Company: Actiontec Electronics Inc

Test of: WEB5500
To: FCC CFR 47 Part 15 Subpart C 15.247 (DTS)

Report No.: ATEC11-U5a Conducted Rev B

CONDUCTED TEST REPORT

CONDUCTED TEST REPORT

FROM

MiCOM Labs
opening wireless markets

Test of: Actiontec Electronics Inc. WEB5500
to

To: FCC CFR 47 Part 15 Subpart C 15.247 (DTS)

Test Report Serial No.: ATEC11–U5a Conducted Rev B

This report supersedes: ATEC11–U5a Conducted Rev A

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

Report Number	Test Report Type
ATEC011-U2	FCC Part 15B Test Report
ATEC11-U5a, b	2.4 GHz Conducted & Radiated Test Reports
ATEC11-U8a, b	5 GHz (non-DFS) Conducted, Radiated Test Reports
ATEC11-U11a, b, c	5 GHz (DFS) Conducted, Radiated, DFS Test Reports

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

Product Function: 802.11ac Wireless Network Extender

Issue Date: 27th April 2017

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
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A2LA ACCREDITED
TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. Test 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

ilac-MRA A2LA

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 4th day of February 2016.

Senior Director of Quality & Communications
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2017

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 Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	US0159 Listing #: 4143A-2 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) 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

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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

Accredited Product Certification Body

A2LA has accredited

MICOM LABS

Pleasanton, CA

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 management system.

Presented this 4th day of February 2016.

Senior Director of Quality & Communications
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2017

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

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2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	22nd November 2015	
Rev A	10th January 2016	Initial Release
Rev B	27th April 2017	Removed product photographs

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

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3. TEST RESULT CERTIFICATE

Manufacturer:	Actiontec Electronics Inc 760 N Mary Avenue Sunnyvale California 94085 USA	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model:	WEB5500	**Telephone:**	+1 925 462 0304
Type of Equipment:	802.11ac Wireless Network Extender	**Fax:**	+1 925 462 0306
S/N's:	F5		
Test Date(s):	3rd – 17th November 2015	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart C 15.247 (DTS)	**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:

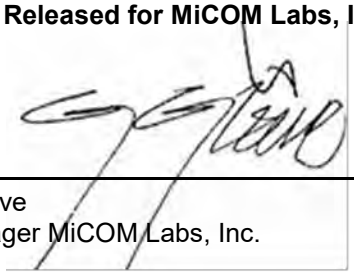
1. This document reports conditions under which testing was conducted and the results of testing performed.

2. Details of test methods used have been recorded and kept on file by the laboratory.

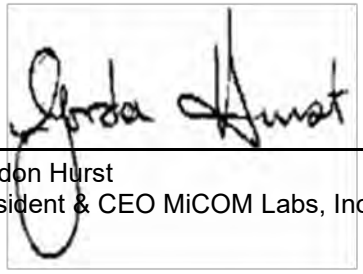
3. Test results apply only to the item(s) tested.

A2LA 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.

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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	KDB 644545 D03 v01	August 14th 2014	Guidance for IEEE 802.11ac New Rules
X	FCC 47 CFR Part 2.1033	2014	FCC requirements and rules regarding photographs and test setup diagrams.
XI	M 3003	Edition 3 Nov. 2012	Expression of Uncertainty and Confidence in Measurements

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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.

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5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Actiontec Electronics Inc WEB5500 to FCC CFR 47 Part 15 Subpart C 15.247 (DTS). Radio Frequency Devices; Subpart C – Intentional Radiators
Applicant:	Actiontec Electronics Inc 760 N Mary Avenue Sunnyvale California 94085 USA
Manufacturer:	As Applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	ATEC11 - WEB5500 FCC
Date EUT received:	3rd November 2015
Standard(s) applied:	FCC CFR 47 Part 15 Subpart C 15.247 (DTS)
Dates of test (from - to):	3rd – 17th November 2015
No of Units Tested:	1
Type of Equipment:	802.11a/b/g/n/ac
Model(s):	WEB5500
Location for use:	Indoor
Declared Frequency Range(s):	2400 - 2483.5 MHz;
Primary function of equipment:	802.11ac Wireless Network Extender
Secondary function of equipment:	None Provided
Type of Modulation:	Per 802.11 –CCK, BPSK, QPSK, DSSS, OFDM
EUT Modes of Operation:	2400 - 2483.5 MHz: 802.11b; 802.11g; 802.11n HT-20; 802.11n HT-40;
Declared Nominal Output Power (Ave):	2400 - 2483.5 MHz: 802.11b: +25 dBm; 802.11g: +22 dBm; 802.11n HT-20: +22 dBm; 802.11n HT-40:+22 dBm
Transmit/Receive Operation:	Transceiver - Half Duplex
Rated Input Voltage and Current:	AC/ DC adaptor (adaptor sold with unit) Input: 115 Vac 0.6A Output: 12Vdc, 1.5 A
Operating Temperature Range:	Declared Range 0°C to 45°C
ITU Emission Designator:	2400 – 2483.5 MHz 802.11b 15M9G1D 2400 – 2483.5 MHz 802.11g 16M8D1D 2400 – 2483.5 MHz 802.11n – HT-20 18M0D1D 2400 – 2483.5 MHz 802.11n – HT-40 36M4D1D
Equipment Dimensions:	4.75” (W) x 7.00” (H) x 2.25” (D)
Weight:	0.75 lb
Hardware Rev:	AM2
Software Rev:	V.3.1.9.3c

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5.2. Scope Of Test Program

Actiontec Electronics Inc WEB5500

The scope of the test program was to test the Actiontec Electronics Inc WEB5500, 802.11a/b/g/n/ac 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

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

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	802.111ac Wireless Network Extender	Actiontec	WEB5500	F5
EUT	Power Adapter 100 - 240Vac 50/60Hz 0.6A 12 Vdc 1.5 A	Actiontec	NBS24J120150VU	Unknown
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	Dipole	5.5	-	360	-	2400 - 2483.5
integral	Galtronics	Custom PCB	Dipole	3.0	-	360	-	2400 - 2483.5

BF Gain - Beamforming Gain
Dir BW - Directional BeamWidth
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	2	N	RJ-45	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	1.00	2412.00	2437.00	2462.00
802.11g	6.00	2412.00	2437.00	2462.00
802.11n HT-20	6.50	2412.00	2437.00	2462.00
802.11n HT-40	13.50	2422.00	2437.00	2452.00

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5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:
1. NONE

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

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6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
Conducted Test Results		
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

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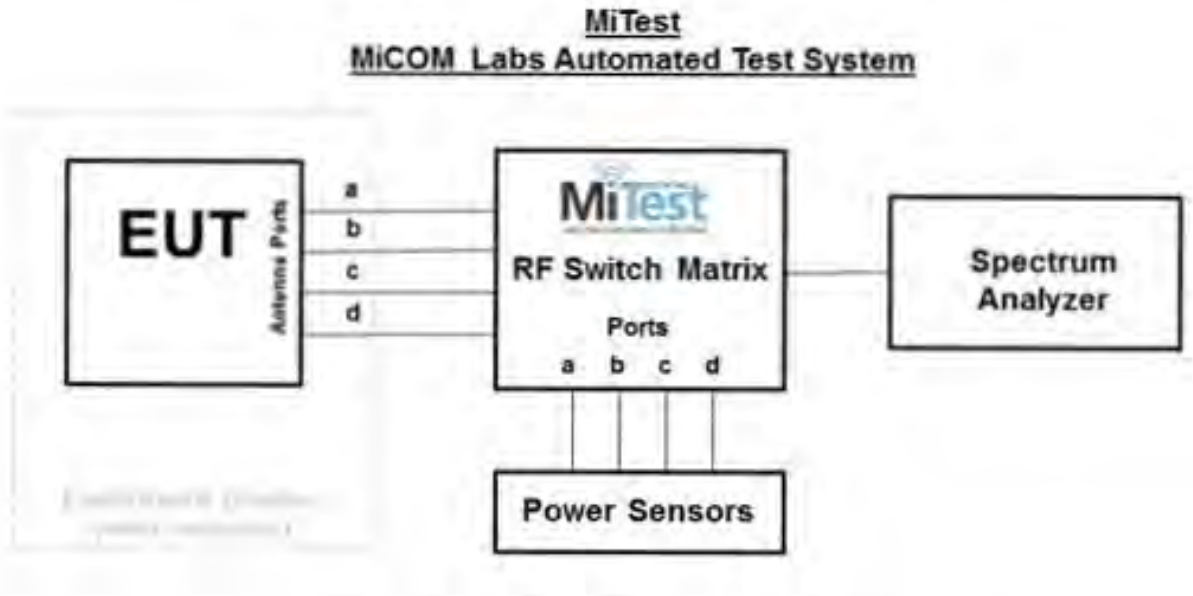
7. TEST EQUIPMENT CONFIGURATION(S)

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 Spurious Emissions
4. Conducted Band-Edge Emissions
5. 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.

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Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
127	Power Supply	HP	6674A	US36370530	Cal when used
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
193	Receiver 20 Hz to 7 GHz	Rhode & Schwarz	ESI 7	838496/007	14 Jan 2016
248	Resistance Thermometer	Thermotronics	GR2105-02	9340 #1	21 Oct 2016
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	27 Aug 2016
376	USB 10MHz - 18GHz Average Power Sensor	Agilent	U2000A	MY51440005	23 Oct 2016
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	04 Aug 2016
381	4x4 RF Switch Box	MiCOM Labs	MiTest RF Switch Box	MIC002	20 Dec 2015
419	Laptop	Lenova	W520	TS02	Not Required
420	USB to GPIB Interface	National Instruments	GPIB-USB HS	1346738	Not Required
435	USB Wideband Power Sensor	Boonton	55006	8730	31 Jul 2016
440	USB Wideband Power Sensor	Boonton	55006	9178	25 Sep 2016
441	USB Wideband Power Sensor	Boonton	55006	9179	25 Sep 2016
442	USB Wideband Power Sensor	Boonton	55006	9181	25 Sep 2016
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
460	Dell Computer	Dell	Optiplex330	BC944G1	Not Required
74	Environmental Chamber 3	Tenney	TTC	12808-1	30 Sep 2016
RF#2 GPIB#1	GPIB cable to Power Supply	HP	GPIB	None	Not Required
RF#2 SMA#1	EUT to Mitest box port 1	Flexco	SMA Cable port1	None	20 Dec 2015
RF#2 SMA#2	EUT to Mitest box port 2	Flexco	SMA Cable port2	None	20 Dec 2015
RF#2 SMA#3	EUT to Mitest box port 3	Flexco	SMA Cable port3	None	20 Dec 2015
RF#2 SMA#4	EUT to Mitest box port 4	Flexco	SMA Cable port4	None	20 Dec 2015
RF#2 SMA#SA	Mitest box to SA	Flexco	SMA Cable SA	None	20 Dec 2015
RF#2 USB#1	USB Cable to Mitest Box	Dynex	USB Cable	None	Not Required

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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.

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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	CCK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
2412.0	10.020	10.020	--	--	10.020	10.020	≥500.0	-9.52
2437.0	10.020	10.020	--	--	10.020	10.020	≥500.0	-9.52
2462.0	10.020	10.020	--	--	10.020	10.020	≥500.0	-9.52

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2412.0	15.631	15.792	--	--	15.792		
2437.0	15.711	15.872	--	--	15.872		
2462.0	15.711	15.711	--	--	15.711		

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).

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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11g	**Duty Cycle (%):**	86
Data Rate:	6.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

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

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2412.0	16.593	16.593	--	--	16.593		
2437.0	16.593	16.754	--	--	16.754		
2462.0	16.593	16.673	--	--	16.673		

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).

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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11n HT-20	**Duty Cycle (%):**	86
Data Rate:	6.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
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	17.555	--	--	17.555	17.555	≥500.0	-17.06

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2412.0	17.876	17.956	--	--	17.956		
2437.0	17.876	18.036	--	--	18.036		
2462.0	17.876	17.956	--	--	17.956		

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).

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Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11n HT-40	**Duty Cycle (%):**	72
Data Rate:	13.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
2422.0	35.752	35.591	--	--	35.752	35.591	≥500.0	-35.09
2437.0	35.752	35.591	--	--	35.752	35.591	≥500.0	-35.09
2452.0	35.591	35.431	--	--	35.591	35.431	≥500.0	-34.93

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

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).

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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

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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.

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Equipment Configuration for Average Output Power			
Variant:	802.11b	**Duty Cycle (%):**	99.0
Data Rate:	1.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	CCK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power + DCCF (+0.04 dB) (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dB	
2412.0	25.28	25.05	--	--	28.18	30.00	-1.82	58/58
2437.0	25.07	24.79	--	--	27.95	30.00	-2.05	58/58
2462.0	24.17	24.11	--	--	27.15	30.00	-2.85	58/58

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

DCCF - Duty Cycle Correction Factor

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Equipment Configuration for Average Output Power			
Variant:	802.11g	**Duty Cycle (%):**	86.0
Data Rate:	6.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power + DCCF (+0.66 dB) (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dB	
2412.0	21.99	22.54	--	--	25.28	30.00	-4.72	58/58
2437.0	22.13	22.60	--	--	25.38	30.00	-4.62	58/58
2462.0	21.58	22.25	--	--	24.93	30.00	-5.07	58/58

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

DCCF - Duty Cycle Correction Factor

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Equipment Configuration for Average Output Power			
Variant:	802.11n HT-20	**Duty Cycle (%):**	86.0
Data Rate:	6.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power + DCCF (+0.66 dB) (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dB	
2412.0	21.23	21.73	--	--	24.49	30.00	-5.51	57/57*
2437.0	22.13	22.59	--	--	25.37	30.00	-4.63	58/58
2462.0	19.52	20.26	--	--	22.91	30.00	-7.09	56/56*

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

DCCF - Duty Cycle Correction Factor

*A power reduction was required as a result of radiated band-edge measurement, see MiCOM Labs report ATEC11-U5b

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Equipment Configuration for Average Output Power			
Variant:	802.11n HT-40	**Duty Cycle (%):**	72.0
Data Rate:	13.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power + DCCF (+1.43 dB) (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dB	
2422.0	21.59	22.08	--	--	24.85	30.00	-5.15	57/57
2437.0	21.96	22.56	--	--	25.28	30.00	-4.72	58/58
2452.0	20.63	21.31	--	--	23.99	30.00	-6.01	57/57

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

DCCF - Duty Cycle Correction Factor

*A power reduction was required as a result of radiated band-edge measurement, see MiCOM Labs report ATEC11-U5b

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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)).

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Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1.00 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-38.00	-64.737	-38.00	--	--	--	--
2437.0	30.0 - 26000.0	-64.737	-38.00	-64.737	-38.00	--	--	--	--
2462.0	30.0 - 26000.0	-64.737	-39.00	-64.737	-38.00	--	--	--	--

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).

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Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	802.11g	**Duty Cycle (%):**	86
Data Rate:	6.00 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-41.00	-64.737	-40.00	--	--	--	--
2437.0	30.0 - 26000.0	-64.737	-40.00	-64.737	-40.00	--	--	--	--
2462.0	30.0 - 26000.0	-64.737	-41.00	-64.737	-40.00	--	--	--	--

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).

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Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	802.11n HT-20	**Duty Cycle (%):**	86
Data Rate:	6.50 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-41.00	-64.737	-40.00	--	--	--	--
2437.0	30.0 - 26000.0	-64.737	-40.00	-64.737	-39.00	--	--	--	--
2462.0	30.0 - 26000.0	-64.737	-41.00	-64.737	-40.00	--	--	--	--

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).

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Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	802.11n HT-40	**Duty Cycle (%):**	72
Data Rate:	13.50 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-64.737	-43.00	-64.737	-43.00	--	--	--	--
2437.0	30.0 - 26000.0	-64.737	-39.00	-64.737	-38.00	--	--	--	--
2452.0	30.0 - 26000.0	-64.737	-39.00	-64.737	-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).

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9.3.1.2. Conducted Band-Edge Spurious 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):**	5.5
Modulation:	CCK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-27.58	-24.00	2401.90	--	--	-1.900
b	-27.10	-24.00	2401.90	--	--	-1.900

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).

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Equipment Configuration for Conducted Low Band-Edge Emissions - Average			
Variant:	802.11g	**Duty Cycle (%):**	86.0
Data Rate:	6.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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)	M1 Amplitude (dBm)	Plot Limit (dBm)	M2A Frequency (MHz)	(MHz)
a	-31.33	-30.00	2400.40	--	--	--	-0.400
b	-28.29	-30.00	2397.80	-28.29	-24.00	2401.67	-1.665

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).

Where an entry appears in the above matrix for Markers M1, M2A and Plot Limit it implies a modified limit was used and a revised graphic provided in order to prove compliance. Modified limit is the maximum limit found for all operational modes. Graphical data is provided for both the initial measurement and revised limit.

M2A Frequency – Adjusted Marker Frequency as a result of using revised limit
Plot Limit – Revised plot limit using highest power limit found from any operational mode

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Equipment Configuration for Conducted Low Band-Edge Emissions - Average			
Variant:	802.11n HT-20	**Duty Cycle (%):**	86.0
Data Rate:	6.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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)	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	(MHz)
a	-29.98	-30.00	2399.90	-29.98	-24.00	2401.66	-1.655
b	-27.27	-30.00	2396.60	-27.27	-24.00	2401.22	-1.222

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).

Where an entry appears in the above matrix for Markers M1, M2A and Plot Limit it implies a modified limit was used and a revised graphic provided in order to prove compliance. Modified limit is the maximum limit found for all operational modes. Graphical data is provided for both the initial measurement and revised limit.

M2A Frequency – Adjusted Marker Frequency as a result of using revised limit
Plot Limit – Revised plot limit using highest power limit found from any operational mode

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Equipment Configuration for Conducted Low Band-Edge Emissions - Average			
Variant:	802.11n HT-40	**Duty Cycle (%):**	72.0
Data Rate:	13.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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)**	**M1 Amplitude (dBm)**	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**(MHz)**
a	-34.48	-35.00	2399.60	-34.48	-24.00	2403.22	-3.222
b	-31.65	-34.00	2394.80	-31.65	-24.00	2402.92	-2.922

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).

Where an entry appears in the above matrix for Markers M1, M2A and Plot Limit it implies a modified limit was used and a revised graphic provided in order to prove compliance. Modified limit is the maximum limit found for all operational modes. Graphical data is provided for both the initial measurement and revised limit.

M2A Frequency – Adjusted Marker Frequency as a result of using revised limit
Plot Limit – Revised plot limit using highest power limit found from any operational mode

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):**	5.5
Modulation:	CCK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-53.98	-25.00	2471.90	--	--	-11.600
b	-49.12	-25.00	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).

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Equipment Configuration for Conducted High Band-Edge Emissions - Average			
Variant:	802.11g	**Duty Cycle (%):**	86.0
Data Rate:	6.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-43.10	-30.00	2473.50	--	--	-10.000
b	-39.17	-30.00	2477.00	--	--	-6.500

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).

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Equipment Configuration for Conducted High Band-Edge Emissions - Average			
Variant:	802.11n HT-20	**Duty Cycle (%):**	86.0
Data Rate:	6.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-40.92	-30.00	2473.80	--	--	-9.700
b	-37.08	-30.00	2477.30	--	--	-6.200

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).

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Equipment Configuration for Conducted High Band-Edge Emissions - Average			
Variant:	802.11n HT-40	**Duty Cycle (%):**	72.0
Data Rate:	13.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-40.60	-35.00	2473.80	--	--	-9.700
b	-36.20	-34.00	2478.30	--	--	-5.200

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).

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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 (å) 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.

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Equipment Configuration for Power Spectral Density - Average			
Variant:	802.11b	**Duty Cycle (%):**	99.0
Data Rate:	1.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	CCK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
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	-8.340	-8.753	--	--	-5.733	8.0	-13.7
2437.0	-8.831	-8.867	--	--	-5.877	8.0	-13.9
2462.0	-9.284	-9.450	--	--	-6.353	8.0	-14.4

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).

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Equipment Configuration for Power Spectral Density - Average			
Variant:	802.11g	**Duty Cycle (%):**	86.0
Data Rate:	6.00 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation + DCCF (+0.66 dB)	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
2412.0	-14.510	-13.726	--	--	-10.441	8.0	-18.5
2437.0	-14.267	-13.676	--	--	-10.343	8.0	-18.4
2462.0	-14.816	-13.877	--	--	-10.656	8.0	-18.7

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).

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Equipment Configuration for Power Spectral Density - Average			
Variant:	802.11n HT-20	**Duty Cycle (%):**	86.0
Data Rate:	6.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation + DCCF (+0.66 dB)	Limit	Margin
MHz	**a**	**b**	**c**	**d**	**dBm/3KHz**	**dBm/3KHz**	**dB**
2412.0	-14.496	-13.713	--	--	-10.651	8.0	-18.7
2437.0	-14.442	-14.070	--	--	-10.710	8.0	-18.7
2462.0	-15.075	-14.031	--	--	-10.973	8.0	-19.0

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).

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Equipment Configuration for Power Spectral Density - Average			
Variant:	802.11n HT-40	**Duty Cycle (%):**	72.0
Data Rate:	13.50 MBit/s	**Antenna Gain (dBi):**	5.5
Modulation:	OFDM	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation + DCCF (+1.43 dB)	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
2422.0	-18.142	-17.816	--	--	-13.568	8.0	-21.6
2437.0	-18.546	-18.080	--	--	-13.869	8.0	-21.9
2452.0	-18.993	-18.438	--	--	-14.333	8.0	-22.3

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).

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A. APPENDIX - GRAPHICAL IMAGES

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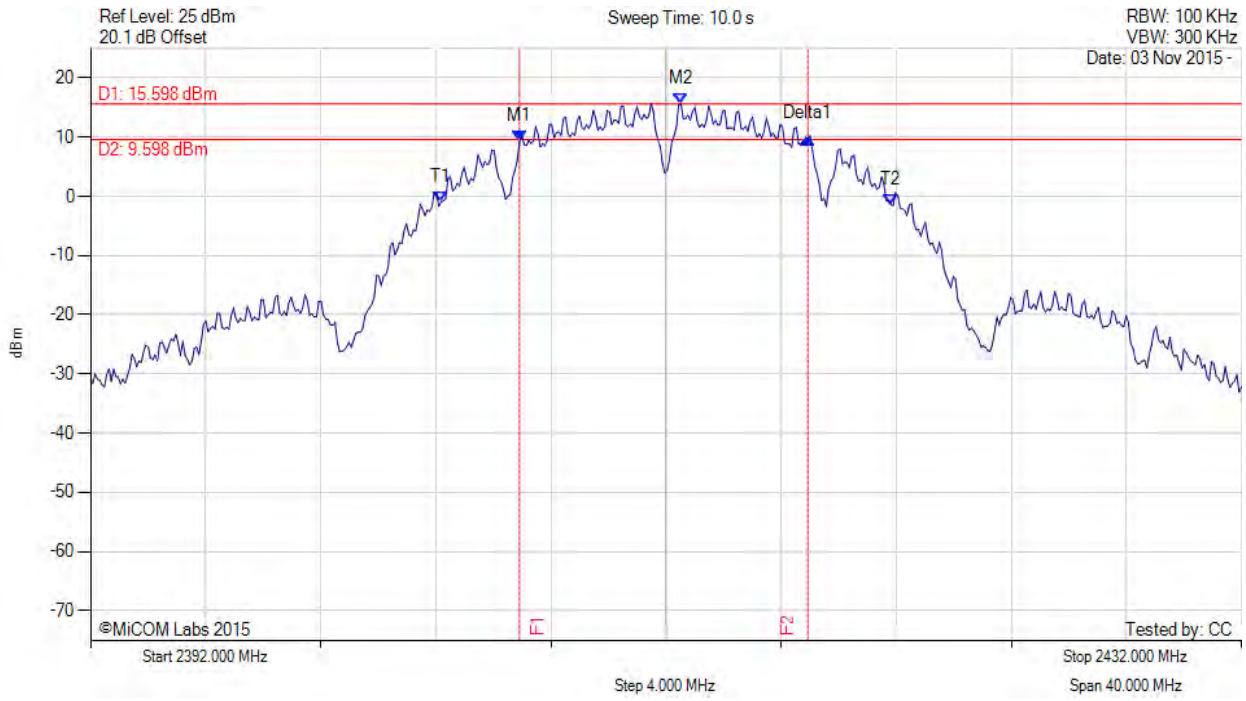
A.1. 6 dB & 99% Bandwidth

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2406.910 MHz : 9.247 dBm M2 : 2412.521 MHz : 15.598 dBm Delta1 : 10.020 MHz : 0.433 dB T1 : 2404.184 MHz : -0.908 dBm T2 : 2419.816 MHz : -1.422 dBm OBW : 15.631 MHz	Measured 6 dB Bandwidth: 10.020 MHz Limit: ≥500.0 kHz Margin: -9.52 MHz

back to matrix

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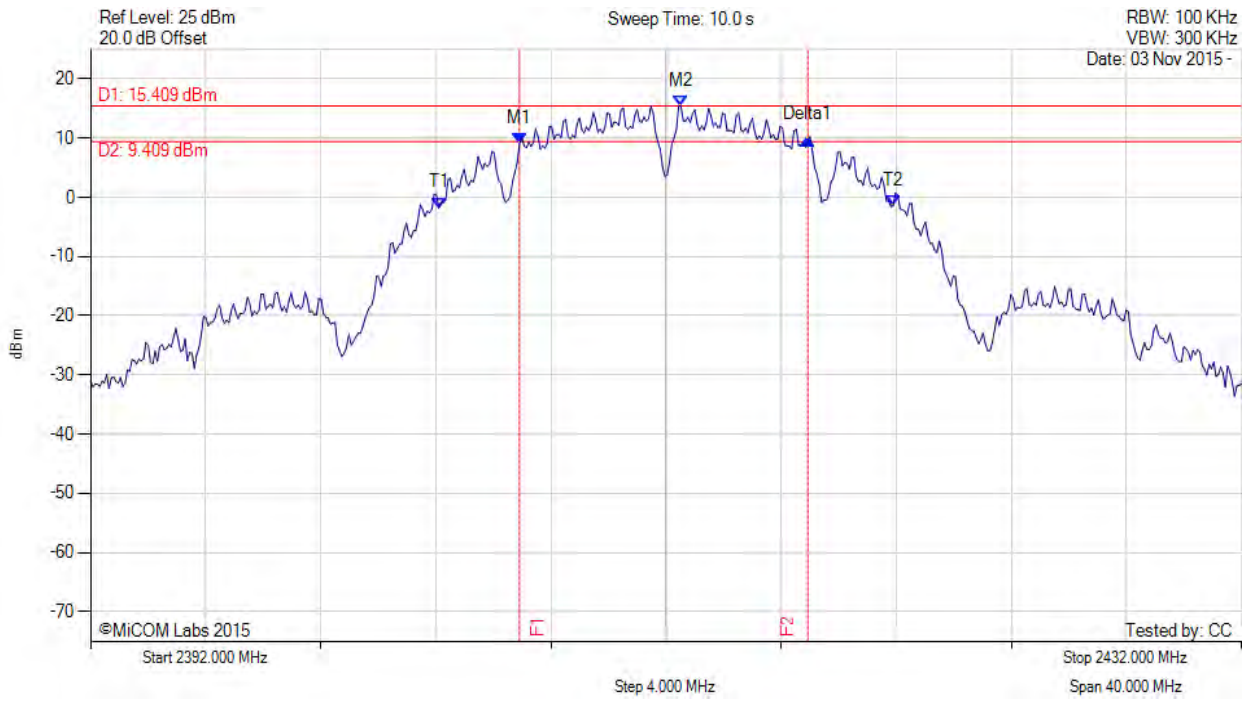
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2406.910 MHz : 9.068 dBm M2 : 2412.521 MHz : 15.409 dBm Delta1 : 10.020 MHz : 0.622 dB T1 : 2404.104 MHz : -1.795 dBm T2 : 2419.896 MHz : -1.451 dBm OBW : 15.792 MHz	Measured 6 dB Bandwidth: 10.020 MHz Limit: ≥500.0 kHz Margin: -9.52 MHz

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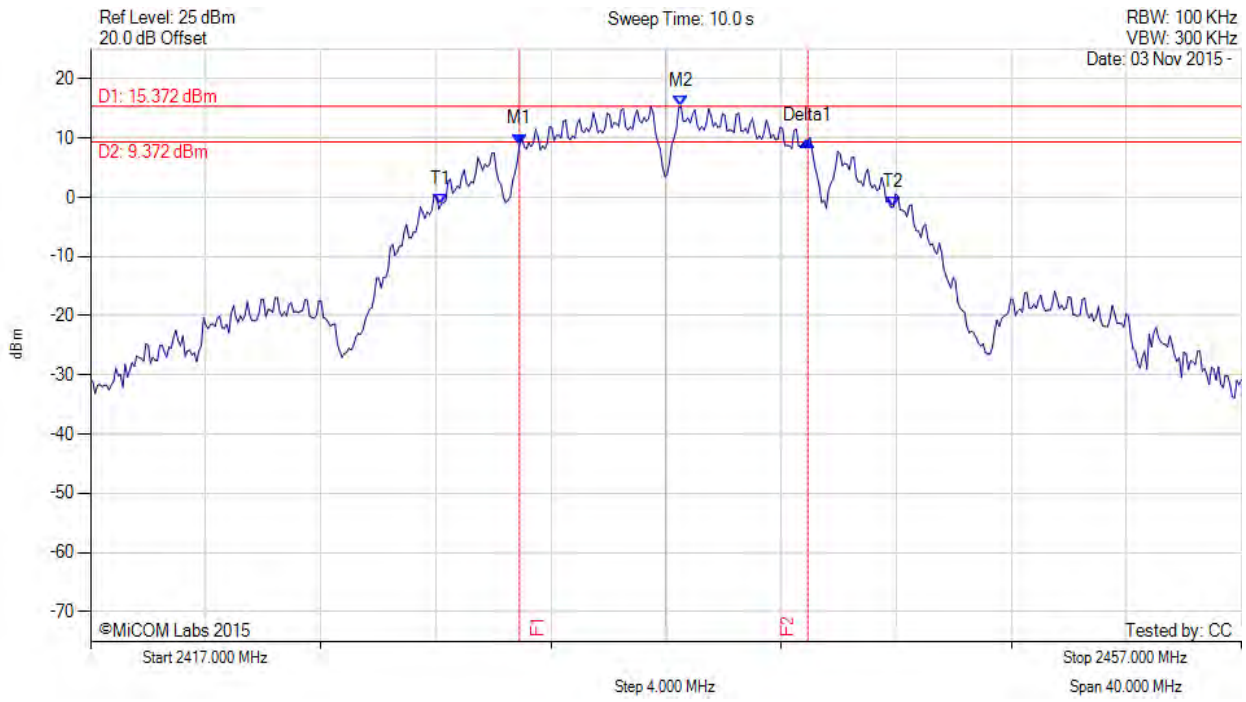
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2431.910 MHz : 8.966 dBm M2 : 2437.521 MHz : 15.372 dBm Delta1 : 10.020 MHz : 0.602 dB T1 : 2429.184 MHz : -1.142 dBm T2 : 2444.896 MHz : -1.671 dBm OBW : 15.711 MHz	Measured 6 dB Bandwidth: 10.020 MHz Limit: ≥500.0 kHz Margin: -9.52 MHz

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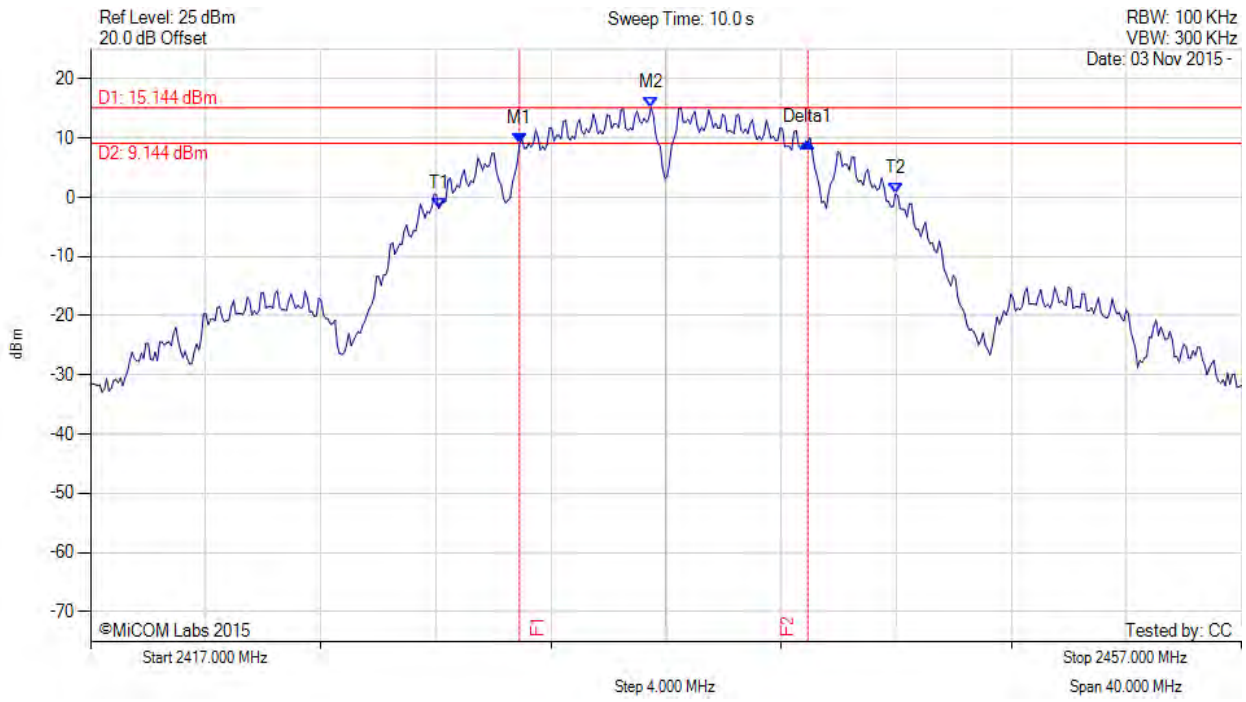
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2431.910 MHz : 9.019 dBm M2 : 2436.479 MHz : 15.144 dBm Delta1 : 10.020 MHz : 0.348 dB T1 : 2429.104 MHz : -1.874 dBm T2 : 2444.976 MHz : 0.589 dBm OBW : 15.872 MHz	Measured 6 dB Bandwidth: 10.020 MHz Limit: ≥500.0 kHz Margin: -9.52 MHz

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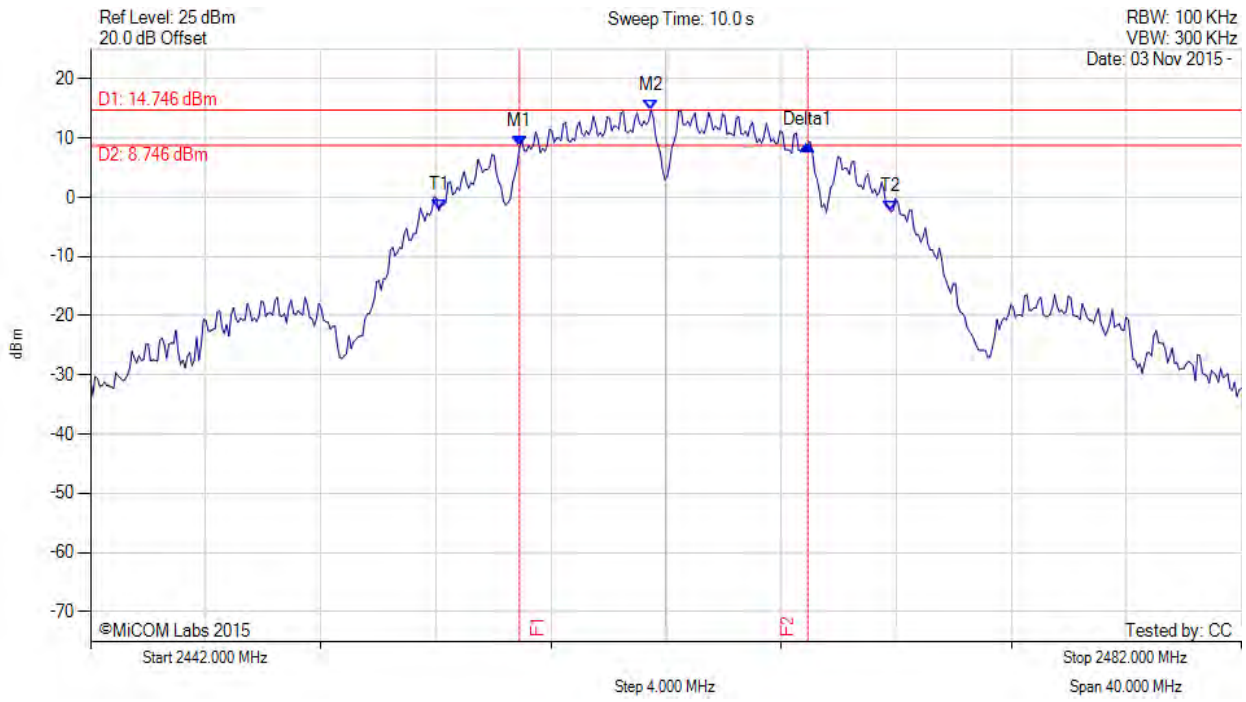
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2456.910 MHz : 8.565 dBm M2 : 2461.479 MHz : 14.746 dBm Delta1 : 10.020 MHz : 0.307 dB T1 : 2454.104 MHz : -2.226 dBm T2 : 2469.816 MHz : -2.466 dBm OBW : 15.711 MHz	Measured 6 dB Bandwidth: 10.020 MHz Limit: ≥500.0 kHz Margin: -9.52 MHz

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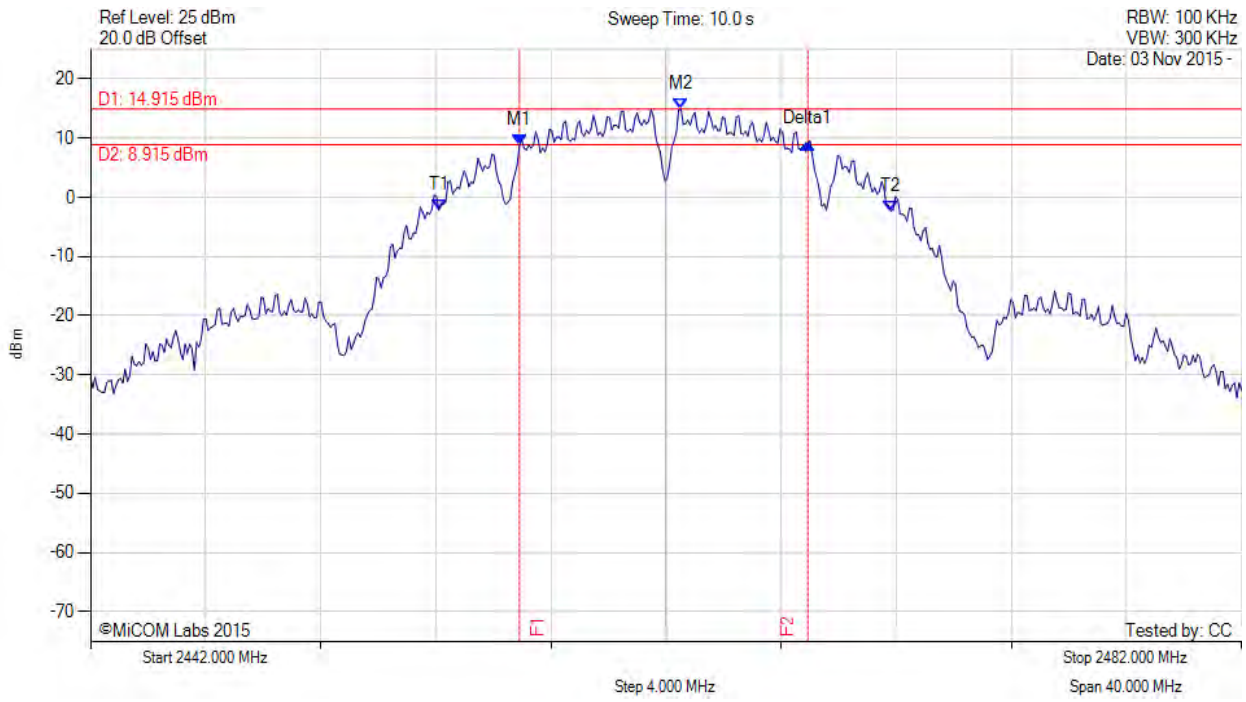
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2456.910 MHz : 8.803 dBm M2 : 2462.521 MHz : 14.915 dBm Delta1 : 10.020 MHz : 0.293 dB T1 : 2454.104 MHz : -2.163 dBm T2 : 2469.816 MHz : -2.313 dBm OBW : 15.711 MHz	Measured 6 dB Bandwidth: 10.020 MHz Limit: ≥500.0 kHz Margin: -9.52 MHz

