Test of Aruba AP-104 802.11a/b/g/n Wireless AP

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

Test Report Serial No.: ARUB99-U2 Rev A

TEST REPORT

FROM

MiCOM Labs

Test of Aruba AP-104 802.11a/b/g/n Wireless AP

to

To FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: ARUB99-U2 Rev A

Note: this report contains data with regard to the 2400 to 2483.5 MHz and 5725 to 5850 MHz operational modes of the Aruba Networks AP-104 Wireless Access Point. 5,150 to 5,250 MHz test data is reported in MiCOM Labs test report ARUB99-U3.

This report supersedes: NONE

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

Product Function: Wireless Access Point

Copy No: pdf Issue Date: 4th April 2012

This Test Report is Issued Under the Authority of;

MiCOM Labs, Inc.
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Pleasanton, CA 94566 USA
Phone: +1 (925) 462-0304
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ACCREDITED

TEST CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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ACCREDITATION, LISTINGS & RECOGNITION

ACCREDITATION

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

ilac-MRA

A2LA World Class Accreditation

The American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

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

Presented this 27th 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.

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

PRODUCT CERTIFICATION

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

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

Industry Canada – Certification Body
CAB Identifier – US0159

Europe – Notified Body
Notified Body Identifier - 2280

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

DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	4th April 2012	Initial release.

1. TEST RESULT CERTIFICATE

Manufacturer:	Aruba Networks, Inc 1344 Crossman Avenue Sunnyvale California 94089, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	802.11a/b/g/n Wireless Access Point	Telephone:	+1 925 462 0304
Model:	AP-104	Fax:	+1 925 462 0306
S/N's:	BE0253435		
Test Date(s):	7th - 30th Jan 2012	Website:	www.micomlabs.com

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:

ACCREDITED

TEST CERTIFICATE #2381.01

Graeme Grieve
Quality Manager MiCOM Labs,

Gordon Hurst
President & CEO MiCOM Labs, Inc.

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	4th 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

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.

3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description
Purpose:	Test of the Aruba AP-104 802.11a/b/g/n Wireless AP to FCC Part 15.247 and Industry Canada RSS-210 regulations.
Applicant:	Aruba Networks, Inc 1344 Crossman Avenue Sunnyvale California 94089, USA
Manufacturer:	As applicant.
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	ARUB99-U2 Rev A
Date EUT received:	6th January 2012
Standard(s) applied:	FCC 47 CFR Part 15.247 & IC RSS-210
Dates of test (from - to):	7th - 30th Jan 2012
No of Units Tested:	Two (separate units for conducted and radiated)
Type of Equipment:	802.11a/b/g/n Wireless Access Point, 2x2 Spatial Multiplexing MIMO configuration
Manufacturers Trade Name:	Wireless Access Point
Model(s):	AP-104
Location for use:	Indoor
Declared Frequency Range(s):	2400 - 2483.5 MHz; 5725 - 5850 MHz
Software Release	AOS 6.1.3. ART version: V09-B07
Type of Modulation:	Per 802.11 –CCK, BPSK, QPSK, DSSS, OFDM
Declared Nominal Average Output Power:	802.11b: +19 dBm 802.11g:Leg. +19dBm,HT-20 +19 dBm,HT-40 +18 dBm 802.11a:Leg. +19dBm,HT-20 +19 dBm,HT-40 +18 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:	12Vdc 1.25A; POE 48 Vdc 350 mA
Operating Temperature Range:	Declared range 0 to +40ºC
ITU Emission Designator:	2400 – 2483.5 MHz 802.11b 16M0G1D 2400 – 2483.5 MHz 802.11g 17M2D1D 2400 – 2483.5 MHz 802.11n – HT-20 19M0D1D 2400 – 2483.5 MHz 802.11n – HT-40 36M6D1D 5725 – 5850 MHz 802.11a 16M7D1D 5725 – 5850 MHz 802.11n – HT-20 17M8D1D 5725 – 5850 MHz 802.11n – HT-40 36M4D1D
Frequency Stability:	±20 ppm max
Equipment Dimensions:	132 X 135 X 45mm
Weight:	300 grams
Primary function of equipment:	Wireless Access Point for transmitting data and voice.

3.2. Scope of Test Program

The scope of the test program was to test the Aruba Networks AP-104 802.11a/b/g/n Wireless Access Point against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications in the frequency ranges 2400 - 2483.5 MHz and 5725 – 5850 MHz.

Aruba AP-104 Access Point
The AP-104 is a multi-band 802.11a/b/g/n dual-radio indoor wireless access point designed for dense enterprise deployments of 802.11n. The AP-104 delivers unprecedented value with the performance and reliability of 802.11n in a compact, streamlined 2x2 MIMO package. Capable of delivering wireless data rates of up to 300Mbps, the multifunction AP-104 provides wireless LAN access, air monitoring, and wireless intrusion detection and prevention over the 2.4GHz and 5GHz RF spectrum. The access point works in conjunction with Aruba's line of high-performance controllers to deliver high-speed, secure network services.

802.11n enables the use of wireless as a primary network connection with speed and reliability comparable to a wired LAN. 802.11n increases performance through techniques such as channel bonding, block acknowledgement, and Multiple In Multiple Out (MIMO). Advanced RF techniques such Cyclic Delay Diversity also increase range and reliability.

The AP-104 features a 100/1000Base-T Ethernet interface and operates from standard 802.3af Power over Ethernet (PoE) sources. Equipped with four external antenna ports, the AP-104 provides full RF diversity and 2x2 MIMO operation on both the 2.4GHz and 5GHz bands.

Aruba Networks AP-104

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

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial Nos.
EUT	802.11a/b/g/n Wireless Access Point	Aruba Networks	AP-104	BE0253435
Support	Laptop PC	IBM	Thinkpad	None

3.4. Antenna Details

1. External Antennas;-

Model	Type	Gain	Freq. Band	Note
		dBi	MHz	
AP-ANT-1B	Omni	3.8	2400 - 2500	(4 x per unit)
		5.8	4900 - 5875	
AP- ANT-1F	Omni	2.8	2400-2500	(4 x per unit)
		4.5	5100-5900	(4 x per unit)
AP-ANT-8	Omni	5	2400-2500	(2 x per unit)
AP-ANT-10	Omni	6	5100-5900	(2 x per unit)
AP-ANT-13B	Omni	4.4	2400 - 2500	(2 x per unit)
		3.3	4900 - 5900	
AP-ANT-14	Omni	3	2400-2500	(1x per unit)
		3.6	4900-5990	MIMO
AP-ANT-16	Omni	3.9	2400 - 2500	(1x per unit)
		4.7	4900 - 5900	MIMO
AP-ANT-17	Directional 120degr.	6	2400 - 2500	(1x per unit)
		5	4900 - 5875	MIMO
AP-ANT-18	Directional 60degr.	7	2400 - 2500	(1x per unit)
		7.5	5150 - 5875	MIMO
AP-ANT-19	Omni	3	2400 - 2500	(2 x per unit)
		6	5150 - 5875	

Antenna's highlighted were the highest gain antenna tested as part of this test program. All other antennas were of equal or lower gain.

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. 10/100/1000 Ethernet
2. Console – serial maintenance terminal
3. 12 Vdc, 4mm supply connector

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 2,437 2,462
g	Legacy	6 MBit/s	
n	HT-20	6.5 MCS	
	HT-40	13.5 MCS	2,422 2,437 2,452
a	Legacy	6 MBit/s	5,745 5,785 5,825
n	HT-20	6.5 MCS	
	HT-40	13.5 MCS	5,755 5,785 5,815

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report.

Antenna Test Configurations for Radiated Emissions

Spurious Emission and Band-Edge Test Strategy

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

2,400 – 2483.5 MHz

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

KEY;-

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

5,725 – 5850 MHz

15.247	
	External
Legacy	
802.11a	a SE 5745
	a SE 5785
	a SE 5825
	Pk a 5745
	Pk a 5785
	Pk a 5825
	BE a 5460
HT-20	a SE 5745
	a SE 5785
	a SE 5825
	Pk a 5745
	Pk a 5785
	Pk a 5825
	BE a 5460
HT-40	a SE 5755
	a SE 5795
	Pk a 5755
	Pk a 5795
	BE a 5460

KEY;-

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

3.7. Equipment Modifications

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

EUT Software Power Settings - Radiated Testing

1. Measurements were made using the highest gain antenna used with the AP-104, Antenna AP-ANT-18; 7 dBi 2400 - 2483.5 MHz band and 7.5 dBi; 5725 – 5850 MHz band.

2. As no other antennas were fully evaluated for radiated emissions and band edge performance these ART power settings apply irrespective of the antenna installed with the AP-104.

AP-ANT-18; 7 dBi 2400 - 2483.5 MHz

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Aggregate Measured Pwr (dBm)
11b	2412	20	17.5	+21.63
	2437	20	20.0	+23.69
	2462	20	14.0	+18.85
11g	2412	20	15.5	+20.52
	2437	20	20.0	+22.51
	2462	20	14.0	+18.83
HT-20	2412	20	15.5	+20.42
	2437	20	20.0	+23.51
	2462	20	12.0	+16.97
HT-40	2422	20	12.0	+17.43
	2437	20	20.0	+22.52
	2452	20	11.0	+16.33

AP-ANT-18; 7.5 dBi; 5725 – 5850 MHz

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Aggregate Measured Pwr (dBm)
11a	5745	20	20.0	+22.16
	5785	20	20.0	+21.73
	5825	20	20.0	+21.61
HT-20	5745	20	20.0	+22.28
	5785	20	20.0	+21.98
	5825	20	19.0	+21.86
HT-40	5755	20	20.0	+22.08
	5795	20	20.0	+21.56

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

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
15.247(a)(2) **A8.2(1)** **4.4**	6 dB and 99 % Bandwidths	≥500 kHz	Conducted	Complies	5.1.1
15.247(b)(3) **15.31(e)** **A8.4(4)**	Peak Output Power Voltage Variation	Shall not exceed 1W Variation of supply voltage 85 % -115 %	Conducted	Complies	5.1.2
15.247(e) **A8.2**	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	5.1.3
15.247(i) **5.5**	Maximum Permissible Exposure	Exposure to radio frequency energy levels	Conducted	Complies	5.1.4
15.247(d) **15.205 /** **15.209** **A8.5** **2.2** **4.7**	Spurious Emissions (30MHz - 26 GHz b/g and 30 MHz – 40 GHz a)	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

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
15.247(d) **15.205 /** **15.209** **A8.5** **2.2** **2.6** **4.7**	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 **RSS-Gen §4.10, §6**	Receiver Radiated Spurious Emissions	Emissions above 1 GHz		Complies	*5.1.6.3*
15.205 / **15.209** **2.2**	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz)	Radiated	Complies	*5.1.6.4*
15.207 **7.2.2**	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*

5. TEST RESULTS

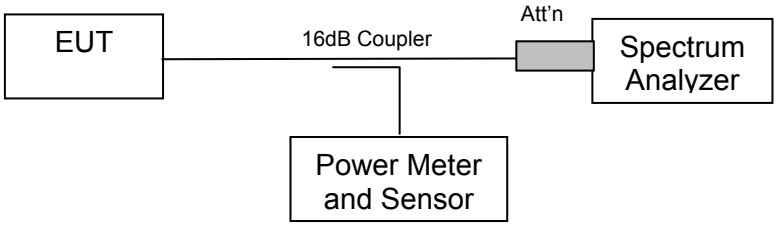
5.1. Device Characteristics

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

Test Conditions:	15.247 (a)(2)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11b	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

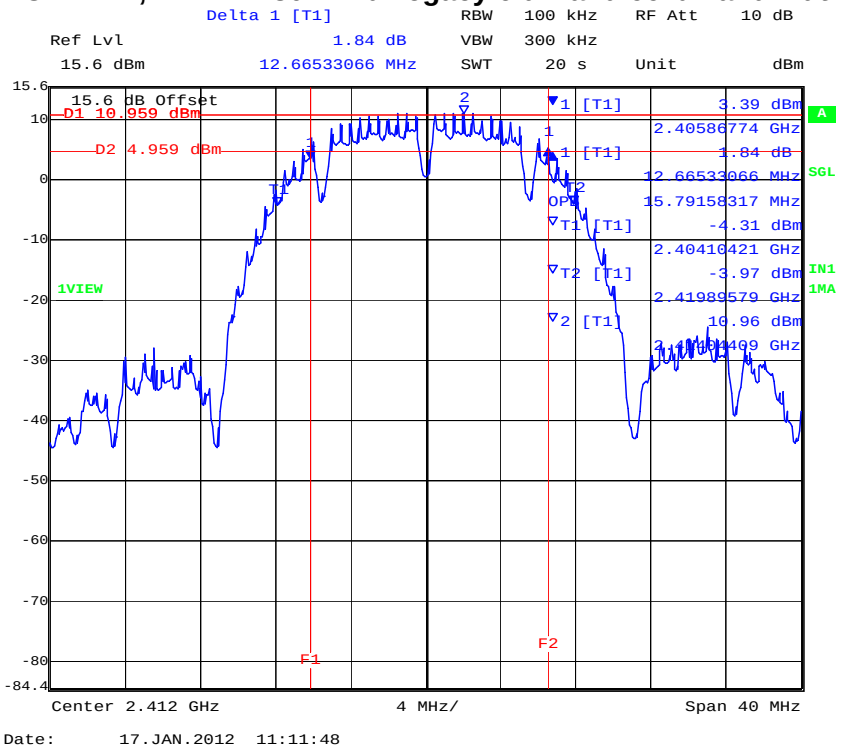
Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
2412.000	12.665000	12.184000	--	--	500	0.5	-11.684000
2437.000	12.665000	12.184000	--	--			-11.684000
2462.000	12.184000	11.222000	--	--			-10.722000

99% Bandwidth

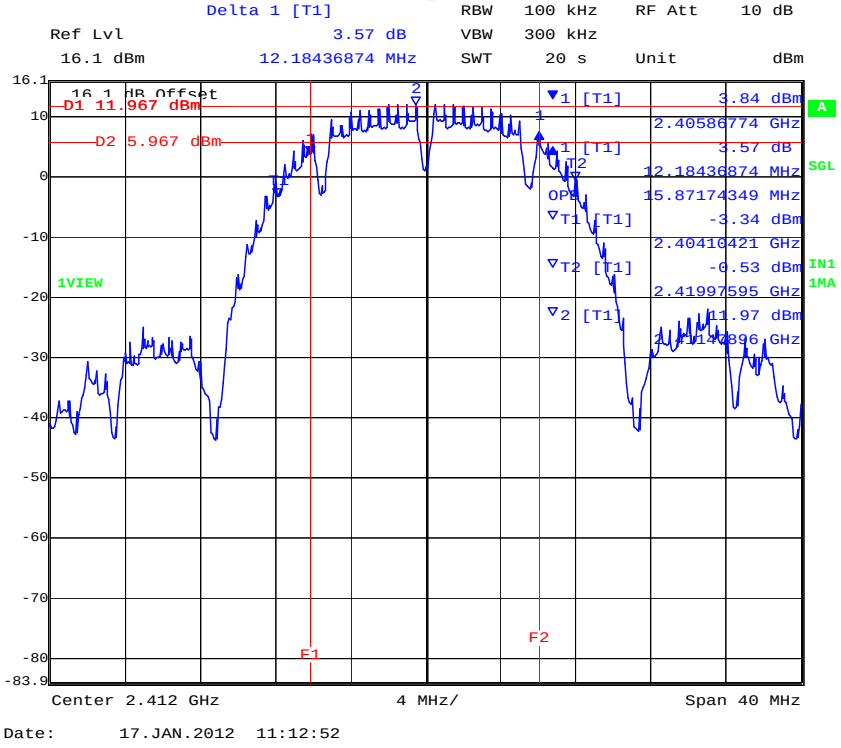
Test Frequency	99 % Bandwidth						
	MHz						
MHz	**a**	**b**	**c**	**d**			
2412.000	15.792000	15.872000	--	--			
2437.000	15.952000	15.872000	--	--			
2462.000	15.952000	15.872000	--	--			

Measurement uncertainty:	±2.81 dB

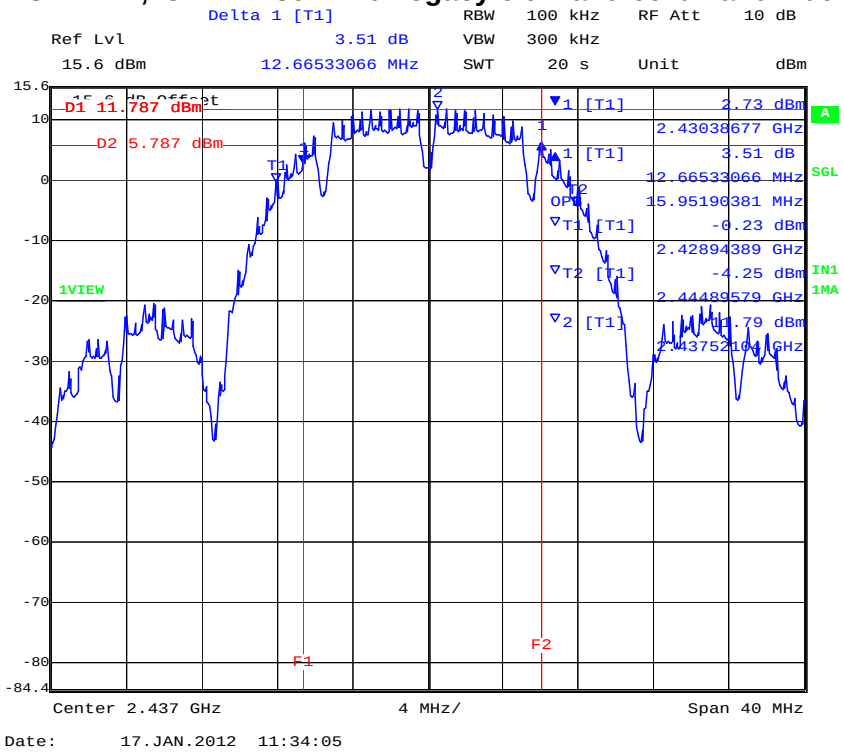
PORT A 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth



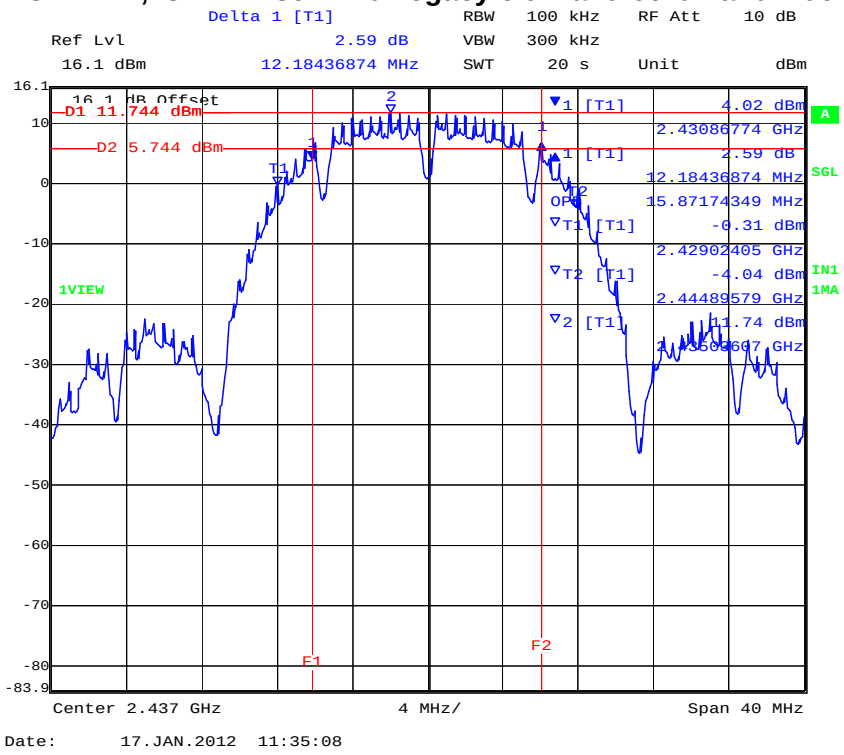
PORT B 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth



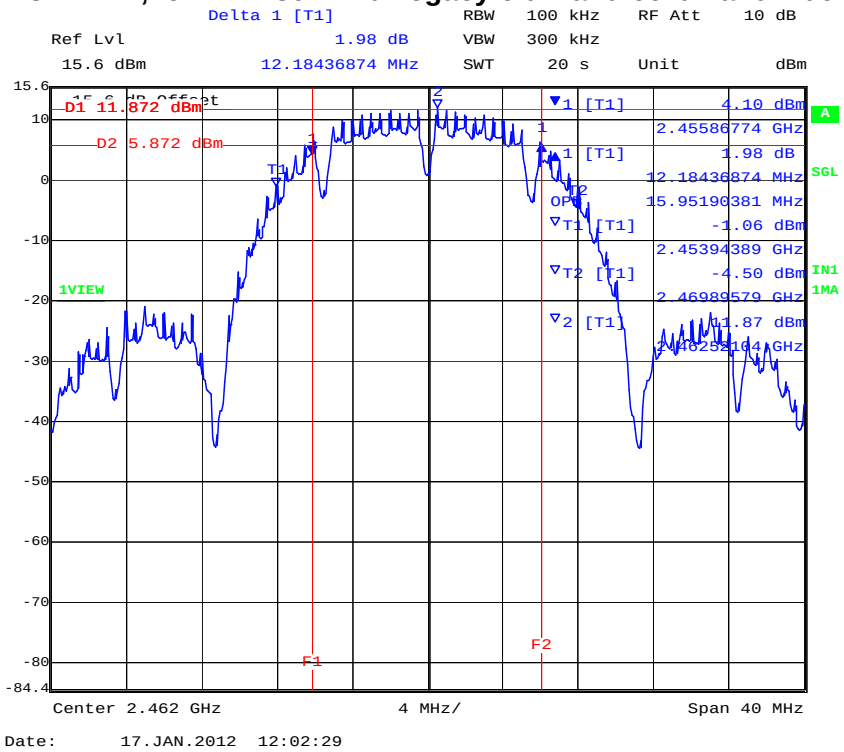
PORT A 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth



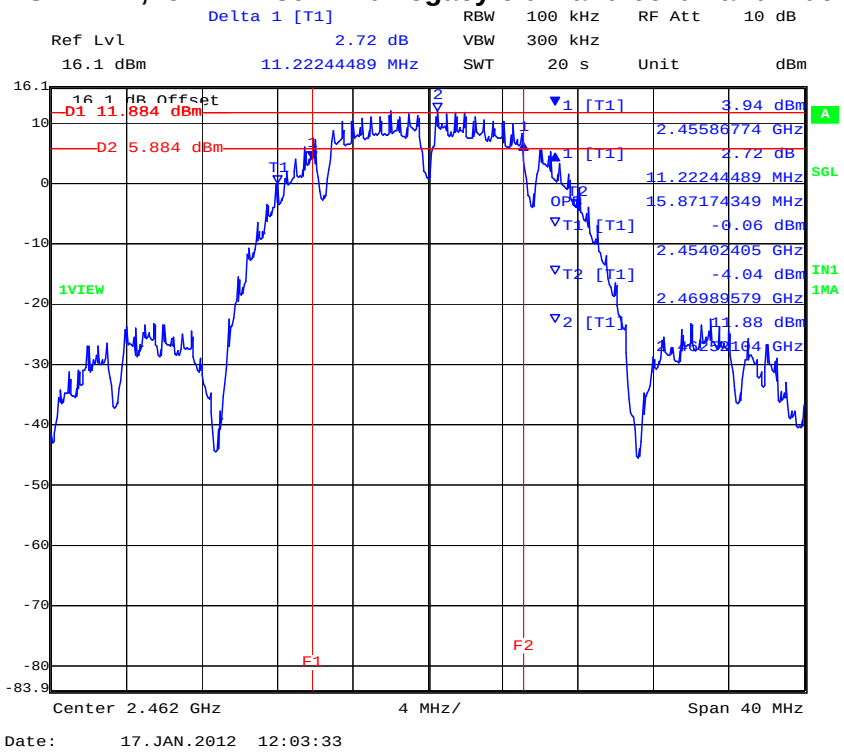
PORT B 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth



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



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



Test Conditions:	15.247 (a)(2)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11g	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

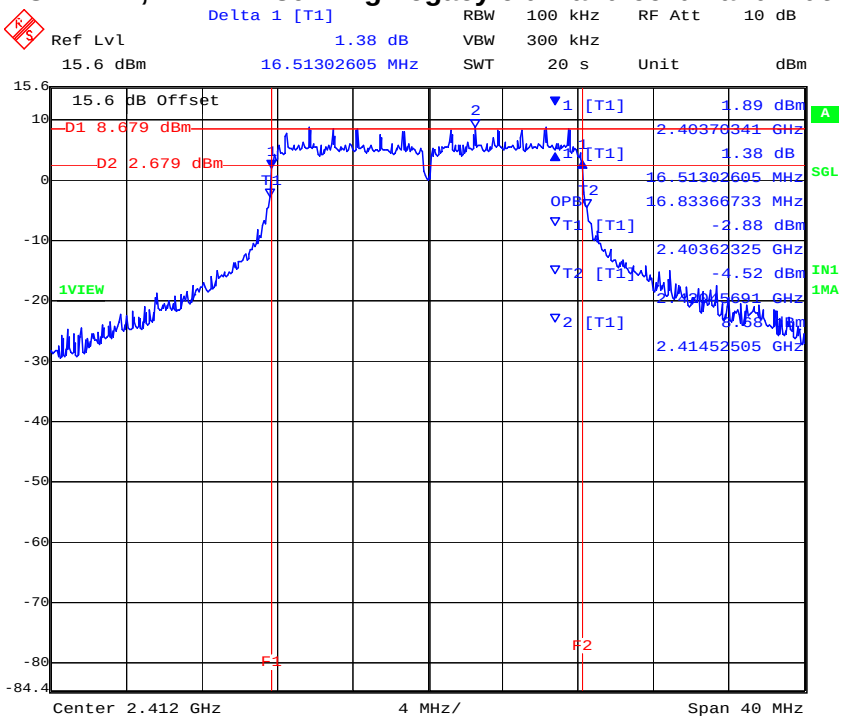
Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
2412.000	16.513000	16.513000	--	--	500	0.5	-16.013000
2437.000	16.433000	16.433000	--	--			-15.933000
2462.000	16.513000	16.433000	--	--			-15.933000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	**a**	**b**	**c**	**d**			
2412.000	16.834000	16.994000	--	--			
2437.000	16.914000	17.154000	--	--			
2462.000	16.914000	16.994000	--	--			

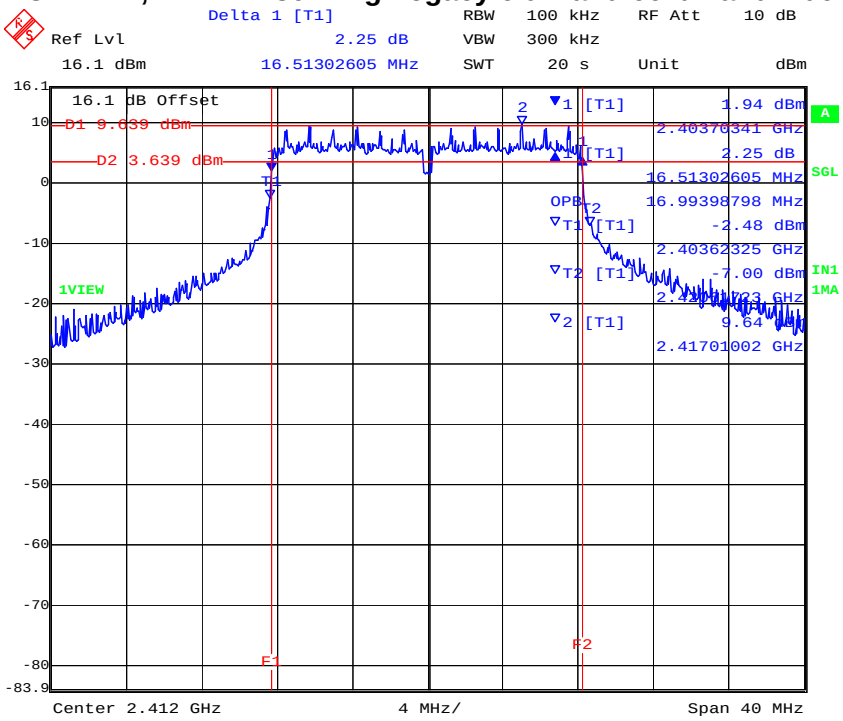
Measurement uncertainty:	±2.81 dB

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



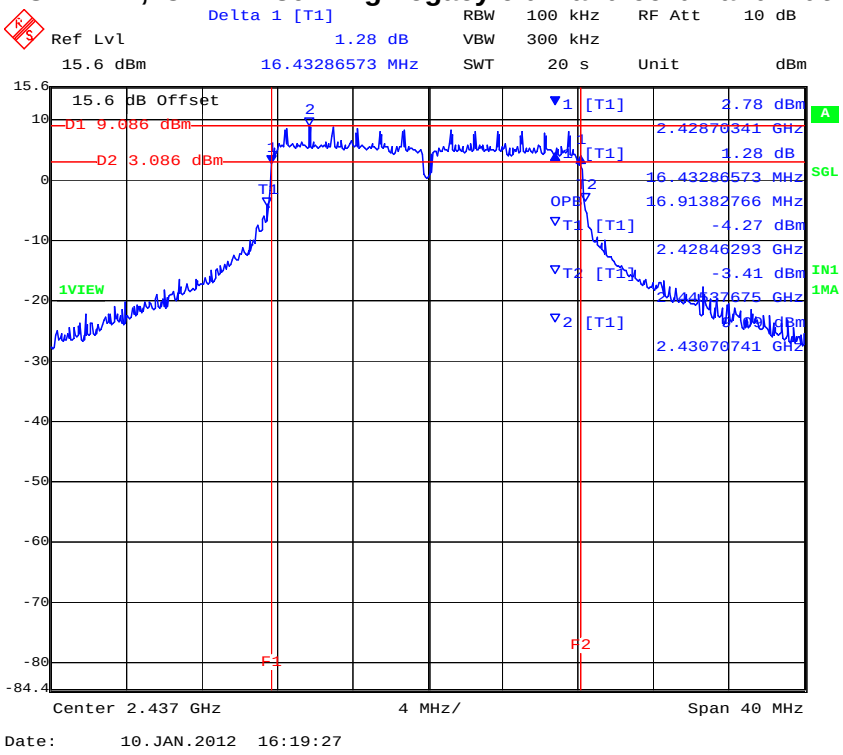
Date: 10.JAN.2012 15:50:58

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

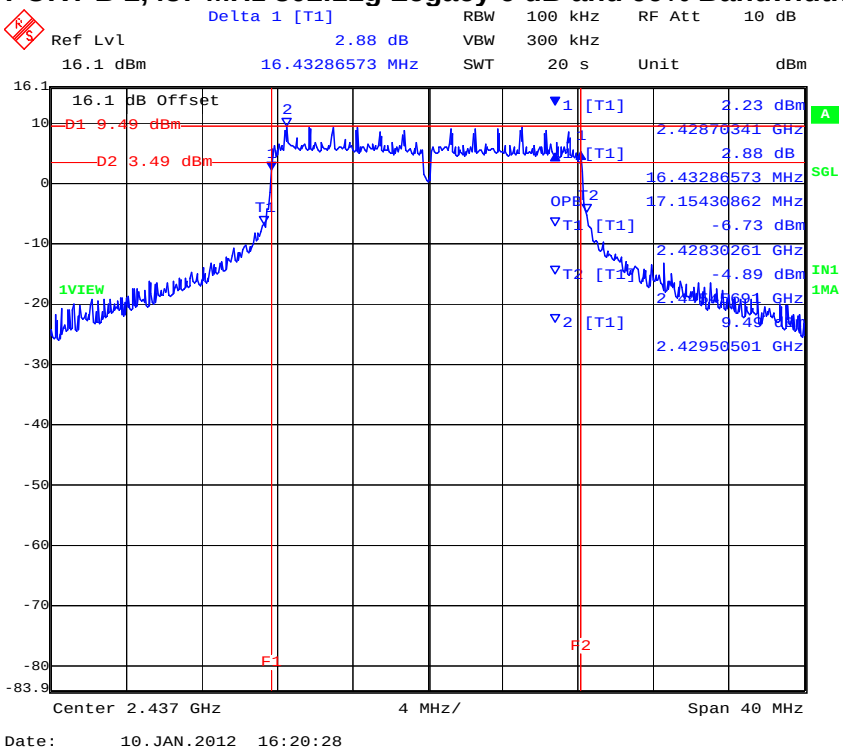


Date: 10.JAN.2012 15:52:01

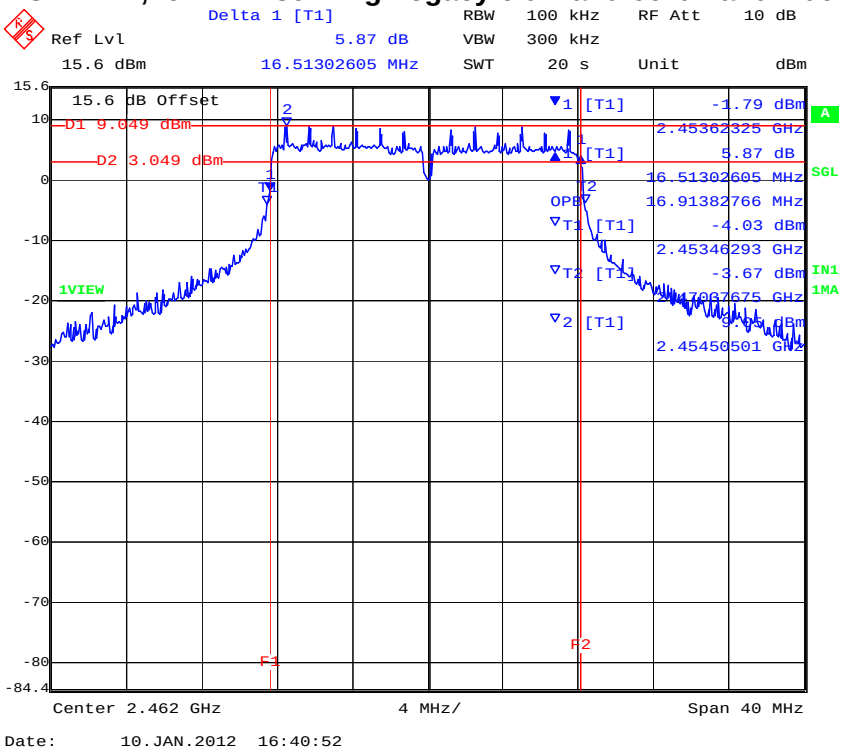
PORT A 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth



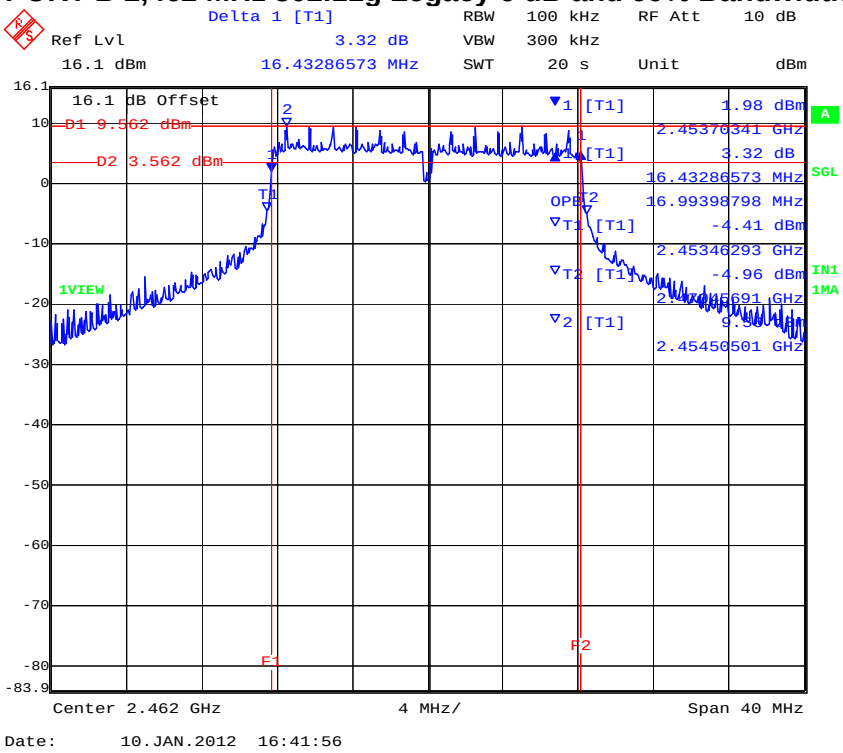
PORT B 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth



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



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



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	5 dBi	
Applied Voltage:	12.00	Vdc			
Notes 1:					
Notes 2:					

6 dB Bandwidth

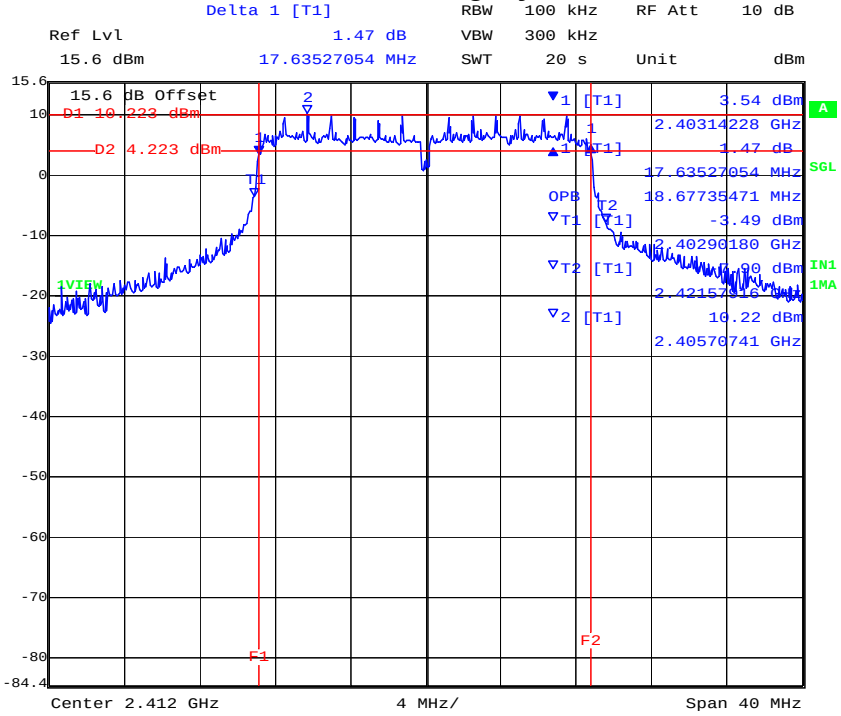
Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
2412.000	17.635000	17.635000	--	--	500	0.5	-17.135000
2437.000	17.635000	17.635000	--	--			-17.135000
2462.000	17.635000	17.635000	--	--			-17.135000

99% Bandwidth

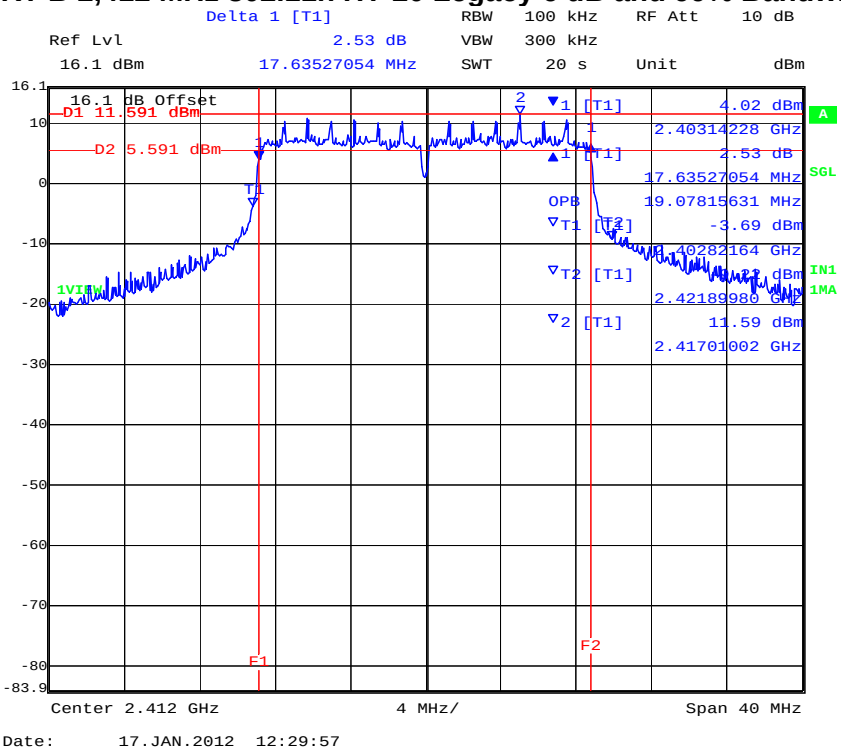
Test Frequency	99 % Bandwidth						
	MHz						
MHz	**a**	**b**	**c**	**d**			
2412.000	18.677000	19.078000	--	--			
2437.000	19.078000	18.838000	--	--			
2462.000	18.437000	18.758000	--	--			

Measurement uncertainty:	±2.81 dB

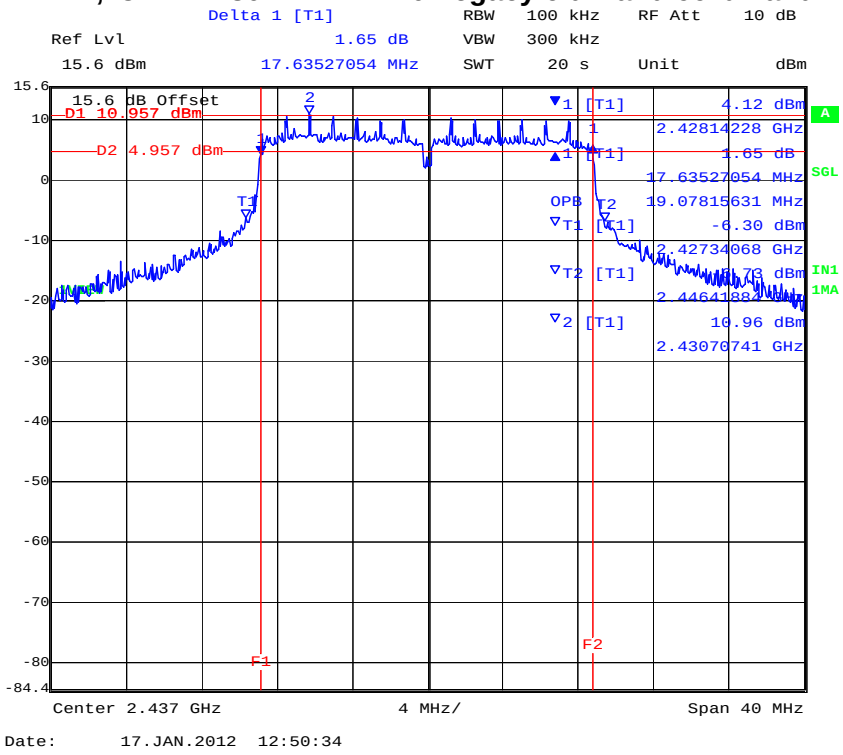
PORT A 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



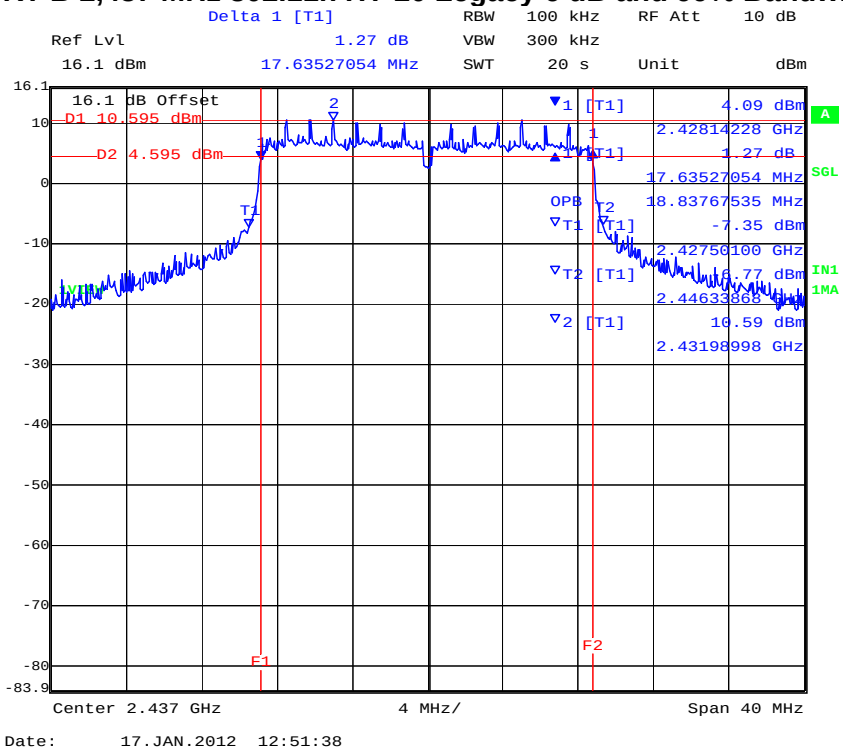
PORT B 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



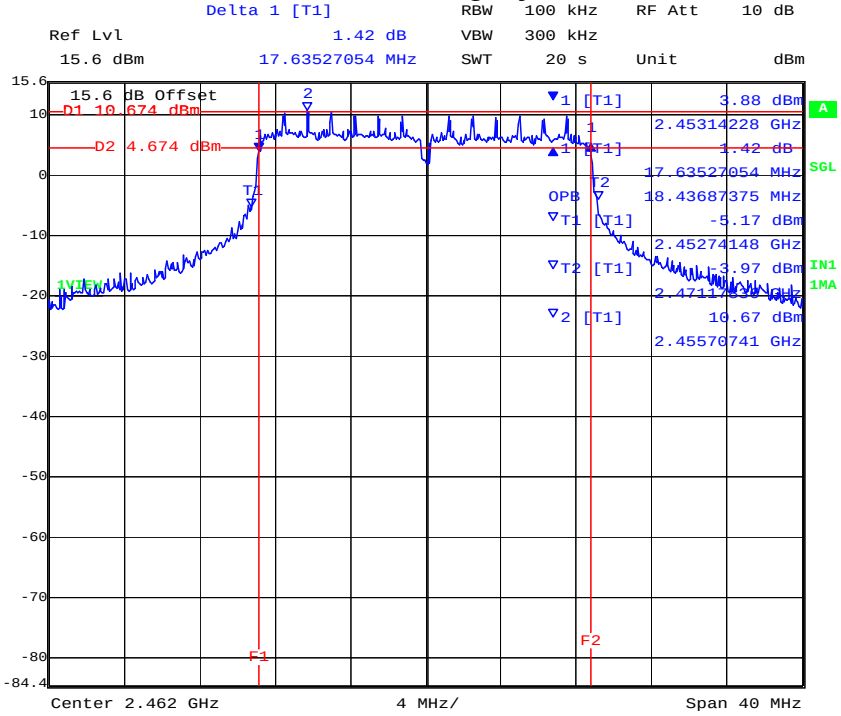
PORT A 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



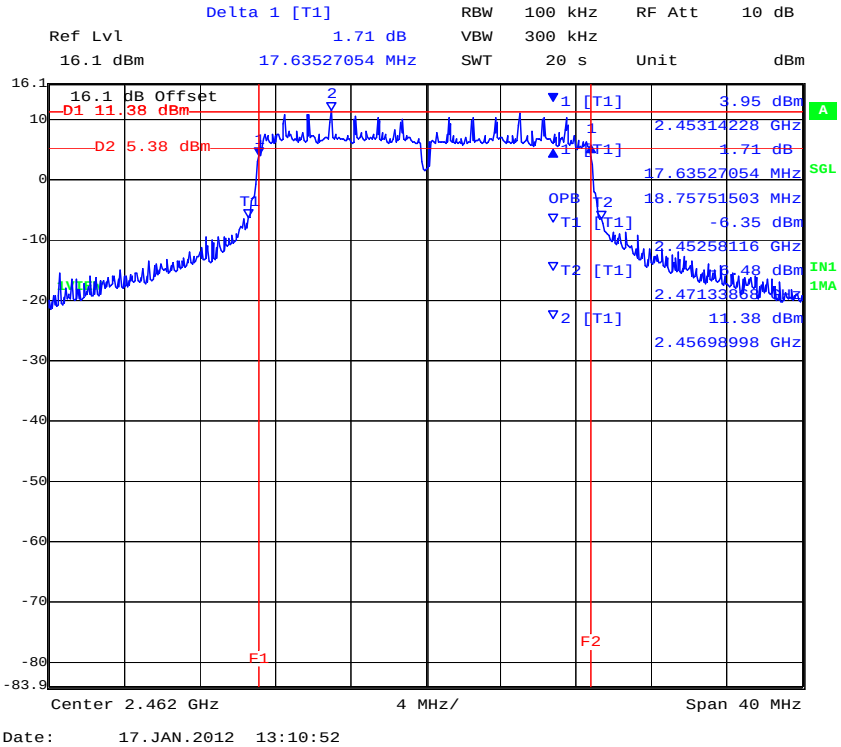
PORT B 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



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



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



Test Conditions:	15.247 (a)(2)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-40	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

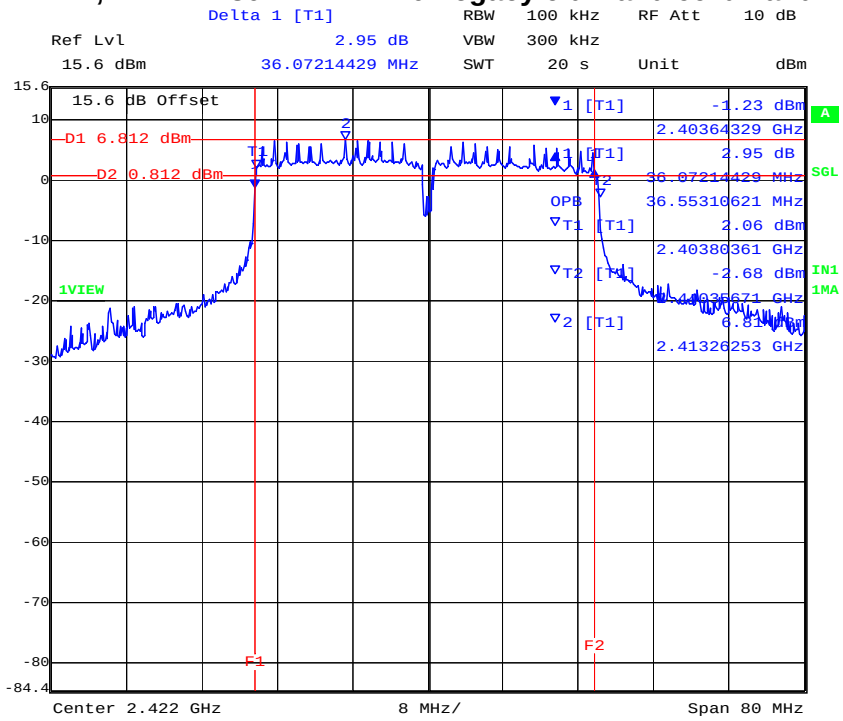
Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
2422.000	36.072000	36.072000	--	--	500	0.5	-35.572000
2437.000	36.072000	35.912000	--	--			-35.412000
2452.000	36.232000	36.072000	--	--			-35.572000

99% Bandwidth

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

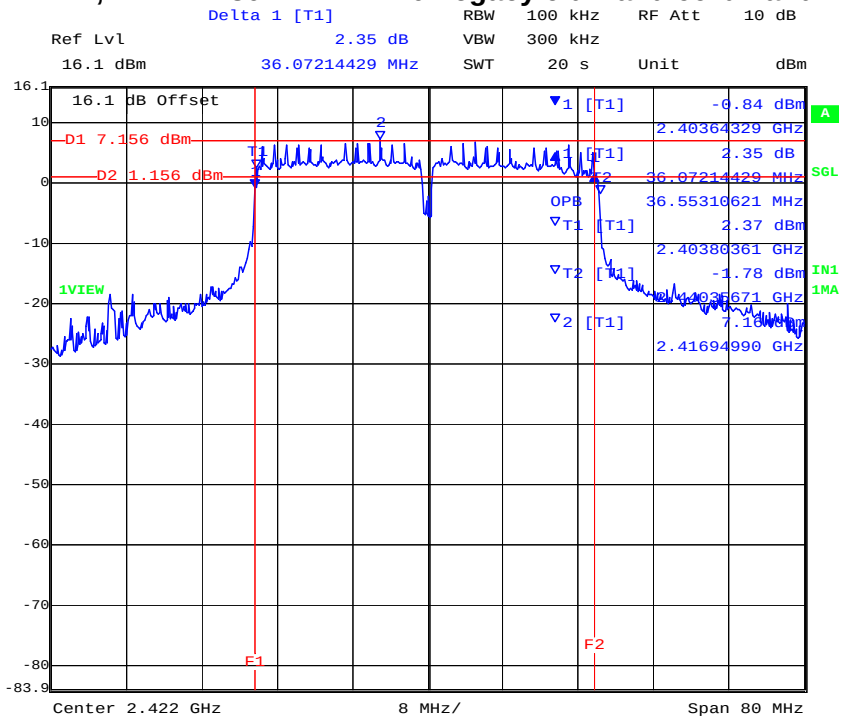
Measurement uncertainty:	±2.81 dB

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



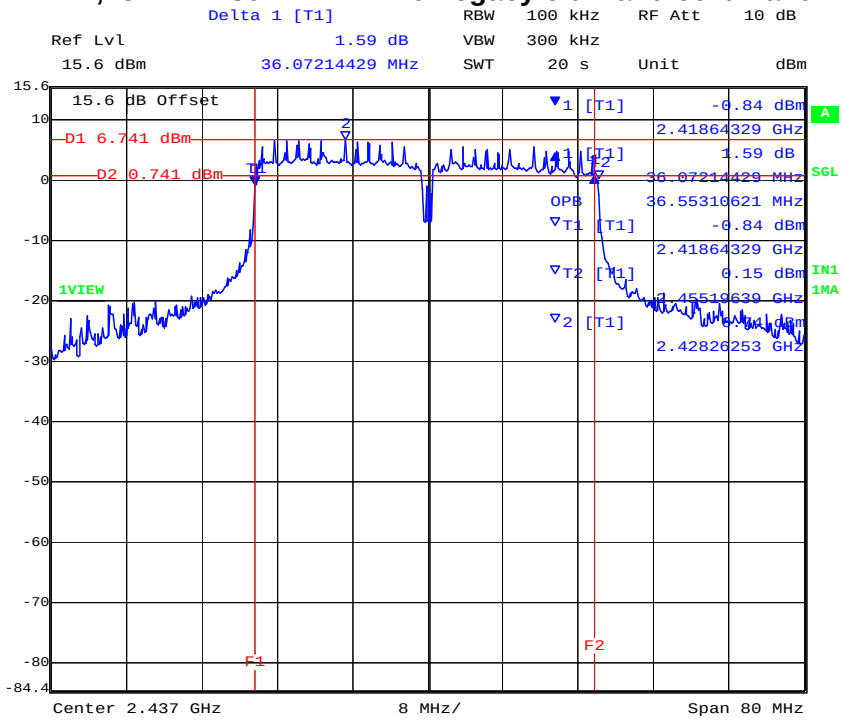
Date: 17.JAN.2012 13:32:49

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

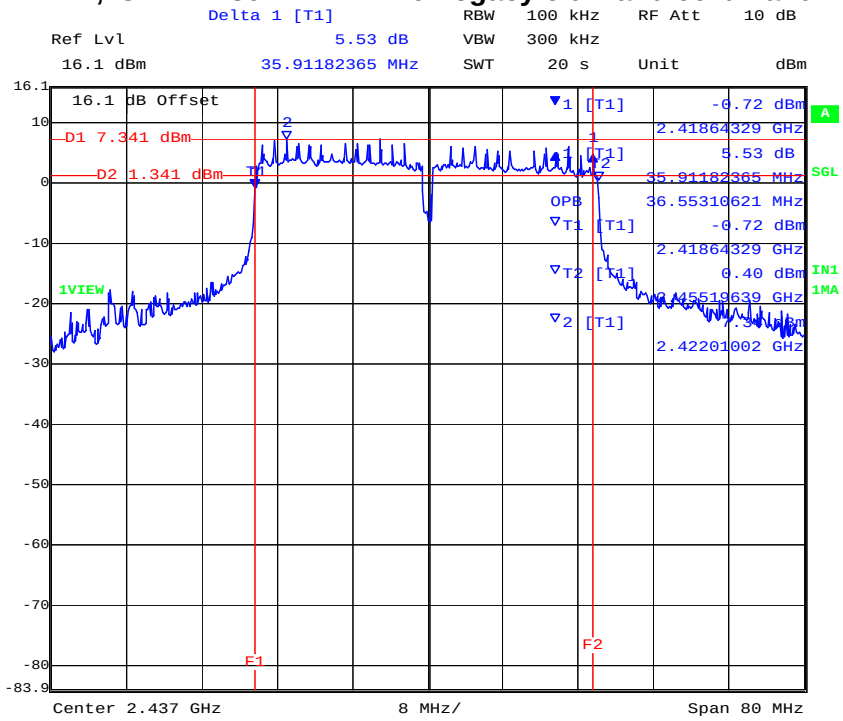


Date: 17.JAN.2012 13:33:50

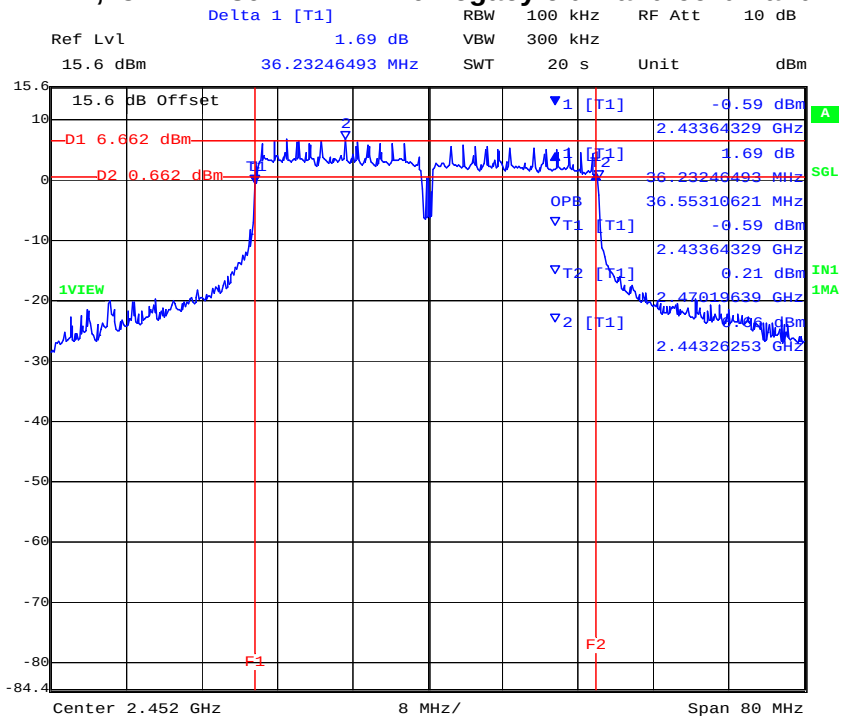
PORT A 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



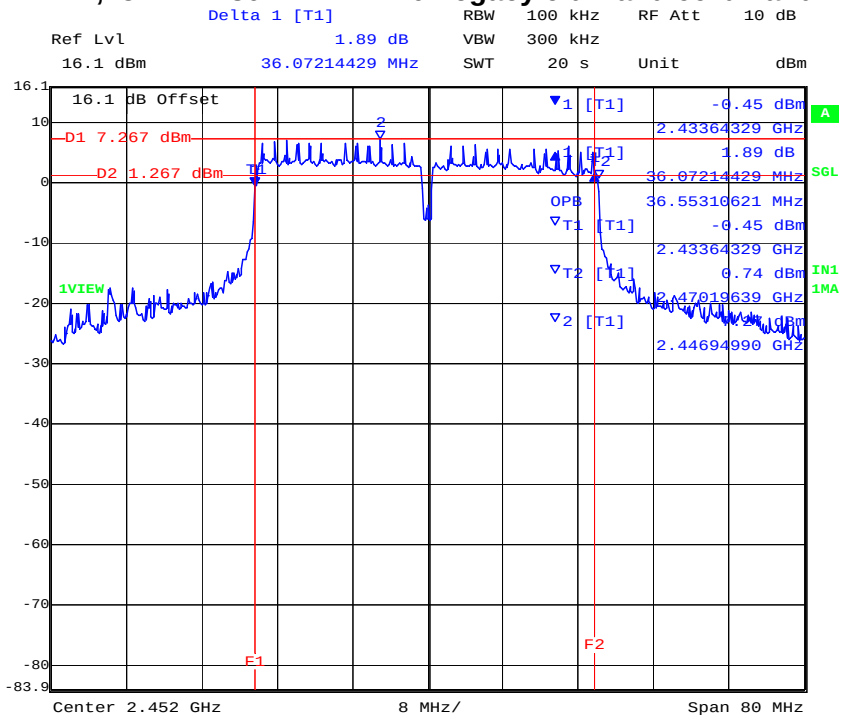
PORT B 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



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



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



Test Conditions:	15.247 (a)(2)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11a	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

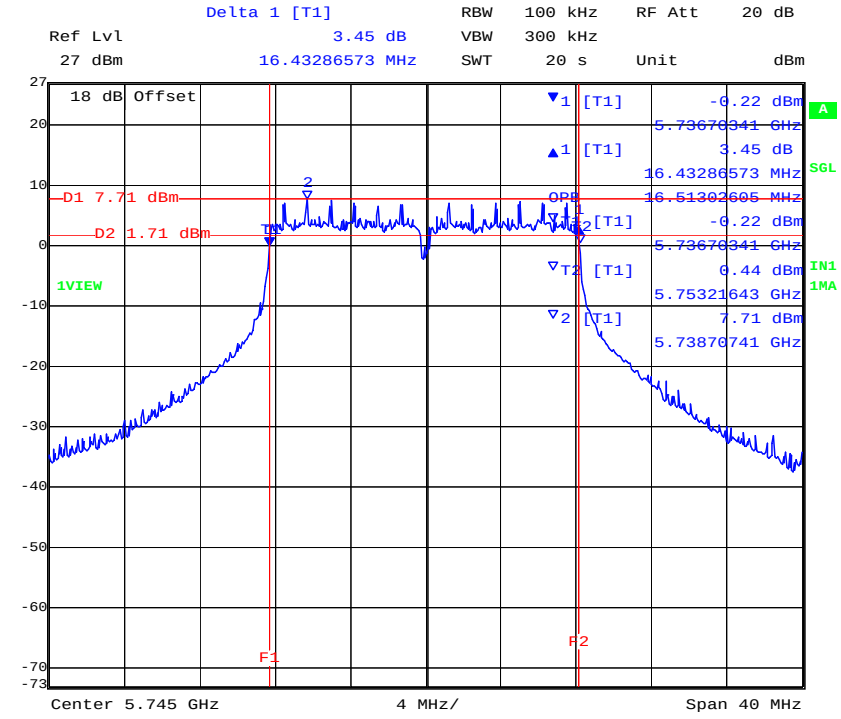
Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
5745.000	16.433000	16.433000	--	--	500	0.5	-15.933000
5785.000	16.433000	16.433000	--	--			-15.933000
5825.000	16.433000	16.433000	--	--			-15.933000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	**a**	**b**	**c**	**d**			
5745.000	16.513000	16.673000	--	--			
5785.000	16.513000	16.673000	--	--			
5825.000	16.513000	16.673000	--	--			

