in a 3 kHz bandwidth was measured. A peak value was found over the full emission bandwidth and the frequency span reduced to obtain enhanced resolution. Sweep time  $\geq$  span / 3 kHz with video averaging turned off. The Peak Power Spectral Density is the highest level found across the emission in a 3 kHz resolution bandwidth.

#### Test Measurement Set up



Measurement set up for Peak Power Spectral Density

#### Measurement Results for Peak Power Spectral Density

Ambient conditions.

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

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

**NOTE: KDB 662911 was implemented for In-band power spectral density (PSD) measurements.  
Option (2) Measure and add 10 log (N) dB was implemented**

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 128 of 412

### Peak Power Spectral Density

#### TABLE OF RESULTS – 802.11b

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

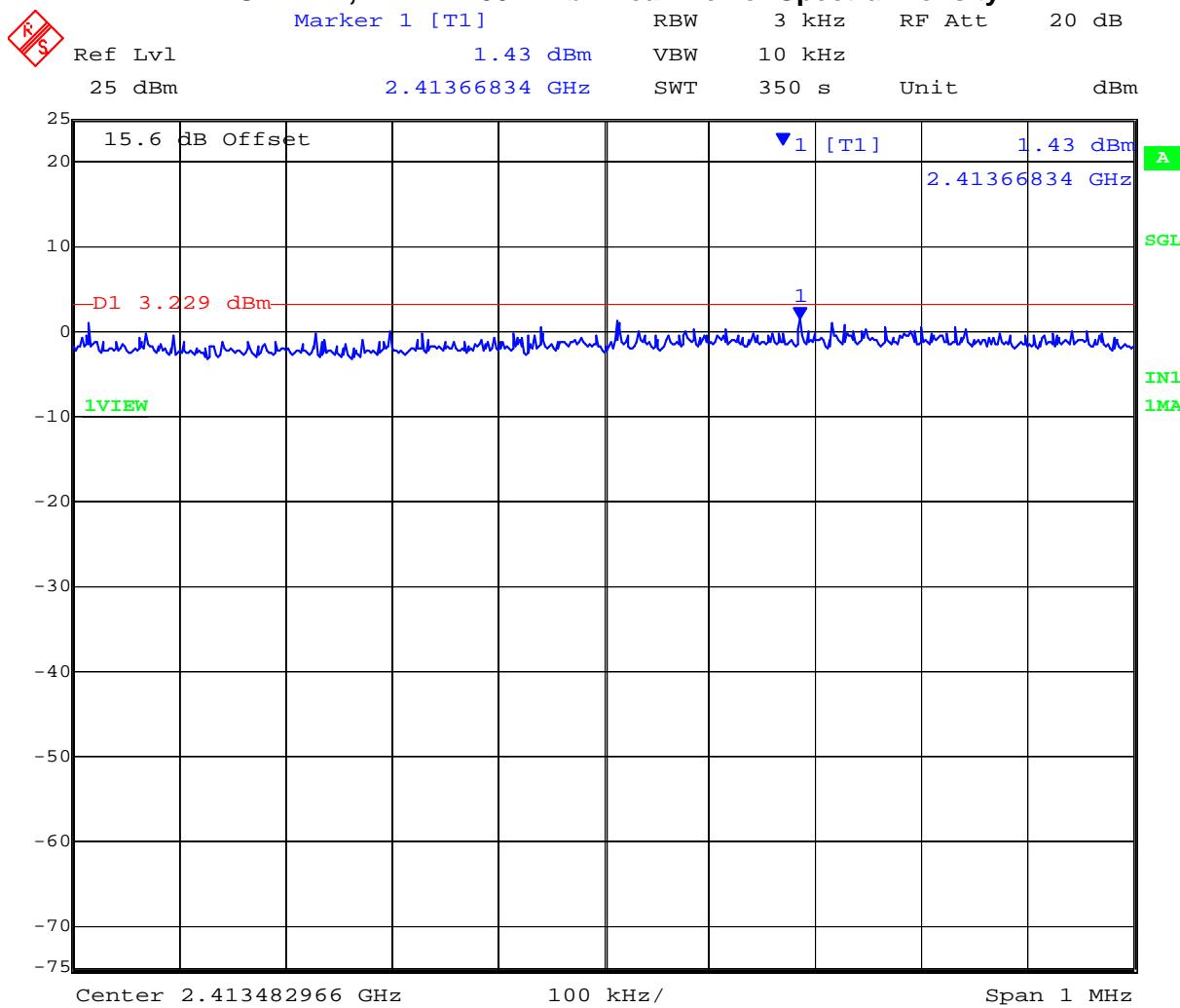
Test Frequency	Measured Power Density				Correction factor	$\Sigma$ Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2412	1.43	0.61	2.05	--	4.77	6.82	3.23	-1.18
2437	1.16	0.71	0.72	--	4.77	5.93	3.23	-2.07
2462	0.33	0.75	0.38	--	4.77	5.52	3.23	-2.48

Measurement uncertainty:	± 1.33 dB
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NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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### PORT A 2,412 MHz 802.11b - Peak Power Spectral Density

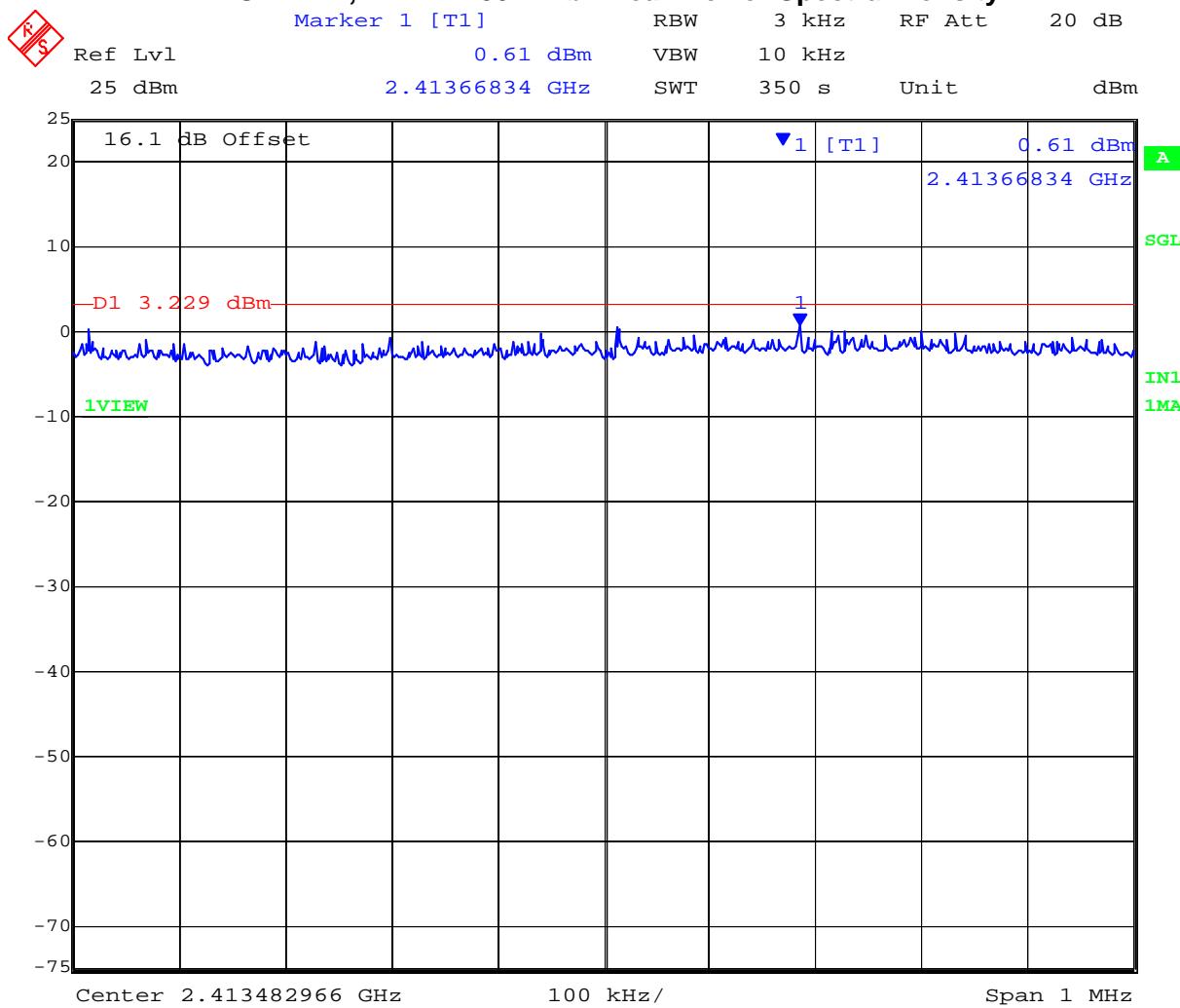


Date: 29.FEB.2012 18:55:06

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### PORT B 2,412 MHz 802.11b - Peak Power Spectral Density

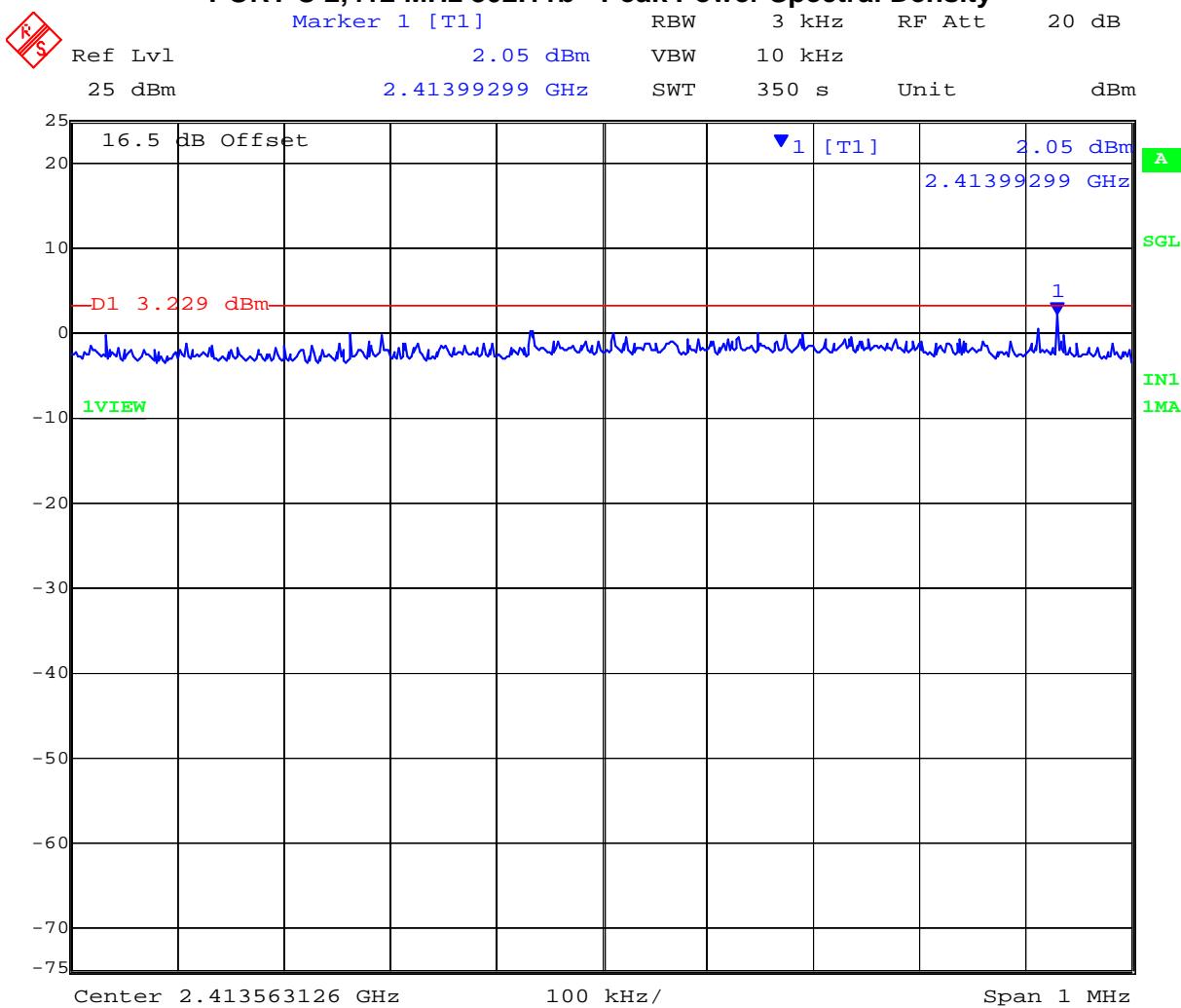


Date: 29.FEB.2012 19:01:37

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### PORT C 2,412 MHz 802.11b - Peak Power Spectral Density



Date: 29.FEB.2012 19:08:06

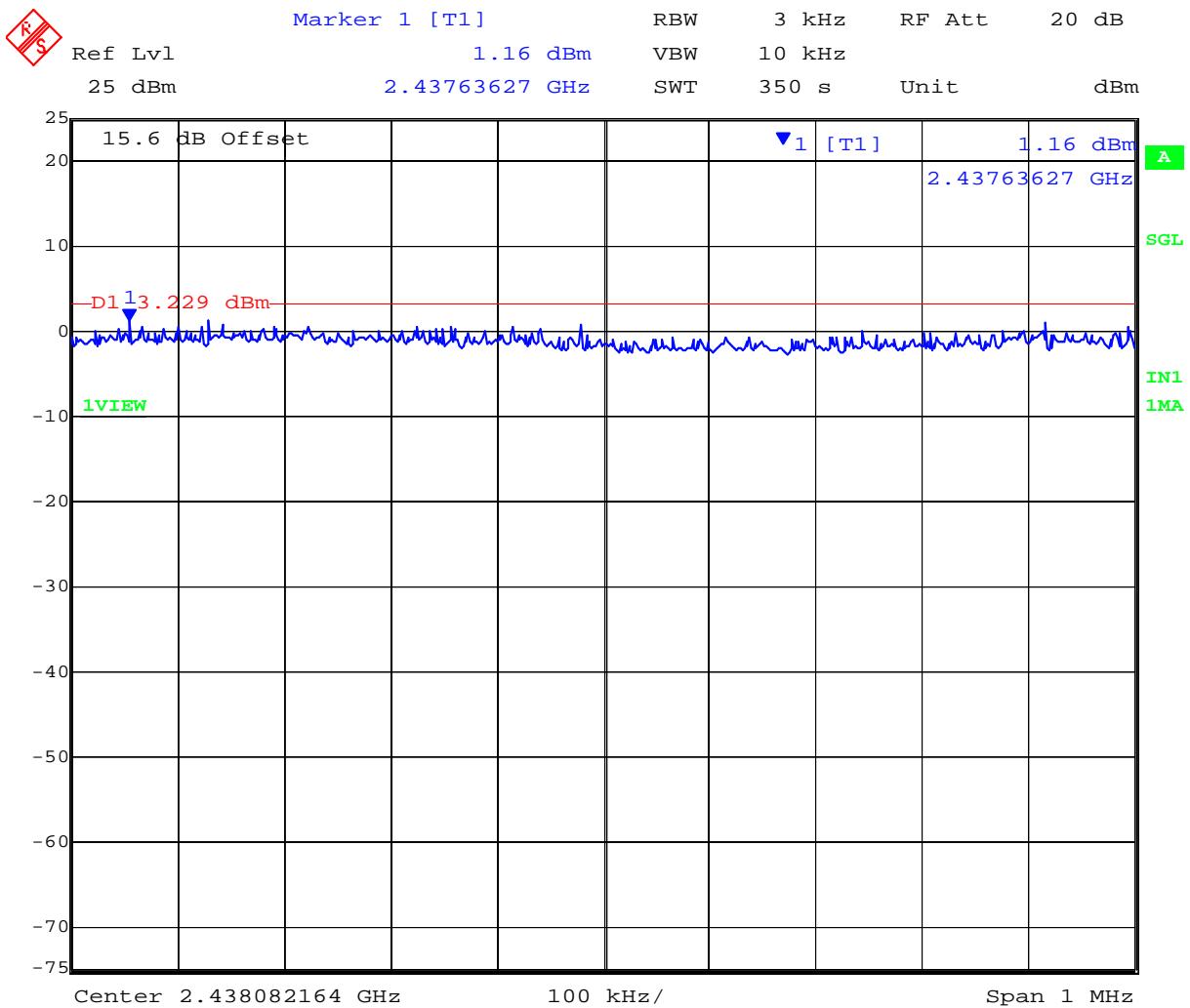
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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 132 of 412

### PORT A 2,437 MHz 802.11b - Peak Power Spectral Density



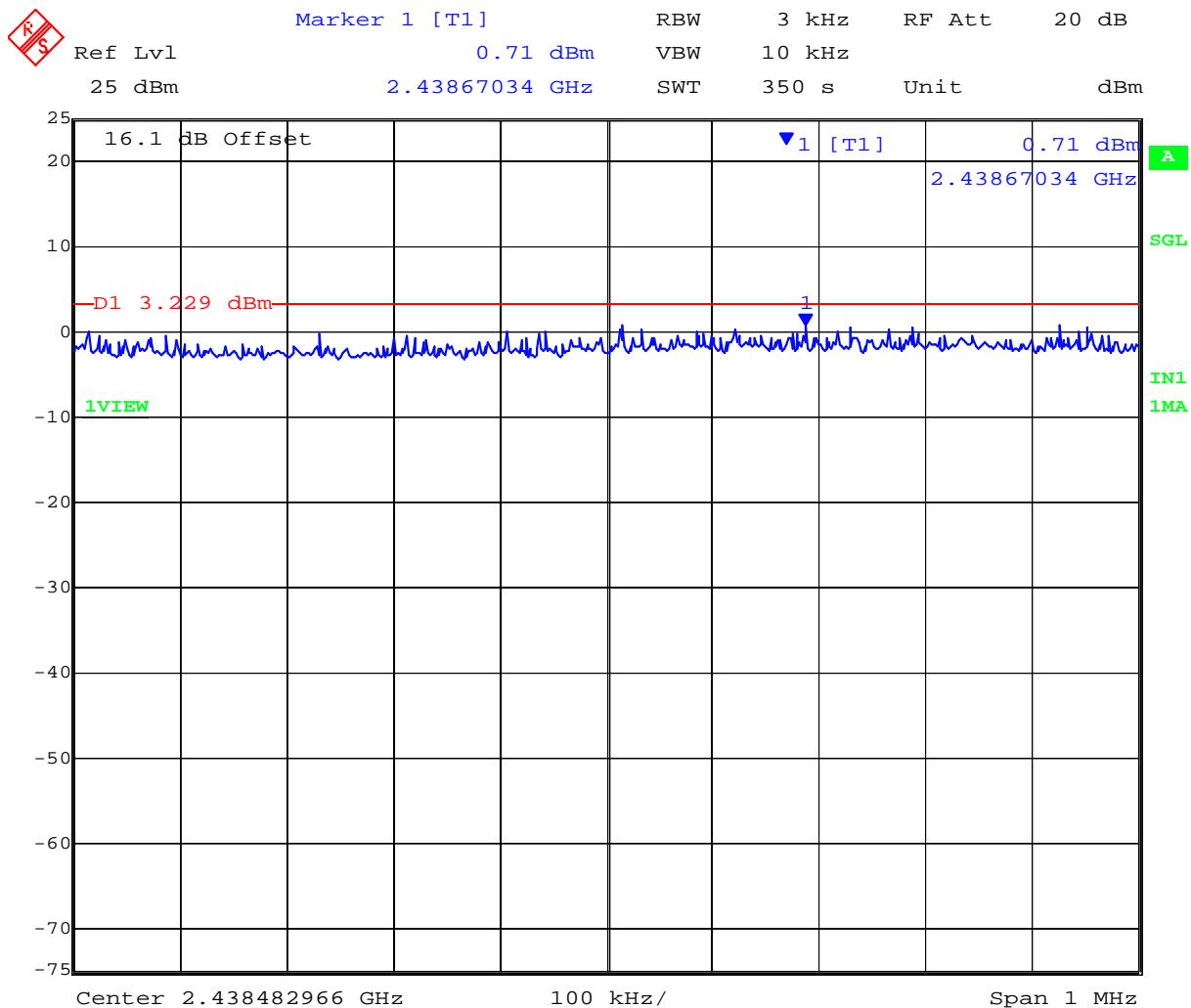
Date: 29.FEB.2012 13:45:01

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 133 of 412

### PORT B 2,437 MHz 802.11b - Peak Power Spectral Density



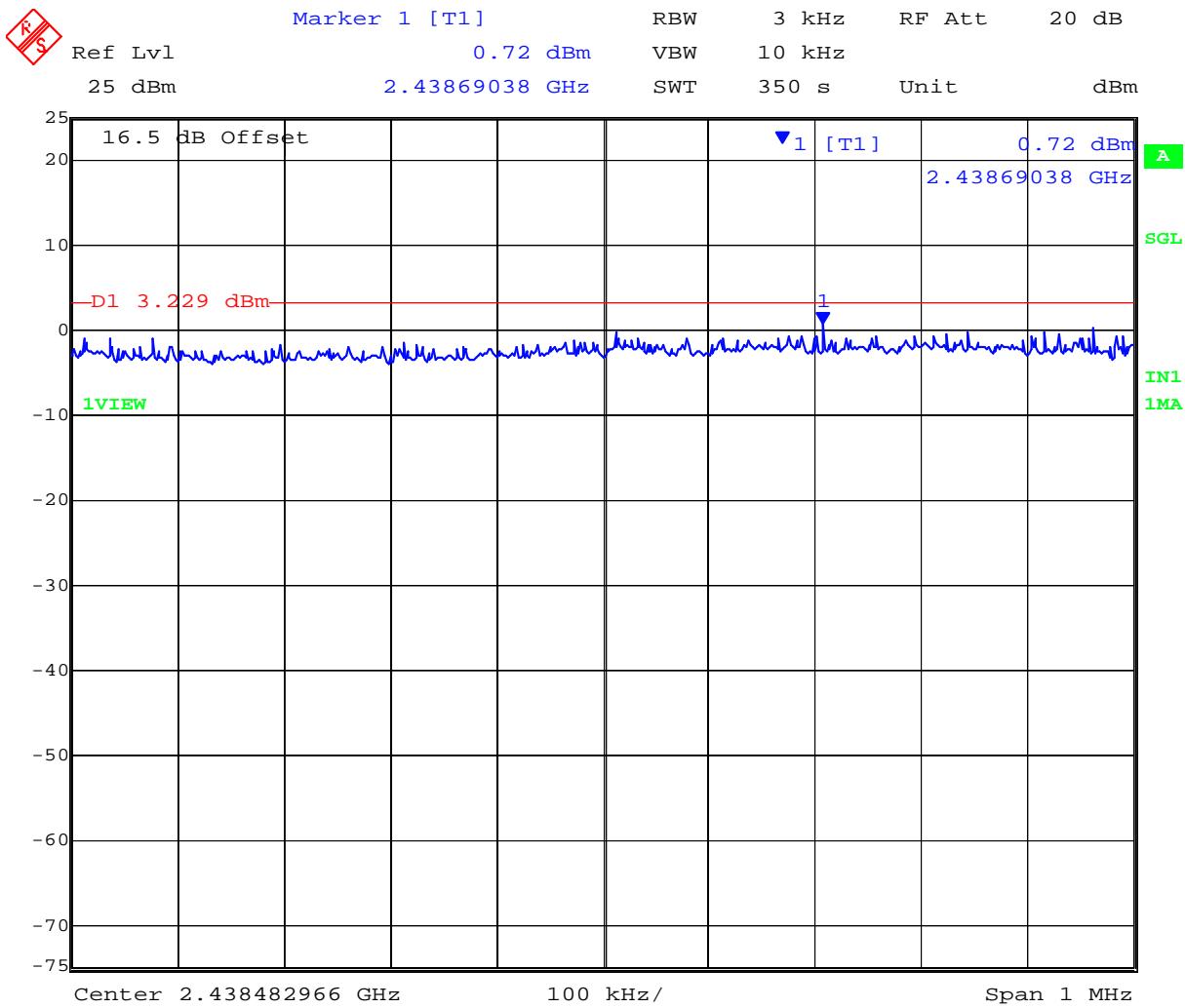
Date: 29.FEB.2012 13:51:32

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 134 of 412

### PORT C 2,437 MHz 802.11b - Peak Power Spectral Density



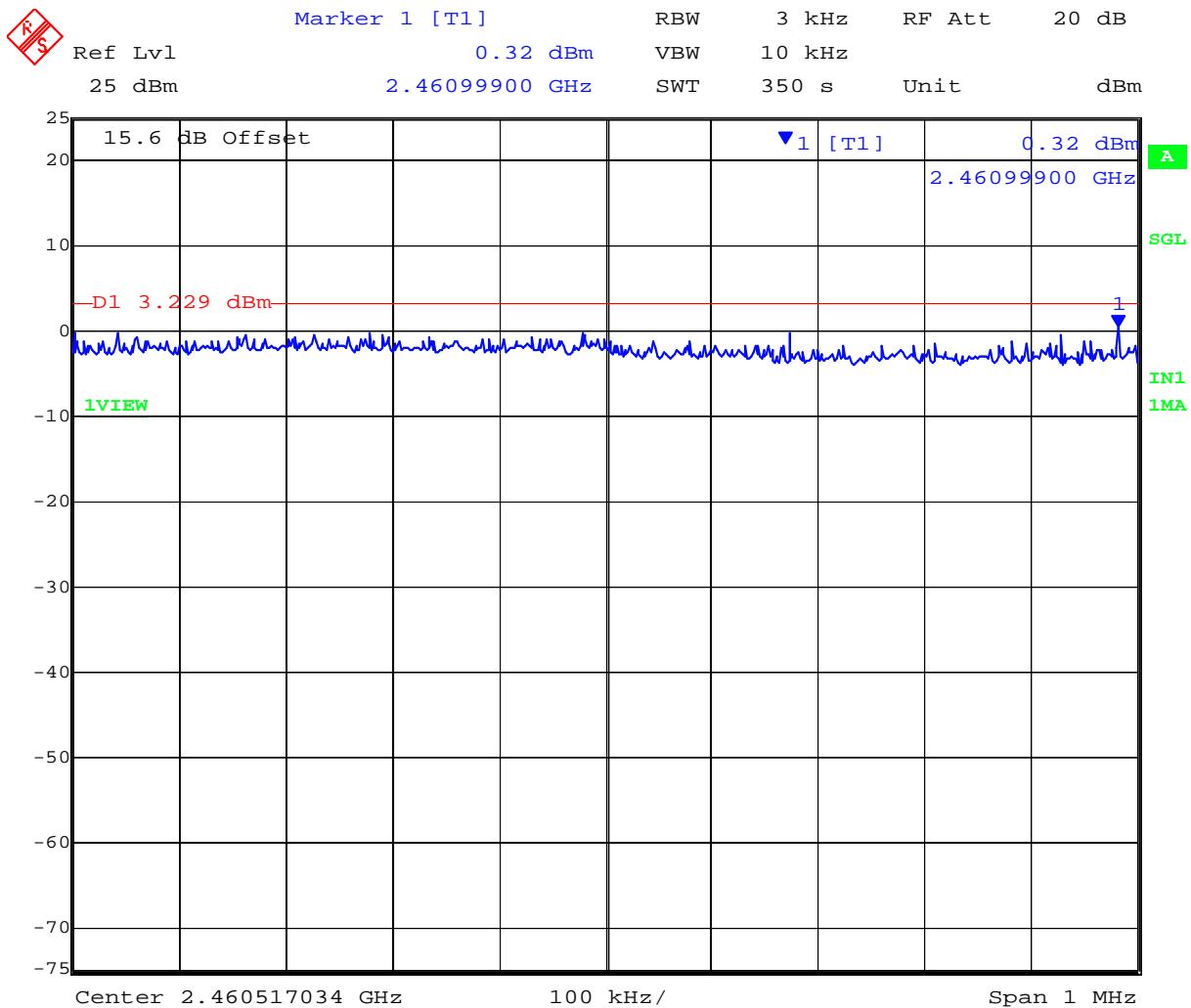
Date: 29.FEB.2012 13:58:02

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 135 of 412

### PORT A 2,462 MHz 802.11b - Peak Power Spectral Density



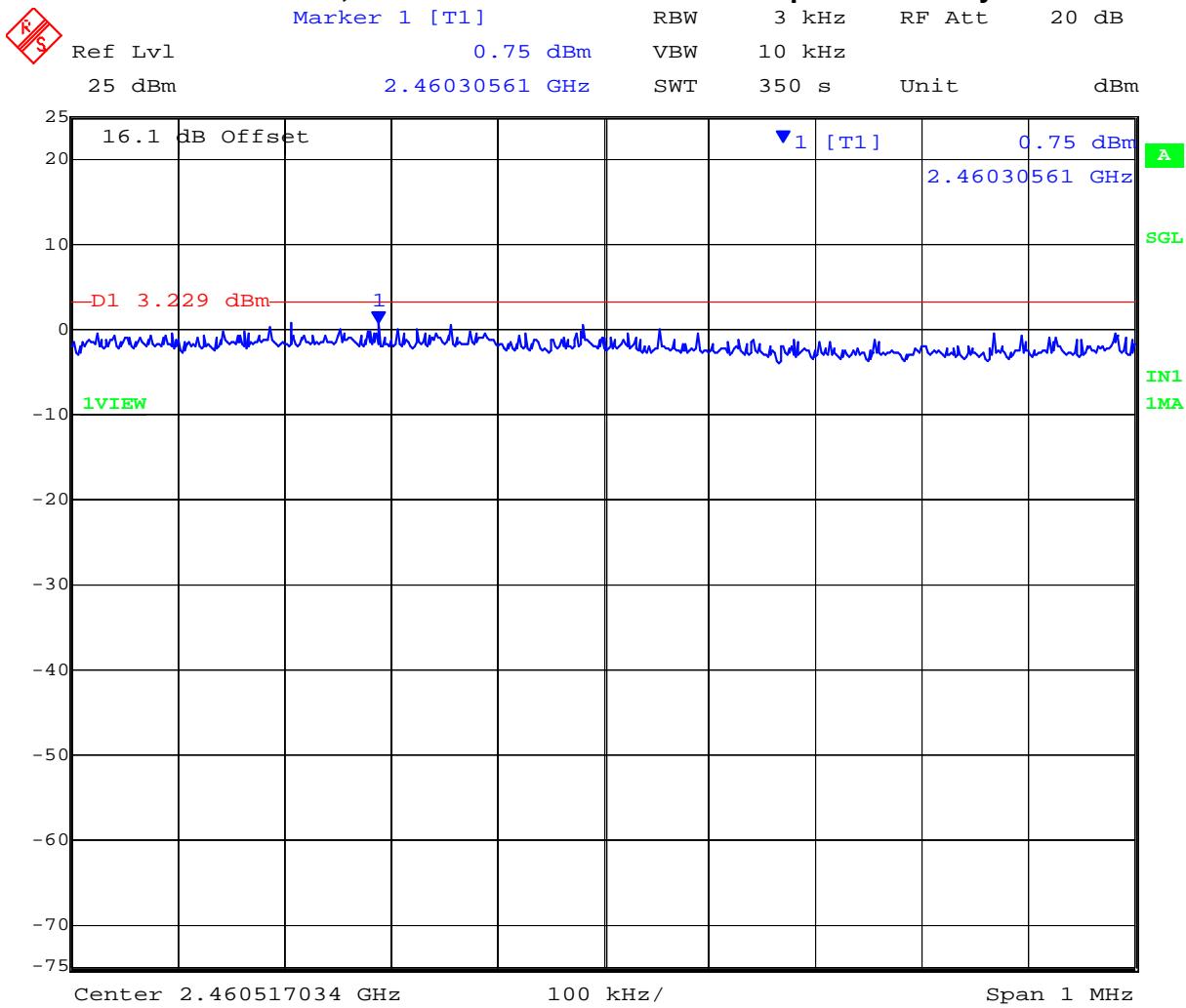
Date: 29.FEB.2012 19:15:47

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 136 of 412

### PORT B 2,462 MHz 802.11b - Peak Power Spectral Density



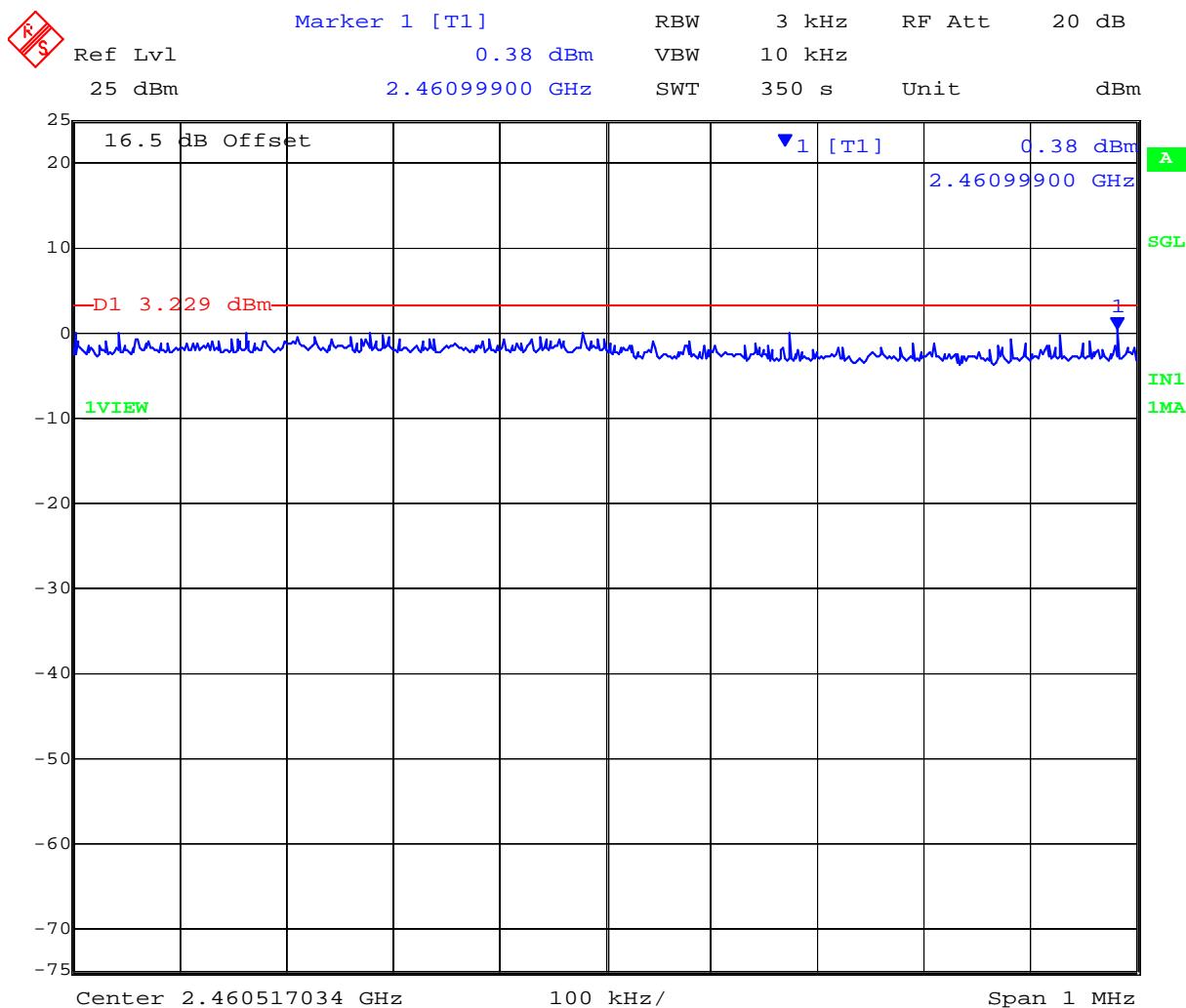
Date: 29.FEB.2012 19:22:18

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 137 of 412

### PORT C 2,462 MHz 802.11b - Peak Power Spectral Density



Date: 29.FEB.2012 19:28:48

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 138 of 412

### Peak Power Spectral Density

#### TABLE OF RESULTS – 802.11g Legacy

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

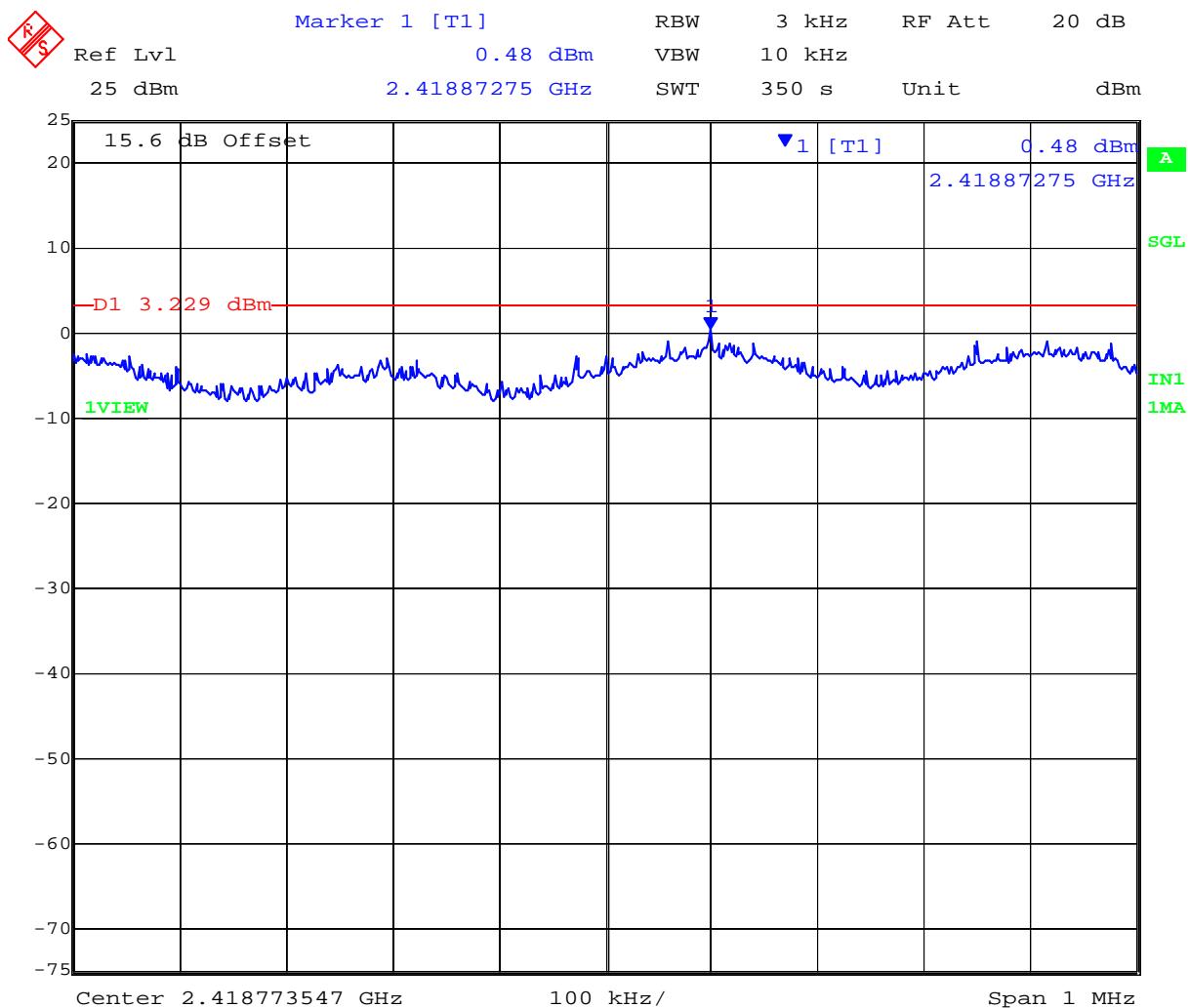
Test Frequency	Measured Power Density				Correction factor	$\Sigma$ Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2412	0.48	-0.80	-0.86	--	4.77	5.25	3.23	-2.75
2437	-0.73	-2.21	-0.41	--	4.77	4.36	3.23	-3.64
2462	-0.98	-0.82	0.06	--	4.77	4.84	3.23	-3.17

Measurement uncertainty:	± 1.33 dB
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NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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### PORT A 2,412 MHz 802.11g Legacy - Peak Power Spectral Density

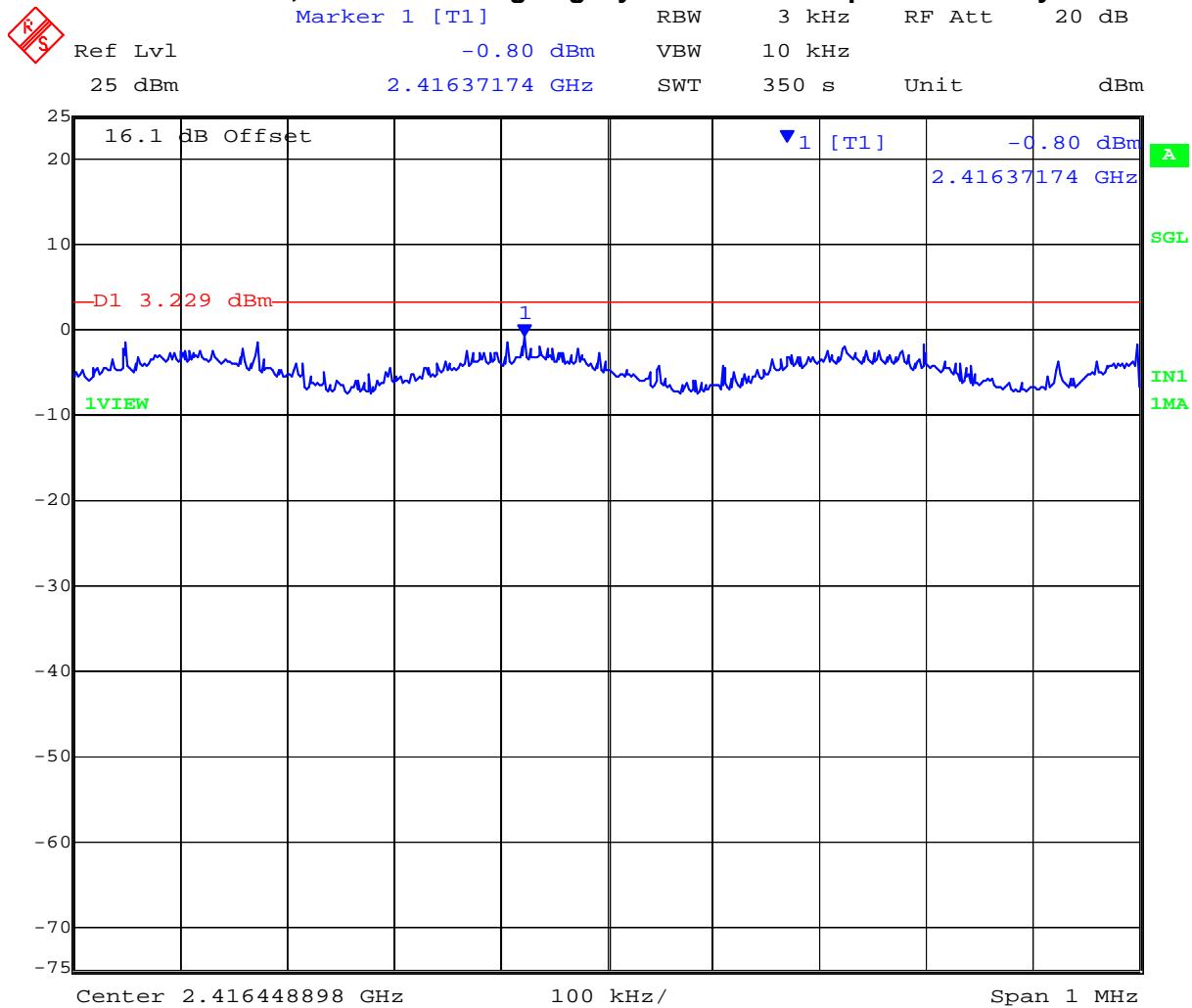


Date: 29.FEB.2012 11:29:29

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### PORT B 2,412 MHz 802.11g Legacy - Peak Power Spectral Density

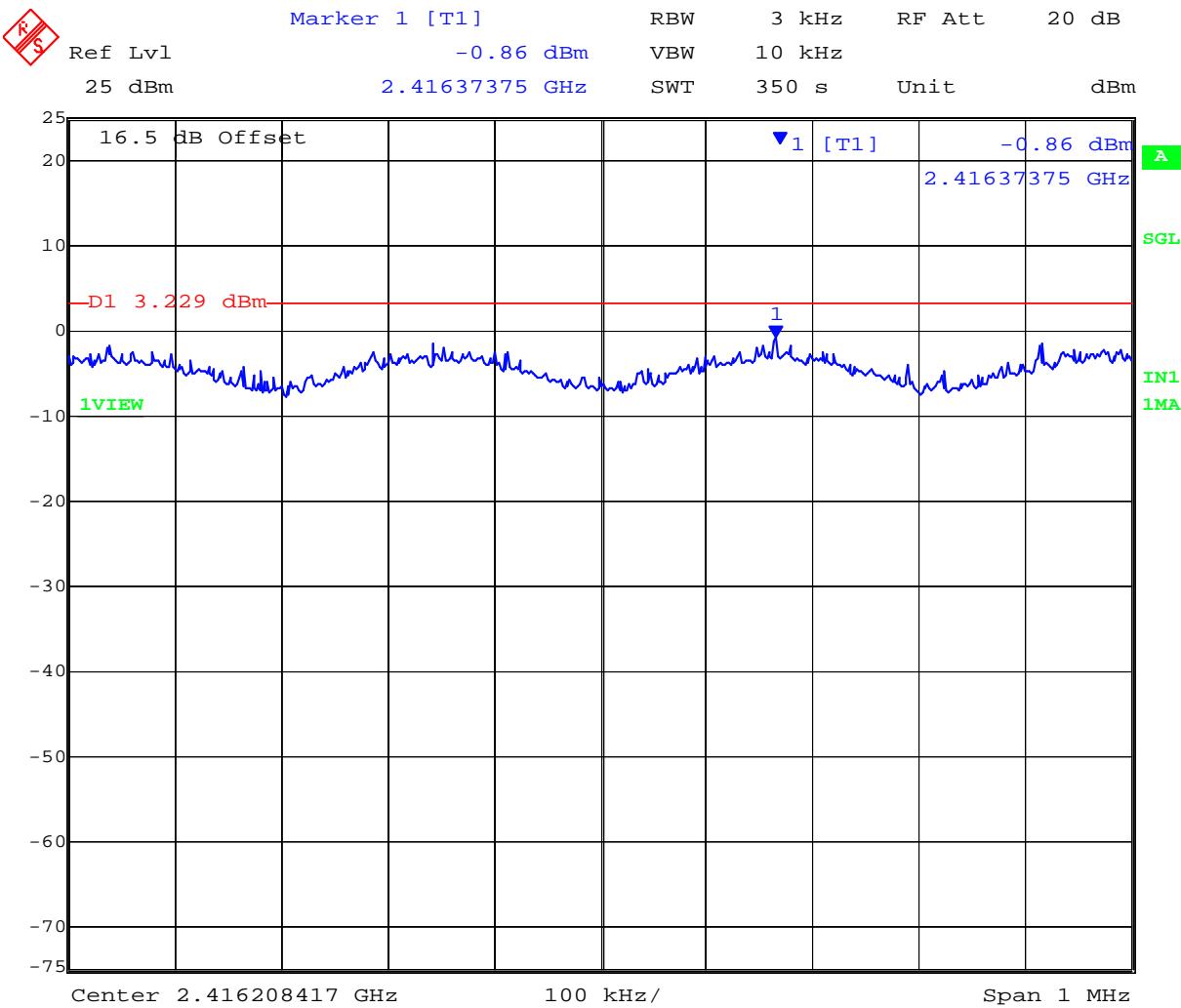


Date: 29.FEB.2012 11:36:00

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### PORT C 2,412 MHz 802.11g Legacy - Peak Power Spectral Density

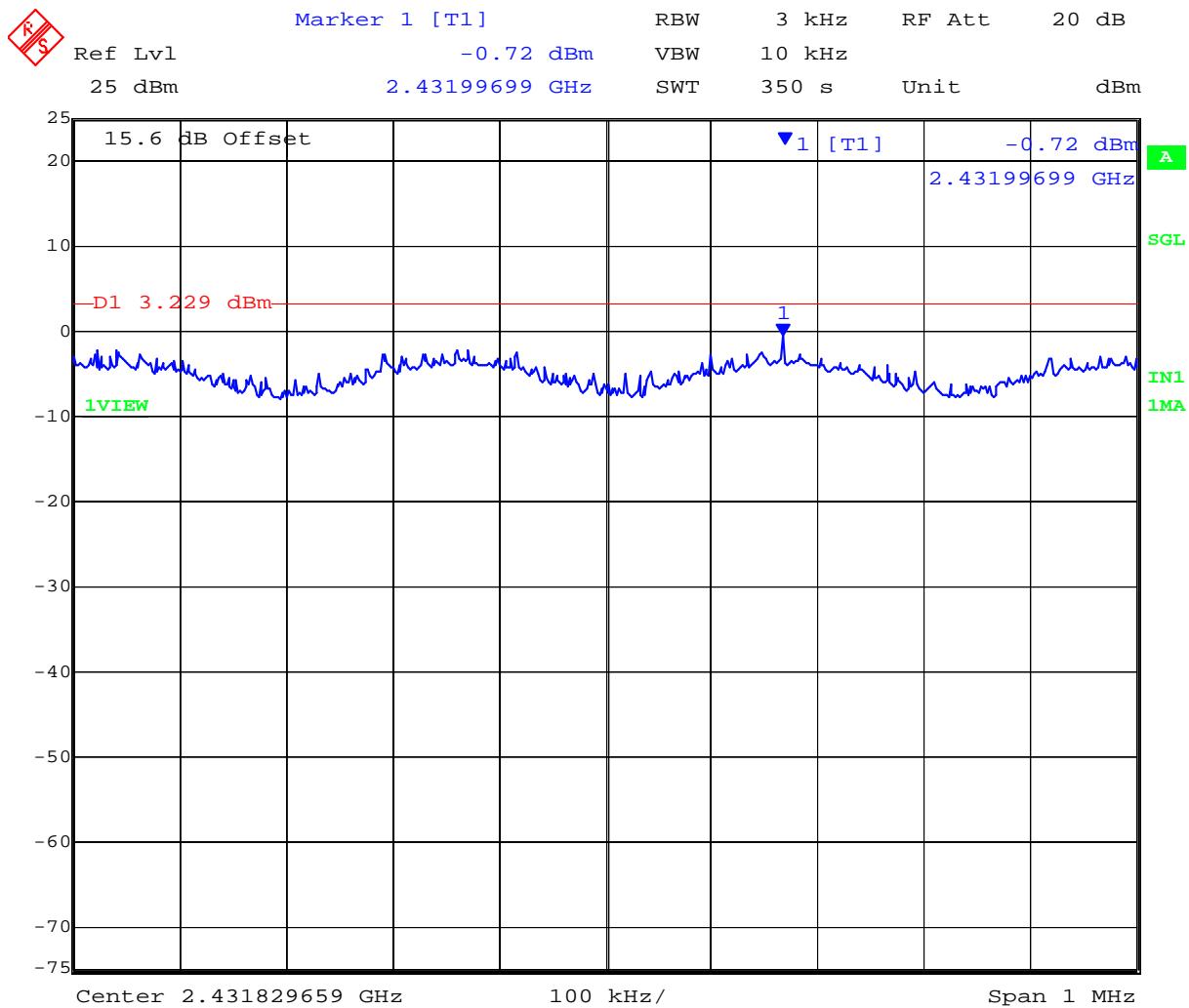


Date: 29.FEB.2012 11:42:29

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### PORT A 2,437 MHz 802.11g Legacy - Peak Power Spectral Density

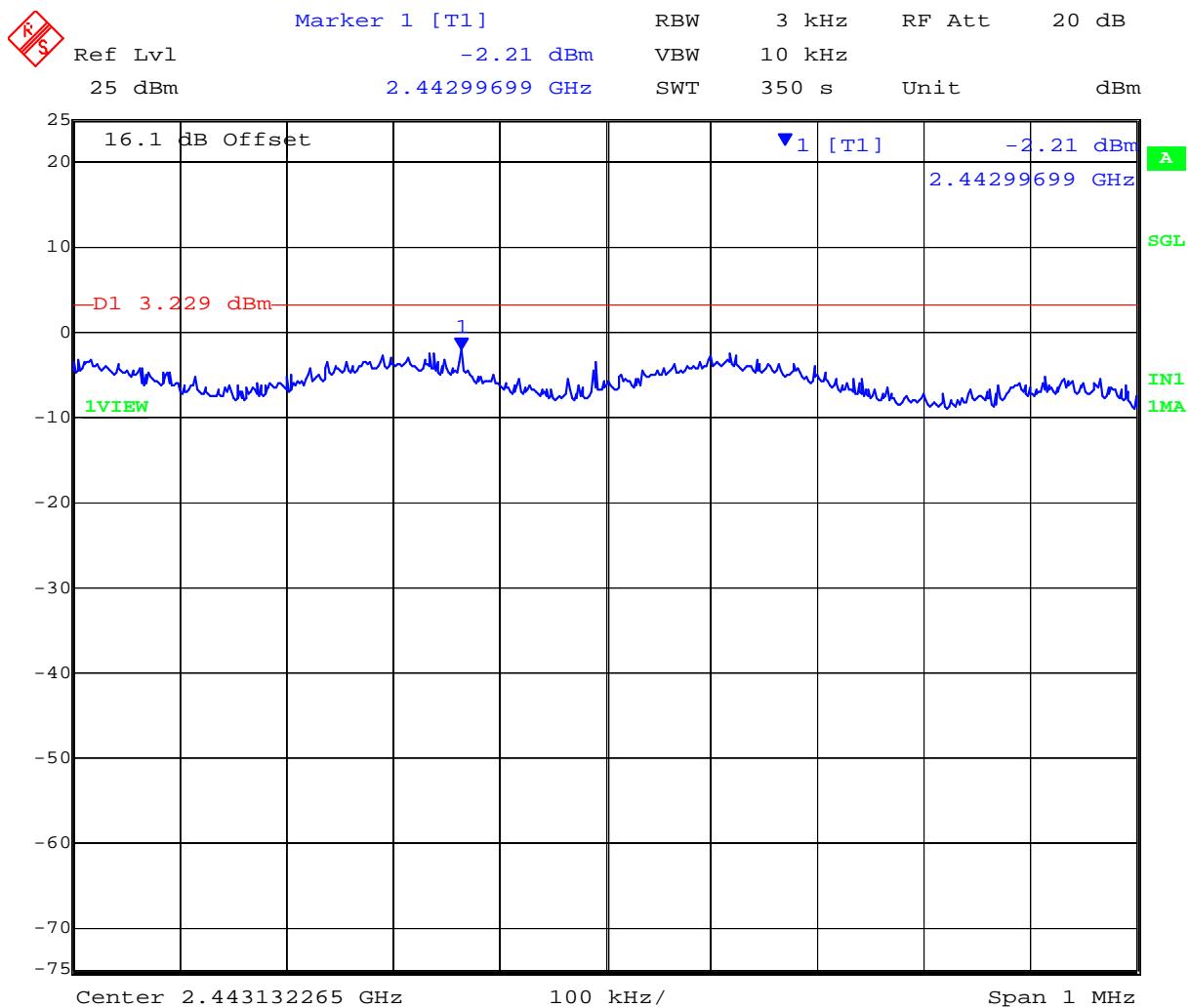


Date: 29.FEB.2012 12:01:04

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### PORT B 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 29.FEB.2012 12:07:36

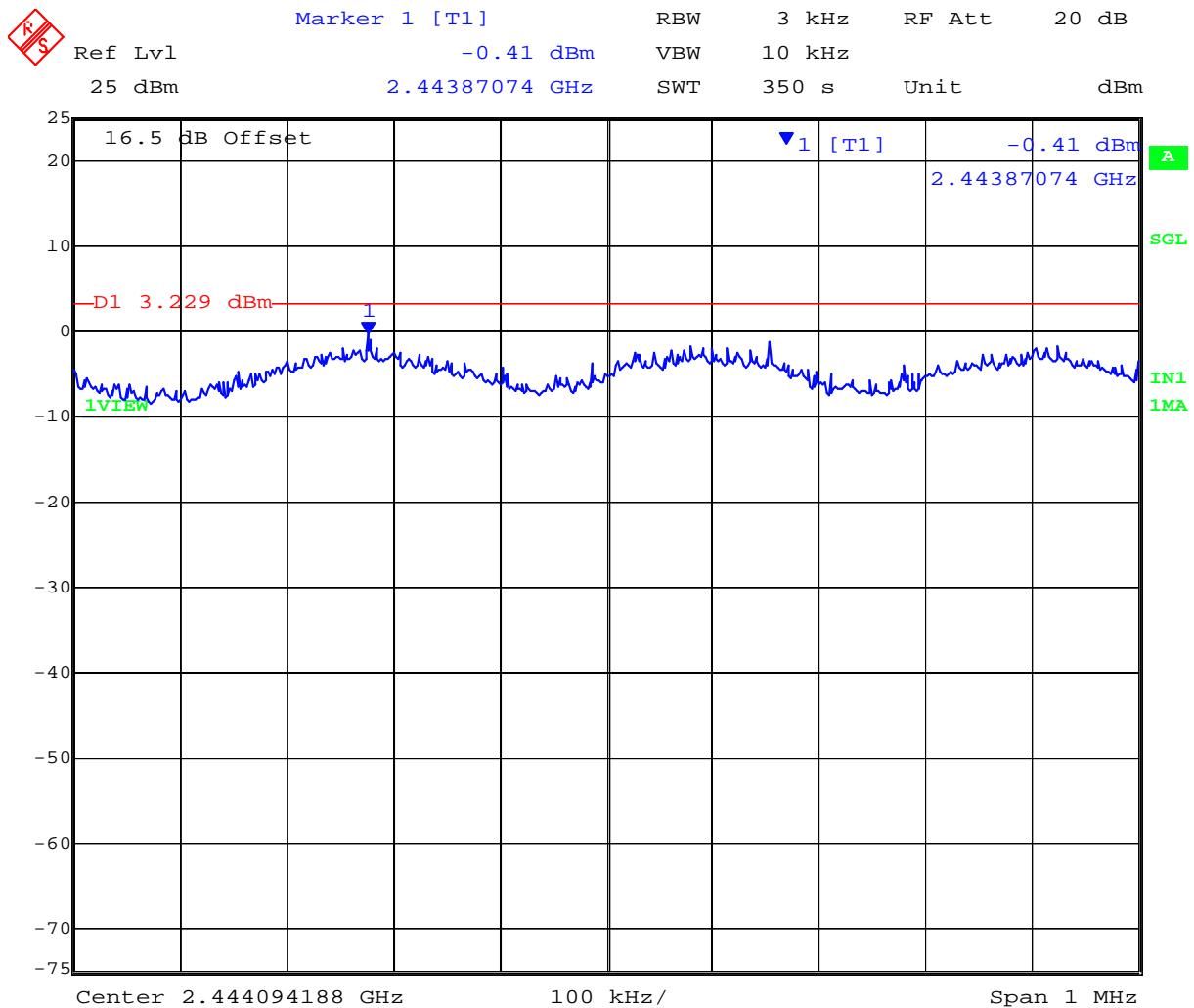
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 144 of 412

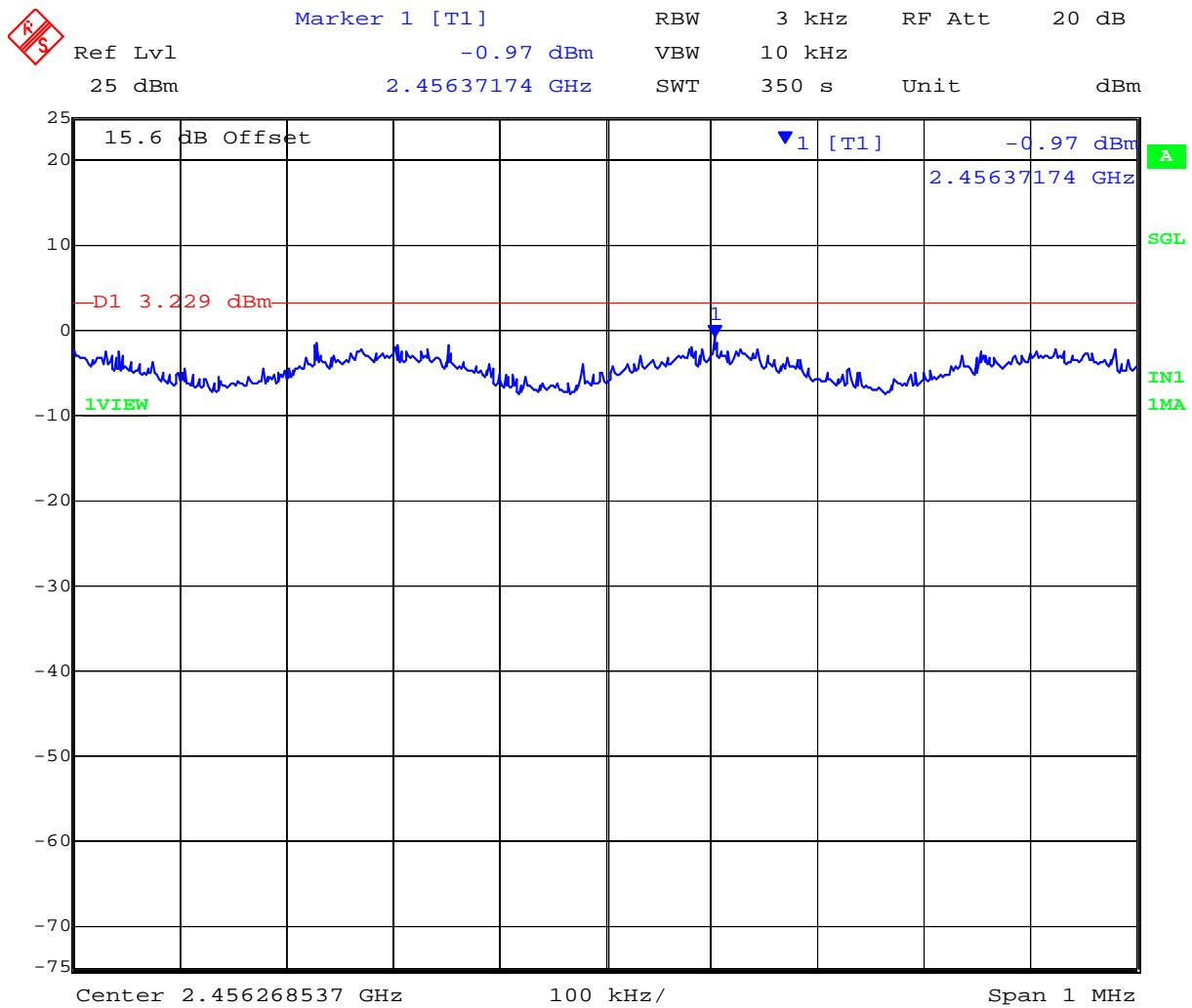
### PORT C 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 29.FEB.2012 12:14:06

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### PORT A 2,462 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 29.FEB.2012 12:36:44

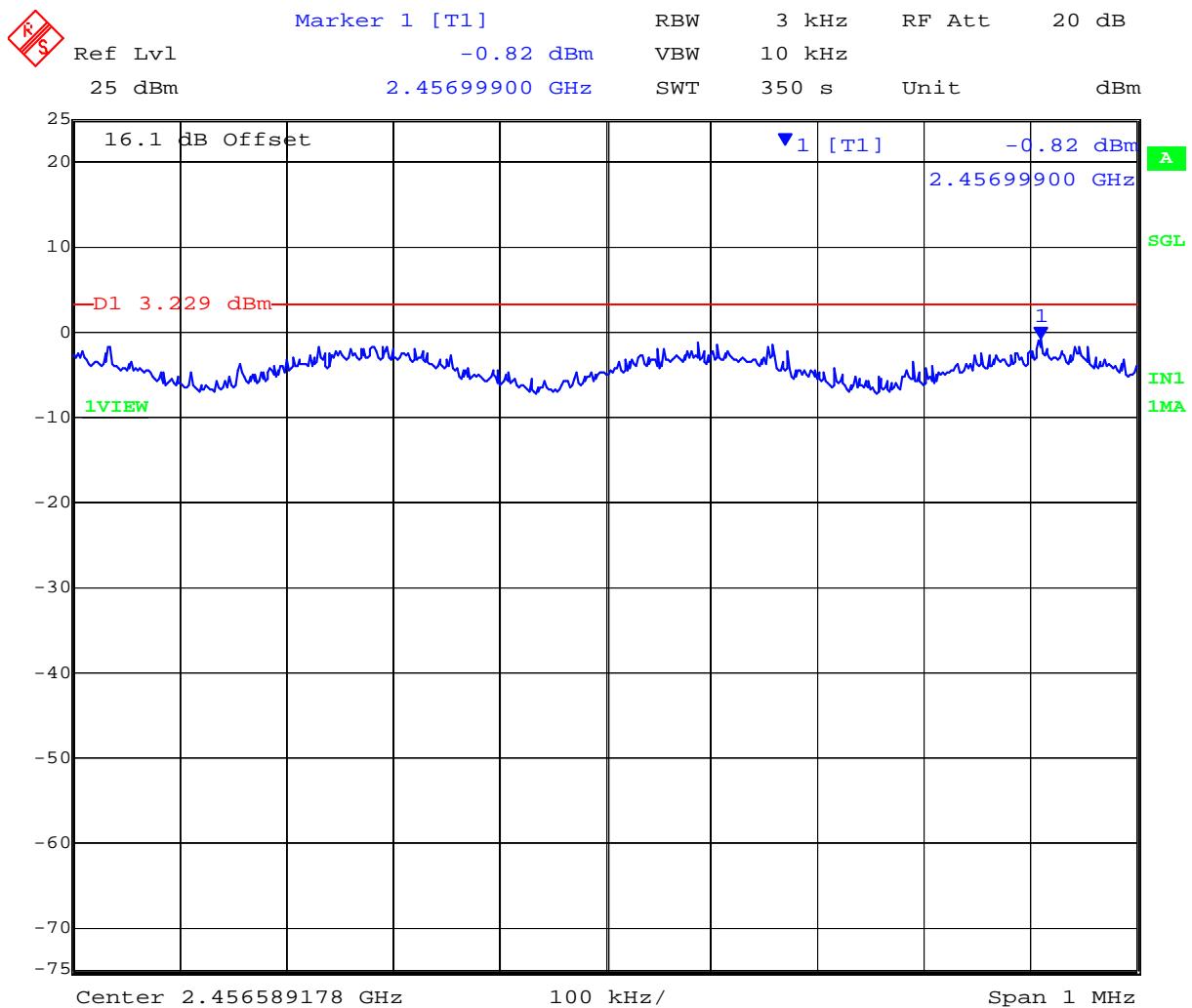
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 146 of 412

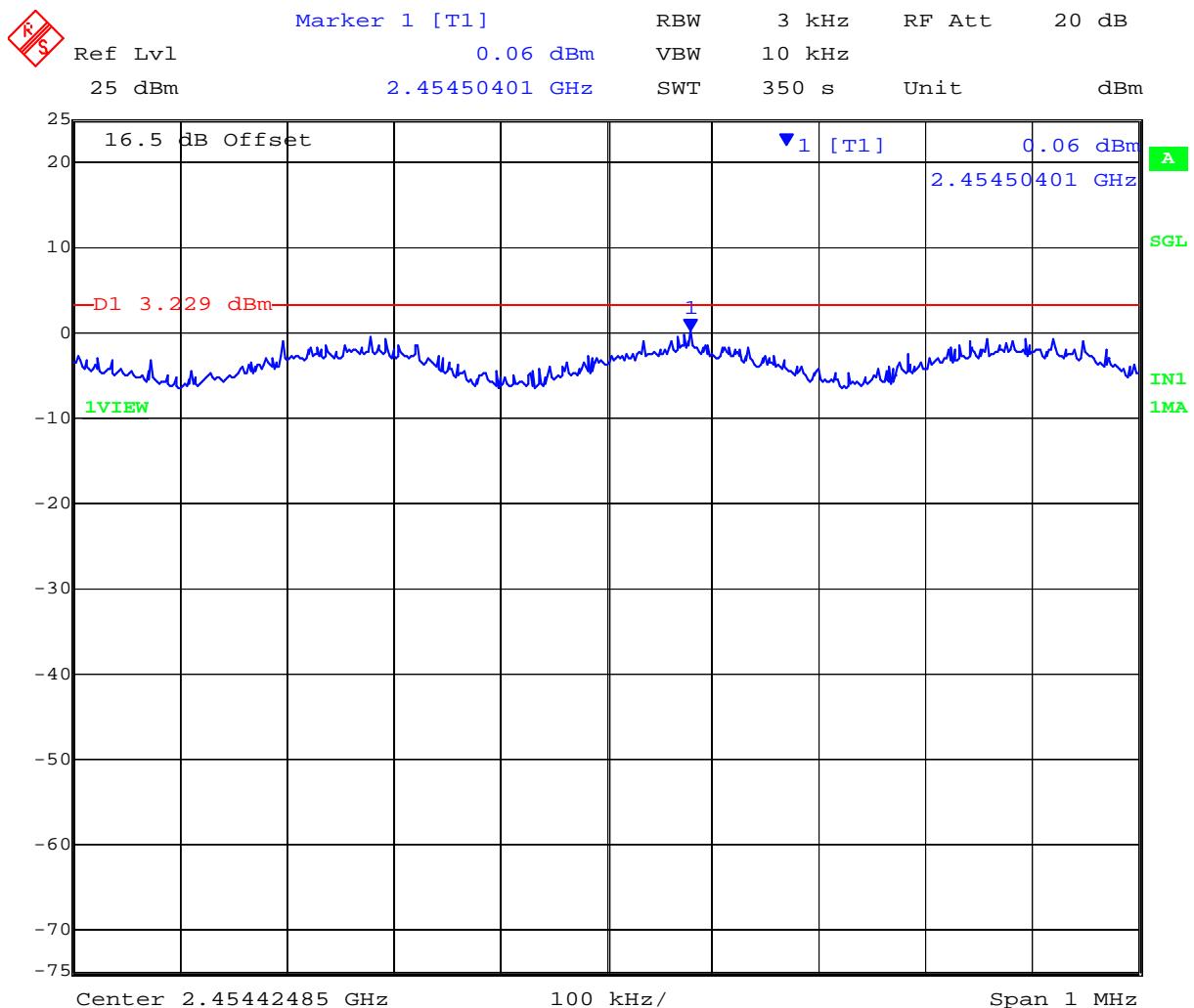
### PORT B 2,462 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 29.FEB.2012 12:43:17

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### PORT C 2,462 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 29.FEB.2012 12:49:48

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 148 of 412

### Peak Power Spectral Density

#### TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2412	-1.97	-1.49	-2.55	--	4.77	3.29	3.23	-4.72
2437	-2.41	-2.16	-2.29	--	4.77	2.61	3.23	-5.39
2462	-1.79	-0.25	-1.05	--	4.77	4.53	3.23	-3.48

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

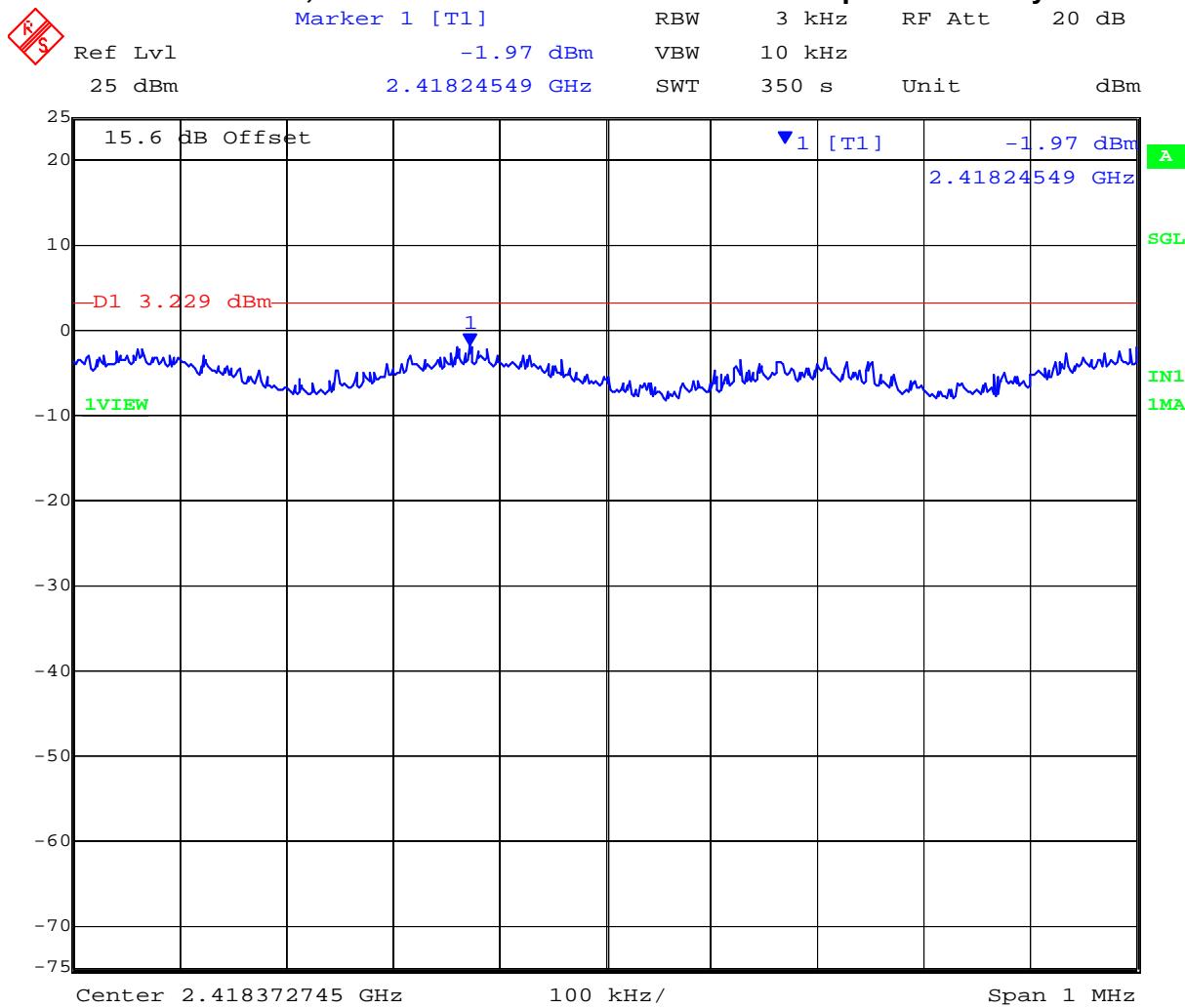
NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 149 of 412

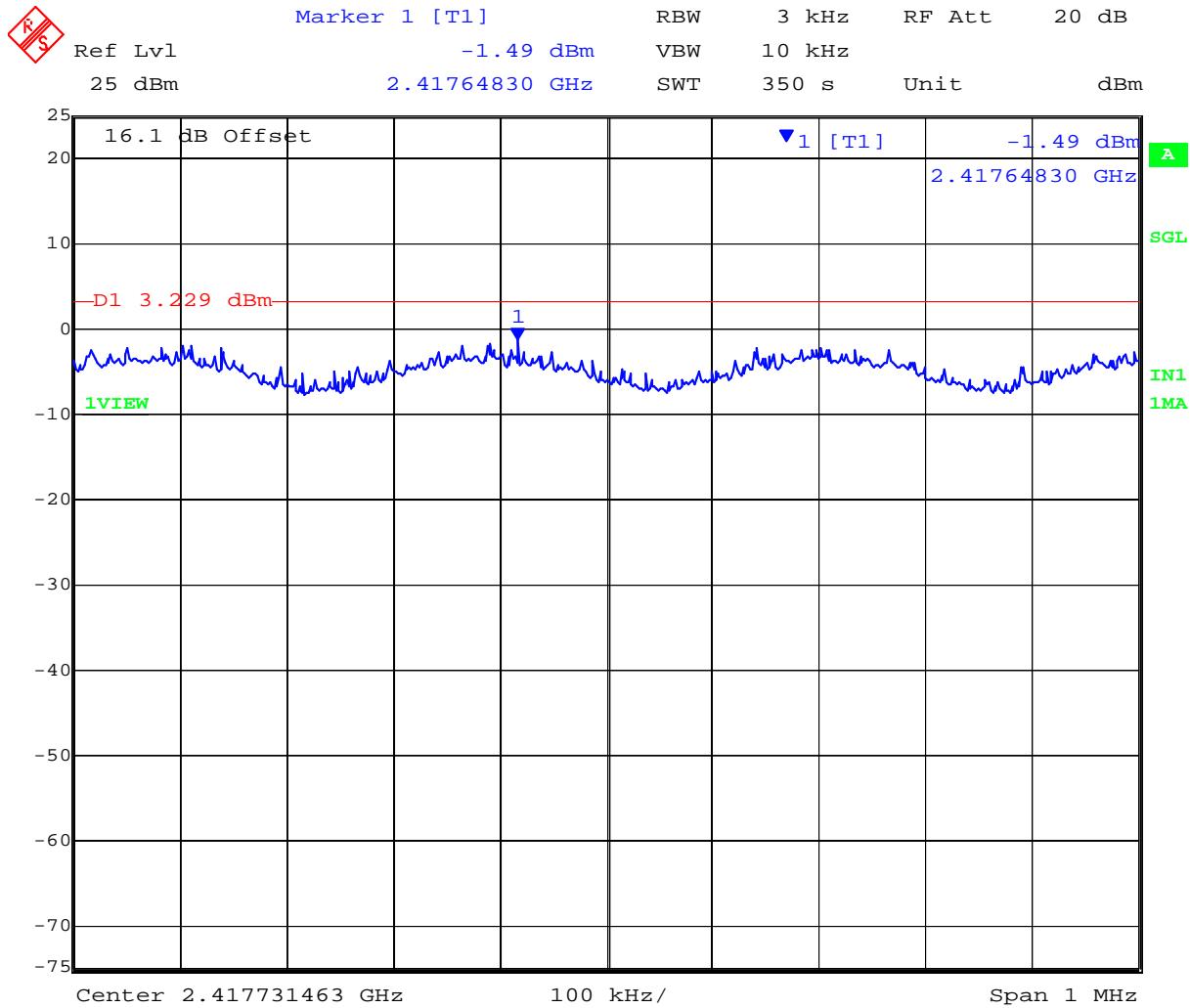
### PORT A 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 15:00:15

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### PORT B 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 15:06:46

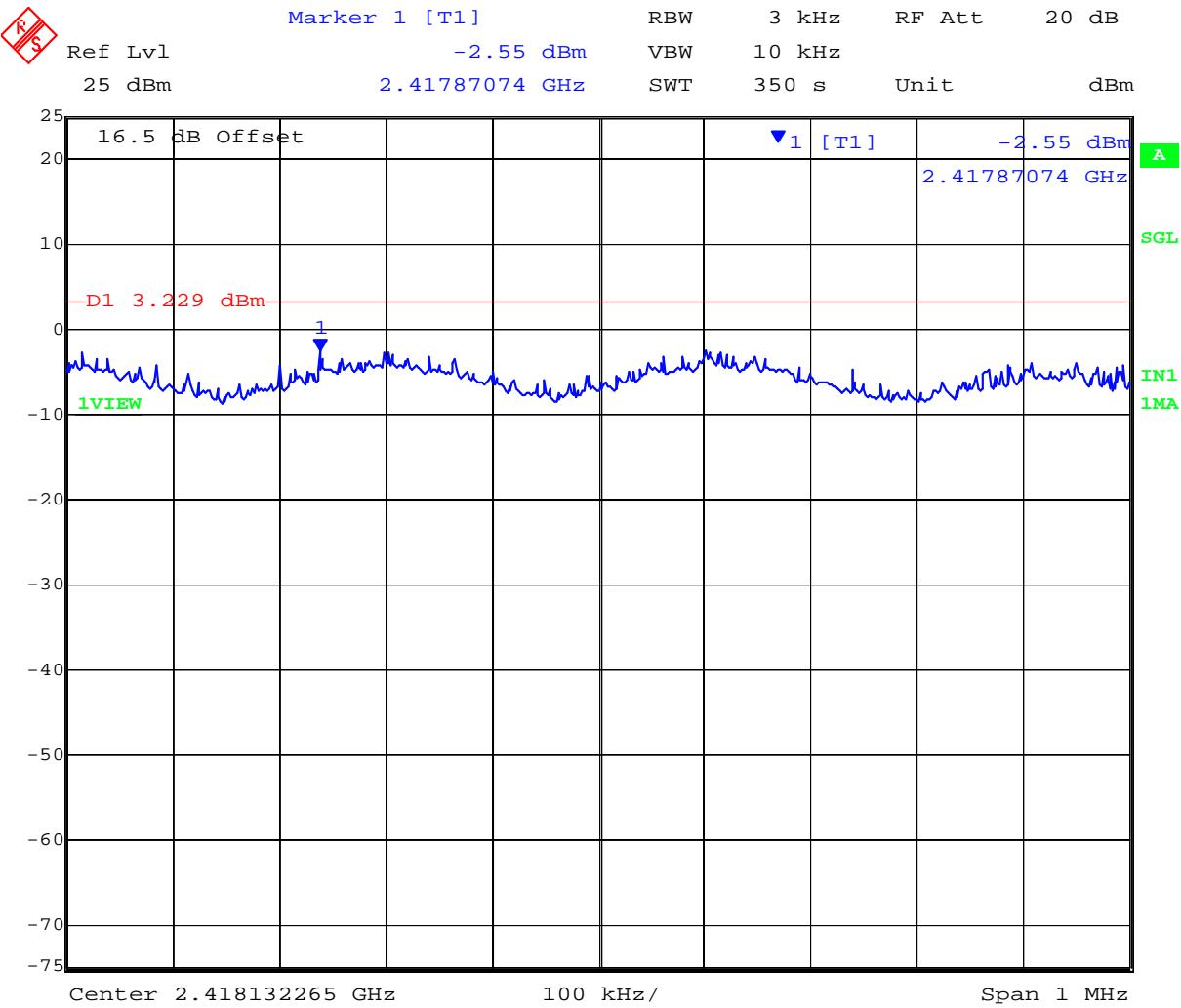
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 151 of 412

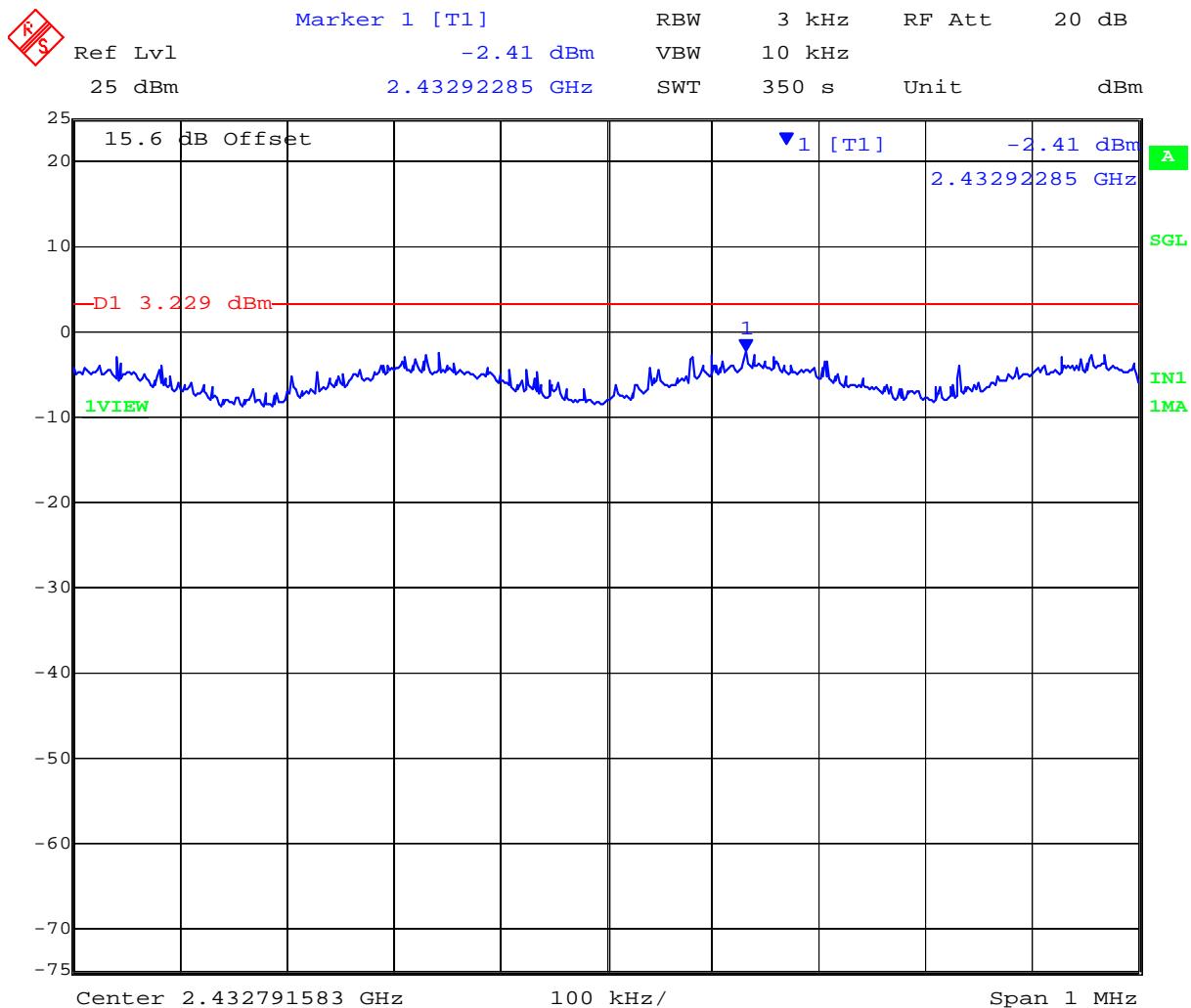
### PORT C 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 15:13:15

