

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:

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TEST CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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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

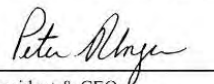
Pleasanton, CA

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



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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

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3. TEST EQUIPMENT CONFIGURATION(S)

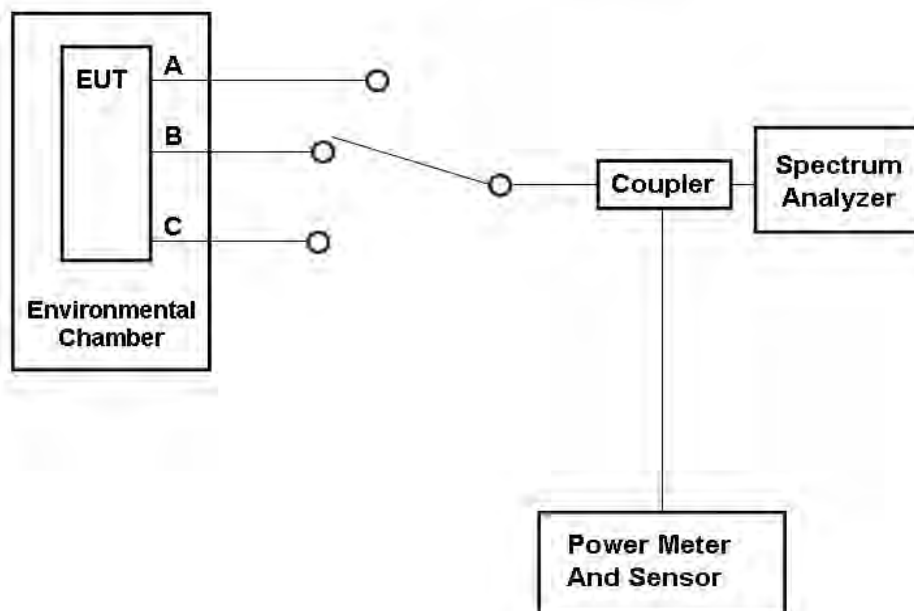
3.1. Conducted RF Emission Test Set-up

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

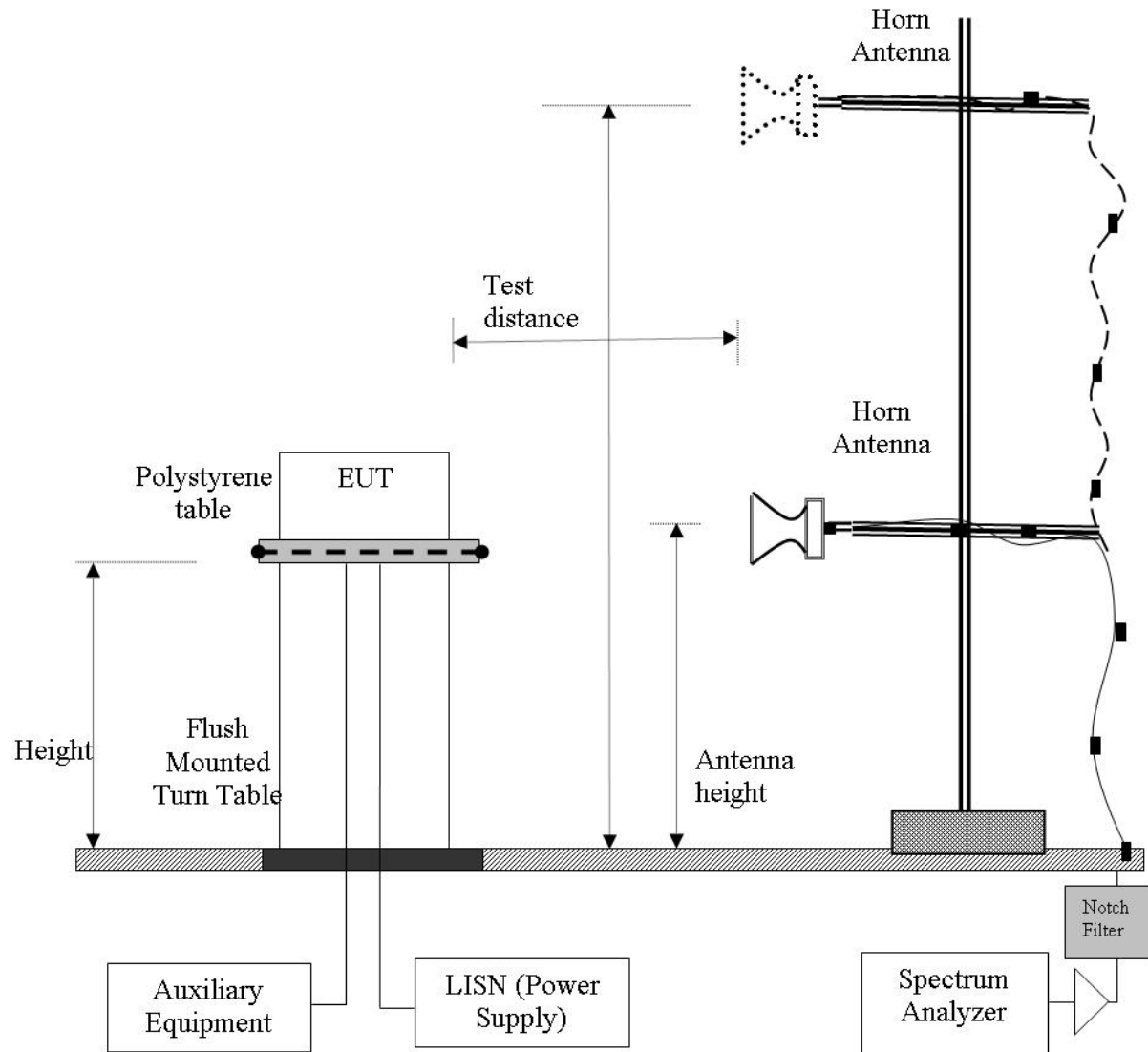
3 - Port Test Configuration



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

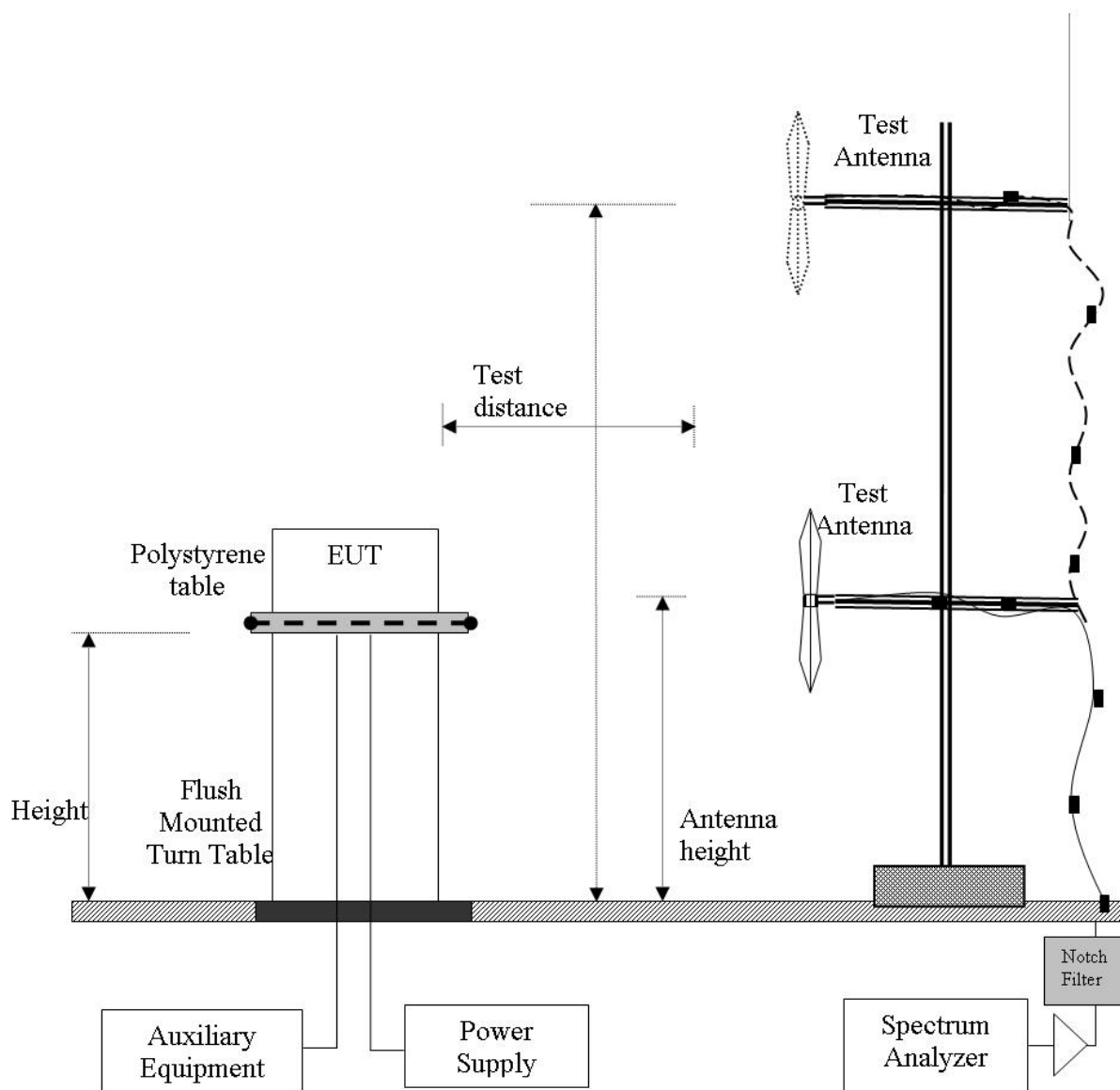


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3.3. Digital Emissions Test Set-up (0.03 – 1 GHz)

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

Digital Emission Measurement Setup – Below 1 GHz

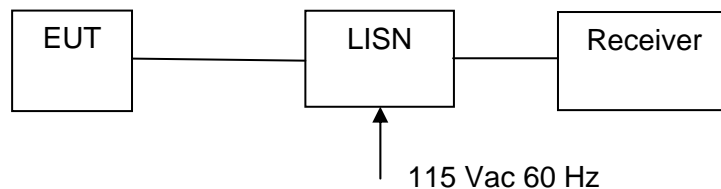


3.4. ac Wireline Emission Test Set-up

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 Log10 ($10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10}$)], 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 $A = \text{Total Power Spectral Density } [10 \text{ Log}_{10} (10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})]$ $x = \text{Duty Cycle}$ 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 | | |
| <p>Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement</p> <p>Transmitter Conducted Spurious and Band-Edge emissions were measured with a spectrum analyzer connected to the antenna terminal using one of the following limits;</p> <p>1).. Peak Detector - 20 dB below the highest in-band spectral density (i.e. 20 dBc)</p> <p>2).. Average Detector – 30 dB below the highest in-band spectral density (i.e. 30 dBc)</p> <p>Selection of the analyzer detector is determined by the client, however the same detector type must be used for each of the following tests;</p> <p>A). Output Power</p> <p>B).. Power Density</p> <p>C).. Conducted Spurious Emissions</p> <p>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.</p> | | | |

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

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

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

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

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

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

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

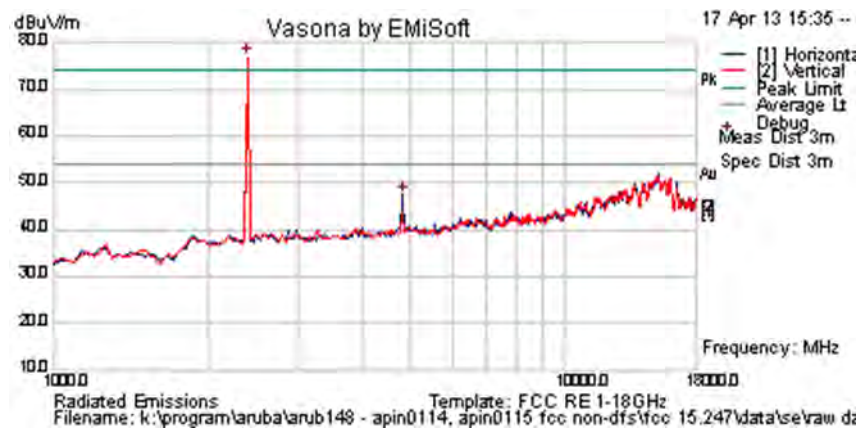
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5.1.2.1. Integral antenna – Spurious Emissions

| | | | |
|---------------|----------------------|----------------|------|
| 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

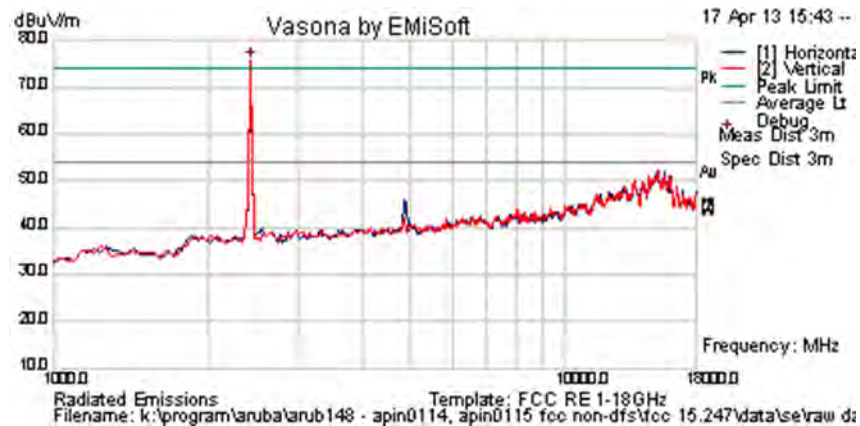
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

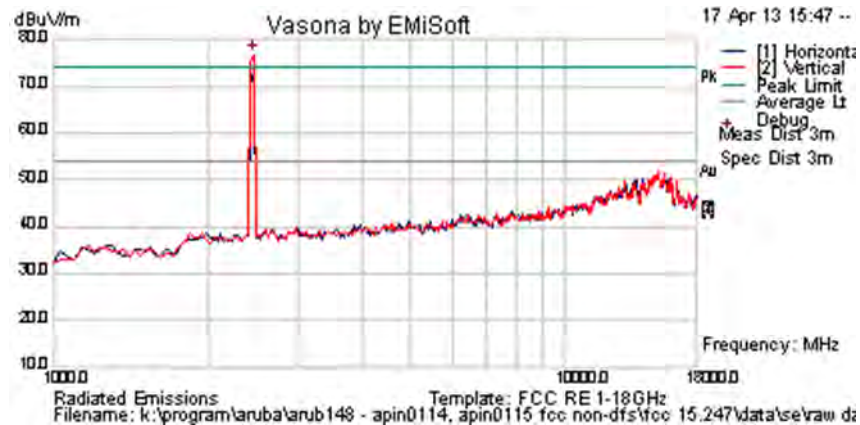
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

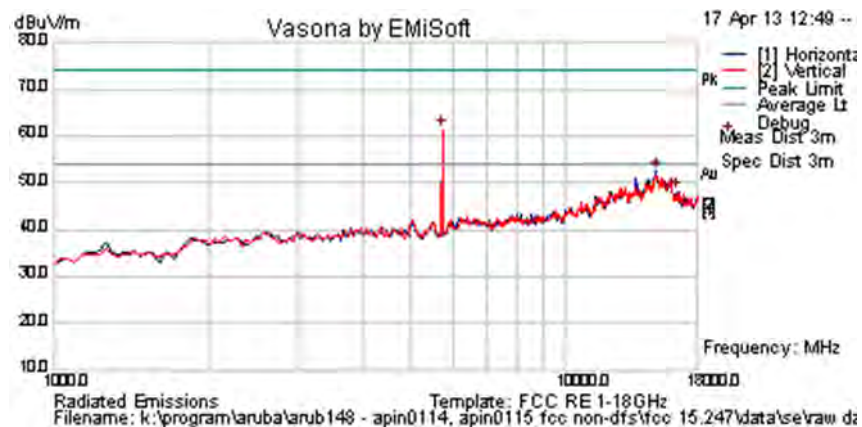
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

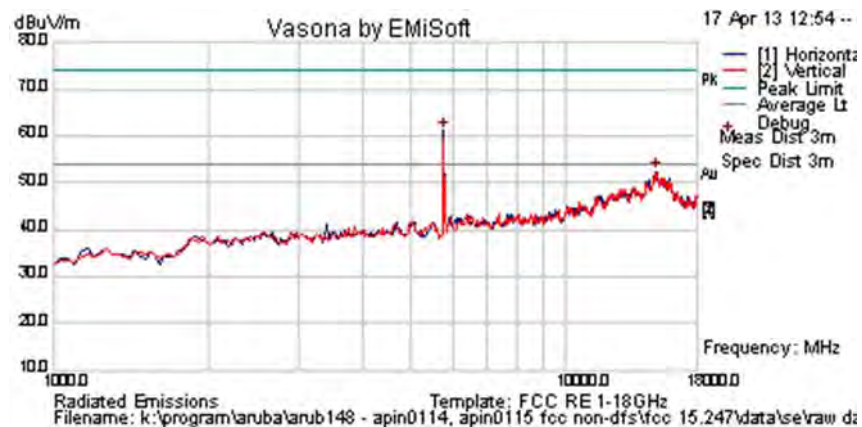
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

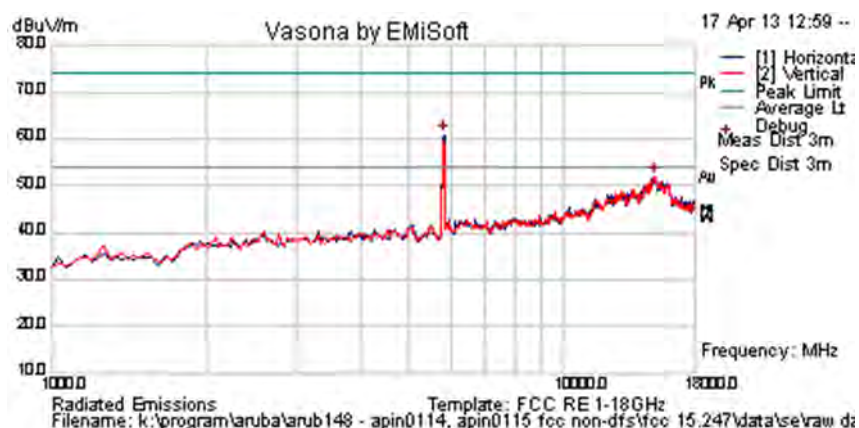
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | | | | | | | | | | | | |

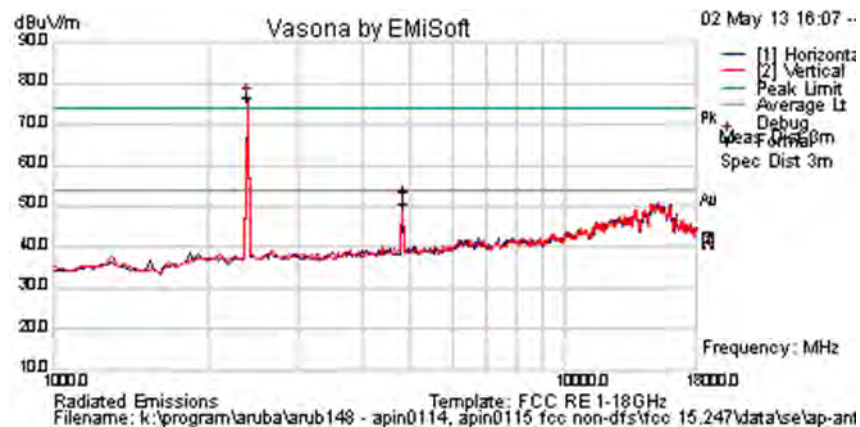
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5.1.2.2. AP-ANT-1B – Spurious Emissions

| | | | |
|---------------|----------------------|----------------|------|
| 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

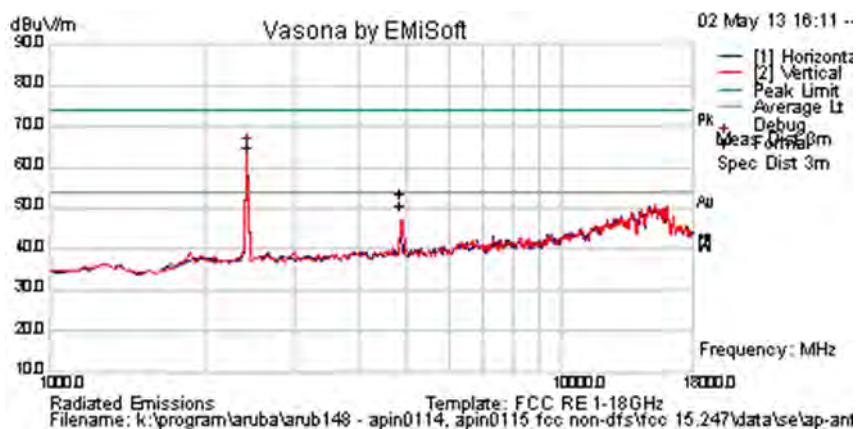
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

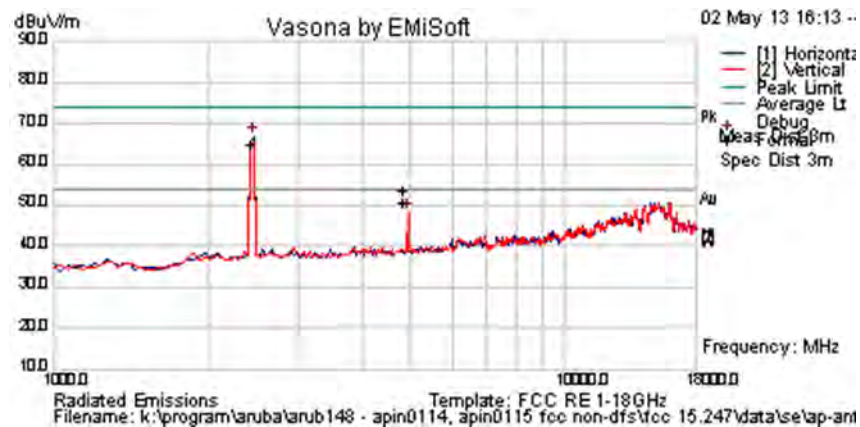
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

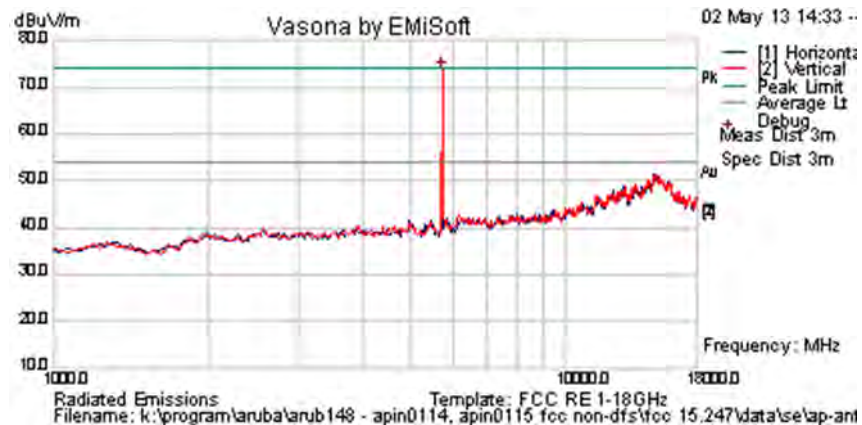
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

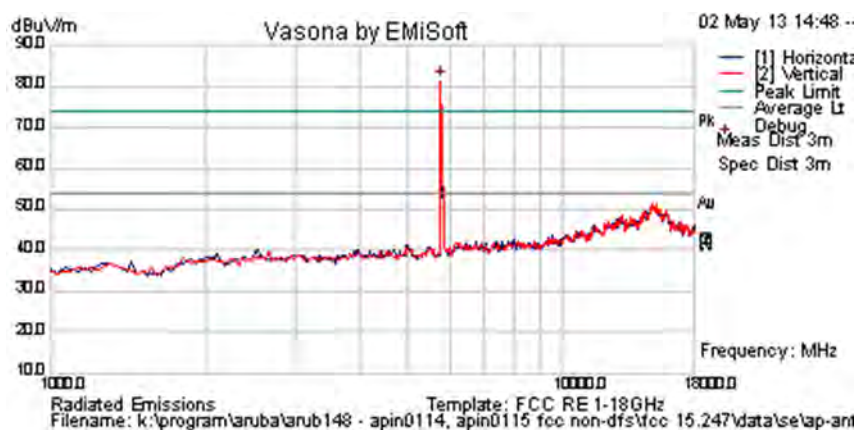
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

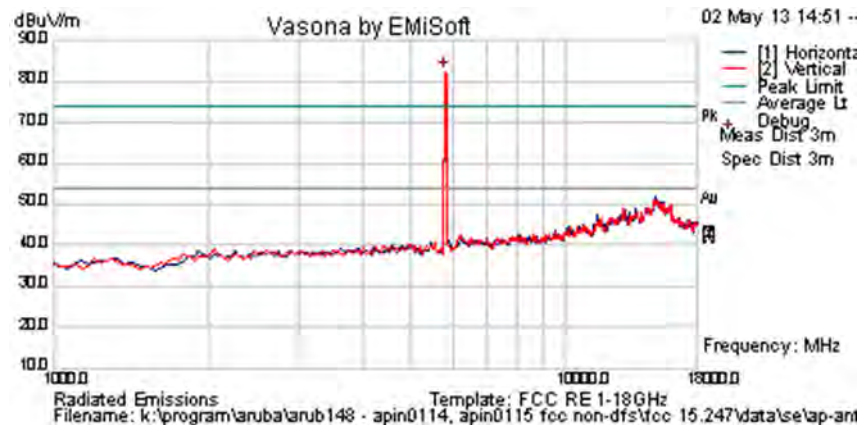
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

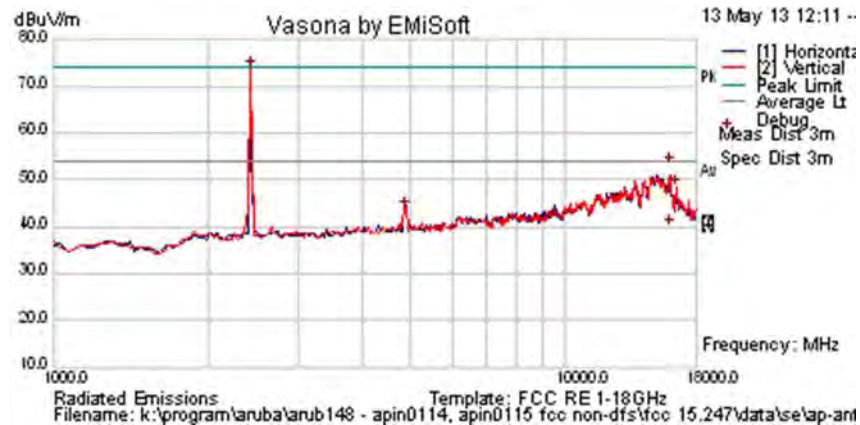
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | | | | | | | | | | | | |

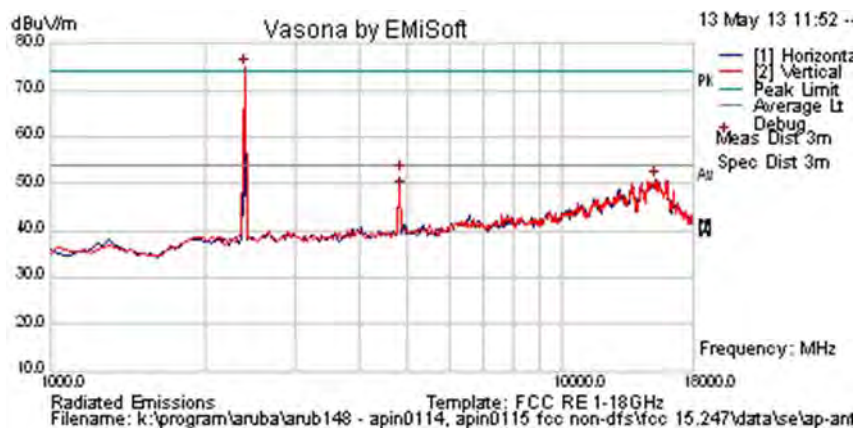
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5.1.2.3. AP-ANT-13B – Spurious Emissions

| | | | |
|---------------|----------------------|----------------|------|
| 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

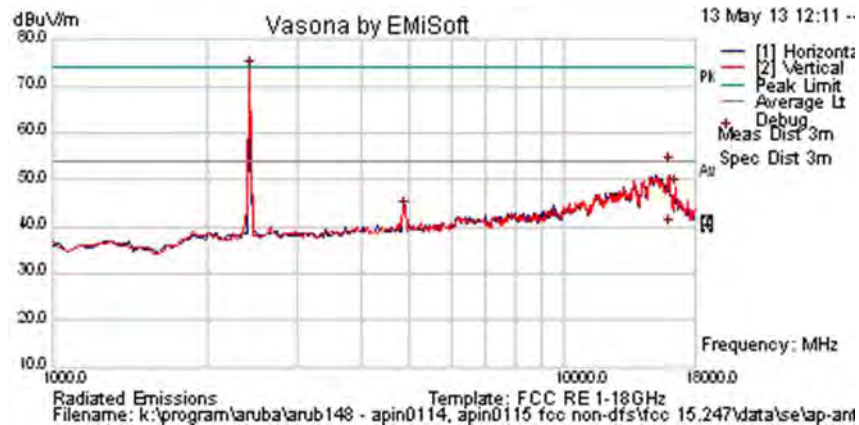
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 |

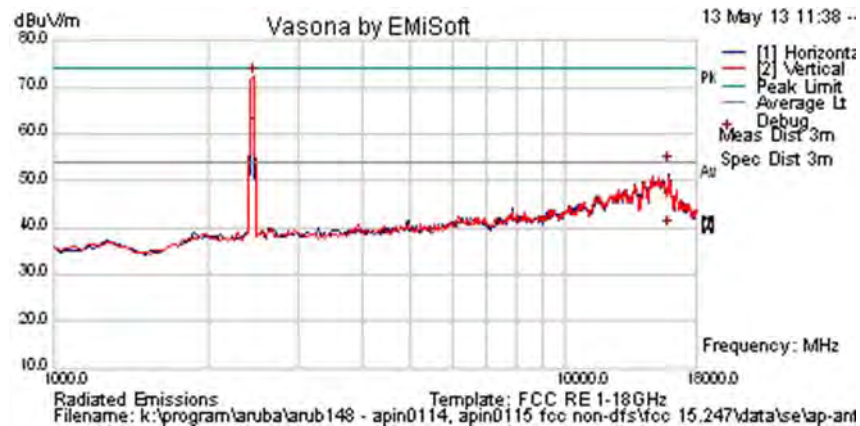
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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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

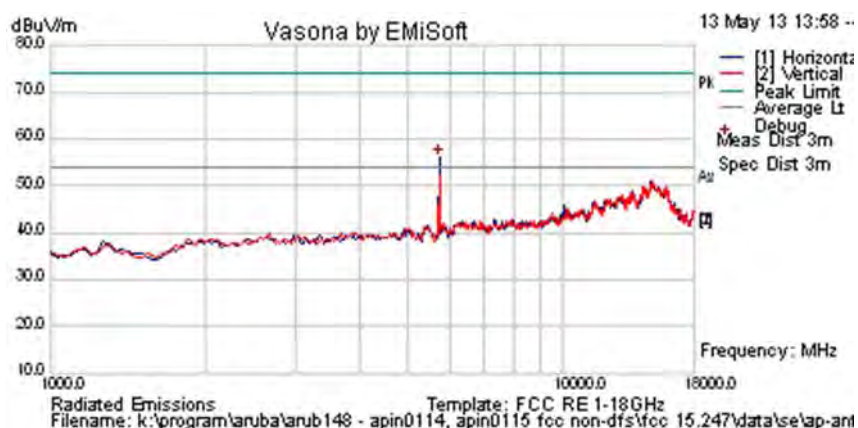
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

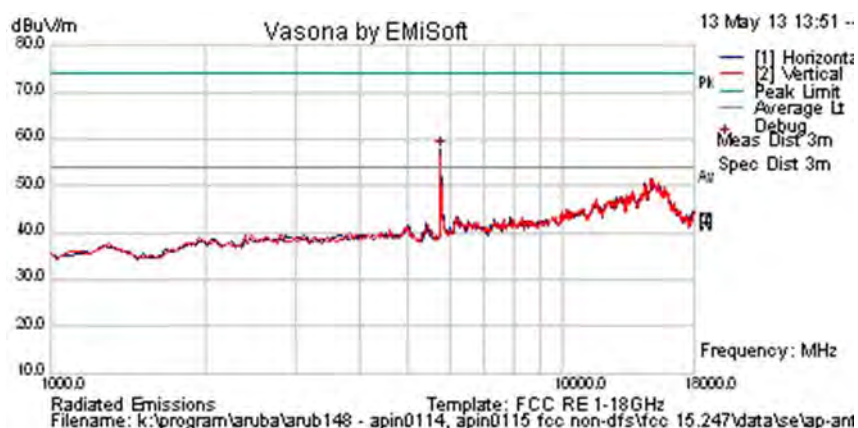
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | | | | | | | | | | | | |

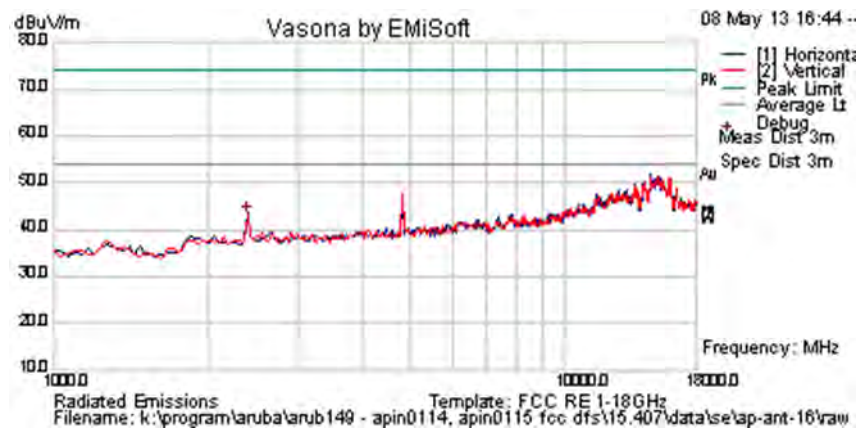
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5.1.2.4. AP-ANT-16 – Spurious Emissions

| | | | |
|---------------|----------------------|----------------|------|
| 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

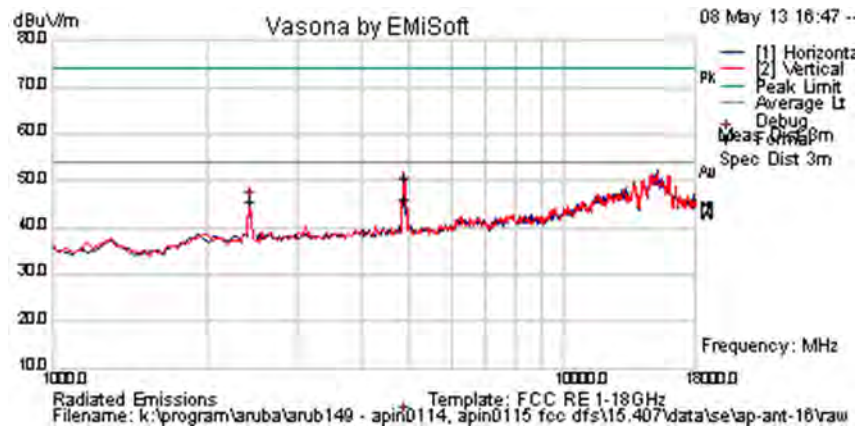
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

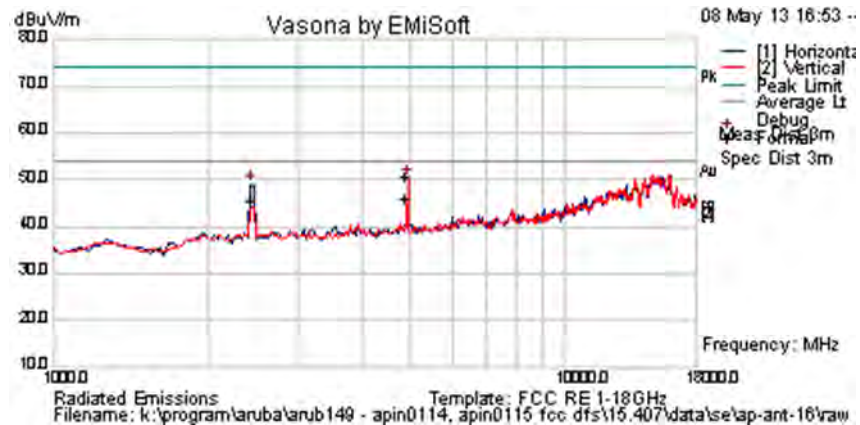
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

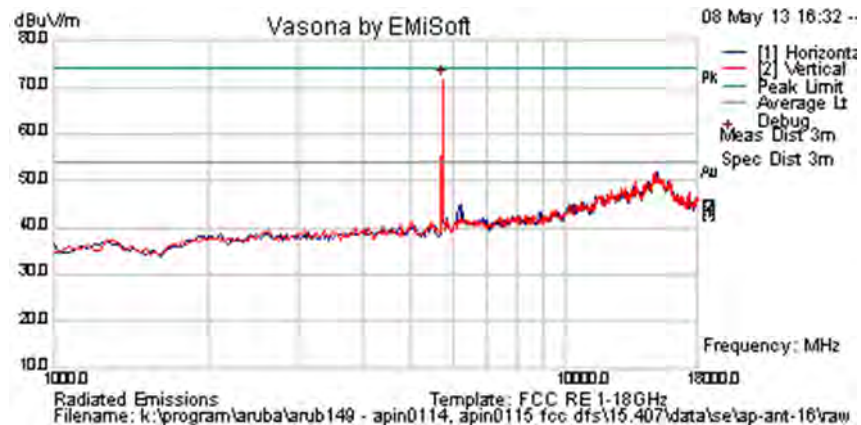
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

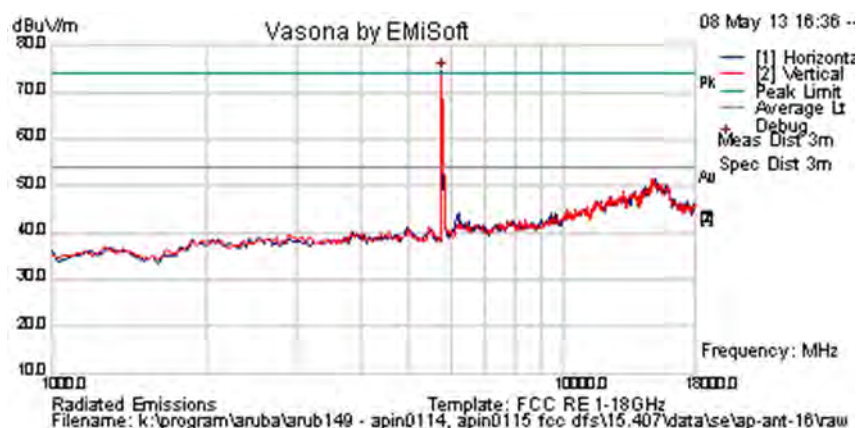
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

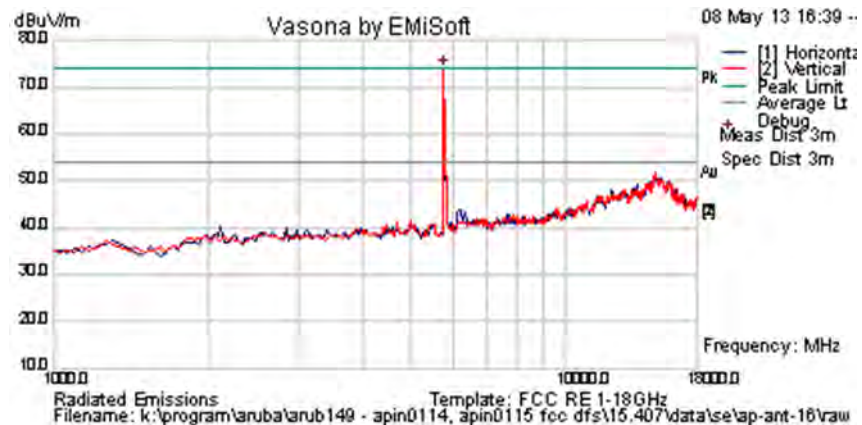
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | | | | | | | | | | | | |

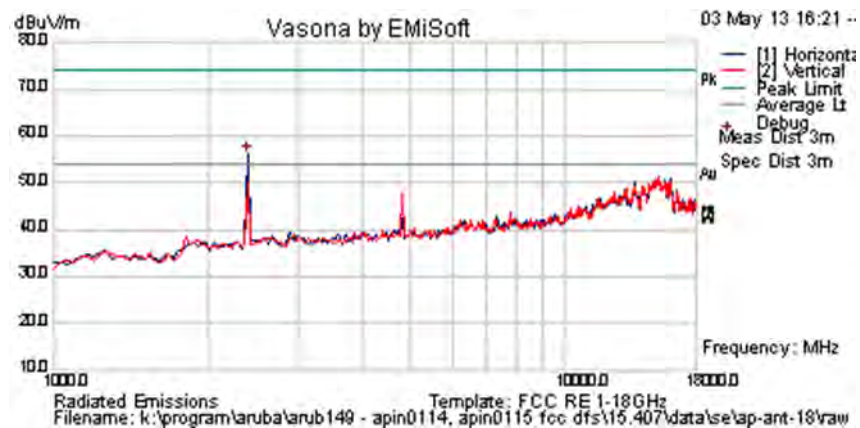
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5.1.2.5. AP-ANT-18 – Spurious Emissions

| | | | |
|---------------|----------------------|----------------|------|
| 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

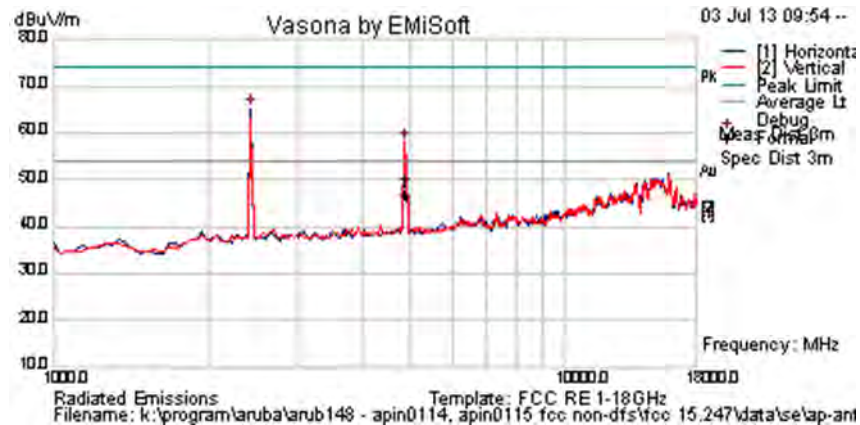
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