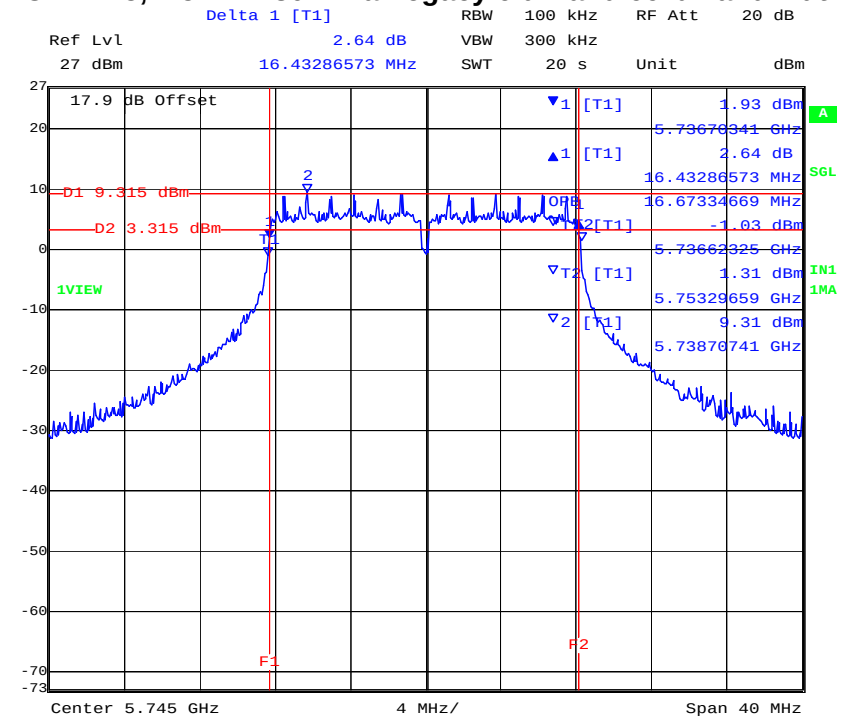
Measurement uncertainty:	±2.81 dB

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



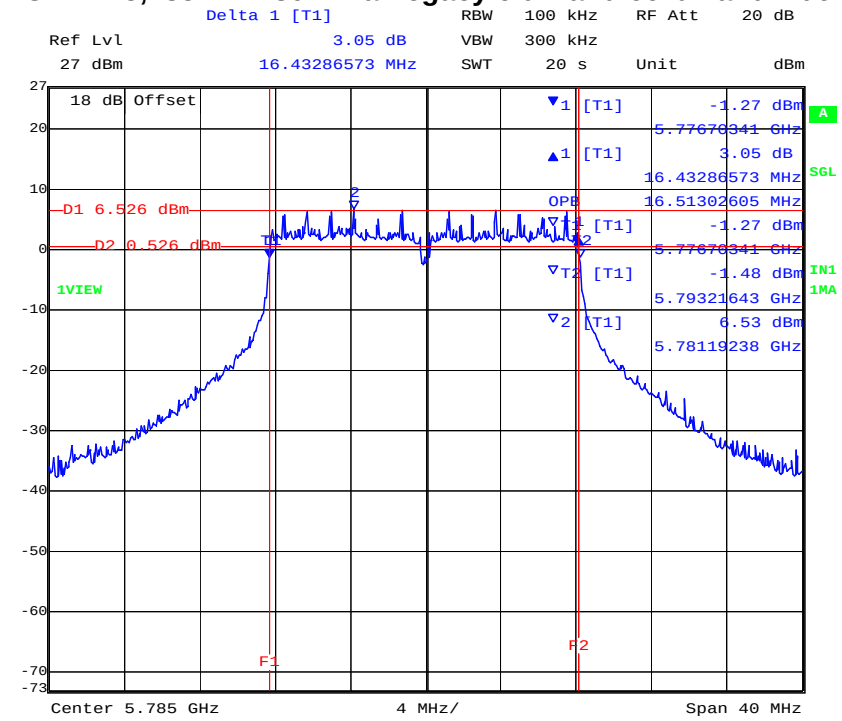
Date: 17.JAN.2012 14:42:05

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



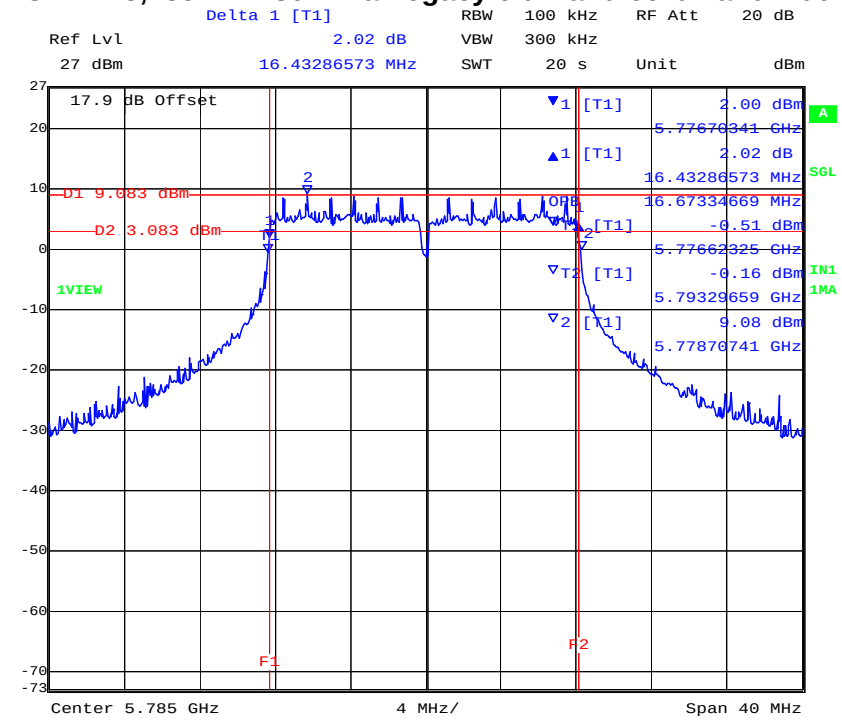
Date: 17.JAN.2012 14:43:07

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



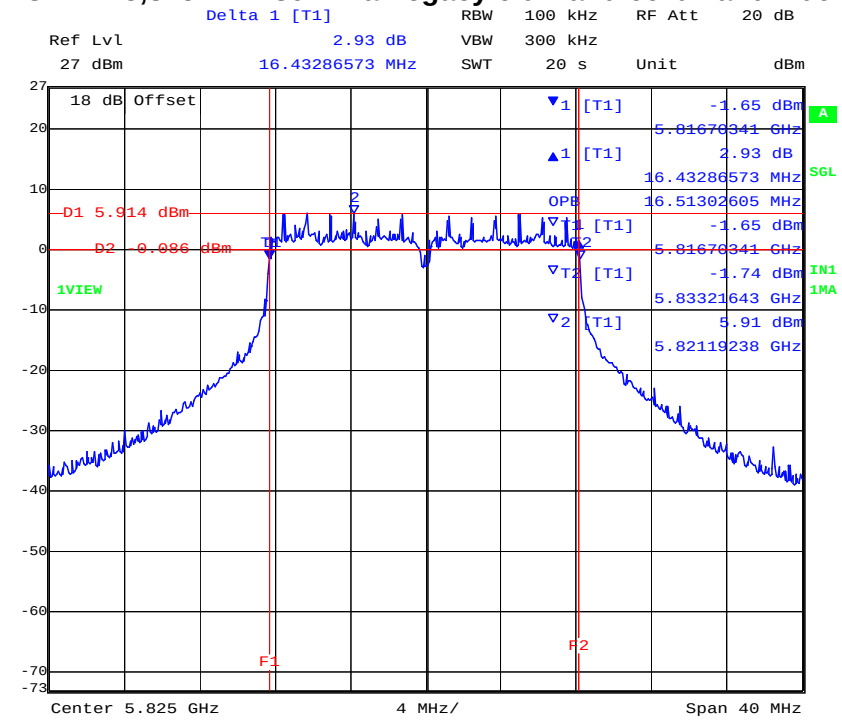
Date: 17.JAN.2012 15:03:55

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



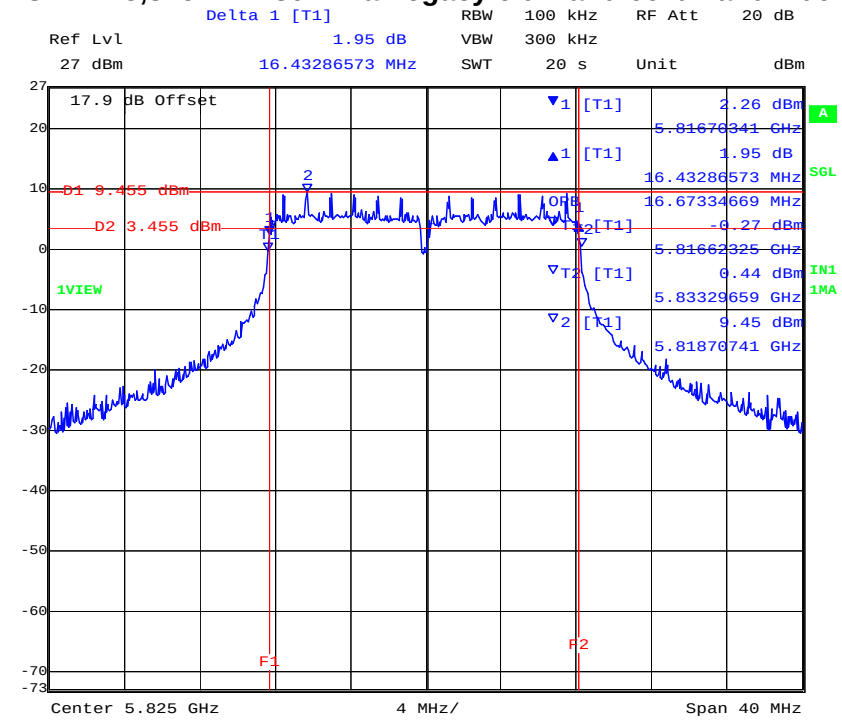
Date: 17.JAN.2012 15:04:58

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



Date: 17.JAN.2012 15:23:13

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



Date: 17.JAN.2012 15:24:17

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to	42
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to	22
TPC:	HIGH		**Pressure (mBars):**	998 to	1003
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	6 dBi	
Applied Voltage:	12.00	Vdc			
Notes 1:					
Notes 2:					

6 dB Bandwidth

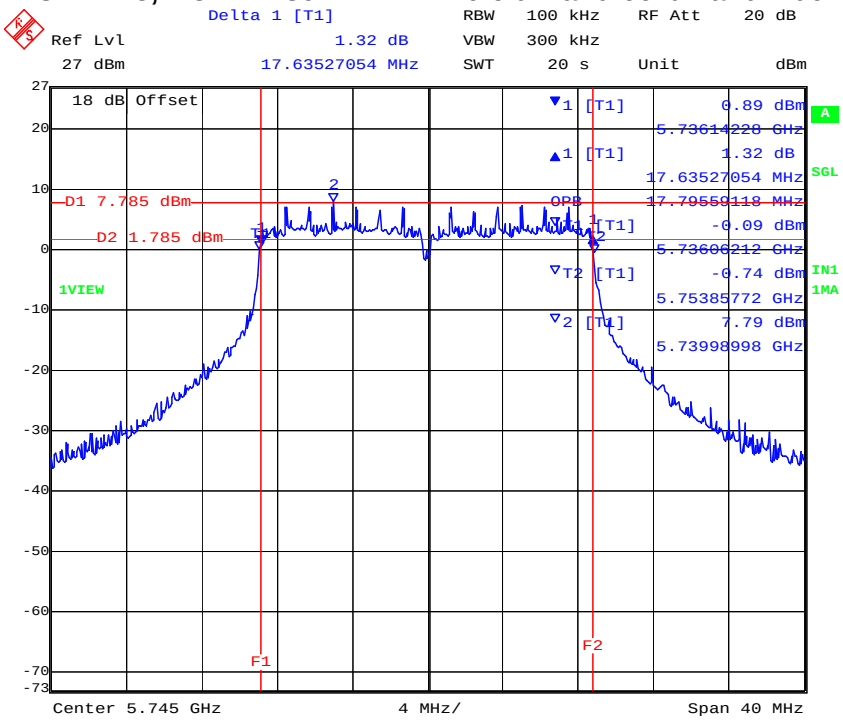
Test Frequency	**6 dB Bandwidth**				**Minimum 6dB Bandwidth Limit**		**Margin**
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
5745.000	17.635000	17.635000	--	--	500	0.5	-17.135000
5785.000	17.154000	17.635000	--	--			-16.654000
5825.000	17.395000	17.635000	--	--			-16.895000

99% Bandwidth

Test Frequency	**99 % Bandwidth**						
	MHz						
MHz	**a**	**b**	**c**	**d**			
5745.000	17.796000	17.796000	--	--			
5785.000	17.796000	17.796000	--	--			
5825.000	17.715000	17.796000	--	--			

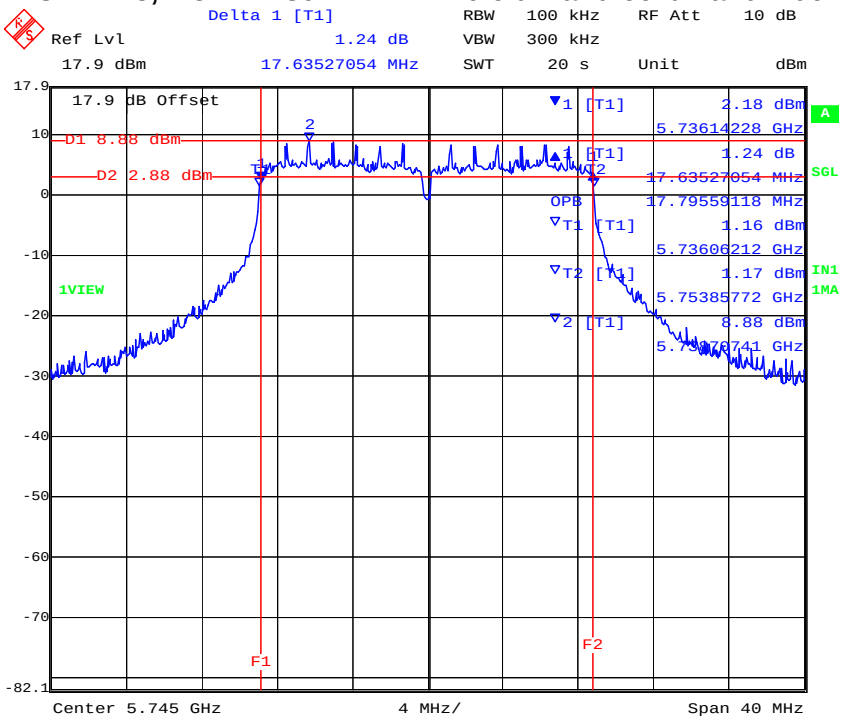
Measurement uncertainty:	±2.81 dB

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



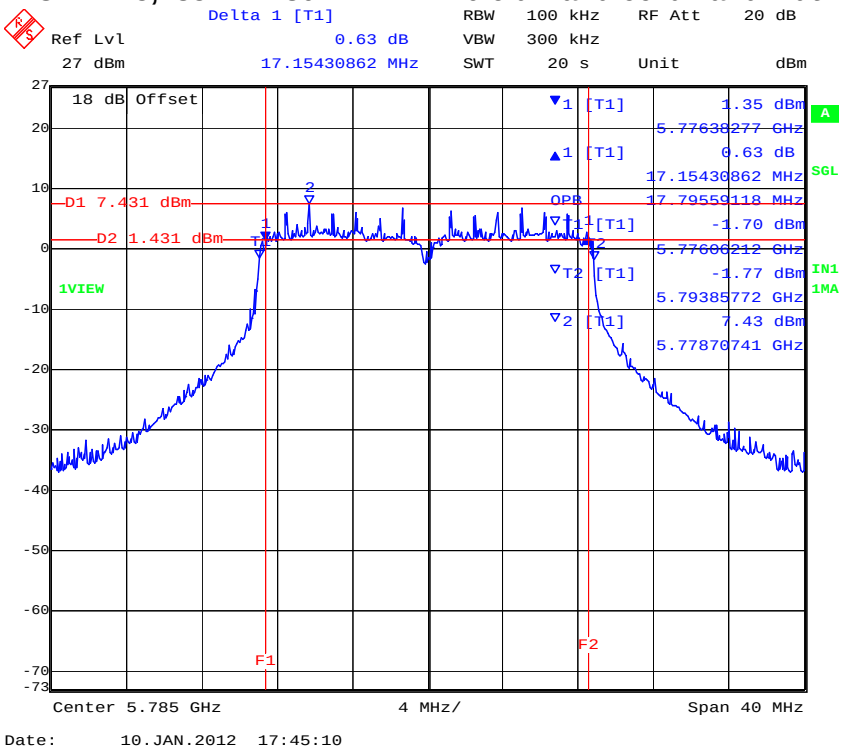
Date: 10.JAN.2012 17:15:00

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

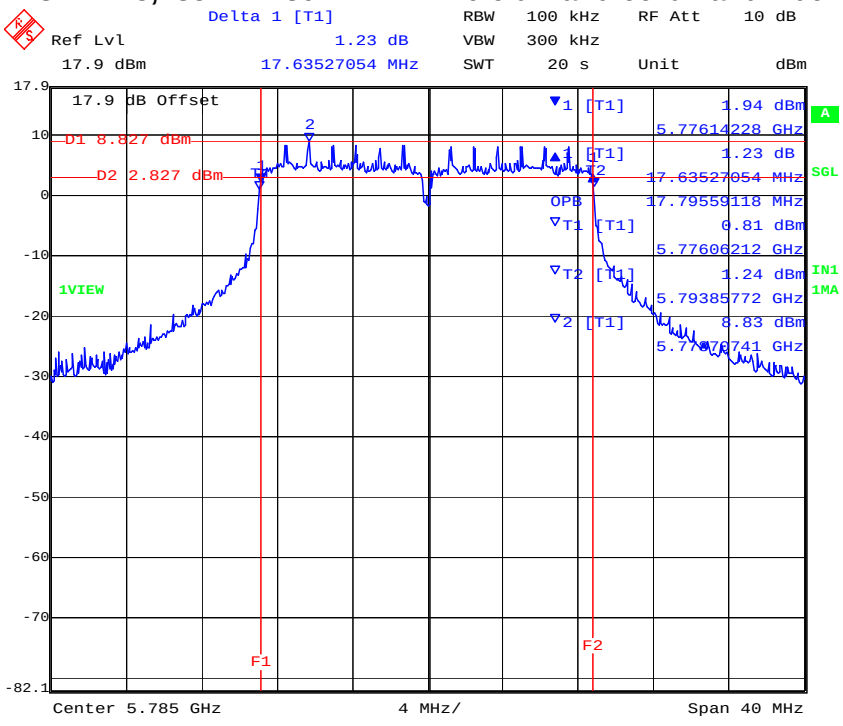


Date: 10.JAN.2012 17:16:02

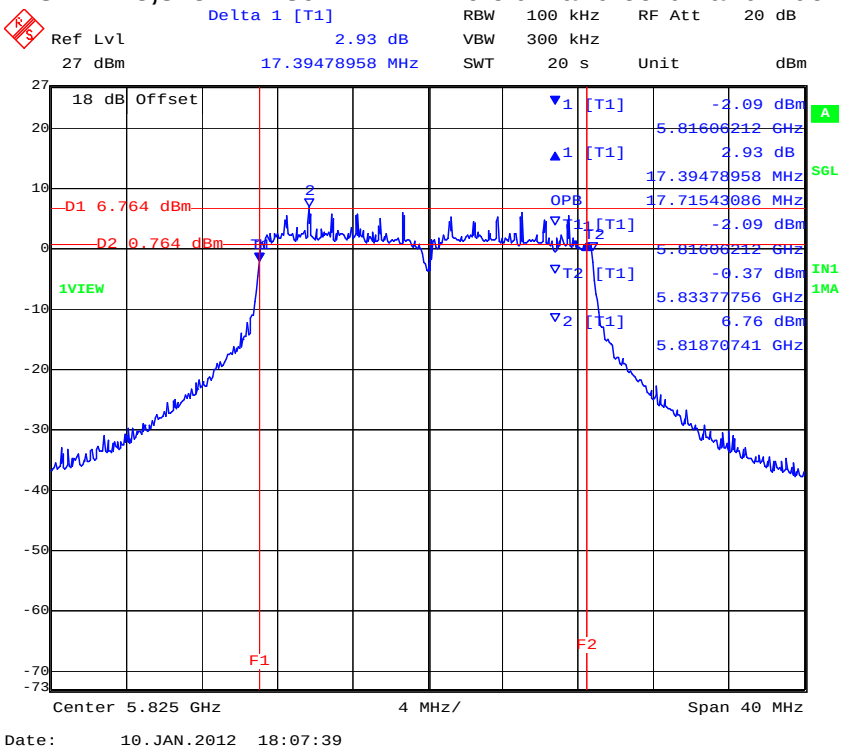
PORT A 5,785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



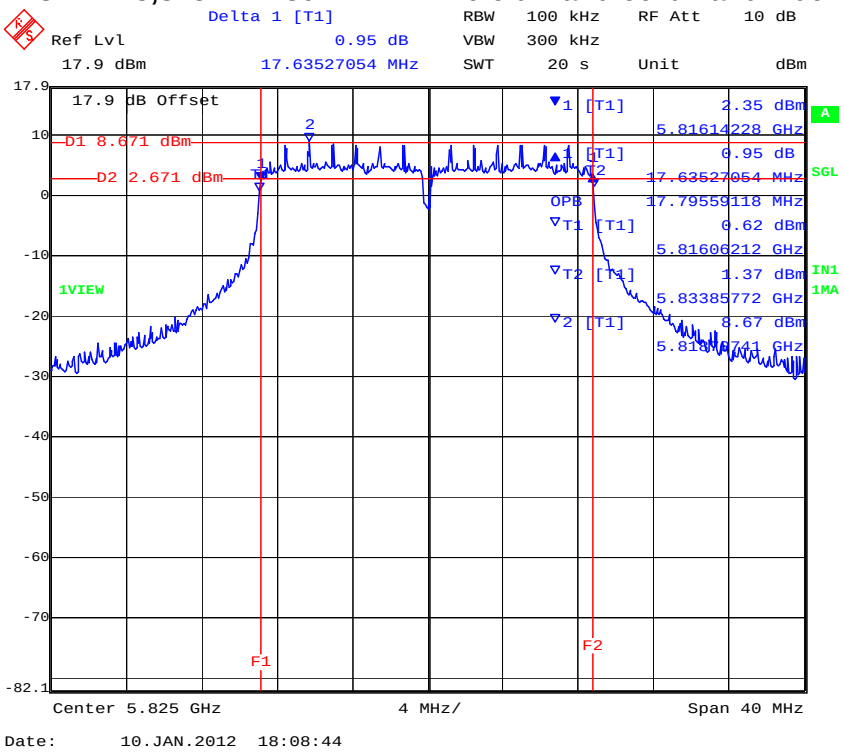
PORT B 5,785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



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



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



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	5 dBi	
Applied Voltage:	12.00	Vdc			
Notes 1:					
Notes 2:					

6 dB Bandwidth

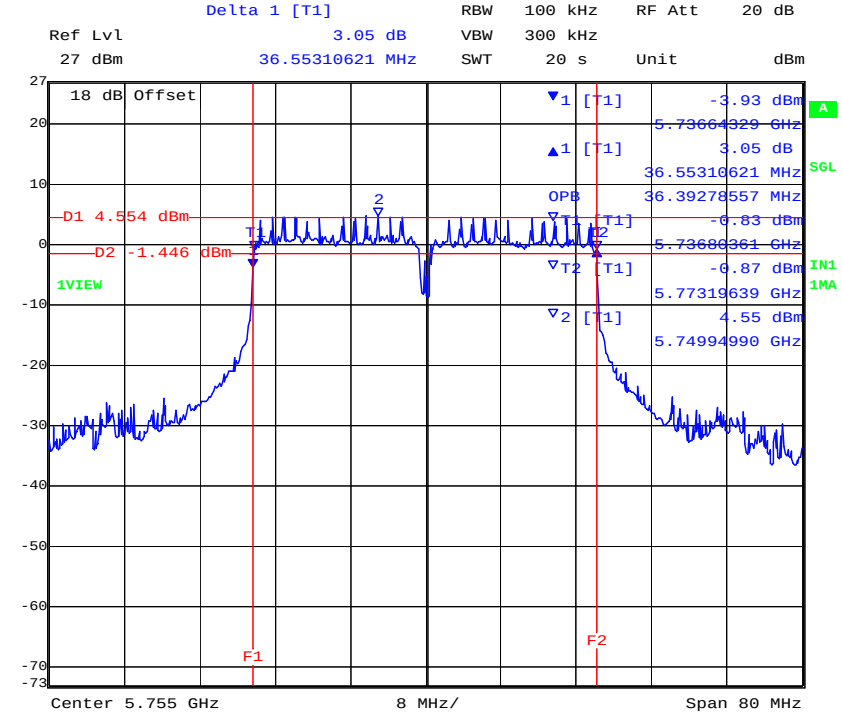
Test Frequency	**6 dB Bandwidth**				**Minimum 6dB Bandwidth Limit**		**Margin**
	MHz						
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
5755.000	36.553000	36.072000	--	--	500	0.5	-35.572000
5795.000	36.553000	36.553000	--	--			-36.053000

99% Bandwidth

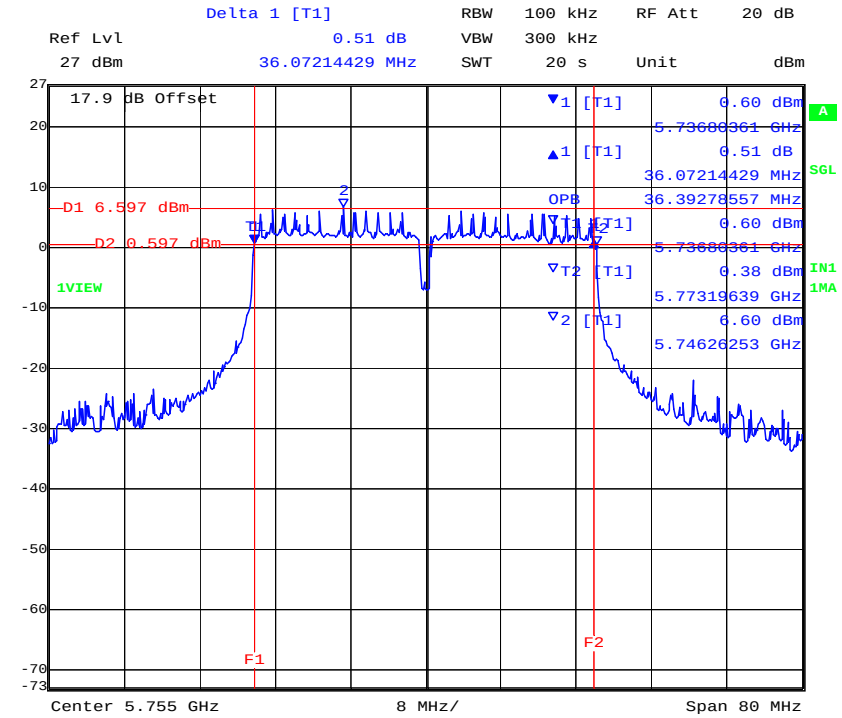
Test Frequency	**99 % Bandwidth**						
	MHz						
MHz	**a**	**b**	**c**	**d**			
5755.000	36.393000	36.393000	--	--			
5795.000	36.393000	36.393000	--	--			

Measurement uncertainty:	±2.81 dB

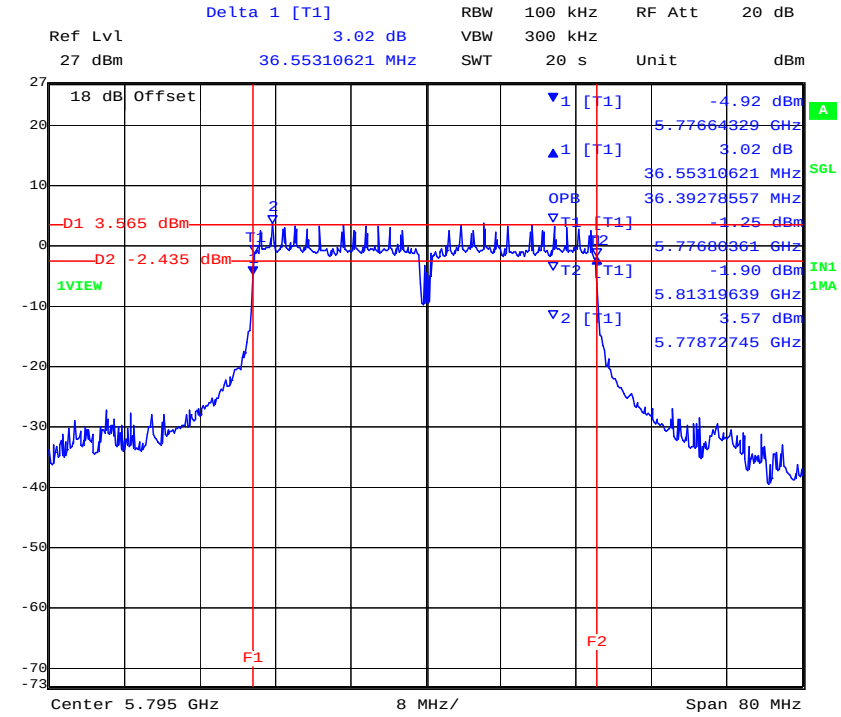
PORTA 5,755 MHz 802.11n HT-40 6 dB and 99% Bandwidth



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

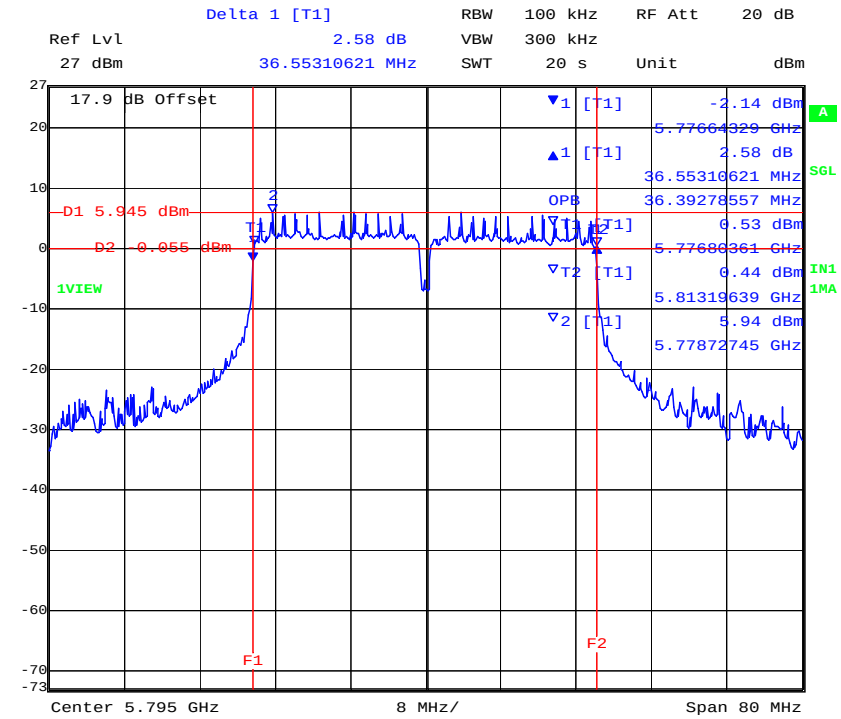


PORT A 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 17.JAN.2012 16:12:49

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



Date: 17.JAN.2012 16:13:51

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

Traceability

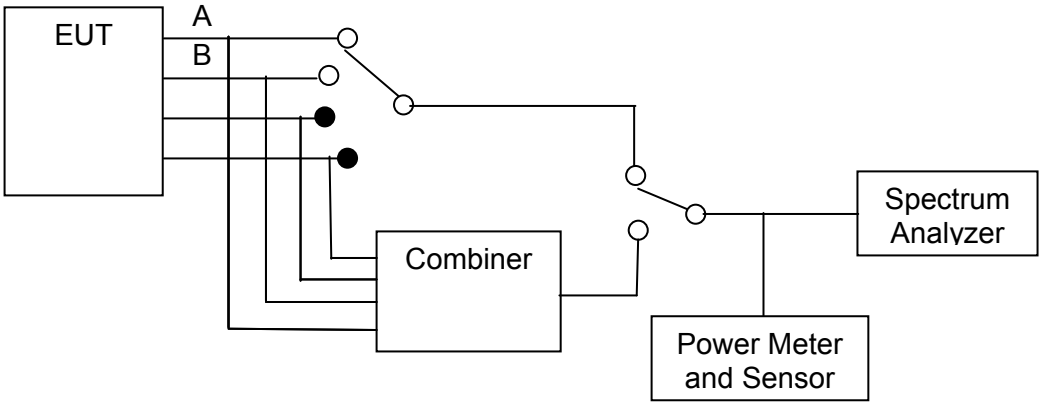
Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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

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

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

MIMO Operation

2.4 GHz MIMO (Non-Legacy Operation)

Antenna	Gain	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP
(dB)	(dBi)	Non-Beam Forming	Beam Forming	(dBm)
AP-ANT-1B	3.8	+30.0	N/A	+36.0
AP-ANT-8	5.0	+30.0		
AP-ANT-13B	4.4	+30.0		
AP-ANT-14	3.0	+30.0		
AP-ANT-16	3.9	+30.0		
AP-ANT-17	6.0	+30.0		
AP-ANT-18	7.0	+29.0		
AP-ANT-19	3.0	+30.0		

5.8 GHz MIMO Operation (Non-Legacy Operation)

Antenna	Gain	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP
(dB)	(dBi)	Non-Beam Forming	Beam Forming	(dBm)
AP-ANT-1B	5.8	+30.0	N/A	+36.0
AP-ANT-10	6.0	+30.0		
AP-ANT-13B	3.3	+30.0		
AP-ANT-14	3.6	+30.0		
AP-ANT-16	4.7	+30.0		
AP-ANT-17	5.0	+30.0		
AP-ANT-18	7.5	+28.5		
AP-ANT-19	6.0	+30.0		

Non-MIMO Operation

2.4 GHz Non-MIMO Operation (Legacy)

Antenna	Gain dBi	Antenna Gain Increase V's No. Antenna Ports		Total Gain	Max. Allowable Conducted Peak Power	Maximum EIRP
(dB)		Ports	dB	dBi	(dBm)	(dBm)
AP-ANT-1B	3.8	2	3.00	6.8	+29.2	+36.0
AP-ANT-8	5.0			8.0	+28.0	
AP-ANT-13B	4.4			7.4	+28.6	
AP-ANT-14	3.0			6.0	+30.0	
AP-ANT-16	3.9			6.9	+29.1	
AP-ANT-17	6.0			9.0	+27.0	
AP-ANT-18	7.0			10.0	+26.0	
AP-ANT-19	3.0			6.0	+30.0	

5.8 GHz Non-MIMO Operation (Legacy)

Antenna	Gain dBi	Antenna Gain Increase V's No. Antenna Ports		Total Gain	Max. Allowable Conducted Peak Power	Maximum EIRP
(dB)		Ports	dB	dBi	(dBm)	(dBm)
AP-ANT-1B	5.8	2	3.00	8.8	+27.2	+36.0
AP-ANT-10	6.0			9.0	+27.0	
AP-ANT-13B	3.3			6.3	+29.7	
AP-ANT-14	3.6			6.6	+29.4	
AP-ANT-16	4.7			7.7	+28.3	
AP-ANT-17	5.0			8.0	+28.0	
AP-ANT-18	7.5			10.5	+25.5	
AP-ANT-19	6.0			9.0	+27.0	
AP-ANT-1B	5.8			8.8	+27.2	

Radio Parameters
Duty Cycle: 100%
Output: Modulated Carrier
Power: Maximum Default Power

NOTE: The following power measurements take into account the power reduction as a result of Radiated Band-Edge measurements.

TABLE OF RESULTS – **802.11b – Legacy**

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11b	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-8		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	16.82	18.11	--	--	N/A	20.52	30.00	-9.48
2437	20.76	20.60	--	--	N/A	23.69	30.00	-6.31
2462	18.45	18.84	--	--	N/A	21.66	30.00	-8.34

Measurement uncertainty:	±1.33 dB

AP-ANT-18; 7 dBi 2400 - 2483.5 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11b	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-18		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	16.88	18.25	--	--	N/A	21.63	29.00	-7.37
2437	20.76	20.60	--	--	N/A	23.69	29.00	-5.31
2462	14.83	14.85	--	--	N/A	18.85	29.00	-10.15

Measurement uncertainty:	±1.33 dB

NOTE: The following power measurements take into account the power reduction as a result of Radiated Band-Edge measurements

TABLE OF RESULTS – **802.11g – Legacy**

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11g	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-8		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	14.18	14.64	--	--	N/A	17.43	30.00	-12.57
2437	19.34	19.66	--	--	N/A	22.51	30.00	-7.49
2462	15.04	16.06	--	--	N/A	18.59	30.00	-11.41

Measurement uncertainty:	±1.33 dB

AP-ANT-18; 7 dBi 2400 - 2483.5 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11g	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-18		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	15.89	17.05	--	--	N/A	20.52	29.00	-8.48
2437	19.34	19.66	--	--	N/A	22.51	29.00	-6.49
2462	14.74	14.90	--	--	N/A	18.83	29.00	-10.17

Measurement uncertainty:	±1.33 dB

NOTE: The following power measurements take into account the power reduction as a result of Radiated Band-Edge measurements

TABLE OF RESULTS – **802.11n HT-20 – MIMO**

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-20	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-8		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	14.22	14.79	--	--	N/A	17.52	30.00	-12.48
2437	20.65	20.34	--	--	N/A	23.51	30.00	-6.49
2462	15.04	15.14	--	--	N/A	18.10	30.00	-11.90

Measurement uncertainty:	±1.33 dB

AP-ANT-18; 7 dBi 2400 - 2483.5 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-20	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-18		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	16.01	16.77	--	--	N/A	20.42	29.00	-8.58
2437	20.65	20.34	--	--	N/A	23.51	29.00	-5.49
2462	13.15	12.77	--	--	N/A	16.97	29.00	-12.03

Measurement uncertainty:	±1.33 dB

NOTE: The following power measurements take into account the power reduction as a result of Radiated Band-Edge measurements

TABLE OF RESULTS – **802.11n HT-40 – MIMO**

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-40	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-8		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2422	10.54	11.76	--	--	N/A	14.20	30.00	-15.80
2437	19.36	19.66	--	--	N/A	22.52	30.00	-7.48
2452	12.16	12.46	--	--	N/A	15.32	30.00	-14.68

Measurement uncertainty:	±1.33 dB

AP-ANT-18; 7 dBi 2400 - 2483.5 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-40	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:	AP-ANT-18		
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2422	13.16	13.66	--	--	N/A	17.43	29.00	-11.57
2437	19.36	19.66	--	--	N/A	22.52	29.00	-6.48
2452	12.15	12.48	--	--	N/A	16.33	29.00	-12.67

Measurement uncertainty:	±1.33 dB

NOTE: The following power measurements are the maximum for the 5.8 GHz band. No power reduction is required in this band. The power reported below are for all specified antennas in Section 3.4 Antenna Details

TABLE OF RESULTS – **802.11a – Legacy**

AP-ANT-18; 7.5 dBi; 5725 – 5850 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11a	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7.5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
5745	16.65	18.47	--	--	N/A	22.16	28.50	-6.34
5785	15.58	18.41	--	--	N/A	21.73	28.50	-6.77
5825	14.92	18.55	--	--	N/A	21.61	28.50	-6.89

Measurement uncertainty:	±1.33 dB

NOTE: The following power measurements are the maximum for the 5.8 GHz band. No power reduction is required in this band. The power reported below are for all specified antennas in Section 3.4 Antenna Details

TABLE OF RESULTS – **802.11n HT-20 – MIMO**

AP-ANT-18; 7.5 dBi; 5725 – 5850 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-20	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7.5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	**Measured Peak Power RF Port (dBm)**				**Total Power (dBm)**		**Limit**	**Margin**
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
5745	16.82	18.55	--	--	N/A	22.28	28.50	-6.22
5785	15.89	18.62	--	--	N/A	21.98	28.50	-6.52
5825	15.14	18.81	--	--	N/A	21.86	28.50	-6.64

Measurement uncertainty:	±1.33 dB

NOTE: The following power measurements are the maximum for the 5.8 GHz band. No power reduction is required in this band. The power reported below are for all specified antennas in Section 3.4 Antenna Details

TABLE OF RESULTS – **802.11n HT-40 – MIMO**

AP-ANT-18; 7.5 dBi; 5725 – 5850 MHz

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11n HT-40	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	7.5 dBi
Applied Voltage:	12.00 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
5755	16.46	18.45	--	--	N/A	22.08	28.50	-6.42
5795	15.35	18.27	--	--	N/A	21.56	28.50	-6.94

Measurement uncertainty:	±1.33 dB

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.

Laboratory Measurement Uncertainty for Power Measurements

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

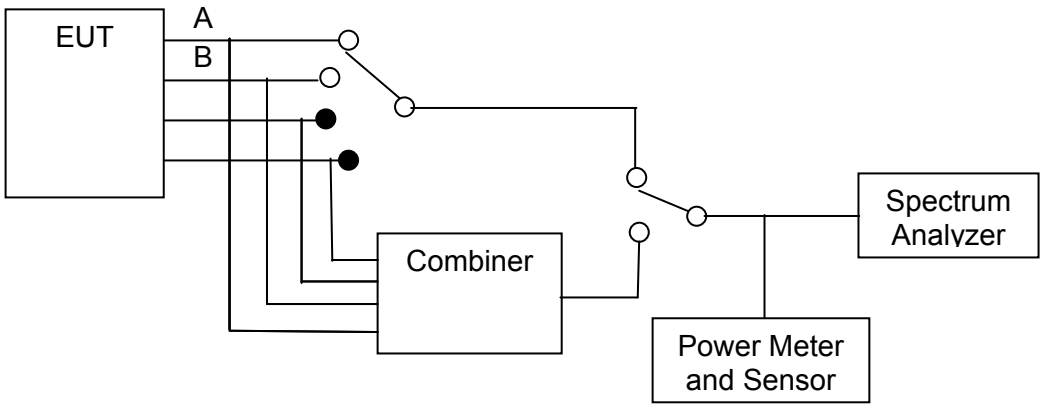
5.1.3. Peak Power Spectral Density

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 ≥ 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

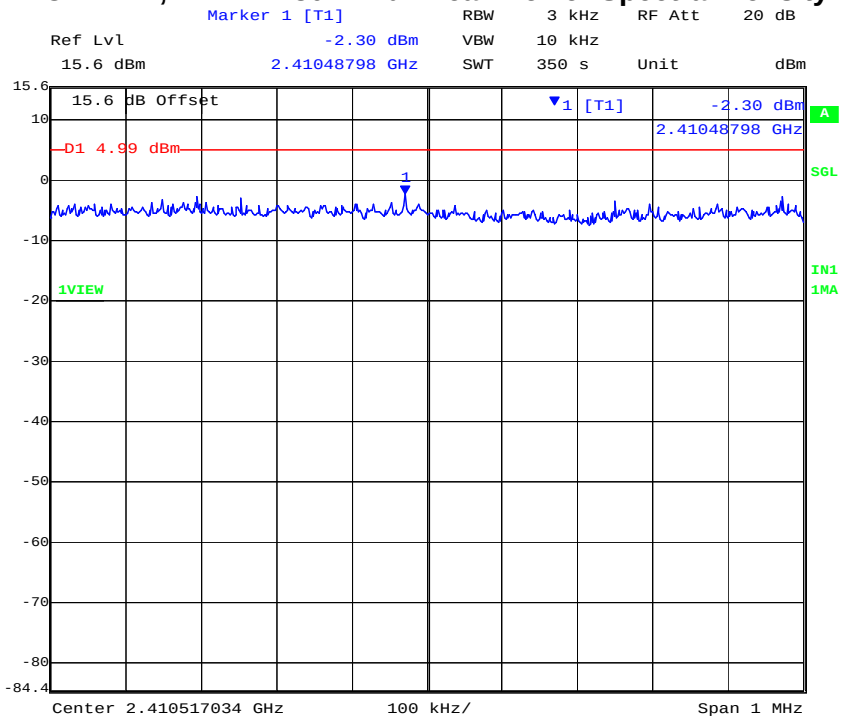
Radio Parameters
Duty Cycle: 100%
Output: Modulated Carrier
Power: Maximum Default Power

Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11b		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	5 dBi	
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2	
Notes 1:					
Notes 2:					

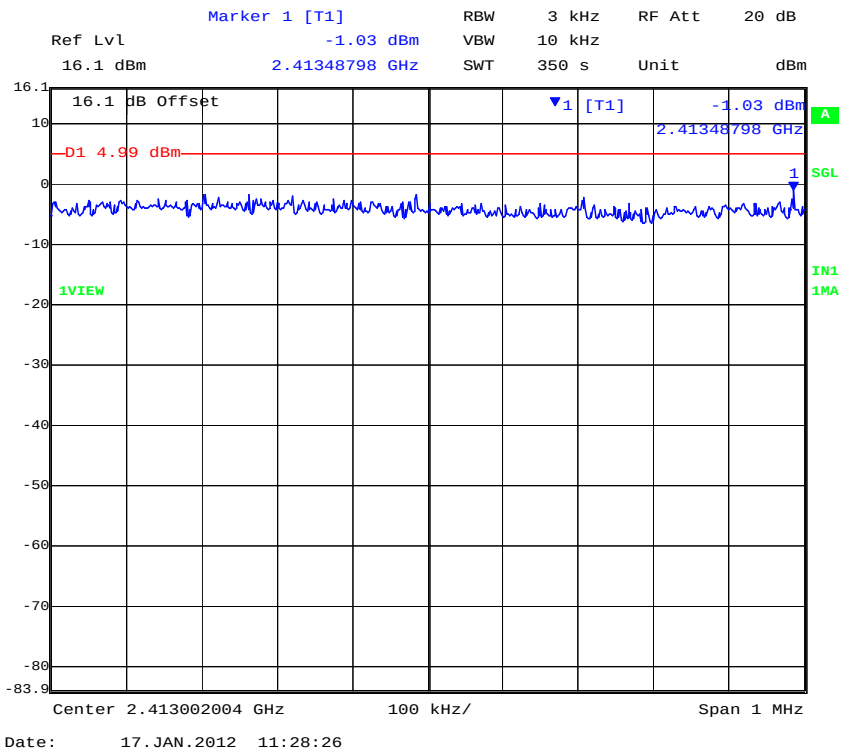
Test Frequency	Measured Power Density RF Port (dBm)				Correction factor	Peak Power Spectral Density	Limit	Margin
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
2412.000	-2.30	-1.03	--	--	3.01	1.98	8.00	-6.02
2437.000	-1.64	-1.23	--	--	3.01	1.78	8.00	-6.22
2462.000	-1.19	-1.04	--	--	3.01	1.97	8.00	-6.03

Measurement uncertainty:	± 1.33 dB

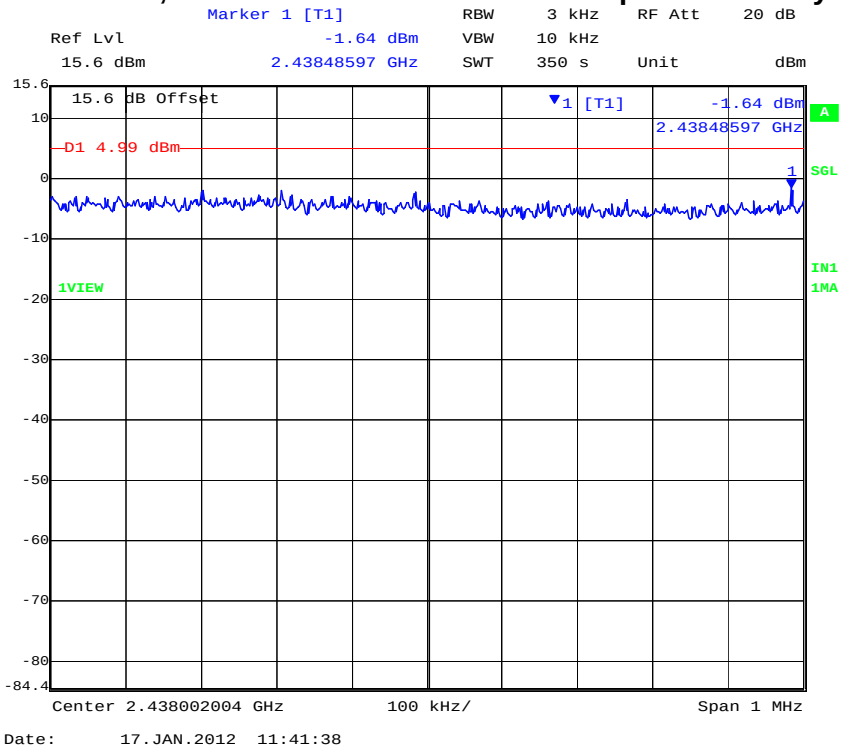
PORT A 2,412 MHz 802.11b - Peak Power Spectral Density



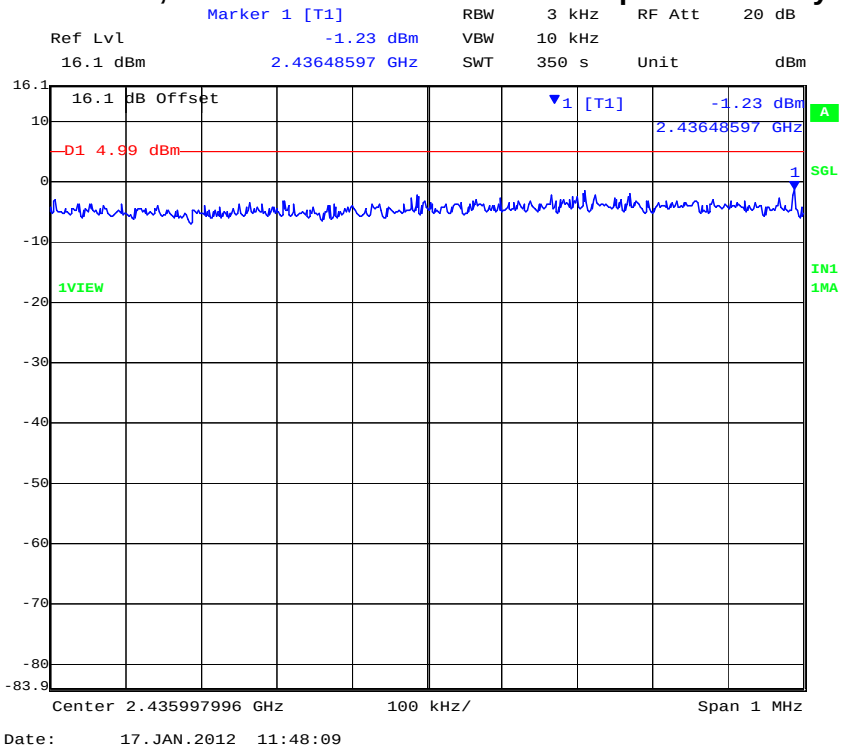
PORT B 2,412 MHz 802.11b - Peak Power Spectral Density



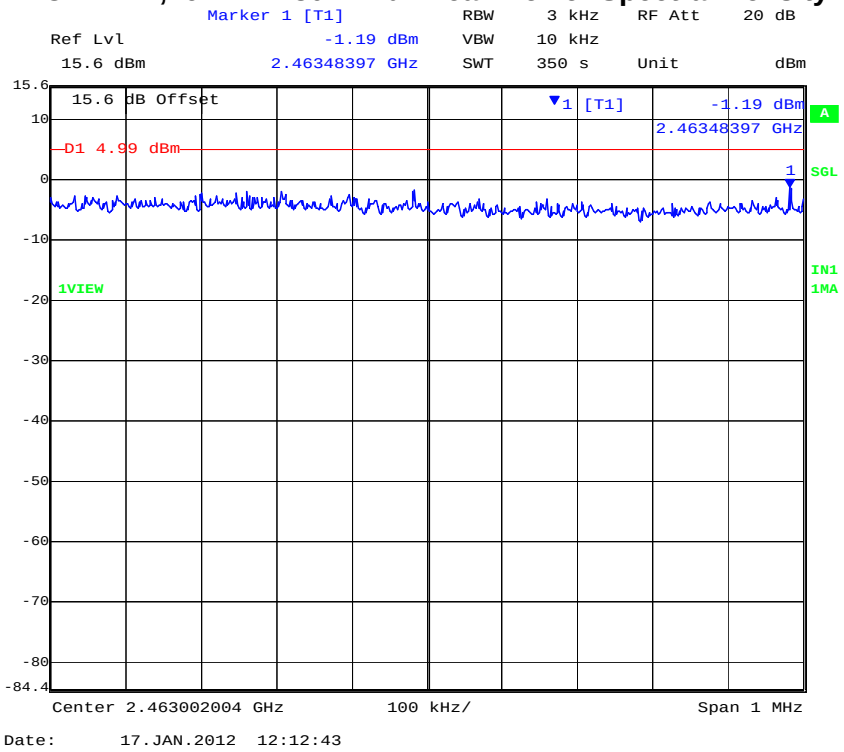
PORT A 2,437 MHz 802.11b - Peak Power Spectral Density



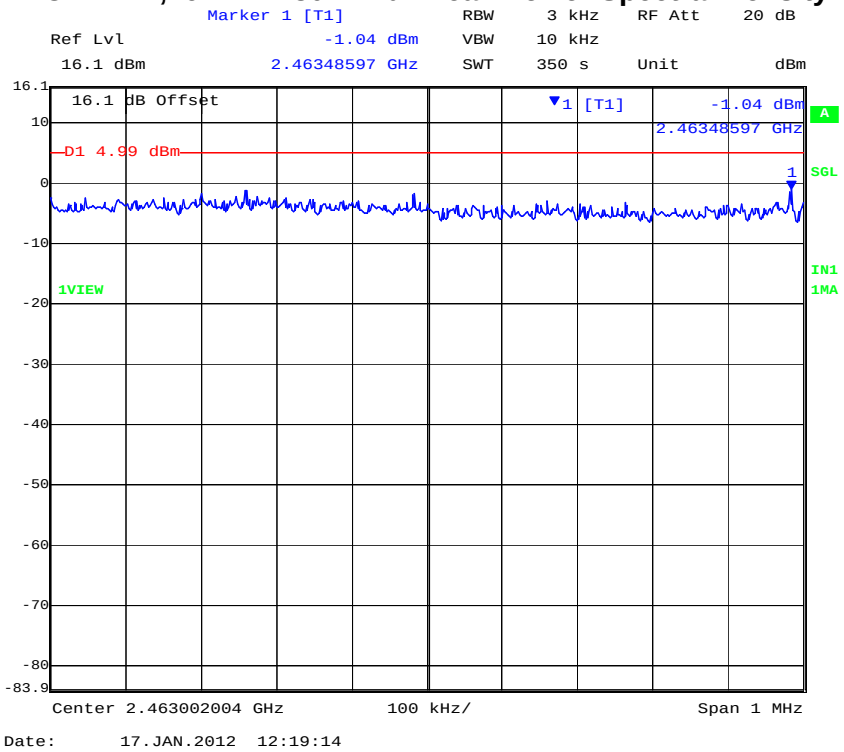
PORT B 2,437 MHz 802.11b - Peak Power Spectral Density



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



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

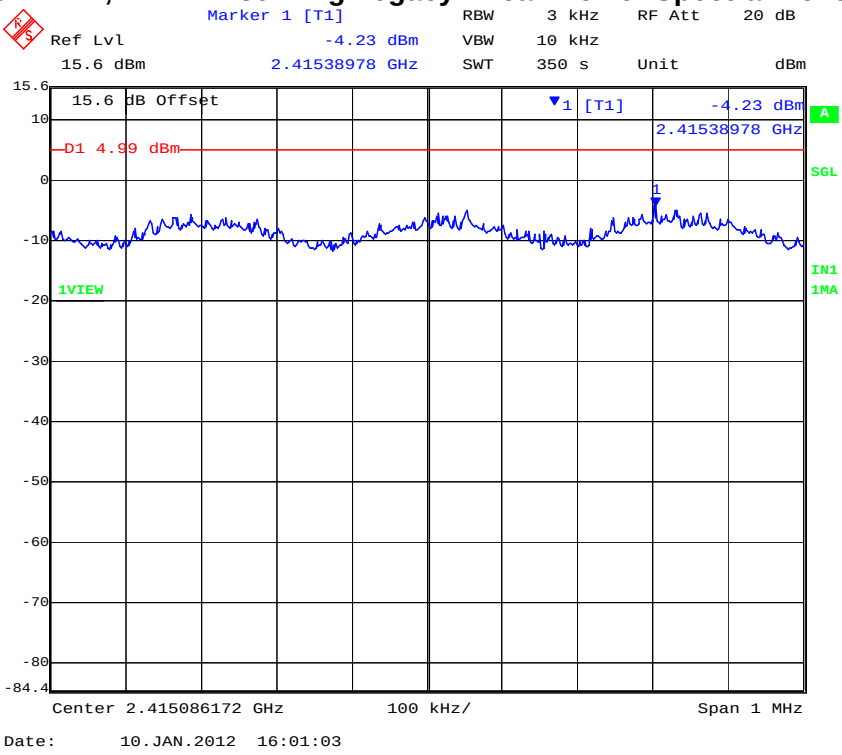


Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11g		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	5 dBi		
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2		
Notes 1:						
Notes 2:						

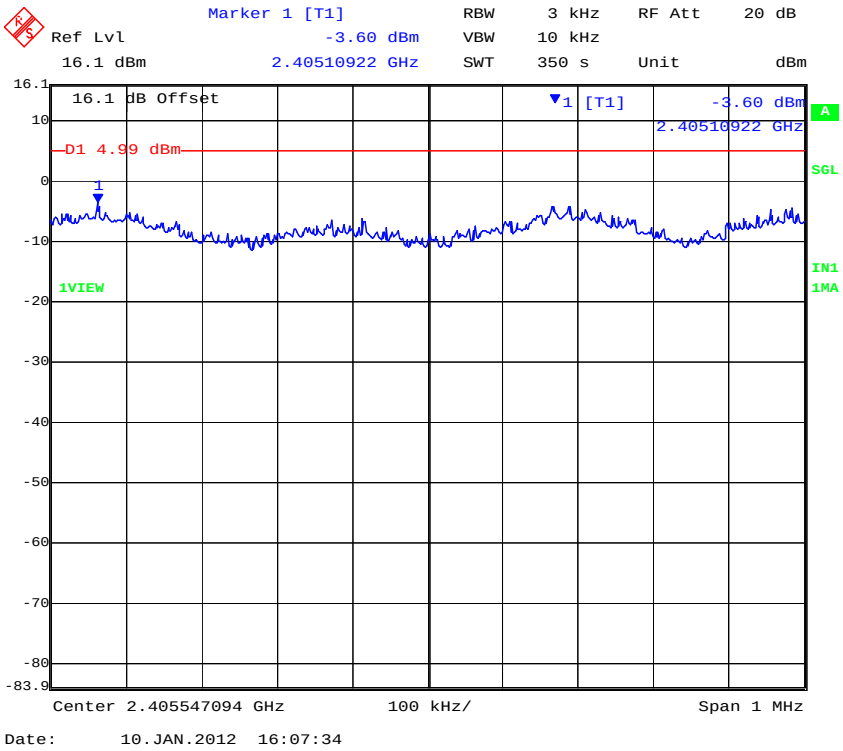
Test Frequency	Measured Power Density RF Port (dBm)				Correction factor	Peak Power Spectral Density	Limit	Margin
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
2412.000	-4.23	-3.60	--	--	3.01	-0.59	8.00	-8.59
2437.000	-3.60	-4.25	--	--	3.01	-0.59	8.00	-8.59
2462.000	-5.07	-3.69	--	--	3.01	-0.68	8.00	-8.68

Measurement uncertainty:	± 1.33 dB

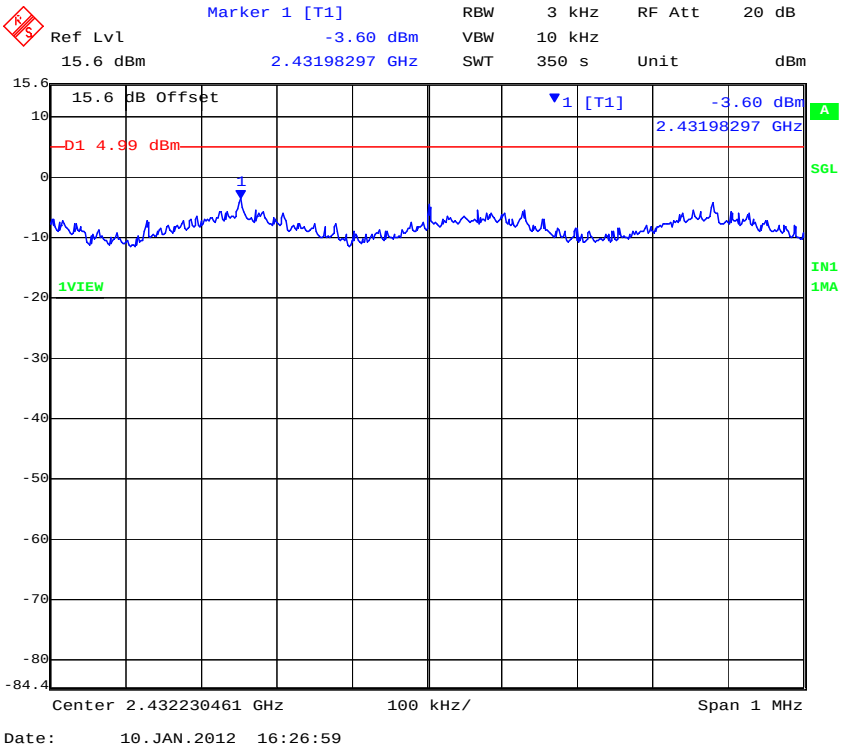
PORT A 2,412 MHz 802.11g Legacy - Peak Power Spectral Density



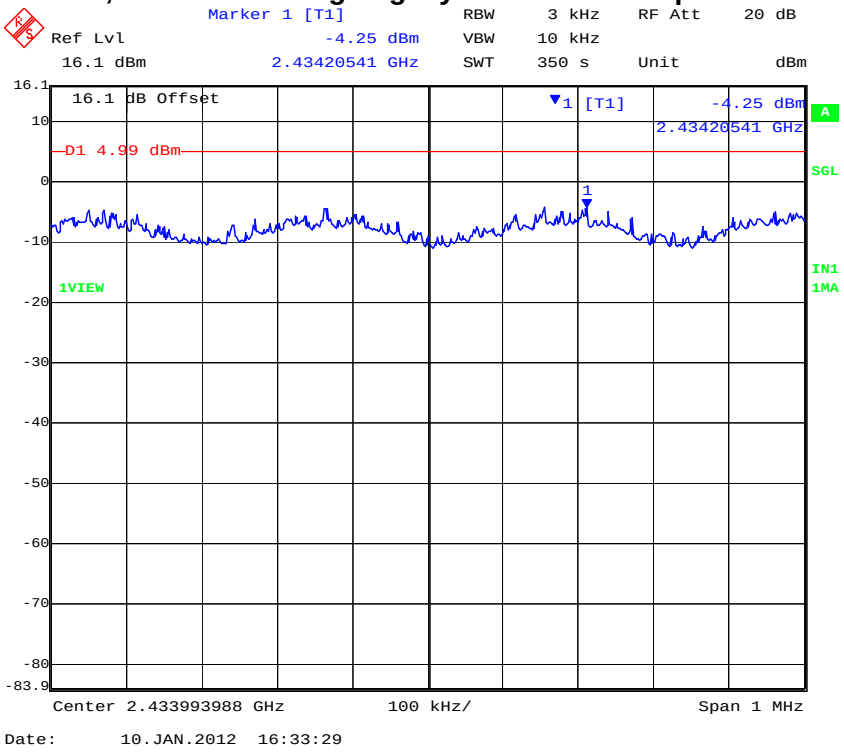
PORT B 2,412 MHz 802.11g Legacy - Peak Power Spectral Density



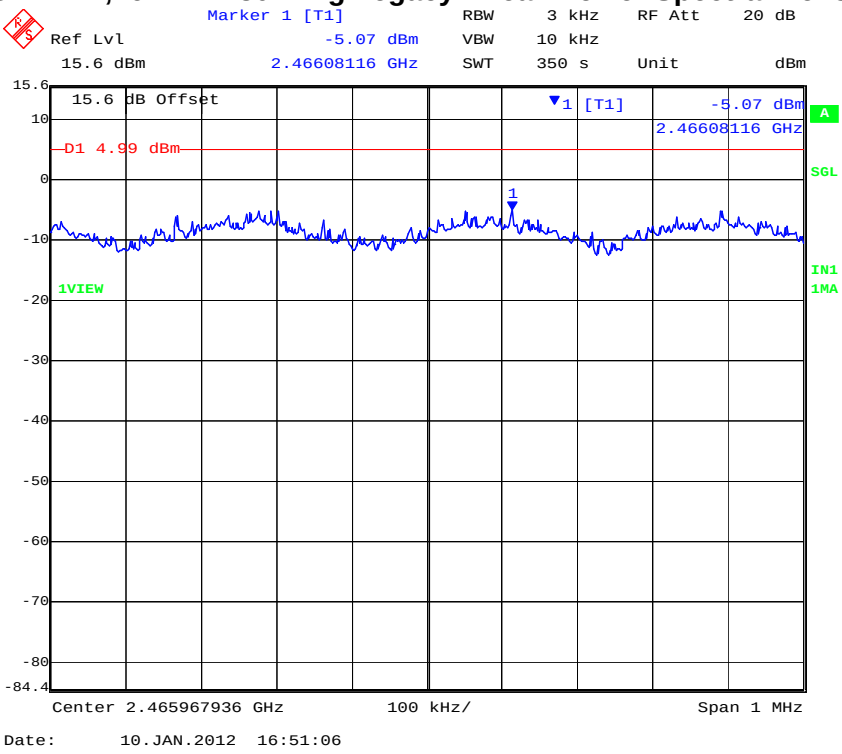
PORT A 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



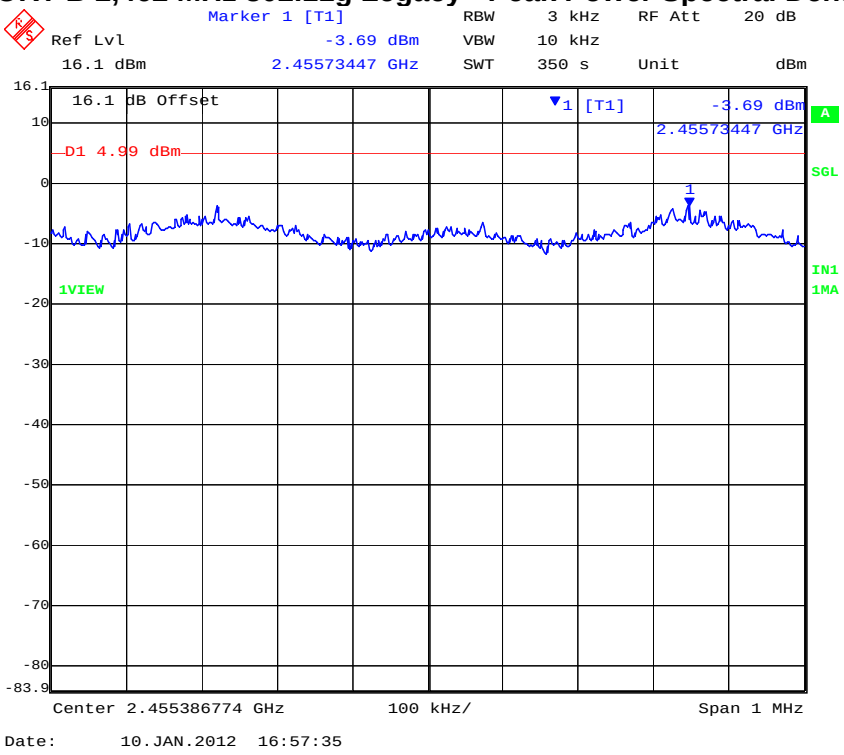
PORT B 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



