

Test of APIN0114, APIN0115 802.11a/b/g/n

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

Test Report Serial No.: ARUB148-U4 Rev A



TEST REPORT

FROM



Test of APIN0114, APIN0115 802.11a/b/g/n

to

To FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: ARUB148-U4 Rev A

Note: this report contains data with regard to the 2400-2483.5 MHz and 5725-5850 MHz operational modes of the Aruba Networks APIN0114 and APIN0115 Wireless Access Point. Test data for the 5,150 - 5,350 and 5,470–5,725 MHz is reported in MiCOM Labs test report ARUB149-U4

This report supersedes: NONE

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

Product Function: Wireless LAN Access Point

Copy No: pdf Issue Date: 2nd August 2013

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.

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TEST CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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To: FCC 47 CFR Part 15.247 & IC RSS-210
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ACCREDITATION, LISTINGS & RECOGNITION

TESTING ACCREDITATION

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



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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	-	US0159 Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	US0159 Listing #: 4143A-2
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	RCB 210
	VCCI	--	--	A-0012
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>



The American Association for Laboratory Accreditation

Accredited Product Certification Body

A2LA has accredited

MICOM LABS

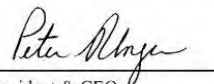
Pleasanton, CA

for technical competence as a

Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC Guide 65:1996 *General requirements for bodies operating product certification systems*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 27th day of March 2012.



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

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

United States of America – Telecommunication Certification Body (TCB)

TCB Identifier – US0159

Industry Canada – Certification Body

CAB Identifier – US0159

Europe – Notified Body

Notified Body Identifier - 2280

Japan – Recognized Certification Body (RCB)

RCB Identifier - 210

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DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	2 nd August 2013	Initial release.

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TEST RESULT CERTIFICATE

Manufacturer:	Aruba Networks 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 LAN Access Point	Telephone:	+1 925 462 0304
Model:	APIN0114 & APIN0115	Fax:	+1 925 462 0306
S/N's:	Engineering Sample		
Test Date(s):	10th April - 20th June 2013	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.

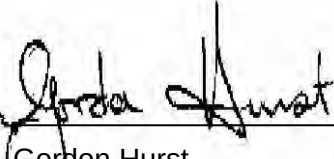
Approved & Released for MiCOM Labs, Inc. by:



TEST CERTIFICATE #2381.01



Graeme Grieve
Quality Manager MiCOM Labs,



Gordon Hurst
President & CEO MiCOM Labs, Inc.

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1. REFERENCES AND MEASUREMENT UNCERTAINTY

1.1. 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 License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment
iii.	FCC OET KDB 662911	4 th 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	July 2012	Reference to A2LA Accreditation Status – A2LA Advertising Policy

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1.2. Test and Uncertainty Procedures

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

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

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

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2. PRODUCT DETAILS AND TEST CONFIGURATIONS

2.1. Technical Details

Details	Description
Purpose:	Test of the APIN0114, APIN0115 802.11a/b/g/n to FCC Part 15.247 and Industry Canada RSS-210 regulations.
Applicant:	Aruba Networks 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:	ARUB148-U4 Rev A
Date EUT received:	10 th April 2013
Standard(s) applied:	FCC 47 CFR Part 15.247 & IC RSS-210
Dates of test (from - to):	10th April - 20th June 2013
No of Units Tested:	One
Type of Equipment:	802.11a/b/g/n Wireless Access Point 3x3 Spatial Multiplexing MIMO configuration
Manufacturers Trade Name:	Wireless Access Point
Model(s):	APIN0114, APIN0115
Location for use:	Indoor only
Declared Frequency Range(s):	2400 - 2483.5 MHz; 5725 - 5850 MHz
Hardware Rev	P2
Software Rev	AOS 6.3.0.0
EUT Modes of Operation:	Legacy 802.11a/b/g, 802.11n HT-20, HT-40
Type of Modulation:	Per 802.11 –CCK, BPSK, QPSK, DSSS, OFDM
Declared Nominal Average Output Power:	802.11b: +23 dBm 802.11g: Leg. +23dBm, HT-20 +23 dBm, HT-40 +23 dBm 802.11a: Leg. +23 dBm, HT-20 +23 dBm, HT-40 +23 dBm
Transmit/Receive Operation:	Time Division Duplex
System Beam Forming:	Device has no capability for antenna beam forming
Rated Input Voltage and Current:	POE 56 Vdc Voltage: 12 Vdc, 1.25 A (ac/dc adapter)
Operating Temperature Range:	Declared range 0° to +50° client declared range
ITU Emission Designator:	802.11b 13M9G1D 802.11g 16M6D1D 802.11n – HT-20 17M8D1D 802.11n – HT-40 36M6D1D 802.11a 17M7D1D
Equipment Dimensions:	170mm x 170mm x 45mm
Weight:	1 kgs
Primary function of equipment:	Wireless Access Point for transmitting data and voice.

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2.2. Scope of Test Program

Aruba Networks APIN0114, APIN0115 Wireless Access Point

The scope of the test program was to test the APIN0114, APIN0115 802.11a/b/g/n, 3x3 Spatial Multiplexing MIMO configurations in the frequency ranges 2400 - 2483.5 MHz and 5725 – 5850 MHz for compliance against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications.

FCC OET KDB Implementation

This test program implements the following FCC KDB – 662911 4/4/2011;

Emissions Testing of Transmitters with Multiple Outputs in the Same Band

The KDB document provides guidance for measurements of conducted output emissions of devices that employ a single transmitter with multiple outputs in the same band, with the outputs occupying the same or overlapping frequency ranges. It applies to EMC compliance measurements on devices that transmit on multiple antennas simultaneously in the same or overlapping frequency ranges through a coordinated process. Examples include, but are not limited to, devices employing beam forming or multiple-input and multiple-output (MIMO.) This guidance applies to both licensed and unlicensed devices wherever the FCC rules call for conducted output measurements. Guidance is provided for in-band, out-of-band and spurious emission measurements.

This guidance does not apply to the multiple transmitters included in a composite device, such as a device that combines an 802.11 modem with a cell phone in one enclosure with each driving its own antenna.

Aruba Networks Inc
APIN0114 External Antenna 802.11 a/b/g/n Wireless Access Point



Aruba Networks Inc
APIN0114, APIN0115 802.11 a/b/g/n Wireless Access Point (Rear)





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

Equipment Type	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	Wireless LAN Access Point	Aruba Networks	APIN0114	Engineering Sample
EUT	Wireless LAN Access Point (Integral Antenna)	Aruba Networks	APIN0115	Engineering Sample
Support	Laptop PC	IBM	Thinkpad	None

2.4. Antenna Details

Model	Type	Gain	Freq. Band	Note
		dBi	MHz	
AP-ANT-1B	Omni	3.8	2400 - 2500	(3x per unit)
		5.8	4900 - 5875	
AP-ANT-13B	Omni	4.4	2400 - 2500	(3x per unit)
		3.3	4900 - 5900	
AP-ANT-16	Omni	3.9	2400 - 2500	(3x per unit)
		4.7	4900 - 5900	
AP-ANT-17	Directional 120degr.	6.0	2400 - 2500	(3x per unit)
		5.0	4900 - 5875	
AP-ANT-18	Directional 60degr.	7.5	2400 - 2500	(3x per unit)
		7.5	5150 - 5875	
AP-ANT-19	Omni	3.0	2400 - 2500	(3 x per unit)
		6.0	5150 - 5875	
AP-ANT-20	Omni	2.0	2400 - 2500	(3 x per unit)
		2.0	5150 - 5875	

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APIN0115 Integrated Antennas

Model	Type	Gain	Freq. Band	Note
		dBi	MHz	
metal sheet	Omni	4.0	2400 - 2500	(3x per band, per unit)
		5.0	4900 - 5875	

2.5. Cabling and I/O Ports

Number and type of I/O ports

1. 2 x 10/100/1000 Ethernet ENET0, ENET1
2. Console - Serial maintenance terminal
3. 12 Vdc, supply connector
4. RF Antenna Connectors (x3) – Reverse SMA (APIN0114 Only)
5. USB

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2.6. 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/ac)	Variant	Data Rate with Highest Power	Frequencies (MHz)
2.4 GHz			
b	Legacy	1 MBit/s	2,412 2,437 2,462
g	Legacy	6 MBit/s	
n	HT-20	6.5 (MCS 0)	
	HT-40	13.5 (MCS 0)	2,422 2,437 2,452
5.8 GHz			
a	Legacy	6 MBit/s	5,745 5,785 5,825
n	HT-20	6.5 (MCS 0)	
	HT-40	13.5 (MCS 0)	5,755 5,795

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report

.



Antenna Test Configurations for Radiated Emissions

Results for the following configurations are provided in this report.

Radiated emissions testing was performed for three different antennas that represent the highest gain for each antenna type intended for use with the EUT;- Integral antenna (As used in APINR109) ; ANT-18 60 degree sector antenna; ANT-19 monopole antenna.

Radiated emissions testing was performed for all possible configurations for antenna ANT-18 which is the highest gain antenna used with the equipment. Radiated emissions testing was performed for the other two antennas in worst case mode (mode with the highest spectral density)

2,400 – 2483.5 MHz

5,725 – 5850 MHz

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

15.247	
802.11a 802.11n HT-20	a SE 5745
	a SE 5785
	a SE 5825
802.11n HT-40	SE 5755
	SE 5795
	BE 5460

KEY;-

SE – Spurious Emission
BE – Band-Edge



2.7. Equipment Modifications

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

1. Section 5.1.1.2 RF Power ReCalibration between Antenna Ports Required

Initial conducted testing was performed on the APIN0114. It was found that a re-calibration of output power was required as the power between ports varied outside the Aruba Networks specification. After recalibration was performed the client requested to increase power on the mid channel i.e. 2437 MHz and 5785 (a, HT-20) / 5795 MHz HT-40.

The two sets of calibration were used to generate this report.

2.8. Deviations from the Test Standard

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

1. NONE

3. TEST EQUIPMENT CONFIGURATION(S)

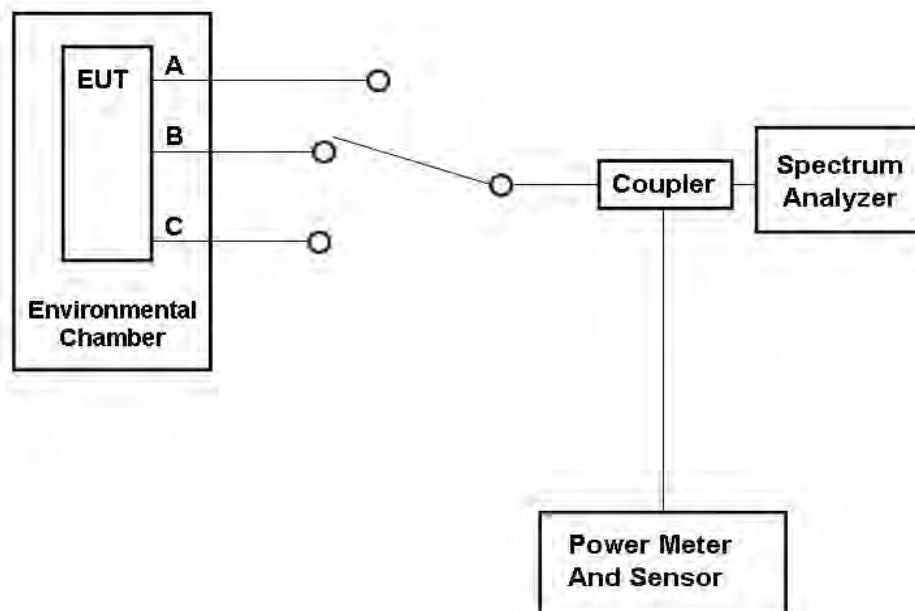
3.1. Conducted RF Emission Test Set-up

The following tests were performed using the conducted test set-up shown in the diagram below.

1. Section 5.1.1.1. 6 dB and 99% Bandwidth
2. Section 5.1.1.2. Peak Output Power
3. Section 5.1.1.3. Power Spectral Density
4. Section 5.1.1.4. Conducted Spurious Emissions

Conducted Test Set-Up Pictorial Representation

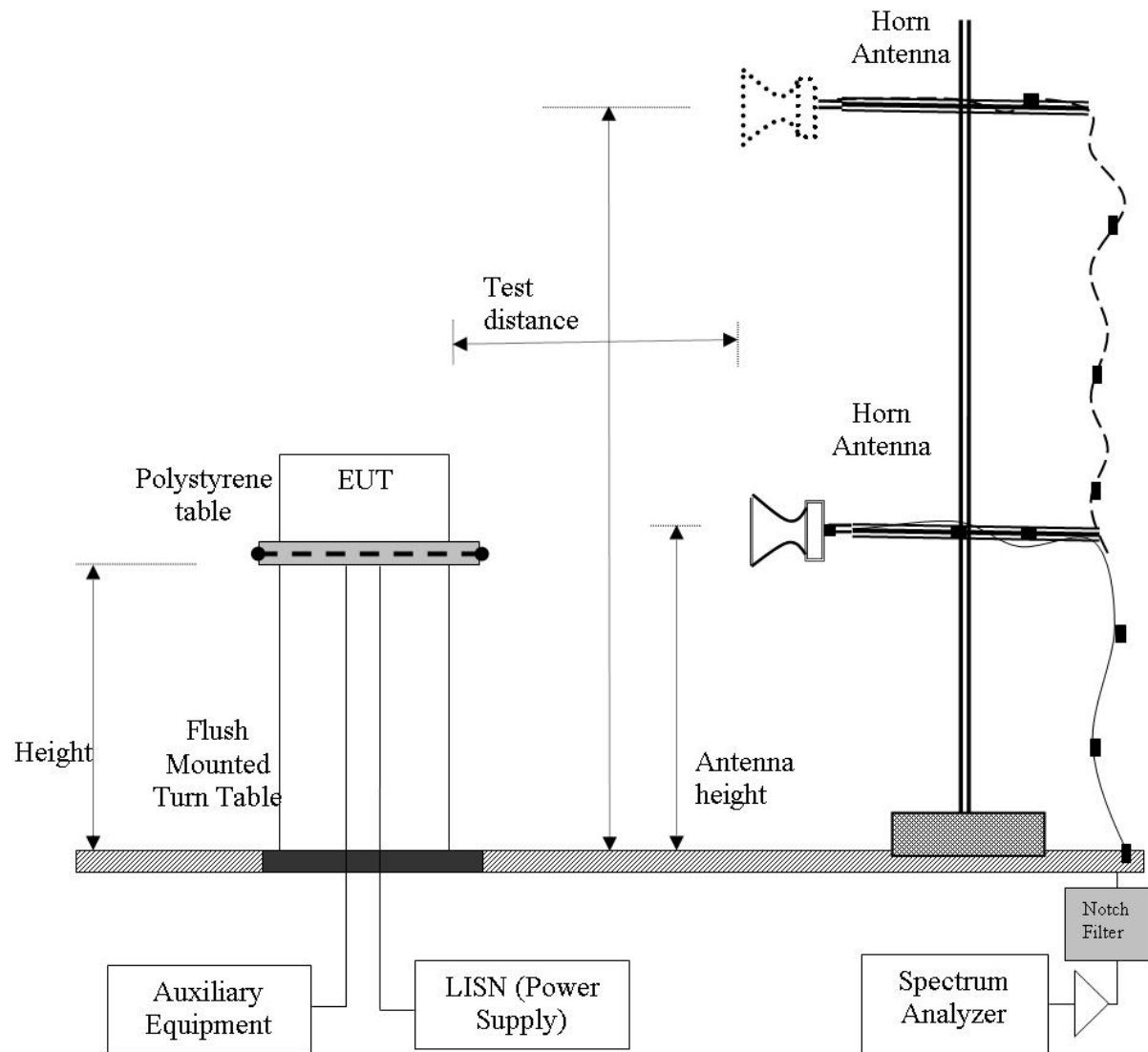
3 - Port Test Configuration



3.2. Radiated Spurious Emission Test Set-up > 1 GHz

The following tests were performed using the conducted test set-up shown in the diagram below.

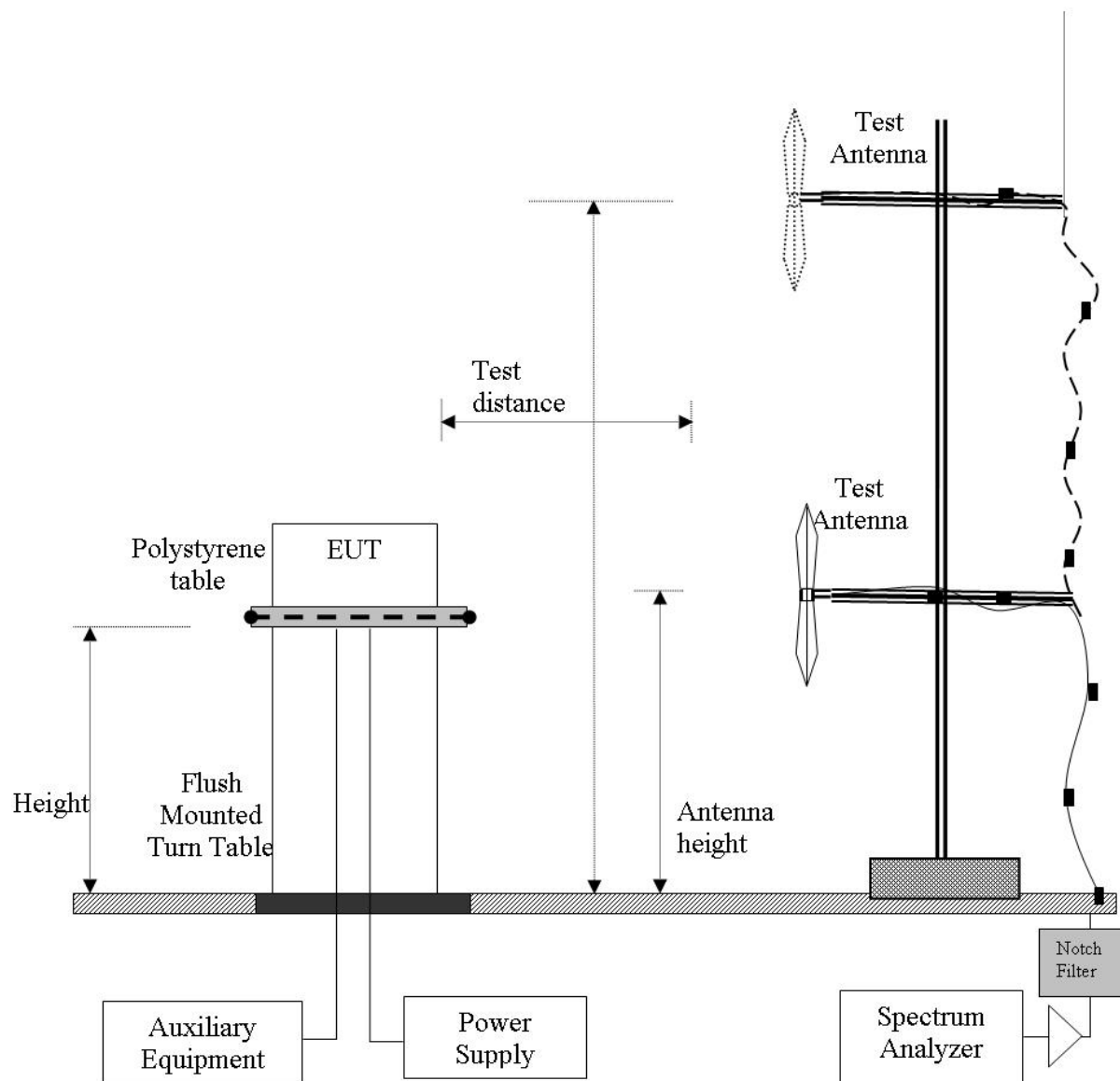
Radiated Emission Measurement Setup – Above 1 GHz



3.3. Digital Emissions Test Set-up (0.03 – 1 GHz)

The following tests were performed using the conducted test set-up shown in the diagram below.

Digital Emission Measurement Setup – Below 1 GHz

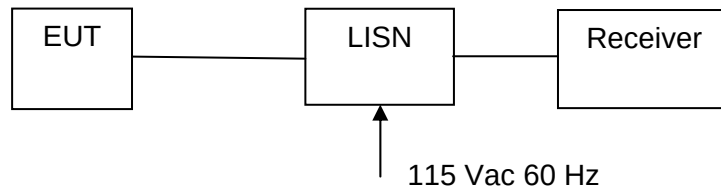


3.4. ac Wireline Emission Test Set-up

The following tests were performed using the conducted test set-up shown in the diagram below.

1. Section 5.1.3 ac Wireline Conducted Emissions

Conducted Test Set-Up Pictorial Representation





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4. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247** 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	5.1.1.1
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	5.1.1.2
15.247(e) A8.2	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	5.1.1.3
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	5.1.1.4

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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	5.1.2
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	
	Radiated Band Edge	Band-edge results Peak Emissions		Complies	
15.205 / 15.209 2.2	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz)	Radiated	Complies	5.1.2.4
15.207 7.2.2	AC Wireline Conducted Emissions 150 kHz– 30 MHz	Conducted Emissions	Conducted	Complies	5.1.3

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

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5. TEST RESULTS

5.1. Device Characteristics

5.1.1. Conducted Testing

5.1.1.1. 6 dB and 99 % Bandwidth

Conducted Test Conditions for 6 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	6 dB and 99 % Bandwidth	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (a)(2)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.1 Emission Bandwidth		
Test Procedure for 6 dB and 99% Bandwidth Measurement The bandwidth at 6 dB and 99 % was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.			

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11b	Duty Cycle (%):	100
Data Rate:	1 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	CCK	Beam Forming Gain (Y):	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
2412.0	6.172	6.253	6.172	--	6.253	6.172	≥500.0	-5.67
2437.0	6.172	6.172	6.172	--	6.172	6.172	≥500.0	-5.67
2462.0	6.172	6.172	6.172	--	6.172	6.172	≥500.0	-5.67

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
2412.0	10.661	10.421	10.421	--	10.661		
2437.0	10.581	10.822	10.982	--	10.982		
2462.0	10.421	10.341	10.341	--	10.421		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11g	Duty Cycle (%):	100
Data Rate:	6 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
2412.0	16.433	16.433	16.513	--	16.513	16.433	≥500.0	-15.93
2437.0	16.593	16.513	16.513	--	16.593	16.513	≥500.0	-16.01
2462.0	16.513	16.513	16.593	--	16.593	16.513	≥500.0	-16.01

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c		d	
2412.0	16.513	16.593	16.593	--	16.593		
2437.0	16.914	17.234	17.154	--	17.234		
2462.0	16.513	16.593	16.593	--	16.593		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
2412.0	17.715	17.715	17.475	--	17.715	17.475	≥500.0	-16.98
2437.0	17.715	17.715	17.715	--	17.715	17.715	≥500.0	-17.22
2462.0	17.715	17.715	17.715	--	17.715	17.715	≥500.0	-17.22

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
	MHz	a	b	c		d	
2412.0	17.796	17.796	17.796	--	17.796		
2437.0	18.036	18.437	18.517	--	18.517		
2462.0	17.715	17.715	17.876	--	17.876		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
2422.0	36.874	36.713	36.713	--	36.874	36.713	≥500.0	-36.21
2437.0	35.752	36.393	36.393	--	36.393	35.752	≥500.0	-35.25
2452.0	36.713	36.874	36.874	--	36.874	36.713	≥500.0	-36.21

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
2422.0	36.393	36.393	36.393	--	36.393		
2437.0	36.393	36.713	37.355	--	37.355		
2452.0	36.393	36.393	36.232	--	36.393		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11a	Duty Cycle (%):	100
Data Rate:	6 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
5745.0	16.673	16.673	16.593	--	16.673	16.593	≥500.0	-16.09
5785.0	16.513	15.872	16.513	--	16.513	15.872	≥500.0	-15.37
5825.0	16.673	16.673	16.593	--	16.673	16.593	≥500.0	-16.09

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
5745.0	17.796	16.673	16.513	--	17.796		
5785.0	24.369	25.010	32.224	--	32.224		
5825.0	18.517	16.673	16.593	--	18.517		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
5745.0	17.876	17.796	17.796	--	17.876	17.796	≥500.0	-17.30
5785.0	17.395	16.754	17.395	--	17.395	16.754	≥500.0	-16.25
5825.0	17.796	17.796	17.796	--	17.796	17.796	≥500.0	-17.30

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
5745.0	19.880	17.796	17.715	--	19.880		
5785.0	28.457	29.018	33.828	--	33.828		
5825.0	19.399	17.796	17.876	--	19.399		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	KHz	MHz
MHz	a	b	c	d				
5755.0	36.713	36.713	36.713	--	36.713	36.713	≥500.0	-36.21
5795.0	35.912	36.713	36.072	--	36.713	35.912	≥500.0	-35.41

Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)		
	Port(s)						
MHz	a	b	c	d			
5755.0	37.675	36.393	36.232	--	37.675		
5795.0	50.982	44.409	39.599	--	50.982		

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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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.

Traceability

Test Equipment Used
0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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5.1.1.2. Peak Output Power

Conducted Test Conditions for Fundamental Emission Output Power			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Emission Output Power	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (a)(2)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.2 Fundamental Emission Output Power KDB 662911 was implemented for In-band power measurements. The measure and sum technique was implemented in all cases.		

Test Procedure for Fundamental Emission Output Power Measurement

Selection of the detector type is determined by the client, either a peak detector or average power detector can be selected however the same detector type **must** be used for each of the following tests;

- A). Output Power
- B).. Power Density
- C).. Conducted Spurious Emissions

Average Power

To measure average power a power meter measuring average power is implemented

Peak Detector

To measure peak power a spectrum analyser is used with the peak detector selected. The transmitter terminal of EUT was connected to the input of the spectrum analyser. The resolution filter bandwidth was set for 6 dB and the analyzers built-in power function used to integrate peak power over the EUT's 20 dB bandwidth.

Supporting Information

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

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

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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.

Uncorrelated Operation

2.4 GHz Uncorrelated Operation (MIMO)

Antenna	Gain	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP
(dB)	(dBi)	Uncorrelated	Max. Power Per Chain	(dBm)
Integral	+3.0	+30.0	+25.23	+33.0

5.8 GHz Uncorrelated Operation (MIMO)

Antenna	Gain	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP
(dB)	(dBi)	Uncorrelated	Max. Power Per Chain	(dBm)
Integral	+3.3	+30.0	+25.23	+33.3

Correlated Operation

2.4 GHz Correlated Operation (Non-MIMO i.e. 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	Σ (dBm)	(dBm)
Integral	3.0	3	4.77	7.77	+28.23	+36.0

5.8 GHz Correlated Operation (Non-MIMO i.e. 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	Σ (dBm)	(dBm)
Integral	3.3	3	4.77	8.07	+27.93	+36.0



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Equipment Configuration for Average Output Power

Variant:	802.11b	Duty Cycle (%):	100
Data Rate:	1 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	CCK	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
2412.0	17.60	17.94	16.86	--	22.26	30.00	-7.74	15.00
2437.0	22.27	22.85	22.33	--	27.26	30.00	-2.74	23.00
2462.0	17.61	19.14	17.89	--	23.04	30.00	-6.96	19.00

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

Equipment Configuration for Average Output Power

Variant:	802.11g	Duty Cycle (%):	100
Data Rate:	6 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
2412.0	17.55	18.65	17.73	--	22.78	30.00	-7.22	17.50
2437.0	22.11	22.84	22.17	--	27.16	30.00	-2.84	22.50
2462.0	17.26	18.50	17.44	--	22.54	30.00	-7.46	17.50

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

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Equipment Configuration for Average Output Power

Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
2412.0	18.13	19.29	18.29	--	23.37	30.00	-6.63	16.00
2437.0	22.58	23.28	22.63	--	27.61	30.00	-2.39	23.00
2462.0	18.10	19.37	18.19	--	23.36	30.00	-6.64	15.50

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

Equipment Configuration for Average Output Power

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
2422.0	18.28	19.16	18.04	--	23.29	30.00	-6.71	15.50
2437.0	22.29	23.23	22.90	--	27.60	30.00	-2.40	23.00
2452.0	17.88	18.54	18.03	--	22.93	30.00	-7.07	15.50

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

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Equipment Configuration for Average Output Power

Variant:	802.11a	Duty Cycle (%):	100
Data Rate:	6.0 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
5745.0	17.45	18.77	18.63	--	23.09	30.00	-6.91	17.00
5785.0	22.15	23.08	20.82	--	26.88	30.00	-3.12	24.50
5825.0	17.41	18.08	17.98	--	22.60	30.00	-7.40	18.00

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

Equipment Configuration for Average Output Power

Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
5745.0	17.81	19.34	19.10	--	23.57	30.00	-6.43	17.00
5785.0	22.42	23.51	20.40	--	27.06	30.00	-2.94	26.00
5825.0	17.46	18.23	17.99	--	22.68	30.00	-7.32	18.00

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

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Equipment Configuration for Average Output Power

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	0 dBi
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
5755.0	17.74	19.25	18.44	--	23.29	30.00	-6.71	17.50
5795.0	21.75	22.14	21.00	--	26.43	30.00	-3.57	22.00

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	± 1.33 dB

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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.

Traceability

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

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5.1.1.3. Power Spectral Density

Conducted Test Conditions for Power Spectral Density			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Power Spectral Density	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (e)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.3 Maximum Power Spectral Density Level in the Emission Bandwidth		
Test Procedure for Power Spectral Density The transmitter output was connected to a spectrum analyzer and the maximum spectral emission was measured in a 30 kHz bandwidth for each antenna chain. Sweep time was auto selected by the analyzer which was set for max hold. Once the maximum emission was found the emission(s) were summed for each chain. As the FCC limit is provided for a 3 kHz resolution bandwidth the measured data required to be converted. Spectral Density Conversion Factor $10 * \text{Log} (3 \text{ kHz} / \text{measurement bandwidth}) = 10 * \text{Log} (3/30) = -10\text{dB}$ Detector Selection Selection of the analyzer detector is determined by the client, however the same detector type must be used for each of the following tests; A). Output Power B).. Power Density C).. Conducted Spurious Emissions Supporting Information Calculated Power = A + 10 log (1/x) dBm A = Total Power Spectral Density [10 Log10 (10 ^{a/10} + 10 ^{b/10} + 10 ^{c/10} + 10 ^{d/10})] x = Duty Cycle Limit Line: KDB 662911 was implemented for In-band power spectral density (PSD) measurements - Option (2) measure and subtract 10 log (N) dB from the limit for devices with multiple RF ports.			

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Equipment Configuration for Power Spectral Density - Average

Variant:	802.11b	Duty Cycle (%):	tx99
Data Rate:	1 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	CCK	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
2412.0	1.358	1.458	0.700	--	5.956	-4.044	8.00	-12.05
2437.0	4.733	5.358	4.890	--	9.773	-0.227	8.00	-8.23
2462.0	-0.059	0.759	0.236	--	5.096	-4.904	8.00	-12.90

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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Equipment Configuration for Power Spectral Density - Average

Variant:	802.11g	Duty Cycle (%):	tx99
Data Rate:	6 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
2412.0	-3.200	-1.725	-3.252	--	2.105	-7.895	8.00	-15.90
2437.0	1.046	1.076	0.008	--	5.509	-4.491	8.00	-12.49
2462.0	-3.638	-2.343	-3.323	--	1.706	-8.294	8.00	-16.30

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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Equipment Configuration for Power Spectral Density - Average

Variant:	802.11n HT-20	Duty Cycle (%):	tx99
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
2412.0	-3.271	-2.110	-3.591	--	1.828	-8.172	8.00	-16.17
2437.0	0.390	1.316	0.333	--	5.475	-4.525	8.00	-12.53
2462.0	-3.729	-2.438	-4.014	--	1.433	-8.567	8.00	-16.57

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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Equipment Configuration for Power Spectral Density - Average

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
2422.0	-7.875	-7.495	-8.613	--	-3.199	-13.199	8.00	-21.20
2437.0	-3.713	-2.936	-2.648	--	1.695	-8.305	8.00	-16.31
2452.0	-8.462	-7.984	-8.049	--	-3.389	-13.389	8.00	-21.39

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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Equipment Configuration for Power Spectral Density - Average

Variant:	802.11a	Duty Cycle (%):	100
Data Rate:	6.0 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
5745.0	-4.076	-2.871	-2.914	--	1.519	-8.481	12.77	-21.25
5785.0	-0.408	0.621	-1.219	--	4.501	-5.499	8.00	-13.50
5825.0	-4.339	-3.151	-3.713	--	1.064	-8.936	12.77	-21.71

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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Equipment Configuration for Power Spectral Density - Average

Variant:	802.11n HT-20	Duty Cycle (%):	tx99
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
5745.0	-4.238	-1.890	-2.683	--	1.940	-8.060	12.77	-20.83
5785.0	0.943	1.126	-1.622	--	5.088	-4.912	8.00	-12.91
5825.0	-4.088	-3.584	-3.709	--	0.983	-9.017	12.77	-21.79

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
5755.0	-7.991	-6.708	-7.844		-2.704	-12.704	12.77	-25.48
5795.0	-4.242	-5.407	-5.630		-0.278	-10.278	12.77	-23.05

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	± 2.81 dB

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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.

Traceability

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

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5.1.1.4. Conducted Spurious Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Max Unwanted Emission Levels	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (d)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.4 Maximum Unwanted Emission Levels		
Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement Transmitter Conducted Spurious and Band-Edge emissions were measured with a spectrum analyzer connected to the antenna terminal using one of the following limits; 1).. Peak Detector - 20 dB below the highest in-band spectral density (i.e. 20 dBc) 2).. Average Detector – 30 dB below the highest in-band spectral density (i.e. 30 dBc) Selection of the analyzer detector is determined by the client, however the same detector type must be used for each of the following tests; A). Output Power B).. Power Density C).. Conducted Spurious Emissions Measurements were made while EUT was operating in transmit mode of operation at the appropriate centre frequency closest to the band-edge. Emissions were maximized during the measurement and limits derived from the peak spectral power and drawn on each plot.			

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11b	Duty Cycle (%):	100
Data Rate:	1 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	CCK	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2412.0	30 - 26000	-63.286	-46.58	-62.643	-45.45	-63.286	-46.24		
2437.0	30 - 26000	-63.286	-42.05	-62.643	-41.59	-63.286	-41.80		
2462.0	30 - 26000	-63.286	-47.32	-62.643	-46.10	-63.286	-46.89		
SE - Maximum spurious emission found									

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
2412.0	2400.0	-51.344	-28.33	-45.322	-27.04	-49.090	-27.90		
2462.0	2483.5	-68.745	-28.92	-58.702	-27.65	-59.102	-28.83		
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11g	Duty Cycle (%):	100
Data Rate:	6 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2412.0	30 - 26000	-63.286	-44.61	-62.643	-43.37	-63.286	-44.46		
2437.0	30 - 26000	-63.286	-39.59	-62.643	-39.00	-63.286	-39.67		
2462.0	30 - 26000	-63.286	-43.85	-62.643	-42.61	-63.286	-43.68		
SE - Maximum spurious emission found									

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
2412.0	2400.0	-35.311	-32.97	-32.538	-31.55	-33.917	-32.84		
2462.0	2483.5	-52.486	-33.05	-48.245	-31.55	-52.386	-32.55		
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2412.0	30 - 26000	-63.286	-44.41	-62.643	-43.00	-63.286	-44.11		
2437.0	30 - 26000	-63.286	-38.98	-62.643	-38.29	-63.286	-38.83		
2462.0	30 - 26000	-63.286	-43.61	-62.643	-42.24	-63.286	-43.48		

SE - Maximum spurious emission found

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
2412.0	2400.0	-33.727	-32.45	-32.327	-32.25	-33.010	-32.68		
2462.0	2483.5	-52.486	-32.83	-46.661	-31.91	-51.144	-32.79		

BE - Maximum band-edge emission found

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2422.0	30 - 26000	-63.286	-44.71	-62.643	-43.92	-62.643	-45.17		
2437.0	30 - 26000	-63.286	-36.76	-62.643	-35.83	-63.286	-36.07		
2452.0	30 - 26000	-63.286	-40.75	-62.643	-40.07	-63.286	-40.61		
SE - Maximum spurious emission found									

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
2422.0	2400.0	-38.779	-36.40*	-37.119	-36.40*	-38.859	-36.40*		
2452.0	2483.5	-49.190	-36.40*	-48.245	-36.40	-50.056	-36.40*		
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

*NOTE: Per communications with the FCC the band-edge limit was modified to take into account the highest -30 dBc limit on a chain by chain basis. In this case the highest limit was provided by Channel 2452 MHz Port b, @ -36.40 dBm. Band-edge limits were increased to -36.40 dBm for all chains. EUT complies

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11a	Duty Cycle (%):	100
Data Rate:	6 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
5745.0	30 - 26000	-59.121	-47.73	-57.961	-47.01	-57.607	-47.26		
5785.0	30 - 26000	-58.331	-39.48	-55.462	-39.05	-59.121	-40.37		
5825.0	30 - 26000	-59.121	-44.03	-58.717	-43.82	-58.331	-43.84		

SE - Maximum spurious emission found

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
5745.0	5725.0	-39.901	-33.19	-45.956	-32.01	-45.345	-32.28		
5825.0	5850.0	-48.243	-33.63	-53.663	-32.96	-50.537	-32.78		

BE - Maximum band-edge emission found

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
5745.0	30 - 26000	-59.121	-48.13	-58.717	-47.04	-58.331	-47.44		
5785.0	30 - 26000	-58.331	-39.54	-55.462	-38.83	-58.717	-40.62		
5825.0	30 - 26000	-59.121	-43.80	-58.717	-43.41	-57.961	-43.56		

SE - Maximum spurious emission found

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
5745.0	5725.0	-36.780	-33.16	-42.266	-31.75	-43.407	-31.96		
5825.0	5850.0	-47.083	-33.64	-51.480	-32.86	-50.537	-32.92		

BE - Maximum band-edge emission found

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	802.11n HT-40	Duty Cycle (%):	100%
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	Not Applicable
Modulation:	OFDM	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
5755.0	30 - 26000	-59.121	-42.15	-57.961	-41.04	-57.607	-41.86		
5795.0	30 - 26000	-59.121	-46.22	-58.331	-45.07	-57.607	-45.82		
SE - Maximum spurious emission found									

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
5755.0	5725.0	-34.323	-33.70*	-40.923	-35.19	-42.322	-35.85		
5795.0	5850.0	-43.561	-33.70	-44.445	-33.98	-45.690	-34.41		
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	≤40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

*NOTE: Per discussion with the FCC the limit for Band-Edge 5755 MHz Port a can be increased to the highest limit found in the frequency band. In this case the limit for 5795 MHz Band-Edge Port a at -33.70 dBm was used.

The EUT complies.

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Specification

Limits Band-Edge

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

§15.247(d) 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.

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5.1.2. Radiated Emission Testing

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

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

Industry Canada RSS-210 §A8.5, §2.2, §2.6

Industry Canada RSS-Gen §4.7

Test Procedure

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

Field Strength Calculation

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

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

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

For example:

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

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

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

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

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

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

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

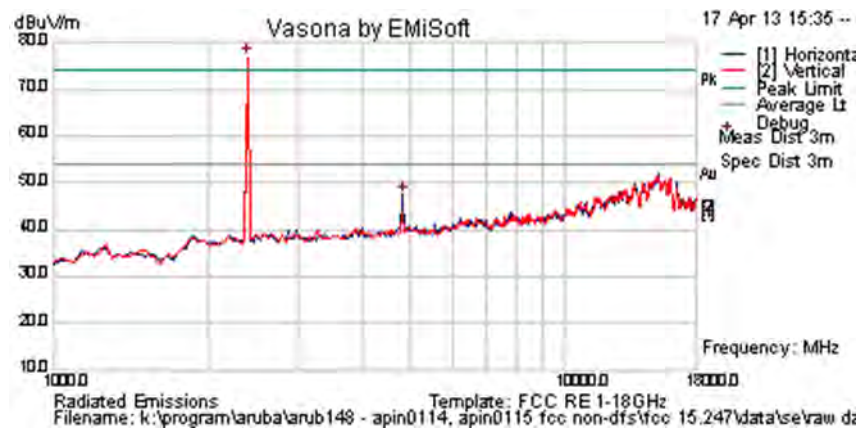
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5.1.2.1. Integral antenna – Spurious Emissions

Test Freq.	2412 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

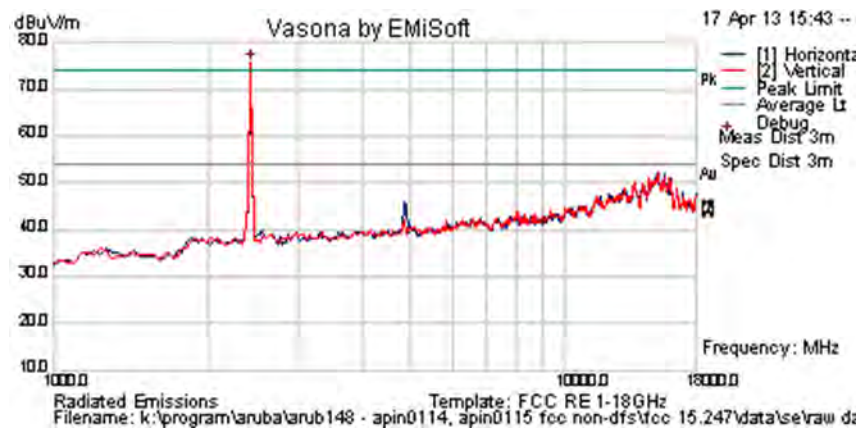
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2396.794	85.4	3.2	-11.7	76.9	Peak [Scan]	V						FUND
4814.404	52.5	4.6	-9.7	47.5	Peak [Scan]	V	98	360	54.0	-6.5	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

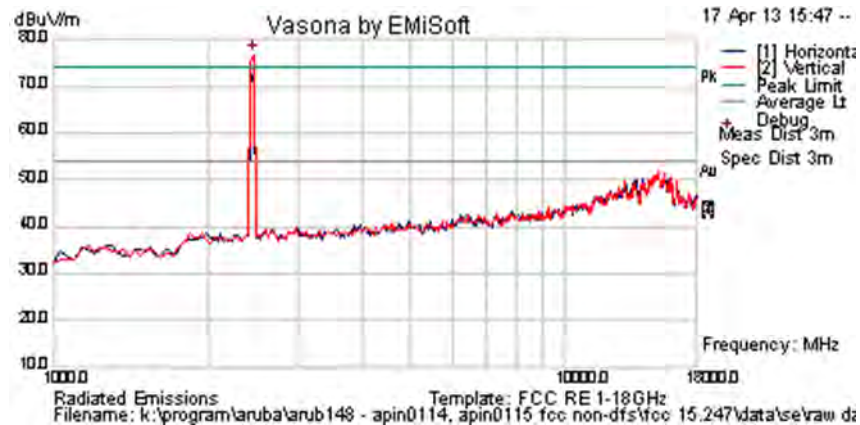
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2430.862	84.0	3.2	-11.6	75.7	Peak [Scan]	V						FUND
4845.948	50.5	4.6	-9.7	45.4	Peak [Scan]	V	98	361	54.0	-8.6	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

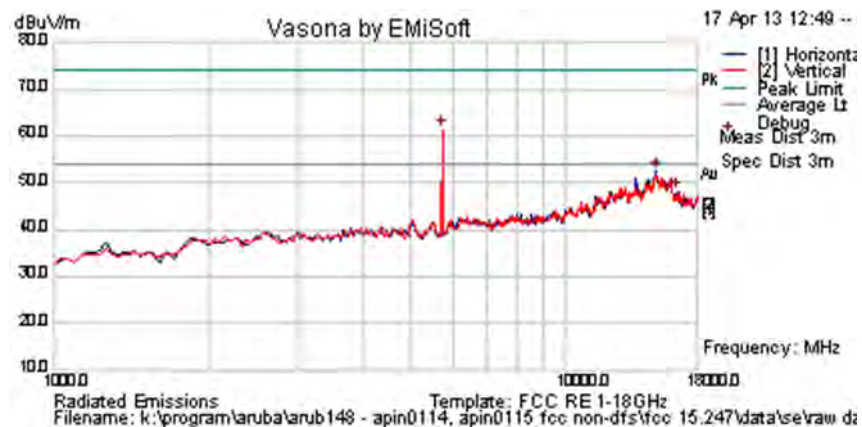
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2464.930	85.1	3.2	-11.5	76.8	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5745 MHz	Engineer	JMH
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	Integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

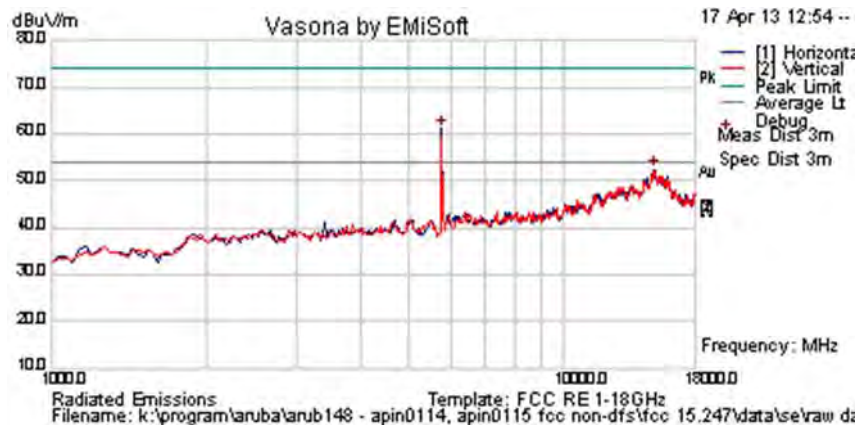
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	65.9	5.0	-9.5	61.3	Peak [Scan]	V						FUND
15002.004	46.3	8.5	-2.1	52.7	Peak [Scan]	H	100					NRB
16432.866	38.6	9.3	0.2	48.1	Peak [Scan]	H	100					NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5785 MHz	Engineer	JMH
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	Integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

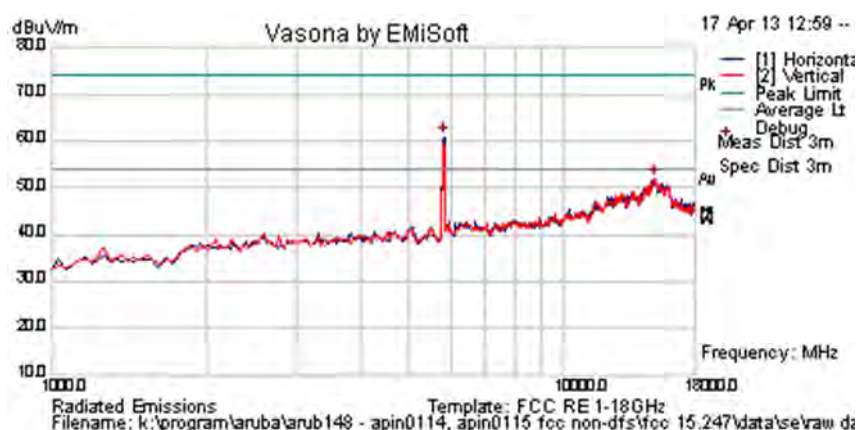
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.539	65.5	5.0	-9.5	61.1	Peak [Scan]	H						FUND
15036.072	45.9	8.5	-2.0	52.4	Peak [Scan]	V	150					NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5825 MHz	Engineer	JMH
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	Integral	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5837.675	65.1	5.2	-9.3	61.0	Peak [Scan]	H						FUND
15036.072	45.5	8.5	-2.0	52.0	Peak [Scan]	V	100					NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

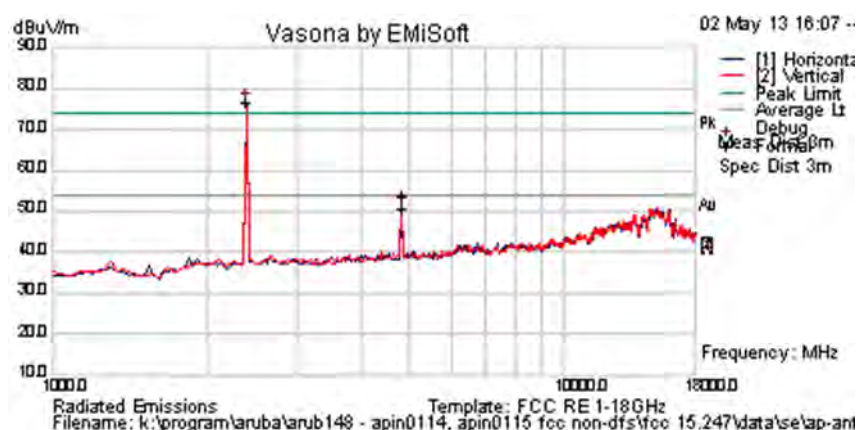
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5.1.2.2. AP-ANT-1B – Spurious Emissions

Test Freq.	2412 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-1B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

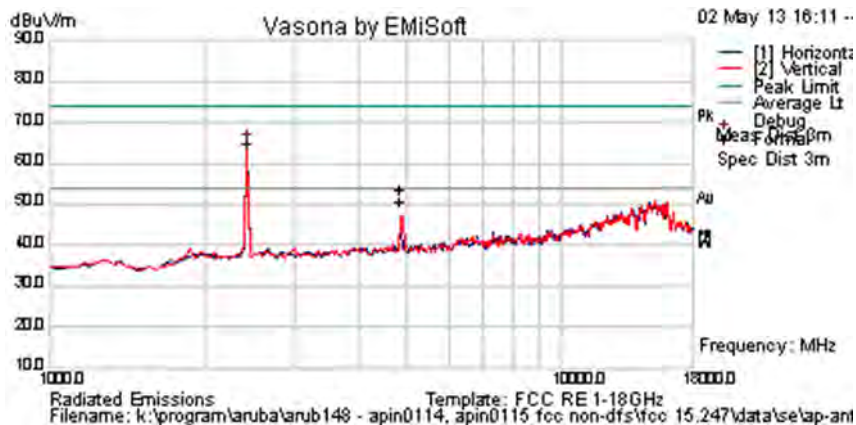
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4824.003	58.8	4.6	-9.7	53.7	Peak Max	V	98	312	74.0	-20.3	Pass	
4824.003	55.7	4.6	-9.7	50.6	Average Max	V	98	312	54.0	-3.4	Pass	
2396.794	85.0	3.2	-11.7	76.5	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-1B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