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### PORT A 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 15:38:33

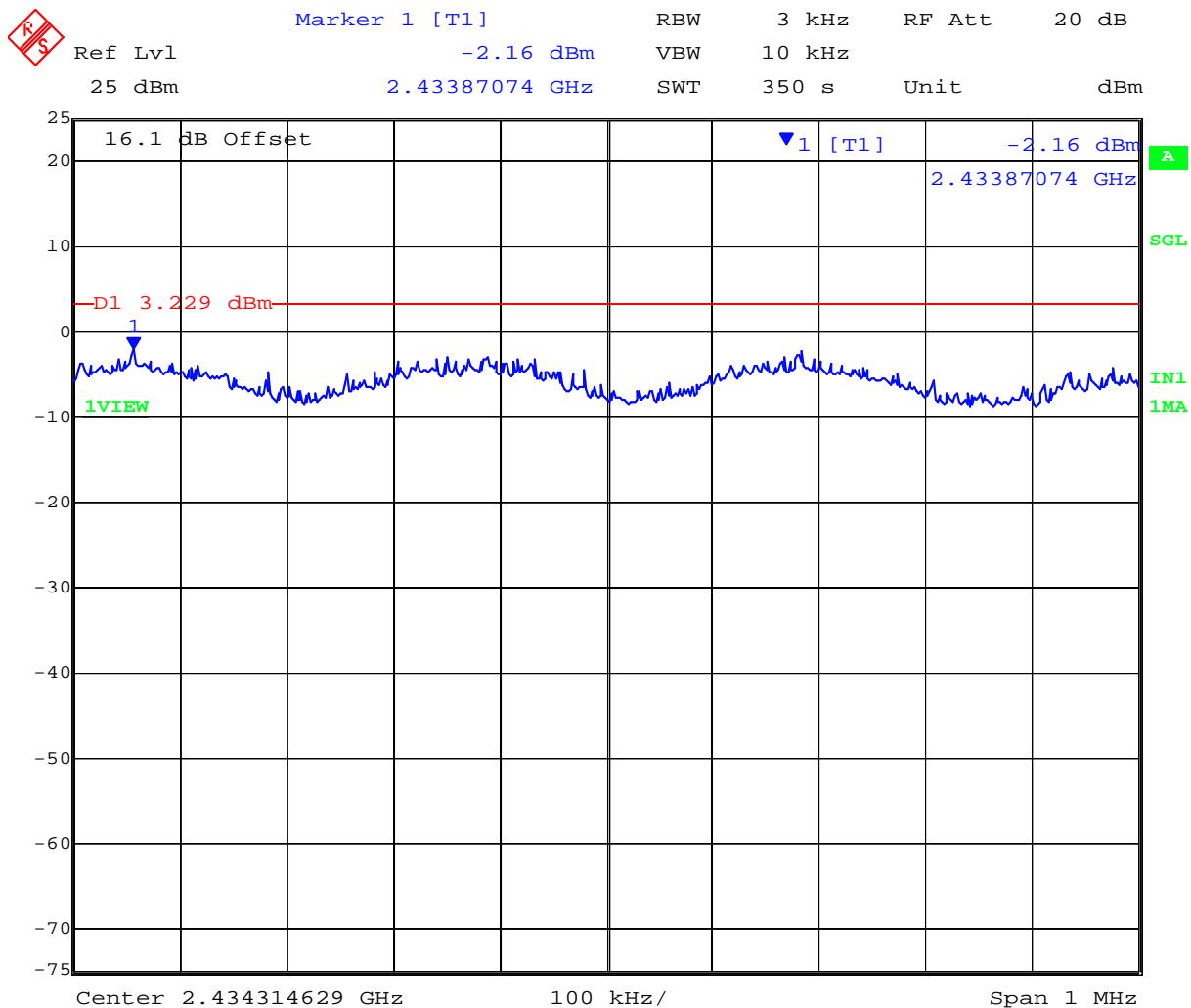
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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 153 of 412

### PORT B 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



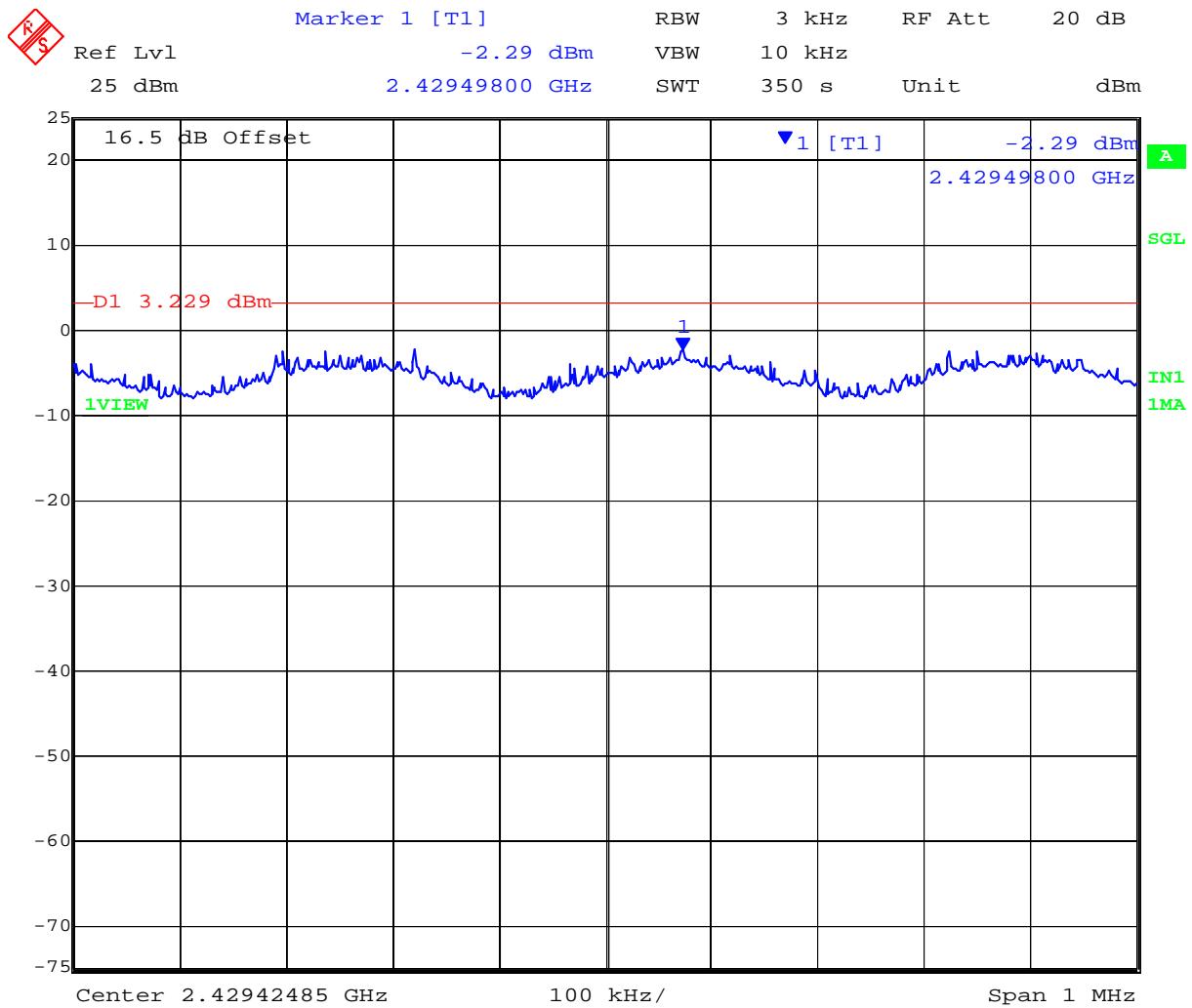
Date: 29.FEB.2012 15:45:04

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 154 of 412

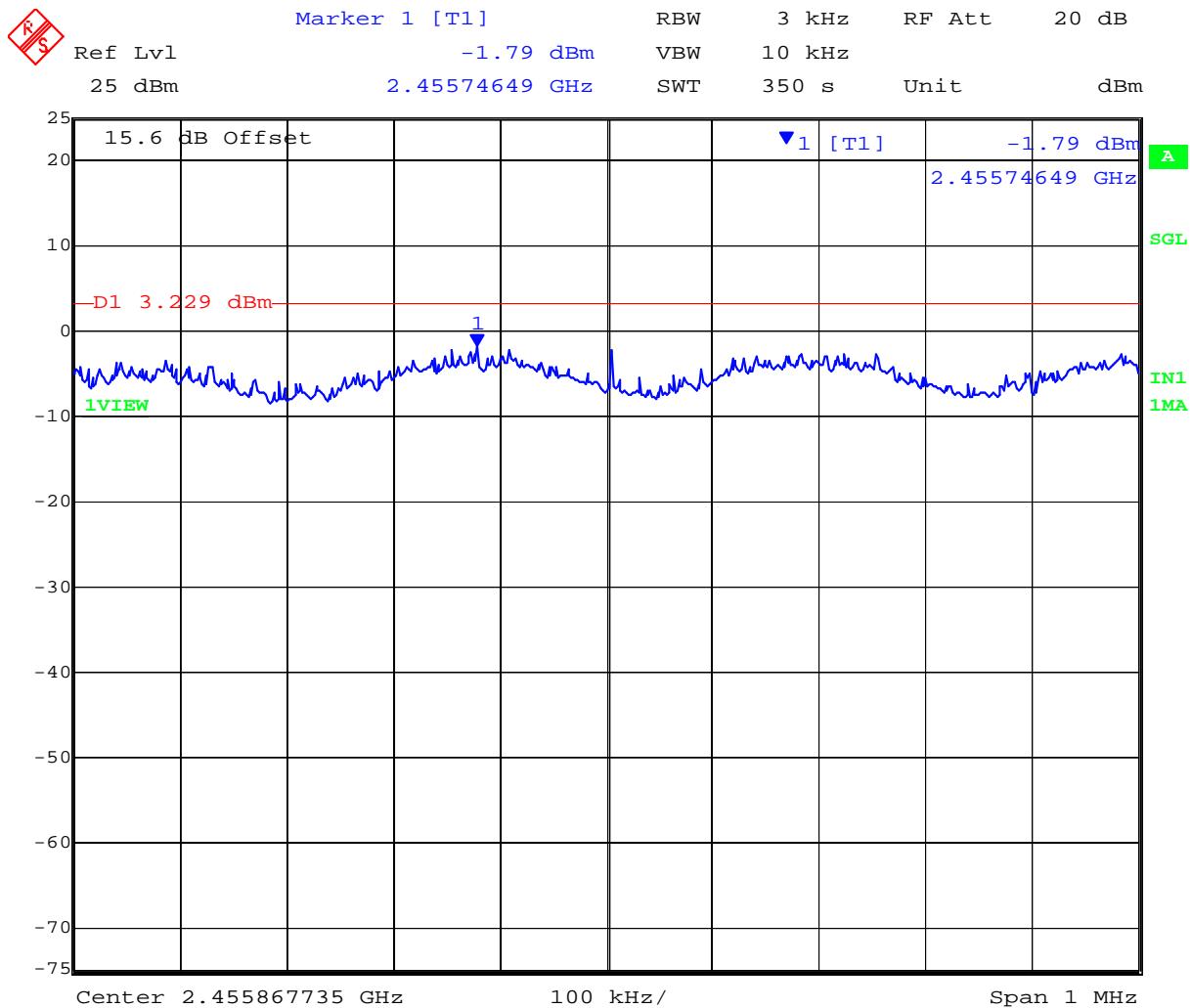
### PORT C 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 15:51:34

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### PORT A 2,462 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 16:11:29

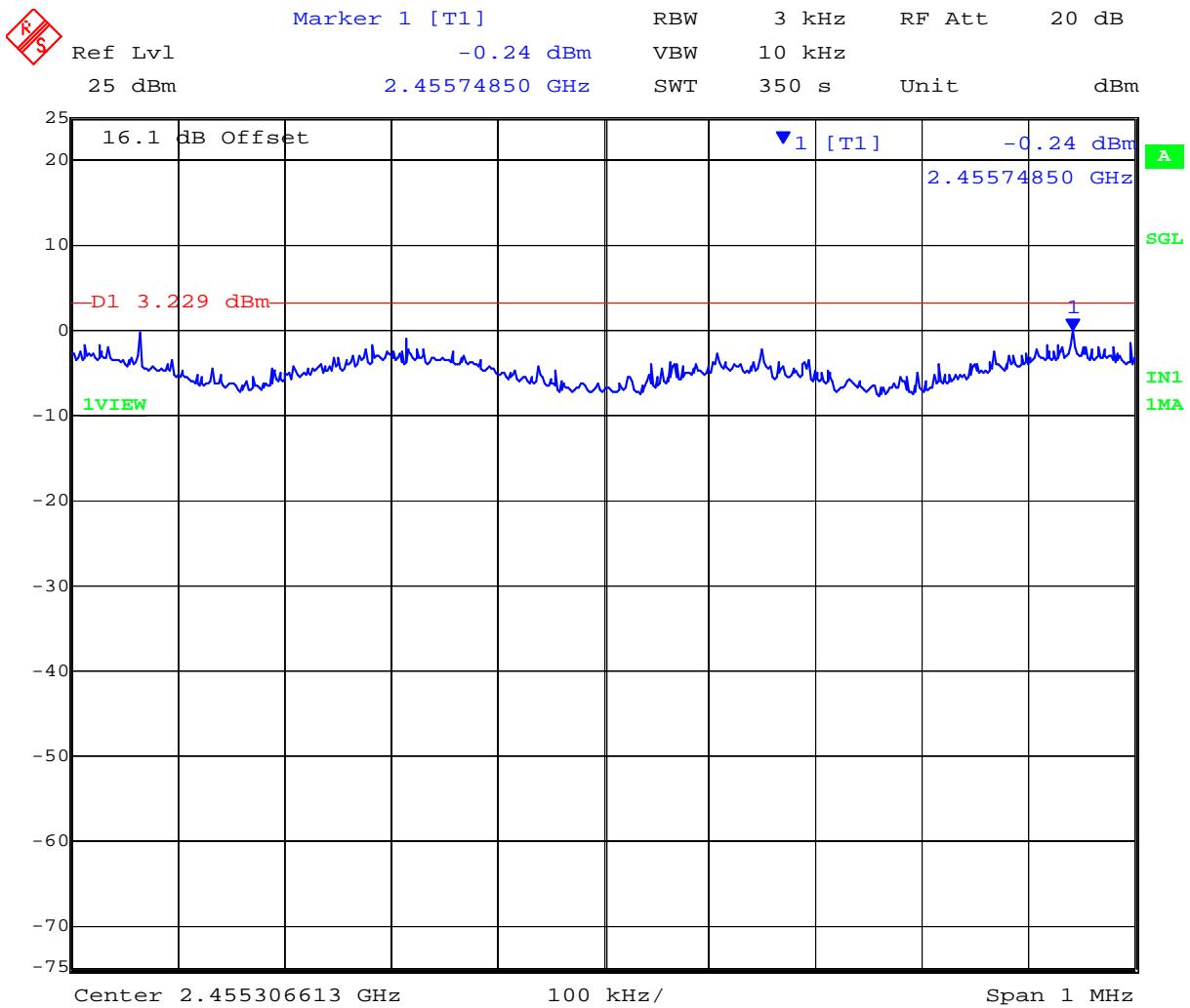
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 156 of 412

### PORT B 2,462 MHz 802.11n HT-20 - Peak Power Spectral Density



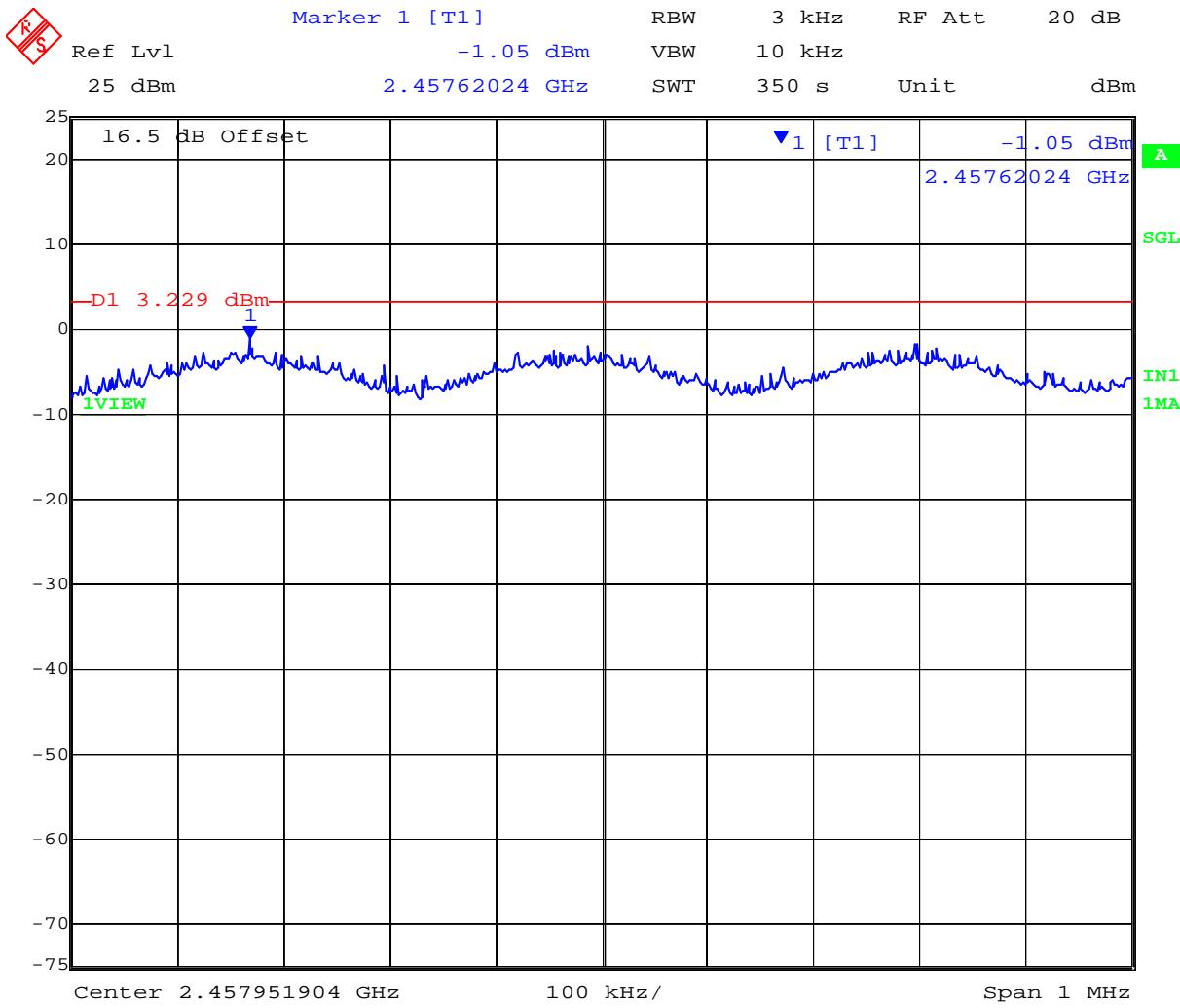
Date: 29.FEB.2012 16:18:02

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 157 of 412

### PORT C 2,462 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 29.FEB.2012 16:24:32

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 158 of 412

### Peak Power Spectral Density

#### TABLE OF RESULTS – 802.11n HT-40

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

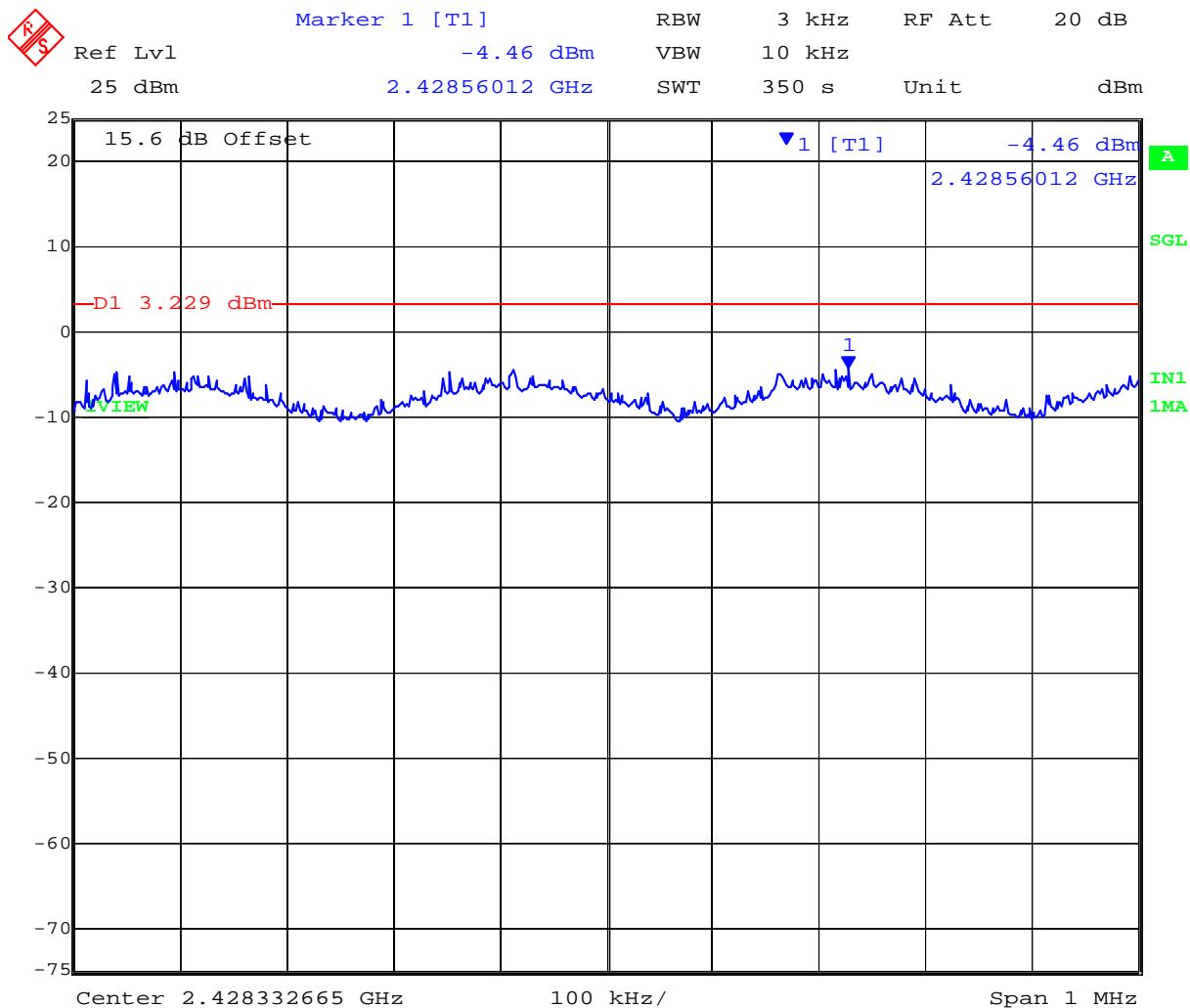
Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2422	-4.47	-2.84	-4.50	--	4.77	1.93	3.23	-6.07
2437	-3.26	-4.61	-3.99	--	4.77	1.52	3.23	-6.49
2452	-4.69	-4.06	-3.92	--	4.77	0.86	3.23	-7.15

Measurement uncertainty:	± 1.33 dB
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NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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### PORT A 2,422 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 29.FEB.2012 16:58:36

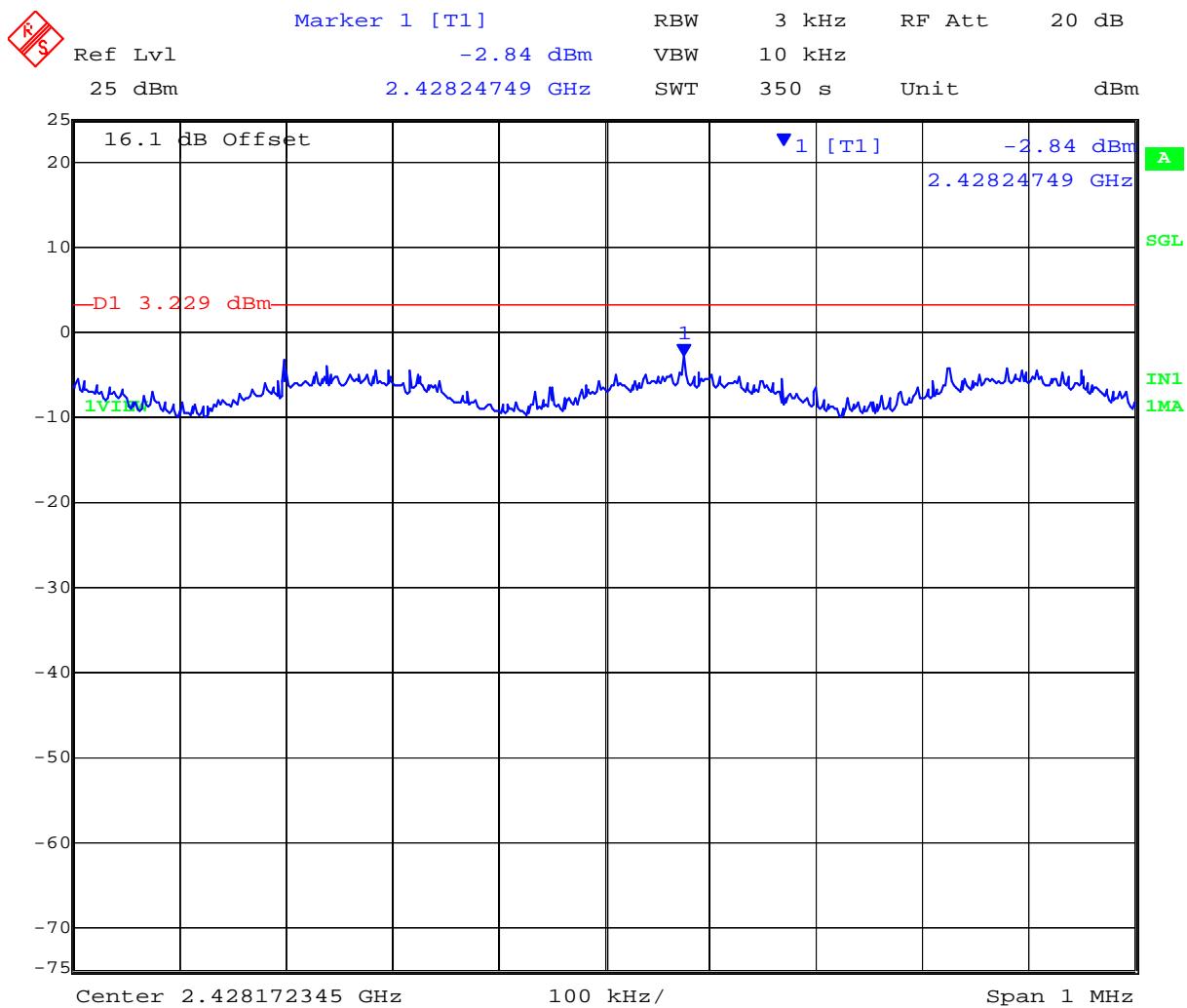
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 160 of 412

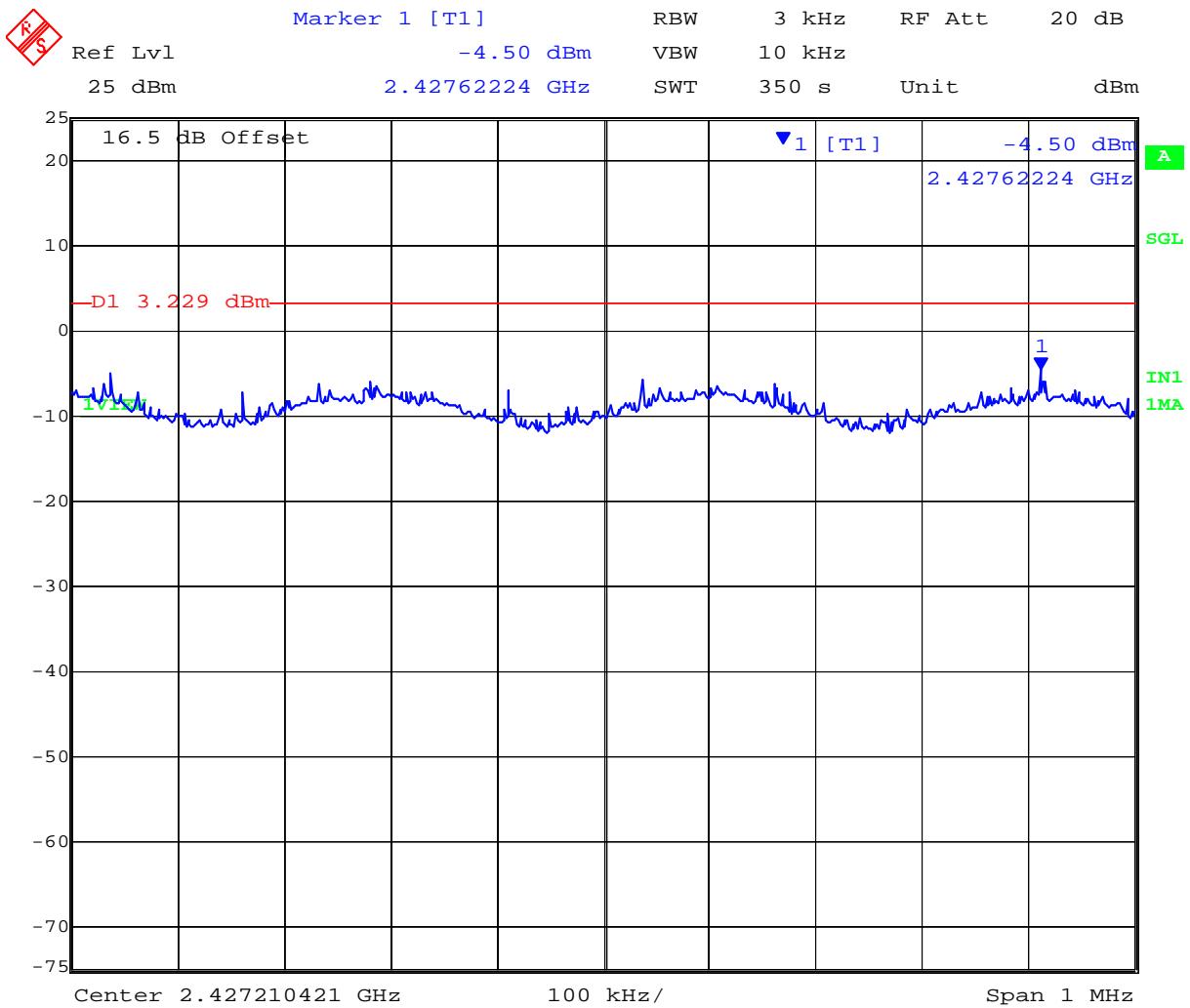
### PORT B 2,422 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 29.FEB.2012 17:05:08

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### PORT C 2,422 MHz 802.11n HT-40 - Peak Power Spectral Density

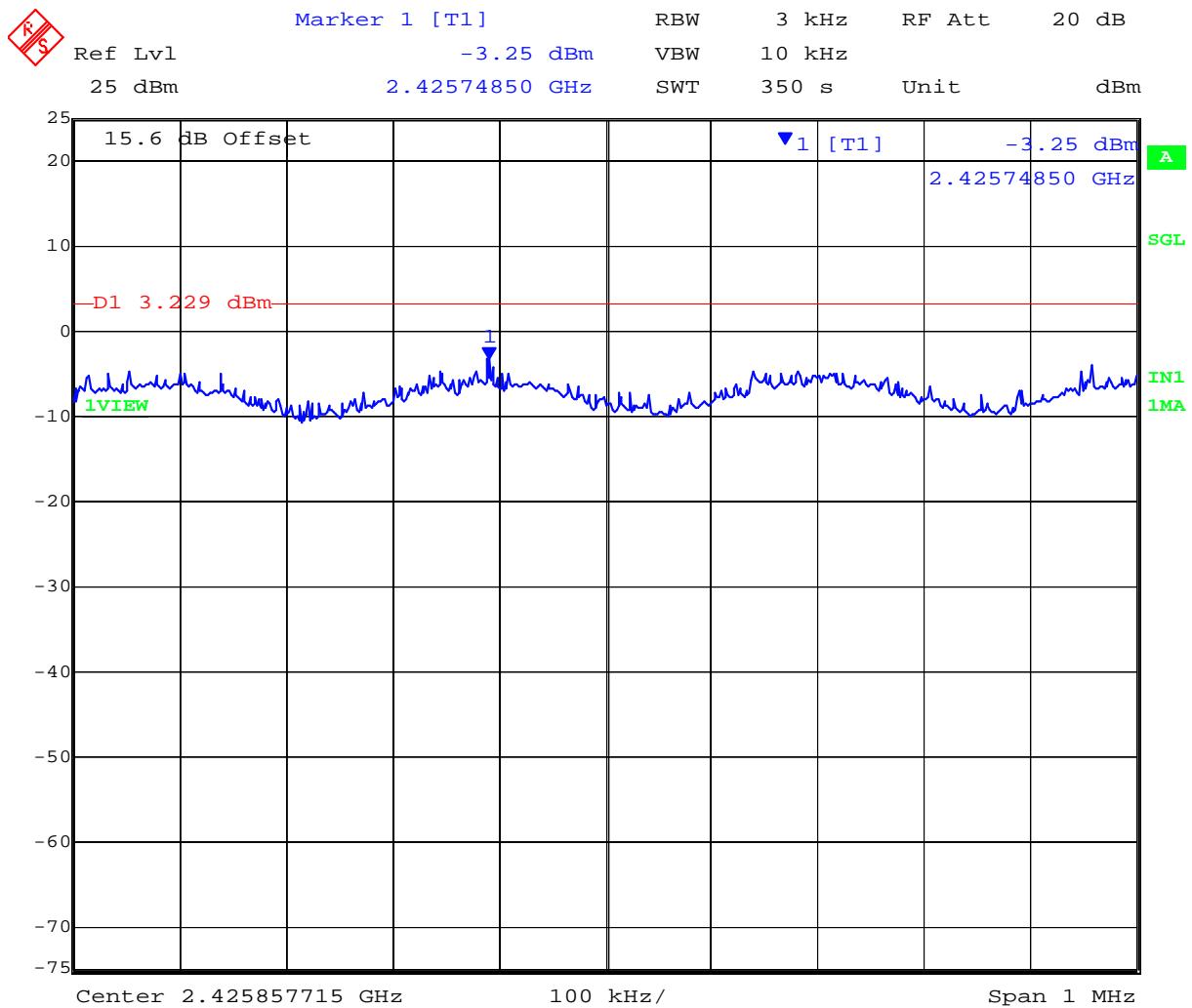


Date: 29.FEB.2012 17:11:36

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### PORT A 2,437 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 29.FEB.2012 17:27:29

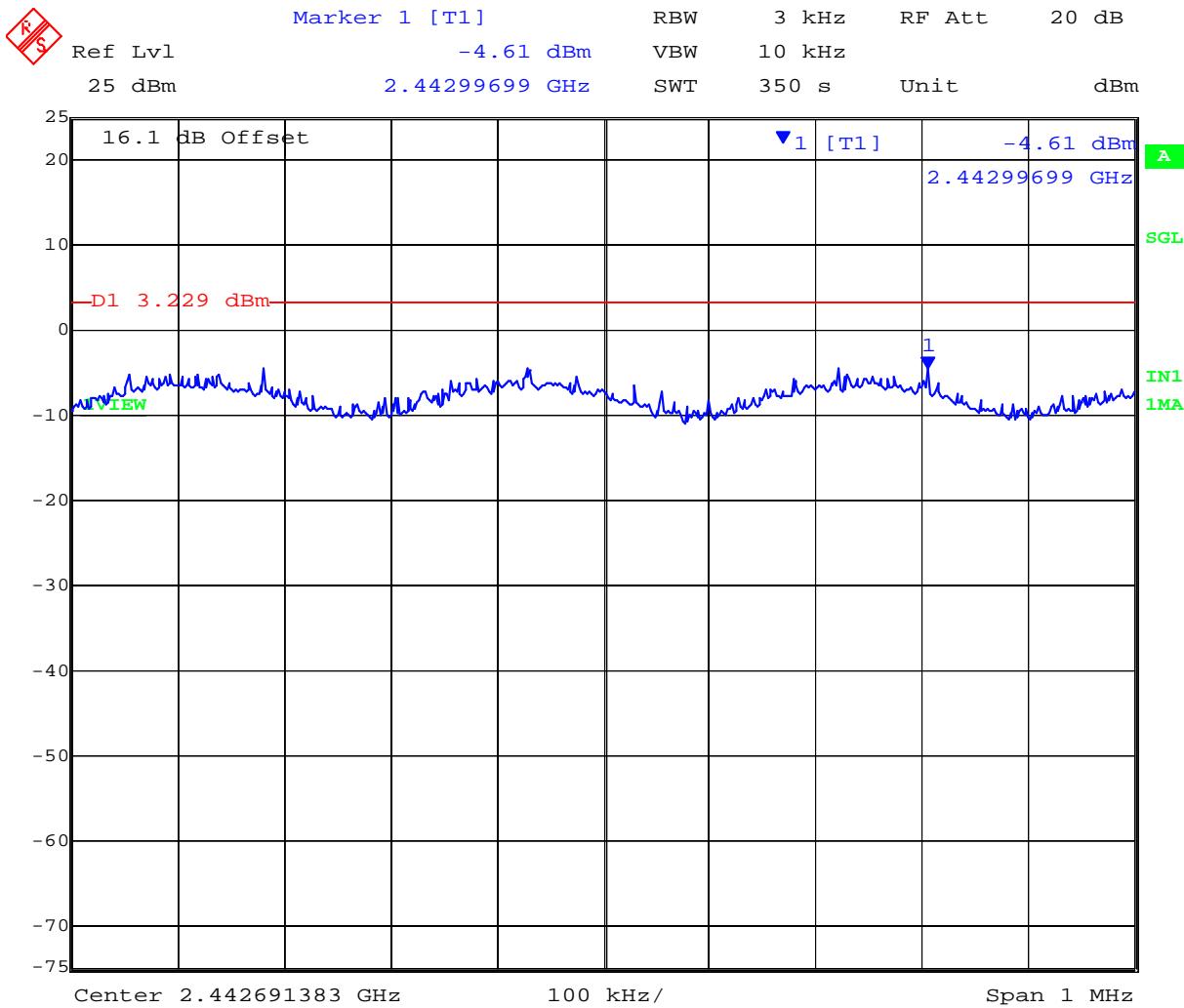
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 163 of 412

### PORT B 2,437 MHz 802.11n HT-40 - Peak Power Spectral Density



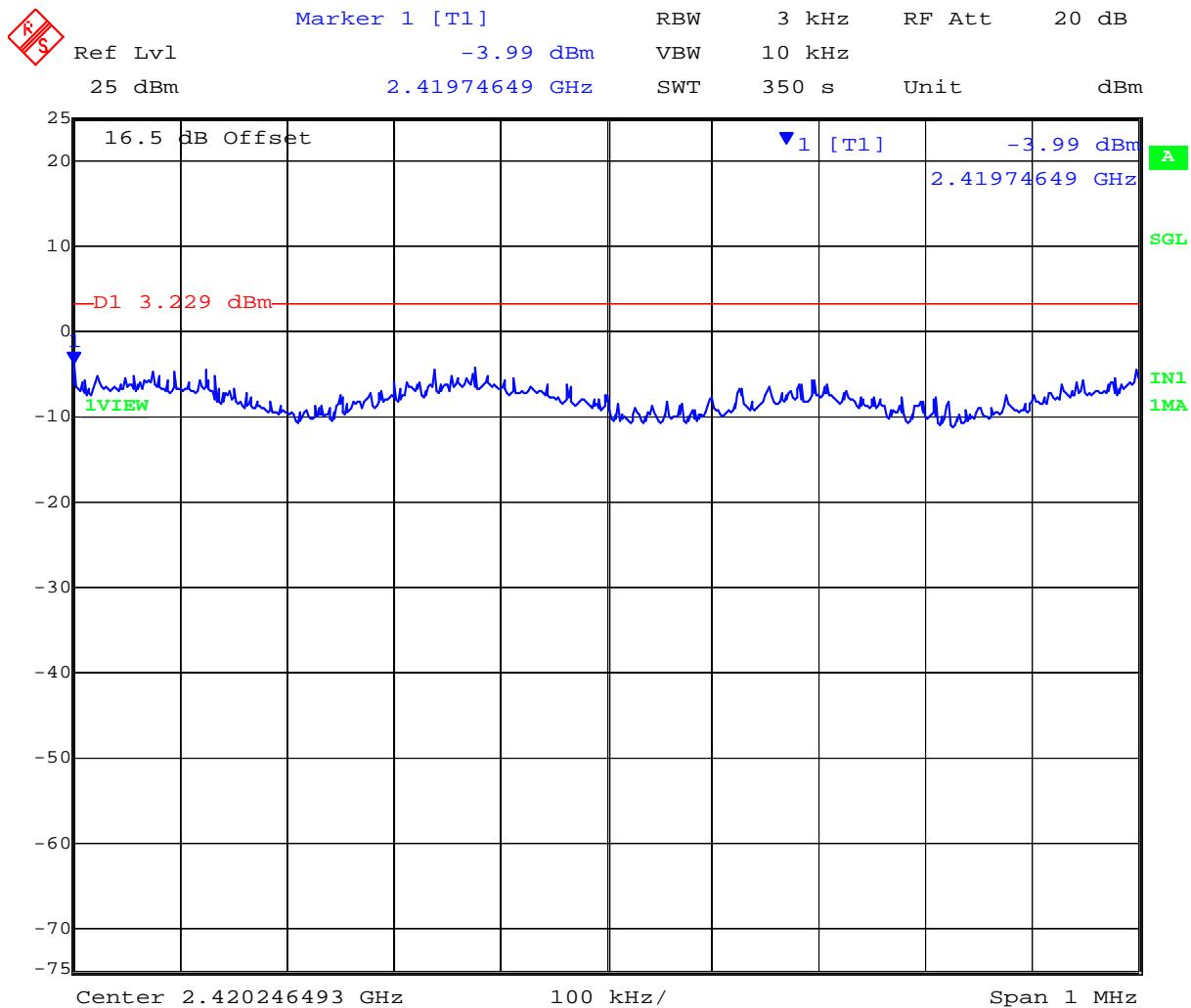
Date: 29.FEB.2012 17:34:01

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 164 of 412

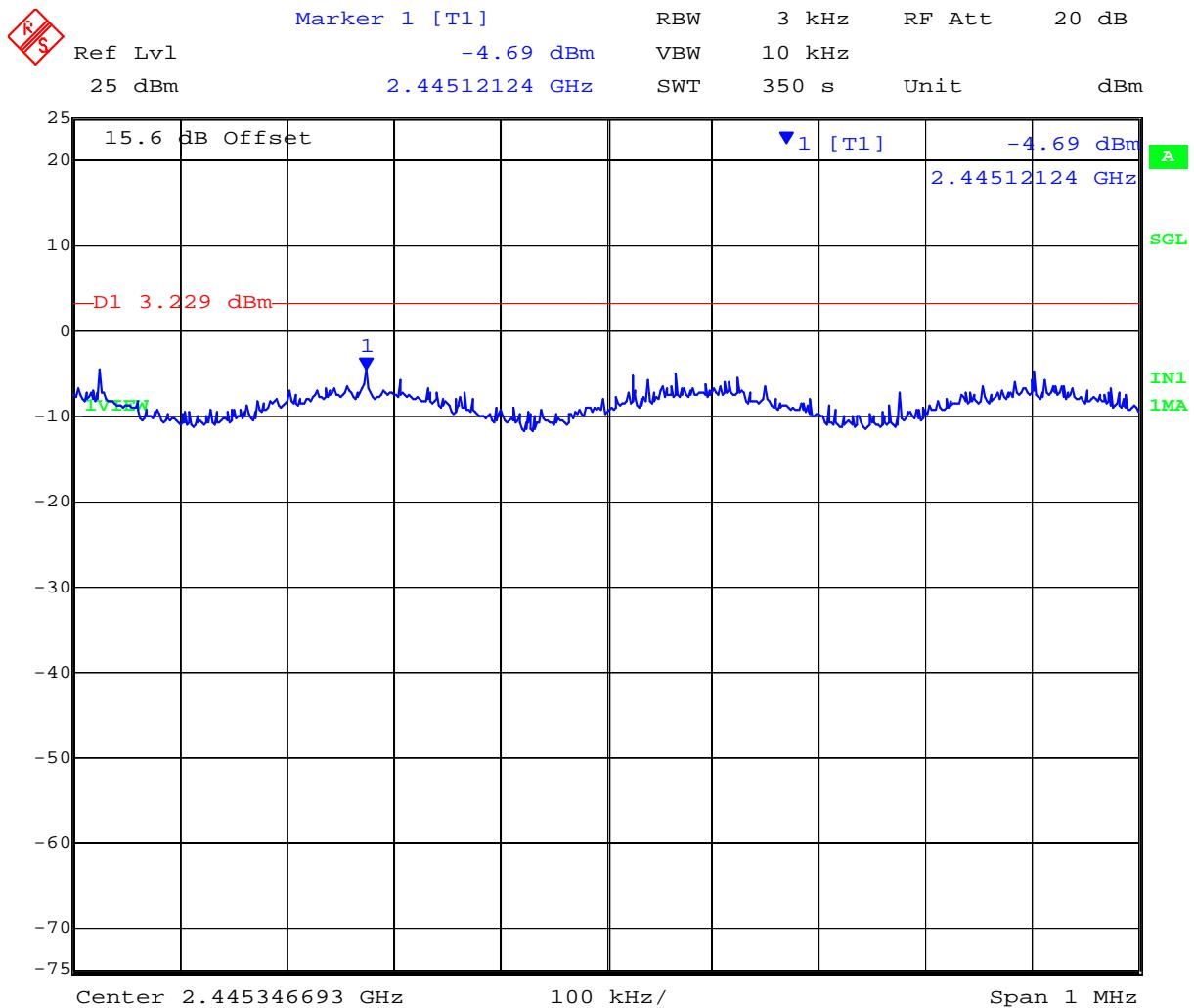
### PORT C 2,437 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 29.FEB.2012 17:40:31

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### PORT A 2,452 MHz 802.11n HT-40 - Peak Power Spectral Density

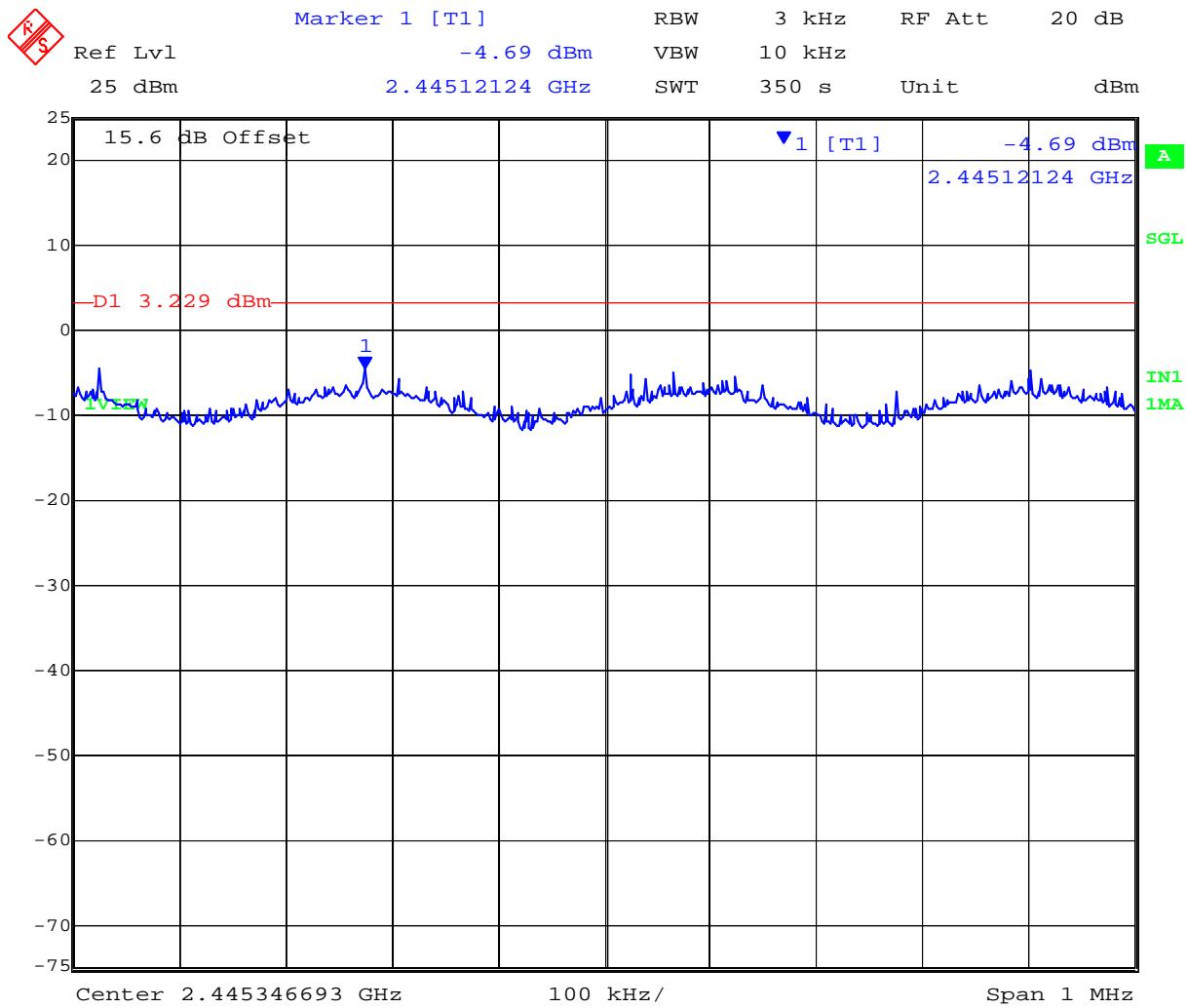


Date: 29.FEB.2012 18:01:45

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### PORT B 2,452 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 29.FEB.2012 18:01:45

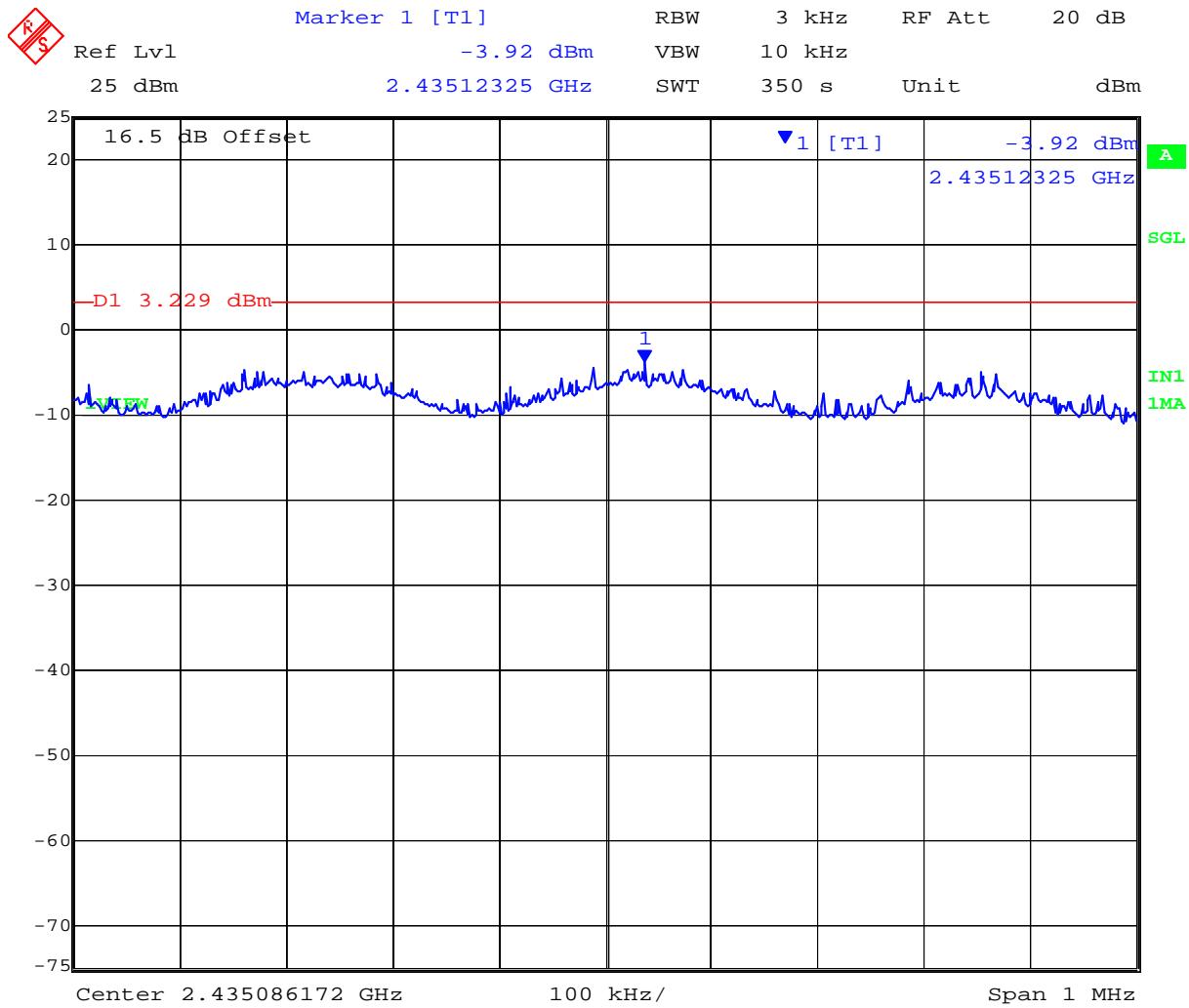
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 167 of 412

### PORT C 2,452 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 29.FEB.2012 18:14:48

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 168 of 412

#### TABLE OF RESULTS – 802.11a Legacy 5 MHz, 6 MBit/s

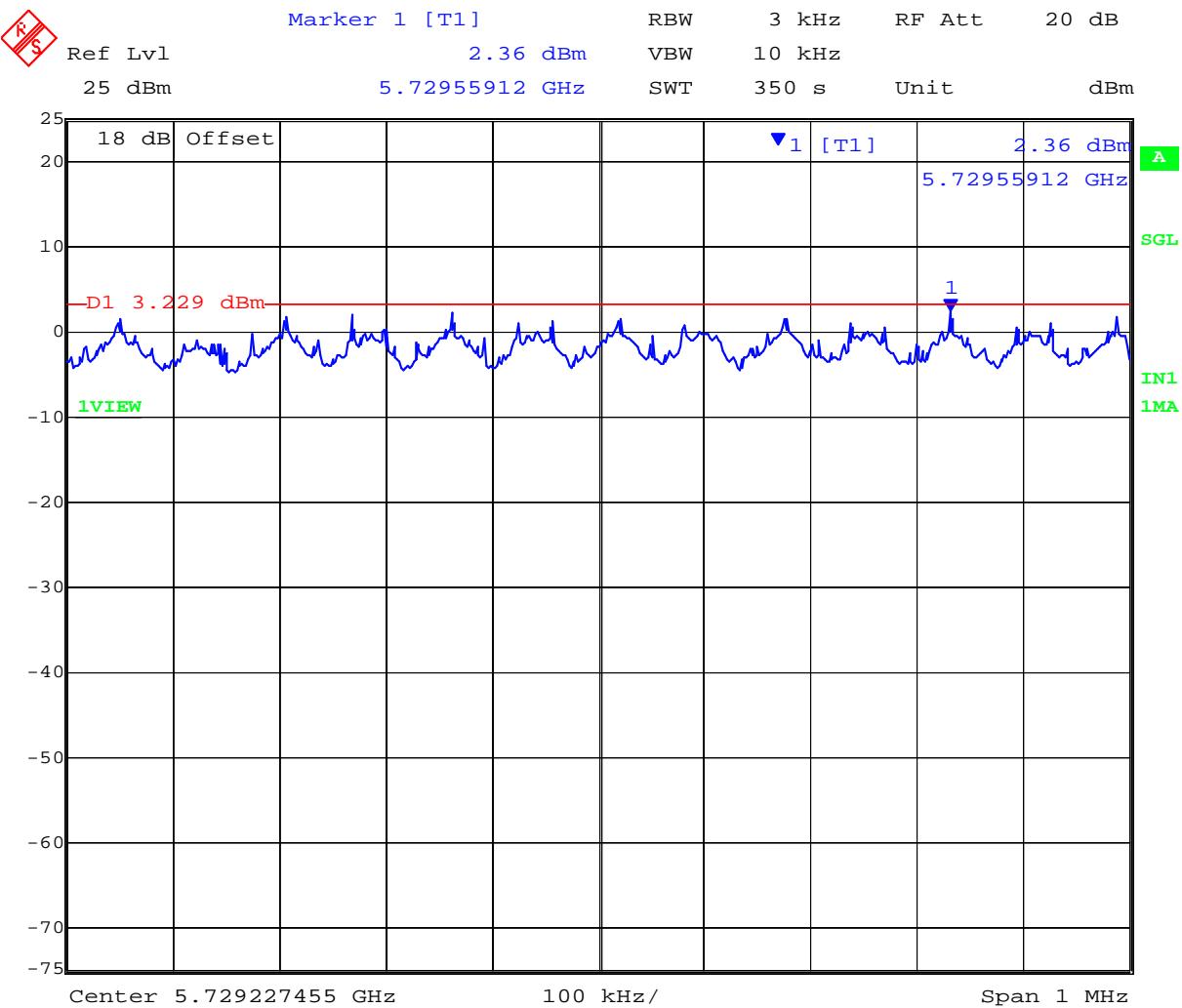
<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a, 5 MHz	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	N/A	dBi	
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

Test Frequency	Measured Power Density				Correction factor	Maximum Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5730.500	2.36	3.20	1.85	--	4.77	3.20	3.23	-0.03
5790.500	-0.01	0.03	1.91	--	4.77	1.91	3.23	-1.32
5845.500	0.86	-2.03	0.13	--	4.77	0.86	3.23	-2.37

Measurement uncertainty:	± 1.33 dB
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### 5 MHz PORT A 5,730.5 MHz 802.11a 6 MBits - Peak Power Spectral Density

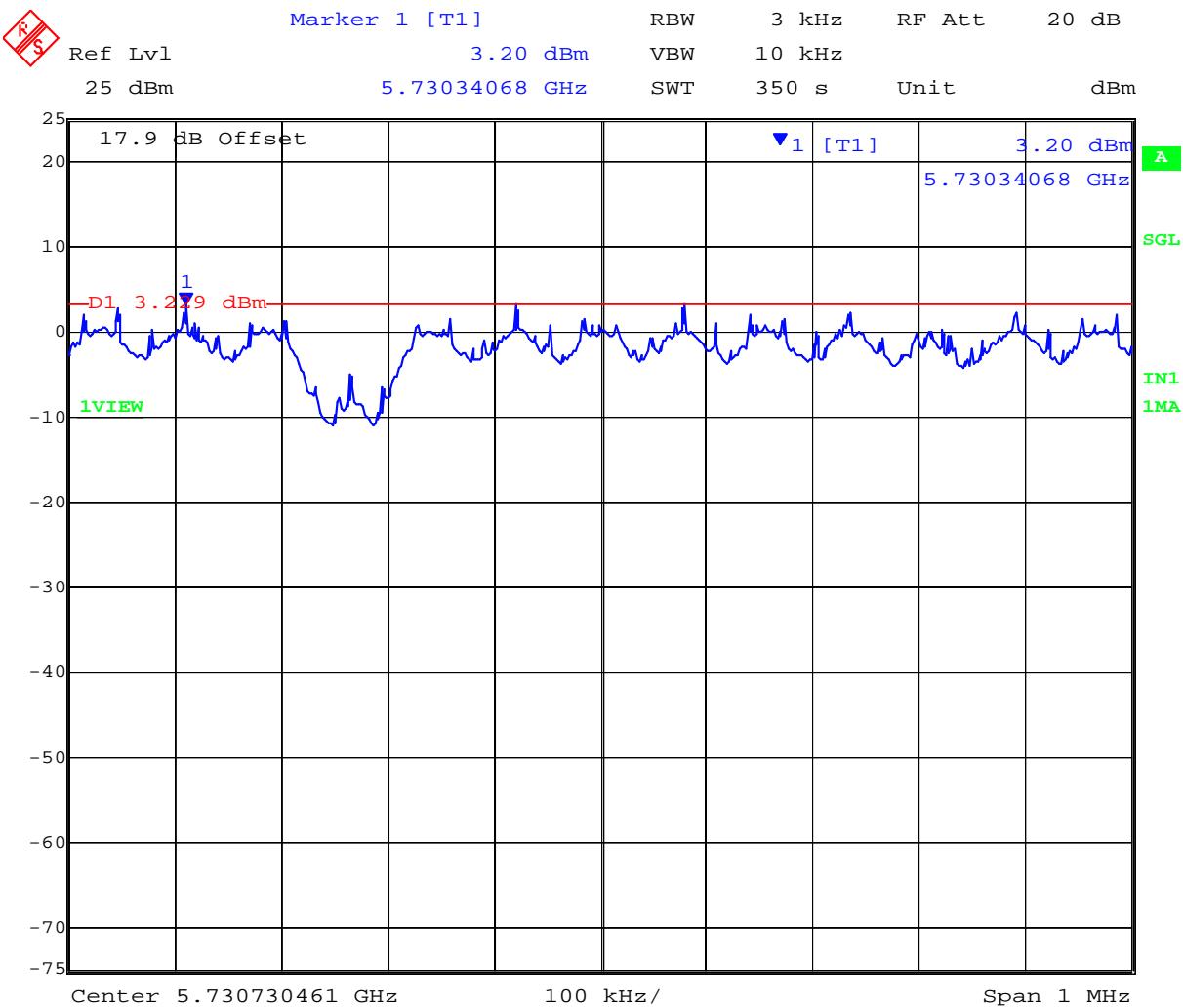


Date: 16.MAR.2012 11:05:17

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### 5 MHz PORT B 5,730.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 11:11:50

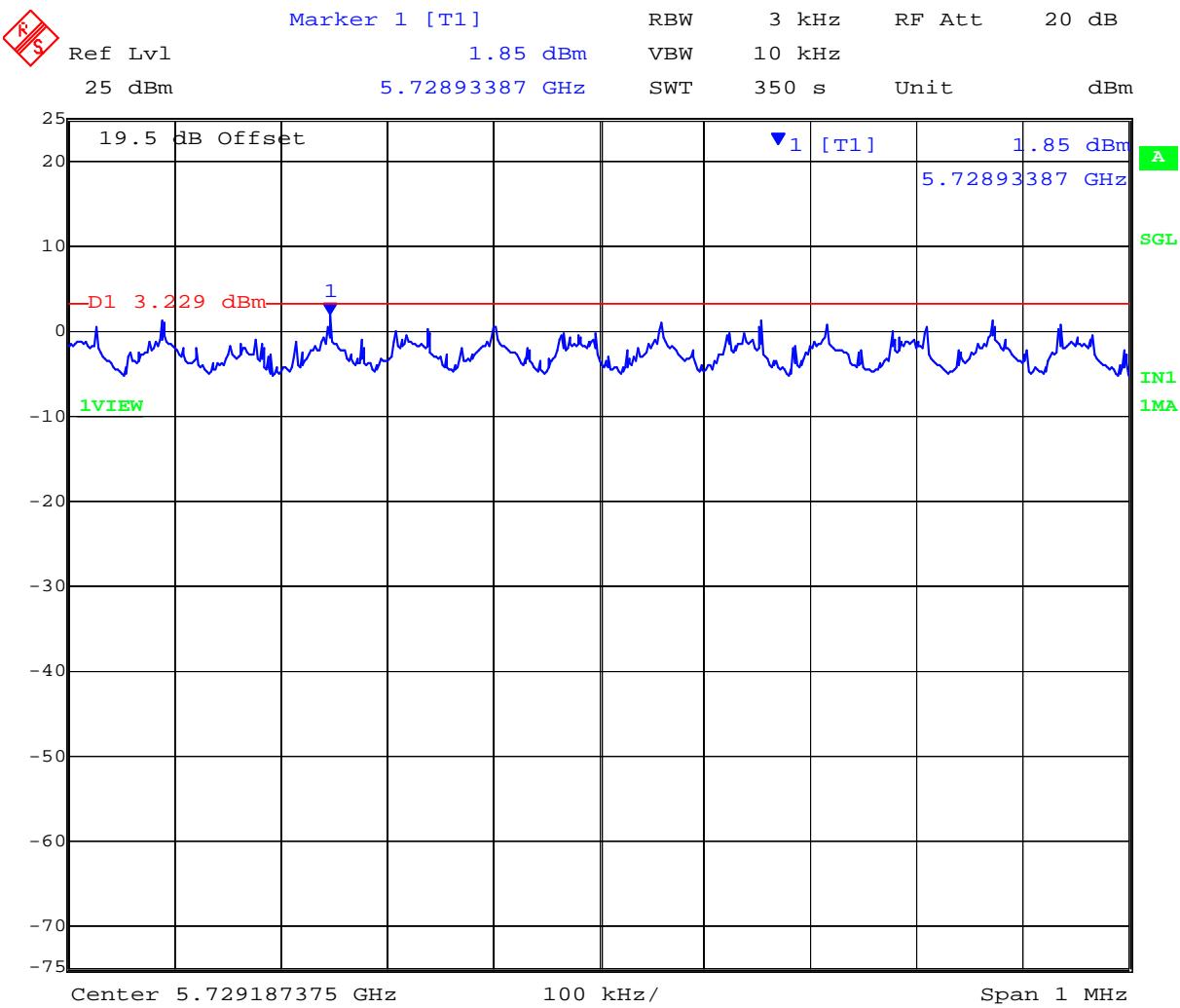
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 171 of 412

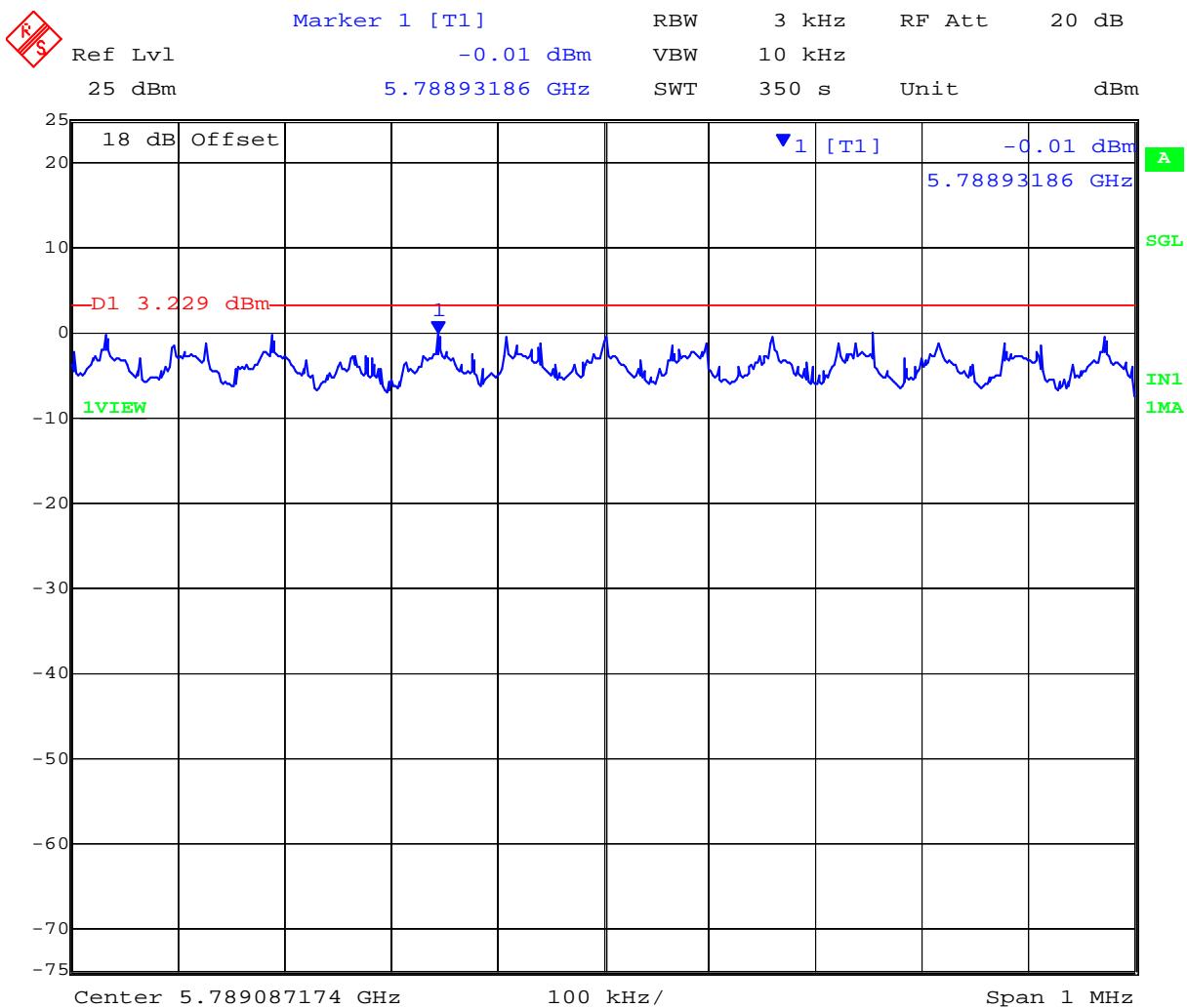
### 5 MHz PORT C 5,730.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 11:18:19

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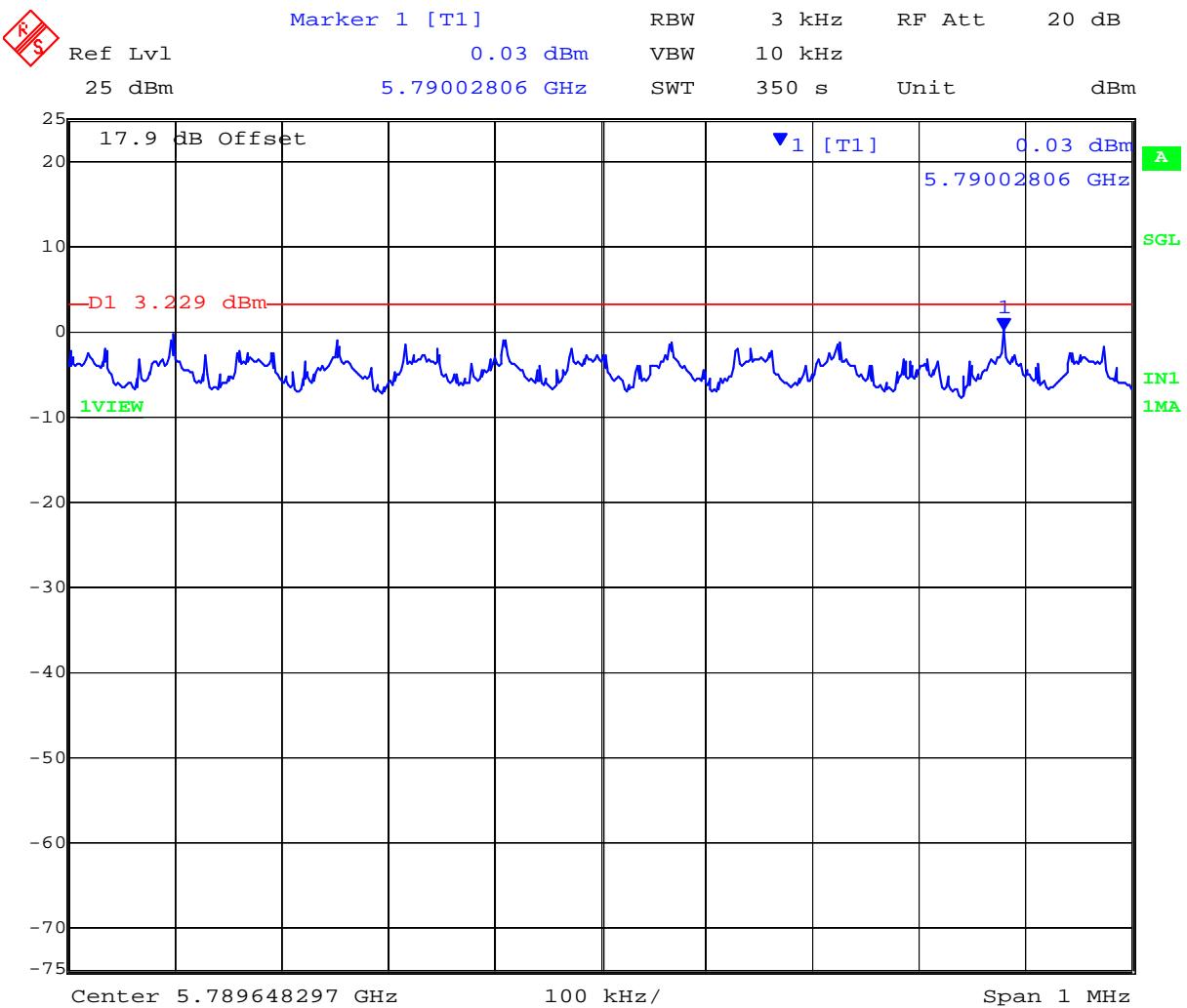
### 5 MHz PORT A 5,790.5 MHz 802.11a 6 MBits - Peak Power Spectral Density




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### 5 MHz PORT B 5,790.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



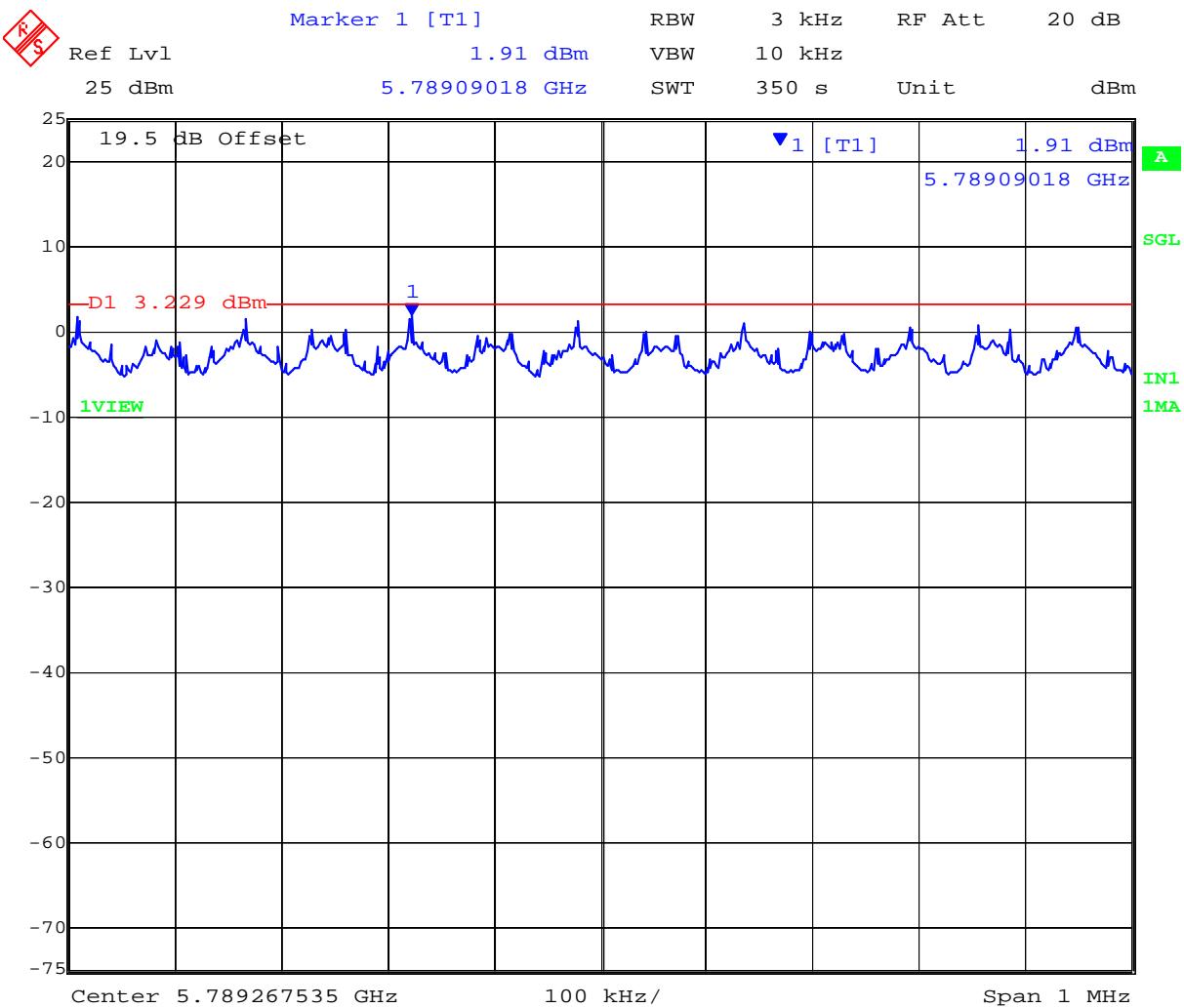

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 174 of 412

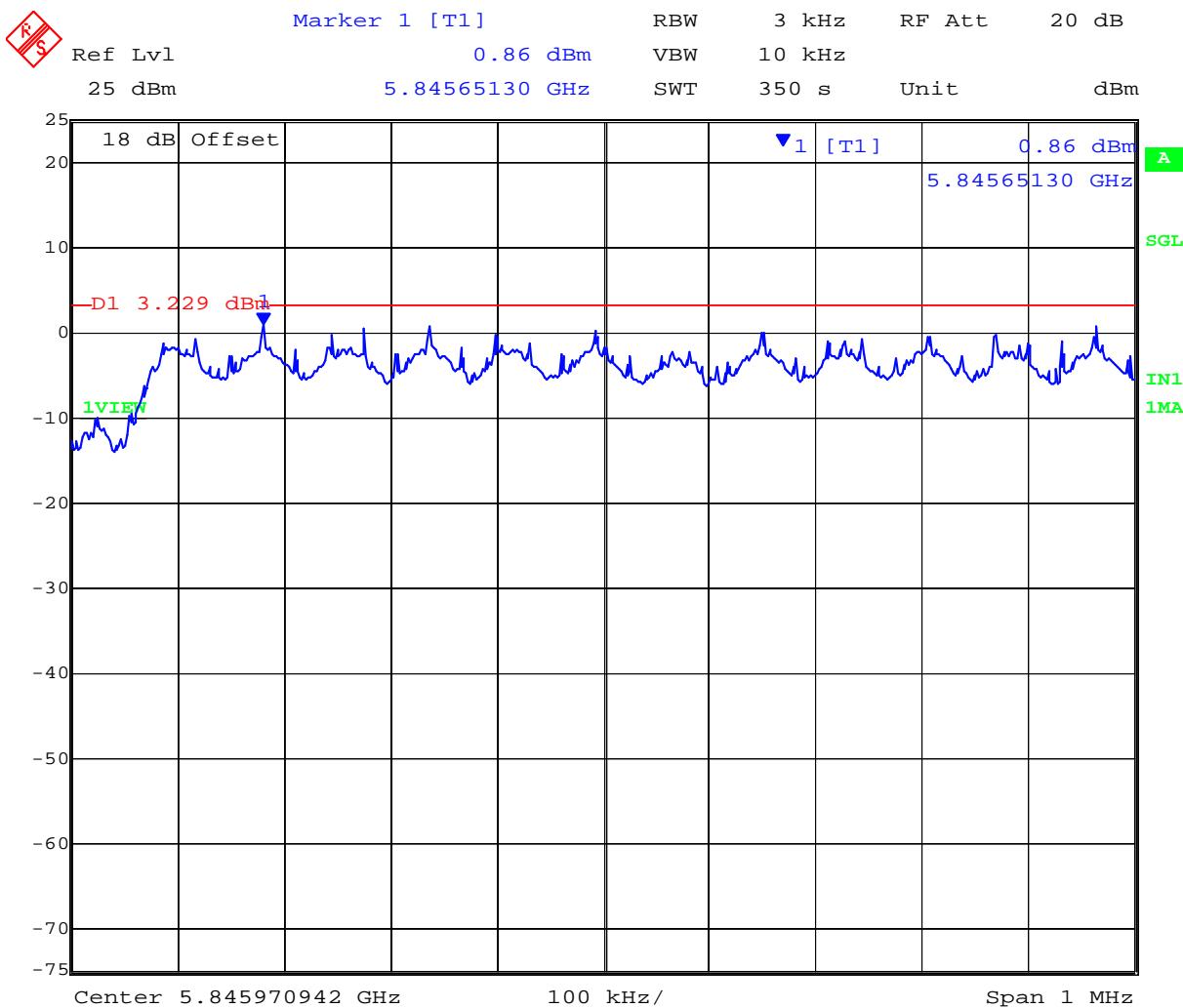
### 5 MHz PORT C 5,790.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 11:49:54

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### 5 MHz PORT A 5.845.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 12:17:38

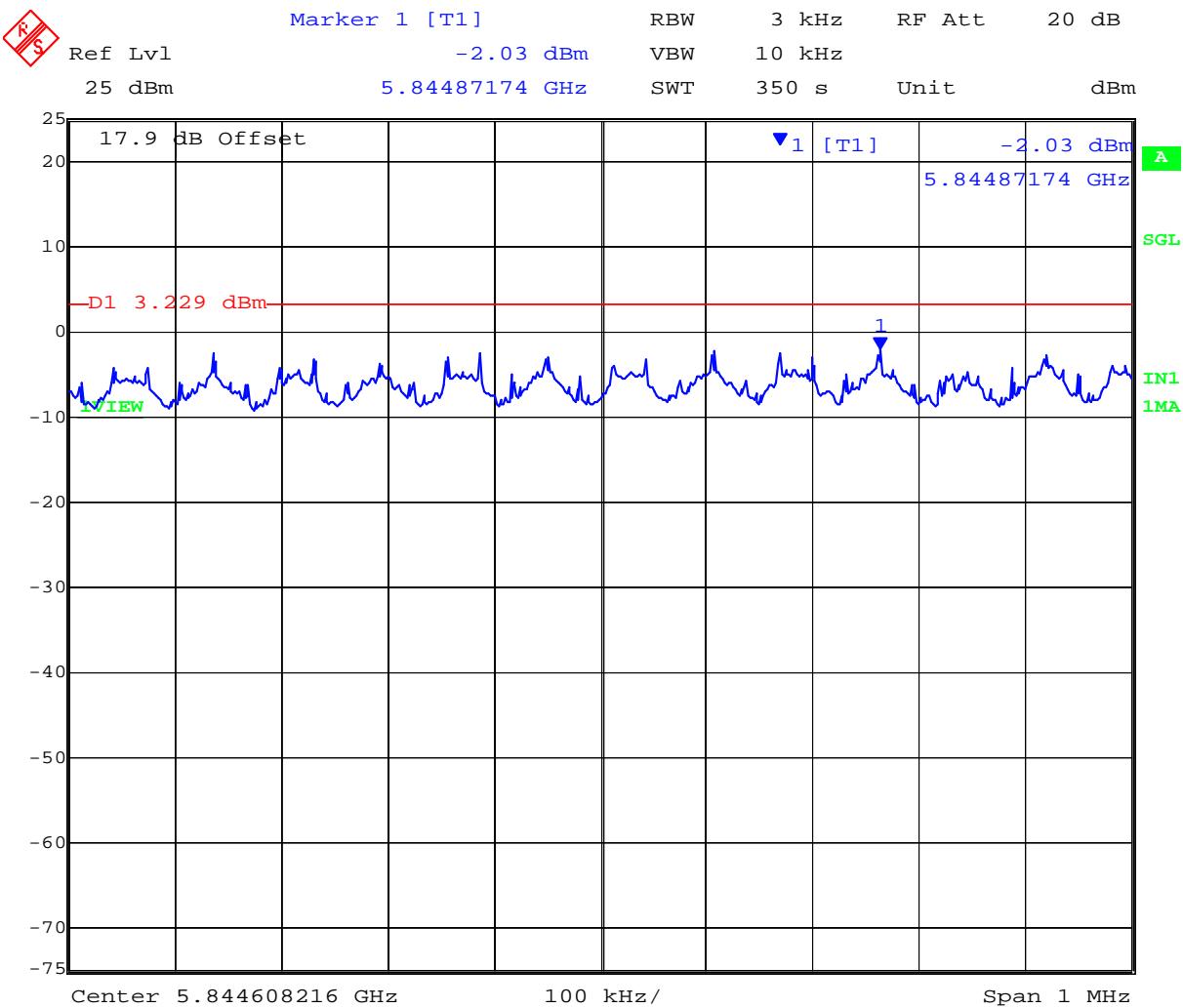
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 176 of 412

