



FCC 47 CFR PART 15 SUBPART E

TEST REPORT

For

AC1200 Dual-Band Wireless LAN Repeater

Model: EW-7476RPC

Trade Name: EDIMAX

Issued to

EDIMAX TECHNOLOGY CO., LTD.

No.3, Wu-Chuan 3rd Road, Wu-Ku Industrial Park, New Taipei City, Taiwan

Issued by

Compliance Certification Services Inc.

**No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)**

<http://www.ccsrf.com>

service@ccsrf.com

Issued Date: June 16, 2015



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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		June 16, 2015		Initial Issue	ALL	Kelly Cheng



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1. TEST RESULT CERTIFICATION

Applicant: EDIMAX TECHNOLOGY CO., LTD.
No.3,Wu-Chuan 3rd Road,Wu-Ku Industrial Park, New Taipei City,
Taiwan

Equipment Under Test: AC1200 Dual-Band Wireless LAN Repeater

Trade Name: EDIMAX

Model: EW-7476RPC

Date of Test: June 10, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart E	No non-compliance noted

We hereby certify that:

Compliance Certification Services Inc. tested the above equipment. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Reviewed by:

Miller Lee
Manager
Compliance Certification Services Inc.

Angel Cheng
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	AC1200 Dual-Band Wireless LAN Repeater					
Trade Name	EDIMAX					
Model Number	EW-7476RPC					
Model Discrepancy	N/A					
Received Date	March 29, 2015					
Power Supply	Power from host device					
Frequency Range	IEEE 802.11a, IEEE 802.11n HT20 : 5180MHz ~ 5240MHz; 5745 ~ 5825MHz IEEE 802.11n HT40 : 5190MHz ~ 5230MHz; 5755 ~ 5795MHz IEEE 802.11ac VHT80 mode: 5210MHz; 5775MHz					
Channel Number	IEEE 802.11a, IEEE 802.11n HT20 : 5180MHz ~ 5825MHz : 9 Channels IEEE 802.11n HT40 : 5190MHz ~ 5795MHz : 4 Channels IEEE 802.11ac VHT80 mode: 5210MHz ~ 5775MHz : 2 Channels					
Transmit Power			Mode	Frequency Range (MHz)	Transmit Power (dBm)	Transmit Power (W)
	UNII Band I		IEEE 802.11a	5180 – 5240	24.38	0.2742
			IEEE 802.11n HT 20 mode	5180 – 5240	24.38	0.2742
			IEEE 802.11n HT 40 mode	5190 ~ 5230	19.94	0.0986
			IEEE 802.11ac VHT80 mode	5210	14.48	0.0281
	UNII Band IV		IEEE 802.11a	5745 ~ 5825	23.62	0.2301
			IEEE 802.11n HT 20 mode	5745 ~ 5825	23.94	0.2477
			IEEE 802.11n HT 40 mode	5755 ~ 5815	23.79	0.2393
		IEEE 802.11ac VHT80 mode	5775	12.41	0.0174	
Modulation Technique	OFDM (QPSK, BPSK, 16-QAM, 64-QAM, 256QAM)					
Transmit Data Rate	IEEE 802.11a mode: 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT 20 mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) IEEE 802.11n HT 40 mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps) IEEE 802.11ac VHT80 mode: OFDM (29.3, 58.5, 87.8, 117, 175.5, 234, 263.3, 292.5, 351, 390, 468, 526.5, 585, 702, 780 Mbps)					
Antenna Specification	MAG.LAYERS / EDA-1313-25GR2-A10-E 1. LYN wave / ALA150-222031 / Gain: 4.79 dBi 2. LYN wave / ALA150-222030 / Gain: 4.19 dBi					

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: NDD9574761501 filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.



3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10. Radiated testing was performed at an antenna to EUT distance 3 meters, KDB 789033 D02.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

3.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on the turntable, which is 1.5 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

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



3.5 DESCRIPTION OF TEST MODES

The EUT (model: EW-7476RPC) had been tested under operating condition.

The EUT is a 2x2 configuration spatial MIMO (2Tx & 2Rx) without beam forming function that operate in double TX chains and double RX chains. The 2x2 configuration is implemented with two outside TX & RX chains (Chain 0 and 1).

Software used to control the EUT for staying in continuous transmitting mode was programmed.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

Band I

IEEE 802.11a mode / 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz:

Channel Low (5190MHz) and Channel High (5230MHz) with 13.5Mbps data rate were chosen for full testing.

IEEE 802.11ac VHT80 Mode for 5210MHz:

Channel (5210MHz) with 6.5Mbps data rate were chosen for full testing.

Band IV

IEEE 802.11a mode / 5745 ~ 5825MHz

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 mode: / 5745 ~ 5825MHz

Channel Low(5745MHz), Channel Mid(5785MHz) and Channel High(5825MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel Low(5755MHz) and Channel High(5795MHz) with 13.5Mbps data rate were chosen for full testing.

IEEE 802.11ac VHT80 Mode for 5775MHz:

Channel (5775MHz) with 6.5Mbps data rate were chosen for full testing.



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	11/23/2015
Thermostatic/Hrgrosatic Chamber	TAICHY	MHG-150LF	930619	10/07/2015
AC Power Source	EXTECH	6205	1140845	N.C.R
DC Power Supply	ABM	8301HD	D011531	N.C.R
Power Meter	Anritsu	ML2495A	1012009	06/07/2016
Power Sensor	Anritsu	MA2411A	0917072	06/08/2016
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40	101073	07/09/2015

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	09/18/2015
EMI Test Receiver	R&S	ESCI	100064	06/04/2016
Bilog Antenna	Sunol Sciences	JB3	A030105	08/19/2015
Horn Antenna	EMCO	3117	00055165	01/26/2016
Horn Antenna	EMCO	3116	26370	12/25/2015
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Pre-Amplifier	MITEQ	1652-3000	1490939	08/09/2016
Pre-Amplifier	EMC	EMC 01265	4035	08/09/2016
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	12/25/2015
Coaxial Cable	Huber+Suhner	102	29212/2	12/25/2015
Coaxial Cable	Huber+Suhner	102	29406/2	12/25/2015
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # B				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	101073	09/18/2015
LISN	R&S	ENV216	101054	06/06/2016
LISN	SCHWARZBECK	NSLK 8127	8127-541	11/25/2015
Capacitive Voltage Probe	FCC	F-CVP-1	100185	03/12/2016
Test S/W	CCS-3A1-CE			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / <200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- ☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
- ☒ No.139, Wugong Rd., Wugu Dist., New Taipei City 24891, Taiwan (R.O.C.)
- ☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
- ☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 EQUIPMENT

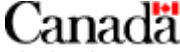
Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

**5.3 TABLE OF ACCREDITATIONS AND LISTINGS**

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

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6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Notebook PC	TOSHIBA	Satellite M840	N/A	PPD-AR5B225	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



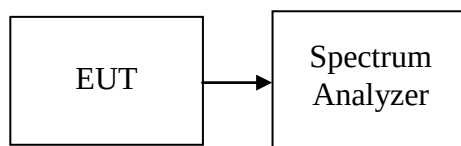
7. FCC PART 15 REQUIREMENTS

7.1 26 DB EMISSION BANDWIDTH

LIMIT

According to §15.303(c), for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span >26dB bandwidth, and Sweep = auto.
4. Mark the peak frequency and -26dB (upper and lower) frequency.
5. Repeat until all the rest channels were investigated.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz**

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Low	5180	31.540	32.811
Mid	5220	40.000	38.914
High	5240	39.895	39.740

Test mode: IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Low	5180	33.955	30.580
Mid	5220	40.000	39.816
High	5240	24.770	24.506

Test mode: IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Low	5190	41.430	40.625
High	5230	61.081	65.956

Test mode: IEEE 802.11ac VHT80 Mode/ 5210MHz

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Mid	5210	81.934	81.627

**Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz**

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Low	5745	16.422	16.248
Mid	5785	16.565	16.457
High	5825	16.461	16.409

Test mode: IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Low	5745	17.692	17.769
Mid	5785	17.652	17.563
High	5825	17.463	17.437

Test mode: IEEE 802.11n HT 40 mode / 5755 ~ 5815MHz

Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Low	5755	36.230	35.950
High	5795	36.283	36.129

Test mode: IEEE 802.11ac VHT80 Mode/ 5775MHz

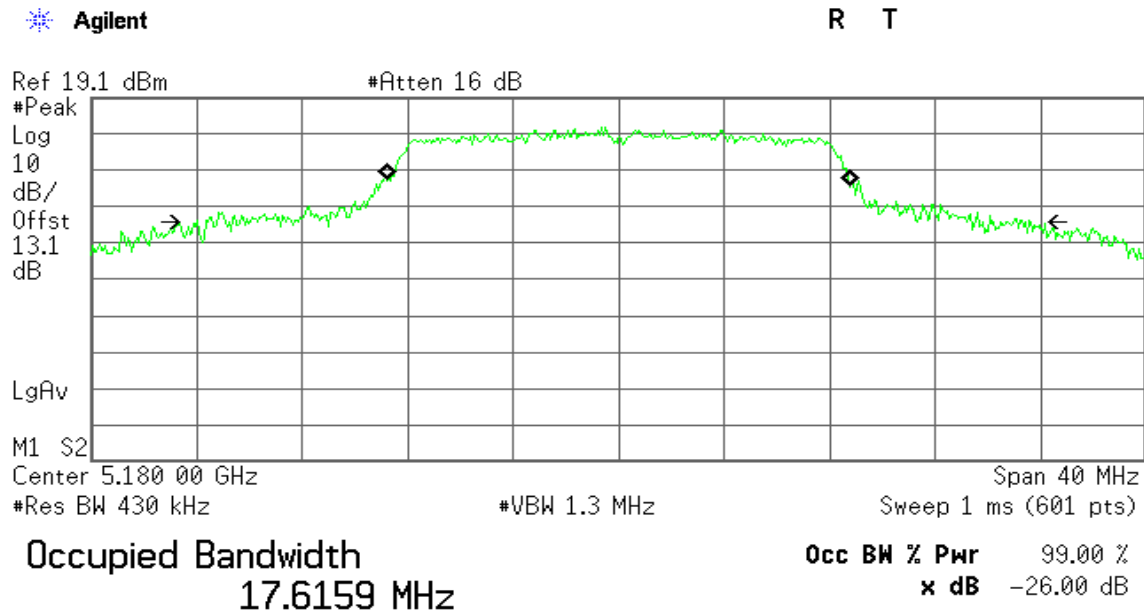
Channel	Frequency (MHz)	Chain 0 Bandwidth (MHz)	Chain 1 Bandwidth (MHz)
Mid	5775	74.398	74.140



Test Plot

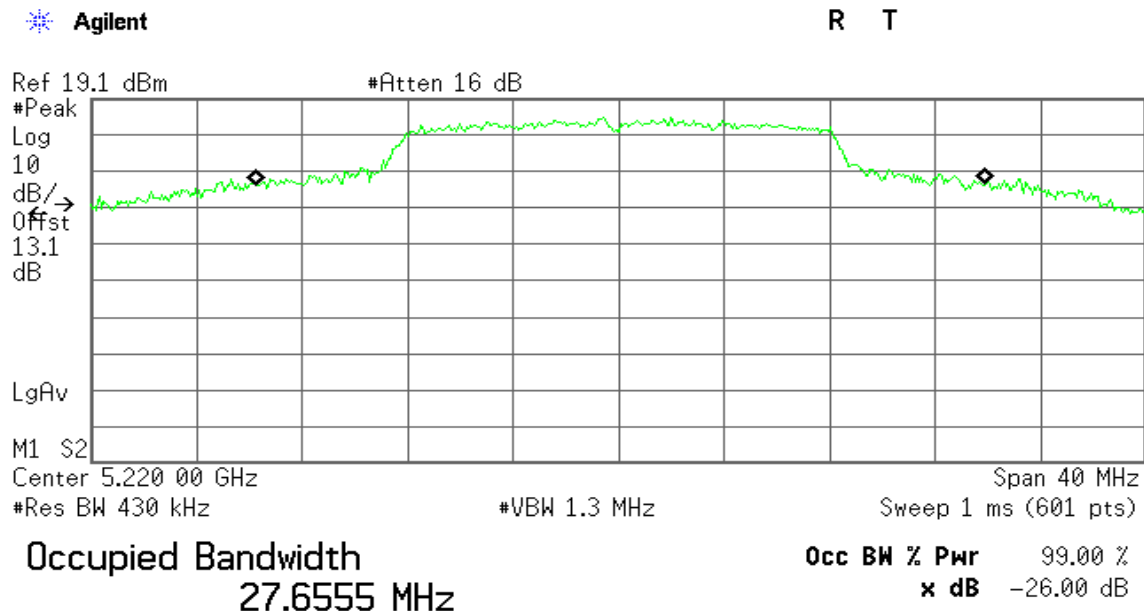
IEEE 802.11a mode / 5180 ~ 5240MHz / Chain 0

CH Low



Transmit Freq Error -17.263 kHz
x dB Bandwidth 31.540 MHz

CH Mid



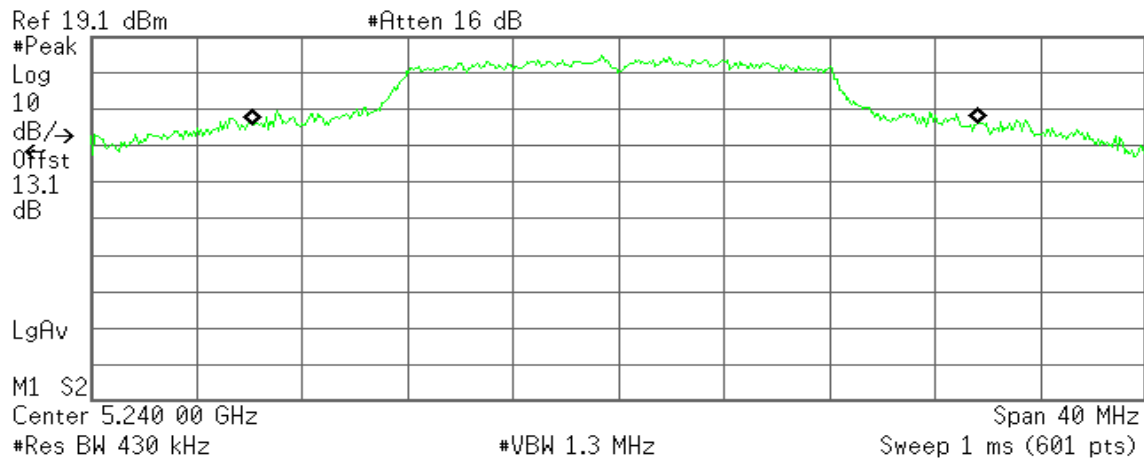
Transmit Freq Error 66.758 kHz
x dB Bandwidth 40.000 MHz



CH High

Agilent

R T



Occupied Bandwidth
27.4547 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

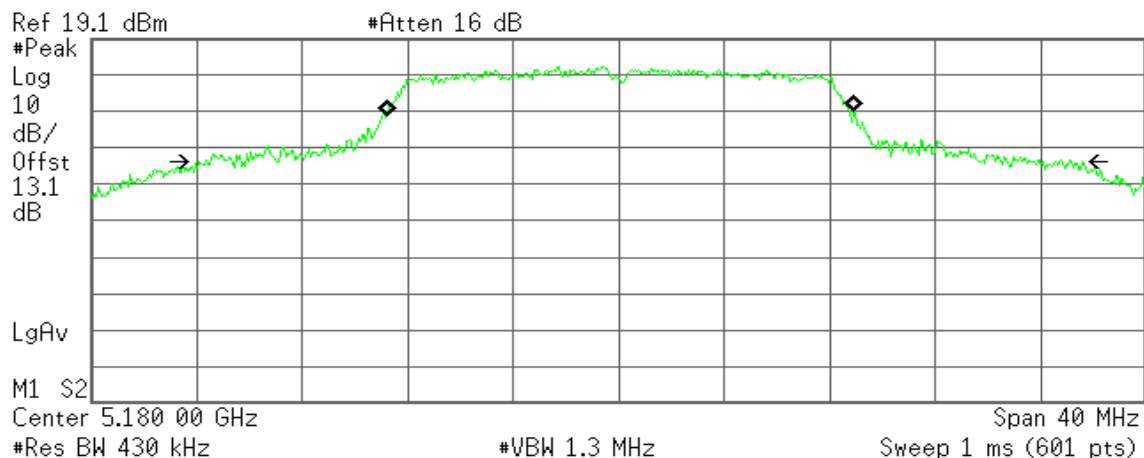
Transmit Freq Error -122.540 kHz
x dB Bandwidth 39.895 MHz

IEEE 802.11a mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent

R T



Occupied Bandwidth
17.7725 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

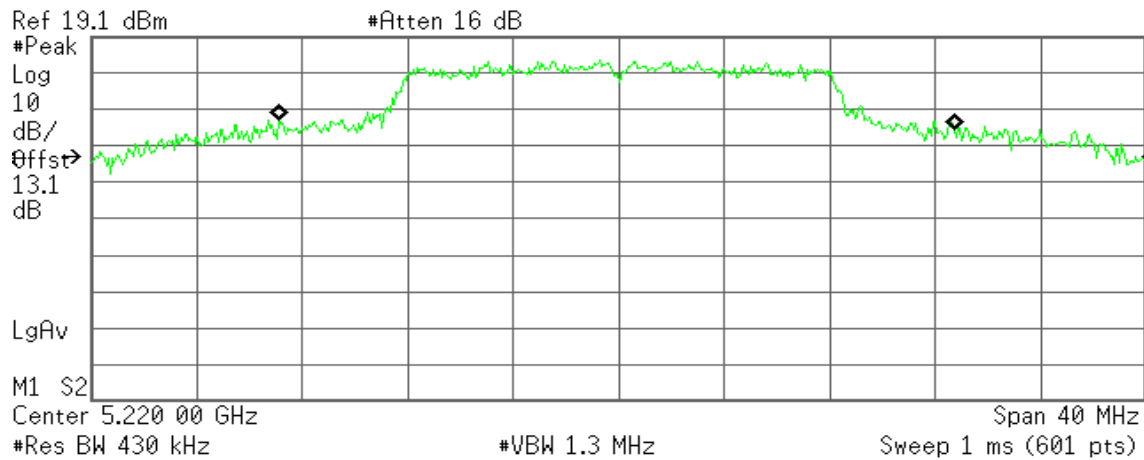
Transmit Freq Error 61.424 kHz
x dB Bandwidth 32.811 MHz



CH Mid

Agilent

R T

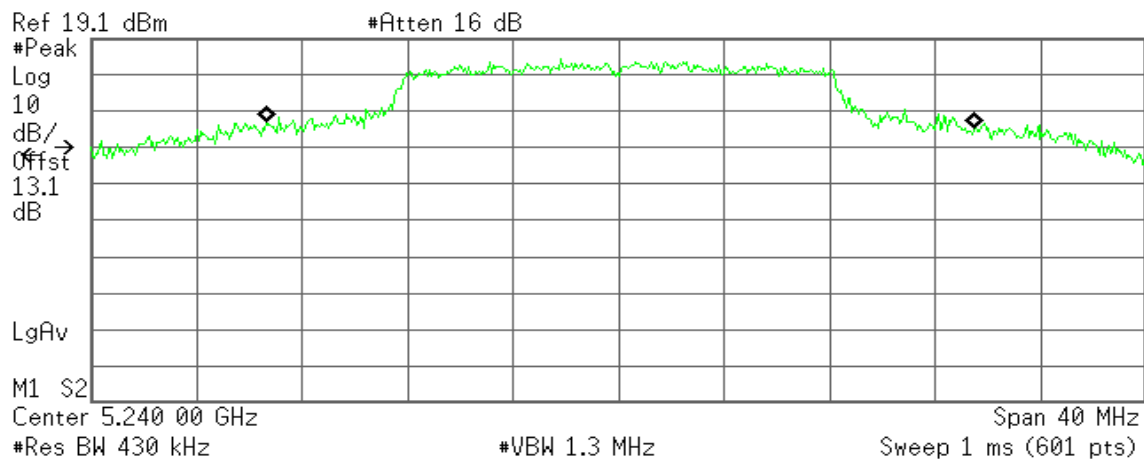


Transmit Freq Error -65.719 kHz
x dB Bandwidth 38.914 MHz

CH High

Agilent

R T

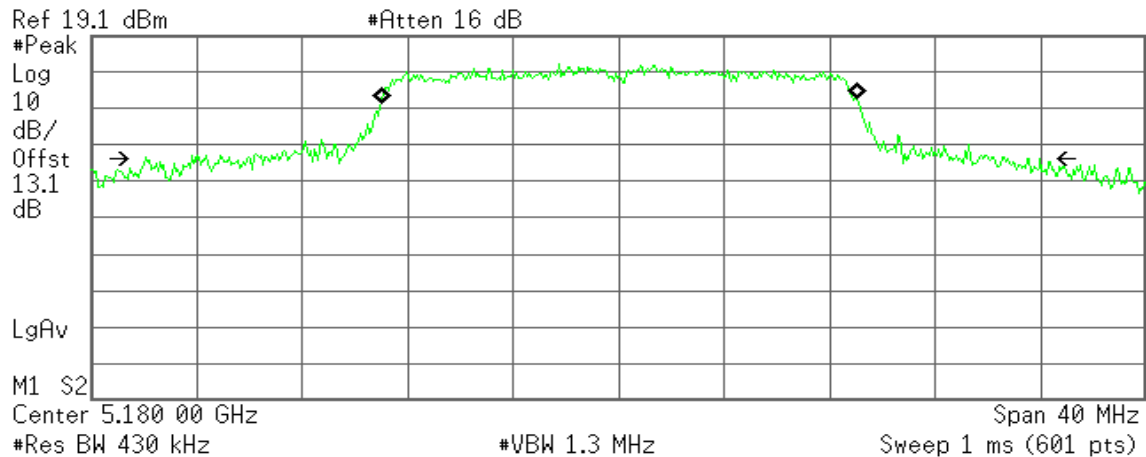


Transmit Freq Error 67.433 kHz
x dB Bandwidth 39.740 MHz

**IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 0****CH Low**

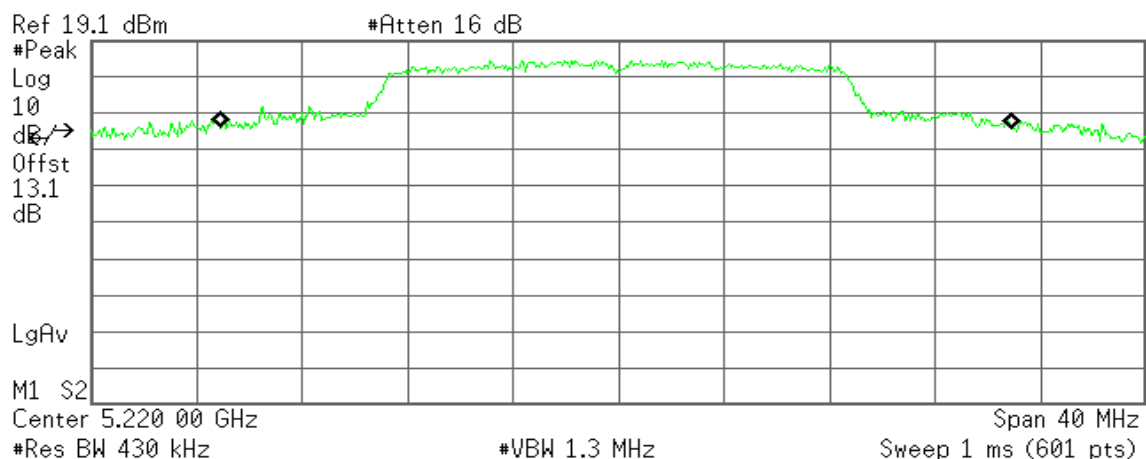
* Agilent

R T

**Occupied Bandwidth**
18.0872 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** 19.799 kHz
x dB Bandwidth 33.955 MHz**CH Mid**

* Agilent

R T

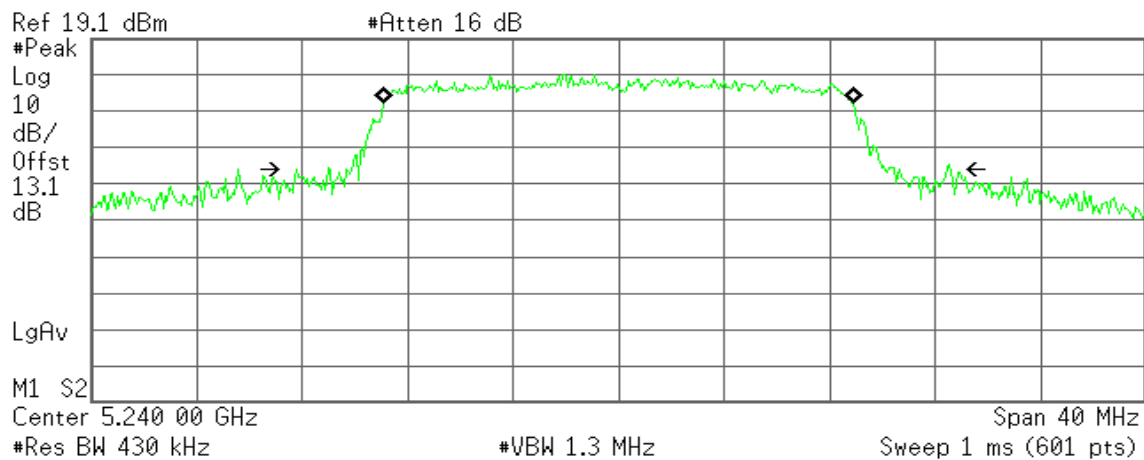
**Occupied Bandwidth**
29.9287 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -70.730 kHz
x dB Bandwidth 40.000 MHz