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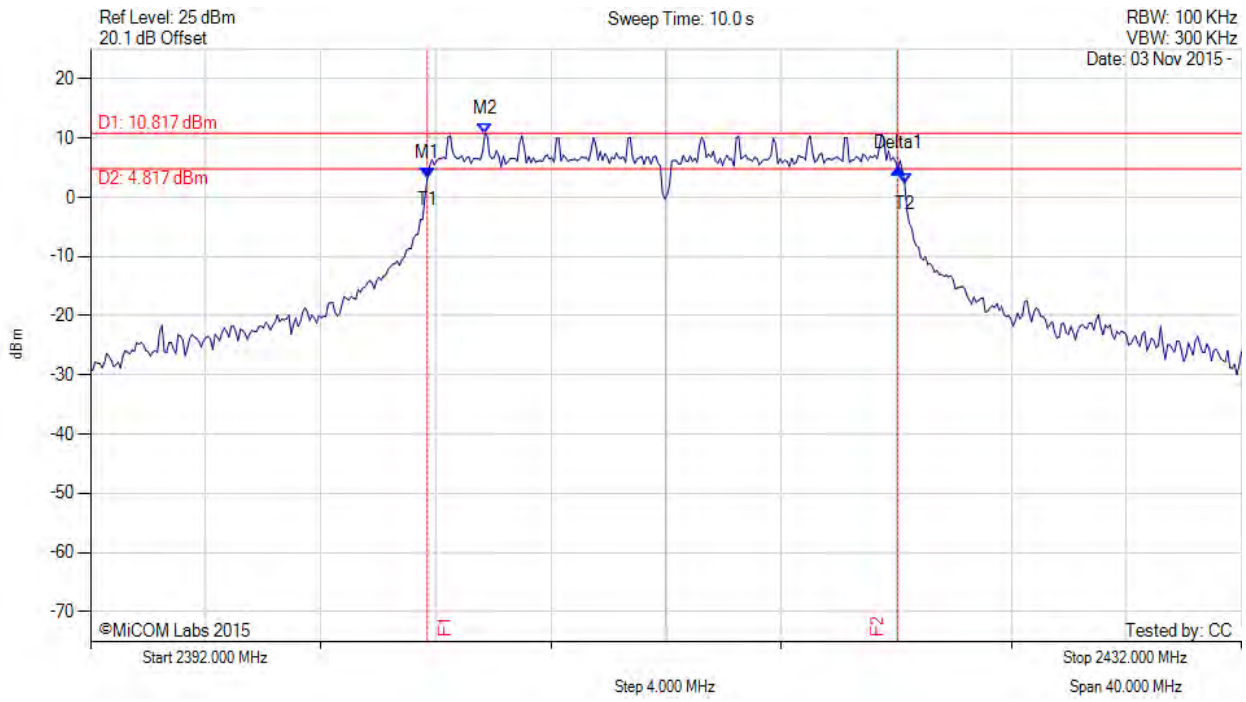
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2403.703 MHz : 3.180 dBm M2 : 2405.707 MHz : 10.817 dBm Delta1 : 16.353 MHz : 1.710 dB T1 : 2403.703 MHz : 3.180 dBm T2 : 2420.297 MHz : 2.360 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.353 MHz Limit: ≥500.0 kHz Margin: -15.85 MHz

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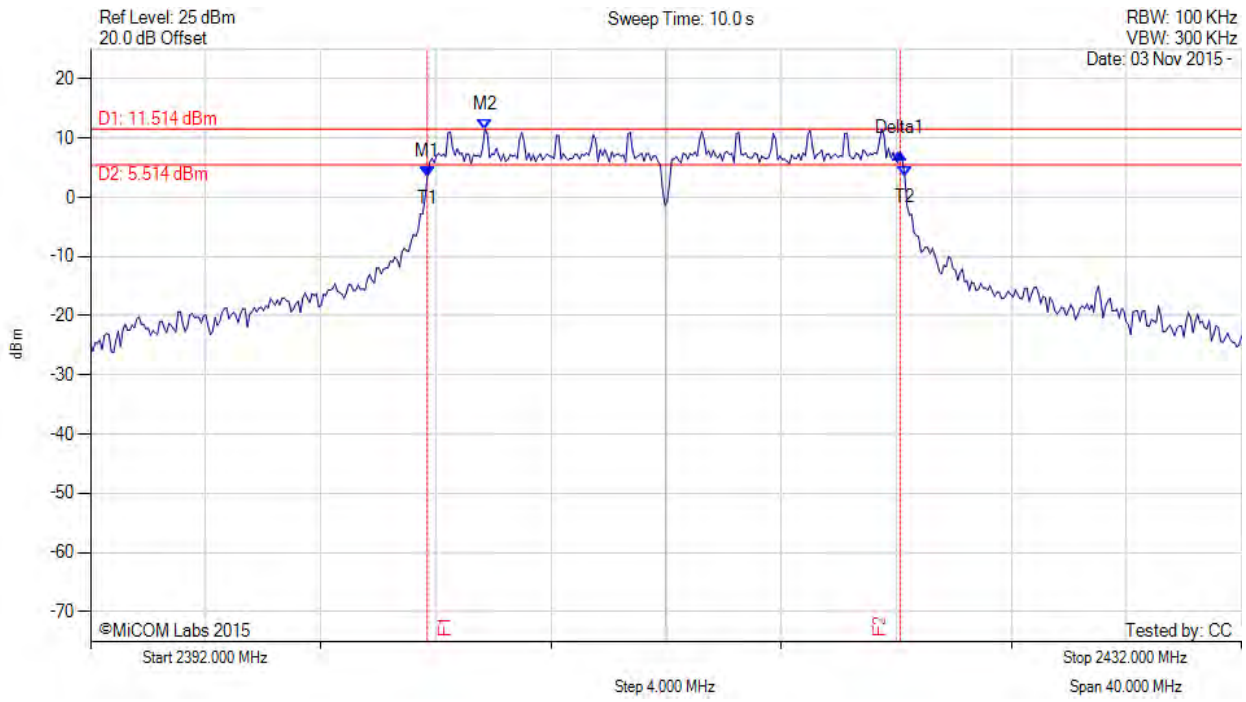
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2403.703 MHz : 3.440 dBm M2 : 2405.707 MHz : 11.514 dBm Delta1 : 16.433 MHz : 3.954 dB T1 : 2403.703 MHz : 3.440 dBm T2 : 2420.297 MHz : 3.566 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.433 MHz Limit: ≥500.0 kHz Margin: -15.93 MHz

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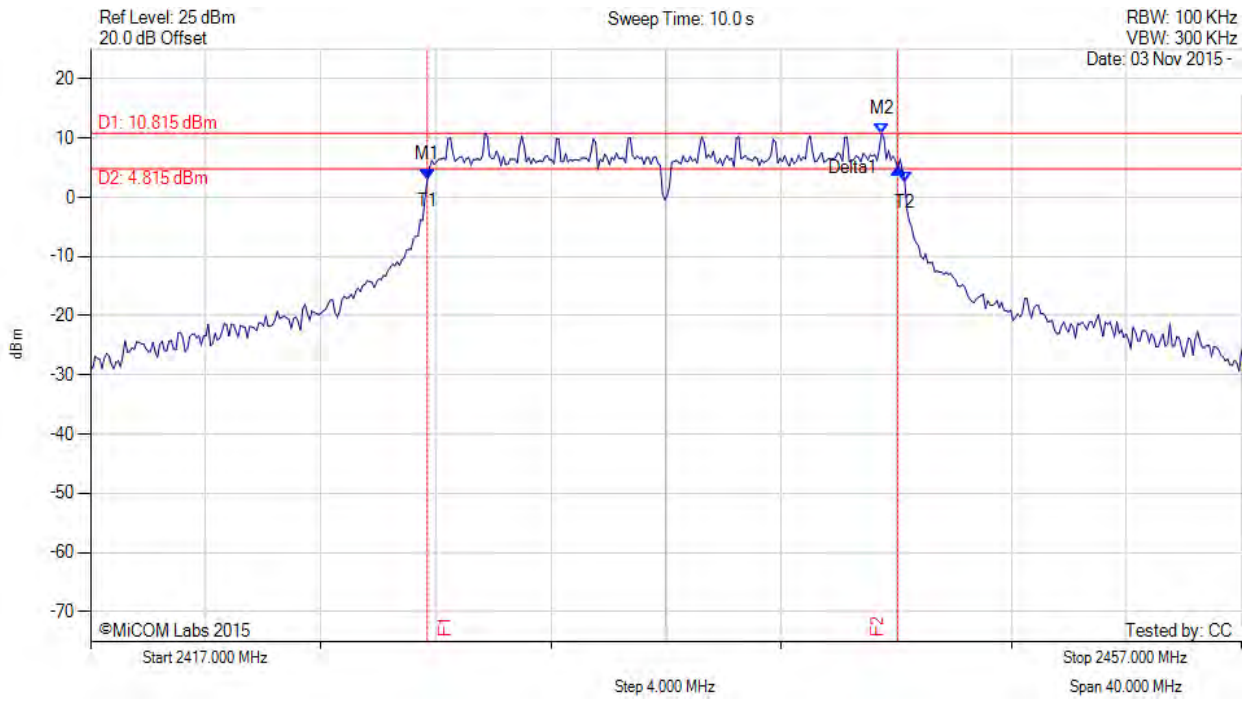
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2428.703 MHz : 3.007 dBm M2 : 2444.495 MHz : 10.815 dBm Delta1 : 16.353 MHz : 1.934 dB T1 : 2428.703 MHz : 3.007 dBm T2 : 2445.297 MHz : 2.619 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.353 MHz Limit: ≥500.0 kHz Margin: -15.85 MHz

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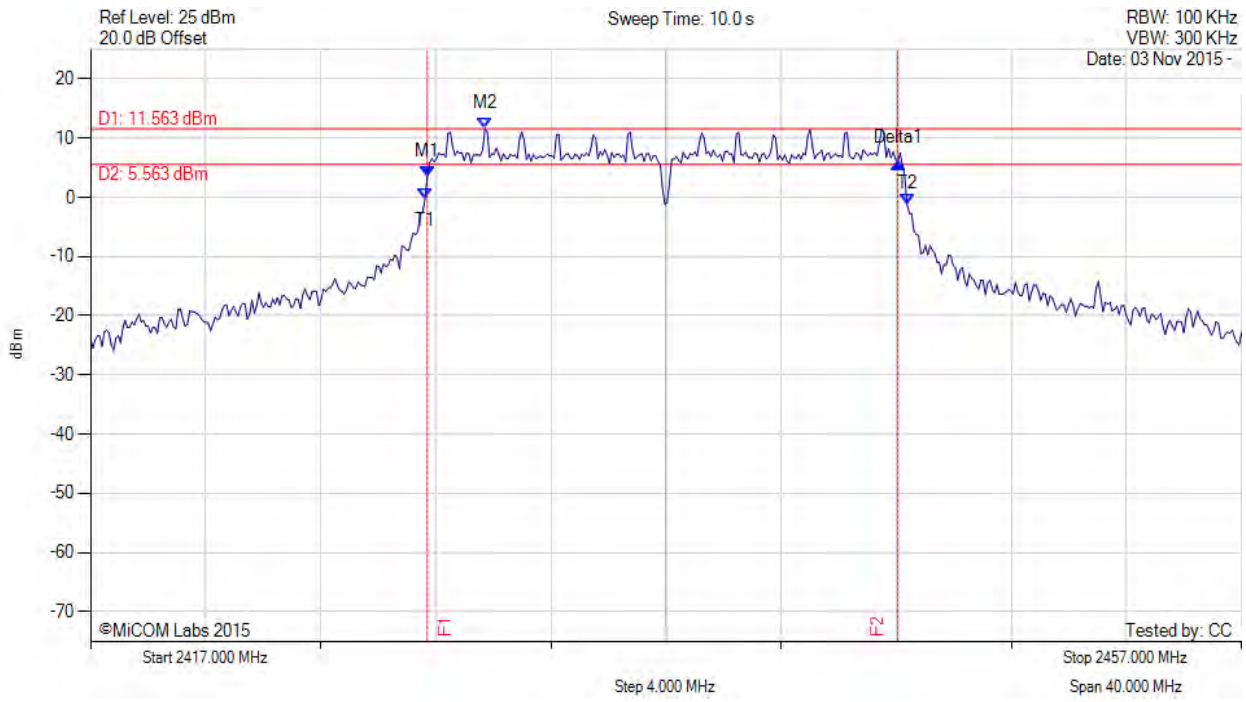
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2428.703 MHz : 3.513 dBm M2 : 2430.707 MHz : 11.563 dBm Delta1 : 16.353 MHz : 2.394 dB T1 : 2428.623 MHz : -0.263 dBm T2 : 2445.377 MHz : -1.107 dBm OBW : 16.754 MHz	Measured 6 dB Bandwidth: 16.353 MHz Limit: ≥500.0 kHz Margin: -15.85 MHz

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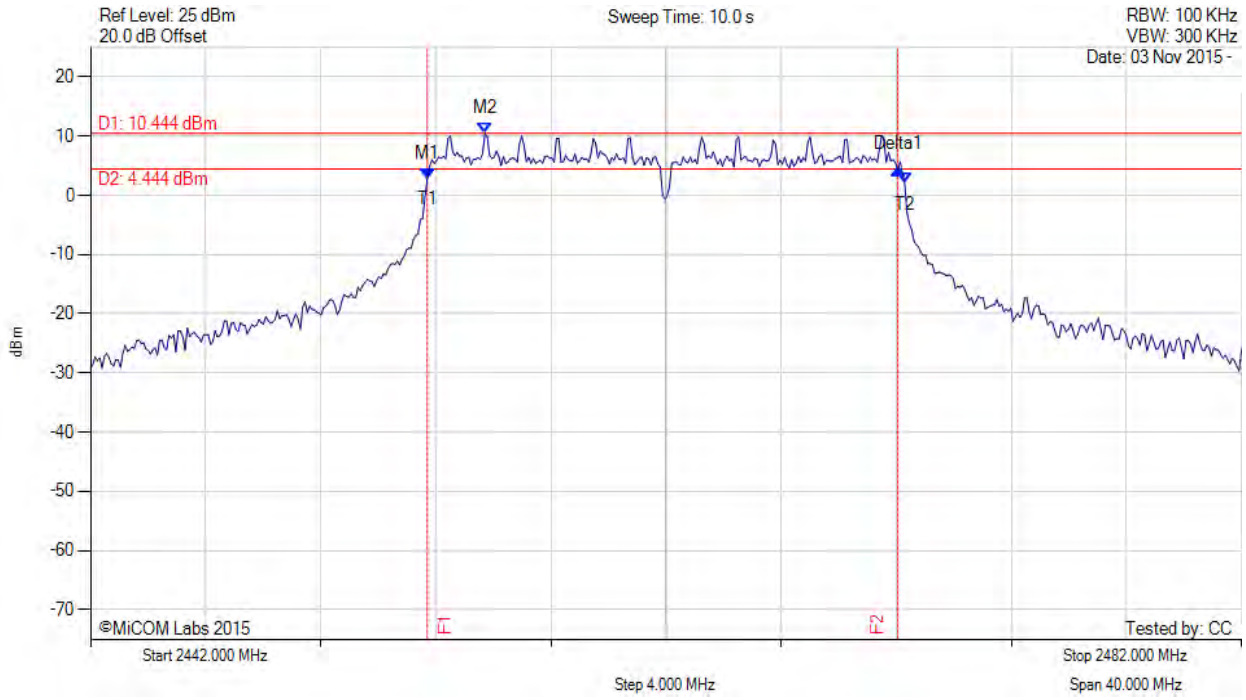
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2453.703 MHz : 2.828 dBm M2 : 2455.707 MHz : 10.444 dBm Delta1 : 16.353 MHz : 1.505 dB T1 : 2453.703 MHz : 2.828 dBm T2 : 2470.297 MHz : 1.972 dBm OBW : 16.593 MHz	Measured 6 dB Bandwidth: 16.353 MHz Limit: ≥500.0 kHz Margin: -15.85 MHz

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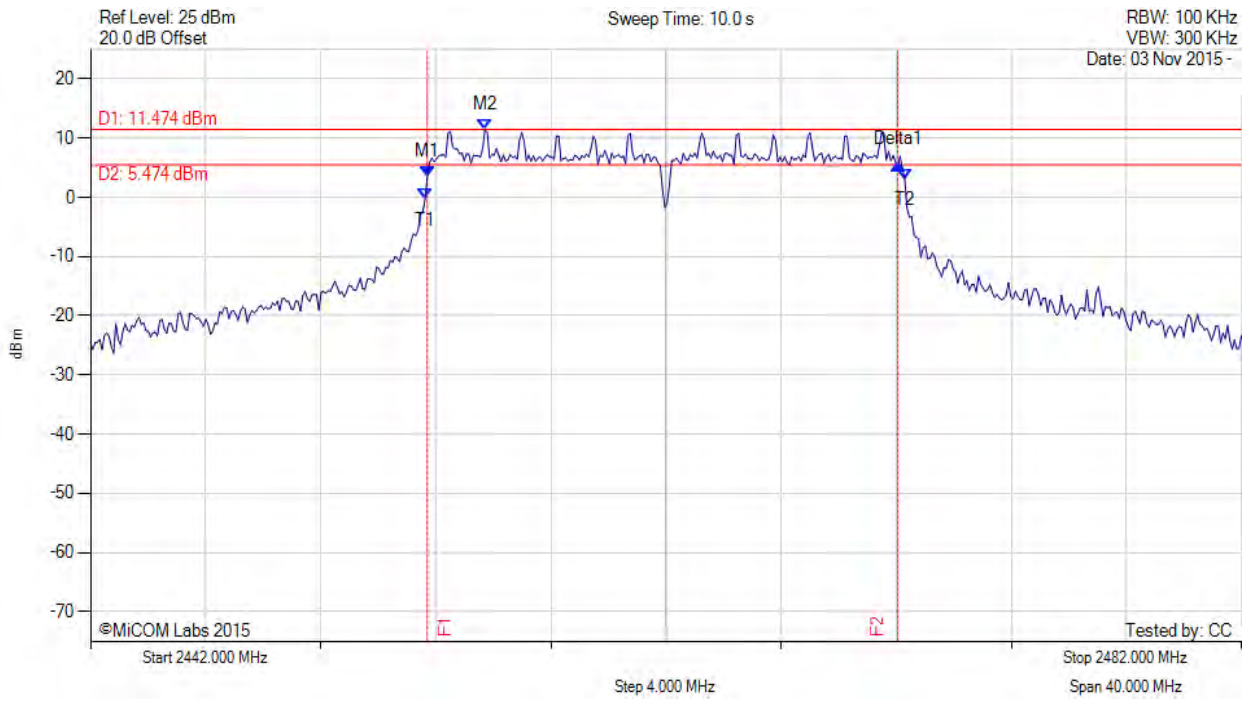
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2453.703 MHz : 3.446 dBm M2 : 2455.707 MHz : 11.474 dBm Delta1 : 16.353 MHz : 2.083 dB T1 : 2453.623 MHz : -0.314 dBm T2 : 2470.297 MHz : 3.090 dBm OBW : 16.673 MHz	Measured 6 dB Bandwidth: 16.353 MHz Limit: ≥500.0 kHz Margin: -15.85 MHz

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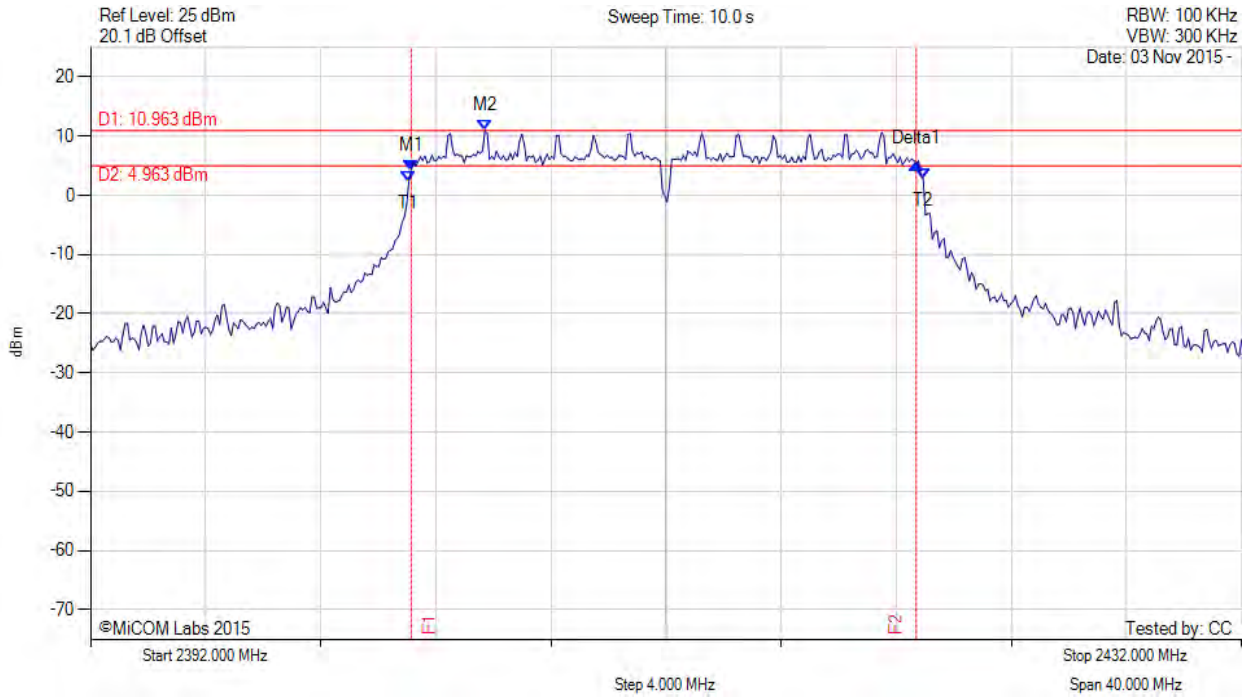
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2403.142 MHz : 4.270 dBm M2 : 2405.707 MHz : 10.963 dBm Delta1 : 17.555 MHz : 1.167 dB T1 : 2403.062 MHz : 2.299 dBm T2 : 2420.938 MHz : 2.791 dBm OBW : 17.876 MHz	Measured 6 dB Bandwidth: 17.555 MHz Limit: ≥500.0 kHz Margin: -17.06 MHz

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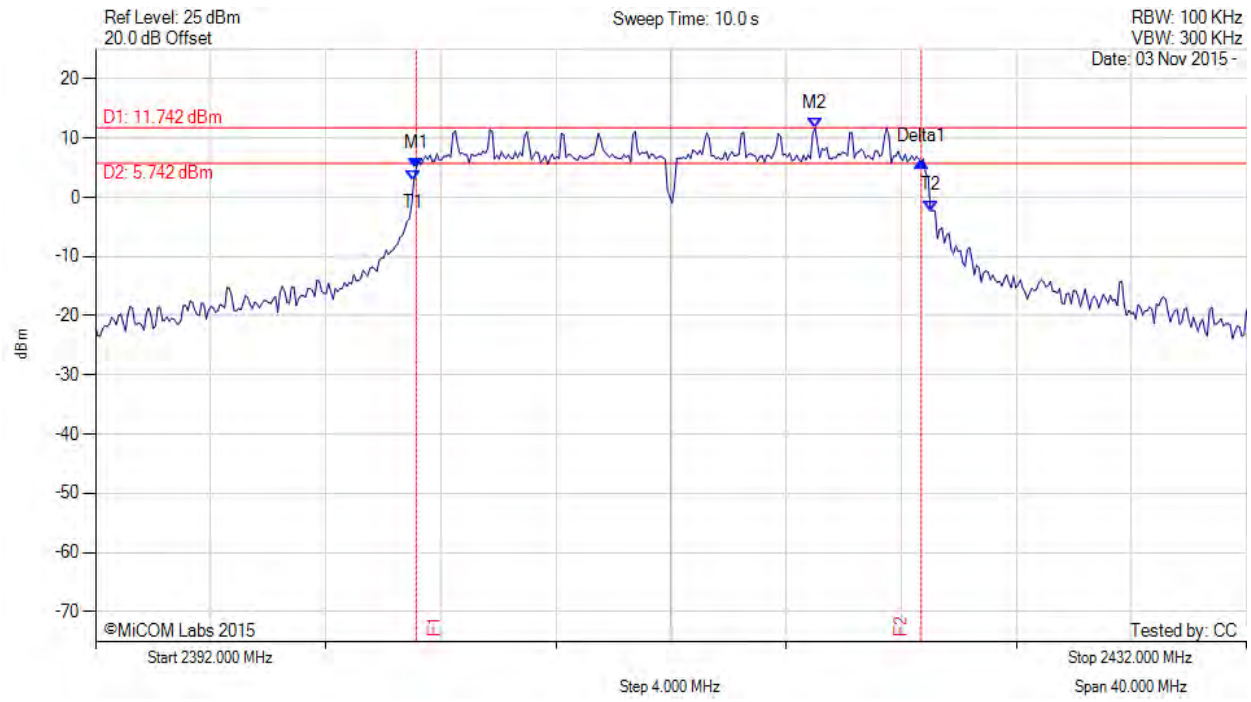
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2403.142 MHz : 4.827 dBm M2 : 2417.010 MHz : 11.742 dBm Delta1 : 17.555 MHz : 1.135 dB T1 : 2403.062 MHz : 2.702 dBm T2 : 2421.018 MHz : -2.268 dBm OBW : 17.956 MHz	Measured 6 dB Bandwidth: 17.555 MHz Limit: ≥500.0 kHz Margin: -17.06 MHz

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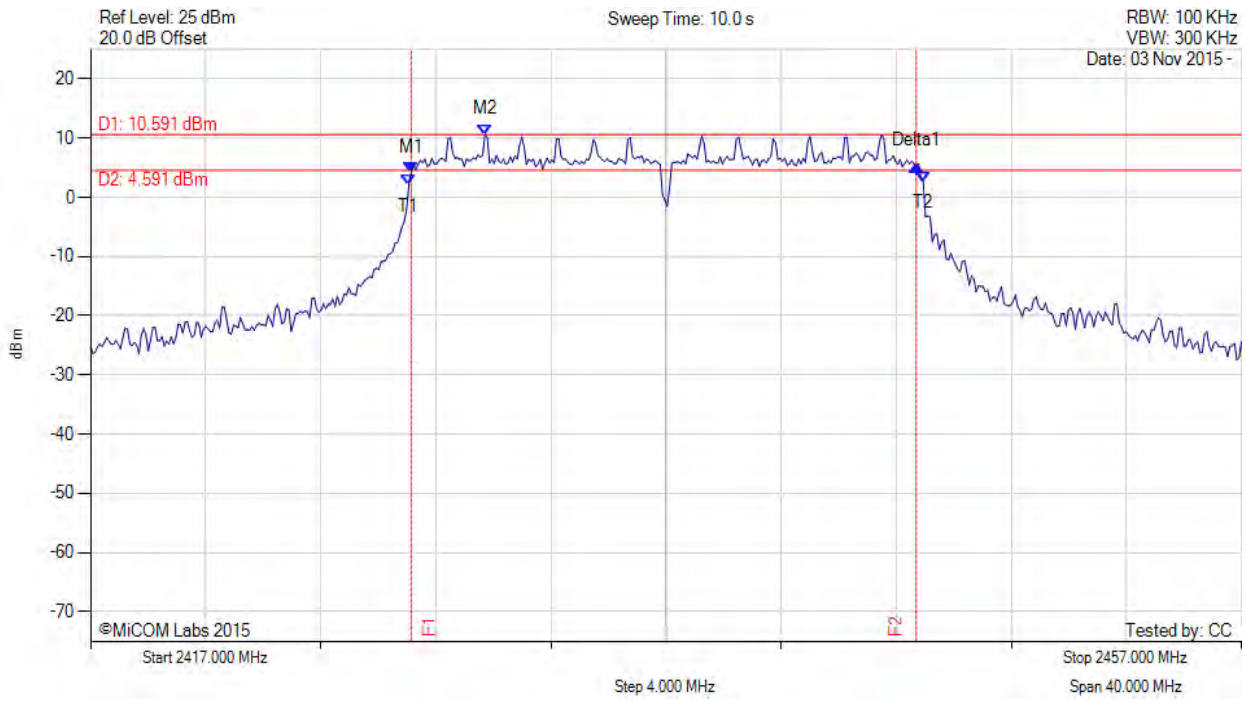
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2428.142 MHz : 4.118 dBm M2 : 2430.707 MHz : 10.591 dBm Delta1 : 17.555 MHz : 1.293 dB T1 : 2428.062 MHz : 1.998 dBm T2 : 2445.938 MHz : 2.657 dBm OBW : 17.876 MHz	Measured 6 dB Bandwidth: 17.555 MHz Limit: ≥500.0 kHz Margin: -17.06 MHz

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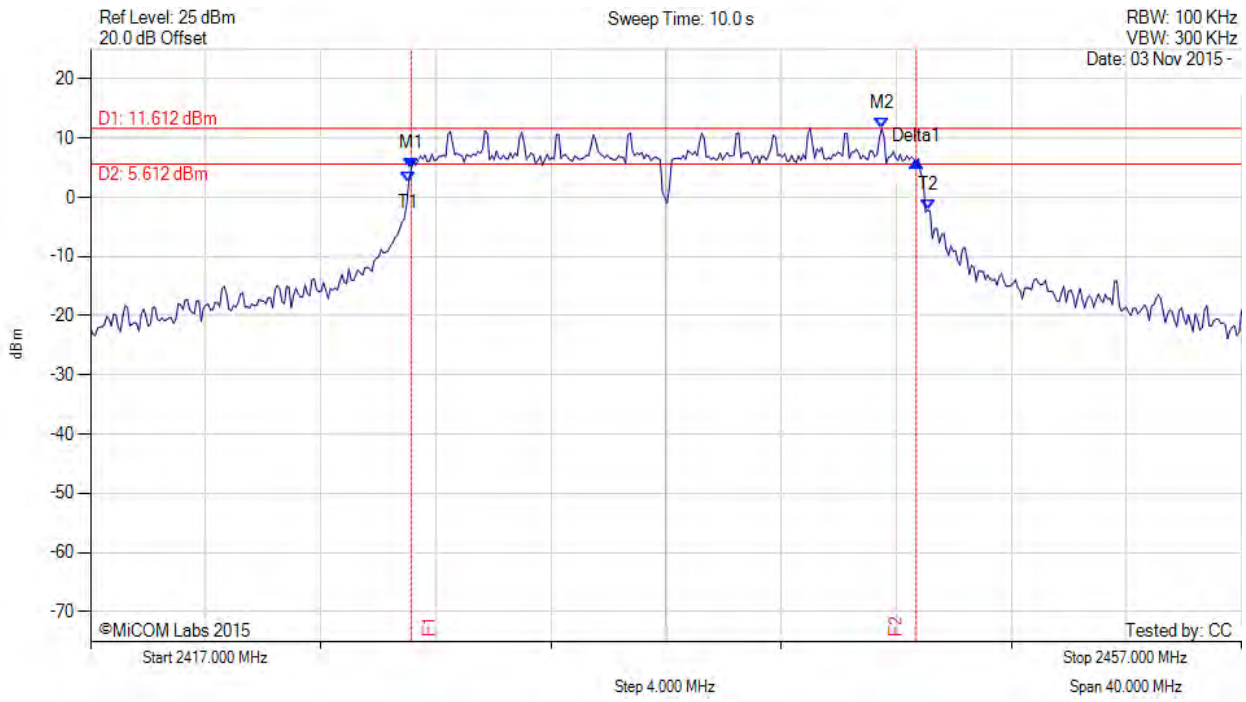
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2428.142 MHz : 4.805 dBm M2 : 2444.495 MHz : 11.612 dBm Delta1 : 17.555 MHz : 1.295 dB T1 : 2428.062 MHz : 2.631 dBm T2 : 2446.098 MHz : -2.169 dBm OBW : 18.036 MHz	Measured 6 dB Bandwidth: 17.555 MHz Limit: ≥500.0 kHz Margin: -17.06 MHz

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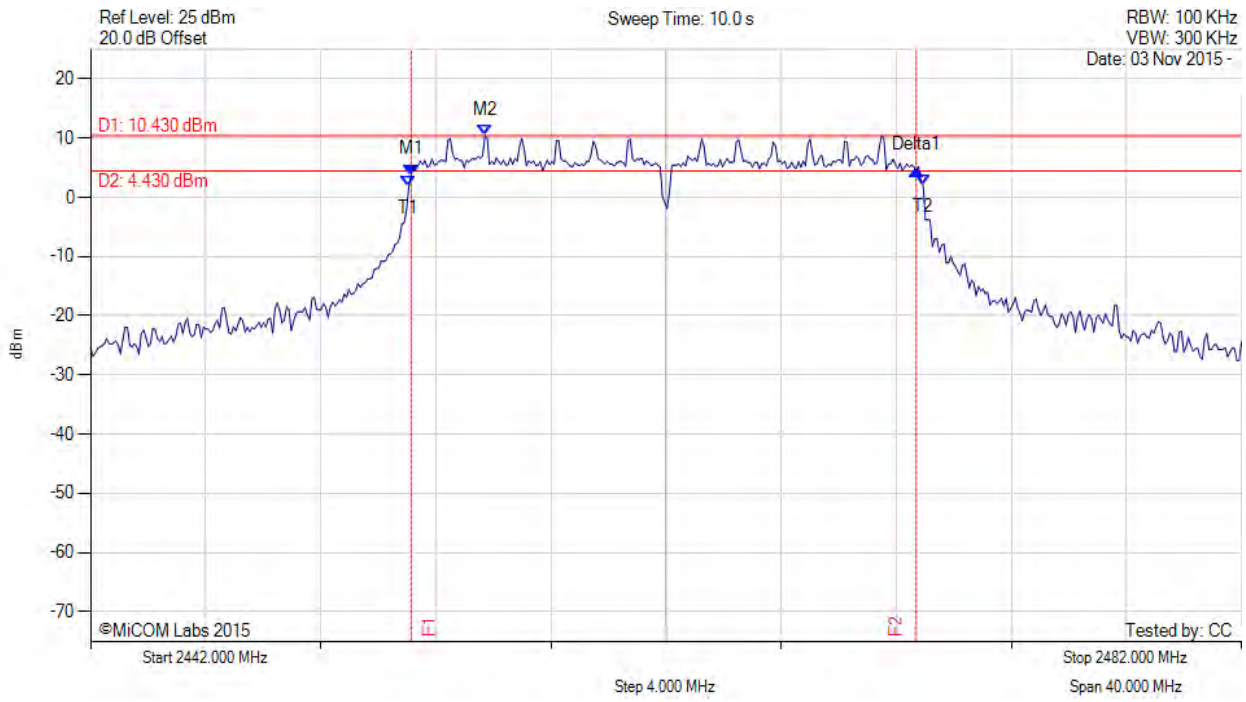
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2453.142 MHz : 3.833 dBm M2 : 2455.707 MHz : 10.430 dBm Delta1 : 17.555 MHz : 0.761 dB T1 : 2453.062 MHz : 1.832 dBm T2 : 2470.938 MHz : 1.984 dBm OBW : 17.876 MHz	Measured 6 dB Bandwidth: 17.555 MHz Limit: ≥500.0 kHz Margin: -17.06 MHz

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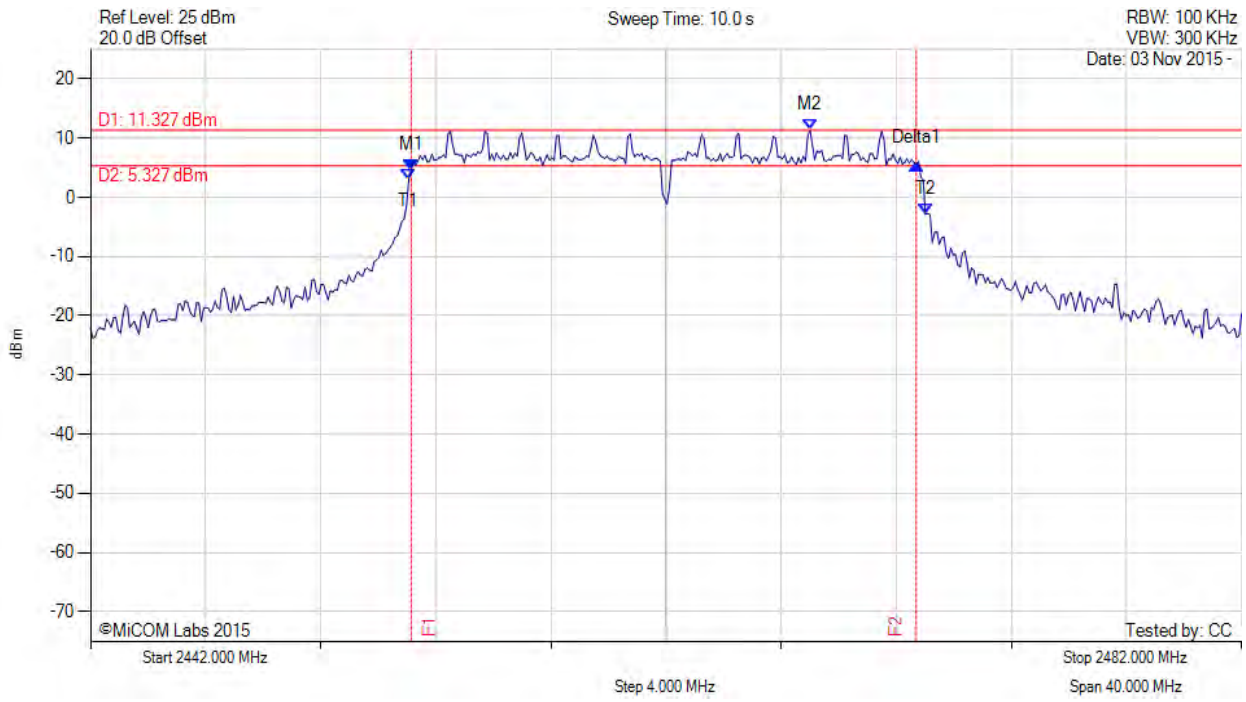
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2453.142 MHz : 4.679 dBm M2 : 2467.010 MHz : 11.327 dBm Delta1 : 17.555 MHz : 1.011 dB T1 : 2453.062 MHz : 3.038 dBm T2 : 2471.018 MHz : -2.881 dBm OBW : 17.956 MHz	Measured 6 dB Bandwidth: 17.555 MHz Limit: ≥500.0 kHz Margin: -17.06 MHz

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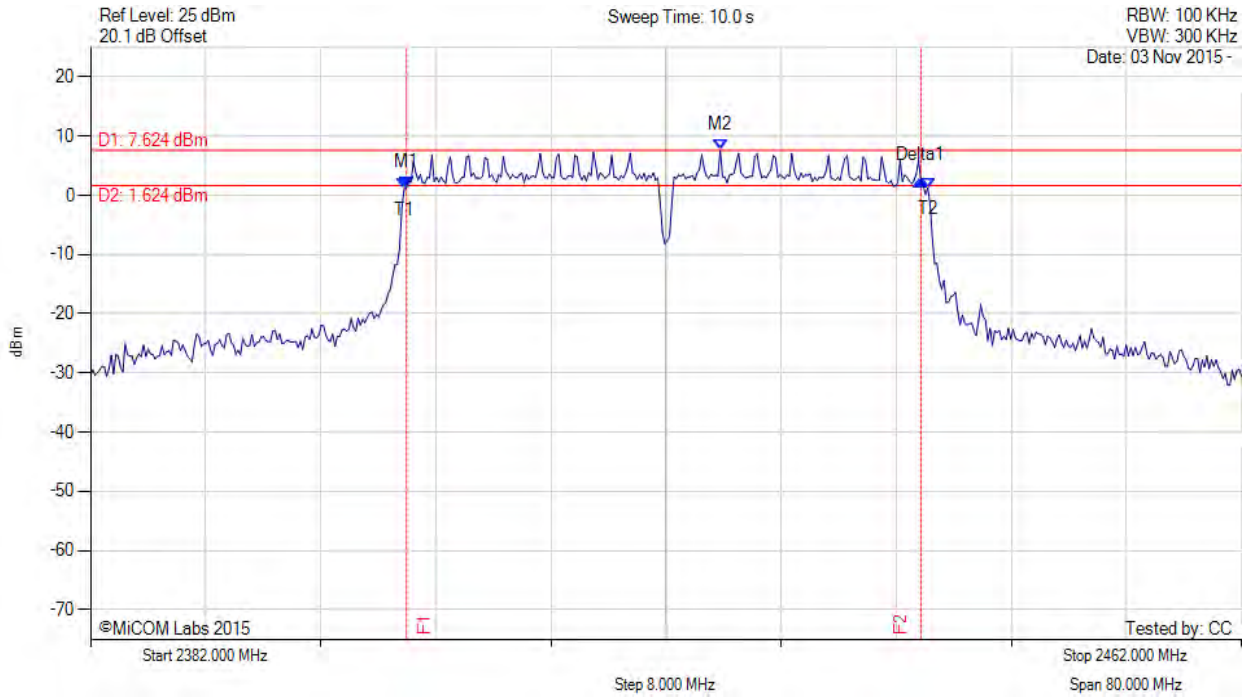
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2403.964 MHz : 1.404 dBm M2 : 2425.768 MHz : 7.624 dBm Delta1 : 35.752 MHz : 1.047 dB T1 : 2403.804 MHz : 1.081 dBm T2 : 2440.196 MHz : 1.246 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 35.752 MHz Limit: ≥500.0 kHz Margin: -35.25 MHz