### 5 MHz PORT B 5,845.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



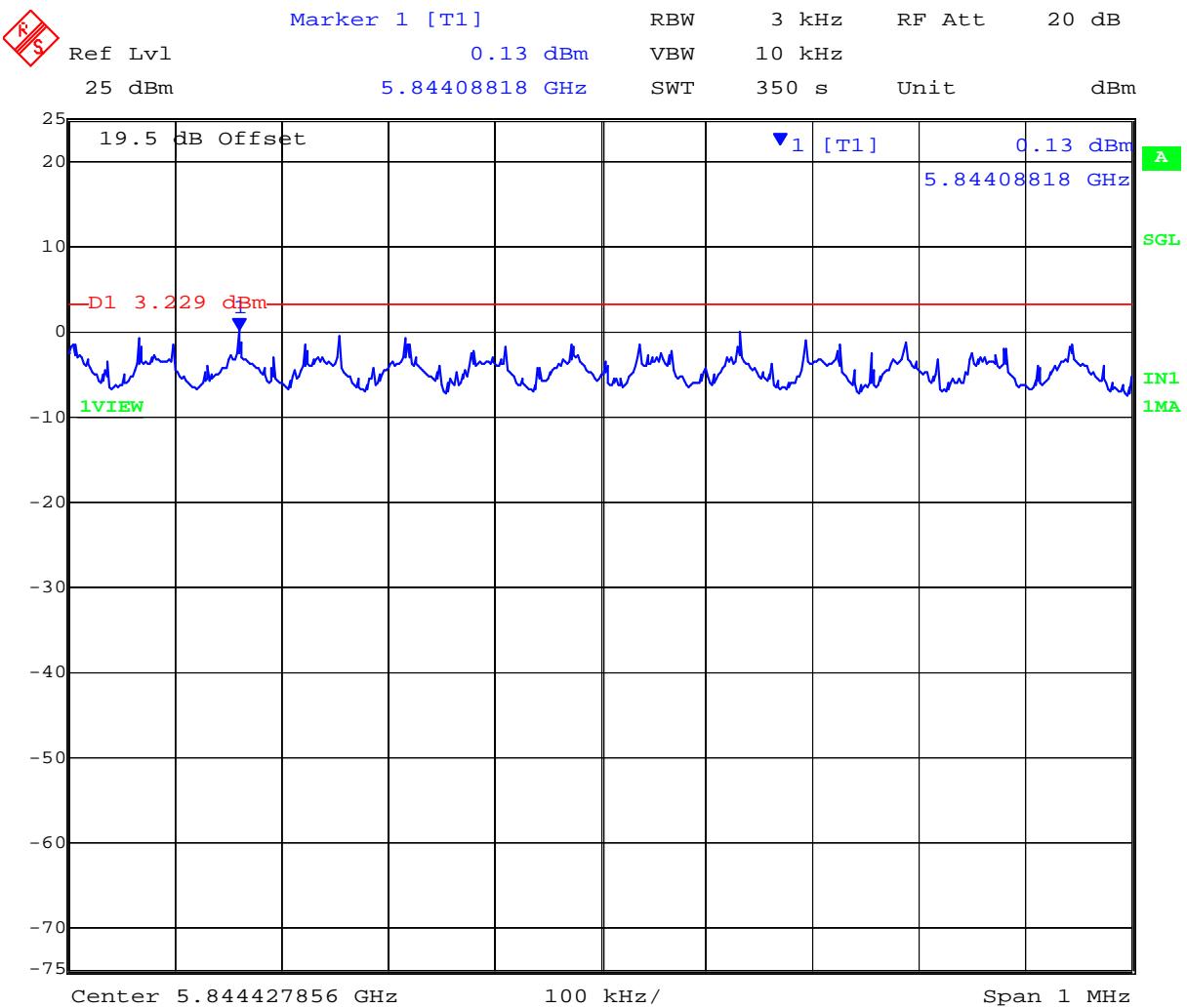
Date: 16.MAR.2012 12:24:11

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 177 of 412

### 5 MHz PORT C 5,845.5 MHz 802.11a 6 MBits - Peak Power Spectral Density



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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 178 of 412

#### TABLE OF RESULTS – 802.11a Legacy 10 MHz, 6 MBit/s

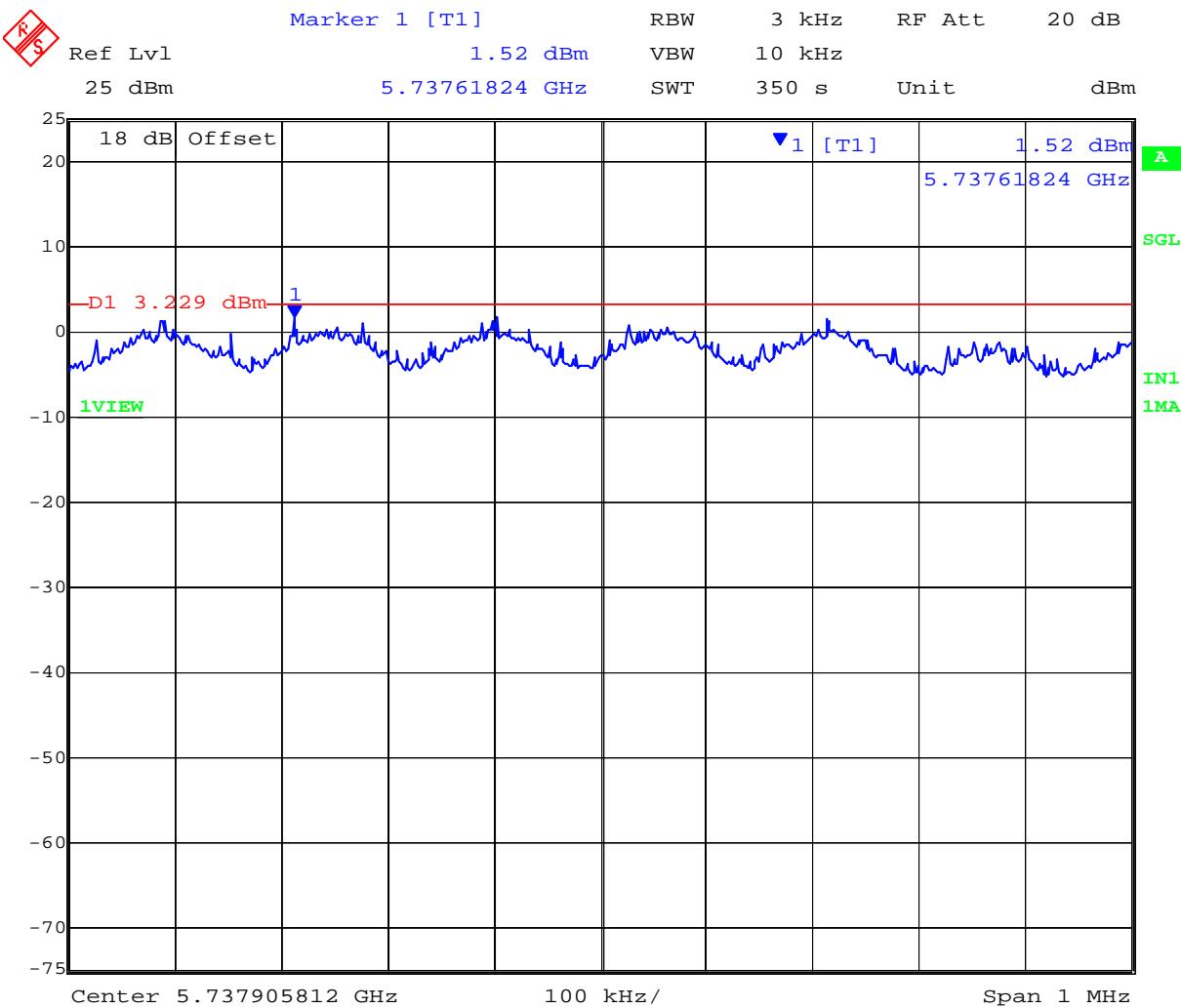
<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a, 10 MHz	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	N/A	dB	
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

Test Frequency	Measured Power Density				Correction factor	Maximum Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5735.000	1.52	1.61	1.42	--	4.77	1.61	3.23	-1.62
5790.000	1.53	1.00	2.87	--	4.77	2.87	3.23	-0.36
5840.000	2.04	0.75	1.78	--	4.77	2.04	3.23	-1.19

Measurement uncertainty:	± 1.33 dB
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### 10 MHz PORT A 5,735 MHz 802.11a 6 MBits - Peak Power Spectral Density

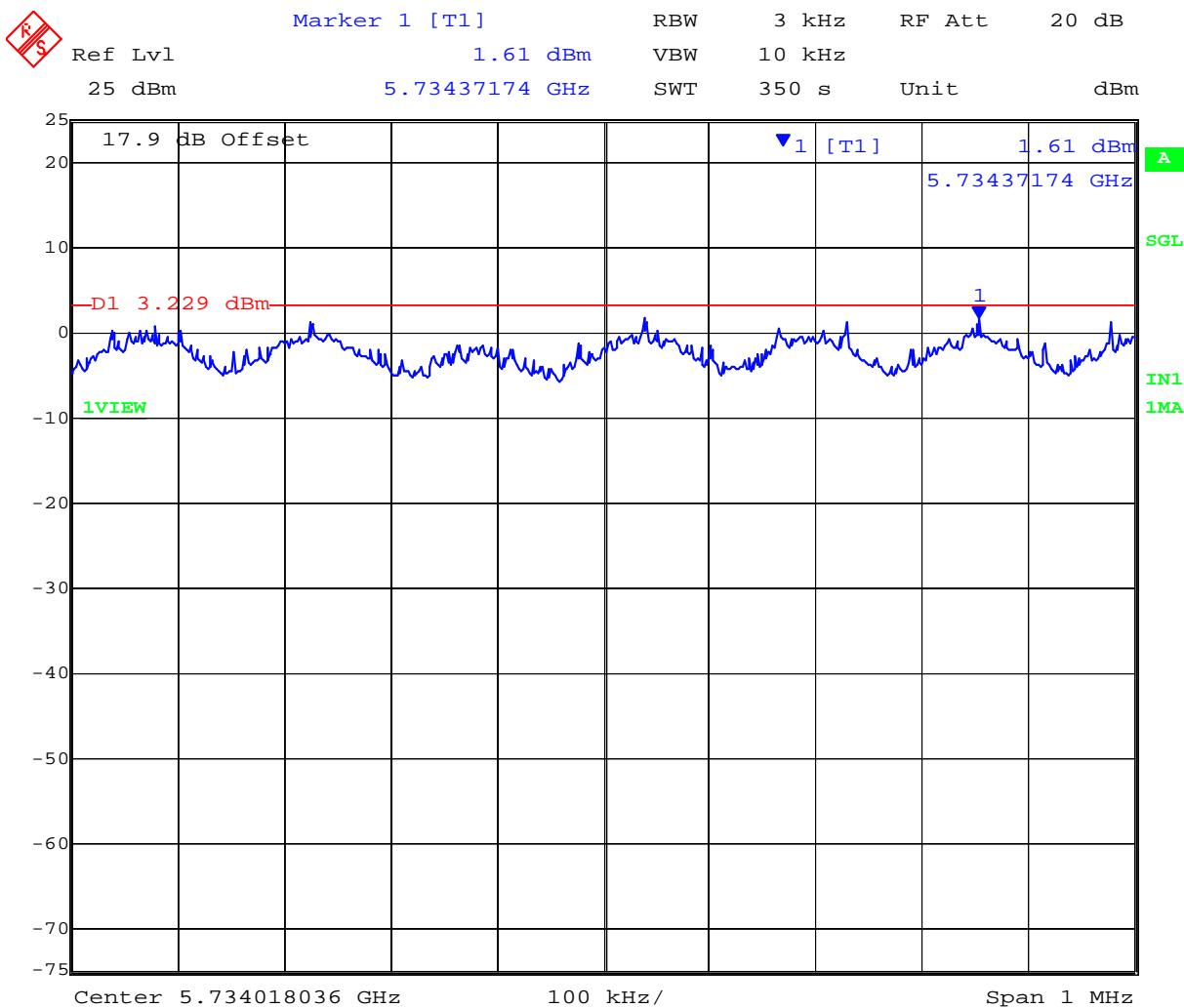


Date: 16.MAR.2012 14:36:17

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### 10 MHz PORT B 5.735 MHz 802.11a 6 MBits - Peak Power Spectral Density

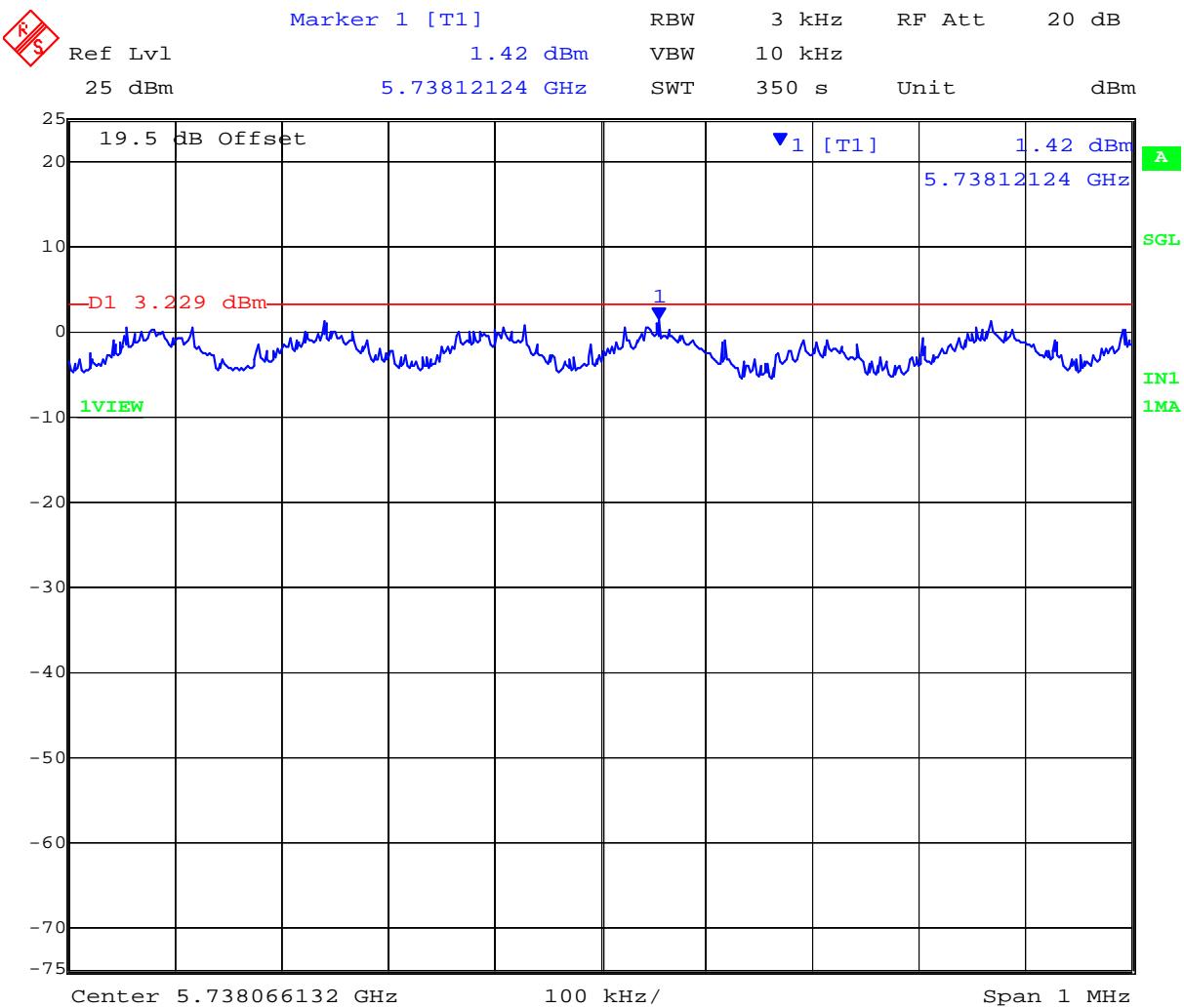


Date: 16.MAR.2012 14:42:50

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### 10 MHz PORT C 5,735 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 14:49:18

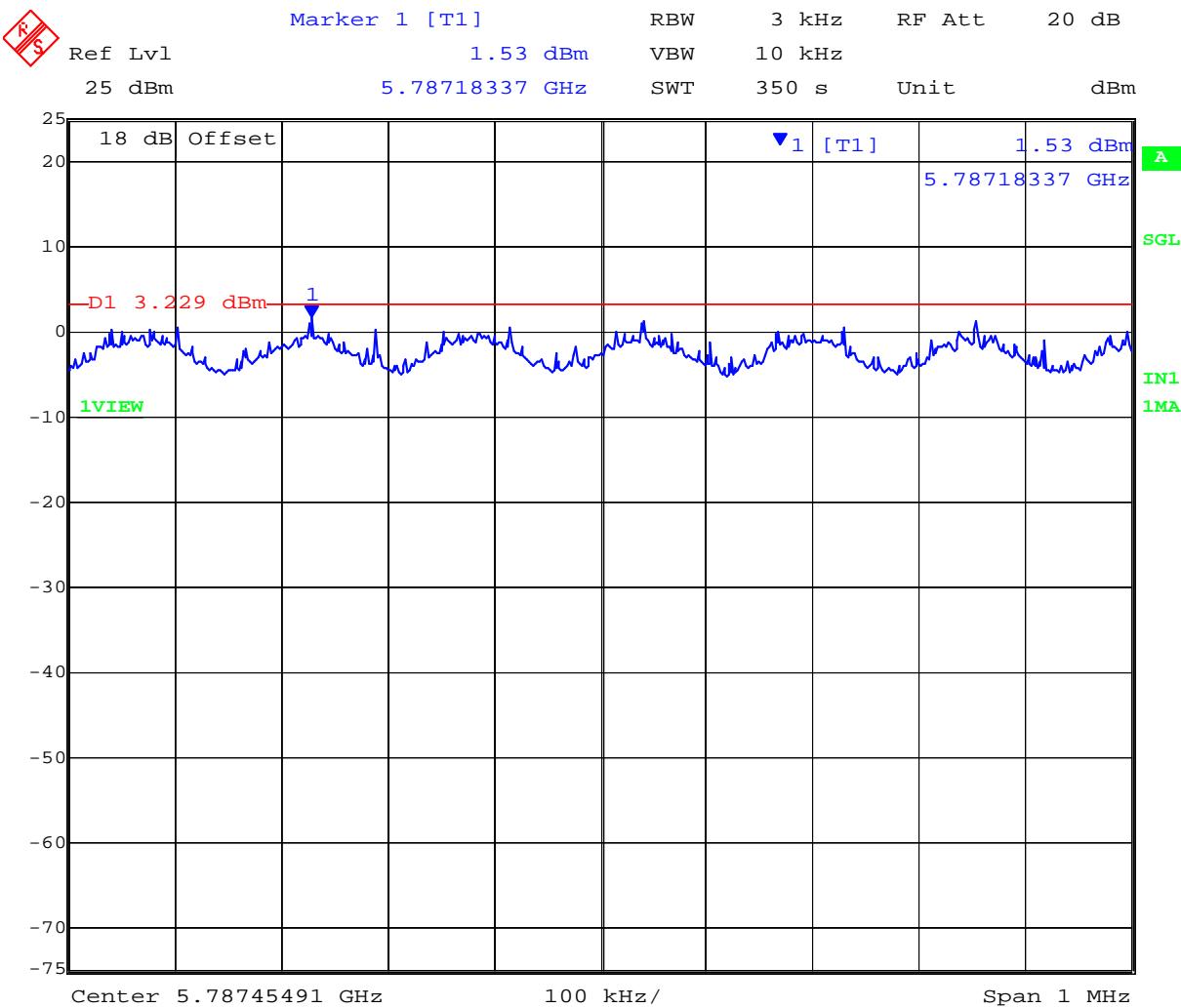
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 182 of 412

### 10 MHz PORT A 5,790 MHz 802.11a 6 MBits - Peak Power Spectral Density



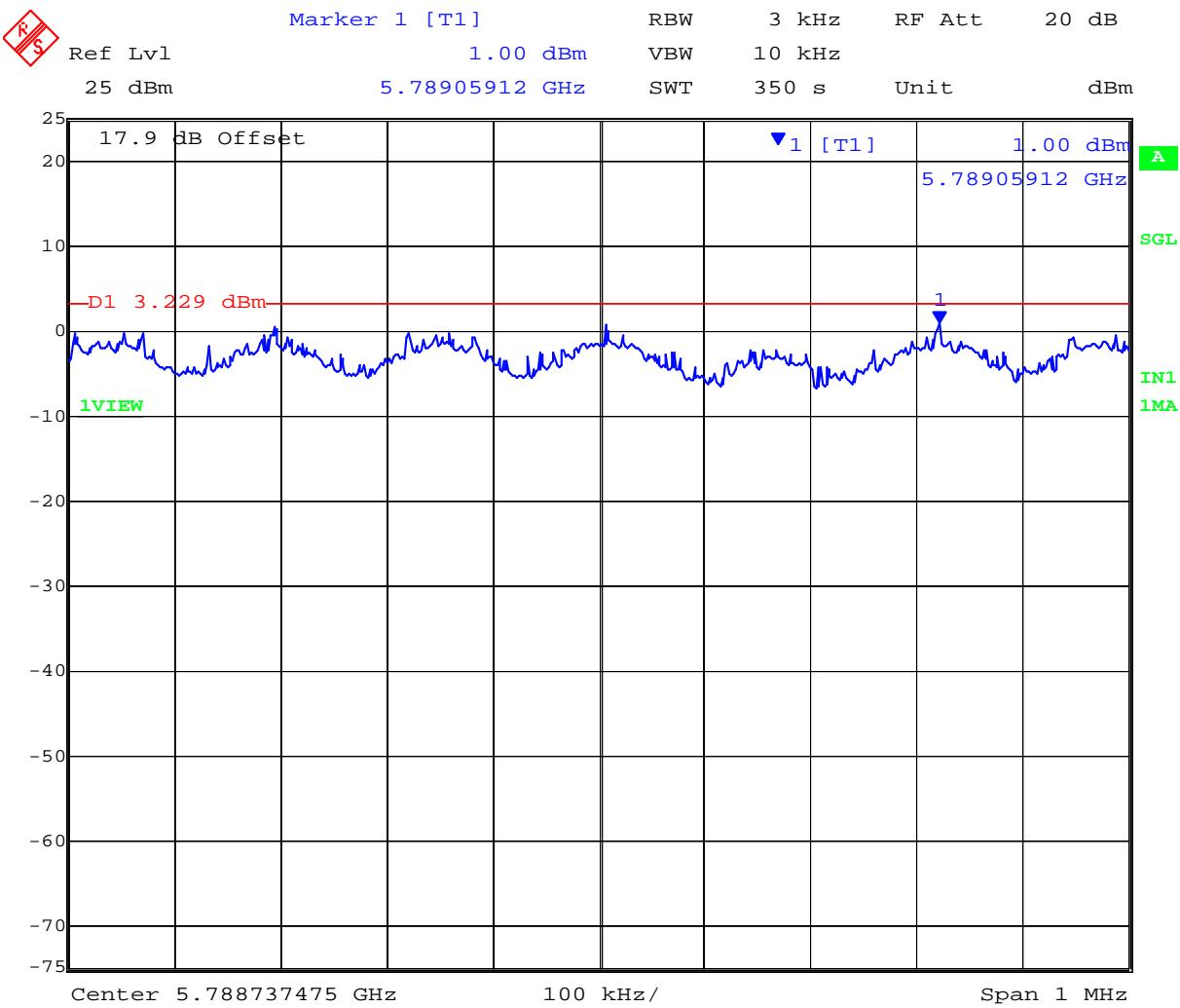
Date: 16.MAR.2012 15:05:48

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 183 of 412

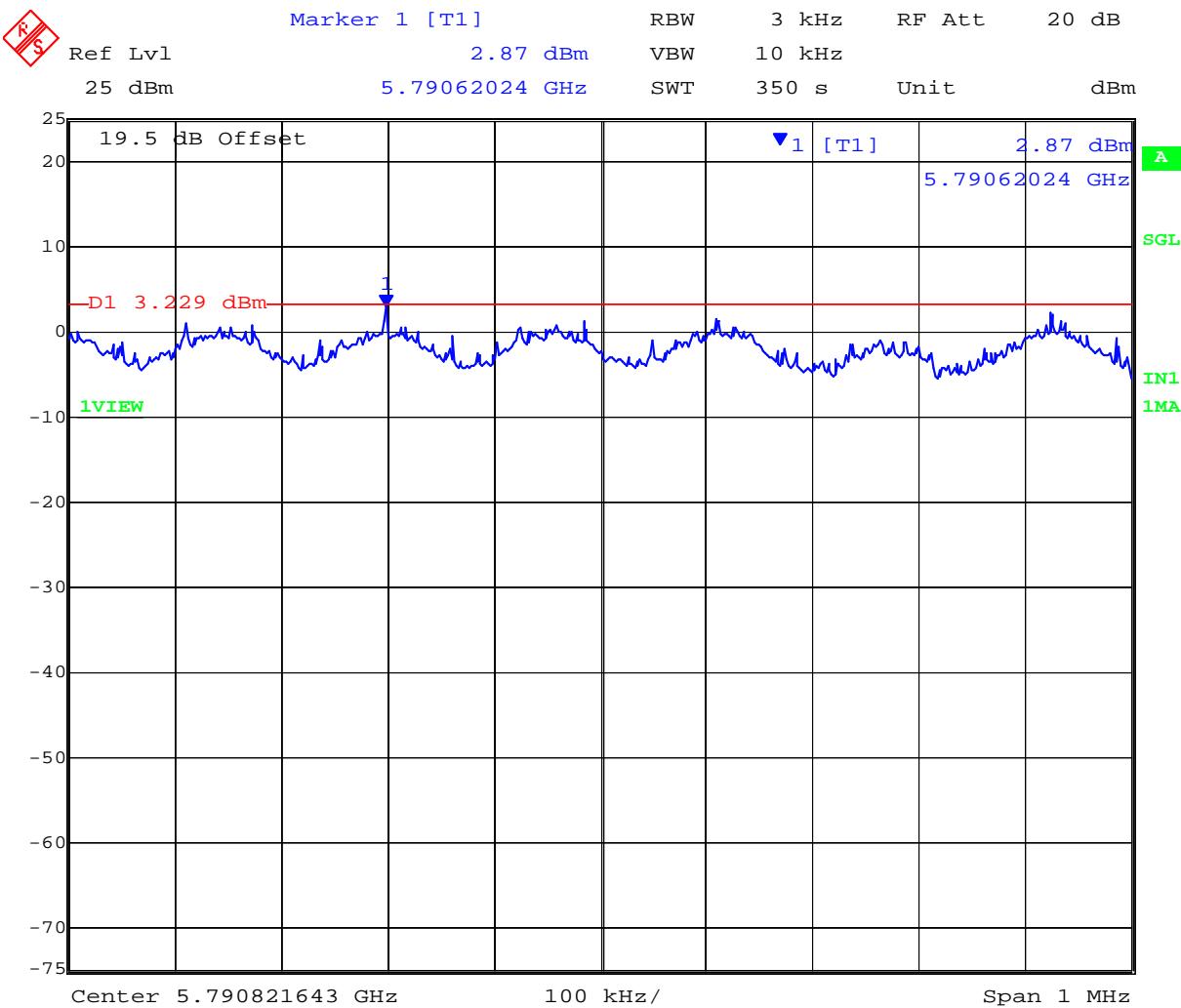
### 10 MHz PORT B 5,790 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 15:12:19

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### 10 MHz PORT C 5,790 MHz 802.11a 6 MBits - Peak Power Spectral Density

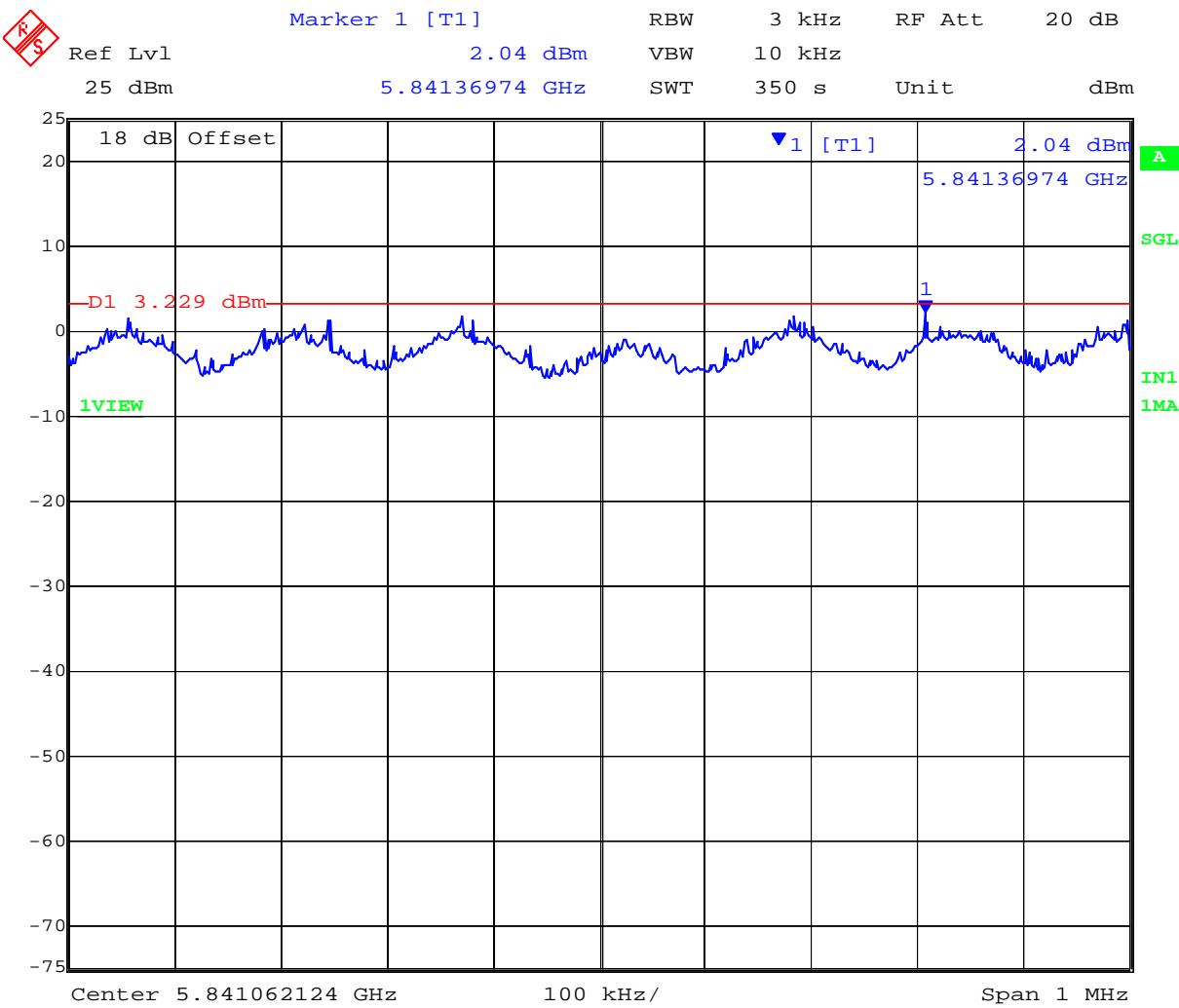


Date: 16.MAR.2012 15:18:49

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### 10 MHz PORT A 5,840 MHz 802.11a 6 MBits - Peak Power Spectral Density

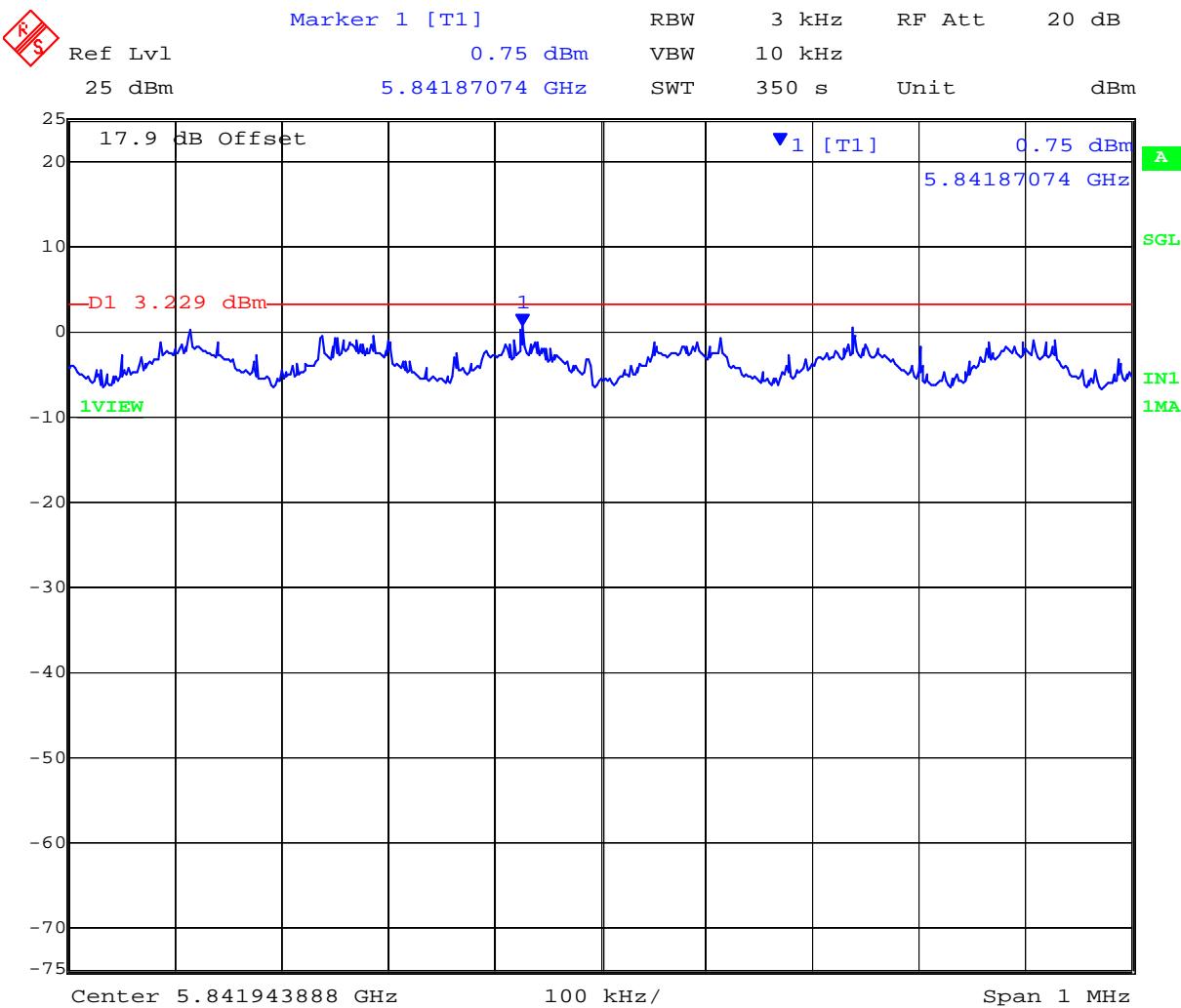


Date: 16.MAR.2012 15:50:58

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### 10 MHz PORT B 5,840 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 15:57:30

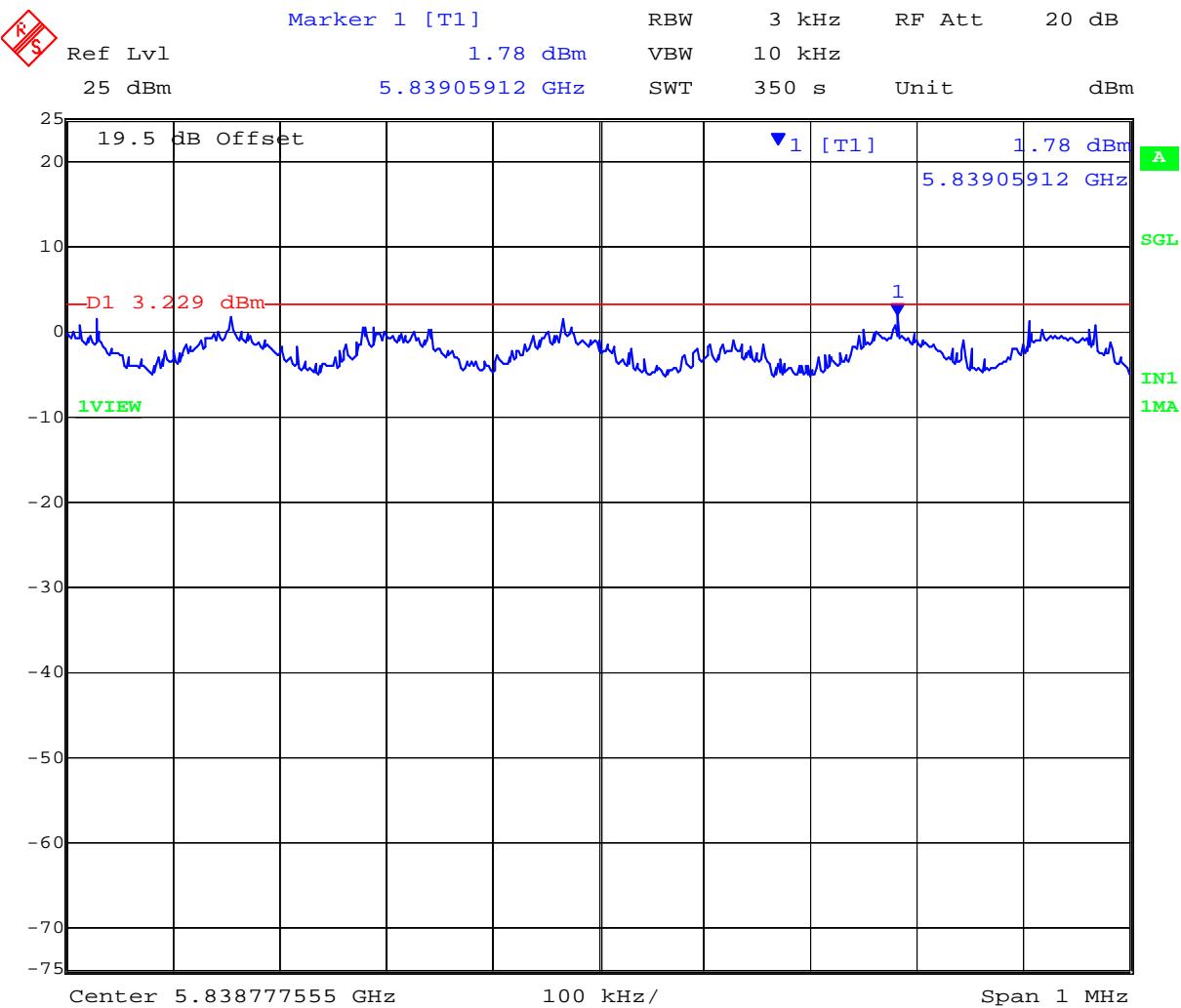
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 187 of 412

### 10 MHz PORT C 5,840 MHz 802.11a 6 MBits - Peak Power Spectral Density



Date: 16.MAR.2012 16:04:01

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 188 of 412

## TABLE OF RESULTS – 802.11a Legacy

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

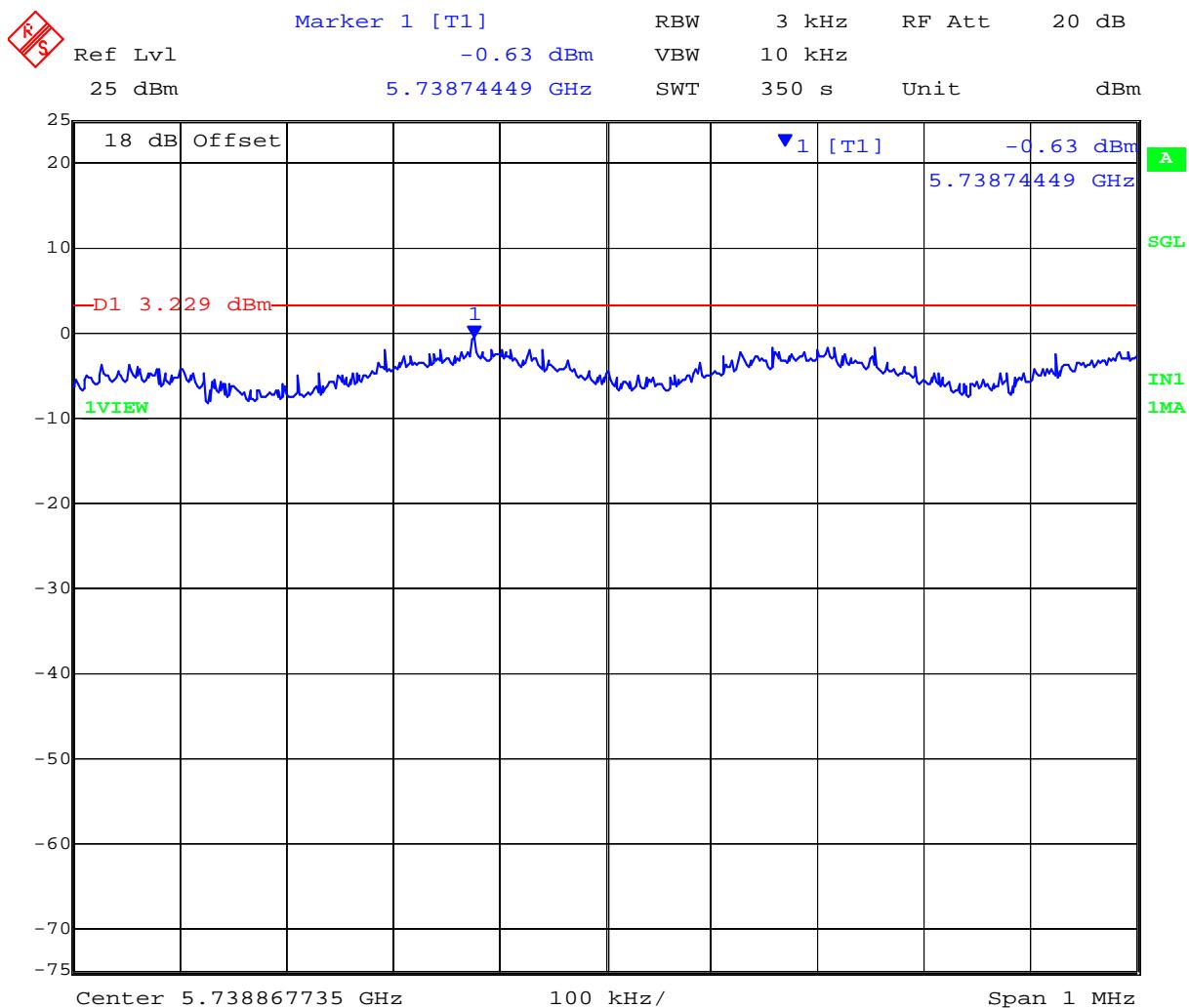
<b>Test Frequency</b>	<b>Measured Power Density</b>				<b>Correction factor</b>	<b>Σ Power Spectral Density</b>	<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>10Log(N)</b>	<b>dBm</b>	<b>dBm</b>	<b>dB</b>
5745	-0.63	-1.09	1.17	--	4.77	5.94	3.23	-2.06
5785	0.56	-1.84	1.92	--	4.77	6.69	3.23	-1.31
5825	-0.43	-2.98	0.11	--	4.77	4.88	3.23	-3.12

<b>Measurement uncertainty:</b>	± 1.33 dB
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NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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### PORT A 5,745 MHz 802.11a Legacy - Peak Power Spectral Density

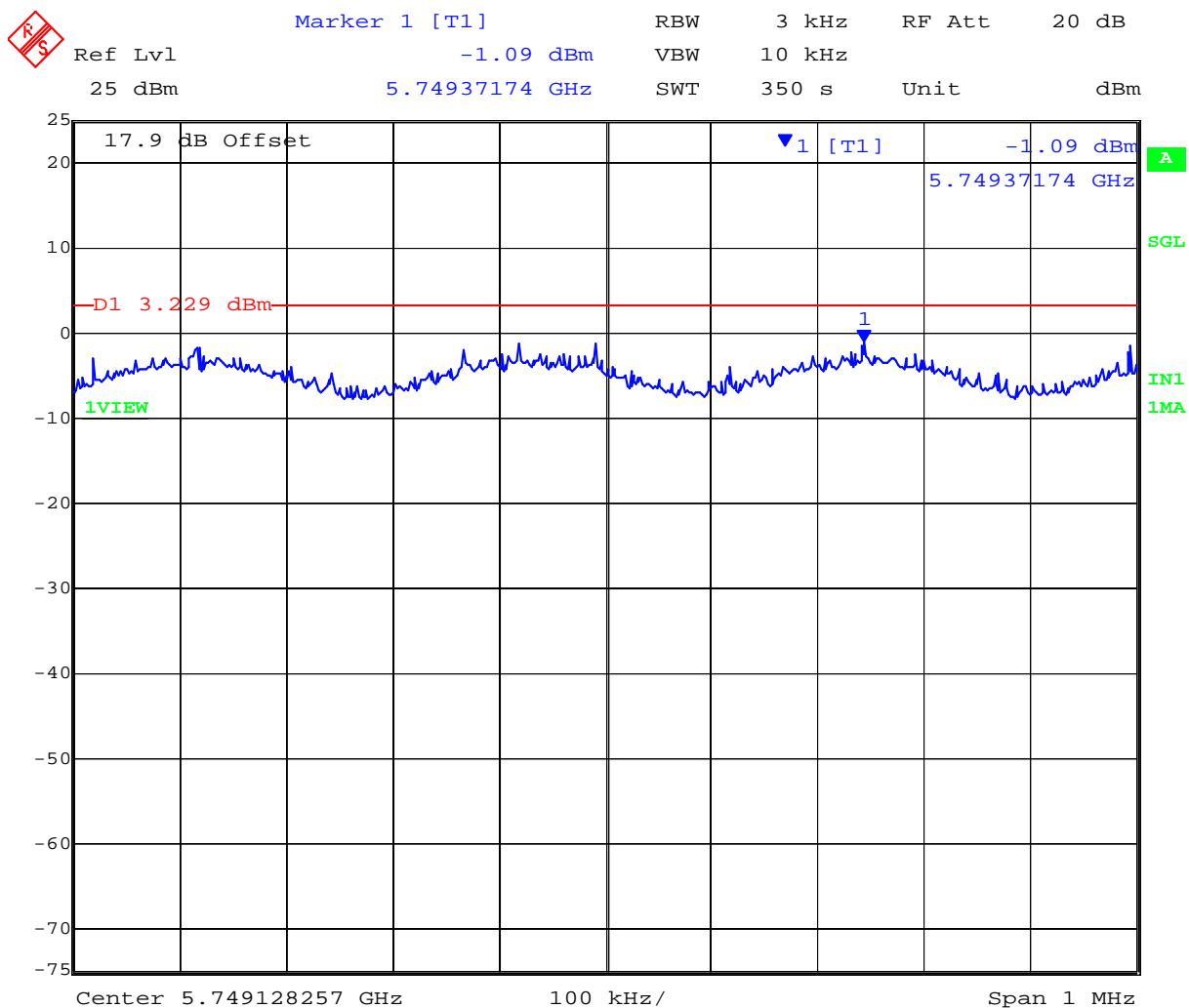


Date: 28.FEB.2012 12:03:28

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### PORT B 5,745 MHz 802.11a Legacy - Peak Power Spectral Density

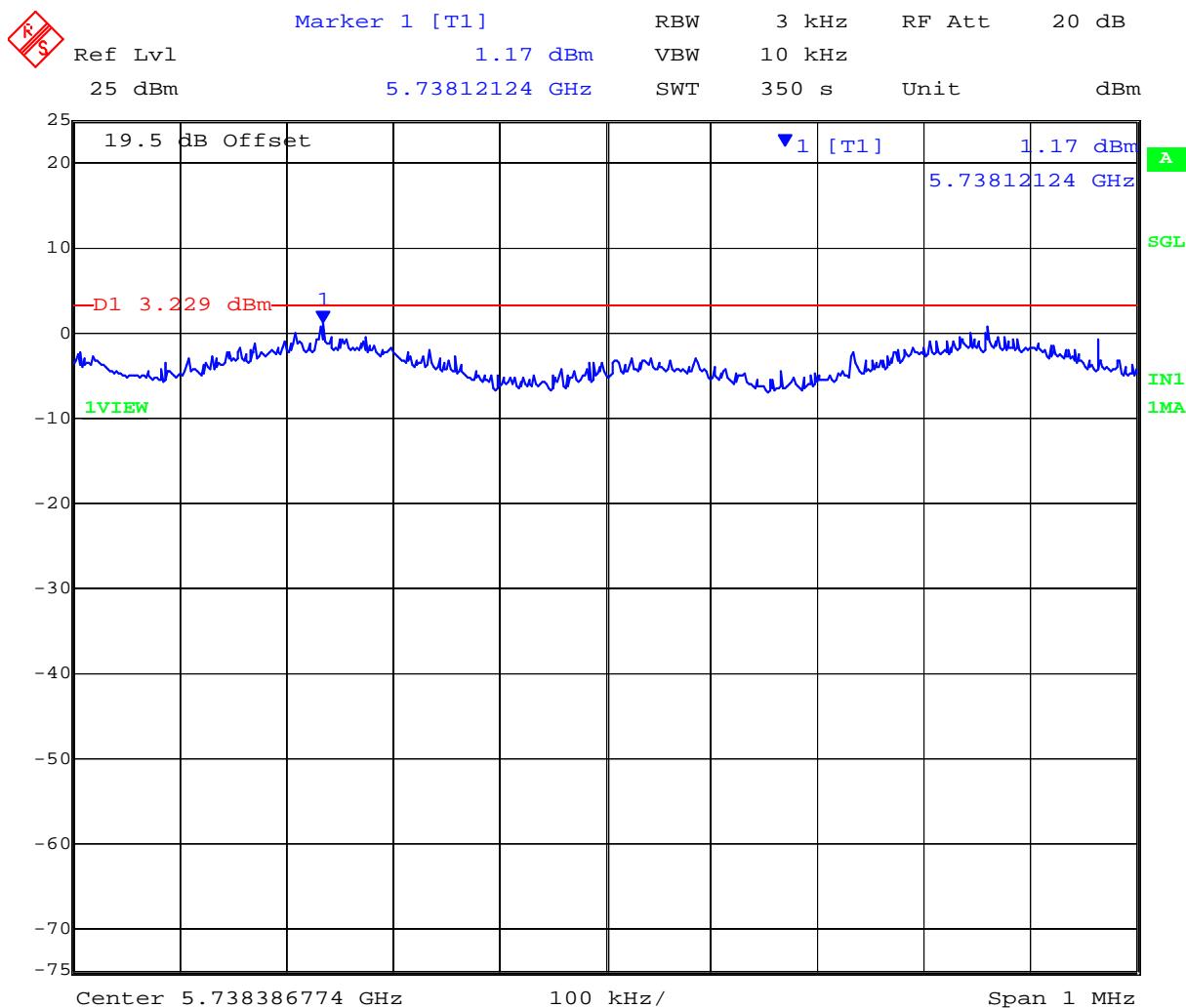


Date: 28.FEB.2012 12:10:01

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### PORT C 5,745 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 12:16:31

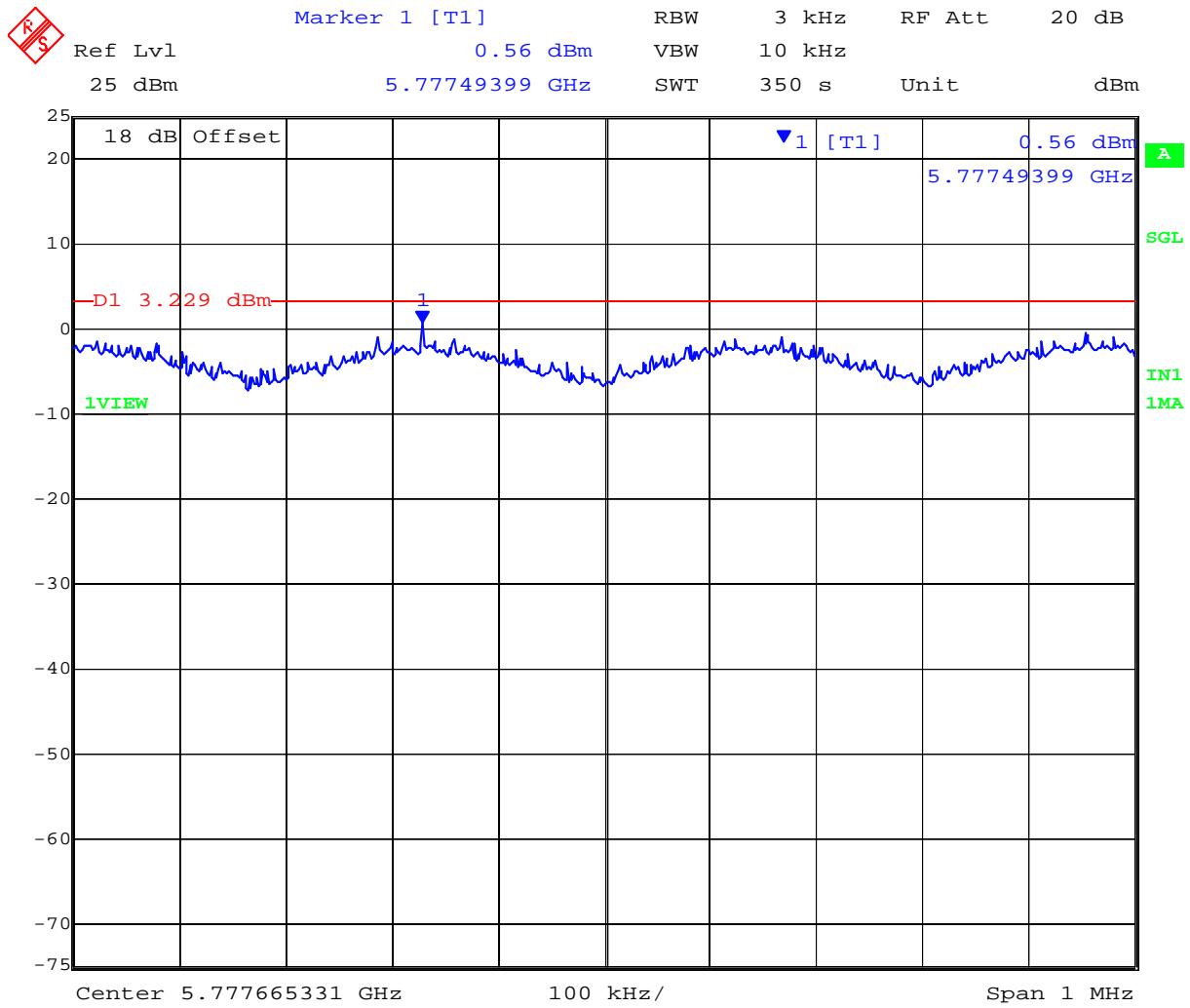
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 192 of 412

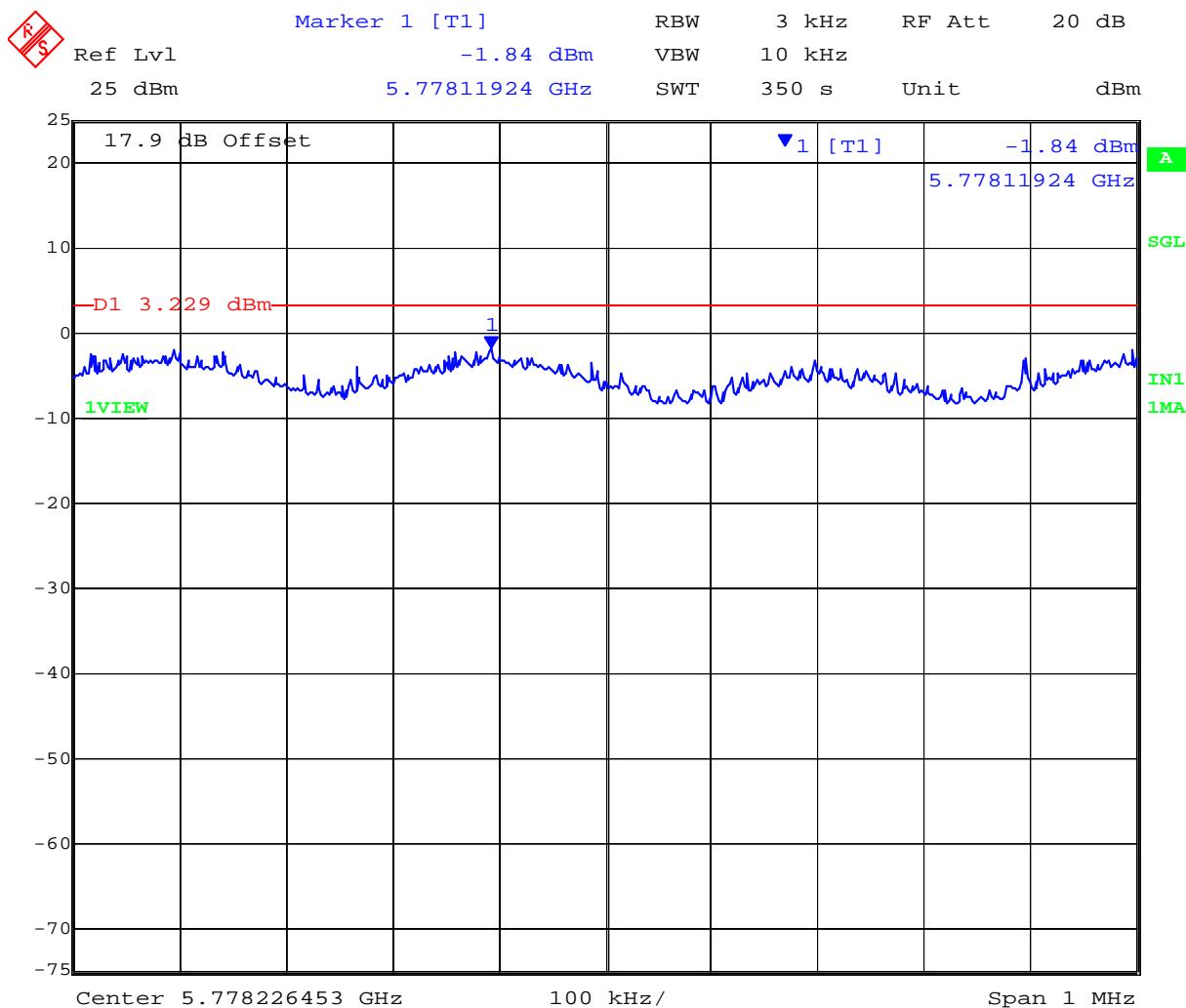
### PORT A 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 12:32:50

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### PORT B 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 12:39:24

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 194 of 412

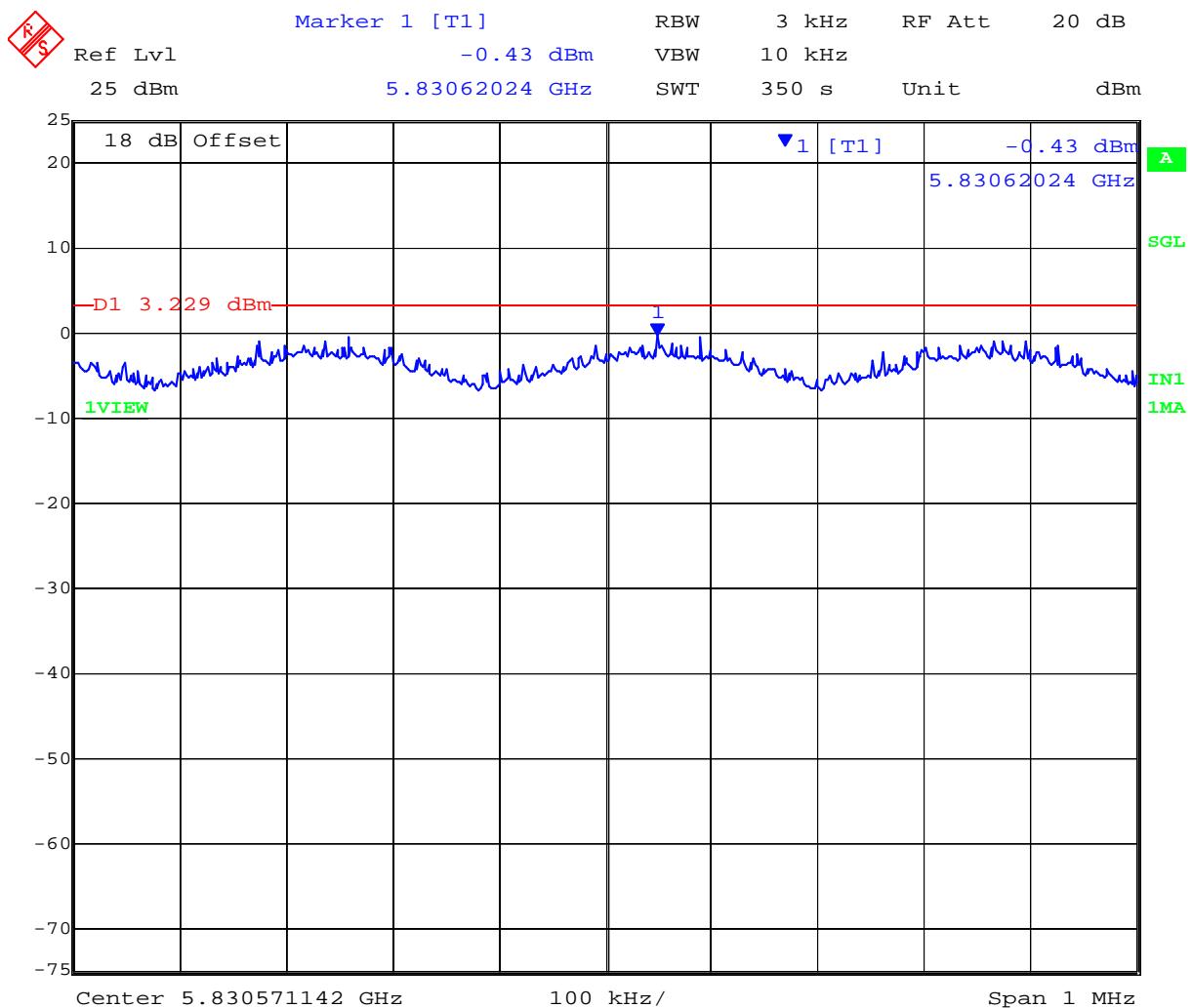
### PORT C 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 12:45:55

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### PORT A 5.825 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 13:07:25

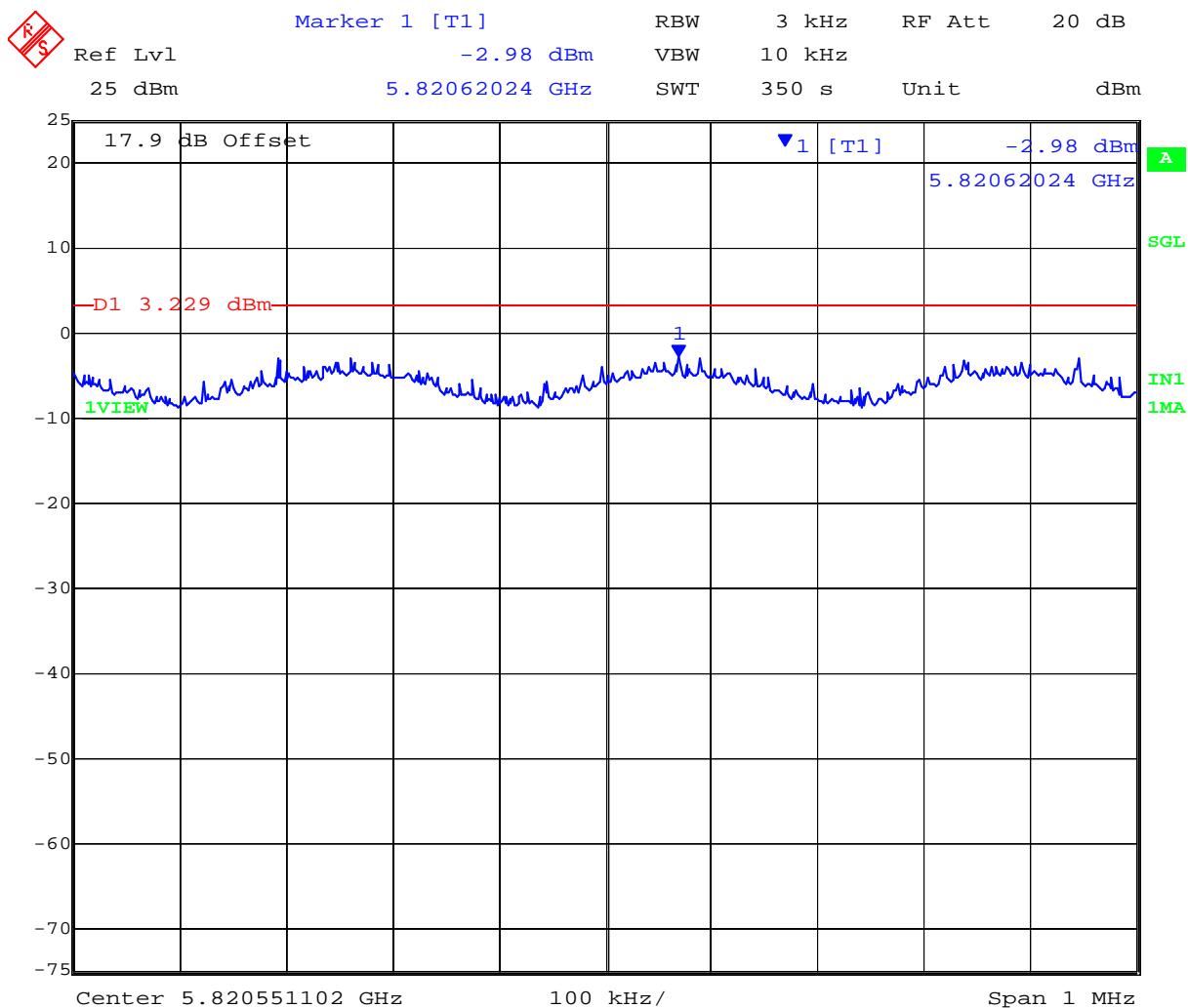
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 196 of 412

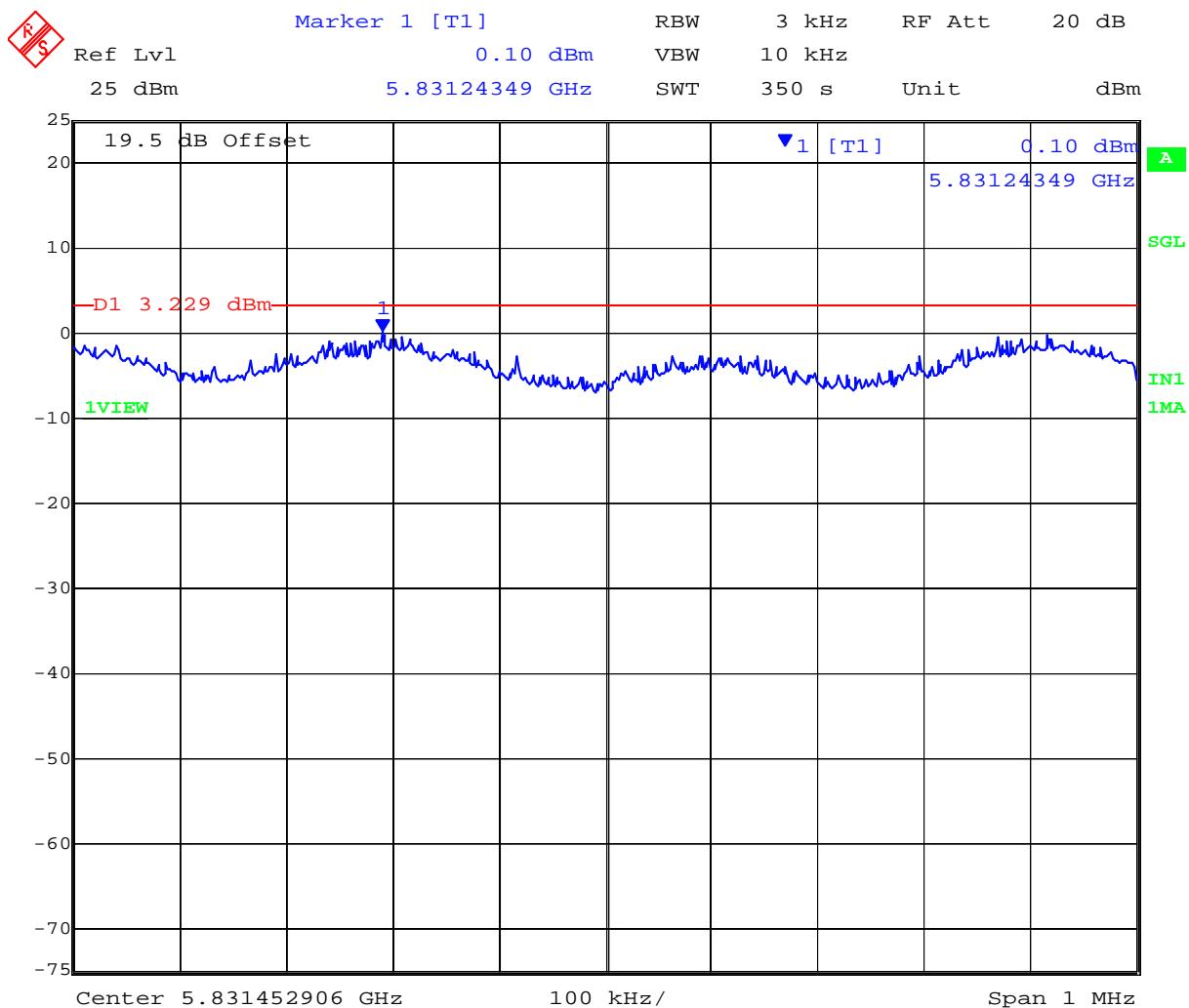
### PORT B 5,825 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 13:13:59

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### PORT C 5,825 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 28.FEB.2012 13:20:30

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 198 of 412

## TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

Test Frequency	Measured Power Density				Correction factor	$\Sigma$ Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5745	-1.50	-2.04	-0.06	--	4.77	4.71	3.23	-3.29
5785	-0.17	-1.84	1.10	--	4.77	5.87	3.23	-2.13
5825	0.08	-2.28	-0.37	--	4.77	4.85	3.23	-3.28

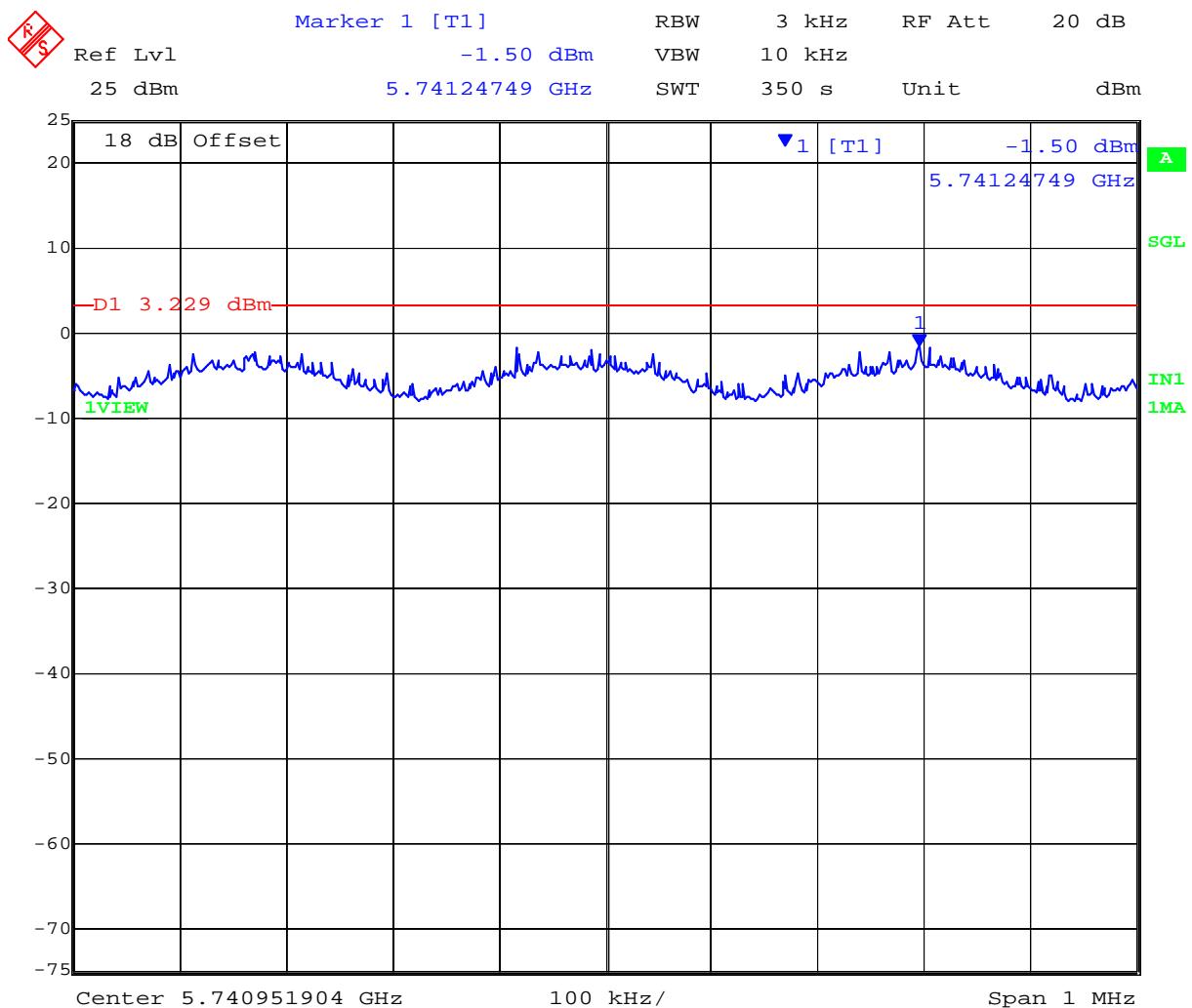
Measurement uncertainty:

± 1.33 dB

NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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### PORT A 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density

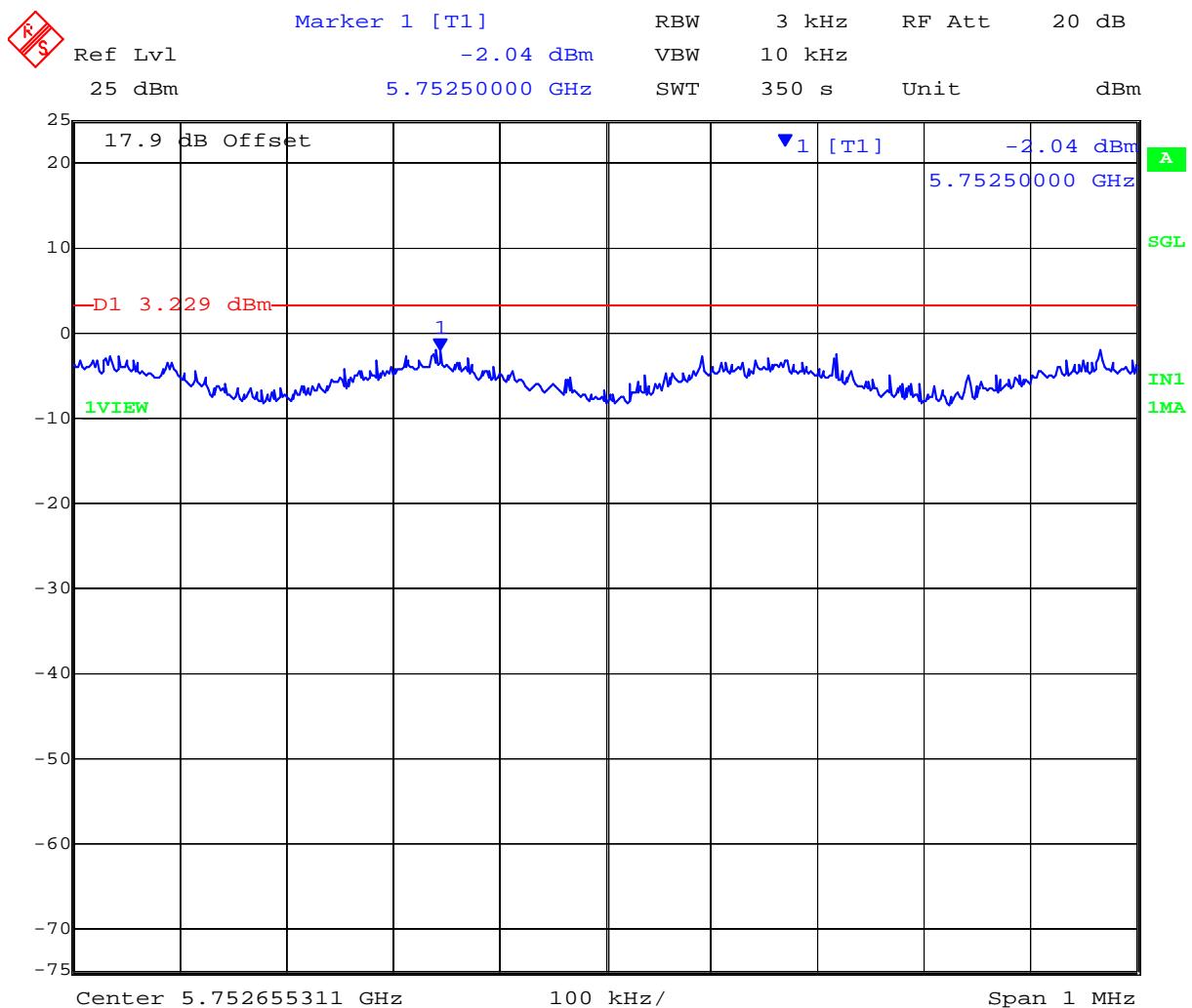


Date: 28.FEB.2012 13:48:55

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### PORT B 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density

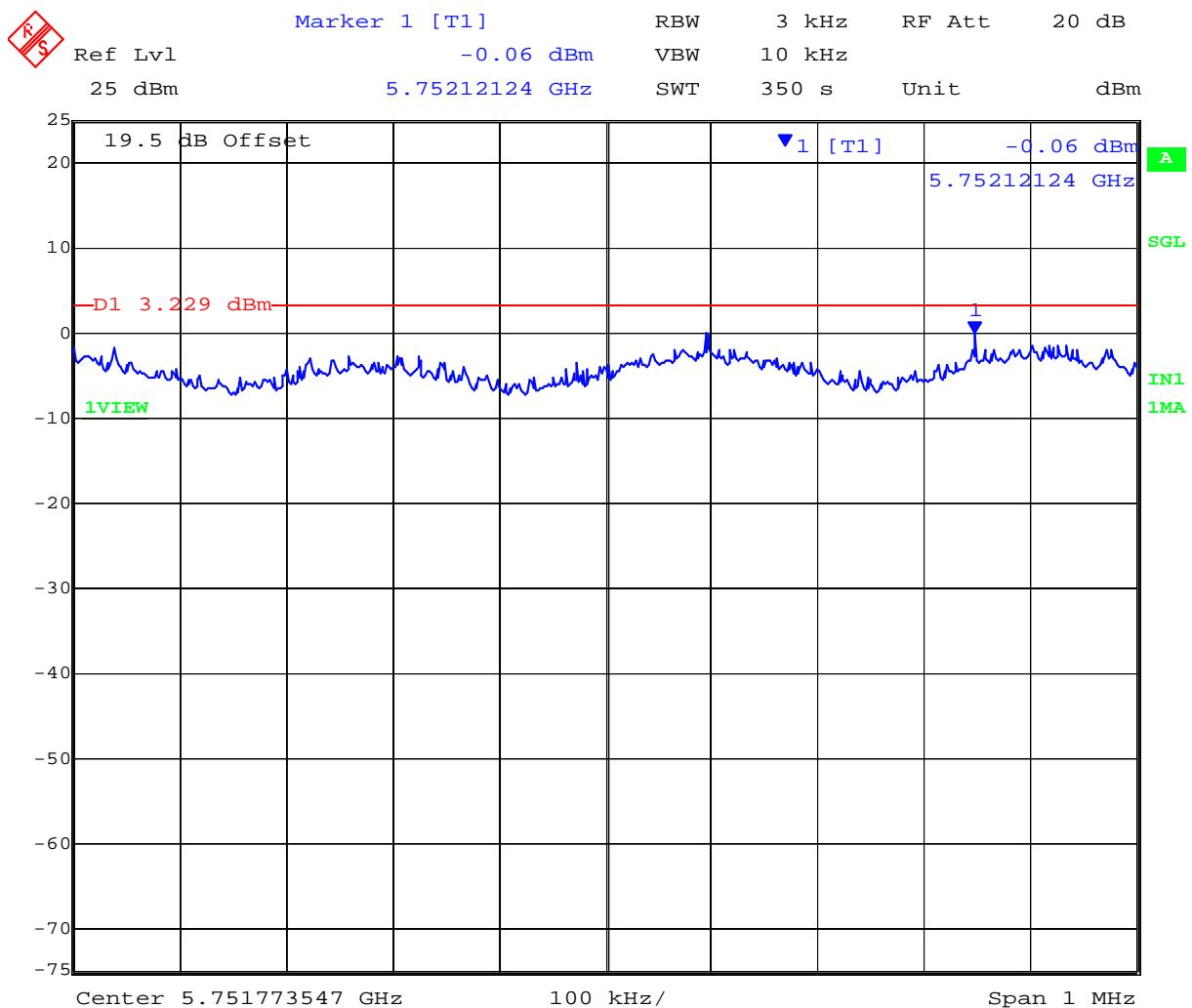


Date: 28.FEB.2012 13:55:26

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### PORT C 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density