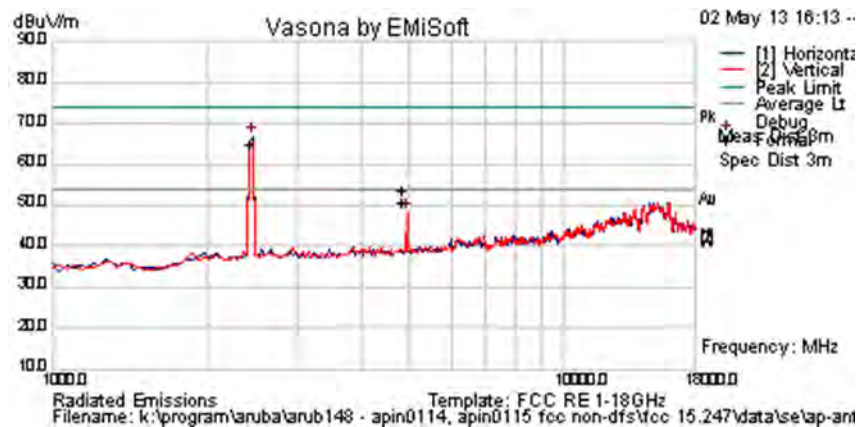
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4824.003	58.8	4.6	-9.7	53.7	Peak Max	V	98	312	74.0	-20.3	Pass	
4824.003	55.7	4.6	-9.7	50.6	Average Max	V	98	312	54.0	-3.4	Pass	
2430.862	73.4	3.2	-11.6	65.0	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-1B	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	75.0	3.2	-11.5	66.7	Peak [Scan]	H						FUND
4917.83567	53.4	4.6	-9.8	48.2	Peak [Scan]	V	100	0	54.0	-5.8	Pass	

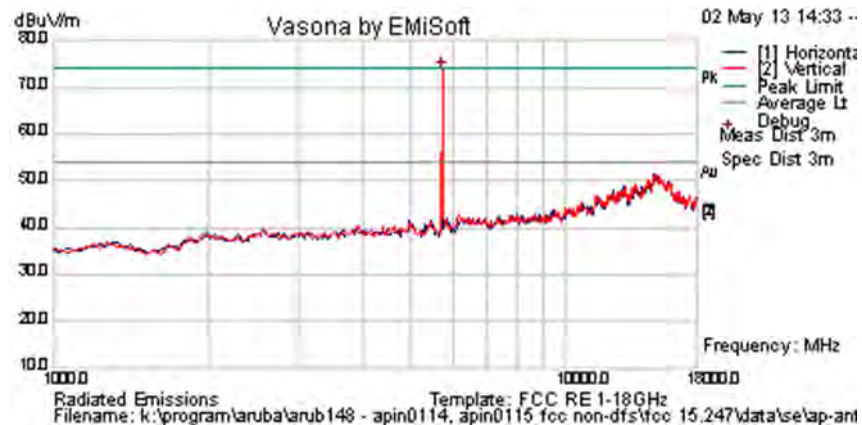
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	5745 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-1B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

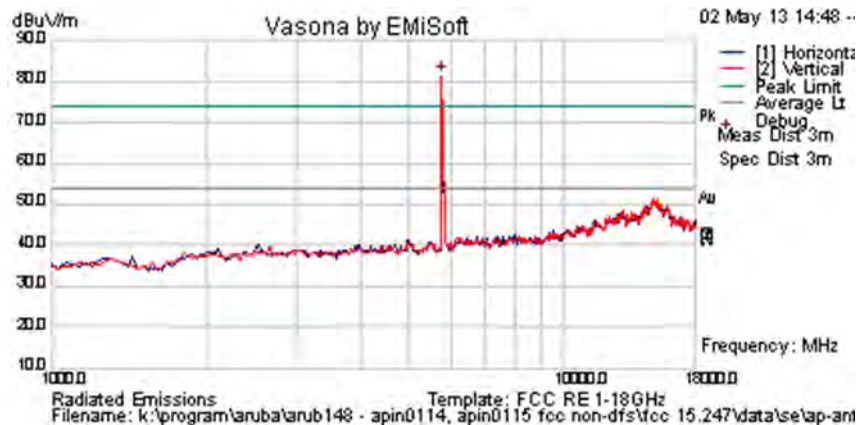
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	78.2	5.0	-9.5	73.7	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-1B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

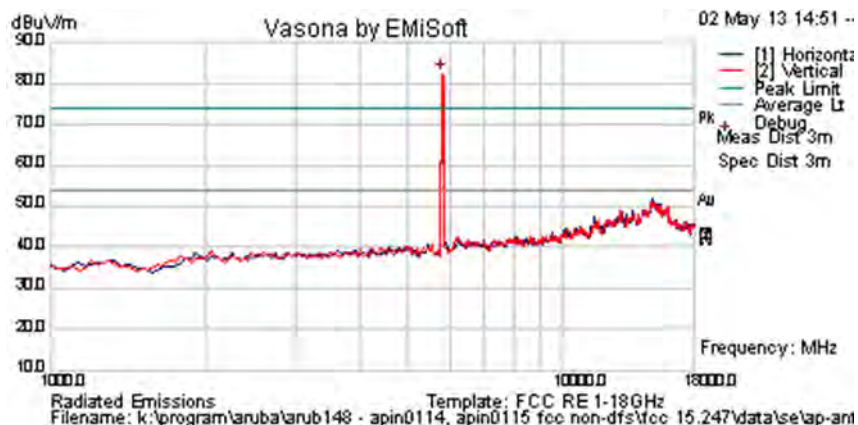
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.539	86.0	5.0	-9.5	81.5	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-1B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

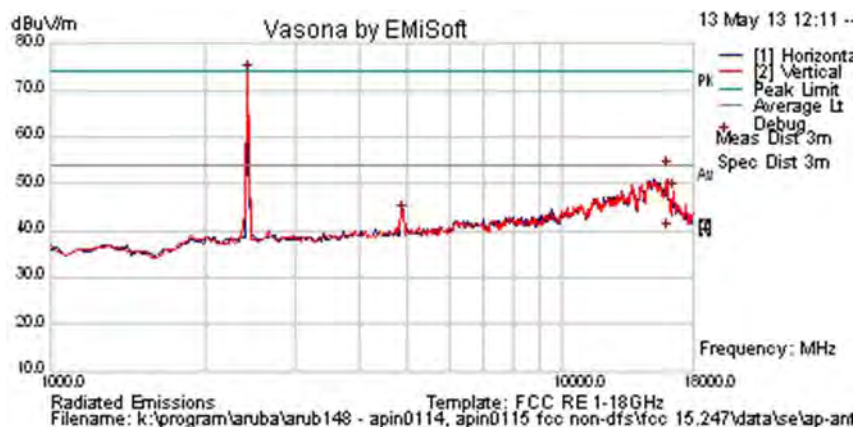
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5803.607	86.8	5.1	-9.4	82.5	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	2437 MHz	Engineer	JMH
Variant	802.11b; 1 Mbs	Temp (°C)	25.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	Maximum	Press. (mBars)	1004
Antenna	AP-ANT-13B	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	82.0	3.2	-11.6	73.7	Peak [Scan]	V						Fund
4888.151	48.8	4.6	-9.7	43.7	Peak [Scan]	V	98	360	54.0	-10.4	Pass	RB
15983.226	43.9	9.1	0.1	53.1	Peak Max	V	179	76	74	-21.0	Pass	RB
15983.226	30.7	9.1	0.1	39.9	Average Max	V	179	76	54.0	-14.1	Pass	RB
16466.934	38.7	9.4	0.3	48.3	Peak [Scan]	V	150					NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

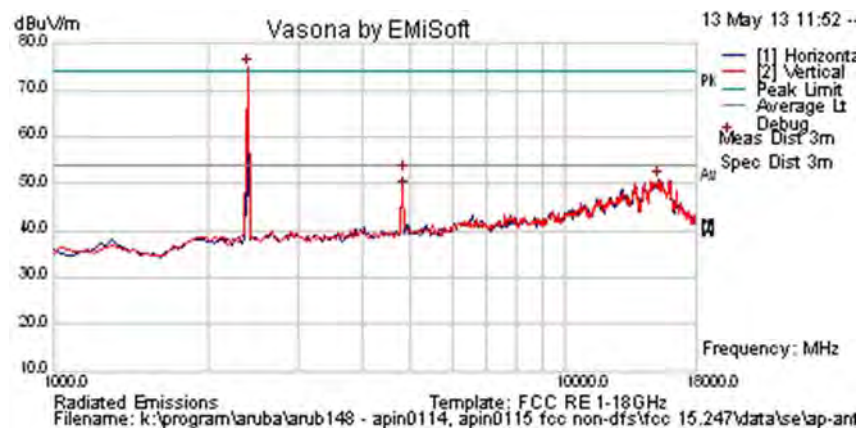
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5.1.2.3. AP-ANT-13B – Spurious Emissions

Test Freq.	2412 MHz	Engineer	JMH
Variant	802.11b; 1 Mbs	Temp (°C)	25.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	Maximum	Press. (mBars)	1004
Antenna	AP-ANT-13B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

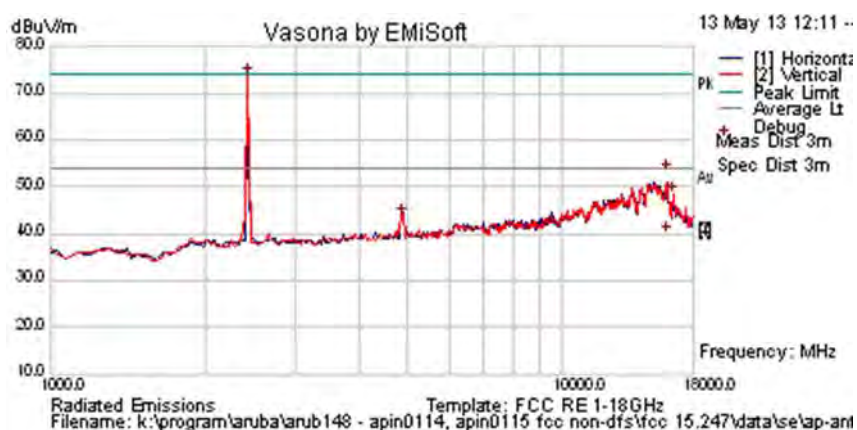
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2396.794	83.4	3.2	-11.7	74.9	Peak [Scan]	V						FUND
4824.088	57.2	4.6	-9.7	52.1	Peak Max	H	108	298	74.0	-21.9	Pass	RB
4824.088	53.9	4.6	-9.7	48.8	Average Max	H	108	298	54	-5.2	Pass	RB
15206.413	43.8	8.6	-1.5	50.9	Peak [Scan]	H	150					NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2437 MHz	Engineer	JMH
Variant	802.11b; 1 Mbs	Temp (°C)	25.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	Maximum	Press. (mBars)	1004
Antenna	AP-ANT-13B	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	82.0	3.2	-11.6	73.7	Peak [Scan]	V						Fund
4888.151	48.8	4.6	-9.7	43.7	Peak [Scan]	V	98	360	54.0	-10.4	Pass	RB
15983.226	43.9	9.1	0.1	53.1	Peak Max	V	179	76	74	-21.0	Pass	RB
15983.226	30.7	9.1	0.1	39.9	Average Max	V	179	76	54.0	-14.1	Pass	RB
16466.934	38.7	9.4	0.3	48.3	Peak [Scan]	V	150					NRB

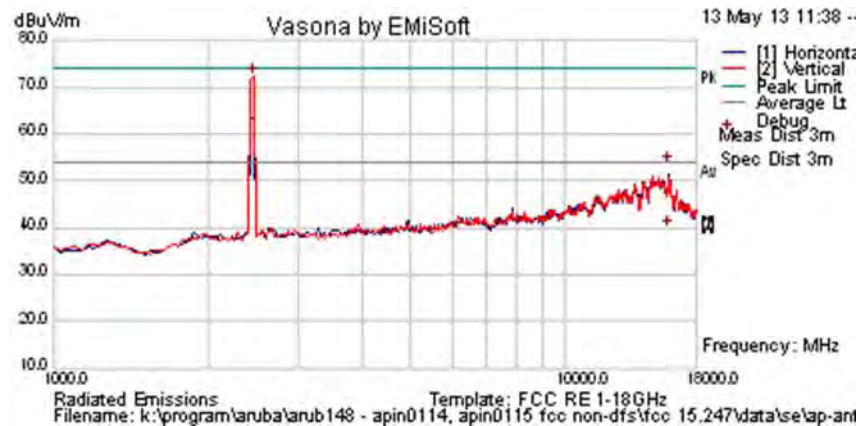
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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Test Freq.	2462 MHz	Engineer	JMH
Variant	802.11b; 1 Mbs	Temp (°C)	25.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	Maximum	Press. (mBars)	1004
Antenna	AP-ANT-13B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

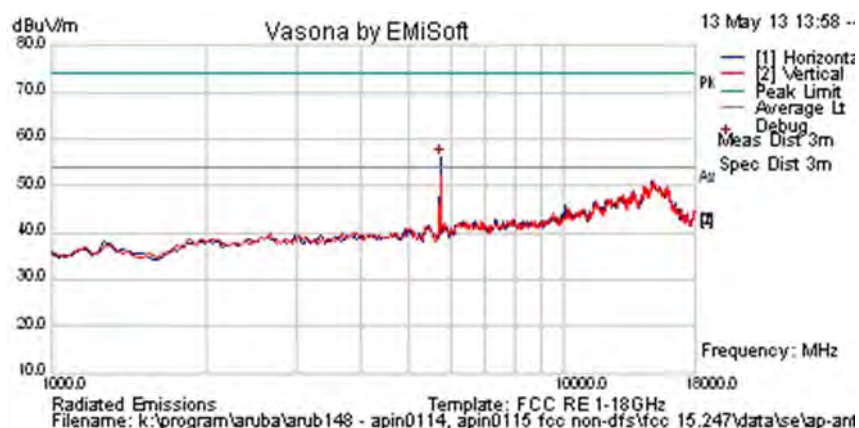
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2464.930	80.6	3.2	-11.5	72.3	Peak [Scan]	V						Fund
15923.648	44.4	9.0	-0.1	53.3	Peak Max	H	179	133	74.0	-20.7	Pass	
15923.648	30.9	9.0	-0.1	39.9	Average Max	H	179	133	54.0	-14.2	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5745 MHz	Engineer	jmh
Variant	802.11a; 6 Mbs	Temp (°C)	27
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	32
Power Setting	Maximum	Press. (mBars)	1004
Antenna	AP-ANT-13B	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

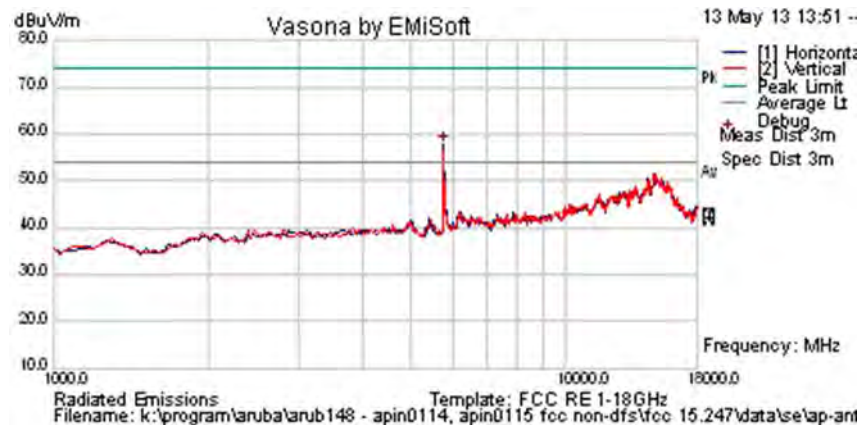
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	60.7	5.0	-9.5	56.1	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5785 MHz	Engineer	jmh
Variant	802.11a; 6 Mbs	Temp (°C)	27
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	32
Power Setting	Maximum	Press. (mBars)	1004
Antenna	AP-ANT-13B	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
5769.539	62.3	5.0	-9.5	57.8	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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5.1.2.4. AP-ANT-16 – Spurious Emissions

Test Freq.	2412 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-16	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

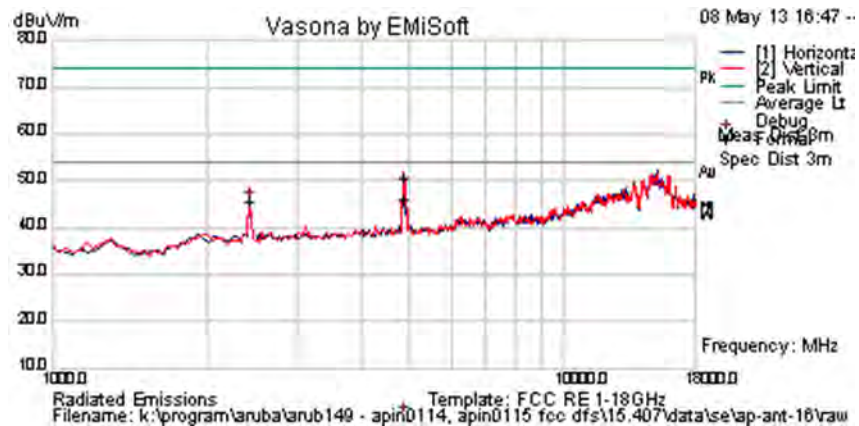
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2400.753	51.7	3.2	-11.6	43.2	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-16	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

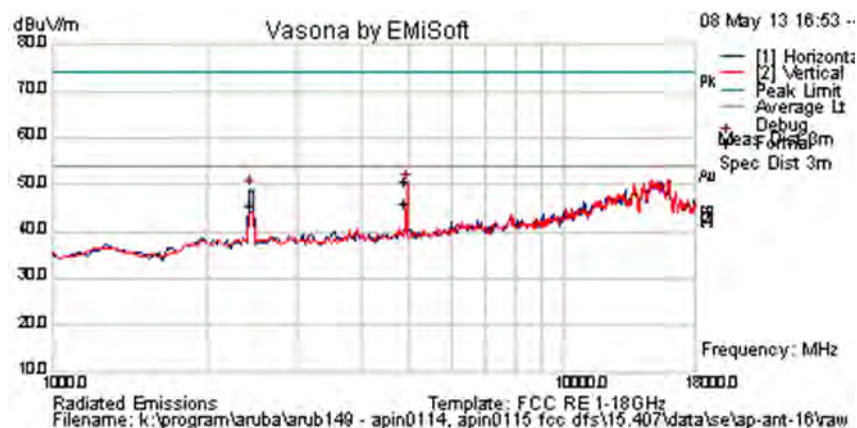
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4873.948	55.8	4.6	-9.7	50.7	Peak Max	V	98	233	74.0	-23.3	Pass	
4873.948	51.2	4.6	-9.7	46.1	Average Max	V	98	233	54.0	-7.9	Pass	
2433.815	54.0	3.2	-11.6	45.7	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-18	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

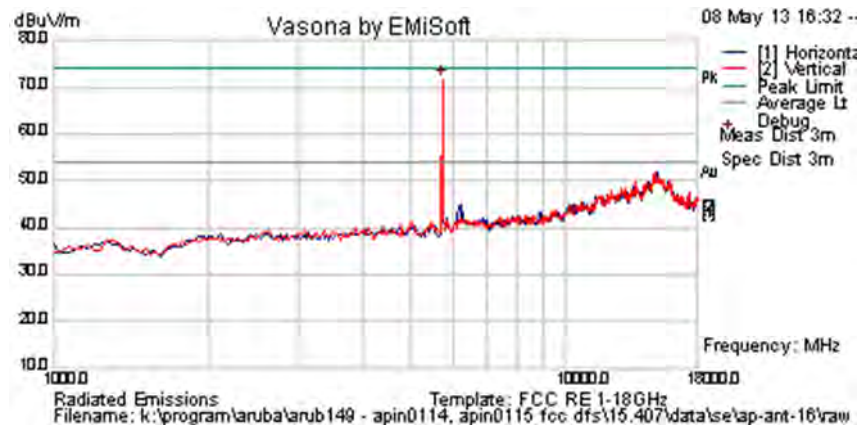
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2430.862	57.3	3.2	-11.6	49.0	Peak [Scan]	H						FUND
4873.948	55.8	4.6	-9.7	50.7	Peak Max	V	98	233	74.0	-23.3	Pass	
4873.948	51.2	4.6	-9.7	46.1	Average Max	V	98	233	54.0	-7.9	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5745 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-16	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

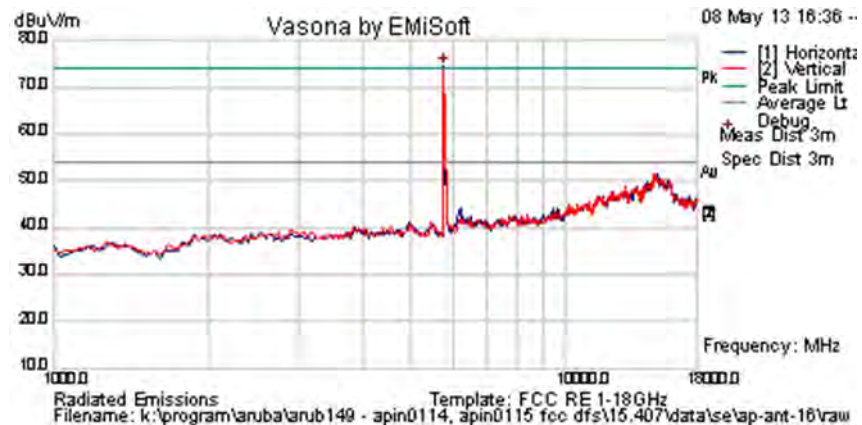
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	76.2	5.0	-9.5	71.6	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-16	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

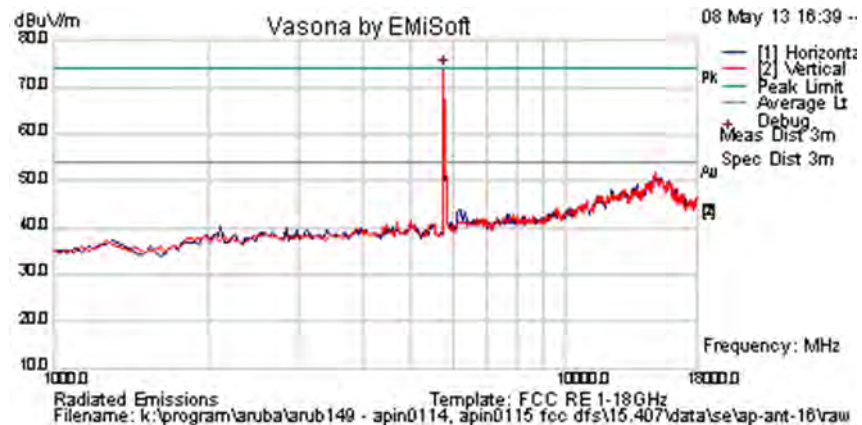
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.539	78.9	5.0	-9.5	74.4	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-16	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
5796.676	0.0	0.0	-9.5	73.8	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

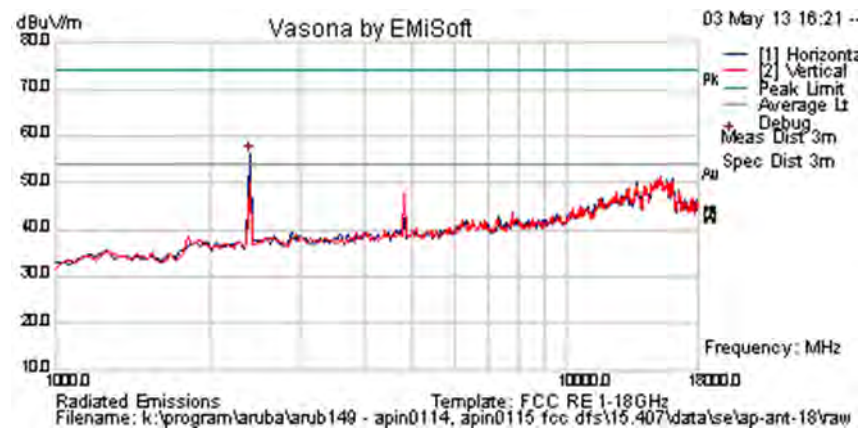
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5.1.2.5. AP-ANT-18 – Spurious Emissions

Test Freq.	2412 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-18	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

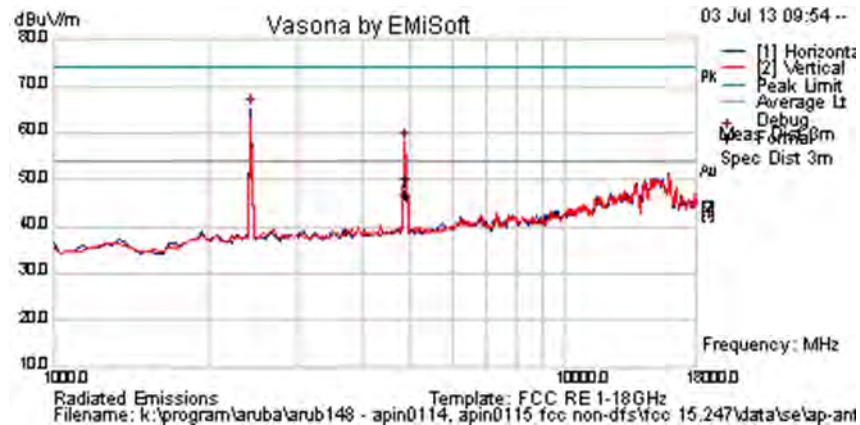
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2396.794	64.6	3.2	-11.7	56.1	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-18	Duty Cycle (%)	100
Test Notes 1	New Image 6-27-2013		
Test Notes 2			



Formally measured emission peaks

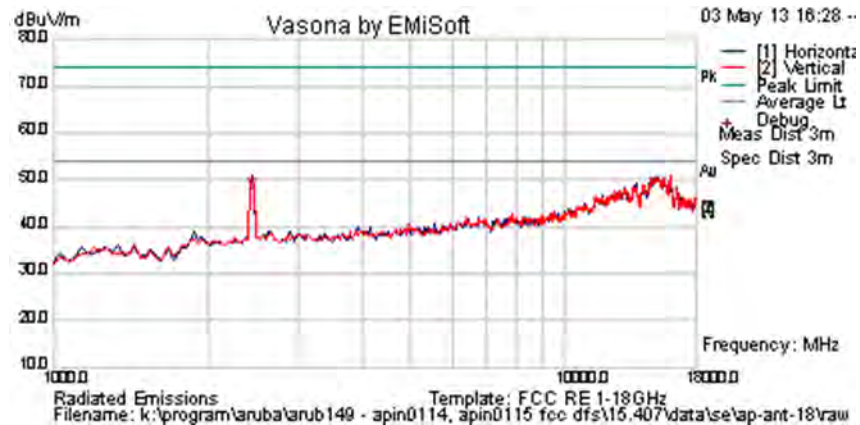
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4873.922	55.3	4.6	-9.7	50.2	Peak Max	H	98	32	74	-23.8	Pass	RB
4873.97201	51.9	4.6	-9.7	46.8	Average Max	V	98	32	54.0	-7.2	Pass	RB
2430.862	73.6	3.2	-11.6	65.2	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-18	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

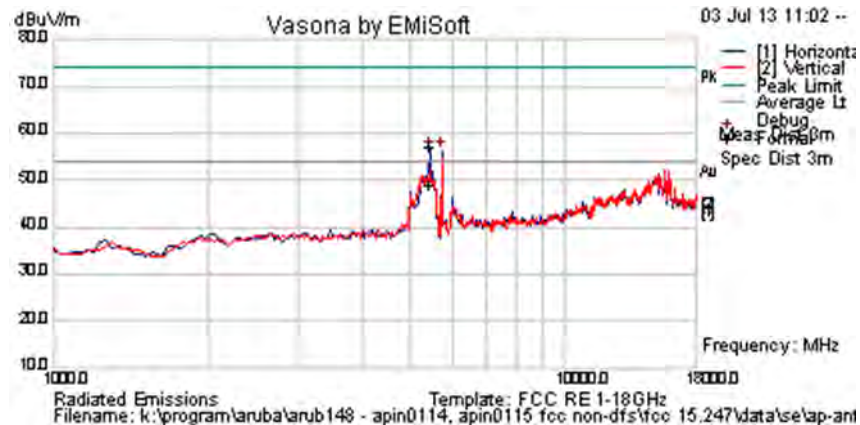
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2455.968	56.4	3.2	-11.5	48.1	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5745 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-18	Duty Cycle (%)	100
Test Notes 1	New Image 6-27-2013		
Test Notes 2			



Formally measured emission peaks

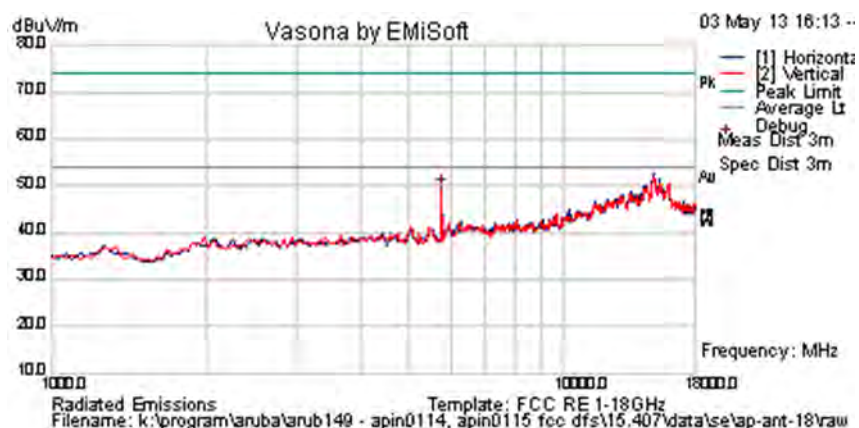
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5440.000	62.1	4.9	-9.7	57.4	Peak Max	H	98	21	74.0	-16.6	Pass	RB
5440	54.0	4.9	-9.7	49.2	Average Max	H	98	21	54.0	-4.8	Pass	RB
5735.471	60.9	5.0	-9.5	56.4	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-18	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

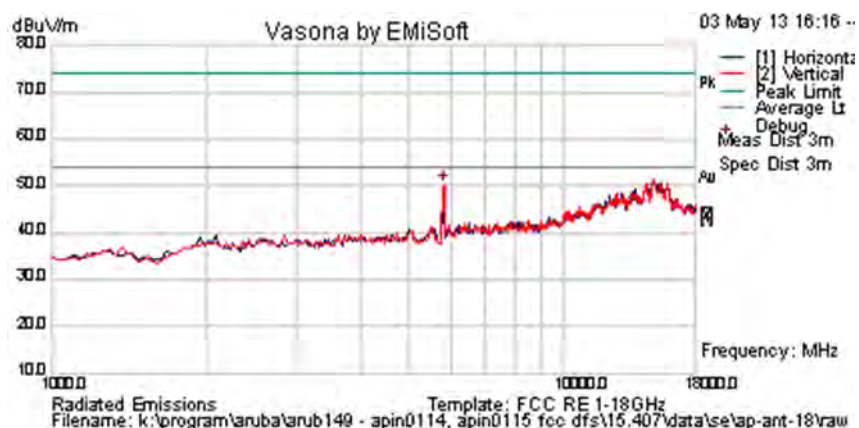
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5769.539	54.0	5.0	-9.5	49.5	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
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
5803.607	74.3	5.1	-9.4	70.0	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

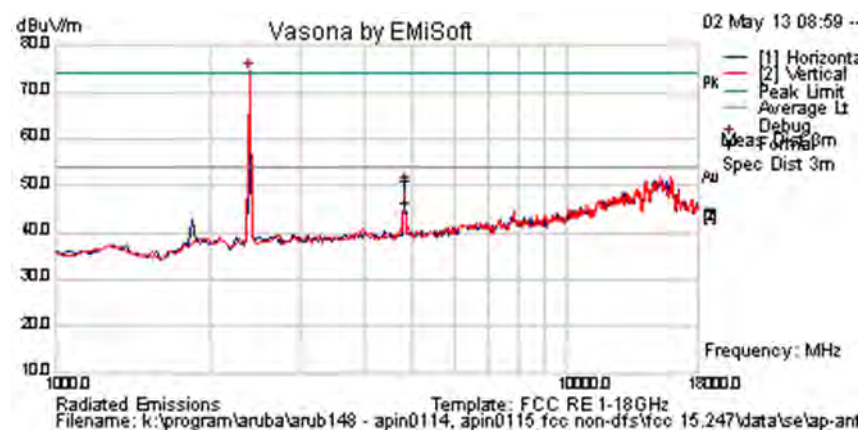
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5.1.2.6. AP-ANT-19 – Spurious Emissions

Test Freq.	2412 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-19	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

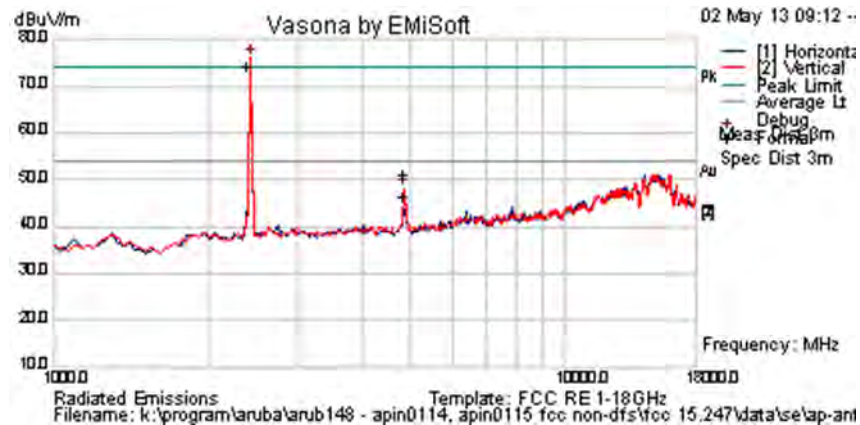
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4823.998	56.2	4.6	-9.7	51.1	Peak Max	H	100	24	74.0	-22.9	Pass	
4823.998	51.8	4.6	-9.7	46.7	Average Max	H	100	24	54.0	-7.3	Pass	
2396.794	83.0	3.2	-11.7	74.5	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2437 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-19	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

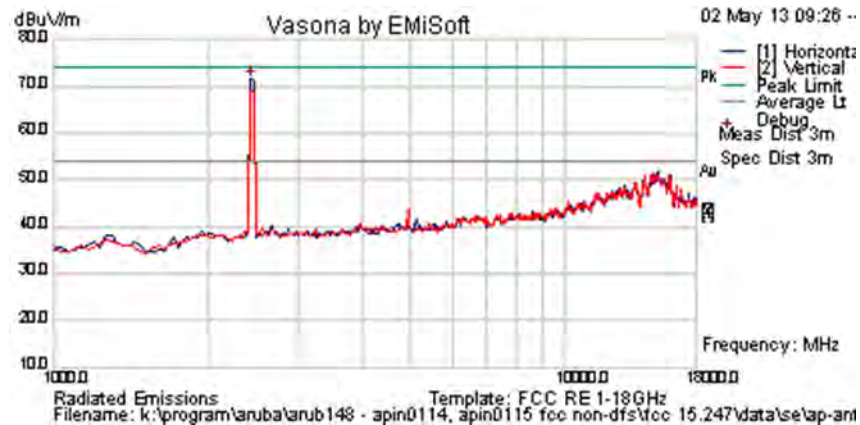
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
4849.699	56.2	4.6	-9.7	51.1	Peak Max	H	100	24	74.0	-22.9	Pass	
4849.699	51.8	4.6	-9.7	46.7	Average Max	H	100	24	54.0	-7.3	Pass	
2430.862	84.5	3.2	-11.6	76.2	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	2462 MHz	Engineer	SB
Variant	802.11b; 1 Mbs	Temp (°C)	17.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	36
Power Setting	Maximum	Press. (mBars)	1005
Antenna	AP-ANT-19	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

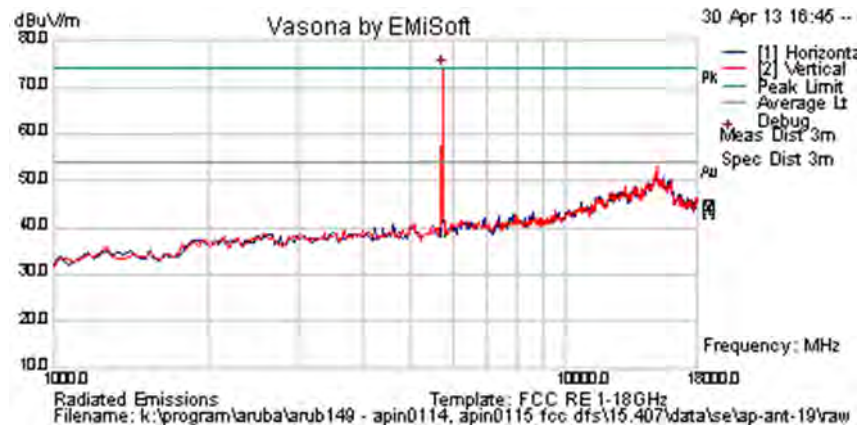
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2430.862	80.0	3.2	-11.6	71.6	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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Test Freq.	5745 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-19	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

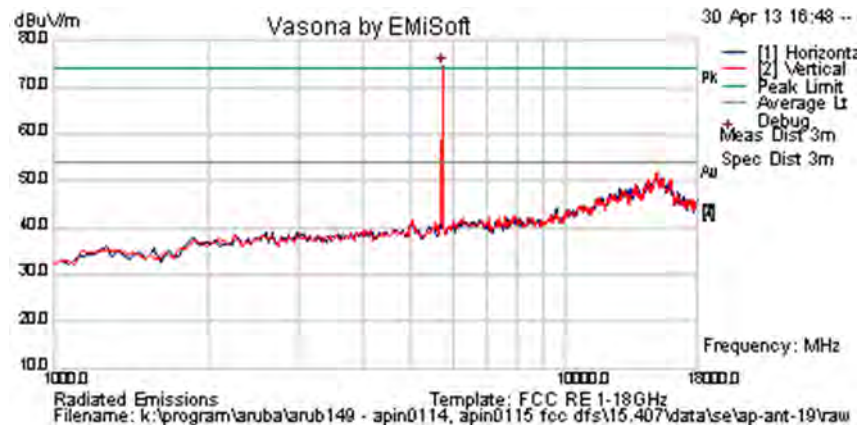
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	78.4	5.0	-9.5	73.9	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5785 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-19	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

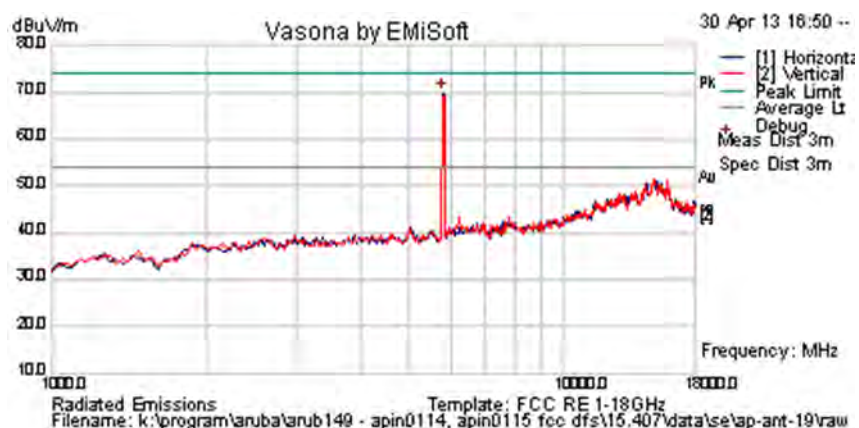
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5735.471	79.1	5.0	-9.5	74.6	Peak [Scan]	V						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5825 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	23
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	31
Power Setting	Maximum	Press. (mBars)	1010
Antenna	AP-ANT-19	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
5803.607	74.3	5.1	-9.4	70.0	Peak [Scan]	H						FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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5.1.2.7. Band-Edge - Spurious Emissions

2.4 GHz Frequency Band

Peak Limit 74.0 dBμV, Peak Limit 54.0 dBμV

Integral Antenna

Operational Mode	2390 MHz			2483.5 MHz		
	dBμV		Power Setting	dBμV		Power Setting
	Peak	Average		Peak	Average	
b	51.66	39.74	15.0	53.42	41.38	16.0
g	67.51	48.04	15.5	64.60	42.80	14.5
n HT-20	70.94	51.62	16.0	68.96	45.18	14.5
n HT-40	72.44	53.00	15.5	66.34	49.23	15.0

5.8 GHz Frequency Band

Integral Antenna

Operational Mode	5460 MHz		
	Peak	Average	Power Setting
a	56.64	47.41	17.0
n HT-20	56.67	47.28	17.0
n HT-40	57.74	46.73	17.5



2.4 GHz Frequency Band

Antenna ANT-1B

Operational Mode	2390 MHz			2483.5 MHz		
	dBµV		Power Setting	dBµV		Power Setting
	Peak	Average		Peak	Average	
b	50.37	38.90	16.0	50.35	38.09	16.0
g	73.79	51.06	14.5	72.31	45.57	12.0
n HT-20	70.86	47.32	14.5	67.92	46.07	11.5
n HT-40	67.58	49.47	12.0	73.73	51.09	13.0

5.8 GHz Frequency Band

Antenna ANT-1B

Operational Mode	5460 MHz		
	Peak	Average	Power Setting
a	57.14	48.90	17.0
n HT-20	57.39	48.95	17.0
n HT-40	57.39	49.80	17.0



2.4 GHz Frequency Band

Antenna ANT-13B

Operational Mode	2390 MHz			2483.5 MHz		
	dBμV		Power Setting	dBμV		Power Setting
	Peak	Average		Peak	Average	
b	51.24	39.27	16.0	51.8	42.41	16.0
g	71.21	50.47	14.5	68.10	43.89	13.0
n HT-20	72.40	50.39	15.0	64.66	44.32	11.5
n HT-40	70.18	52.04	12.0	73.05	48.79	13.0

5.8 GHz Frequency Band

Antenna 13B

Operational Mode	5460 MHz		
	Peak	Average	Power Setting
a	55.70	45.8	17.0
n HT-20	57.0	46.7	17.0
n HT-40	55.24	45.0	17.5



2.4 GHz Frequency Band

Antenna ANT-16

Operational Mode	2390 MHz			2483.5 MHz		
	dBμV		Power Setting	dBμV		Power Setting
	Peak	Average		Peak	Average	
b	47.21	34.95	16.0	48.86	37.04	16.0
g	65.30	50.56	15.5	72.28	49.02	15.5
n HT-20	71.85	51.77	16.0	73.53	47.88	14.0
n HT-40	70.94	53.18	14.0	73.47	48.86	14.0

5.8 GHz Frequency Band

Antenna ANT-16

Operational Mode	5460 MHz		
	Peak	Average	Power Setting
a	51.12	38.20	17.0
n HT-20	50.58	38.65	17.0
n HT-40	50.91	38.80	17.0



2.4 GHz Frequency Band

Antenna ANT-18

Operational Mode	2390 MHz			2483.5 MHz		
	dBμV		Power Setting	dBμV		Power Setting
	Peak	Average		Peak	Average	
b	52.28	40.44	16.0	49.23	37.04	16
g	71.75	51.51	15.5	73.05	47.92	14.5
n HT-20	65.88	44.09	13.0	73.44	45.57	14.5
n HT-40	66.61	48.87	13.0	73.57	49.26	14.0

5.8 GHz Frequency Band

Antenna ANT-18

Operational Mode	5460 MHz		
	Peak	Average	Power Setting
a	52.12	40.62	17.0
n HT-20	52.63	41.72	17.0
n HT-40	52.63	42.32	17.0



2.4 GHz Frequency Band

Antenna ANT-19

Operational Mode	2390 MHz			2483.5 MHz		
	dBµV		Power Setting	dBµV		Power Setting
	Peak	Average		Peak	Average	
b	48.69	37.04	15.0	52.98	40.64	19.0
g	72.40	52.04	15.5	72.40	47.18	13.0
n HT-20	73.94	53.11	16.0	73.48	47.48	13.5
n HT-40	69.24	51.24	12.0	70.91	49.23	12.5

5.8 GHz Frequency Band

Antenna ANT-19

Operational Mode	5460 MHz		
	Peak	Average	Power Setting
a	57.52	45.03	17.0
n HT-20	56.24	45.24	17.0
n HT-40	57.45	45.24	17.0

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 or 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.



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§15.209 (a) Limit Matrix

Frequency(MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/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

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5.1.2.8. Digital Emissions (0.03-1 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.

Field Strength Calculation

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

$$FS = R + AF + CORR$$

where:

FS = Field Strength

R = Measured Receiver Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

For example:

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

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

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

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

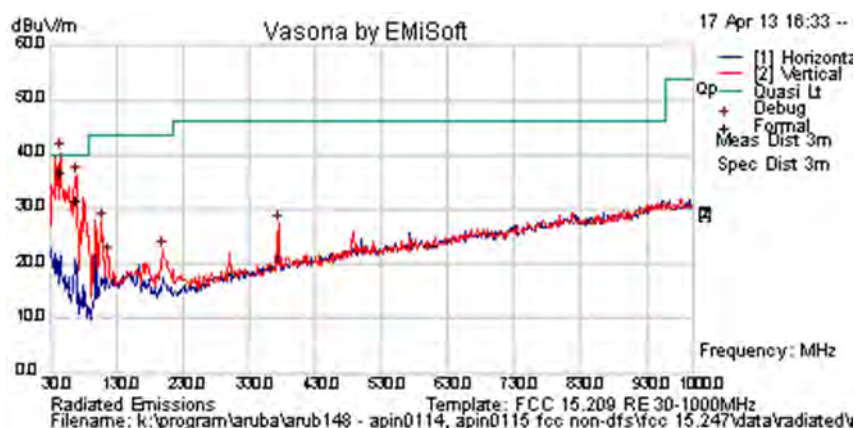
$$40 \text{ dB}\mu\text{V/m} = 100\mu\text{V/m}$$

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



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Test Freq.	2437 MHz	Engineer	SB
Variant	Digital Emissions	Temp (°C)	24.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	30
Power Setting	18	Press. (mBars)	1005
Antenna	integrak		
Test Notes 1	EUT Position Vertical; POE Powered		
Test Notes 2	POE Injector in the control room with ferrite clamp on Ethernet cables;		



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
46.665	54.6	3.7	-21.7	36.6	Quasi Max	V	99	202	40	-3.4	Pass	
68.084	51.1	3.9	-23.3	31.7	Quasi Max	V	177	331	40	-8.3	Pass	
373.833	37.1	5.4	-15.3	27.1	Peak [Scan]	V	177	331	46	-18.9	Pass	
199.074	36.3	4.6	-18.4	22.6	Peak [Scan]	V	177	331	43.5	-20.9	Pass	
107.369	42.7	4.1	-19.4	27.5	Peak [Scan]	V	177	331	43.5	-16.0	Pass	
117.157	35.0	4.2	-17.7	21.5	Peak [Scan]	V	177	331	43.5	-22.0	Pass	

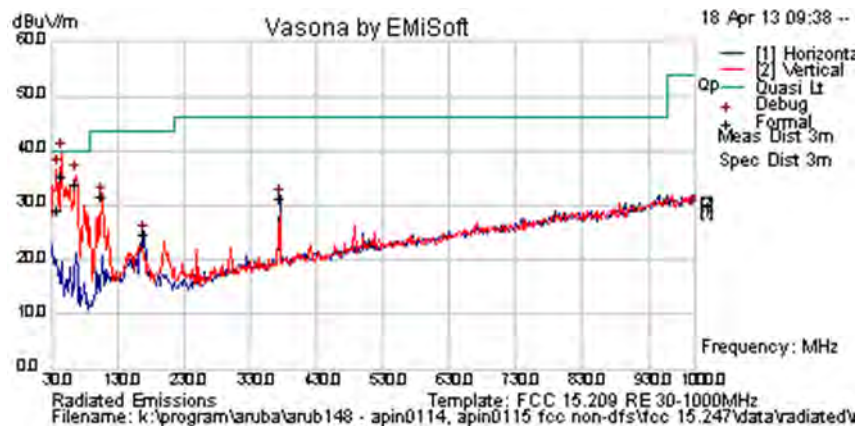
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
 NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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Test Freq.	2437 MHz	Engineer	SB
Variant	Digital Emissions	Temp (°C)	24.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	30
Power Setting	18	Press. (mBars)	1005
Antenna	integral		
Test Notes 1	EUT Position Horizontal; POE Powered		
Test Notes 2	POE Injector in the control room with ferrite clamp on Ethernet cables;		



Formally measured emission peaks

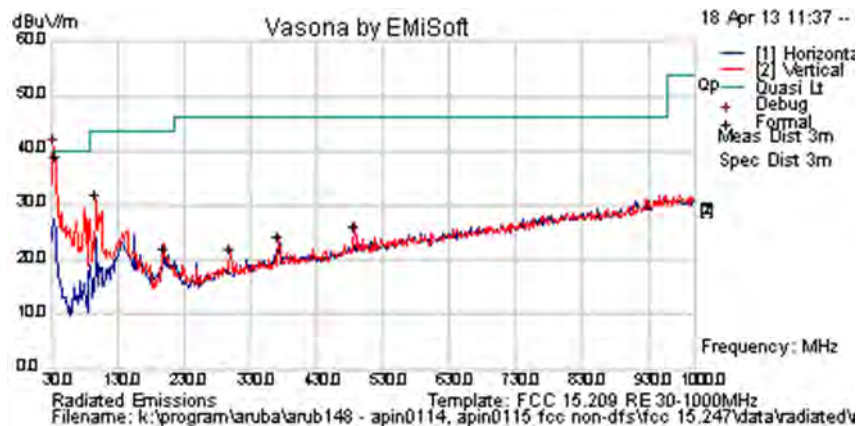
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
46.682	53.3	3.7	-21.7	35.3	Quasi Max	V	119	-2	40.0	-4.7	Pass	
37.940	41.4	3.6	-16.0	29.0	Quasi Max	V	152	37	40.0	-11.0	Pass	
67.182	53.3	3.8	-23.3	33.8	Quasi Max	V	117	361	40.0	-6.2	Pass	
374.190	41.1	5.4	-15.3	31.1	Peak [Scan]	H	117	361	46.0	-14.9	Pass	
169.759	39.6	4.5	-19.4	24.8	Peak [Scan]	H	117	361	43.5	-18.7	Pass	
107.126	46.8	4.1	-19.4	31.5	Peak [Scan]	V	117	361	43.5	-12.0	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency												
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band												

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Test Freq.	2437 MHz	Engineer	SB
Variant	Digital Emissions	Temp (°C)	24.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	30
Power Setting	18	Press. (mBars)	1005
Antenna	integral		
Test Notes 1	EUT Position Horizontal; AC/DC Powered		
Test Notes 2	AC/DC adapter on table near EUT;		



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
33.888	49.0	3.6	-13.7	38.9	Quasi Max	V	103	208	40.0	-1.1	Pass	
97.839	49.9	4.1	-21.9	32.1	Peak [Scan]	V	103	320	43.5	-11.4	Pass	
200.600	36.0	4.6	-18.4	22.3	Peak [Scan]	V	103	327	43.5	-21.3	Pass	
300.511	34.2	5.1	-17.2	22.1	Peak [Scan]	V	103	352	46.0	-23.9	Pass	
372.309	34.3	5.4	-15.3	24.4	Peak [Scan]	V	103	357	46.0	-21.6	Pass	
486.686	33.0	5.8	-12.8	25.9	Peak [Scan]	V	103	365	46.0	-20.1	Pass	

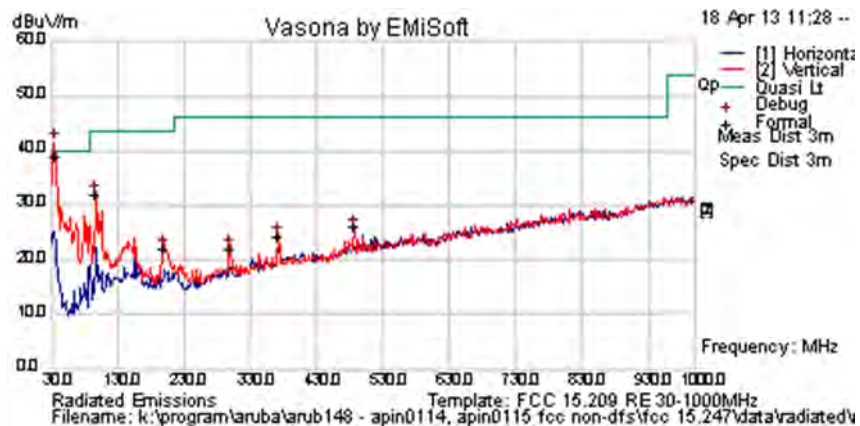
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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Test Freq.	2437 MHz	Engineer	SB
Variant	Digital Emissions	Temp (°C)	24.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	30
Power Setting	18	Press. (mBars)	1005
Antenna	integral		
Test Notes 1	EUT Position Vertical; AC/DC Powered		
Test Notes 2	AC/DC adapter on table near EUT;		



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
35.122	49.0	3.6	-13.7	38.9	Quasi Max	V	103	208	40.0	-1.1	Pass	
100.839	49.9	4.1	-21.9	32.1	Peak [Scan]	V	103	320	43.5	-11.4	Pass	
200.600	36.0	4.6	-18.4	22.3	Peak [Scan]	V	103	327	43.5	-21.3	Pass	
300.511	34.2	5.1	-17.2	22.1	Peak [Scan]	V	103	352	46.0	-23.9	Pass	
372.309	34.3	5.4	-15.3	24.4	Peak [Scan]	V	103	357	46.0	-21.6	Pass	
486.686	33.0	5.8	-12.8	25.9	Peak [Scan]	V	103	365	46.0	-20.1	Pass	

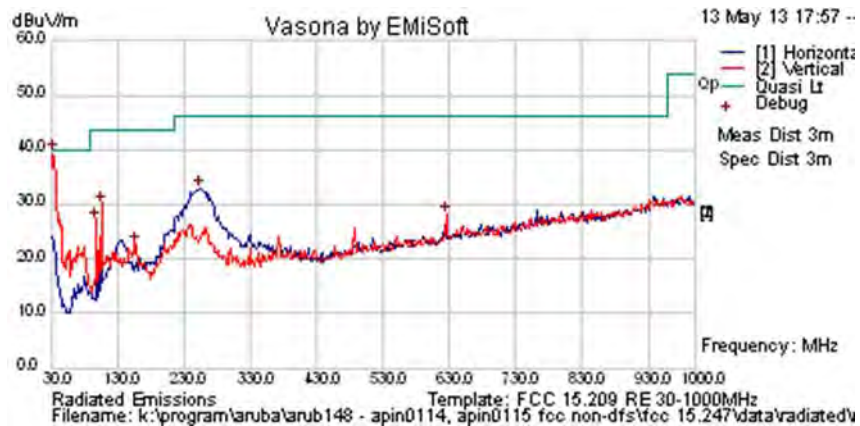
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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Test Freq.	2437 MHz	Engineer	JMH
Variant	Digital Emissions	Temp (°C)	29
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	32
Power Setting	18	Press. (mBars)	1002
Antenna	13B		
Test Notes 1	EUT Position Vertical; AC/DC Powered		
Test Notes 2	AC/DC adapter on table near EUT;		



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
33.532	45.0	3.5	-12.5	36.0	Quasi Max	V	103	17	40.0	-4.0	Pass	
254.555	47.0	4.9	-19.0	32.9	Peak [Scan]	H	98	0	46.0	-13.1	Pass	
105.758	45.6	4.1	-19.7	30.0	Peak [Scan]	V	98	0	43.5	-13.5	Pass	
98.135	44.5	4.1	-21.8	26.8	Peak [Scan]	V	98	0	43.5	-16.7	Pass	
625.048	32.6	6.3	-11.0	27.9	Peak [Scan]	V	98	0	46.0	-18.1	Pass	
158.040	36.9	4.4	-18.8	22.5	Peak [Scan]	V	98	0	43.5	-21.0	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency												
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band												

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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 (μ V/m)	Field Strength (dB μ V/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

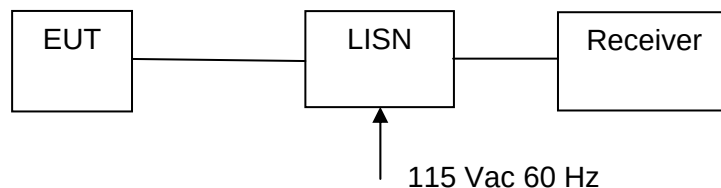
5.1.3. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

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)

Ambient conditions.