CH High

Agilent

R T



Occupied Bandwidth
17.8463 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

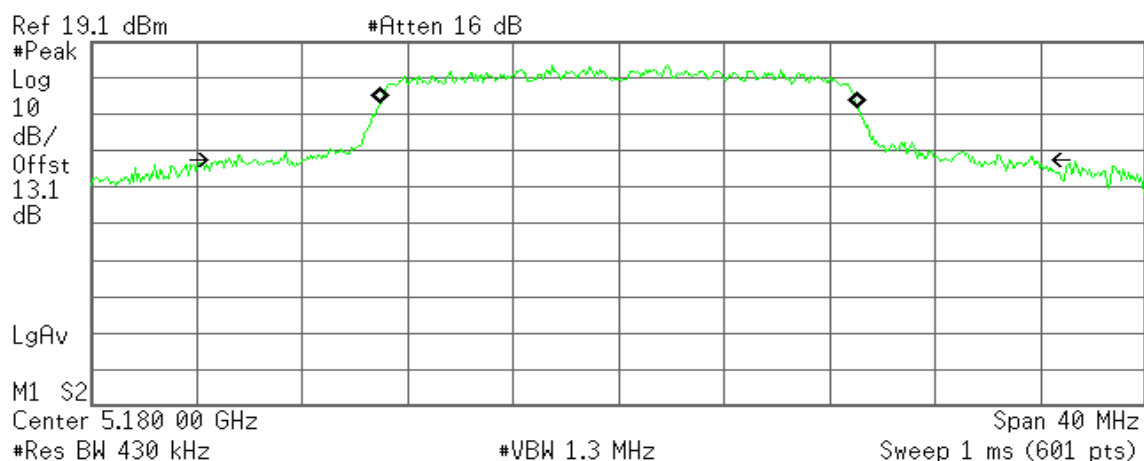
Transmit Freq Error -6.713 kHz
x dB Bandwidth 24.770 MHz

IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent

R T



Occupied Bandwidth
18.1151 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

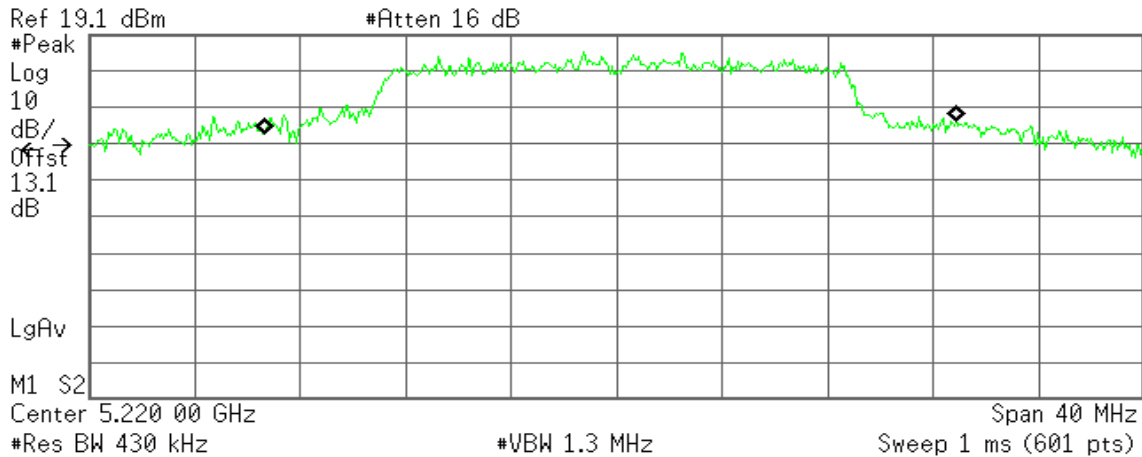
Transmit Freq Error -9.244 kHz
x dB Bandwidth 30.580 MHz



CH Mid

Agilent

R T



Occupied Bandwidth
26.1983 MHz

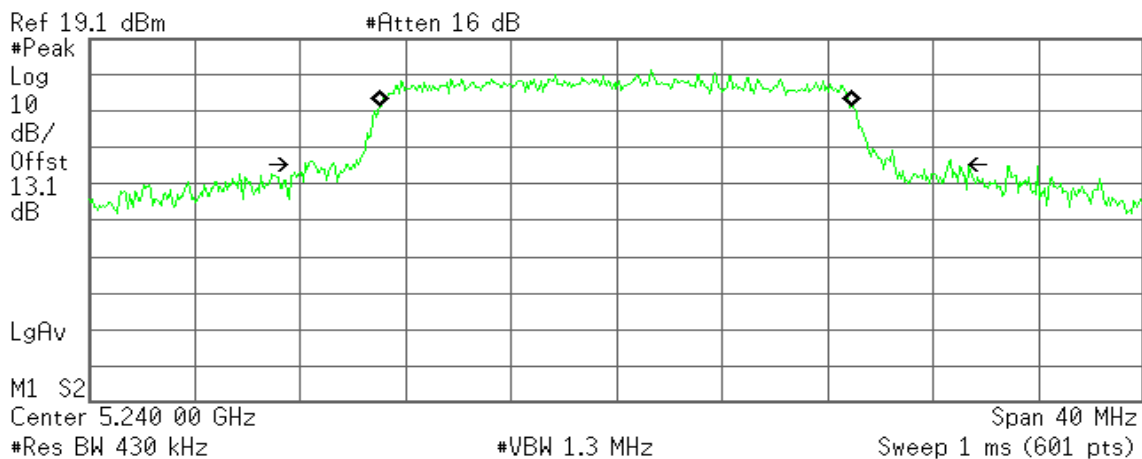
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -247.596 kHz
x dB Bandwidth 39.816 MHz

CH High

Agilent

R T



Occupied Bandwidth
17.9281 MHz

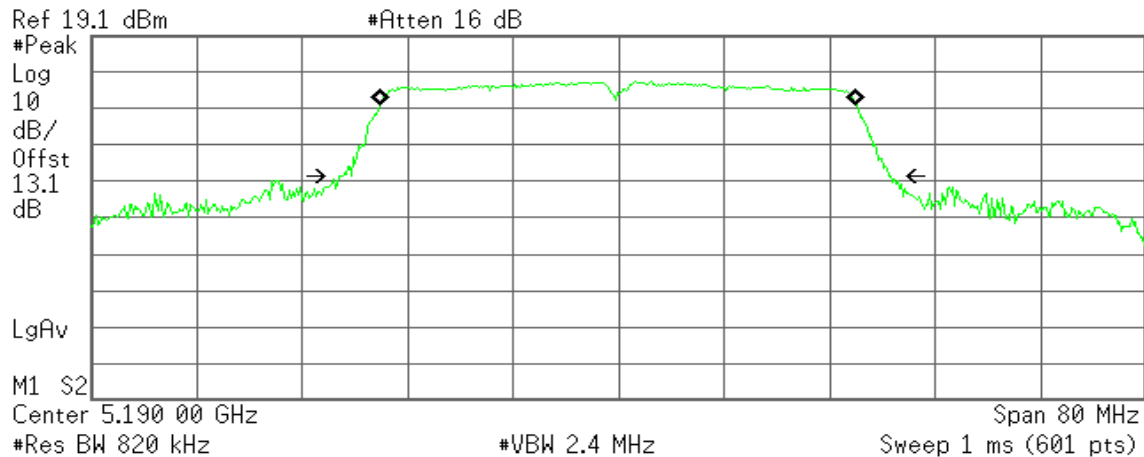
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -4.048 kHz
x dB Bandwidth 24.506 MHz

**IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 0****CH Low**

Agilent

R T



Occupied Bandwidth
36.2042 MHz

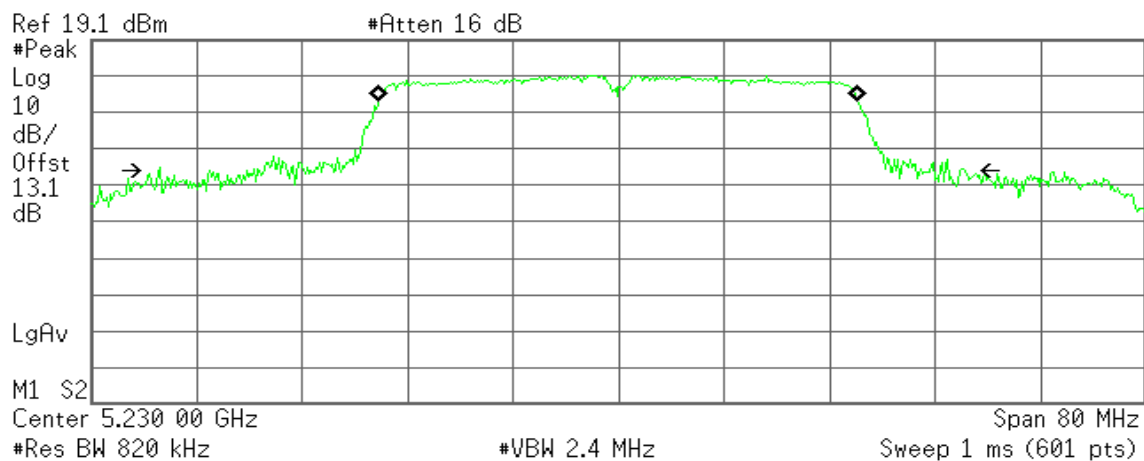
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -57.537 kHz
x dB Bandwidth 41.430 MHz

CH High

Agilent

R T



Occupied Bandwidth
36.4335 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -26.773 kHz
x dB Bandwidth 61.081 MHz

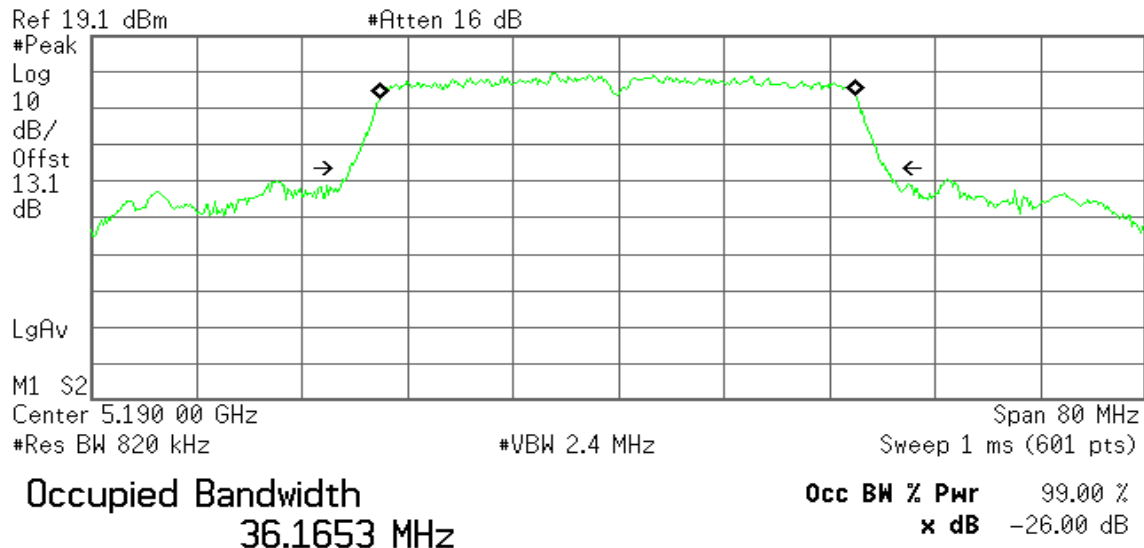


IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 1

CH Low

Agilent

R T

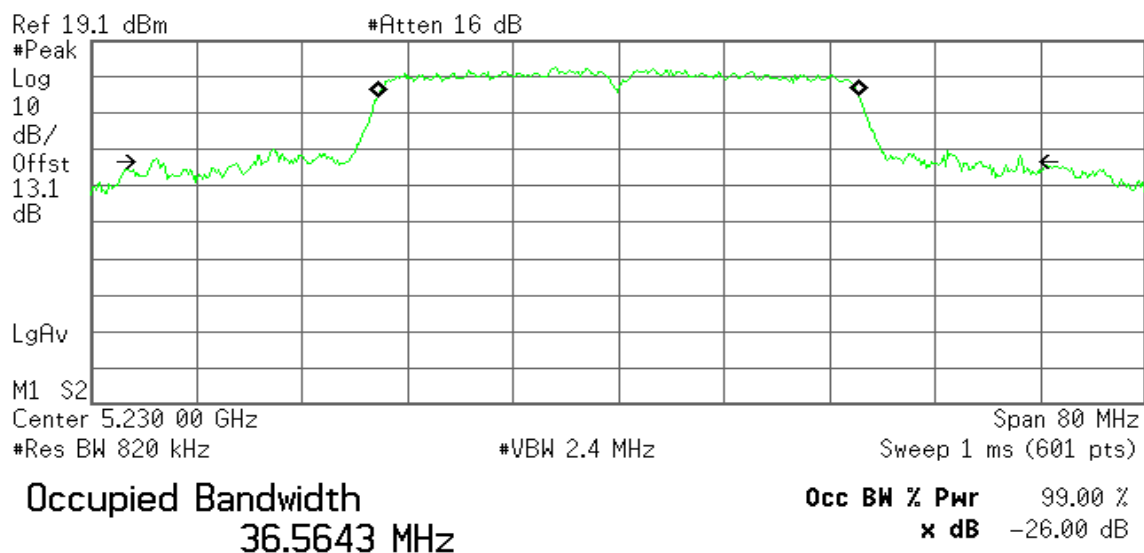


Transmit Freq Error -35.485 kHz
x dB Bandwidth 40.625 MHz

CH High

Agilent

R T



Transmit Freq Error -37.731 kHz
x dB Bandwidth 65.956 MHz

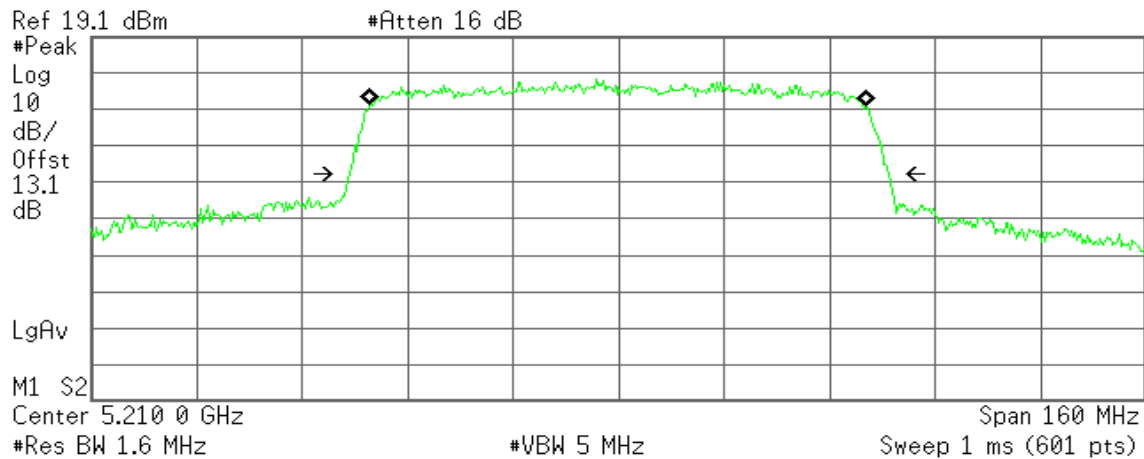


IEEE 802.11ac VHT80 Mode / 5210MHz / Chain 0

CH Mid

Agilent

R T



Occupied Bandwidth
75.2718 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

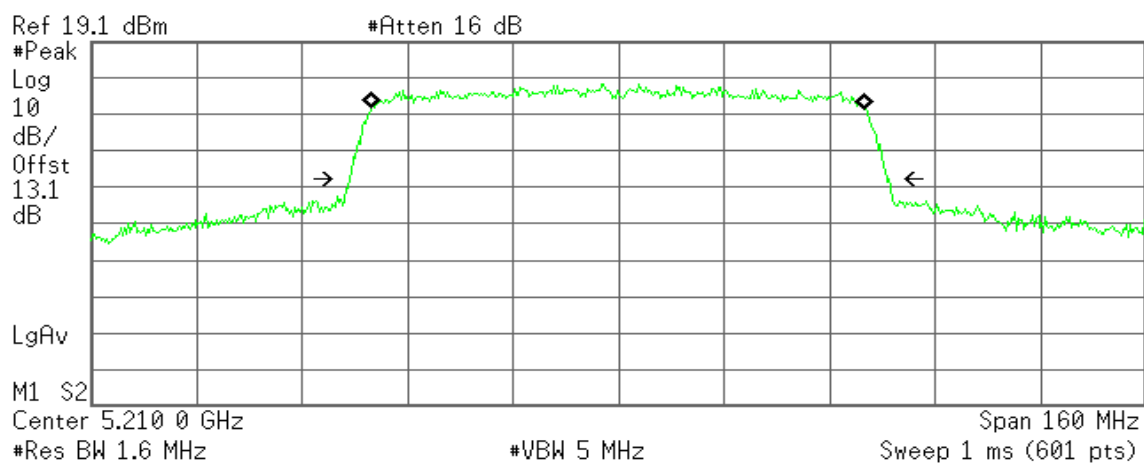
Transmit Freq Error -116.536 kHz
x dB Bandwidth 81.934 MHz

IEEE 802.11ac VHT80 Mode / 5210MHz / Chain 1

CH Mid

Agilent

R T



Occupied Bandwidth
75.0367 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -60.319 kHz
x dB Bandwidth 81.627 MHz

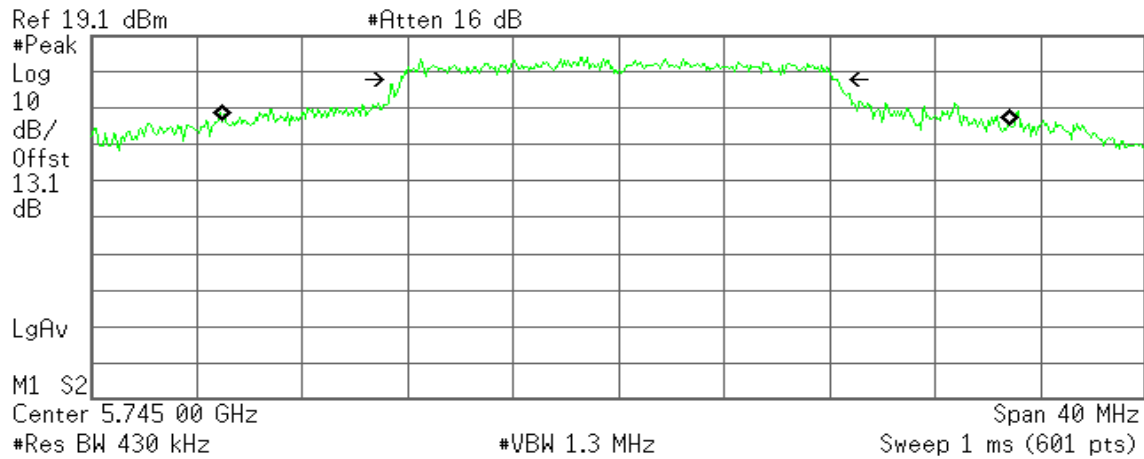


IEEE 802.11a mode / 5745 ~ 5825MHz / Chain 0

CH Low

Agilent

R T



Occupied Bandwidth
29.7882 MHz

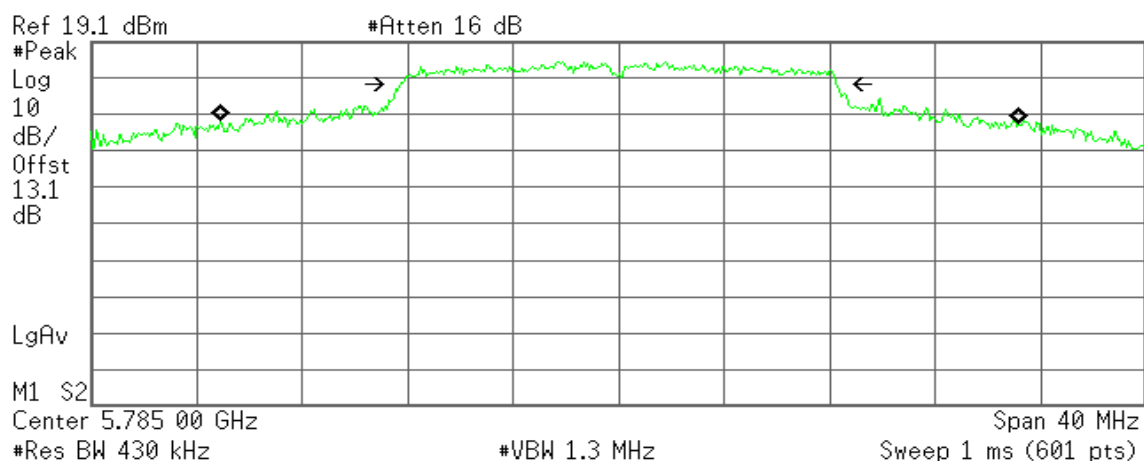
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -117.350 kHz
x dB Bandwidth 16.422 MHz

CH Mid

Agilent

R T



Occupied Bandwidth
30.1862 MHz

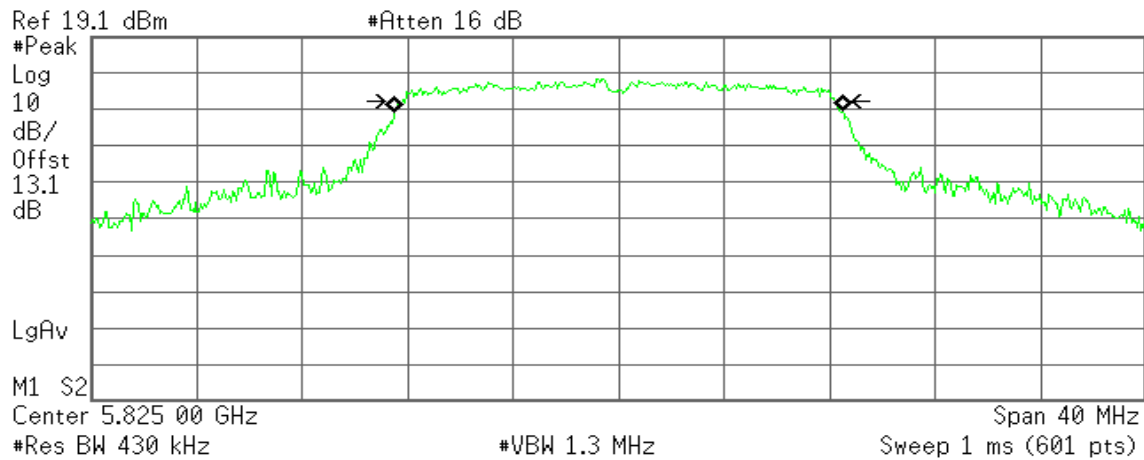
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 25.466 kHz
x dB Bandwidth 16.565 MHz

**CH High**

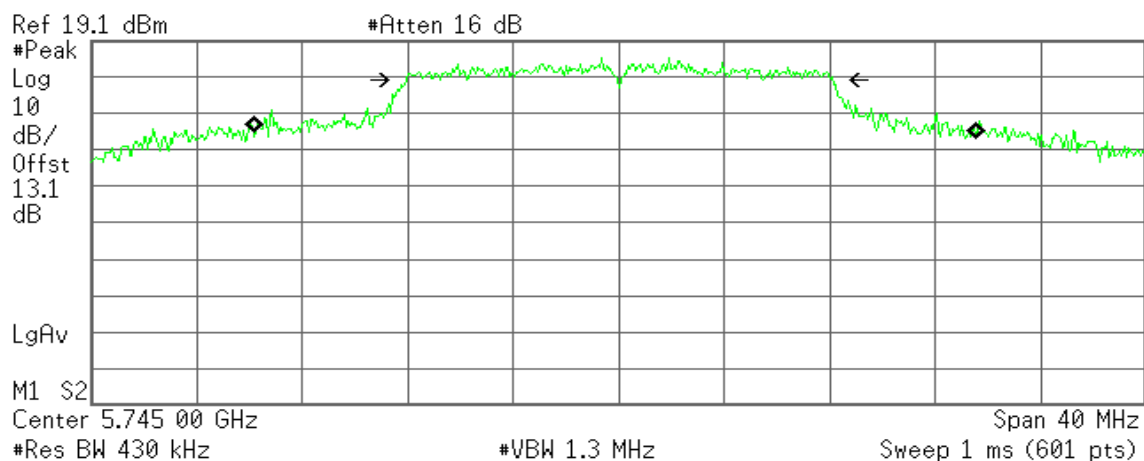
* Agilent

R T

**Occupied Bandwidth****17.0318 MHz****Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** 8.043 kHz
x dB Bandwidth 16.461 MHz**IEEE 802.11a mode / 5745 ~ 5825MHz / Chain 1****CH Low**

* Agilent

R T

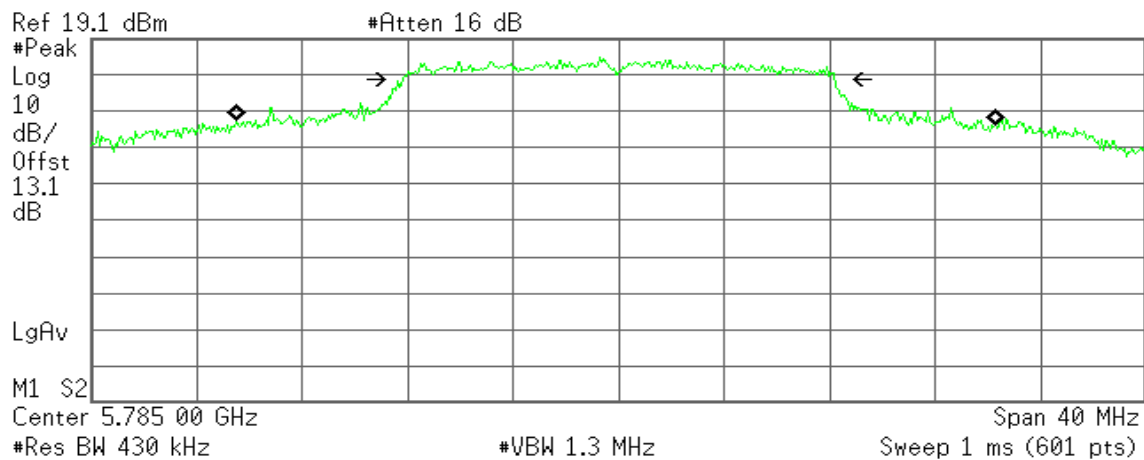
**Occupied Bandwidth****27.3646 MHz****Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** -146.241 kHz
x dB Bandwidth 16.248 MHz