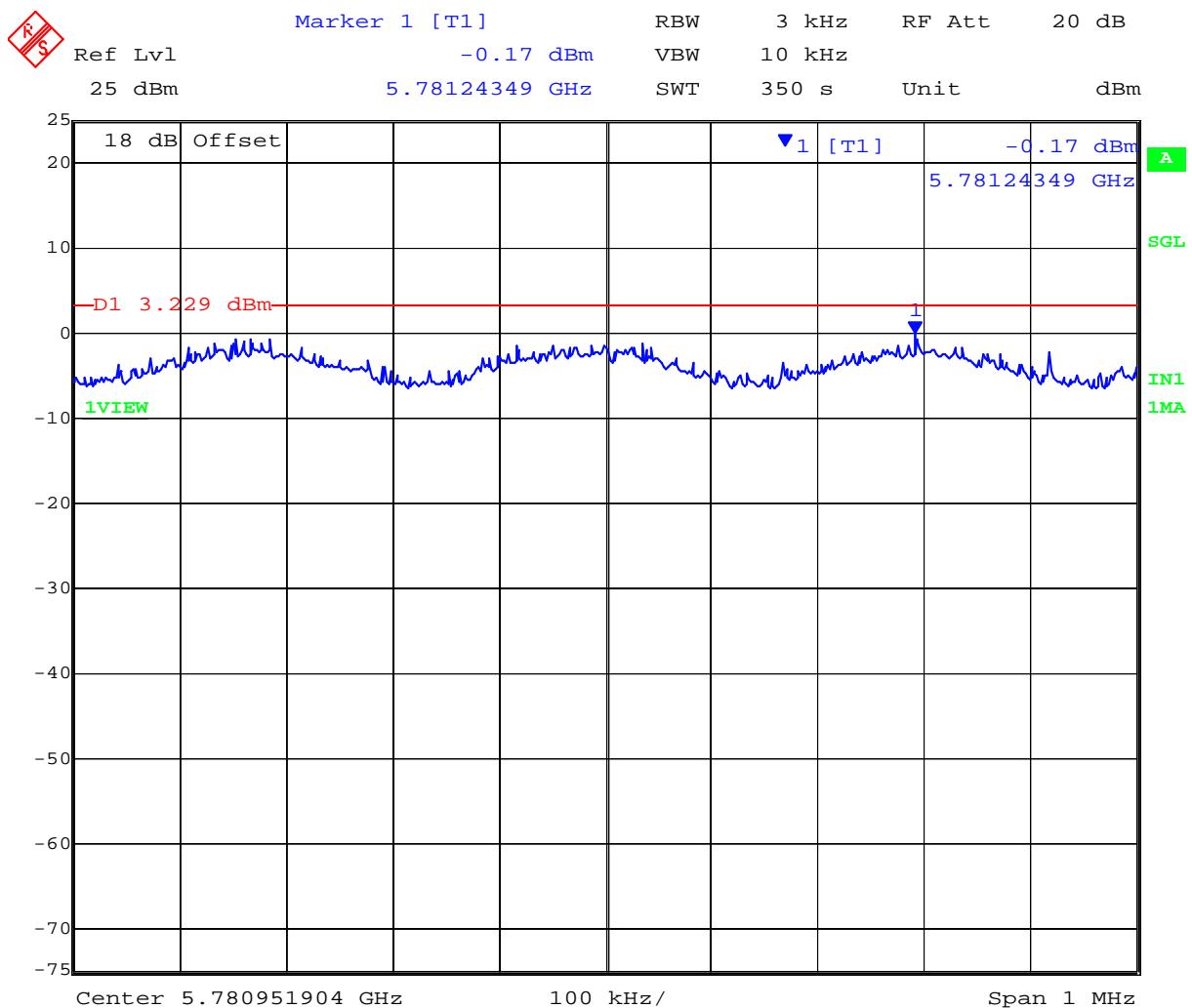


Date: 28.FEB.2012 14:01:58

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### PORT A 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density

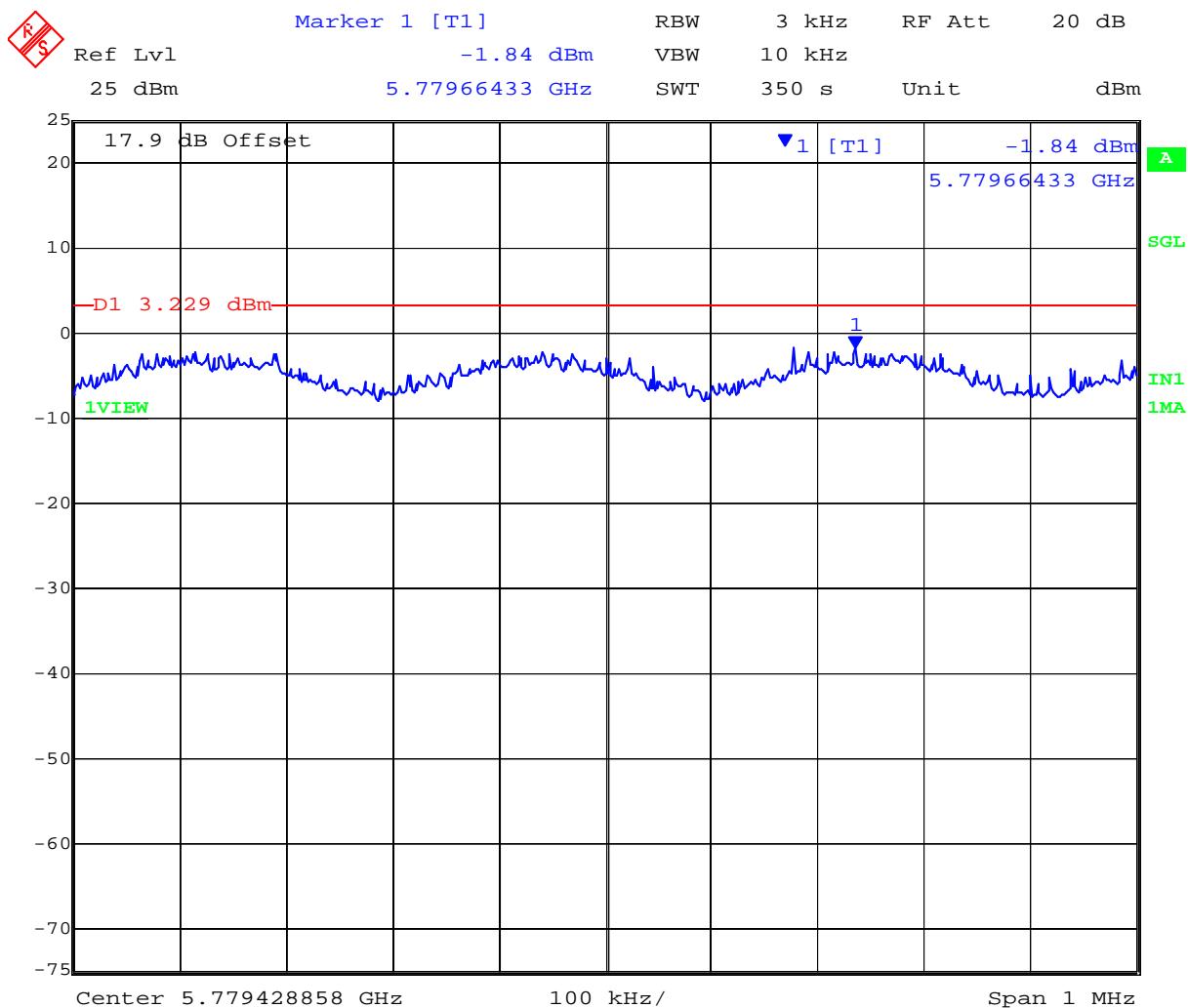


Date: 28.FEB.2012 14:19:46

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### PORT B 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 28.FEB.2012 14:26:20

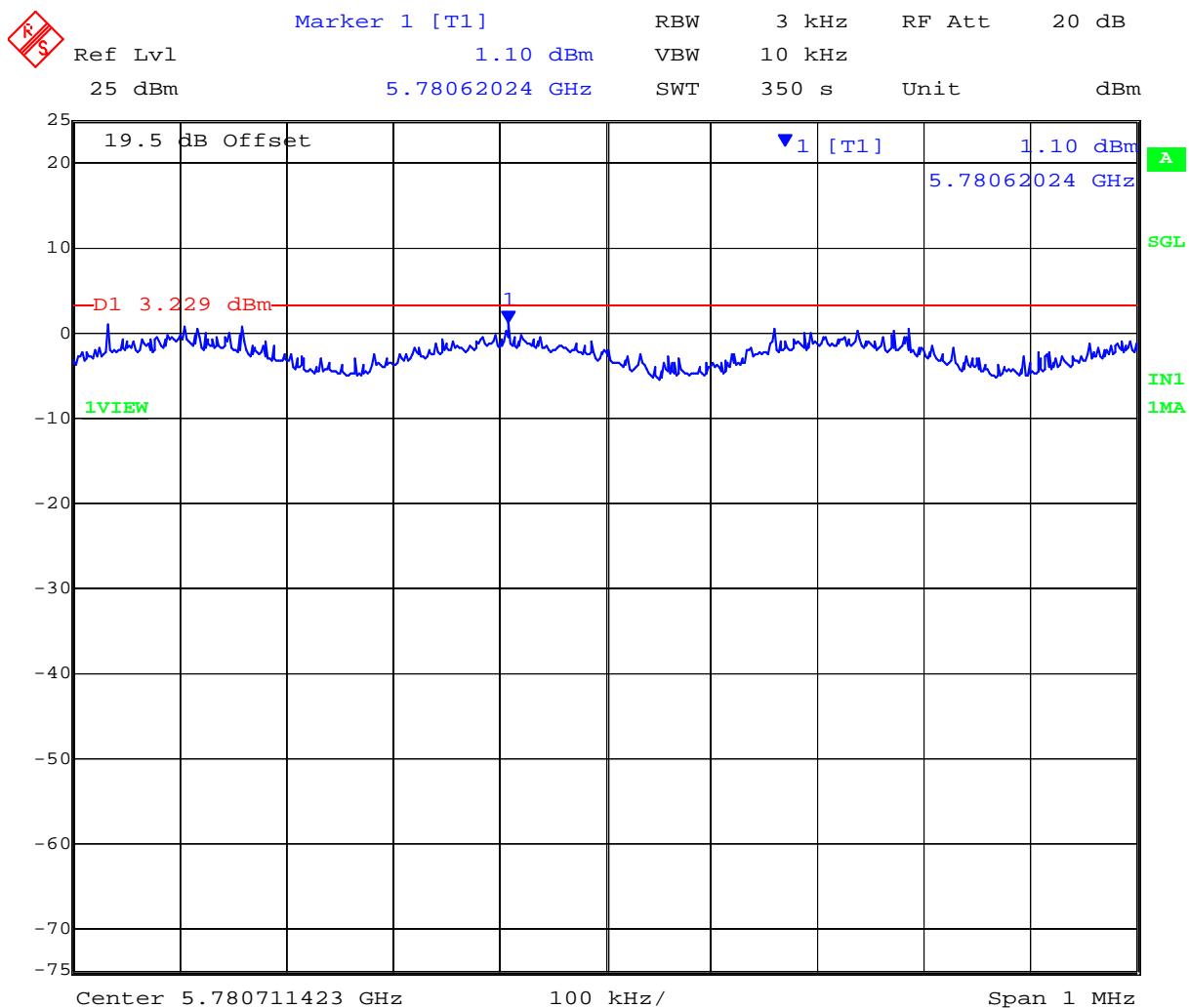
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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 204 of 412

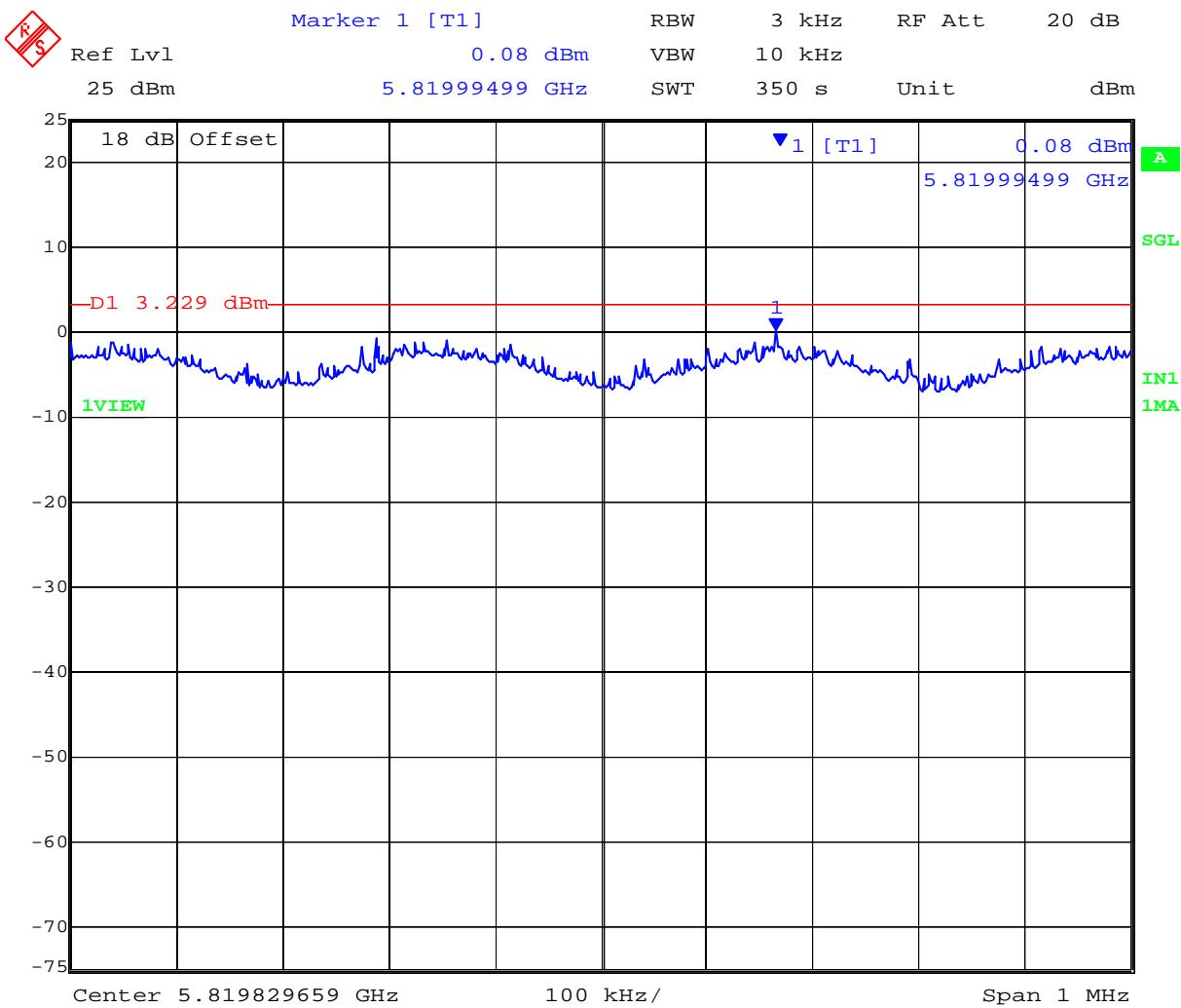
### PORT C 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 28.FEB.2012 14:32:50

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### PORT A 5,825 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 28.FEB.2012 15:01:05

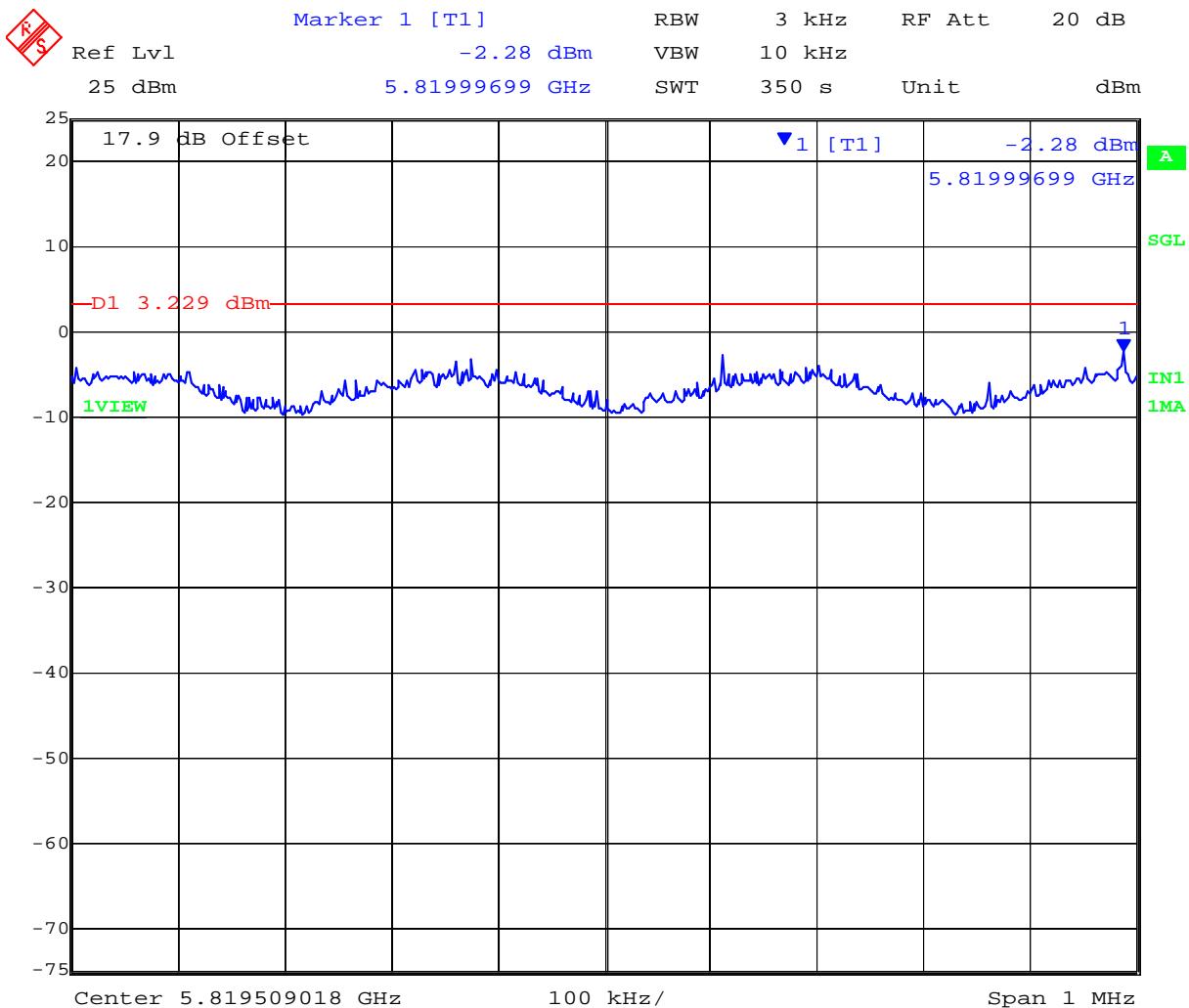
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 206 of 412

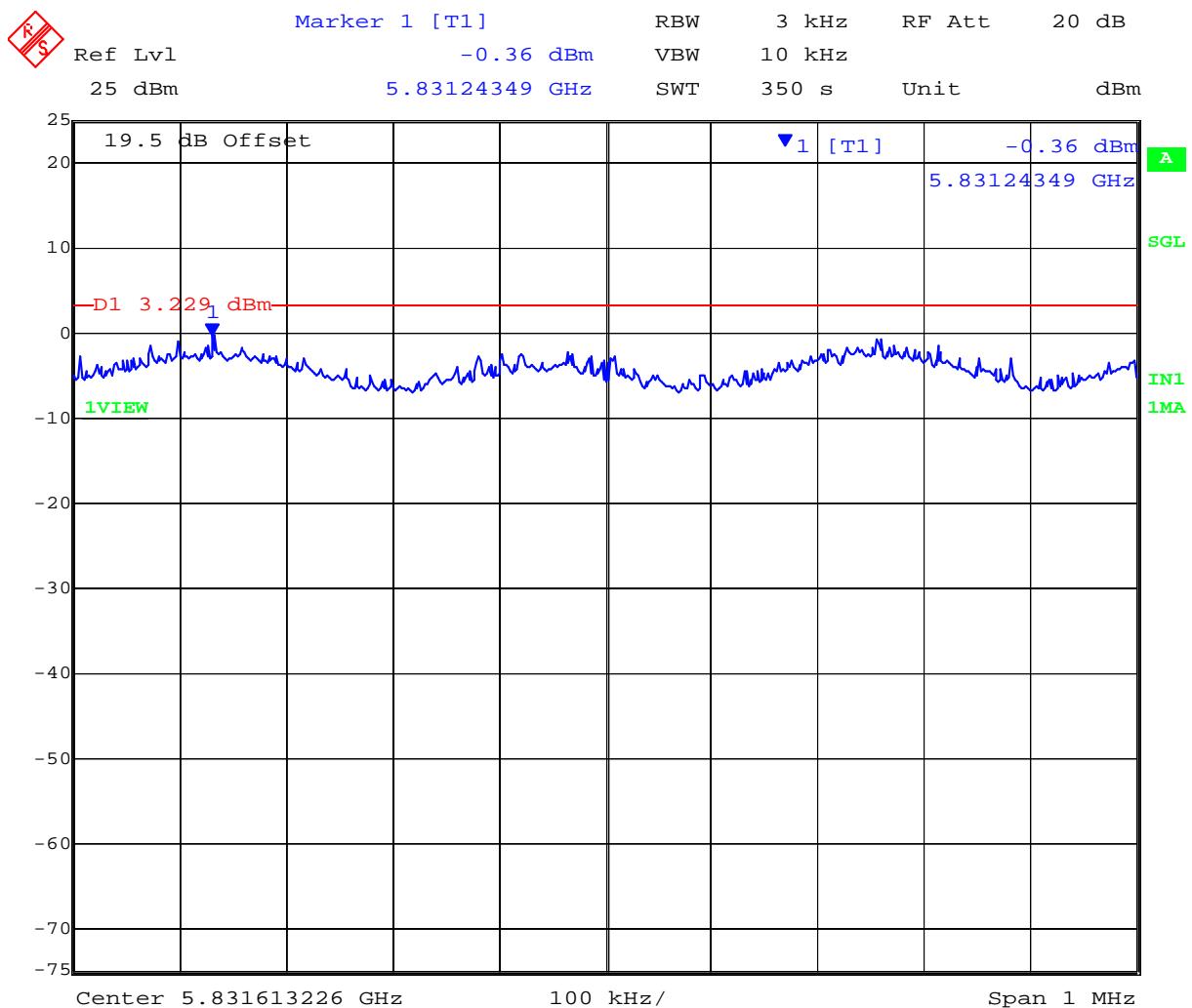
### PORT B 5,825 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 28.FEB.2012 15:07:39

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### PORT C 5,825 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 28.FEB.2012 15:14:11

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 208 of 412

## TABLE OF RESULTS – 802.11n HT-40

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>			
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	3		
<b>Notes 1:</b>					
<b>Notes 2:</b>					

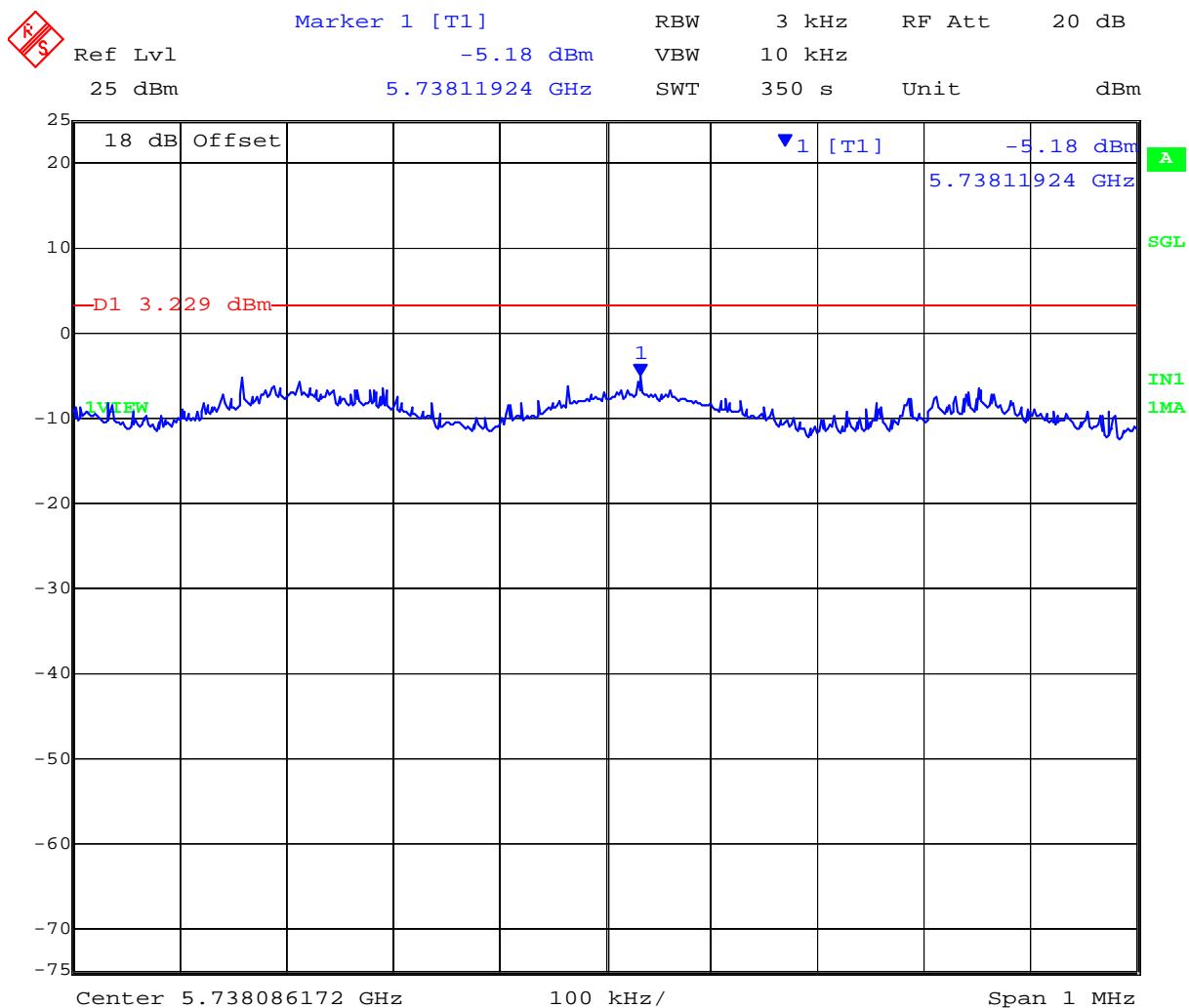
Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5755	-5.18	-6.27	-3.99	--	4.77	0.78	3.23	-7.22
5795	-3.46	-4.28	-0.96	--	4.77	3.81	3.23	-4.19

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

NOTE: above margin is calculated from the highest Power Density returned from Chain A or B or C

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### PORT A 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 28.FEB.2012 15:56:25

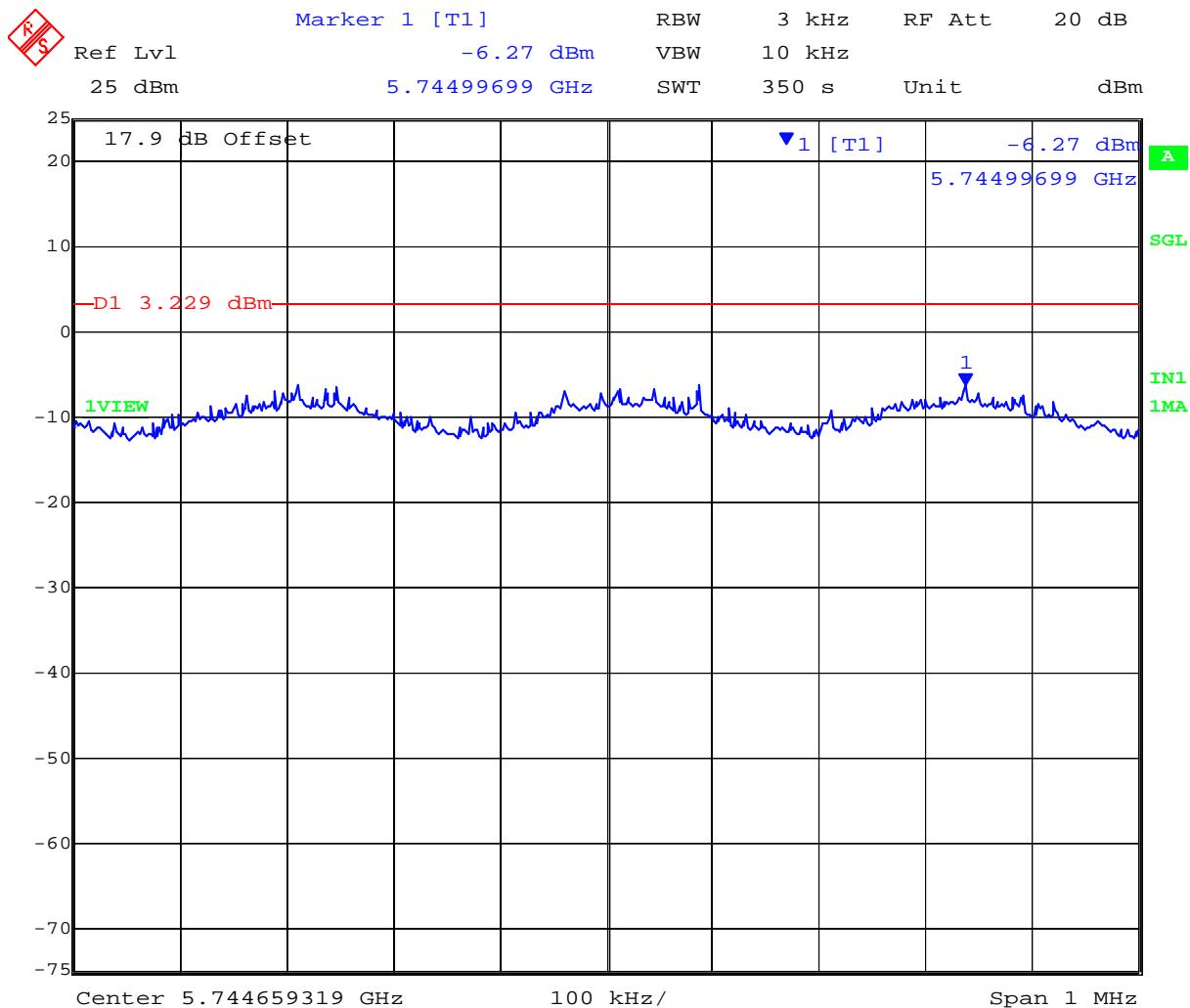
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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 210 of 412

### PORT B 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density



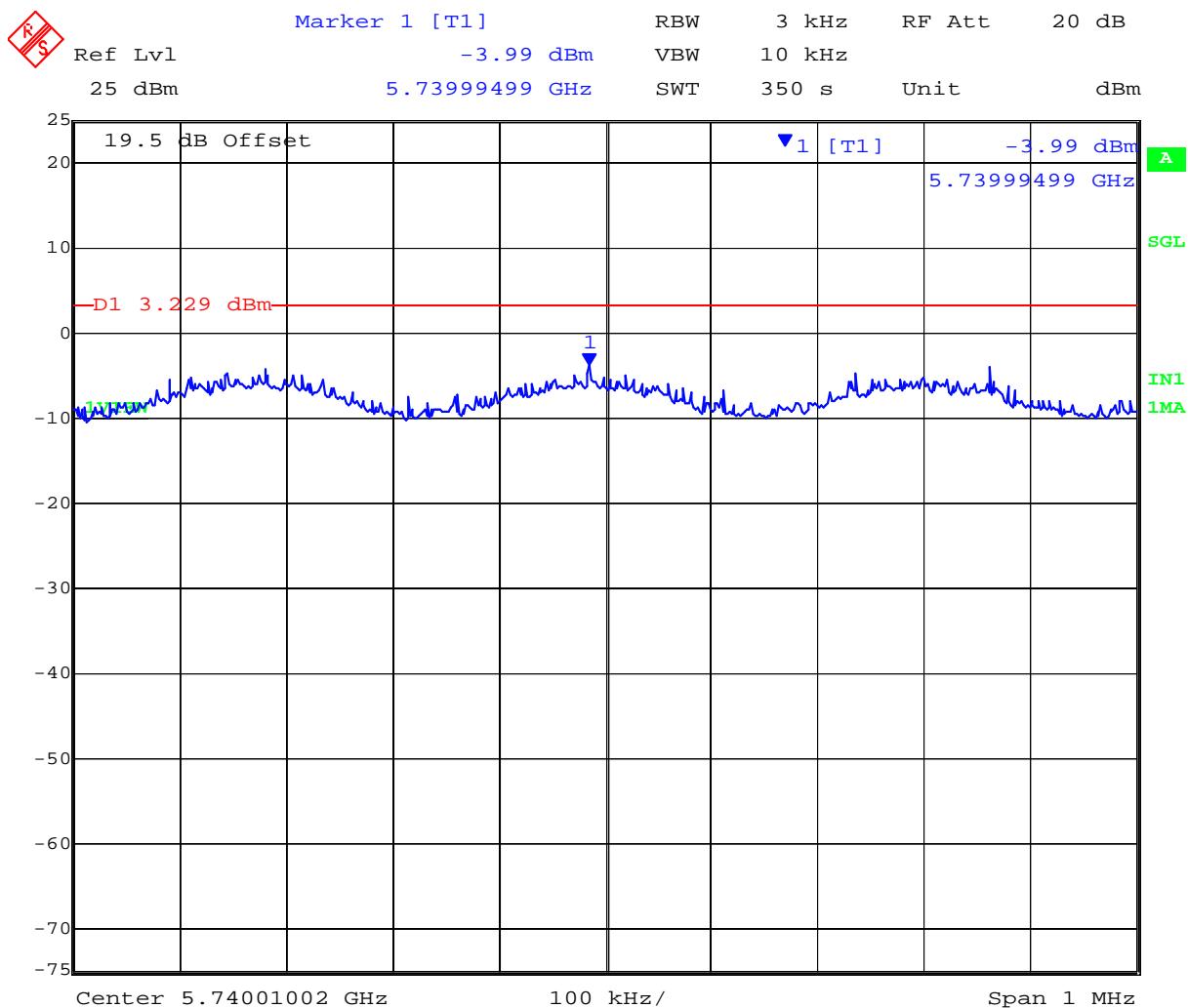
Date: 28.FEB.2012 16:02:59

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 211 of 412

### PORT C 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density

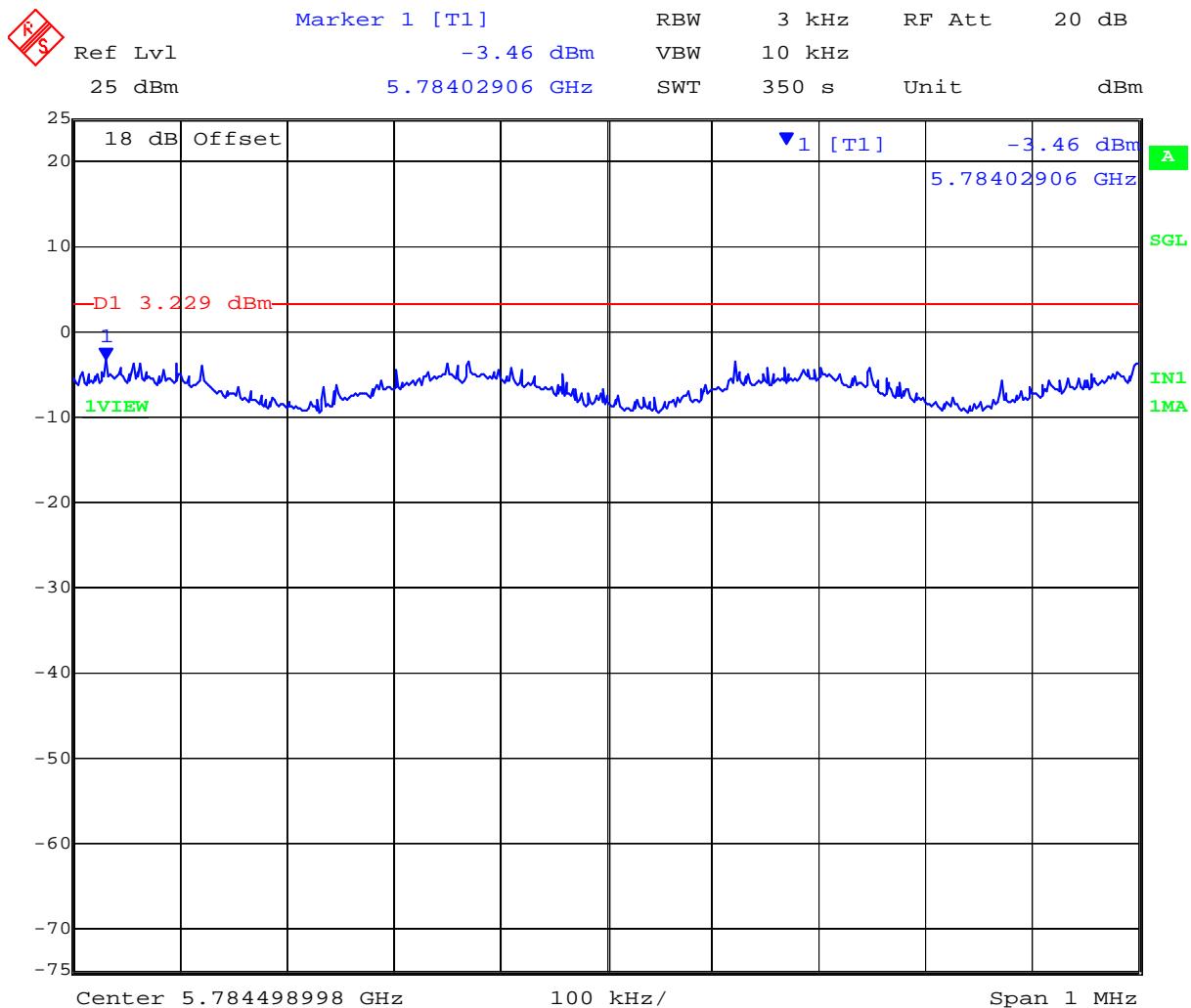


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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 212 of 412

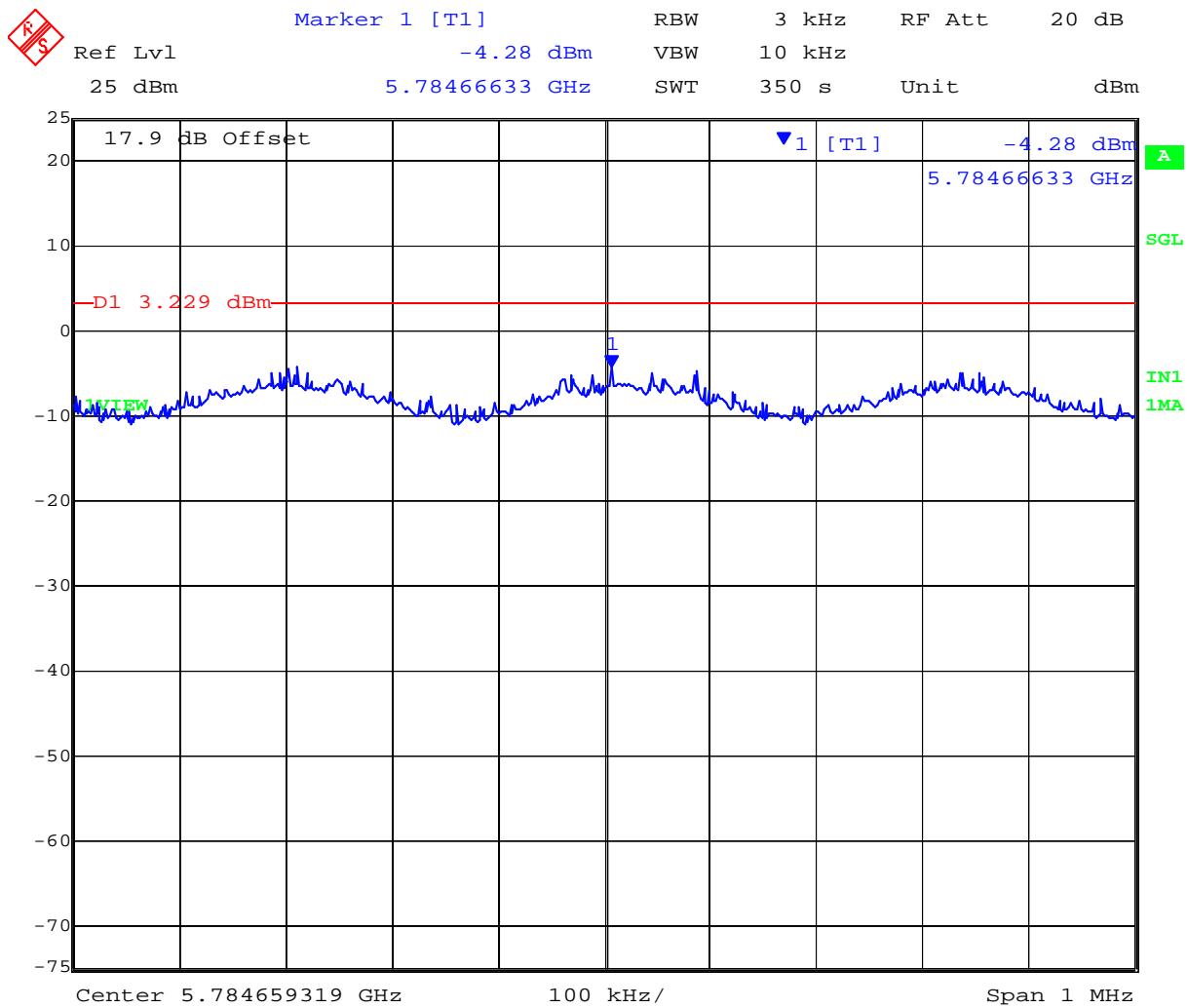
### PORT A 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 28.FEB.2012 16:29:53

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### PORT B 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



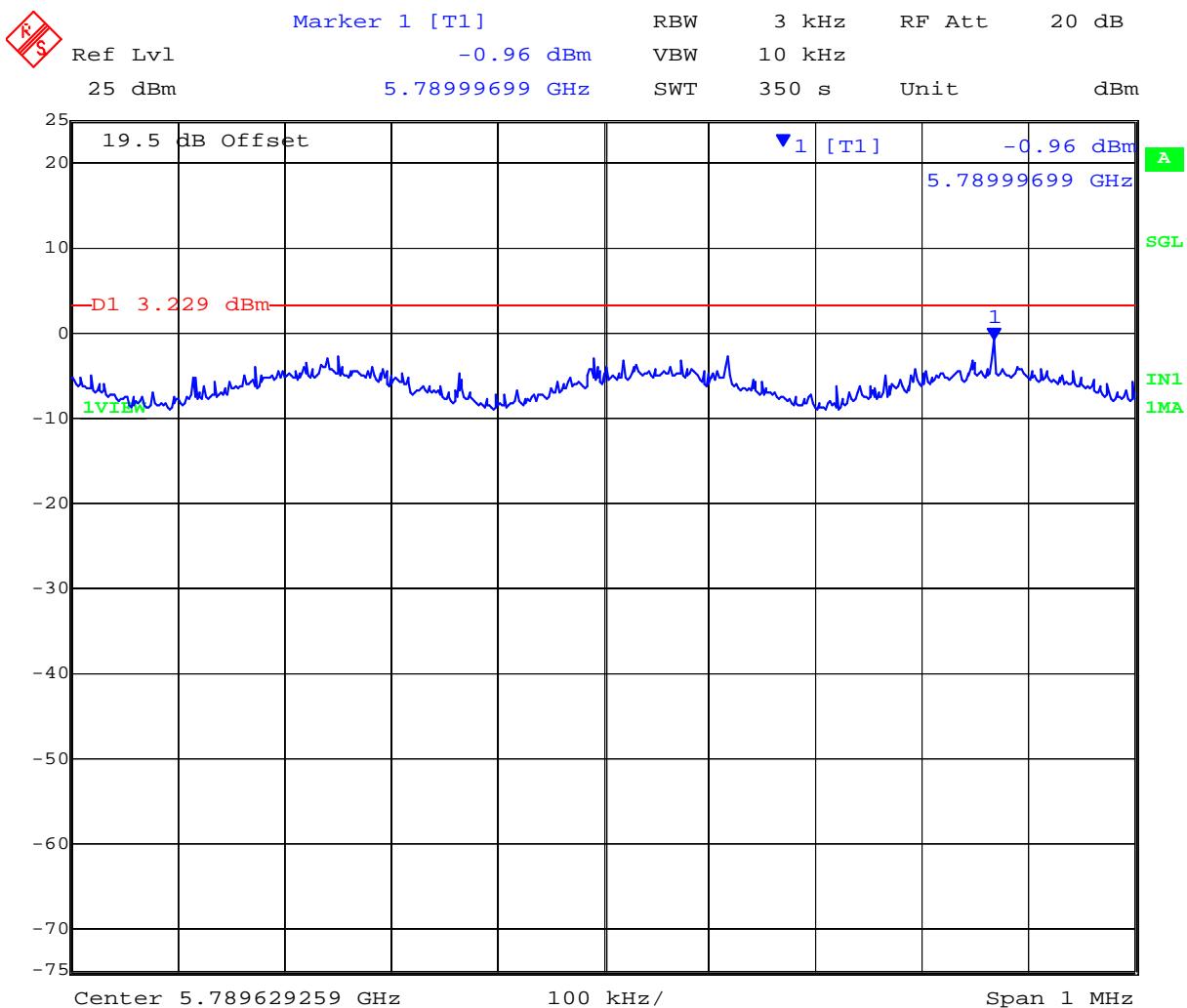

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 214 of 412

### PORT C 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 28.FEB.2012 16:43:01

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 215 of 412

## Specification

### Peak Power Spectral Density Limits

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

**RSS-210 §A8.2(2)** The transmitter power spectral density (into the antenna) shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

### Laboratory Measurement Uncertainty for Spectral Density

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

### Traceability

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

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 216 of 412

#### 5.1.4. Maximum Permissible Exposure

**FCC, Part 15 Subpart C §15.247(i)**

**Industry Canada RSS-Gen §5.5**

#### Calculations for Maximum Permissible Exposure Levels

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

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

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

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

The Wavion WBSn-2450-O/-S Wireless LAN Access Point has three transmitters in each frequency band. The peak power in the table below is calculated by assuming a worst case scenario where all transmitters are operating simultaneously on the same channel therefore the  $\Sigma$  of all chain power was used to calculate MPE.

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

Freq. Band (GHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ 1mW/cm <sup>2</sup> Limit(cm)	Minimum Separation Distance (cm)
2.4 OMNI	7.4	5.5	+26.84	483.1	14.54	20.0*
2.4 SECTOR	12.0	15.8	+26.28	424.6	23.11	23.11
5.8 OMNI	8.5	7.1	+27.99	629.5	18.86	20.0*
5.8 SECTOR	14.0	25.1	+27.48	559.8	33.34	33.34

**\*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

**§15.247(i)** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency levels in excess of the Commission's guidelines.

**FCC §1.1310** Limit = 1mW / cm<sup>2</sup> from 1.310 Table 1

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

#### Laboratory Measurement Uncertainty for Power Measurements

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

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### **5.1.5. Conducted Spurious Emissions**

**FCC, Part 15 Subpart C §15.247(d); 15.205; 15.209**

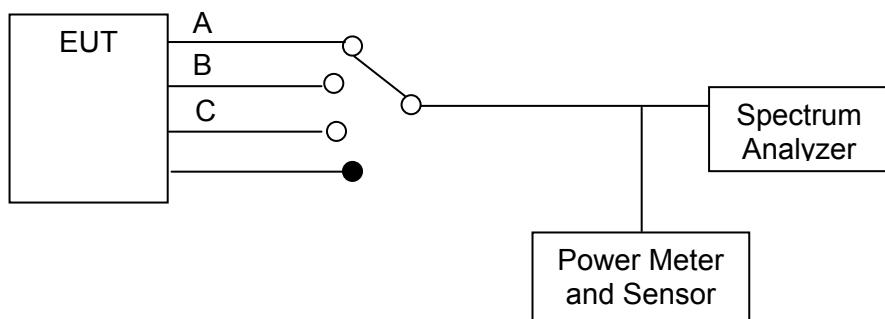
**Industry Canada RSS-210 §A8.5, §2.2**

**Industry Canada RSS-Gen 4.7**

#### **Test Procedure**

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

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



Band-edge measurement test configuration

#### **Measurement Results of Conducted Spurious Emissions**

Ambient conditions.

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

#### **Radio Parameters**

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

**NOTE: KDB 662911 was implemented for Out-of-Band measurements. Where necessary Option (2) Measure and add 10 log (N) dB was implemented**

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 218 of 412

### Conducted Spurious Emission Results

Measurements were performed with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the band-edge measurements provided below are drawn on each plot.

TABLE OF RESULTS – 802.11b – Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-42.15	-7.50	-42.49	-8.38	-42.31	-7.92		
2437.000	30.00	26000.00	-43.13	-6.84	-42.55	-8.87	-42.69	-8.85		
2462.000	30.00	26000.00	-43.06	-8.03	-43.35	-7.83	-42.67	-7.01		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-35.99	-6.99	-33.97	-7.39	-36.28	-7.29		
2462.000	2483.50	-49.30	-6.75	-49.27	-6.67	-48.61	-6.07		

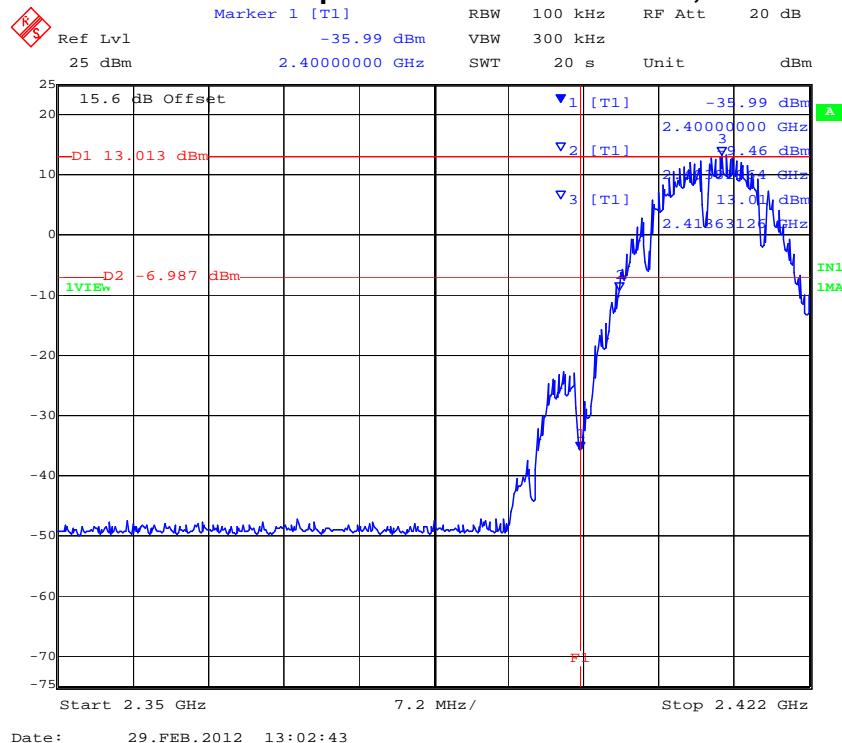
BE: Maximum Band edge emission found

<b>Measurement uncertainty:</b>	±2.81 dB
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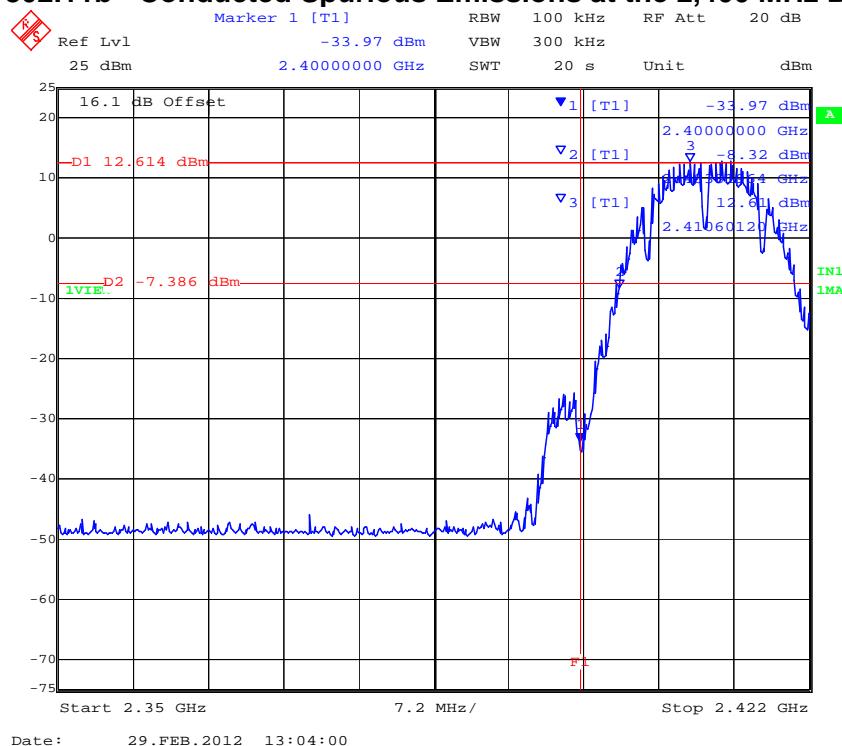
Note: Limit is based on 20dB down from fundamental emissions

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### PORT A 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge

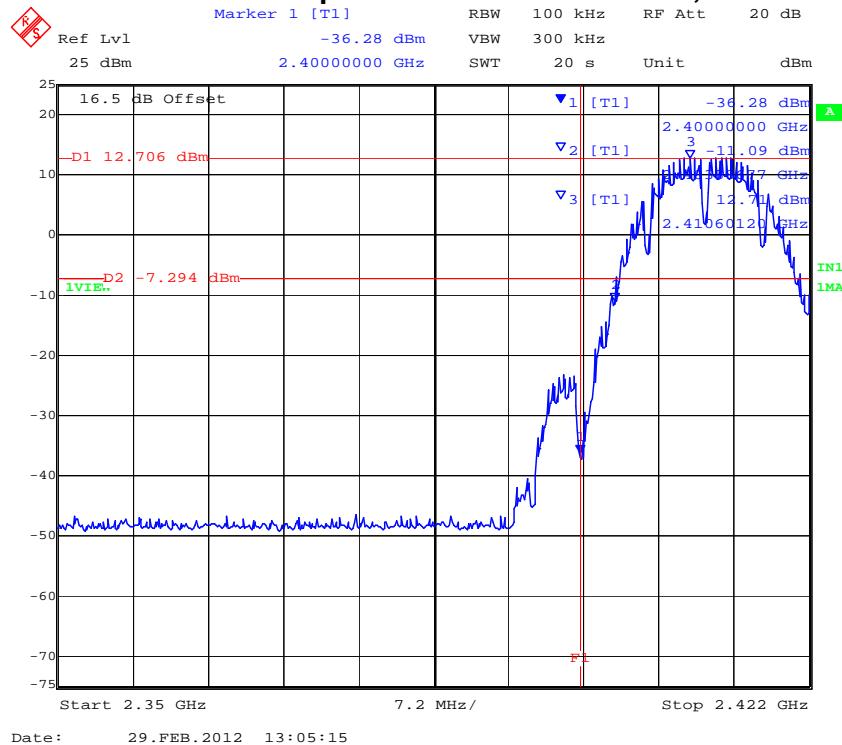


### PORT B 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge



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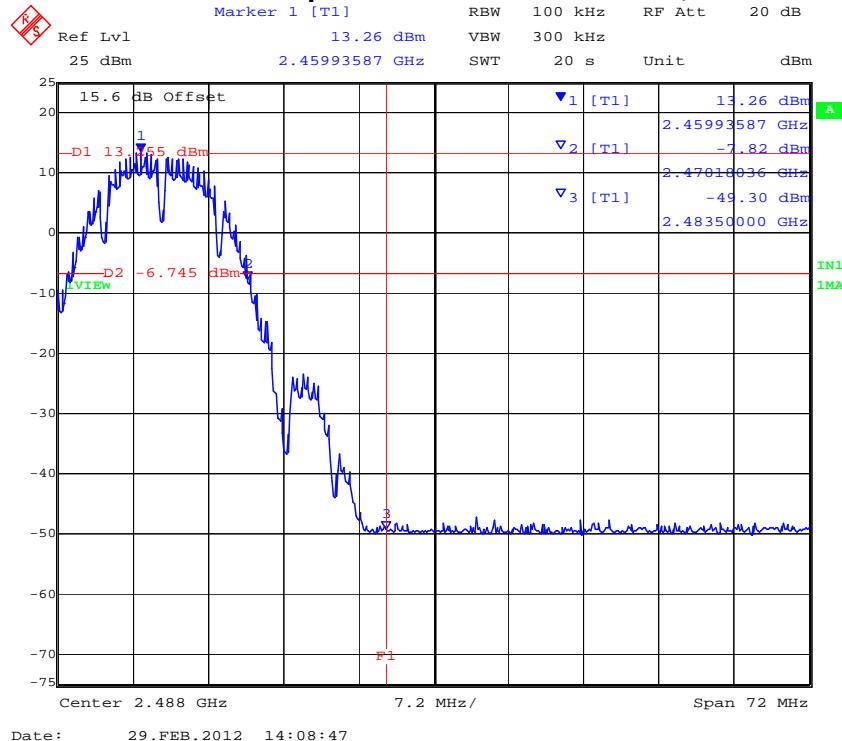
### PORT C 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge



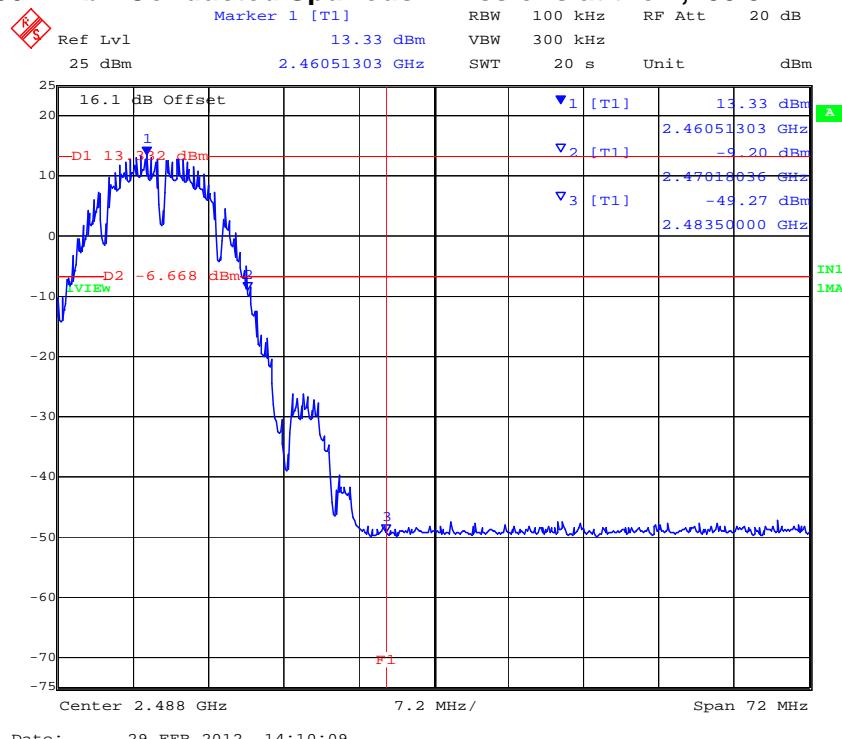

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### PORT A 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge

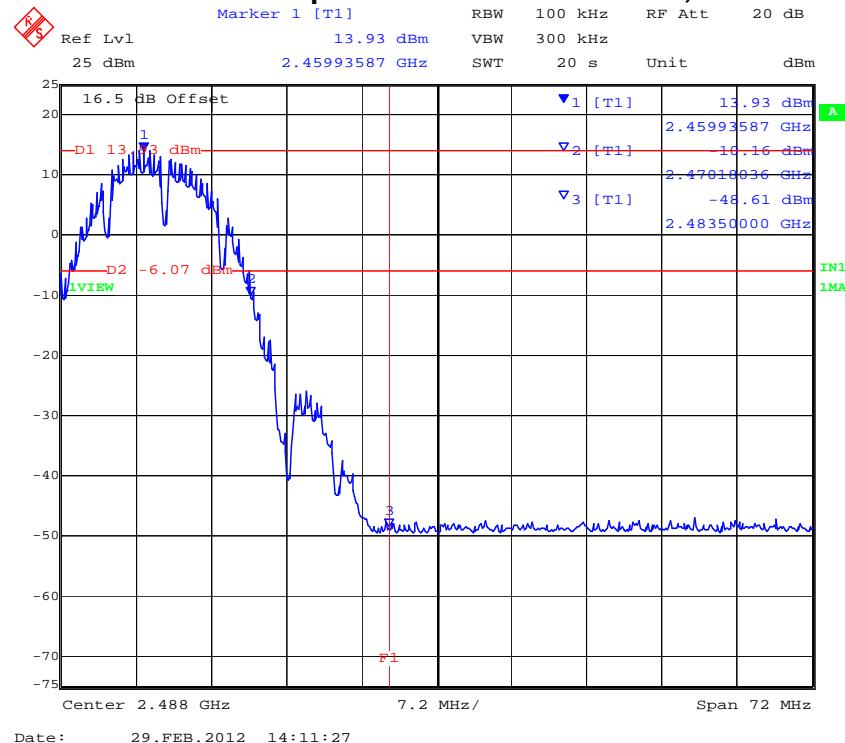


### PORT B 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



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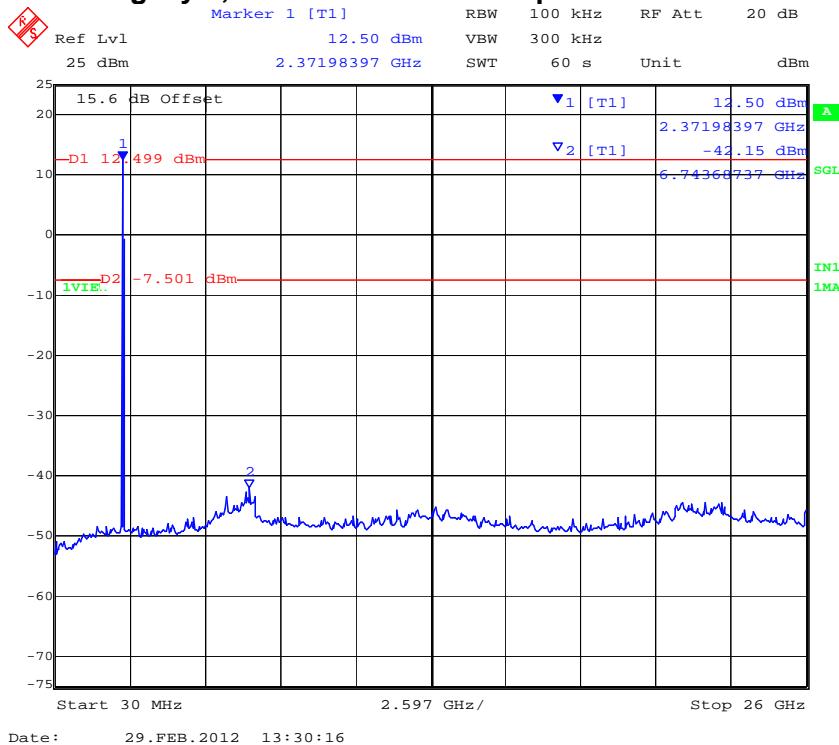
### PORT C 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge




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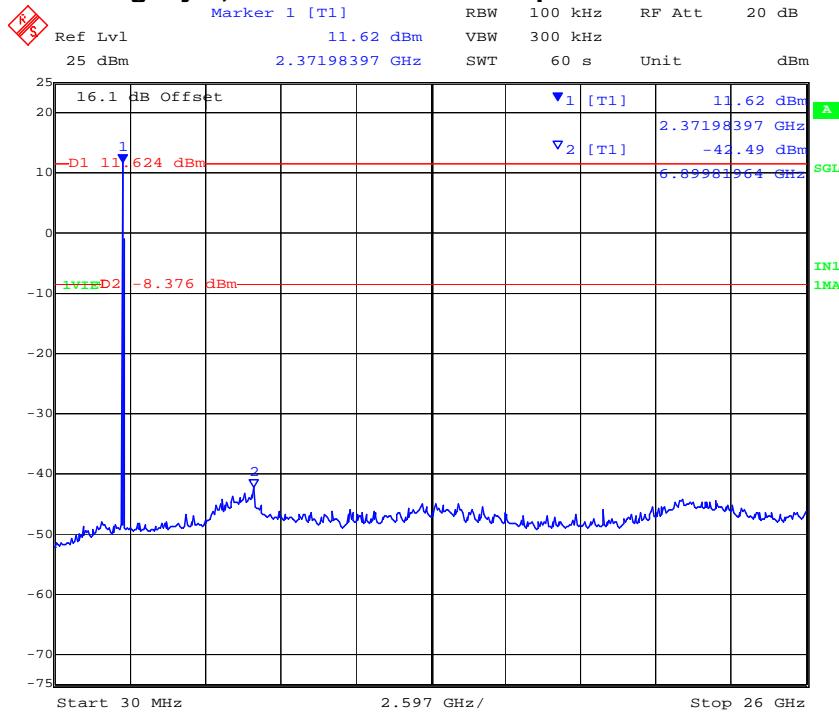
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

**PORT A 802.11b-Legacy 2,412 MHz Conducted Spurious Emissions 0.30 to 26 GHz**



Date: 29.FEB.2012 13:30:16

**PORT B 802.11b-Legacy 2,412 MHz Conducted Spurious Emissions 0.30 to 26 GHz**

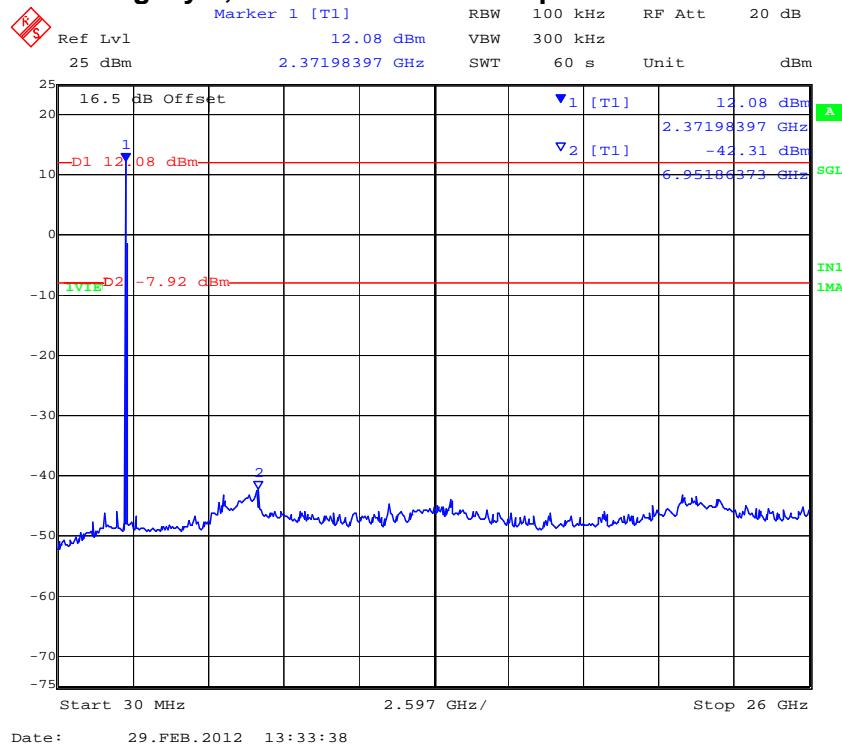


Date: 29.FEB.2012 13:31:58

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**PORT C 802.11b-Legacy 2,412 MHz Conducted Spurious Emissions 0.30 to 26 GHz**



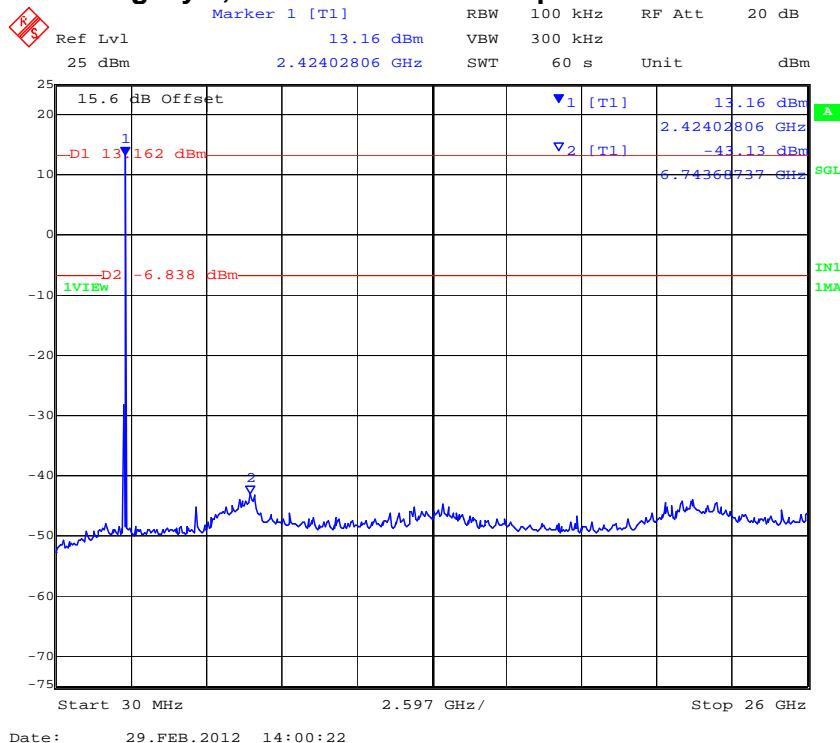

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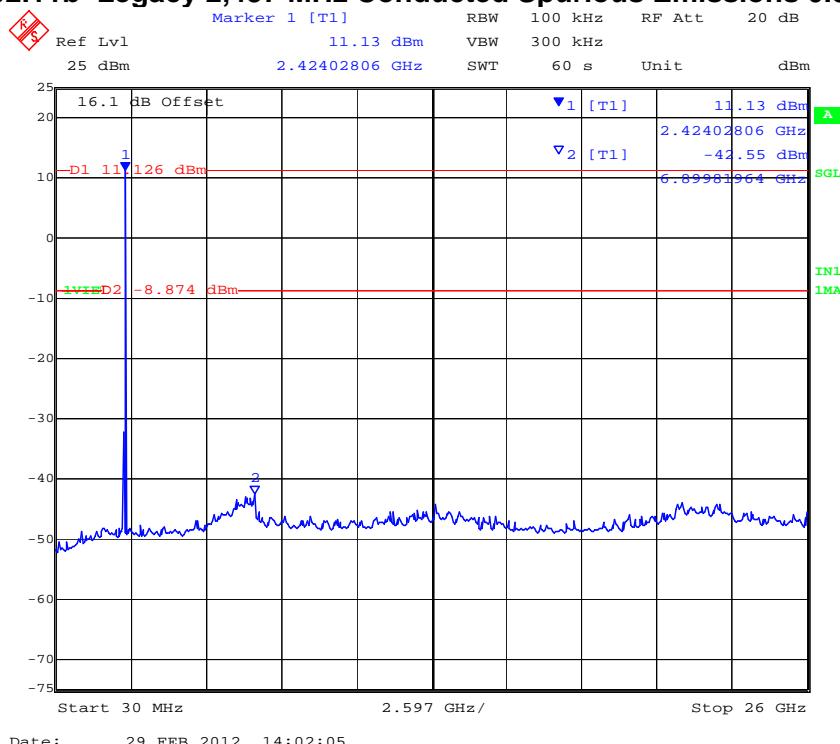
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 225 of 412

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### PORT A 802.11b-Legacy 2,437 MHz Conducted Spurious Emissions 0.30 to 26 GHz



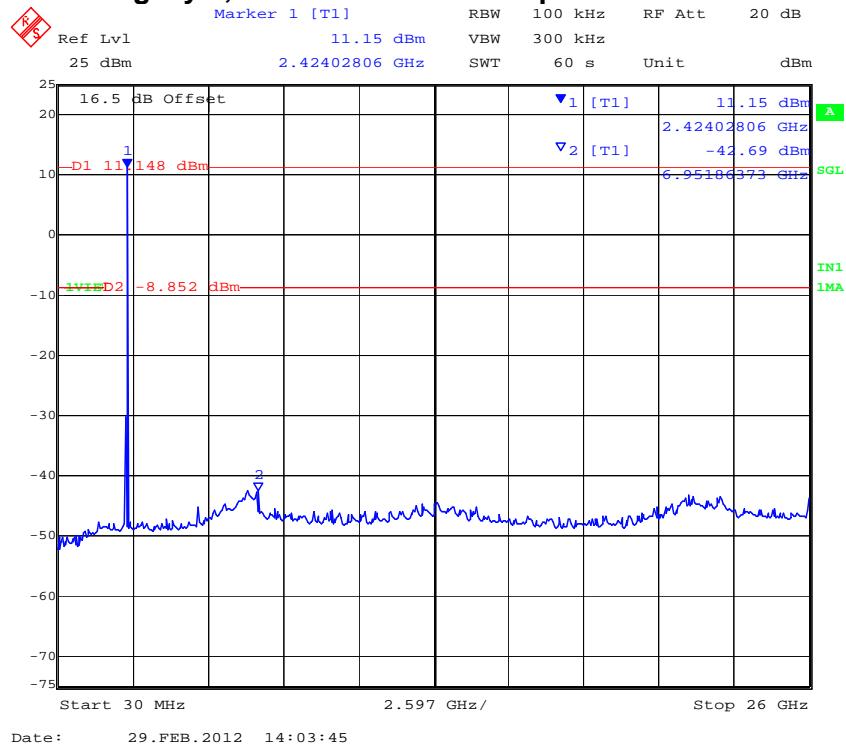
### PORT B 802.11b-Legacy 2,437 MHz Conducted Spurious Emissions 0.30 to 26 GHz




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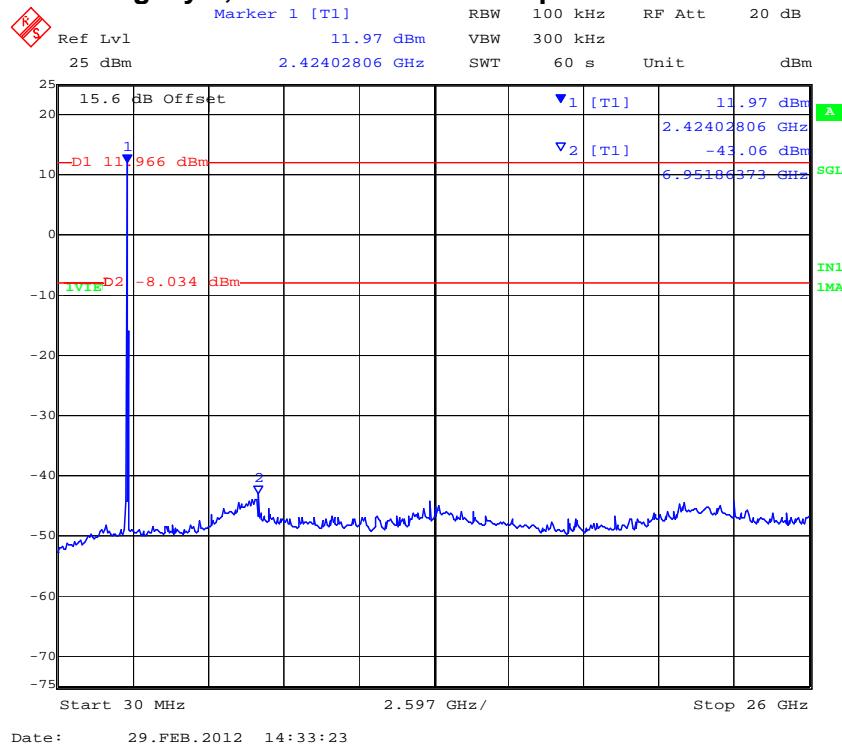
**PORT C 802.11b-Legacy 2,437 MHz Conducted Spurious Emissions 0.30 to 26 GHz**



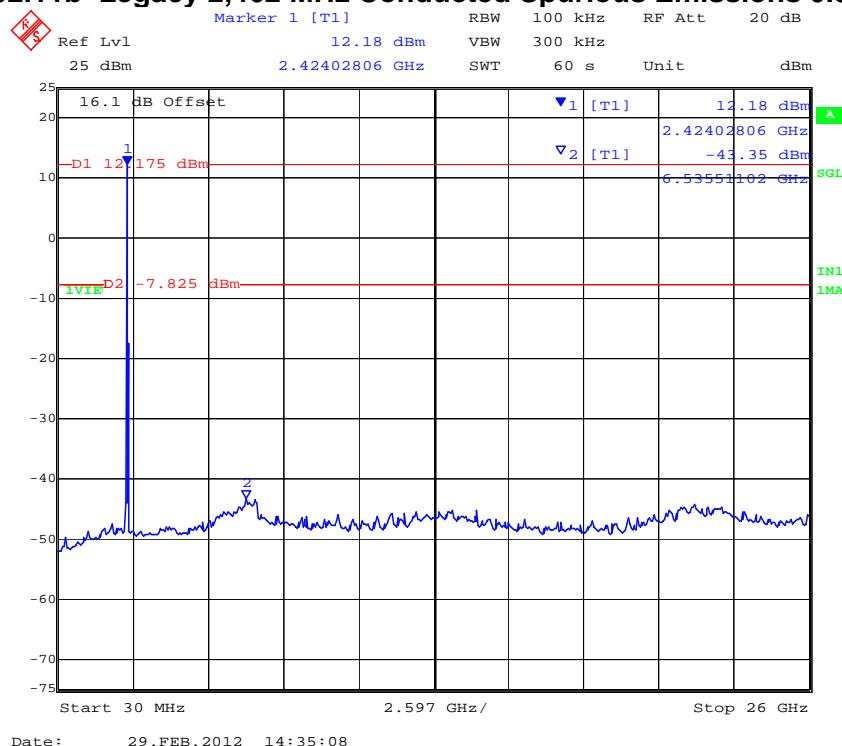

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**PORT A 802.11b-Legacy 2,462 MHz Conducted Spurious Emissions 0.30 to 26 GHz**



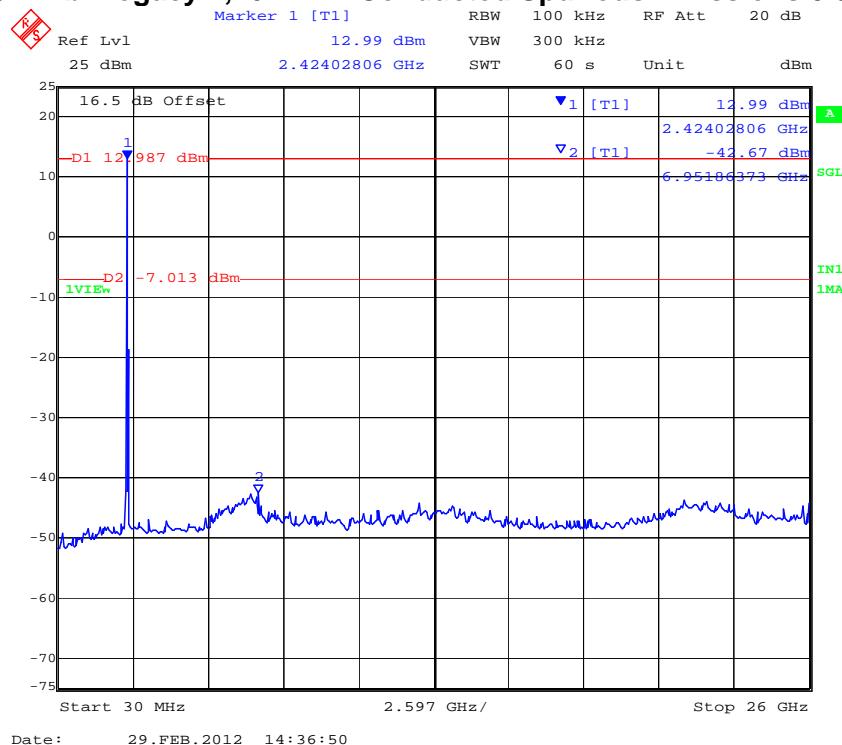
**PORT B 802.11b-Legacy 2,462 MHz Conducted Spurious Emissions 0.30 to 26 GHz**




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**PORT C 802.11b-Legacy 2,462 MHz Conducted Spurious Emissions 0.30 to 26 GHz**




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 229 of 412

## Conducted Spurious Emission Results

TABLE OF RESULTS – 802.11g Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11b	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-43.00	-11.26	-43.51	-11.76	-42.73	-11.32		
2437.000	30.00	26000.00	-43.35	-11.51	-42.93	-12.45	-42.43	-11.55		
2462.000	30.00	26000.00	-43.21	-11.27	-42.72	-10.82	-42.31	-11.21		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-12.05	-9.40	-13.47	-10.36	-11.28	-10.02		
2462.000	2483.50	-44.24	-10.46	-47.69	-9.37	-44.91	-8.92		

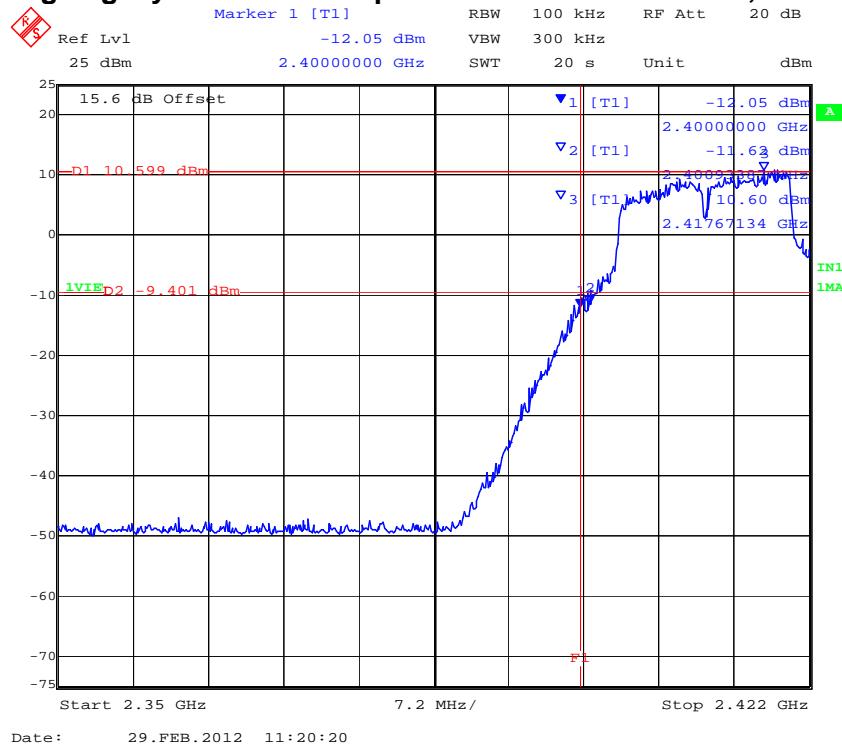
BE: Maximum Band edge emission found

<b>Measurement uncertainty:</b>	±2.81 dB
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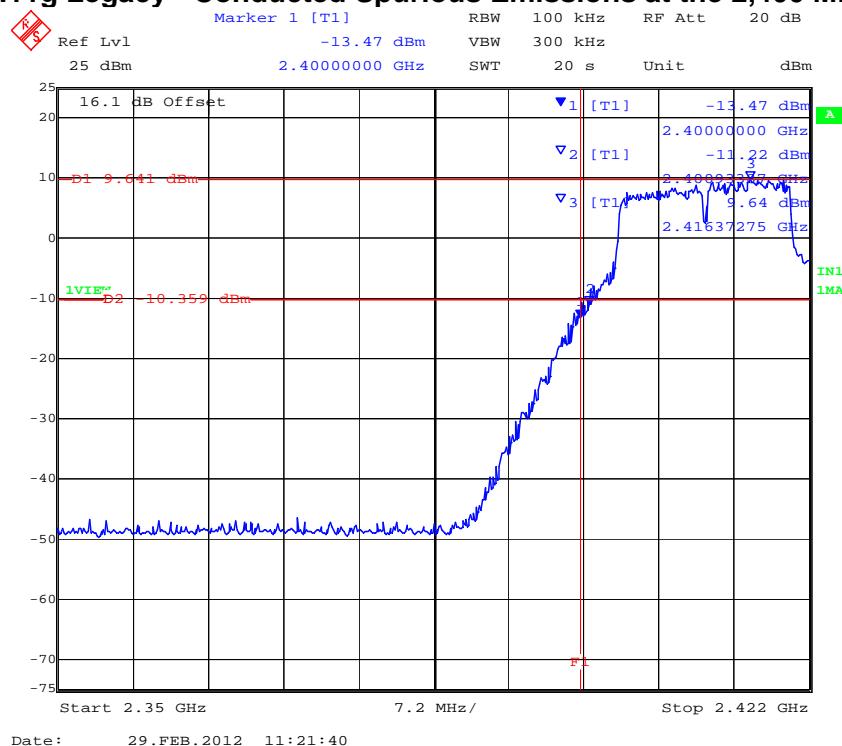
Note: Limit is based on 20dB down from fundamental emissions