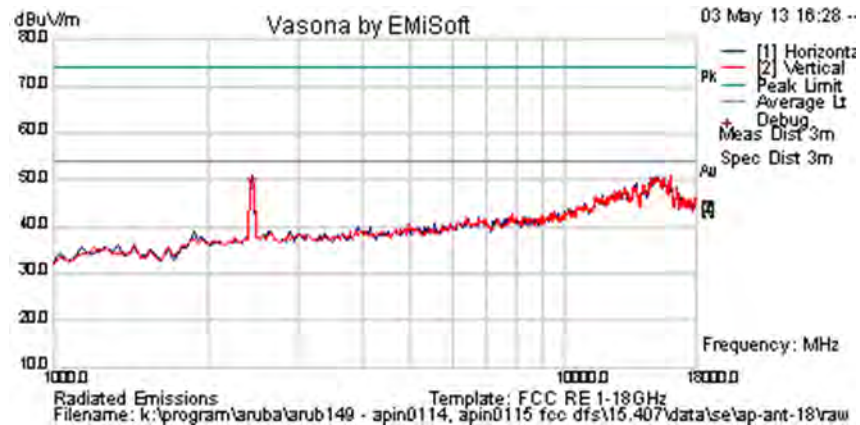
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

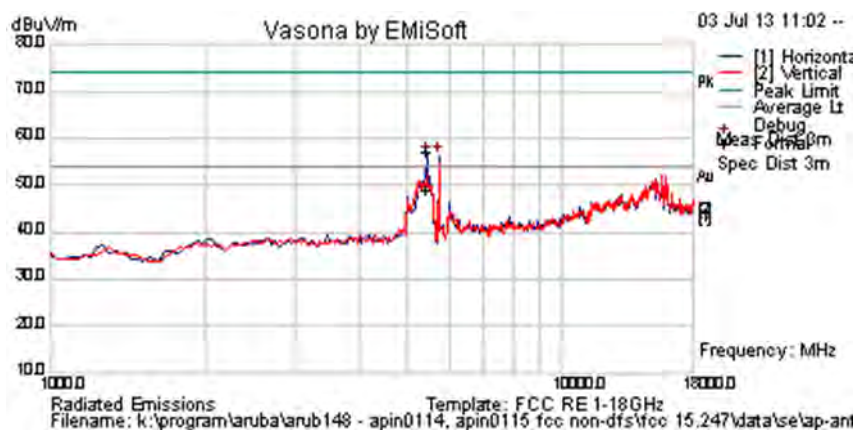
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

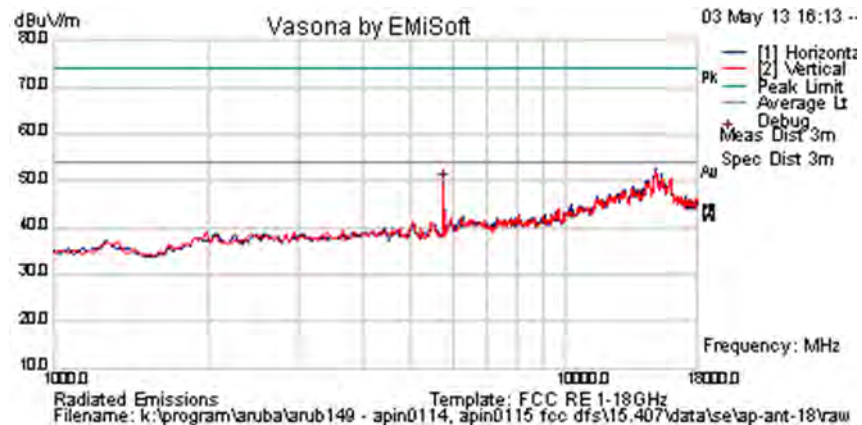
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

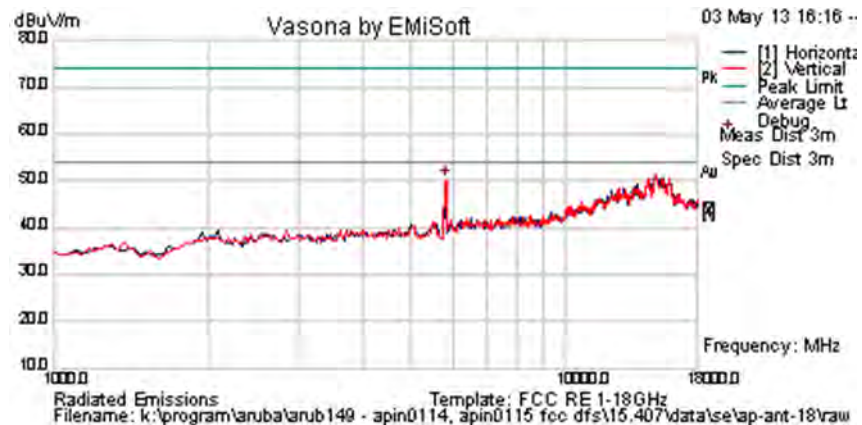
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | | | | | | | | | | | | |

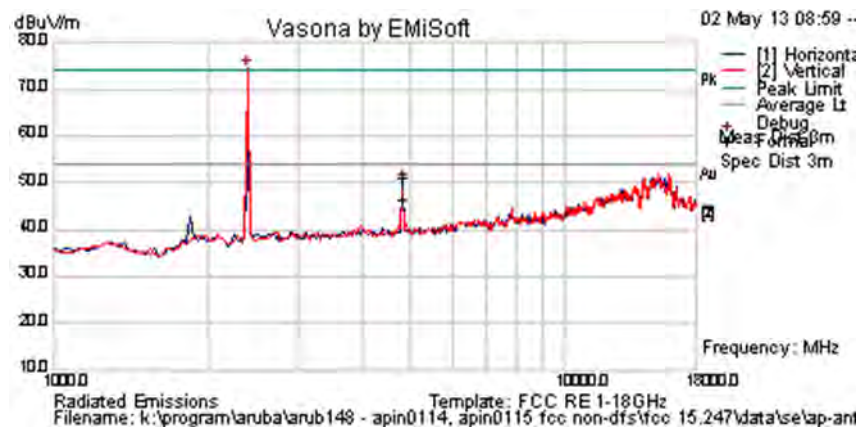
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5.1.2.6. AP-ANT-19 – Spurious Emissions

| | | | |
|---------------|----------------------|----------------|------|
| 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

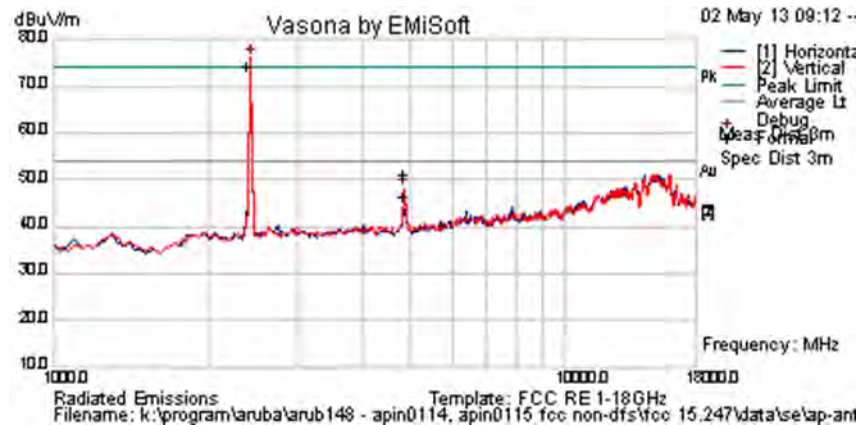
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

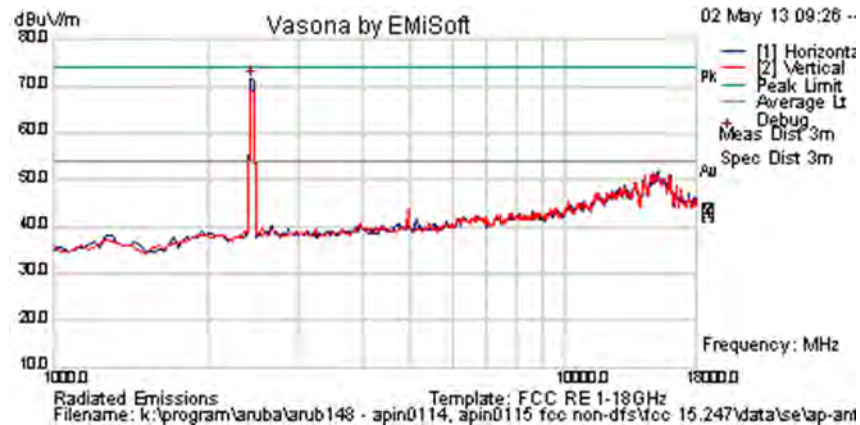
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

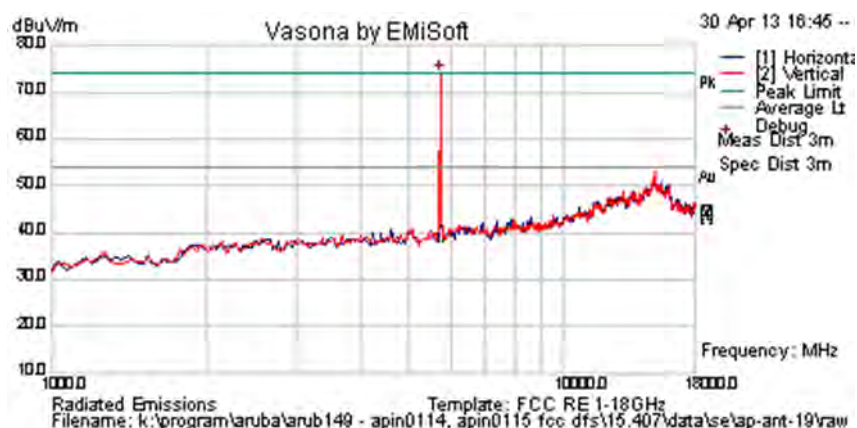
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

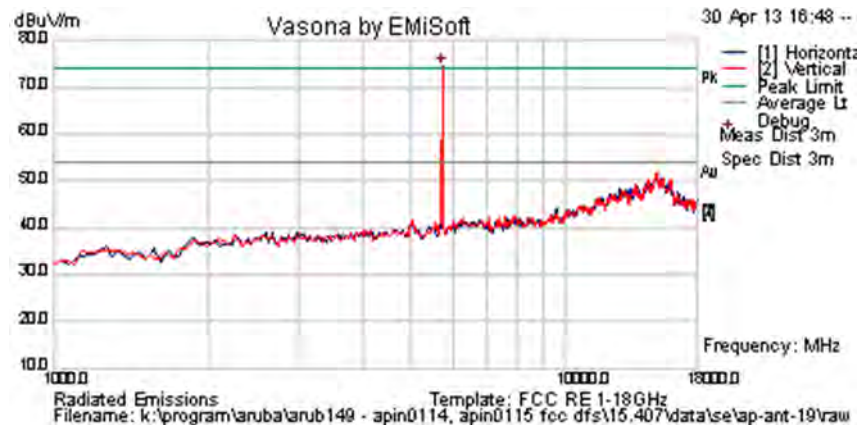
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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

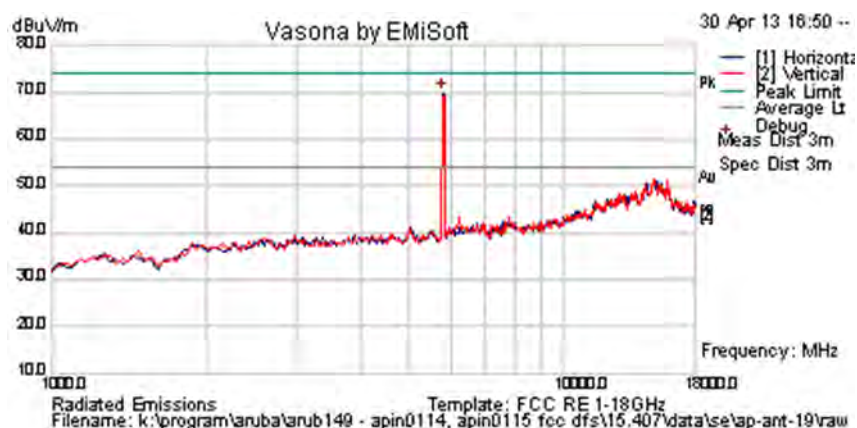
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | | |
|------------------|------------|---------|---------------|------------|---------|---------------|
| | dB μ V | | Power Setting | dB μ V | | 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 |



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2.4 GHz Frequency Band

Antenna ANT-19

| Operational Mode | 2390 MHz | | | 2483.5 MHz | | |
|------------------|------------|---------|---------------|------------|---------|---------------|
| | dB μ V | | Power Setting | dB μ V | | 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 |

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Specification Limits

FCC §15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

FCC §15.247(d)

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

IC RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

IC RSS-Gen §4.7

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

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

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

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



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§15.209 (a) Limit Matrix

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

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

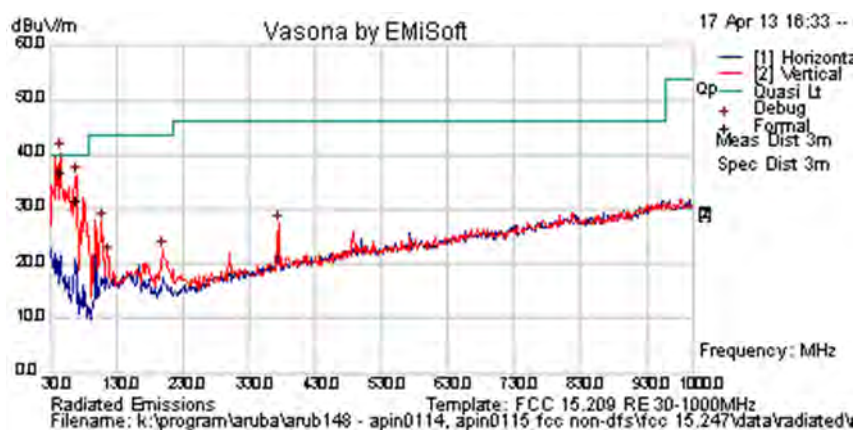
$$40 \text{ dB}\mu\text{V/m} = 100\mu\text{V/m}$$

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



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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 | |

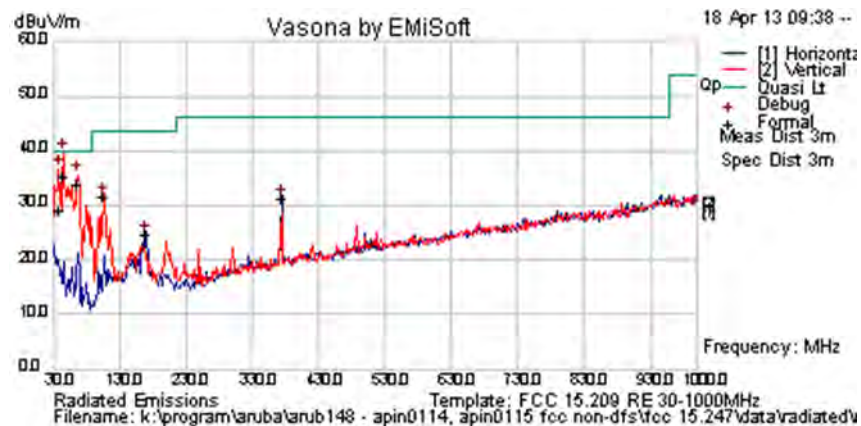
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
 NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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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 | |

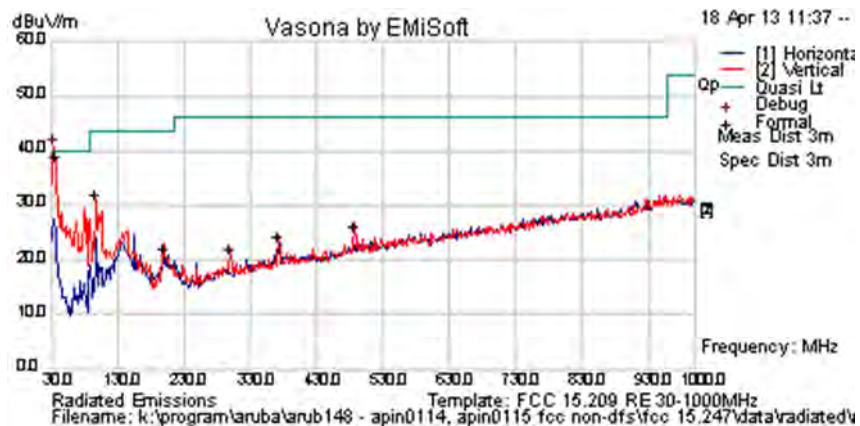
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
 NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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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

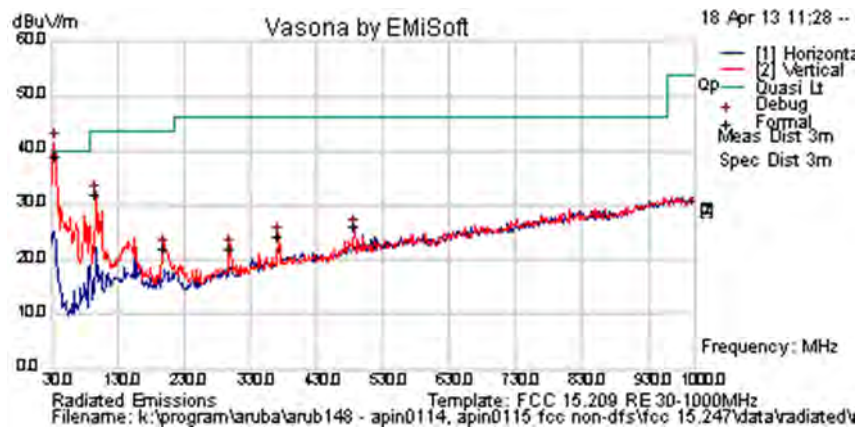
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|--|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 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 | |

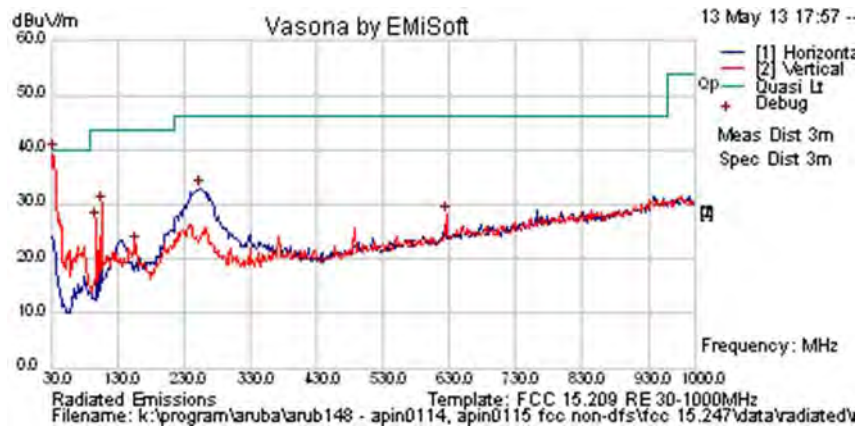
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
 NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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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 |

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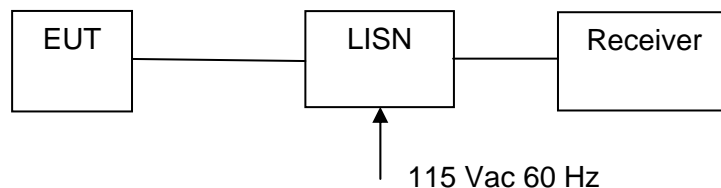
5.1.3. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

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.

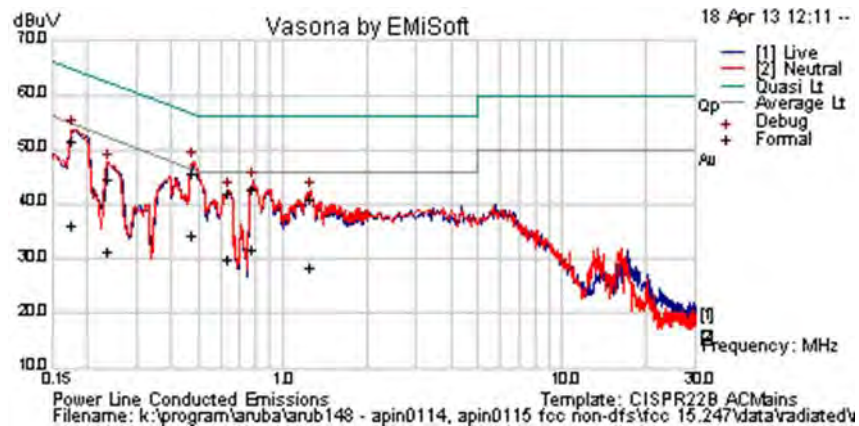
Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar



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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 |

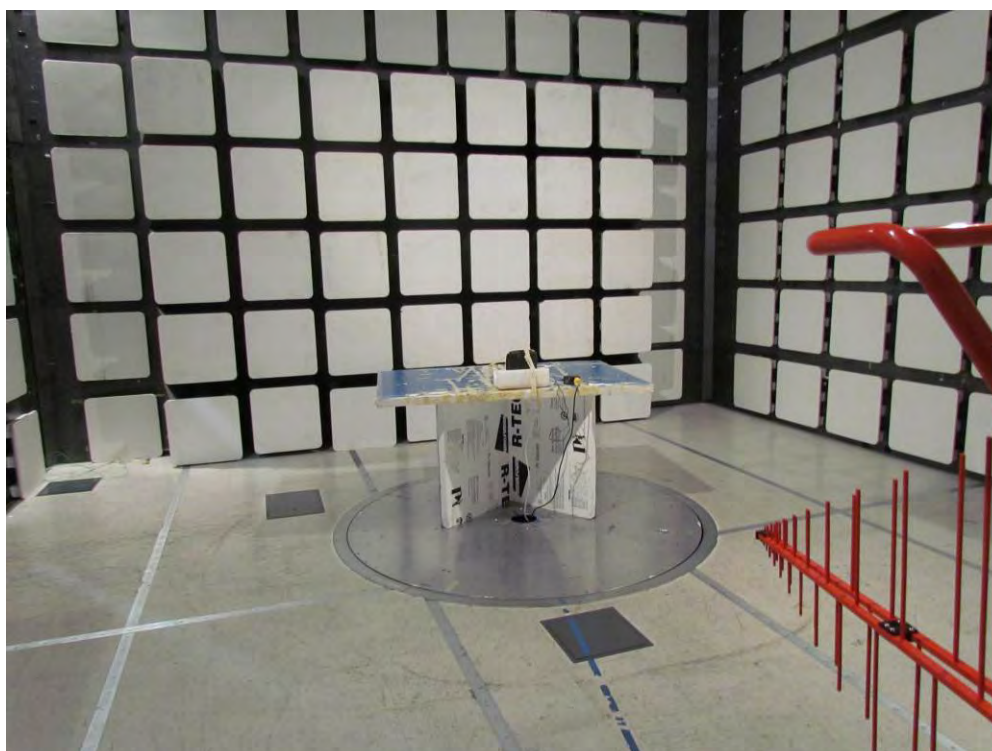
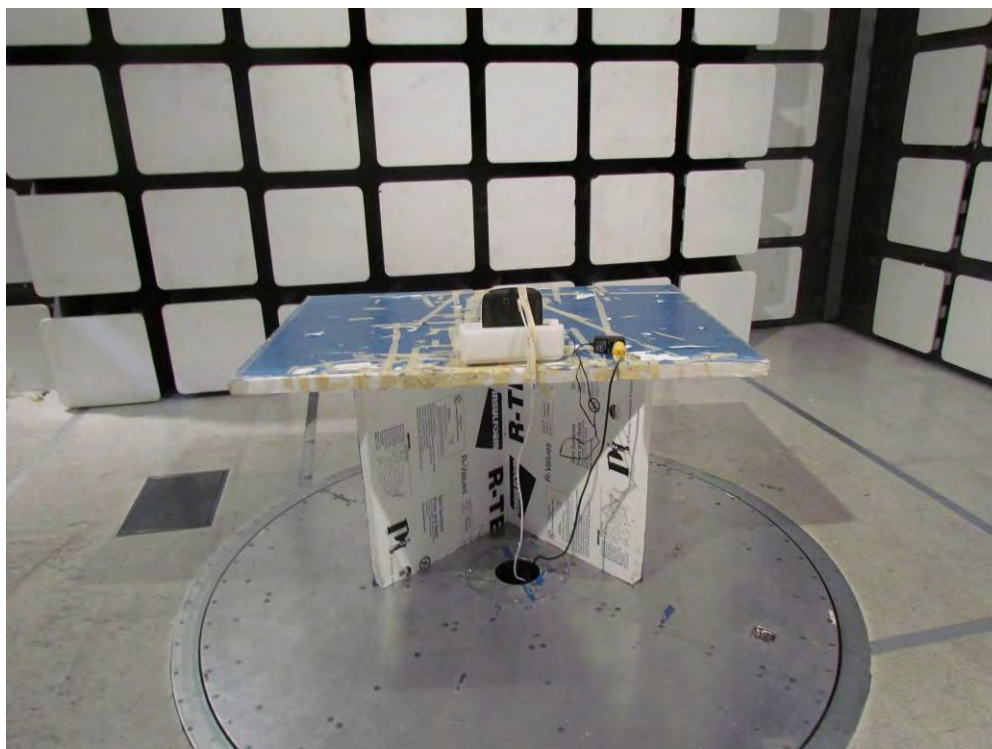
6. PHOTOGRAPHS

6.1. Conducted Test Setup



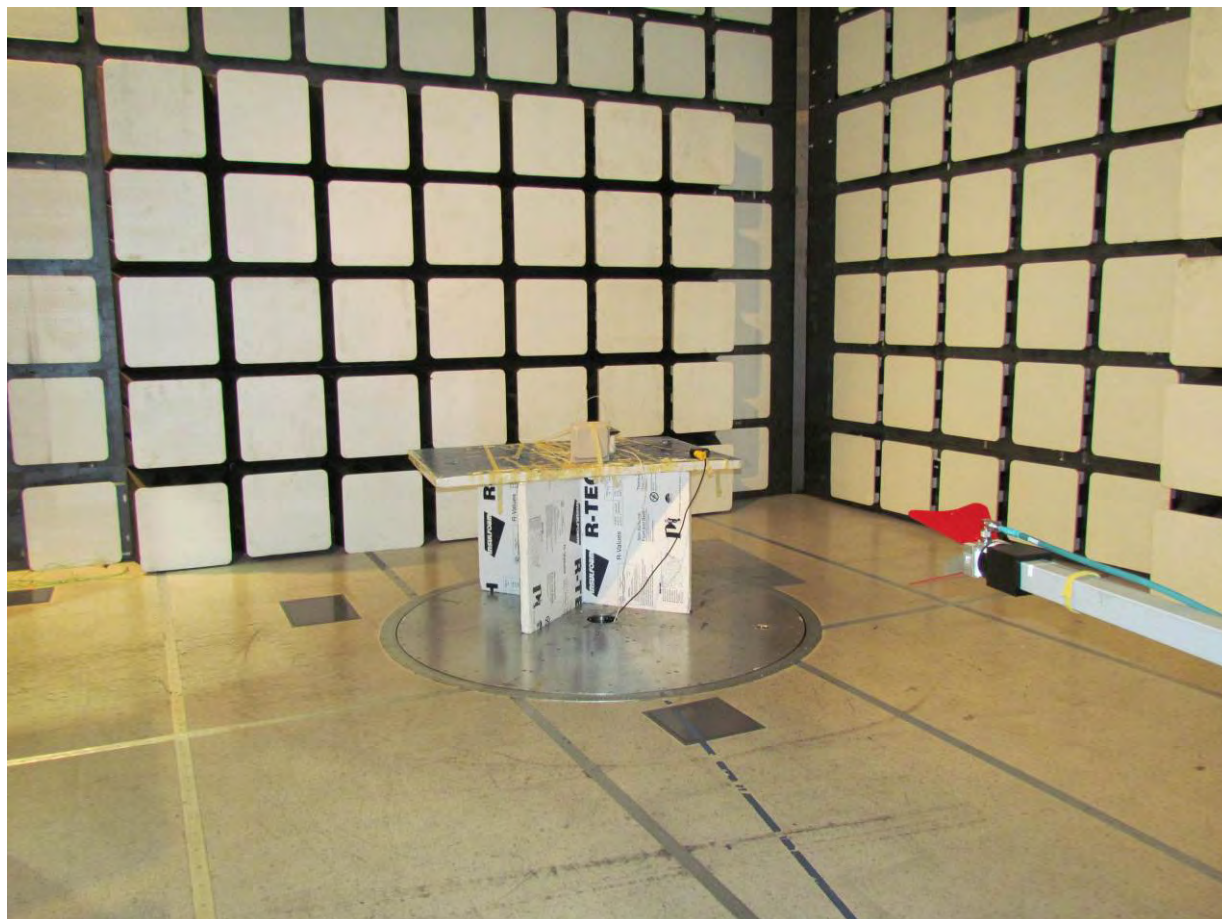
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6.2. Test Setup - Digital Emissions <1 GHz



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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

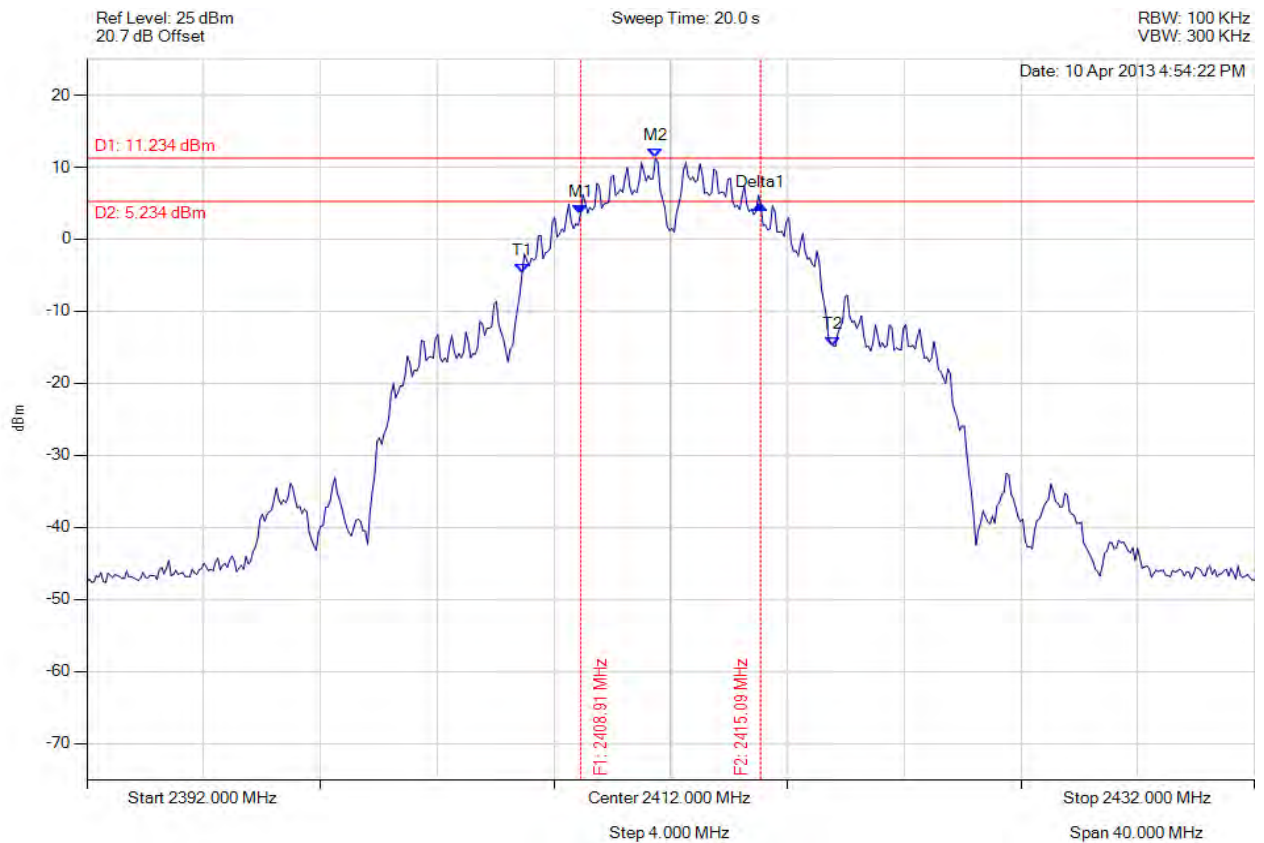
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A.1.1. 6 dB & 99% Bandwidth



6 dB & 99% BANDWIDTH

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



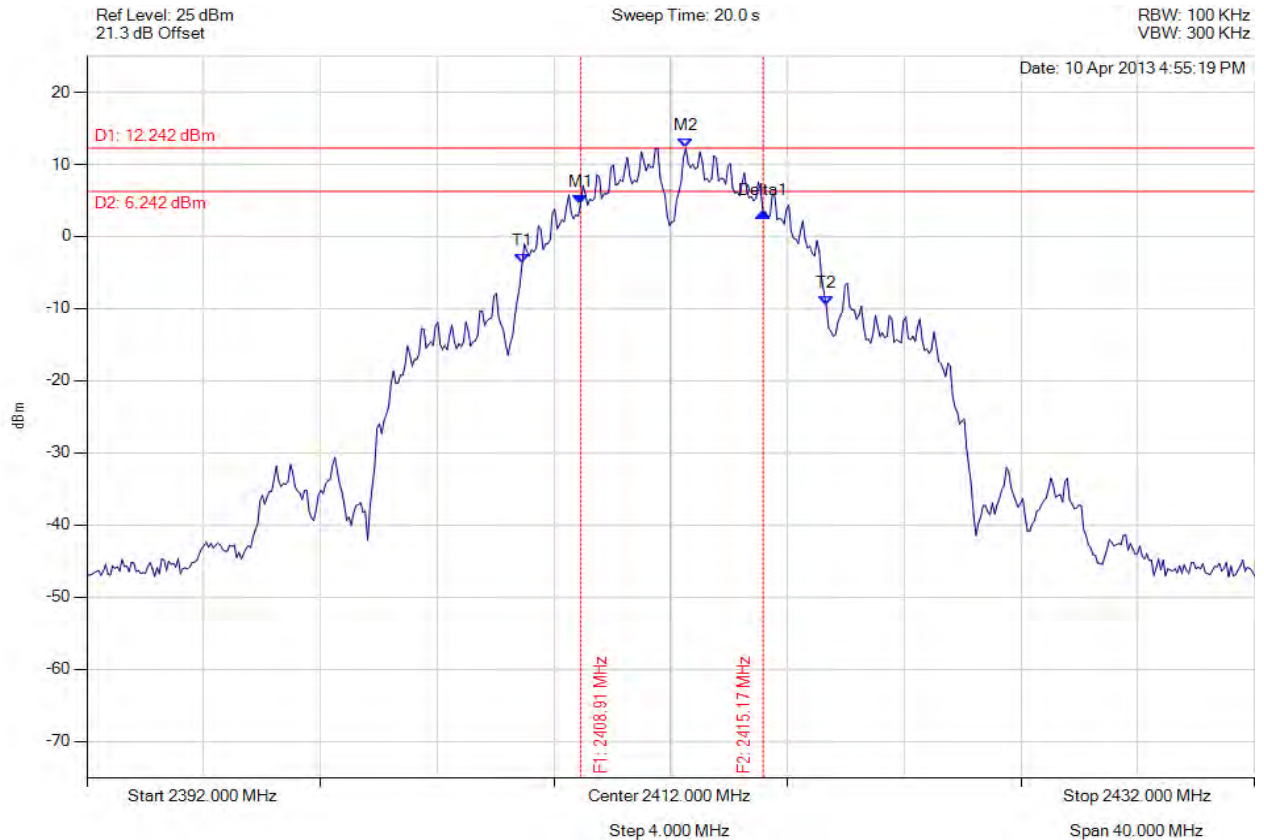
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2408.914 MHz : 3.542 dBm M2 : 2411.479 MHz : 11.234 dBm Delta1 : 6.172 MHz : 1.310 dB T1 : 2406.910 MHz : -4.709 dBm T2 : 2417.571 MHz : -14.811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

[Back to the Matrix](#)

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6 dB & 99% BANDWIDTH

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



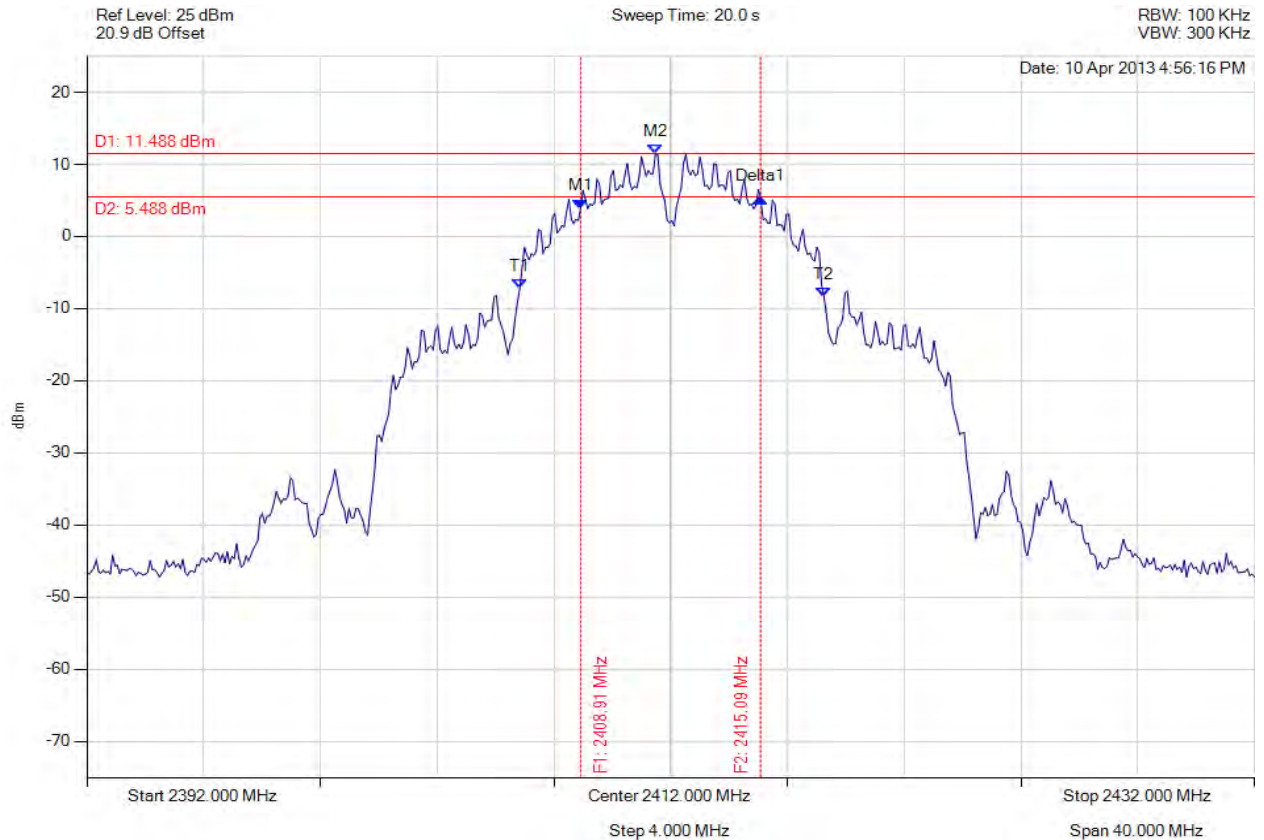
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2408.914 MHz : 4.488 dBm M2 : 2412.521 MHz : 12.242 dBm Delta1 : 6.253 MHz : -1.117 dB T1 : 2406.910 MHz : -3.765 dBm T2 : 2417.331 MHz : -9.604 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



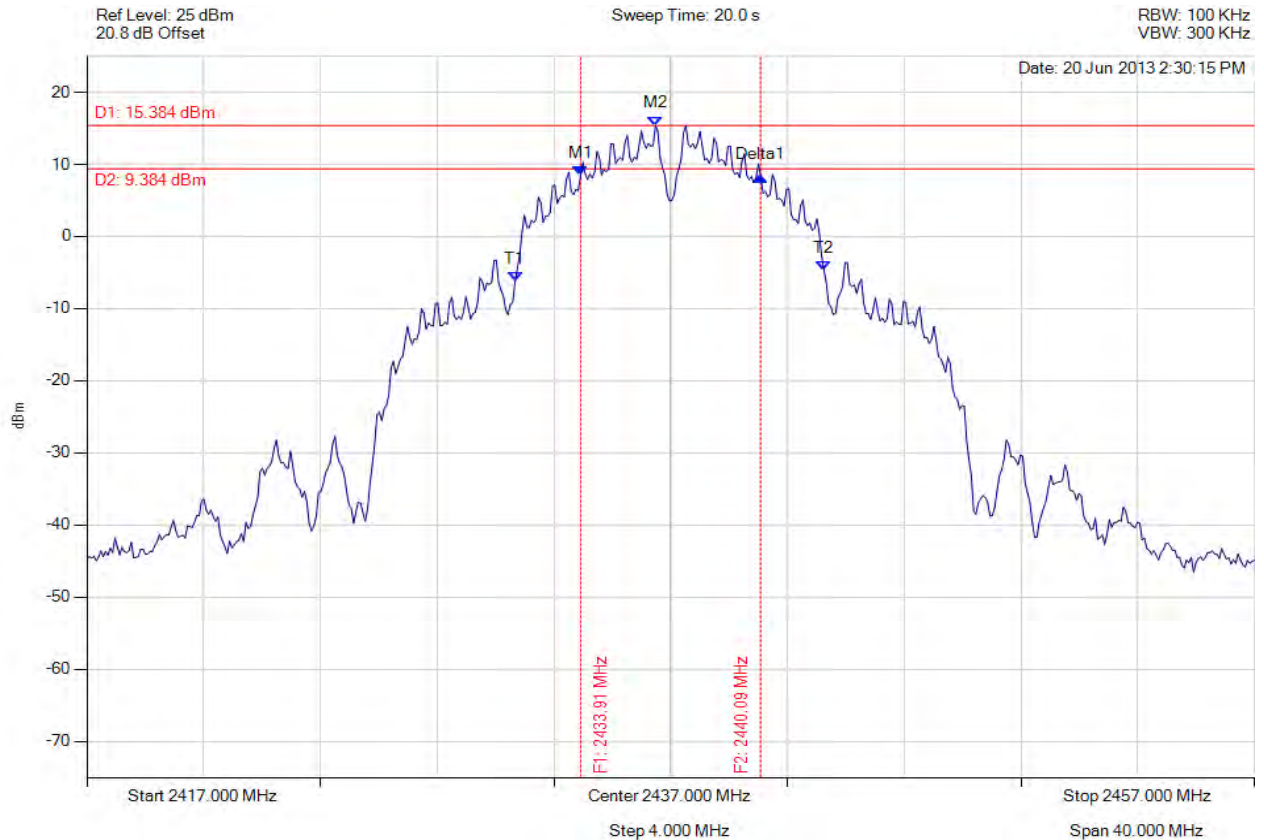
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2408.914 MHz : 3.886 dBm M2 : 2411.479 MHz : 11.488 dBm Delta1 : 6.172 MHz : 1.379 dB T1 : 2406.830 MHz : -7.202 dBm T2 : 2417.251 MHz : -8.394 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



