Company: Actiontec Electronics Inc

Test of: WCB6240Q
To: FCC CFR 47 Part 15 Subpart C 15.247 (DTS) +
Industry Canada RSS-247 Issue 1

Report No.: ATEC09-U5a Conducted Rev C

**CONDUCTED TEST REPORT**

MiCOM Labs
opening wireless markets

# CONDUCTED TEST REPORT

FROM

Test of: Actiontec Electronics Inc WCB6240Q
to

To: FCC CFR 47 Part 15 Subpart C 15.247 (DTS) +
Industry Canada RSS-247 Issue 1

Test Report Serial No.: ATEC09-U5a Conducted Rev C

This report supersedes: ATEC09-U5a Conducted Rev B

Note: this report is one of a set of three reports that together address the requirements for certification purposes

| Report Number | Test Report Type |
|---|---|
| ATEC09-U5a, b | 2.4 GHz Conducted & Radiated Test Reports |
| ATEC09-U8a, b | 5 GHz (non-DFS) Conducted, Radiated Test Reports |
| ATEC09-U11a, b, c | 5 GHz (DFS) Conducted, Radiated, DFS Test Reports |
| ATEC09-U2 | FCC Part 15B / ICES-003 Test Report |

Applicant: Actiontec Electronics Inc.
760 N Mary Avenue
Sunnyvale California 94085
USA

Product Function: Wireless Access Point and Ethernet Router

Issue Date: 24th November 2015

**This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**
575 Boulder Court
Pleasanton California 94566
USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

ACCREDITED
TESTING CERT #2381.01

**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**

# Table of Contents

**1. ACCREDITATION, LISTINGS & RECOGNITION....4**
1.1. TESTING ACCREDITATION....4
1.2. RECOGNITION....5
1.3. PRODUCT CERTIFICATION....6
**2. DOCUMENT HISTORY....7**
**3. TEST RESULT CERTIFICATE....8**
**4. REFERENCES AND MEASUREMENT UNCERTAINTY....9**
4.1. Normative References....9
4.2. Test and Uncertainty Procedure....10
**5. PRODUCT DETAILS AND TEST CONFIGURATIONS....11**
5.1. Technical Details....11
5.2. Scope Of Test Program....12
5.3. Equipment Model(s) and Serial Number(s)....15
5.4. Antenna Details....15
5.5. Cabling and I/O Ports....15
5.6. Test Configurations....16
5.7. Equipment Modifications....16
5.8. Deviations from the Test Standard....16
**6. TEST SUMMARY....17**
**7. TEST EQUIPMENT CONFIGURATION(S)....18**
7.1. Conducted....18
**8. MEASUREMENT AND PRESENTATION OF TEST DATA....20**
**9. TEST RESULTS....21**
9.1. 6 dB & 99% Bandwidth....21
9.2. Conducted Output Power....26
9.3. Emissions....32
*9.3.1. Conducted Emissions....32*
9.3.1.1. Conducted Spurious Emissions....32
9.3.1.2. Conducted Band-Edge Emissions....37
9.4. Power Spectral Density....45
**A. APPENDIX - GRAPHICAL IMAGES....50**
A.1. 6 dB & 99% Bandwidth....51
A.2. Emissions....75
*A.2.1. Conducted Emissions....75*
A.2.1.1. Conducted Spurious Emissions....75
A.2.1.2. Conducted Band-Edge Emissions....99
A.3. Power Spectral Density....116

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

# 1. ACCREDITATION, LISTINGS & RECOGNITION

## 1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. 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

American Association for Laboratory Accreditation

**Accredited Laboratory**

A2LA has accredited

**MICOM LABS**

*Pleasanton, CA*

for technical competence in the field of

Electrical Testing

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

Presented this 28th day of February 2014.

President & CEO
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2015

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

## 1.2. RECOGNITION

MiCOM Labs, Inc has widely recognized wireless testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

| Country | Recognition Body | Status | Phase | Identification No. |
|---|---|---|---|---|
| USA | Federal Communications Commission (FCC) | TCB | - | US0159<br>Listing #: 102167 |
| Canada | Industry Canada (IC) | FCB | APEC MRA 2 | US0159<br>Listing #: 4143A-2<br>4143A-3 |
| 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)<br>Bureau of Standards, Metrology and Inspection (BSMI) | CAB | APEC MRA 1 | |
| Vietnam | Ministry of Communication (MIC) | CAB | APEC MRA 1 | |

EU MRA – European Union Mutual Recognition Agreement.
NB – Notified Body
APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. 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

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

## 1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. 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

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 17065:2012 - *Requirements for bodies certifying products, processes and services*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 28th day of February 2014.

President & CEO
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2015

*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)
Industry Canada – Certification Body, CAB Identifier – US0159
Europe – Notified Body (NB), NB Identifier - 2280
Japan – Recognized Certification Body (RCB), RCB Identifier - 210

## 2. DOCUMENT HISTORY

| Document History | | |
|---|---|---|
| Revision | Date | Comments |
| Draft | 13th October 2015 | |
| Draft #2 | 19th October 2015 | |
| Rev A | 27th October 2015 | Initial Release |
| | | |
| Draft #3 | 13th November 2015 | The initial program (Rev A) for 802.11n HT-40 only tested mid channel (2437 MHz).<br><br>As a result of the manufacturer introducing additional frequencies for HT-40 operational mode conducted measurements were required. |
| Rev B | 16th November 2015 | 2nd document release |
| Rev C | 24th November 2015 | Updated HT-40 power settings |
| . | | |

In the above table the latest report revision will replace all earlier versions.

# 3. TEST RESULT CERTIFICATE

| | | | |
|---|---|---|---|
| **Manufacturer:** | Actiontec Electronics Inc<br>760 N Mary Avenue<br>Sunnyvale California 94085<br>USA | **Tested By:** | MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton<br>California 94566 USA |
| **Model:** | WCB6240Q | **Telephone:**<br>**Fax:** | +1 925 462 0304<br>+1 925 462 0306 |
| **Type Of Equipment:** | 802.11a/b/g/n/ac Wireless Router | | |
| **S/N's:** | GWXA5360700016 | | |
| **Test Date(s):** | 22nd – 28th September 2015 | **Website:** | www.micomlabs.com |

| STANDARD(S) | TEST RESULTS |
|---|---|
| **FCC CFR 47 Part 15 Subpart C 15.247 (DTS)**<br>**Industry Canada RSS-247 Issue 1** | **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.

ACCREDITED
TESTING CERT #2381.01

**Approved & Released for MiCOM Labs, Inc. by**:

Graeme Grieve
Quality Manager MiCOM Labs, Inc.

Gordon Hurst
President & CEO MiCOM Labs, Inc.

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

# 4. REFERENCES AND MEASUREMENT UNCERTAINTY

## 4.1. Normative References

| REF. | PUBLICATION | YEAR | TITLE |
|---|---|---|---|
| I | KDB 662911 | Oct 31 2013 | Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band |
| II | KDB 558074 D01 v03r03 | 9th June 2015 | Guidance for performing compliance measurements on Digital Transmission Systems (DTS) operating under section 15.247. |
| III | A2LA | June 2015 | R105 - Requirement's When Making Reference to A2LA Accreditation Status |
| IV | ANSI C63.10 | 2013 | American National Standard for Testing Unlicensed Wireless Devices |
| V | 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 |
| VI | CISPR 22 | 2008 | Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement |
| VII | ETSI TR 100 028 | 2001-12 | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics |
| VIII | FCC 47 CFR Part 15.247 | 2014 | Radio Frequency Devices; Subpart C – Intentional Radiators |
| IX | ICES-003 | Issue 5 2012 | Spectrum Management and Telecommunications; Interference-Causing Equipment Standard. Information Technology Equipment (ITE) – Limits and methods of measurement. |
| X | M 3003 | Edition 3 Nov. 2012 | Expression of Uncertainty and Confidence in Measurements |
| XI | RSS-247 Issue 1 | May 2015 | Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices |
| XII | RSS-Gen Issue 4 | November 2014 | General Requirements and Information for the Certification of Radiocommunication Equipment |
| XIII | KDB 644545 D03 v01 | August 14th 2014 | Guidance for IEEE 802.11ac New Rules |
| XIV | FCC 47 CFR Part 2.1033 | 2014 | FCC requirements and rules regarding photographs and test setup diagrams. |

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

## 4.2. Test and Uncertainty Procedure

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.

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

# 5. PRODUCT DETAILS AND TEST CONFIGURATIONS

## 5.1. Technical Details

| Details | Description |
|---|---|
| Purpose: | Test of the Actiontec Electronics Inc WCB6240Q to FCC CFR 47 Part 15 Subpart C 15.247 (DTS) and Industry Canada RSS-247 Issue 1 |
| Applicant: | Actiontec Electronics Inc<br>760 N Mary Avenue<br>Sunnyvale California 94085 USA |
| Manufacturer: | As Applicant |
| Laboratory performing the tests: | MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566 USA |
| Test report reference number: | ATEC09-U5a Conducted |
| Date EUT received: | 15th September 2015 |
| Standard(s) applied: | FCC CFR 47 Part 15 Subpart C 15.247 (DTS)<br>Industry Canada RSS-247 Issue 1 |
| Dates of test (from - to): | 22nd – 28th September 2015 |
| No of Units Tested: | 2 |
| Type of Equipment: | 802.11a/b/g/n/ac Wireless Router |
| Product Family Name: | 802.11ac Wireless 4-Port Ethernet Bridge with Optional MoCA |
| Model(s): | Tested Device: WCB6240Q +<br>WEB6040Q |
| Location for use: | Indoor |
| Declared Frequency Range(s): | 2400 - 2483.5 MHz |
| Primary function of equipment: | Wireless Access Point and Ethernet Router |
| Secondary function of equipment: | Optional Cable MoCA Bridge |
| Type of Modulation: | Per 802.11 –CCK, BPSK, QPSK, DSSS, OFDM |
| EUT Modes of Operation: | 802.11b/g/HT-20/HT-40; |
| Declared Nominal Output Power (Ave): | +25 dBm |
| Transmit/Receive Operation: | Transceiver - Half Duplex |
| Rated Input Voltage and Current: | AC/ DC adaptor (adaptor sold with unit) 12Vdc, 2A |
| Operating Temperature Range: | Declared Range 0°C to 40°C |
| ITU Emission Designator: | 802.11b 10M1G1D<br>802.11g 16M6D1D<br>802.11n – HT-20 17M5D1D<br>802.11n – HT-40 36M2D1D |
| Equipment Dimensions: | 9 x 1.5 x 5.75 inches |
| Weight: | 1.1 lbs |
| Hardware Rev: | AM3 |
| Software Rev: | 1.1.01.19yfa |

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

## 5.2. Scope Of Test Program

**Actiontec Electronics Inc WCB6240Q**
The scope of the test program was to test the Actiontec Electronics Inc WCB6240Q configurations in the frequency ranges 2400 - 2483.5 MHz; for compliance against the following specification:

**FCC CFR 47 Part 15 Subpart C 15.247 (DTS)**
Radio Frequency Devices; Subpart C – Intentional Radiators

**Industry Canada RSS-247 Issue 1**
Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices

**Manufacturers Declaration of Similarity**
FCC ID: LNQWXB6X40Q
IC ID: 2496A-WXB6X40Q
Actiontec Models: WxB6x40Q

Product Similarities;
Actiontec Models: WCB6240Q and WEB6040Q To whom it may concern: We, Actiontec Electronics, Inc., hereby to declare the mentioned two models have electrically identical Wireless circuitry with the same electromagnetic emissions and electromagnetic compatibility characteristics. Descriptions of the differences between these two models are as follows;

WCB6240Q – 802.11ac Wireless 4-Port Ethernet Bridge with Bonded MoCA
WEB6040Q – 802.11ac Wireless 4-Port Ethernet Bridge without MoCA.

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

**Actiontec Electronics Inc WCB6240Q**

**Actiontec Electronics Inc WCB6240Q**

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

| Type (EUT/ Support) | Equipment Description (Including Brand Name) | Mfr | Model No. | Serial No. |
|---|---|---|---|---|
| EUT | Wireless Router | Actiontec | WCB6240Q | GWXA5360700016 |
| EUT | Power Adapter<br>100 - 240Vac 50/60Hz 0.7A<br>12 Vdc 2.0 A | Actiontec | WA-24Q12FU | DJ87714D14043198400 |
| Support | Laptop PC | IBM | Thinkpad | None |

## 5.4. Antenna Details

| Type | Manufacturer | Model | Family | Gain (dBi) | BF Gain | Dir BW | X-Pol | Frequency Band (MHz) |
|---|---|---|---|---|---|---|---|---|
| integral | Galtronics | Custom PCB SMT | Dipole | 3.1 | - | 360 | - | 2400 - 2483.5 |
| integral | Galtronics | Custom Internal Cabled | Dipole | 3.1 | - | 360 | - | 2400 - 2483.5 |
| BF Gain - Beamforming Gain<br>Dir BW - Directional BeamWidth<br>X-Pol - Cross Polarization | | | | | | | | |

## 5.5. Cabling and I/O Ports

| Port Type | Max Cable Length | # Of Ports | Screened | Conn Type | Data Type |
|---|---|---|---|---|---|
| Ethernet | 100m GbE LAN | 4 | N | RJ45 | Packet Data |

## 5.6. Test Configurations

Results for the following configurations are provided in this report:

| Operational Mode(s) (802.11a/b/g/n/ac) | Data Rate with Highest Power MBit/s | Channel Frequency (MHz) | | |
|---|---|---|---|---|
| | | Low | Mid | High |
| **2400 - 2483.5 MHz** | | | | |
| 802.11b | 1 | 2,412.00 | 2,437.00 | 2,462.00 |
| 802.11g | 6 | 2,412.00 | 2,437.00 | 2,462.00 |
| 802.11n HT-20 | 6.5 | 2,412.00 | 2,437.00 | 2,462.00 |
| 802.11n HT-40* | 13.5 | -- | 2,437.00 | -- |

*Only mid channel was tested for 802.11n HT-40, see Section 5.7 Equipment Modifications

## 5.7. Equipment Modifications

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

1. Conducted Band-Edge Emissions (802.11n HT-40 only)

**Problem:** Conducted Band-Edge failed on channels 2422 and 2452 MHz

**Solution:** 802.11n HT-40 channels 2422 and 2452 MHz were dropped and the equipment can only operate on channel 2437 MHz for HT-40 operational mode.

## 5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:
1. NONE

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

# 6. TEST SUMMARY

List of Measurements

| Test Header | Result | Data Link |
|---|---|---|
| 15.247(a)(2) 6 dB & 99% Bandwidth | Complies | View Data |
| 15.247(b), 15.31(e) Conducted Output Power | Complies | View Data |
| 15.247(d) Emissions | Complies | |
| (1) Conducted Emissions | Complies | |
| (i) Conducted Spurious Emissions | Complies | View Data |
| (ii) Conducted Band-Edge Emissions | Complies | View Data |
| 15.247(e) Power Spectral Density | Complies | View Data |

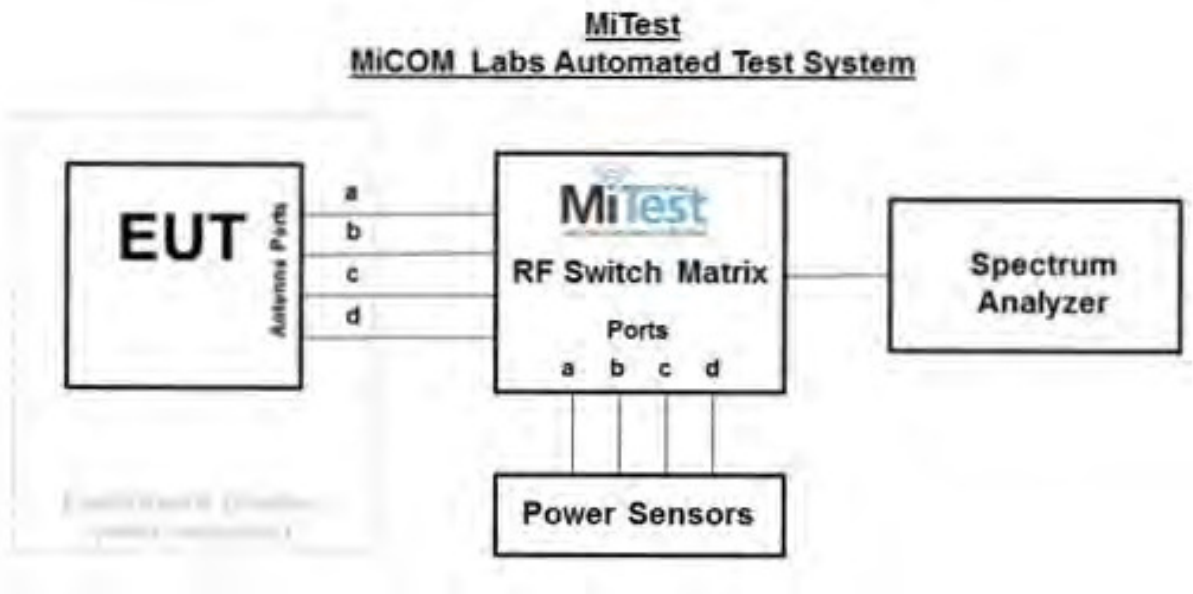
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.

# 7. TEST EQUIPMENT CONFIGURATION(S)

## 7.1. Conducted

Conducted RF Emission Test Set-up(s).
The following tests were performed using the conducted test set-up shown in the diagram below.

1. 6 dB & 99% Bandwidth
2. Conducted Output Power
3. Conducted Emissions
4. Power Spectral Density




Conducted Test Measurement Setup

A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.

| Asset# | Description | Manufacturer | Model# | Serial# | Calibration Due Date |
|---|---|---|---|---|---|
| 158 | Barometer/Thermometer | Control Company | 4196 | E2846 | 04 Dec 2015 |
| 249 | Resistance Thermometer | Thermotronics | GR2105-02 | 9340 #2 | 30 Oct 2015 |
| 287 | Rohde & Schwarz 40 GHz Receiver | Rhode & Schwarz | ESIB40 | 100201 | 27 Aug 2016 |
| 361 | Desktop for RF#1, Labview Software installed | Dell | Vostro 220 | WS RF#1 | Not Required |
| 380 | 4x4 RF Switch Box | MiCOM Labs | MiTest RF Switch Box | MIC001 | 20 Dec 2015 |
| 390 | USB Power Head 50MHz - 24GHz -60 to +20dBm | Agilent | U2002A | MY50000103 | 17 Oct 2015 |
| 398 | Test Software | MiCOM | MiTest ATS | Version 3.0.0.16 | Not Required |
| 408 | USB to GPIB interface | National Instruments | GPIB-USB HS | 14C0DE9 | Not Required |
| 435 | USB Wideband Power Sensor | Boonton | 55006 | 8731 | 31 Jul 2016 |
| 440 | USB Wideband Power Sensor | Boonton | 55006 | 8759 | 25 Sept 2016 |
| 441 | USB Wideband Power Sensor | Boonton | 55006 | 8731 | 25 Sept 2016 |
| 442 | USB Wideband Power Sensor | Boonton | 55006 | 8759 | 25 Sept 2016 |
| 445 | PoE Injector | D-Link | DPE-101GL | QTAH1E2000625 | Not Required |
| 75 | Environmental Chamber | Thermatron | SE-300-2-2 | 27946 | 28 Nov 2015 |
| RF#1 GPIB#1 | GPIB cable to Power Supply | HP | GPIB | None | Not Required |
| RF#1 SMA SA #452 | Precision SMA Male RG-402 Spectrun Analyzer | Fairview Microwave | Precision SMA Male RG 402 coax | None | 20 Dec 2015 |
| RF#1 SMA#1 | EUT to Mitest box port 1 | Flexco | SMA Cable port1 | None | 20 Dec 2015 |
| RF#1 SMA#2 | EUT to Mitest box port 2 | Flexco | SMA Cable port2 | None | 20 Dec 2015 |
| RF#1 SMA#3 | EUT to Mitest box port 3 | Flexco | SMA Cable port3 | None | 20 Dec 2015 |
| RF#1 SMA#4 | EUT to Mitest box port 4 | Flexco | SMA Cable port4 | None | 20 Dec 2015 |
| RF#1 USB#1 | USB Cable to Mitest Box | Dynex | USB Cable | None | Not Required |

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

# 8. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by MiTest. MiTest is an automated test system developed by MiCOM Labs. MiTest is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.

The MiCOM Labs "MiTest" Automated Test System" (Patent Pending)

# 9. TEST RESULTS

## 9.1. 6 dB & 99% Bandwidth

| Conducted Test Conditions for 6 dB and 99% Bandwidth | | | |
|---|---|---|---|
| **Standard:** | FCC CFR 47:15.247 | **Ambient Temp. (ºC):** | 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):** | See Normative References | | |

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.

Testing was performed under ambient conditions at nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

**Limits for 6 dB and 99% Bandwidth**

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(2) Systems using digital modulation techniques may operate in the 902-928 MHz and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

| Equipment Configuration for 6 dB & 99% Bandwidth | | | |
|---|---|---|---|
| **Variant:** | 802.11b | **Duty Cycle (%):** | 99 |
| **Data Rate:** | 1 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | CCK | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured 6 dB Bandwidth (MHz) | | | | 6 dB Bandwidth (MHz) | | Limit | Lowest Margin |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | Highest | Lowest | KHz | MHz |
| 2412.0 | 8.096 | 8.096 | -- | -- | 8.096 | 8.096 | ≥500.0 | -7.60 |
| 2437.0 | 8.096 | 8.096 | -- | -- | 8.096 | 8.096 | ≥500.0 | -7.60 |
| 2462.0 | 8.096 | 8.096 | -- | -- | 8.096 | 8.096 | ≥500.0 | -7.60 |

| Test Frequency | Measured 99% Bandwidth (MHz) | | | | Maximum 99% Bandwidth (MHz) | | |
|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | |
| MHz | a | b | c | d | | | |
| 2412.0 | 10.100 | 10.100 | -- | -- | 10.100 | | |
| 2437.0 | 10.100 | 10.020 | -- | -- | 10.100 | | |
| 2462.0 | 10.100 | 10.100 | -- | -- | 10.100 | | |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

Note: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for 6 dB & 99% Bandwidth | | | |
|---|---|---|---|
| **Variant:** | 802.11g | **Duty Cycle (%):** | 98 |
| **Data Rate:** | 6.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured 6 dB Bandwidth (MHz) | | | | 6 dB Bandwidth (MHz) | | Limit | Lowest Margin |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | Highest | Lowest | KHz | MHz |
| 2412.0 | 16.353 | 16.353 | -- | -- | 16.353 | 16.353 | ≥500.0 | -15.85 |
| 2437.0 | 16.433 | 16.433 | -- | -- | 16.433 | 16.433 | ≥500.0 | -15.93 |
| 2462.0 | 16.353 | 16.353 | -- | -- | 16.353 | 16.353 | ≥500.0 | -15.85 |

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

Note: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for 6 dB & 99% Bandwidth | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-20 | **Duty Cycle (%):** | 96 |
| **Data Rate:** | 6.50 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured 6 dB Bandwidth (MHz) | | | | 6 dB Bandwidth (MHz) | | Limit | Lowest Margin |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | Highest | Lowest | KHz | MHz |
| 2412.0 | 17.555 | 17.555 | -- | -- | 17.555 | 17.555 | ≥500.0 | -17.06 |
| 2437.0 | 17.555 | 17.555 | -- | -- | 17.555 | 17.555 | ≥500.0 | -17.06 |
| 2462.0 | 17.555 | 17.635 | -- | -- | 17.635 | 17.555 | ≥500.0 | -17.06 |

| Test Frequency | Measured 99% Bandwidth (MHz) | | | | Maximum 99% Bandwidth (MHz) | | |
|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | |
| MHz | a | b | c | d | | | |
| 2412.0 | 17.715 | 17.715 | -- | -- | 17.715 | | |
| 2437.0 | 17.715 | 17.715 | -- | -- | 17.715 | | |
| 2462.0 | 17.715 | 17.635 | -- | -- | 17.715 | | |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

Note: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for 6 dB & 99% Bandwidth | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-40 | **Duty Cycle (%):** | 93 |
| **Data Rate:** | 13.50 MBit/s | **Antenna Gain (dBi):** | 3 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | JK |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured 6 dB Bandwidth (MHz) | | | | 6 dB Bandwidth (MHz) | | Limit | Lowest Margin |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | Highest | Lowest | KHz | MHz |
| 2422.0 | 34.930 | 34.800 | | | 34.930 | 34.800 | ≥500.0 | -34.30 |
| 2437.0 | 35.591 | 35.431 | | | 35.591 | 35.431 | ≥500.0 | -34.93 |
| 2452.0 | 34.930 | 34.930 | | | 34.930 | 34.930 | ≥500.0 | -34.43 |

| Test Frequency | Measured 99% Bandwidth (MHz) | | | | Maximum 99% Bandwidth (MHz) | | |
|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | |
| MHz | a | b | c | d | | | |
| 2422.0 | 35.419 | 35.491 | | | 35.491 | | |
| 2437.0 | 36.072 | 36.232 | | | 36.232 | | |
| 2452.0 | 35.475 | 35.602 | | | 35.602 | | |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

Note: click the links in the above matrix to view the graphical image (plot).

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

## 9.2. Conducted Output Power

| Conducted Test Conditions for Fundamental Emission Output Power | | | |
|---|---|---|---|
| **Standard:** | FCC CFR 47:15.247 | **Ambient Temp. (ºC):** | 24.0 - 27.5 |
| **Test Heading:** | Output Power | **Rel. Humidity (%):** | 32 - 45 |
| **Standard Section(s):** | 15.247 (b) & (c) | **Pressure (mBars):** | 999 - 1001 |
| **Reference Document(s):** | See Normative References | | |

Test Procedure for Fundamental Emission Output Power Measurement
In the case of average power measurements an average power sensor was utilized.

For peak power measurements the spectrum analyzer built-in power function was used to integrate peak power over the 20 dB bandwidth.

Testing was performed under ambient conditions at nominal voltage only. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured, summed (Σ) and reported.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.
Supporting Information
Calculated Power = A + G + Y+ 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
Y = Beamforming Gain
x = Duty Cycle (average power measurements only)

**Limits for Fundamental Emission Output Power**
(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following for non-frequency hopping systems:

(3) For systems using digital modulation in the 902-928 MHz and 2400-2483.5 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) 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)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(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.

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

instructions informing the operator and the installer of this responsibility.

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

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

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

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

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

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

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

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

**Equipment Configuration for Average Output Power**

| | | | |
|---|---|---|---|
| **Variant:** | 802.11b | **Duty Cycle (%):** | 99.0 |
| **Data Rate:** | 1 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | CCK | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Output Power + DCCF (+0.04 dB) (dBm) | | | | Calculated Total Power Σ Port(s) | Limit | Margin | EUT Power Setting |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | dBm | dBm | dB | |
| 2412.0 | 22.28 | 22.71 | -- | -- | 25.51 | 30.00 | -4.49 | |
| 2437.0 | 21.85 | 22.44 | -- | -- | 25.17 | 30.00 | -4.83 | |
| 2462.0 | 21.94 | 22.25 | -- | -- | 25.11 | 30.00 | -4.89 | |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB |

DCCF - Duty Cycle Correction Factor

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

**Equipment Configuration for Average Output Power**

| | | | |
|---|---|---|---|
| **Variant:** | 802.11g | **Duty Cycle (%):** | 97.9 |
| **Data Rate:** | 6 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Output Power + DCCF (+0.09 dB) (dBm) | | | | Calculated Total Power Σ Port(s) | Limit | Margin | EUT Power Setting |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | dBm | dBm | dB | |
| 2412.0 | 21.79 | 21.93 | -- | -- | 24.87 | 30.00 | -5.13 | |
| 2437.0 | 21.52 | 21.69 | -- | -- | 24.62 | 30.00 | -5.38 | |
| 2462.0 | 21.20 | 21.64 | -- | -- | 24.44 | 30.00 | -5.56 | |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB |

DCCF - Duty Cycle Correction Factor

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

**Equipment Configuration for Average Output Power**

| | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-20 | **Duty Cycle (%):** | 96.2 |
| **Data Rate:** | 6 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Output Power + DCCF (+0.18 dB) (dBm) | | | | Calculated Total Power Σ Port(s) | Limit | Margin | EUT Power Setting |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | dBm | dBm | dB | |
| 2412.0 | 20.32 | 19.59 | -- | -- | 22.98 | 30.00 | -7.02 | |
| 2437.0 | 19.78 | 19.37 | -- | -- | 22.59 | 30.00 | -7.41 | |
| 2462.0 | 19.55 | 19.06 | -- | -- | 22.32 | 30.00 | -7.68 | |

| **Traceability to Industry Recognized Test Methodologies** | |
|---|---|
| Work Instruction: | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB |

DCCF - Duty Cycle Correction Factor

**Equipment Configuration for Average Output Power**

| | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-40 | **Duty Cycle (%):** | 93.1 |
| **Data Rate:** | 13.5 Mbit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | JK |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Output Power + DCCF (+0.32 dB) (dBm) | | | | Calculated Total Power Σ Port(s) | Limit | Margin | EUT Power Setting |
|---|---|---|---|---|---|---|---|---|
| | Port(s) | | | | | | | |
| MHz | a | b | c | d | dBm | dBm | dB | |
| 2422.0 | 18.48 | 20.33 | -- | -- | 22.51 | 30.00 | -7.49 | |
| 2437.0 | 20.12 | 21.26 | -- | -- | 22.74 | 30.00 | -7.26 | |
| 2452.0 | 18.20 | 19.93 | -- | -- | 22.16 | 30.00 | -7.84 | |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB |

DCCF - Duty Cycle Correction Factor

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

## 9.3. Emissions

### 9.3.1. Conducted Emissions

#### 9.3.1.1. Conducted Spurious Emissions

| Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions | | | |
|---|---|---|---|
| **Standard:** | FCC CFR 47:15.247 | **Ambient Temp. (ºC):** | 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):** | See Normative References | | |

**Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement**
Transmitter Conducted Spurious and Band-Edge emissions were measured at a limit of 30 dBc (average detector) or 20 dBc (peak detector) below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. 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.

Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured separately. Testing was performed under ambient conditions at nominal voltage only.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

**Limits Transmitter Conducted Spurious and Band-Edge Emissions**
(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

| Equipment Configuration for Transmitter Conducted Spurious Emissions | | | |
|---|---|---|---|
| **Variant:** | 802.11b | **Duty Cycle (%):** | 99 |
| **Data Rate:** | 1.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | CCK | **Beam Forming Gain (Y):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **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** | 30.0 - 26000.0 | -60.956 | -41.00 | -60.956 | -41.00 | -- | -- | -- | -- |
| **2437.0** | 30.0 - 26000.0 | -59.121 | -42.00 | -58.717 | -42.00 | -- | -- | -- | -- |
| **2462.0** | 30.0 - 26000.0 | -59.990 | -42.00 | -59.545 | -42.00 | -- | -- | -- | -- |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Transmitter Conducted Spurious Emissions | | | |
|---|---|---|---|
| **Variant:** | 802.11g | **Duty Cycle (%):** | 98 |
| **Data Rate:** | 6.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **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** | 30.0 - 26000.0 | -61.483 | -41.00 | -61.483 | -40.00 | -- | -- | -- | -- |
| **2437.0** | 30.0 - 26000.0 | -59.545 | -40.00 | -59.121 | -40.00 | -- | -- | -- | -- |
| **2462.0** | 30.0 - 26000.0 | -60.460 | -41.00 | -59.990 | -41.00 | -- | -- | -- | -- |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Transmitter Conducted Spurious Emissions | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-20 | **Duty Cycle (%):** | 96 |
| **Data Rate:** | 6.50 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **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** | 30.0 - 26000.0 | -64.737 | -42.00 | -63.982 | -43.00 | -- | -- | -- | -- |
| **2437.0** | 30.0 - 26000.0 | -61.483 | -42.00 | -62.643 | -43.00 | -- | -- | -- | -- |
| **2462.0** | 30.0 - 26000.0 | -60.956 | -43.00 | -60.460 | -43.00 | -- | -- | -- | -- |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Transmitter Conducted Spurious Emissions | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-40 | **Duty Cycle (%):** | 93 |
| **Data Rate:** | 13.50 MBit/s | **Antenna Gain (dBi):** | Not Applicable |
| **Modulation:** | OFDM | **Beam Forming Gain (Y):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | JK |
| **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** | 30.0 - 26000.0 | -63.061 | -34.63 | -59.499 | -32.74 | -- | -- | -- | -- |
| **2437.0** | 30.0 - 26000.0 | -62.643 | -35.00 | -60.956 | -34.00 | -- | -- | -- | -- |
| **2452.0** | 30.0 - 26000.0 | -62.940 | -34.26 | -59.763 | -32.54 | -- | -- | -- | -- |

| 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: click the links in the above matrix to view the graphical image (plot).

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

### 9.3.1.2. Conducted Band-Edge Emissions

| Equipment Configuration for Conducted Low Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11b | **Duty Cycle (%):** | 99.0 |
| **Data Rate:** | 1.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | CCK | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | |
|---|---|
| **Channel Frequency:** | 2412.0 MHz |
| **Band-Edge Frequency:** | 2400.0 MHz |
| **Test Frequency Range:** | 2350.0 - 2422.0 MHz |

| Port(s) | Band-Edge Markers and Limit | | | Revised Limit | | Margin |
|---|---|---|---|---|---|---|
| | M1 Amplitude (dBm) | Plot Limit (dBm) | M2 Frequency (MHz) | Amplitude (dBm) | M2A Frequency (MHz) | (MHz) |
| a | -38.42 | -25.00 | 2405.10 | -- | -- | -5.100 |
| b | -39.08 | -26.00 | 2405.00 | -- | -- | -5.000 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

**Equipment Configuration for Conducted Low Band-Edge Emissions - Average**

| | | | |
|---|---|---|---|
| **Variant:** | 802.11g | **Duty Cycle (%):** | 97.9 |
| **Data Rate:** | 6.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2412.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2400.0 MHz | | | | | |
| **Test Frequency Range:** | 2350.0 - 2422.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M1 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -32.91 | -30.00 | 2401.70 | -- | -- | -1.700 |
| **b** | -32.58 | -30.00 | 2401.70 | -- | -- | -1.700 |

| **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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Conducted Low Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-20 | **Duty Cycle (%):** | 96.2 |
| **Data Rate:** | 6.50 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2412.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2400.0 MHz | | | | | |
| **Test Frequency Range:** | 2350.0 - 2422.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M1 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -34.37 | -31.00 | 2401.70 | -- | -- | -1.700 |
| **b** | -34.68 | -32.00 | 2401.70 | -- | -- | -1.700 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Conducted Low Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-40 | **Duty Cycle (%):** | 93.1 |
| **Data Rate:** | 13.5 Mbit/s | **Antenna Gain (dBi):** | 3.10 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | JK |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2422.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2400.0 MHz | | | | | |
| **Test Frequency Range:** | 2292.0 - 2442.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M1 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -32.20 | -30.77 | 2402.50 | -- | -- | -2.500 |
| **b** | -29.04 | -28.98 | 2402.00 | -- | -- | -2.000 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Conducted High Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11b | **Duty Cycle (%):** | 99.0 |
| **Data Rate:** | 1.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | CCK | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2462.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2483.5 MHz | | | | | |
| **Test Frequency Range:** | 2452.0 - 2524.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M3 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -58.07 | -26.00 | 2468.90 | -- | -- | -14.600 |
| **b** | -57.77 | -26.00 | 2468.90 | -- | -- | -14.600 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Conducted High Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11g | **Duty Cycle (%):** | 97.9 |
| **Data Rate:** | 6.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2462.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2483.5 MHz | | | | | |
| **Test Frequency Range:** | 2452.0 - 2524.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M3 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -52.05 | -30.00 | 2472.10 | -- | -- | -11.400 |
| **b** | -50.16 | -30.00 | 2472.10 | -- | -- | -11.400 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Conducted High Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-20 | **Duty Cycle (%):** | 96.2 |
| **Data Rate:** | 6.50 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2462.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2483.5 MHz | | | | | |
| **Test Frequency Range:** | 2452.0 - 2524.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M3 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -55.79 | -32.00 | 2472.20 | -- | -- | -11.300 |
| **b** | -56.94 | -32.00 | 2472.20 | -- | -- | -11.300 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Conducted High Band-Edge Emissions - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-40 | **Duty Cycle (%):** | 93.1 |
| **Data Rate:** | 13.50 MBit/s | **Antenna Gain (dBi):** | 3.10 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | JK |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Channel Frequency:** | 2452.0 MHz | | | | | |
| **Band-Edge Frequency:** | 2483.5 MHz | | | | | |
| **Test Frequency Range:** | 2432.0 - 2582.0 MHz | | | | | |
| **Port(s)** | **Band-Edge Markers and Limit** | | | **Revised Limit** | | **Margin** |
| | **M3 Amplitude (dBm)** | **Plot Limit (dBm)** | **M2 Frequency (MHz)** | **Amplitude (dBm)** | **M2A Frequency (MHz)** | **(MHz)** |
| **a** | -40.16 | -31.23 | 2471.00 | -- | -- | -12.500 |
| **b** | -34.59 | -29.45 | 2471.50 | -- | -- | -12.000 |

| 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: click the links in the above matrix to view the graphical image (plot).

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

## 9.4. Power Spectral Density

| Conducted Test Conditions for Power Spectral Density | | | |
|---|---|---|---|
| **Standard:** | FCC CFR 47:15.247 | **Ambient Temp. (ºC):** | 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):** | See Normative References | | |

**Test Procedure for Power Spectral Density**
The transmitter output was connected to a spectrum analyzer and the measured made in a 3 kHz resolution bandwidth using the analyzer auto-coupled sweep-time. A peak value was found over the full emission bandwidth and the spectrum downloaded for post processing purposes.

Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured separately. The Peak Power Spectral Density is the highest level found across the emission bandwidth. With multiple antenna port measurements the numerical analyzer data from each port is summed (à) and a link to this additional graphic is provided.

Testing was performed under ambient conditions at nominal voltage only.

Test configuration and setup used for the measurement was per the Conducted Test Set-up specified in this document.

Measure and sum the spectra across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The individual spectra are then summed mathematically in linear power units. Unlike in-band power measurements, in which the sum involves a single measured value (output power) from each output, measurements for compliance with PSD limits involve summing entire spectra across corresponding frequency bins on the various outputs. Consistency is maintained for any device with multiple transmitter outputs to be certain the individual outputs are all aligned with the same span and same number of points. In this instance, the linear power spectrum value within the first spectral bin of output 0 is summed with that in the first spectral bin of output 1, and the first spectral bin of output 2, and so on up to the Nth output to obtain the true value for the first frequency bin of the summed spectrum. The summed spectrum value for each frequency bin is computed in this fashion. These summed spectral values were post processed and the resulting numerical and graphical data presented.

NOTE:
It may be observed that the spectrum in some antenna port plots break the limit line however this in itself does NOT constitute a failure. In all cases a spectrum summation plot is provided in order to prove compliance. A failure occurs only after the summation of all spectrum plots have been summed and are found to be greater than the limit line.