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### PORT A 802.11g Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge

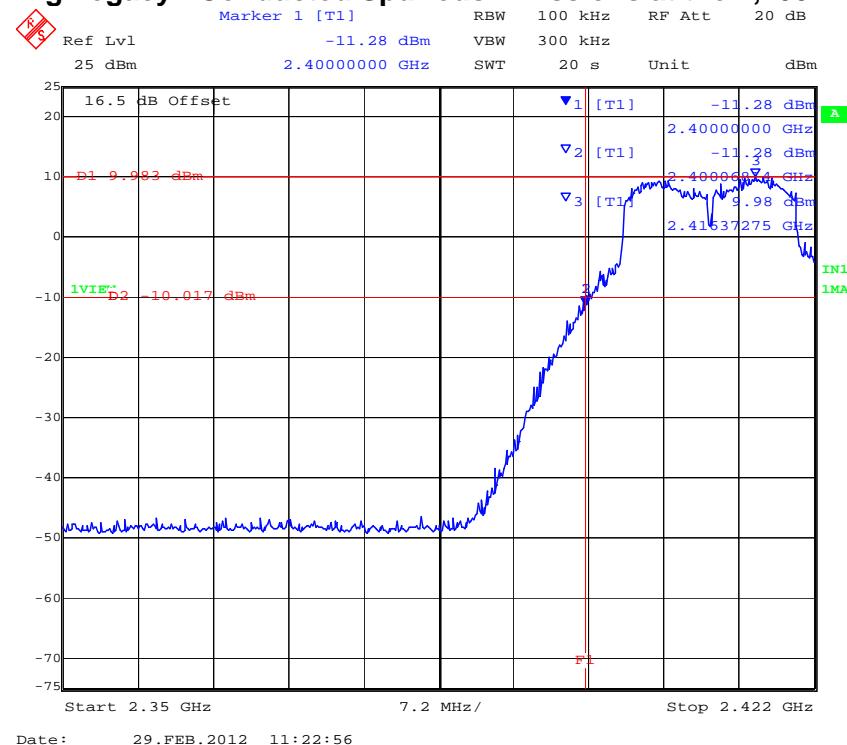


### PORT B 802.11g Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge



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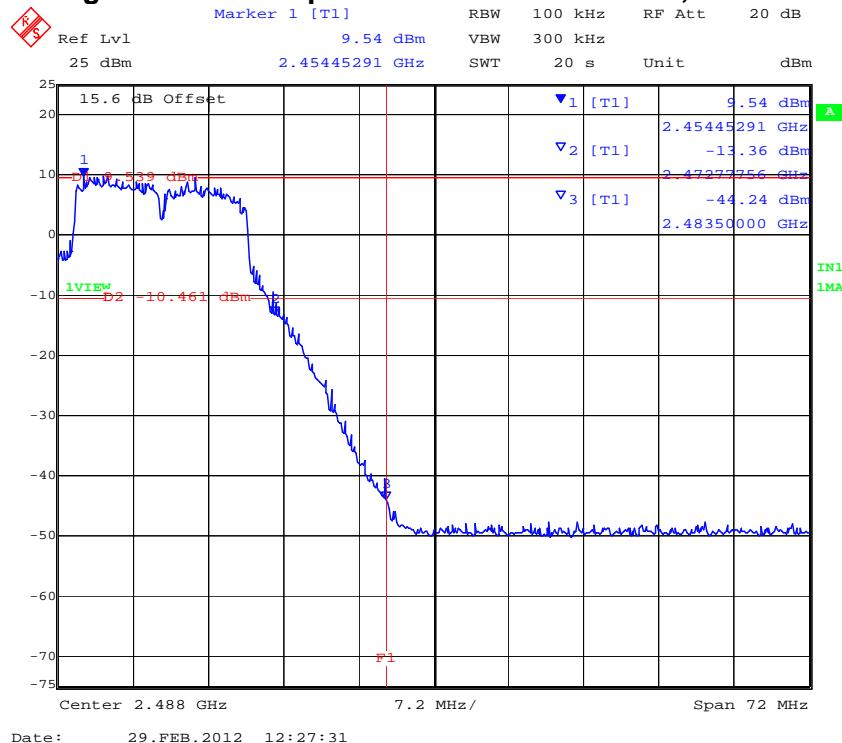
### PORT C 802.11g Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge



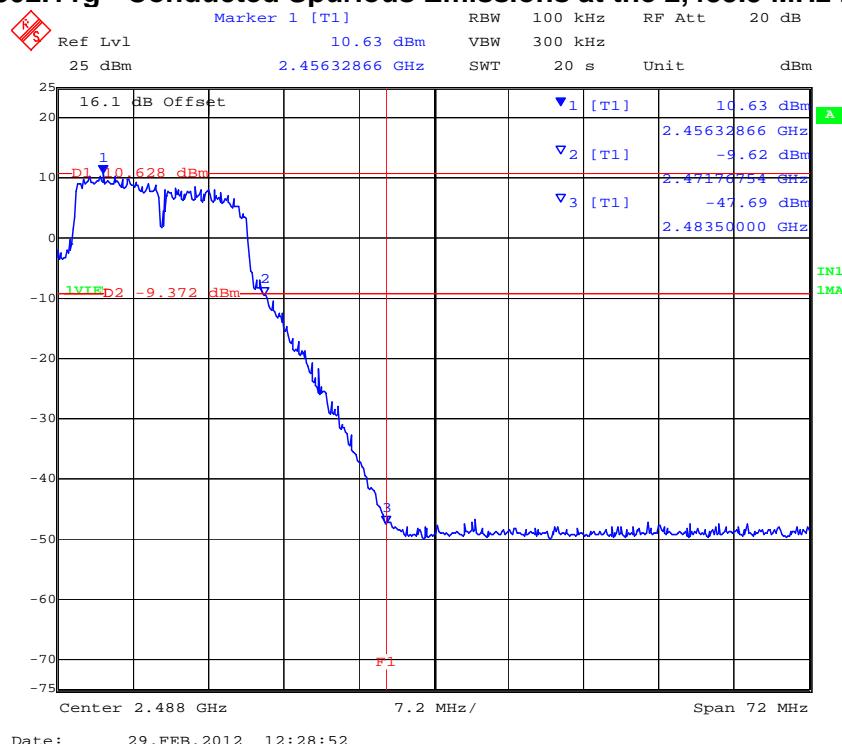

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### PORT A 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge

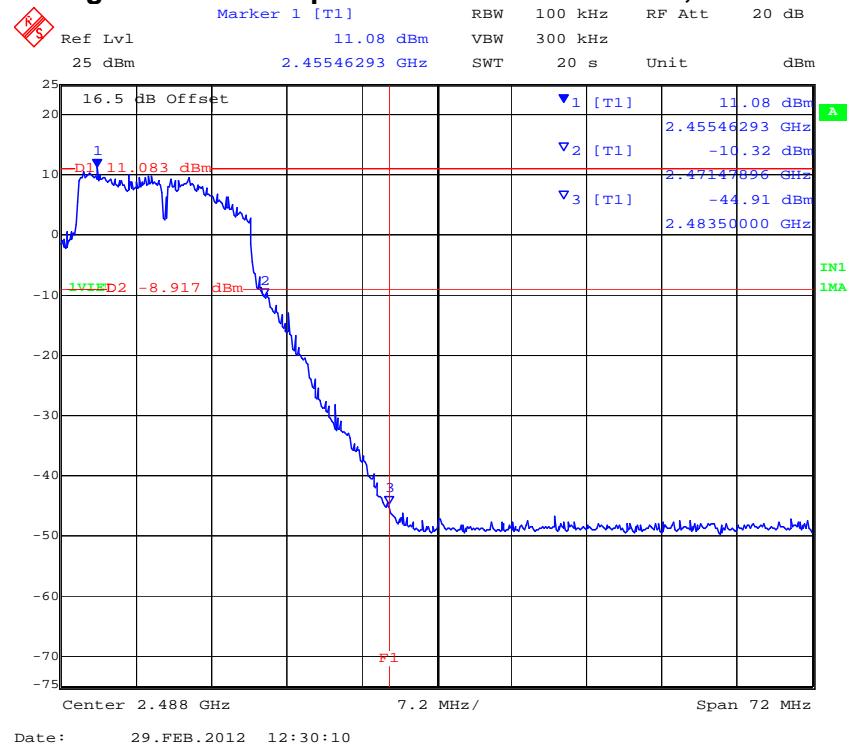


### PORT B 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



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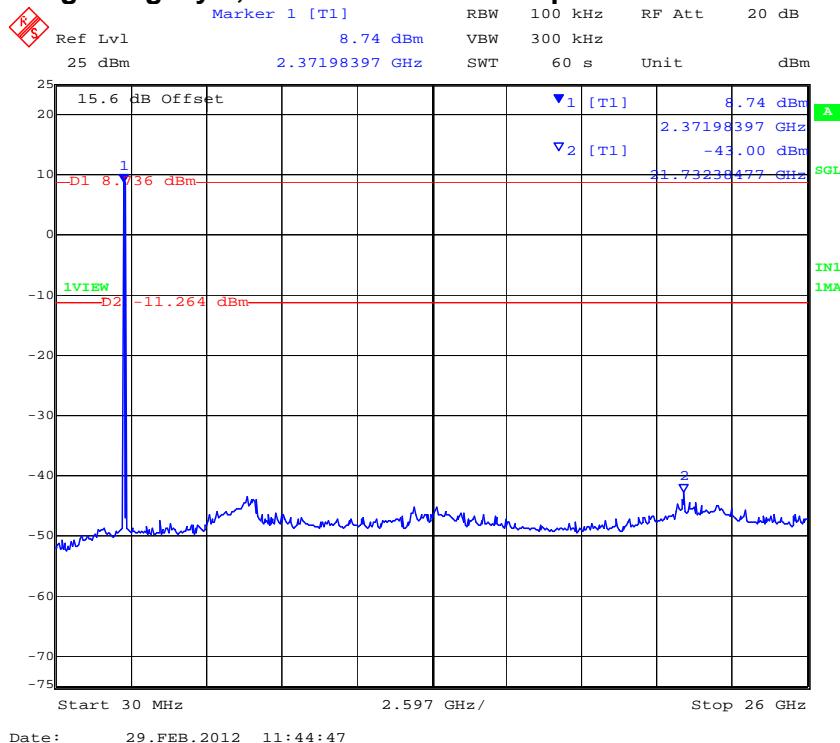
### PORT C 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge




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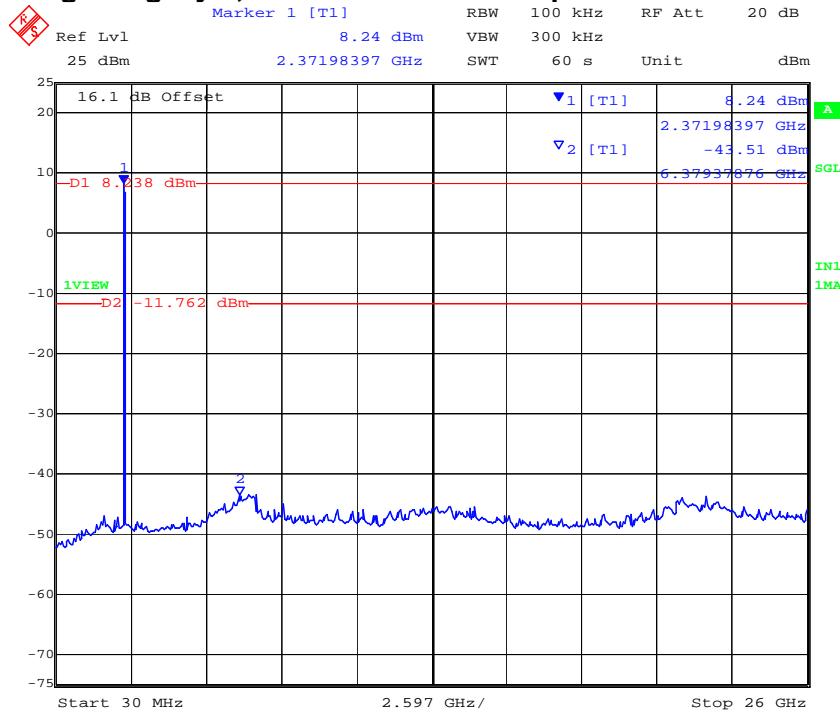
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### PORT A 802.11g – Legacy 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



Date: 29.FEB.2012 11:44:47

### PORT B 802.11g – Legacy 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz

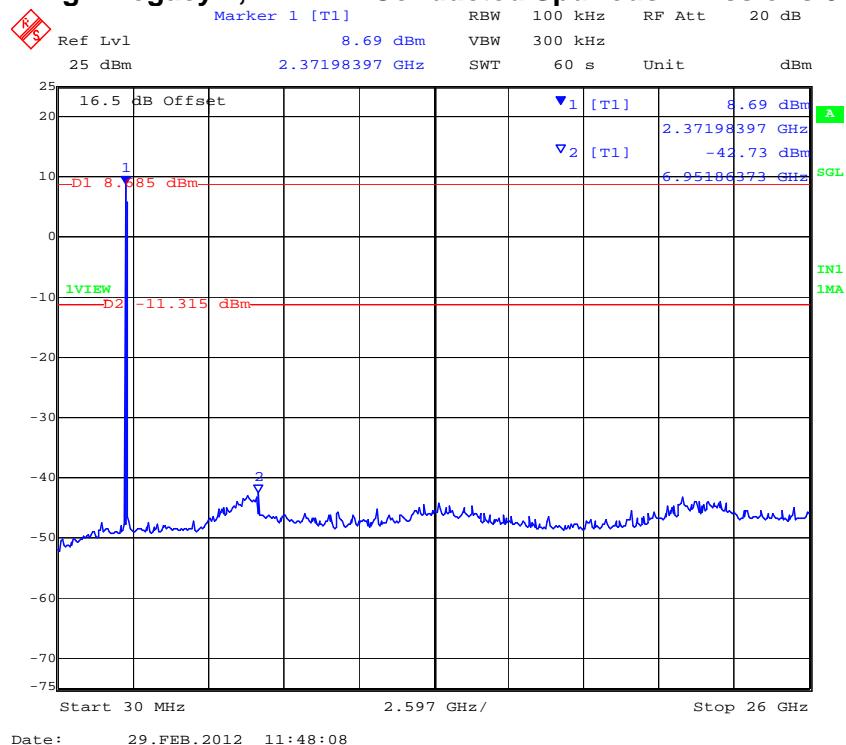


Date: 29.FEB.2012 11:46:29

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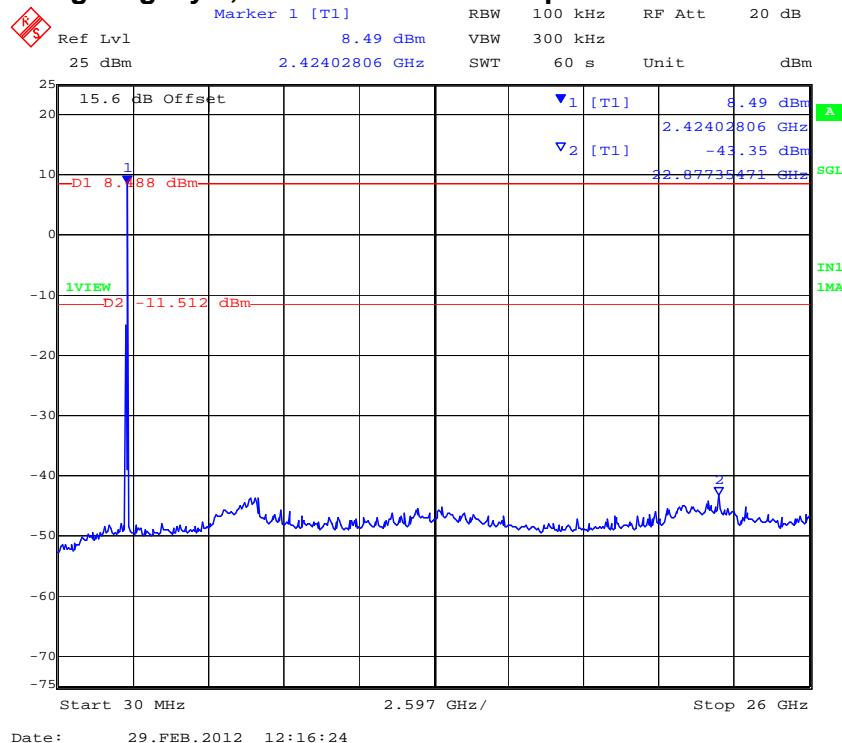
### PORT C 802.11g – Legacy 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz



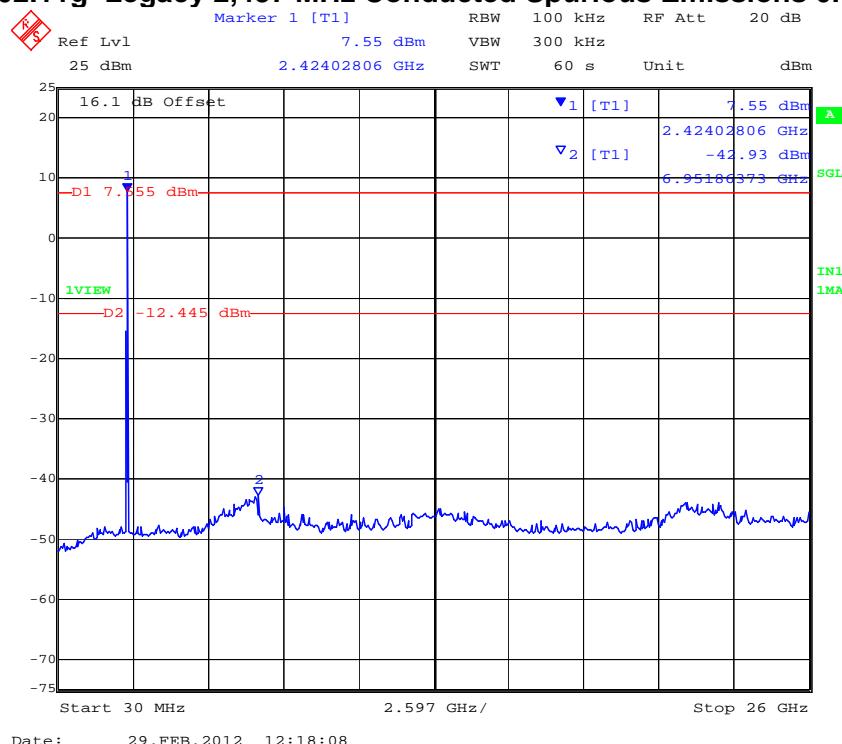

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**PORT A 802.11g-Legacy 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



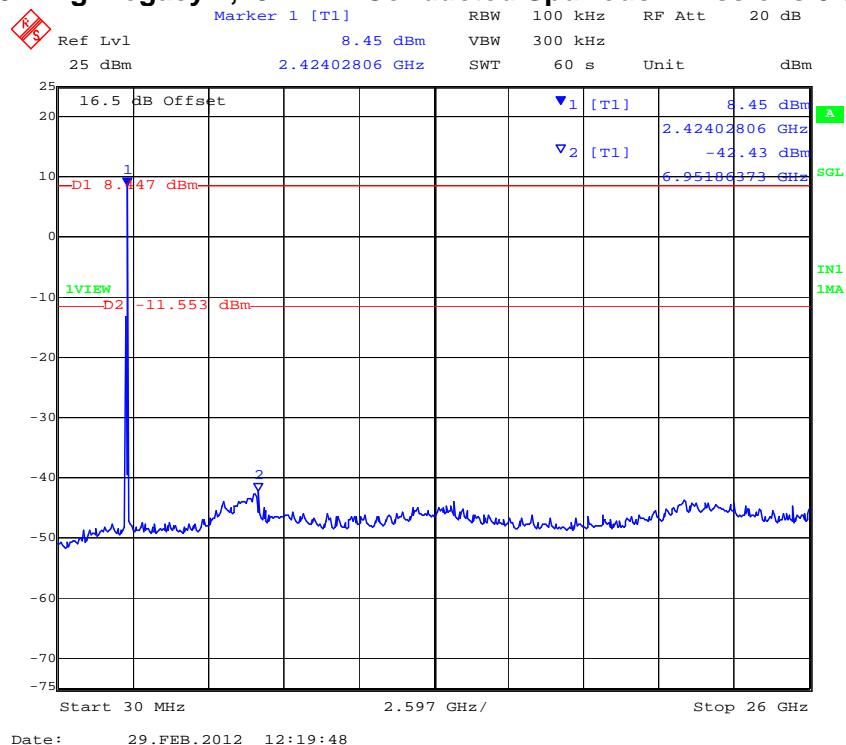
**PORT B 802.11g-Legacy 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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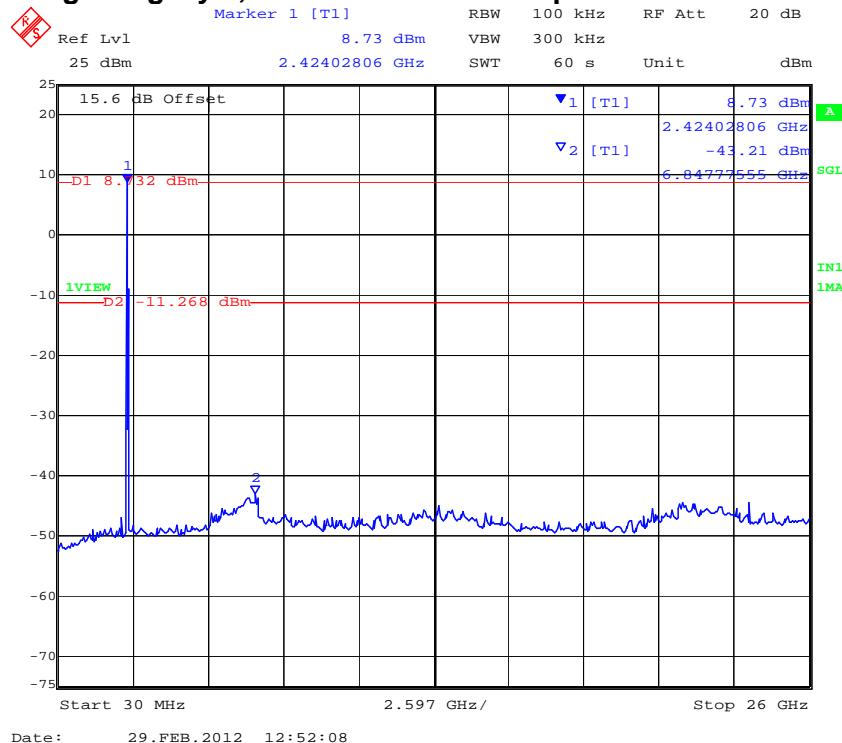
**PORT C 802.11g-Legacy 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



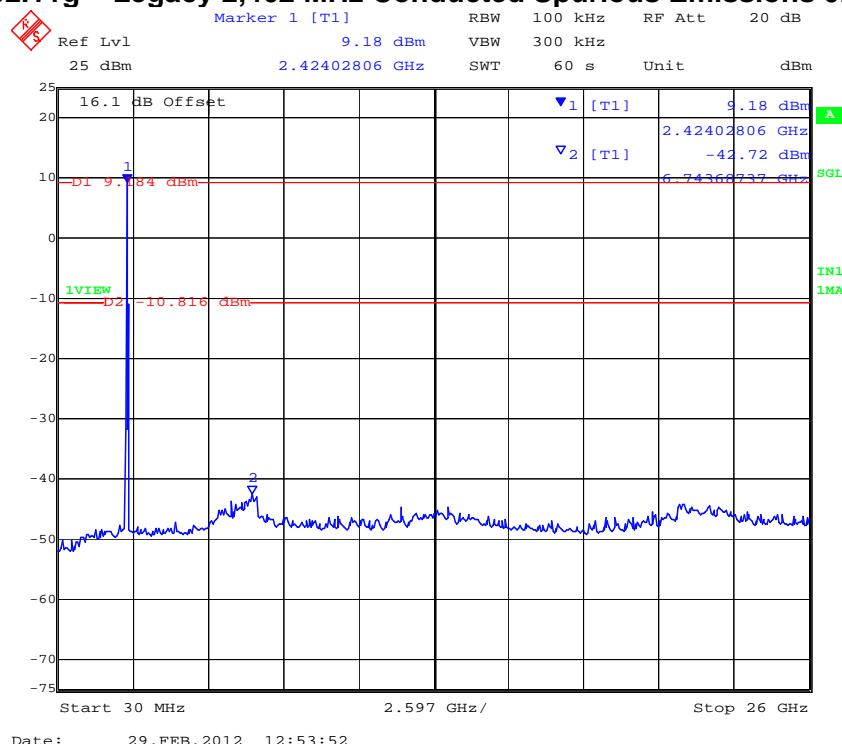

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### PORT A 802.11g – Legacy 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz



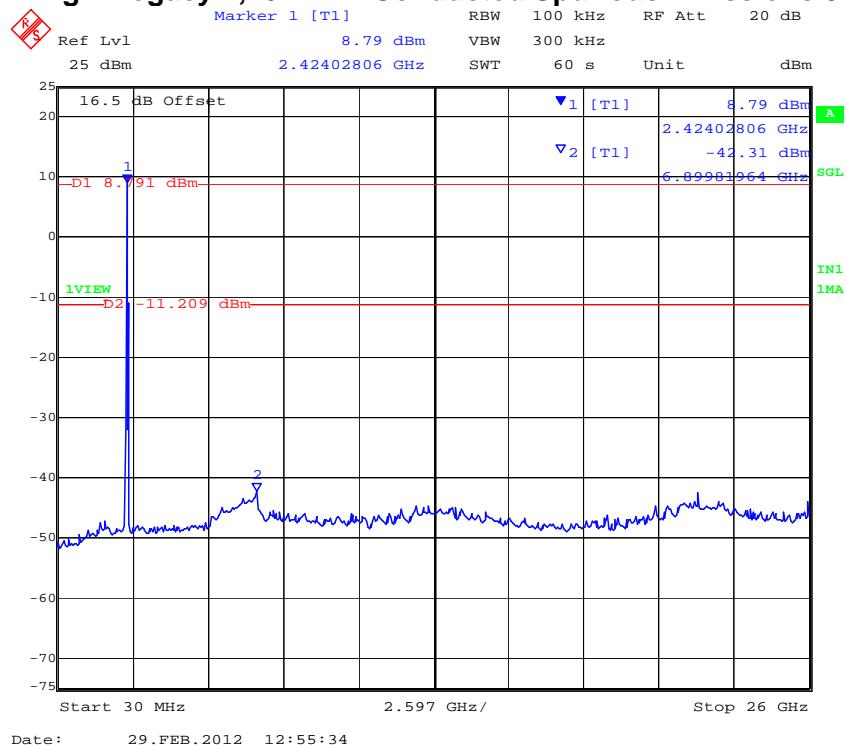
### PORT B 802.11g – Legacy 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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### PORT C 802.11g – Legacy 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 240 of 412

## Conducted Spurious Emission Results

TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-43.45	-11.44	-42.47	-11.84	-42.83	-11.24		
2437.000	30.00	26000.00	-43.83	-12.38	-42.50	-12.54	-42.68	-11.84		
2462.000	30.00	26000.00	-43.35	-12.26	-43.00	-11.47	-42.82	-12.25		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-13.93	-10.69	-13.60	-10.63	-10.85	-10.83		
2462.000	2483.50	-44.15	-10.14	-45.74	-9.40	-44.19	-10.33		

BE: Maximum Band edge emission found

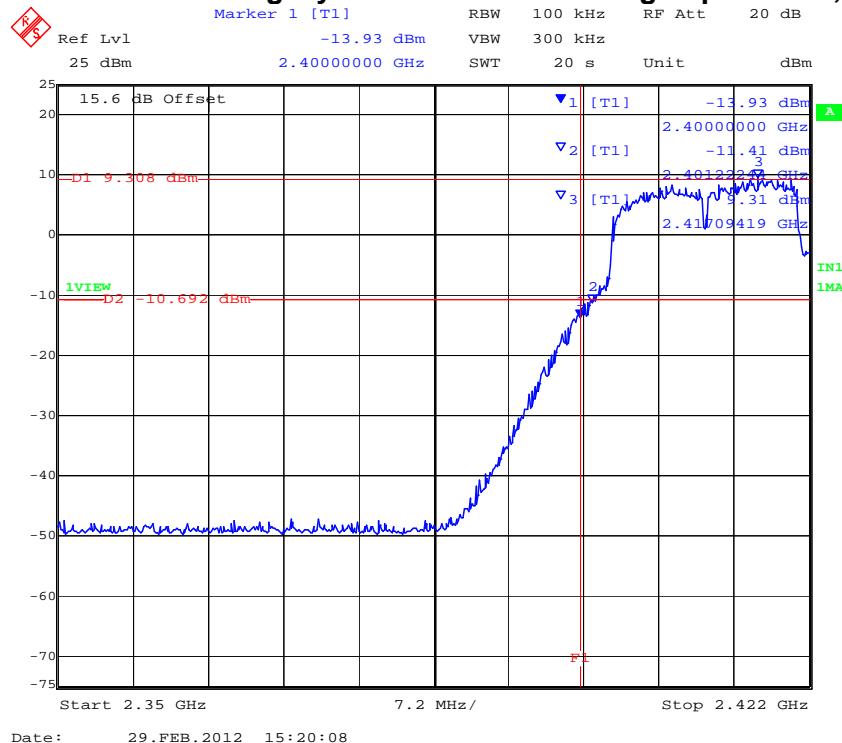
Measurement uncertainty:

±2.81 dB

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

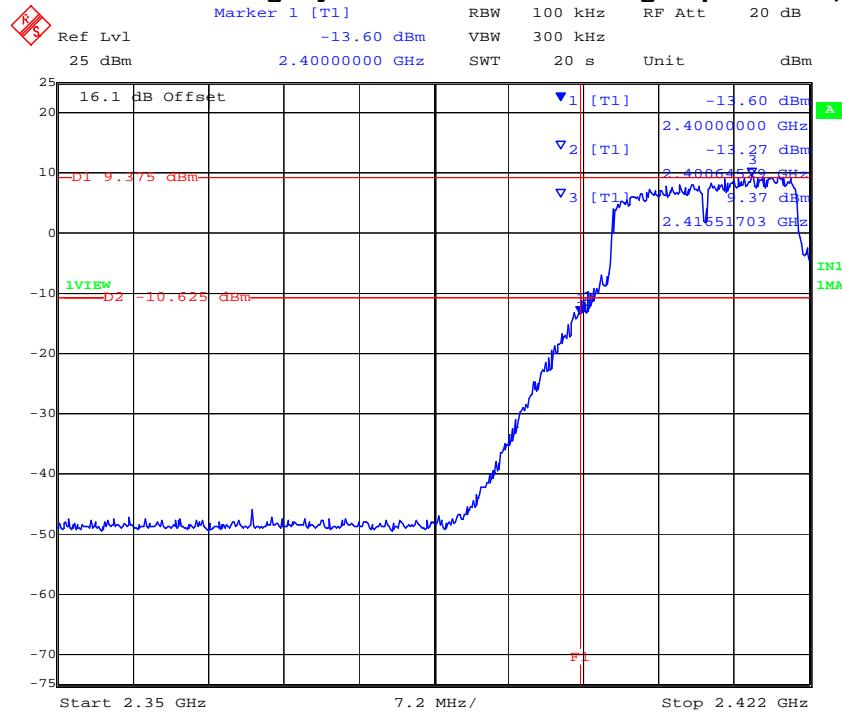
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

**PORT A 802.11n HT-20 Legacy - Conducted Band Edge Spurious 2,400 MHz**



Date: 29.FEB.2012 15:20:08

**PORT B 802.11n HT-20 Legacy - Conducted Band Edge Spurious 2,400 MHz**

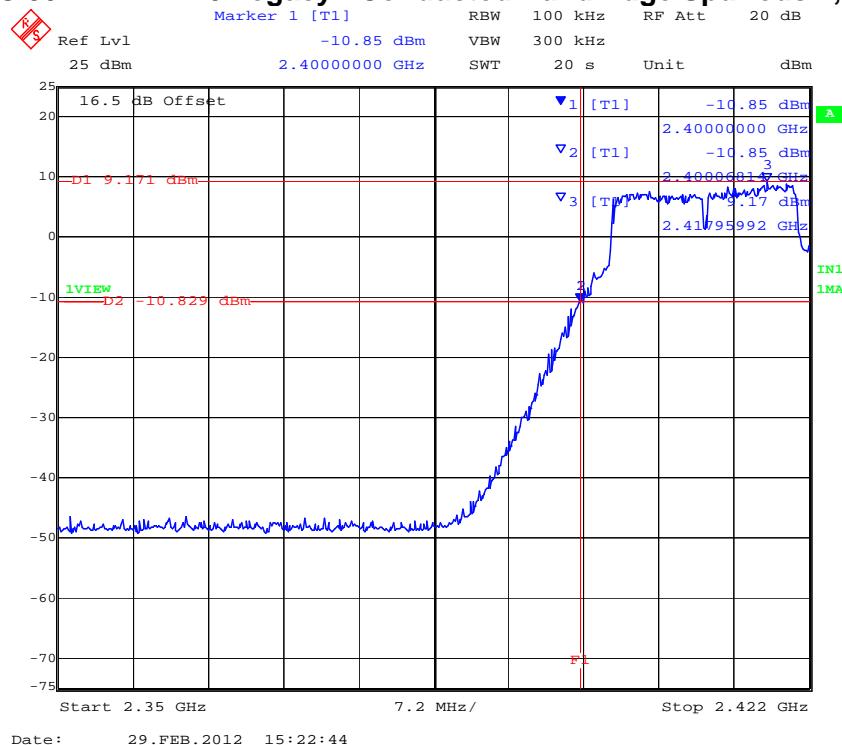


Date: 29.FEB.2012 15:21:27

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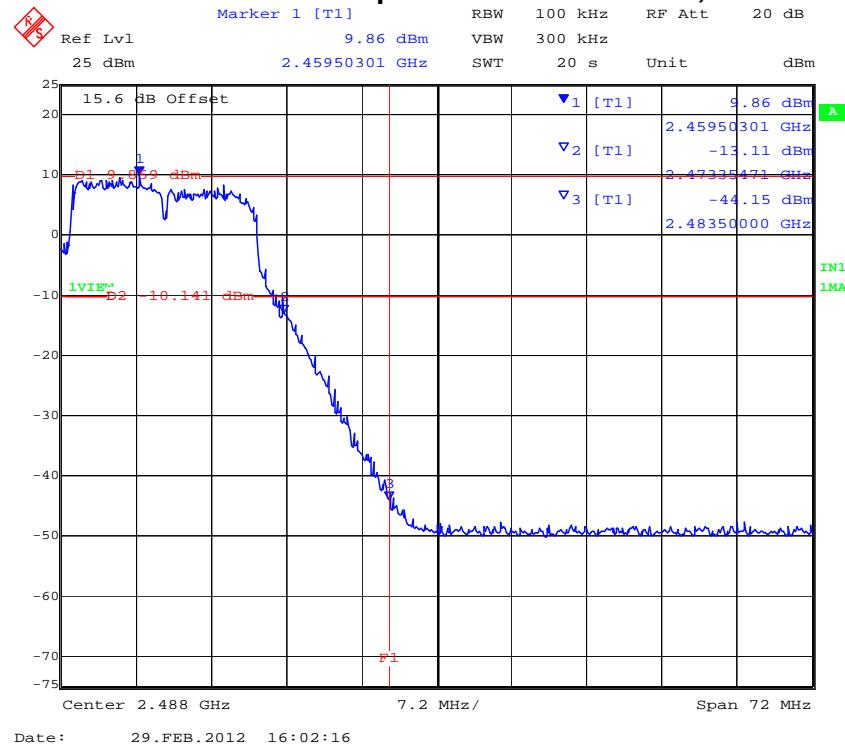
**PORT C 802.11n HT-20 Legacy - Conducted Band Edge Spurious 2,400 MHz**



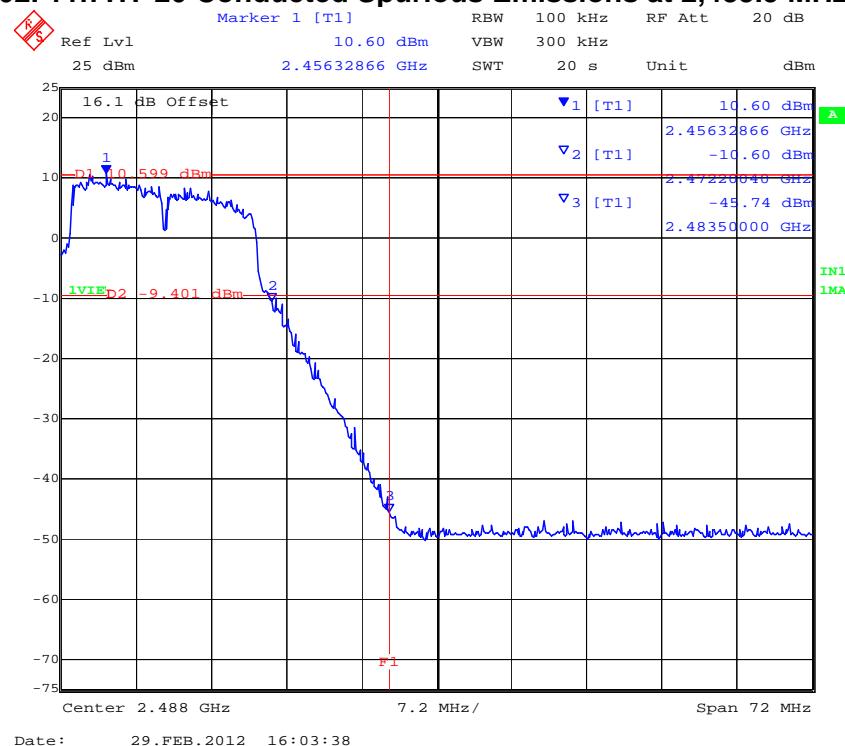

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### PORT A 802.11n HT-20 Conducted Spurious Emissions at 2,483.5 MHz Band Edge

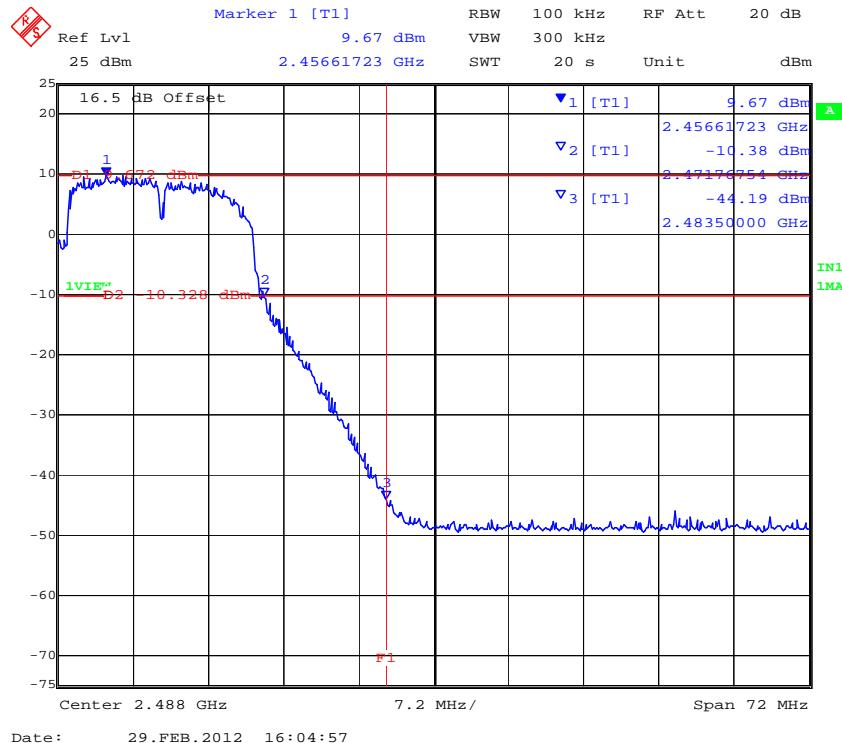


### PORT B 802.11n HT-20 Conducted Spurious Emissions at 2,483.5 MHz Band Edge



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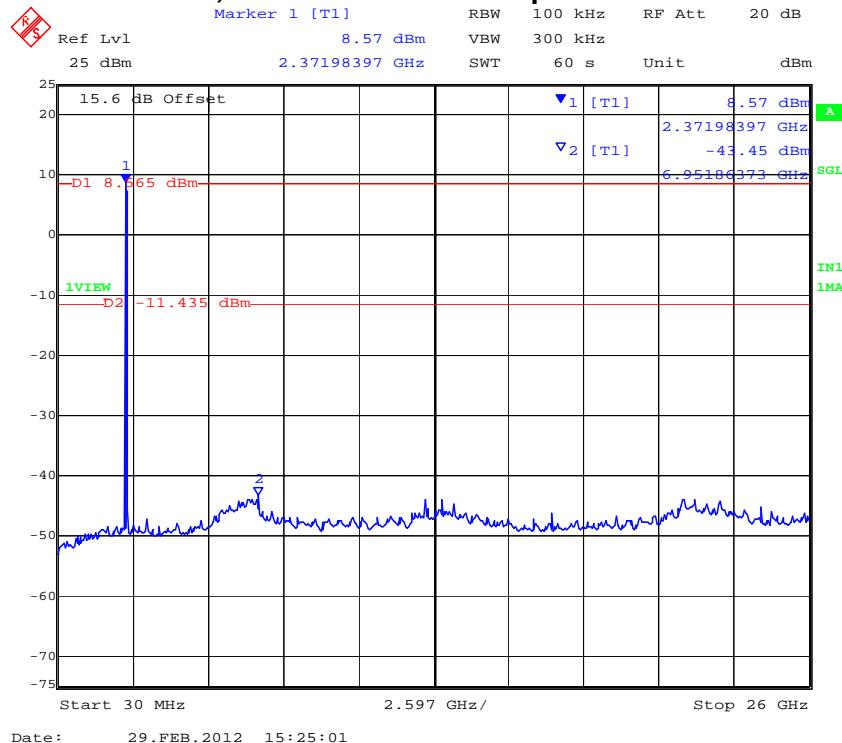
### PORT C 802.11n HT-20 Conducted Spurious Emissions at 2,483.5 MHz Band Edge



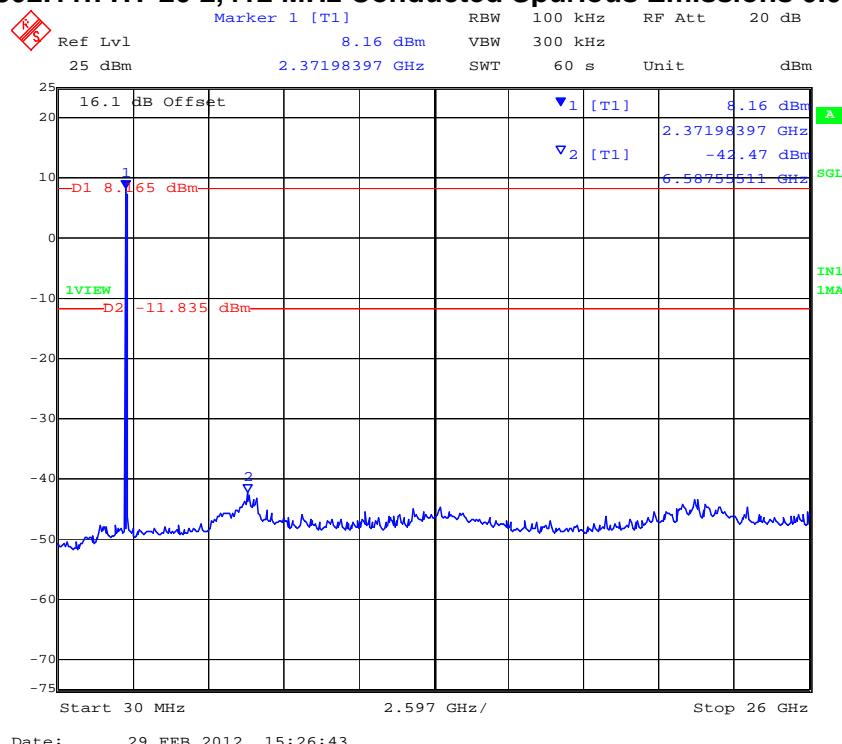

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**PORT A 802.11n HT-20 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



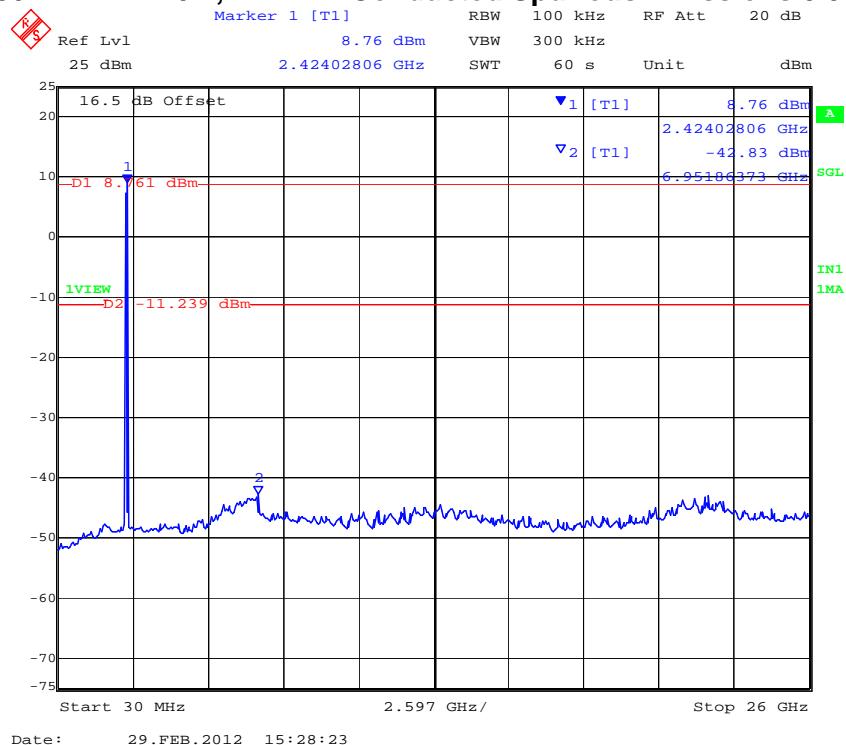
**PORT B 802.11n HT-20 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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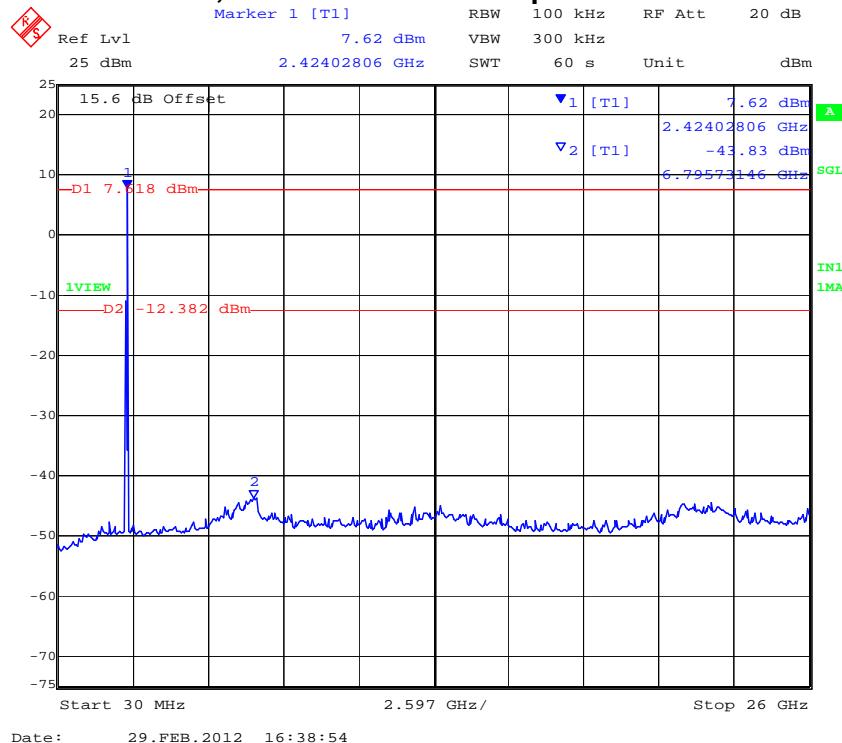
**PORT C 802.11n HT-20 2,412 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



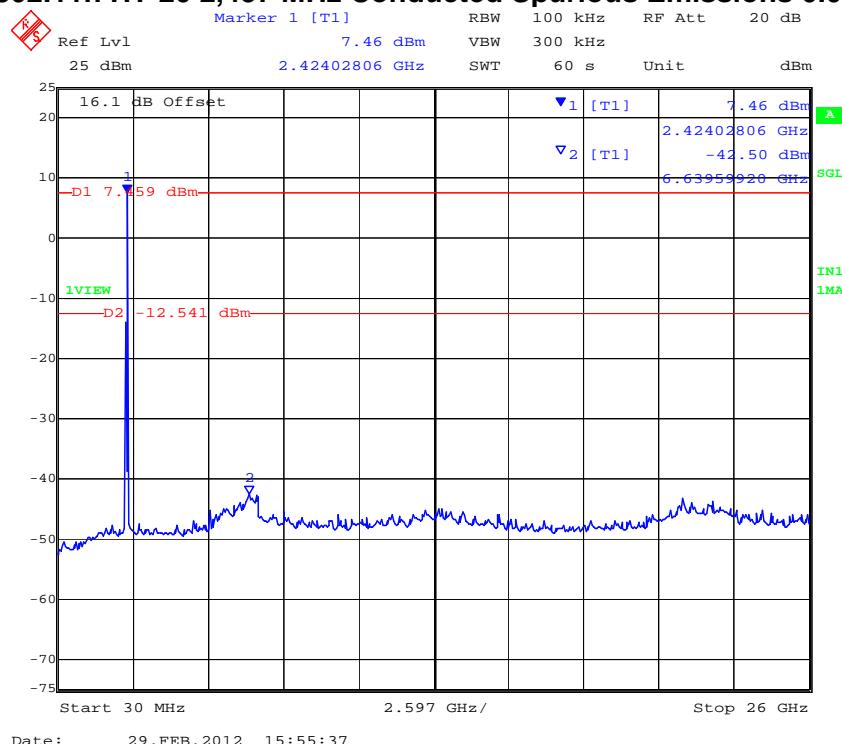

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**PORT A 802.11n HT-20 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



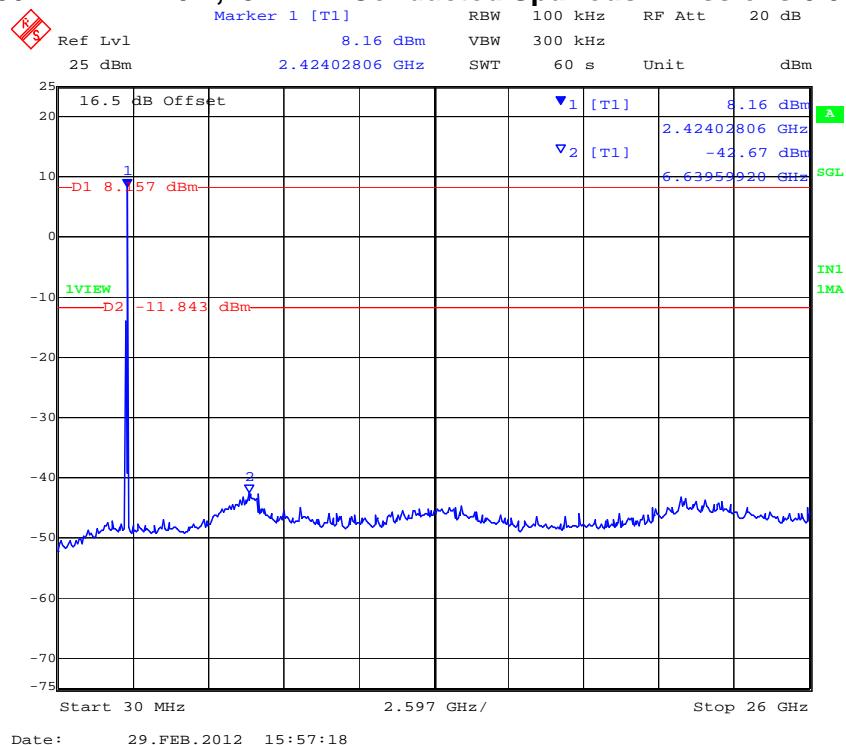
**PORT B 802.11n HT-20 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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**PORT C 802.11n HT-20 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



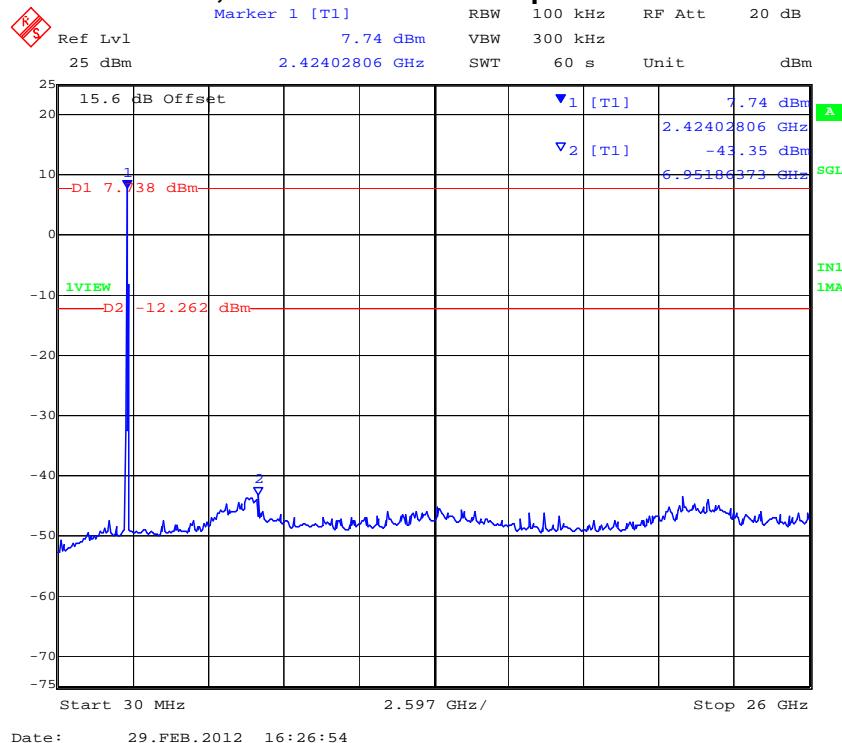

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

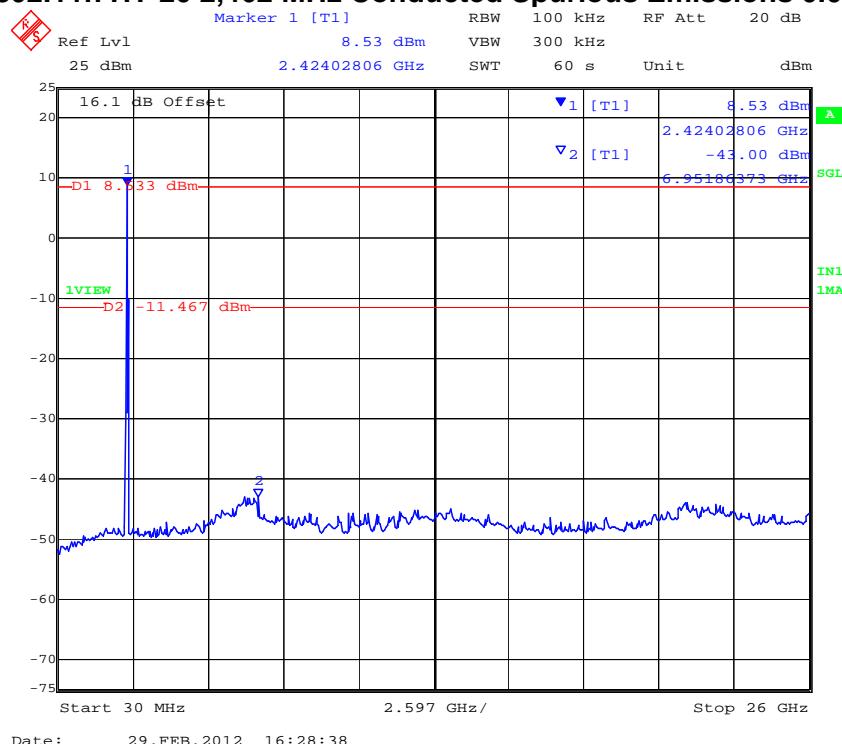
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 249 of 412

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### PORT A 802.11n HT-20 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz



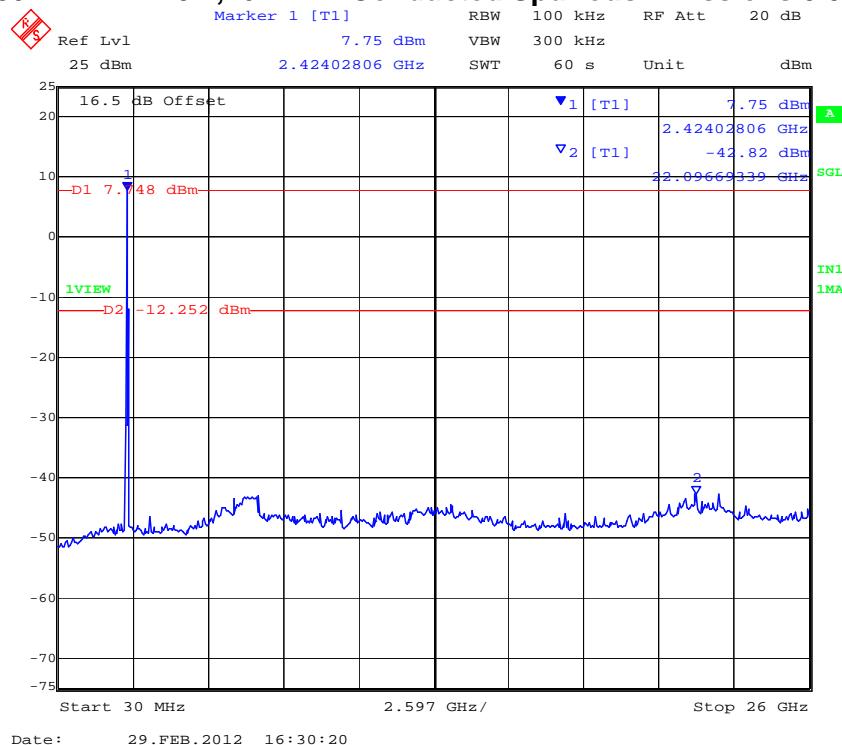
### PORT B 802.11n HT-20 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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**PORT C 802.11n HT-20 2,462 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 251 of 412

## Conducted Spurious Emission Results

### TABLE OF RESULTS – 802.11N HT-40

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2422.000	30.00	26000.00	-43.07	-13.51	-42.66	-13.02	-43.00	-14.96		
2437.000	30.00	26000.00	-43.39	-14.06	-42.16	-14.65	-42.52	-14.39		
2452.000	30.00	26000.00	-43.66	-14.62	-42.41	-14.64	-42.72	-14.24		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D		
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm
2422.000	2400.00	-13.99	-12.87	-16.45	-12.28	-16.21	-14.41			
2452.000	2483.50	-45.20	-13.16	-45.65	-13.51	-45.81	-13.61			

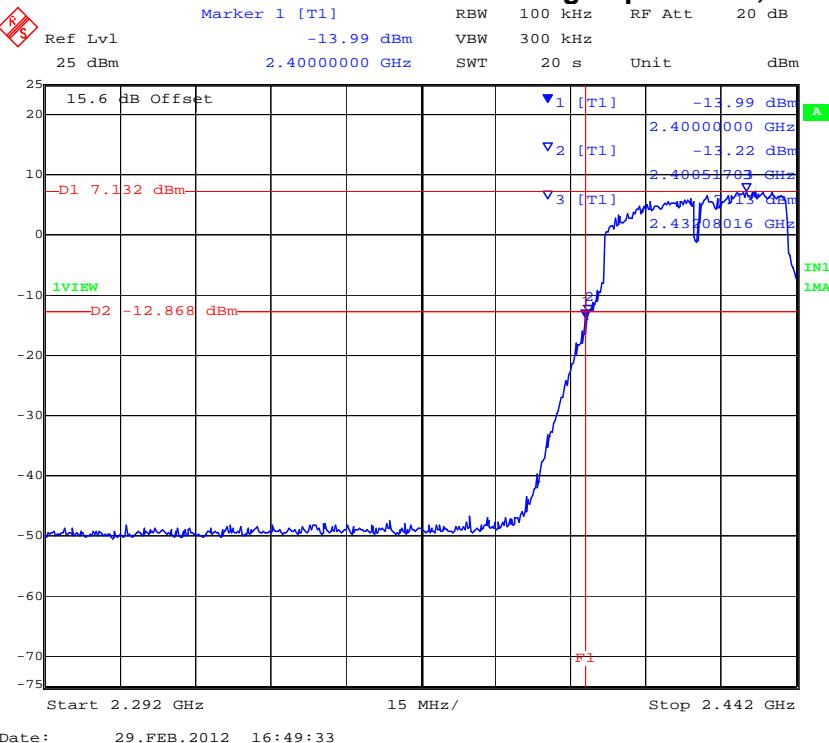
BE: Maximum Band edge emission found

Measurement uncertainty:	±2.81 dB
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Note: Limit is based on 20dB down from fundamental emissions

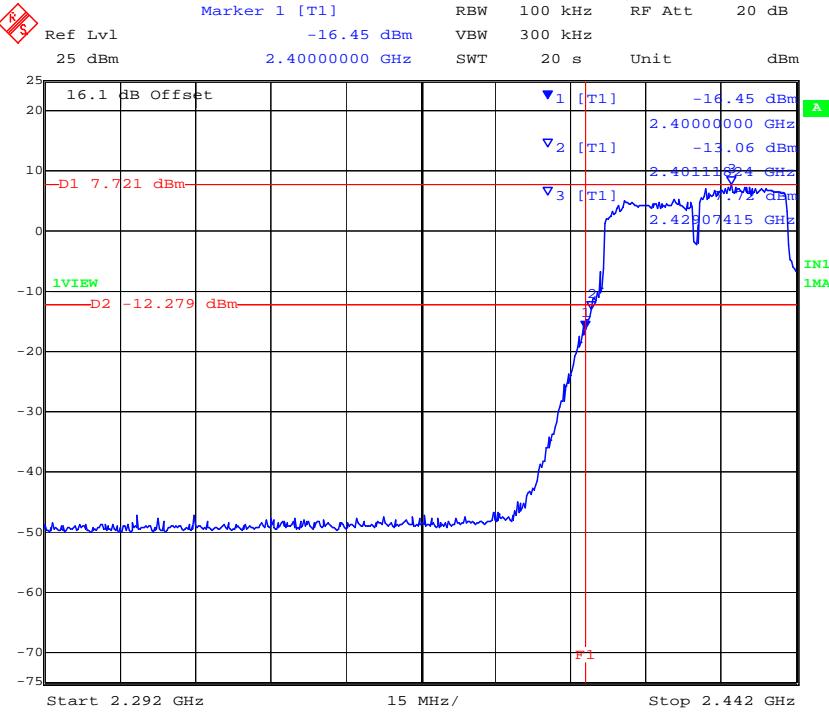
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### PORT A 802.11n HT-40 Conducted Band Edge Spurious 2,400 MHz



Date: 29.FEB.2012 16:49:33

### PORT B 802.11n HT-40 Conducted Band Edge Spurious 2,400 MHz

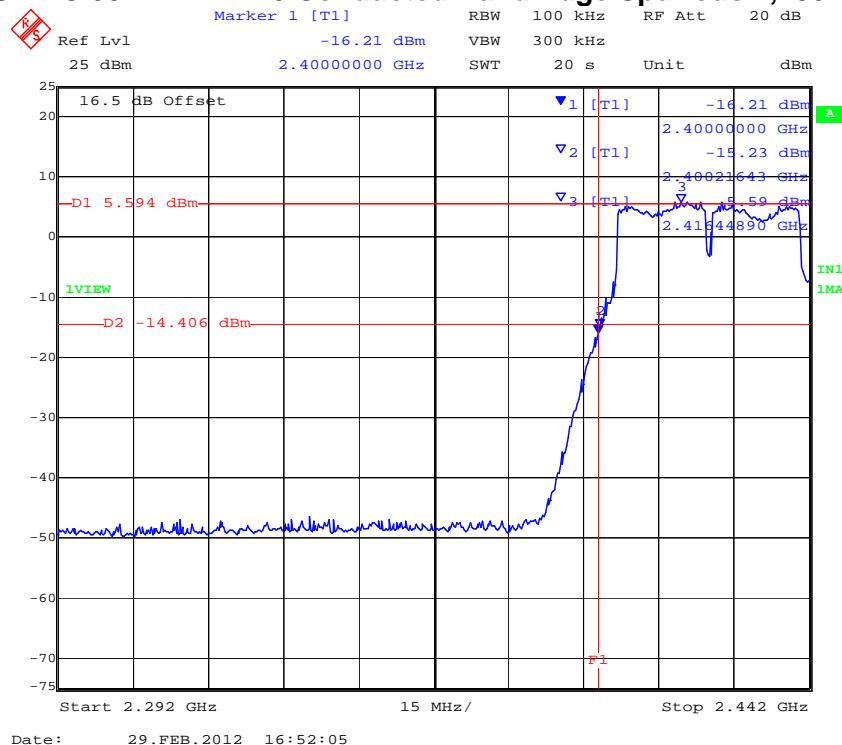


Date: 29.FEB.2012 16:50:51

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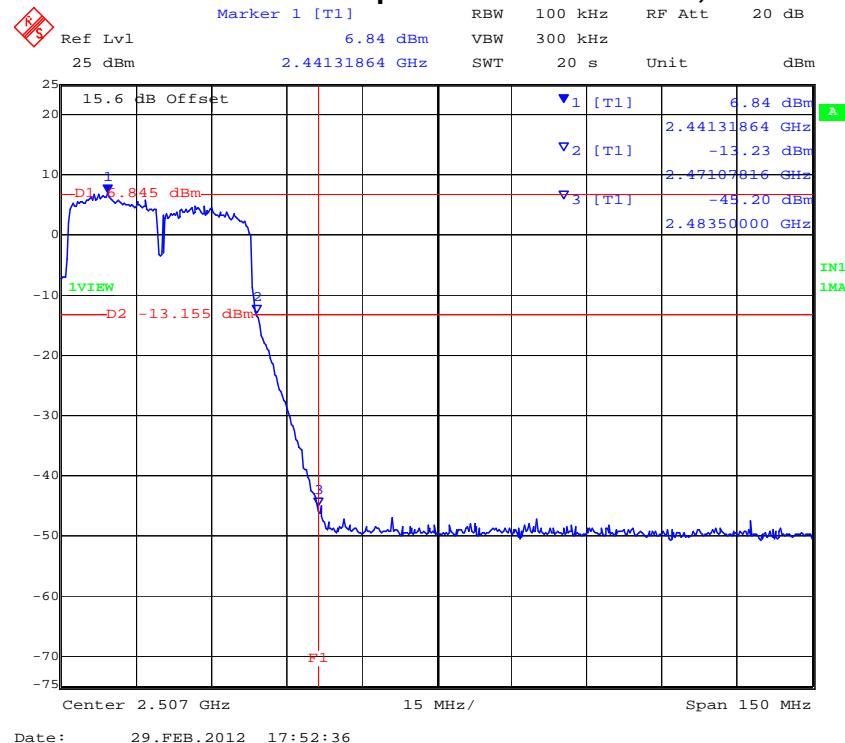
### PORT C 802.11n HT-40 Conducted Band Edge Spurious 2,400 MHz



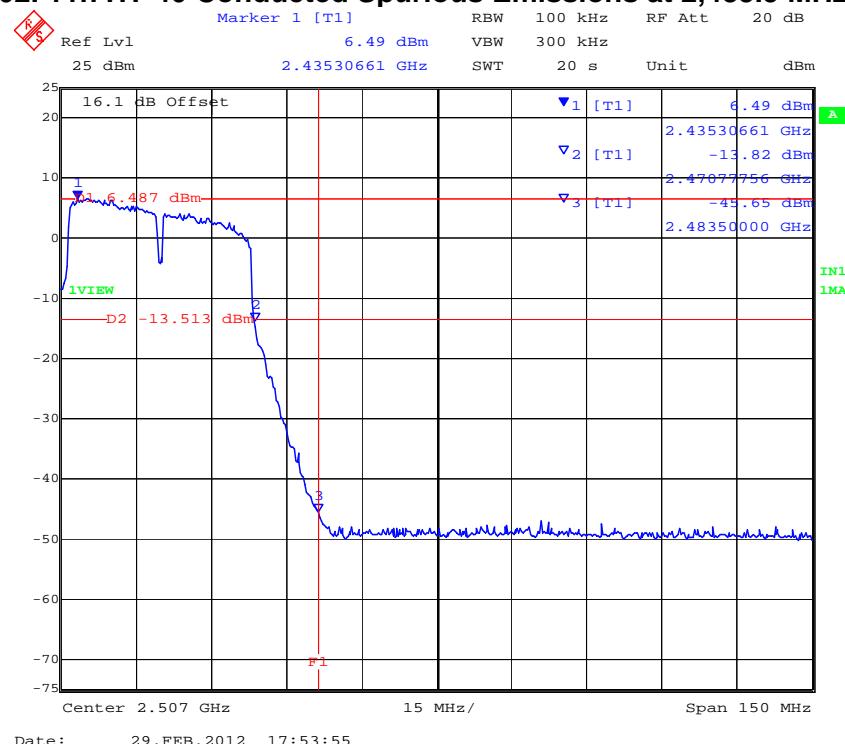

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

**PORT A 802.11n HT-40 Conducted Spurious Emissions at 2,483.5 MHz Band Edge**

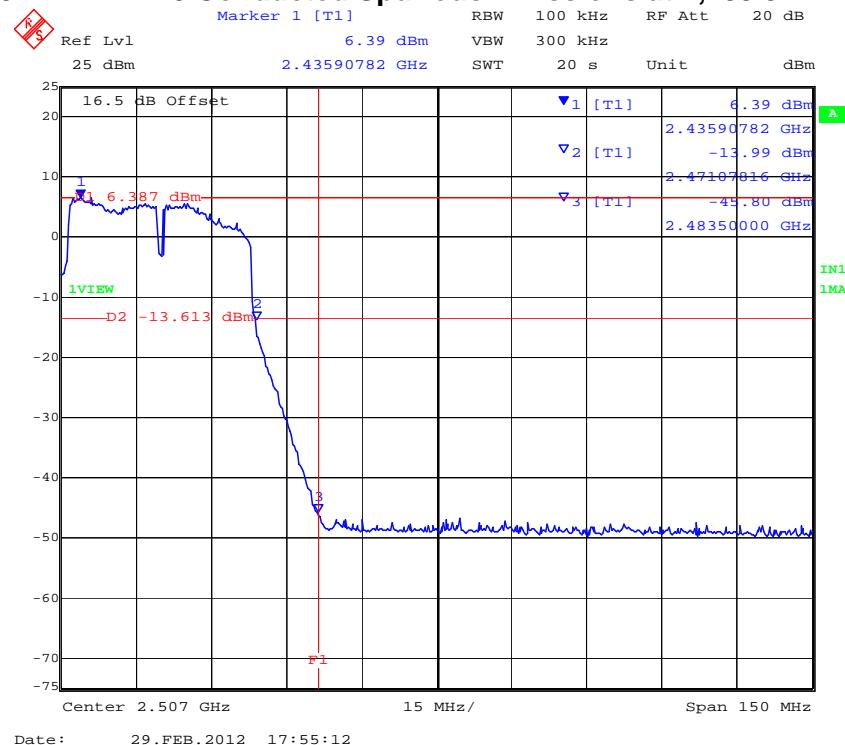


**PORT B 802.11n HT-40 Conducted Spurious Emissions at 2,483.5 MHz Band Edge**



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

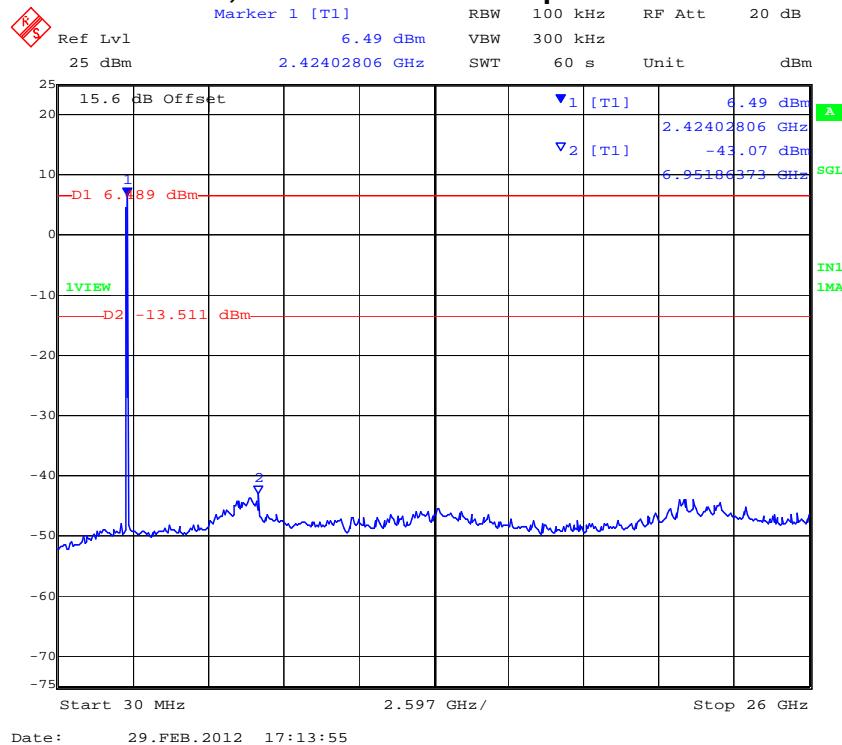
**PORT C 802.11n HT-40 Conducted Spurious Emissions at 2,483.5 MHz Band Edge**



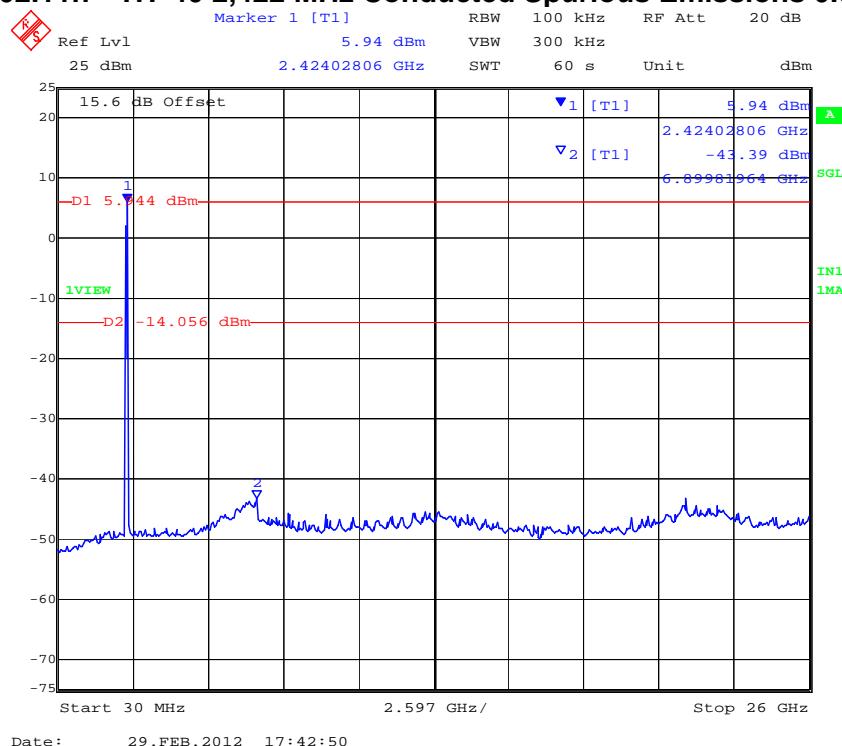

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### PORT A 802.11n – HT-40 2,422 MHz Conducted Spurious Emissions 0.03 – 26 GHz



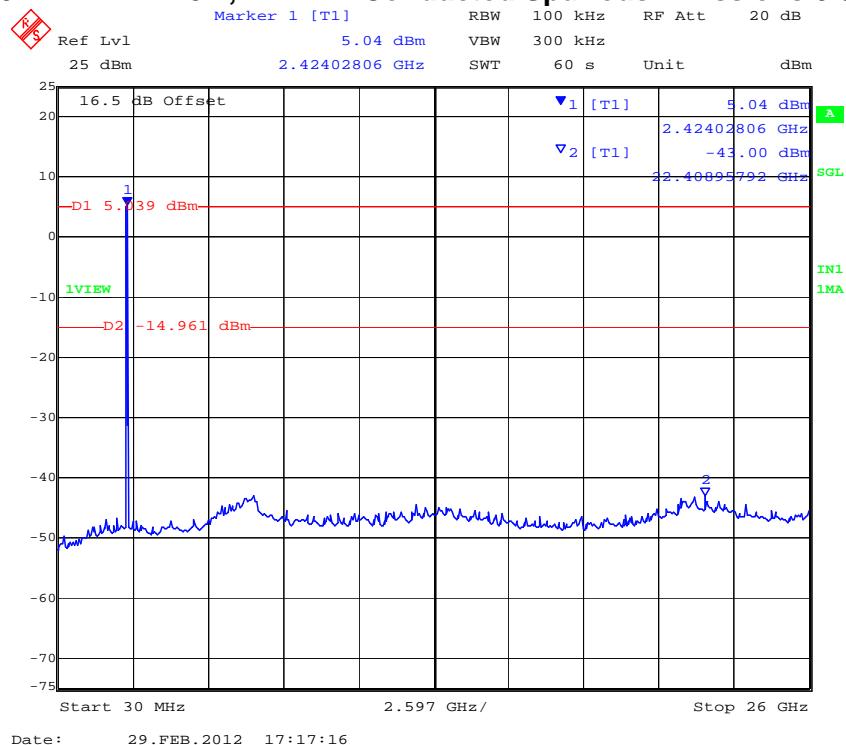
### PORT B 802.11n – HT-40 2,422 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

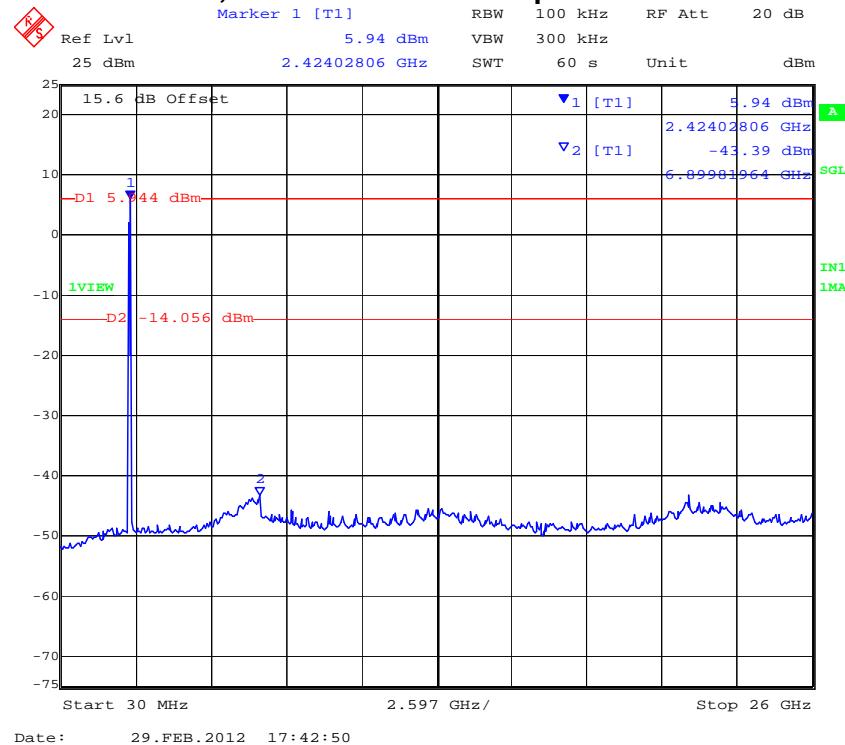
**PORT C 802.11n – HT-40 2,422 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



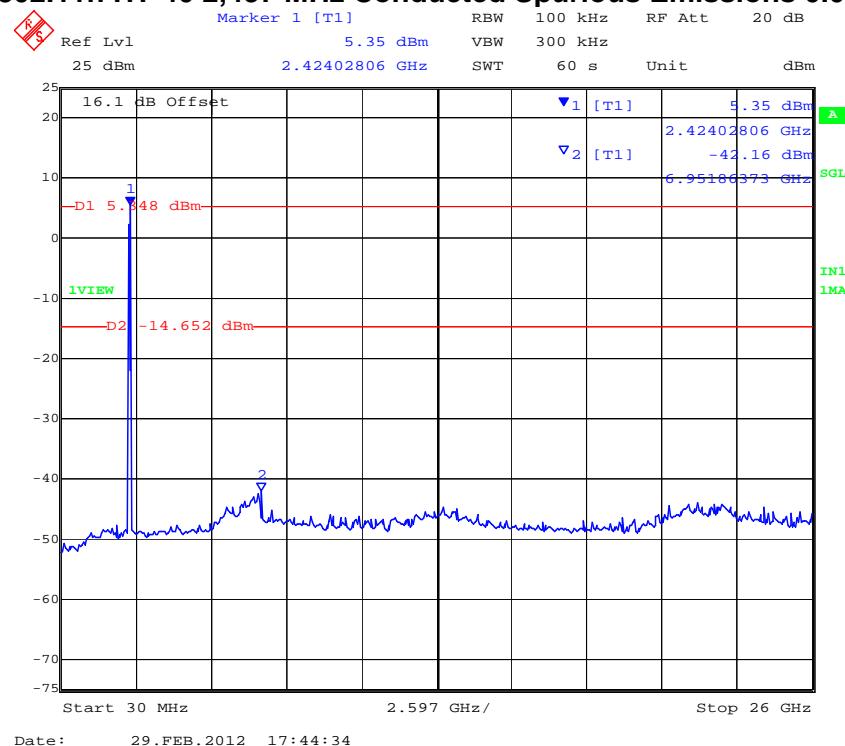

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### PORT A 802.11n HT-40 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz



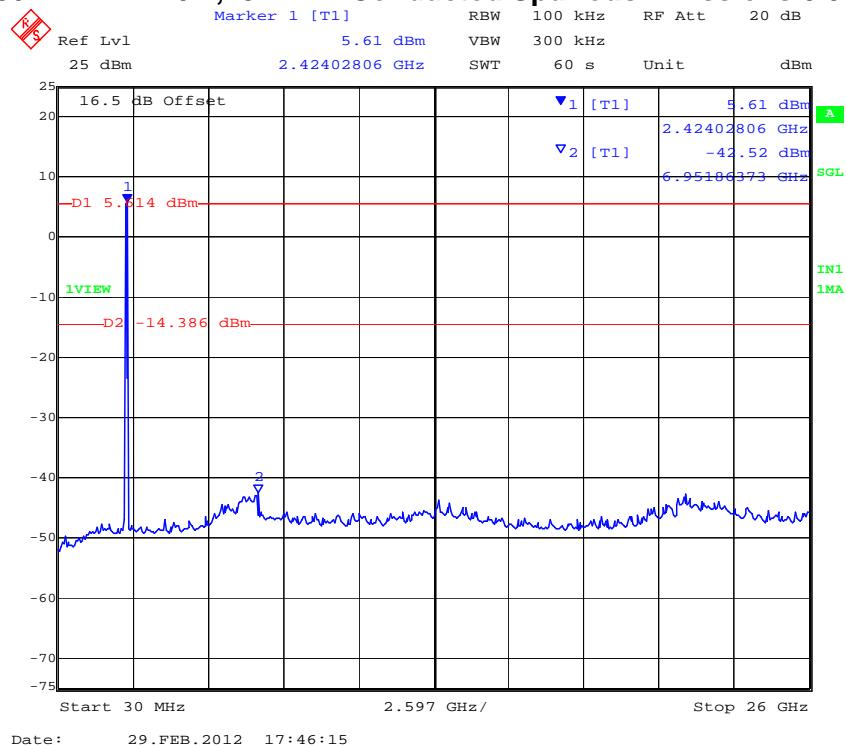
### PORT B 802.11n HT-40 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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**PORT C 802.11n HT-40 2,437 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