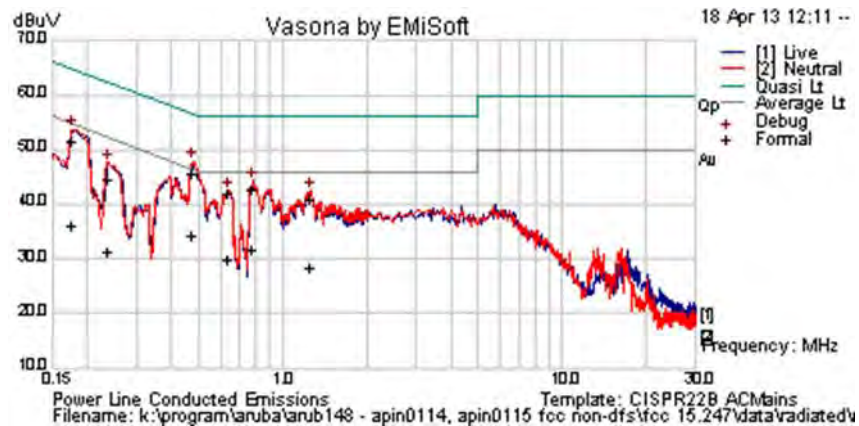
Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar



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ac/dc Adaptor

Test Freq.	N/A	Engineer	SB
Variant	AC Line Emissions	Temp (°C)	23.5
Freq. Range	0.150 MHz - 30 MHz	Rel. Hum.(%)	30
Power Setting		Press. (mBars)	1011
Antenna			
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.478	35.7	9.9	0.1	45.7	Quasi Peak	Neutral	56.37	-10.7	Pass	
0.178	41.4	9.9	0.1	51.4	Quasi Peak	Neutral	64.58	-13.2	Pass	
0.781	32.9	10.0	0.1	42.9	Quasi Peak	Neutral	56	-13.1	Pass	
0.645	31.8	10.0	0.1	41.9	Quasi Peak	Neutral	56	-14.1	Pass	
1.255	31.0	10.0	0.1	41.0	Quasi Peak	Neutral	56	-15.0	Pass	
0.237	34.6	9.9	0.1	44.6	Quasi Peak	Neutral	62.2	-17.6	Pass	
0.478	24.3	9.9	0.1	34.2	Average	Neutral	46.37	-12.1	Pass	
0.178	26.1	9.9	0.1	36.1	Average	Neutral	54.58	-18.5	Pass	
0.781	21.6	10.0	0.1	31.7	Average	Neutral	46	-14.3	Pass	
0.645	19.8	10.0	0.1	29.8	Average	Neutral	46	-16.2	Pass	
1.255	18.5	10.0	0.1	28.5	Average	Neutral	46	-17.5	Pass	
0.237	21.3	9.9	0.1	31.3	Average	Neutral	52.2	-21.0	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency										
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band										

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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 $\mu\Omega$ line impedance stabilization network (LISN), see §15.207 (a) matrix below. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

RSS-Gen §7.2.2

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

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

The lower limit applies at the boundary between frequency ranges

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

* Decreases with the logarithm of the frequency

Laboratory Measurement Uncertainty for Conducted Emissions

Measurement uncertainty	± 2.64 dB
-------------------------	---------------

Traceability

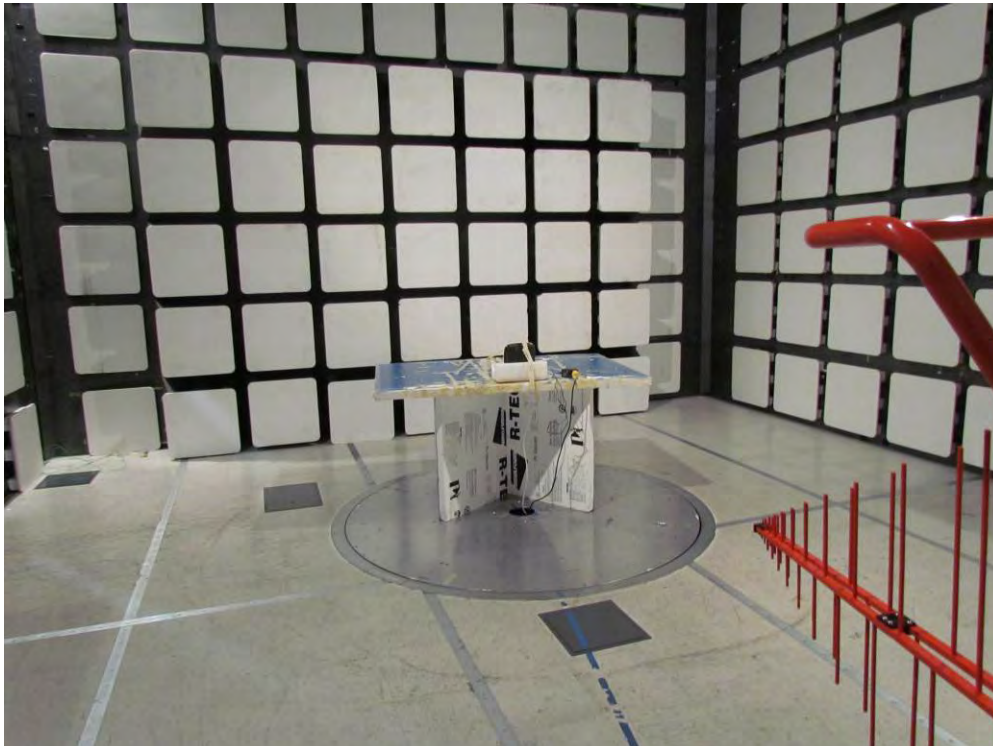
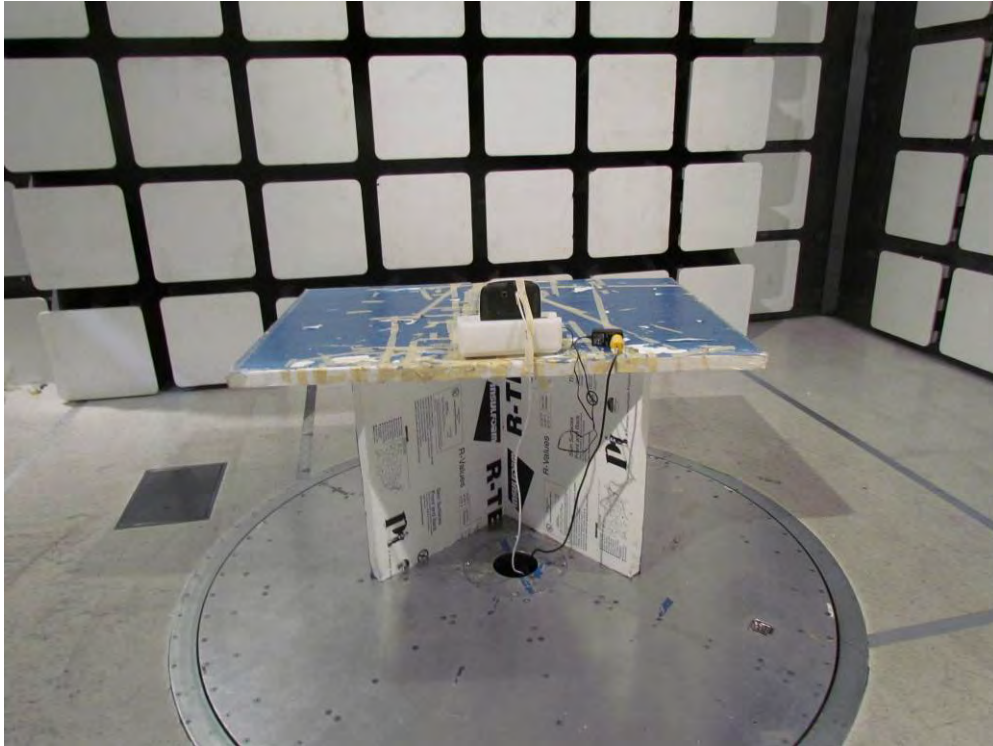
Method	Test Equipment Used
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'	0158, 0184, 0287, 0190, 0293, 0307

6. PHOTOGRAPHS

6.1. Conducted Test Setup

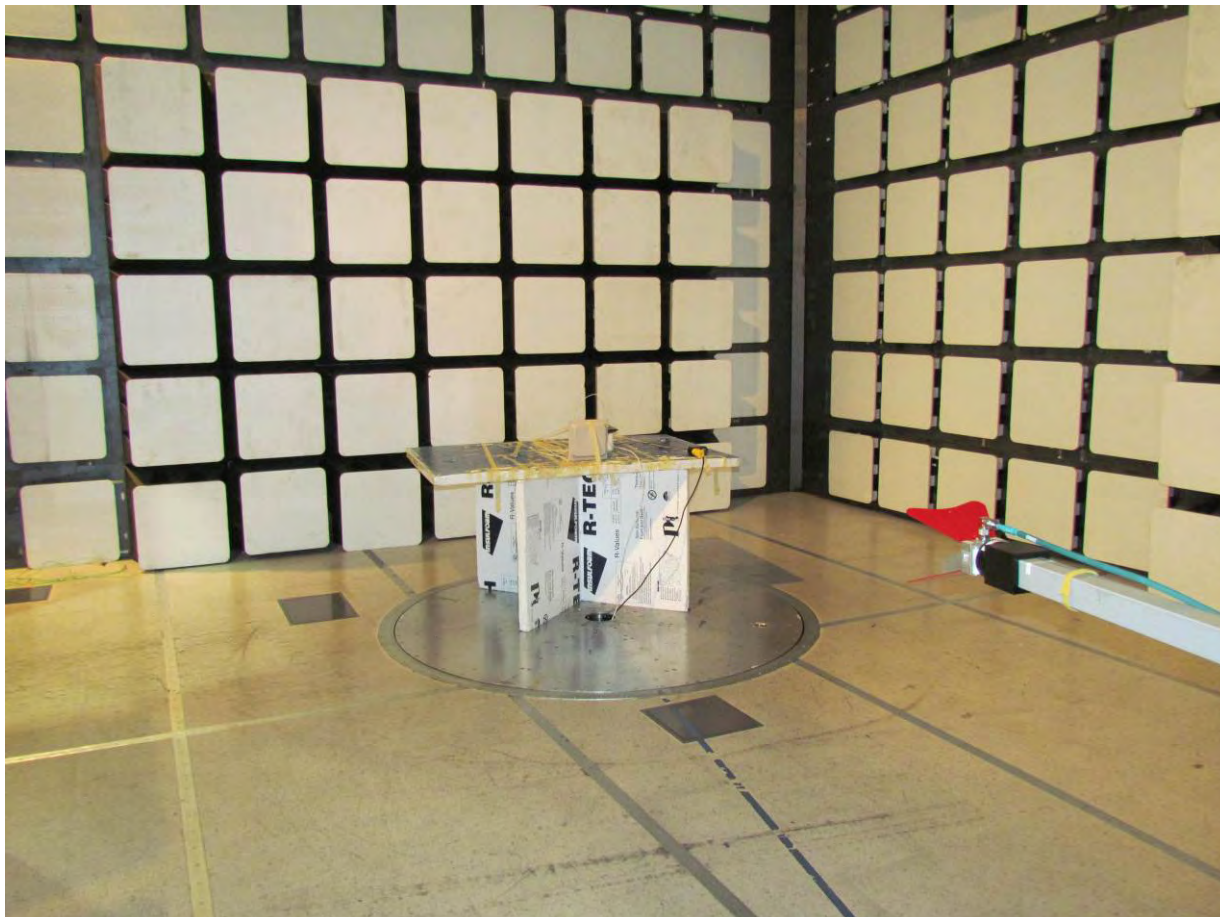


6.2. Test Setup - Digital Emissions <1 GHz



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6.3. Radiated Emissions Test Setup >1 GHz



6.4. ac Wireline Test Setup >1 GHz





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7. TEST EQUIPMENT

Asset #	Instrument	Manufacturer	Part #	Serial #	Calibration Due Date
0070	Power Meter	Hewlett Packard	437B	3125U11552	28 th Nov 13
0117	Power Sensor	Hewlett Packard	8487D	3318A00371	15 th Nov 13
0223	Power Meter	Hewlett Packard	EPM-442A	US37480256	15 th Nov 13
0374	Power Sensor	Hewlett Packard	8485A	3318A19694	29 th Nov 13
0158	Barometer /Thermometer	Control Co.	4196	E2846	8 th Dec 13
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007	2 nd Dec 13
0287	EMI Receiver	Rhode & Schwartz	ESIB40	100201	16 th Nov 13
0338	30 - 3000 MHz Antenna	Sunol	JB3	A052907	8 th Nov 13
0335	1-18 GHz Horn Antenna	EMCO	3117	00066580	7 th Nov 13
0252	SMA Cable	Megaphase	Sucoflex 104	None	N/A
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001	N/A
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002	N/A
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001	N/A
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001	N/A
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623	N/A
	EMC Test Software	EMISoft	Vasona	5.0051	N/A
	RF Conducted Test Software	National Instruments	Labview	Version 8.2	N/A
	RF Conducted Test Software	MiCOM Labs ATS		Version 1.5	N/A

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APPENDIX

A. SUPPORTING INFORMATION

A.1. CONDUCTED TEST PLOTS

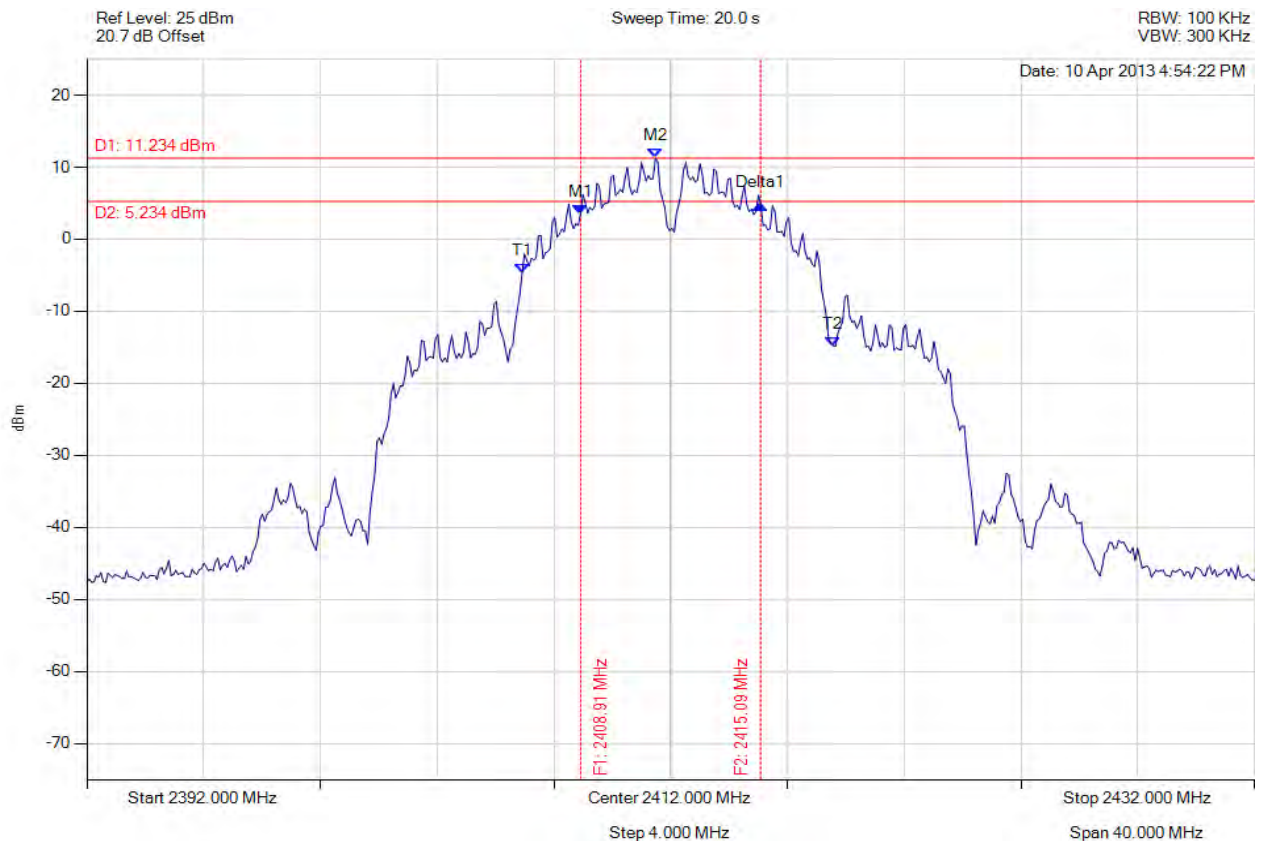
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A.1.1. 6 dB & 99% Bandwidth



6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2408.914 MHz : 3.542 dBm M2 : 2411.479 MHz : 11.234 dBm Delta1 : 6.172 MHz : 1.310 dB T1 : 2406.910 MHz : -4.709 dBm T2 : 2417.571 MHz : -14.811 dBm OBW : 10.661 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥ 500.0 kHz Margin: -5.67 MHz

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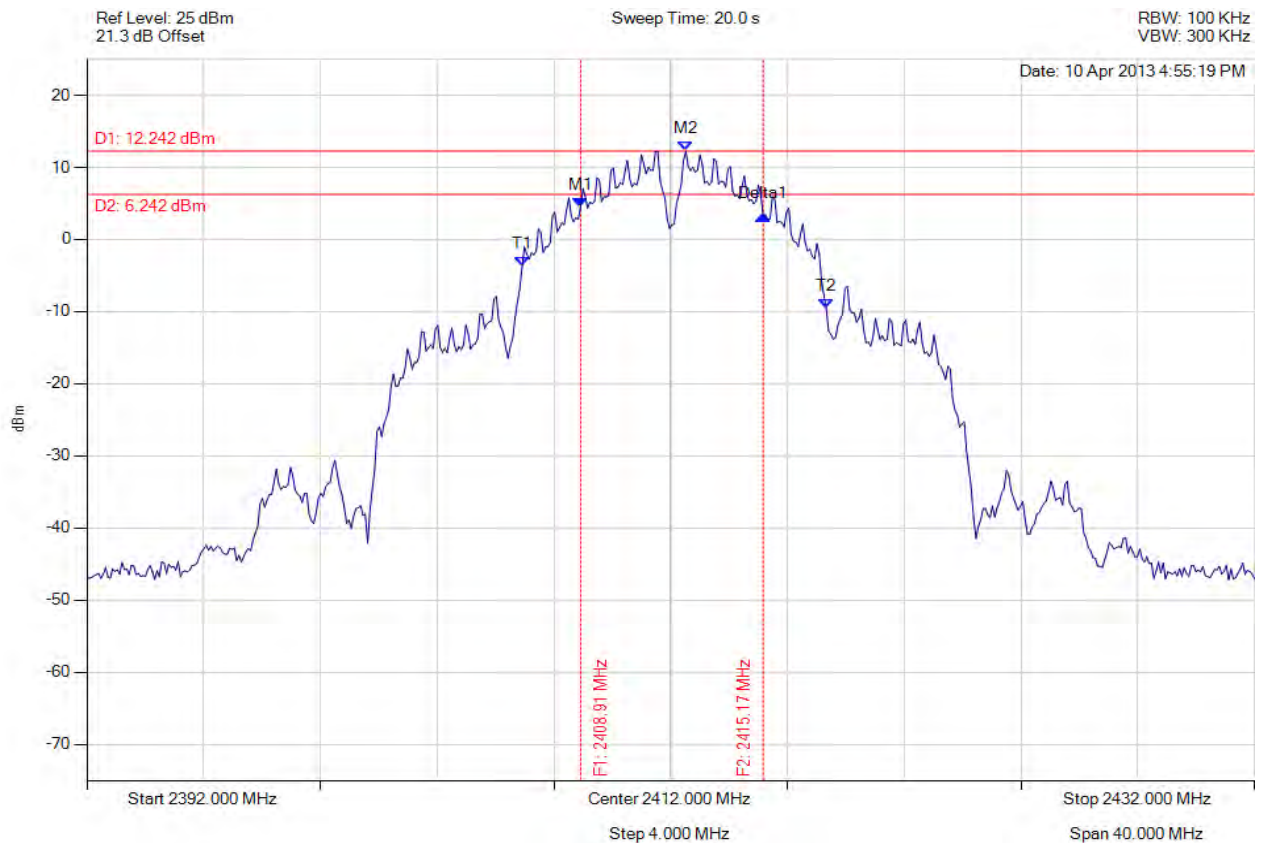


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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2412.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



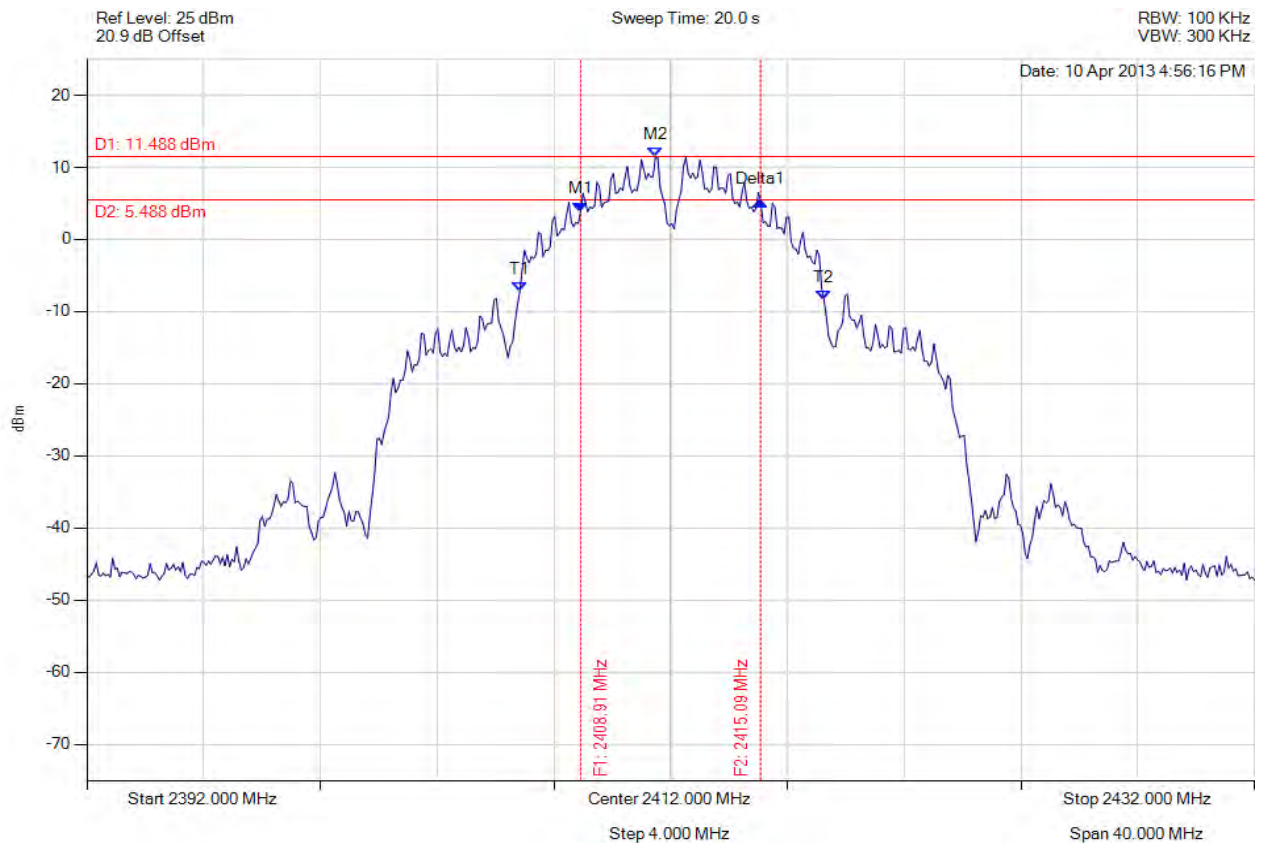
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2408.914 MHz : 4.488 dBm M2 : 2412.521 MHz : 12.242 dBm Delta1 : 6.253 MHz : -1.117 dB T1 : 2406.910 MHz : -3.765 dBm T2 : 2417.331 MHz : -9.604 dBm OBW : 10.421 MHz	Measured 6 dB Bandwidth: 6.253 MHz Limit: ≥ 500.0 kHz Margin: -5.75 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2412.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



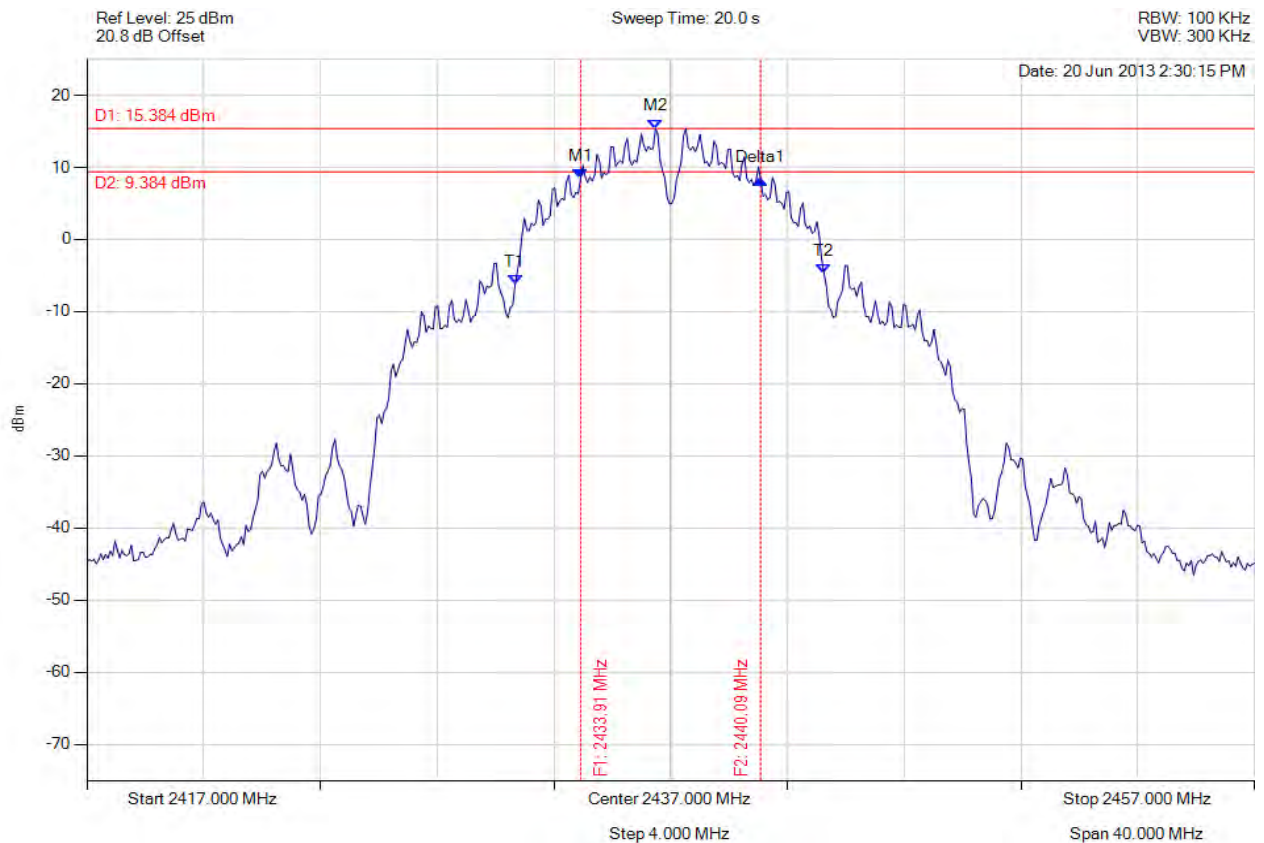
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2408.914 MHz : 3.886 dBm M2 : 2411.479 MHz : 11.488 dBm Delta1 : 6.172 MHz : 1.379 dB T1 : 2406.830 MHz : -7.202 dBm T2 : 2417.251 MHz : -8.394 dBm OBW : 10.421 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥ 500.0 kHz Margin: -5.67 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



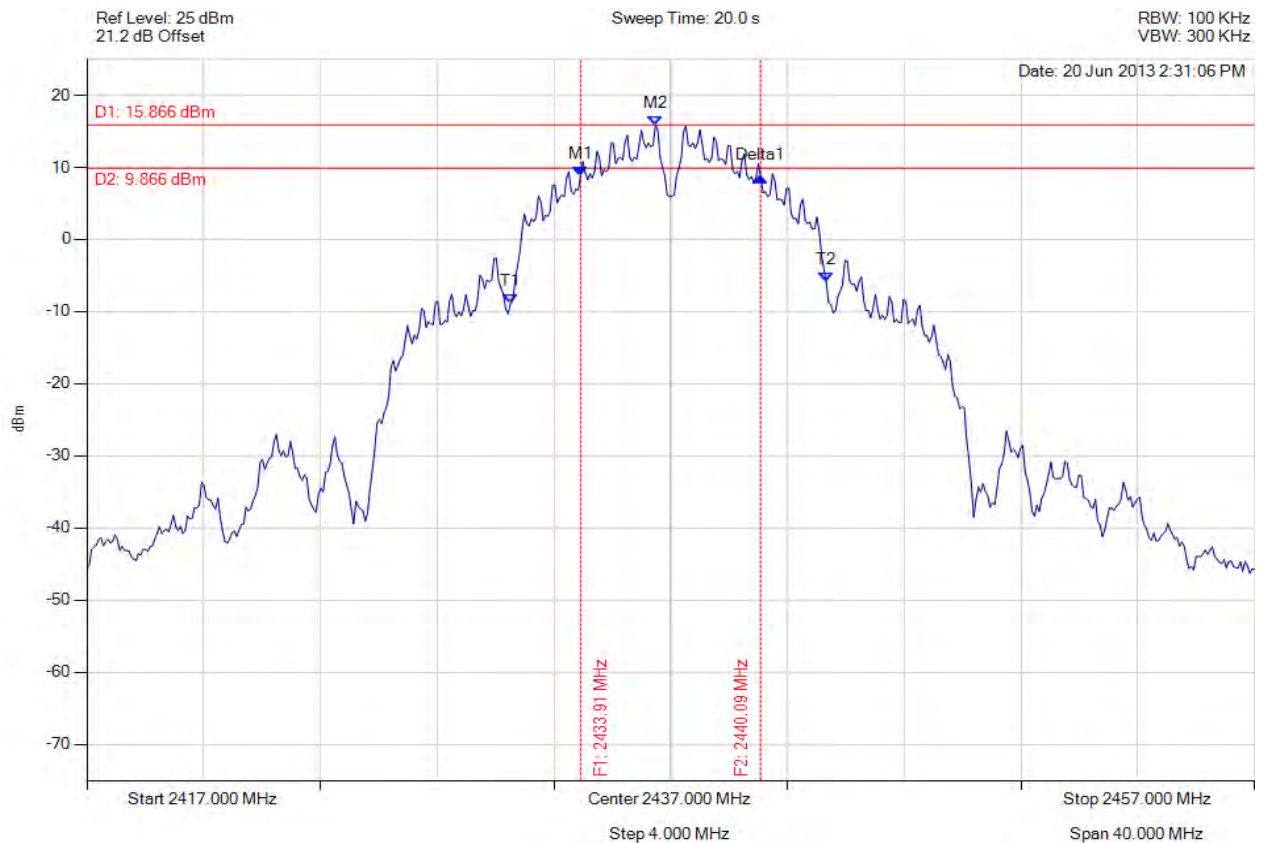
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2433.914 MHz : 8.425 dBm M2 : 2436.479 MHz : 15.384 dBm Delta1 : 6.172 MHz : -0.138 dB T1 : 2431.669 MHz : -6.281 dBm T2 : 2442.251 MHz : -4.676 dBm OBW : 10.581 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥500.0 kHz Margin: -5.67 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2437.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



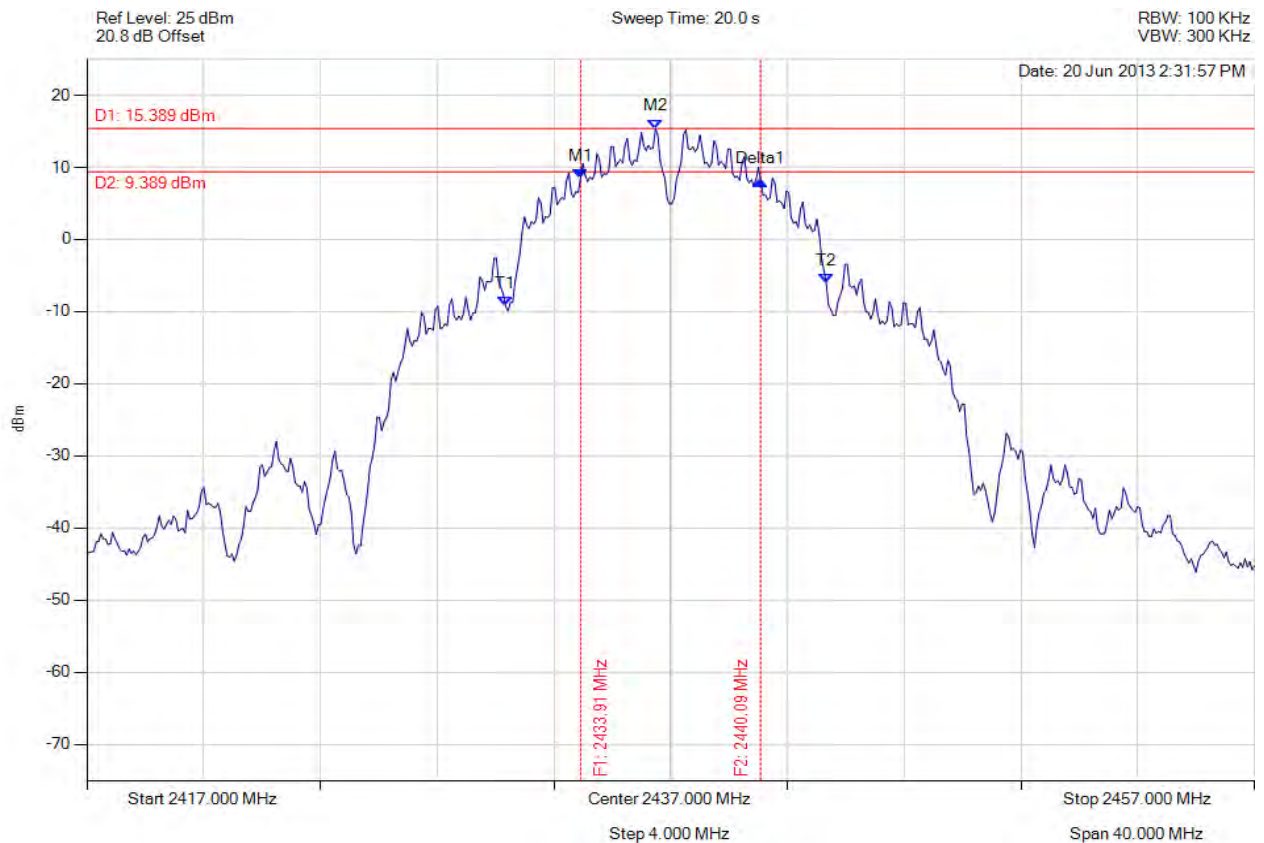
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2433.914 MHz : 8.779 dBm M2 : 2436.479 MHz : 15.866 dBm Delta1 : 6.172 MHz : -0.169 dB T1 : 2431.509 MHz : -8.852 dBm T2 : 2442.331 MHz : -5.840 dBm OBW : 10.822 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥ 500.0 kHz Margin: -5.67 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2437.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



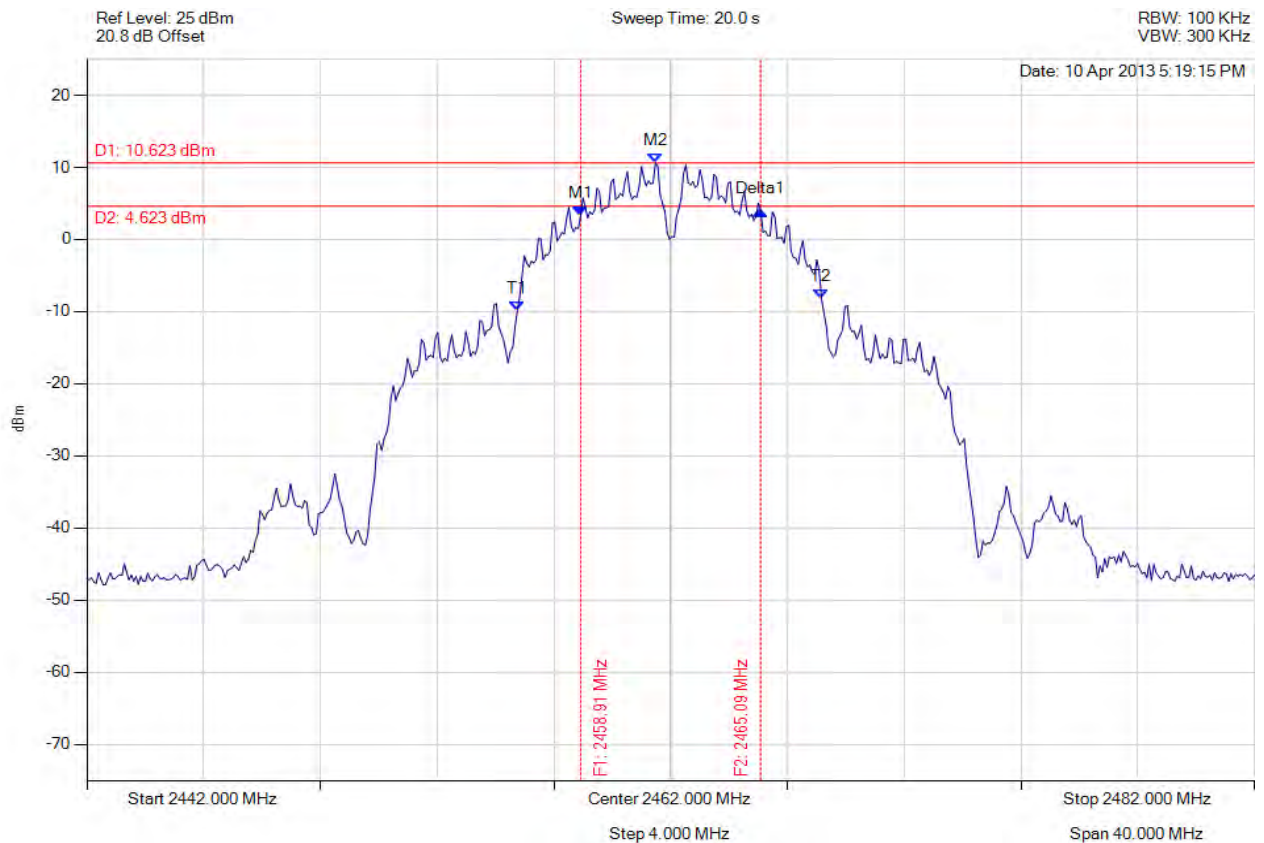
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2433.914 MHz : 8.541 dBm M2 : 2436.479 MHz : 15.389 dBm Delta1 : 6.172 MHz : -0.356 dB T1 : 2431.349 MHz : -9.260 dBm T2 : 2442.331 MHz : -6.053 dBm OBW : 10.982 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥500.0 kHz Margin: -5.67 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



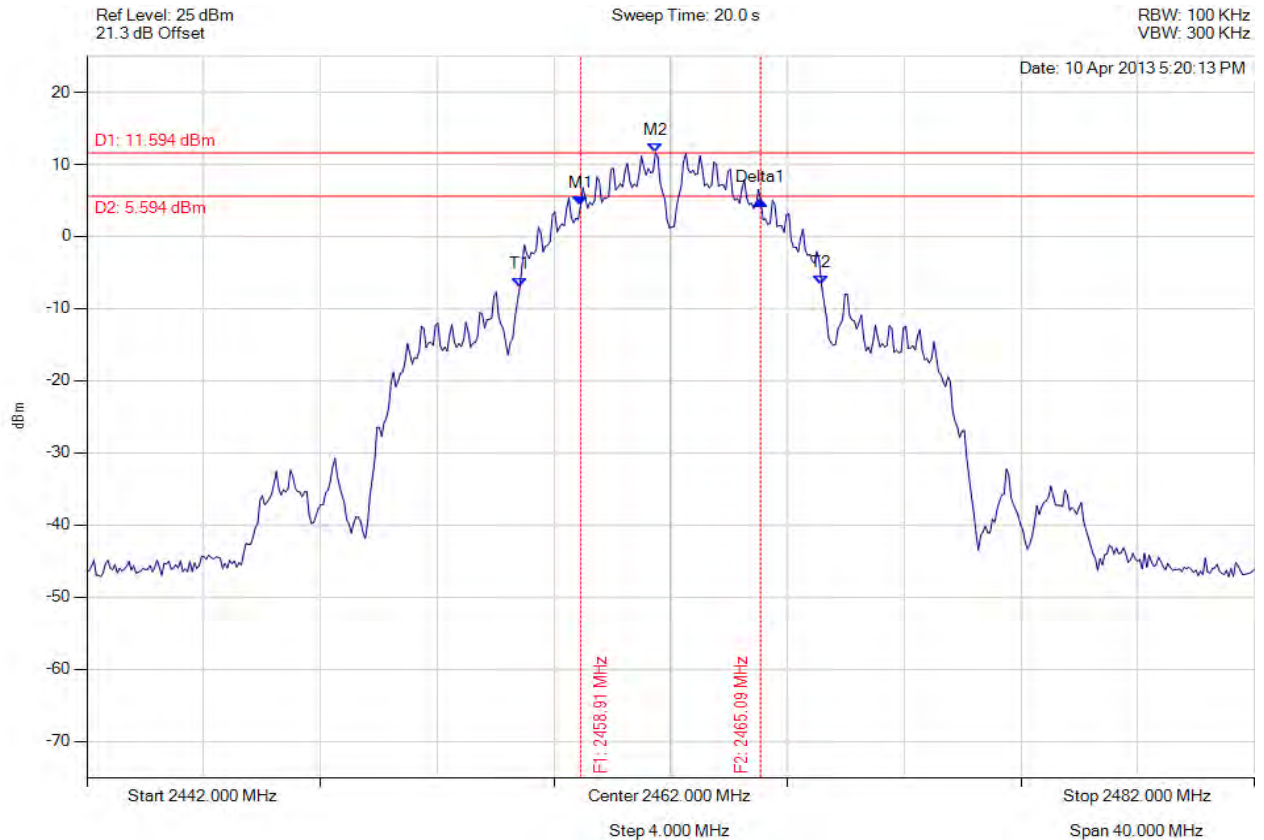
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2458.914 MHz : 3.237 dBm M2 : 2461.479 MHz : 10.623 dBm Delta1 : 6.172 MHz : 0.742 dB T1 : 2456.749 MHz : -9.844 dBm T2 : 2467.170 MHz : -8.213 dBm OBW : 10.421 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥ 500.0 kHz Margin: -5.67 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2462.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2458.914 MHz : 4.229 dBm M2 : 2461.479 MHz : 11.594 dBm Delta1 : 6.172 MHz : 0.824 dB T1 : 2456.830 MHz : -6.962 dBm T2 : 2467.170 MHz : -6.724 dBm OBW : 10.341 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥ 500.0 kHz Margin: -5.67 MHz

