

Company: Hewlett Packard Enterprise

Test of: APINR203 & APINP203

To: FCC CFR 47 Part 15 Subpart E 15.407

Report No.: HPEN96-U8 Rev A 1x1

COMPLETE TEST REPORT





Test of: Hewlett Packard Enterprise APINR203 & APINP203

to

To: FCC CFR 47 Part 15 Subpart E 15.407

Test Report Serial No.: HPEN96-U8 Rev A 1x1

This report supersedes: NONE

Applicant: Hewlett Packard Enterprise
3000 Hanover St.
Palo Alto, California 94034
USA

Product Function Wireless LAN Access Point

Issue Date: 23rd March 2017

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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www.micomlabs.com



MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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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

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1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



United States of America – Telecommunication Certification Body (TCB)
Industry Canada – Certification Body, CAB Identifier – US0159
Europe – Notified Body (NB), NB Identifier - 2280
Japan – Recognized Certification Body (RCB), RCB Identifier - 210



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2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	2 nd March 2017	
Rev A	23 rd March 2017	Initial Release

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

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3. TEST RESULT CERTIFICATE

Manufacturer: Hewlett Packard Enterprise 3000 Hanover St. Palo Alto California 94034 USA	Tested By: MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model: APINR203 & APINP203	Telephone: +1 925 462 0304 Fax: +1 925 462 0306
Type Of Equipment: Wireless Access Point	
S/N's: CNCPK2T006, CNCPK2T00L	
Test Date(s): 31st January to 1st February 2017	Website: www.micomlabs.com

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

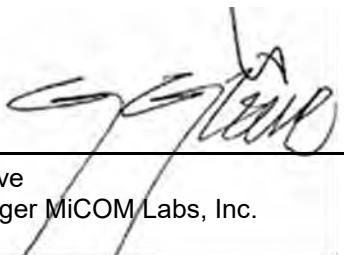
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

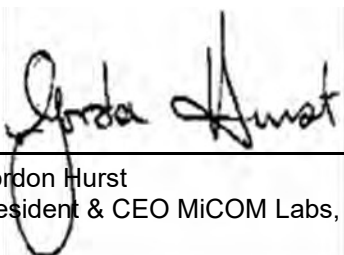
1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

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 D01 & D02	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 D07 v02	22nd August 2016	Test guidance to demonstrate compliance for U-NII devices subject to DFS requirements.
III	KDB 926956 D01 v02	22nd August 2016	U-NII Device Transition Plan
IV	KDB 789033 D02 v01r03	22nd August 2016	General UNII Test Procedures New Rules
V	A2LA	June 2015	R105 - Requirement's When Making Reference to A2LA Accreditation Status
VI	ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices
VII	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
VIII	CISPR 22	2008	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
IX	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
X	FCC 06-96	Jun 30 2006	Memorandum Opinion and Order
XI	FCC 47 CFR Part 15.407	2016	Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices
XII	ICES-003	Issue 6 Jan 2016	Spectrum Management and Telecommunications; Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement.
XIII	M 3003	Edition 3 Nov.2012	Expression of Uncertainty and Confidence in Measurements
XIV	RSS-247 Issue 2	Feb 2017	Digital Transmission Systems (DTSS), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices
XV	RSS-Gen Issue 4	November 2014	General Requirements and Information for the Certification of Radio communication Equipment
XVI	KDB 644545 D03 v01	August 14th 2014	Guidance for IEEE 802.11ac New Rules
XVII	FCC 47 CFR Part 2.1033	2016	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.

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5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Hewlett Packard Enterprise APINR203 / APINP203 1X1 configuration in the frequency ranges 5150 - 5250 MHz, 5725 - 5850 MHz to FCC CFR 47 Part 15 Subpart E 15.407. Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices
Applicant:	Hewlett Packard Enterprise 3000 Hanover St. Palo Alto California 94034 USA
Manufacturer:	Hewlett Packard Enterprise
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	HPEN96-U8 Draft 1x1
Date EUT received:	26 th January 2017
Standard(s) applied:	FCC CFR 47 Part 15 Subpart E 15.407
Dates of test (from - to):	31st January to 2nd February 2017
No of Units Tested:	2
Product Family Name:	Access Point
Model(s):	APINR203 / APINP203
Location for use:	Indoors
Declared Frequency Range(s):	5150 - 5250 MHz; 5725 - 5850 MHz;
Type of Modulation:	OFDM
EUT Modes of Operation:	5250 - 5350 MHz: 802.11a; ac-80; HT-20; HT-40; 5725 - 5850 MHz: 802.11a; ac-80; HT-20; HT-40;
Declared Nominal Output Power (dBm):	+24 dBm
Transmit/Receive Operation:	Transceiver - Full Duplex
Rated Input Voltage and Current:	AC 100-240V, APINR203: 0.3A, APINP203: 0.6A
Operating Temperature Range:	Nominal: 20 °C Max: 40 °C Min: 0 °C
ITU Emission Designator:	802.11a: 17M0D1D 802.11n HT-20: 17M0D1D 802.11n HT-40: 38M0D1D 802.11ac AC-80 77M0D1D
Equipment Dimensions:	155mm x 50mm x 95mm
Weight:	0.320 kg (AP-203R) & 0.340 kg (AP-203RP)
Hardware Rev:	1
Software Rev:	WNC RF Load Rev. 1.0

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5.2. Scope Of Test Program

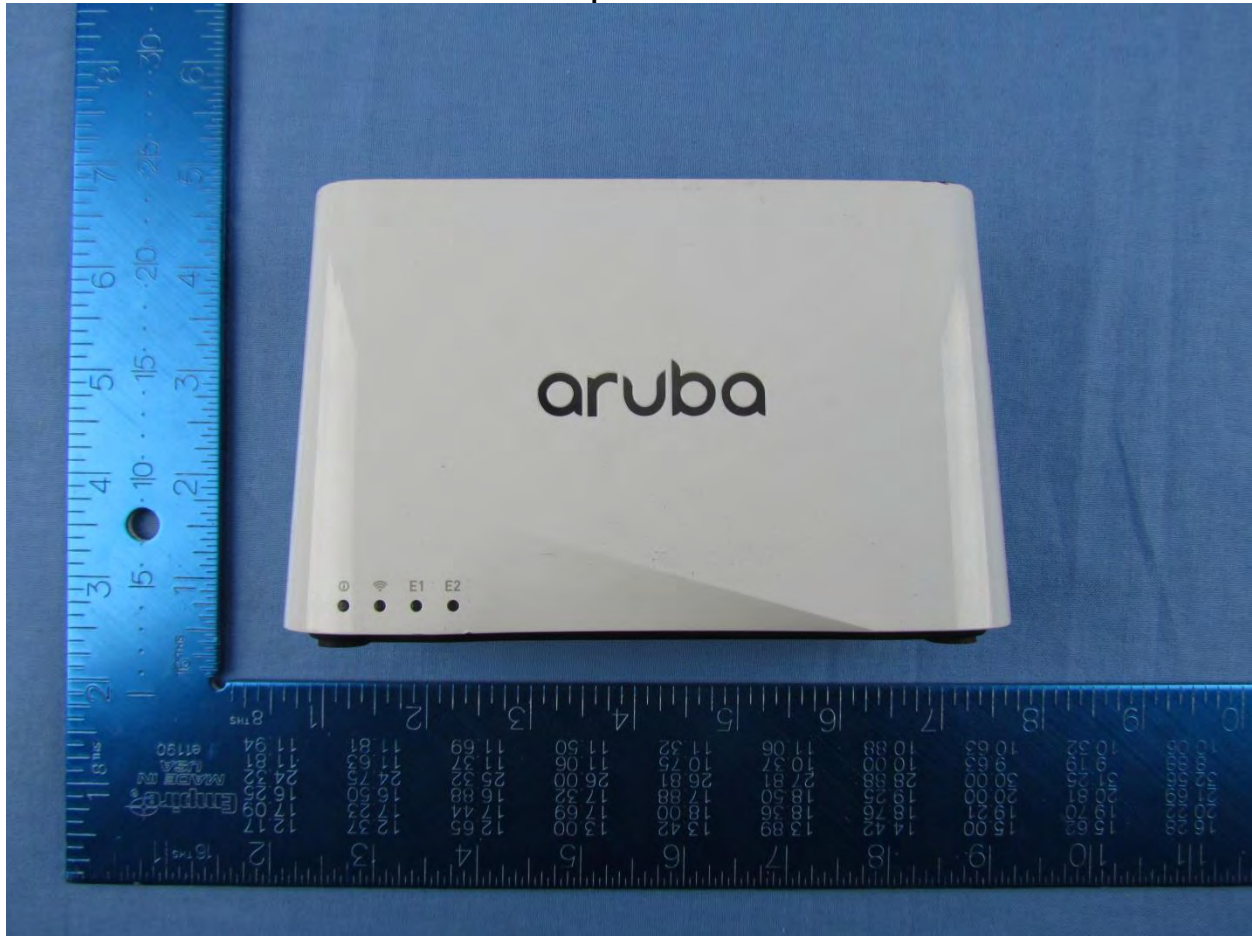
Hewlett Packard Enterprise APINR203 & APINP203

The scope of the test program was to test the Hewlett Packard Enterprise APINR203 & APINP203 1X1 configurations in the frequency ranges 5150 - 5250 MHz, 5725 - 5850 MHz; for compliance against the following specification:

FCC CFR 47 Part 15 Subpart E 15.407

Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices

Hewlett Packard Enterprise APINR203 & APINP203



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

Type (EUT/Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	802.11a/b/g/n	Hewlett Packard Enterprises	APINP203	CNCPK2T006
EUT	802.11a/b/g/n	Hewlett Packard Enterprises	APINP203	CNCPK2T00L
Support	Laptop PC	Dell	E5550	None

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
integral	HPE	Metal Sheet	5	2.9	-	360	-	5150 - 5250
integral	HPE	Metal Sheet	5	2.9	-	360	-	5250 - 5350
integral	HPE	Metal Sheet	5	2.9	-	360	-	5470 - 5725
integral	HPE	Metal Sheet	5	2.9	-	360	-	5725 - 5850

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	100	3	N	RJ45	Packet Data
AC Input	N/A	1	N	AC Wire	--
USB	Configuration	1	No	Micro USB	Data
USB	Mgmt only	1	No	USB	Data

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5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s) (802.11a/n/ac)	Data Rate with Highest Power MBit/s	Channel Frequency (MHz)		
		Low	Mid	High
802.11a	6 Mbit/s	5180	5200	5240
802.11n HT20	6.6 Mbit/s	5180	5200	5240
802.11n HT40	13.5 Mbit/s	5190	--	5230
802.11ac 80	29.3 Mbit/s	--	5210	--

Operational Mode(s) (802.11a/n/ac)	Data Rate with Highest Power MBit/s	Channel Frequency (MHz)		
		Low	Mid	High
802.11a	6 Mbit/s	5745	5785	5825
802.11n HT20	6.6 Mbit/s	5745	5785	5825
802.11n HT40	13.5 Mbit/s	5755	--	5795
802.11ac 80	29.3 Mbit/s	--	5775	--

5.7. Equipment Modifications

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

1. NONE

5.8. Deviations from the Test Standard

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

1. NONE



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6. TEST SUMMARY

List of Measurements

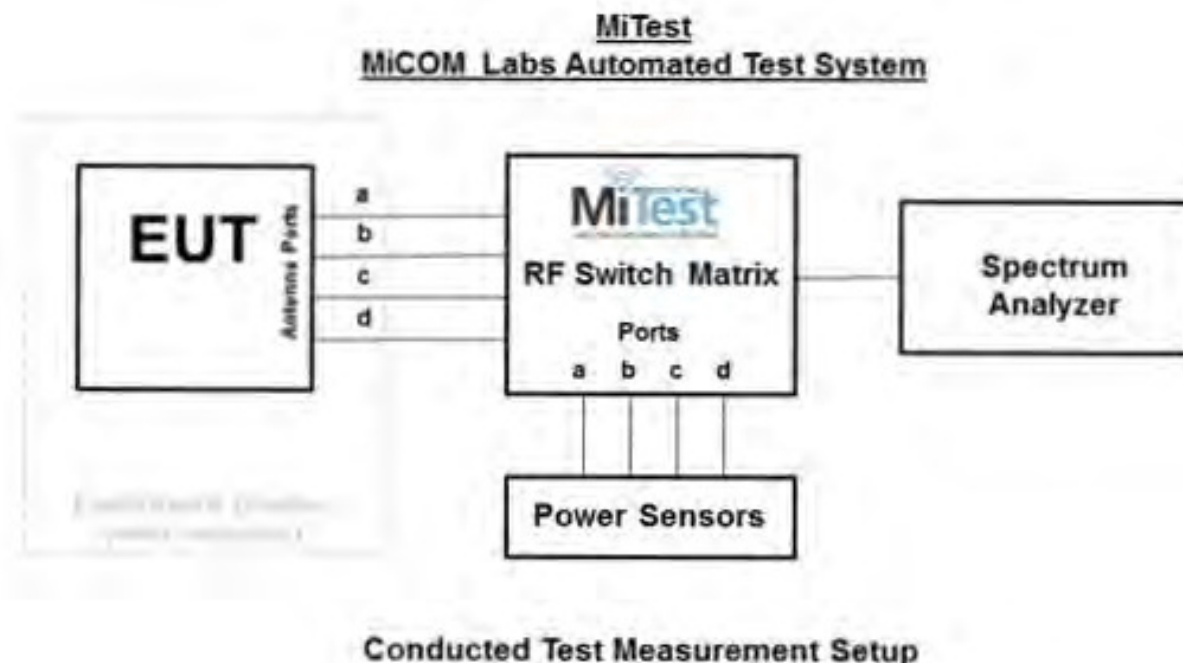
Test Header	Result	Data Link
Peak Transmit Power	Complies	View Data
26 dB & 99% Bandwidth	Complies	View Data
6 dB & 99% Bandwidth	Complies	View Data
Power Spectral Density	Complies	View Data
Radiated	Complies	
TX Spurious & Restricted Band Emissions	Complies	View Data
Restricted Edge & Band-Edge Emissions	Complies	View Data

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7. TEST EQUIPMENT CONFIGURATION(S)

7.1. Conducted

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



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
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814-0101-72	#3 SA	2 Jun 2017
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	2 Jun 2017
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	2 Jun 2017
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	2 Jun 2017
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	2 Jun 2017
158	Barometer/Thermometer	Control Company	4196	E2846	30 Nov 2017
249	Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	23 Oct 2017
287	Rohde & Schwarz 40	Rhode &	ESIB40	100201	2 May 2017

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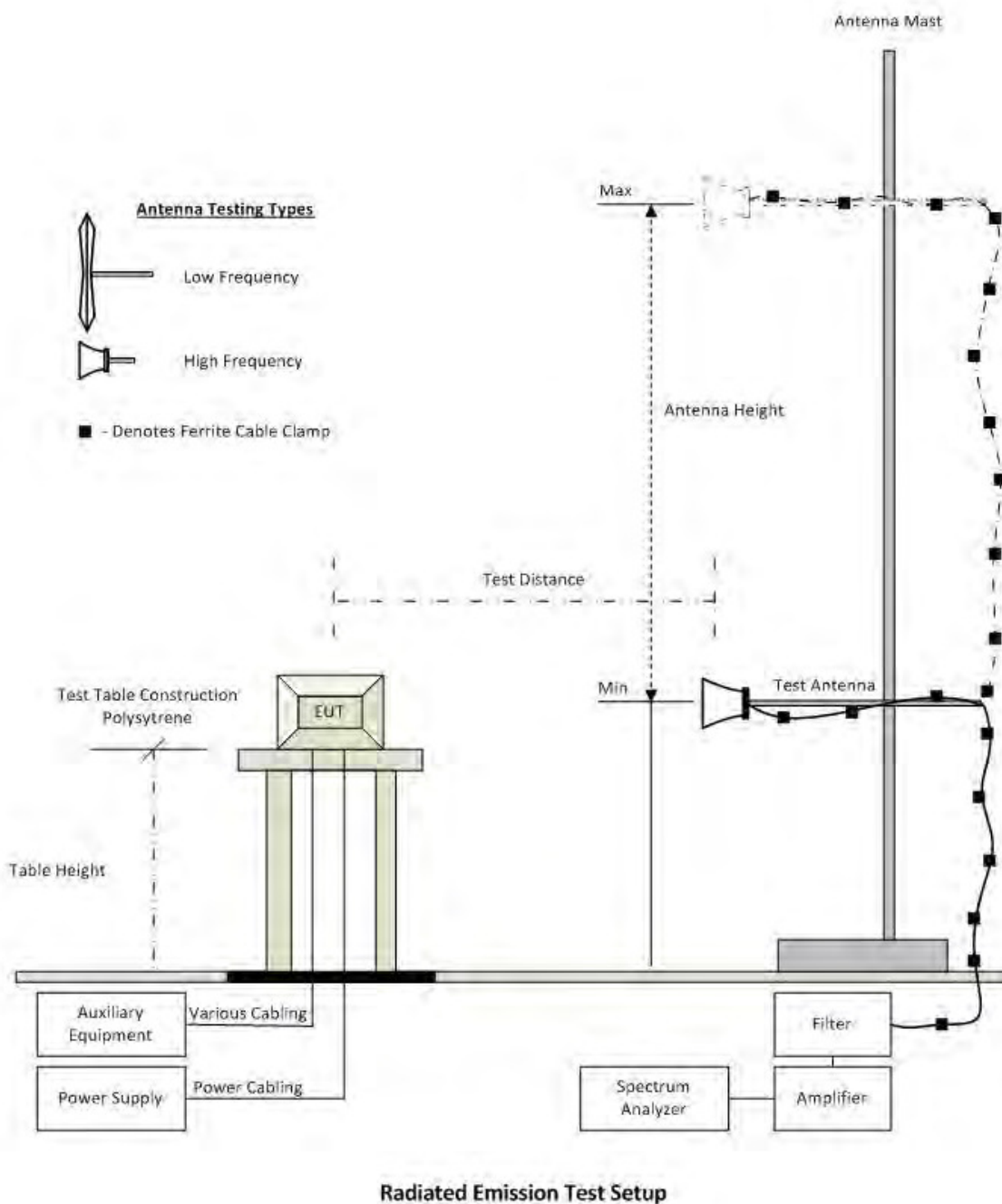
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	GHz Receiver	Schwarz			
361	Desktop for RF#1, Labview Software installed	Dell	Vostro 220	WS RF#1	Not Required
390	USB Power Head 50MHz - 24GHz -60 to +20dBm	Agilent	U2002A	MY50000103	17 Oct 2017
398	Test Software	MiCOM	MiTest ATS	Version 4.1.0.76	Not Required
405	DC Power Supply 0-60V	Agilent	6654A	MY4001826	Cal when used
408	USB to GPIB interface	National Instruments	GPIB-USB HS	14C0DE9	Not Required
441	USB Wideband Power Sensor	Boonton	55006	9179	25 Sep 2017
443	4x4 RF Switch Box	MiCOM Labs	MiTest 4X4 RF Switch Box	MIC003	2 Jun 2017
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	24 Nov 2017

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7.2. Radiated Emissions - 3m Chamber

The following tests were performed using the radiated test set-up shown in the diagram below. Radiated emissions below 1GHz. Radiated Emissions above 1GHz.



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

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
158	Barometer/Thermometer	Control Company	4196	E2846	30 Nov 2017
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
301	5470 to 5725 MHz Notch Filter	Microtronics	RBC50704	001	16 Aug 2017
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	15 Aug 2017
377	Band Rejection Filter 5150 to 5880MHz	Microtronics	BRM50716	034	16 Aug 2017
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	4 Aug 2017
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	16 Aug 2017
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	9 Jun 2017
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	10 Apr 2017
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	9 Jun 2017
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
447	Rad Emissions Test Software	MiCOM	Rad Emissions Test Software Version 1.0.109	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	31 May 2017
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	31 May 2017
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	31 May 2017
465	Low Pass Filter DC-	Mini-Circuits	NLP-1200+	VUU01901402	2 Jun 2017

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	1000 MHz				
466	Low Pass Filter DC-1500 MHz	Mini-Circuits	NLP-1750+	VUU10401438	2 Jun 2017
467	2495 to 2650 MHz notch filter	MicroTronics	BRM50709	011	16 Aug 2017
468	Low pass filter	Mini Circuits	SLP-550	None	16 Aug 2017
469	Low pass filter	Mini Circuit	SLP-1000	None	16 Aug 2017
470	High Pass filter	Mini Circuits	SHP-700	None	16 Aug 2017
476	Low Pass dc-2200MHz filter	Mini Circuits	15542 NLP-2400+	VUU13801345	16 Aug 2017
480	Cable - Bulkhead to Amp	SRC Haverhill	157-157-3050360	480	2 Jun 2017
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-151-3050787	481	2 Jun 2017
482	Cable - Amp to Antenna	SRC Haverhill	157-157-3051574	482	2 Jun 2017
502	Test Software for Radiated Emissions	EMISoft	Vasona	Version 5 Build 59	Not Required
CC05	Confidence Check	MiCOM	CC05	None	26 Apr 2017

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8. MEASUREMENT AND PRESENTATION OF TEST DATA

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

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

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



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

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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.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band

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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 $11 \text{ dBm} + 10 \log B$, 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.



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Equipment Configuration for Peak Transmit Power

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5180.0	15.74				15.74	--	30.00	-14.26	
5200.0	16.47				16.47	--	30.00	-13.53	
5240.0	16.45				16.45	--	30.00	-13.55	

Traceability to Industry Recognized Test Methodologies

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Transmit Power

Variant:	802.11ac-80	Duty Cycle (%):	80.0
Data Rate:	29.30 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5210.0	13.11				13.11	--	30.00	-16.89	

Traceability to Industry Recognized Test Methodologies

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5180.0	15.72				15.72	--	30.00	-14.28	
5200.0	16.38				16.38	--	30.00	-13.62	
5240.0	16.38				16.38	--	30.00	-13.62	

Traceability to Industry Recognized Test Methodologies

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

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Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-40	Duty Cycle (%):	89.8
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5190.0	16.65				16.65	--	30.00	-13.35	
5230.0	16.85				16.85	--	30.00	-13.15	

Traceability to Industry Recognized Test Methodologies

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Transmit Power

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5745.0	17.09				17.09	--	30.00	-12.91	
5785.0	16.79				16.79	--	30.00	-13.21	
5825.0	16.80				16.80	--	30.00	-13.20	

Traceability to Industry Recognized Test Methodologies

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Transmit Power

Variant:	802.11ac-80	Duty Cycle (%):	80.0
Data Rate:	29.30 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5775.0	15.46				15.46	--	30.00	-14.54	

Traceability to Industry Recognized Test Methodologies

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

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Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5745.0	16.92				16.92	--	30.00	-13.08	
5785.0	16.83				16.83	--	30.00	-13.17	
5825.0	16.92				16.92	--	30.00	-13.08	

Traceability to Industry Recognized Test Methodologies

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-40	Duty Cycle (%):	89.8
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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	dB	
5755.0	17.51				17.51	--	30.00	-12.49	
5795.0	17.42				17.42	--	30.00	-12.58	

Traceability to Industry Recognized Test Methodologies

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

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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9.2. 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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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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		
5180.0	25.892				25.892	25.892		
5200.0	27.014				27.014	27.014		
5240.0	25.892				25.892	25.892		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5180.0	16.994				16.994	16.994		
5200.0	17.154				17.154	17.154		
5240.0	16.994				16.994	16.994		

Traceability to Industry Recognized Test Methodologies

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

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

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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11ac-80	Duty Cycle (%):	81.0
Data Rate:	29.30 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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		
5210.0	146.854				146.854	146.854		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5210.0	76.954				76.954	76.954		

Traceability to Industry Recognized Test Methodologies

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

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

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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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		
5180.0	23.166				23.166	23.166		
5200.0	25.972				25.972	25.972		
5240.0	25.812				25.812	25.812		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5180.0	16.994				16.994	16.994		
5200.0	17.154				17.154	17.154		
5240.0	16.994				16.994	16.994		

Traceability to Industry Recognized Test Methodologies

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

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

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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11n HT-40	Duty Cycle (%):	89.8
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
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		
5190.0	73.427				73.427	73.427		
5230.0	65.411				65.411	65.411		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5190.0	38.156				38.156	38.156		
5230.0	37.996				37.996	37.996		

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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9.3. 6 dB & 99% Bandwidth

Conducted Test Conditions for 6 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	6 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 6 dB and 99% Bandwidth Measurement The bandwidth at 6 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 100 kHz. 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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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5745.0	16.353				16.353	16.353		
5785.0	16.353				16.353	16.353		
5825.0	16.353				16.353	16.353		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5745.0	16.754				16.754	16.754		
5785.0	16.673				16.673	16.673		
5825.0	16.754				16.754	16.754		

Traceability to Industry Recognized Test Methodologies

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

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

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11ac-80	Duty Cycle (%):	80.0
Data Rate:	29.30 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5775.0	75.351				75.351	75.351		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5775.0	76.954				76.954	76.954		

Traceability to Industry Recognized Test Methodologies

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

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

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5745.0	16.353				16.353	16.353		
5785.0	16.353				16.353	16.353		
5825.0	16.353				16.353	16.353		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5745.0	16.673				16.673	16.673		
5785.0	16.673				16.673	16.673		
5825.0	16.754				16.754	16.754		

Traceability to Industry Recognized Test Methodologies

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

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

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Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	802.11n HT-40	Duty Cycle (%):	89.8
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz)				6 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5755.0	35.752				35.752	35.752		
5795.0	35.752				35.752	35.752		
Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
5755.0	37.034				37.034	37.034		
5795.0	36.713				36.713	36.713		

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 (à) 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

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

$x = \text{Duty Cycle}$

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



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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.



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Equipment Configuration for Power Spectral Density

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5180.0	4.051				4.095	17.0	-12.9
5200.0	3.763				3.807	17.0	-13.2
5240.0	4.812				4.856	17.0	-12.1

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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

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Equipment Configuration for Power Spectral Density

Variant:	802.11ac-80	Duty Cycle (%):	80.0
Data Rate:	29.30 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.97 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5210.0	-4.604				-3.635	17.0	-20.6

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5180.0	4.426				4.470	17.0	-12.5
5200.0	3.835				3.879	17.0	-13.1
5240.0	4.757				4.801	17.0	-12.2

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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Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-40	Duty Cycle (%):	89.8
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.46 dB)	Limit	Margin
	Port(s) (dBm/MHz)						
MHz	a	b	c	d	dBm/MHz	dBm/MHz	dB
5190.0	1.406				1.874	17.0	-15.1
5230.0	0.354				0.822	17.0	-16.2

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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Equipment Configuration for Power Spectral Density

Variant:	802.11a	Duty Cycle (%):	99.0
Data Rate:	6.00 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/500 KHz)						
MHz	a	b	c	d	dBm/500 KHz	dBm/500 KHz	dB
5745.0	1.607				1.651	30.0	-28.3
5785.0	2.116				2.160	30.0	-27.8
5825.0	1.606				1.650	30.0	-28.4

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Equipment Configuration for Power Spectral Density

Variant:	802.11ac-80	Duty Cycle (%):	80.0
Data Rate:	29.30 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.97 dB)	Limit	Margin
	Port(s) (dBm/500 KHz)						
MHz	a	b	c	d	dBm/500 KHz	dBm/500 KHz	dB
5775.0	-7.973				-7.004	30.0	-37.0

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-20	Duty Cycle (%):	99.0
Data Rate:	6.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.04 dB)	Limit	Margin
	Port(s) (dBm/500 KHz)						
MHz	a	b	c	d	dBm/500 KHz	dBm/500 KHz	dB
5745.0	1.457				1.501	30.0	-28.5
5785.0	2.092				2.136	30.0	-27.9
5825.0	1.599				1.643	30.0	-28.4

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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

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Equipment Configuration for Power Spectral Density

Variant:	802.11n HT-40	Duty Cycle (%):	89.8
Data Rate:	13.50 MBit/s	Antenna Gain (dBi):	2.90
Modulation:	OFDM	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Summation Peak Marker + DCCF (+0.46 dB)	Limit	Margin
	Port(s) (dBm/500 KHz)						
MHz	a	b	c	d	dBm/500 KHz	dBm/500 KHz	dB
5755.0	-0.296				0.172	30.0	-29.8
5795.0	0.377				0.845	30.0	-29.2

Traceability to Industry Recognized Test Methodologies

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

DCCF - Duty Cycle Correction Factor

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

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9.5. Radiated

Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	20.0 - 24.5
Test Heading:	Radiated Spurious and Band-Edge Emissions	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (b), 15.205, 15.209	Pressure (mBars):	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Radiated Spurious and Band-Edge Emissions

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

Measurements on any restricted band frequency or frequencies above 1 GHz are based on the use of measurement instrumentation employing peak and average detectors. All measurements were performed using a resolution bandwidth of 1 MHz.

Test configuration and setup for Undesirable Measurement were per the Radiated Test Set-up specified in this document.

15.407 (b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

Limits for Restricted Bands (15.205, 15.209)

Peak emission: 74 dBuV/m

Average emission: 54 dBuV/m

Field Strength Calculation

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

FS = R + AF + CORR - FO

where:

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FS = Field Strength
R = Measured Spectrum analyzer Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain
FO = Distance Falloff Factor
NFL = Notch Filter Loss

Example:

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

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

where P is the EIRP in Watts

Therefore: -27 dBm/MHz equates to 68.23 dBμV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are as follows:

Level (dBmV/m) = 20 * Log (level (mV/m))

40 dBmV/m = 100 mV/m

48 dBmV/m = 250 mV/m

Restricted Bands of Operation (15.205)

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

Frequency Band			
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

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(b) Except as provided 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 §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e) of this section, regardless of the field strength limits specified elsewhere in this subpart, the provisions of this section apply to emissions from any intentional radiator.

(d) The following devices are exempt from the requirements of this section:

(1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a) of this section, the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a) of this section, and the fundamental emission is outside of the bands listed in paragraph (a) of this section more than 99% of the time the device is actively transmitting, without compensation for duty cycle.

(2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.

(3) Cable locating equipment operated pursuant to §15.213.

(4) Any equipment operated under the provisions of §15.253, 15.255, and 15.256 in the frequency band 75-85 GHz, or §15.257 of this part.

(5) Biomedical telemetry devices operating under the provisions of §15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.

(6) Transmitters operating under the provisions of subparts D or F of this part.

(7) Devices operated pursuant to §15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.

(8) Devices operated in the 24.075-24.175 GHz band under §15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in §15.245(b).

(9) Devices operated in the 24.0-24.25 GHz band under §15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in §15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).



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9.5.1. TX Spurious & Restricted Band Emissions

Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5180.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5177.87	66.06	3.69	-11.51	58.24	Fundamental	Horizontal	100	0	--	--	
#2	10362.62	50.56	5.58	-5.25	50.89	Peak (NRB)	Vertical	100	118	--	--	Pass
Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.												

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Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5200.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5198.81	69.14	3.66	-11.47	61.33	Fundamental	Horizontal	100	0	--	--	
#2	10398.45	52.07	5.39	-5.05	52.41	Peak (NRB)	Vertical	100	306	--	--	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5240.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5233.87	71.50	3.63	-11.38	63.75	Fundamental	Horizontal	100	0	--	--	
#2	10485.99	50.98	5.42	-4.42	51.98	Peak (NRB)	Vertical	100	215	--	--	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5745.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5744.01	54.45	3.84	-10.66	47.63	Fundamental	Horizontal	100	0	--	--	
#2	11493.47	51.56	5.44	-4.84	52.16	Max Peak	Vertical	134	1	74.0	-21.8	Pass
#3	11493.47	38.25	5.44	-4.84	38.85	Max Avg	Vertical	134	1	54.0	-15.2	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5785.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5791.21	56.52	3.79	-10.41	49.90	Fundamental	Horizontal	100	0	--	--	
#2	11566.31	52.33	5.52	-4.65	53.20	Max Peak	Horizontal	147	143	74.0	-20.8	Pass
#3	11566.31	38.01	5.52	-4.65	38.88	Max Avg	Horizontal	147	143	54.0	-15.1	Pass
Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.												