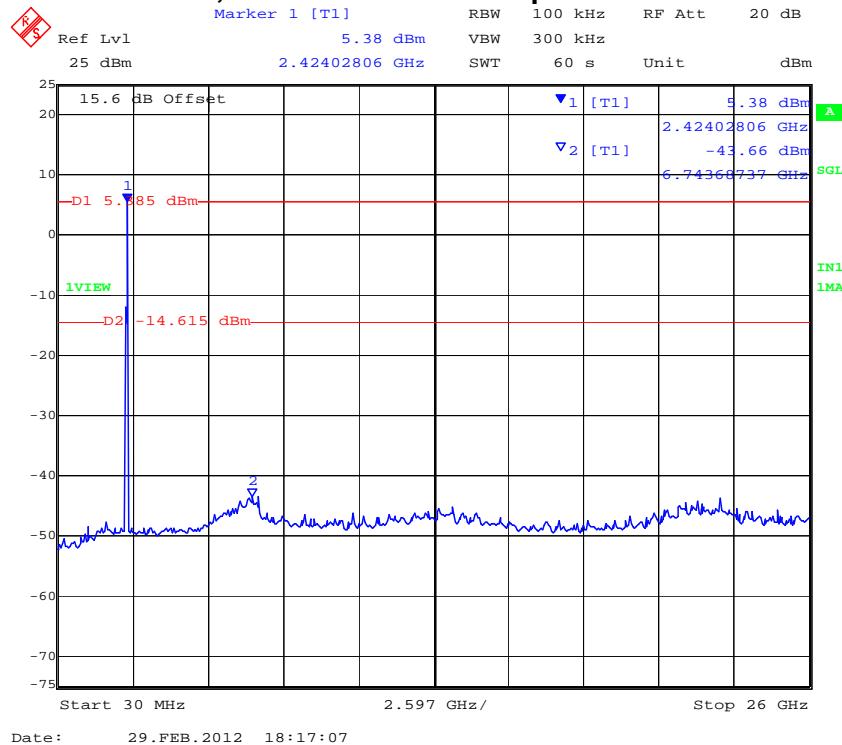

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

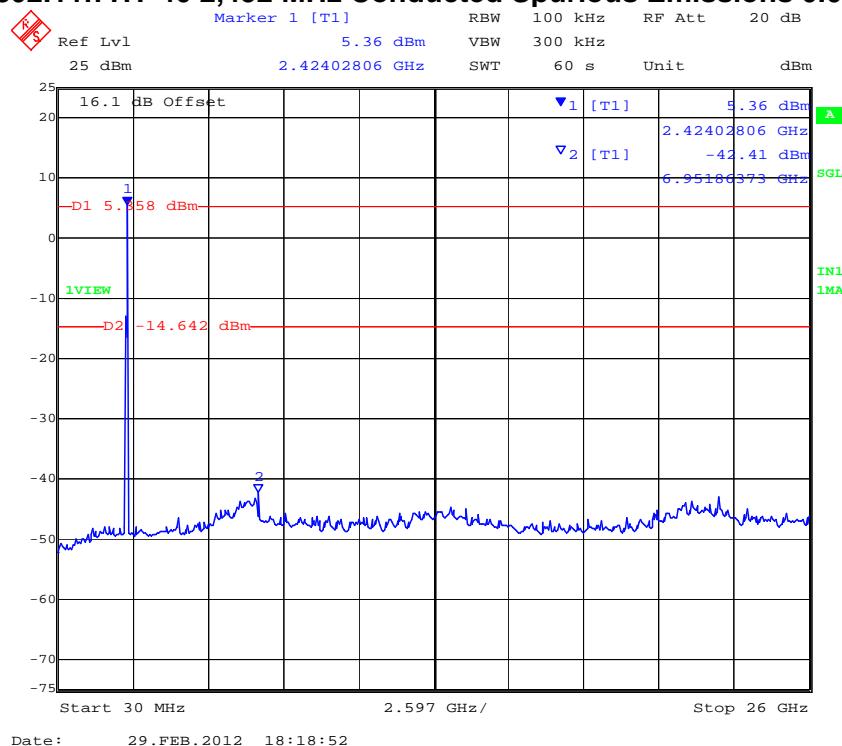
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 260 of 412

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### PORT A 802.11n HT-40 2,452 MHz Conducted Spurious Emissions 0.03 – 26 GHz



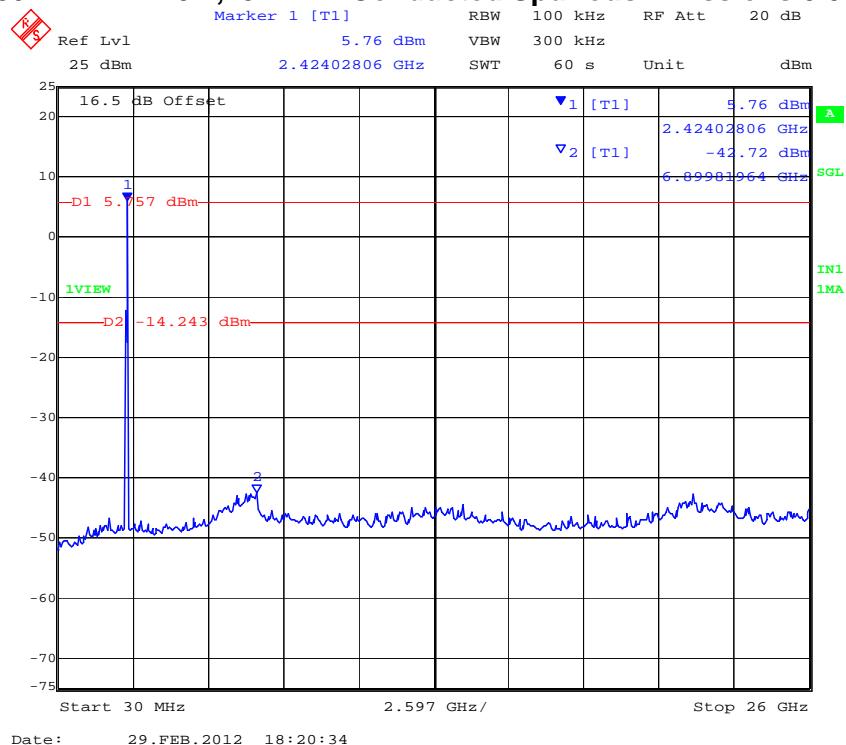
### PORT B 802.11n HT-40 2,452 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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**PORT C 802.11n HT-40 2,452 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 262 of 412

## Conducted Spurious Emission Results

TABLE OF RESULTS – 802.11a Legacy 5 MHz, 6 MBit/s

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a, 5 MHz	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A	dBi	
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5730.500	30.00	26000.00	-42.05	-8.91	-41.29	-7.08	-42.03	-8.59		
5790.500	30.00	26000.00	-42.14	-9.91	-41.33	-9.64	-41.56	-8.13		
5845.500	30.00	26000.00	-41.05	-9.82	-41.20	-11.84	-41.22	-10.06		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5730.500	5725.00	-16.23	-5.96	-11.23	-4.35	-14.05	-5.33		
5845.500	5850.00	-13.59	-8.08	-18.25	-10.02	-17.26	-8.46		

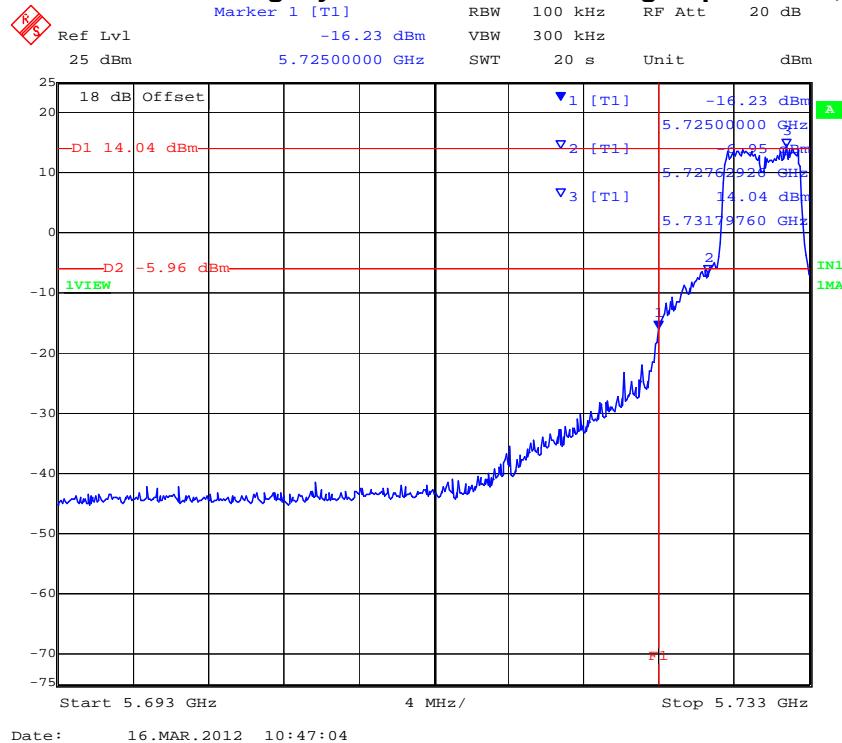
BE: Maximum Band edge emission found

<b>Measurement uncertainty:</b>	±2.81 dB
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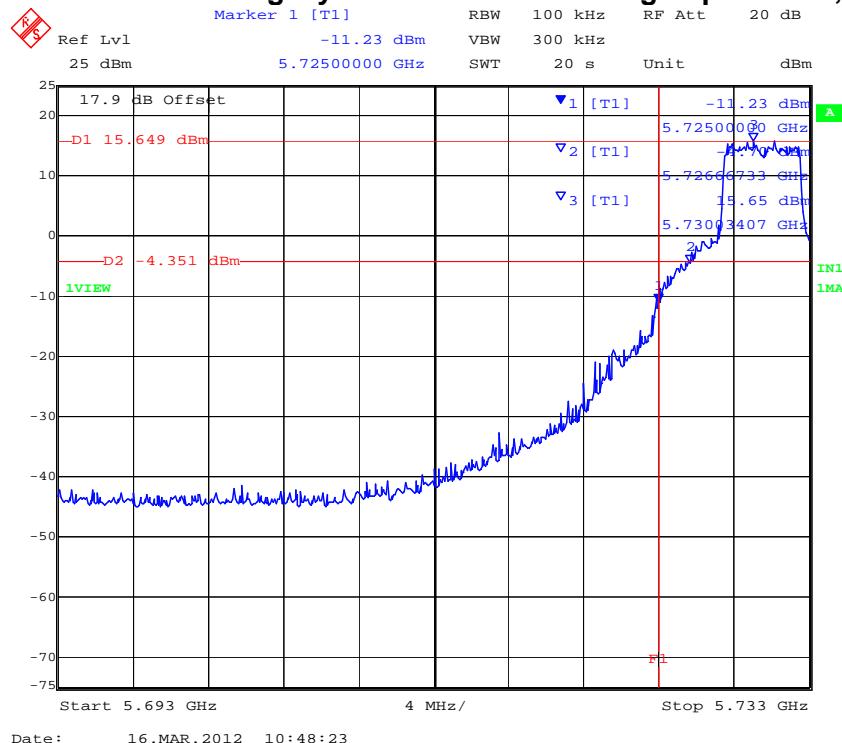
Note: Limit is based on 20dB down from fundamental emission

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### 5 MHz PORT A 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz



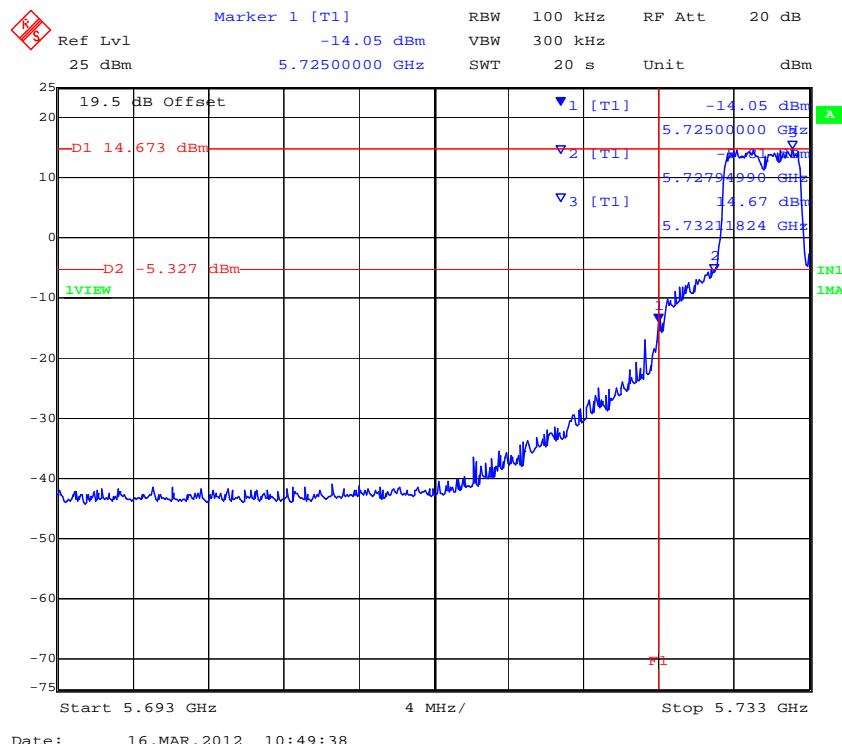
### 5 MHz PORT B 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz




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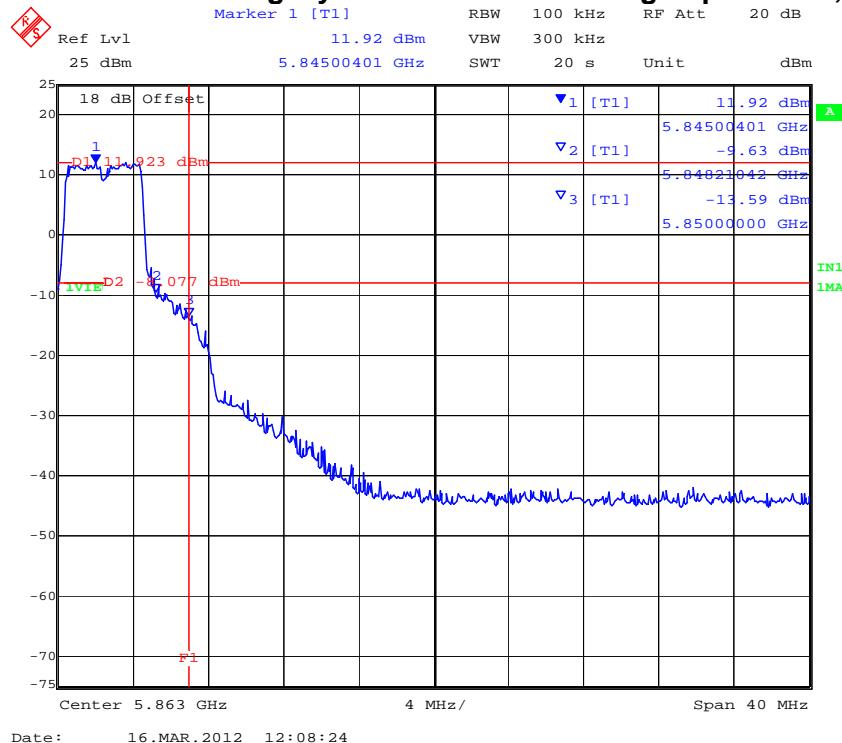
### 5 MHz PORT C 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz




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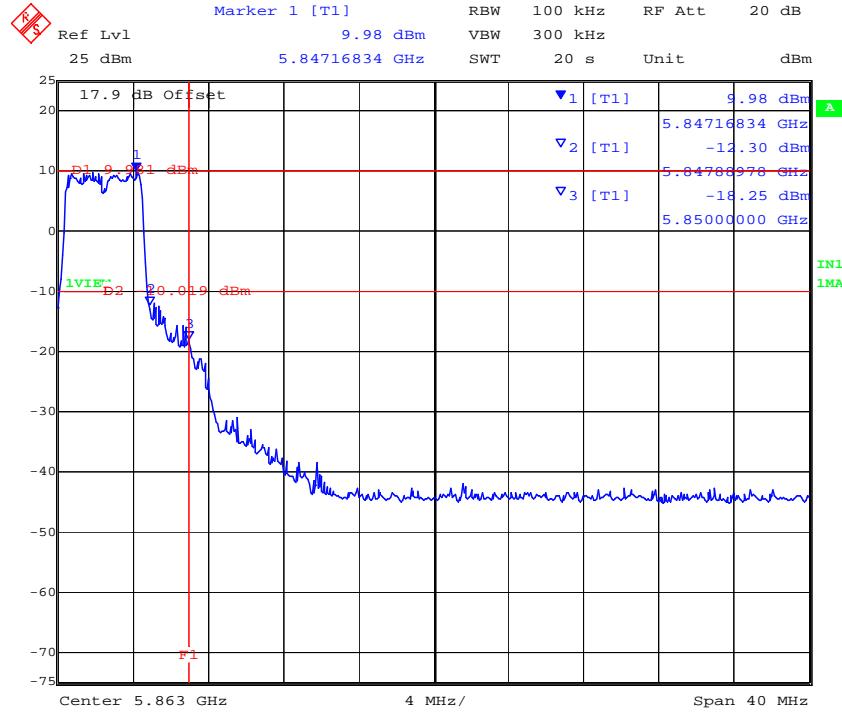
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### 5 MHz PORT A 802.11a Legacy - Conducted Band Edge Spurious 5,850 MHz



Date: 16.MAR.2012 12:08:24

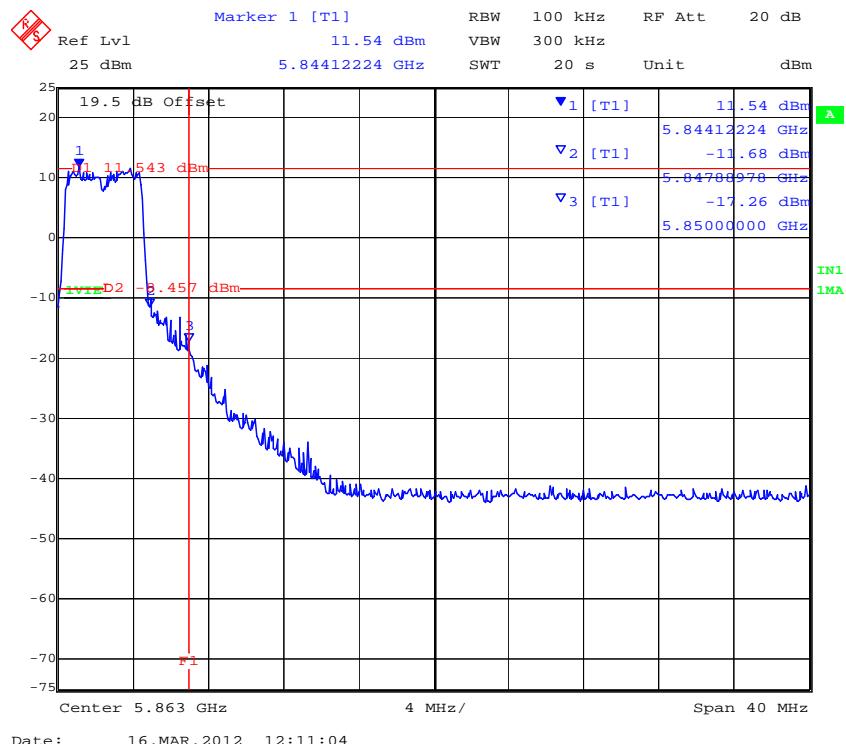
### 5 MHz PORT B 802.11a Legacy - Conducted Band Edge Spurious 5,850 MHz



Date: 16.MAR.2012 12:09:45

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### 5 MHz PORT C 802.11a Legacy - Conducted Band Edge Spurious 5,850 MHz



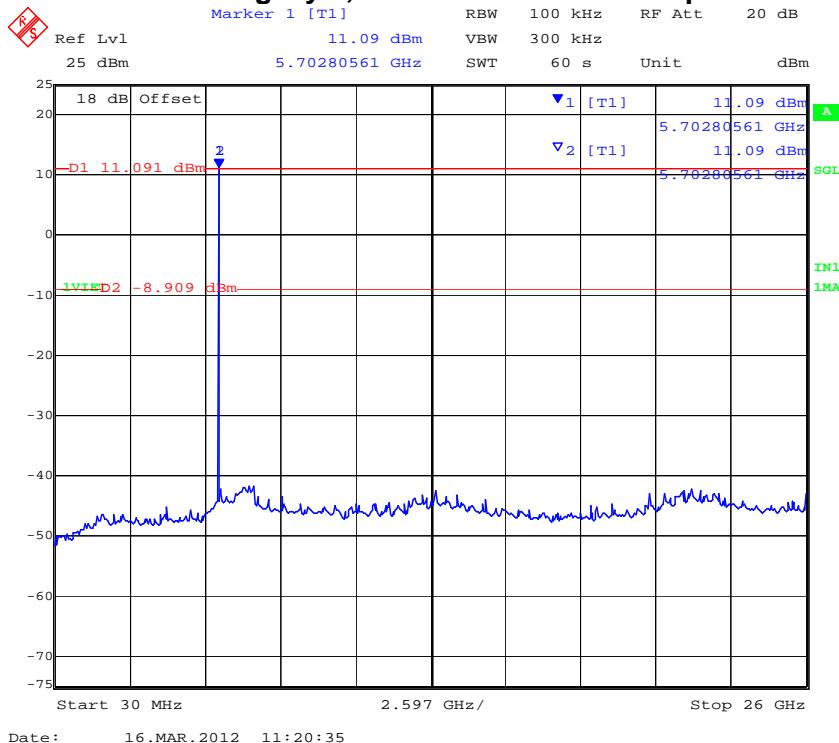

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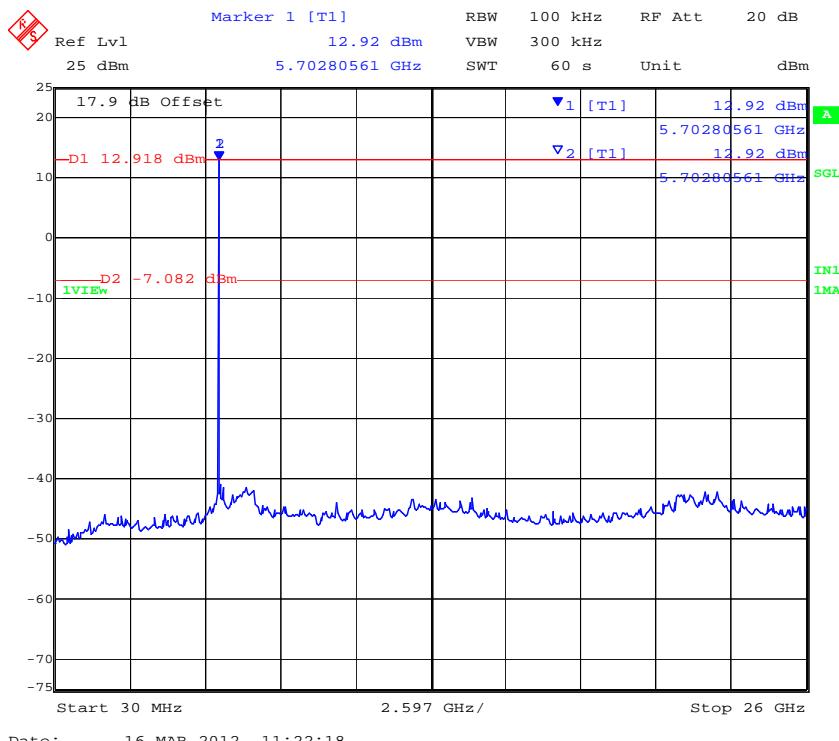
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 267 of 412

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### 5 MHz PORT A 802.11a-Legacy 5,730.5 MHz Conducted Spurious 0.03–26 GHz



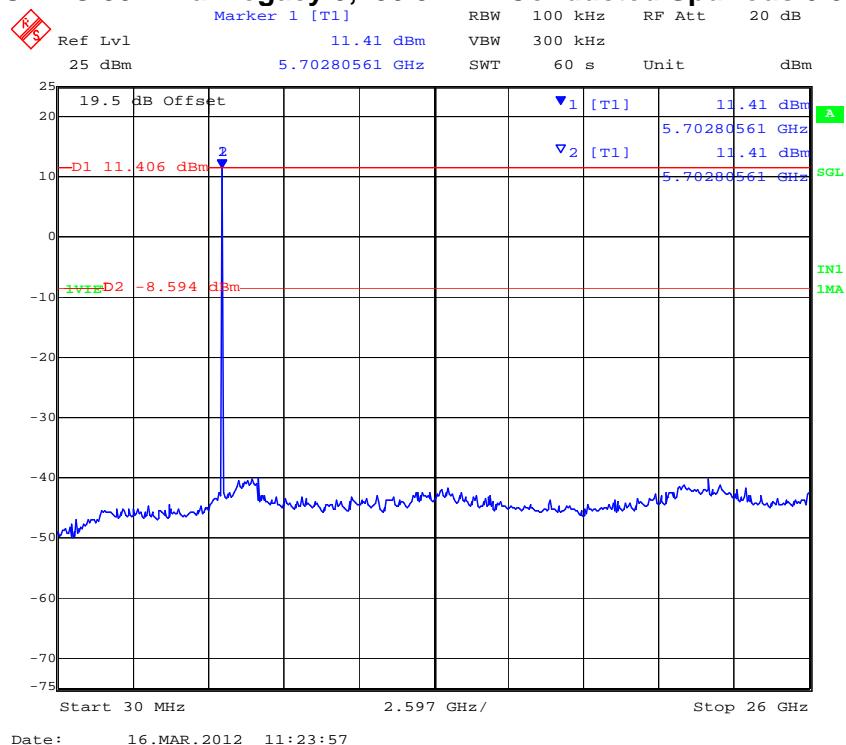
### 5 MHz PORT B 802.11a-Legacy 5,730.5 MHz Conducted Spurious 0.03–26 GHz




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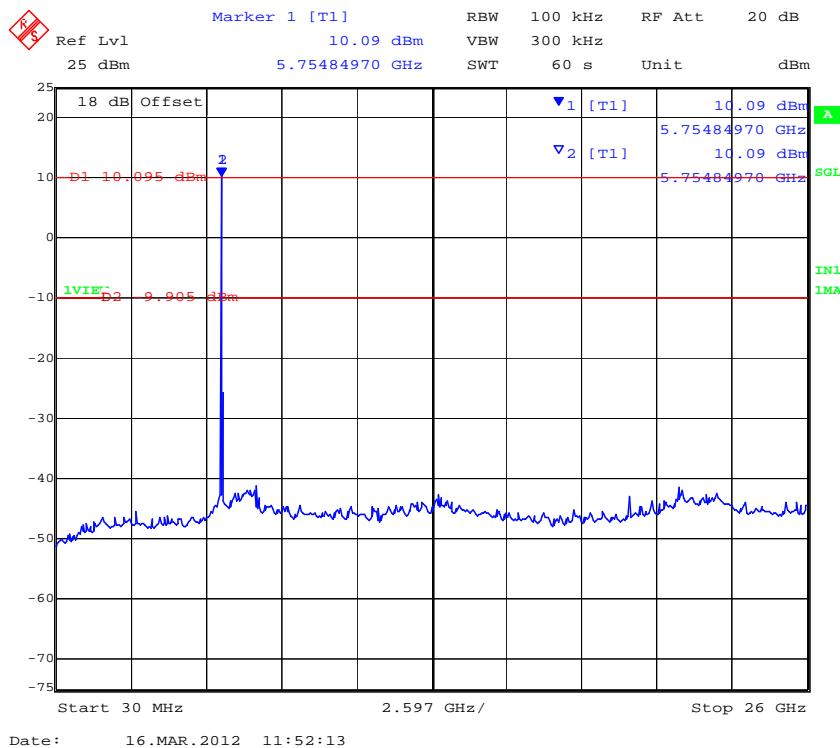
### 5 MHz PORT C 802.11a-Legacy 5,730.5 MHz Conducted Spurious 0.03–26 GHz



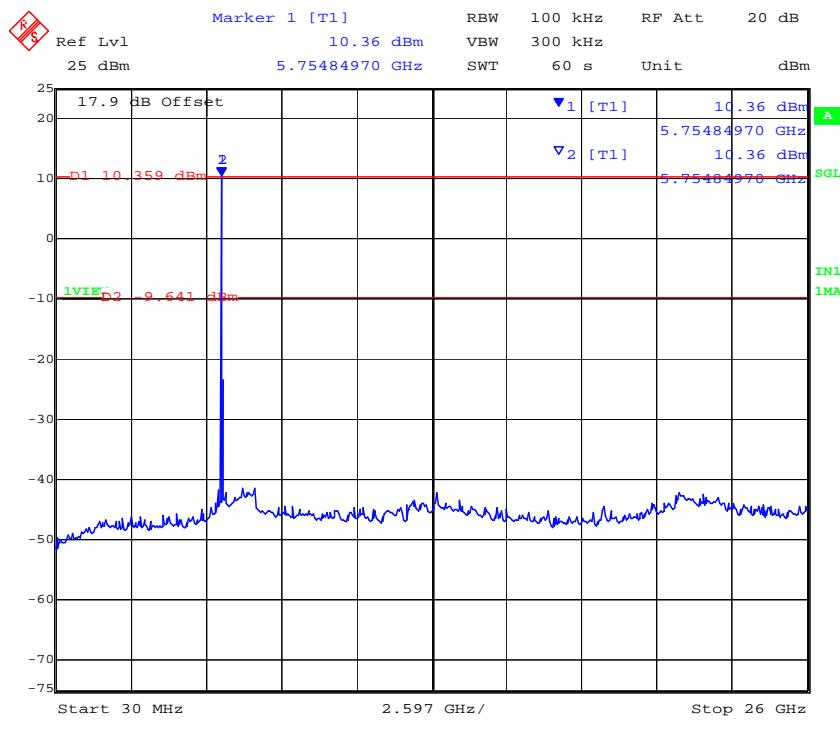

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### 5 MHz PORT A 802.11a-Legacy 5,790.5 MHz Conducted Spurious 0.03–26 GHz



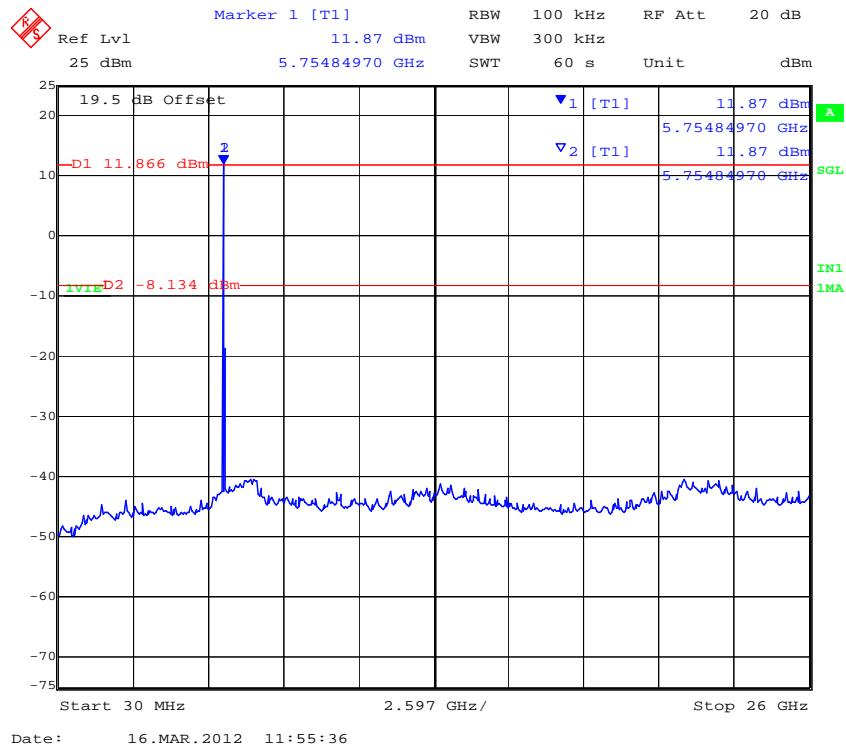
### 5 MHz PORT B 802.11a-Legacy 5,790.5 MHz Conducted Spurious 0.03–26 GHz




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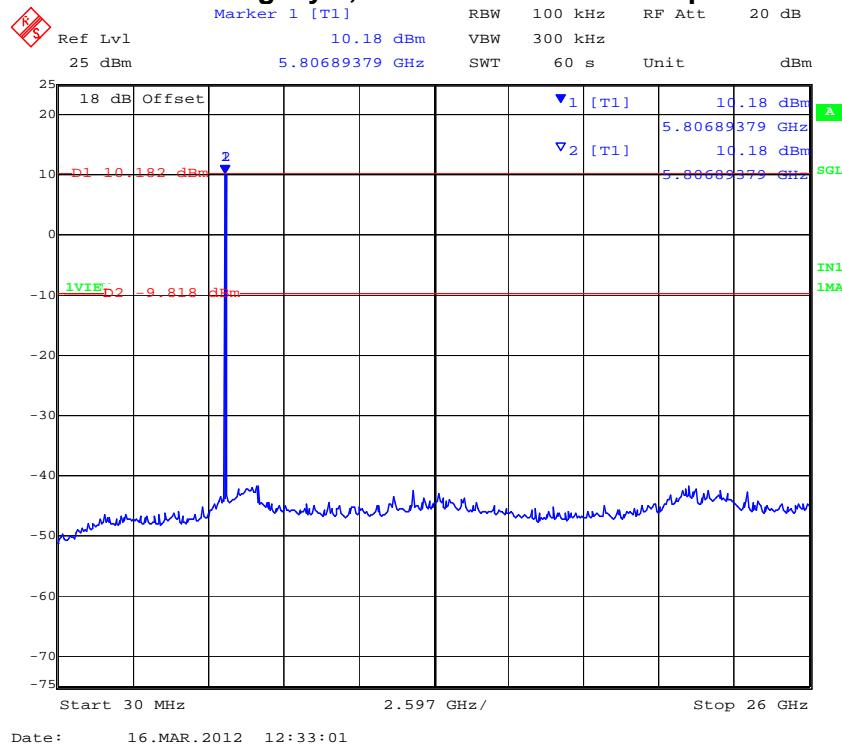
### 5 MHz PORT C 802.11a-Legacy 5,790.5 MHz Conducted Spurious 0.03–26 GHz



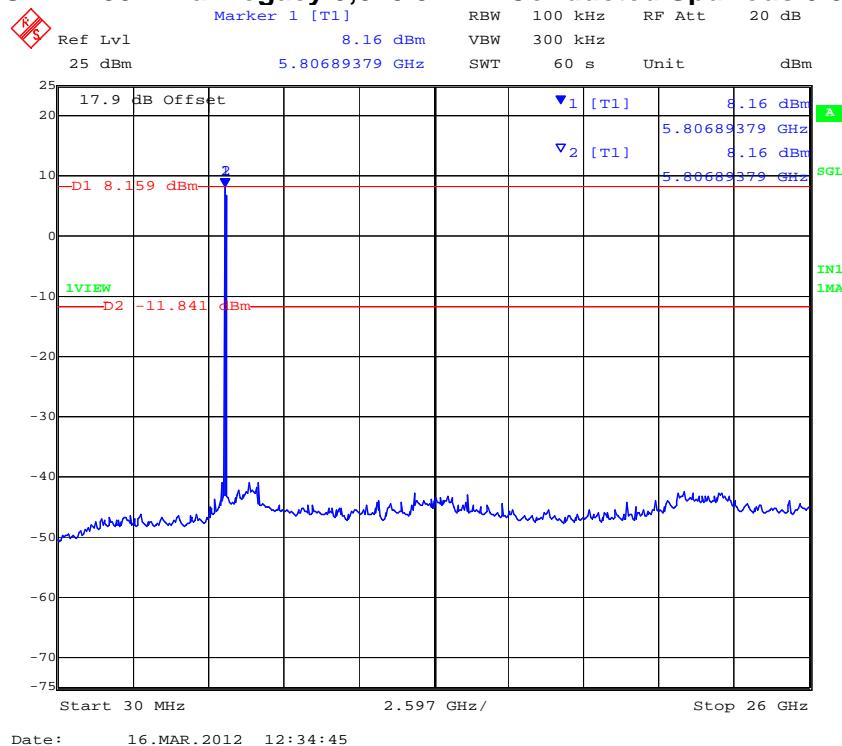

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### 5 MHz PORT A 802.11a-Legacy 5,845.5 MHz Conducted Spurious 0.03–26 GHz



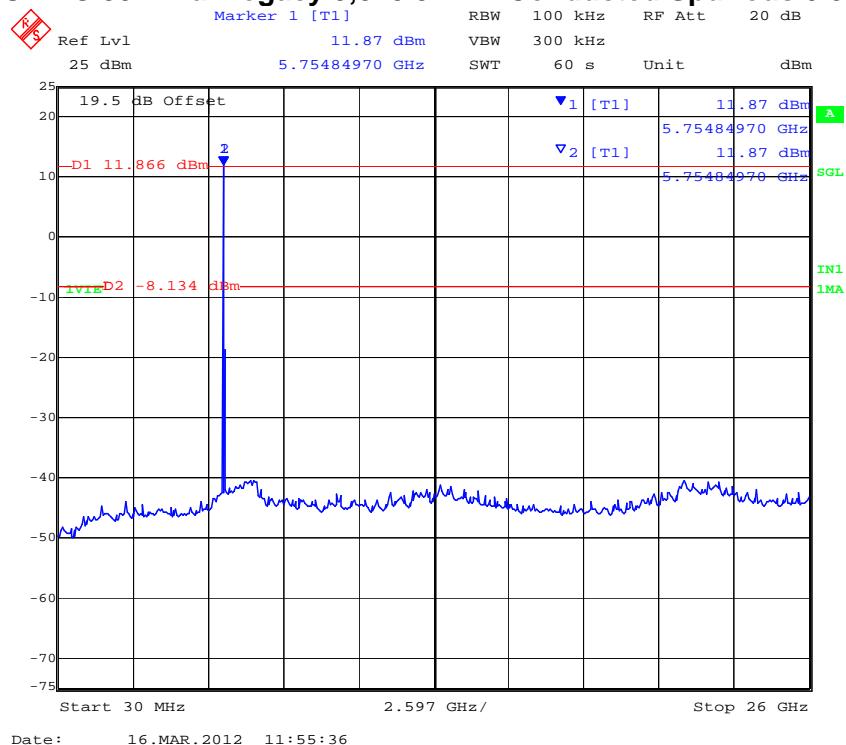
### 5 MHz PORT B 802.11a-Legacy 5,845.5 MHz Conducted Spurious 0.03–26 GHz




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### 5 MHz PORT C 802.11a-Legacy 5,845.5 MHz Conducted Spurious 0.03–26 GHz




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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 273 of 412

## TABLE OF RESULTS – 802.11a Legacy 10 MHz, 6 MBit/s

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a, 10 MHz	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			SE dBm	Limit dBm						
5735.000	30.00	26000.00	-41.36	-8.99	-41.83	-8.69	-40.05	-9.01		
5790.000	30.00	26000.00	-41.37	-9.73	-41.44	-9.58	-39.53	-8.14		
5840.000	30.00	26000.00	-41.89	-8.53	-41.54	-9.69	-40.25	-8.82		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		BE dBm	Limit dBm						
5735.000	5725.00	-10.78	-7.10	-9.61	-7.42	-11.64	-7.28		
5840.000	5850.00	-7.66	-7.10	-12.20	-8.93	-8.51	-7.34		

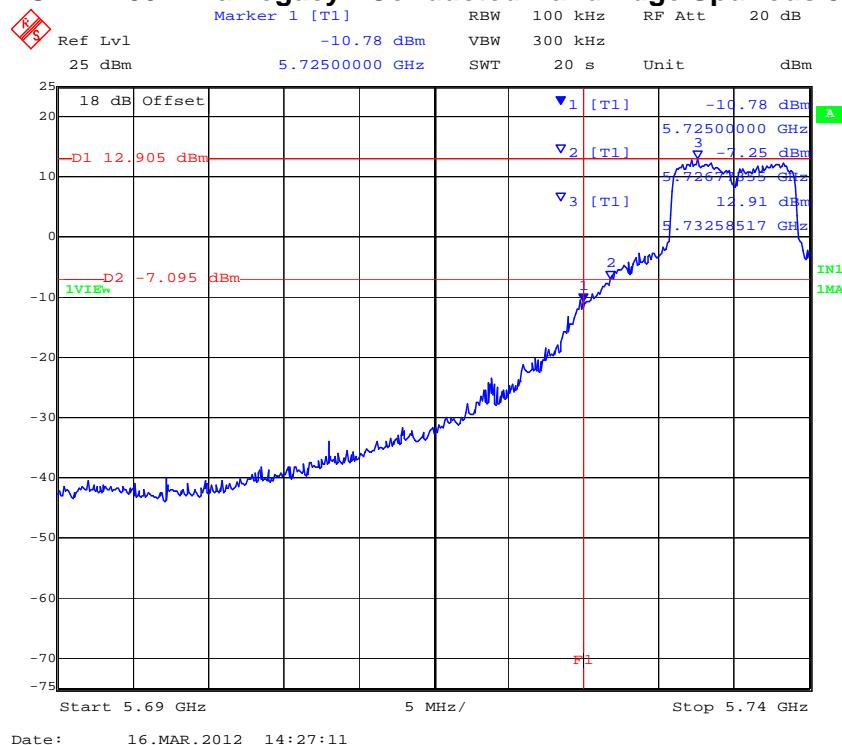
BE: Maximum Band edge emission found

Measurement uncertainty:	±2.81 dB
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Note: Limit is based on 20dB down from fundamental emission

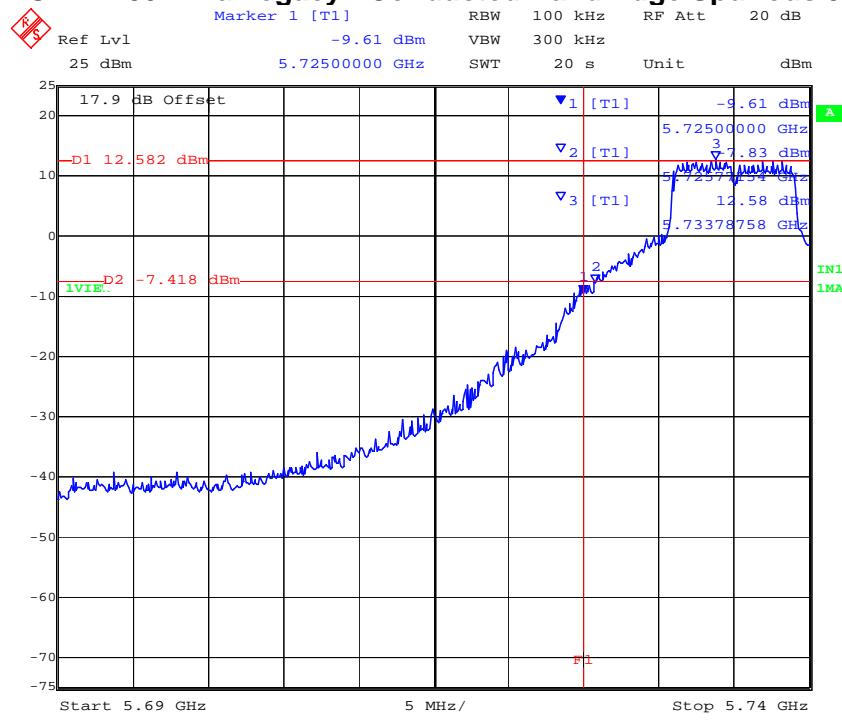
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### 10 MHz PORT A 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz



Date: 16.MAR.2012 14:27:11

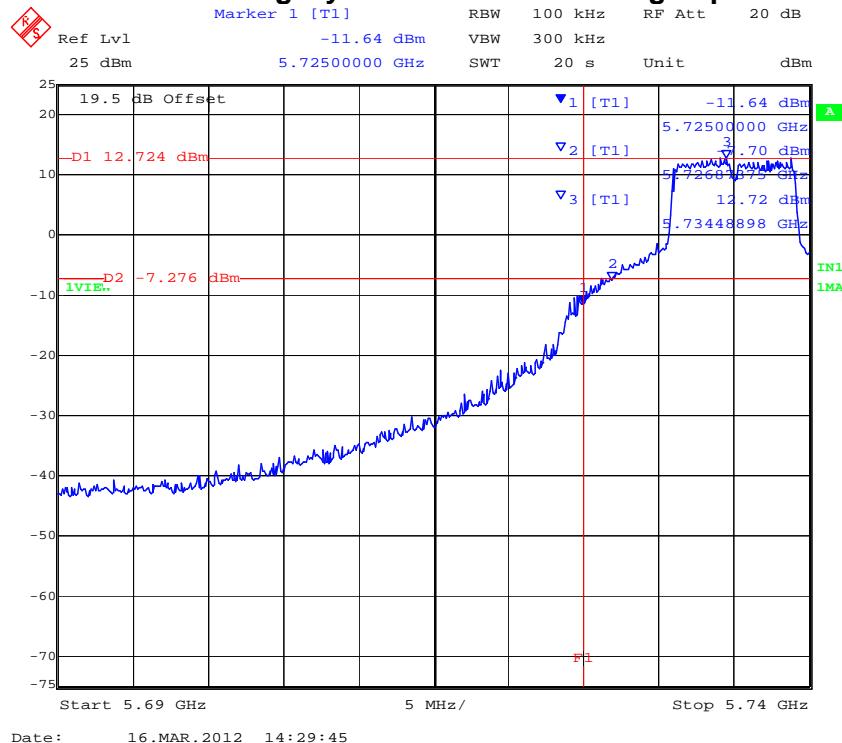
### 10 MHz PORT B 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz



Date: 16.MAR.2012 14:28:28

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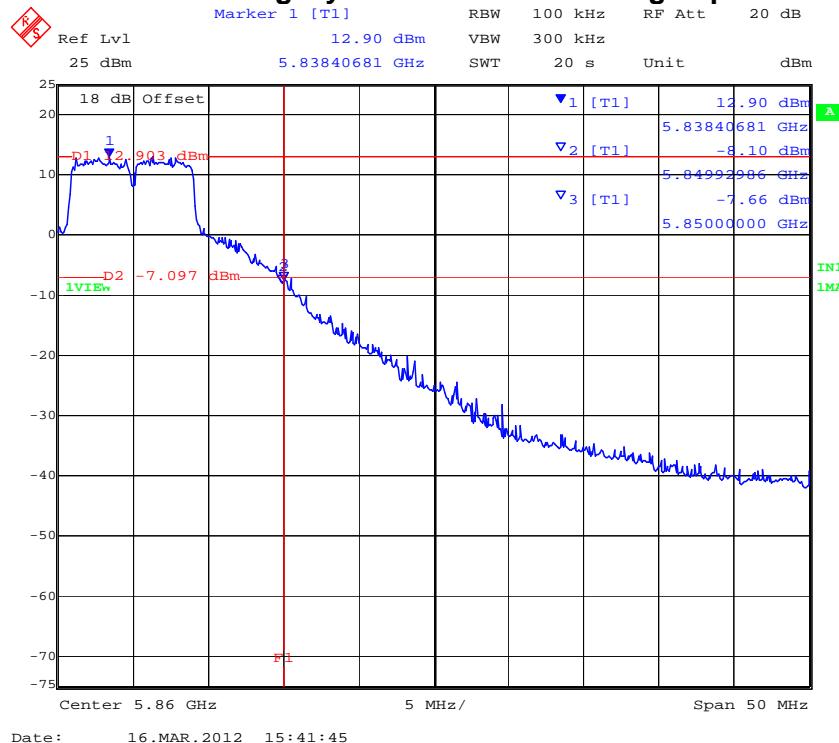
### 10 MHz PORT C 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz



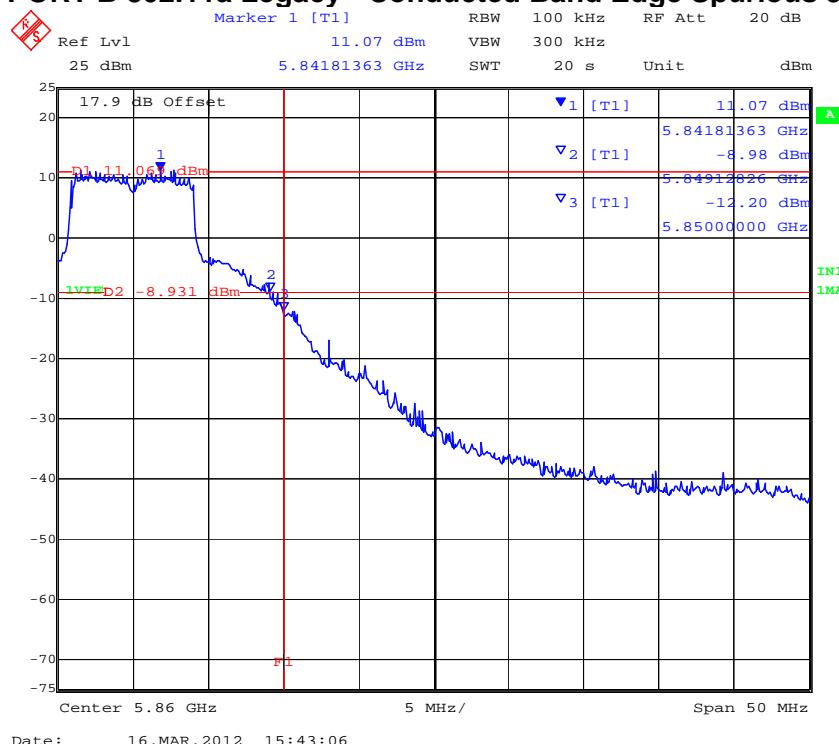

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### 10 MHz PORT A 802.11a Legacy - Conducted Band Edge Spurious 5,850 MHz



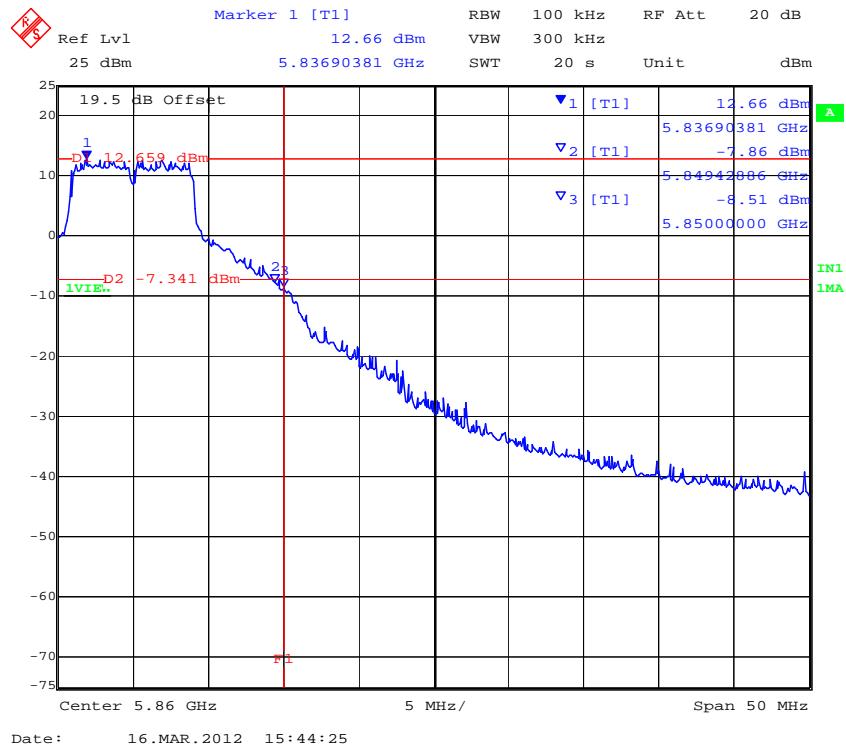
### 10 MHz PORT B 802.11a Legacy - Conducted Band Edge Spurious 5,850 MHz




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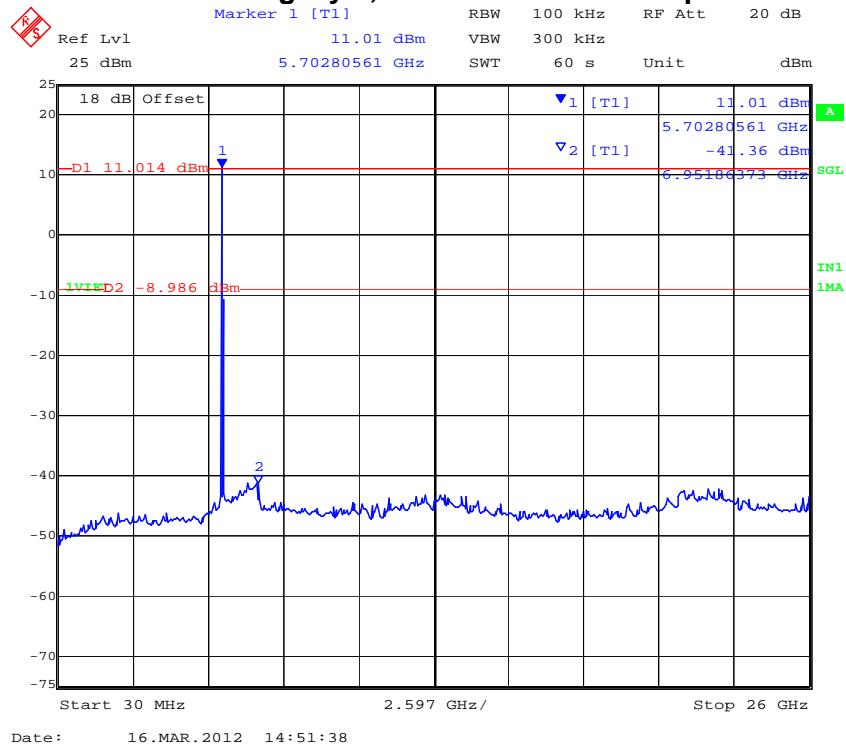
### 10 MHz PORT C 802.11a Legacy - Conducted Band Edge Spurious 5,850 MHz



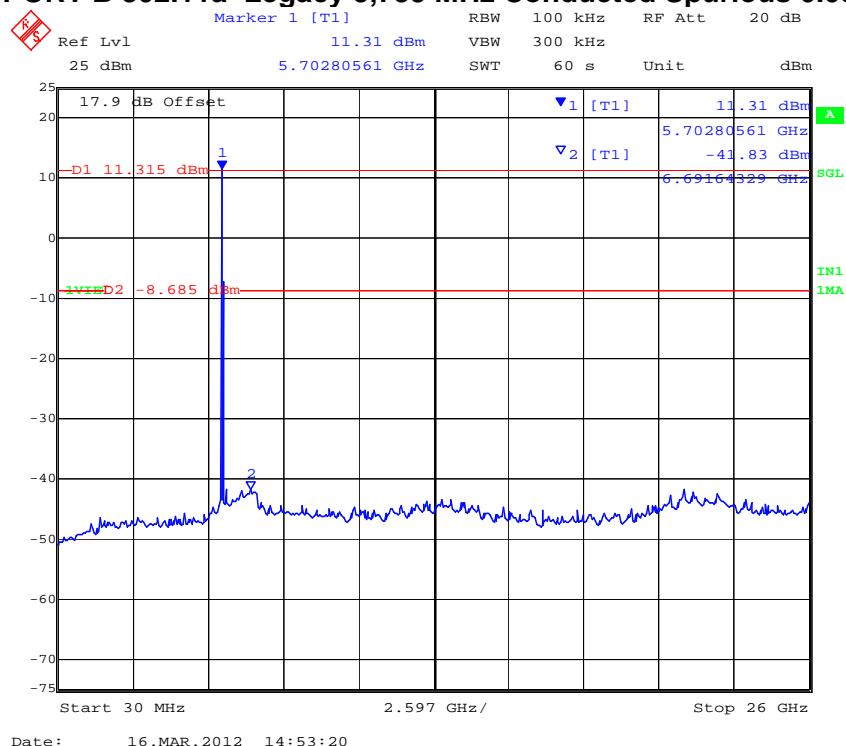

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### 10 MHz PORT A 802.11a-Legacy 5,735 MHz Conducted Spurious 0.03–26 GHz



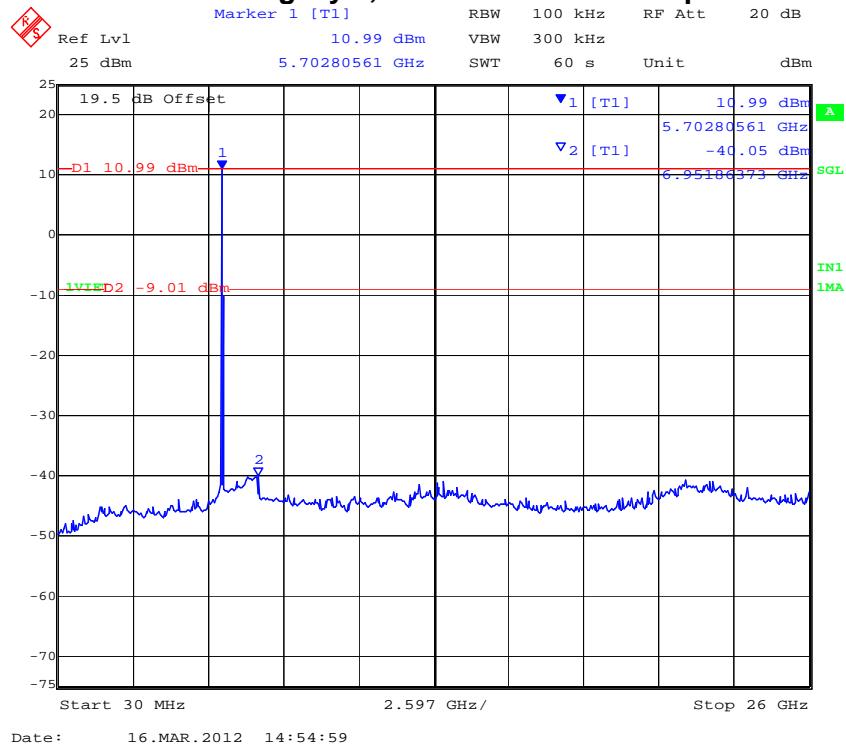
### 10 MHz PORT B 802.11a-Legacy 5,735 MHz Conducted Spurious 0.03–26 GHz




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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

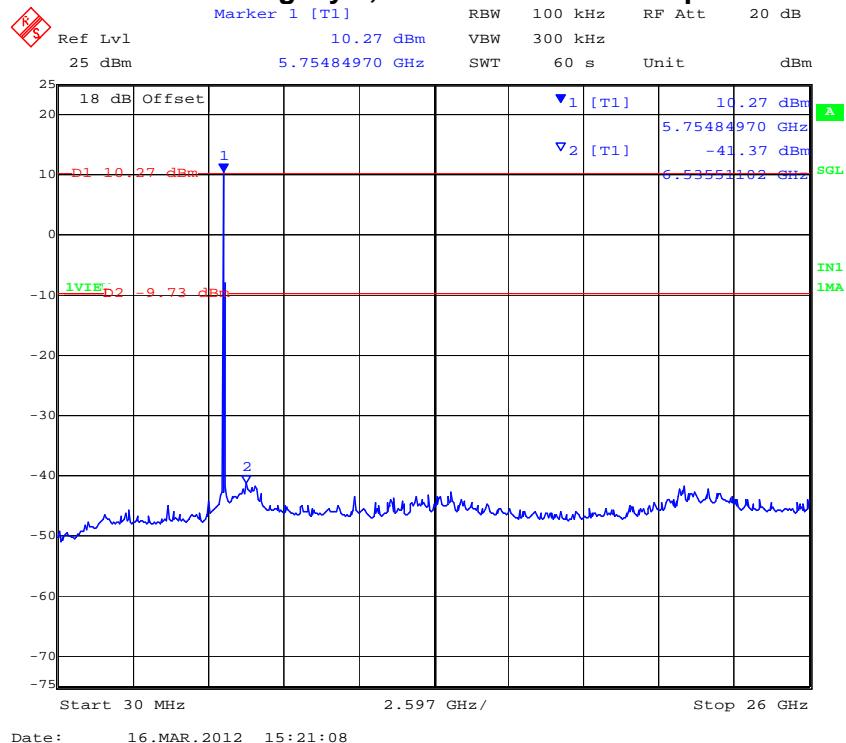
### 10 MHz PORT C 802.11a-Legacy 5,735 MHz Conducted Spurious 0.03–26 GHz



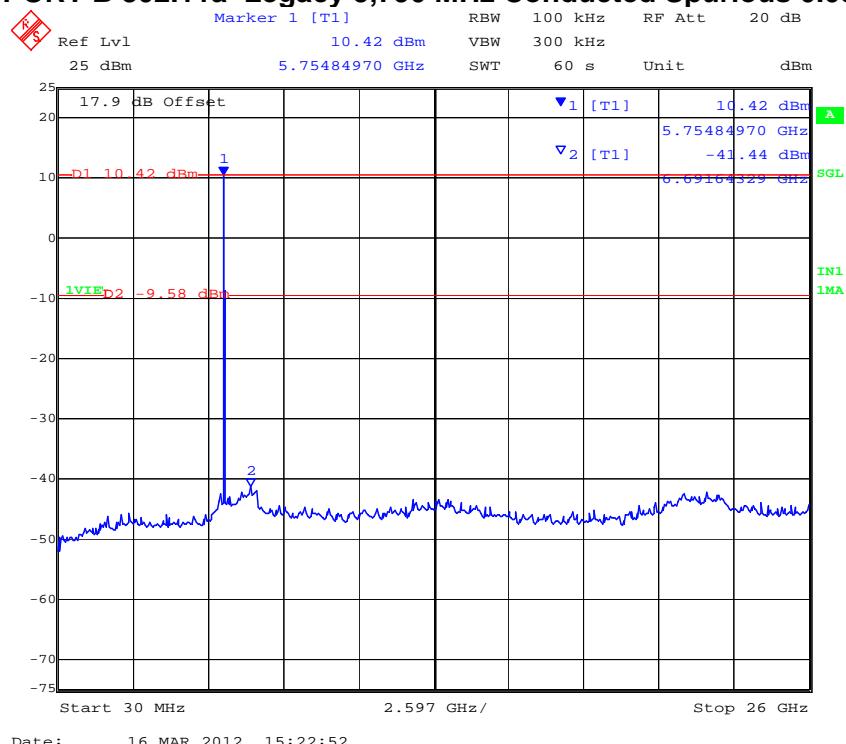

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### 10 MHz PORT A 802.11a-Legacy 5,790 MHz Conducted Spurious 0.03–26 GHz



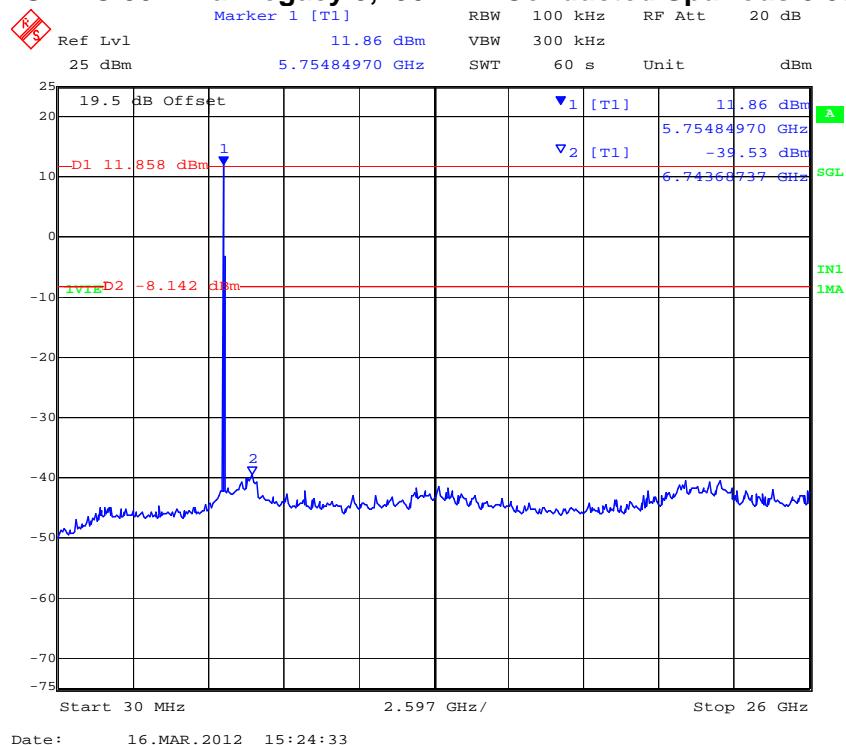
### 10 MHz PORT B 802.11a-Legacy 5,790 MHz Conducted Spurious 0.03–26 GHz




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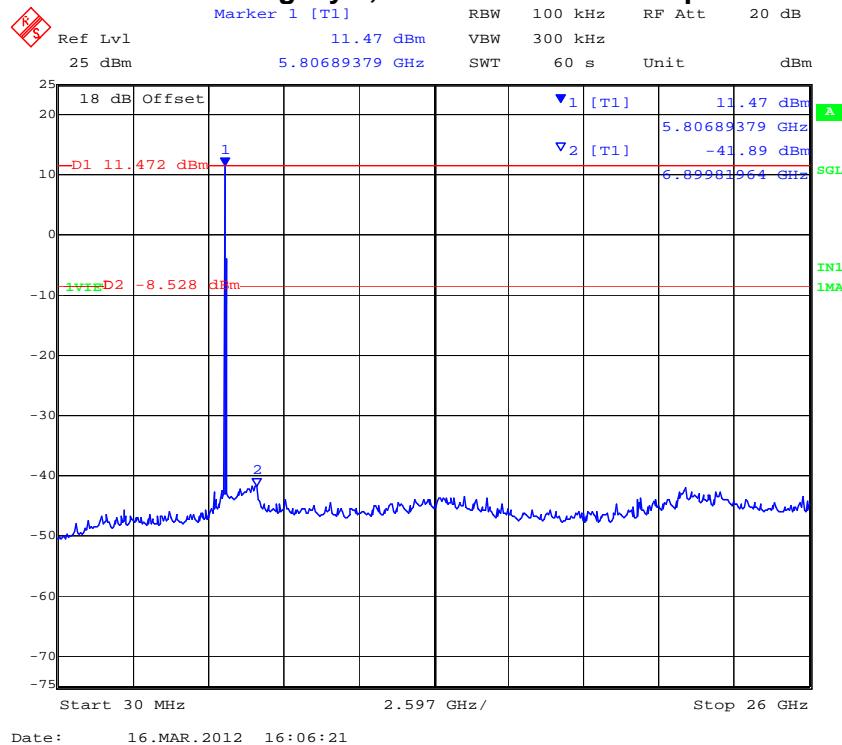
### 10 MHz PORT C 802.11a-Legacy 5,790 MHz Conducted Spurious 0.03–26 GHz



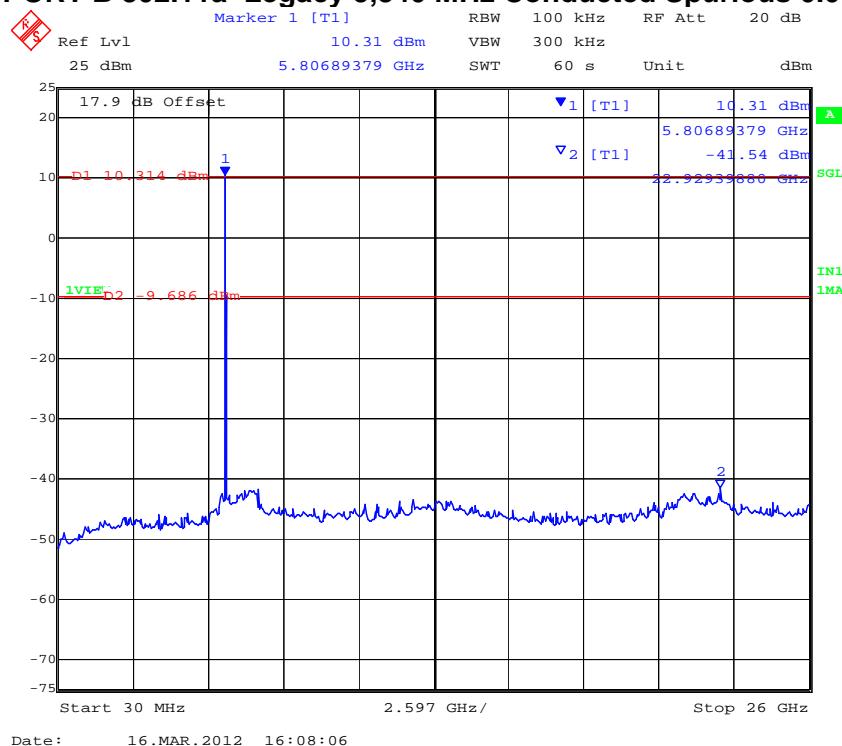

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### 10 MHz PORT A 802.11a-Legacy 5,840 MHz Conducted Spurious 0.03–26 GHz



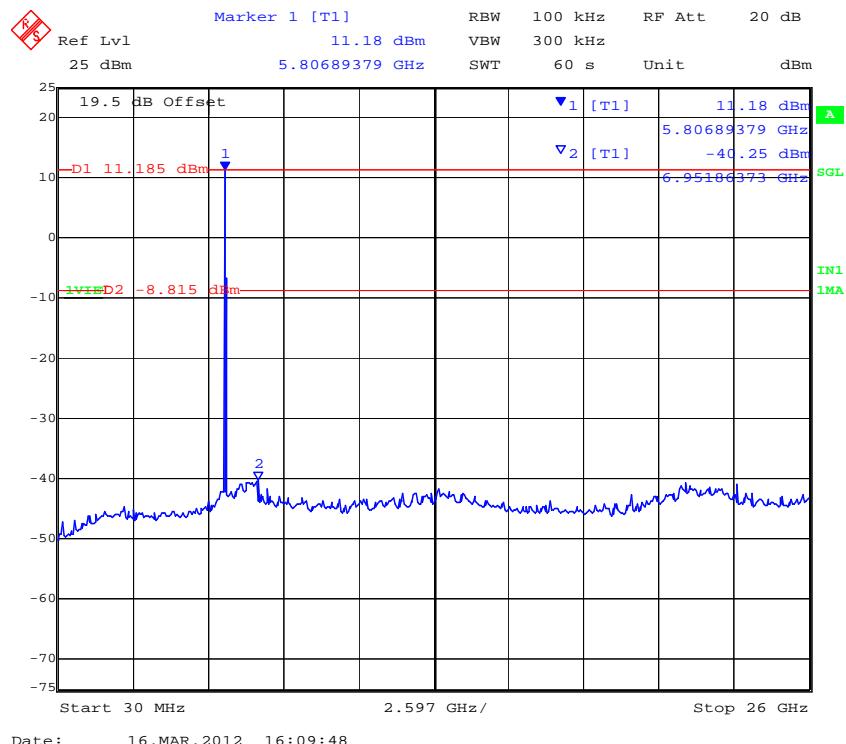
### 10 MHz PORT B 802.11a-Legacy 5,840 MHz Conducted Spurious 0.03–26 GHz




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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### 10 MHz PORT C 802.11a-Legacy 5,840 MHz Conducted Spurious 0.03–26 GHz




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 284 of 412

## TABLE OF RESULTS – 802.11a Legacy

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5745.000	30.00	26000.00	-41.24	-11.69	-42.05	-12.16	-40.08	-9.81		
5785.000	30.00	26000.00	-40.99	-9.70	-41.78	-10.68	-39.60	-7.29		
5825.000	30.00	26000.00	-38.38	-9.19	-41.29	-11.24	-40.13	-9.36		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5745.000	5725.00	-13.00	-9.88	-10.38	-9.81	-9.68	-7.81		
5825.000	5850.00	-11.64	-8.27	-16.14	-10.27	-11.35	-7.62		

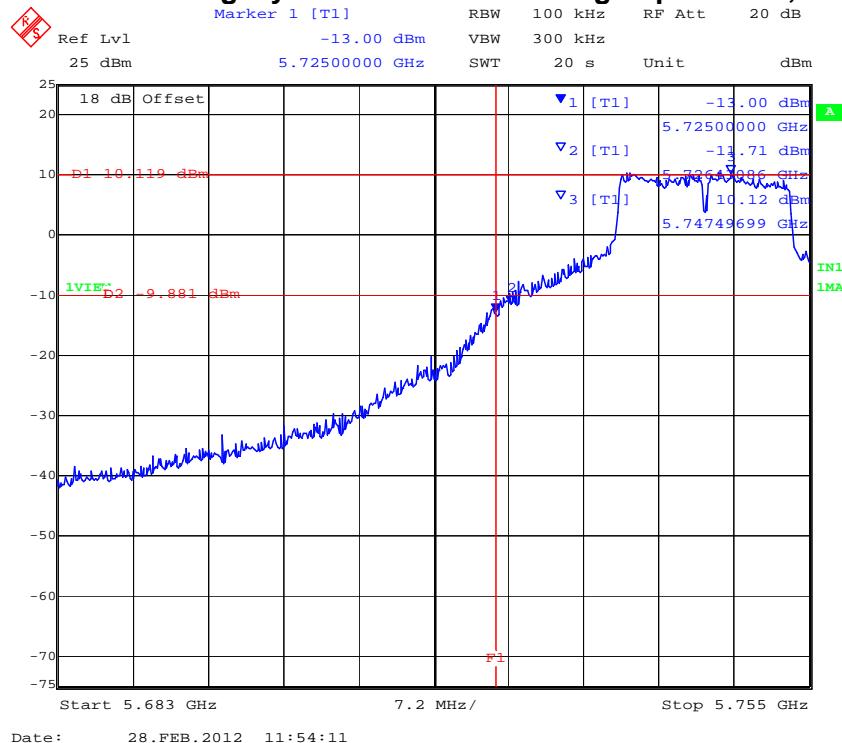
BE: Maximum Band edge emission found

Measurement uncertainty:	±2.81 dB
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Note: Limit is based on 20dB down from fundamental emission

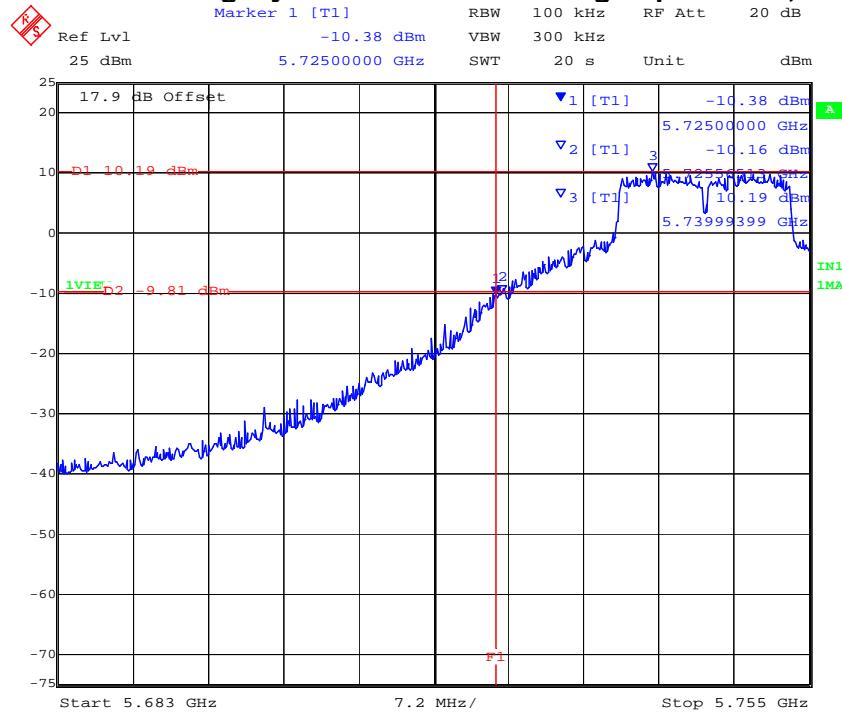
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### PORT A 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz



Date: 28.FEB.2012 11:54:11

### PORT B 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz

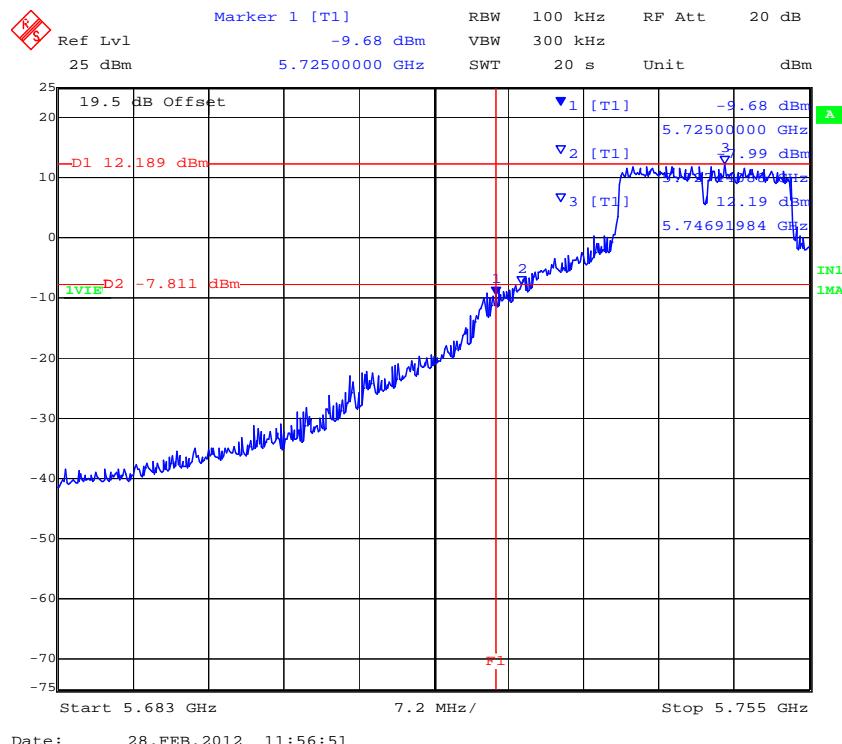


Date: 28.FEB.2012 11:55:33

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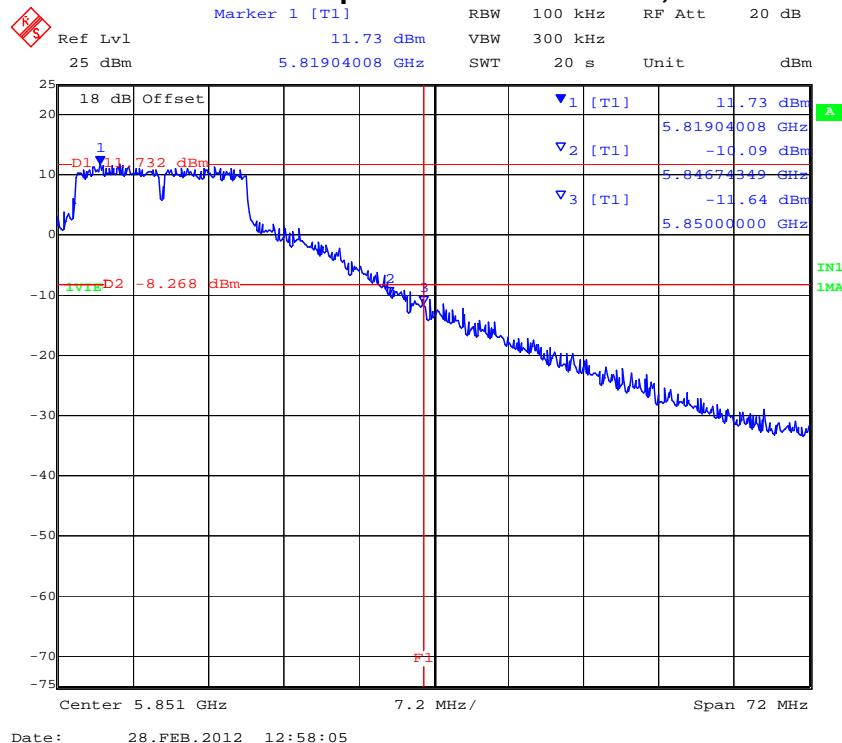
### PORT C 802.11a Legacy - Conducted Band Edge Spurious 5,725 MHz



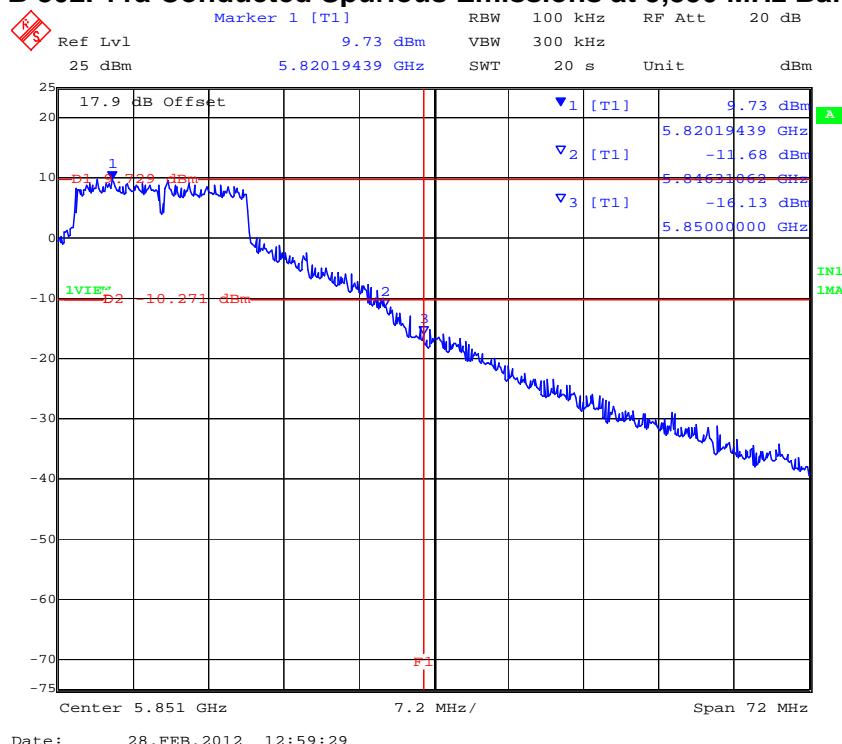

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### PORT A 802.11a Conducted Spurious Emissions at 5,850 MHz Band Edge

