

Company: Xirrus

Test of: 802.11 a/b/g/n Outdoor Wireless LAN Access Point
2x2 MIMO

To: FCC CFR 47 Part 15 Subpart E 15.407

Report No.: XIRR11-U3b Rev A





Test of: Xirrus XR520H

to

To: FCC CFR 47 Part 15 Subpart E 15.407

Test Report Serial No.: XIRR11-U3b Rev A

This report supersedes: NONE

Applicant: Xirrus
2101 Corporate Center Drive
Thousand Oaks, California 91320
USA

Product Function: Outdoor Wireless LAN Access Point

Issue Date: 8th April 2015

This Test Report is Issued Under the Authority of:

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TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 3 of 151

Table of Contents

1. ACCREDITATION, LISTINGS & RECOGNITION.....	4
1.1. TESTING ACCREDITATION.....	4
1.2. RECOGNITION	5
1.3. PRODUCT CERTIFICATION	6
2. DOCUMENT HISTORY	7
3. TEST RESULT CERTIFICATE.....	8
4. REFERENCES AND MEASUREMENT UNCERTAINTY	9
4.1. Normative References	9
4.2. Test and Uncertainty Procedure	10
5. PRODUCT DETAILS AND TEST CONFIGURATIONS.....	11
5.1. Technical Details	11
5.2. Scope Of Test Program	12
5.3. Equipment Model(s) and Serial Number(s)	14
5.4. Antenna Details	14
5.5. Cabling and I/O Ports	14
5.6. Test Configurations.....	15
5.7. Equipment Modifications	15
5.8. Deviations from the Test Standard	15
6. TEST SUMMARY	16
7. TEST EQUIPMENT CONFIGURATION(S)	17
8. MEASUREMENT AND PRESENTATION OF TEST DATA	22
9. WORST CASE MEASUREMENT RESULTS.....	Error! Bookmark not defined.
10. TEST RESULTS	23
10.1. Peak Transmit Power	23
10.2. Transmit Power Control (TPC)	31
10.3. 26 dB & 99% Bandwidth.....	32
10.4. Power Spectral Density	39
10.5. Frequency Stability	47
10.6. Radiated Emissions.....	48
10.6.1. Radiated Spurious Emissions.....	51
10.6.2. Restricted Band-Edge Emissions	57
10.6.3. Digital Emissions.....	58
10.7. ac Wireline Conducted Emissions (150 kHz – 30 MHz).....	61
A. APPENDIX - GRAPHICAL IMAGES	64
A.1. 26 dB & 99% Bandwidth	65
A.2. Power Spectral Density	99

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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



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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

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>



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



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 7 of 151

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	7 th Apr 2015	
Rev A	8 th April 2015	Initial Release
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In the above table the latest report revision will replace all earlier versions.

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 8 of 151

3. TEST RESULT CERTIFICATE

Manufacturer: Xirrus 2101 Corporate Center Drive Thousand Oaks, California 91320 USA	Tested By: MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model: XR520H	Telephone: +1 925 462 0304 Fax: +1 925 462 0306
Type Of Equipment: 802.11 a/b/g/n Outdoor Wireless LAN Access Point 2x2 MIMO	
S/N's: XR5233200618C	
Test Date(s): 6 th March – 7 th April 2015	Website: www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart E new 15.407	EQUIPMENT COMPLIES

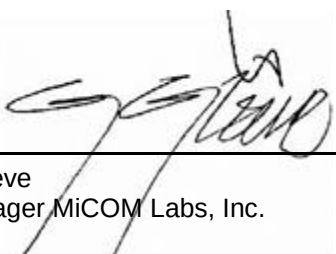
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

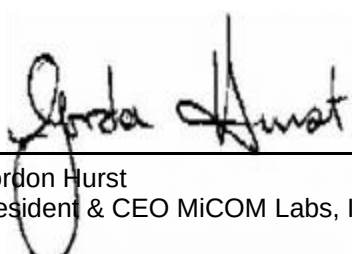
1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

Approved & Released for MiCOM Labs, Inc. by:





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 905462	August 2014	Test guidance to demonstrate compliance for U-NII devices subject to DFS requirements.
III	KDB 926956	June 3,2014	U-NII Device Transition Plan
IV	KDB 443999 V01r3	Sept 23rd 2014	Approval of DFS UNII The current interim procedures to approve UNII devices operating in the 5470 - 5725 MHz band with radar detection and DFS capabilities
V	KDB 789033 D02	Jun 8 2014	General UNII Test Procedures New Rules V01
VI	A2LA	April 2014	Reference to A2LA Accreditation Status – A2LA Advertising Policy
VII	ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices
VIII	ANSI C63.4	2014	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
IX	CISPR 22	2008	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
X	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
XI	FCC 06-96	Jun 3 2006	Memorandum Opinion and Order
XII	FCC 47 CFR Part 15.407	2014	CFR Title 47 Part 15.407 – Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices
XIII	ICES-003	Issue 5 2012	Spectrum Management and Telecommunications; Interference-Causing Equipment Standard. Information Technology Equipment (ITE) – Limits and methods of measurement.
XIV	M 3003	Edition 3 Nov. 2012	Expression of Uncertainty and Confidence in Measurements
XV	RSS-210 Annex 9	2010	Radio Standards Specification 210; Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
XVI	RSS-Gen	2014	General Requirements and Information for the Certification of Radiocommunication Equipment
XVII	KDB 644545 D03	August 14th 2014	Guidance for IEEE 802.11ac New Rules v01
XVIII	FCC 47 CFR Part 2.1033	2014	FCC requirements and rules regarding photographs and test setup diagrams.

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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.



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 11 of 151

5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Xirrus XR520H to CFR Title 47 Part 15.407 – Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices
Applicant:	Xirrus 2101 Corporate Center Drive Thousand Oaks, California 91320 USA
Manufacturer:	As Applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	XIRR11-U3b
Date EUT received:	10 th February 2015
Standard(s) applied:	FCC CFR 47 Part 15 Subpart E 15.407
Dates of test (from - to):	6 th March – 7 th April 2015
No of Units Tested:	2
Type of Equipment:	802.11 a/b/g/n Outdoor Wireless LAN Access Point 2x2 MIMO
Product Family Name:	XR
Model(s):	XR-520H
Location for use:	Outdoor
Declared Frequency Range(s):	5250 - 5350 MHz; 5470 - 5725 MHz
Primary function of equipment:	Outdoor Wireless LAN Access Point
Secondary function of equipment:	Wireless LAN Access Point
Type of Modulation:	OFDM
EUT Modes of Operation:	5250 - 5350 MHz: 802.11a; 802.11n HT-20; 802.11n HT-40; 5470 - 5725 MHz: 802.11a; 802.11n HT-20; 802.11n HT-40;
Declared Nominal Output Power (Ave):	5250 - 5350 MHz: +23 dBm 5470 - 5725 MHz: +23 dBm
Transmit/Receive Operation:	Transceiver – Half Duplex
Rated Input Voltage and Current:	POE 56Vdc, 0.3A
Operating Temperature Range:	Declared Range -20°C to 55°C
ITU Emission Designator:	802.11a 20M0D1D 802.11n HT-20 18M9D1D 802.11n HT-40 39M4D1D
Hardware Rev:	A6

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5.2. Scope Of Test Program

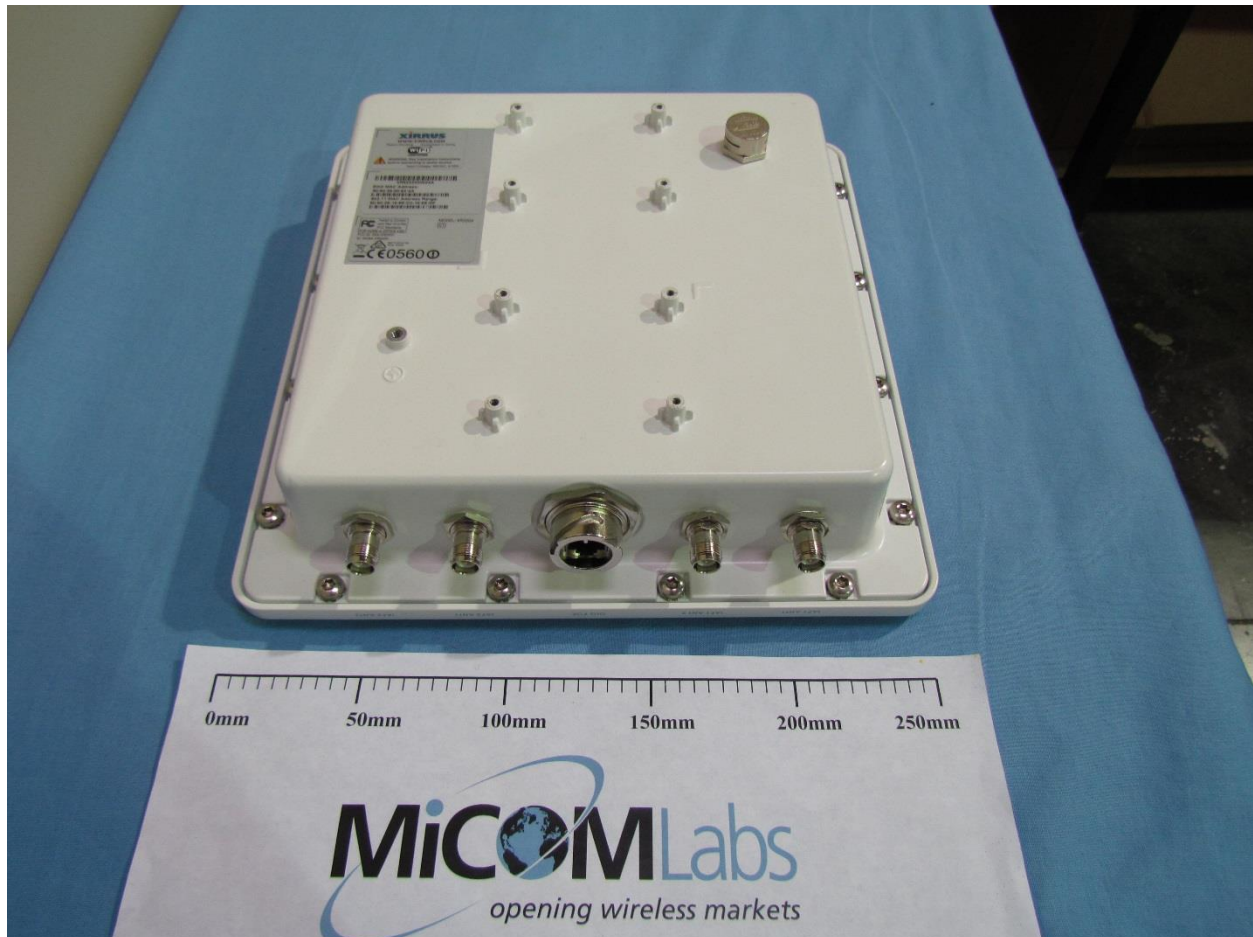
Xirrus XR520H

The scope of the test program was to test the Xirrus XR520H, 802.11 a/b/g/n/ac Outdoor Wireless LAN Access Point 2x2 MIMO configurations in the frequency ranges 5250 - 5350 MHz; 5470 - 5725 MHz; for compliance against the following specification:

FCC CFR 47 Part 15 Subpart E 15.407

CFR Title 47 Part 15.407 – Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices

Xirrus XR520H



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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 13 of 151

FCC OET KDB Implementation

This test program implements the following FCC KDB – 662911 31st October 2013;

Emissions Testing of Transmitters with Multiple Outputs in the Same Band

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

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

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 14 of 151

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

Type	Description	Manufacturer	Model	Serial no.	Delivery Data
EUT	Wireless Access Point	Xirrus	520H	XR5233200618C	2 nd February 2015

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
Ext	Laird Technologies	RD2458-5-RTNC	Dipole	5.0	-	360	-	5150 - 5725
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	1	N	RJ-45	

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5.6. Test Configurations

Testing was performed to determine the highest power level versus bit rate. The variant with the highest power was used to exercise the product.

Operational Mode(s) (802.11a/b/g/n/ac)	Data Rate with Highest Power MBit/s	Channel Frequency (MHz)		
		Low	Mid	High
5250 - 5350 MHz				
802.11a	6	5,260.00	5,300.00	5,320.00
5470 - 5725 MHz				
802.11a	6	5,500.00	5,580.00	5,700.00
5250 - 5350 MHz				
802.11n HT-20	6.5	5,260.00	5,300.00	5,320.00
5470 - 5725 MHz				
802.11n HT-20	6.5	5,500.00	5,580.00	5,700.00
5250 - 5350 MHz				
802.11n HT-40	13.5	5,270.00	-	5,310.00
5470 - 5725 MHz				
802.11n HT-40	13.5	5,510.00	5,550.00	5,670.00

Results for the above configurations are provided in this report

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



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 16 of 151

6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
Conducted Testing		
(a) Peak Transmit Power	Complies	View Data
(a) 26 dB & 99% Bandwidth	Complies	View Data
(a)(5) Power Spectral Density	Complies	View Data
(g) Frequency Stability	Complies	View Data
Radiated Testing		
(b)(2) Radiated Emissions	-	-
i).. Radiated Spurious Emissions	Complies	View Data
ii).. Restricted Band-Edge Emissions	Complies	View Data
iii).. Digital Emissions	Complies	NT ¹
15.207 ac Wireline Emissions	Complies	NT ¹

NT¹ – Not Tested, manufacturer supplied 3rd party test reports in lieu of testing

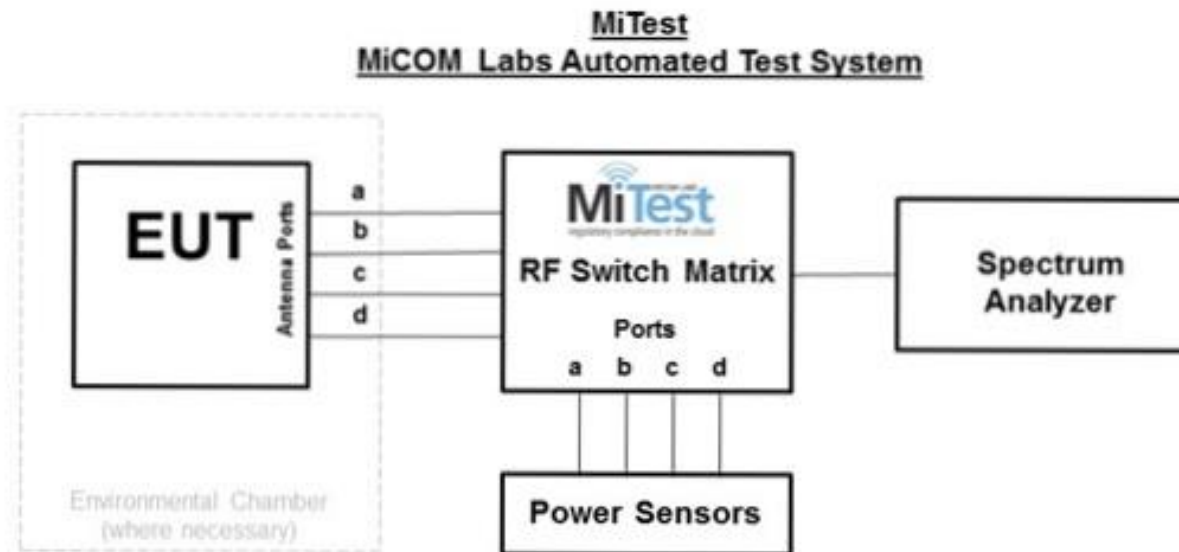
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7. TEST EQUIPMENT CONFIGURATION(S)

Conducted

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

1. Peak Transmit Power
2. Transmit Power Control
3. 26 dB and 99% Occupied Channel Bandwidth
4. Power Density



Conducted Test Measurement Setup

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

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
127	Power Supply	HP	6674A	US36370530	Cal when used
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
248	Resistance Thermometer	Thermotronics	GR2105-02	9340 #1	30 Oct 2015



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 18 of 151

287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	31 Jul 2015
376	USB 10MHz - 18GHz Average Power Sensor	Agilent	U2000A	MY51440005	28 Oct 2015
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	17 Jul 2015
381	4x4 RF Switch Box	MiCOM Labs	MiTest RF Switch Box	MIC002	30 Jun 2015
419	Laptop with Labview Software	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 2015
436	USB Wideband Power Sensor	Boonton	55006	8731	31 Jul 2015
437	USB Wideband Power Sensor	Boonton	55006	8759	31 Jul 2015
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
460	Dell Computer with installation of MiTest executable.	Dell	Optiplex330	BC944G1	Not Required
74	Environmental Chamber Chamber 3	Tenney	TTC	12808-1	30 Sep 2015
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	30 Jun 2015
RF#2 SMA#2	EUT to Mitest box port 2	Flexco	SMA Cable port2	None	30 Jun 2015
RF#2 SMA#3	EUT to Mitest box port 3	Flexco	SMA Cable port3	None	30 Jun 2015
RF#2 SMA#4	EUT to Mitest box port 3	Flexco	SMA Cable port4	None	30 Jun 2015
RF#2 SMA#SA	Mitest box to SA	Flexco	SMA Cable SA	None	30 Jun 2015
RF#2 USB#1	USB Cable to Mitest Box	Dynex	USB Cable	None	Not Required

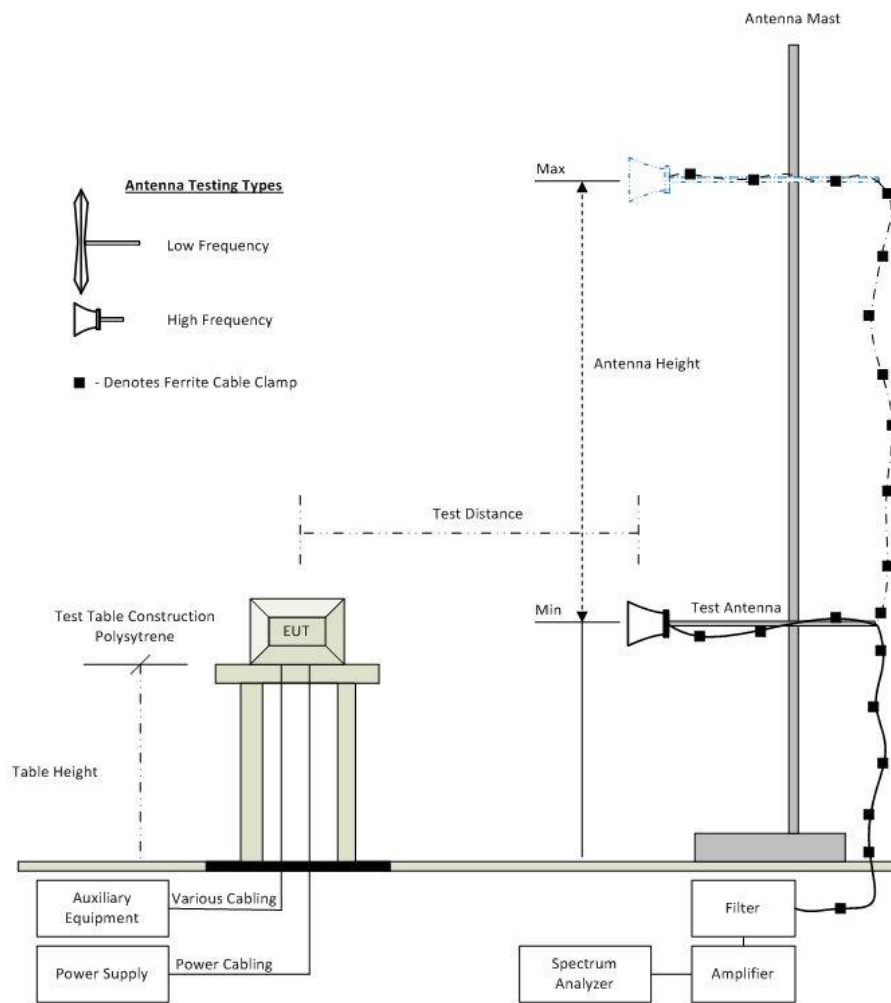
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Radiated Testing

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

- 10.6.1 Radiated Spurious Emissions
- 10.6.2 Radiated Restricted Band-Edge Emissions
- 10.6.3 Radiated Digital Emissions

Radiated Emission Measurement Setup



Radiated Emission Test Setup

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 20 of 151

Assets Utilized for Radiated Emission Testing

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CY101	04R08507	Not Required
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	31 Jul 2015
301	5470 to 5725 MHz Notch Filter	Microtronics	RBC50704	001	08 Oct 2015
302	5150 to 5350 MHz Notch Filter	Microtronics	BRC50703	002	08 Oct 2015
303	5725 to 5875 MHz Notch filter	Microtronics	BRC50705	003	08 Oct 2015
310	SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001	30 Oct 2015
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	14 Aug 2015
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	08 Oct 2015
343	5.15 GHz Notch Filter	EWT	EWT-14-0200	H1	08 Oct 2015
344	5.35 GHz Notch Filter	EWT	EWT-14-0201	H1	08 Oct 2015
345	5.46 GHz Notch Filter	EWT	EWT-14-0202	H1	08 Oct 2015
377	Band Rejection Filter 5150 to 5880MHz	Microtronics	BRM50716	034	08 Oct 2015
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	07 Oct 2015
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	23 Oct 2015
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	10 Oct 2015
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	30 May 2015
410	Desktop Computer	Dell	Inspiron 620	WS38	Not Required
411	Mast/Turntable Controller	Sunol Sciences	SC98V	060199-1D	Not Required
412	USB to GPIB Interface	National Instruments	GPIB-USB HS	11B8DC2	Not Required
413	Mast Controller	Sunol Science	TWR95-4	030801-3	Not Required
414	DC Power Supply 0-60V	HP	6274	1029A01285	Cal when used
415	Turntable Controller	Sunol Sciences	Turntable Controller	None	Not Required
416	Gigabit ethernet filter	ETS-Lingren	Gigafoil 260366	None	Not Required
502	Test Software for Radiated Emissions	EMISoft	Vasona	Version 5 Build 59	Not Required
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used

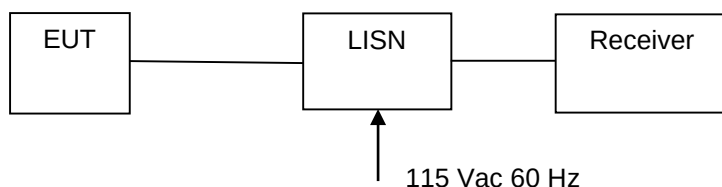
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AC Wireline Emissions

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

10.7 ac Wireline Conducted Emissions

Conducted Test Set-Up Pictorial Representation



Measurement set up for ac Wireline Conducted Emissions Test

Traceability of Test Equipment Utilized for ac Wireline Emission Testing

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
184	Pulse Limiter	Rhode & Schwarz	ESH3Z2	357.8810.52	Cal when used
190	LISN (two-line V-network)	Rhode & Schwarz	ESH3Z5	836679/006	12 Sep 2015
193	Receiver 20 Hz to 7 GHz	Rhode & Schwarz	ESI 7	838496/007	14 Jan 2015
307	BNC-CABLE	Megaphase	1689 1GVT4	15F50B002	Cal when used
316	Dell desktop computer workstation	Dell	Desktop	WS04	Not Required

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)

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9. TEST RESULTS

9.1. Peak Transmit Power

Conducted Test Conditions for Maximum Conducted Output Power			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Maximum Conducted Output Power	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (a)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Maximum Conducted Output Power Measurement

Method PM (Measurement using an RF average power meter). KDB 789033 defines a methodology using an average wideband power meter. Measurements were made while the EUT was operating in a continuous transmission mode (100% duty cycle) at the appropriate center frequency. All operational modes and frequency bands were measured independently and the resultant calculated. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported separately. A summation (Σ) of each antenna port output power is provided which includes any offset due to Duty Cycle Correction Factor (DCCF). Testing was performed under ambient conditions at nominal voltage.

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

Supporting Information

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

A = Total Power [$10 \cdot \log_{10}(10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})$]

G = Antenna Gain

Y = Beamforming Gain

x = Duty Cycle (average power measurements only)

Limits Maximum Conducted Output Power

Operating Frequency Band 5150-5250 MHz

15.407 (a)(1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Operating Frequency Band 5250-5350 and 5470 – 5725 MHz

15. 407 (a)(2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Operating Frequency Band 5725 – 5850 MHz

15. 407 (a)(3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 25 of 151

Equipment Configuration for Peak Transmit Power

Variant:	802.11a	Duty Cycle (%):	99
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5260.0	16.08	18.23	--	--	20.34	30.670	24.00	-3.66	
5300.0	18.30	18.89	--	--	21.66	31.420	24.00	-2.34	
5320.0	18.25	18.60	--	--	21.48	28.250	24.00	-2.52	

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 26 of 151

Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-20	Duty Cycle (%):	99
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5260.0	17.84	18.17	--	--	21.06	27.420	24.00	-2.94	
5300.0	18.69	19.64	--	--	22.24	30.250	24.00	-1.76	
5320.0	18.48	18.98	--	--	21.79	28.670	24.00	-2.21	

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 27 of 151

Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-40	Duty Cycle (%):	99
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5270.0	18.60	18.55	--	--	21.63	67.170	24.00	-0.37	
5310.0	18.77	19.12	--	--	22.00	73.330	24.00	-0.00	

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 28 of 151

Equipment Configuration for Peak Transmit Power

Variant:	802.11a	Duty Cycle (%):	99
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5500.0	18.15	18.20	--	--	21.23	25.250	24.00	-2.77	
5580.0	17.18	18.17	--	--	20.76	23.920	24.00	-3.24	
5700.0	18.17	18.22	--	--	21.25	28.080	24.00	-2.75	

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 29 of 151

Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-20	Duty Cycle (%):	99
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5500.0	18.93	19.12	--	--	22.08	29.670	24.00	-1.92	
5580.0	17.89	18.66	--	--	21.35	29.330	24.00	-2.65	
5700.0	17.47	17.51	--	--	20.54	26.830	24.00	-3.46	

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 30 of 151

Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-40	Duty Cycle (%):	99
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5510.0	20.25	20.53	--	--	23.45	69.170	24.00	-0.55	
5550.0	20.24	20.04	--	--	23.20	65.830	24.00	-0.80	
5670.0	18.95	18.90	--	--	21.98	62.330	24.00	-2.02	

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 31 of 151

9.2. Transmit Power Control (TPC)

Conducted Test Conditions for Transmit Power Control (TPC)			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	20.0 - 24.5
Test Heading:	Transmit Power Control (TPC)	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (h)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Section "Normative References" KDB 789033 - D01 DTS General UNII Test Procedures KDB 662911 - Measurement of Transmitters with Multiple Output, MIMO, Smart Antenna		
Test Procedure for Transmit Power Control Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW. Transmit Power Control measurement test setup diagram is provided in Section "Test Equipment Measurement Setup \ Conducted RF Emissions".			

From the Peak Transmit Power section in this document it was found that the device EIRP was greater than 500 mW therefore Transmit Power Control implementation is required. Testing was performed and the unit TPC function was greater than 6 dB.

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 32 of 151

9.3. 26 dB & 99% Bandwidth

Conducted Test Conditions for 26 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	26 dB and 99 % Bandwidth	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (a)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		
Test Procedure for 26 dB and 99% Bandwidth Measurement The bandwidth at 26 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency. The Resolution Bandwidth was set to approximately 1% of the emission bandwidth. 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 section specified in this document.			

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 33 of 151

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5260.0	30.670	33.000	--	--	33.000	30.670		
5300.0	31.420	36.750	--	--	36.750	31.420		
5320.0	28.250	36.330	--	--	36.330	28.250		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5260.0	17.512	18.655	--	--	18.655	17.512		
5300.0	17.503	19.986	--	--	19.986	17.503		
5320.0	17.403	19.005	--	--	19.005	17.403		

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 34 of 151

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5260.0	28.000	27.420	--	--	28.000	27.420		
5300.0	30.250	34.250	--	--	34.250	30.250		
5320.0	28.670	33.330	--	--	33.330	28.670		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5260.0	18.217	18.228	--	--	18.228	18.217		
5300.0	18.352	18.861	--	--	18.861	18.352		
5320.0	18.264	18.588	--	--	18.588	18.264		

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 35 of 151

Equipment Configuration for 26 dB & 99% Occupied Bandwidth
--

Variant:	802.11n HT-40	Duty Cycle (%):	99.0
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5270.0	67.170	76.330	--	--	76.330	67.170		
5310.0	73.330	74.670	--	--	74.670	73.330		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5270.0	37.514	39.412	--	--	39.412	37.514		
5310.0	37.561	38.840	--	--	38.840	37.561		

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 36 of 151

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Results - Power Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5500.0	25.830	25.250	--	--	25.830	25.250		
5580.0	23.920	25.830	--	--	25.830	23.920		
5700.0	29.330	28.080	--	--	29.330	28.080		

Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5500.0	16.961	16.885	--	--	16.961	16.885		
5580.0	16.895	16.846	--	--	16.895	16.846		
5700.0	17.348	17.140	--	--	17.348	17.140		

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 37 of 151

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5500.0	29.670	30.250	--	--	30.250	29.670		
5580.0	29.330	29.750	--	--	29.750	29.330		
5700.0	29.580	26.830	--	--	29.580	26.830		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5500.0	18.471	18.425	--	--	18.471	18.425		
5580.0	18.179	18.262	--	--	18.262	18.179		
5700.0	18.172	18.043	--	--	18.172	18.043		

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 38 of 151

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11n HT-40	Duty Cycle (%):	99.0
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	5.00
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5510.0	74.000	69.170	--	--	74.000	69.170		
5550.0	66.000	65.830	--	--	66.000	65.830		
5670.0	67.000	62.330	--	--	67.000	62.330		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5510.0	37.715	38.151	--	--	38.151	37.715		
5550.0	37.429	37.735	--	--	37.735	37.429		
5670.0	37.673	37.293	--	--	37.673	37.293		

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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9.4. Power Spectral Density

Conducted Test Conditions for Power Spectral Density			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Power Spectral Density	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (a)	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Power Spectral Density

The in-band power spectral density was measured using the test technique specified in KDB 789033. A 1 MHz measurement bandwidth was implemented for the analyzer sweep. Once the sweep is complete the analyzer trace data is downloaded and used 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 (Σ) and a link to this additional graphic is provided.

Test configuration and setup used for the measurement was per the Conducted Test Set-up section 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 spectrum in some 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 [$10 \cdot \log_{10}(10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})$]

x = Duty Cycle

Limits Power Spectral Density

Operating Frequency Band 5150-5250 MHz

15.407 (a)(1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Operating Frequency Band 5250-5350 and 5470 – 5725 MHz

15. 407 (a)(2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Operating Frequency Band 5725 – 5850 MHz

15. 407 (a)(3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 41 of 151

Equipment Configuration for Power Spectral Density

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6 MBit/s	Antenna Gain (dBi):	5.00
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				Amplitude Summation + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5260.0	6.928	7.353	--	--	10.155	11.0	-0.9
5300.0	7.278	7.838	--	--	10.560	11.0	-0.5
5320.0	7.202	7.561	--	--	10.382	11.0	-0.6

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 42 of 151

Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	5.00
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				Amplitude Summation + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5260.0	6.574	6.965	--	--	9.743	11.0	-1.3
5300.0	7.349	8.146	--	--	10.761	11.0	-0.2
5320.0	7.313	7.680	--	--	10.482	11.0	-0.5

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 43 of 151

Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-40	Duty Cycle (%):	99.0
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	5.00
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				Amplitude Summation + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5270.0	6.355	6.469	--	--	9.412	11.0	-1.6
5310.0	6.610	6.784	--	--	9.573	11.0	-1.4

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 44 of 151

Equipment Configuration for Power Spectral Density

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	5.00
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				Amplitude Summation + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5500.0	7.140	7.287	--	--	10.191	11.0	-0.8
5580.0	6.411	7.341	--	--	9.911	11.0	-1.1
5700.0	7.262	7.273	--	--	10.276	11.0	-0.7

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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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 45 of 151

Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	5.00
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				Amplitude Summation + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5500.0	7.696	7.758	--	--	10.705	11.0	-0.3
5580.0	6.816	7.619	--	--	10.265	11.0	-0.7
5700.0	6.407	6.286	--	--	9.350	11.0	-1.7

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 46 of 151

Equipment Configuration for Power Spectral Density
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Variant:	802.11n HT-40	Duty Cycle (%):	99.0
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	5.00
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				Amplitude Summation + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5510.0	6.285	6.324	--	--	9.259	11.0	-1.8
5550.0	6.076	6.274	--	--	9.173	11.0	-1.8
5670.0	4.863	4.816	--	--	7.835	11.0	-3.2

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

DCCF - Duty Cycle Correction Factor

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9.5. Frequency Stability

FCC, Part 15 Subpart C §15.407(g)
Industry Canada RSS-210 §2.1

Test Procedure

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions.

Manufacturer Declaration

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signals should have ± 20 ppm stability.

This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

± 20 ppm at 5.250 GHz translates to a maximum frequency shift of ± 105 KHz. As the edge of the channels is at least one MHz from either of the band edges, ± 105 KHz is more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the EUT.

Specification

Limits

§15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 48 of 151

9.6. Radiated Emissions

FCC, Part 15 Subpart C §15.407(b)(2), §15.205(a)/15.209(a)
Industry Canada RSS-210 §A9.3(2); §2.2; §2.6; RSS-Gen §4.7

Test Procedure

Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak hold mode. Depending on the frequency band spanned a notch filter and/or waveguide filter was used to remove the fundamental frequency.

Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR compliant receiver. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Emissions from 30 MHz – 1000 MHz are measured utilizing a CISPR compliant quasi-peak detector with a tuned receiver, using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed.

Field Strength Calculation

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

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

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

$$CORR = \text{Correction Factor} = CL - AG + NFL$$

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

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Field Strength Calculation Example:

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

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

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

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

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

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

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dB μ V/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

$$\text{Therefore: } -27 \text{ dBm/MHz} = 68.23 \text{ dB}\mu\text{V/m}$$

Note: The data in this Section identifies that the EUT is in compliance with the -27dBm/MHz EIRP limit (68.23 dB μ V/m) for out of band emissions. All out of band emissions are less than 68.23 dB μ V/m.

Specification

Radiated Spurious Emissions

15.407 (b)(2). All emissions outside of the 5,150-5,350MHz band shall not exceed an EIRP of -27dBm/MHz.

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

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

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

RSS-210 §A9.3(2) For transmitters operating in the 5250-5350 MHz band, all emissions outside the 5150-5350 MHz band shall not exceed -27 dBm/MHz e.i.r.p. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band shall not exceed out of band emission limit of 27 dBm/MHz e.i.r.p. in the 5150-5250 MHz band in order to operate indoor/outdoor, or alternatively shall comply with the spectral power density for operation within the 5150-5250 MHz band and shall be labeled "for indoor use only".

RSS-Gen §4.7 The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

RSS-Gen §6 Receiver Spurious Emission Standard

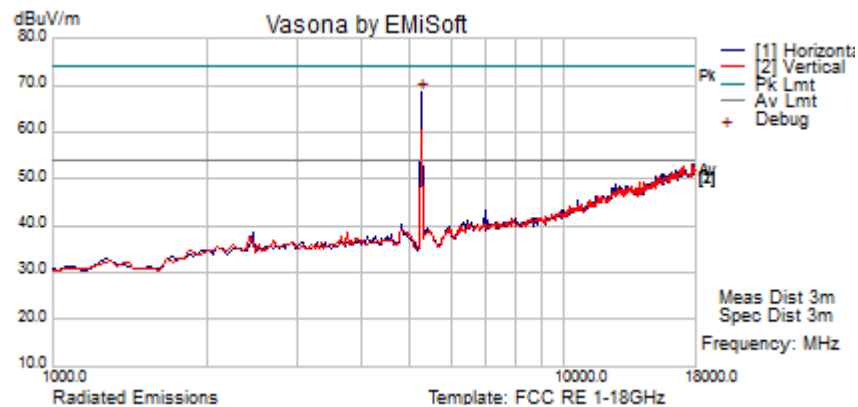
If a radiated measurement is made, all spurious emissions shall comply with the limits of the following Table. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emission measurements below 1.0 GHz and 1.0 MHz for measurements above 1.0 GHz

Table 1: FCC 15.209 Spurious Emissions Limits

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

9.6.1. Radiated Spurious Emissions

Test Freq.	5260 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	15	Press. (mBars)	1004
Antenna	5.0 dBi	Duty Cycle (%)	99
Test Notes 1			
Test Notes 2			



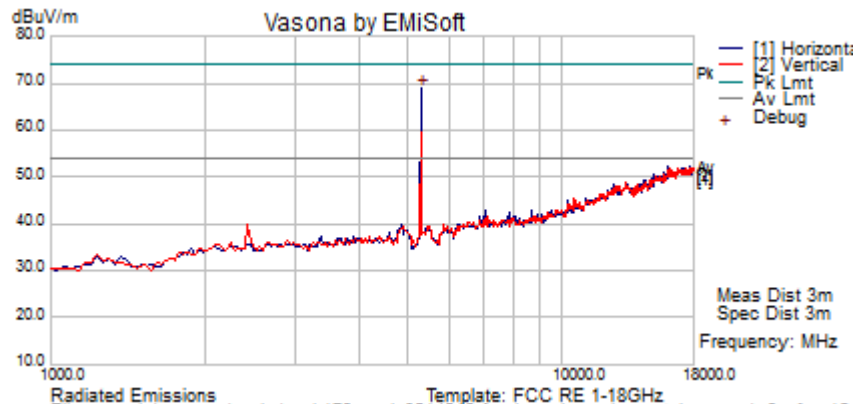
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5258.517	64.8	5.9	-2.2	68.5	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 52 of 151

Test Freq.	5300 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	15	Press. (mBars)	1004
Antenna	5.0 dBi	Duty Cycle (%)	99
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

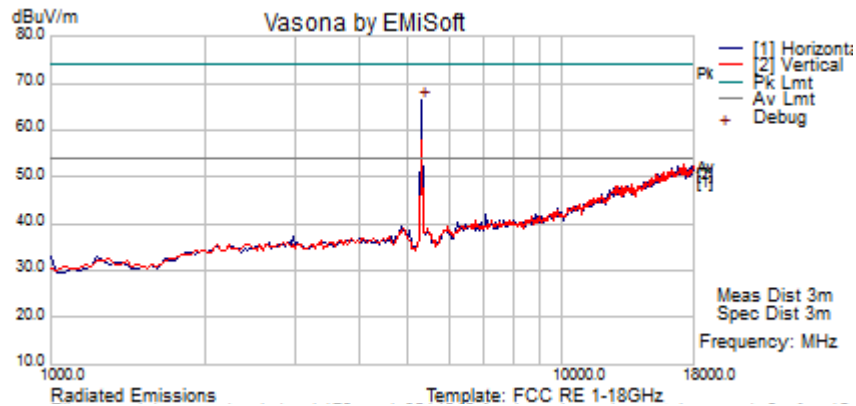
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	64.9	6.0	-2.1	68.8	Peak [Scan]	H	150					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 53 of 151

Test Freq.	5320 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	15	Press. (mBars)	1004
Antenna	5.0 dBi	Duty Cycle (%)	99
Test Notes 1			
Test Notes 2			

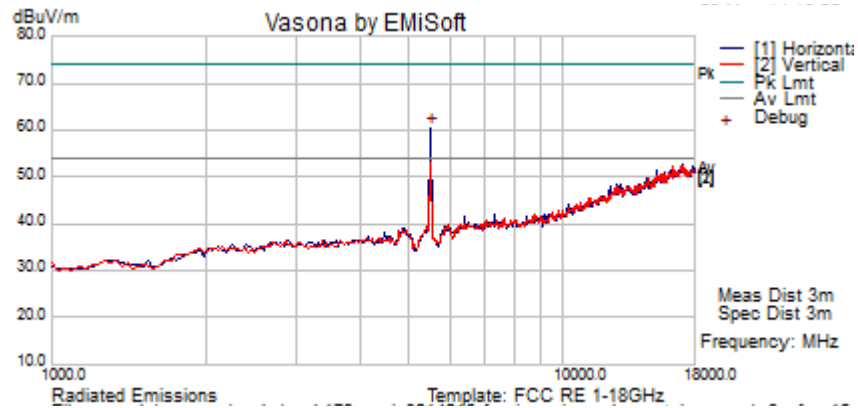


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5326.653	62.3	6.0	-1.9	66.4	Peak [Scan]	H	150					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5500 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	16	Press. (mBars)	1004
Antenna	5.0 dBi	Duty Cycle (%)	99
Test Notes 1			
Test Notes 2			



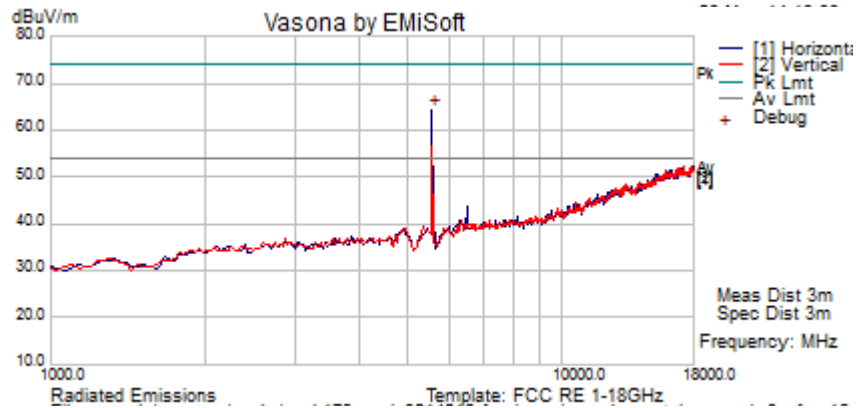
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.994	56.5	6.1	-2.0	60.5	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 55 of 151

Test Freq.	5580 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	16.5	Press. (mBars)	1004
Antenna	5.0 dBi	Duty Cycle (%)	99
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

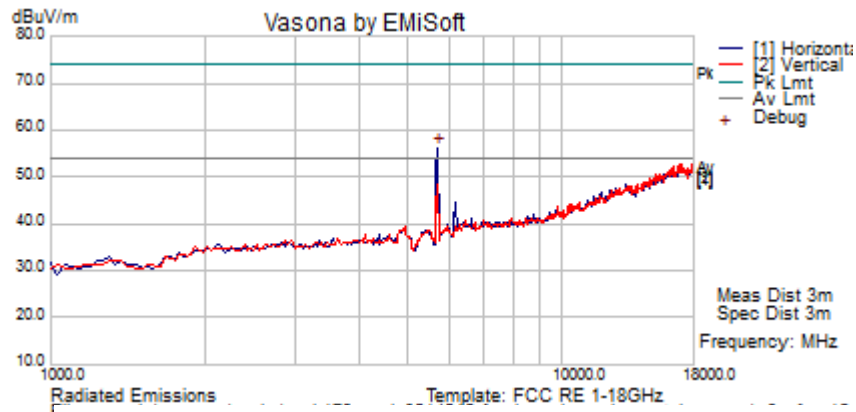
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5565.130	60.5	6.1	-2.1	64.5	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 56 of 151

Test Freq.	5700 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	18.5
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	1004
Antenna	5.0 dBi	Duty Cycle (%)	99
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5701.403	52.1	6.2	-2.0	56.3	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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9.6.2. Restricted Band-Edge Emissions

Radiated Band-Edge

Peak Limit 74.0 dBμV, Average Limit 54.0 dBμV

		5350 MHz		
		dBμV		Power Setting
Operational Mode	Operating Frequency (MHz)	Peak	Average	
a	5320.0	64.74	53.49	15.0
n HT-20	5320.0	64.72	53.93	15.5
n HT-40	5310.0	66.25	53.85	15.0

		5470 MHz		
		dBμV		Power Setting
Operational Mode	Operating Frequency	Peak	Average	
a	5500.0	62.37	50.68	16.0
n HT-20	5500.0	62.66	46.50	16.5
n HT-40	5510.0	68.13	50.81	18.0

9.6.3. Digital Emissions

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

Test Procedure

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

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

Field Strength Calculation

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

$$FS = R + AF + CORR$$

where:

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

For example:

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

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

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

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

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

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



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 59 of 151

Digital Emissions

In lieu of testing manufacturer supplied 3rd party test report.

Test Laboratory: ADT
Test Report No.: RF130514C29-1
Model No.: XR520H
FDD ID.: SK6-XR520H
Report Issued Date: 3rd July 2013

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Specification

Limits

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

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

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

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

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

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

Traceability

Method
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'



Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 61 of 151

9.7. ac Wireline Conducted Emissions (150 kHz – 30 MHz)

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

Test Procedure

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

Measurement Results for AC Wireline Conducted Emissions (0.150 – 30 MHz)

Ambient conditions.

Temperature: **Error! Reference source not found.** °C

Reference source not found. %
source not found. mbar

Relative humidity: **Error!**

Pressure: **Error! Reference**

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Title: Xirrus XR520H
To: FCC CFR 47 Part 15 Subpart E 15.407
Serial #: XIRR11-U3b Rev A
Issue Date: 8th April 2015
Page: 62 of 151

ac Wireline Emissions

In lieu of testing manufacturer supplied 3rd party test report.