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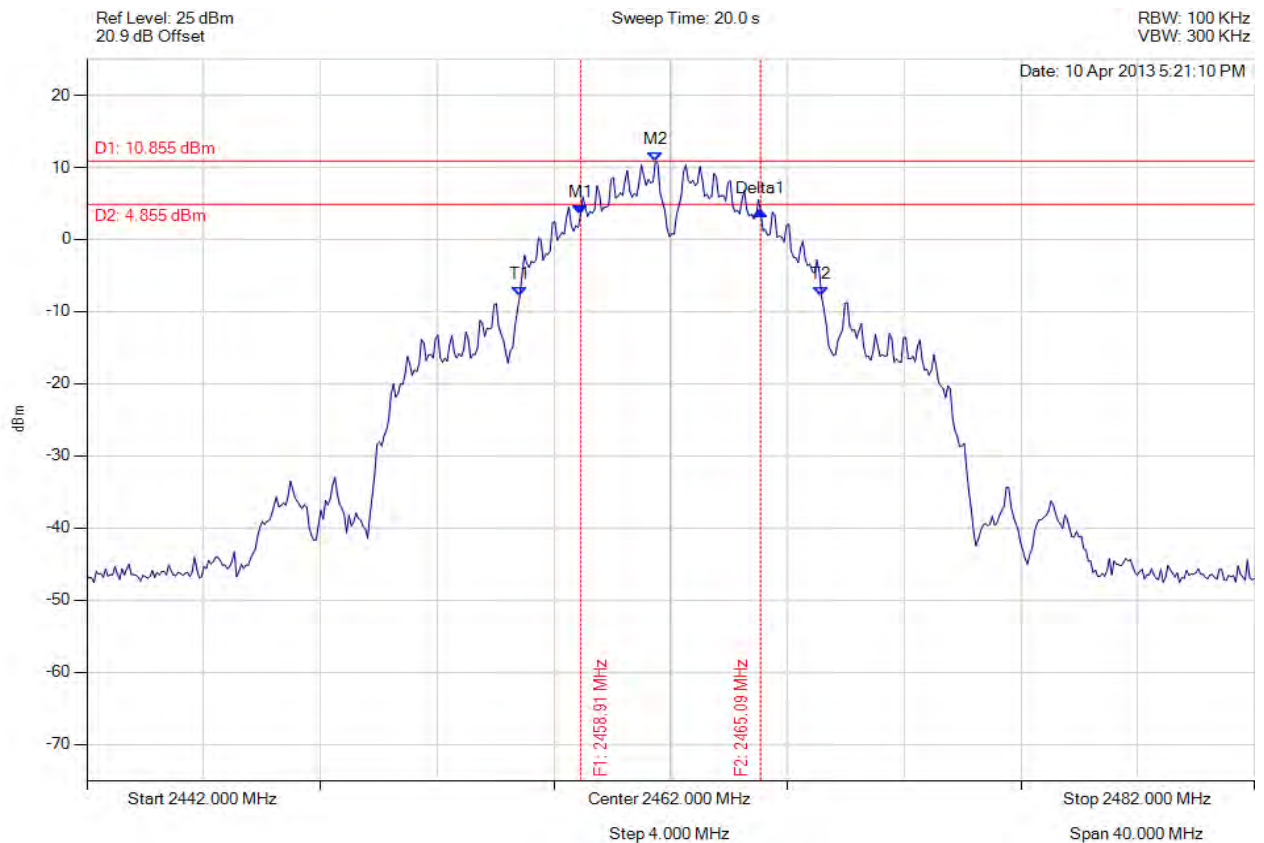


Title: APIN0114, APIN0115 802.11a/b/g/n
To: FCC 47 CFR Part 15.247 & IC RSS-210
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6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2462.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2458.914 MHz : 3.471 dBm M2 : 2461.479 MHz : 10.855 dBm Delta1 : 6.172 MHz : 0.472 dB T1 : 2456.830 MHz : -7.831 dBm T2 : 2467.170 MHz : -7.939 dBm OBW : 10.341 MHz	Measured 6 dB Bandwidth: 6.172 MHz Limit: ≥ 500.0 kHz Margin: -5.67 MHz

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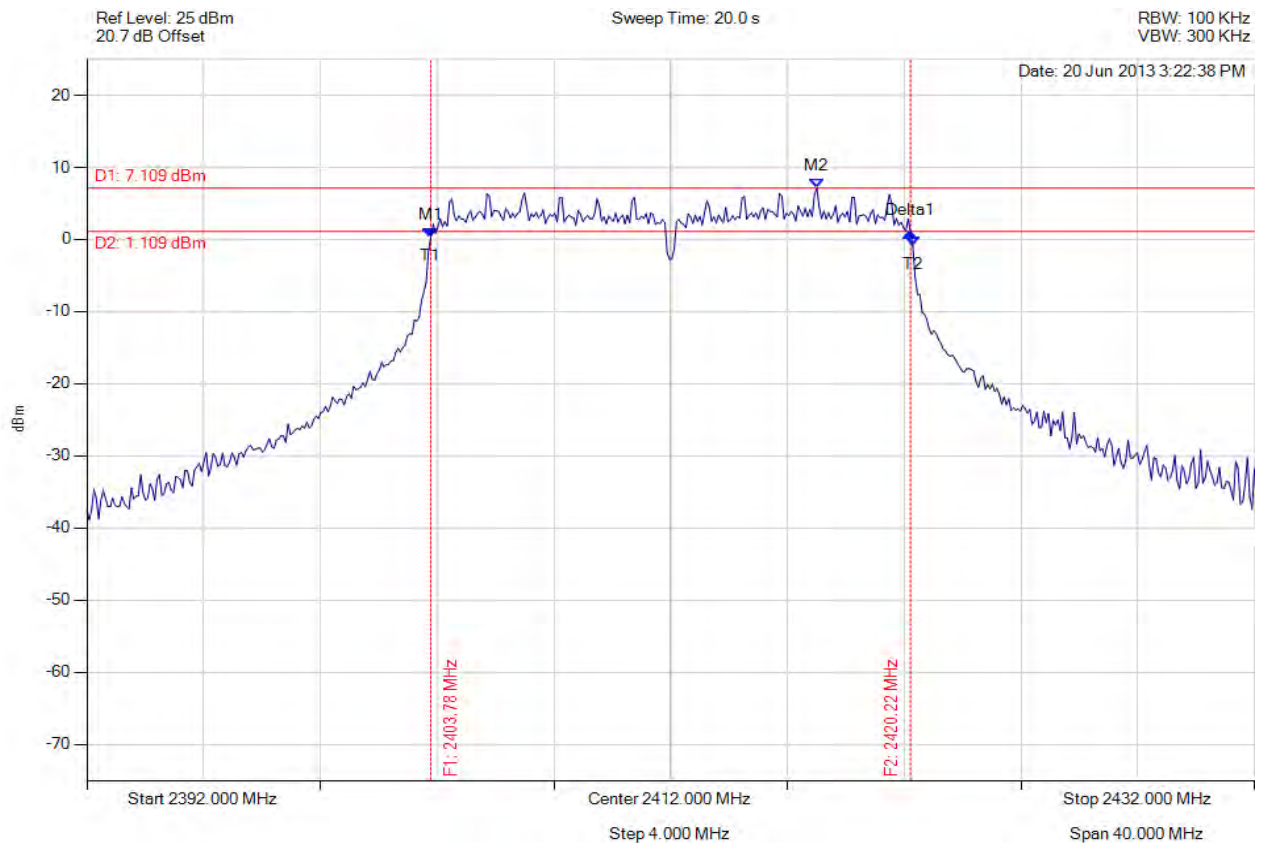


Title: APIN0114, APIN0115 802.11a/b/g/n
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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



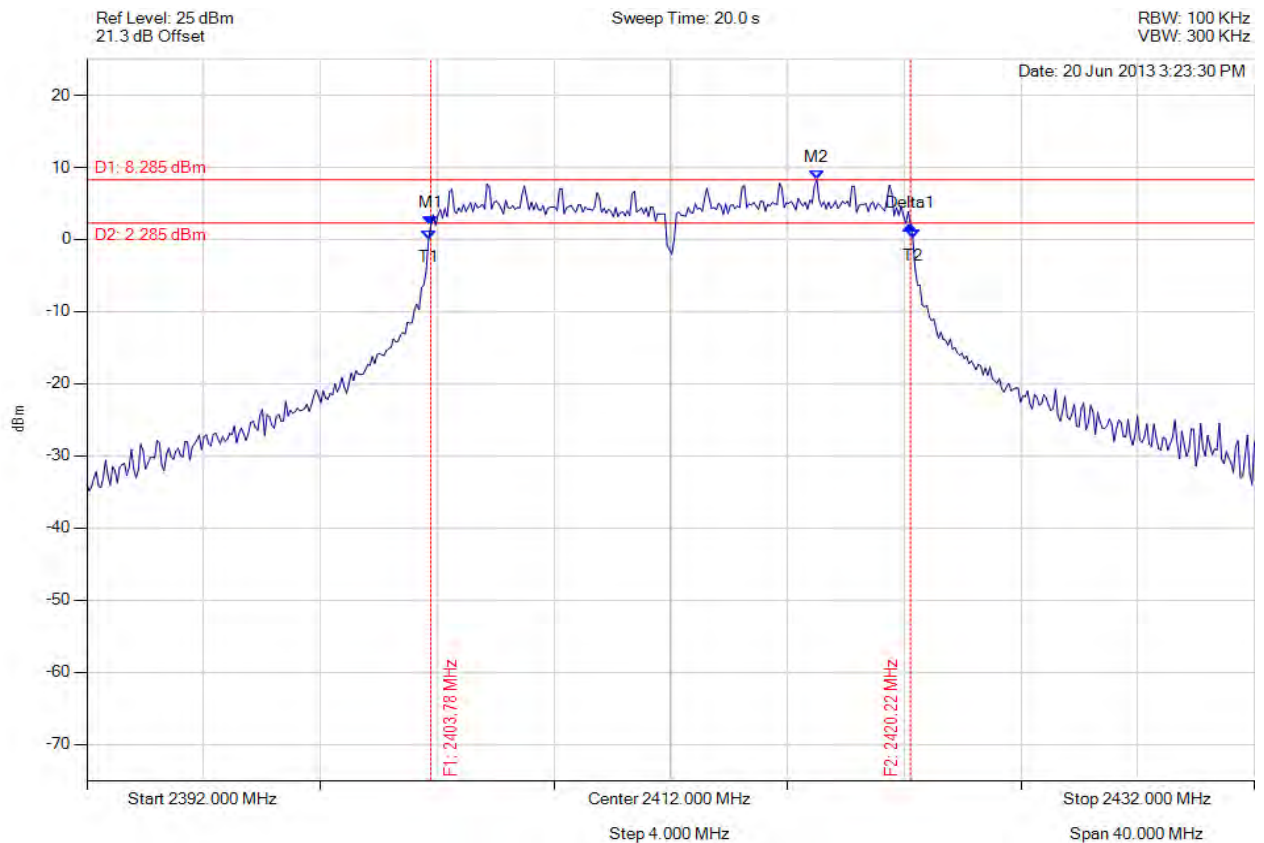
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.784 MHz : 0.320 dBm M2 : 2417.010 MHz : 7.109 dBm Delta1 : 16.433 MHz : 0.681 dB T1 : 2403.784 MHz : 0.320 dBm T2 : 2420.297 MHz : -0.934 dBm OBW : 16.513 MHz	Measured 6 dB Bandwidth: 16.433 MHz Limit: ≥ 500.0 kHz Margin: -15.93 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2412.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



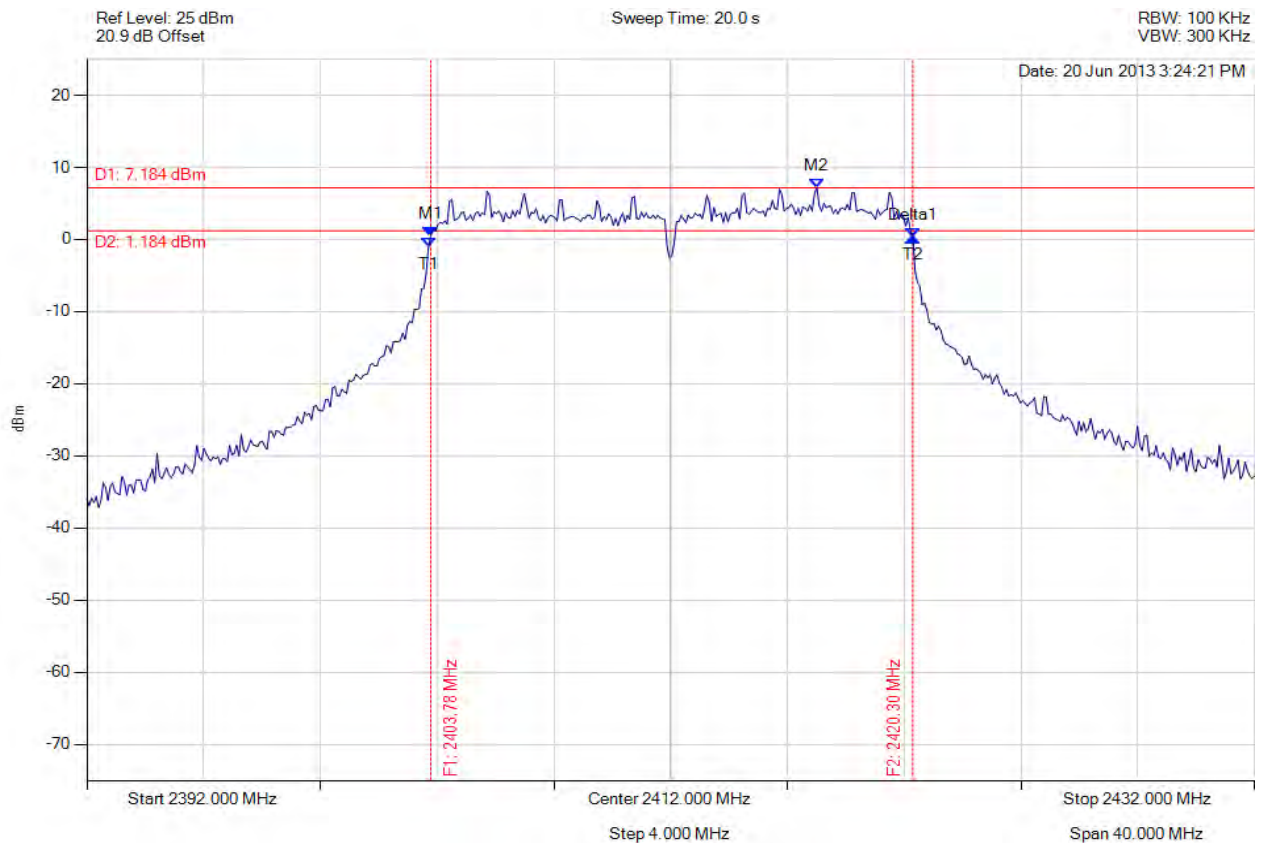
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.784 MHz : 1.935 dBm M2 : 2417.010 MHz : 8.285 dBm Delta1 : 16.433 MHz : 0.055 dB T1 : 2403.703 MHz : 0.001 dBm T2 : 2420.297 MHz : 0.180 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.433 MHz Limit: ≥ 500.0 kHz Margin: -15.93 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2412.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



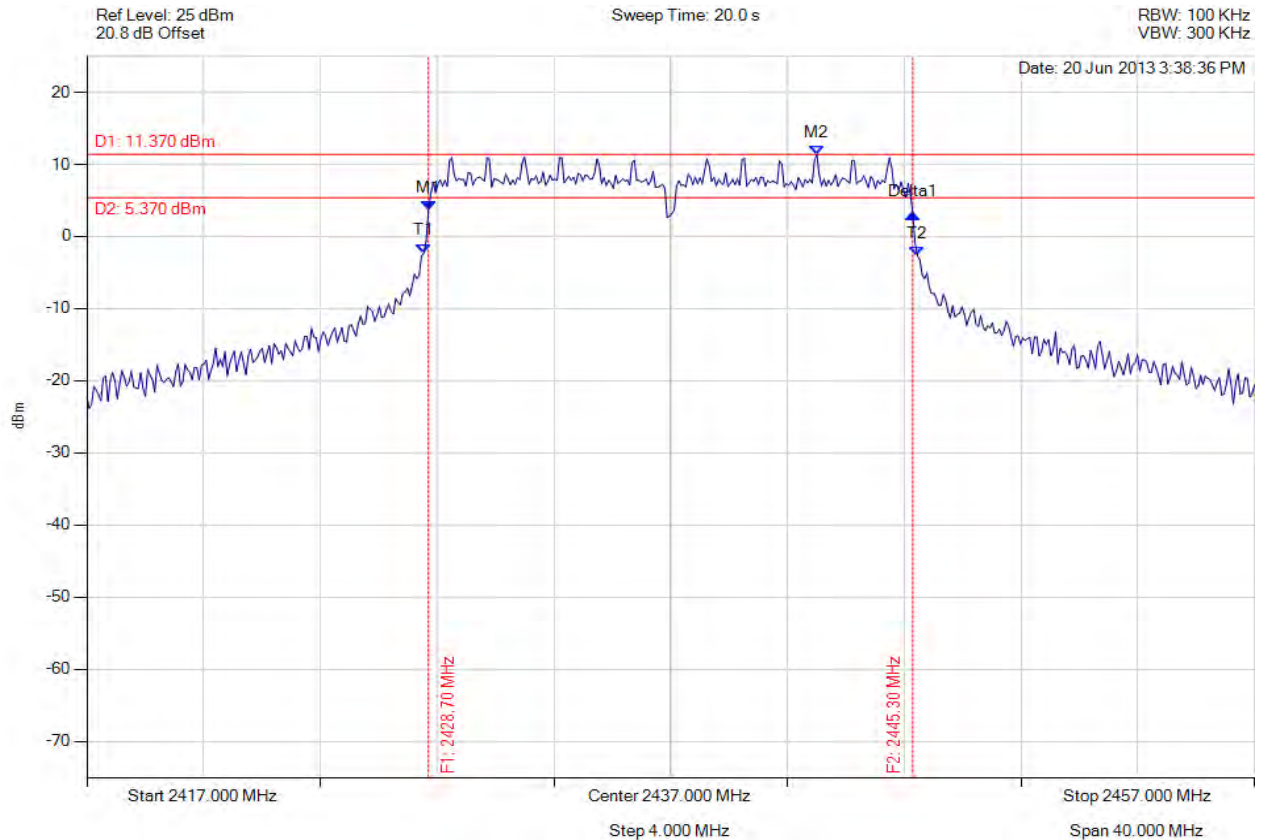
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.784 MHz : 0.506 dBm M2 : 2417.010 MHz : 7.184 dBm Delta1 : 16.513 MHz : -0.153 dB T1 : 2403.703 MHz : -0.971 dBm T2 : 2420.297 MHz : 0.353 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



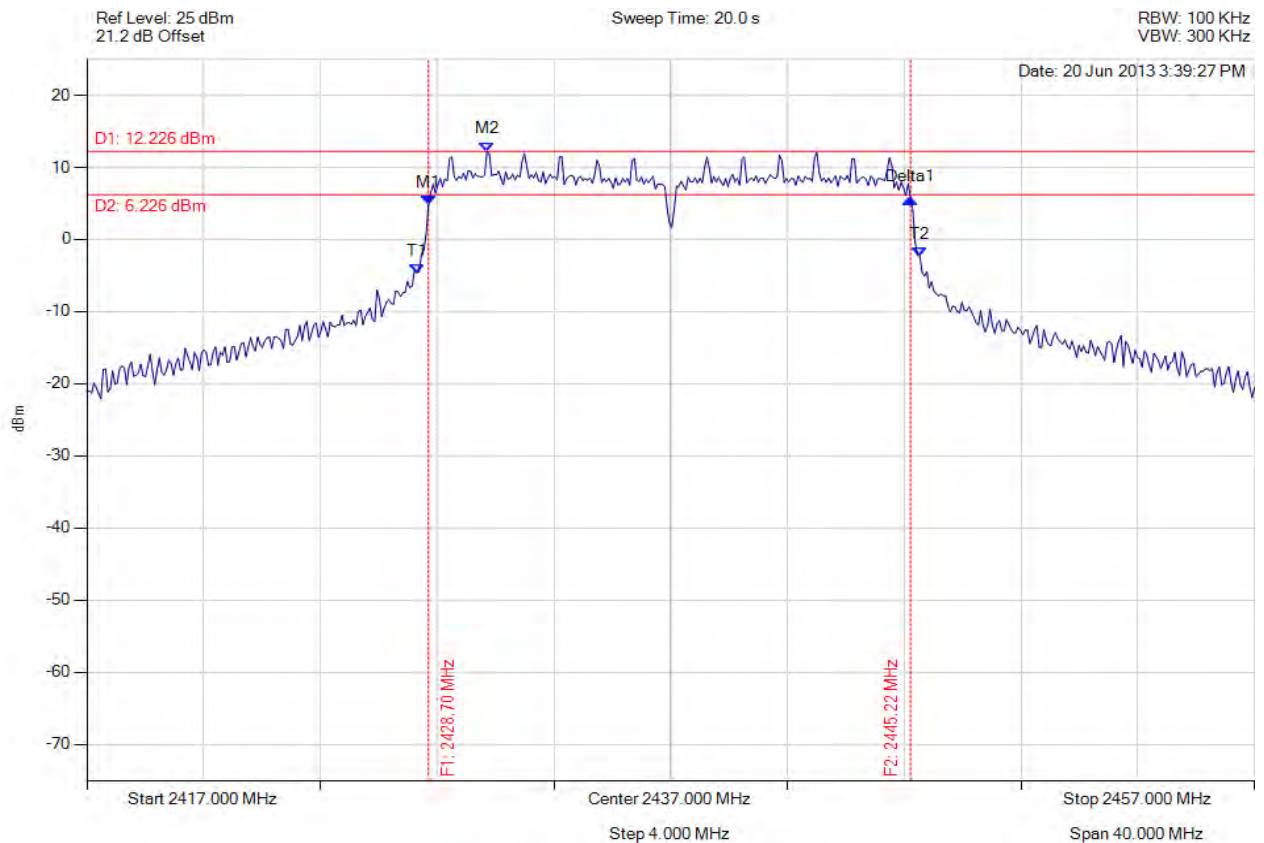
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2428.703 MHz : 3.686 dBm M2 : 2442.010 MHz : 11.370 dBm Delta1 : 16.593 MHz : -0.531 dB T1 : 2428.543 MHz : -2.293 dBm T2 : 2445.457 MHz : -2.726 dBm OBW : 16.914 MHz	Measured 6 dB Bandwidth: 16.593 MHz Limit: ≥ 500.0 kHz Margin: -16.09 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2437.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



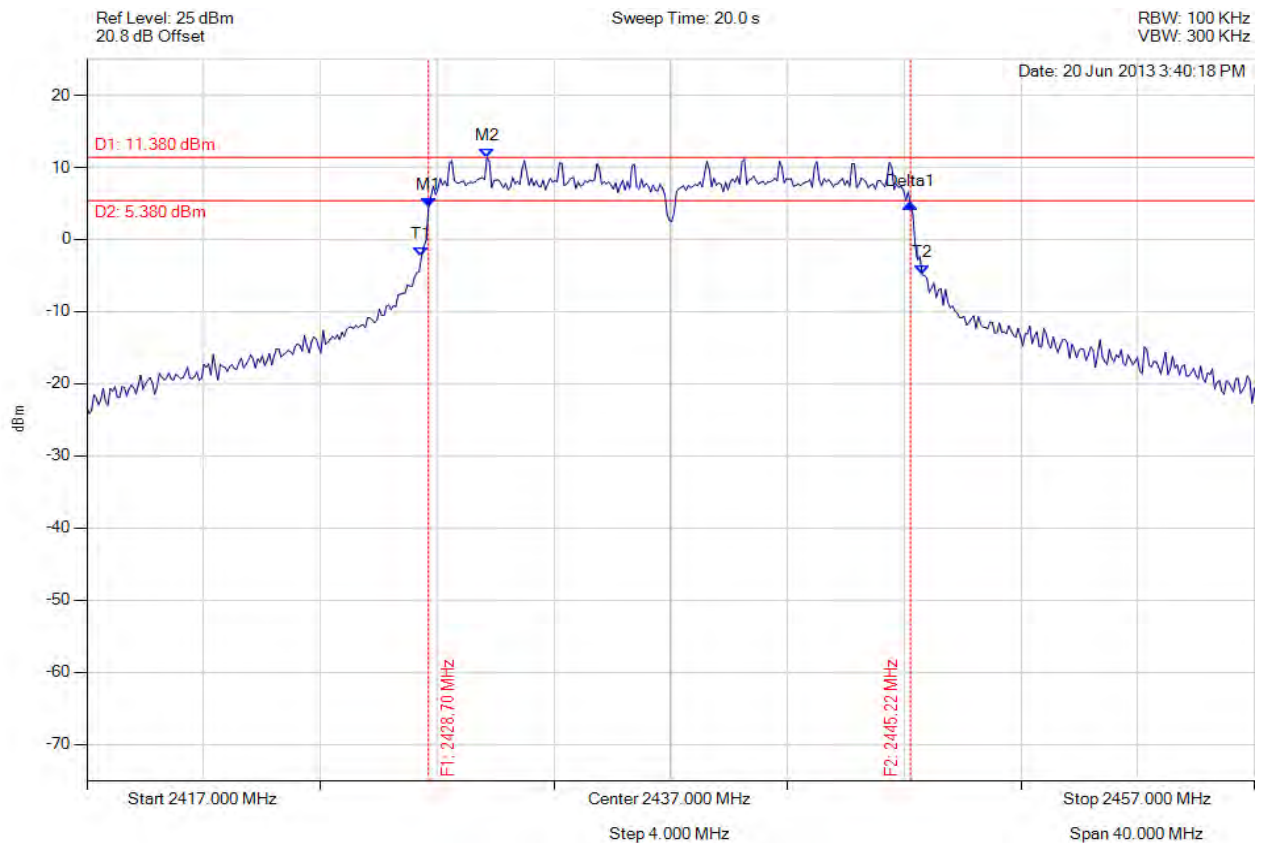
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2428.703 MHz : 4.844 dBm M2 : 2430.707 MHz : 12.226 dBm Delta1 : 16.513 MHz : 0.862 dB T1 : 2428.303 MHz : -4.654 dBm T2 : 2445.537 MHz : -2.309 dBm OBW : 17.234 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2437.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



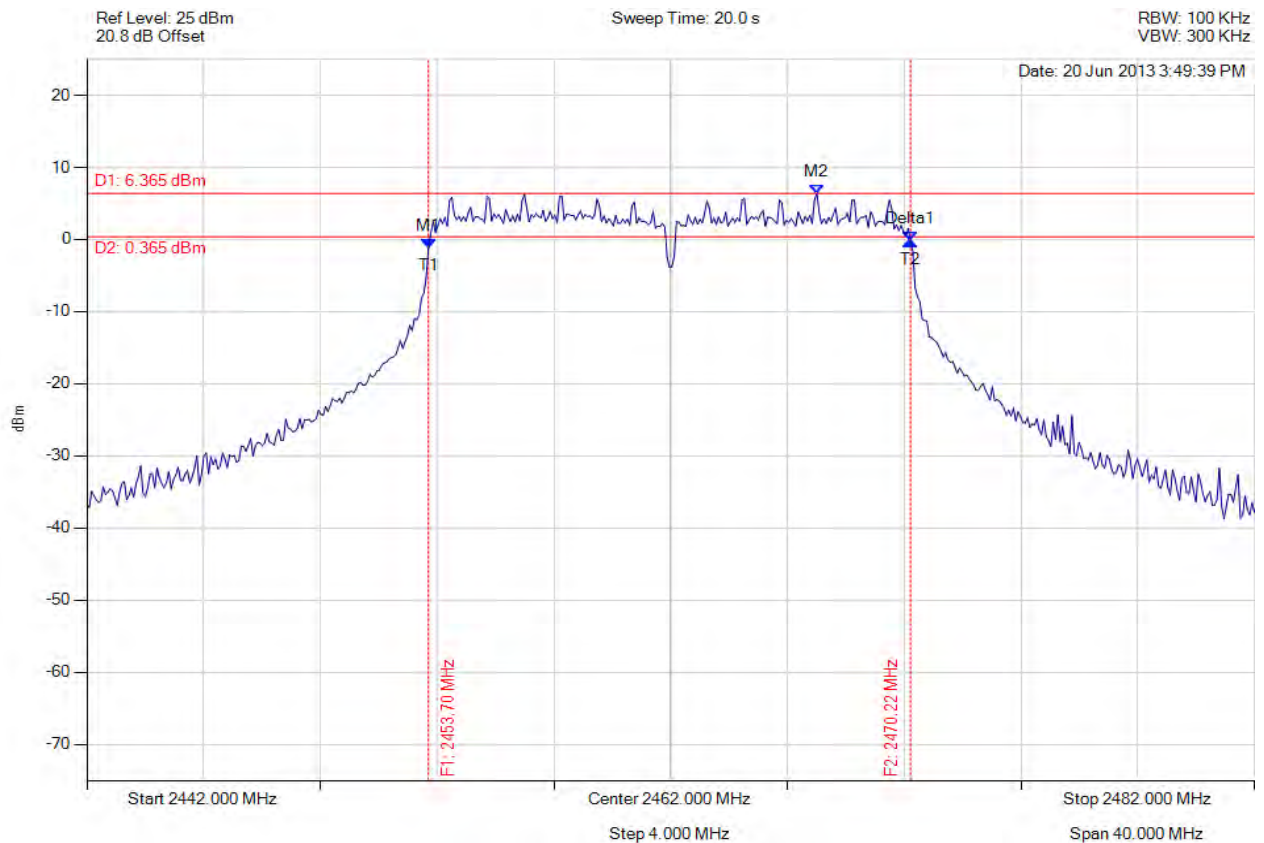
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2428.703 MHz : 4.421 dBm M2 : 2430.707 MHz : 11.380 dBm Delta1 : 16.513 MHz : 0.480 dB T1 : 2428.463 MHz : -2.374 dBm T2 : 2445.617 MHz : -4.906 dBm OBW : 17.154 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



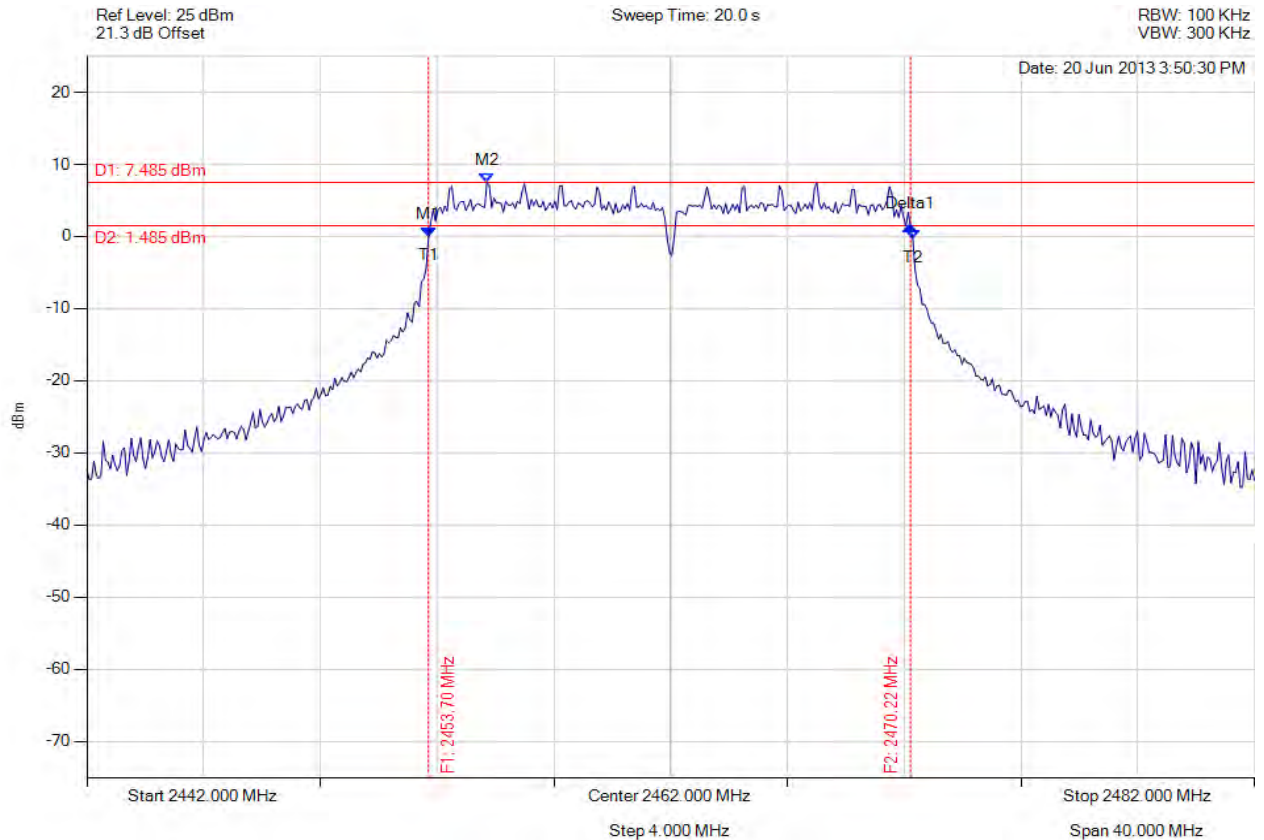
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2453.703 MHz : -1.136 dBm M2 : 2467.010 MHz : 6.365 dBm Delta1 : 16.513 MHz : 0.903 dB T1 : 2453.703 MHz : -1.136 dBm T2 : 2470.216 MHz : -0.233 dBm OBW : 16.513 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2462.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



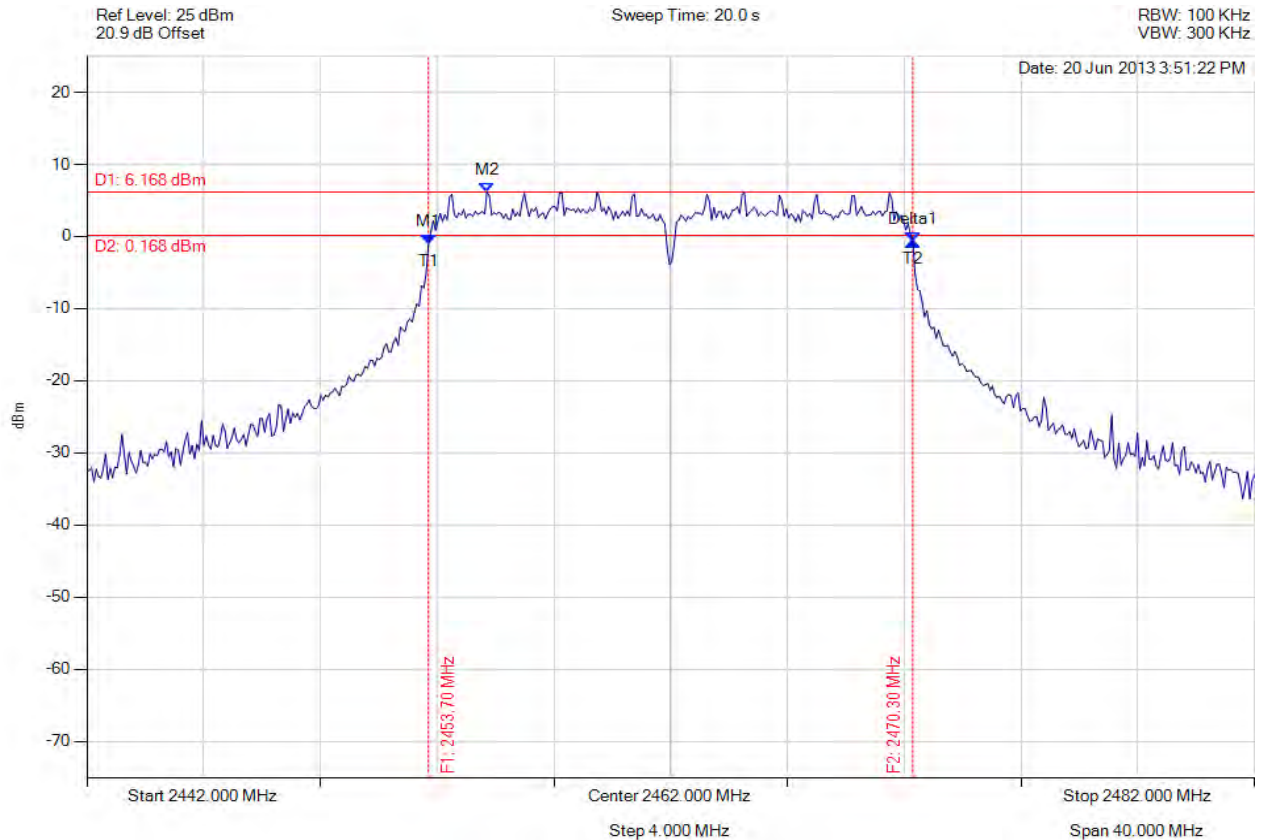
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2453.703 MHz : -0.088 dBm M2 : 2455.707 MHz : 7.485 dBm Delta1 : 16.513 MHz : 1.485 dB T1 : 2453.703 MHz : -0.088 dBm T2 : 2470.297 MHz : -0.353 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2462.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



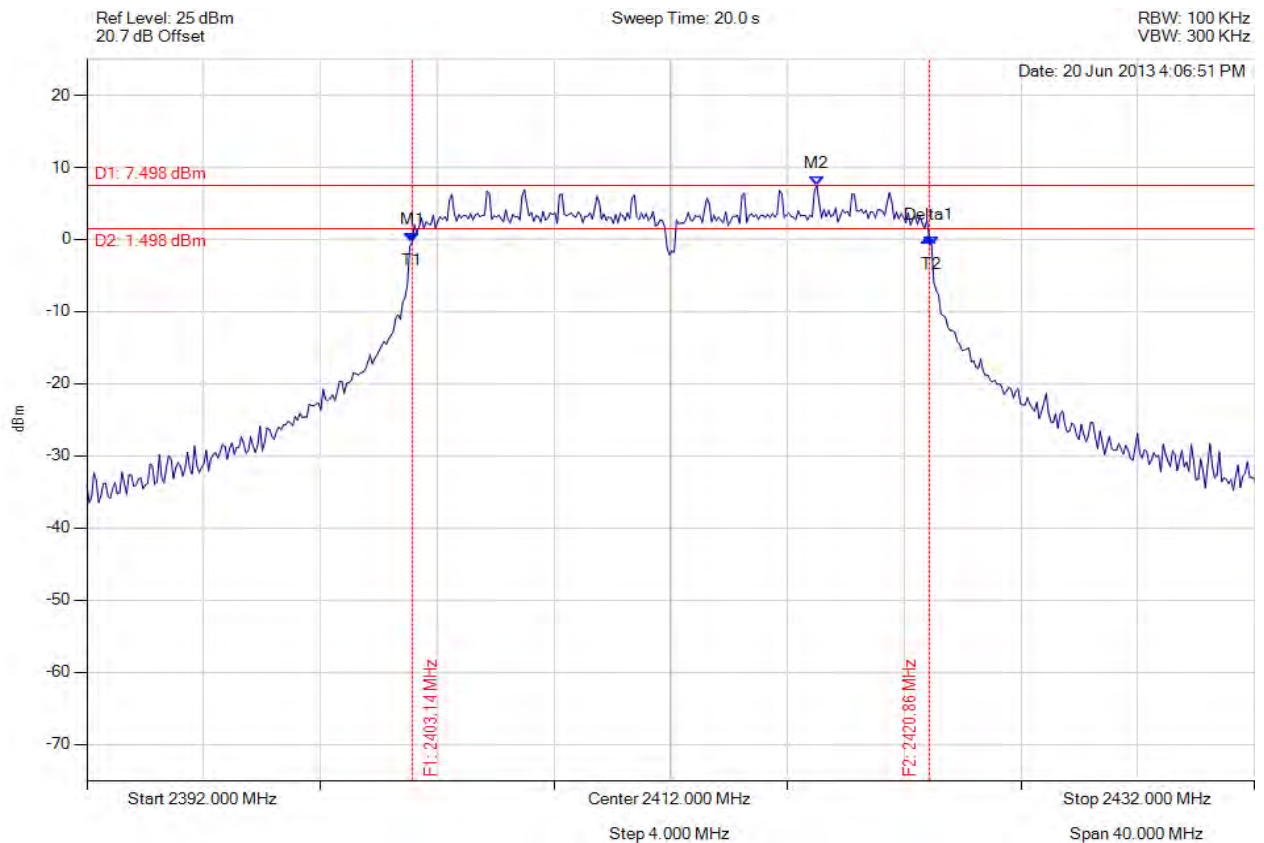
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2453.703 MHz : -0.969 dBm M2 : 2455.707 MHz : 6.168 dBm Delta1 : 16.593 MHz : 0.299 dB T1 : 2453.703 MHz : -0.969 dBm T2 : 2470.297 MHz : -0.670 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.593 MHz Limit: ≥ 500.0 kHz Margin: -16.09 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



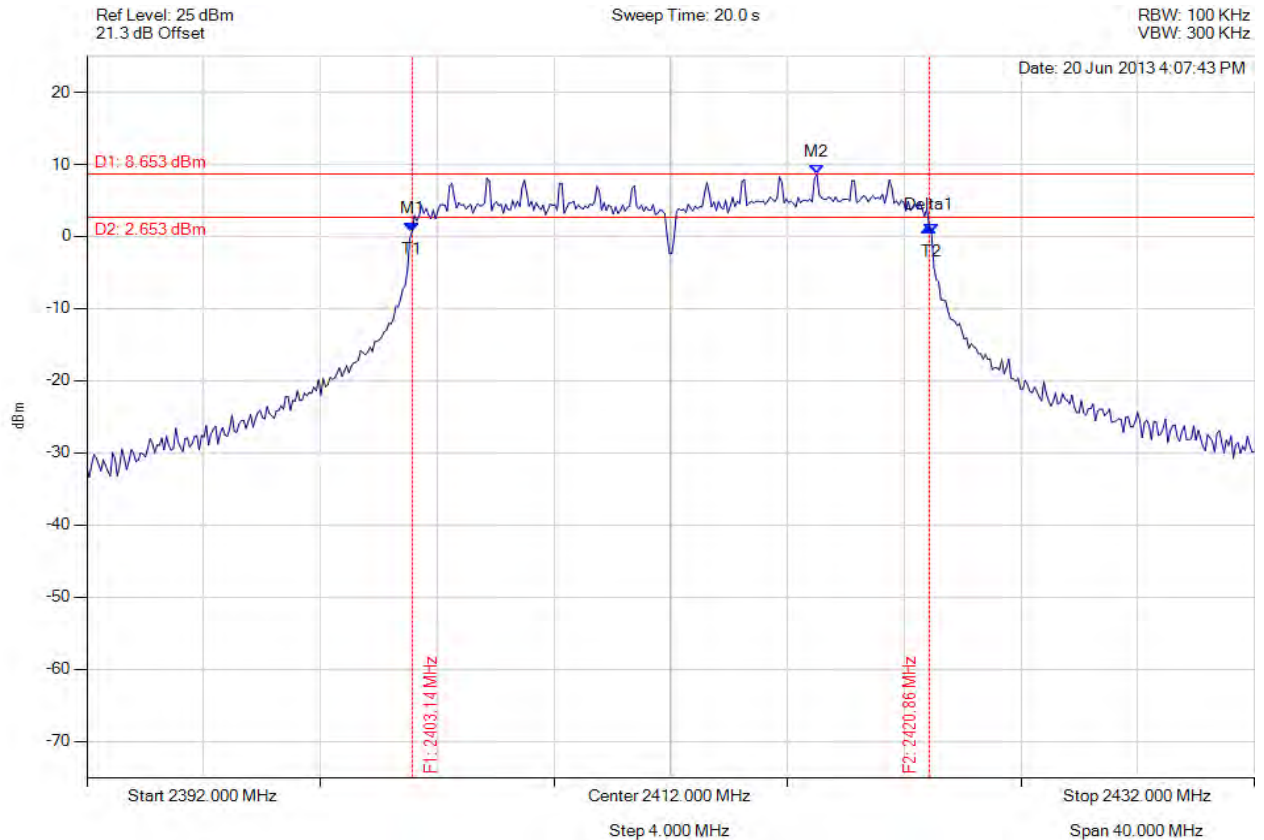
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.142 MHz : -0.383 dBm M2 : 2417.010 MHz : 7.498 dBm Delta1 : 17.715 MHz : 0.608 dB T1 : 2403.142 MHz : -0.383 dBm T2 : 2420.938 MHz : -0.916 dBm OBW : 17.796 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥ 500.0 kHz Margin: -17.22 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2412.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.142 MHz : 0.719 dBm M2 : 2417.010 MHz : 8.653 dBm Delta1 : 17.715 MHz : 0.639 dB T1 : 2403.142 MHz : 0.719 dBm T2 : 2420.938 MHz : 0.483 dBm OBW : 17.796 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥ 500.0 kHz Margin: -17.22 MHz

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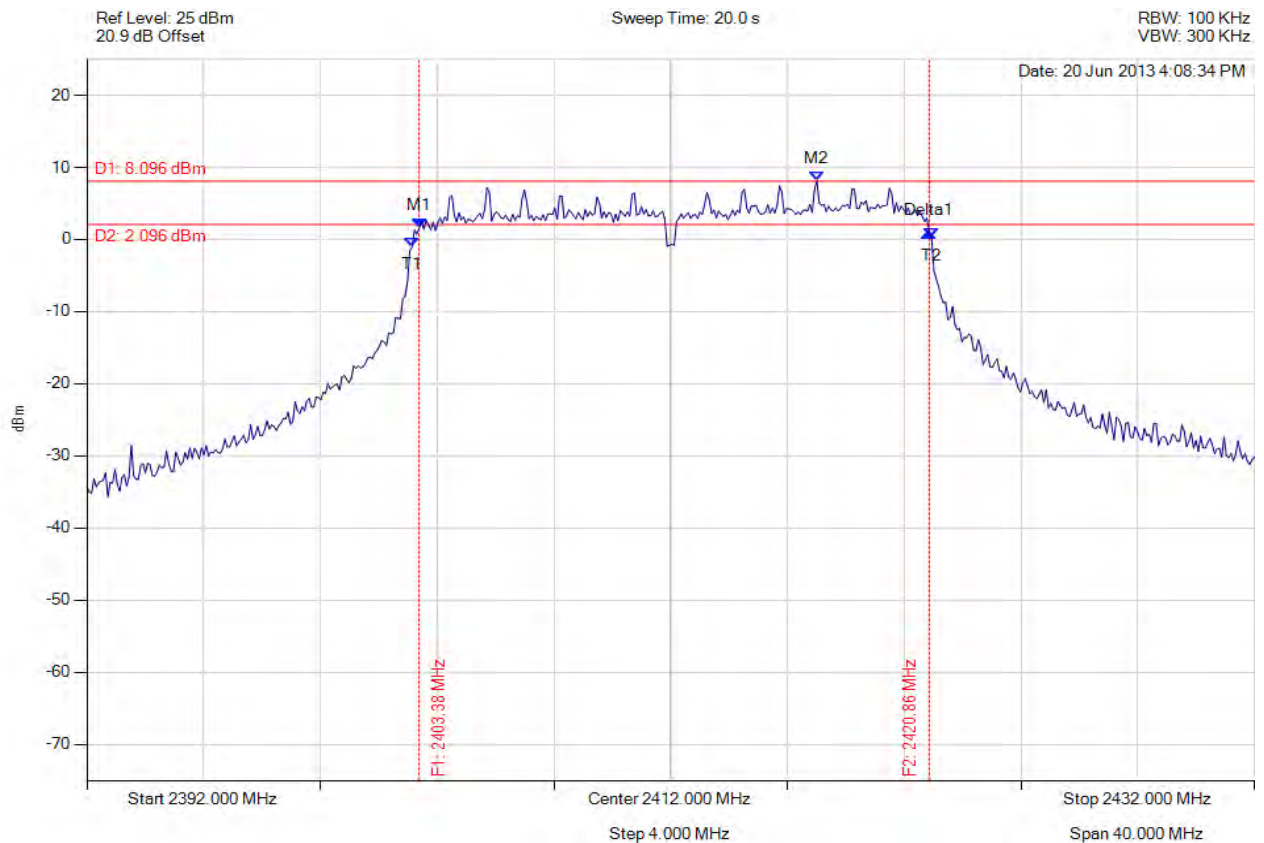


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2412.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.383 MHz : 1.563 dBm M2 : 2417.010 MHz : 8.096 dBm Delta1 : 17.475 MHz : -0.576 dB T1 : 2403.142 MHz : -0.989 dBm T2 : 2420.938 MHz : 0.325 dBm OBW : 17.796 MHz	Measured 6 dB Bandwidth: 17.475 MHz Limit: ≥ 500.0 kHz Margin: -16.98 MHz

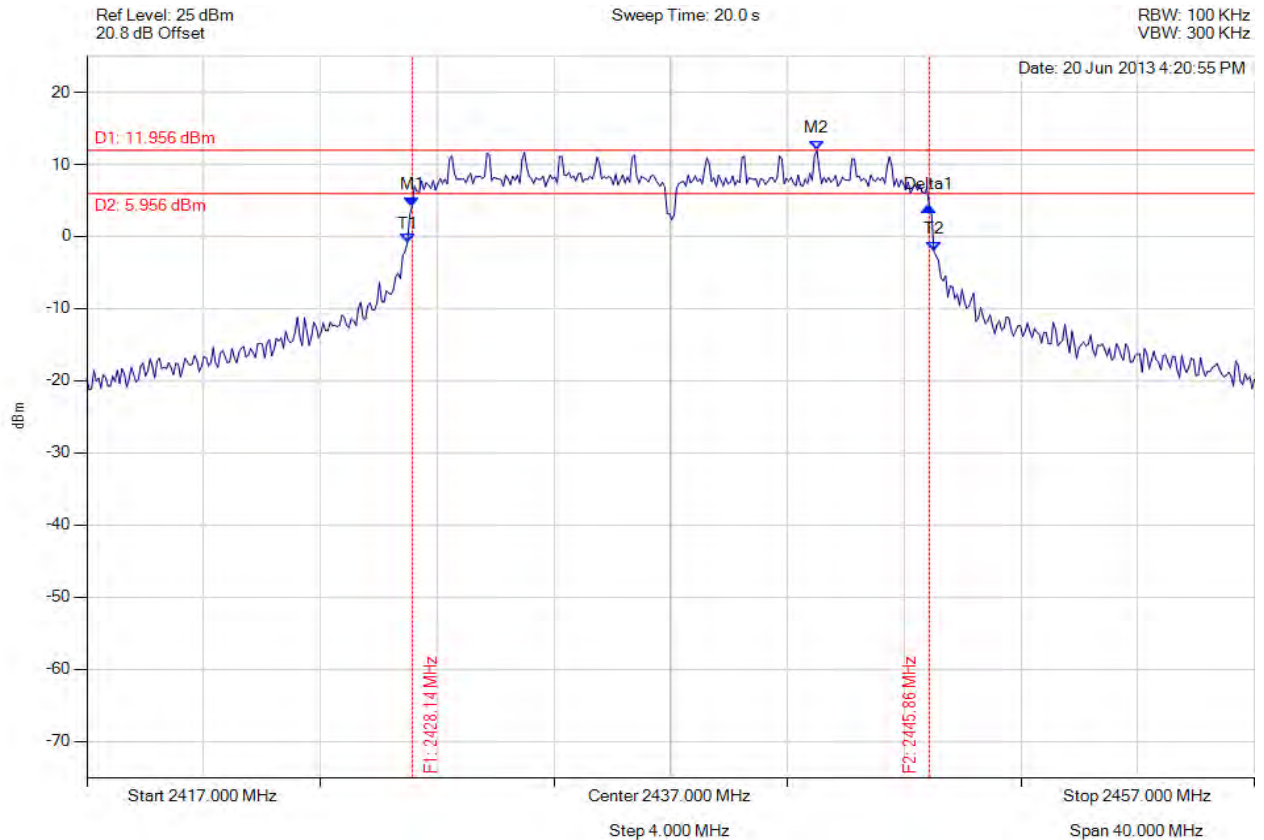
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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