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Equipment Configuration for TX Spurious & Restricted Band Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5825.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5830.56	56.14	3.84	-10.22	49.76	Fundamental	Horizontal	100	0	--	--	
#2	11649.93	53.70	5.44	-4.47	54.67	Max Peak	Vertical	162	347	74.0	-19.3	Pass
#3	11649.93	42.94	5.44	-4.47	43.91	Max Avg	Vertical	162	347	54.0	-10.1	Pass
Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.												

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9.5.2. Restricted Edge & Band-Edge Emissions

RESULTS SUMMARY FOR RADIATED BAND-EDGE EMISSIONS

5150 - 5250 MHz

HPE Metal Sheet		Band-Edge Freq	Limit 74.0dB μ V/m	Limit 54.0dB μ V/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dB μ V/m	dB μ V/m	
802.11a	5180.00	5150.00	71.00	53.15	68
802.11ac-80	5210.00	5150.00	70.33	53.54	56
802.11n HT-20	5180.00	5150.00	71.34	52.95	68
802.11n HT-40	5190.00	5150.00	67.78	51.99	72

5725 MHz Radiated Lower Band-Edge Emissions

HPE Metal Sheet		Band-Edge Freq	Limit 110.8dB μ V/m	Limit 122.2dB μ V/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dB μ V/m	dB μ V/m	
802.11a	5745.00	5725.00	67.85	74.74	72
802.11ac-80	5775.00	5725.00	66.47	68.77	72
802.11n HT-20	5745.00	5725.00	56.01	63.03	72
802.11n HT-40	5755.00	5725.00	69.48	73.22	72

5850 MHz Radiated Higher Band-Edge Emissions

HPE Metal Sheet		Band-Edge Freq	Limit 122.2dB μ V/m	Limit 110.8dB μ V/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dB μ V/m	dB μ V/m	
802.11a	5825.00	5850.00	65.03	60.04	72
802.11ac-80	5775.00	5850.00	69.56	71.00	72
802.11n HT-20	5825.00	5850.00	58.21	55.51	72
802.11n HT-40	5795.00	5850.00	61.13	59.77	72

Click on the links to view the data.

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Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5180.00	Data Rate:	6.00 MBit/s
Power Setting:	68	Tested By:	JMH

Test Measurement Results

4500.00 - 5190.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5150.00	15.37	3.67	34.11	53.15	Max Avg	Horizontal	198	339	54.0	-0.9	Pass
#2	5150.00	33.22	3.67	34.11	71.00	Max Peak	Horizontal	198	339	74.0	-3.0	Pass
#3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC. Power reduced to 68 to meet band edge limits.

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Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11ac-80
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5210.00	Data Rate:	29.30 MBit/s
Power Setting:	56	Tested By:	JMH

Test Measurement Results

4500.00 - 5230.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5147.07	32.54	3.68	34.11	70.33	Max Peak	Horizontal	198	339	74.0	-3.7	Pass
#2	5147.15	15.75	3.68	34.11	53.54	Max Avg	Horizontal	198	339	54.0	-0.5	Pass
#3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--
Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC. Power reduced to 56 to meet band edge limit.												

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Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11n HT-20
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5180.00	Data Rate:	6.50 MBit/s
Power Setting:	68	Tested By:	JMH

Test Measurement Results

4475.00 - 5190.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5150.00	15.17	3.67	34.11	52.95	Max Avg	Horizontal	198	339	54.0	-1.1	Pass
#2	5150.00	33.56	3.67	34.11	71.34	Max Peak	Horizontal	198	339	74.0	-2.7	Pass
#3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC. Power reduced to 68 to meet band edge limits.

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Equipment Configuration for Restricted Lower Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11n HT-40
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5190.00	Data Rate:	13.50 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

4500.00 - 5200.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5150.00	14.21	3.67	34.11	51.99	Max Avg	Horizontal	198	339	54.0	-2.0	Pass
#2	5150.00	30.00	3.67	34.11	67.78	Max Peak	Horizontal	198	339	74.0	-6.2	Pass
#3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5745.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5600.00 - 5745.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5715.29	29.70	3.81	34.34	67.85	Max Avg	Horizontal	188	352	109.4	-41.6	Pass
#2	5724.71	36.60	3.79	34.35	74.74	Max Avg	Horizontal	188	352	122.2	-47.5	Pass
#3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11ac-80
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5775.00	Data Rate:	29.30 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5600.00 - 5775.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5715.00	28.32	3.81	34.34	66.47	Max Avg	Horizontal	188	352	109.4	-42.9	Pass
#2	5725.00	30.63	3.79	34.35	68.77	Max Avg	Horizontal	188	352	122.2	-53.4	Pass
#3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11n HT-20
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5745.00	Data Rate:	6.50 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5600.00 - 5745.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5715.00	17.86	3.81	34.34	56.01	Max Avg	Horizontal	188	352	109.4	-53.4	Pass
#2	5725.00	24.89	3.79	34.35	63.03	Max Avg	Horizontal	188	352	122.2	-59.2	Pass
#3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11n HT-40
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5755.00	Data Rate:	13.50 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5600.00 - 5755.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5715.00	31.33	3.81	34.34	69.48	Max Avg	Horizontal	188	352	109.4	-39.9	Pass
#2	5723.14	35.07	3.80	34.35	73.22	Max Avg	Horizontal	188	352	117.6	-44.4	Pass
#3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11a
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5825.00	Data Rate:	6.00 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5825.00 - 6000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5850.00	26.59	3.81	34.63	65.03	Max Avg	Horizontal	188	352	122.2	-57.2	Pass
#3	5860.00	21.53	3.86	34.65	60.04	Max Avg	Horizontal	188	352	109.4	-49.4	Pass
#2	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11ac-80
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5775.00	Data Rate:	29.30 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5775.00 - 6000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5850.00	31.12	3.81	34.63	69.56	Max Avg	Horizontal	188	352	122.2	-52.6	Pass
#3	5859.55	32.49	3.86	34.65	71.00	Max Avg	Horizontal	188	352	109.4	-38.4	Pass
#2	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11n HT-20
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5825.00	Data Rate:	6.50 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5825.00 - 6000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#1	5850.00	19.77	3.81	34.63	58.21	Max Avg	Horizontal	188	352	122.2	-64.0	Pass
#3	5860.00	17.00	3.86	34.65	55.51	Max Avg	Horizontal	188	352	109.4	-53.9	Pass
#2	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

Antenna:	HPE Metal Sheet	Variant:	802.11n HT-40
Antenna Gain (dBi):	2.90	Modulation:	OFDM
Beam Forming Gain (Y):	3.0	Duty Cycle (%):	99
Channel Frequency (MHz):	5795.00	Data Rate:	13.50 MBit/s
Power Setting:	72	Tested By:	JMH

Test Measurement Results

5795.00 - 6000.00 MHz

Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
#2	5850.08	22.72	3.84	34.57	61.13	Max Avg	Horizontal	188	352	122.2	-51.1	Pass
#3	5860.82	21.25	3.86	34.66	59.77	Max Avg	Horizontal	188	352	109.1	-49.4	Pass
#1	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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A. APPENDIX - GRAPHICAL IMAGES

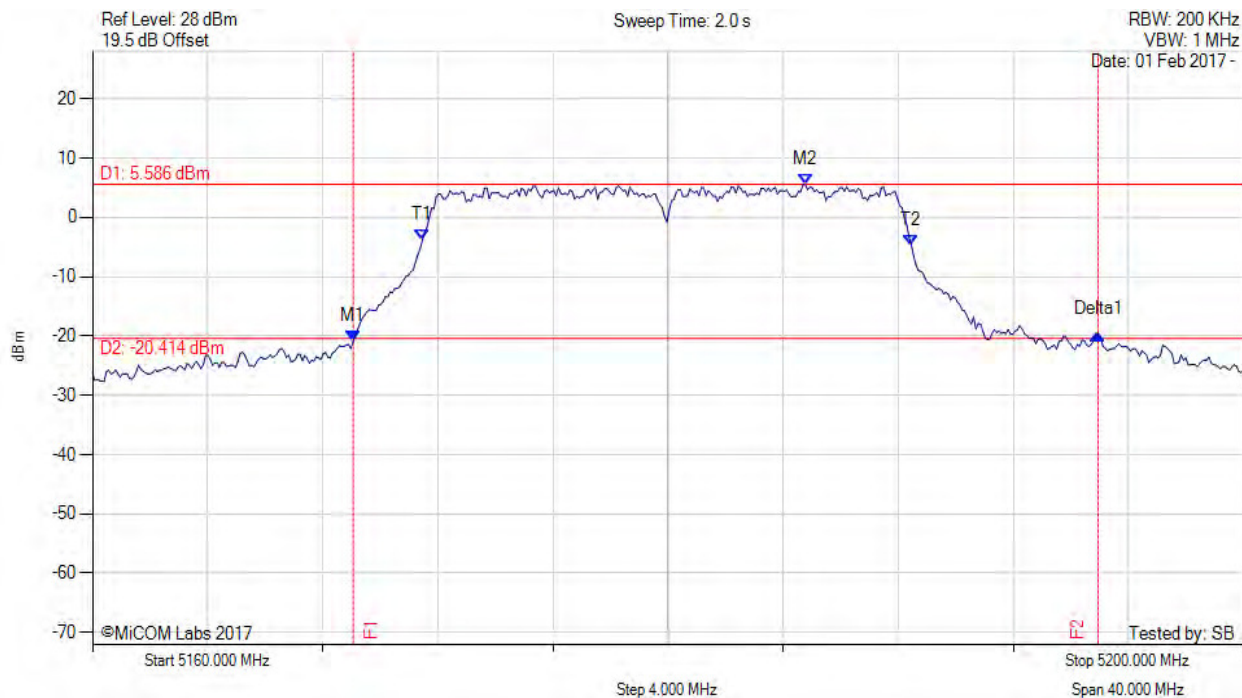
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A.1. 26 dB & 99% Bandwidth



26 dB & 99% BANDWIDTH

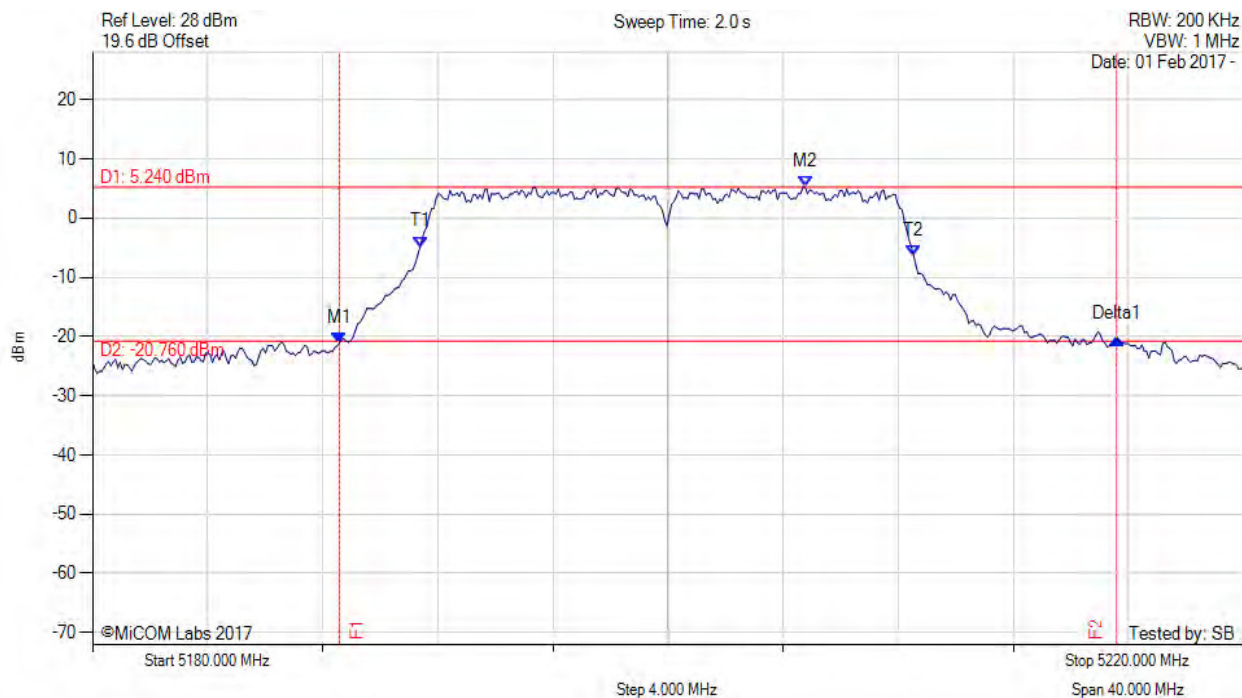
Variant: 802.11a, Channel: 5180.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5169.058 MHz : -20.926 dBm M2 : 5184.770 MHz : 5.586 dBm Delta1 : 25.892 MHz : 1.224 dB T1 : 5171.463 MHz : -3.903 dBm T2 : 5188.457 MHz : -4.690 dBm OBW : 16.994 MHz	Measured 26 dB Bandwidth: 25.892 MHz Measured 99% Bandwidth: 16.994 MHz

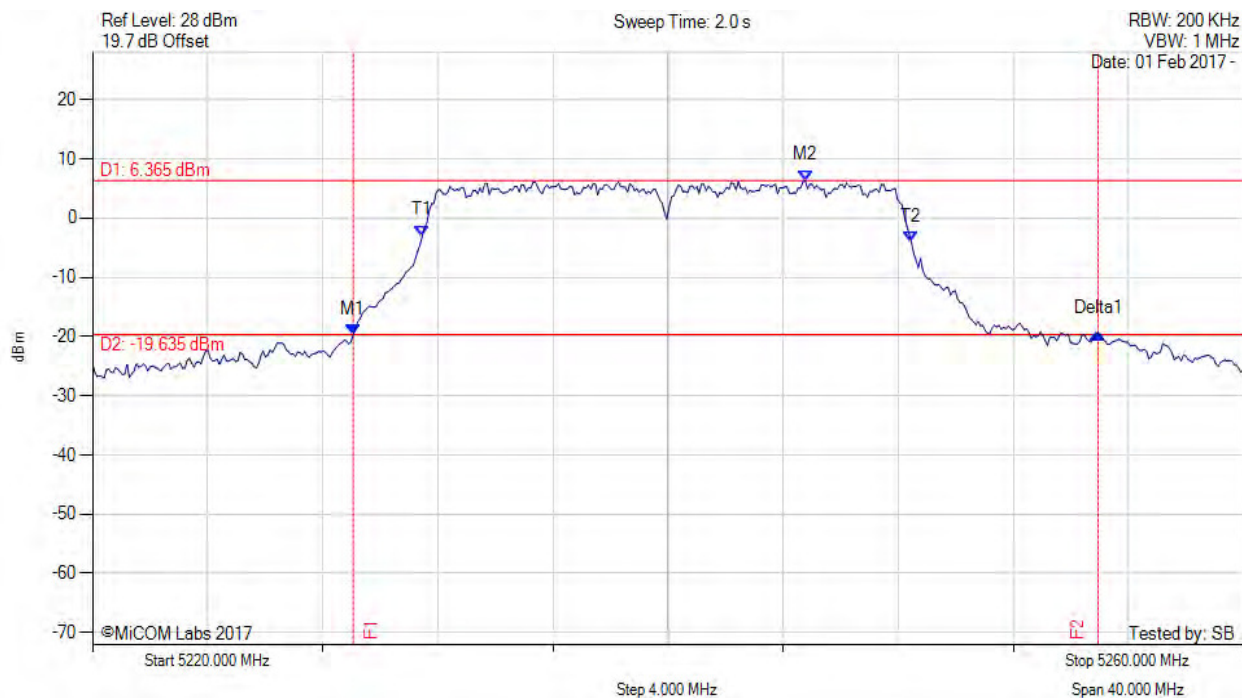
[back to matrix](#)

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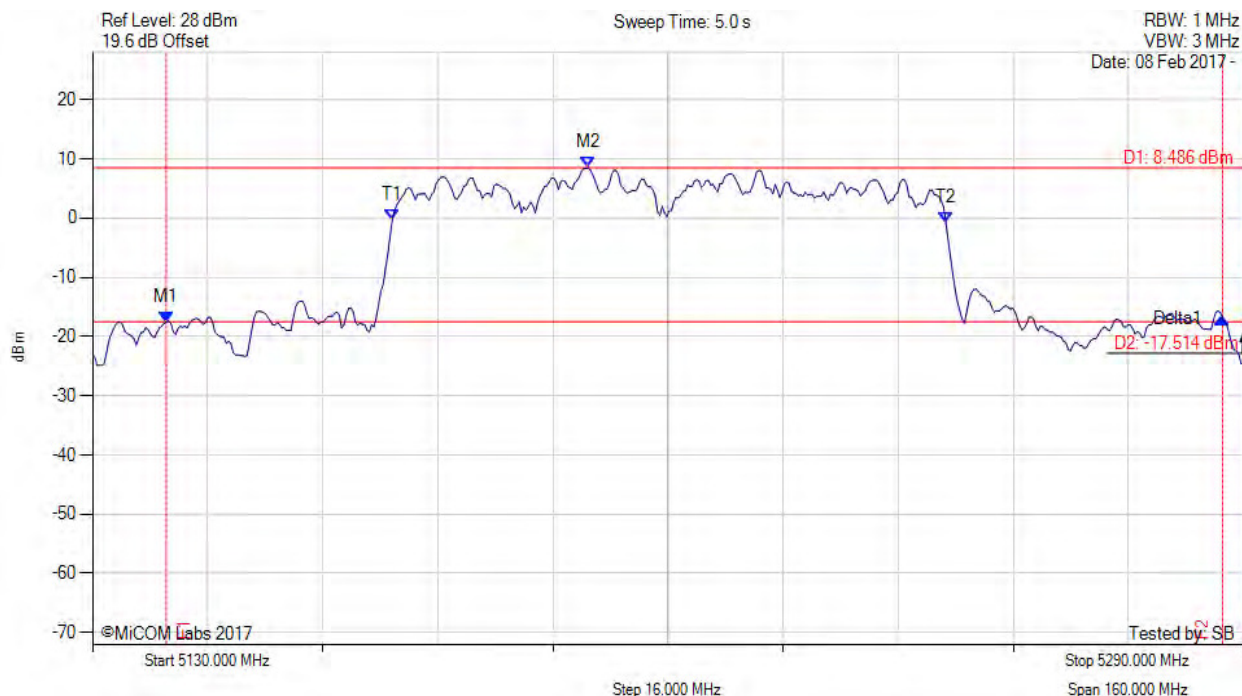
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5188.577 MHz : -21.141 dBm M2 : 5204.770 MHz : 5.240 dBm Delta1 : 27.014 MHz : 0.661 dB T1 : 5191.383 MHz : -4.851 dBm T2 : 5208.537 MHz : -6.352 dBm OBW : 17.154 MHz	Measured 26 dB Bandwidth: 27.014 MHz Measured 99% Bandwidth: 17.154 MHz

[back to matrix](#)



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5229.058 MHz : -19.758 dBm M2 : 5244.770 MHz : 6.365 dBm Delta1 : 25.892 MHz : 0.319 dB T1 : 5231.463 MHz : -3.004 dBm T2 : 5248.457 MHz : -4.001 dBm OBW : 16.994 MHz	Measured 26 dB Bandwidth: 25.892 MHz Measured 99% Bandwidth: 16.994 MHz

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Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5140.261 MHz : -17.601 dBm M2 : 5198.938 MHz : 8.486 dBm Delta1 : 146.854 MHz : 0.710 dB T1 : 5171.683 MHz : -0.277 dBm T2 : 5248.637 MHz : -0.877 dBm OBW : 76.954 MHz	Measured 26 dB Bandwidth: 146.854 MHz Measured 99% Bandwidth: 76.954 MHz

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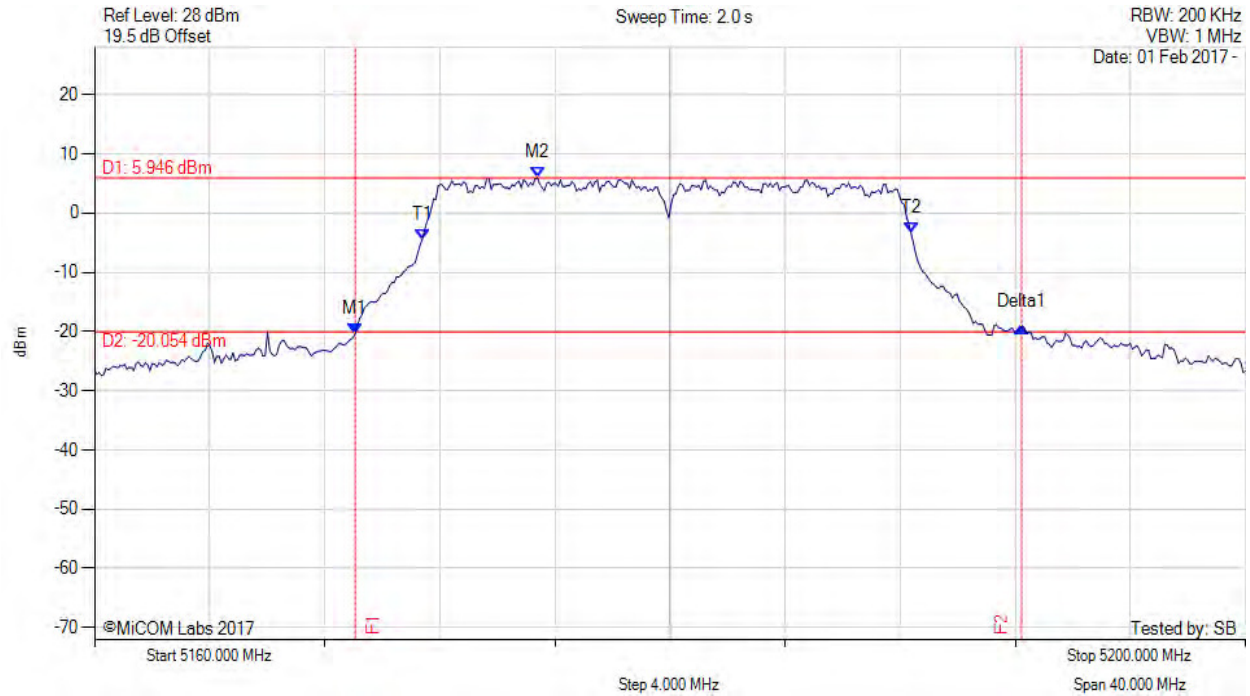


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26 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5169.058 MHz : -20.436 dBm M2 : 5175.391 MHz : 5.946 dBm Delta1 : 23.166 MHz : 1.176 dB T1 : 5171.383 MHz : -4.509 dBm T2 : 5188.377 MHz : -3.297 dBm OBW : 16.994 MHz	Measured 26 dB Bandwidth: 23.166 MHz Measured 99% Bandwidth: 16.994 MHz

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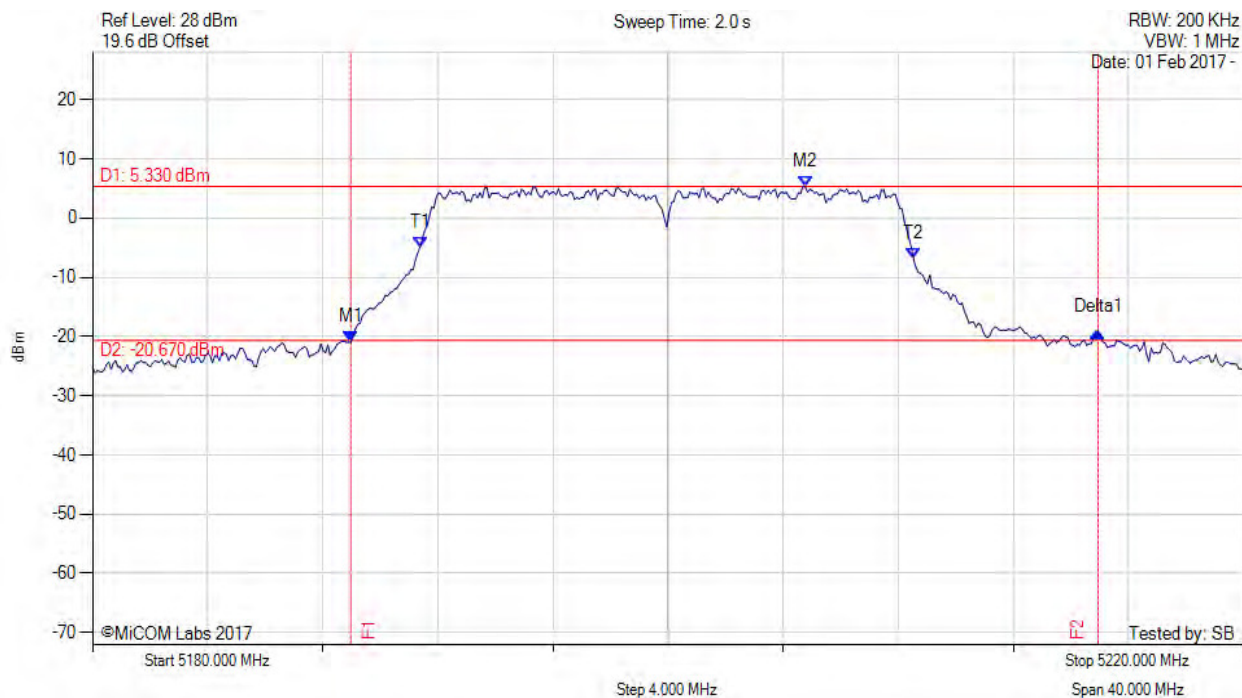


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26 dB & 99% BANDWIDTH

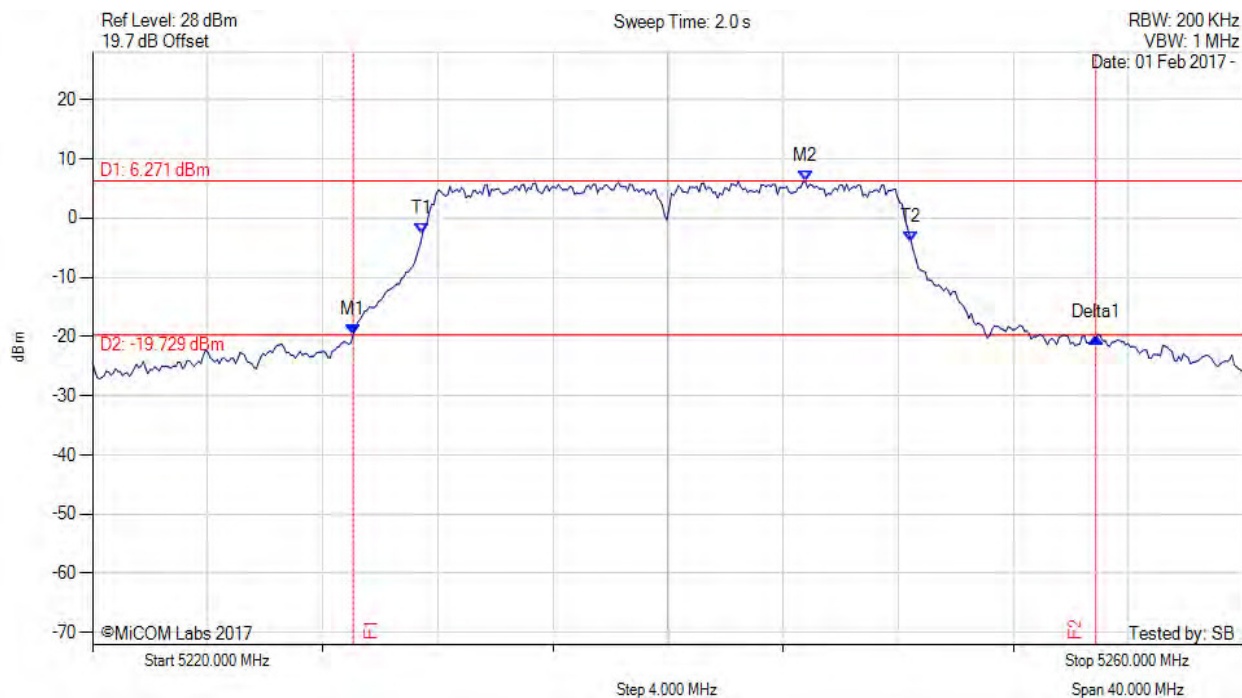
Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5188.978 MHz : -20.942 dBm M2 : 5204.770 MHz : 5.330 dBm Delta1 : 25.972 MHz : 1.649 dB T1 : 5191.383 MHz : -4.908 dBm T2 : 5208.537 MHz : -6.948 dBm OBW : 17.154 MHz	Measured 26 dB Bandwidth: 25.972 MHz Measured 99% Bandwidth: 17.154 MHz

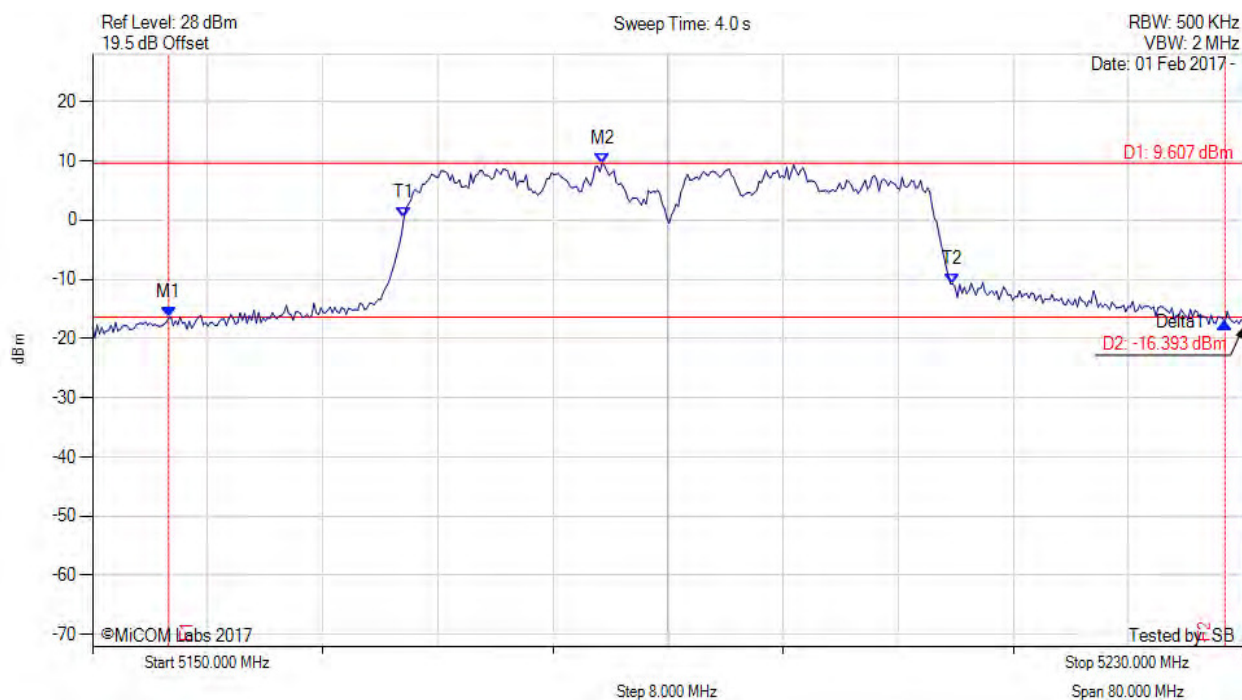
[back to matrix](#)

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Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5229.058 MHz : -19.771 dBm M2 : 5244.770 MHz : 6.271 dBm Delta1 : 25.812 MHz : -0.443 dB T1 : 5231.463 MHz : -2.730 dBm T2 : 5248.457 MHz : -4.056 dBm OBW : 16.994 MHz	Measured 26 dB Bandwidth: 25.812 MHz Measured 99% Bandwidth: 16.994 MHz

[back to matrix](#)