Test Laboratory: ADT
Test Report No.: RF130514C29-1
Model No.: XR520H
FDD ID.: SK6-XR520H
Report Issued Date: 3rd July 2013

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Specification

Limit

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

RSS-Gen §7.2.2

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

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

The lower limit applies at the boundary between frequency ranges

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

* Decreases with the logarithm of the frequency

Laboratory Measurement Uncertainty for Conducted Emissions

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

Traceability

Method
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'

A. APPENDIX - GRAPHICAL IMAGES

A.1. 26 dB & 99% Bandwidth



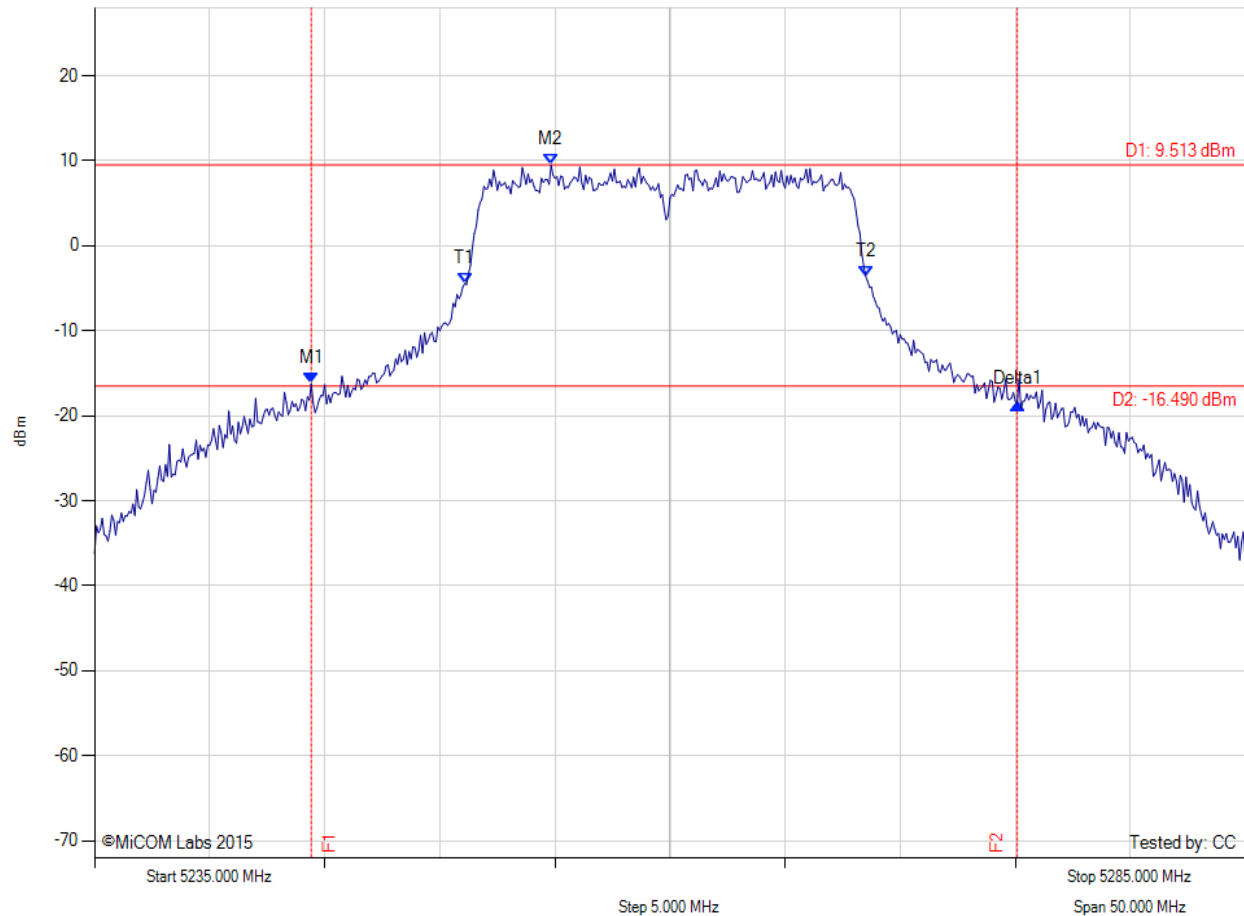
26 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5260.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.4 dB Offset

Sweep Time: 2.0 s

RBW: 200 KHz
VBW: 1 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5244.420 MHz : -16.215 dBm M2 : 5254.830 MHz : 9.513 dBm Delta1 : 30.670 MHz : -2.337 dB T1 : 5251.083 MHz : -4.432 dBm T2 : 5268.500 MHz : -3.552 dBm OBW : 17.512 MHz	Measured 26 dB Bandwidth: 30.670 MHz Measured 99% Bandwidth: 17.512 MHz

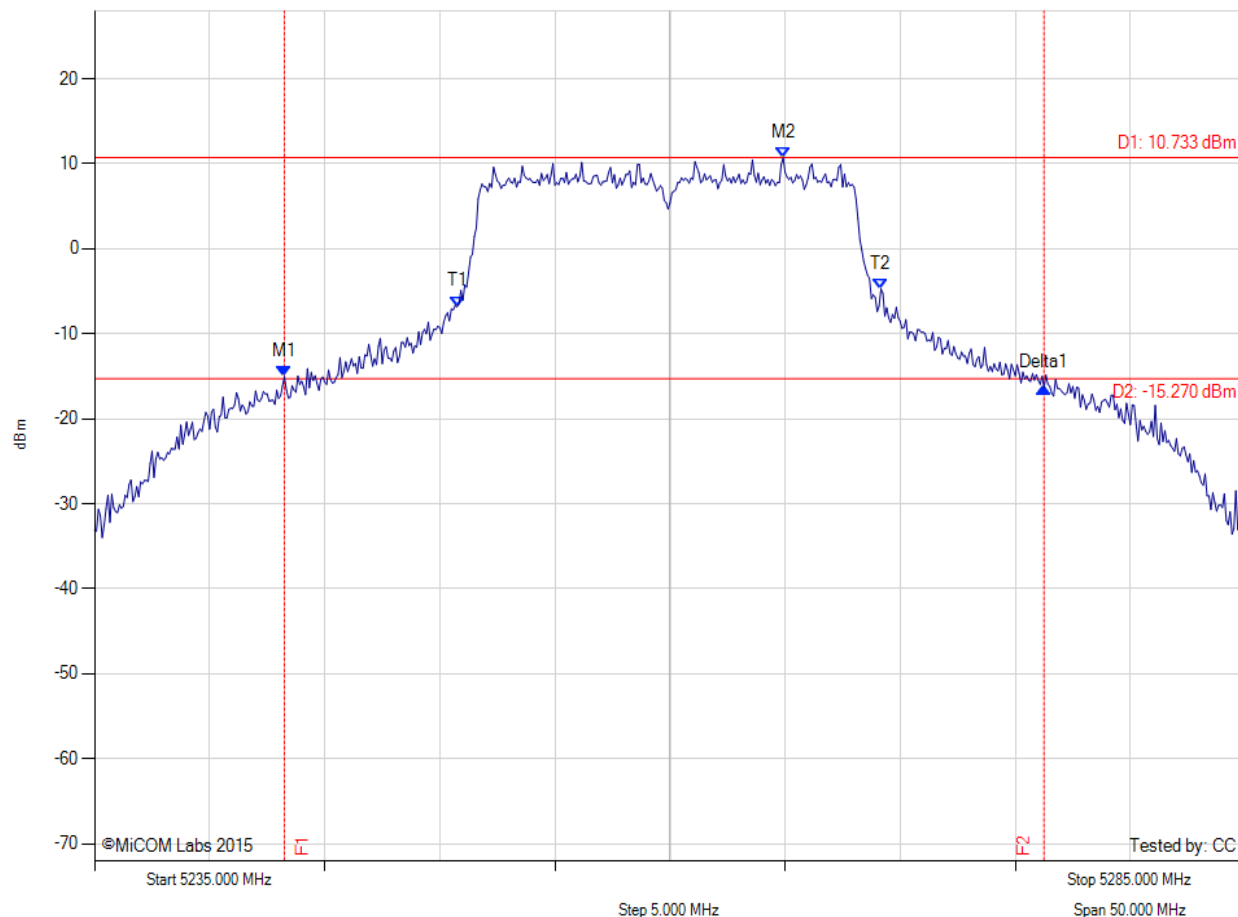
[back to matrix](#)

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Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 2.0 s

RBW: 200 KHz
VBW: 1 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5243.250 MHz : -15.037 dBm M2 : 5264.920 MHz : 10.733 dBm Delta1 : 33.000 MHz : -1.313 dB T1 : 5250.750 MHz : -6.806 dBm T2 : 5269.167 MHz : -4.718 dBm OBW : 18.655 MHz	Measured 26 dB Bandwidth: 33.000 MHz Measured 99% Bandwidth: 18.655 MHz

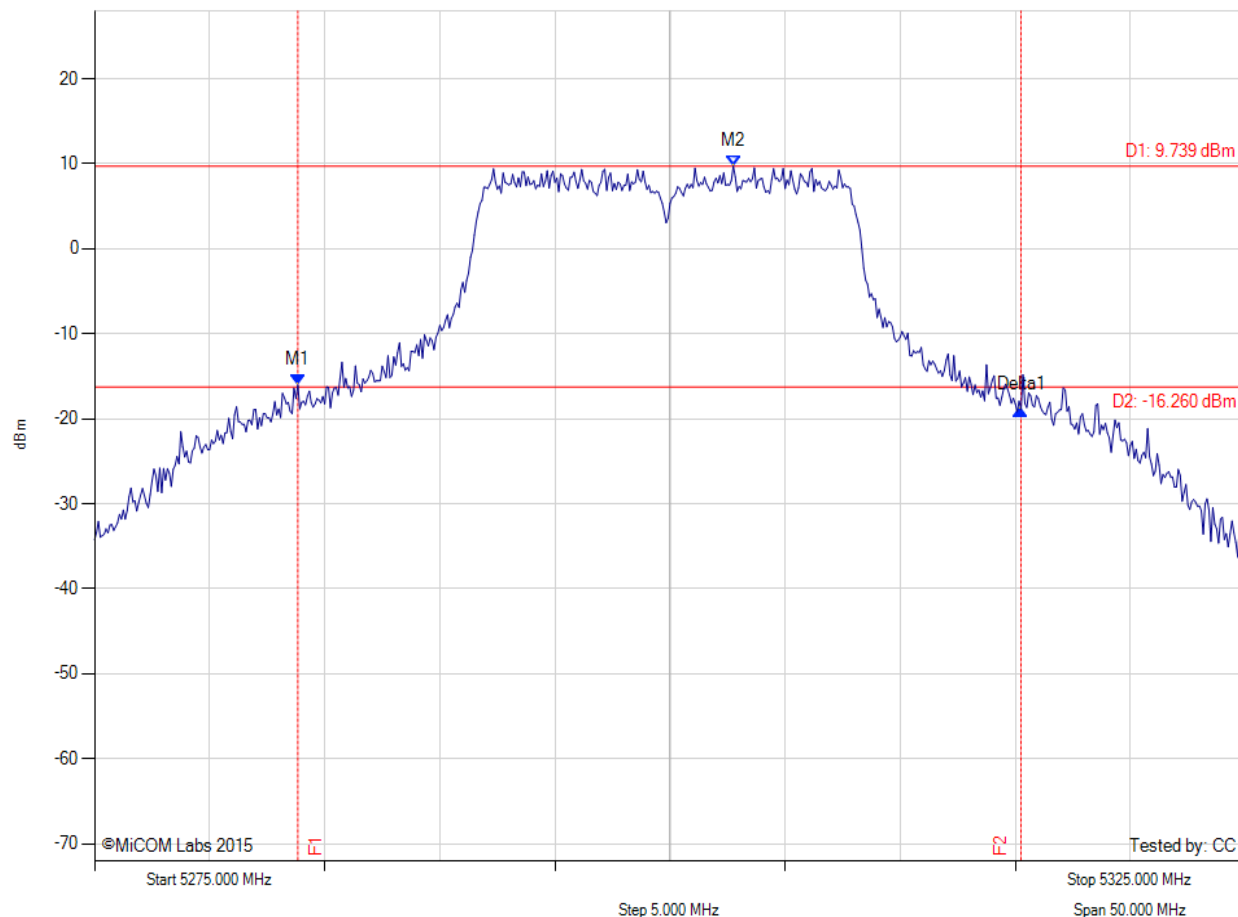
[back to matrix](#)

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Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 2.0 s

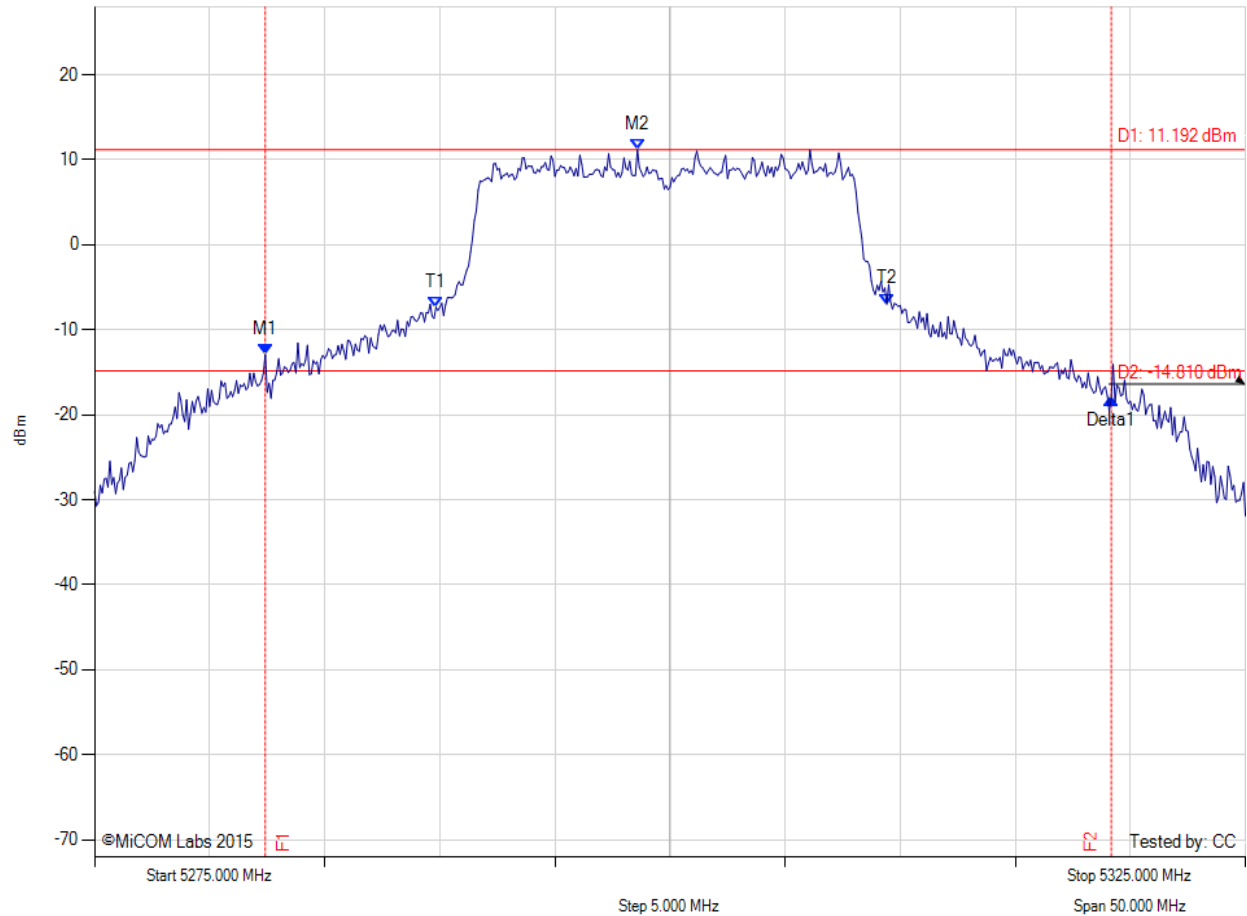
RBW: 200 KHz
VBW: 1 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5283.830 MHz : -16.001 dBm M2 : 5302.750 MHz : 9.739 dBm Delta1 : 31.420 MHz : -2.908 dB T1 : 0 Hz : 0.000 dBm T2 : 0 Hz : 0.000 dBm OBW : 17.503 MHz	Measured 26 dB Bandwidth: 31.420 MHz Measured 99% Bandwidth: 17.503 MHz

[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5282.420 MHz : -12.909 dBm M2 : 5298.580 MHz : 11.192 dBm Delta1 : 36.750 MHz : -5.193 dB T1 : 5289.833 MHz : -7.339 dBm T2 : 5309.417 MHz : -6.964 dBm OBW : 19.986 MHz	Measured 26 dB Bandwidth: 36.750 MHz Measured 99% Bandwidth: 19.986 MHz

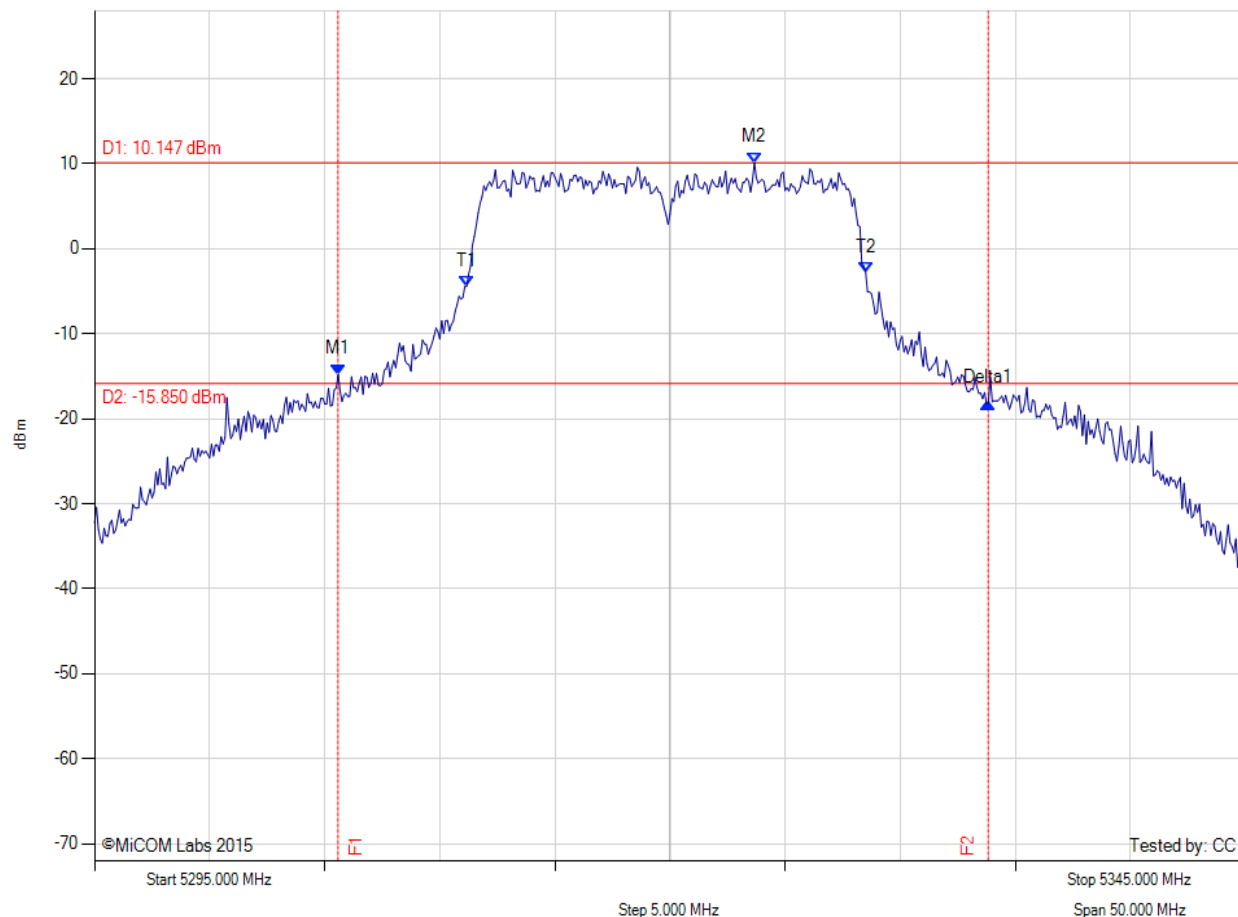
[back to matrix](#)

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Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 2.0 s

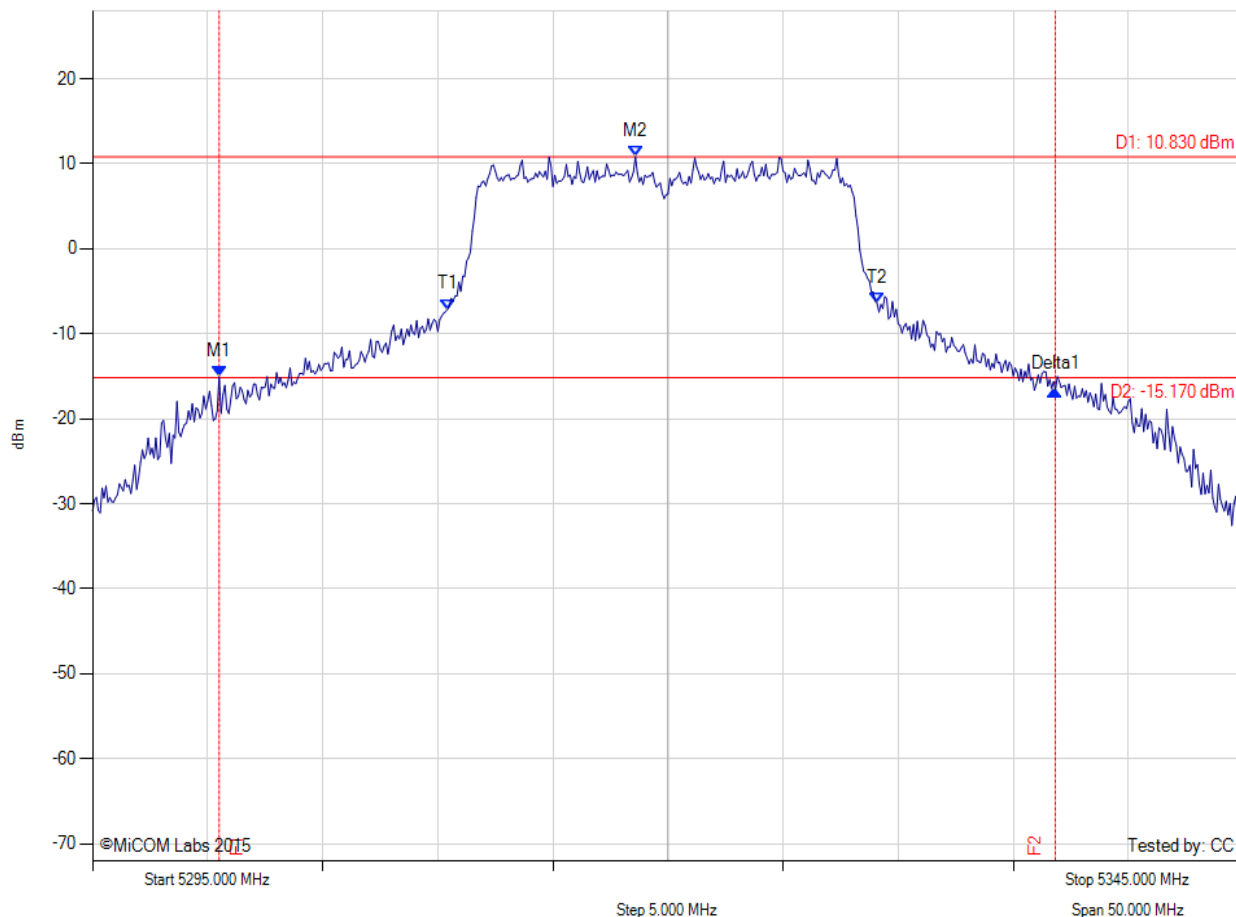
RBW: 200 KHz
VBW: 1 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5305.580 MHz : -14.785 dBm M2 : 5323.670 MHz : 10.147 dBm Delta1 : 28.250 MHz : -3.303 dB T1 : 5311.167 MHz : -4.393 dBm T2 : 5328.500 MHz : -2.737 dBm OBW : 17.403 MHz	Measured 26 dB Bandwidth: 28.250 MHz Measured 99% Bandwidth: 17.403 MHz

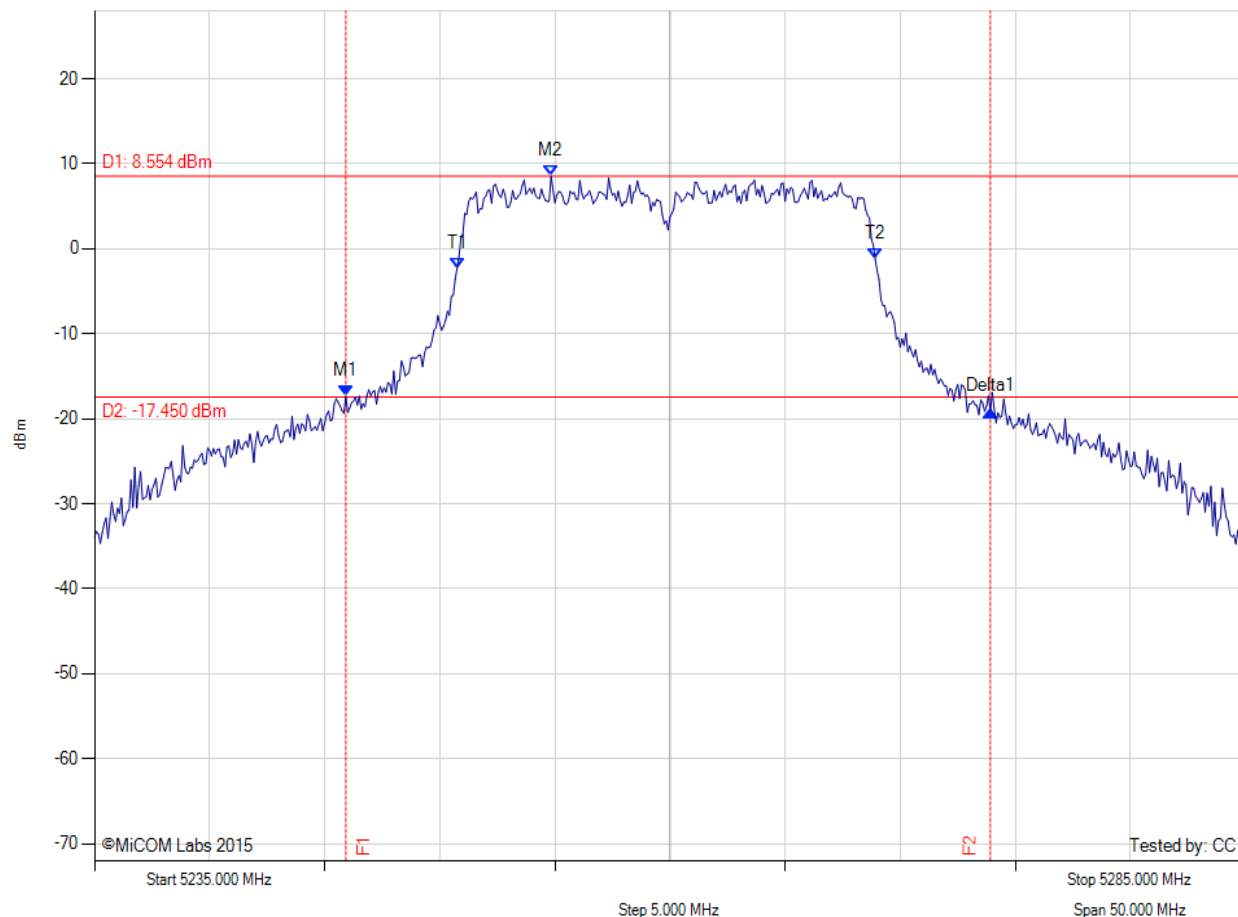
[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5300.500 MHz : -15.078 dBm M2 : 5318.580 MHz : 10.830 dBm Delta1 : 36.330 MHz : -1.483 dB T1 : 5310.417 MHz : -7.125 dBm T2 : 5329.083 MHz : -6.405 dBm OBW : 19.005 MHz	Measured 26 dB Bandwidth: 36.330 MHz Measured 99% Bandwidth: 19.005 MHz

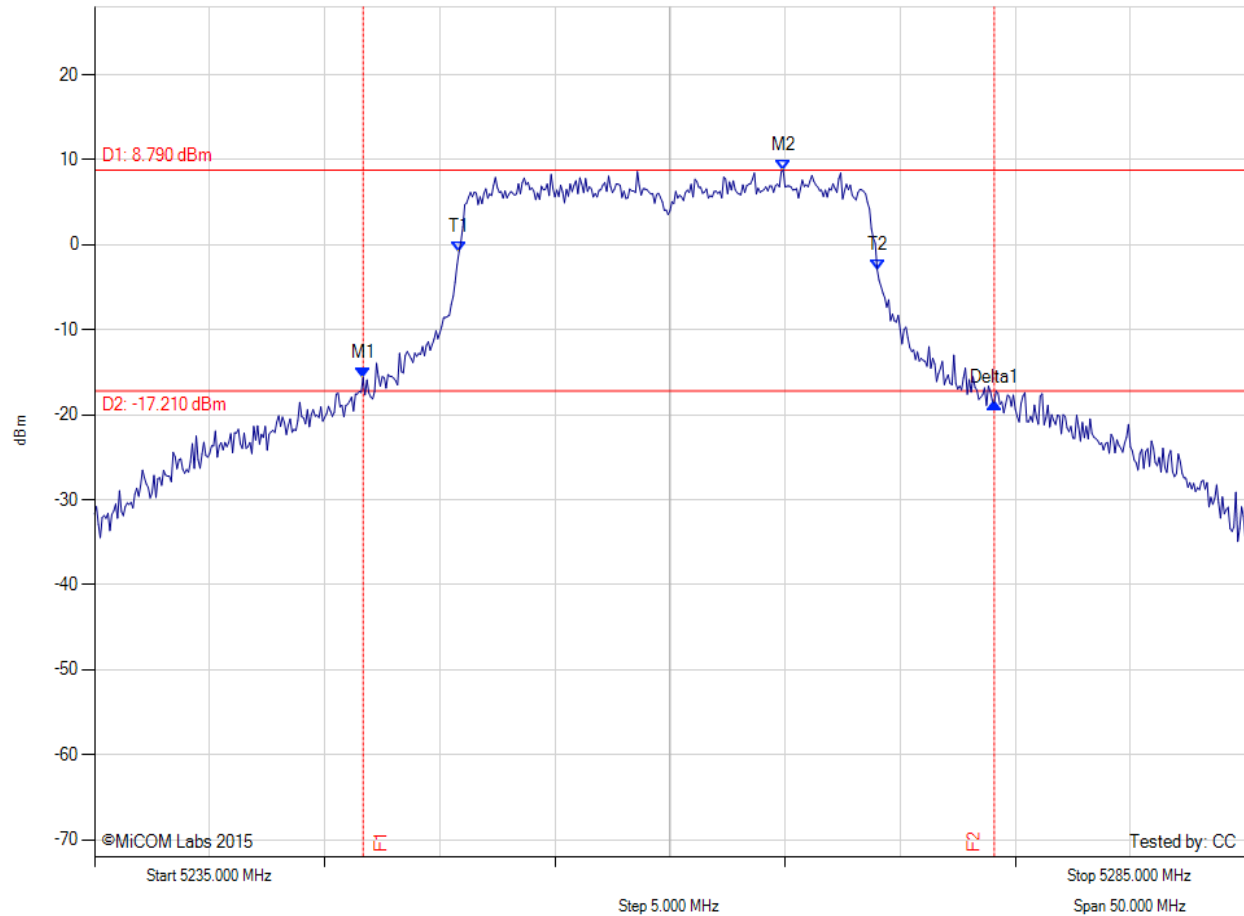
[back to matrix](#)



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5245.920 MHz : -17.335 dBm M2 : 5254.830 MHz : 8.554 dBm Delta1 : 28.000 MHz : -1.721 dB T1 : 5250.750 MHz : -2.289 dBm T2 : 5268.917 MHz : -1.231 dBm OBW : 18.217 MHz	Measured 26 dB Bandwidth: 28.000 MHz Measured 99% Bandwidth: 18.217 MHz

[back to matrix](#)

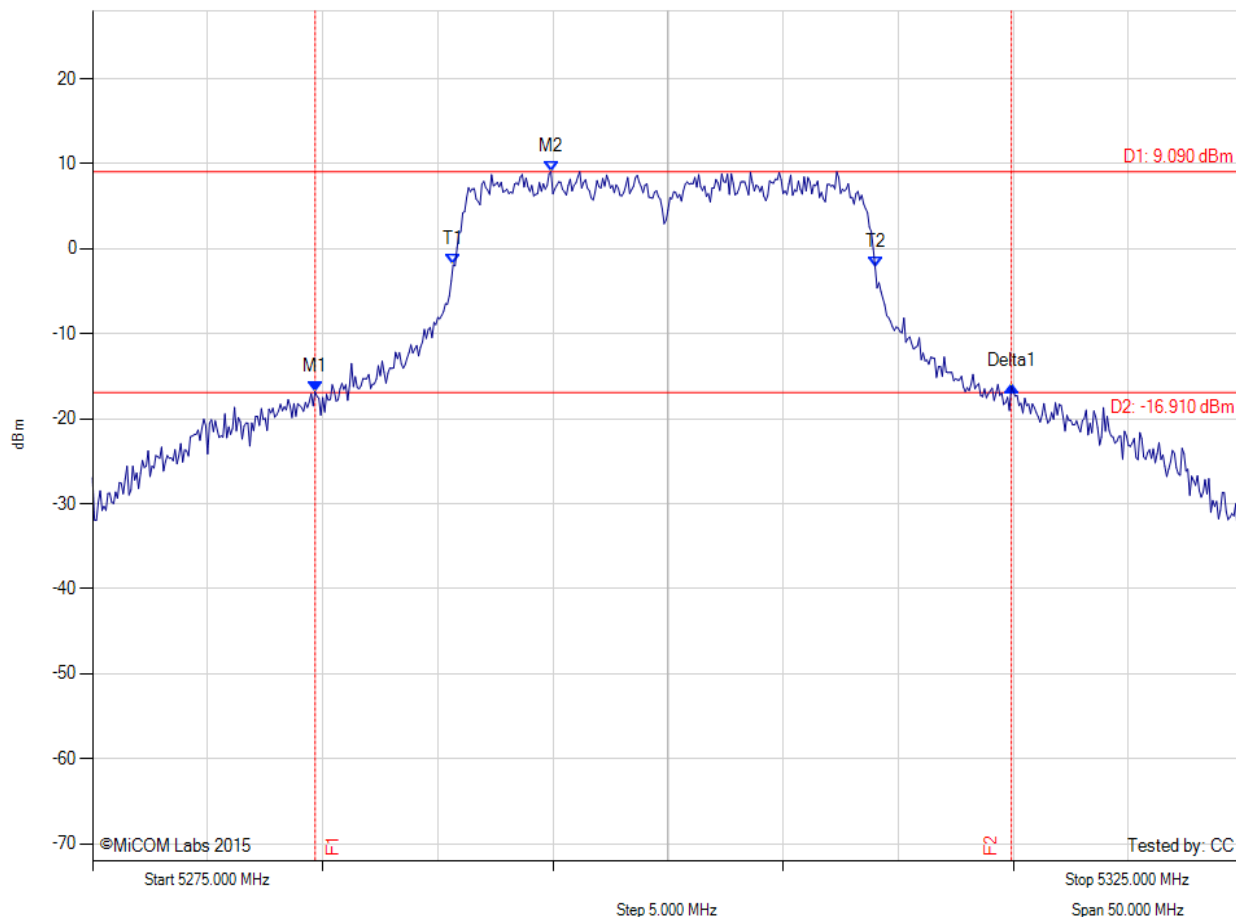
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5246.670 MHz : -15.633 dBm M2 : 5264.920 MHz : 8.790 dBm Delta1 : 27.420 MHz : -2.956 dB T1 : 5250.833 MHz : -0.834 dBm T2 : 5269.000 MHz : -2.927 dBm OBW : 18.228 MHz	Measured 26 dB Bandwidth: 27.420 MHz Measured 99% Bandwidth: 18.228 MHz

[back to matrix](#)

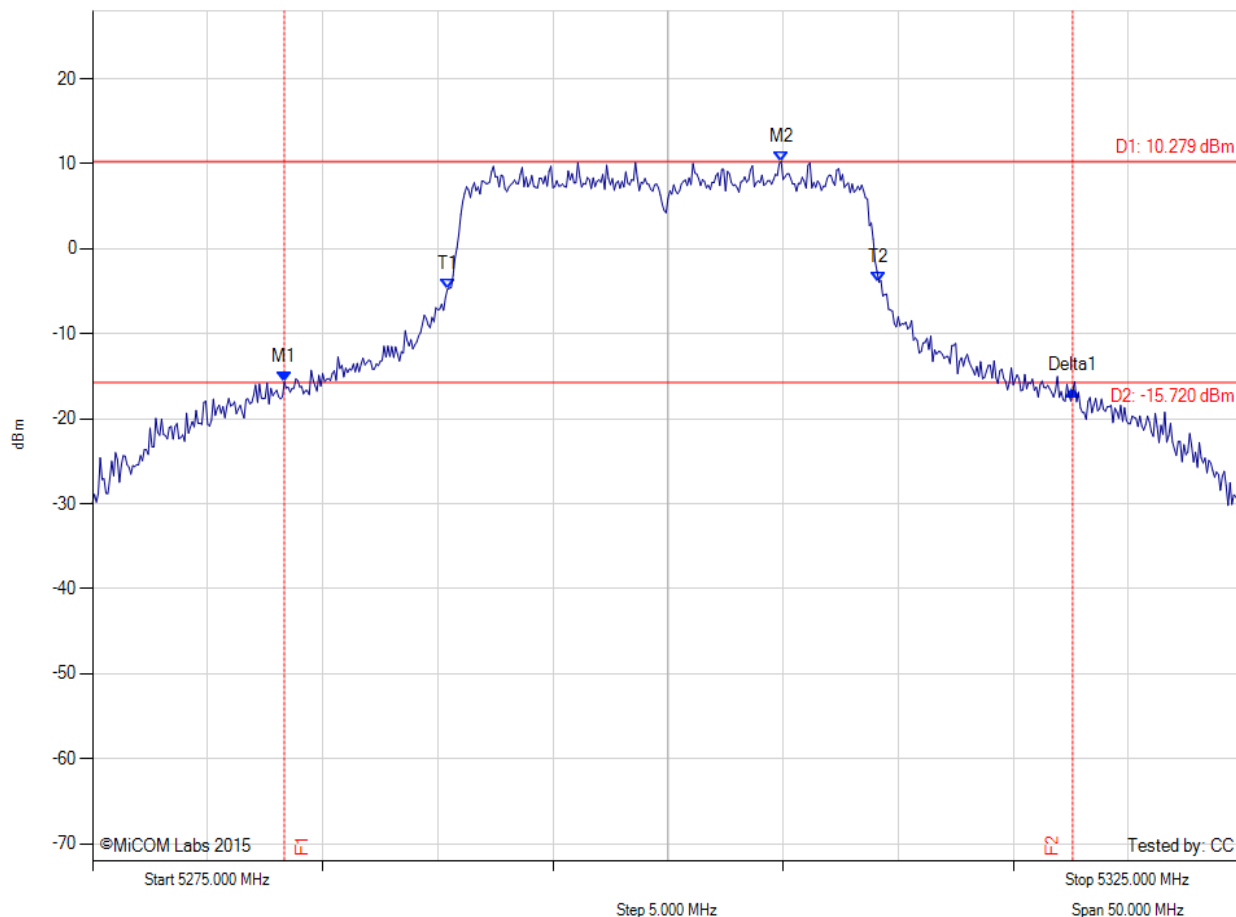
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5284.670 MHz : -16.782 dBm M2 : 5294.920 MHz : 9.090 dBm Delta1 : 30.250 MHz : 0.636 dB T1 : 5290.667 MHz : -1.874 dBm T2 : 5309.000 MHz : -2.210 dBm OBW : 18.352 MHz	Measured 26 dB Bandwidth: 30.250 MHz Measured 99% Bandwidth: 18.352 MHz

[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5283.330 MHz : -15.682 dBm M2 : 5304.920 MHz : 10.279 dBm Delta1 : 34.250 MHz : -0.968 dB T1 : 5290.417 MHz : -4.761 dBm T2 : 5309.167 MHz : -3.938 dBm OBW : 18.861 MHz	Measured 26 dB Bandwidth: 34.250 MHz Measured 99% Bandwidth: 18.861 MHz

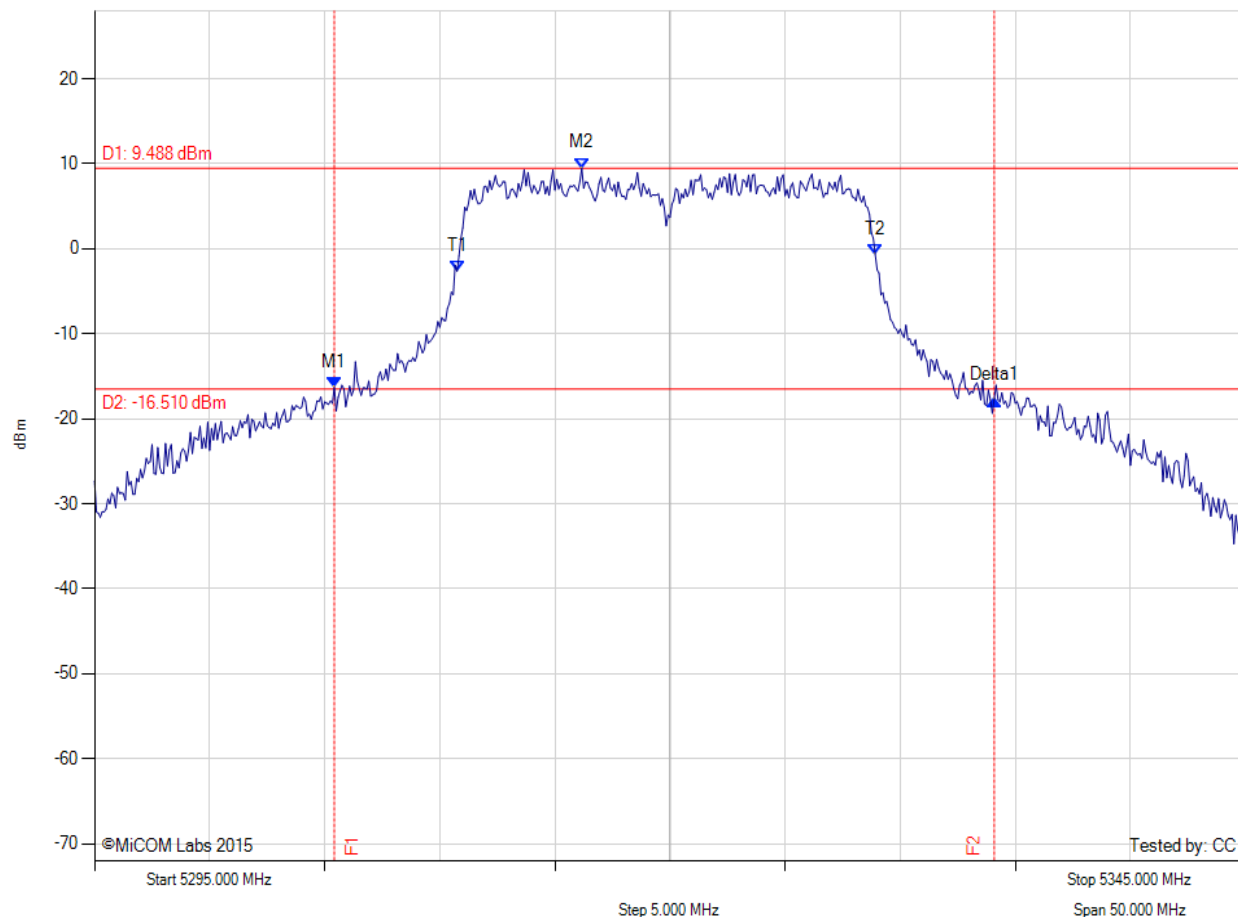
[back to matrix](#)

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Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 2.0 s

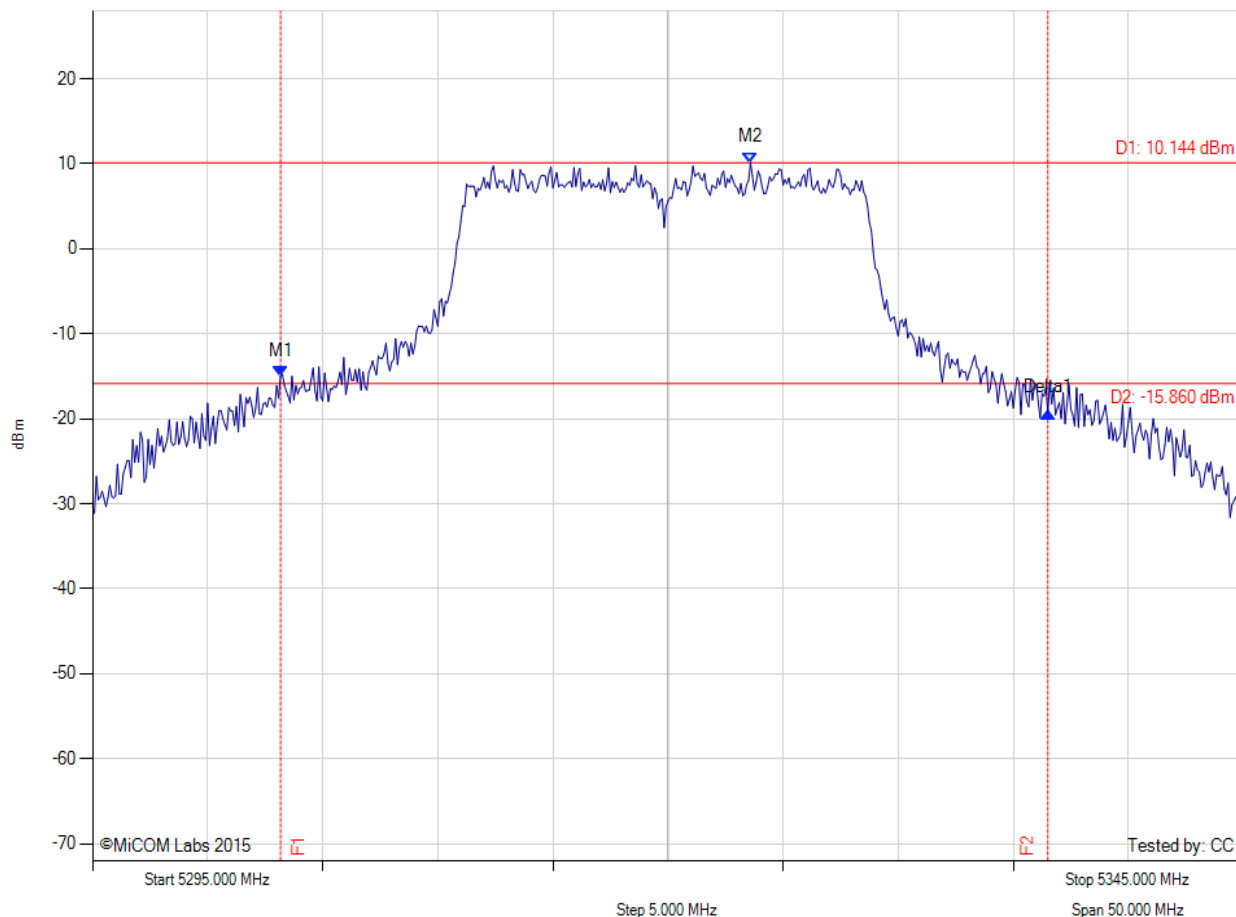
RBW: 200 KHz
VBW: 1 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5305.420 MHz : -16.332 dBm M2 : 5316.170 MHz : 9.488 dBm Delta1 : 28.670 MHz : -1.391 dB T1 : 5310.750 MHz : -2.645 dBm T2 : 5328.917 MHz : -0.686 dBm OBW : 18.264 MHz	Measured 26 dB Bandwidth: 28.670 MHz Measured 99% Bandwidth: 18.264 MHz

[back to matrix](#)