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



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

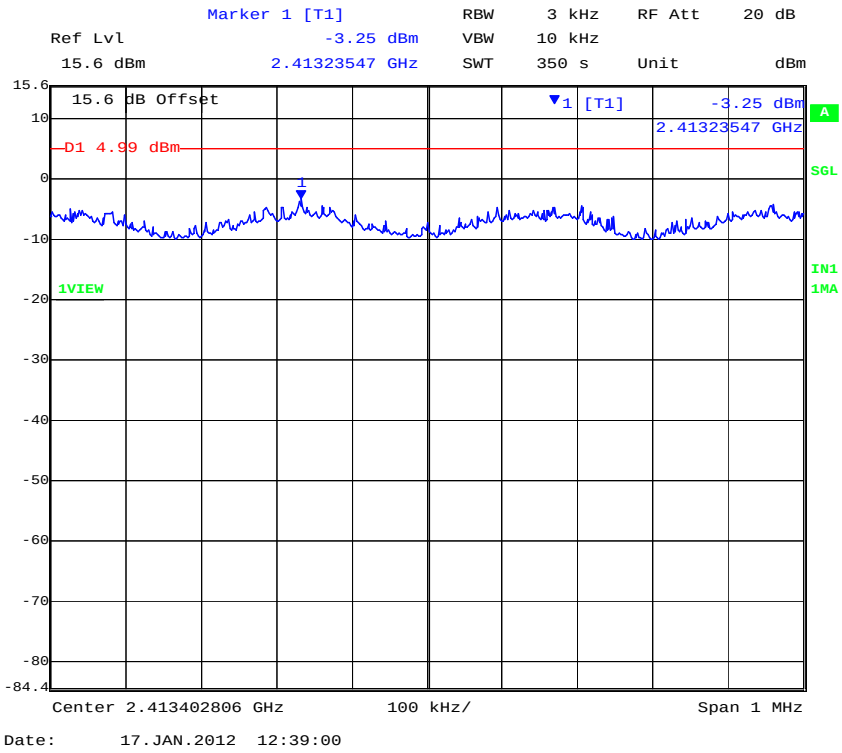


Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	5 dBi	
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2	
Notes 1:					
Notes 2:					

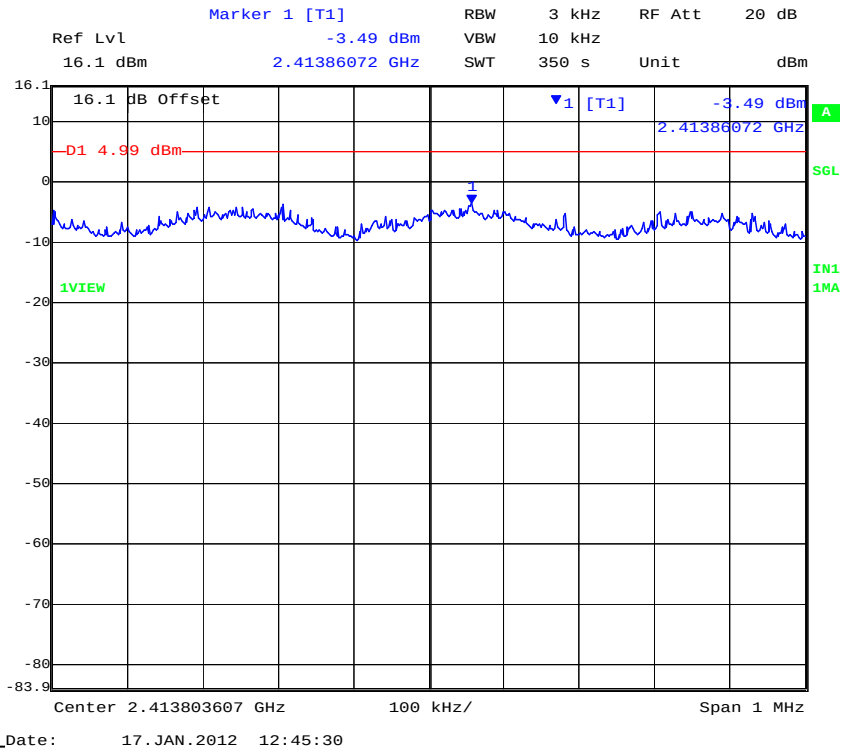
Test Frequency	**Measured Power Density RF Port (dBm)**				**Correction factor**	**Peak Power Spectral Density**	**Limit**	**Margin**
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
2412.000	-3.25	-3.49	--	--	3.01	-0.24	8.00	-8.24
2437.000	-2.40	-3.97	--	--	3.01	0.62	8.00	-7.38
2462.000	-3.11	-3.03	--	--	3.01	-0.02	8.00	-8.02

Measurement uncertainty:	± 1.33 dB

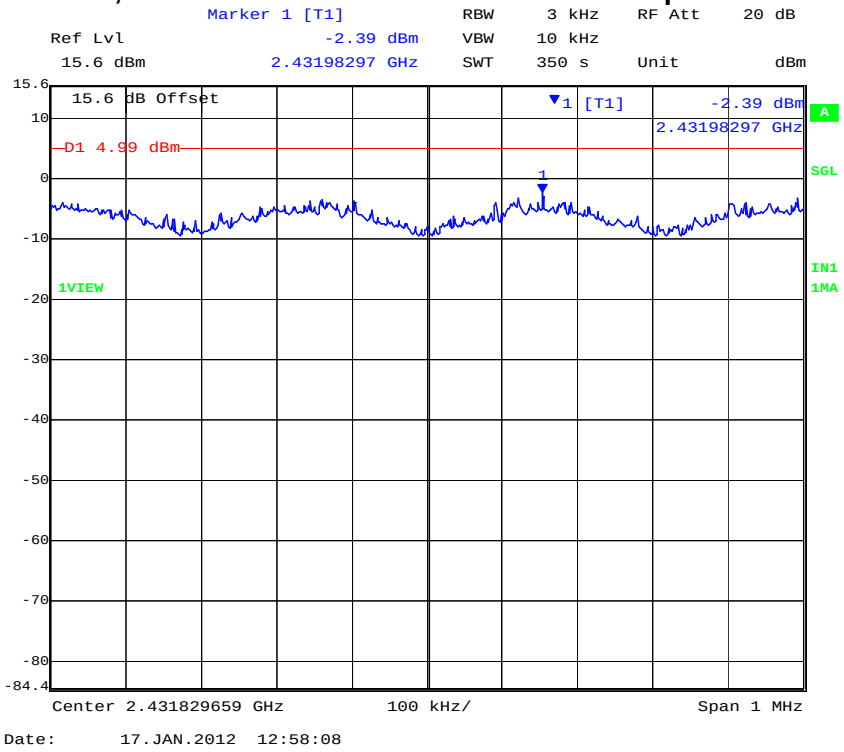
PORT A 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



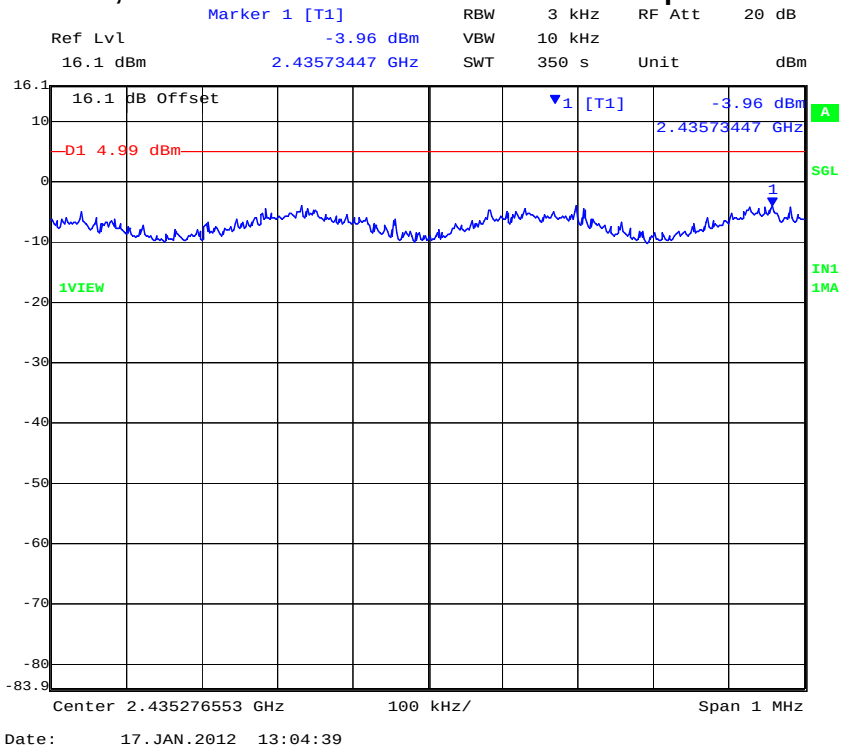
PORT B 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



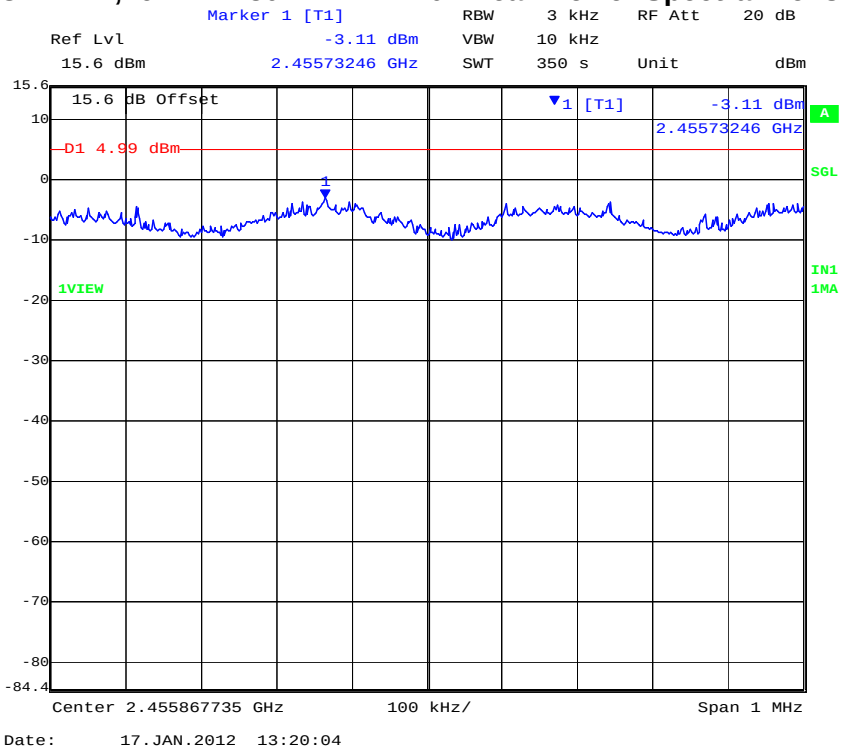
PORT A 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



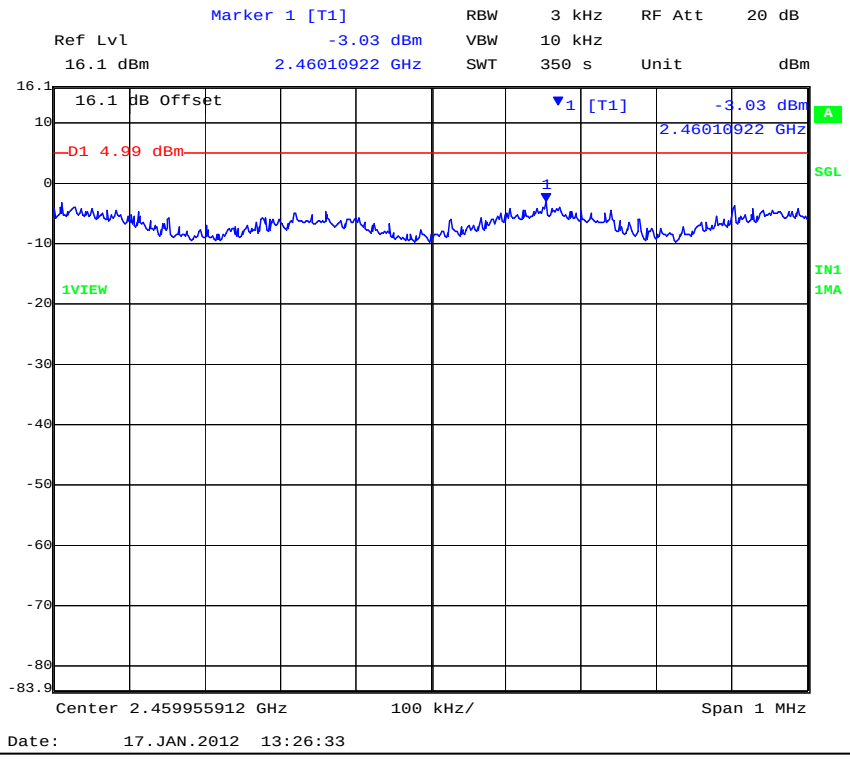
PORT B 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



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



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

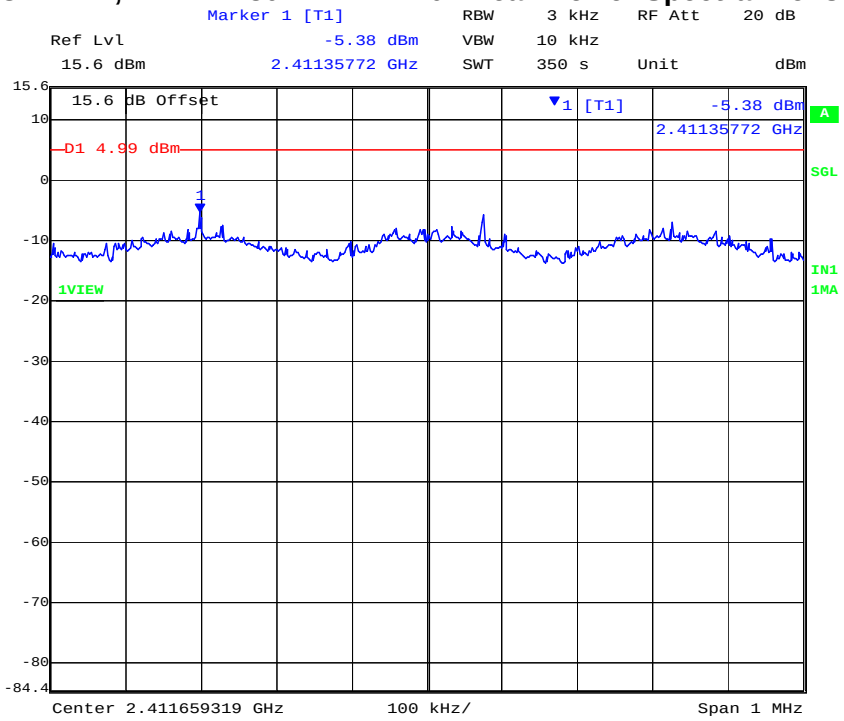


Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	5 dBi	
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2	
Notes 1:					
Notes 2:					

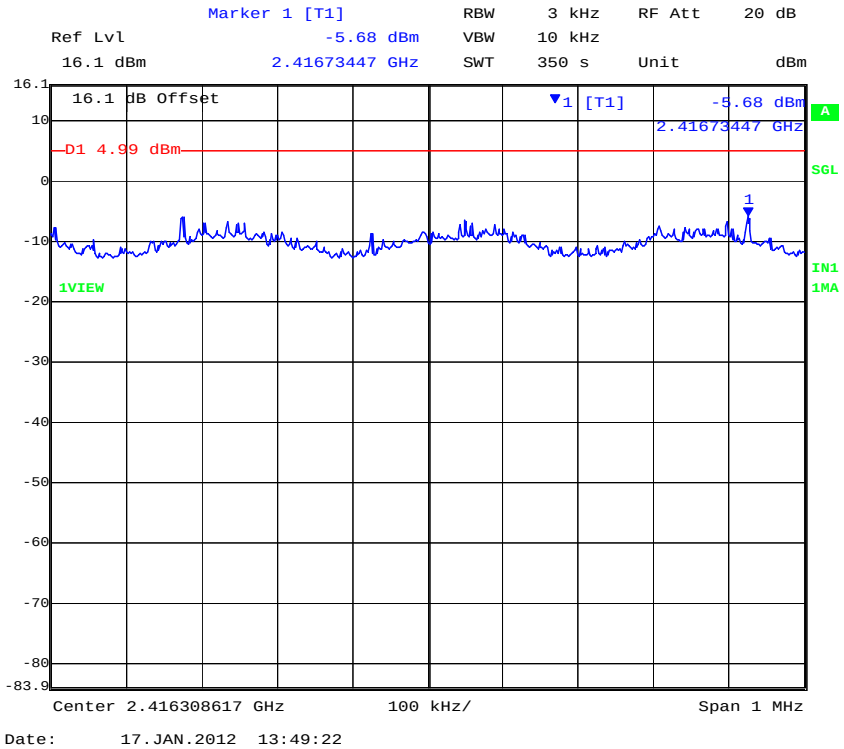
Test Frequency	Measured Power Density RF Port (dBm)				Correction factor	Peak Power Spectral Density	Limit	Margin
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
2422.000	-5.38	-5.68	--	--	3.01	-2.37	8.00	-10.37
2437.000	-6.28	-5.86	--	--	3.01	-2.85	8.00	-10.85
2452.000	-6.16	-6.44	--	--	3.01	-3.15	8.00	-11.15

Measurement uncertainty:	± 1.33 dB

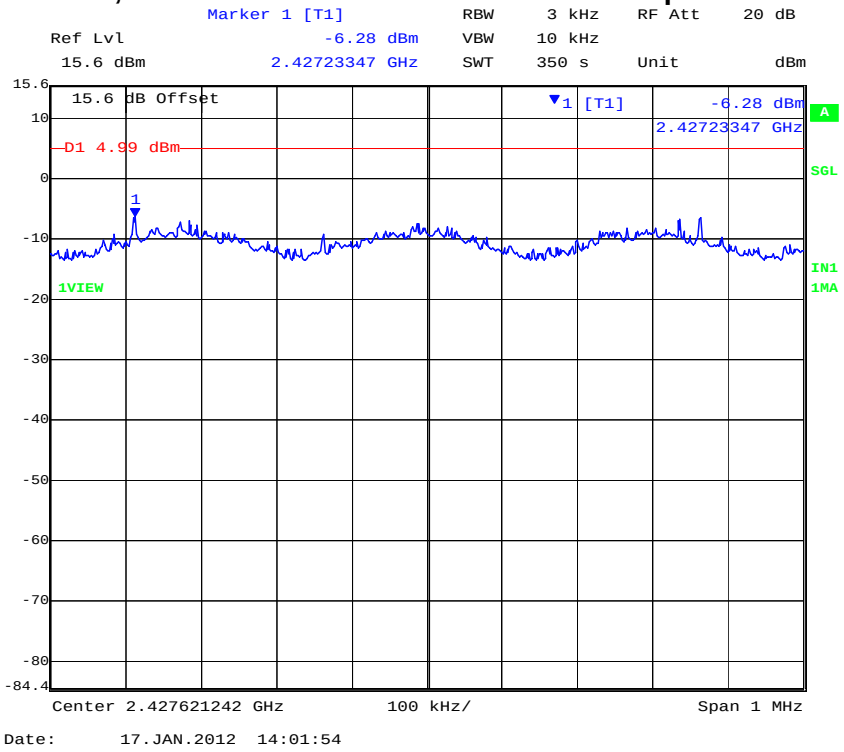
PORT A 2,422 MHz 802.11n HT-40 - Peak Power Spectral Density



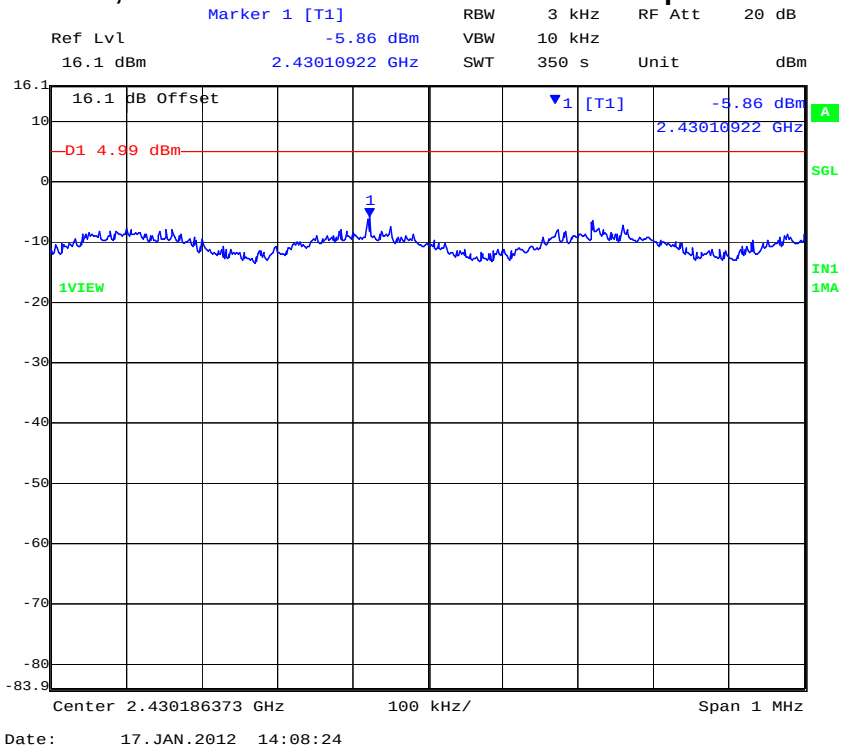
PORT B 2,422 MHz 802.11n HT-40 - Peak Power Spectral Density



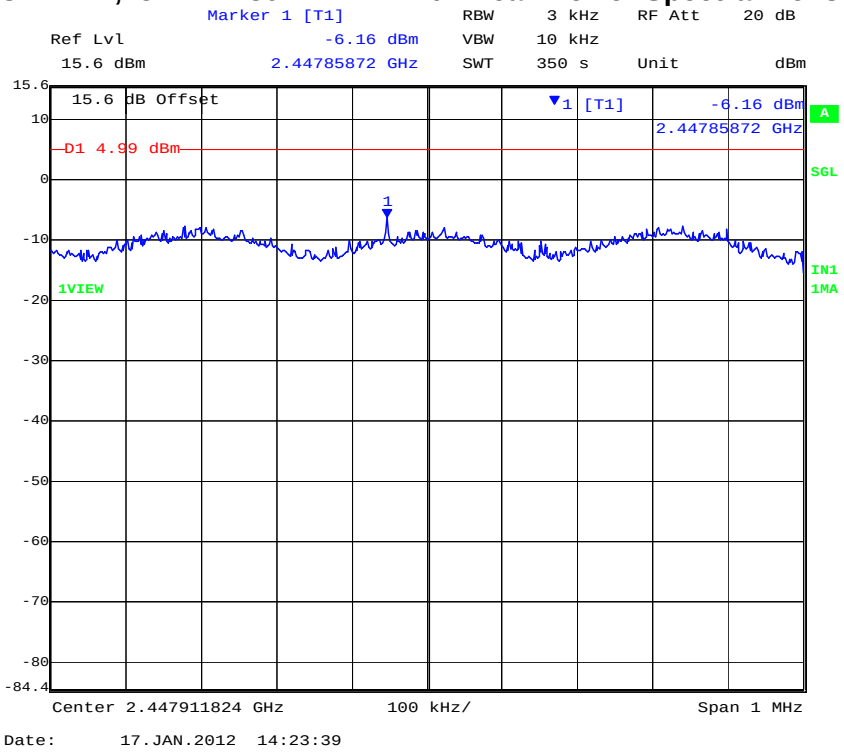
PORT A 2,437 MHz 802.11n HT-40 - Peak Power Spectral Density



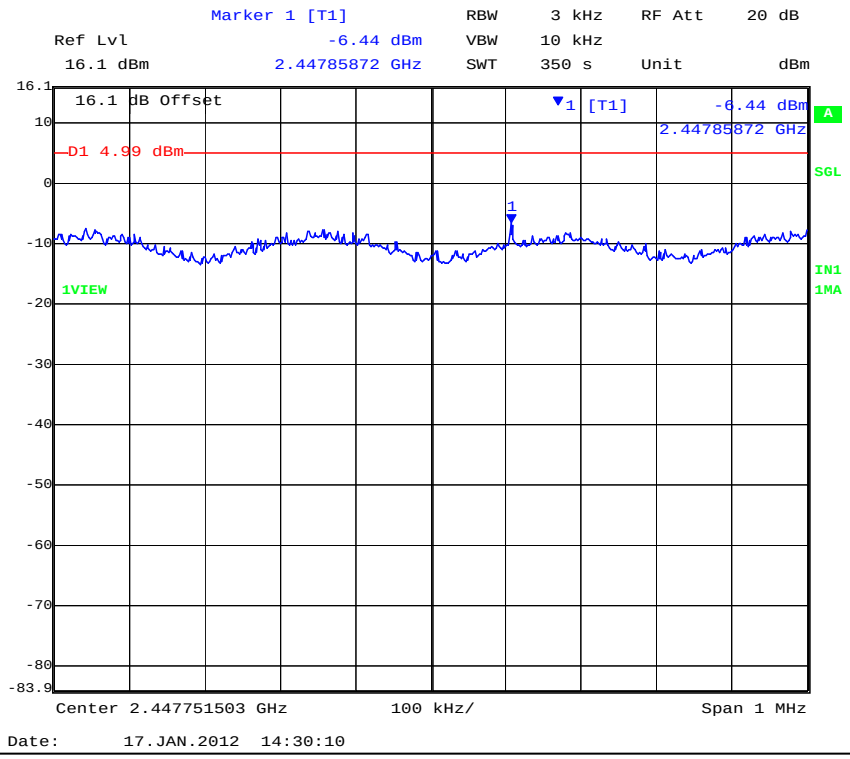
PORT B 2,437 MHz 802.11n HT-40 - Peak Power Spectral Density



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



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

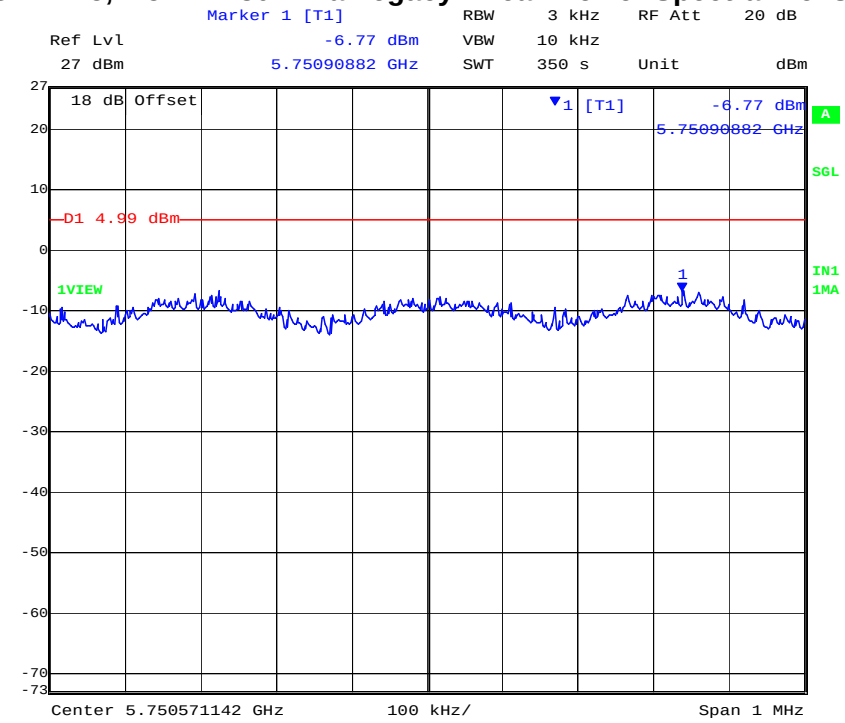


Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11a		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	7.5 dBi		
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2		
Notes 1:						
Notes 2:						

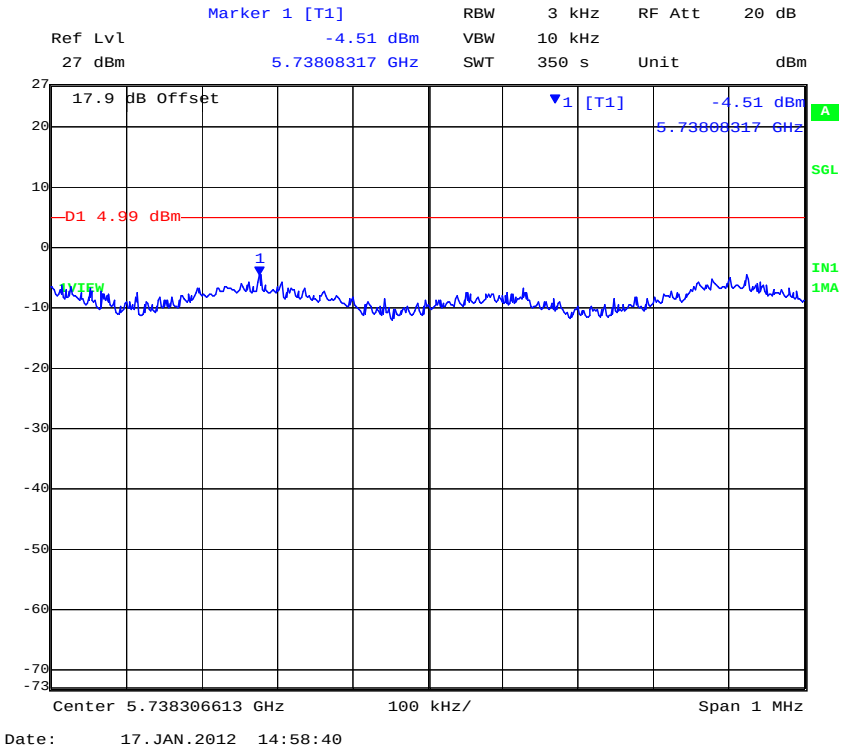
Test Frequency	**Measured Power Density RF Port (dBm)**				**Correction factor**	**Peak Power Spectral Density**	**Limit**	**Margin**
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
5745.000	-6.77	-4.52	--	--	3.01	-1.50	8.00	-9.50
5785.000	-6.16	-4.94	--	--	3.01	-1.93	8.00	-9.93
5825.000	-7.20	-5.35	--	--	3.01	-2.33	8.00	-10.33

Measurement uncertainty:	± 1.33 dB

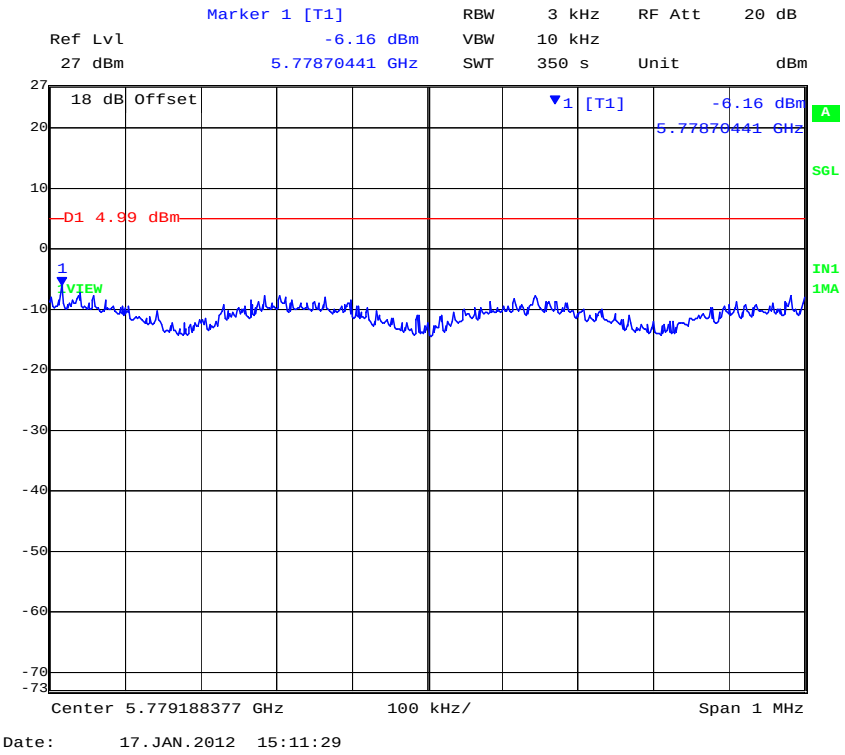
PORT A 5,745 MHz 802.11a Legacy - Peak Power Spectral Density



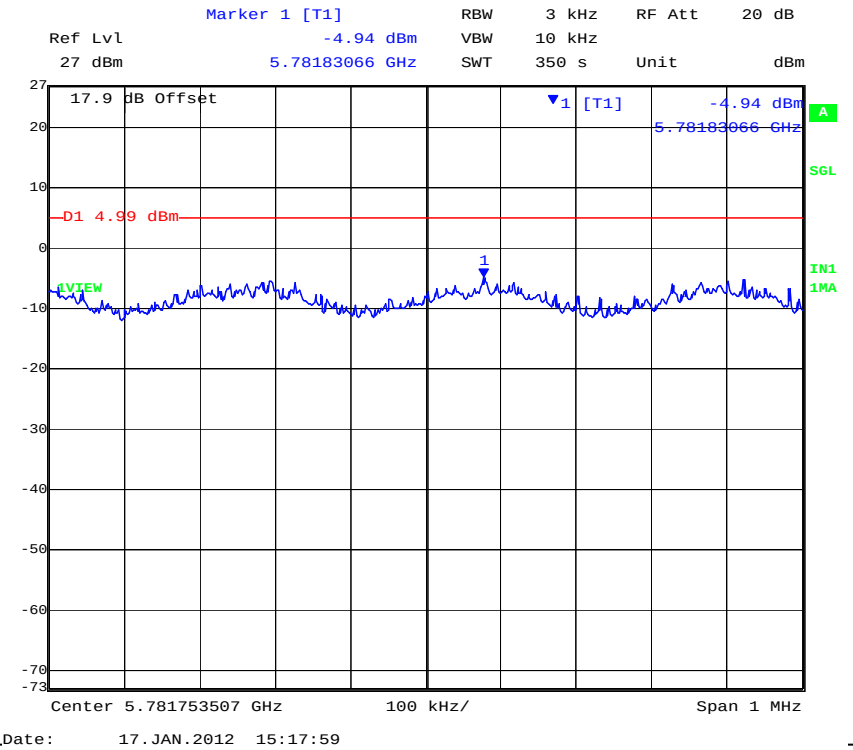
PORT B 5,745 MHz 802.11a Legacy - Peak Power Spectral Density



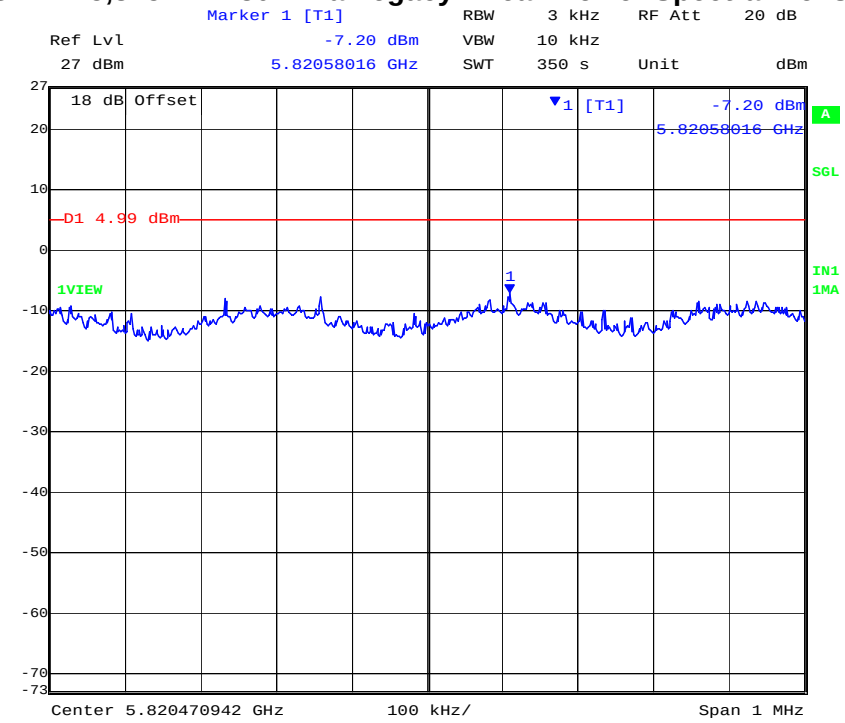
PORT A 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



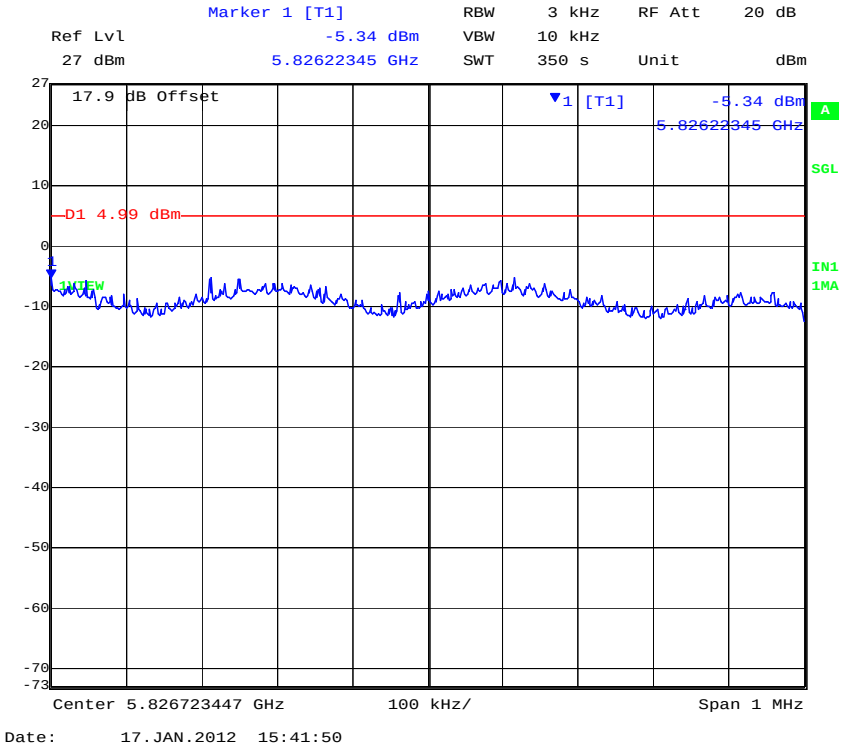
PORT B 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



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



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

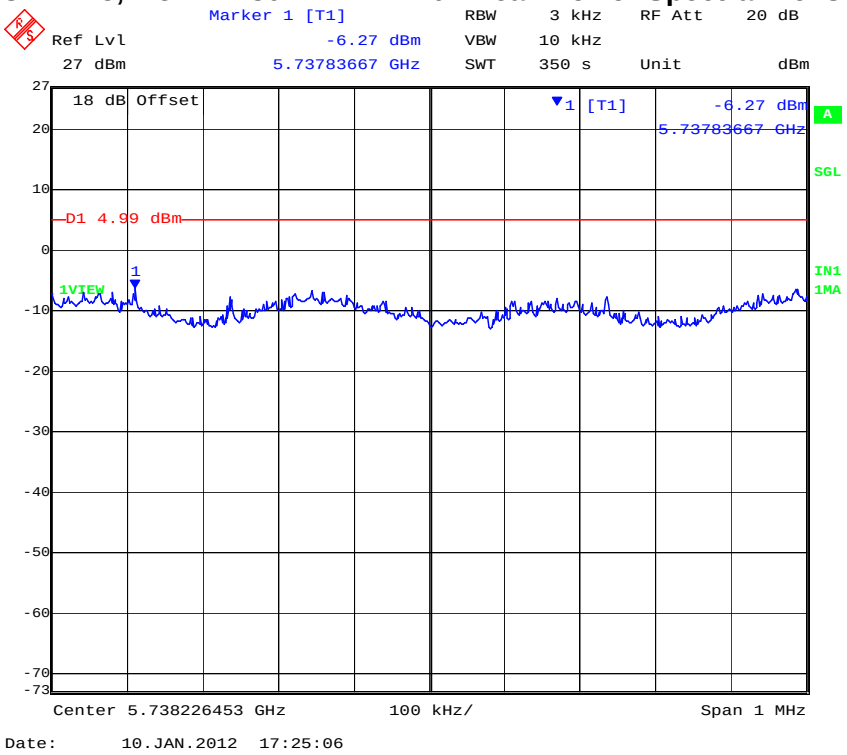


Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	7.5 dBi	
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2	
Notes 1:					
Notes 2:					

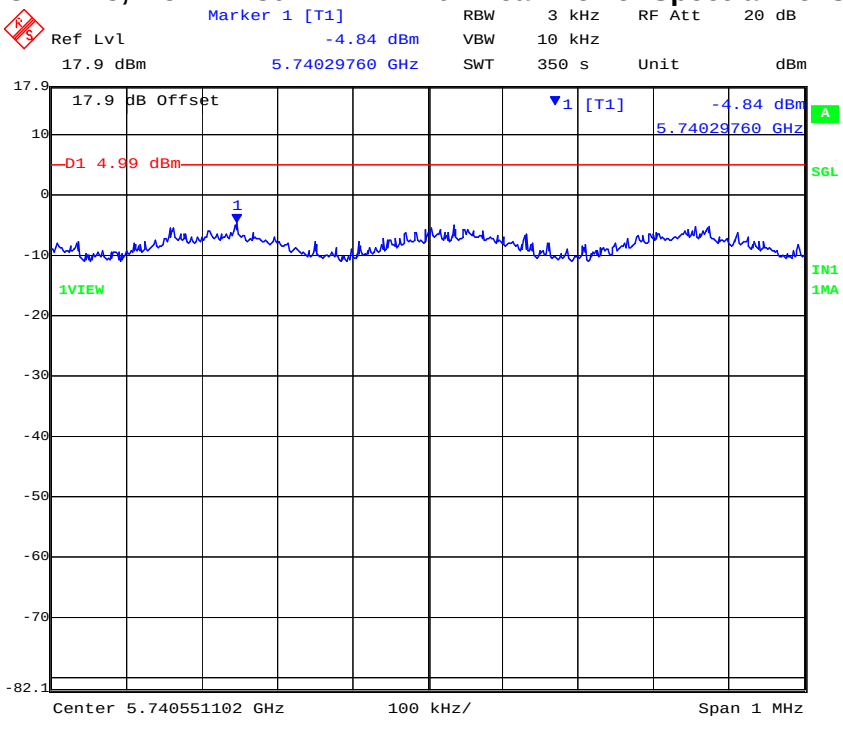
Test Frequency	Measured Power Density RF Port (dBm)				Correction factor	Peak Power Spectral Density	Limit	Margin
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
5745.000	-6.27	-4.84	--	--	3.01	-1.83	8.00	-9.83
5785.000	-6.93	-4.79	--	--	3.01	-1.78	8.00	-9.78
5825.000	-7.65	-5.09	--	--	3.01	-2.08	8.00	-10.08

Measurement uncertainty:	± 1.33 dB

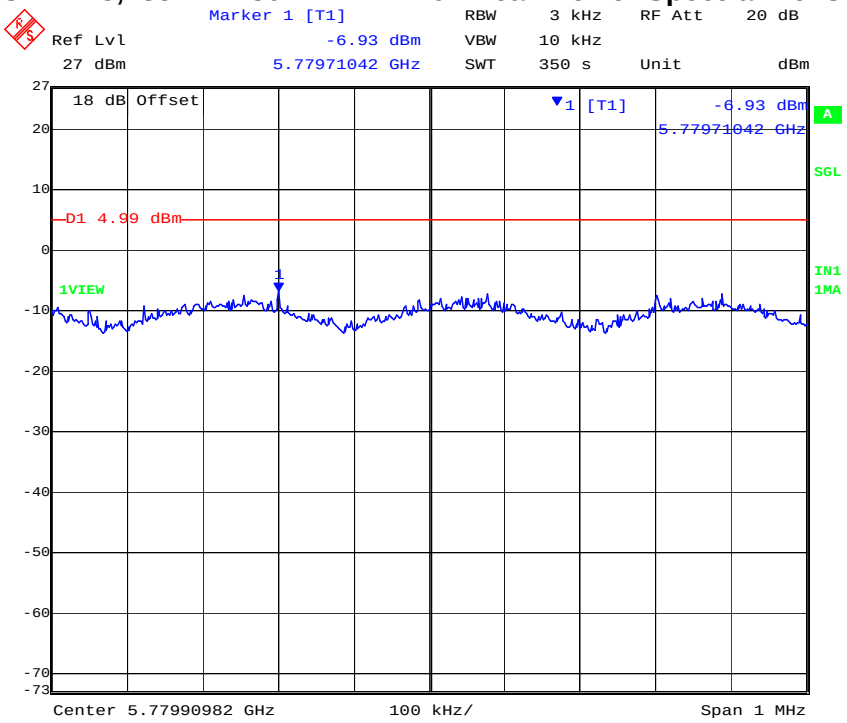
PORT A 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density



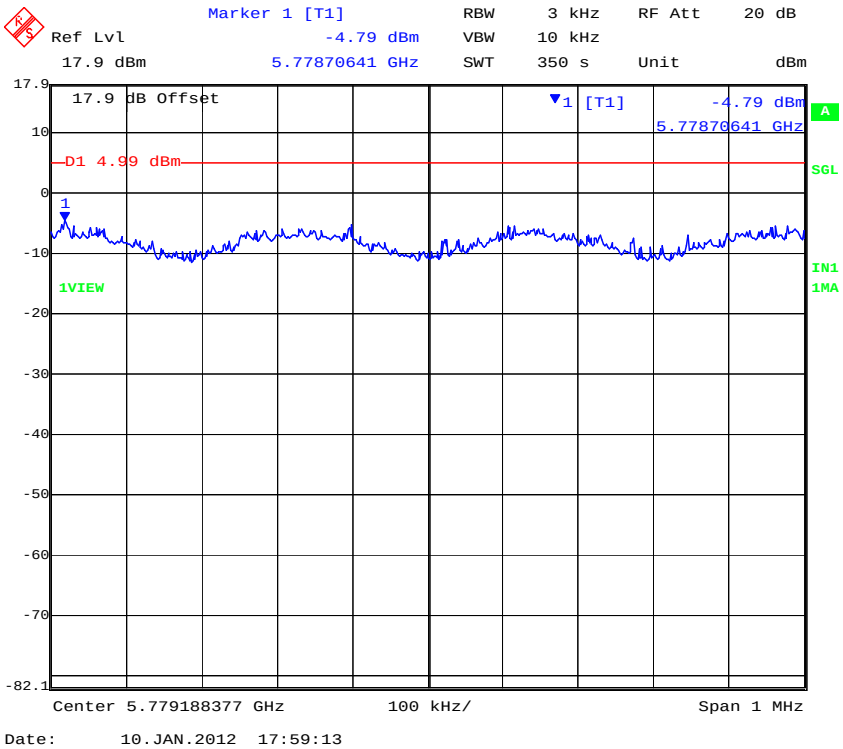
PORT B 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density



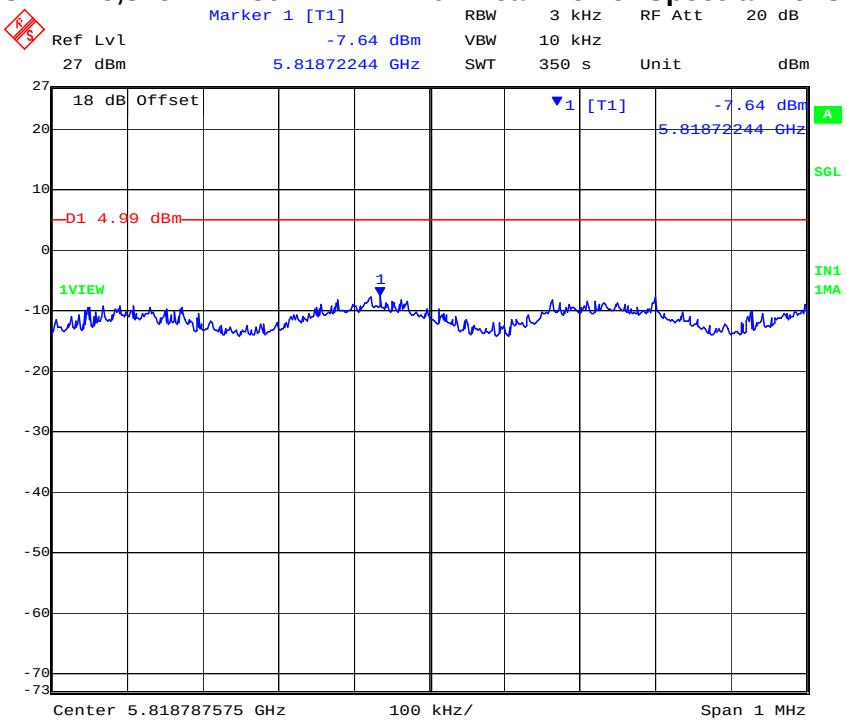
PORT A 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



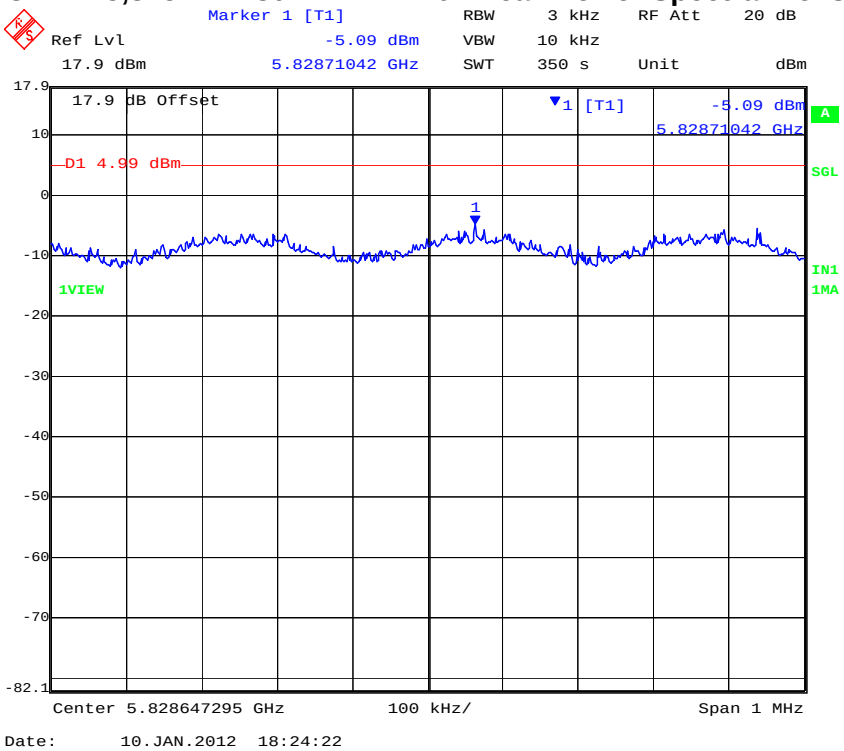
PORT B 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



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



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

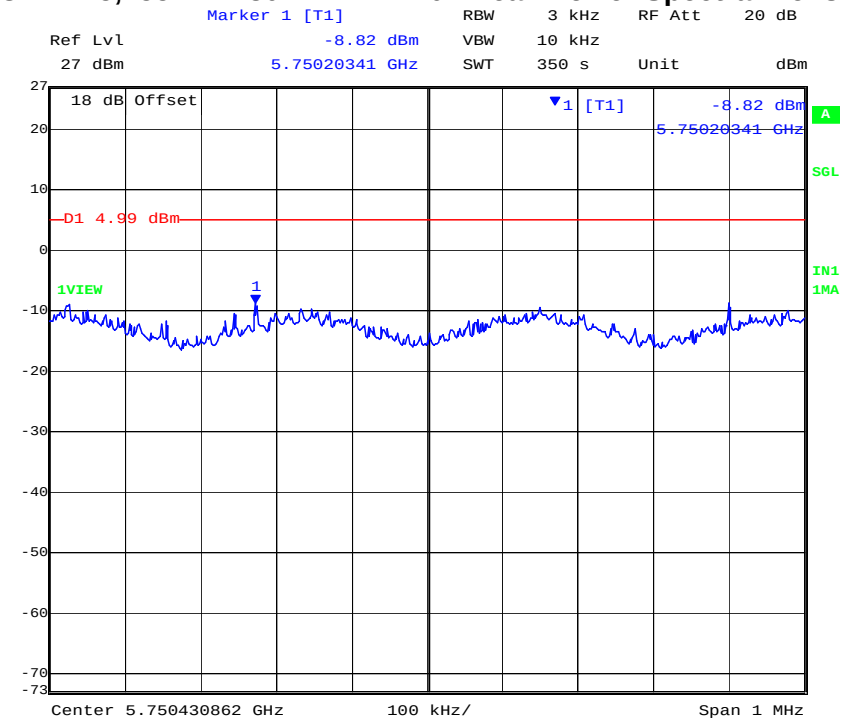


Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	7.5 dBi	
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2	
Notes 1:					
Notes 2:					

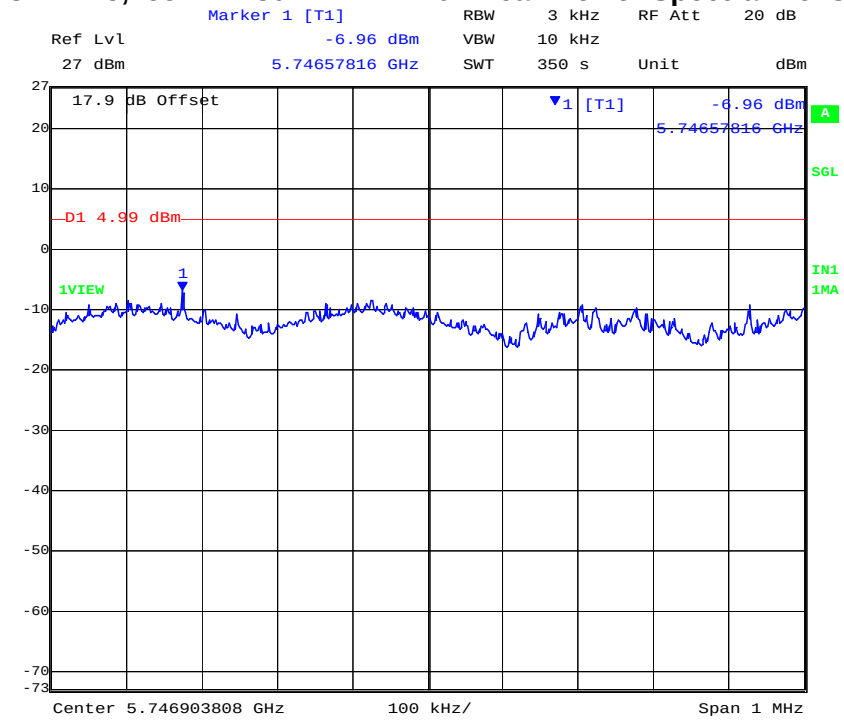
Test Frequency	Measured Power Density RF Port (dBm)				Correction factor	Peak Power Spectral Density	Limit	Margin
MHz	**a**	**b**	**c**	**d**	**10Log(N)**	**dBm**	**dBm**	**dB**
5755.000	-8.82	-6.96	--	--	3.01	-3.95	8.00	-11.95
5795.000	-10.83	-7.92	--	--	3.01	-4.91	8.00	-12.91

Measurement uncertainty:	± 1.33 dB

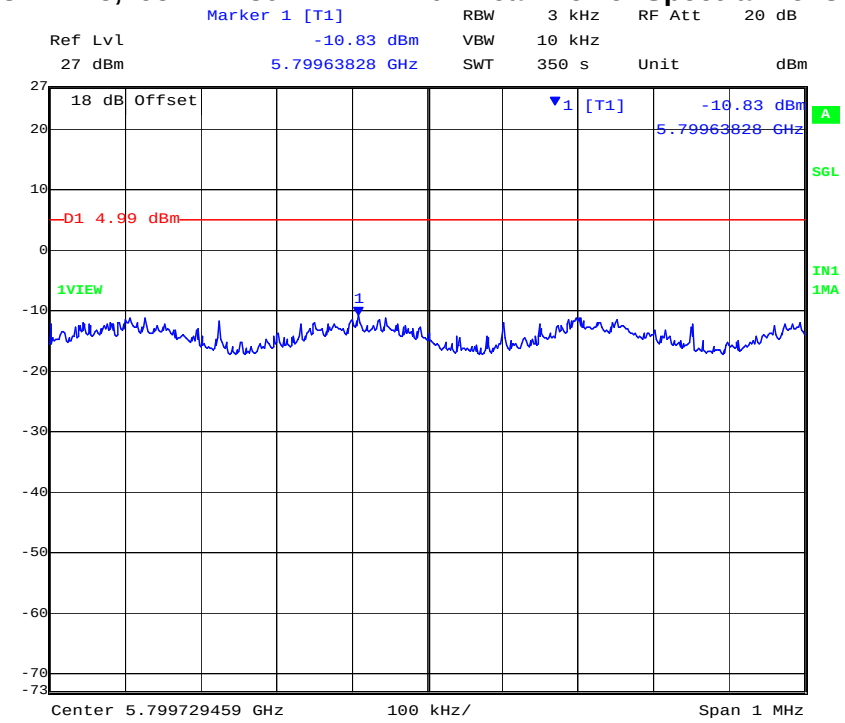
PORT A 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density



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

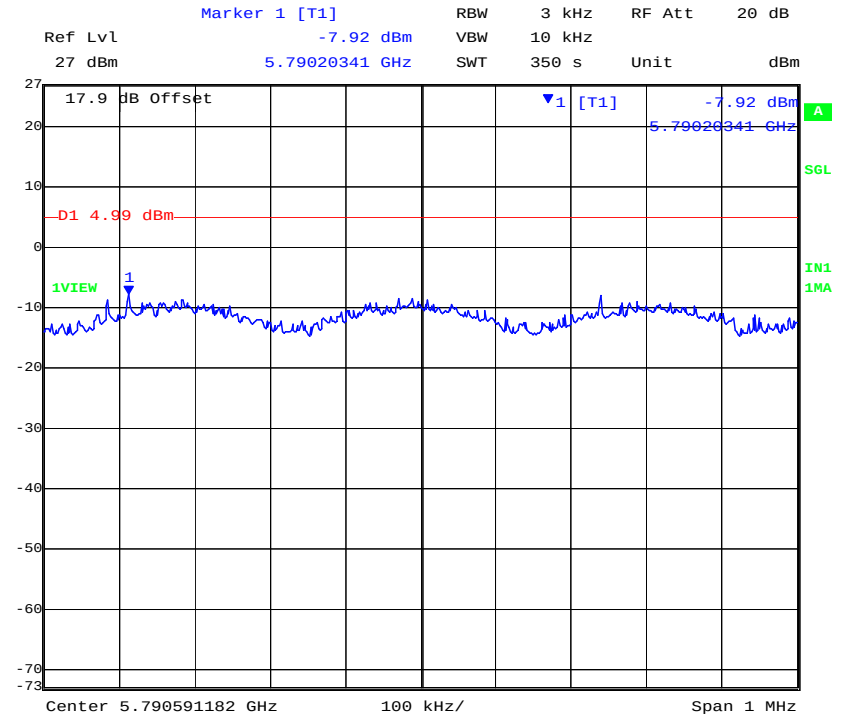


PORT A 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 17.JAN.2012 16:22:57

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



Date: 17.JAN.2012 16:29:29

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

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

Power Density = Pd (mW/cm^2) = EIRP/(4πd^2)

EIRP = P * G

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

Numeric Gain = 10 ^ (G (dBi)/10)

The Aruba AP-104 has two transmitters operating in each band. The peak power in the table below is calculated by assuming a worst case scenario where the two transmitters are operating simultaneously in the same band. The Peak Power in mW is calculated by taking the maximum allowable conducted power measured in each band from both antennas.

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

Freq. Band (GHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density @ 20cm (mW/cm^2)	Minimum Separation Distance (cm)
2.4	7.0	5.01	+23.69	233.9	0.23	20.0*
5.8	7.5	5.62	+22.28	169.0	0.19	20.0*

*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^2 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

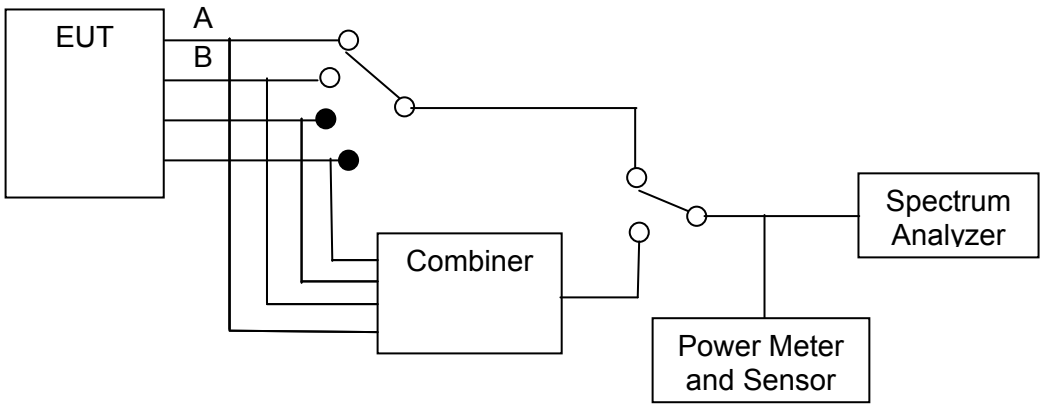
Measurement uncertainty	±1.33 dB

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



Spurious Emission and 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

Conducted Band-Edge 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.