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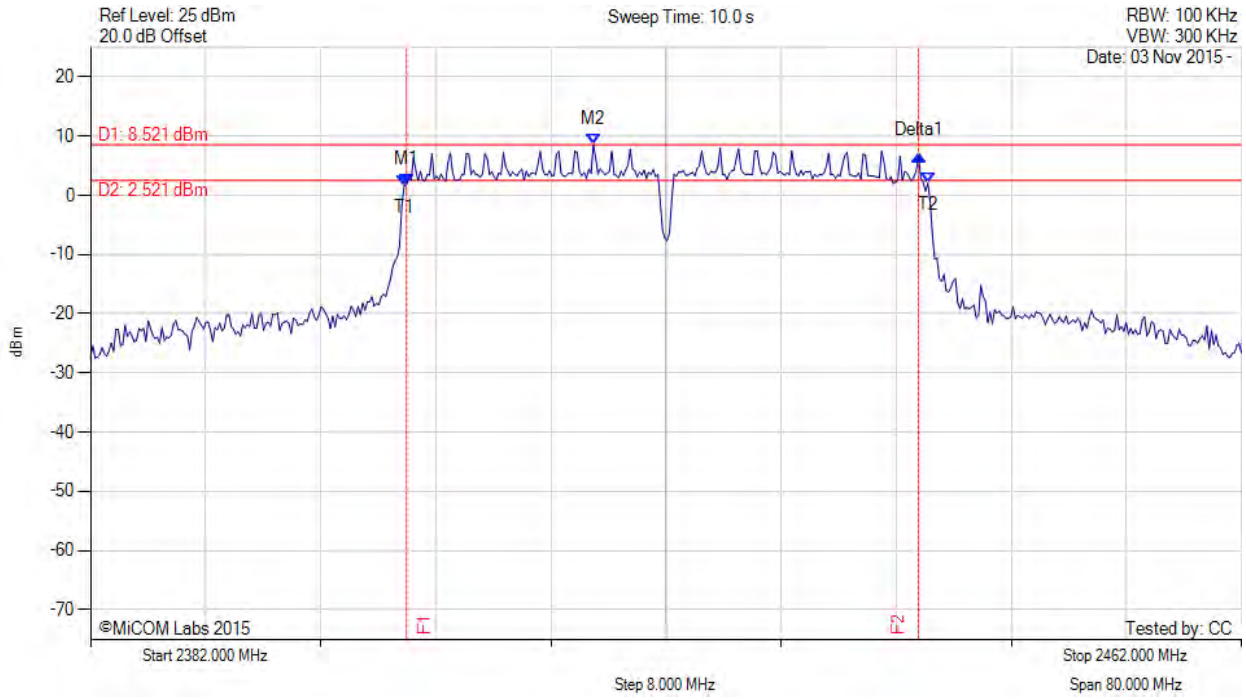
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2403.964 MHz : 1.858 dBm M2 : 2416.950 MHz : 8.521 dBm Delta1 : 35.591 MHz : 4.792 dB T1 : 2403.804 MHz : 1.624 dBm T2 : 2440.196 MHz : 2.041 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 35.591 MHz Limit: ≥500.0 kHz Margin: -35.09 MHz

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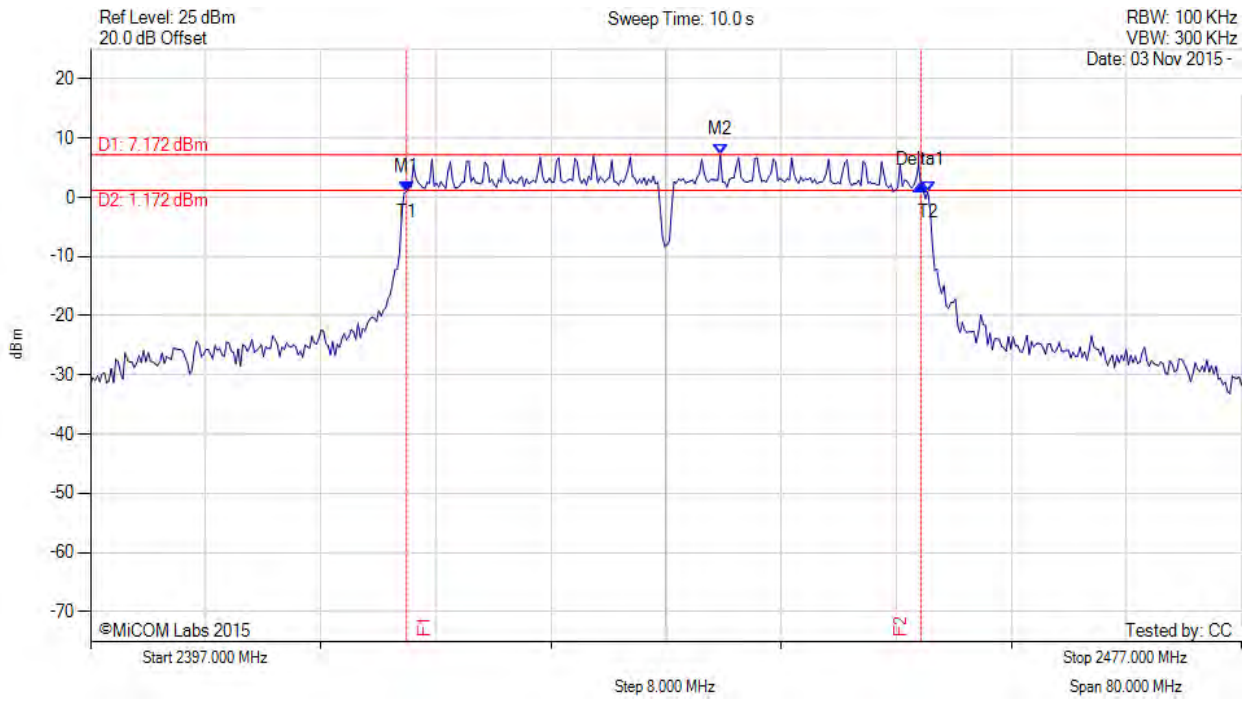
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2418.964 MHz : 0.983 dBm M2 : 2440.768 MHz : 7.172 dBm Delta1 : 35.752 MHz : 1.017 dB T1 : 2418.964 MHz : 0.983 dBm T2 : 2455.196 MHz : 0.937 dBm OBW : 36.232 MHz	Measured 6 dB Bandwidth: 35.752 MHz Limit: ≥500.0 kHz Margin: -35.25 MHz

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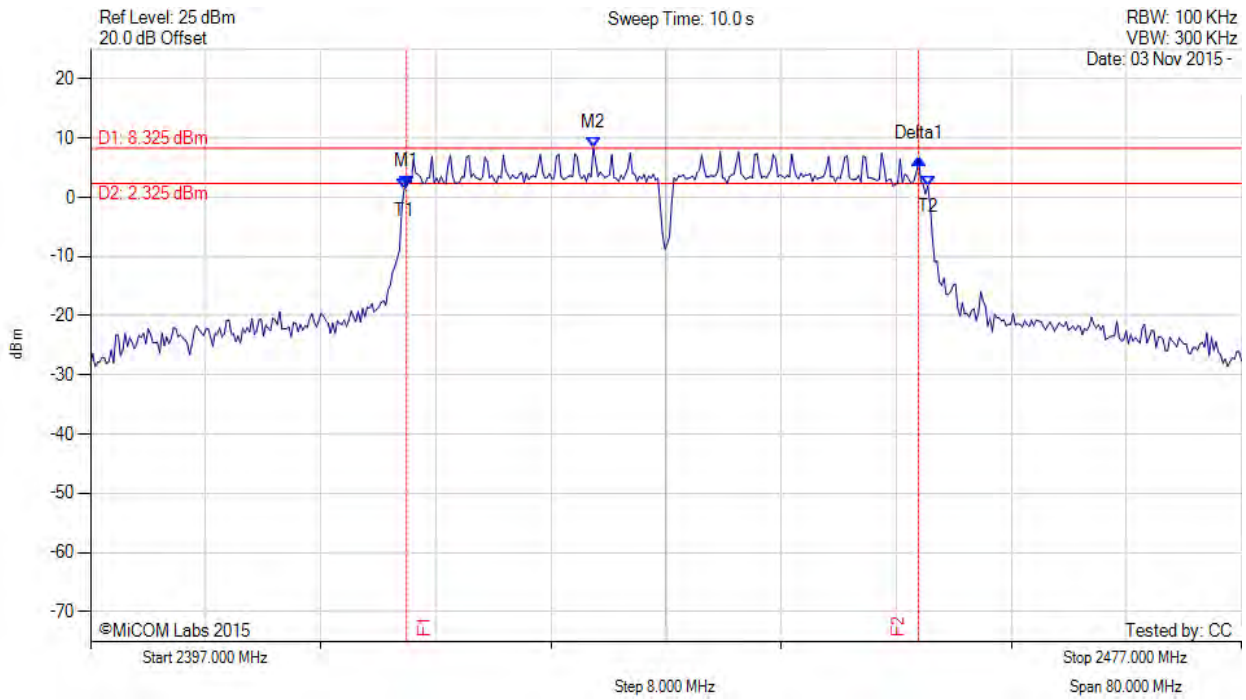
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2418.964 MHz : 1.811 dBm M2 : 2431.950 MHz : 8.325 dBm Delta1 : 35.591 MHz : 4.771 dB T1 : 2418.804 MHz : 1.396 dBm T2 : 2455.196 MHz : 1.907 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 35.591 MHz Limit: ≥500.0 kHz Margin: -35.09 MHz

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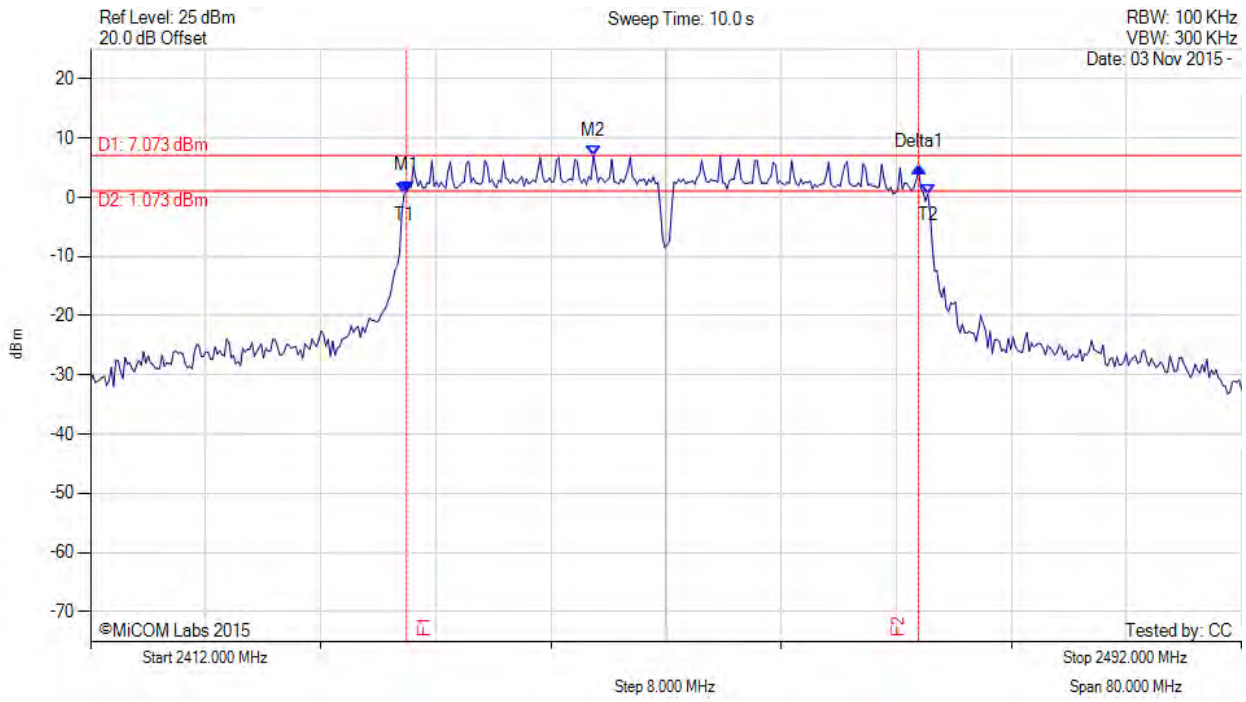
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2433.964 MHz : 1.018 dBm M2 : 2446.950 MHz : 7.073 dBm Delta1 : 35.591 MHz : 3.996 dB T1 : 2433.804 MHz : 0.595 dBm T2 : 2470.196 MHz : 0.510 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 35.591 MHz Limit: ≥500.0 kHz Margin: -35.09 MHz

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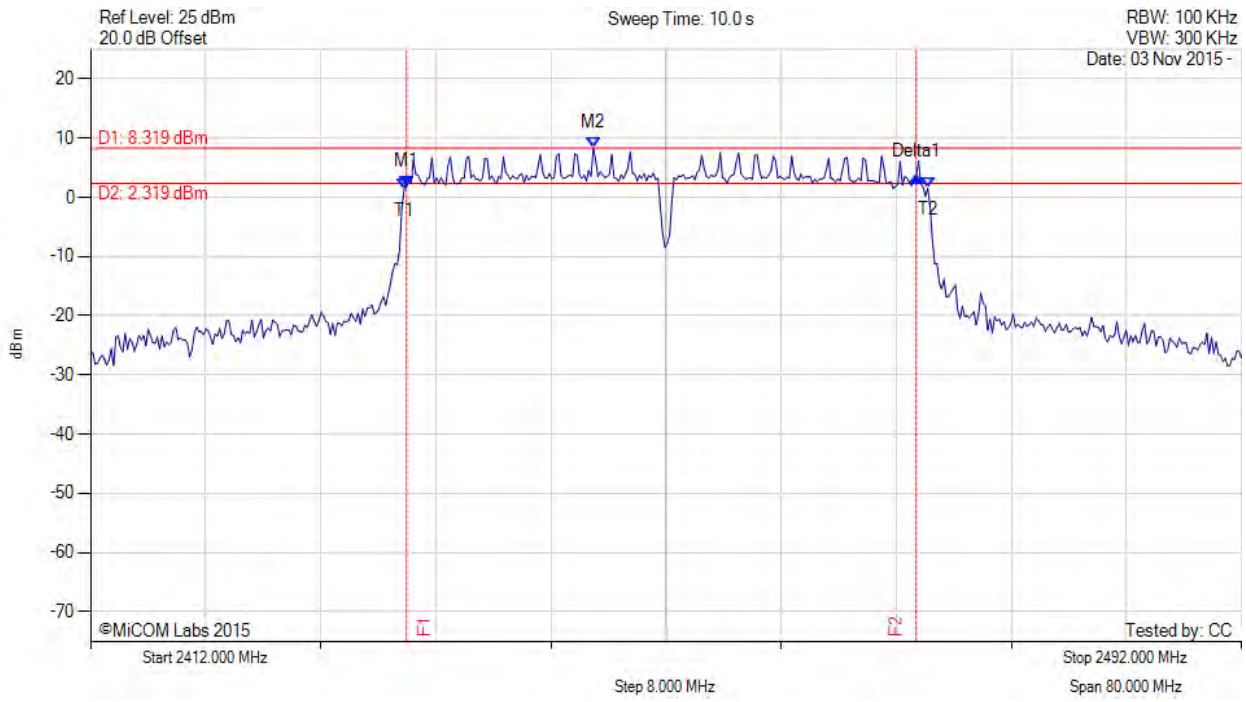
6 dB & 99% BANDWIDTH

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 2433.964 MHz : 1.781 dBm M2 : 2446.950 MHz : 8.319 dBm Delta1 : 35.431 MHz : 1.777 dB T1 : 2433.804 MHz : 1.398 dBm T2 : 2470.196 MHz : 1.520 dBm OBW : 36.393 MHz	Measured 6 dB Bandwidth: 35.431 MHz Limit: ≥500.0 kHz Margin: -34.93 MHz

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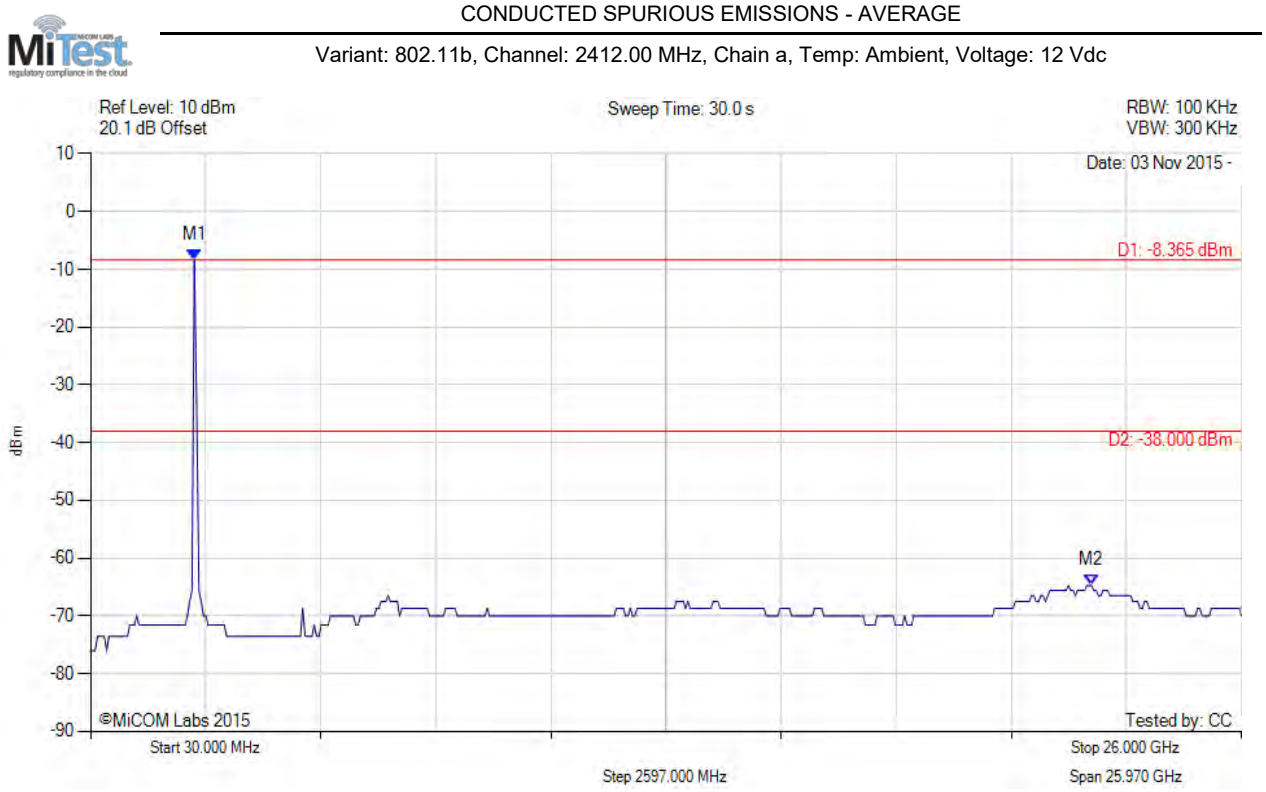
A.2. Emissions

A.2.1. Conducted Emissions

A.2.1.1. Conducted Spurious Emissions



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2371.984 MHz : -8.365 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -38.00 dBm Margin: -26.74 dB

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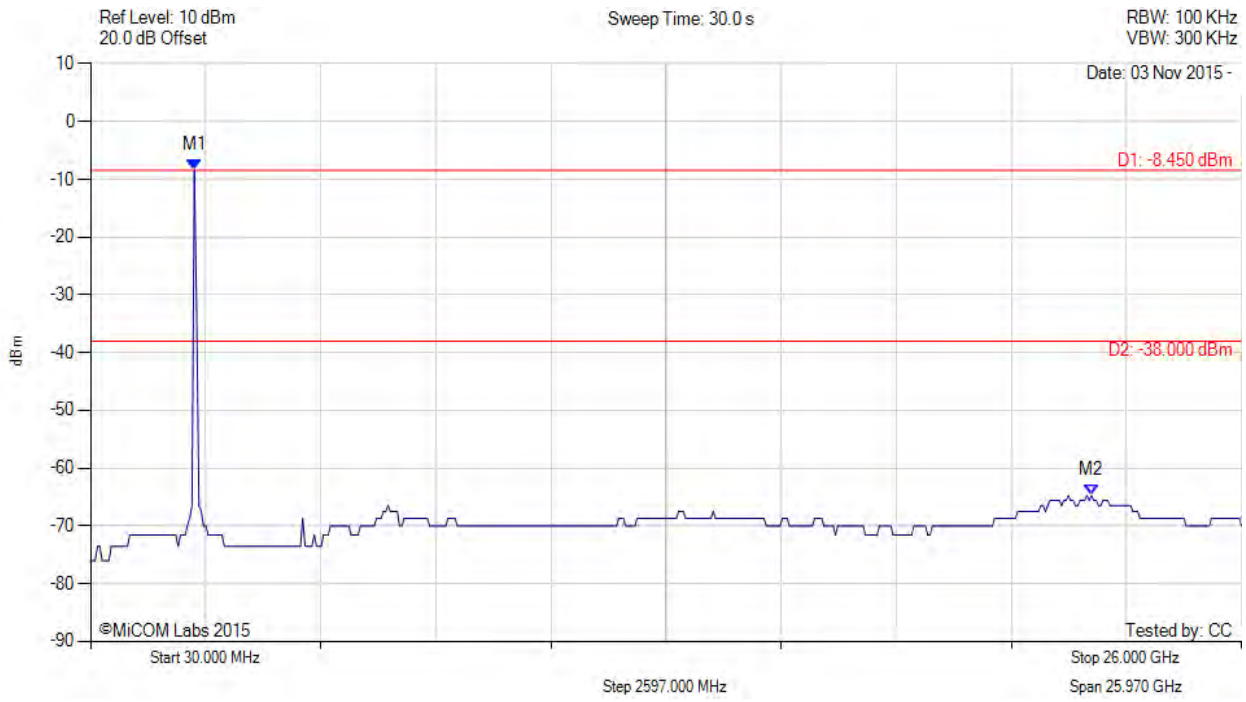
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2371.984 MHz : -8.450 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -38.00 dBm Margin: -26.74 dB

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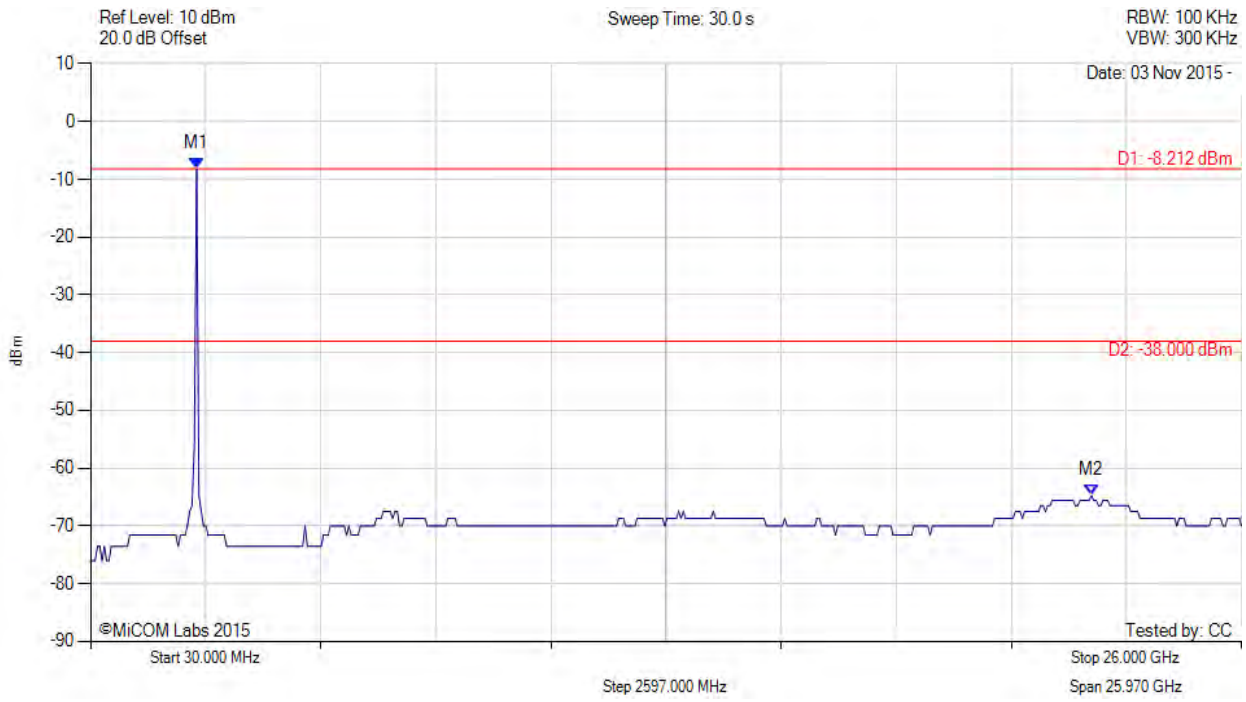
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -8.212 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -38.00 dBm Margin: -26.74 dB

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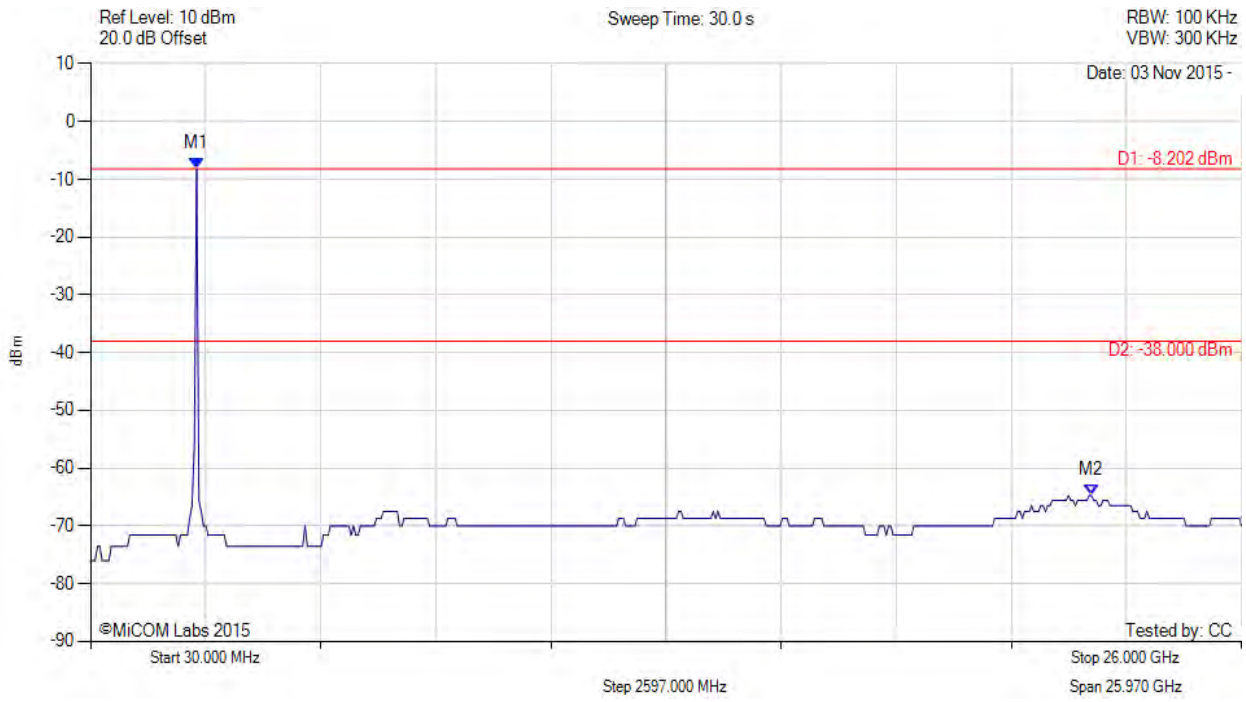
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -8.202 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -38.00 dBm Margin: -26.74 dB

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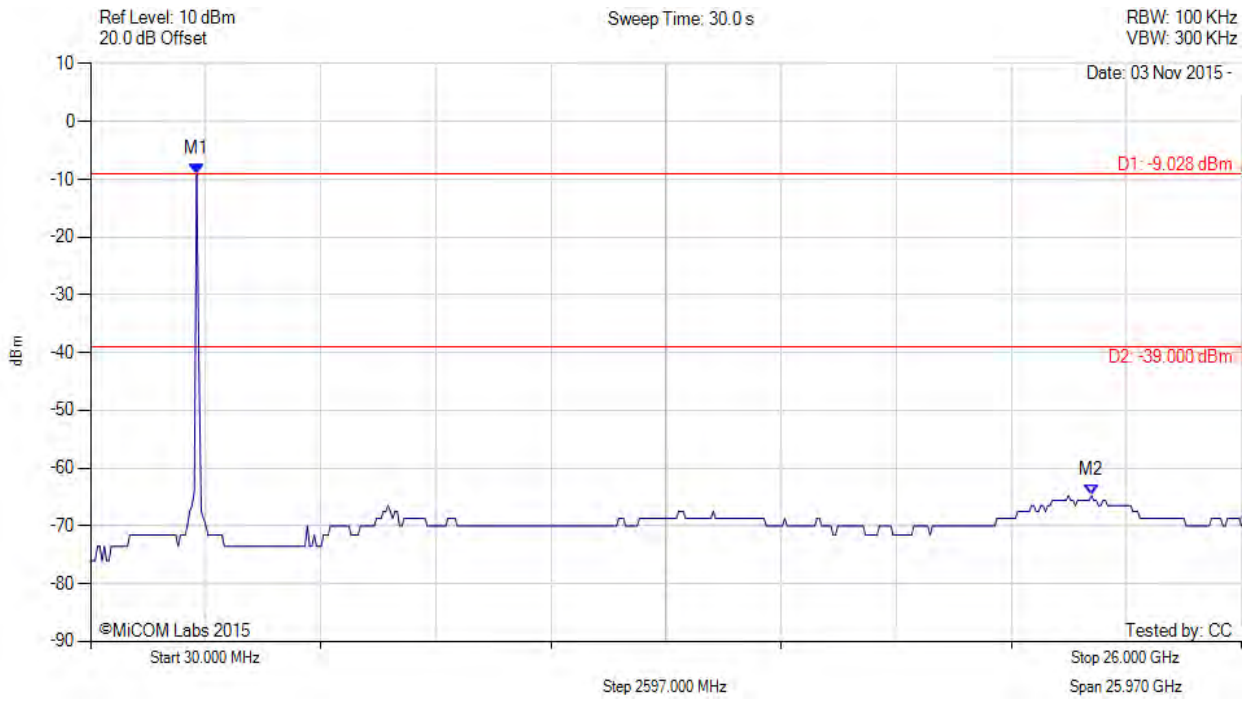
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -9.028 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -39.00 dBm Margin: -25.74 dB

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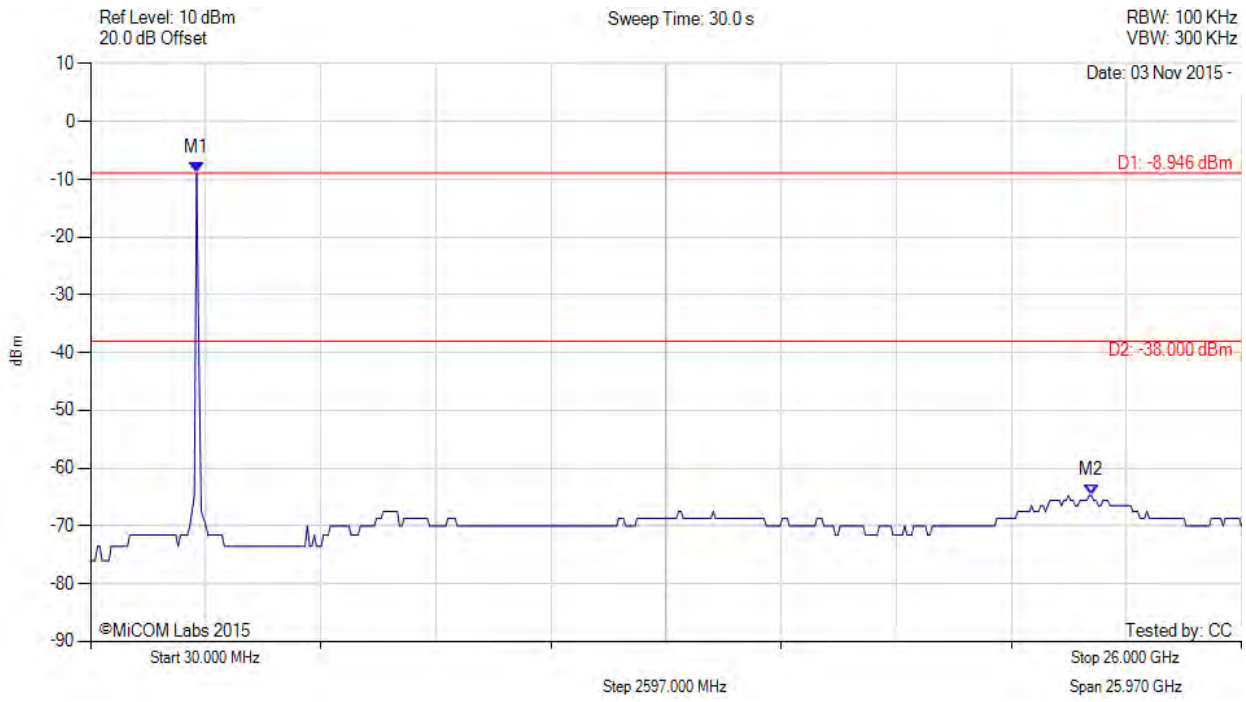
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -8.946 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -38.00 dBm Margin: -26.74 dB

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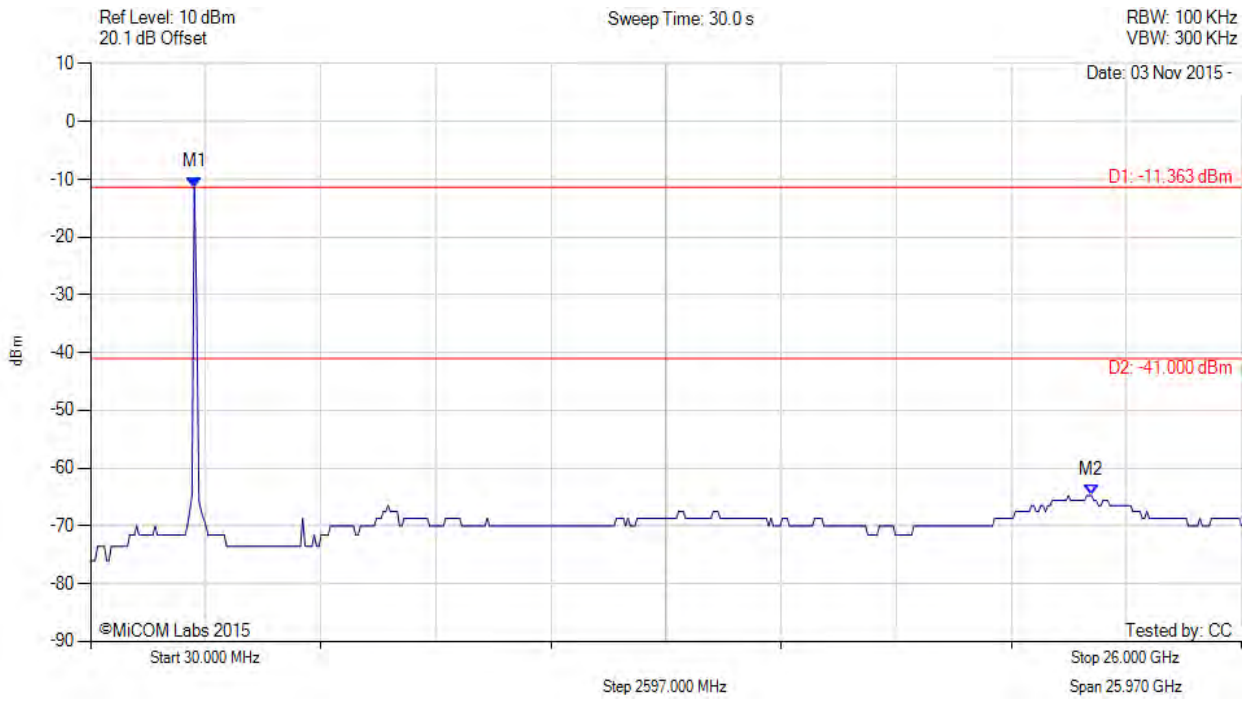
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2371.984 MHz : -11.363 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -41.00 dBm Margin: -23.74 dB