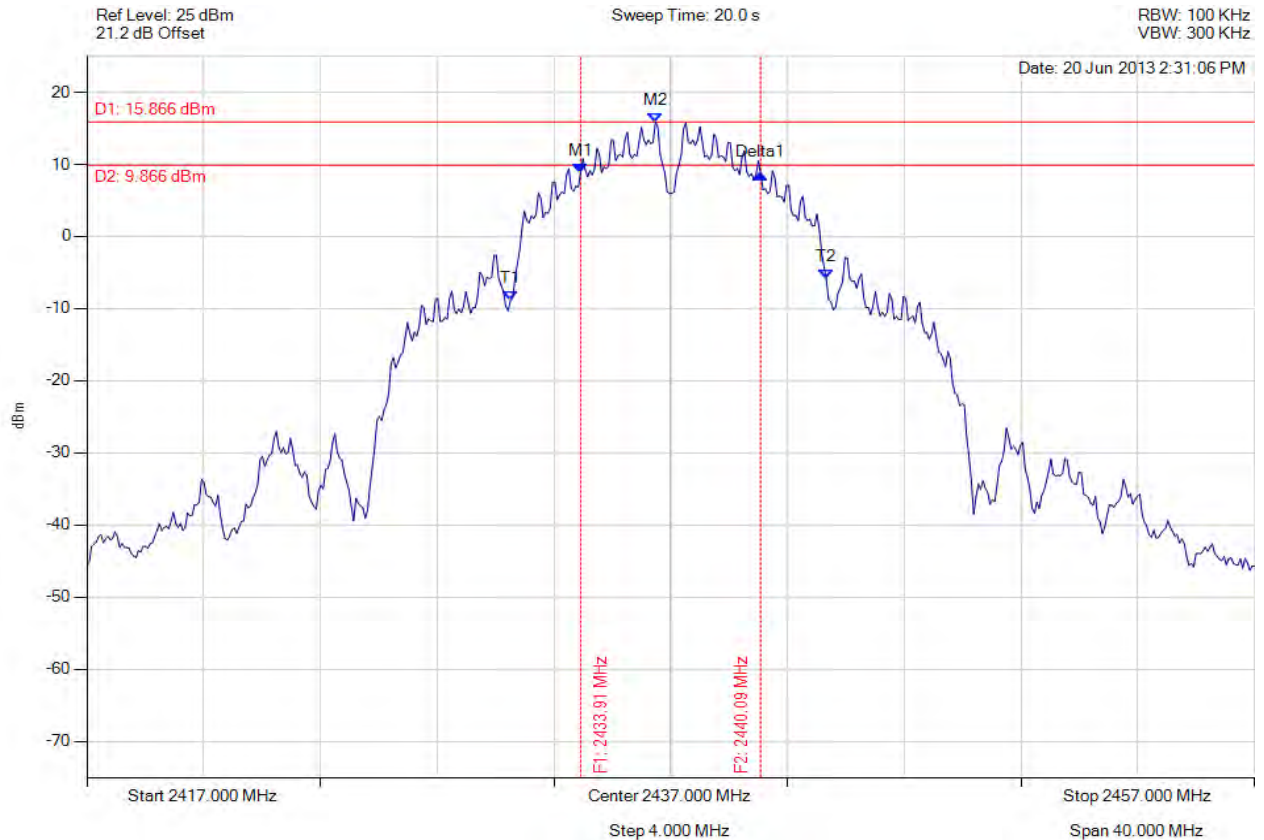
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2433.914 MHz : 8.425 dBm M2 : 2436.479 MHz : 15.384 dBm Delta1 : 6.172 MHz : -0.138 dB T1 : 2431.669 MHz : -6.281 dBm T2 : 2442.251 MHz : -4.676 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



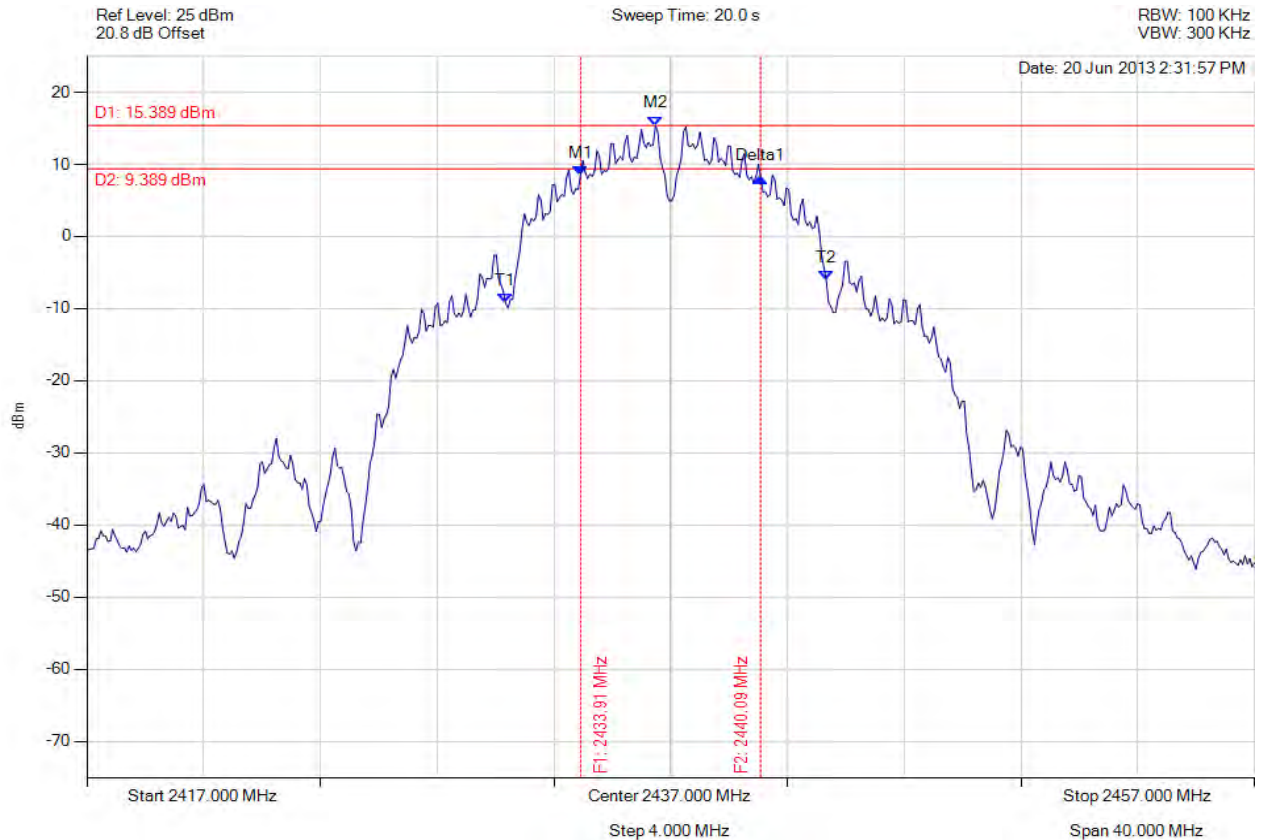
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2433.914 MHz : 8.779 dBm M2 : 2436.479 MHz : 15.866 dBm Delta1 : 6.172 MHz : -0.169 dB T1 : 2431.509 MHz : -8.852 dBm T2 : 2442.331 MHz : -5.840 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



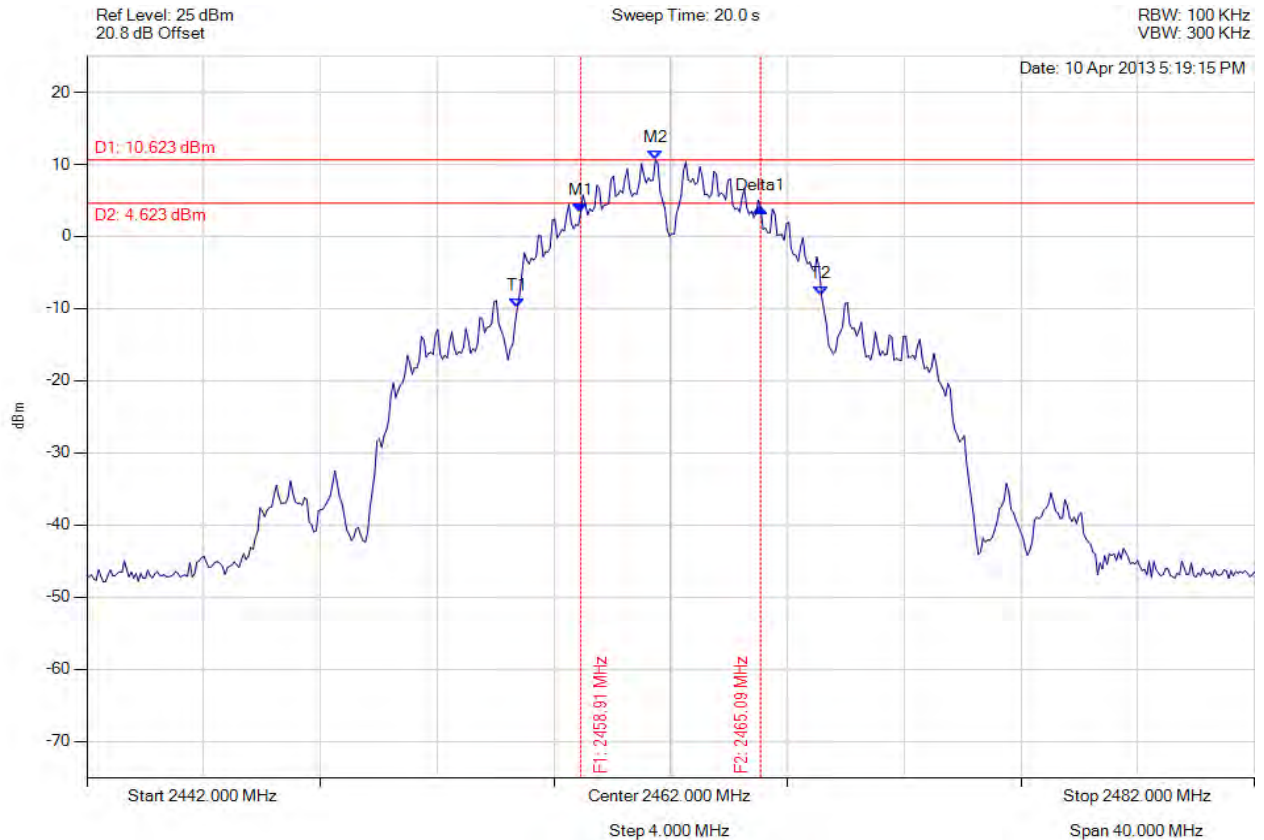
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2433.914 MHz : 8.541 dBm M2 : 2436.479 MHz : 15.389 dBm Delta1 : 6.172 MHz : -0.356 dB T1 : 2431.349 MHz : -9.260 dBm T2 : 2442.331 MHz : -6.053 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



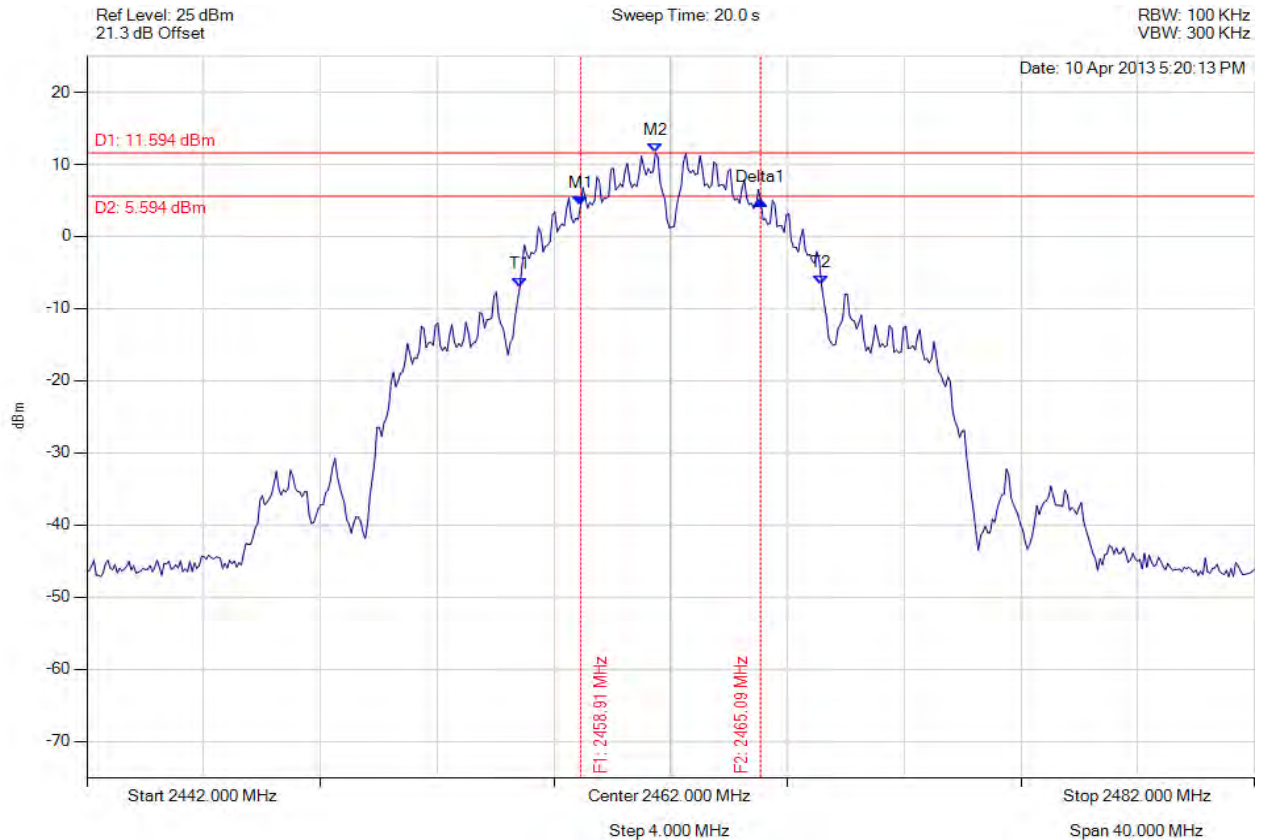
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2458.914 MHz : 3.237 dBm M2 : 2461.479 MHz : 10.623 dBm Delta1 : 6.172 MHz : 0.742 dB T1 : 2456.749 MHz : -9.844 dBm T2 : 2467.170 MHz : -8.213 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



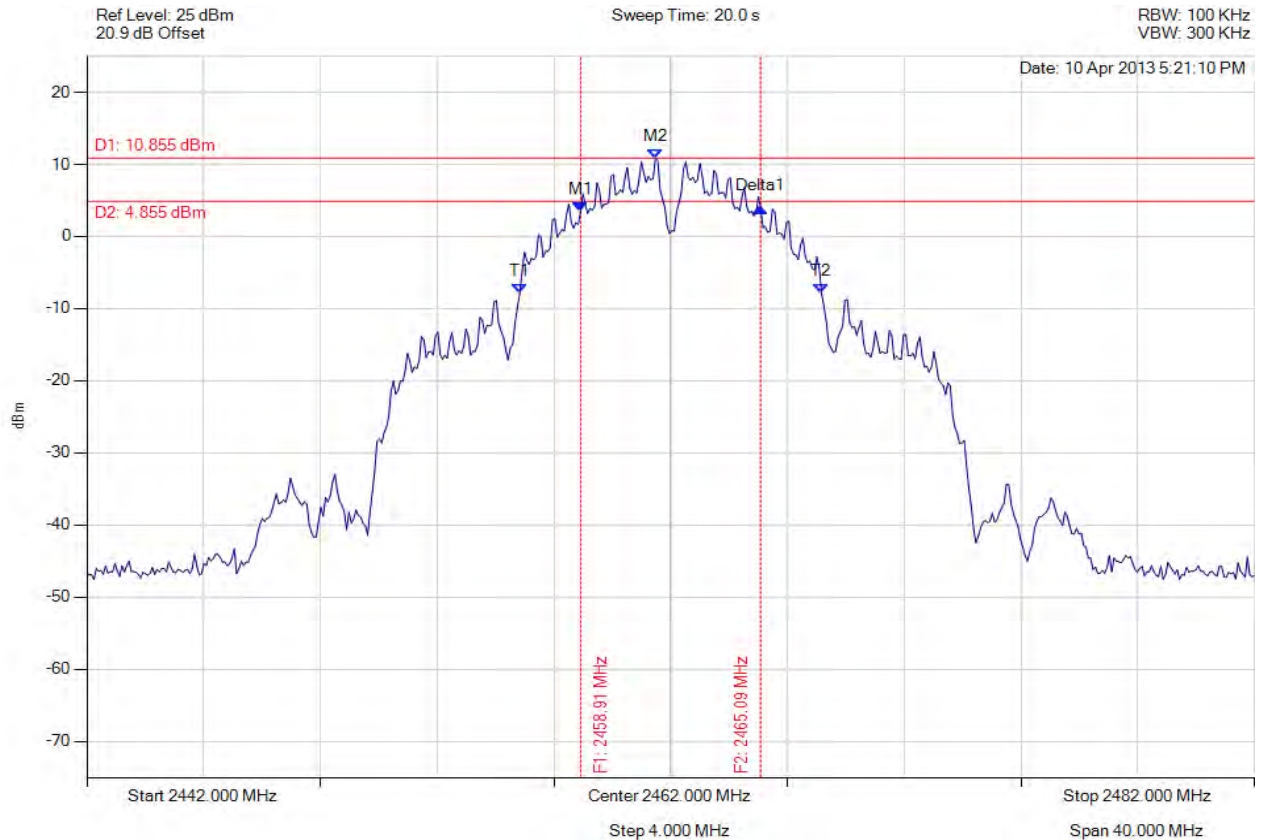
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2458.914 MHz : 4.229 dBm M2 : 2461.479 MHz : 11.594 dBm Delta1 : 6.172 MHz : 0.824 dB T1 : 2456.830 MHz : -6.962 dBm T2 : 2467.170 MHz : -6.724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

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6 dB & 99% BANDWIDTH

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



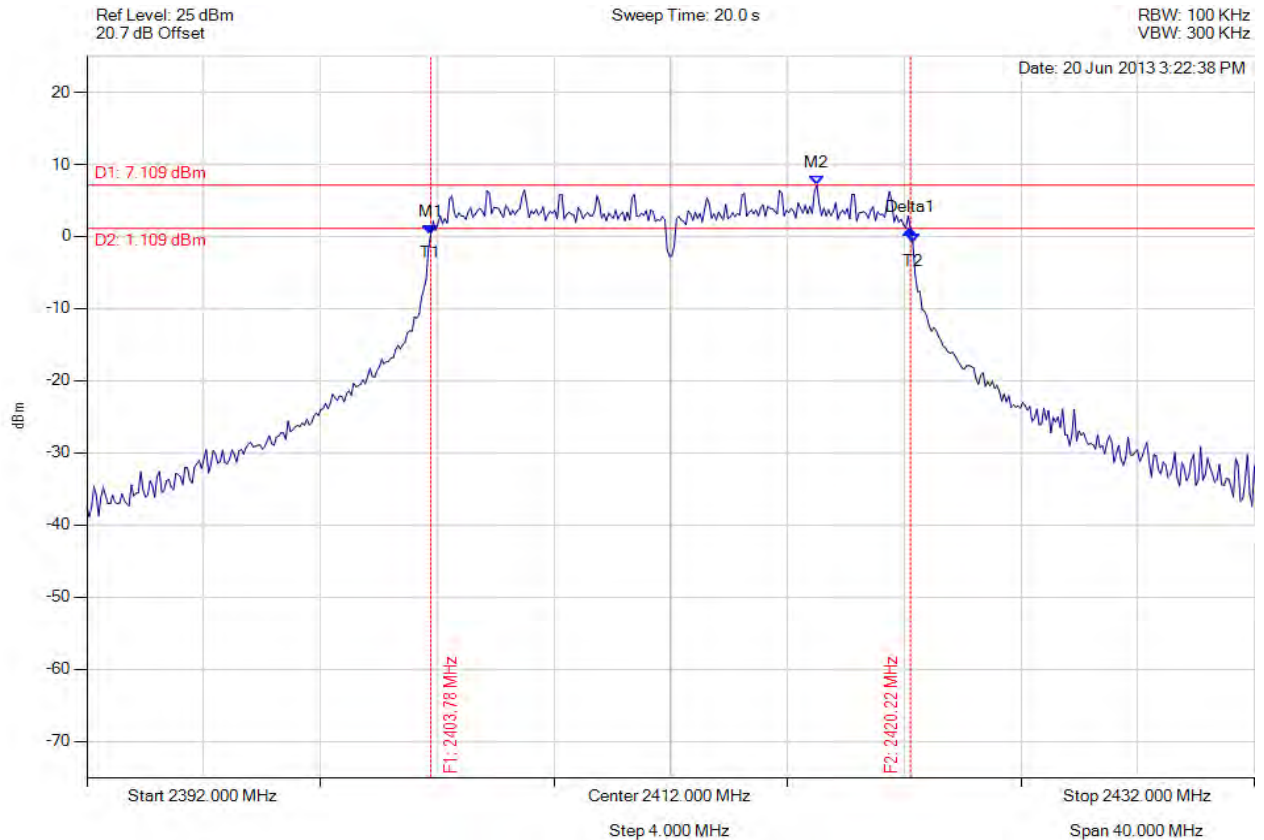
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2458.914 MHz : 3.471 dBm M2 : 2461.479 MHz : 10.855 dBm Delta1 : 6.172 MHz : 0.472 dB T1 : 2456.830 MHz : -7.831 dBm T2 : 2467.170 MHz : -7.939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

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6 dB & 99% BANDWIDTH

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



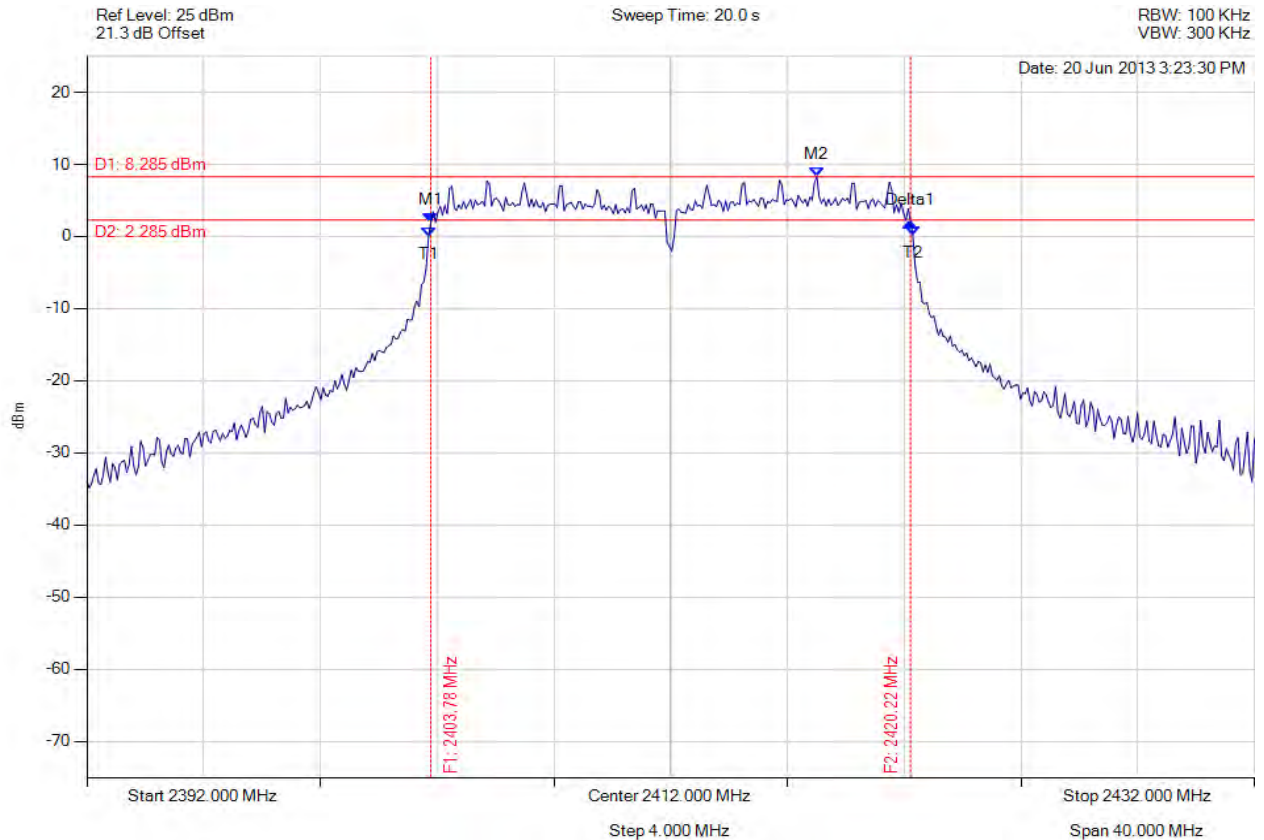
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.784 MHz : 0.320 dBm M2 : 2417.010 MHz : 7.109 dBm Delta1 : 16.433 MHz : 0.681 dB T1 : 2403.784 MHz : 0.320 dBm T2 : 2420.297 MHz : -0.934 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



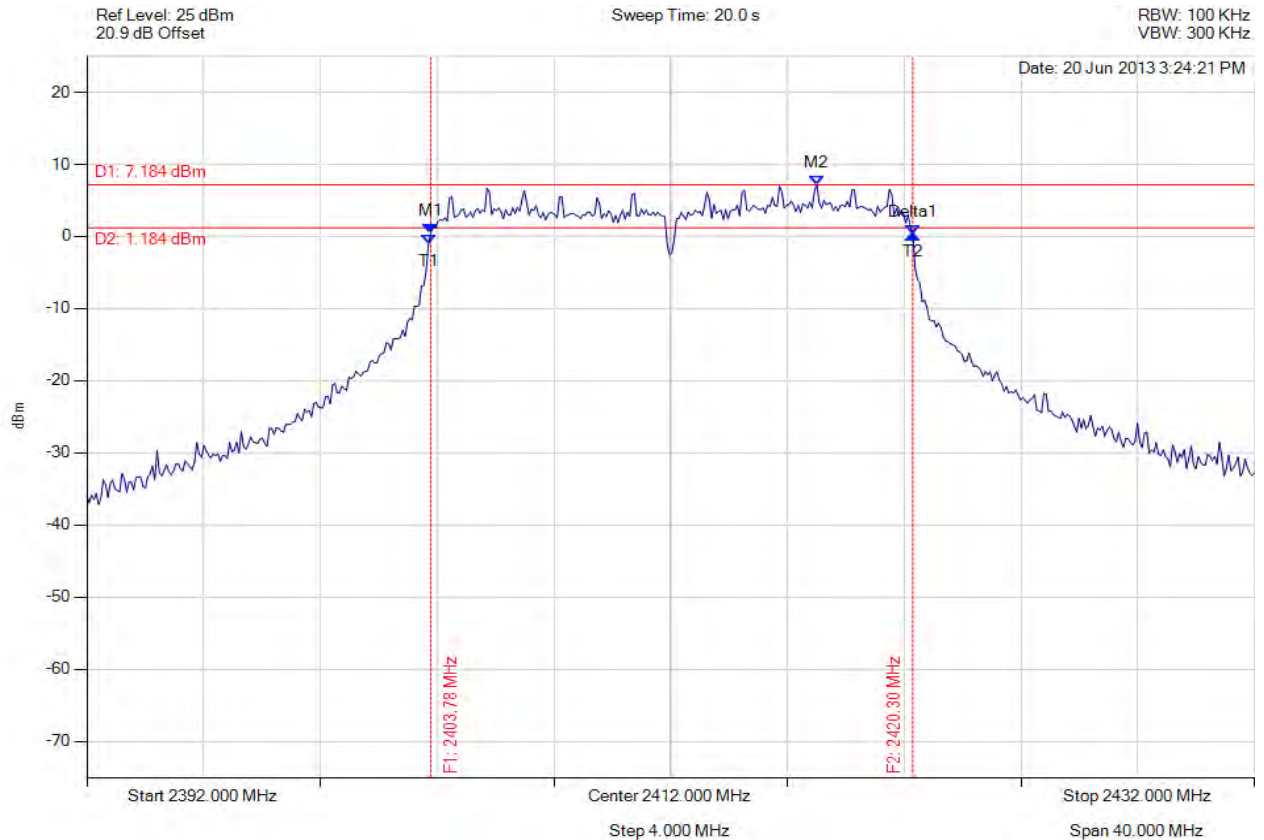
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.784 MHz : 1.935 dBm M2 : 2417.010 MHz : 8.285 dBm Delta1 : 16.433 MHz : 0.055 dB T1 : 2403.703 MHz : 0.001 dBm T2 : 2420.297 MHz : 0.180 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



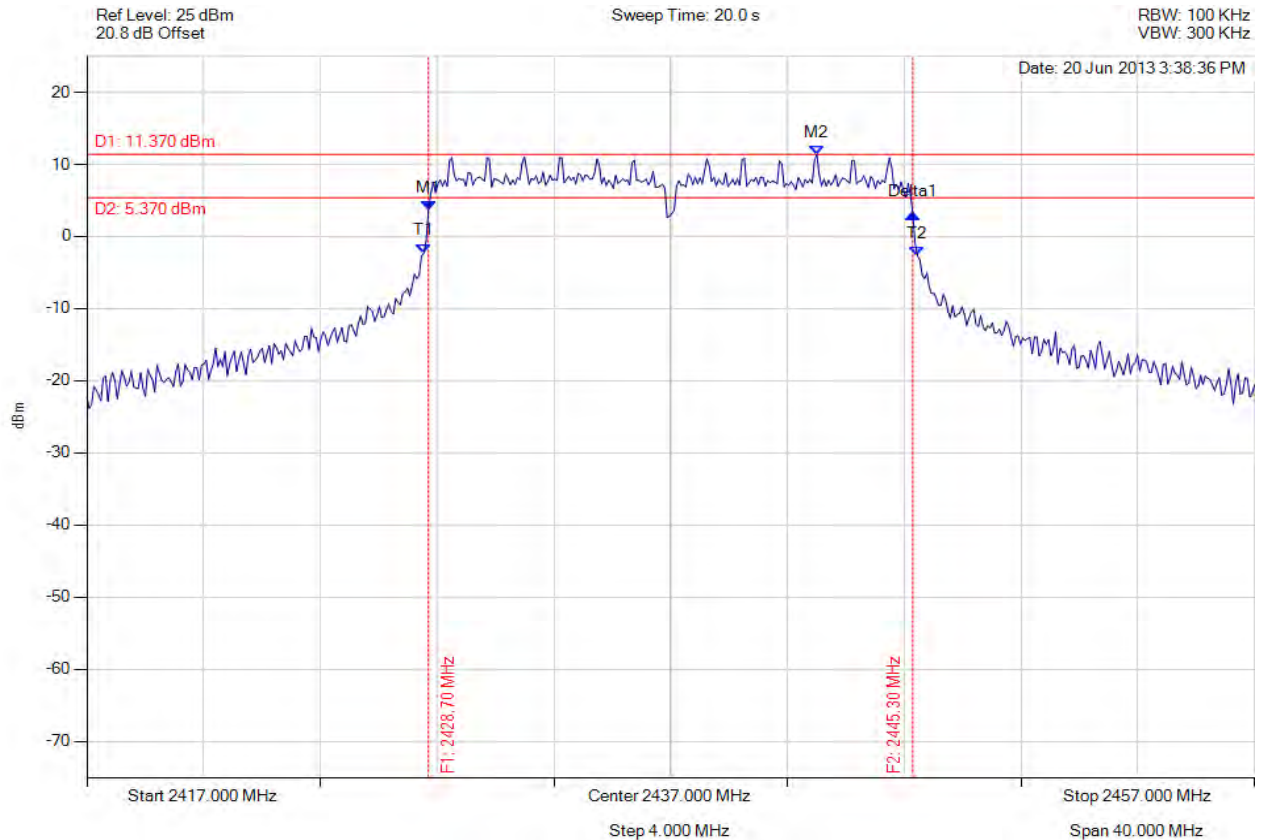
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.784 MHz : 0.506 dBm M2 : 2417.010 MHz : 7.184 dBm Delta1 : 16.513 MHz : -0.153 dB T1 : 2403.703 MHz : -0.971 dBm T2 : 2420.297 MHz : 0.353 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



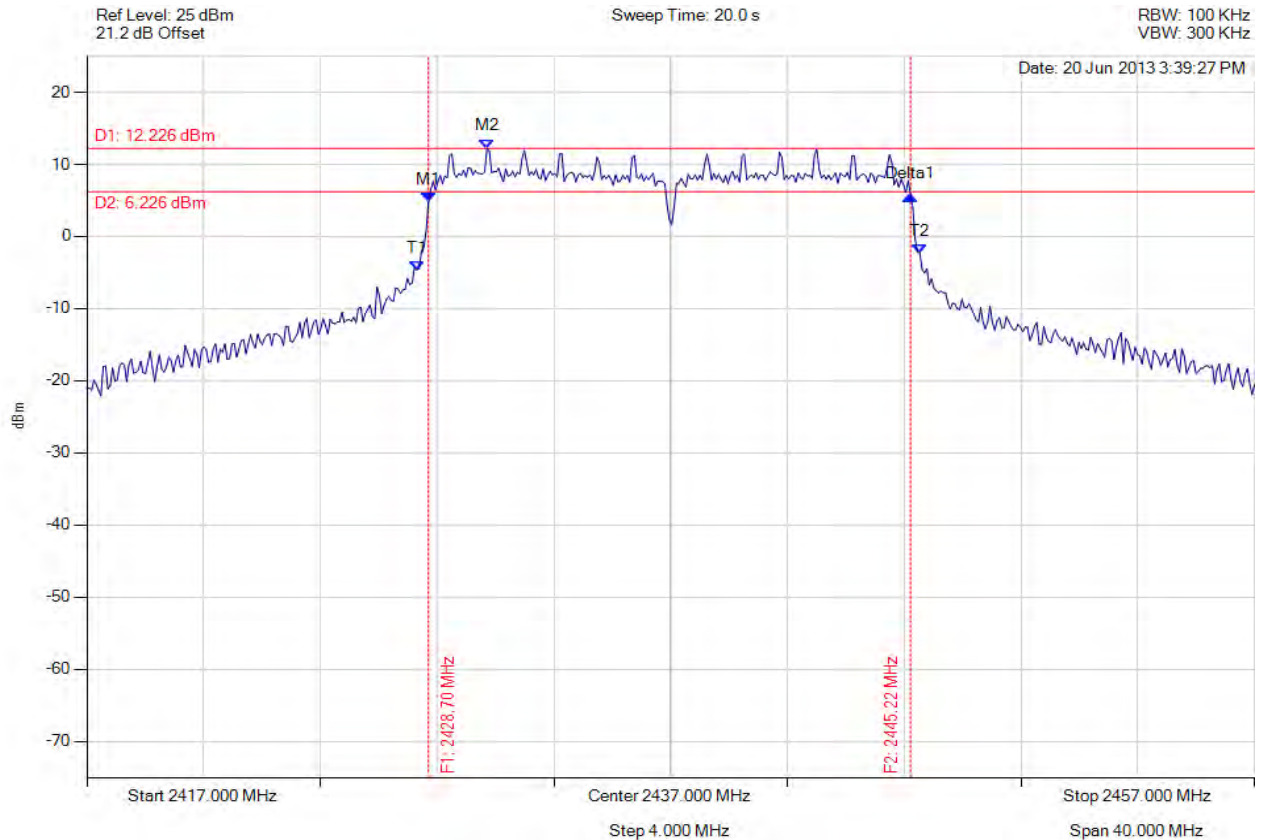
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2428.703 MHz : 3.686 dBm M2 : 2442.010 MHz : 11.370 dBm Delta1 : 16.593 MHz : -0.531 dB T1 : 2428.543 MHz : -2.293 dBm T2 : 2445.457 MHz : -2.726 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



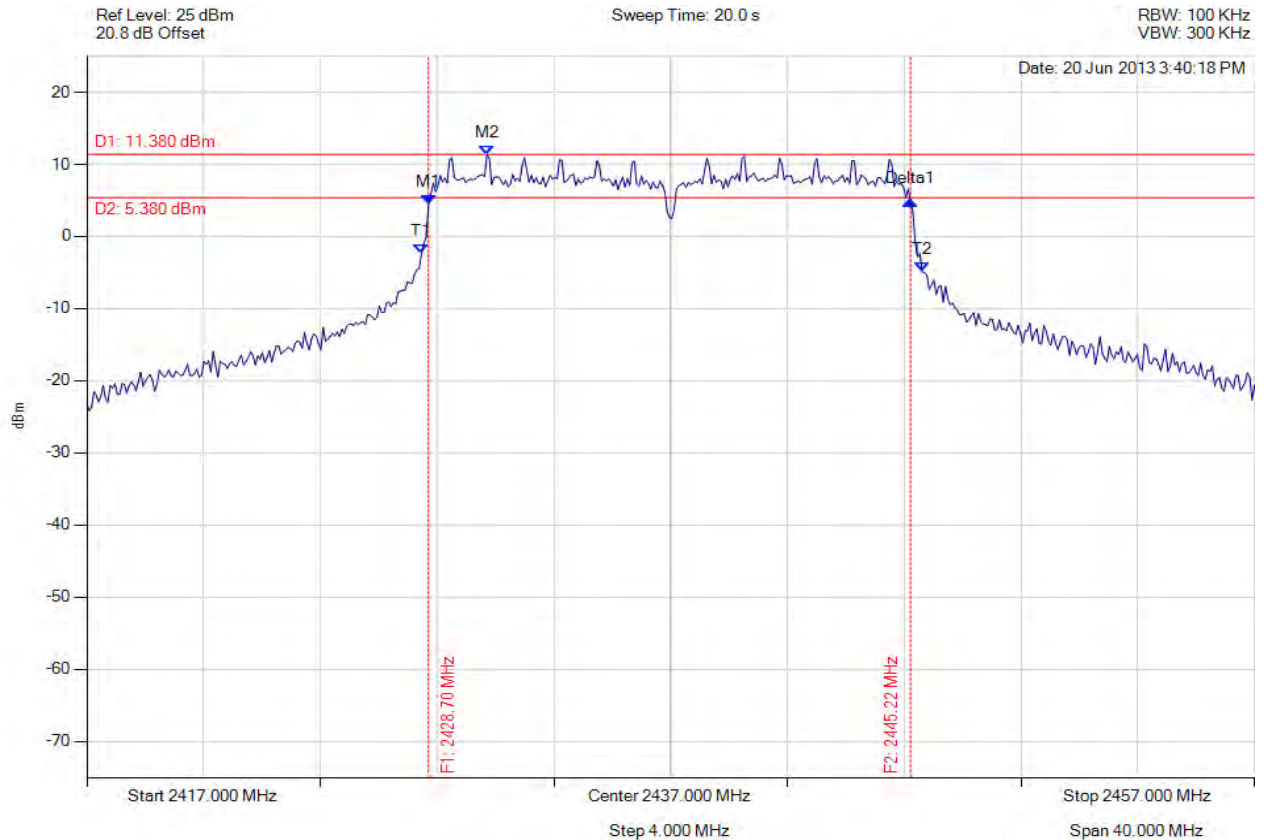
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2428.703 MHz : 4.844 dBm M2 : 2430.707 MHz : 12.226 dBm Delta1 : 16.513 MHz : 0.862 dB T1 : 2428.303 MHz : -4.654 dBm T2 : 2445.537 MHz : -2.309 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