CH Mid

Agilent

R T



Occupied Bandwidth
28.7180 MHz

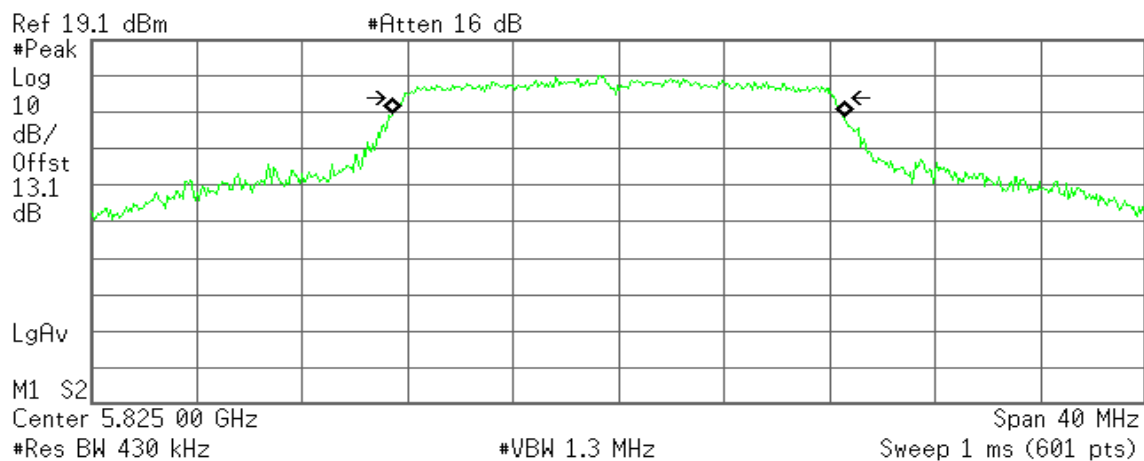
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -107.396 kHz
x dB Bandwidth 16.457 MHz

CH High

Agilent

R T



Occupied Bandwidth
17.1585 MHz

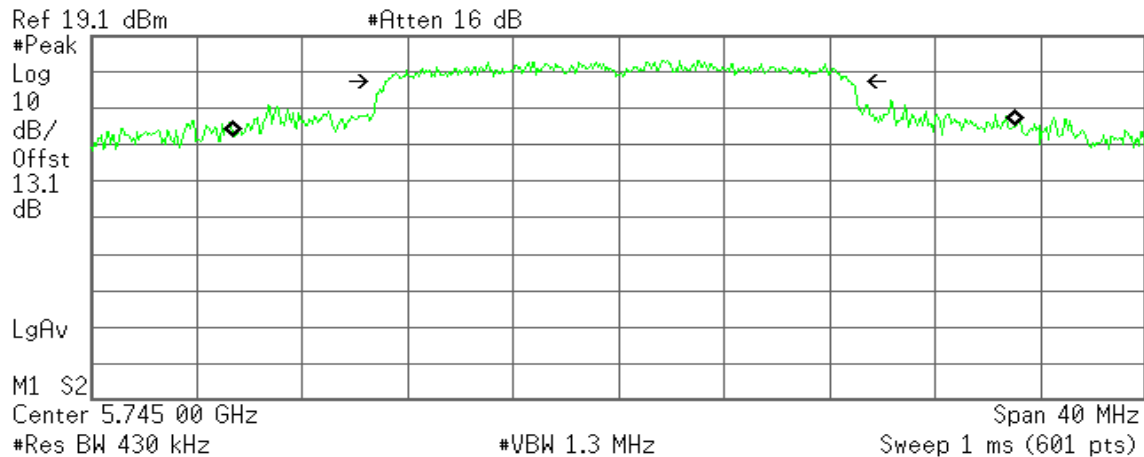
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -12.234 kHz
x dB Bandwidth 16.409 MHz

**IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / Chain 0****CH Low**

* Agilent

R T



Occupied Bandwidth
29.5996 MHz

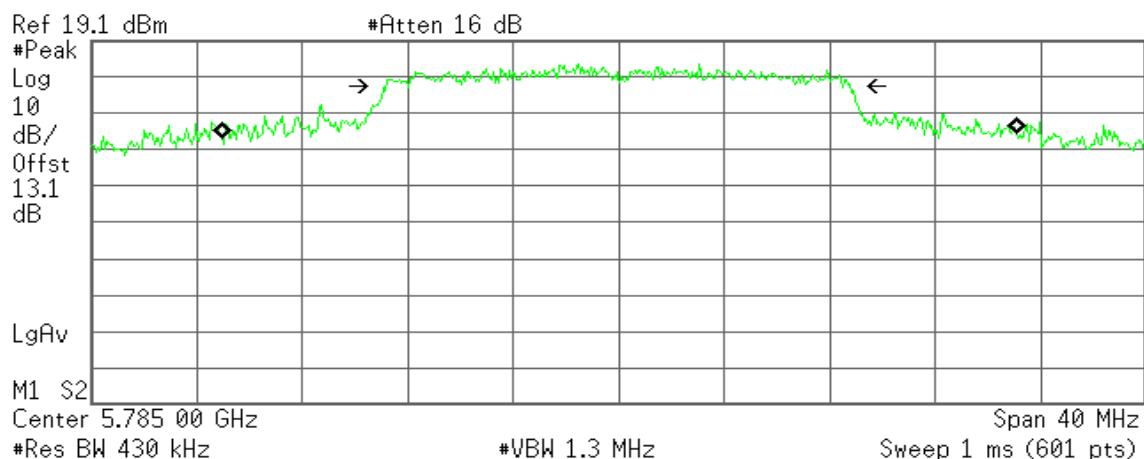
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 221.969 kHz
x dB Bandwidth 17.692 MHz

CH Mid

* Agilent

R T



Occupied Bandwidth
30.0509 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

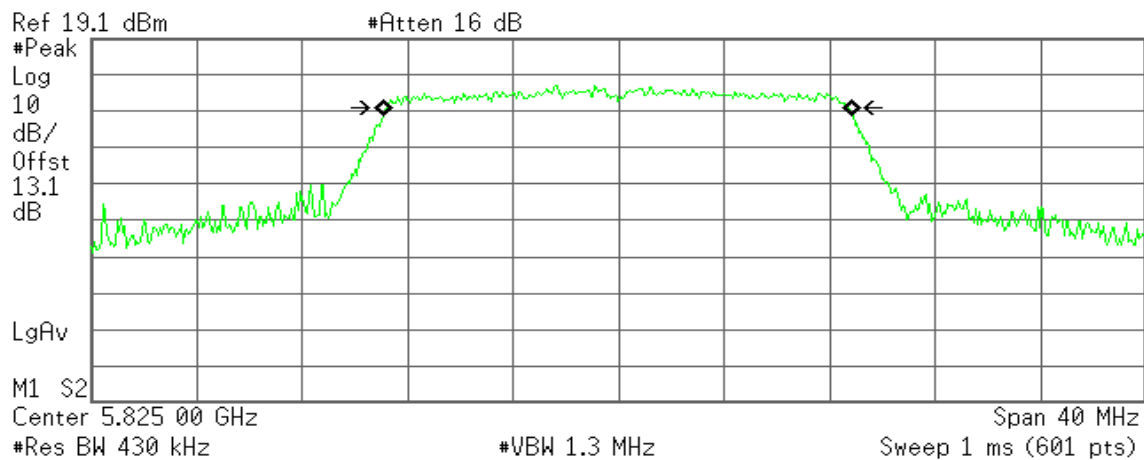
Transmit Freq Error 40.446 kHz
x dB Bandwidth 17.652 MHz



CH High

Agilent

R T



Occupied Bandwidth
17.7835 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

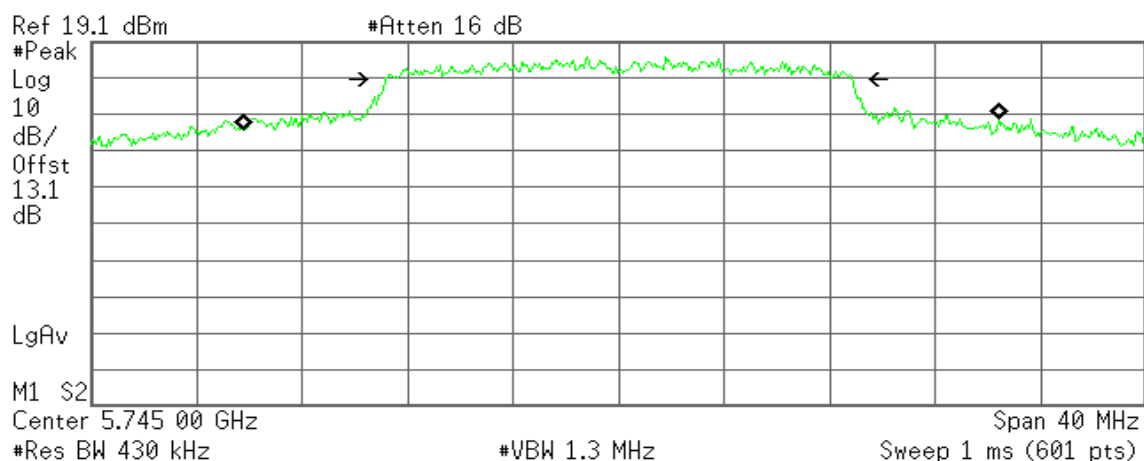
Transmit Freq Error -33.032 kHz
x dB Bandwidth 17.463 MHz

IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / Chain 1

CH Low

Agilent

R T



Occupied Bandwidth
28.5785 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

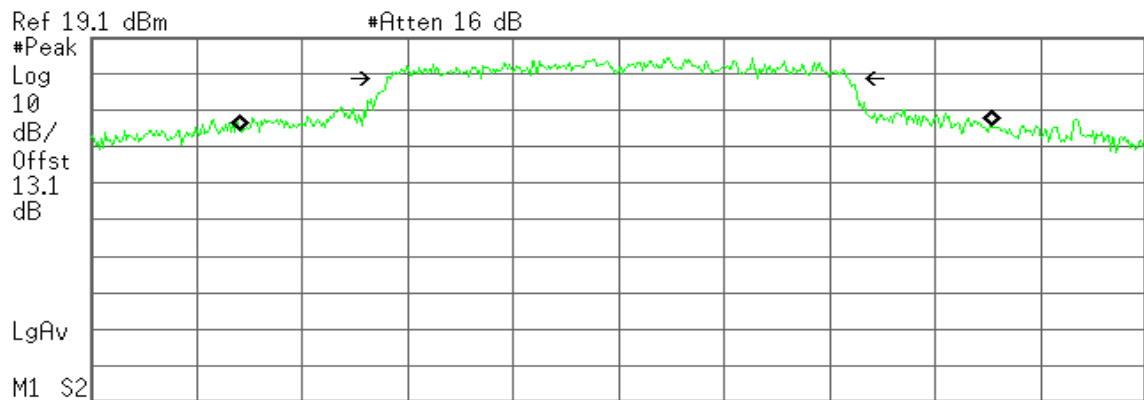
Transmit Freq Error 102.965 kHz
x dB Bandwidth 17.769 MHz



CH Mid

Agilent

R T



Occupied Bandwidth

28.4184 MHz

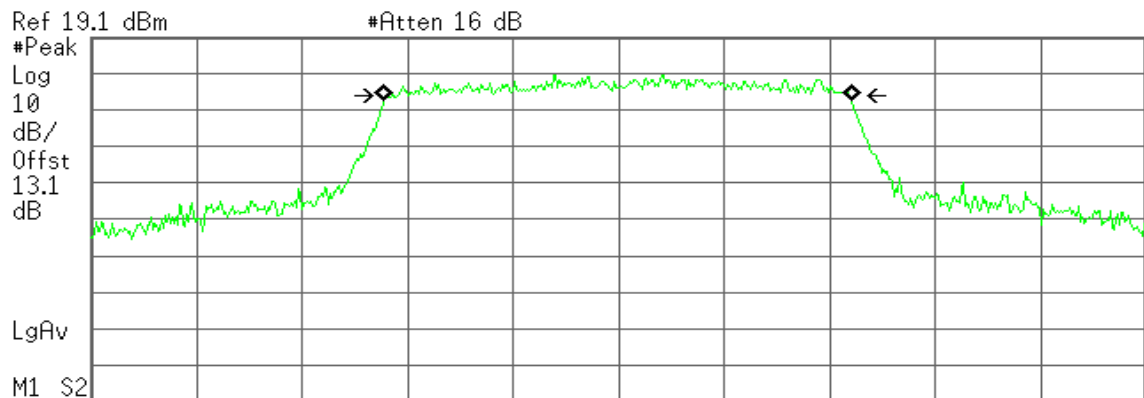
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -92.868 kHz
x dB Bandwidth 17.563 MHz

CH High

Agilent

R T



Occupied Bandwidth

17.7564 MHz

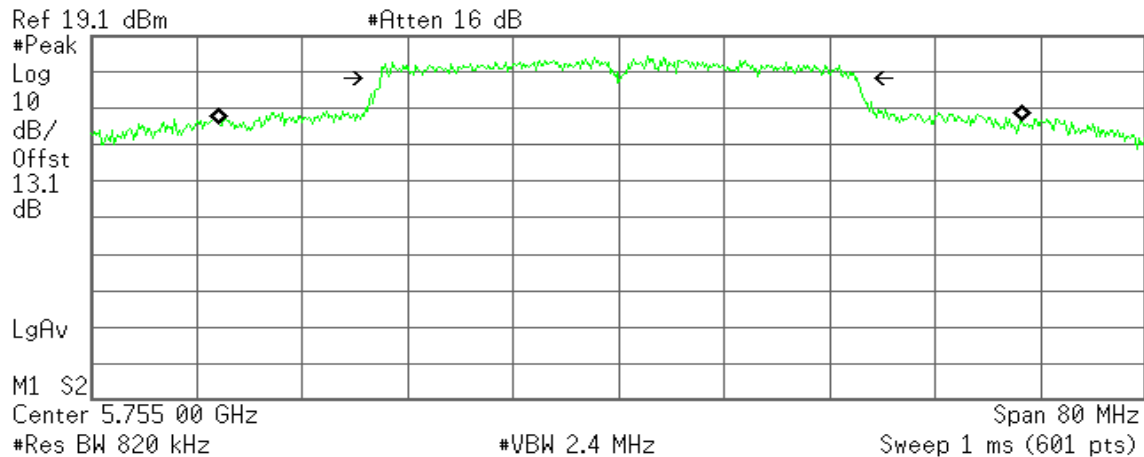
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -26.320 kHz
x dB Bandwidth 17.437 MHz

**IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz / Chain 0****CH Low**

* Agilent

R T



Occupied Bandwidth
60.8128 MHz

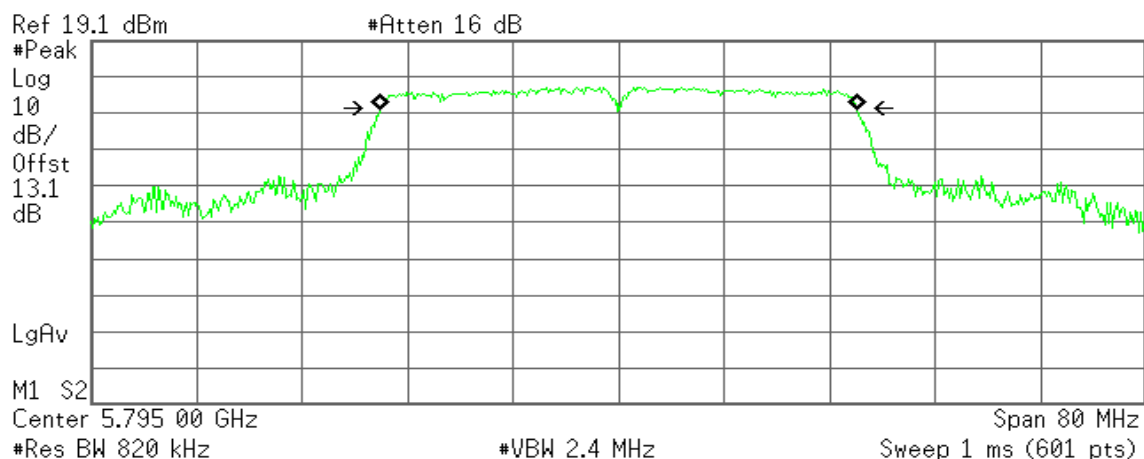
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 107.294 kHz
x dB Bandwidth 36.230 MHz

CH High

* Agilent

R T



Occupied Bandwidth
36.2979 MHz

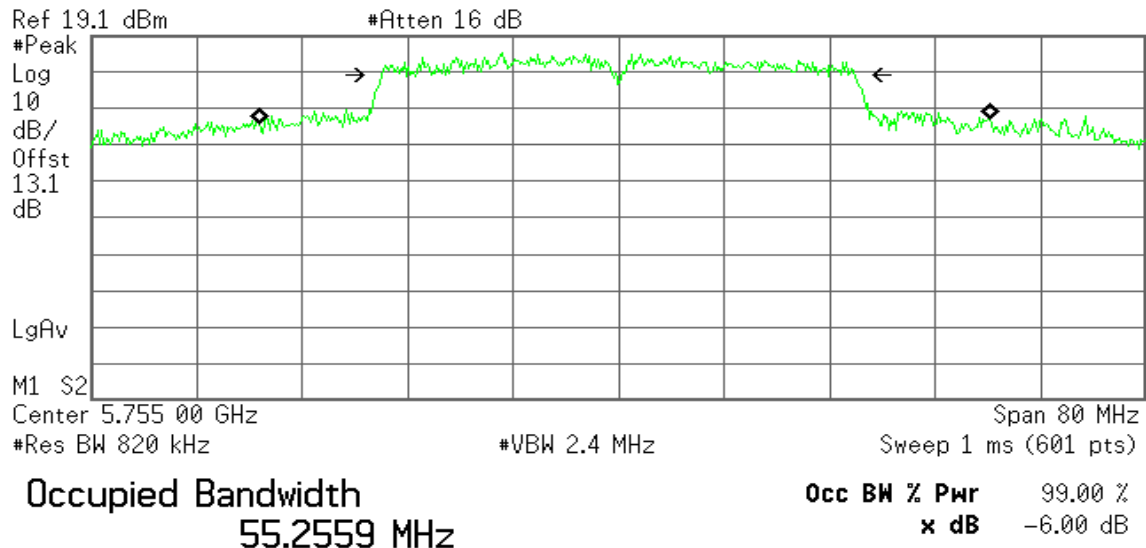
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 16.108 kHz
x dB Bandwidth 36.283 MHz

**IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz / Chain 1****CH Low**

* Agilent

R T

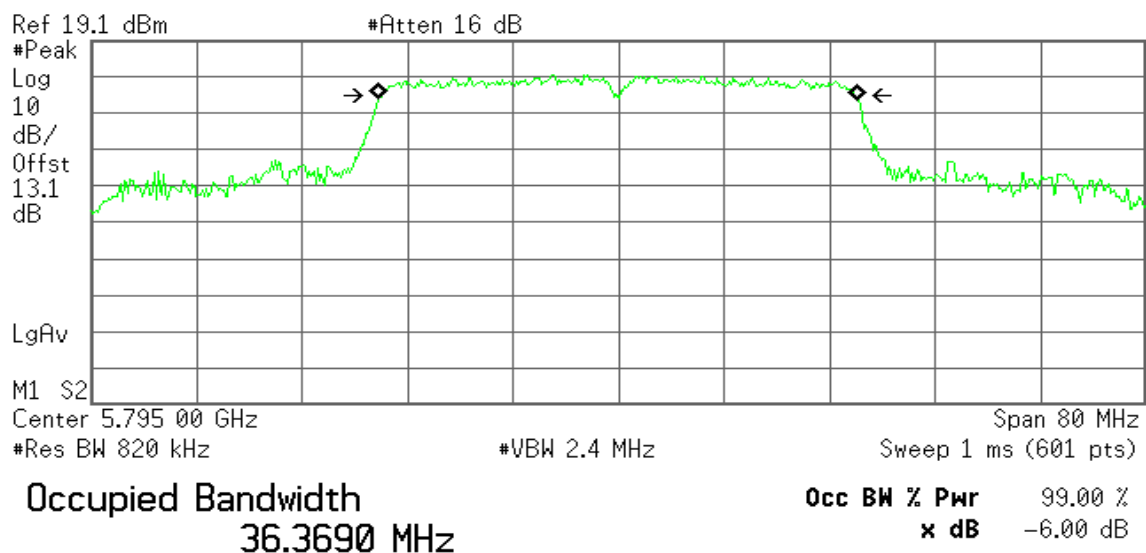


Transmit Freq Error 462.069 kHz
x dB Bandwidth 35.950 MHz

CH High

* Agilent

R T

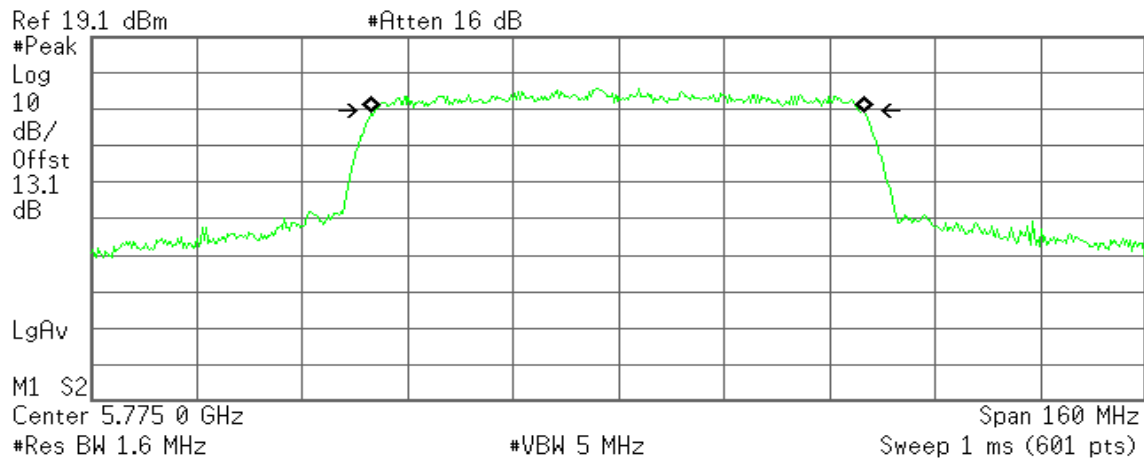


Transmit Freq Error -24.969 kHz
x dB Bandwidth 36.129 MHz

**IEEE 802.11ac VHT80 Mode / 5775MHz / Chain 0****CH Mid**

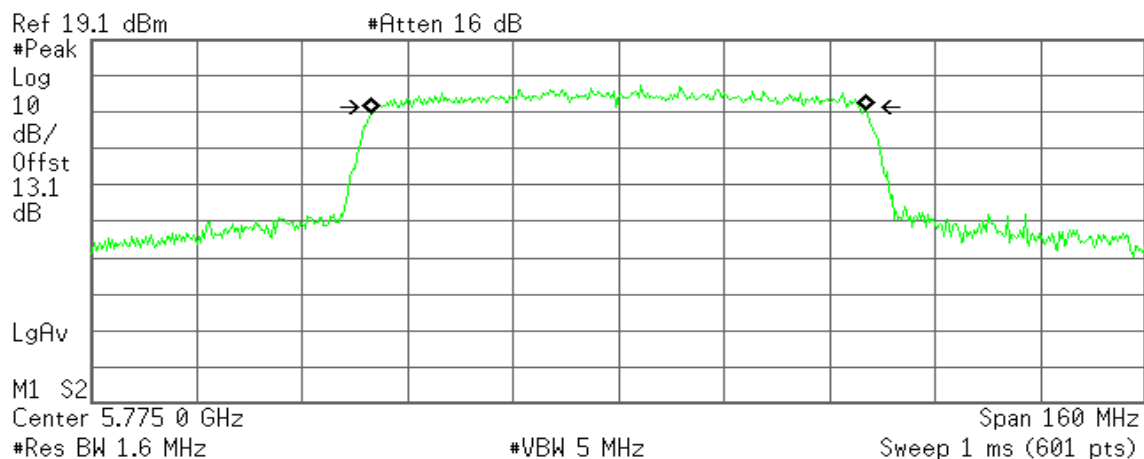
* Agilent

R T

**Occupied Bandwidth**
74.9822 MHz**Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** -88.615 kHz
x dB Bandwidth 74.398 MHz**IEEE 802.11ac VHT80 Mode / 5775MHz / Chain 1****CH Mid**

* Agilent

R T

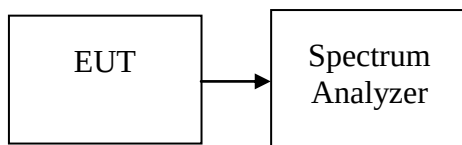
**Occupied Bandwidth**
75.0841 MHz**Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** 33.566 kHz
x dB Bandwidth 74.140 MHz



7.2 MAXIMUM CONDUCTED OUTPUT POWER

Test Configuration

The EUT was connected to a spectrum analyzer through a 50Ω RF cable.



TEST PROCEDURE

Set span to encompass the entire emission bandwidth (EBW) of the signal.

Set RBW = 1 MHz / Set VBW = 3 MHz.

Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”. Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5180	17.27	17.96	20.63	28.49
Mid	5220	21.26	21.49	24.38	28.49
High	5240	21.02	21.05	24.04	28.49

Test mode: IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5180	17.57	18.23	20.92	28.49
Mid	5220	21.17	21.57	24.38	28.49
High	5240	16.59	16.62	19.61	28.49

Test mode: IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5190	13.62	14.25	16.96	28.49
High	5230	16.60	17.23	19.94	28.49

Test mode: IEEE 802.11ac VHT80 Mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Mid	5210	11.31	11.63	14.48	28.49

Remark:

1. Total Output Power (w) = Chain 0 ($10^{(Output\ Power / 10) / 1000}$) + Chain 1 ($10^{(Output\ Power / 10) / 1000}$)

**Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5745	20.81	19.99	23.42	28.49
Mid	5785	21.07	20.11	23.62	28.49
High	5825	14.63	14.22	17.44	28.49

Test mode: IEEE 802.11n HT 20 mode / 5745~5825MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5745	20.71	20.35	23.54	28.49
Mid	5785	21.26	20.57	23.94	28.49
High	5825	14.22	13.80	17.02	28.49

Test mode: IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5755	21.09	20.44	23.79	28.49
High	5795	15.51	15.61	18.57	28.49

Test mode: IEEE 802.11ac VHT80 Mode / 5775MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Mid	5775	9.07	9.71	12.41	28.49

Remark:

1. Total Output Power (w) = Chain 0 ($10^{(Output\ Power / 10) / 1000}$) + Chain 1 ($10^{(Output\ Power / 10) / 1000}$)



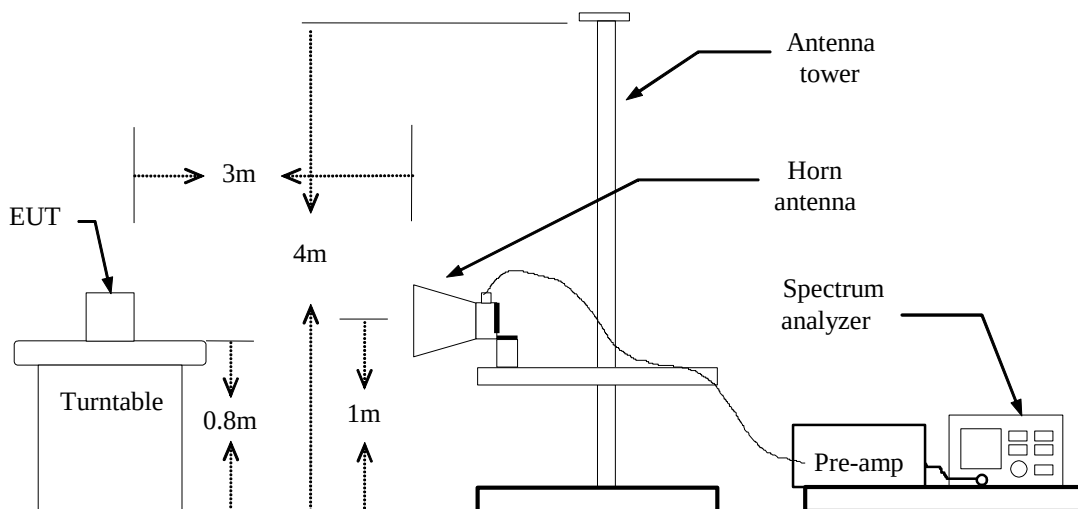
7.3 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(b),

- (1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz,
if duty cycle $\geq 98\%$, VBW=10Hz.
if duty cycle $< 98\%$ VBW=1/T.
IEEE 802.11a mode: = 88%, VBW=750Hz
IEEE 802.11n HT 20 MHz mode: = 78%, VBW=1.5KHz
IEEE 802.11n HT 40 MHz mode: = 65%, VBW=3KHz
IEEE 802.11ac VHT 80 MHz mode: = 78%, VBW=1.5KHz
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

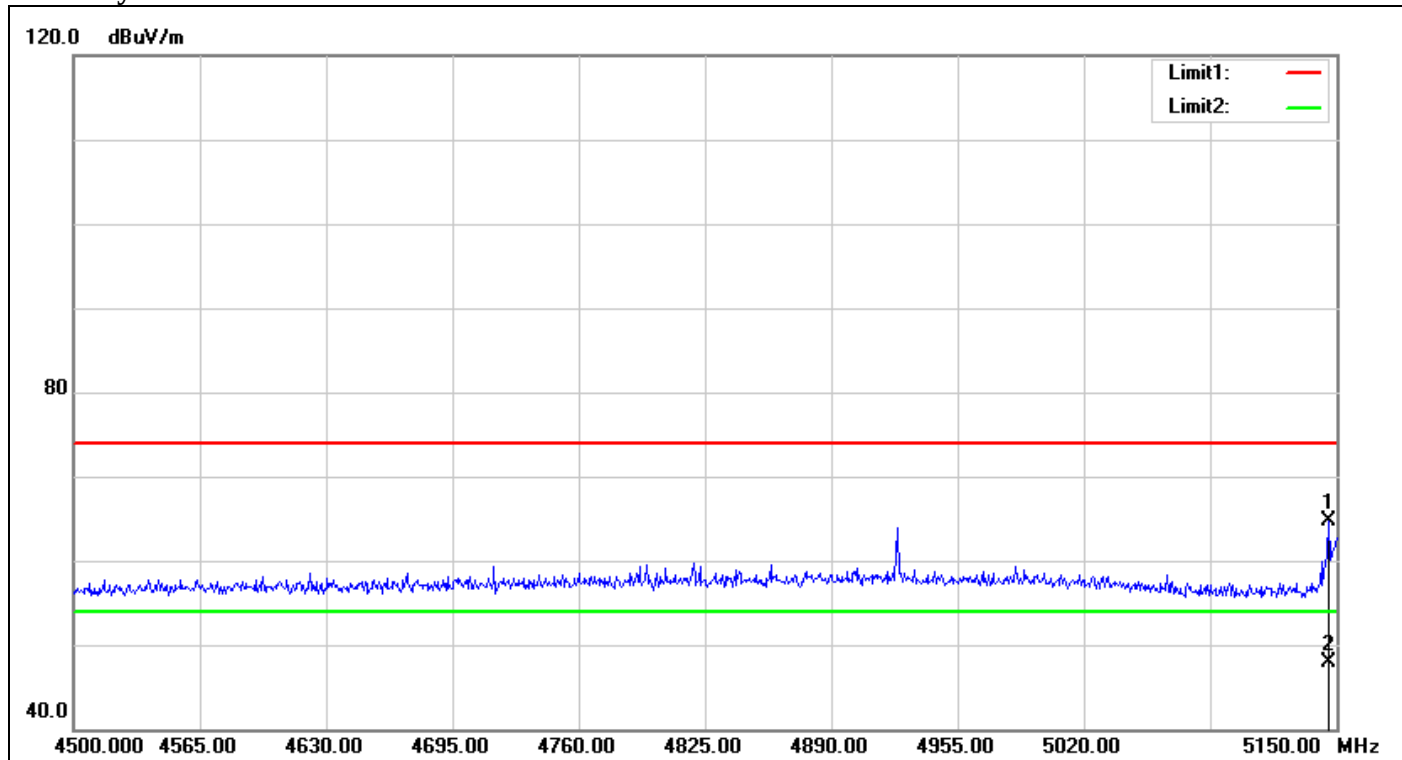
TEST RESULTS

Refer to attach spectrum analyzer data chart.



Band Edges (IEEE 802.11a mode / 5180 MHz)

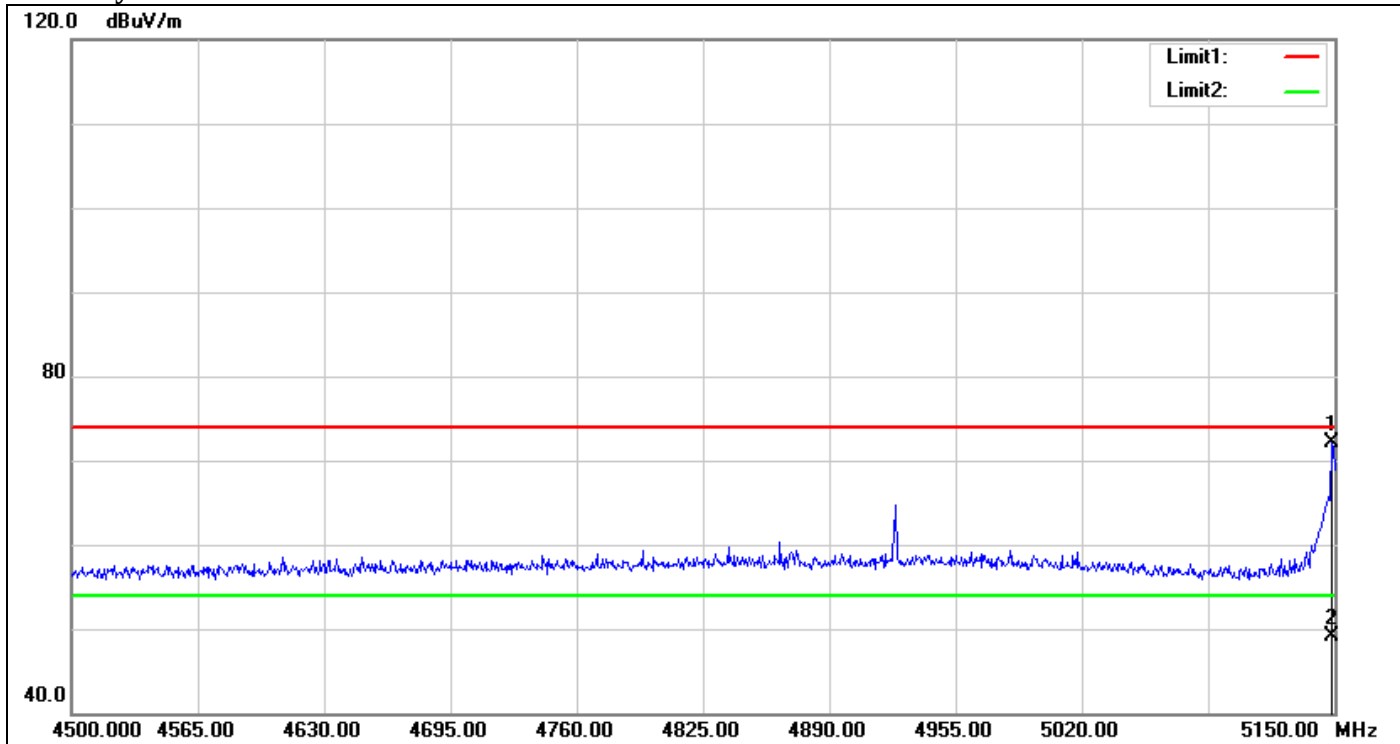
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5146.100	61.61	3.01	64.62	74.00	-9.38	100	21	peak
2	5146.100	44.99	3.01	48.00	54.00	-6.00	100	21	AVG



Polarity: Horizontal

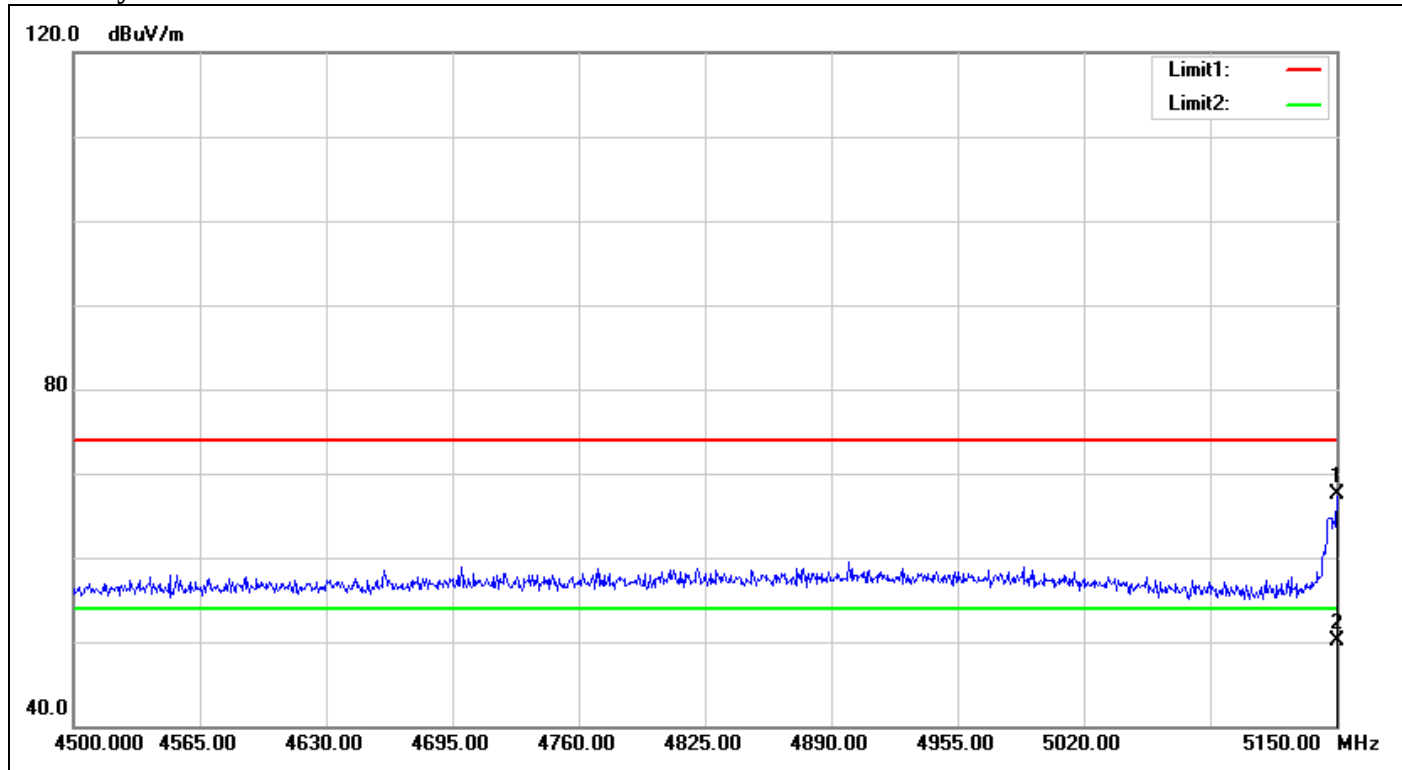


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5148.700	66.98	3.03	70.01	74.00	-3.99	100	95	peak
2	5148.700	46.09	3.03	49.12	54.00	-4.88	100	95	AVG



Band Edges (IEEE 802.11n HT 20 mode / 5180 MHz)

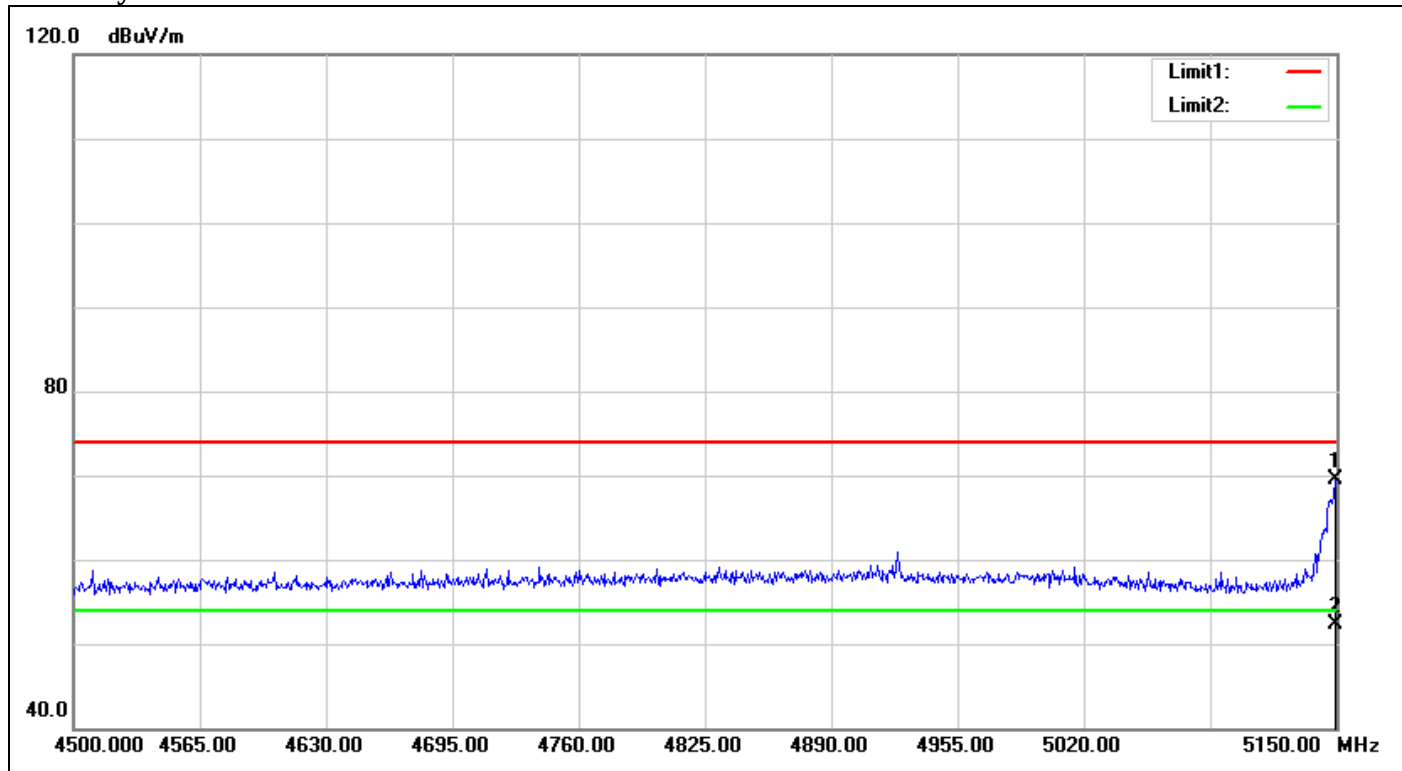
Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	64.46	3.04	67.50	74.00	-6.50	100	109	peak
2	5150.000	47.04	3.04	50.08	54.00	-3.92	100	109	AVG



Polarity: Horizontal

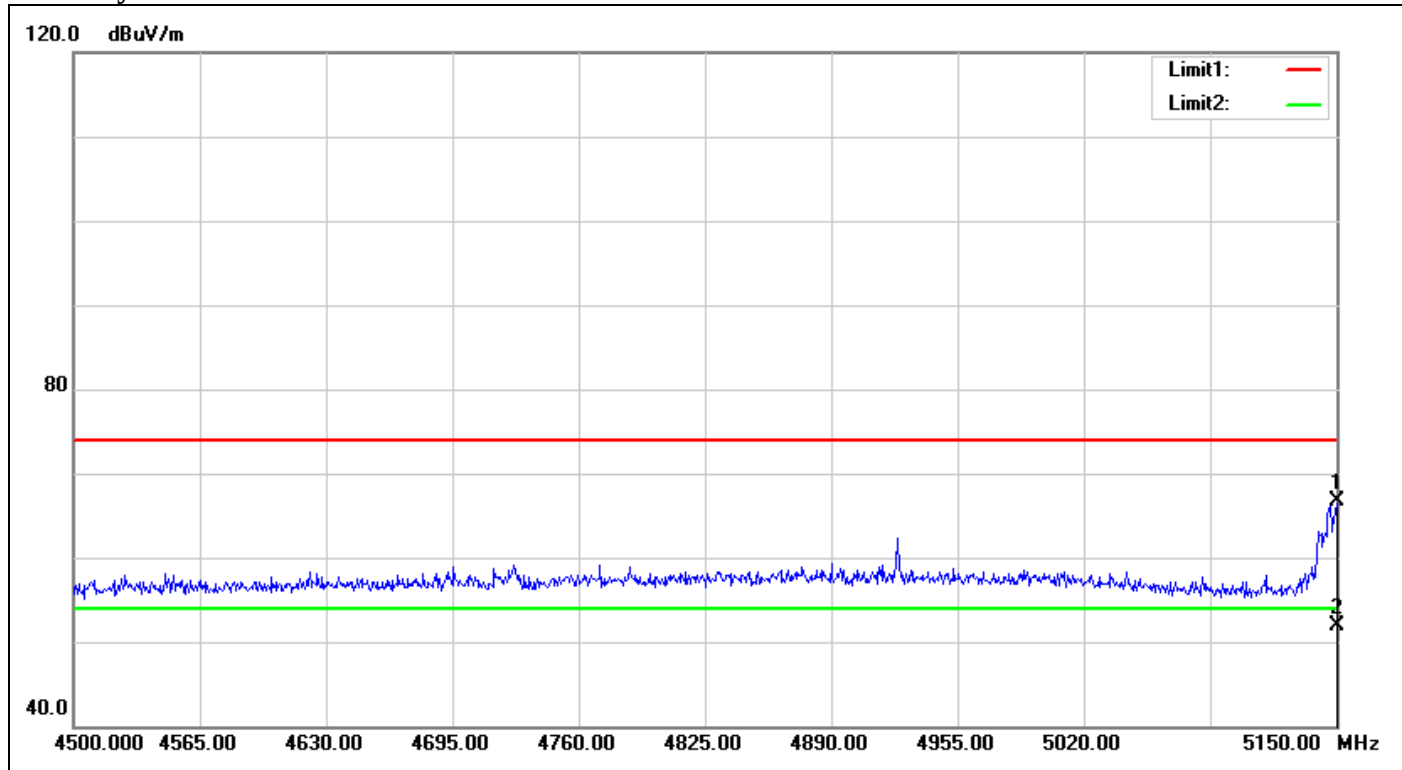


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5149.350	66.54	3.04	69.58	74.00	-4.42	100	3	peak
2	5149.350	47.30	3.04	50.34	54.00	-3.66	100	3	AVG



Band Edges (IEEE 802.11n HT 40 mode / 5190 MHz)

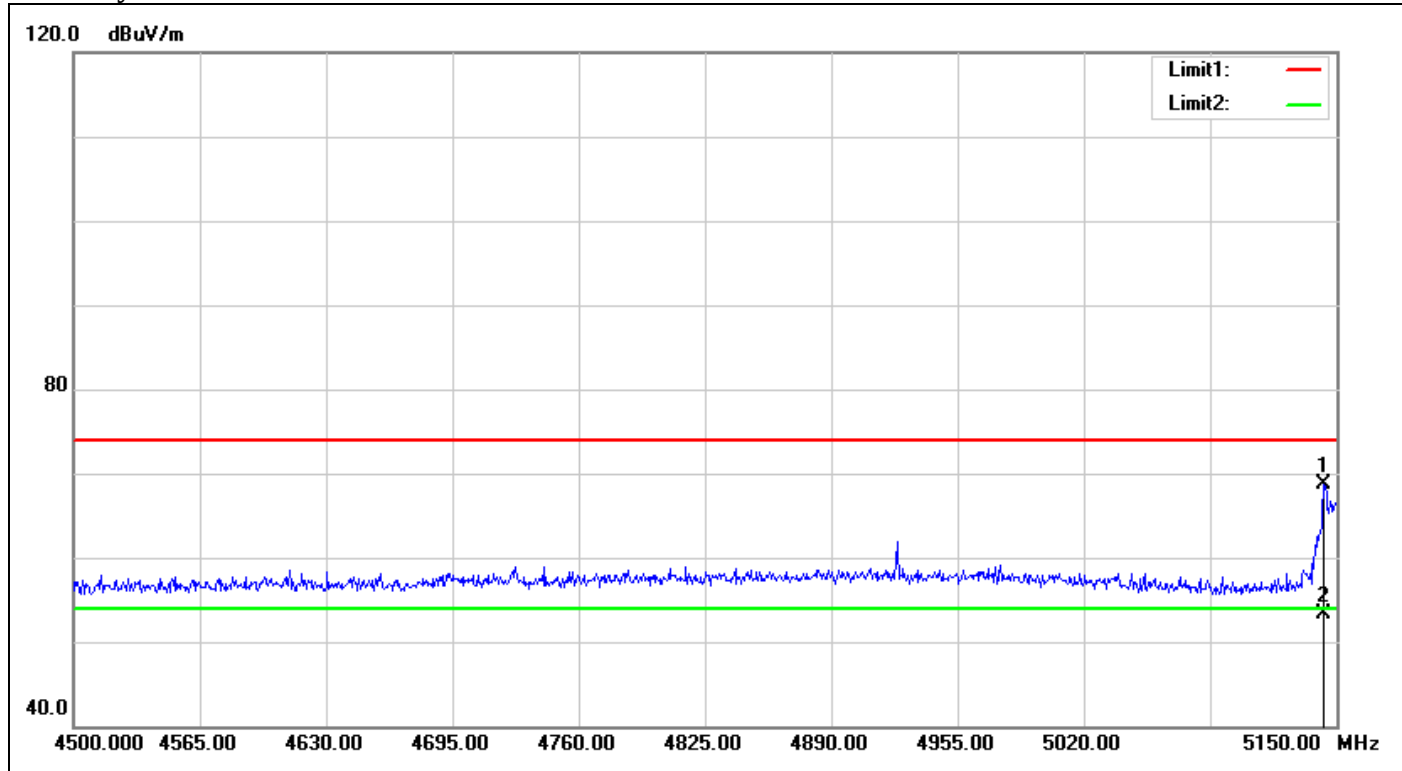
Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	63.72	3.04	66.76	74.00	-7.24	100	204	peak
2	5150.000	47.82	3.04	50.86	54.00	-3.14	100	204	AVG



Polarity: Horizontal

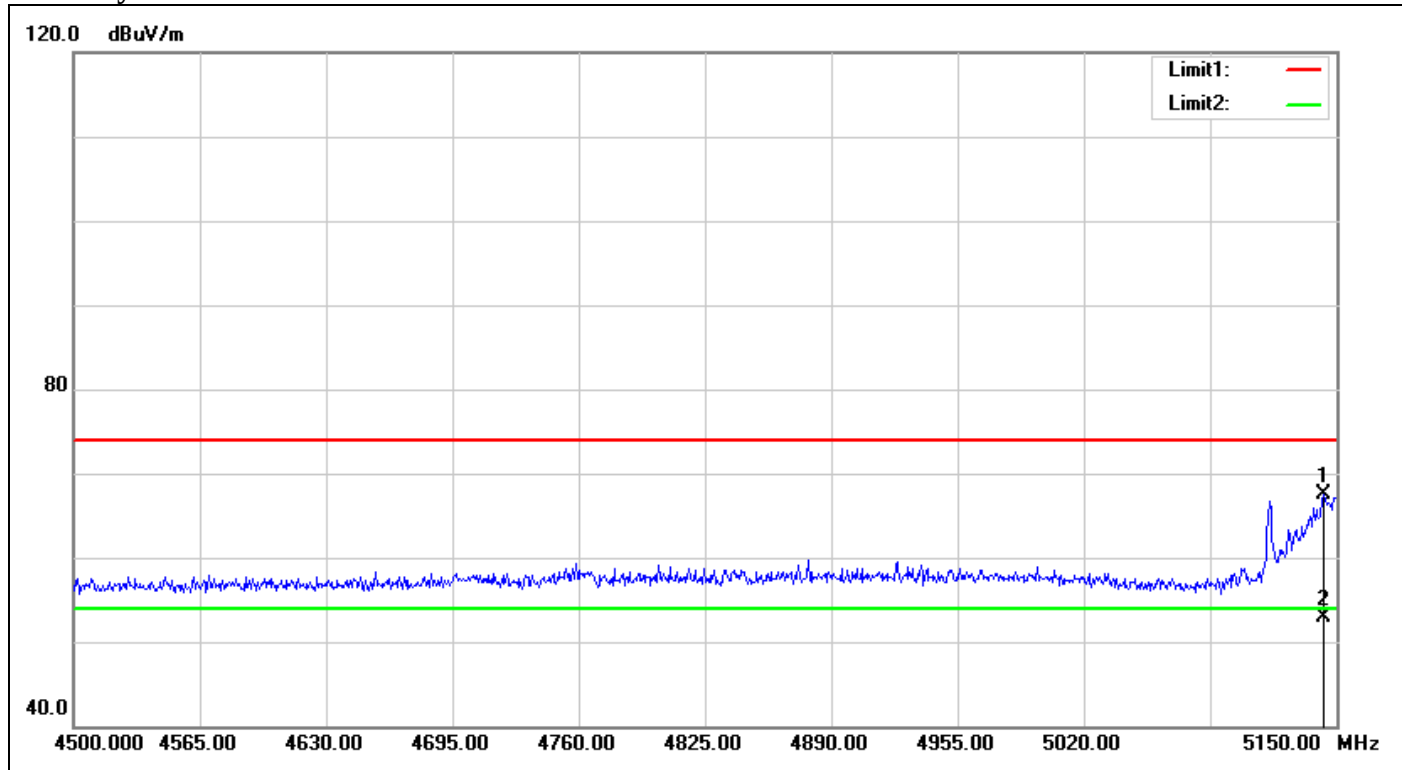


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5143.500	65.73	3.00	68.73	74.00	-5.27	100	284	peak
2	5143.500	47.36	3.00	50.36	54.00	-3.64	100	284	AVG