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11b		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A dB		**Antenna Gain:**	N/A dBi	
Applied Voltage:	12.00 Vdc		**Antenna Ports (N):**		
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-43.95	-9.78	-41.84	-9.10				
2437.000	30.00	26000.00	-41.95	-9.09	-42.02	-9.02				
2462.000	30.00	26000.00	-41.39	-10.37	-41.78	-9.92				

SE: Maximum spurious emsission found

Band-edge Measurement

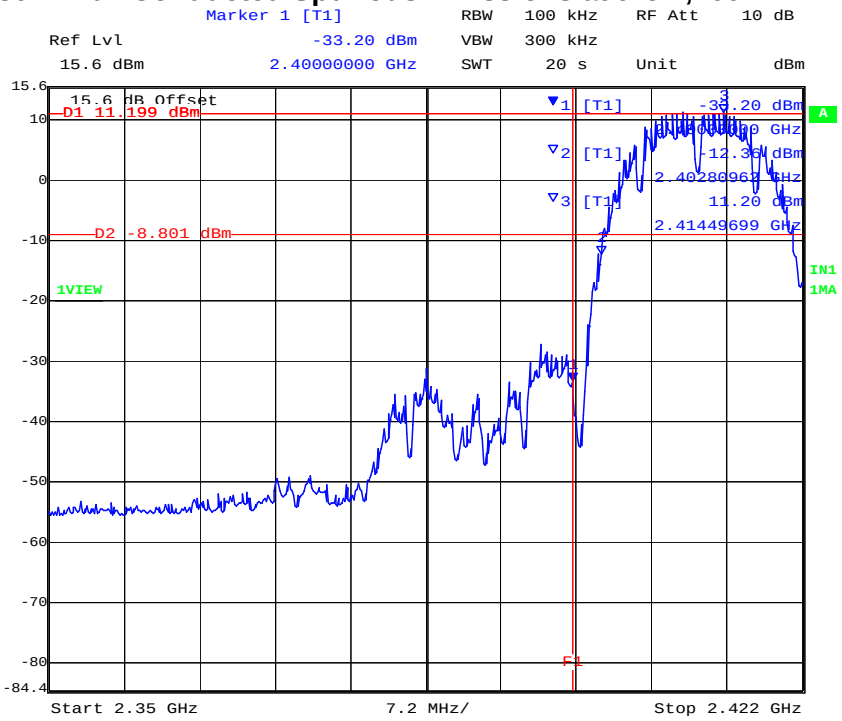
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-33.20	-8.80	-30.06	-7.77				
2462.000	2483.50	-39.80	-8.57	-38.64	-8.04				

BE: Maximum Band edge emssion found

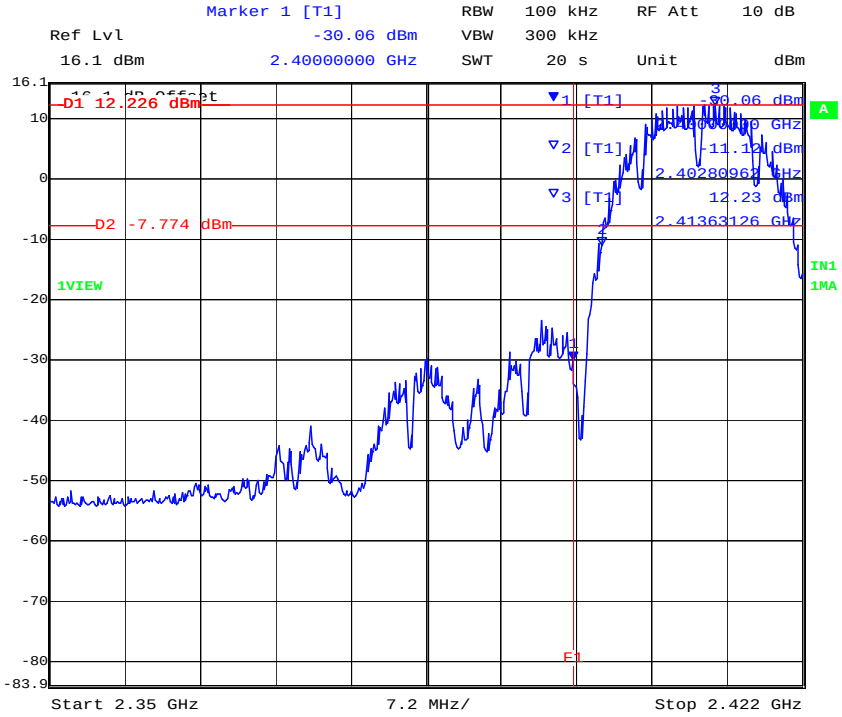
Measurement uncertainty:	±2.81 dB

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

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

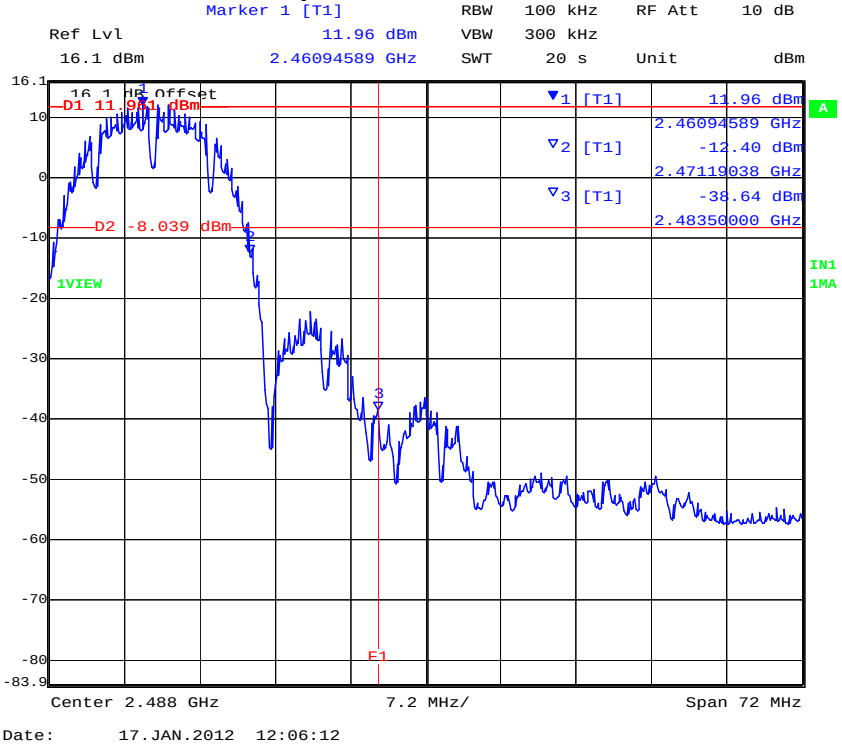


Chain B 802.11b - Conducted Spurious Emissions at the 2,400 MHz Band Edge

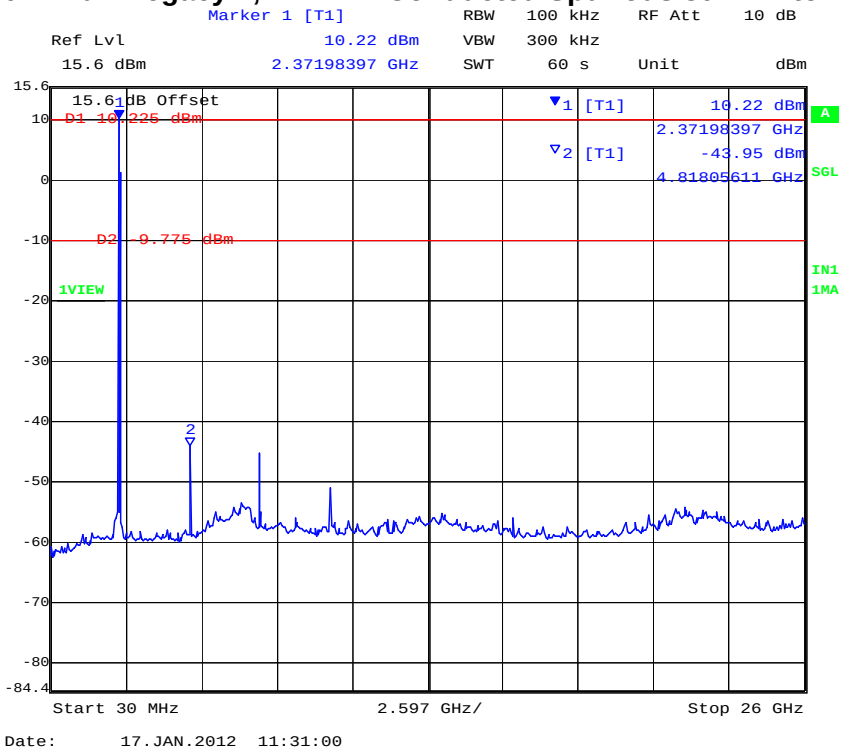


Chain A 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge

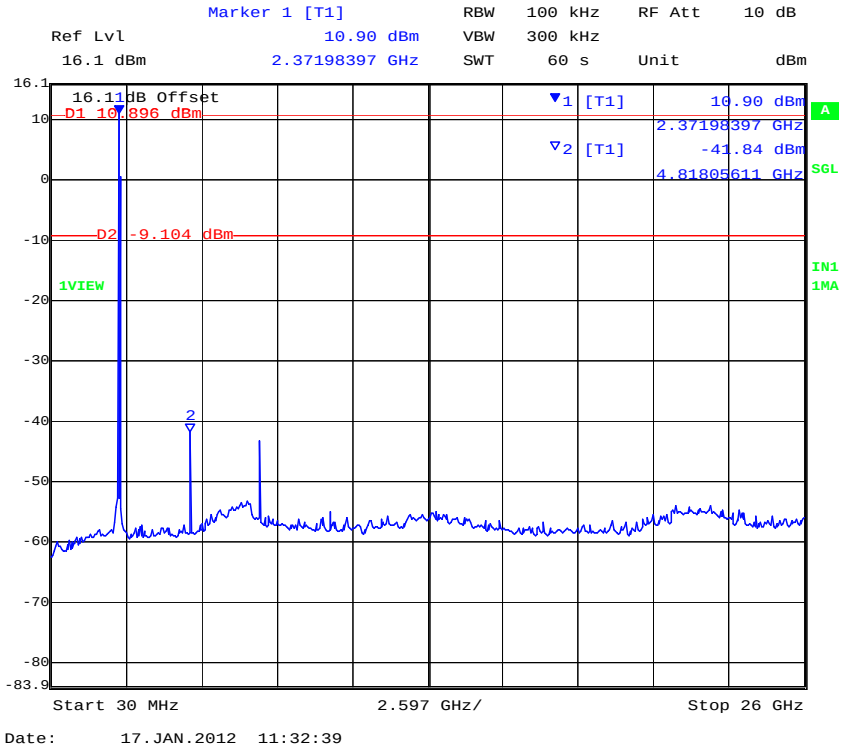
Chain B 802.11b - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



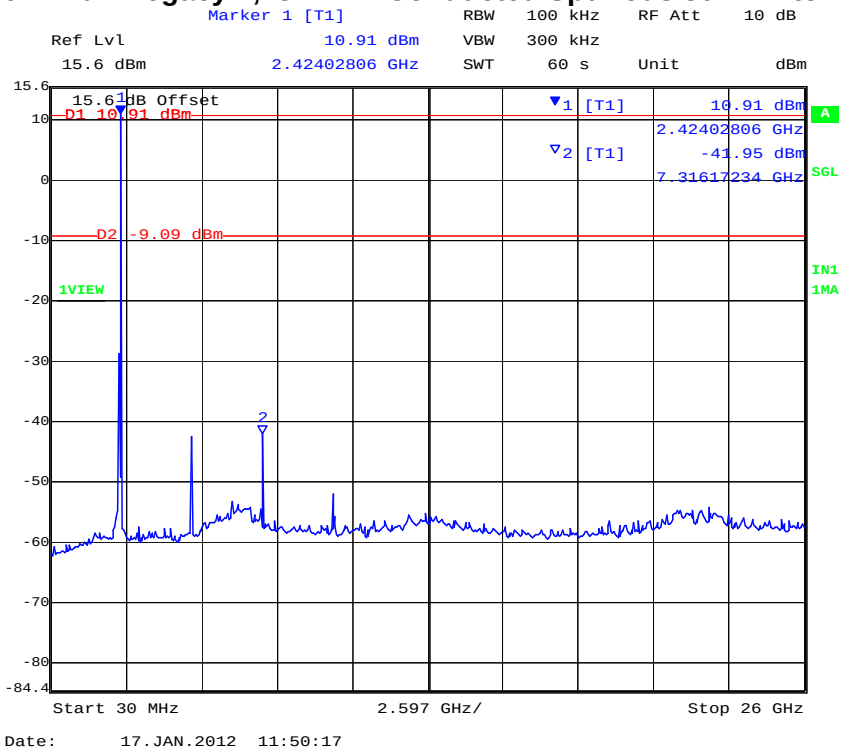
Chain A 802.11b – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



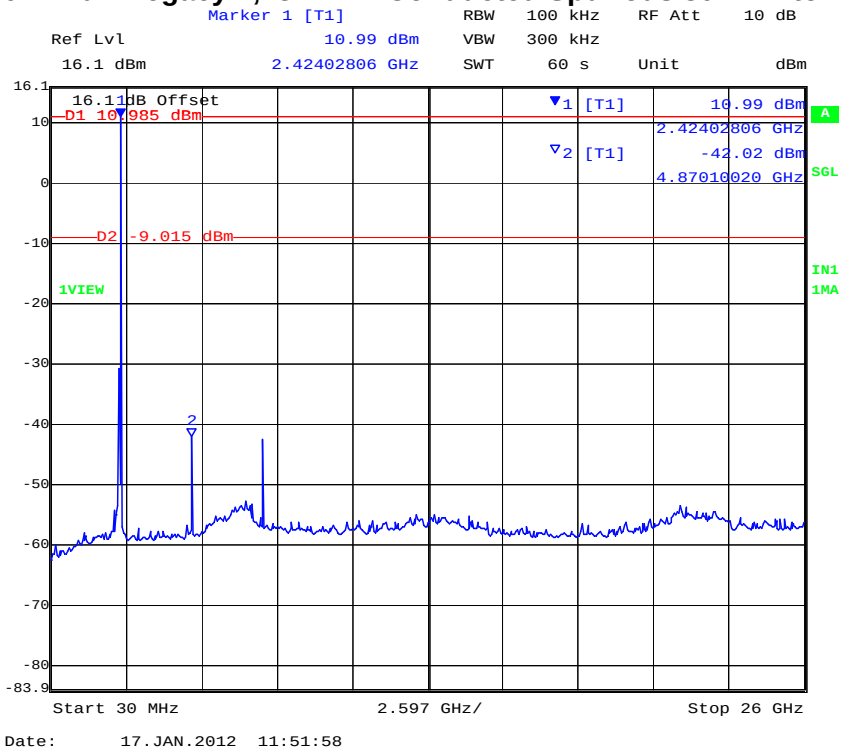
Chain B 802.11b – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



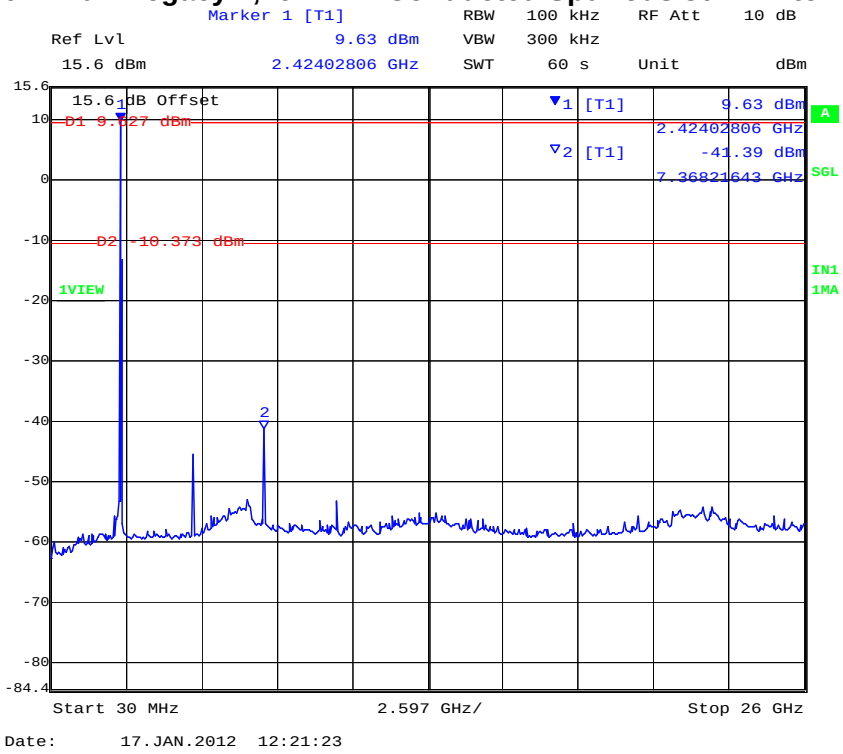
Chain A 802.11b – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



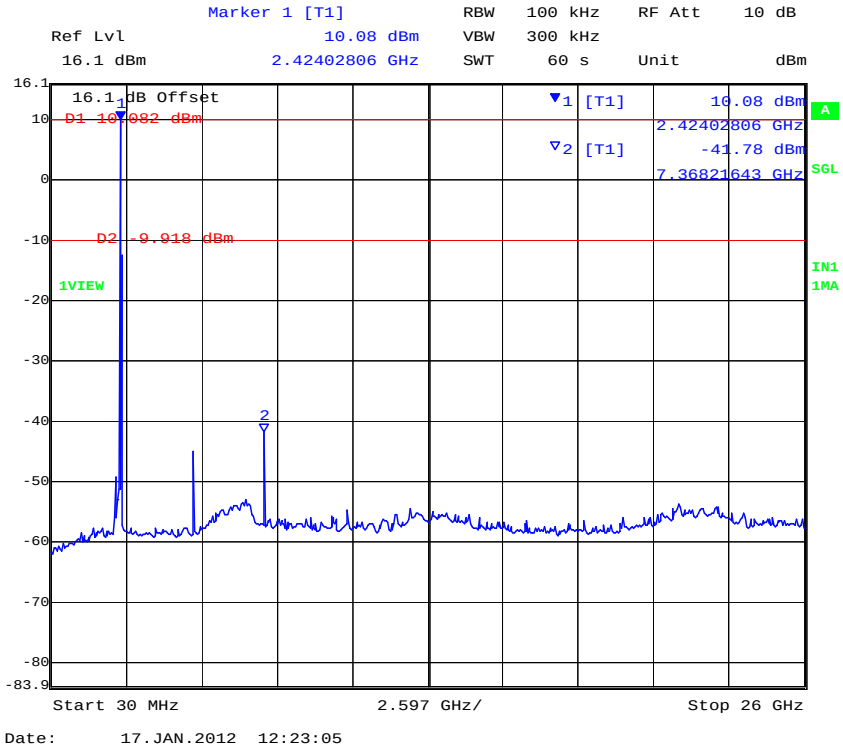
Chain B 802.11b – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain A 802.11b – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain B 802.11b – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11g		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**		
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-45.14	-11.60	-45.14	-11.66				
2437.000	30.00	26000.00	-43.16	-12.09	-41.77	-11.31				
2462.000	30.00	26000.00	-42.99	-12.71	-41.28	-12.00				

SE: Maximum spurious emsission found

Band-edge Measurement

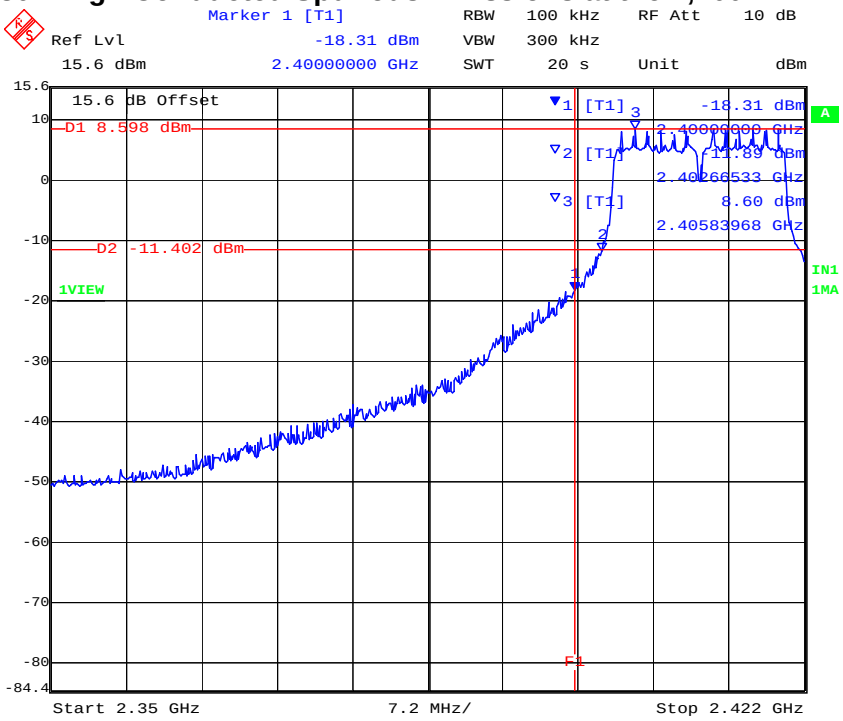
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-18.31	-11.40	-16.37	-10.35				
2462.000	2483.50	-29.06	-10.87	-27.68	-10.42				

BE: Maximum Band edge emssion found

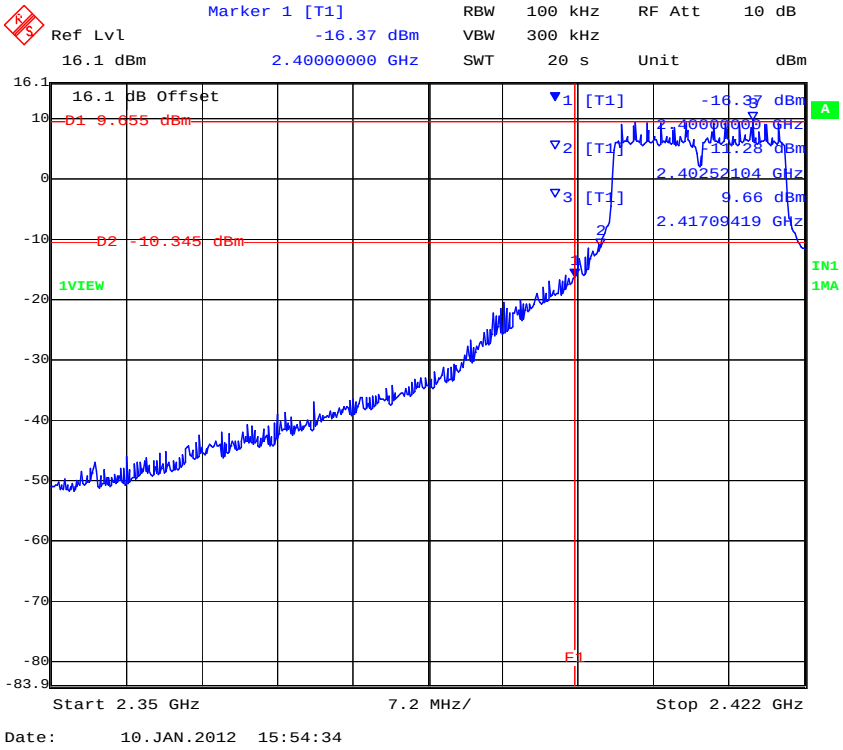
Measurement uncertainty:	±2.81 dB

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

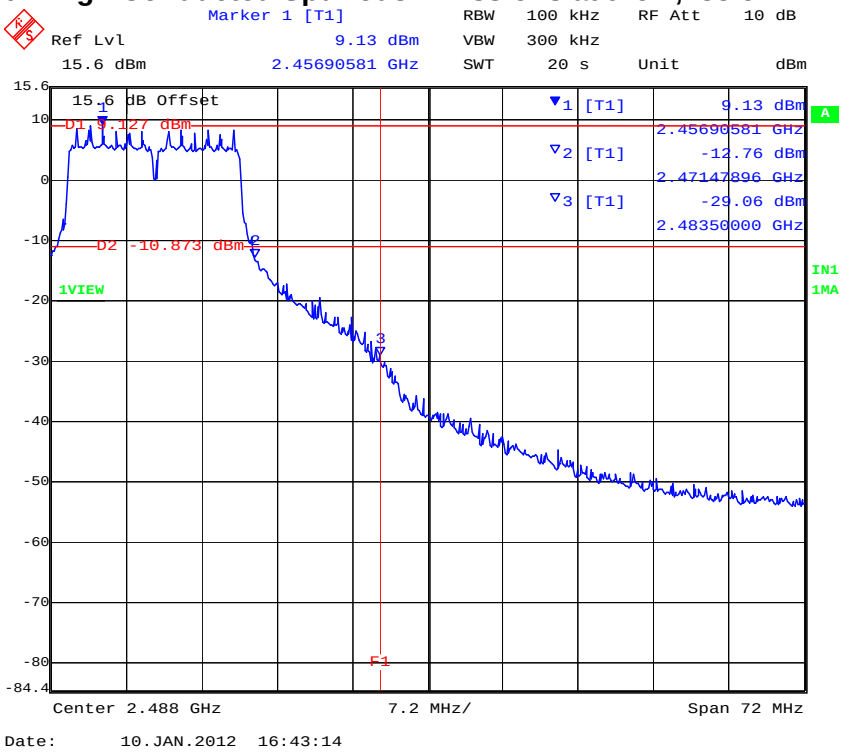
Chain A 802.11g - Conducted Spurious Emissions at the 2,400 MHz Band Edge



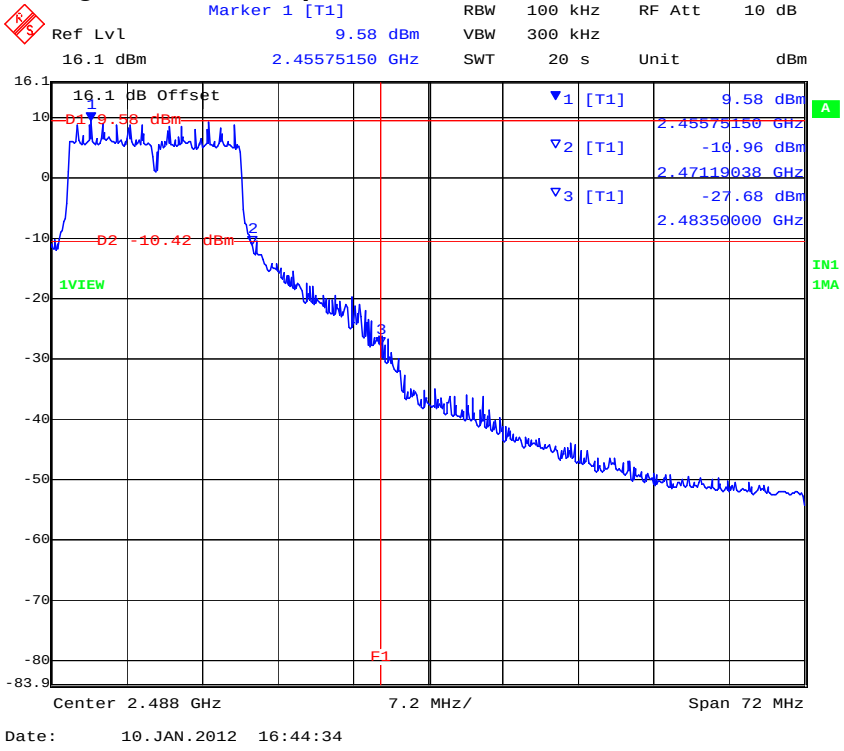
Chain B 802.11g - Conducted Spurious Emissions at the 2,400 MHz Band Edge



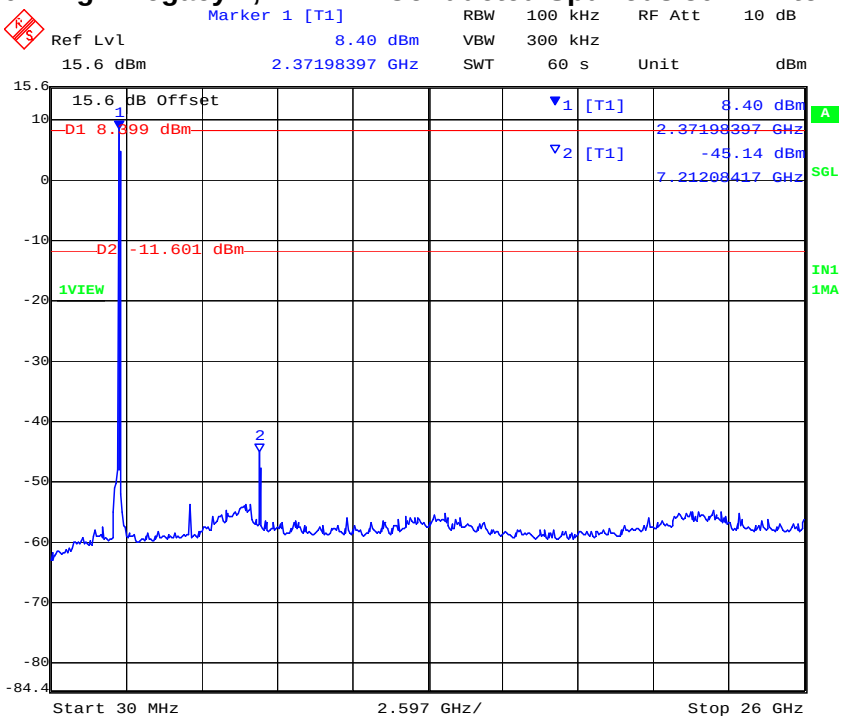
Chain A 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



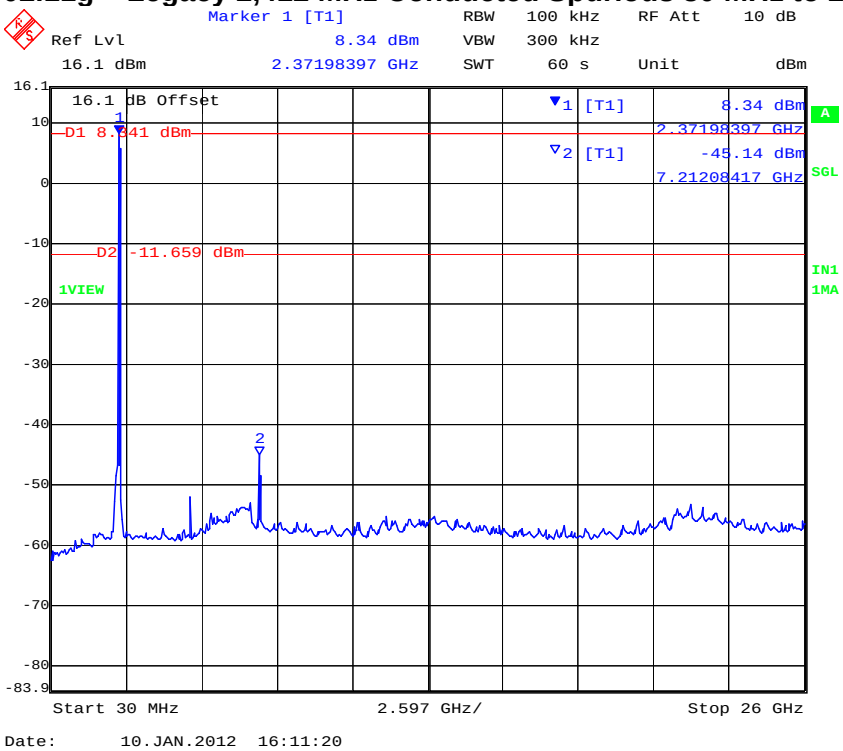
Chain B 802.11g - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



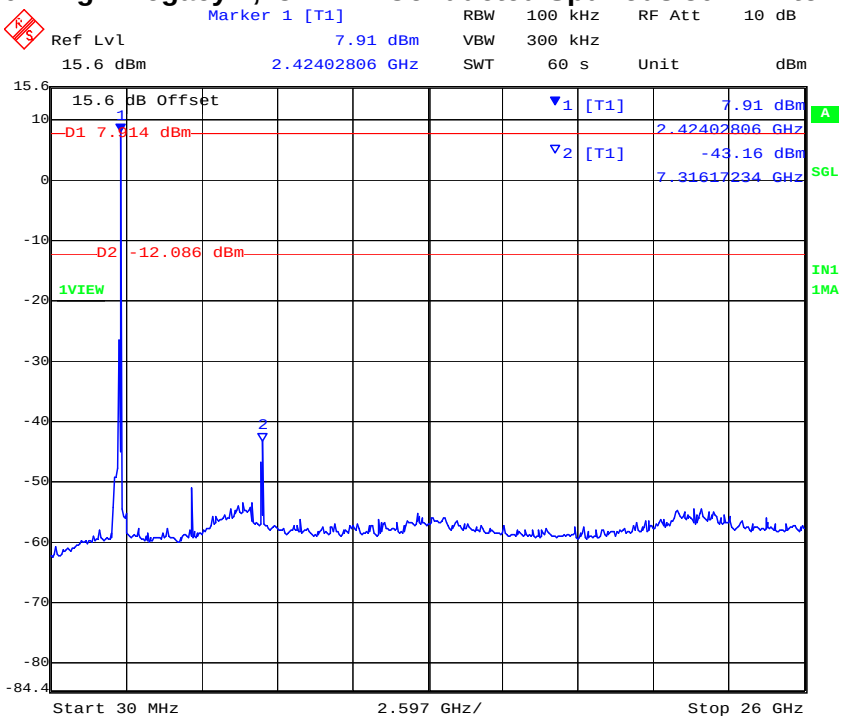
Chain A 802.11g – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



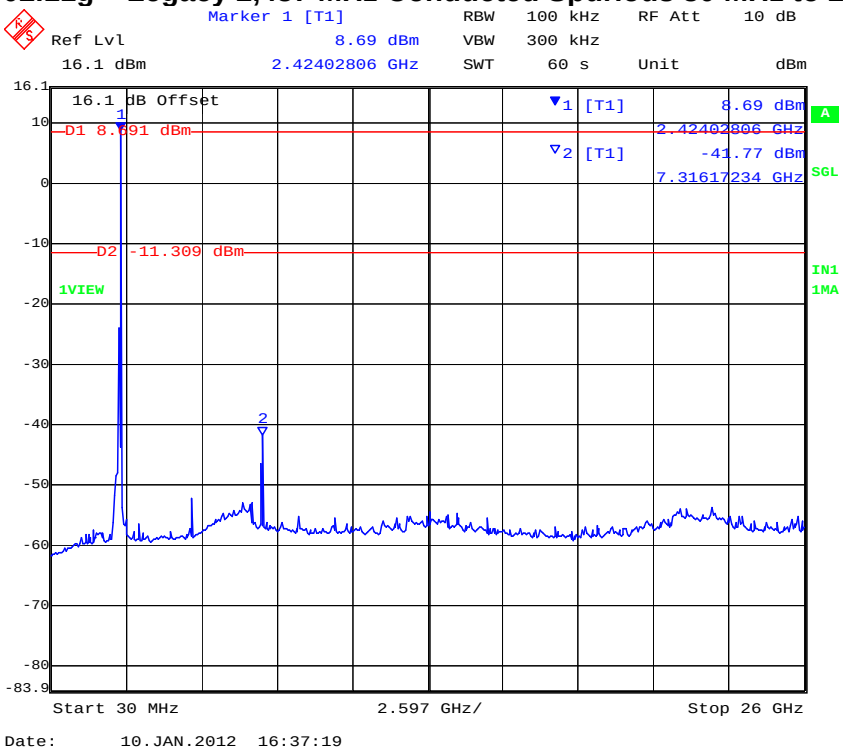
Chain B 802.11g – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



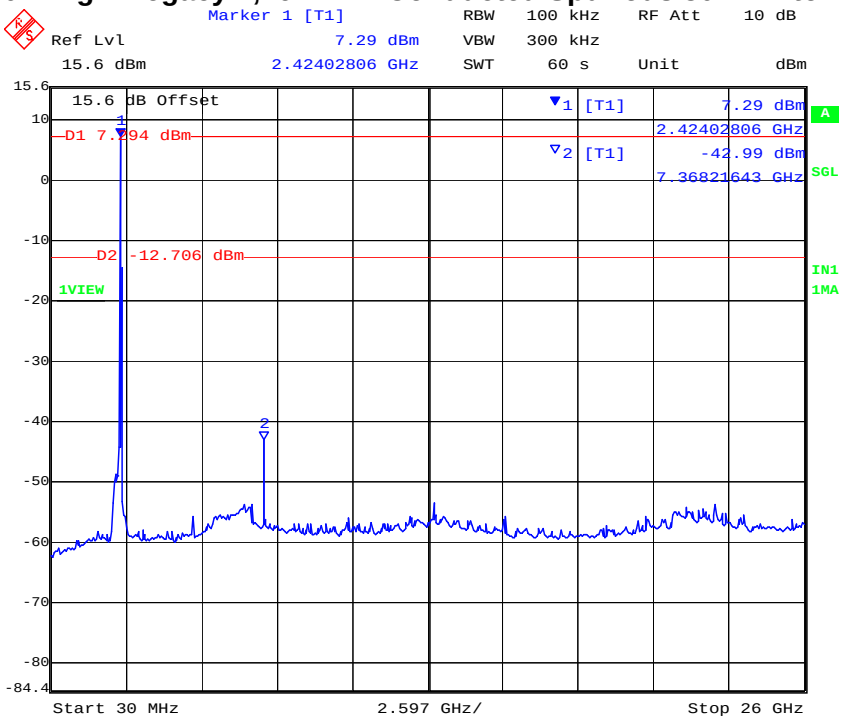
Chain A 802.11g – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



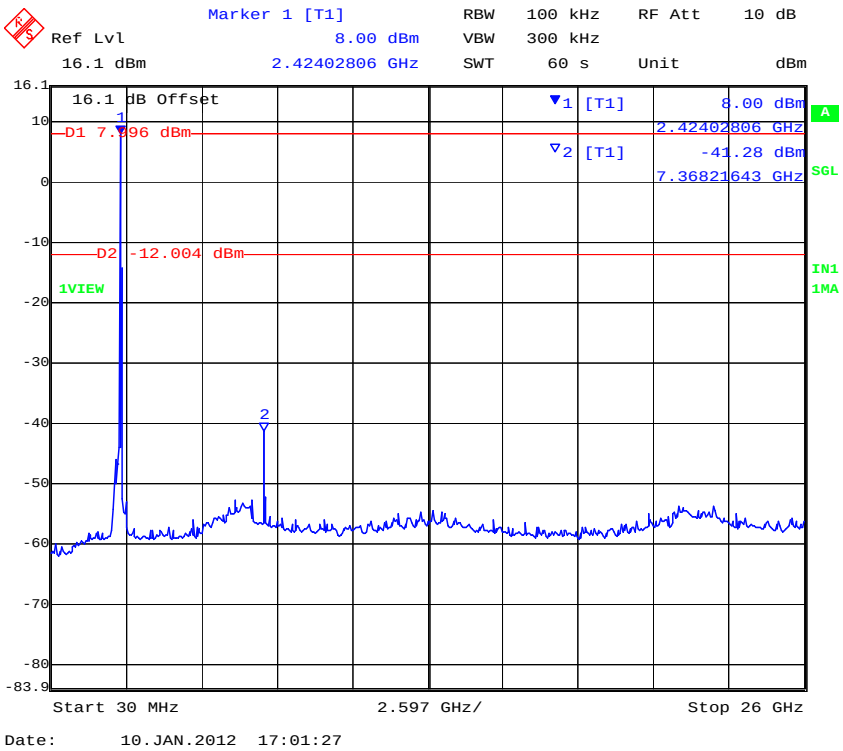
Chain B 802.11g – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain A 802.11g – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain B 802.11g – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**		
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2412.000	30.00	26000.00	-44.00	-13.25	-44.19	-9.45				
2437.000	30.00	26000.00	-41.17	-12.94	-39.20	-13.35				
2462.000	30.00	26000.00	-39.64	-10.45	-38.23	-13.55				

SE: Maximum spurious emsission found

Band-edge Measurement

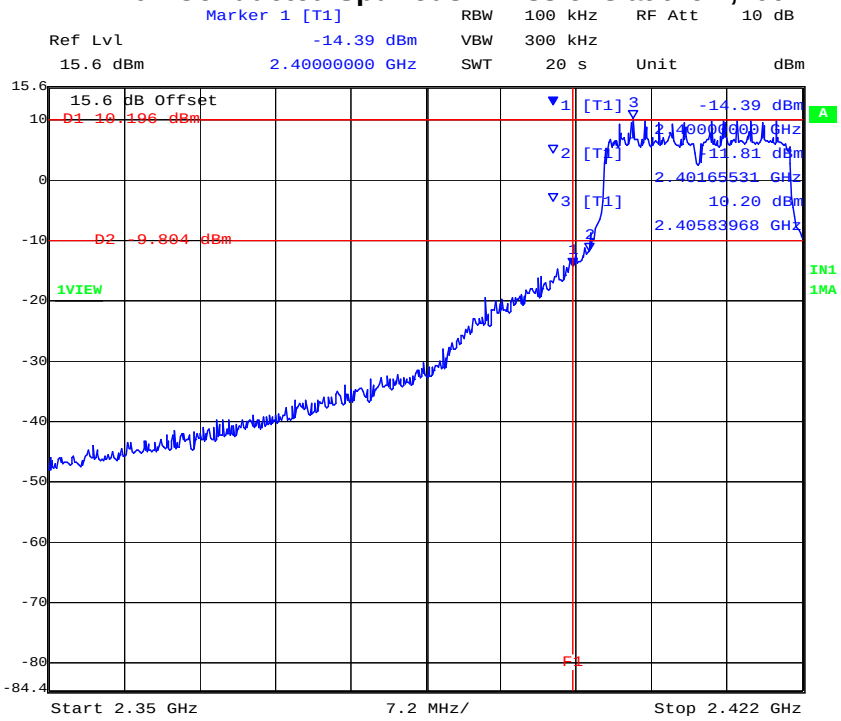
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2412.000	2400.00	-14.39	-9.80	-12.69	-8.84				
2462.000	2483.50	-23.82	-9.37	-22.75	-9.08				

BE: Maximum Band edge emssion found

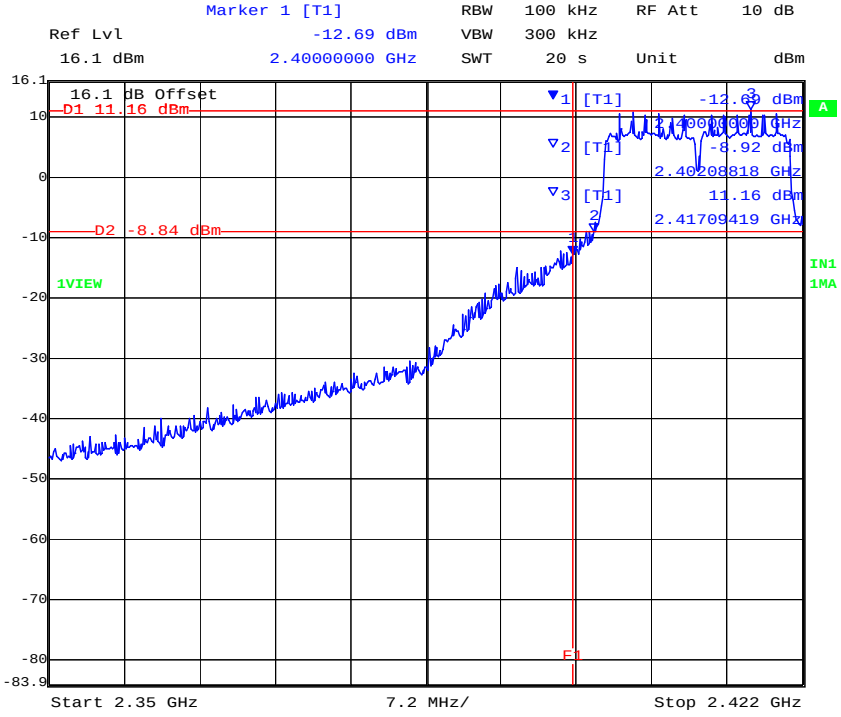
Measurement uncertainty:	±2.81 dB

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

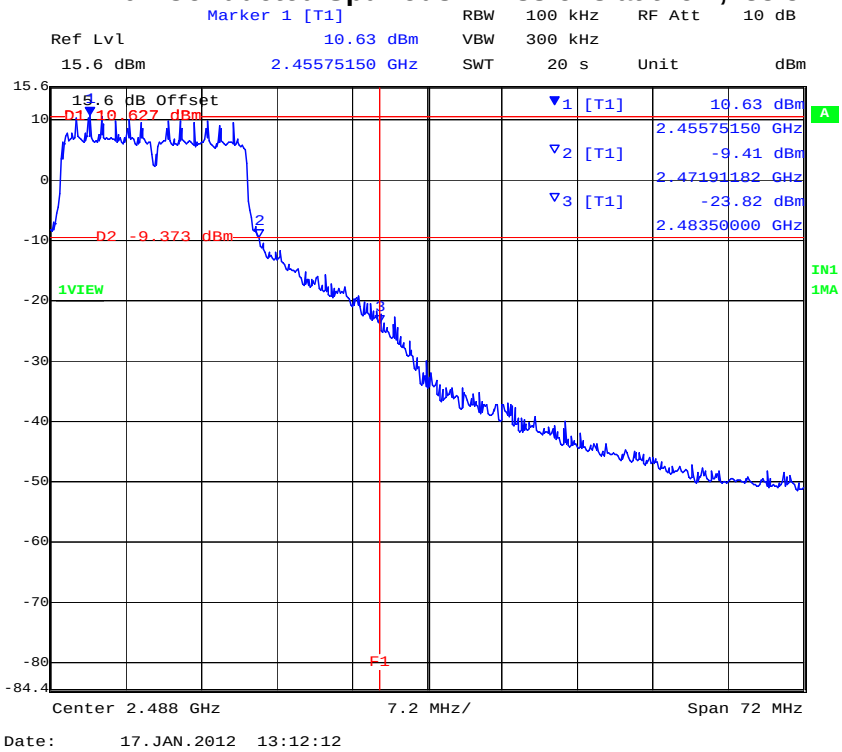
Chain A 802.11n HT-20 - Conducted Spurious Emissions at the 2,400 MHz Band Edge



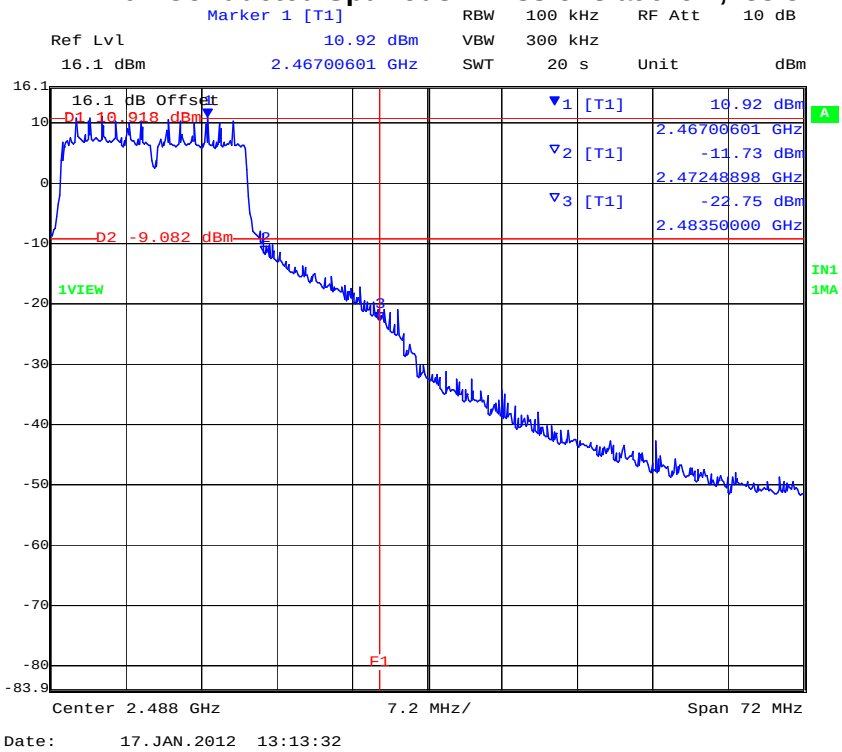
Chain B 802.11n HT-20 - Conducted Spurious Emissions at the 2,400 MHz Band Edge



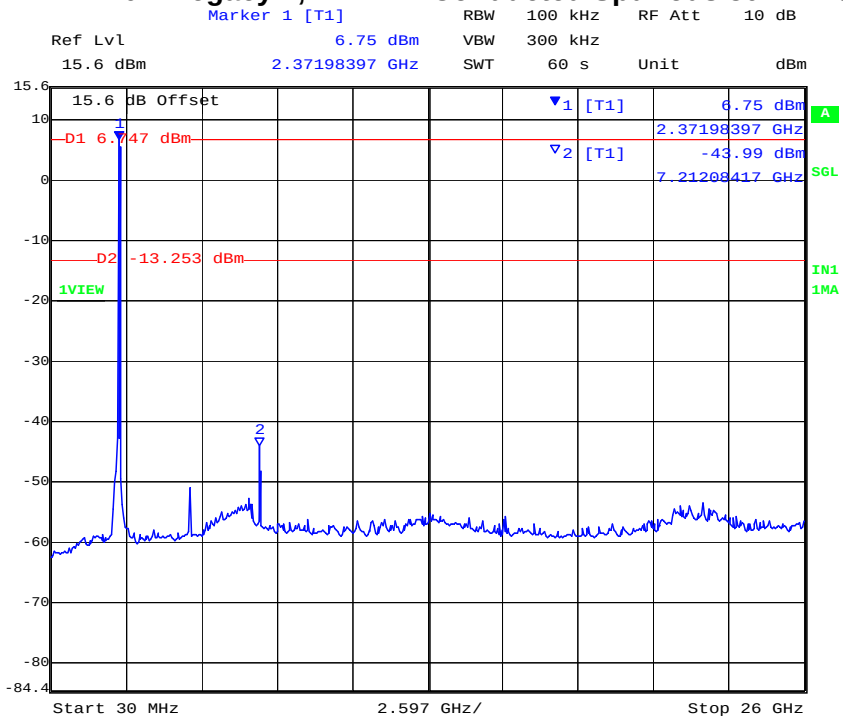
Chain A 802.11n HT-20 - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



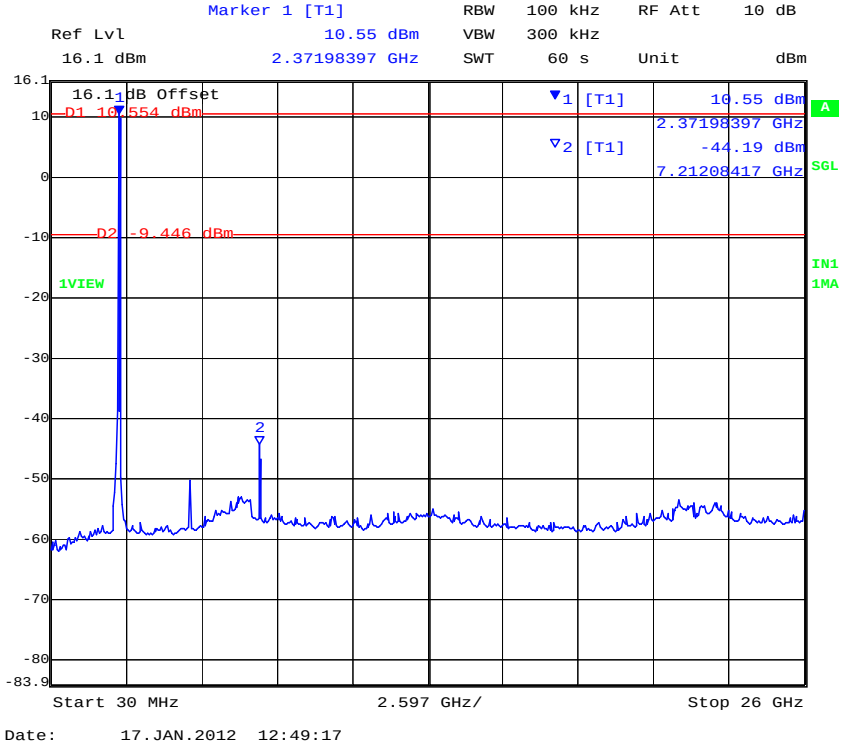
Chain B 802.11n HT-20 - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



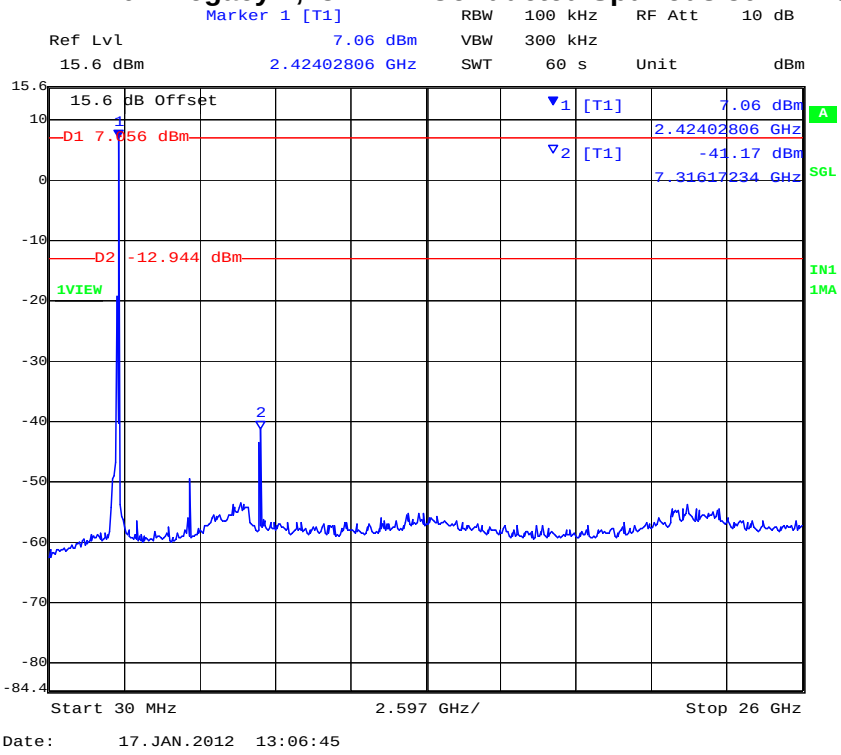
Chain A 802.11n HT-20 – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



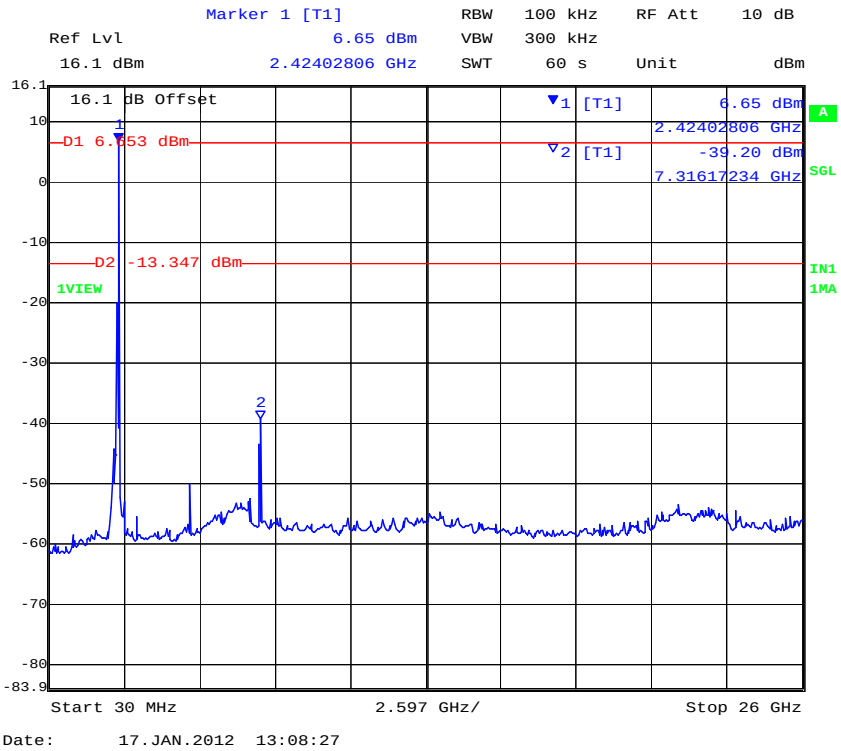
Chain B 802.11n HT-20 – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



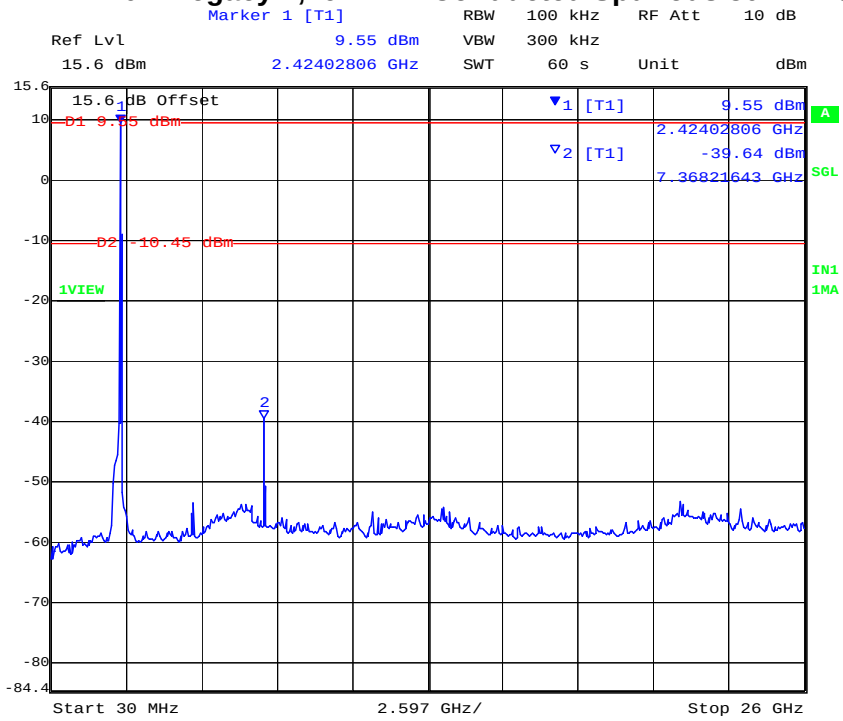
Chain A 802.11n HT-20 – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



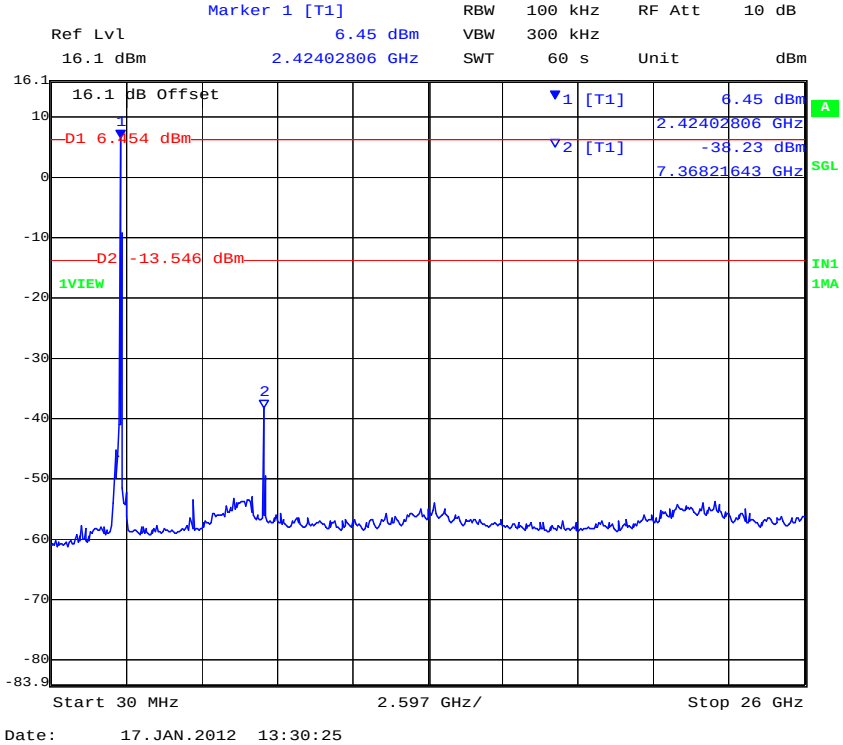
Chain B 802.11n HT-20 – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain A 802.11n HT-20 – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain B 802.11n HT-20 – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**		
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
2422.000	30.00	26000.00	-47.38	-16.47	-46.27	-16.65				
2437.000	30.00	26000.00	-46.22	-16.69	-44.65	-16.17				
2452.000	30.00	26000.00	-44.85	-16.72	-42.64	-16.51				

SE: Maximum spurious emsission found

Band-edge Measurement

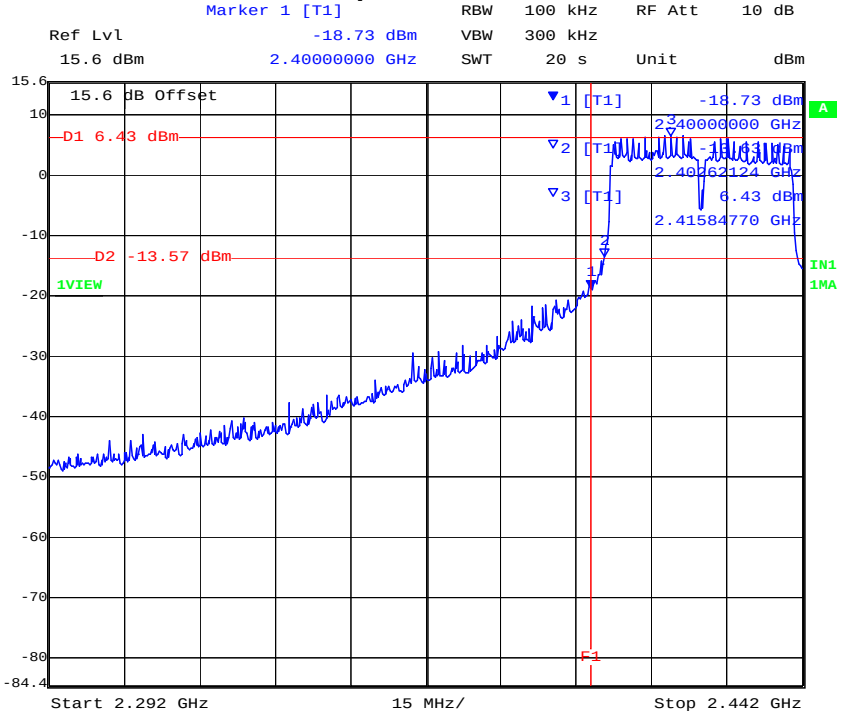
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
2422.000	2400.00	-18.73	-13.57	-18.37	-12.62				
2452.000	2483.50	-22.95	-13.24	-22.25	-12.99				

BE: Maximum Band edge emssion found

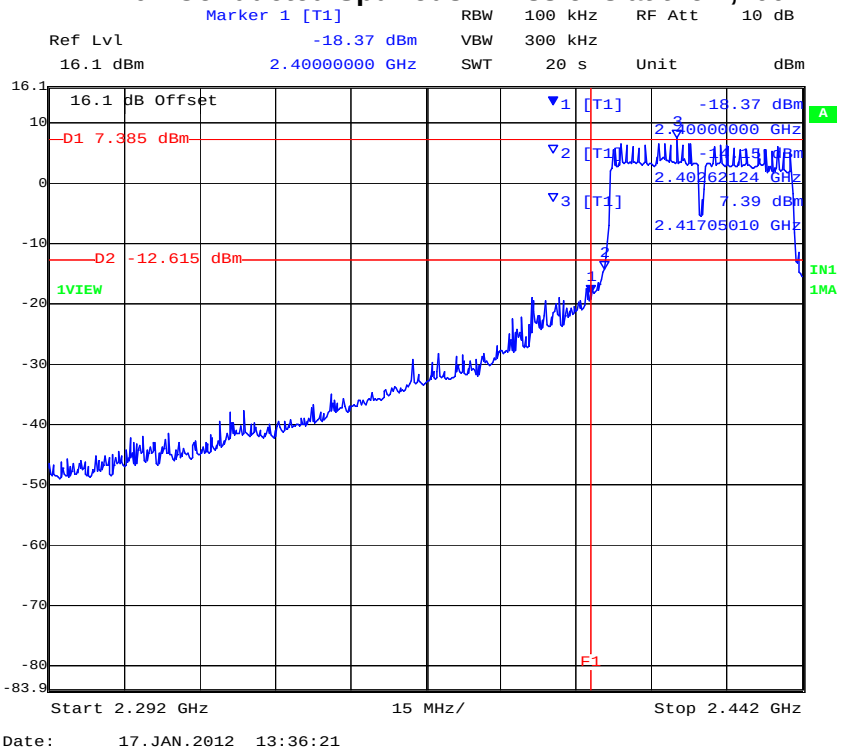
Measurement uncertainty:	±2.81 dB

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

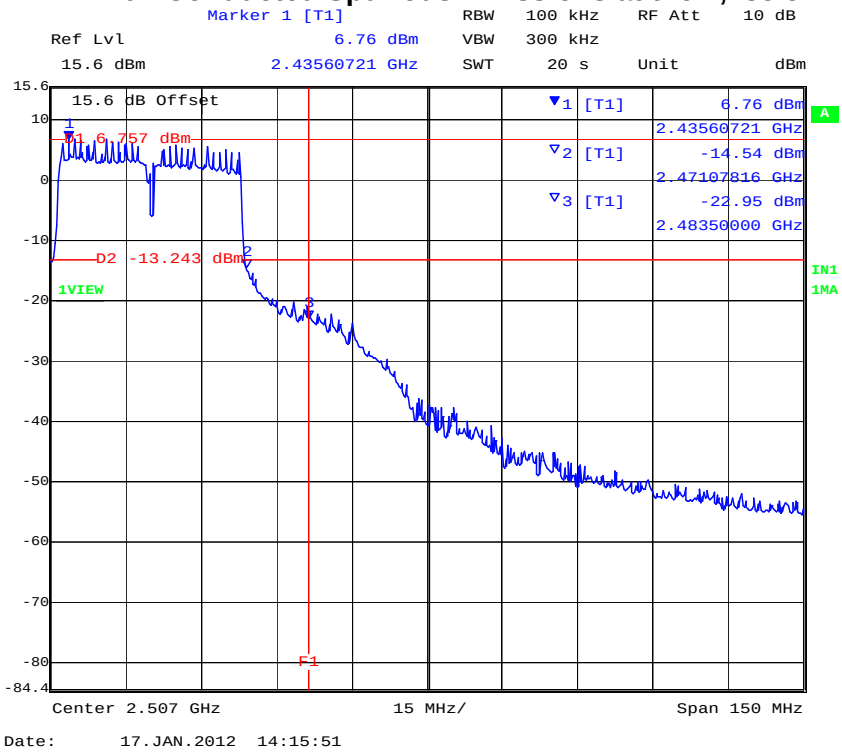
Chain A 802.11n HT-40 - Conducted Spurious Emissions at the 2,400 MHz Band Edge



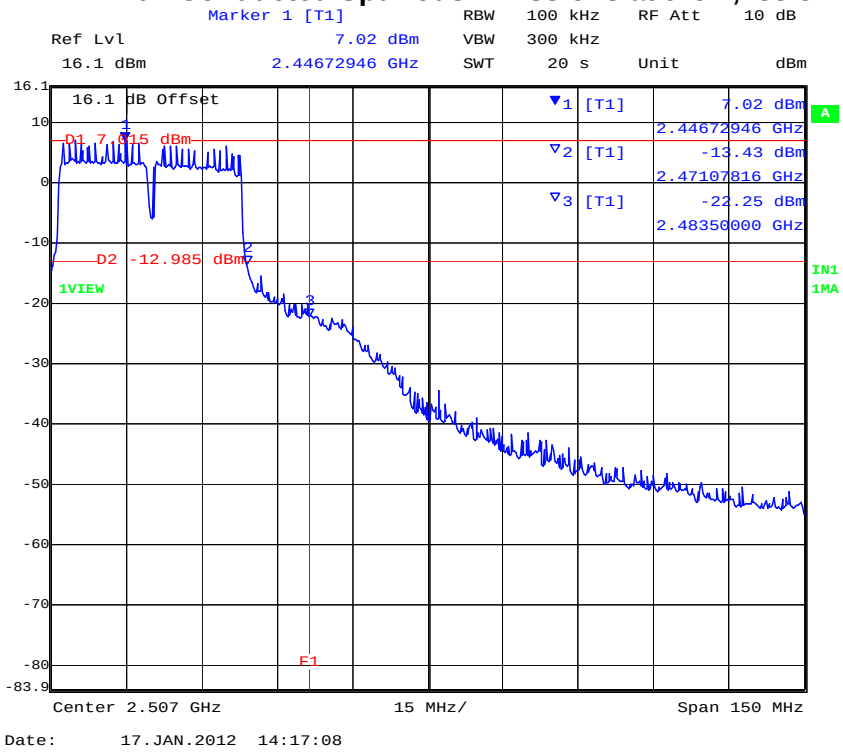
Chain B 802.11n HT-40 - Conducted Spurious Emissions at the 2,400 MHz Band Edge