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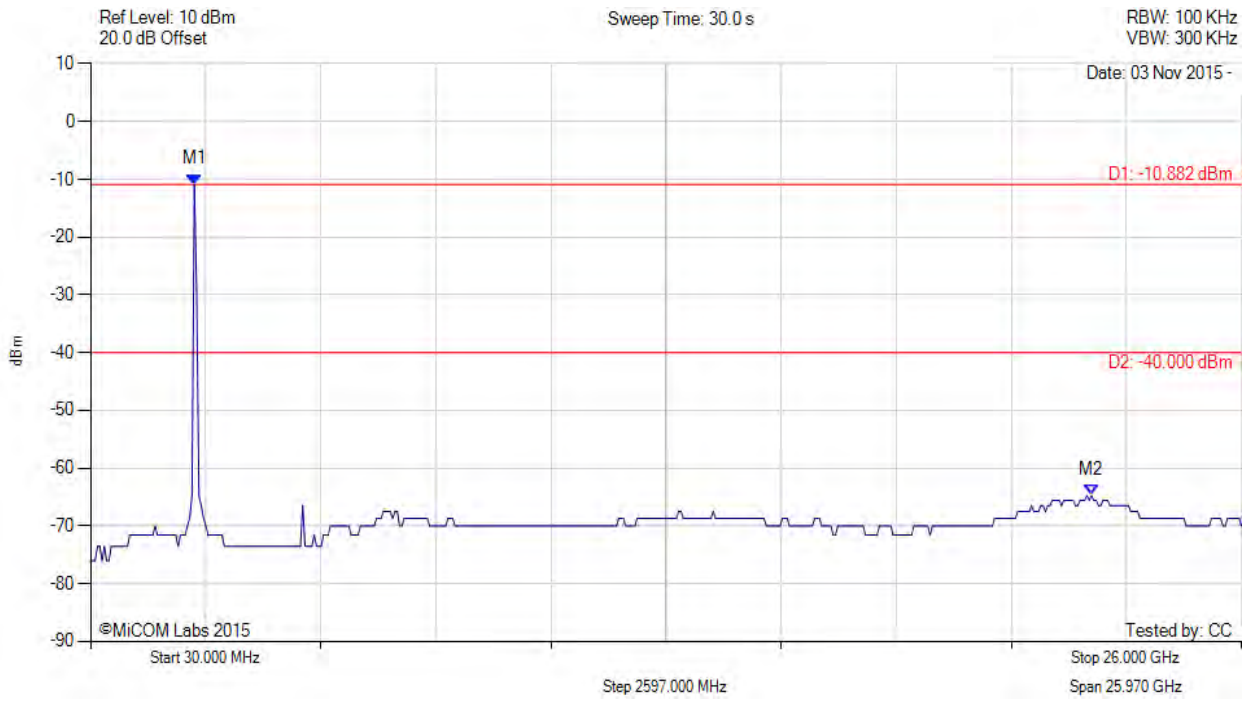
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2371.984 MHz : -10.882 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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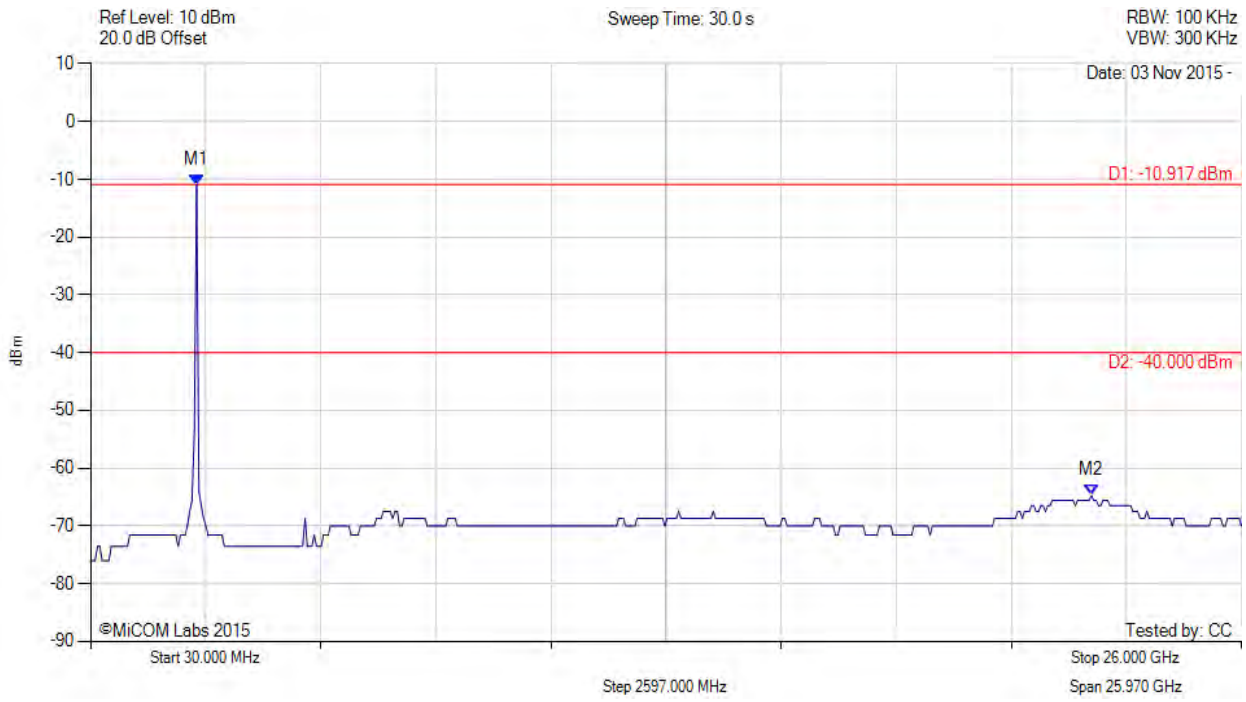
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -10.917 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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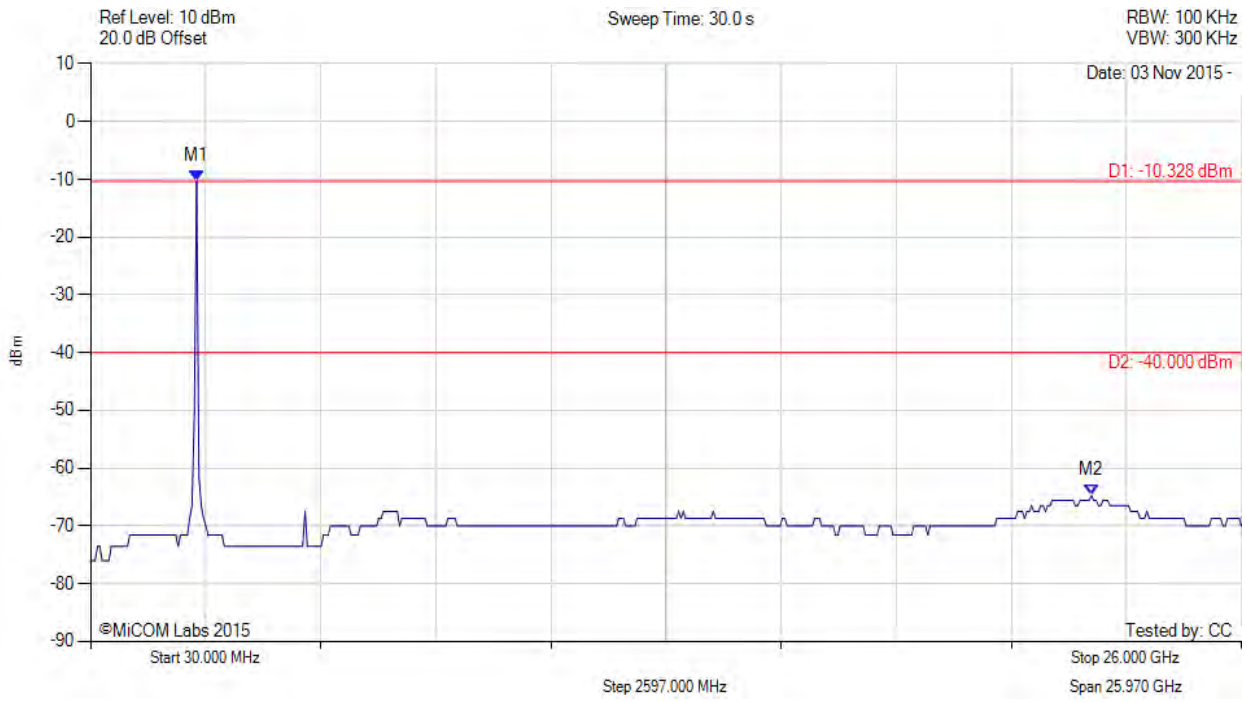
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -10.328 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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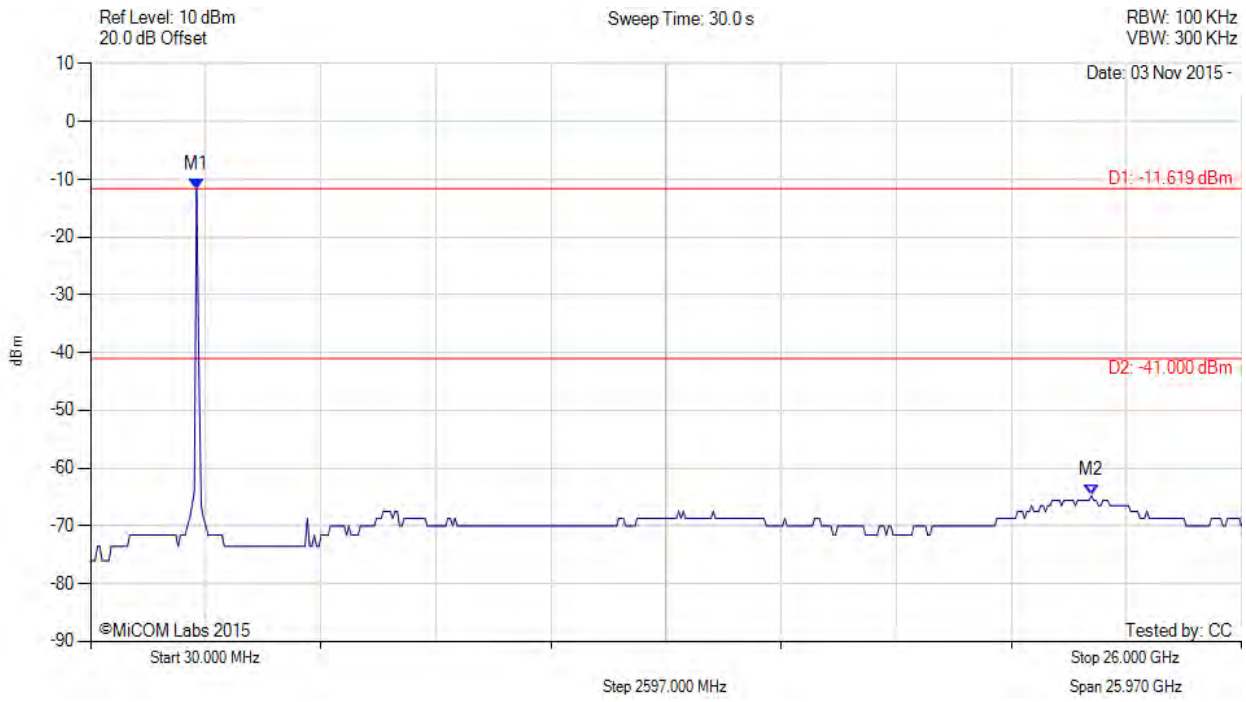
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -11.619 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -41.00 dBm Margin: -23.74 dB

back to matrix

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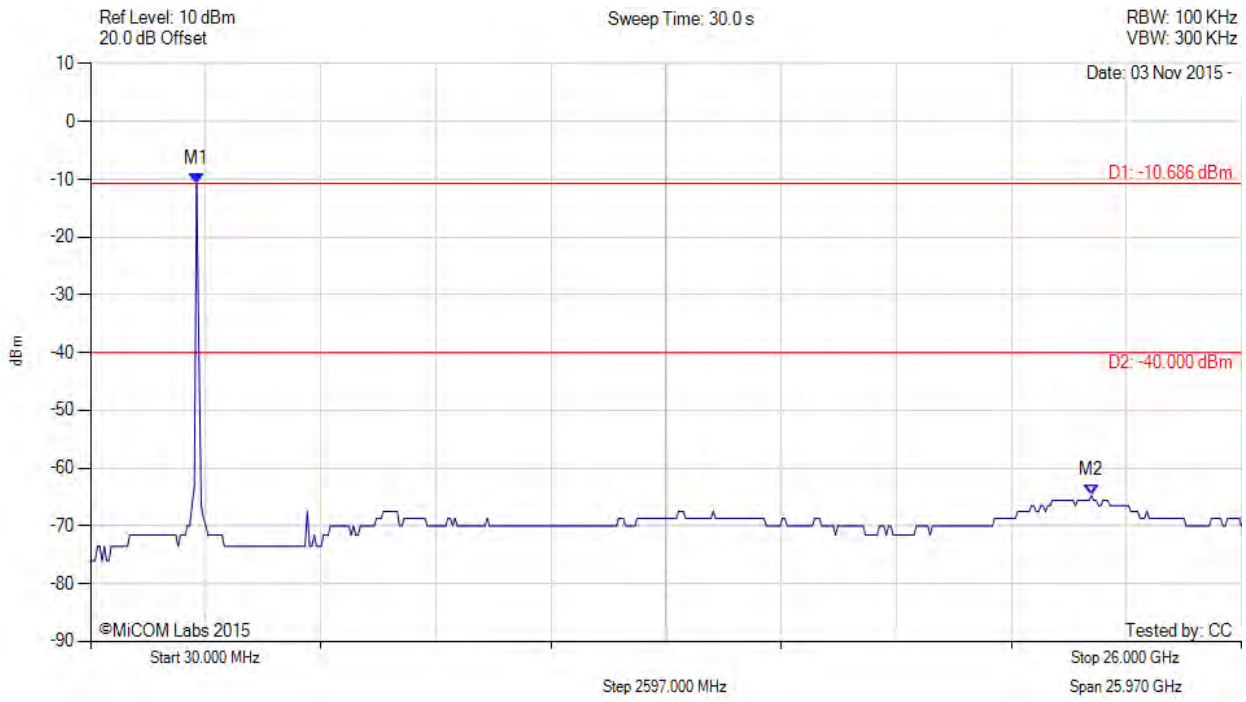
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -10.686 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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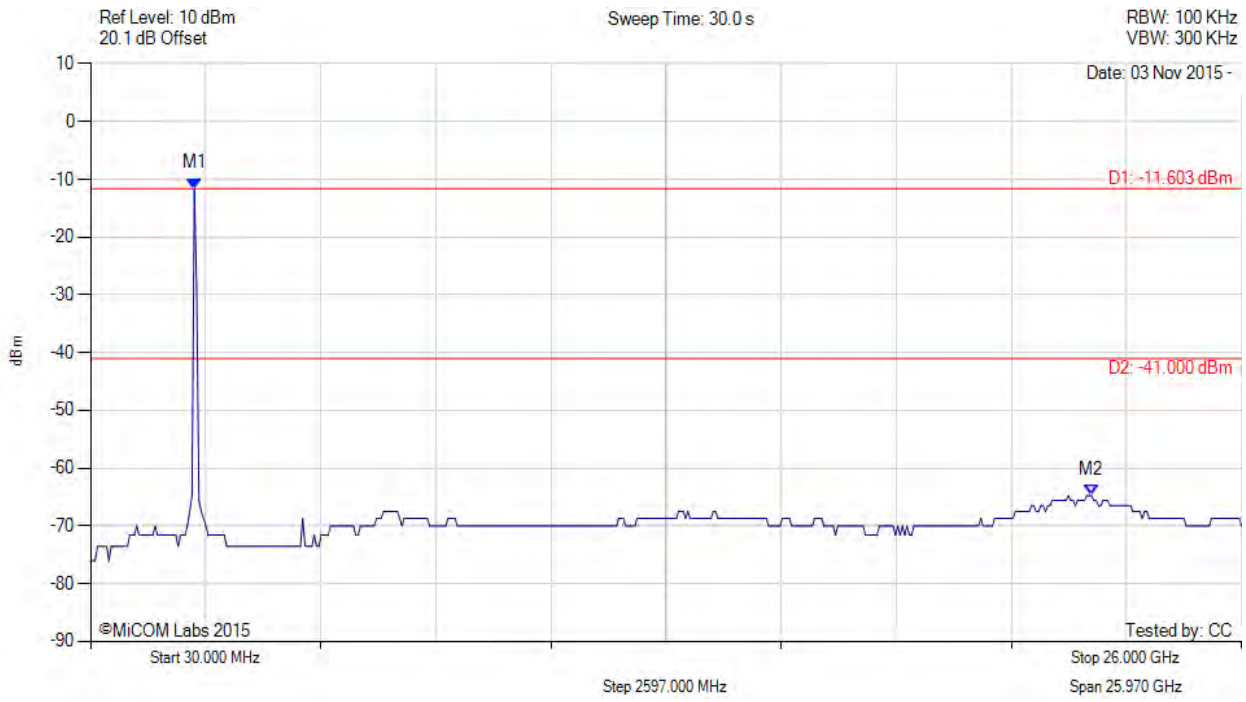
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2371.984 MHz : -11.603 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -41.00 dBm Margin: -23.74 dB

back to matrix

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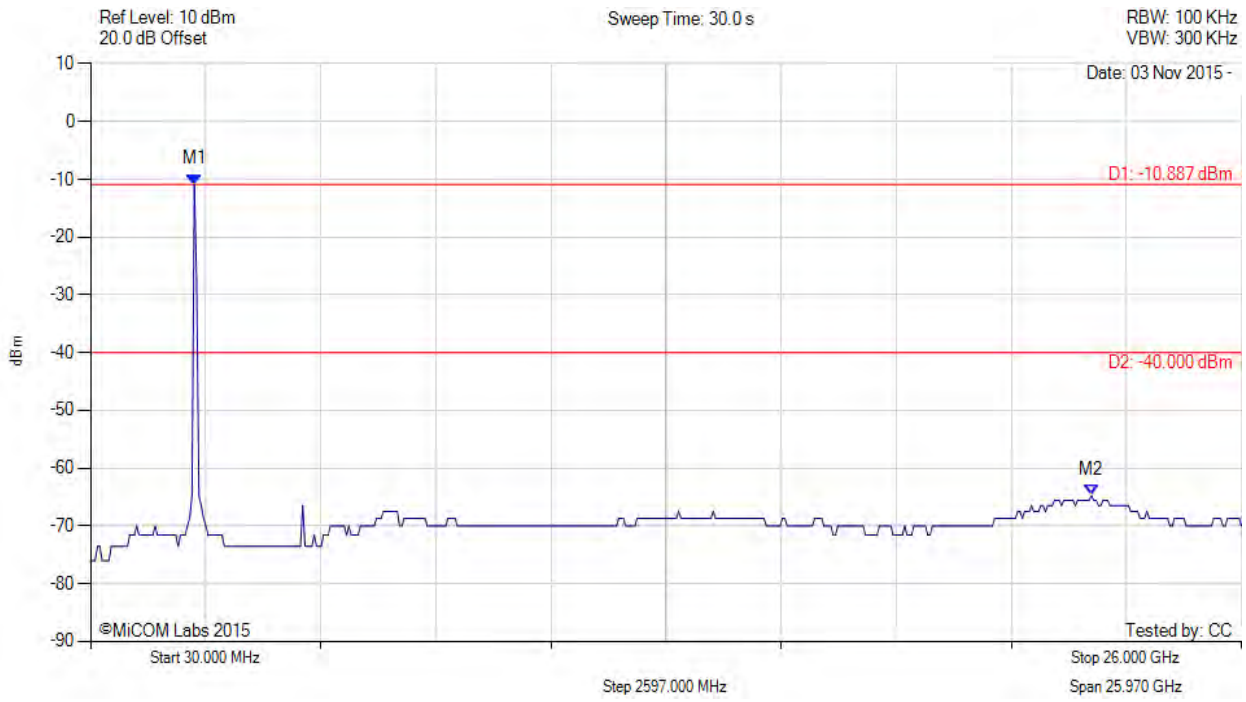
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2371.984 MHz : -10.887 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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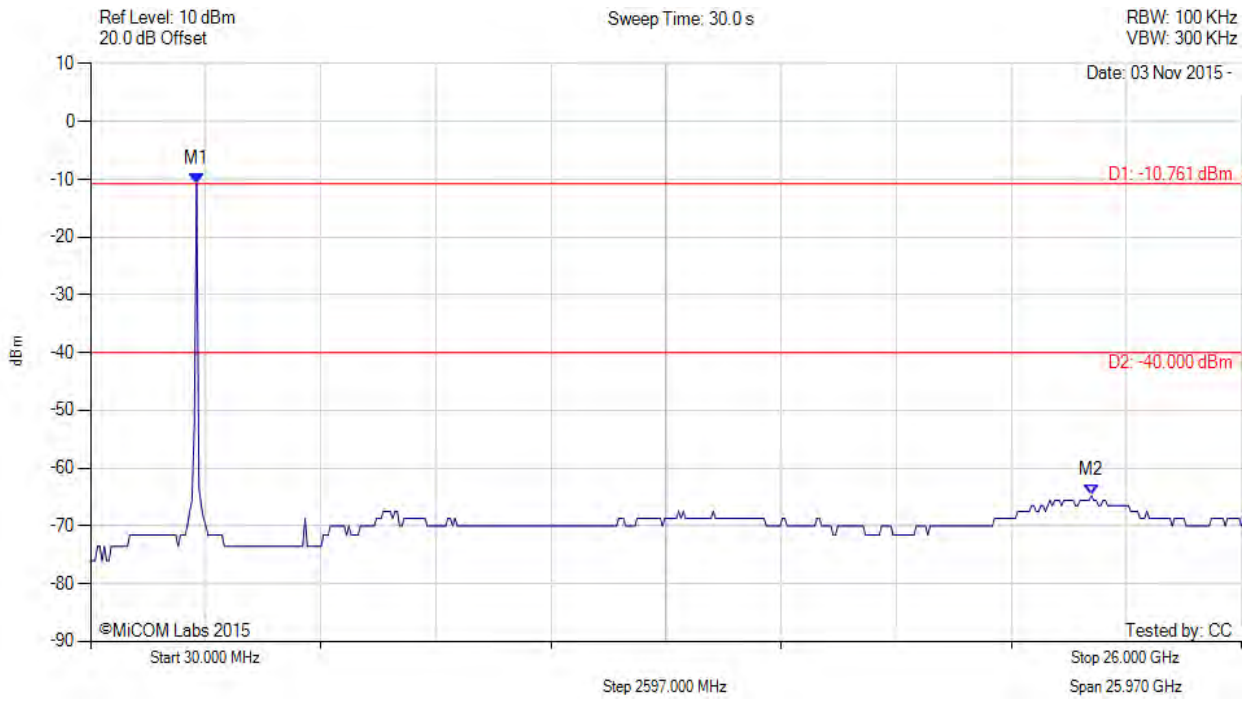
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -10.761 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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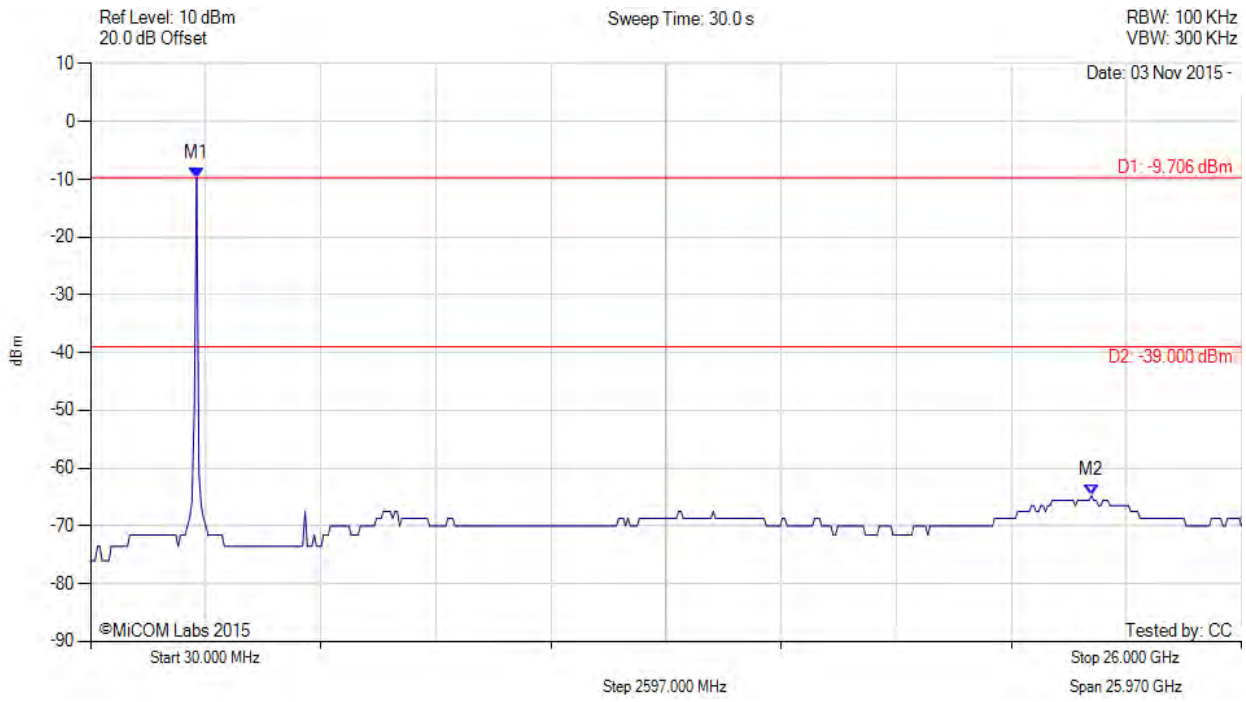
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -9.706 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -39.00 dBm Margin: -25.74 dB

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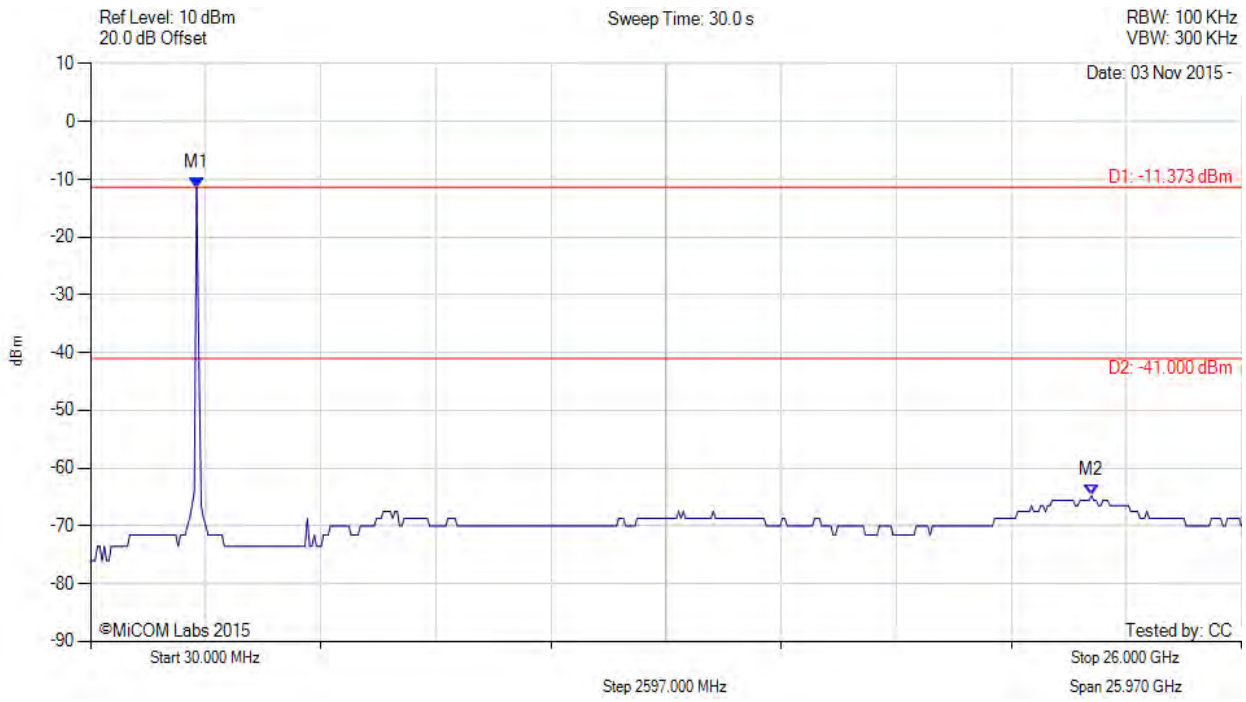
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -11.373 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -41.00 dBm Margin: -23.74 dB

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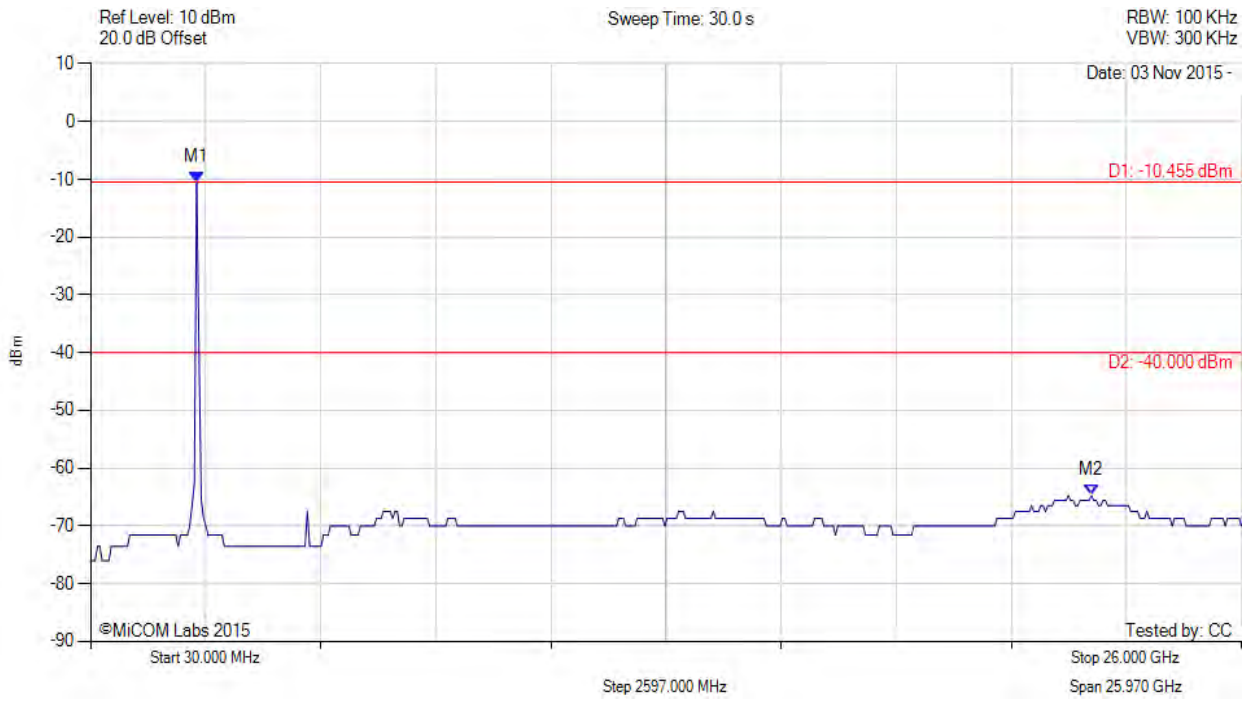
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -10.455 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -40.00 dBm Margin: -24.74 dB

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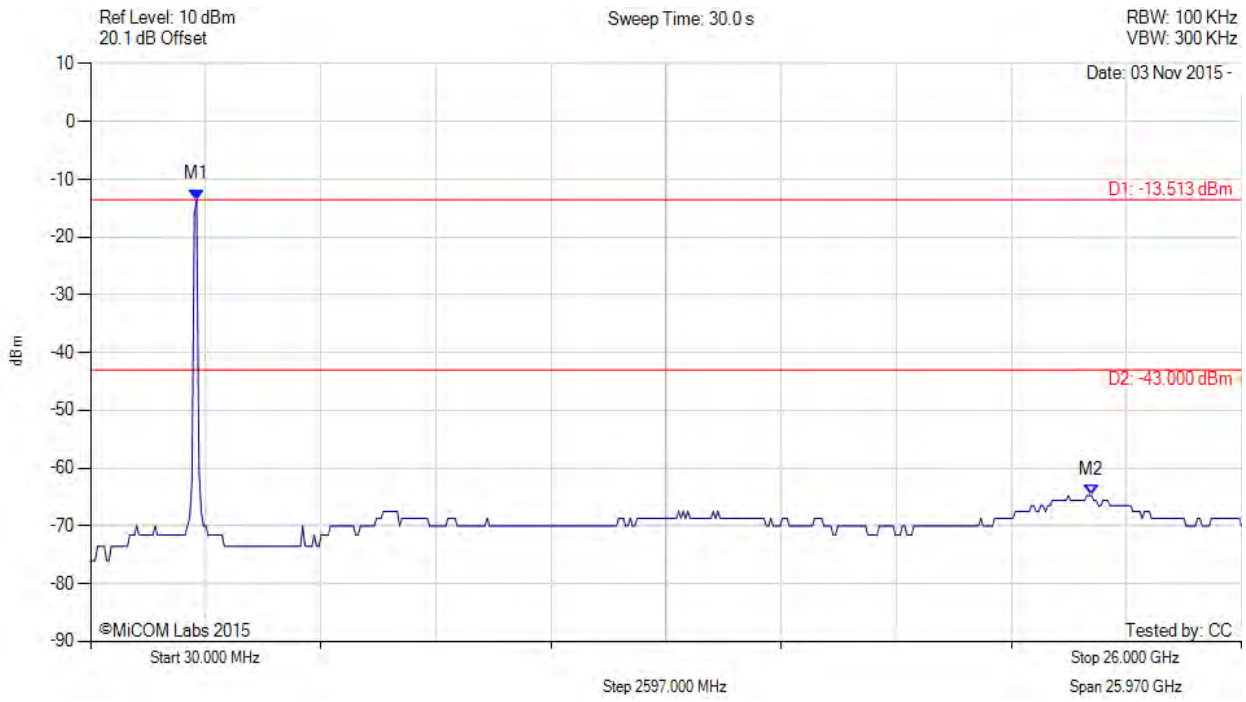
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -13.513 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -43.00 dBm Margin: -21.74 dB

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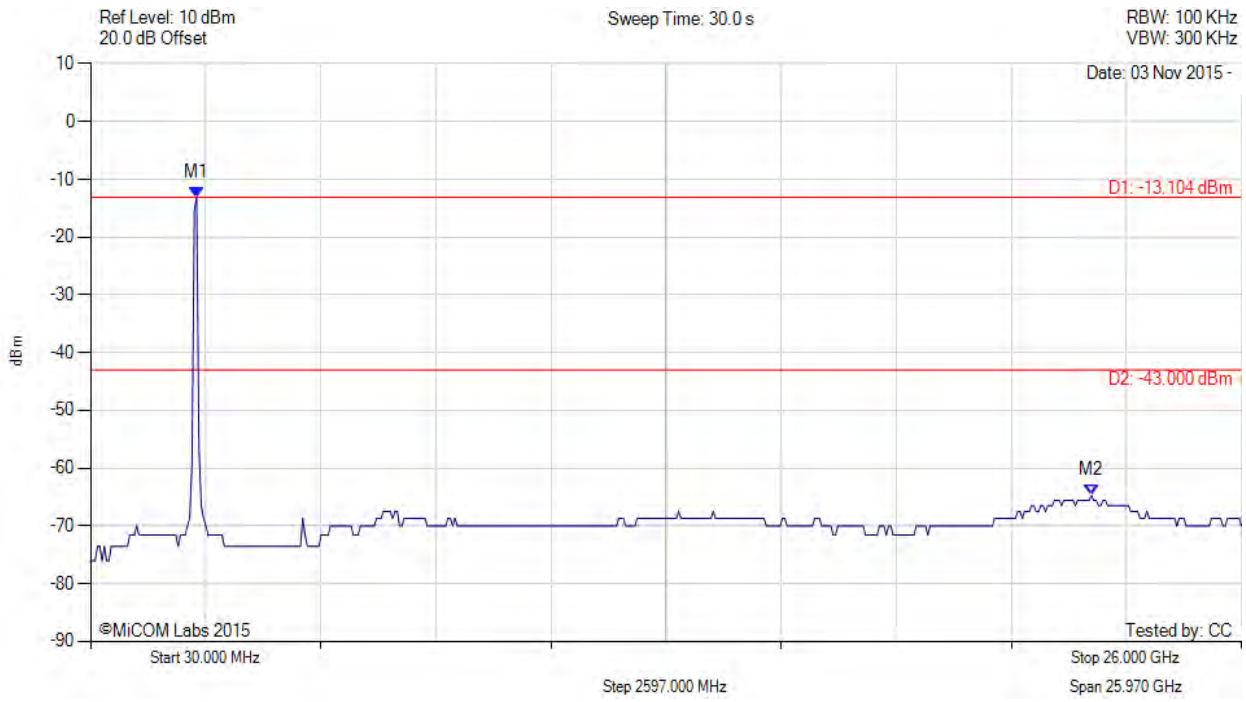
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -13.104 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -43.00 dBm Margin: -21.74 dB

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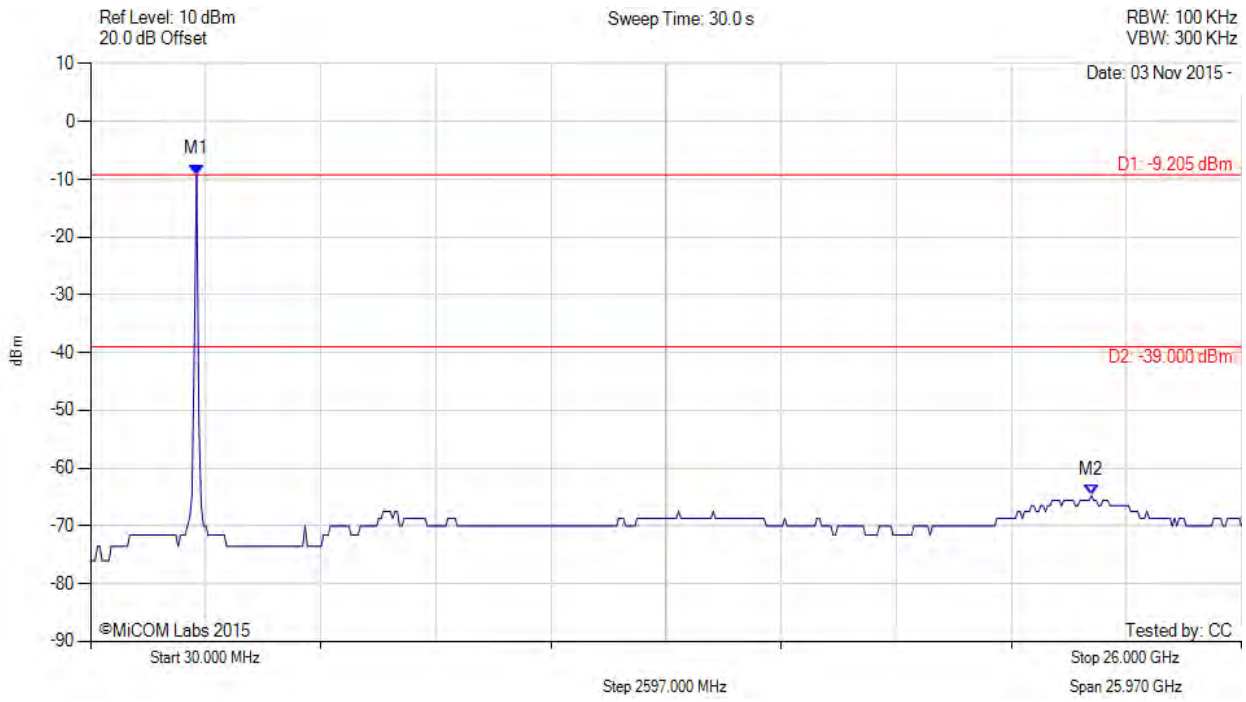
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -9.205 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -39.00 dBm Margin: -25.74 dB

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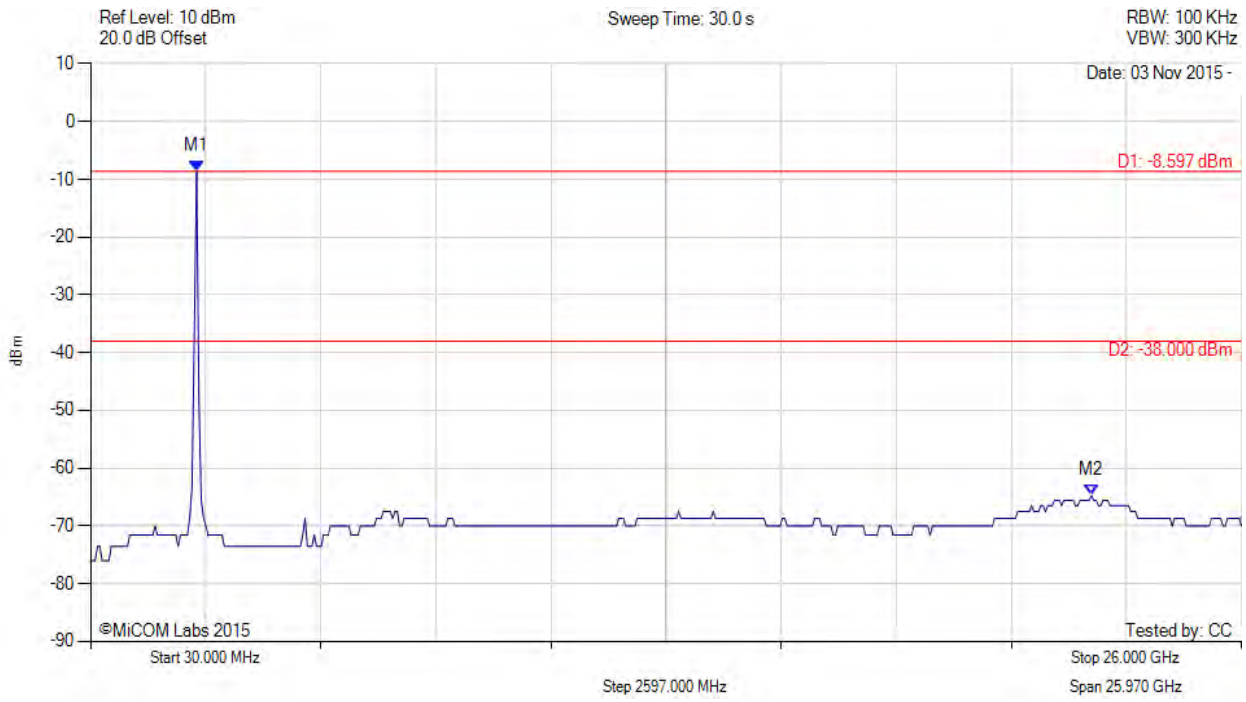
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -8.597 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -38.00 dBm Margin: -26.74 dB

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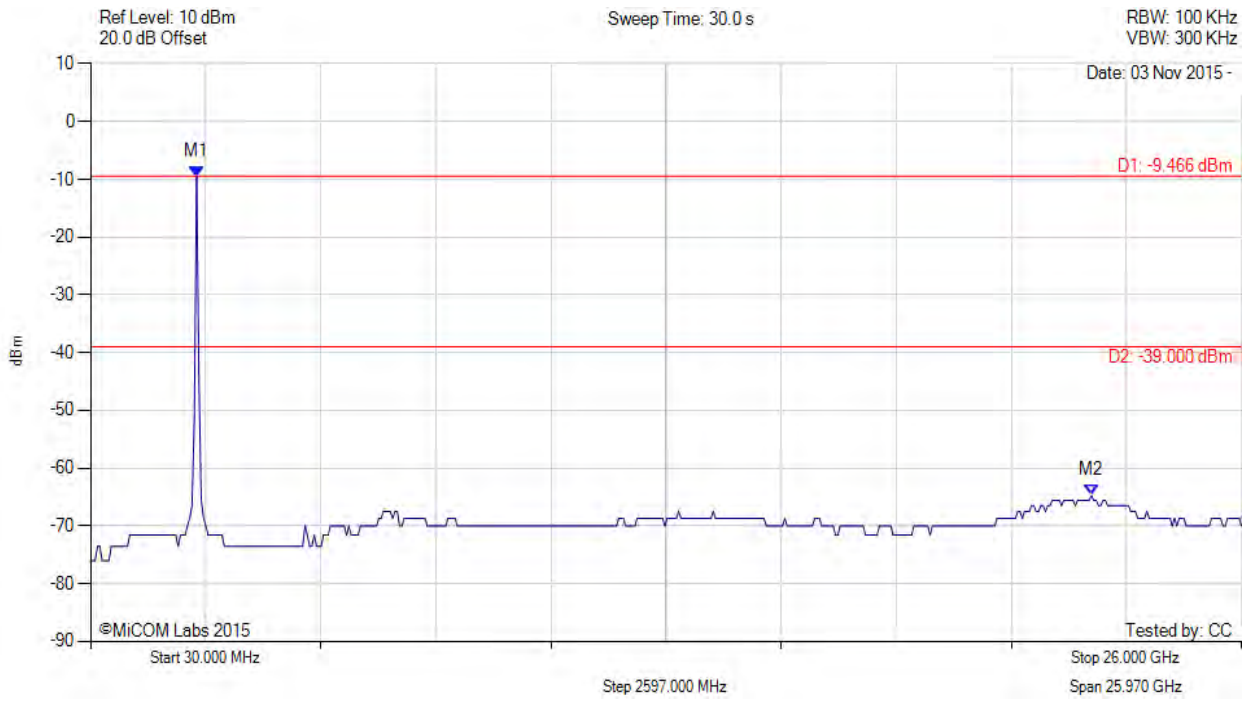
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -9.466 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -39.00 dBm Margin: -25.74 dB