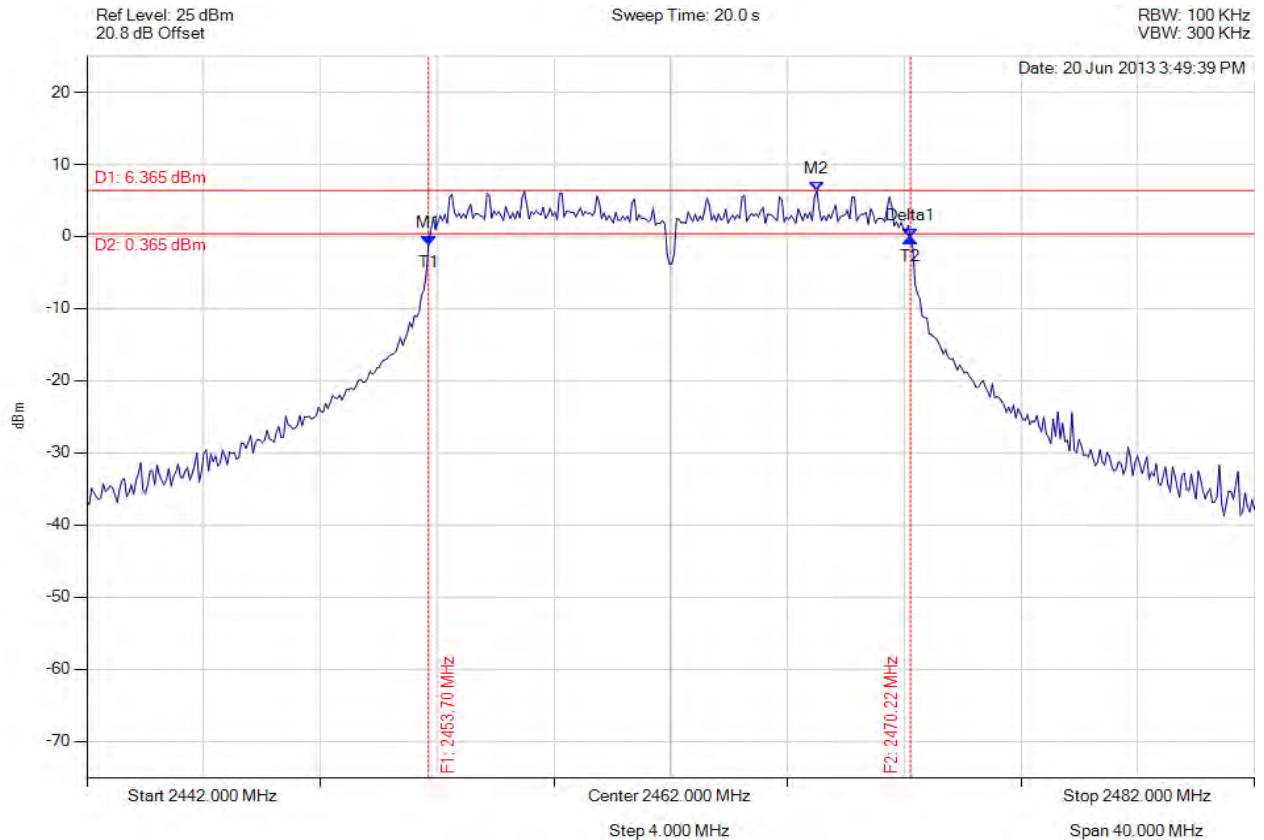
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2428.703 MHz : 4.421 dBm M2 : 2430.707 MHz : 11.380 dBm Delta1 : 16.513 MHz : 0.480 dB T1 : 2428.463 MHz : -2.374 dBm T2 : 2445.617 MHz : -4.906 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



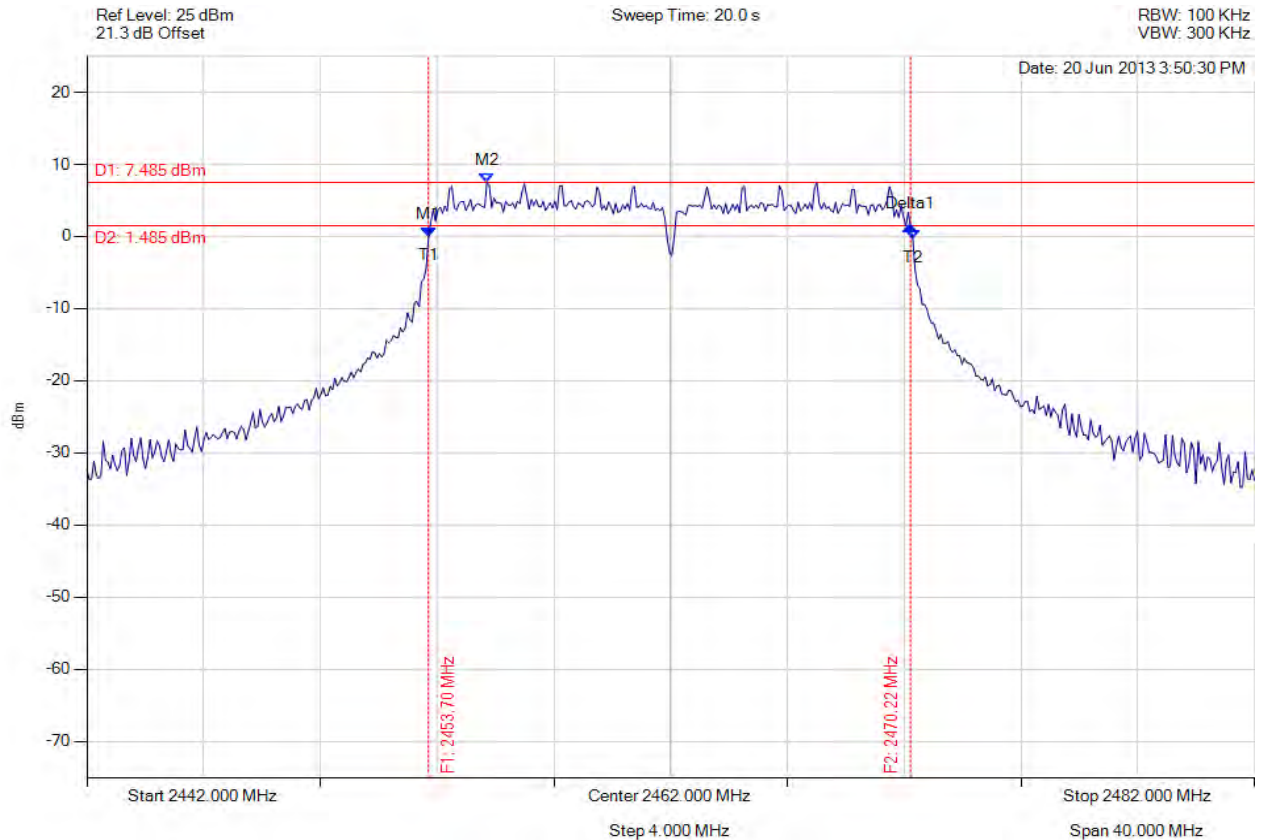
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2453.703 MHz : -1.136 dBm M2 : 2467.010 MHz : 6.365 dBm Delta1 : 16.513 MHz : 0.903 dB T1 : 2453.703 MHz : -1.136 dBm T2 : 2470.216 MHz : -0.233 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



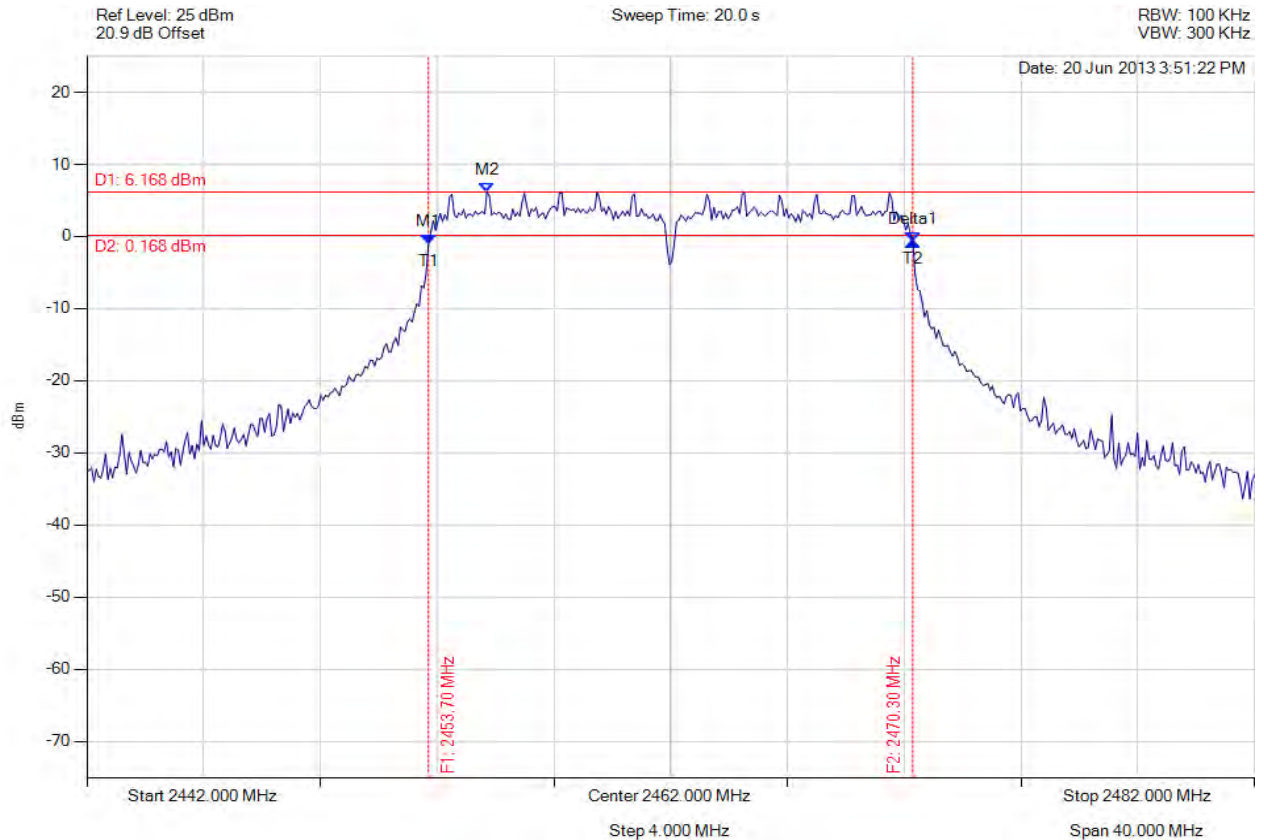
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2453.703 MHz : -0.088 dBm M2 : 2455.707 MHz : 7.485 dBm Delta1 : 16.513 MHz : 1.485 dB T1 : 2453.703 MHz : -0.088 dBm T2 : 2470.297 MHz : -0.353 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



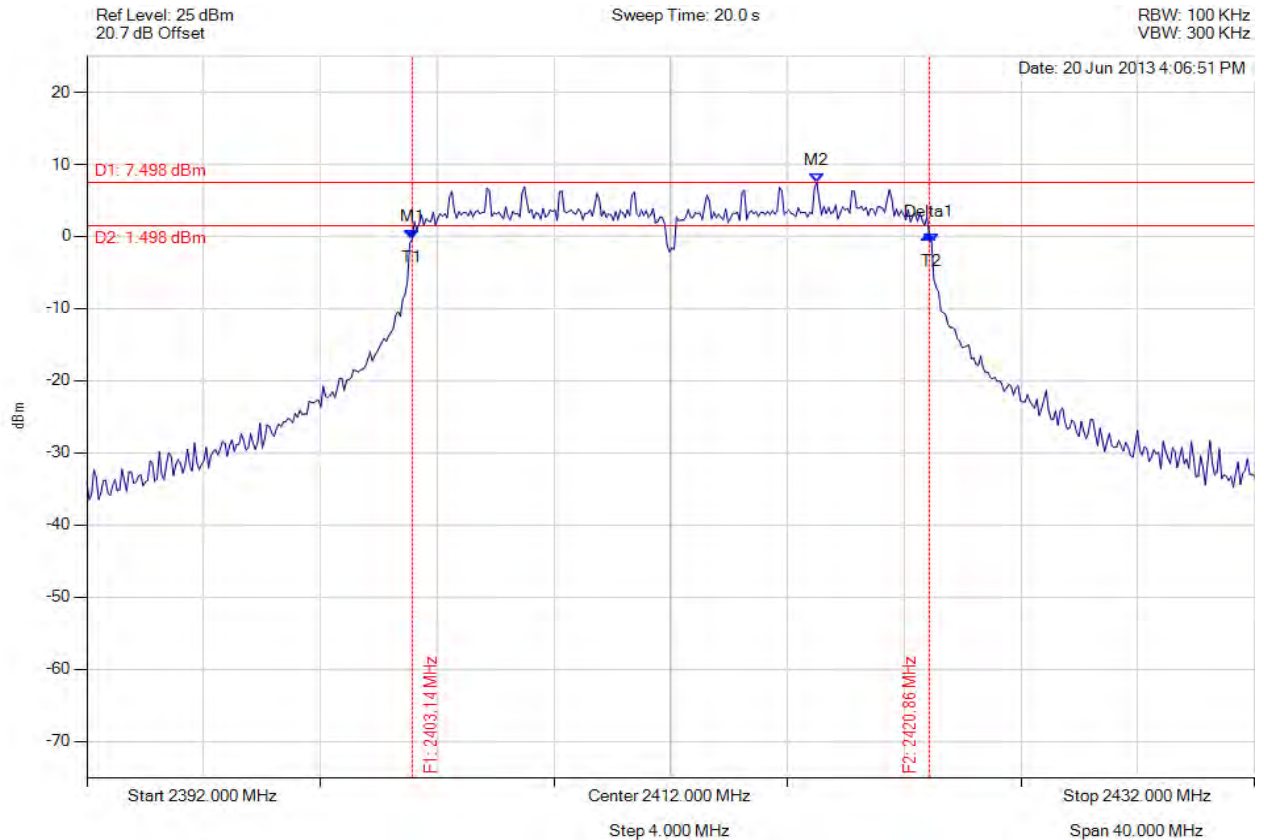
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2453.703 MHz : -0.969 dBm M2 : 2455.707 MHz : 6.168 dBm Delta1 : 16.593 MHz : 0.299 dB T1 : 2453.703 MHz : -0.969 dBm T2 : 2470.297 MHz : -0.670 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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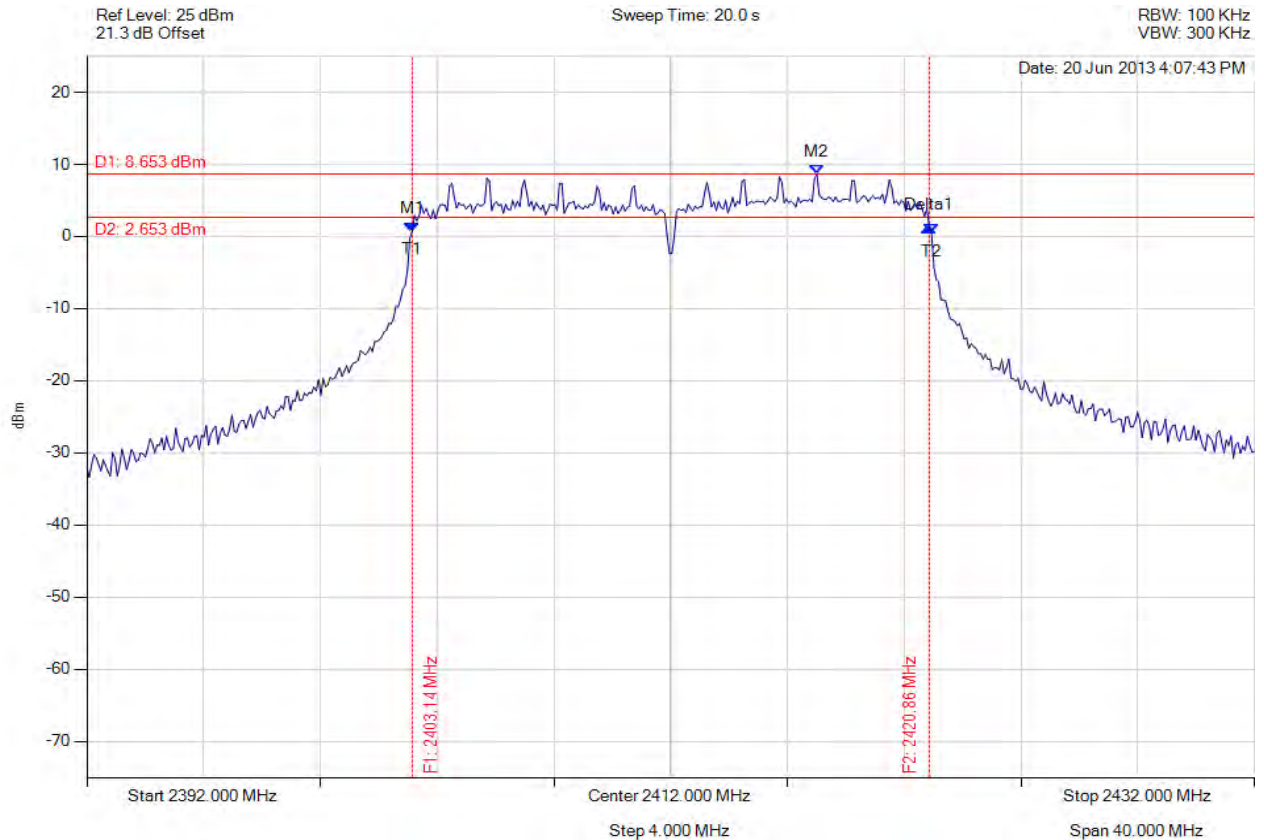


Title: APIN0114, APIN0115 802.11a/b/g/n
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB148-U4 Rev A
Issue Date: 2nd August 2013
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6 dB & 99% BANDWIDTH

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



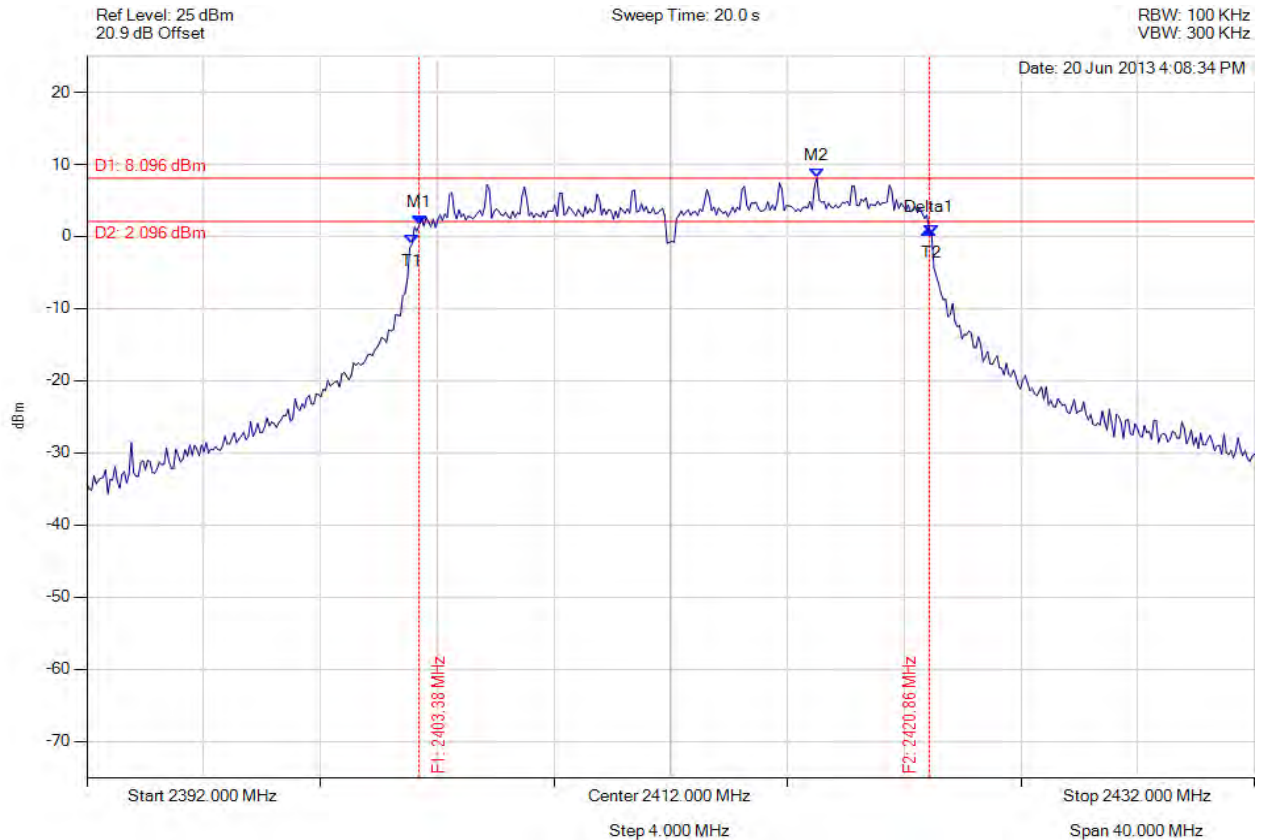
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.142 MHz : 0.719 dBm M2 : 2417.010 MHz : 8.653 dBm Delta1 : 17.715 MHz : 0.639 dB T1 : 2403.142 MHz : 0.719 dBm T2 : 2420.938 MHz : 0.483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

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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 |

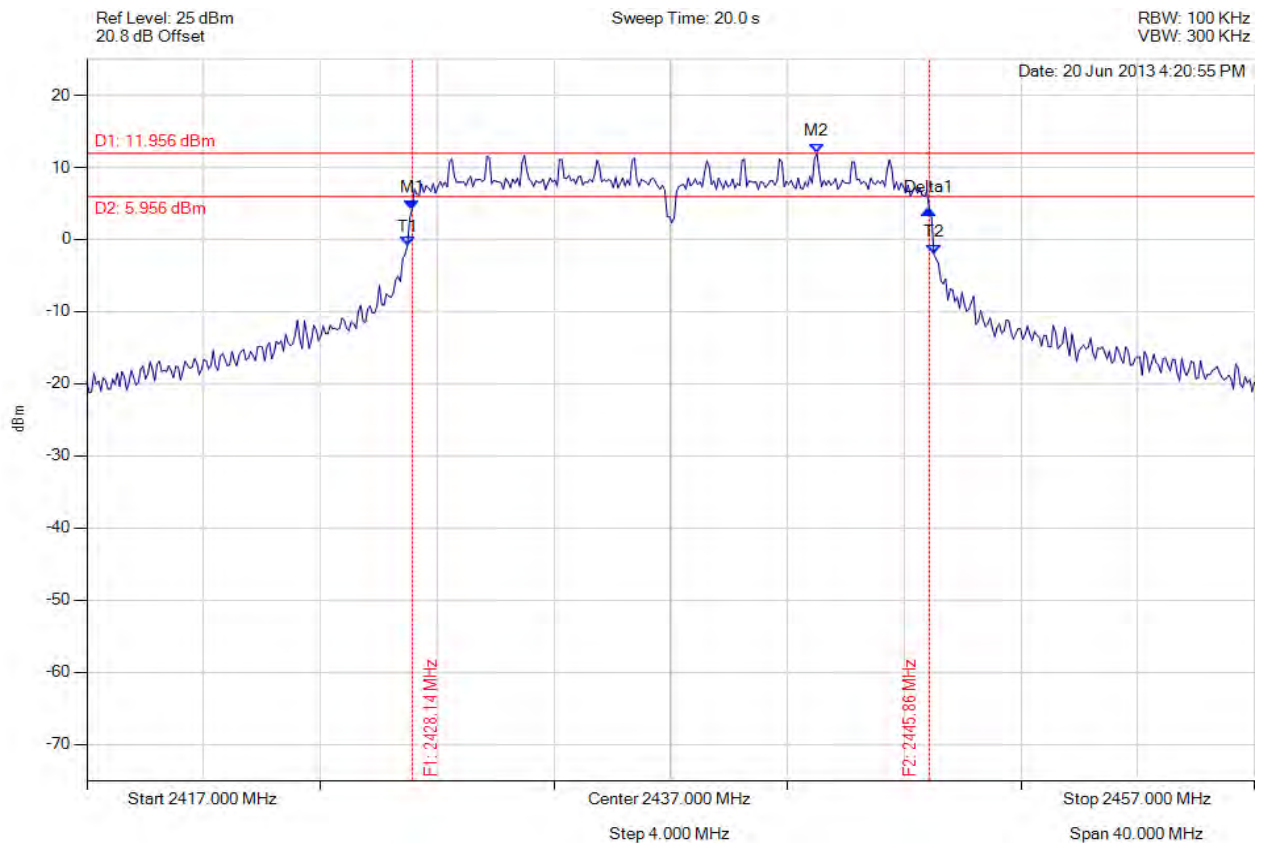
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6 dB & 99% BANDWIDTH

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



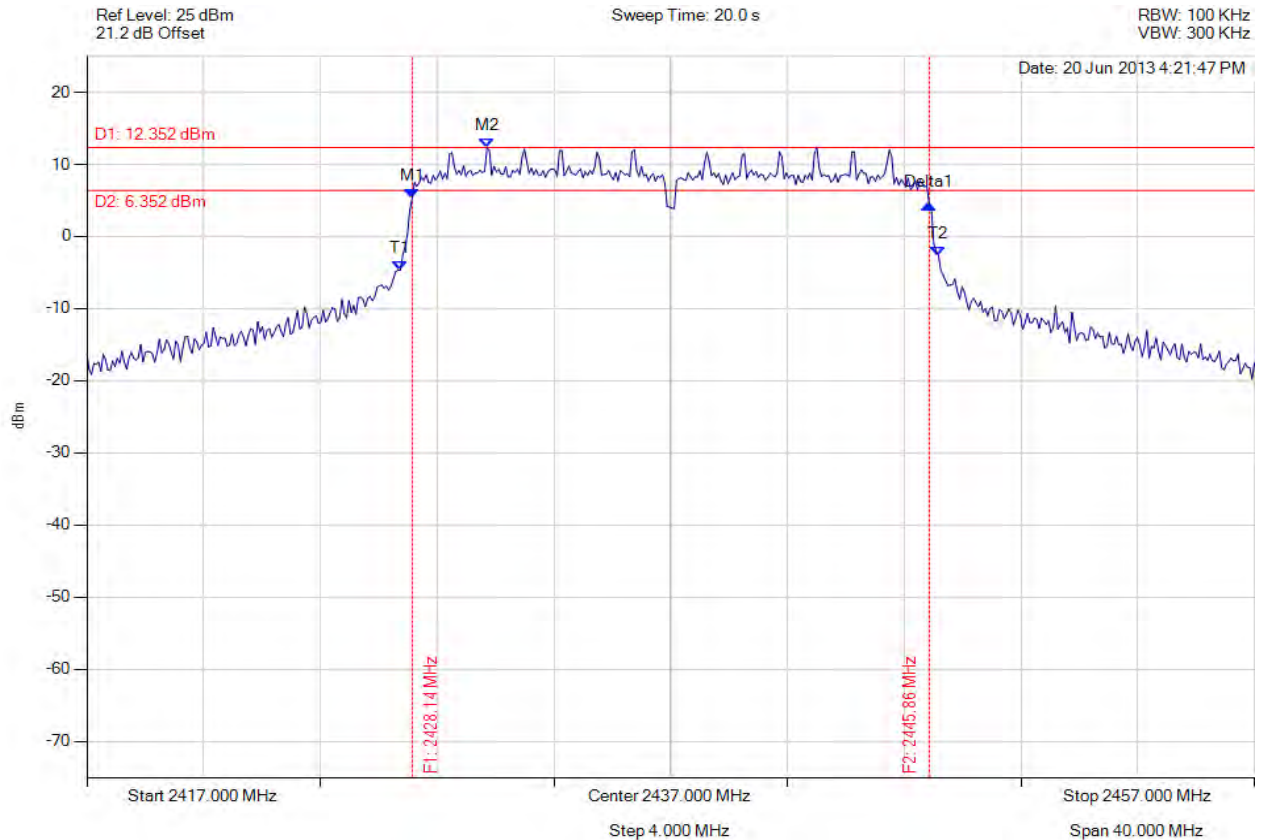
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2428.142 MHz : 4.197 dBm M2 : 2442.010 MHz : 11.956 dBm Delta1 : 17.715 MHz : -0.031 dB T1 : 2427.982 MHz : -0.827 dBm T2 : 2446.018 MHz : -2.079 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



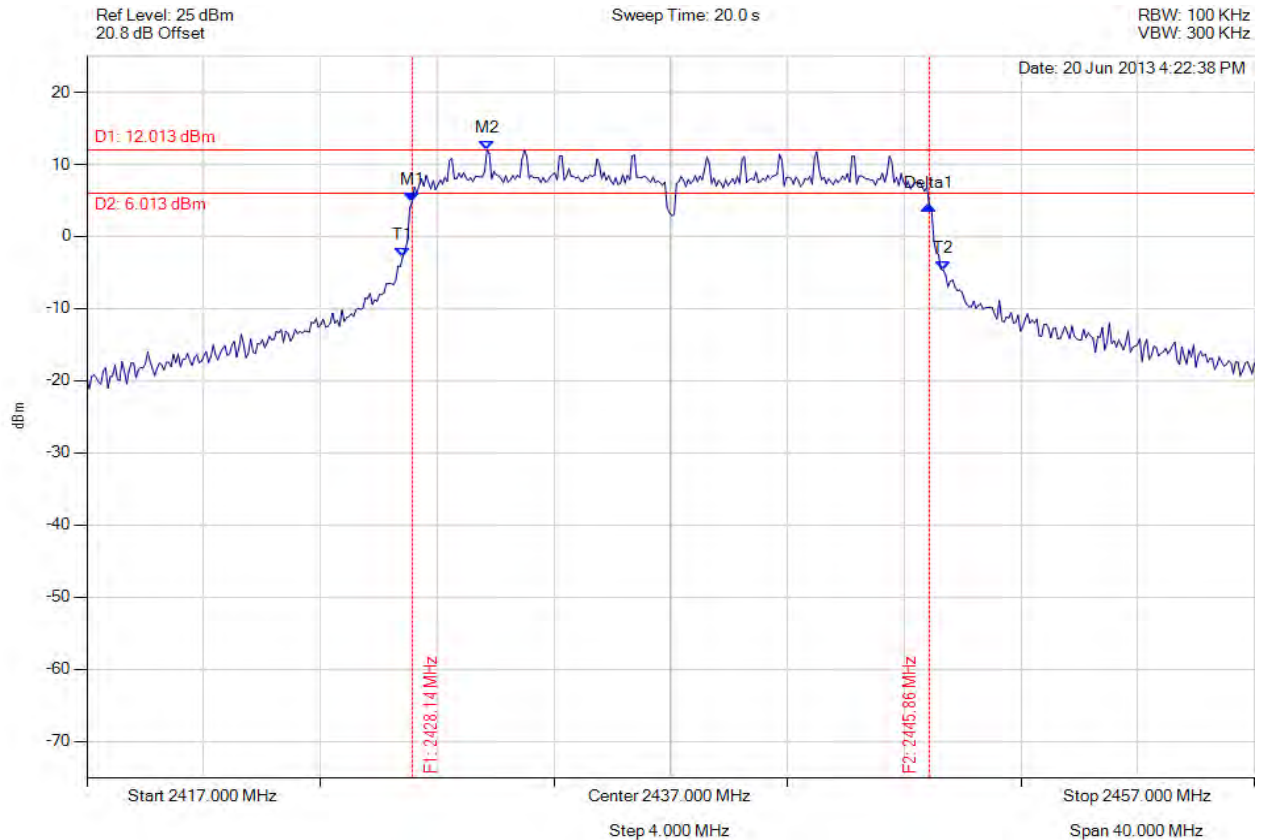
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2428.142 MHz : 5.248 dBm M2 : 2430.707 MHz : 12.352 dBm Delta1 : 17.715 MHz : -0.799 dB T1 : 2427.741 MHz : -4.674 dBm T2 : 2446.178 MHz : -2.694 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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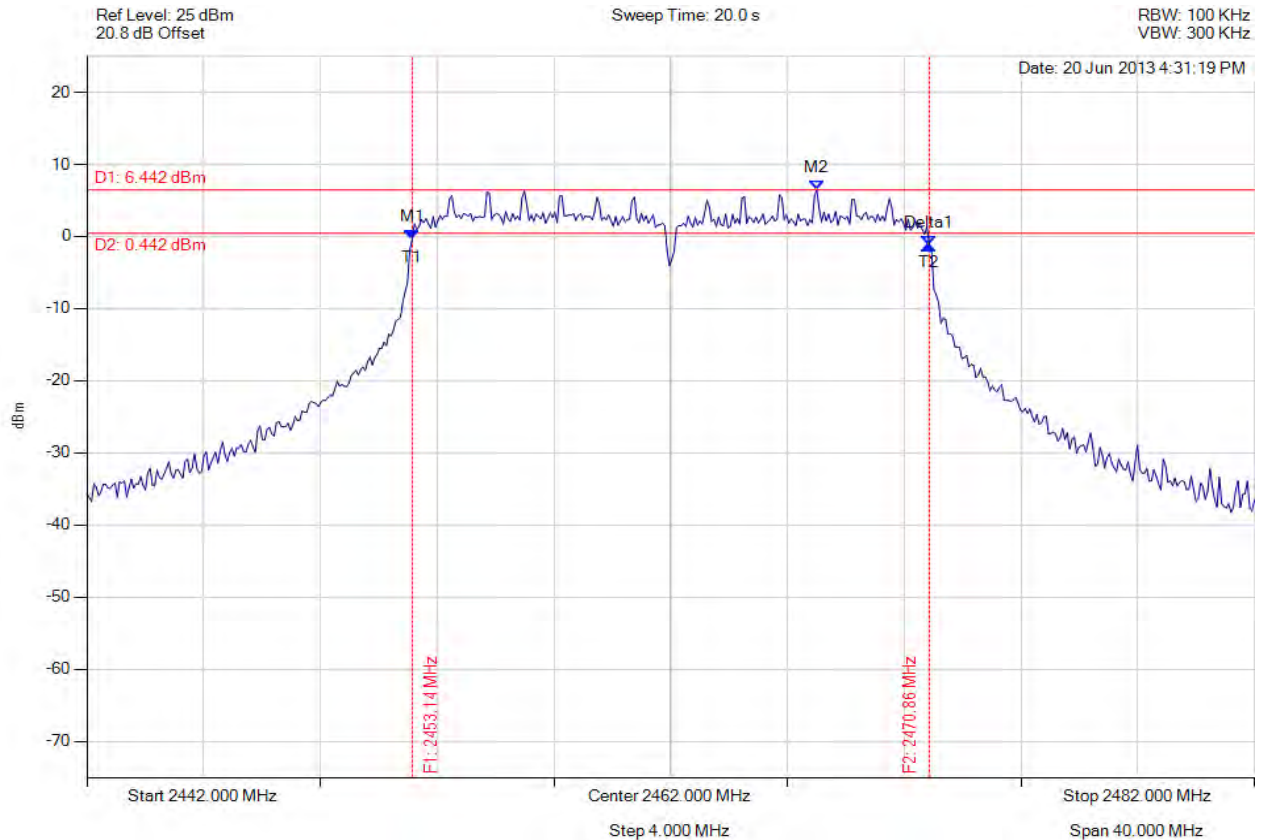


Title: APIN0114, APIN0115 802.11a/b/g/n
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB148-U4 Rev A
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6 dB & 99% BANDWIDTH

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



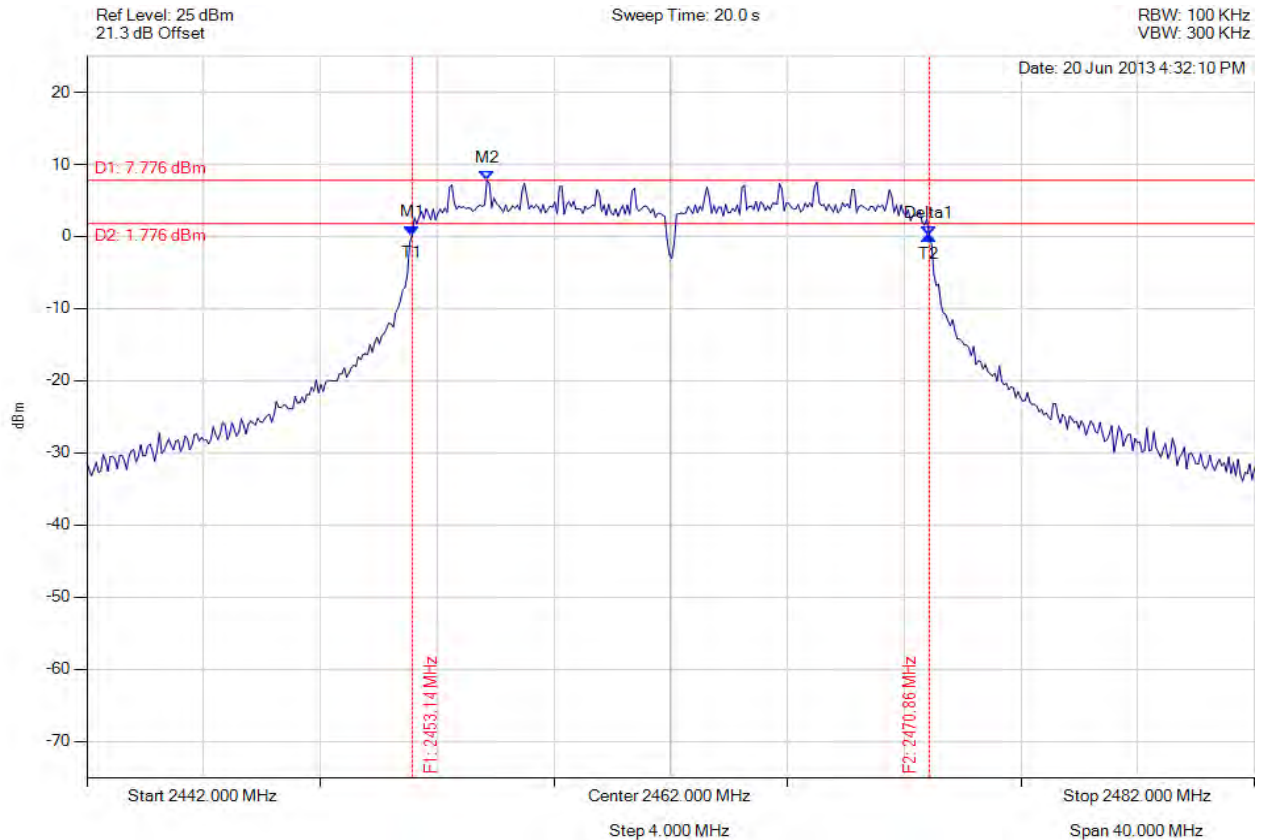
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2453.142 MHz : -0.343 dBm M2 : 2467.010 MHz : 6.442 dBm Delta1 : 17.715 MHz : -0.791 dB T1 : 2453.142 MHz : -0.343 dBm T2 : 2470.858 MHz : -1.134 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 |

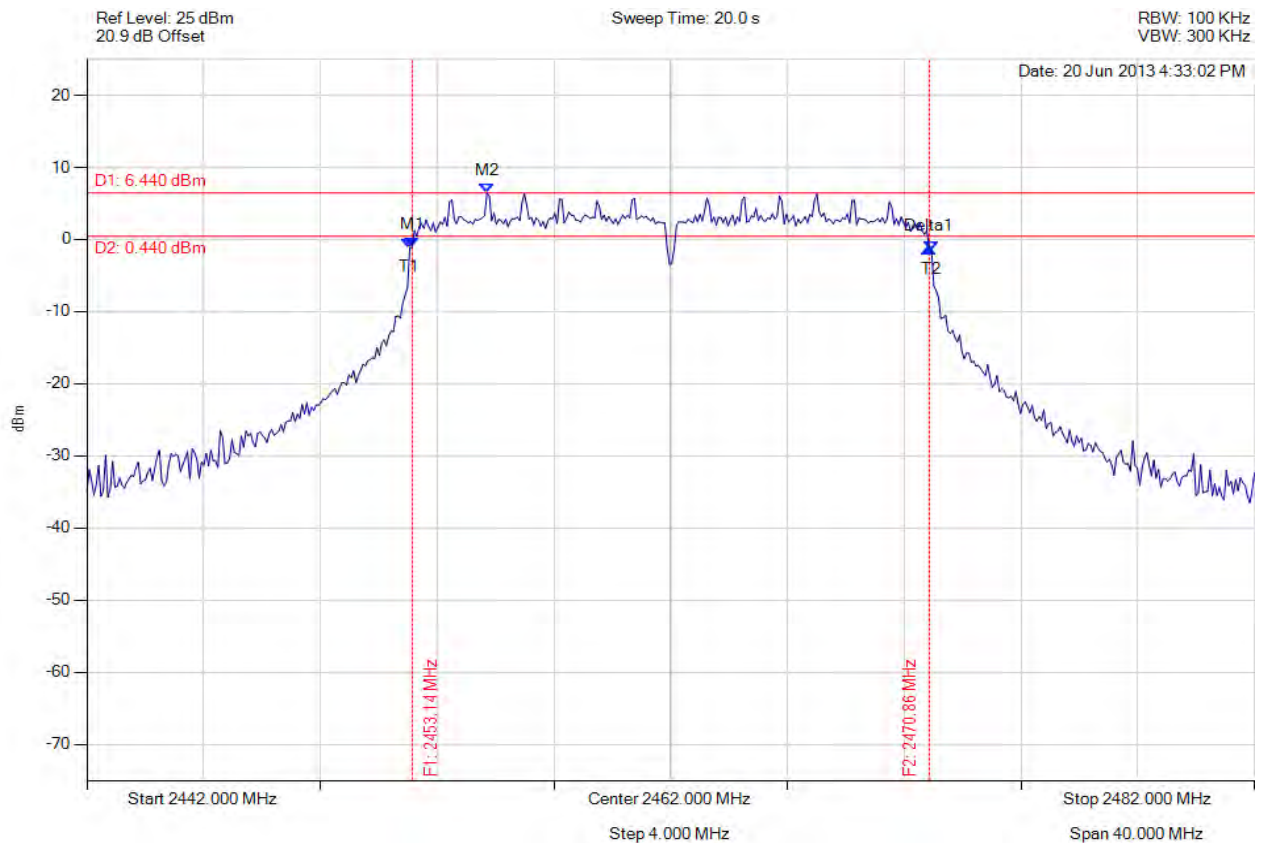
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6 dB & 99% BANDWIDTH

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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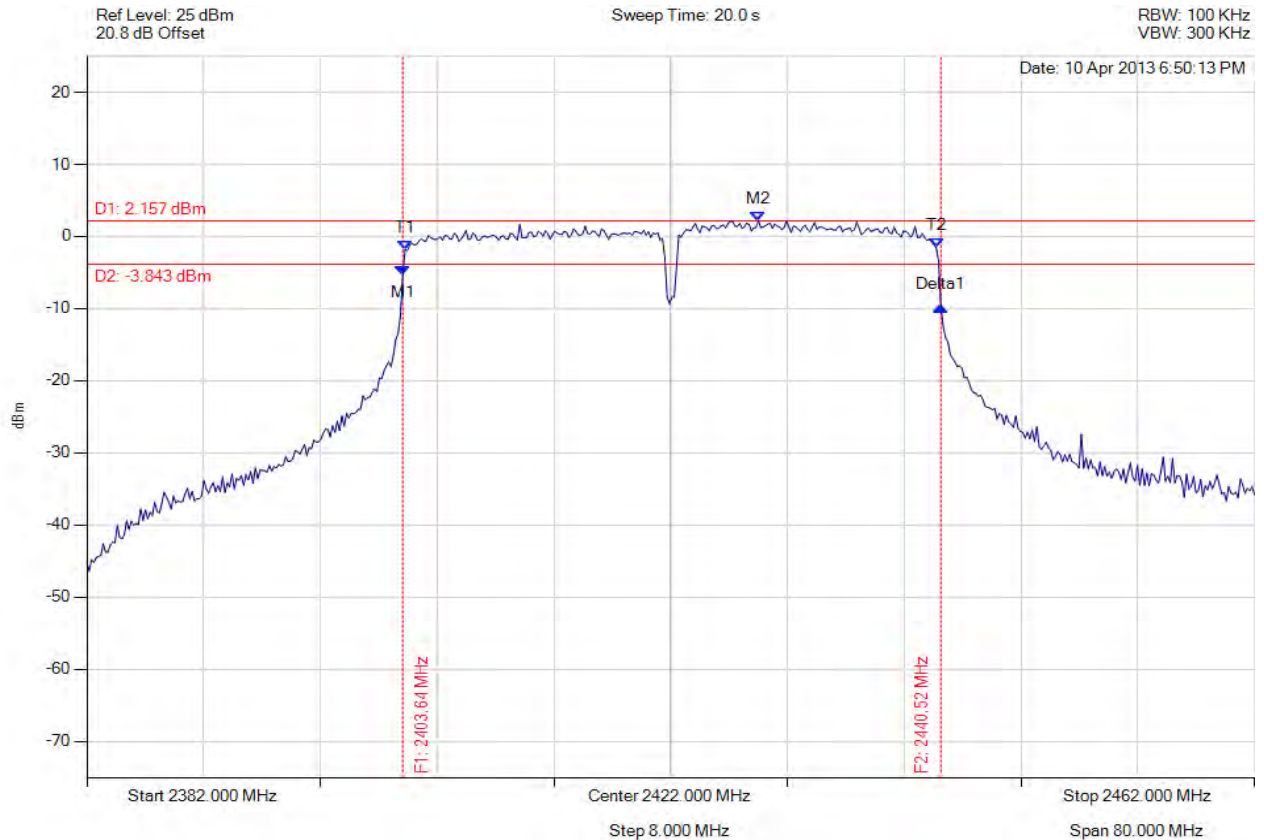