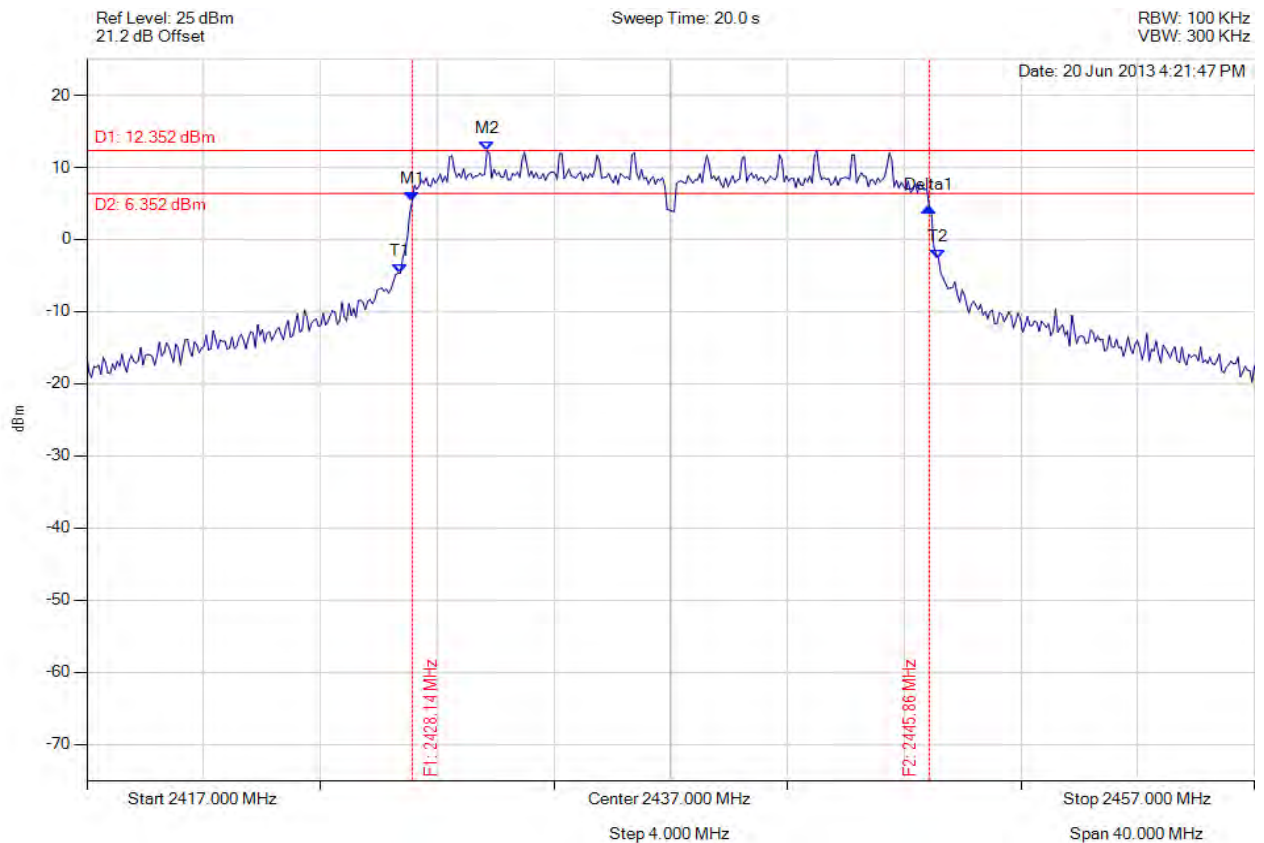
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2428.142 MHz : 4.197 dBm M2 : 2442.010 MHz : 11.956 dBm Delta1 : 17.715 MHz : -0.031 dB T1 : 2427.982 MHz : -0.827 dBm T2 : 2446.018 MHz : -2.079 dBm OBW : 18.036 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥500.0 kHz Margin: -17.22 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2437.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



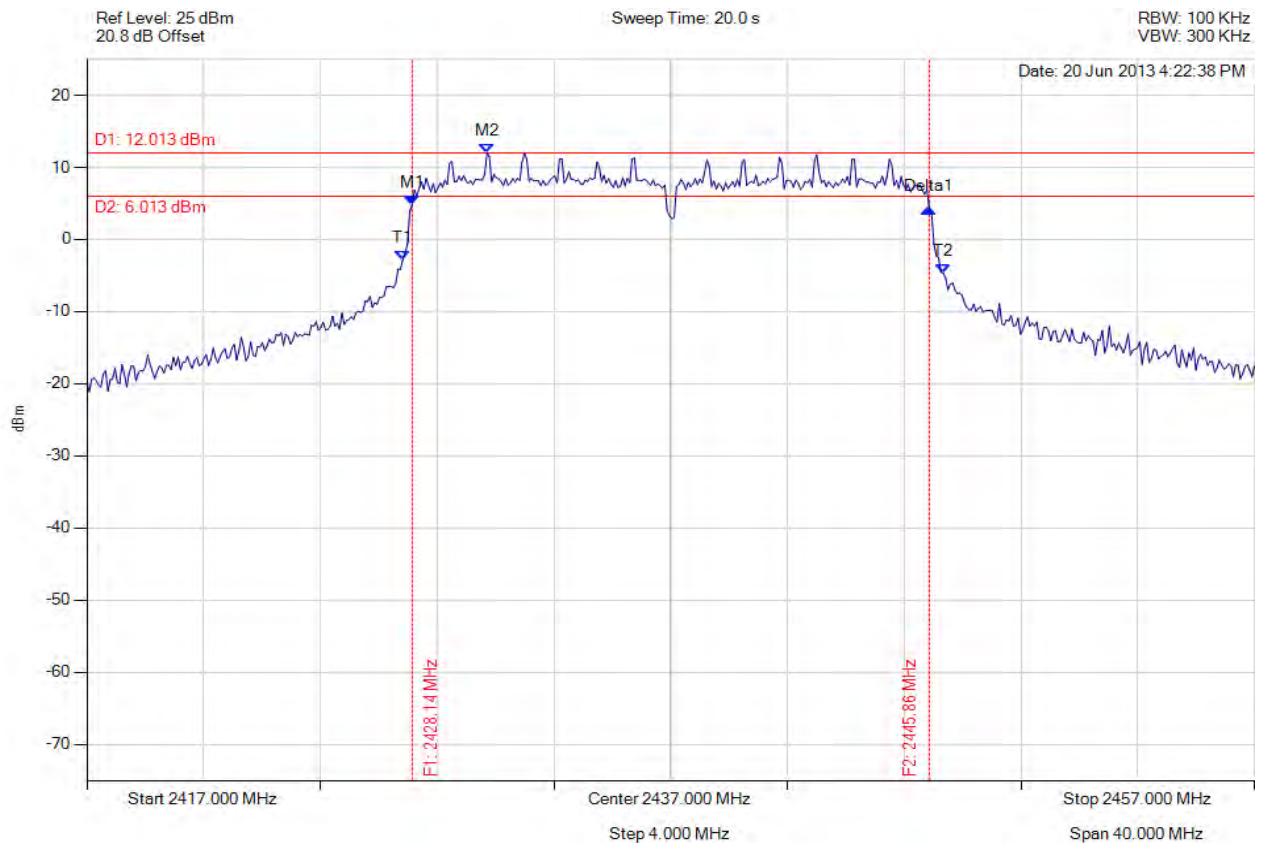
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2428.142 MHz : 5.248 dBm M2 : 2430.707 MHz : 12.352 dBm Delta1 : 17.715 MHz : -0.799 dB T1 : 2427.741 MHz : -4.674 dBm T2 : 2446.178 MHz : -2.694 dBm OBW : 18.437 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥ 500.0 kHz Margin: -17.22 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2437.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2428.142 MHz : 4.831 dBm M2 : 2430.707 MHz : 12.013 dBm Delta1 : 17.715 MHz : -0.500 dB T1 : 2427.822 MHz : -2.803 dBm T2 : 2446.339 MHz : -4.660 dBm OBW : 18.517 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥ 500.0 kHz Margin: -17.22 MHz

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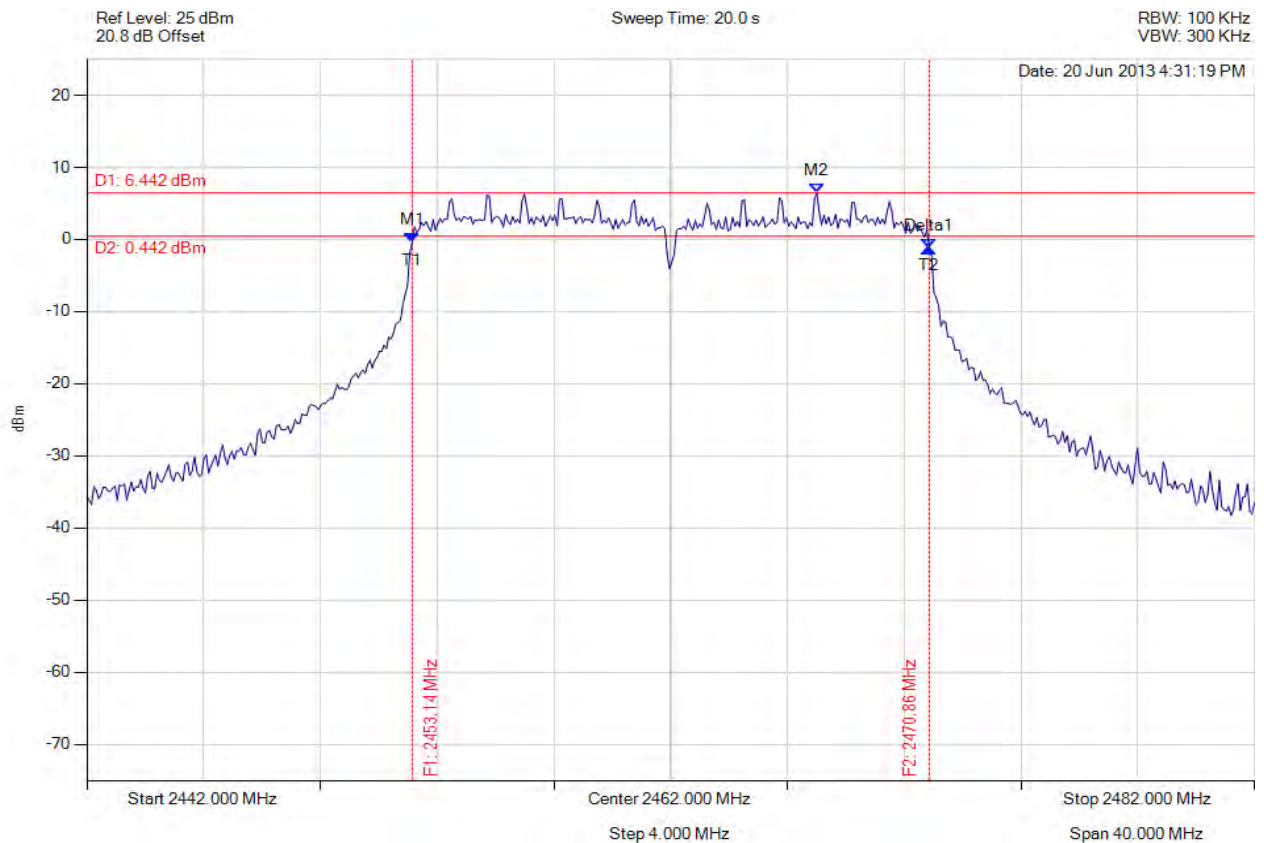


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



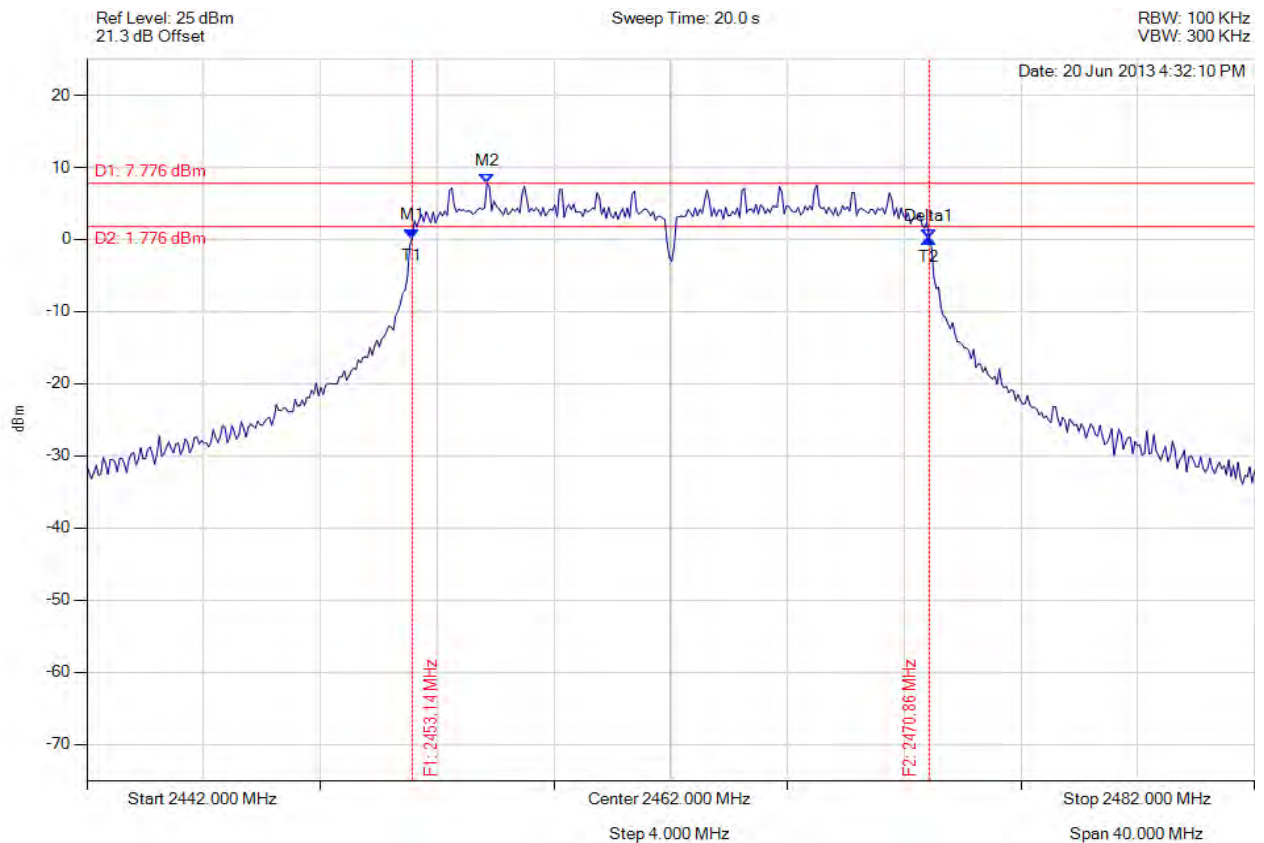
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2453.142 MHz : -0.343 dBm M2 : 2467.010 MHz : 6.442 dBm Delta1 : 17.715 MHz : -0.791 dB T1 : 2453.142 MHz : -0.343 dBm T2 : 2470.858 MHz : -1.134 dBm OBW : 17.715 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥ 500.0 kHz Margin: -17.22 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2462.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2453.142 MHz : 0.217 dBm M2 : 2455.707 MHz : 7.776 dBm Delta1 : 17.715 MHz : -0.073 dB T1 : 2453.142 MHz : 0.217 dBm T2 : 2470.858 MHz : 0.144 dBm OBW : 17.715 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥ 500.0 kHz Margin: -17.22 MHz

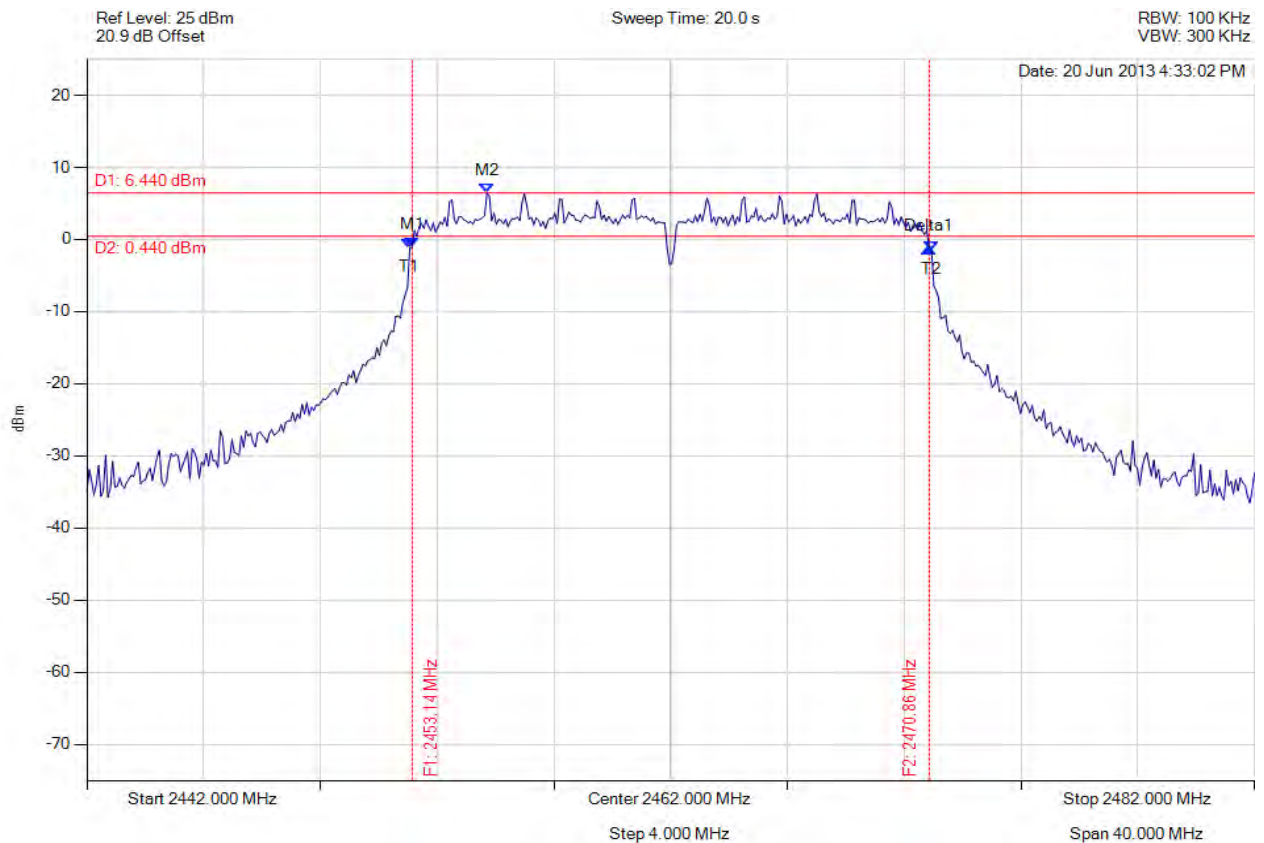
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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 2462.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2453.142 MHz : -1.064 dBm M2 : 2455.707 MHz : 6.440 dBm Delta1 : 17.715 MHz : -0.126 dB T1 : 2453.062 MHz : -1.221 dBm T2 : 2470.938 MHz : -1.536 dBm OBW : 17.876 MHz	Measured 6 dB Bandwidth: 17.715 MHz Limit: ≥500.0 kHz Margin: -17.22 MHz

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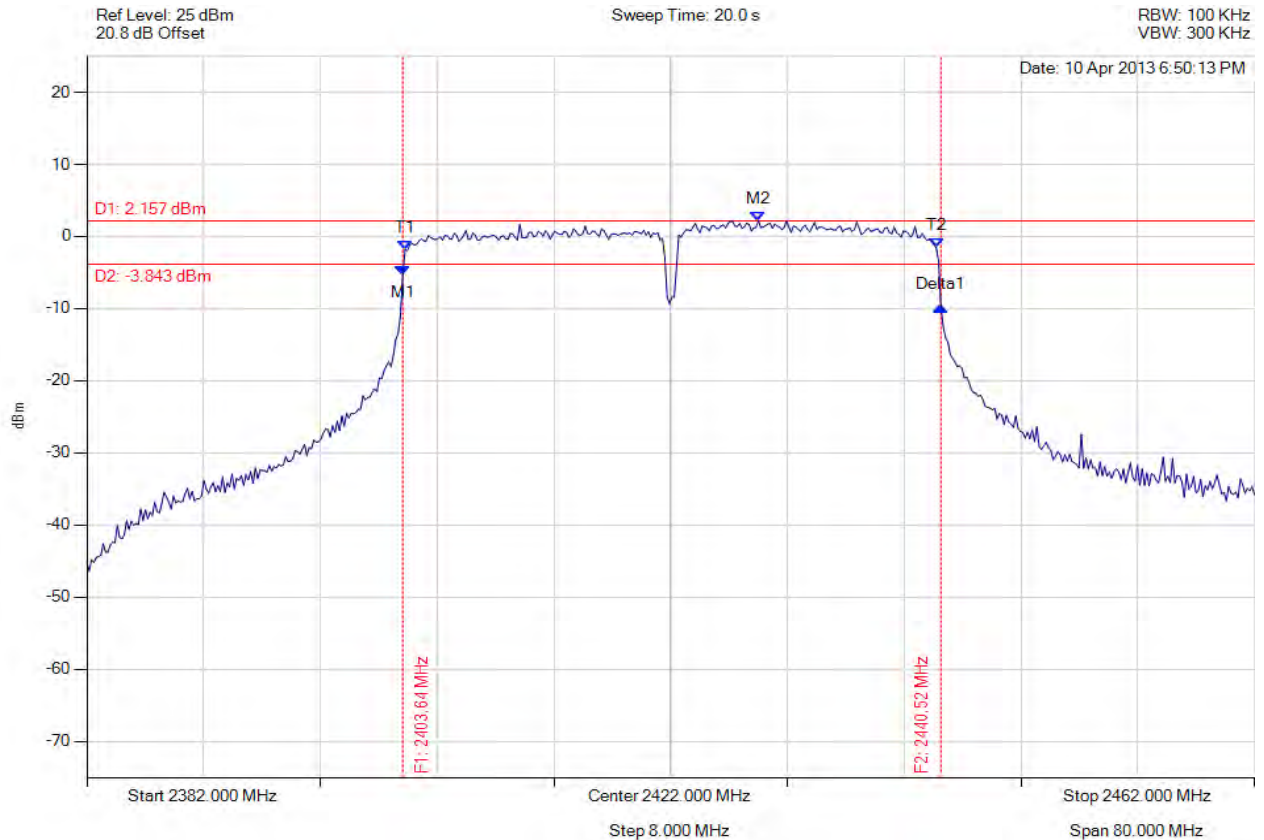


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2422.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.643 MHz : -5.287 dBm M2 : 2428.012 MHz : 2.157 dBm Delta1 : 36.874 MHz : -4.427 dB T1 : 2403.804 MHz : -1.858 dBm T2 : 2440.196 MHz : -1.536 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 36.874 MHz Limit: ≥ 500.0 kHz Margin: -36.37 MHz

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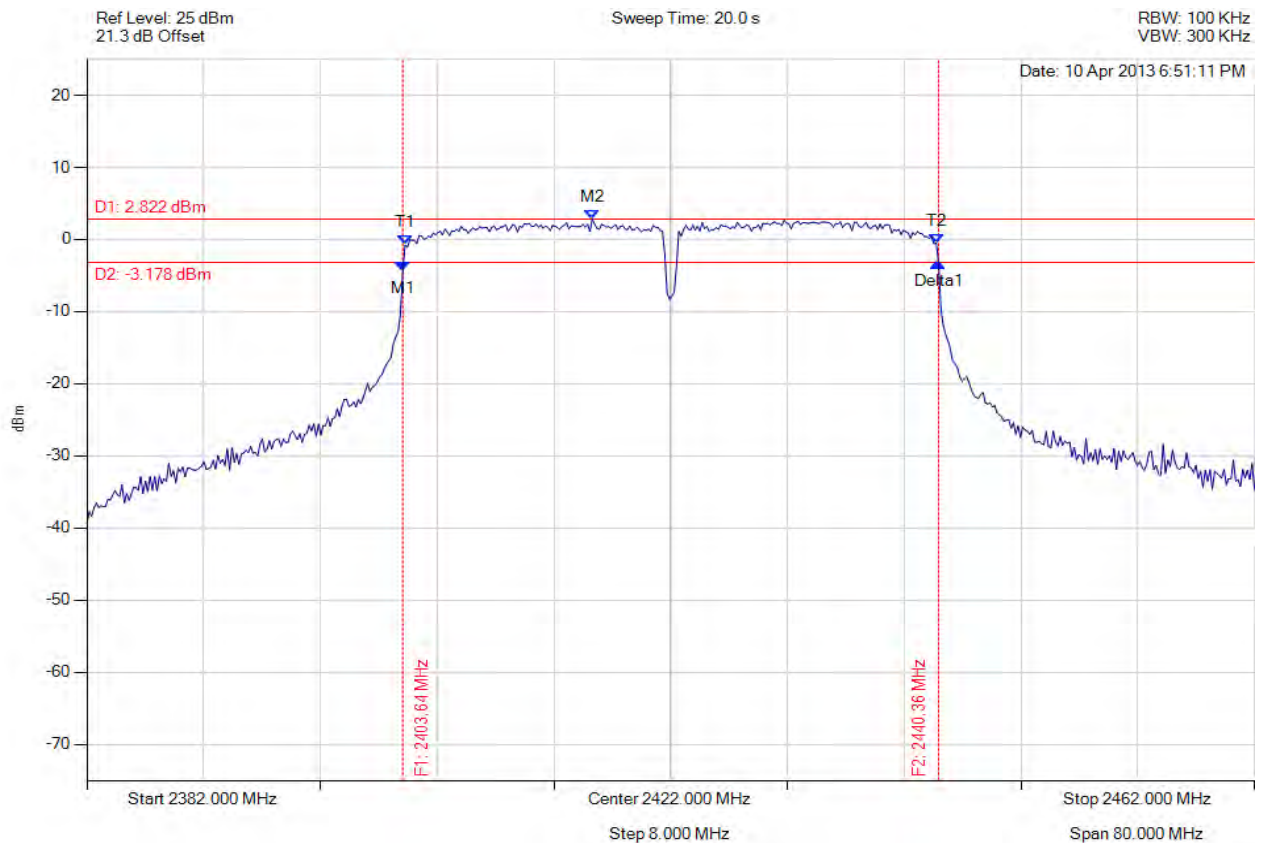


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2422.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



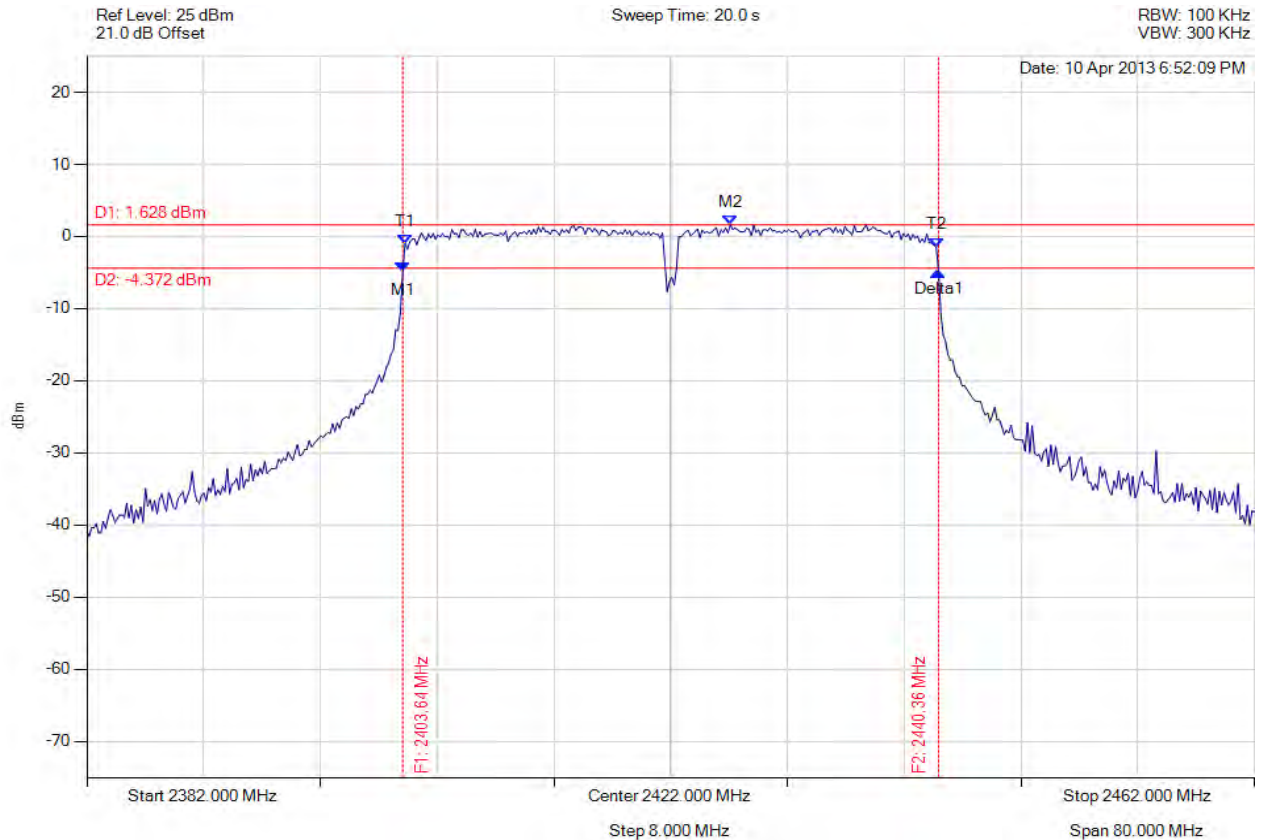
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.643 MHz : -4.339 dBm M2 : 2416.629 MHz : 2.822 dBm Delta1 : 36.713 MHz : 1.074 dB T1 : 2403.804 MHz : -0.763 dBm T2 : 2440.196 MHz : -0.493 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥ 500.0 kHz Margin: -36.21 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2422.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



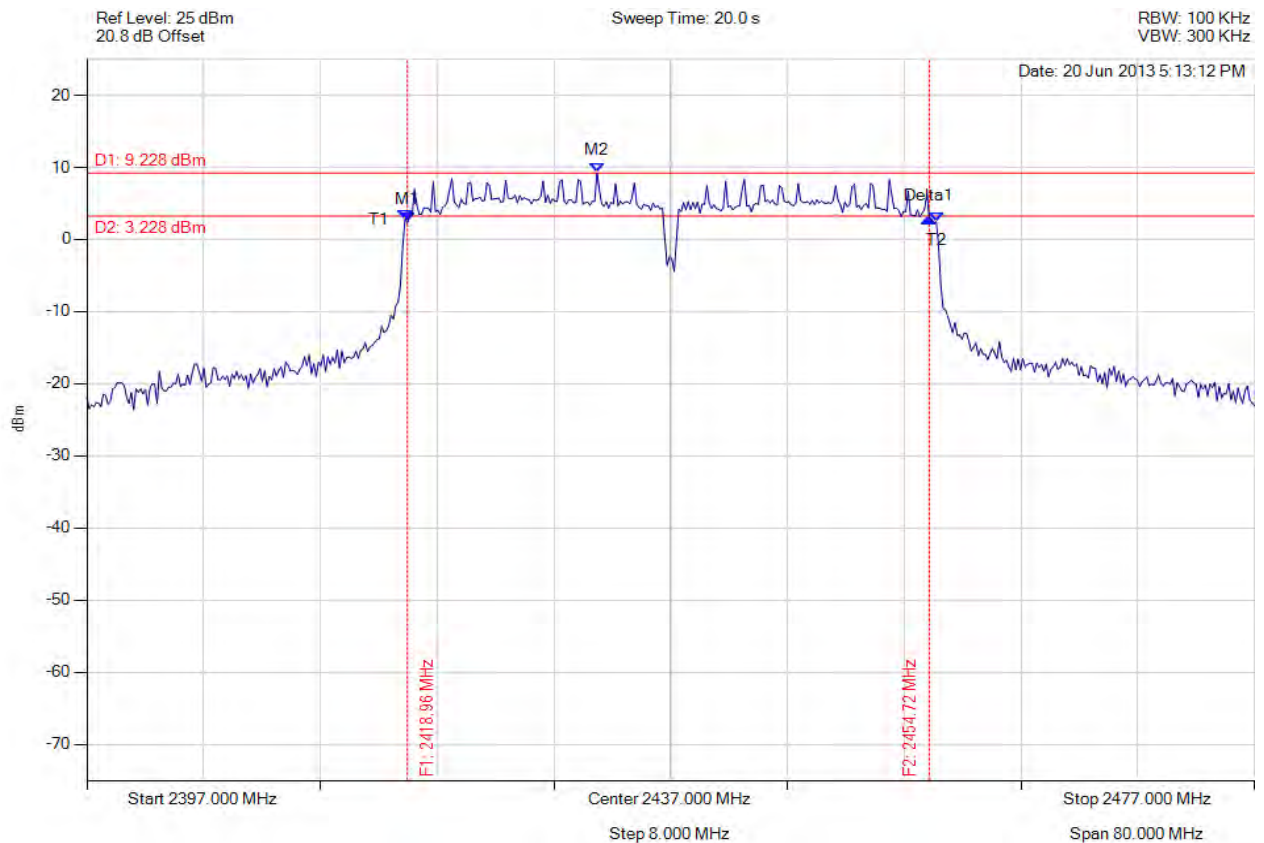
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.643 MHz : -4.904 dBm M2 : 2426.088 MHz : 1.628 dBm Delta1 : 36.713 MHz : 0.063 dB T1 : 2403.804 MHz : -0.991 dBm T2 : 2440.196 MHz : -1.459 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥ 500.0 kHz Margin: -36.21 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



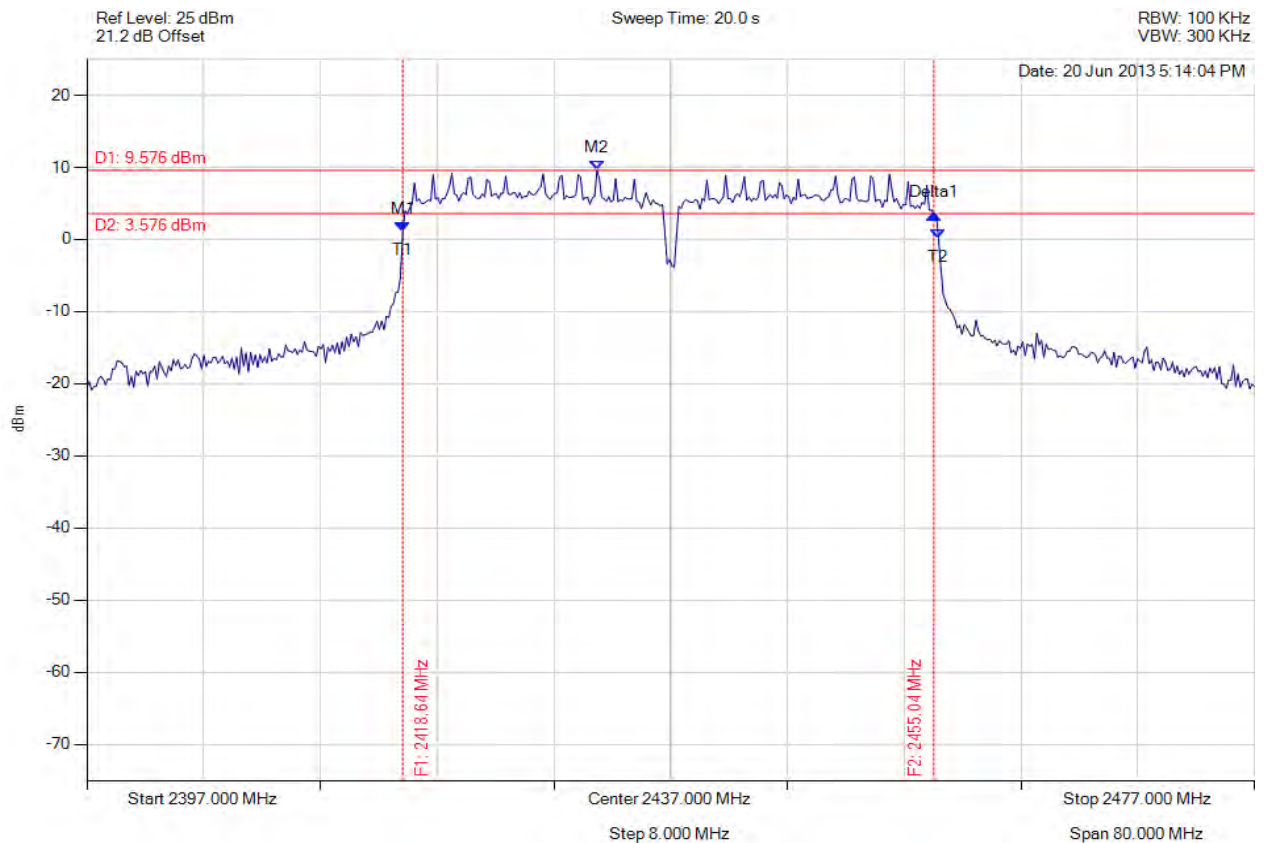
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2418.964 MHz : 2.391 dBm M2 : 2431.950 MHz : 9.228 dBm Delta1 : 35.752 MHz : 0.592 dB T1 : 2418.804 MHz : 2.810 dBm T2 : 2455.196 MHz : 2.417 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 35.752 MHz Limit: ≥ 500.0 kHz Margin: -35.25 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2437.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



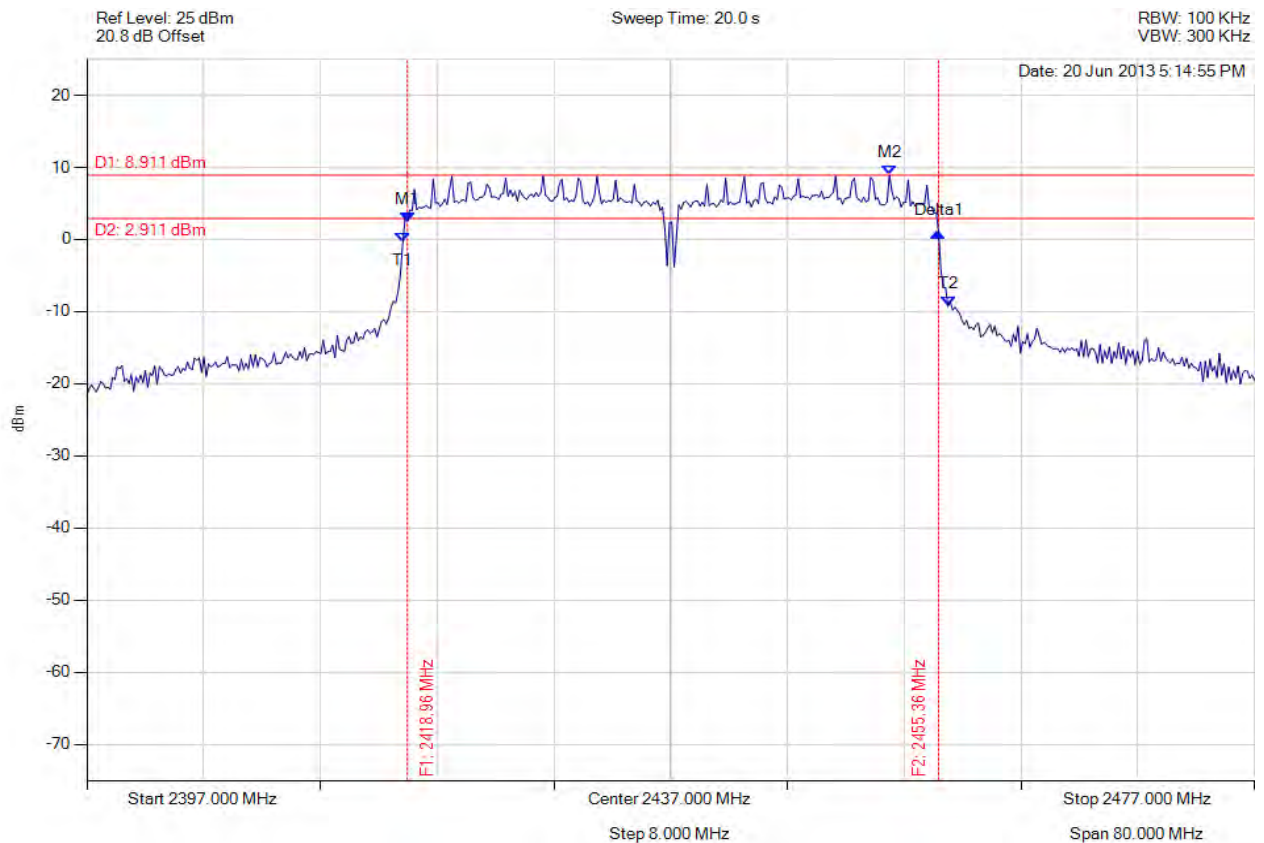
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2418.643 MHz : 1.081 dBm M2 : 2431.950 MHz : 9.576 dBm Delta1 : 36.393 MHz : 2.457 dB T1 : 2418.643 MHz : 1.081 dBm T2 : 2455.357 MHz : 0.123 dBm OBW : 36.713 MHz	Measured 6 dB Bandwidth: 36.393 MHz Limit: ≥ 500.0 kHz Margin: -35.89 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2437.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



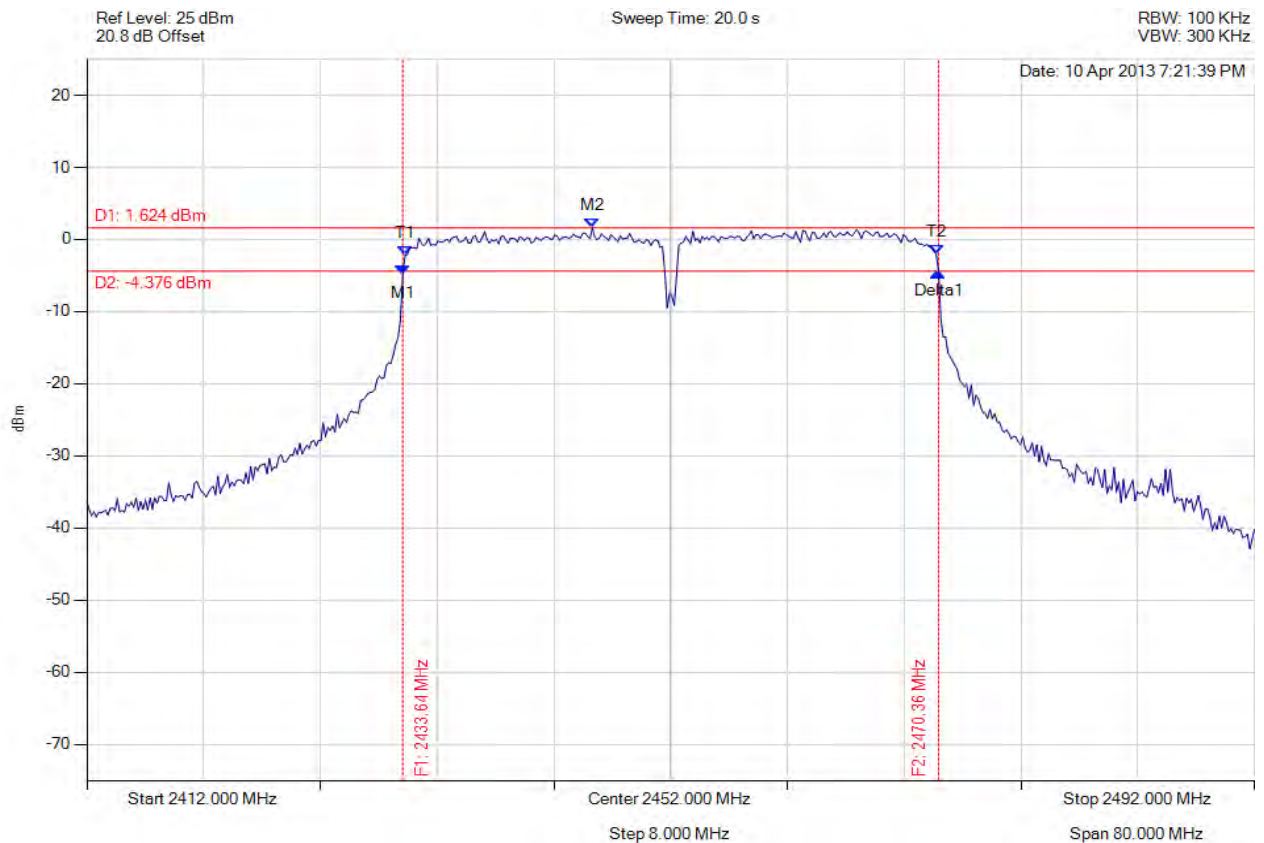
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2418.964 MHz : 2.517 dBm M2 : 2451.990 MHz : 8.911 dBm Delta1 : 36.393 MHz : -1.521 dB T1 : 2418.643 MHz : -0.406 dBm T2 : 2455.998 MHz : -9.263 dBm OBW : 37.355 MHz	Measured 6 dB Bandwidth: 36.393 MHz Limit: ≥ 500.0 kHz Margin: -35.89 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2452.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2433.643 MHz : -4.937 dBm M2 : 2446.629 MHz : 1.624 dBm Delta1 : 36.713 MHz : 0.370 dB T1 : 2433.804 MHz : -2.236 dBm T2 : 2470.196 MHz : -2.018 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥ 500.0 kHz Margin: -36.21 MHz

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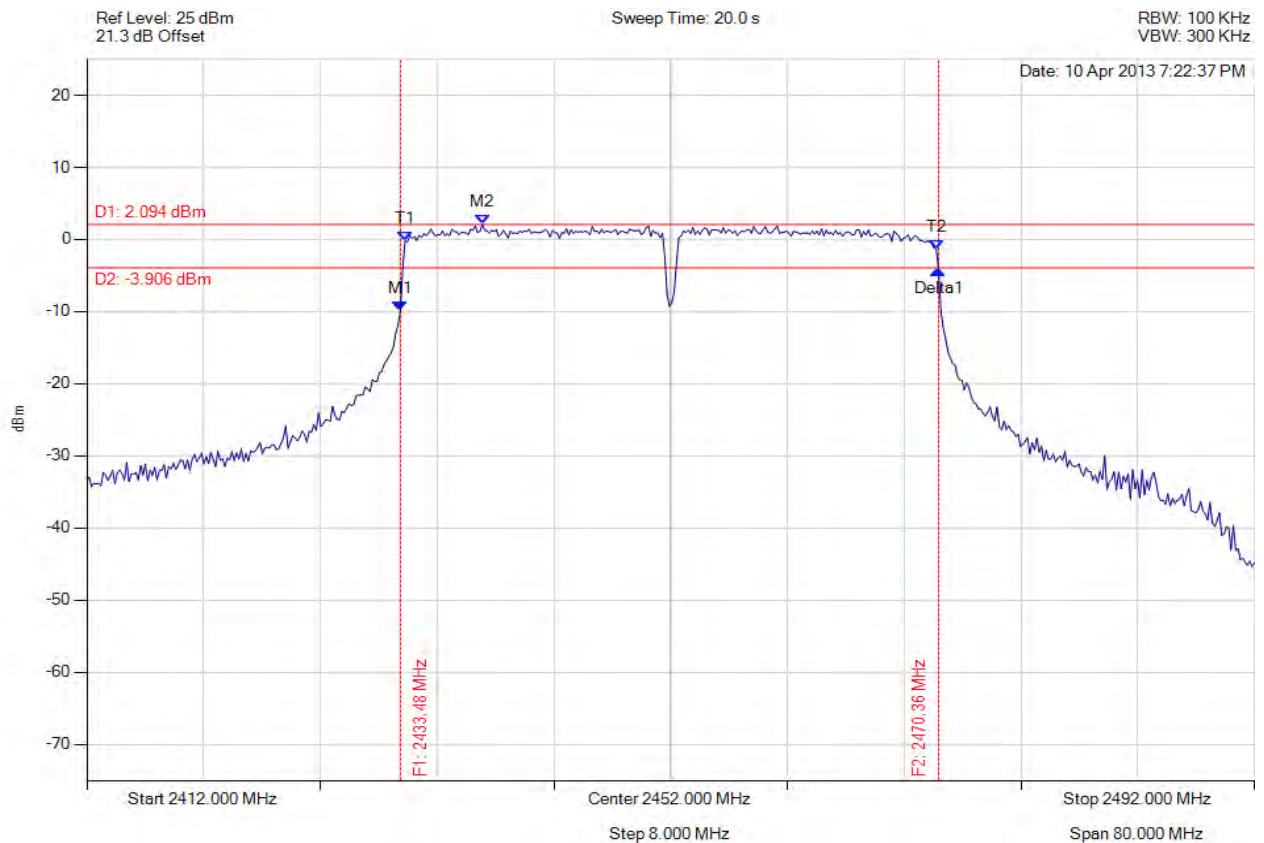


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2452.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