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5155.291 MHz : -16.519 dBm M2 : 5185.431 MHz : 9.607 dBm Delta1 : 73.427 MHz : -0.789 dB T1 : 5171.643 MHz : 0.400 dBm T2 : 5209.800 MHz : -10.759 dBm OBW : 38.156 MHz	Measured 26 dB Bandwidth: 73.427 MHz Measured 99% Bandwidth: 38.156 MHz

[back to matrix](#)

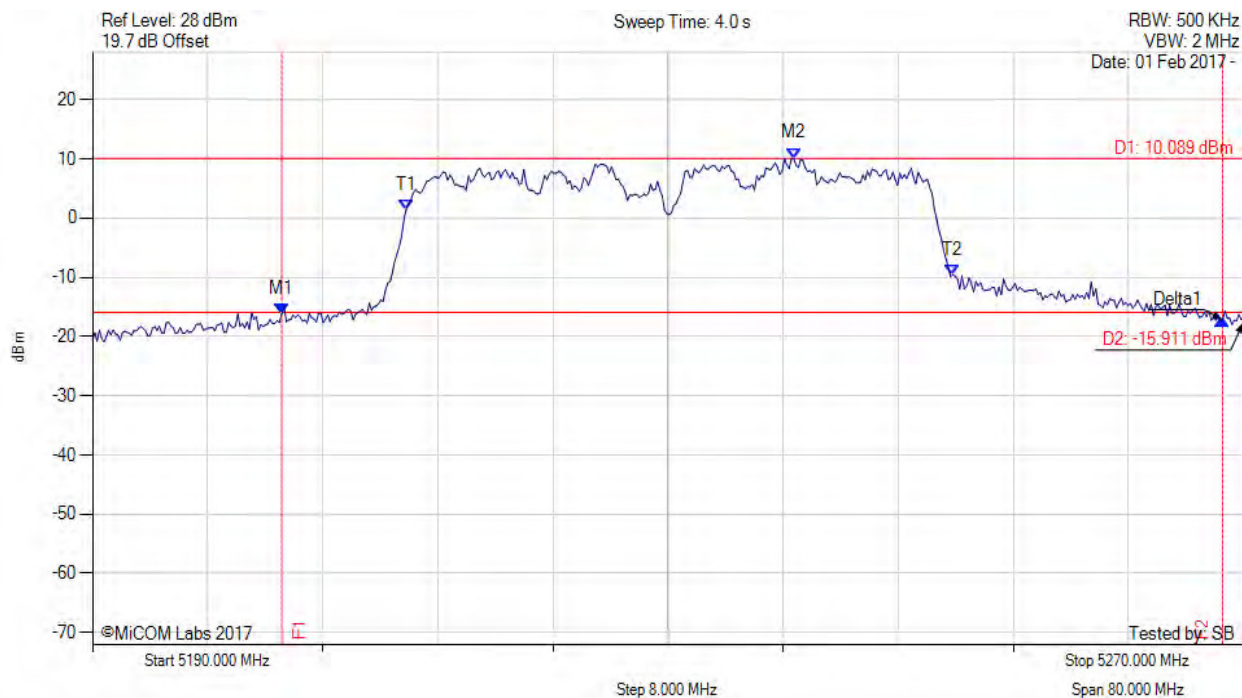


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26 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5203.146 MHz : -16.155 dBm M2 : 5238.737 MHz : 10.089 dBm Delta1 : 65.411 MHz : -1.039 dB T1 : 5211.804 MHz : 1.431 dBm T2 : 5249.800 MHz : -9.569 dBm OBW : 37.996 MHz	Measured 26 dB Bandwidth: 65.411 MHz Measured 99% Bandwidth: 37.996 MHz

[back to matrix](#)

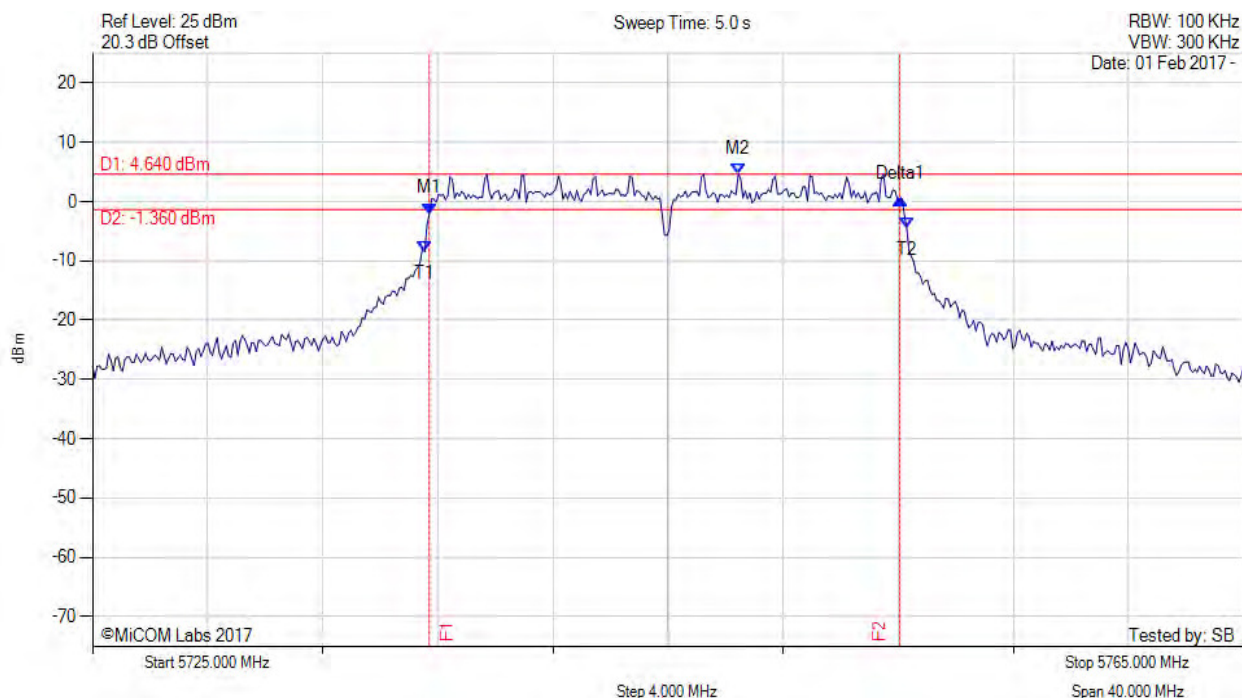
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A.2. 6 dB & 99% Bandwidth



6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5736.703 MHz : -2.018 dBm M2 : 5747.445 MHz : 4.640 dBm Delta1 : 16.353 MHz : 2.400 dB T1 : 5736.543 MHz : -8.453 dBm T2 : 5753.297 MHz : -4.532 dBm OBW : 16.754 MHz	Measured 6 dB Bandwidth: 16.353 MHz Measured 99% Bandwidth: 16.754 MHz

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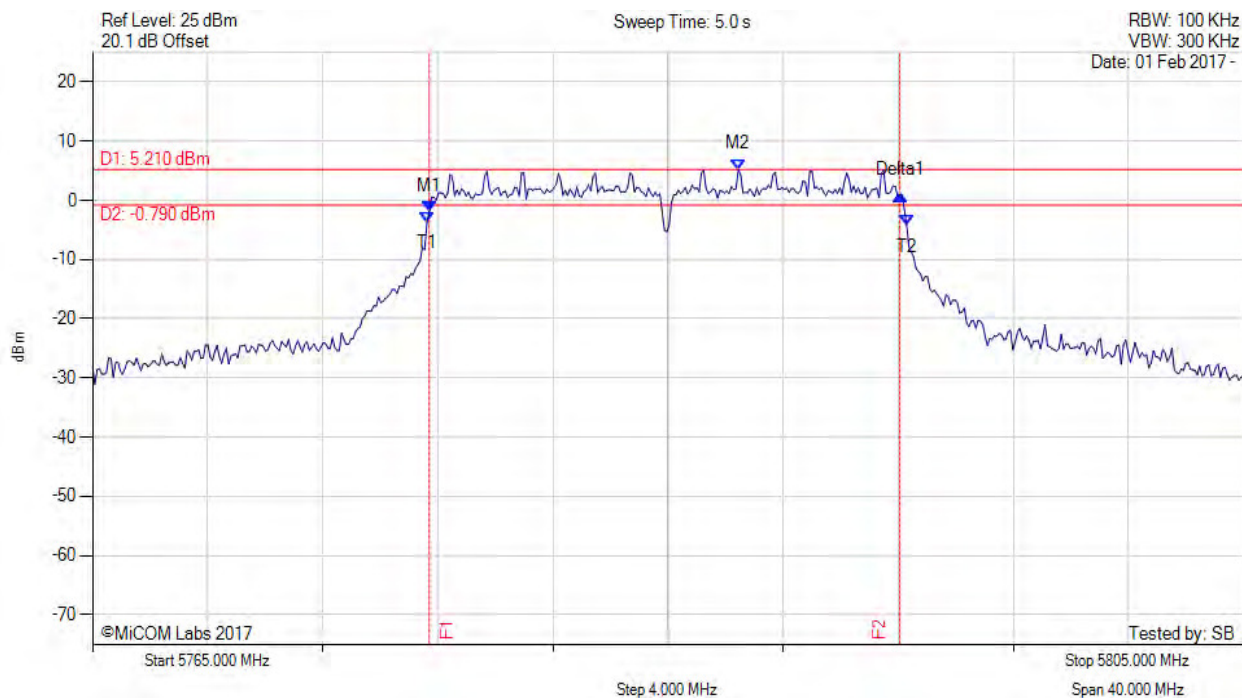


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5785.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5776.703 MHz : -1.937 dBm M2 : 5787.445 MHz : 5.210 dBm Delta1 : 16.353 MHz : 2.833 dB T1 : 5776.623 MHz : -3.719 dBm T2 : 5793.297 MHz : -4.270 dBm OBW : 16.673 MHz	Measured 6 dB Bandwidth: 16.353 MHz Measured 99% Bandwidth: 16.673 MHz

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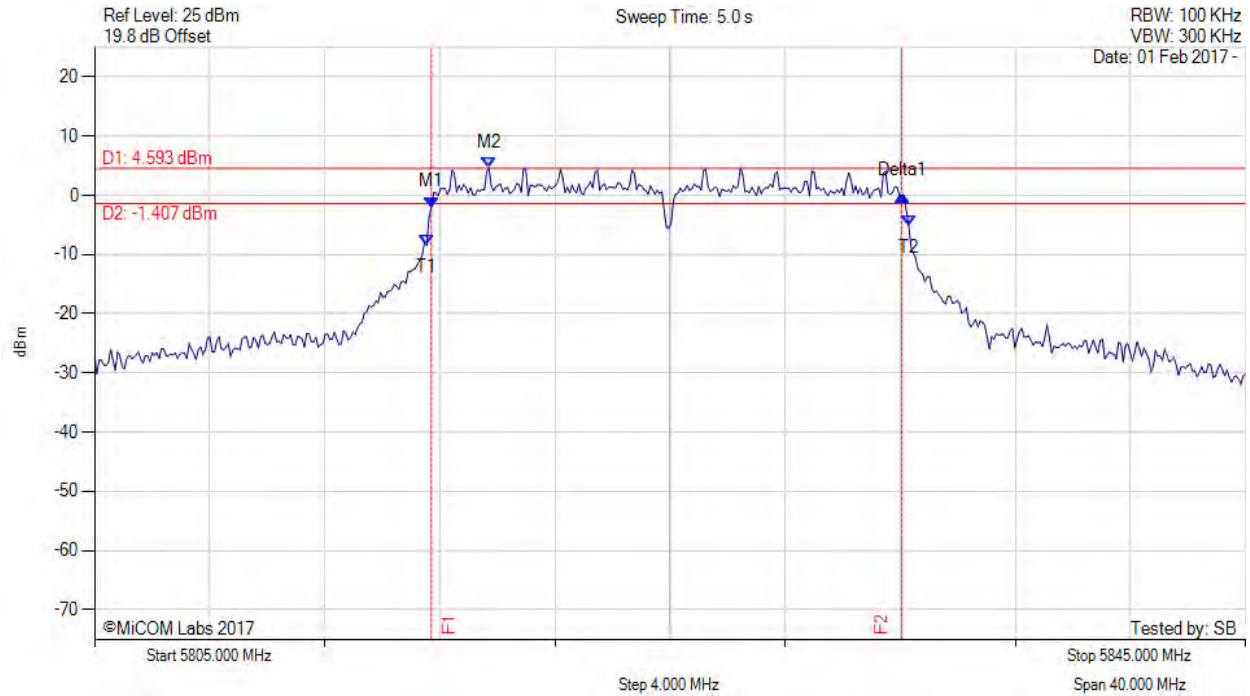


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6 dB & 99% BANDWIDTH

Variant: 802.11a, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5816.703 MHz : -2.016 dBm M2 : 5818.707 MHz : 4.593 dBm Delta1 : 16.353 MHz : 2.036 dB T1 : 5816.543 MHz : -8.457 dBm T2 : 5833.297 MHz : -5.156 dBm OBW : 16.754 MHz	Measured 6 dB Bandwidth: 16.353 MHz Measured 99% Bandwidth: 16.754 MHz

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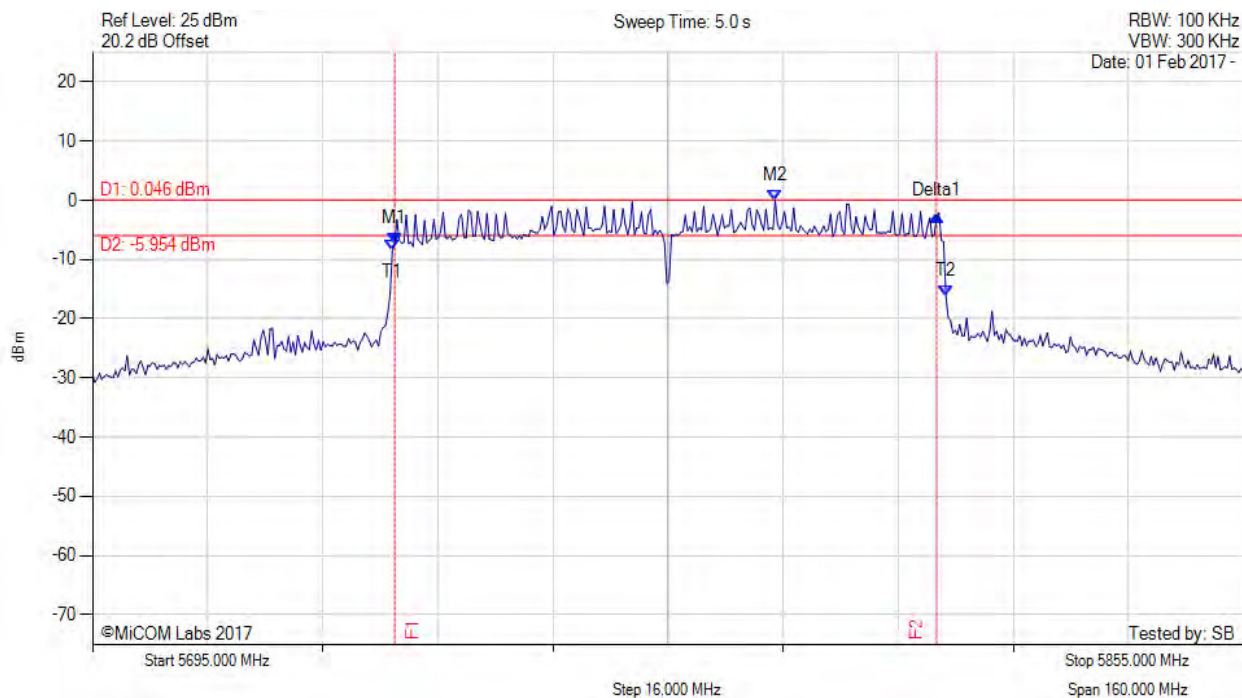


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6 dB & 99% BANDWIDTH

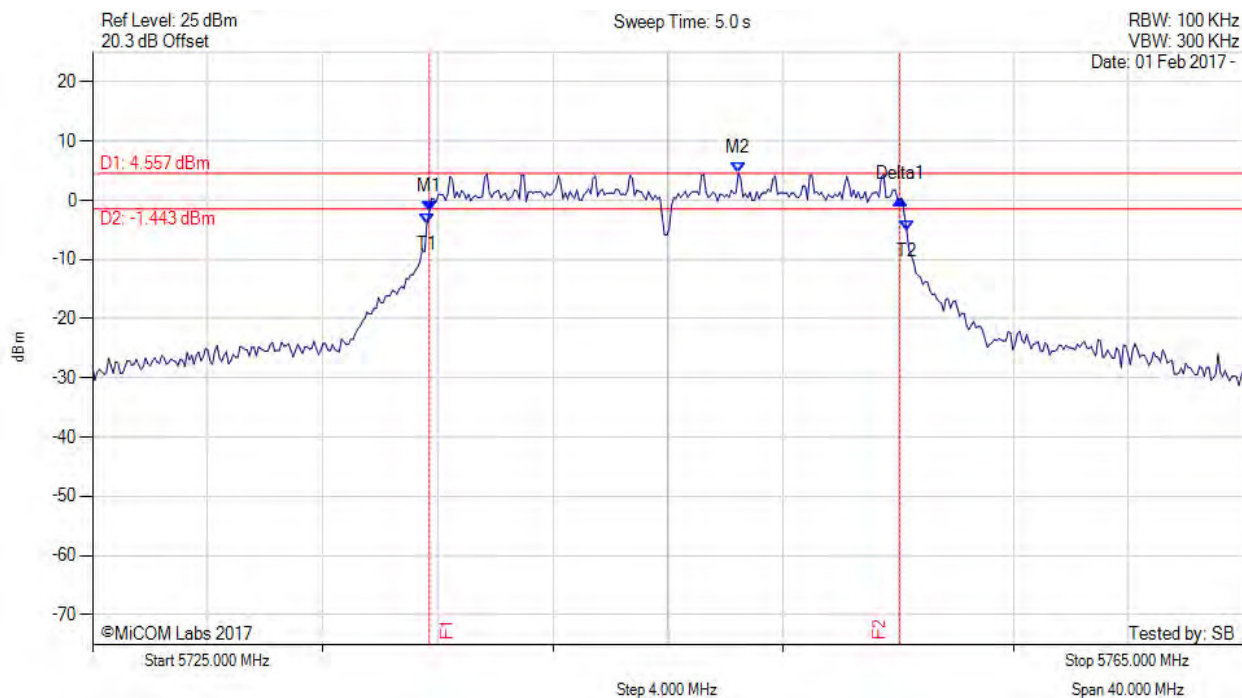
Variant: 802.11ac-80, Channel: 5775.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5737.004 MHz : -7.351 dBm M2 : 5789.910 MHz : 0.046 dBm Delta1 : 75.351 MHz : 4.710 dB T1 : 5736.683 MHz : -8.520 dBm T2 : 5813.637 MHz : -16.189 dBm OBW : 76.954 MHz	Measured 6 dB Bandwidth: 75.351 MHz Measured 99% Bandwidth: 76.954 MHz

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Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5736.703 MHz : -2.006 dBm M2 : 5747.445 MHz : 4.557 dBm Delta1 : 16.353 MHz : 2.255 dB T1 : 5736.623 MHz : -3.916 dBm T2 : 5753.297 MHz : -5.085 dBm OBW : 16.673 MHz	Measured 6 dB Bandwidth: 16.353 MHz Measured 99% Bandwidth: 16.673 MHz

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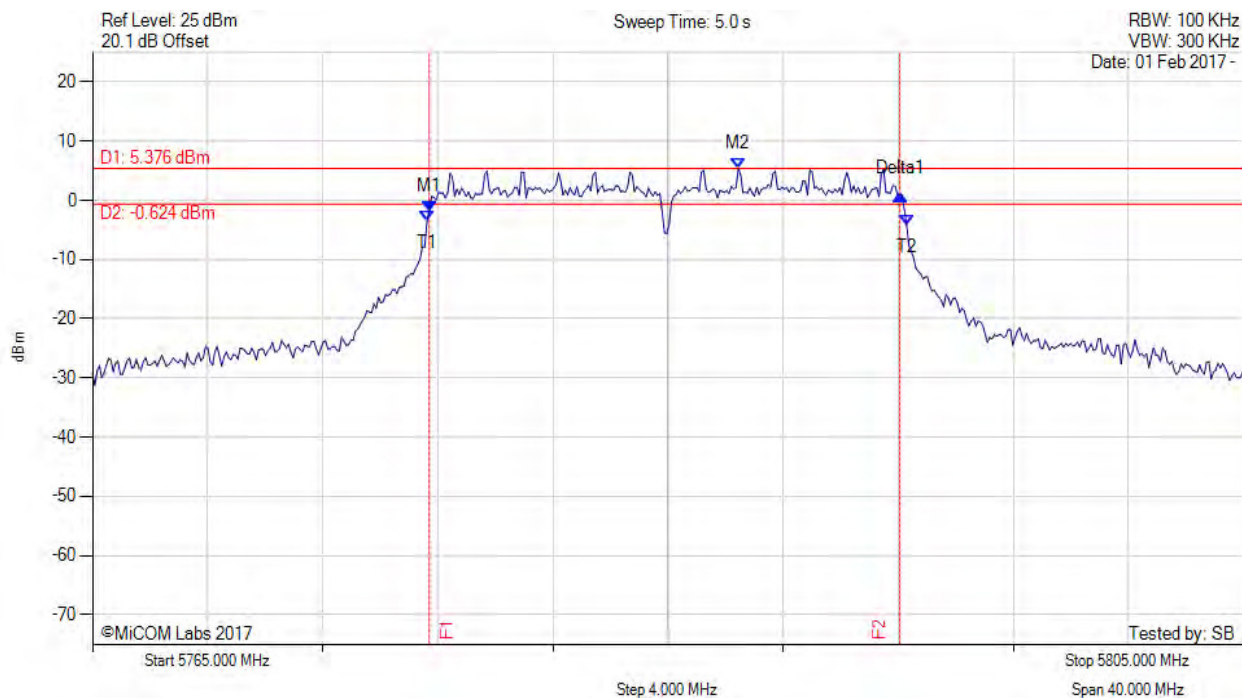


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5785.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5776.703 MHz : -1.803 dBm M2 : 5787.445 MHz : 5.376 dBm Delta1 : 16.353 MHz : 2.809 dB T1 : 5776.623 MHz : -3.552 dBm T2 : 5793.297 MHz : -4.286 dBm OBW : 16.673 MHz	Measured 6 dB Bandwidth: 16.353 MHz Measured 99% Bandwidth: 16.673 MHz

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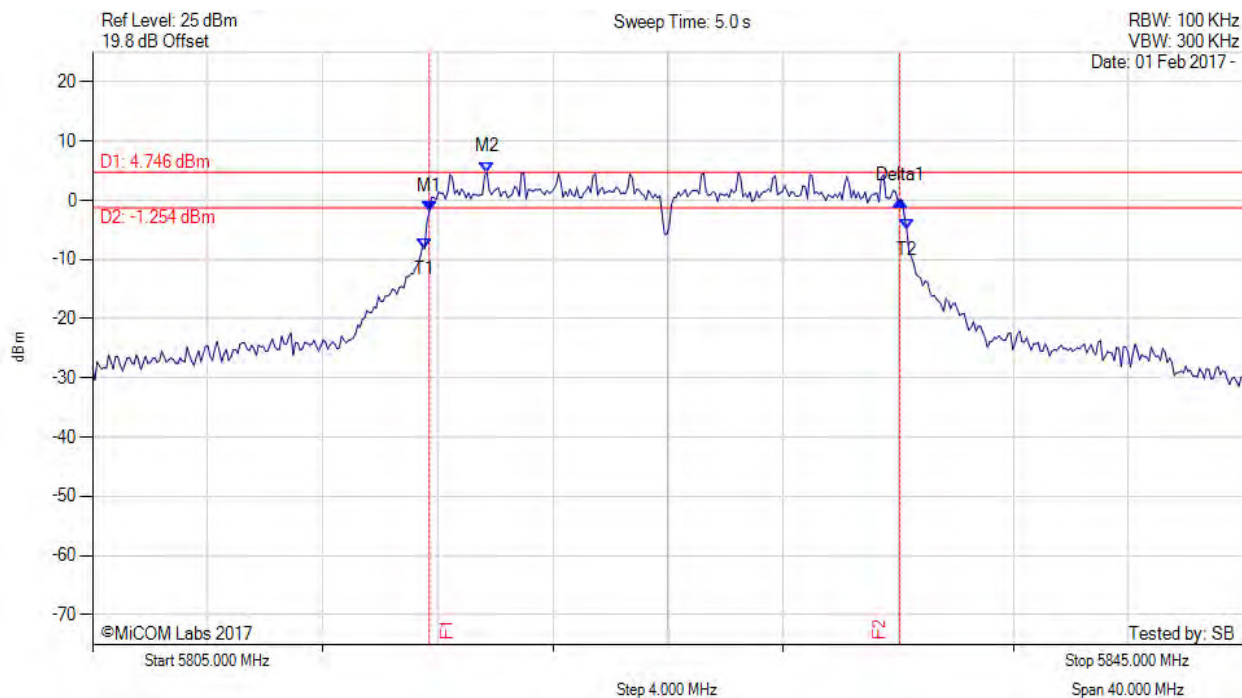


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-20, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5816.703 MHz : -1.961 dBm M2 : 5818.707 MHz : 4.746 dBm Delta1 : 16.353 MHz : 2.001 dB T1 : 5816.543 MHz : -8.126 dBm T2 : 5833.297 MHz : -4.898 dBm OBW : 16.754 MHz	Measured 6 dB Bandwidth: 16.353 MHz Measured 99% Bandwidth: 16.754 MHz

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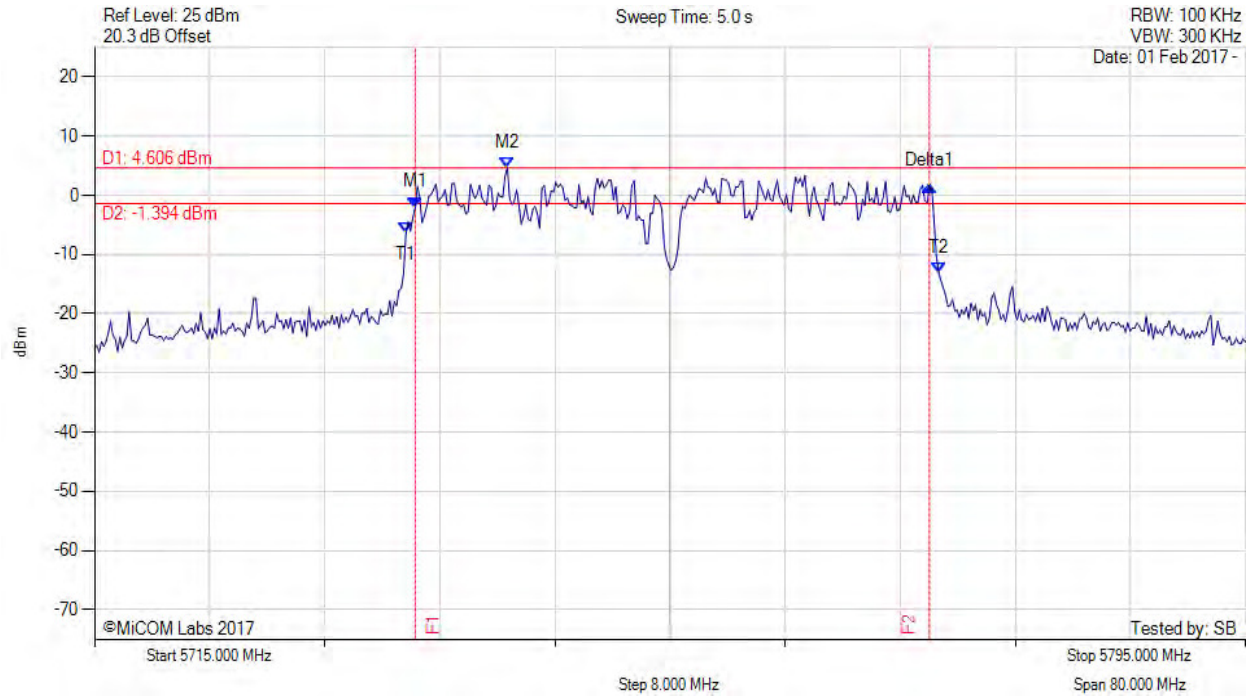


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5755.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5737.285 MHz : -2.026 dBm M2 : 5743.697 MHz : 4.606 dBm Delta1 : 35.752 MHz : 3.527 dB T1 : 5736.643 MHz : -6.338 dBm T2 : 5773.677 MHz : -13.119 dBm OBW : 37.034 MHz	Measured 6 dB Bandwidth: 35.752 MHz Measured 99% Bandwidth: 37.034 MHz

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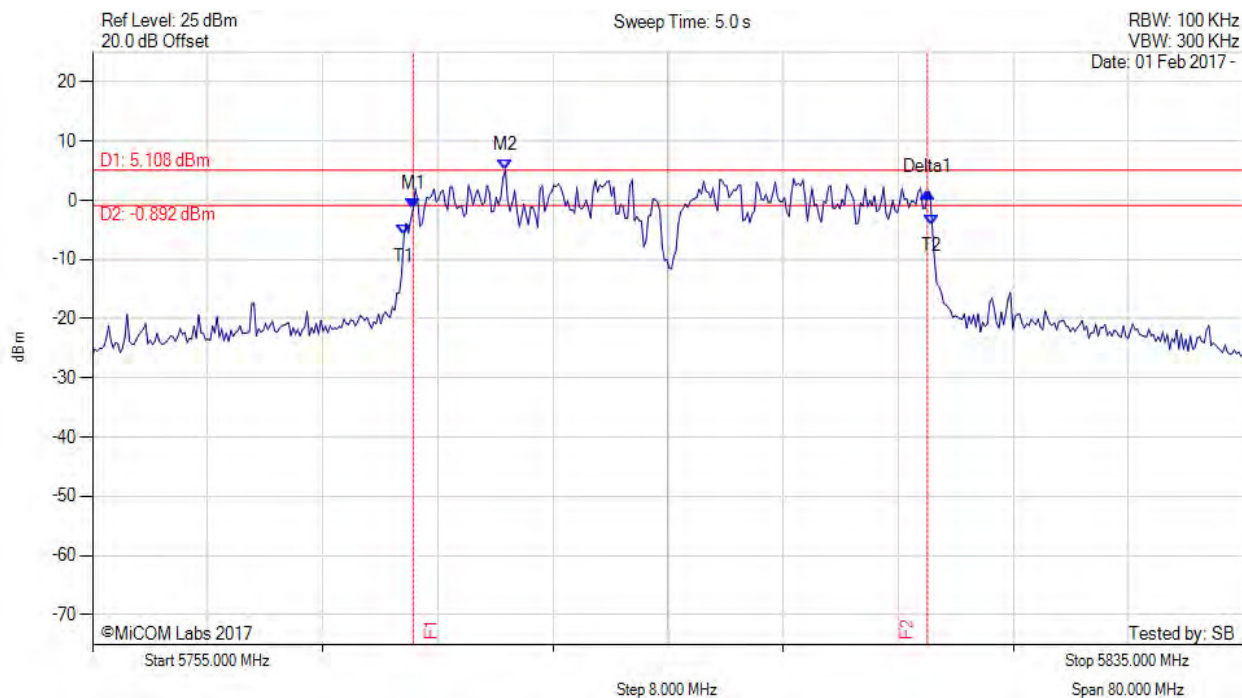


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6 dB & 99% BANDWIDTH

Variant: 802.11n HT-40, Channel: 5795.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = MAX HOLD	M1 : 5777.285 MHz : -1.520 dBm M2 : 5783.697 MHz : 5.108 dBm Delta1 : 35.752 MHz : 2.819 dB T1 : 5776.643 MHz : -5.931 dBm T2 : 5813.357 MHz : -4.174 dBm OBW : 36.713 MHz	Measured 6 dB Bandwidth: 35.752 MHz Measured 99% Bandwidth: 36.713 MHz