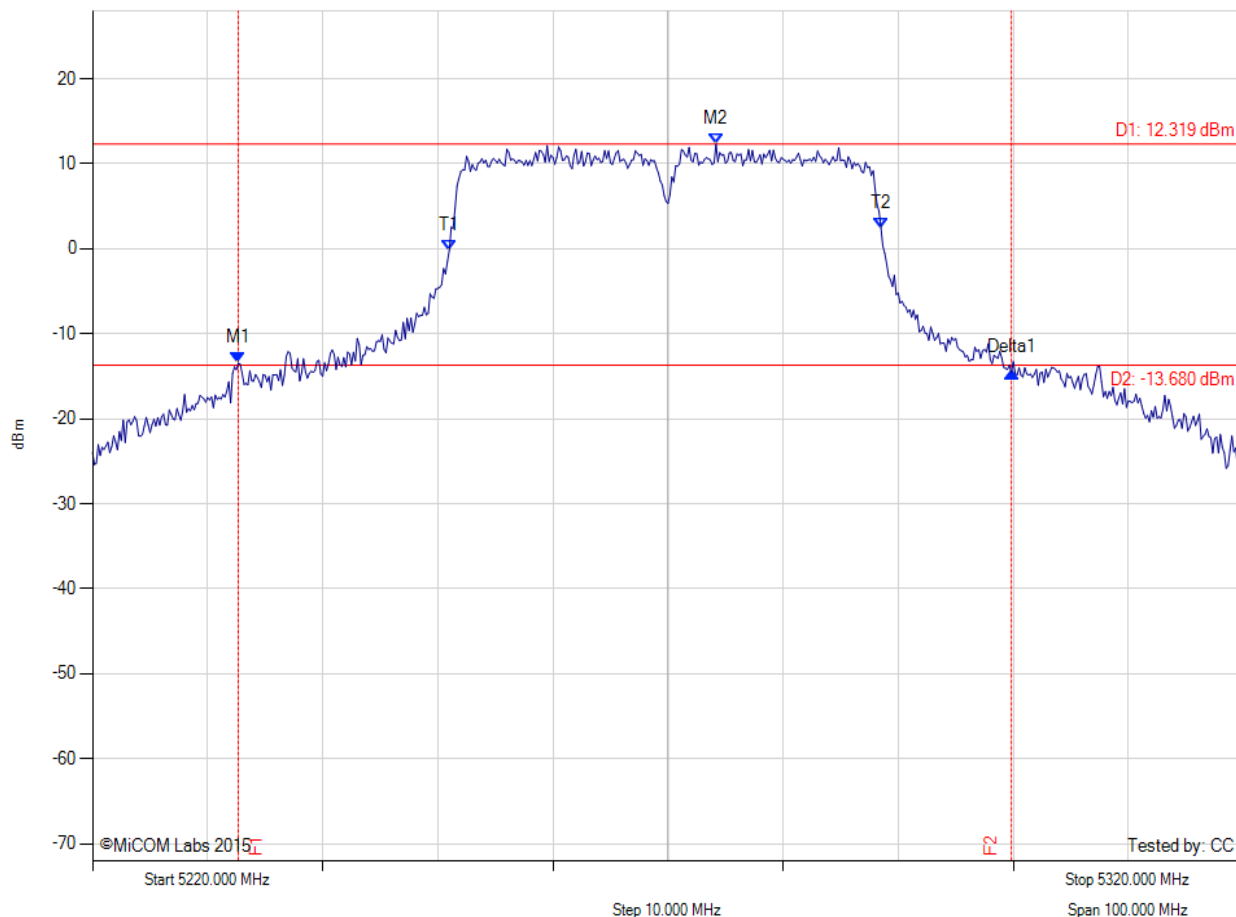
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5303.170 MHz : -14.961 dBm M2 : 5323.580 MHz : 10.144 dBm Delta1 : 33.330 MHz : -4.283 dB T1 : 0 Hz : 0.000 dBm T2 : 0 Hz : 0.000 dBm OBW : 18.588 MHz	Measured 26 dB Bandwidth: 33.330 MHz Measured 99% Bandwidth: 18.588 MHz

[back to matrix](#)

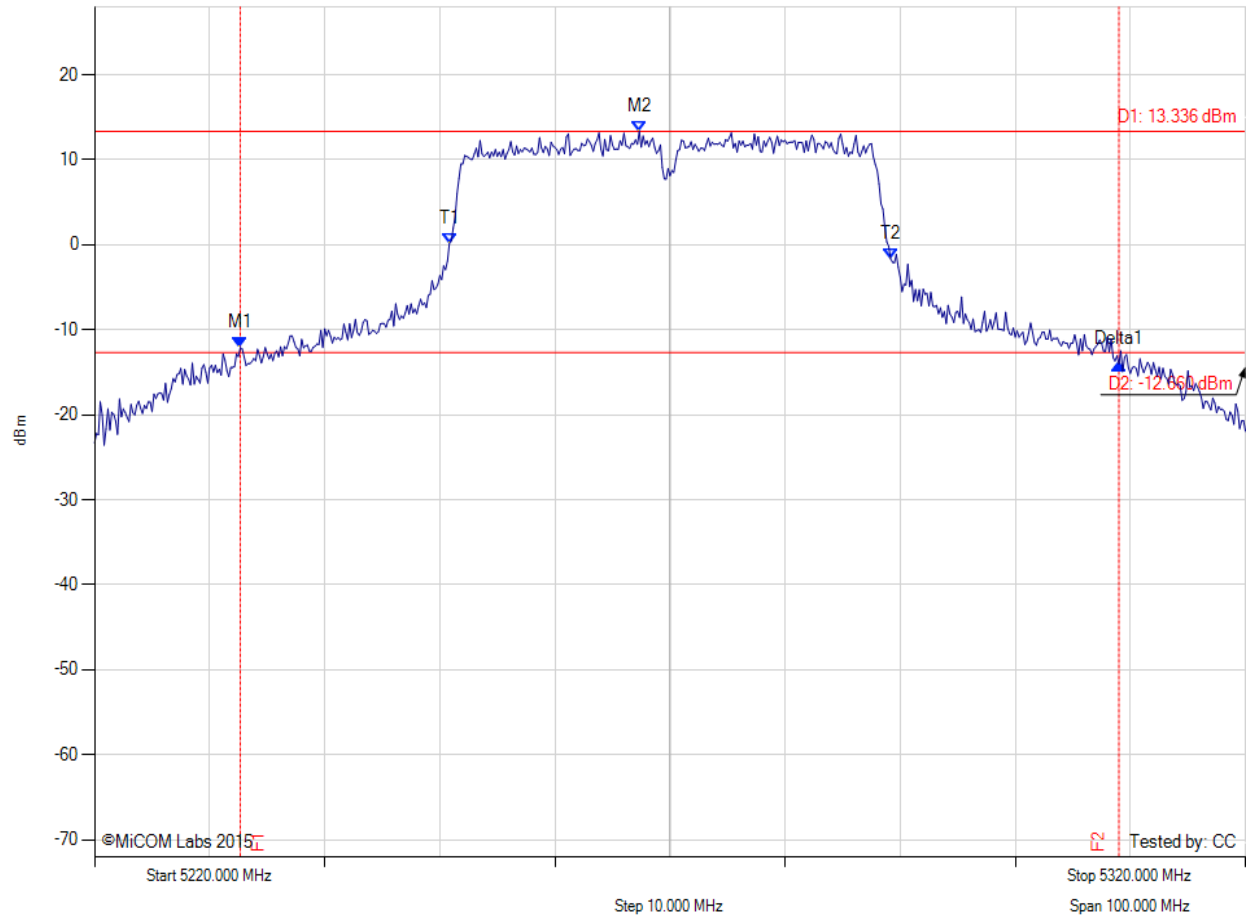
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5232.670 MHz : -13.433 dBm M2 : 5274.170 MHz : 12.319 dBm Delta1 : 67.170 MHz : -1.143 dB T1 : 5251.000 MHz : -0.154 dBm T2 : 5288.500 MHz : 2.475 dBm OBW : 37.514 MHz	Measured 26 dB Bandwidth: 67.170 MHz Measured 99% Bandwidth: 37.514 MHz

[back to matrix](#)

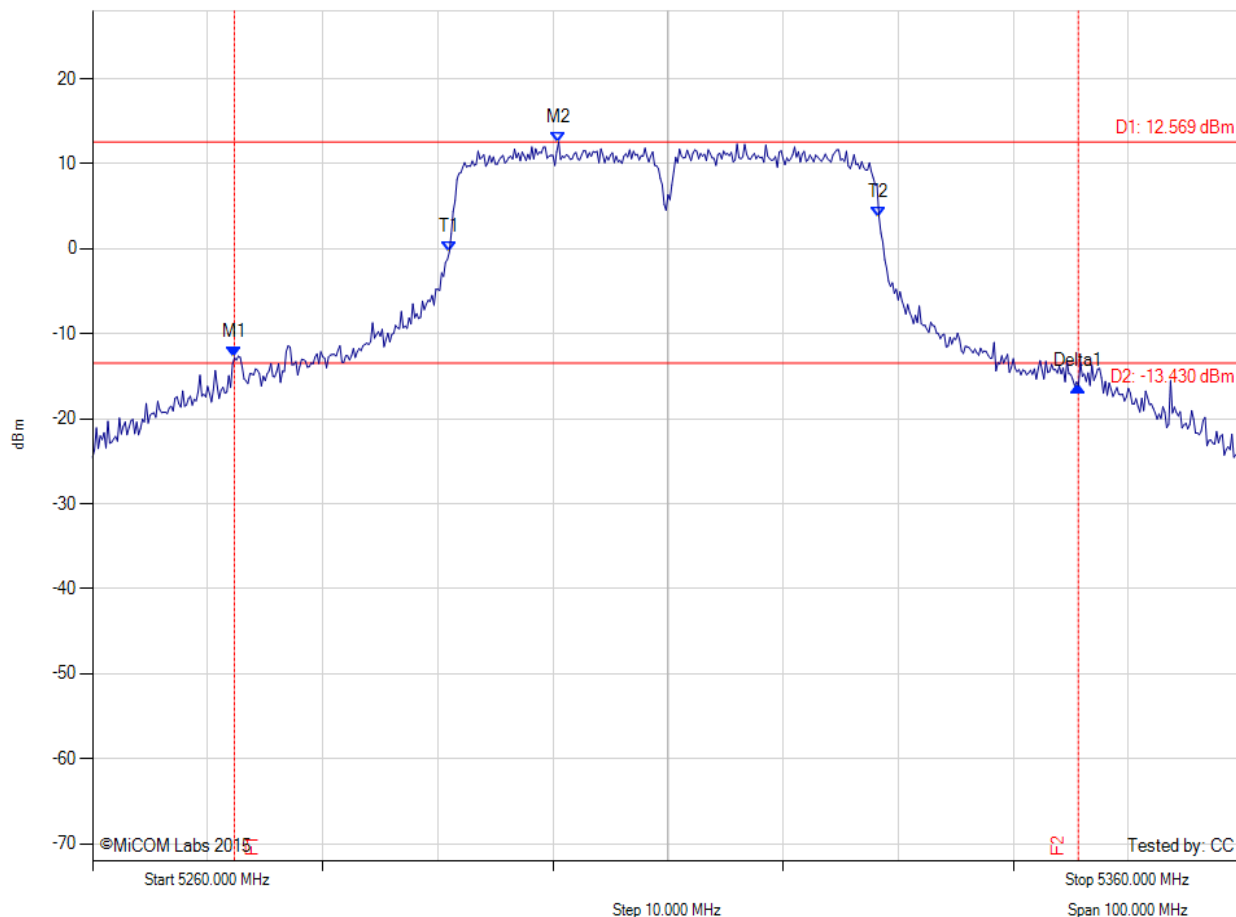
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5232.670 MHz : -12.093 dBm M2 : 5267.330 MHz : 13.336 dBm Delta1 : 76.330 MHz : -1.918 dB T1 : 5250.833 MHz : 0.163 dBm T2 : 5289.167 MHz : -1.647 dBm OBW : 39.412 MHz	Measured 26 dB Bandwidth: 76.330 MHz Measured 99% Bandwidth: 39.412 MHz

[back to matrix](#)

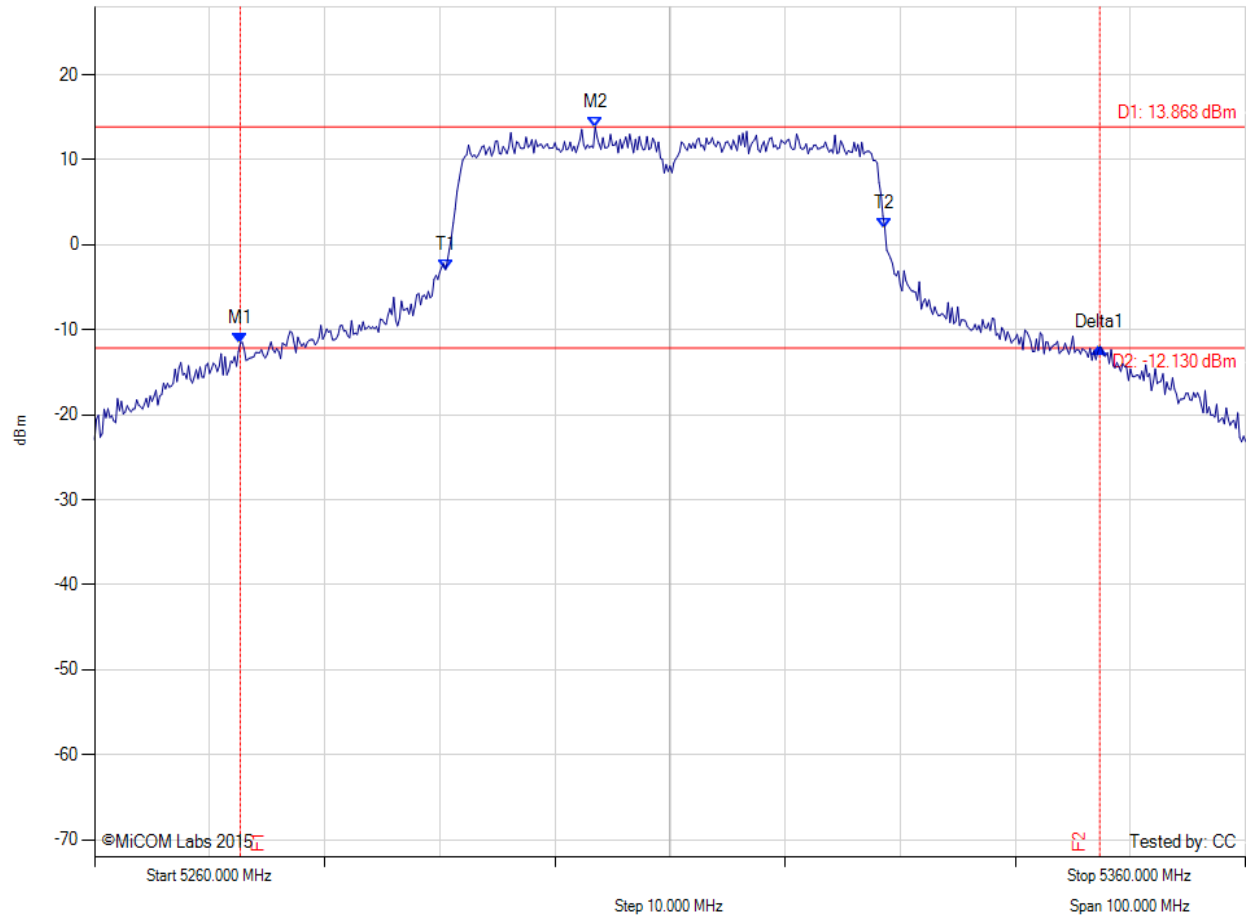
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5272.330 MHz : -12.793 dBm M2 : 5300.500 MHz : 12.569 dBm Delta1 : 73.330 MHz : -3.301 dB T1 : 5291.000 MHz : -0.388 dBm T2 : 5328.333 MHz : 3.772 dBm OBW : 37.561 MHz	Measured 26 dB Bandwidth: 73.330 MHz Measured 99% Bandwidth: 37.561 MHz

[back to matrix](#)

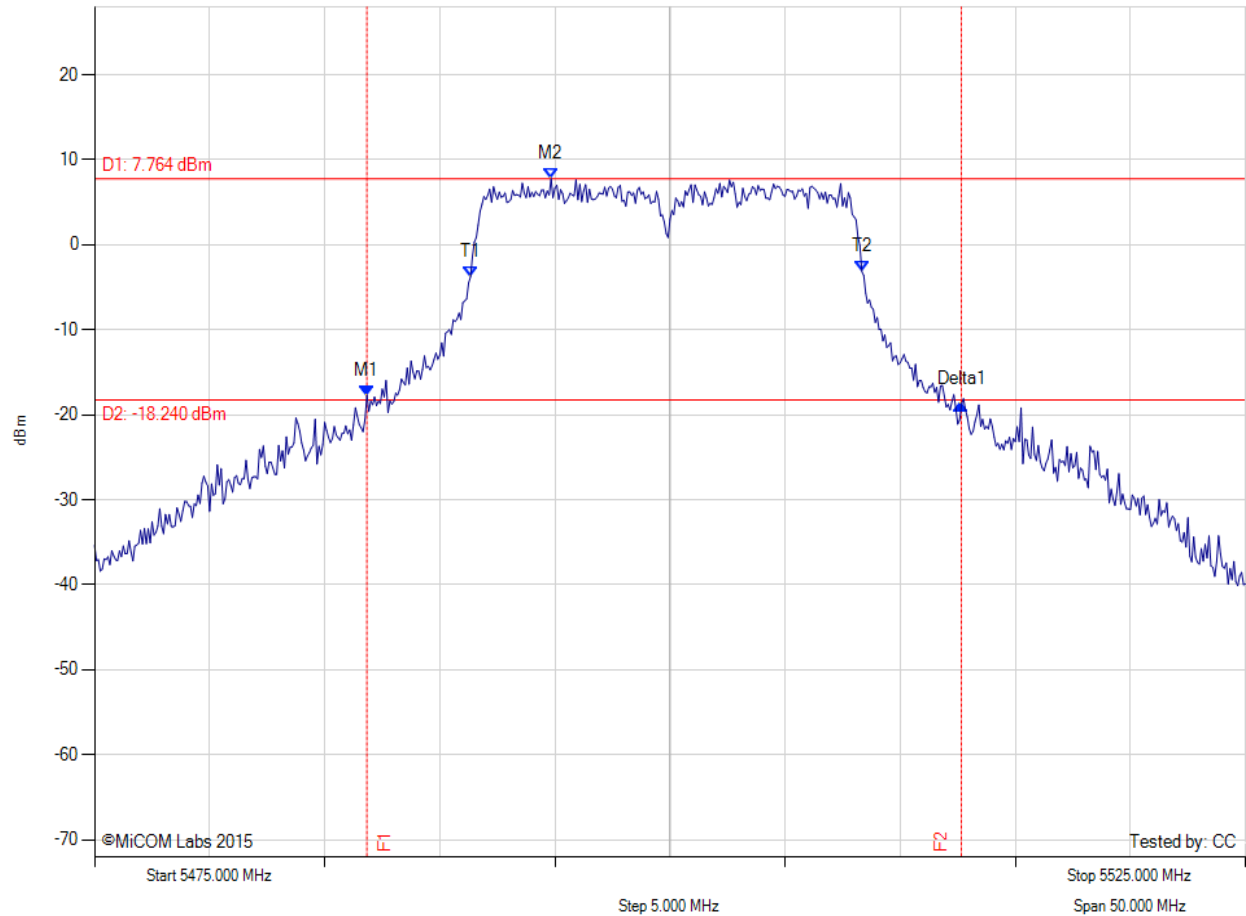
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5272.670 MHz : -11.541 dBm M2 : 5303.500 MHz : 13.868 dBm Delta1 : 74.670 MHz : -0.504 dB T1 : 5290.500 MHz : -2.920 dBm T2 : 5328.667 MHz : 1.975 dBm OBW : 38.840 MHz	Measured 26 dB Bandwidth: 74.670 MHz Measured 99% Bandwidth: 38.840 MHz

[back to matrix](#)

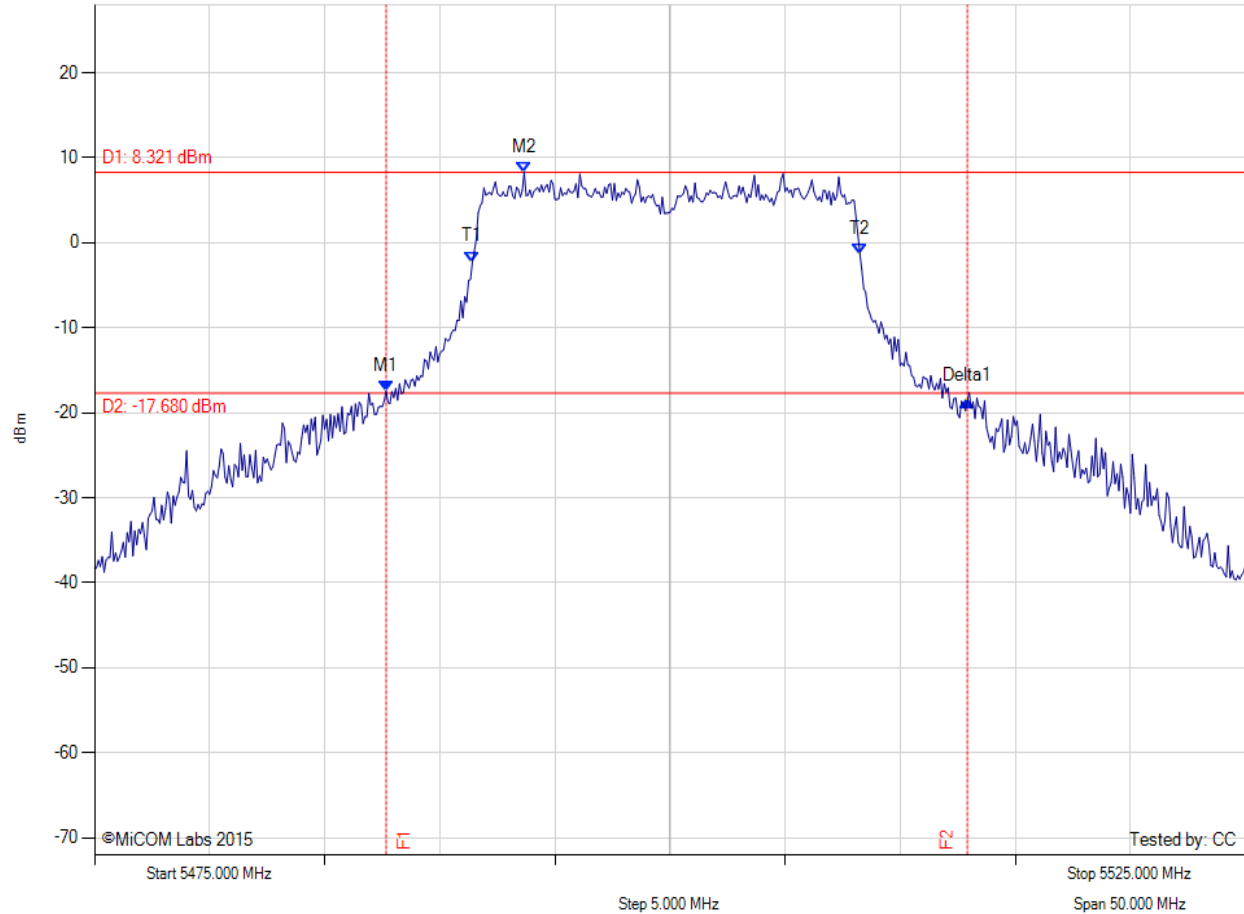
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5486.830 MHz : -17.736 dBm M2 : 5494.830 MHz : 7.764 dBm Delta1 : 25.830 MHz : -1.009 dB T1 : 5491.333 MHz : -3.769 dBm T2 : 5508.333 MHz : -3.132 dBm OBW : 16.961 MHz	Measured 26 dB Bandwidth: 25.830 MHz Measured 99% Bandwidth: 16.961 MHz

[back to matrix](#)

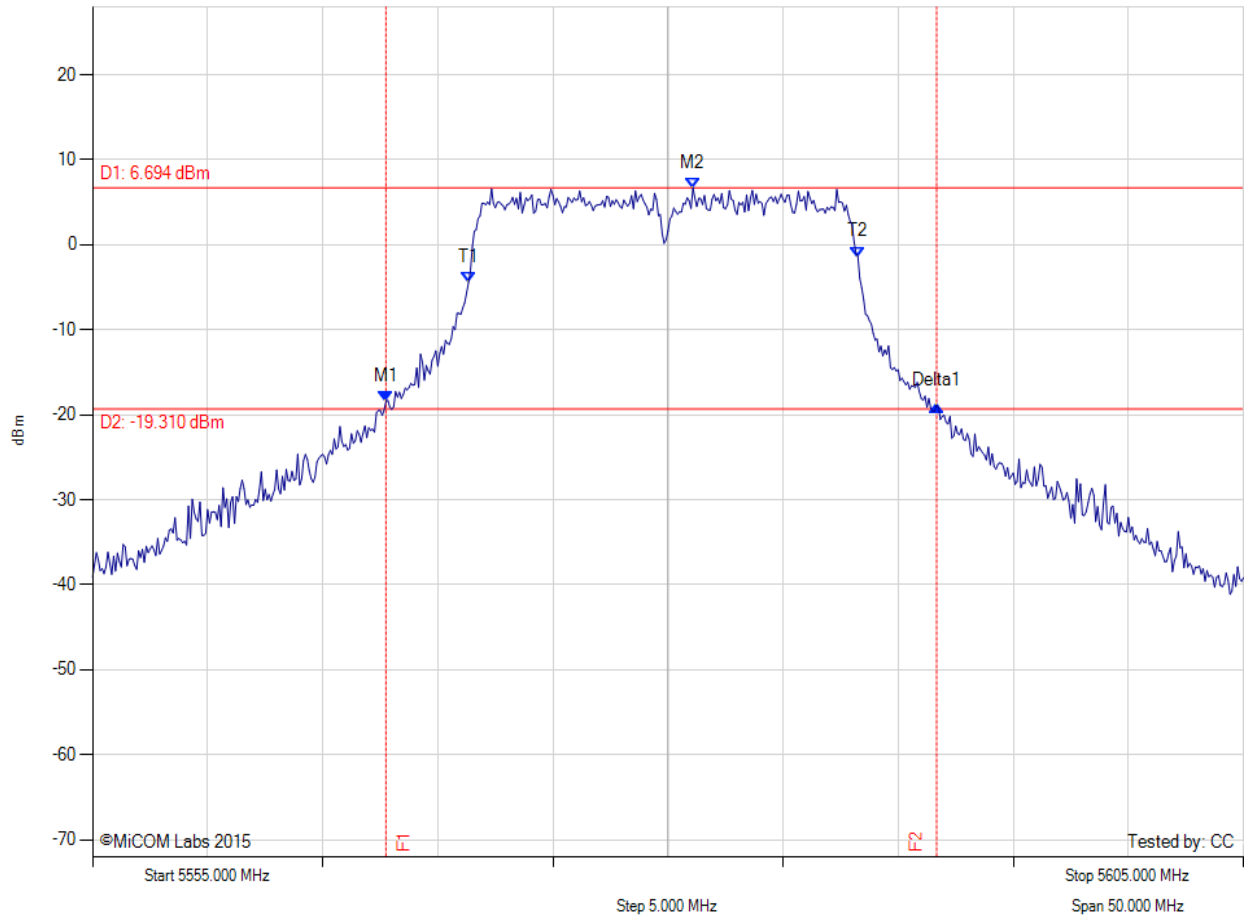
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5487.670 MHz : -17.449 dBm M2 : 5493.670 MHz : 8.321 dBm Delta1 : 25.250 MHz : -1.141 dB T1 : 5491.417 MHz : -2.229 dBm T2 : 5508.250 MHz : -1.340 dBm OBW : 16.885 MHz	Measured 26 dB Bandwidth: 25.250 MHz Measured 99% Bandwidth: 16.885 MHz

[back to matrix](#)

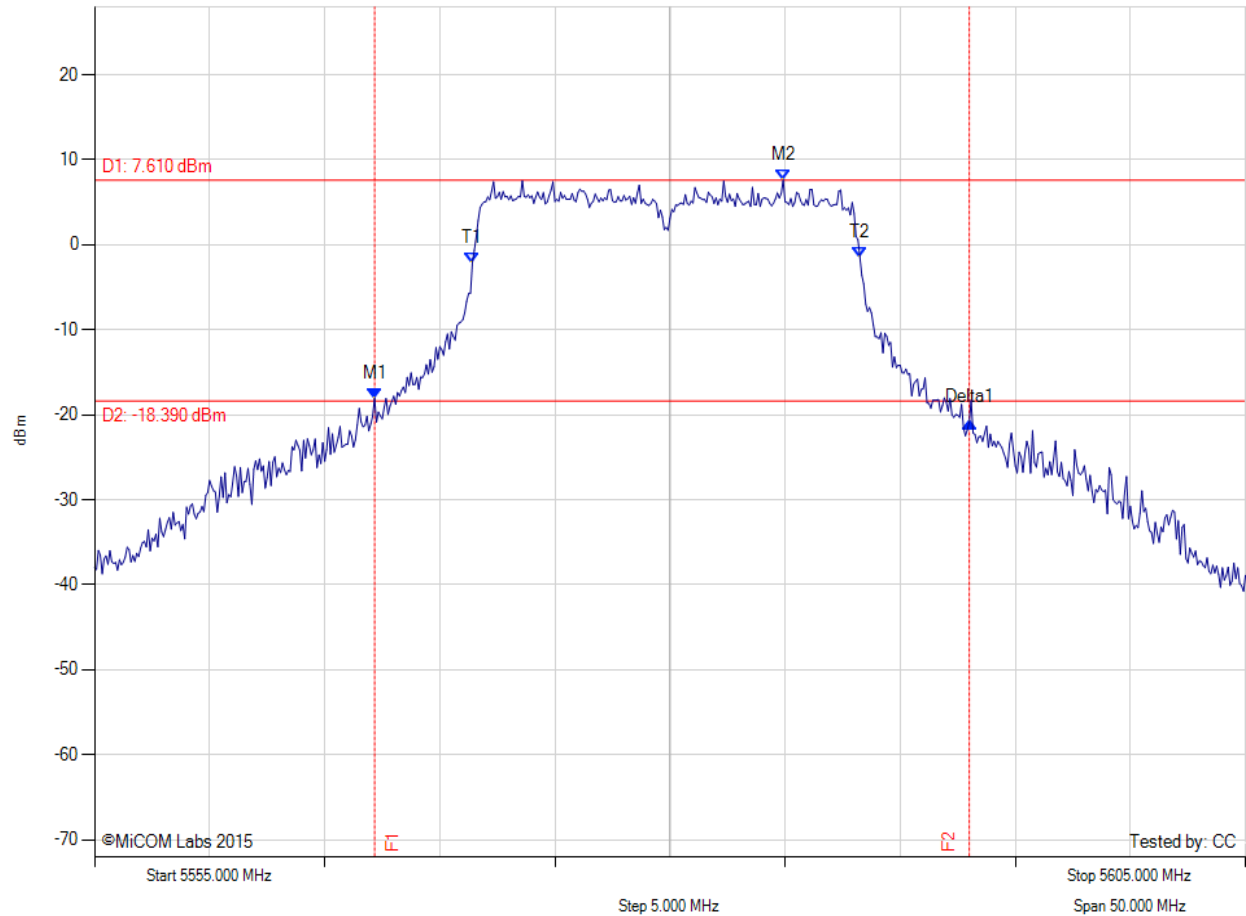
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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5567.750 MHz : -18.395 dBm M2 : 5581.080 MHz : 6.694 dBm Delta1 : 23.920 MHz : -0.497 dB T1 : 5571.333 MHz : -4.417 dBm T2 : 5588.250 MHz : -1.421 dBm OBW : 16.895 MHz	Measured 26 dB Bandwidth: 23.920 MHz Measured 99% Bandwidth: 16.895 MHz

[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5567.170 MHz : -18.055 dBm M2 : 5584.920 MHz : 7.610 dBm Delta1 : 25.830 MHz : -2.811 dB T1 : 5571.417 MHz : -2.092 dBm T2 : 5588.250 MHz : -1.484 dBm OBW : 16.846 MHz	Measured 26 dB Bandwidth: 25.830 MHz Measured 99% Bandwidth: 16.846 MHz

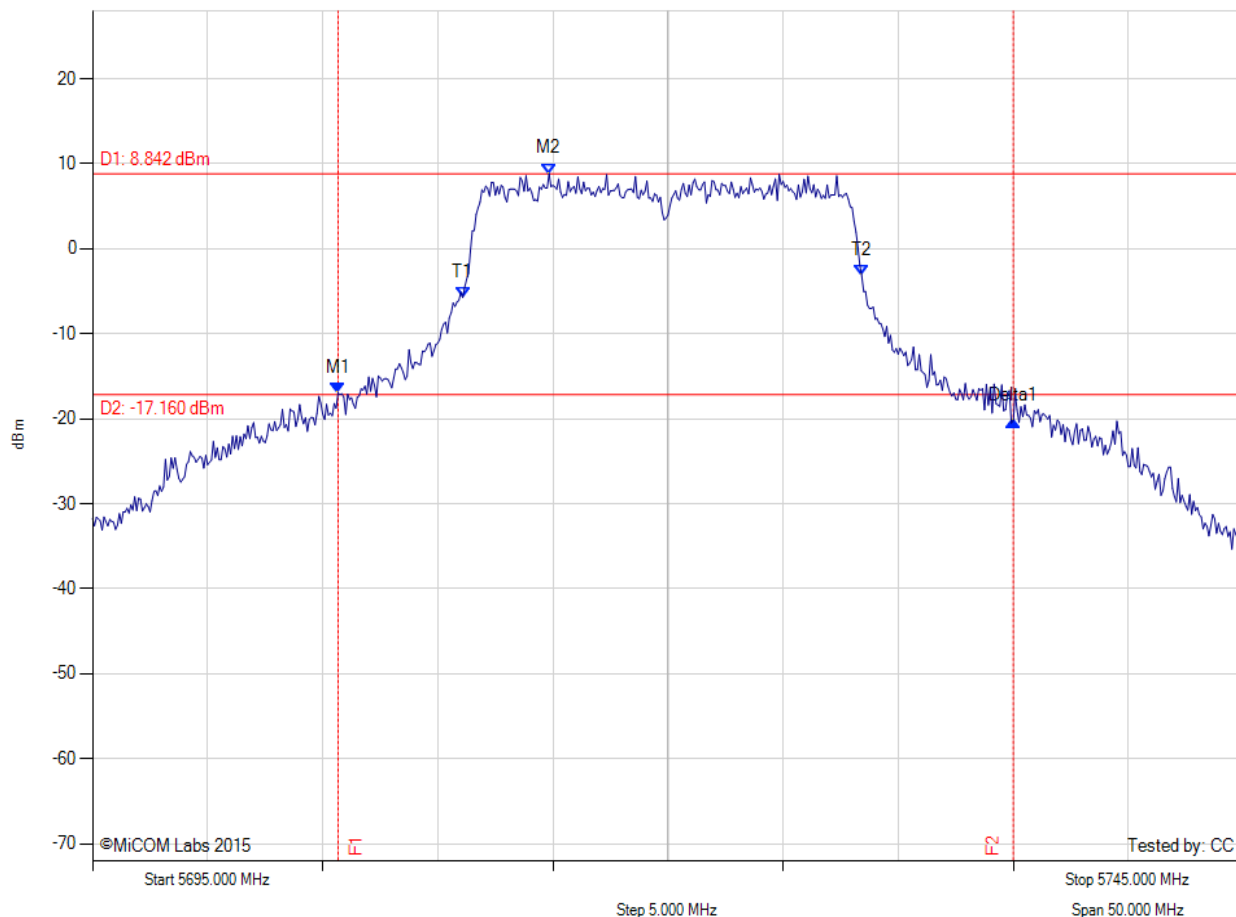
[back to matrix](#)

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Ref Level: +2.800E+01 dBm
23.8 dB Offset

Sweep Time: 2.0 s

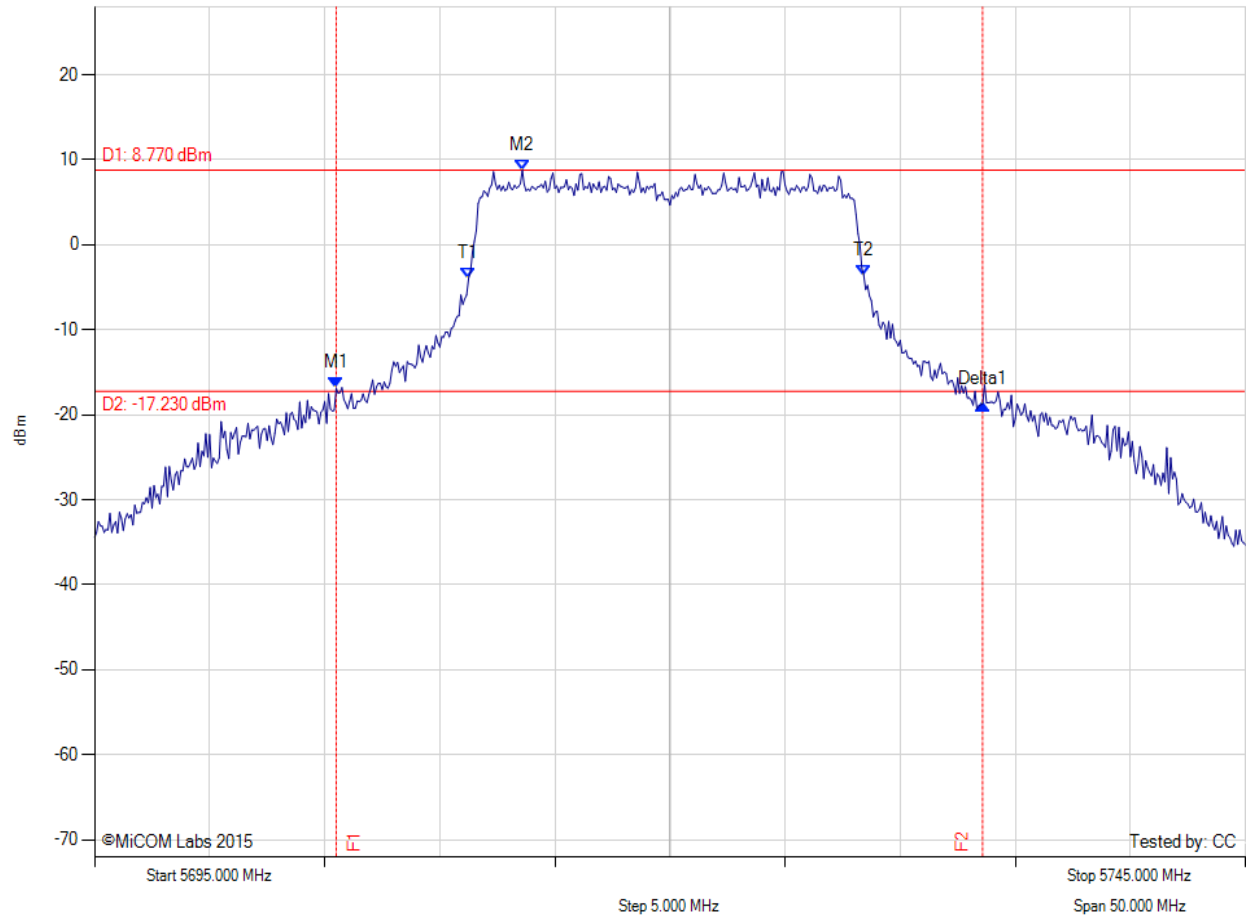
RBW: 200 KHz
VBW: 1 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5705.670 MHz : -16.957 dBm M2 : 5714.830 MHz : 8.842 dBm Delta1 : 29.330 MHz : -3.287 dB T1 : 5711.083 MHz : -5.719 dBm T2 : 5728.417 MHz : -3.182 dBm OBW : 17.348 MHz	Measured 26 dB Bandwidth: 29.330 MHz Measured 99% Bandwidth: 17.348 MHz

[back to matrix](#)

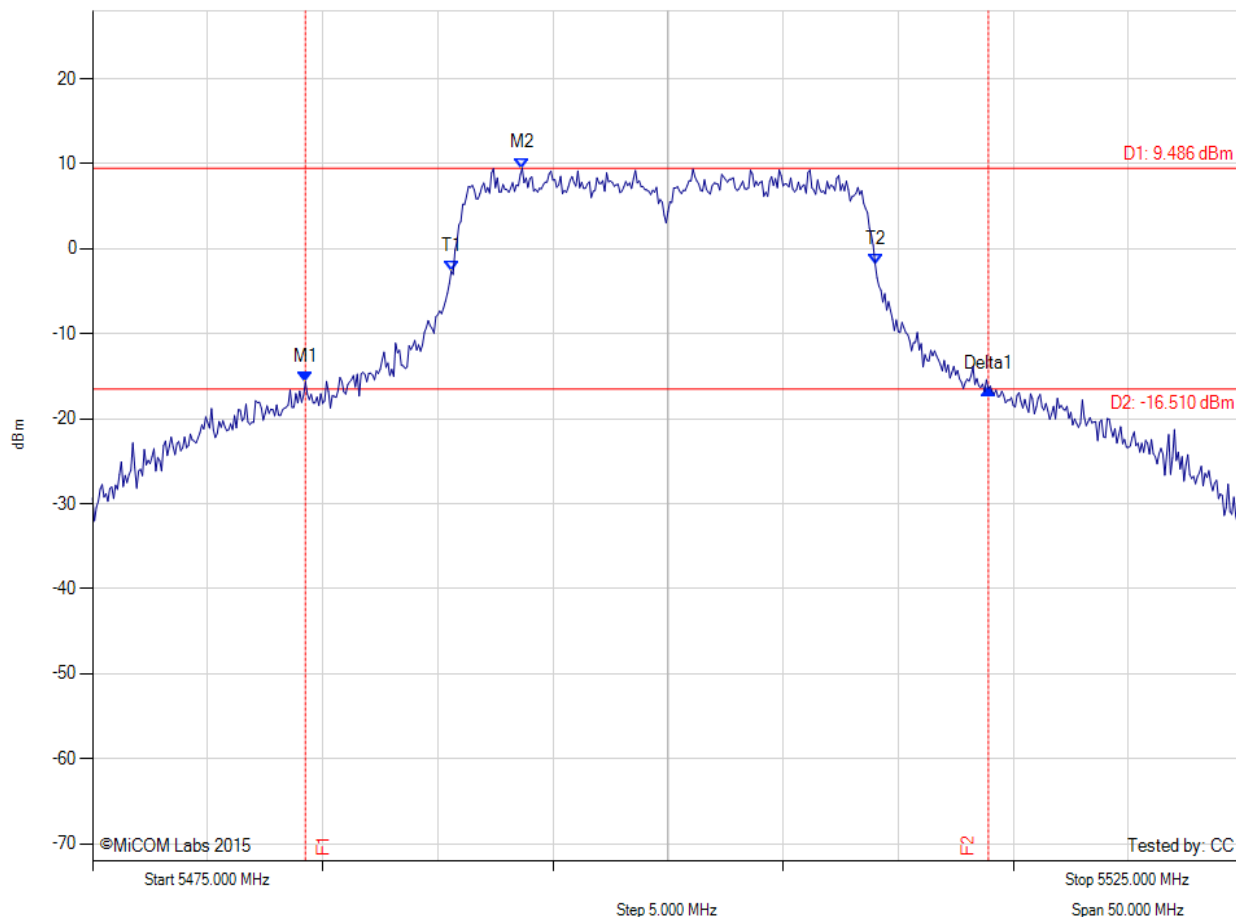
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5705.500 MHz : -16.859 dBm M2 : 5713.580 MHz : 8.770 dBm Delta1 : 28.080 MHz : -1.872 dB T1 : 5711.250 MHz : -3.947 dBm T2 : 5728.417 MHz : -3.550 dBm OBW : 17.140 MHz	Measured 26 dB Bandwidth: 28.080 MHz Measured 99% Bandwidth: 17.140 MHz

[back to matrix](#)

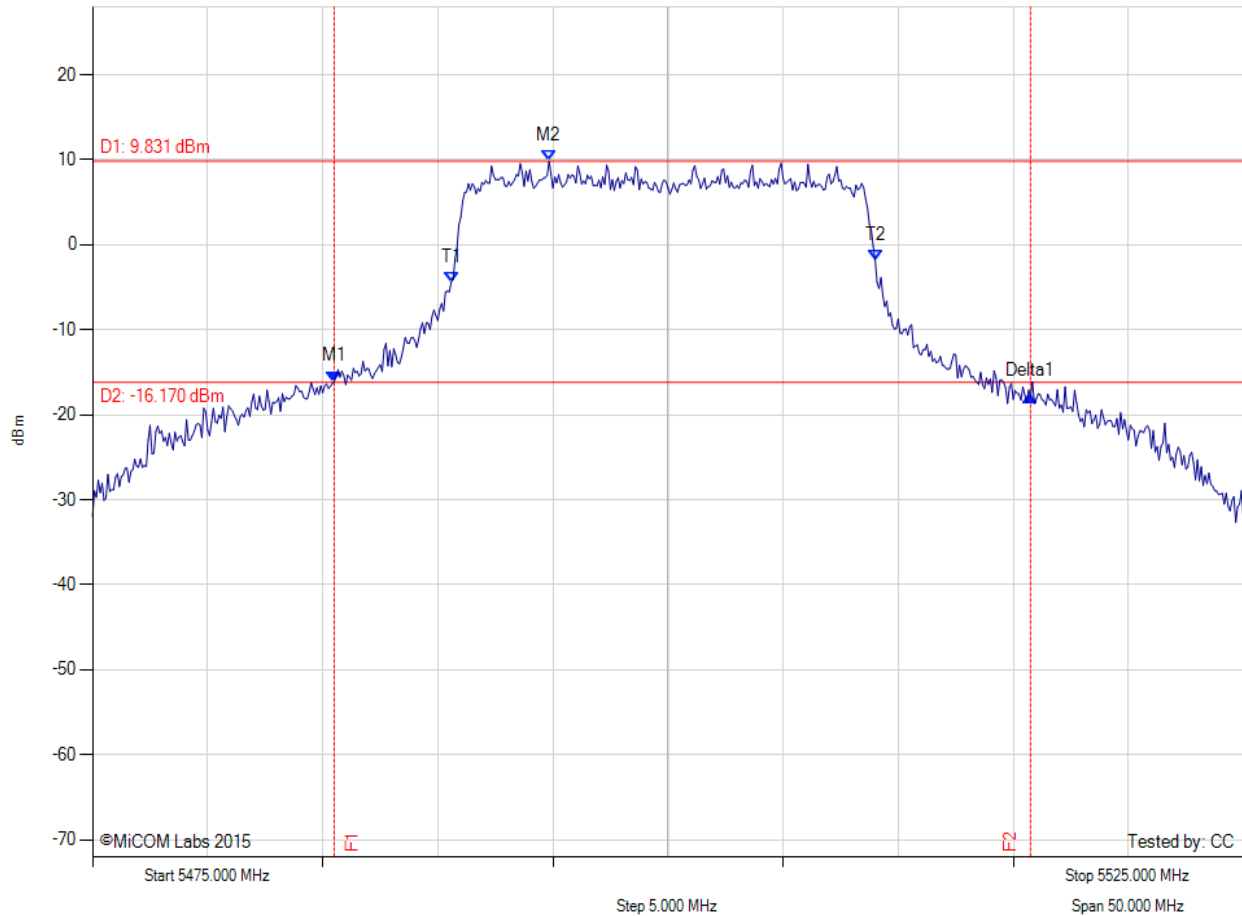
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5484.250 MHz : -15.669 dBm M2 : 5493.670 MHz : 9.486 dBm Delta1 : 29.670 MHz : -0.787 dB T1 : 5490.583 MHz : -2.595 dBm T2 : 5509.000 MHz : -1.827 dBm OBW : 18.471 MHz	Measured 26 dB Bandwidth: 29.670 MHz Measured 99% Bandwidth: 18.471 MHz