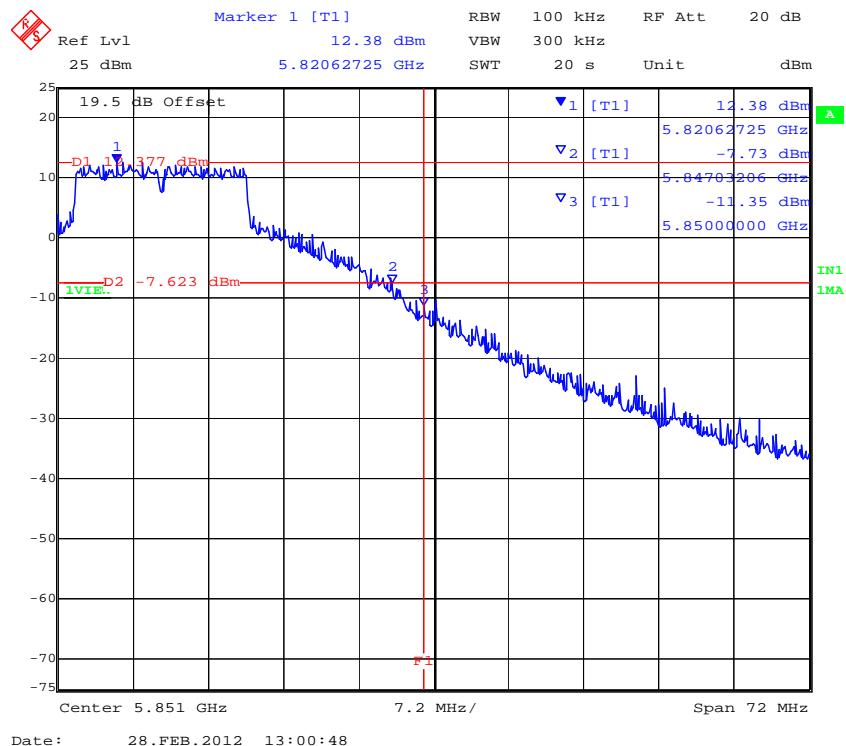


### PORT B 802.11a Conducted Spurious Emissions at 5,850 MHz Band Edge



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

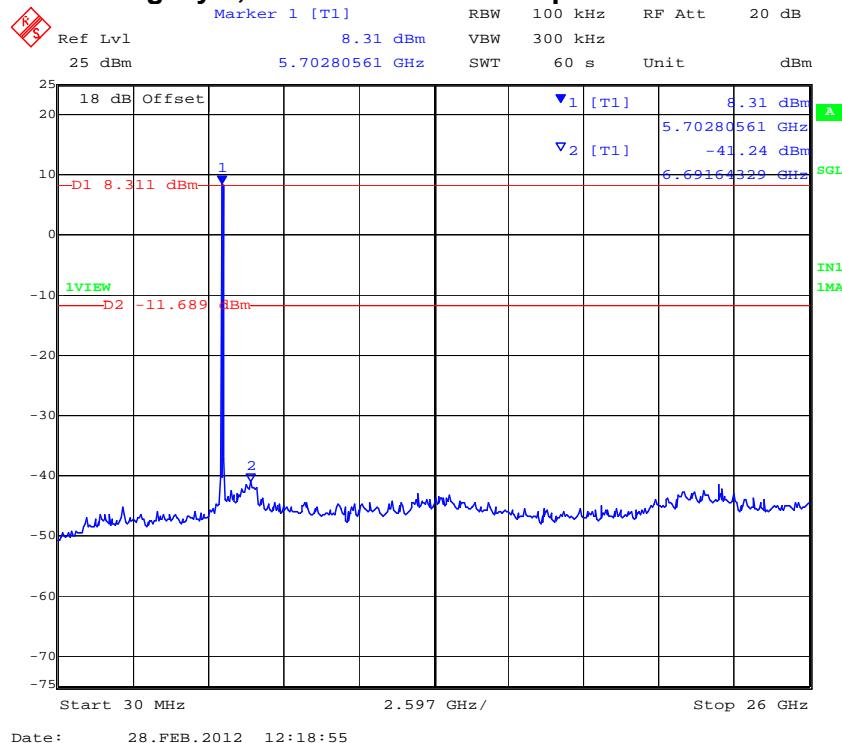
### PORT C 802.11a Conducted Spurious Emissions at 5,850 MHz Band Edge



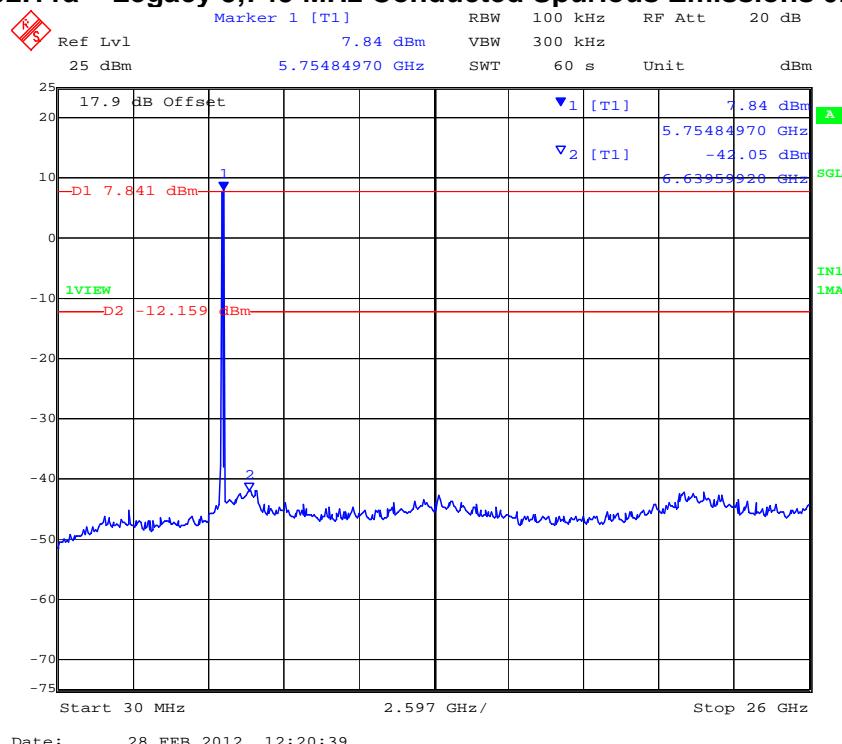

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### PORT A 802.11a – Legacy 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz



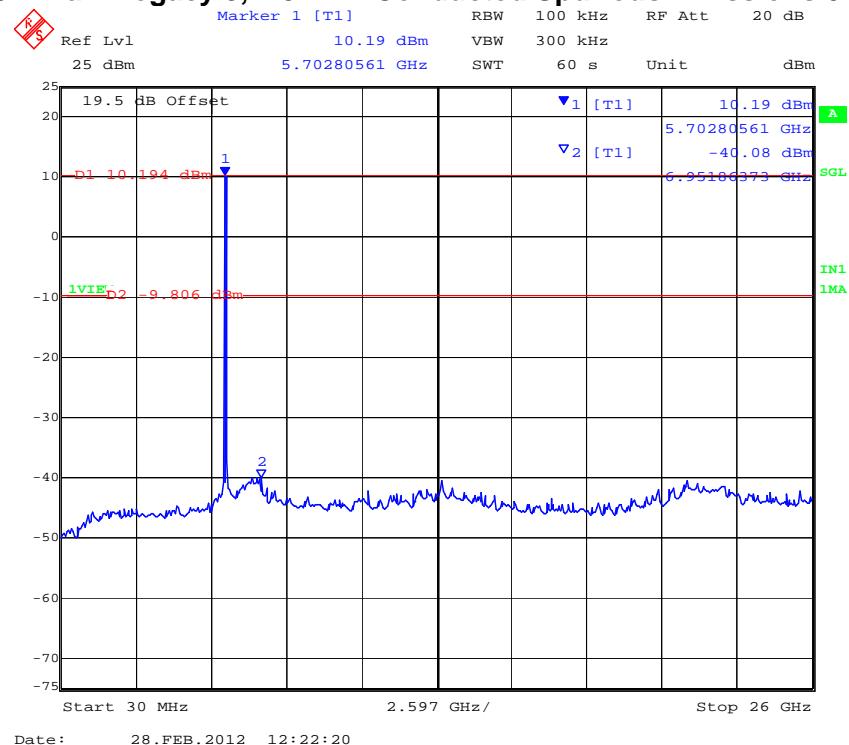
### PORT B 802.11a – Legacy 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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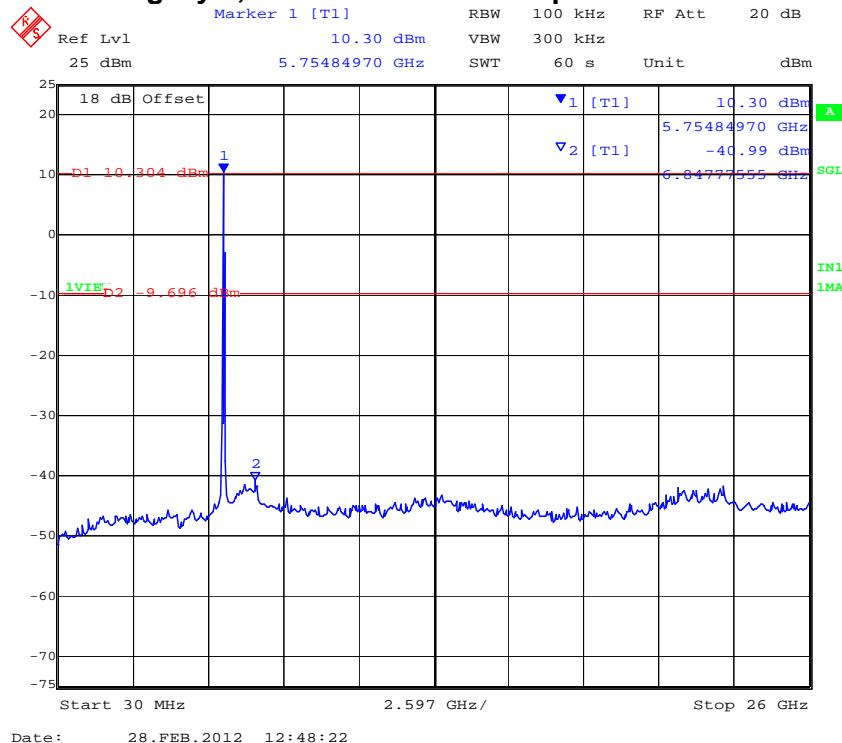
**PORT C 802.11a – Legacy 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



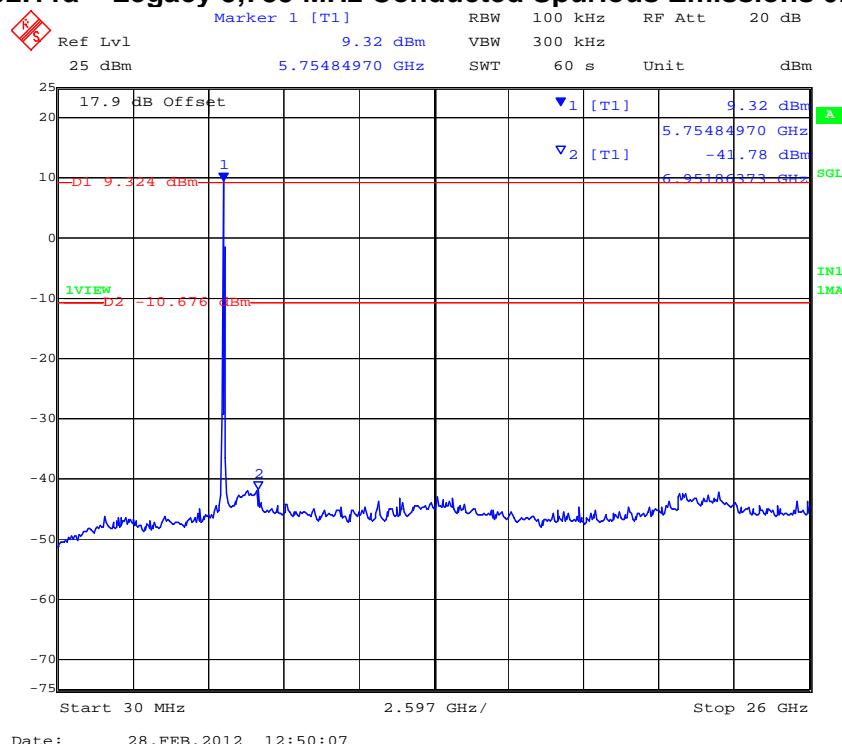

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### PORT A 802.11a – Legacy 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz

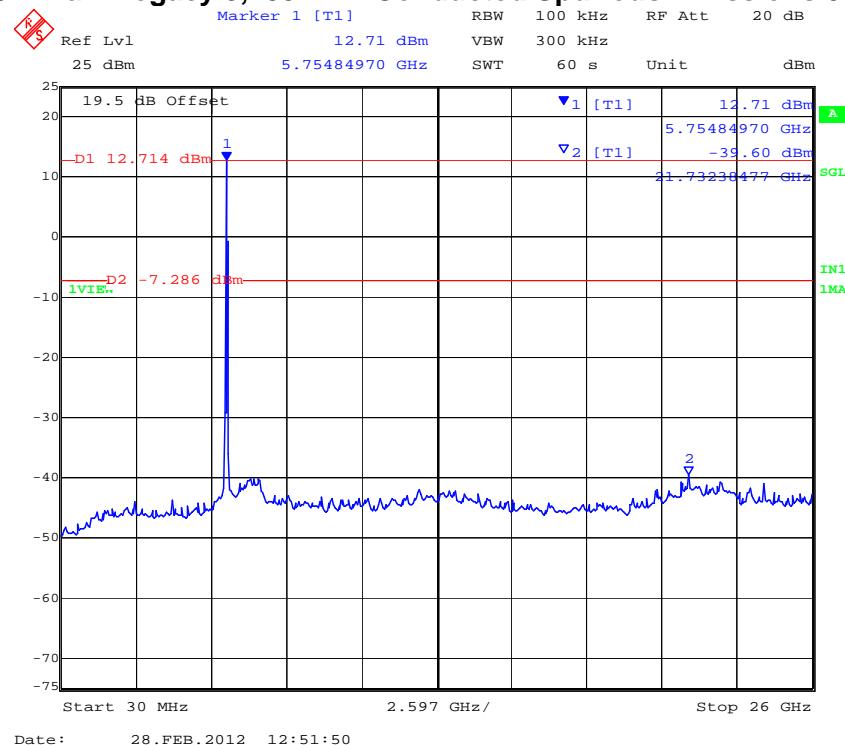


### PORT B 802.11a – Legacy 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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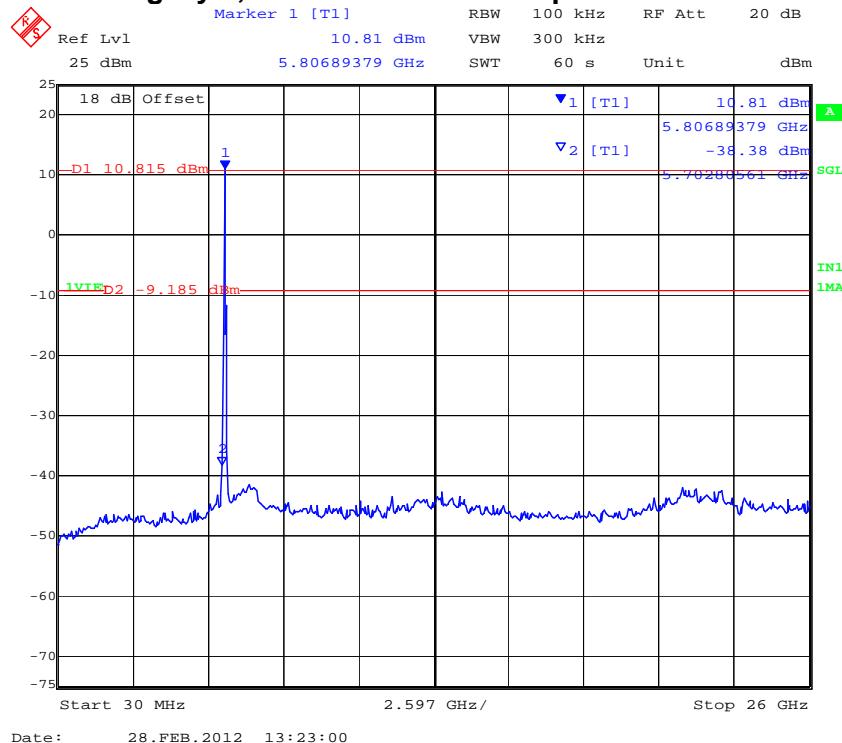
**PORT C 802.11a – Legacy 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



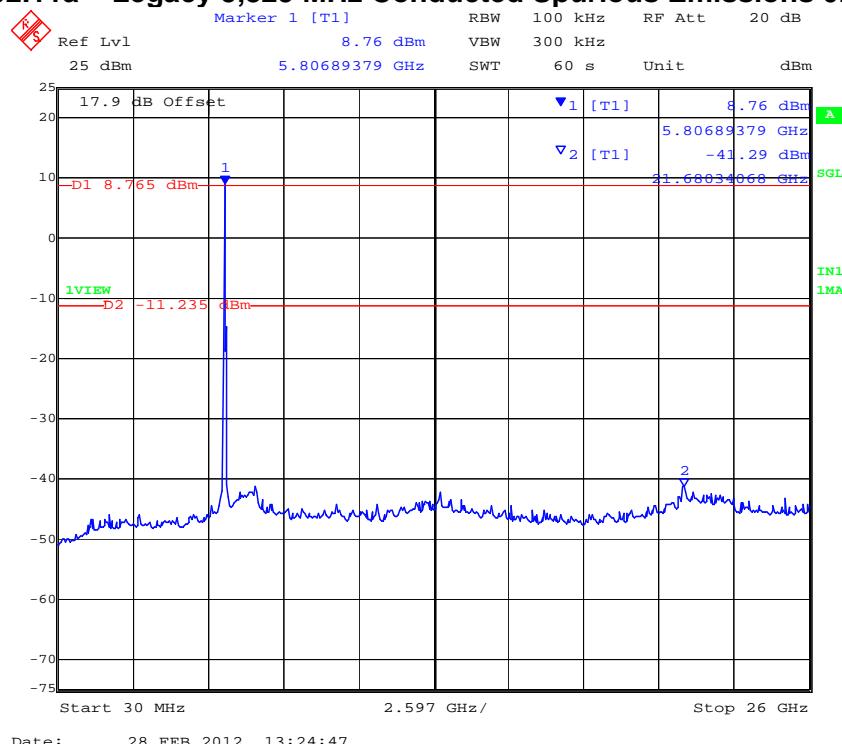

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

### PORT A 802.11a – Legacy 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz

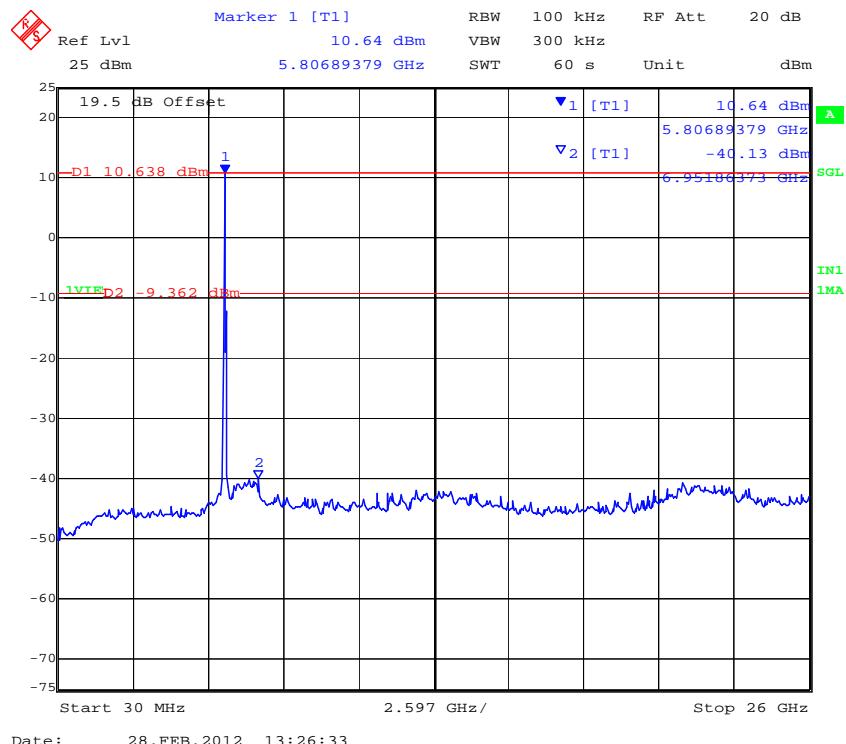


### PORT B 802.11a – Legacy 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz



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**PORT C 802.11a – Legacy 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 295 of 412

### Conducted Spurious Emission Results

TABLE OF RESULTS – 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5745.000	30.00	26000.00	-41.14	-12.04	-41.33	-12.21	-39.68	-10.40		
5785.000	30.00	26000.00	-41.31	-9.51	-40.81	-10.16	-40.18	-8.40		
5825.000	30.00	26000.00	-39.25	-9.70	-41.17	-12.82	-39.43	-9.68		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D		
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm
5745.000	5725.00	-14.55	-11.72	-12.75	-11.99	-12.73	-10.34			
5825.000	5850.00	-12.66	-7.79	-16.74	-11.12	-14.75	-8.82			

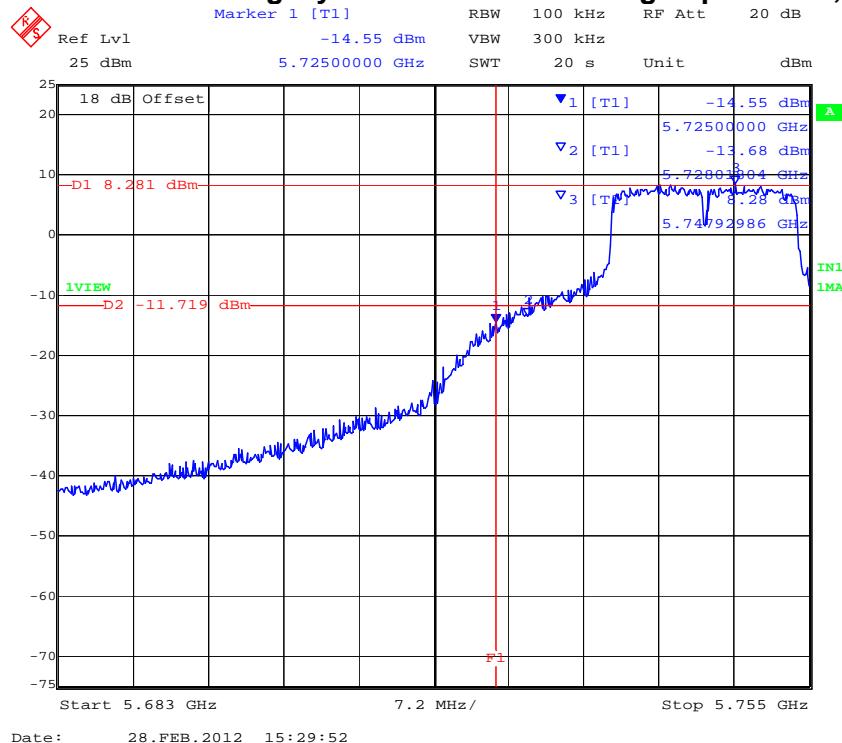
BE: Maximum Band edge emission found

Measurement uncertainty:	±2.81 dB
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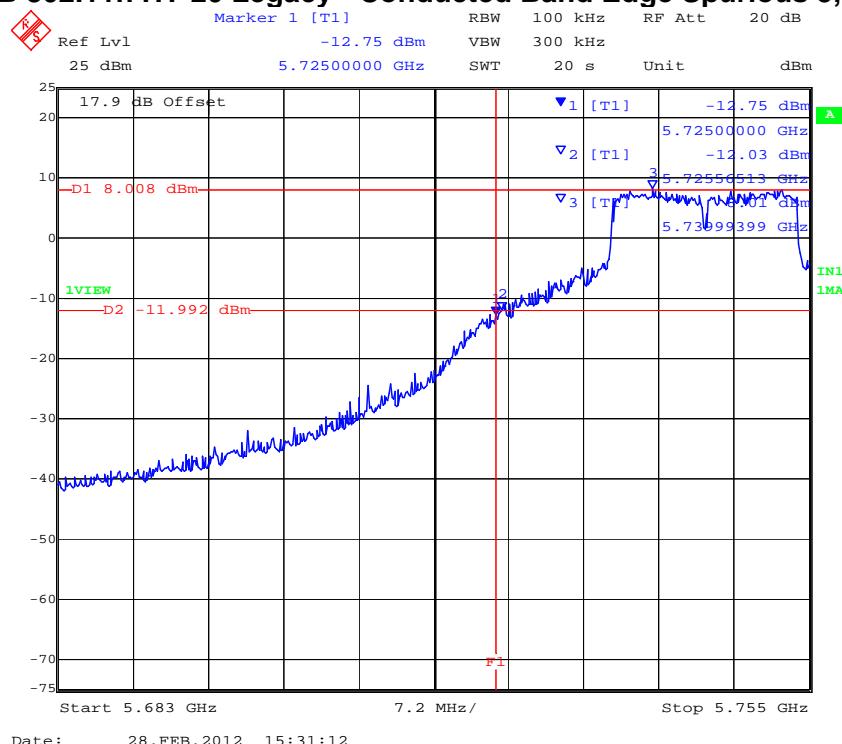
Note: Limit is based on 20dB down from fundamental emission

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**PORT A 802.11n HT-20 Legacy - Conducted Band Edge Spurious 5,725 MHz**



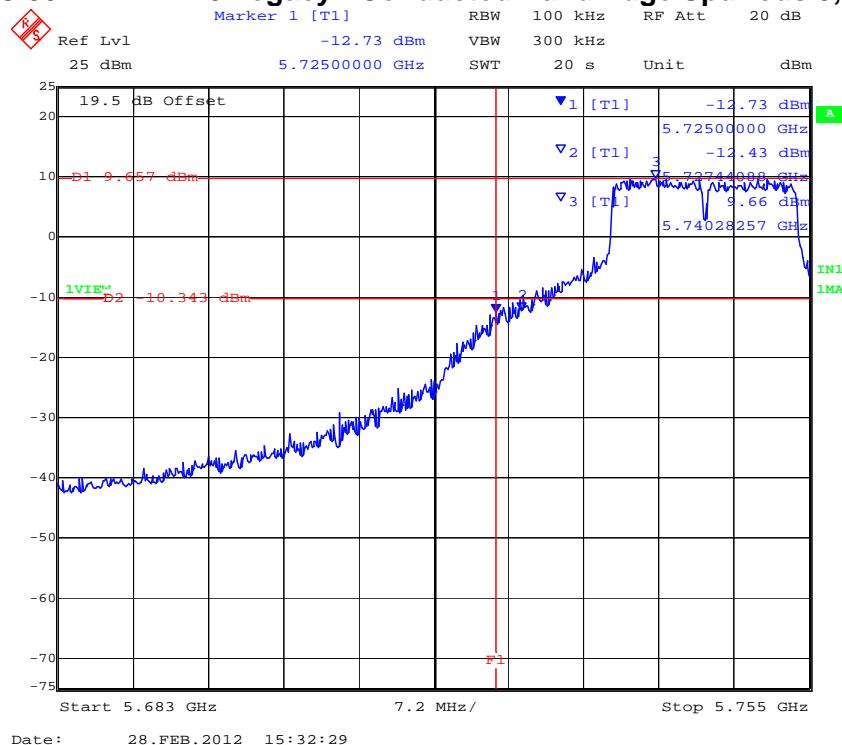
**PORT B 802.11n HT-20 Legacy - Conducted Band Edge Spurious 5,725 MHz**




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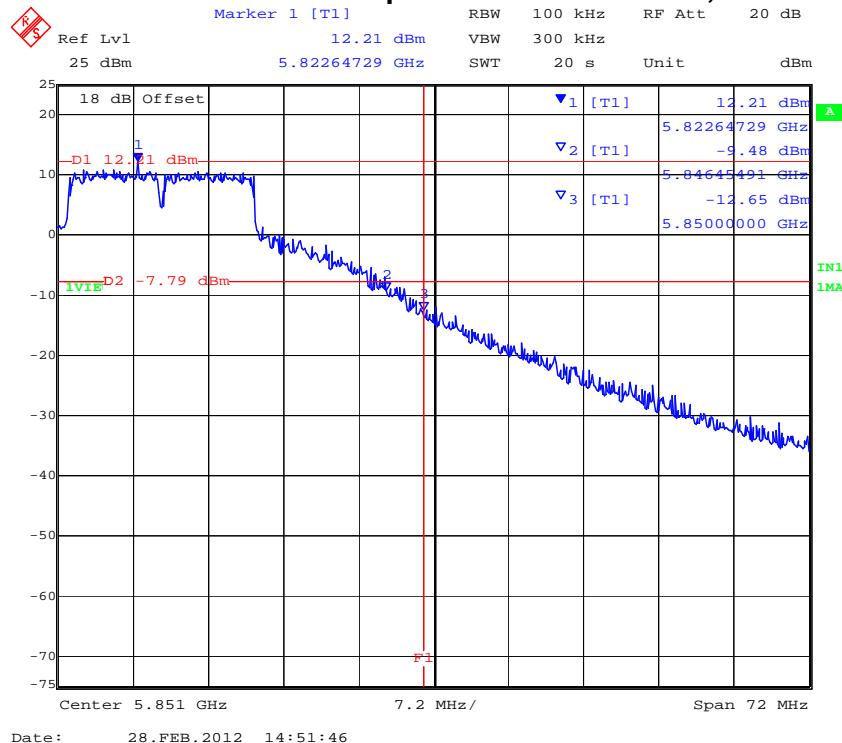
**PORT C 802.11n HT-20 Legacy - Conducted Band Edge Spurious 5,725 MHz**



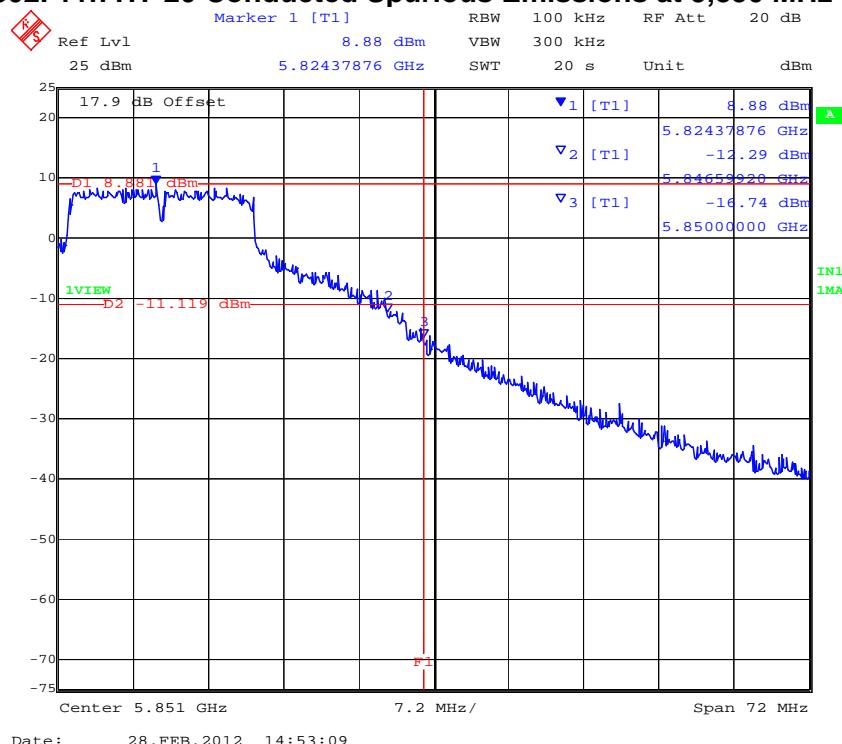

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### PORT A 802.11n HT-20 Conducted Spurious Emissions at 5,850 MHz Band Edge



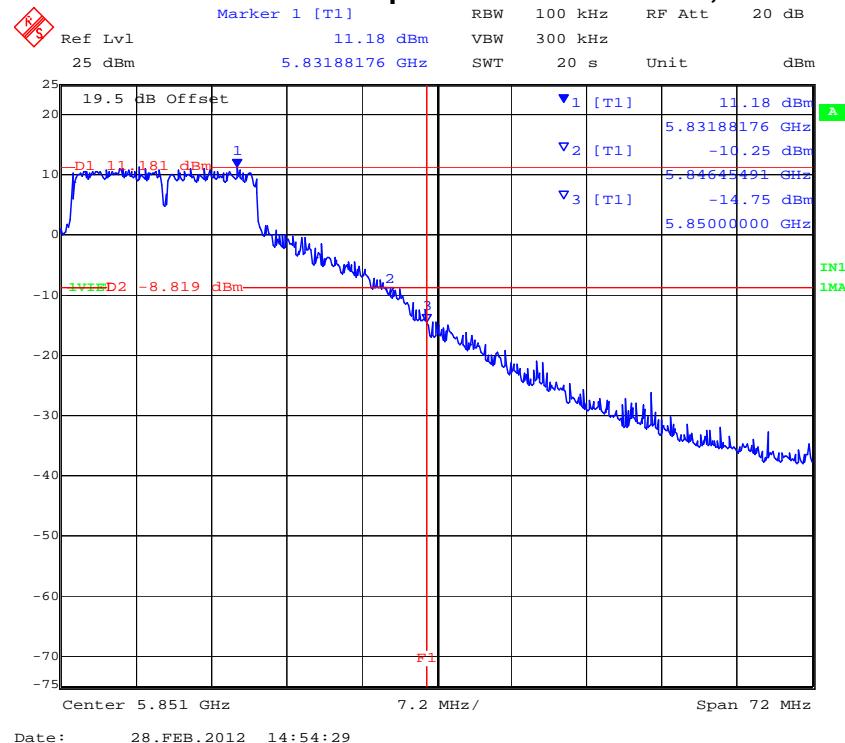
### PORT B 802.11n HT-20 Conducted Spurious Emissions at 5,850 MHz Band Edge




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**PORT C 802.11n HT-20 Conducted Spurious Emissions at 5,850 MHz Band Edge**



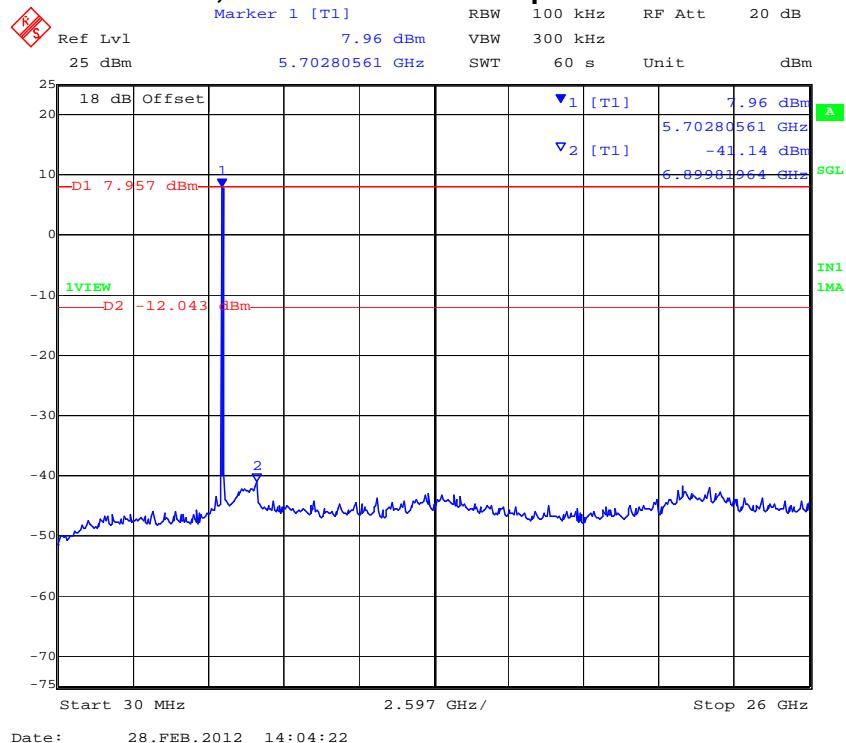

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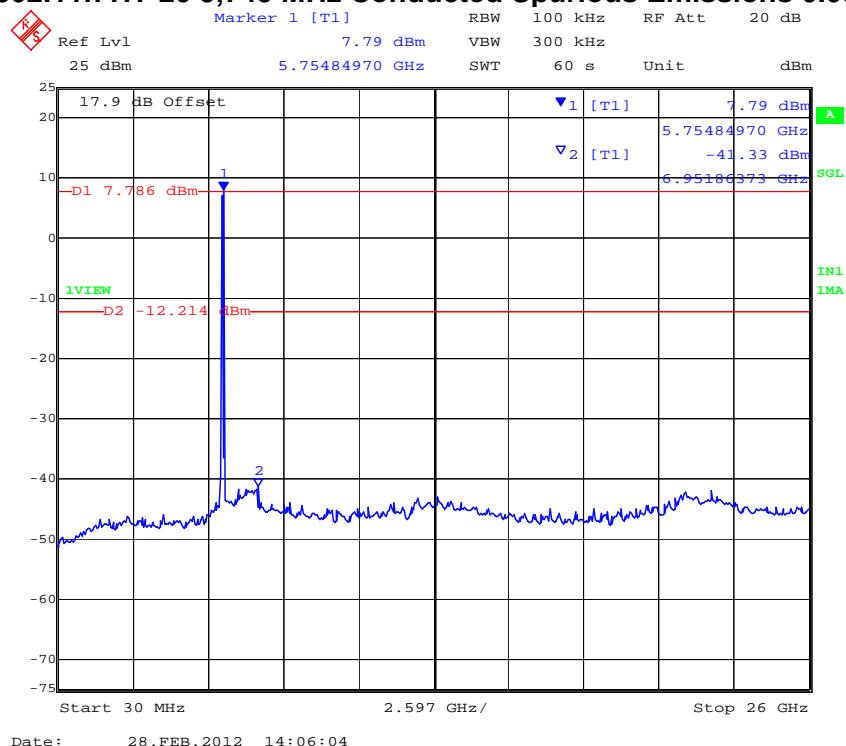
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 300 of 412

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### PORT A 802.11n HT-20 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz



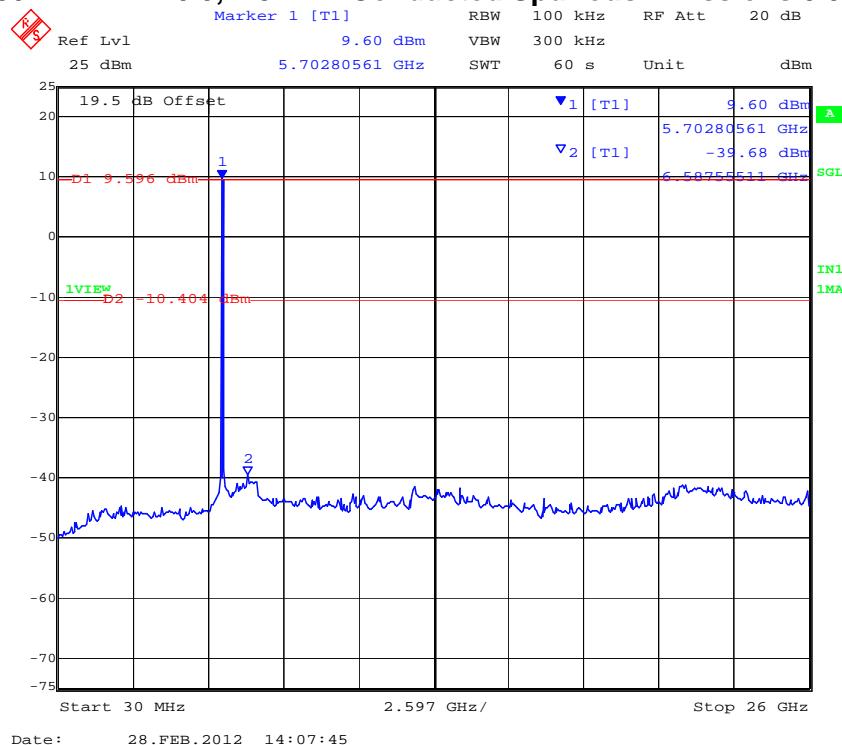
### PORT B 802.11n HT-20 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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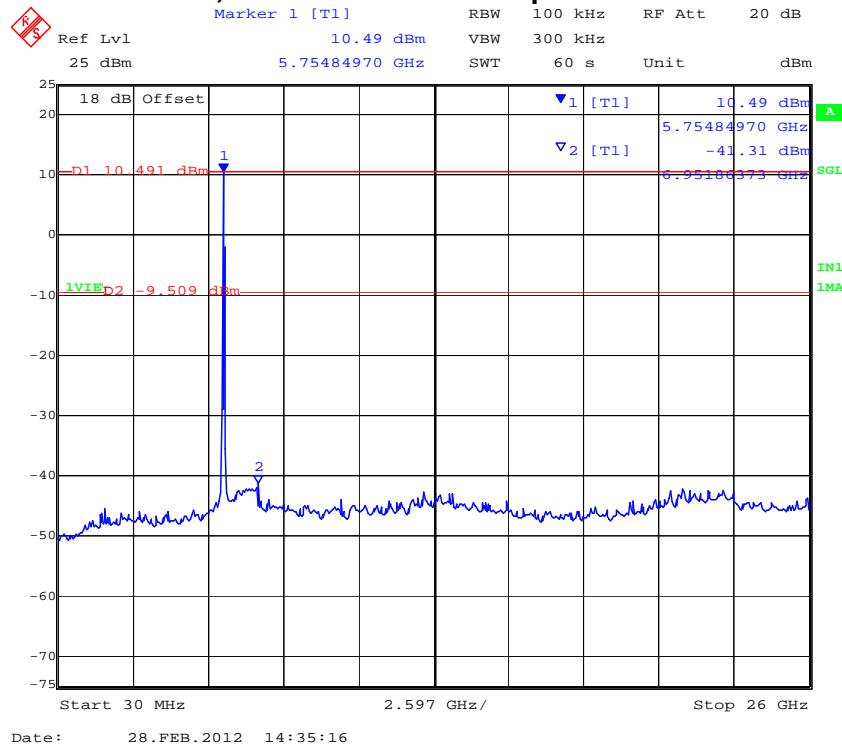
**PORT C 802.11n HT-20 5,745 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



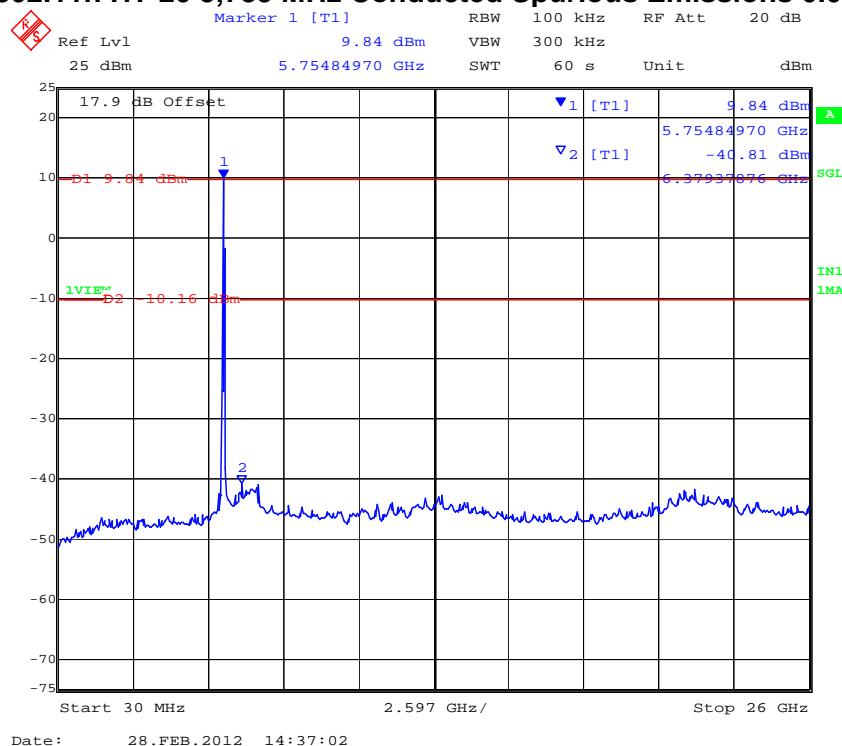

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### PORT A 802.11n HT-20 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz



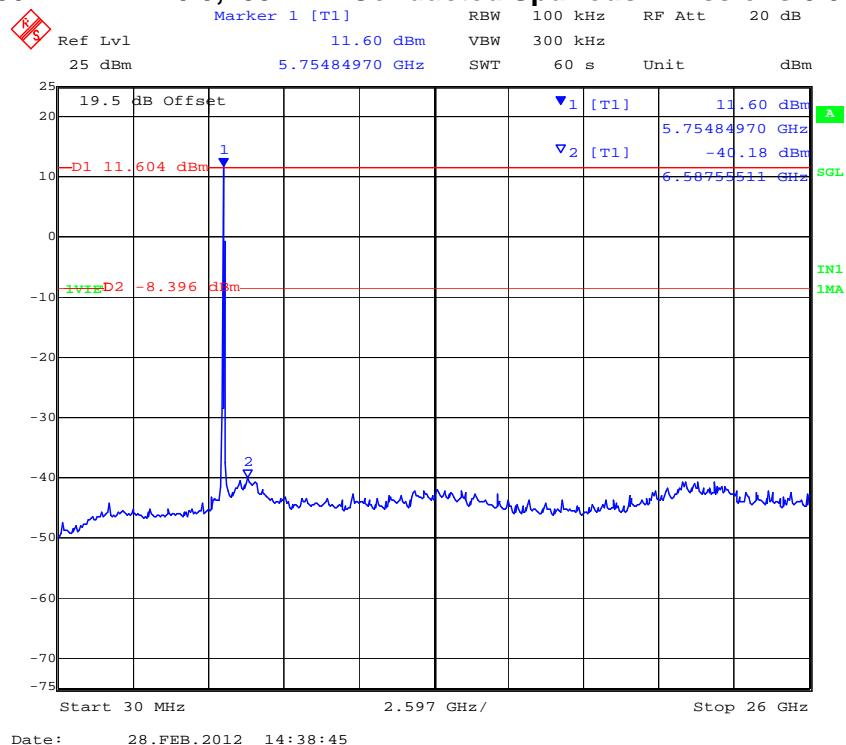
### PORT B 802.11n HT-20 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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### PORT C 802.11n HT-20 5,785 MHz Conducted Spurious Emissions 0.03 – 26 GHz



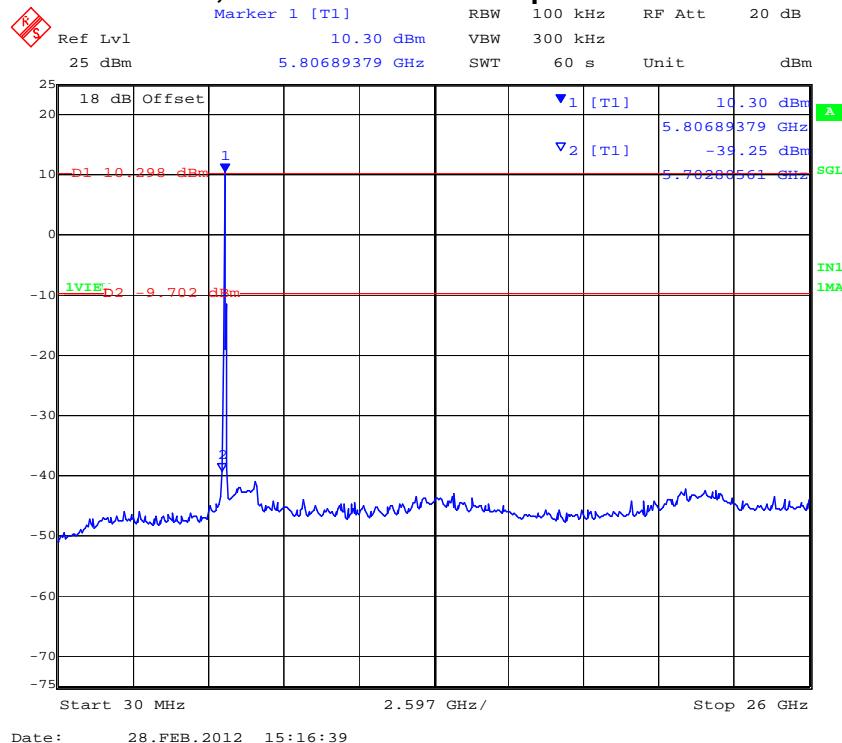

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

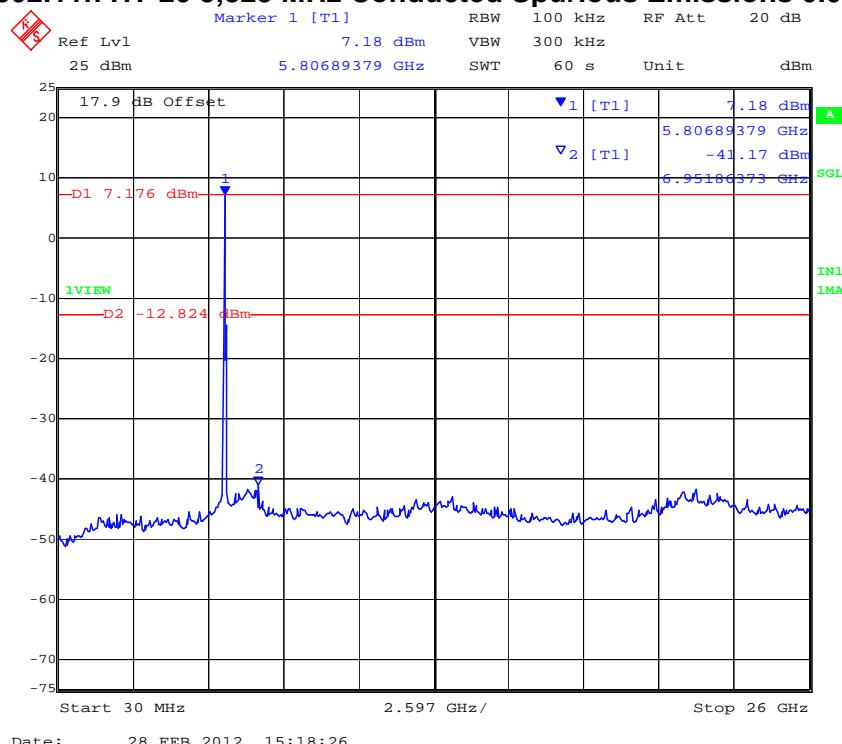
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 304 of 412

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### PORT A 802.11n HT-20 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz



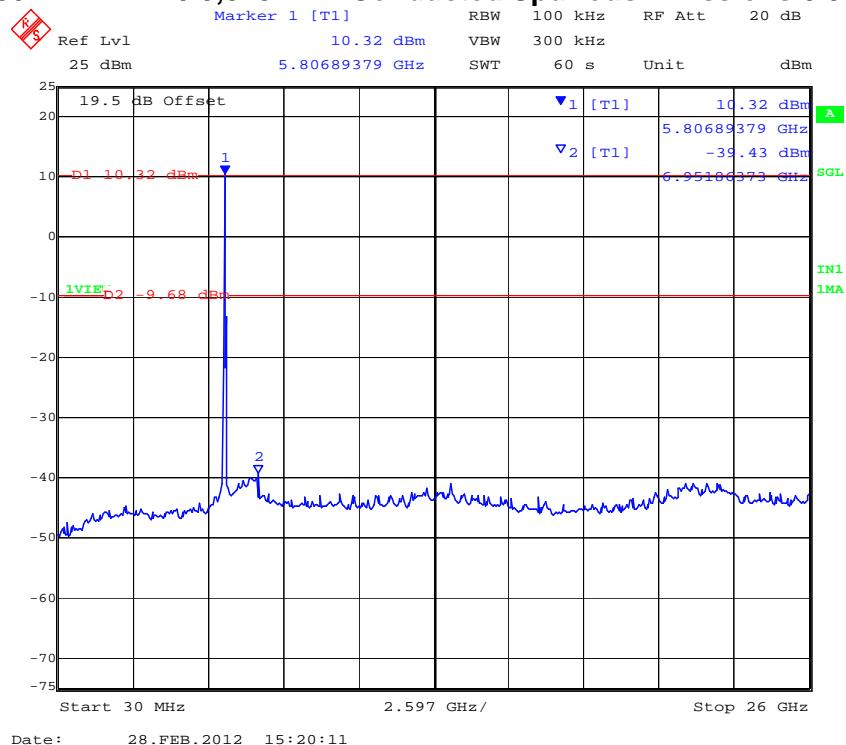
### PORT B 802.11n HT-20 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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**PORT C 802.11n HT-20 5,825 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 306 of 412

## Conducted Spurious Emission Results

TABLE OF RESULTS – 802.11N HT-40

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-40	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	100
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	48.00 Vdc	<b>Antenna Ports (N):</b>	
<b>Notes 1:</b>			
<b>Notes 2:</b>			

### Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
			MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5755.000	30.00	26000.00	-41.29	-15.39	-41.76	-16.52	-39.27	-14.68		
5795.000	30.00	26000.00	-40.99	-12.27	-40.67	-12.97	-39.82	-11.37		

SE: Maximum spurious emission found

### Band-edge Measurement

Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
		MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5755.000	5725.00	-25.10	-16.96	-17.78	-17.06	-22.86	-15.51		
5795.000	5850.00	-18.98	-12.06	-20.13	-13.02	-18.76	-10.50		

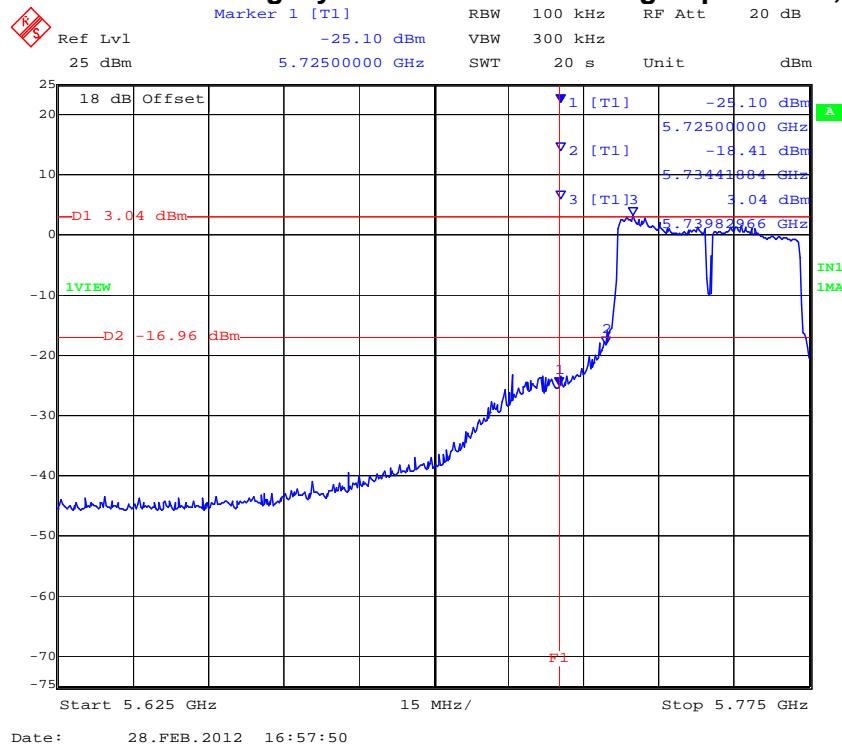
BE: Maximum Band edge emission found

Measurement uncertainty:	±2.81 dB
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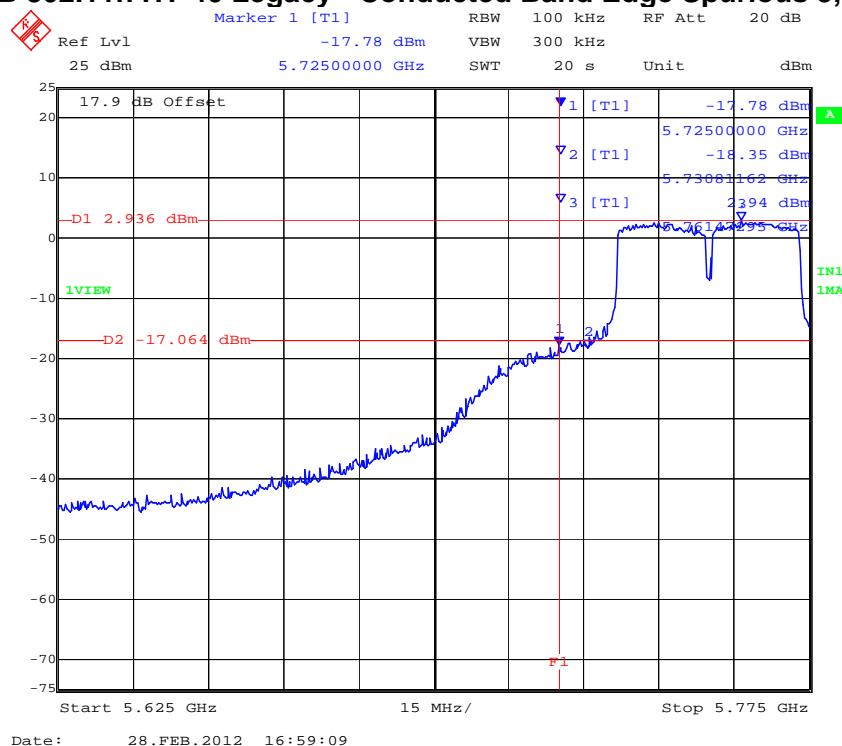
Note: Limit is based on 20dB down from fundamental emission

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**PORT A 802.11n HT-40 Legacy - Conducted Band Edge Spurious 5,725 MHz**



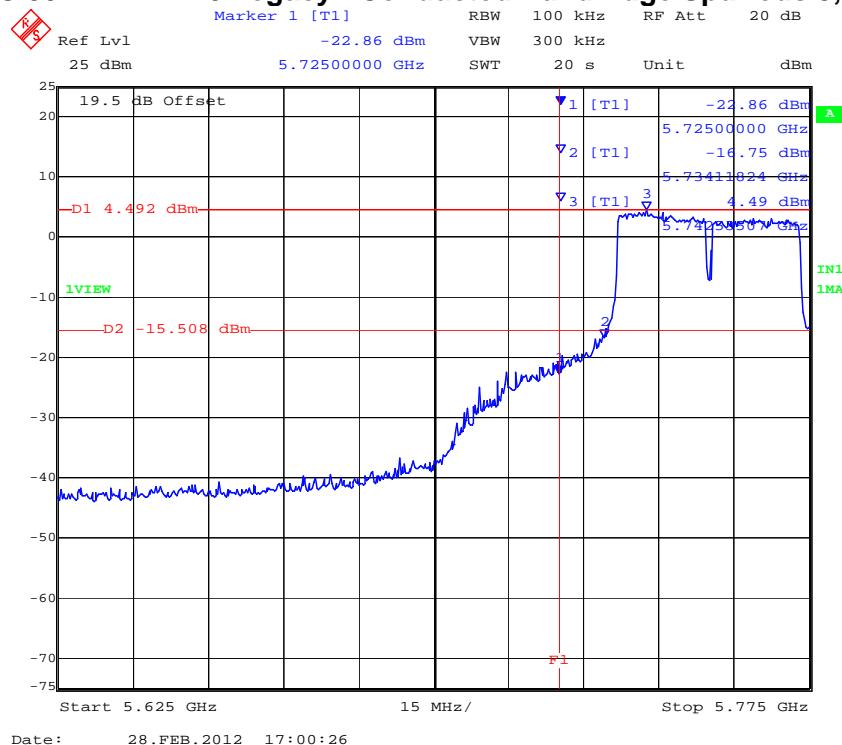
**PORT B 802.11n HT-40 Legacy - Conducted Band Edge Spurious 5,725 MHz**




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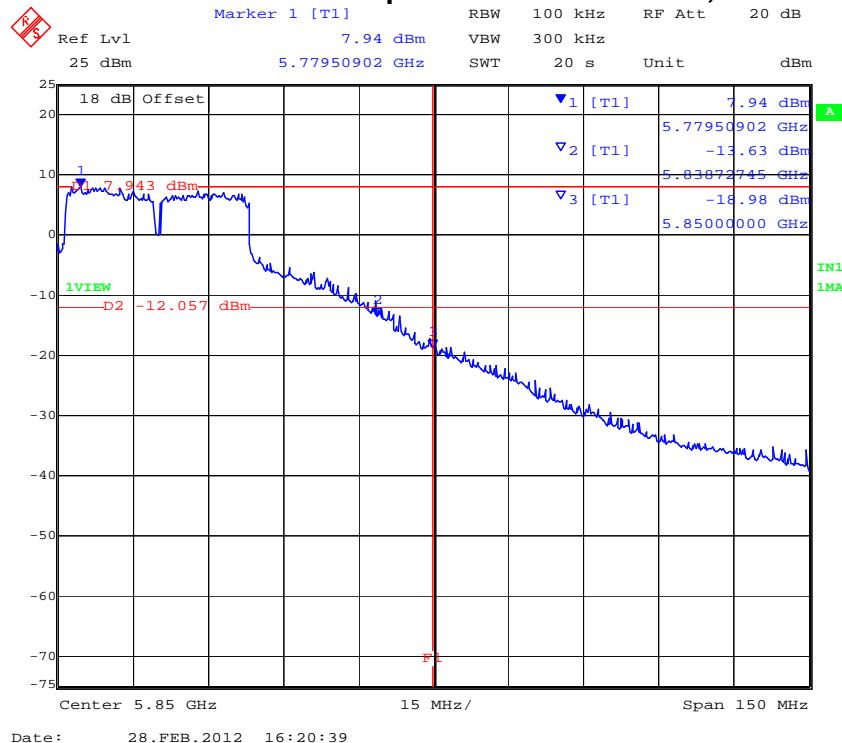
**PORT C 802.11n HT-40 Legacy - Conducted Band Edge Spurious 5,725 MHz**



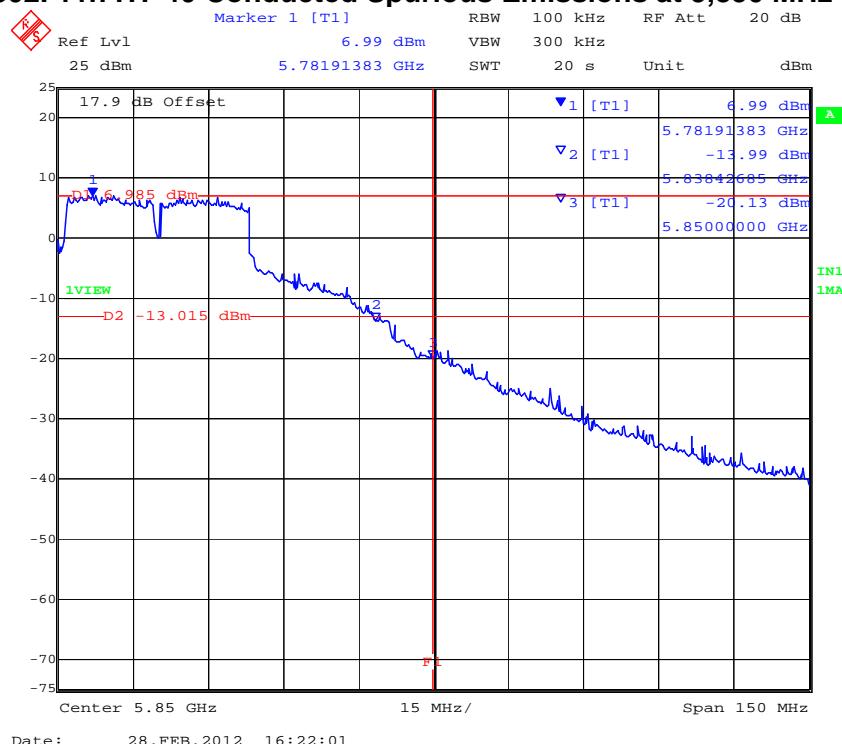

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### PORT A 802.11n HT-40 Conducted Spurious Emissions at 5,850 MHz Band Edge



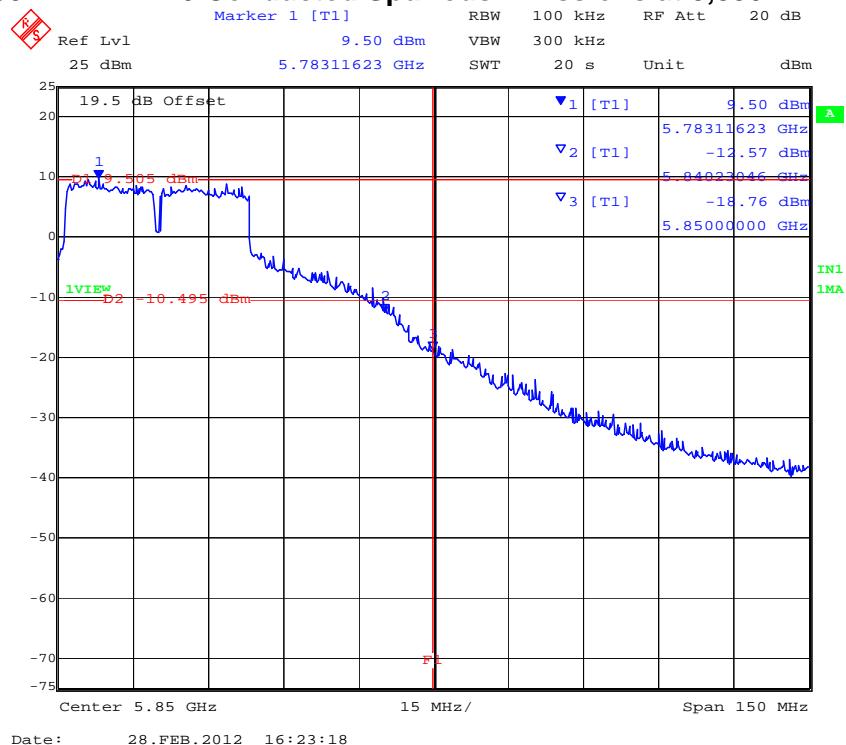
### PORT B 802.11n HT-40 Conducted Spurious Emissions at 5,850 MHz Band Edge




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**PORT C 802.11n HT-40 Conducted Spurious Emissions at 5,850 MHz Band Edge**



Date: 28.FEB.2012 16:23:18

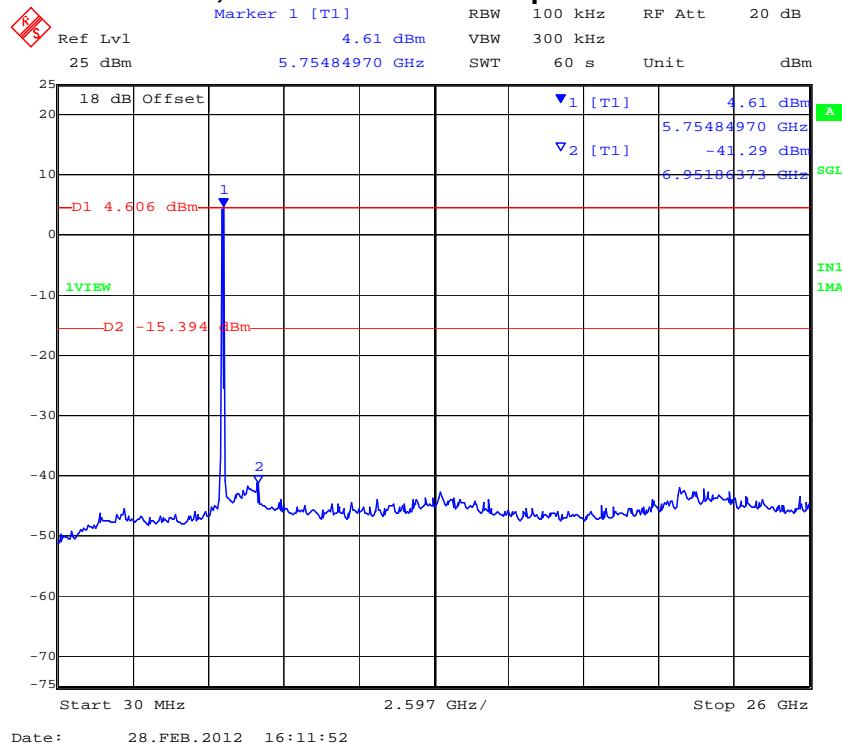
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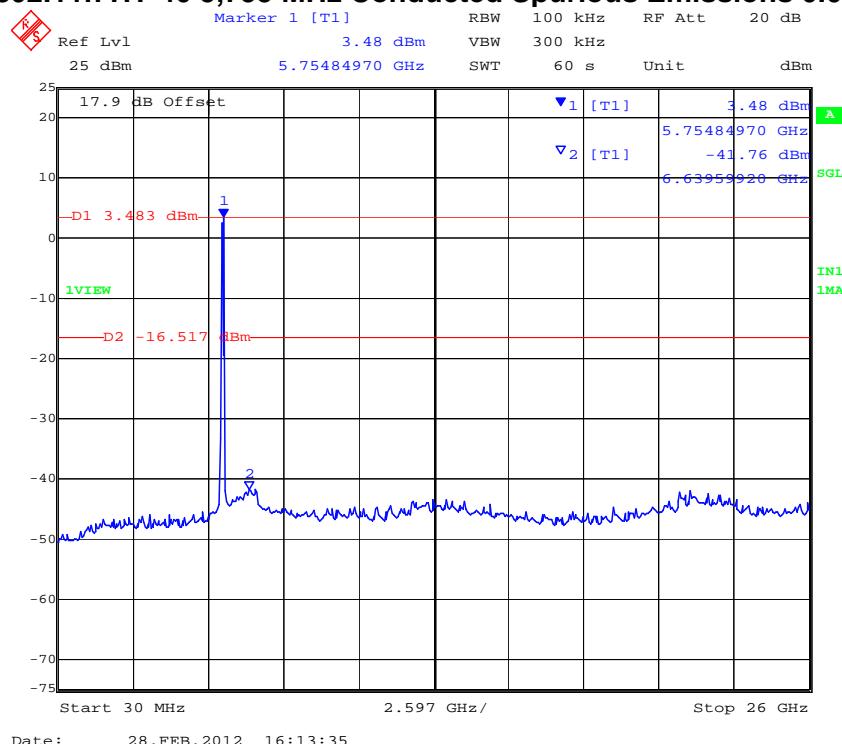
**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 311 of 412

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### PORT A 802.11n HT-40 5,755 MHz Conducted Spurious Emissions 0.03 – 26 GHz



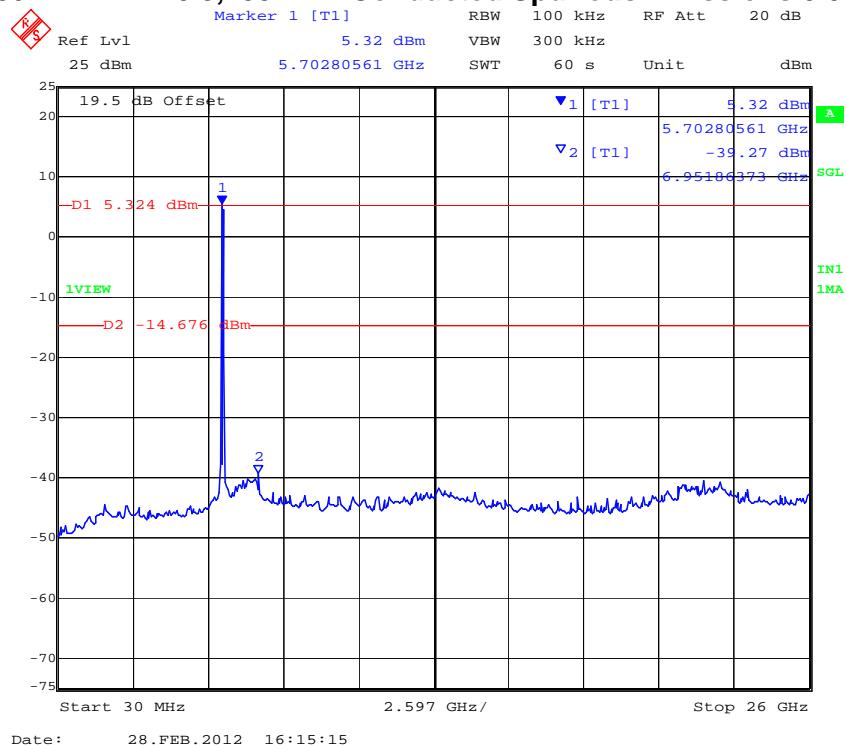
### PORT B 802.11n HT-40 5,755 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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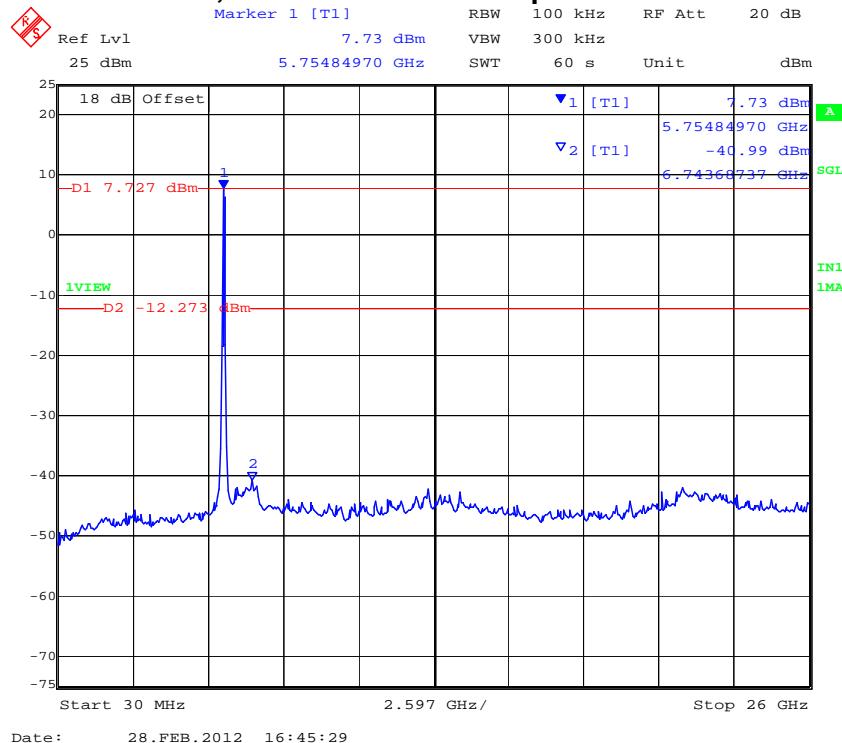
**PORT C 802.11n HT-40 5,755 MHz Conducted Spurious Emissions 0.03 – 26 GHz**



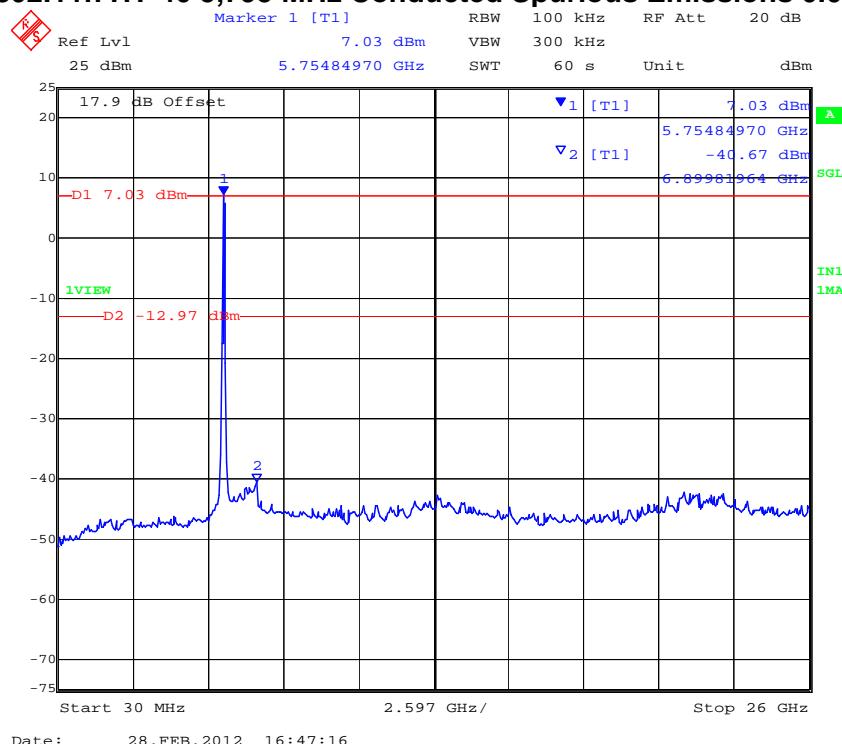

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### PORT A 802.11n HT-40 5,795 MHz Conducted Spurious Emissions 0.03 – 26 GHz



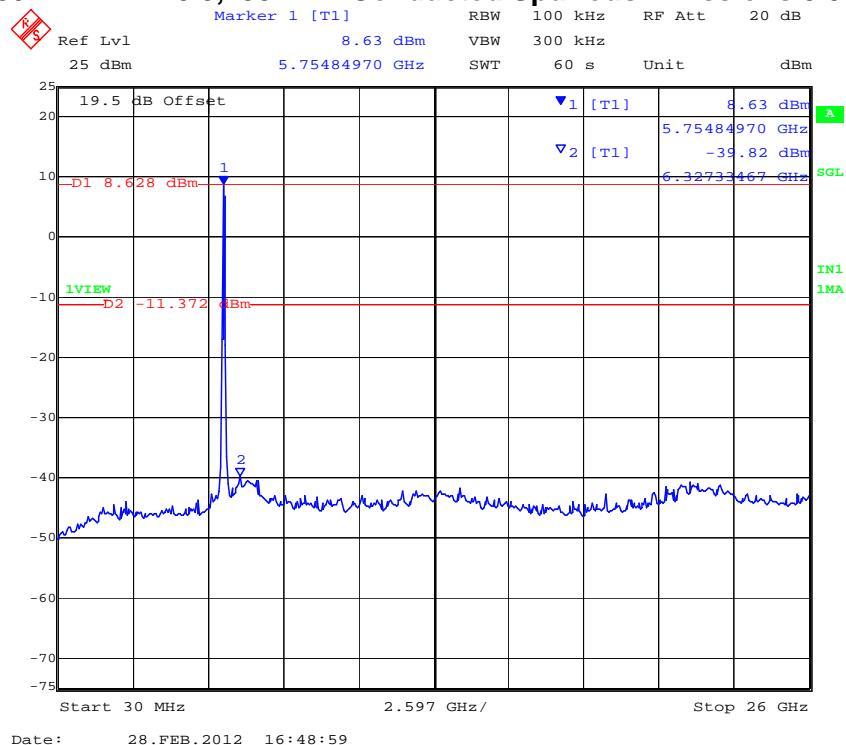
### PORT B 802.11n HT-40 5,795 MHz Conducted Spurious Emissions 0.03 – 26 GHz




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**PORT C 802.11n HT-40 5,795 MHz Conducted Spurious Emissions 0.03 – 26 GHz**




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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 315 of 412

## Specification

### Limits Band-Edge

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

**§15.247(d) and RSS-210 §A8.5** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### §15.247(d)

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

**RSS-210 §A8.5** If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

### RSS-Gen §4.7

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

## Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB
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## Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0088, 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117.