**Supporting Information**
Calculated Power = A + 10 log (1/x) dBm
A = Total Power Spectral Density [10 Log10 ($10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10}$)]
x = Duty Cycle

**Limits Power Spectral Density**
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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

| Equipment Configuration for Power Spectral Density - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11b | **Duty Cycle (%):** | 99.0 |
| **Data Rate:** | 1.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | CCK | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Power Spectral Density Port(s) (dBm/3KHz) | | | | Amplitude Summation + DCCF (+0.04 dB) | Limit | Margin |
|---|---|---|---|---|---|---|---|
| MHz | a | b | c | d | dBm/3KHz | dBm/3KHz | dB |
| 2412.0 | -9.817 | -9.651 | -- | -- | -6.687 | 8.0 | -14.7 |
| 2437.0 | -10.741 | -10.133 | -- | -- | -7.435 | 8.0 | -15.4 |
| 2462.0 | -10.496 | -10.258 | -- | -- | -7.321 | 8.0 | -15.3 |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Power Spectral Density - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11g | **Duty Cycle (%):** | 97.9 |
| **Data Rate:** | 6.00 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Power Spectral Density Port(s) (dBm/3KHz) | | | | Amplitude Summation + DCCF (+0.09 dB) | Limit | Margin |
|---|---|---|---|---|---|---|---|
| MHz | a | b | c | d | dBm/3KHz | dBm/3KHz | dB |
| 2412.0 | -13.359 | -13.157 | -- | -- | -10.266 | 8.0 | -18.3 |
| 2437.0 | -13.540 | -13.726 | -- | -- | -10.717 | 8.0 | -18.7 |
| 2462.0 | -13.371 | -13.565 | -- | -- | -10.562 | 8.0 | -18.6 |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

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

| Equipment Configuration for Power Spectral Density - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-20 | **Duty Cycle (%):** | 96.2 |
| **Data Rate:** | 6.50 MBit/s | **Antenna Gain (dBi):** | 3.1 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | SB |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Power Spectral Density Port(s) (dBm/3KHz) | | | | Amplitude Summation + DCCF (+0.17 dB) | Limit | Margin |
|---|---|---|---|---|---|---|---|
| MHz | a | b | c | d | dBm/3KHz | dBm/3KHz | dB |
| 2412.0 | -15.134 | -16.346 | -- | -- | -12.853 | 8.0 | -20.9 |
| 2437.0 | -15.695 | -16.179 | -- | -- | -12.932 | 8.0 | -20.9 |
| 2462.0 | -16.229 | -16.656 | -- | -- | -13.460 | 8.0 | -21.5 |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

| Equipment Configuration for Power Spectral Density - Average | | | |
|---|---|---|---|
| **Variant:** | 802.11n HT-40 | **Duty Cycle (%):** | 93.1 |
| **Data Rate:** | 13.50 MBit/s | **Antenna Gain (dBi):** | 3.10 |
| **Modulation:** | OFDM | **Beam Forming Gain (Y)(dB):** | Not Applicable |
| **TPC:** | Not Applicable | **Tested By:** | JK |
| **Engineering Test Notes:** | | | |

**Test Measurement Results**

| Test Frequency | Measured Power Spectral Density Port(s) (dBm/3KHz) | | | | Amplitude Summation + DCCF (+0.31 dB) | Limit | Margin |
|---|---|---|---|---|---|---|---|
| MHz | a | b | c | d | dBm/3KHz | dBm/3KHz | dB |
| 2422.0 | -14.770 | -12.174 | -- | -- | -10.269 | 8.0 | -18.3 |
| 2437.0 | -14.959 | -13.814 | -- | -- | -10.887 | 8.0 | -18.9 |
| 2452.0 | -14.999 | -13.398 | -- | -- | -10.804 | 8.0 | -18.8 |

| Traceability to Industry Recognized Test Methodologies | |
|---|---|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

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

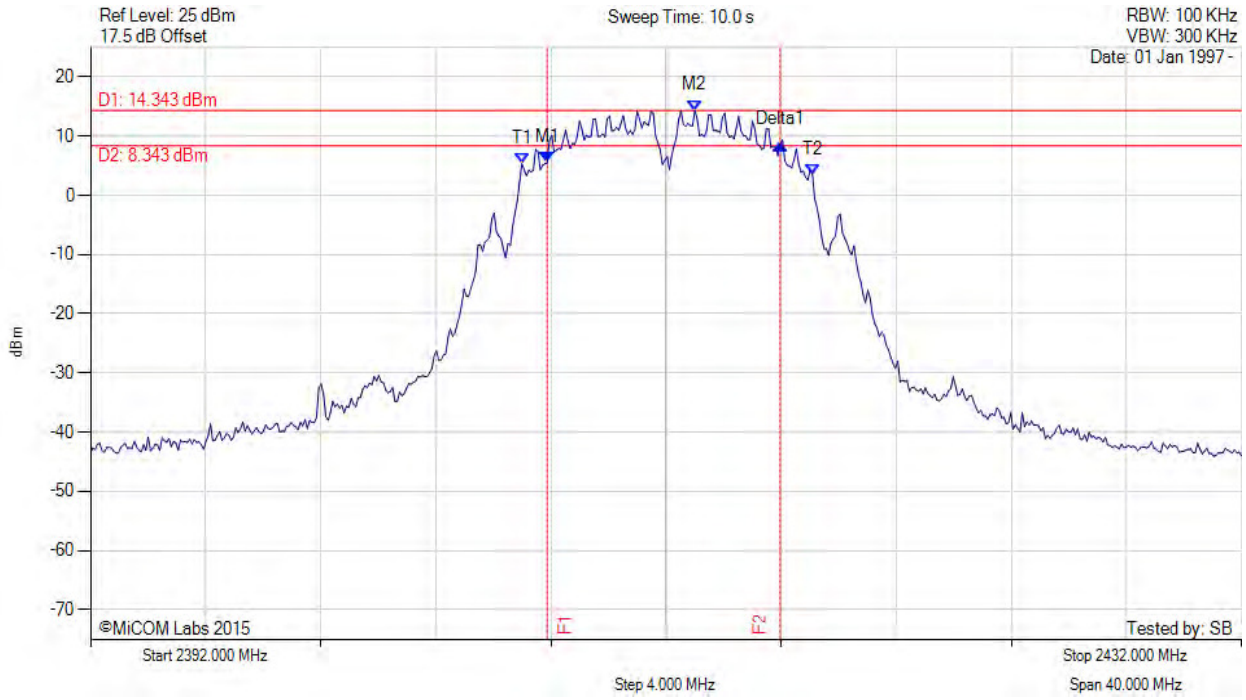
# A. APPENDIX - GRAPHICAL IMAGES

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

## A.1. 6 dB & 99% Bandwidth

6 dB & 99% BANDWIDTH

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

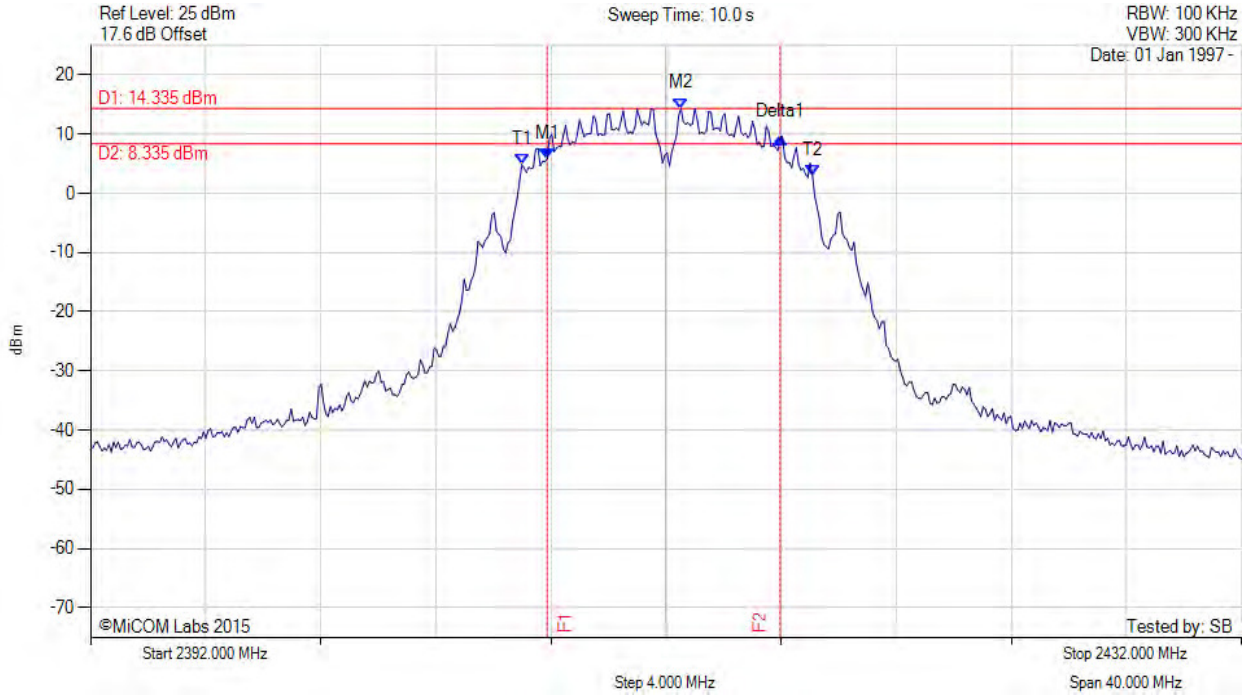



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2407.872 MHz : 5.488 dBm<br>M2 : 2413.002 MHz : 14.343 dBm<br>Delta1 : 8.096 MHz : 3.199 dB<br>T1 : 2406.990 MHz : 5.340 dBm<br>T2 : 2417.090 MHz : 3.497 dBm<br>OBW : 10.100 MHz | Measured 6 dB Bandwidth: 8.096 MHz<br>Limit: ≥500.0 kHz<br>Margin: -7.60 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

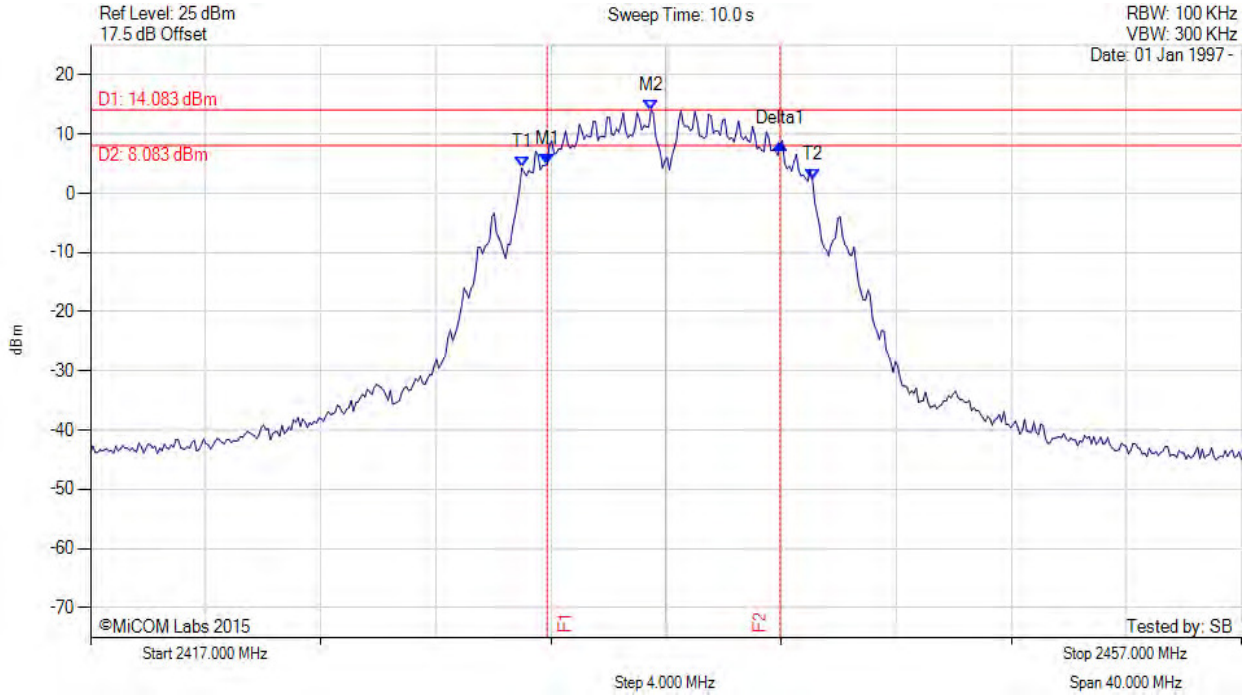



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2407.872 MHz : 5.852 dBm<br>M2 : 2412.521 MHz : 14.335 dBm<br>Delta1 : 8.096 MHz : 3.575 dB<br>T1 : 2406.990 MHz : 4.848 dBm<br>T2 : 2417.090 MHz : 3.068 dBm<br>OBW : 10.100 MHz | Measured 6 dB Bandwidth: 8.096 MHz<br>Limit: ≥500.0 kHz<br>Margin: -7.60 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

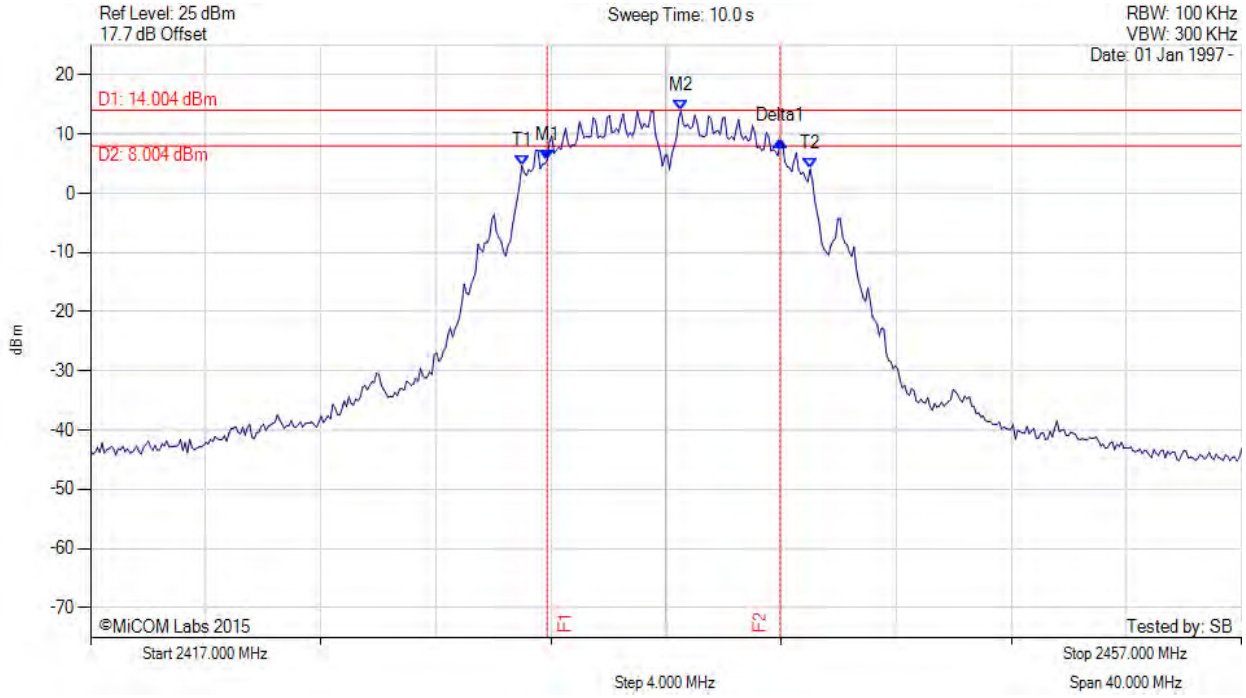



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2432.872 MHz : 4.935 dBm<br>M2 : 2436.479 MHz : 14.083 dBm<br>Delta1 : 8.096 MHz : 3.535 dB<br>T1 : 2431.990 MHz : 4.317 dBm<br>T2 : 2442.090 MHz : 2.381 dBm<br>OBW : 10.100 MHz | Measured 6 dB Bandwidth: 8.096 MHz<br>Limit: ≥500.0 kHz<br>Margin: -7.60 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

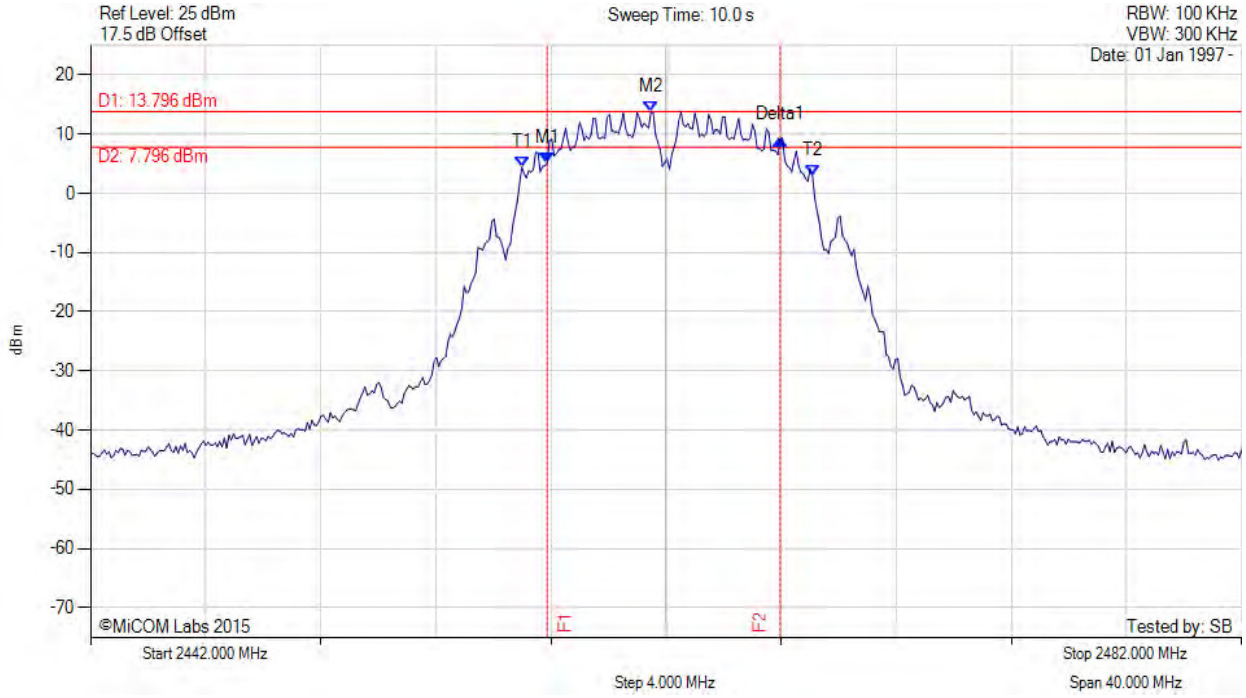



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2432.872 MHz : 5.657 dBm<br>M2 : 2437.521 MHz : 14.004 dBm<br>Delta1 : 8.096 MHz : 3.272 dB<br>T1 : 2431.990 MHz : 4.679 dBm<br>T2 : 2442.010 MHz : 4.089 dBm<br>OBW : 10.020 MHz | Measured 6 dB Bandwidth: 8.096 MHz<br>Limit: ≥500.0 kHz<br>Margin: -7.60 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

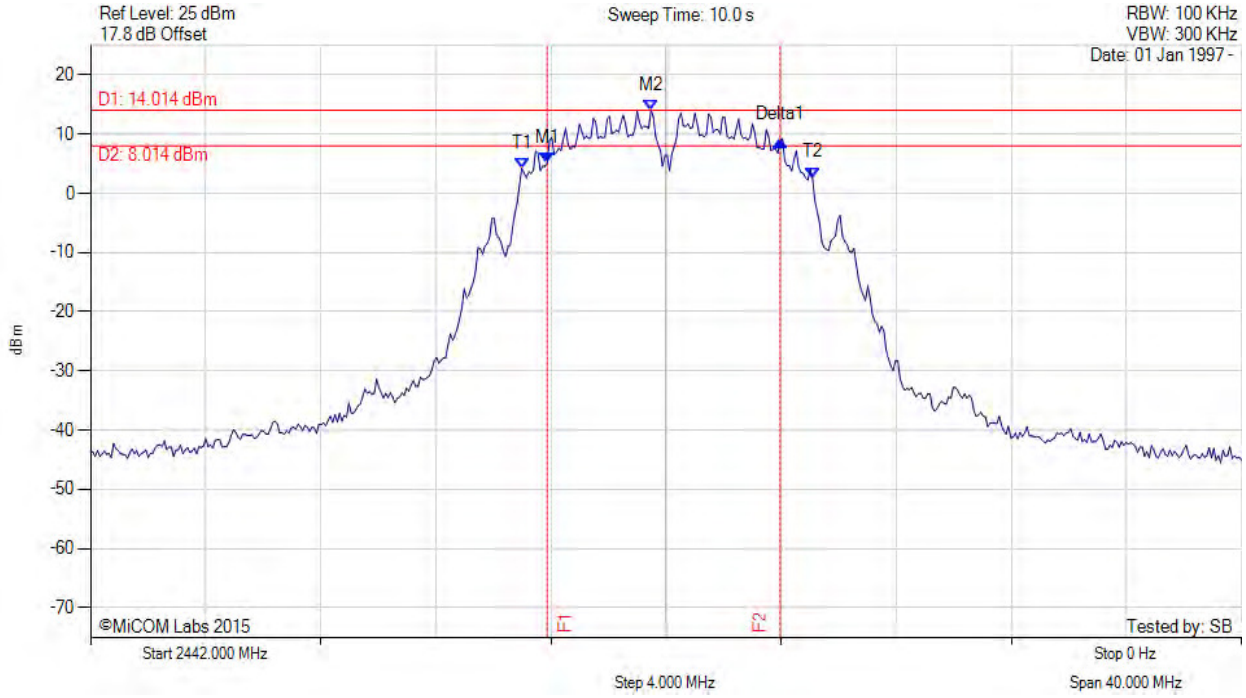



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2457.872 MHz : 5.191 dBm<br>M2 : 2461.479 MHz : 13.796 dBm<br>Delta1 : 8.096 MHz : 3.842 dB<br>T1 : 2456.990 MHz : 4.433 dBm<br>T2 : 2467.090 MHz : 3.062 dBm<br>OBW : 10.100 MHz | Measured 6 dB Bandwidth: 8.096 MHz<br>Limit: ≥500.0 kHz<br>Margin: -7.60 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

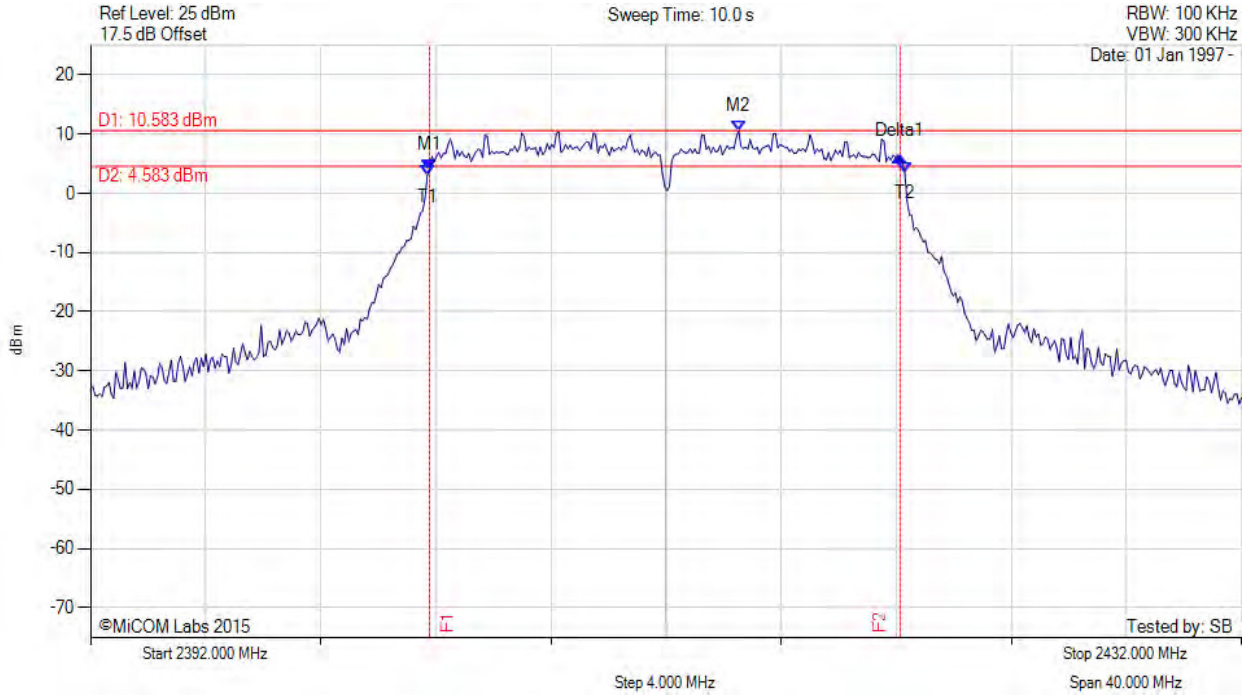



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2457.872 MHz : 5.100 dBm<br>M2 : 2461.479 MHz : 14.014 dBm<br>Delta1 : 8.096 MHz : 3.856 dB<br>T1 : 2456.990 MHz : 4.258 dBm<br>T2 : 2467.090 MHz : 2.653 dBm<br>OBW : 10.100 MHz | Measured 6 dB Bandwidth: 8.096 MHz<br>Limit: ≥500.0 kHz<br>Margin: -7.60 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

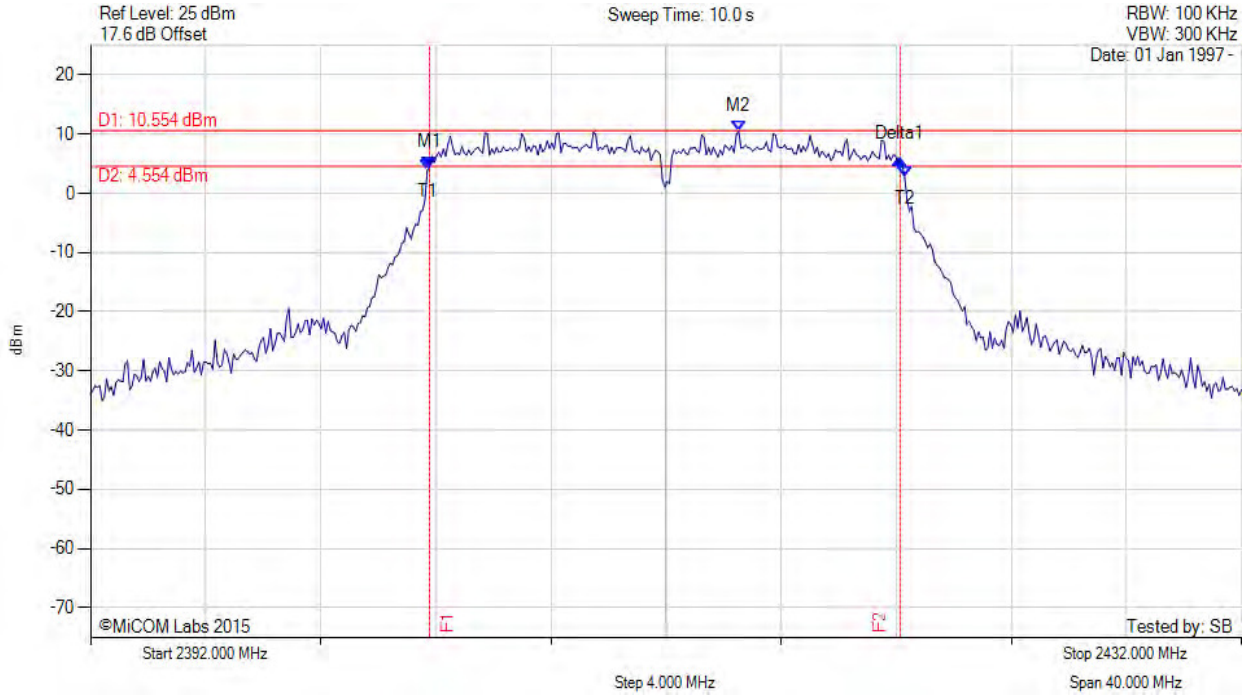



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2403.784 MHz : 3.947 dBm<br>M2 : 2414.525 MHz : 10.583 dBm<br>Delta1 : 16.353 MHz : 2.272 dB<br>T1 : 2403.703 MHz : 2.989 dBm<br>T2 : 2420.297 MHz : 3.554 dBm<br>OBW : 16.593 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Limit: ≥500.0 kHz<br>Margin: -15.85 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

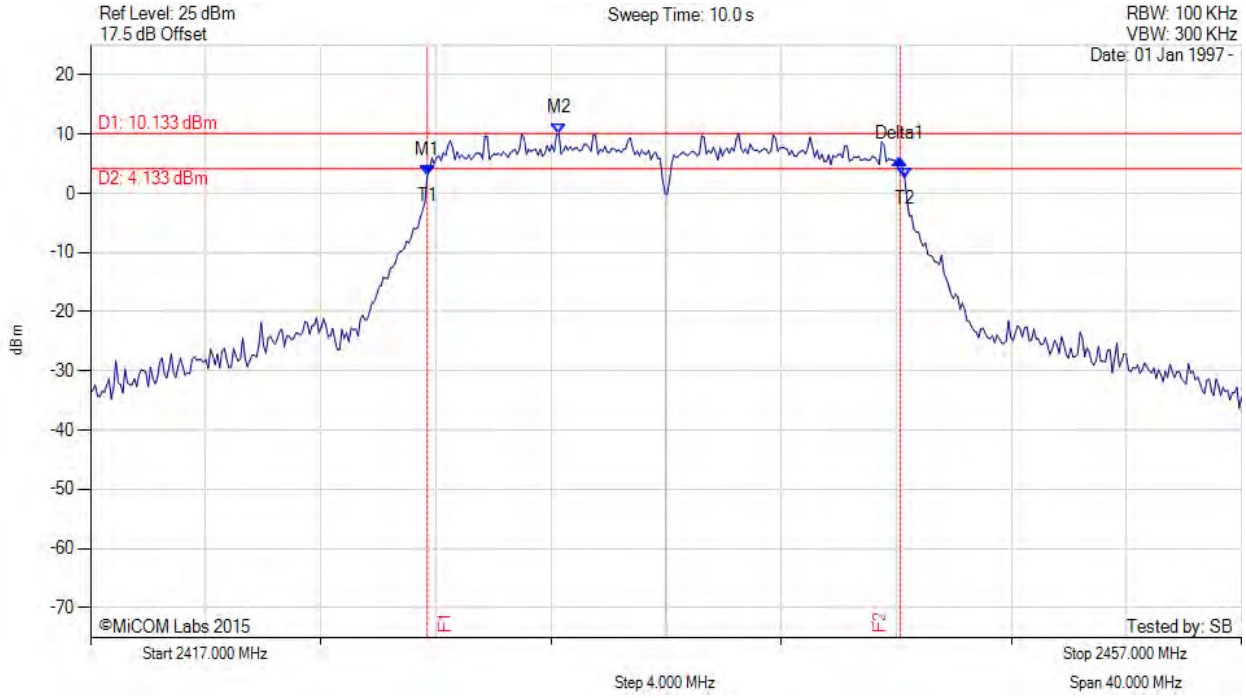



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2403.784 MHz : 4.380 dBm<br>M2 : 2414.525 MHz : 10.554 dBm<br>Delta1 : 16.353 MHz : 1.487 dB<br>T1 : 2403.703 MHz : 3.892 dBm<br>T2 : 2420.297 MHz : 2.680 dBm<br>OBW : 16.593 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Limit: ≥500.0 kHz<br>Margin: -15.85 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

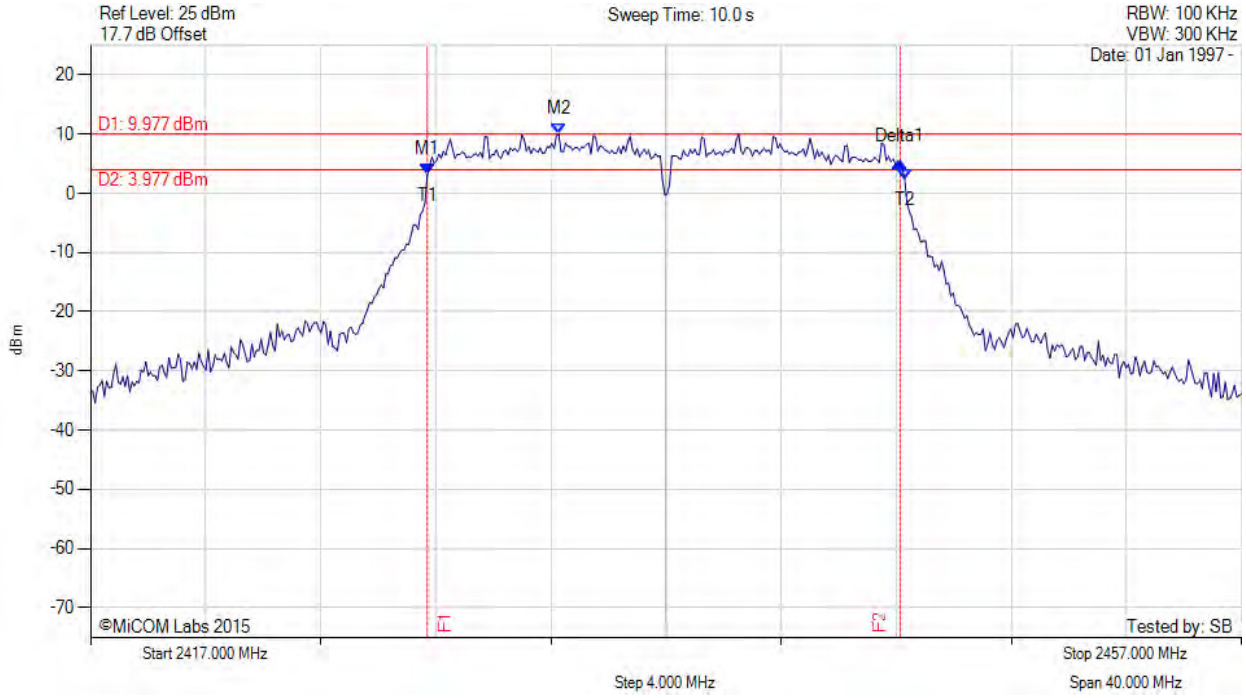



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2428.703 MHz : 3.090 dBm<br>M2 : 2433.273 MHz : 10.133 dBm<br>Delta1 : 16.433 MHz : 2.642 dB<br>T1 : 2428.703 MHz : 3.090 dBm<br>T2 : 2445.297 MHz : 2.576 dBm<br>OBW : 16.593 MHz | Measured 6 dB Bandwidth: 16.433 MHz<br>Limit: ≥500.0 kHz<br>Margin: -15.93 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

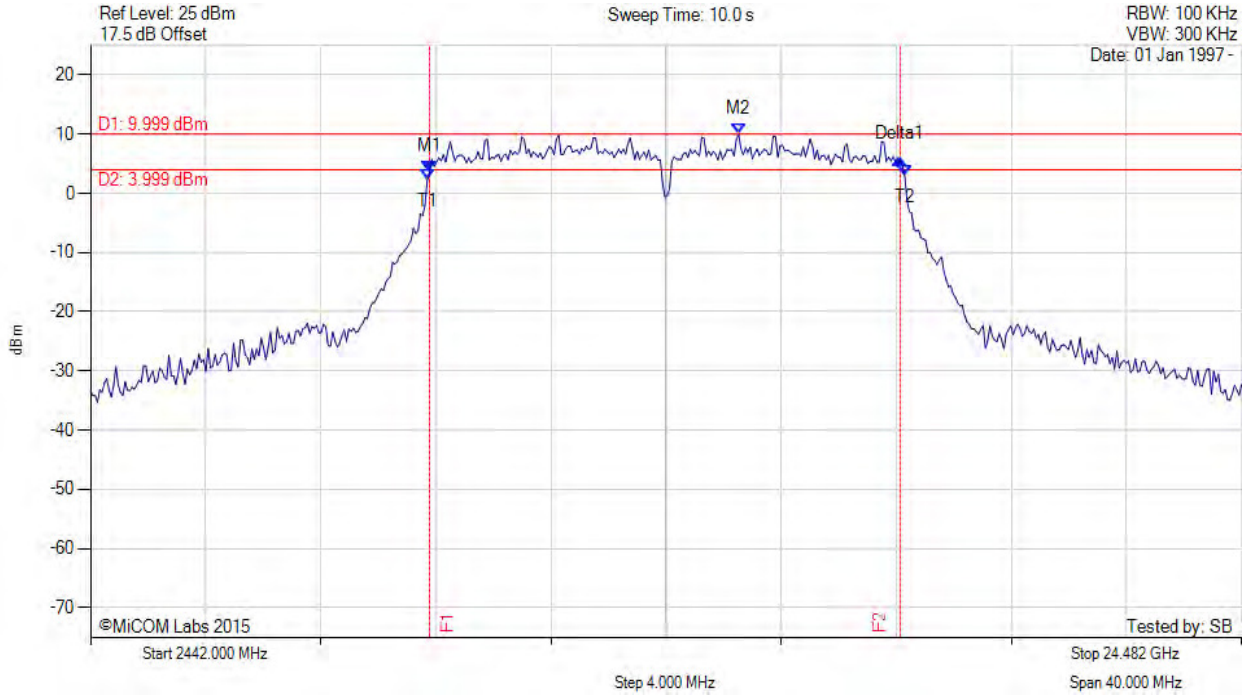



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2428.703 MHz : 3.147 dBm<br>M2 : 2433.273 MHz : 9.977 dBm<br>Delta1 : 16.433 MHz : 2.174 dB<br>T1 : 2428.703 MHz : 3.147 dBm<br>T2 : 2445.297 MHz : 2.419 dBm<br>OBW : 16.593 MHz | Measured 6 dB Bandwidth: 16.433 MHz<br>Limit: ≥500.0 kHz<br>Margin: -15.93 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

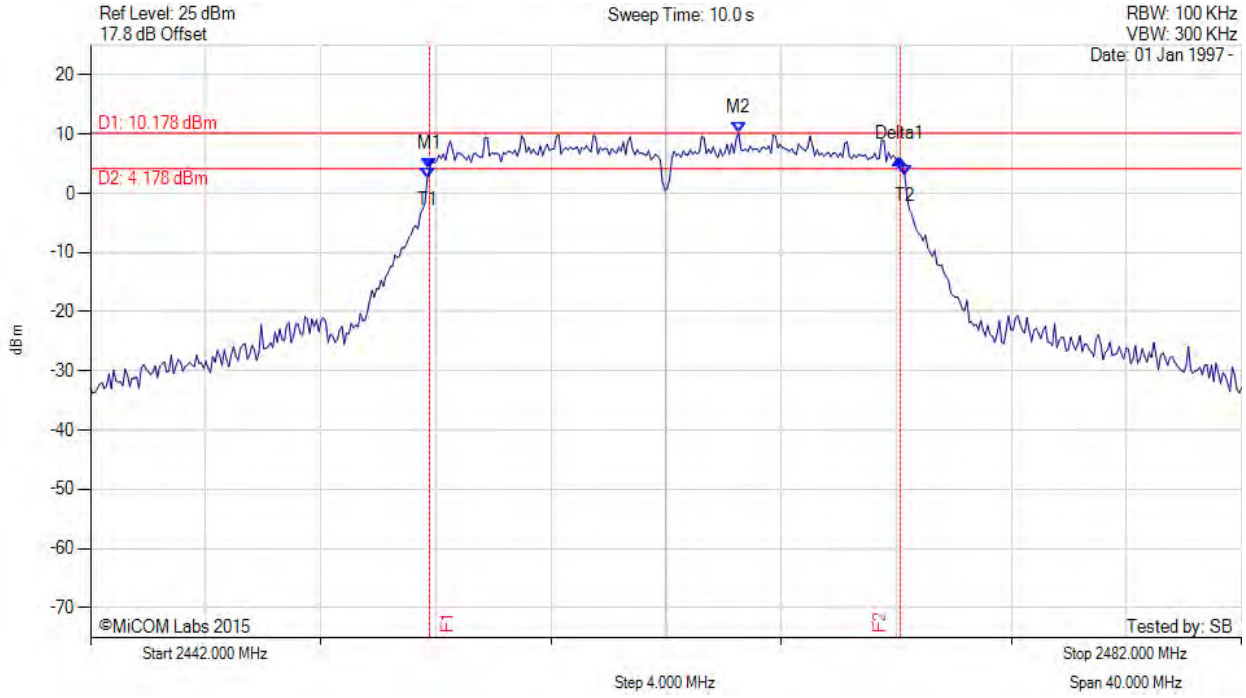



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2453.784 MHz : 3.699 dBm<br>M2 : 2464.525 MHz : 9.999 dBm<br>Delta1 : 16.353 MHz : 2.093 dB<br>T1 : 2453.703 MHz : 2.210 dBm<br>T2 : 2470.297 MHz : 2.958 dBm<br>OBW : 16.593 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Limit: ≥500.0 kHz<br>Margin: -15.85 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

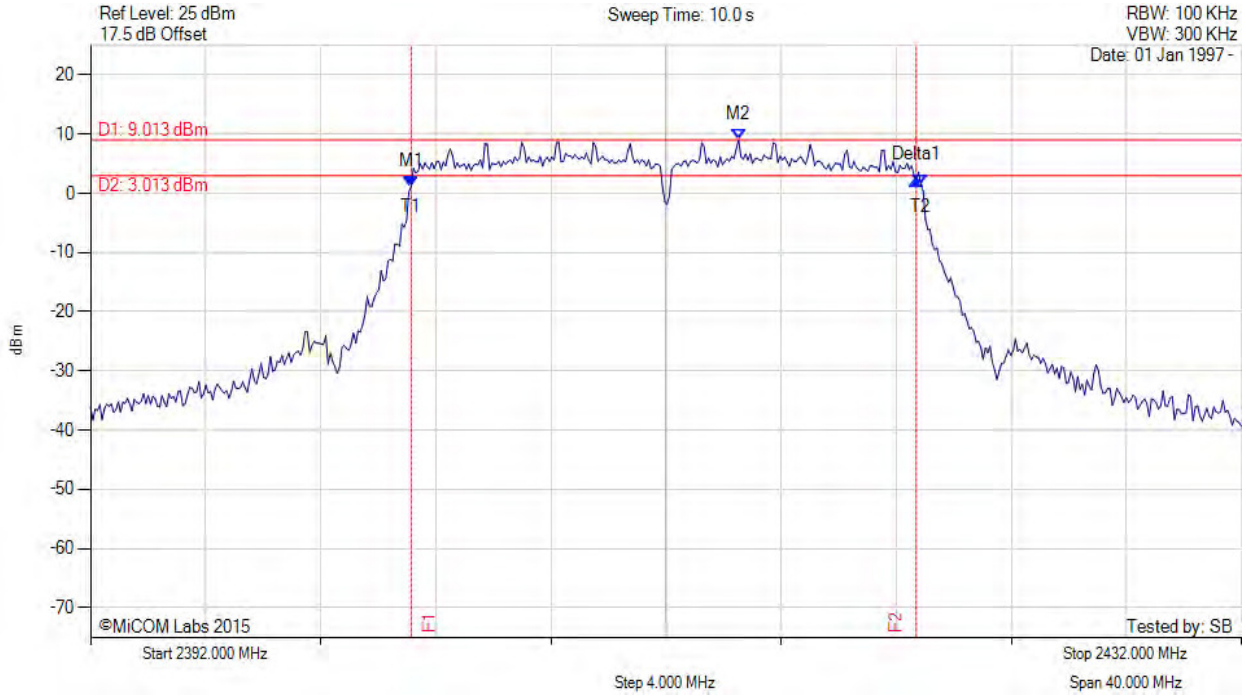



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2453.784 MHz : 4.113 dBm<br>M2 : 2464.525 MHz : 10.178 dBm<br>Delta1 : 16.353 MHz : 1.678 dB<br>T1 : 2453.703 MHz : 2.503 dBm<br>T2 : 2470.297 MHz : 3.095 dBm<br>OBW : 16.593 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Limit: ≥500.0 kHz<br>Margin: -15.85 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