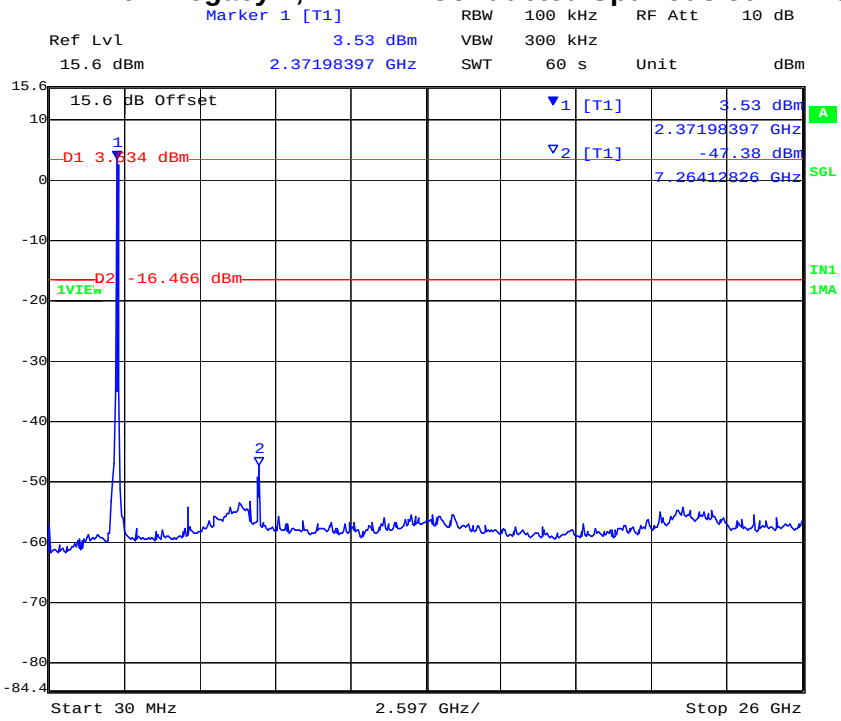
Chain A 802.11n HT-40 - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



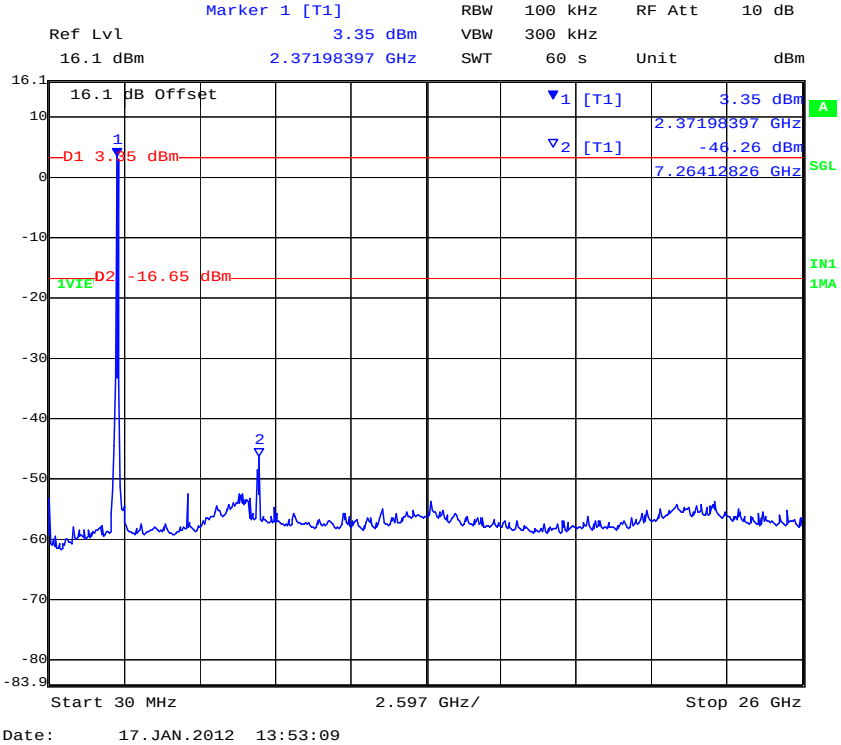
Chain B 802.11n HT-40 - Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



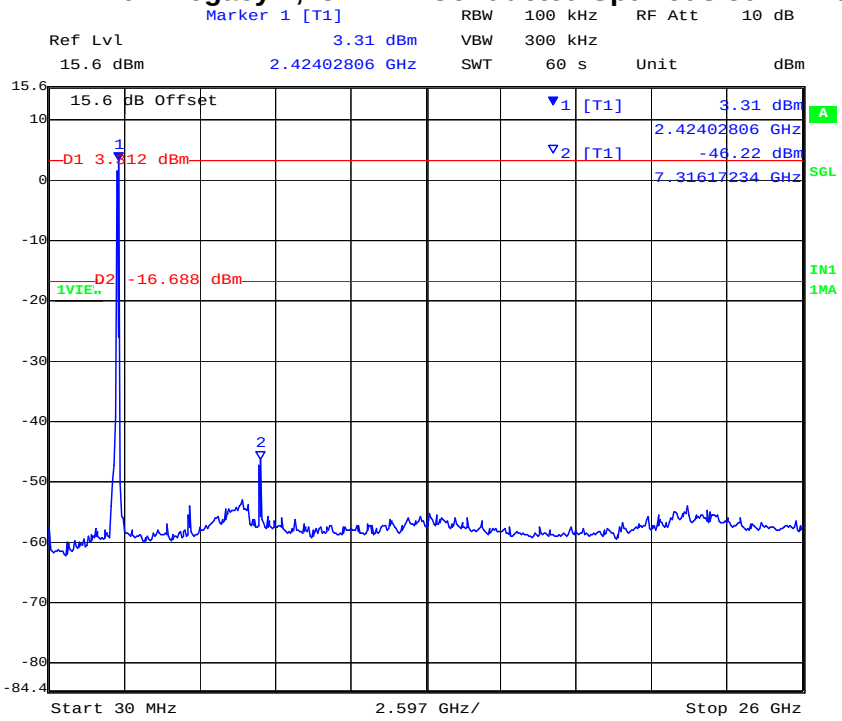
Chain A 802.11n HT-40 – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



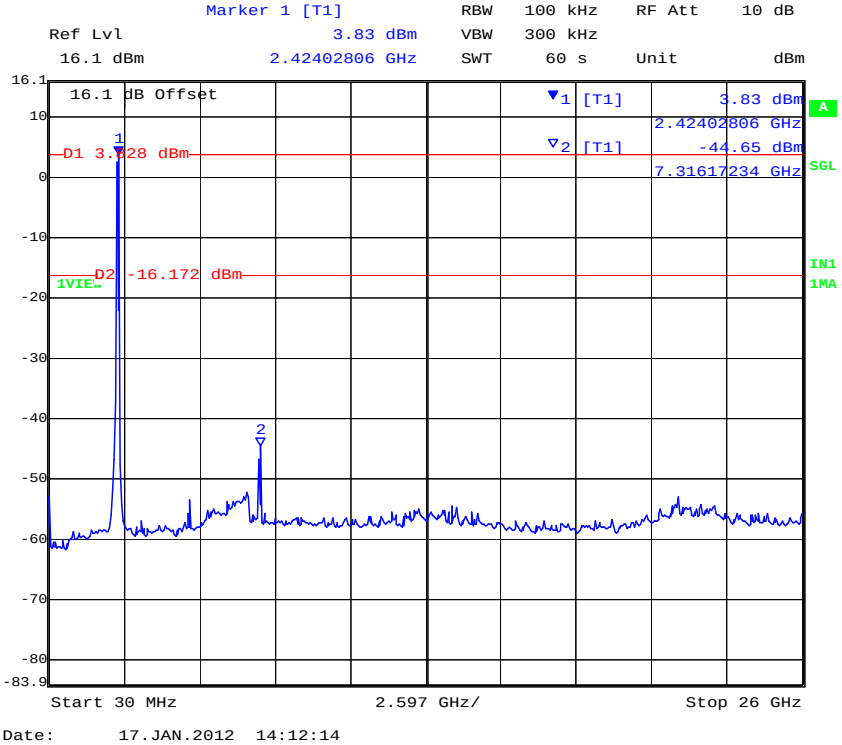
Chain B 802.11n HT-40 – Legacy 2,412 MHz Conducted Spurious 30 MHz to 26,000 MHz



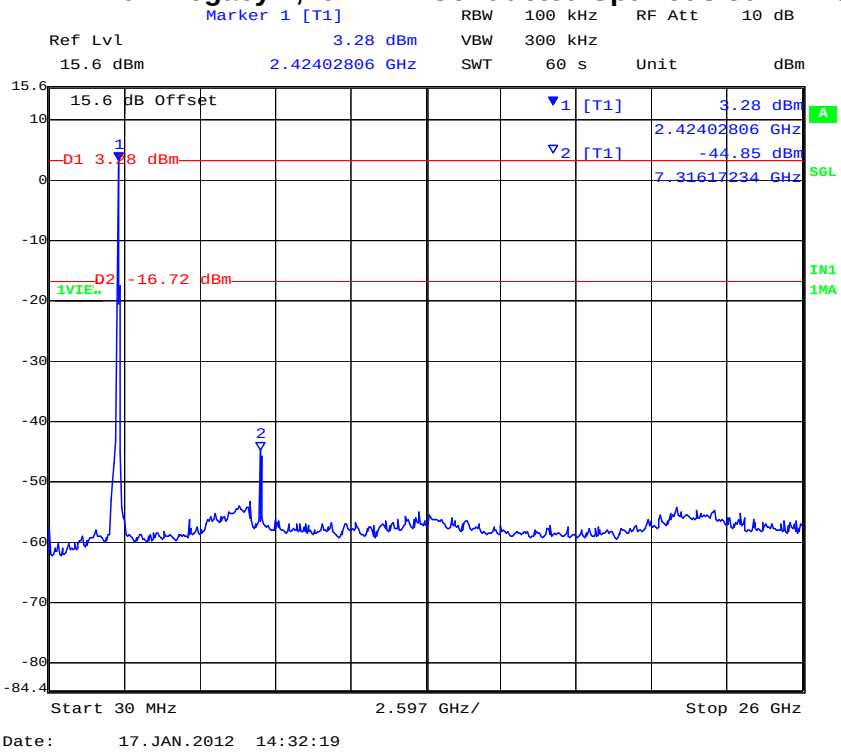
Chain A 802.11n HT-40 – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



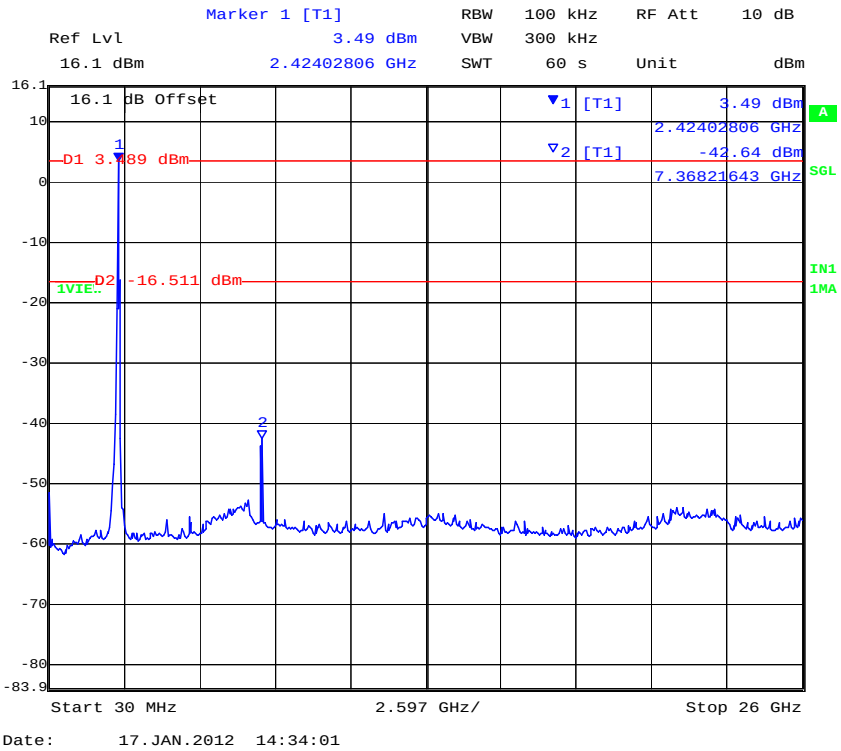
Chain B 802.11n HT-40 – Legacy 2,437 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain A 802.11n HT-40 – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Chain B 802.11n HT-40 – Legacy 2,462 MHz Conducted Spurious 30 MHz to 26,000 MHz



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11a		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**		
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5745.000	30.00	26000.00	-39.06	-14.80	-38.31	-14.44				
5785.000	30.00	26000.00	-38.86	-17.81	-36.11	-13.54				
5825.000	30.00	26000.00	-38.44	-13.99	-35.70	-13.44				

SE: Maximum spurious emsission found

Band-edge Measurement

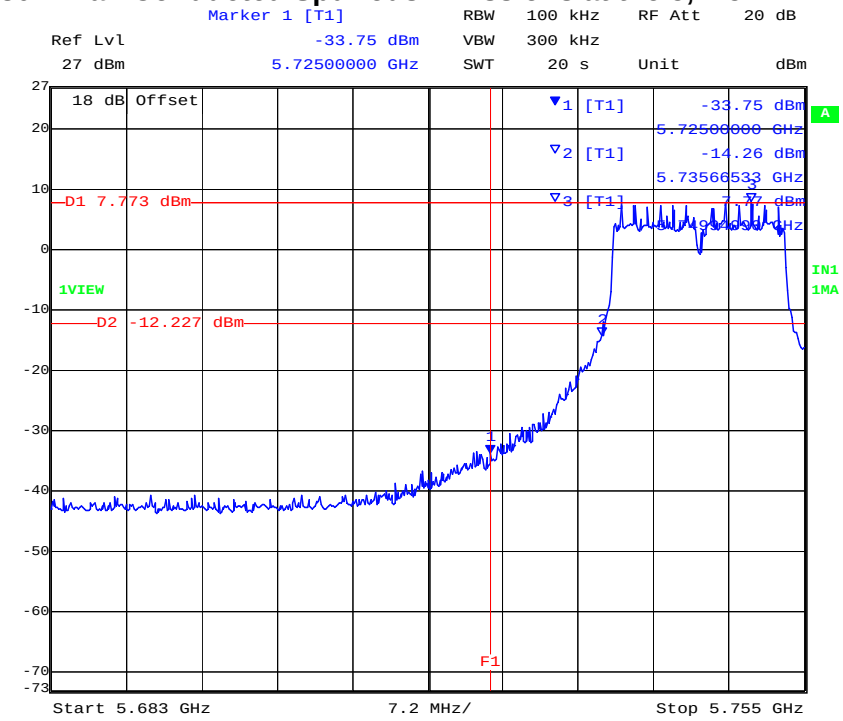
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5745.000	5725.00	-33.75	-12.23	-30.11	-10.59				
5825.000	5850.00	-40.99	-13.47	-34.67	-11.15				

BE: Maximum Band edge emssion found

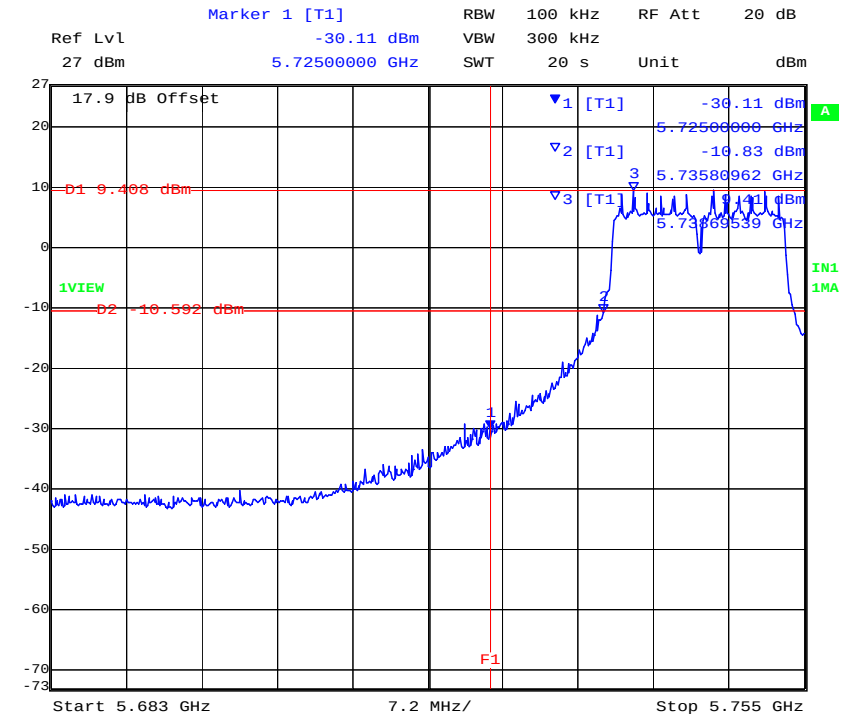
Measurement uncertainty:	±2.81 dB

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

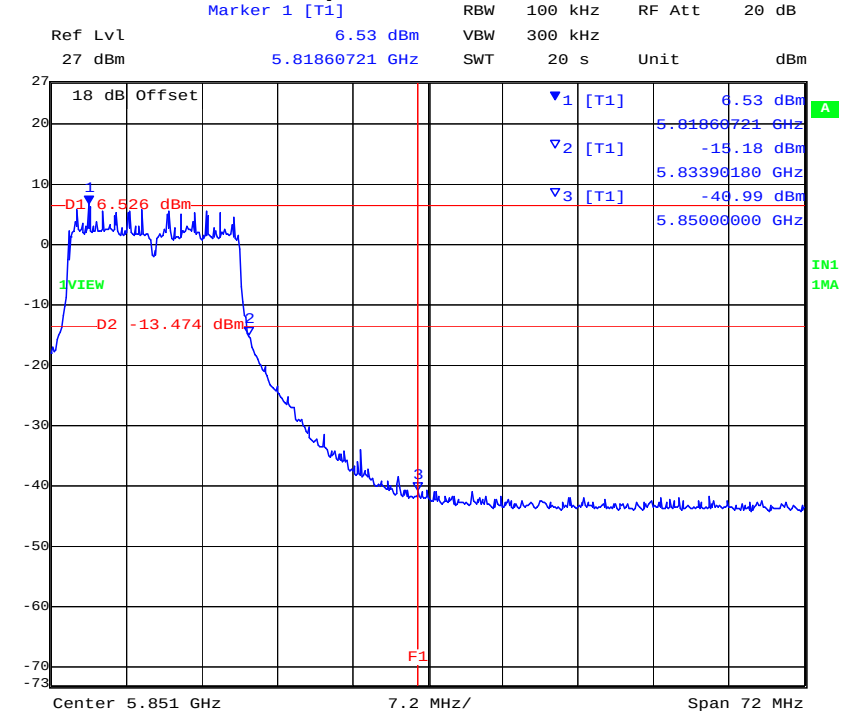
Chain A 802.11a - Conducted Spurious Emissions at the 5,725 MHz Band Edge



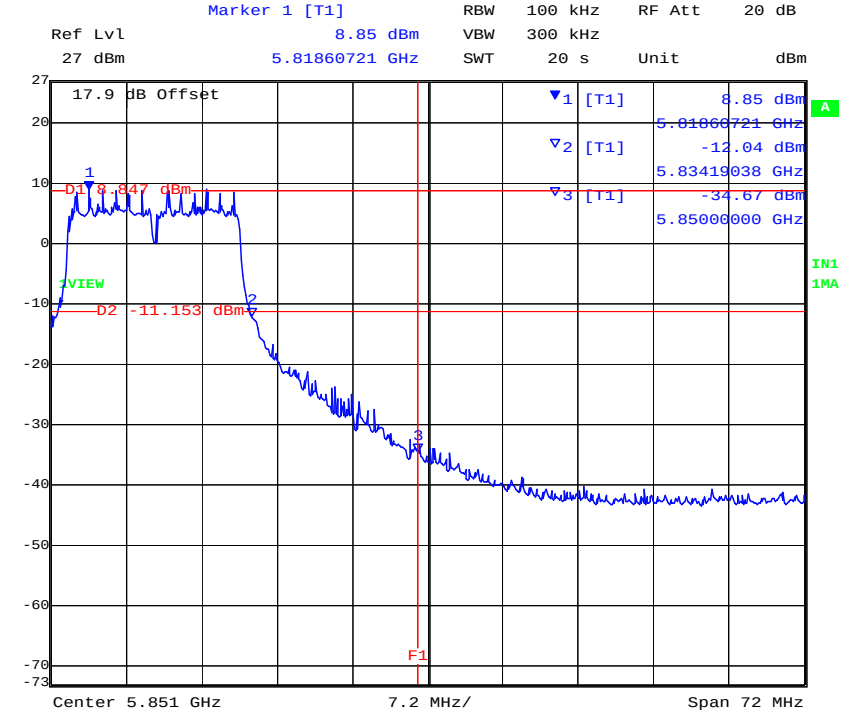
Chain B 802.11a - Conducted Spurious Emissions at the 5,725 MHz Band Edge



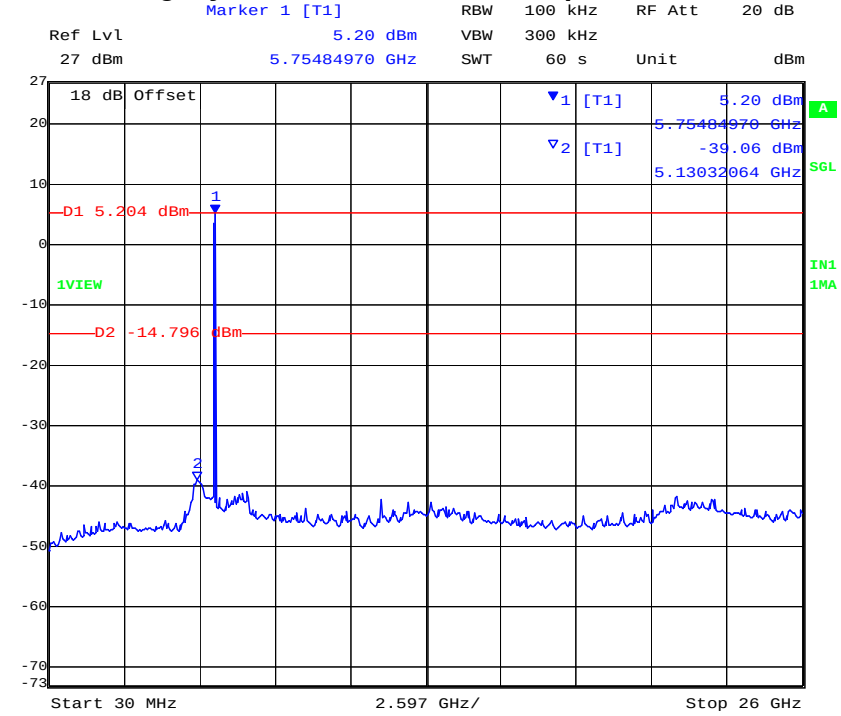
Chain A 802.11a - Conducted Spurious Emissions at the 5,850 MHz Band Edge



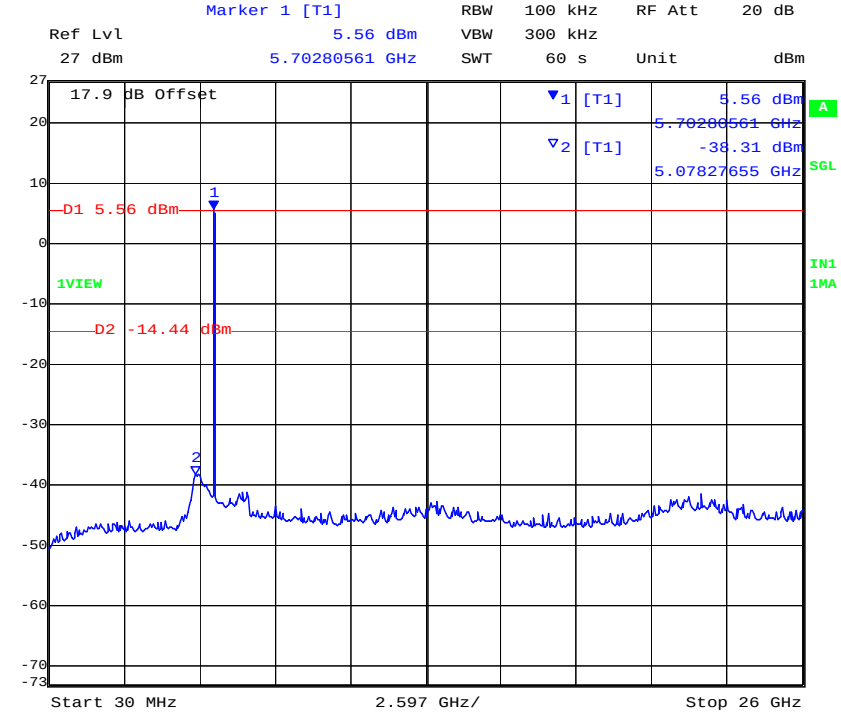
Chain B 802.11a - Conducted Spurious Emissions at the 5,850 MHz Band Edge



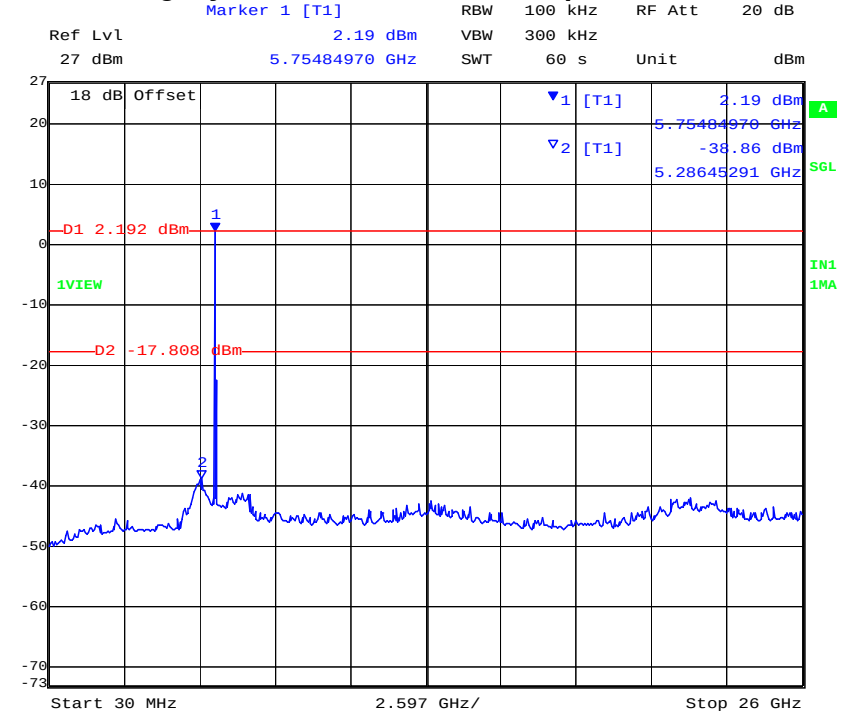
Chain A 802.11a – Legacy 5,745 MHz Conducted Spurious 30 MHz to 40,000 MHz



Chain B 802.11a – Legacy 5,745 MHz Conducted Spurious 30 MHz to 40,000 MHz

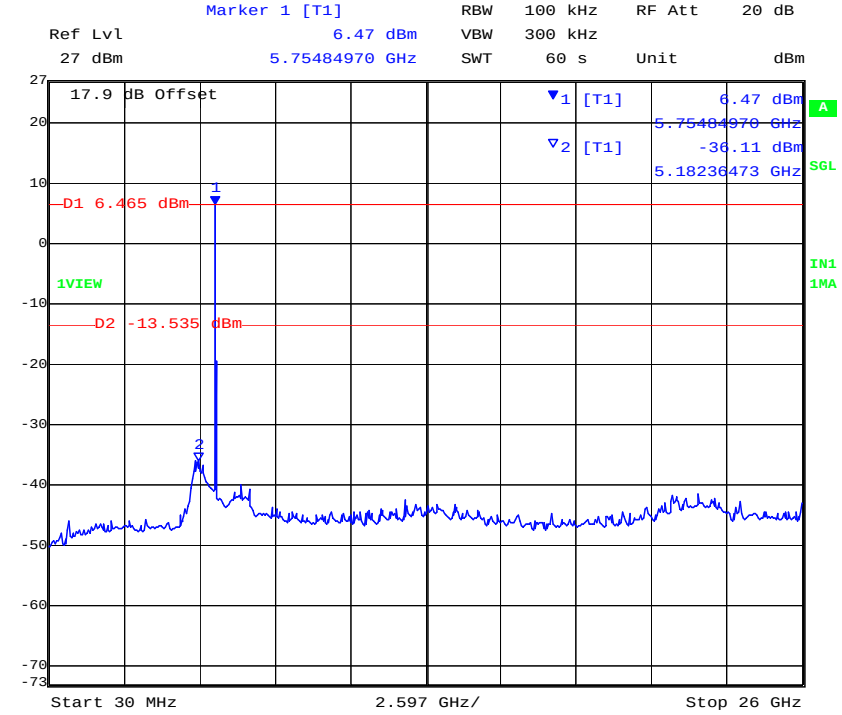


Chain A 802.11a – Legacy 5,785 MHz Conducted Spurious 30 MHz to 40,000 MHz



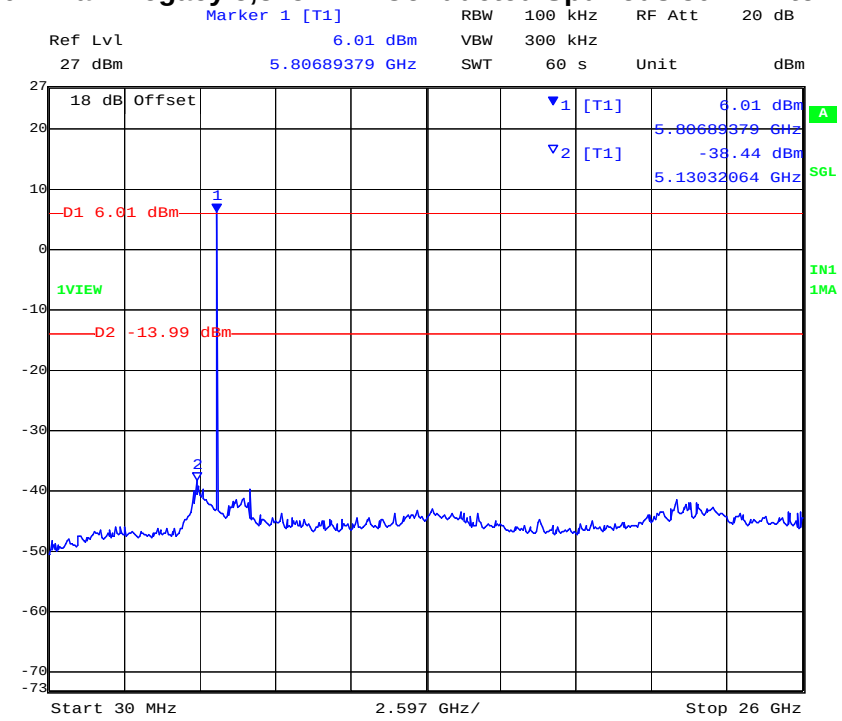
Date: 17.JAN.2012 15:20:07

Chain B 802.11a – Legacy 5,785 MHz Conducted Spurious 30 MHz to 40,000 MHz

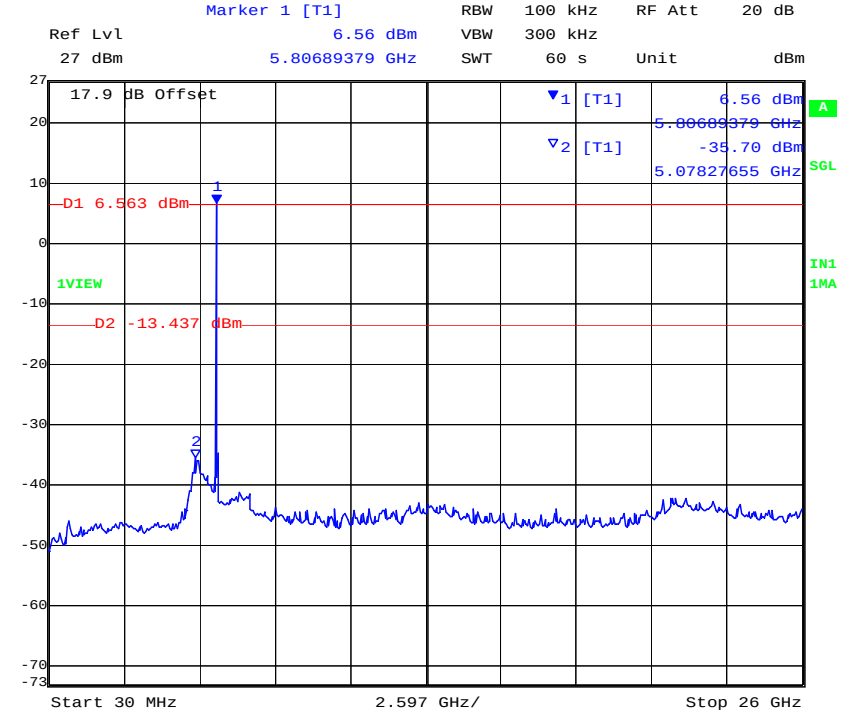


Date: 17.JAN.2012 15:21:49

Chain A 802.11a – Legacy 5,825 MHz Conducted Spurious 30 MHz to 40,000 MHz



Chain B 802.11a – Legacy 5,825 MHz Conducted Spurious 30 MHz to 40,000 MHz



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**	2	
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5745.000	30.00	26000.00	-38.00	-12.84	-38.64	-12.06				
5785.000	30.00	26000.00	-38.91	-16.60	-36.29	-15.23				
5825.000	30.00	26000.00	-39.13	-17.74	-35.51	-15.63				

SE: Maximum spurious emsission found

Band-edge Measurement

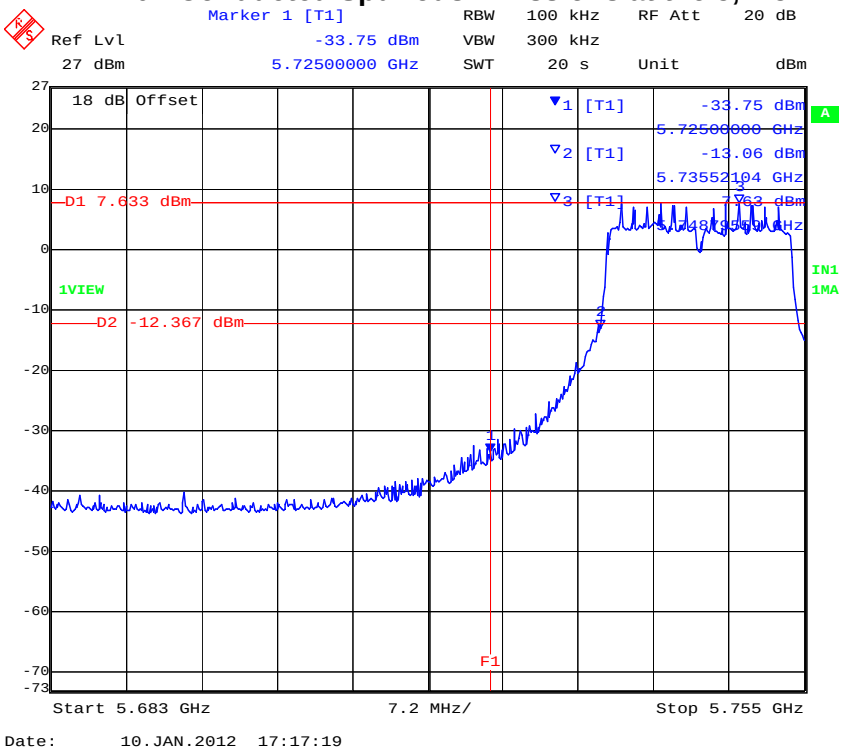
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5745.000	5725.00	-33.75	-12.37	-30.38	-10.82				
5825.000	5850.00	-40.53	-13.86	-34.02	-11.83				

BE: Maximum Band edge emssion found

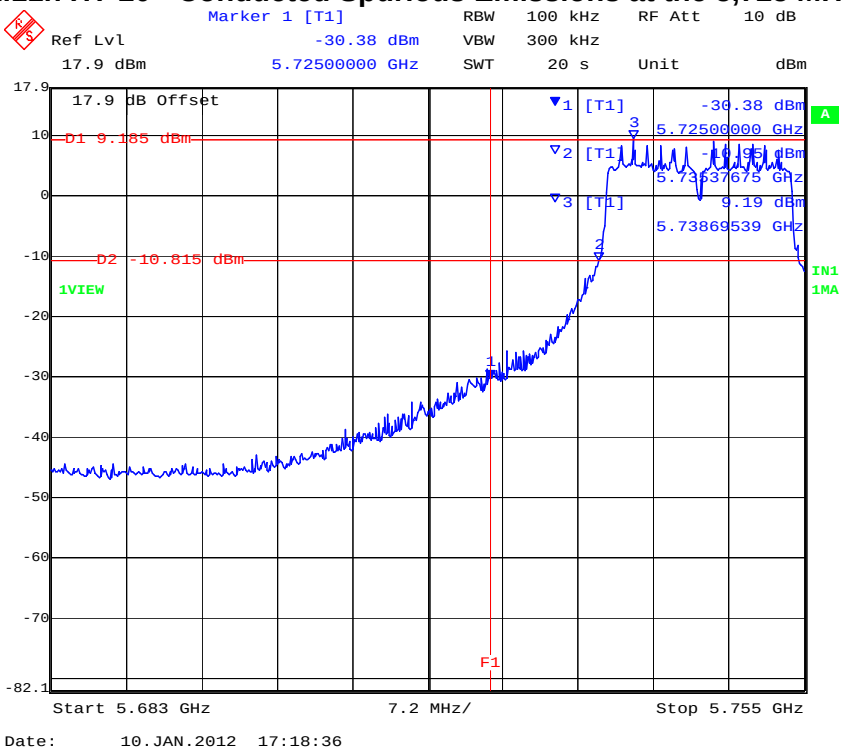
Measurement uncertainty:	±2.81 dB

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

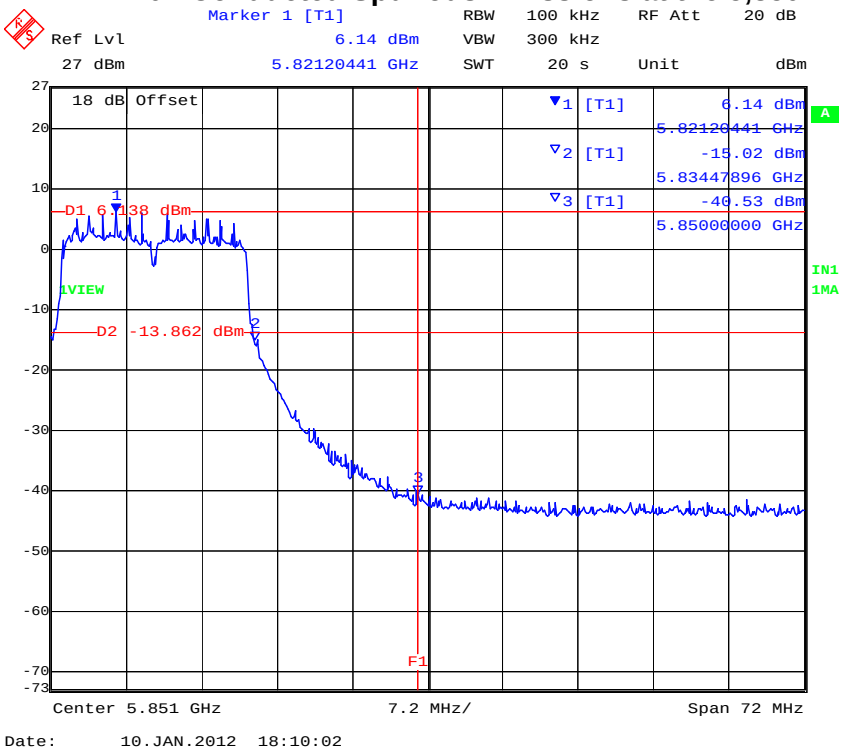
Chain A 802.11n HT-20 - Conducted Spurious Emissions at the 5,725 MHz Band Edge



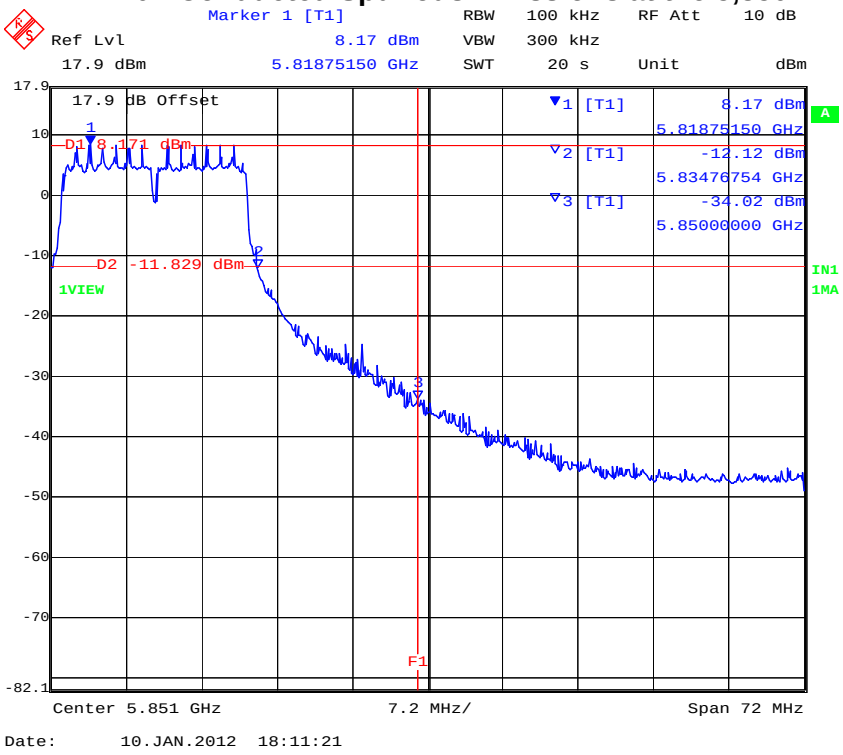
Chain B 802.11n HT-20 - Conducted Spurious Emissions at the 5,725 MHz Band Edge



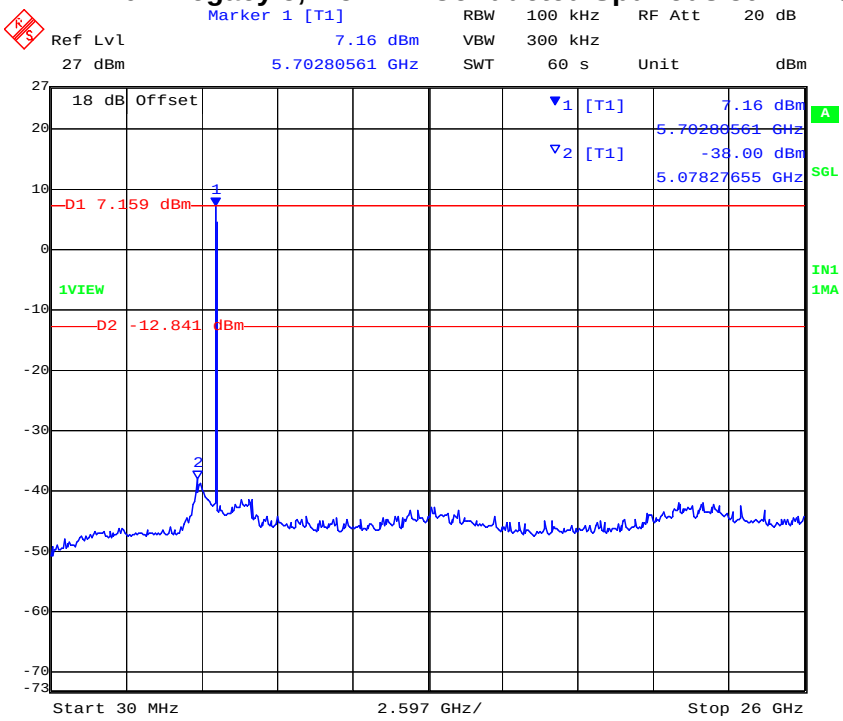
Chain A 802.11n HT-20 - Conducted Spurious Emissions at the 5,850 MHz Band Edge



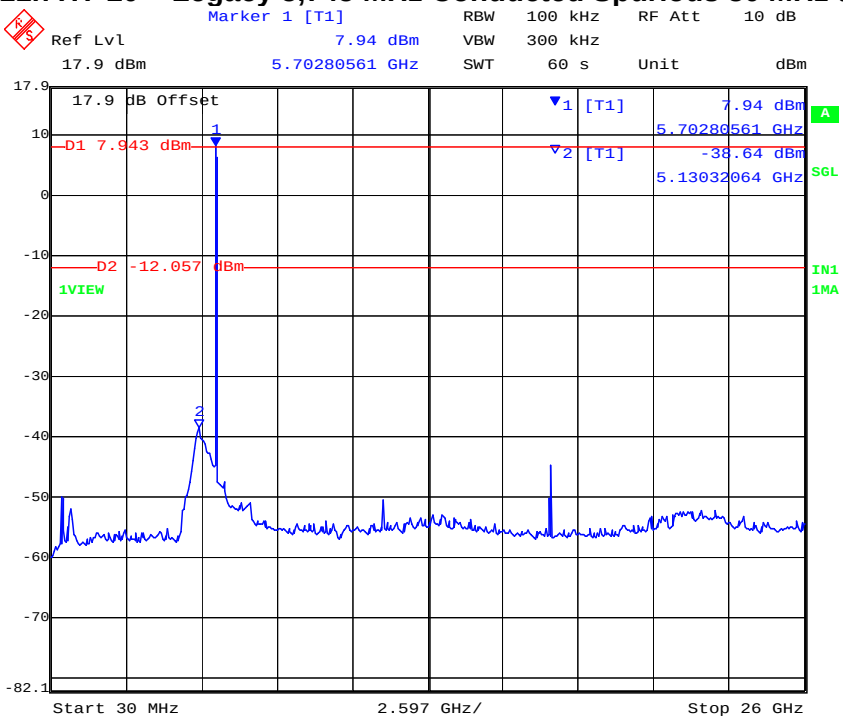
Chain B 802.11n HT-20 - Conducted Spurious Emissions at the 5,850 MHz Band Edge



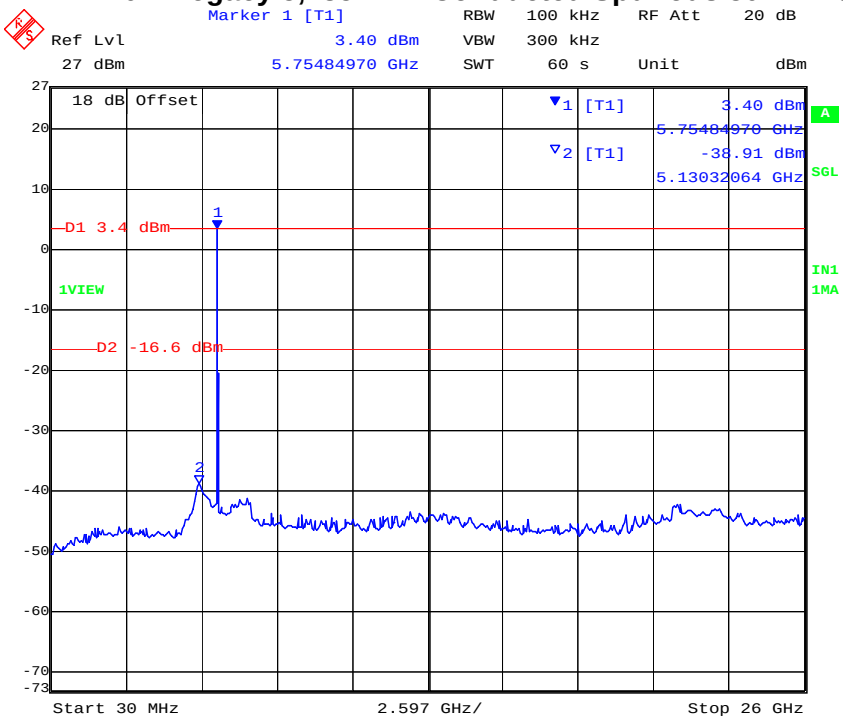
Chain A 802.11n HT-20 – Legacy 5,745 MHz Conducted Spurious 30 MHz to 40,000 MHz



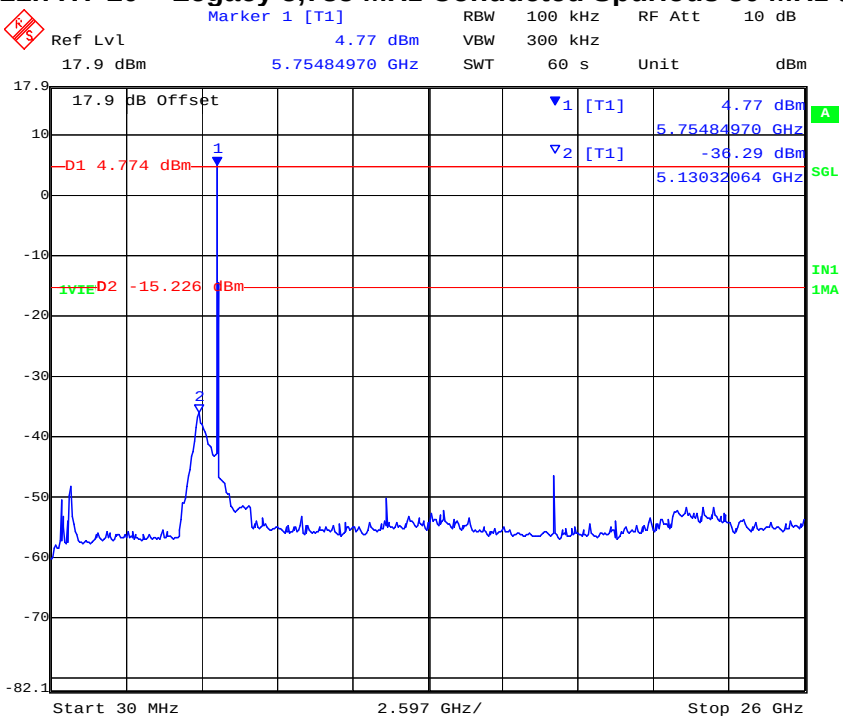
Chain B 802.11n HT-20 – Legacy 5,745 MHz Conducted Spurious 30 MHz to 40,000 MHz



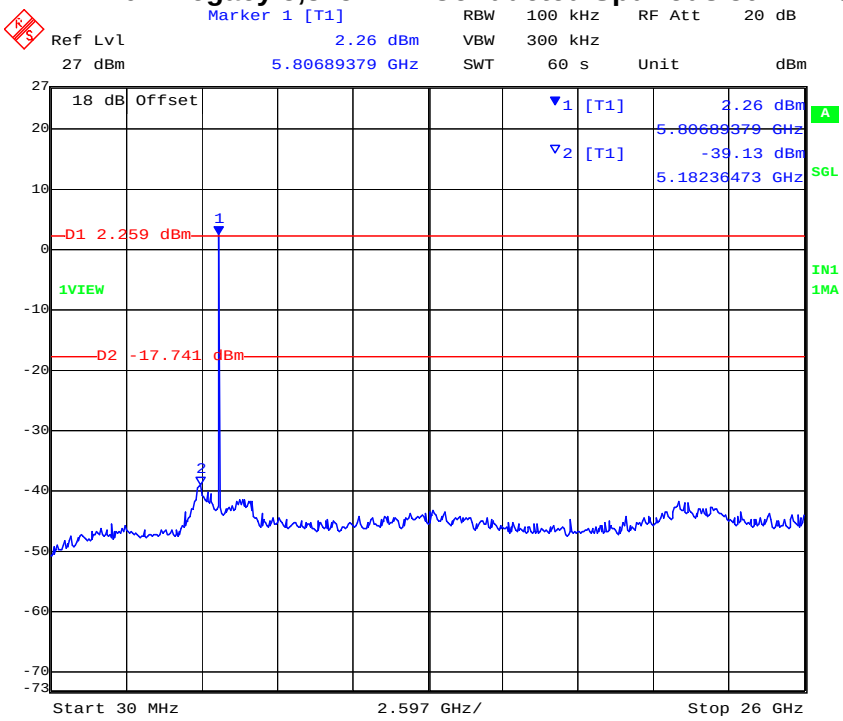
Chain A 802.11n HT-20 – Legacy 5,785 MHz Conducted Spurious 30 MHz to 40,000 MHz



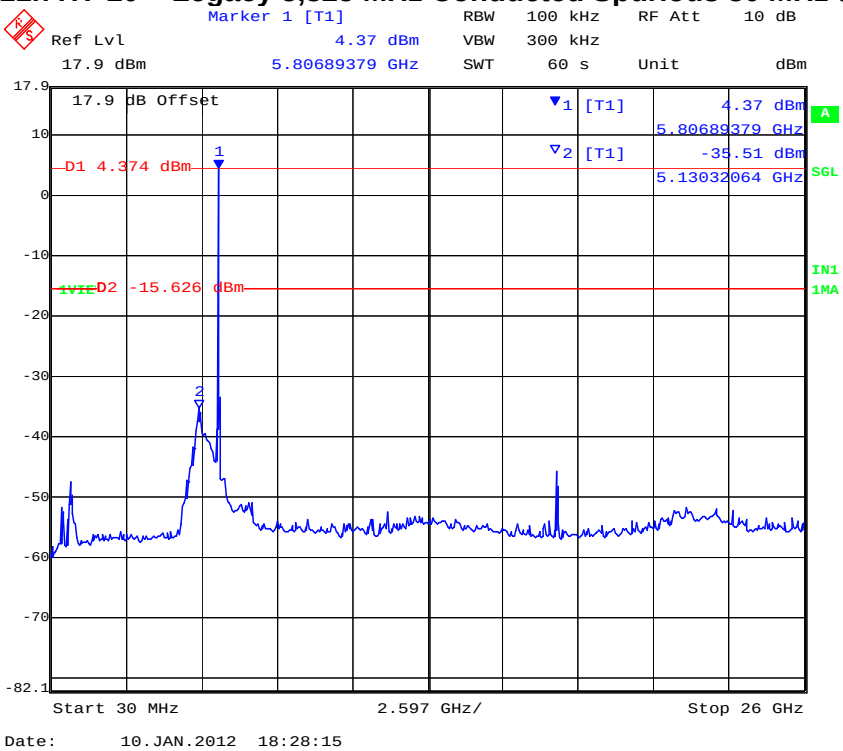
Chain B 802.11n HT-20 – Legacy 5,785 MHz Conducted Spurious 30 MHz to 40,000 MHz



Chain A 802.11n HT-20 – Legacy 5,825 MHz Conducted Spurious 30 MHz to 40,000 MHz



Chain B 802.11n HT-20 – Legacy 5,825 MHz Conducted Spurious 30 MHz to 40,000 MHz



Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.00	Vdc	**Antenna Ports (N):**		
Notes 1:					
Notes 2:					

Conducted Spurious Measurement

Test Freq.	Start Freq.	Stop Freq.	Port A		Port B		Port C		Port D	
MHz	MHz	MHz	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm	SE dBm	Limit dBm
5755.000	30.00	26000.00	-38.14	-16.13	-36.22	-17.32				
5795.000	30.00	26000.00	-39.12	-20.50	-36.09	-15.01				

SE: Maximum spurious emsission found

Band-edge Measurement

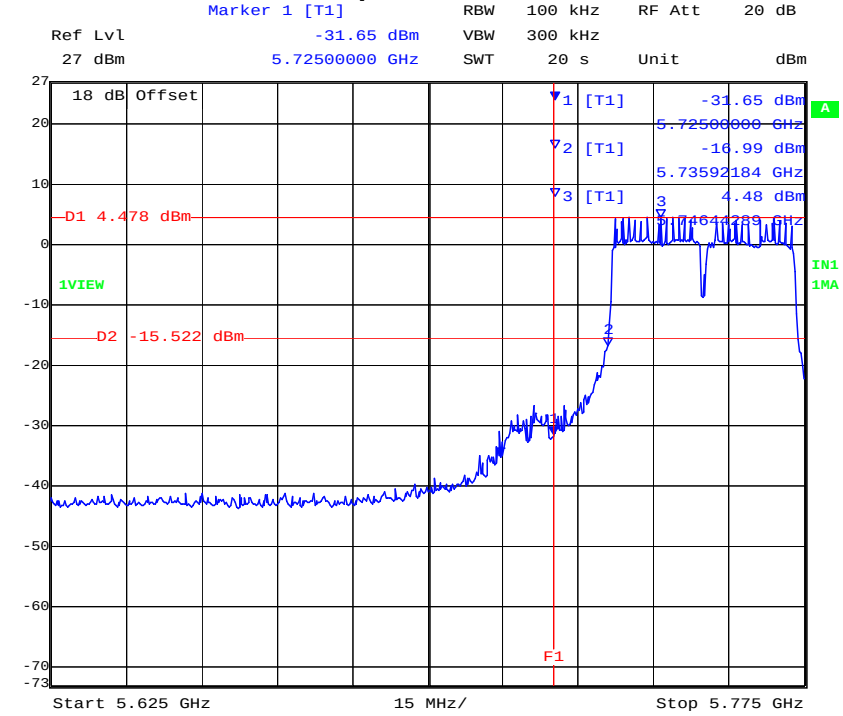
Test Freq.	Band-edge freq.	Port A		Port B		Port C		Port D	
MHz	MHz	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm	BE dBm	Limit dBm
5755.000	5725.00	-31.65	-15.52	-27.75	-13.95				
5795.000	5850.00	-42.27	-16.56	-37.70	-13.99				

BE: Maximum Band edge emssion found

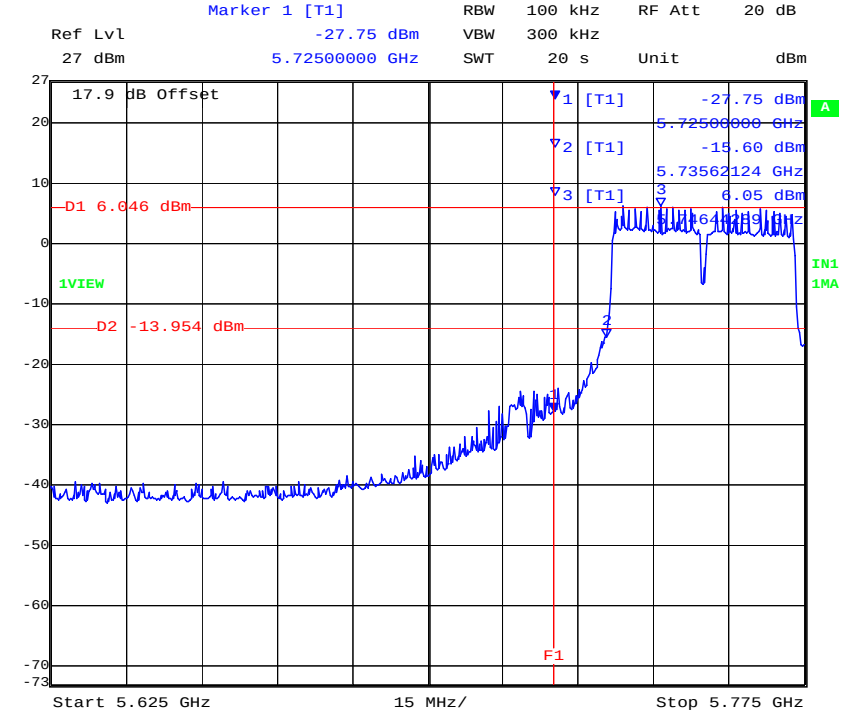
Measurement uncertainty:	±2.81 dB

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

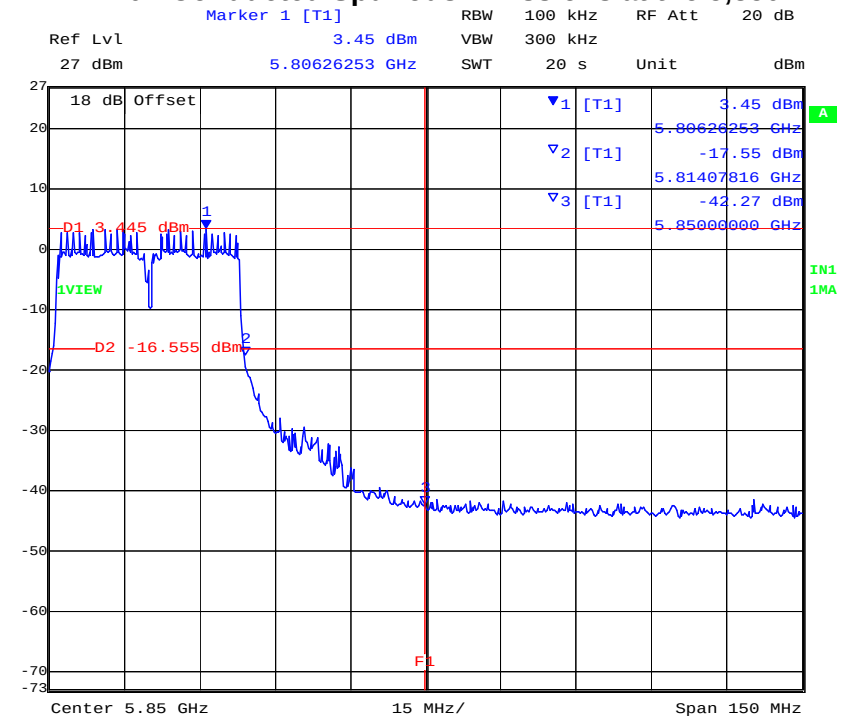
Chain A 802.11n HT-40 - Conducted Spurious Emissions at the 5,725 MHz Band Edge



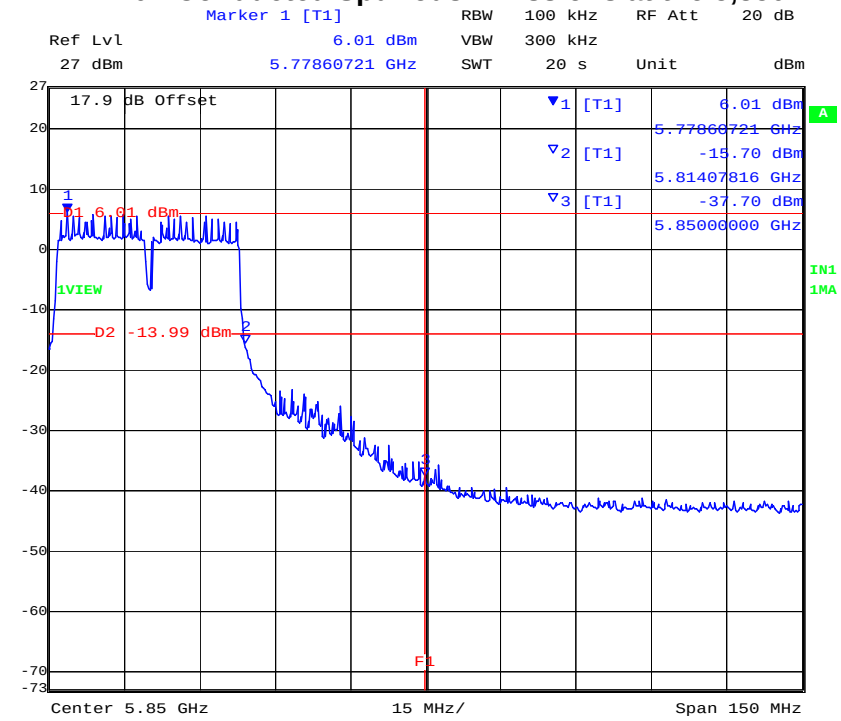
Chain B 802.11n HT-40 - Conducted Spurious Emissions at the 5,725 MHz Band Edge



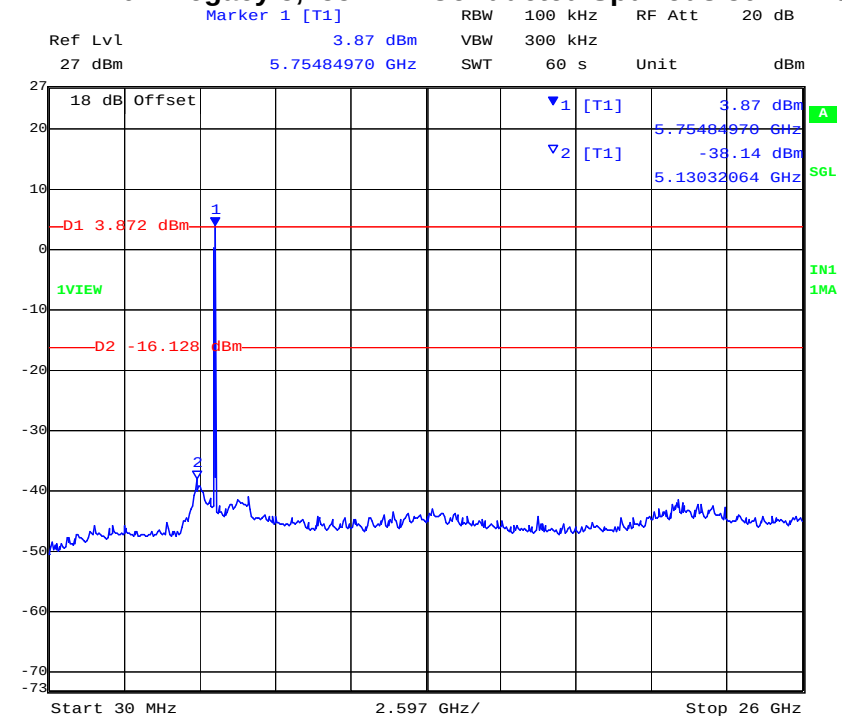
Chain A 802.11n HT-40 - Conducted Spurious Emissions at the 5,850 MHz Band Edge



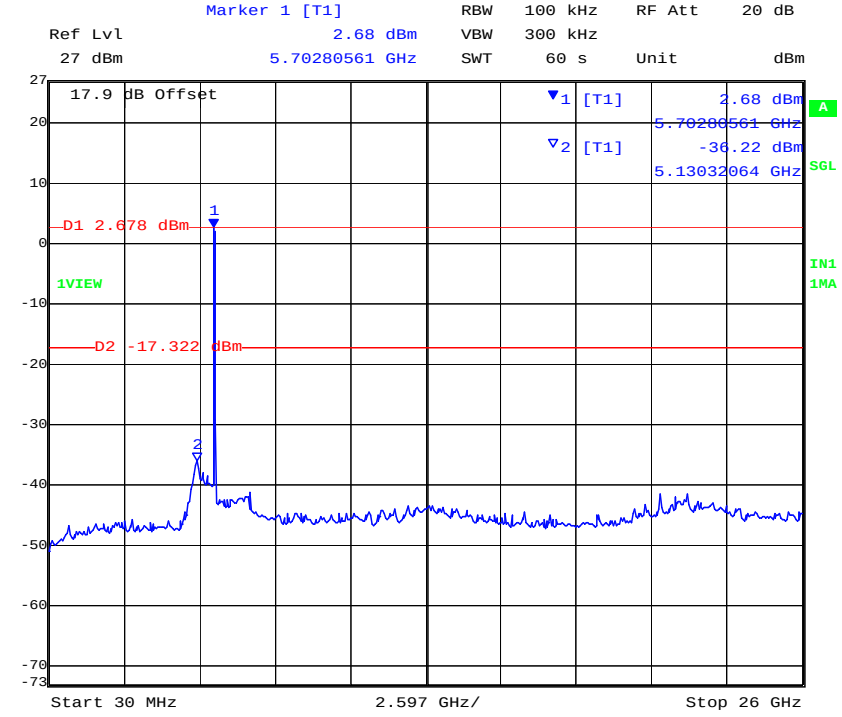
Chain B 802.11n HT-40 - Conducted Spurious Emissions at the 5,850 MHz Band Edge



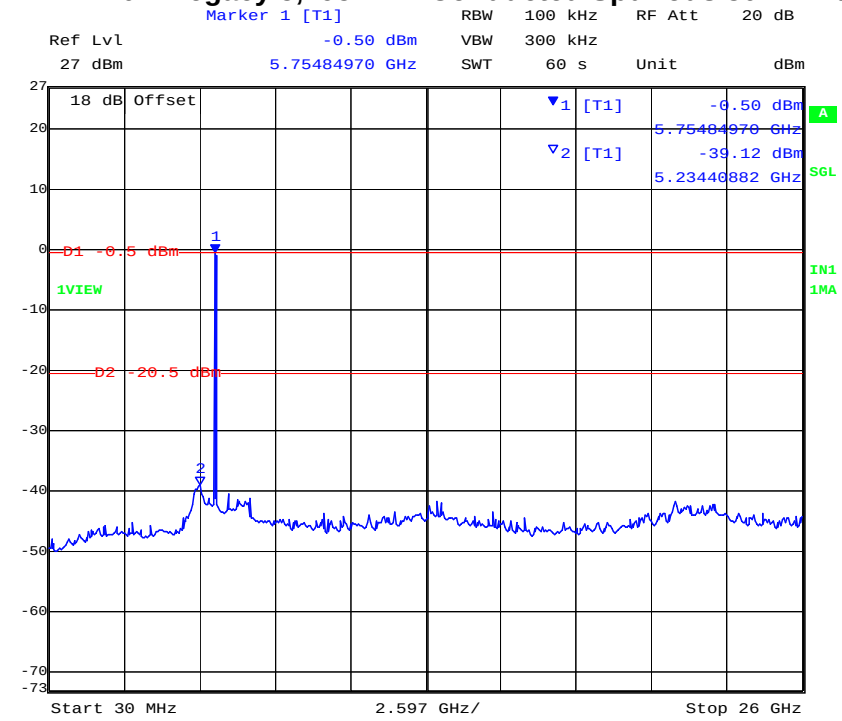
Chain A 802.11n HT-40 – Legacy 5,755 MHz Conducted Spurious 30 MHz to 40,000 MHz



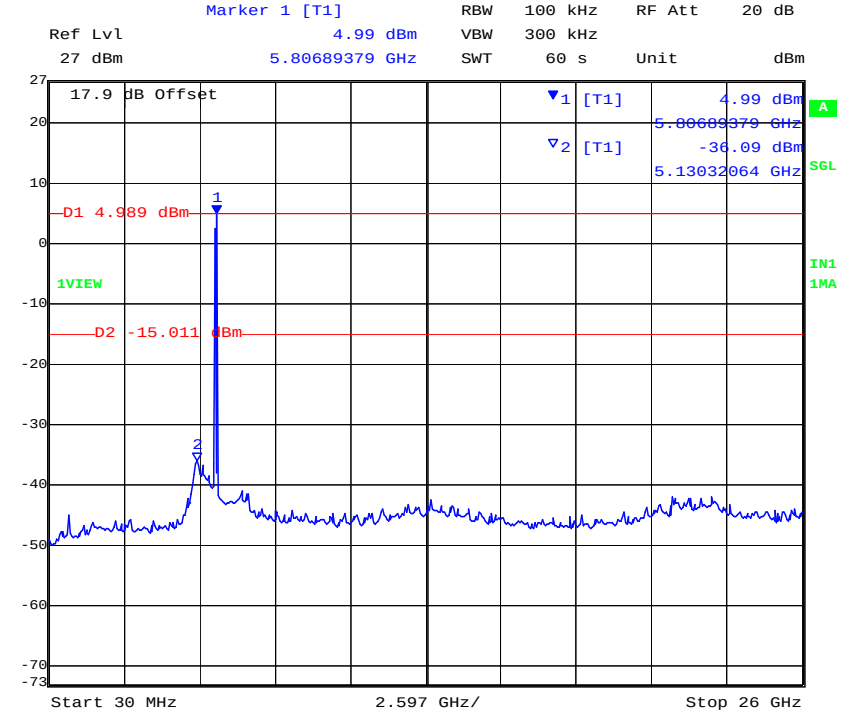
Chain B 802.11n HT-40 – Legacy 5,755 MHz Conducted Spurious 30 MHz to 40,000 MHz



Chain A 802.11n HT-40 – Legacy 5,795 MHz Conducted Spurious 30 MHz to 40,000 MHz



Chain B 802.11n HT-40 – Legacy 5,795 MHz Conducted Spurious 30 MHz to 40,000 MHz



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 5th harmonic of the highest frequency generated without exceeding 40 GHz.

Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB

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.

5.1.6. Radiated Emissions

5.1.6.1. Transmitter Radiated Spurious Emissions (above 1 GHz); Peak Field Strength Measurements; and Radiated Band Edge Measurements – Restricted Bands

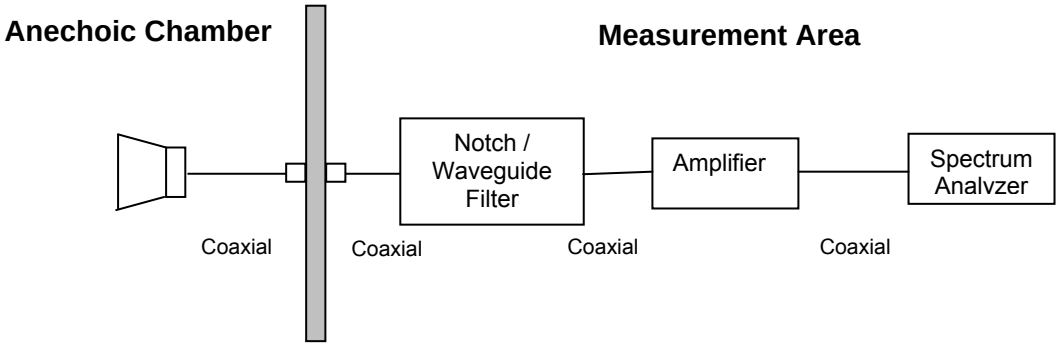
FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209
Industry Canada RSS-210 §A8.5, §2.2, §2.6
Industry Canada RSS-Gen §4.7

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.

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

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

FS = R + AF + CORR - FO

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 dBμV; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3 dBμV/m

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

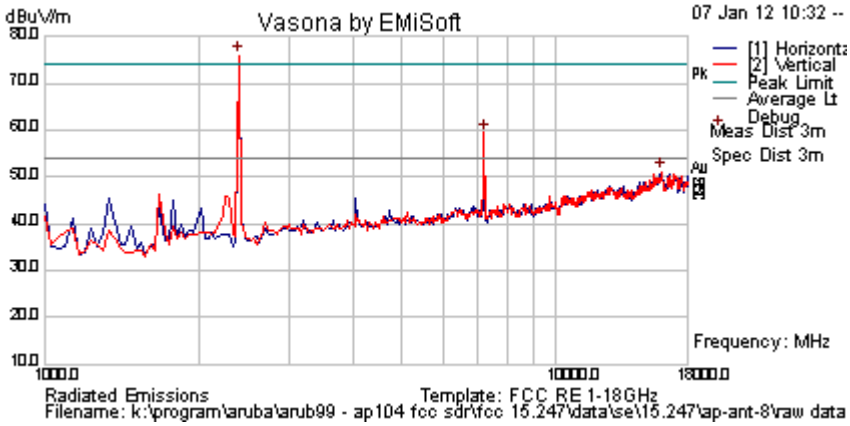
Level (dBμV/m) = 20 * Log (level (μV/m))

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

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

Spurious Emissions AP-ANT-8

Test Freq.	2412 MHz	**Engineer**	GMH
Variant	802.11b; 1 Mbs	**Temp (°C)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

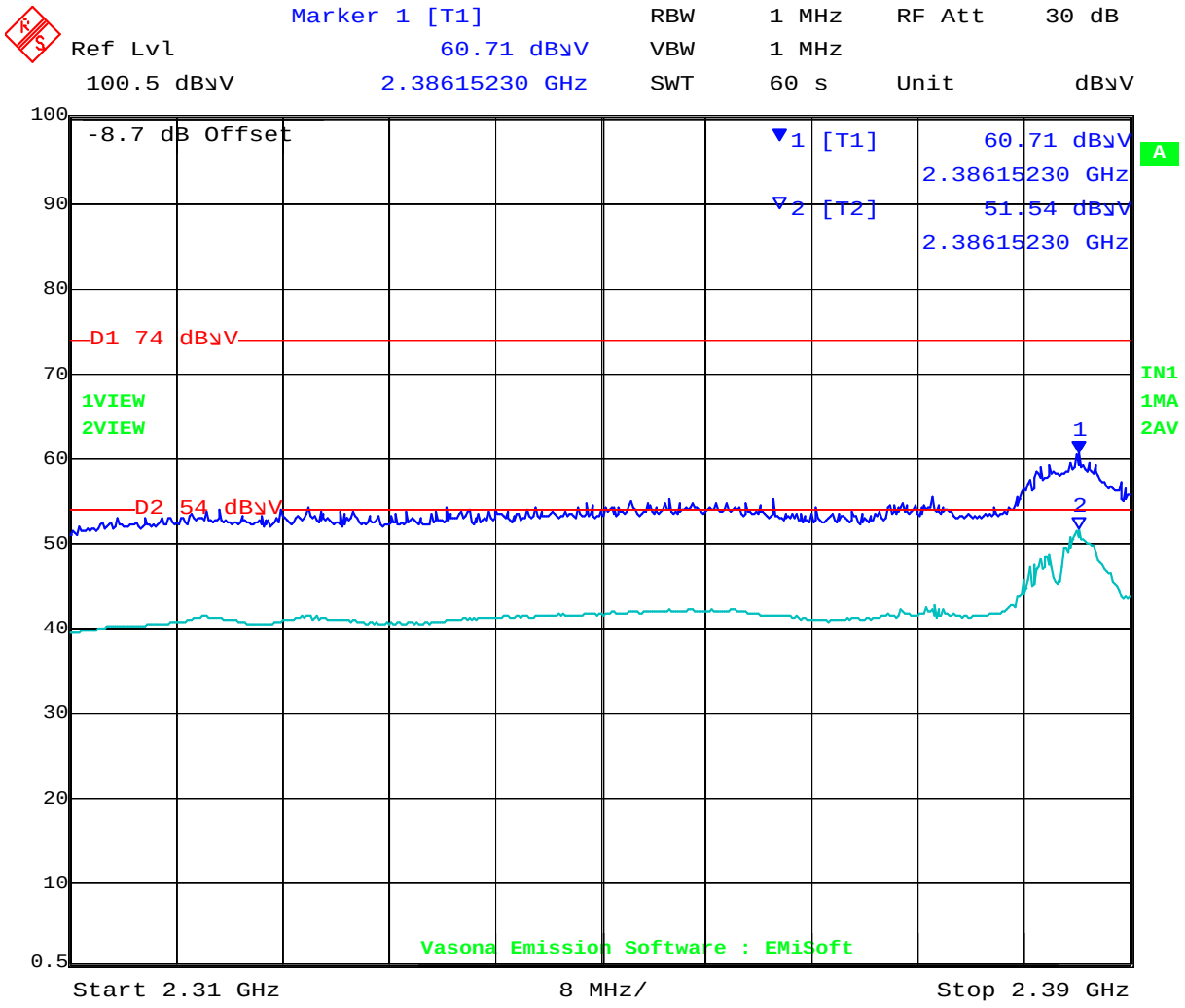


Formally measured emission peaks

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
2396.794	84.7	3.0	-11.7	76.0	Peak [Scan]	H						FUND
16024.048	42.0	9.0	0.2	51.2	Peak [Scan]	V	100	0	54	-2.8	Pass	NOISE
7238.637	58.9	5.4	-5.8	58.5	Peak Max	V	169	227	74	-15.6	Pass	NRB
7238.637	50.9	5.4	-5.8	50.5	Average Max	V	169	227	54	-3.5	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

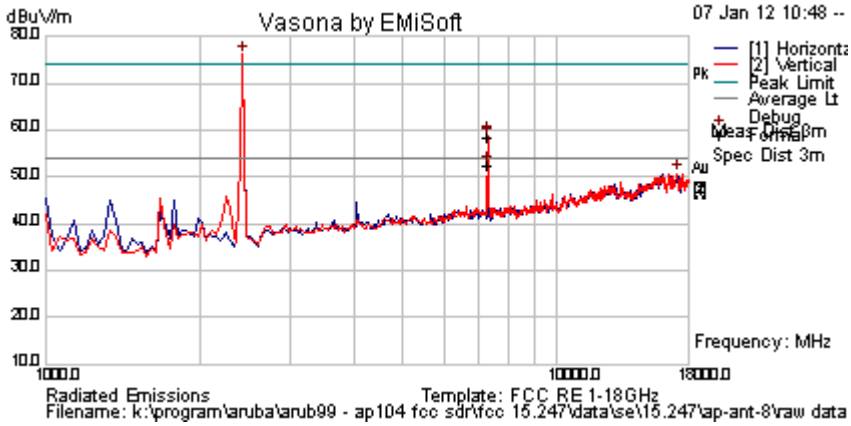
802.11b Band-Edge 2390 MHz



Power reduction required to bring into compliance;

Power setting 17

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11b; 1 Mbs	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

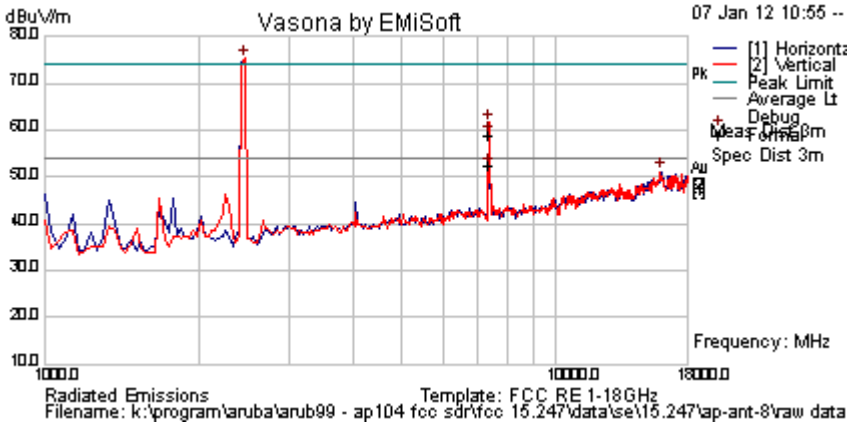


Formally measured emission peaks

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
2430.862	84.8	3.0	-11.6	76.3	Peak [Scan]	V						FUND
17148.297	41.7	8.6	0.5	50.8	Peak [Scan]	V	100	0	54	-3.2	Pass	NOISE
7306.974	58.9	5.4	-5.7	58.6	Peak Max	V	98	222	74	-15.4	Pass	RB
7306.974	52.7	5.4	-5.7	52.4	Average Max	V	98	222	54	-1.6	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

Test Freq.	2462 MHz	**Engineer**	GMH
Variant	802.11b; 1 Mbs	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

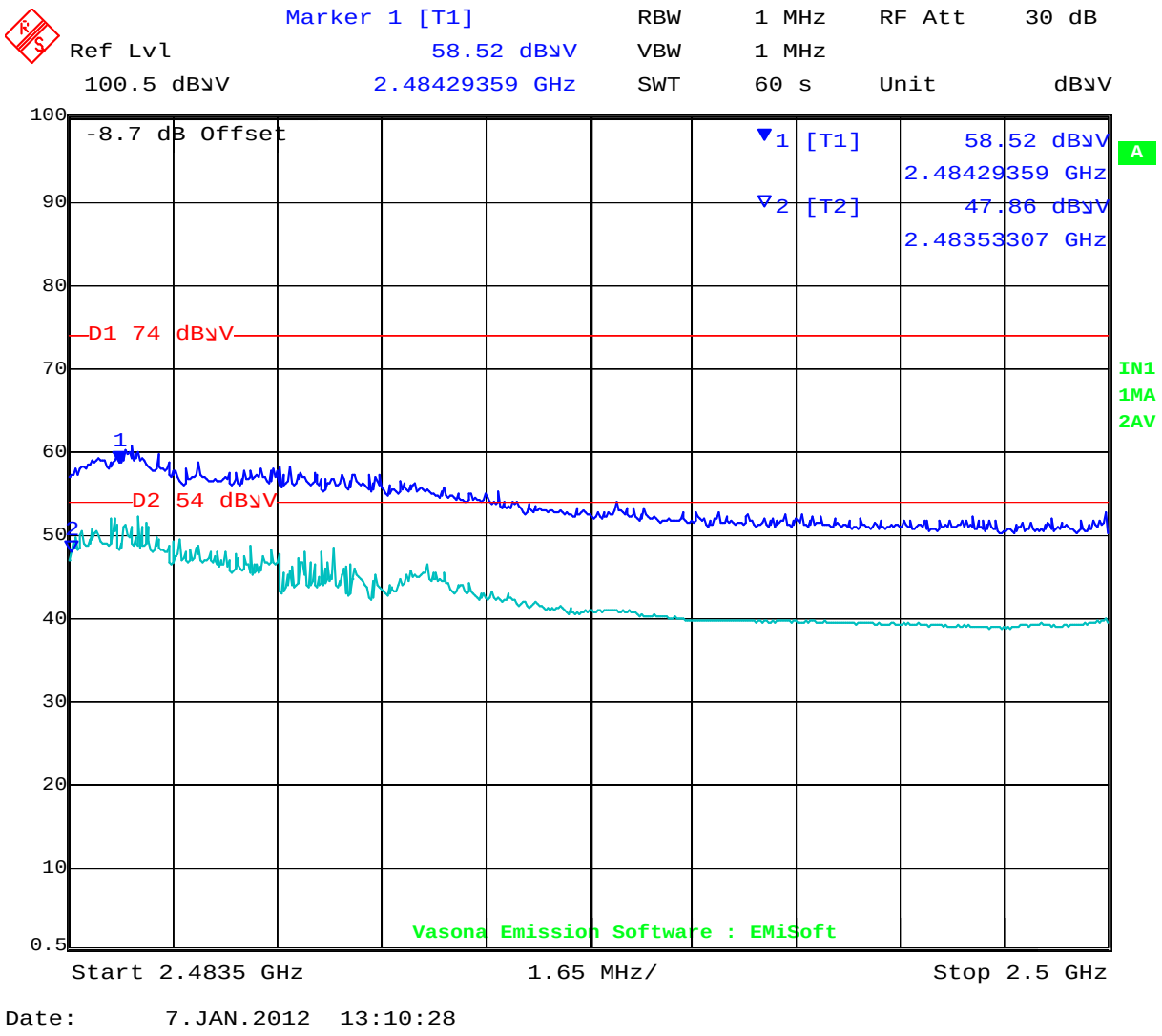


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2464.930	83.8	3.0	-11.5	75.2	Peak [Scan]	V						FUND
16058.116	41.8	9.0	0.3	51.1	Peak [Scan]	H	100	0	54	-2.9	Pass	NOISE
7389.515	59.1	5.5	-5.5	59.1	Peak Max	V	98	0	74	-14.9	Pass	RB
7389.515	52.3	5.5	-5.5	52.3	Average Max	V	98	0	54	-1.7	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

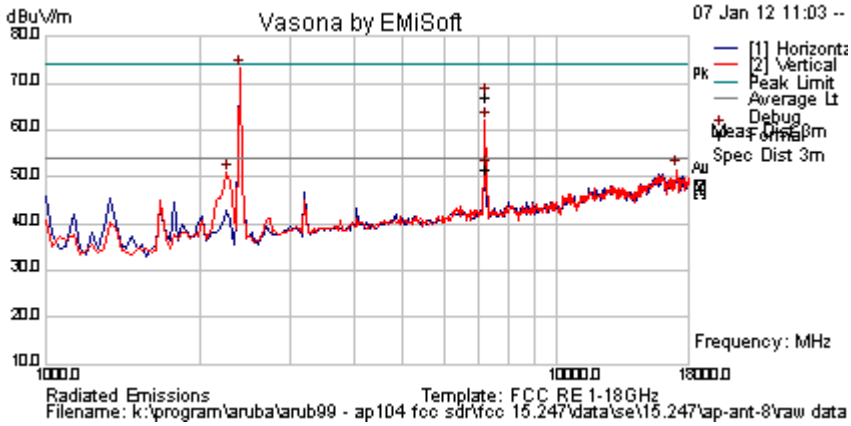
802.11b Band-Edge 2483.5 MHz



Power reduction required to bring into compliance;

Power setting 18

Test Freq.	2412 MHz	**Engineer**	GMH
Variant	802.11g; 6 Mbs	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 19	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

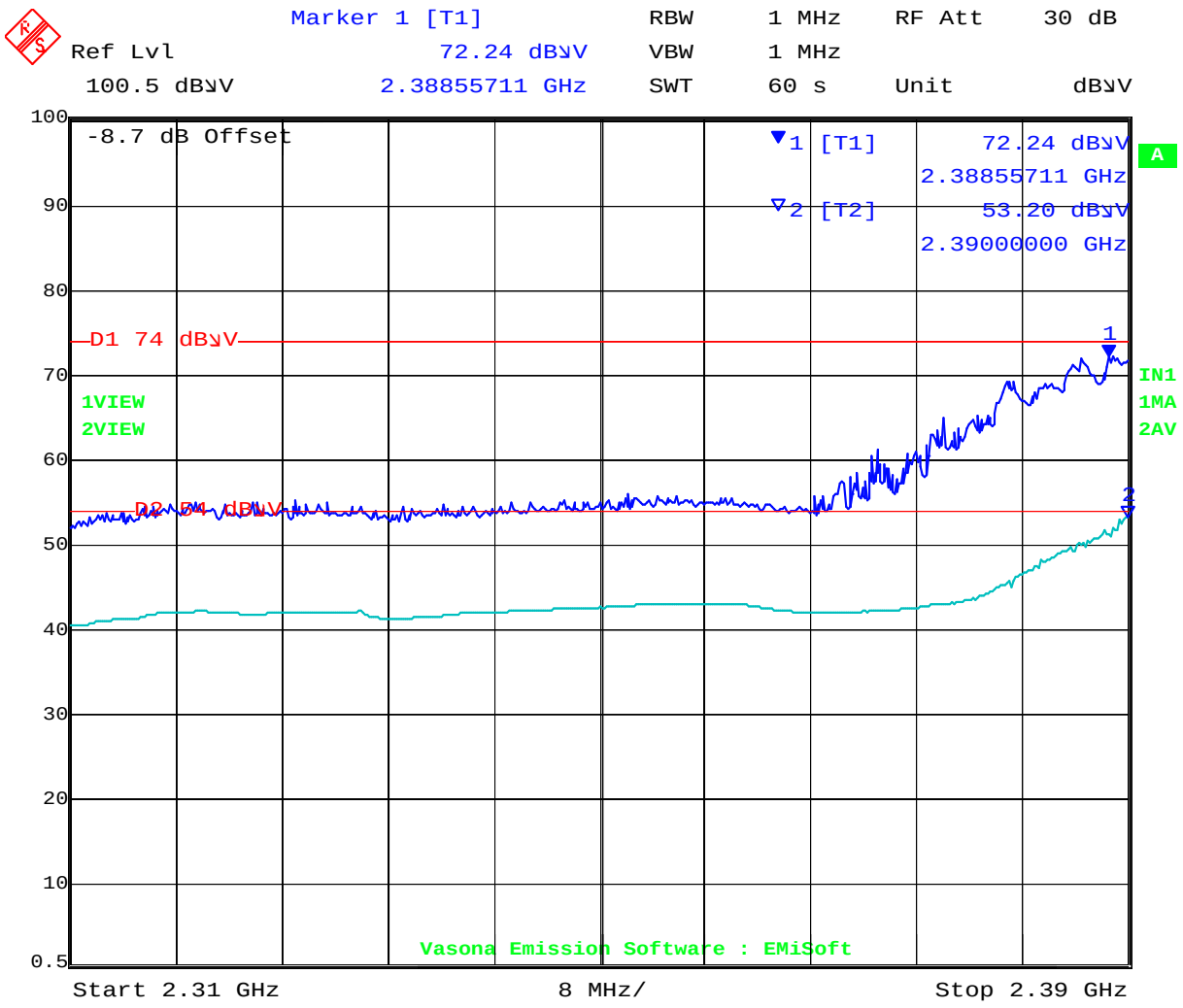


Formally measured emission peaks

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
2396.794	81.9	3.0	-11.7	73.2	Peak [Scan]	H						FUND
17080.160	42.7	8.5	0.4	51.6	Peak [Scan]	V	100	0	54	-2.5	Pass	NOISE
2260.521	59.8	2.9	-11.8	50.8	Peak [Scan]	V					Pass	BE
7235.139	67.5	5.4	-5.8	67.1	Peak Max	V	99	225	74	-6.9	Pass	RB
7235.139	52.0	5.4	-5.8	51.6	Average Max	V	99	225	54	-2.4	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

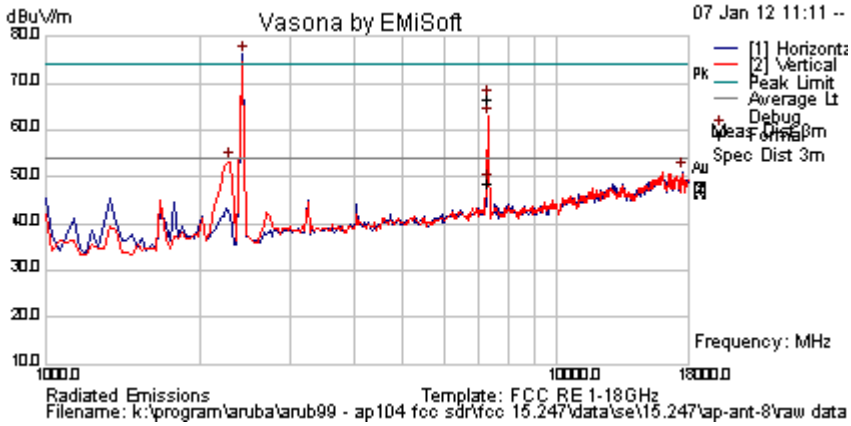
802.11g Band-Edge 2390 MHz



Power reduction required to bring into compliance;

Power setting 14.5

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11g; 6 Mbs	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 19	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

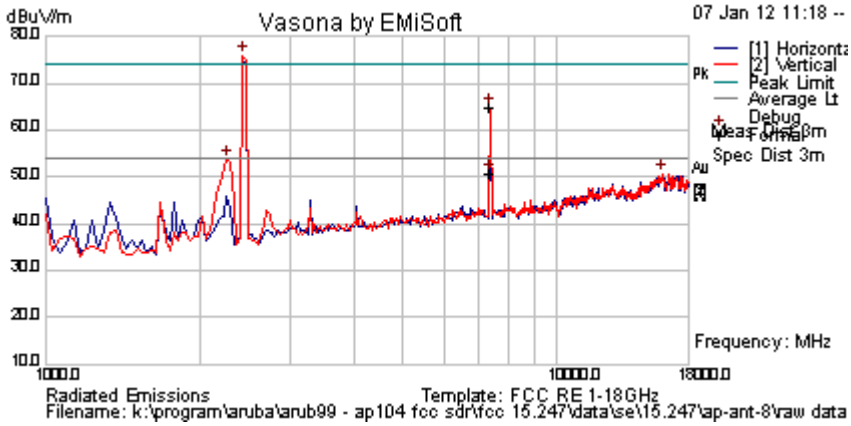


Formally measured emission peaks

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
2430.862	84.8	3.0	-11.6	76.2	Peak [Scan]	H						FUND
2294.589	62.3	2.9	-11.9	53.3	Peak [Scan]	V					Pass	BE
17523.046	41.4	8.8	0.9	51.1	Peak [Scan]	H	100	0	54	-2.9	Pass	NOISE
7304.404	66.9	5.4	-5.7	66.6	Peak Max	V	155	222	74	-7.4	Pass	RB
7304.404	48.9	5.4	-5.7	48.6	Average Max	V	155	222	54	-5.4	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

Test Freq.	2462 MHz	**Engineer**	GMH
Variant	802.11g; 6 Mbs	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 19	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

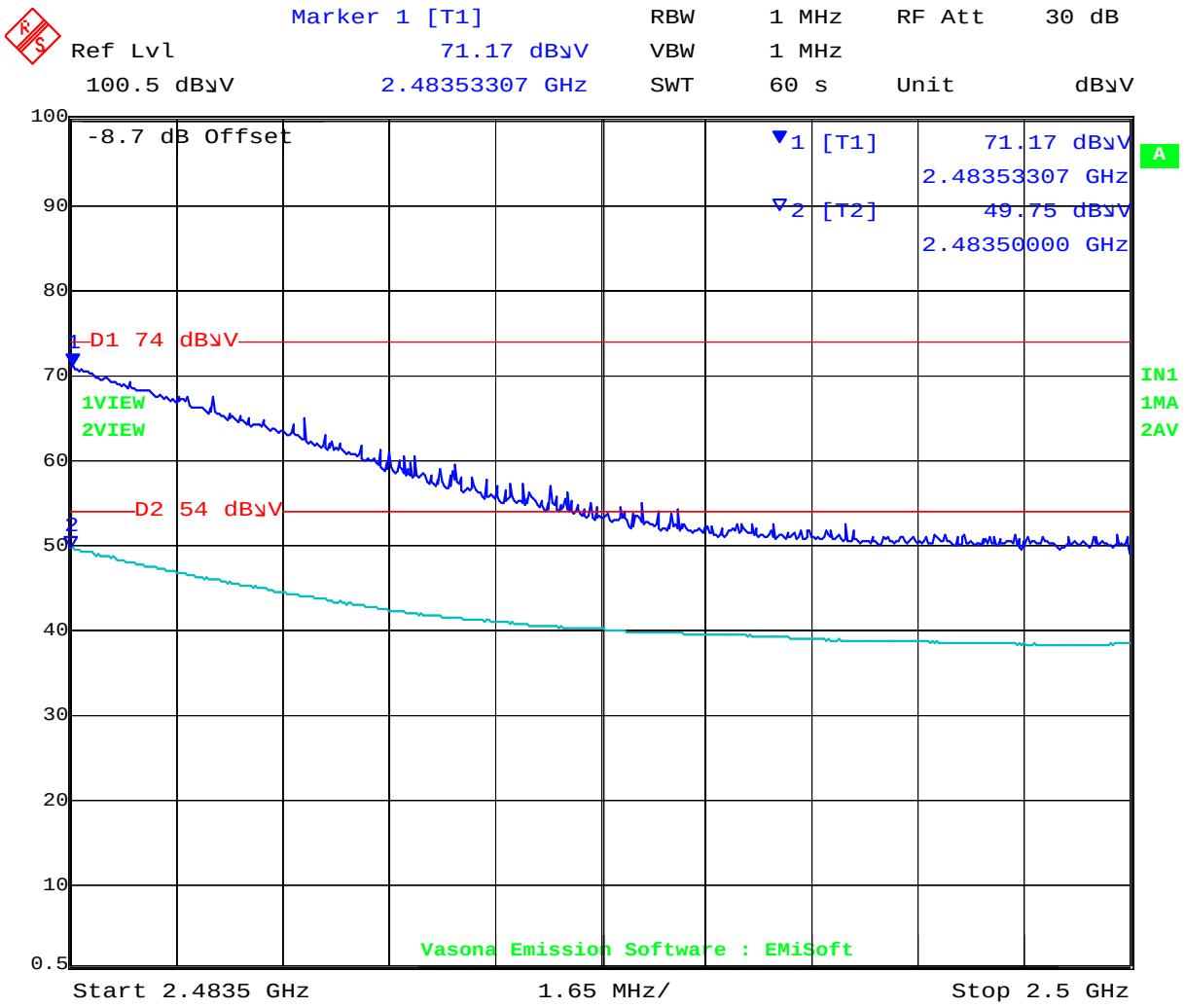


Formally measured emission peaks

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
2430.862	84.5	3.0	-11.6	75.9	Peak [Scan]	V						FUND
2260.521	62.9	2.9	-11.8	53.9	Peak [Scan]	V					Pass	BE
16058.116	41.5	9.0	0.3	50.7	Peak [Scan]	V	100	0	54	-3.3	Pass	NOISE
7382.525	64.8	5.5	-5.5	64.8	Peak Max	V	173	225	74	-9.2	Pass	RB
7382.525	50.8	5.5	-5.5	50.8	Average Max	V	173	225	54	-3.3	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

802.11g Band-Edge 2483.5 MHz

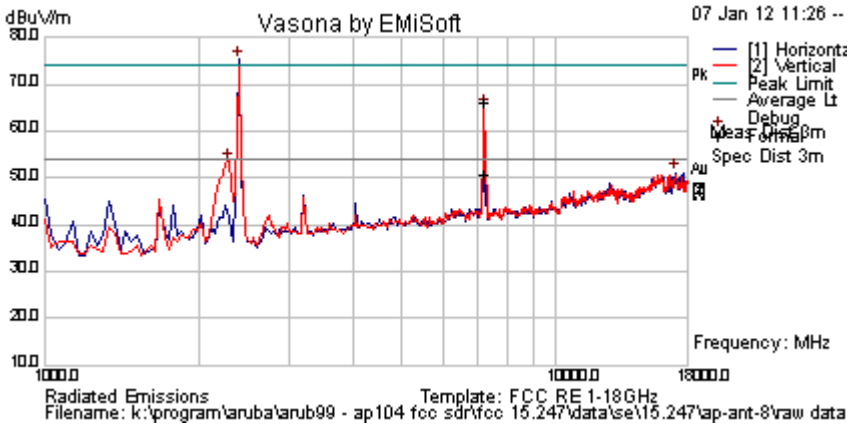


Date: 7.JAN.2012 13:14:17

Power reduction required to bring into compliance;

Power setting 13.5

Test Freq.	2412 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

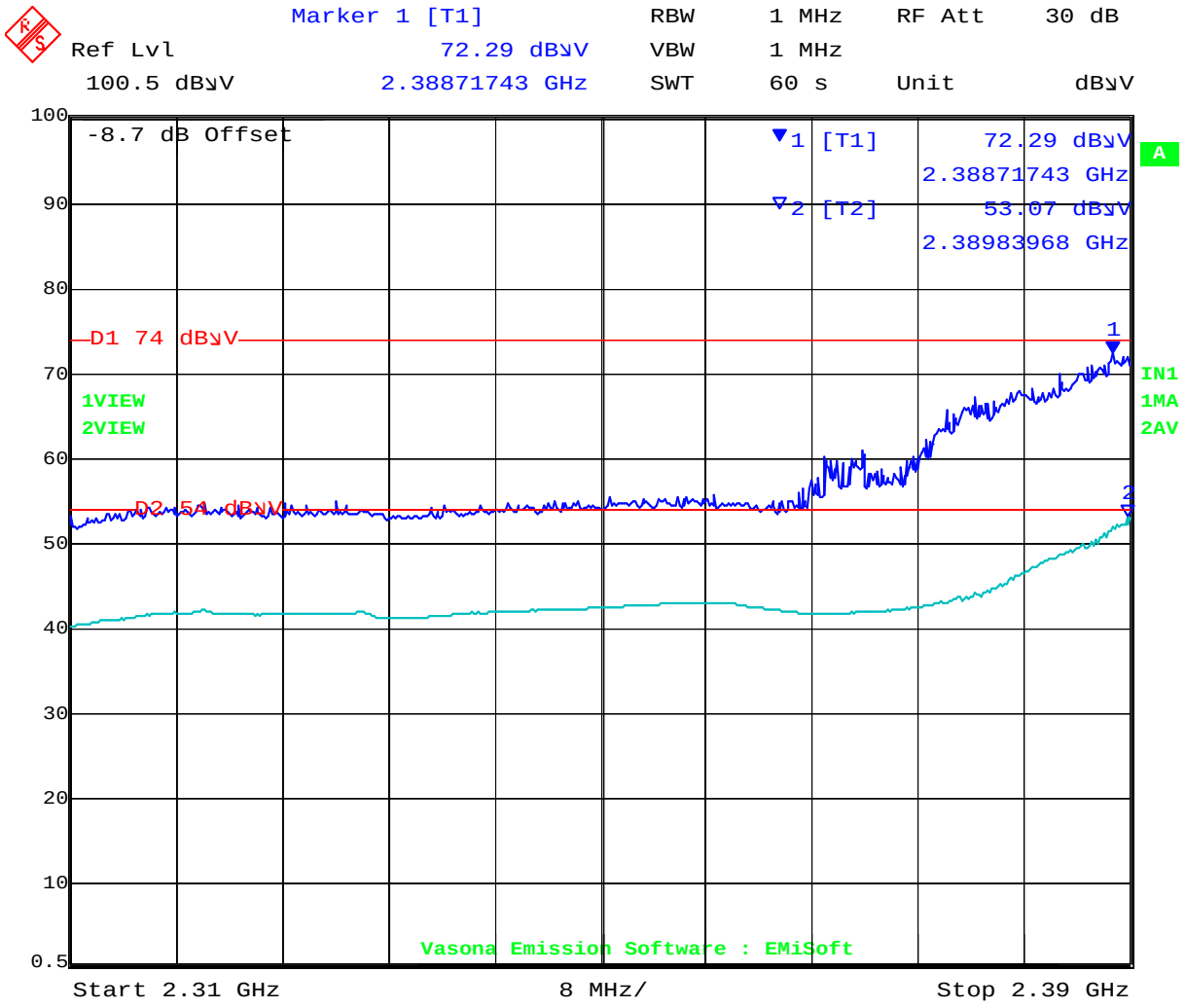


Formally measured emission peaks

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
2396.794	84.1	3.0	-11.7	75.4	Peak [Scan]	H						FUND
2294.589	62.4	2.9	-11.9	53.4	Peak [Scan]	V					Pass	BE
17114.228	42.2	8.5	0.5	51.2	Peak [Scan]	H	100	0	54	-2.8	Pass	NOISE
7232.420	66.5	5.4	-5.8	66.1	Peak Max	V	98	214	74	-7.9	Pass	RB
7232.420	51.3	5.4	-5.8	50.9	Average Max	V	98	214	54	-3.1	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

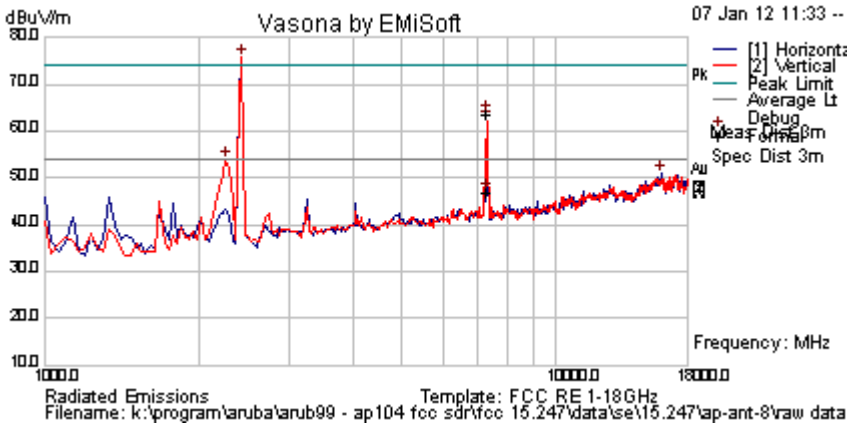
802.11n HT-20 Band-Edge 2390 MHz



Power reduction required to bring into compliance;

Power setting 14.0

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

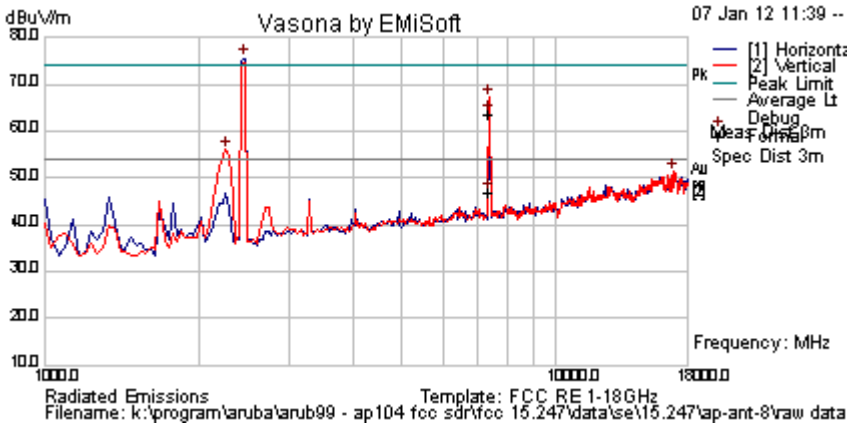


Formally measured emission peaks

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
2430.862	84.3	3.0	-11.6	75.7	Peak [Scan]	H						FUND
2260.521	62.9	2.9	-11.8	54.0	Peak [Scan]	V					Pass	BE
16024.048	41.7	9.0	0.2	51.0	Peak [Scan]	H	100	0	54	-3.1	Pass	NOISE
7306.255	63.8	5.4	-5.7	63.5	Peak Max	V	174	230	74	-10.5	Pass	RB
7306.255	47.3	5.4	-5.7	47.1	Average Max	V	174	230	54	-6.9	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

Test Freq.	2462 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

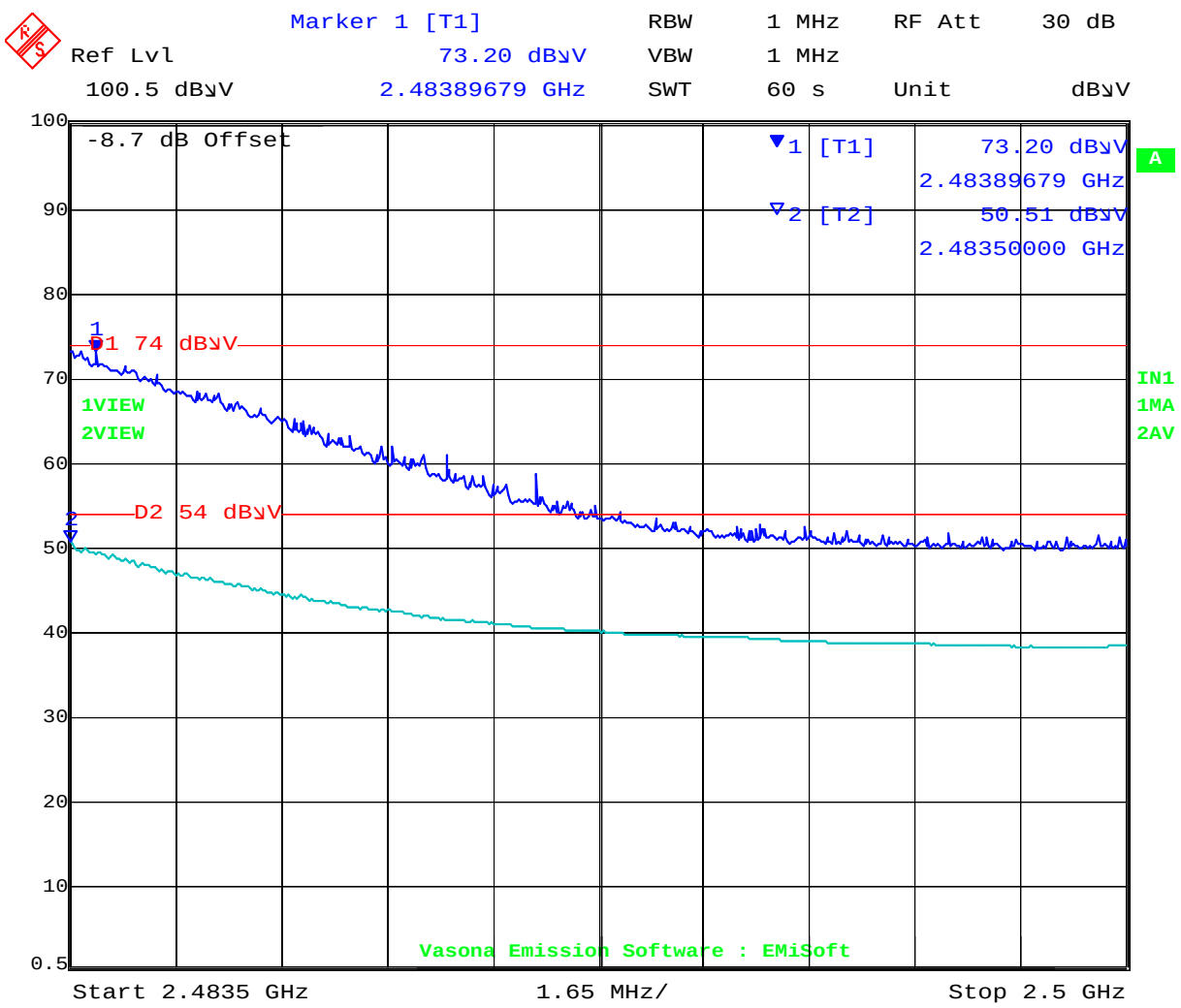


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2464.930	84.1	3.0	-11.5	75.6	Peak [Scan]	H						FUND
2260.521	64.9	2.9	-11.8	55.9	Peak [Scan]	V					Pass	BE
16875.752	42.1	8.6	0.7	51.4	Peak [Scan]	V	100	0	54	-2.6	Pass	NOISE
7382.605	63.7	5.5	-5.5	63.6	Peak Max	V	153	277	74	-10.4	Pass	RB
7382.605	47.0	5.5	-5.5	47.0	Average Max	V	153	277	54	-7.0	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

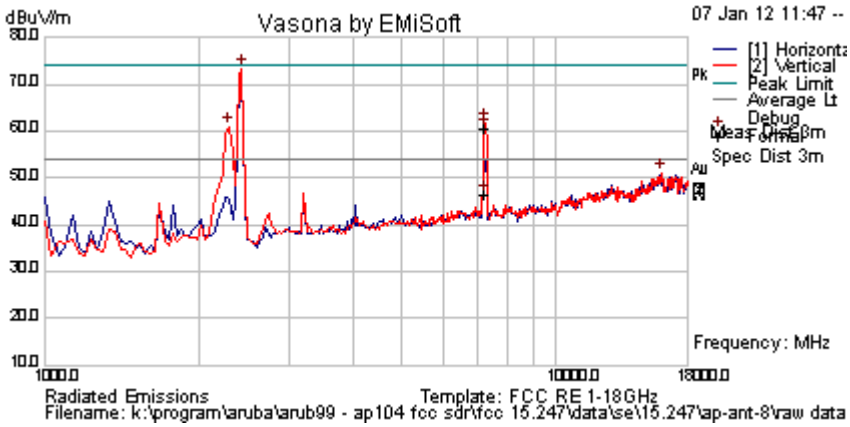
802.11n HT-20 Band-Edge 2483.5 MHz



Power reduction required to bring into compliance;

Power setting 13.5

Test Freq.	2422 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

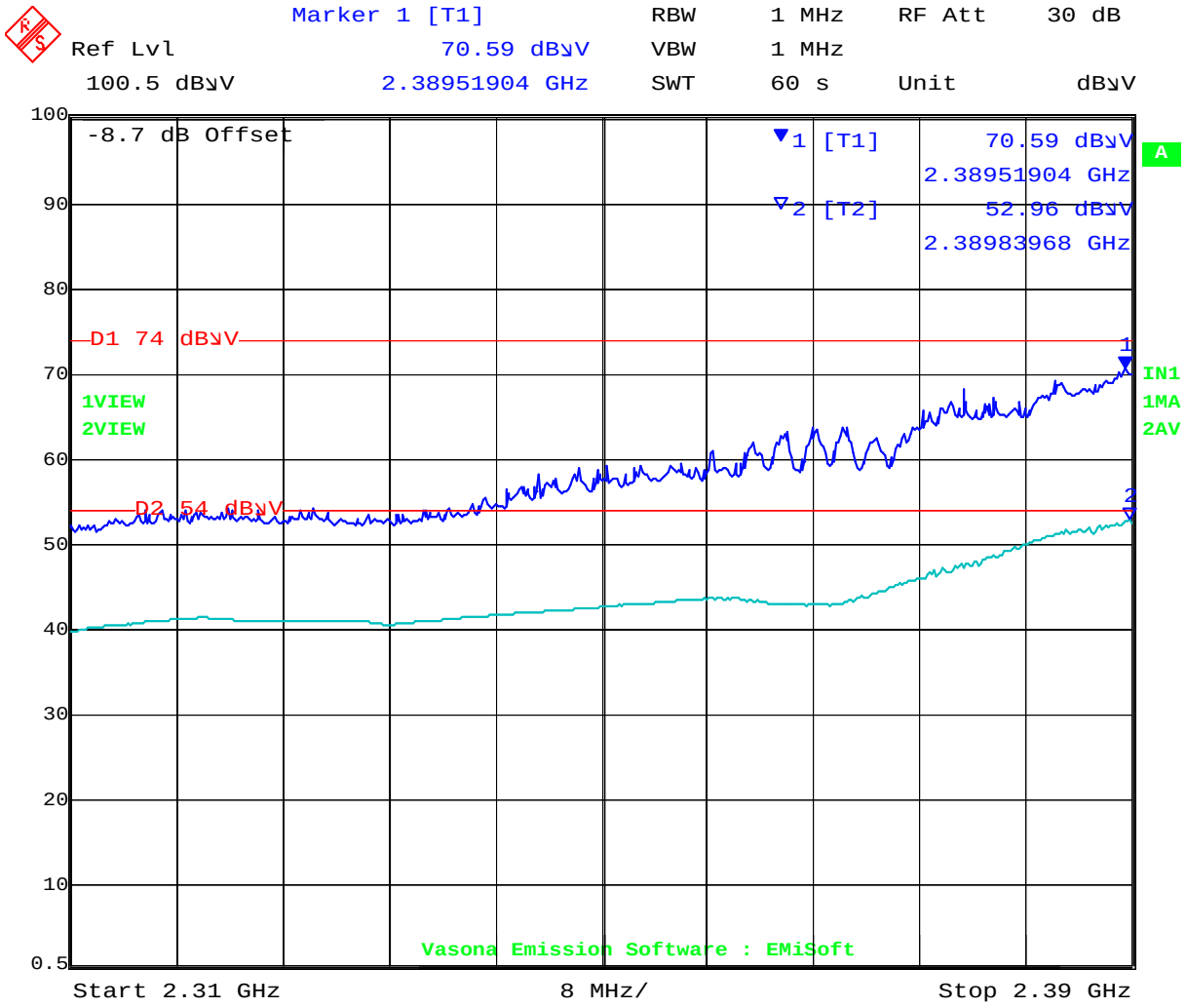


Formally measured emission peaks

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
2430.862	81.9	3.0	-11.6	73.4	Peak [Scan]	H						FUND
2294.589	70.0	2.9	-11.9	61.0	Peak [Scan]	V					Pass	BE
15989.980	42.0	9.0	0.1	51.1	Peak [Scan]	V	100	0	54	-2.9	Pass	NOISE
7270.942	60.9	5.4	-5.8	60.6	Peak Max	V	108	232	74	-13.4	Pass	RB
7270.942	46.9	5.4	-5.8	46.6	Average Max	V	108	232	54	-7.4	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

802.11n HT-40 Band-Edge 2390 MHz



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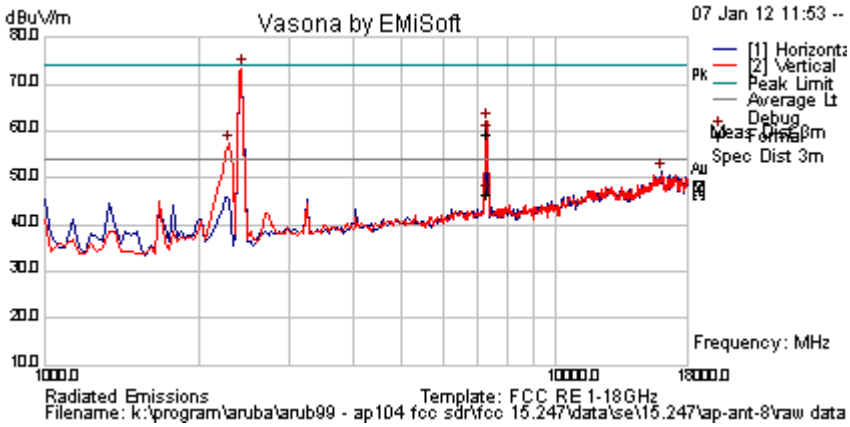
Power reduction required to bring into compliance;

Power setting 10

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

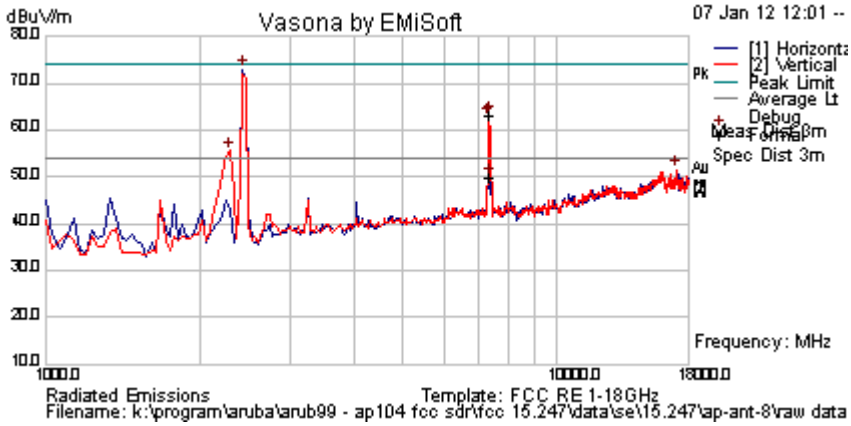


Formally measured emission peaks

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
2430.862	82.1	3.0	-11.6	73.5	Peak [Scan]	H						FUND
2294.589	66.4	2.9	-11.9	57.4	Peak [Scan]	V					Pass	BE
16058.116	42.0	9.0	0.3	51.3	Peak [Scan]	H	100	0	54	-2.7	Pass	NOISE
7304.850	59.8	5.4	-5.7	59.5	Peak Max	V	166	230	74	-14.5	Pass	RB
7304.850	46.6	5.4	-5.7	46.4	Average Max	V	166	230	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

Test Freq.	2452 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	ART = 20	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi	**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
2430.862	81.6	3.0	-11.6	73.0	Peak [Scan]	H						FUND
2294.589	64.7	2.9	-11.9	55.7	Peak [Scan]	V					Pass	BE
17080.160	42.7	8.5	0.4	51.6	Peak [Scan]	V	100	0	54	-2.5	Pass	NOISE
7352.064	63.3	5.5	-5.6	63.2	Peak Max	V	98	1	74	-10.8	Pass	RB
7352.064	50.0	5.5	-5.6	49.9	Average Max	V	98	1	54	-4.1	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

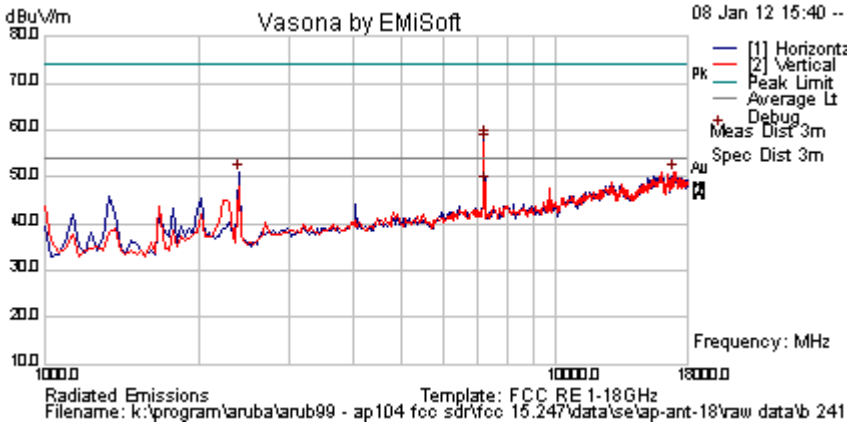
802.11n HT-40 Band-Edge 2483.5 MHz

Power reduction required to bring into compliance;

Power setting 11

Spurious Emissions AP-ANT-18

Test Freq.	2412 MHz	**Engineer**	GMH
Variant	802.11b; 1 Mbs	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

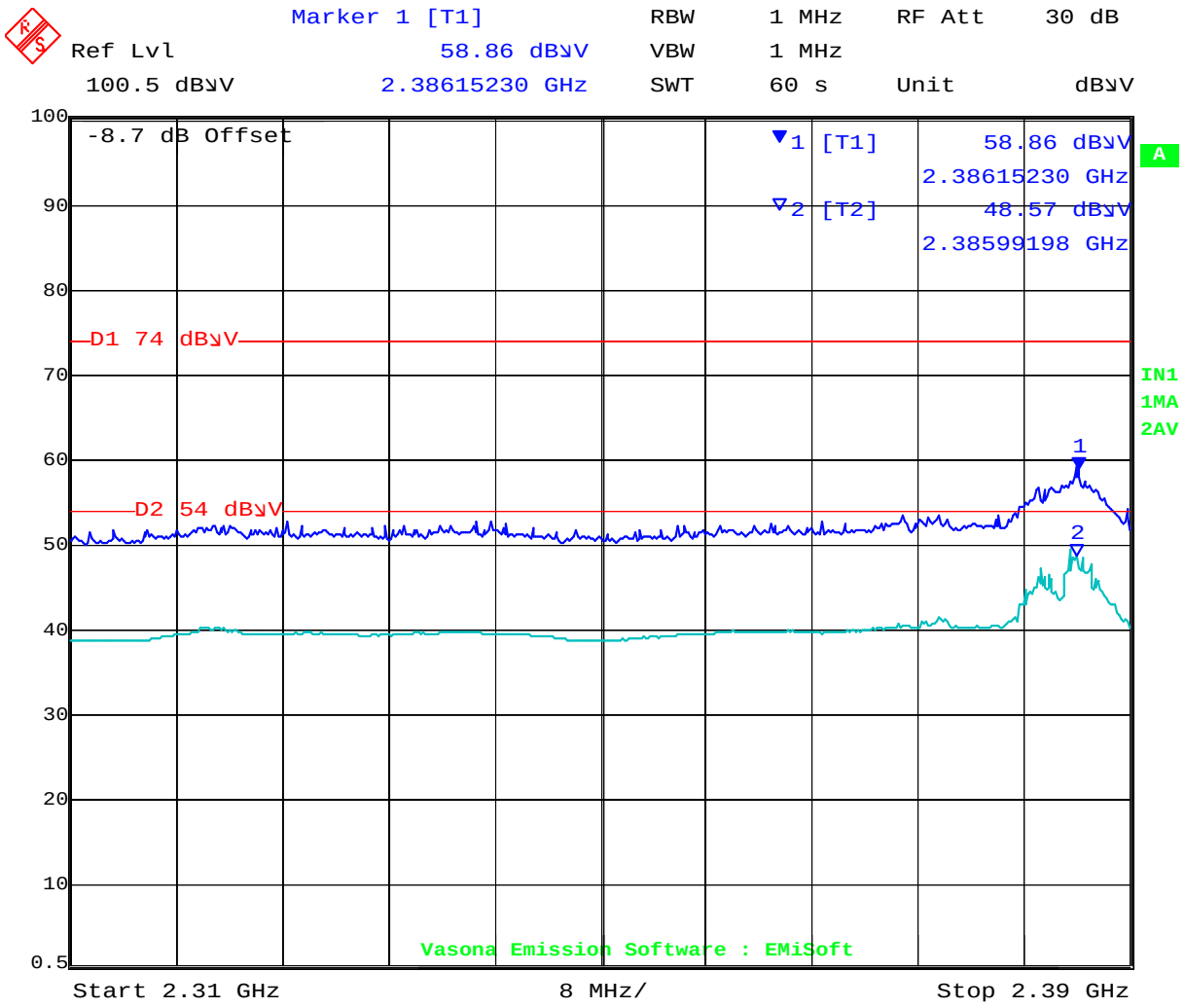


Formally measured emission peaks

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
16875.752	41.7	8.6	0.7	51.0	Peak [Scan]	V	100	0	54.0	-3.0	Pass	NOISE
2396.794	59.6	3.0	-11.7	50.9	Peak [Scan]	H						FUND
7232.465	57.7	5.4	-5.8	57.3	Peak Max	H	149	0	74	-16.8	Pass	NRB
7232.465	48.6	5.4	-5.8	48.2	Average Max	H	149	0	54	-5.8	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

802.11b Band-Edge 2390 MHz

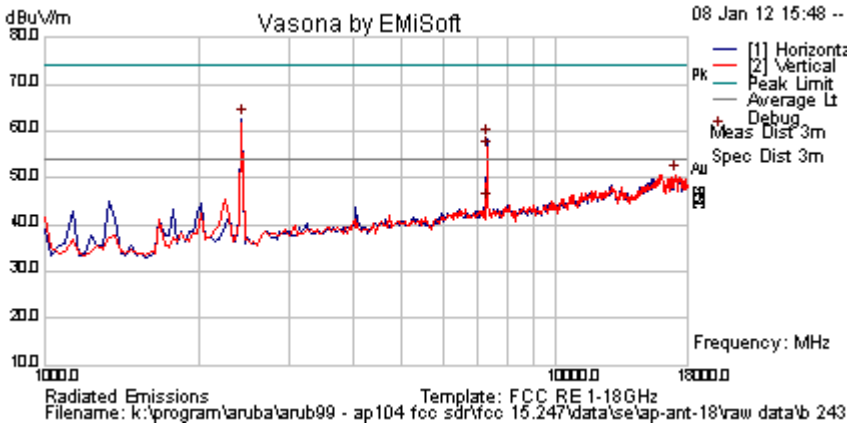


Date: 8.JAN.2012 17:08:19

Power reduction required to bring into compliance;

Power setting 17.5

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11b; 1 Mbs	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

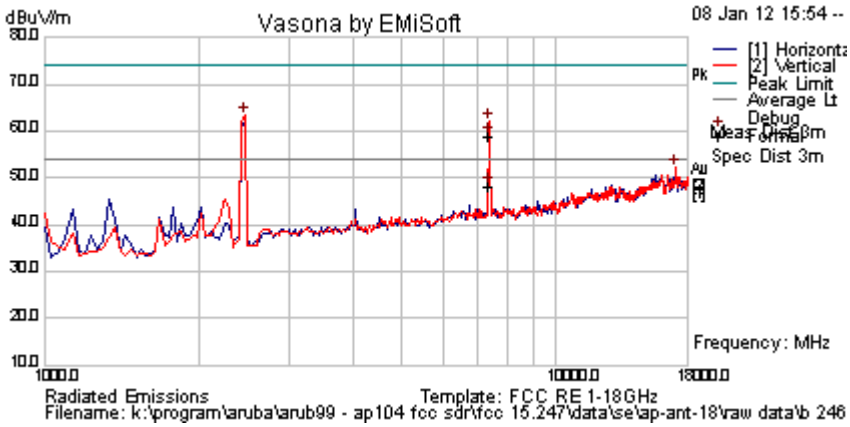


Formally measured emission peaks

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
2430.862	71.3	3.0	-11.6	62.7	Peak [Scan]	H						FUND
17080.160	41.8	8.5	0.4	50.7	Peak [Scan]	H	100	0	54	-3.3	Pass	NOISE
7308.457	56.3	5.4	-5.7	56.0	Peak Max	H	131	0	74	-18.0	Pass	RB
7308.457	45.0	5.4	-5.7	44.8	Average Max	H	131	0	54	-9.2	Pass	RB

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

Test Freq.	2462 MHz	**Engineer**	GMH
Variant	802.11b; 1 Mbs	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2464.930	71.8	3.0	-11.5	63.3	Peak [Scan]	V						FUND
17080.160	43.4	8.5	0.4	52.3	Peak [Scan]	V	100	0	54	-1.7	Pass	NOISE
7383.487	58.9	5.5	-5.5	58.8	Peak Max	V	139	17	74	-15.2	Pass	RB
7383.487	48.3	5.5	-5.5	48.3	Average Max	V	139	17	54	-5.7	Pass	RB