[back to matrix](#)

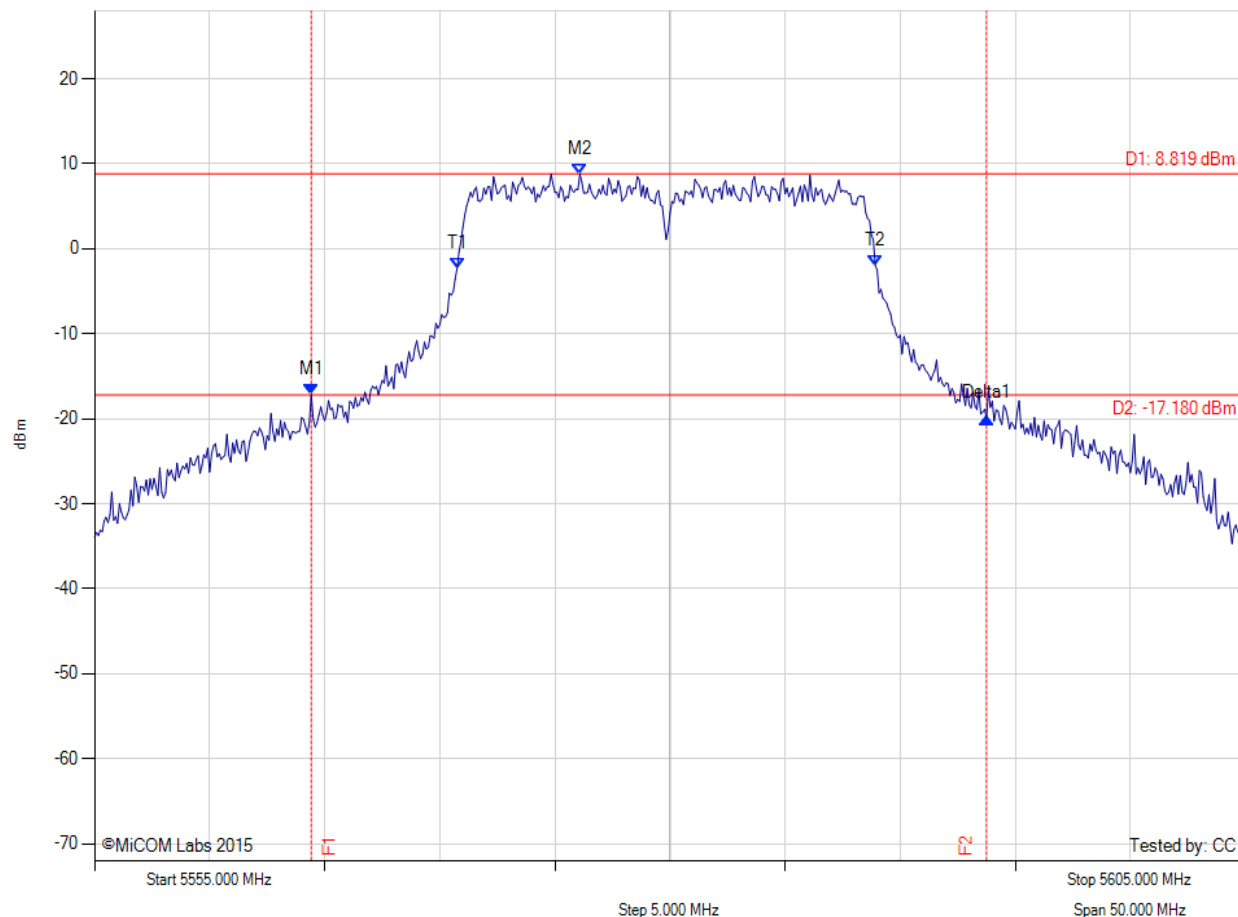
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5485.500 MHz : -16.083 dBm M2 : 5494.830 MHz : 9.831 dBm Delta1 : 30.250 MHz : -1.764 dB T1 : 5490.583 MHz : -4.383 dBm T2 : 5509.000 MHz : -1.788 dBm OBW : 18.425 MHz	Measured 26 dB Bandwidth: 30.250 MHz Measured 99% Bandwidth: 18.425 MHz

[back to matrix](#)

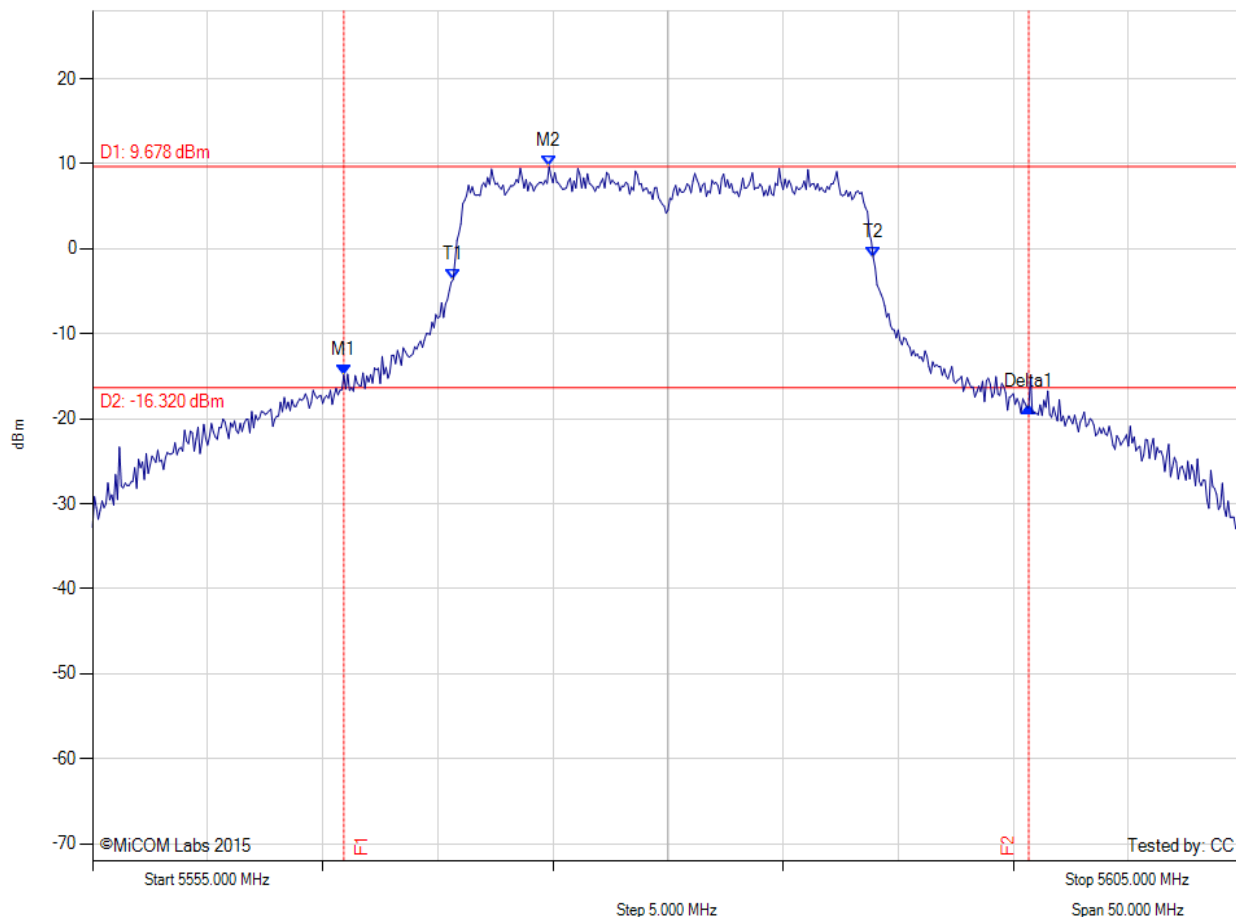
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5564.420 MHz : -17.173 dBm M2 : 5576.080 MHz : 8.819 dBm Delta1 : 29.330 MHz : -2.683 dB T1 : 5570.750 MHz : -2.311 dBm T2 : 5588.917 MHz : -1.961 dBm OBW : 18.179 MHz	Measured 26 dB Bandwidth: 29.330 MHz Measured 99% Bandwidth: 18.179 MHz

[back to matrix](#)

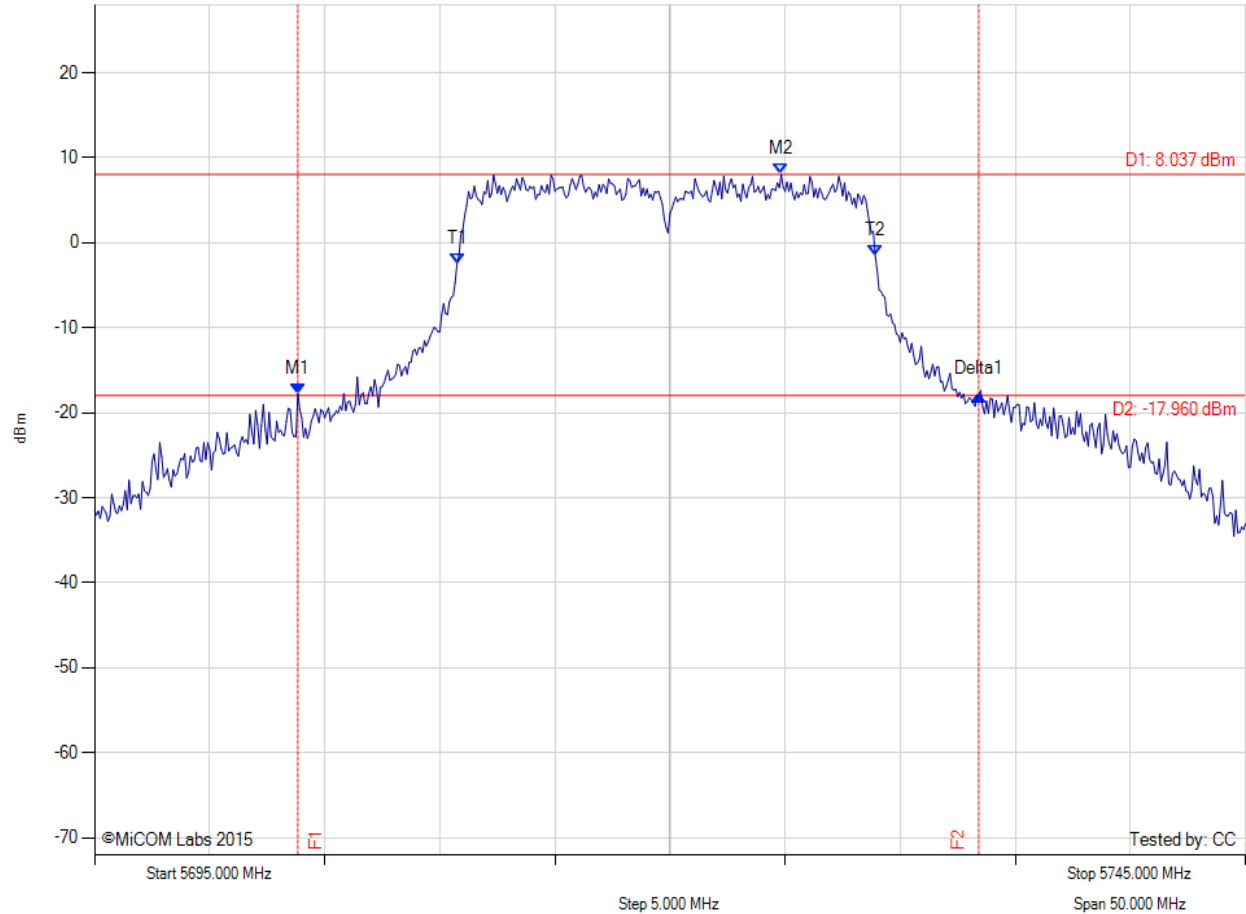
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5565.920 MHz : -14.829 dBm M2 : 5574.830 MHz : 9.678 dBm Delta1 : 29.750 MHz : -3.846 dB T1 : 5570.667 MHz : -3.617 dBm T2 : 5588.917 MHz : -1.034 dBm OBW : 18.262 MHz	Measured 26 dB Bandwidth: 29.750 MHz Measured 99% Bandwidth: 18.262 MHz

[back to matrix](#)

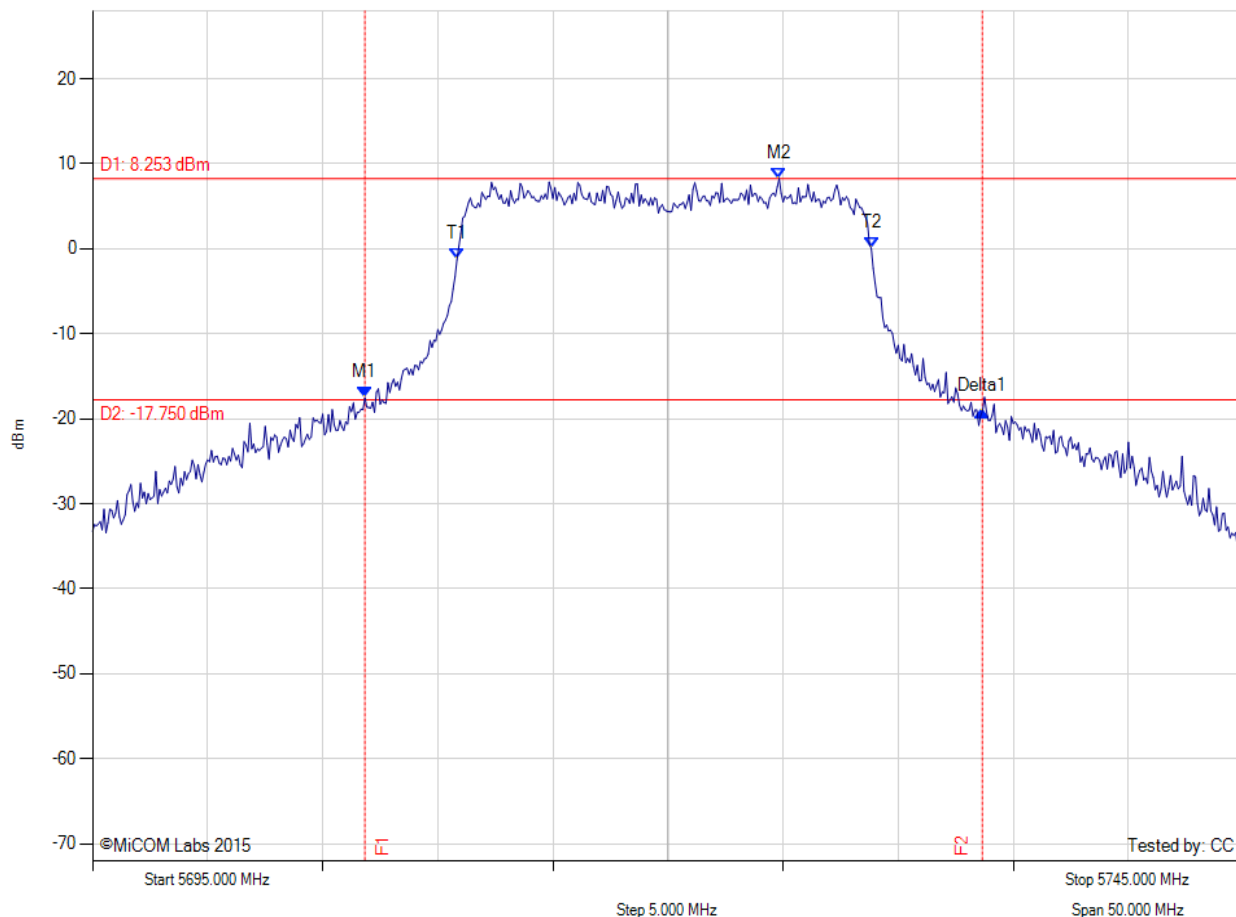
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5703.830 MHz : -17.747 dBm M2 : 5724.830 MHz : 8.037 dBm Delta1 : 29.580 MHz : -0.129 dB T1 : 5710.750 MHz : -2.409 dBm T2 : 5728.917 MHz : -1.518 dBm OBW : 18.172 MHz	Measured 26 dB Bandwidth: 29.580 MHz Measured 99% Bandwidth: 18.172 MHz

[back to matrix](#)

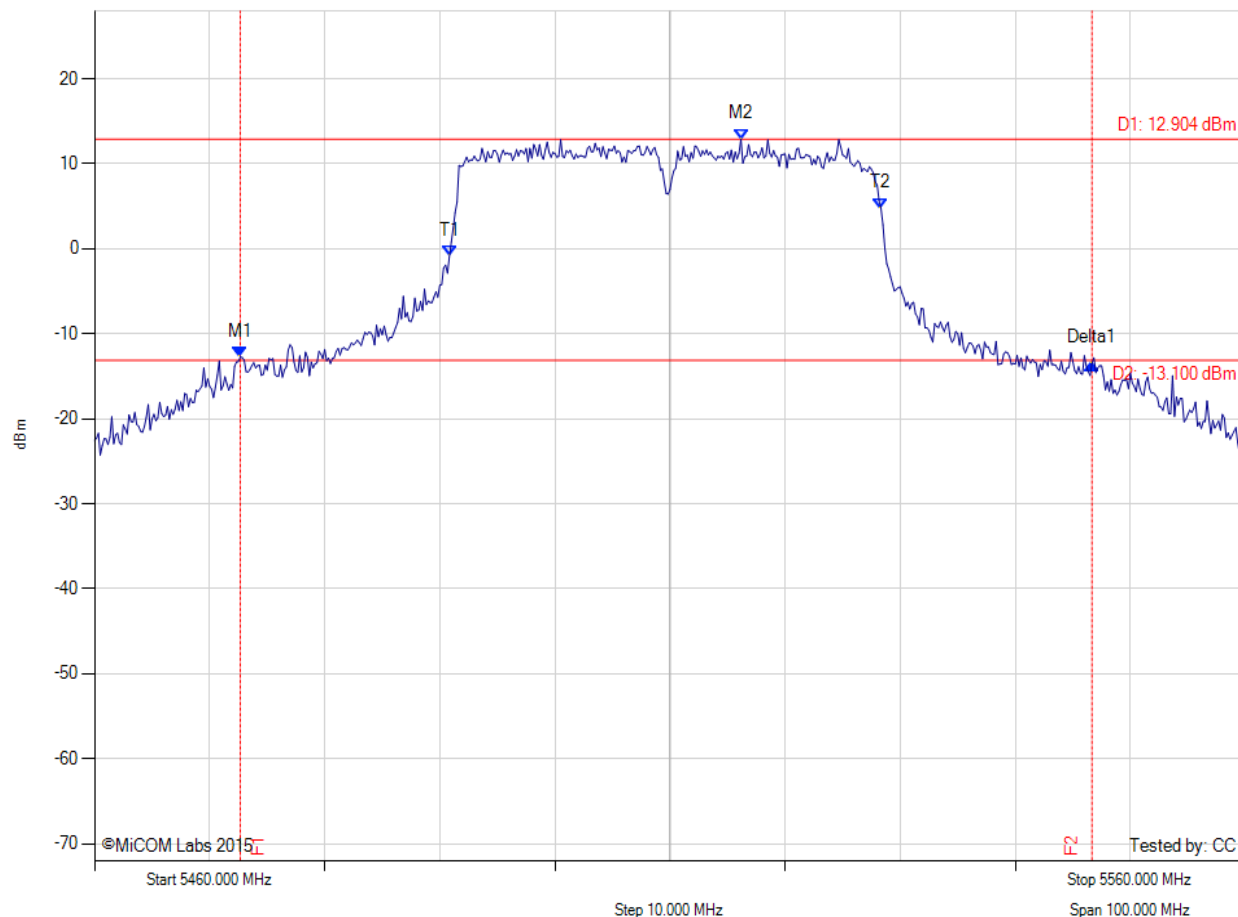
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5706.830 MHz : -17.521 dBm M2 : 5724.830 MHz : 8.253 dBm Delta1 : 26.830 MHz : -1.515 dB T1 : 5710.833 MHz : -1.231 dBm T2 : 5728.833 MHz : 0.060 dBm OBW : 18.043 MHz	Measured 26 dB Bandwidth: 26.830 MHz Measured 99% Bandwidth: 18.043 MHz

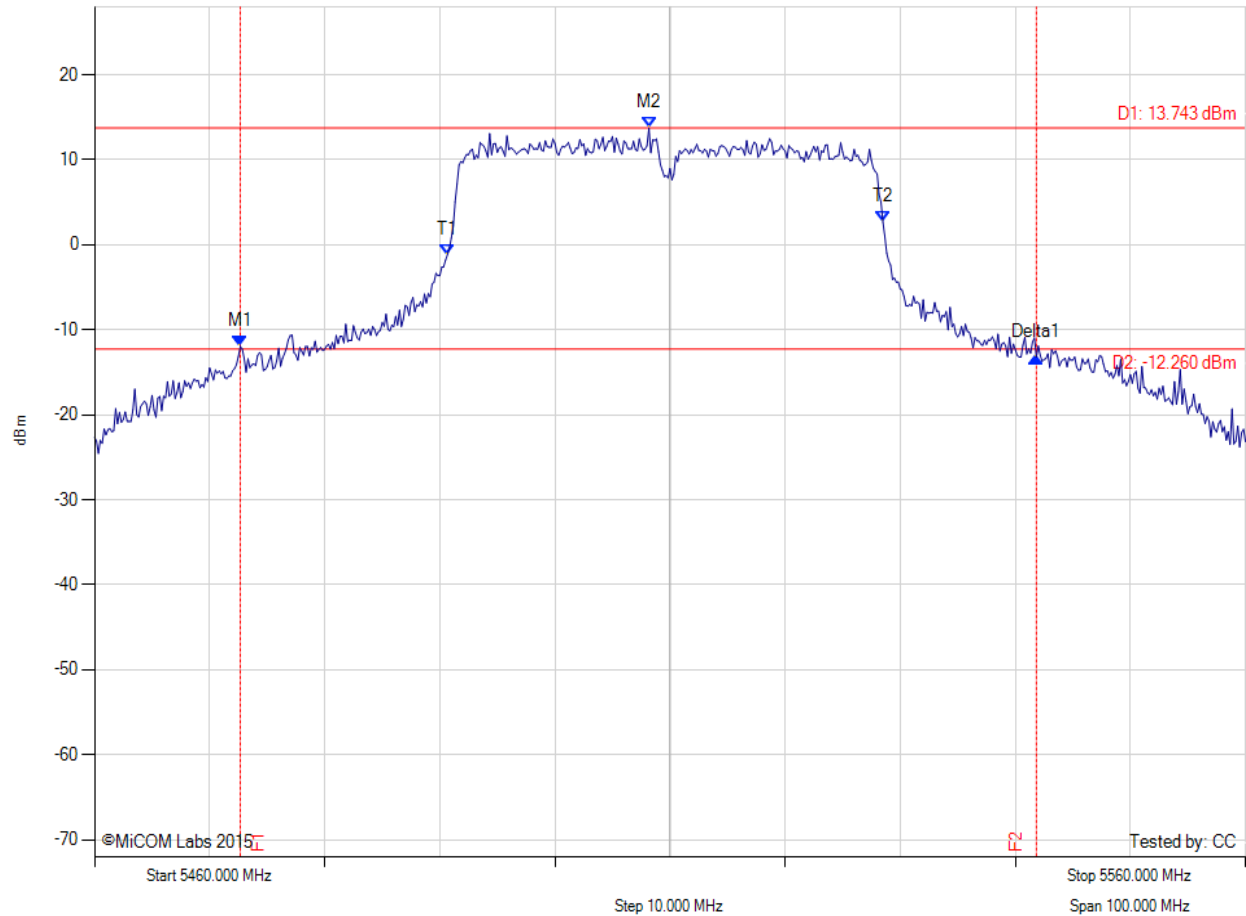
[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5472.670 MHz : -12.715 dBm M2 : 5516.170 MHz : 12.904 dBm Delta1 : 74.000 MHz : -0.759 dB T1 : 5490.833 MHz : -0.906 dBm T2 : 5528.333 MHz : 4.773 dBm OBW : 37.715 MHz	Measured 26 dB Bandwidth: 74.000 MHz Measured 99% Bandwidth: 37.715 MHz

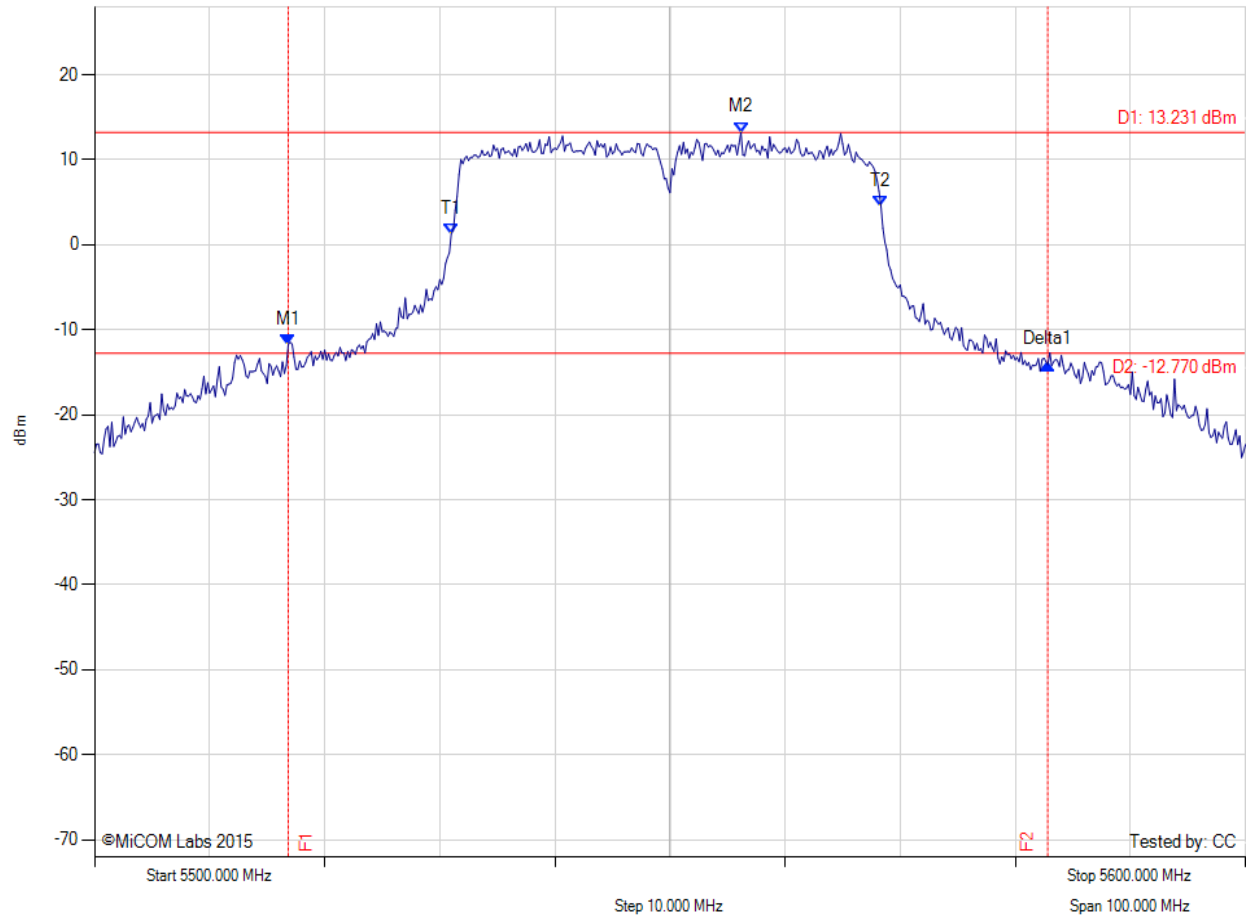
[back to matrix](#)



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5472.670 MHz : -11.949 dBm M2 : 5508.170 MHz : 13.743 dBm Delta1 : 69.170 MHz : -1.260 dB T1 : 5490.667 MHz : -1.145 dBm T2 : 5528.500 MHz : 2.688 dBm OBW : 38.151 MHz	Measured 26 dB Bandwidth: 69.170 MHz Measured 99% Bandwidth: 38.151 MHz

[back to matrix](#)

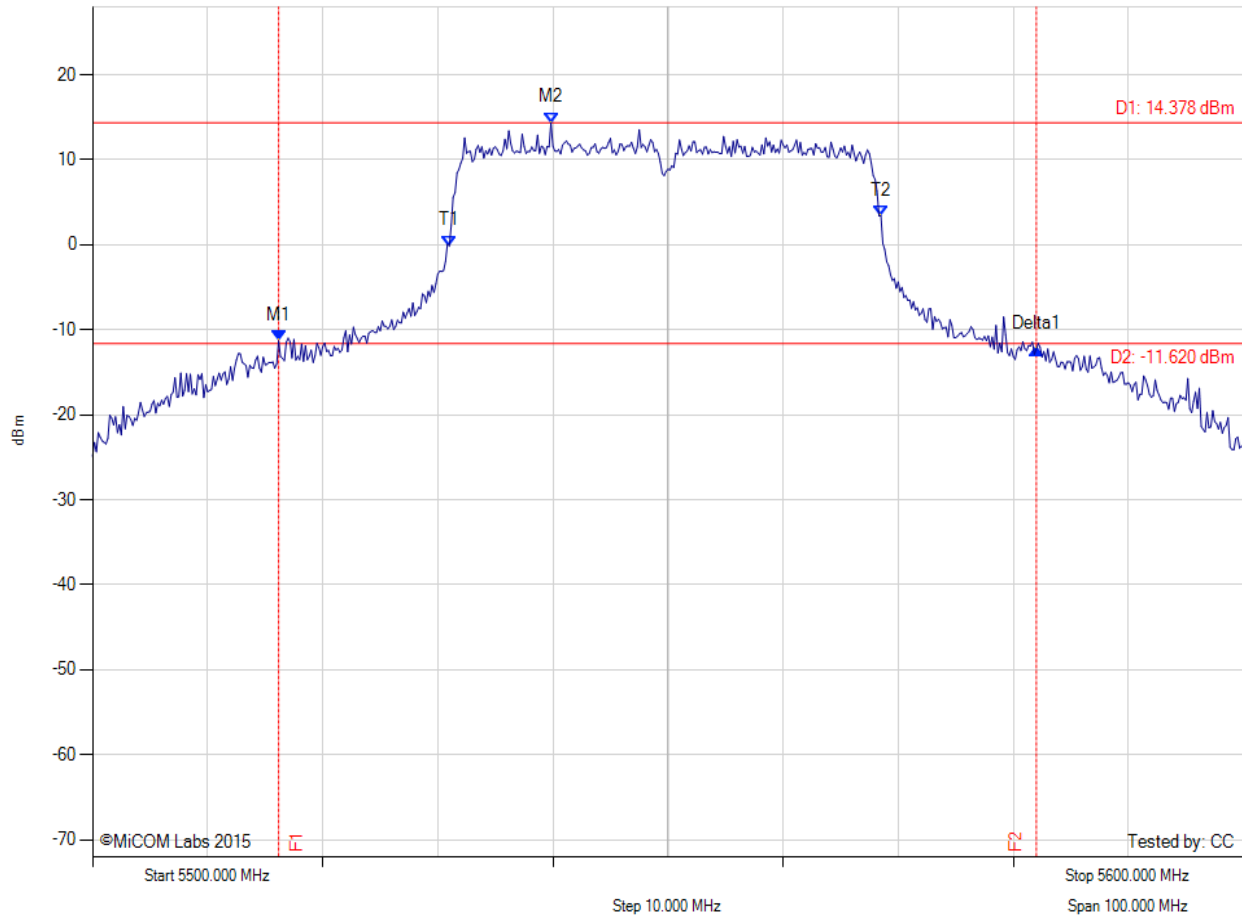
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. All changes will be noted in the Document History section of the report.



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5516.830 MHz : -11.755 dBm M2 : 5556.170 MHz : 13.231 dBm Delta1 : 66.000 MHz : -2.341 dB T1 : 5531.000 MHz : 1.334 dBm T2 : 5568.333 MHz : 4.517 dBm OBW : 37.429 MHz	Measured 26 dB Bandwidth: 66.000 MHz Measured 99% Bandwidth: 37.429 MHz

[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5516.170 MHz : -11.300 dBm M2 : 5539.830 MHz : 14.378 dBm Delta1 : 65.830 MHz : -1.010 dB T1 : 5531.000 MHz : -0.121 dBm T2 : 5568.500 MHz : 3.412 dBm OBW : 37.735 MHz	Measured 26 dB Bandwidth: 65.830 MHz Measured 99% Bandwidth: 37.735 MHz

[back to matrix](#)

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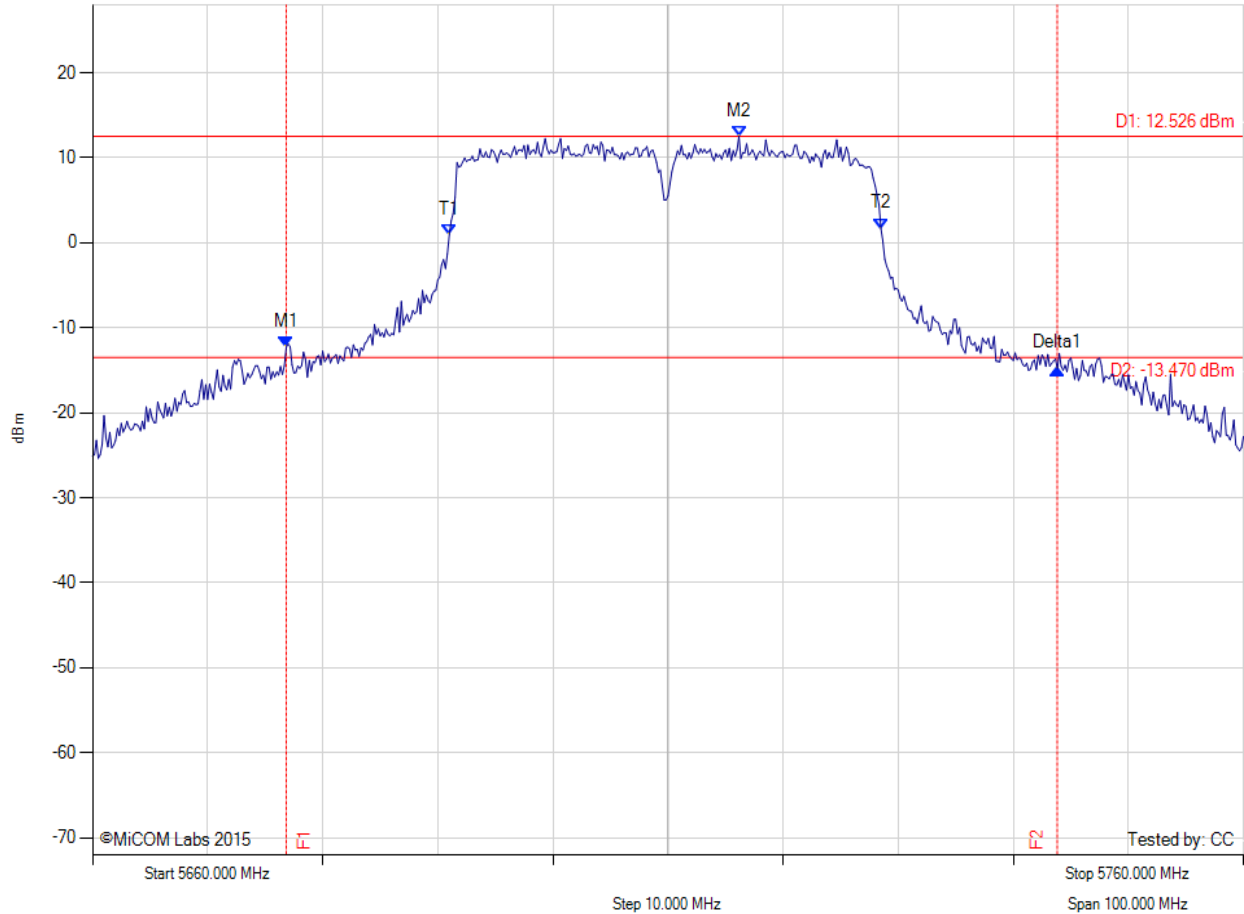
26 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5710.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.8 dB Offset

Sweep Time: 4.0 s

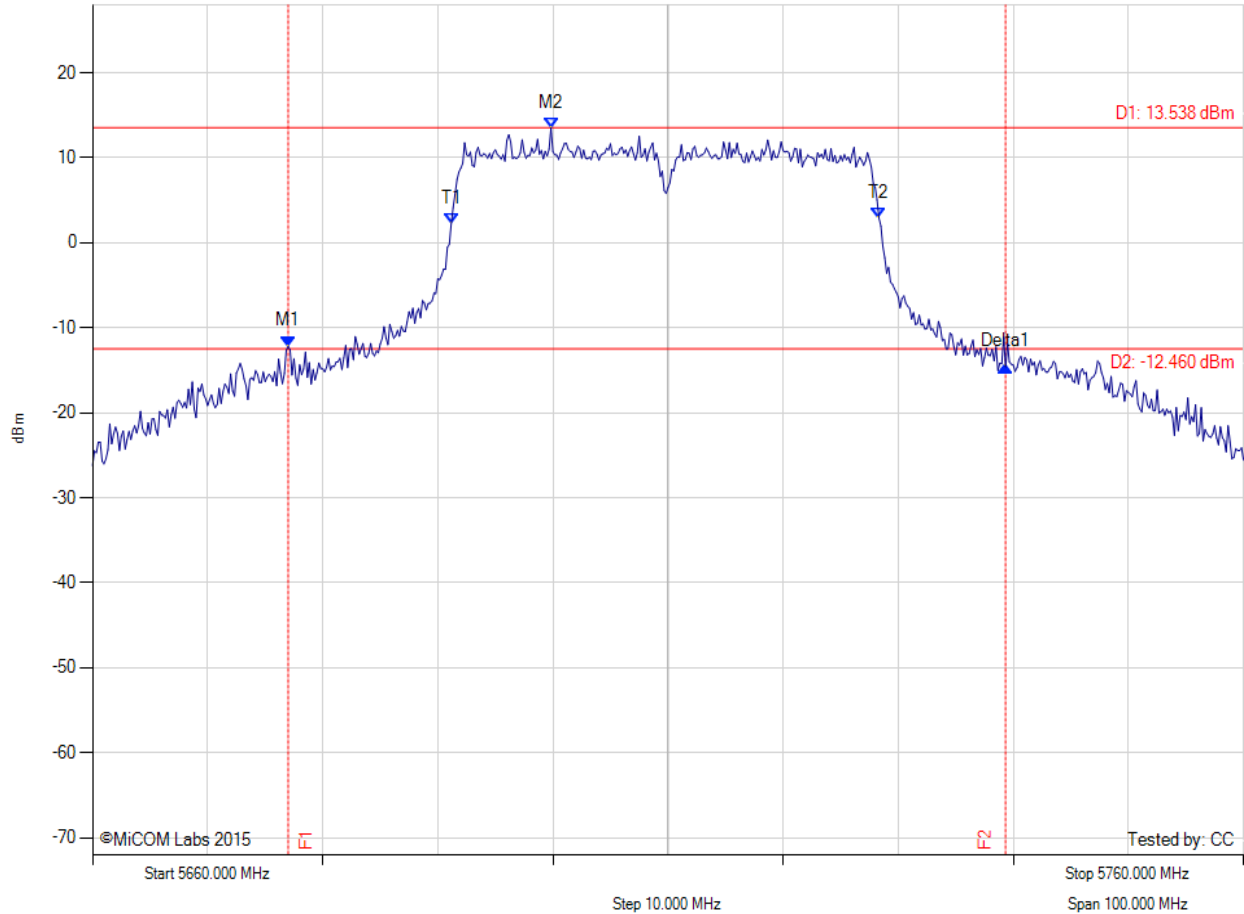
RBW: 510 KHz
VBW: 2 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5676.830 MHz : -12.288 dBm M2 : 5716.170 MHz : 12.526 dBm Delta1 : 67.000 MHz : -2.493 dB T1 : 5691.000 MHz : 0.957 dBm T2 : 5728.500 MHz : 1.664 dBm OBW : 37.673 MHz	Measured 26 dB Bandwidth: 67.000 MHz Measured 99% Bandwidth: 37.673 MHz

[back to matrix](#)

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = POS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAXH	M1 : 5677.000 MHz : -12.173 dBm M2 : 5699.830 MHz : 13.538 dBm Delta1 : 62.330 MHz : -2.419 dB T1 : 5691.167 MHz : 2.299 dBm T2 : 5728.333 MHz : 2.905 dBm OBW : 37.293 MHz	Measured 26 dB Bandwidth: 62.330 MHz Measured 99% Bandwidth: 37.293 MHz

[back to matrix](#)