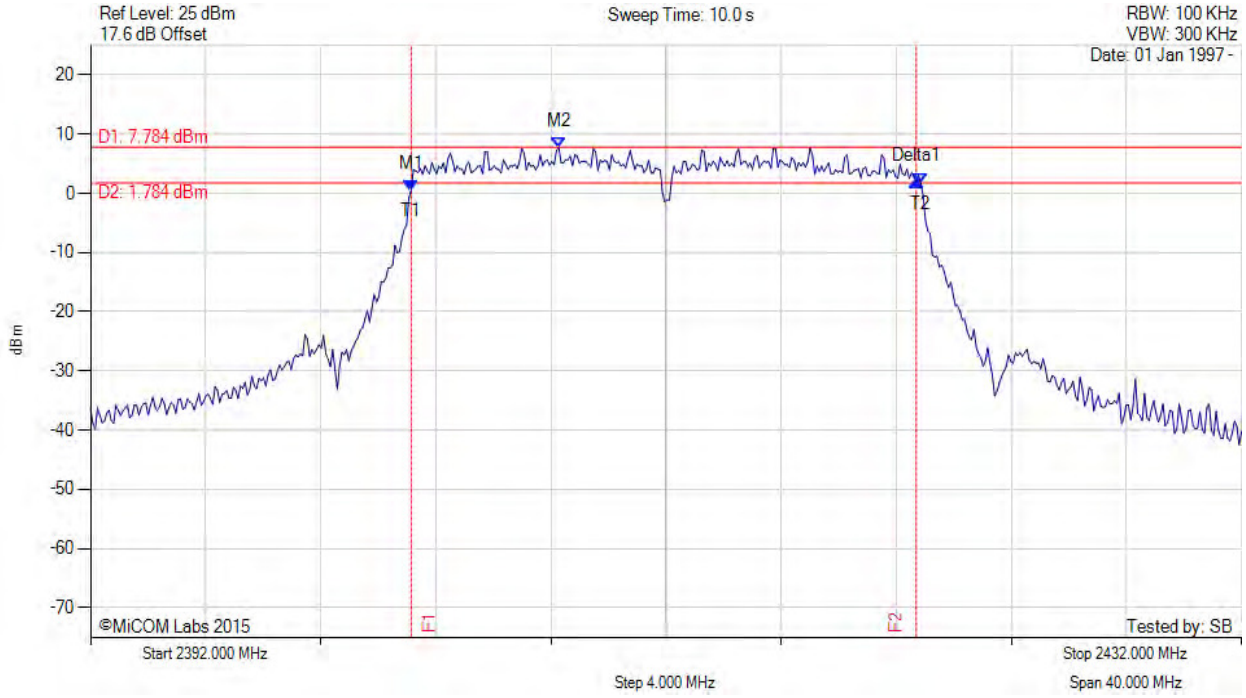



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2403.142 MHz : 1.219 dBm<br>M2 : 2414.525 MHz : 9.013 dBm<br>Delta1 : 17.555 MHz : 1.078 dB<br>T1 : 2403.142 MHz : 1.219 dBm<br>T2 : 2420.858 MHz : 1.335 dBm<br>OBW : 17.715 MHz | Measured 6 dB Bandwidth: 17.555 MHz<br>Limit: ≥500.0 kHz<br>Margin: -17.06 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

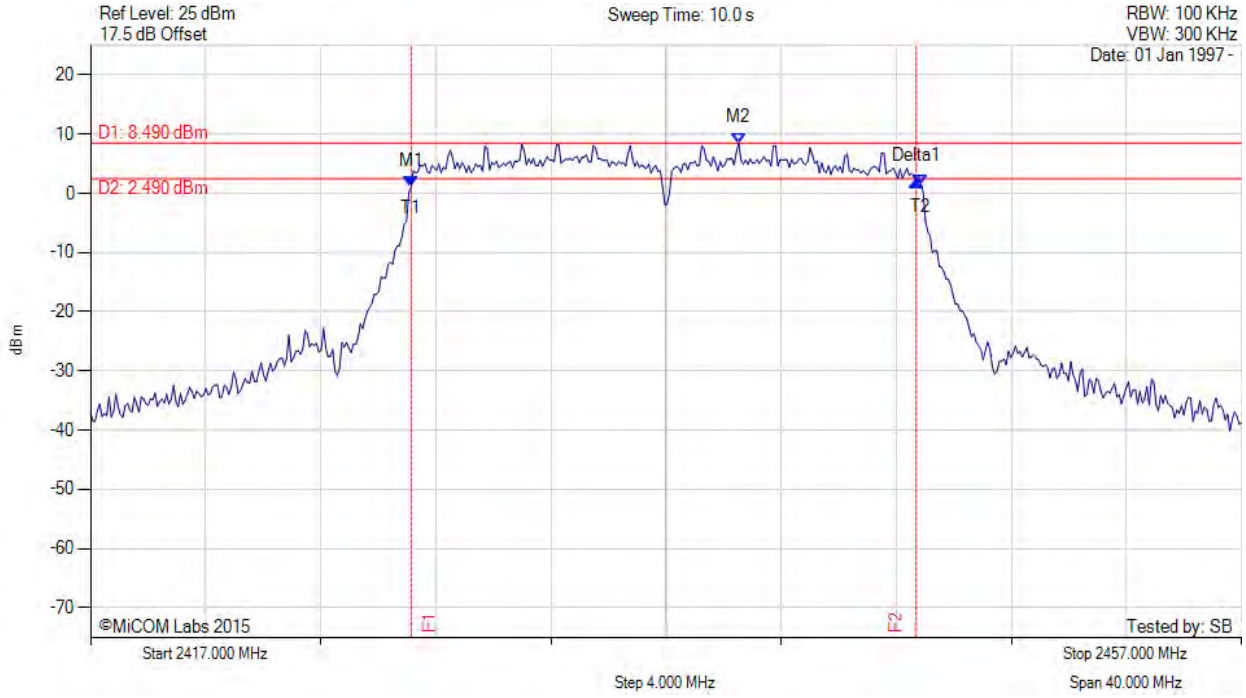



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2403.142 MHz : 0.560 dBm<br>M2 : 2408.273 MHz : 7.784 dBm<br>Delta1 : 17.555 MHz : 1.515 dB<br>T1 : 2403.142 MHz : 0.560 dBm<br>T2 : 2420.858 MHz : 1.653 dBm<br>OBW : 17.715 MHz | Measured 6 dB Bandwidth: 17.555 MHz<br>Limit: ≥500.0 kHz<br>Margin: -17.06 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

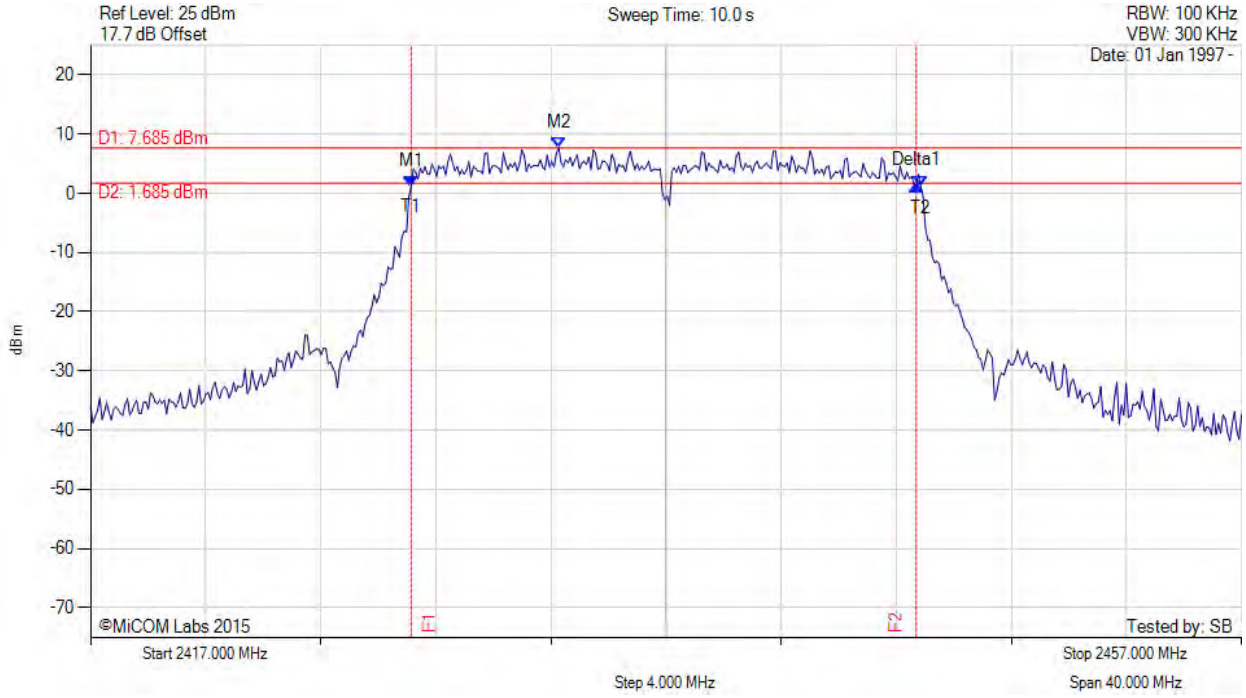



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2428.142 MHz : 1.051 dBm<br>M2 : 2439.525 MHz : 8.490 dBm<br>Delta1 : 17.555 MHz : 0.986 dB<br>T1 : 2428.142 MHz : 1.051 dBm<br>T2 : 2445.858 MHz : 1.335 dBm<br>OBW : 17.715 MHz | Measured 6 dB Bandwidth: 17.555 MHz<br>Limit: ≥500.0 kHz<br>Margin: -17.06 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

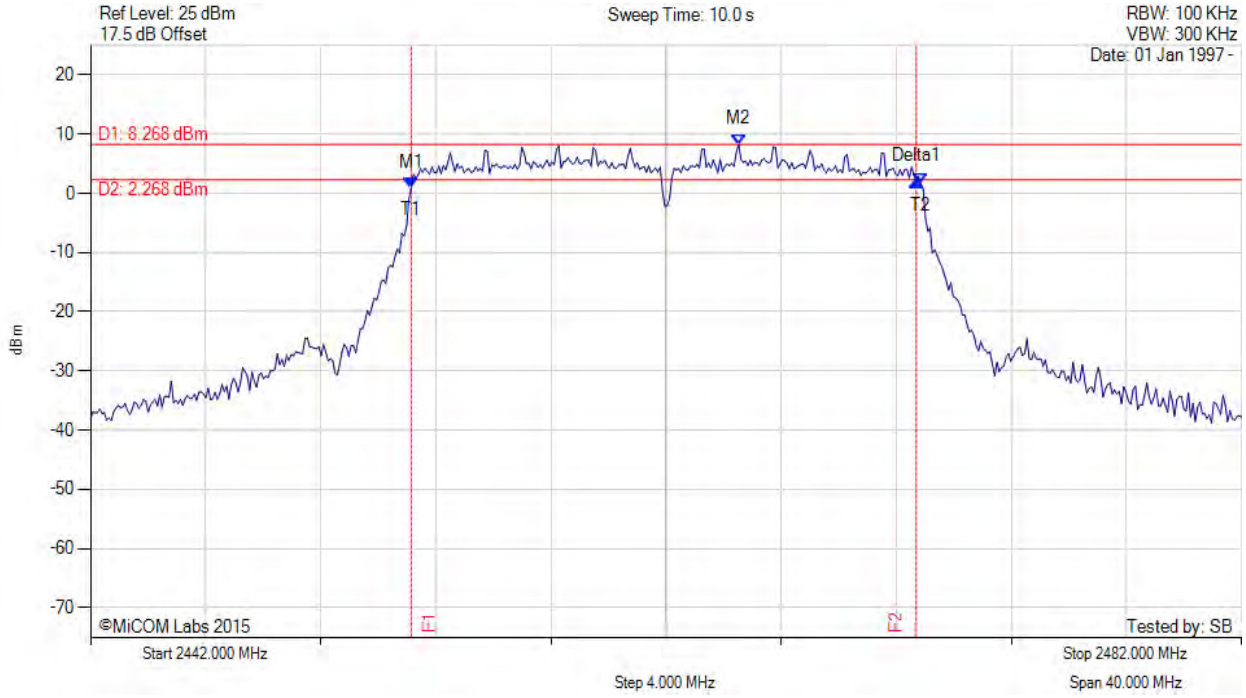



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2428.142 MHz : 1.171 dBm<br>M2 : 2433.273 MHz : 7.685 dBm<br>Delta1 : 17.555 MHz : 0.214 dB<br>T1 : 2428.142 MHz : 1.171 dBm<br>T2 : 2445.858 MHz : 1.103 dBm<br>OBW : 17.715 MHz | Measured 6 dB Bandwidth: 17.555 MHz<br>Limit: ≥500.0 kHz<br>Margin: -17.06 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

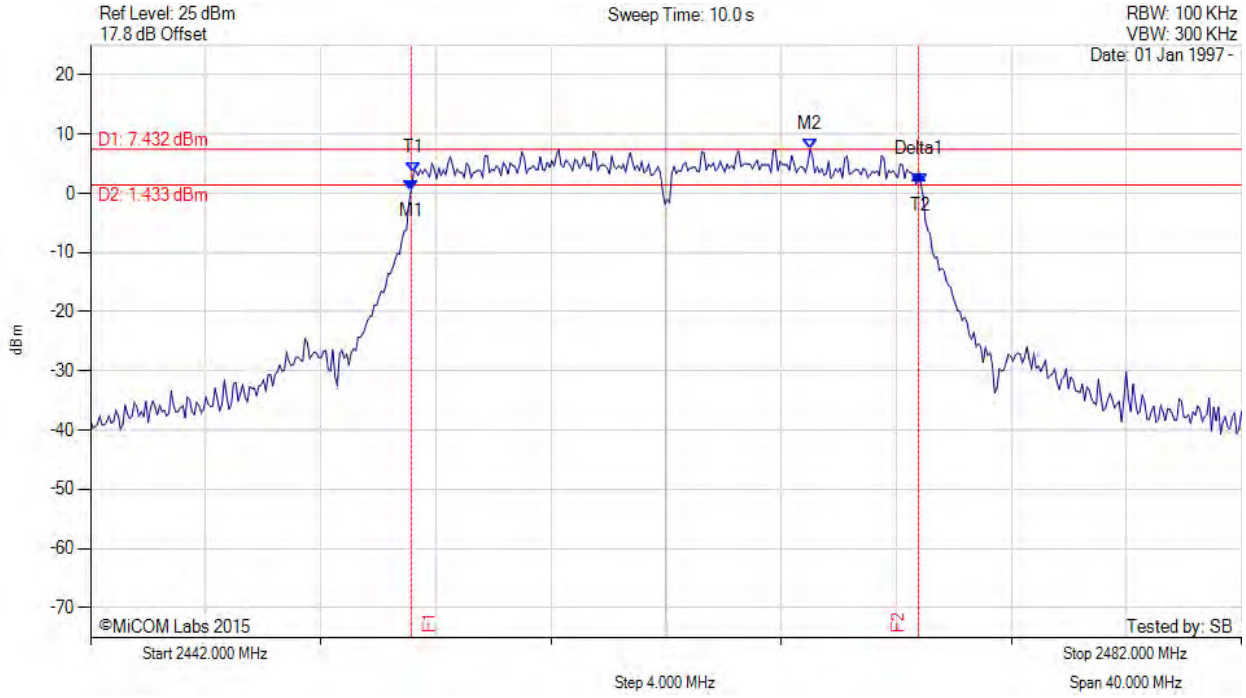



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2453.142 MHz : 0.833 dBm<br>M2 : 2464.525 MHz : 8.268 dBm<br>Delta1 : 17.555 MHz : 1.180 dB<br>T1 : 2453.142 MHz : 0.833 dBm<br>T2 : 2470.858 MHz : 1.543 dBm<br>OBW : 17.715 MHz | Measured 6 dB Bandwidth: 17.555 MHz<br>Limit: ≥500.0 kHz<br>Margin: -17.06 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

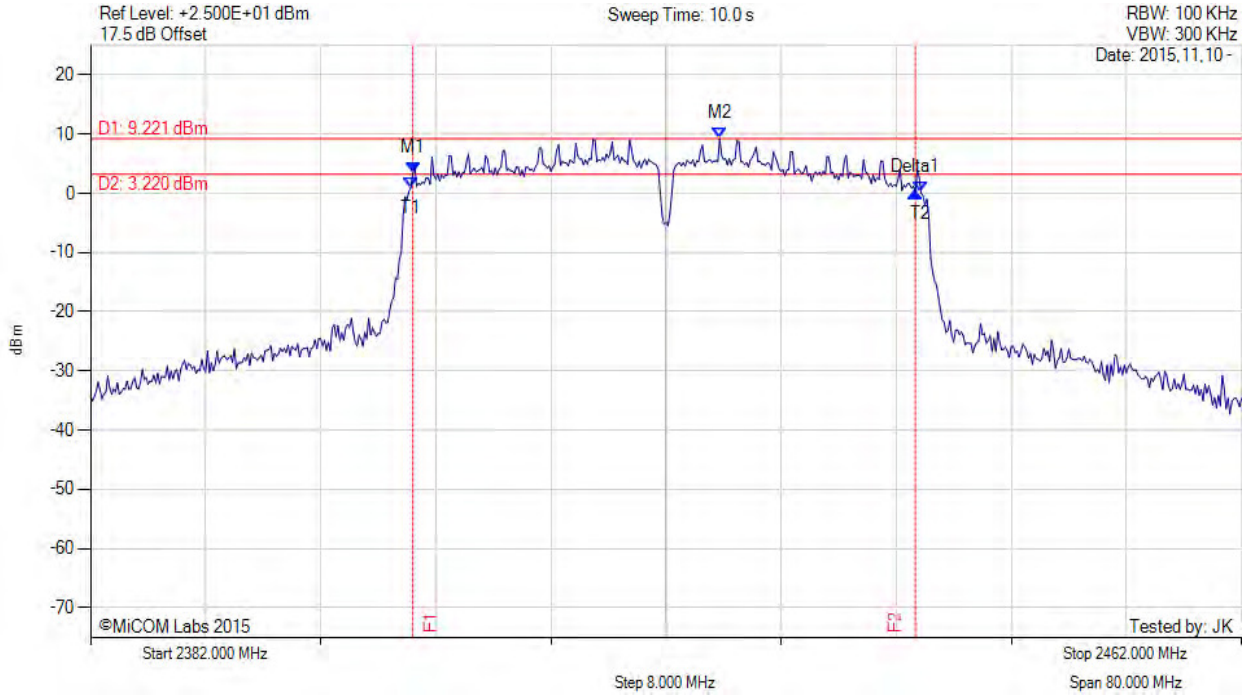



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2453.142 MHz : 0.554 dBm<br>M2 : 2467.010 MHz : 7.432 dBm<br>Delta1 : 17.635 MHz : 2.752 dB<br>T1 : 2453.222 MHz : 3.406 dBm<br>T2 : 2470.858 MHz : 1.557 dBm<br>OBW : 17.635 MHz | Measured 6 dB Bandwidth: 17.635 MHz<br>Limit: ≥500.0 kHz<br>Margin: -17.14 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

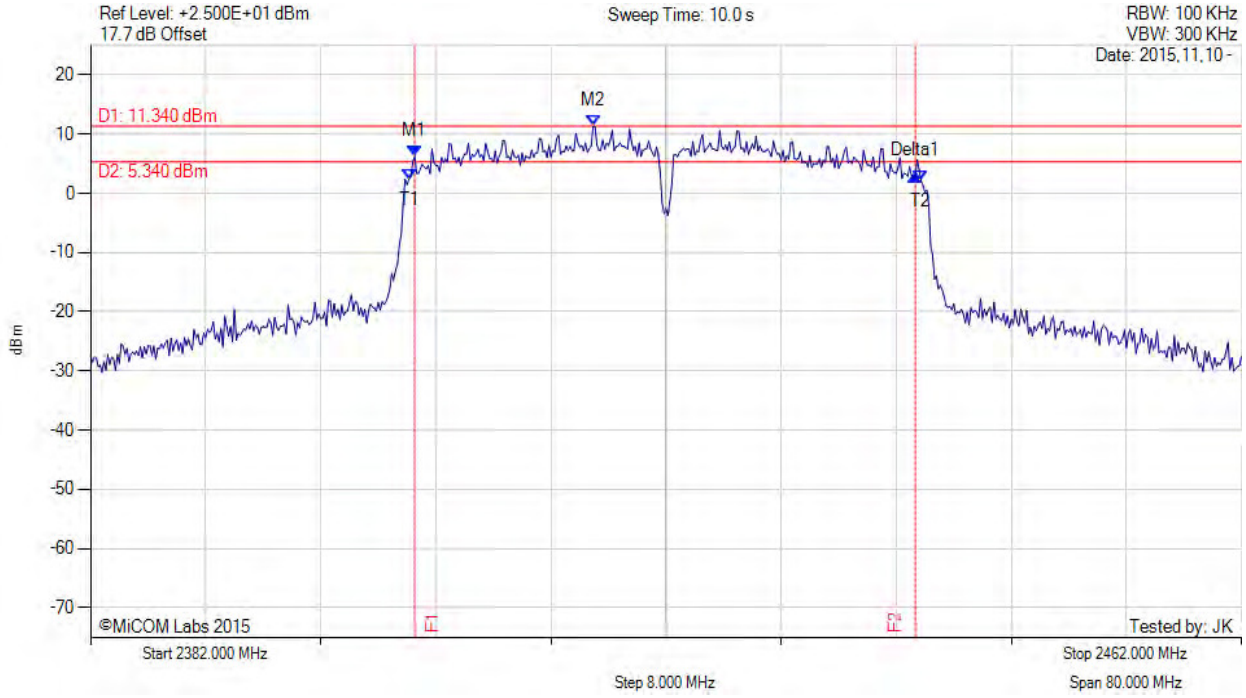



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = POS<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAXH | M1 : 2404.400 MHz : 3.393 dBm<br>M2 : 2425.730 MHz : 9.221 dBm<br>Delta1 : 34.930 MHz : -3.261 dB<br>T1 : 2404.267 MHz : 0.973 dBm<br>T2 : 2439.733 MHz : 0.097 dBm<br>OBW : 35.419 MHz | Measured 6 dB Bandwidth: 34.930 MHz<br>Limit: ≥500.0 kHz<br>Margin: -34.43 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

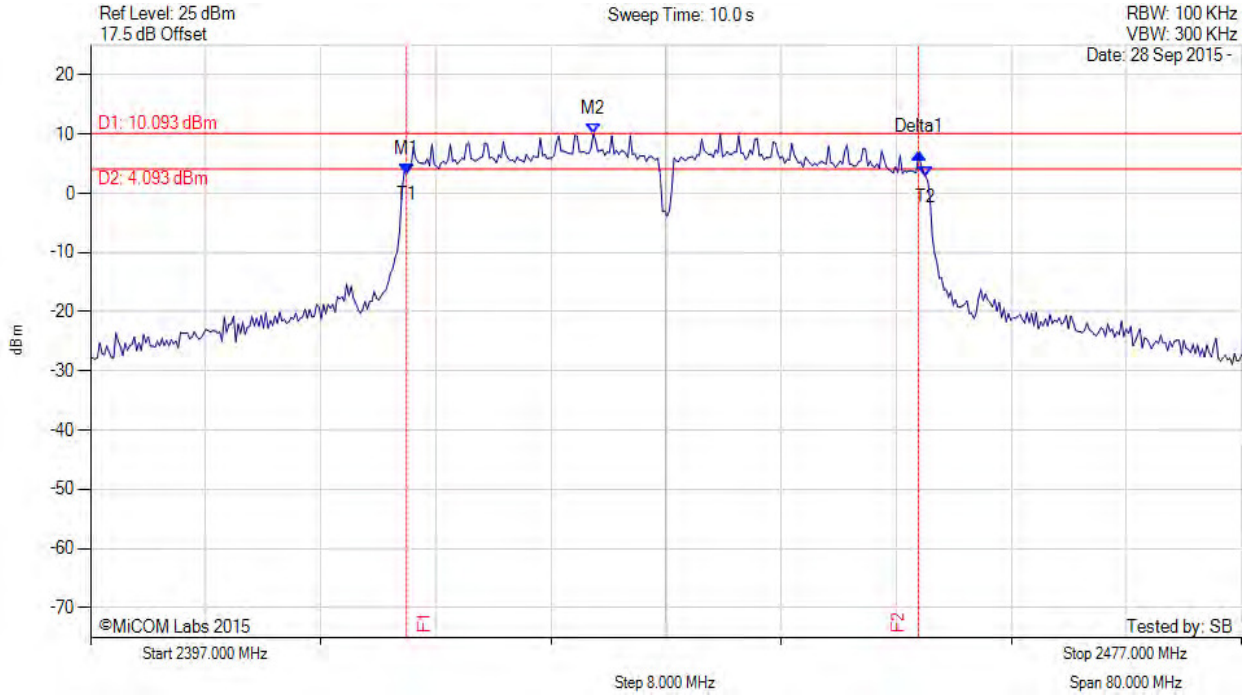



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = POS<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAXH | M1 : 2404.530 MHz : 6.262 dBm<br>M2 : 2416.930 MHz : 11.340 dBm<br>Delta1 : 34.800 MHz : -3.338 dB<br>T1 : 2404.133 MHz : 2.377 dBm<br>T2 : 2439.733 MHz : 2.172 dBm<br>OBW : 35.491 MHz | Measured 6 dB Bandwidth: 34.800 MHz<br>Limit: ≥500.0 kHz<br>Margin: -34.30 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

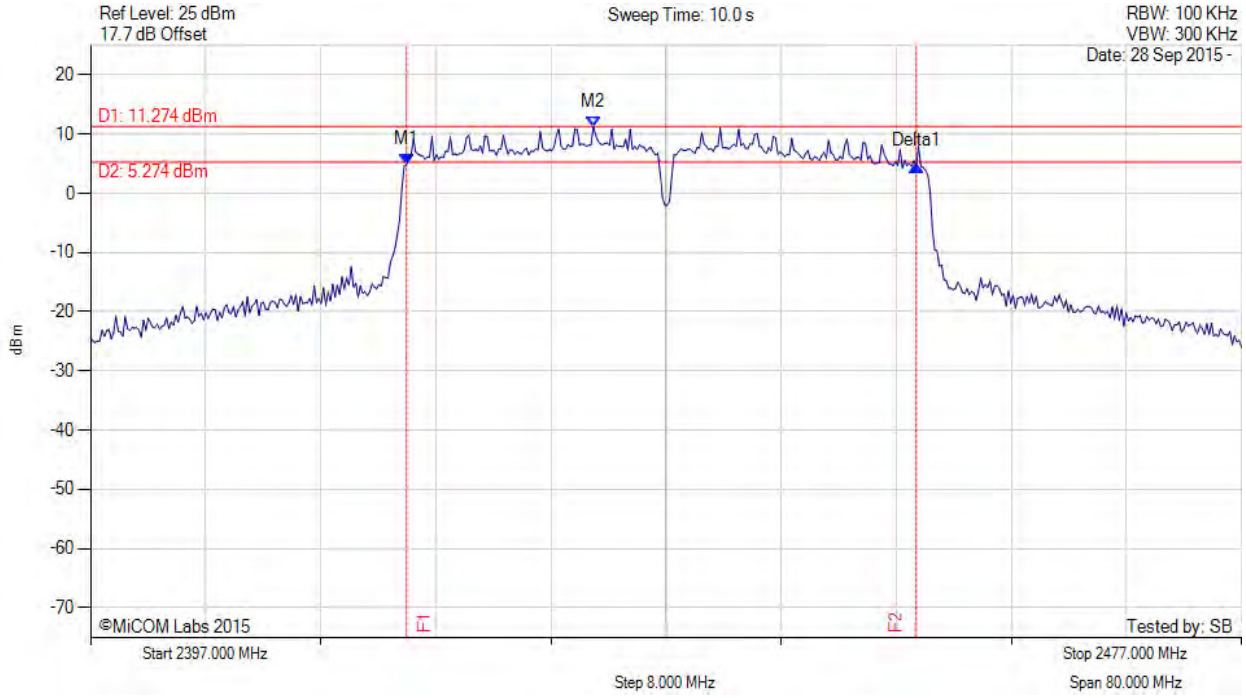



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2418.964 MHz : 3.316 dBm<br>M2 : 2431.950 MHz : 10.093 dBm<br>Delta1 : 35.591 MHz : 3.533 dB<br>T1 : 2418.964 MHz : 3.316 dBm<br>T2 : 2455.036 MHz : 2.869 dBm<br>OBW : 36.072 MHz | Measured 6 dB Bandwidth: 35.591 MHz<br>Limit: ≥500.0 kHz<br>Margin: -35.09 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

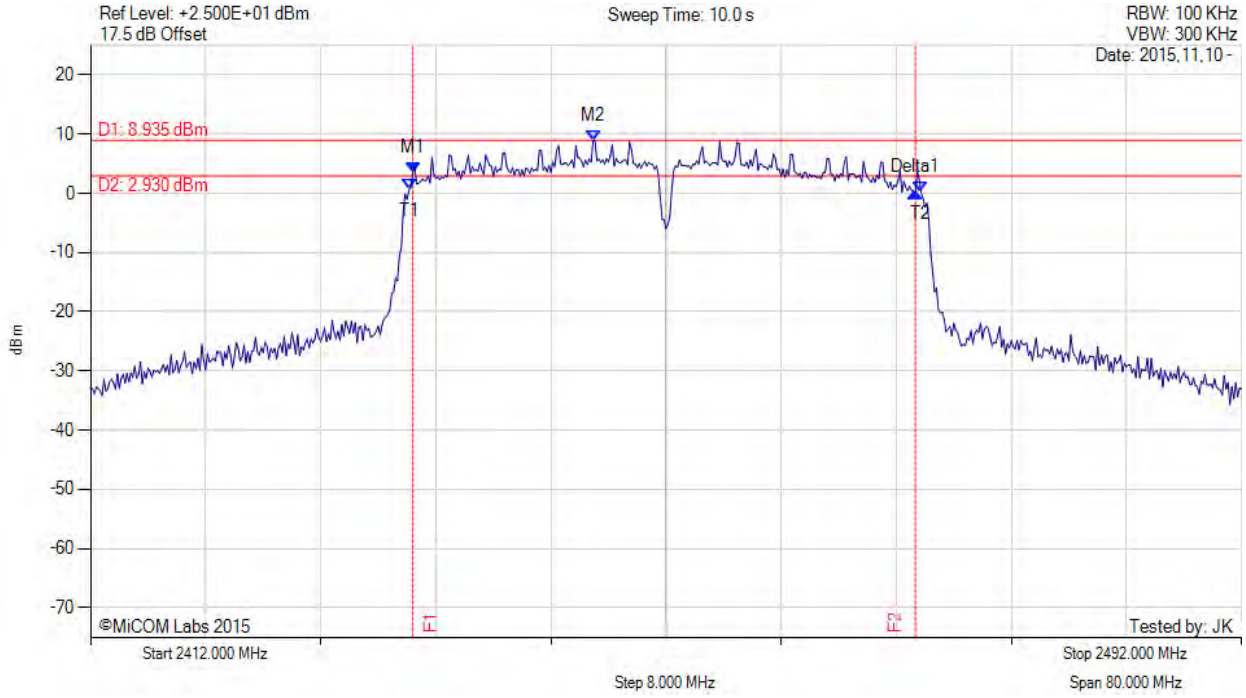



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 2418.964 MHz : 4.962 dBm<br>M2 : 2431.950 MHz : 11.274 dBm<br>Delta1 : 35.431 MHz : -0.244 dB<br>T1 : 0 Hz : 500.000 dBm<br>T2 : 0 Hz : 500.000 dBm<br>OBW : 36.232 MHz | Measured 6 dB Bandwidth: 35.431 MHz<br>Limit: ≥500.0 kHz<br>Margin: -34.93 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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

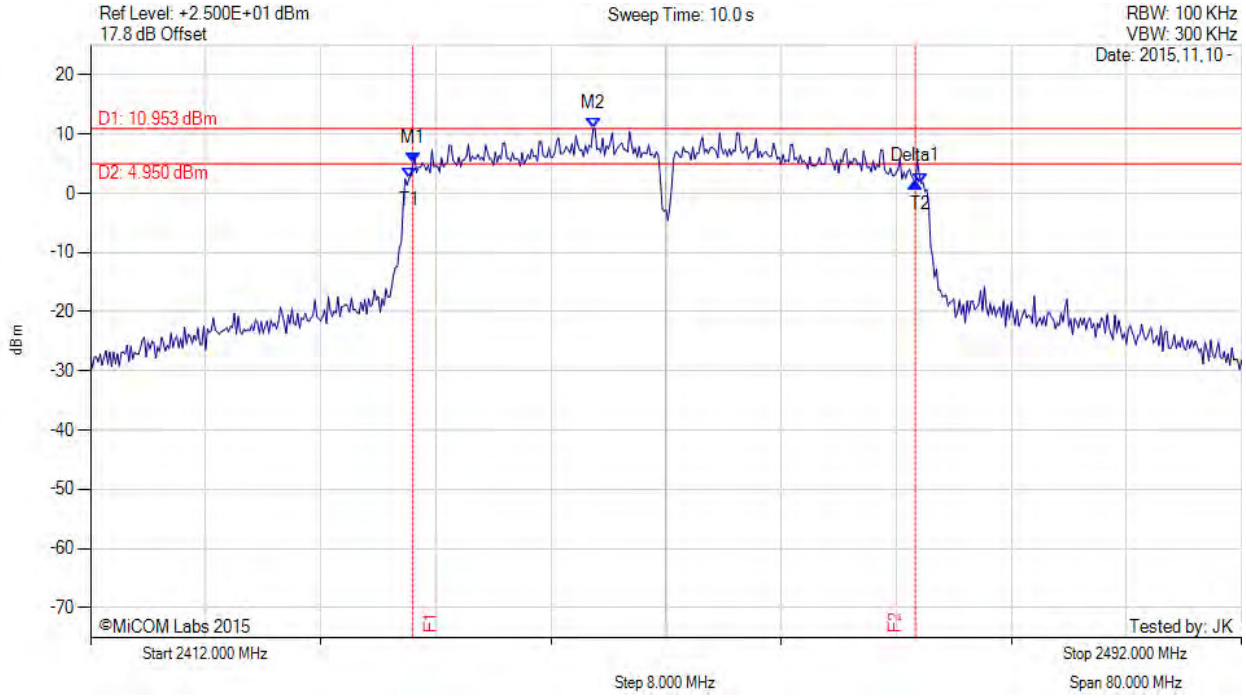



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = POS<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAXH | M1 : 2434.400 MHz : 3.553 dBm<br>M2 : 2446.930 MHz : 8.935 dBm<br>Delta1 : 34.930 MHz : -3.333 dB<br>T1 : 2434.133 MHz : 0.603 dBm<br>T2 : 2469.733 MHz : 0.135 dBm<br>OBW : 35.475 MHz | Measured 6 dB Bandwidth: 34.930 MHz<br>Limit: ≥500.0 kHz<br>Margin: -34.43 MHz |

back to matrix

6 dB & 99% BANDWIDTH

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



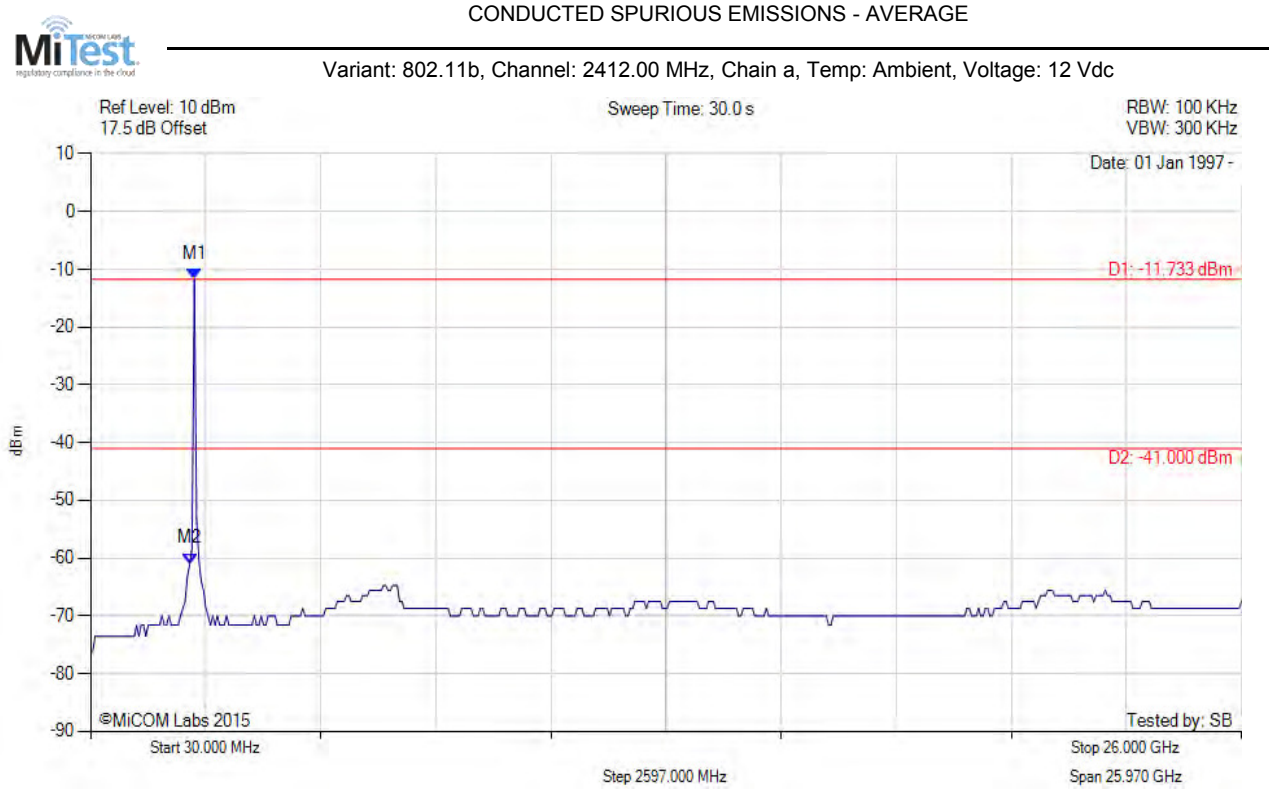

| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = POS<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAXH | M1 : 2434.400 MHz : 5.005 dBm<br>M2 : 2446.930 MHz : 10.953 dBm<br>Delta1 : 34.930 MHz : -3.066 dB<br>T1 : 2434.133 MHz : 2.514 dBm<br>T2 : 2469.733 MHz : 1.707 dBm<br>OBW : 35.602 MHz | Measured 6 dB Bandwidth: 34.930 MHz<br>Limit: ≥500.0 kHz<br>Margin: -34.43 MHz |

back to matrix

# A.2. Emissions

## A.2.1. Conducted Emissions

### A.2.1.1. Conducted Spurious Emissions

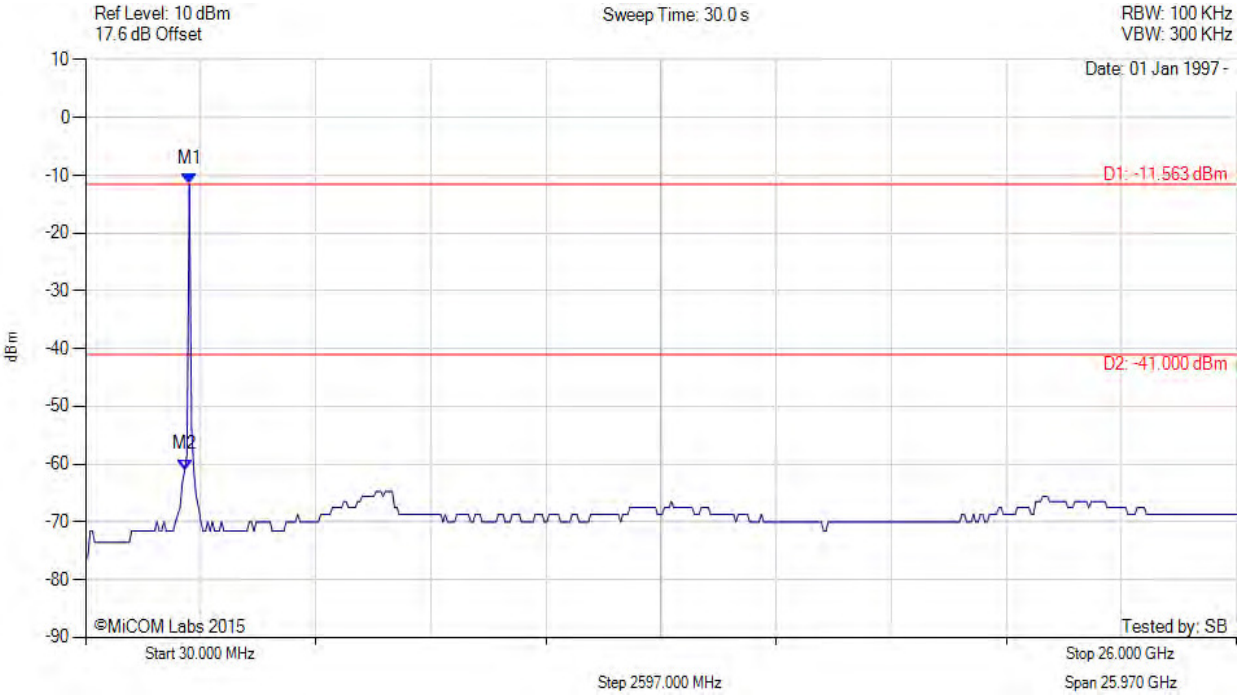



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2371.984 MHz : -11.733 dBm<br>M2 : 2267.896 MHz : -60.956 dBm | Limit: -41.00 dBm<br>Margin: -19.96 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