Band Edges (IEEE 802.11ac VHT80 Mode / CH 5210 MHz)

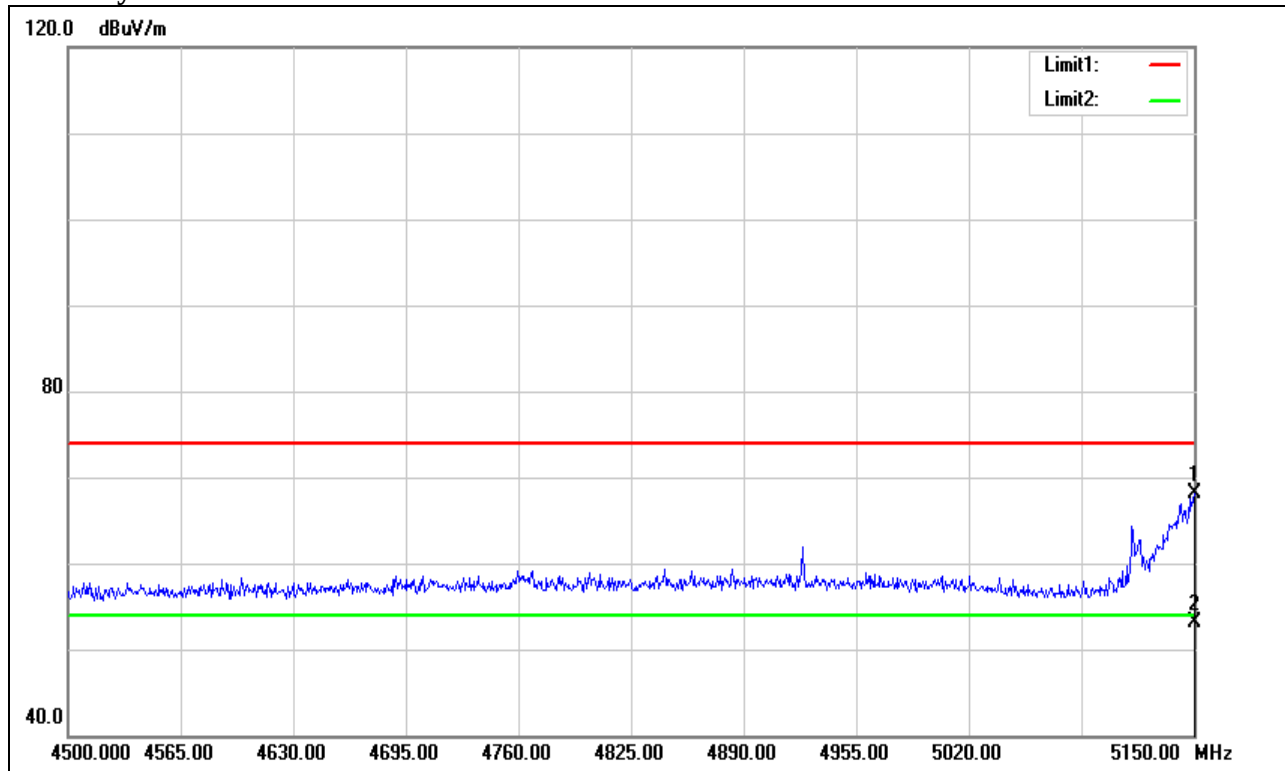
Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5143.500	64.40	3.00	67.40	74.00	-6.60	100	193	peak
2	5143.500	47.83	3.00	50.83	54.00	-3.17	100	193	AVG



Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	65.16	3.04	68.20	74.00	-5.80	100	36	peak
2	5150.000	47.00	3.04	50.04	54.00	-3.96	100	36	AVG



7.4 PEAK POWER SPECTRAL DENSITY

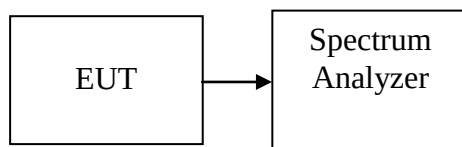
LIMIT

According to §15.407(a),

- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.
- (2) For the band 5.25-5.35 GHz and 5.47-5.725 GHz bands, the peak power spectral density shall not exceed 11dBm in any 1MHz band.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = Sweep= AUTO
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz**

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5180	6.37	6.21	9.30	15.49	PASS
Mid	5220	9.21	8.86	12.05	15.49	PASS
High	5240	9.07	9.12	12.11	15.49	PASS

Test mode: IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5180	5.80	5.88	8.85	15.49	PASS
Mid	5220	8.68	8.63	11.67	15.49	PASS
High	5240	4.42	4.24	7.34	15.49	PASS

Test mode: IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5190	-2.96	-1.99	0.56	15.49	PASS
High	5230	0.24	0.79	3.53	15.49	PASS

Test mode: IEEE 802.11ac VHT80 Mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Mid	5210	-7.65	-6.07	-3.78	15.49	PASS

Remark:

1. Total PPSD (dBm) = $10 * \text{LOG}(10^{(\text{Chain 0 PPSD} / 10)} + 10^{(\text{Chain 1 PPSD} / 10)})$

**Test mode: IEEE 802.11a mode/ 5745 ~ 5825MHz**

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	5.92	6.28	9.11	15.49	PASS
Mid	5785	6.14	6.21	9.19	15.49	PASS
High	5825	0.43	1.41	3.96	15.49	PASS

Test mode: IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	4.61	5.49	8.08	15.49	PASS
Mid	5785	4.89	4.89	7.90	15.49	PASS
High	5825	-1.53	-0.14	2.23	15.49	PASS

Test mode: IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5755	0.97	1.59	4.30	15.49	PASS
High	5795	-4.58	-4.58	-1.57	15.49	PASS

Test mode: IEEE 802.11ac VHT80 Mode / 5775MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Mid	5775	-12.97	-11.55	-9.19	15.49	PASS

Remark:

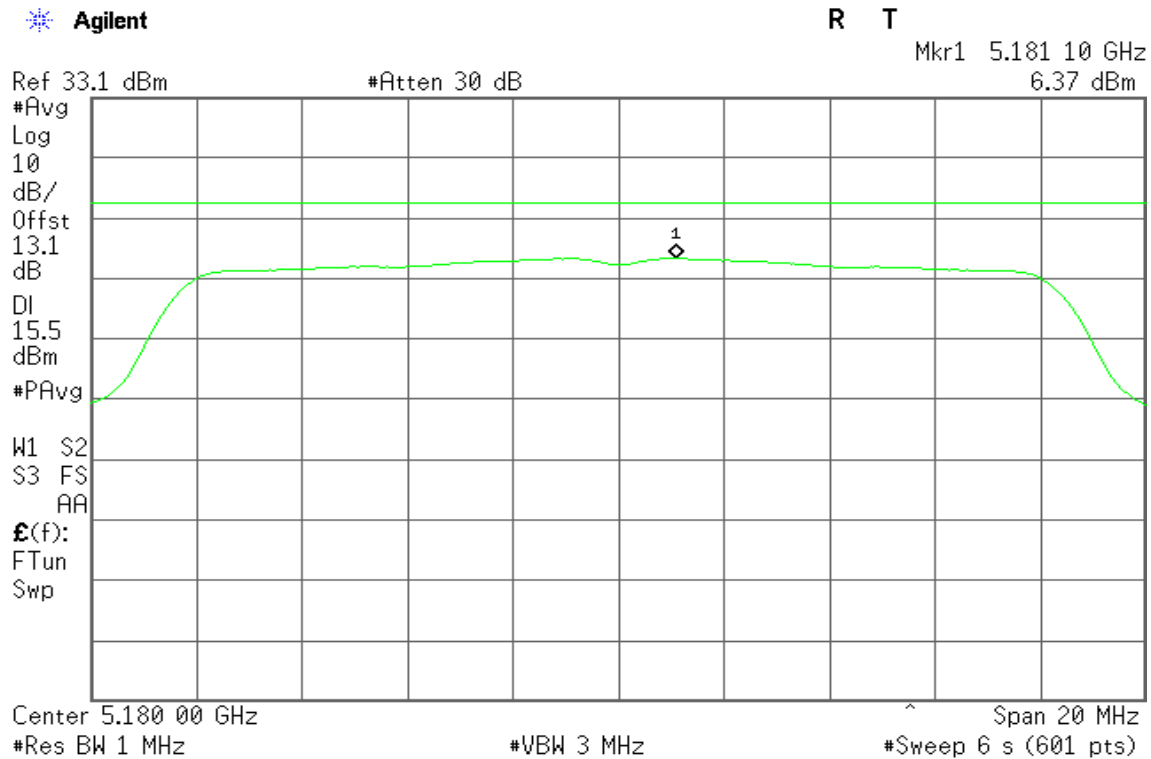
1. Total PPSD (dBm) = $10 \cdot \log(10^{\text{Chain 0 PPSD} / 10} + 10^{\text{Chain 1 PPSD} / 10})$



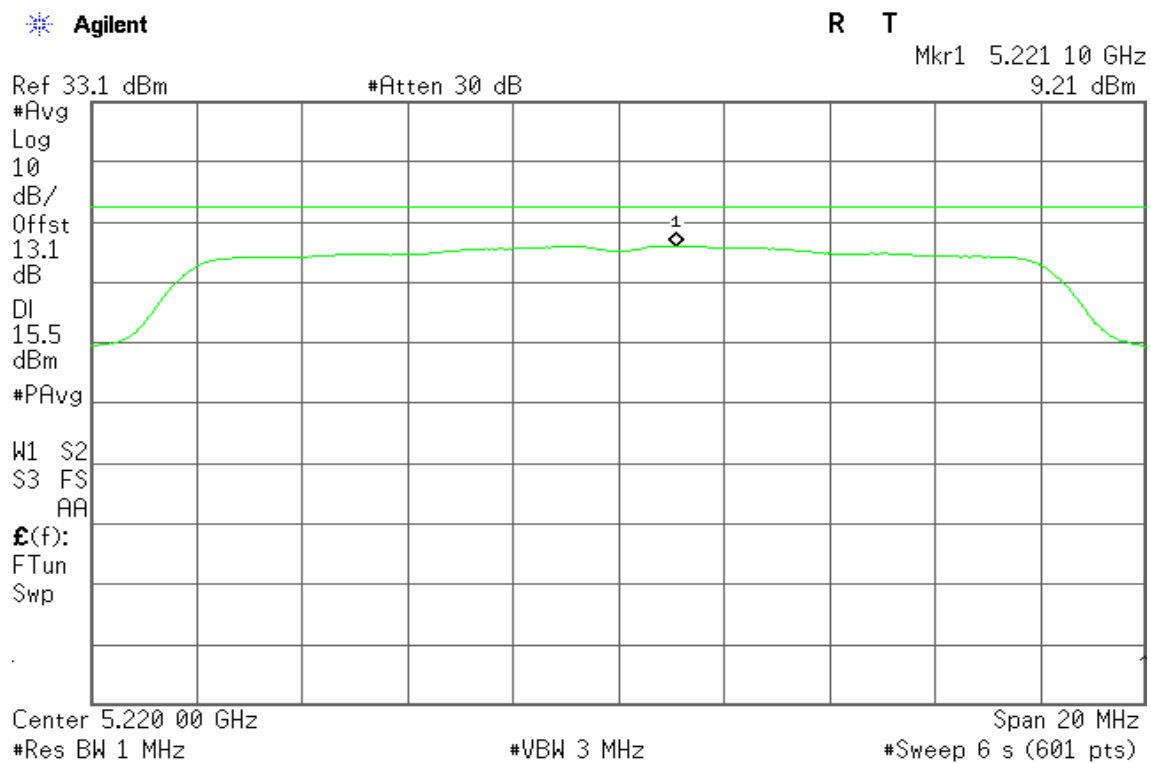
Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz / Chain 0

CH Low



CH Mid





CH High

Agilent

R T

Mkr1 5.241 13 GHz
9.07 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

IEEE 802.11a mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent

R T

Mkr1 5.181 07 GHz
6.21 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

V1 S2

S3 FC

AA

£(f):

FTun

Swp

Center 5.180 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



CH Mid

Agilent

R T

Mkr1 5.221 07 GHz
8.86 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.220 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

CH High

Agilent

R T

Mkr1 5.241 10 GHz
9.12 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

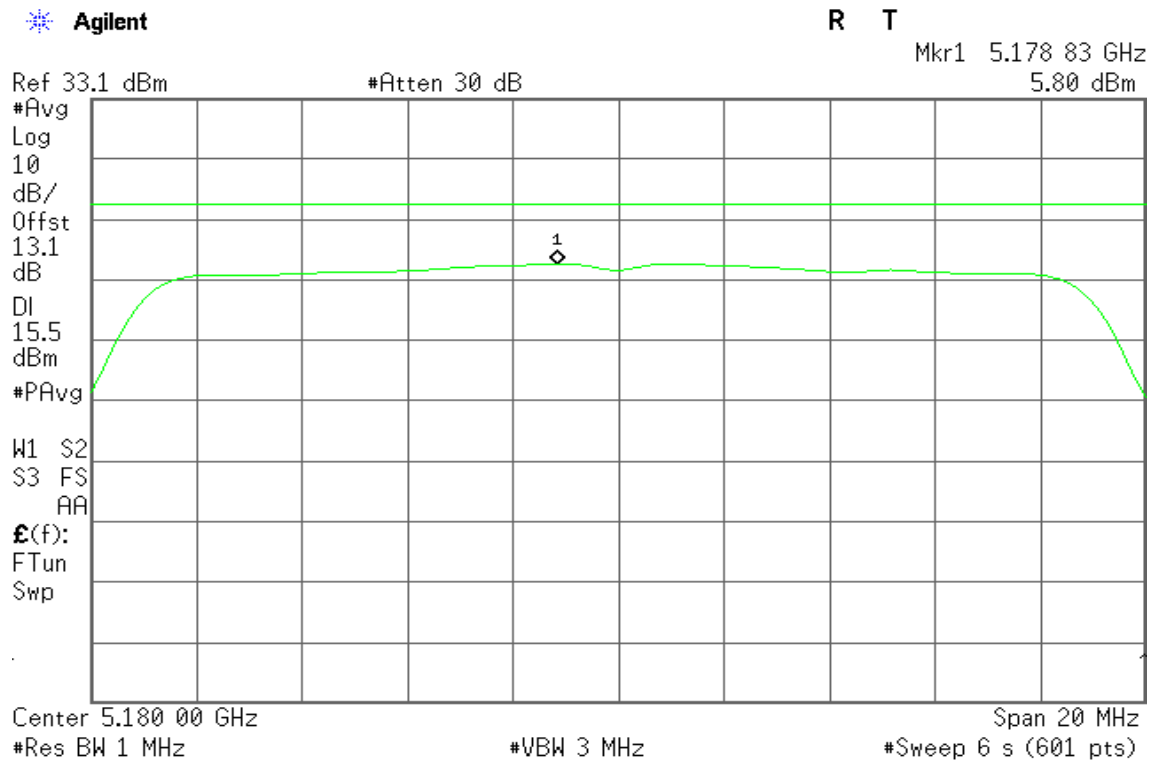
Span 20 MHz

#Sweep 6 s (601 pts)

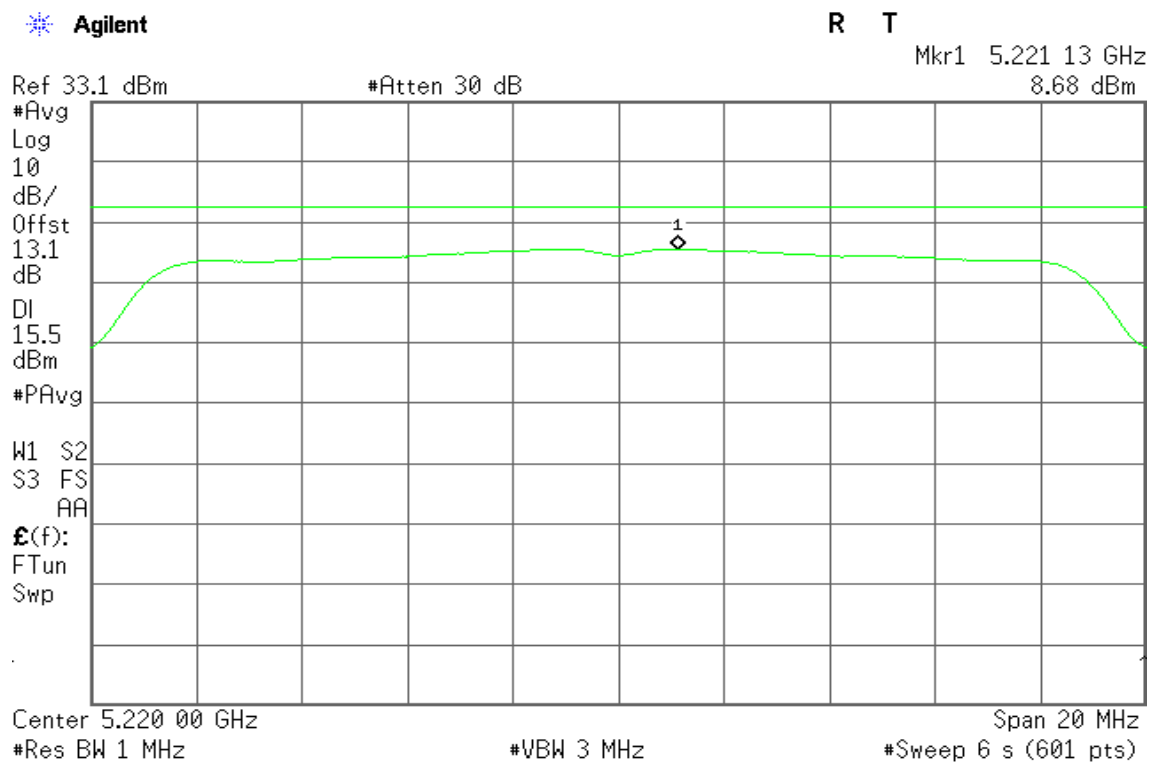


IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 0

CH Low



CH Mid





CH High

Agilent

R T

Mkr1 5.241 00 GHz
4.42 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent

R T

Mkr1 5.178 90 GHz
5.88 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.180 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



CH Mid

Agilent

R T

Mkr1 5.218 83 GHz
8.63 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

.

Center 5.220 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

CH High

Agilent

R T

Mkr1 5.238 87 GHz
4.24 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

15.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

.

Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

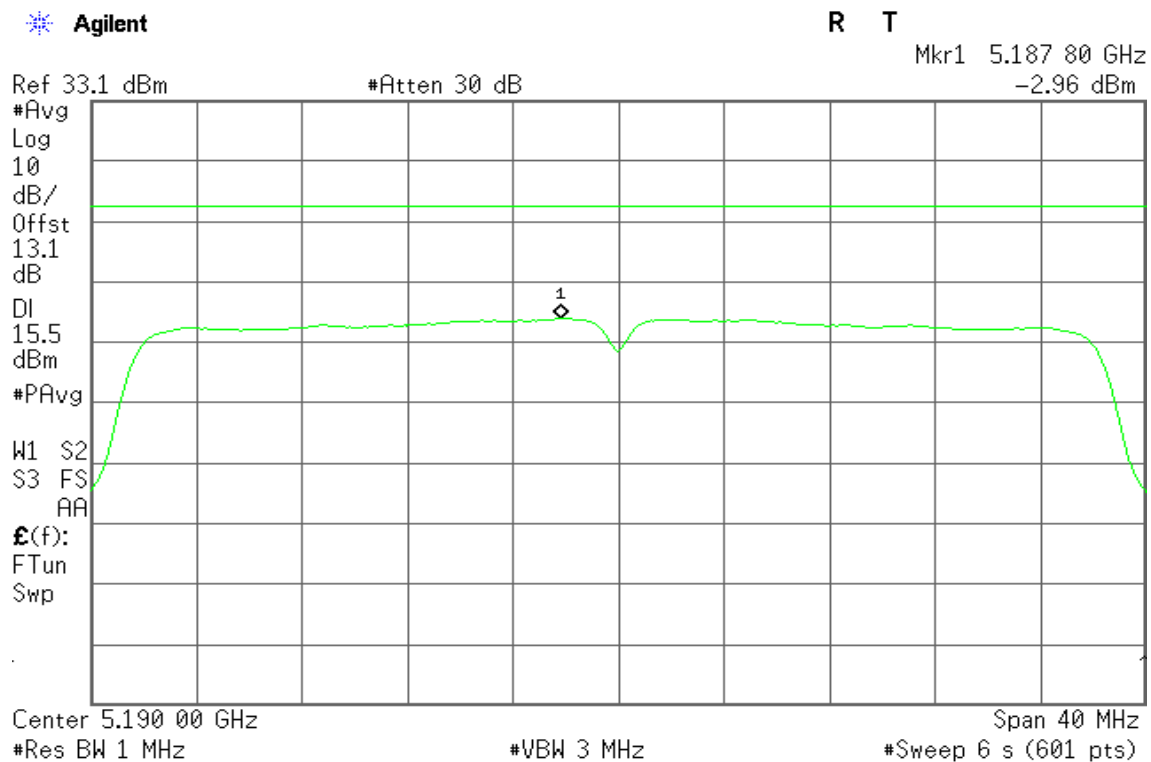
Span 20 MHz

#Sweep 6 s (601 pts)