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A.2. Power Spectral Density



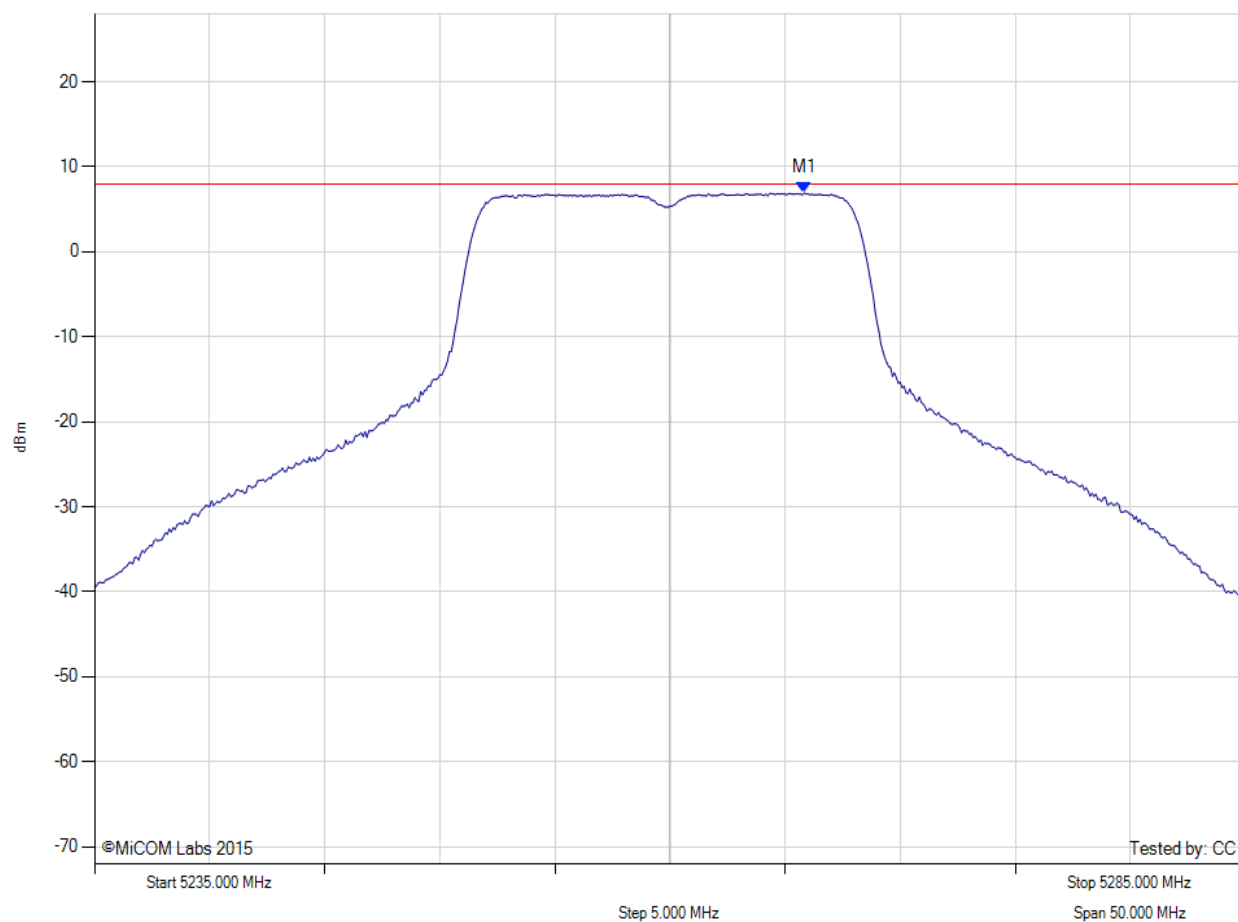
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5260.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.4 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5265.830 MHz : 6.928 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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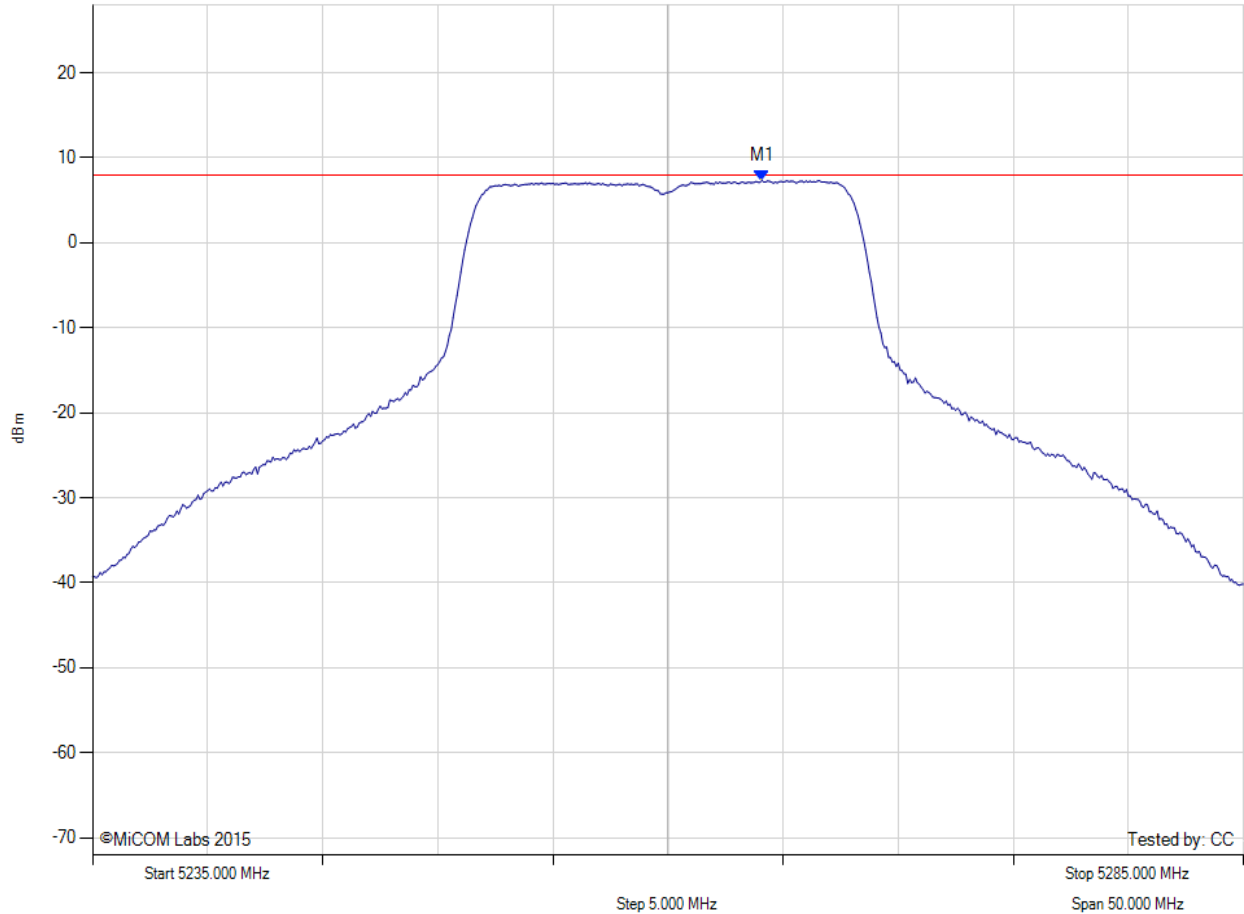
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5260.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5264.080 MHz : 7.353 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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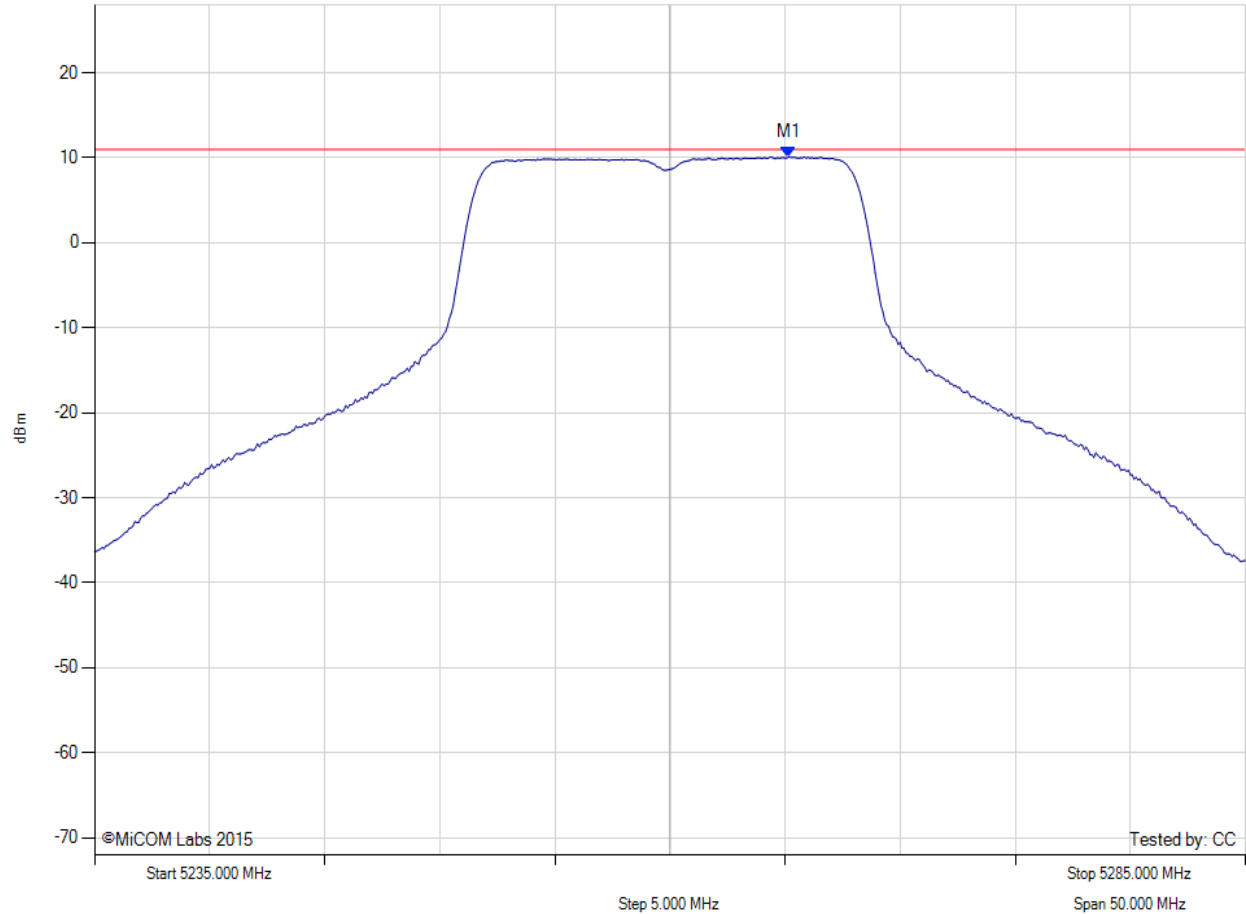
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5260.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.4 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5265.200 MHz : 10.111 dBm M1 + DCCF : 5265.200 MHz : 10.155 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.9 dB

[back to matrix](#)

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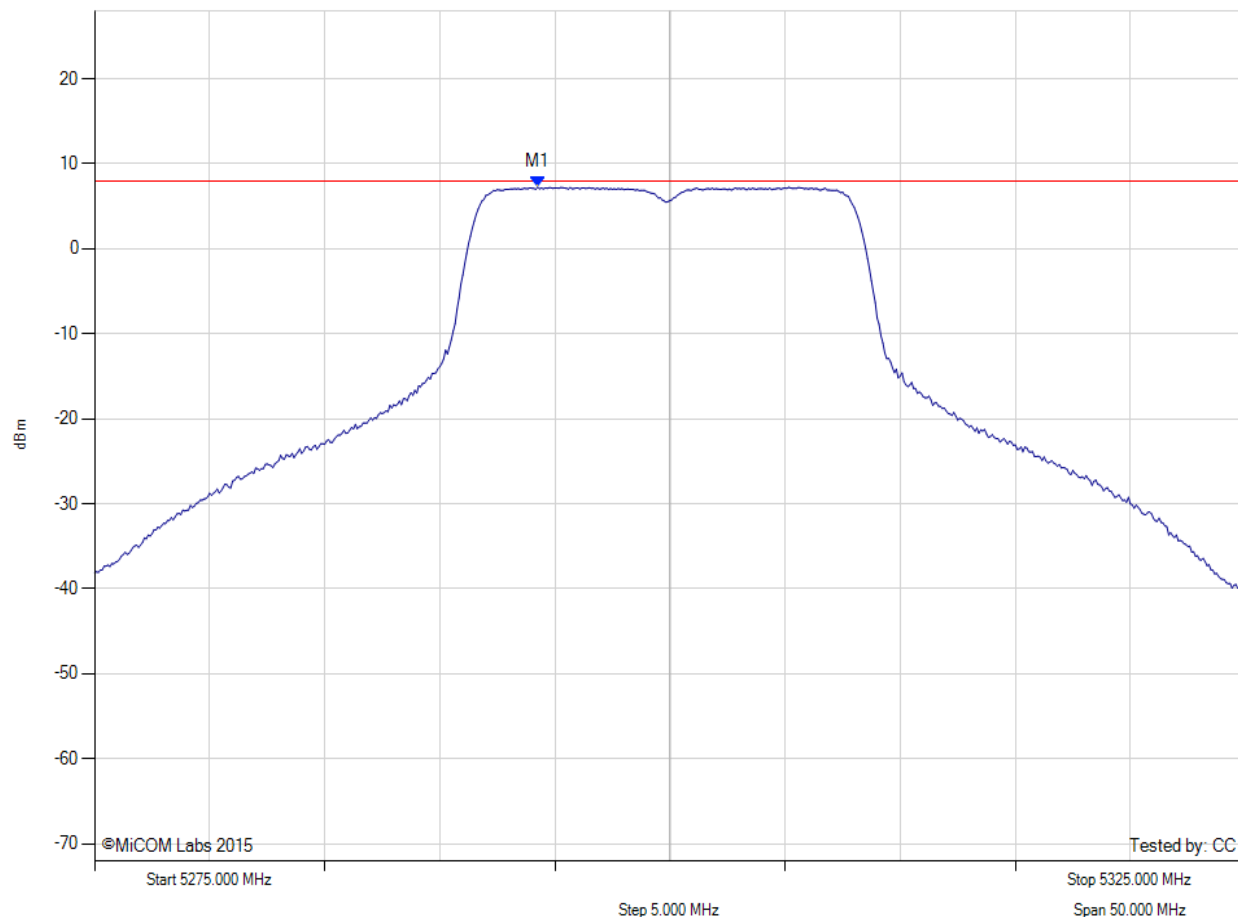
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5300.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5294.250 MHz : 7.278 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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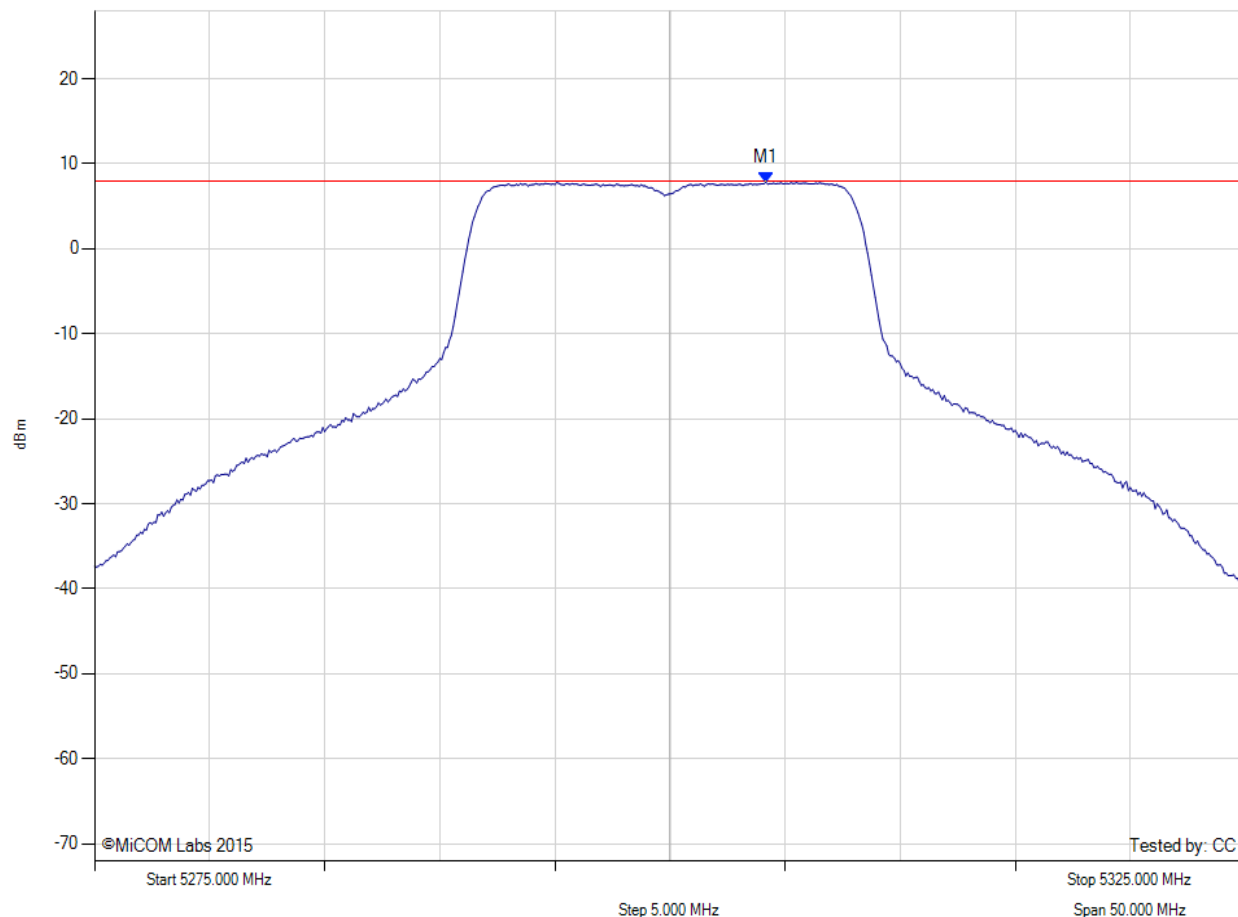
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5300.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5304.170 MHz : 7.838 dBm	Channel Frequency: 5300.00 MHz

[back to matrix](#)

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.

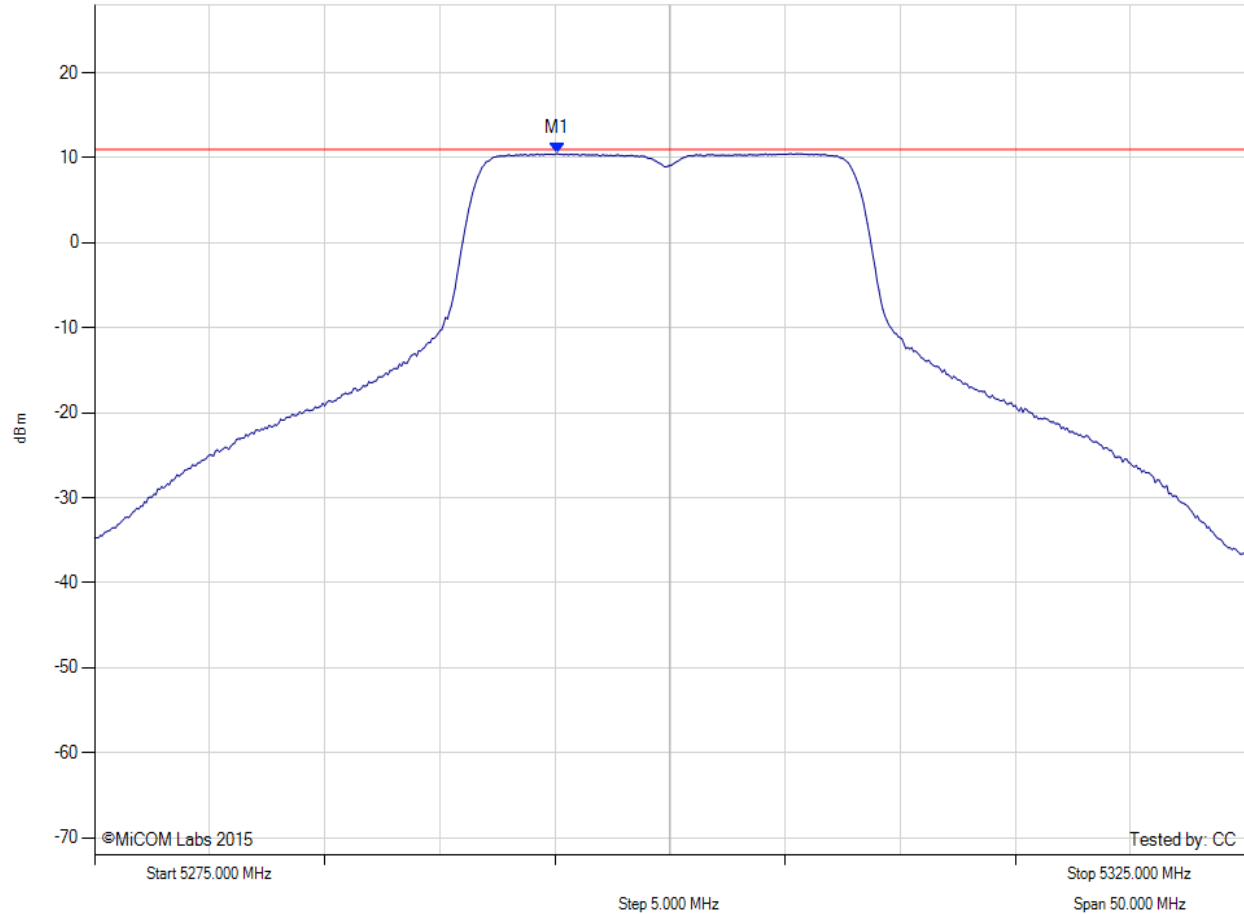
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5300.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5295.100 MHz : 10.516 dBm M1 + DCCF : 5295.100 MHz : 10.560 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.5 dB

[back to matrix](#)

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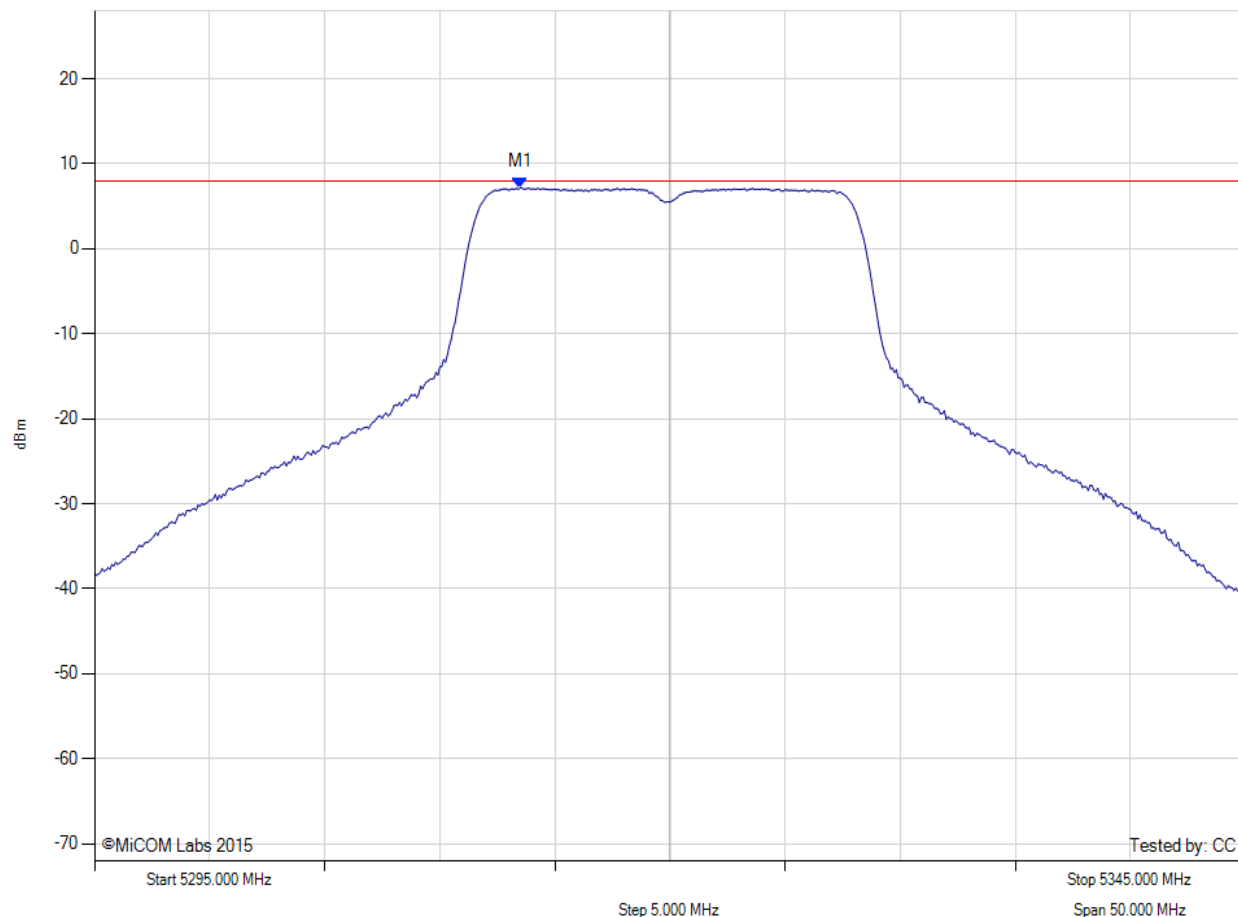
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5320.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5313.500 MHz : 7.202 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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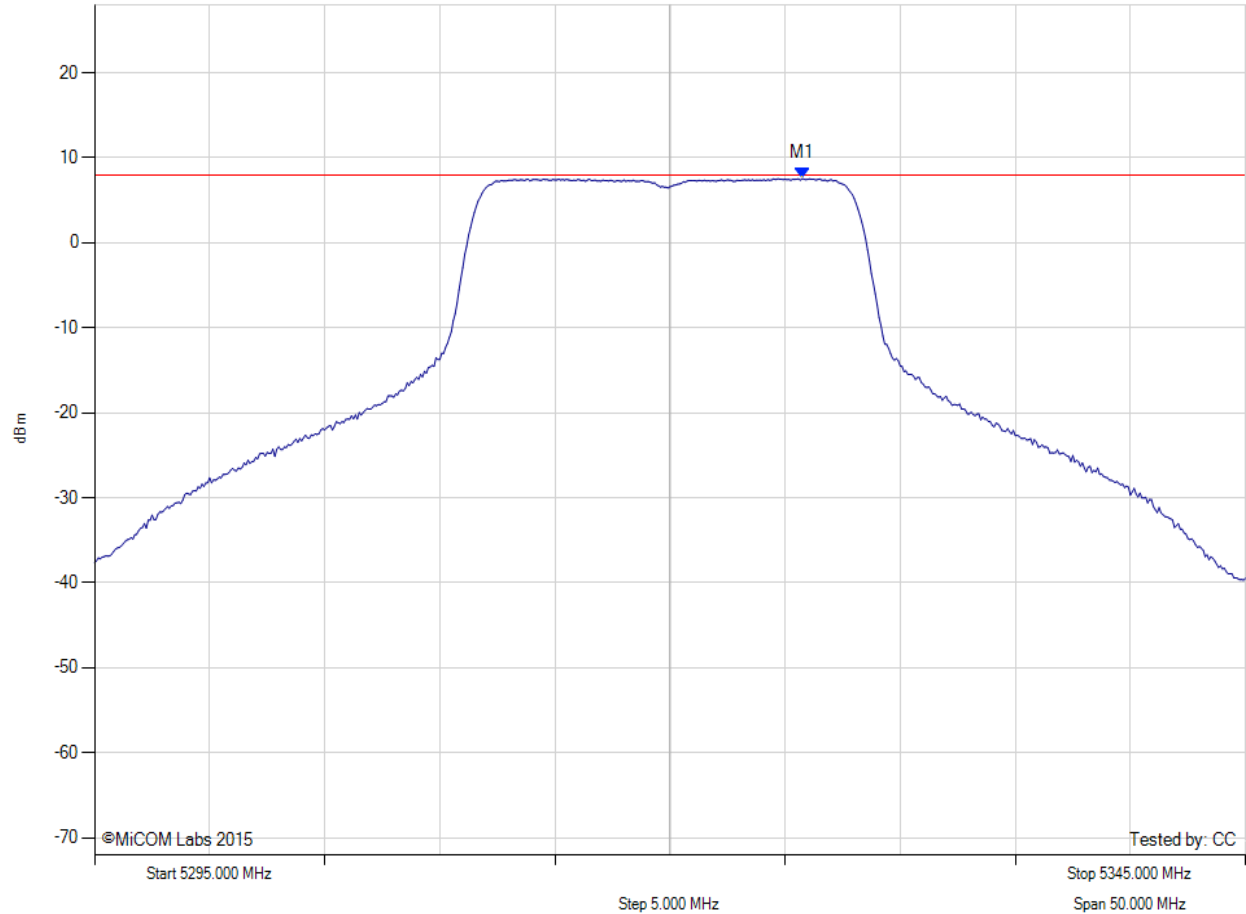
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5320.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5325.750 MHz : 7.561 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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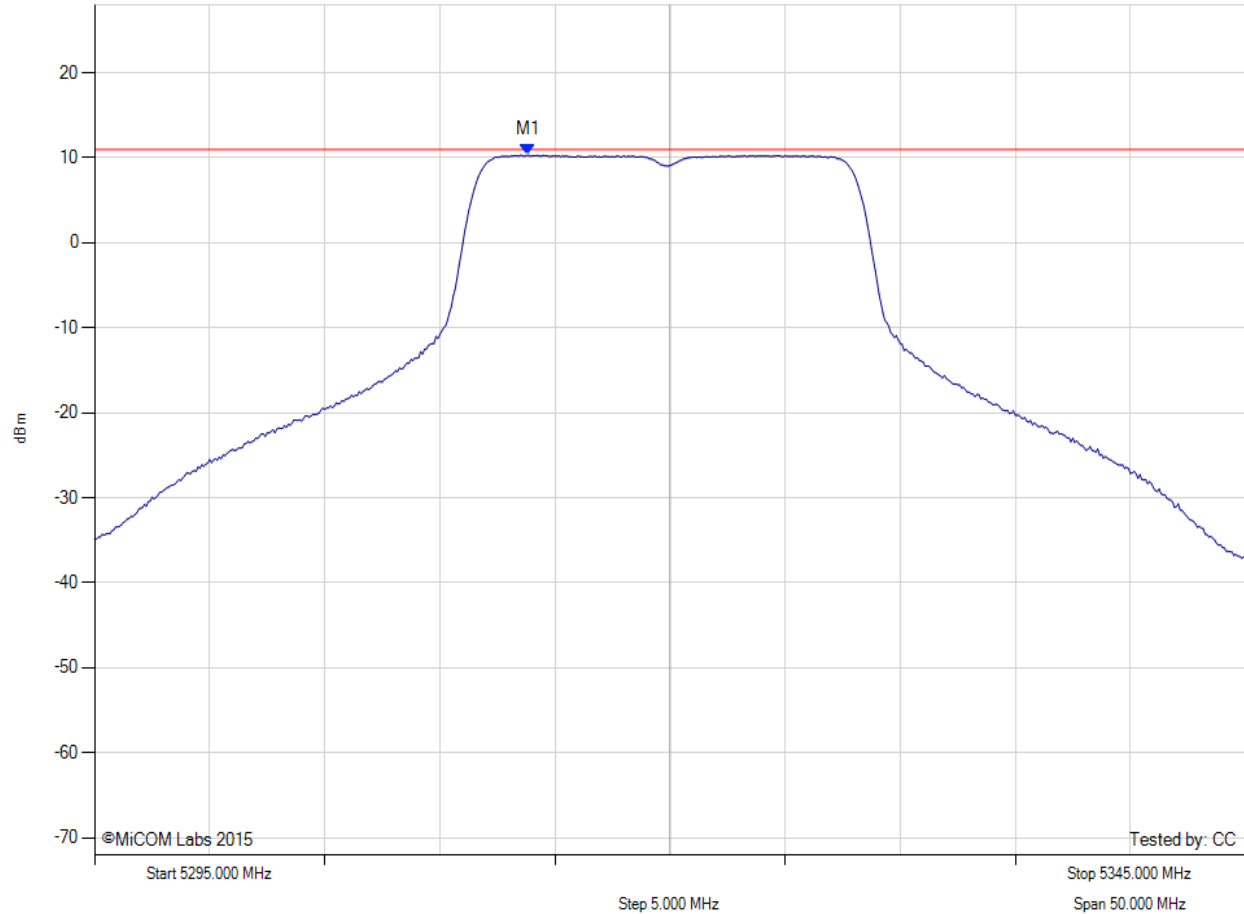
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5320.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5313.800 MHz : 10.338 dBm M1 + DCCF : 5313.800 MHz : 10.382 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.6 dB

[back to matrix](#)

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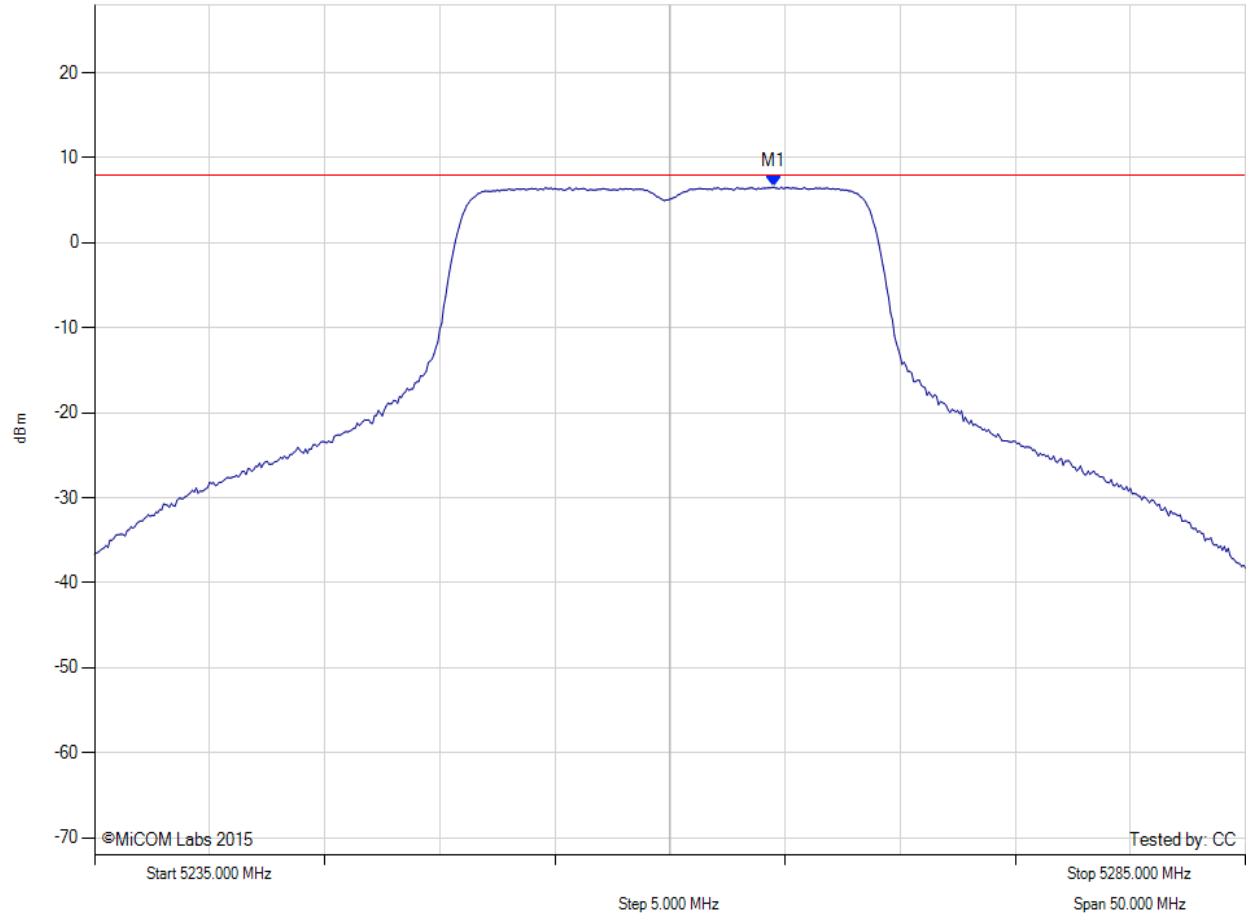
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5260.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.4 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5264.500 MHz : 6.574 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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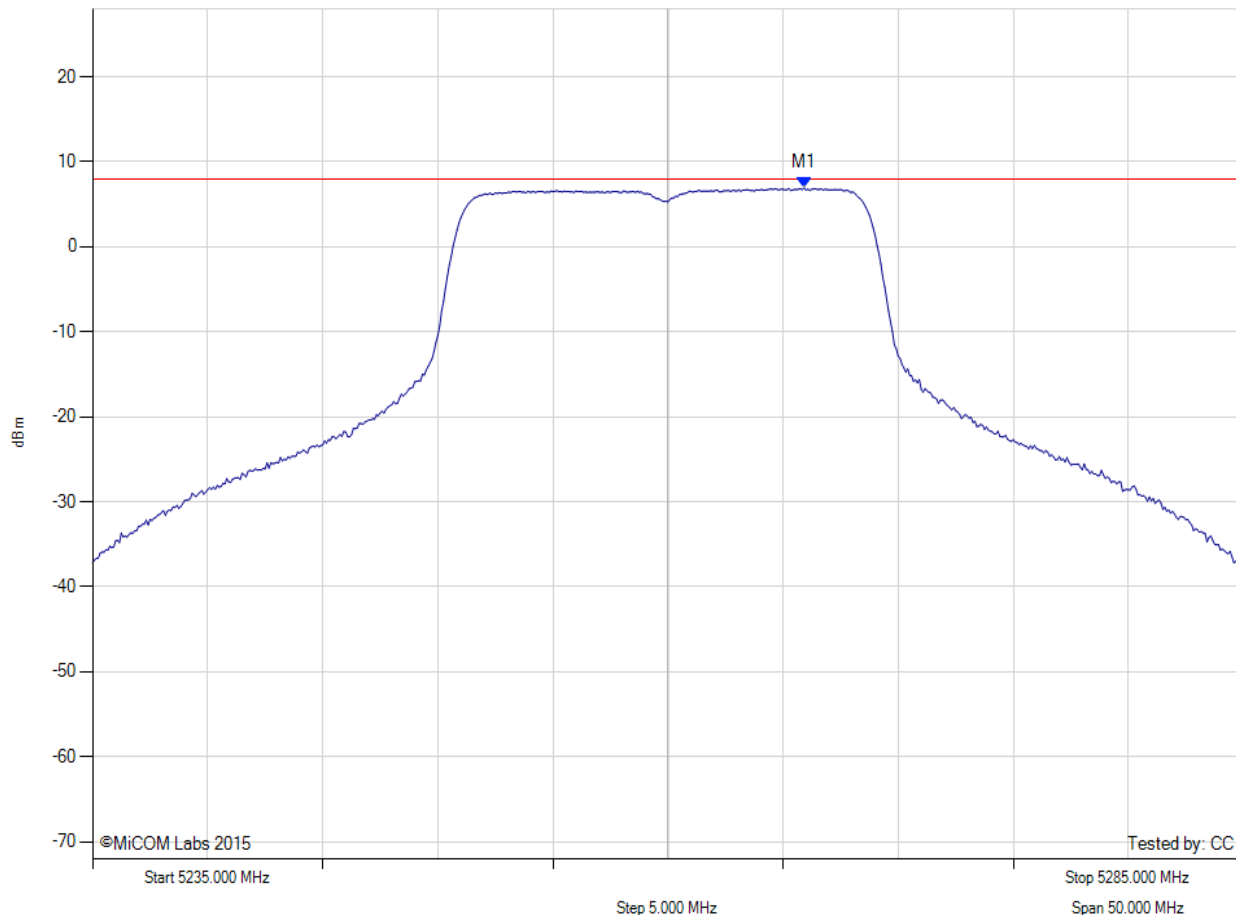
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5260.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

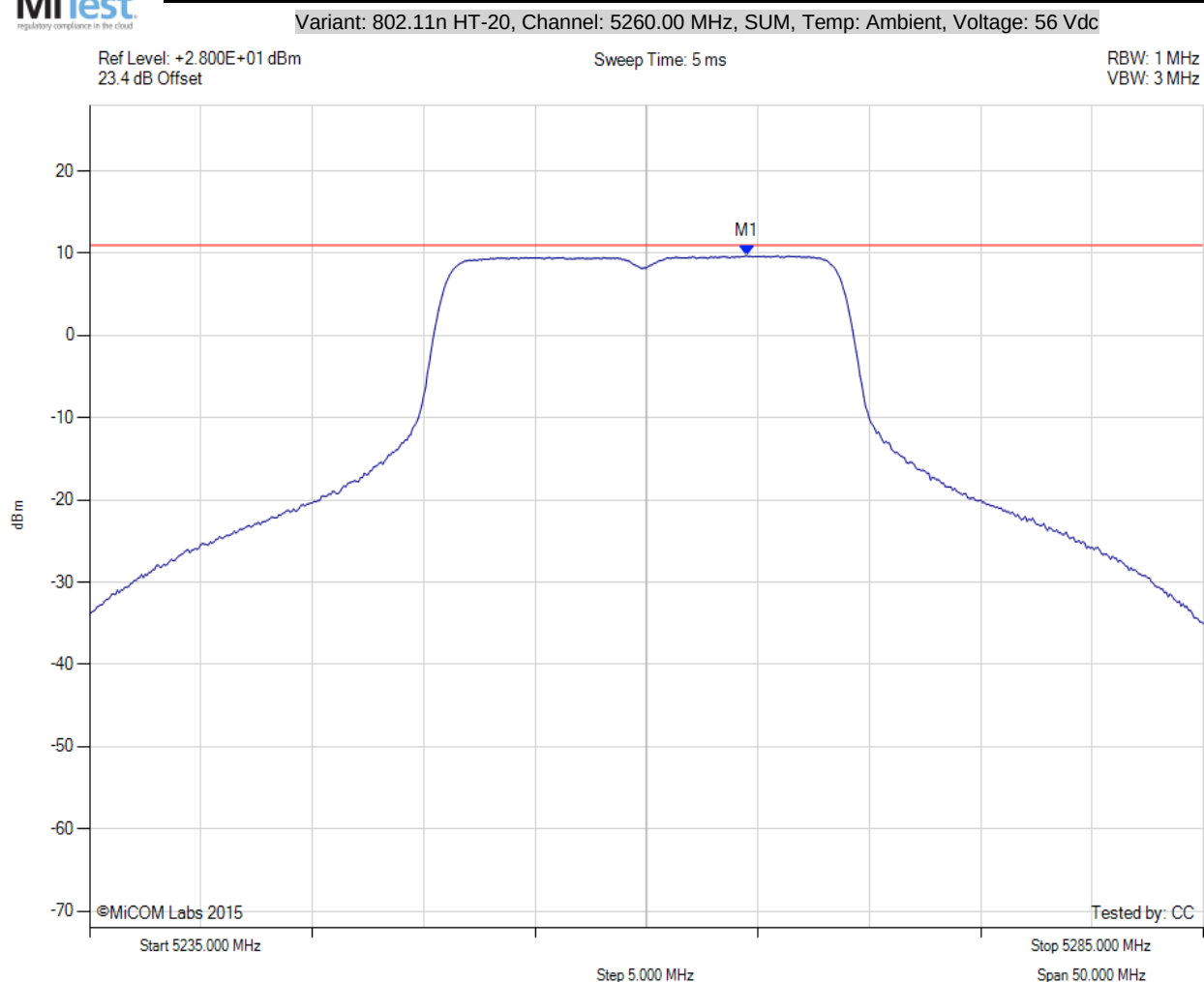


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5265.920 MHz : 6.965 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5264.500 MHz : 9.699 dBm M1 + DCCF : 5264.500 MHz : 9.743 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.3 dB

[back to matrix](#)

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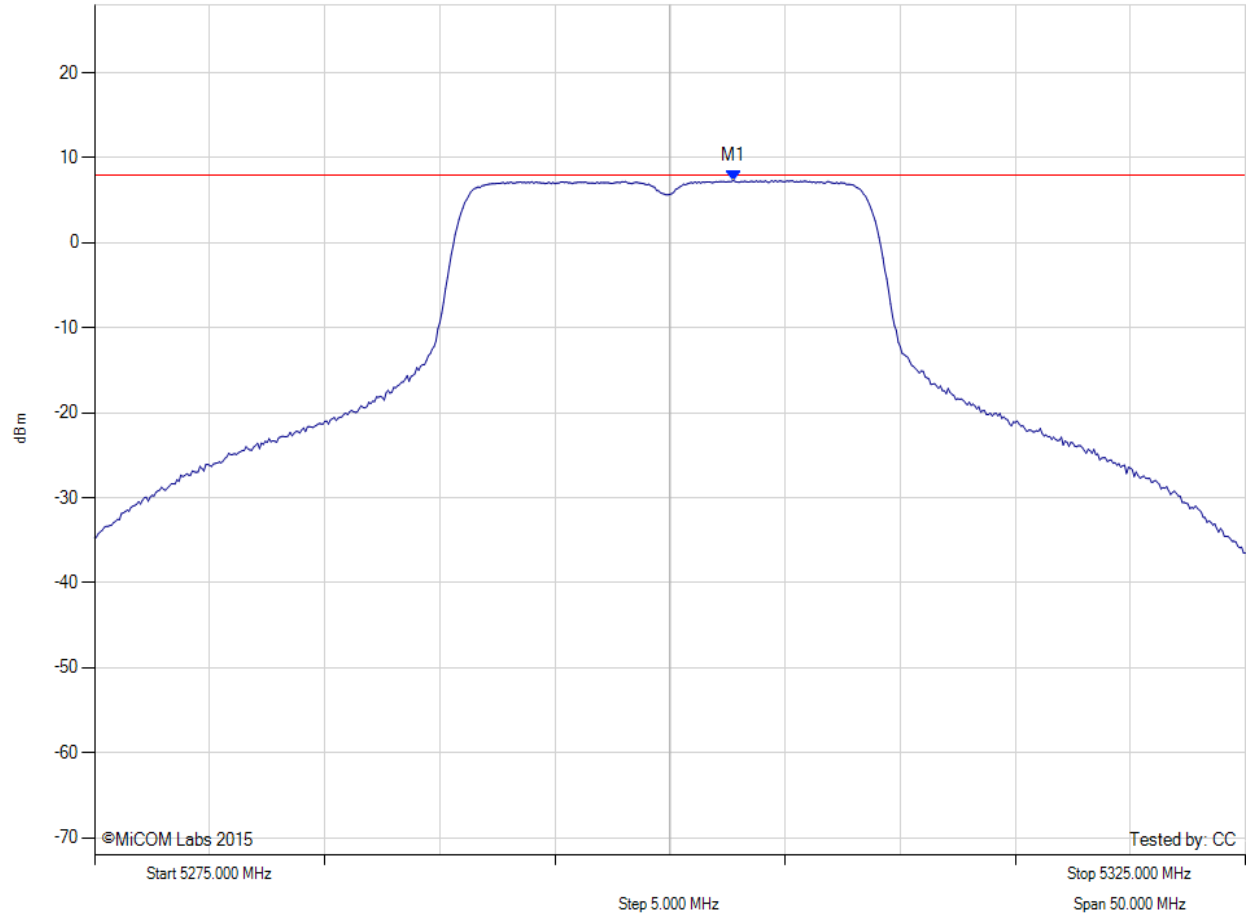
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5300.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5302.750 MHz : 7.349 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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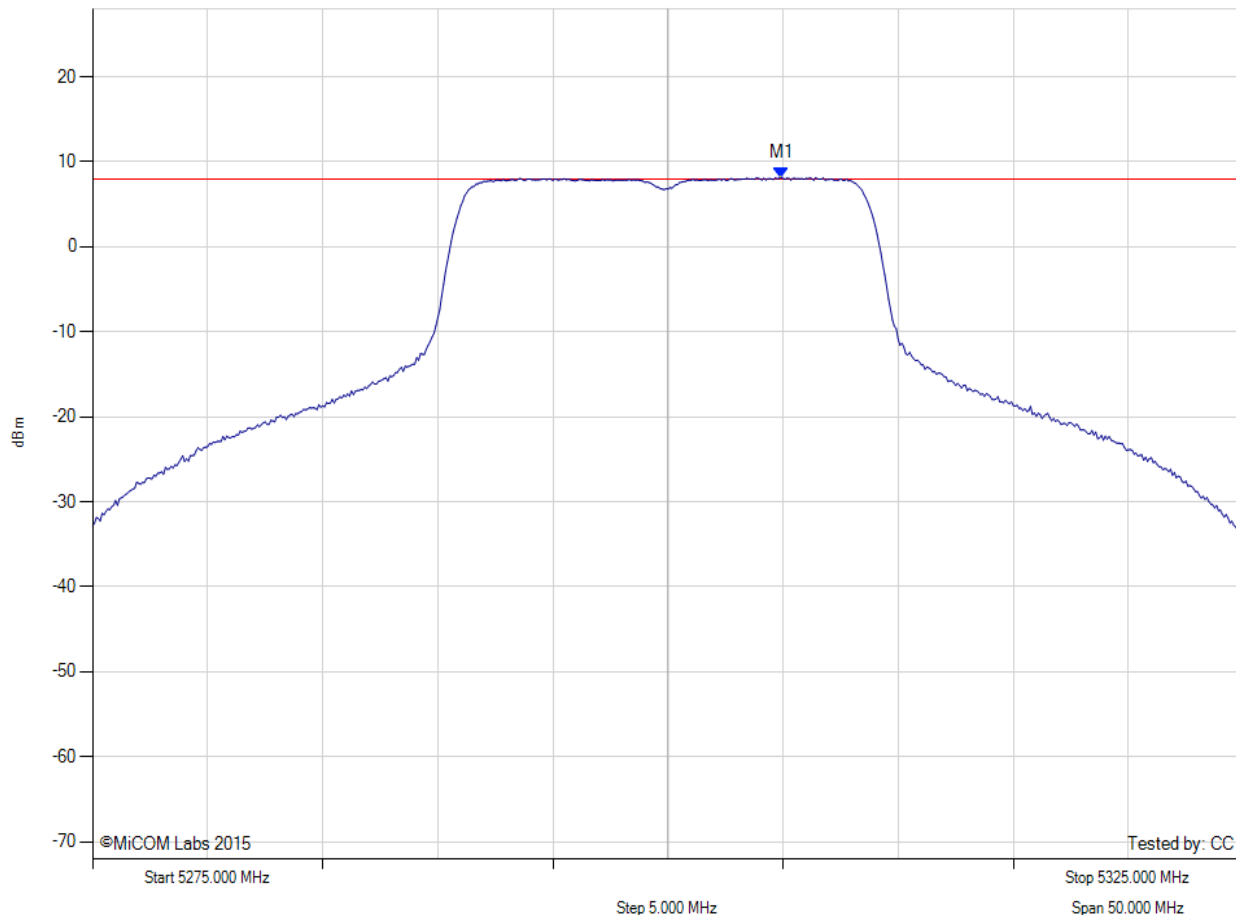
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5300.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

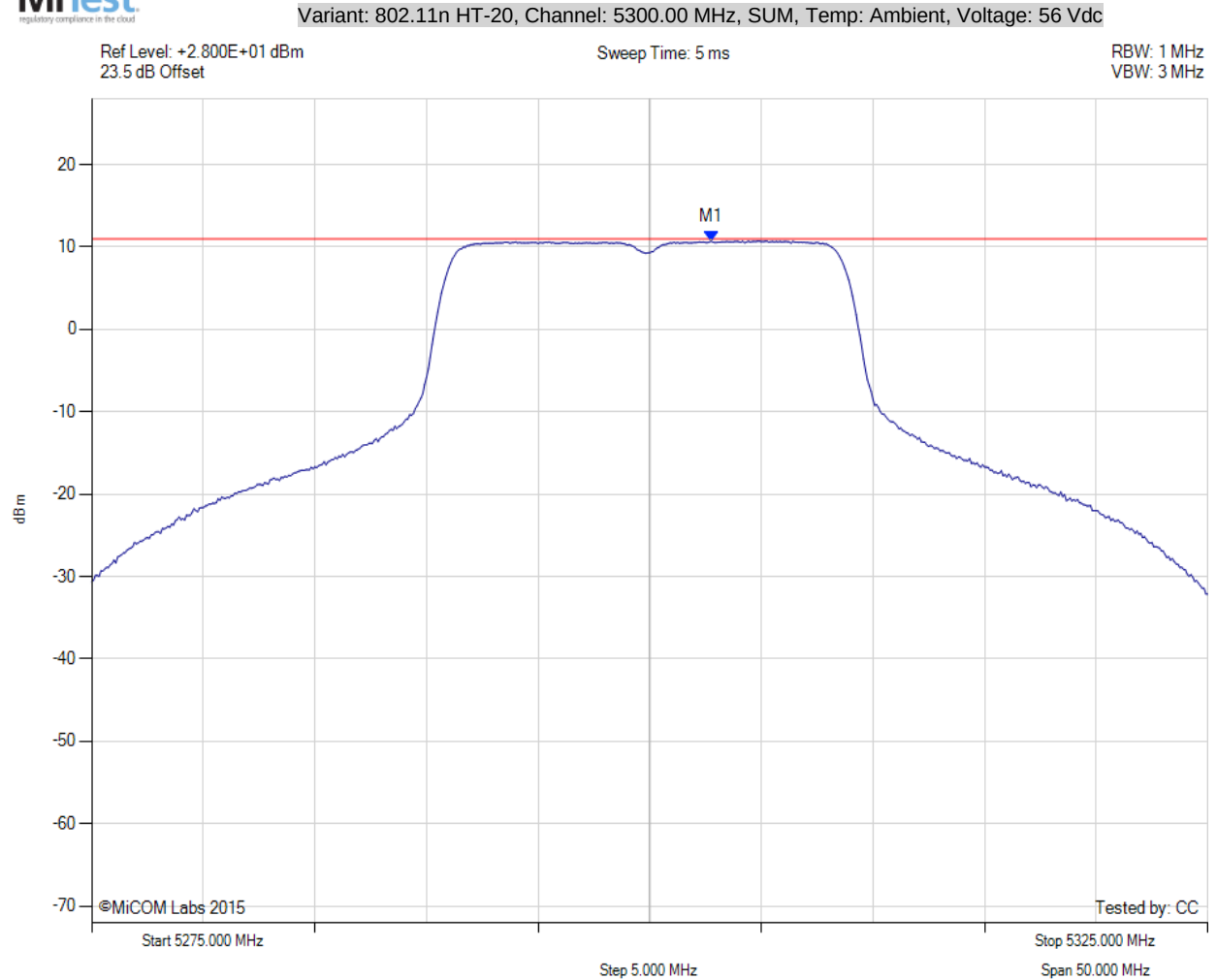


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5304.920 MHz : 8.146 dBm	Channel Frequency: 5300.00 MHz

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5302.800 MHz : 10.717 dBm M1 + DCCF : 5302.800 MHz : 10.761 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.2 dB

[back to matrix](#)

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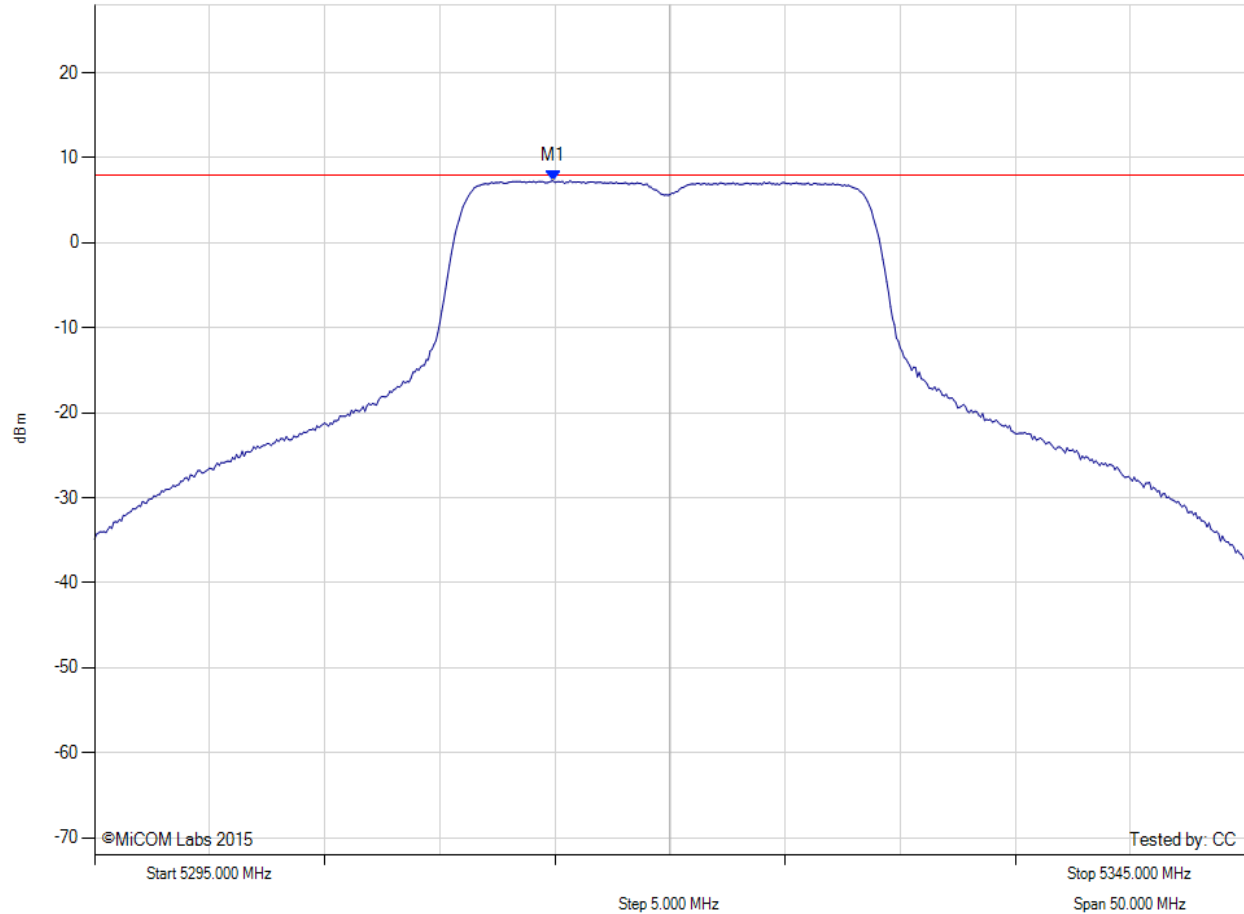
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5320.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5314.920 MHz : 7.313 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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.