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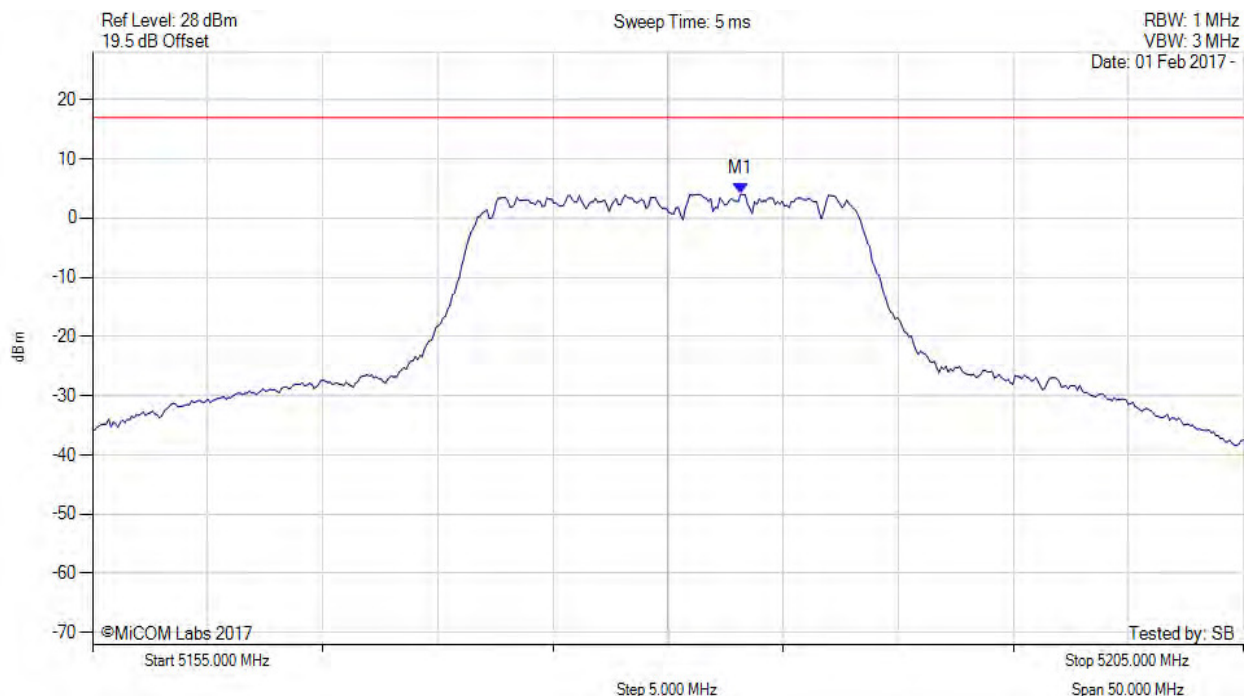
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A.3. Power Spectral Density



POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5180.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



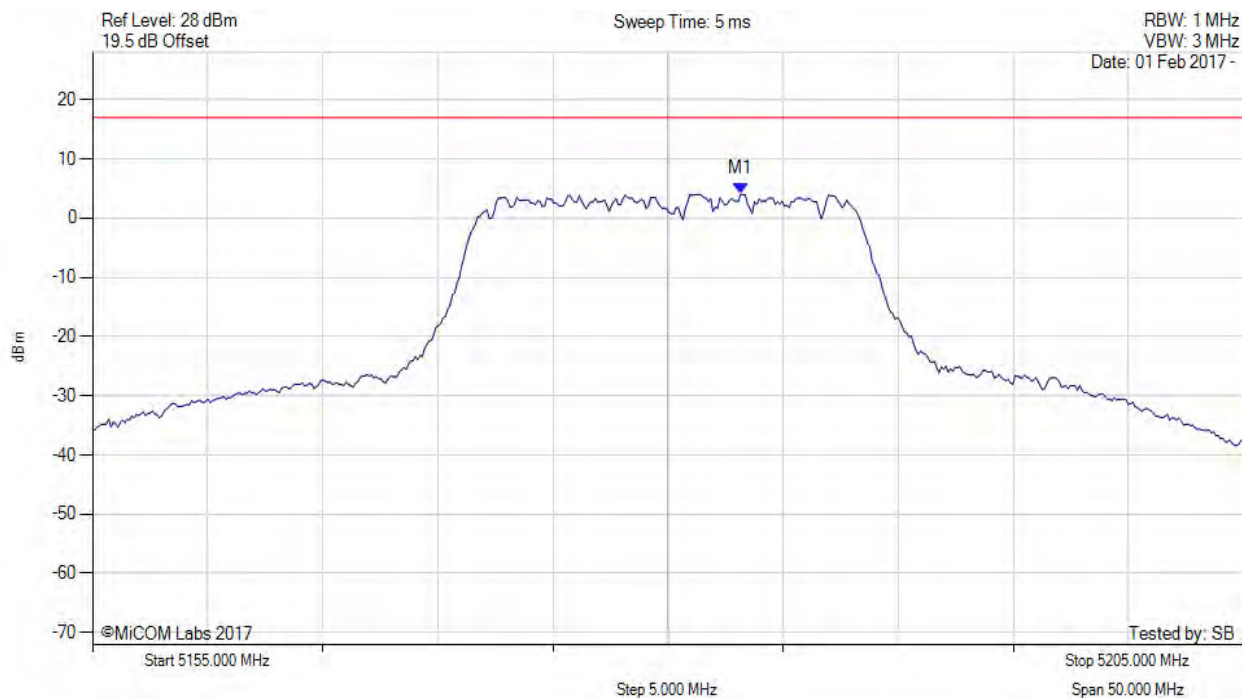
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5183.156 MHz : 4.051 dBm	Limit: ≤ 17.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5180.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5183.200 MHz : 4.051 dBm M1 + DCCF : 5183.200 MHz : 4.095 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 17.0 dBm Margin: -12.9 dB

[back to matrix](#)

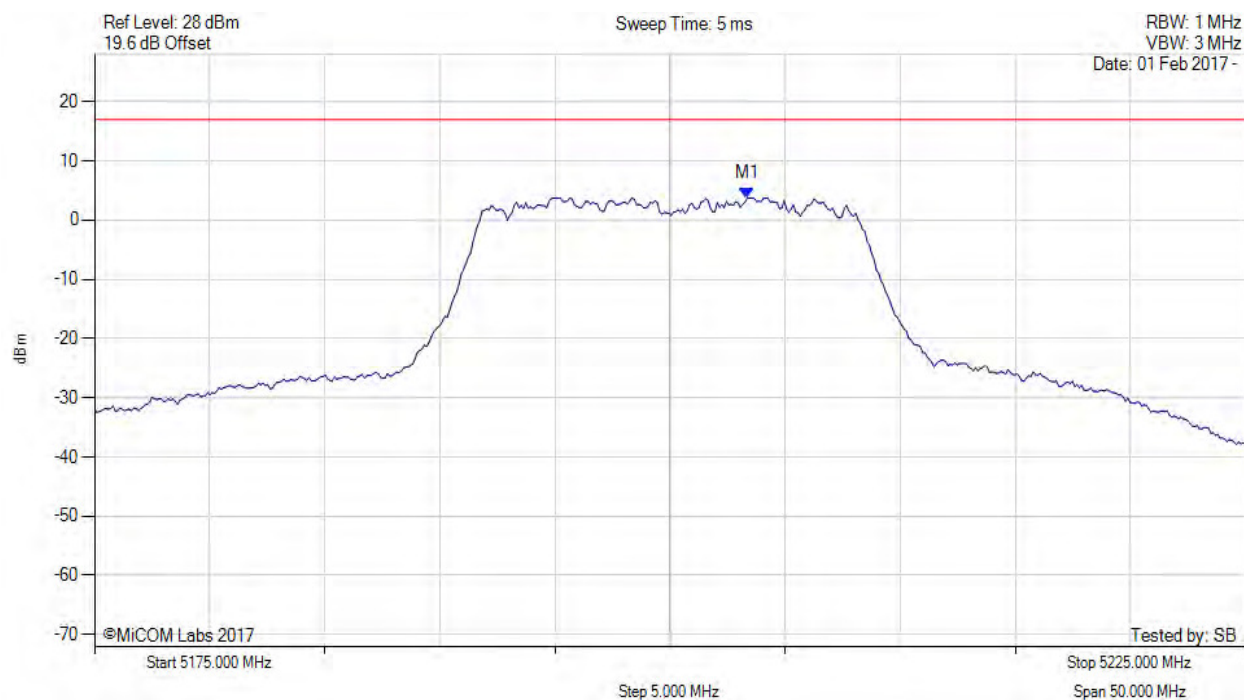


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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5200.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5203.357 MHz : 3.763 dBm	Limit: ≤ 17.000 dBm

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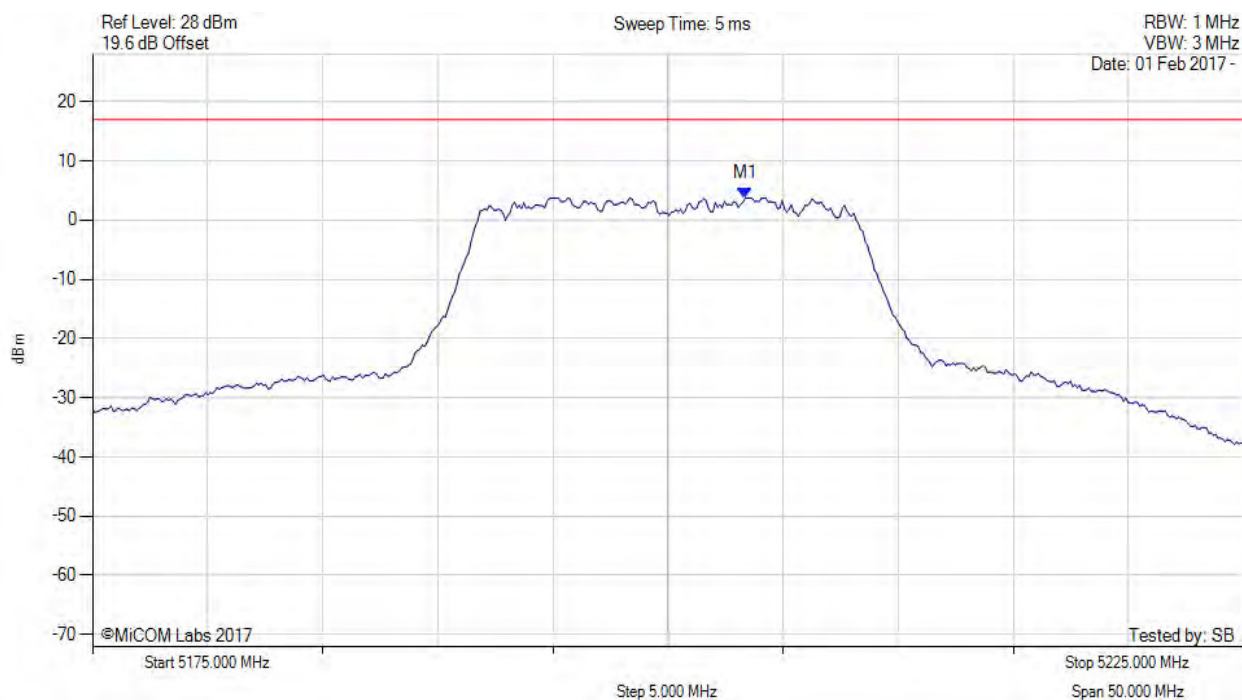


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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5200.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5203.400 MHz : 3.763 dBm M1 + DCCF : 5203.400 MHz : 3.807 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 17.0 dBm Margin: -13.2 dB

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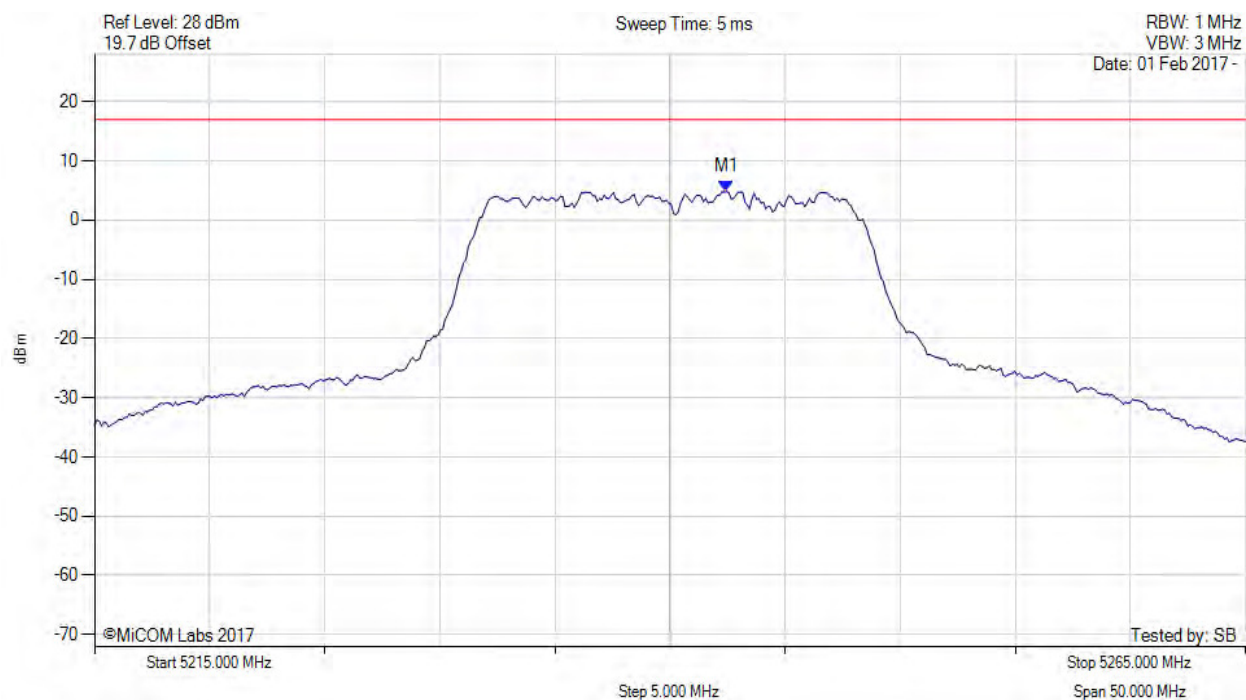


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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5240.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5242.455 MHz : 4.812 dBm	Limit: ≤ 17.000 dBm

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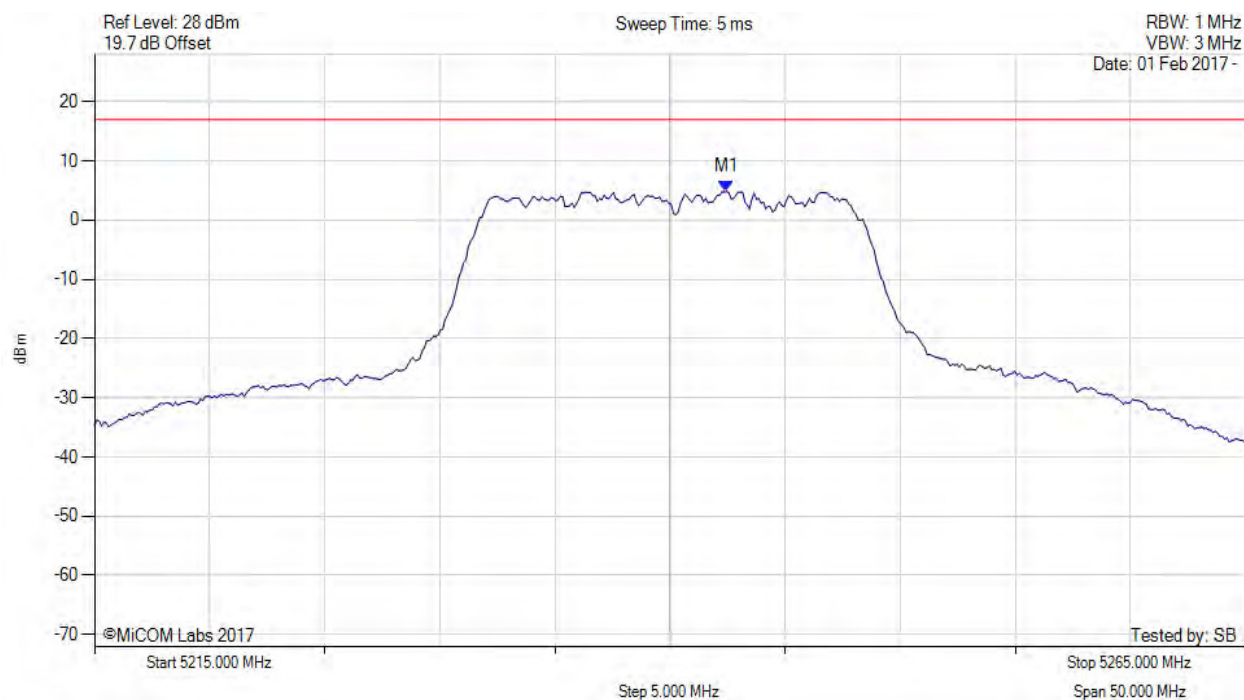


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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5240.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5242.500 MHz : 4.812 dBm M1 + DCCF : 5242.500 MHz : 4.856 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 17.0 dBm Margin: -12.1 dB

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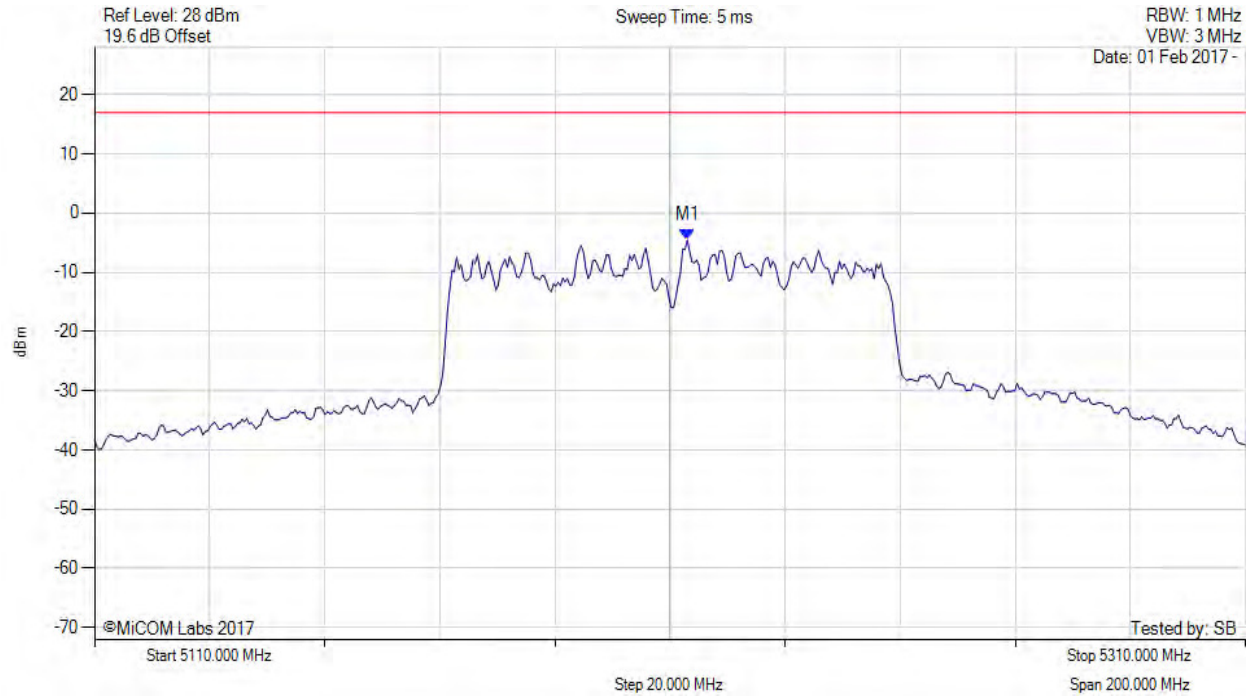


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POWER SPECTRAL DENSITY

Variant: 802.11ac-80, Channel: 5210.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



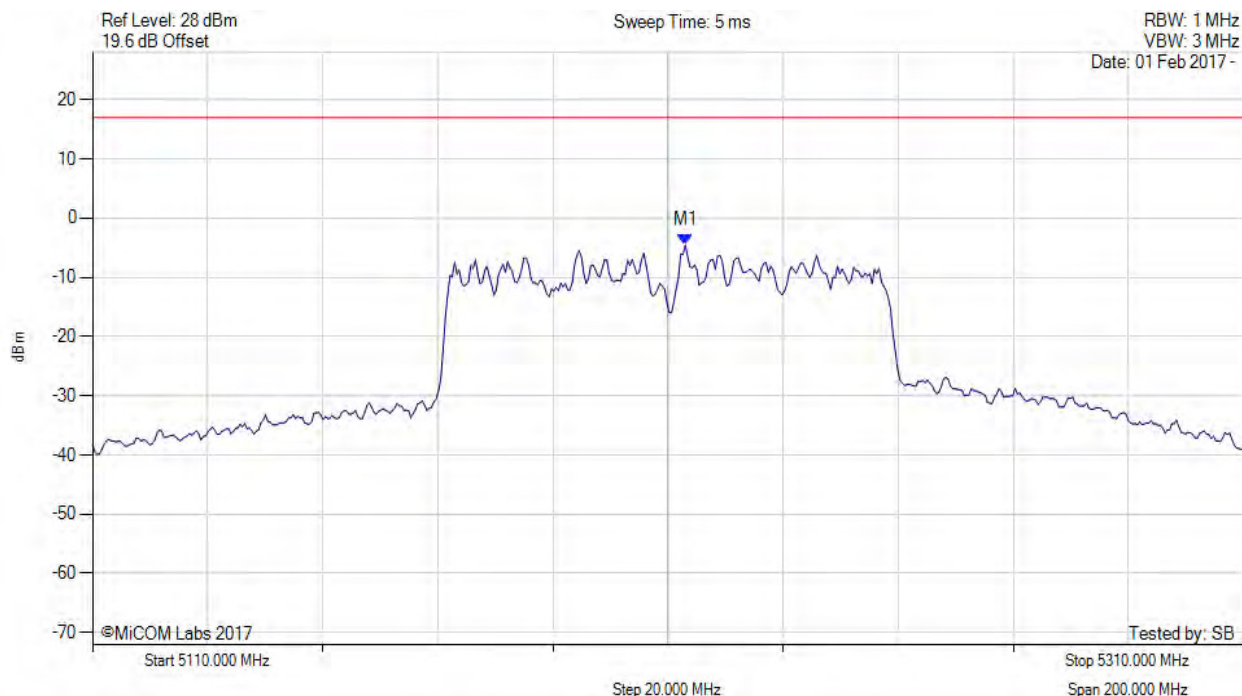
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5213.006 MHz : -4.604 dBm	Limit: ≤ 17.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11ac-80, Channel: 5210.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5213.000 MHz : -4.604 dBm M1 + DCCF : 5213.000 MHz : -3.635 dBm Duty Cycle Correction Factor : +0.97 dB	Limit: ≤ 17.0 dBm Margin: -20.6 dB

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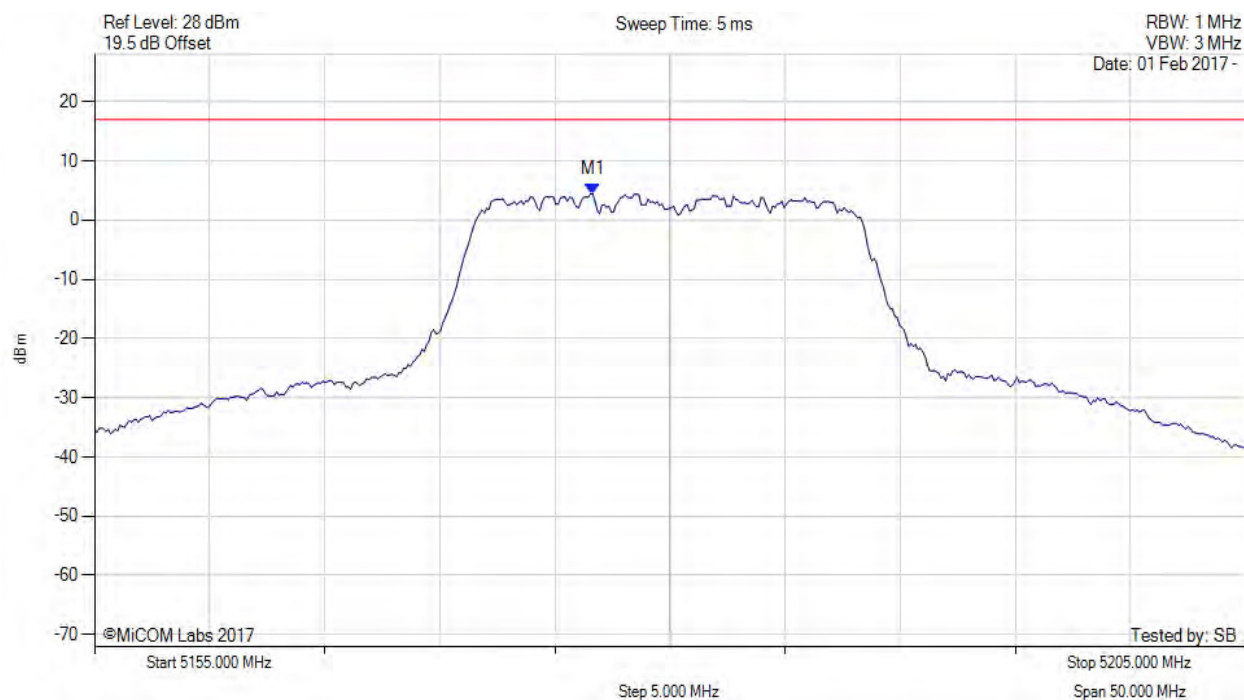


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5176.643 MHz : 4.426 dBm	Limit: ≤ 17.000 dBm

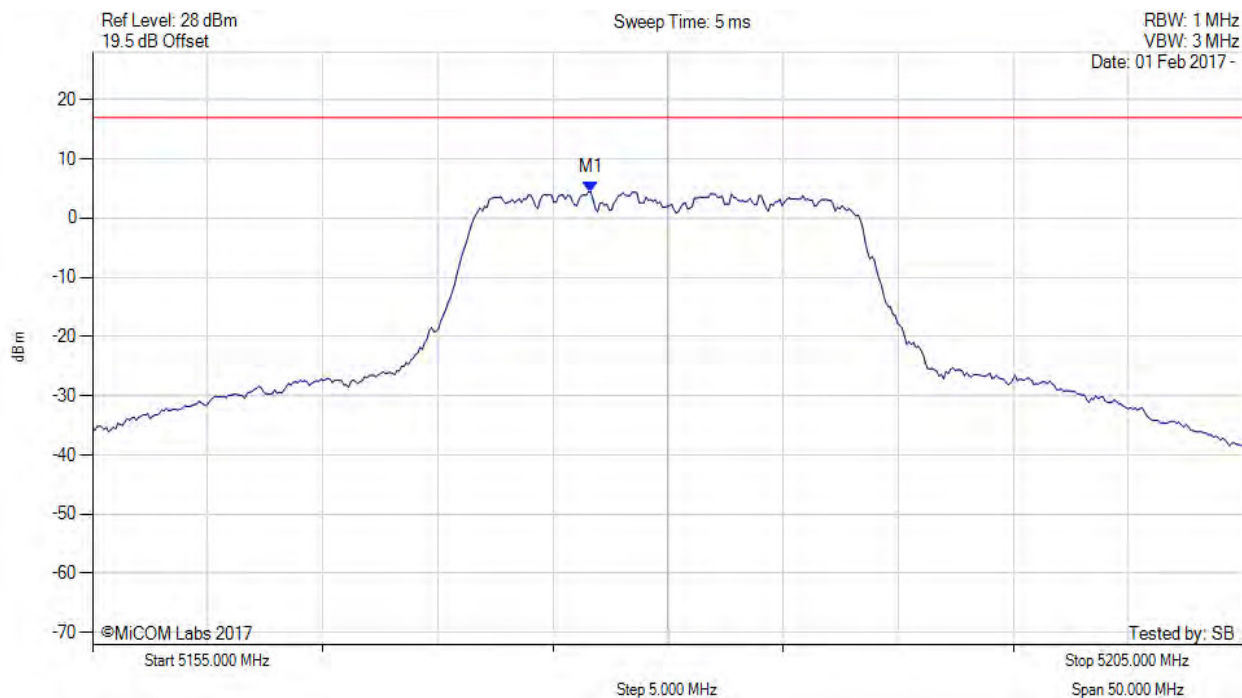
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POWER SPECTRAL DENSITY



Variant: 802.11n HT-20, Channel: 5180.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5176.600 MHz : 4.426 dBm M1 + DCCF : 5176.600 MHz : 4.470 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 17.0 dBm Margin: -12.5 dB

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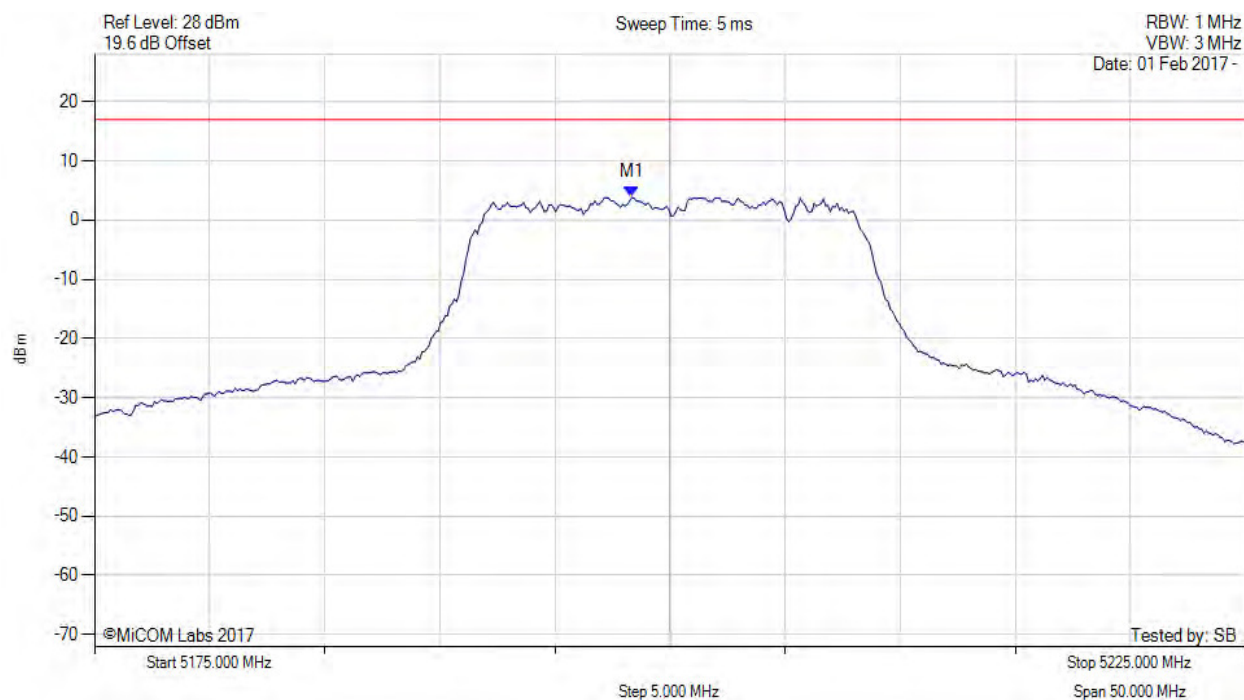