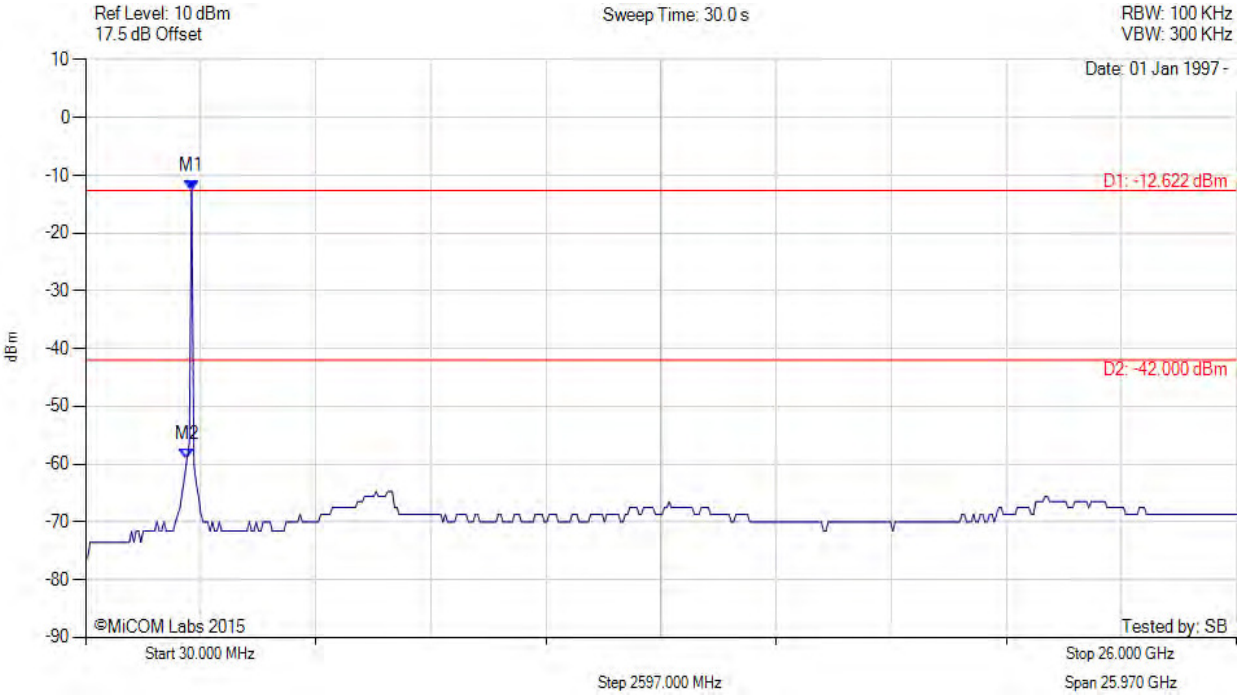



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2371.984 MHz : -11.563 dBm<br>M2 : 2267.896 MHz : -60.956 dBm | Limit: -41.00 dBm<br>Margin: -19.96 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

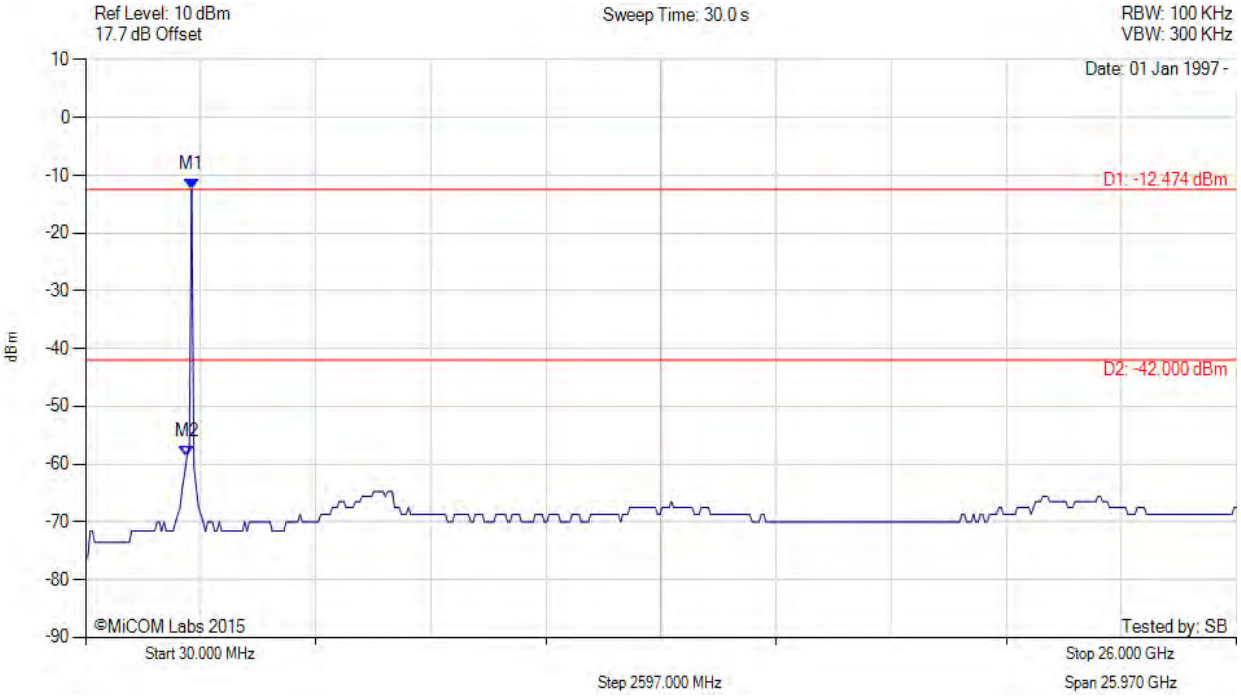



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -12.622 dBm<br>M2 : 2319.940 MHz : -59.121 dBm | Limit: -42.00 dBm<br>Margin: -17.12 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

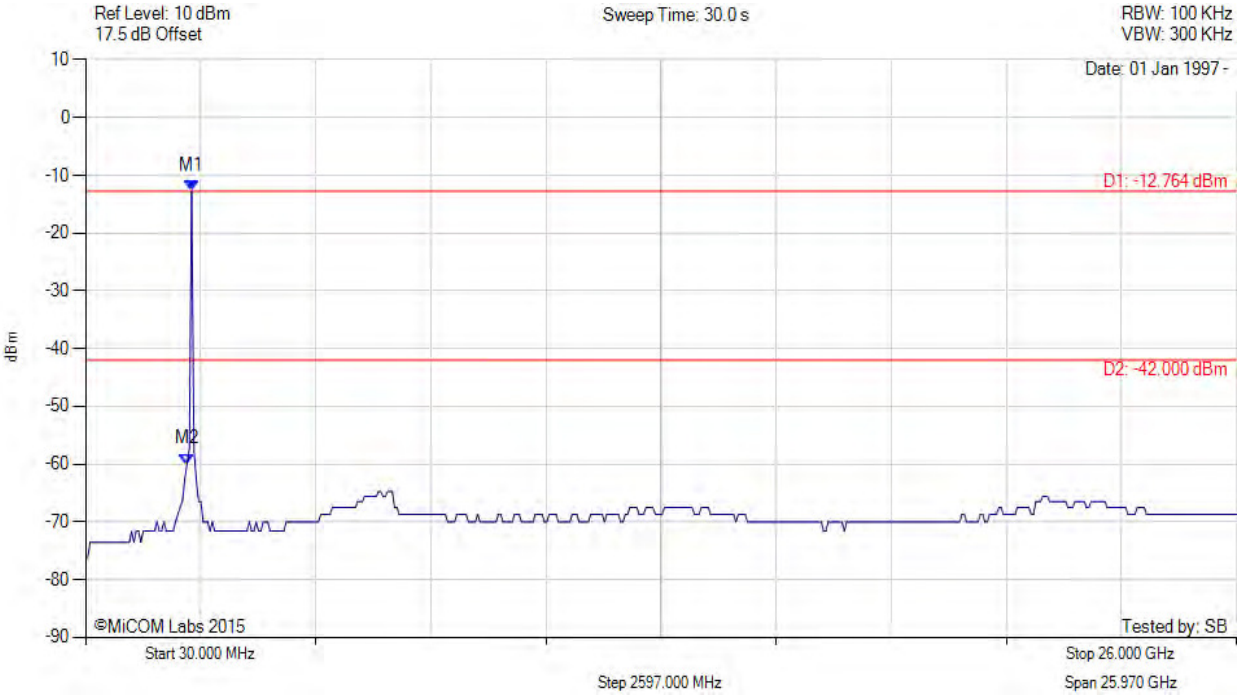



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -12.474 dBm<br>M2 : 2319.940 MHz : -58.717 dBm | Limit: -42.00 dBm<br>Margin: -16.72 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

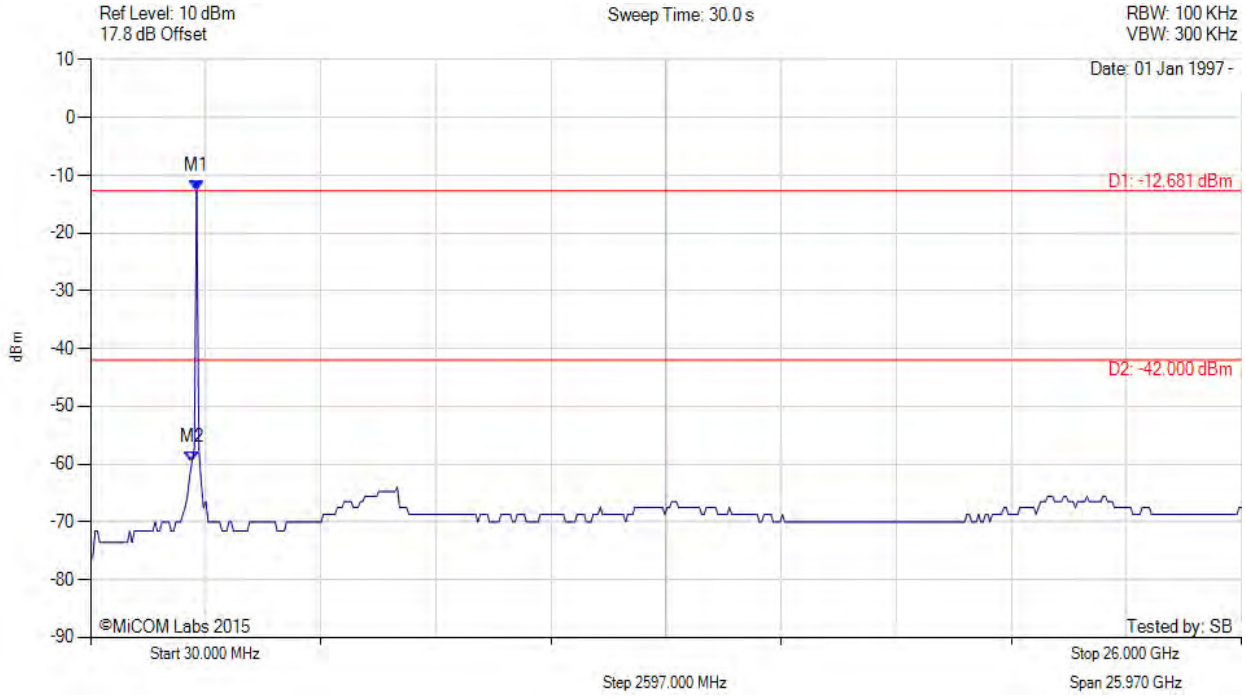



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -12.764 dBm<br>M2 : 2319.940 MHz : -59.990 dBm | Limit: -42.00 dBm<br>Margin: -17.99 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

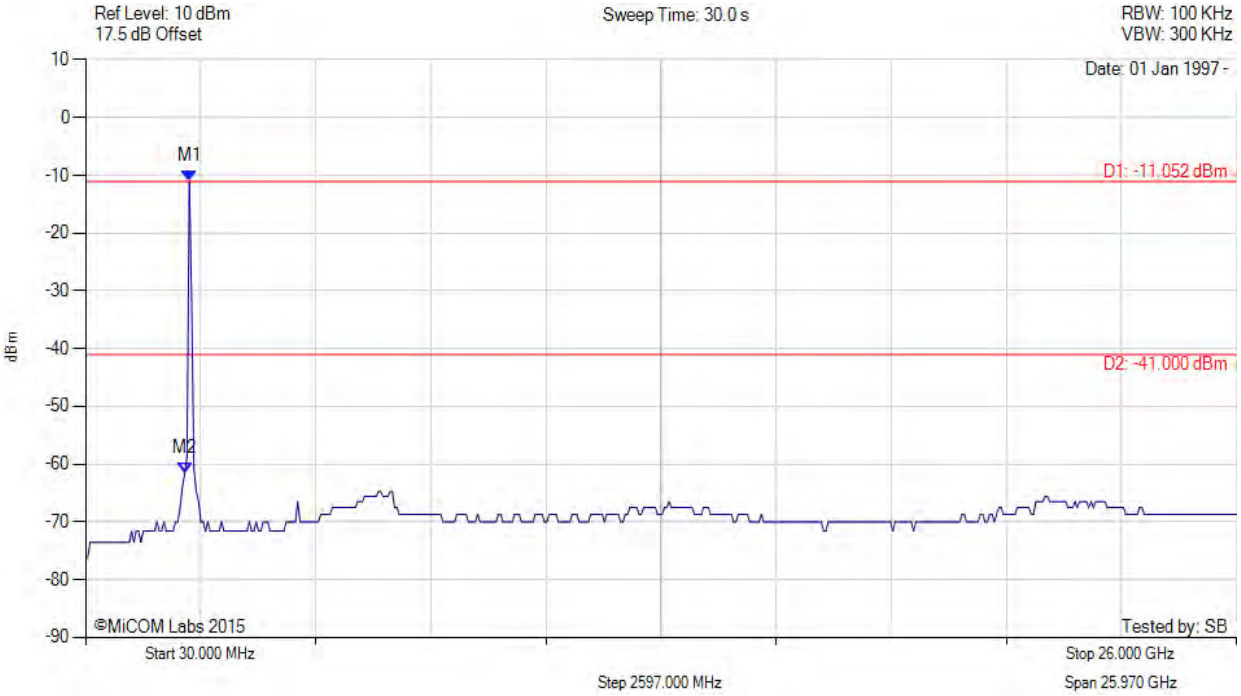



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -12.681 dBm<br>M2 : 2319.940 MHz : -59.545 dBm | Limit: -42.00 dBm<br>Margin: -17.55 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

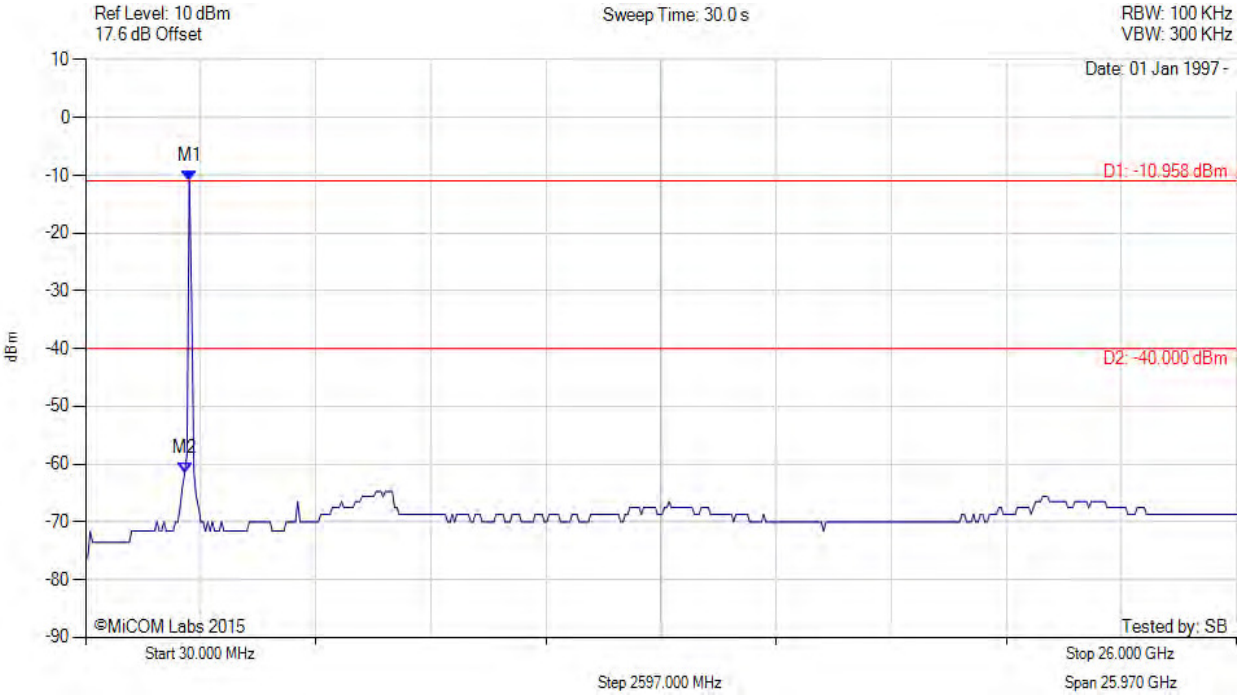



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2371.984 MHz : -11.052 dBm<br>M2 : 2267.896 MHz : -61.483 dBm | Limit: -41.00 dBm<br>Margin: -20.48 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

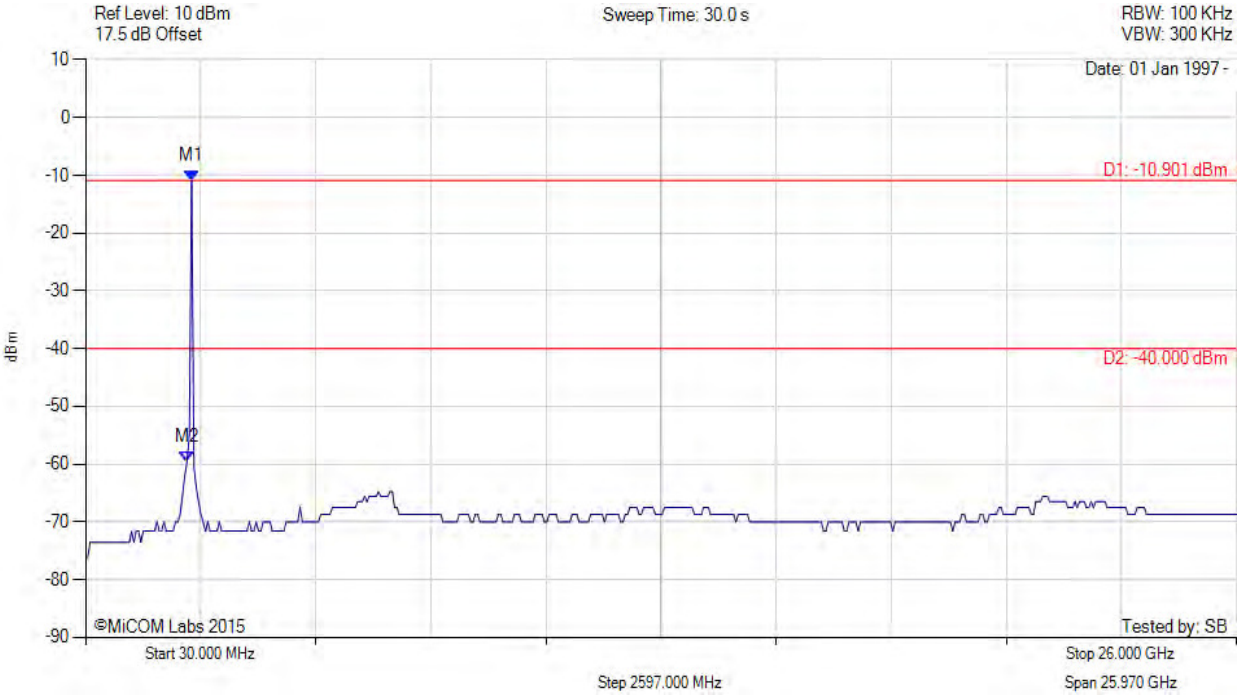



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2371.984 MHz : -10.958 dBm<br>M2 : 2267.896 MHz : -61.483 dBm | Limit: -40.00 dBm<br>Margin: -21.48 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

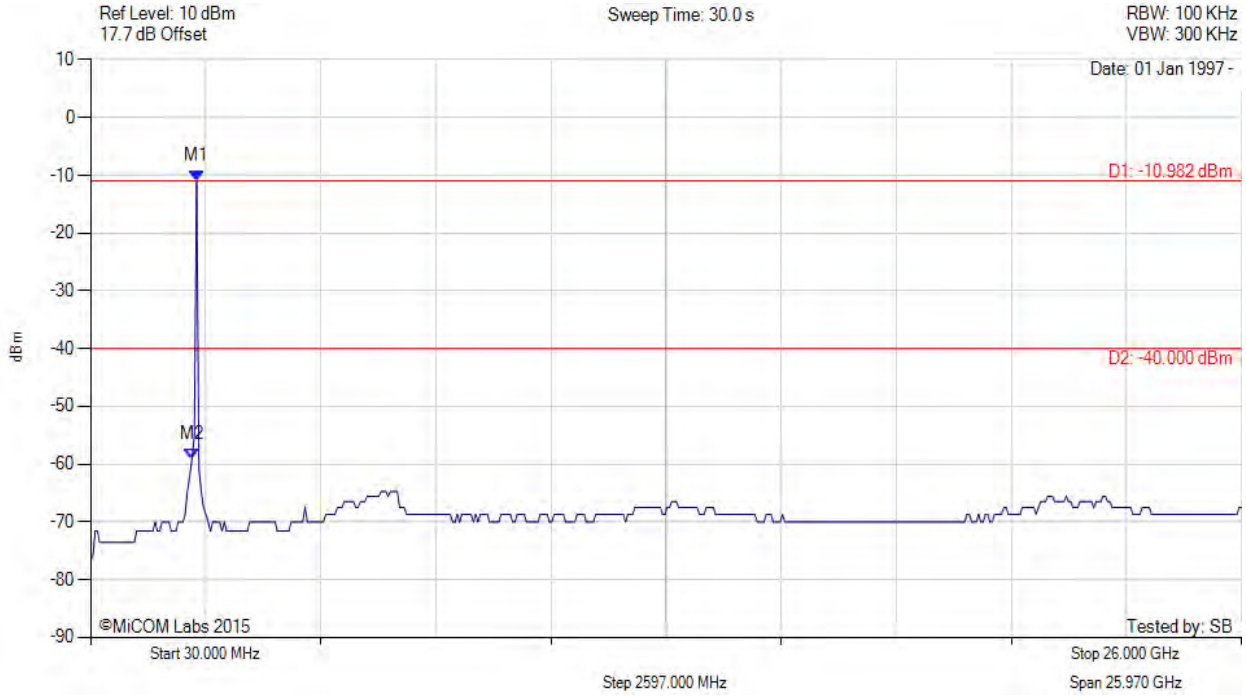



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -10.901 dBm<br>M2 : 2319.940 MHz : -59.545 dBm | Limit: -40.00 dBm<br>Margin: -19.55 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

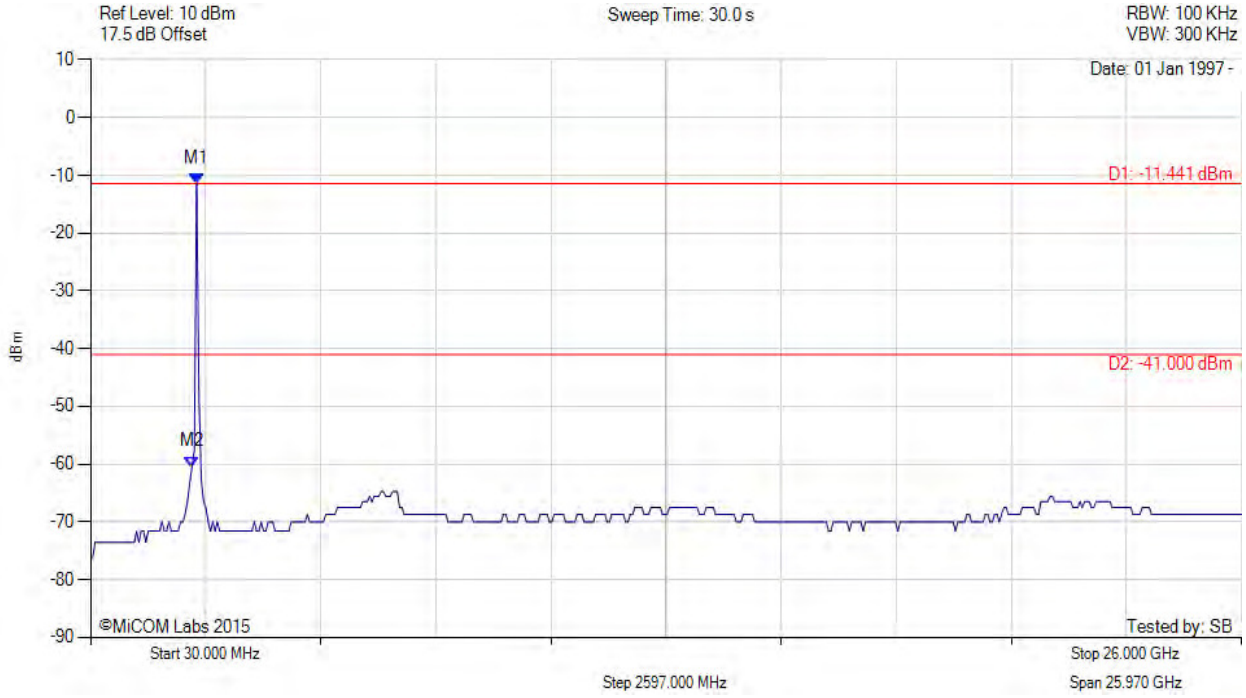



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -10.982 dBm<br>M2 : 2319.940 MHz : -59.121 dBm | Limit: -40.00 dBm<br>Margin: -19.12 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

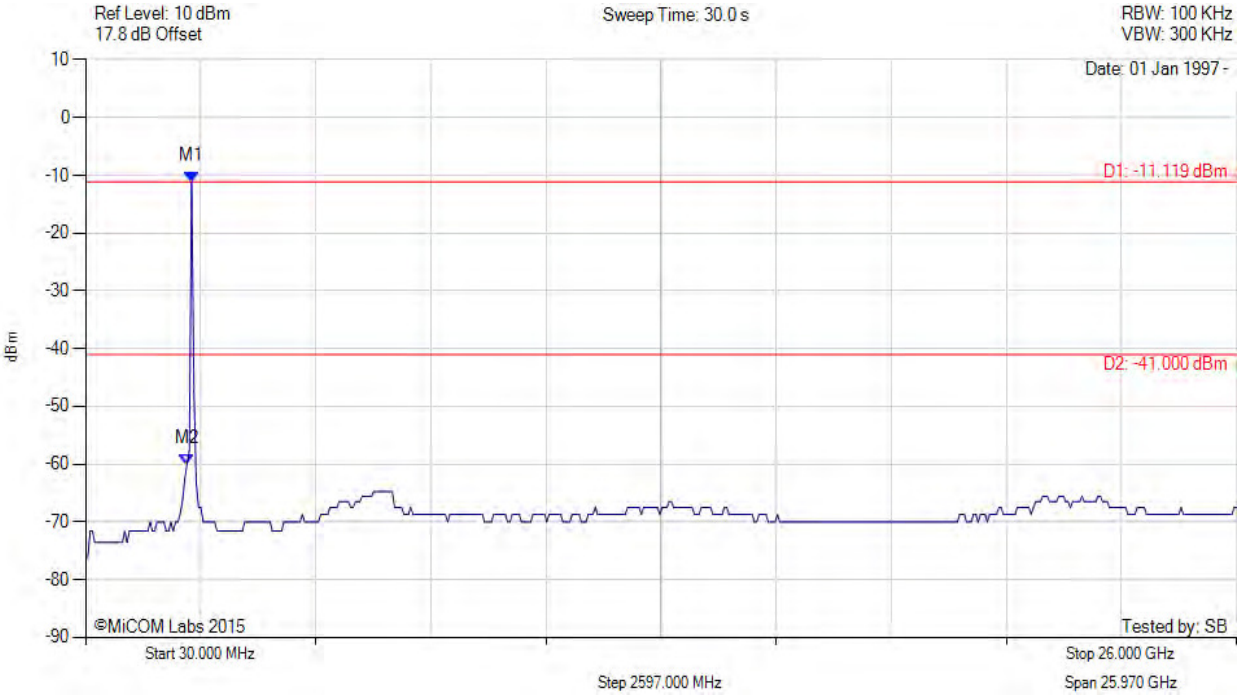



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -11.441 dBm<br>M2 : 2319.940 MHz : -60.460 dBm | Limit: -41.00 dBm<br>Margin: -19.46 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

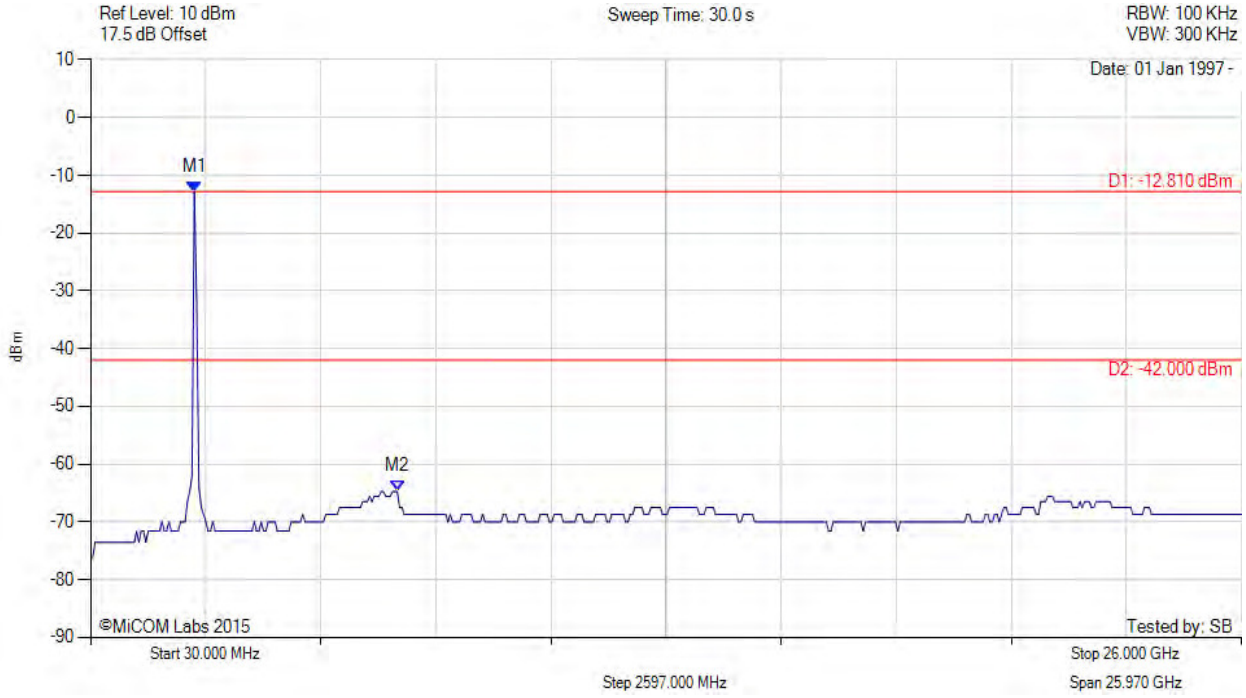



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -11.119 dBm<br>M2 : 2319.940 MHz : -59.990 dBm | Limit: -41.00 dBm<br>Margin: -18.99 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

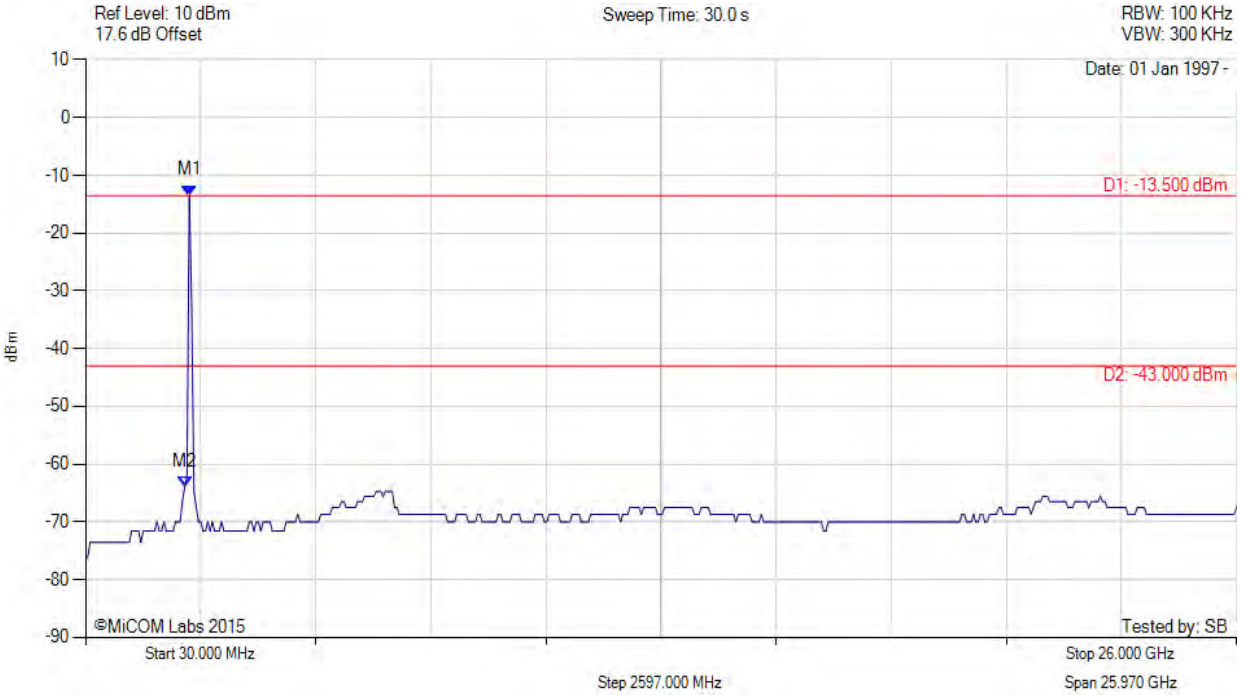



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2371.984 MHz : -12.810 dBm<br>M2 : 6951.864 MHz : -64.737 dBm | Limit: -42.00 dBm<br>Margin: -22.74 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

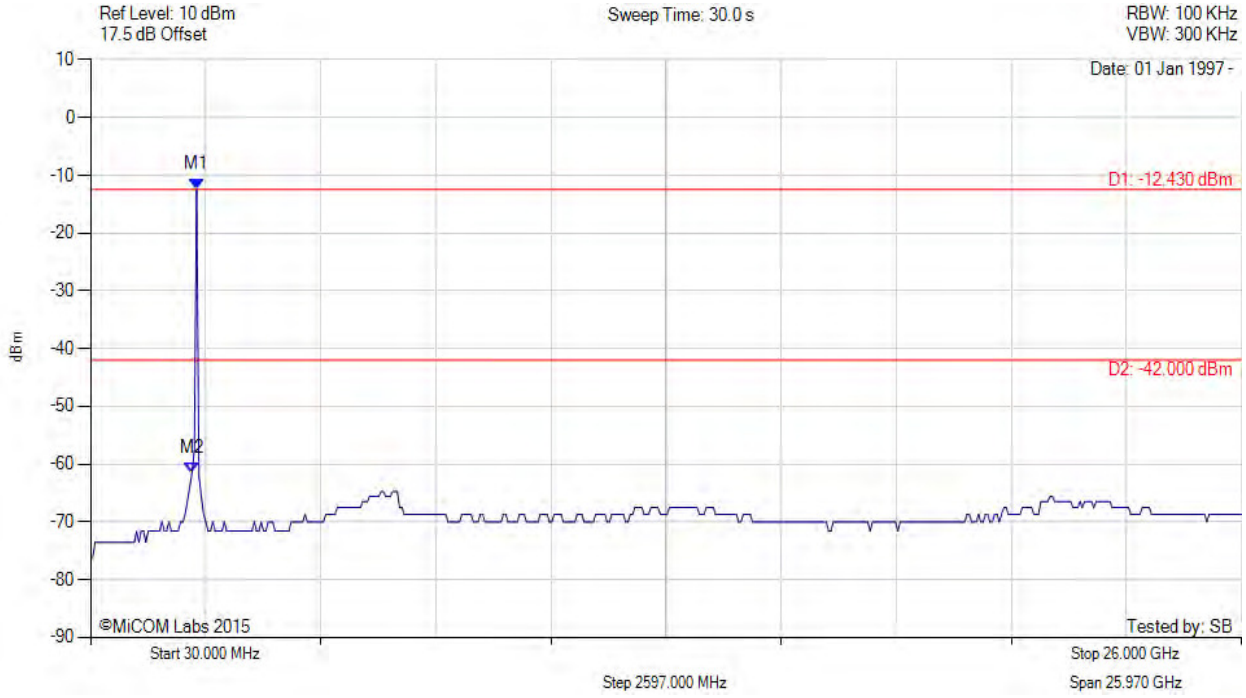



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2371.984 MHz : -13.500 dBm<br>M2 : 2267.896 MHz : -63.982 dBm | Limit: -43.00 dBm<br>Margin: -20.98 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

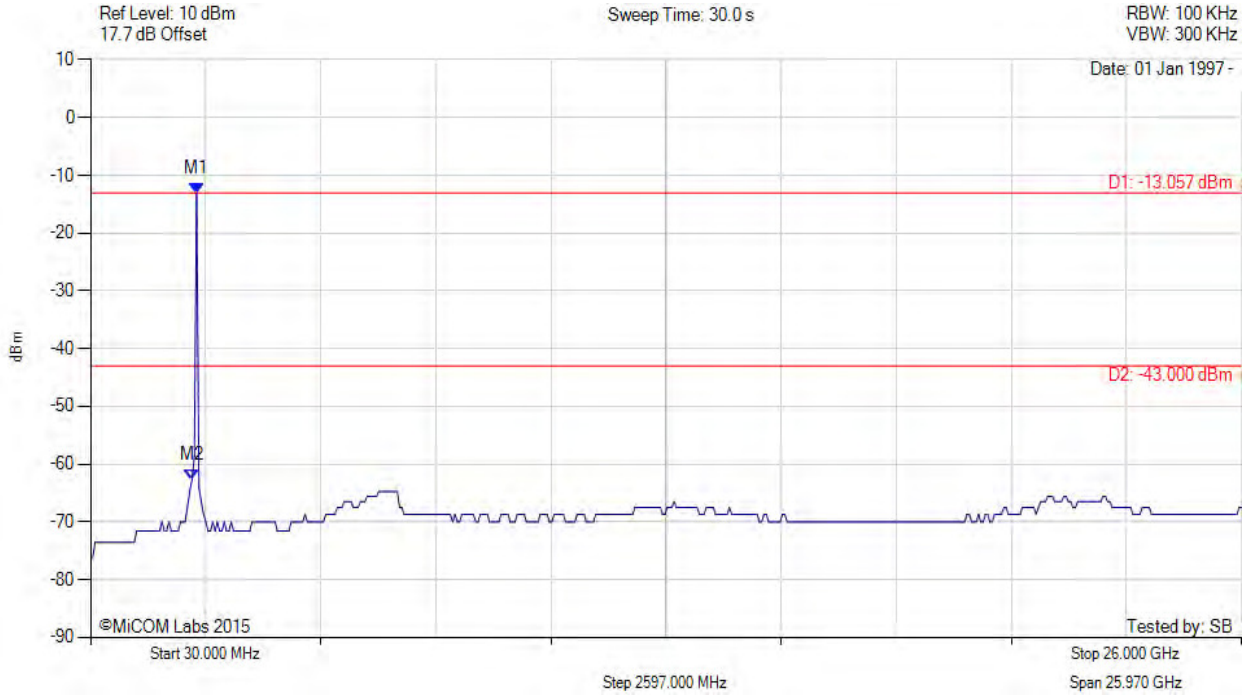



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -12.430 dBm<br>M2 : 2319.940 MHz : -61.483 dBm | Limit: -42.00 dBm<br>Margin: -19.48 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