Title: APIN0114, APIN0115 802.11a/b/g/n
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB148-U4 Rev A
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6 dB & 99% BANDWIDTH

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



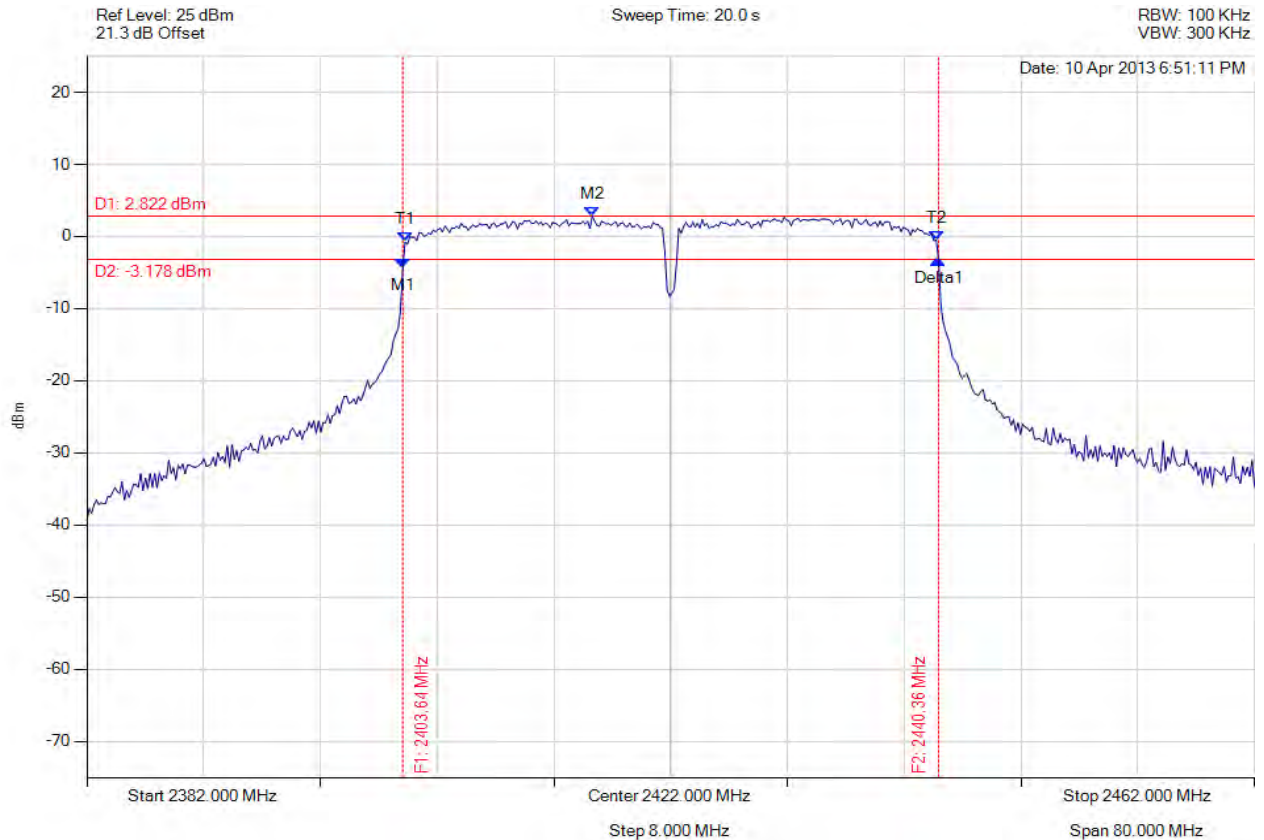
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.643 MHz : -5.287 dBm M2 : 2428.012 MHz : 2.157 dBm Delta1 : 36.874 MHz : -4.427 dB T1 : 2403.804 MHz : -1.858 dBm T2 : 2440.196 MHz : -1.536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

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6 dB & 99% BANDWIDTH

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



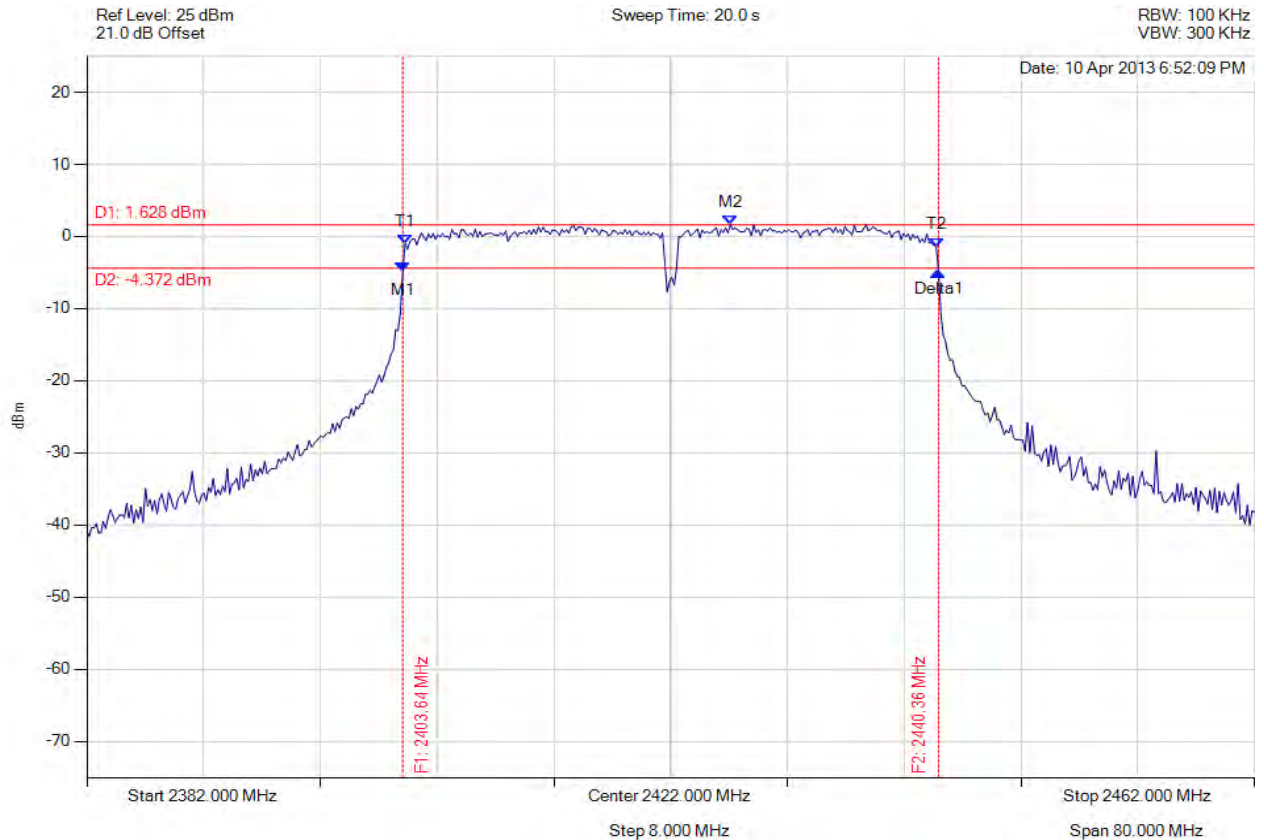
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.643 MHz : -4.339 dBm M2 : 2416.629 MHz : 2.822 dBm Delta1 : 36.713 MHz : 1.074 dB T1 : 2403.804 MHz : -0.763 dBm T2 : 2440.196 MHz : -0.493 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



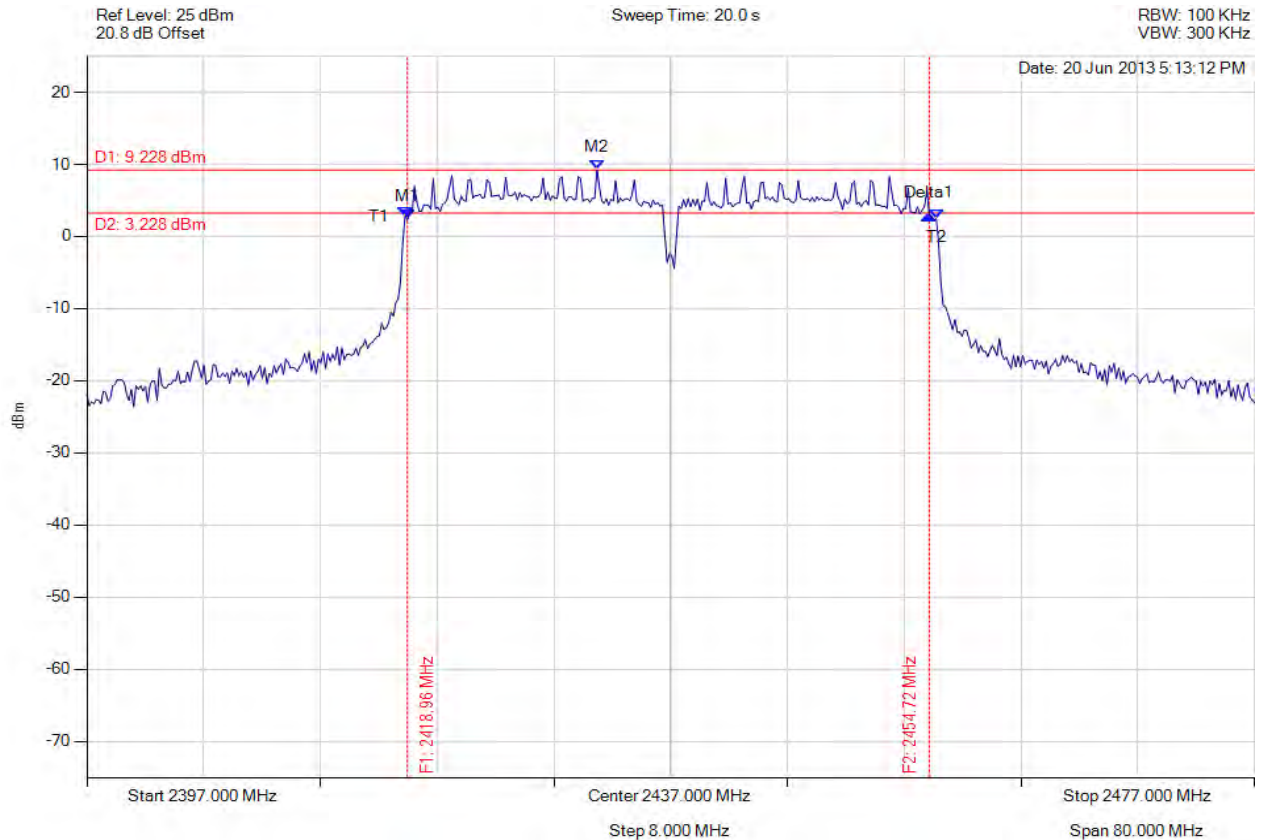
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2403.643 MHz : -4.904 dBm M2 : 2426.088 MHz : 1.628 dBm Delta1 : 36.713 MHz : 0.063 dB T1 : 2403.804 MHz : -0.991 dBm T2 : 2440.196 MHz : -1.459 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



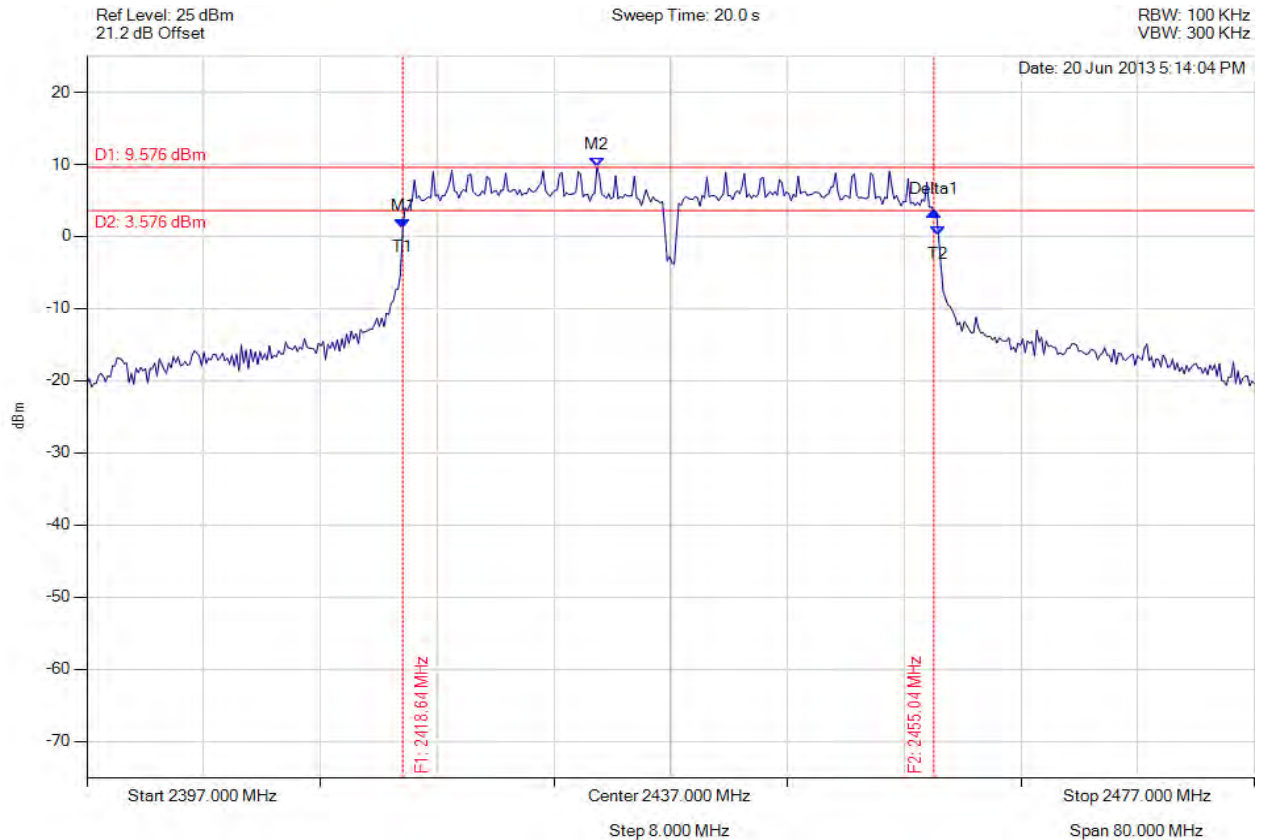
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2418.964 MHz : 2.391 dBm M2 : 2431.950 MHz : 9.228 dBm Delta1 : 35.752 MHz : 0.592 dB T1 : 2418.804 MHz : 2.810 dBm T2 : 2455.196 MHz : 2.417 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



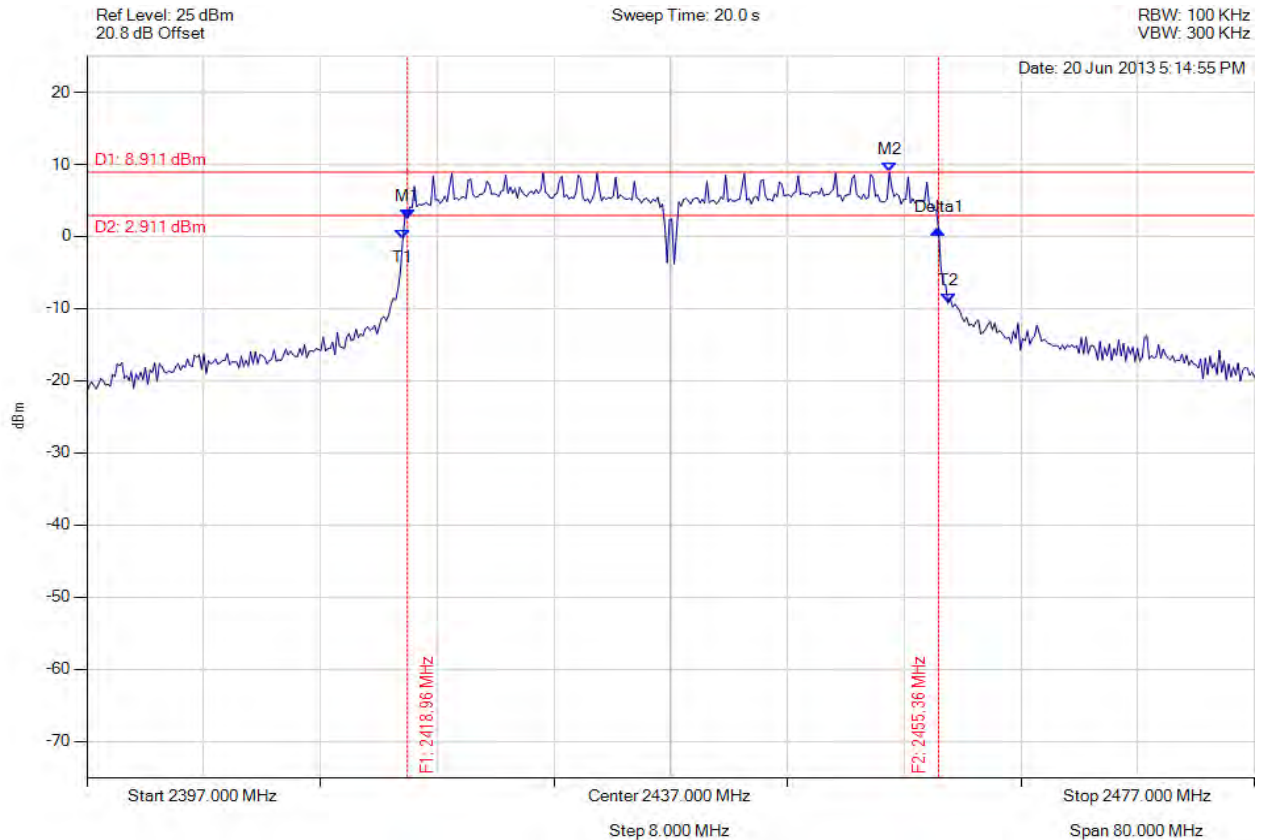
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2418.643 MHz : 1.081 dBm M2 : 2431.950 MHz : 9.576 dBm Delta1 : 36.393 MHz : 2.457 dB T1 : 2418.643 MHz : 1.081 dBm T2 : 2455.357 MHz : 0.123 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



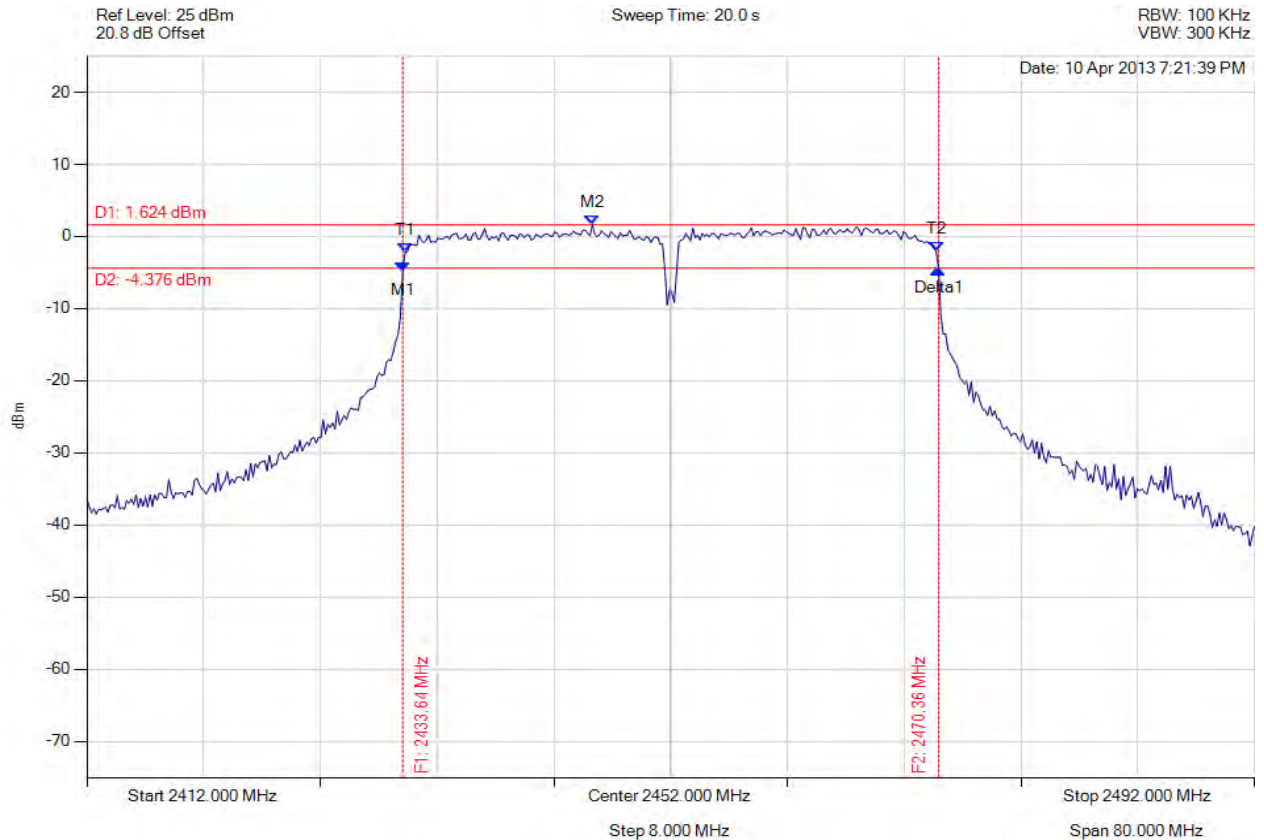
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2418.964 MHz : 2.517 dBm M2 : 2451.990 MHz : 8.911 dBm Delta1 : 36.393 MHz : -1.521 dB T1 : 2418.643 MHz : -0.406 dBm T2 : 2455.998 MHz : -9.263 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



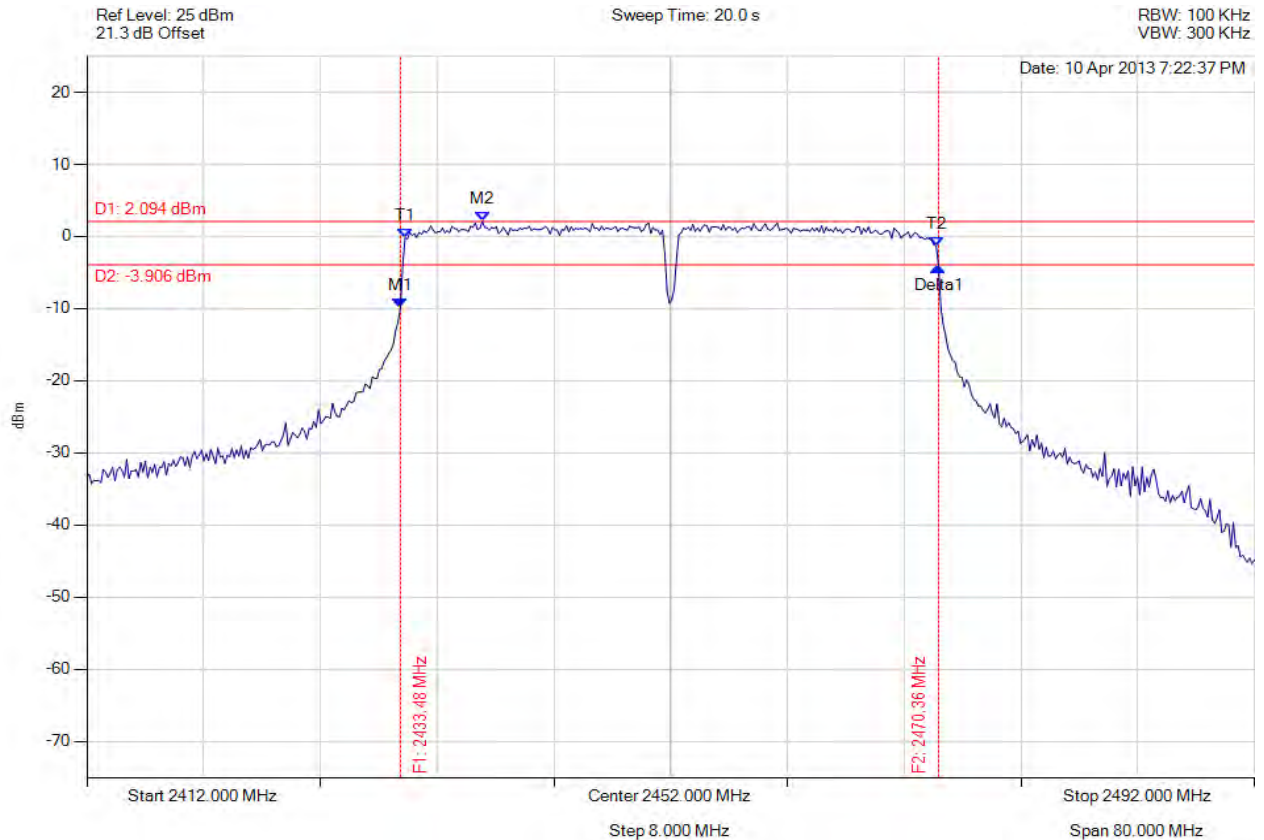
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2433.643 MHz : -4.937 dBm M2 : 2446.629 MHz : 1.624 dBm Delta1 : 36.713 MHz : 0.370 dB T1 : 2433.804 MHz : -2.236 dBm T2 : 2470.196 MHz : -2.018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

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6 dB & 99% BANDWIDTH

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



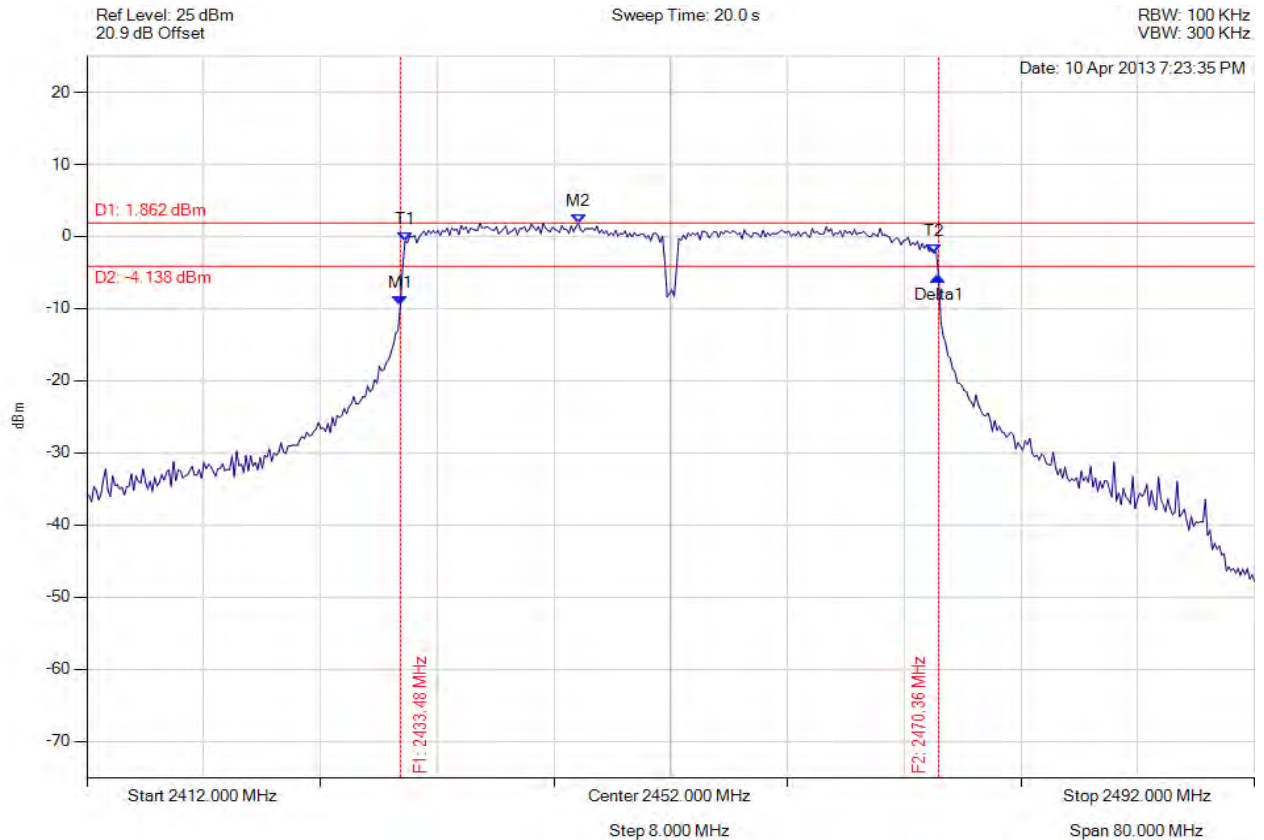
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2433.483 MHz : -9.885 dBm M2 : 2439.094 MHz : 2.094 dBm Delta1 : 36.874 MHz : 5.619 dB T1 : 2433.804 MHz : -0.223 dBm T2 : 2470.196 MHz : -1.319 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



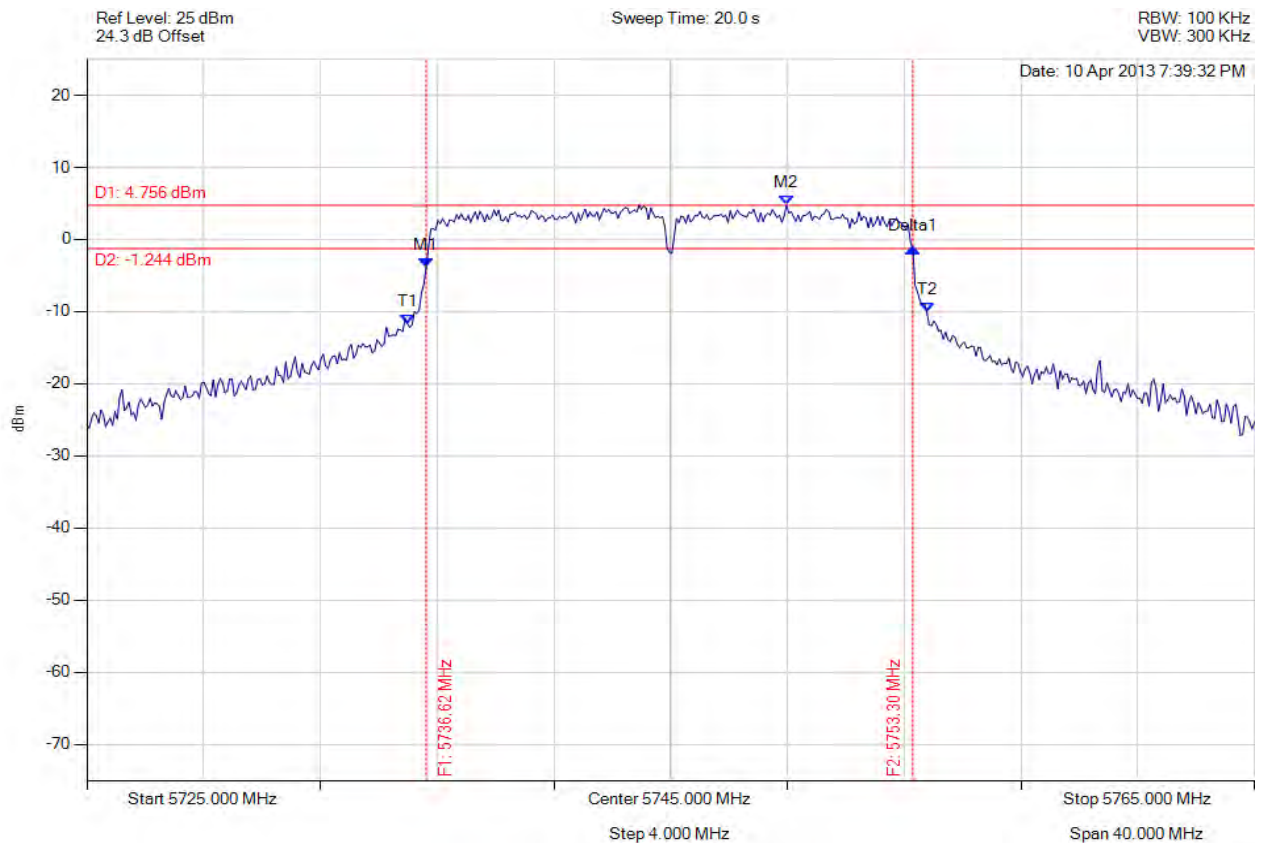
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 2433.483 MHz : -9.472 dBm M2 : 2445.667 MHz : 1.862 dBm Delta1 : 36.874 MHz : 3.960 dB T1 : 2433.804 MHz : -0.646 dBm T2 : 2470.036 MHz : -2.303 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



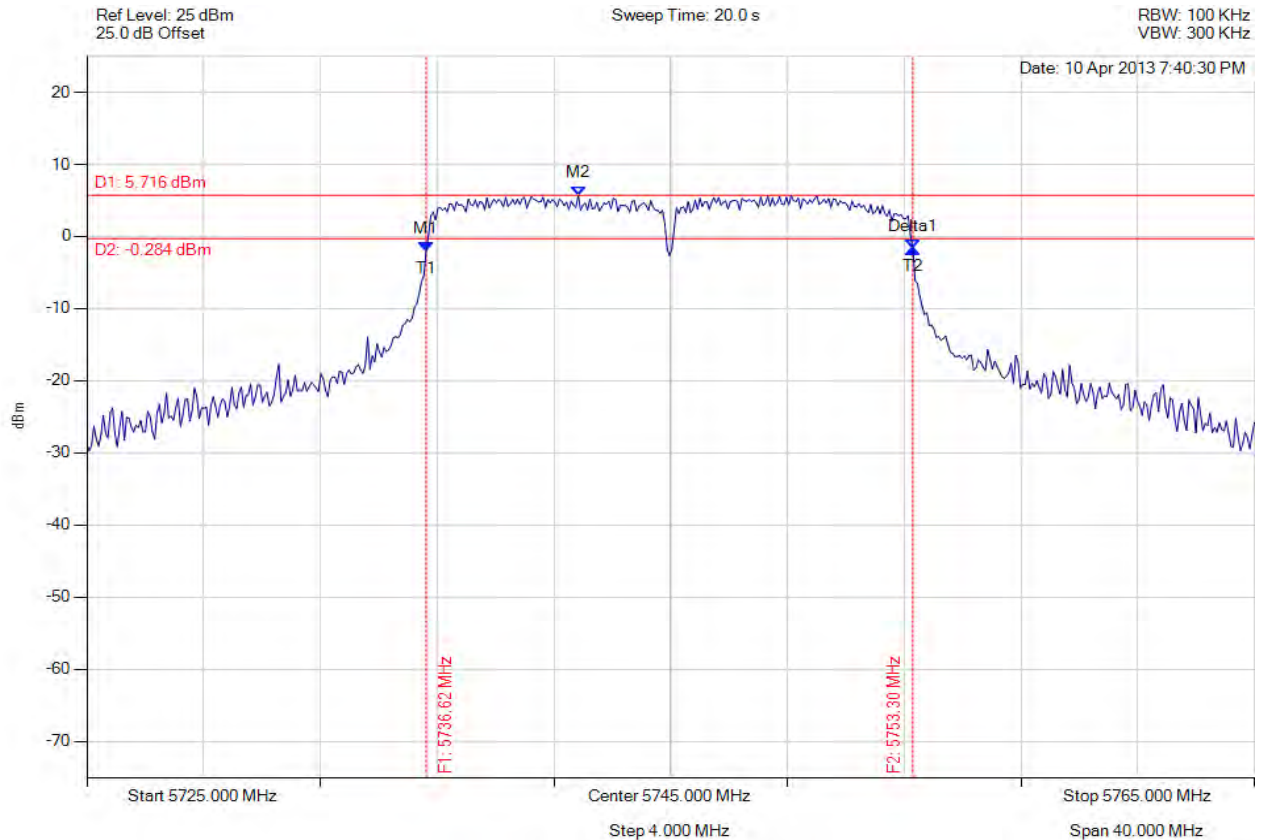
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.623 MHz : -3.946 dBm M2 : 5748.968 MHz : 4.756 dBm Delta1 : 16.673 MHz : 2.689 dB T1 : 5735.982 MHz : -11.689 dBm T2 : 5753.778 MHz : -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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6 dB & 99% BANDWIDTH

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



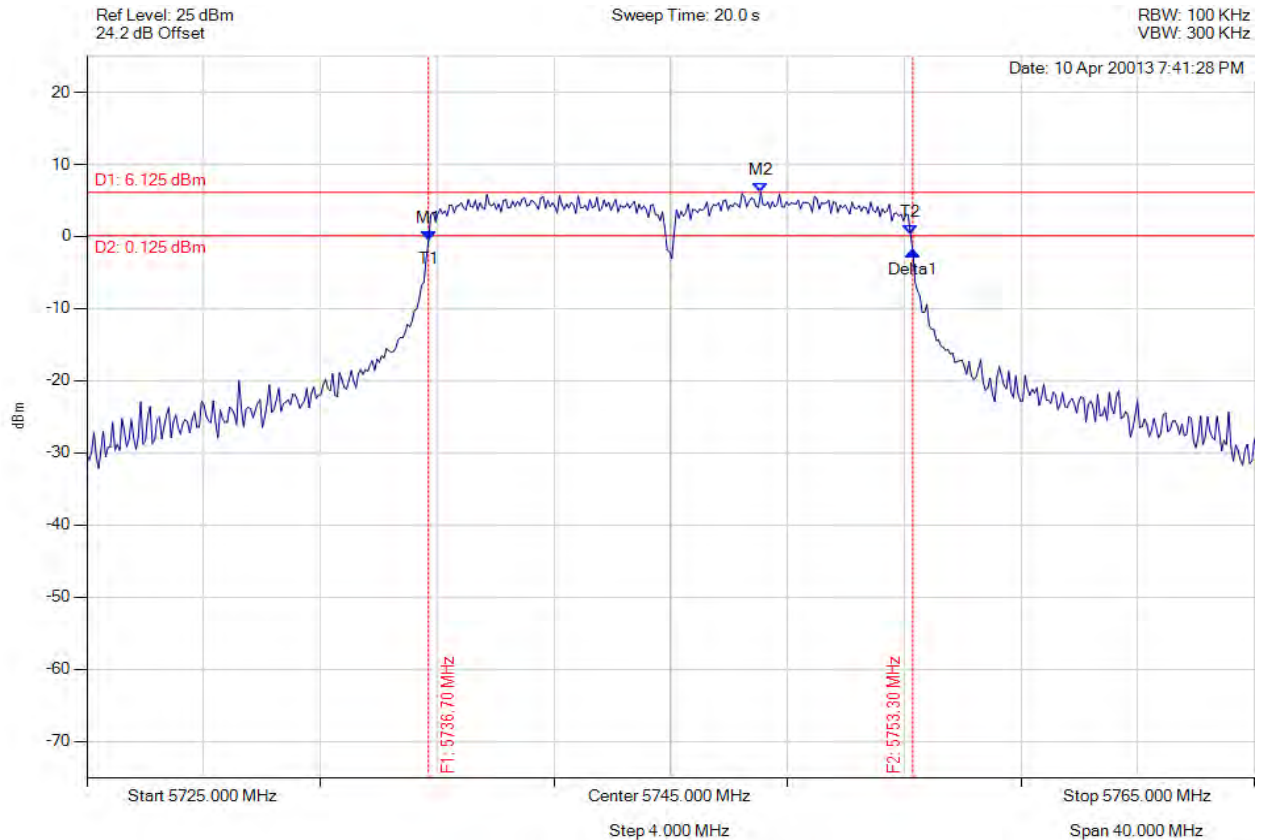
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.623 MHz : -1.974 dBm M2 : 5741.834 MHz : 5.716 dBm Delta1 : 16.673 MHz : 0.323 dB T1 : 5736.623 MHz : -1.974 dBm T2 : 5753.297 MHz : -1.650 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