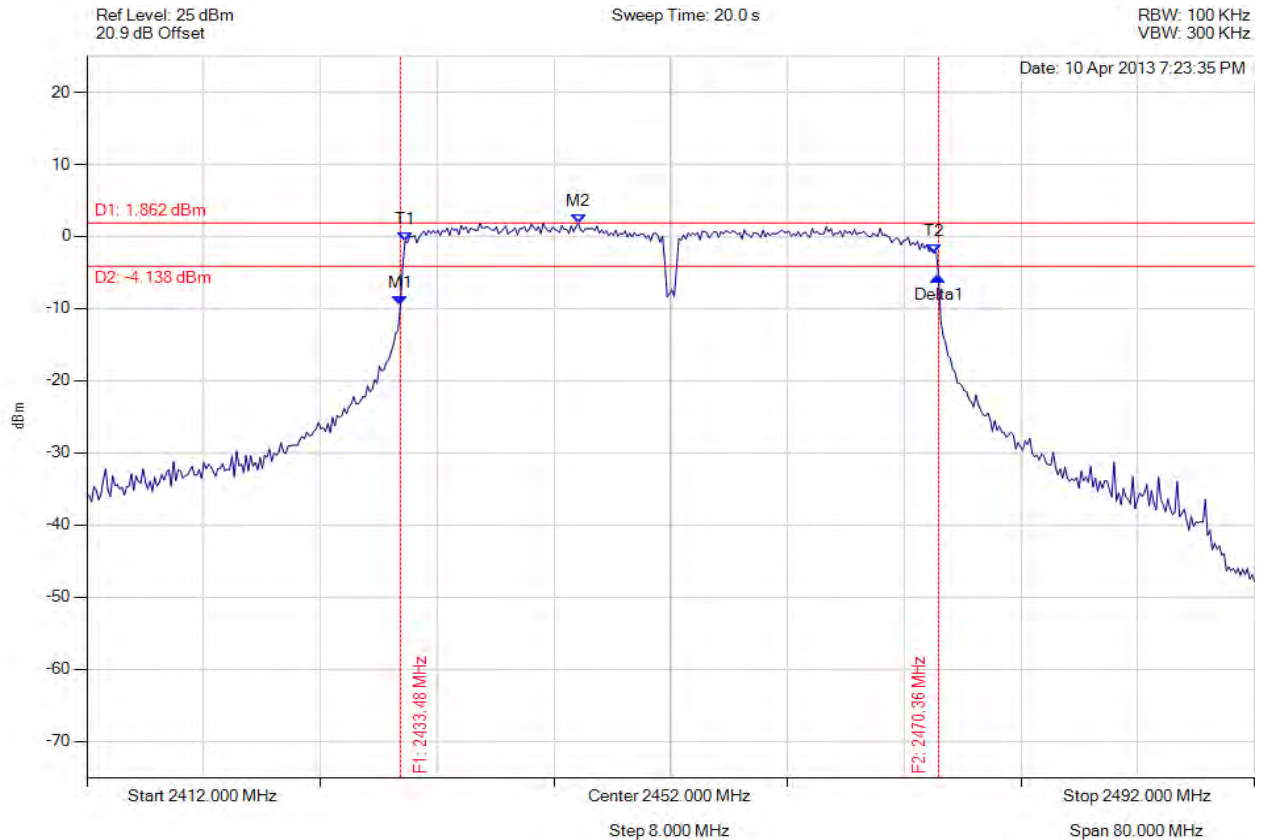
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2433.483 MHz : -9.885 dBm M2 : 2439.094 MHz : 2.094 dBm Delta1 : 36.874 MHz : 5.619 dB T1 : 2433.804 MHz : -0.223 dBm T2 : 2470.196 MHz : -1.319 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 36.874 MHz Limit: ≥ 500.0 kHz Margin: -36.37 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 2452.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



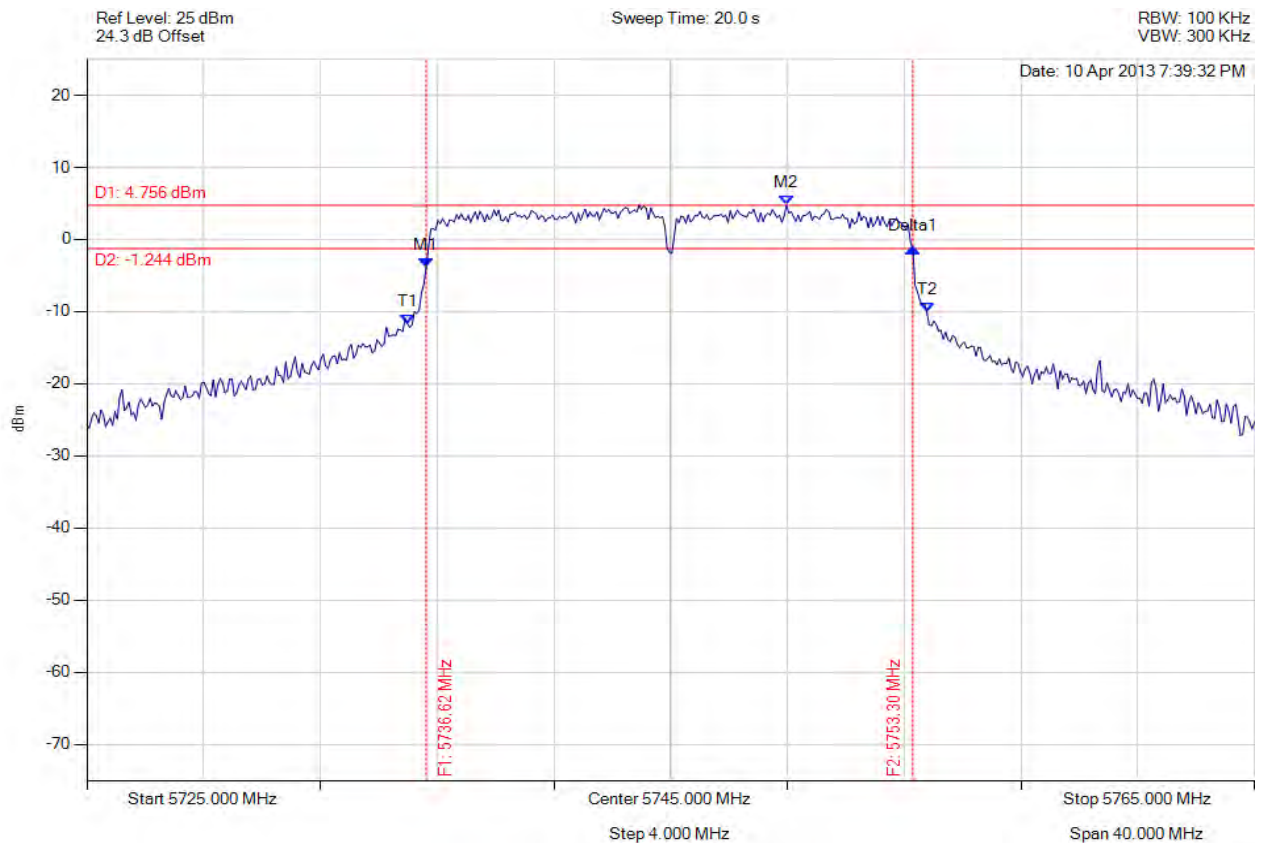
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2433.483 MHz : -9.472 dBm M2 : 2445.667 MHz : 1.862 dBm Delta1 : 36.874 MHz : 3.960 dB T1 : 2433.804 MHz : -0.646 dBm T2 : 2470.036 MHz : -2.303 dBm OBW : 36.232 MHz	Measured 6 dB Bandwidth: 36.874 MHz Limit: ≥500.0 kHz Margin: -36.37 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5745.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.623 MHz : -3.946 dBm M2 : 5748.968 MHz : 4.756 dBm Delta1 : 16.673 MHz : 2.689 dB T1 : 5735.982 MHz : -11.689 dBm T2 : 5753.778 MHz : -10.064 dBm OBW : 17.796 MHz	Measured 6 dB Bandwidth: 16.673 MHz Limit: ≥ 500.0 kHz Margin: -16.17 MHz

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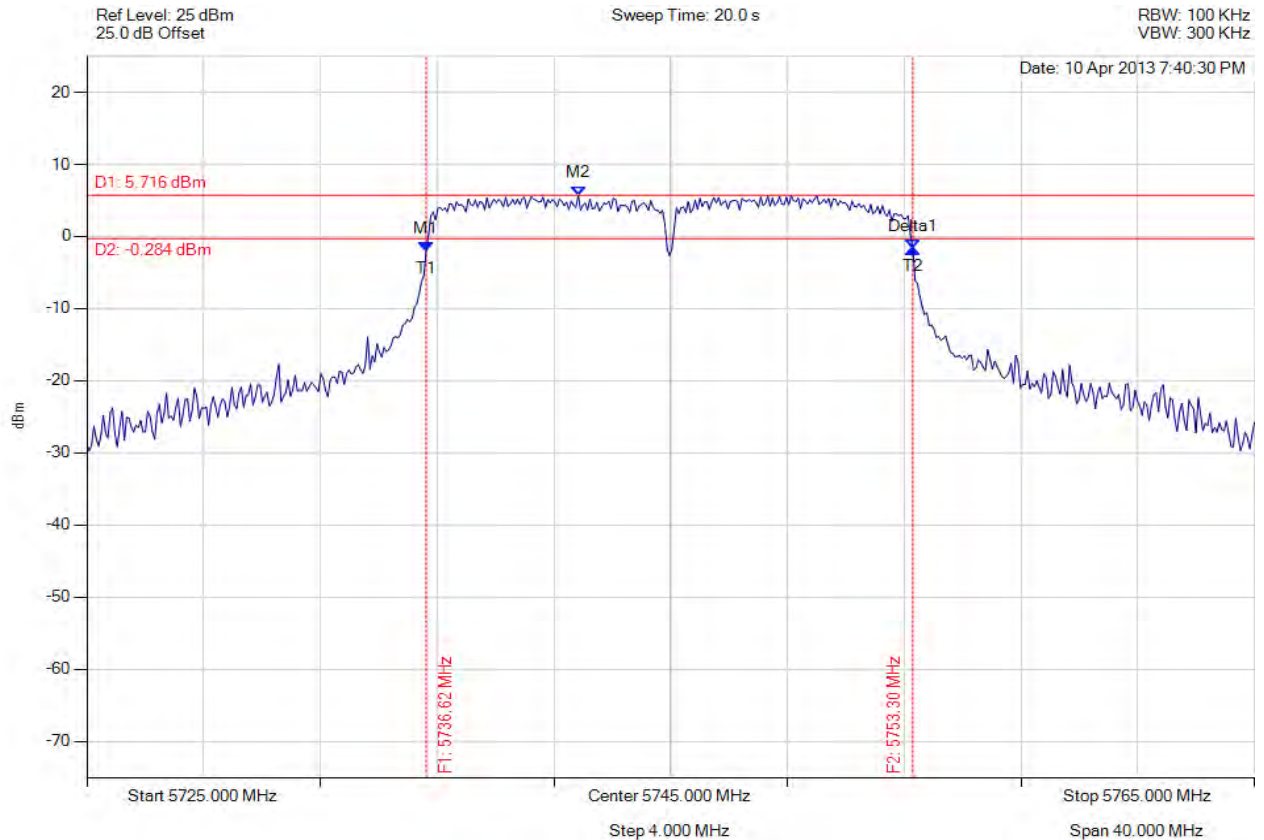


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5745.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



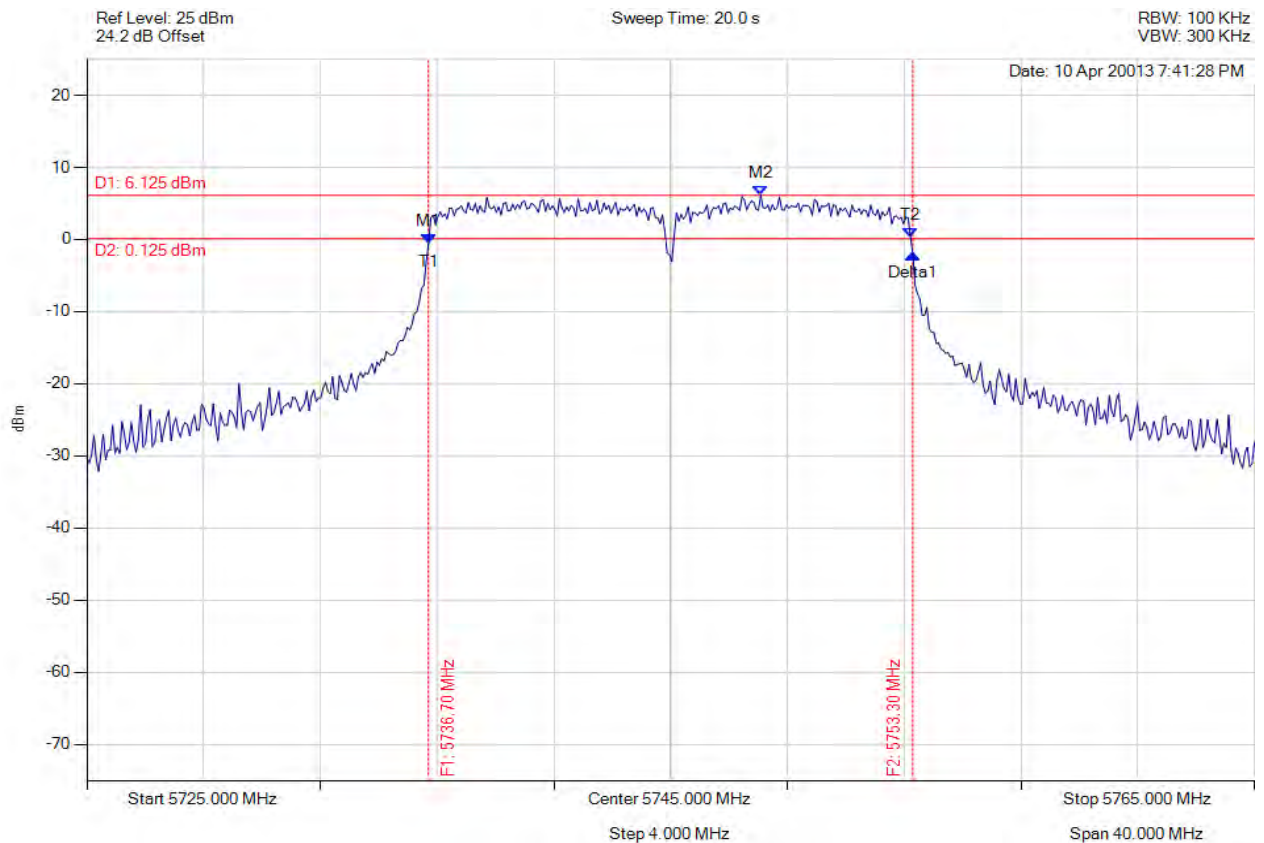
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.623 MHz : -1.974 dBm M2 : 5741.834 MHz : 5.716 dBm Delta1 : 16.673 MHz : 0.323 dB T1 : 5736.623 MHz : -1.974 dBm T2 : 5753.297 MHz : -1.650 dBm OBW : 16.673 MHz	Measured 6 dB Bandwidth: 16.673 MHz Limit: ≥ 500.0 kHz Margin: -16.17 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5745.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



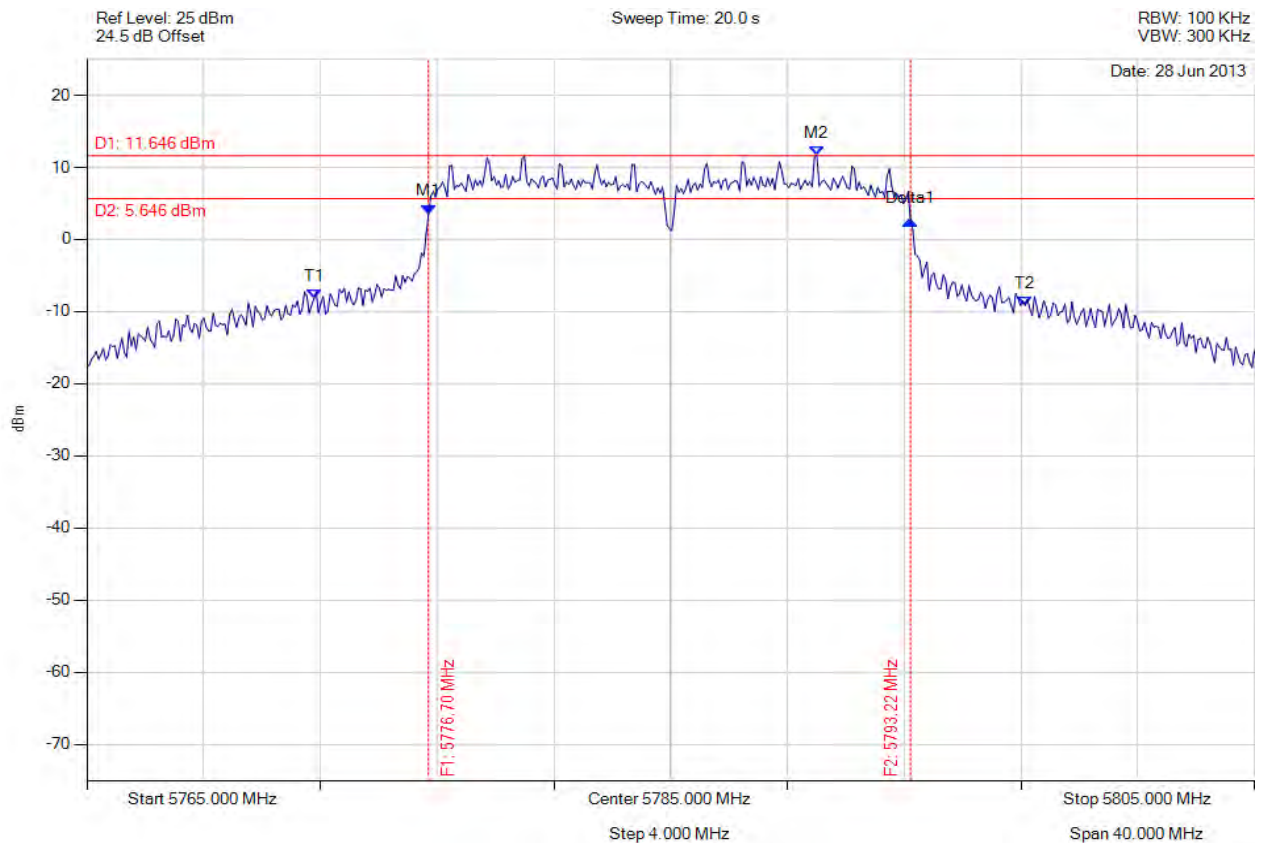
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.703 MHz : -0.607 dBm M2 : 5748.086 MHz : 6.125 dBm Delta1 : 16.593 MHz : -1.454 dB T1 : 5736.703 MHz : -0.607 dBm T2 : 5753.216 MHz : 0.251 dBm OBW : 16.513 MHz	Measured 6 dB Bandwidth: 16.593 MHz Limit: ≥500.0 kHz Margin: -16.09 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5785.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.703 MHz : 3.554 dBm M2 : 5790.010 MHz : 11.646 dBm Delta1 : 16.513 MHz : -0.879 dB T1 : 5772.776 MHz : -8.254 dBm T2 : 5797.144 MHz : -9.155 dBm OBW : 24.369 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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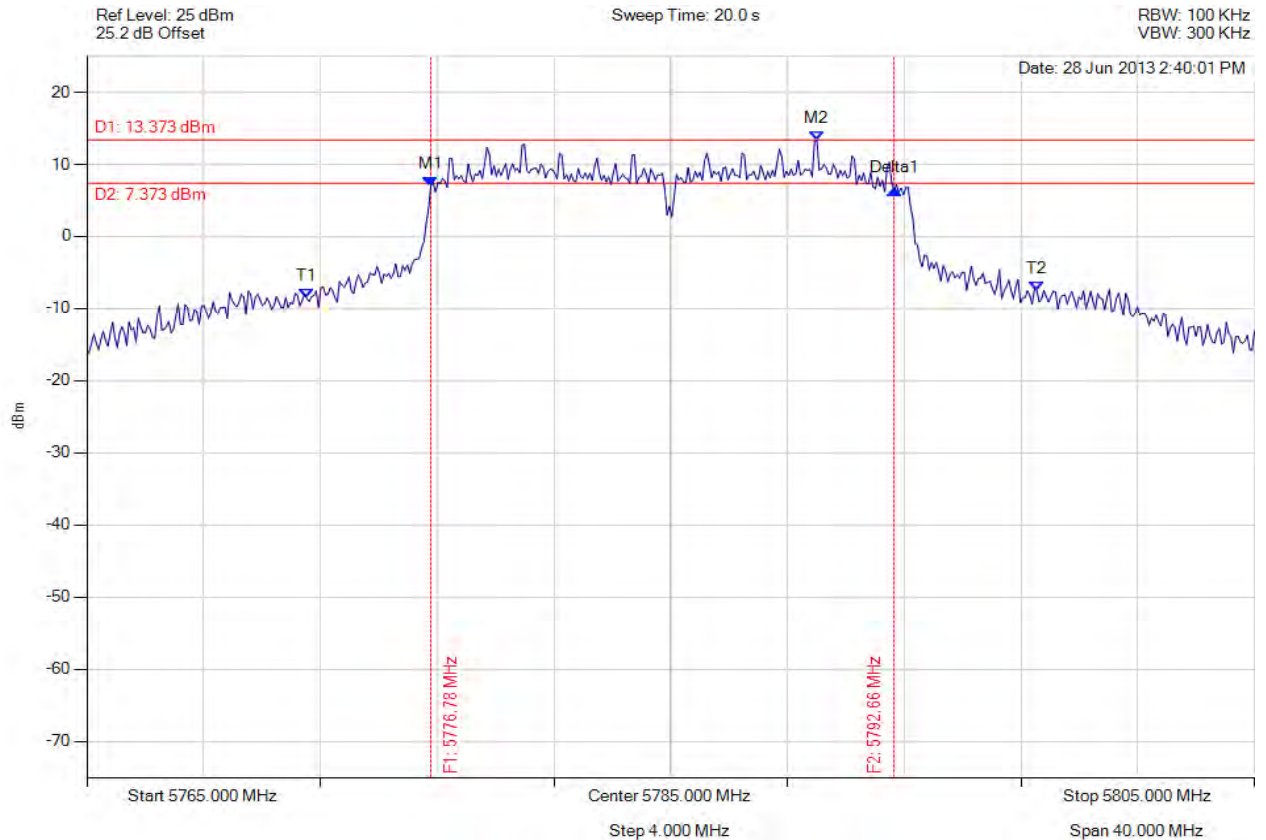


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5785.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



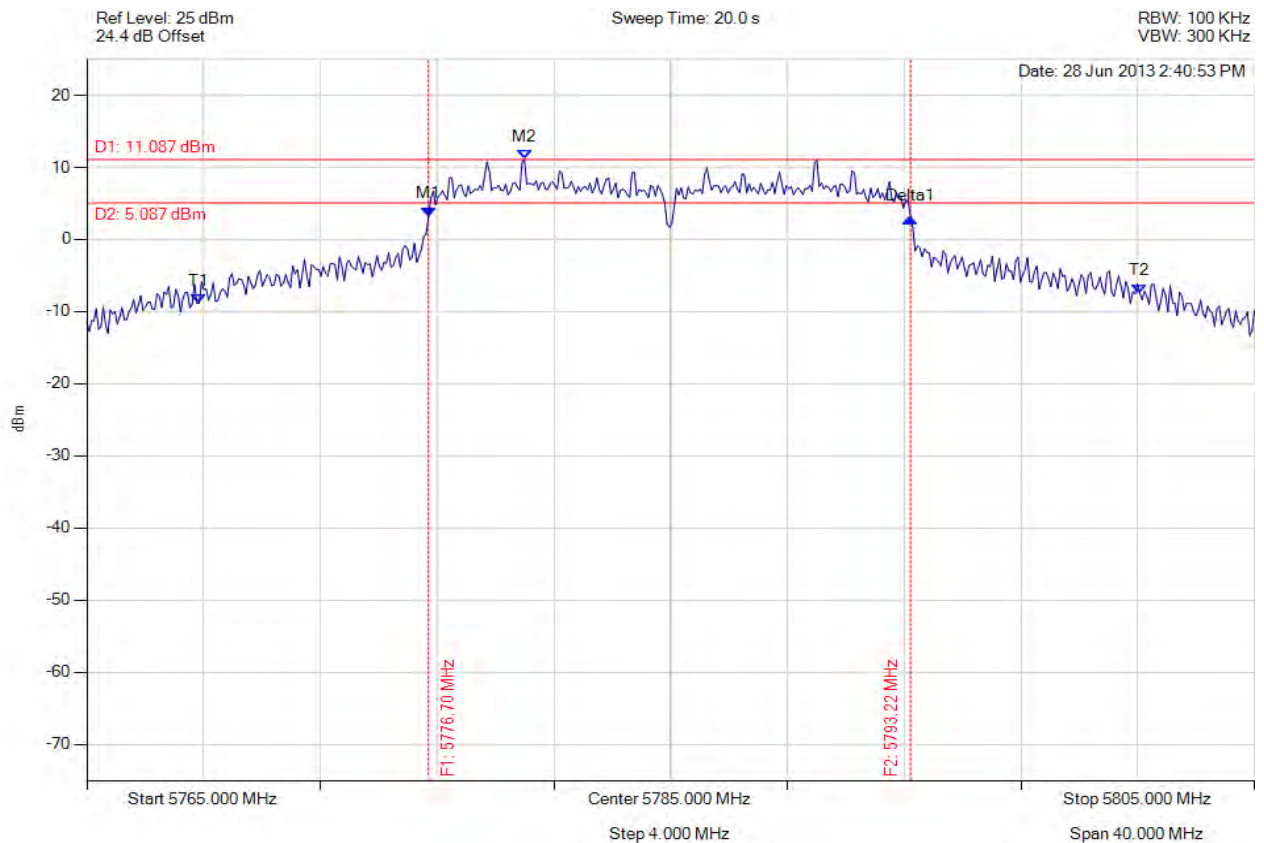
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.784 MHz : 7.016 dBm M2 : 5790.010 MHz : 13.373 dBm Delta1 : 15.872 MHz : -0.533 dB T1 : 5772.535 MHz : -8.593 dBm T2 : 5797.545 MHz : -7.526 dBm OBW : 25.010 MHz	Measured 6 dB Bandwidth: 15.872 MHz Limit: ≥ 500.0 kHz Margin: -15.37 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5785.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.703 MHz : 3.212 dBm M2 : 5779.990 MHz : 11.087 dBm Delta1 : 16.513 MHz : -0.222 dB T1 : 5768.848 MHz : -8.842 dBm T2 : 5801.072 MHz : -7.450 dBm OBW : 32.224 MHz	Measured 6 dB Bandwidth: 16.513 MHz Limit: ≥ 500.0 kHz Margin: -16.01 MHz

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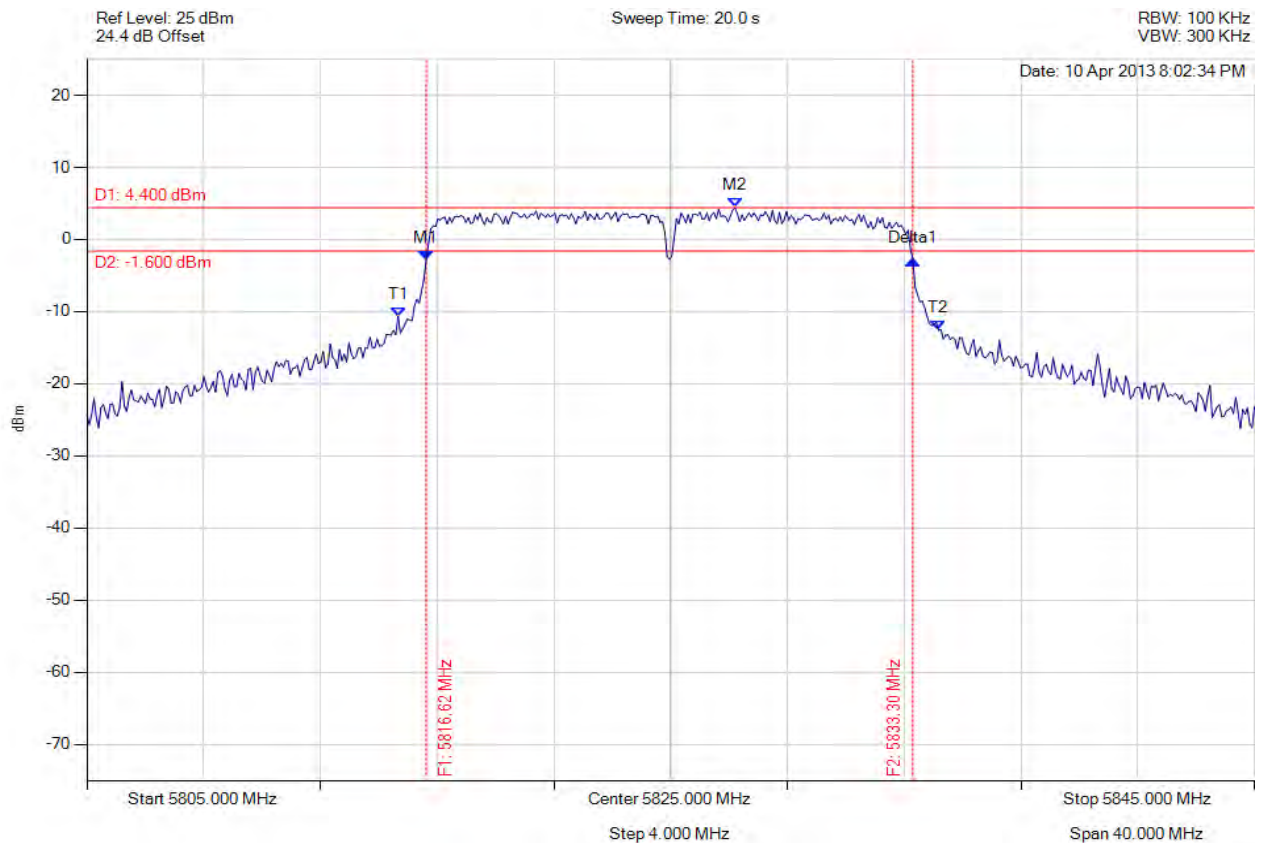


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5825.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5816.623 MHz : -2.889 dBm M2 : 5827.204 MHz : 4.400 dBm Delta1 : 16.673 MHz : 0.089 dB T1 : 5815.661 MHz : -10.652 dBm T2 : 5834.178 MHz : -12.602 dBm OBW : 18.517 MHz	Measured 6 dB Bandwidth: 16.673 MHz Limit: ≥ 500.0 kHz Margin: -16.17 MHz

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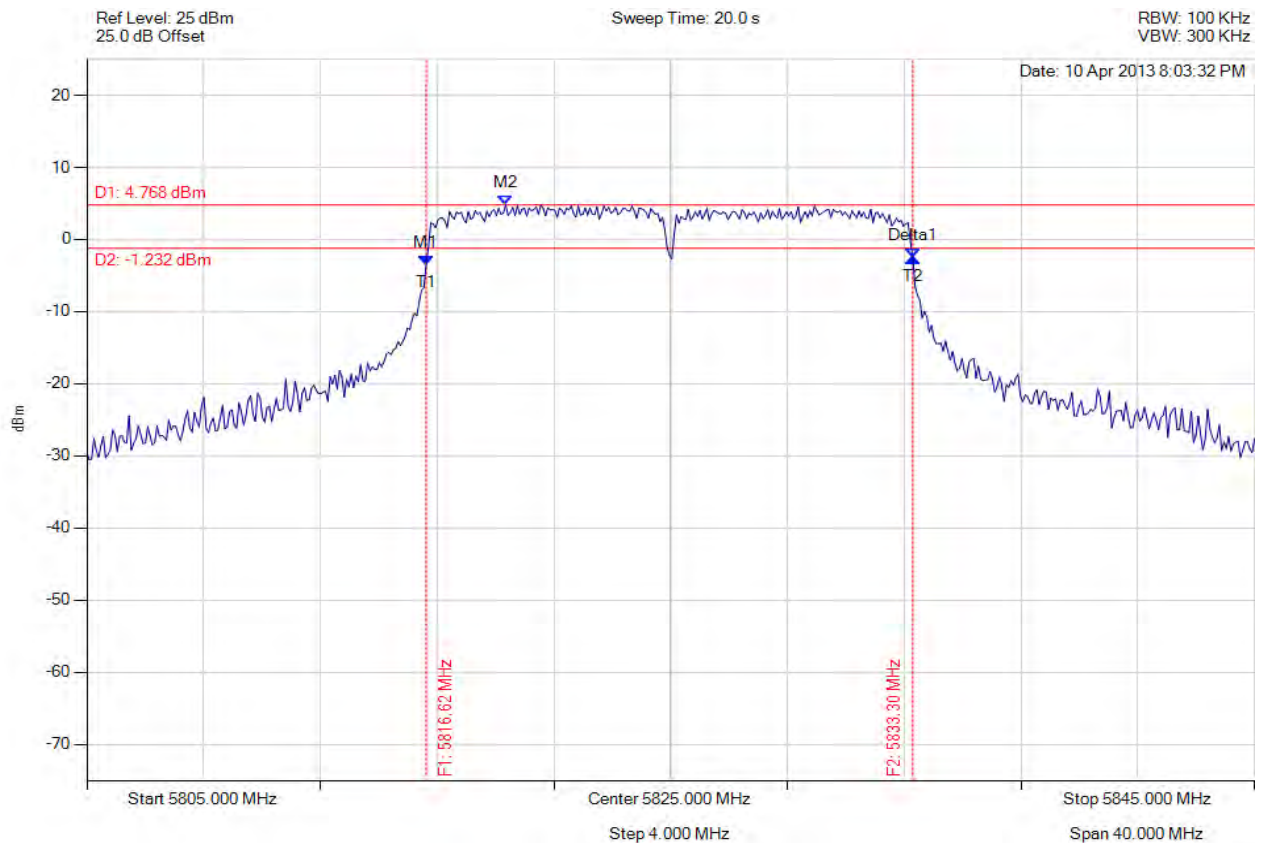


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5825.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5816.623 MHz : -3.501 dBm M2 : 5819.349 MHz : 4.768 dBm Delta1 : 16.673 MHz : 0.944 dB T1 : 5816.623 MHz : -3.501 dBm T2 : 5833.297 MHz : -2.557 dBm OBW : 16.673 MHz	Measured 6 dB Bandwidth: 16.673 MHz Limit: ≥ 500.0 kHz Margin: -16.17 MHz

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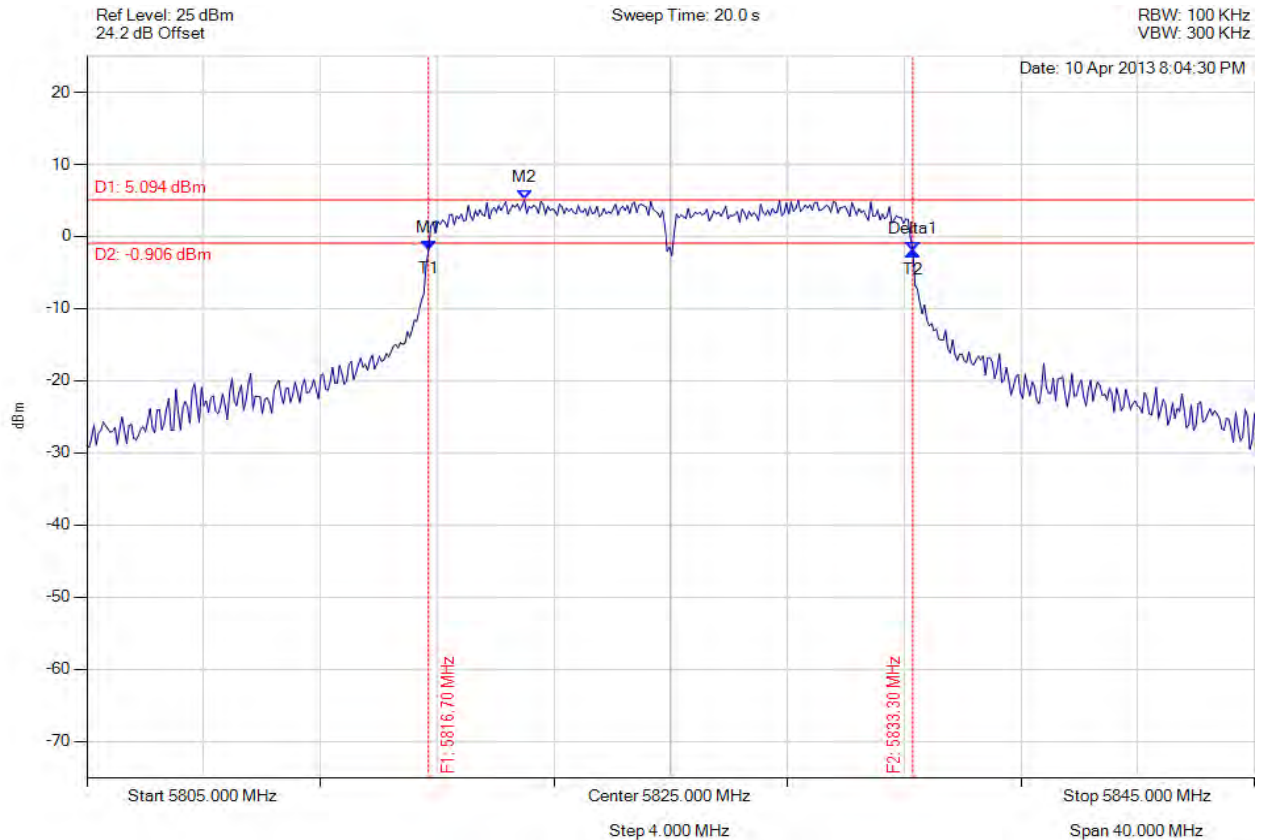


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5825.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5816.703 MHz : -1.943 dBm M2 : 5819.990 MHz : 5.094 dBm Delta1 : 16.593 MHz : -0.073 dB T1 : 5816.703 MHz : -1.943 dBm T2 : 5833.297 MHz : -2.016 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.593 MHz Limit: ≥ 500.0 kHz Margin: -16.09 MHz

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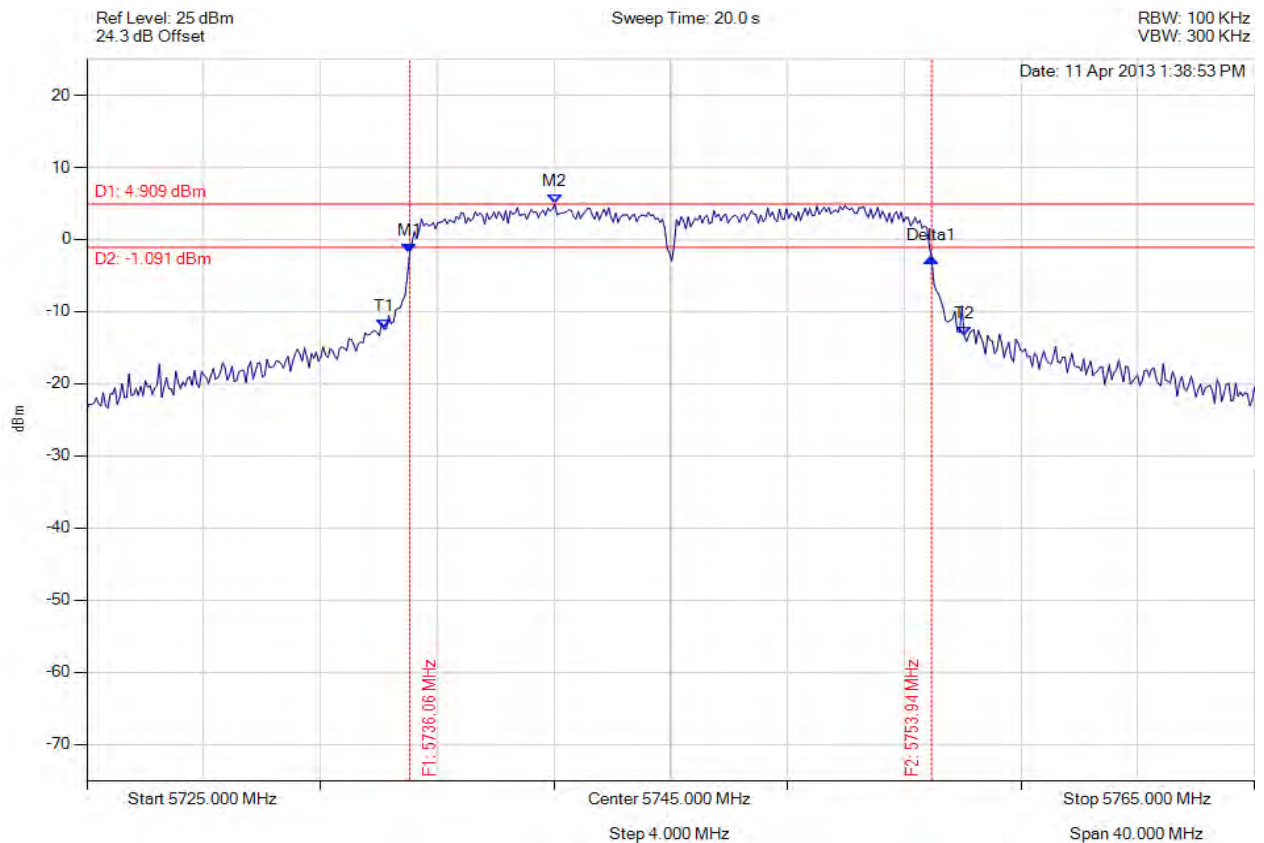


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5745.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



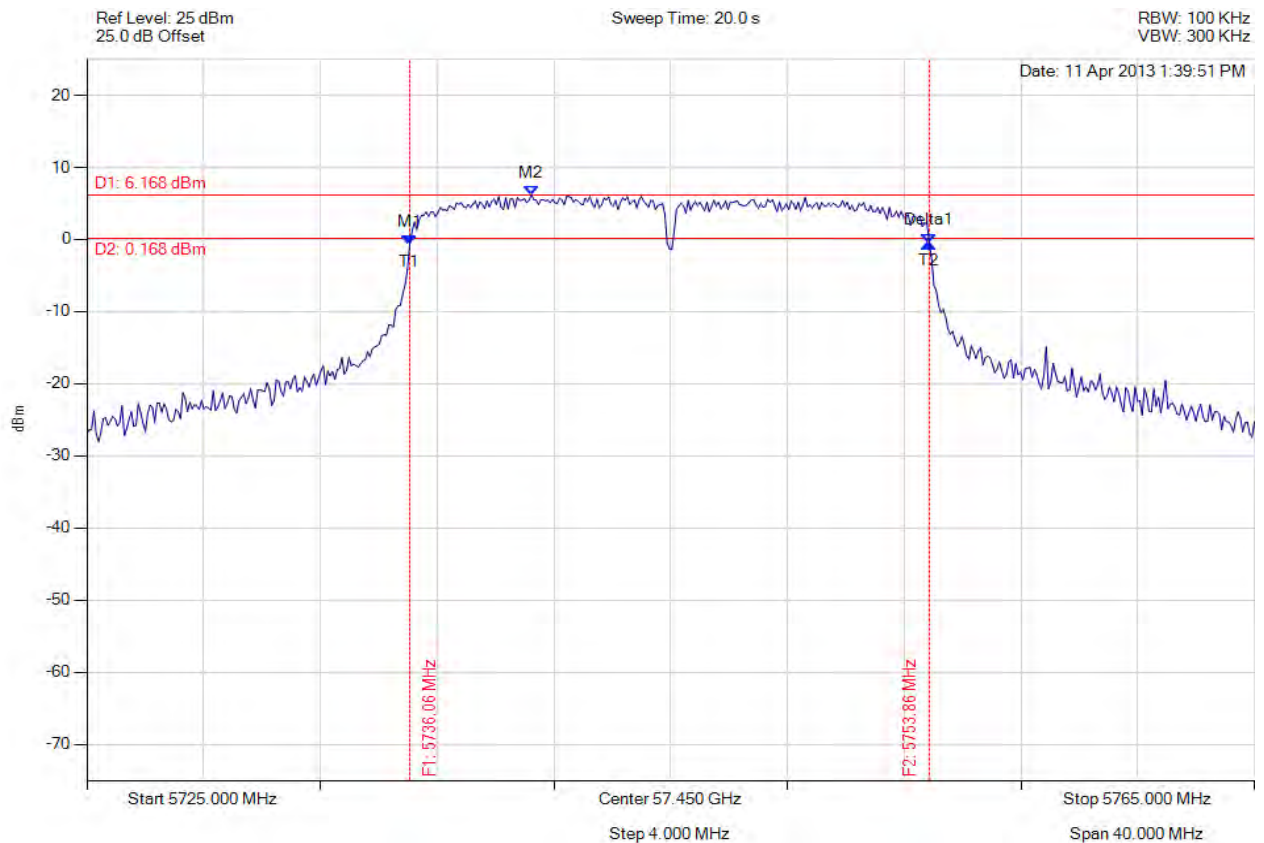
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.062 MHz : -1.801 dBm M2 : 5741.032 MHz : 4.909 dBm Delta1 : 17.876 MHz : -0.811 dB T1 : 5735.180 MHz : -12.425 dBm T2 : 5755.060 MHz : -13.407 dBm OBW : 19.880 MHz	Measured 6 dB Bandwidth: 17.876 MHz Limit: ≥ 500.0 kHz Margin: -17.38 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5745.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



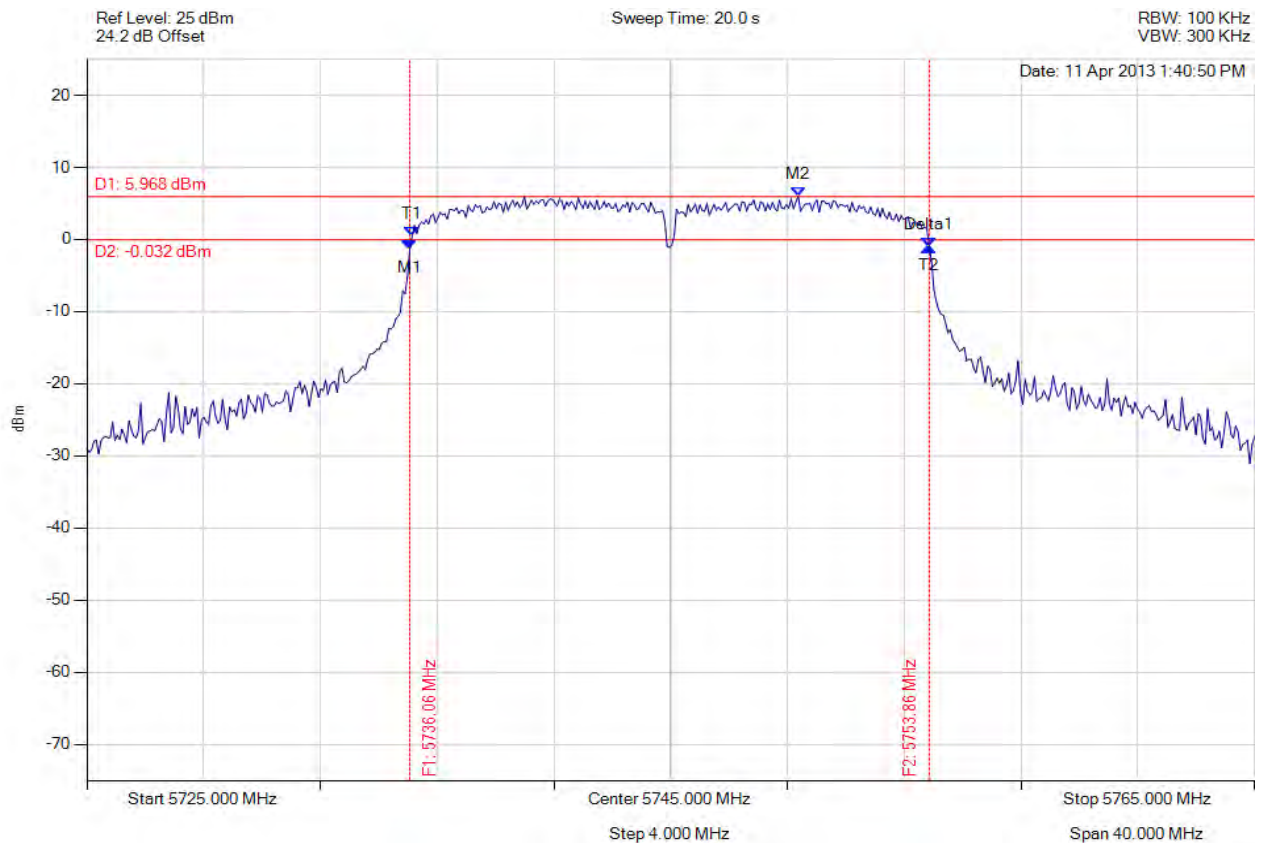
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.062 MHz : -0.631 dBm M2 : 5740.230 MHz : 6.168 dBm Delta1 : 17.796 MHz : 0.181 dB T1 : 5736.062 MHz : -0.631 dBm T2 : 5753.858 MHz : -0.450 dBm OBW : 17.796 MHz	Measured 6 dB Bandwidth: 17.796 MHz Limit: ≥ 500.0 kHz Margin: -17.30 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5745.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