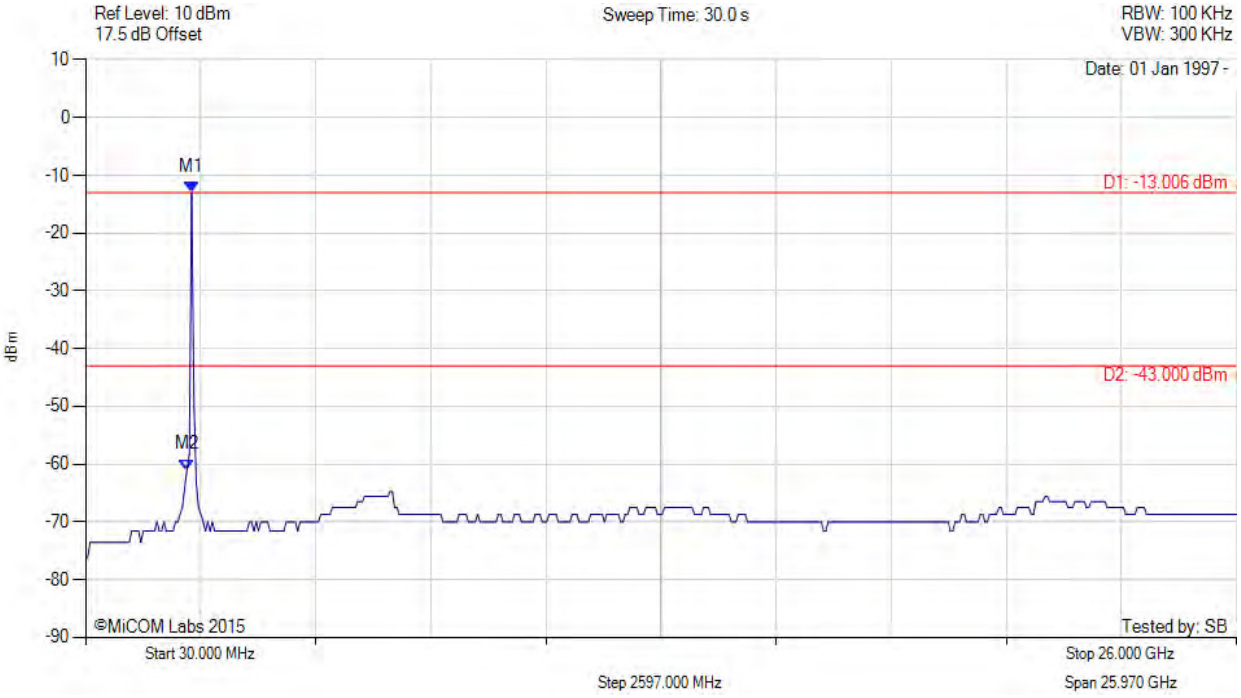



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -13.057 dBm<br>M2 : 2319.940 MHz : -62.643 dBm | Limit: -43.00 dBm<br>Margin: -19.64 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

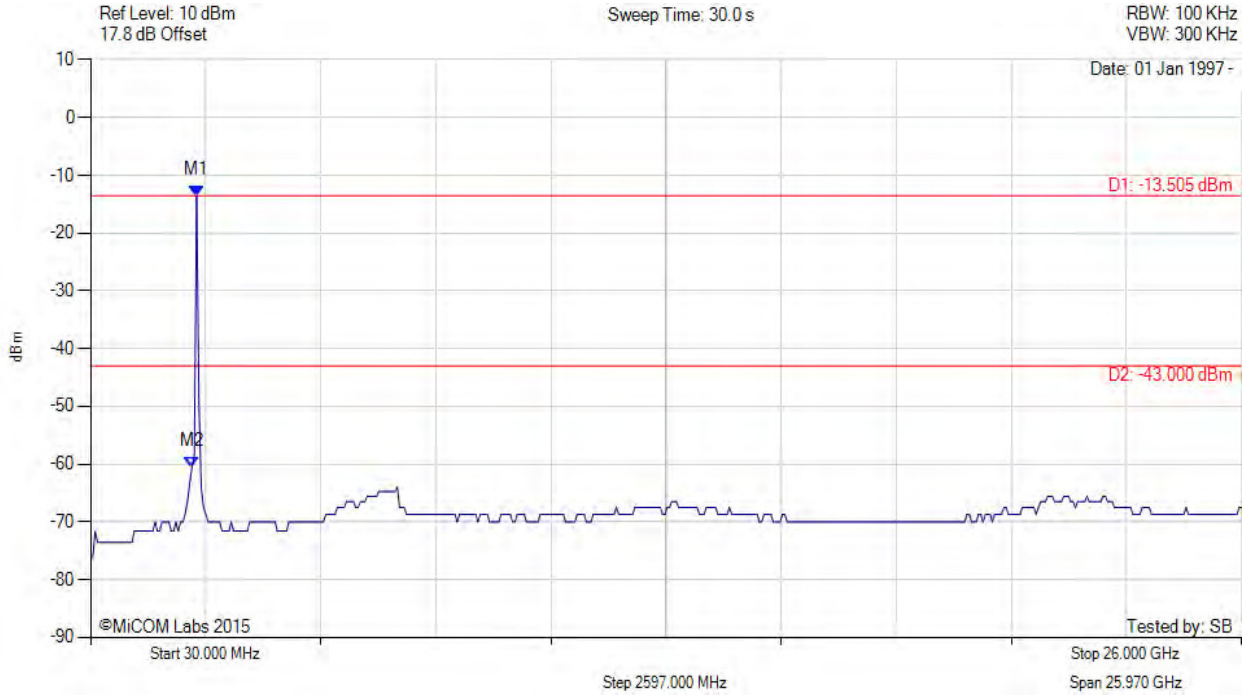



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -13.006 dBm<br>M2 : 2319.940 MHz : -60.956 dBm | Limit: -43.00 dBm<br>Margin: -17.96 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

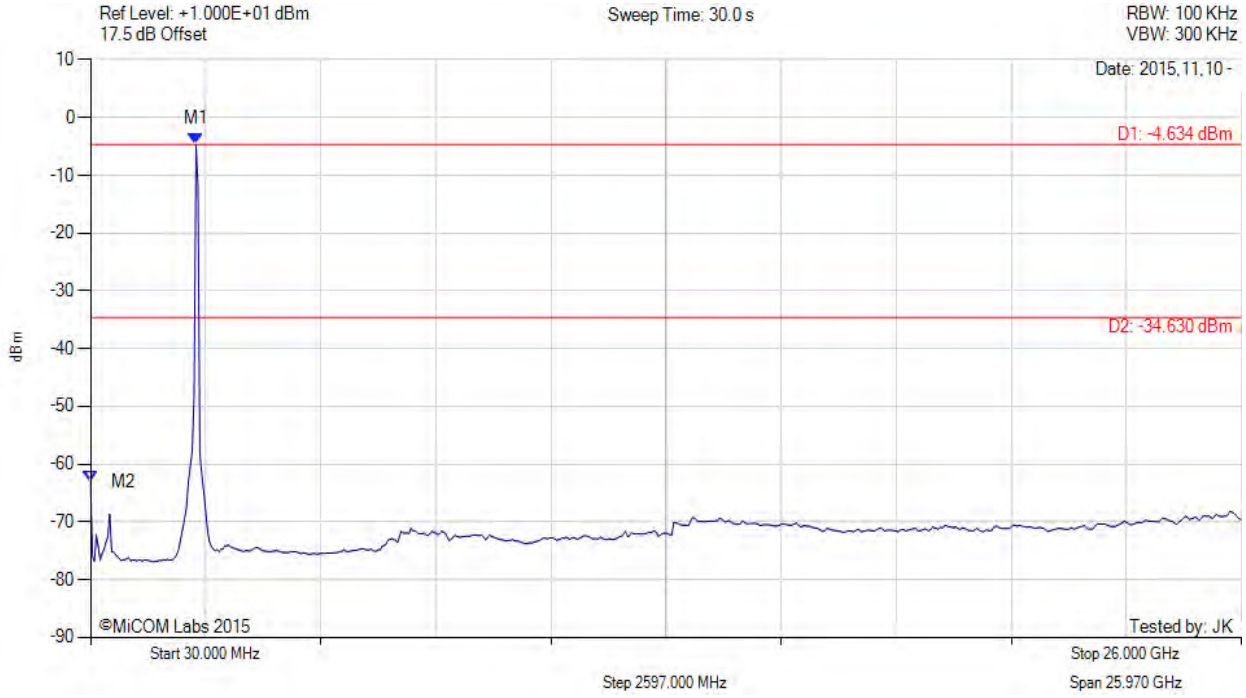



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -13.505 dBm<br>M2 : 2319.940 MHz : -60.460 dBm | Limit: -43.00 dBm<br>Margin: -17.46 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

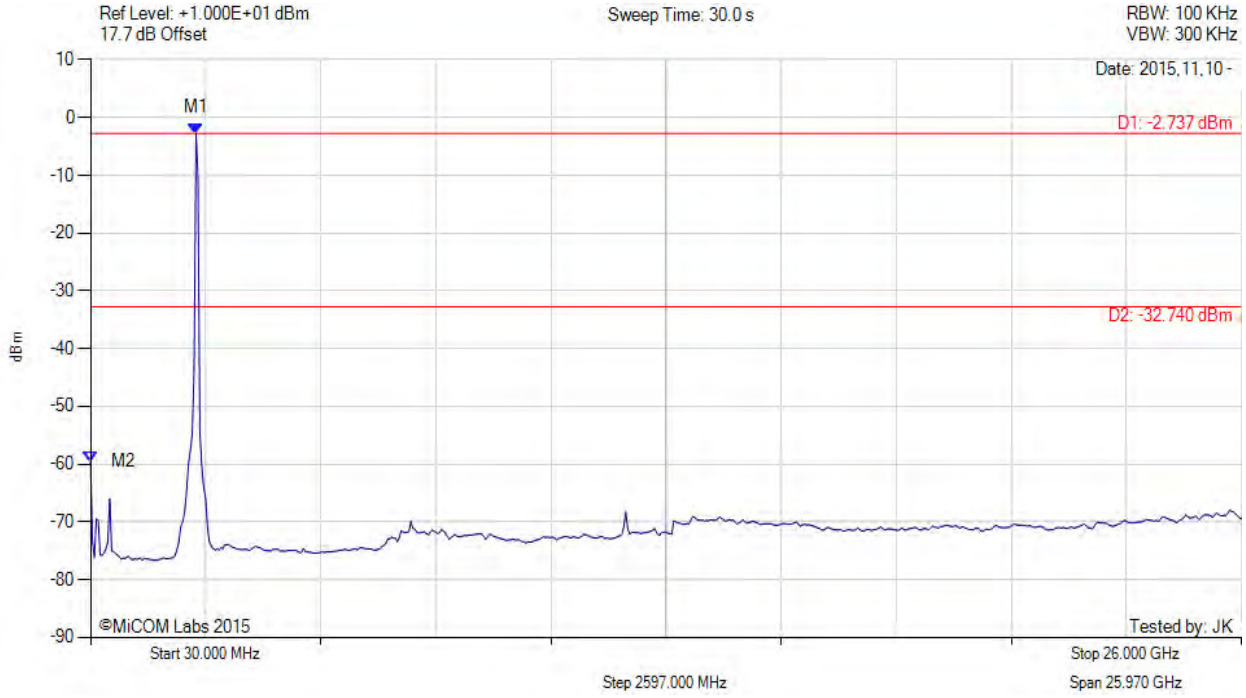



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2410.000 MHz : -4.634 dBm<br>M2 : 30.000 MHz : -63.061 dBm | Limit: -34.63 dBm<br>Margin: -28.43 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

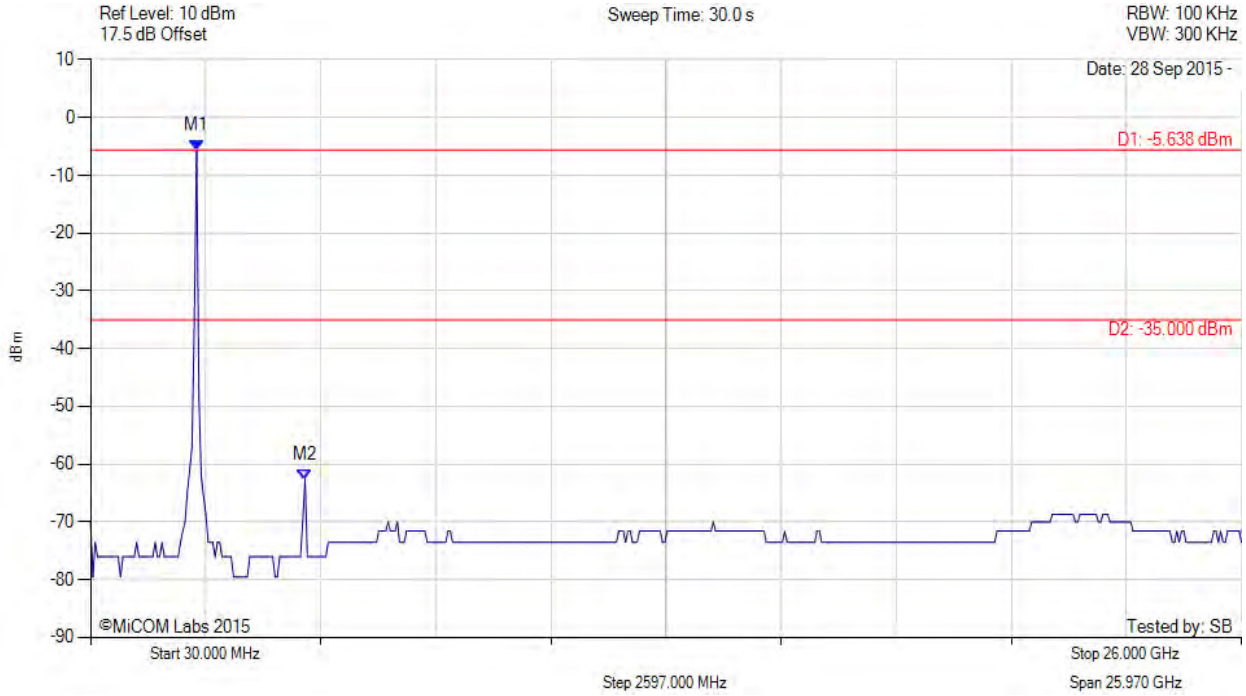



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2410.000 MHz : -2.737 dBm<br>M2 : 30.000 MHz : -59.499 dBm | Limit: -32.74 dBm<br>Margin: -26.76 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

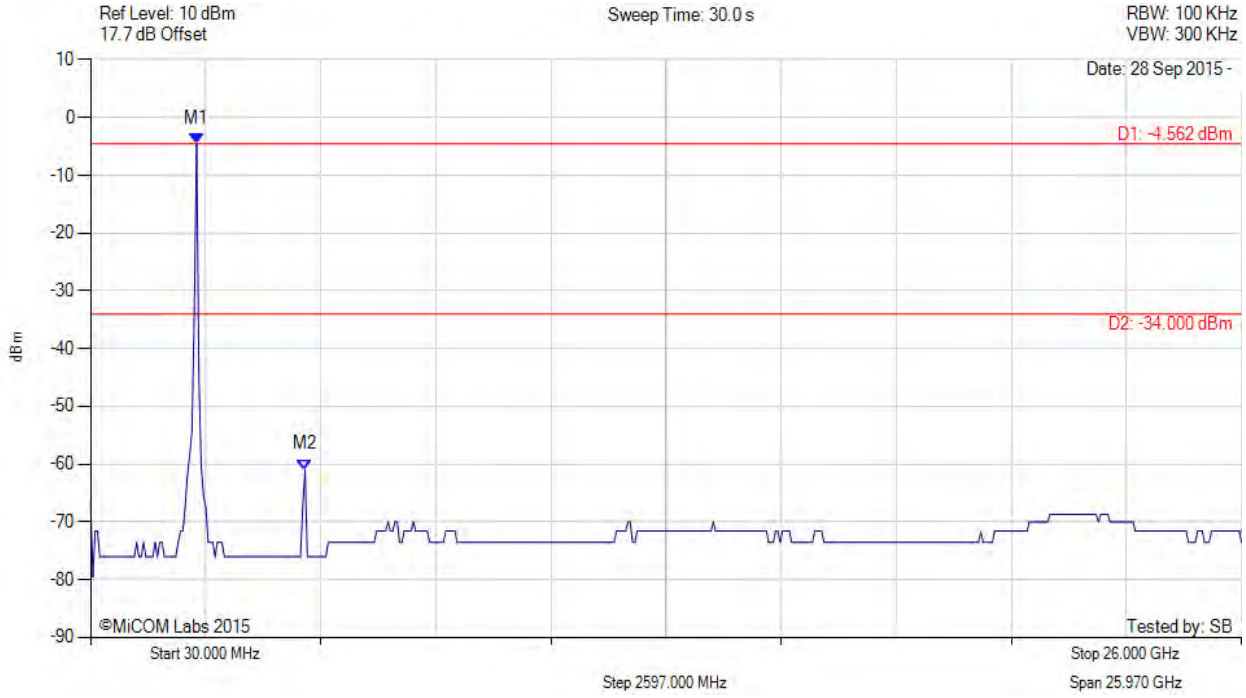



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -5.638 dBm<br>M2 : 4870.100 MHz : -62.643 dBm | Limit: -35.00 dBm<br>Margin: -27.64 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

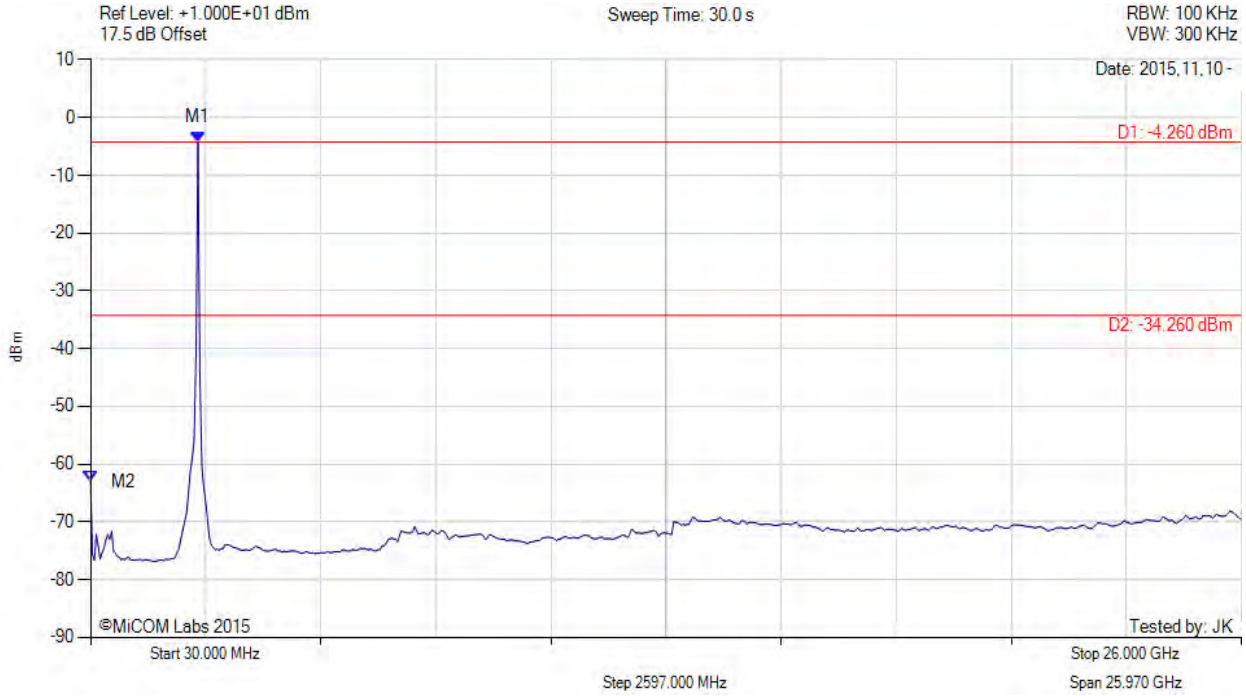



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2424.028 MHz : -4.562 dBm<br>M2 : 4870.100 MHz : -60.956 dBm | Limit: -34.00 dBm<br>Margin: -26.96 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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

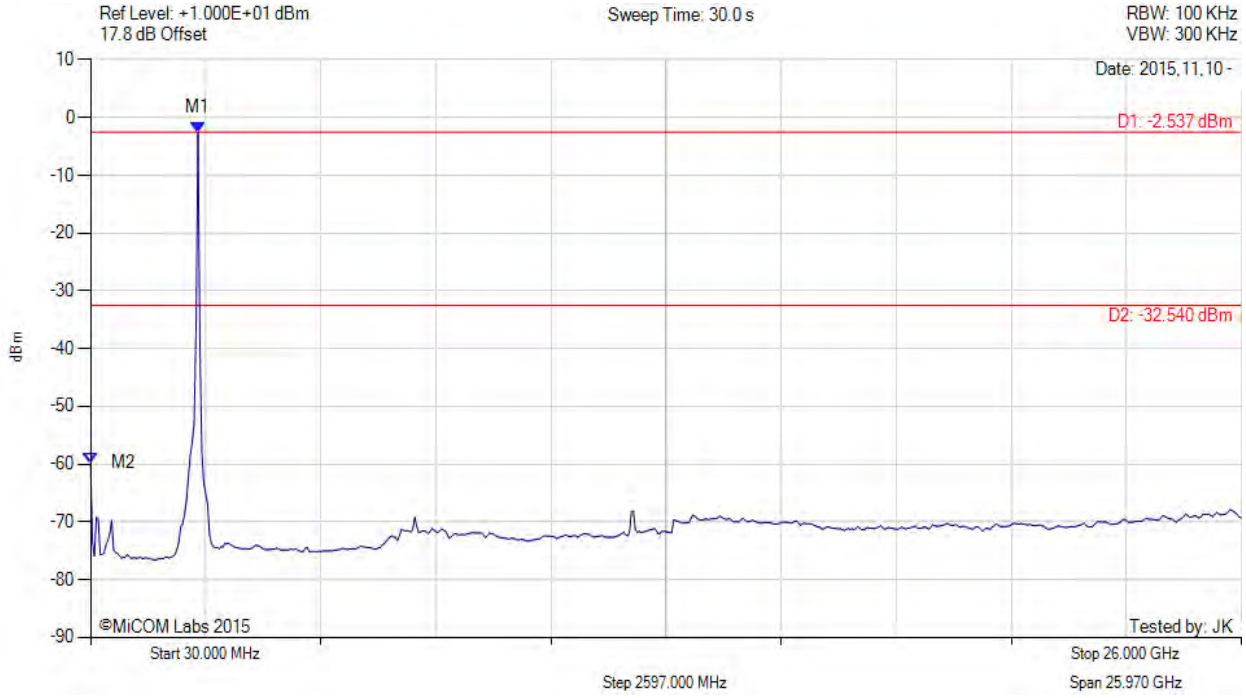



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2450.000 MHz : -4.260 dBm<br>M2 : 30.000 MHz : -62.940 dBm | Limit: -34.26 dBm<br>Margin: -28.68 dB |

back to matrix

CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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




| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2450.000 MHz : -2.537 dBm<br>M2 : 30.000 MHz : -59.763 dBm | Limit: -32.54 dBm<br>Margin: -27.22 dB |

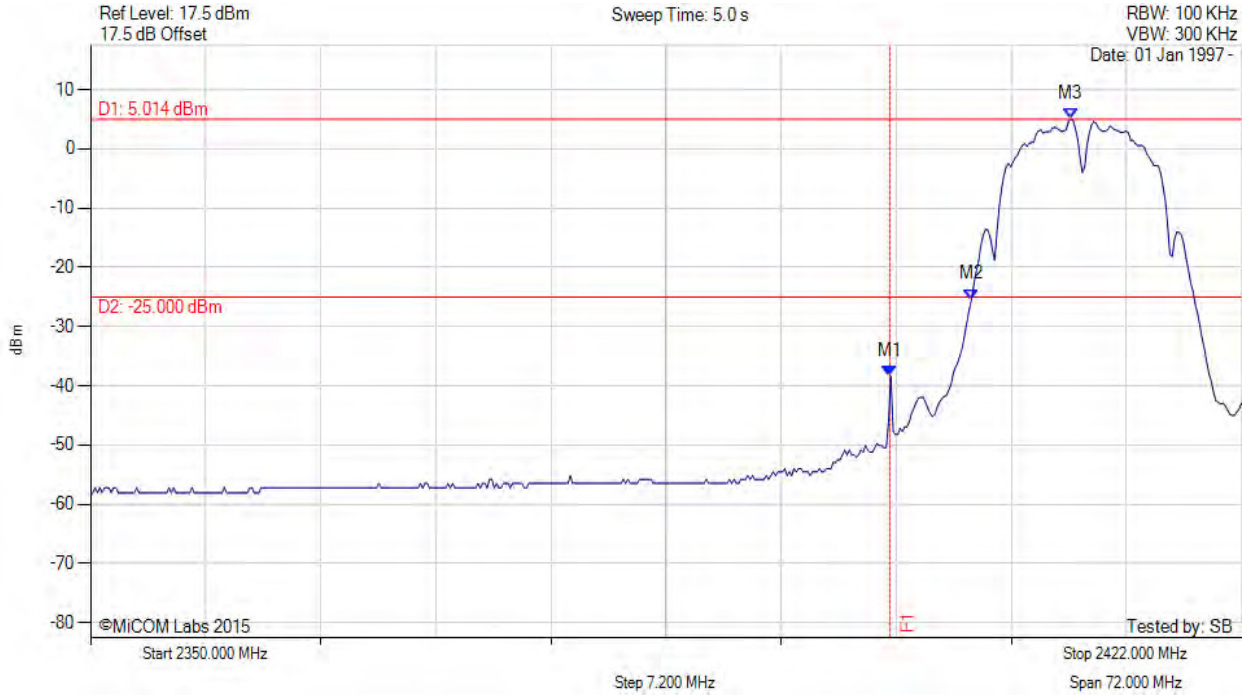
back to matrix

### A.2.1.2. Conducted Band-Edge Emissions

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

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

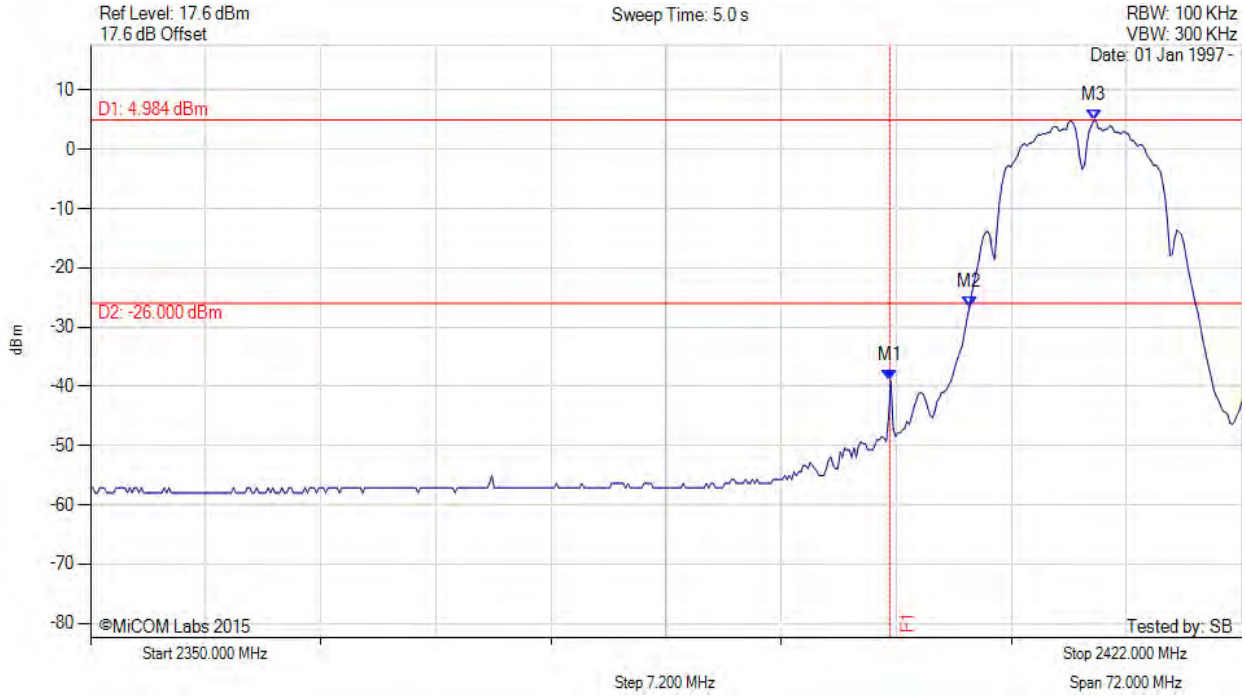



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -38.420 dBm<br>M2 : 2405.118 MHz : -25.416 dBm<br>M3 : 2411.323 MHz : 5.014 dBm | Channel Frequency: 2412.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

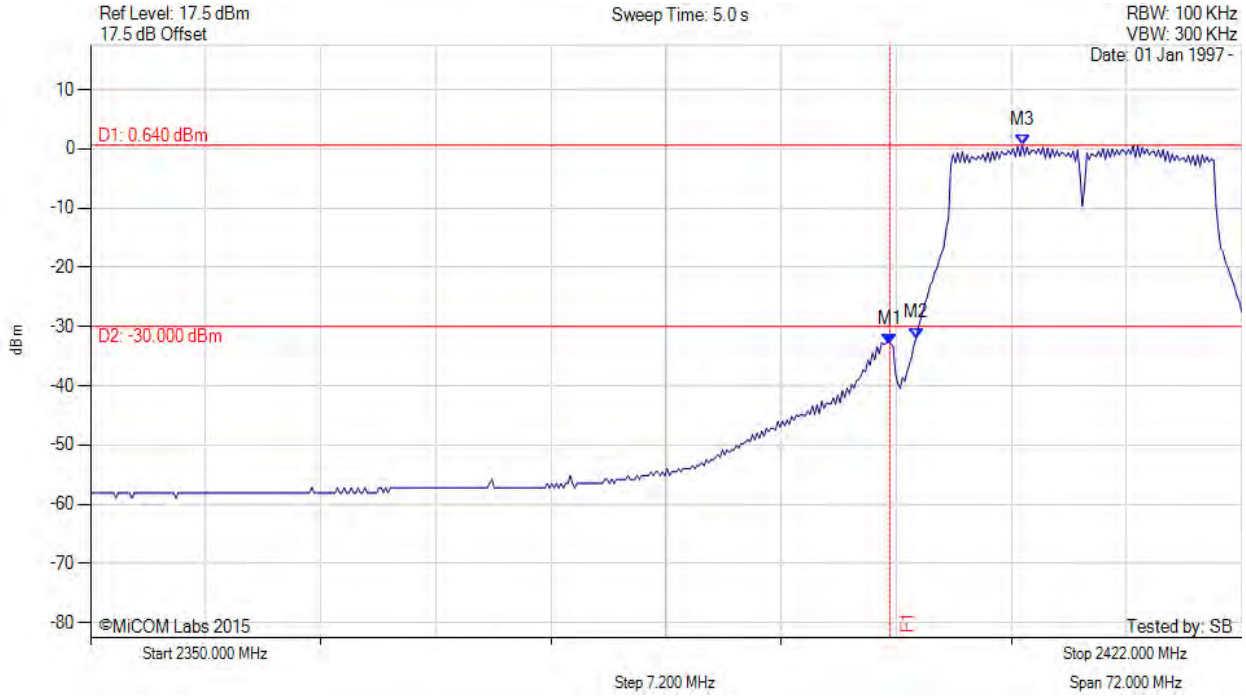



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -39.076 dBm<br>M2 : 2404.974 MHz : -26.696 dBm<br>M3 : 2412.766 MHz : 4.984 dBm | Channel Frequency: 2412.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

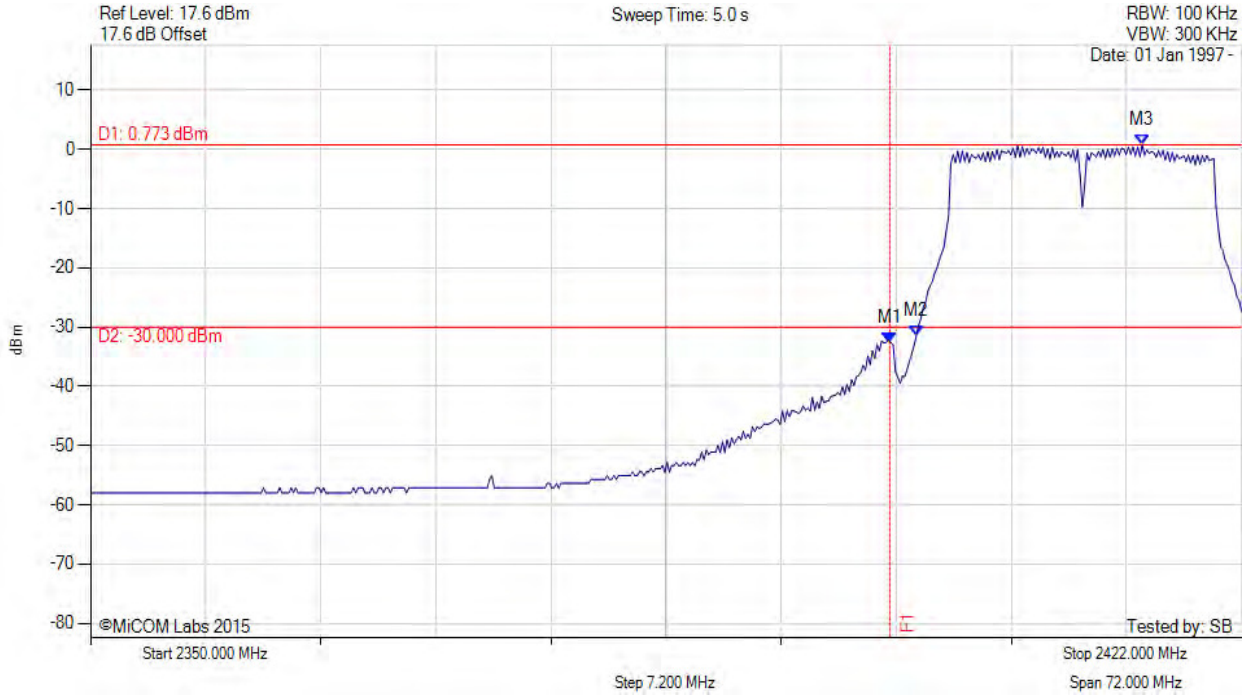



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -32.912 dBm<br>M2 : 2401.655 MHz : -31.958 dBm<br>M3 : 2408.293 MHz : 0.640 dBm | Channel Frequency: 2412.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

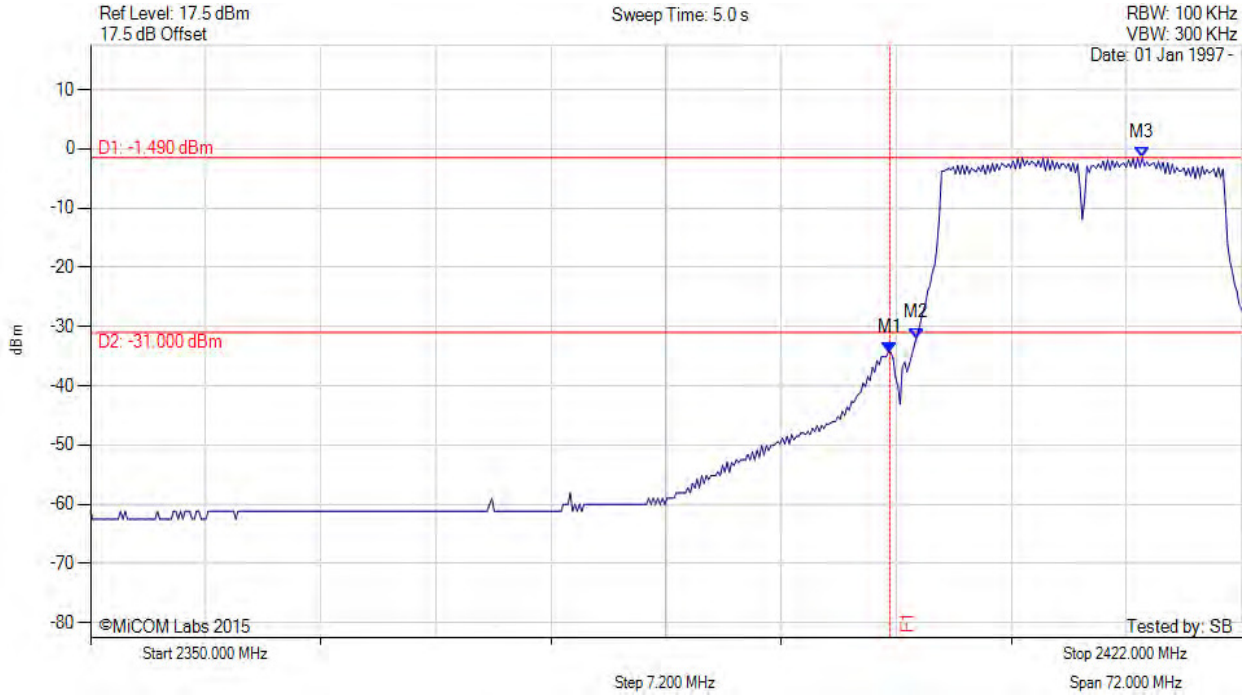



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -32.575 dBm<br>M2 : 2401.655 MHz : -31.480 dBm<br>M3 : 2415.796 MHz : 0.773 dBm | Channel Frequency: 2412.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

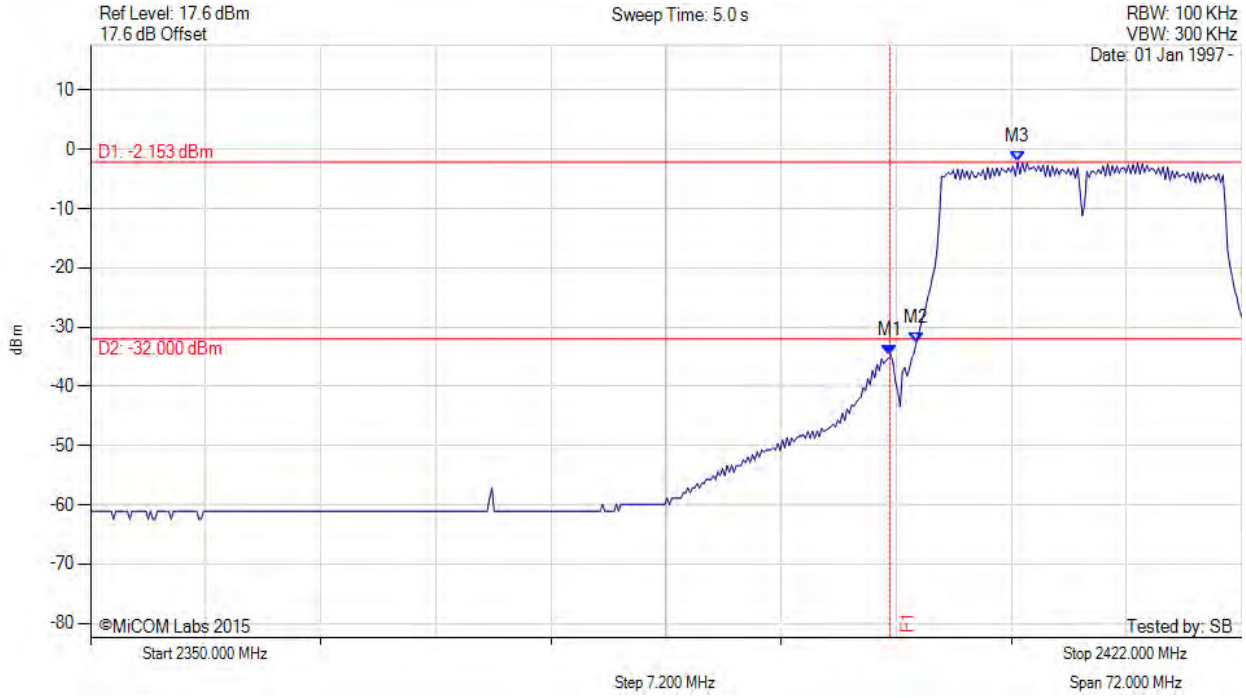



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -34.372 dBm<br>M2 : 2401.655 MHz : -31.958 dBm<br>M3 : 2415.796 MHz : -1.490 dBm | Channel Frequency: 2412.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

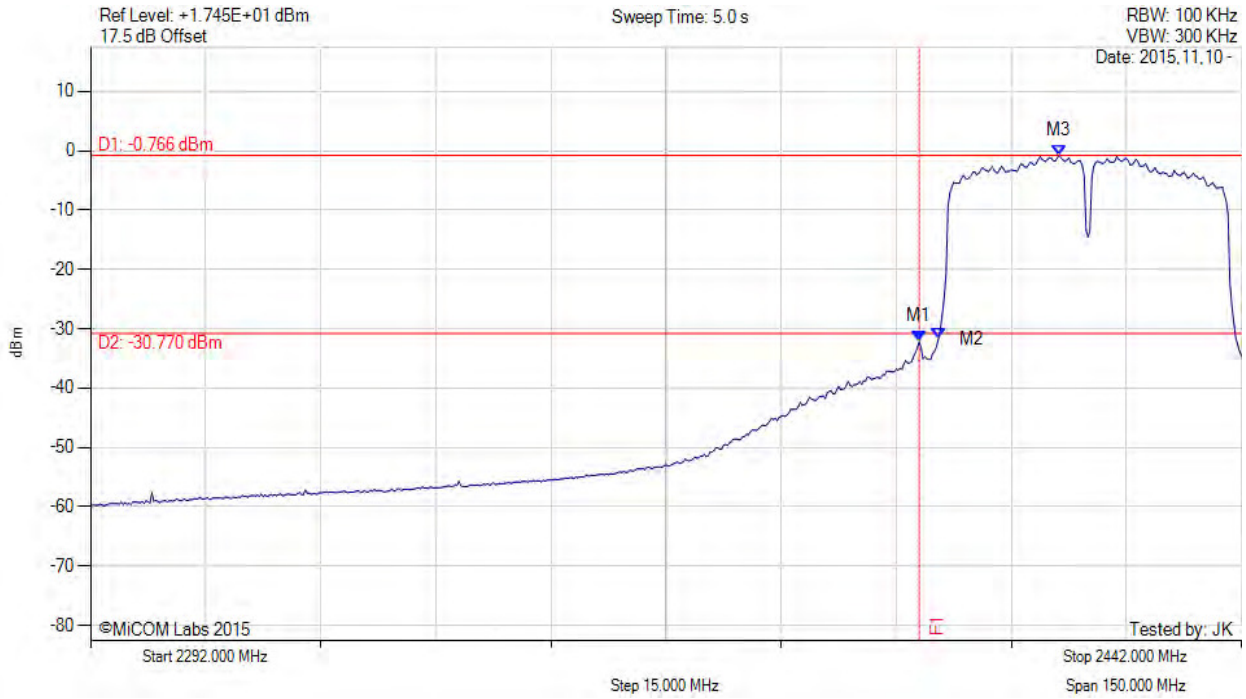



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -34.678 dBm<br>M2 : 2401.655 MHz : -32.716 dBm<br>M3 : 2408.004 MHz : -2.153 dBm | Channel Frequency: 2412.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