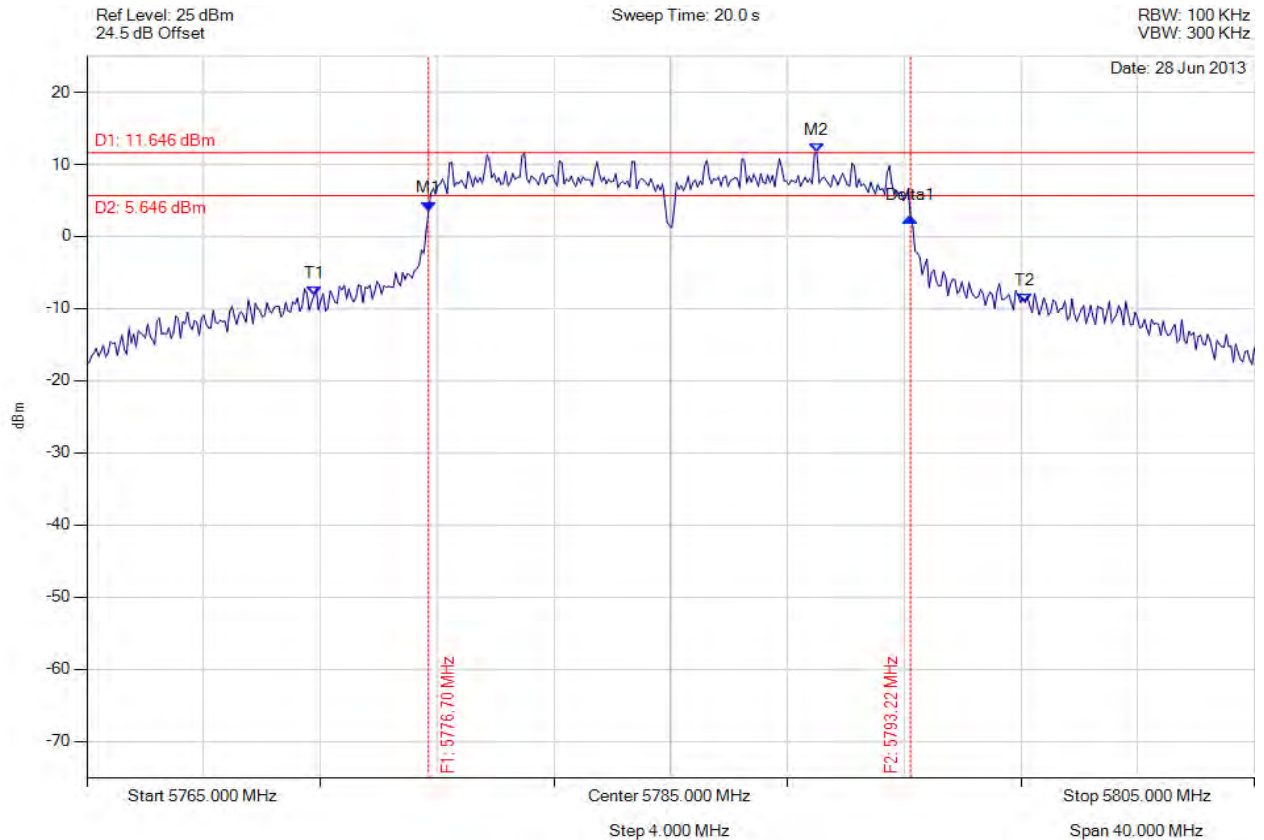
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.703 MHz : -0.607 dBm M2 : 5748.086 MHz : 6.125 dBm Delta1 : 16.593 MHz : -1.454 dB T1 : 5736.703 MHz : -0.607 dBm T2 : 5753.216 MHz : 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



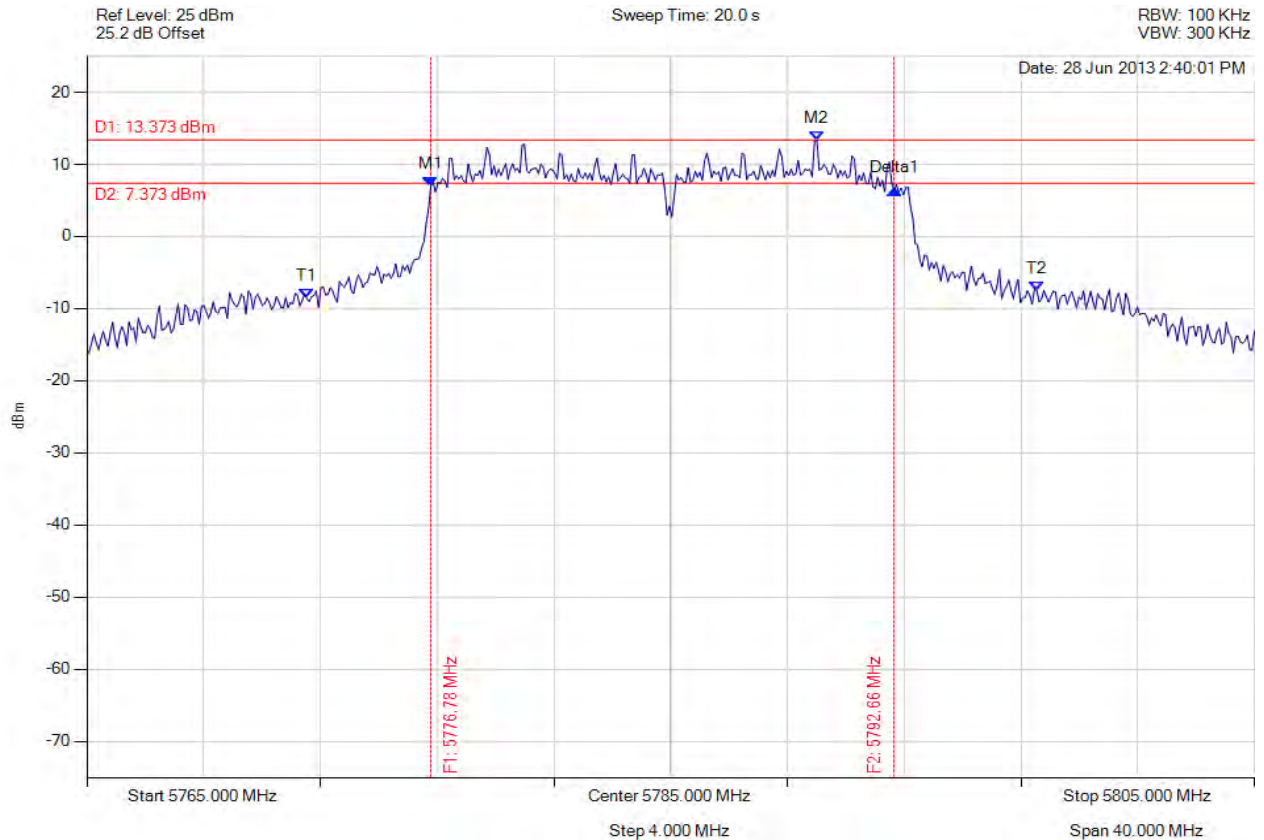
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5776.703 MHz : 3.554 dBm M2 : 5790.010 MHz : 11.646 dBm Delta1 : 16.513 MHz : -0.879 dB T1 : 5772.776 MHz : -8.254 dBm T2 : 5797.144 MHz : -9.155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

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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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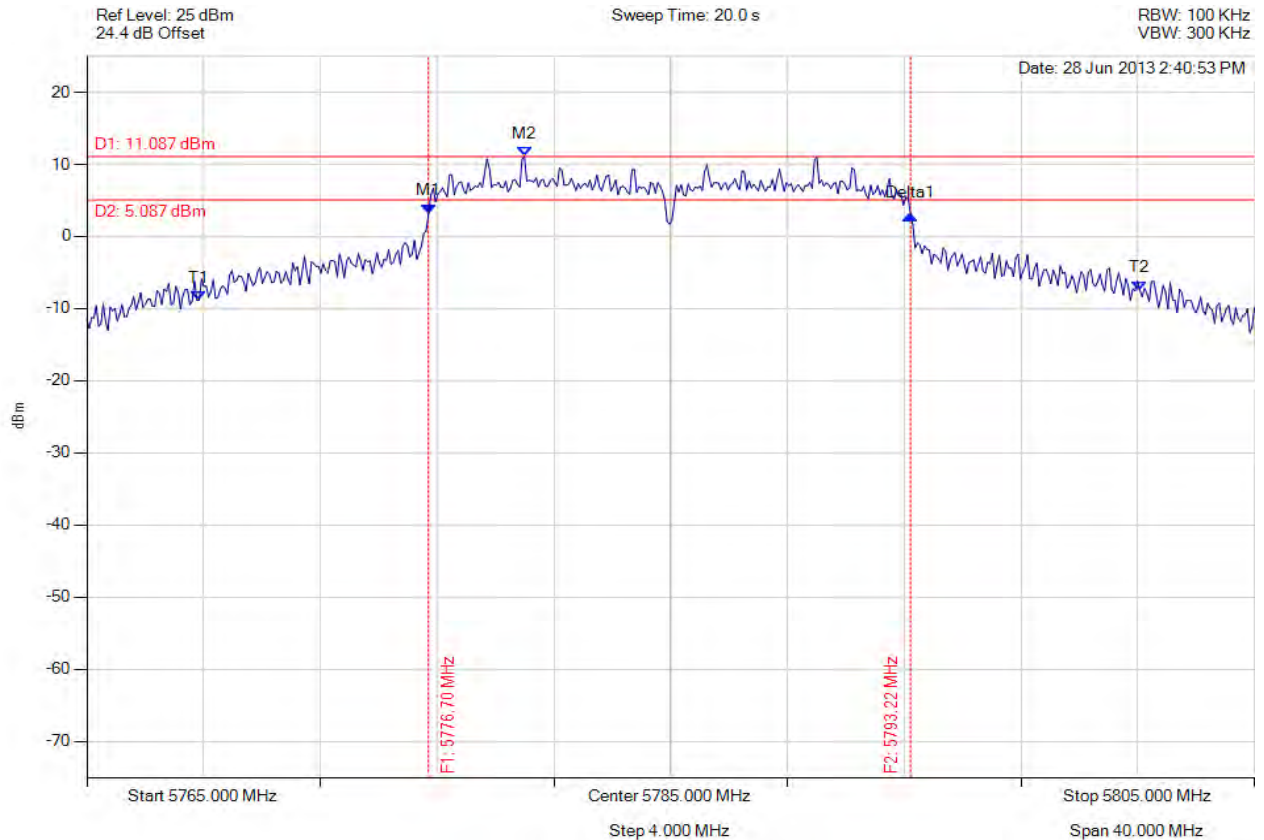


Title: APIN0114, APIN0115 802.11a/b/g/n
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6 dB & 99% BANDWIDTH

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



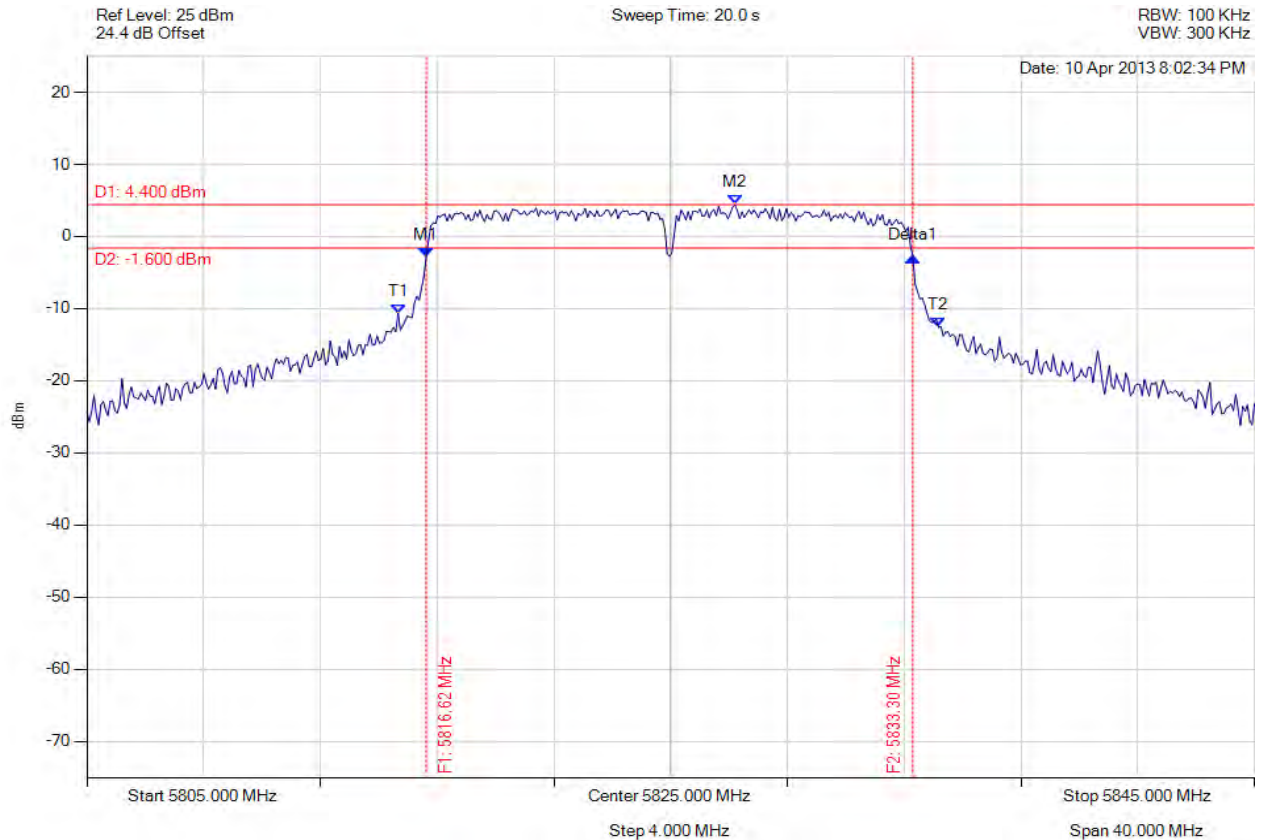
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5776.703 MHz : 3.212 dBm M2 : 5779.990 MHz : 11.087 dBm Delta1 : 16.513 MHz : -0.222 dB T1 : 5768.848 MHz : -8.842 dBm T2 : 5801.072 MHz : -7.450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

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6 dB & 99% BANDWIDTH

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



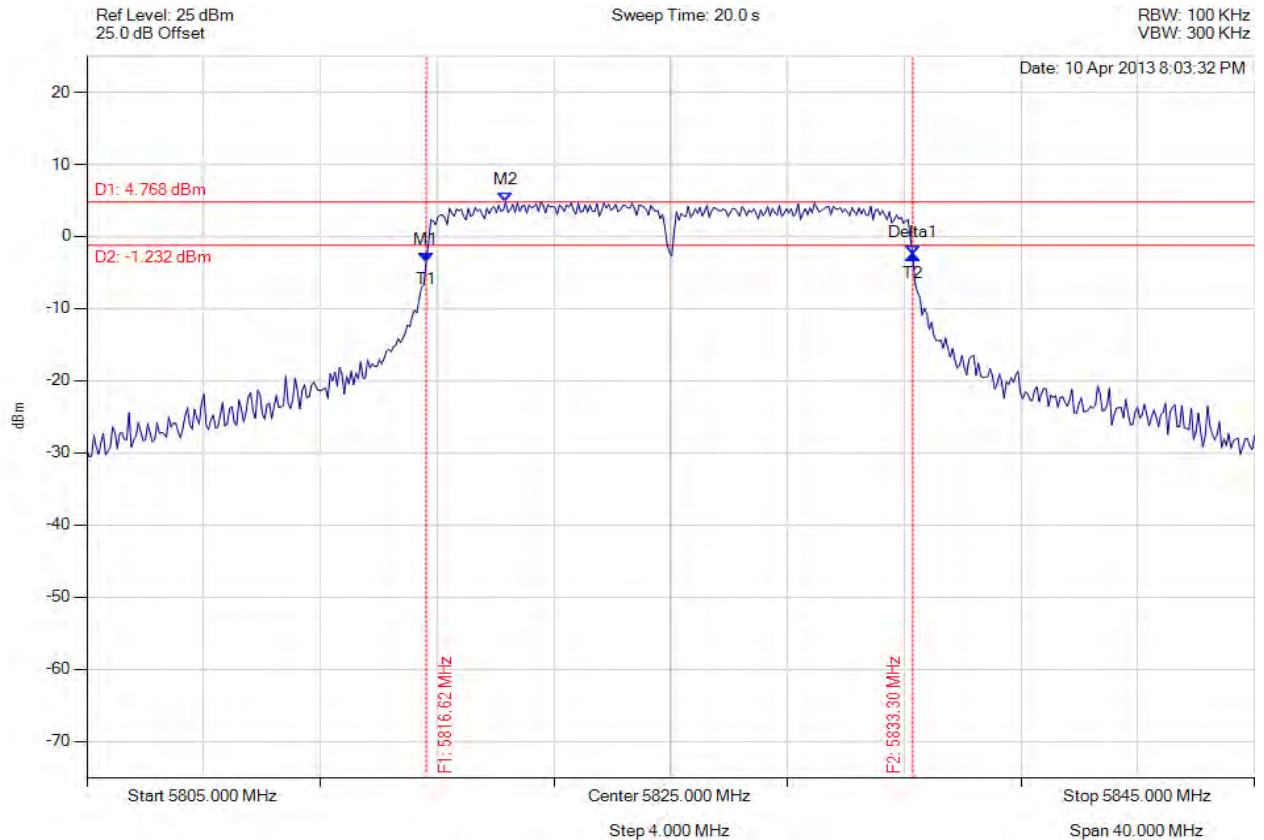
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5816.623 MHz : -2.889 dBm M2 : 5827.204 MHz : 4.400 dBm Delta1 : 16.673 MHz : 0.089 dB T1 : 5815.661 MHz : -10.652 dBm T2 : 5834.178 MHz : -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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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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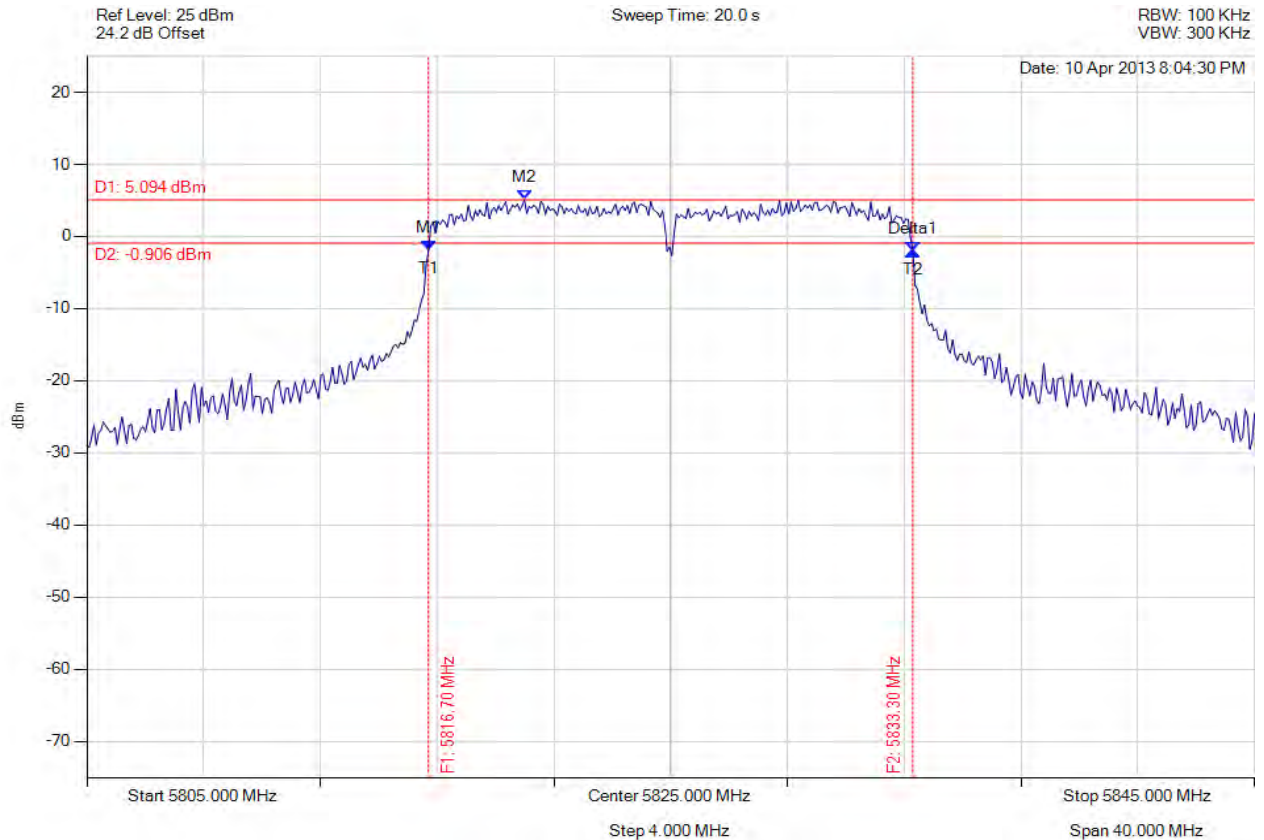


Title: APIN0114, APIN0115 802.11a/b/g/n
To: FCC 47 CFR Part 15.247 & IC RSS-210
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6 dB & 99% BANDWIDTH

Variant: 802.11a, 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 |

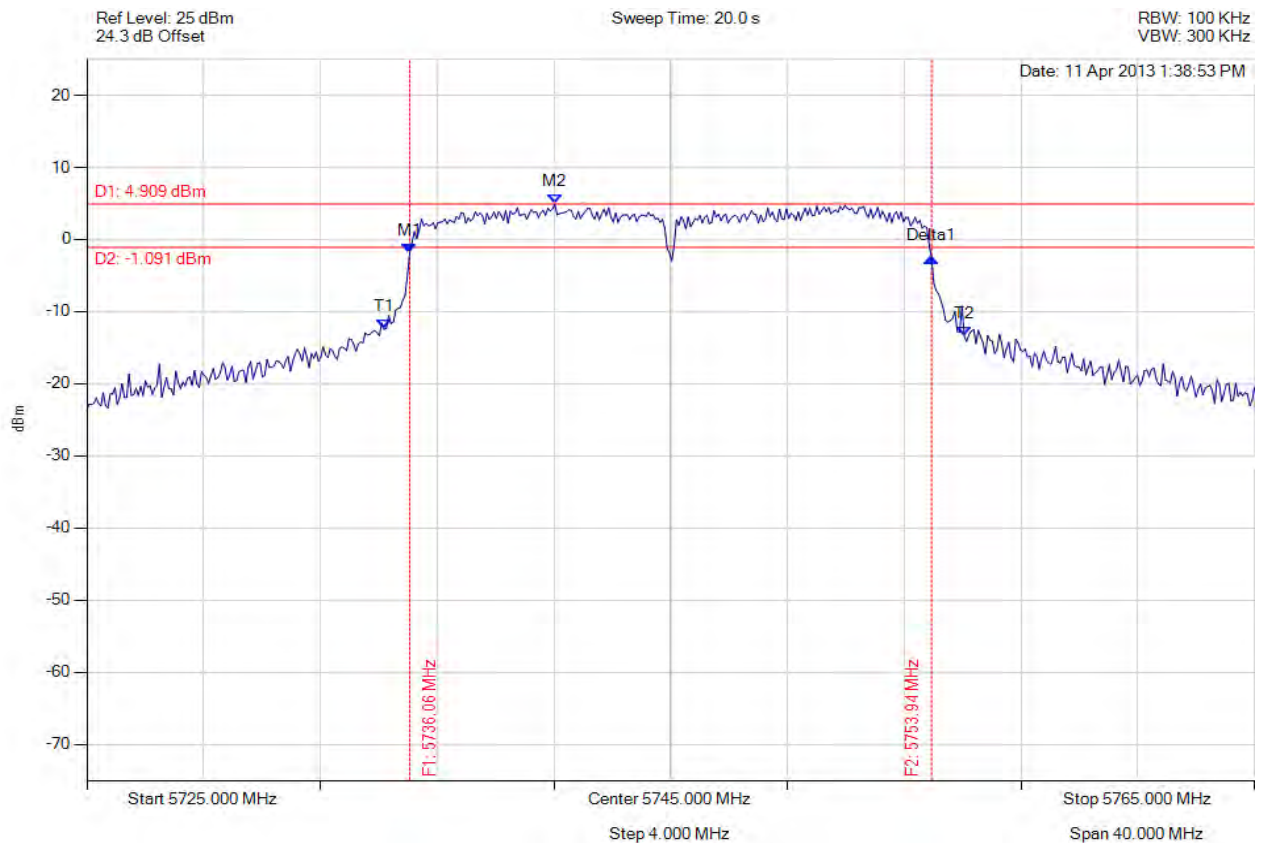
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6 dB & 99% BANDWIDTH

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



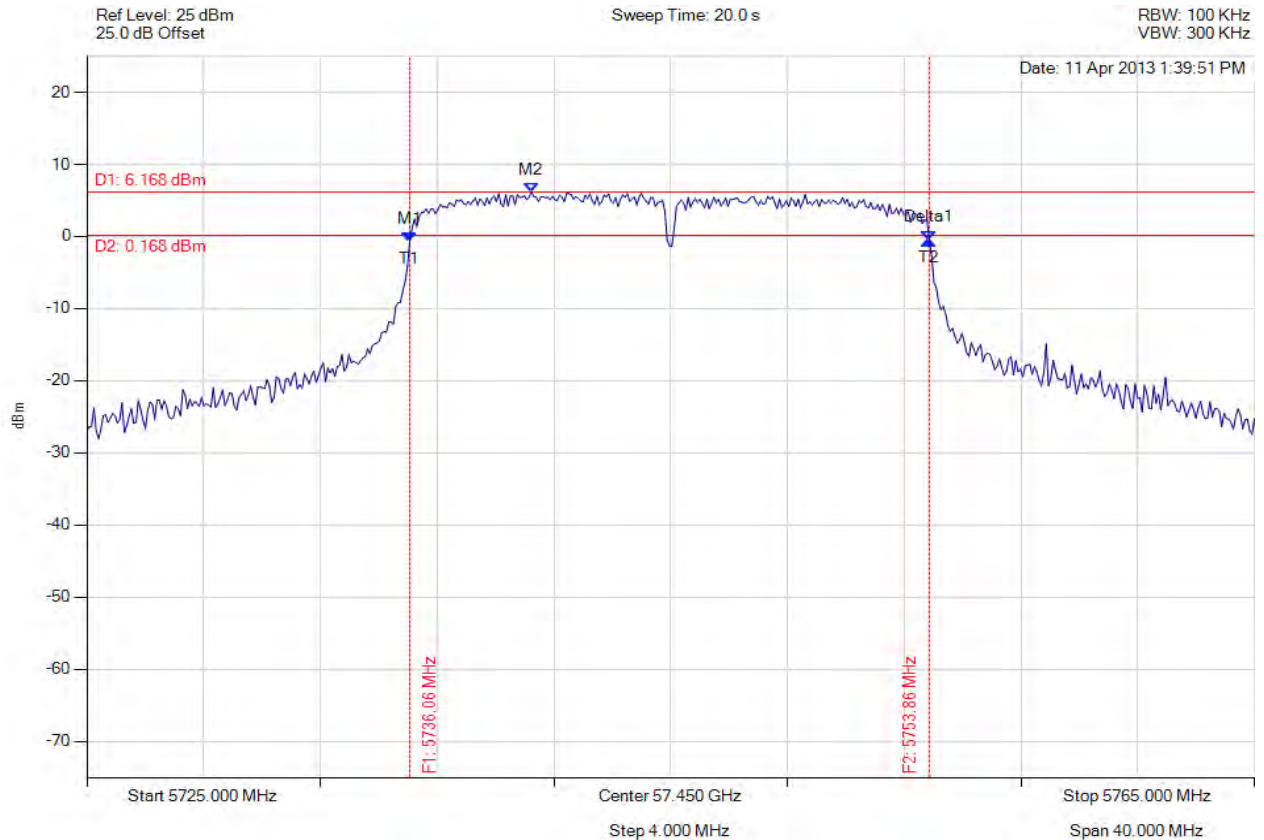
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.062 MHz : -1.801 dBm M2 : 5741.032 MHz : 4.909 dBm Delta1 : 17.876 MHz : -0.811 dB T1 : 5735.180 MHz : -12.425 dBm T2 : 5755.060 MHz : -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



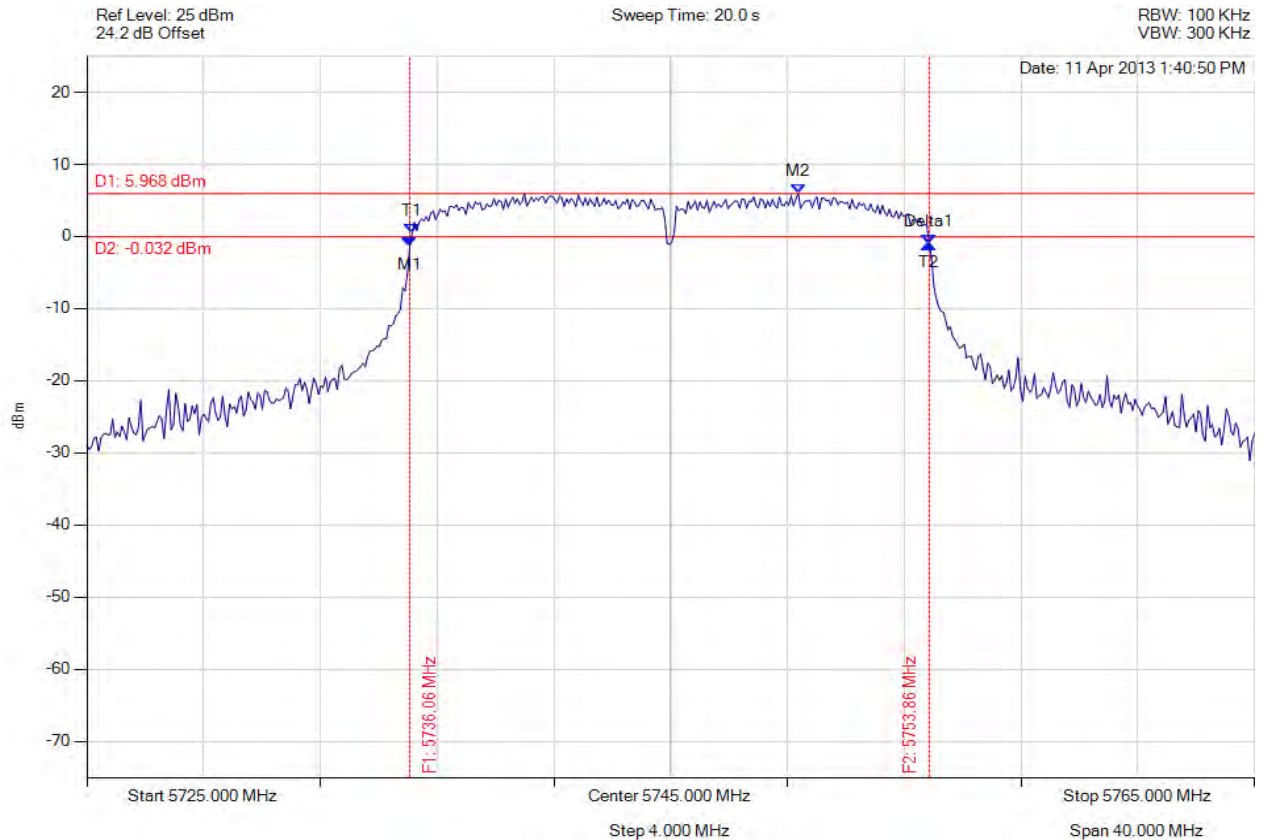
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.062 MHz : -0.631 dBm M2 : 5740.230 MHz : 6.168 dBm Delta1 : 17.796 MHz : 0.181 dB T1 : 5736.062 MHz : -0.631 dBm T2 : 5753.858 MHz : -0.450 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



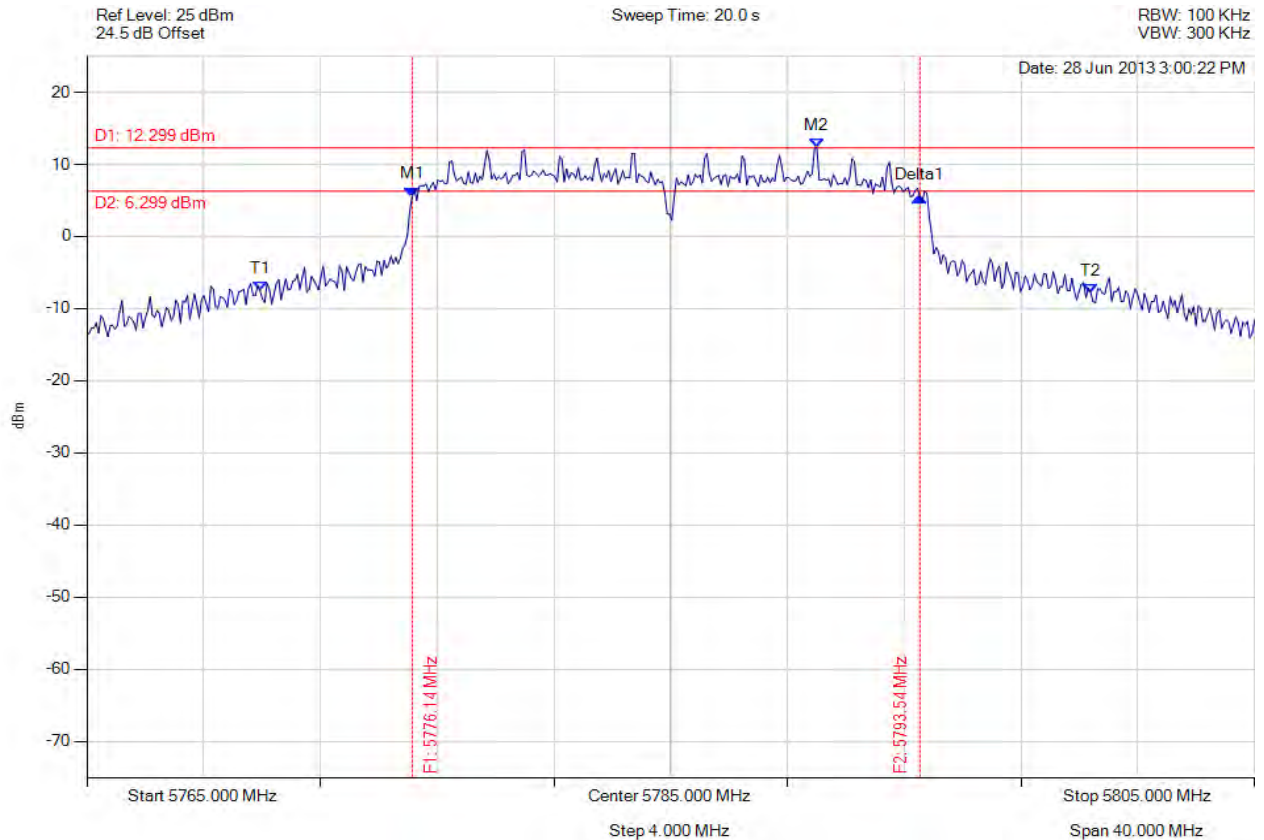
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.062 MHz : -1.351 dBm M2 : 5749.369 MHz : 5.968 dBm Delta1 : 17.796 MHz : 0.317 dB T1 : 5736.142 MHz : 0.416 dBm T2 : 5753.858 MHz : -1.034 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



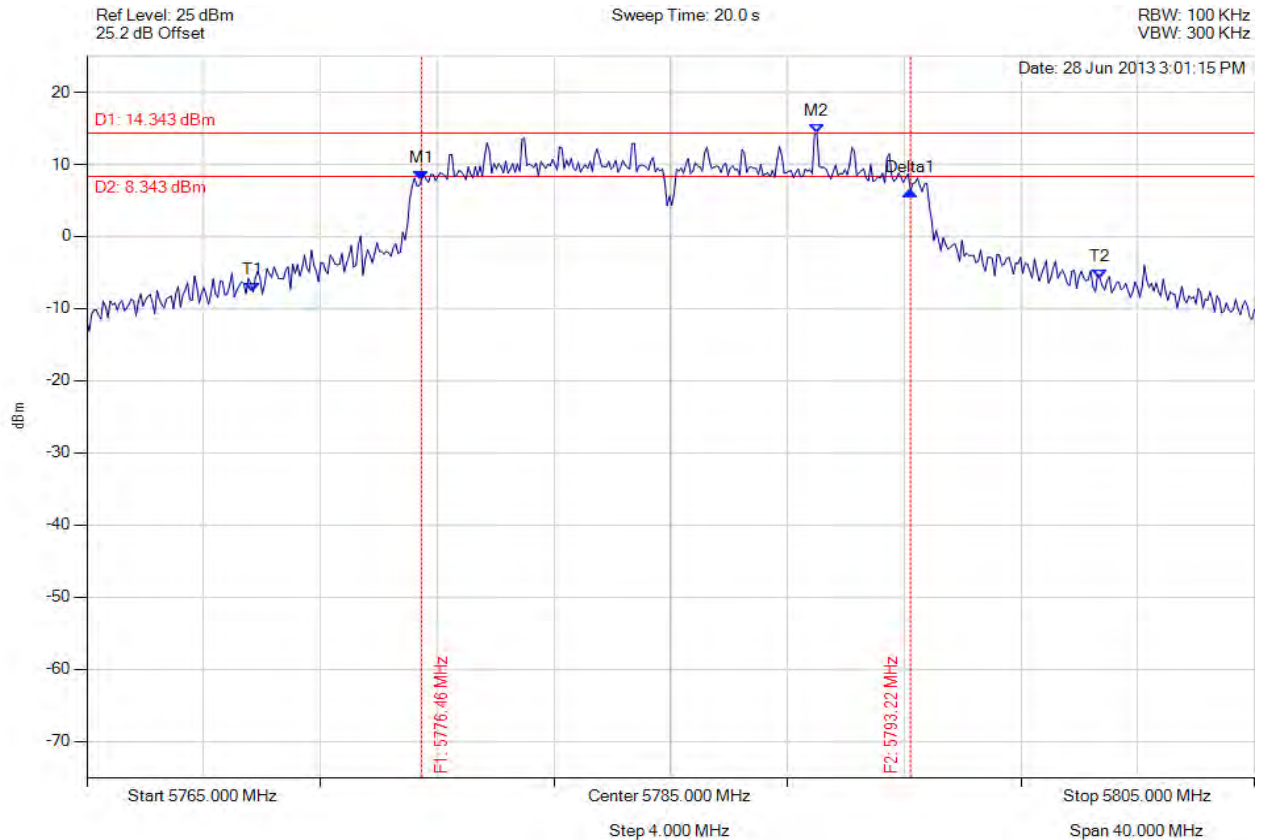
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5776.142 MHz : 5.555 dBm M2 : 5790.010 MHz : 12.299 dBm Delta1 : 17.395 MHz : -0.077 dB T1 : 5770.932 MHz : -7.511 dBm T2 : 5799.389 MHz : -7.800 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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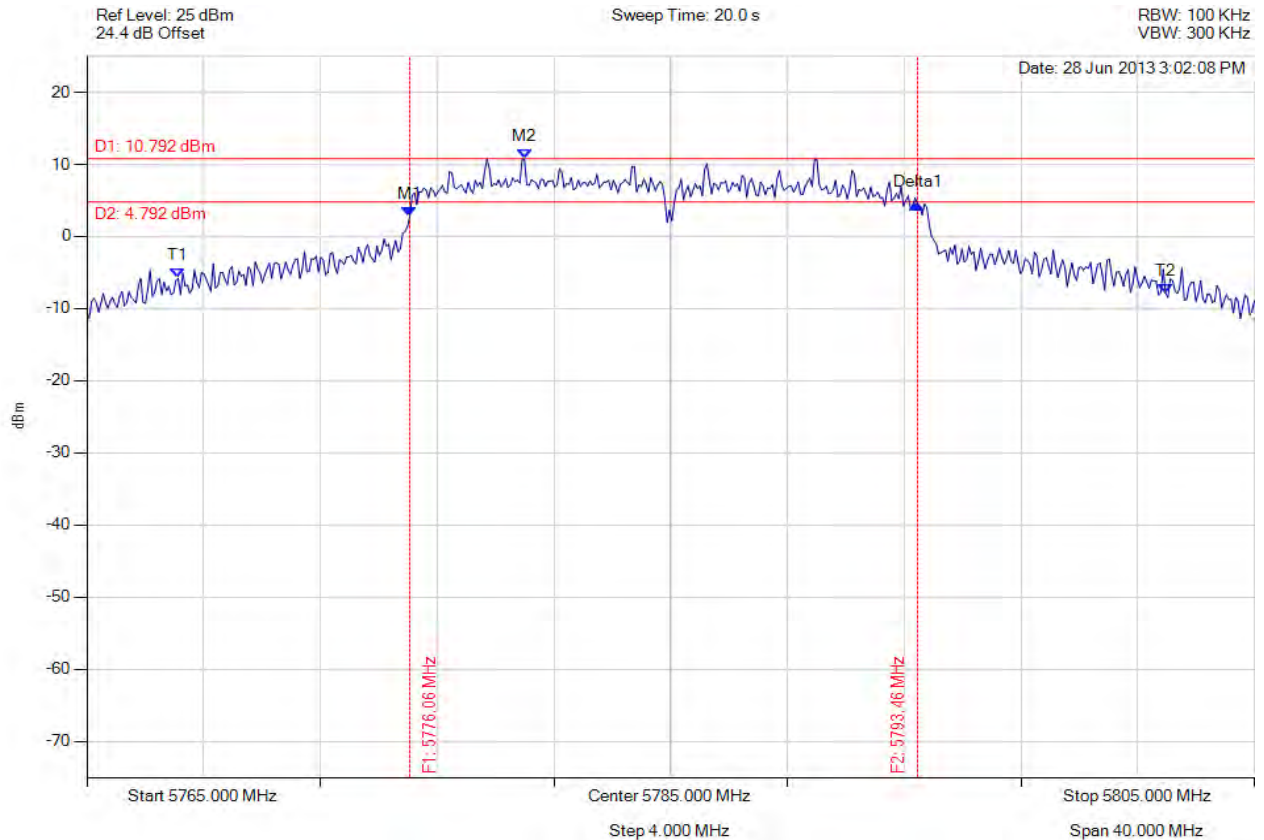


Title: APIN0114, APIN0115 802.11a/b/g/n
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6 dB & 99% BANDWIDTH