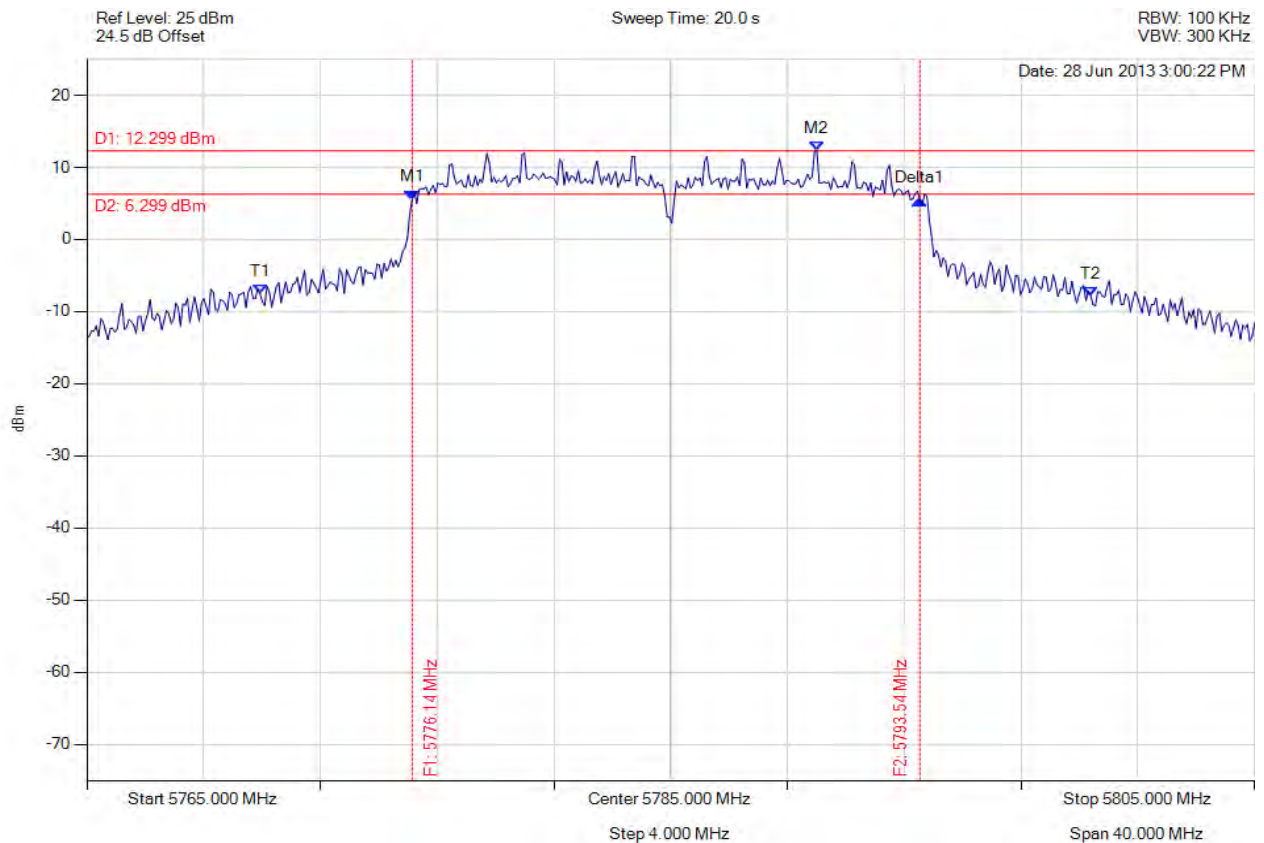
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.062 MHz : -1.351 dBm M2 : 5749.369 MHz : 5.968 dBm Delta1 : 17.796 MHz : 0.317 dB T1 : 5736.142 MHz : 0.416 dBm T2 : 5753.858 MHz : -1.034 dBm OBW : 17.715 MHz	Measured 6 dB Bandwidth: 17.796 MHz Limit: ≥ 500.0 kHz Margin: -17.30 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5785.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



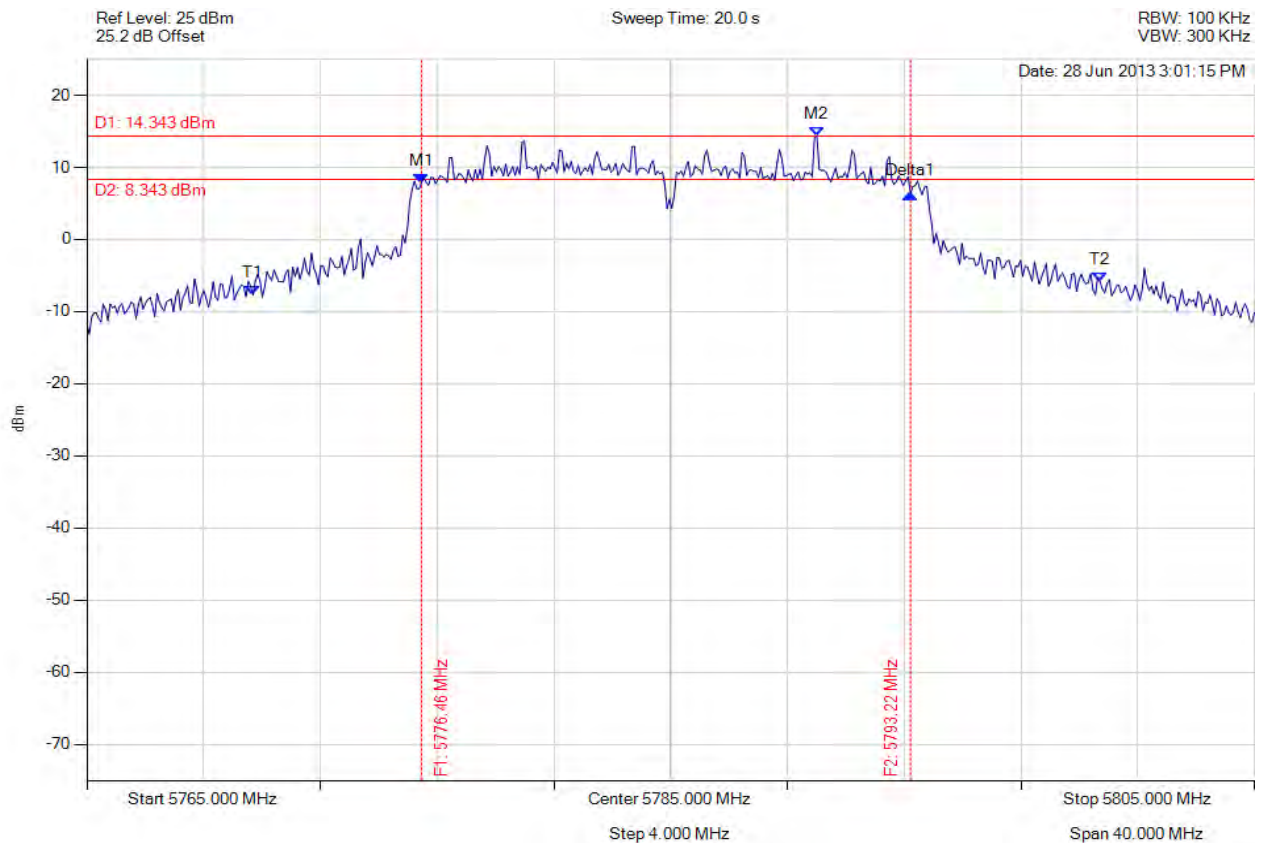
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.142 MHz : 5.555 dBm M2 : 5790.010 MHz : 12.299 dBm Delta1 : 17.395 MHz : -0.077 dB T1 : 5770.932 MHz : -7.511 dBm T2 : 5799.389 MHz : -7.800 dBm OBW : 28.457 MHz	Measured 6 dB Bandwidth: 17.395 MHz Limit: ≥ 500.0 kHz Margin: -16.90 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5785.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.463 MHz : 7.862 dBm M2 : 5790.010 MHz : 14.343 dBm Delta1 : 16.754 MHz : -1.483 dB T1 : 5770.691 MHz : -7.666 dBm T2 : 5799.709 MHz : -5.889 dBm OBW : 29.018 MHz	Measured 6 dB Bandwidth: 16.754 MHz Limit: ≥ 500.0 kHz Margin: -16.25 MHz

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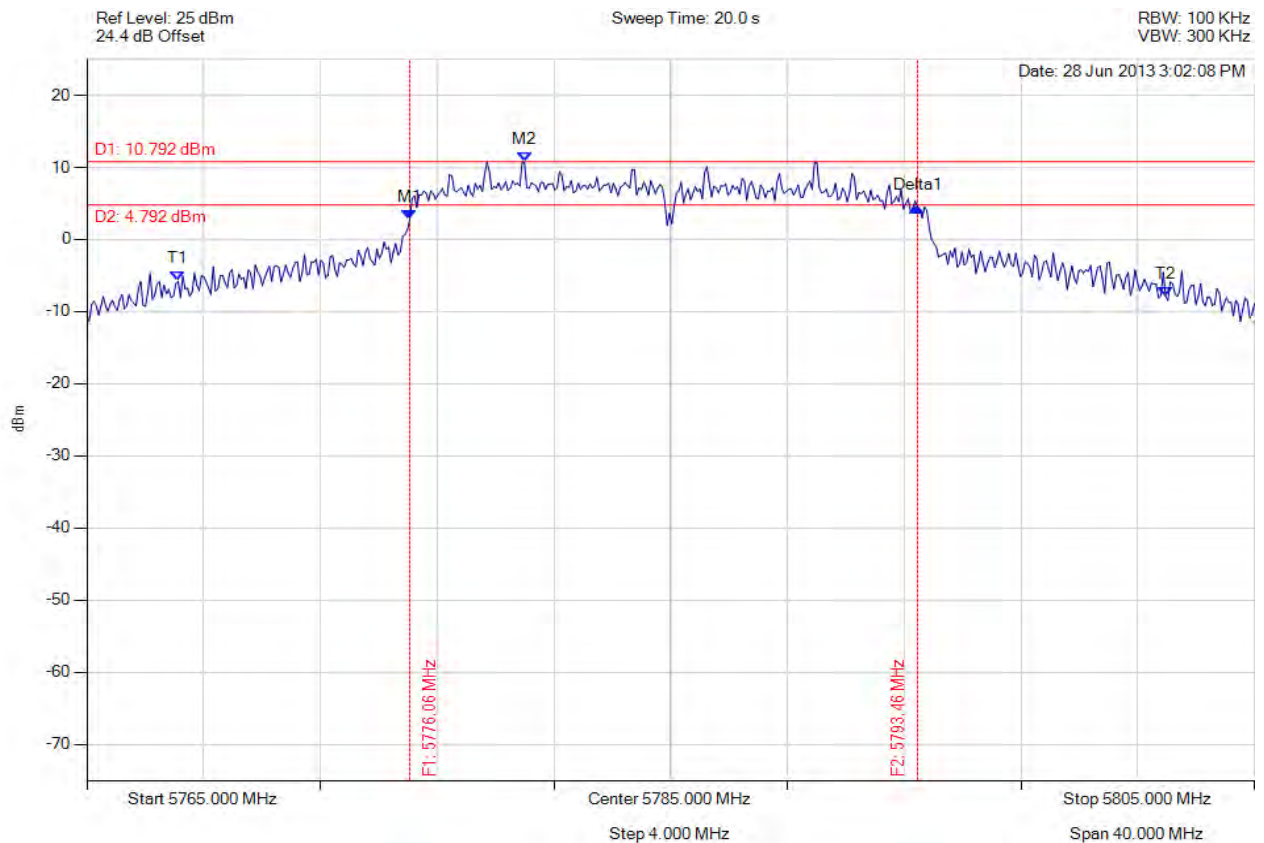


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Variant: 802.11n HT-20, Channel: 5785.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



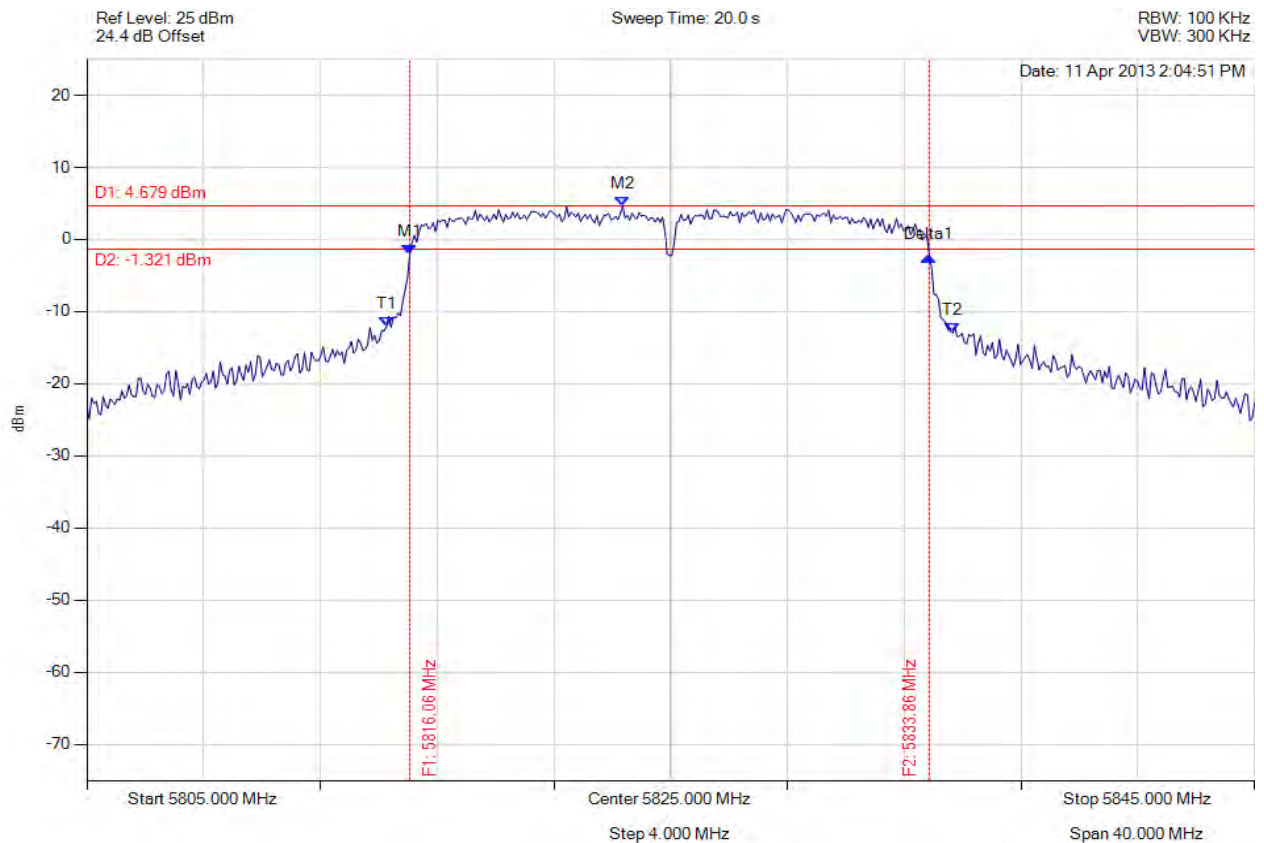
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.062 MHz : 2.753 dBm M2 : 5779.990 MHz : 10.792 dBm Delta1 : 17.395 MHz : 1.786 dB T1 : 5768.126 MHz : -5.775 dBm T2 : 5801.954 MHz : -7.859 dBm OBW : 33.828 MHz	Measured 6 dB Bandwidth: 17.395 MHz Limit: ≥ 500.0 kHz Margin: -16.90 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5825.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5816.062 MHz : -2.081 dBm M2 : 5823.357 MHz : 4.679 dBm Delta1 : 17.796 MHz : -0.268 dB T1 : 5815.261 MHz : -12.108 dBm T2 : 5834.659 MHz : -12.937 dBm OBW : 19.399 MHz	Measured 6 dB Bandwidth: 17.796 MHz Limit: ≥500.0 kHz Margin: -17.30 MHz

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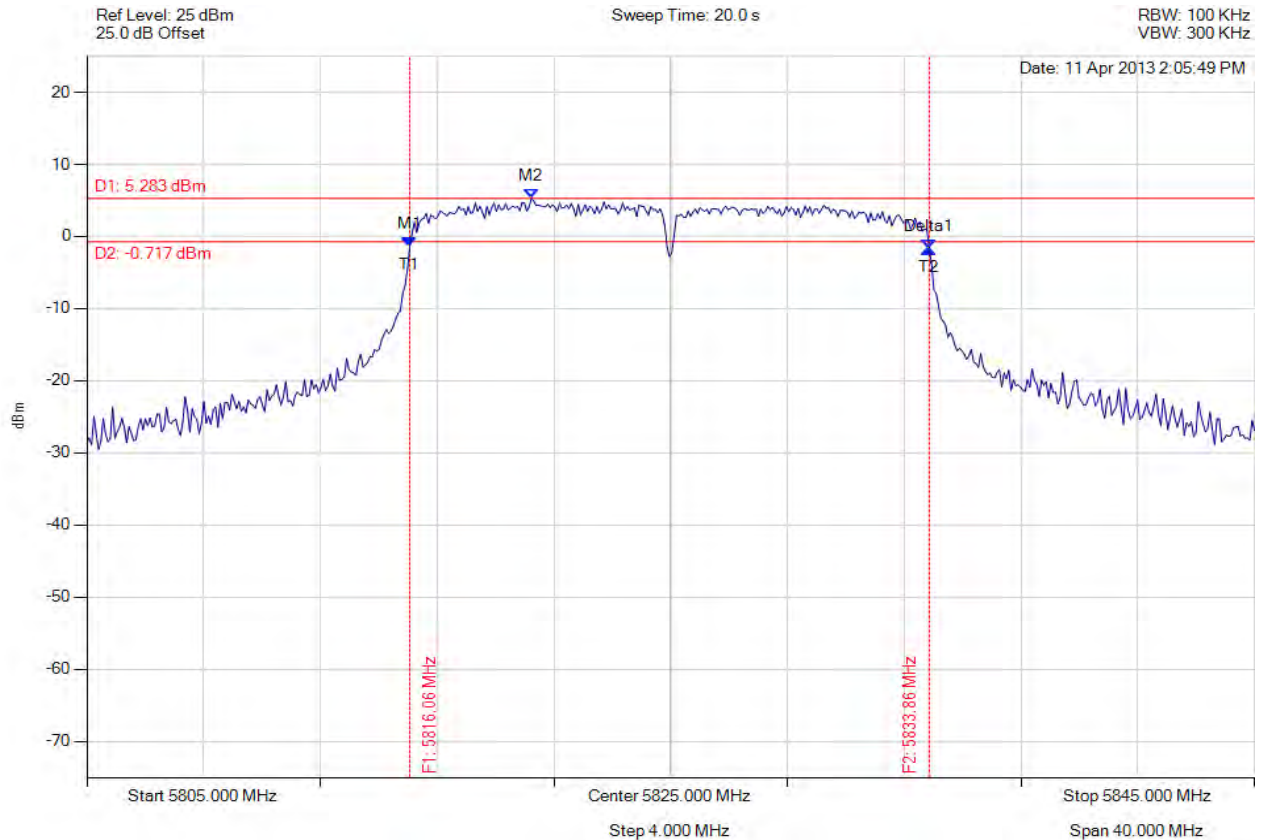


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5825.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



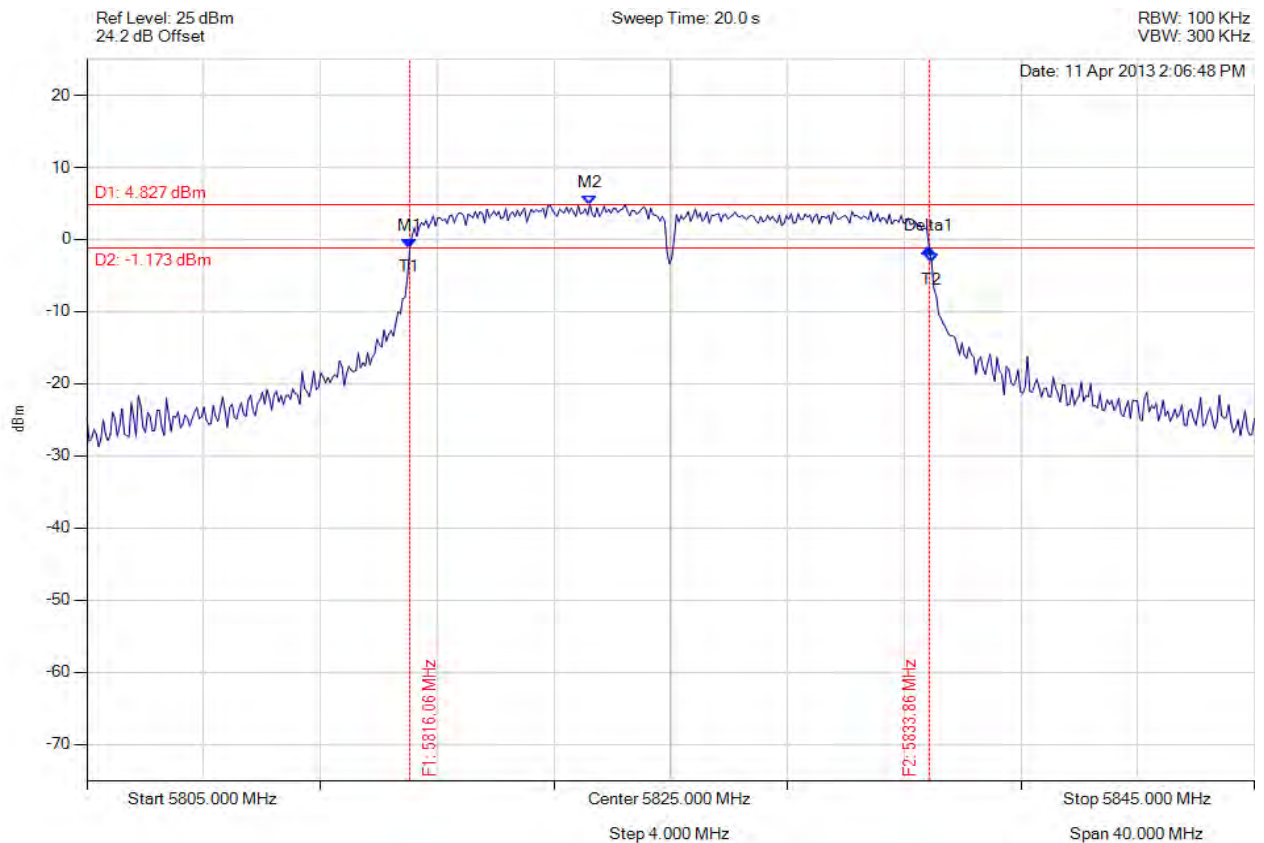
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5816.062 MHz : -1.361 dBm M2 : 5820.230 MHz : 5.283 dBm Delta1 : 17.796 MHz : -0.376 dB T1 : 5816.062 MHz : -1.361 dBm T2 : 5833.858 MHz : -1.738 dBm OBW : 17.796 MHz	Measured 6 dB Bandwidth: 17.796 MHz Limit: ≥ 500.0 kHz Margin: -17.30 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5825.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5816.062 MHz : -1.268 dBm M2 : 5822.234 MHz : 4.827 dBm Delta1 : 17.796 MHz : 0.053 dB T1 : 5816.062 MHz : -1.268 dBm T2 : 5833.938 MHz : -3.137 dBm OBW : 17.876 MHz	Measured 6 dB Bandwidth: 17.796 MHz Limit: ≥ 500.0 kHz Margin: -17.30 MHz

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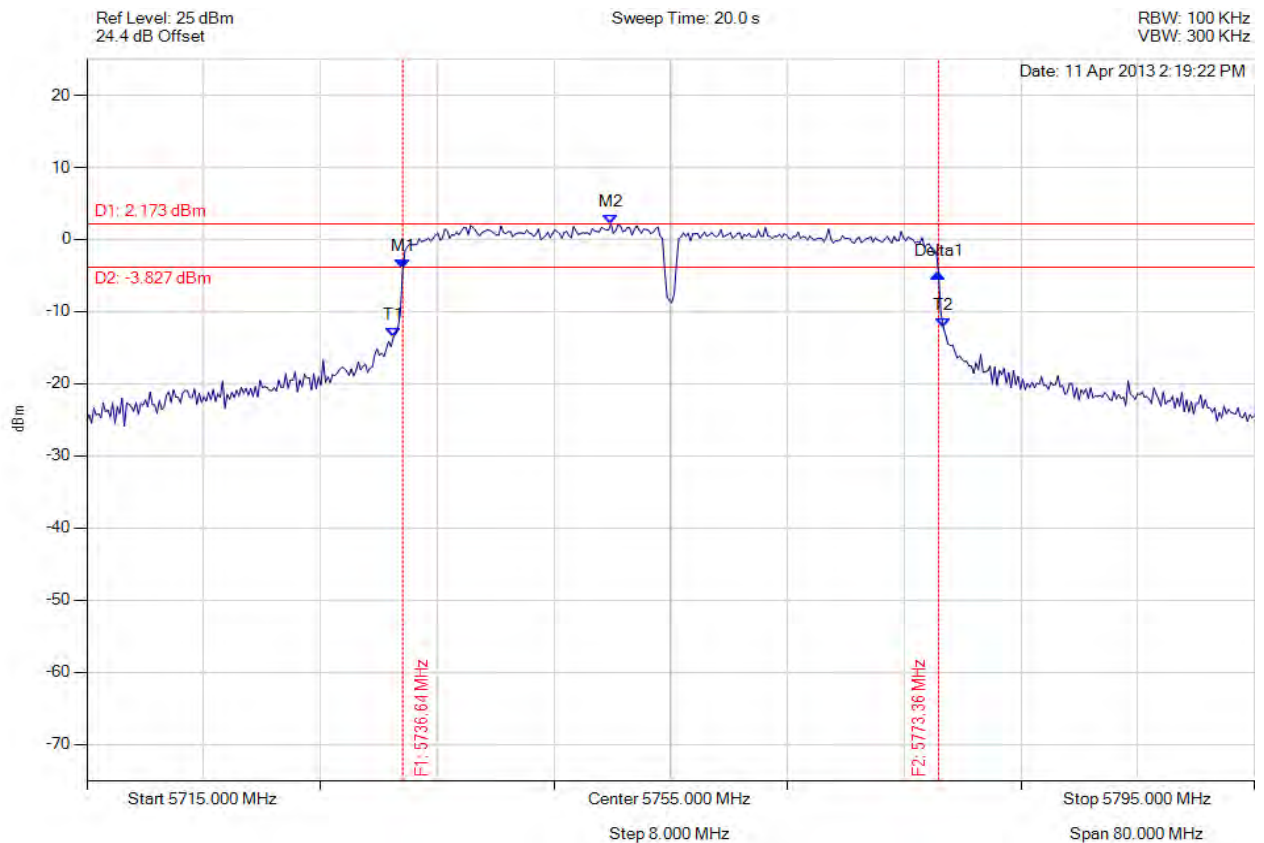


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5755.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.643 MHz : -4.097 dBm M2 : 5750.912 MHz : 2.173 dBm Delta1 : 36.713 MHz : -0.651 dB T1 : 5736.002 MHz : -13.507 dBm T2 : 5773.677 MHz : -12.152 dBm OBW : 37.675 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥ 500.0 kHz Margin: -36.21 MHz

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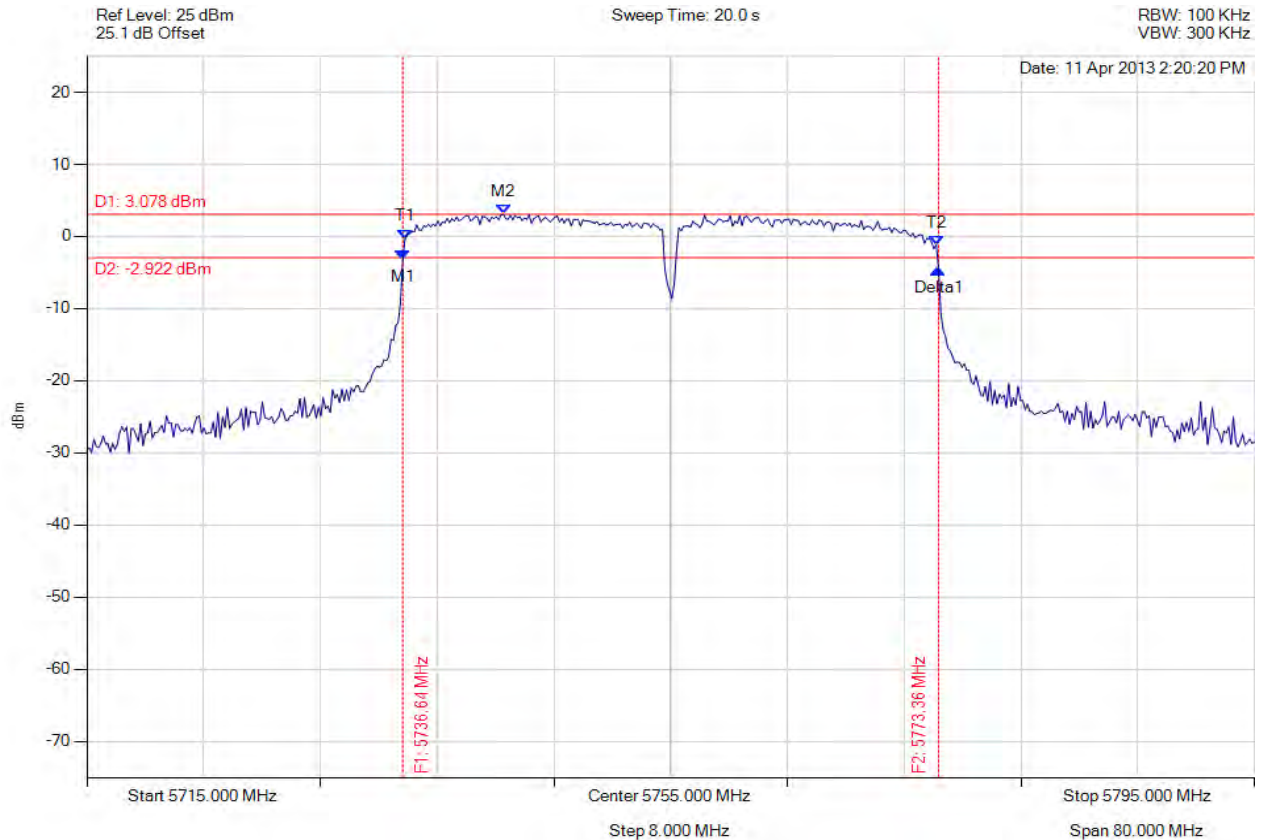


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5755.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.643 MHz : -3.137 dBm M2 : 5743.537 MHz : 3.078 dBm Delta1 : 36.713 MHz : -1.446 dB T1 : 5736.804 MHz : -0.290 dBm T2 : 5773.196 MHz : -1.148 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥ 500.0 kHz Margin: -36.21 MHz

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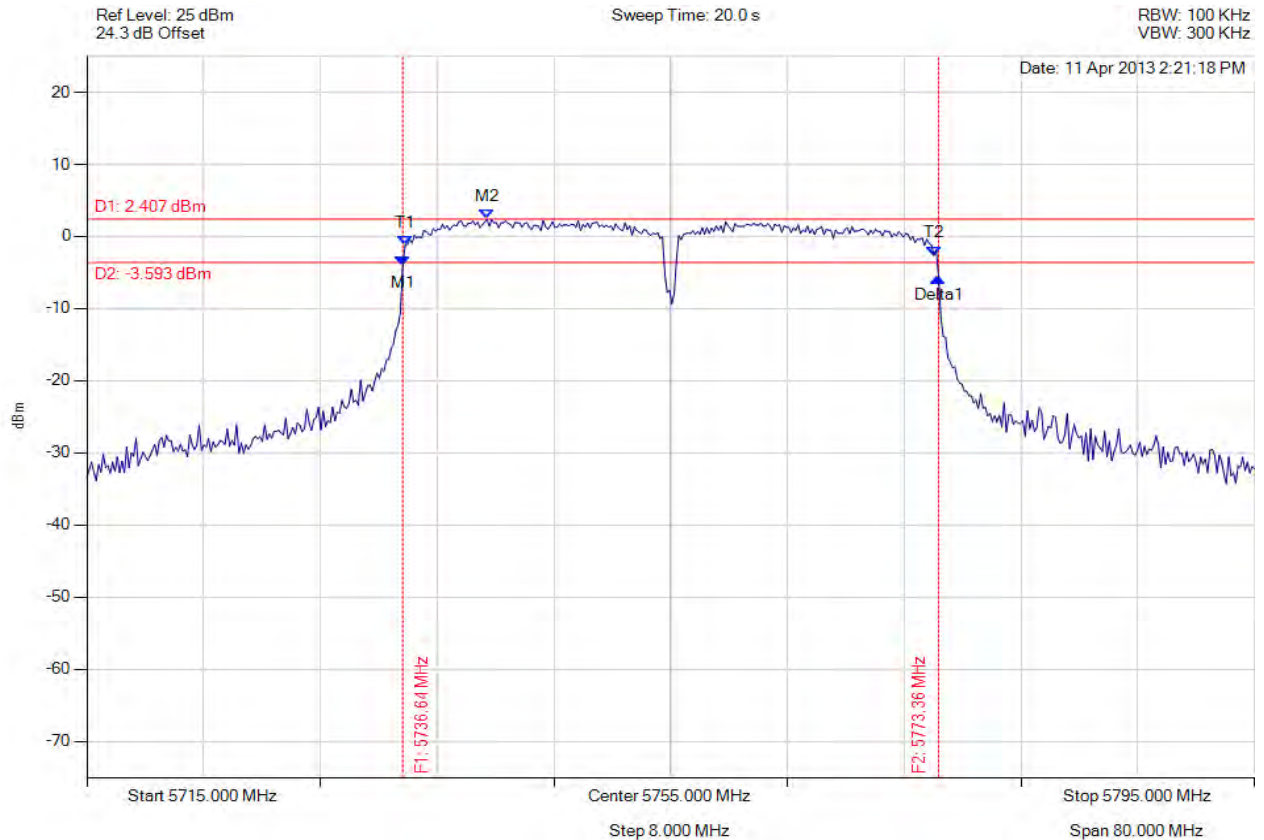


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5755.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5736.643 MHz : -3.950 dBm M2 : 5742.415 MHz : 2.407 dBm Delta1 : 36.713 MHz : -1.676 dB T1 : 5736.804 MHz : -1.248 dBm T2 : 5773.036 MHz : -2.624 dBm OBW : 36.232 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥ 500.0 kHz Margin: -36.21 MHz

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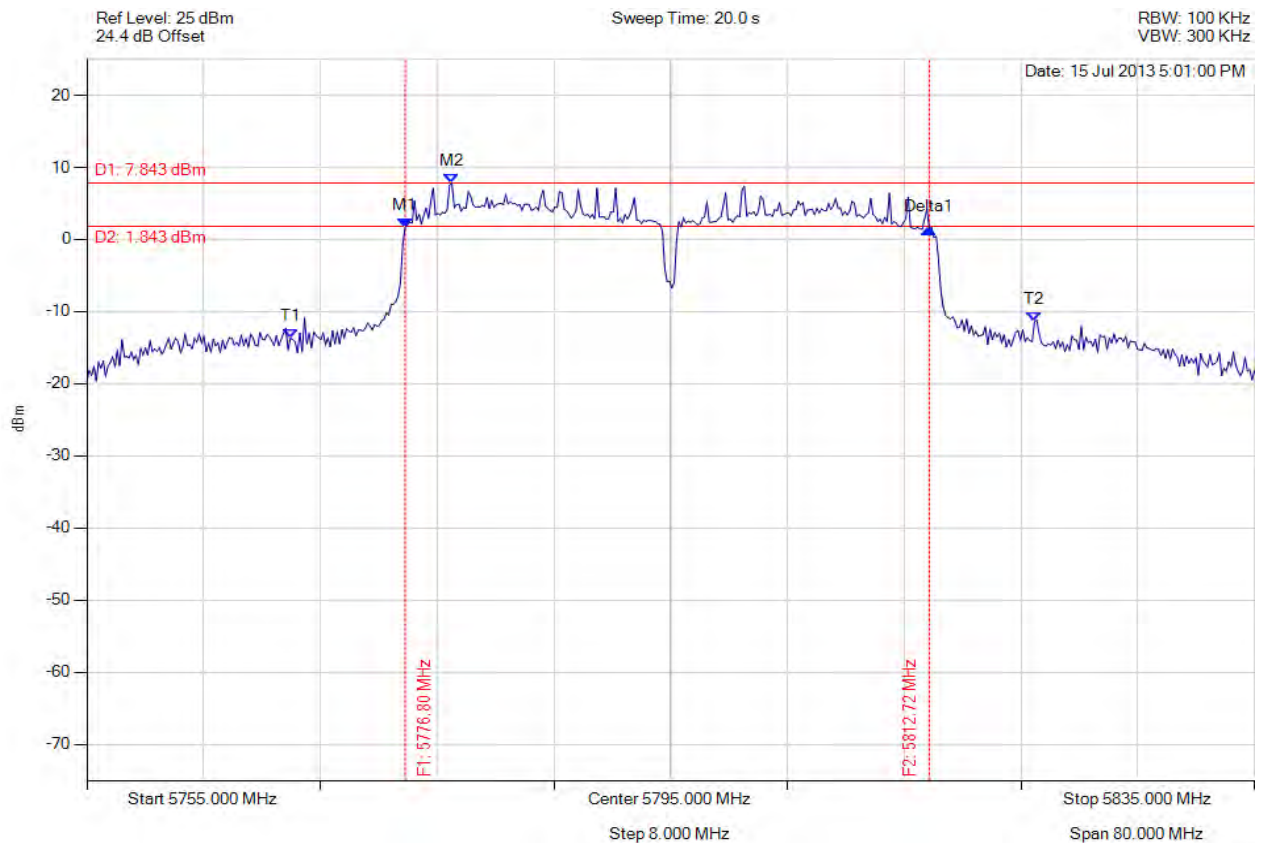


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5795.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



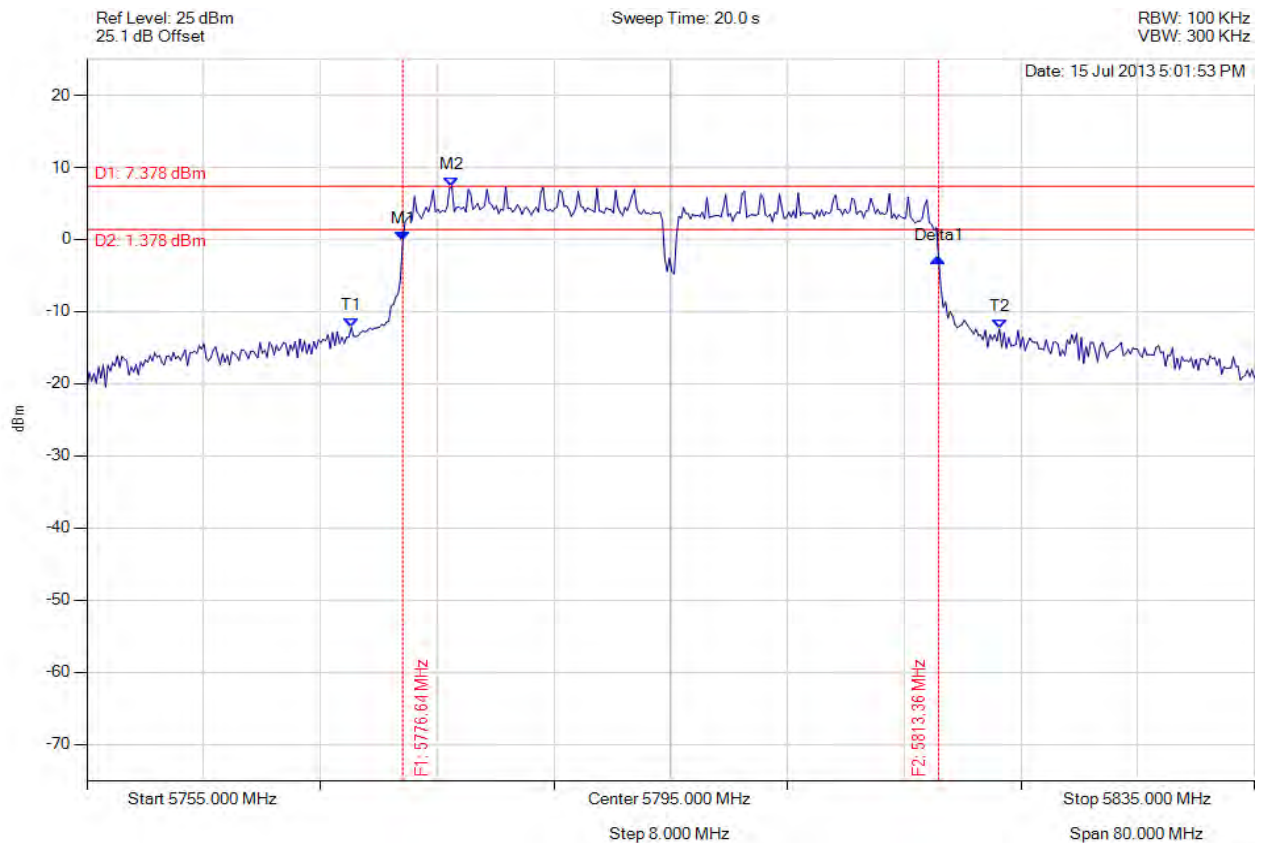
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.804 MHz : 1.644 dBm M2 : 5780.010 MHz : 7.843 dBm Delta1 : 35.912 MHz : -0.136 dB T1 : 5768.948 MHz : -13.676 dBm T2 : 5819.930 MHz : -11.420 dBm OBW : 50.982 MHz	Measured 6 dB Bandwidth: 35.912 MHz Limit: ≥ 500.0 kHz Margin: -35.41 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5795.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



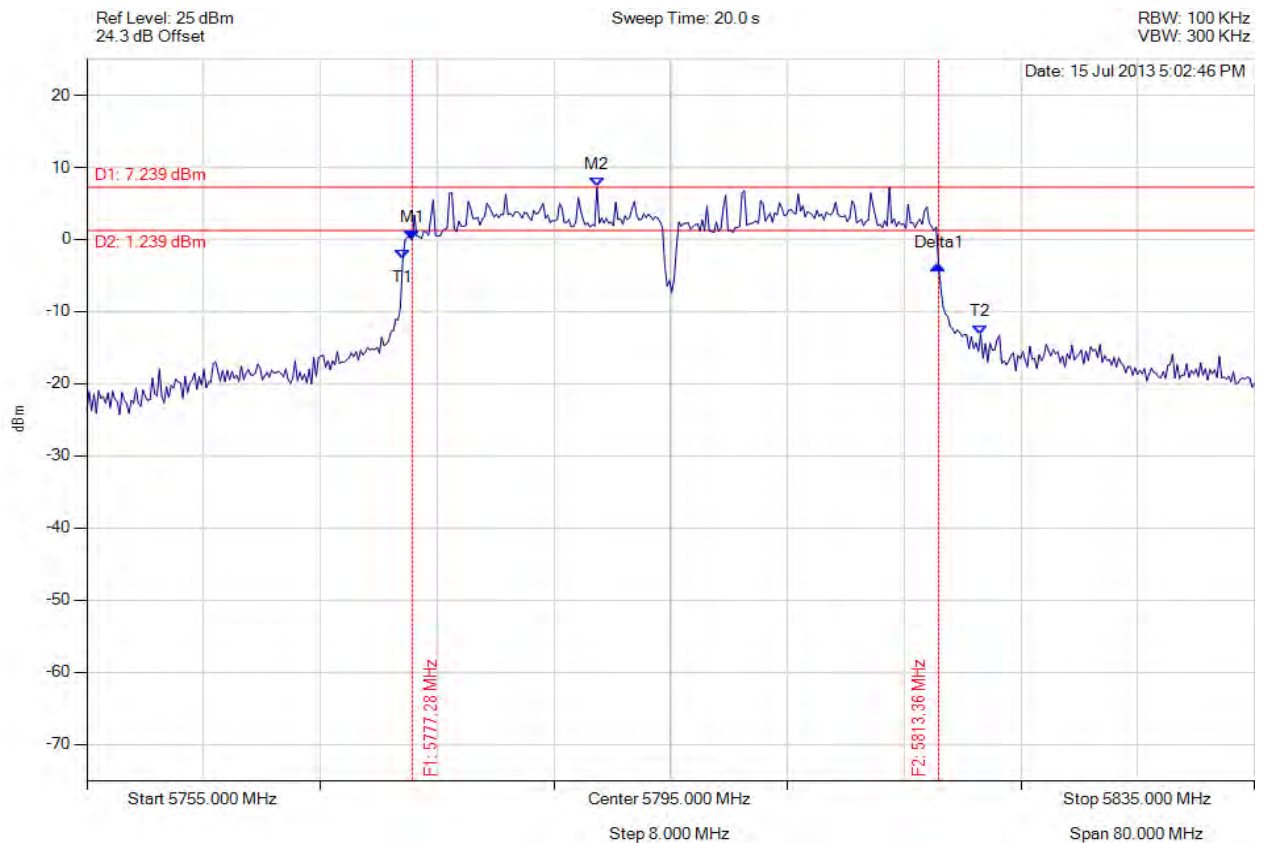
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5776.643 MHz : -0.176 dBm M2 : 5780.010 MHz : 7.378 dBm Delta1 : 36.713 MHz : -2.325 dB T1 : 5773.116 MHz : -12.181 dBm T2 : 5817.525 MHz : -12.403 dBm OBW : 44.409 MHz	Measured 6 dB Bandwidth: 36.713 MHz Limit: ≥500.0 kHz Margin: -36.21 MHz

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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5795.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5777.285 MHz : -0.096 dBm M2 : 5789.950 MHz : 7.239 dBm Delta1 : 36.072 MHz : -3.449 dB T1 : 5776.643 MHz : -2.720 dBm T2 : 5816.242 MHz : -13.133 dBm OBW : 39.599 MHz	Measured 6 dB Bandwidth: 36.072 MHz Limit: ≥ 500.0 kHz Margin: -35.57 MHz

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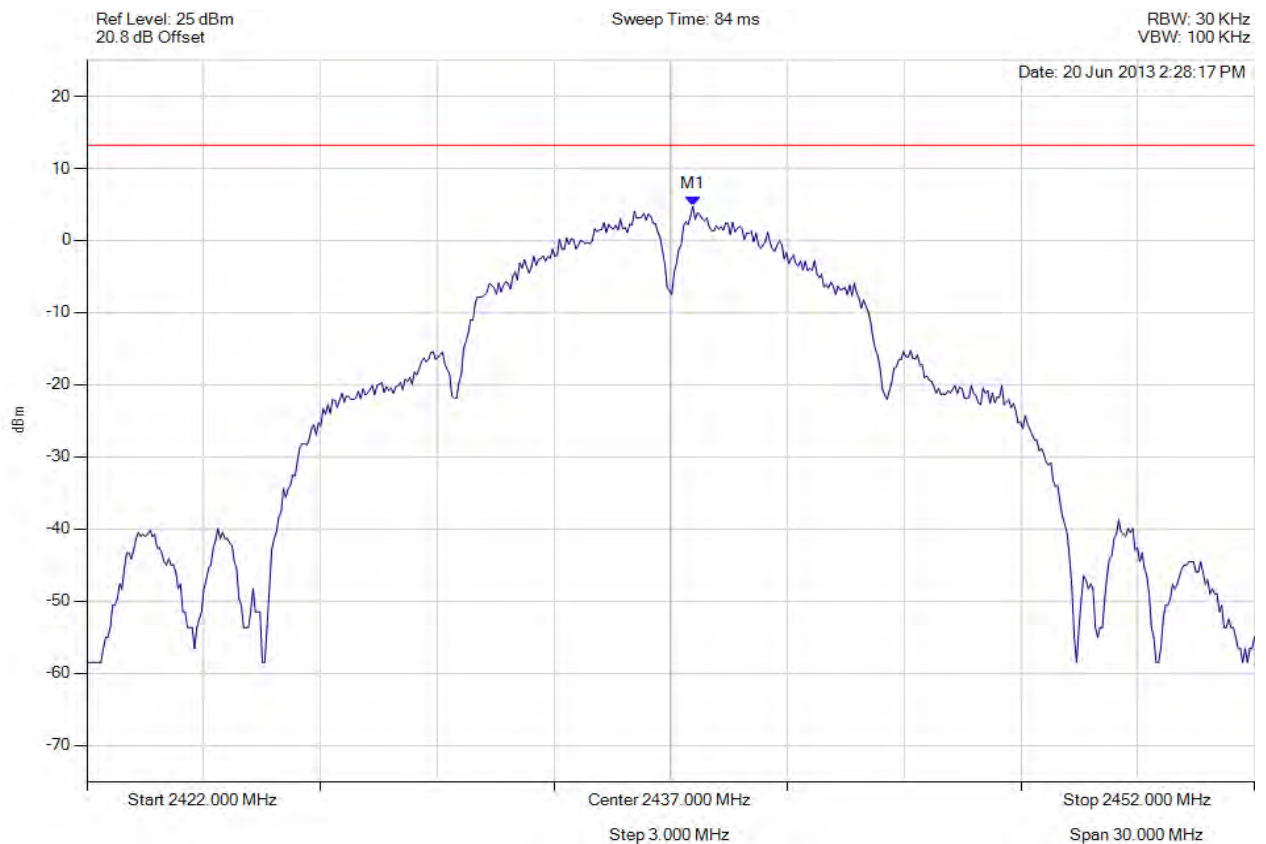
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A.1.2. Power Spectral Density



POWER SPECTRAL DENSITY - AVERAGE

Variant: 802.11b, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2437.571 MHz : 4.733 dBm	Limit: ≤ 13.229 dBm Margin: -8.50 dB

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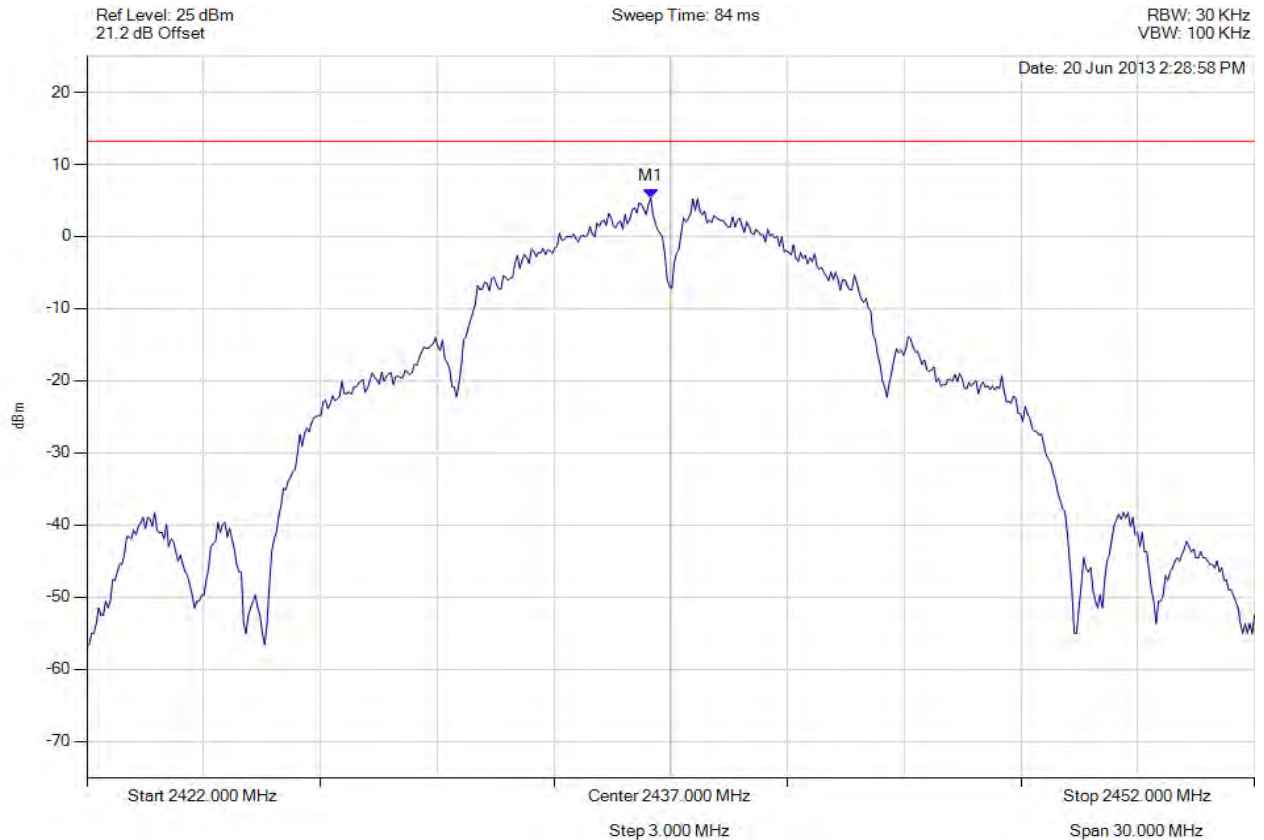