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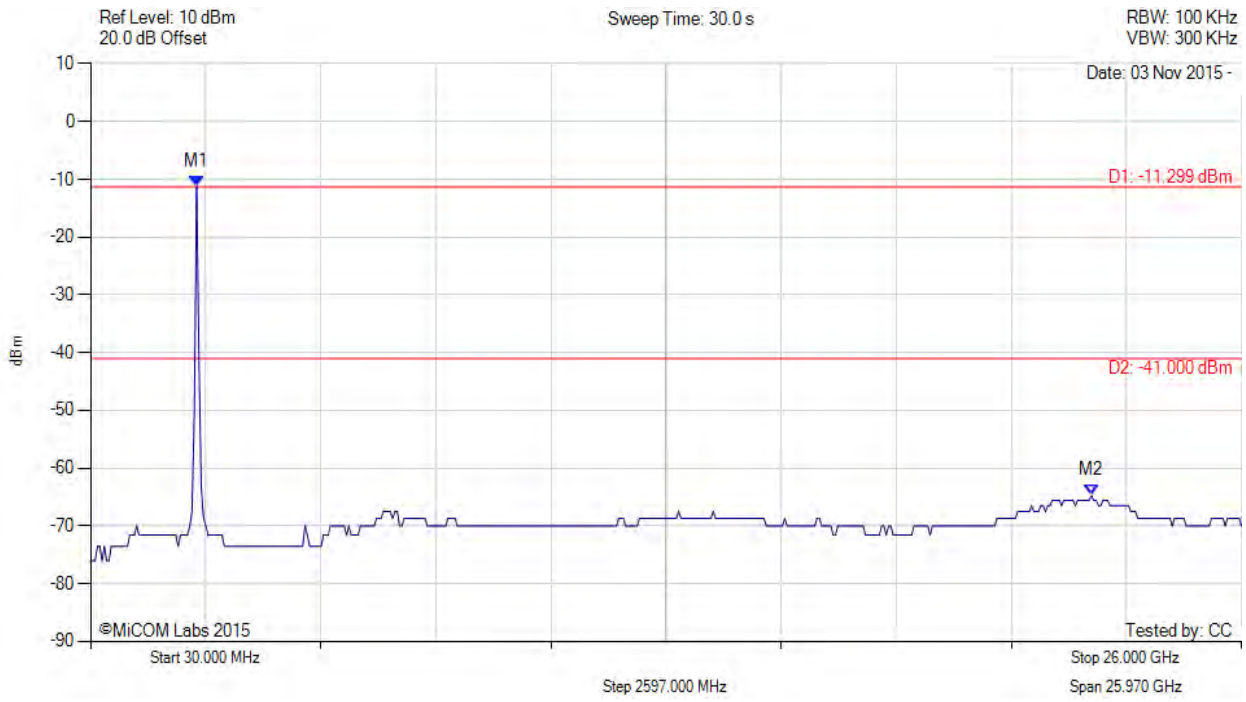
CONDUCTED SPURIOUS EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -11.299 dBm M2 : 22.617 GHz : -64.737 dBm	Limit: -41.00 dBm Margin: -23.74 dB

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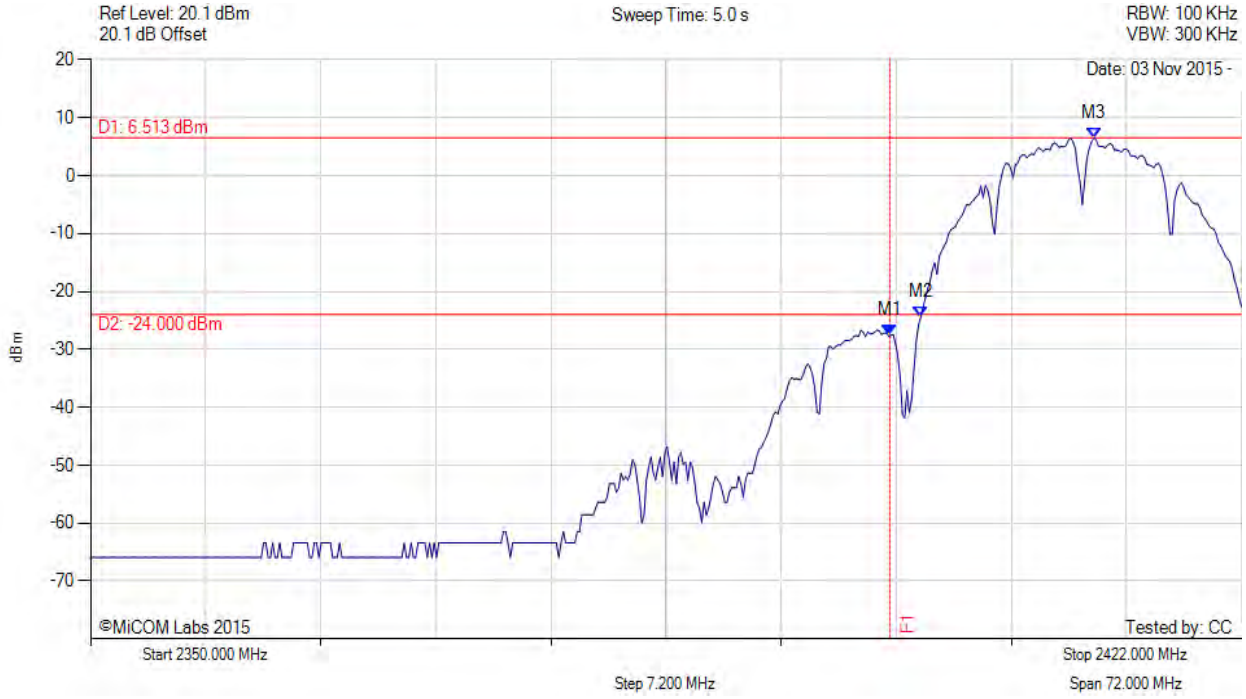
A.2.1.2. Conducted Band-Edge Emissions

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -27.576 dBm M2 : 2401.944 MHz : -24.485 dBm M3 : 2412.766 MHz : 6.513 dBm	Channel Frequency: 2412.00 MHz

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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 b, Temp: Ambient, Voltage: 12 Vdc

Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -27.100 dBm M2 : 2401.944 MHz : -24.016 dBm M3 : 2412.766 MHz : 6.388 dBm	Channel Frequency: 2412.00 MHz

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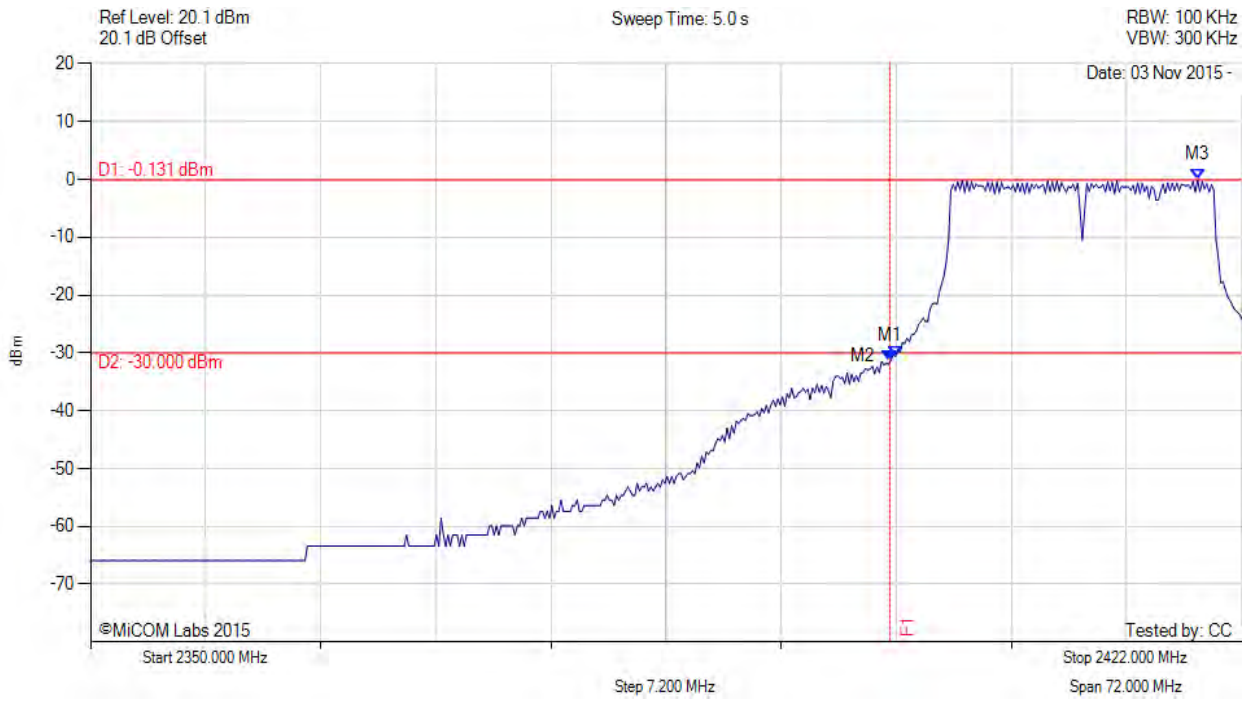
CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -31.329 dBm M2 : 2400.357 MHz : -30.555 dBm M3 : 2419.259 MHz : -0.131 dBm	Channel Frequency: 2412.00 MHz

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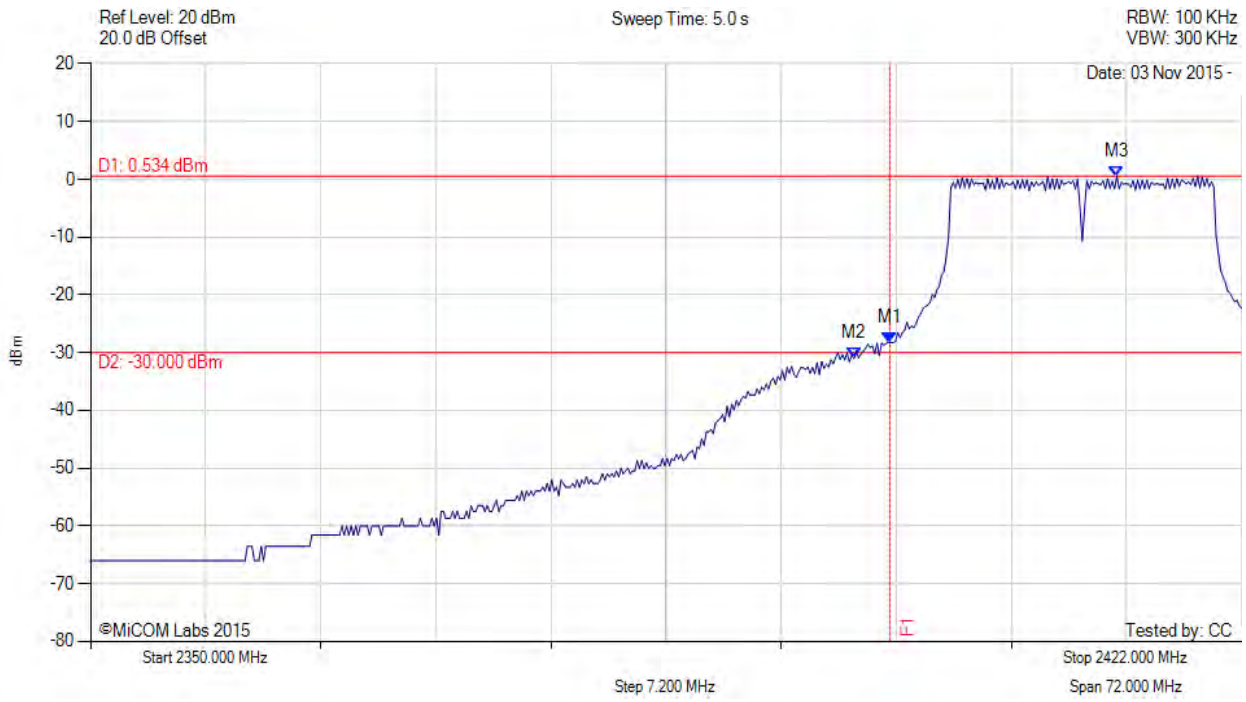
CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -28.293 dBm M2 : 2397.760 MHz : -31.008 dBm M3 : 2414.208 MHz : 0.534 dBm	Channel Frequency: 2412.00 MHz

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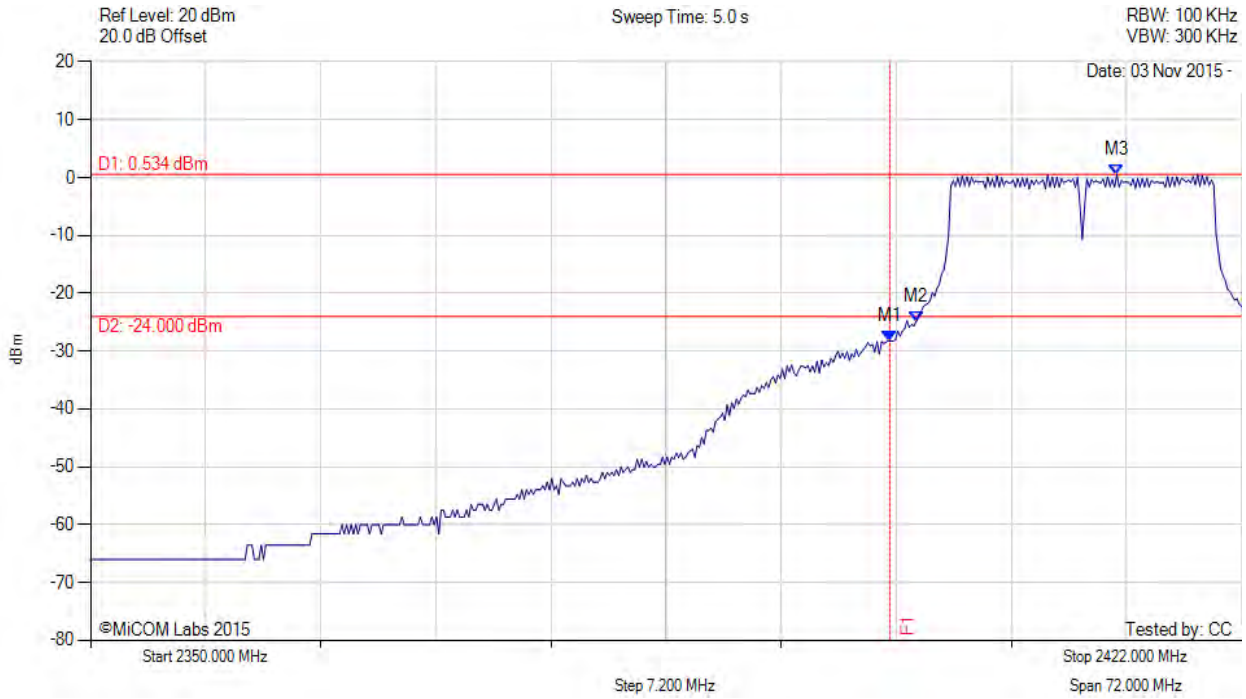
CONDUCTED LOW BAND-EDGE EMISSIONS – AVERAGE 802.11b LIMIT

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -28.293 dBm M2 : 2401.655 MHz : -24.885 dBm M3 : 2414.208 MHz : 0.534 dBm	Channel Frequency: 2412.00 MHz

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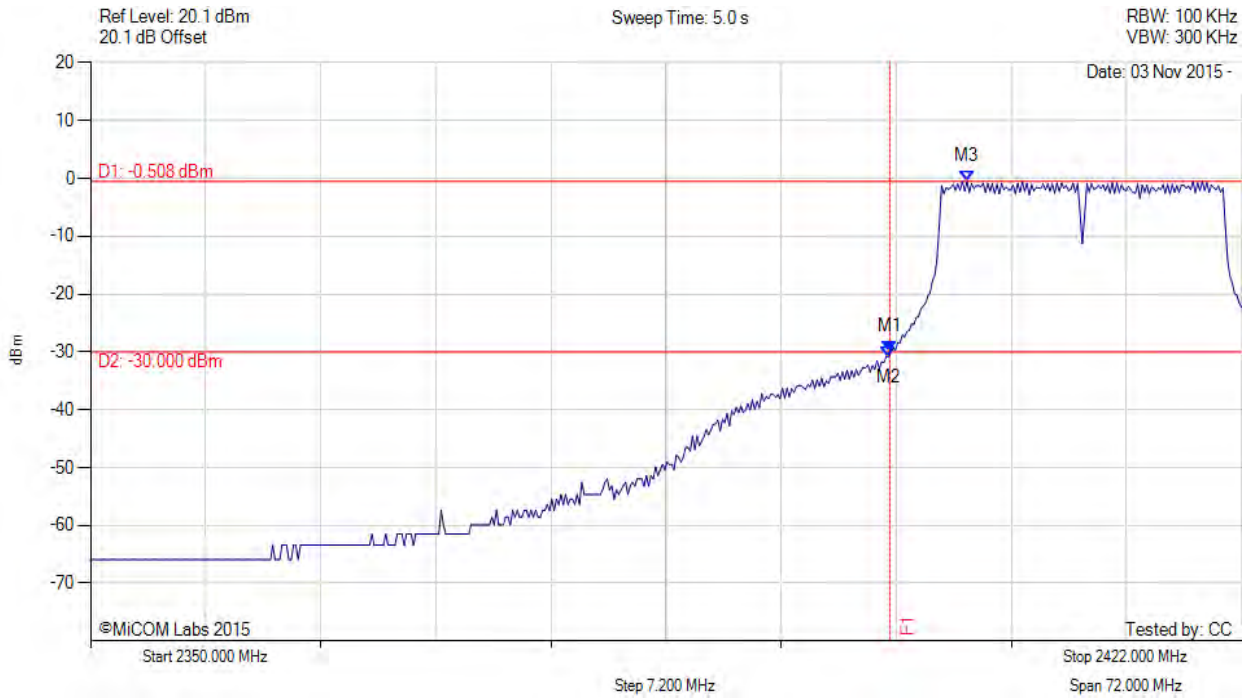
CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -29.982 dBm M2 : 2399.924 MHz : -30.805 dBm M3 : 2404.830 MHz : -0.508 dBm	Channel Frequency: 2412.00 MHz

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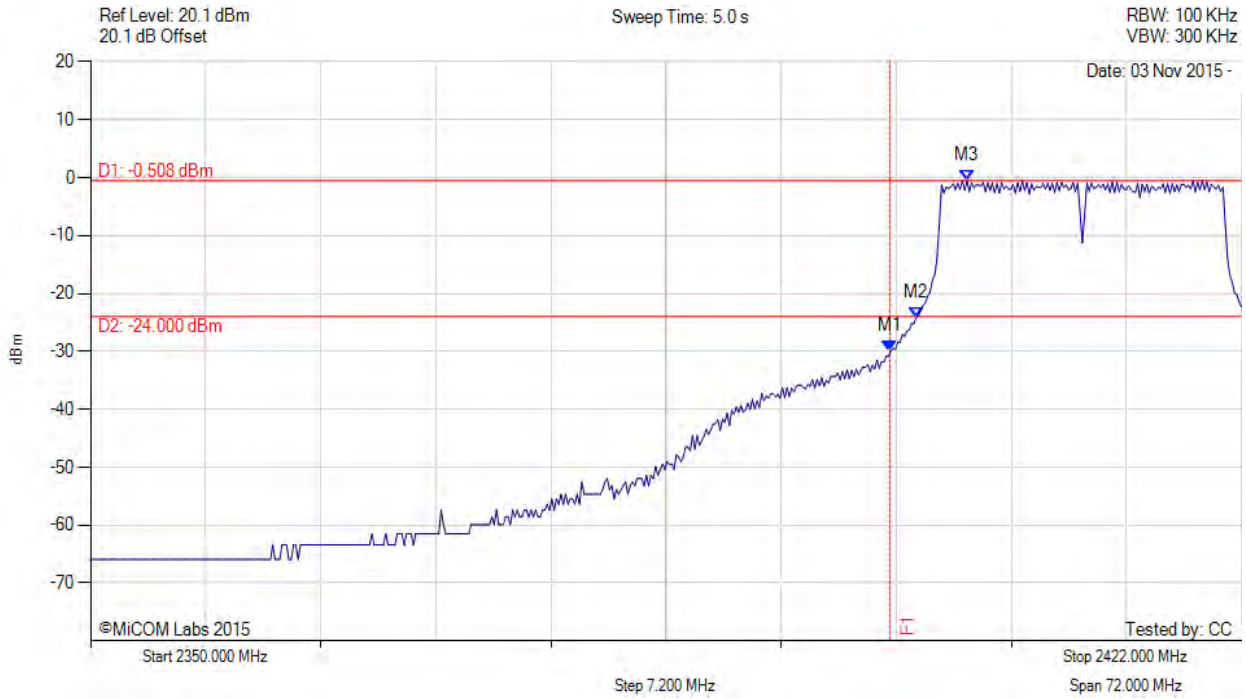
CONDUCTED LOW BAND-EDGE EMISSIONS – AVERAGE 802.11b LIMIT

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -29.982 dBm M2 : 2401.655 MHz : -24.101 dBm M3 : 2404.830 MHz : -0.508 dBm	Channel Frequency: 2412.00 MHz

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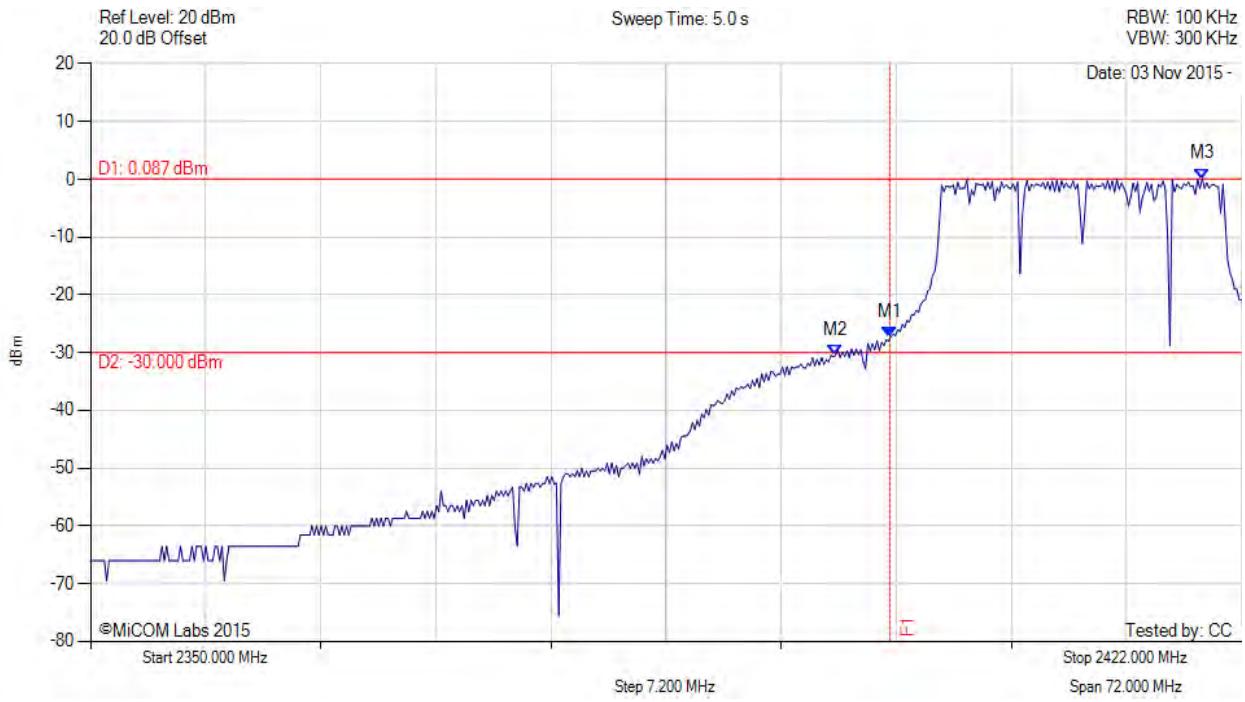
CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -27.266 dBm M2 : 2396.605 MHz : -30.508 dBm M3 : 2419.547 MHz : 0.087 dBm	Channel Frequency: 2412.00 MHz

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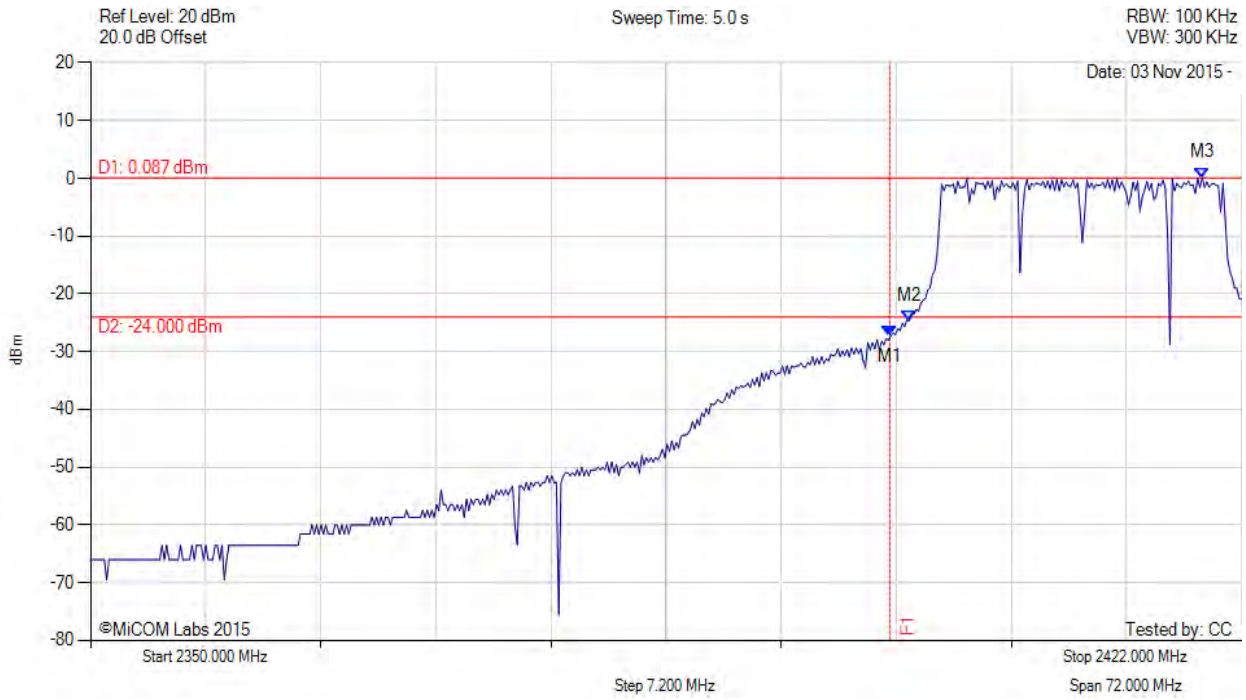
CONDUCTED LOW BAND-EDGE EMISSIONS – AVERAGE 802.11b LIMIT

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -27.266 dBm M2 : 2401.222 MHz : -24.709 dBm M3 : 2419.547 MHz : 0.087 dBm	Channel Frequency: 2412.00 MHz

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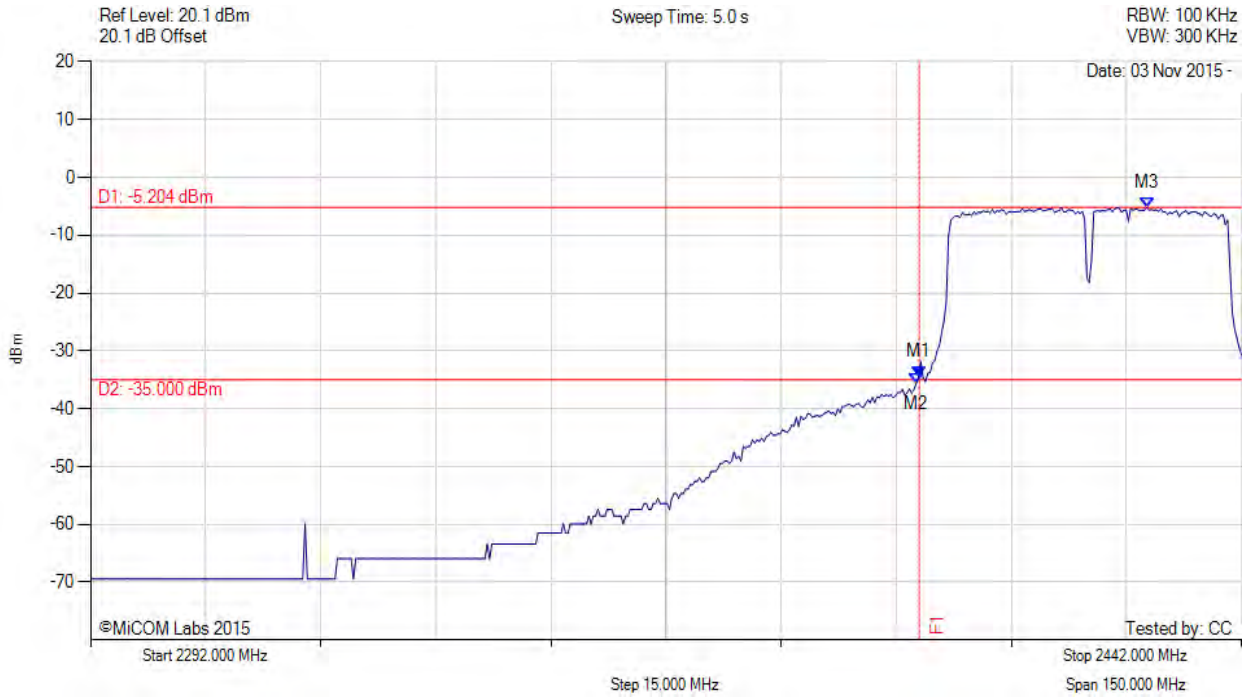
CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -34.481 dBm M2 : 2399.615 MHz : -35.641 dBm M3 : 2429.675 MHz : -5.204 dBm	Channel Frequency: 2422.00 MHz

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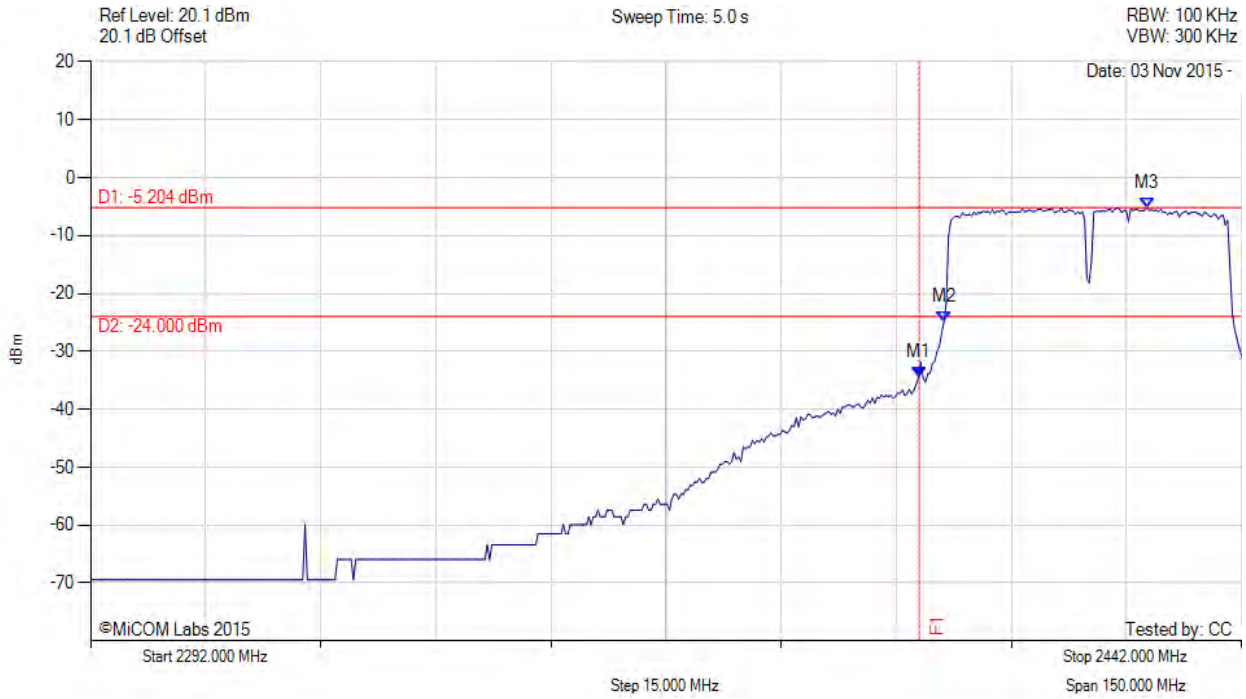
CONDUCTED LOW BAND-EDGE EMISSIONS – AVERAGE 802.11b LIMIT

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -34.481 dBm M2 : 2403.222 MHz : -24.887 dBm M3 : 2429.675 MHz : -5.204 dBm	Channel Frequency: 2422.00 MHz

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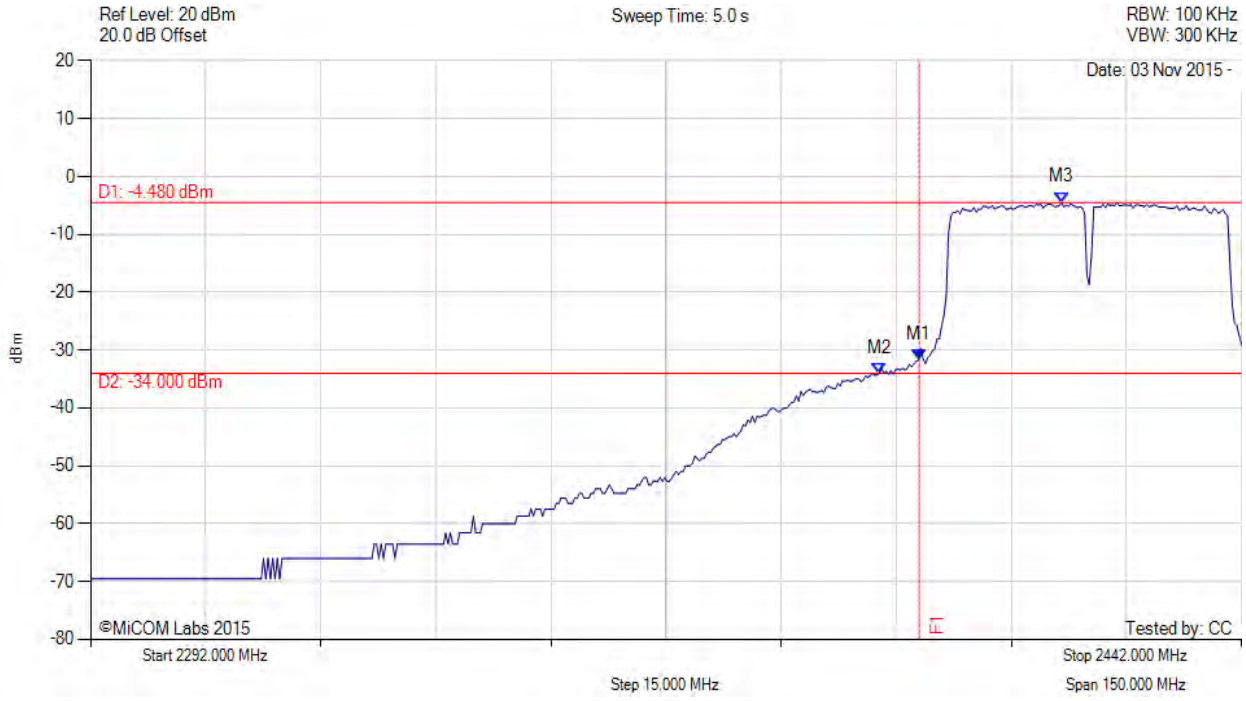
CONDUCTED LOW BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -31.647 dBm M2 : 2394.806 MHz : -34.054 dBm M3 : 2418.553 MHz : -4.480 dBm	Channel Frequency: 2422.00 MHz

back to matrix

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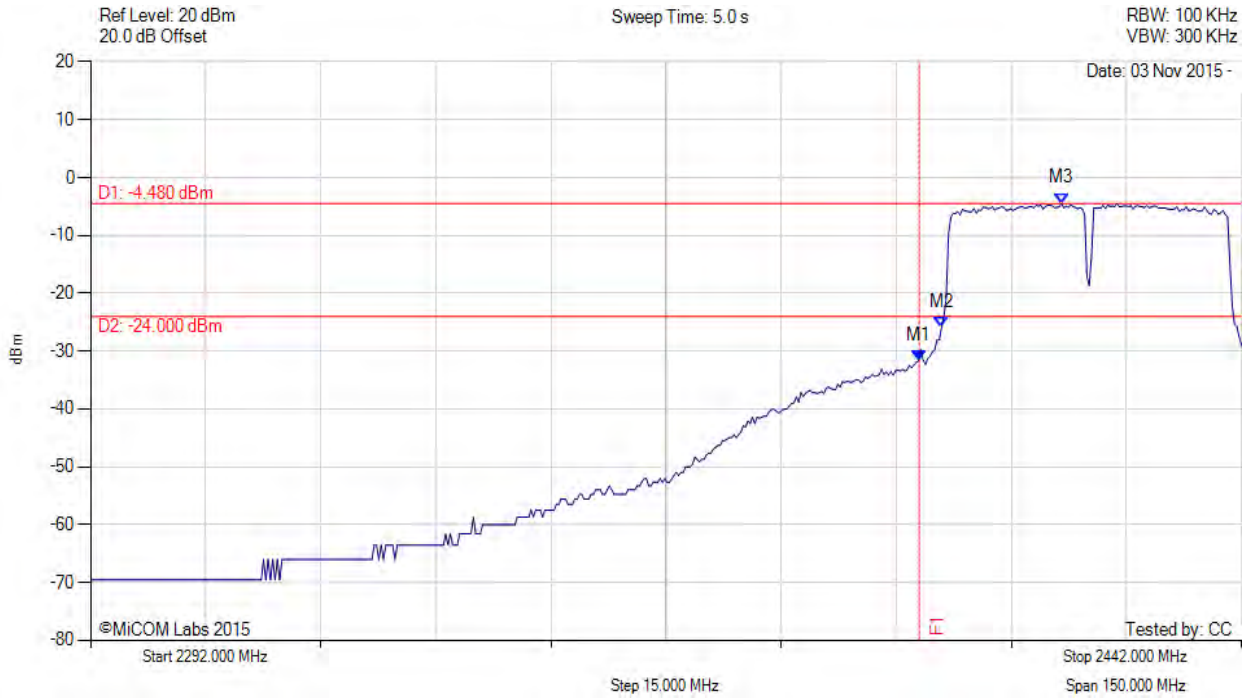
NDUCTED LOW BAND-EDGE EMISSIONS – AVERAGE 802.11b LIMIT

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2400.000 MHz : -31.647 dBm M2 : 2402.922 MHz : -25.851 dBm M3 : 2418.553 MHz : -4.480 dBm	Channel Frequency: 2422.00 MHz

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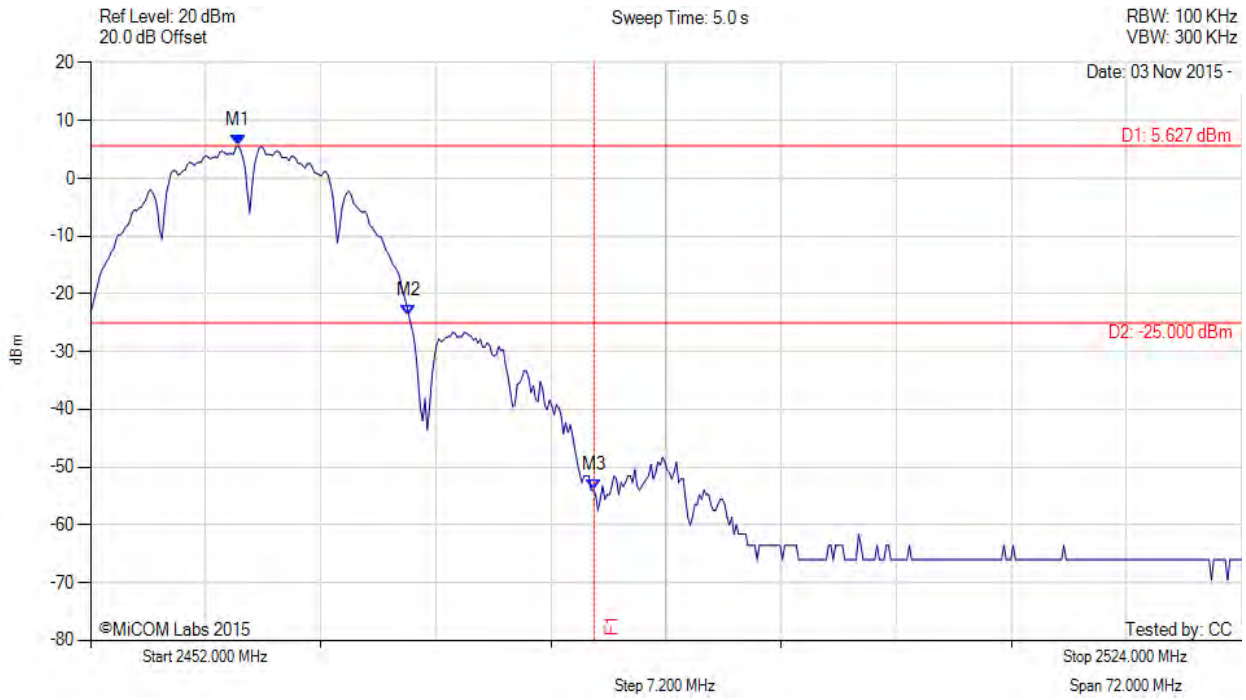
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2461.234 MHz : 5.627 dBm M2 : 2471.912 MHz : -23.700 dBm M3 : 2483.500 MHz : -53.982 dBm	Channel Frequency: 2462.00 MHz