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



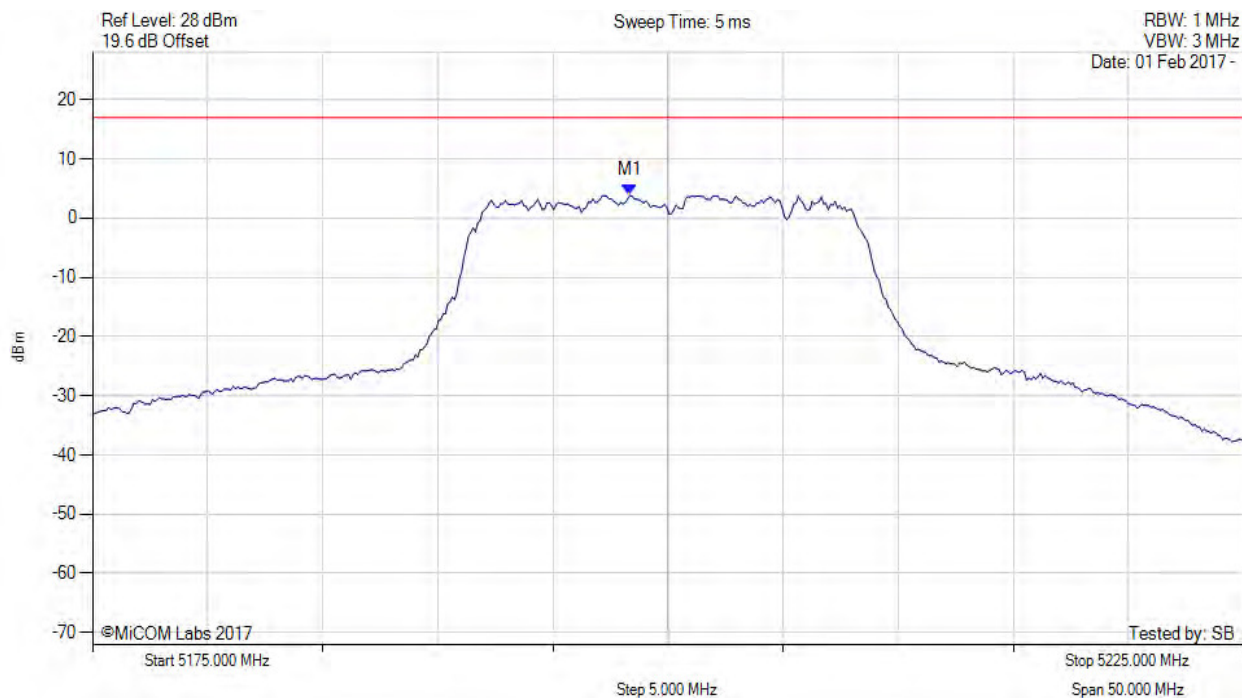
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5198.347 MHz : 3.835 dBm	Limit: ≤ 17.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5200.00 MHz, SUM, Temp: 20, Voltage: 110 Vac

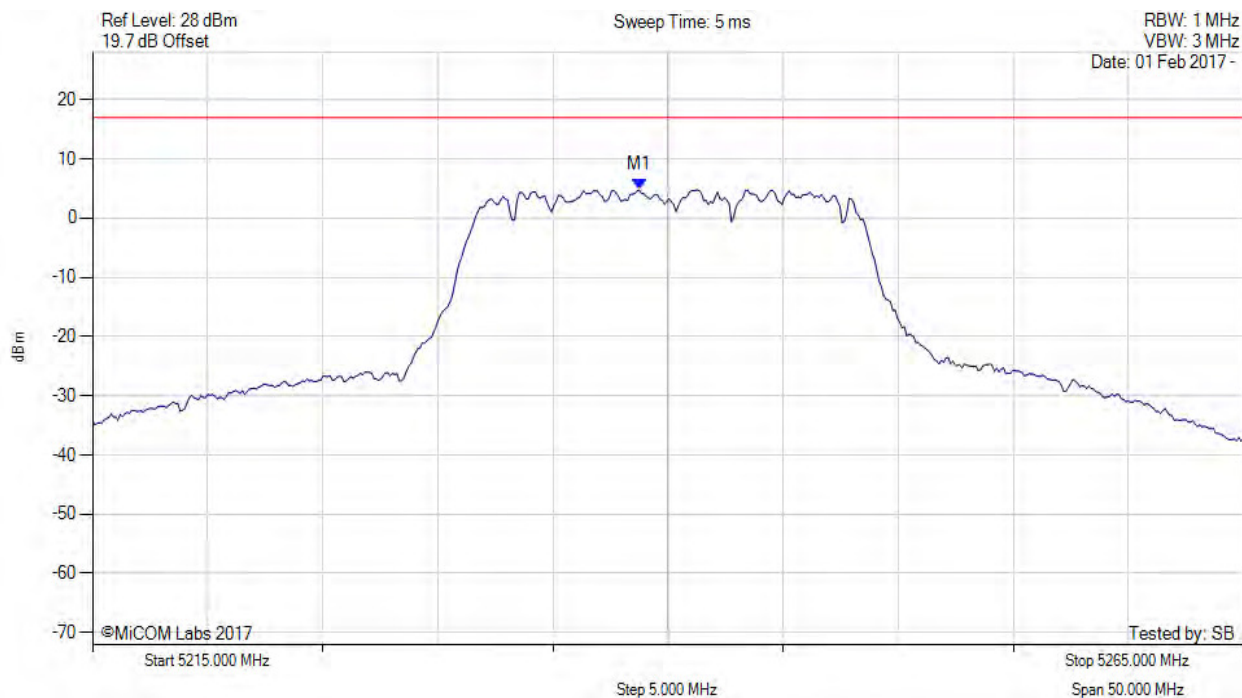


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5198.300 MHz : 3.835 dBm M1 + DCCF : 5198.300 MHz : 3.879 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 17.0 dBm Margin: -13.1 dB

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac

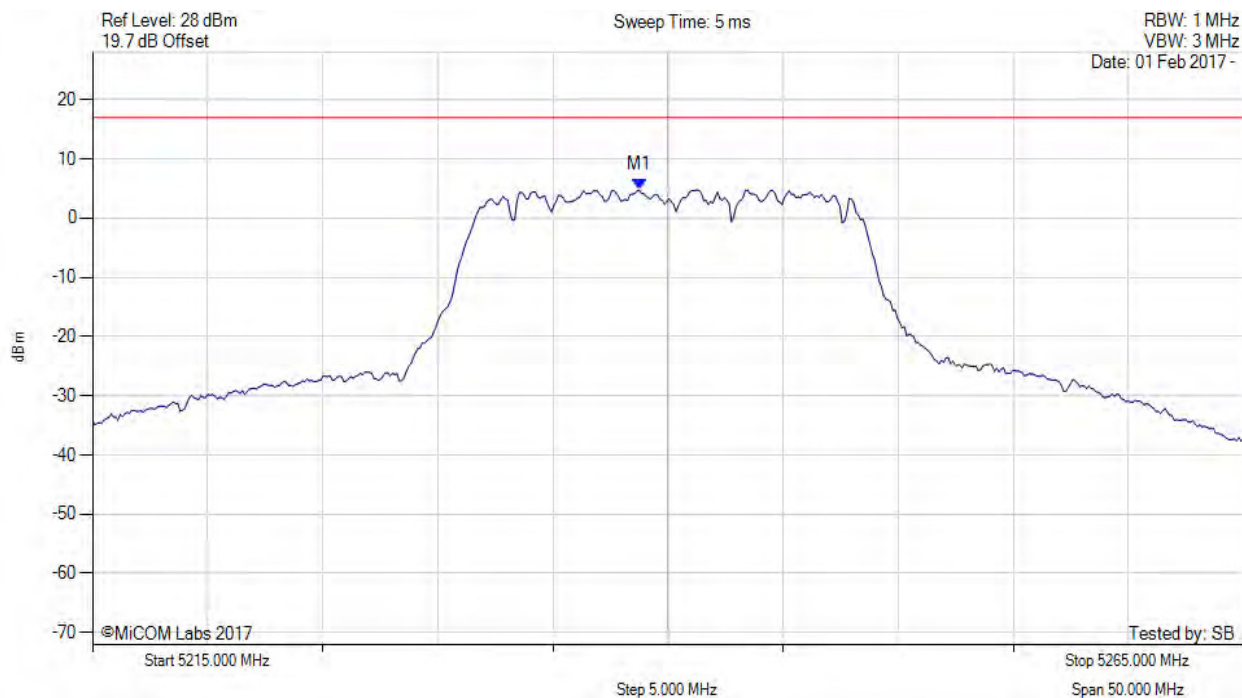


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5238.747 MHz : 4.757 dBm	Limit: ≤ 17.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5240.00 MHz, SUM, Temp: 20, Voltage: 110 Vac

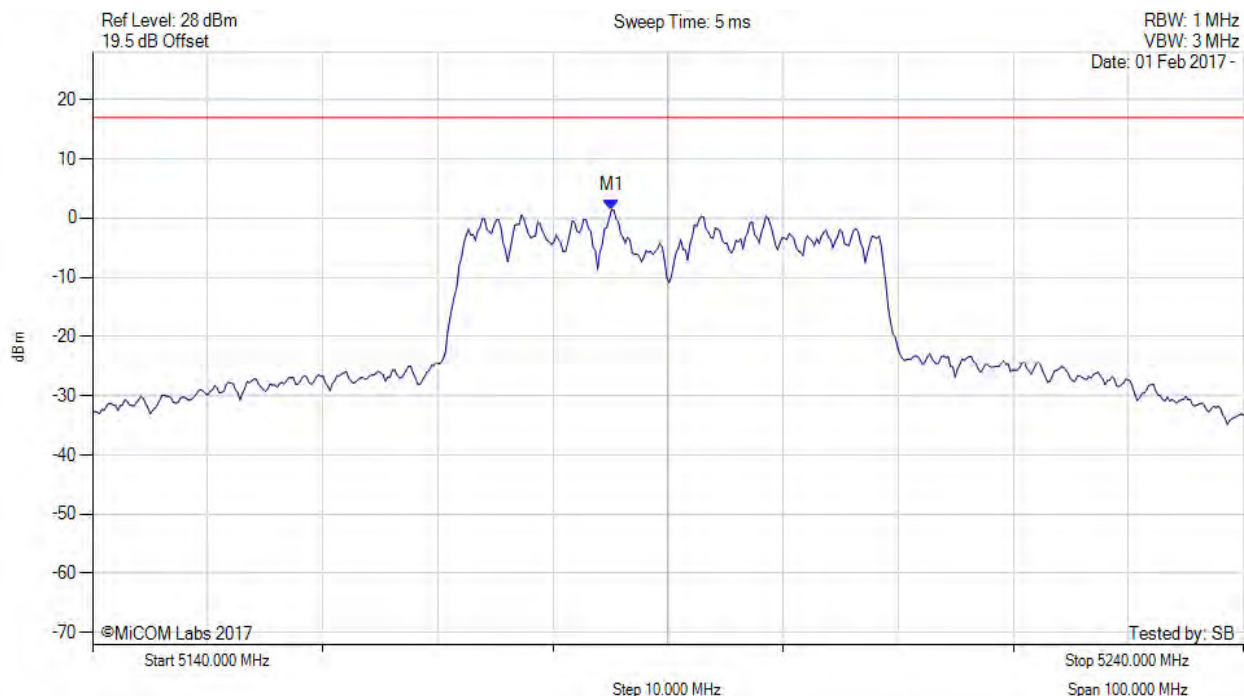


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5238.700 MHz : 4.757 dBm M1 + DCCF : 5238.700 MHz : 4.801 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 17.0 dBm Margin: -12.2 dB

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac

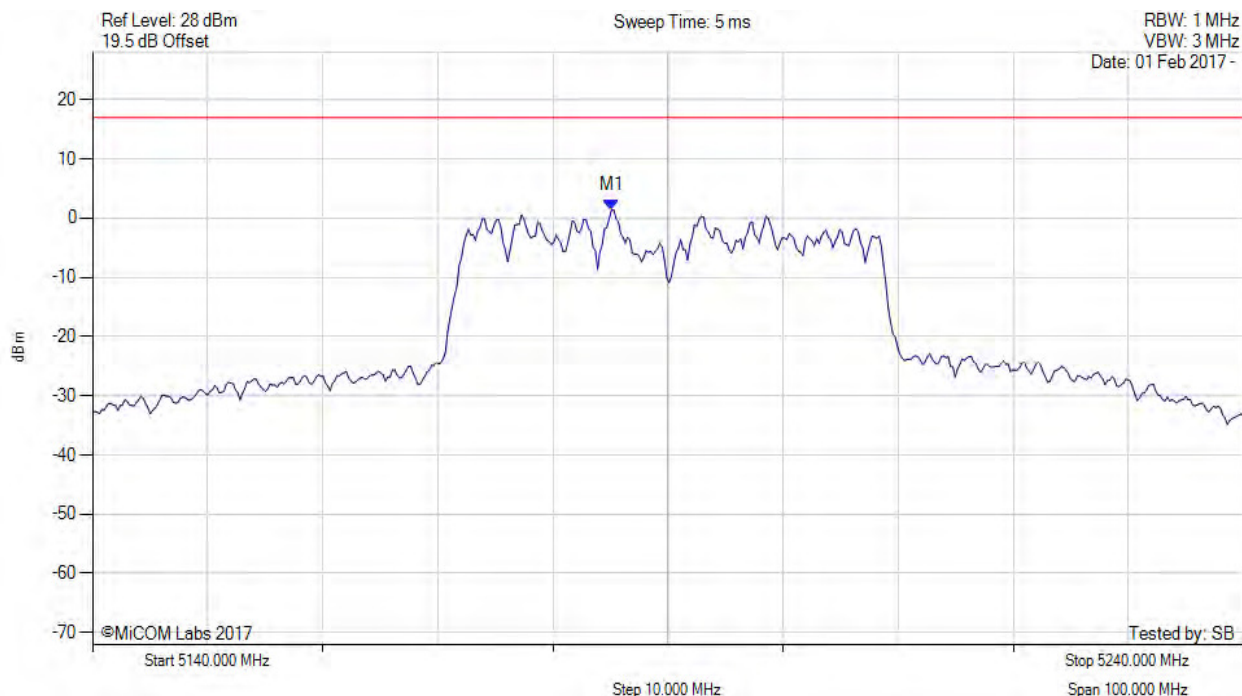


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5185.090 MHz : 1.406 dBm	Limit: ≤ 17.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5190.00 MHz, SUM, Temp: 20, Voltage: 110 Vac

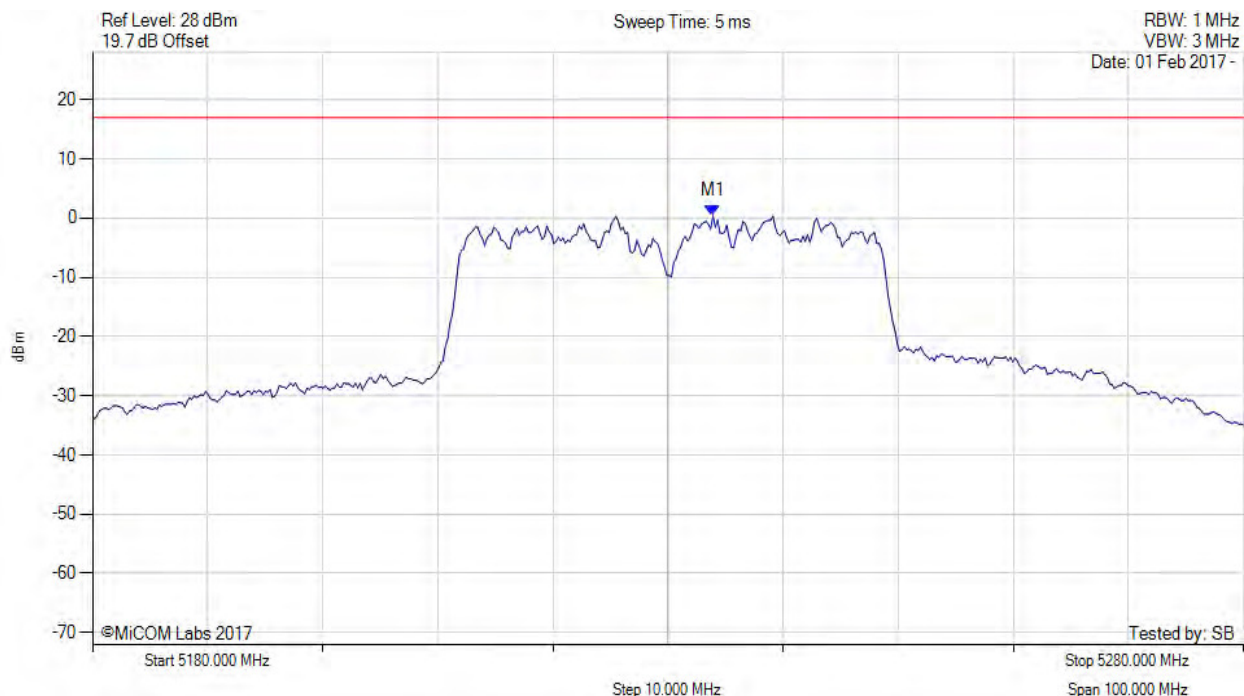


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5185.100 MHz : 1.406 dBm M1 + DCCF : 5185.100 MHz : 1.874 dBm Duty Cycle Correction Factor : +0.46 dB	Limit: ≤ 17.0 dBm Margin: -15.1 dB

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5233.908 MHz : 0.354 dBm	Limit: ≤ 17.000 dBm

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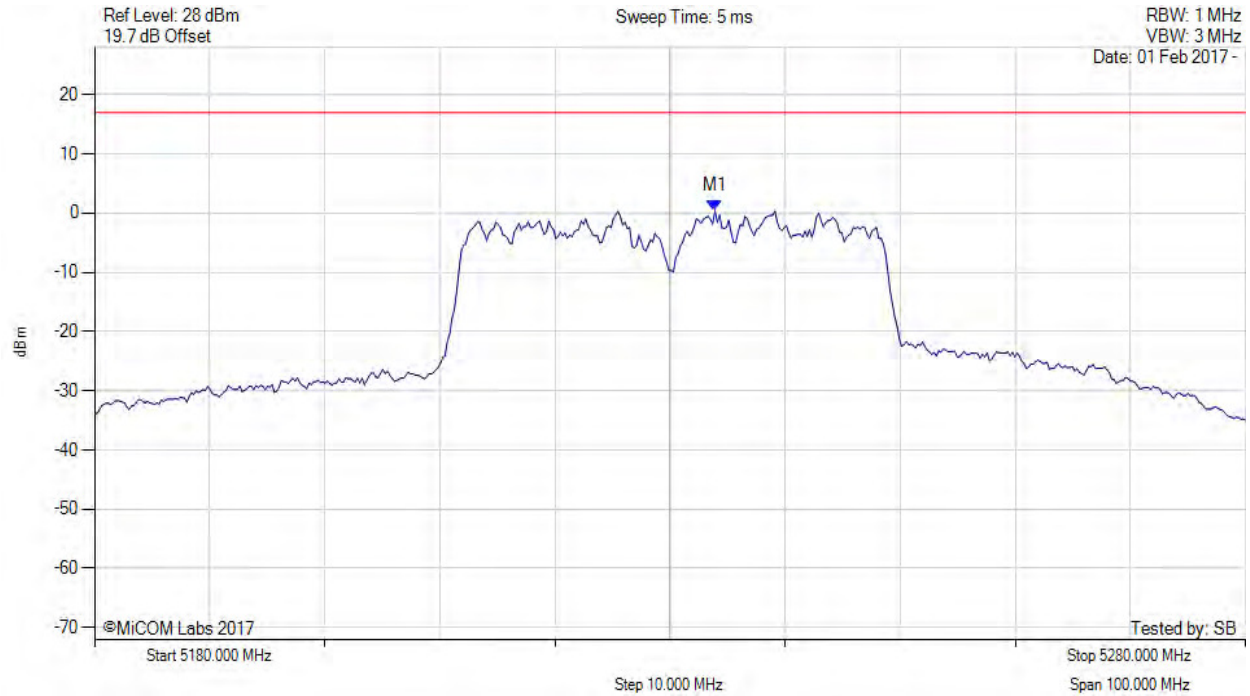


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5230.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



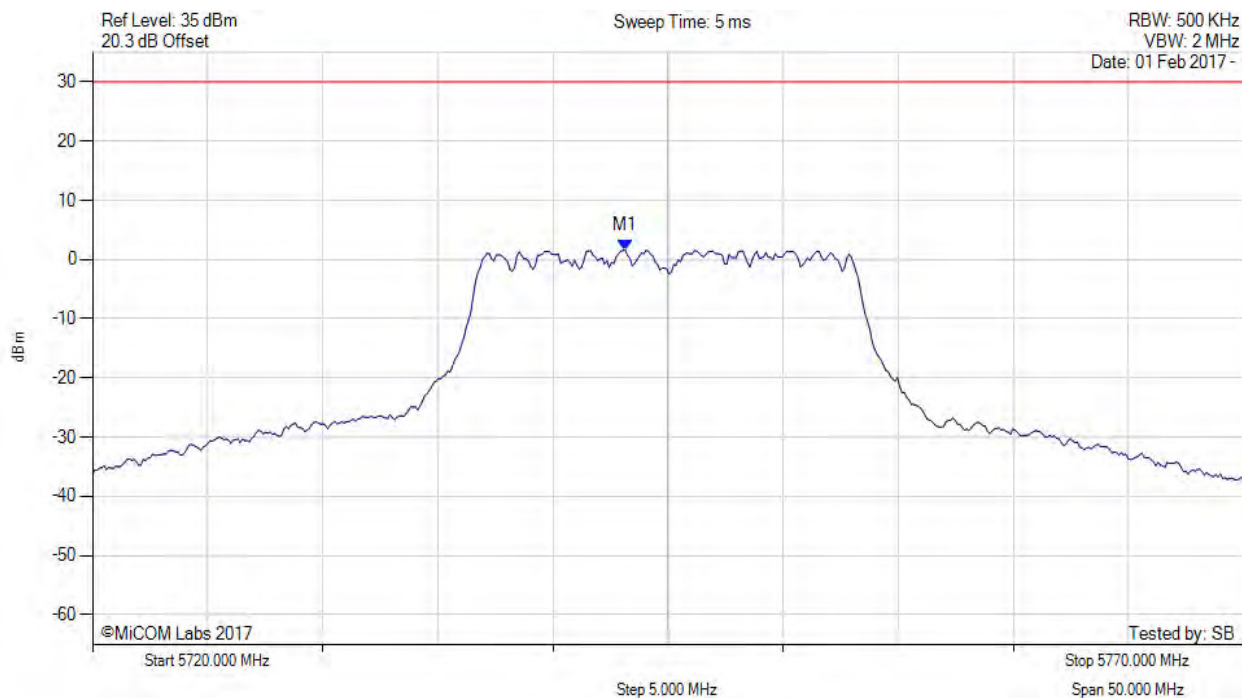
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5233.900 MHz : 0.354 dBm M1 + DCCF : 5233.900 MHz : 0.822 dBm Duty Cycle Correction Factor : +0.46 dB	Limit: ≤ 17.0 dBm Margin: -16.2 dB

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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac

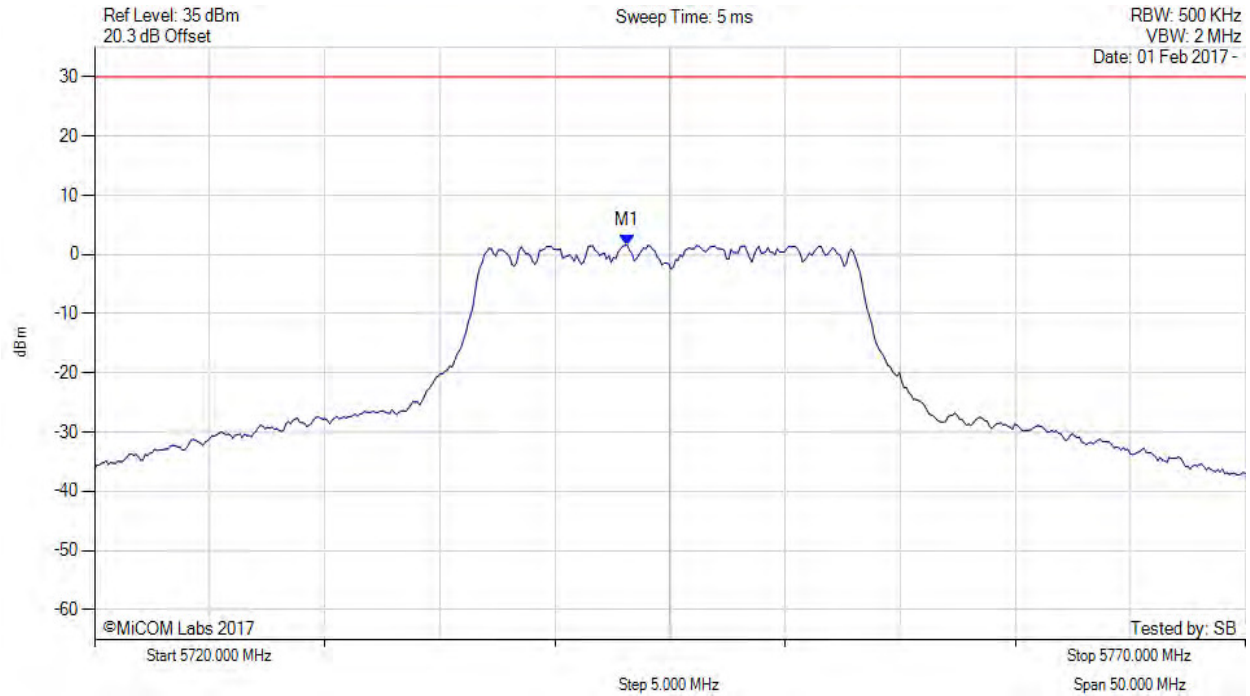


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5743.146 MHz : 1.607 dBm	Limit: ≤ 30.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5745.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5743.100 MHz : 1.607 dBm M1 + DCCF : 5743.100 MHz : 1.651 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 30.0 dBm Margin: -28.3 dB

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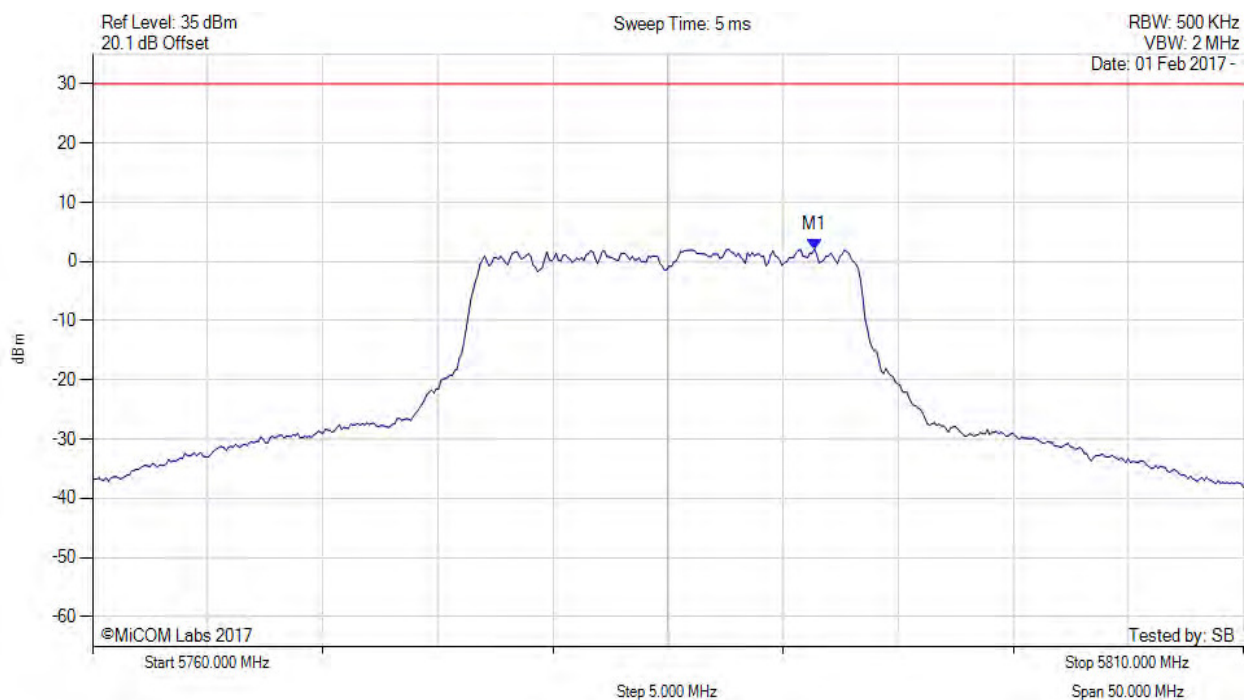


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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5785.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



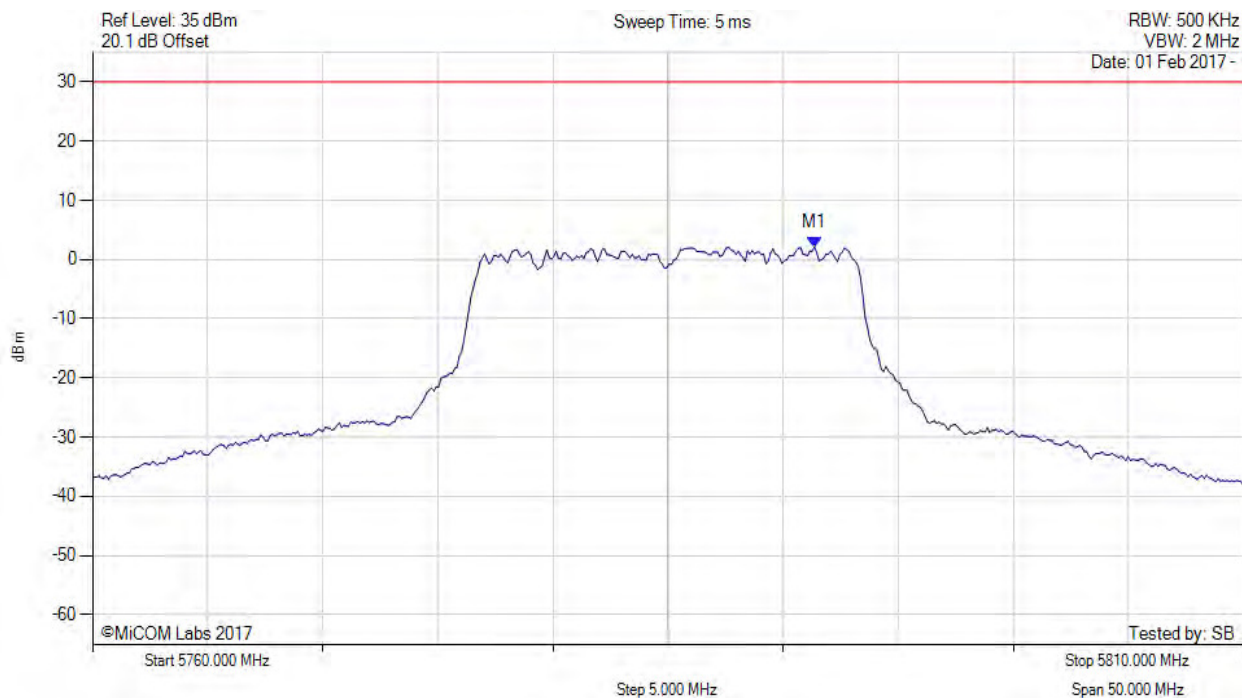
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5791.363 MHz : 2.116 dBm	Limit: ≤ 30.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5785.00 MHz, SUM, Temp: 20, Voltage: 110 Vac