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POWER SPECTRAL DENSITY - AVERAGE

Variant: 802.11b, Channel: 2437.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2436.489 MHz : 5.358 dBm	Limit: ≤ 13.229 dBm Margin: -7.87 dB

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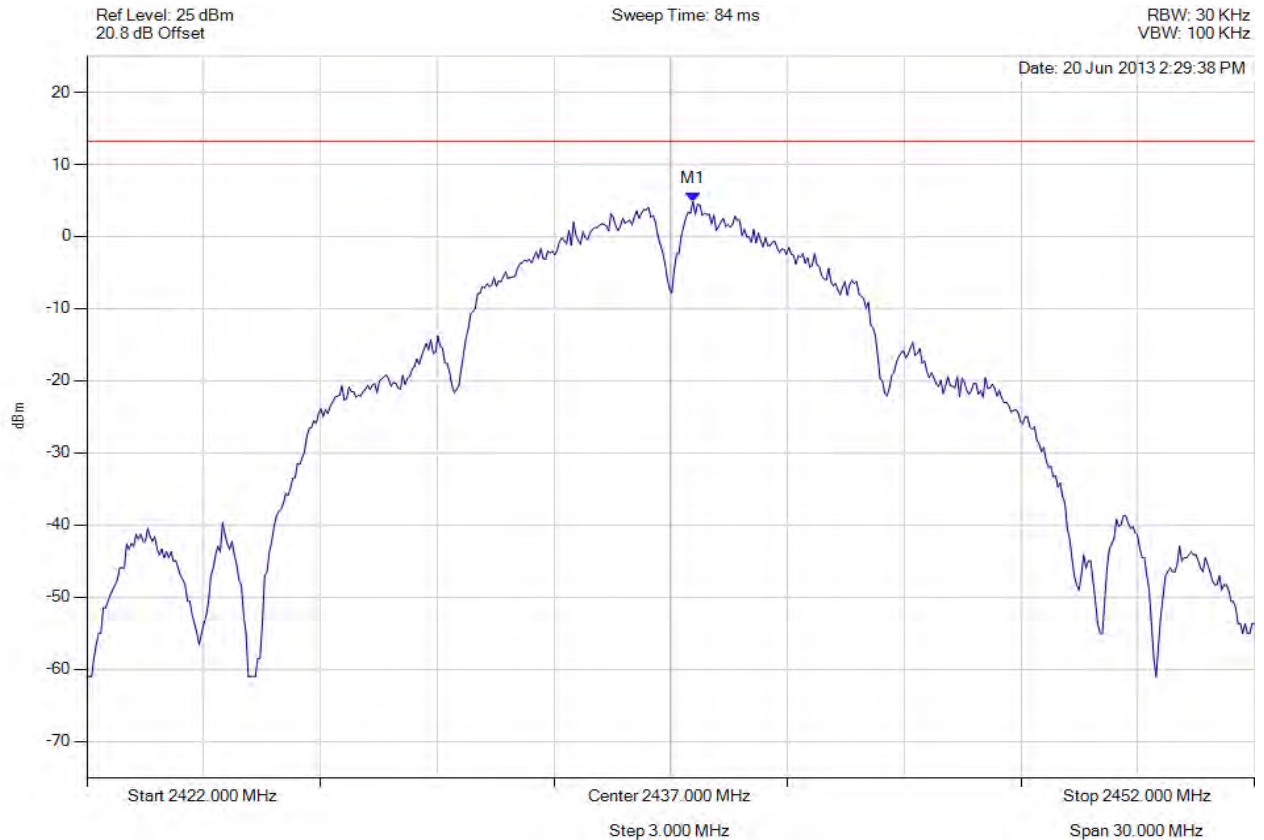


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POWER SPECTRAL DENSITY - AVERAGE

Variant: 802.11b, Channel: 2437.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2437.571 MHz : 4.890 dBm	Limit: ≤ 13.229 dBm Margin: -8.34 dB

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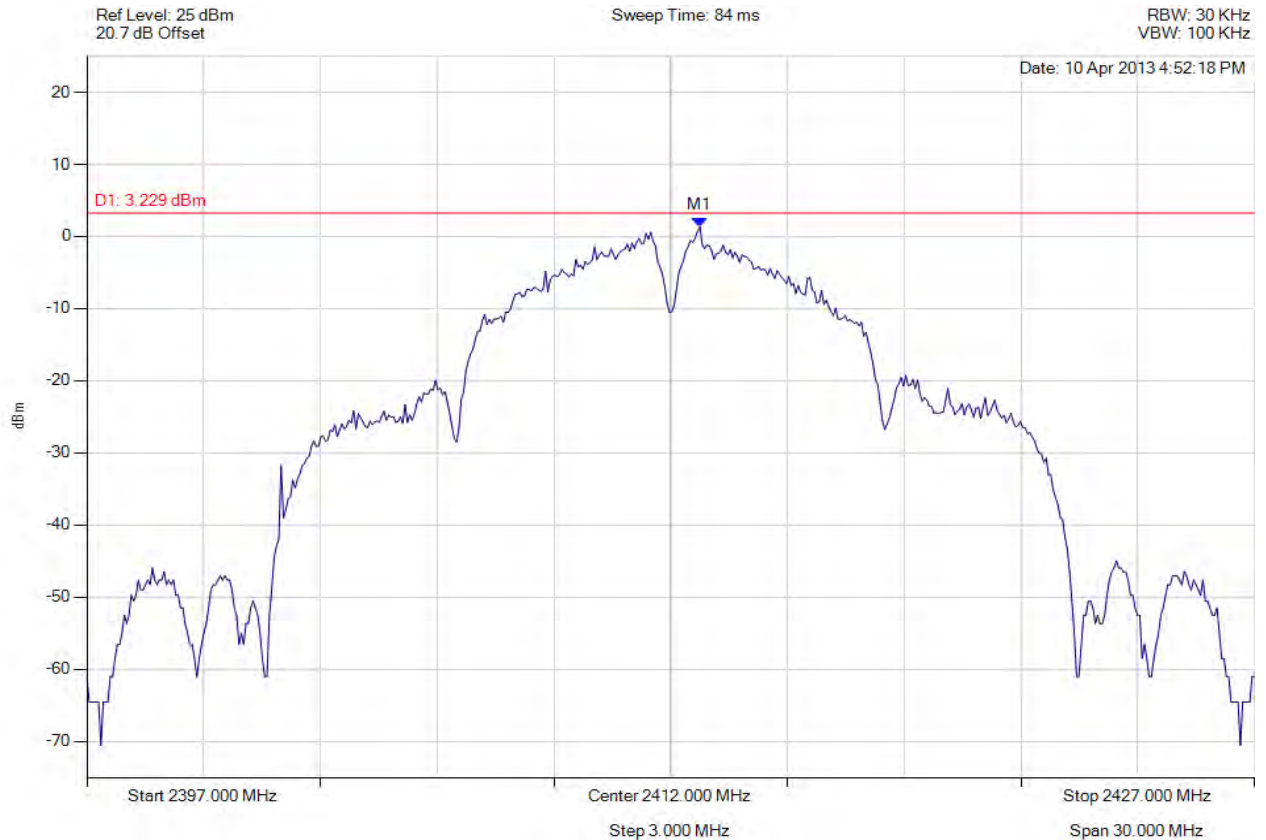


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POWER SPECTRAL DENSITY

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2412.752 MHz : 1.358 dBm	Limit: ≤ 13.229 dBm Margin: -11.87 dB

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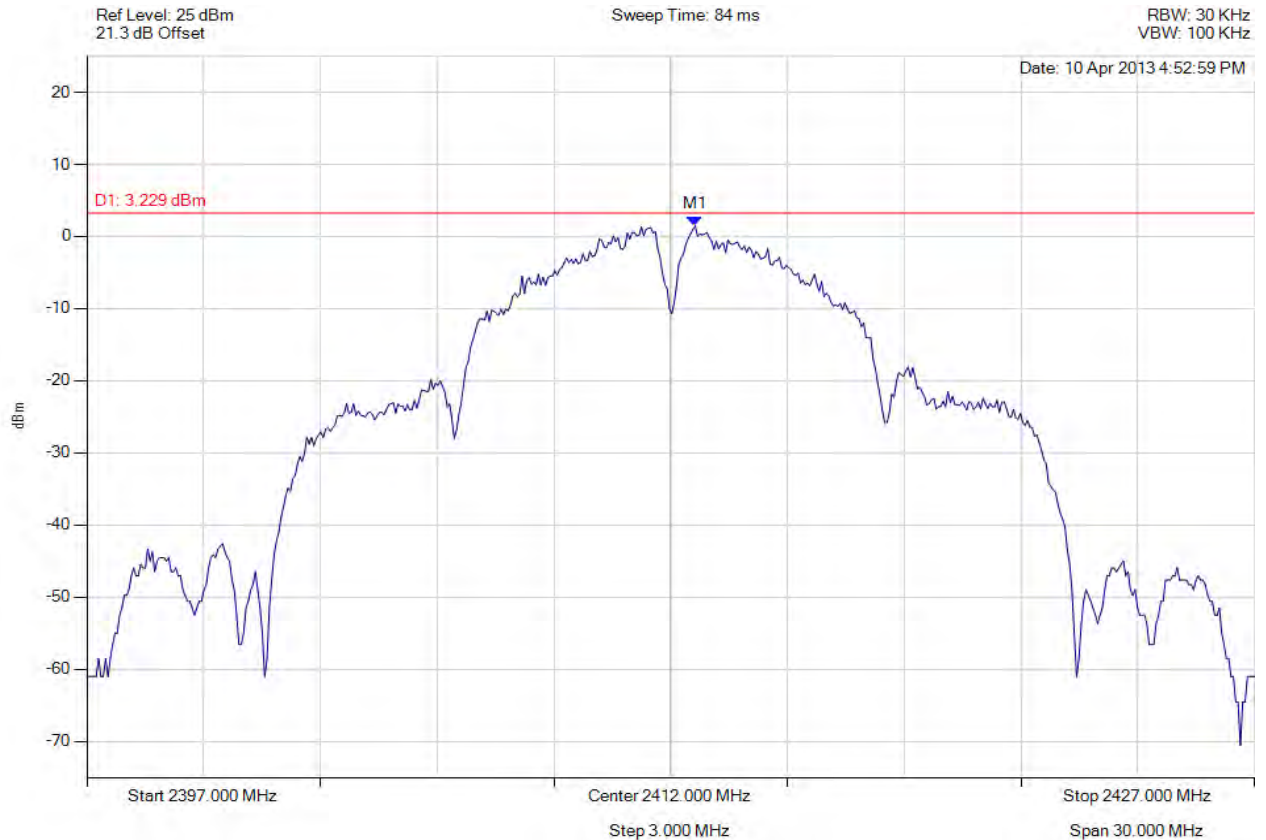


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POWER SPECTRAL DENSITY

Variant: 802.11b, Channel: 2412.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2412.631 MHz : 1.458 dBm	Limit: ≤ 13.229 dBm Margin: -11.77 dB

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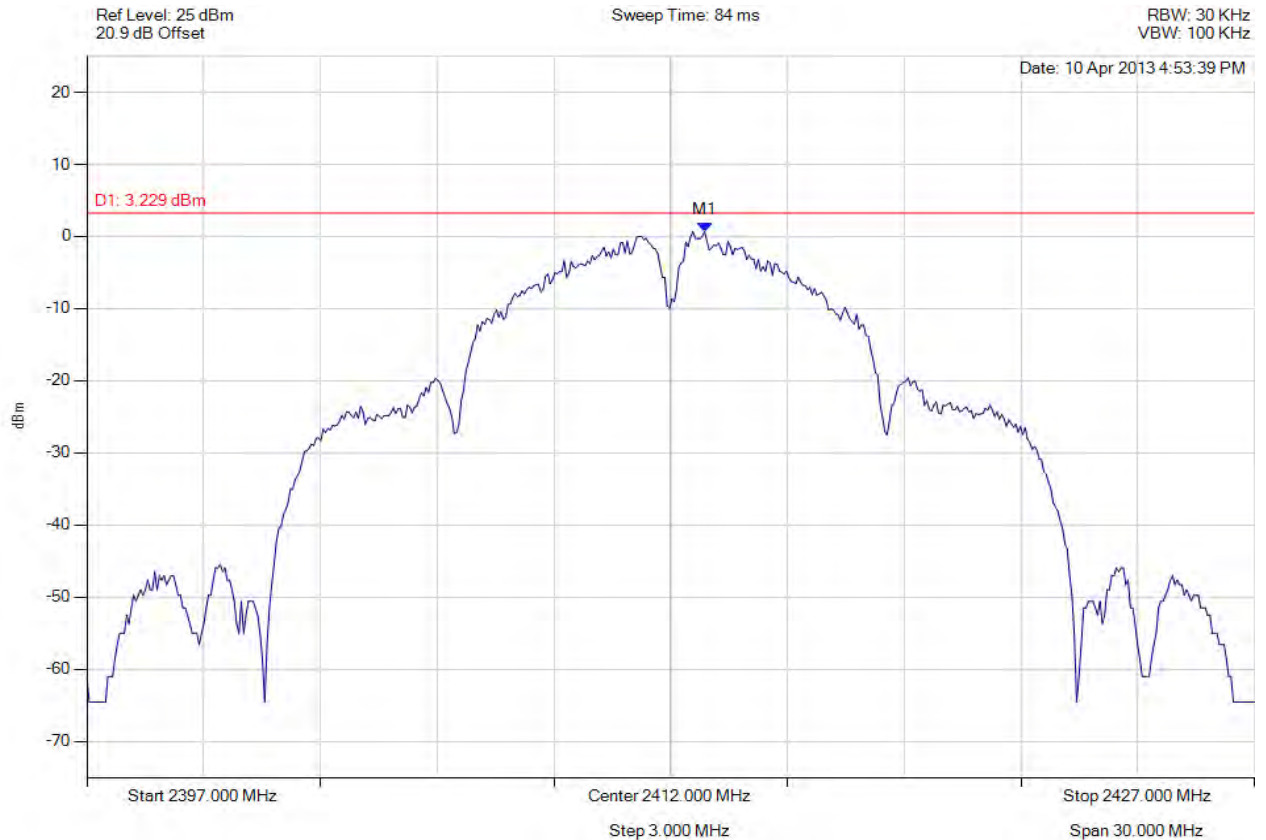


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POWER SPECTRAL DENSITY

Variant: 802.11b, Channel: 2412.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2412.872 MHz : 0.700 dBm	Limit: ≤ 13.229 dBm Margin: -12.53 dB

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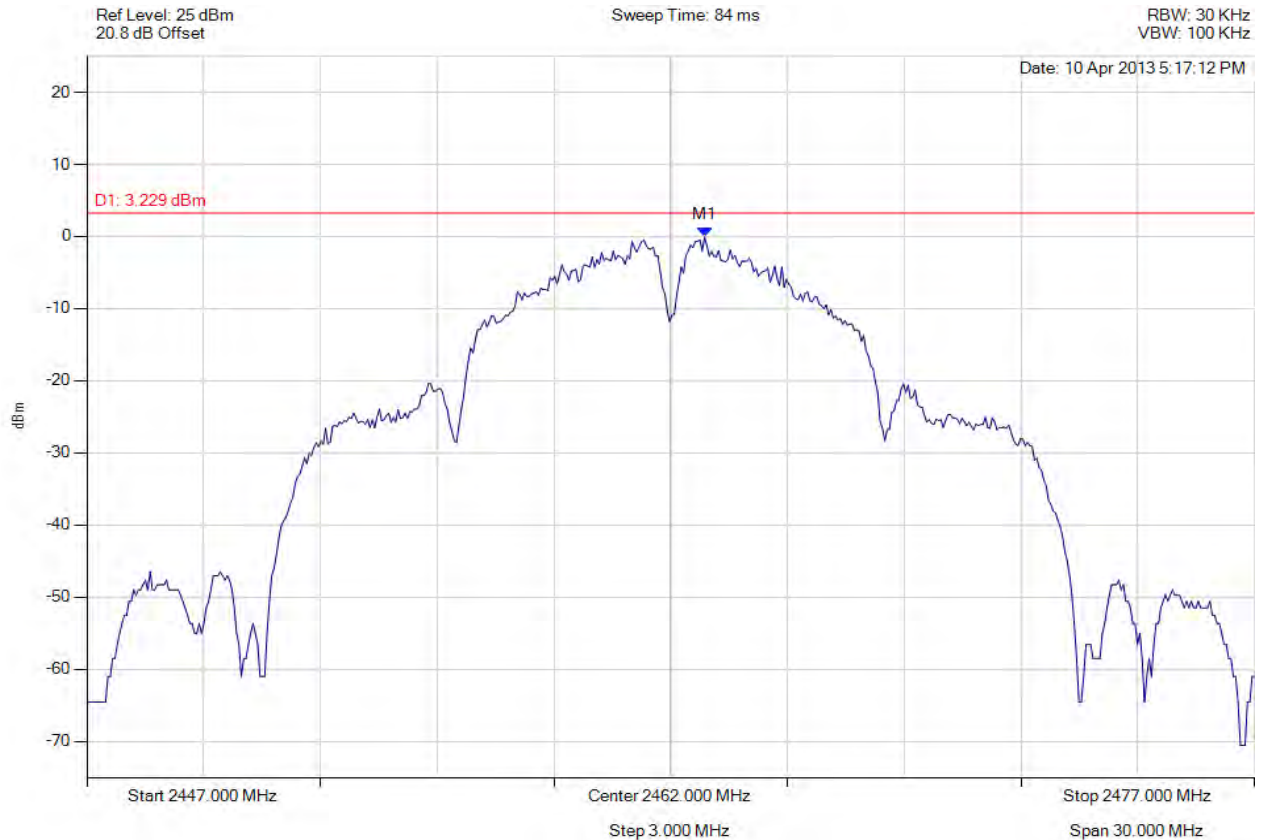


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POWER SPECTRAL DENSITY

Variant: 802.11b, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2462.872 MHz : -0.059 dBm	Limit: ≤ 13.229 dBm Margin: -13.29 dB

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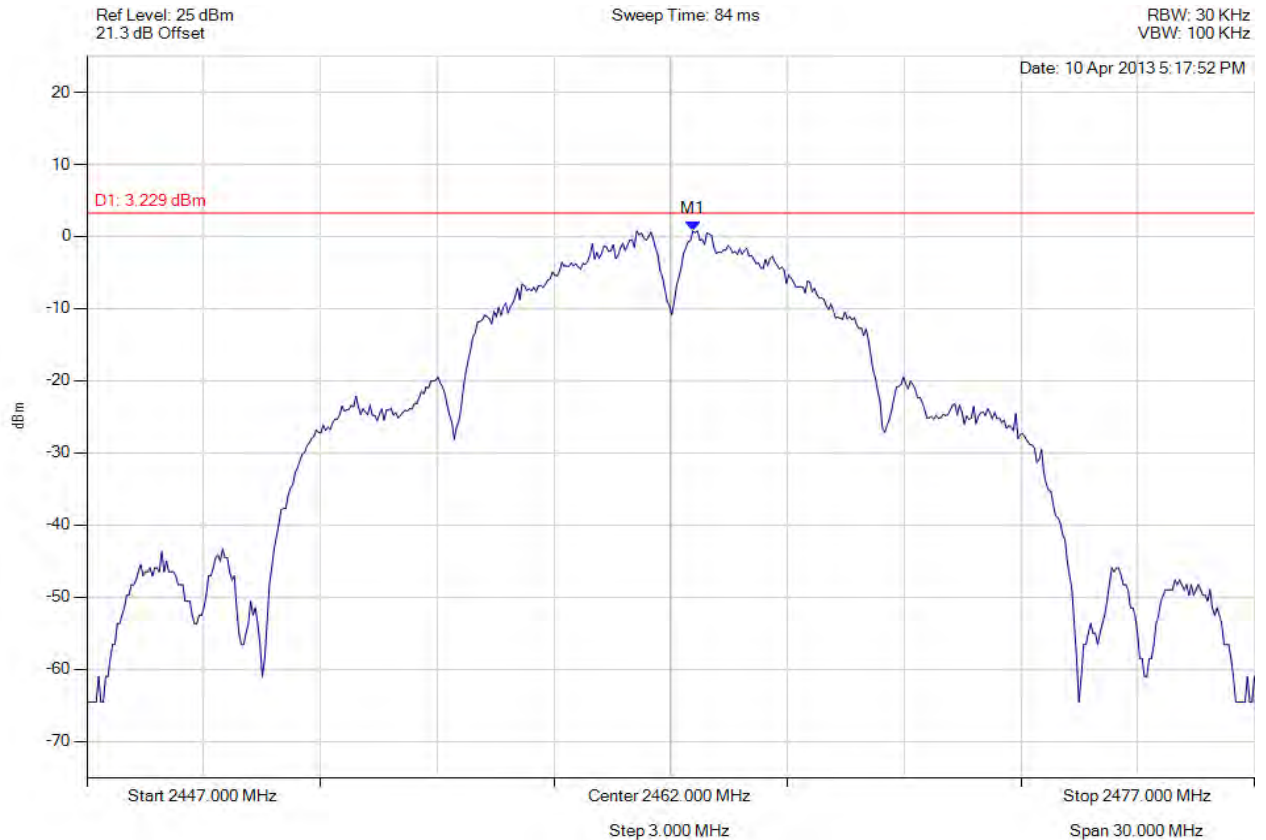


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POWER SPECTRAL DENSITY

Variant: 802.11b, Channel: 2462.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2462.571 MHz : 0.759 dBm	Limit: ≤ 13.229 dBm Margin: -12.47 dB

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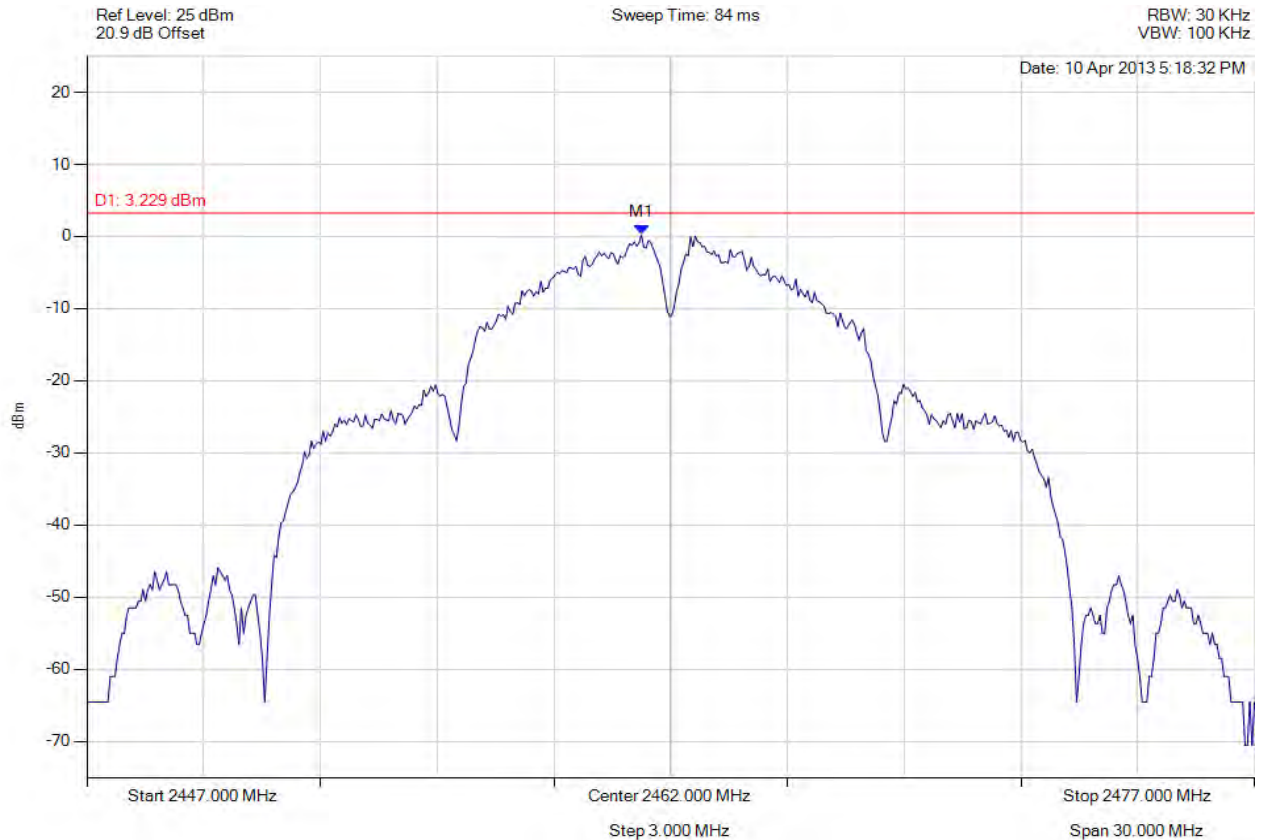


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POWER SPECTRAL DENSITY

Variant: 802.11b, Channel: 2462.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2461.248 MHz : 0.236 dBm	Limit: ≤ 13.229 dBm Margin: -12.99 dB

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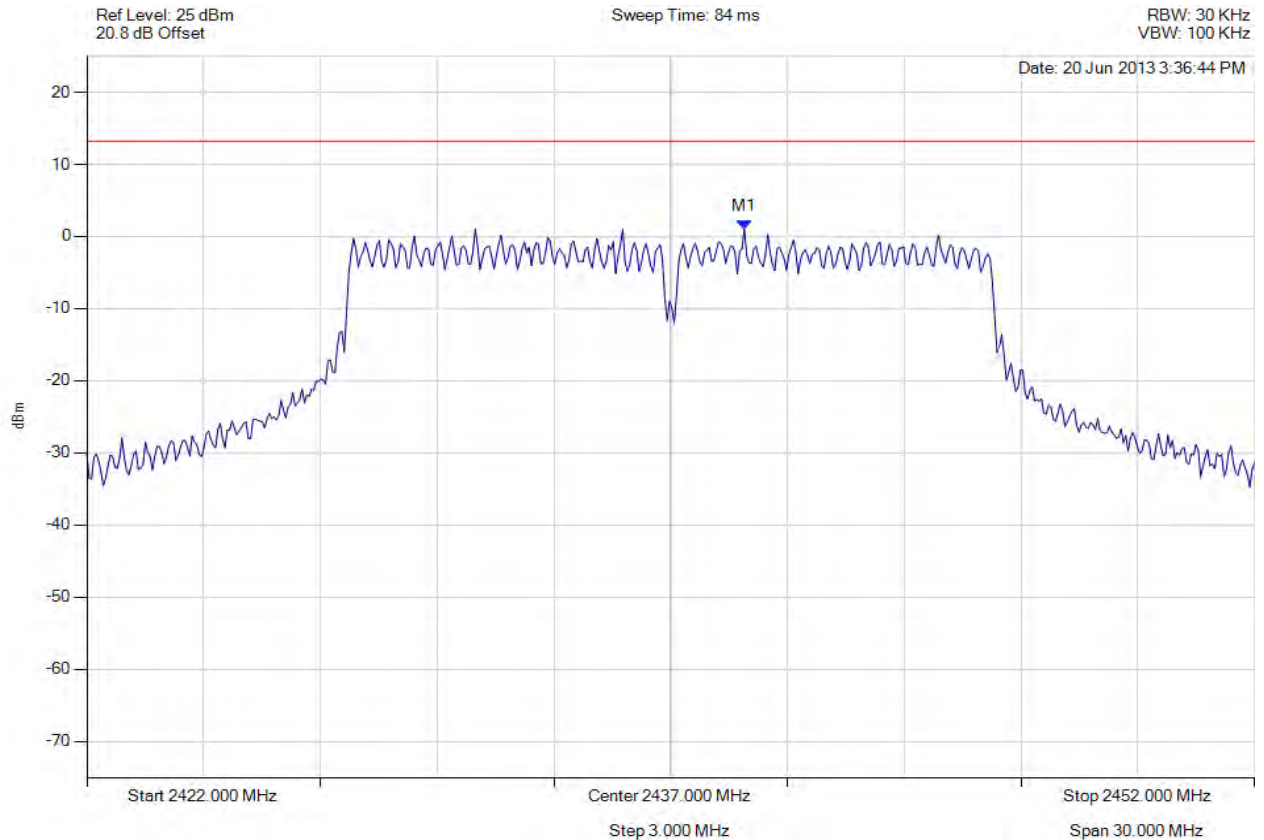


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POWER SPECTRAL DENSITY - AVERAGE

Variant: 802.11g, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2438.894 MHz : 1.046 dBm	Limit: ≤ 13.229 dBm Margin: -12.18 dB

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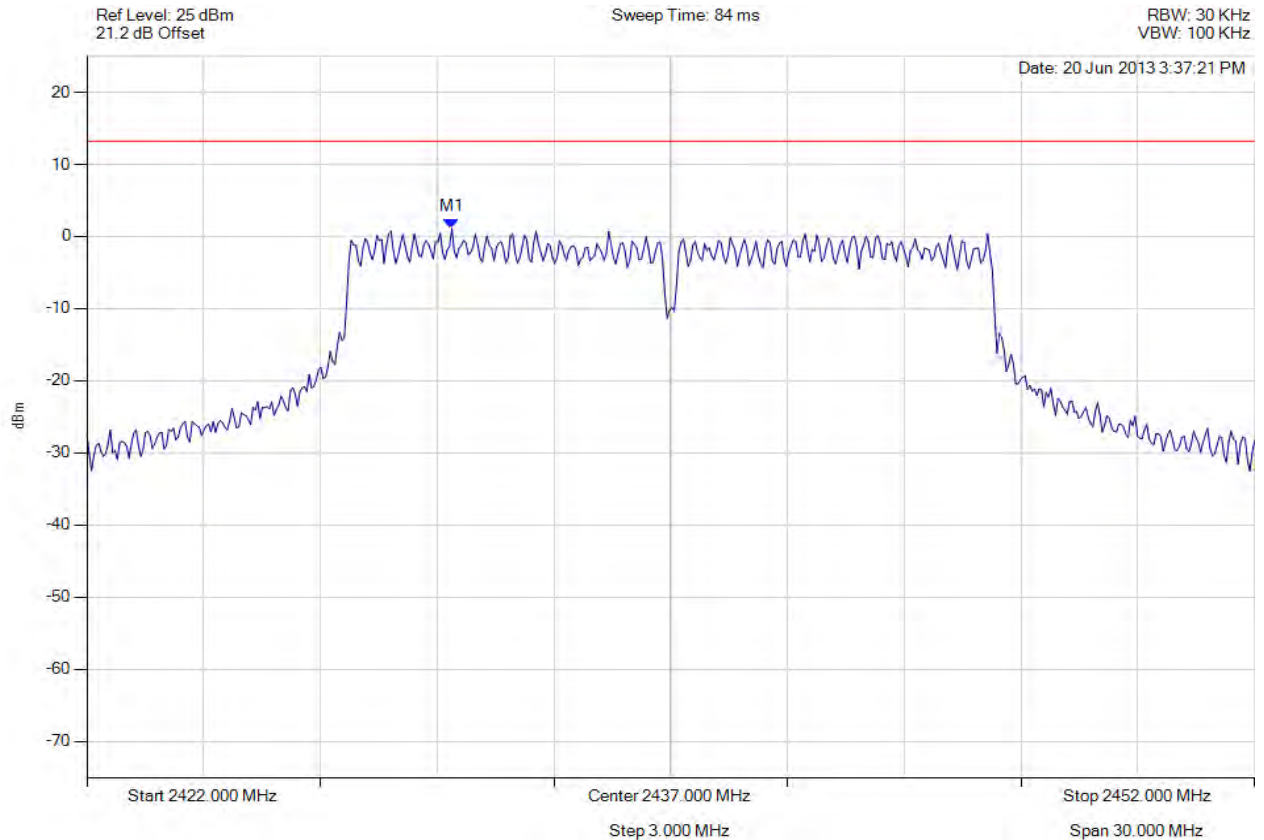


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POWER SPECTRAL DENSITY - AVERAGE

Variant: 802.11g, Channel: 2437.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2431.379 MHz : 1.076 dBm	Limit: ≤ 13.229 dBm Margin: -12.15 dB

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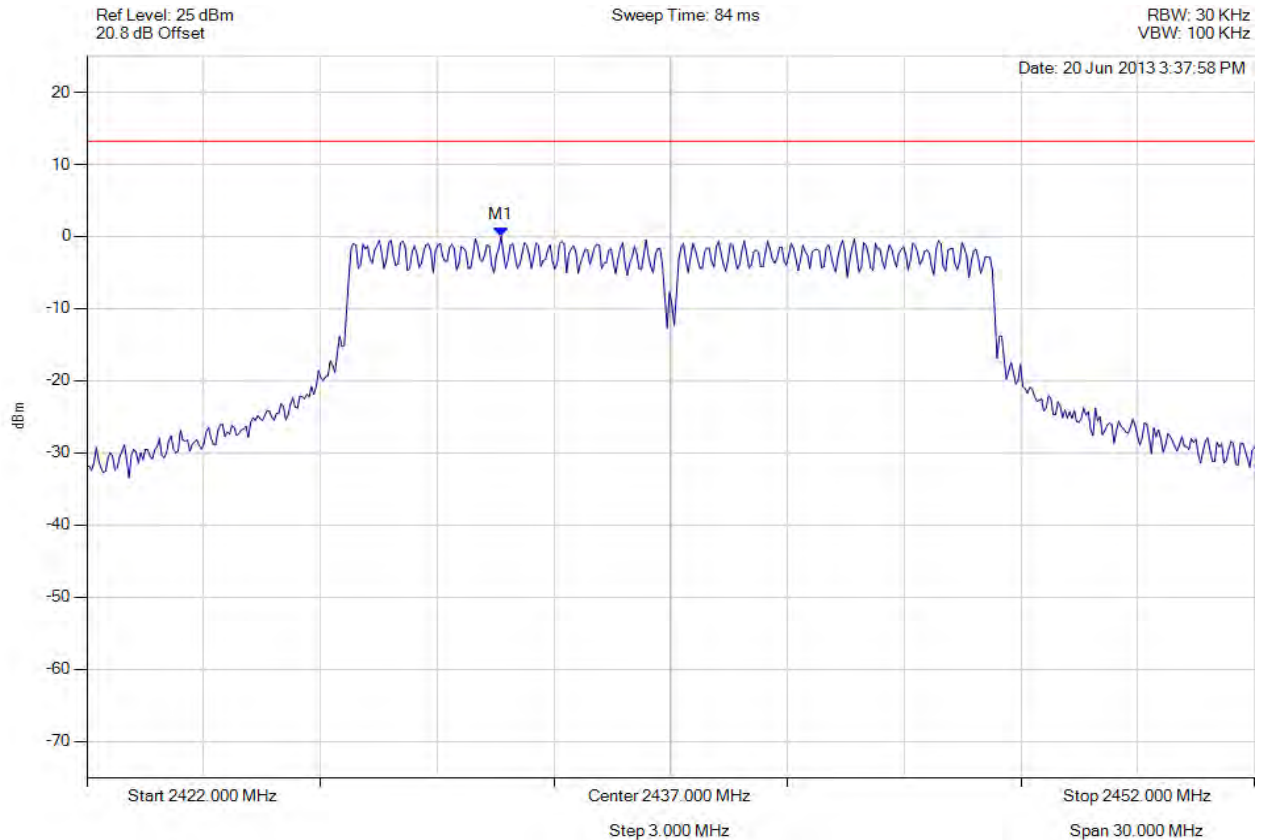


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POWER SPECTRAL DENSITY - AVERAGE

Variant: 802.11g, Channel: 2437.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2432.641 MHz : 0.008 dBm	Limit: ≤ 13.229 dBm Margin: -13.22 dB

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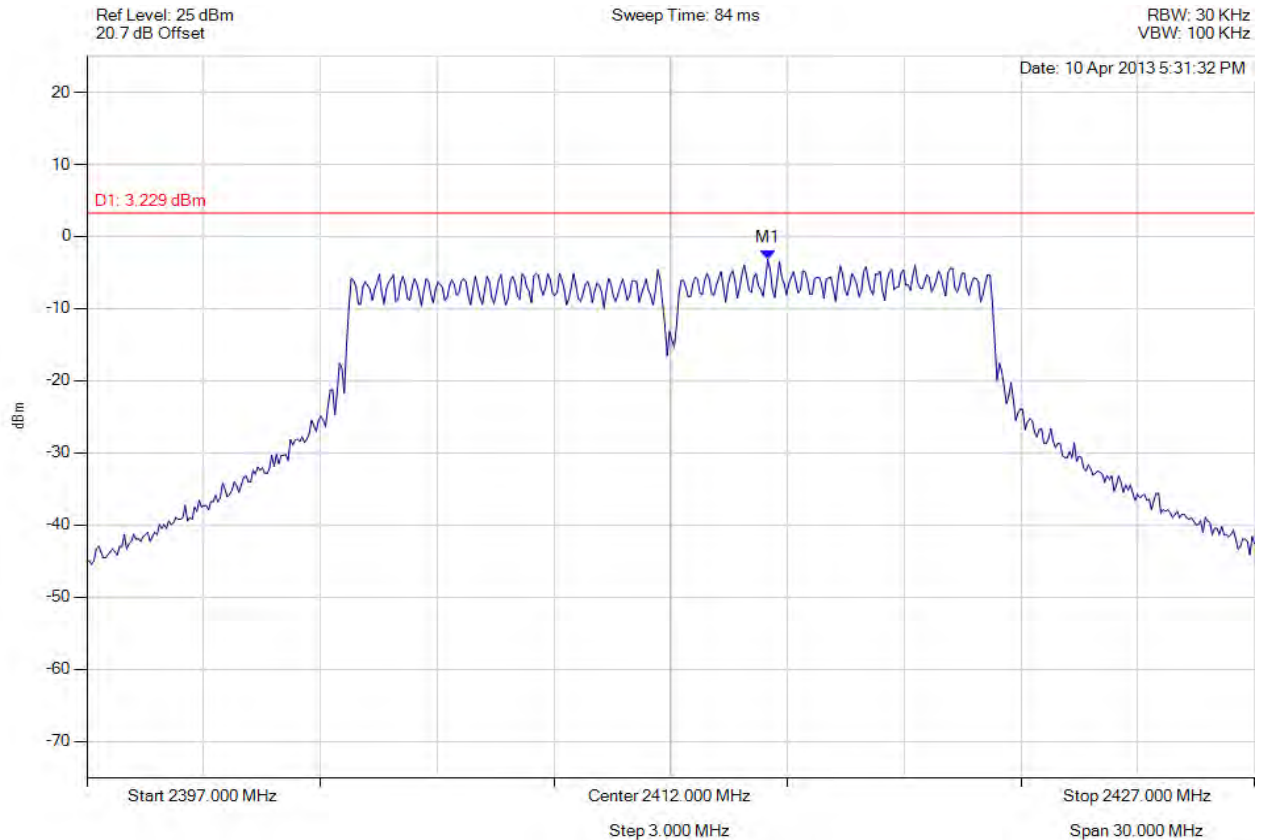


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POWER SPECTRAL DENSITY

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2414.495 MHz : -3.200 dBm	Limit: ≤ 13.229 dBm Margin: -16.43 dB

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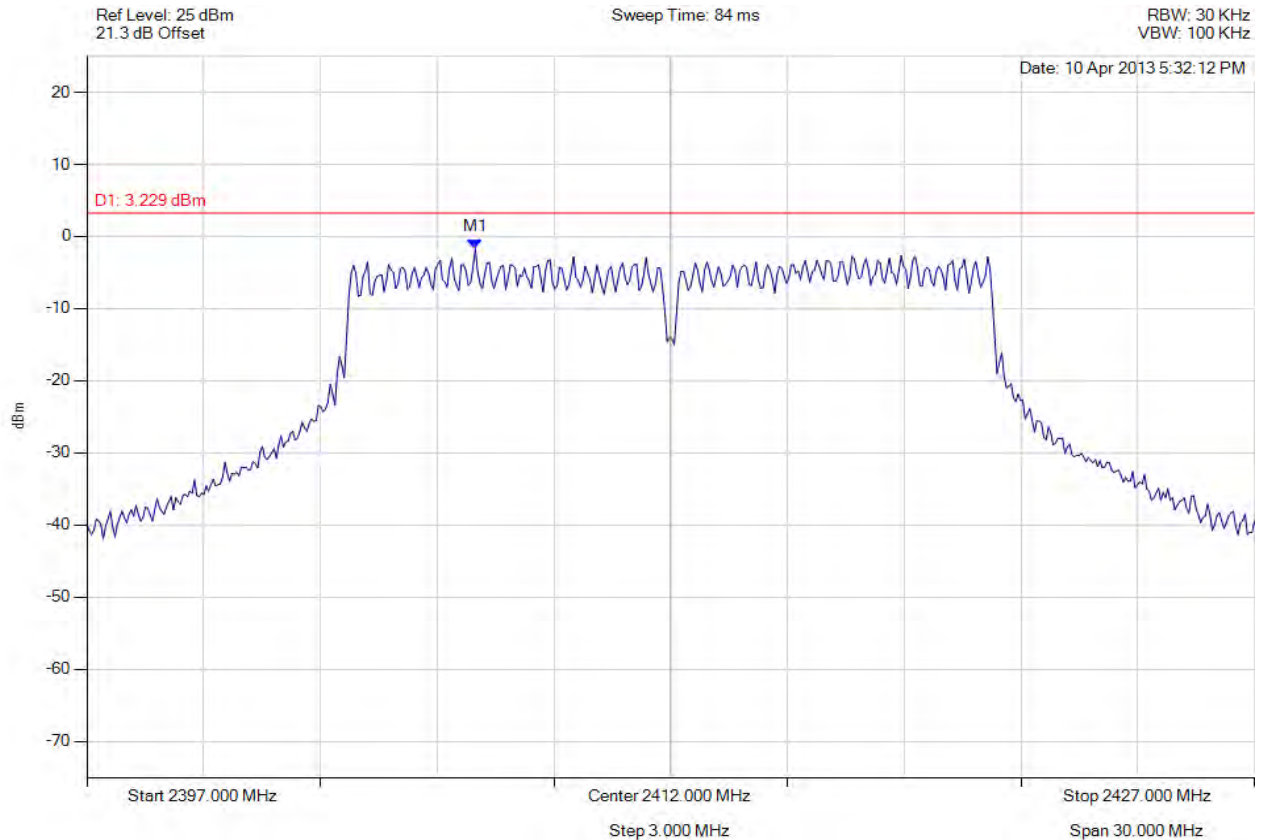


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POWER SPECTRAL DENSITY

Variant: 802.11g, Channel: 2412.00 MHz, Chain b, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2406.980 MHz : -1.725 dBm	Limit: ≤ 13.229 dBm Margin: -14.96 dB

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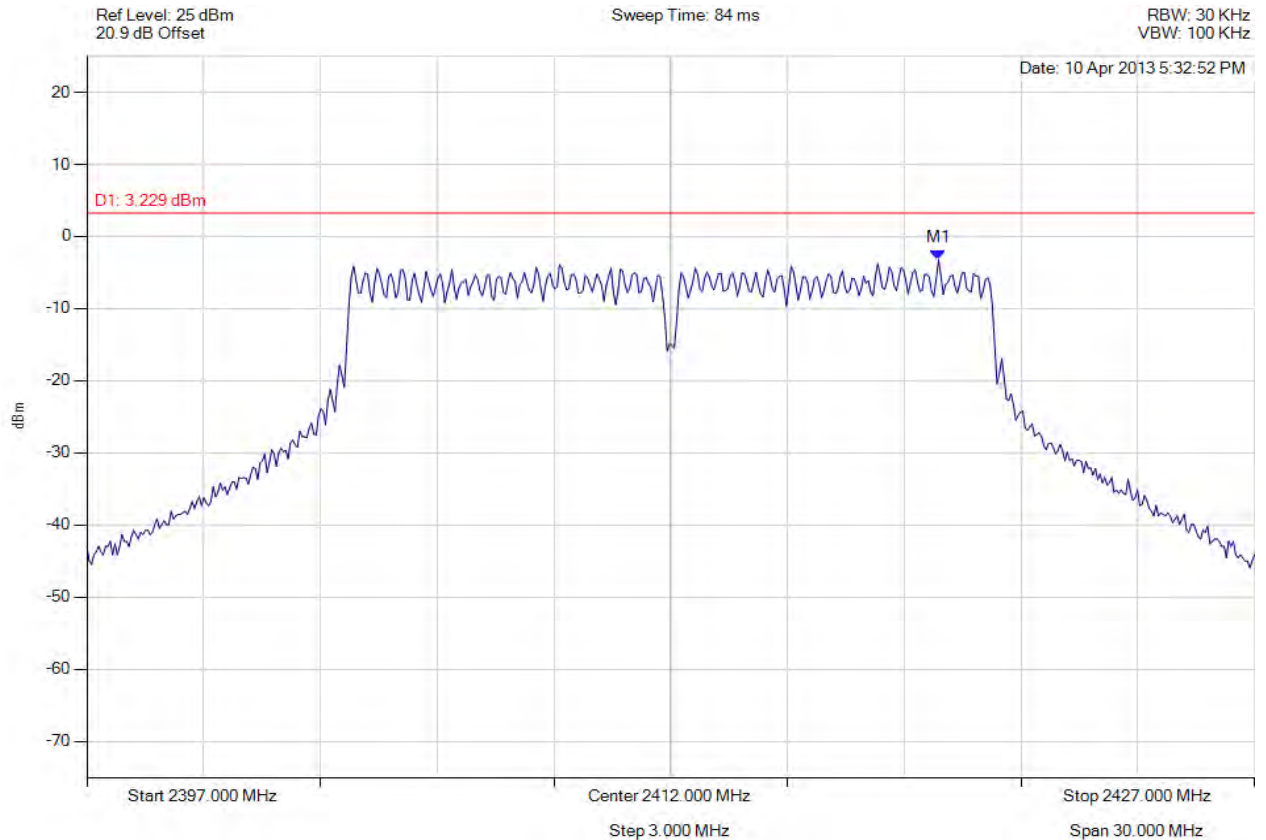


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POWER SPECTRAL DENSITY

Variant: 802.11g, Channel: 2412.00 MHz, Chain c, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2418.884 MHz : -3.252 dBm	Limit: ≤ 13.229 dBm Margin: -16.48 dB

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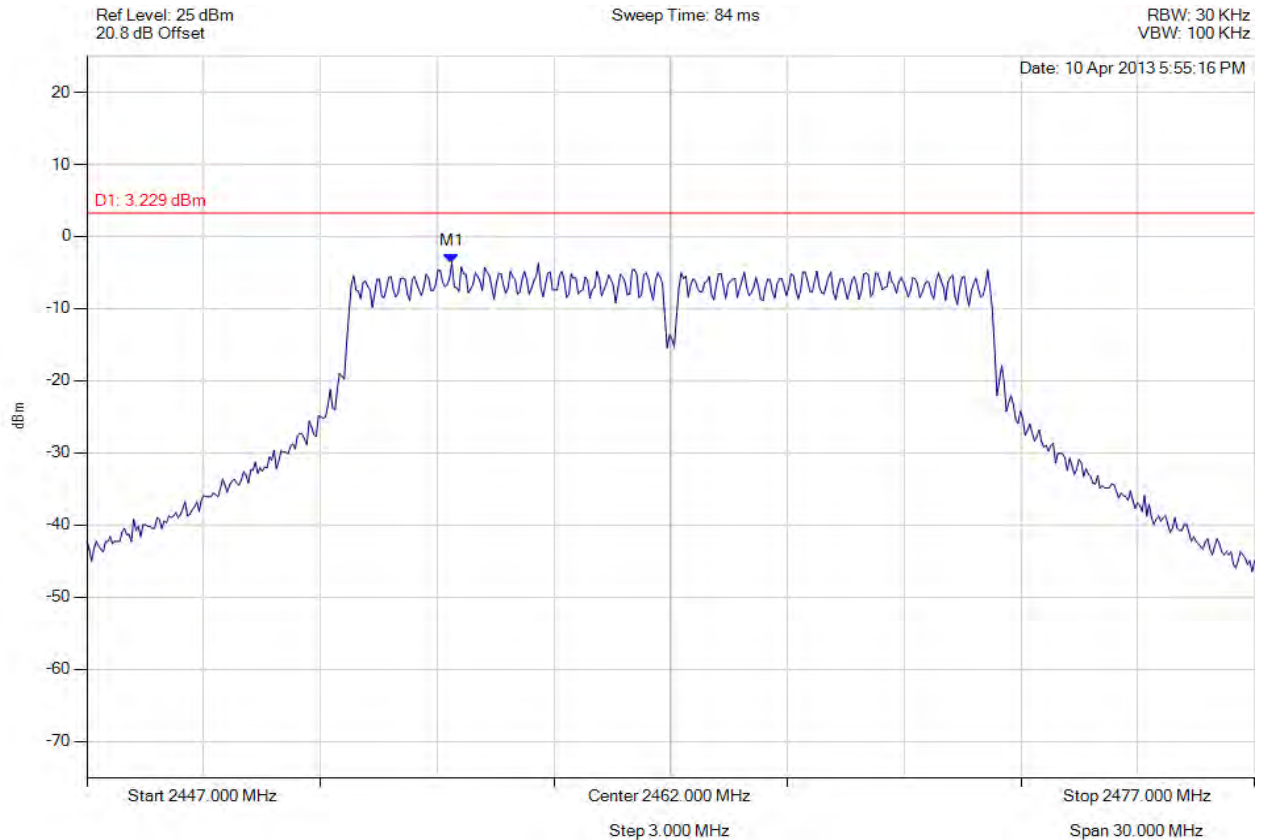


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POWER SPECTRAL DENSITY

Variant: 802.11g, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2456.379 MHz : -3.638 dBm	Limit: ≤ 13.229 dBm Margin: -16.87 dB

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