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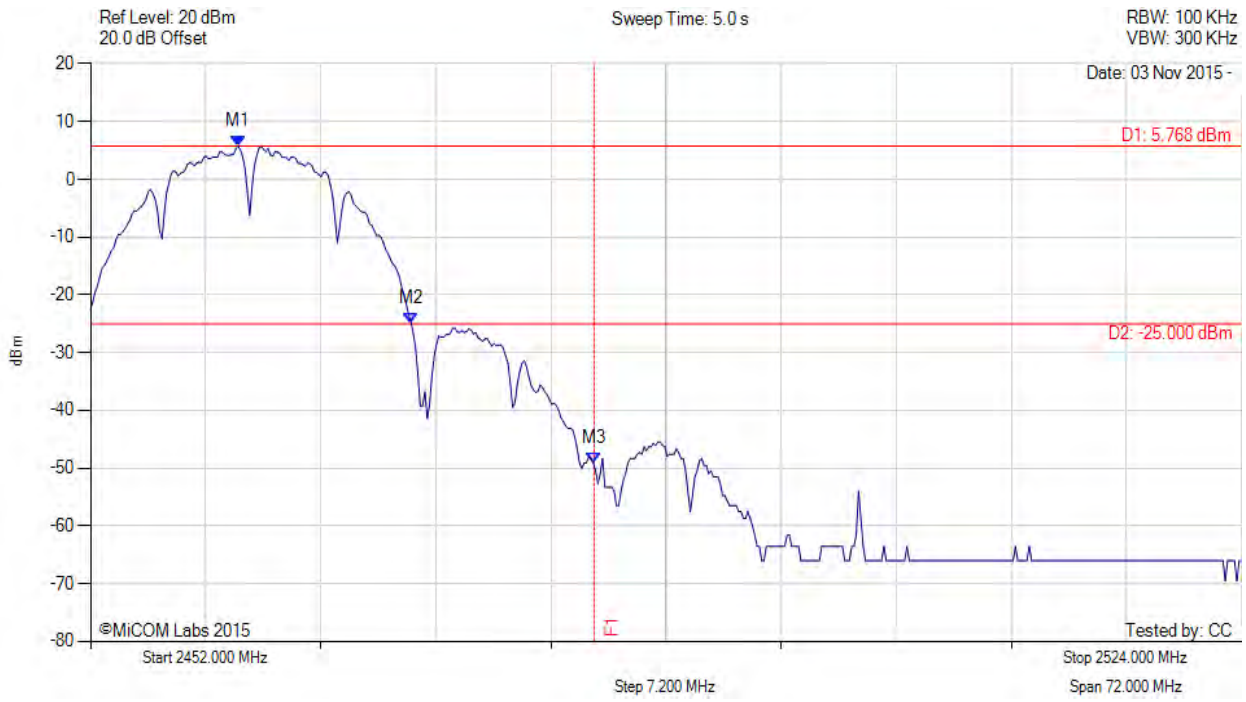
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2461.234 MHz : 5.768 dBm M2 : 2472.056 MHz : -24.910 dBm M3 : 2483.500 MHz : -49.121 dBm	Channel Frequency: 2462.00 MHz

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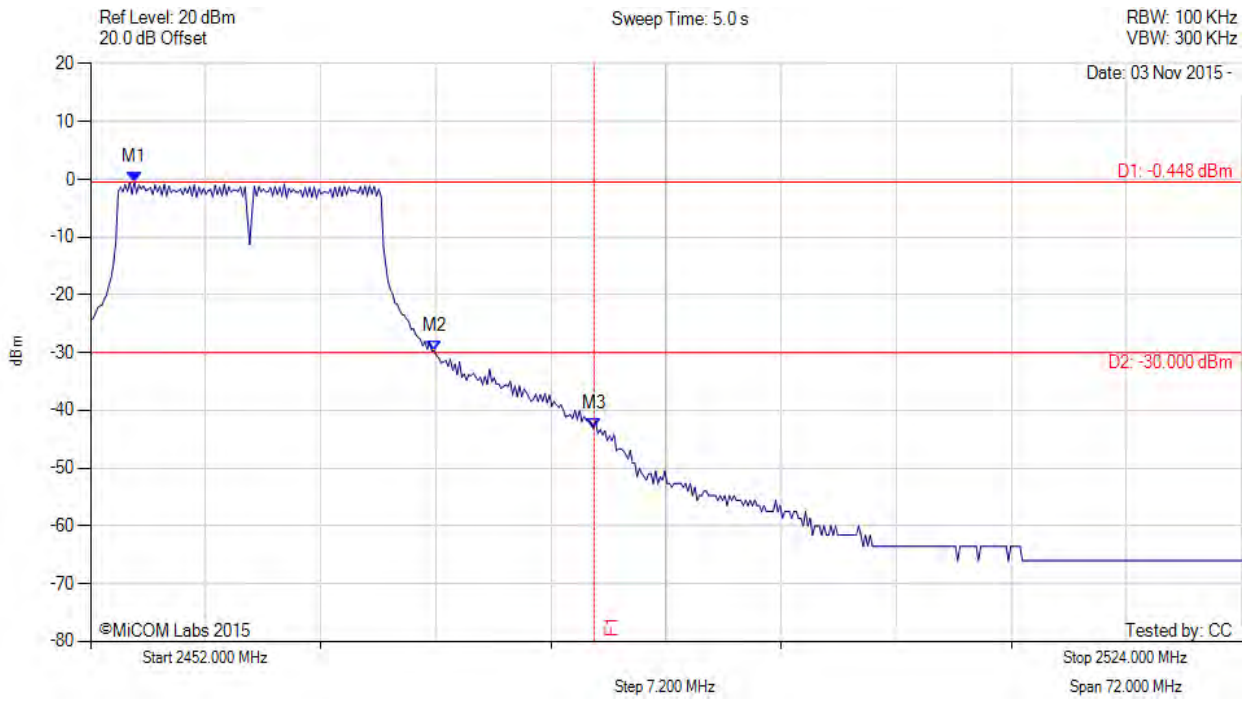
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2454.741 MHz : -0.448 dBm M2 : 2473.499 MHz : -29.676 dBm M3 : 2483.500 MHz : -43.100 dBm	Channel Frequency: 2462.00 MHz

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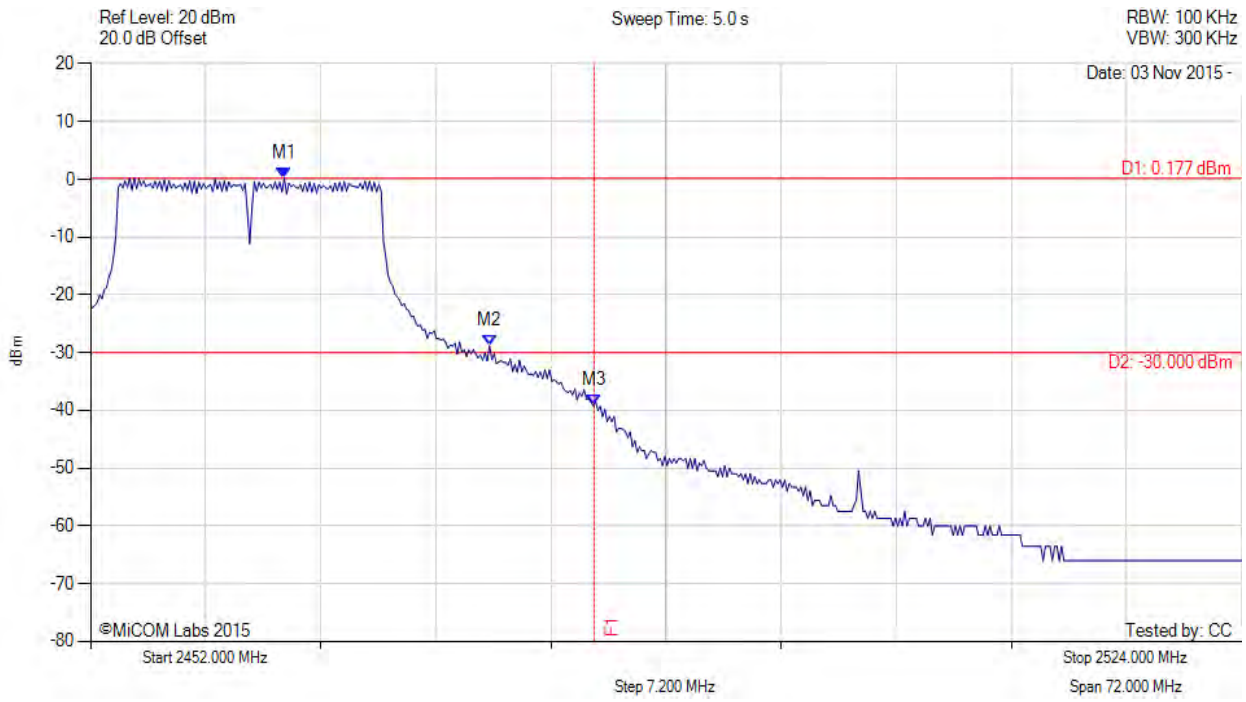
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2464.120 MHz : 0.177 dBm M2 : 2476.962 MHz : -28.836 dBm M3 : 2483.500 MHz : -39.174 dBm	Channel Frequency: 2462.00 MHz

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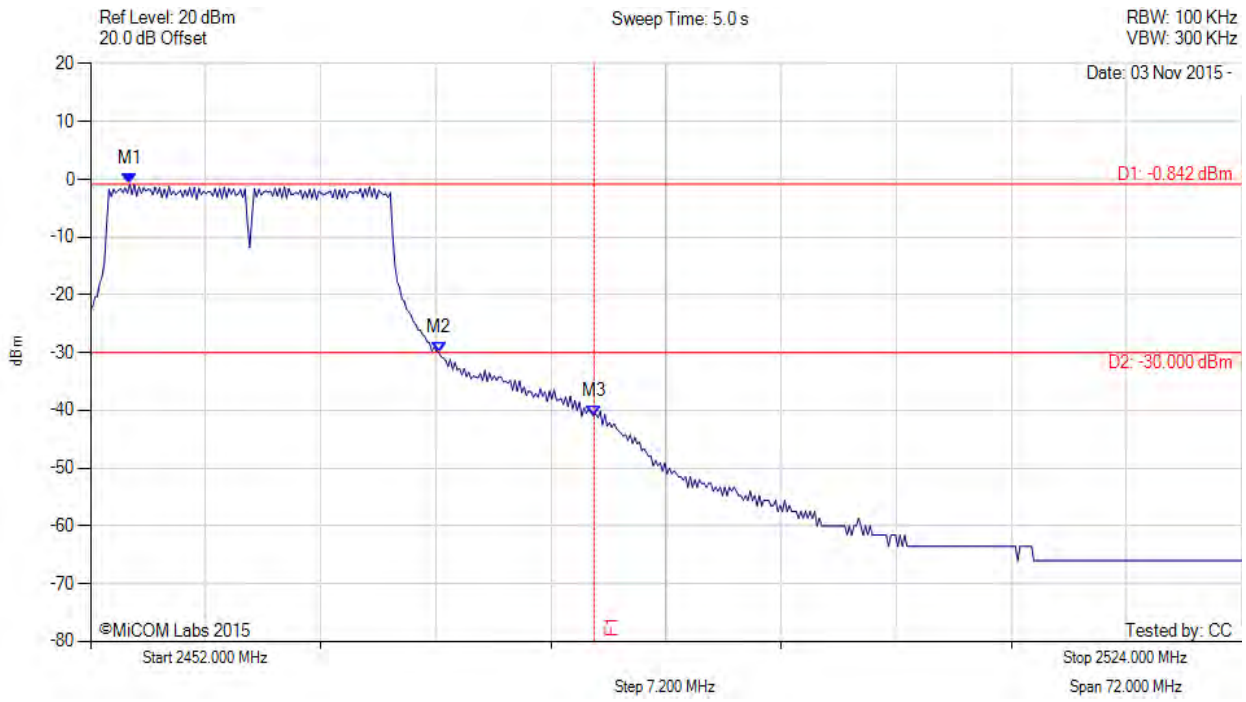
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2454.453 MHz : -0.842 dBm M2 : 2473.788 MHz : -29.945 dBm M3 : 2483.500 MHz : -40.917 dBm	Channel Frequency: 2462.00 MHz

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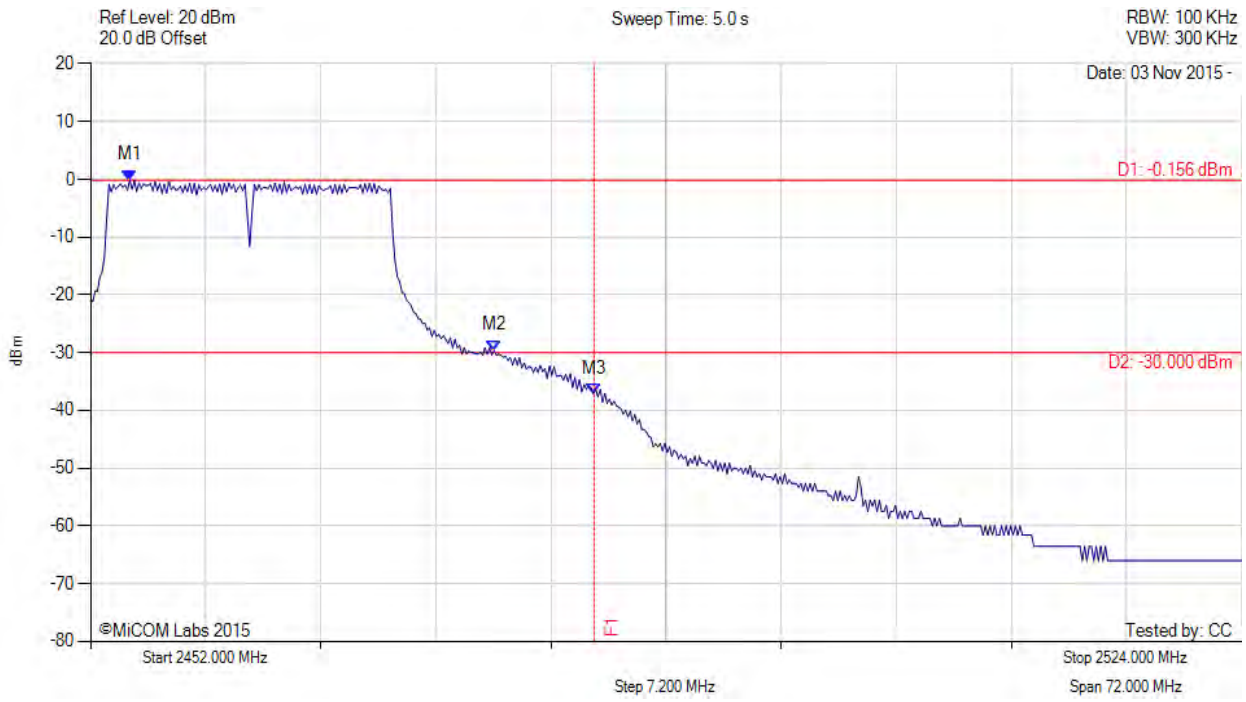
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2454.453 MHz : -0.156 dBm M2 : 2477.251 MHz : -29.632 dBm M3 : 2483.500 MHz : -37.080 dBm	Channel Frequency: 2462.00 MHz

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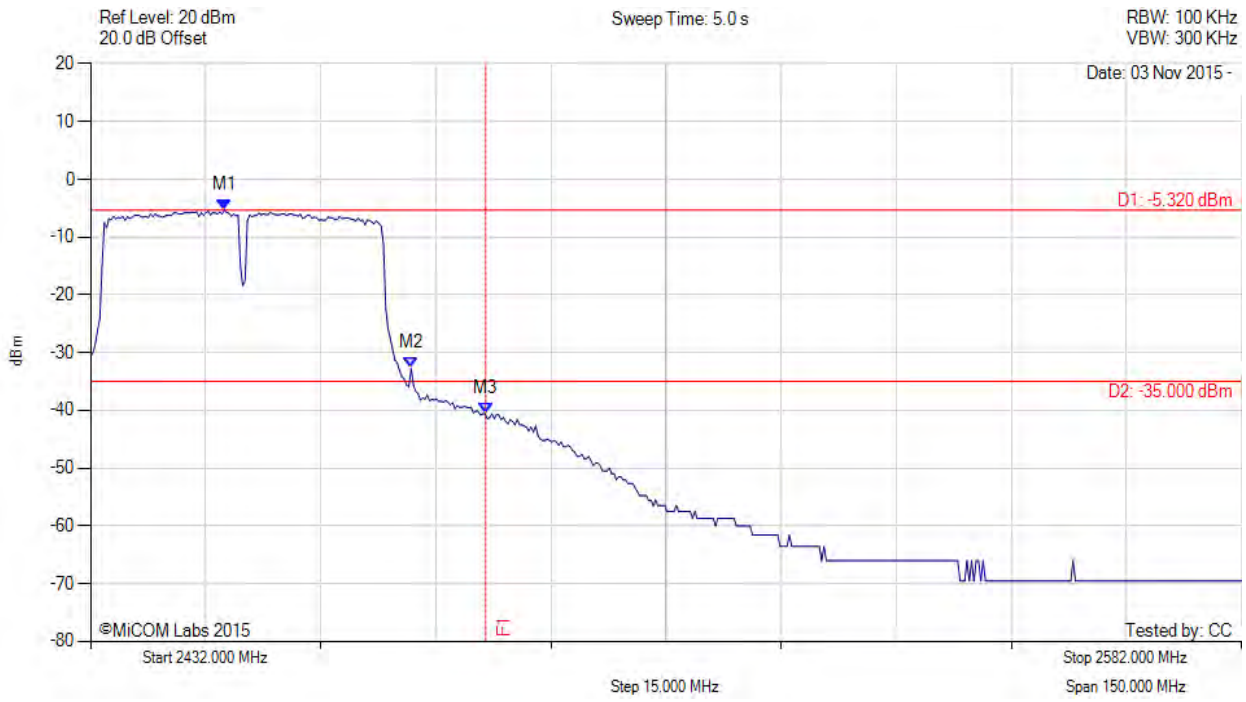
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2449.435 MHz : -5.320 dBm M2 : 2473.784 MHz : -32.705 dBm M3 : 2483.500 MHz : -40.602 dBm	Channel Frequency: 2452.00 MHz

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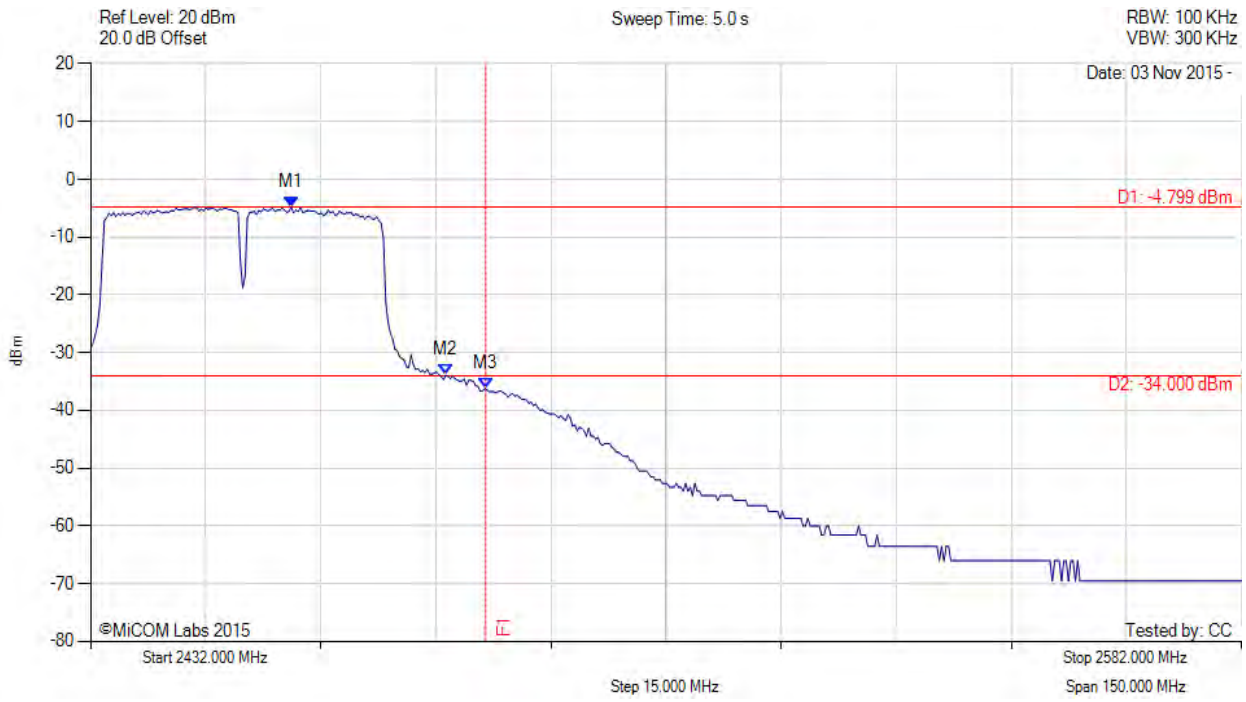
CONDUCTED HIGH BAND-EDGE EMISSIONS - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2458.152 MHz : -4.799 dBm M2 : 2478.293 MHz : -33.910 dBm M3 : 2483.500 MHz : -36.196 dBm	Channel Frequency: 2452.00 MHz

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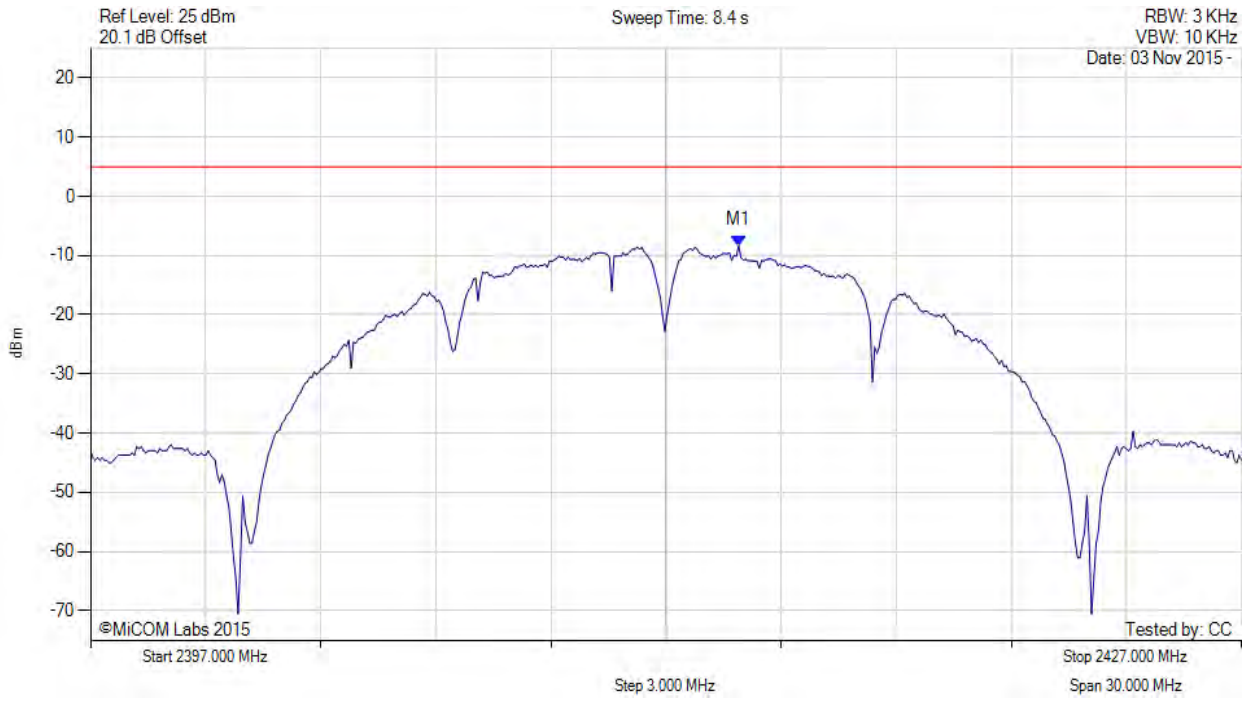
A.3. Power Spectral Density

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2413.894 MHz : -8.340 dBm	Limit: ≤ 4.990 dBm

back to matrix

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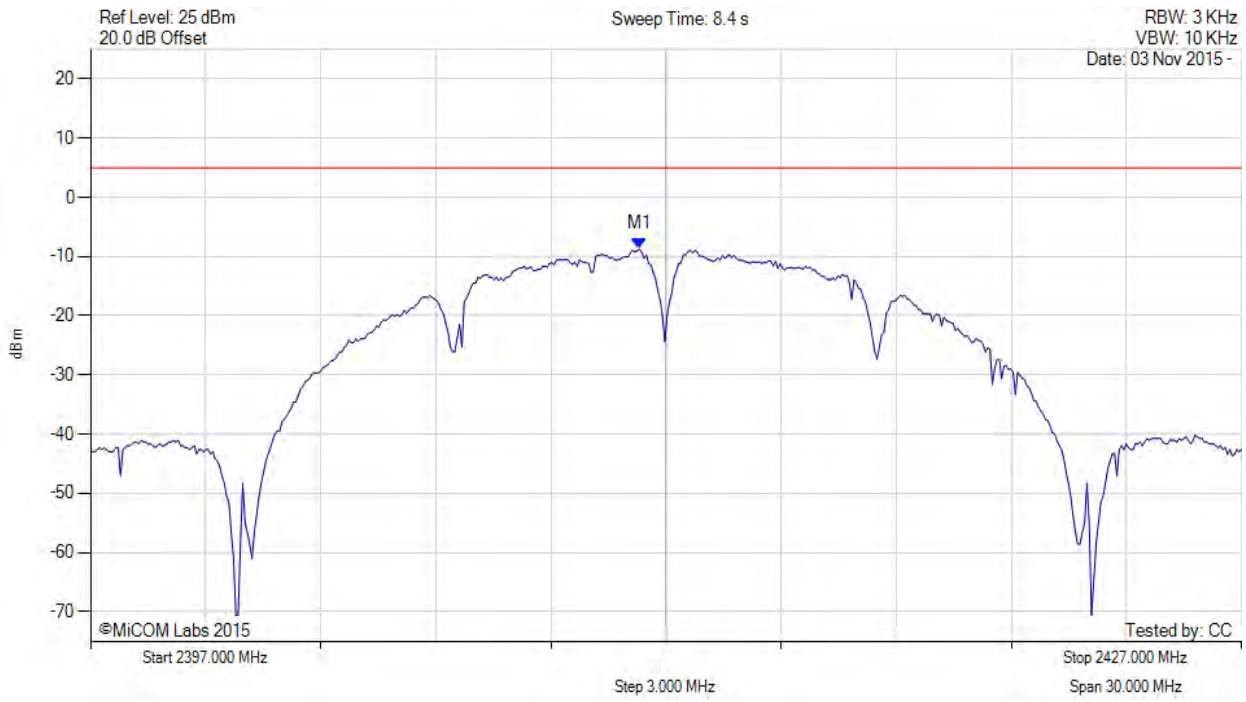
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2411.309 MHz : -8.753 dBm	Limit: ≤ 4.990 dBm

back to matrix

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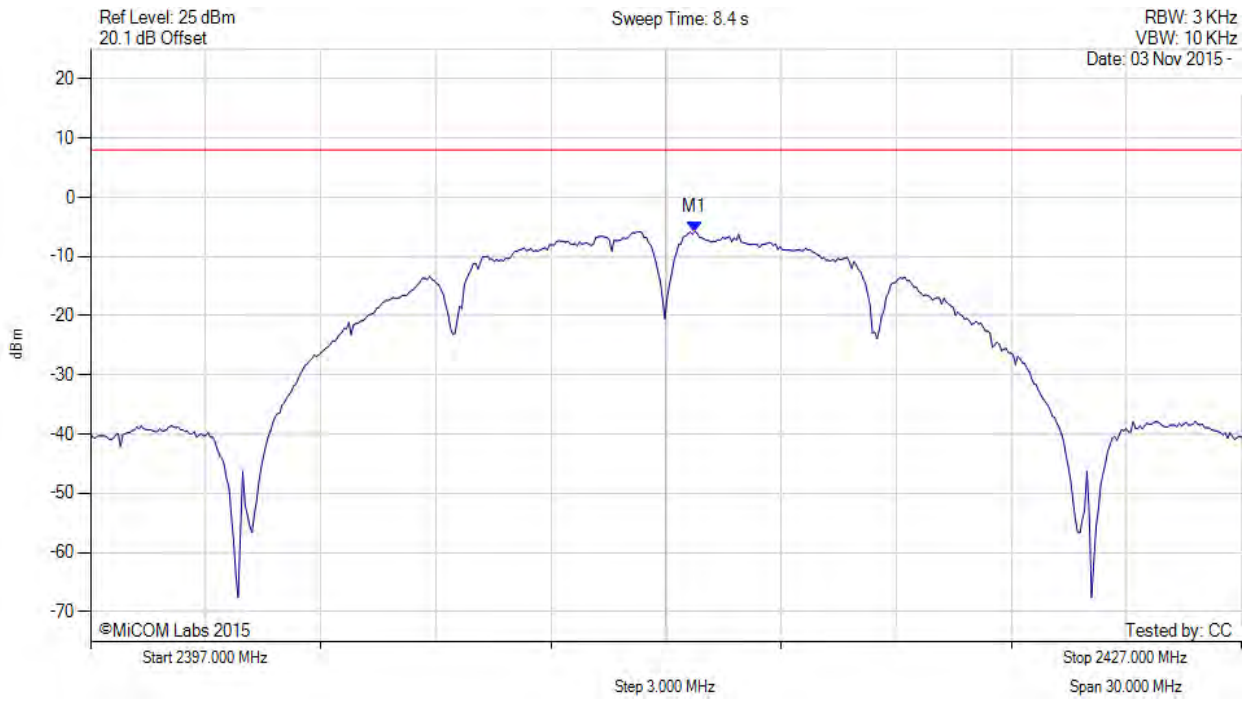
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2412.800 MHz : -5.777 dBm M1 + DCCF : 2412.800 MHz : -5.733 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 8.0 dBm Margin: -13.7 dB

back to matrix

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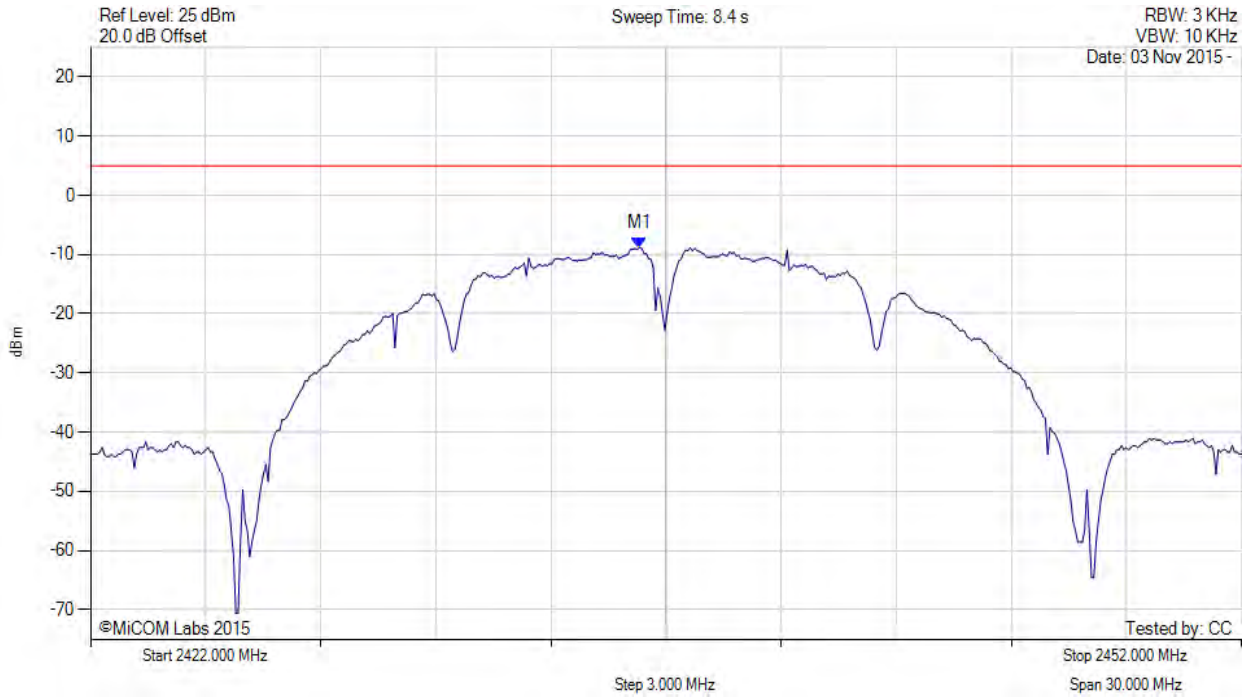
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2436.309 MHz : -8.831 dBm	Limit: ≤ 4.990 dBm

back to matrix

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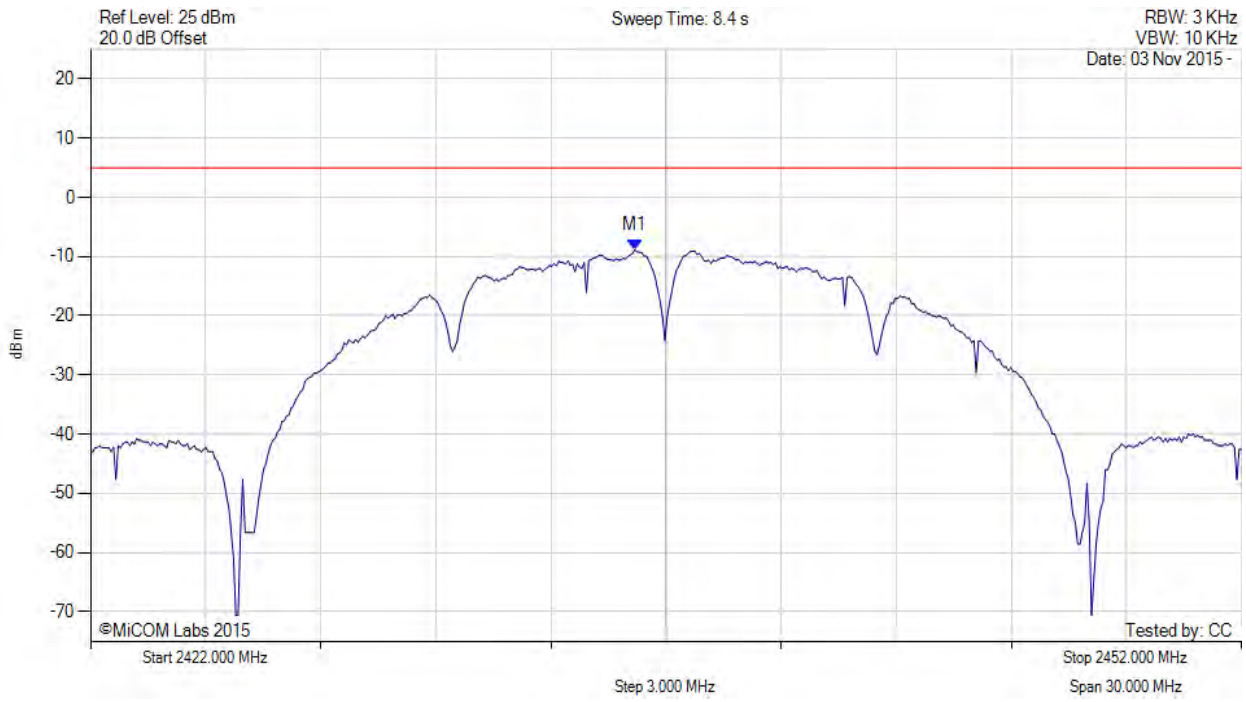
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2436.188 MHz : -8.867 dBm	Limit: ≤ 4.990 dBm

back to matrix

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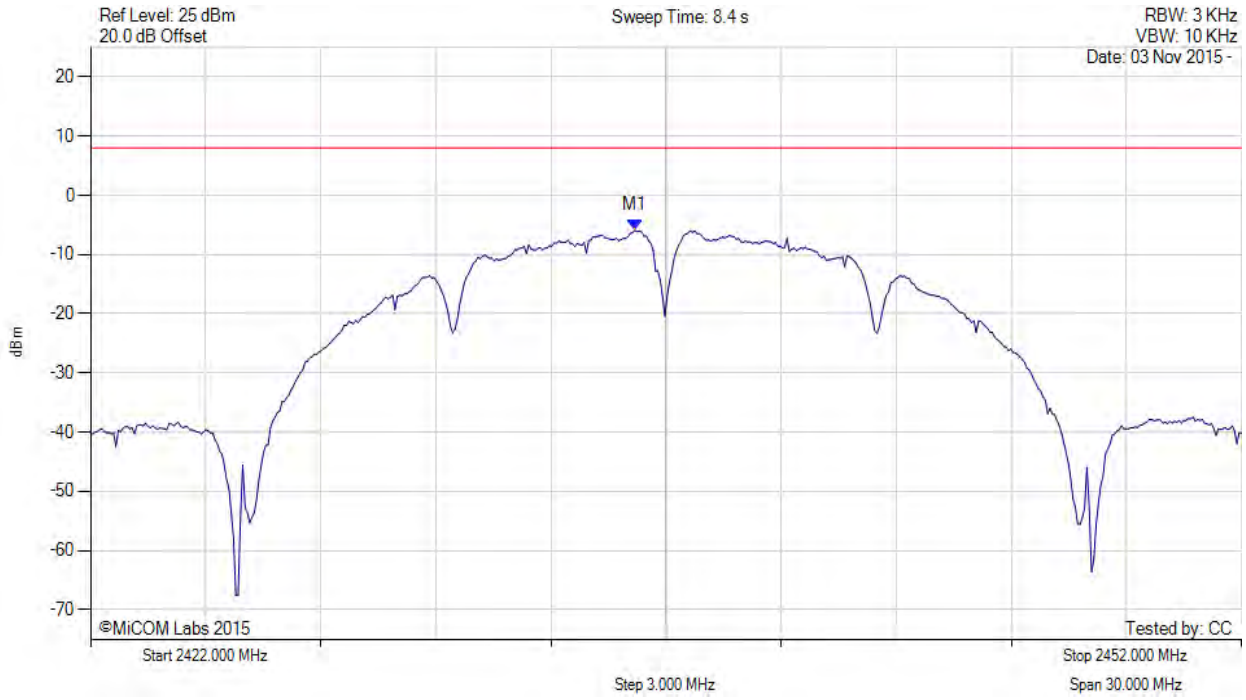
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2436.200 MHz : -5.921 dBm M1 + DCCF : 2436.200 MHz : -5.877 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 8.0 dBm Margin: -13.9 dB