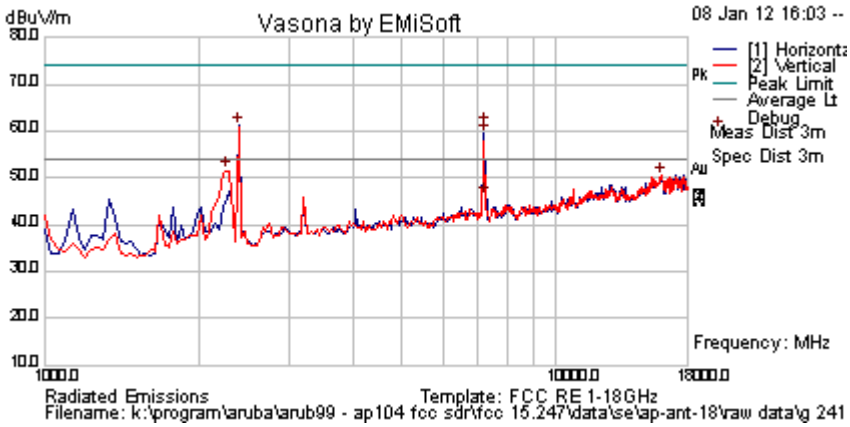
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

802.b Band-Edge 2483.5 MHz

Power reduction required to bring into compliance;

Power setting 14

Test Freq.	2412 MHz	**Engineer**	GMH
Variant	802.11g; 6 Mbs	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

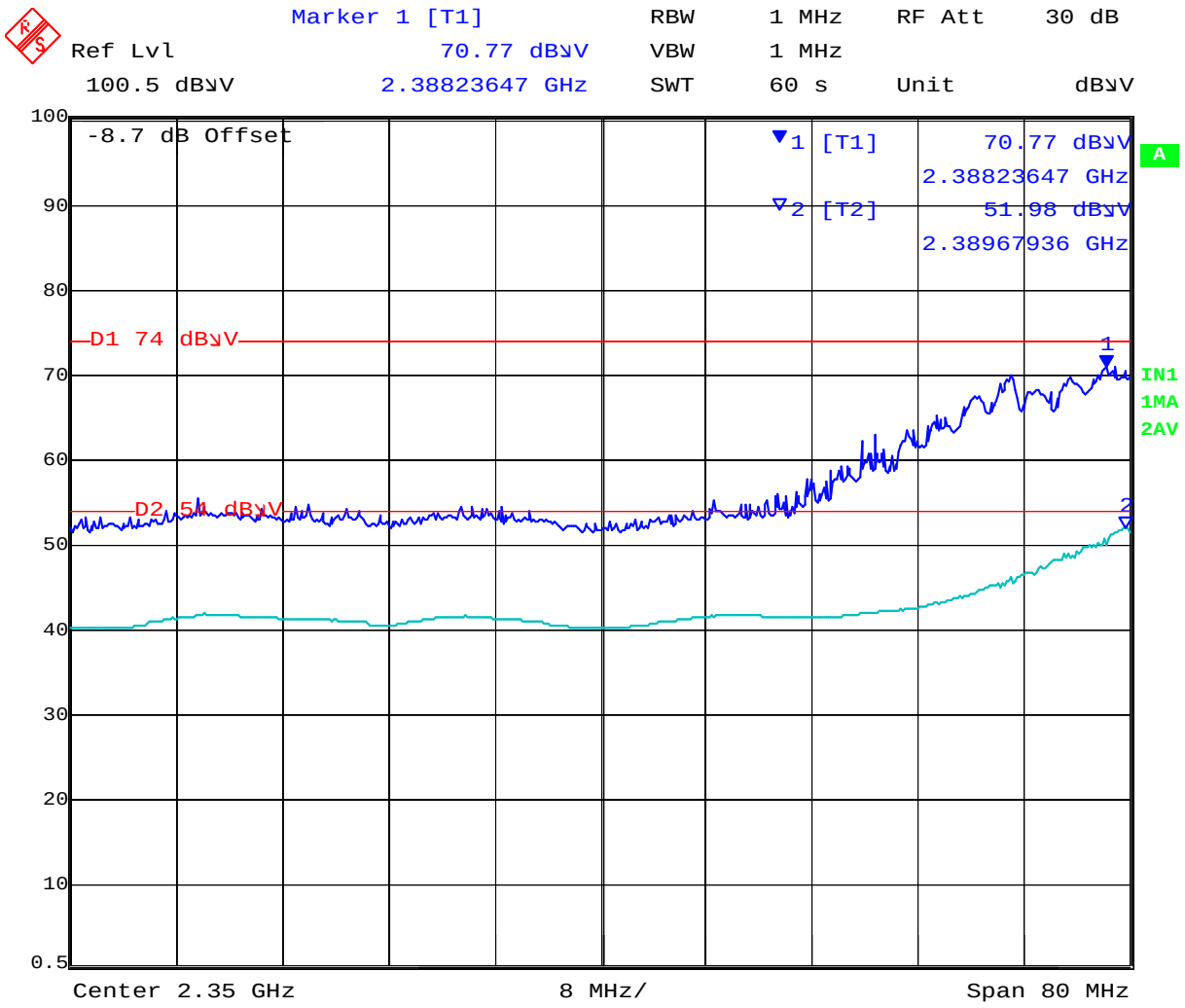


Formally measured emission peaks

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
2396.794	69.9	3.0	-11.7	61.2	Peak [Scan]	H						FUND
2260.521	60.4	2.9	-11.8	51.5	Peak [Scan]	V					Pass	BE
15989.980	41.4	9.0	0.1	50.5	Peak [Scan]	H	100	0	54	-3.5	Pass	NOISE
7233.004	61.6	5.4	-5.8	61.2	Peak Max	H	98	2	74	-12.8	Pass	RB
7233.004	46.7	5.4	-5.8	46.3	Average Max	H	98	2	54	-7.7	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

802.11g Band-Edge 2390 MHz



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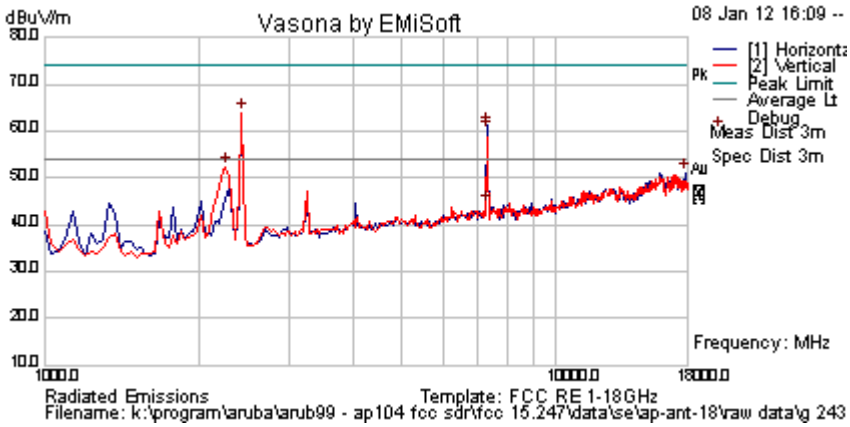
Power reduction required to bring into compliance;

Power setting 15.5

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11g; 6 Mbs	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

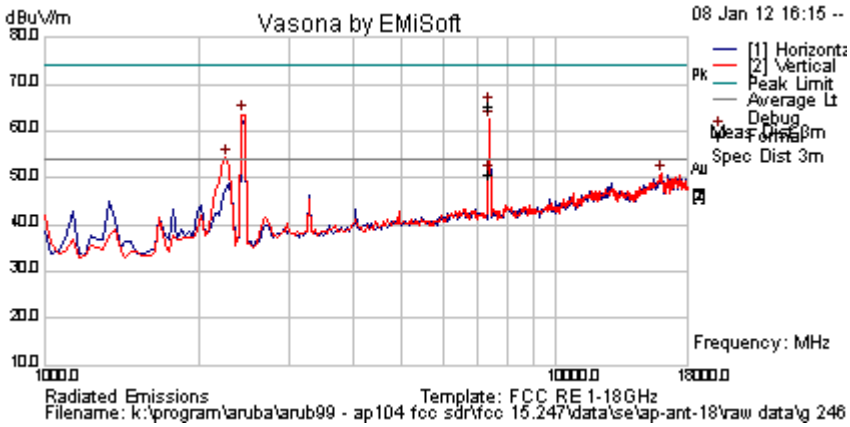


Formally measured emission peaks

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
2430.862	72.6	3.0	-11.6	64.0	Peak [Scan]	H						FUND
2260.521	61.3	2.9	-11.8	52.4	Peak [Scan]	V					Pass	BE
17829.659	42.1	8.8	0.2	51.1	Peak [Scan]	H	100	0	54	-2.9	Pass	NOISE
7312.385	60.5	5.4	-5.7	60.3	Peak Max	H	201	337	74	-13.8	Pass	RB
7312.385	44.4	5.4	-5.7	44.2	Average Max	H	201	337	54	-9.8	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

Test Freq.	2462 MHz	**Engineer**	GMH
Variant	802.11g; 6 Mbs	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

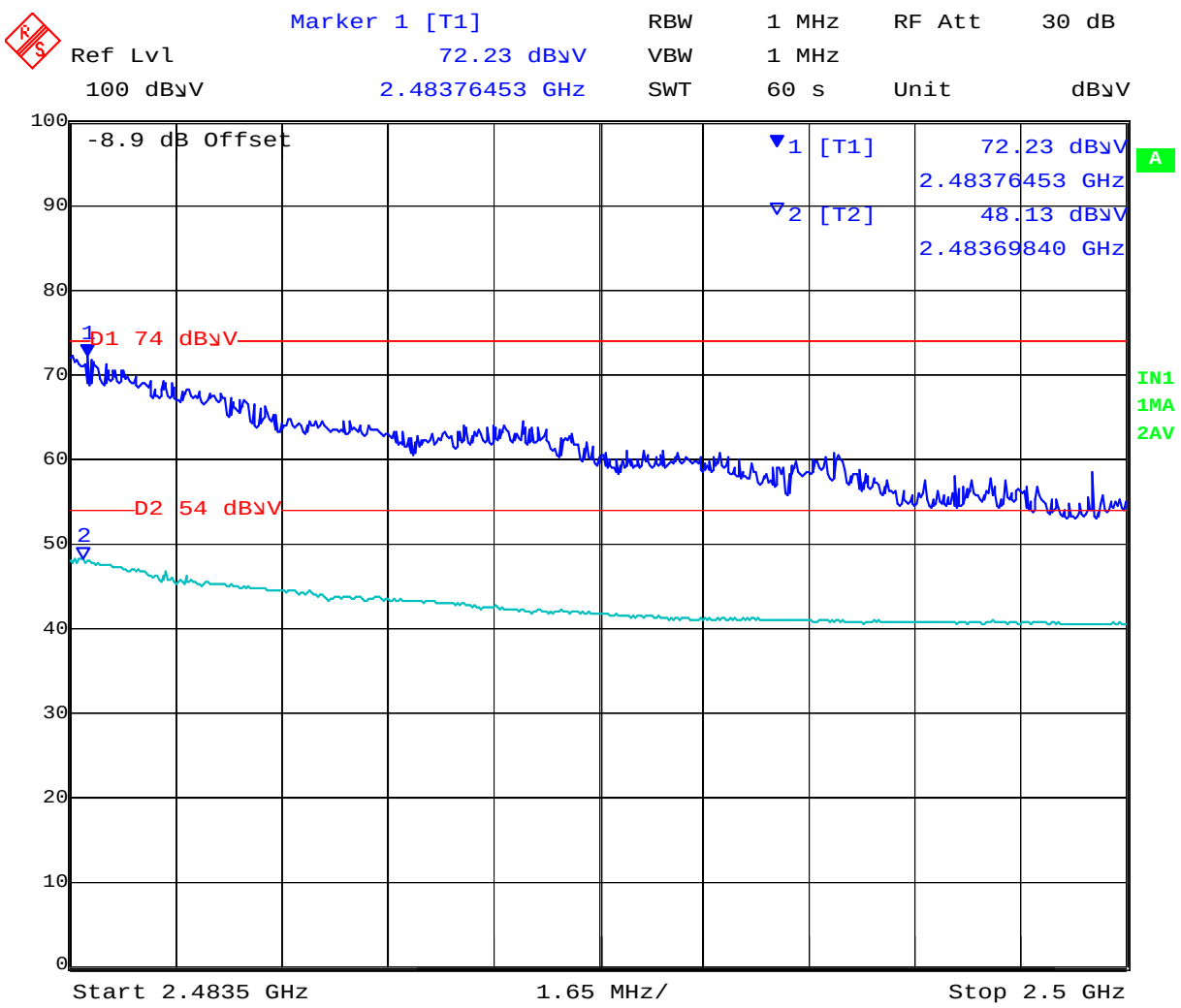


Formally measured emission peaks

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
2430.862	72.2	3.0	-11.6	63.6	Peak [Scan]	V						FUND
2260.521	63.2	2.9	-11.8	54.3	Peak [Scan]	V					Pass	BE
15989.980	41.8	9.0	0.1	51.0	Peak [Scan]	V	100	0	54	-3.1	Pass	NOISE
7385.892	65.5	5.5	-5.5	65.4	Peak Max	H	98	329	74	-8.6	Pass	RB
7385.892	50.9	5.5	-5.5	50.9	Average Max	H	98	329	54	-3.1	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

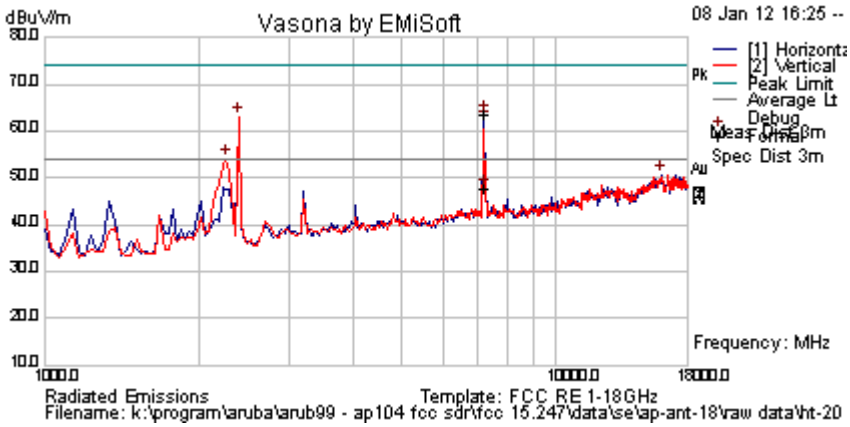
802.11g Band-Edge 2483.5 MHz



Power reduction required to bring into compliance;

Power setting 14

Test Freq.	2412 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

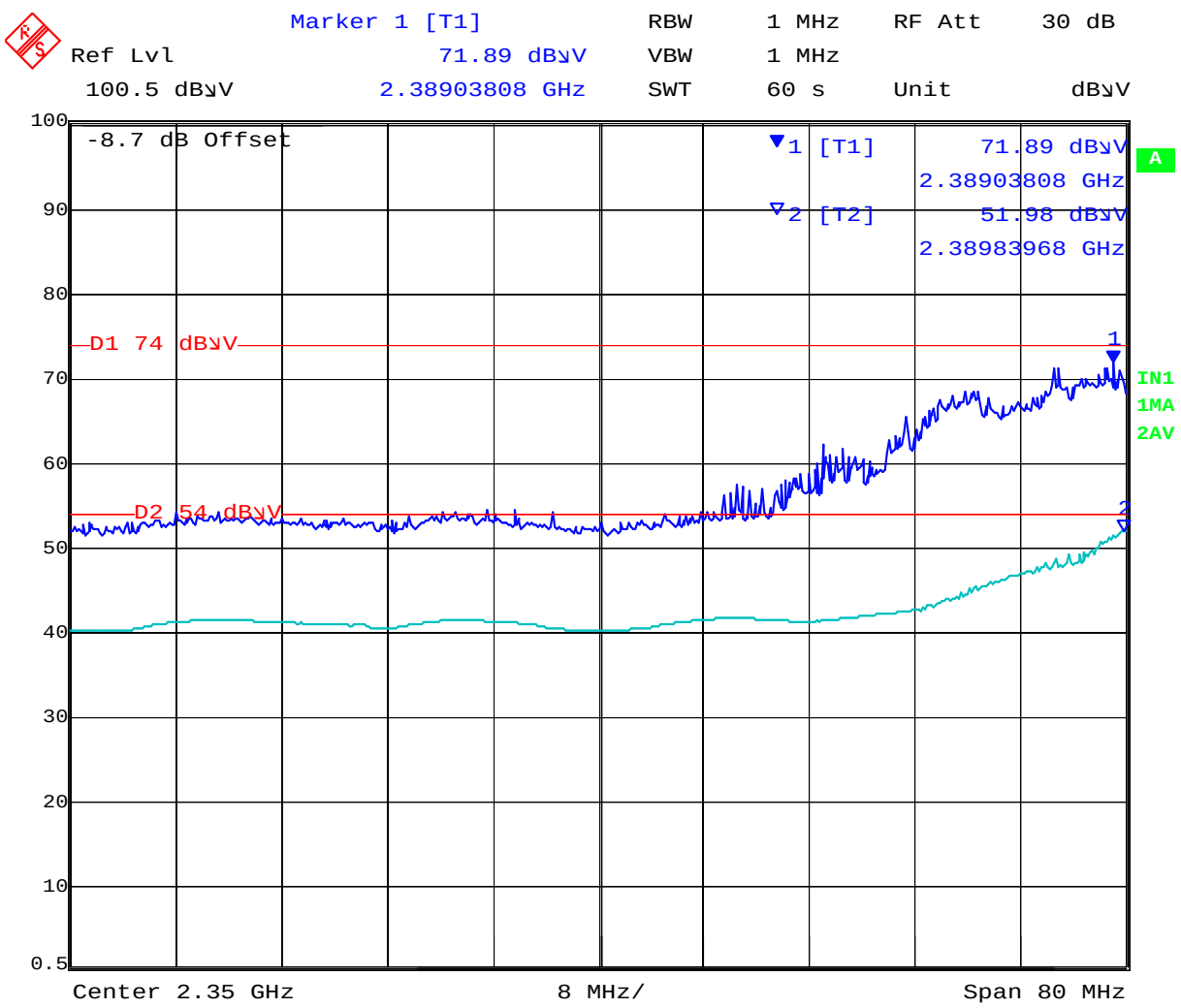


Formally measured emission peaks

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
2396.794	71.8	3.0	-11.7	63.1	Peak [Scan]	V						FUND
2260.521	63.1	2.9	-11.8	54.2	Peak [Scan]	V					Pass	BE
16058.116	41.4	9.0	0.3	50.7	Peak [Scan]	H	100	0	54	-3.3	Pass	NOISE
7230.220	64.1	5.4	-5.8	63.6	Peak Max	H	98	8	74	-10.4	Pass	RB
7230.220	48.4	5.4	-5.8	48.0	Average Max	H	98	8	54	-6.1	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

802.11n HT-20 Band-Edge 2390 MHz



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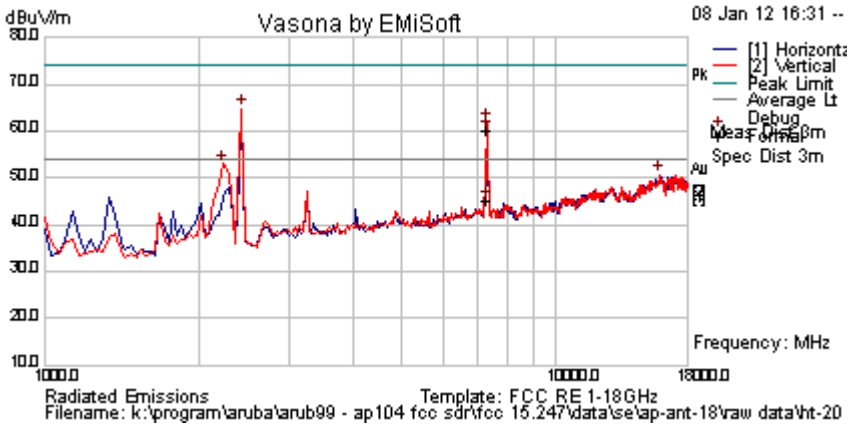
Power reduction required to bring into compliance;

Power setting 15.5

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

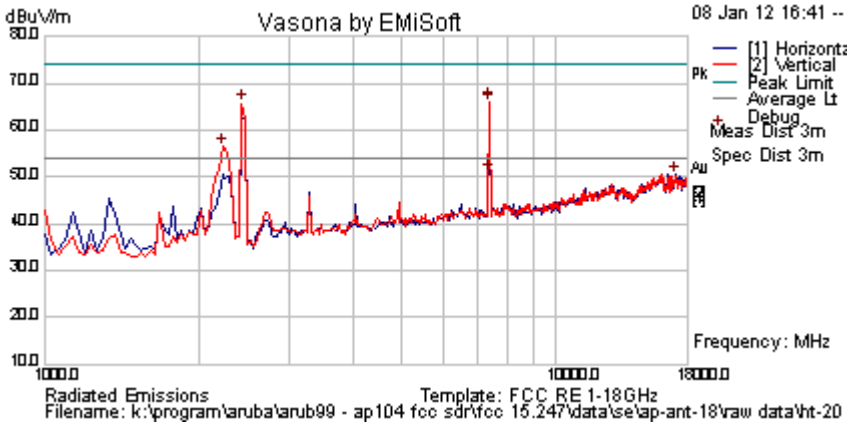


Formally measured emission peaks

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
2430.862	73.5	3.0	-11.6	64.9	Peak [Scan]	V						FUND
2226.453	62.2	2.9	-12.0	53.1	Peak [Scan]	V					Pass	BE
15921.844	41.9	8.9	-0.1	50.7	Peak [Scan]	V	100	0	54	-3.3	Pass	NOISE
7308.457	60.6	5.4	-5.7	60.4	Peak Max	V	98	361	74	-13.6	Pass	RB
7308.457	45.6	5.4	-5.7	45.3	Average Max	V	98	361	54	-8.7	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

Test Freq.	2462 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**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
2430.86172	74.3	3.0	-11.6	65.7	Peak [Scan]	V						FUND
2226.453	65.6	2.9	-12.0	56.6	Peak [Scan]	V					Pass	BE
17080.160	41.7	8.5	0.4	50.5	Peak [Scan]	H	100	0	54	-3.5	Pass	NOISE
7383.086	65.7	5.5	-5.5	65.7	Peak Max	V	98	17	74	-8.3	Pass	RB
7383.086	50.6	5.5	-5.5	50.6	Average Max	V	98	17	54	-3.4	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

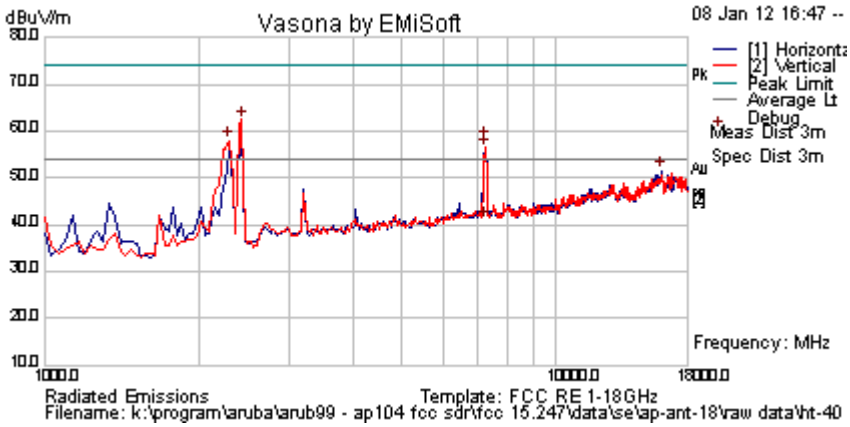
802.11n HT-20 Band-Edge 2483.5 MHz

Date: 8.JAN.2012 17:31:14

Power reduction required to bring into compliance;

Power setting 12

Test Freq.	2422 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

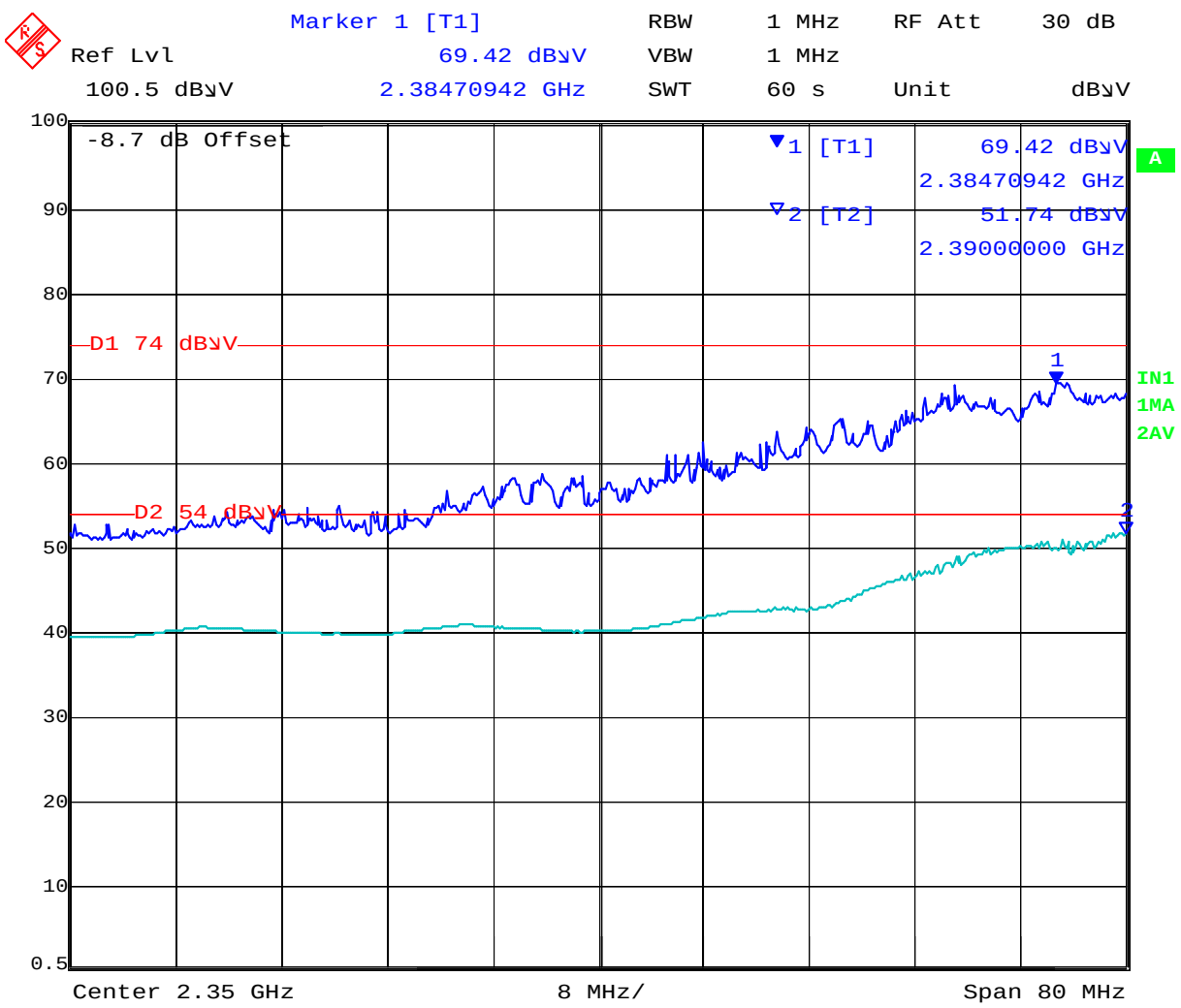


Formally measured emission peaks

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
2430.862	71.0	3.0	-11.6	62.4	Peak [Scan]	V						FUND
2294.58918	66.9	2.9	-11.9	57.9	Peak [Scan]	V					Pass	BE
16024.048	42.2	9.0	0.2	51.5	Peak [Scan]	H	100	0	54	-2.5	Pass	NOISE
7238.890	58.5	5.4	-5.8	58.1	Peak Max	V	140	360	74	-16.0	Pass	RB
7238.890	41.5	5.4	-5.8	41.1	Average Max	V	140	360	54	-12.9	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

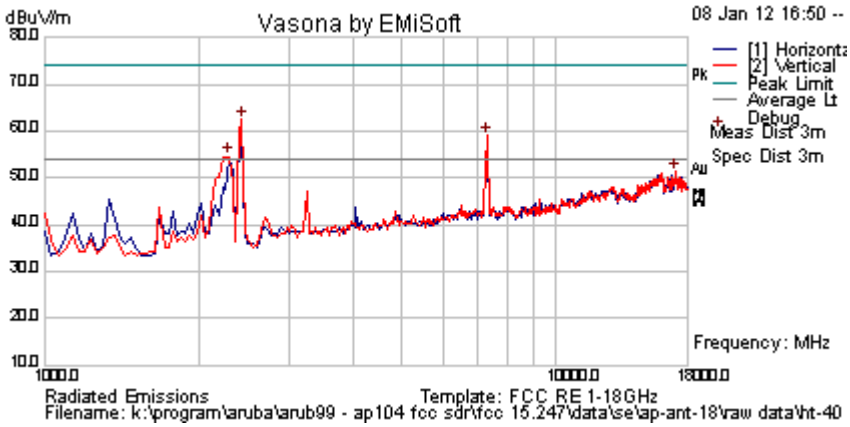
802.11n HT-40 Band-Edge 2390 MHz



Power reduction required to bring into compliance;

Power setting 12

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

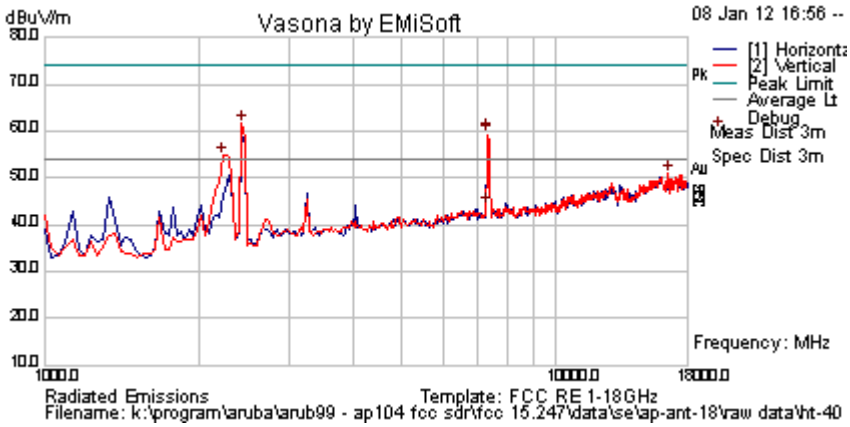


Formally measured emission peaks

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
2430.862	71.2	3.0	-11.6	62.6	Peak [Scan]	V						FUND
2294.589	63.6	2.9	-11.9	54.6	Peak [Scan]	V					Pass	BE
17046.092	42.5	8.5	0.3	51.3	Peak [Scan]	V	100	0	54	-2.8	Pass	NOISE
7385.892	65.5	5.5	-5.5	65.4	Peak Max	H	98	329	74	-8.6	Pass	RB
7385.892	50.9	5.5	-5.5	50.9	Average Max	H	98	329	54	-3.1	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

Test Freq.	2452 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	20.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	32
Power Setting	ART = 20	**Press. (mBars)**	1008
Antenna	AP-ANT-18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

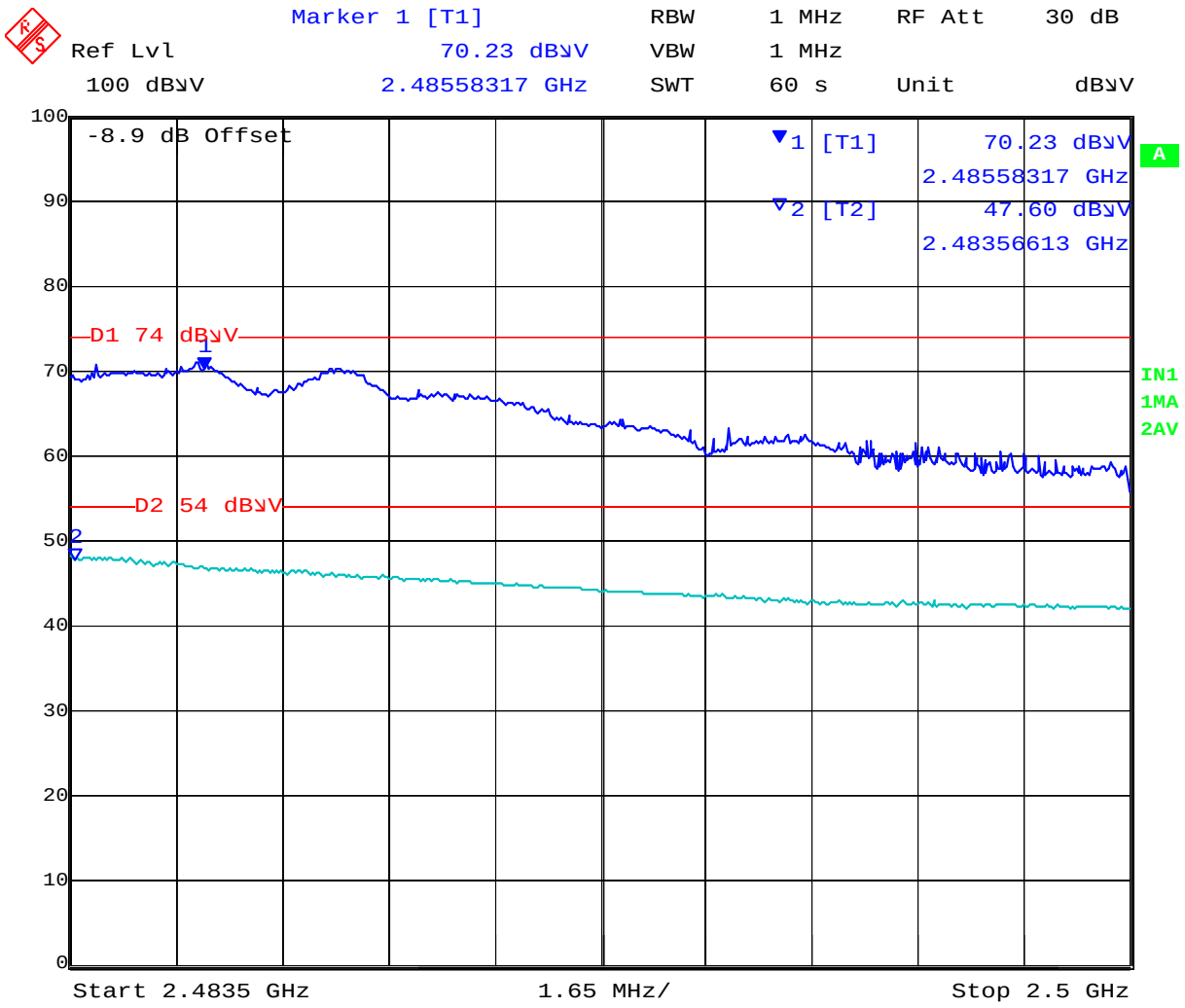


Formally measured emission peaks

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
2430.862	70.2	3.0	-11.6	61.6	Peak [Scan]	V						FUND
2226.453	63.9	2.9	-12.0	54.8	Peak [Scan]	V					Pass	BE
16535.070	41.7	8.8	0.4	50.9	Peak [Scan]	V	100	0	54	-3.1	Pass	NOISE
7344.208	59.9	5.5	-5.6	59.8	Peak Max	H	102	331	74	-14.2	Pass	RB
7344.208	44.2	5.5	-5.6	44.1	Average Max	H	102	331	54	-9.9	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

802.11n HT-40 Band-Edge 2483.5 MHz



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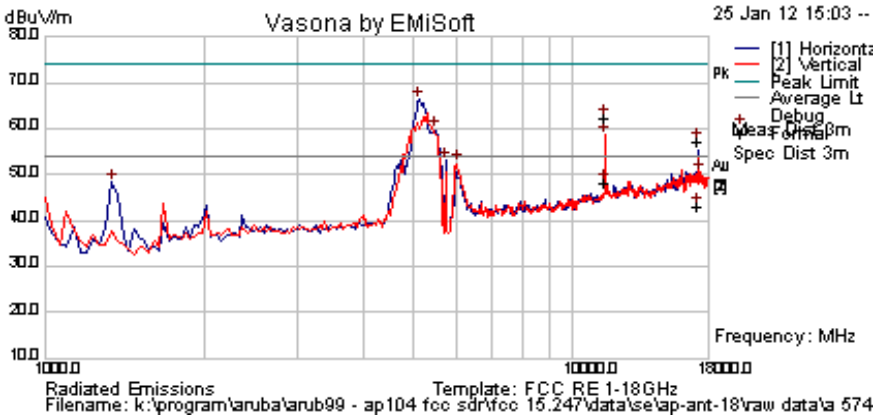
Power reduction required to bring into compliance;

Power setting 11

Test Freq.	5745 MHz	**Engineer**	GMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 20	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

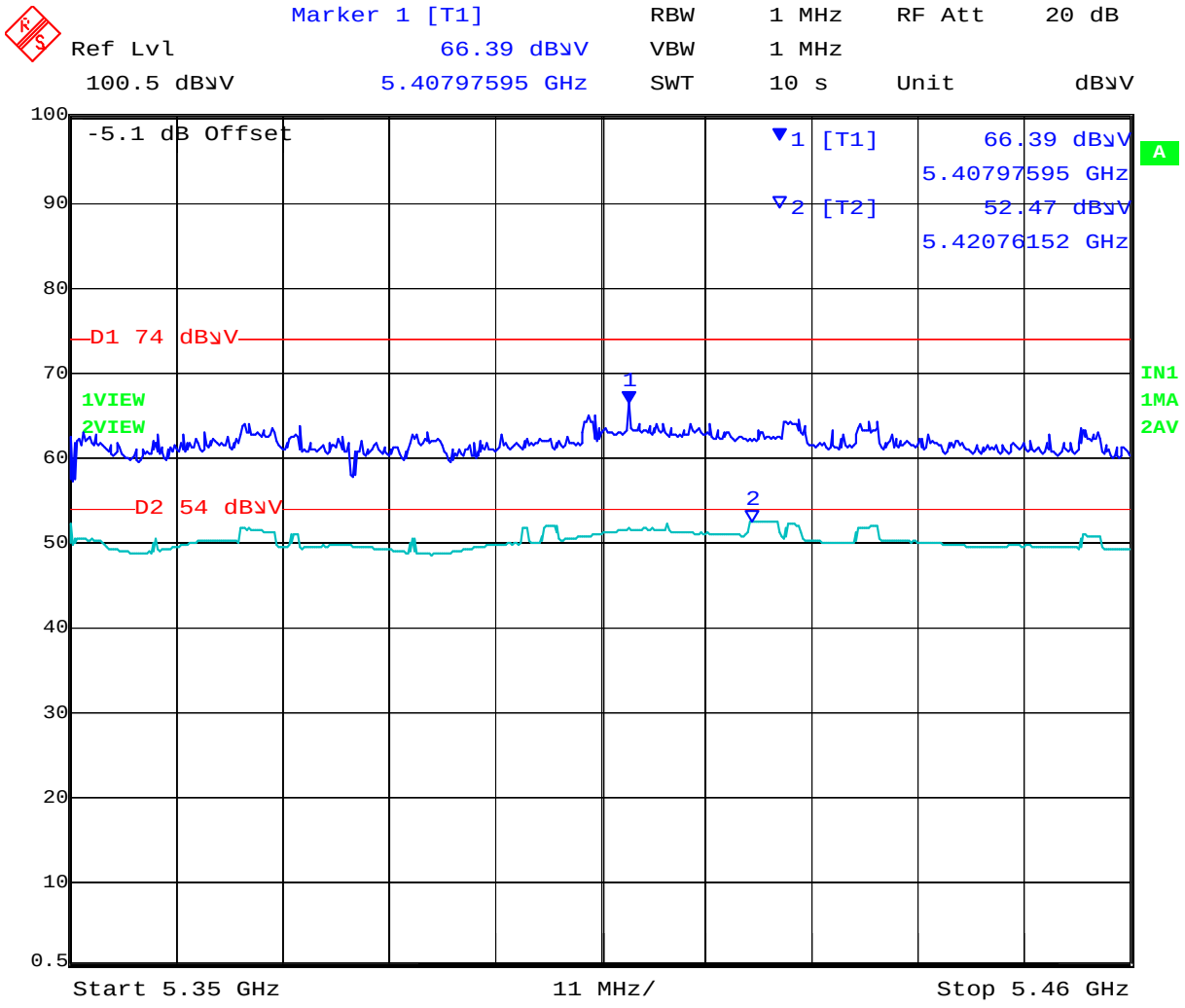


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5122.244	71.5	4.6	-10.0	66.2	Peak [Scan]	H					Pass	BE
5496.993988	64.8	4.6	-9.6	59.8	Peak [Scan]	H					Pass	BE
5735.471	57.8	4.8	-9.5	53.0	Peak [Scan]	H						FUND
6042.084	56.0	4.9	-8.5	52.3	Peak [Scan]	V					Pass	BE
17352.705	40.5	8.7	1.3	50.5	Peak [Scan]	V	100	0	54	-3.5	Pass	Noise
1340.681	60.0	2.3	-13.9	48.3	Peak [Scan]	H	100	0	54	-5.7	Pass	RB
11484.249	57.4	6.8	-2.0	62.2	Peak Max	V	123	161	74	-11.8	Pass	RB
17240.160	47.5	8.6	1.0	57.1	Peak Max	H	99	164	74	-16.9	Pass	NRB
11484.249	43.6	6.8	-2.0	48.4	Average Max	V	123	161	54	-5.6	Pass	RB
17240.160	33.7	8.6	1.0	43.2	Average Max	H	99	164	54	-10.8	Pass	NRB

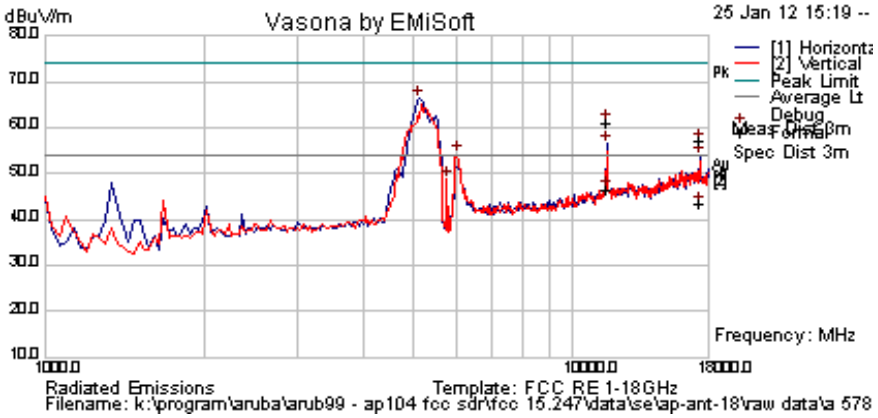
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

802.11a Band-Edge 5460 MHz (Radio Transmitting on 5745 MHz)



Power setting 20

Test Freq.	5785 MHz	**Engineer**	GMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 20	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

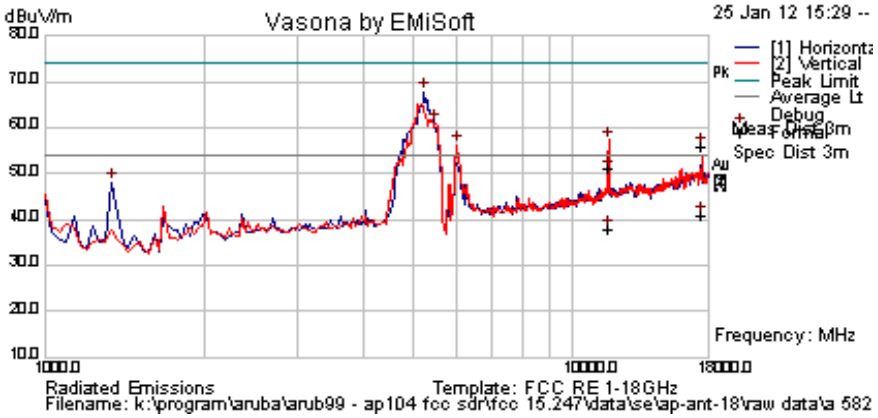


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5122.244	71.6	4.6	-10.0	66.3	Peak [Scan]	H					Pass	BE
6042.084	57.8	4.9	-8.5	54.2	Peak [Scan]	V					Pass	BE
5769.539	53.5	4.8	-9.5	48.8	Peak [Scan]	V						FUND
11568.817	56.1	6.8	-2.0	60.9	Peak Max	H	98	224	74	-13.1	Pass	RB
17349.899	47.0	8.7	1.3	57.0	Peak Max	H	104	168	74	-17.0	Pass	NRB
11568.817	41.9	6.8	-2.0	46.7	Average Max	H	98	224	54	-7.4	Pass	RB
17349.899	33.3	8.7	1.3	43.3	Average Max	H	104	168	54	-10.7	Pass	NRB

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

Test Freq.	5825 MHz	**Engineer**	GMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 20	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

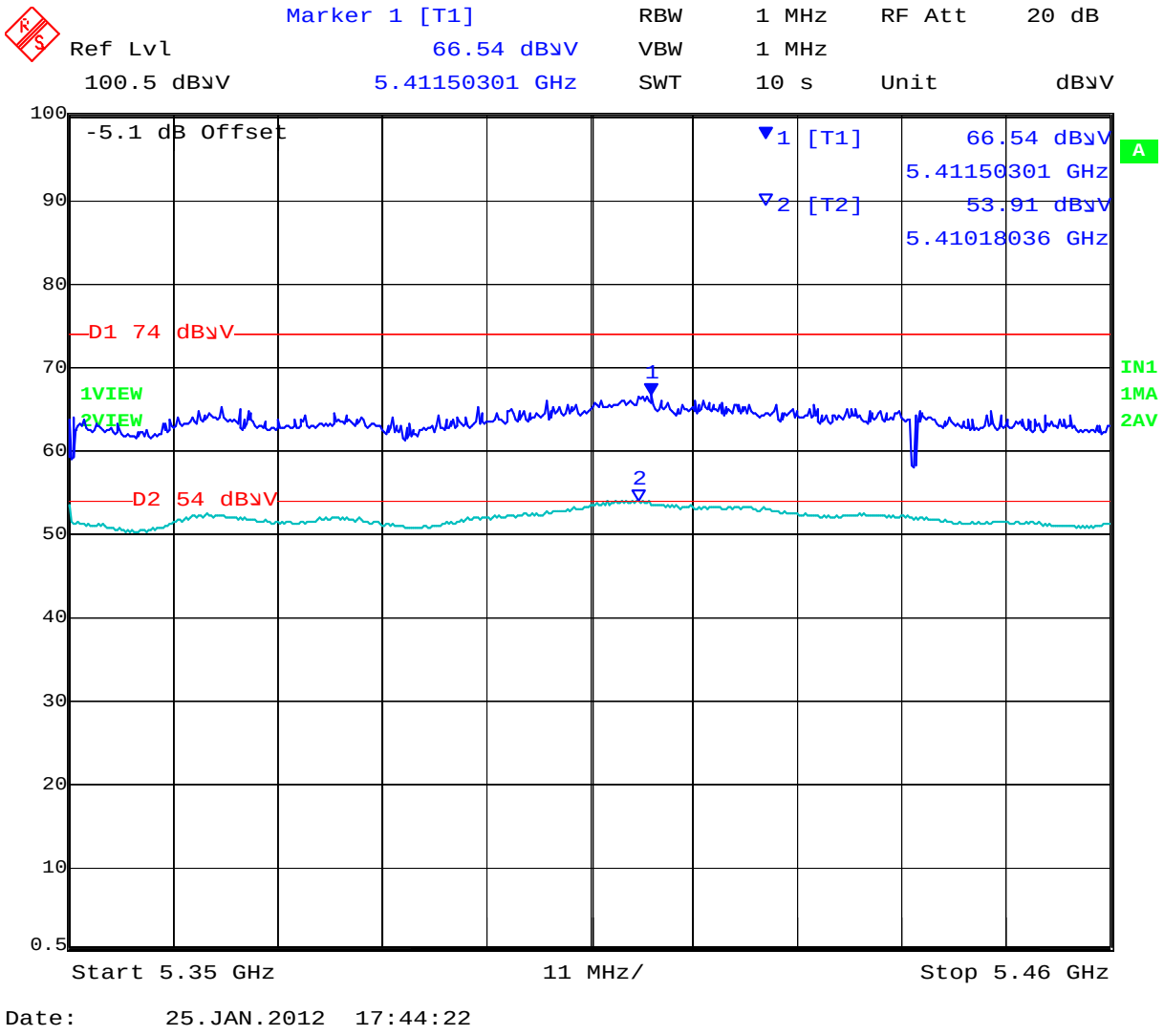


Formally measured emission peaks

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
5224.449	73.0	4.6	-9.8	67.8	Peak [Scan]	H					Pass	BE
5496.993988	66.0	4.6	-9.6	61.0	Peak [Scan]	V					Pass	BE
6042.084	59.9	4.9	-8.5	56.3	Peak [Scan]	V					Pass	BE
1340.681	59.8	2.3	-13.9	48.1	Peak [Scan]	H	100	0	54	-5.9	Pass	NRB
11653.868	46.5	6.8	-2.3	51.0	Peak Max	V	102	162	74	-23.0	Pass	RB
17489.178	46.0	8.8	1.0	55.8	Peak Max	H	100	174	74	-18.3	Pass	NRB
11653.868	33.5	6.8	-2.3	38.1	Average Max	V	102	162	54	-15.9	Pass	RB
17489.178	31.3	8.8	1.0	41.0	Average Max	H	100	174	54	-13.0	Pass	NRB

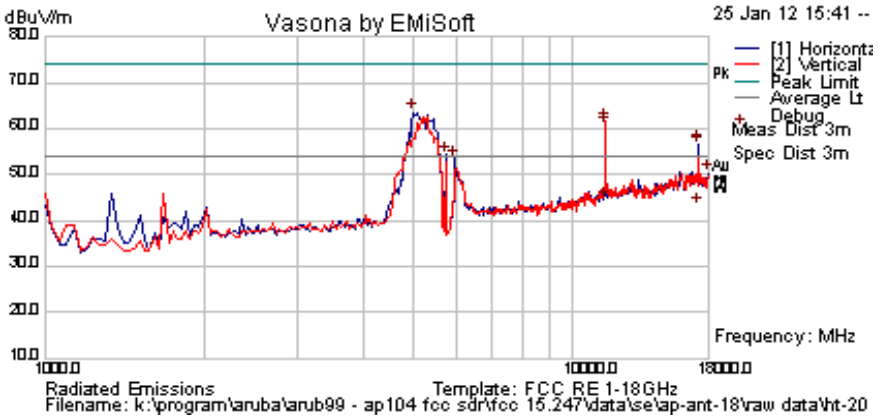
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

802.11a Band-Edge 5460 MHz (Radio Transmitting on 5825 MHz)



Power setting 20

Test Freq.	5745 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 20	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

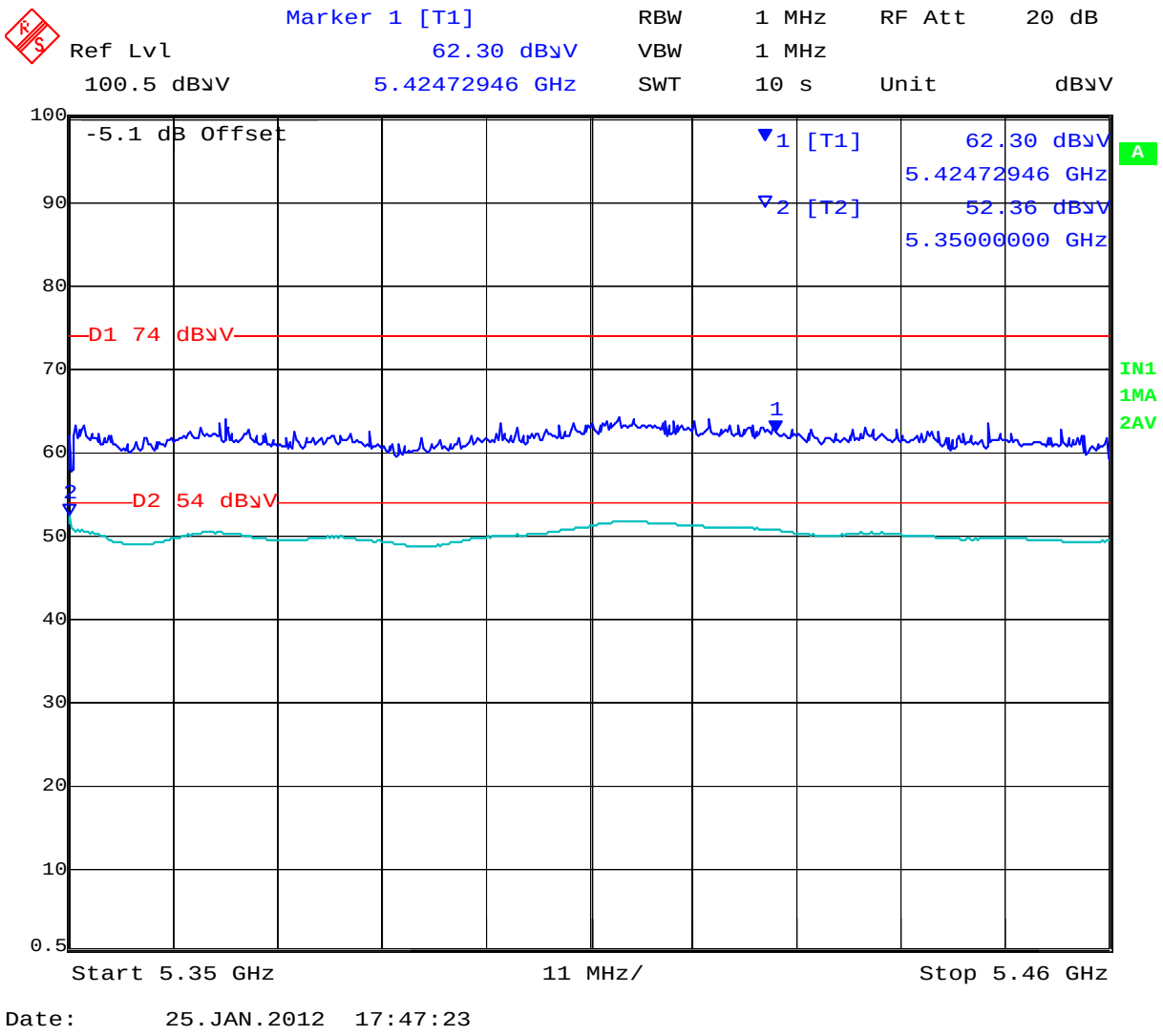


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4985.972	68.9	4.6	-9.9	63.6	Peak [Scan]	H					``	BE
5735.471	59.1	4.8	-9.5	54.3	Peak [Scan]	H						FUND
5973.948	57.3	4.9	-8.7	53.5	Peak [Scan]	H					Pass	BE
18000.000	40.9	8.8	0.7	50.4	Peak [Scan]	H	100	0	54	-3.6	Pass	Noise
11482.966	56.0	6.8	-2.0	60.8	Peak Max	V	129	163	74	-13.2	Pass	RB
17231.423	47.0	8.6	0.9	56.5	Peak Max	H	98	141	74	-17.5	Pass	NRB
11482.966	39.7	6.8	-2.0	44.5	Average Max	V	129	163	54	-9.6	Pass	RB
17231.423	33.5	8.6	0.9	43.0	Average Max	H	98	141	54	-11.0	Pass	NRB

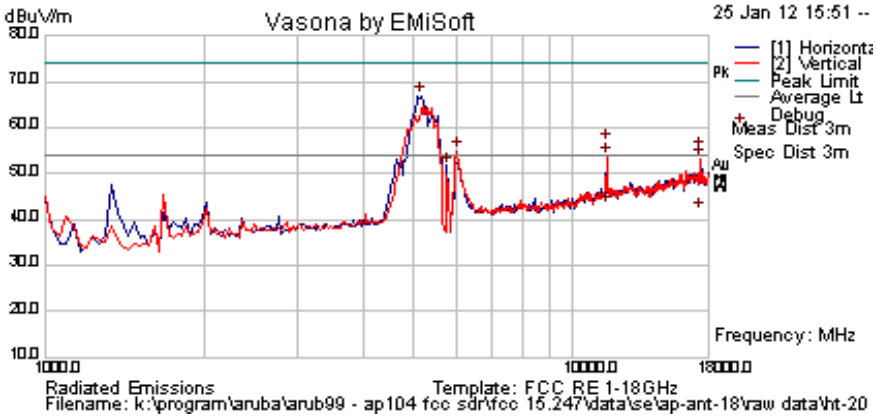
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

802.11n HT-20 Band-Edge 5460 MHz (Radio Transmitting on 5745 MHz)



Power setting 20

Test Freq.	5785 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 20	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

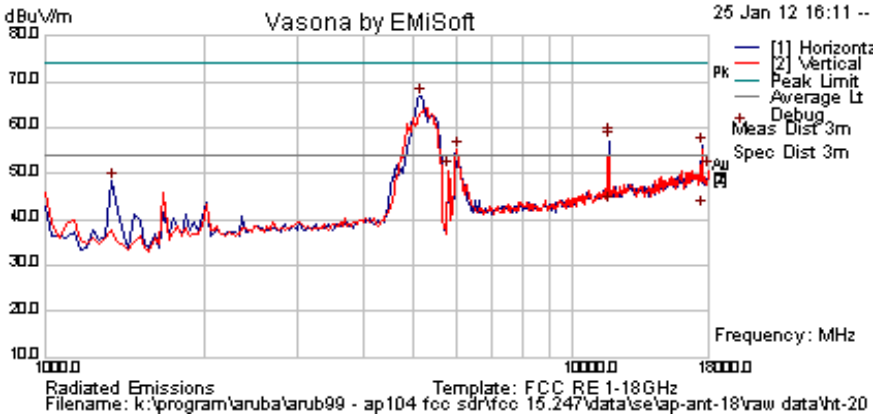


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5156.313	72.4	4.6	-9.9	67.0	Peak [Scan]	H					Pass	BE
6042.084168	58.5	4.9	-8.5	54.9	Peak [Scan]	V					Pass	BE
5769.539	56.5	4.8	-9.5	51.8	Peak [Scan]	H						FUND
11568.016	52.2	6.8	-2.0	57.0	Peak Max	H	98	225	74	-17.0	Pass	RB
17348.377	44.9	8.7	1.3	54.9	Peak Max	V	154	320	74	-19.1	Pass	NRB
11568.016	38.1	6.8	-2.0	42.9	Average Max	H	98	225	54	-11.1	Pass	RB
17348.377	31.8	8.7	1.3	41.8	Average Max	V	154	320	54	-12.3	Pass	NRB

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

Test Freq.	5825 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 20	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

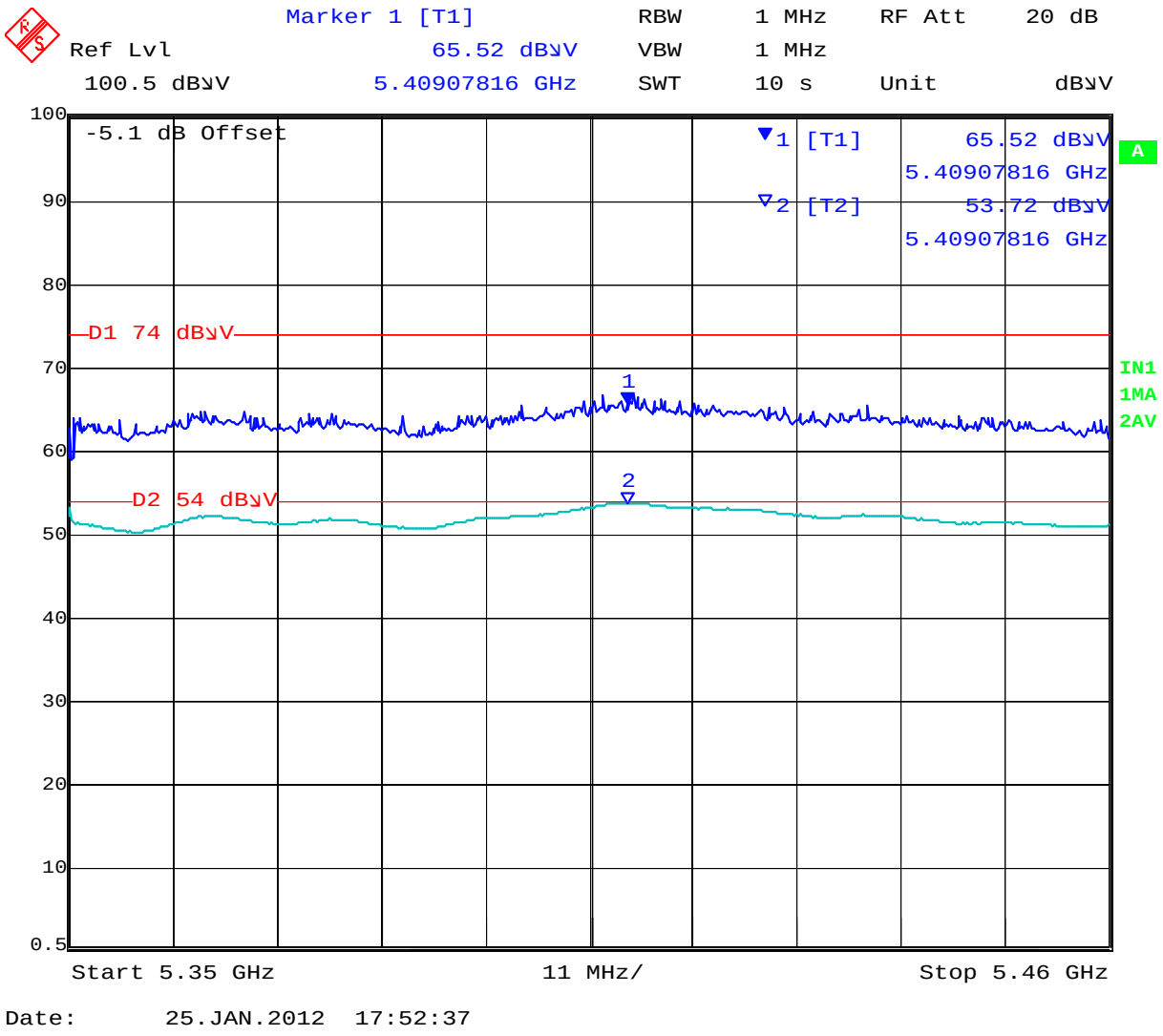


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5122.244	72.3	4.6	-10.0	67.0	Peak [Scan]	H					Pass	BE
6042.084	58.3	4.9	-8.5	54.6	Peak [Scan]	V					Pass	BE
18000.000	40.8	8.8	0.7	50.3	Peak [Scan]	V	100	0	54	-3.7	Pass	NOISE
5803.607	54.1	4.8	-9.4	49.5	Peak [Scan]	H						FUND
6280.561	50.8	5.0	-7.5	48.2	Peak [Scan]	V					Pass	BE
17479.960	47.9	8.8	1.1	57.7	Peak Max	H	117	175	74	-16.3	Pass	NRB
11645.612	57.0	6.8	-2.3	61.6	Peak Max	H	98	225	74	-12.4	Pass	RB
17479.960	33.2	8.8	1.1	43.0	Average Max	H	117	175	54	-11.0	Pass	NRB
11645.612	42.2	6.8	-2.3	46.8	Average Max	H	98	225	54	-7.2	Pass	RB

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

802.11n HT-20 Band-Edge 5460 MHz (Radio Transmitting on 5825 MHz)

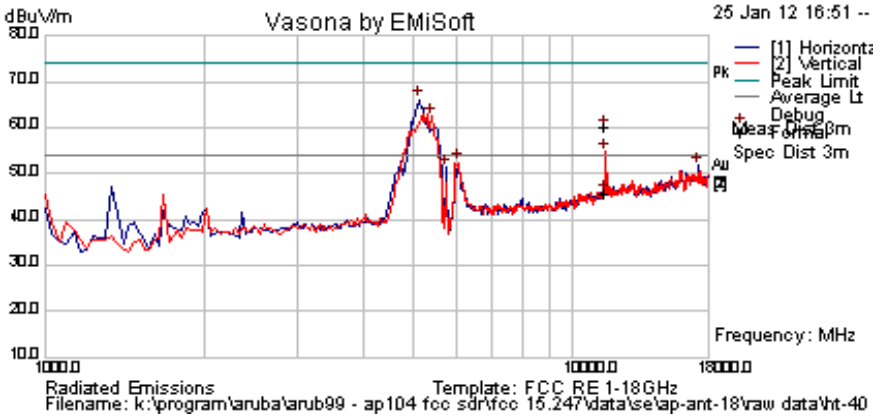


Date: 25.JAN.2012 17:52:37

Power reduction required to bring into compliance;

Power setting 19

Test Freq.	5755 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 19	**Press. (mBars)**	1014
Antenna	Ant 18	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