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



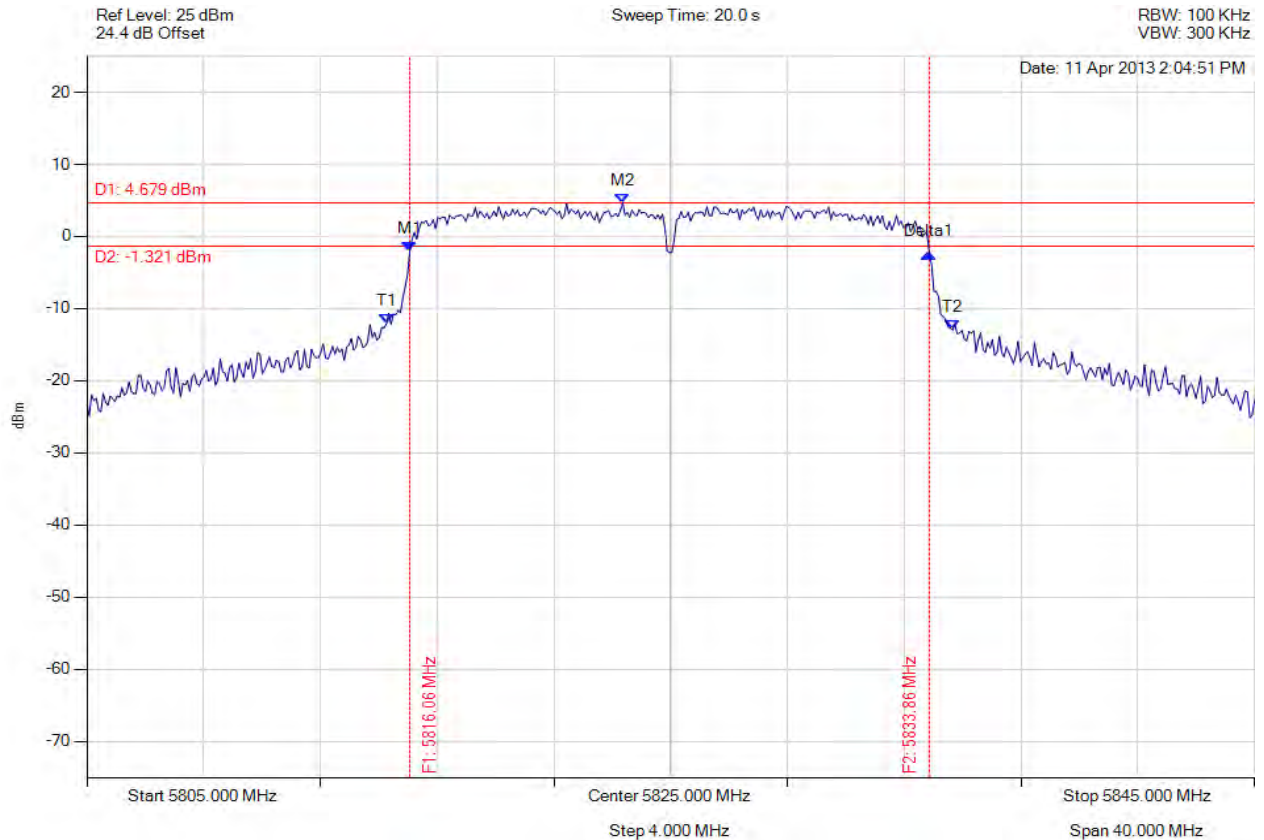
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5776.062 MHz : 2.753 dBm M2 : 5779.990 MHz : 10.792 dBm Delta1 : 17.395 MHz : 1.786 dB T1 : 5768.126 MHz : -5.775 dBm T2 : 5801.954 MHz : -7.859 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



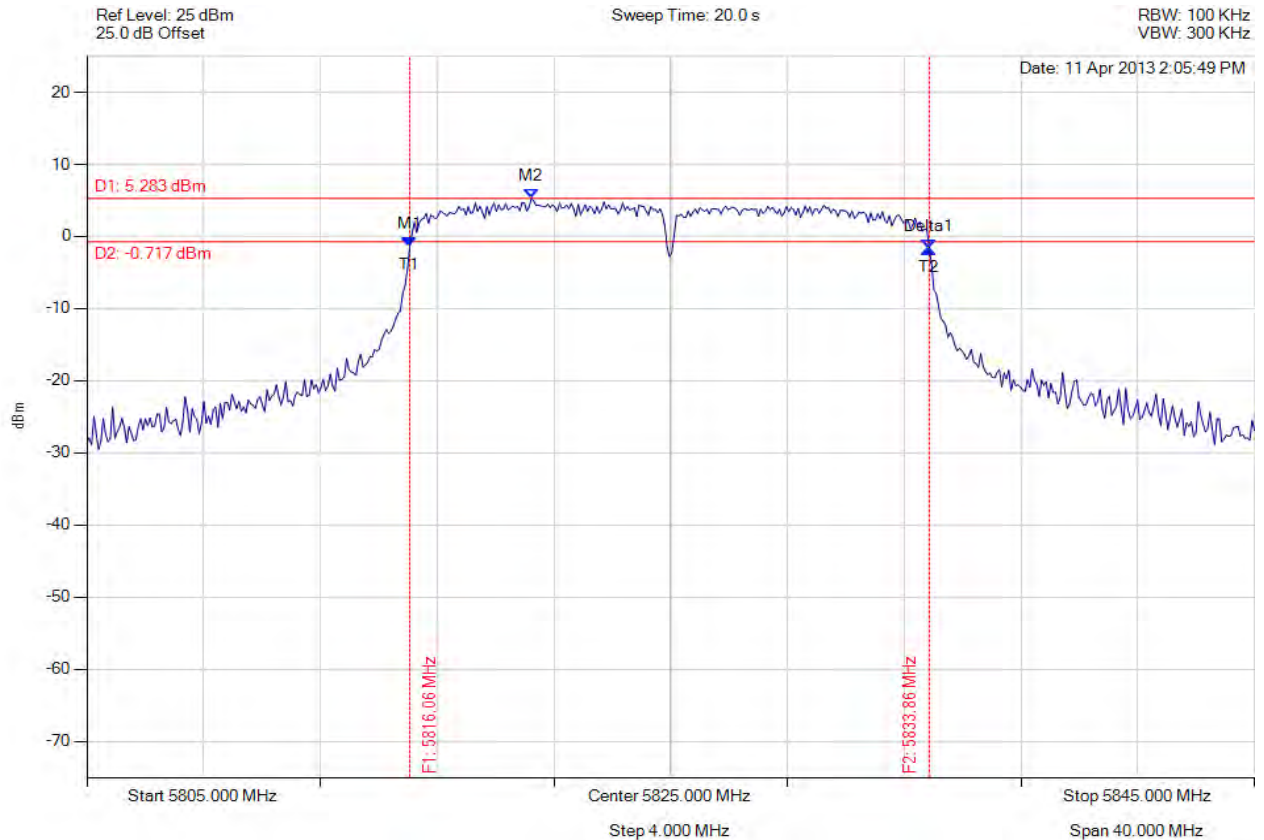
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5816.062 MHz : -2.081 dBm M2 : 5823.357 MHz : 4.679 dBm Delta1 : 17.796 MHz : -0.268 dB T1 : 5815.261 MHz : -12.108 dBm T2 : 5834.659 MHz : -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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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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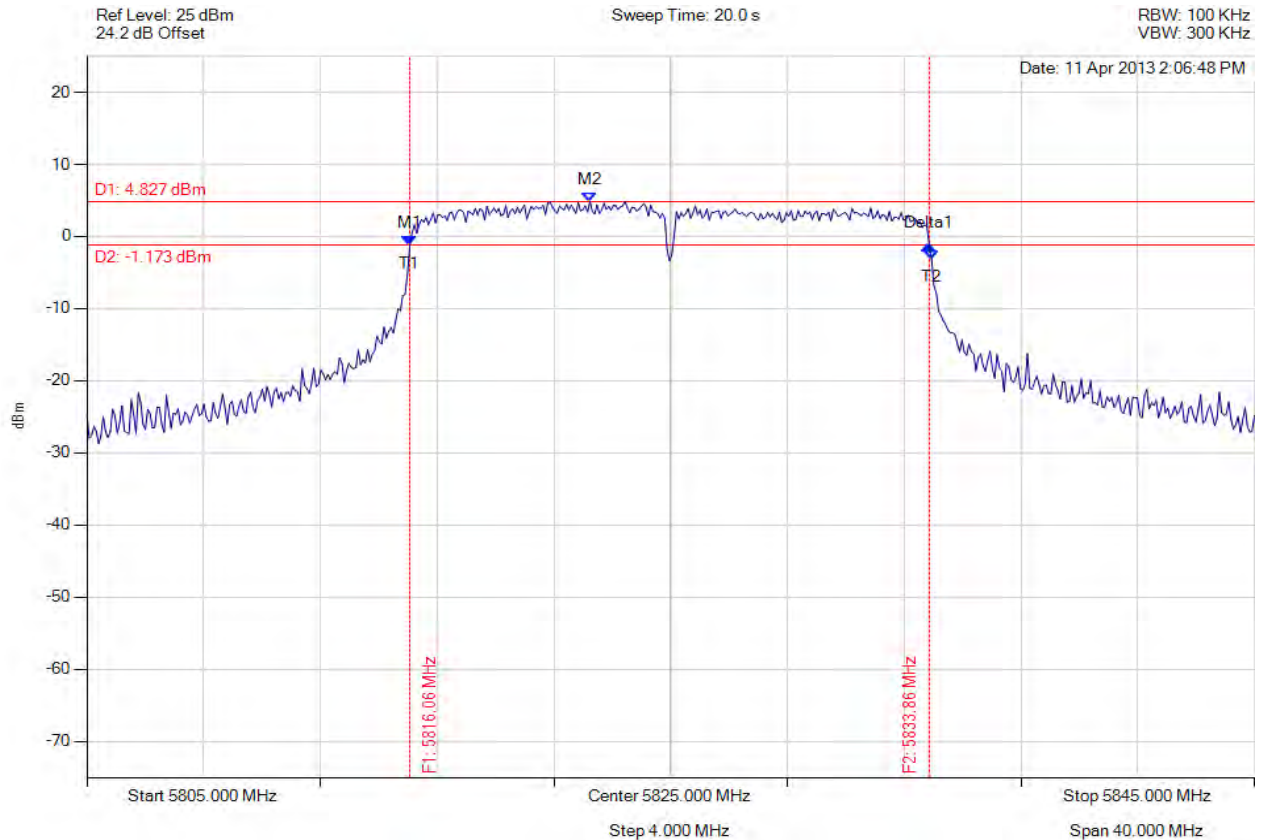


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6 dB & 99% BANDWIDTH

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



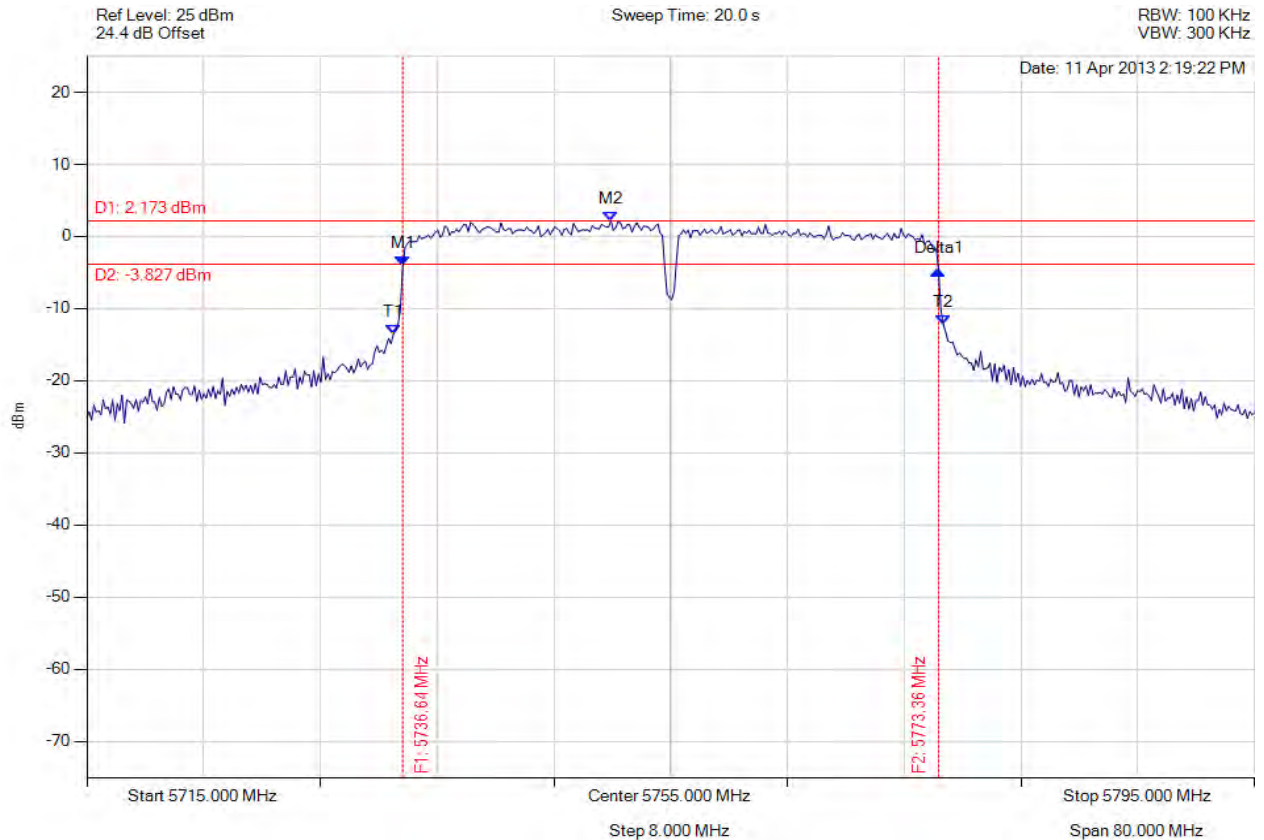
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|---|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5816.062 MHz : -1.268 dBm M2 : 5822.234 MHz : 4.827 dBm Delta1 : 17.796 MHz : 0.053 dB T1 : 5816.062 MHz : -1.268 dBm T2 : 5833.938 MHz : -3.137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

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6 dB & 99% BANDWIDTH

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



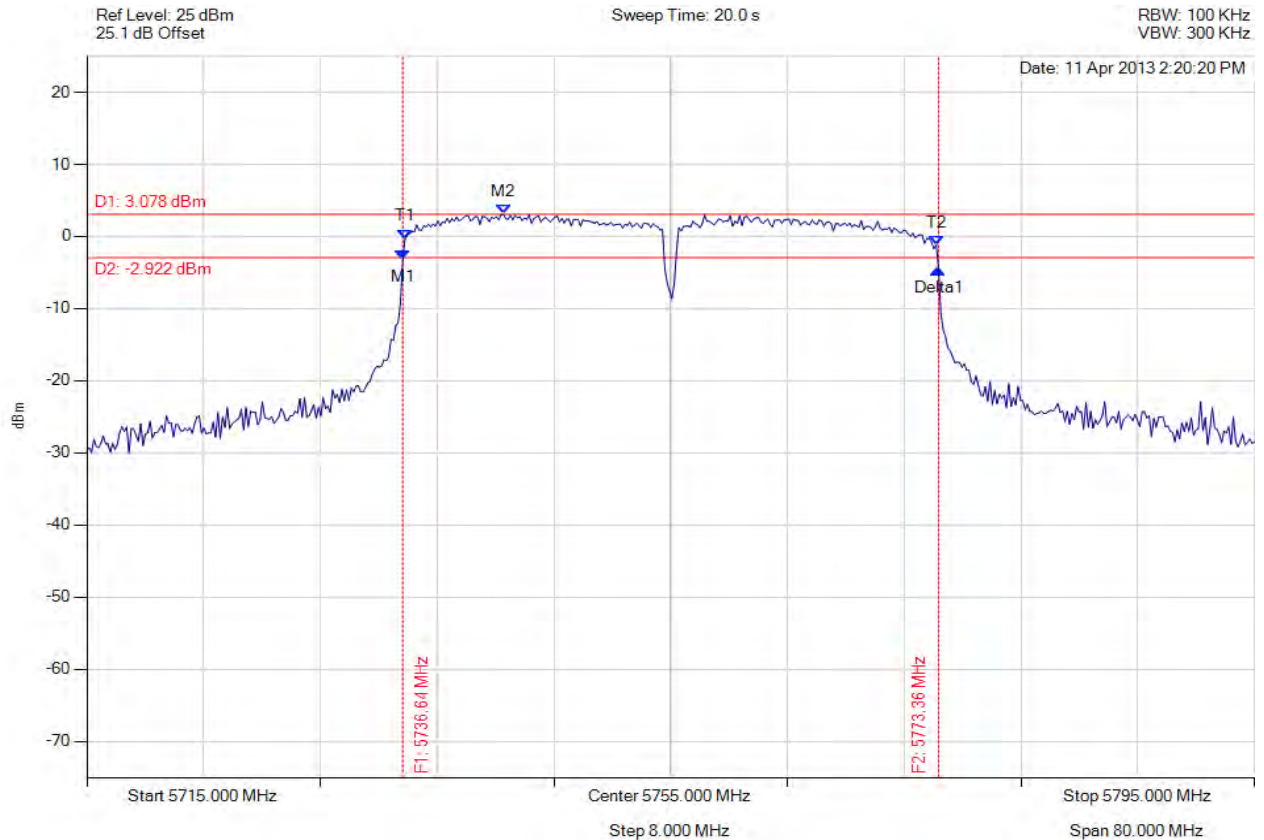
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.643 MHz : -4.097 dBm M2 : 5750.912 MHz : 2.173 dBm Delta1 : 36.713 MHz : -0.651 dB T1 : 5736.002 MHz : -13.507 dBm T2 : 5773.677 MHz : -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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6 dB & 99% BANDWIDTH

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



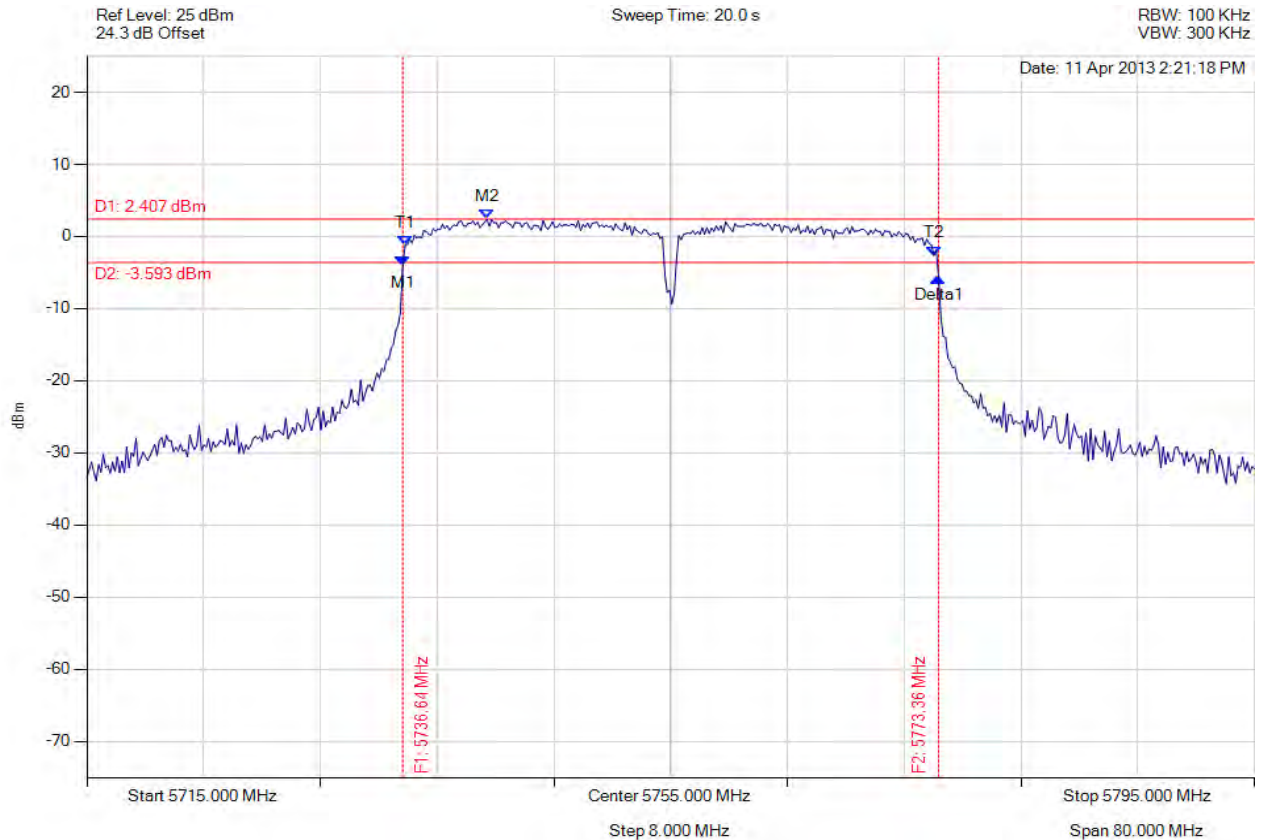
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.643 MHz : -3.137 dBm M2 : 5743.537 MHz : 3.078 dBm Delta1 : 36.713 MHz : -1.446 dB T1 : 5736.804 MHz : -0.290 dBm T2 : 5773.196 MHz : -1.148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

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6 dB & 99% BANDWIDTH

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



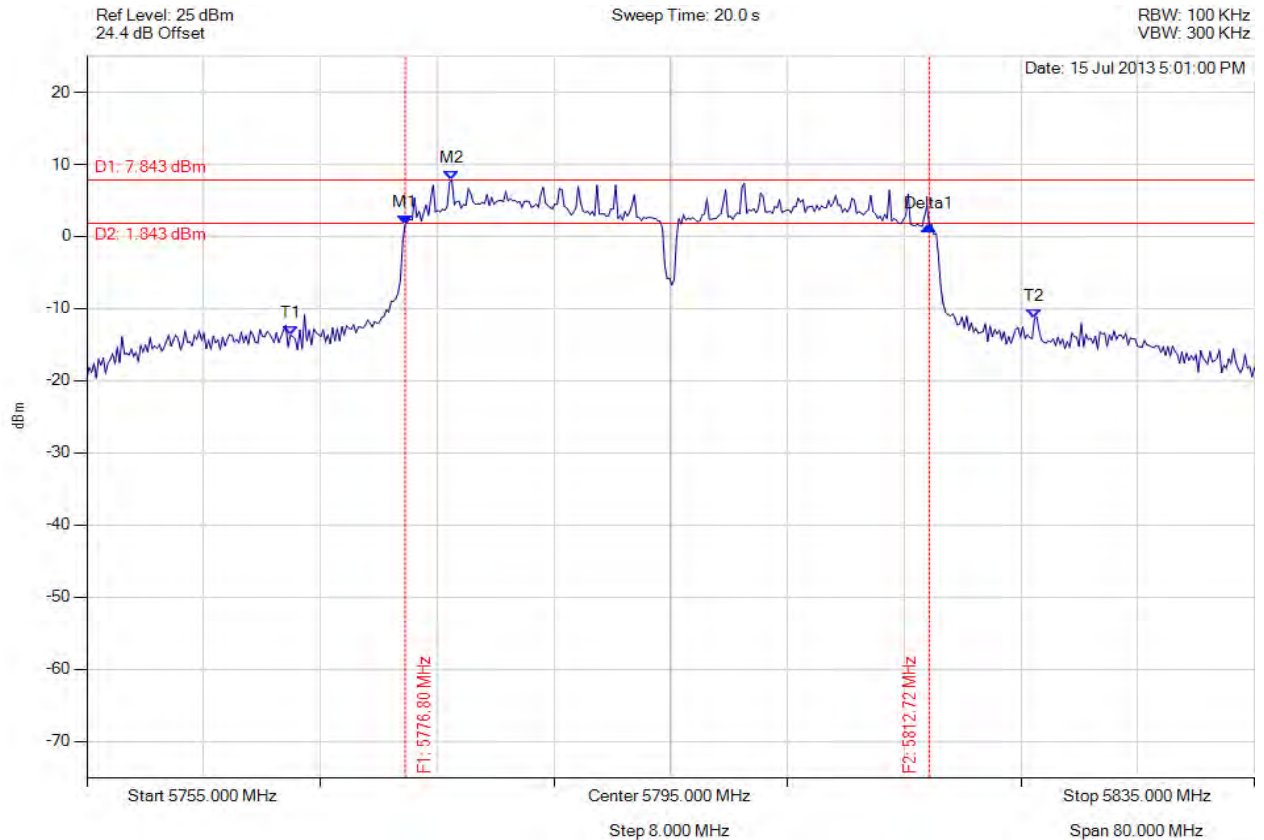
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5736.643 MHz : -3.950 dBm M2 : 5742.415 MHz : 2.407 dBm Delta1 : 36.713 MHz : -1.676 dB T1 : 5736.804 MHz : -1.248 dBm T2 : 5773.036 MHz : -2.624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

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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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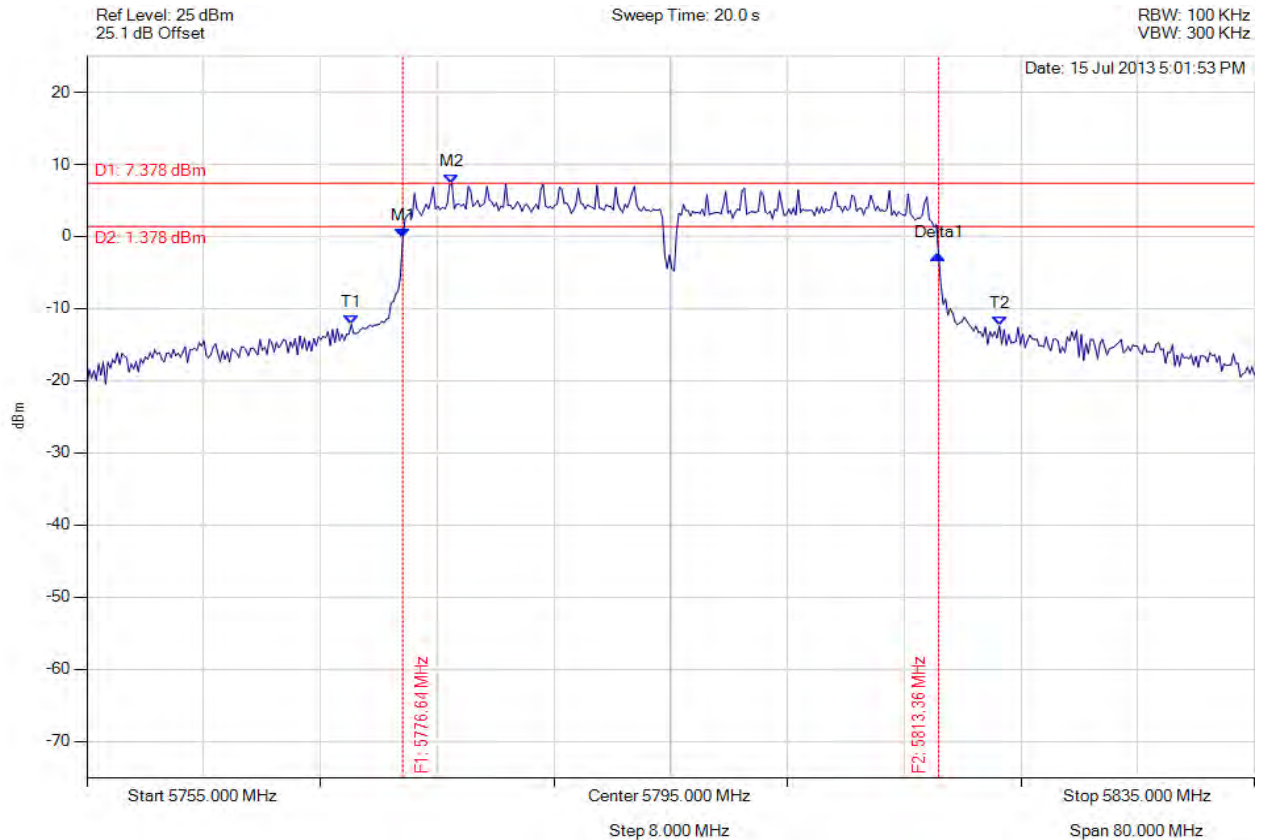


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6 dB & 99% BANDWIDTH

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



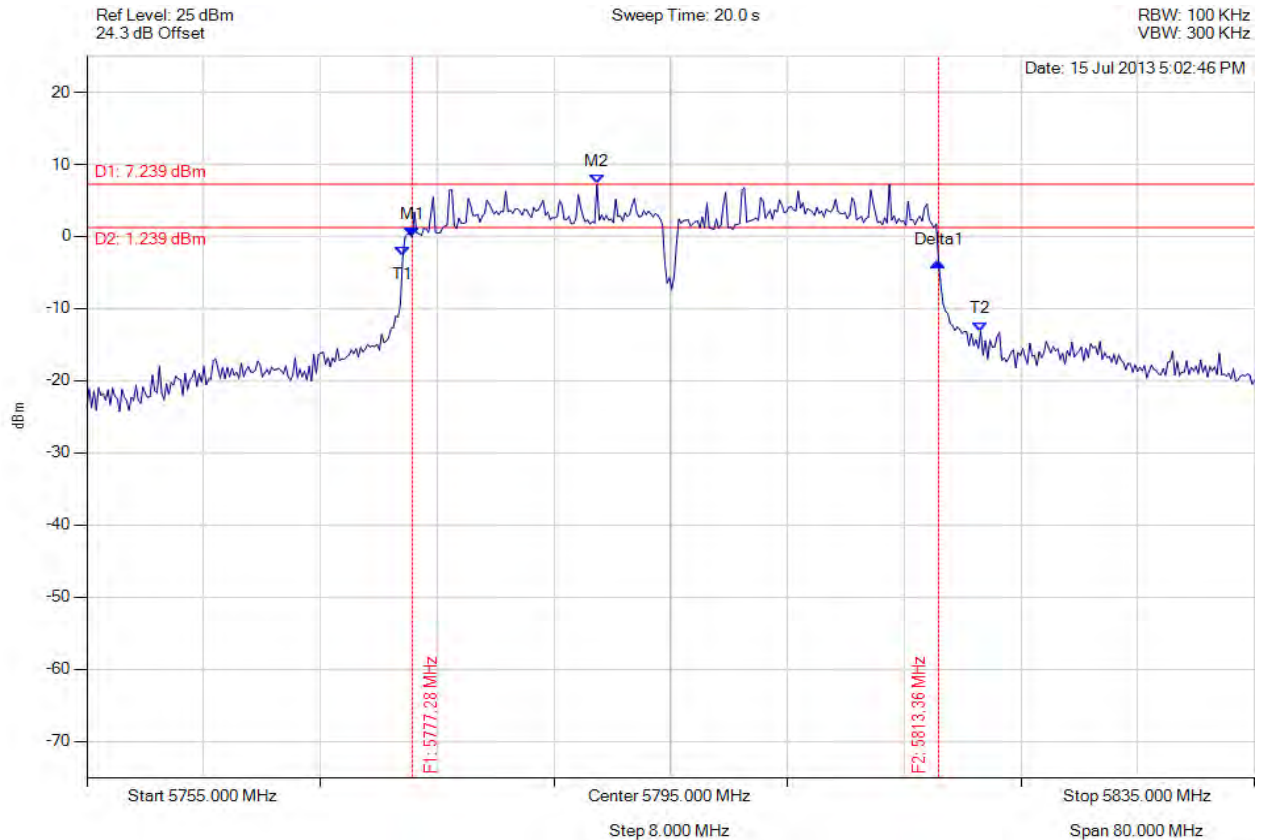
| Analyser Setup | Marker : Frequency : Amplitude | Test Results |
|---|--|--|
| Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW | M1 : 5776.643 MHz : -0.176 dBm M2 : 5780.010 MHz : 7.378 dBm Delta1 : 36.713 MHz : -2.325 dB T1 : 5773.116 MHz : -12.181 dBm T2 : 5817.525 MHz : -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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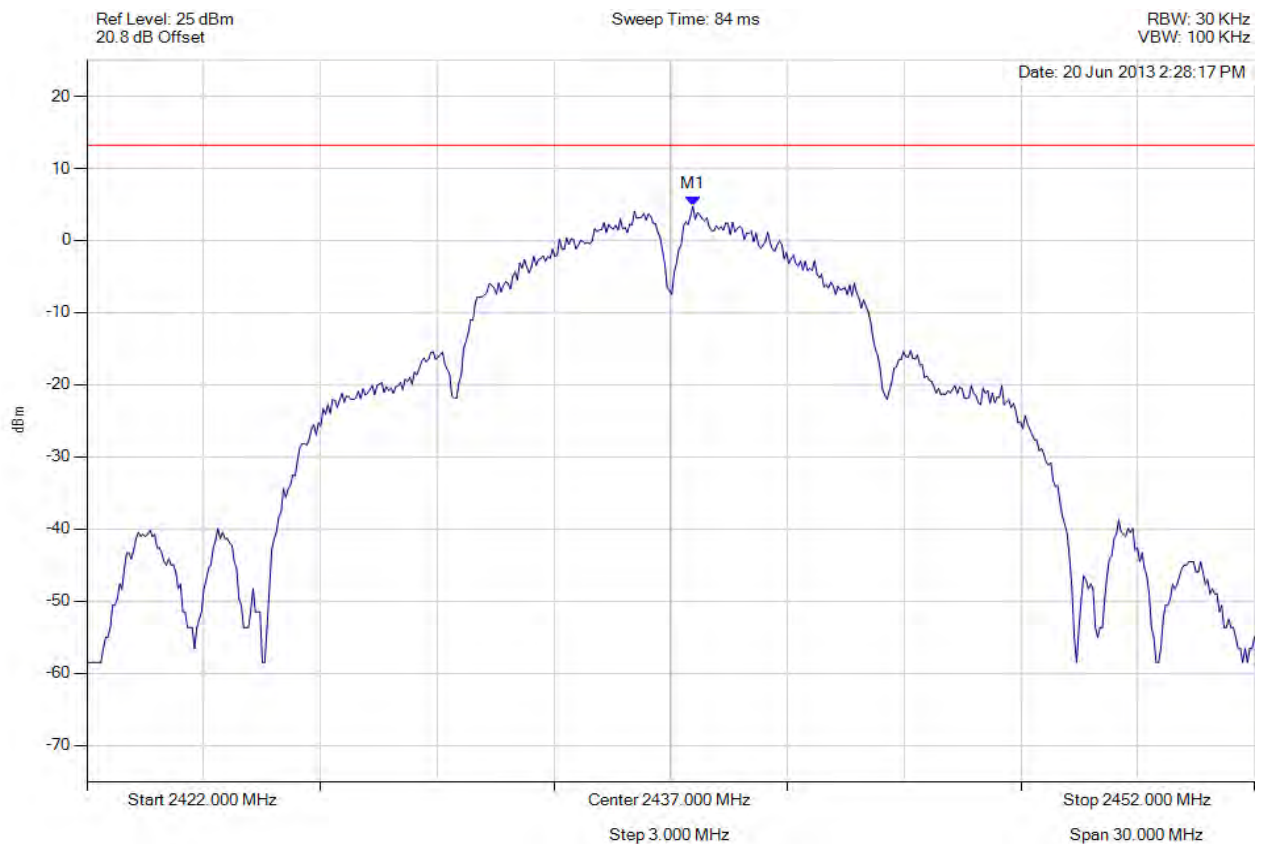
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A.1.2. Power Spectral Density



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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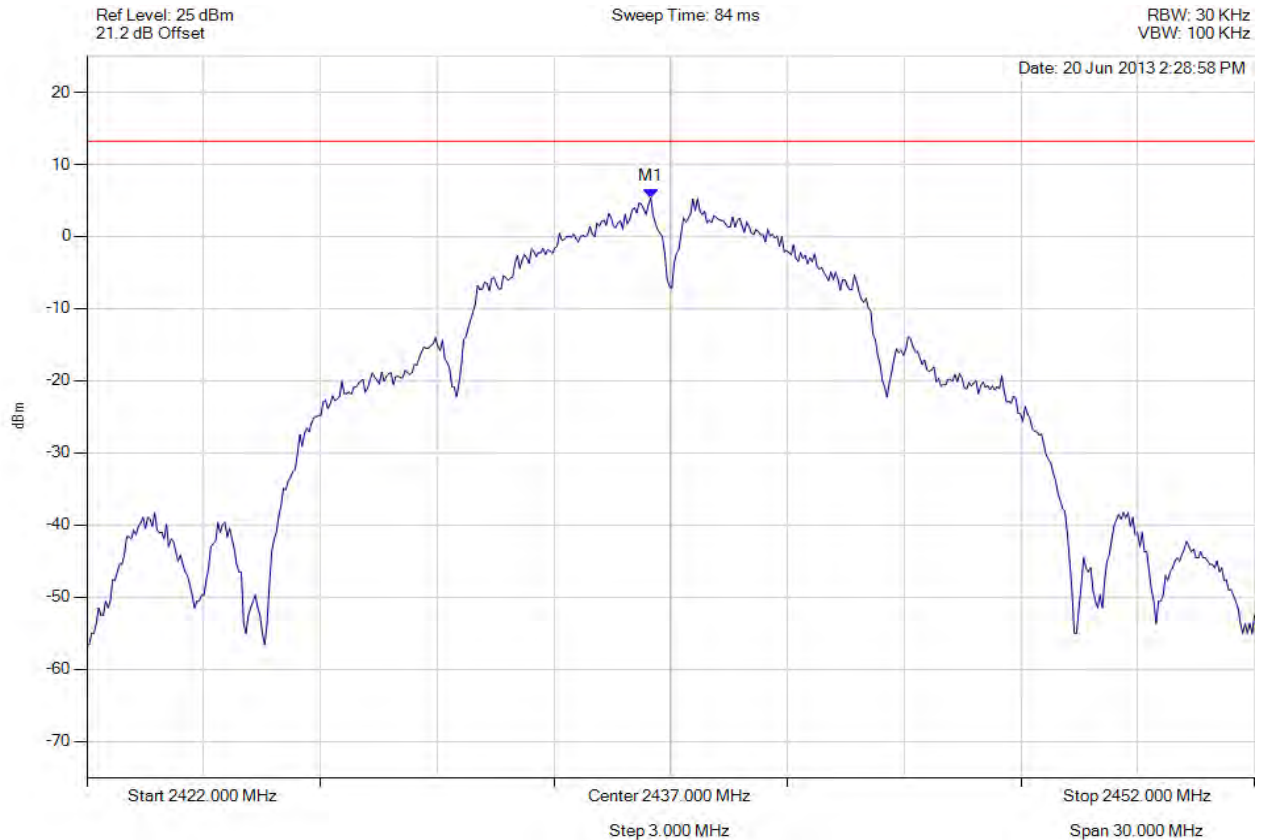


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POWER SPECTRAL DENSITY - AVERAGE

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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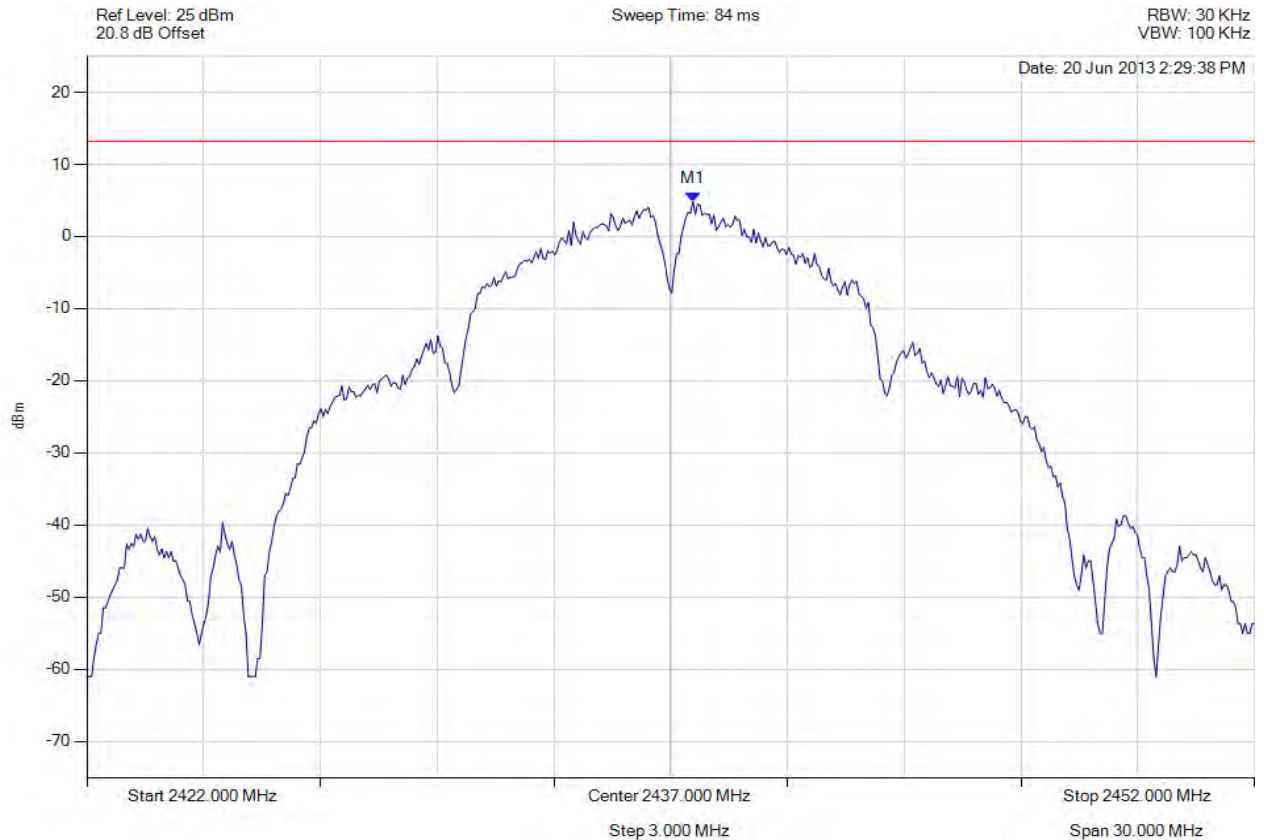


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POWER SPECTRAL DENSITY - AVERAGE