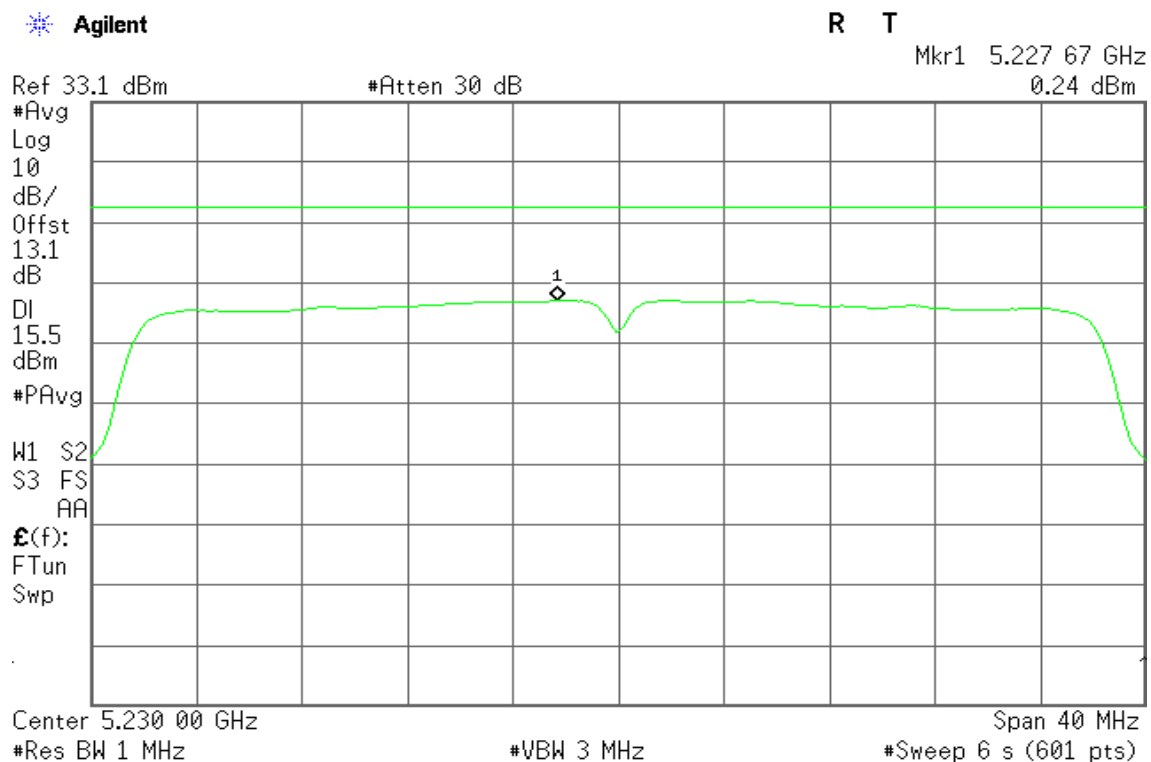


IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 0

CH Low



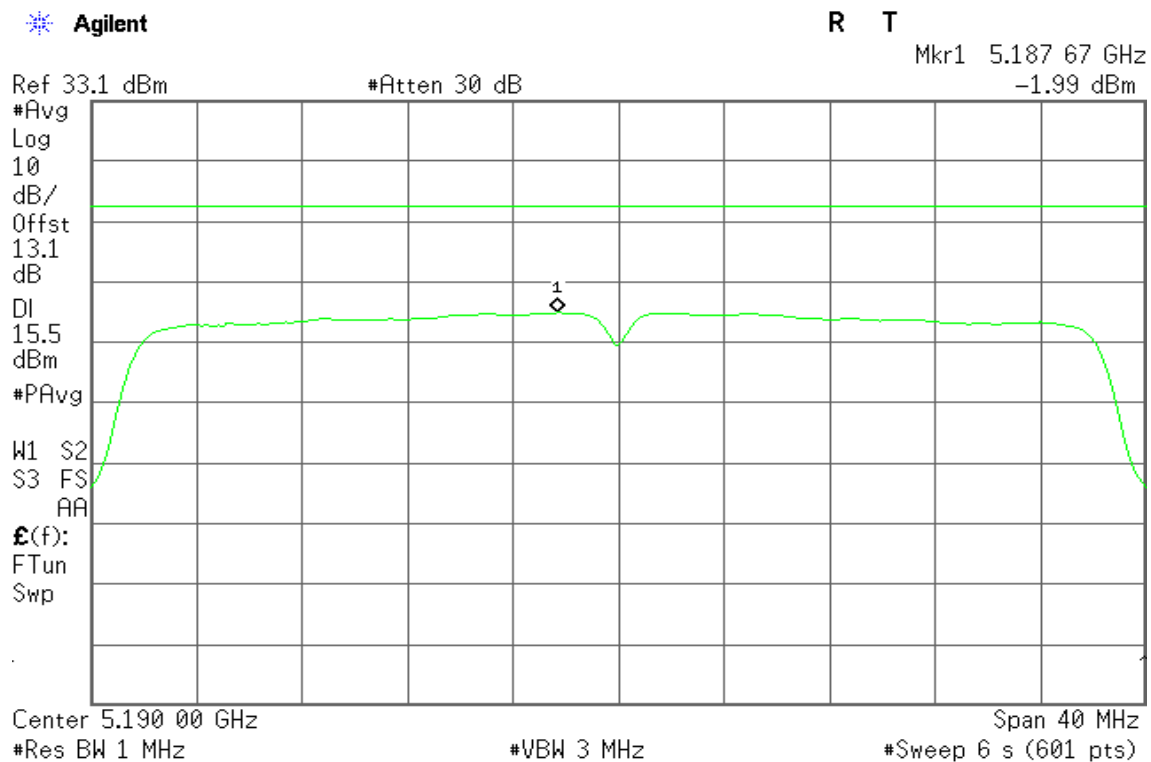
CH High



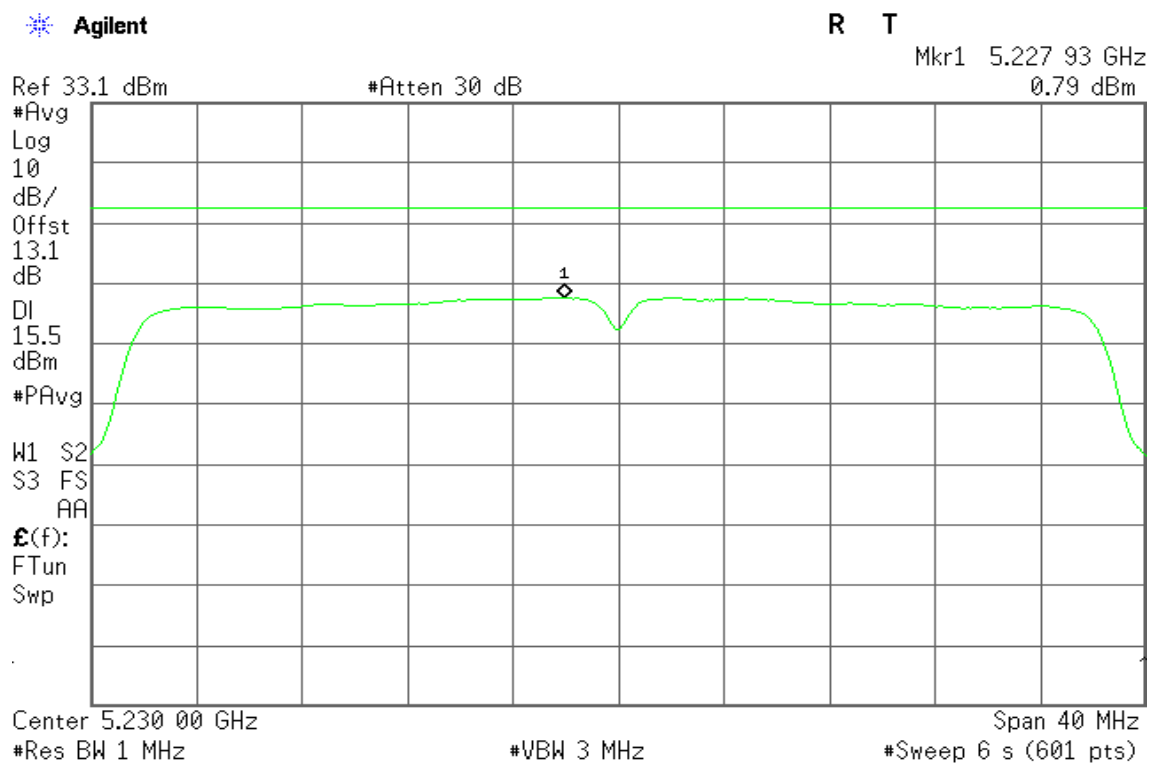


IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 1

CH Low



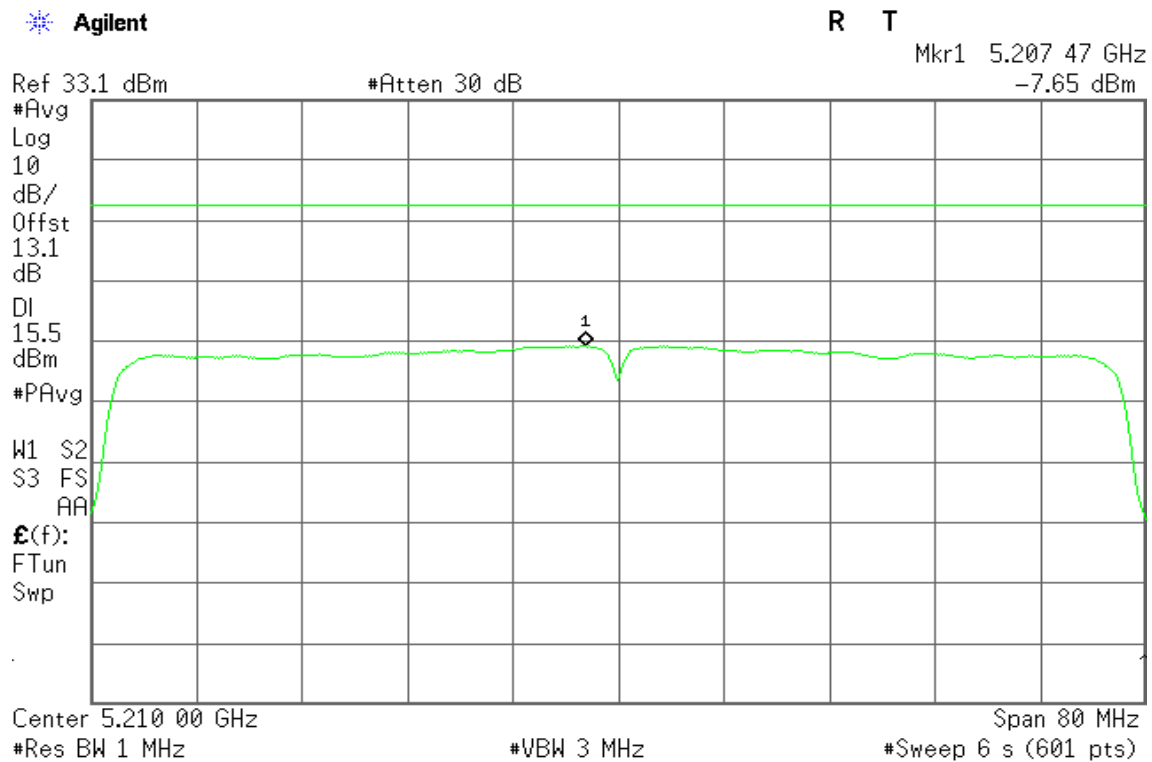
CH High





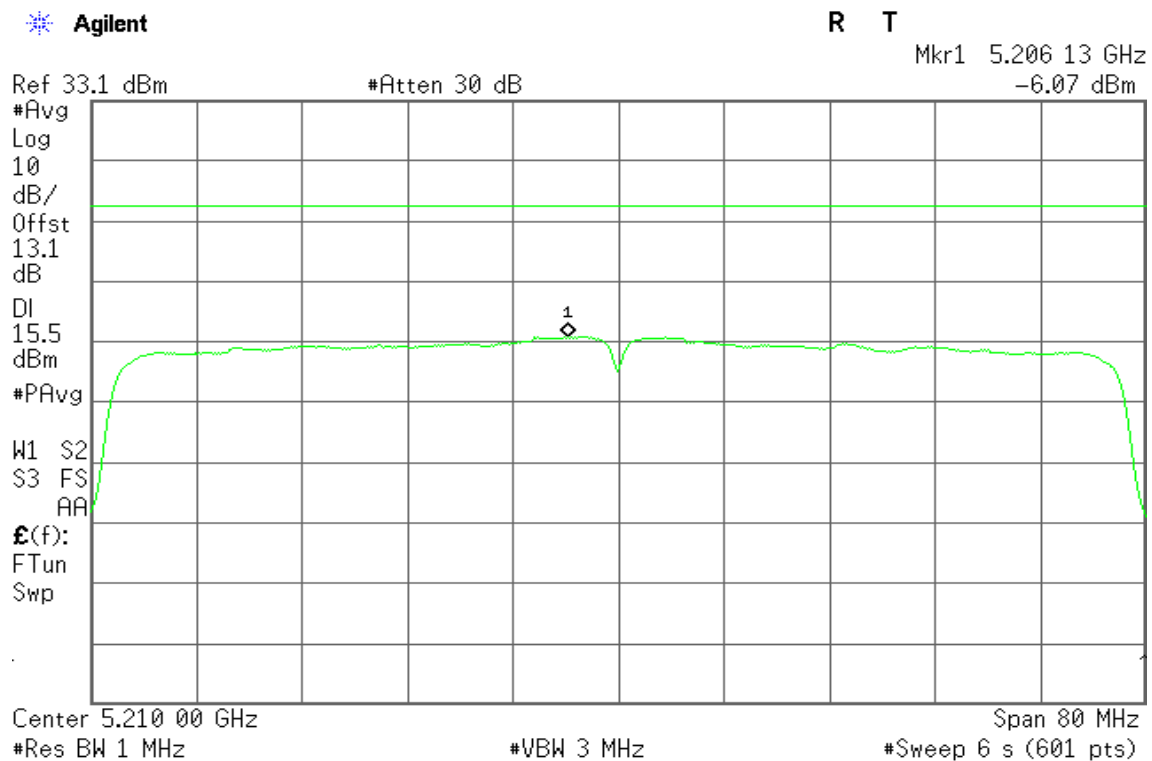
IEEE 802.11ac VHT80 Mode / 5210MHz / Chain 0

CH Mid



IEEE 802.11ac VHT80 Mode / 5210MHz / Chain 1

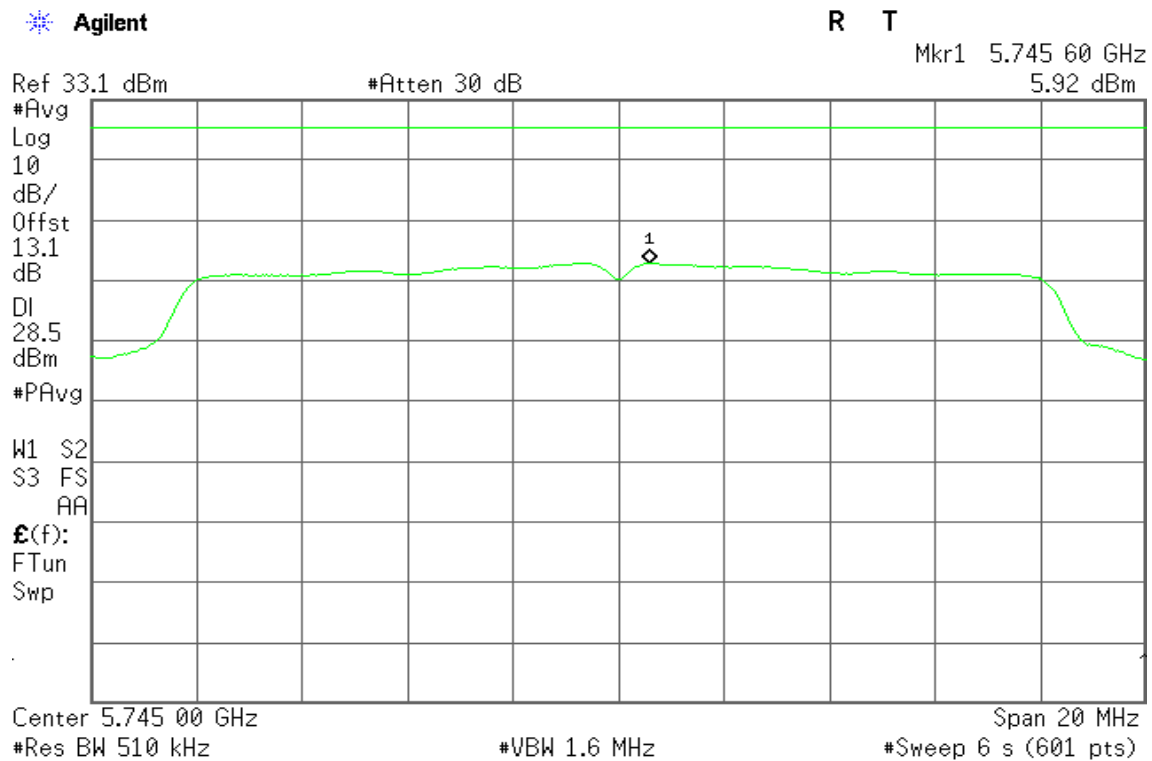
CH Mid



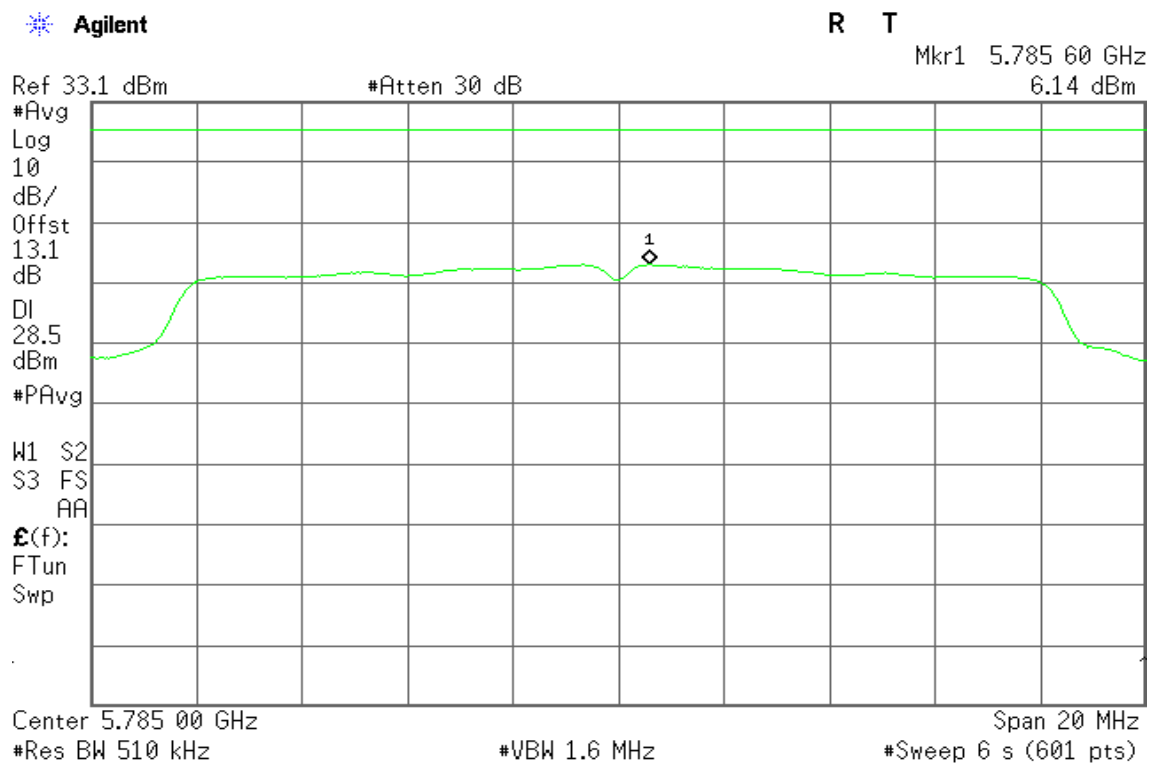


IEEE 802.11a mode / 5745 ~ 5825MHz / Chain 0

CH Low



CH Mid





CH High

Agilent

R T

Mkr1 5.824 33 GHz
0.43 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

28.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.825 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

IEEE 802.11a mode / 5745 ~ 5825MHz / Chain 1

CH Low

Agilent

R T

Mkr1 5.745 67 GHz
6.28 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

28.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.745 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



CH Mid

Agilent

R T

Mkr1 5.784 27 GHz
6.21 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

28.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

.

Center 5.785 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

CH High

Agilent

R T

Mkr1 5.824 37 GHz
1.41 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

28.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

.

Center 5.825 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

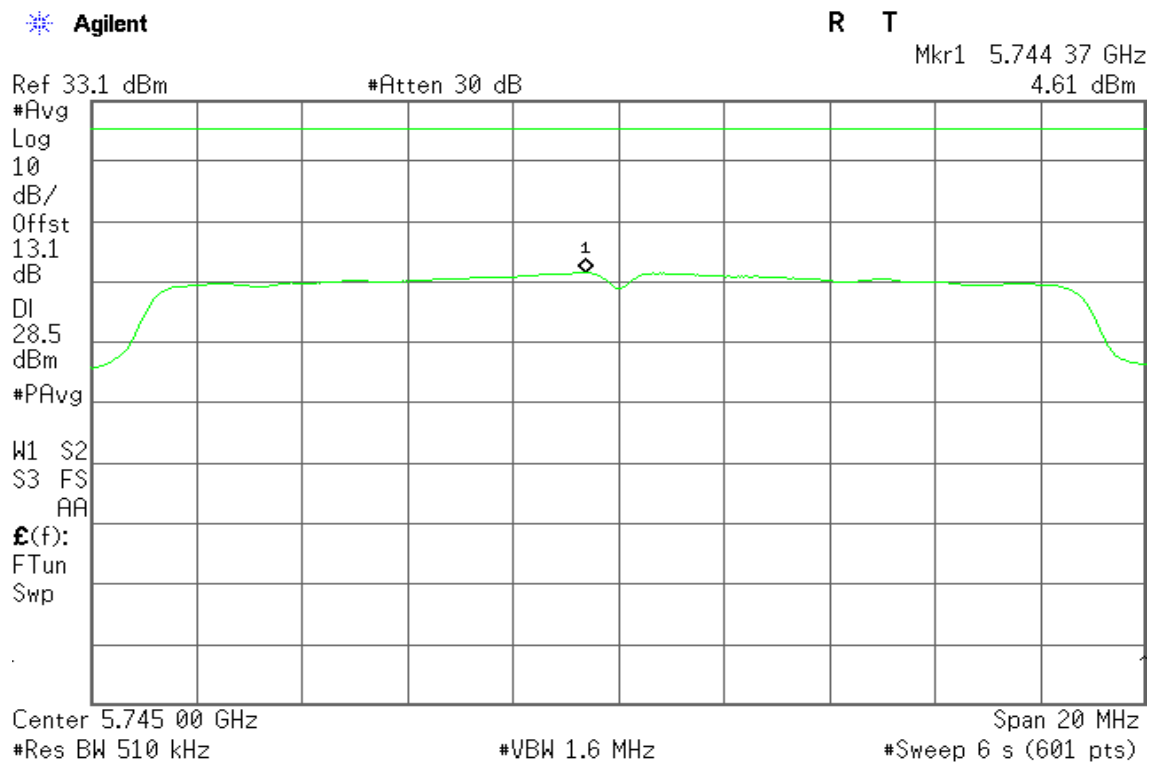
Span 20 MHz

#Sweep 6 s (601 pts)

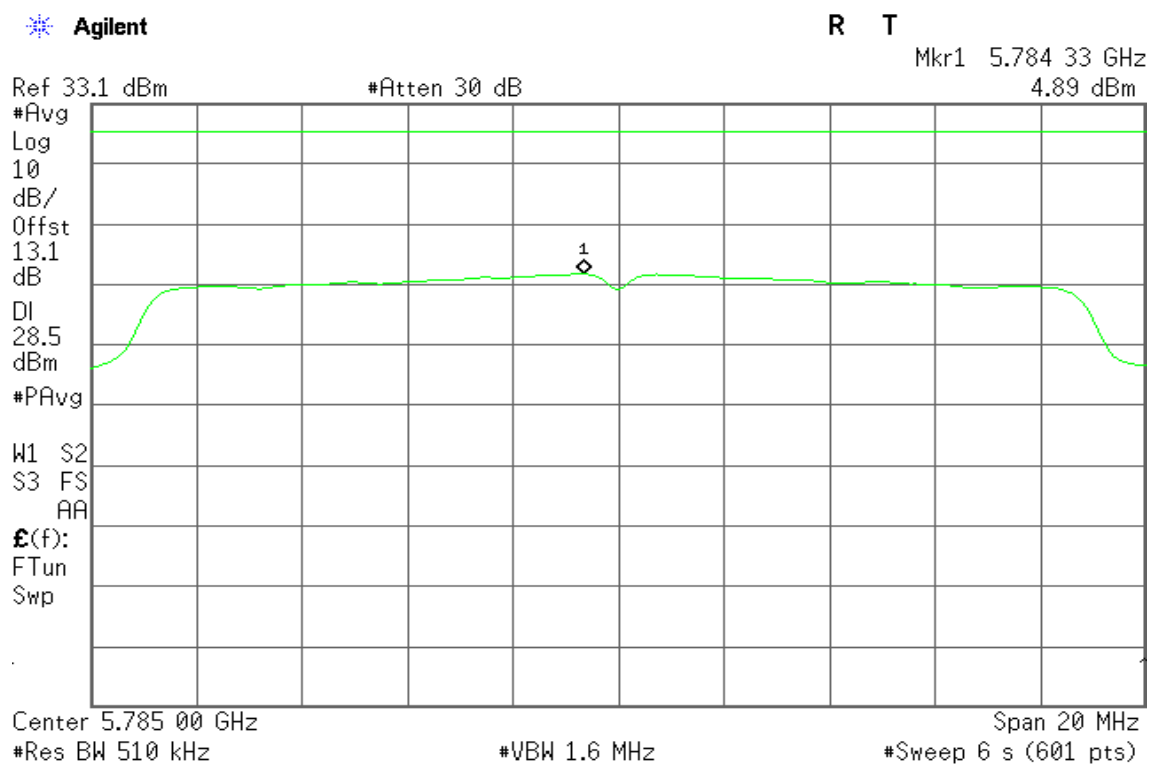


IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / Chain 0

CH Low



CH Mid



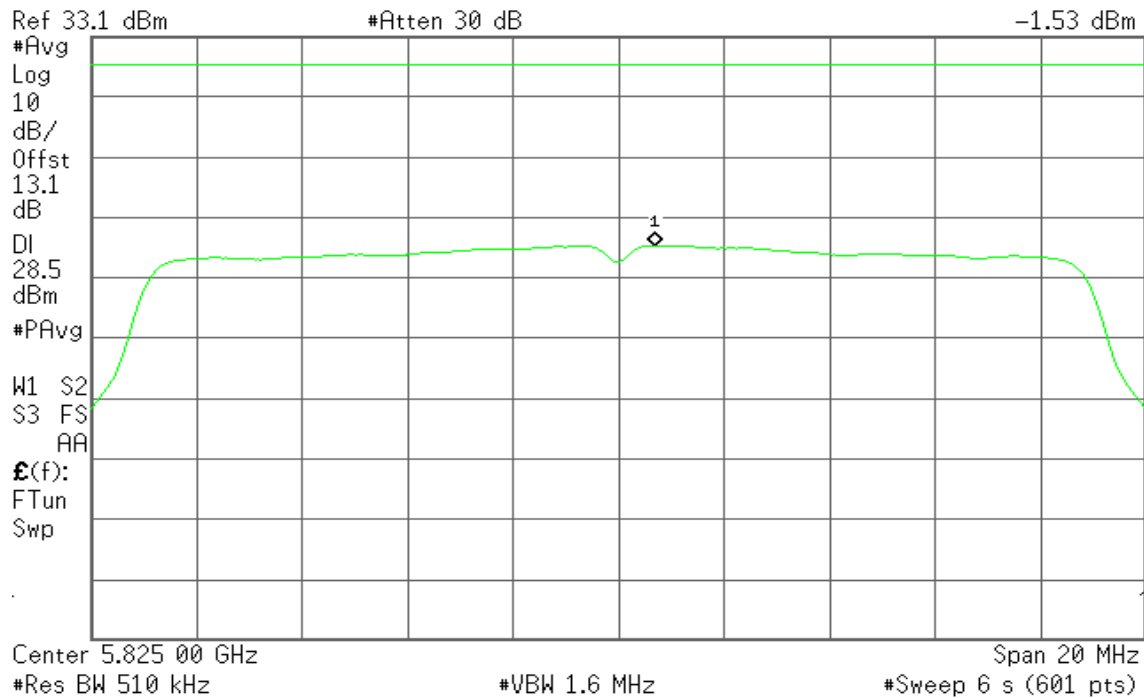


CH High

Agilent

R T

Mkr1 5.825 70 GHz
-1.53 dBm



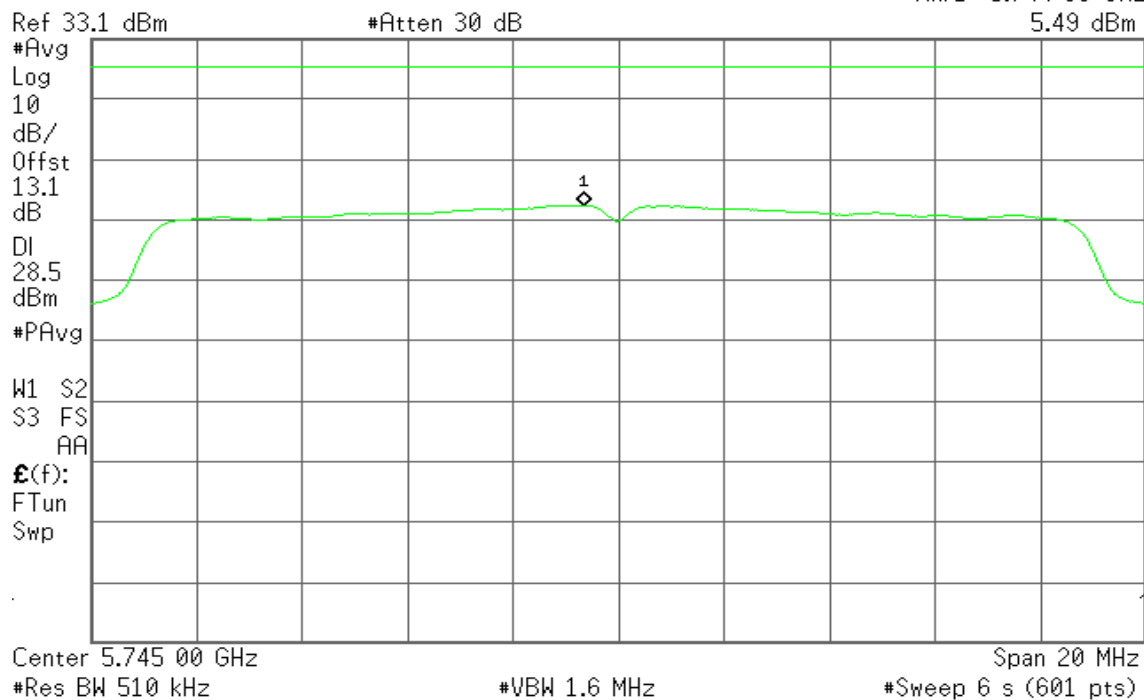
IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / Chain 1