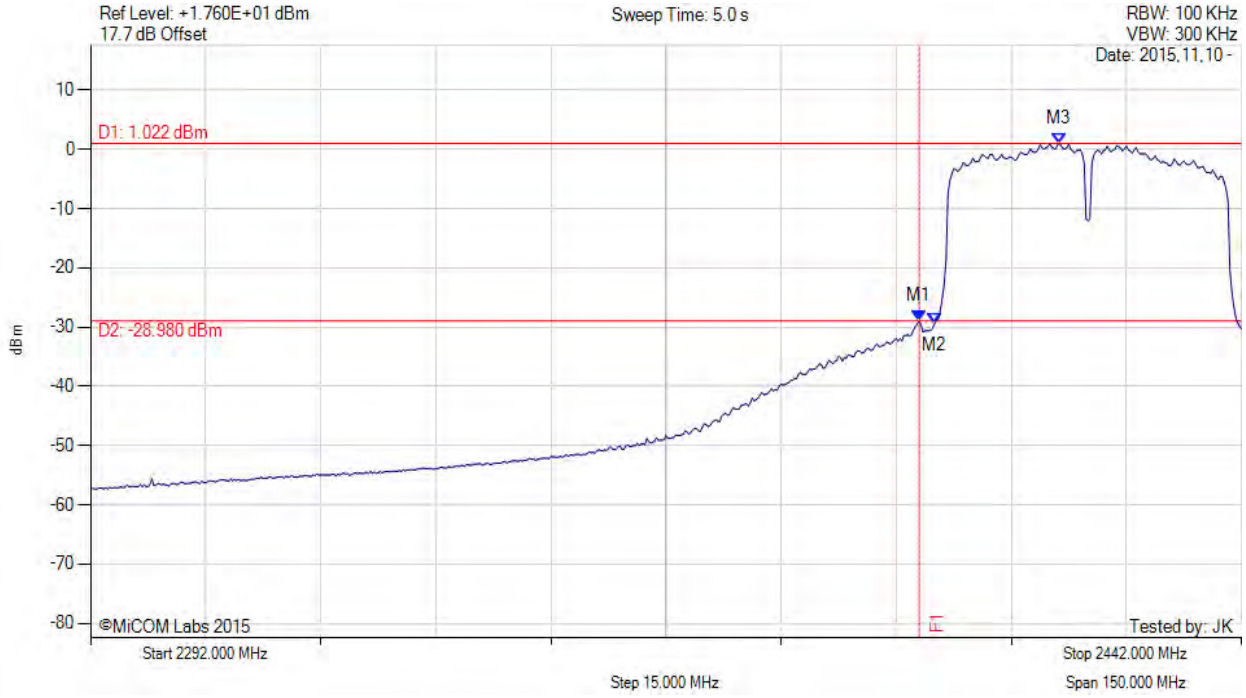



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -32.204 dBm<br>M2 : 2402.500 MHz : -31.721 dBm<br>M3 : 2418.250 MHz : -0.766 dBm | Channel Frequency: 2422.00 MHz |

back to matrix

CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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

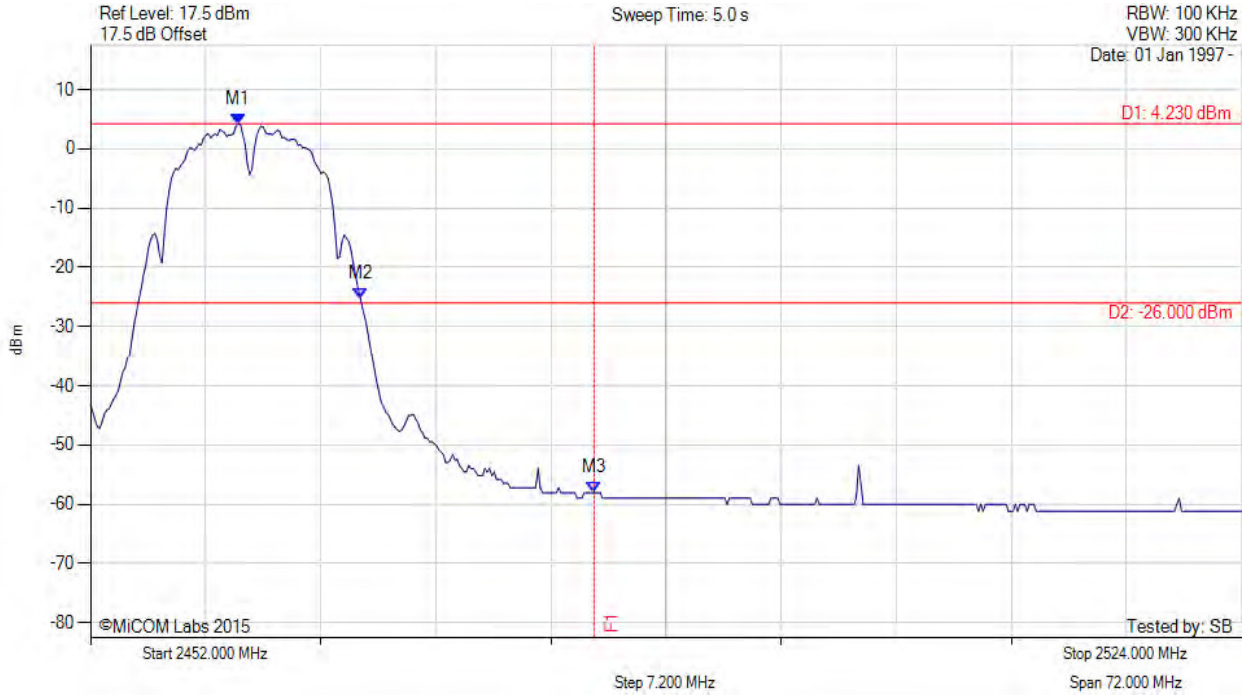



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2400.000 MHz : -29.039 dBm<br>M2 : 2402.000 MHz : -29.434 dBm<br>M3 : 2418.250 MHz : 1.022 dBm | Channel Frequency: 2422.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

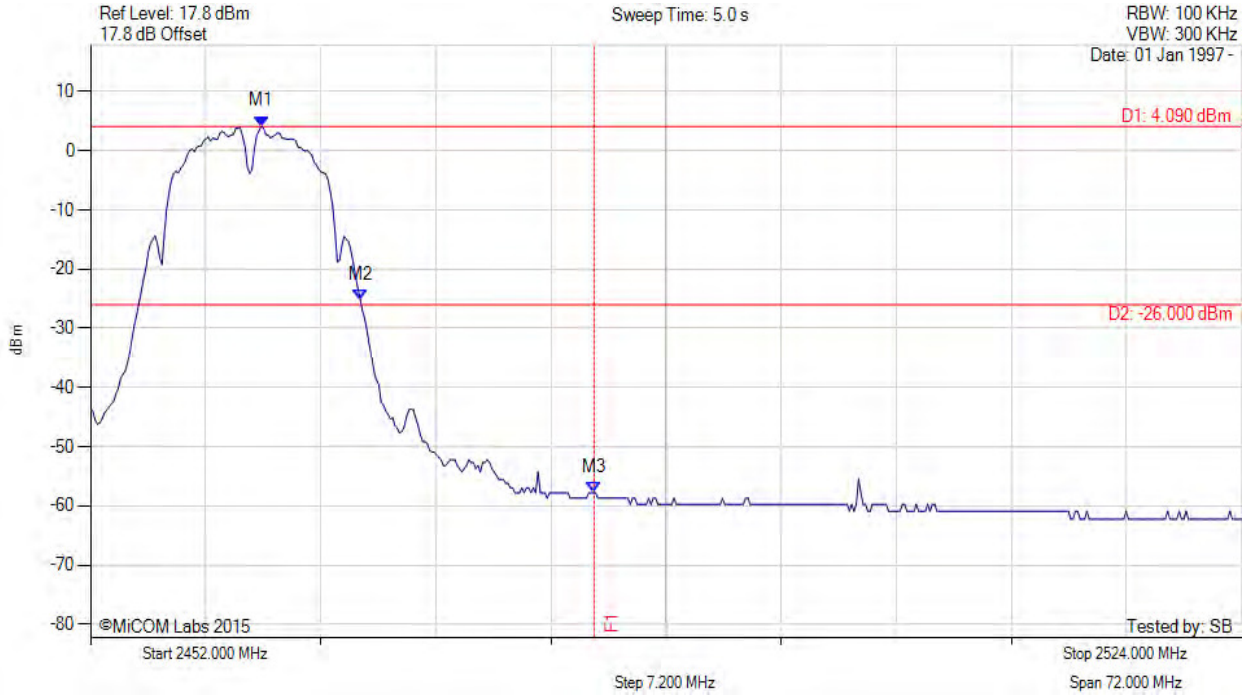



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2461.234 MHz : 4.230 dBm<br>M2 : 2468.882 MHz : -25.236 dBm<br>M3 : 2483.500 MHz : -58.065 dBm | Channel Frequency: 2462.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

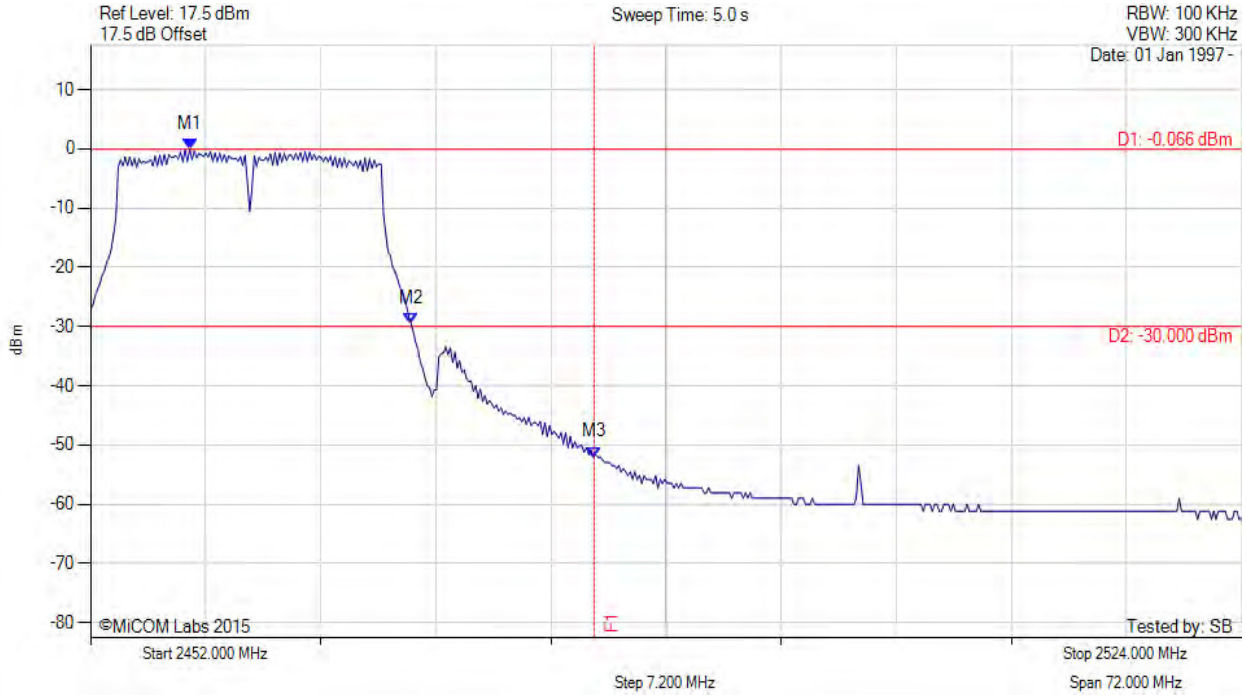



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2462.677 MHz : 4.090 dBm<br>M2 : 2468.882 MHz : -25.239 dBm<br>M3 : 2483.500 MHz : -57.765 dBm | Channel Frequency: 2462.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

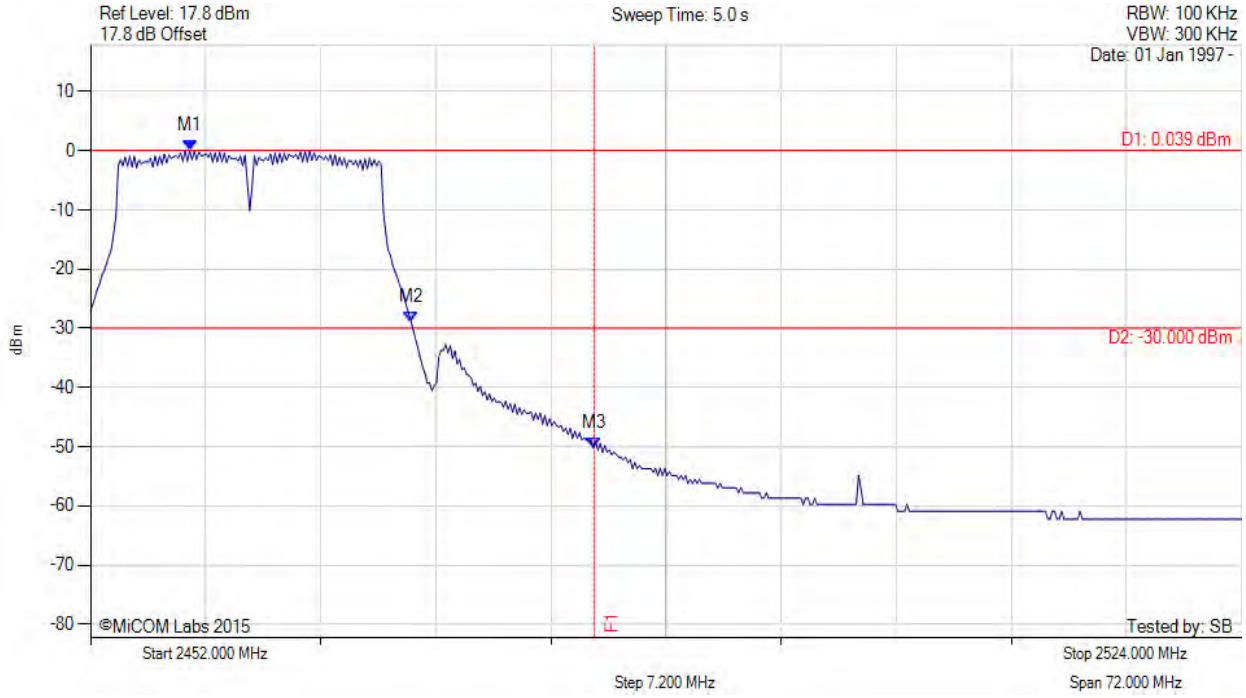



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2458.204 MHz : -0.066 dBm<br>M2 : 2472.056 MHz : -29.568 dBm<br>M3 : 2483.500 MHz : -52.045 dBm | Channel Frequency: 2462.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

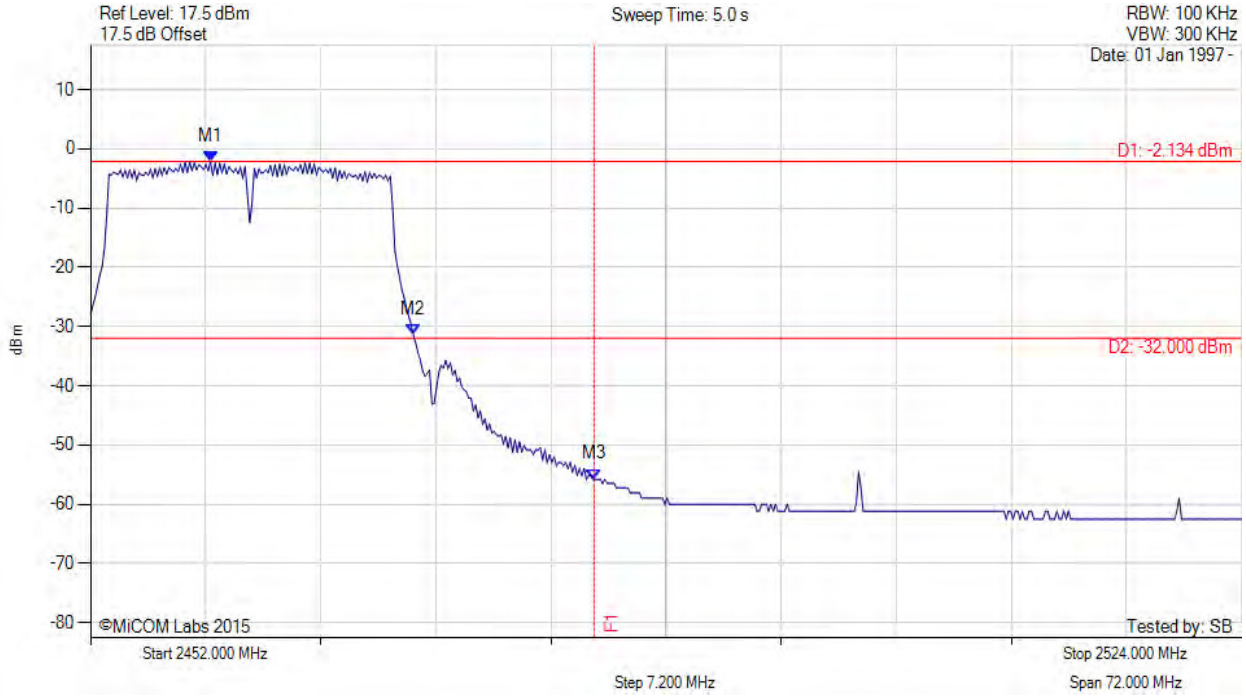



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2458.204 MHz : 0.039 dBm<br>M2 : 2472.056 MHz : -28.884 dBm<br>M3 : 2483.500 MHz : -50.161 dBm | Channel Frequency: 2462.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

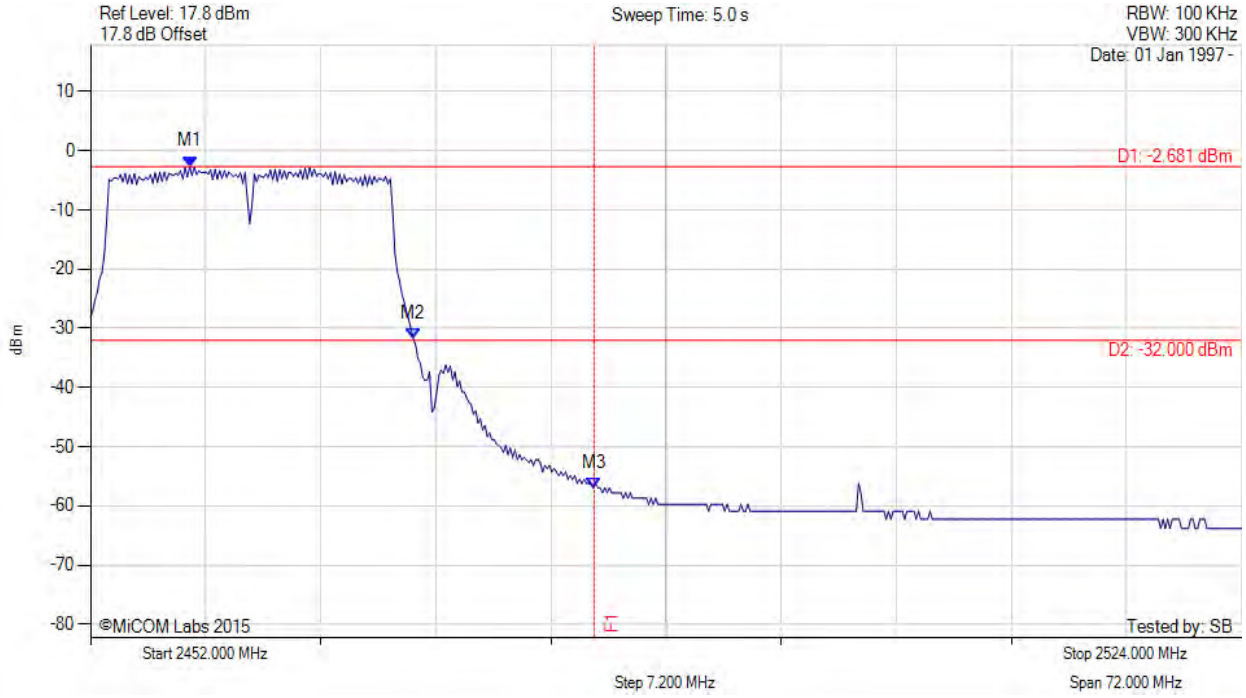



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2459.503 MHz : -2.134 dBm<br>M2 : 2472.200 MHz : -31.457 dBm<br>M3 : 2483.500 MHz : -55.786 dBm | Channel Frequency: 2462.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

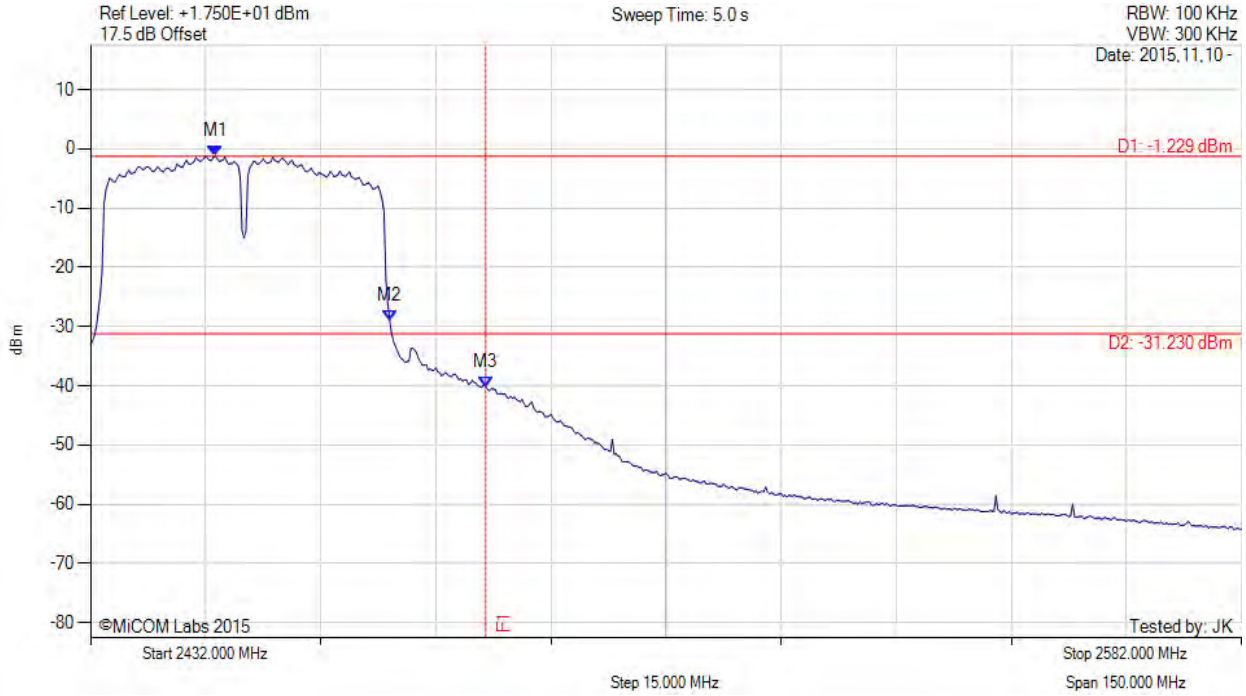



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2458.204 MHz : -2.681 dBm<br>M2 : 2472.200 MHz : -31.701 dBm<br>M3 : 2483.500 MHz : -56.937 dBm | Channel Frequency: 2462.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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

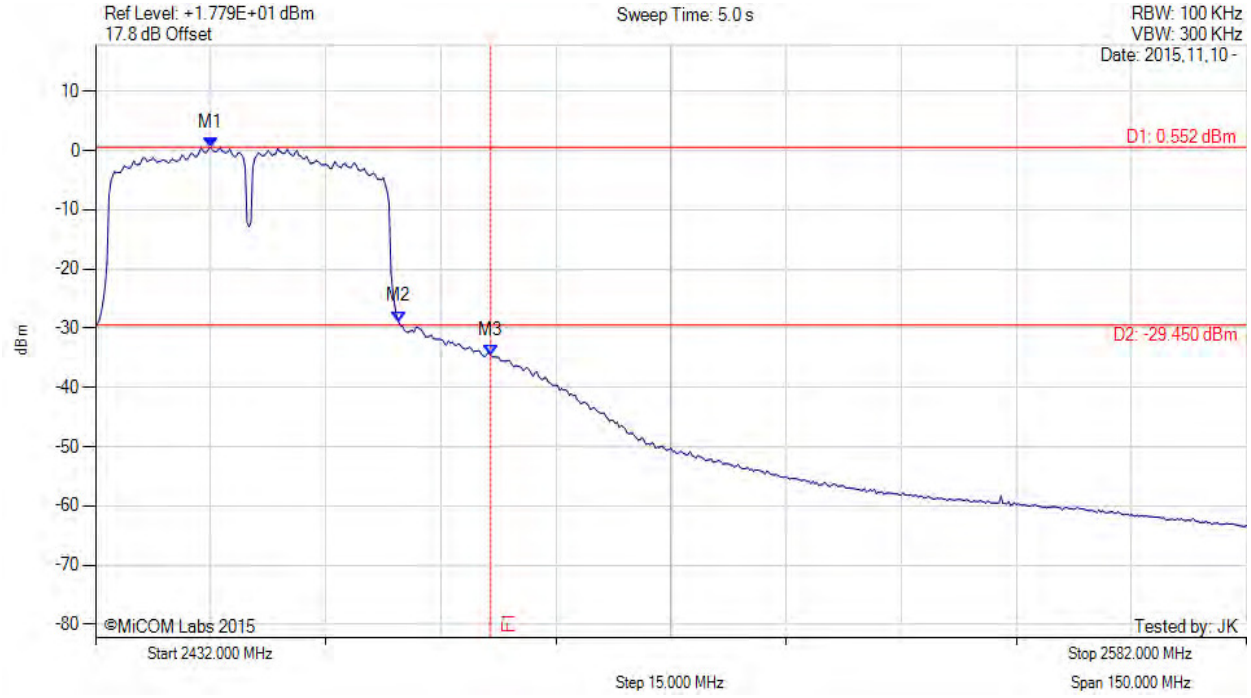



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2448.250 MHz : -1.229 dBm<br>M2 : 2471.000 MHz : -29.028 dBm<br>M3 : 2483.500 MHz : -40.156 dBm | Channel Frequency: 2452.00 MHz |

back to matrix

CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



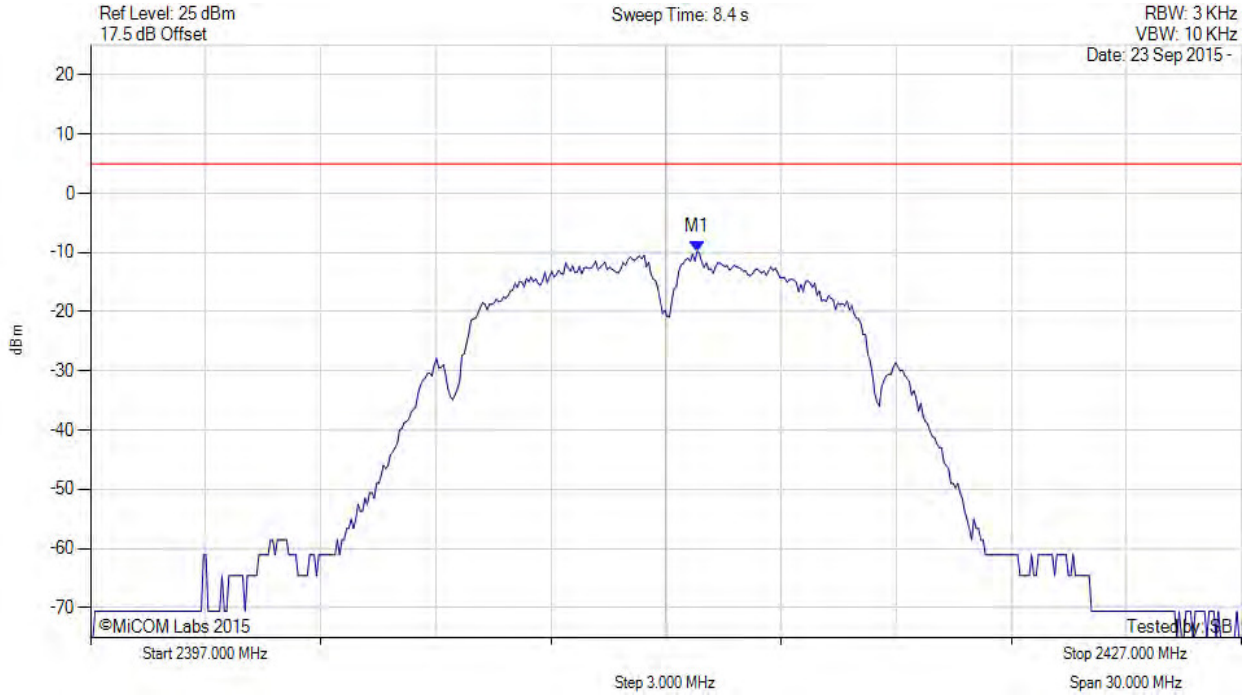

| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 10<br>Trace Mode = VIEW | M1 : 2447.000 MHz : 0.552 dBm<br>M2 : 2471.500 MHz : -28.867 dBm<br>M3 : 2483.500 MHz : -34.587 dBm | Channel Frequency: 2452.00 MHz |

back to matrix

## A.3. Power Spectral Density

POWER SPECTRAL DENSITY - AVERAGE

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

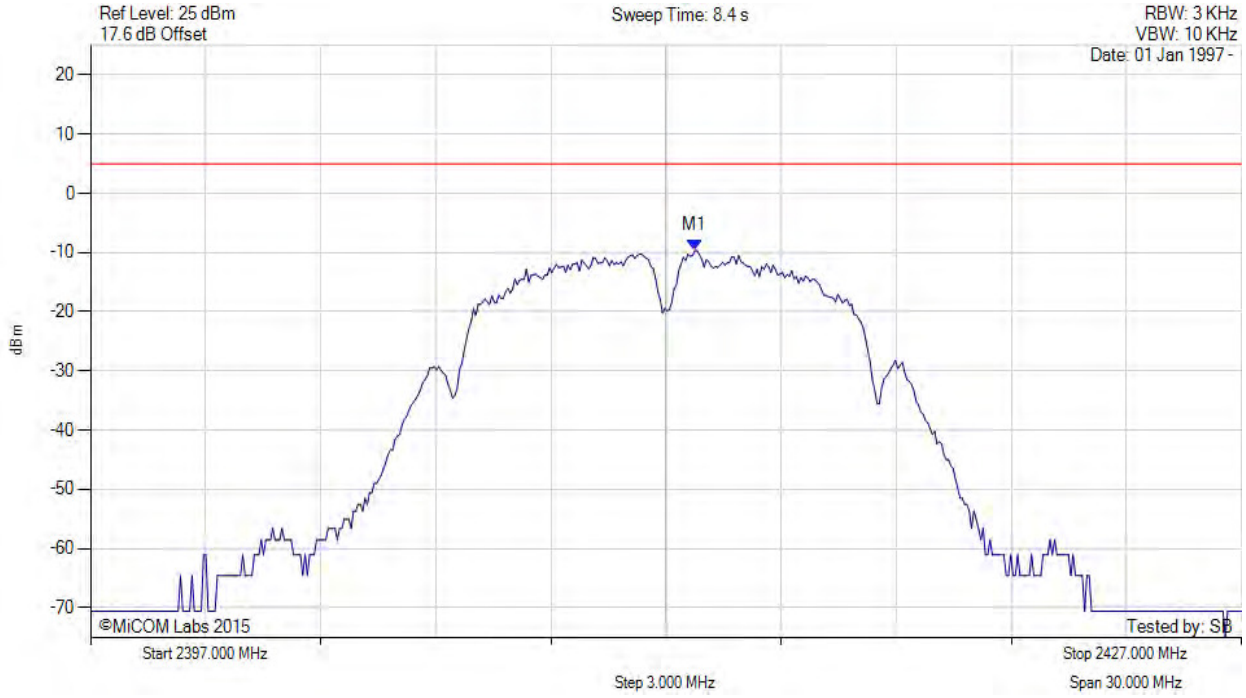



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2412.812 MHz : -9.817 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

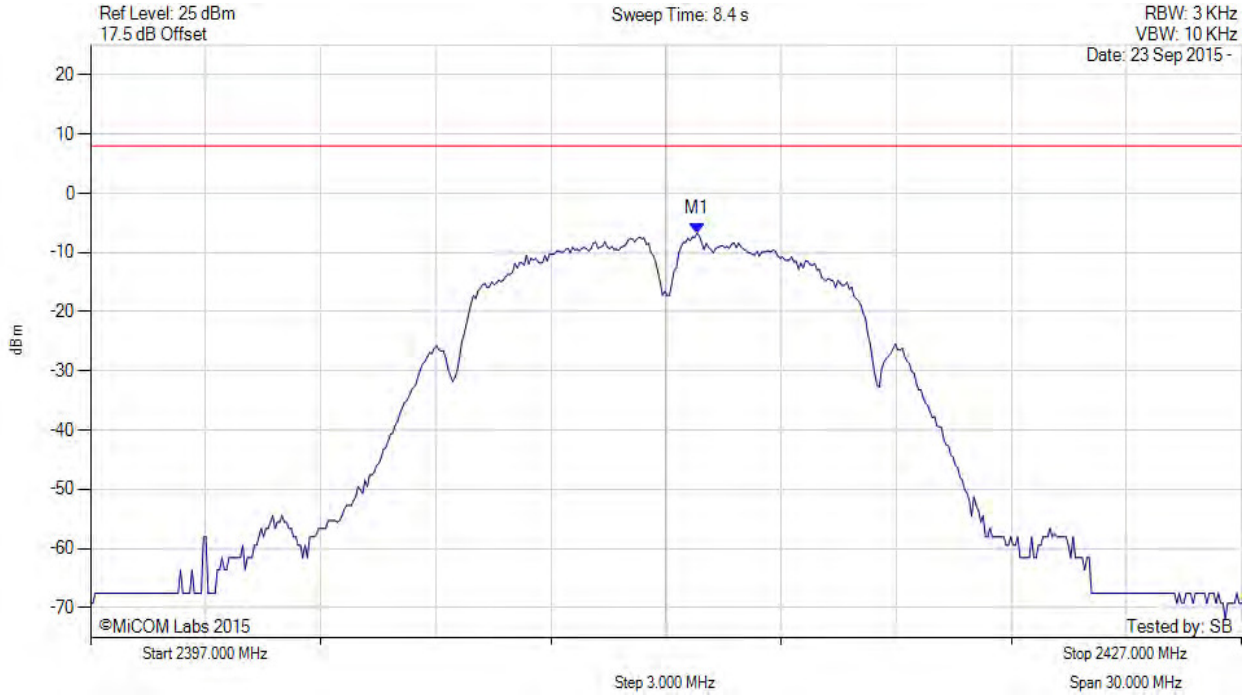



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2412.752 MHz : -9.651 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

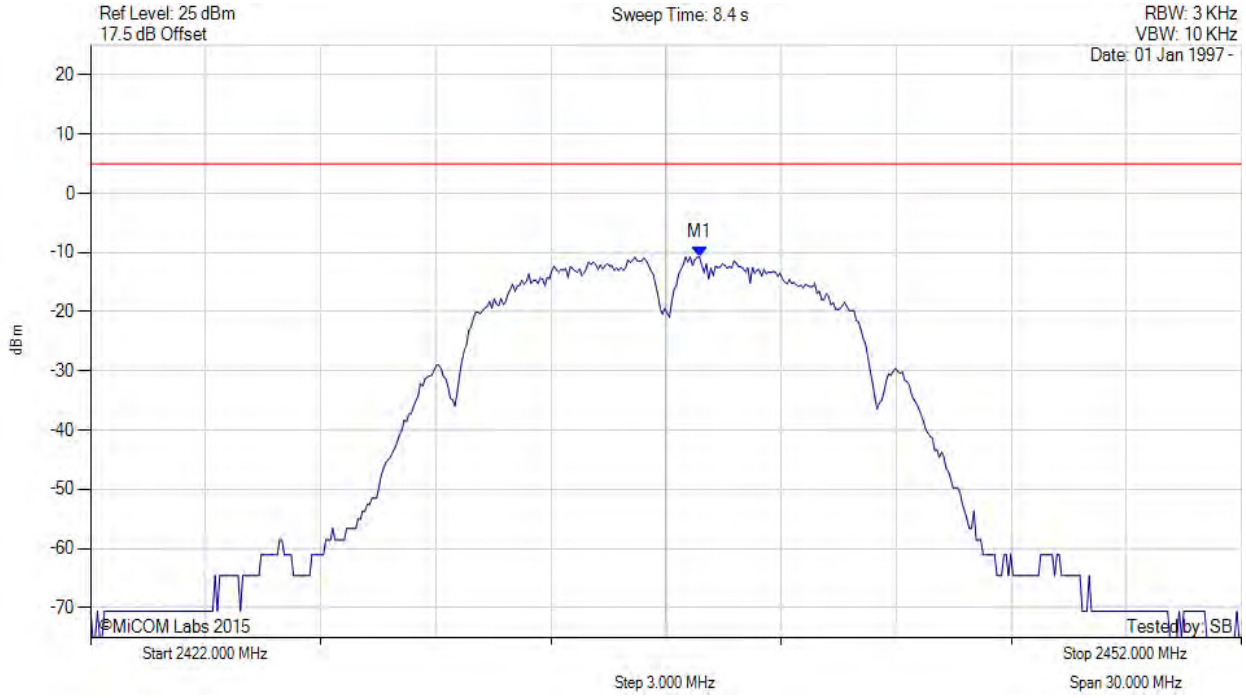



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2412.800 MHz : -6.731 dBm<br>M1 + DCCF : 2412.800 MHz : -6.687 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: ≤ 8.0 dBm<br>Margin: -14.7 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

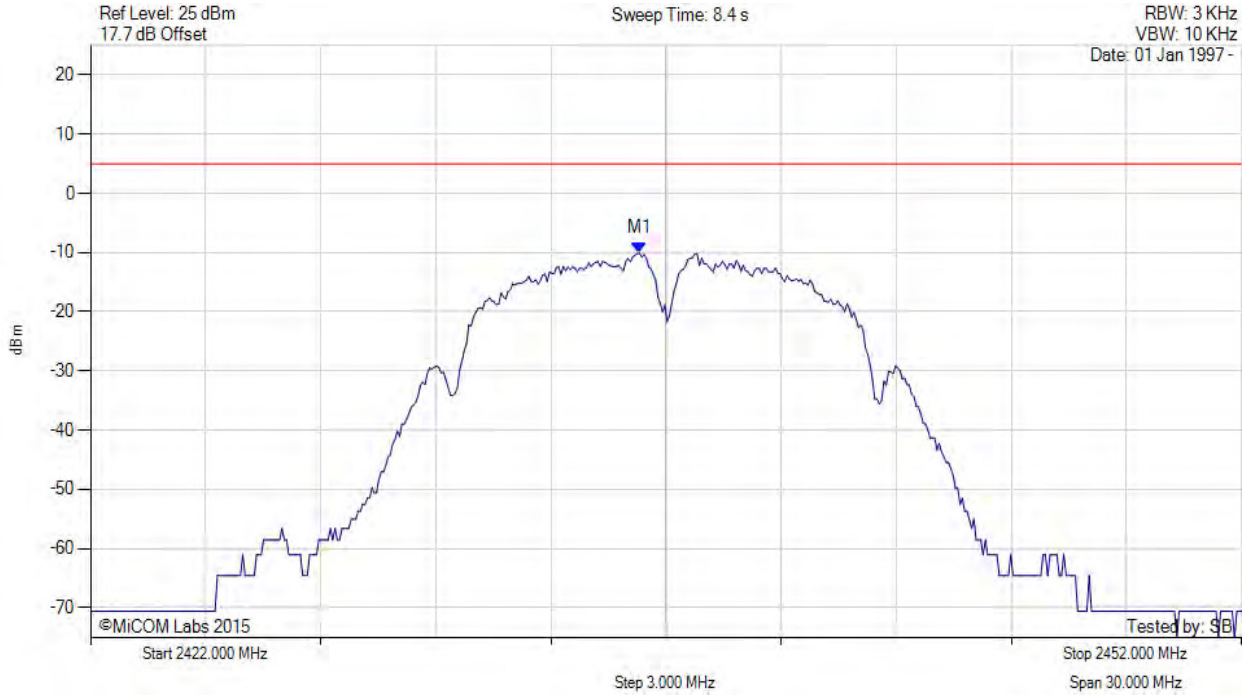



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2437.872 MHz : -10.741 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