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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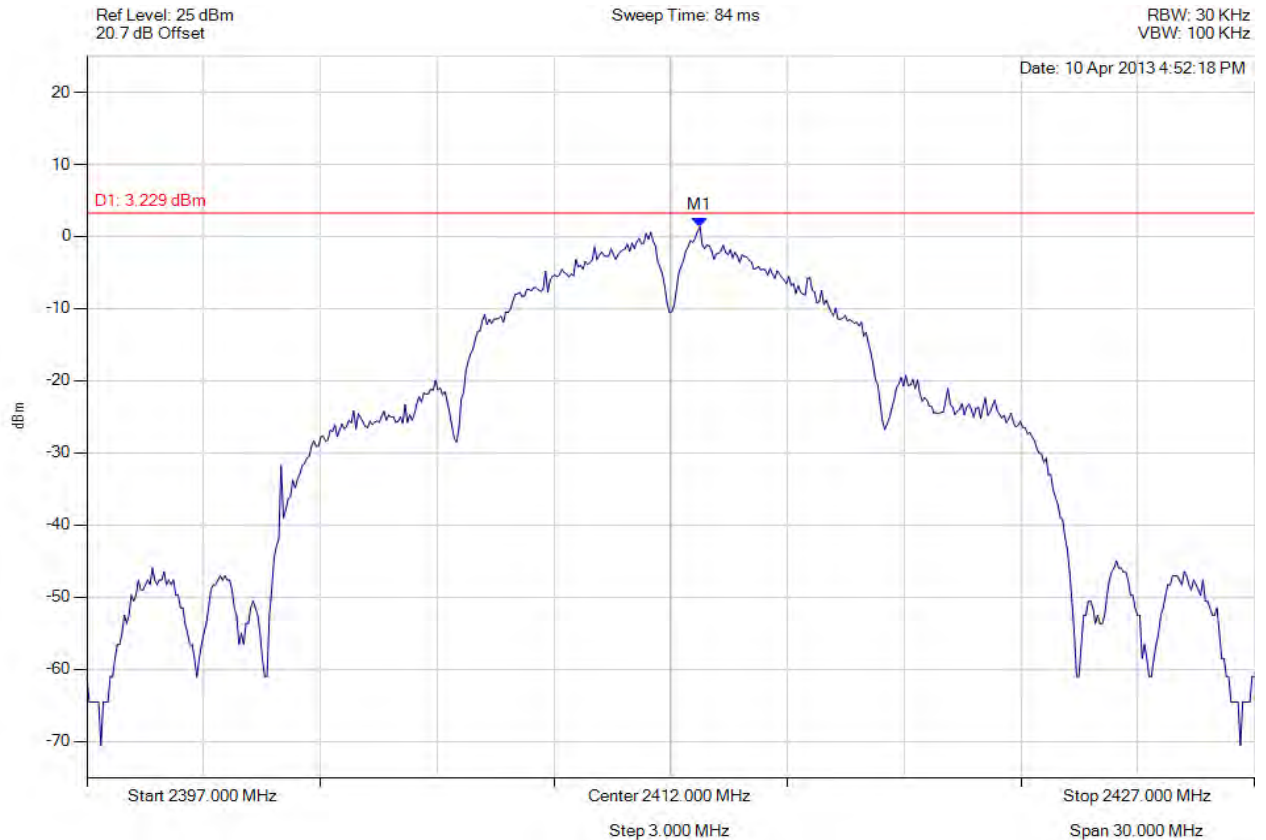


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POWER SPECTRAL DENSITY

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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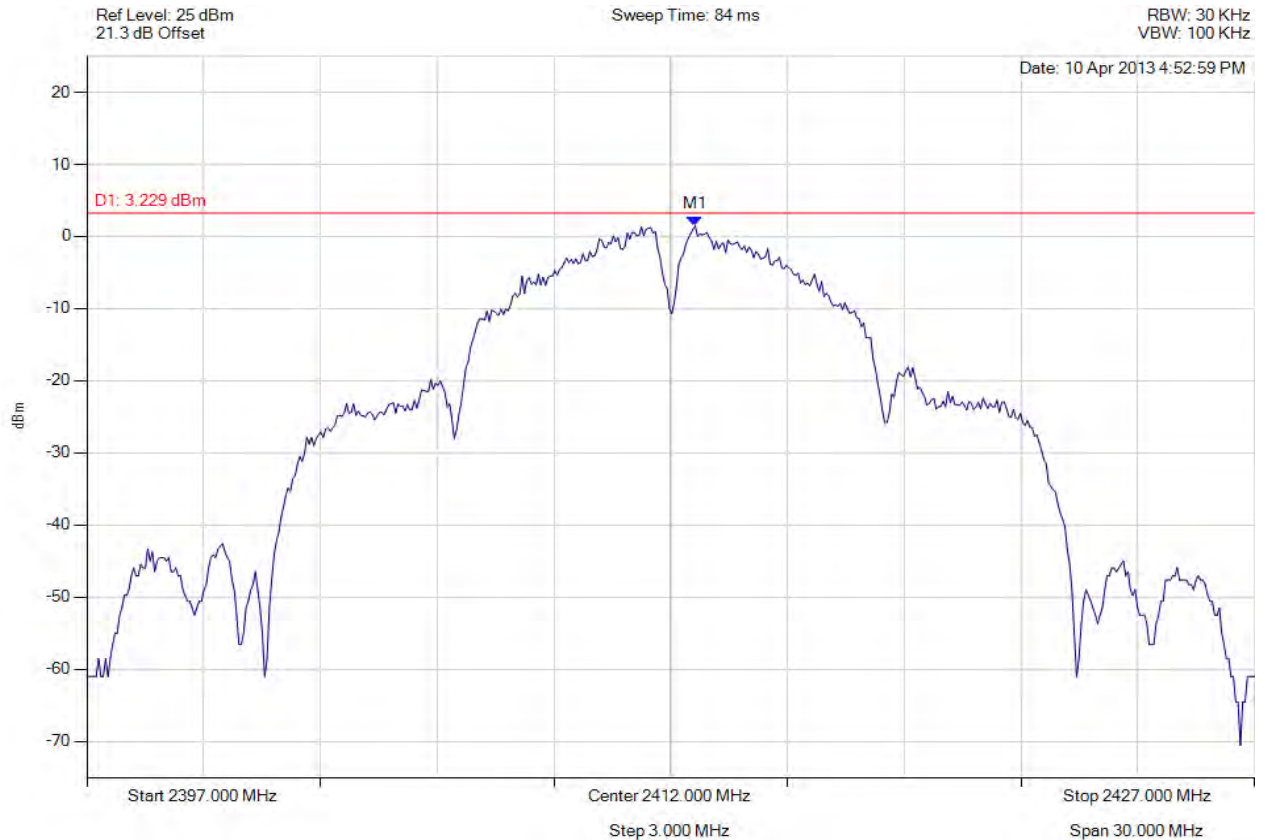


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POWER SPECTRAL DENSITY

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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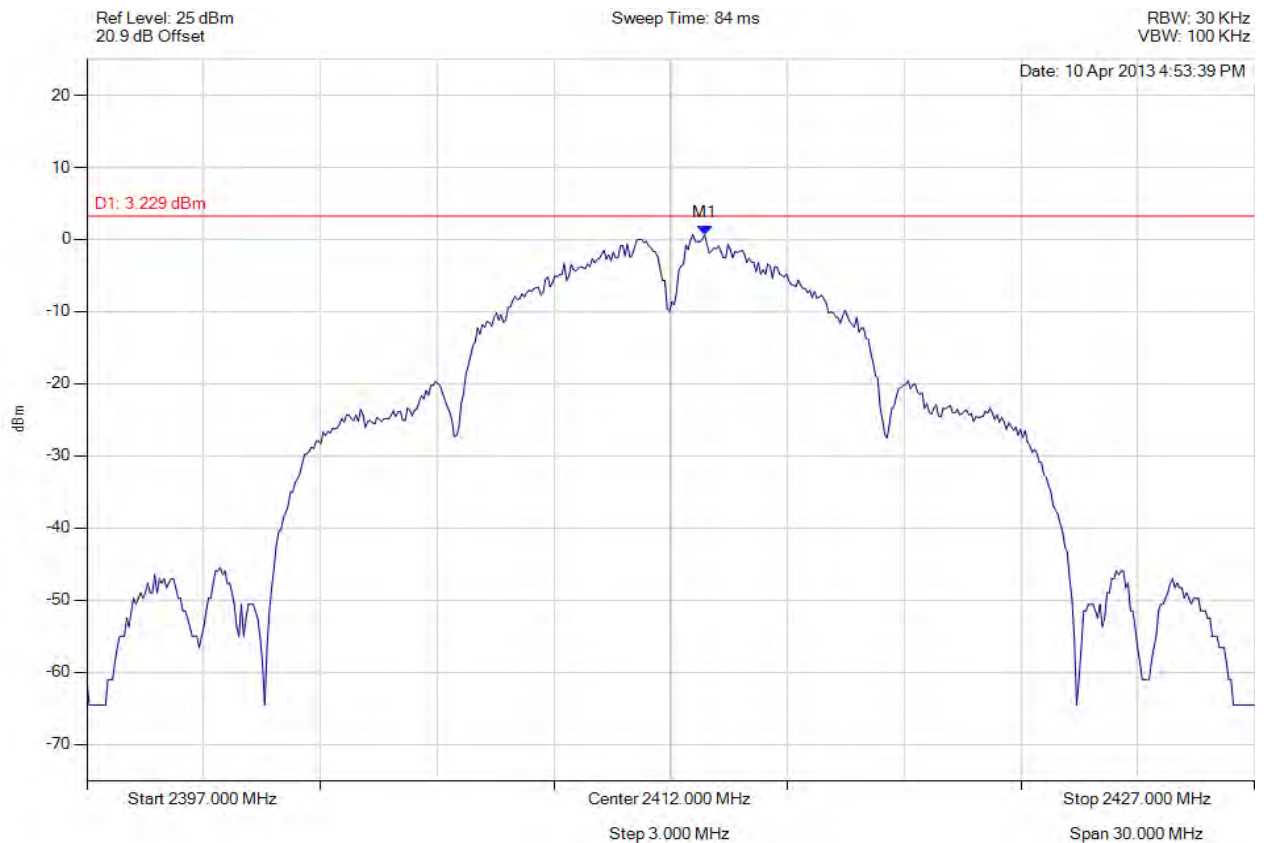


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POWER SPECTRAL DENSITY

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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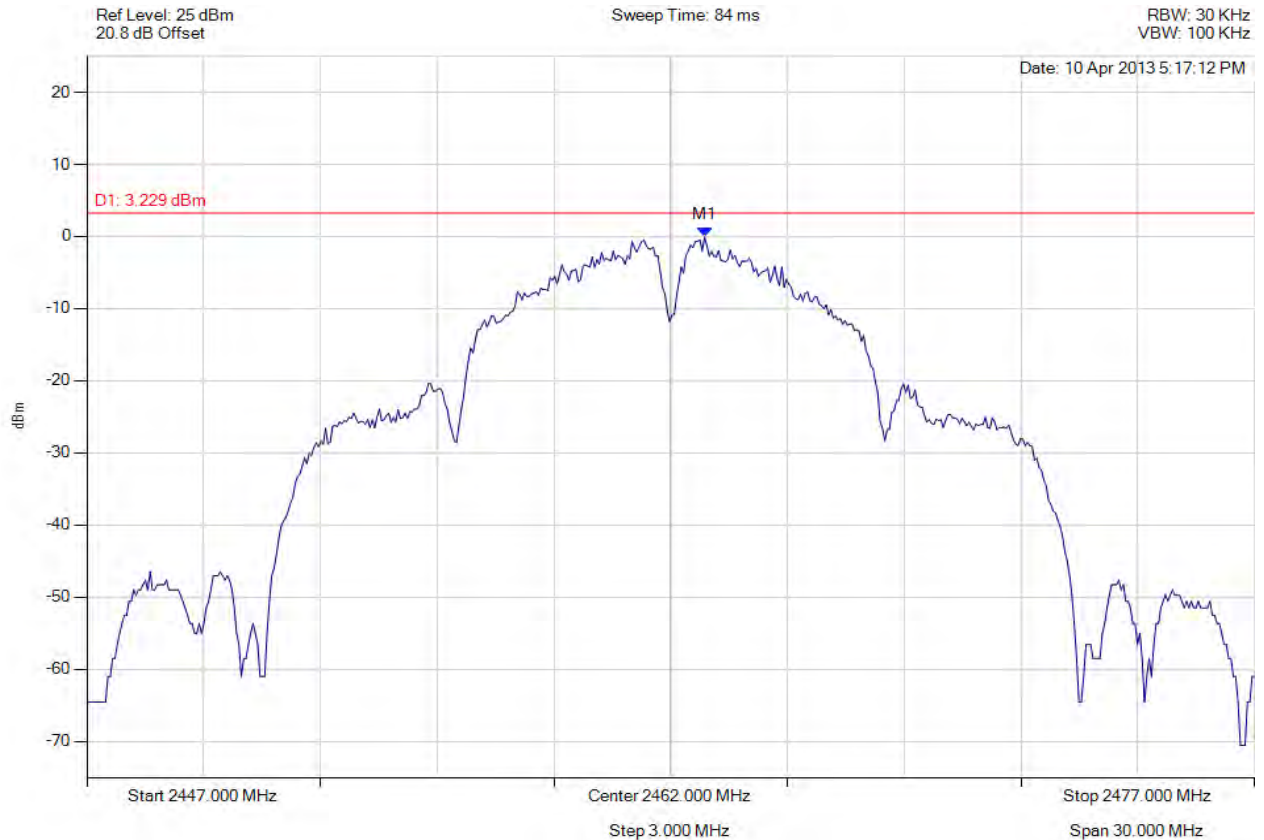


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POWER SPECTRAL DENSITY

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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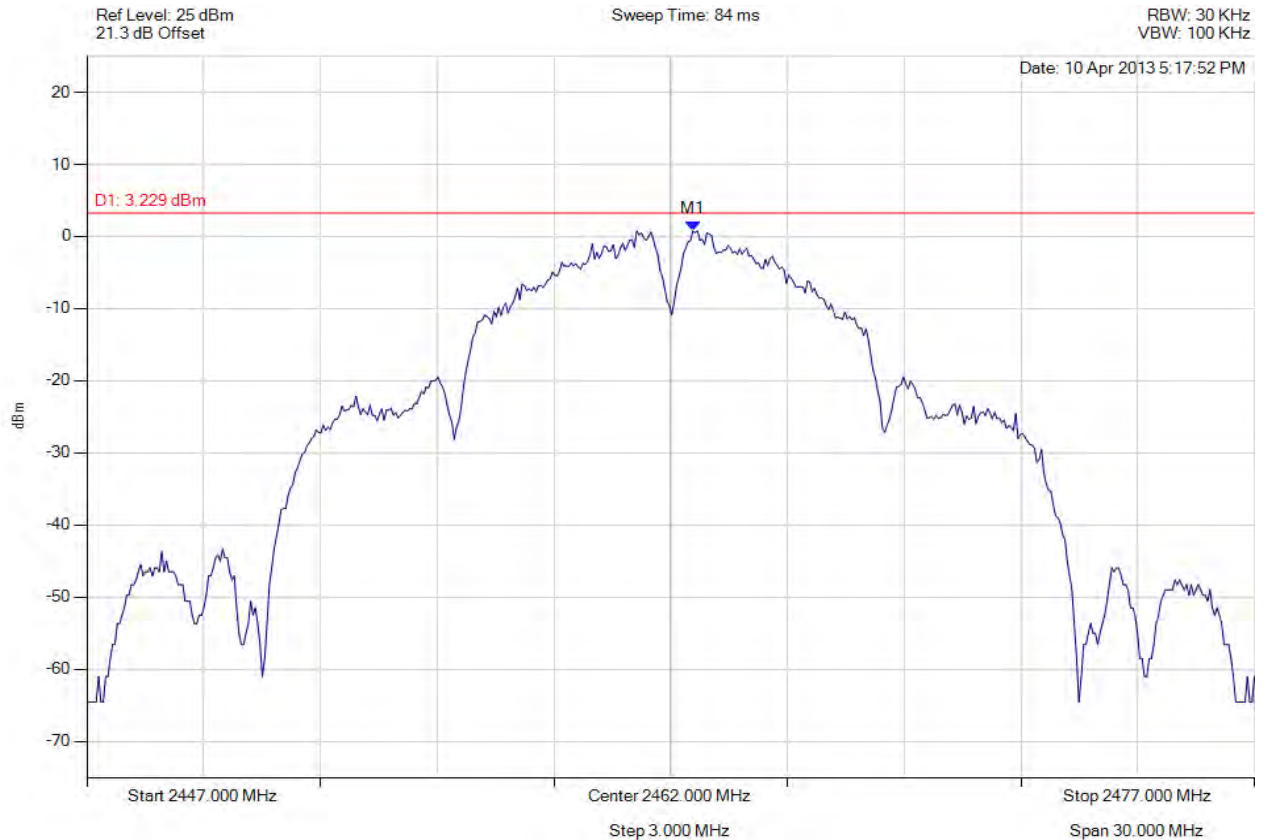


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POWER SPECTRAL DENSITY

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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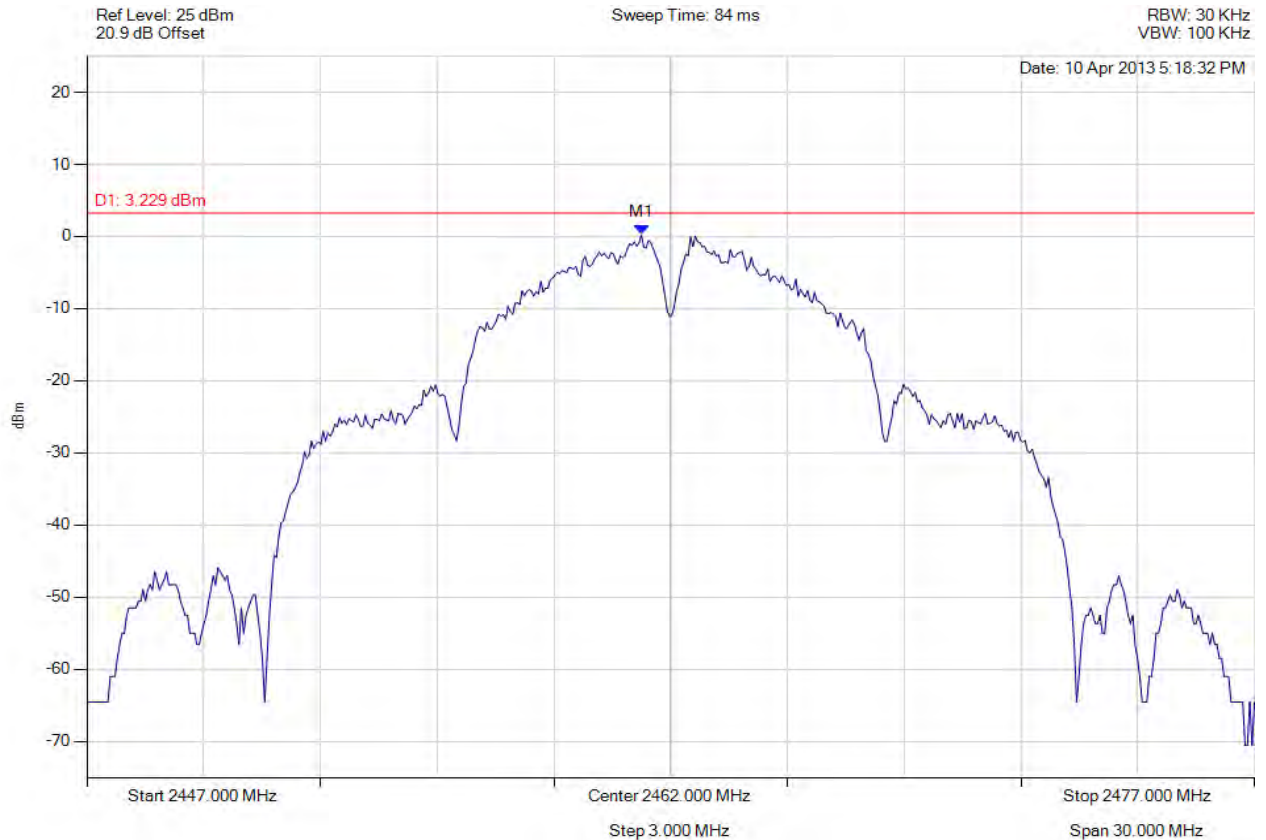


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POWER SPECTRAL DENSITY

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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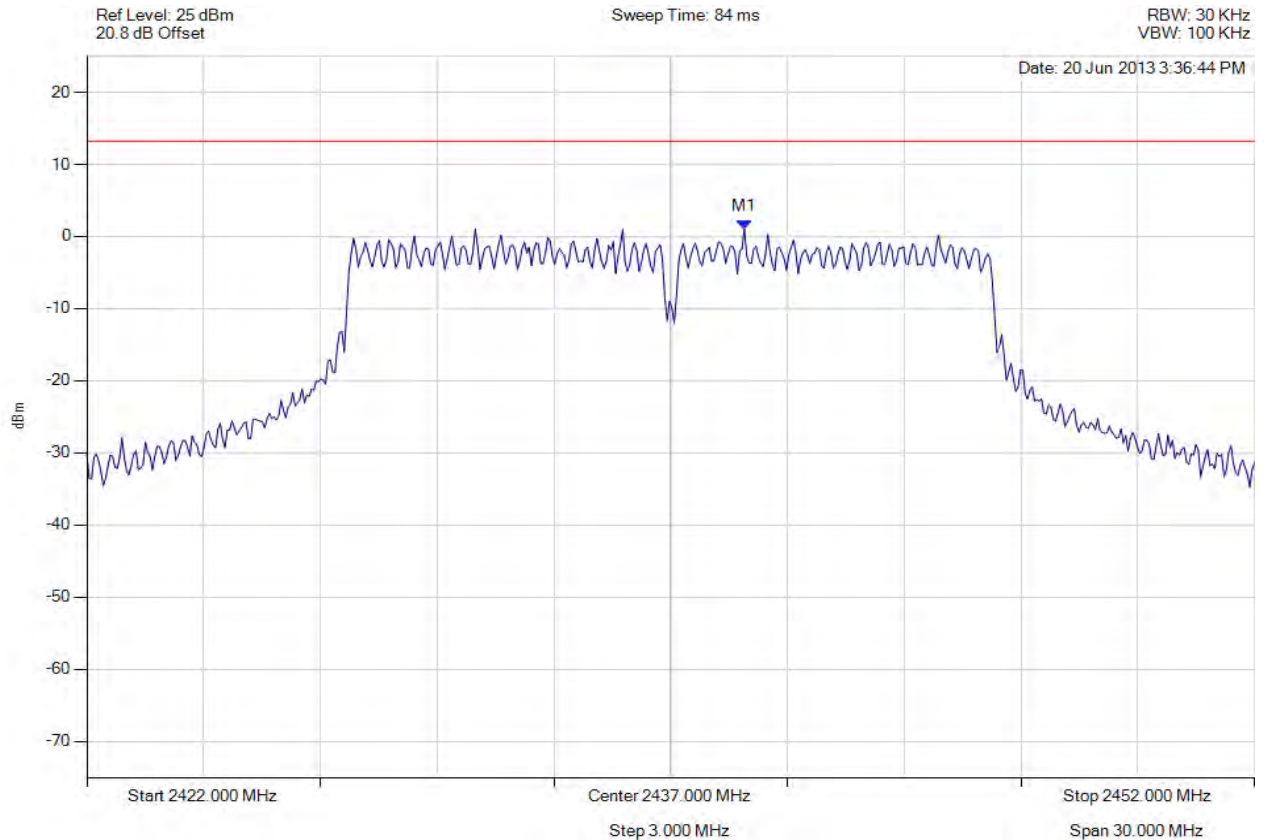


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POWER SPECTRAL DENSITY - AVERAGE

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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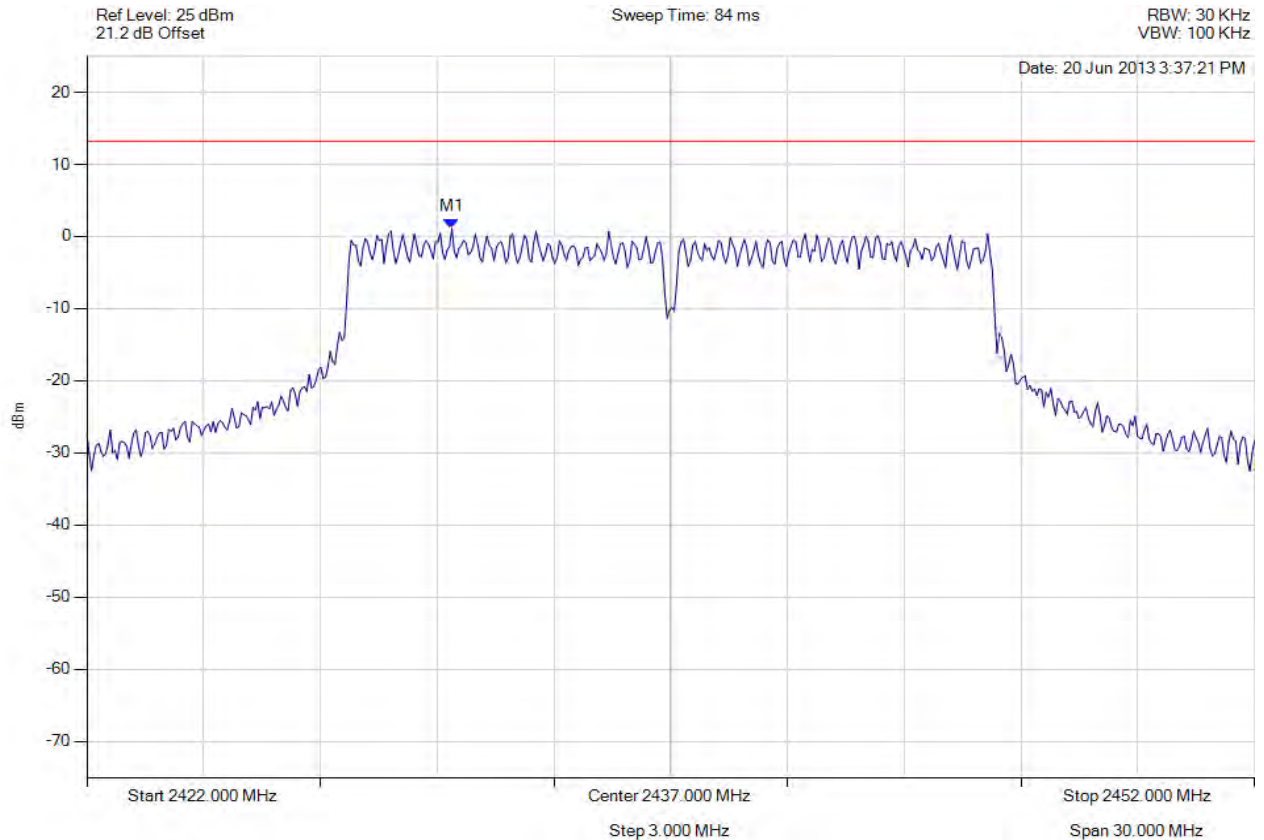


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POWER SPECTRAL DENSITY - AVERAGE

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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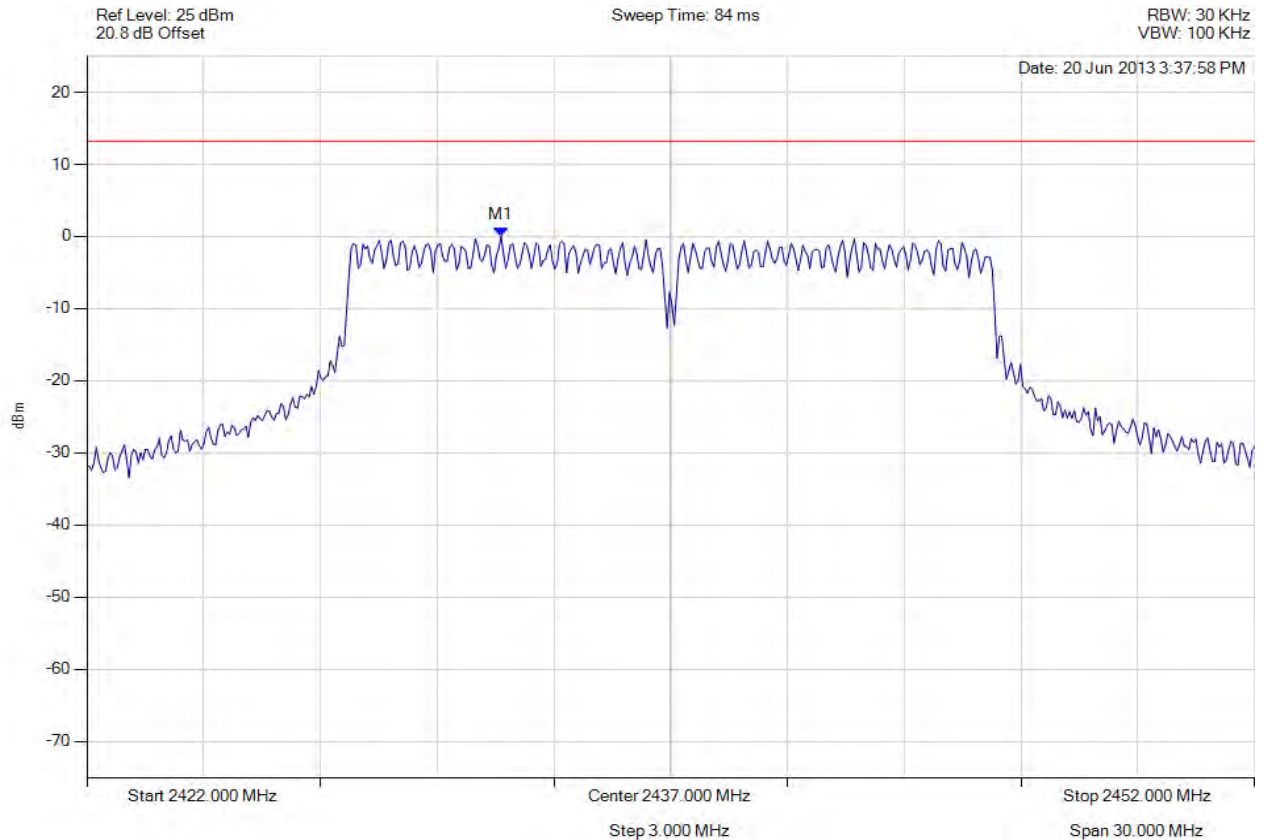


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POWER SPECTRAL DENSITY - AVERAGE

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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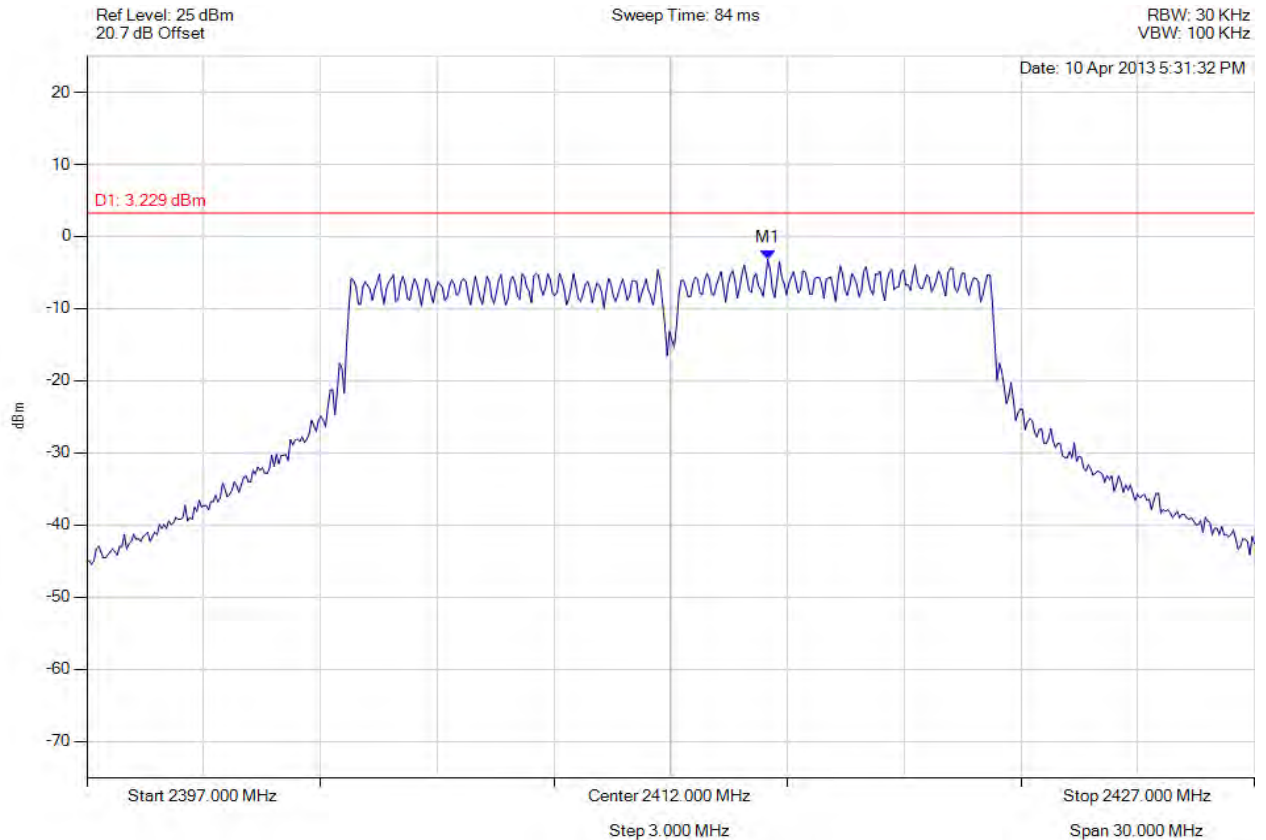


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POWER SPECTRAL DENSITY

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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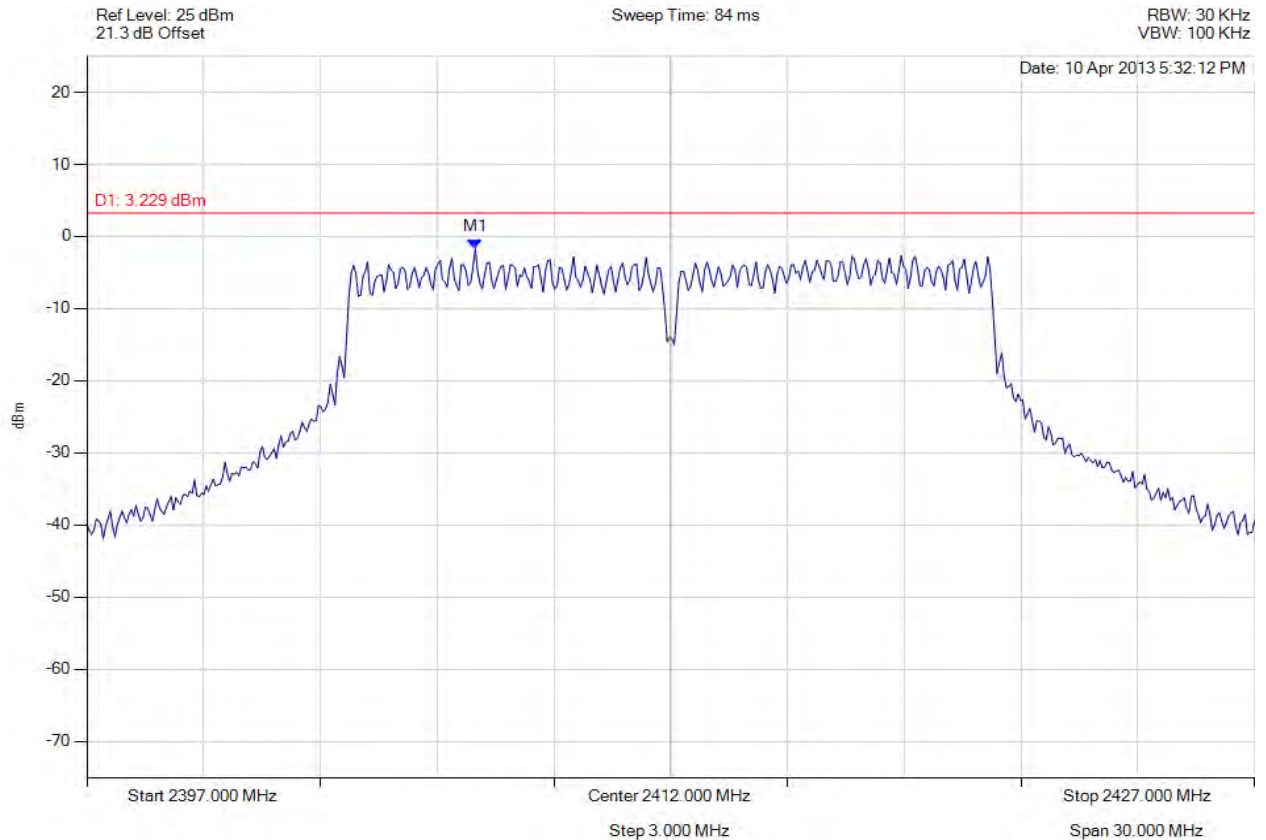


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POWER SPECTRAL DENSITY

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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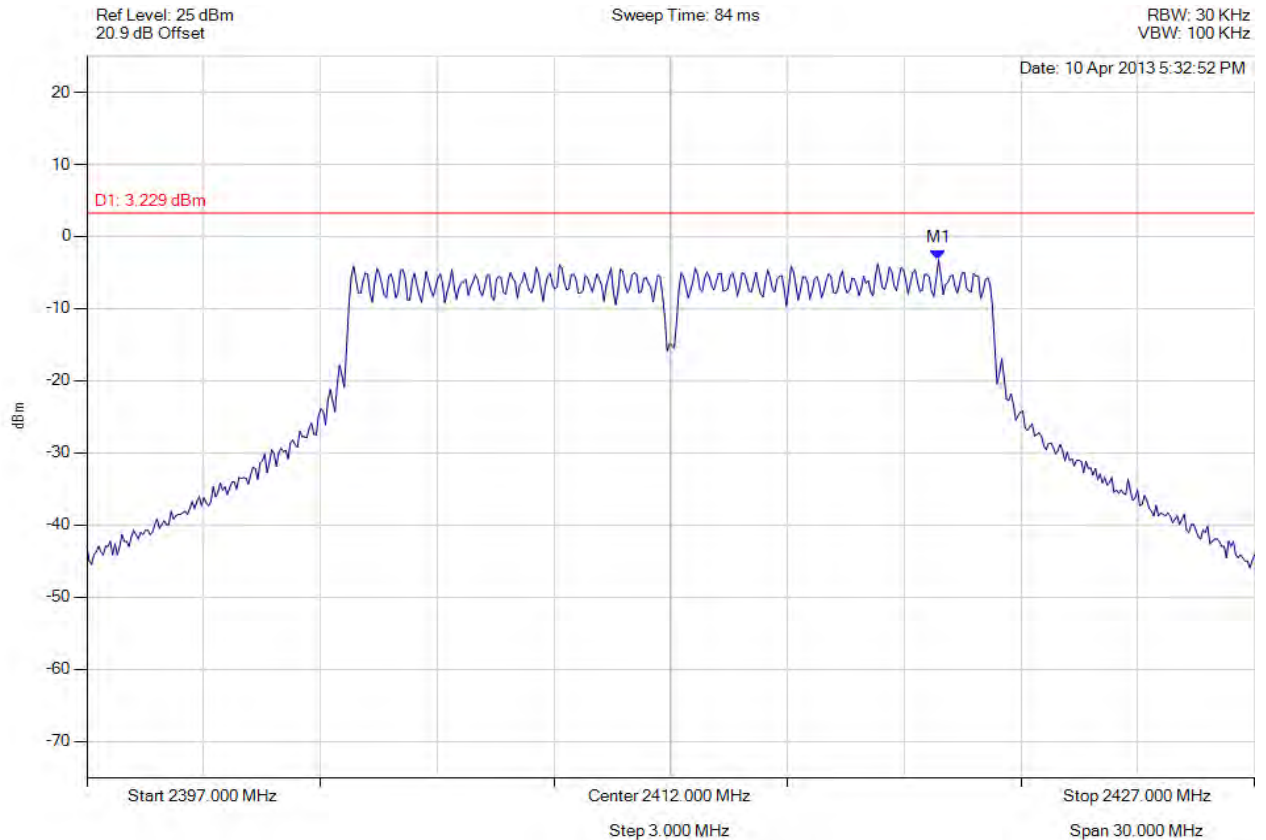


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POWER SPECTRAL DENSITY

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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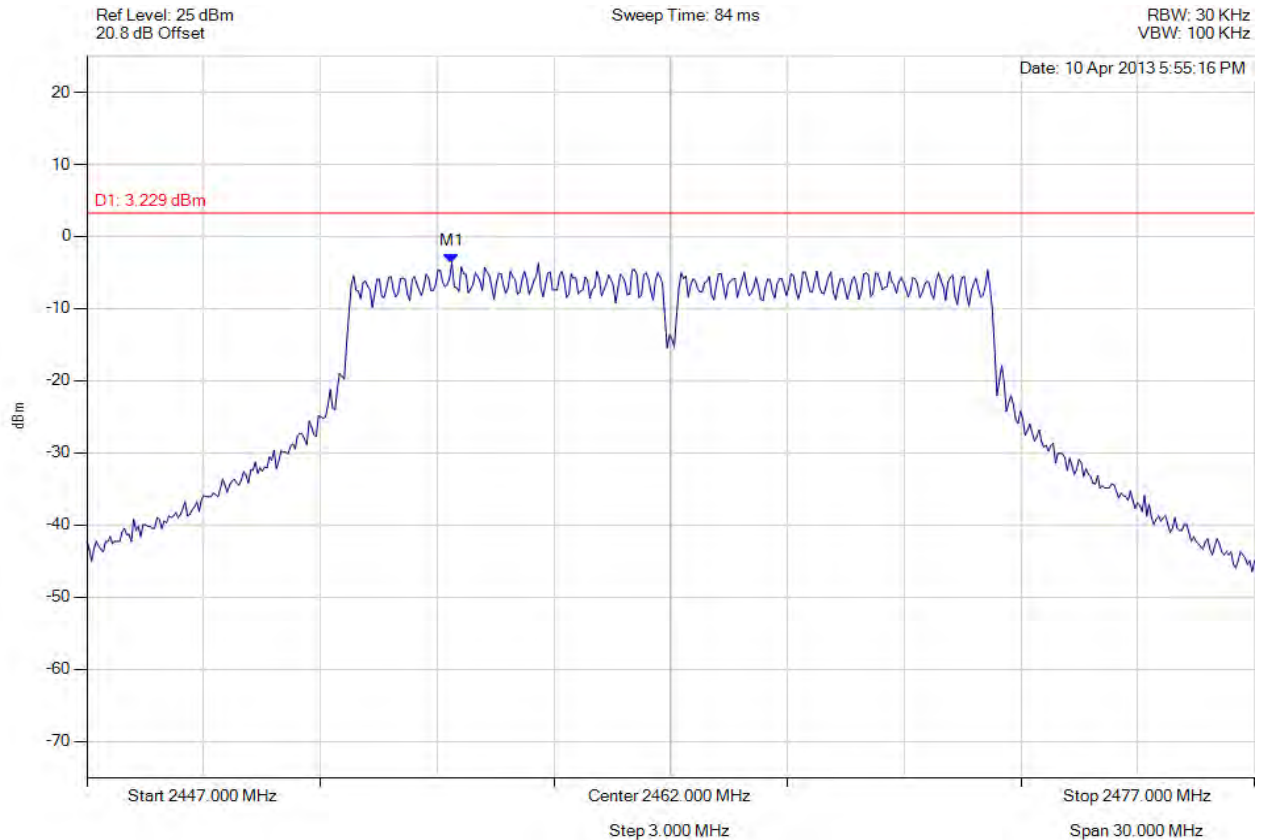


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POWER SPECTRAL DENSITY

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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