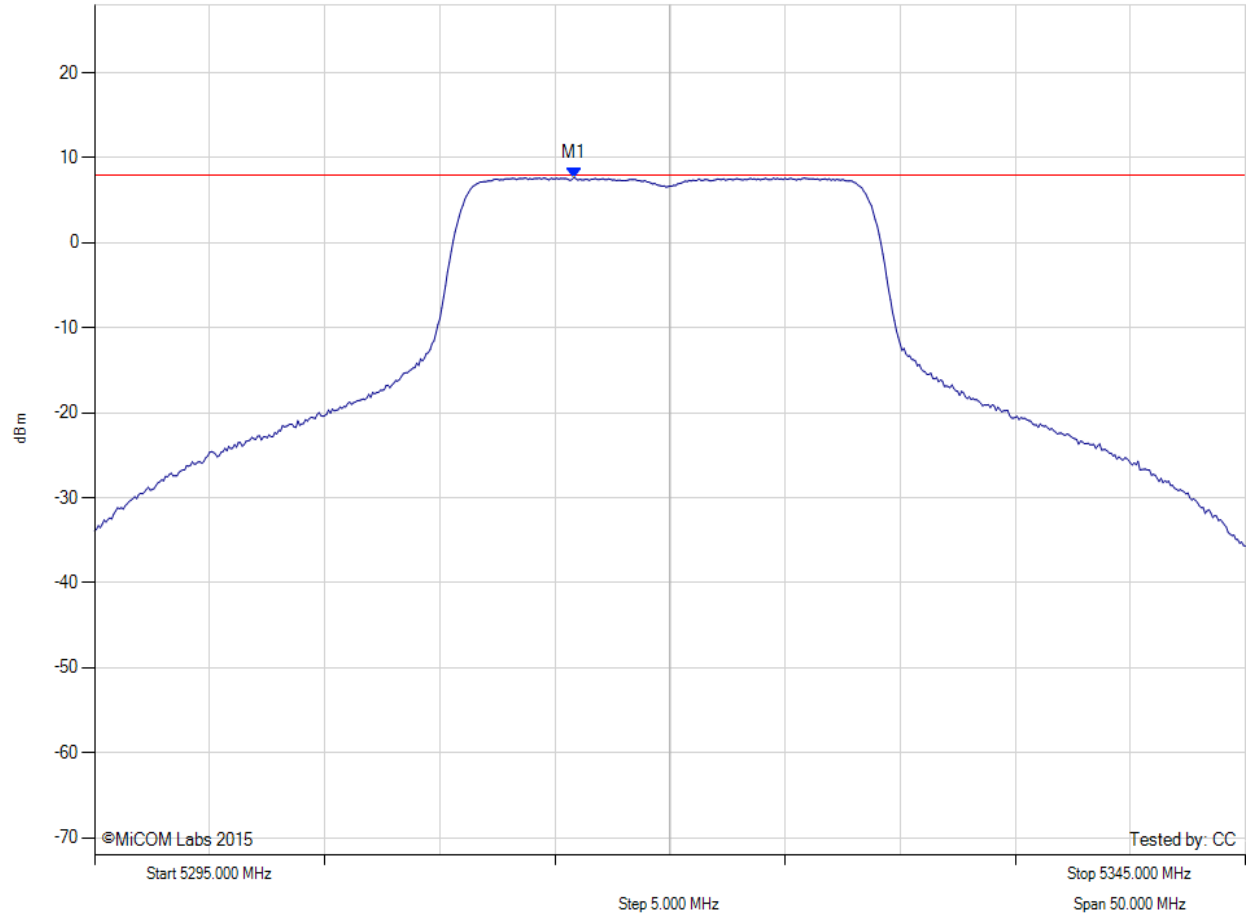
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5320.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5315.830 MHz : 7.680 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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.

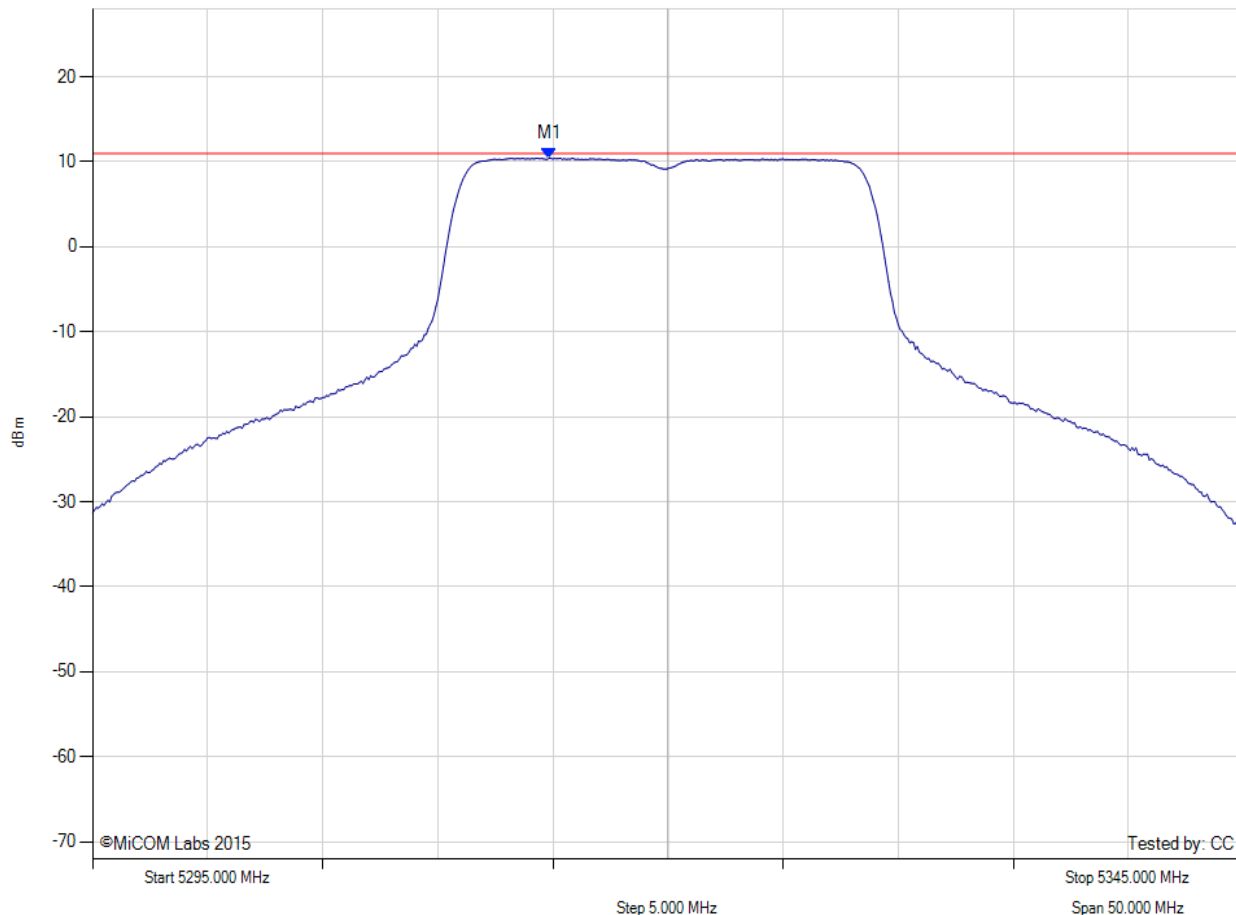
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5320.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5314.800 MHz : 10.438 dBm M1 + DCCF : 5314.800 MHz : 10.482 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.5 dB

[back to matrix](#)

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.

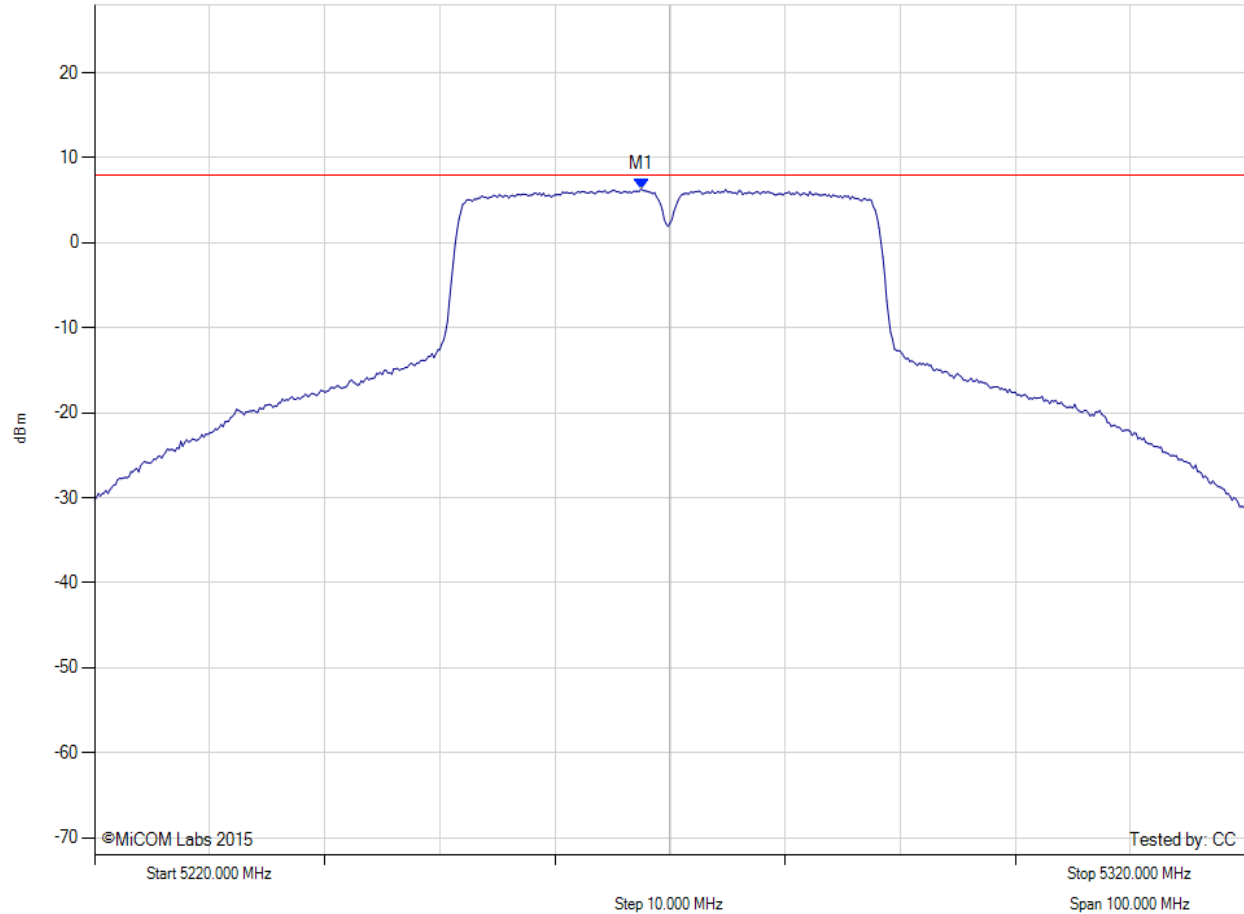
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5270.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5267.500 MHz : 6.355 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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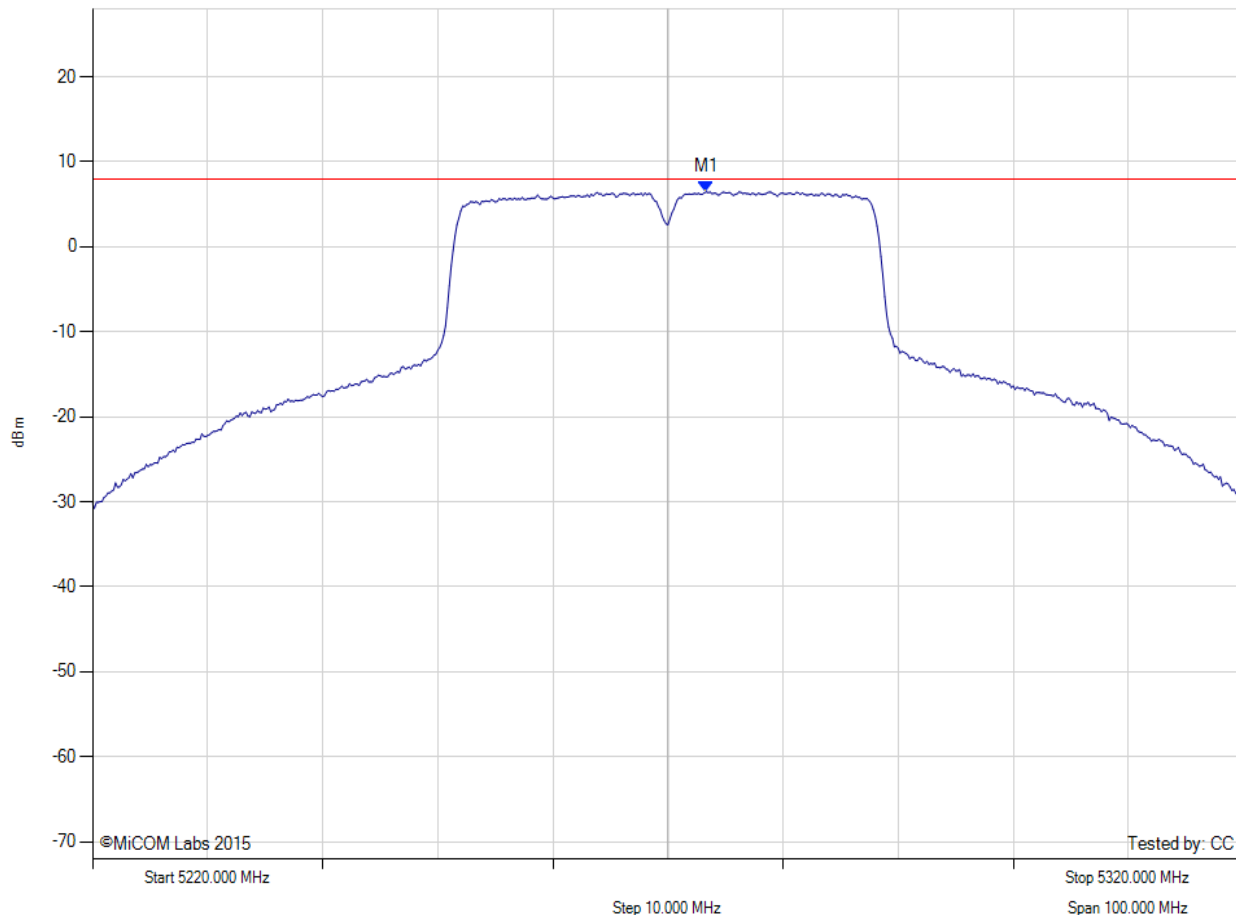
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5270.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5273.330 MHz : 6.469 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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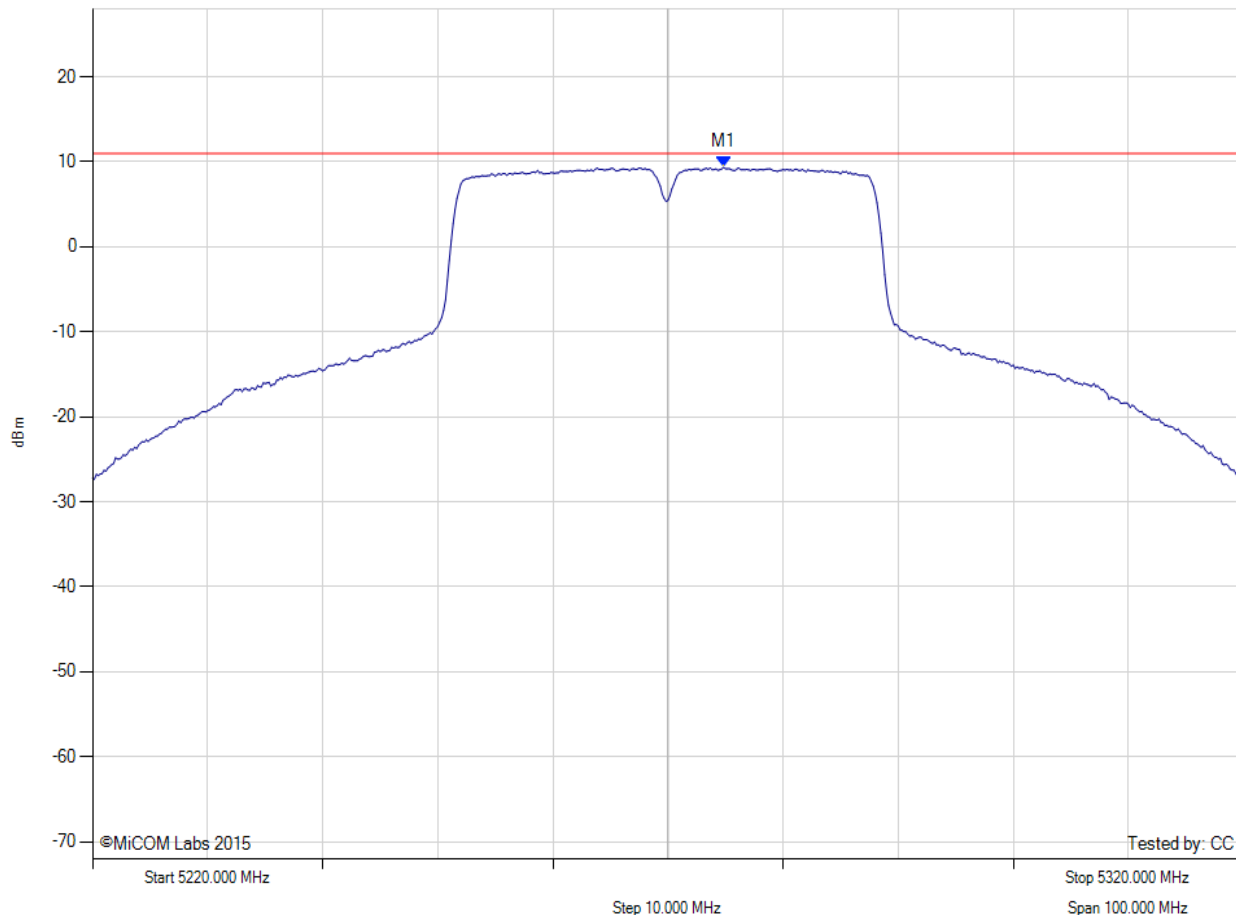
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5270.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5274.800 MHz : 9.368 dBm M1 + DCCF : 5274.800 MHz : 9.412 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.6 dB

[back to matrix](#)

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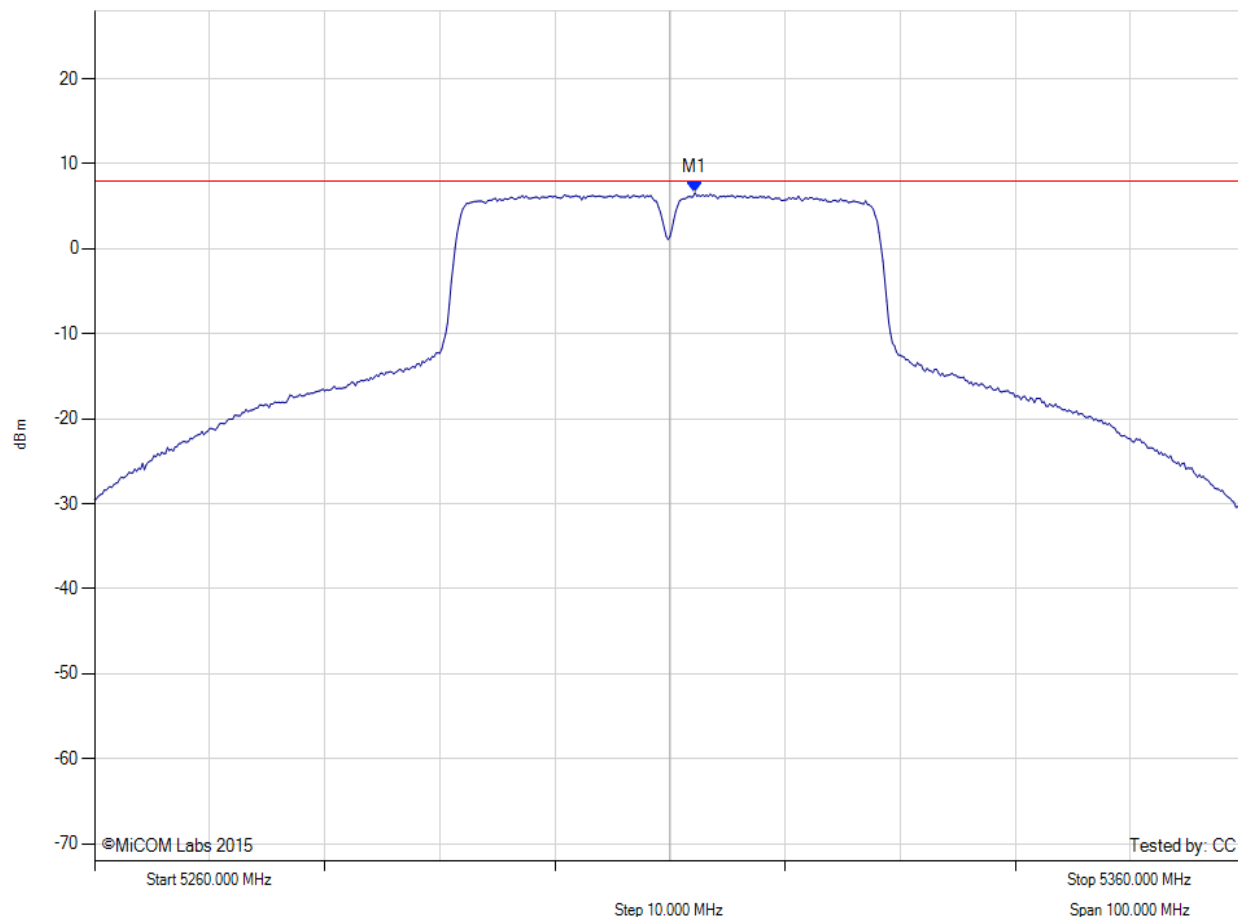
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5310.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.5 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5312.170 MHz : 6.610 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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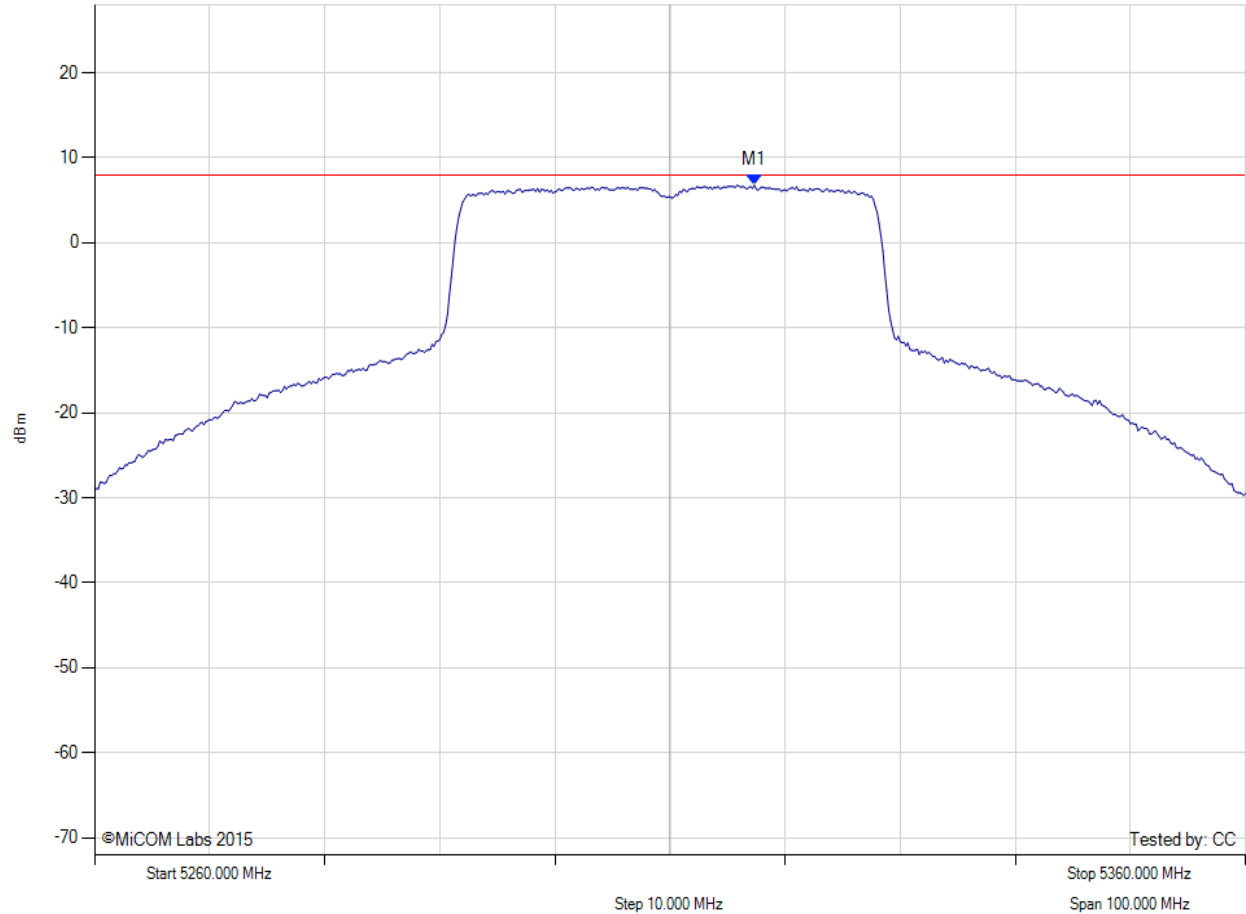
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5310.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

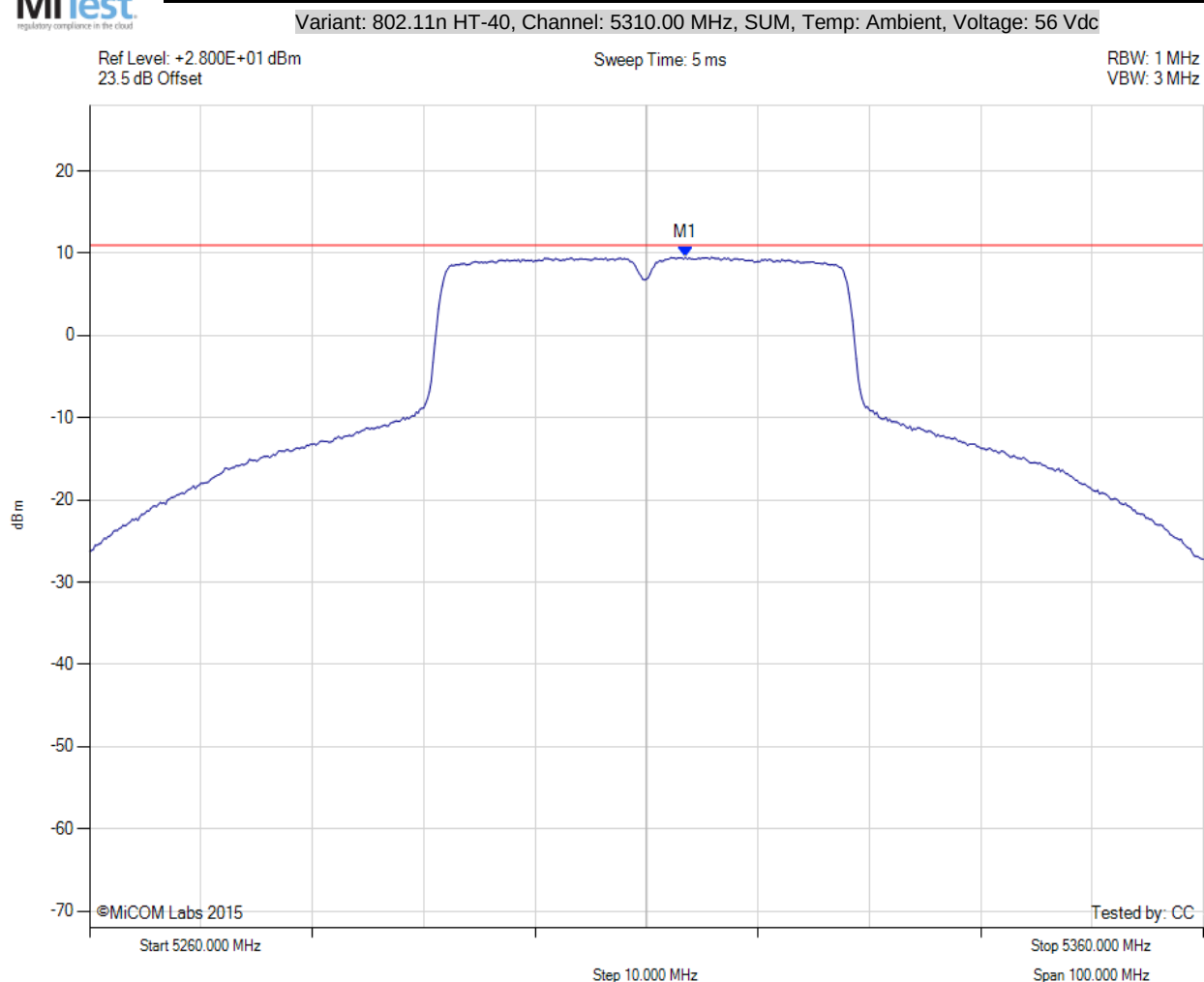


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5317.330 MHz : 6.784 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5313.500 MHz : 9.529 dBm M1 + DCCF : 5313.500 MHz : 9.573 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.4 dB

[back to matrix](#)

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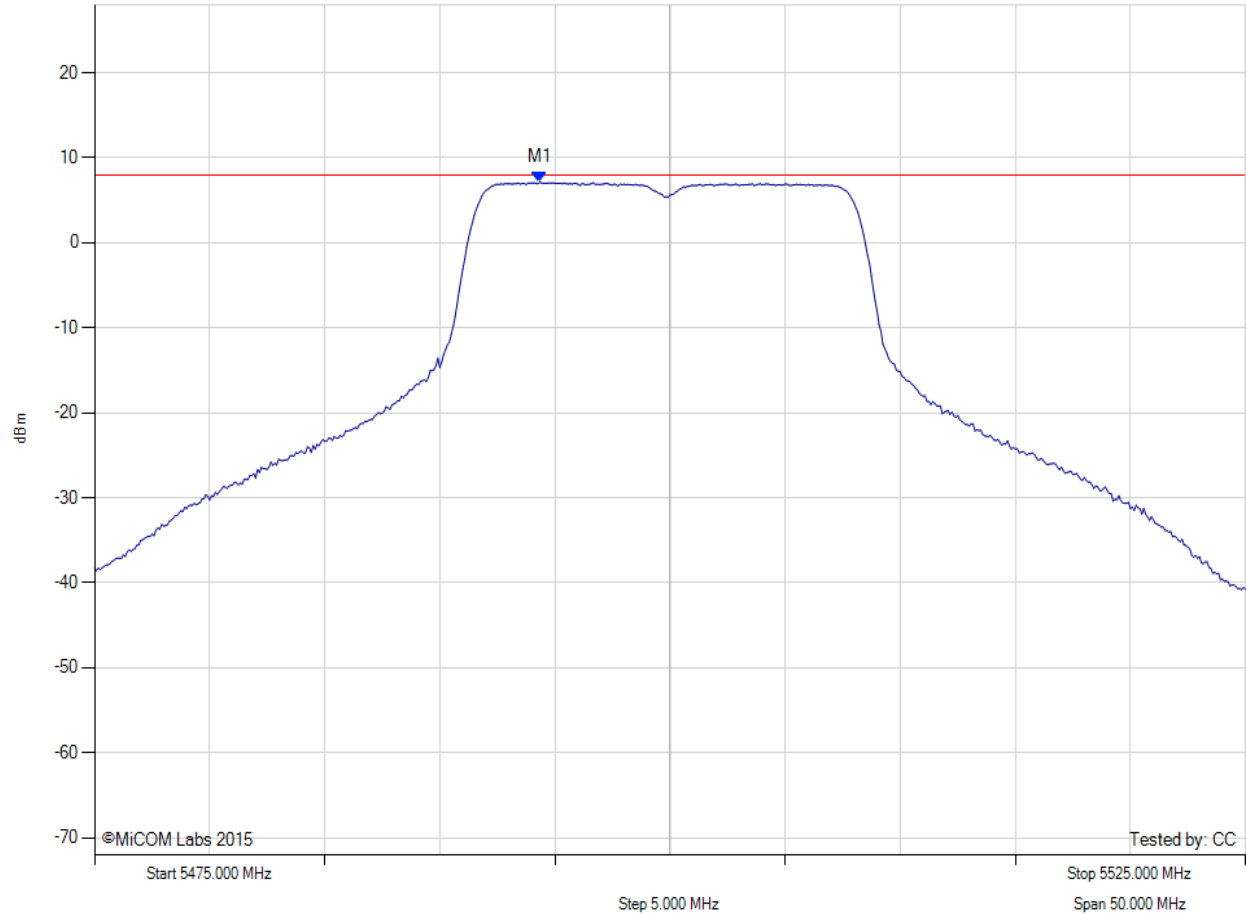
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5500.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5494.330 MHz : 7.140 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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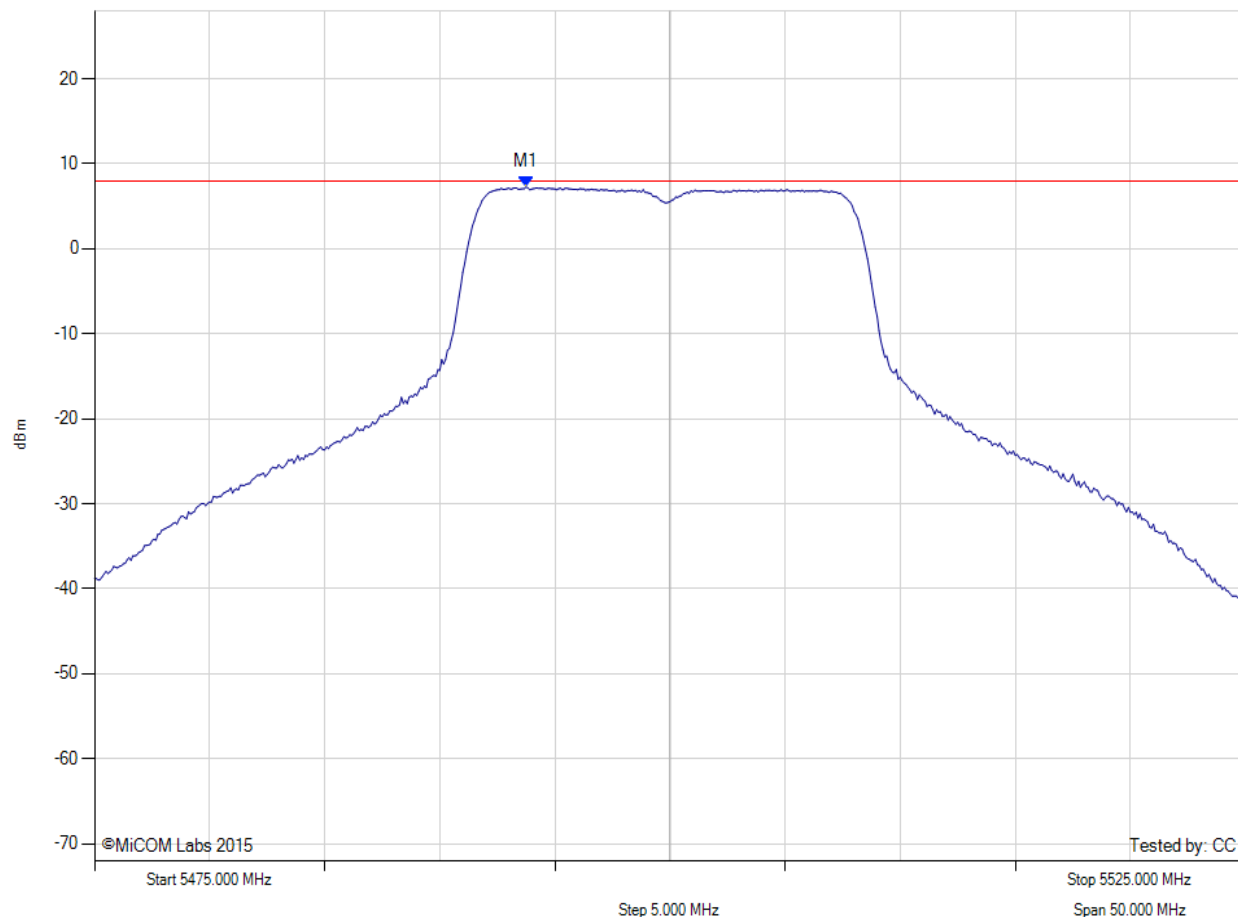
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5500.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.9 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5493.750 MHz : 7.287 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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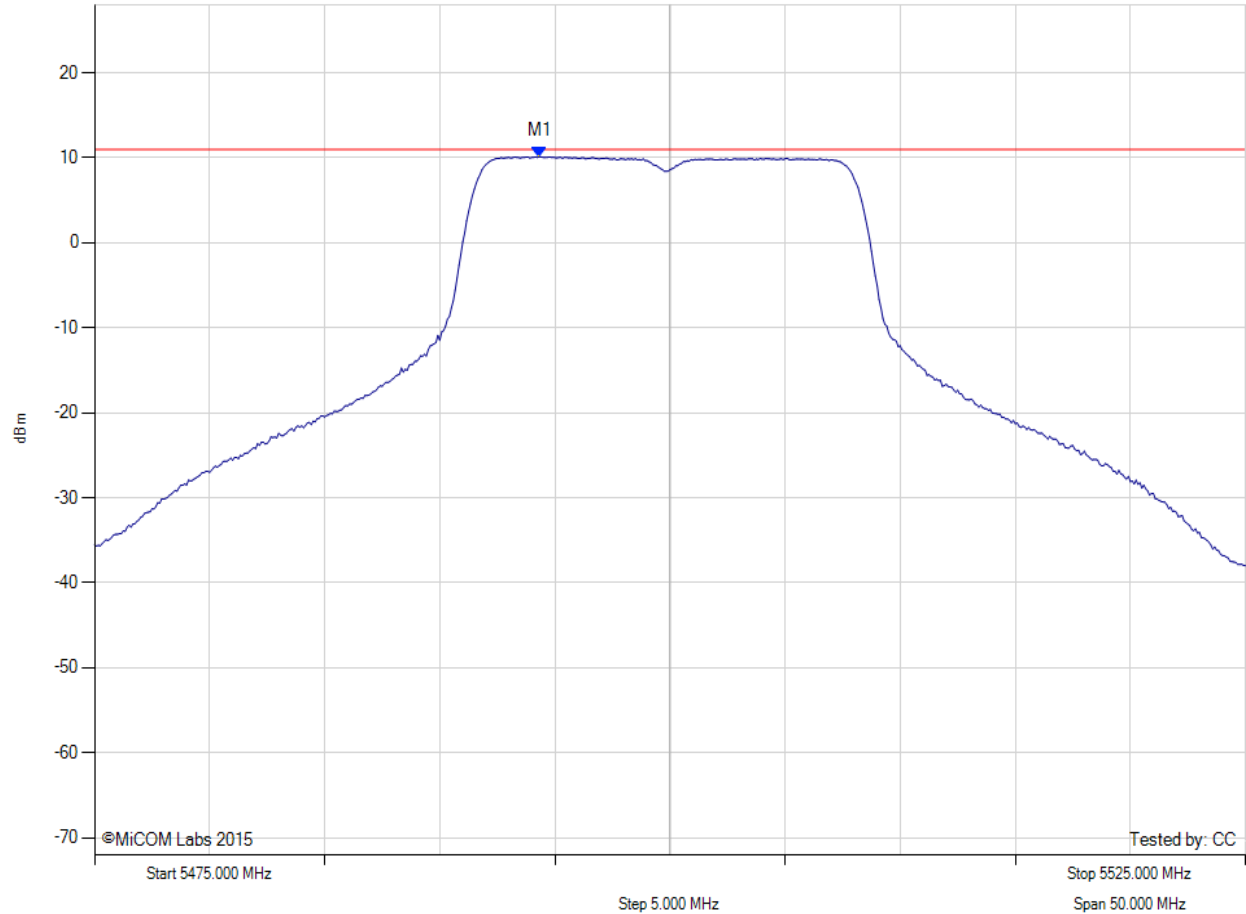
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5500.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5494.300 MHz : 10.147 dBm M1 + DCCF : 5494.300 MHz : 10.191 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.8 dB