CH Low

Agilent

R T

Mkr1 5.744 33 GHz
5.49 dBm





CH Mid

Agilent

R T

Mkr1 5.784 33 GHz
4.89 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

28.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.785 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

CH High

Agilent

R T

Mkr1 5.825 67 GHz
-0.14 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

28.5

dBm

#PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.825 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

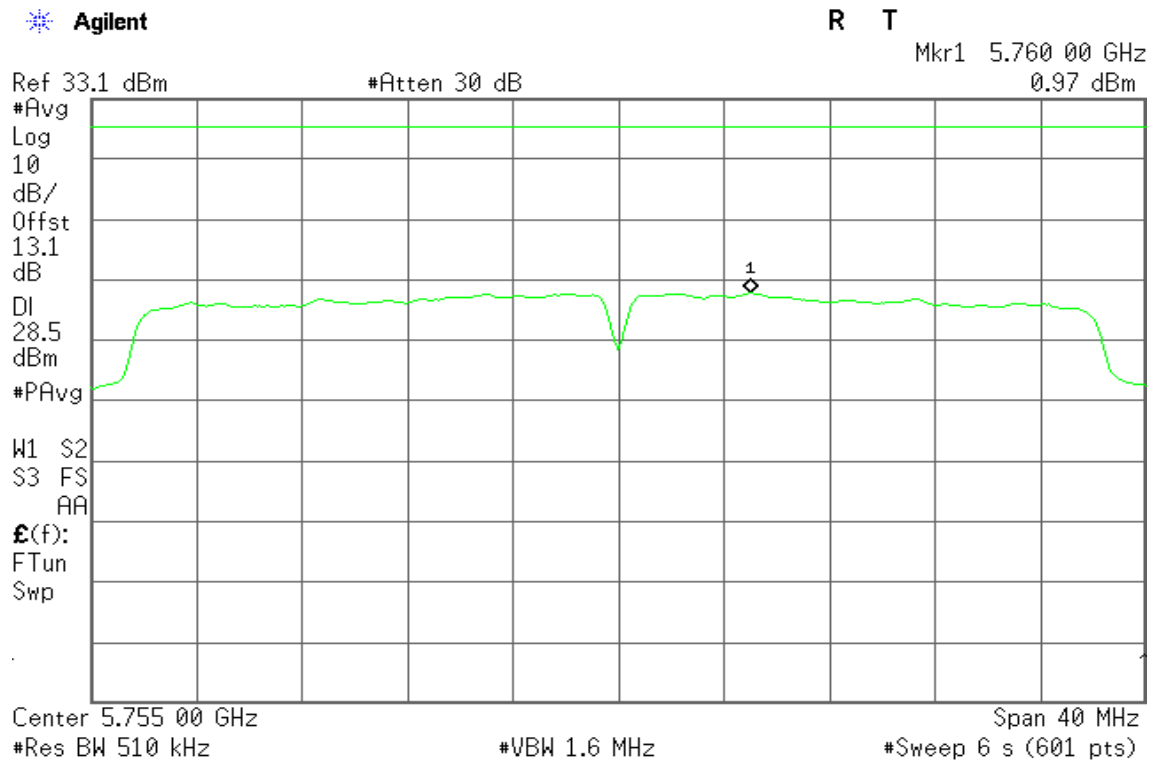
Span 20 MHz

#Sweep 6 s (601 pts)

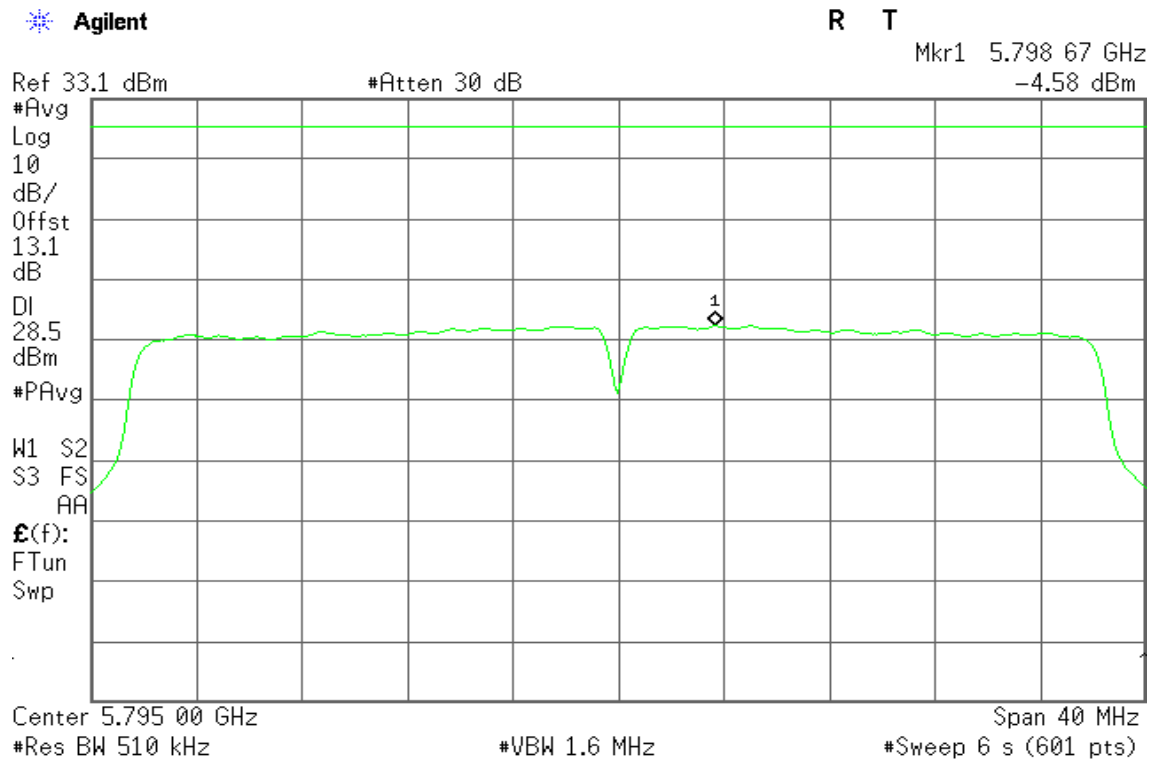


IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz / Chain 0

CH Low



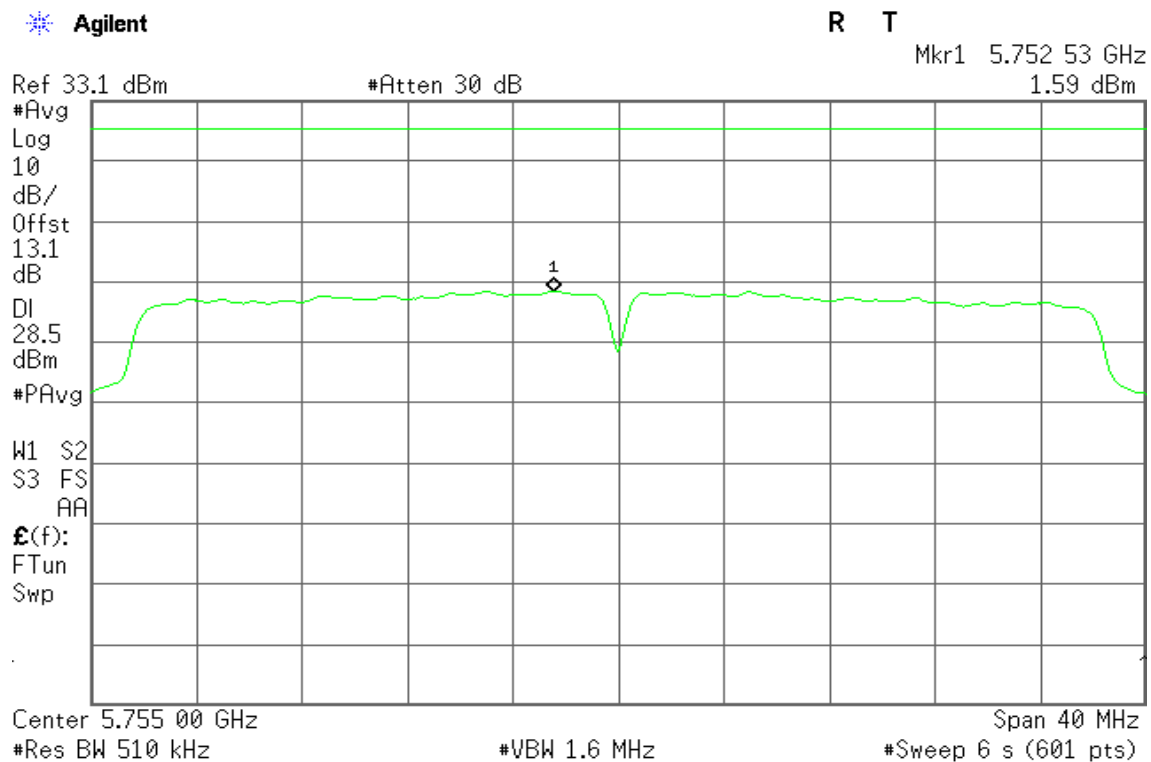
CH High



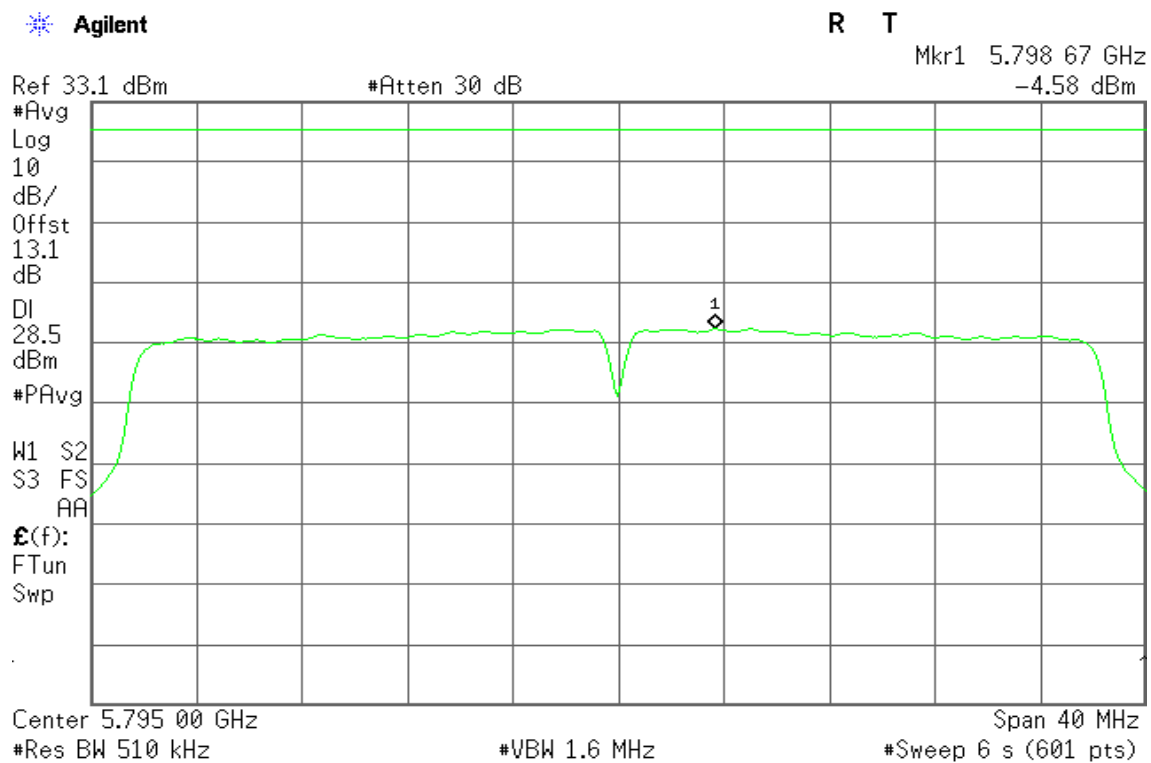


IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz / Chain 1

CH Low



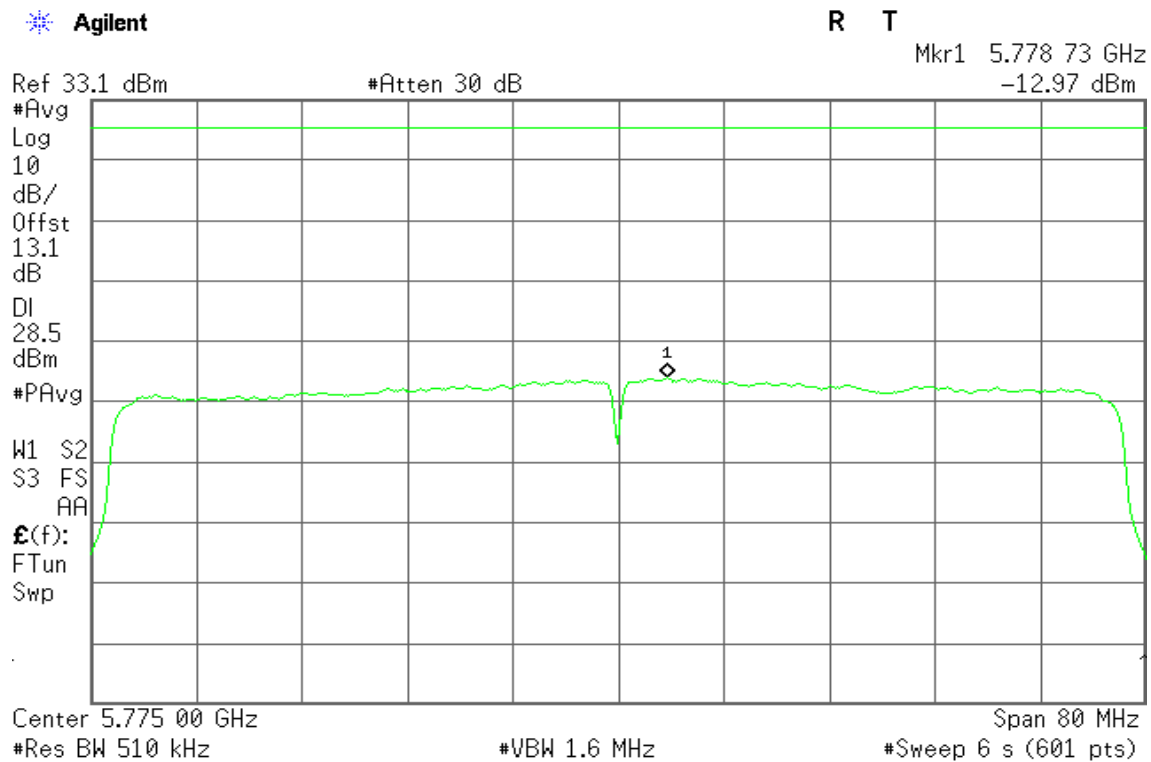
CH High





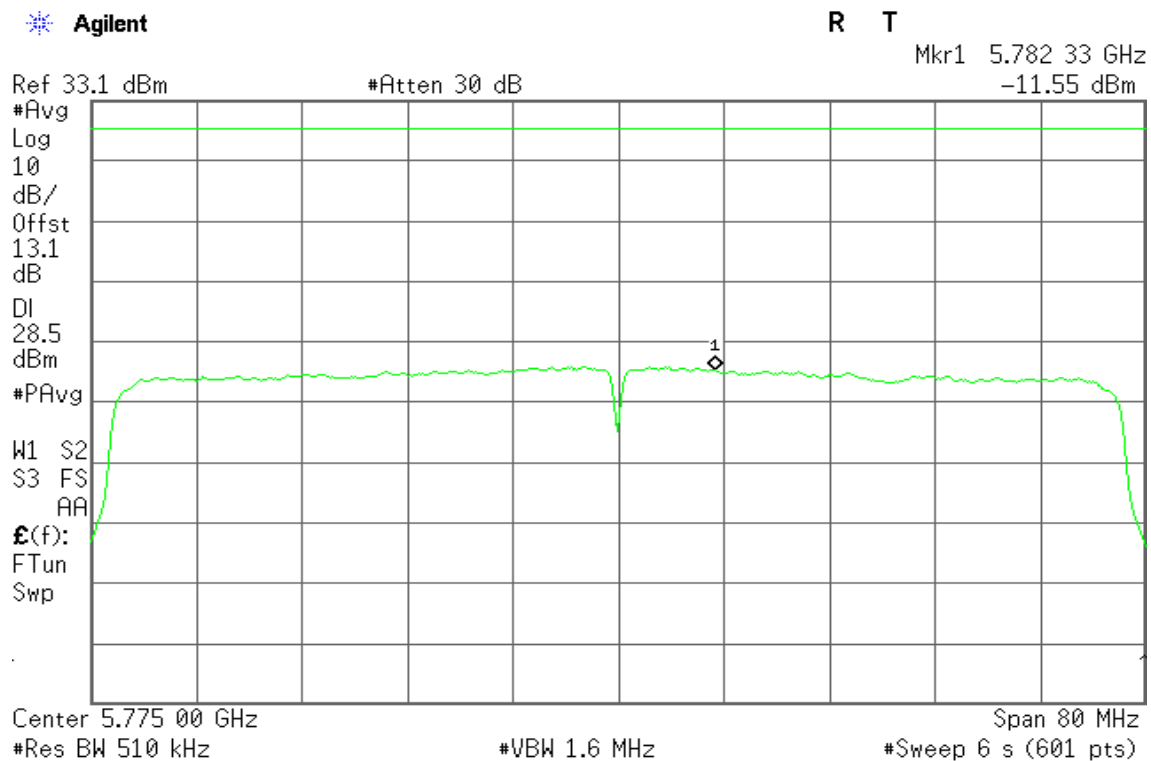
IEEE 802.11ac VHT80 Mode / 5775MHz / Chain 0

CH Mid



IEEE 802.11ac VHT80 Mode / 5775MHz / Chain 1

CH Mid





7.5 RADIATED UNDESIRABLE EMISSION

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

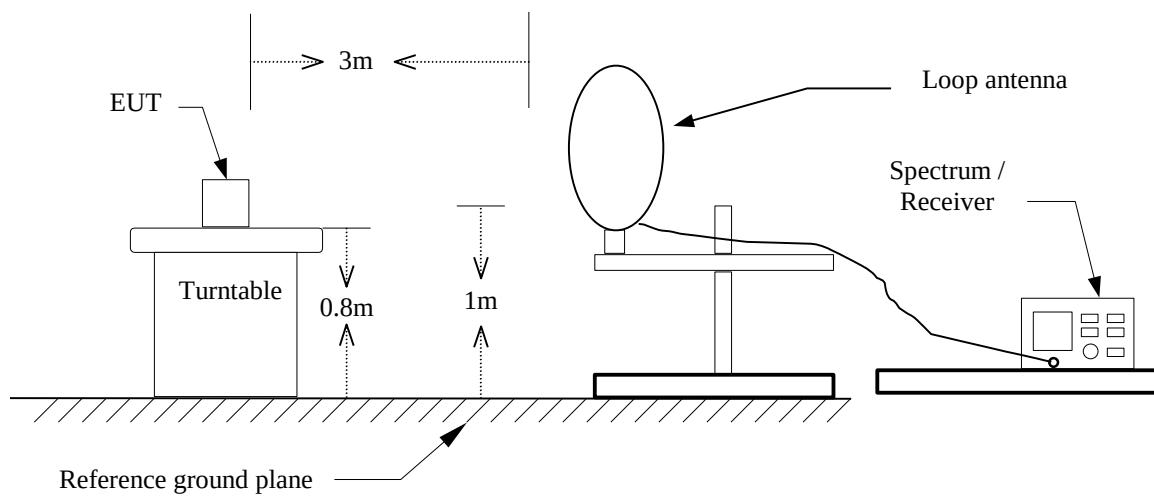
2. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
0.009 - 0.490	2400/F(kHz) +80	20LOG((2400/F(kHz))+80)
0.490 - 1.705	24000/F(kHz) +40	20LOG((24000/F(kHz))+40)
1.705 – 30.0	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

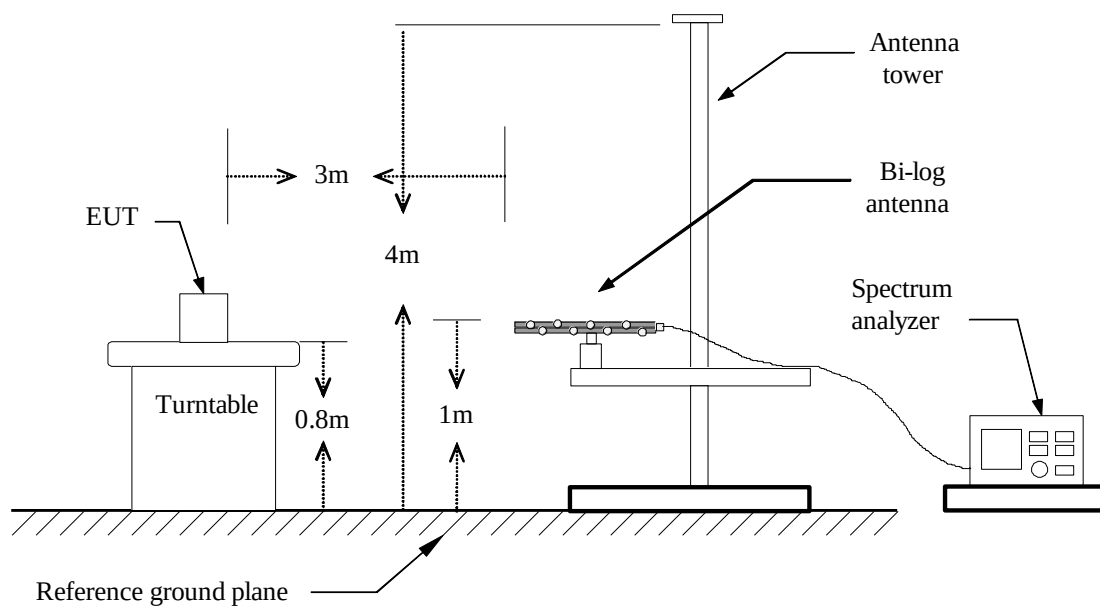


Test Configuration

9kHz ~ 30MHz

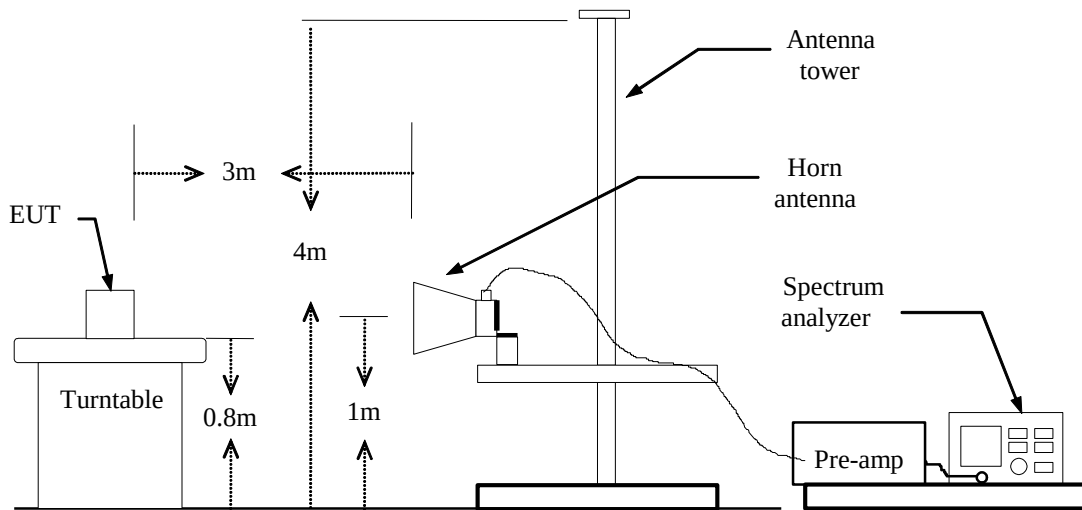


30MHz ~ 1GHz





Above 1 GHz





TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz,
if duty cycle $\geq 98\%$, VBW=10Hz.
if duty cycle $< 98\%$ VBW=1/T.