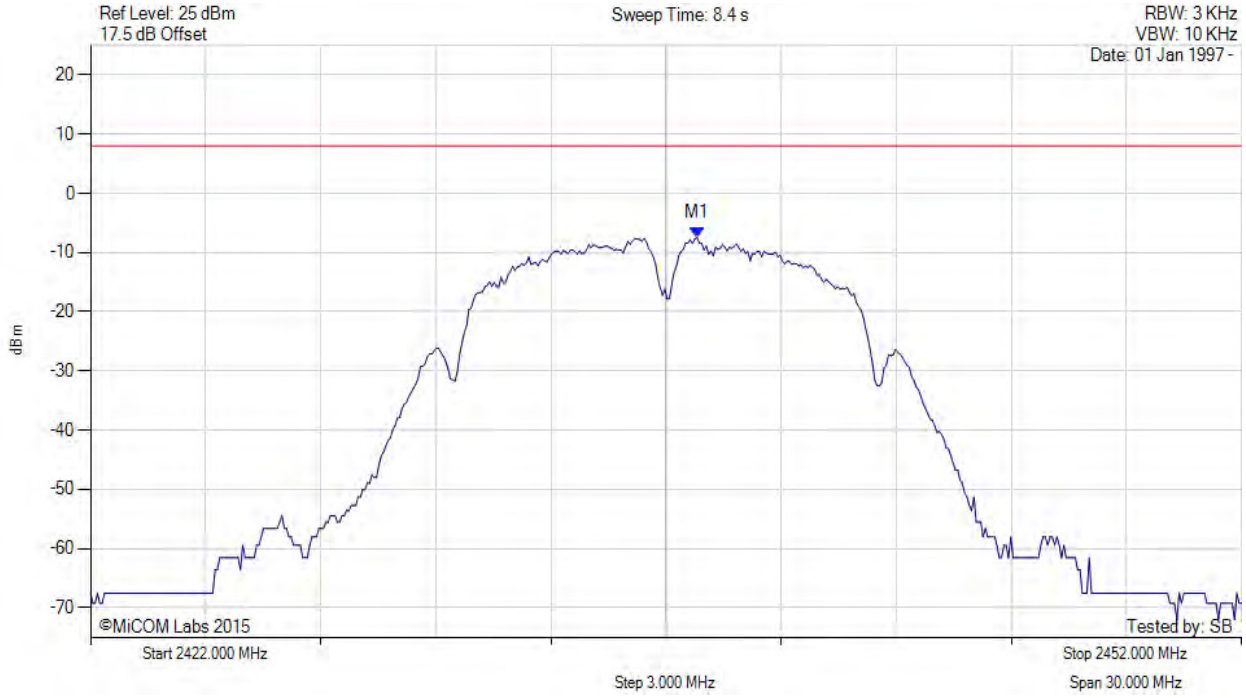



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2436.309 MHz : -10.133 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

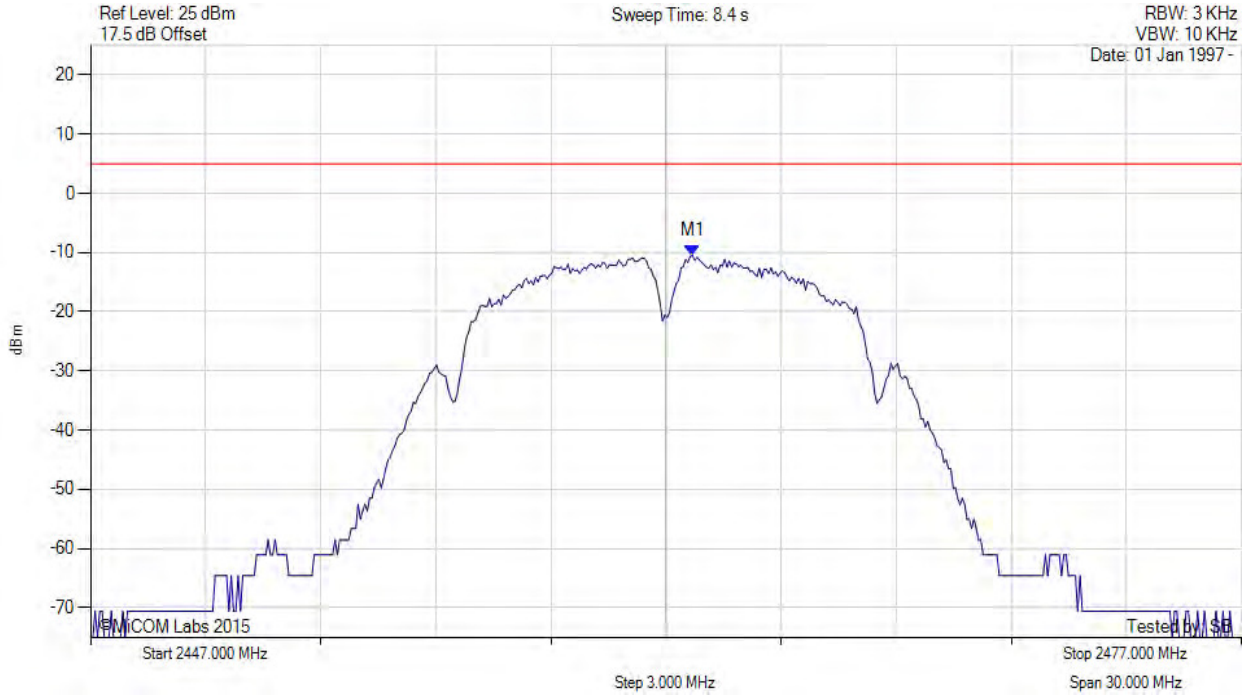



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2437.800 MHz : -7.479 dBm<br>M1 + DCCF : 2437.800 MHz : -7.435 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: ≤ 8.0 dBm<br>Margin: -15.4 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

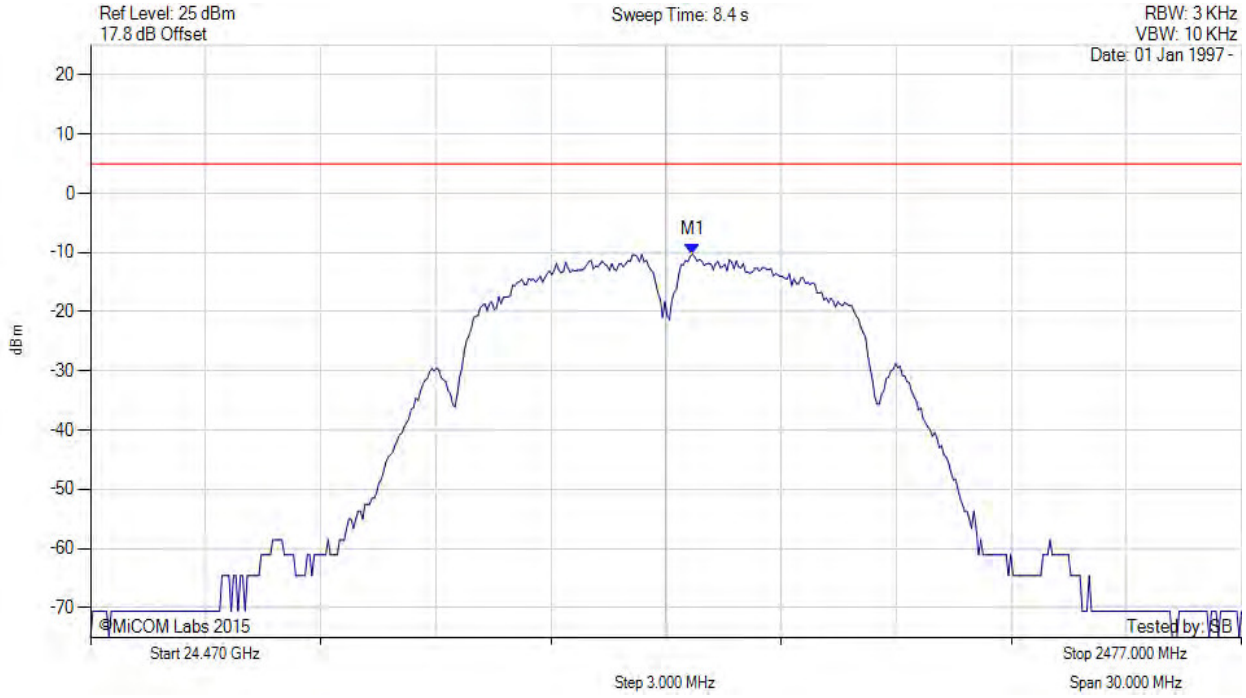



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2462.691 MHz : -10.496 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

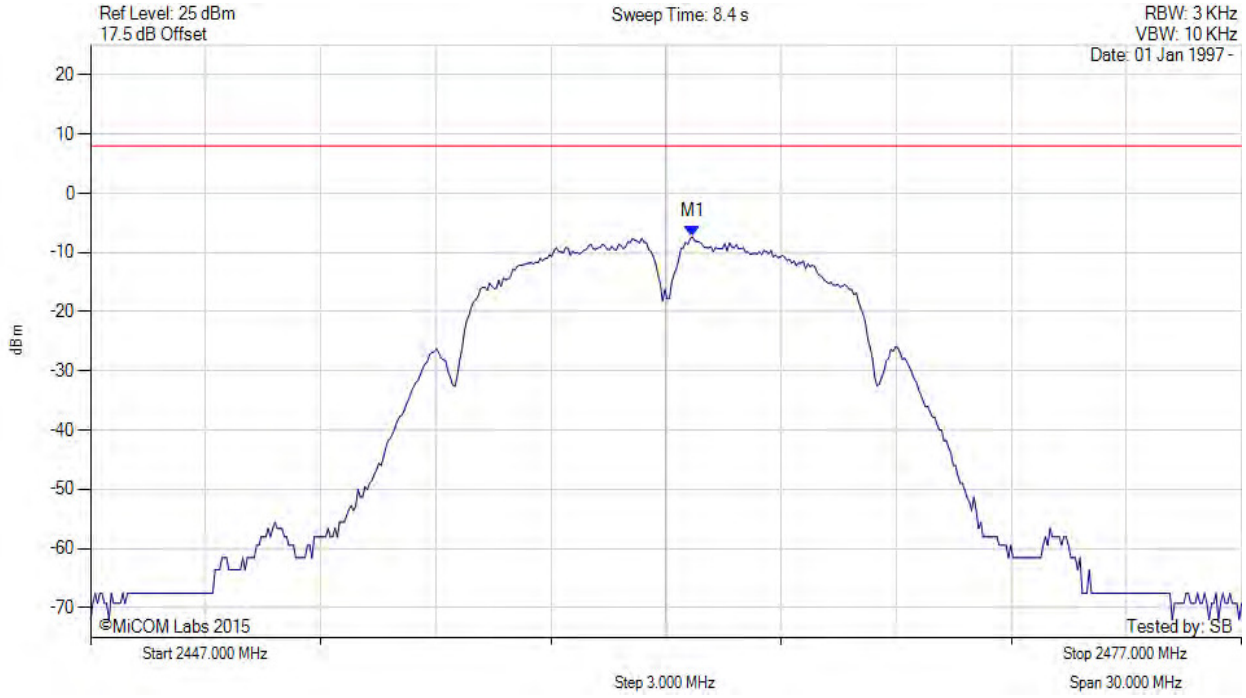



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2462.691 MHz : -10.258 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

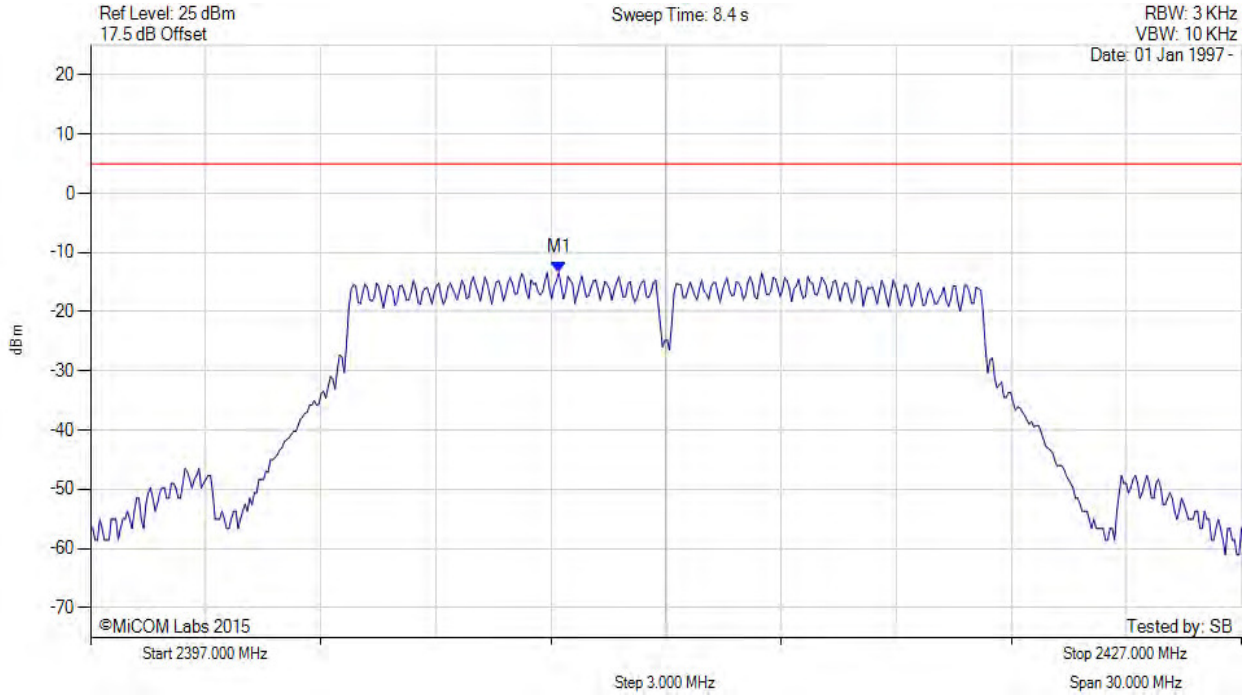



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2462.700 MHz : -7.365 dBm<br>M1 + DCCF : 2462.700 MHz : -7.321 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: ≤ 8.0 dBm<br>Margin: -15.3 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

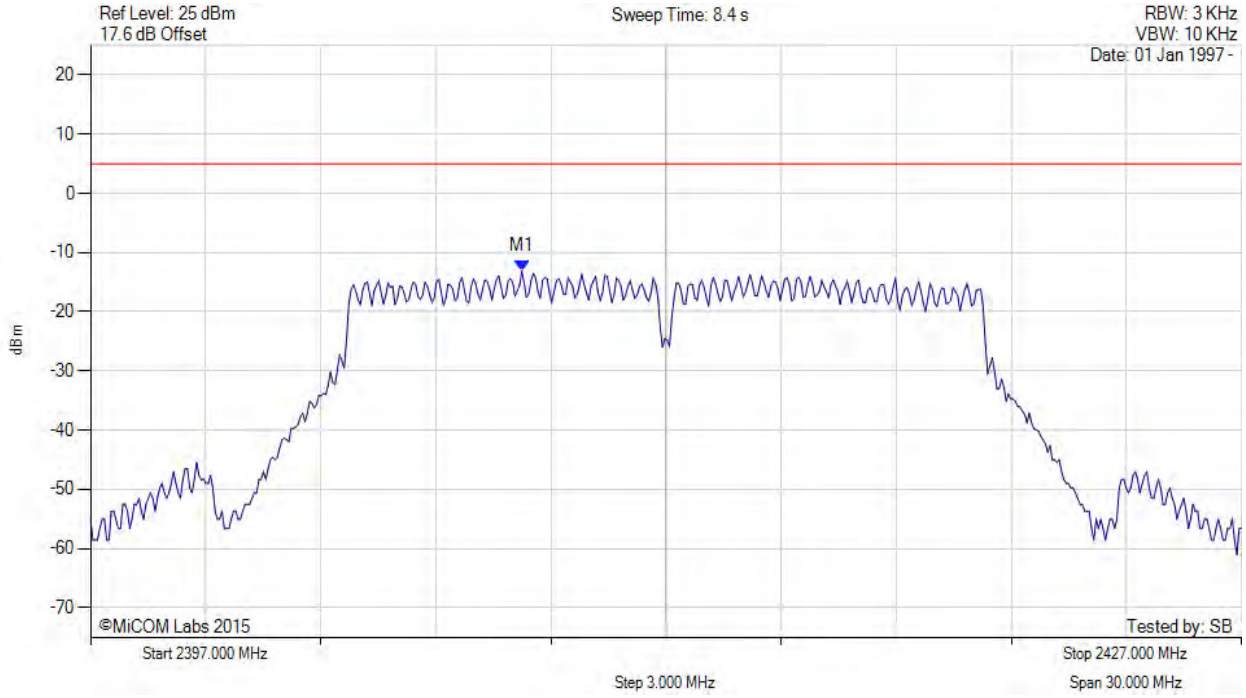



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2409.204 MHz : -13.359 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

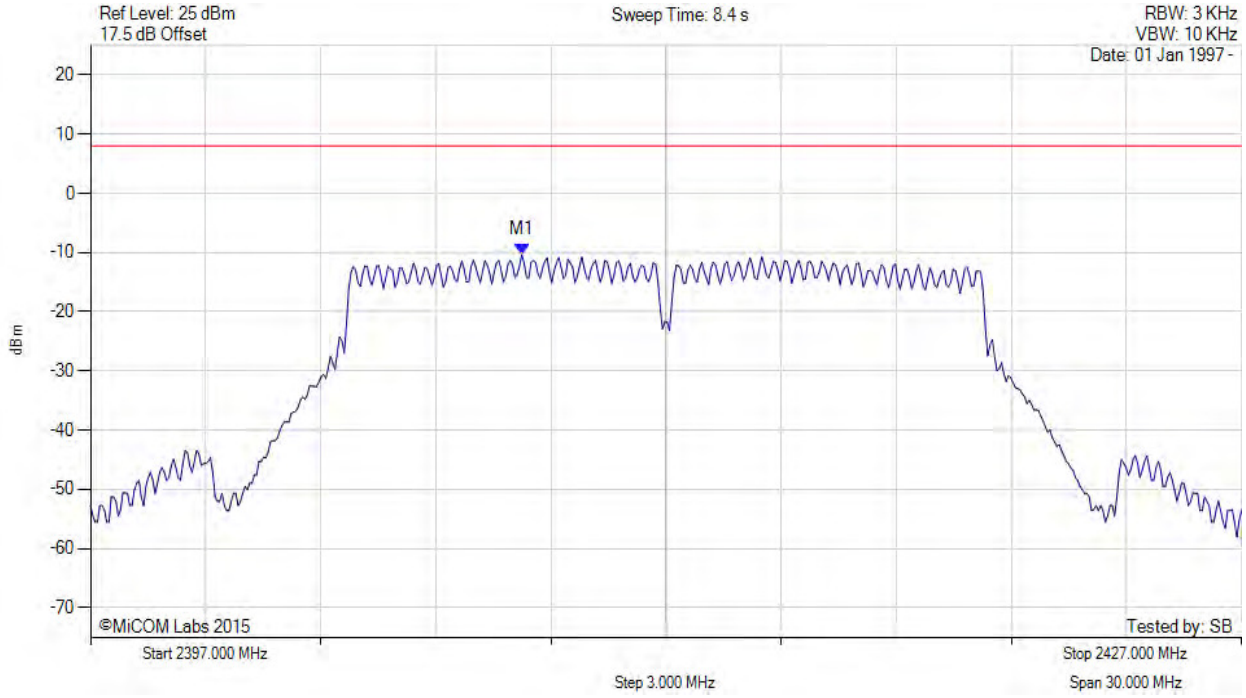



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2408.242 MHz : -13.157 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

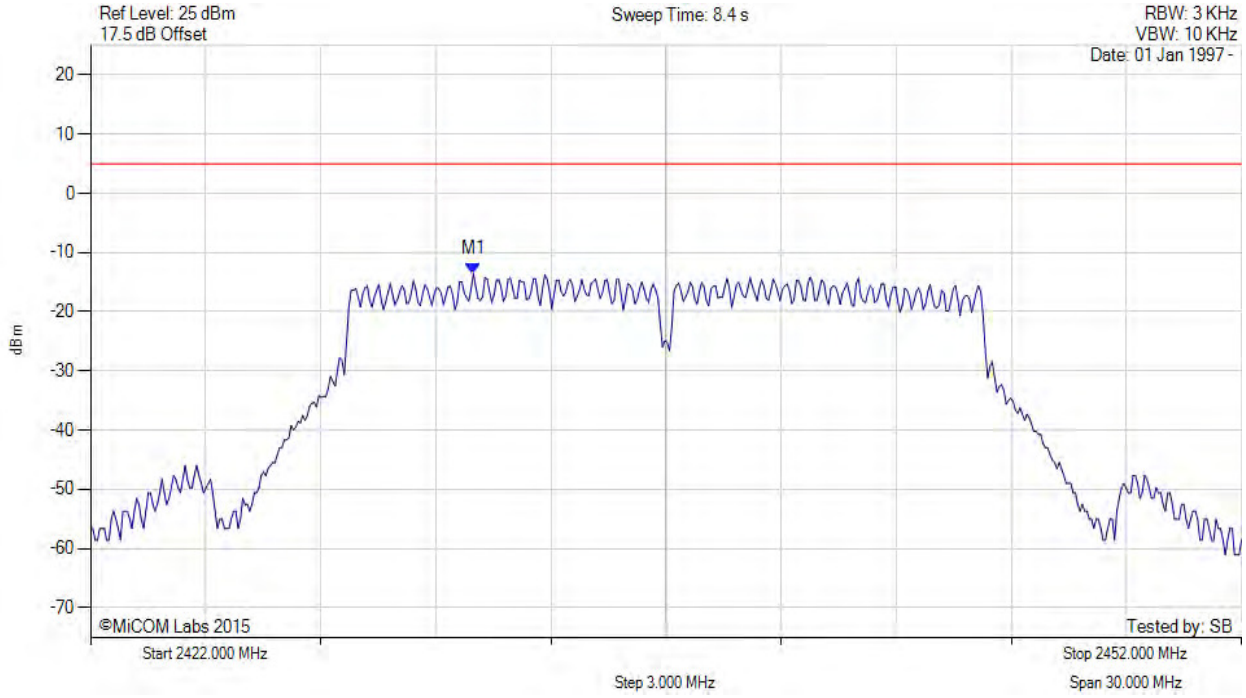



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2408.200 MHz : -10.358 dBm<br>M1 + DCCF : 2408.200 MHz : -10.266 dBm<br>Duty Cycle Correction Factor : +0.09 dB | Limit: ≤ 8.0 dBm<br>Margin: -18.3 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

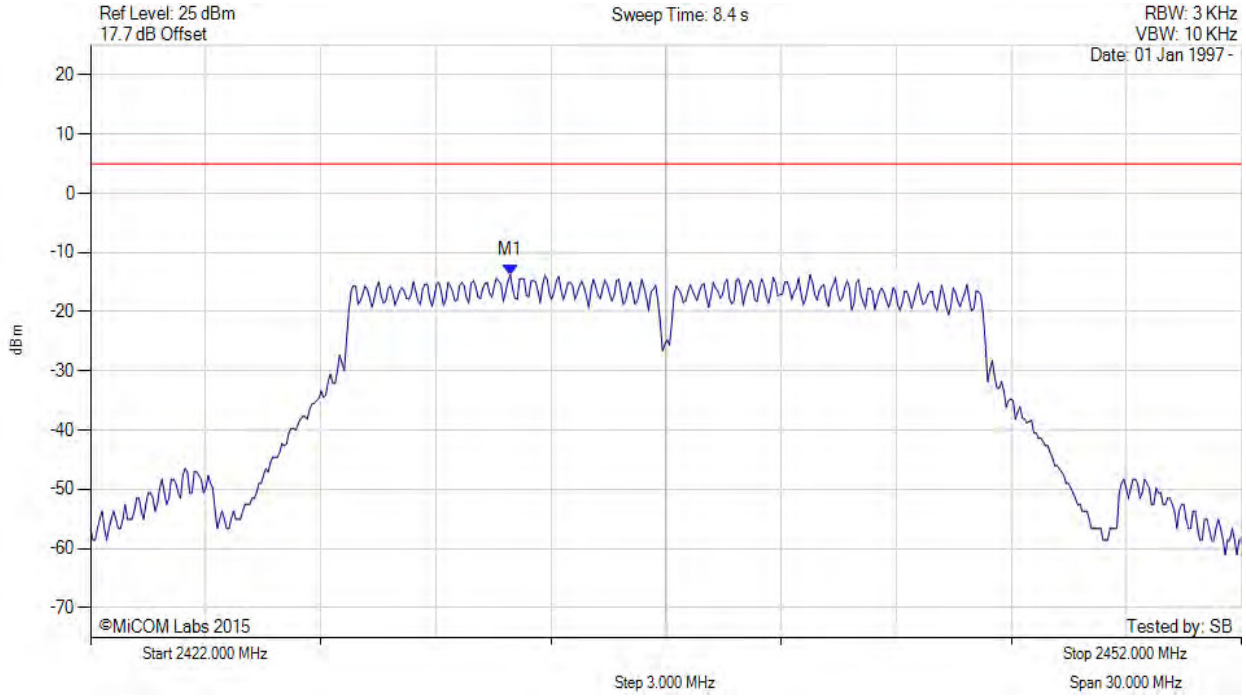



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2431.980 MHz : -13.540 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

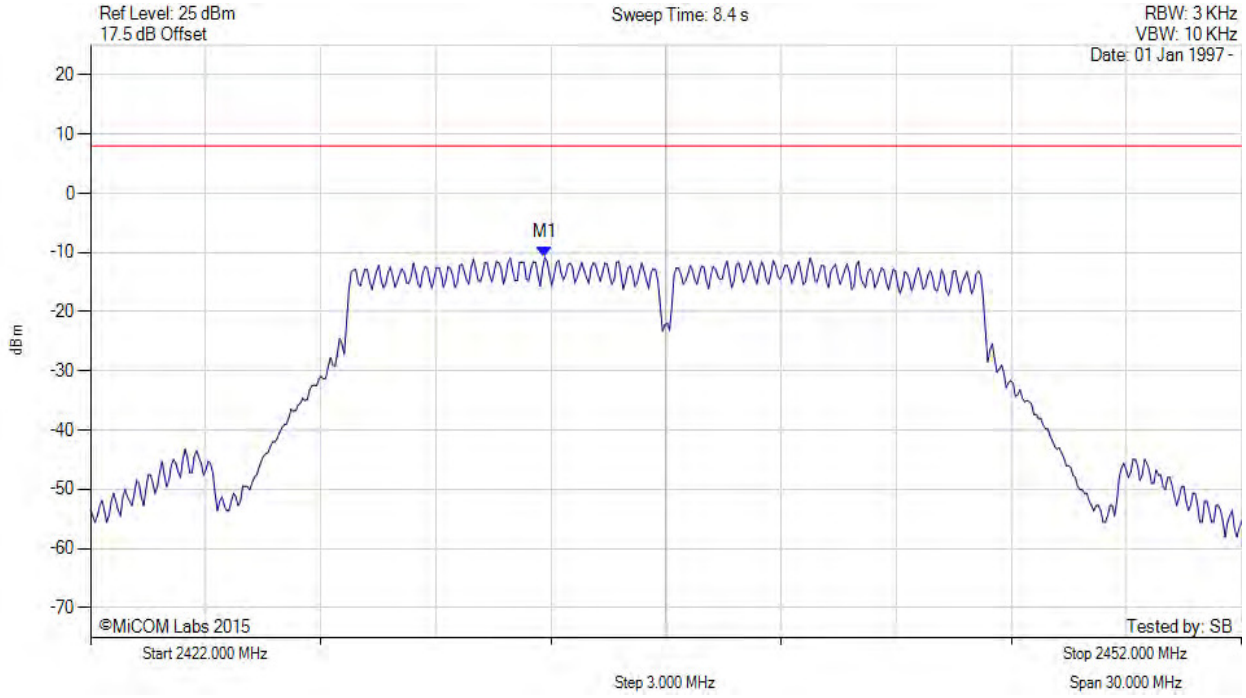



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2432.942 MHz : -13.726 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

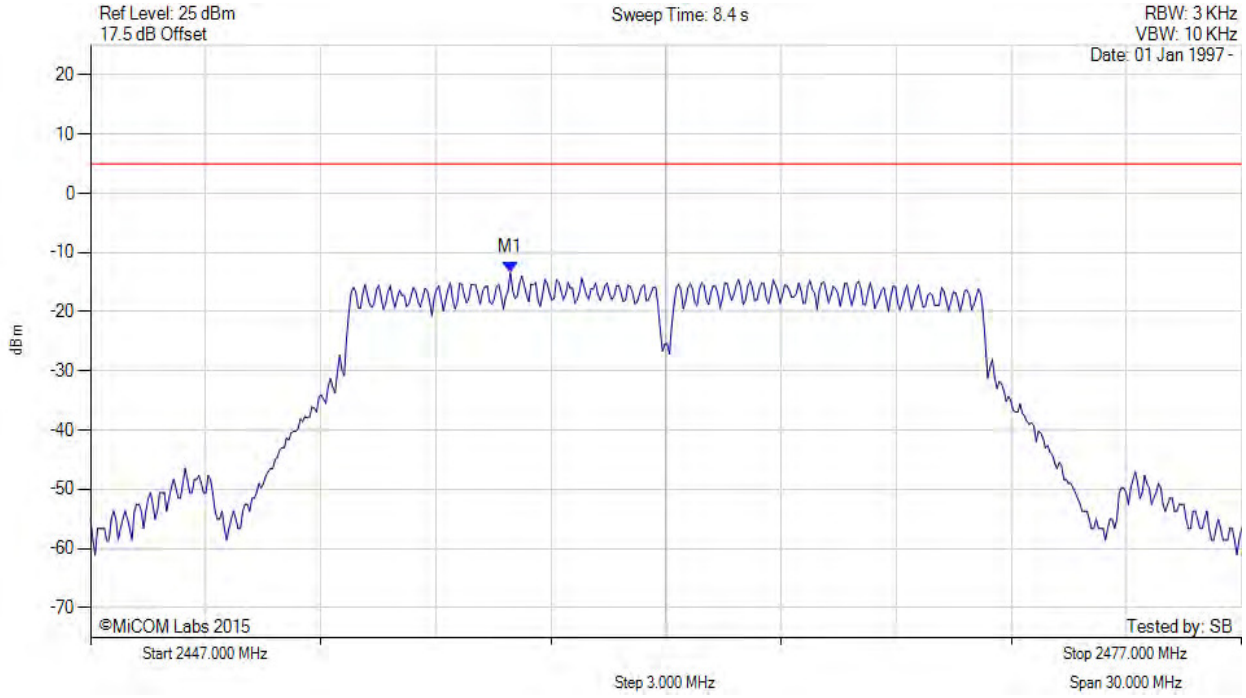



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2433.800 MHz : -10.809 dBm<br>M1 + DCCF : 2433.800 MHz : -10.717 dBm<br>Duty Cycle Correction Factor : +0.09 dB | Limit: ≤ 8.0 dBm<br>Margin: -18.7 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

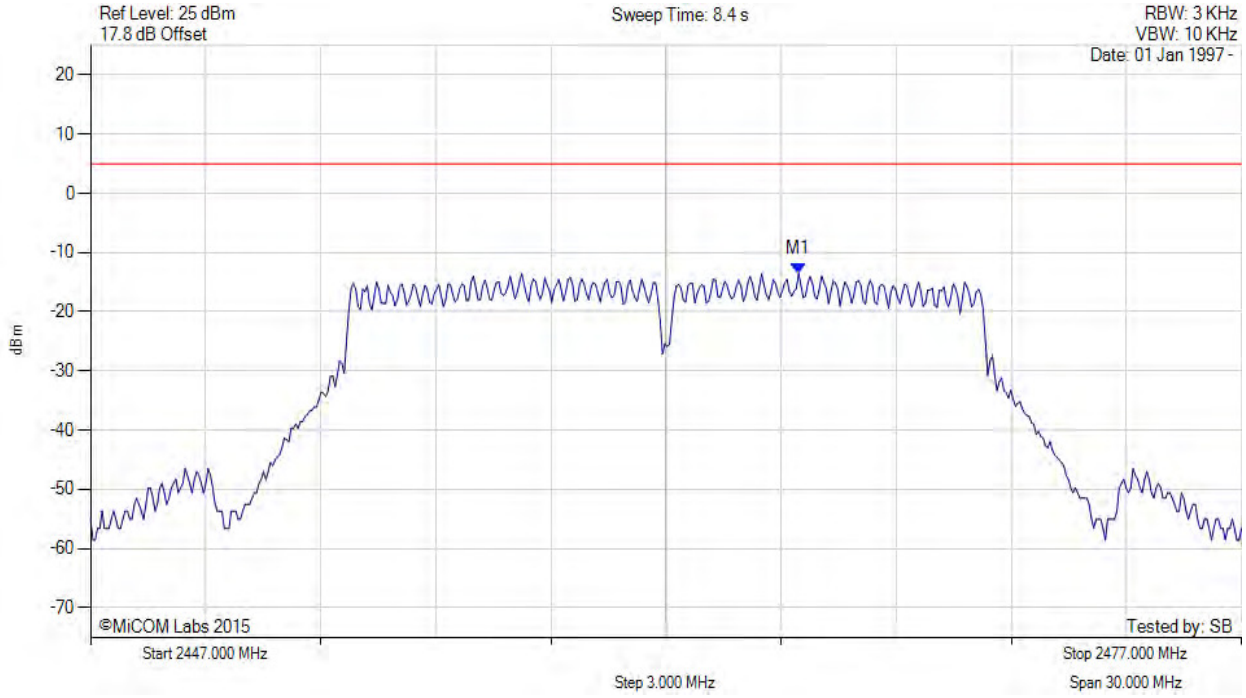



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2457.942 MHz : -13.371 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

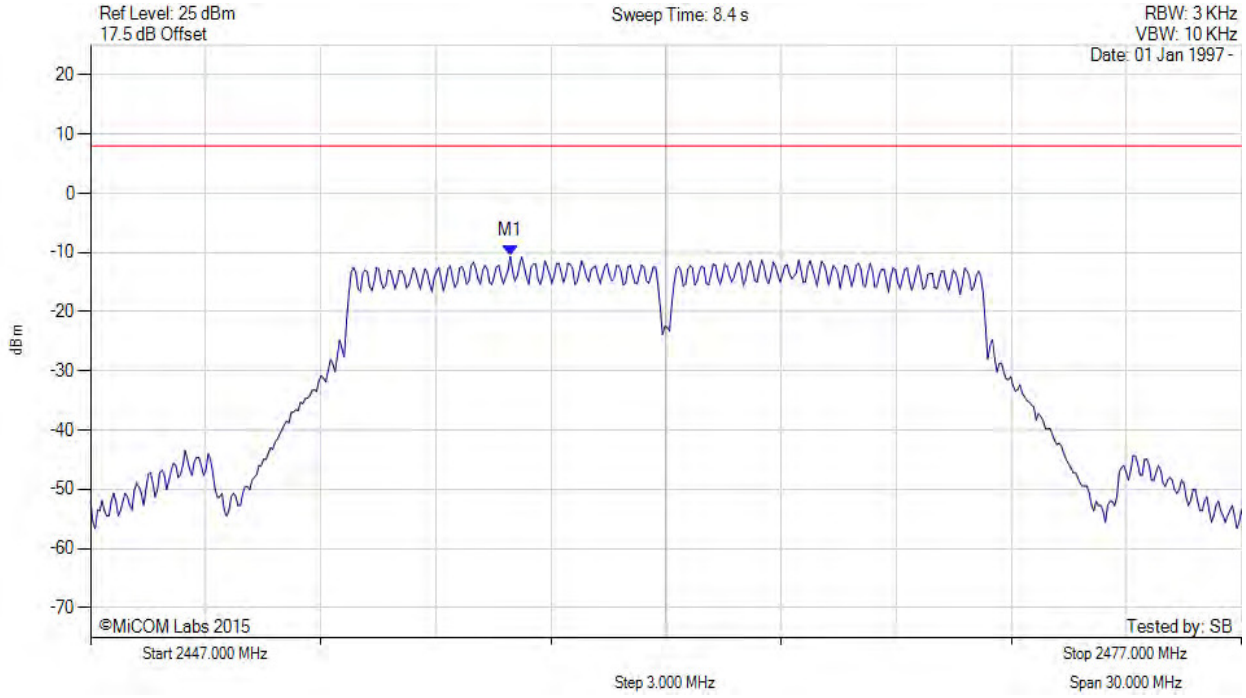



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2465.457 MHz : -13.565 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

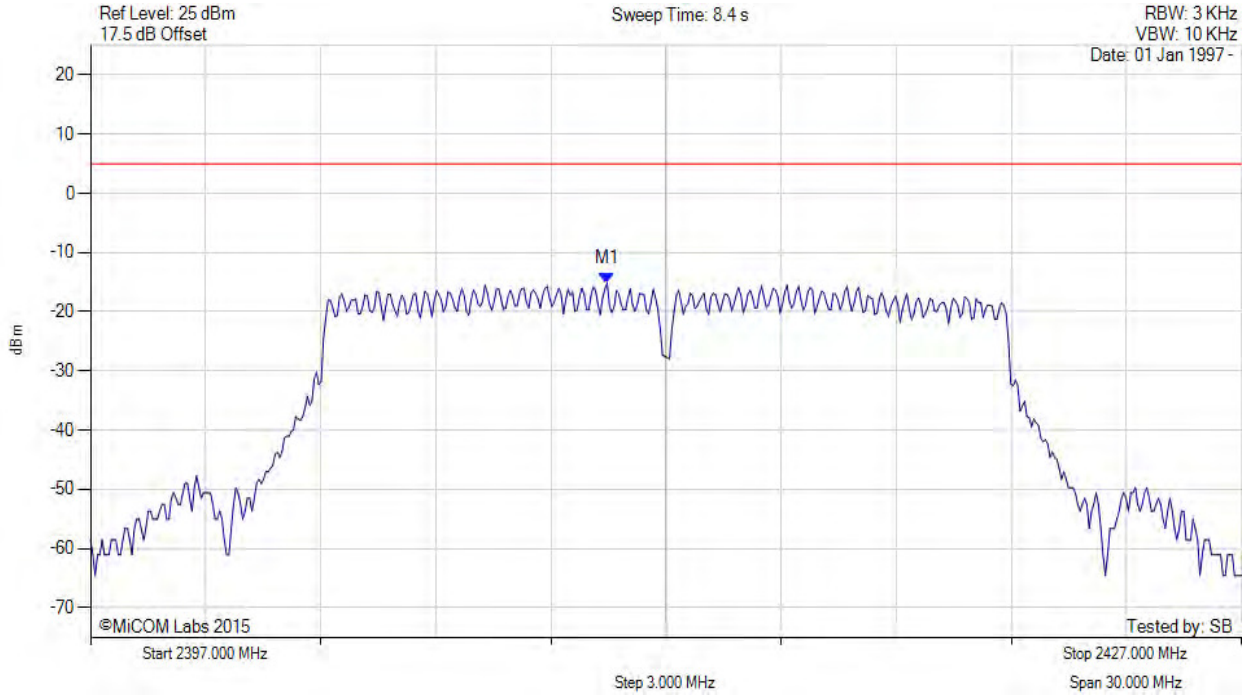



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2457.900 MHz : -10.654 dBm<br>M1 + DCCF : 2457.900 MHz : -10.562 dBm<br>Duty Cycle Correction Factor : +0.09 dB | Limit: ≤ 8.0 dBm<br>Margin: -18.6 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

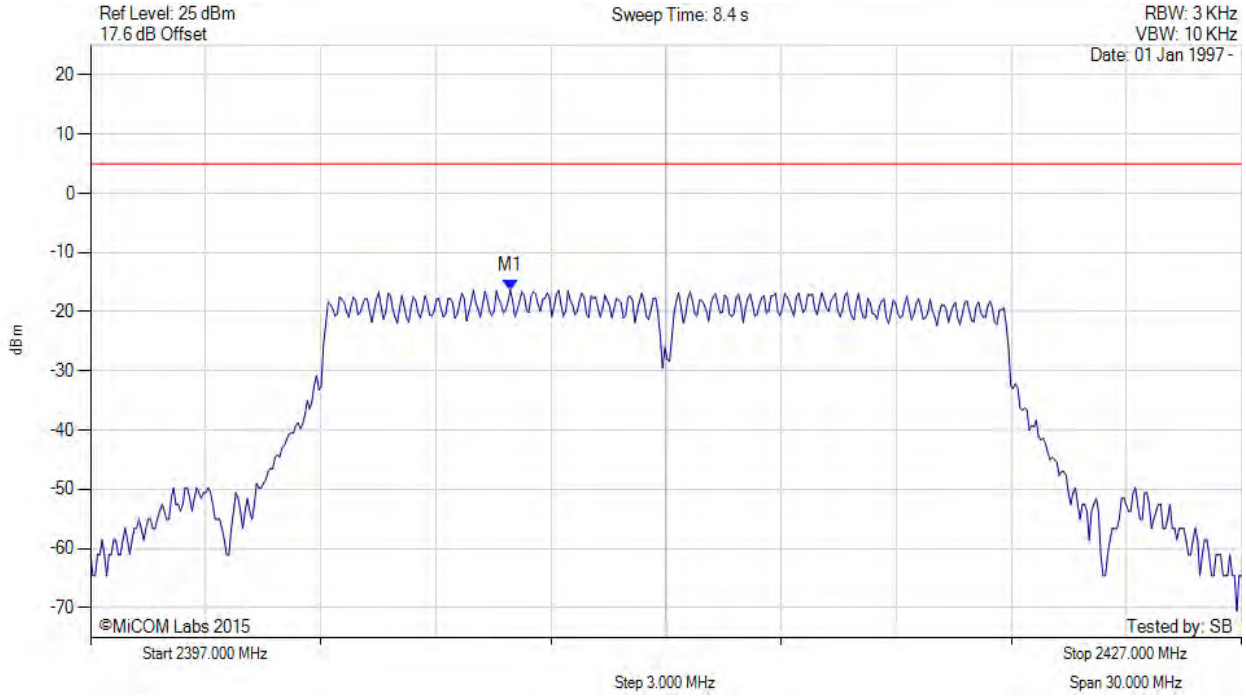



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2410.467 MHz : -15.134 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