[back to matrix](#)

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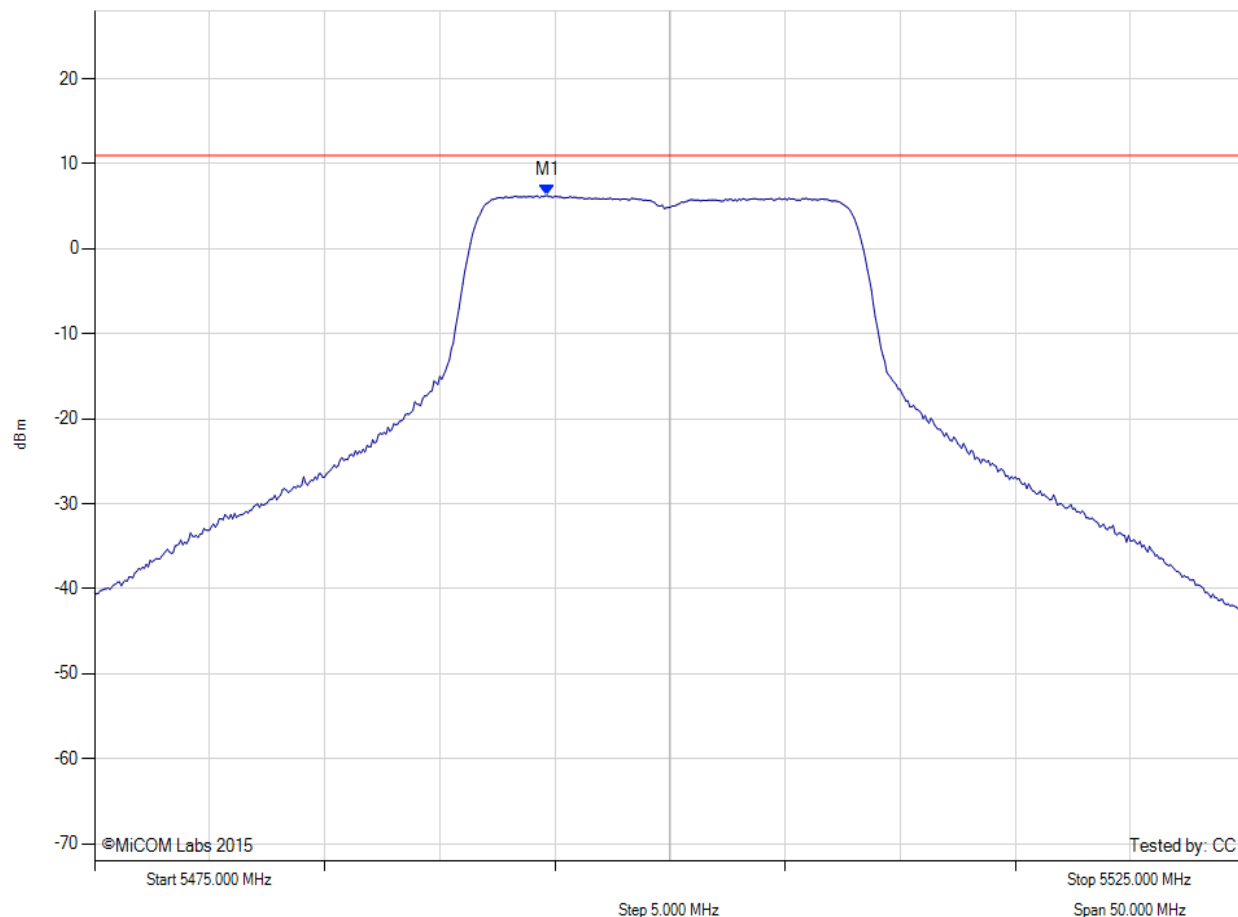
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5500.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.9 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5494.700 MHz : 6.272 dBm M1 + DCCF : 5494.700 MHz : 6.316 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -4.7 dB

[back to matrix](#)

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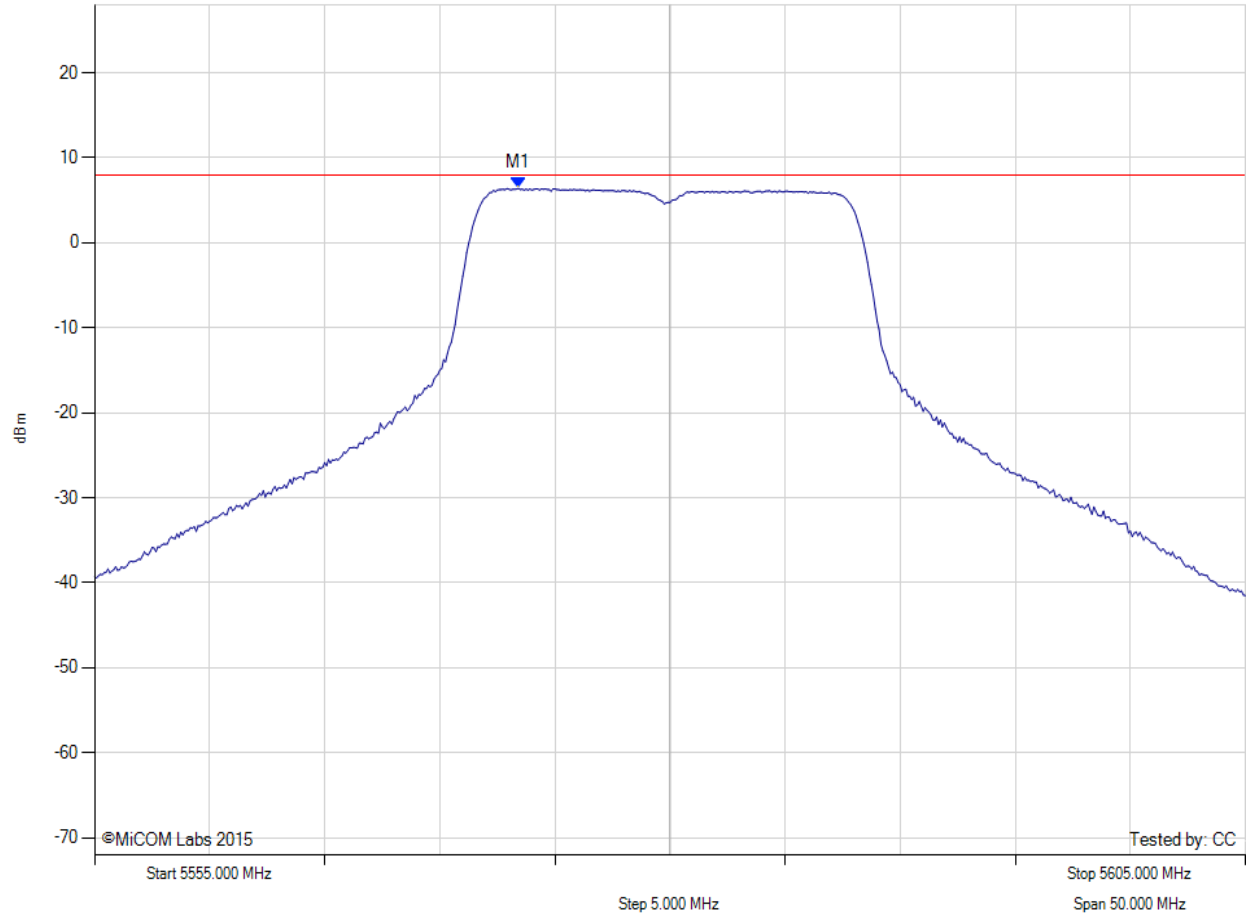
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5580.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5573.420 MHz : 6.411 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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.

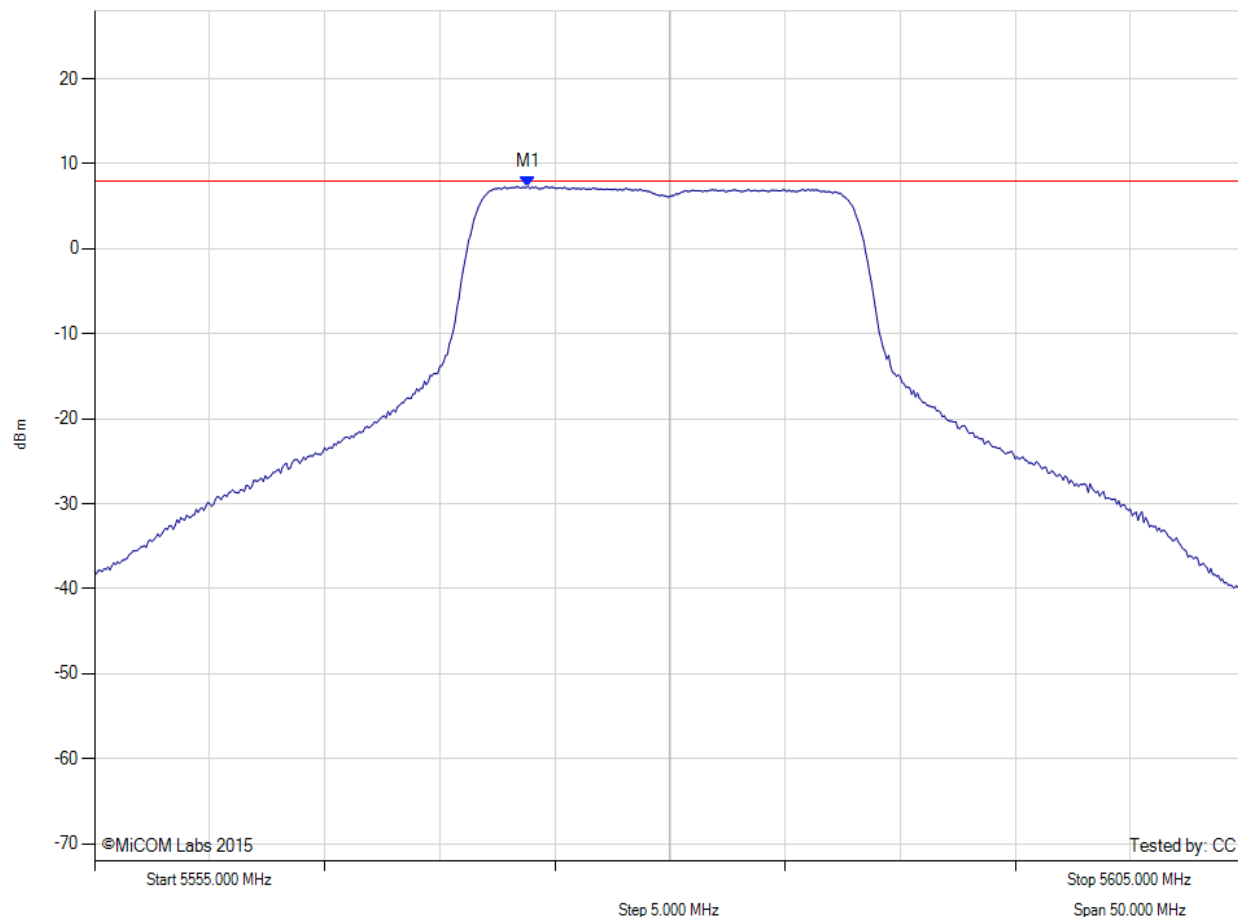
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5580.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
24.0 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5573.830 MHz : 7.341 dBm	Channel Frequency: 5580.00 MHz

[back to matrix](#)

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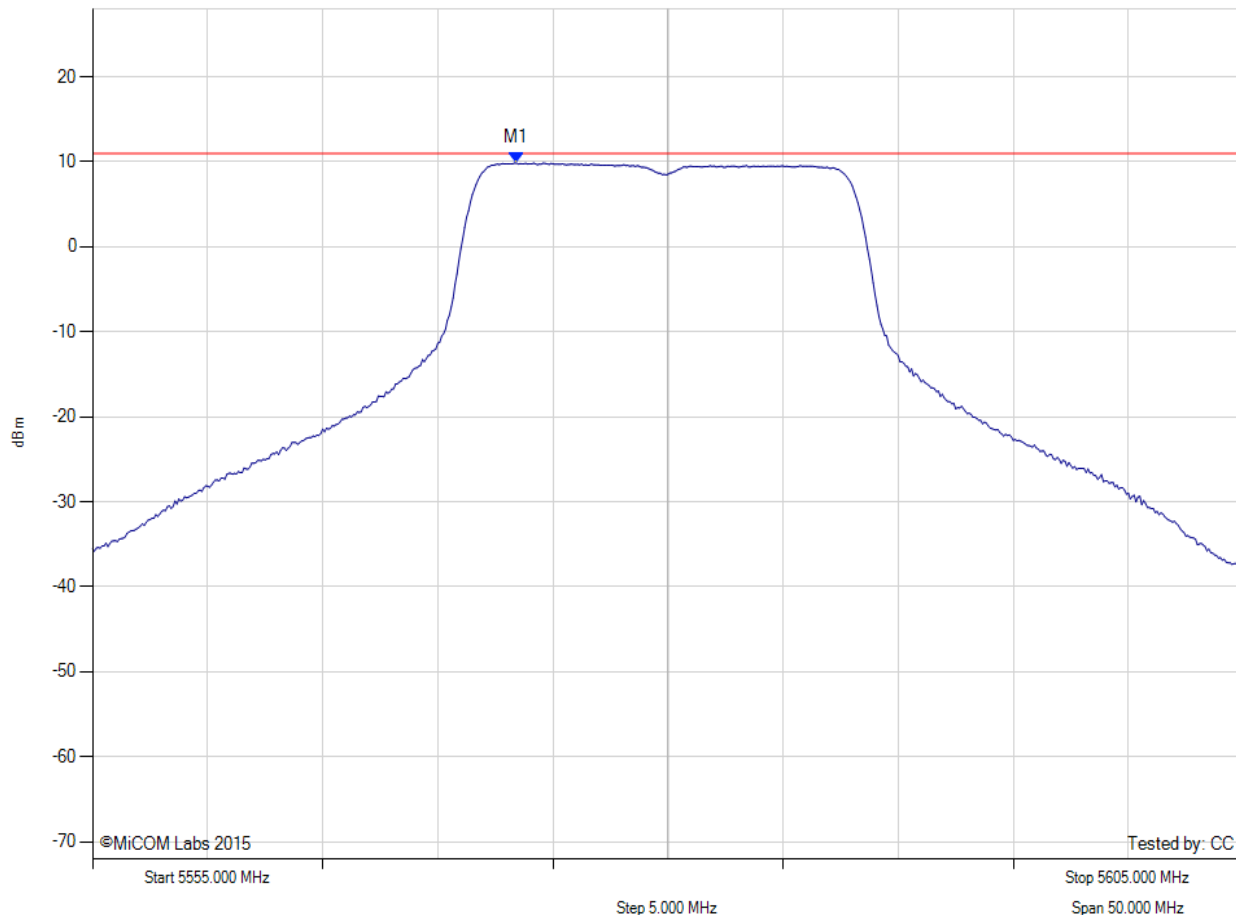
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5580.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5573.400 MHz : 9.867 dBm M1 + DCCF : 5573.400 MHz : 9.911 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.1 dB

[back to matrix](#)

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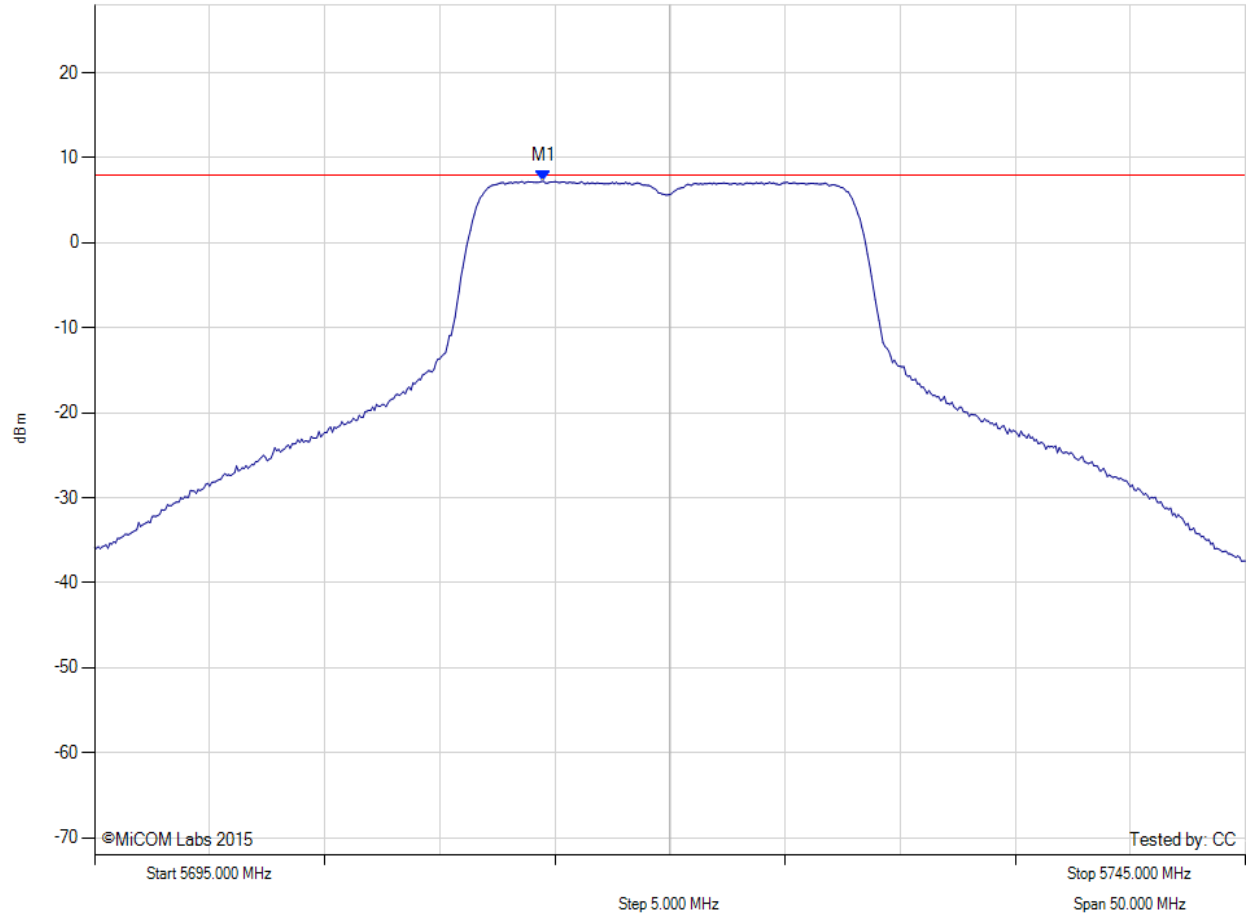
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5720.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.8 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5714.500 MHz : 7.262 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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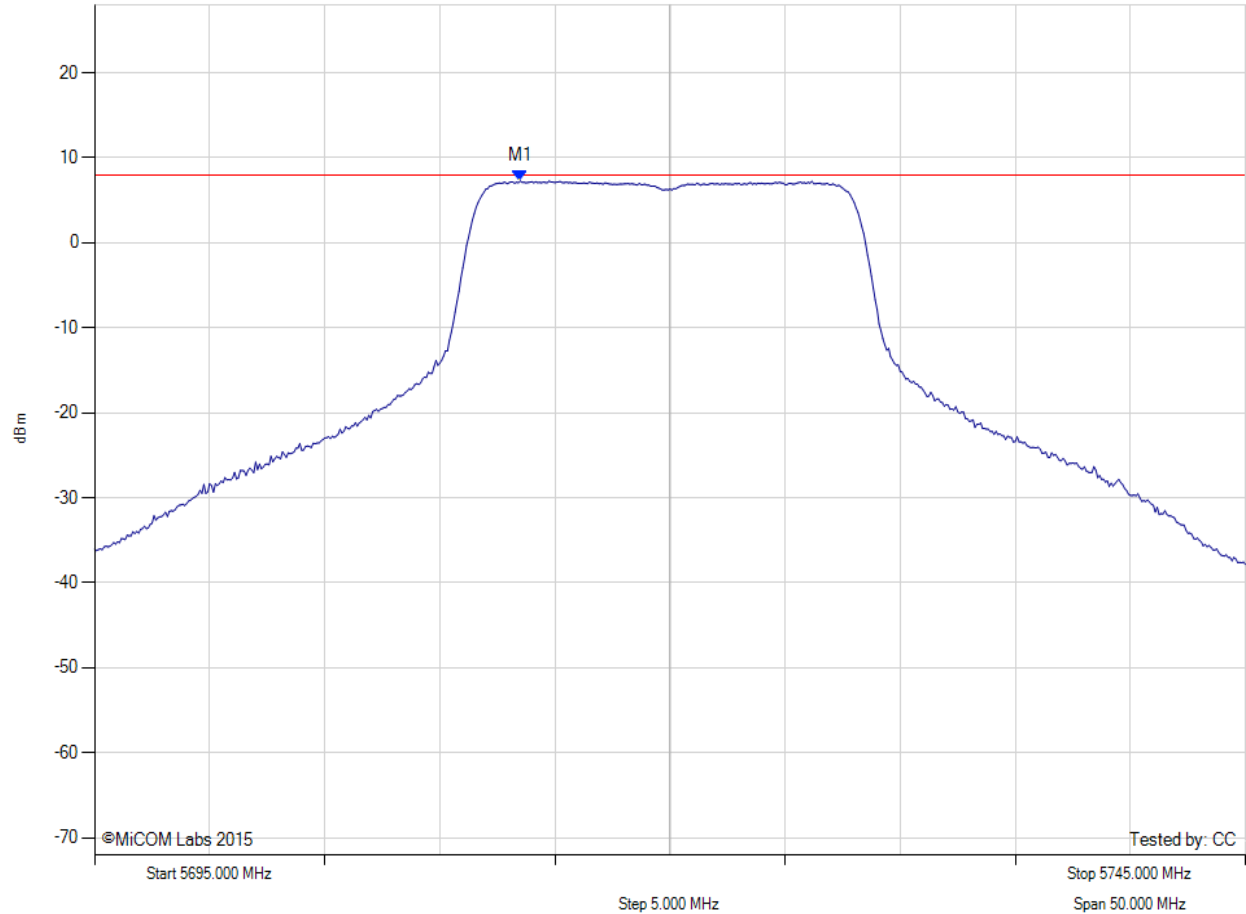
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5720.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
24.1 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5713.500 MHz : 7.273 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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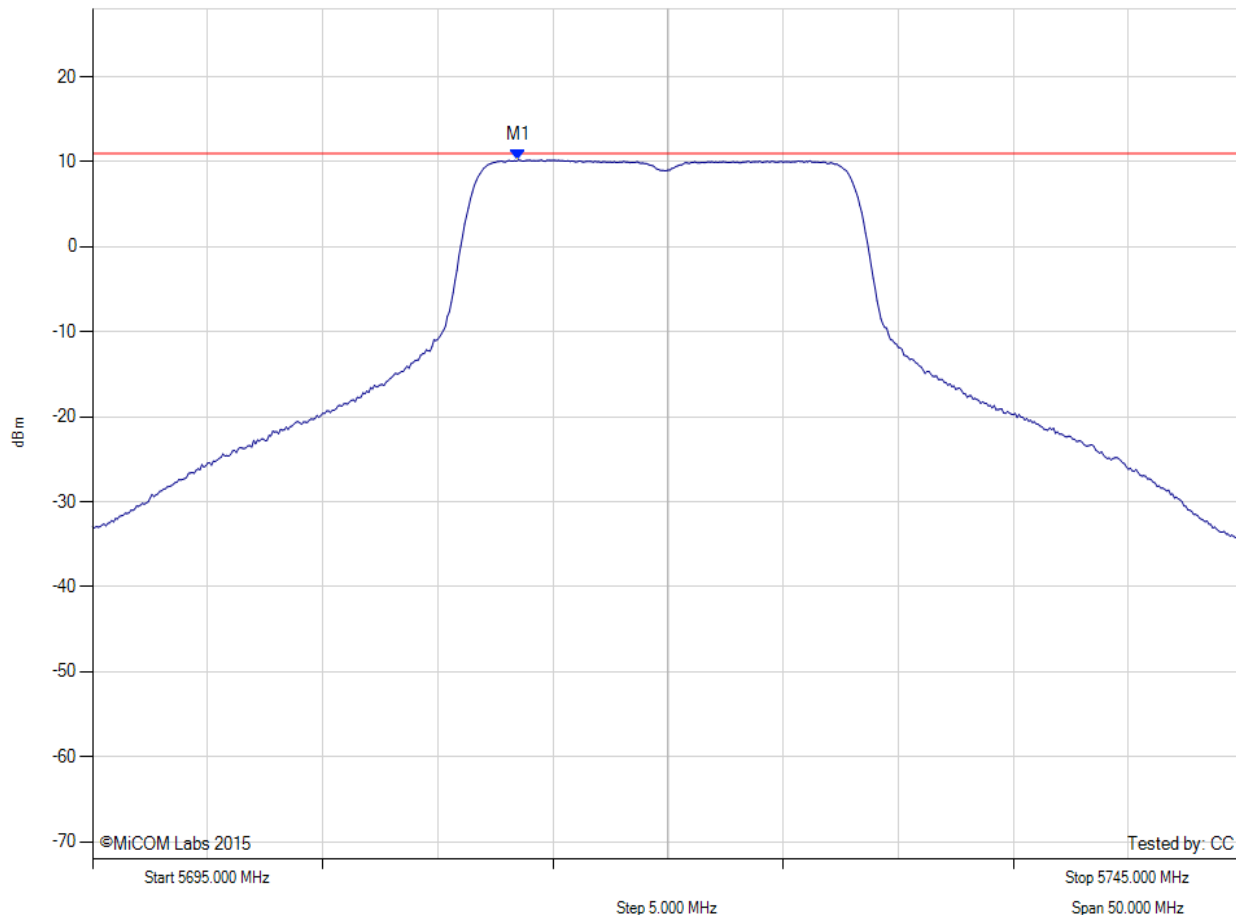
POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5720.00 MHz, SUM, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.8 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5713.500 MHz : 10.232 dBm M1 + DCCF : 5713.500 MHz : 10.276 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.7 dB

[back to matrix](#)

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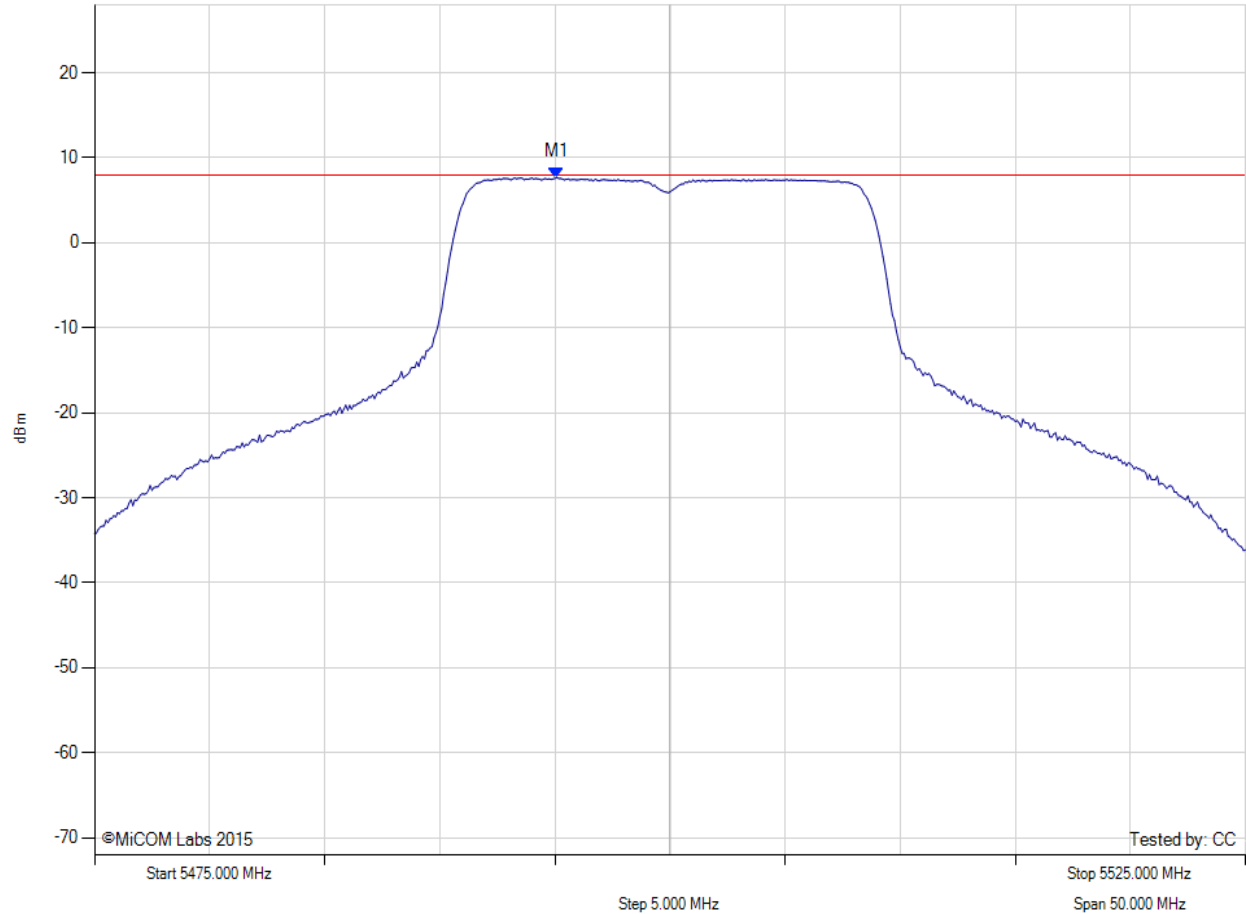
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5500.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5495.080 MHz : 7.696 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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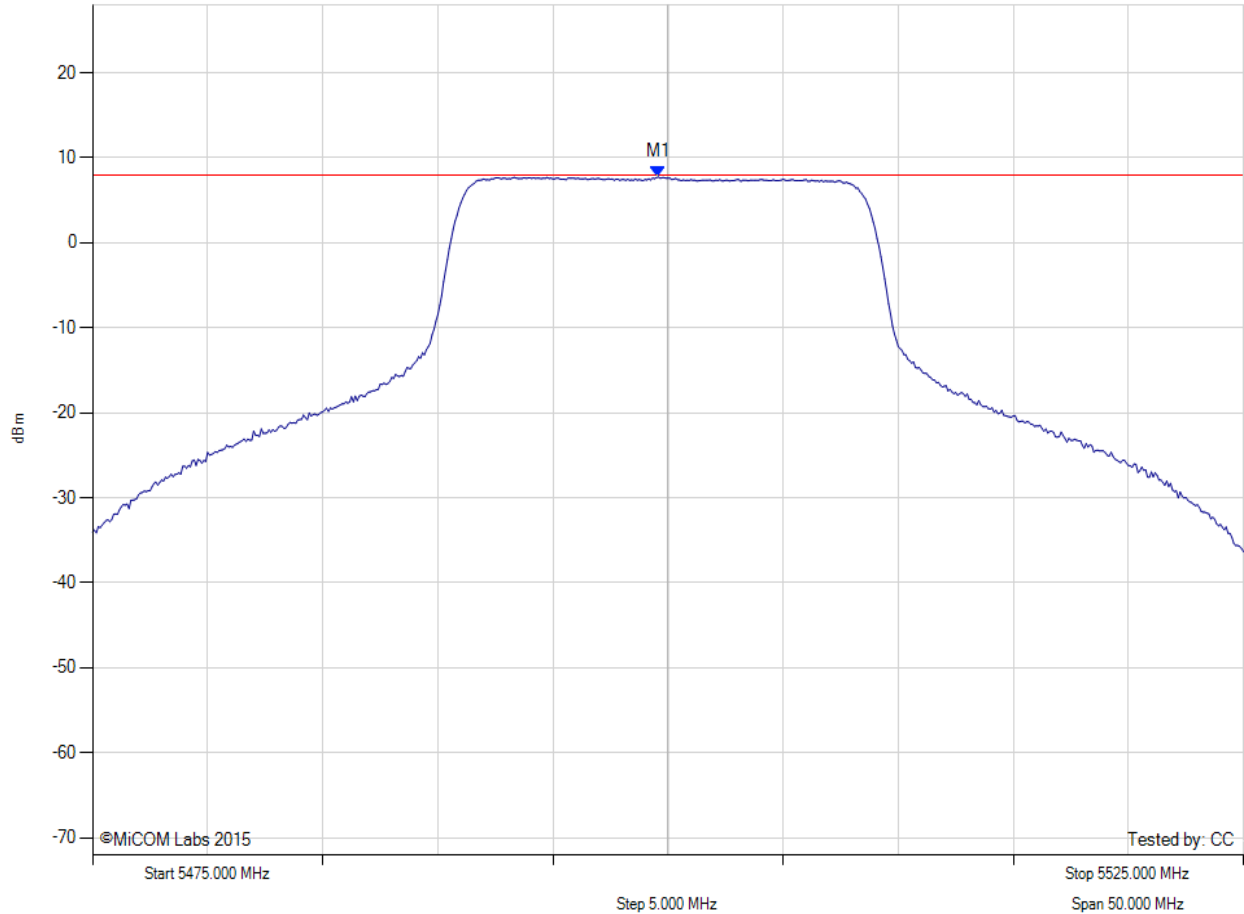
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5500.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.9 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

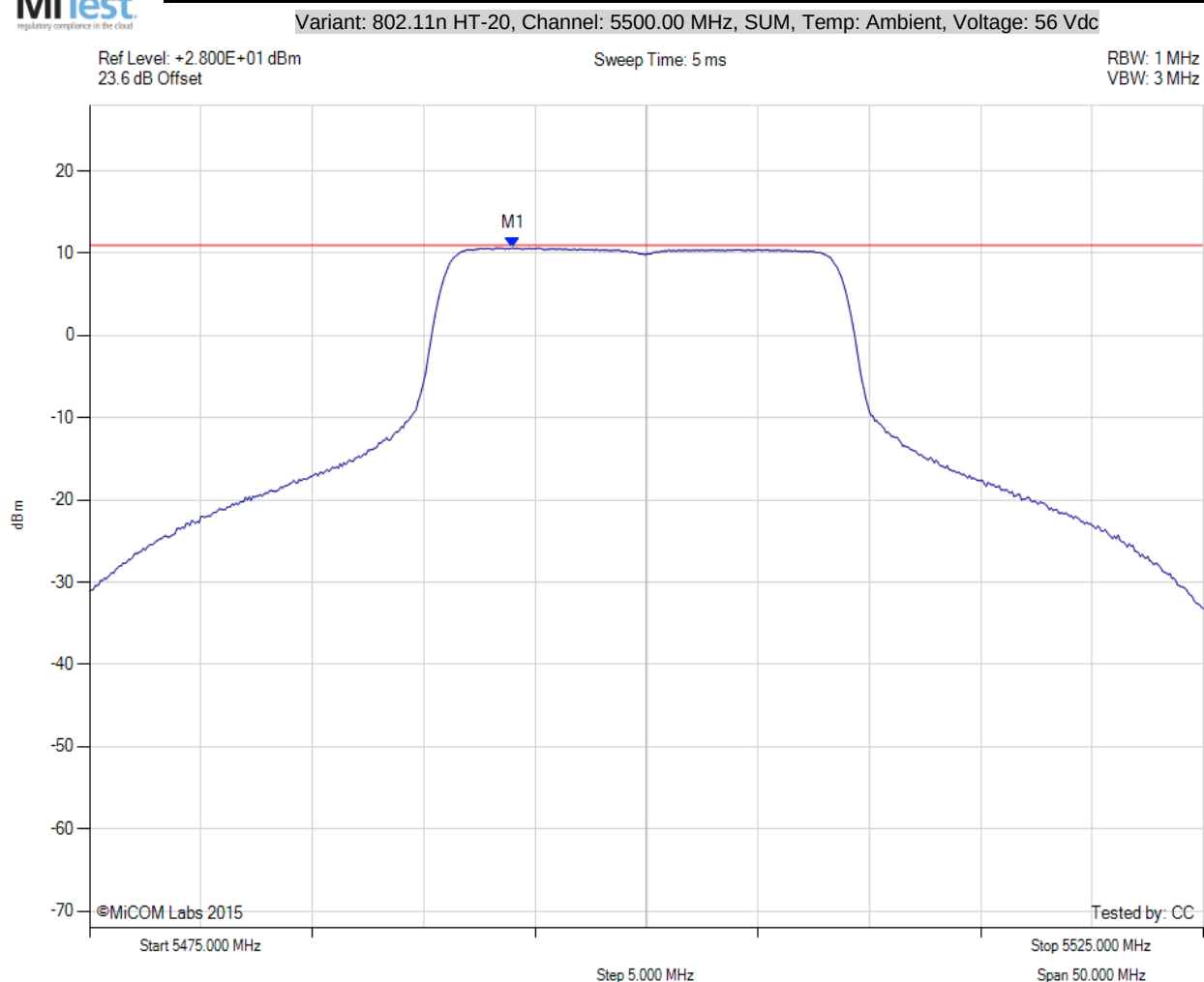


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5499.580 MHz : 7.758 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5494.000 MHz : 10.661 dBm M1 + DCCF : 5494.000 MHz : 10.705 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.3 dB

[back to matrix](#)

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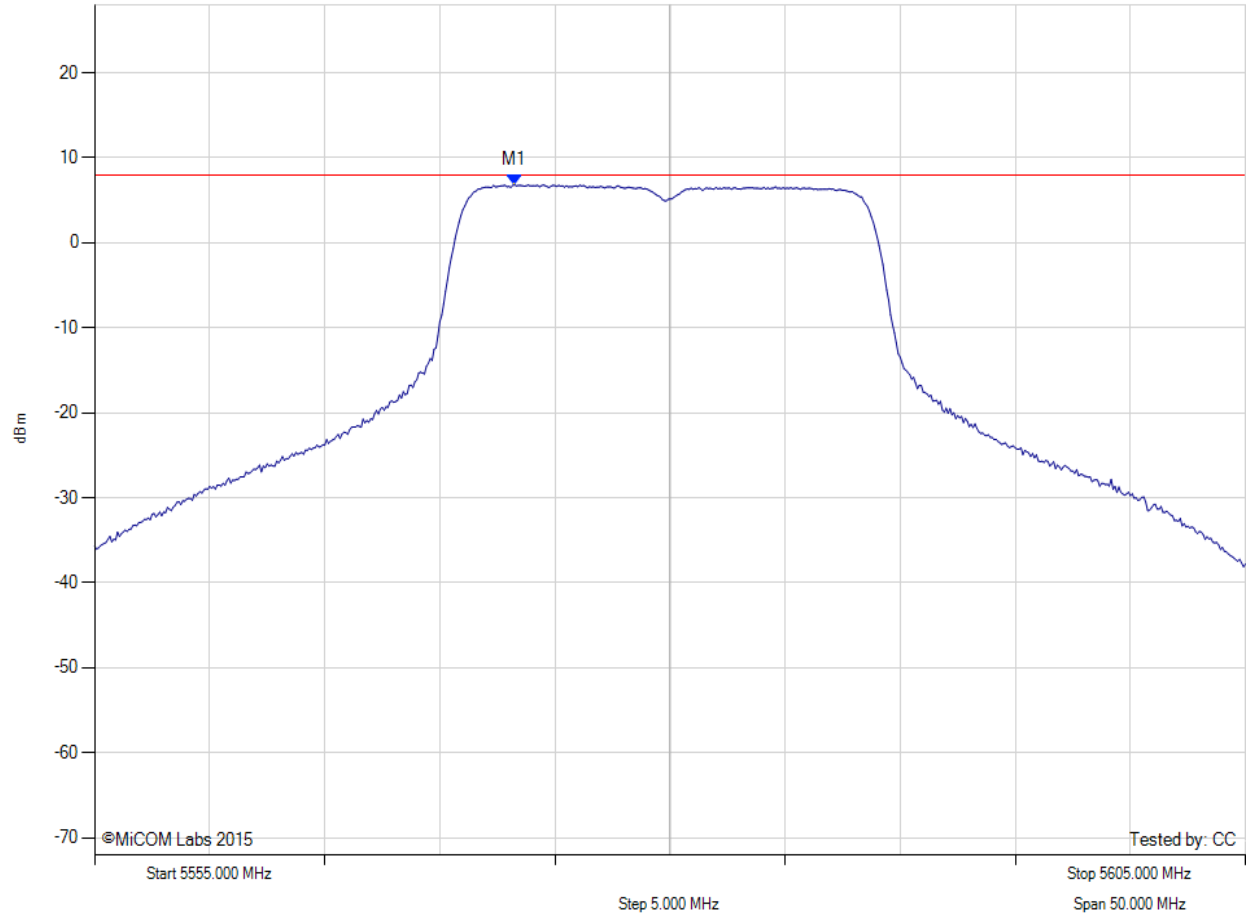
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5580.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5573.250 MHz : 6.816 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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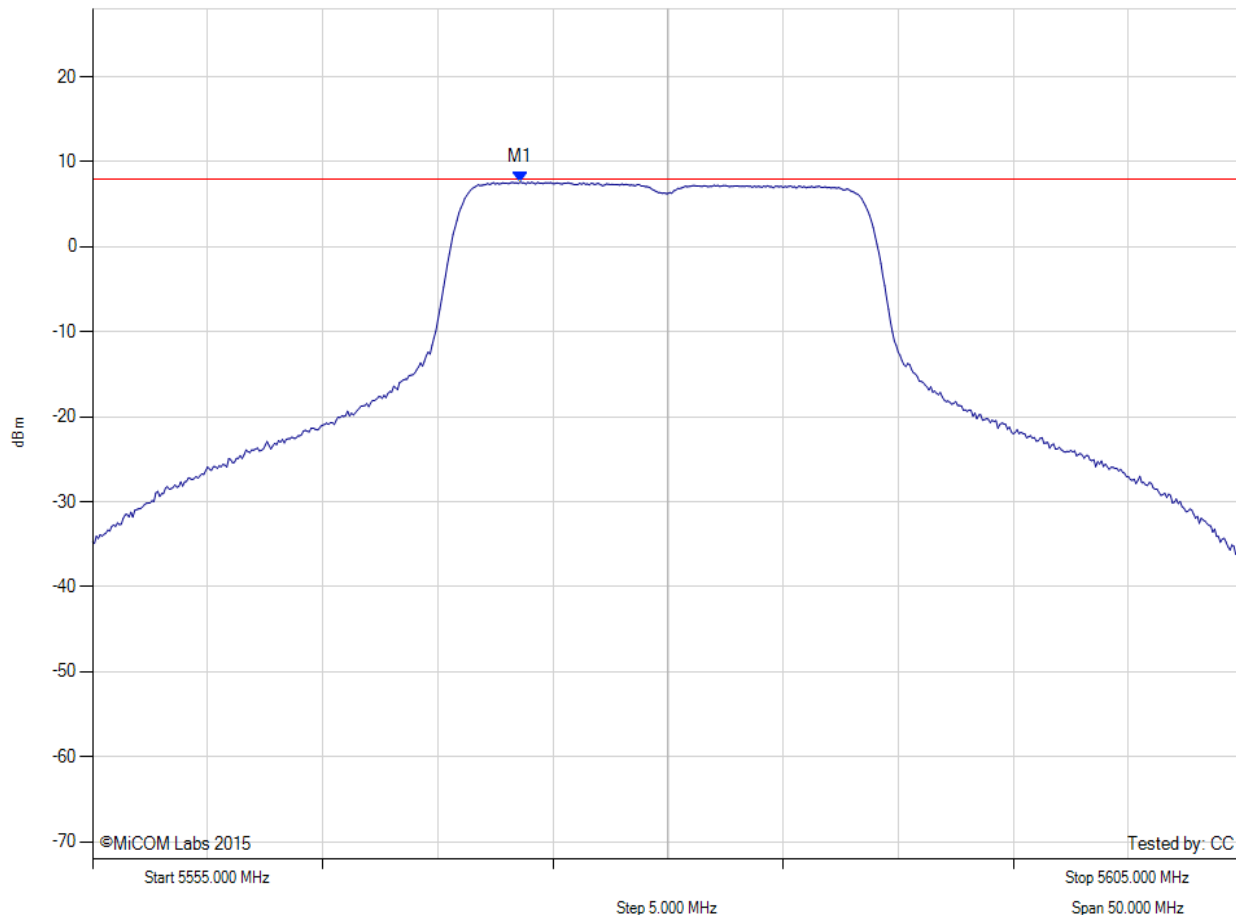
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5580.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
24.0 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

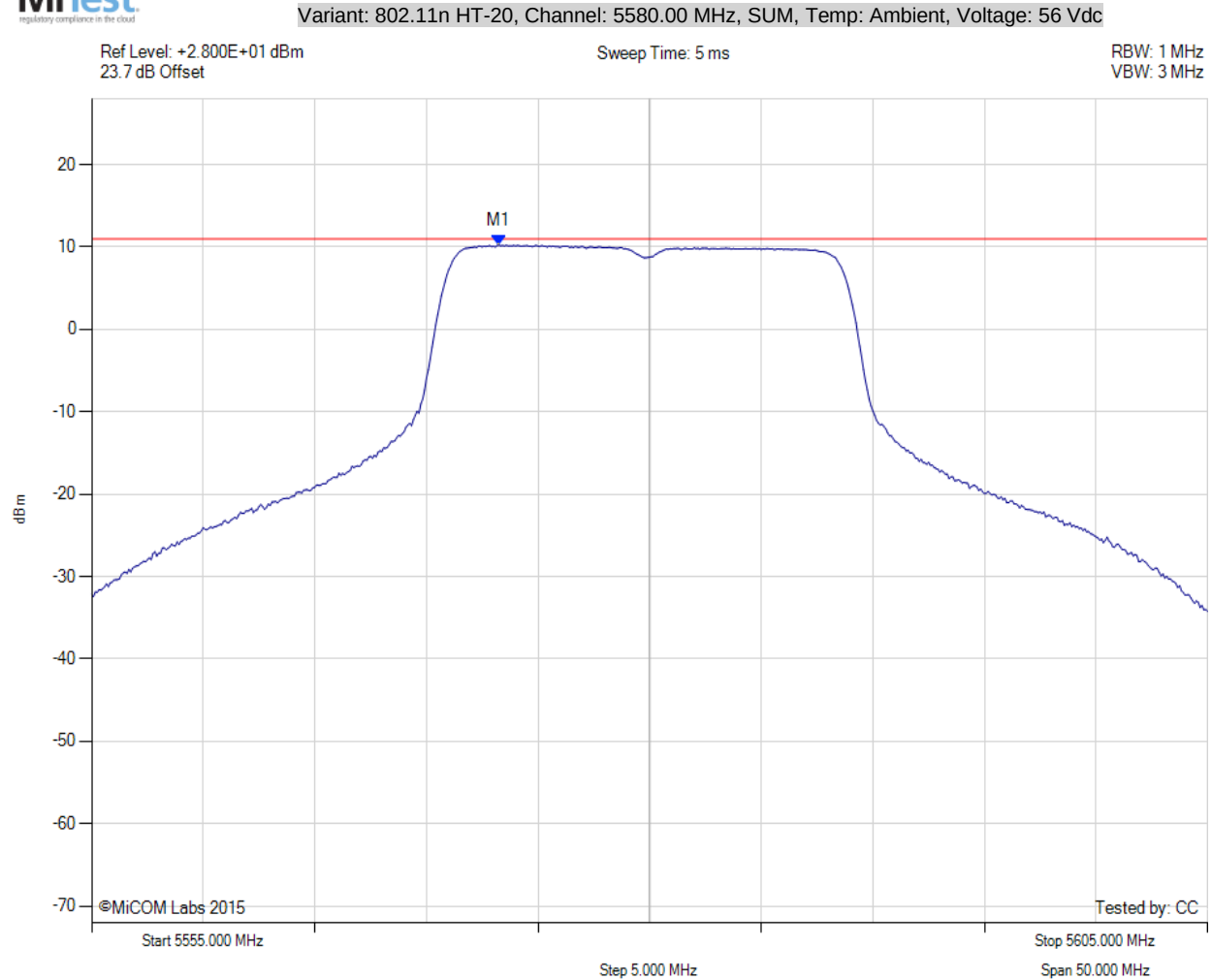


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5573.580 MHz : 7.619 dBm	Channel Frequency: 5580.00 MHz