IEEE 802.11a mode: = 88%, VBW=750Hz

IEEE 802.11n HT 20 MHz mode: = 78%, VBW=1.5KHz

IEEE 802.11n HT 40 MHz mode: = 65%, VBW=3KHz

IEEE 802.11ac VHT 80 MHz mode: = 78%, VBW=1.5KHz

7. Repeat above procedures until the measurements for all frequencies are complete.

**TEST RESULTS****Below 1 GHz****Operation Mode:** Normal Link**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)	Ant.Pol. (H/V)
102.7500	46.42	-20.43	25.99	43.50	-17.51	Peak	V
180.3500	44.41	-19.32	25.09	43.50	-18.41	Peak	V
359.8000	46.45	-14.96	31.49	46.00	-14.51	Peak	V
551.8600	40.20	-10.98	29.22	46.00	-16.78	Peak	V
600.3600	35.36	-10.50	24.86	46.00	-21.14	Peak	V
797.2700	34.55	-7.41	27.14	46.00	-18.86	Peak	V
121.1800	44.23	-17.39	26.84	43.50	-16.66	Peak	H
167.7400	47.73	-18.69	29.04	43.50	-14.46	Peak	H
359.8000	52.00	-14.96	37.04	46.00	-8.96	Peak	H
503.3600	40.70	-11.77	28.93	46.00	-17.07	Peak	H
695.4200	39.89	-8.84	31.05	46.00	-14.95	Peak	H
798.2400	42.96	-7.40	35.56	46.00	-10.44	Peak	H

Remark:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

**Above 1 GHz****Operation Mode:** Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Low **Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	55.44	-3.37	52.07	74.00	-21.93	peak	V
10360.000	35.71	16.52	52.23	74.00	-21.77	peak	V
N/A							
2456.000	55.41	-3.40	52.01	74.00	-21.99	peak	H
10360.000	35.51	16.52	52.03	74.00	-21.97	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Mid
Temperature: 27°C
Humidity: 53% RH

Test Date: June 10, 2015
Tested by: Jason Lu
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3016.000	53.48	-2.07	51.41	74.00	-22.59	peak	V
10440.000	34.40	16.89	51.29	74.00	-22.71	peak	V
N/A							
2456.000	54.73	-3.40	51.33	74.00	-22.67	peak	H
10440.000	45.66	16.89	62.55	74.00	-11.45	peak	H
10440.000	33.79	16.89	50.68	54.00	-3.32	AVG	H
15670.000	45.50	19.15	64.65	74.00	-9.35	peak	H
15670.000	31.64	19.15	50.79	54.00	-3.21	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11a mode / 5180 ~ 5240MHz /
CH High**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2456.000	55.48	-3.40	52.08	74.00	-21.92	peak	V
10480.000	32.97	17.07	50.04	74.00	-23.96	peak	V
N/A							
2463.000	54.66	-3.37	51.29	74.00	-22.71	peak	H
10480.000	42.82	17.07	59.89	74.00	-14.11	peak	H
10480.000	33.39	17.07	50.46	54.00	-3.54	AVG	H
15720.000	47.76	19.19	66.95	74.00	-7.05	peak	H
15720.000	31.59	19.19	50.78	54.00	-3.22	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / CH Low**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2274.000	53.31	-4.33	48.98	74.00	-25.02	peak	V
10370.000	35.44	16.57	52.01	74.00	-21.99	peak	V
N/A							
2701.000	53.99	-2.71	51.28	74.00	-22.72	peak	H
10360.000	34.57	16.52	51.09	74.00	-22.91	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / CH Mid

Test Date: June 10, 2015

Temperature: 27°C

Tested by: Jason Lu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1658.000	55.77	-6.69	49.08	74.00	-24.92	peak	V
10440.000	34.09	16.89	50.98	74.00	-23.02	peak	V
15660.000	40.69	19.14	59.83	74.00	-14.17	peak	V
15660.000	31.35	19.14	50.49	54.00	-3.51	AVG	V
N/A							
2463.000	55.03	-3.37	51.66	74.00	-22.34	peak	H
10440.000	41.98	16.89	58.87	74.00	-15.13	peak	H
10440.000	32.59	16.89	49.48	54.00	-4.52	AVG	H
15660.000	45.00	19.14	64.14	74.00	-9.86	peak	H
15660.000	31.22	19.14	50.36	54.00	-3.64	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / CH High**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1651.000	57.60	-6.73	50.87	74.00	-23.13	peak	V
10470.000	34.67	17.02	51.69	74.00	-22.31	peak	V
N/A							
2869.000	53.81	-2.37	51.44	74.00	-22.56	peak	H
10480.000	42.74	17.07	59.81	74.00	-14.19	peak	H
10480.000	30.23	17.07	47.30	54.00	-6.70	AVG	H
15720.000	46.24	19.19	65.43	74.00	-8.57	peak	H
15720.000	31.57	19.19	50.76	54.00	-3.24	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / CH Low**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	54.64	-3.37	51.27	74.00	-22.73	peak	V
N/A							
2463.000	54.31	-3.37	50.94	74.00	-23.06	peak	H
10380.000	35.33	16.62	51.95	74.00	-22.05	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / CH High

Test Date: June 10, 2015

Temperature: 27°C

Tested by: Jason Lu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	54.98	-3.37	51.61	74.00	-22.39	peak	V
10460.000	38.02	16.98	55.00	74.00	-19.00	peak	V
10460.000	26.96	16.98	43.94	54.00	-10.06	AVG	V
N/A							
2785.000	54.22	-2.54	51.68	74.00	-22.32	peak	H
10460.000	41.06	16.98	58.04	74.00	-15.96	peak	H
10460.000	29.83	16.98	46.81	54.00	-7.19	AVG	H
15690.000	44.79	19.17	63.96	74.00	-10.04	peak	H
15690.000	31.04	19.17	50.21	54.00	-3.79	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11ac VHT80 Mode / 5210MHz / CH Mid **Test Date:** June 10, 2015
Temperature: 27°C **Tested by:** Jason Lu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1658.000	58.23	-6.69	51.54	74.00	-22.46	peak	V
N/A							
2456.000	54.81	-3.40	51.41	74.00	-22.59	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11a mode / 5745 ~ 5825MHz / CH Low
Temperature: 27°C
Humidity: 53% RH

Test Date: June 10, 2015
Tested by: Jason Lu
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	55.35	-3.37	51.98	74.00	-22.02	peak	V
11490.000	35.07	16.78	51.85	74.00	-22.15	peak	V
N/A							
2456.000	55.69	-3.40	52.29	74.00	-21.71	peak	H
11490.000	42.17	16.78	58.95	74.00	-15.05	peak	H
11490.000	33.80	16.78	50.58	54.00	-3.42	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11a mode / 5745 ~ 5825MHz / CH Mid
Temperature: 27°C
Humidity: 53% RH

Test Date: June 10, 2015
Tested by: Jason Lu
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	55.13	-3.37	51.76	74.00	-22.24	peak	V
11580.000	33.64	16.85	50.49	74.00	-23.51	peak	V
N/A							
2575.000	54.34	-2.97	51.37	74.00	-22.63	peak	H
11570.000	44.40	16.84	61.24	74.00	-12.76	peak	H
11570.000	33.24	16.84	50.08	54.00	-3.92	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11a mode / 5745 ~ 5825MHz /
CH High**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2596.000	53.50	-2.93	50.57	74.00	-23.43	peak	V
11650.000	34.88	16.91	51.79	74.00	-22.21	peak	V
N/A							
2463.000	55.58	-3.37	52.21	74.00	-21.79	peak	H
11650.000	35.10	16.91	52.01	74.00	-21.99	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / CH Low**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1658.000	56.01	-6.69	49.32	74.00	-24.68	peak	V
11490.000	35.20	16.78	51.98	74.00	-22.02	peak	V
N/A							
2463.000	55.92	-3.37	52.55	74.00	-21.45	peak	H
11490.000	42.38	16.78	59.16	74.00	-14.84	peak	H
11490.000	33.46	16.78	50.24	54.00	-3.76	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / CH Mid

Test Date: June 10, 2015

Temperature: 27°C

Tested by: Jason Lu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2680.000	54.18	-2.76	51.42	74.00	-22.58	peak	V
11580.000	33.92	16.85	50.77	74.00	-23.23	peak	V
N/A							
2792.000	53.51	-2.53	50.98	74.00	-23.02	peak	H
11570.000	44.81	16.84	61.65	74.00	-12.35	peak	H
11570.000	32.99	16.84	49.83	54.00	-4.17	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz / CH High**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	57.15	-3.37	53.78	74.00	-20.22	peak	V
N/A							
2463.000	54.90	-3.37	51.53	74.00	-22.47	peak	H
11650.000	34.90	16.91	51.81	74.00	-22.19	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz / CH Low**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	56.39	-3.37	53.02	74.00	-20.98	peak	V
11520.000	38.21	16.80	55.01	74.00	-18.99	peak	V
11520.000	26.45	16.80	43.25	54.00	-10.75	AVG	V
N/A							
2673.000	53.75	-2.77	50.98	74.00	-23.02	peak	H
11510.000	42.72	16.79	59.51	74.00	-14.49	peak	H
11510.000	30.59	16.79	47.38	54.00	-6.62	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** Tx / IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz / CH High**Test Date:** June 10, 2015**Temperature:** 27°C**Tested by:** Jason Lu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	55.10	-3.37	51.73	74.00	-22.27	peak	V
N/A							
2876.000	54.14	-2.36	51.78	74.00	-22.22	peak	H
11590.000	41.90	16.86	58.76	74.00	-15.24	peak	H
11590.000	32.81	16.86	49.67	54.00	-4.33	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: Tx / IEEE 802.11ac VHT80 Mode / 5775MHz / CH Mid
Temperature: 27°C
Humidity: 53% RH

Test Date: June 10, 2015
Tested by: Jason Lu
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2463.000	55.84	-3.37	52.47	74.00	-21.53	peak	V
N/A							
2729.000	53.88	-2.66	51.22	74.00	-22.78	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.



7.6 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

**TEST RESULTS**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

Operation Mode: Normal Link **Test Date:** June 10, 2015
Temperature: 24°C **Tested by:** Sehni Hu
Humidity: 50% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1539	28.45	16.27	9.61	38.06	25.88	65.78	55.79	-27.72	-29.91	L1
0.2100	22.86	13.16	9.62	32.48	22.78	63.20	53.21	-30.72	-30.43	L1
0.5820	18.22	11.92	9.63	27.85	21.55	56.00	46.00	-28.15	-24.45	L1
0.7180	17.30	10.92	9.64	26.94	20.56	56.00	46.00	-29.06	-25.44	L1
1.0940	19.46	11.93	9.65	29.11	21.58	56.00	46.00	-26.89	-24.42	L1
25.3420	17.65	10.07	9.95	27.60	20.02	60.00	50.00	-32.40	-29.98	L1
0.1540	29.45	13.52	9.66	39.11	23.18	65.78	55.78	-26.67	-32.60	L2
0.1820	25.68	10.31	9.67	35.35	19.98	64.39	54.39	-29.04	-34.41	L2
0.4140	21.49	18.36	9.67	31.16	28.03	57.57	47.57	-26.41	-19.54	L2
0.5060	22.60	11.39	9.67	32.27	21.06	56.00	46.00	-23.73	-24.94	L2
0.6860	18.78	10.55	9.68	28.46	20.23	56.00	46.00	-27.54	-25.77	L2
21.8260	18.21	12.57	10.02	28.23	22.59	60.00	50.00	-31.77	-27.41	L2

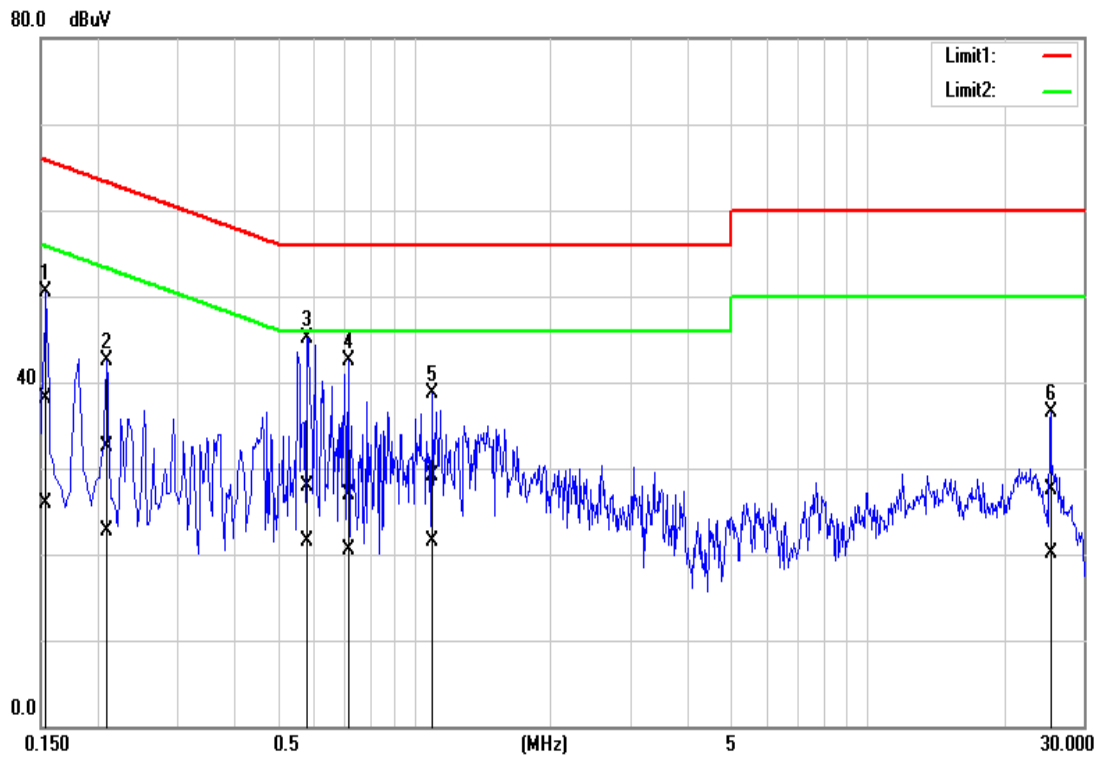
Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

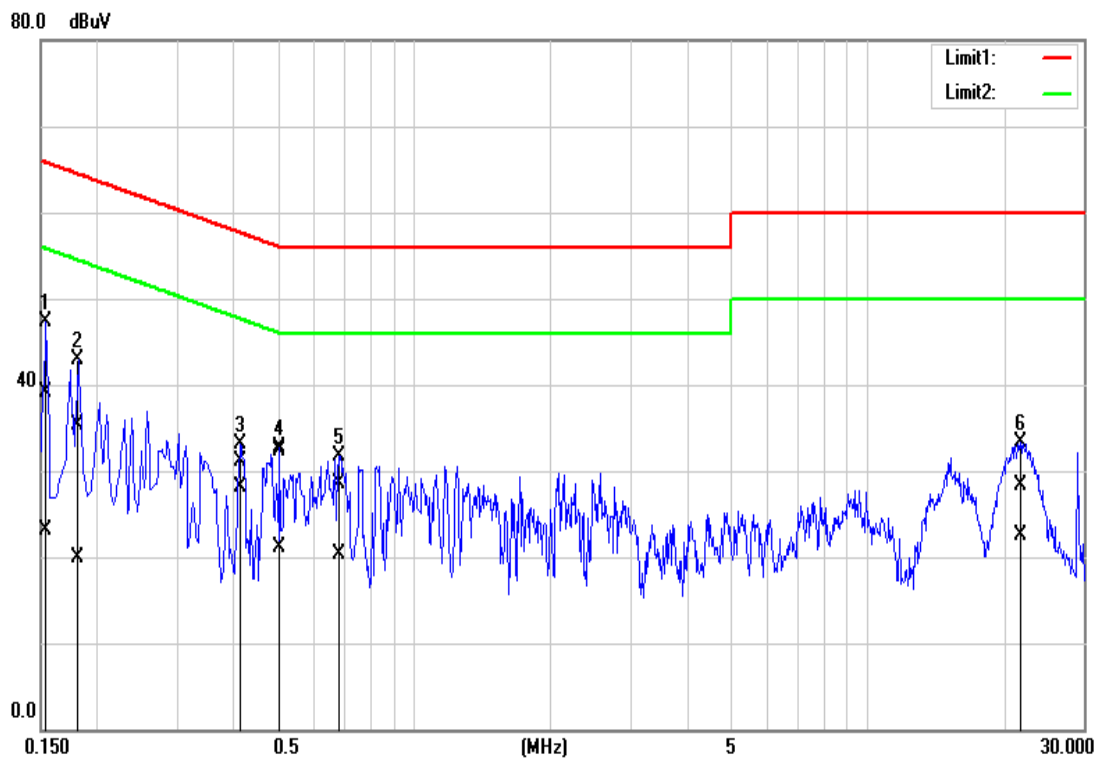


Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)



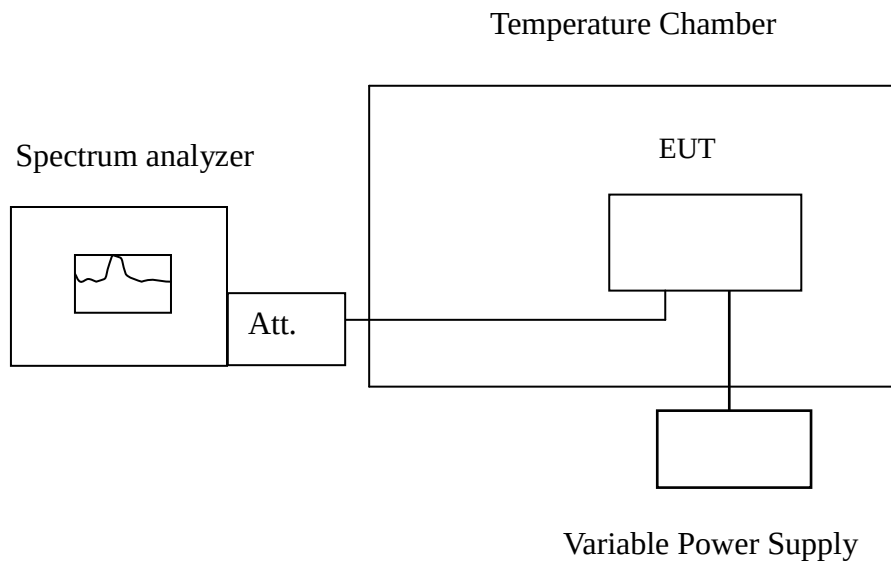


7.7 FREQUENCY STABILITY

LIMIT

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

Test Configuration



Remark: Measurement setup for testing on Antenna connector



TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST RESULTS

No non-compliance noted.

IEEE 802.11a mode / 5180 ~ 5240 MHz / Chain 0:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5180.010262	5150~5250	Pass
40	110	5180.004819	5150~5250	Pass
30	110	5179.994599	5150~5250	Pass
20	110	5179.998449	5150~5250	Pass
10	110	5179.990700	5150~5250	Pass
0	110	5180.002601	5150~5250	Pass
-10	110	5179.991130	5150~5250	Pass
-20	110	5179.995339	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5179.993072	5150~5250	Pass
	110	5180.010771	5150~5250	Pass
	126.5	5179.995781	5150~5250	Pass

**CH Mid**

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5220.010922	5150~5250	Pass
40	110	5220.003257	5150~5250	Pass
30	110	5219.990591	5150~5250	Pass
20	110	5219.997317	5150~5250	Pass
10	110	5219.991767	5150~5250	Pass
0	110	5220.008206	5150~5250	Pass
-10	110	5219.993519	5150~5250	Pass
-20	110	5220.008605	5150~5250	Pass

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5219.997783	5150~5250	Pass
	110	5220.007431	5150~5250	Pass
	126.5	5219.998563	5150~5250	Pass

**CH High**

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5240.008365	5150~5250	Pass
40	110	5239.991132	5150~5250	Pass
30	110	5239.991015	5150~5250	Pass
20	110	5239.997893	5150~5250	Pass
10	110	5239.996002	5150~5250	Pass
0	110	5239.997861	5150~5250	Pass
-10	110	5239.999318	5150~5250	Pass
-20	110	5239.991273	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5240.004052	5150~5250	Pass
	110	5239.991657	5150~5250	Pass
	126.5	5239.995626	5150~5250	Pass

**IEEE 802.11a mode / 5180 ~ 5240 MHz / Chain 1:****CH Low**

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5180.005249	5150~5250	Pass
40	110	5180.000203	5150~5250	Pass
30	110	5179.997077	5150~5250	Pass
20	110	5180.002670	5150~5250	Pass
10	110	5179.995443	5150~5250	Pass
0	110	5179.998337	5150~5250	Pass
-10	110	5180.010558	5150~5250	Pass
-20	110	5180.002544	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5180.007833	5150~5250	Pass
	110	5180.004421	5150~5250	Pass
	126.5	5180.007216	5150~5250	Pass

**CH Mid**

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5220.010525	5150~5250	Pass
40	110	5219.994360	5150~5250	Pass
30	110	5219.996437	5150~5250	Pass
20	110	5220.003631	5150~5250	Pass
10	110	5219.996536	5150~5250	Pass
0	110	5220.006560	5150~5250	Pass
-10	110	5219.991689	5150~5250	Pass
-20	110	5219.990226	5150~5250	Pass

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5219.999244	5150~5250	Pass
	110	5220.001091	5150~5250	Pass
	126.5	5219.994755	5150~5250	Pass

**CH High**

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5239.995551	5150~5250	Pass
40	110	5239.995422	5150~5250	Pass
30	110	5239.999299	5150~5250	Pass
20	110	5240.002240	5150~5250	Pass
10	110	5239.996782	5150~5250	Pass
0	110	5240.005455	5150~5250	Pass
-10	110	5240.010460	5150~5250	Pass
-20	110	5240.005726	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5240.007564	5150~5250	Pass
	110	5239.996083	5150~5250	Pass
	126.5	5239.994461	5150~5250	Pass

**IEEE 802.11n HT 20 mode / 5180 ~ 5240 MHz / Chain 0:****CH Low**

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5179.992995	5150~5250	Pass
40	110	5180.001959	5150~5250	Pass
30	110	5180.002708	5150~5250	Pass
20	110	5180.000062	5150~5250	Pass
10	110	5180.007776	5150~5250	Pass
0	110	5180.006101	5150~5250	Pass
-10	110	5180.003511	5150~5250	Pass
-20	110	5179.998902	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5180.003217	5150~5250	Pass
	110	5180.007209	5150~5250	Pass
	126.5	5179.992342	5150~5250	Pass

**CH Mid**

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5219.997827	5150~5250	Pass
40	110	5219.995749	5150~5250	Pass
30	110	5220.002038	5150~5250	Pass
20	110	5220.005966	5150~5250	Pass
10	110	5220.006090	5150~5250	Pass
0	110	5219.993602	5150~5250	Pass
-10	110	5220.000457	5150~5250	Pass
-20	110	5220.010159	5150~5250	Pass

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5220.00266	5150~5250	Pass
	110	5219.991411	5150~5250	Pass
	126.5	5219.990421	5150~5250	Pass

**CH High**

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5239.997634	5150~5250	Pass
40	110	5240.006172	5150~5250	Pass
30	110	5239.999323	5150~5250	Pass
20	110	5240.001467	5150~5250	Pass
10	110	5240.002618	5150~5250	Pass
0	110	5240.002302	5150~5250	Pass
-10	110	5240.008394	5150~5250	Pass
-20	110	5239.998456	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5239.992121	5150~5250	Pass
	110	5240.002378	5150~5250	Pass
	126.5	5240.00577	5150~5250	Pass

**IEEE 802.11n HT 20 mode / 5180 ~ 5240 MHz / Chain 1:****CH Low**

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5179.990019	5150~5250	Pass
40	110	5179.993601	5150~5250	Pass
30	110	5179.999754	5150~5250	Pass
20	110	5179.992005	5150~5250	Pass
10	110	5179.990068	5150~5250	Pass
0	110	5180.000894	5150~5250	Pass
-10	110	5179.991149	5150~5250	Pass
-20	110	5179.990877	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5180.001132	5150~5250	Pass
	110	5180.003451	5150~5250	Pass
	126.5	5179.994846	5150~5250	Pass

**CH Mid**

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5220.003093	5150~5250	Pass
40	110	5220.003891	5150~5250	Pass
30	110	5220.003758	5150~5250	Pass
20	110	5220.010571	5150~5250	Pass
10	110	5220.006635	5150~5250	Pass
0	110	5220.000842	5150~5250	Pass
-10	110	5220.007961	5150~5250	Pass
-20	110	5219.991303	5150~5250	Pass

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5219.999709	5150~5250	Pass
	110	5219.996528	5150~5250	Pass
	126.5	5220.007353	5150~5250	Pass

**CH High**

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5239.994322	5150~5250	Pass
40	110	5240.000868	5150~5250	Pass
30	110	5239.999585	5150~5250	Pass
20	110	5240.004188	5150~5250	Pass
10	110	5239.990384	5150~5250	Pass
0	110	5239.999653	5150~5250	Pass
-10	110	5240.007106	5150~5250	Pass
-20	110	5240.004629	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5239.998399	5150~5250	Pass
	110	5239.993007	5150~5250	Pass
	126.5	5239.994476	5150~5250	Pass

**IEEE 802.11n HT 40 mode / 5190 ~ 5230 MHz / Chain 0:****CH Low**

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5190.003419	5150~5250	Pass
40	110	5189.997686	5150~5250	Pass
30	110	5190.009808	5150~5250	Pass
20	110	5189.996624	5150~5250	Pass
10	110	5190.004968	5150~5250	Pass
0	110	5190.009572	5150~5250	Pass
-10	110	5189.994152	5150~5250	Pass
-20	110	5190.010364	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5190.004143	5150~5250	Pass
	110	5190.008444	5150~5250	Pass
	126.5	5190.002649	5150~5250	Pass

**CH High**

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5230.006909	5150~5250	Pass
40	110	5229.990890	5150~5250	Pass
30	110	5230.006983	5150~5250	Pass
20	110	5229.996203	5150~5250	Pass
10	110	5229.993522	5150~5250	Pass
0	110	5230.006190	5150~5250	Pass
-10	110	5230.000598	5150~5250	Pass
-20	110	5229.990306	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5229.993459	5150~5250	Pass
	110	5229.992991	5150~5250	Pass
	126.5	5230.004482	5150~5250	Pass

**IEEE 802.11n HT 40 mode / 5190 ~ 5230 MHz / Chain 1:****CH Low**

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5189.998471	5150~5250	Pass
40	110	5190.008318	5150~5250	Pass
30	110	5189.998474	5150~5250	Pass
20	110	5189.999380	5150~5250	Pass
10	110	5190.009664	5150~5250	Pass
0	110	5189.994782	5150~5250	Pass
-10	110	5189.990290	5150~5250	Pass
-20	110	5190.000224	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5189.999228	5150~5250	Pass
	110	5190.00763	5150~5250	Pass
	126.5	5190.001842	5150~5250	Pass

**CH High**

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5230.004574	5150~5250	Pass
40	110	5230.009656	5150~5250	Pass
30	110	5230.005253	5150~5250	Pass
20	110	5229.997465	5150~5250	Pass
10	110	5230.006442	5150~5250	Pass
0	110	5229.992127	5150~5250	Pass
-10	110	5230.001909	5150~5250	Pass
-20	110	5229.990259	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5229.99345	5150~5250	Pass
	110	5229.991688	5150~5250	Pass
	126.5	5230.008561	5150~5250	Pass

**IEEE 802.11ac VHT80 Mode / Chain 0:****CH Mid**

Operating Frequency: 5210 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5210.005483	5150~5250	Pass
40	110	5210.010740	5150~5250	Pass
30	110	5210.007717	5150~5250	Pass
20	110	5210.000003	5150~5250	Pass
10	110	5209.995709	5150~5250	Pass
0	110	5210.008090	5150~5250	Pass
-10	110	5210.005430	5150~5250	Pass
-20	110	5209.997898	5150~5250	Pass

Operating Frequency: 5210 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5210.010613	5150~5250	Pass
	110	5209.998255	5150~5250	Pass
	126.5	5210.009034	5150~5250	Pass

**IEEE 802.11ac VHT80 Mode / Chain 1:****CH Mid**

Operating Frequency: 5210 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5210.007713	5150~5250	Pass
40	110	5209.991566	5150~5250	Pass
30	110	5209.992335	5150~5250	Pass
20	110	5209.995950	5150~5250	Pass
10	110	5209.994937	5150~5250	Pass
0	110	5210.003710	5150~5250	Pass
-10	110	5210.000190	5150~5250	Pass
-20	110	5209.996602	5150~5250	Pass

Operating Frequency: 5210 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	93.5	5210.00963	5150~5250	Pass
	110	5209.990886	5150~5250	Pass
	126.5	5209.992527	5150~5250	Pass