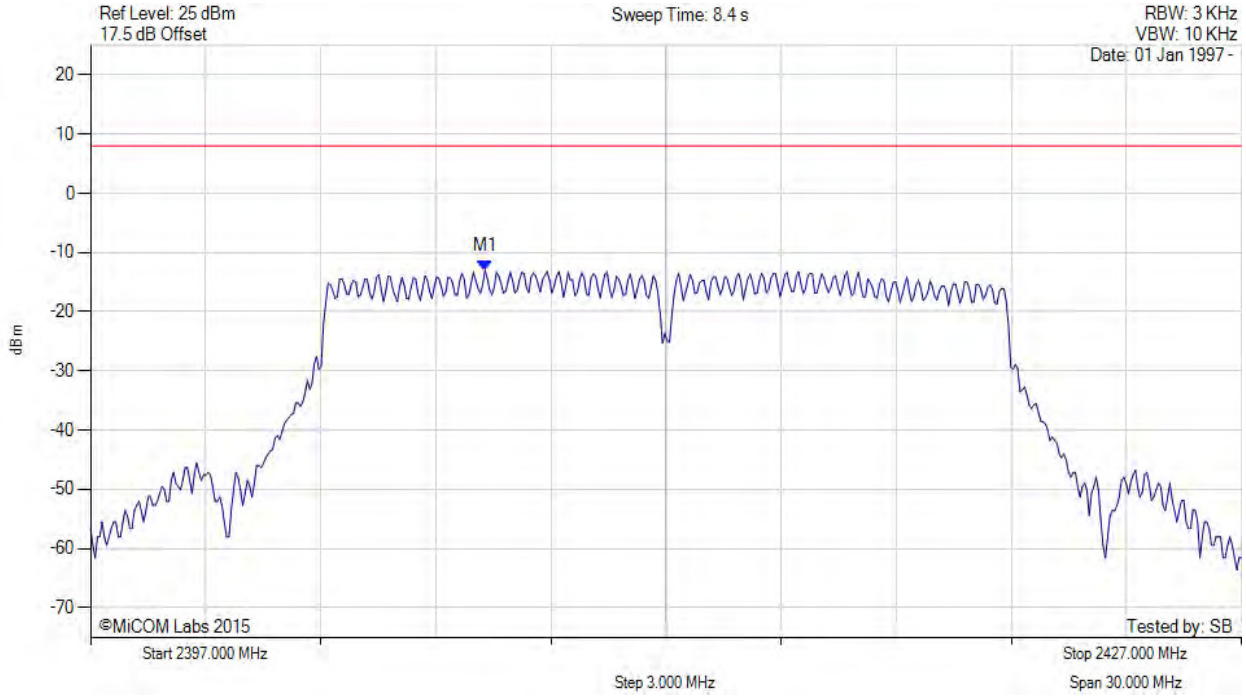



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2407.942 MHz : -16.346 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

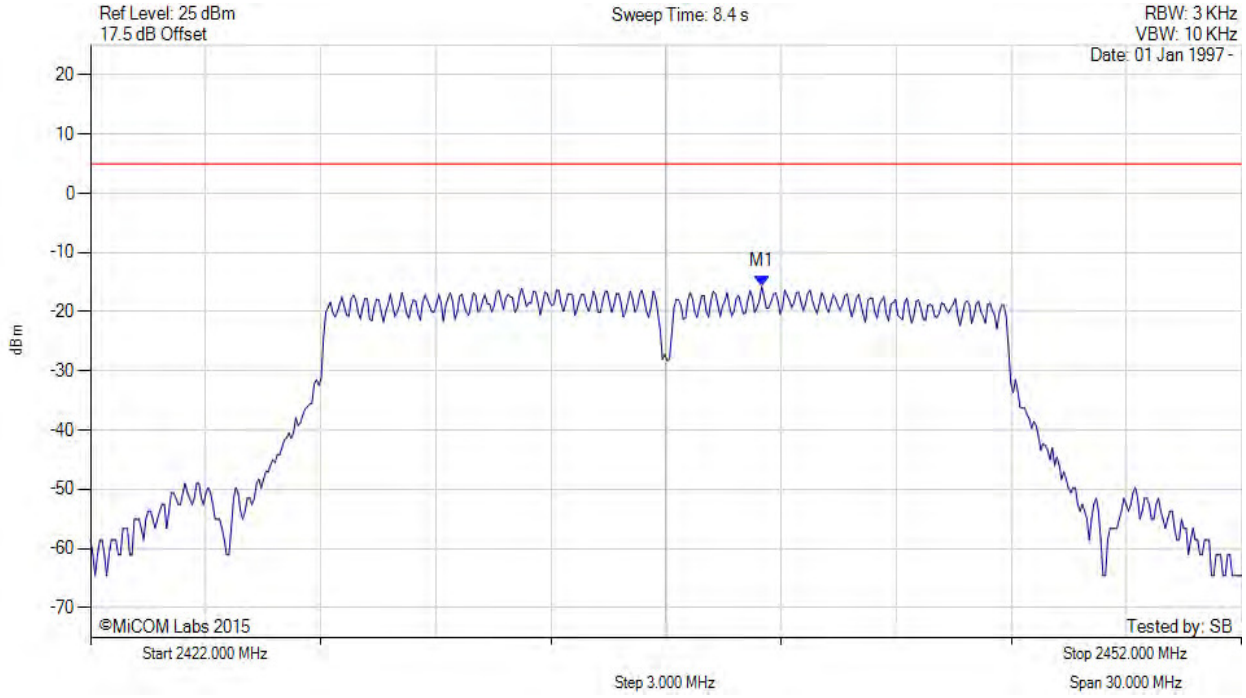



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2407.300 MHz : -13.021 dBm<br>M1 + DCCF : 2407.300 MHz : -12.853 dBm<br>Duty Cycle Correction Factor : +0.17 dB | Limit: ≤ 8.0 dBm<br>Margin: -20.9 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

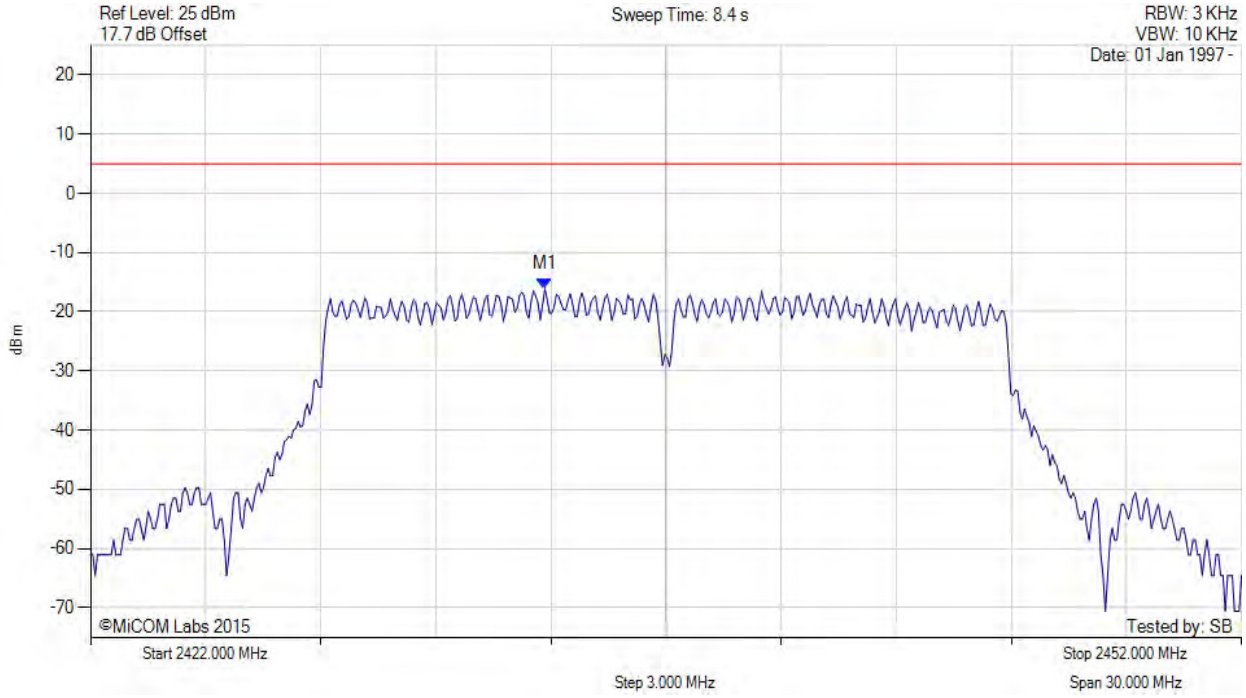



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2439.495 MHz : -15.695 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

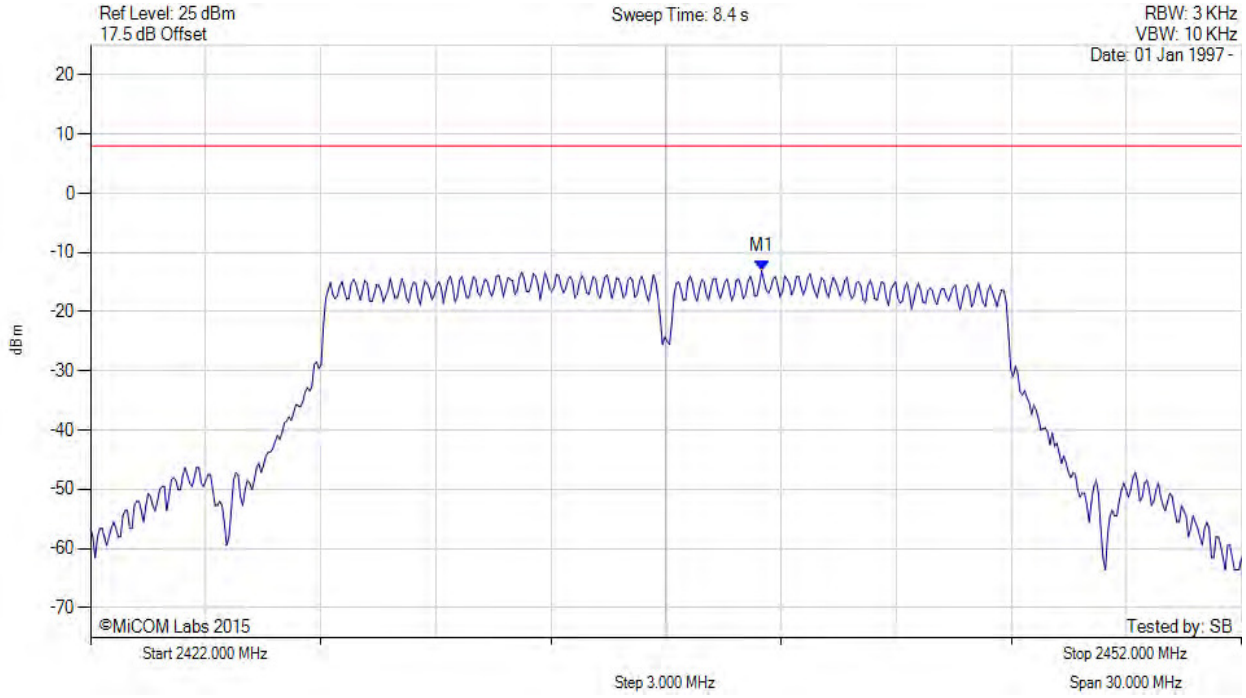



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2433.844 MHz : -16.179 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

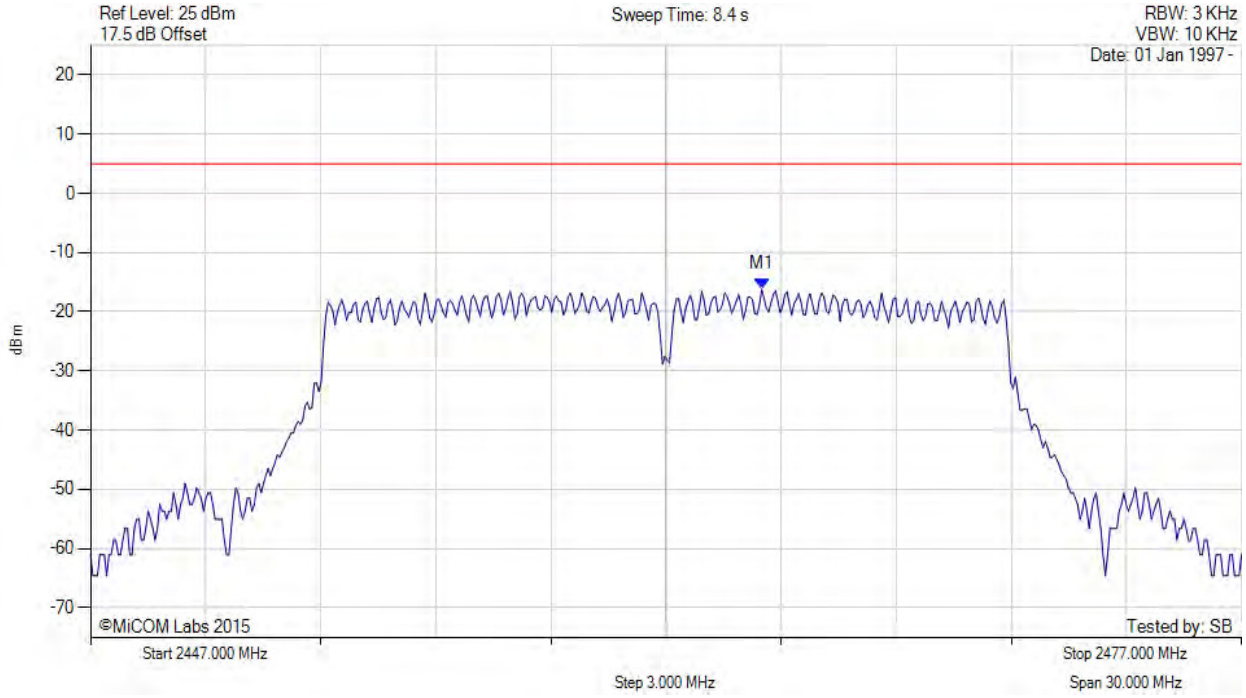



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2439.500 MHz : -13.100 dBm<br>M1 + DCCF : 2439.500 MHz : -12.932 dBm<br>Duty Cycle Correction Factor : +0.17 dB | Limit: ≤ 8.0 dBm<br>Margin: -20.9 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

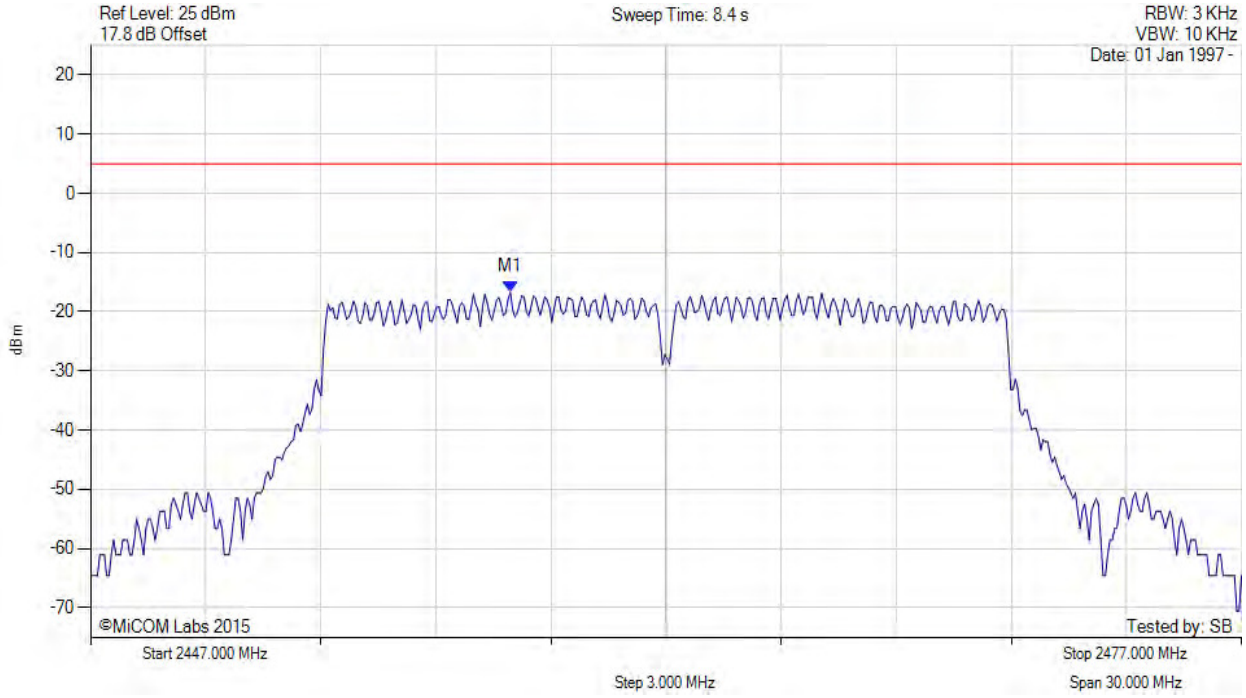



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2464.495 MHz : -16.229 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

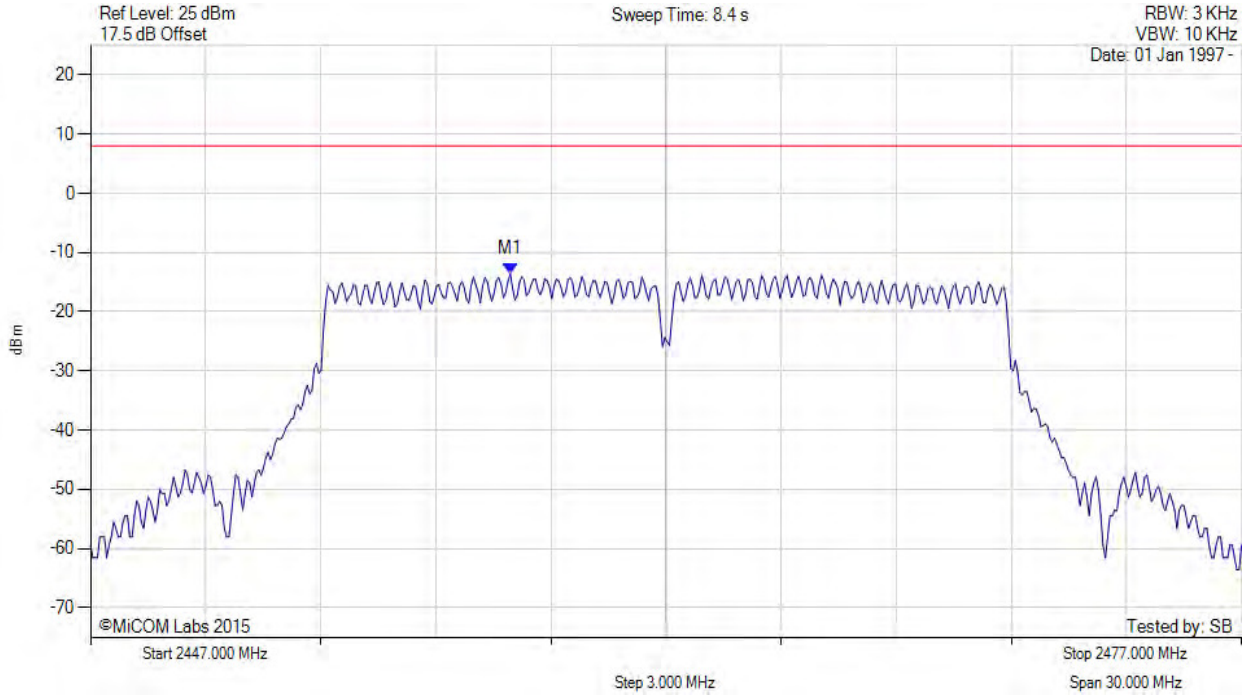



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2457.942 MHz : -16.656 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

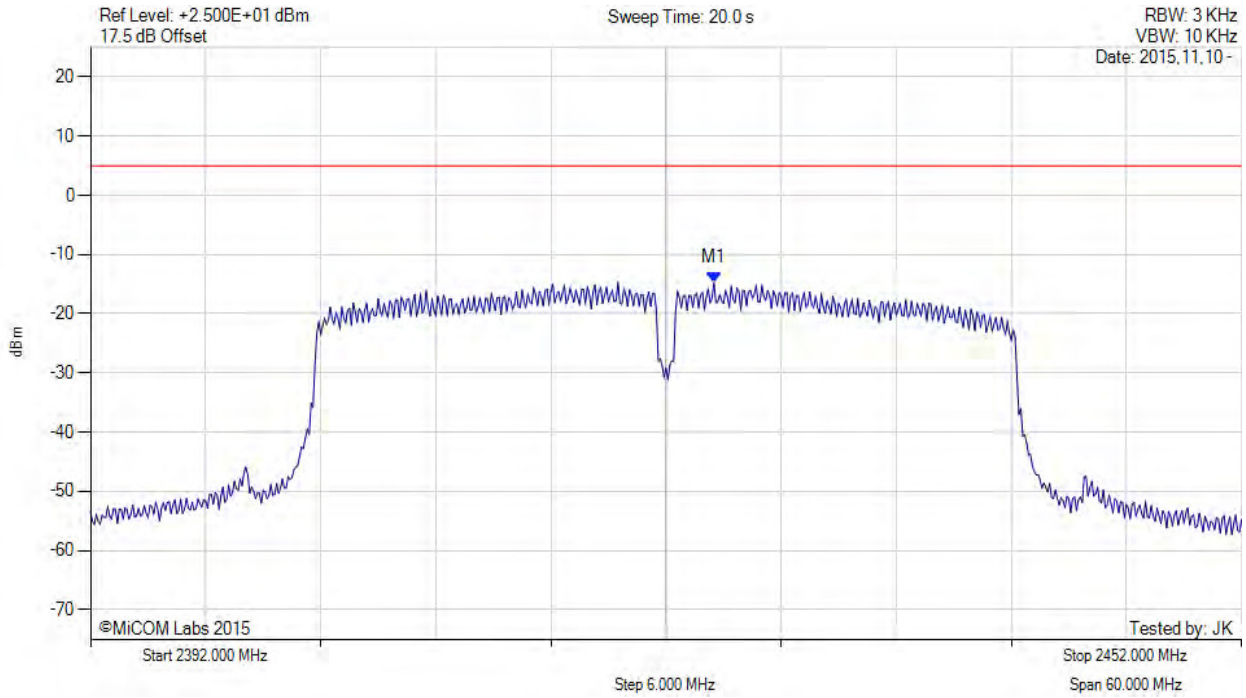



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2457.900 MHz : -13.628 dBm<br>M1 + DCCF : 2457.900 MHz : -13.460 dBm<br>Duty Cycle Correction Factor : +0.17 dB | Limit: ≤ 8.0 dBm<br>Margin: -21.5 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

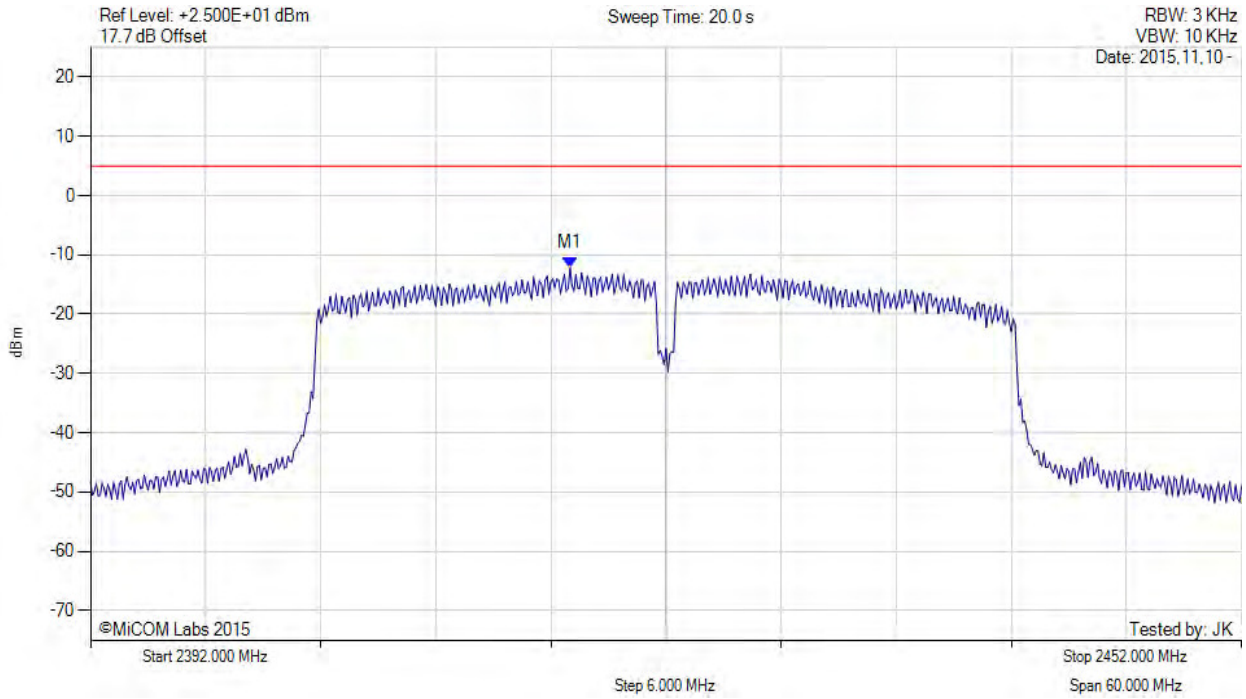



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2424.500 MHz : -14.770 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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




| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2417.000 MHz : -12.174 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

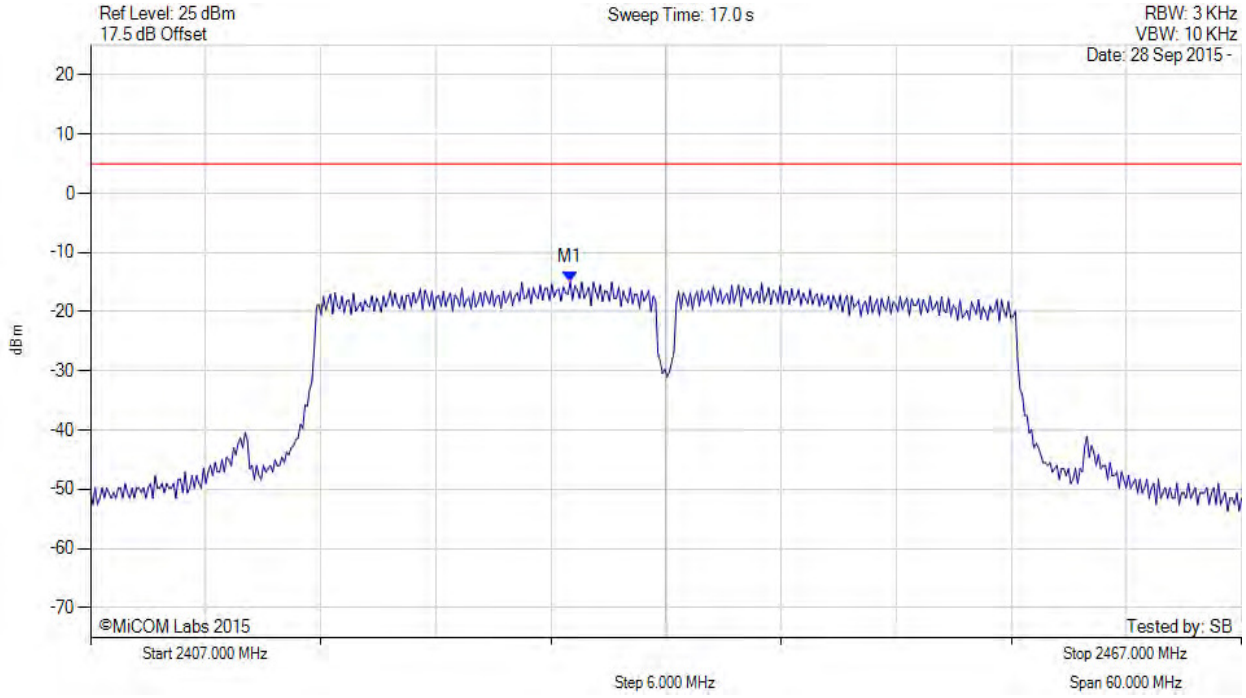
Variant: 802.11n HT-40, Channel: 2422.00 MHz, SUM, Temp: Ambient, Voltage: 12 Vdc

| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2417.000 MHz : -10.580 dBm<br>M1 + DCCF : 2417.000 MHz : -10.269 dBm<br>Duty Cycle Correction Factor : +0.31 dB | Limit: ≤ 8.0 dBm<br>Margin: -18.3 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

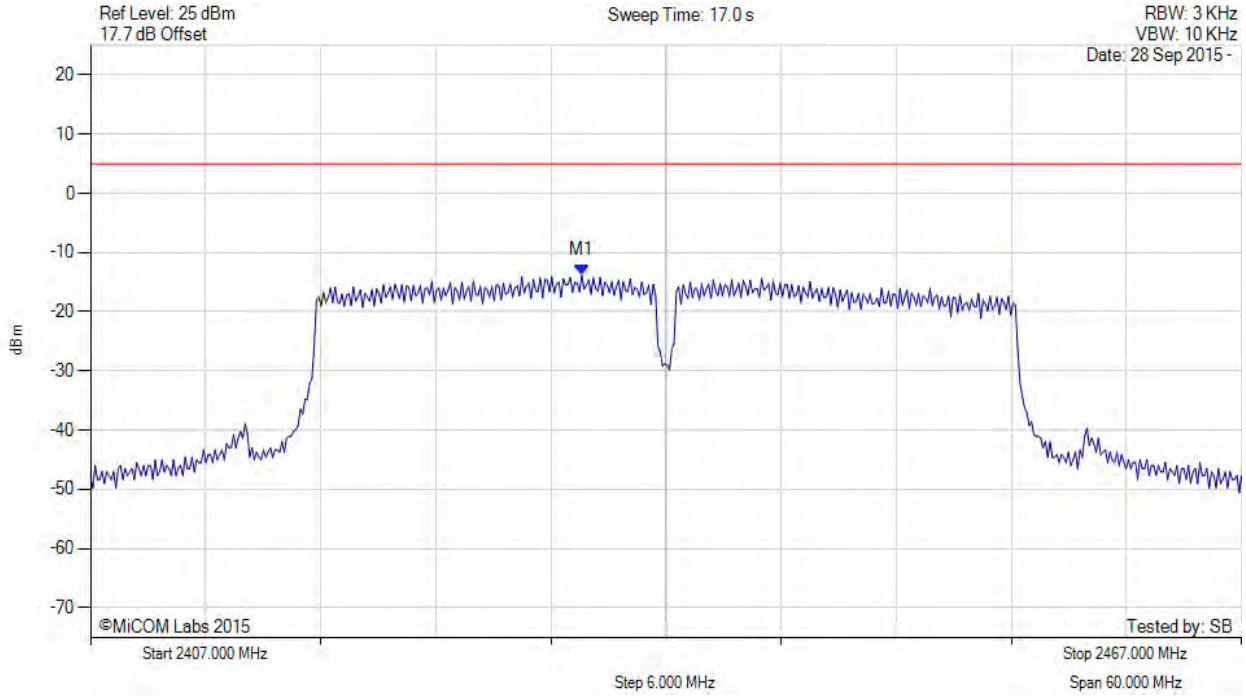



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2432.010 MHz : -14.959 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

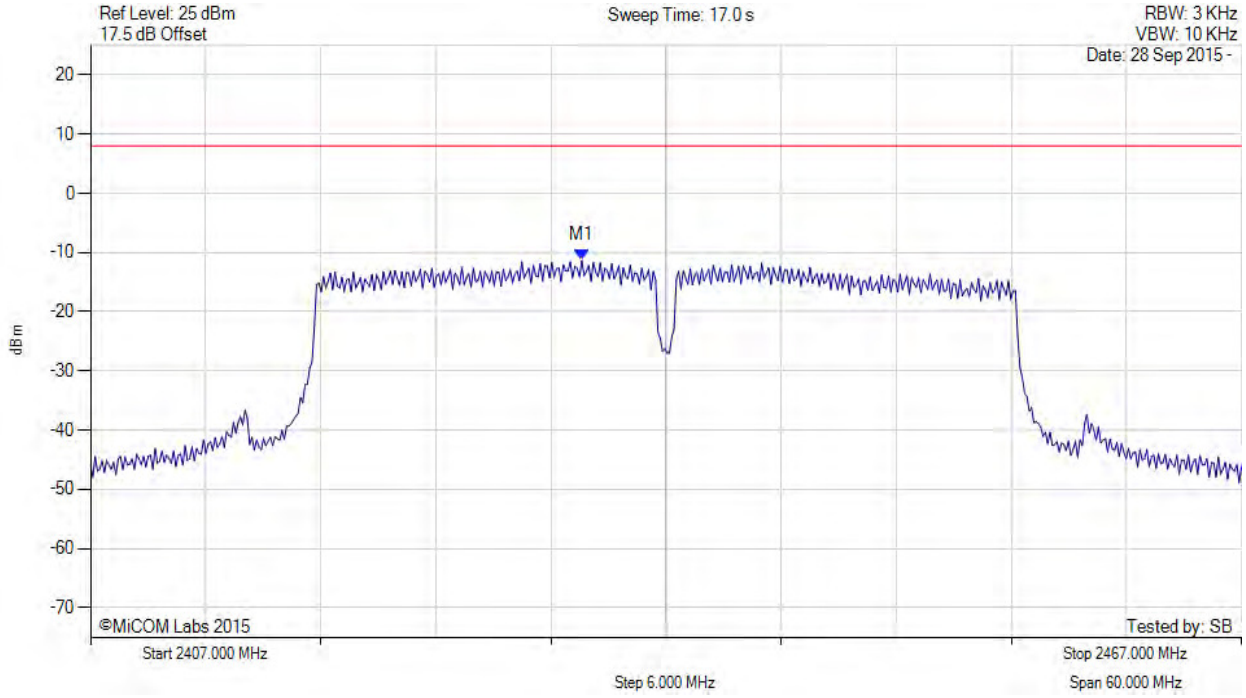



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2432.611 MHz : -13.814 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

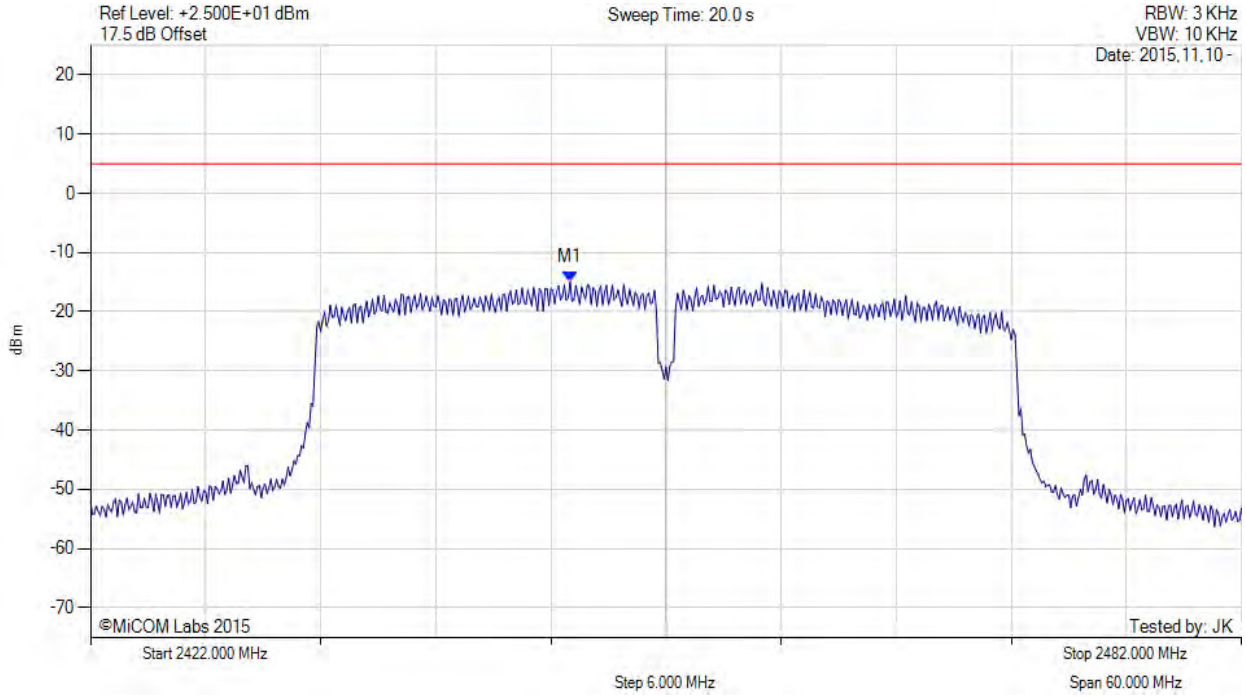



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVERAGE<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2432.600 MHz : -11.345 dBm<br>M1 + DCCF : 2432.600 MHz : -10.887 dBm<br>Duty Cycle Correction Factor : +0.31 dB | Limit: ≤ 8.0 dBm<br>Margin: -18.9 dB |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

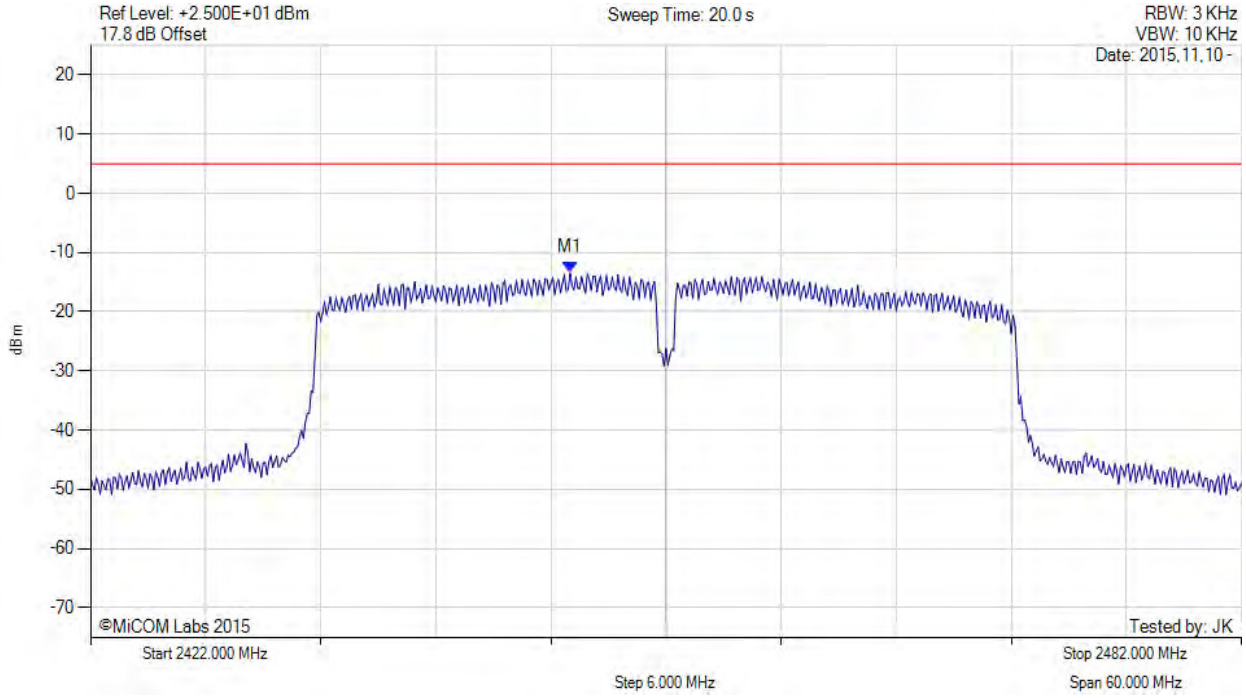



| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2447.000 MHz : -14.999 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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




| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2447.000 MHz : -13.398 dBm | Limit: ≤ 4.990 dBm |

back to matrix

POWER SPECTRAL DENSITY - AVERAGE

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

| Analyser Setup | Marker:Frequency:Amplitude | Test Results |
|---|---|---|
| Detector = AVER<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 2447.000 MHz : -11.115 dBm<br>M1 + DCCF : 2447.000 MHz : -10.804 dBm<br>Duty Cycle Correction Factor : +0.31 dB | Limit: ≤ 8.0 dBm<br>Margin: -18.8 dB |

back to matrix

575 Boulder Court
Pleasanton, California 94566, USA
Tel: +1 (925) 462 0304
Fax: +1 (925) 462 0306
www.micomlabs.com