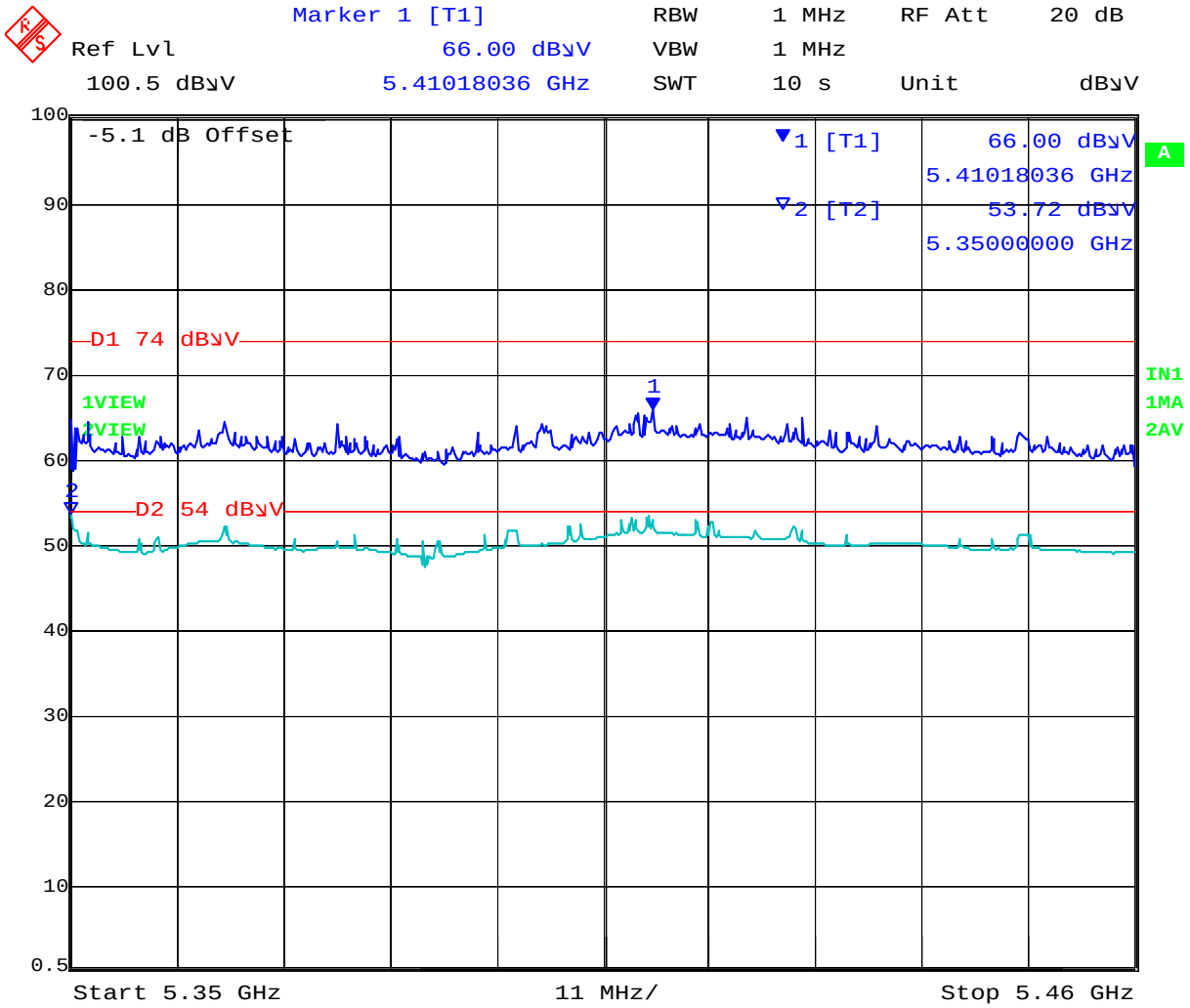


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5122.244	71.5	4.6	-10.0	66.2	Peak [Scan]	H						BE
5394.789579	67.5	4.6	-9.6	62.5	Peak [Scan]	V						BE
6076.152	56.0	4.9	-8.4	52.5	Peak [Scan]	V						BE
17250.501	42.0	8.6	1.0	51.7	Peak [Scan]	H	100	0	54	-2.4	Pass	NRB
5735.471	56.2	4.8	-9.5	51.4	Peak [Scan]	H						FUND
11509.820	55.1	6.8	-1.9	60.0	Peak Max	V	116	160	74	-14.0	Pass	RB
11509.820	40.9	6.8	-1.9	45.7	Average Max	V	116	160	54	-8.3	Pass	RB

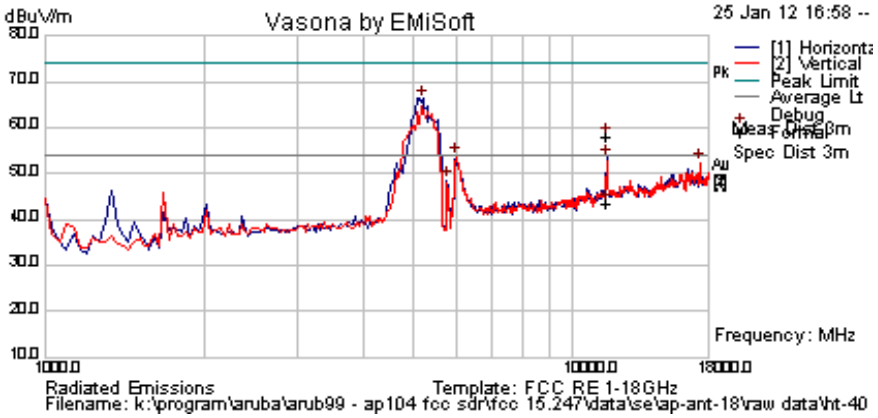
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

802.11n HT-40 Band-Edge 5460 MHz (Radio Transmitting on 5755 MHz)



Power setting 20

Test Freq.	5785 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 19	**Press. (mBars)**	1014
Antenna		**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

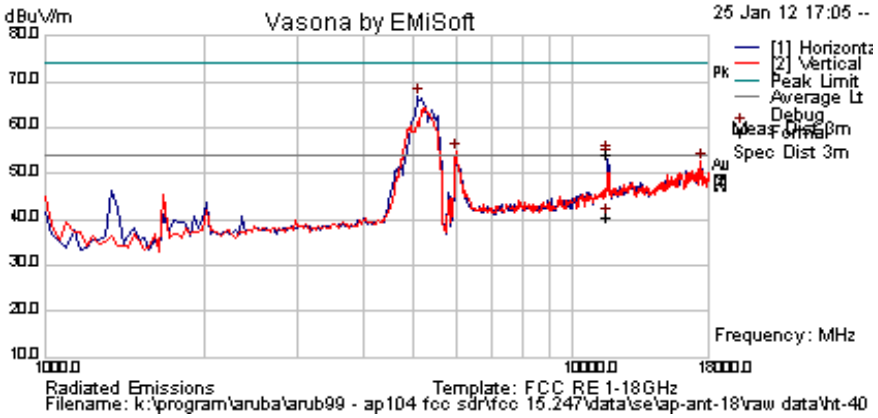


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	71.7	4.6	-9.9	66.4	Peak [Scan]	H					Pass	BE
6008.016032	57.4	4.9	-8.6	53.7	Peak [Scan]	V					Pass	BE
17386.774	42.2	8.7	1.4	52.3	Peak [Scan]	H	100	0	54	-1.7	Pass	NRB
5769.539	53.2	4.8	-9.5	48.6	Peak [Scan]	H						FUND
11567.855	53.1	6.8	-2.0	57.9	Peak Max	H	100	224	74	-16.1	Pass	RB
11567.855	38.8	6.8	-2.0	43.7	Average Max	H	100	224	54	-10.4	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

Test Freq.	5815 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	43
Power Setting	ART = 19	**Press. (mBars)**	1014
Antenna		**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

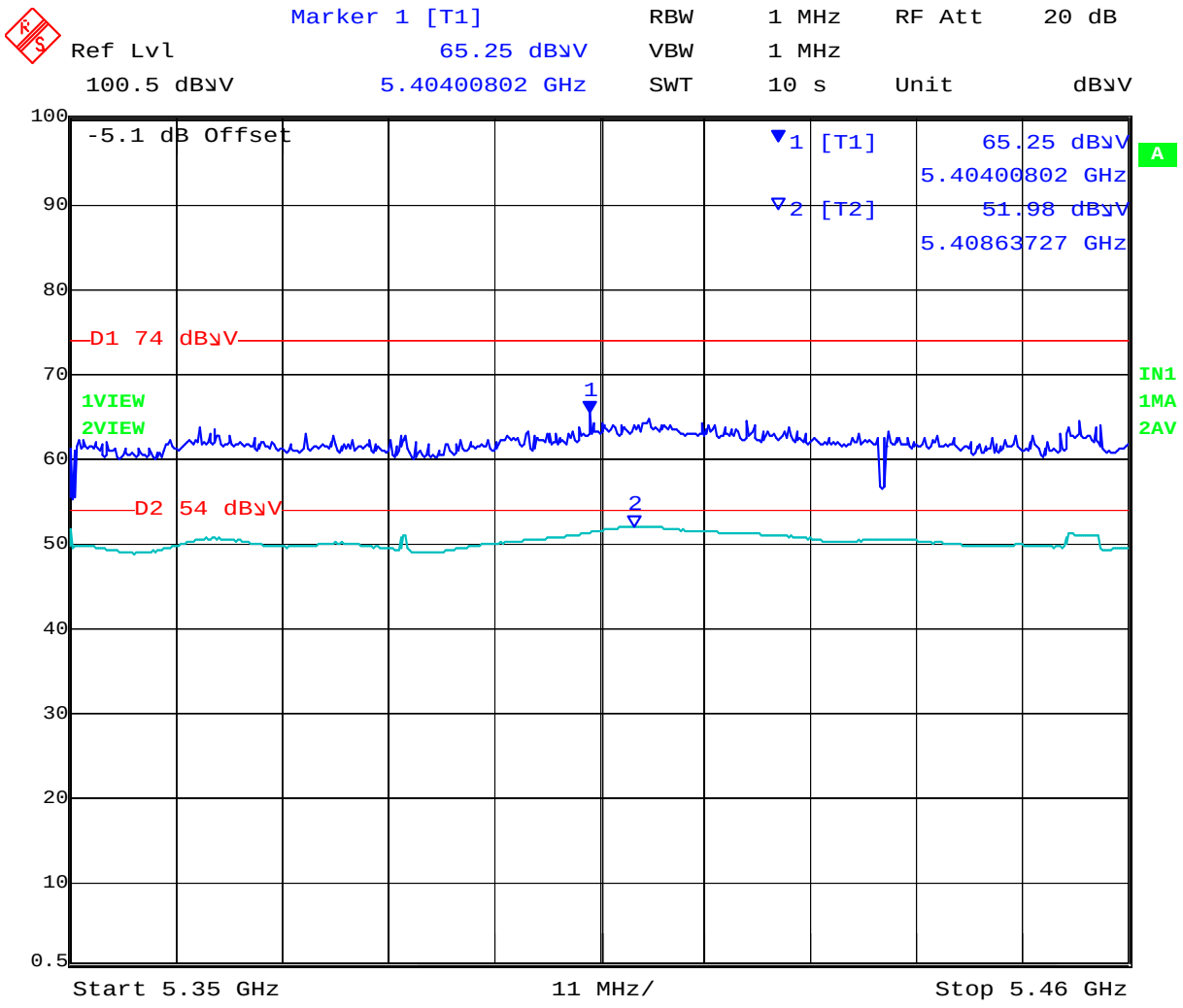


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5088.176	72.2	4.6	-9.9	66.8	Peak [Scan]	H					Pass	BE
6008.016032	58.4	4.9	-8.6	54.6	Peak [Scan]	V					Pass	BE
17454.910	42.7	8.7	1.2	52.6	Peak [Scan]	V	100	0	54	-1.4	Pass	NRB
11624.049	49.4	6.8	-2.2	54.0	Peak Max	H	98	227	74	-20.0	Pass	RB
11624.049	36.0	6.8	-2.2	40.6	Average Max	H	98	227	54	-13.4	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

802.11n HT-40 Band-Edge 5460 MHz (Radio Transmitting on 5815 MHz)



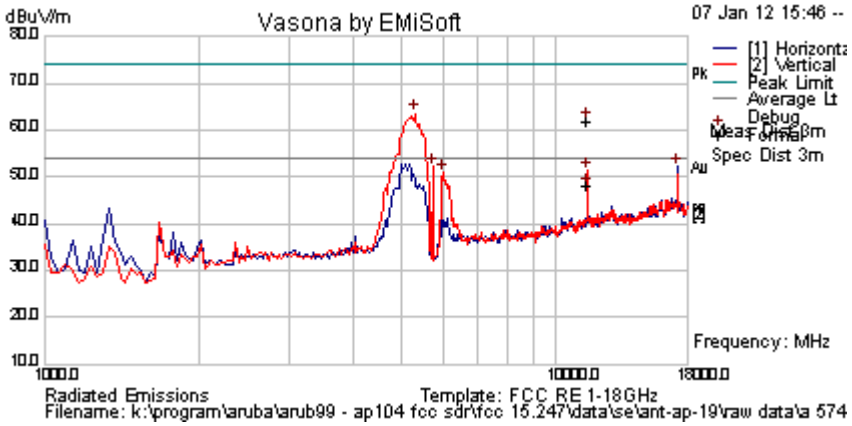
Date: 25.JAN.2012 17:58:14

Power reduction required to bring into compliance;

Power setting 19

SPURIOUS EMISSIONS AP-ANT-19

Test Freq.	5745 MHz	**Engineer**	GMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

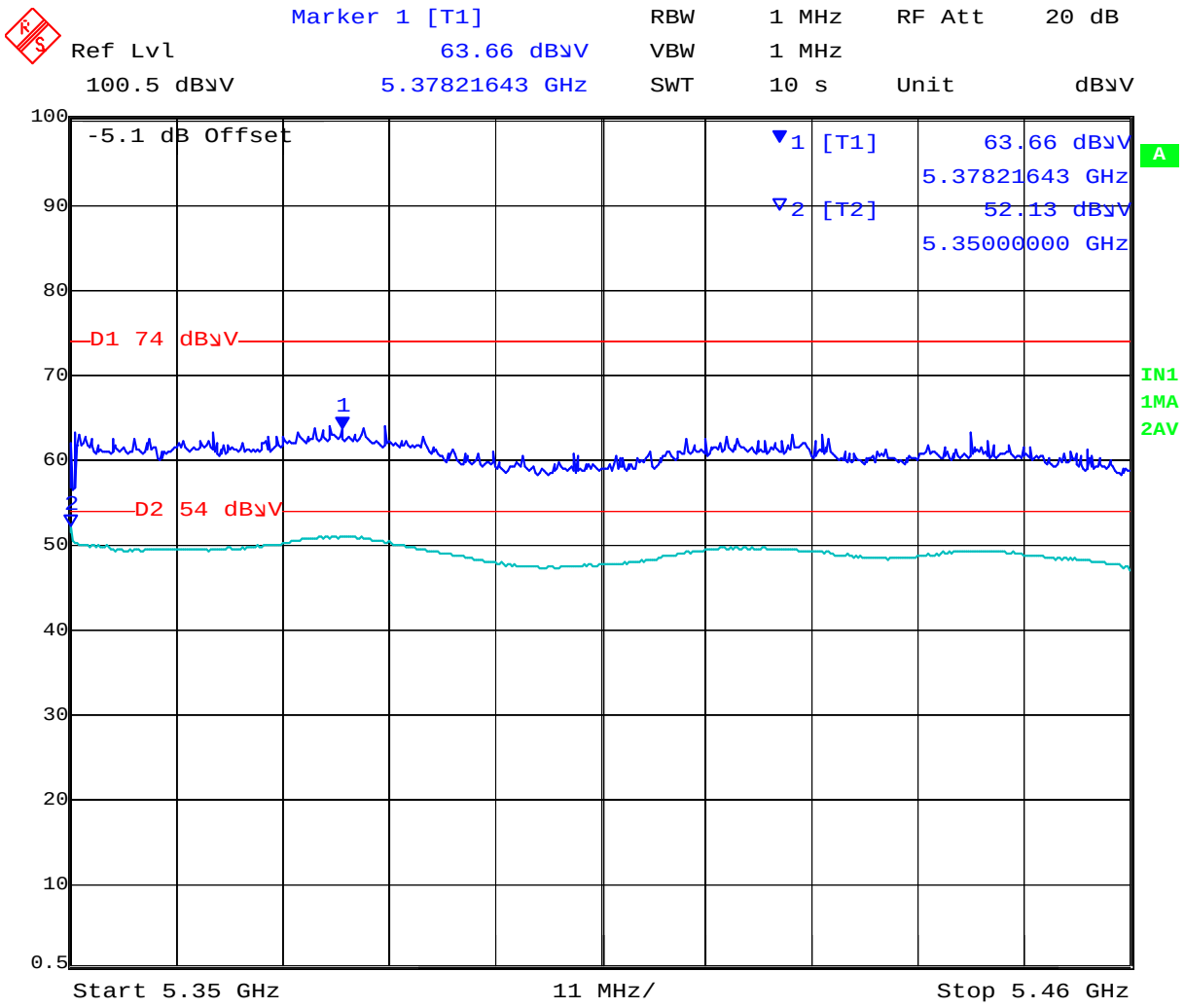


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	68.5	4.6	-9.6	63.5	Peak [Scan]	V					Pass	BE
17250.501	42.7	8.6	1.0	52.3	Peak [Scan]	H	100	0	54.0	-1.7	Pass	NOISE
5735.471	56.9	4.8	-9.5	52.1	Peak [Scan]	V						FUND
6008.016	54.7	4.9	-8.6	51.0	Peak [Scan]	V	100	0	54	-3.0	Pass	NRB
11488.818	57.0	6.8	-2.0	61.8	Peak Max	V	100	205	74	-12.2	Pass	RB
11488.818	43.2	6.8	-2.0	48.0	Average Max	V	100	205	54	-6.0	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

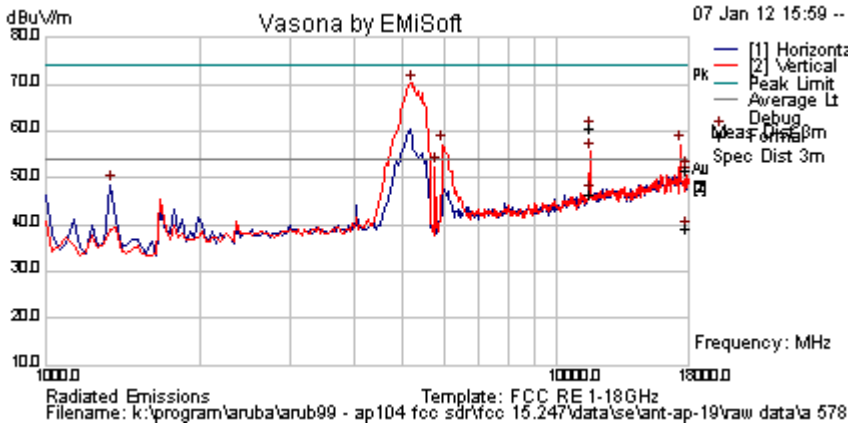
802.11a Band-Edge 5350 - 5460 MHz



Date: 25.JAN.2012 18:57:05

Power setting 20

Test Freq.	5785 MHz	**Engineer**	GMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

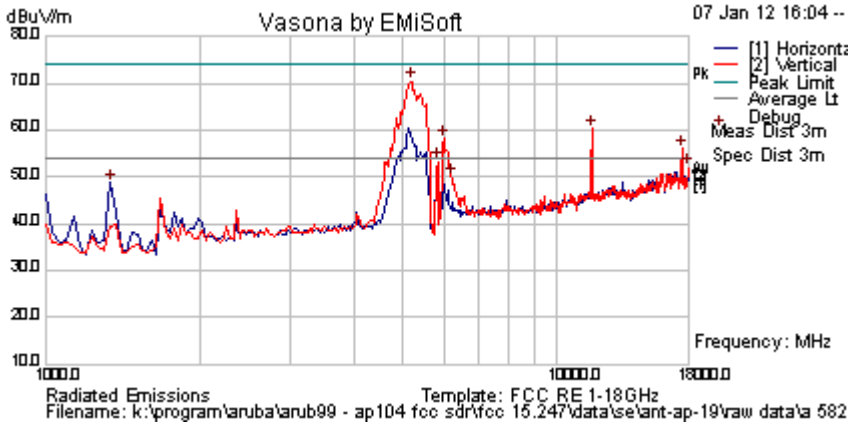


Formally measured emission peaks

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
5190.381	75.4	4.6	-9.9	70.1	Peak [Scan]	V					Pass	BE
5973.948	60.9	4.9	-8.7	57.1	Peak [Scan]	V					Pass	BE
5769.539	57.1	4.8	-9.5	52.4	Peak [Scan]	V						FUND
1340.681	60.2	2.3	-13.9	48.6	Peak [Scan]	H					Pass	NRB
11564.093	55.6	6.8	-2.0	60.4	Peak Max	V	107	208	74	-13.6	Pass	RB
17897.796	42.5	8.8	0.5	51.8	Peak Max	V	158	218	74	-22.3	Pass	RB
11564.093	41.7	6.8	-2.0	46.5	Average Max	V	107	208	54	-7.5	Pass	RB
17897.796	29.7	8.8	0.5	39.0	Average Max	V	158	218	54	-15.0	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

Test Freq.	5825 MHz	**Engineer**	GMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

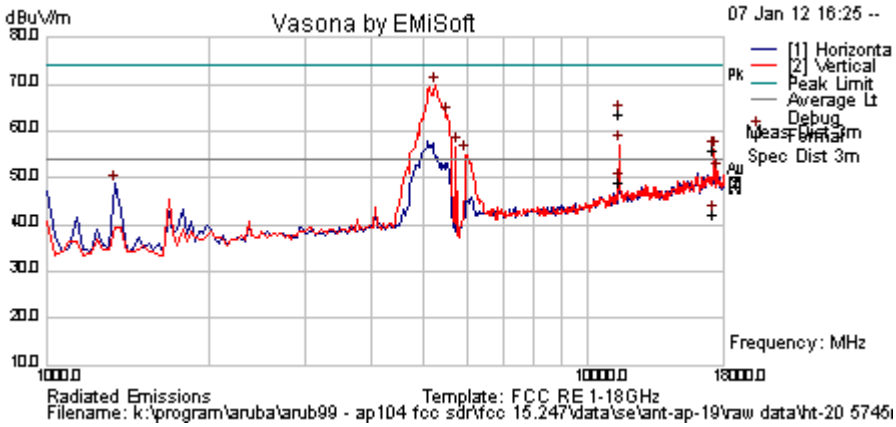


Formally measured emission peaks

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
5190.381	75.6	4.6	-9.9	70.3	Peak [Scan]	V					Pass	BE
6008.016	61.8	4.9	-8.6	58.1	Peak [Scan]	V					Pass	BE
5837.675	57.6	4.8	-9.3	53.2	Peak [Scan]	V						FUND
6246.493	52.4	5.0	-7.6	49.8	Peak [Scan]	V					Pass	NRB
1340.681	60.4	2.3	-13.9	48.8	Peak [Scan]	H					Pass	NRB
11657.155	54.1	6.8	-2.3	58.6	Peak Max	V	98	183	74	-15.4	Pass	RB
18000.000	43.7	8.8	0.7	53.2	Peak Max	V	160	0	74	-20.8	Pass	RB
11657.155	39.6	6.8	-2.3	44.1	Average Max	V	98	183	54	-9.9	Pass	RB
18000.000	30.7	8.8	0.7	40.2	Average Max	V	160	0	54	-13.8	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

Test Freq.	5745 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6 dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

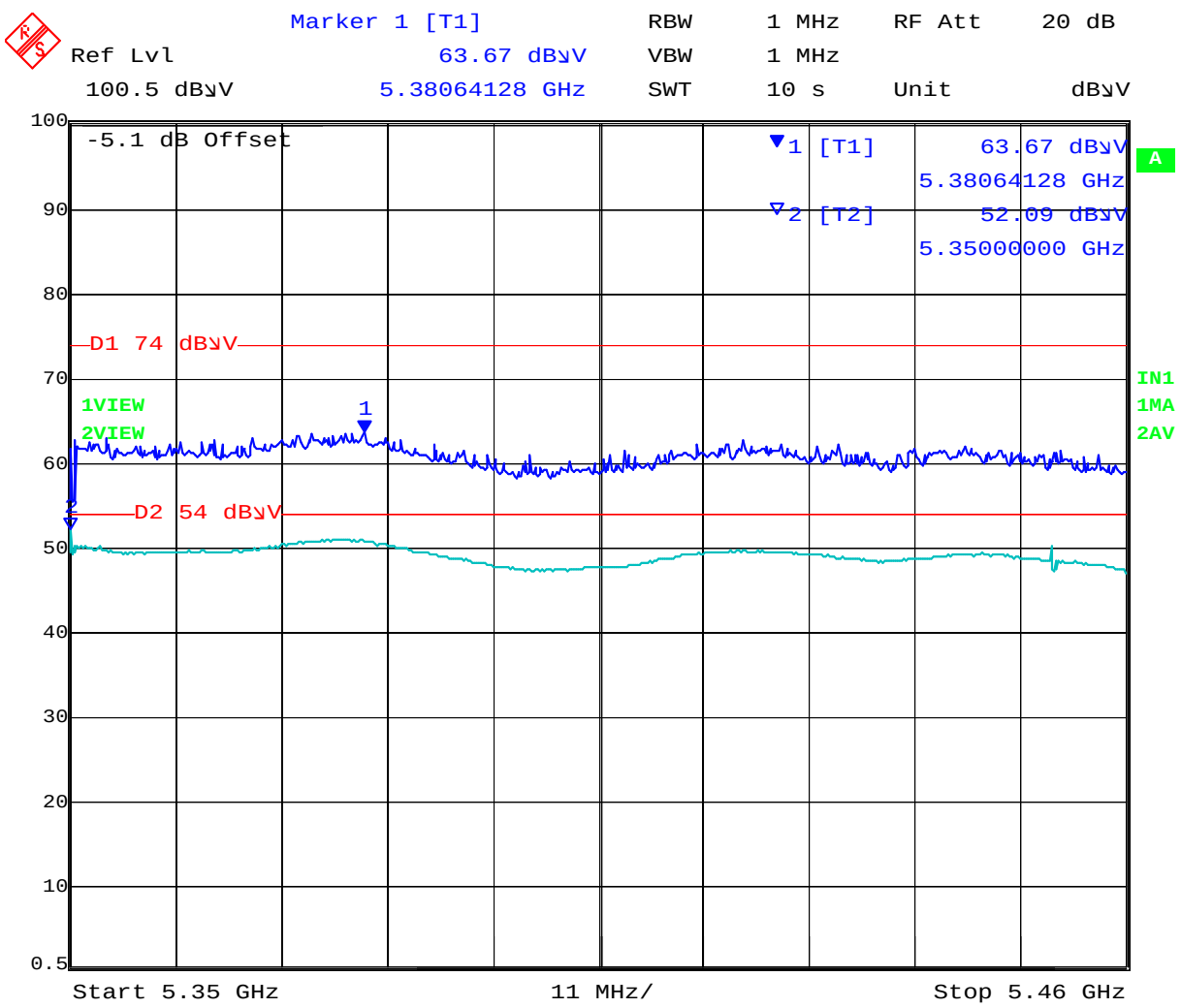


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5258.517	74.8	4.6	-9.7	69.7	Peak [Scan]	V					Pass	BE
5531.062	68.4	4.6	-9.7	63.3	Peak [Scan]	V					Pass	BE
5735.471	61.6	4.8	-9.5	56.8	Peak [Scan]	V						FUND
5973.948	58.8	4.9	-8.7	54.9	Peak [Scan]	V					Pass	BE
1340.681	60.4	2.3	-13.9	48.7	Peak [Scan]	H	100	0	54.0	-5.3	Pass	RB
11484.810	58.9	6.8	-2.0	63.7	Peak Max	V	103	200	74.0	-10.4	Pass	RB
17238.557	46.5	8.6	1.0	56.0	Peak Max	V	101	62	74.0	-18.0	Pass	RB
11484.810	44.2	6.8	-2.0	49.0	Average Max	V	103	200	54.0	-5.0	Pass	RB
17238.557	32.7	8.6	1.0	42.3	Average Max	V	101	62	54.0	-11.7	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

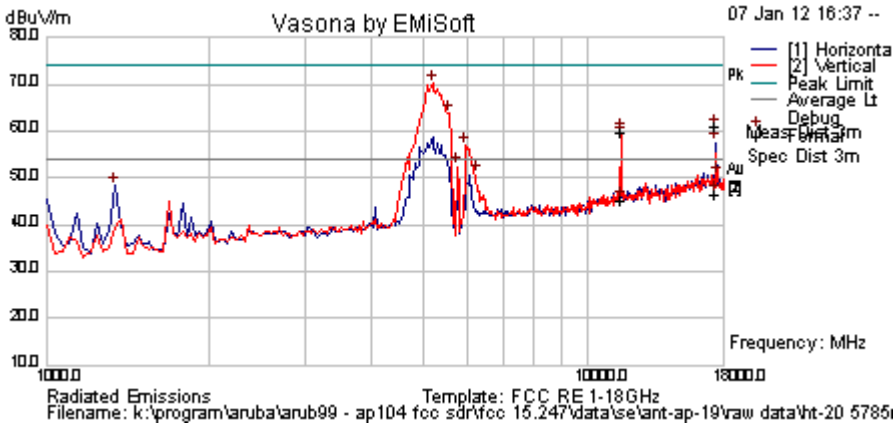
802.11n HT-20 Band-Edge 5350 - 5460 MHz



Date: 25.JAN.2012 18:55:20

Power setting 20

Test Freq.	5785 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6 dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

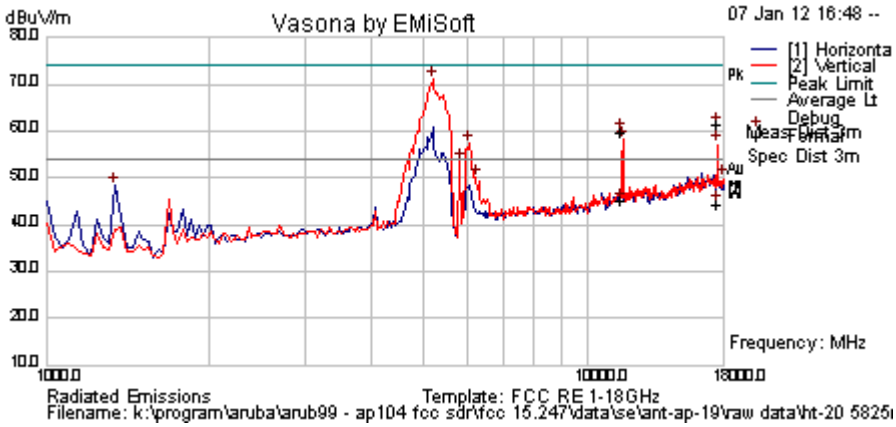


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	75.5	4.6	-9.9	70.3	Peak [Scan]	V					Pass	BE
5565.130	68.9	4.7	-9.7	63.9	Peak [Scan]	V					Pass	BE
5973.948	60.7	4.9	-8.7	56.9	Peak [Scan]	V					Pass	BE
5769.539	57.1	4.8	-9.5	52.4	Peak [Scan]	V						FUND
6246.493	53.3	5.0	-7.6	50.7	Peak [Scan]	V					Pass	BE
17454.910	40.6	8.7	1.2	50.5	Peak [Scan]	V	100	0	54.0	-3.5	Pass	NOISE
1340.681	60.0	2.3	-13.9	48.4	Peak [Scan]	H	100	0	54.0	-5.6	Pass	RB
11564.409	55.0	6.8	-2.0	59.8	Peak Max	V	102	205	74.0	-14.2	Pass	RB
17347.816	50.8	8.7	1.3	60.8	Peak Max	H	100	231	74.0	-13.2	Pass	RB
11564.409	40.4	6.8	-2.0	45.2	Average Max	V	102	205	54.0	-8.8	Pass	RB
17347.816	36.3	8.7	1.3	46.3	Average Max	H	100	231	54.0	-7.7	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

Test Freq.	5825 MHz	**Engineer**	GMH
Variant	802.11n; HT-20; 6.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6 dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

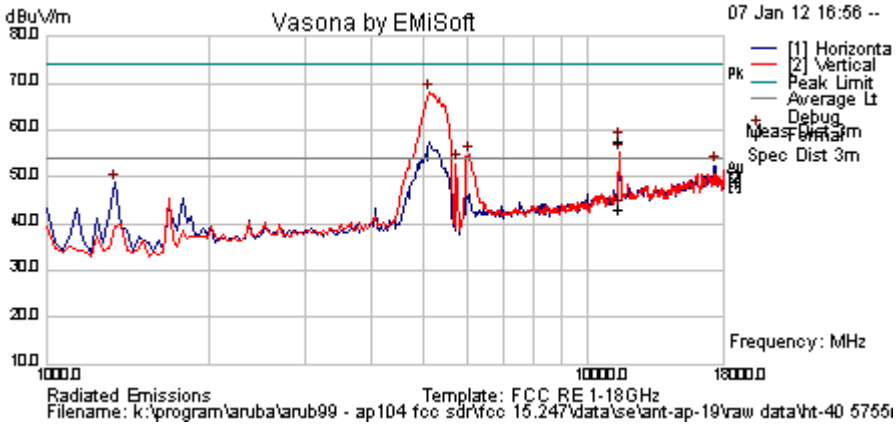


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	76.3	4.6	-9.9	71.0	Peak [Scan]	V					Pass	BE
6076.152	60.9	4.9	-8.4	57.4	Peak [Scan]	V					Pass	BE
5837.675	58.0	4.8	-9.3	53.6	Peak [Scan]	V						FUND
18000.000	40.5	8.8	0.7	50.0	Peak [Scan]	H	100	0	54.0	-4.0	Pass	NOISE
6246.493	52.6	5.0	-7.6	50.0	Peak [Scan]	V	100	0	54.0	-4.0	Pass	BE
1340.681	59.9	2.3	-13.9	48.3	Peak [Scan]	H					Pass	NRB
11646.093	55.3	6.8	-2.3	59.8	Peak Max	V	98	188	74.0	-14.2	Pass	RB
17488.156	51.5	8.8	1.0	61.3	Peak Max	V	105	66	74.0	-12.7	Pass	RB
11646.093	40.4	6.8	-2.3	45.0	Average Max	V	98	188	54.0	-9.0	Pass	RB
17488.156	34.7	8.8	1.0	44.5	Average Max	V	105	66	54.0	-9.5	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

Test Freq.	5755 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6 dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

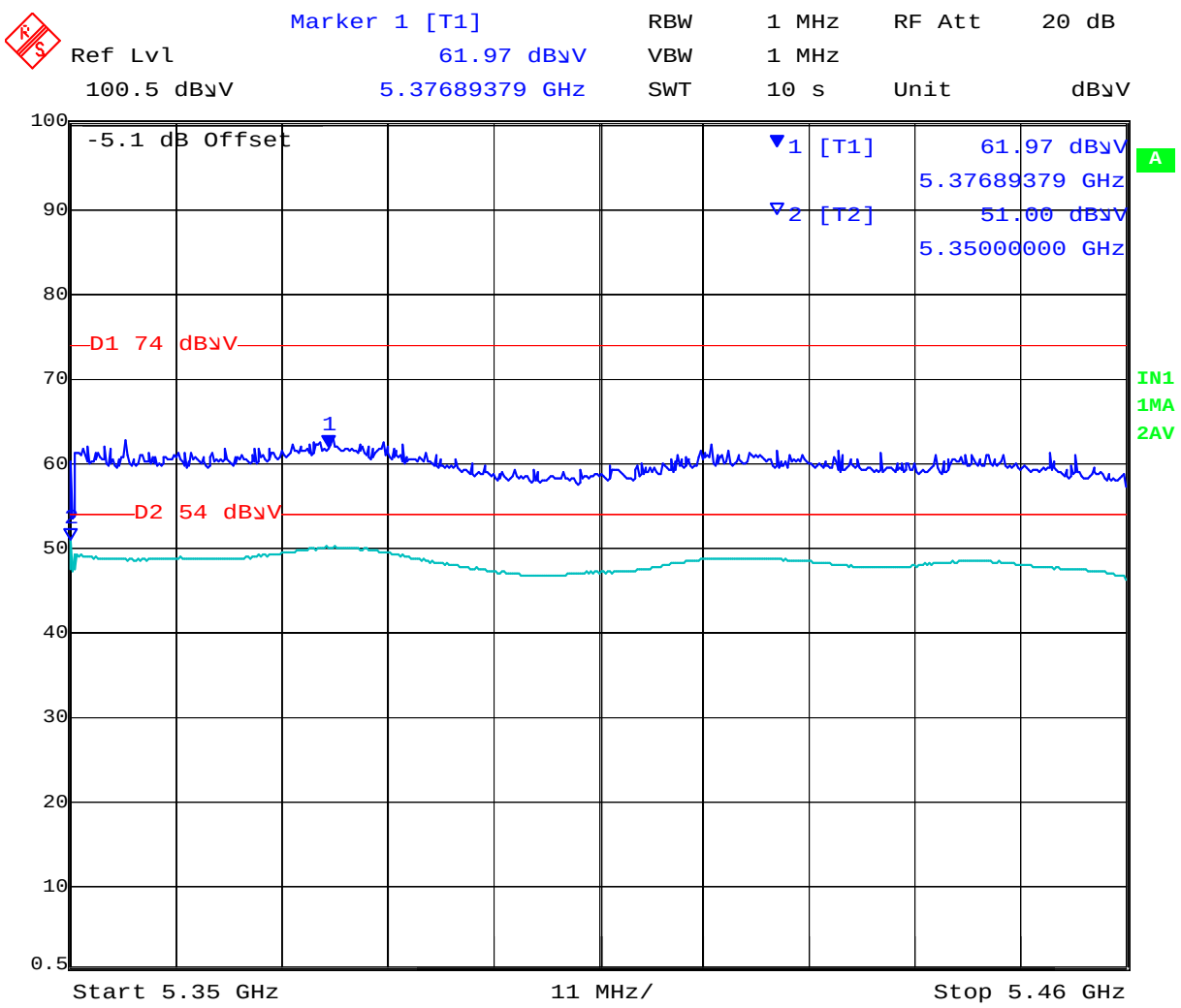


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5122.244	73.3	4.6	-10.0	67.9	Peak [Scan]	V					Pass	BE
6076.152	58.1	4.9	-8.4	54.7	Peak [Scan]	V					Pass	BE
5735.471	57.7	4.8	-9.5	52.9	Peak [Scan]	V						FUND
17284.569	42.7	8.6	1.1	52.4	Peak [Scan]	H	100	0	54	-1.6	Pass	NOISE
1340.681	60.3	2.3	-13.9	48.6	Peak [Scan]	H					Pass	NRB
11506.212	52.9	6.8	-1.9	57.7	Peak Max	V	106	211	74	-16.3	Pass	RB
11506.212	38.1	6.8	-1.9	42.9	Average Max	V	106	211	54	-11.1	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

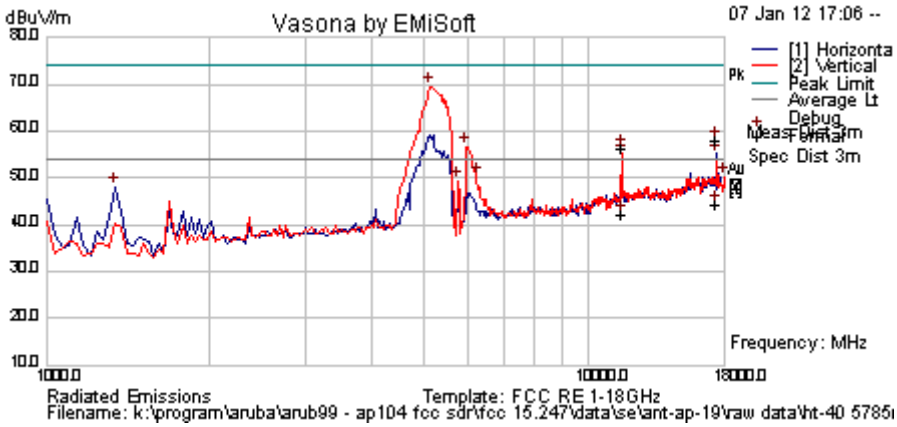
802.11n HT-40 Band-Edge 5350 - 5460 MHz



Date: 25.JAN.2012 19:02:08

Power setting 20

Test Freq.	5795 MHz	**Engineer**	GMH
Variant	802.11n; HT-40; 13.5 MCS	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART=20	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 6 dBi	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5122.244	74.9	4.6	-10.0	69.6	Peak [Scan]	V					Pass	BE
5973.948	60.6	4.9	-8.7	56.8	Peak [Scan]	V					Pass	BE
18000.000	40.8	8.8	0.7	50.4	Peak [Scan]	V	100	0	54.0	-3.6	Pass	NOISE
6246.493	52.9	5.0	-7.6	50.3	Peak [Scan]	V					Pass	BE
5769.539	54.2	4.8	-9.5	49.5	Peak [Scan]	V						FUND
1340.681	59.7	2.3	-13.9	48.1	Peak [Scan]	H					Pass	NRB
17359.278	47.9	8.7	1.4	57.9	Peak Max	H	98	229	74.0	-16.1	Pass	RB
11563.968	51.5	6.8	-2.0	56.3	Peak Max	V	131	206	74.0	-17.7	Pass	RB
17359.278	34.1	8.7	1.4	44.2	Average Max	H	98	229	54.0	-9.8	Pass	RB
11563.968	37.5	6.8	-2.0	42.3	Average Max	V	131	206	54.0	-11.7	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

Specification Limits

FCC §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.

FCC §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)).

IC 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.

IC 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 5th harmonic of the highest frequency generated without exceeding 40 GHz.

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

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

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

§15.209 (a) Limit Matrix

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

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB

Traceability

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

5.1.6.2. Receiver Radiated Spurious Emissions (above 1 GHz)

Industry Canada RSS-Gen §4.10, §6

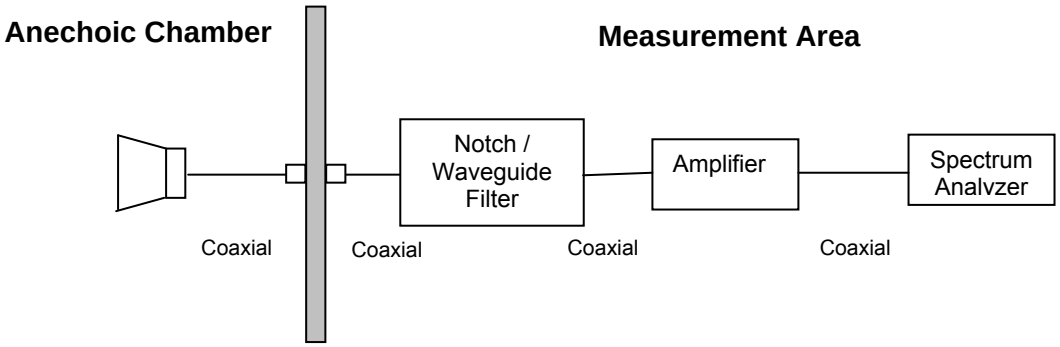
Test Procedure

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.

All Sectors of the EUT were tested simulatneously

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

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

FS = R + AF + CORR - FO

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 dBμV; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3 dBμV/m

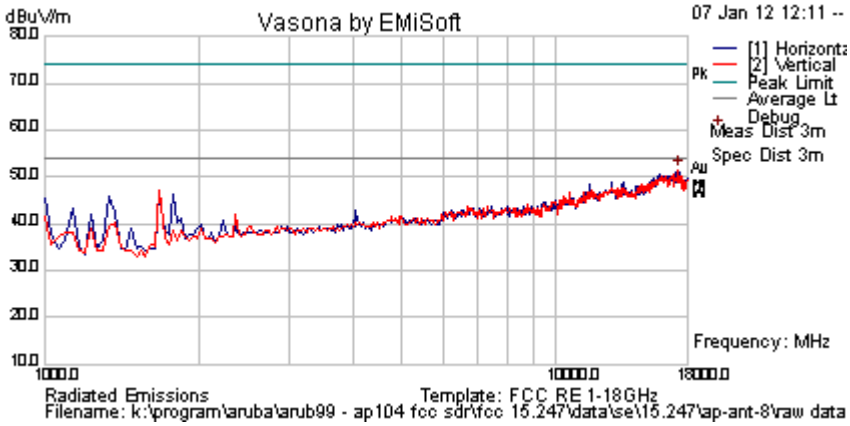
Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

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

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

Receiver Radiated Spurious Emissions above 1 GHz

Test Freq.	2437 MHz	**Engineer**	GMH
Variant	Receive in Test Utility	**Temp (ºC)**	17.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	35
Power Setting	Not Applicable in Receive Mode	**Press. (mBars)**	1010
Antenna	AP-ANT-8, 5dBi		
Test Notes 1			
Test Notes 2			

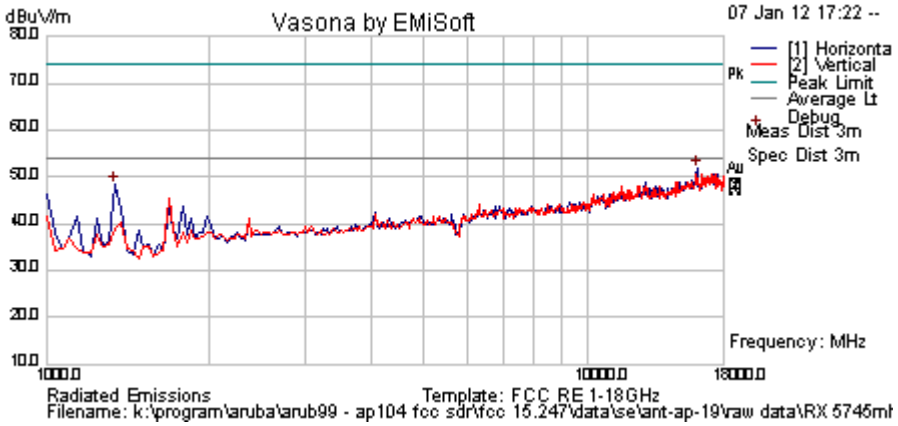


Formally measured emission peaks

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
17318.637	41.6	8.7	1.2	51.5	Peak [Scan]	V	100	0	54	-2.6	Pass	NOISE

Legend:	TRANS = Transient Emission; RB = Restricted Band; NRB = Non-Restricted Band;
	BE = Emission in Restricted Band Nearest Transmission Band Edge; FUND = Fundamental Freq.

Test Freq.	5745 MHz	**Engineer**	GMH
Variant	Receive in Test Utility	**Temp (ºC)**	19.5
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	Not Applicable in Receive Mode	**Press. (mBars)**	1006
Antenna	AP-ANT-19, 7.5 dBi		
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
15989.980	42.7	9.0	0.1	51.8	Peak [Scan]	H	100	0	54	-2.2	Pass	NOISE
1340.681	60.1	2.3	-13.9	48.4	Peak [Scan]	H	100	0	54	-5.6	Pass	NRB

Legend:	TRANS = Transient Emission; RB = Restricted Band; NRB = Non-Restricted Band;
	BE = Emission in Restricted Band Nearest Transmission Band Edge; FUND = Fundamental Freq.

Specification

Receiver Radiated Spurious Emissions

Industry Canada RSS-Gen §4.10,
The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

RSS-Gen §6
The following receiver spurious emission limits shall be complied with;
(a) If a radiated measurement is made, all spurious emissions hall comply with the limits of Table 1.

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

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB

Traceability

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

5.1.6.3. Radiated Spurious Emissions (30M-1 GHz)

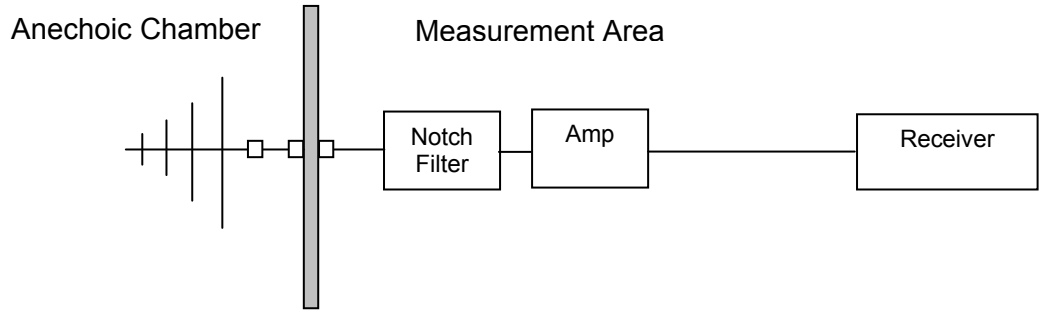
FCC, Part 15 Subpart C §15.205/ §15.209
Industry Canada RSS-210 §2.2

Test Procedure

Testing 30M-1 GHz was performed in a 3-meter anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed. The anechoic chamber test set-up is identified in Section 6 Test Set-Up Photographs.

The EUT had two methods of powering on ac/dc converter and Power over Ethernet (POE). Both modes were tested for emissions below 1GHz.

Test Measurement Set up



Field Strength Calculation

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

$$FS = R + AF + CORR$$

where:

FS = Field Strength
R = Measured Receiver Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain

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

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3dBμV/m

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

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

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

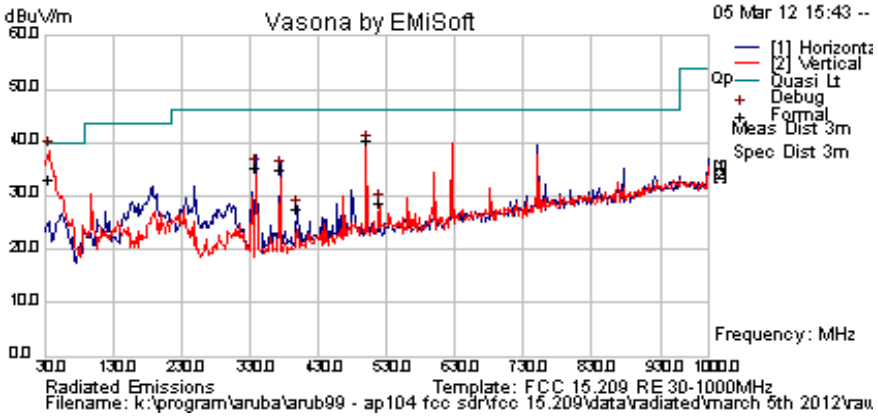
Measurement Results for Spurious Emissions (30 MHz – 1 GHz)

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

TABLE OF RESULTS

12V dc Operation

Test Freq.	Channel 1 (g) + 100+ (HT-40)	**Engineer**	SB
Variant	Digital Emissions	**Temp (ºC)**	21.5
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	33
Power Setting	Beaconing Maximum	**Press. (mBars)**	1000
Antenna	System tested with 2XAP-ANT-18 + 2XAP-ANT-19;		
Test Notes 1	AP105 board in AP104 chassis ; Ferrites changed "R150 & R189";		
Test Notes 2	Gasket on the shielding ;removed ground from shield of RJ45;110vac;15.209 Limits		



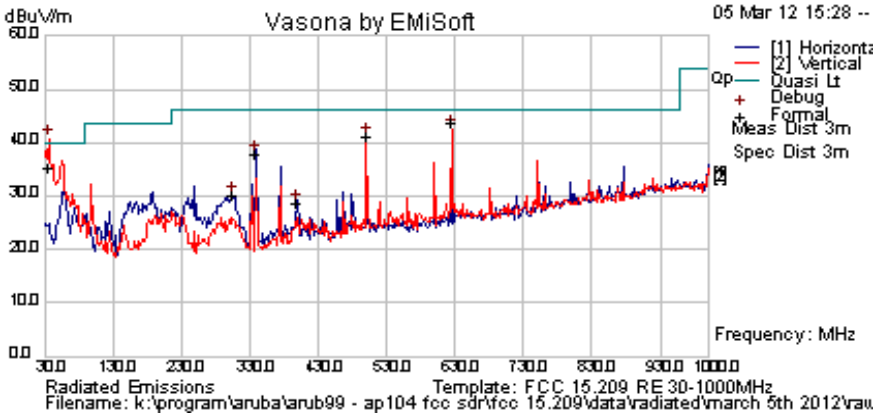
Formally measured emission peaks

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
37.106	44.0	3.5	-14.5	33.0	Quasi Max	V	159	149	40.0	-7.0	Pass	
499.991	46.9	6.0	-12.4	40.4	Quasi Max	V	115	360	46.0	-5.6	Pass	
339.355	45.6	5.4	-15.8	35.2	Peak [Scan]	H	98	360	46.0	-10.8	Pass	
373.860	44.4	5.6	-15.0	35.0	Peak [Scan]	H	98	360	46.0	-11.0	Pass	
519.915	34.7	6.1	-12.2	28.6	Peak [Scan]	V	98	360	46.0	-17.4	Pass	
399.065	36.2	5.7	-14.4	27.5	Peak [Scan]	H	98	360	46.0	-18.5	Pass	

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

TABLE OF RESULTS – POE Power Supply

Test Freq.	Channel 1 (g) + 100+ (HT-40)	**Engineer**	SB
Variant	Digital Emissions	**Temp (°C)**	21.5
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	35
Power Setting	Beaconing Maximum	**Press. (mBars)**	1007
Antenna	System tested with 2XAP-ANT-18 + 2XAP-ANT-19		
Test Notes 1	EUT powered via POE connected to switch; Ferrites changed "R150 & R189";		
Test Notes 2	Gasket on the shielding ;removed ground from shield of RJ45;15.209 Limits		



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
37.242	46.2	3.5	-14.5	35.3	Quasi Max	V	102	161	40	-4.8	Pass	
625.000	47.8	6.5	-10.5	43.7	Quasi Max	V	105	203	46	-2.3	Pass	
500.504	42.0	6.0	-12.4	35.6	Quasi Max	H	103	52	46.0	-10.4	Pass	
339.186	48.2	5.4	-15.8	37.8	Peak [Scan]	H	105	202	46	-8.2	Pass	
304.291	41.4	5.2	-16.6	30.1	Peak [Scan]	H	105	202	46	-15.9	Pass	
399.142	37.6	5.7	-14.4	28.8	Peak [Scan]	H	105	202	46	-17.2	Pass	

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

Specification

Limits

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

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

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

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

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

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB

Traceability

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

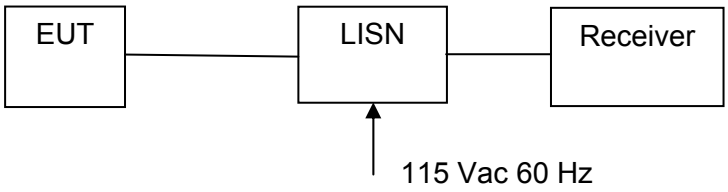
5.1.7. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

FCC, Part 15 Subpart C §15.207
Industry Canada RSS-Gen §7.2.2

Test Procedure

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

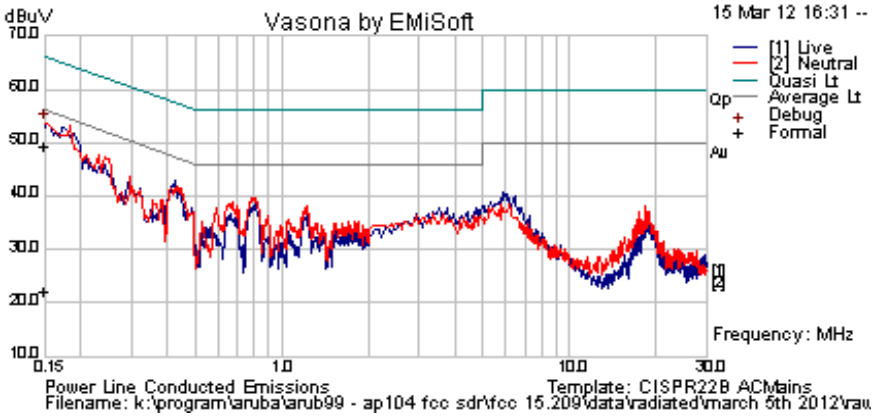
Test Measurement Set up



Measurement set up for AC Wireline Conducted Emissions Test

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

Test Freq.	N/A	**Engineer**	SB
Variant	AC Line Emissions	**Temp (ºC)**	24.5
Freq. Range	0.150 MHz - 30 MHz	**Rel. Hum.(%)**	37
Power Setting	20	**Press. (mBars)**	1004
Antenna	System tested with 2XAP-ANT-18 + 2XAP-ANT-19		
Test Notes 1	AP105 board in AP104 chassis ; Ferrites changed "R150 & R189";		
Test Notes 2	Gasket on the shielding ;removed ground from shield of RJ45;110vac;		



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.150	39.3	9.9	0.1	49.3	Quasi Peak	Neutral	66	-16.7	Pass	
0.150	12.2	9.9	0.1	22.1	Average	Neutral	56	-33.9	Pass	

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

Specification

Limit

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μΩ line impedance stabilization network (LISN), see §15.207 (a) matrix below. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

RSS-Gen §7.2.2
The radio frequency voltage that is conducted back into the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The tighter limit applies at the frequency range boundaries.

§15.207 (a) and **RSS-Gen §7.2.2** Limit Matrix
The lower limit applies at the boundary between frequency ranges

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

Laboratory Measurement Uncertainty for Conducted Emissions

Measurement uncertainty	±2.64 dB

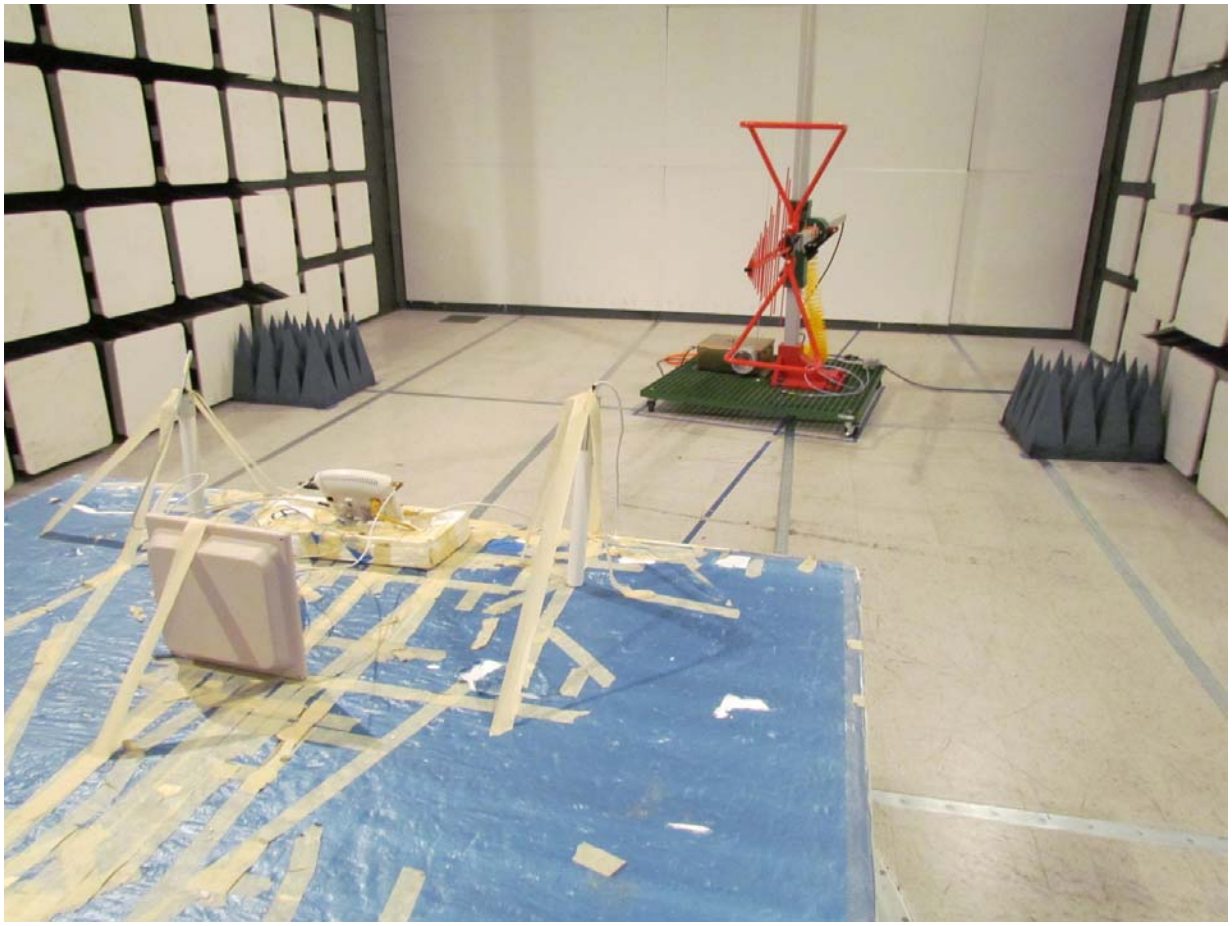
Traceability

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

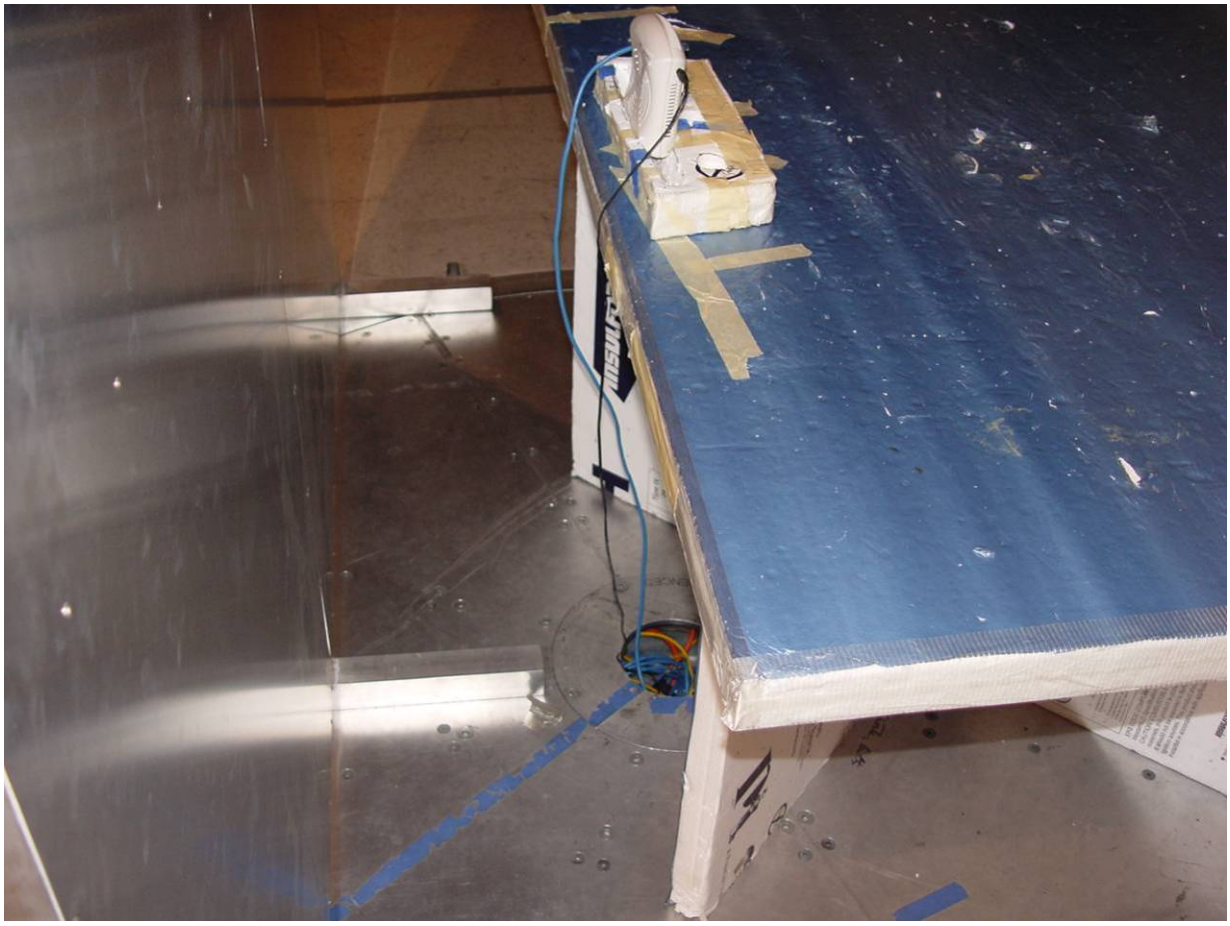
6. PHOTOGRAPHS

6.1. Radiated Emissions > 1GHz

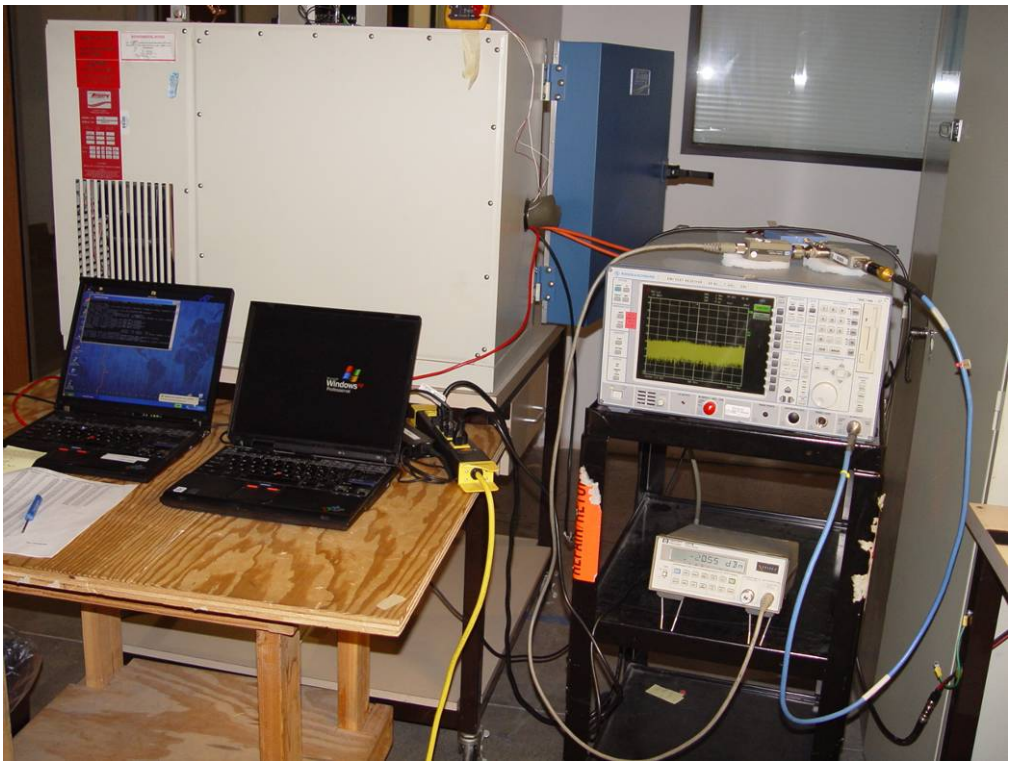
6.2. Radiated Emissions < 1GHz



6.3. AC Wireline Conducted Emissions



6.4. Conducted RF Measurement Test Set-Up



7. TEST EQUIPMENT DETAILS

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

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