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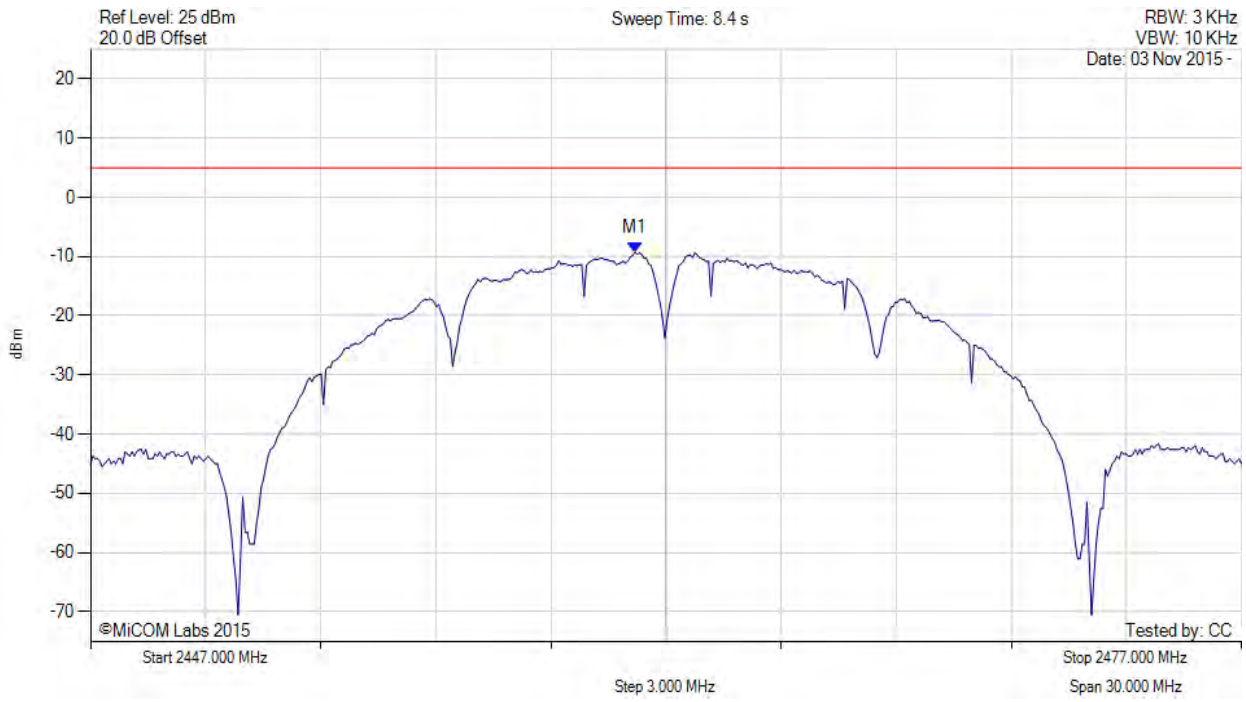
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2461.188 MHz : -9.284 dBm	Limit: ≤ 4.990 dBm

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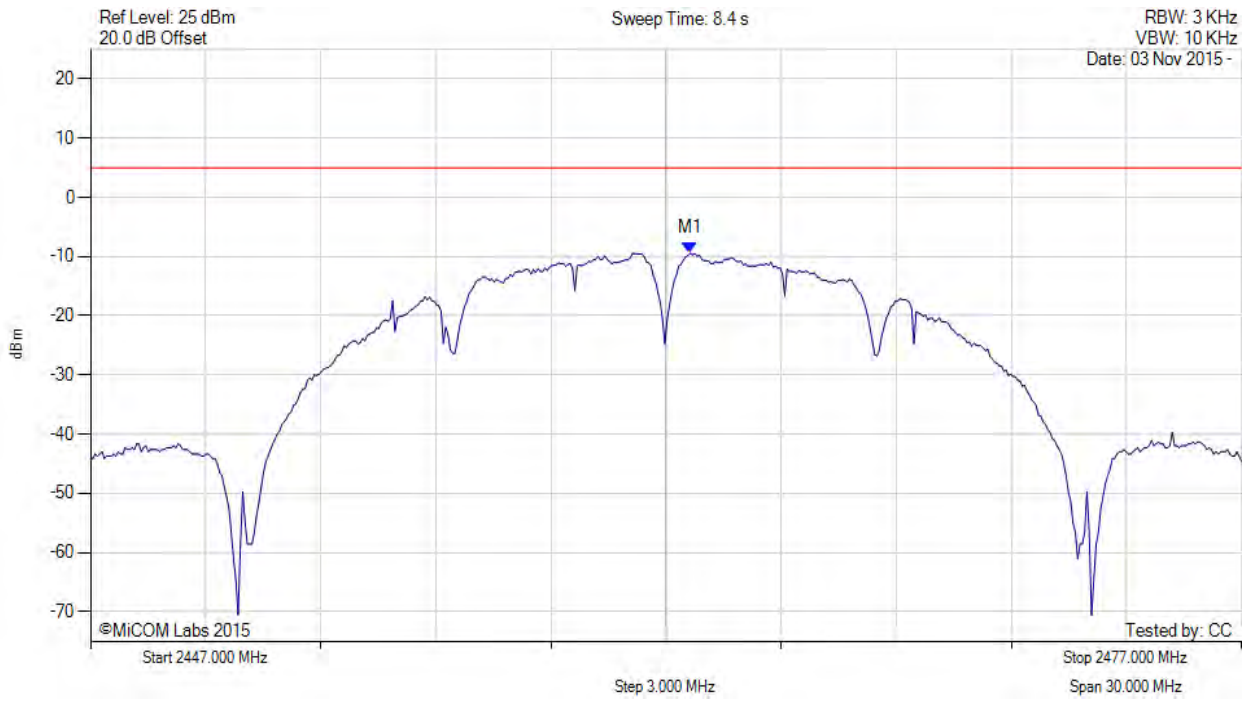
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2462.631 MHz : -9.450 dBm	Limit: ≤ 4.990 dBm

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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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2461.200 MHz : -6.397 dBm M1 + DCCF : 2461.200 MHz : -6.353 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 8.0 dBm Margin: -14.4 dB

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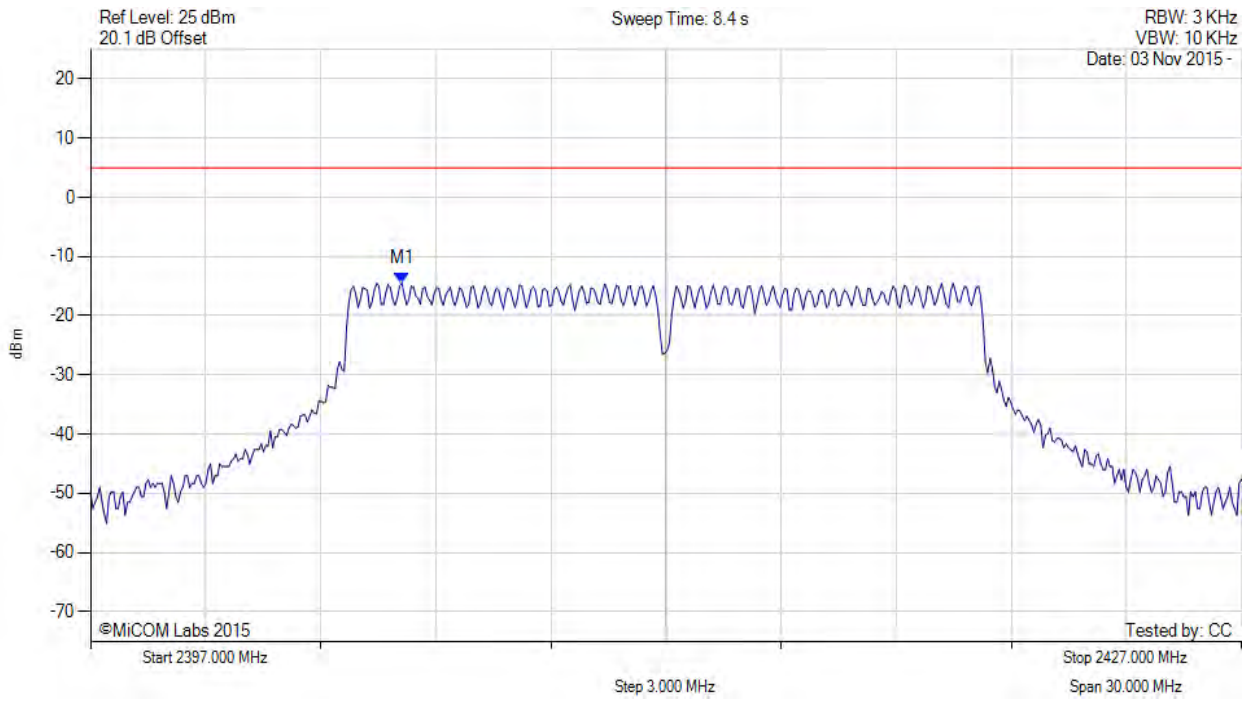
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2405.116 MHz : -14.510 dBm	Limit: ≤ 4.990 dBm

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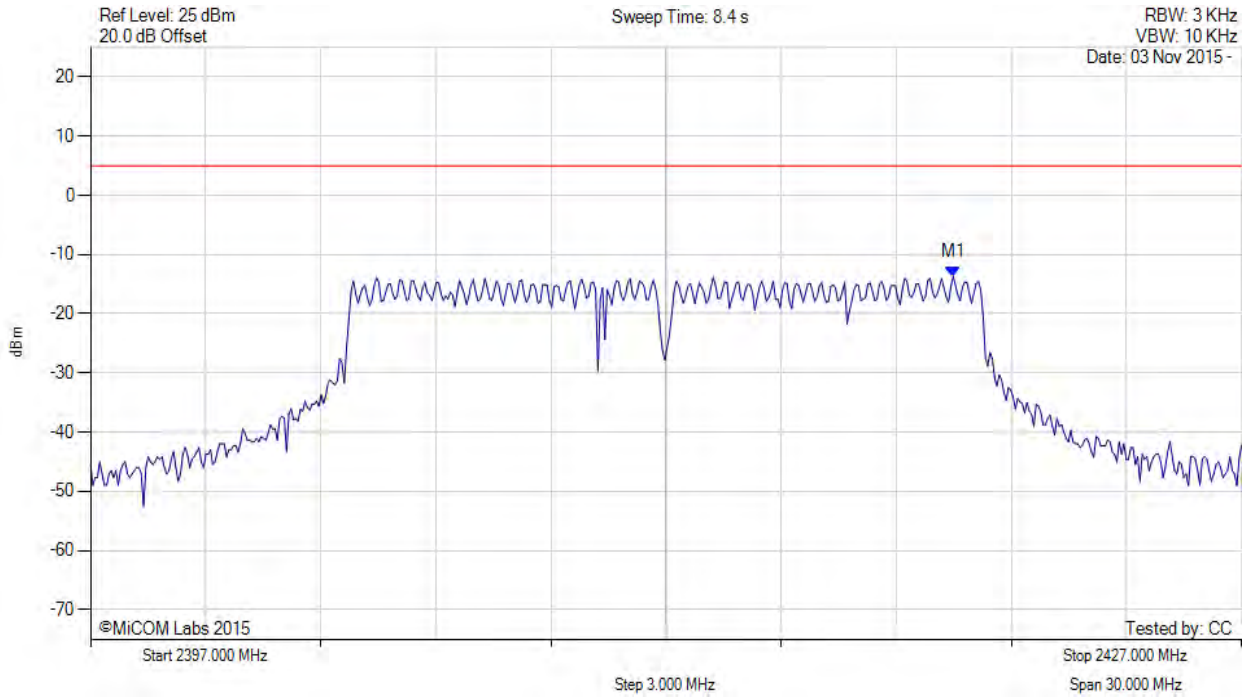
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2419.485 MHz : -13.726 dBm	Limit: ≤ 4.990 dBm

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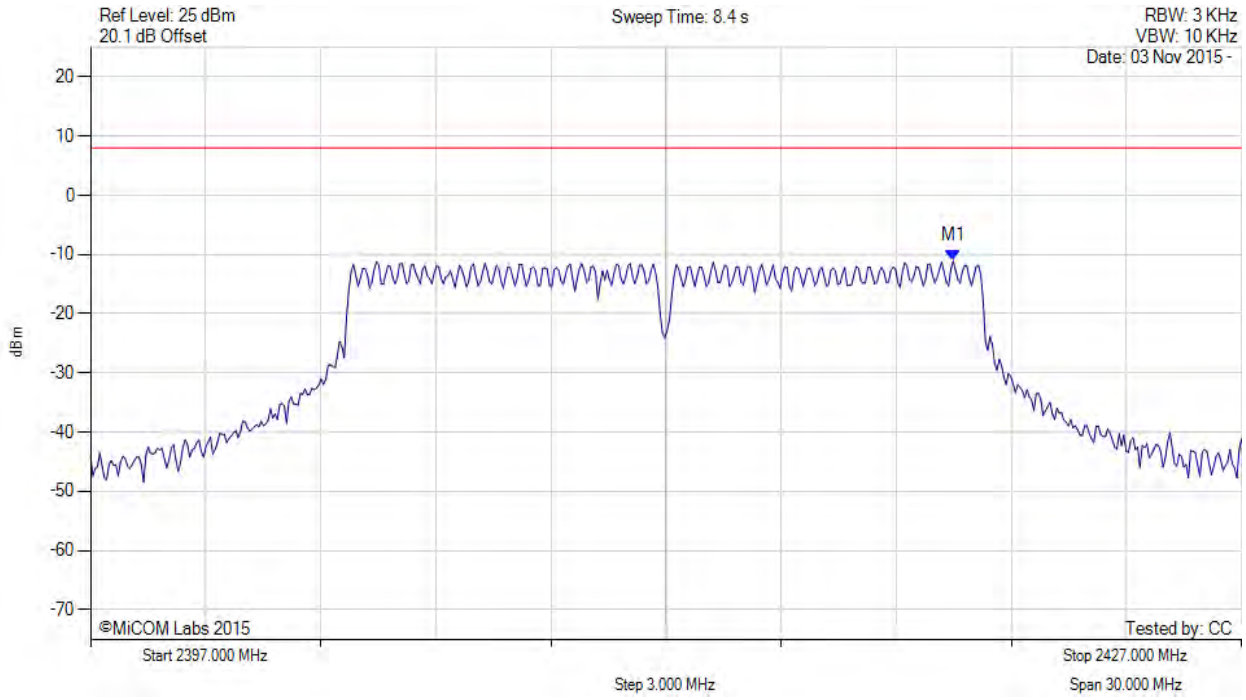
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2419.500 MHz : -11.096 dBm M1 + DCCF : 2419.500 MHz : -10.441 dBm Duty Cycle Correction Factor : +0.66 dB	Limit: ≤ 8.0 dBm Margin: -18.5 dB

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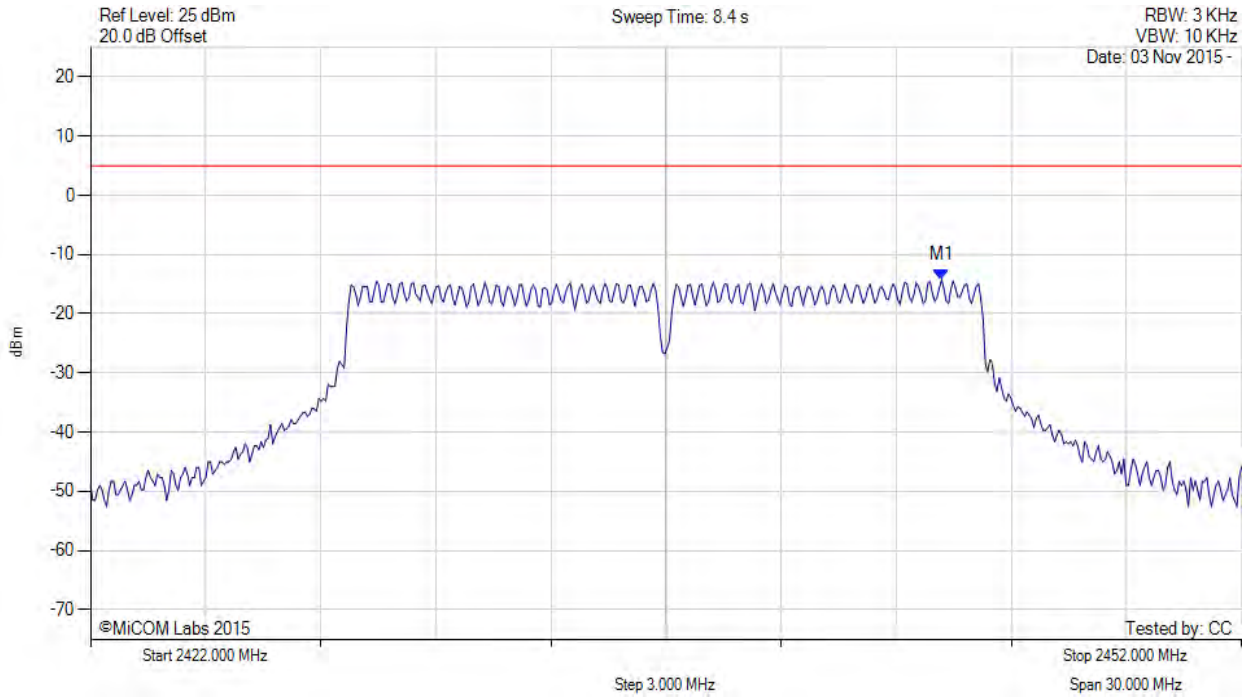
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2444.184 MHz : -14.267 dBm	Limit: ≤ 4.990 dBm

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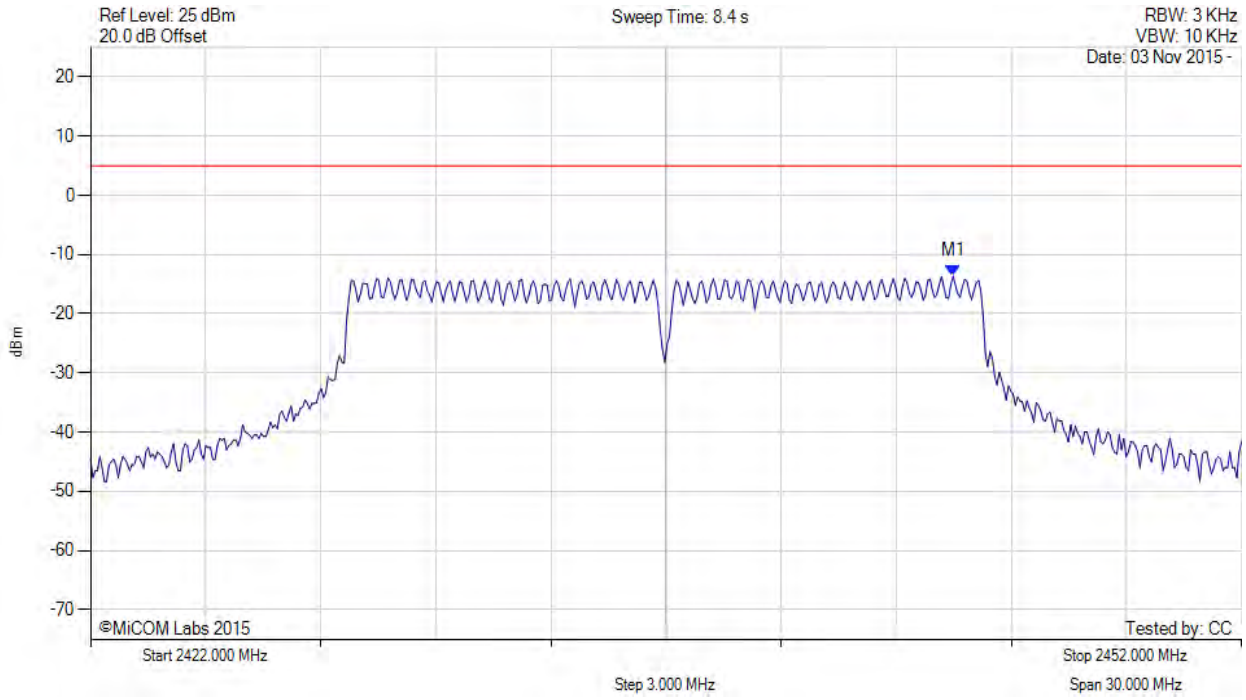
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2444.485 MHz : -13.676 dBm	Limit: ≤ 4.990 dBm

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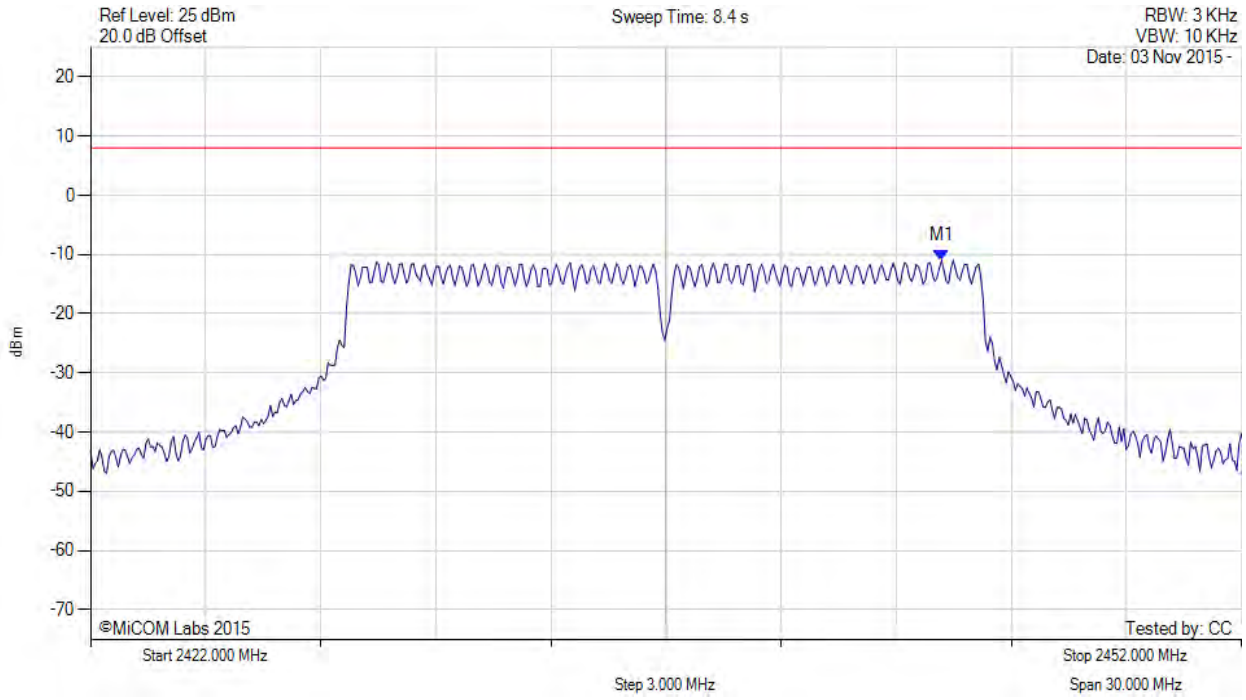
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2444.200 MHz : -10.998 dBm M1 + DCCF : 2444.200 MHz : -10.343 dBm Duty Cycle Correction Factor : +0.66 dB	Limit: ≤ 8.0 dBm Margin: -18.4 dB

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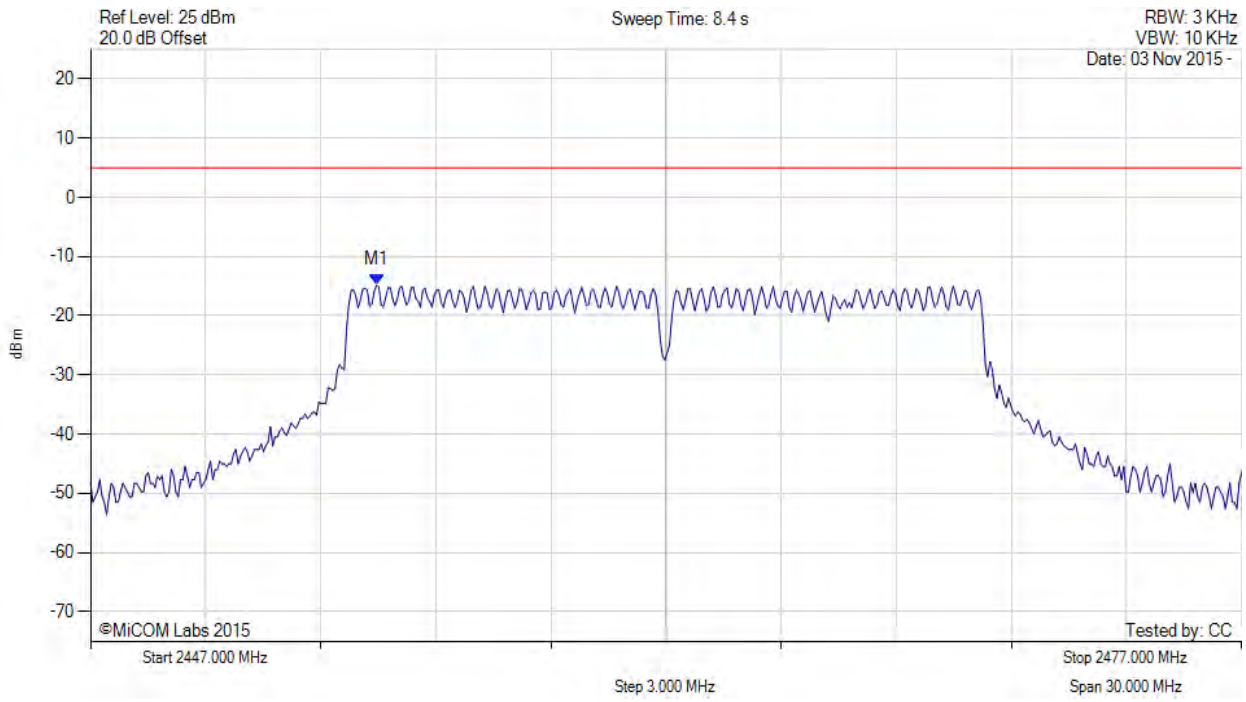
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2454.455 MHz : -14.816 dBm	Limit: ≤ 4.990 dBm

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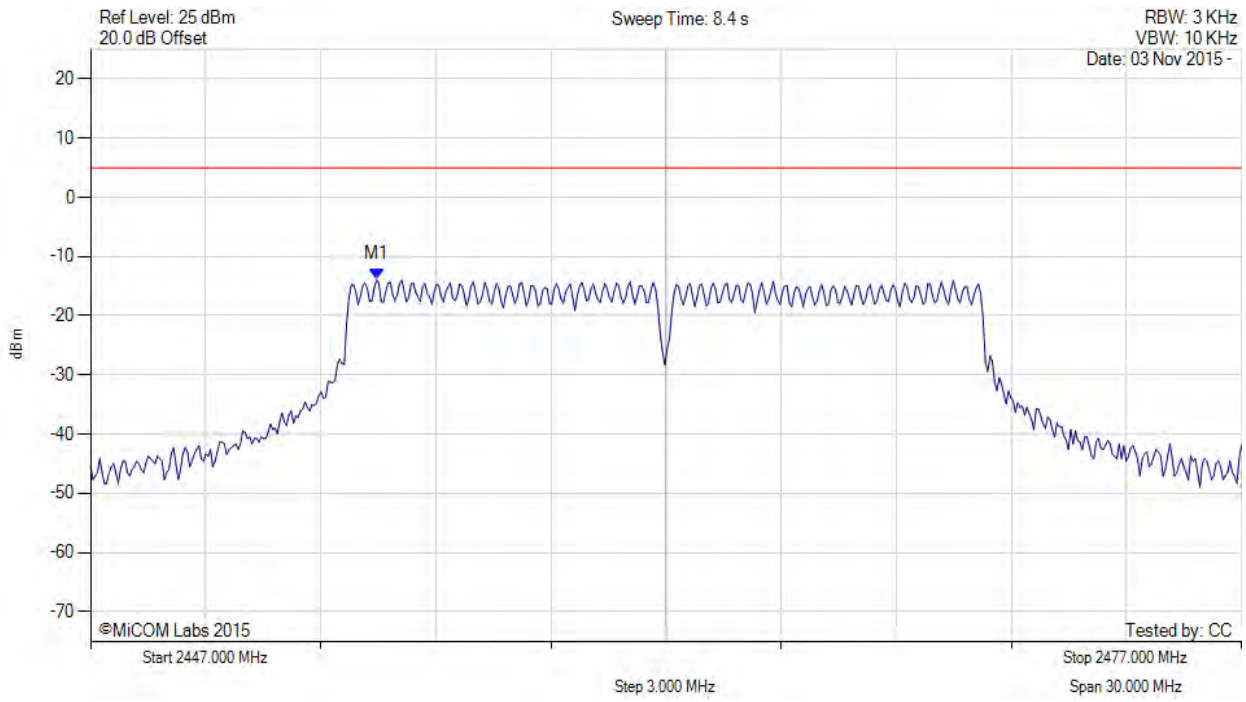
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2454.455 MHz : -13.877 dBm	Limit: ≤ 4.990 dBm

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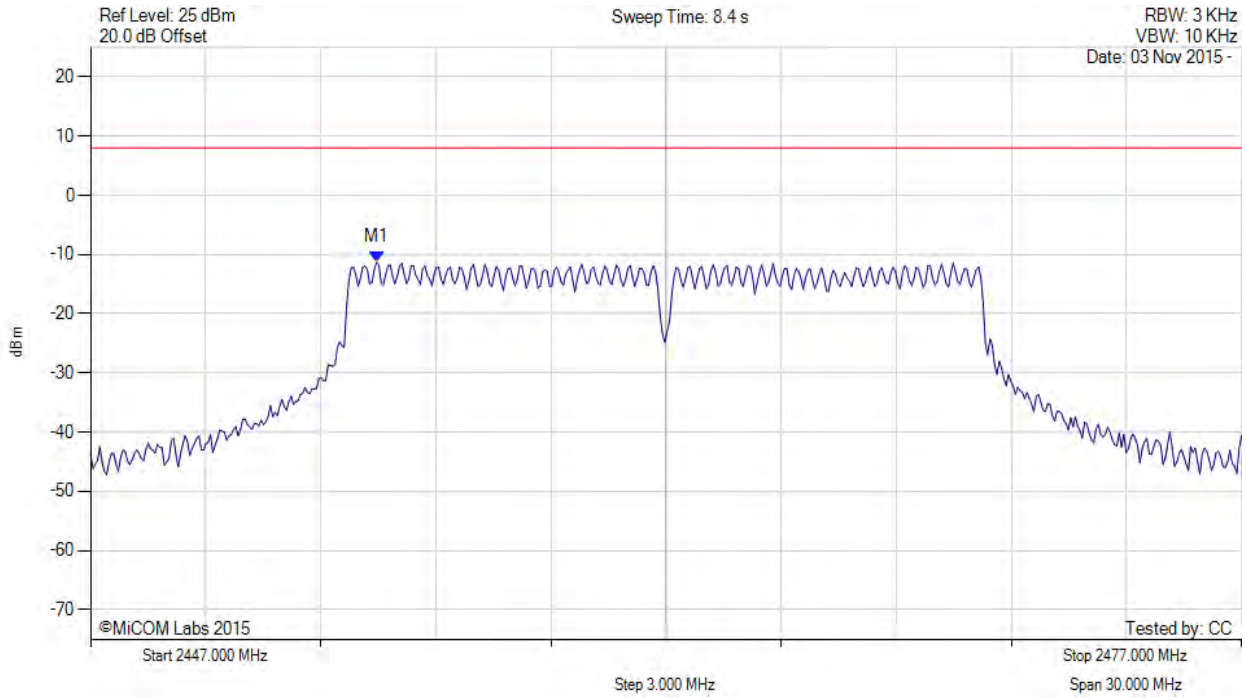
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2454.500 MHz : -11.311 dBm M1 + DCCF : 2454.500 MHz : -10.656 dBm Duty Cycle Correction Factor : +0.66 dB	Limit: ≤ 8.0 dBm Margin: -18.7 dB

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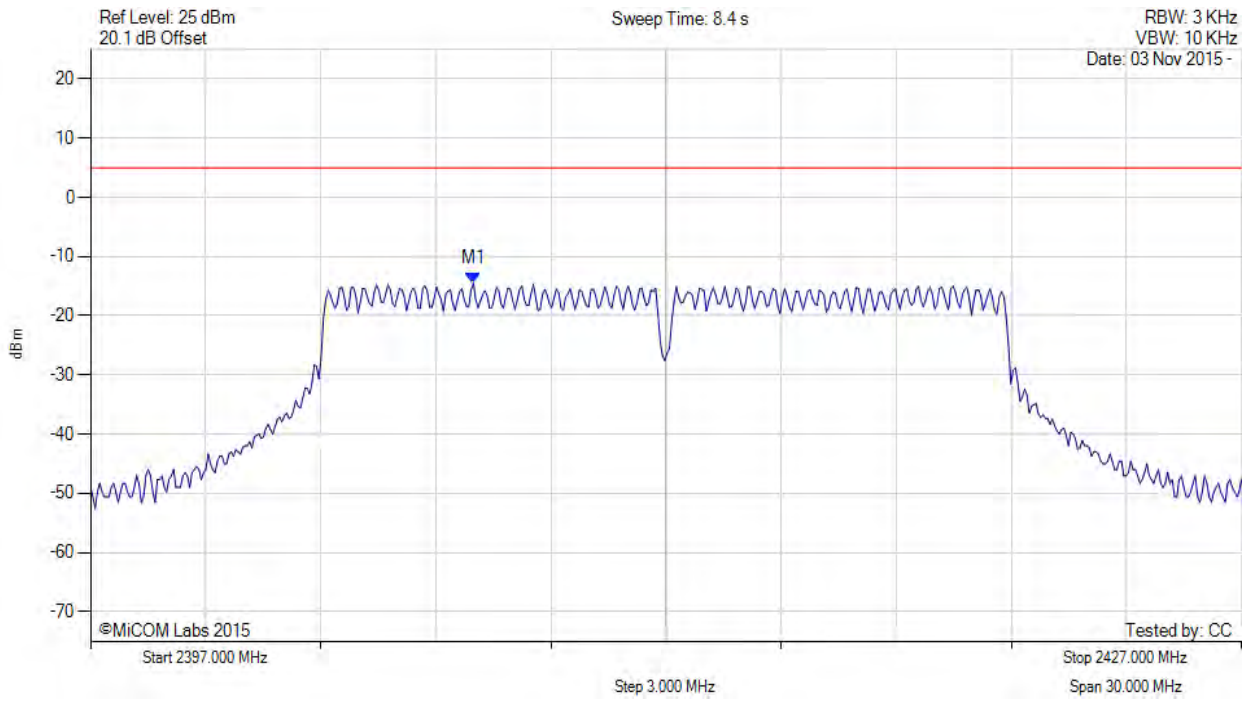
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2406.980 MHz : -14.496 dBm	Limit: ≤ 4.990 dBm

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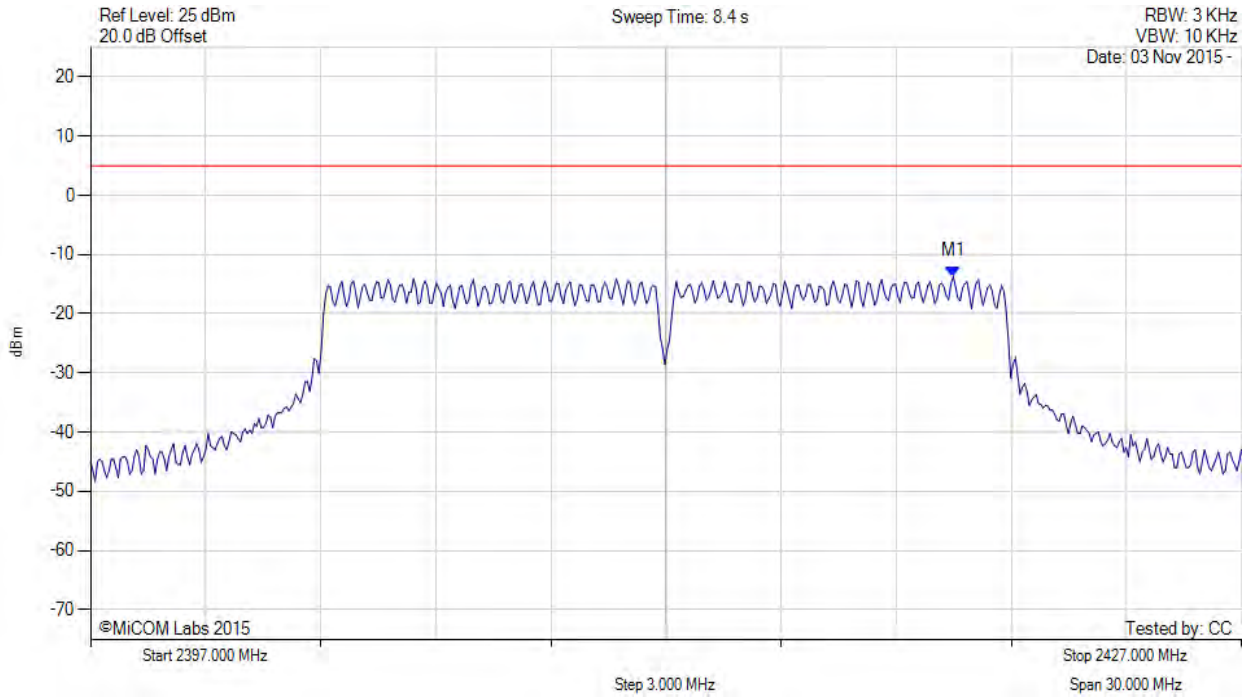
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2419.485 MHz : -13.713 dBm	Limit: ≤ 4.990 dBm

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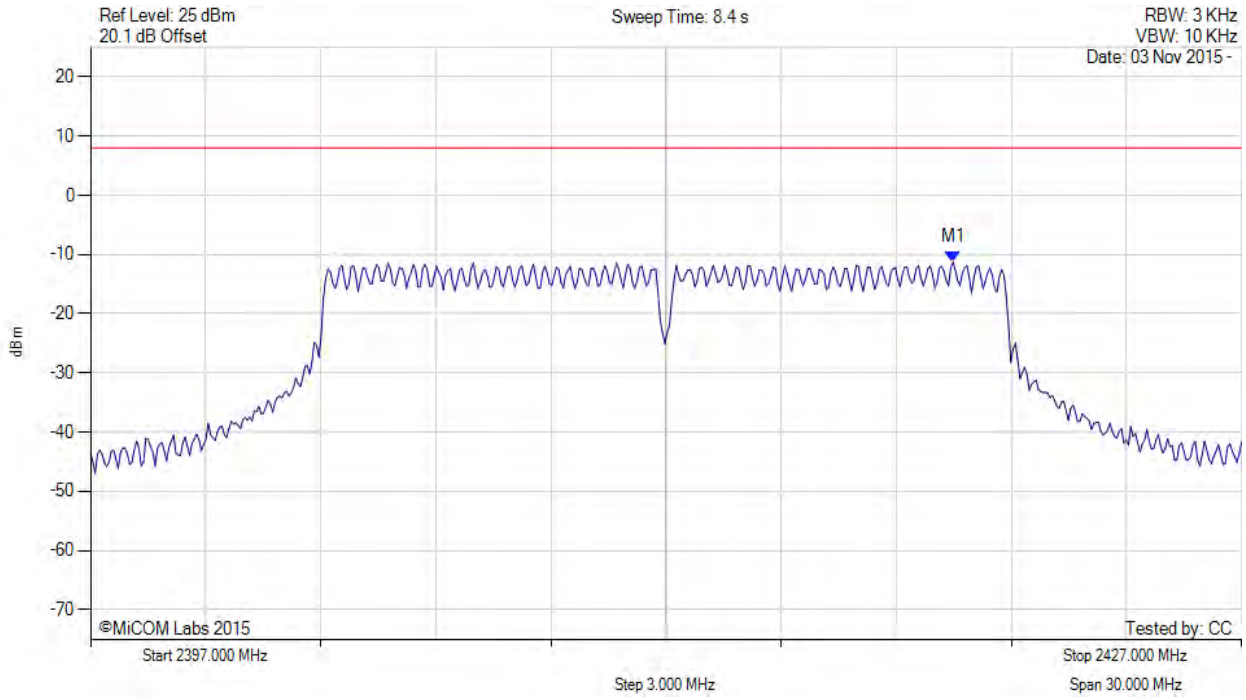
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2419.500 MHz : -11.306 dBm M1 + DCCF : 2419.500 MHz : -10.651 dBm Duty Cycle Correction Factor : +0.66 dB	Limit: ≤ 8.0 dBm Margin: -18.7 dB

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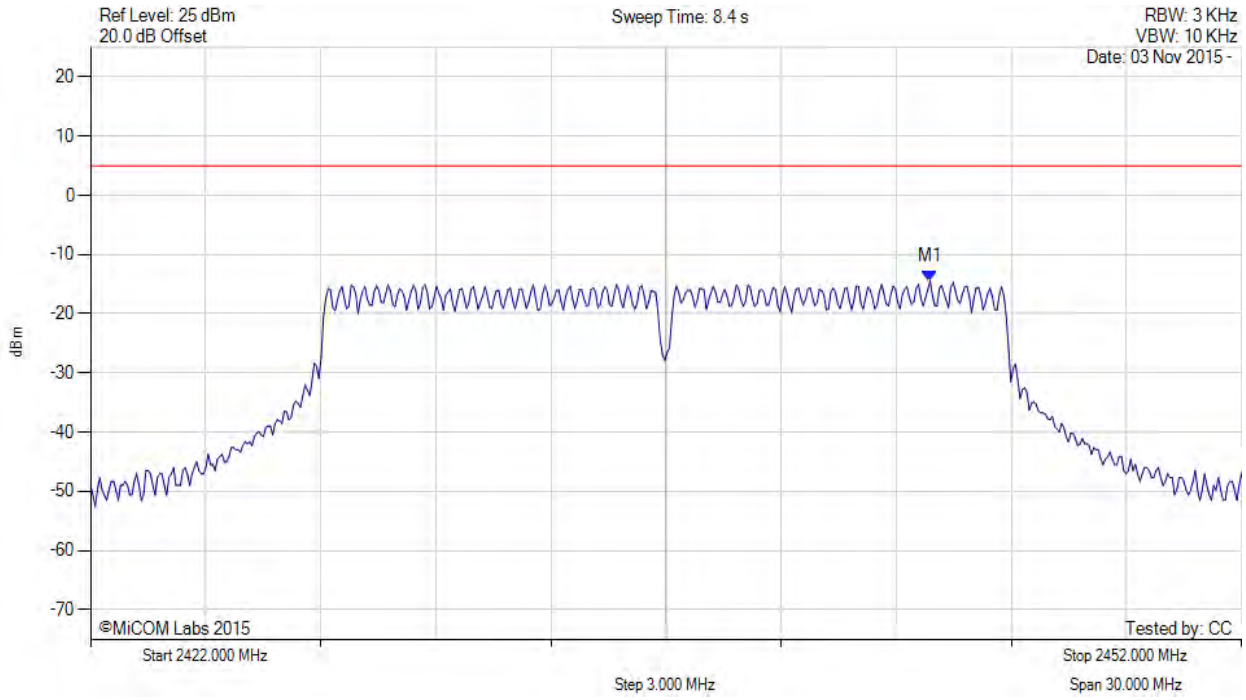
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2443.884 MHz : -14.442 dBm	Limit: ≤ 4.990 dBm