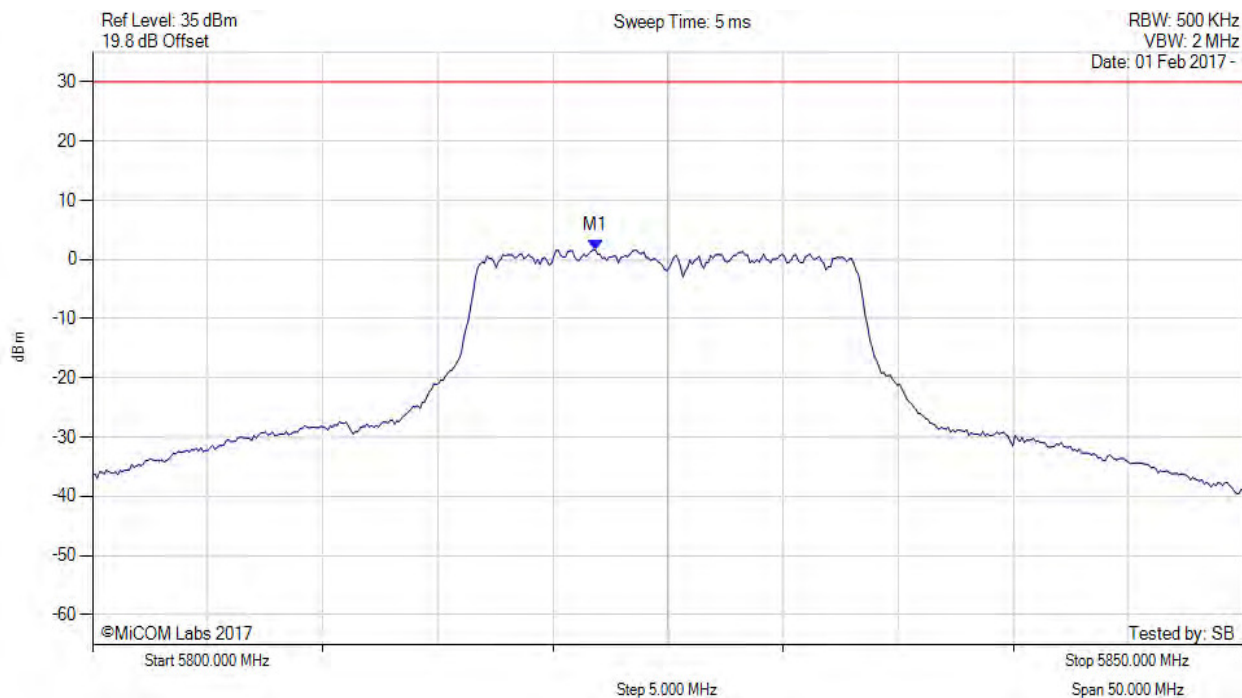


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5791.400 MHz : 2.116 dBm M1 + DCCF : 5791.400 MHz : 2.160 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 30.0 dBm Margin: -27.8 dB

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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5821.844 MHz : 1.606 dBm	Limit: ≤ 30.000 dBm

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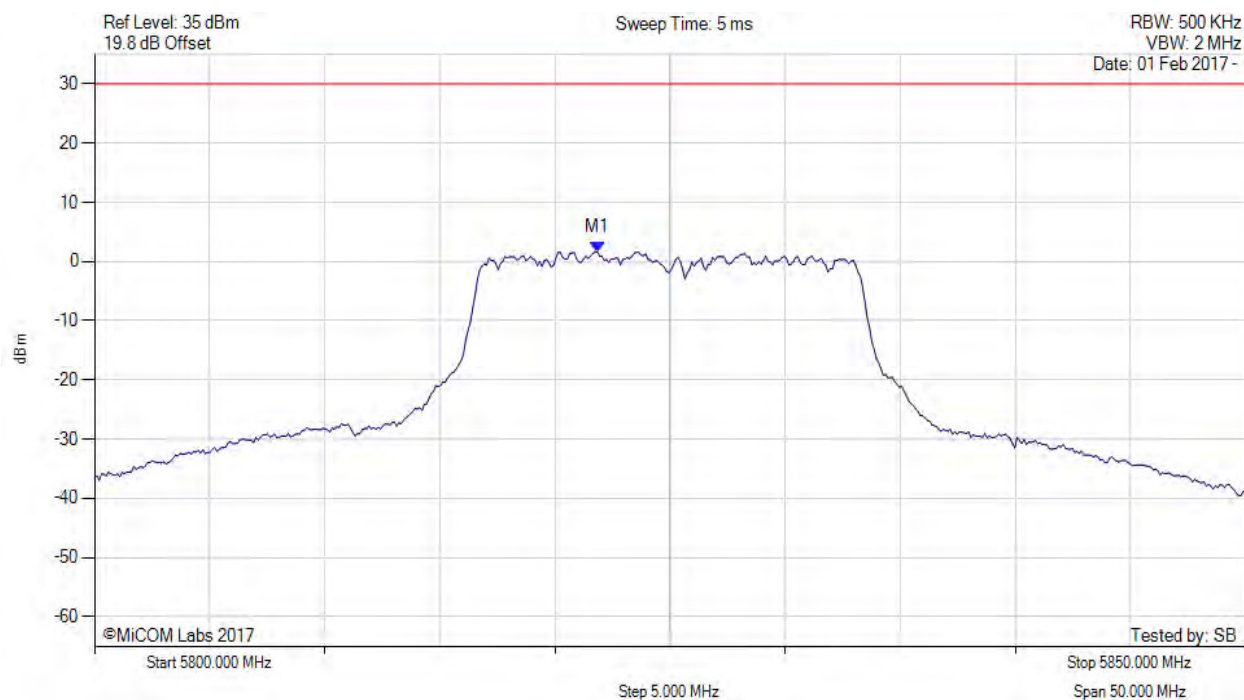


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POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5825.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5821.800 MHz : 1.606 dBm M1 + DCCF : 5821.800 MHz : 1.650 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 30.0 dBm Margin: -28.4 dB

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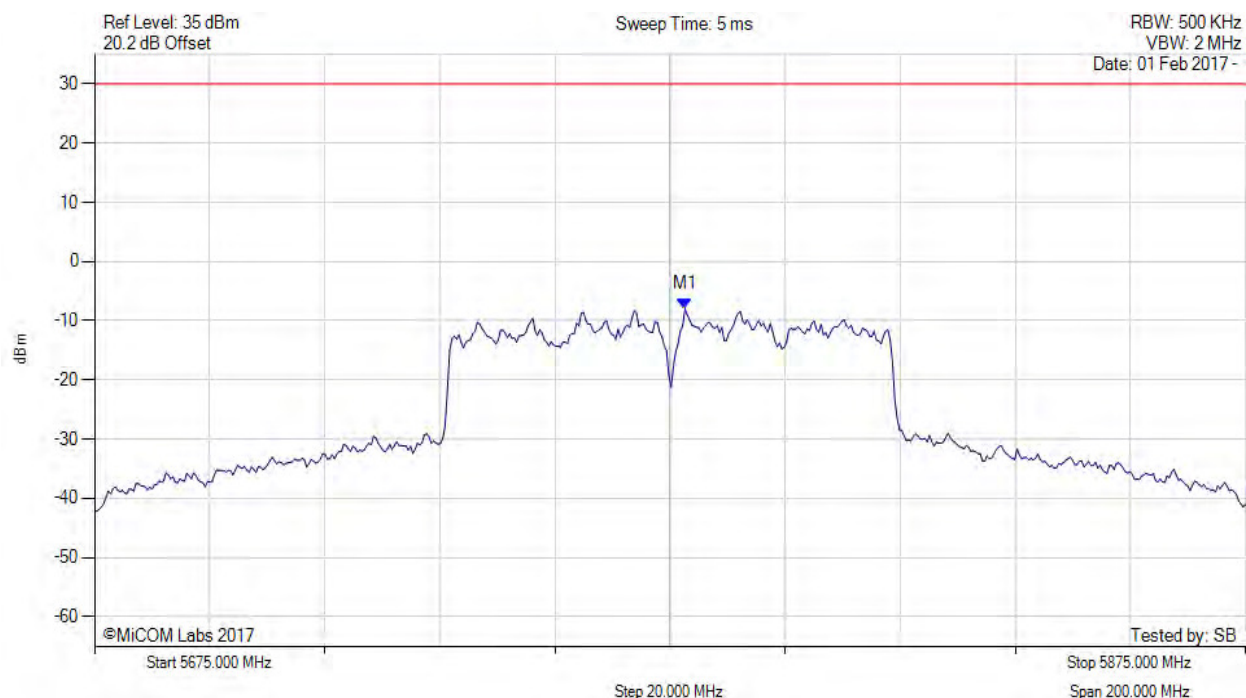


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POWER SPECTRAL DENSITY

Variant: 802.11ac-80, Channel: 5775.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5777.605 MHz : -7.973 dBm	Limit: ≤ 30.000 dBm

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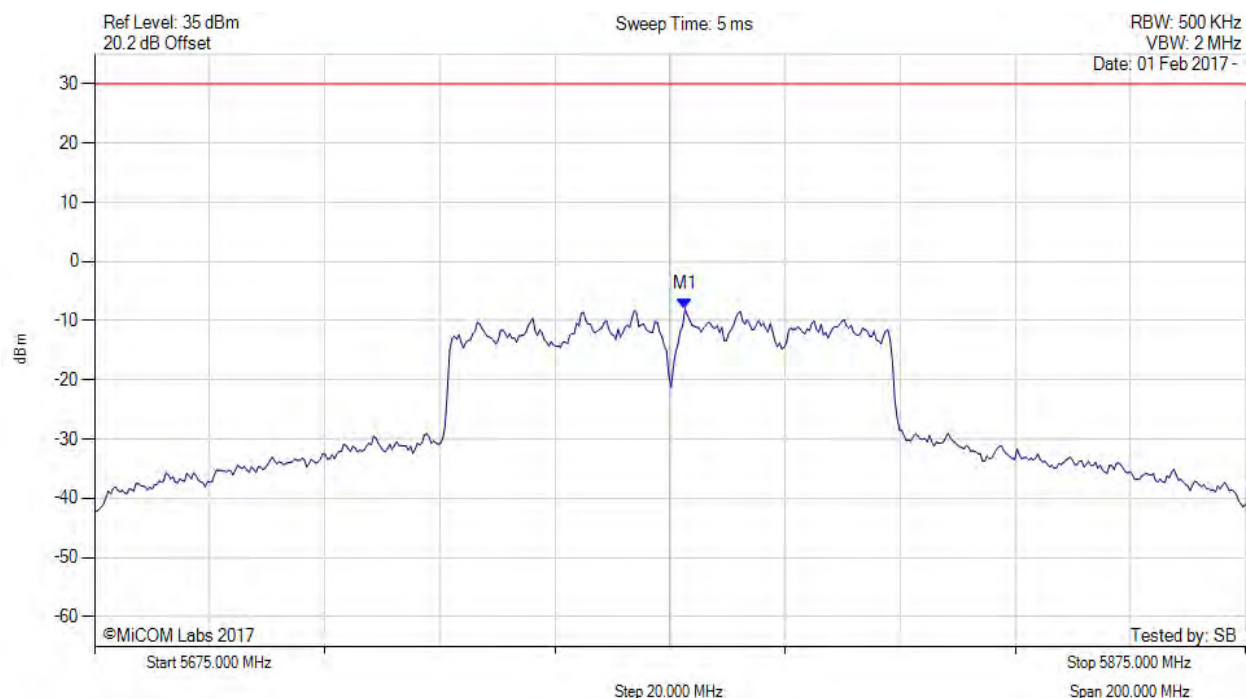


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POWER SPECTRAL DENSITY

Variant: 802.11ac-80, Channel: 5775.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5777.600 MHz : -7.973 dBm M1 + DCCF : 5777.600 MHz : -7.004 dBm Duty Cycle Correction Factor : +0.97 dB	Limit: ≤ 30.0 dBm Margin: -37.0 dB

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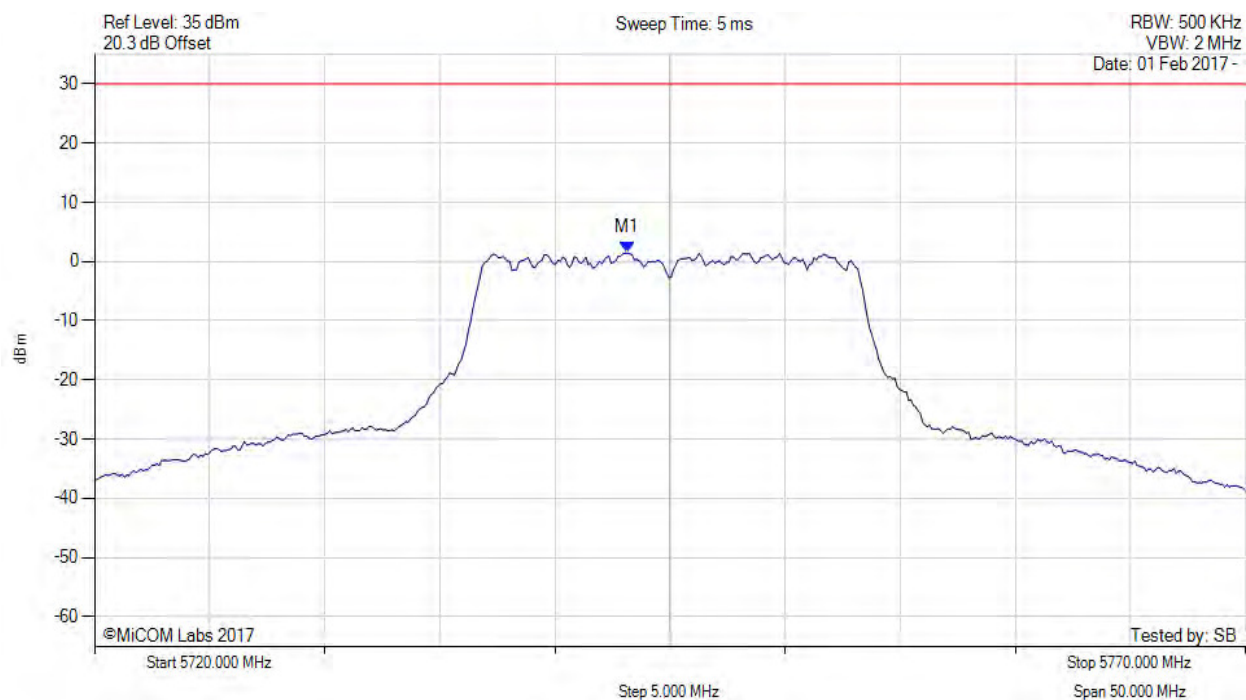


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



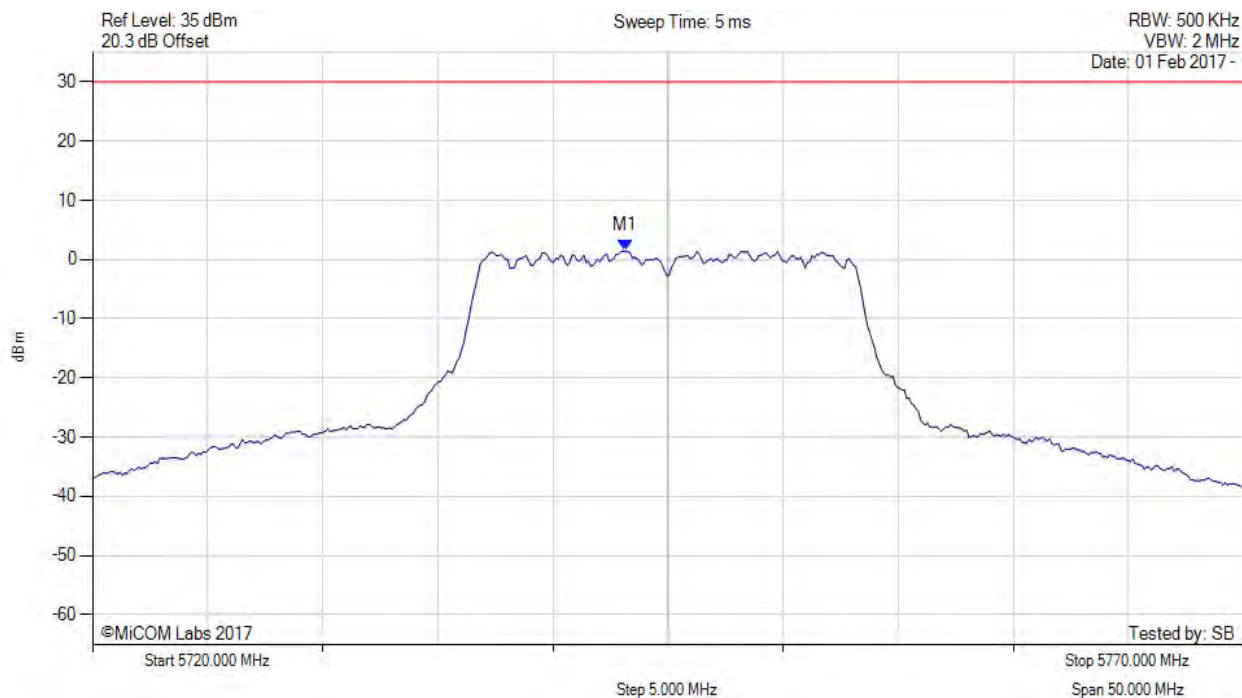
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5743.146 MHz : 1.457 dBm	Limit: ≤ 30.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5745.00 MHz, SUM, Temp: 20, Voltage: 110 Vac

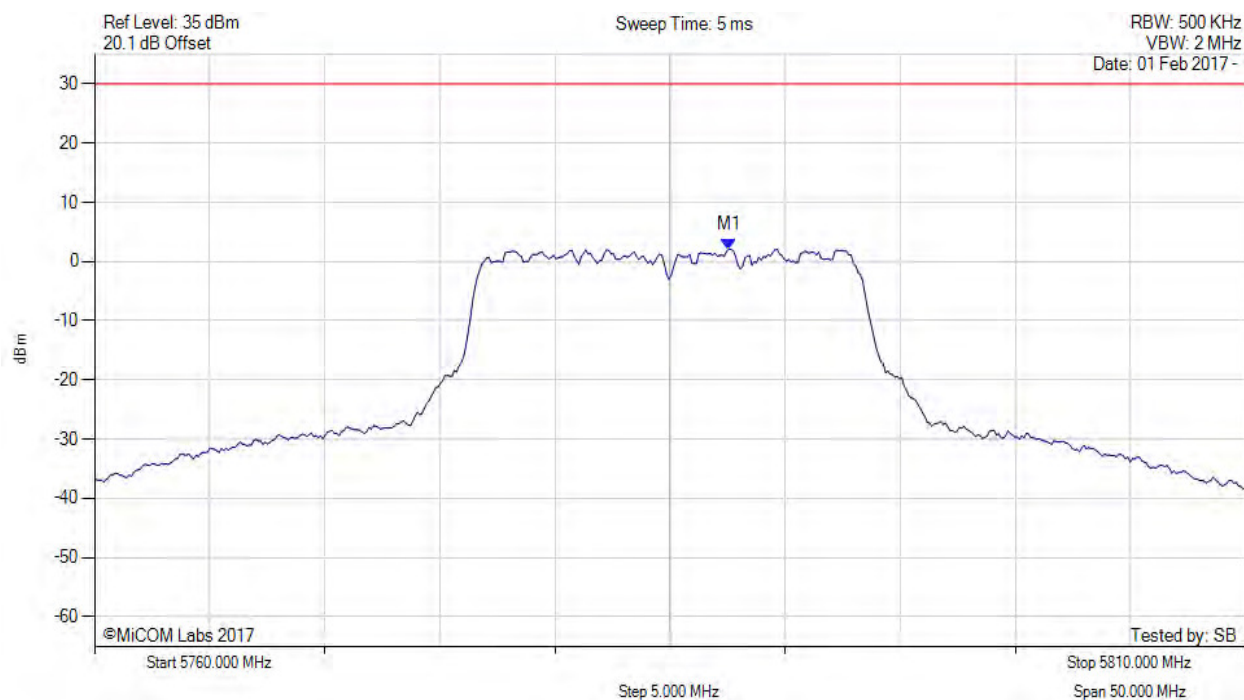


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5743.100 MHz : 1.457 dBm M1 + DCCF : 5743.100 MHz : 1.501 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 30.0 dBm Margin: -28.5 dB

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5785.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5787.555 MHz : 2.092 dBm	Limit: ≤ 30.000 dBm

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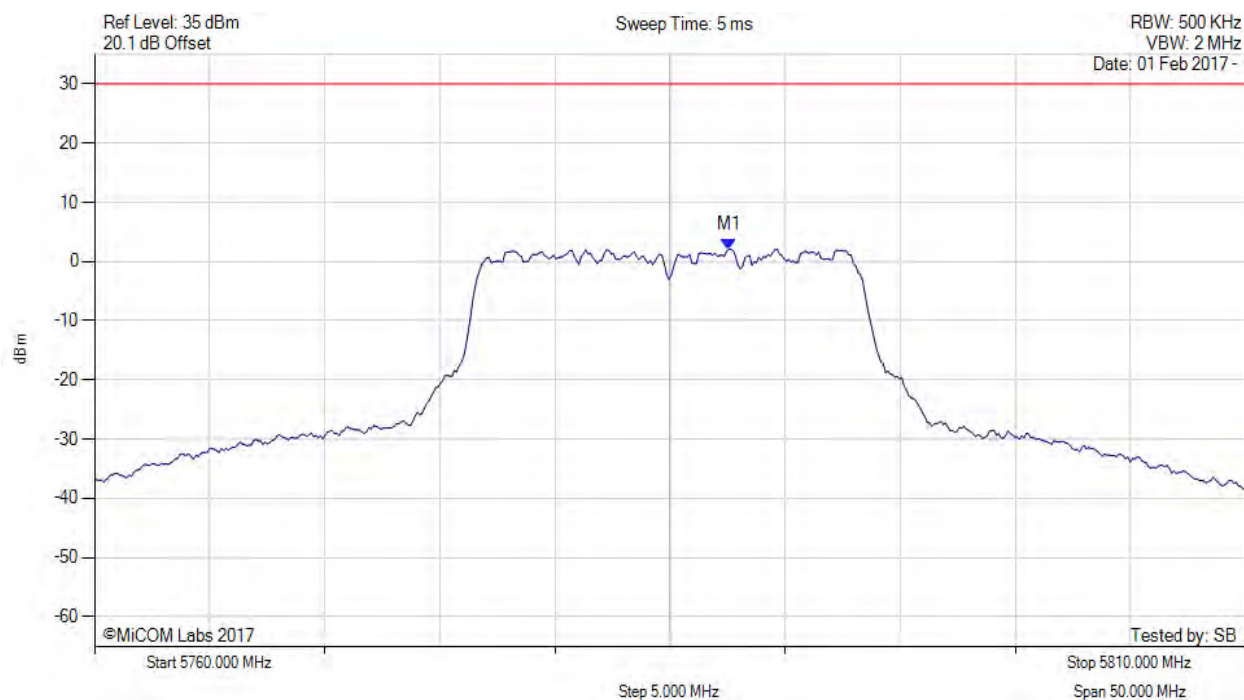


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5785.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5787.600 MHz : 2.092 dBm M1 + DCCF : 5787.600 MHz : 2.136 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 30.0 dBm Margin: -27.9 dB

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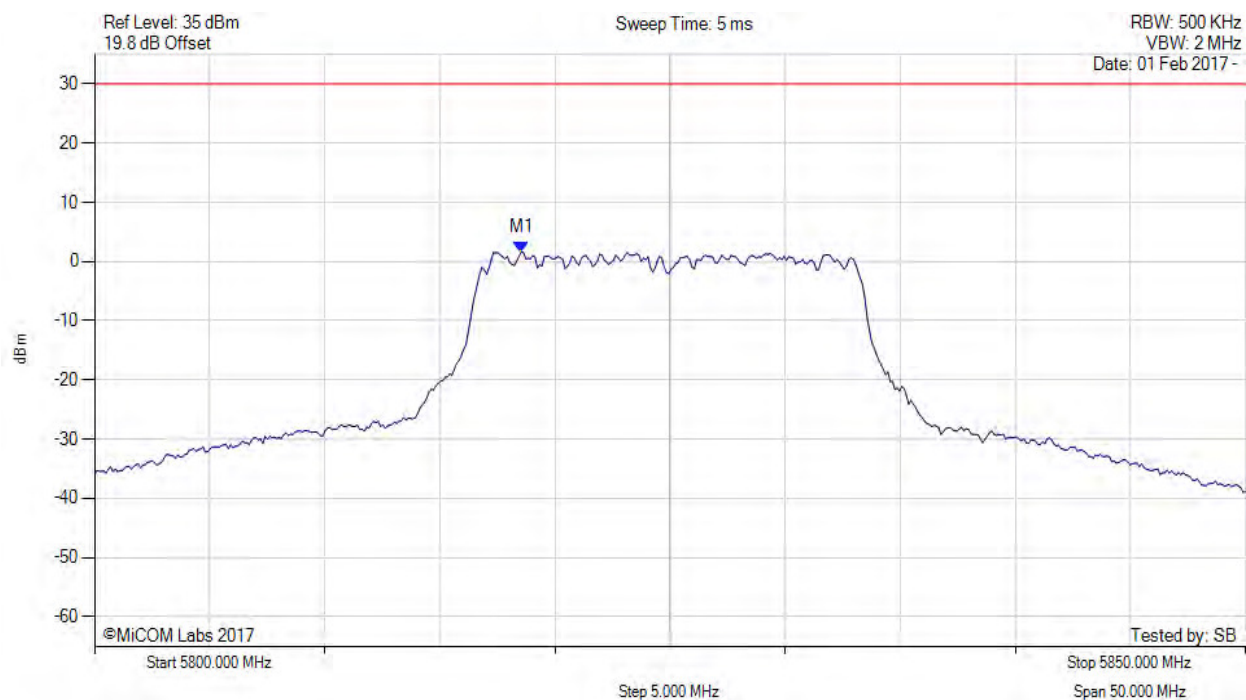


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5818.537 MHz : 1.599 dBm	Limit: ≤ 30.000 dBm

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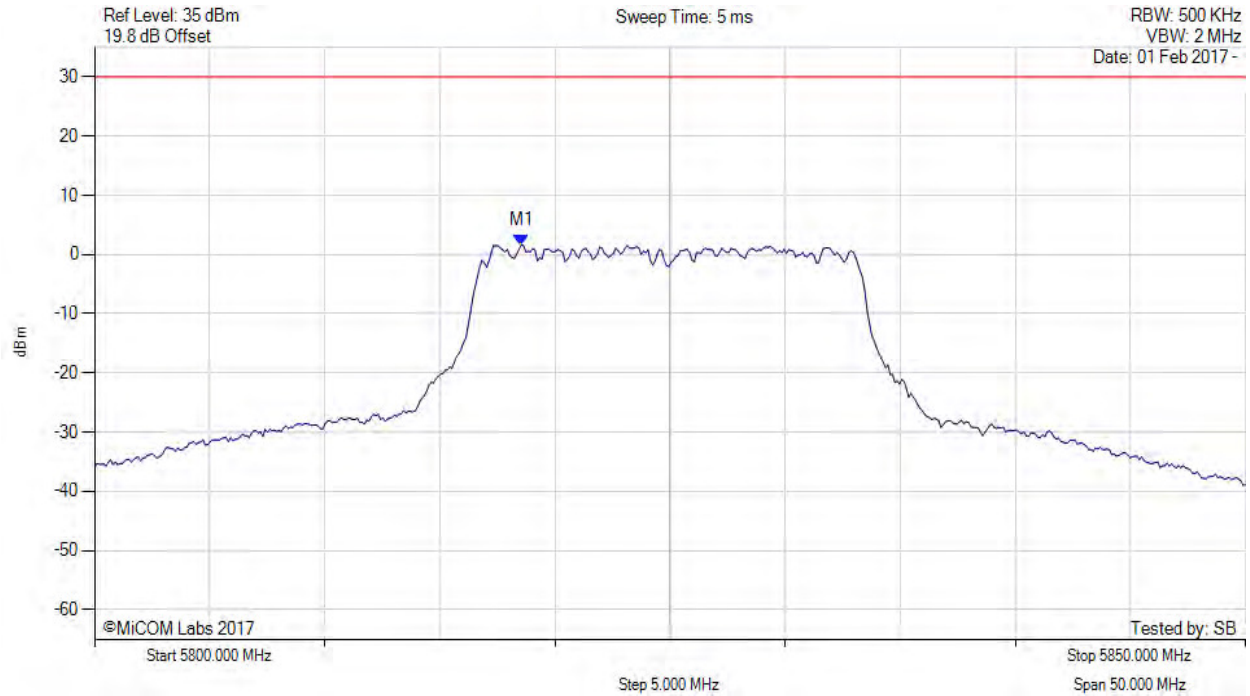


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5825.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



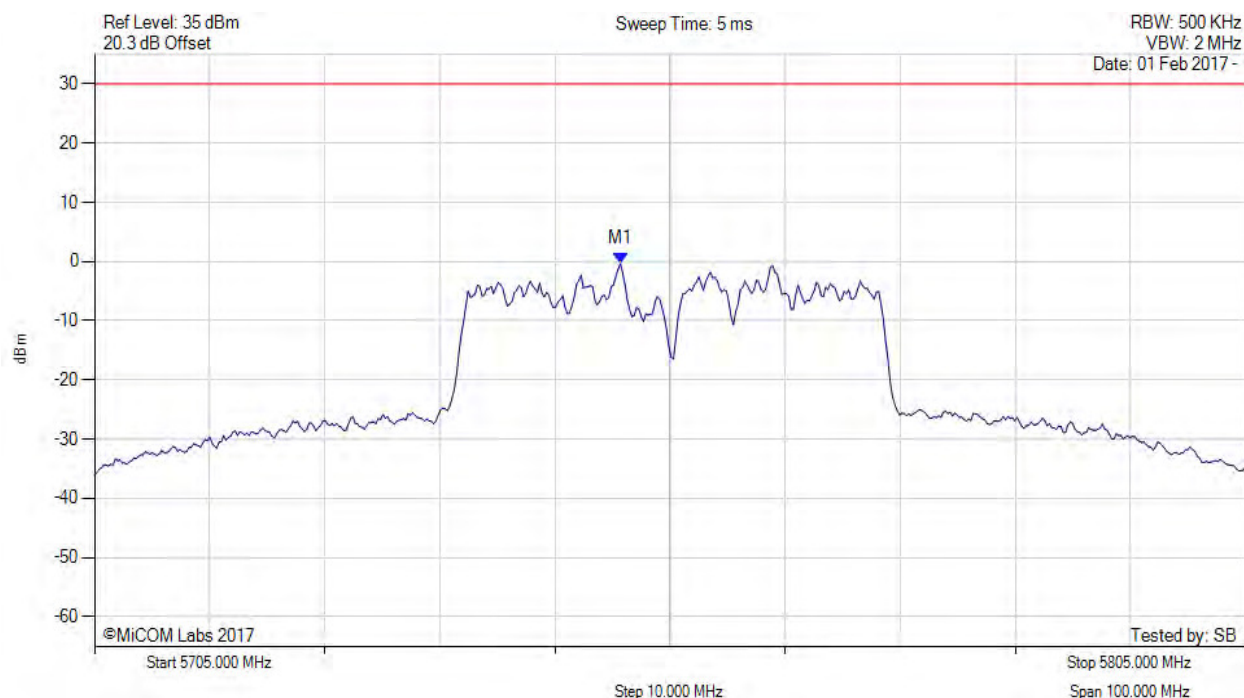
Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5818.500 MHz : 1.599 dBm M1 + DCCF : 5818.500 MHz : 1.643 dBm Duty Cycle Correction Factor : +0.04 dB	Limit: ≤ 30.0 dBm Margin: -28.4 dB

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5755.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac

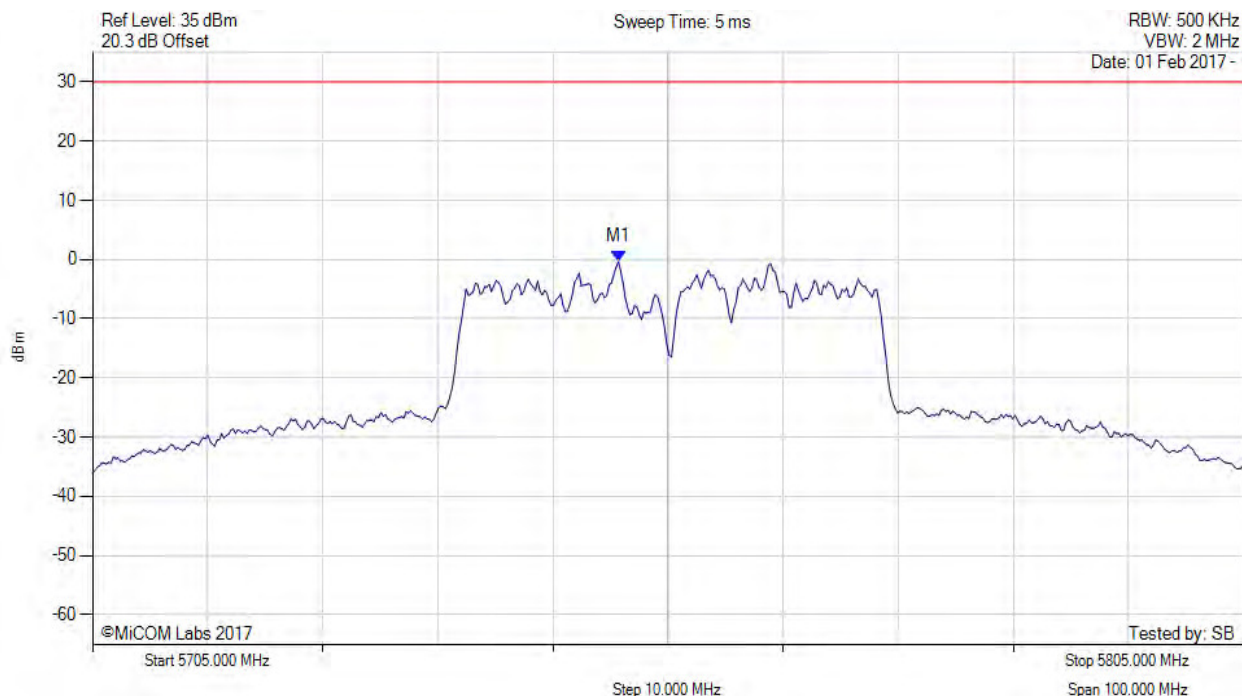


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5750.691 MHz : -0.296 dBm	Limit: ≤ 30.000 dBm

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5755.00 MHz, SUM, Temp: 20, Voltage: 110 Vac

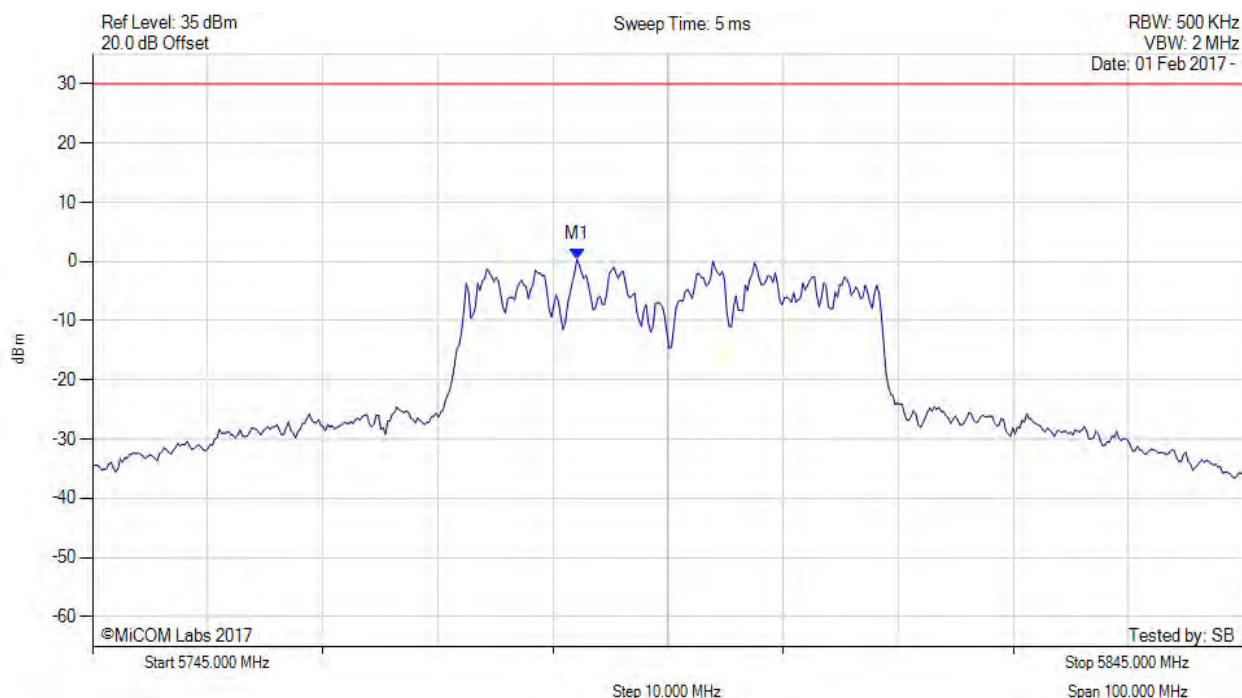


Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5750.700 MHz : -0.296 dBm M1 + DCCF : 5750.700 MHz : 0.172 dBm Duty Cycle Correction Factor : +0.46 dB	Limit: ≤ 30.0 dBm Margin: -29.8 dB

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5795.00 MHz, Chain a, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5787.084 MHz : 0.377 dBm	Limit: ≤ 30.000 dBm

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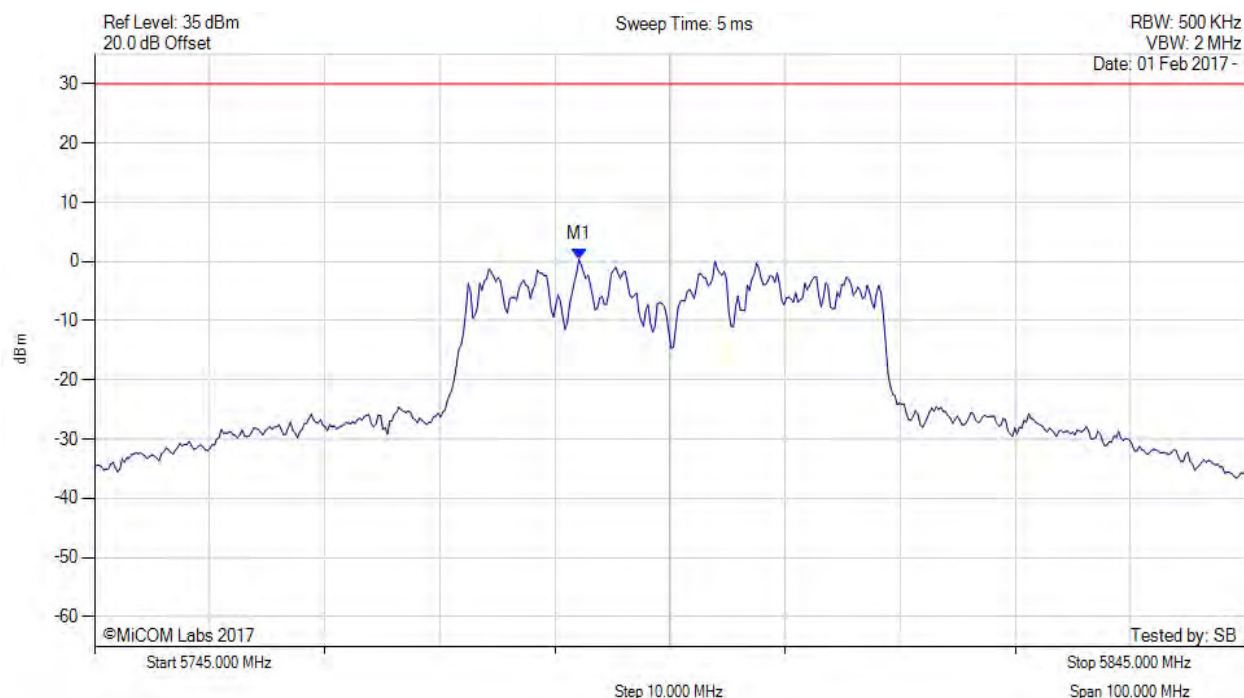


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POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5795.00 MHz, SUM, Temp: 20, Voltage: 110 Vac



Analyzer Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5787.100 MHz : 0.377 dBm M1 + DCCF : 5787.100 MHz : 0.845 dBm Duty Cycle Correction Factor : +0.46 dB	Limit: ≤ 30.0 dBm Margin: -29.2 dB

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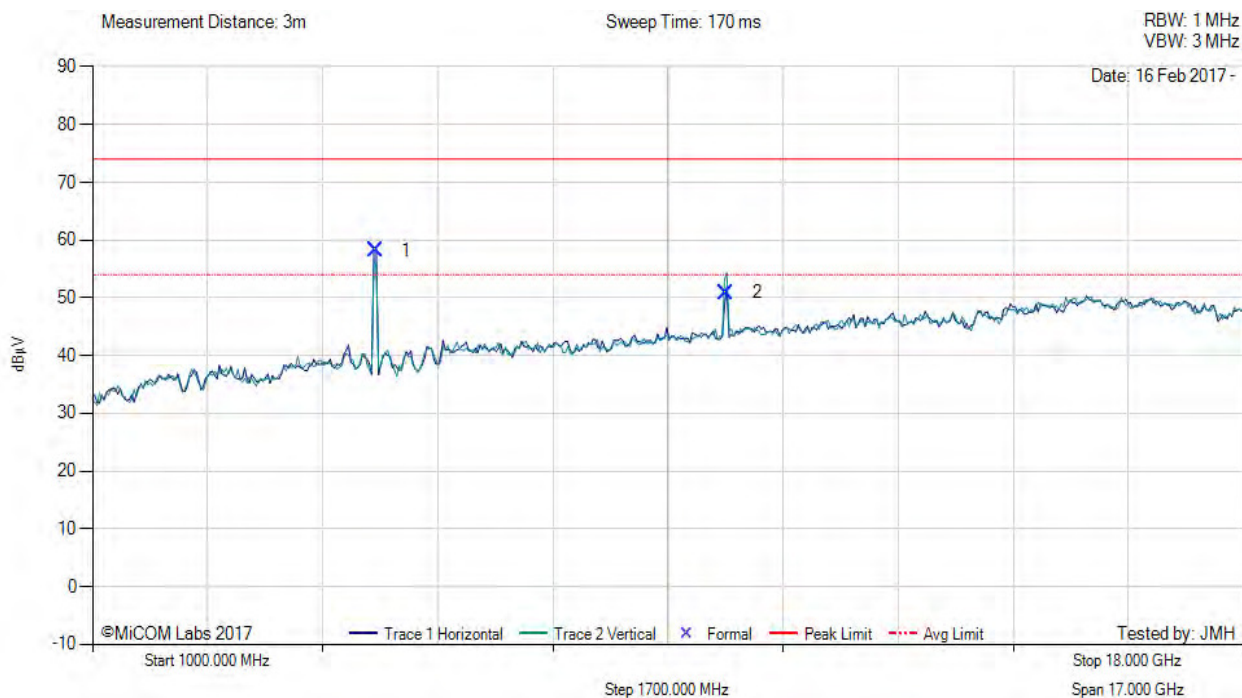
A.4. Radiated

A.4.1. TX Spurious & Restricted Band Emissions



TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5180.00 MHz, Power Setting: 72, Duty Cycle (%): 99



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5177.87	66.06	3.69	-11.51	58.24	Fundamental	Horizontal	100	0	--	--	
2	10362.62	50.56	5.58	-5.25	50.89	Peak (NRB)	Vertical	100	118	--	--	Pass

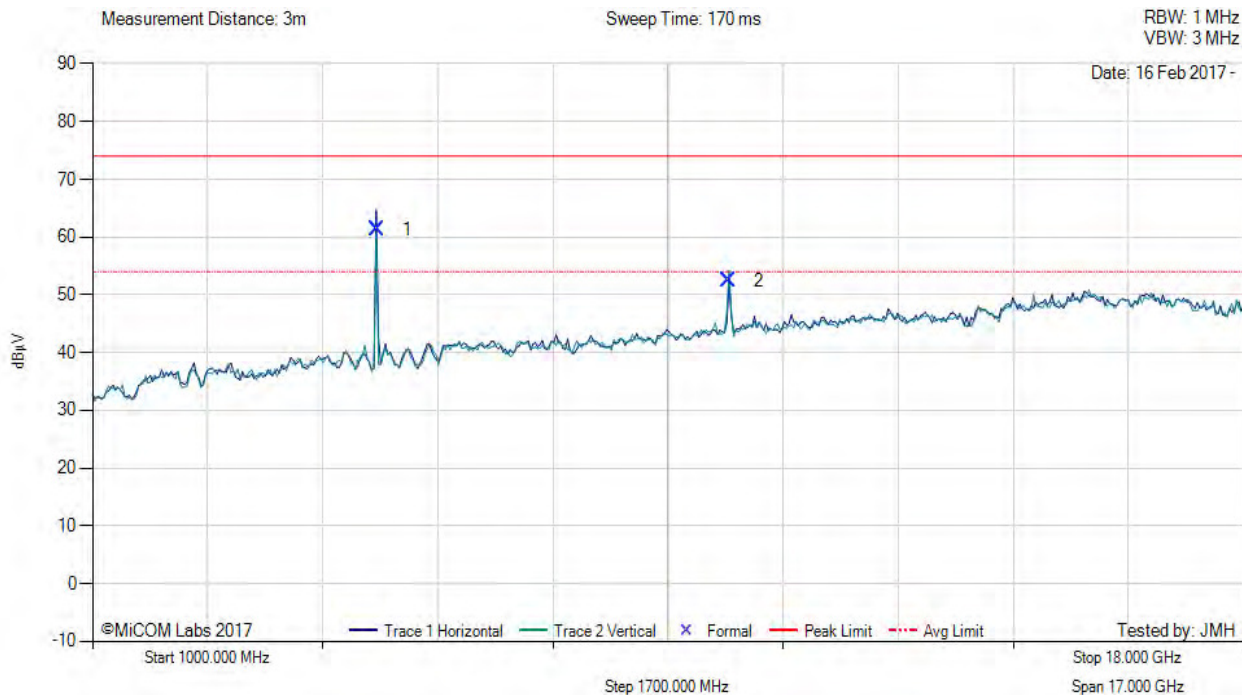
Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5200.00 MHz, Power Setting: 72, Duty Cycle (%): 99



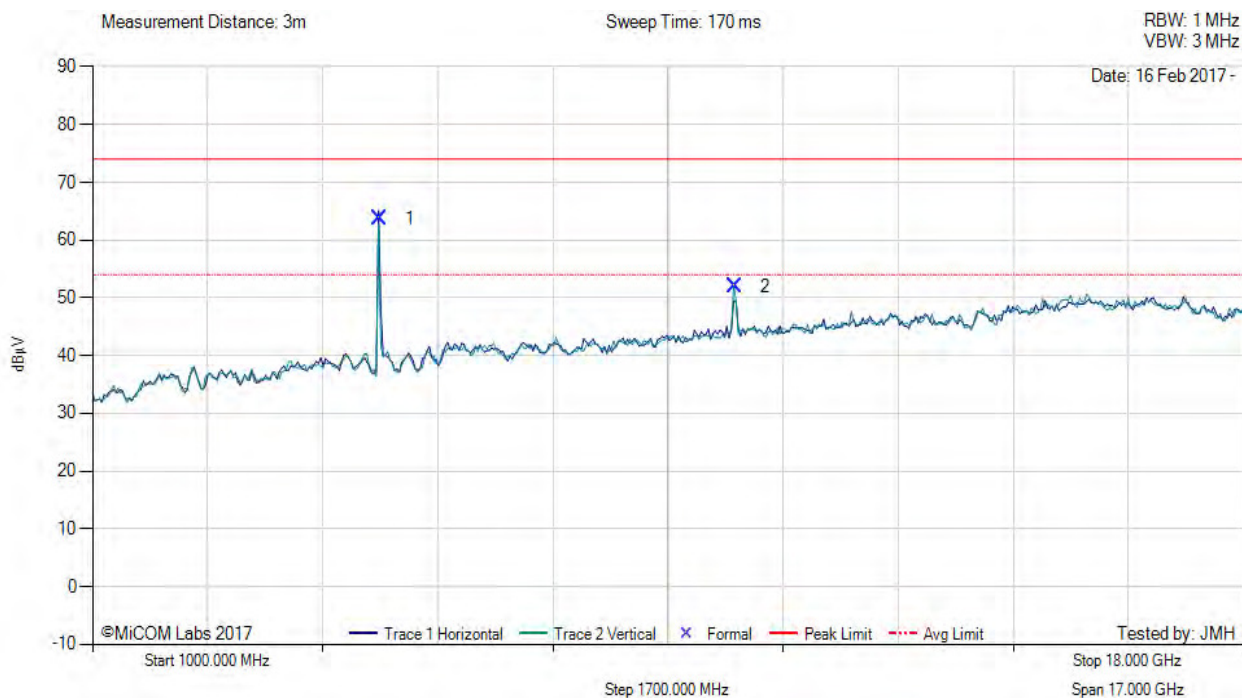
1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5198.81	69.14	3.66	-11.47	61.33	Fundamental	Horizontal	100	0	--	--	
2	10398.45	52.07	5.39	-5.05	52.41	Peak (NRB)	Vertical	100	306	--	--	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5240.00 MHz, Power Setting: 72, Duty Cycle (%): 99



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5233.87	71.50	3.63	-11.38	63.75	Fundamental	Horizontal	100	0	--	--	
2	10485.99	50.98	5.42	-4.42	51.98	Peak (NRB)	Vertical	100	215	--	--	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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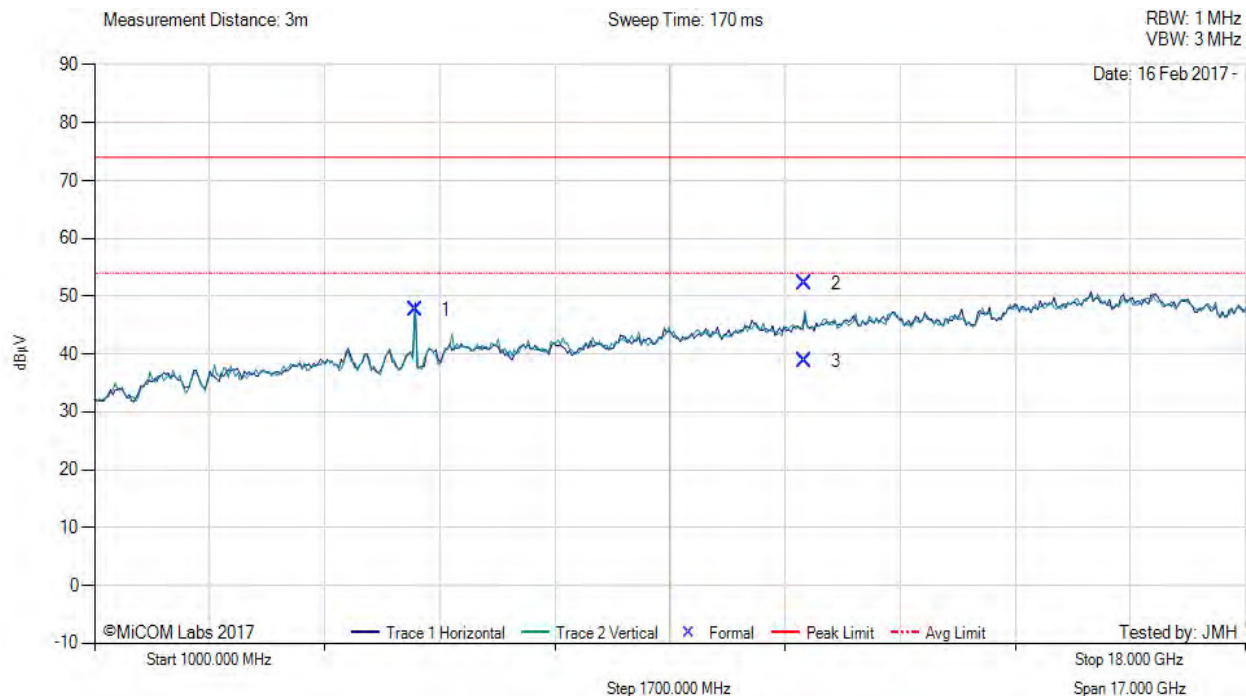


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TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Power Setting: 72, Duty Cycle (%): 99



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5744.01	54.45	3.84	-10.66	47.63	Fundamental	Horizontal	100	0	--	--	
2	11493.47	51.56	5.44	-4.84	52.16	Max Peak	Vertical	134	1	74.0	-21.8	Pass
3	11493.47	38.25	5.44	-4.84	38.85	Max Avg	Vertical	134	1	54.0	-15.2	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

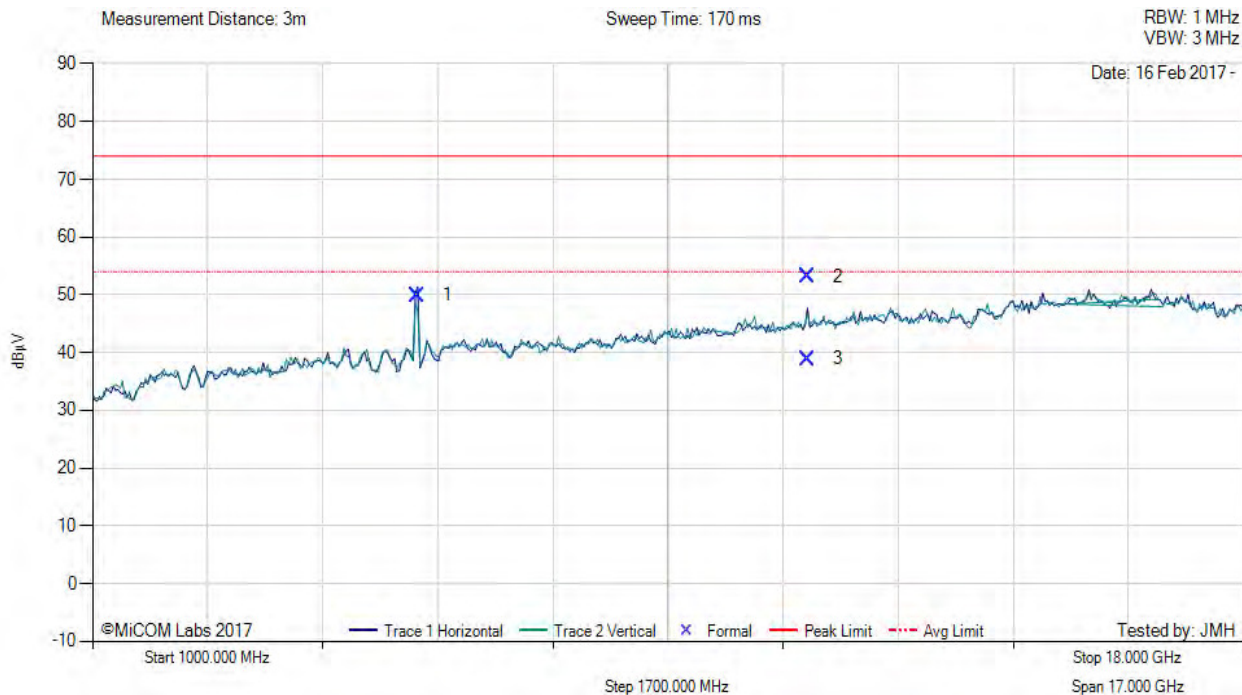
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TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5785.00 MHz, Power Setting: 72, Duty Cycle (%): 99



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5791.21	56.52	3.79	-10.41	49.90	Fundamental	Horizontal	100	0	--	--	
2	11566.31	52.33	5.52	-4.65	53.20	Max Peak	Horizontal	147	143	74.0	-20.8	Pass
3	11566.31	38.01	5.52	-4.65	38.88	Max Avg	Horizontal	147	143	54.0	-15.1	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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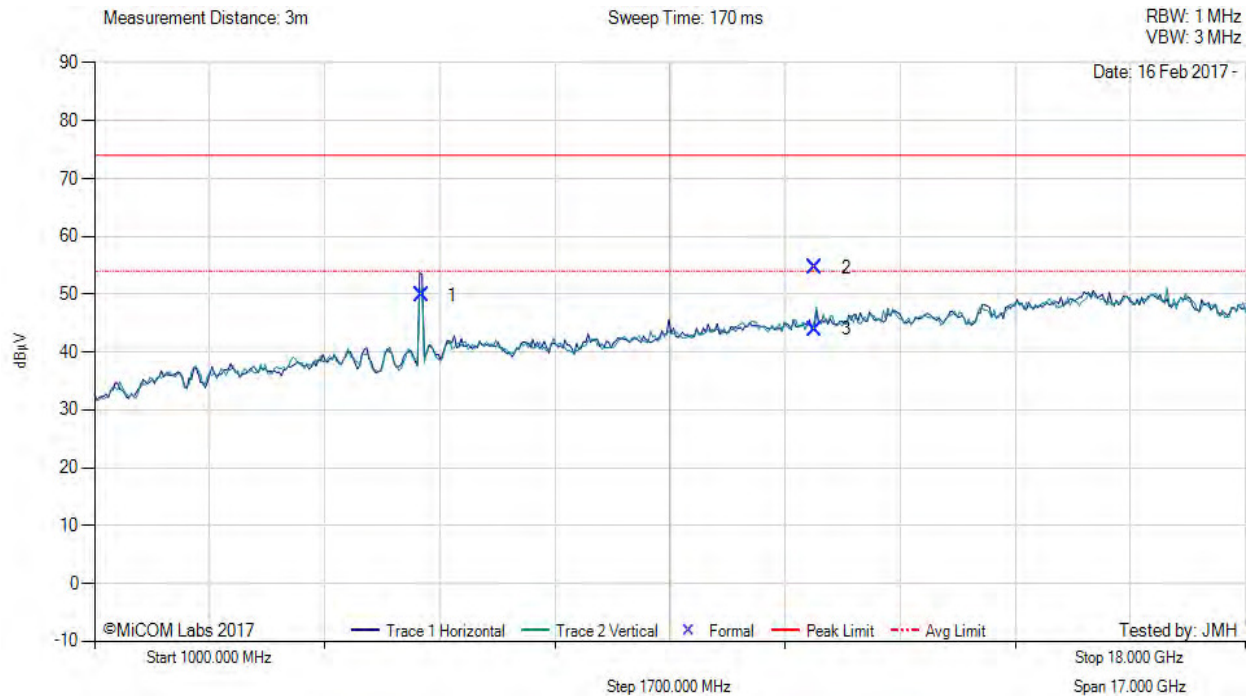


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TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Power Setting: 72, Duty Cycle (%): 99



1000.00 - 18000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5830.56	56.14	3.84	-10.22	49.76	Fundamental	Horizontal	100	0	--	--	
2	11649.93	53.70	5.44	-4.47	54.67	Max Peak	Vertical	162	347	74.0	-19.3	Pass
3	11649.93	42.94	5.44	-4.47	43.91	Max Avg	Vertical	162	347	54.0	-10.1	Pass

Test Notes: AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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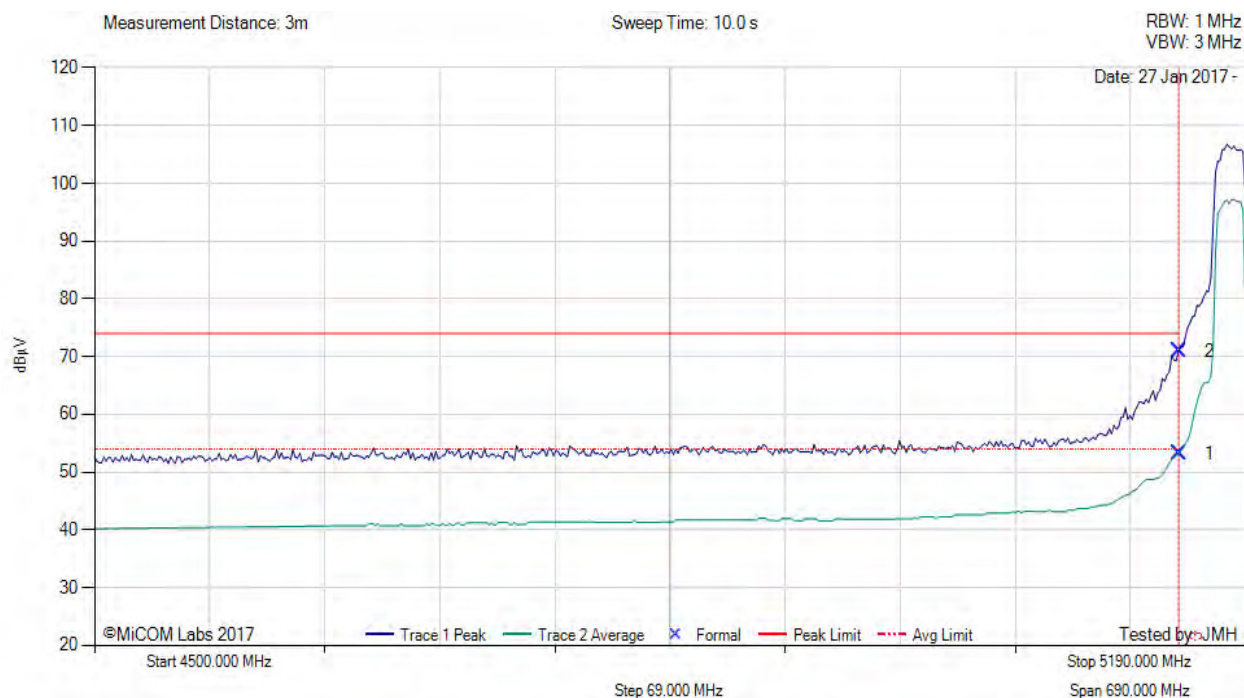
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A.4.2. Restricted Edge & Band-Edge Emissions



RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5180.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 68, Duty Cycle (%): 99



4500.00 - 5190.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5150.00	15.37	3.67	34.11	53.15	Max Avg	Horizontal	198	339	54.0	-0.9	Pass
2	5150.00	33.22	3.67	34.11	71.00	Max Peak	Horizontal	198	339	74.0	-3.0	Pass
3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

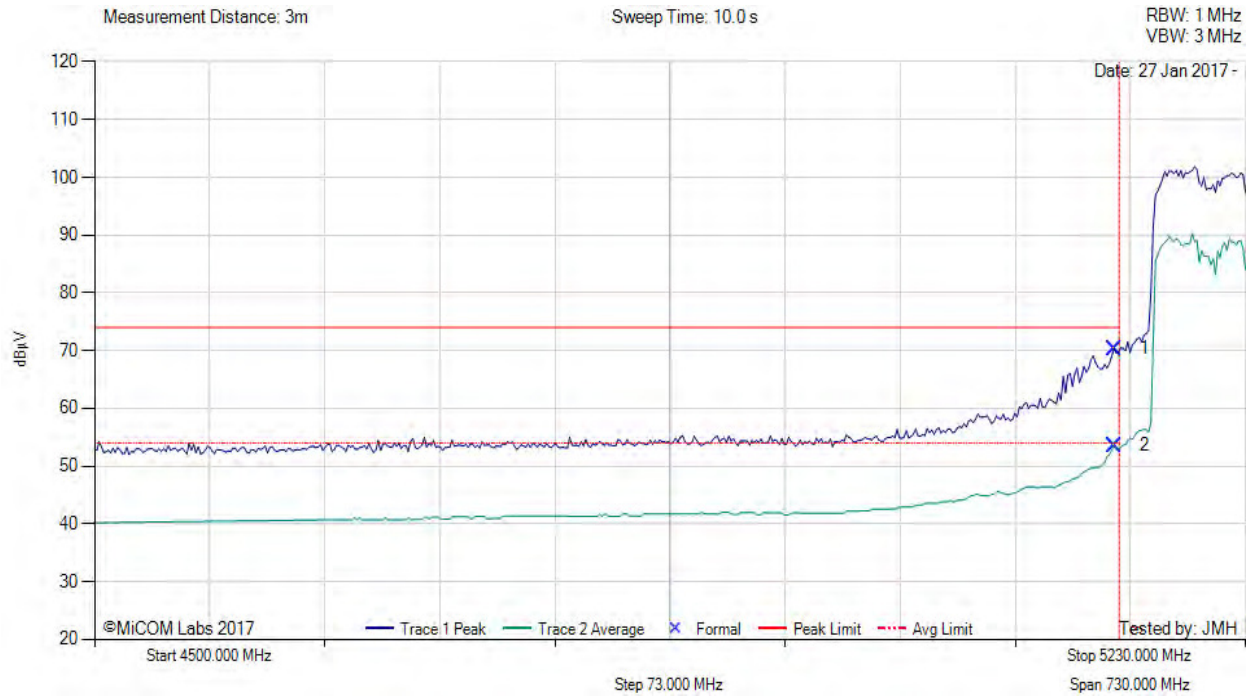
Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC. Power reduced to 68 to meet band edge limits.