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5573.300 MHz : 10.221 dBm M1 + DCCF : 5573.300 MHz : 10.265 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -0.7 dB

[back to matrix](#)

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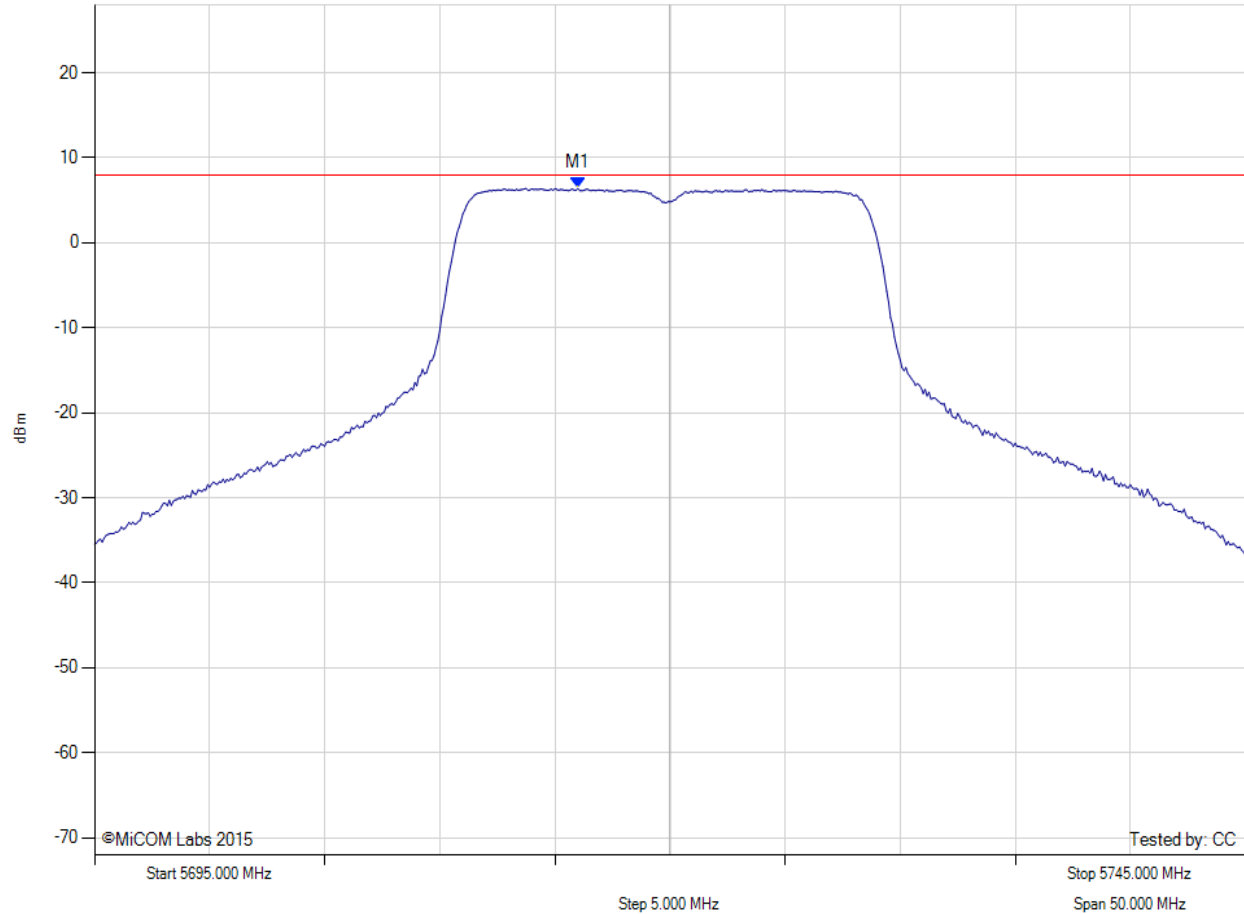
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5720.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.8 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5716.000 MHz : 6.407 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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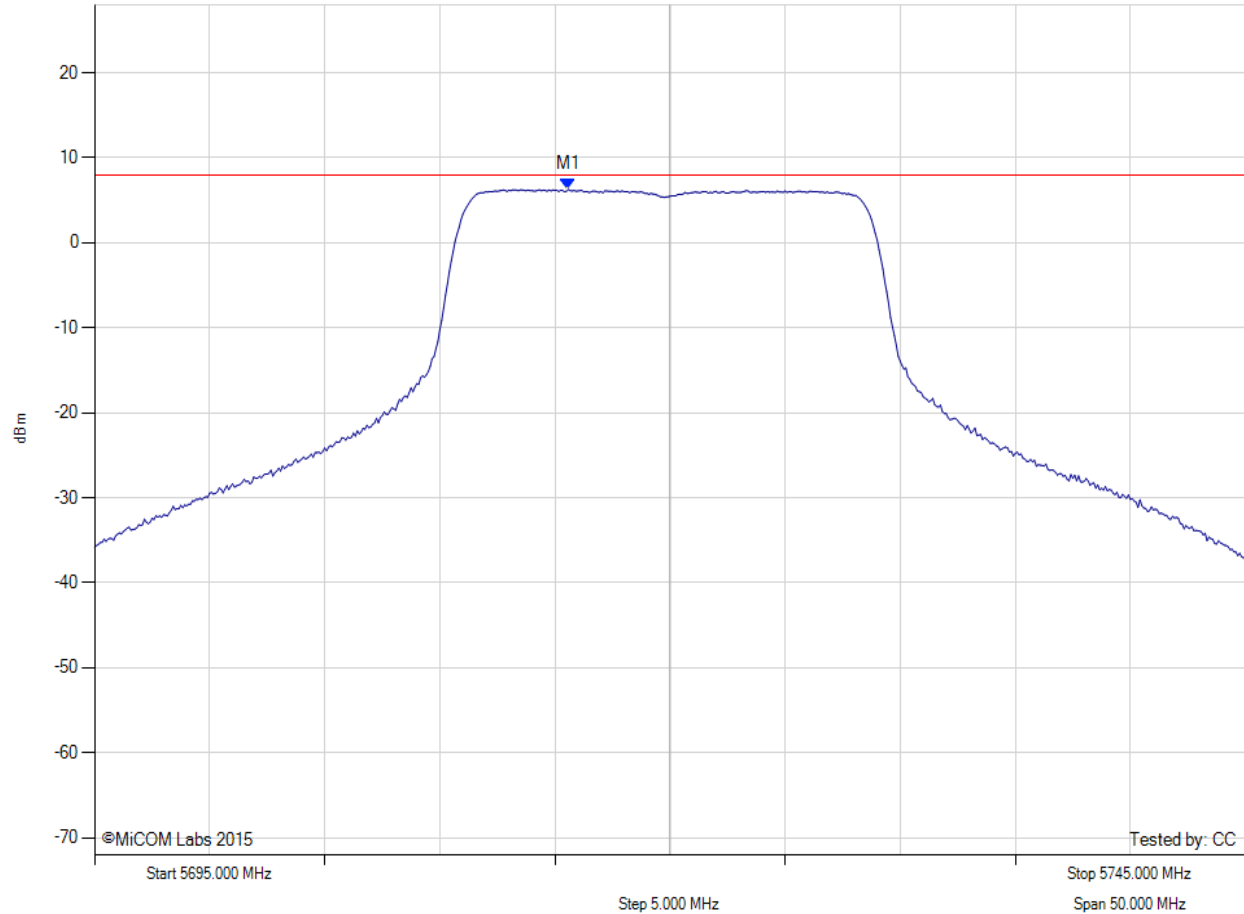
POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5720.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
24.1 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

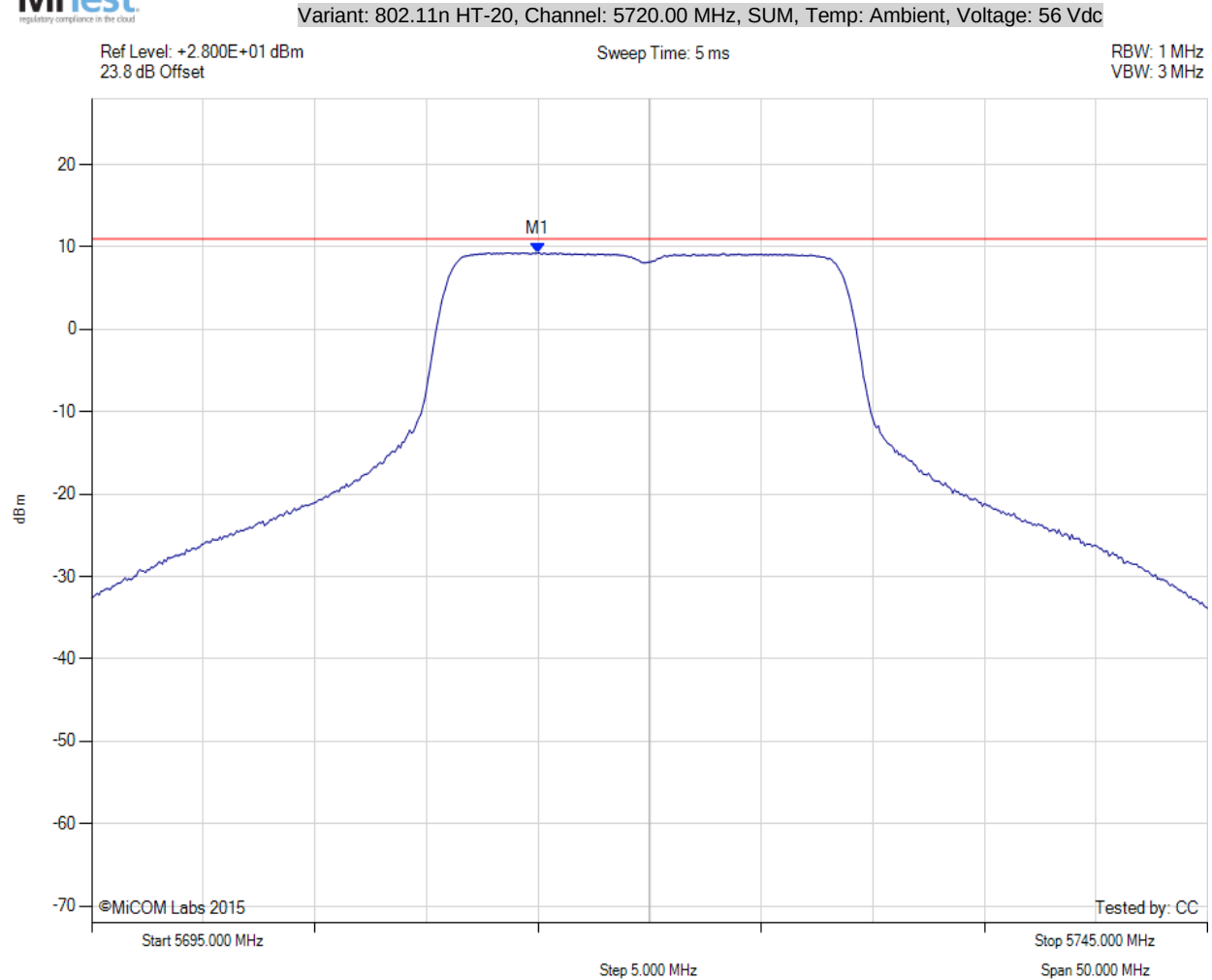


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5715.580 MHz : 6.286 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5715.000 MHz : 9.306 dBm M1 + DCCF : 5715.000 MHz : 9.350 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.7 dB

[back to matrix](#)

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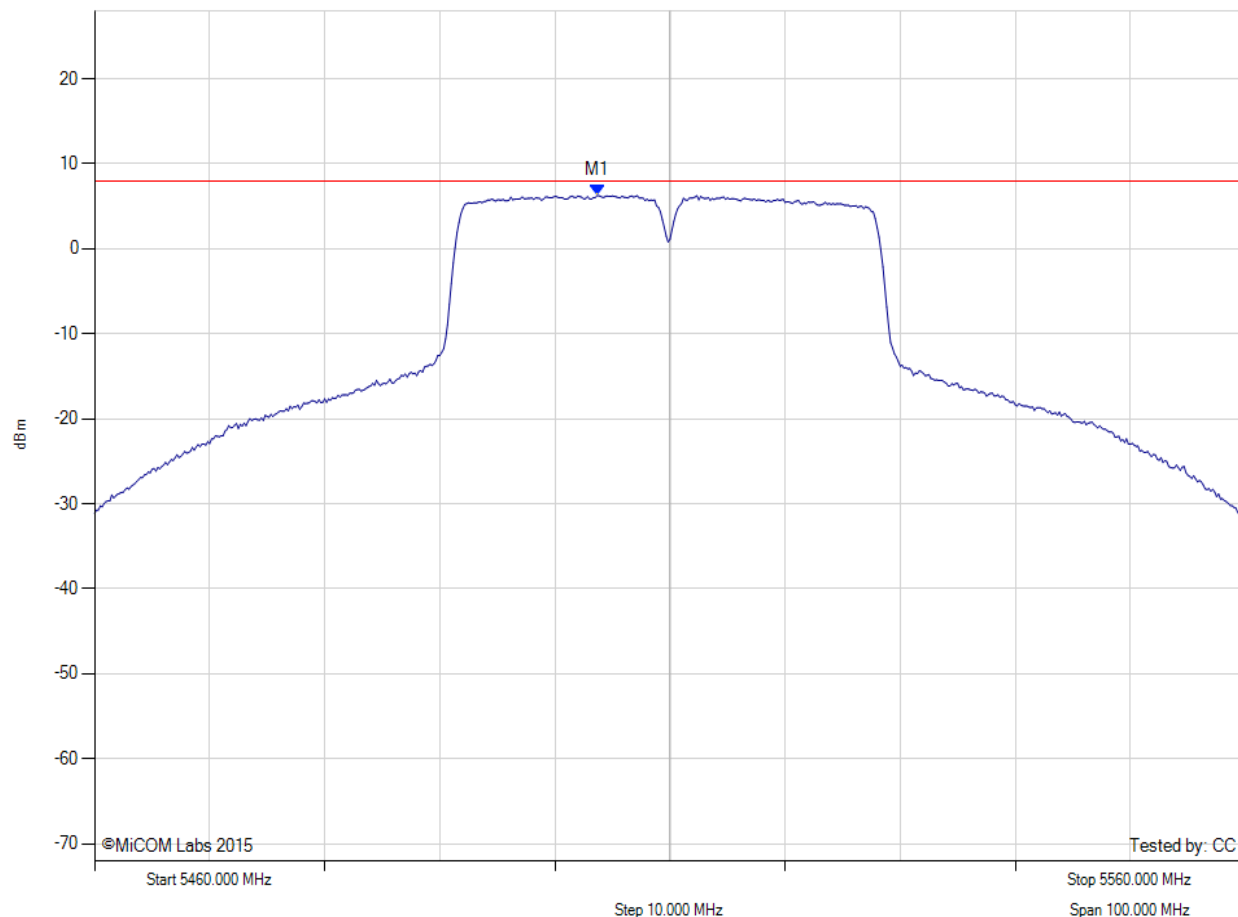
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5510.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.6 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5503.670 MHz : 6.285 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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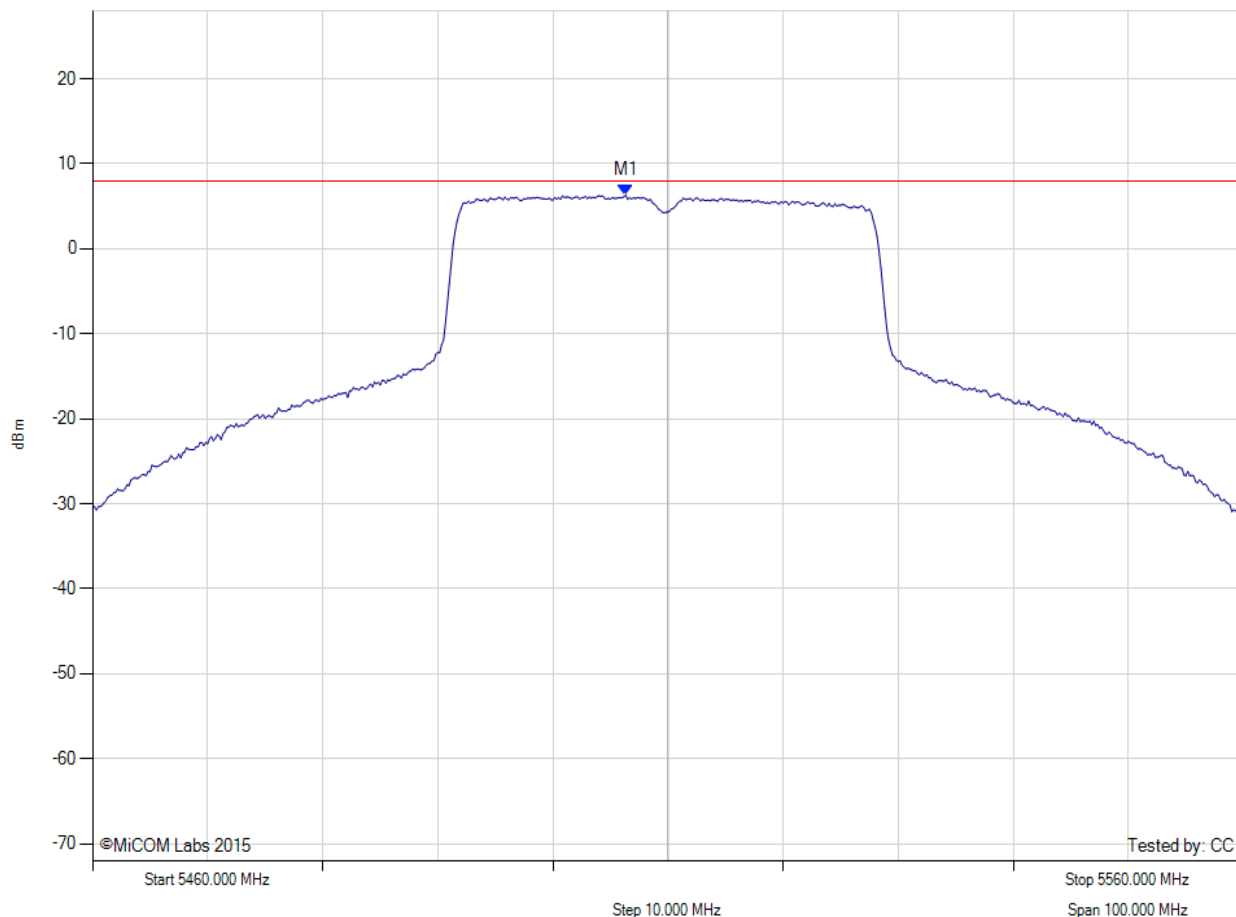
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5510.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.9 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

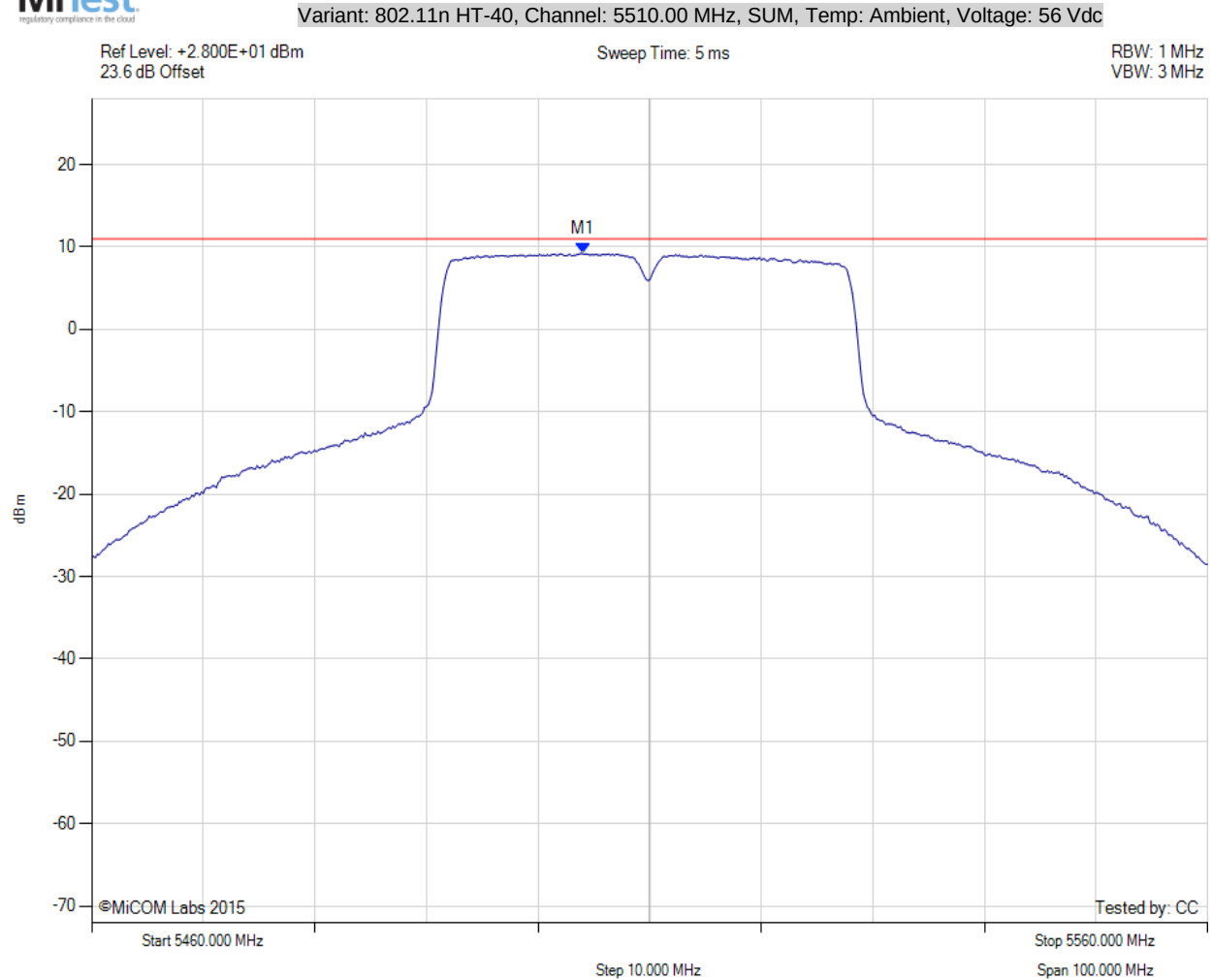


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5506.330 MHz : 6.324 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5504.000 MHz : 9.215 dBm M1 + DCCF : 5504.000 MHz : 9.259 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.8 dB

[back to matrix](#)

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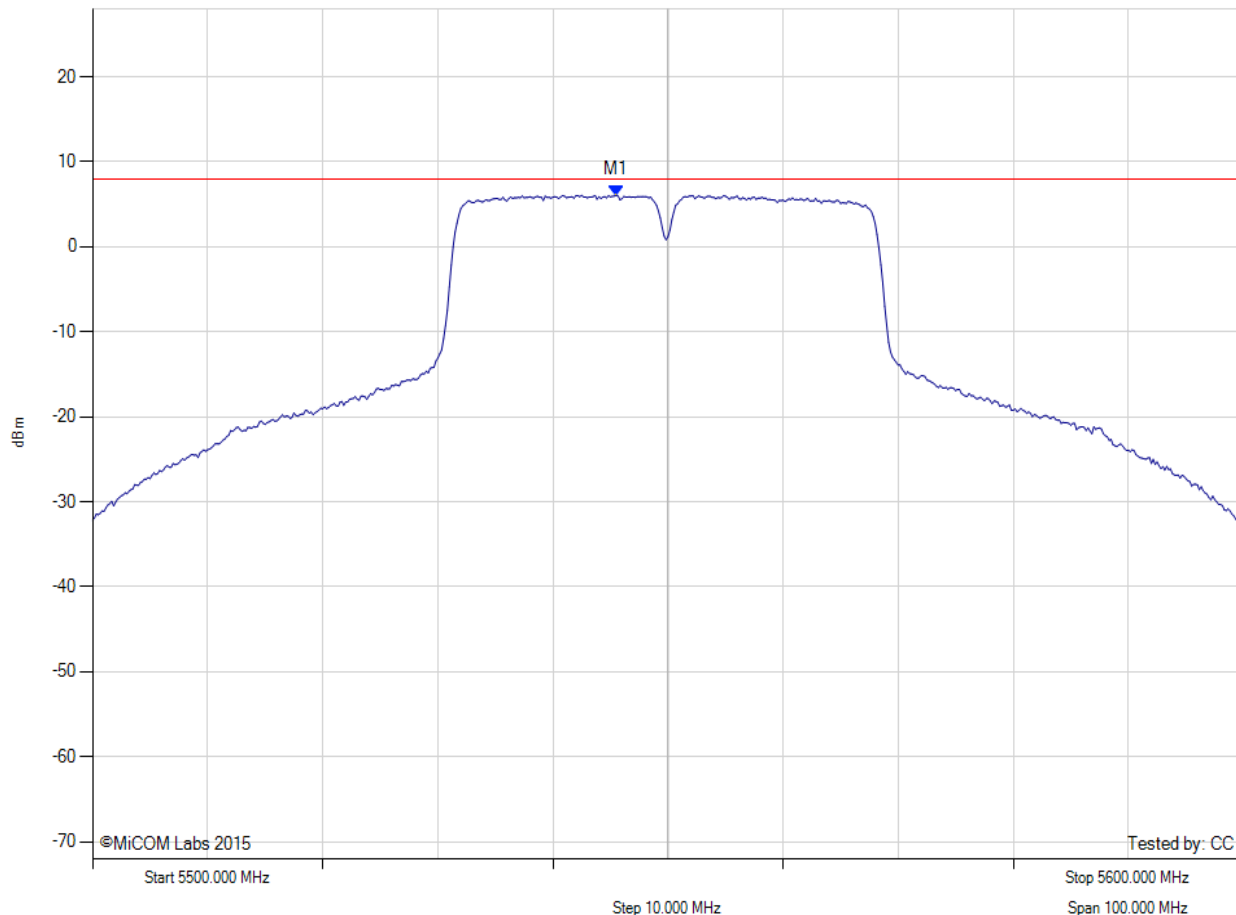
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5550.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.7 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5545.500 MHz : 6.076 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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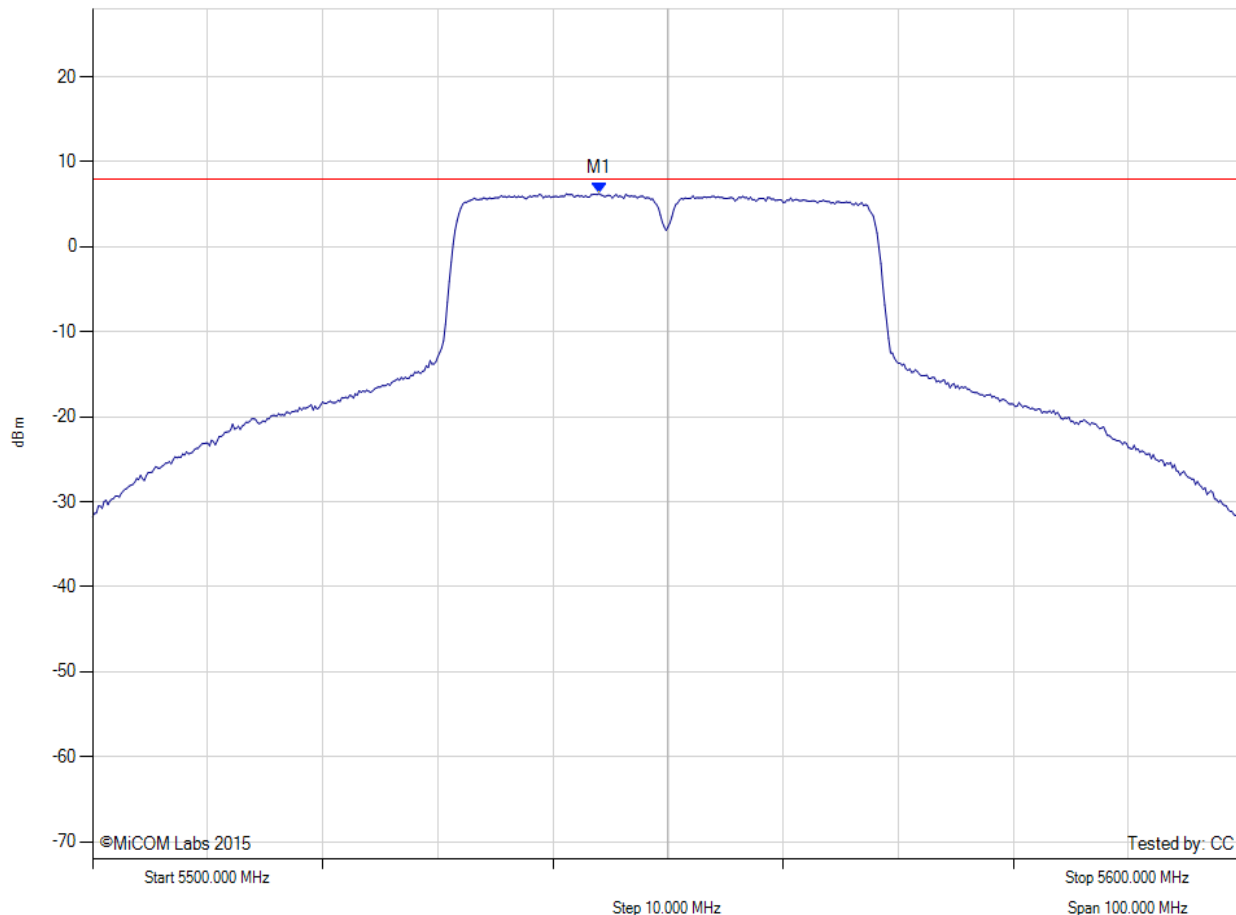
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5550.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
24.0 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

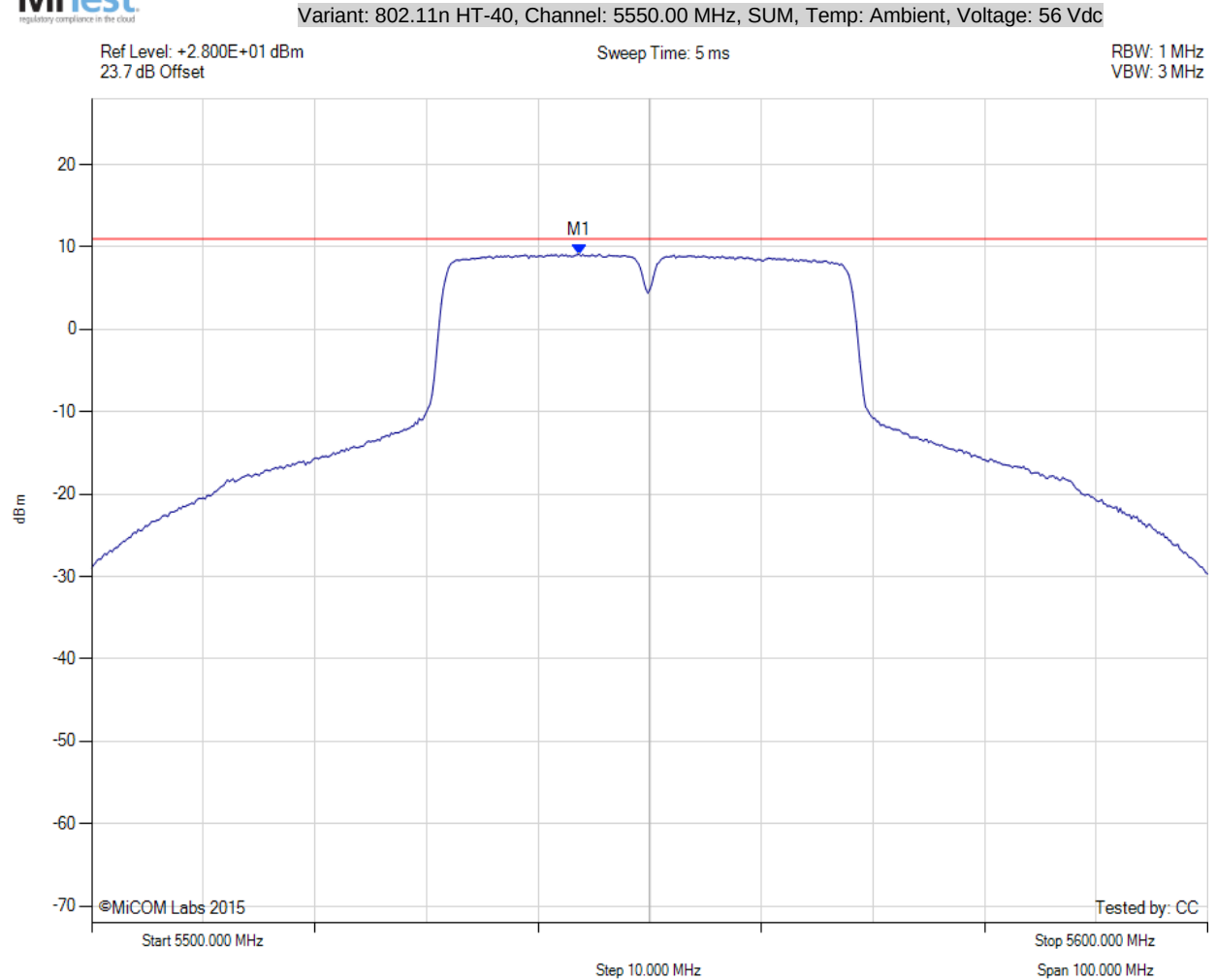


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5544.000 MHz : 6.274 dBm	Channel Frequency: 5550.00 MHz

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5543.700 MHz : 9.129 dBm M1 + DCCF : 5543.700 MHz : 9.173 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -1.8 dB

[back to matrix](#)

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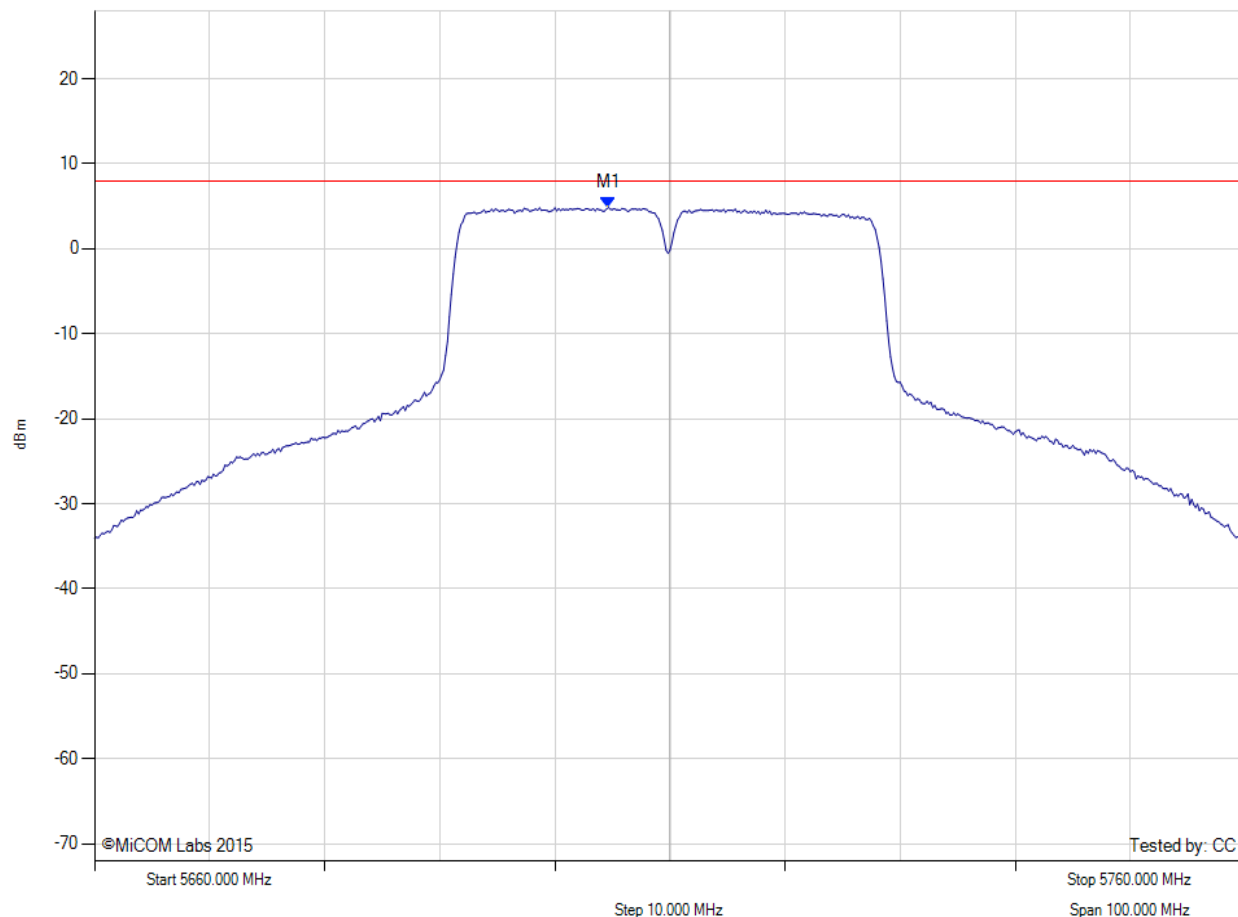
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5710.00 MHz, Chain a, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
23.8 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5704.670 MHz : 4.863 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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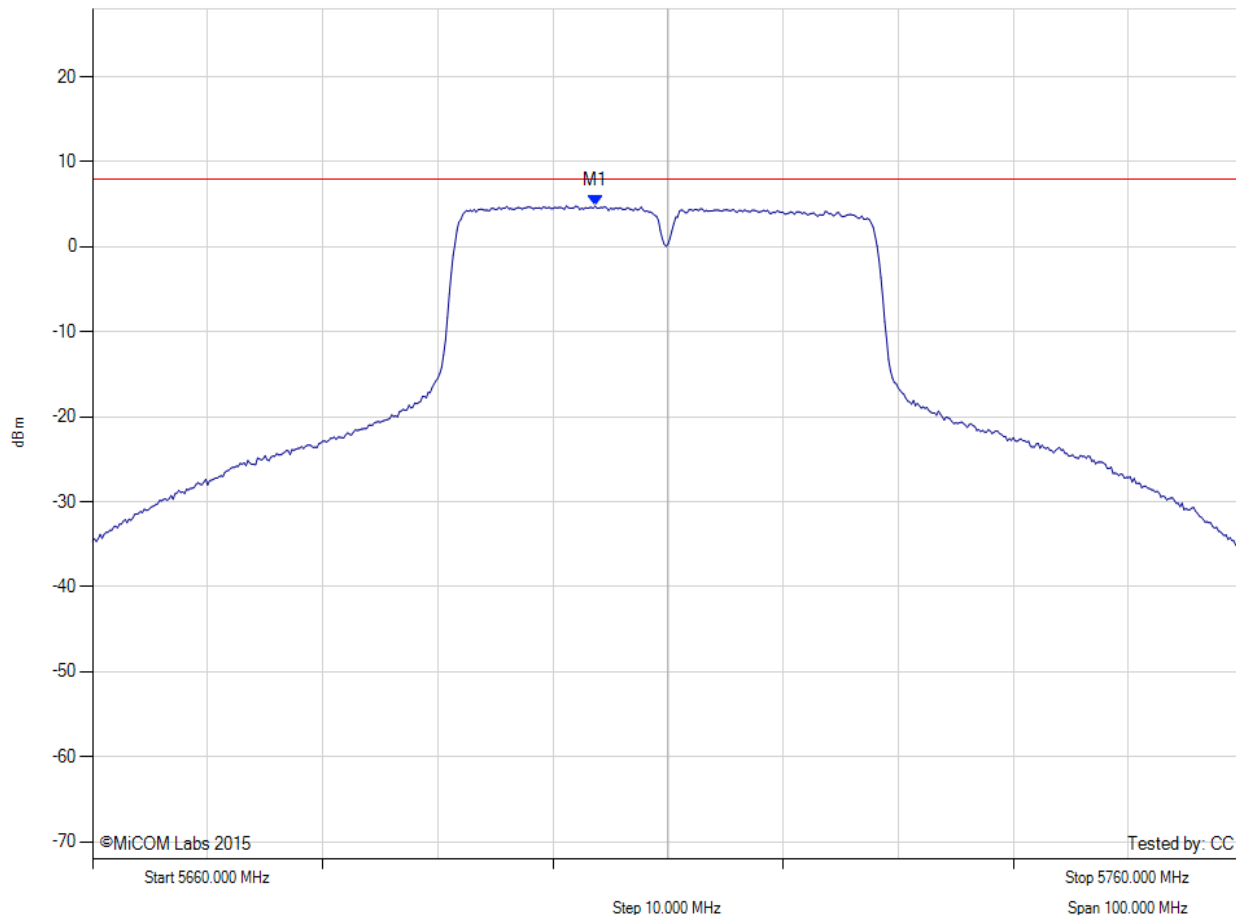
POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5710.00 MHz, Chain b, Temp: Ambient, Voltage: 56 Vdc

Ref Level: +2.800E+01 dBm
24.1 dB Offset

Sweep Time: 5 ms

RBW: 1 MHz
VBW: 3 MHz

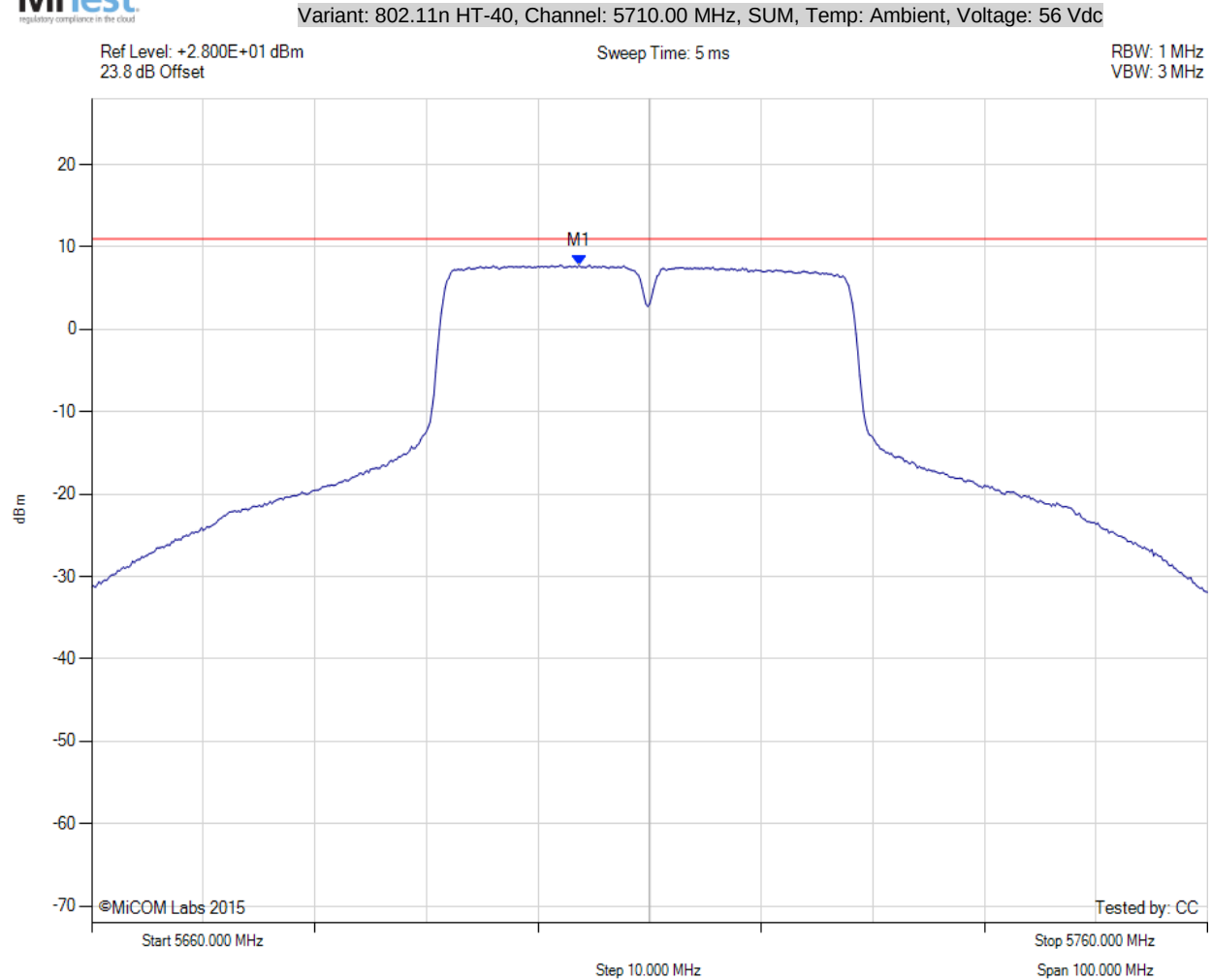


Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5703.670 MHz : 4.816 dBm	Limit: ≤ 7.990 dBm

[back to matrix](#)

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POWER SPECTRAL DENSITY



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = AVER Sweep Count = +100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5703.700 MHz : 7.791 dBm M1 + DCCF : 5703.700 MHz : 7.835 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 11.0 dBm Margin: -3.2 dB

[back to matrix](#)

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