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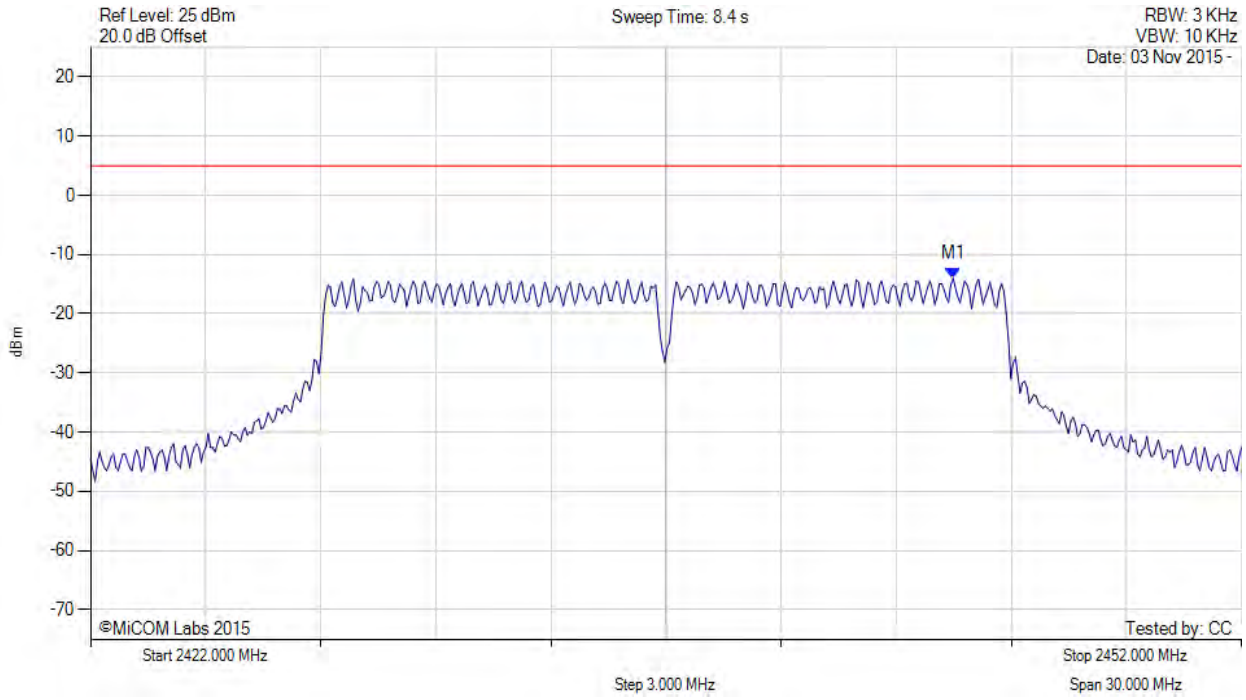
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2444.485 MHz : -14.070 dBm	Limit: ≤ 4.990 dBm

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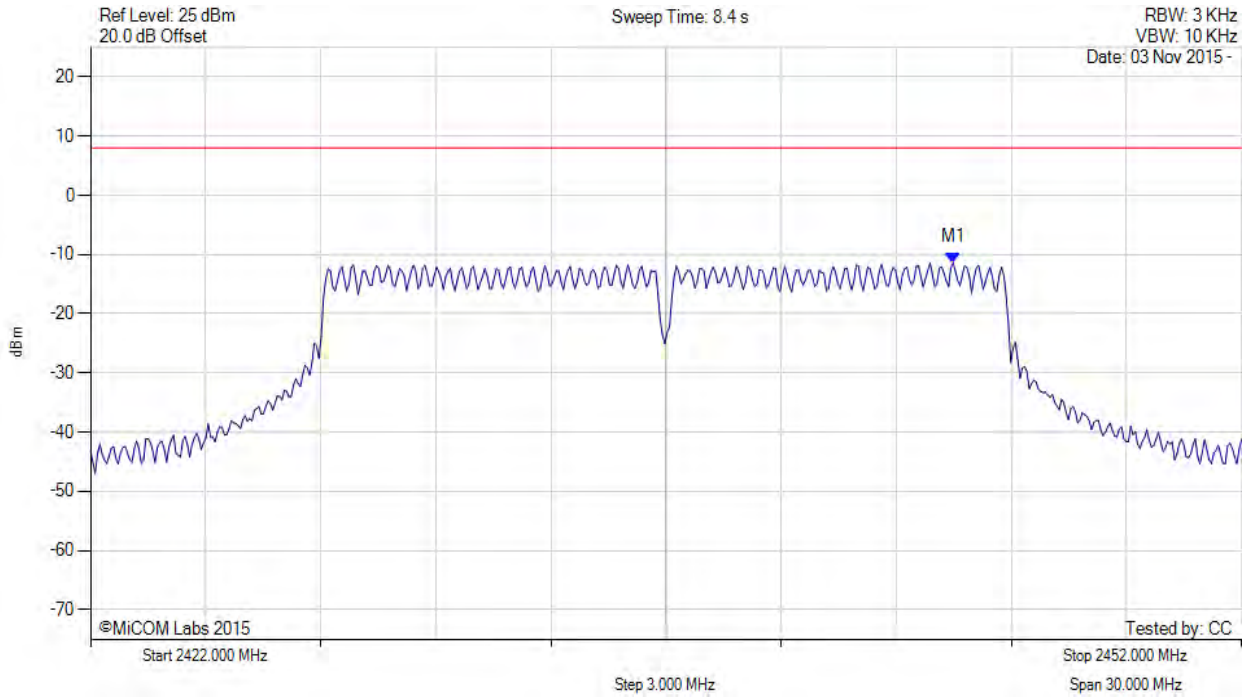
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2444.500 MHz : -11.365 dBm M1 + DCCF : 2444.500 MHz : -10.710 dBm Duty Cycle Correction Factor : +0.66 dB	Limit: ≤ 8.0 dBm Margin: -18.7 dB

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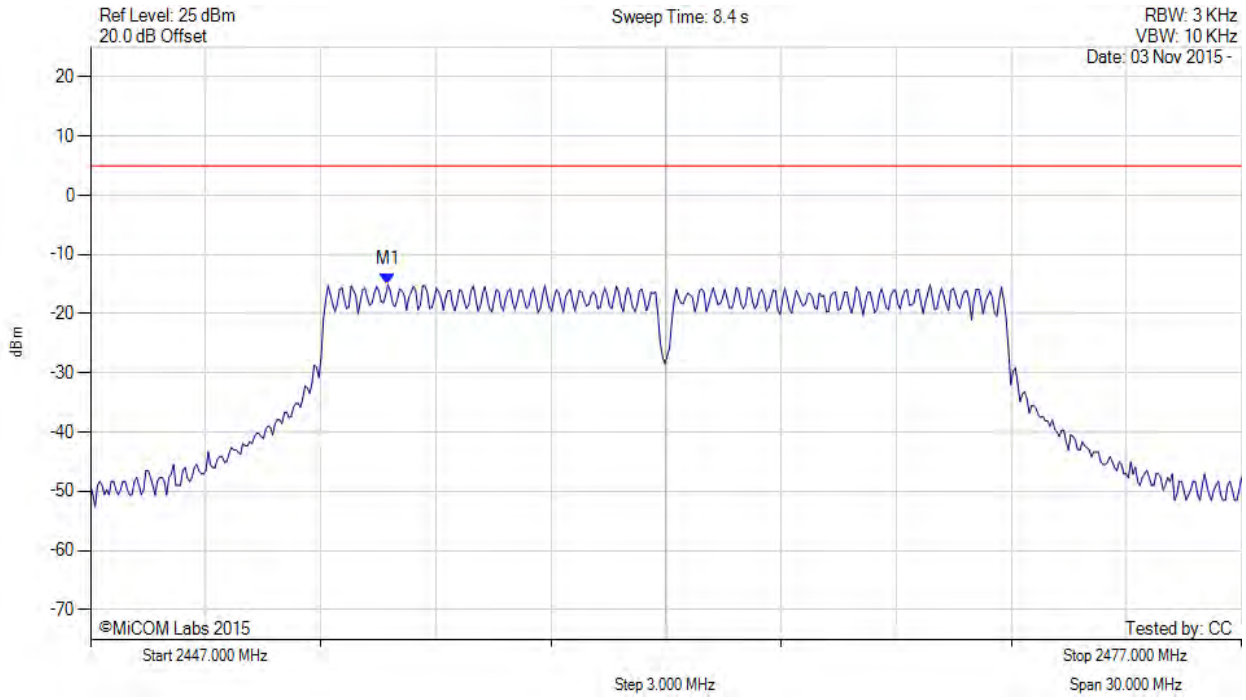
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2454.756 MHz : -15.075 dBm	Limit: ≤ 4.990 dBm

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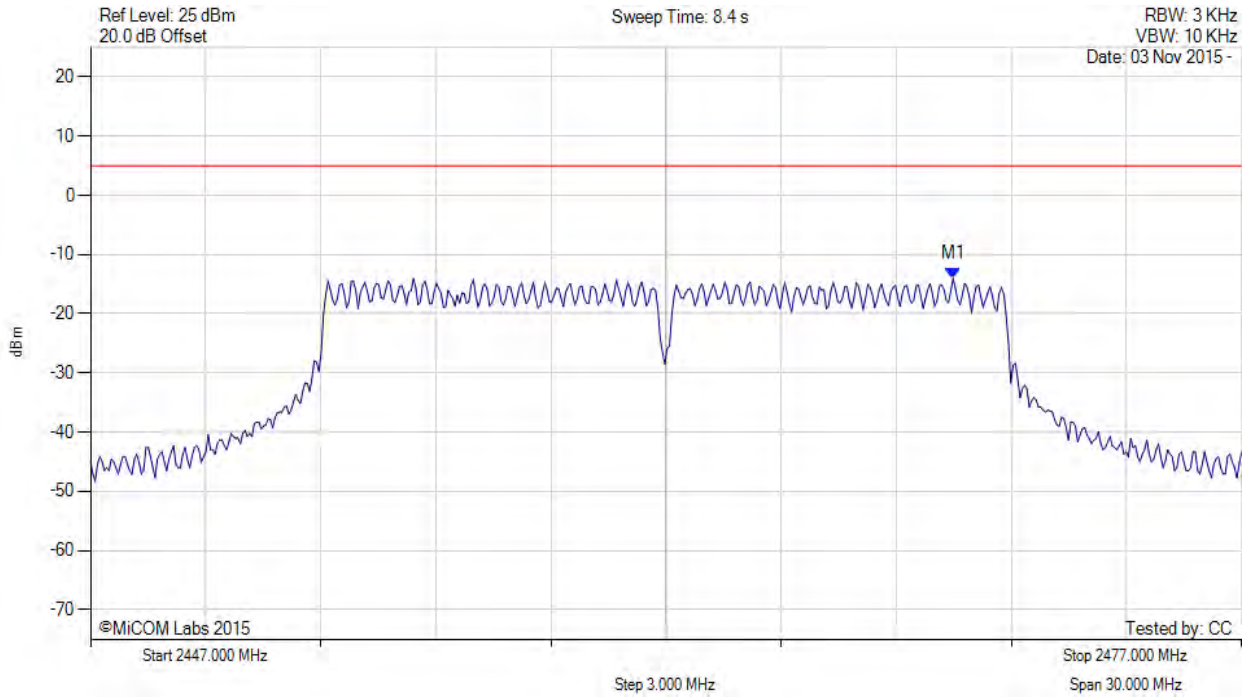
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2469.485 MHz : -14.031 dBm	Limit: ≤ 4.990 dBm

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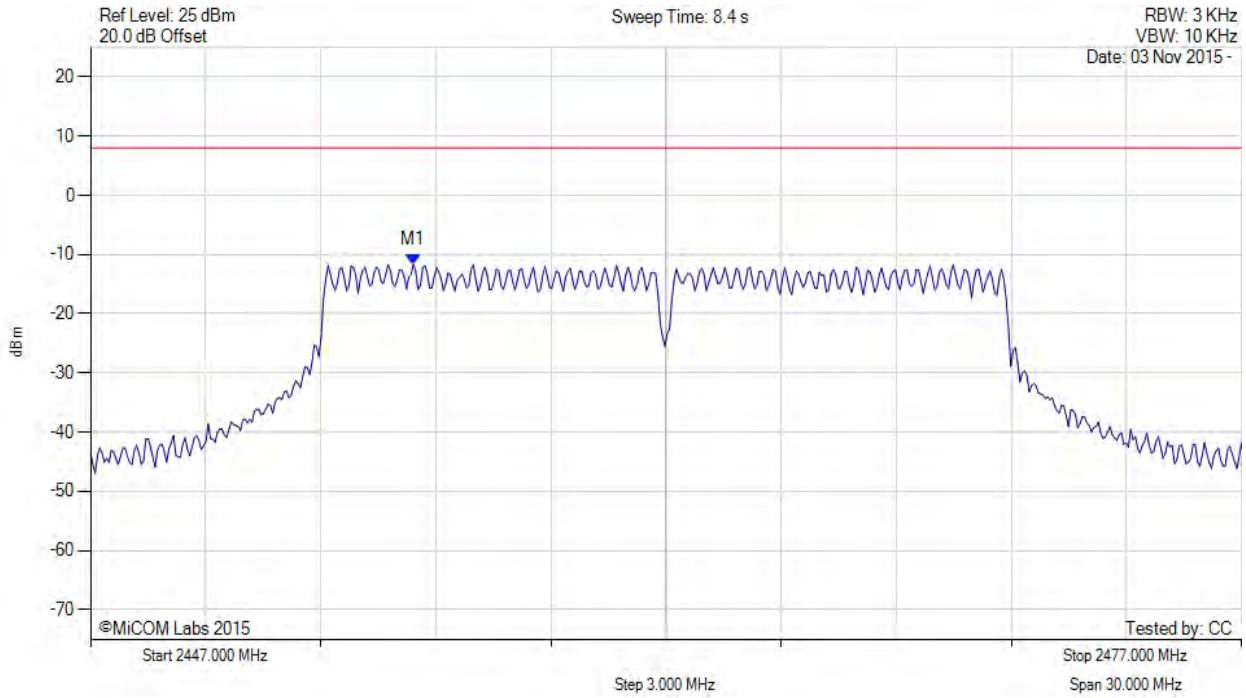
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2455.400 MHz : -11.628 dBm M1 + DCCF : 2455.400 MHz : -10.973 dBm Duty Cycle Correction Factor : +0.66 dB	Limit: ≤ 8.0 dBm Margin: -19.0 dB

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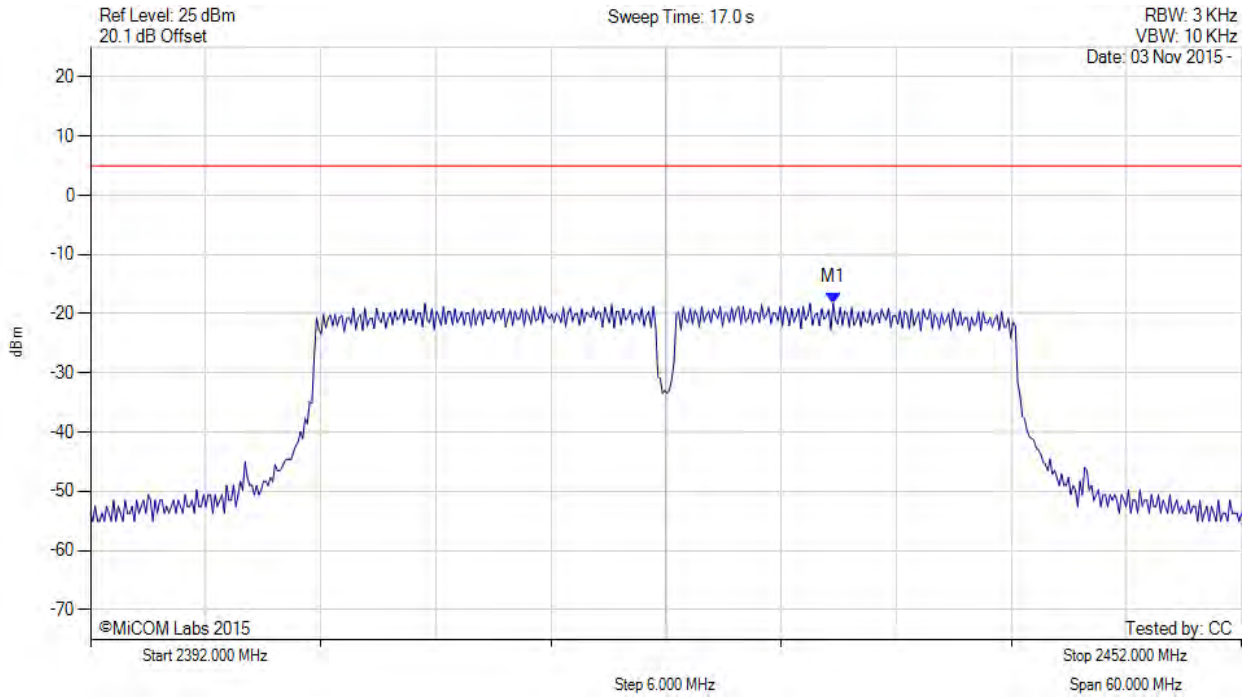
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2430.717 MHz : -18.142 dBm	Limit: ≤ 4.990 dBm

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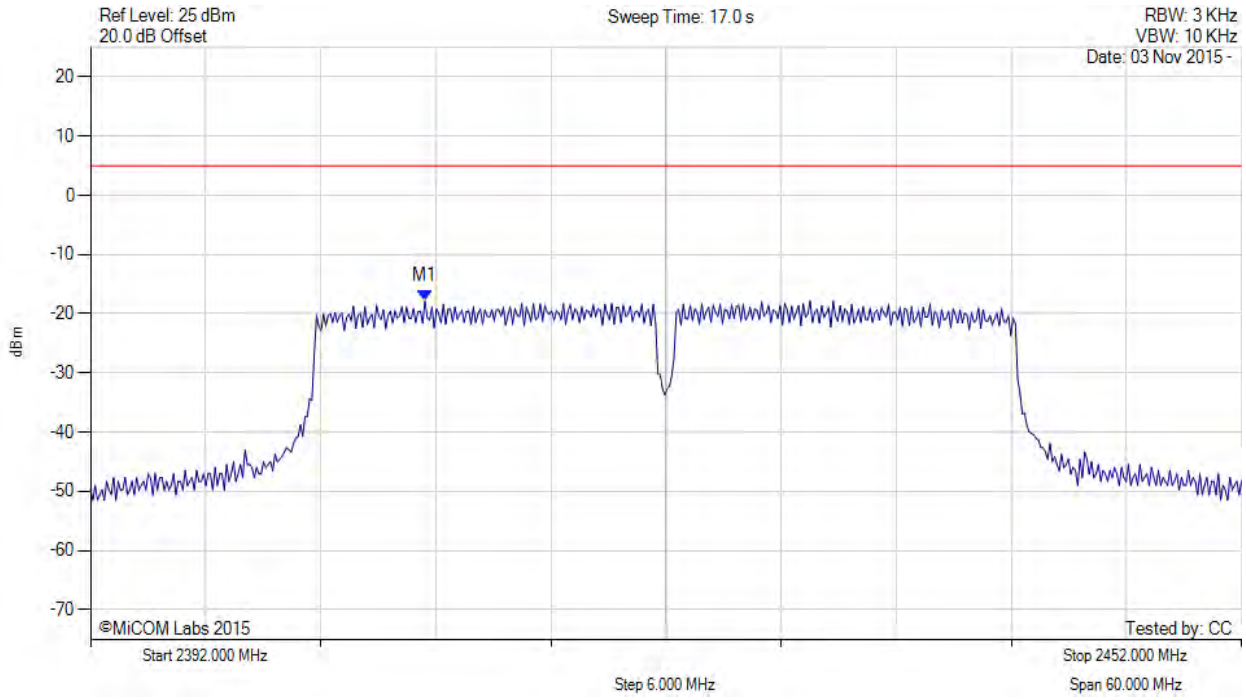
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2409.435 MHz : -17.816 dBm	Limit: ≤ 4.990 dBm

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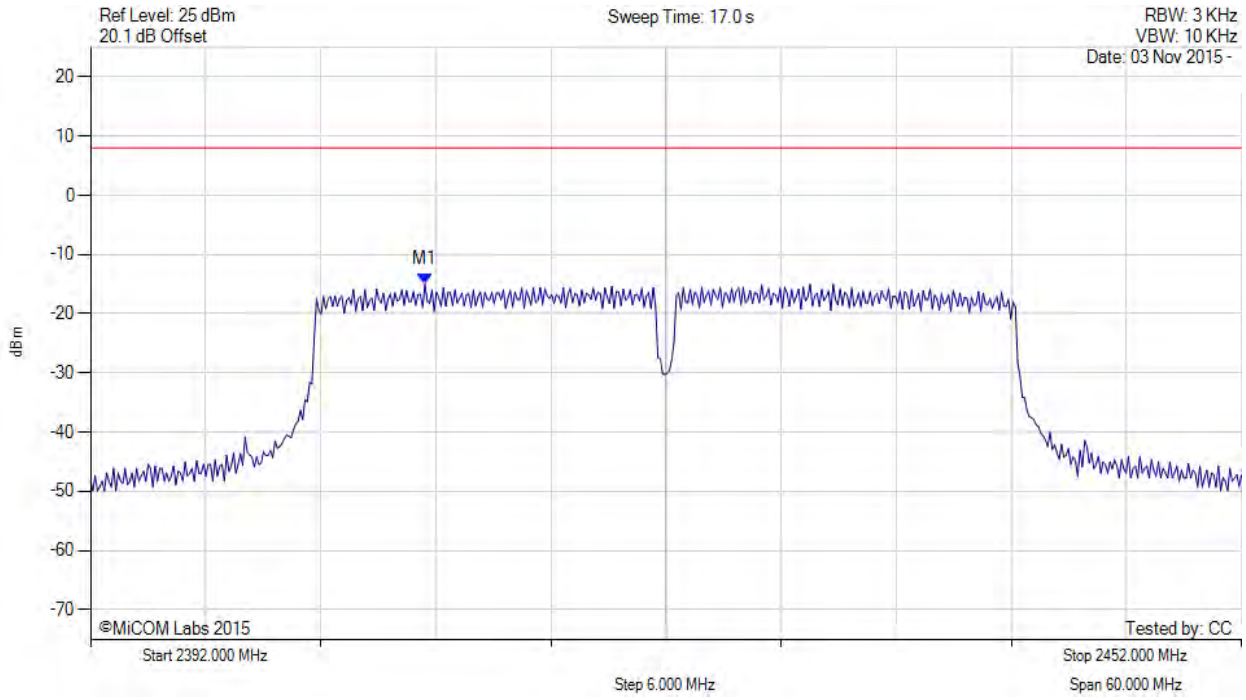
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2409.400 MHz : -14.995 dBm M1 + DCCF : 2409.400 MHz : -13.568 dBm Duty Cycle Correction Factor : +1.43 dB	Limit: ≤ 8.0 dBm Margin: -21.6 dB

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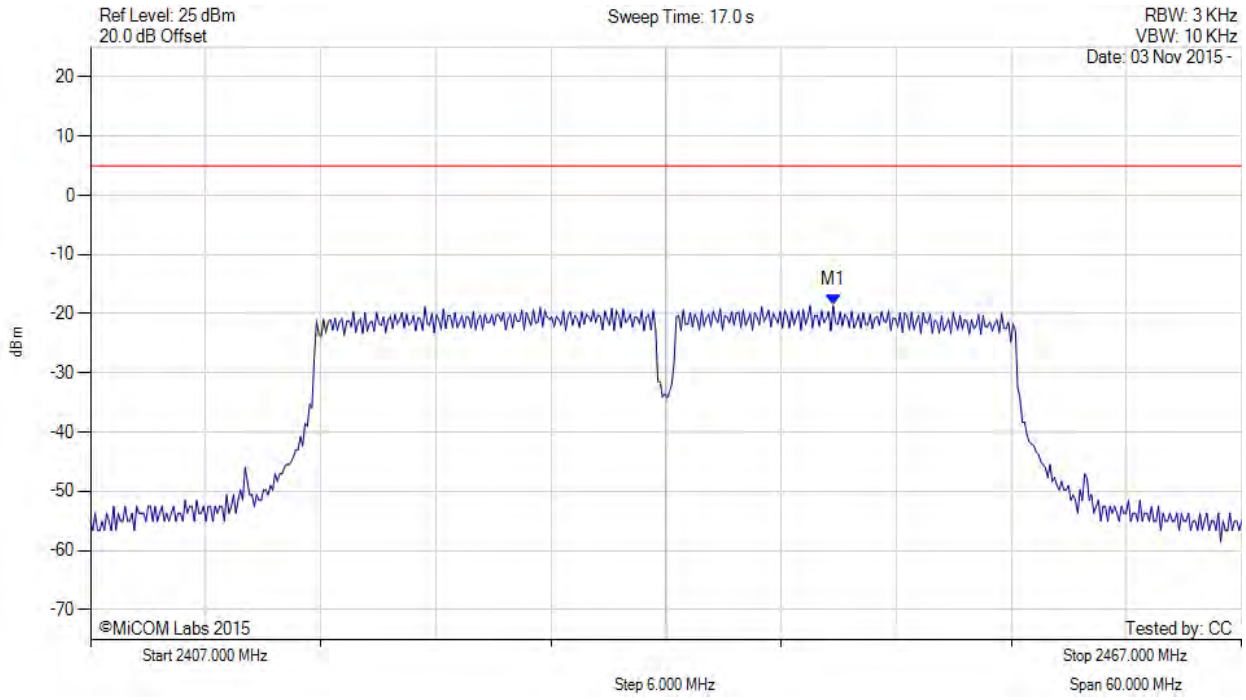
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.717 MHz : -18.546 dBm	Limit: ≤ 4.990 dBm

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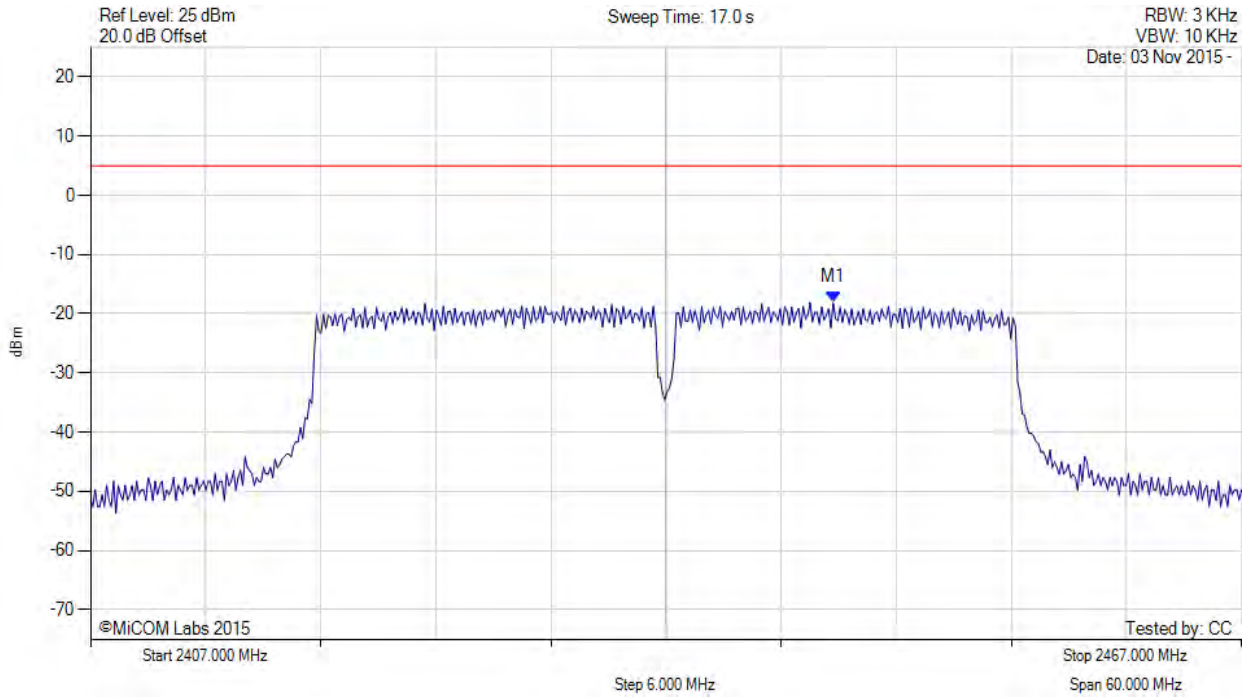
POWER SPECTRAL DENSITY - AVERAGE

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 Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.717 MHz : -18.080 dBm	Limit: ≤ 4.990 dBm

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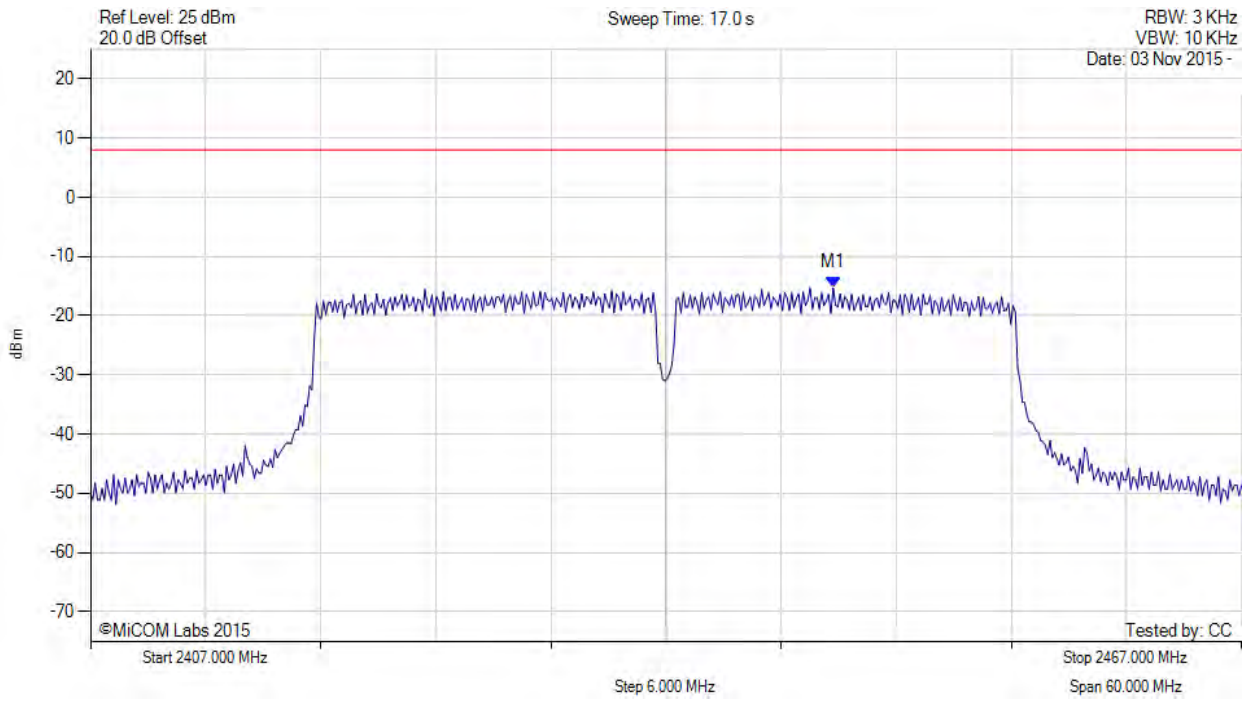
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.700 MHz : -15.296 dBm M1 + DCCF : 2445.700 MHz : -13.869 dBm Duty Cycle Correction Factor : +1.43 dB	Limit: ≤ 8.0 dBm Margin: -21.9 dB

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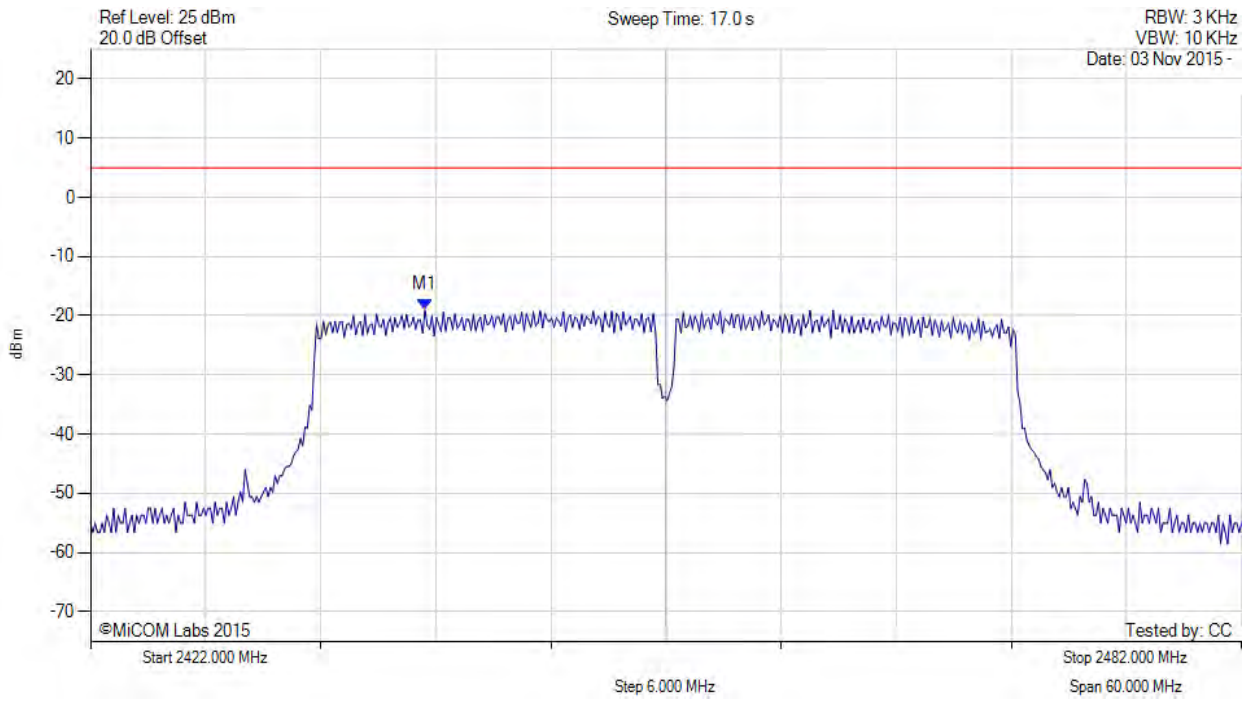
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2439.435 MHz : -18.993 dBm	Limit: ≤ 4.990 dBm

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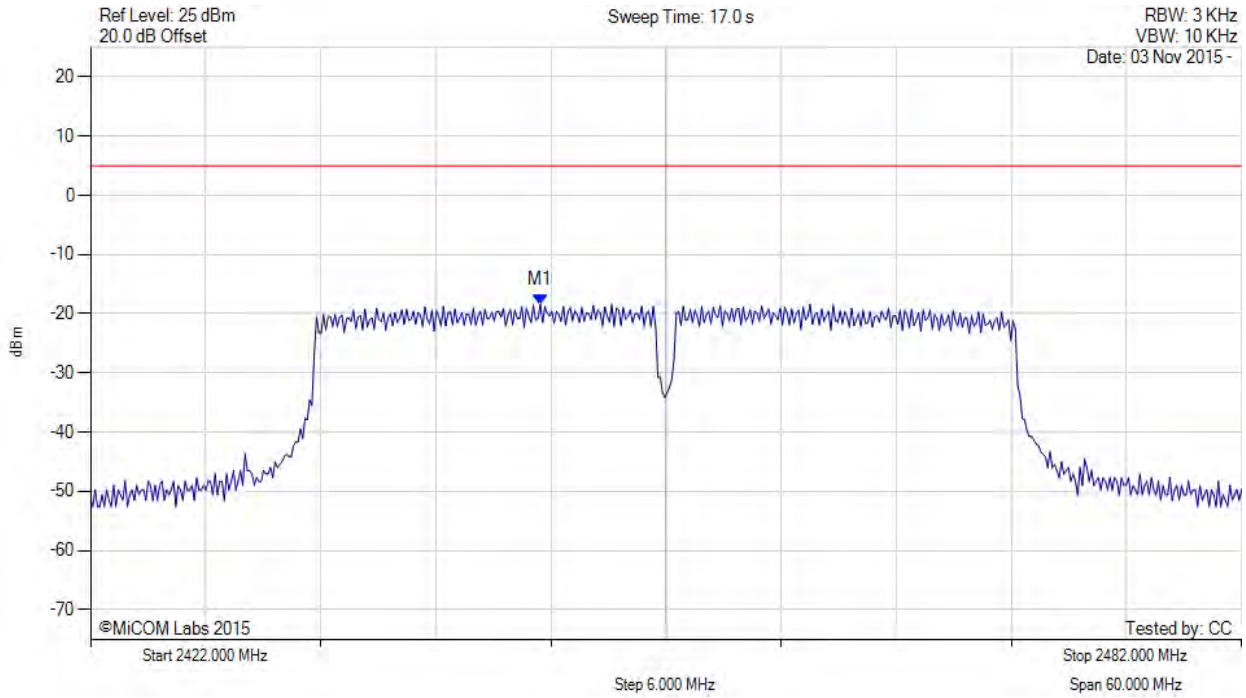
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.447 MHz : -18.438 dBm	Limit: ≤ 4.990 dBm

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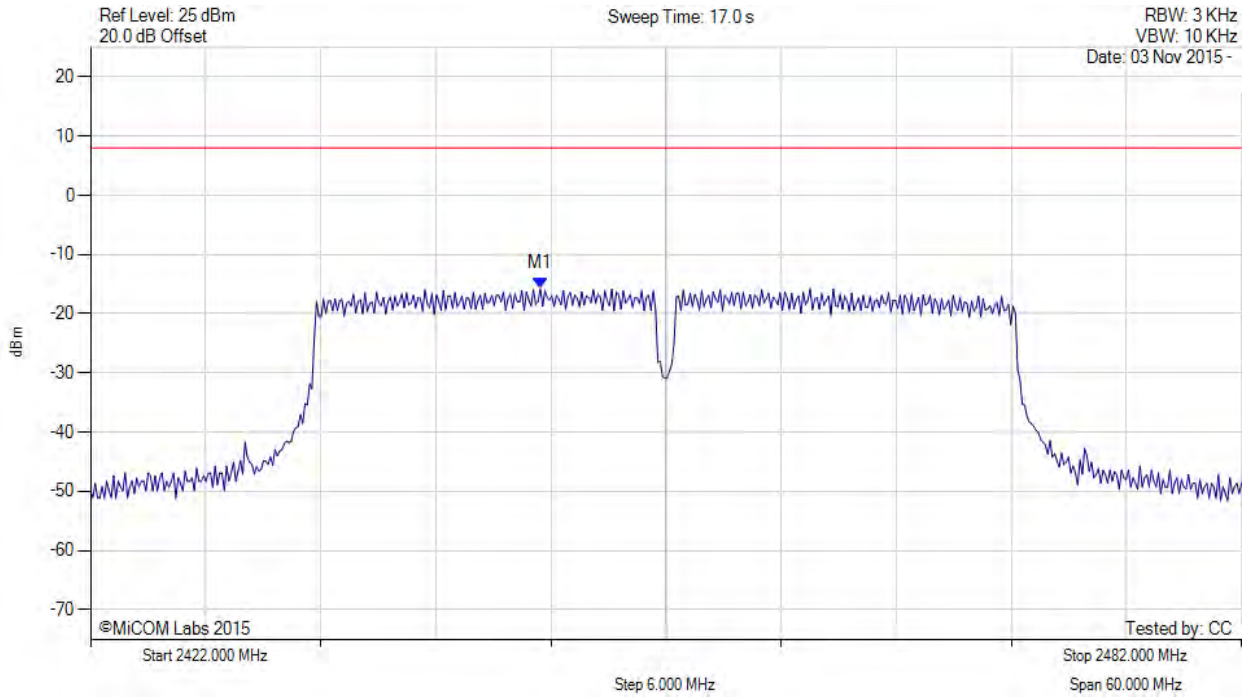
POWER SPECTRAL DENSITY - AVERAGE

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



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVERAGE Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.400 MHz : -15.760 dBm M1 + DCCF : 2445.400 MHz : -14.333 dBm Duty Cycle Correction Factor : +1.43 dB	Limit: ≤ 8.0 dBm Margin: -22.3 dB

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