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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5210.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 56, Duty Cycle (%): 99



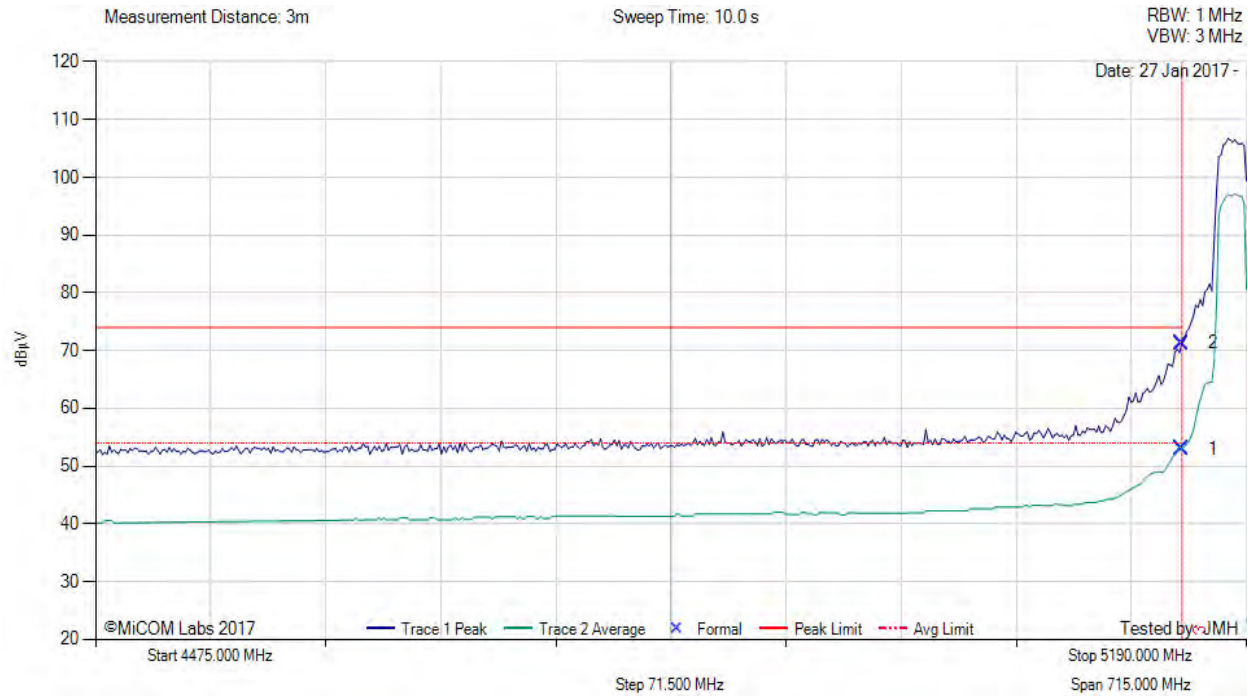
4500.00 - 5230.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5147.07	32.54	3.68	34.11	70.33	Max Peak	Horizontal	198	339	74.0	-3.7	Pass
2	5147.15	15.75	3.68	34.11	53.54	Max Avg	Horizontal	198	339	54.0	-0.5	Pass
3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC. Power reduced to 56 to meet band edge limit.

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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5180.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 68, Duty Cycle (%): 99



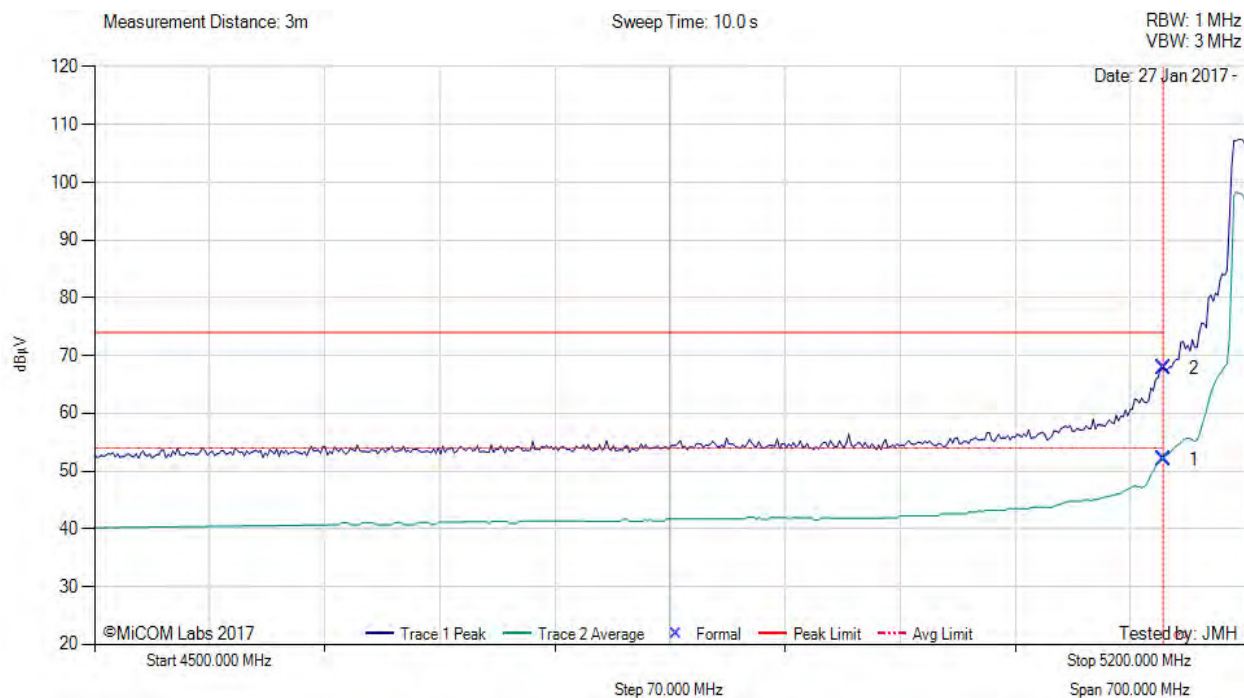
4475.00 - 5190.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5150.00	15.17	3.67	34.11	52.95	Max Avg	Horizontal	198	339	54.0	-1.1	Pass
2	5150.00	33.56	3.67	34.11	71.34	Max Peak	Horizontal	198	339	74.0	-2.7	Pass
3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC. Power reduced to 68 to meet band edge limits.

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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5190.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



4500.00 - 5200.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5150.00	14.21	3.67	34.11	51.99	Max Avg	Horizontal	198	339	54.0	-2.0	Pass
2	5150.00	30.00	3.67	34.11	67.78	Max Peak	Horizontal	198	339	74.0	-6.2	Pass
3	5150.00	--	--	--	--	Restricted-Band	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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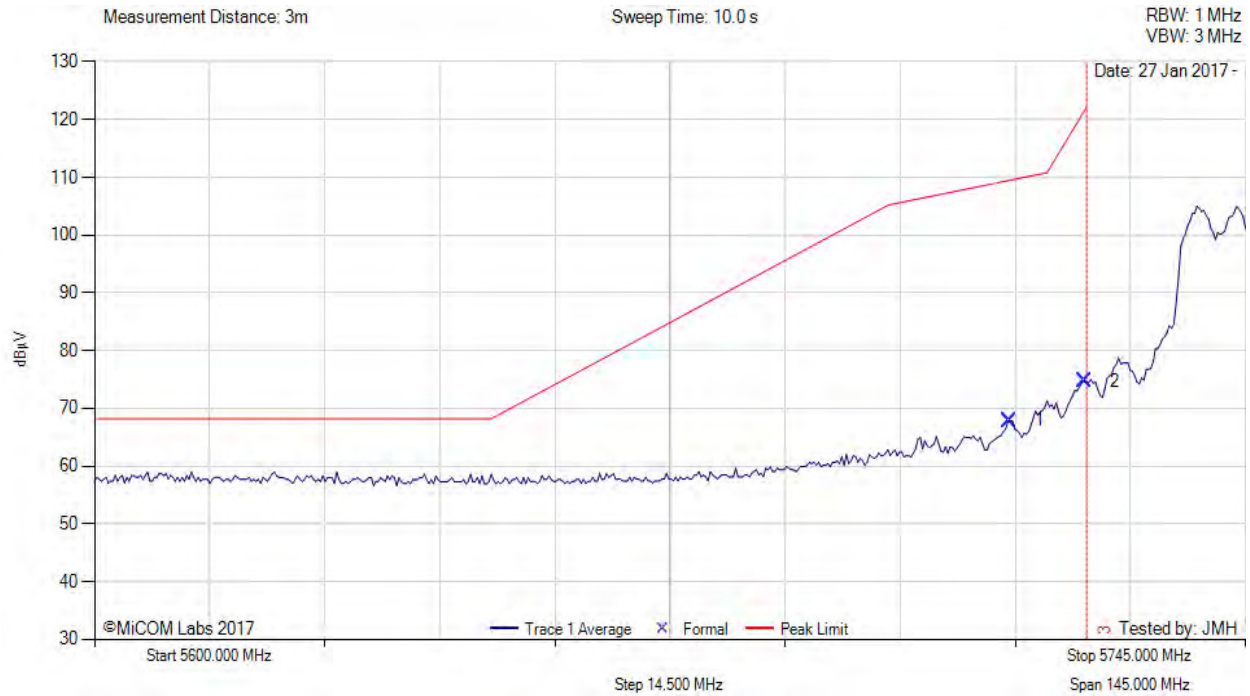


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5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



5600.00 - 5745.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5715.29	29.70	3.81	34.34	67.85	Max Avg	Horizontal	188	352	109.4	-41.6	Pass
2	5724.71	36.60	3.79	34.35	74.74	Max Avg	Horizontal	188	352	122.2	-47.5	Pass
3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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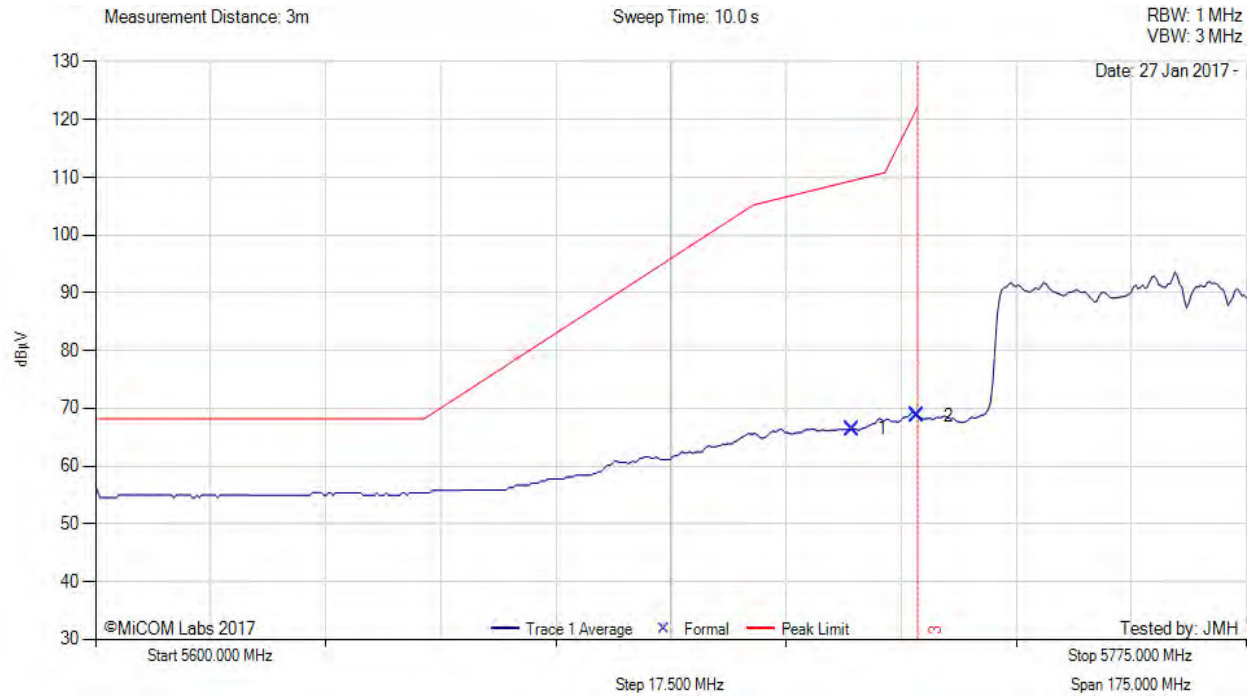


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5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5775.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



5600.00 - 5775.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5715.00	28.32	3.81	34.34	66.47	Max Avg	Horizontal	188	352	109.4	-42.9	Pass
2	5725.00	30.63	3.79	34.35	68.77	Max Avg	Horizontal	188	352	122.2	-53.4	Pass
3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

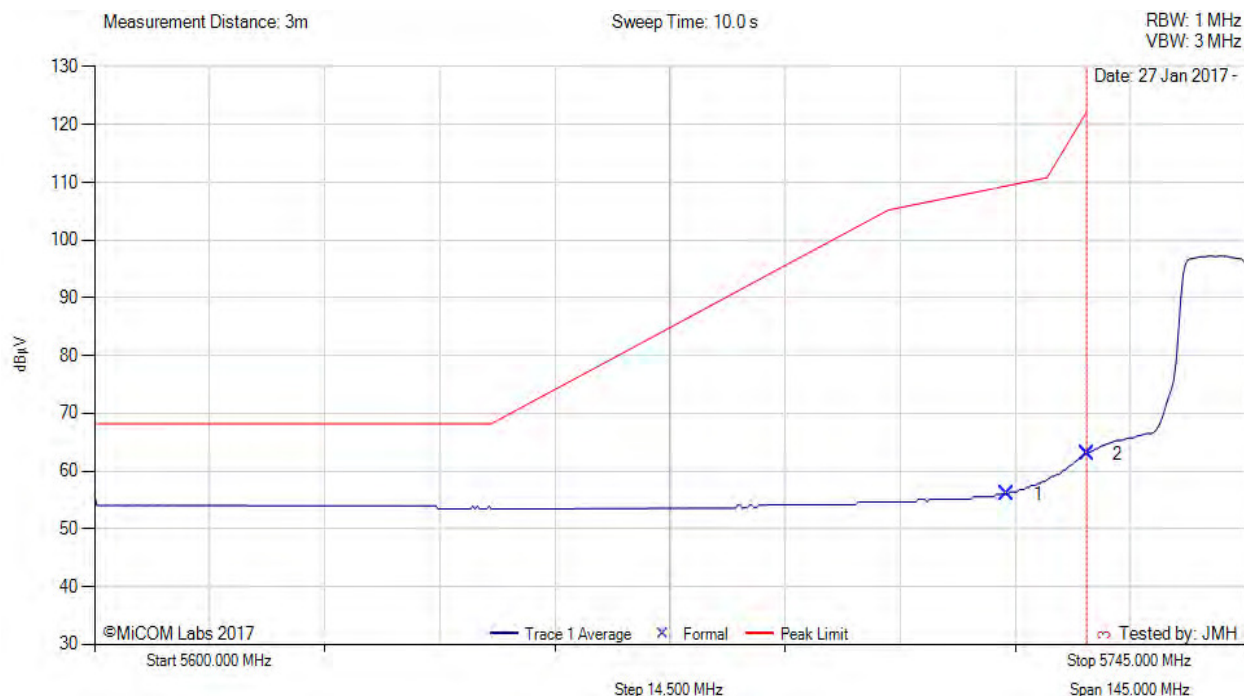
Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5745.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



5600.00 - 5745.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5715.00	17.86	3.81	34.34	56.01	Max Avg	Horizontal	188	352	109.4	-53.4	Pass
2	5725.00	24.89	3.79	34.35	63.03	Max Avg	Horizontal	188	352	122.2	-59.2	Pass
3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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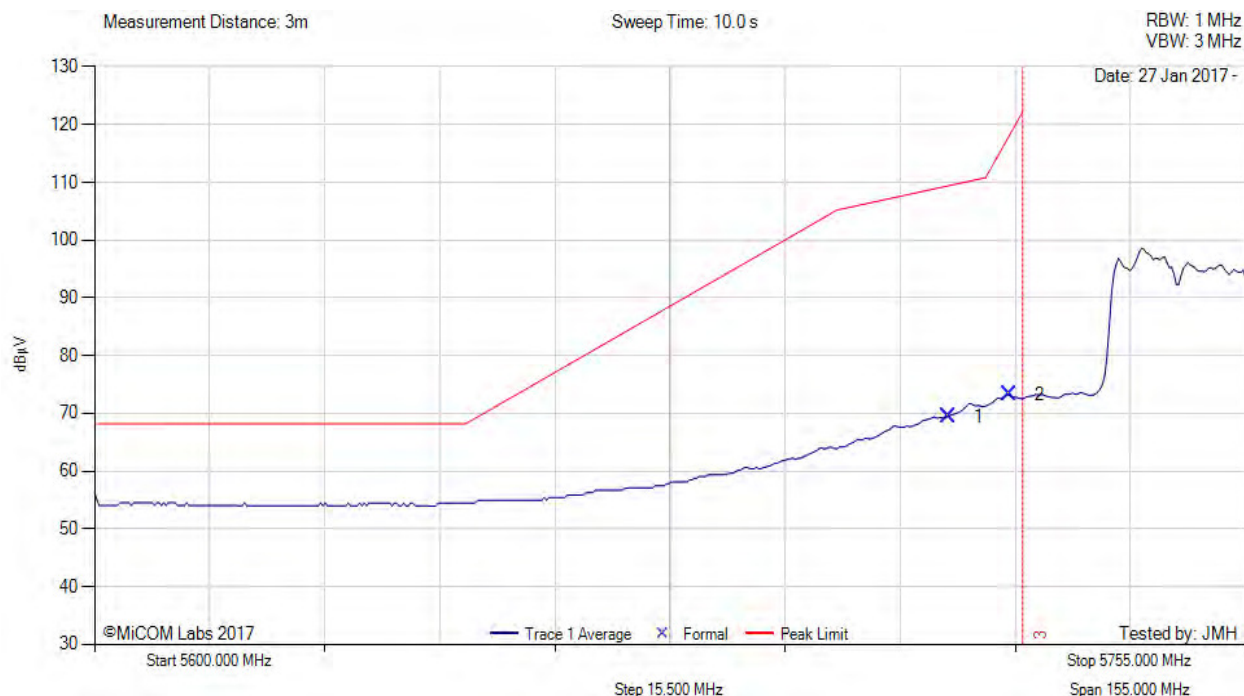


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5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5755.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



5600.00 - 5755.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5715.00	31.33	3.81	34.34	69.48	Max Avg	Horizontal	188	352	109.4	-39.9	Pass
2	5723.14	35.07	3.80	34.35	73.22	Max Avg	Horizontal	188	352	117.6	-44.4	Pass
3	5725.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

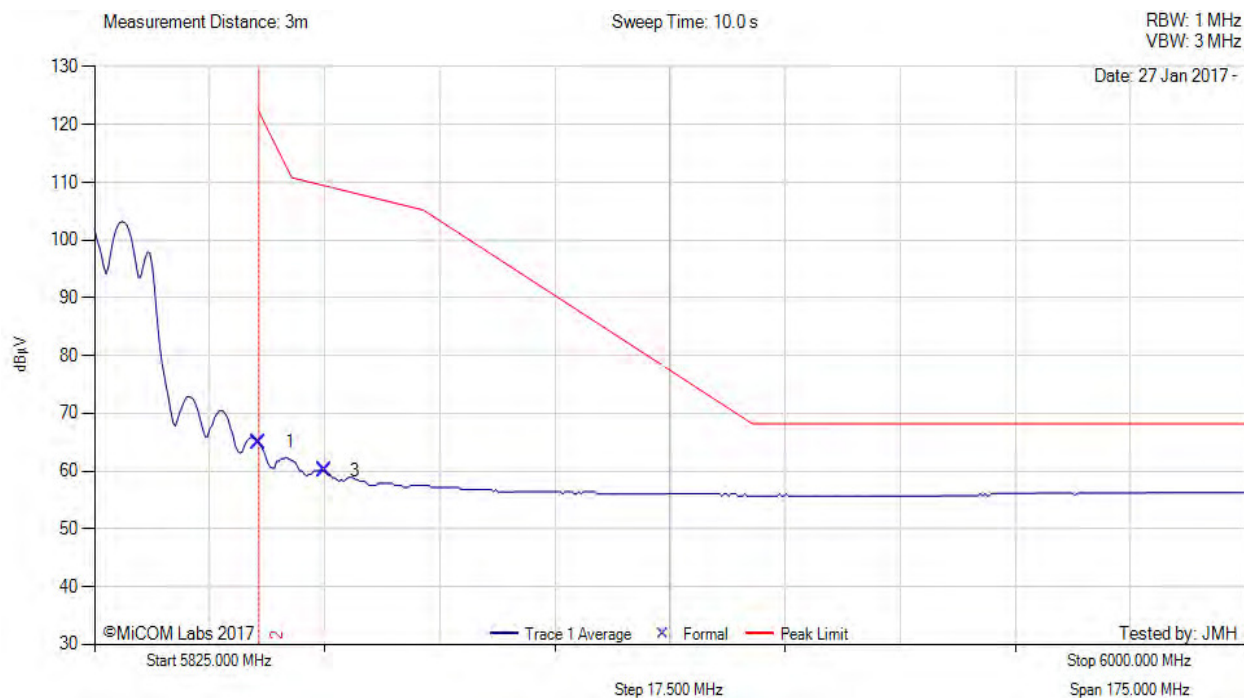
Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



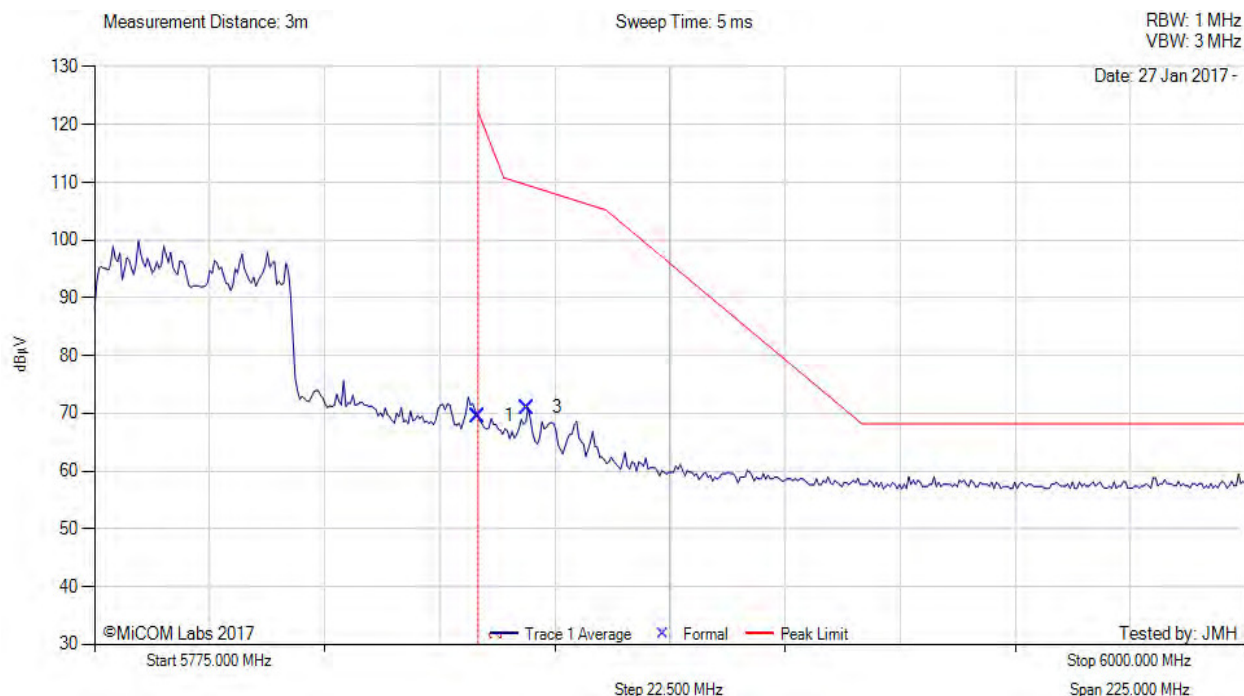
5825.00 - 6000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5850.00	26.59	3.81	34.63	65.03	Max Avg	Horizontal	188	352	122.2	-57.2	Pass
3	5860.00	21.53	3.86	34.65	60.04	Max Avg	Horizontal	188	352	109.4	-49.4	Pass
2	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5775.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



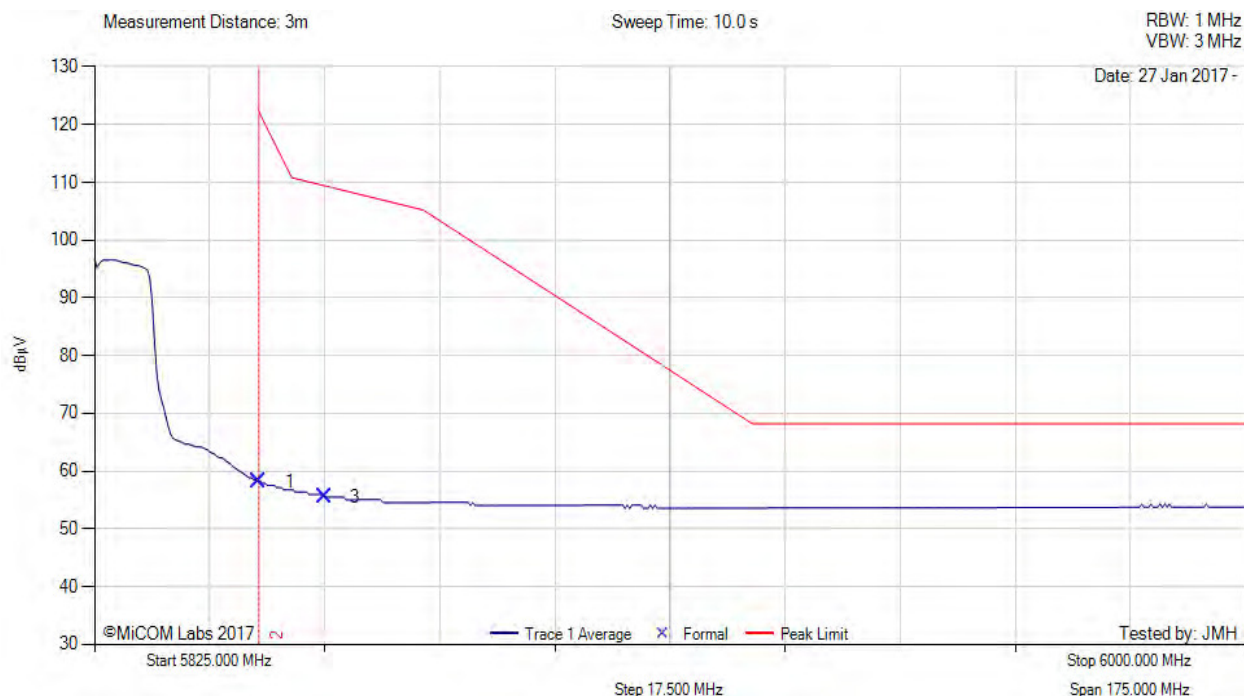
5775.00 - 6000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5850.00	31.12	3.81	34.63	69.56	Max Avg	Horizontal	188	352	122.2	-52.6	Pass
3	5859.55	32.49	3.86	34.65	71.00	Max Avg	Horizontal	188	352	109.4	-38.4	Pass
2	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5825.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



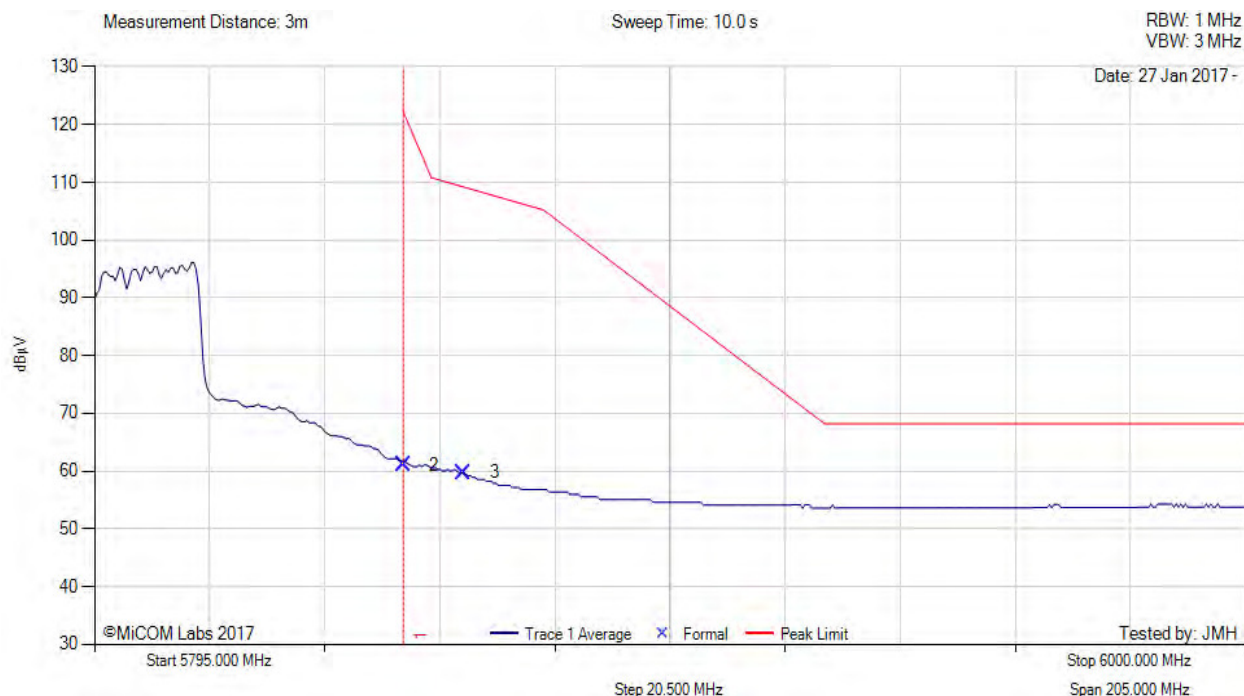
5825.00 - 6000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
1	5850.00	19.77	3.81	34.63	58.21	Max Avg	Horizontal	188	352	122.2	-64.0	Pass
3	5860.00	17.00	3.86	34.65	55.51	Max Avg	Horizontal	188	352	109.4	-53.9	Pass
2	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5795.00 MHz, Antenna: HPE Metal Sheet, Power Setting: 72, Duty Cycle (%): 99



5795.00 - 6000.00 MHz												
Num	Frequency MHz	Raw dBμV	Cable Loss dB	AF dB	Level dBμV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBμV/m	Margin dB	Pass /Fail
2	5850.08	22.72	3.84	34.57	61.13	Max Avg	Horizontal	188	352	122.2	-51.1	Pass
3	5860.82	21.25	3.86	34.66	59.77	Max Avg	Horizontal	188	352	109.1	-49.4	Pass
1	5850.00	--	--	--	--	Band-Edge	--	--	--	--	--	--

Test Notes: EUT AP203RP SN# CNCPK2T00L on 150cm table powered by AC.

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