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 316 of 412

### **5.1.6. Radiated Emissions**

#### **Transmitter Radiated Spurious Emissions (above 1 GHz); Peak Field Strength Measurements; and Radiated Band Edge Measurements – Restricted Bands**

**FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209**  
**Industry Canada RSS-210 §A8.5, §2.2, §2.6**  
**Industry Canada RSS-Gen §4.7**

#### **Test Procedure**

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

#### **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.

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

where: 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

For example:

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

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

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

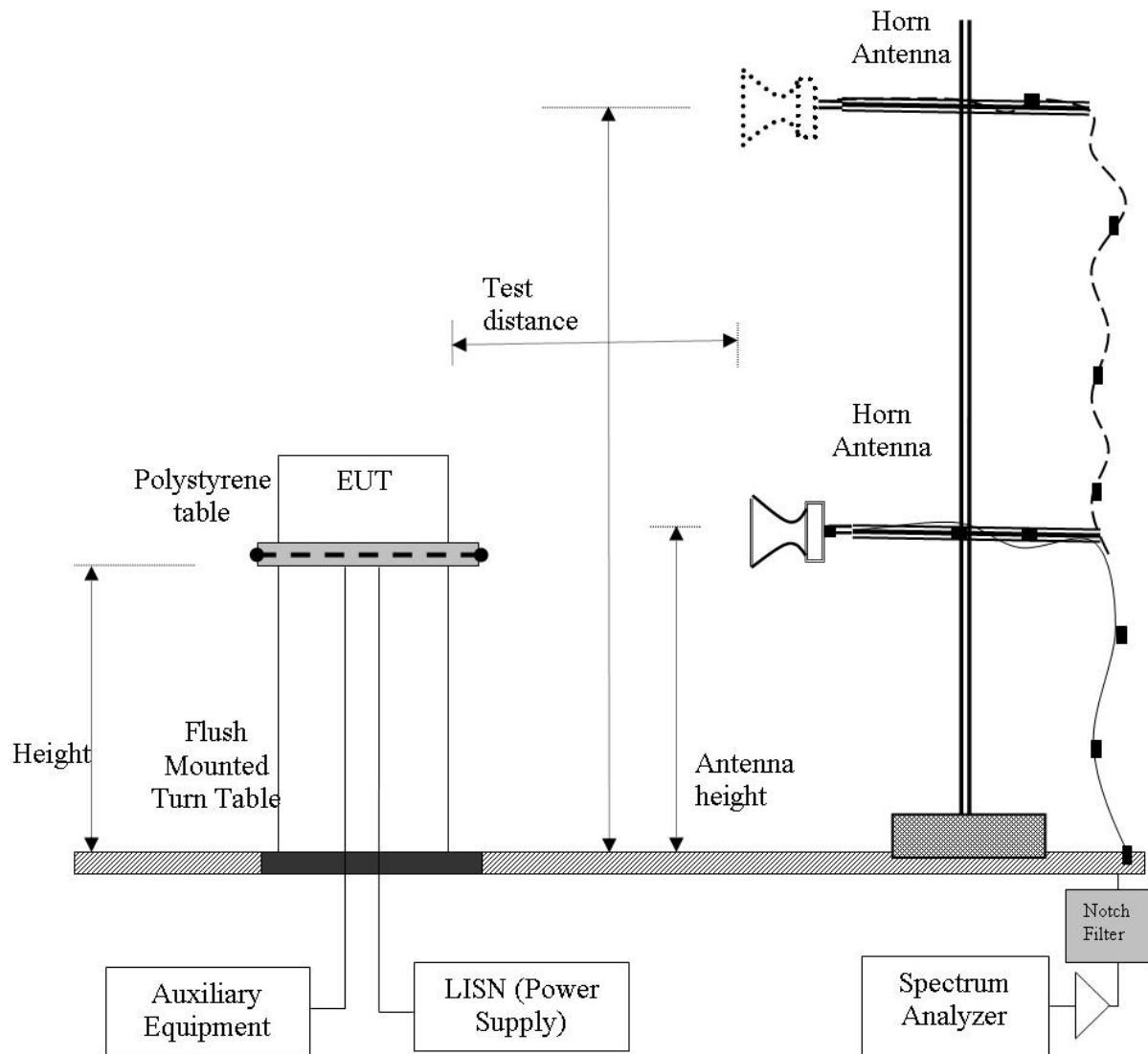
$$\text{Level (dB}\mu\text{V/m)} = 20 * \log (\text{level (}\mu\text{V/m)})$$

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

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

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### Radiated Emission Measurement Setup – Above 1 GHz



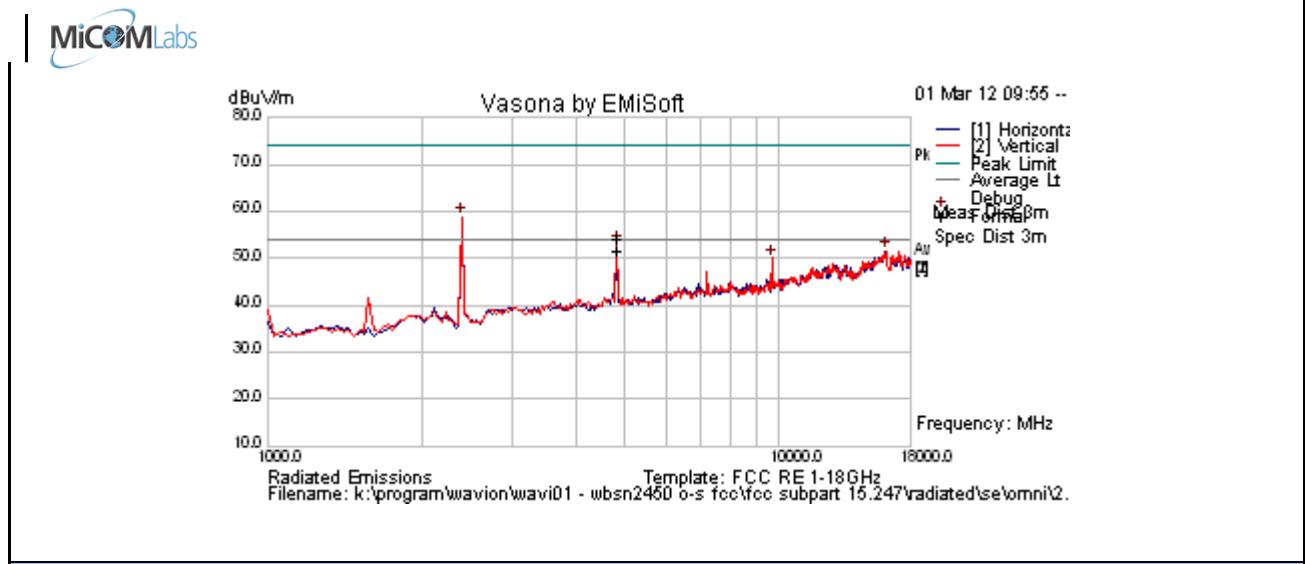
**NOTE: KDB 662911 was implemented for Out-of-Band measurements. Where necessary Option (2) Measure and add  $10 \log (N)$  dB was implemented**

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### 5.1.6.1. Omni Antenna

Test Freq.	2412 MHz	Engineer	GMH
Variant	802.11b; 1 Mbs	Temp (°C)	19.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	23	Press. (mBars)	1011
Antenna	OMNI 7.4 dBi	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



#### Formally measured emission peaks

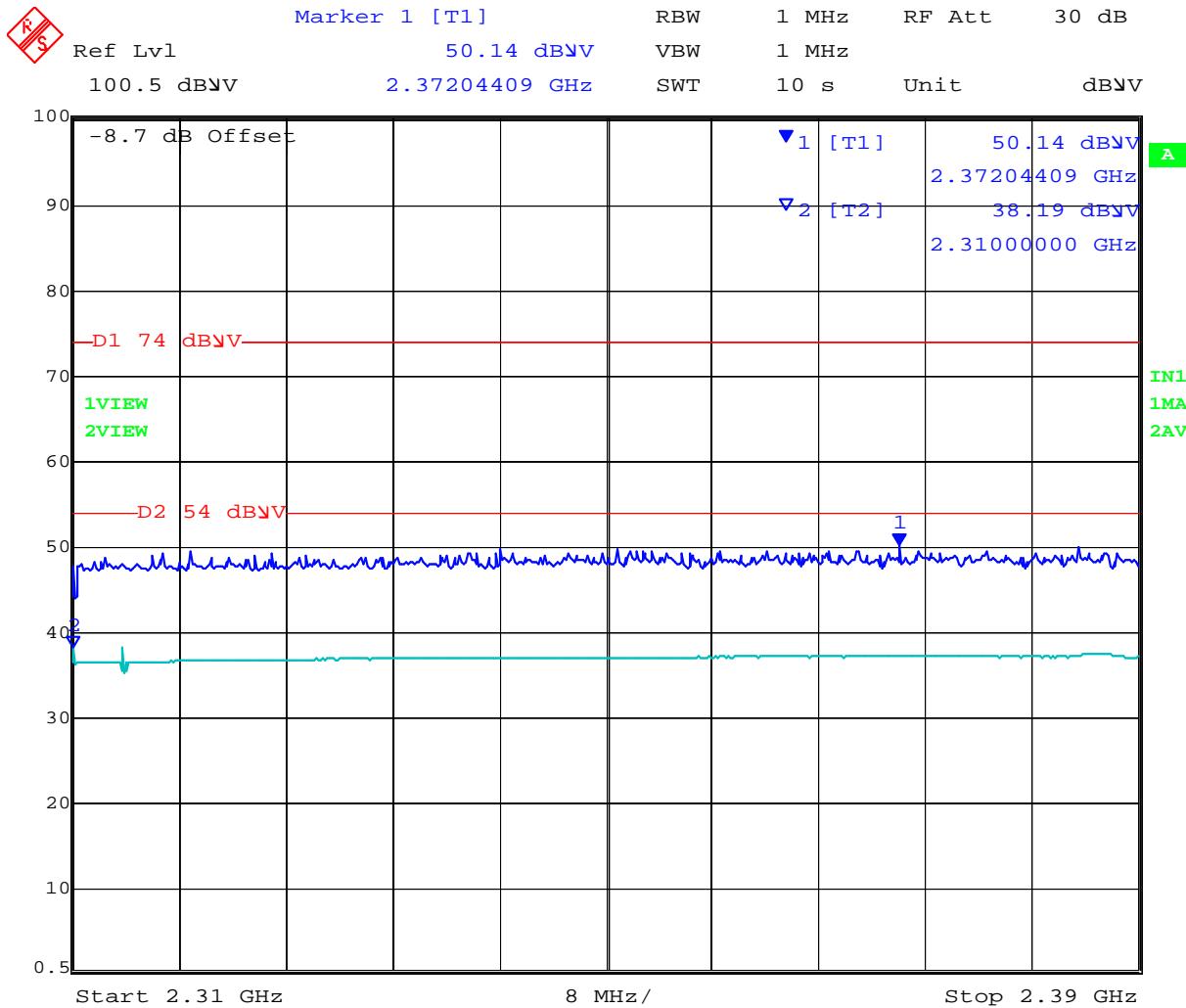
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4824.000	59.5	4.5	-9.7	54.3	Peak Max	V	109	8	74.0	-19.7	Pass	RB
4824.00001	56.9	4.5	-9.7	51.7	Average Max	V	109	8	54.0	-2.3	Pass	RB
2396.794	67.4	3.0	-11.7	58.7	Peak [Scan]	H						FUND
16126.253	42.3	9.0	0.2	51.5	Peak [Scan]	V	200	0	54.0	-2.5	Pass	NOISE
9653.307	47.2	6.3	-3.5	50.0	Peak [Scan]	H					Pass	NRB

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

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 319 of 412



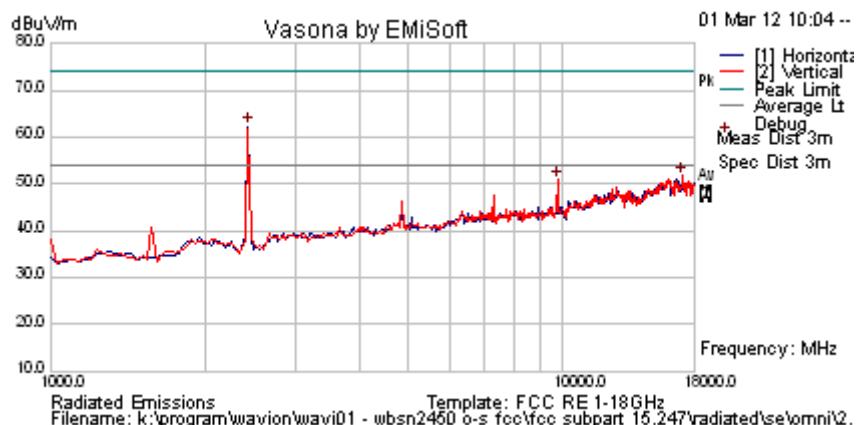
Date: 1.MAR.2012 12:31:10

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 320 of 412

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11b; 1 Mbs	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	23	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

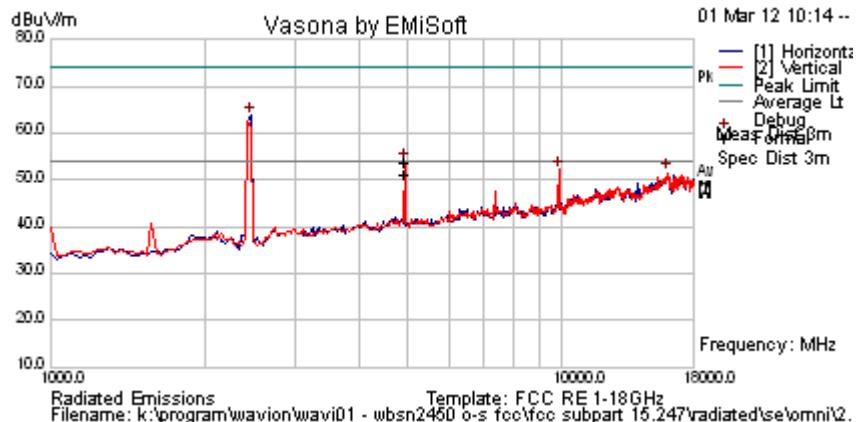
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2430.862	70.8	3.0	-11.6	62.2	Peak [Scan]	H						
17114.228	42.8	8.5	0.5	51.8	Peak [Scan]	V	150	0	54.0	-2.3	Pass	NOISE
9755.511	48.4	6.4	-3.7	51.0	Peak [Scan]	V	100	0	54.0	-3.0	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 321 of 412

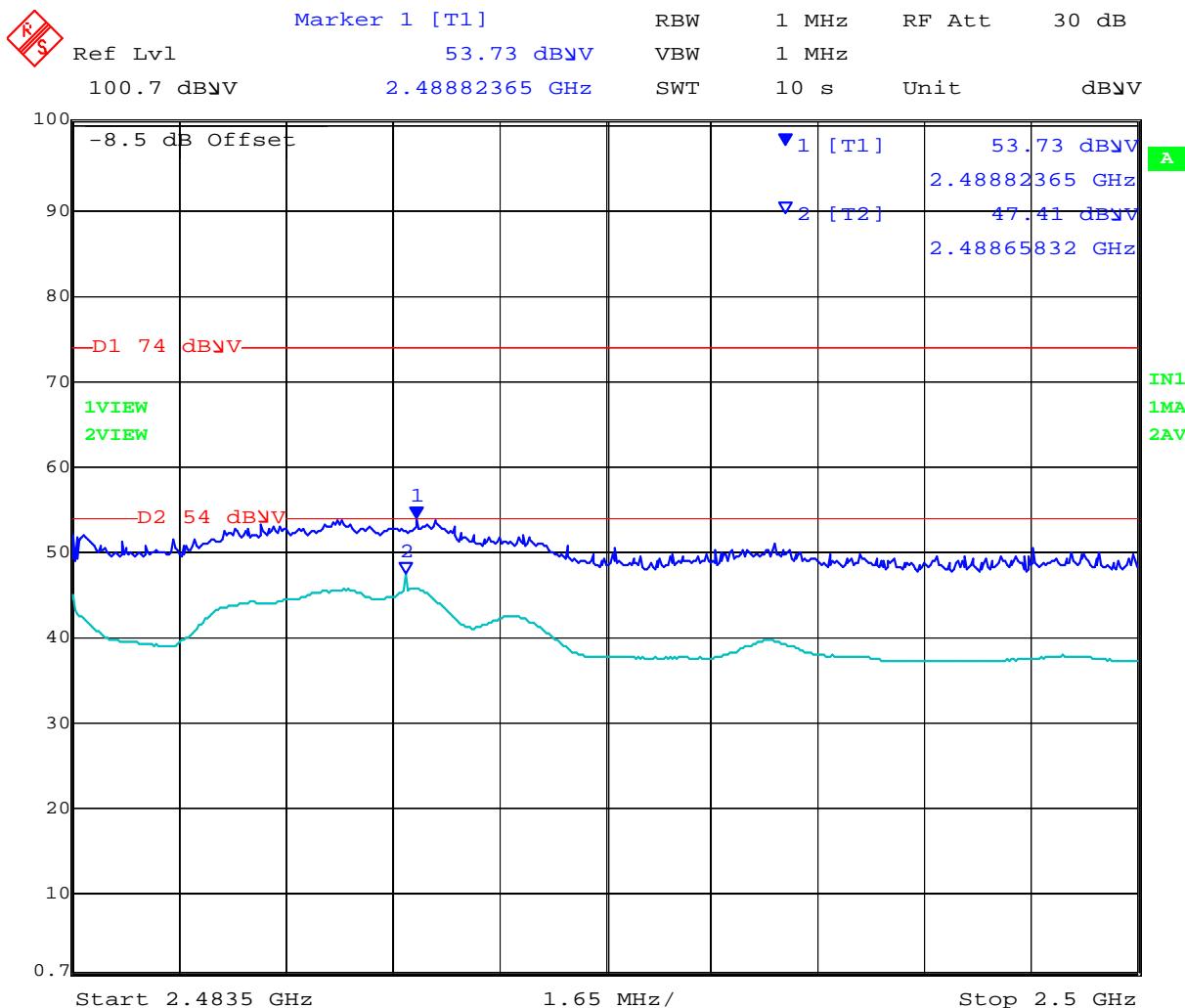
<b>Test Freq.</b>	2462 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11b; 1 Mbs	<b>Temp (°C)</b>	19.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	23	<b>Press. (mBars)</b>	1011
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4923.989	59.1	4.6	-9.8	53.9	Peak Max	V	98	67	74.0	-20.1	Pass	
4923.989	56.4	4.6	-9.8	51.1	Average Max	V	98	67	54.0	-2.9	Pass	
2464.930	72.2	3.0	-11.5	63.7	Peak [Scan]	H	150	0	54.0	9.7	Fail	
9857.715	49.2	6.4	-3.5	52.1	Peak [Scan]	V	150	0	54.0	-1.9	Pass	
16058.116	42.2	9.0	0.3	51.5	Peak [Scan]	V	100	0	54.0	-2.5	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Date: 1.MAR.2012 12:45:38

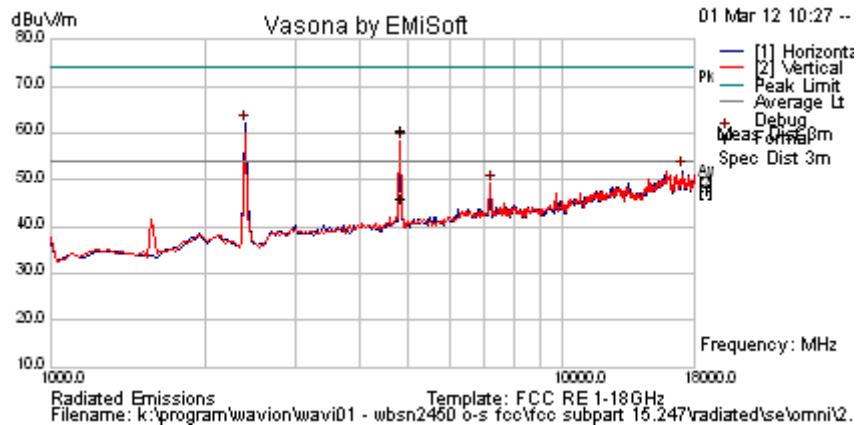
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 323 of 412

<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	22.5 (Power Reduction)	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

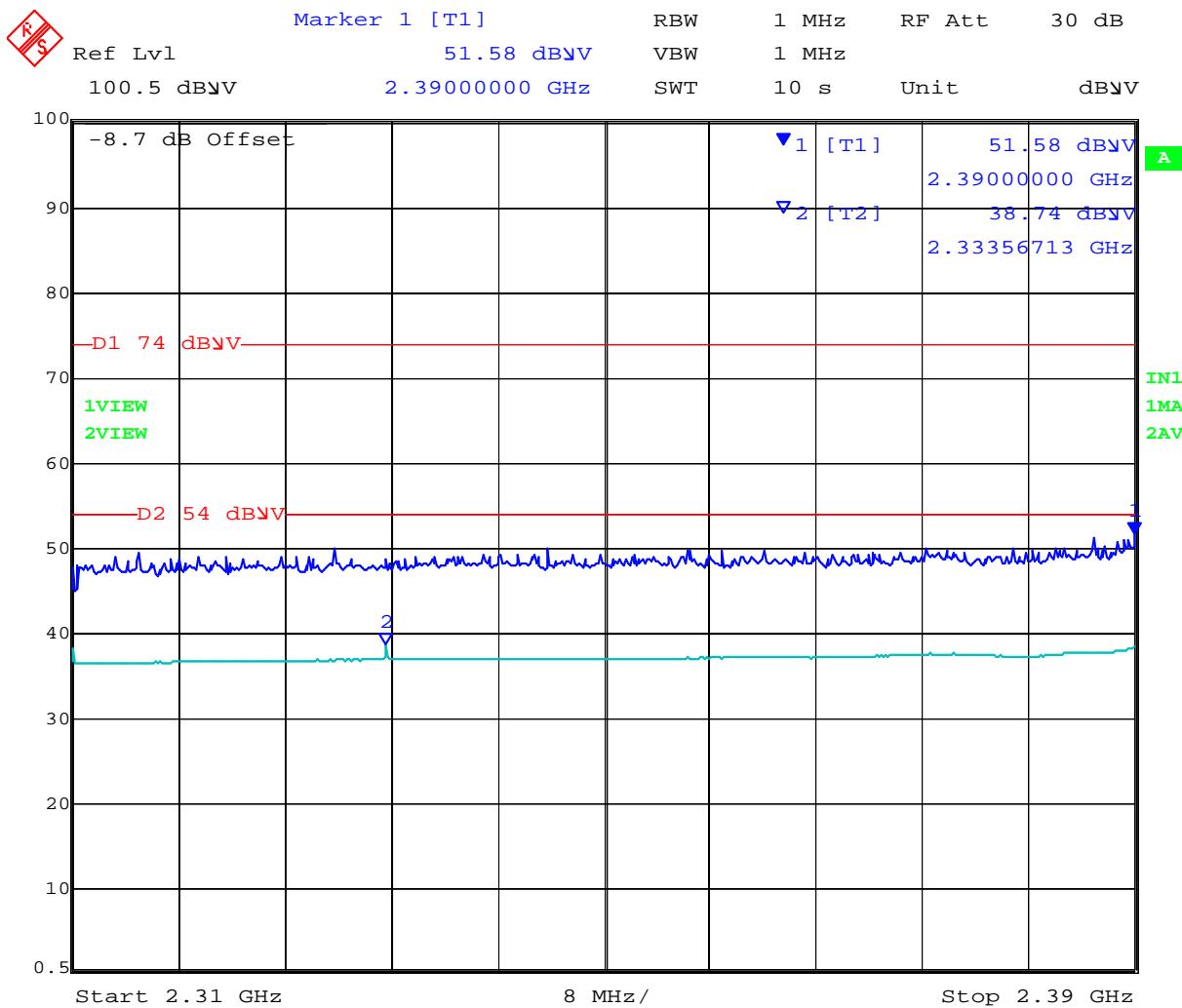
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4821.976	65.9	4.5	-9.7	60.7	Peak Max	V	121	10	74.0	-13.3	Pass	RB
4821.976	51.3	4.5	-9.7	46.1	Average Max	V	121	10	54.0	-7.9	Pass	RB
2396.794	70.7	3.0	-11.7	62.0	Peak [Scan]	H						FUND
17080.160	43.0	8.5	0.4	51.9	Peak [Scan]	H	200	0	54.0	-2.1	Pass	NOISE
7234.469	49.5	5.4	-5.8	49.1	Peak [Scan]	V	150	0	54.0	-4.9	Pass	NRB

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

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 324 of 412

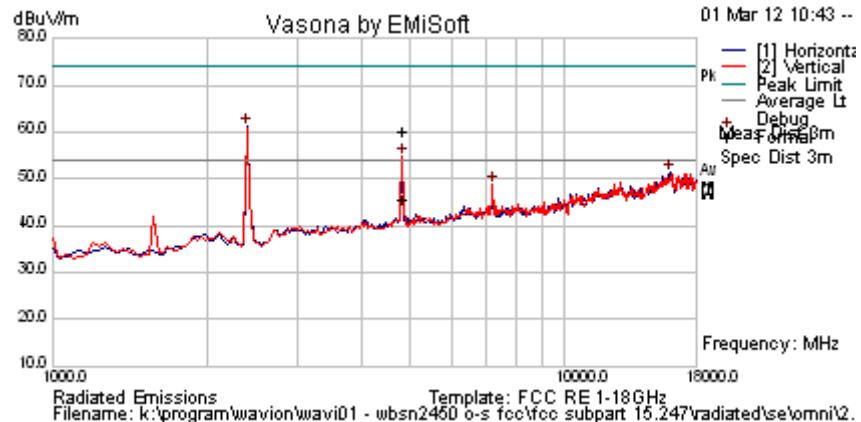


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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 325 of 412

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	22.5 (Power Reduction)	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

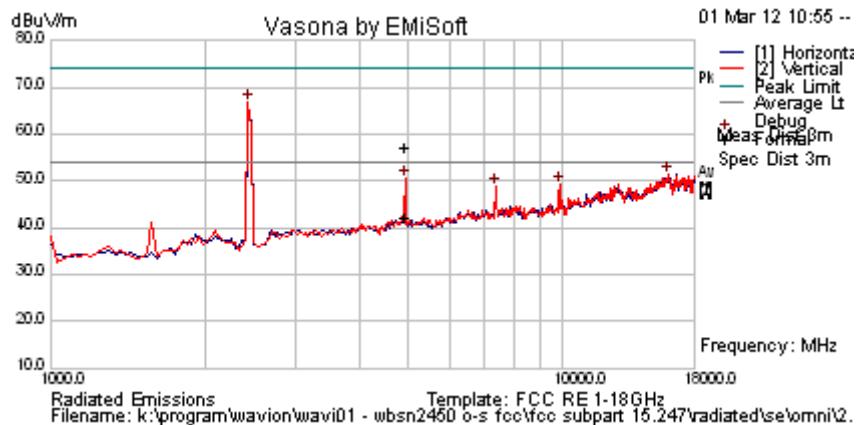
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4822.382	65.6	4.5	-9.7	60.4	Peak Max	V	98	8	74.0	-13.6	Pass	RB
4822.382	50.8	4.5	-9.7	45.6	Average Max	V	98	8	54.0	-8.4	Pass	RB
2396.794	70.0	3.0	-11.7	61.3	Peak [Scan]	H						FUND
16058.116	42.0	9.0	0.3	51.2	Peak [Scan]	H	100	0	54.0	-2.8	Pass	NOISE
7234.469	49.2	5.4	-5.8	48.8	Peak [Scan]	V	200	0	54.0	-5.2	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 326 of 412

<b>Test Freq.</b>	2462 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	22.5 (Power Reduction)	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

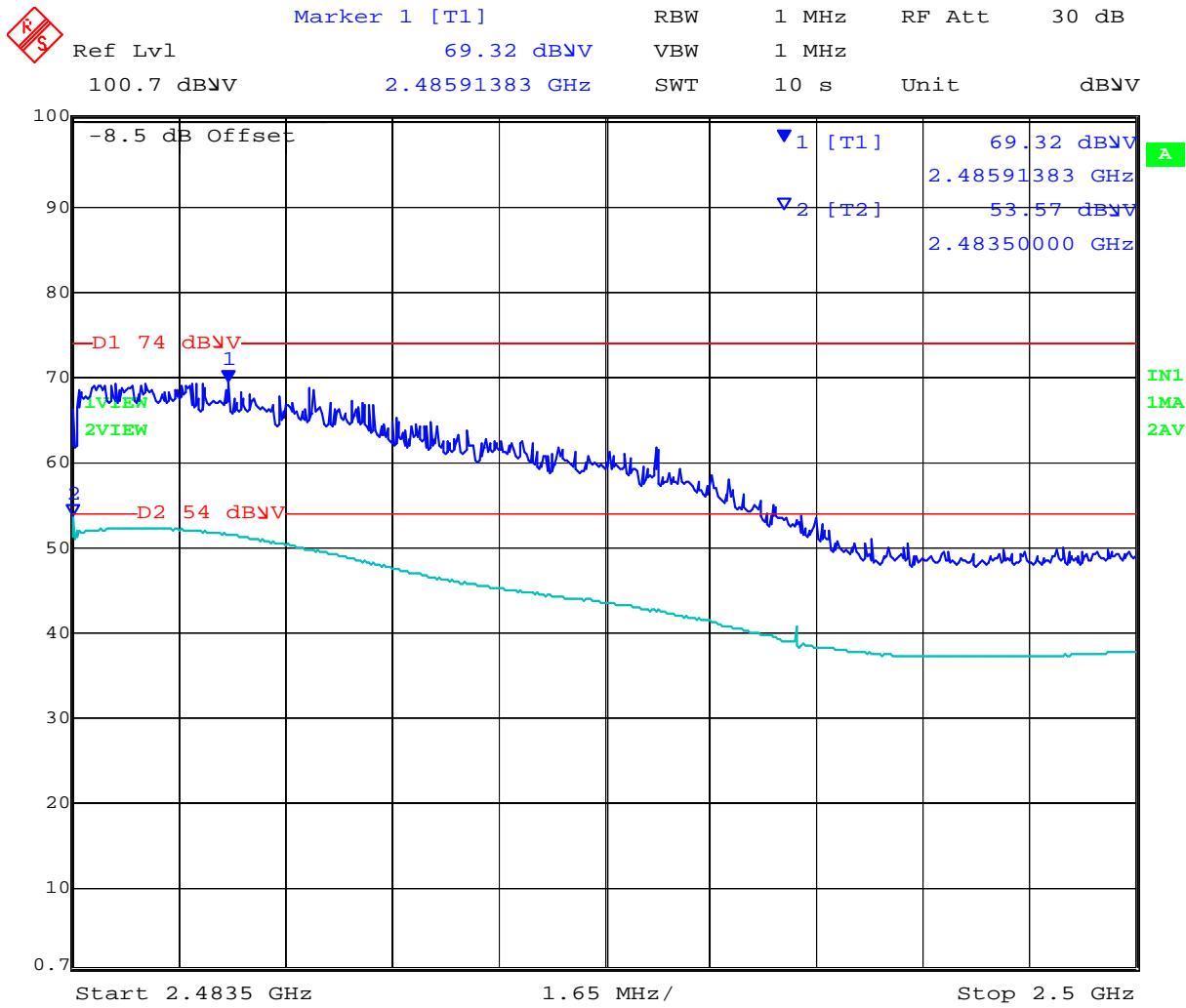
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4924.138	62.3	4.6	-9.8	57.1	Peak Max	V	126	57	74.0	-16.9	Pass	RB
4924.138	47.3	4.6	-9.8	42.1	Average Max	V	126	57	54.0	-11.9	Pass	RB
2430.862	75.2	3.0	-11.6	66.7	Peak [Scan]							FUND
16024.048	42.1	9.0	0.2	51.3	Peak [Scan]	V	200	0	54.0	-2.7	Pass	NOISE
9857.715	46.3	6.4	-3.5	49.2	Peak [Scan]	V	100	0	54.0	-4.8	Pass	NRB
7382.856	50.7	5.5	-5.5	50.7	Peak Max	V	190	20	74.0	-23.3	Pass	RB
7382.856	36.4	5.5	-5.5	36.4	Average Max	V	190	20	54.0	-17.6	Pass	RB

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

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 327 of 412

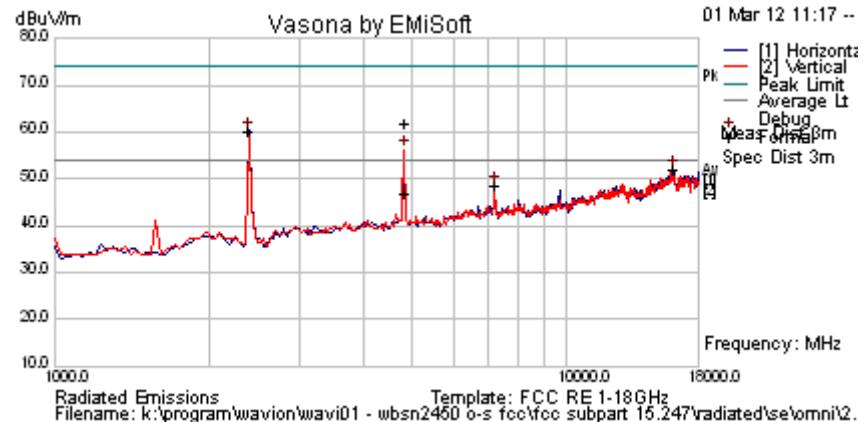


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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 328 of 412

<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	23	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			

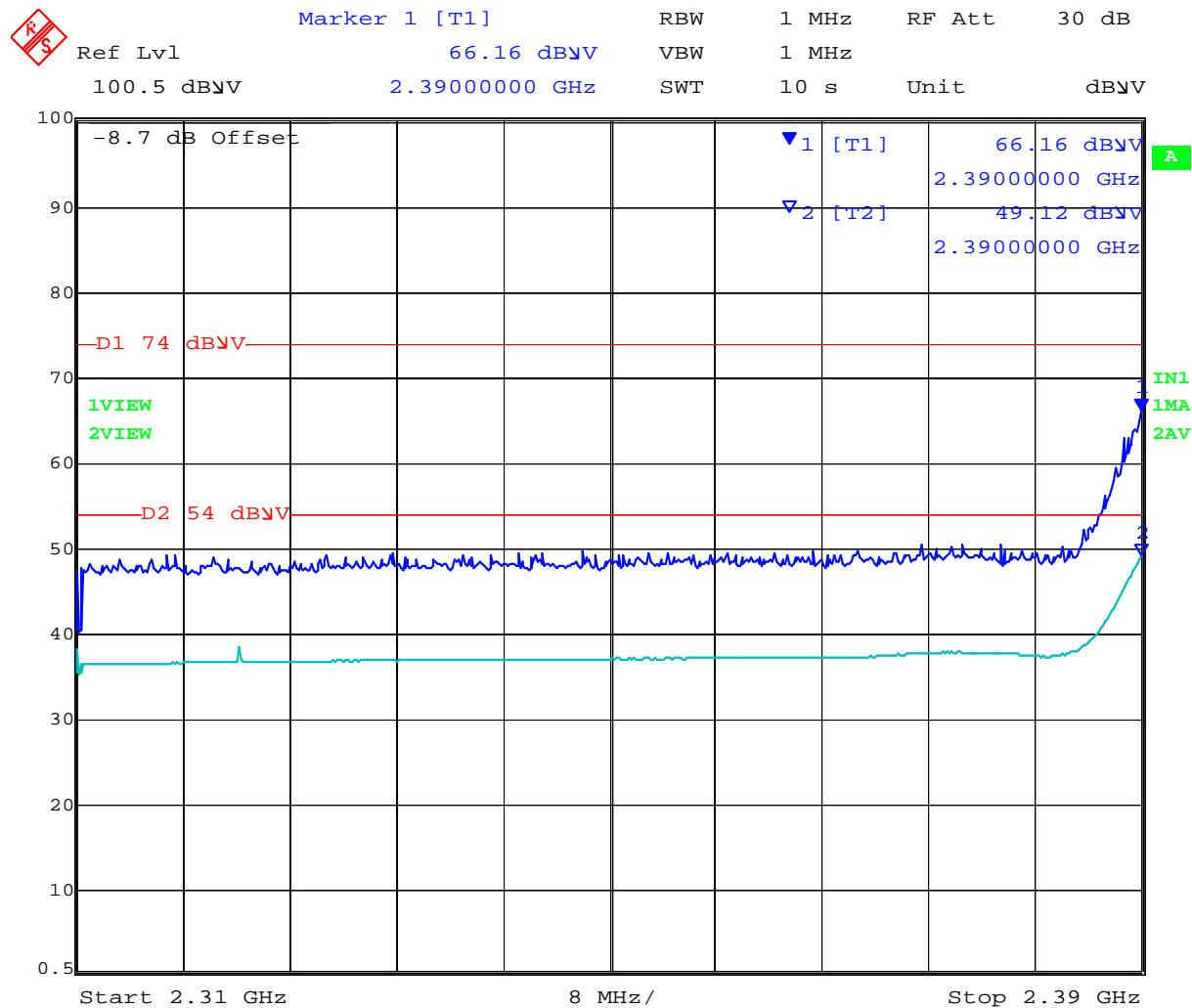


#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4820.847	67.2	4.5	-9.7	62.0	Peak Max	V	121	313	74.0	-12.0	Pass	RB
4820.847	52.0	4.5	-9.7	46.8	Average Max	V	121	313	54.0	-7.2	Pass	RB
2396.794	68.9	3.0	-11.7	60.2	Peak [Scan]	H						FUND
16126.253	42.8	9.0	0.2	51.9	Peak [Scan]	H	100	0	54.0	-2.1	Pass	NOISE
7234.469	49.0	5.4	-5.8	48.6	Peak [Scan]	V	150	0	54.0	-5.4	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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### Band Edge



Date: 1.MAR.2012 12:36:30

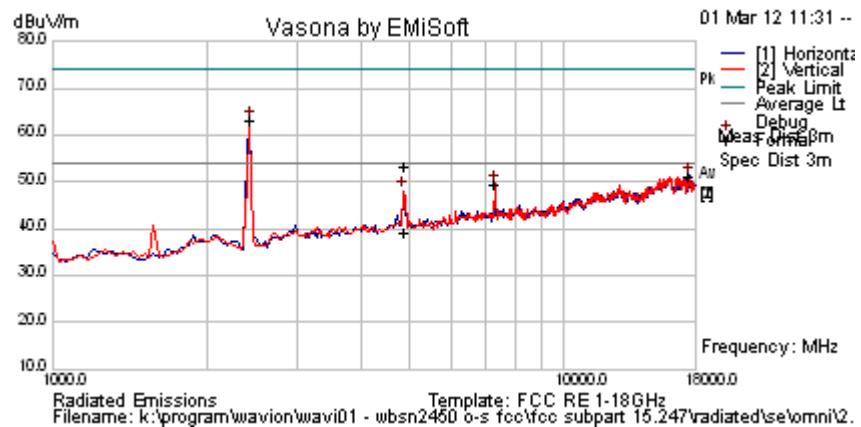
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 330 of 412

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	23	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

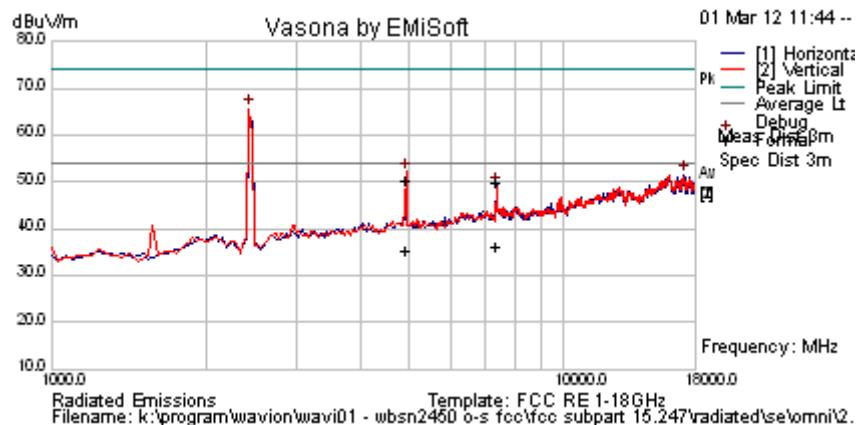
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4869.835	58.6	4.5	-9.7	53.4	Peak Max	V	98	4	74.0	-20.6	Pass	RB
4869.835	44.5	4.5	-9.7	39.4	Average Max	V	98	4	54.0	-14.7	Pass	RB
2430.862	71.8	3.0	-11.6	63.2	Peak [Scan]	H	150	0	54.0	9.2	Fail	FUND
17591.182	41.8	8.8	0.6	51.2	Peak [Scan]	H	100	0	54.0	-2.8	Pass	NOISE
7302.605	49.8	5.4	-5.7	49.5	Peak [Scan]	V	200	0	54.0	-4.5	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 331 of 412

<b>Test Freq.</b>	2462 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	20.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	21 (Power Reduction)	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



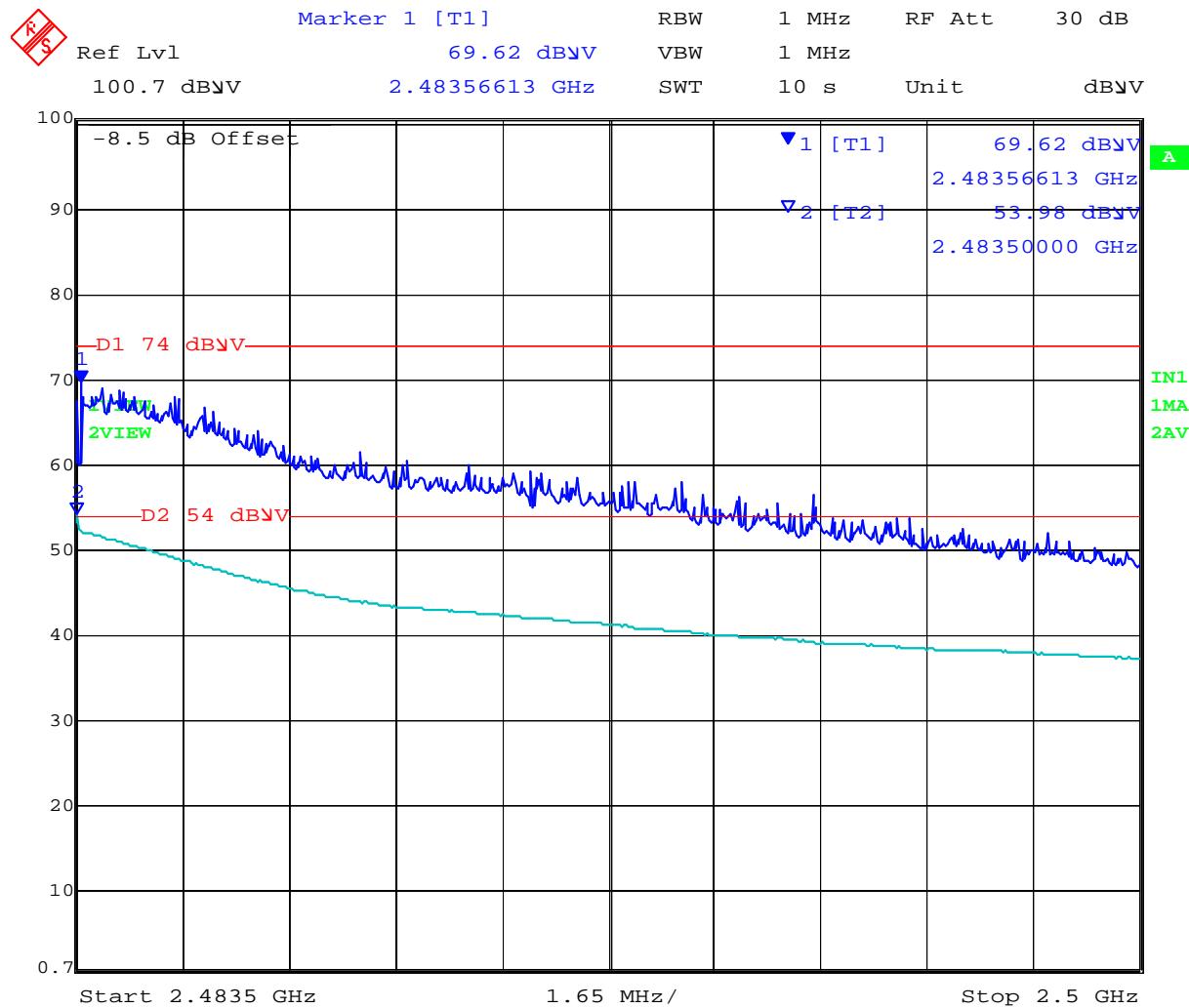
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4920.631	55.8	4.6	-9.8	50.5	Peak Max	V	132	20	74.0	-23.5	Pass	RB
7381.723	49.9	5.5	-5.5	49.9	Peak Max	H	98	351	74.0	-24.1	Pass	RB
4920.631	40.7	4.6	-9.8	35.5	Average Max	V	132	20	54.0	-18.5	Pass	RB
7381.723	36.4	5.5	-5.5	36.3	Average Max	H	98	351	54.0	-17.7	Pass	RB
2430.862	74.4	3.0	-11.6	65.8	Peak [Scan]	V						FUND
17148.297	42.5	8.6	0.5	51.6	Peak [Scan]	H	100	0	54.0	-2.4	Pass	NOISE

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

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### Band Edge



Date: 1.MAR.2012 12:55:07

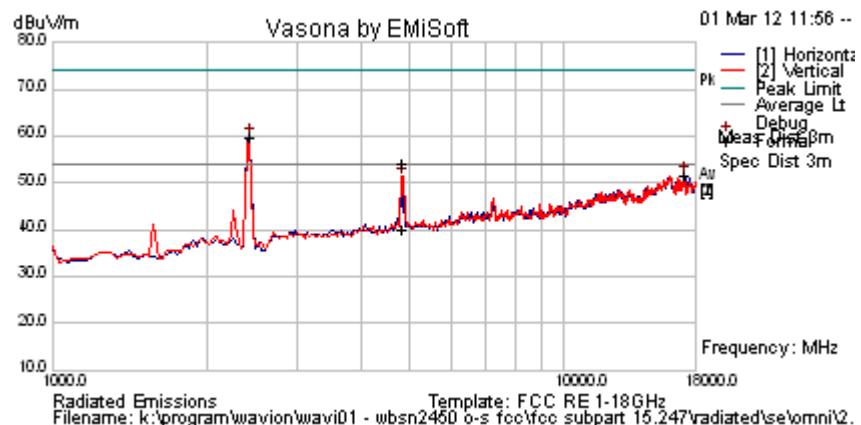
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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 333 of 412

<b>Test Freq.</b>	2422 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-40; 13.5 MCS	<b>Temp (°C)</b>	21
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	21.5 (Power Reduction)	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



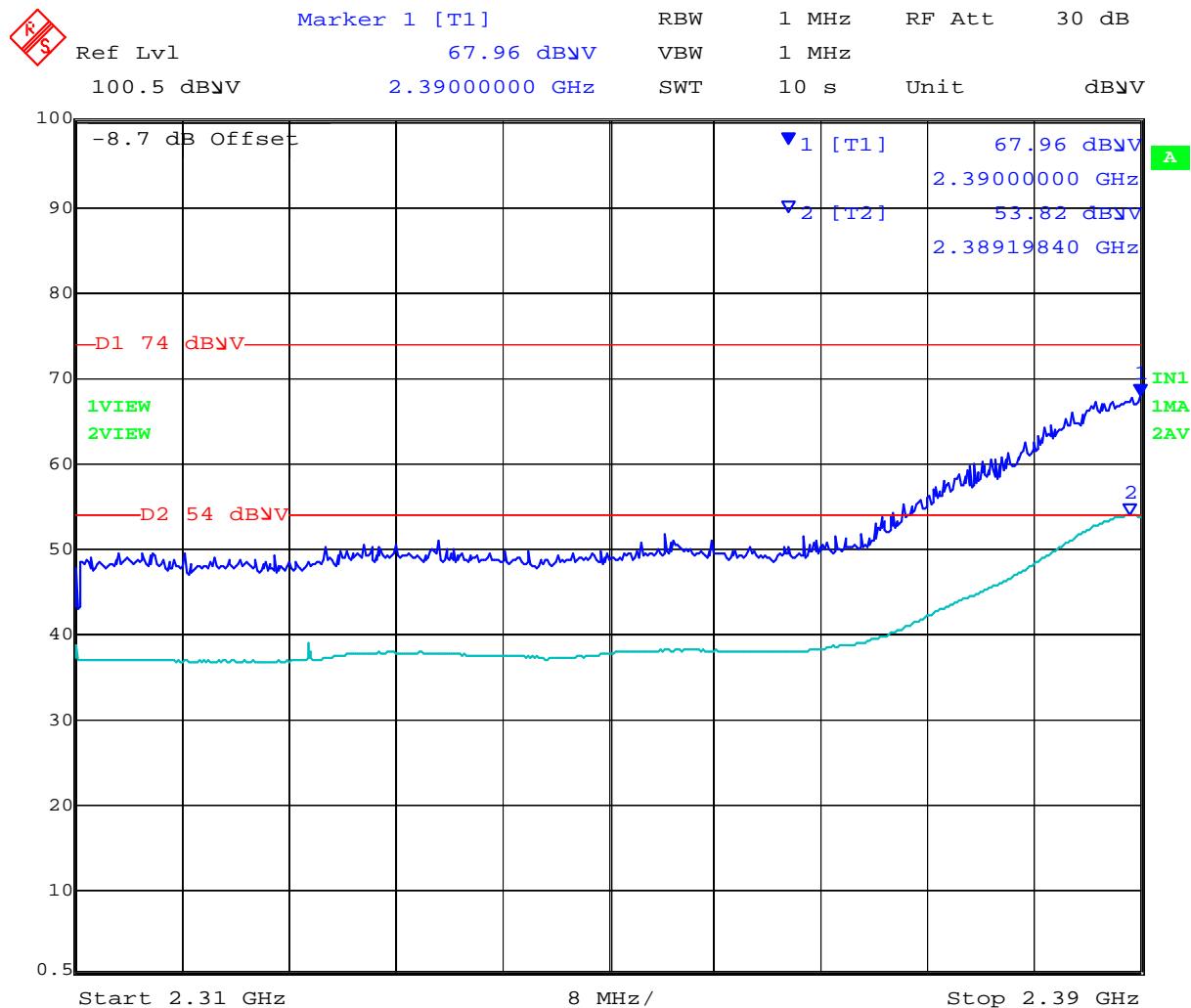
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4839.379	59.3	4.5	-9.7	54.1	Peak Max	V	122	9	74.0	-19.9	Pass	RB
4839.379	45.1	4.5	-9.7	40.0	Average Max	V	122	9	54.0	-14.1	Pass	RB
2430.862	68.5	3.0	-11.6	59.9	Peak [Scan]	H						FUND
17148.297	42.7	8.6	0.5	51.8	Peak [Scan]	H	100	0	54.0	-2.2	Pass	NOISE

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

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### Band Edge



Date: 1.MAR.2012 12:41:21

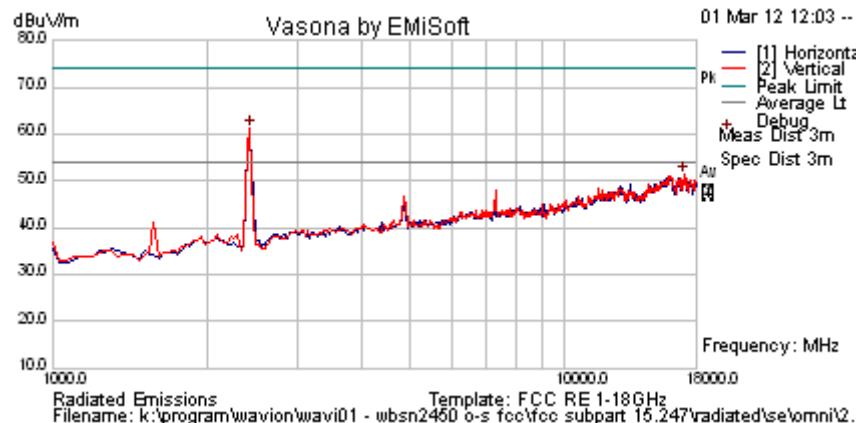
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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 335 of 412

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-40; 13.5 MCS	<b>Temp (°C)</b>	21
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	23	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

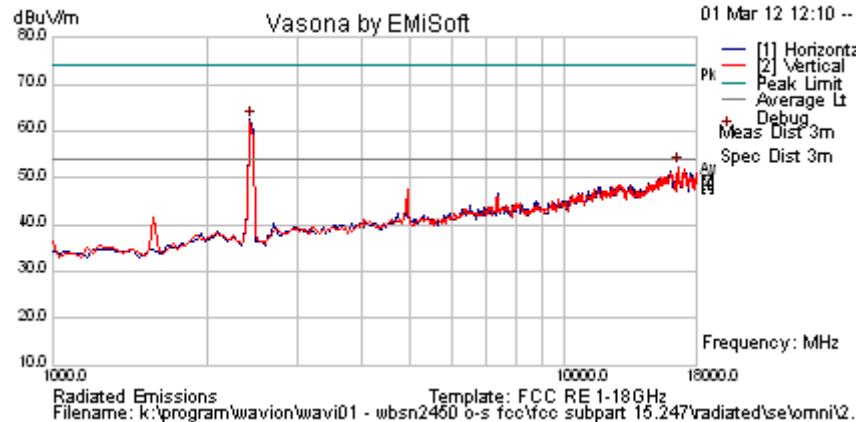
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2430.862	69.8	3.0	-11.6	61.2	Peak [Scan]	V						FUND
17114.228	42.3	8.5	0.5	51.3	Peak [Scan]	V	200	0	54.0	-2.7	Pass	NOISE
Legend:		TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission										
		RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak										

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 336 of 412

<b>Test Freq.</b>	2452 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-40; 13.5 MCS	<b>Temp (°C)</b>	21
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	33
<b>Power Setting</b>	23	<b>Press. (mBars)</b>	1010
<b>Antenna</b>	OMNI 7.4 dBi	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			

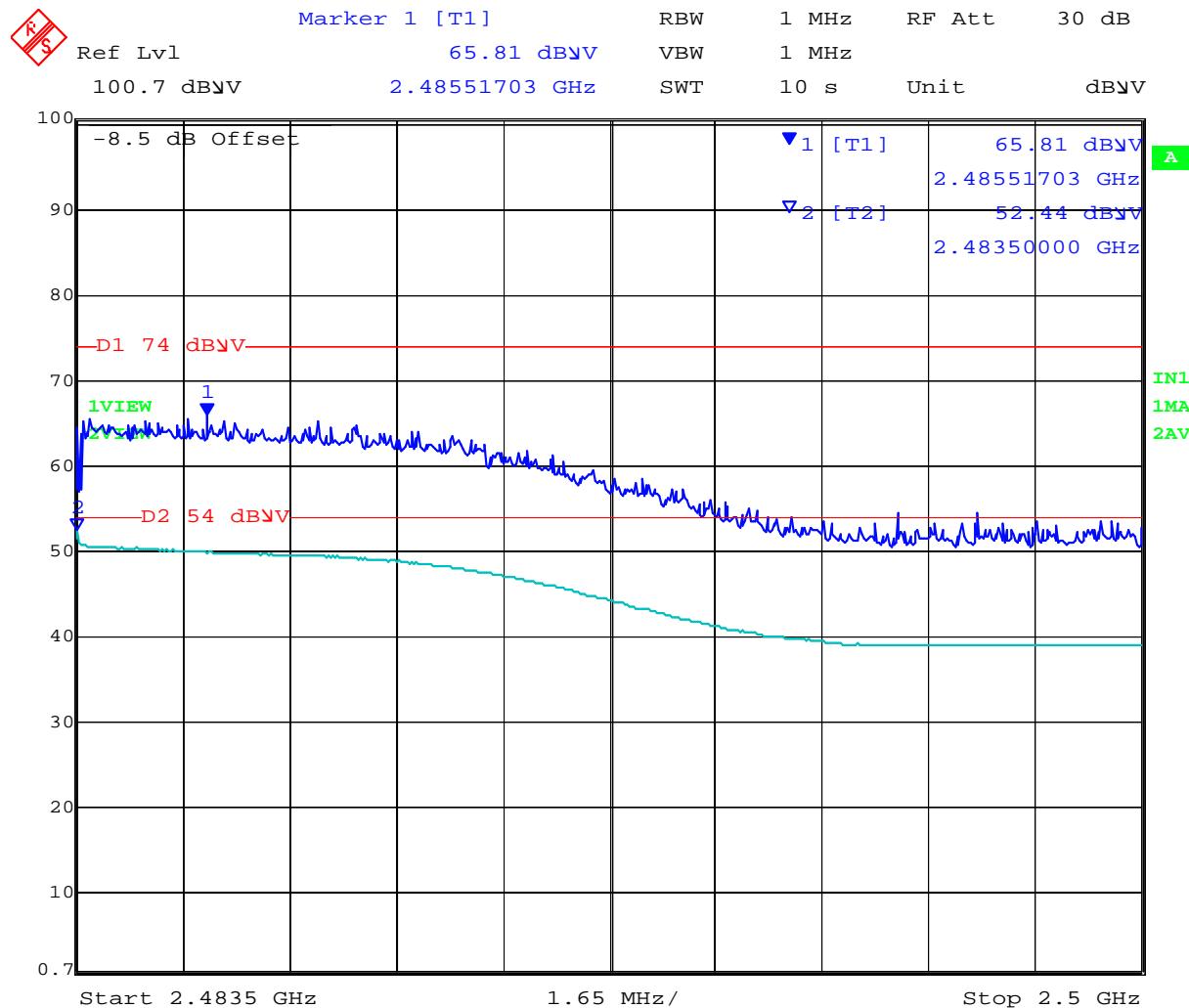


#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2430.862	71.0	3.0	-11.6	62.4	Peak [Scan]	H						FUND
16569.138	43.1	8.8	0.5	52.3	Peak [Scan]	V	150	0	54.0	-1.7	Pass	NOISE
Legend:		TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission										
		RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak										

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### Band Edge

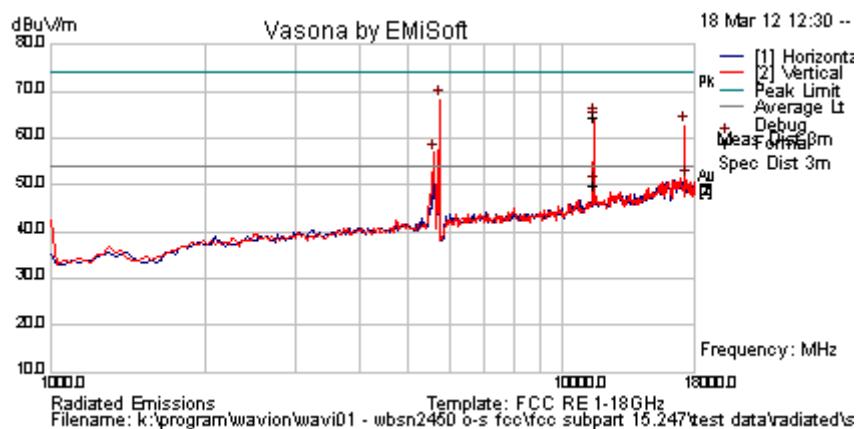


Date: 1.MAR.2012 13:00:03

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<b>Test Freq.</b>	5730.5 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	5 MHz Bandwidth 6 Mbs	<b>Temp (°C)</b>	18.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	36
<b>Power Setting</b>	15	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

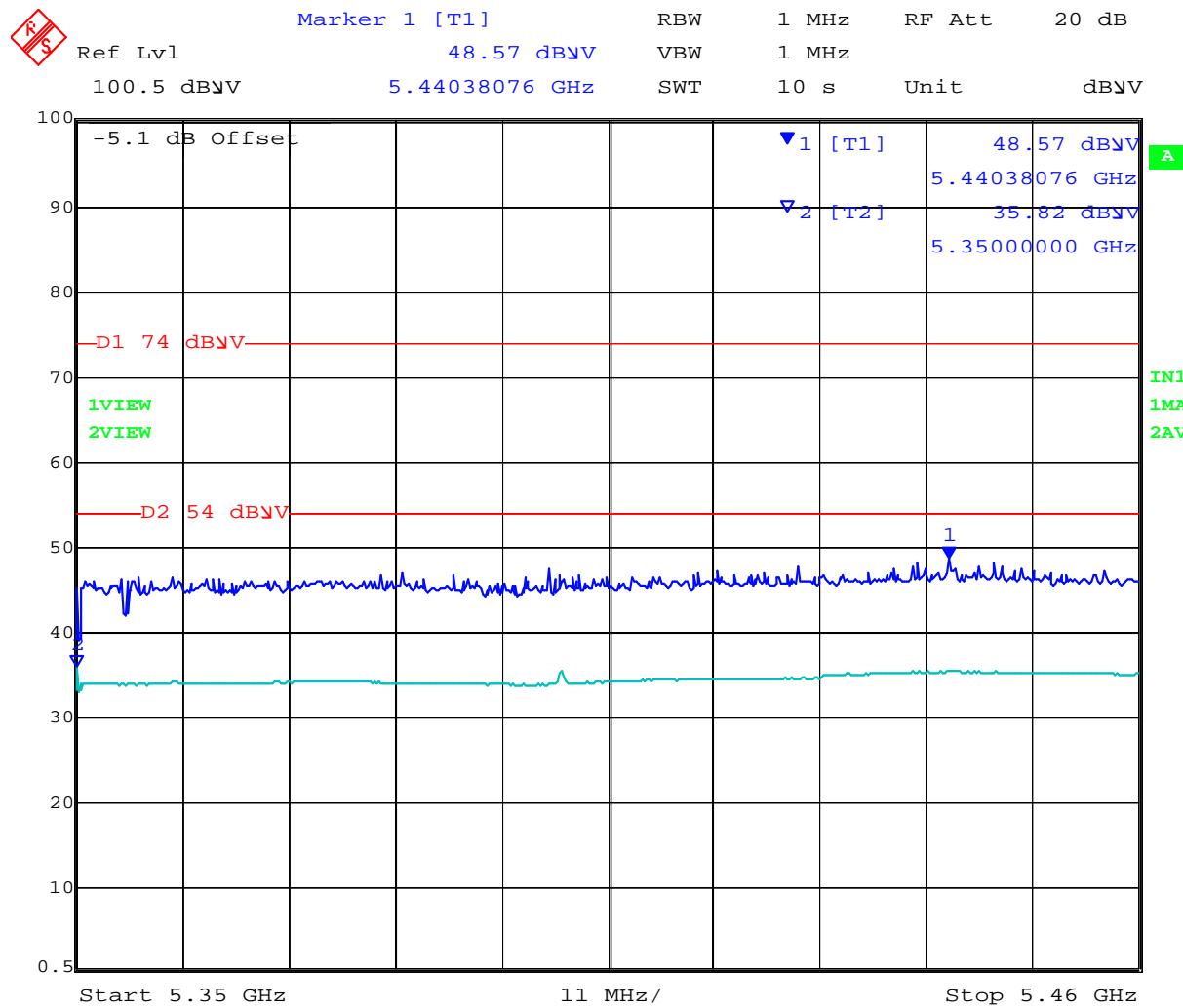
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	73.0	4.8	-9.5	68.2	Peak [Scan]	V						FUND
17216.433	53.3	8.6	0.9	62.7	Peak [Scan]	V					Pass	NRB
5599.198	61.9	4.7	-9.7	56.9	Peak [Scan]	V					Pass	BE
17386.774	41.0	8.7	1.4	51.1	Peak [Scan]	V	100	0	54	-2.9	Pass	NOISE
11459.740	59.9	6.8	-2.1	64.7	Peak Max	V	100	0	74	-9.3	Pass	RB
11459.740	45.4	6.8	-2.1	50.1	Average Max	V	100	0	54	-3.9	Pass	RB
Legend:												
TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 339 of 412

### 5,350 – 5,460 MHz Restricted Band



Date: 19.MAR.2012 19:38:09

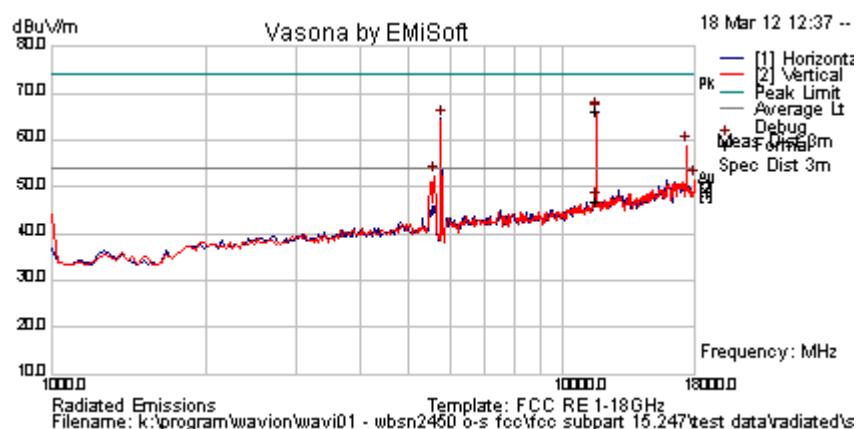
5 MHz Band-Edge EUT Transmitting 5730.5 MHz

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 340 of 412

<b>Test Freq.</b>	5790.5 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	5 MHz Bandwidth 6 Mbs	<b>Temp (°C)</b>	18.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	36
<b>Power Setting</b>	16	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.53908	69.2	4.8	-9.5	64.5	Peak [Scan]	H						FUND
17386.774	48.6	8.7	1.4	58.7	Peak [Scan]	V					Pass	NRB
5599.198	57.4	4.7	-9.7	52.4	Peak [Scan]	V					Pass	BE
18000.000	42.1	8.8	0.7	51.6	Peak [Scan]	V	100	0	54	-2.4	Pass	NOISE
11582.124	61.6	6.8	-2.0	66.4	Peak Max	V	98	1	74	-7.6	Pass	RB
11582.124	42.1	6.8	-2.0	46.9	Average Max	V	98	1	54	-7.1	Pass	RB

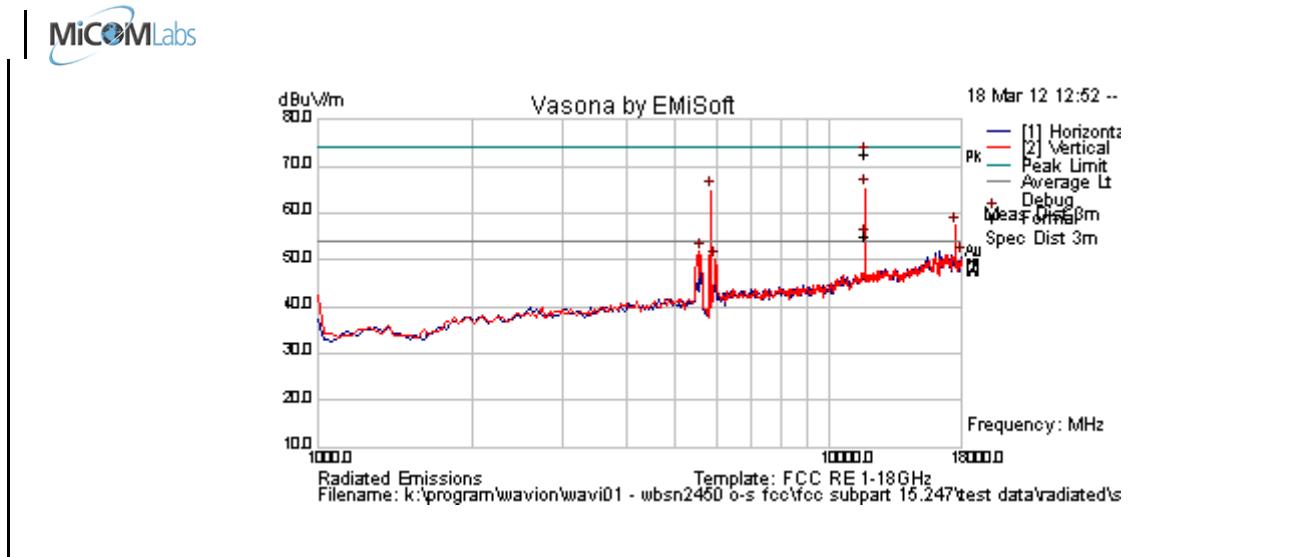
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 341 of 412

Test Freq.	5845.5 MHz	Engineer	GMH
Variant	5 MHz Bandwidth 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	15.5	Press. (mBars)	995
Antenna	8.5 dBi Omni	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
5837.675	69.3	4.8	-9.3	64.8	Peak [Scan]	V						FUND
17557.114	47.8	8.8	0.8	57.4	Peak [Scan]	V						NRB
5565.130	56.7	4.7	-9.7	51.7	Peak [Scan]	V						BE
18000.000	41.3	8.8	0.7	50.8	Peak [Scan]	H	100	0	54	-3.2	Pass	NOISE
5973.948	53.9	4.9	-8.7	50.0	Peak [Scan]	V						BE
11690.489	67.8	6.8	-2.4	72.2	Peak Max	V	99	3	74.0	-1.8	Pass	RB
11690.489	49.2	6.8	-2.4	53.6	Average Max	V	99	3	54.0	-0.4	Pass	RB

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

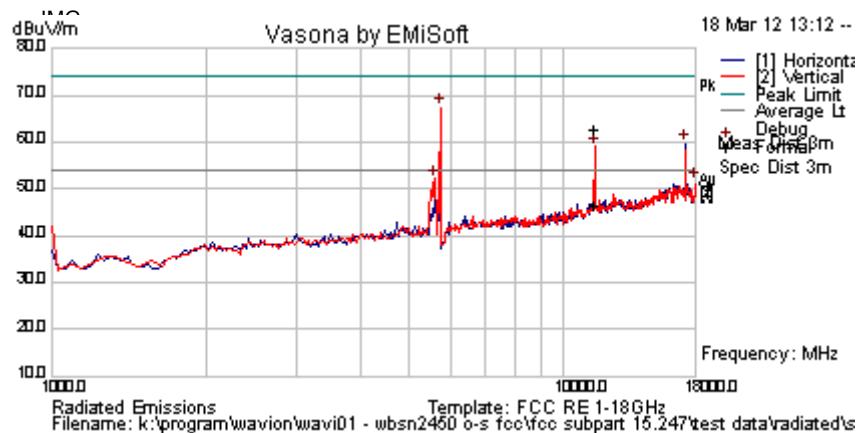
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 342 of 412

Test Freq.	5735 MHz	Engineer	GMH
Variant	10 MHz Bandwidth 6 Mbs	Temp (°C)	19
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	35
Power Setting	19	Press. (mBars)	995
Antenna	8.5 dBi Omni	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			

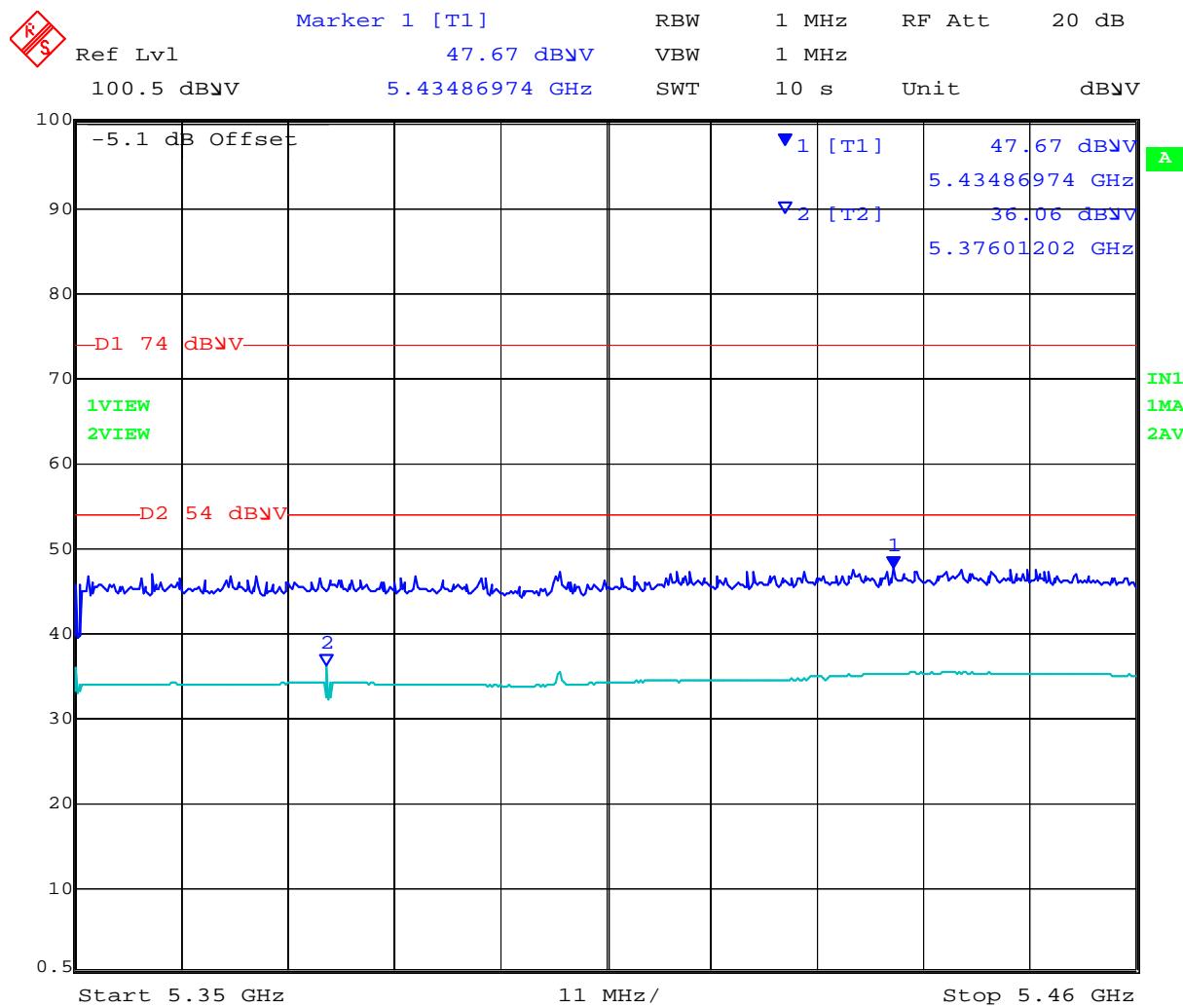


#### Formally measured emission peaks

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
5735.471	72.3	4.8	-9.5	67.5	Peak [Scan]	V						FUND
17216.433	50.3	8.6	0.9	59.7	Peak [Scan]	H					Pass	NRB
5599.198	57.2	4.7	-9.7	52.2	Peak [Scan]	V					Pass	BE
18000.000	42.0	8.8	0.7	51.5	Peak [Scan]	V	100	0	54	-2.5	Pass	NOISE
11466.212	58.1	6.8	-2.1	62.8	Peak Max	V	98	0	74	-11.2	Pass	RB
11466.212	41.6	6.8	-2.1	46.4	Average Max	V	98	0	54	-7.6	Pass	RB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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### Restricted Band 5,350 – 5,460 MHz



10MHz Band-Edge EUT Transmitting 5735 MHz

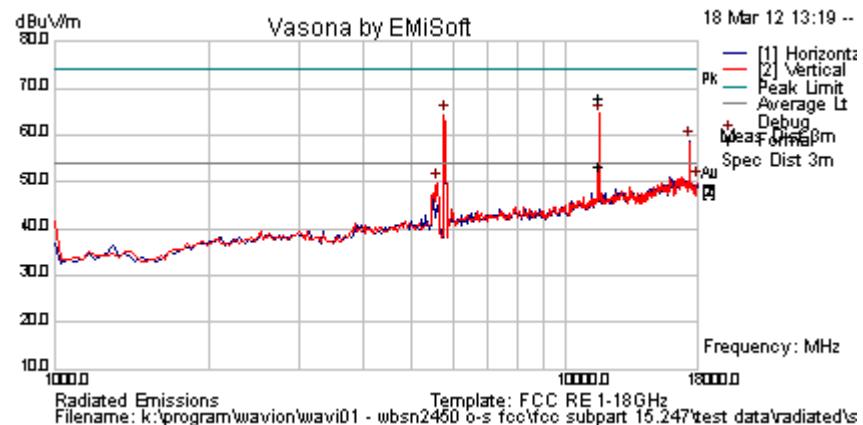
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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 344 of 412

<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	10 MHz Bandwidth 6 Mbs	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	35
<b>Power Setting</b>	21	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.53908	69.1	4.8	-9.5	64.4	Peak [Scan]	V						FUND
17386.774	48.7	8.7	1.4	58.9	Peak [Scan]	H					Pass	NRB
18000.000	40.8	8.8	0.7	50.3	Peak [Scan]	H	100	0	54	-3.7	Pass	NOISE
5599.198	54.8	4.7	-9.7	49.8	Peak [Scan]	V					Pass	BE
11580.801	63.3	6.8	-2.0	68.0	Peak Max	V	98	0	74	-6.0	Pass	RB
11580.801	48.5	6.8	-2.0	53.3	Average Max	V	98	0	54	-0.7	Pass	RB

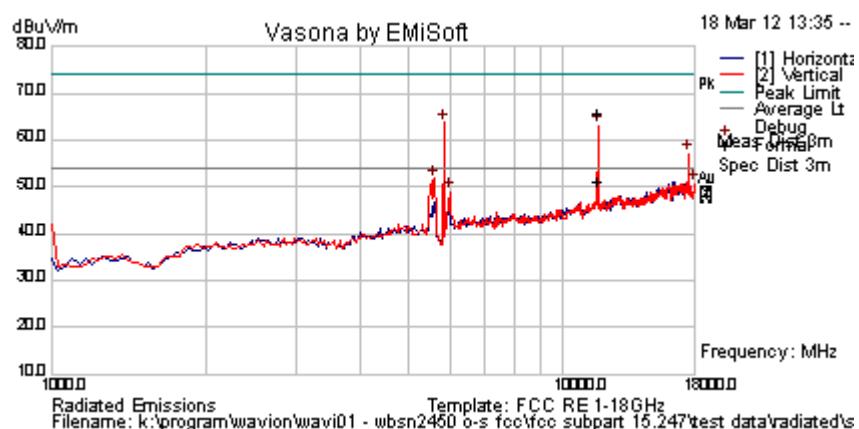
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 345 of 412

<b>Test Freq.</b>	5840 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	10 MHz Bandwidth 6 Mbs	<b>Temp (°C)</b>	19
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	35
<b>Power Setting</b>	19 Reduction	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



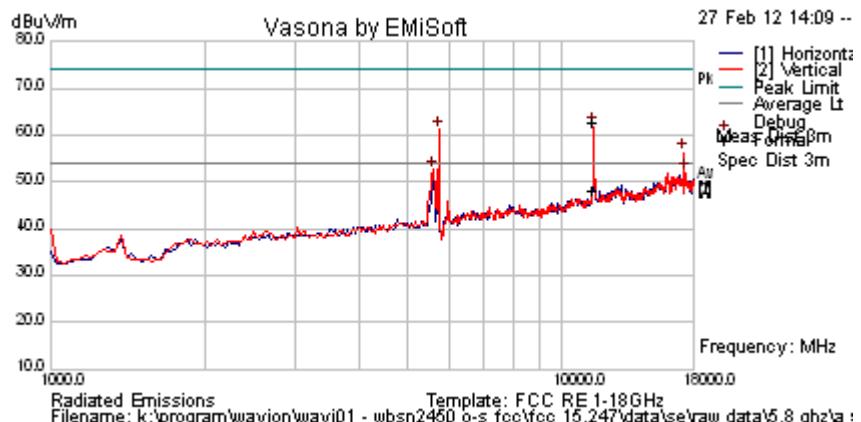
#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5837.675	68.2	4.8	-9.3	63.8	Peak [Scan]	V						FUND
17523.046	47.5	8.8	0.9	57.1	Peak [Scan]	V					Pass	NRB
5599.198	56.8	4.7	-9.7	51.8	Peak [Scan]	V					Pass	BE
18000.000	41.4	8.8	0.7	50.9	Peak [Scan]	V	100	0	54	-3.1	Pass	NOISE
6008.016	52.8	4.9	-8.6	49.0	Peak [Scan]	V					Pass	BE
11678.597	61.2	6.8	-2.4	65.7	Peak Max	V	153	0	74	-8.3	Pass	RB
11678.597	46.6	6.8	-2.4	51.1	Average Max	V	153	0	54	-3.0	Pass	RB

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

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<b>Test Freq.</b>	5745 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11a; 6 Mbs	<b>Temp (°C)</b>	21.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	31
<b>Power Setting</b>	25	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



### Formally measured emission peaks

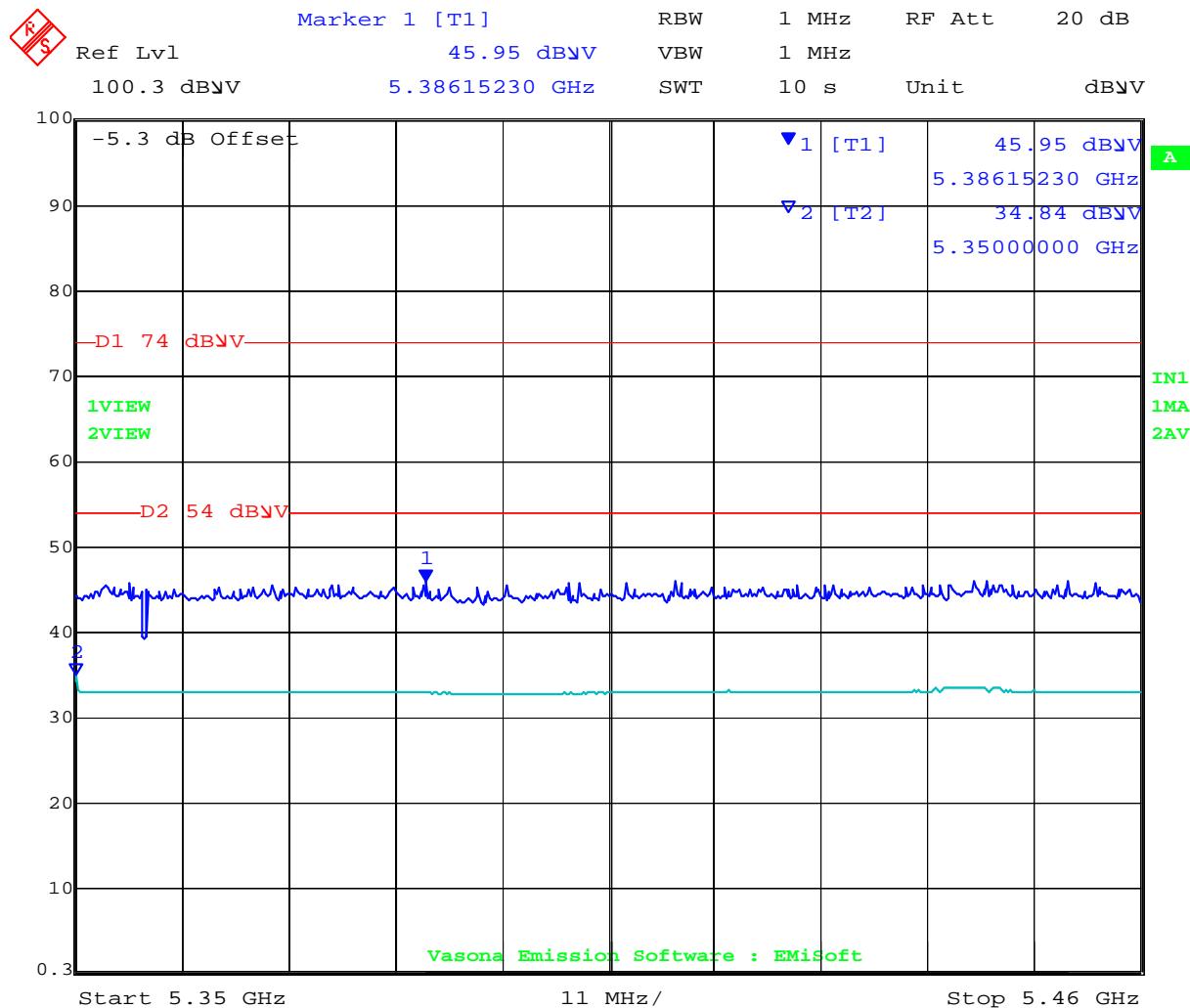
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11484.760	57.8	6.8	-2.0	62.6	Peak Max	V	98	0	74.0	-11.4	Pass	RB
11484.76	43.6	6.8	-2.0	48.4	Average Max	V	98	0	54.0	-5.6	Pass	RB
5735.471	65.9	4.8	-9.5	61.1	Peak [Scan]	V						FUND
5599.198	57.7	4.7	-9.7	52.7	Peak [Scan]	V					Pass	BE
17352.705	41.9	8.7	1.3	52.0	Peak [Scan]	V					Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Title:** Wavion WBSn-2450-O/-S Wireless LAN Access Point  
**To:** FCC 47 CFR Part 15.247 & IC RSS-210  
**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 347 of 412

### Band Edge



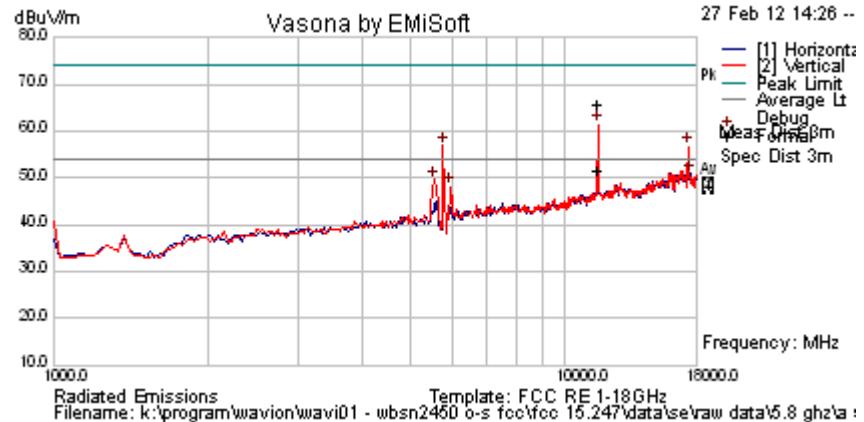
Date: 27.FEB.2012 16:06:46

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 348 of 412

<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11a; 6 Mbs	<b>Temp (°C)</b>	21.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	31
<b>Power Setting</b>	25	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11573.887	60.9	6.8	-2.0	65.7	Peak Max	V	115	0	74.0	-8.3	Pass	RB
11573.887	46.8	6.8	-2.0	51.6	Average Max	V	115	0	54.0	-2.4	Pass	RB
5769.539	61.6	4.8	-9.5	56.9	Peak [Scan]	V						FUND
17352.705	46.6	8.7	1.3	56.6	Peak [Scan]	V						Pass NRB
5531.062	54.7	4.6	-9.7	49.7	Peak [Scan]	V	100	0	54	-4.3	Pass	BE
5973.948	52.0	4.9	-8.7	48.1	Peak [Scan]	V	200	0	54	-5.9	Pass	BE

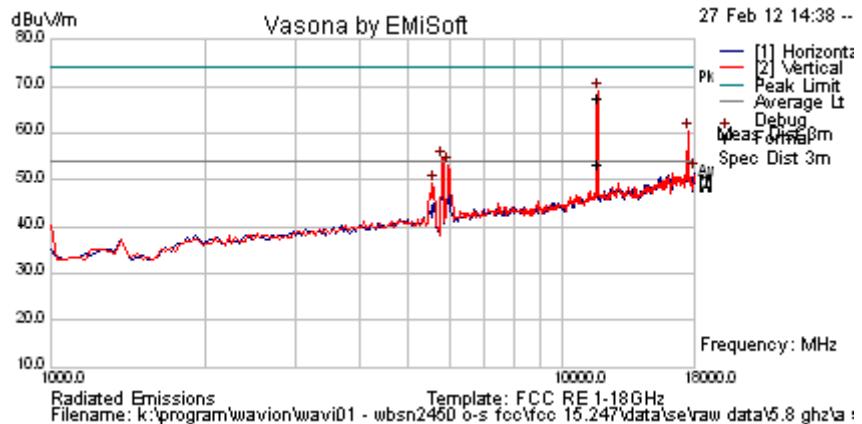
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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**Serial #:** WAVI01-U1 Rev D  
**Issue Date:** 30th March 2012  
**Page:** 349 of 412

<b>Test Freq.</b>	5825 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11a; 6 Mbs	<b>Temp (°C)</b>	21.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	31
<b>Power Setting</b>	25	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5 dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11651.303	62.7	6.8	-2.3	67.3	Peak	V	98	0	74.0	-6.7	Pass	RB
11651.303	49.0	6.8	-2.3	53.5	Average	V	98	0	54.0	-0.5	Pass	RB
17488.978	50.6	8.8	1.0	60.4	Peak [Scan]	V					Pass	NRB
5803.607	58.9	4.8	-9.4	54.4	Peak [Scan]	V						FUND
18000.000	42.2	8.8	0.7	51.7	Peak [Scan]	H	200	0	54	-2.3	Pass	NOISE
5565.130	54.4	4.7	-9.7	49.3	Peak [Scan]	V					Pass	BE

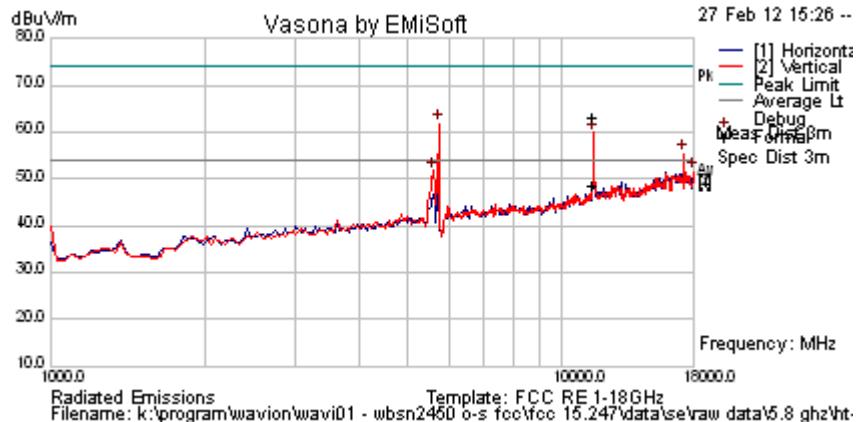
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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**Page:** 350 of 412

<b>Test Freq.</b>	5745 MHz	<b>Engineer</b>	GMH
<b>Variant</b>	802.11n; HT-20; 6.5 Mbit/s, MCS0	<b>Temp (°C)</b>	21.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	31
<b>Power Setting</b>	25	<b>Press. (mBars)</b>	995
<b>Antenna</b>	8.5dBi Omni	<b>Duty Cycle (%)</b>	100
<b>Test Notes 1</b>			
<b>Test Notes 2</b>			



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11483.056	58.6	6.8	-2.0	63.4	Peak Max	V	150	3	74.0	-10.6	Pass	RB
11483.056	43.9	6.8	-2.0	48.7	Average Max	V	150	3	54.0	-5.3	Pass	RB
5735.471	66.6	4.8	-9.5	61.8	Peak [Scan]	V						FUND
17250.501	45.8	8.6	1.0	55.4	Peak [Scan]	V						Pass NRB
18000.000	42.4	8.8	0.7	51.9	Peak [Scan]	V	150	0	54	-2.1	Pass	NOISE
5599.198	56.7	4.7	-9.7	51.7	Peak [Scan]	V	200	0	54	-2.4	Pass	BE

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

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