

**FCC 47 CFR PART 15 SUBPART E &
INDUSTRY CANADA RSS-247****TEST REPORT****For**

Product	Model
Wi-Fi (11a/b/g/n/ac 2Tx2R)+BT (V4.1LE) USB Combo Module	WCBN4507R
	WCBN4508R
Wi-Fi (11a/b/g/n 2Tx2R)+BT (V4.1LE) USB Combo Module	WCBN4507R(32U)
	WCBN4508R(32U)

Trade Name: LITE-ON*Issued to***Lite-On Technology Cop.****Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C***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: August 28, 2015**

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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		August 28, 2015		Initial Issue	ALL	Doris Chu

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1. TEST RESULT CERTIFICATION

Applicant: Lite-On Technology Cop.
Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585,
Taiwan, R.O.C

Manufacturer: LITE-ON TECHNOLOGY (Changzhou) CO., LTD
A9 Building, No.88 Yanghu Road, Wujin Hi-Tech Industrial
Development Zone, Changzhou City, Jiangsu Province 213100
China

Equipment Under Test / Model Number:

Product	Model
Wi-Fi (11a/b/g/n/ac 2Tx2R)+BT (V4.1LE) USB Combo Module	WCBN4507R
	WCBN4508R
Wi-Fi (11a/b/g/n 2Tx2R)+BT (V4.1LE) USB Combo Module	WCBN4507R(32U)
	WCBN4508R(32U)

Trade Name: LITE-ON

Date of Test: August 25, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart E & Industry Canada RSS-247 Issue 1	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: 2013 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 and Industry Canada RSS-247 Issue 1.

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

Approved by:



Miller Lee
Manager
Compliance Certification Services Inc.

Reviewed by:



Angel Cheng
Section Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product / Model Number	Product			Model		
	Wi-Fi (11a/b/g/n/ac 2Tx2R)+BT (V4.1LE) USB Combo Module			WCBN4507R		
				WCBN4508R		
	Wi-Fi (11a/b/g/n 2Tx2R)+BT (V4.1LE) USB Combo Module			WCBN4507R(32U)		
WCBN4508R(32U)						
Trade Name	LITE-ON					
Model Discrepancy	MT7662U – 802.11abgn + ac + BT (WCBN4507R / WCBN4508R) MT7632U – 802.11abgn + BT (WCBN4507R(32U) / WCBN4508R(32U))					
Received Date	July 27, 2015					
Power Supply	Power form host device					
Operating Frequency Range & Number of Channels			Mode	Frequency Range (MHz)	Number of Channels	
	UNII Band I		IEEE 802.11a	5180 – 5240	4 Channels	
			IEEE 802.11n HT 20 MHz	5180 – 5240	4 Channels	
			IEEE 802.11n HT 40 MHz	5190 ~ 5230	2 Channels	
			IEEE 802.11ac VHT 80 MHz	5210	1 Channels	
	UNII Band II		IEEE 802.11a	5260 - 5320	4 Channels	
			IEEE 802.11n HT 20 MHz	5260 - 5320	4 Channels	
			IEEE 802.11n HT 40 MHz	5270 ~ 5310	2 Channels	
			IEEE 802.11ac VHT 80 MHz	5290	1 Channels	
	UNII Band III		IEEE 802.11a	5500 ~ 5720	12 Channels	
			IEEE 802.11n HT 20 MHz	5500 ~ 5720	12 Channels	
			IEEE 802.11n HT 40 MHz	5510 ~ 5710	6 Channels	
			IEEE 802.11ac VHT 80 MHz	5530 ~ 5690	3 Channels	
Transmit Power			Mode	Frequency Range (MHz)	Output Power (dBm)	Output Power (w)
	UNII Band I		IEEE 802.11a	5180 – 5240	14.86	0.0306
			IEEE 802.11n HT 20 MHz	5180 – 5240	13.79	0.0239
			IEEE 802.11n HT 40 MHz	5190 ~ 5230	14.31	0.0270
			IEEE 802.11ac VHT 80 MHz	5210	13.72	0.0236
	UNII Band II		IEEE 802.11a	5260 - 5320	14.86	0.0306
			IEEE 802.11n HT 20 MHz	5260 - 5320	17.66	0.0583
			IEEE 802.11n HT 40 MHz	5270 ~ 5310	15.73	0.0374
			IEEE 802.11ac VHT 80 MHz	5290	15.71	0.0372
	UNII Band III		IEEE 802.11a	5500 ~ 5720	14.76	0.0299
			IEEE 802.11n HT 20 MHz	5500 ~ 5720	17.78	0.0600
			IEEE 802.11n HT 40 MHz	5510 ~ 5710	15.73	0.0374
			IEEE 802.11ac VHT 80 MHz	5530 ~ 5690	15.76	0.0377
Modulation Technique	OFDM (QPSK, BPSK, 16-QAM, 64-QAM)					
Transmit Data Rate	EEE 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 802.11n HT 80 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	1. Tyco PCB Antenna 2195488-2: 0.96 dBi 2195488-3: 3.54 dBi 2. Walsin PCB Antenna RFPCA311131IMLB701: 5.54 dBi RFPCA311148IMLB701: 5.53 dBi MIMO: $10 \cdot \log\left(\frac{10^{5.54/20} + 10^{5.53/20}}{2}\right) = 8.55$ dBi
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Remark: The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013 Radiated testing was performed at an antenna to EUT distance 3 meters.

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR 47 Part 15.207, 15.209 and 15.407, RSS-GEN Issue 2, and RSS-247 Issue 1.

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 ANSI C63.10: 2013, 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 ANSI C63.10: 2013.

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: WCBN4507R) 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.

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.

UNII Band I:

IEEE 802.11a for 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 MHz for 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 MHz Channel for 5190 ~ 5230MHz:

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

IEEE 802.11ac VHT 80 MHz Channel for 5210MHz:

Channel Low(5210MHz) with 29.3Mbps data rate were chosen for full testing.

UNII Band II:

IEEE 802.11a for 5260 ~ 5320MHz:

Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5260 ~ 5320MHz:

Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz for 5270 ~ 5310MHz:

Channel Low (5270MHz) and Channel High (5310MHz) with 13.5Mbps data rate were chosen for full testing.

IEEE 802.11ac VHT 80 MHz for 5290MHz:

Channel Low(5290MHz) with 29.3Mbps data rate were chosen for full testing.

UNII Band III:**IEEE 802.11a for 5500 ~ 5720MHz:**

Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5720MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5500 ~ 5720MHz:

Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5720MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz for 5510 ~ 5710MHz:

Channel Low (5510MHz), Channel Mid (5550MHz) and Channel High (5710MHz) with 13.5Mbps data rate were chosen for full testing.

IEEE 802.11ac VHT 80 MHz for 5530 ~ 5690MHz:

Channel Low (5530MHz) and Channel High (5690MHz) with 29.3Mbps data rate were chosen for full testing.

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 (Y axis) and the worst case was recorded.

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/Humidity 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	07/07/2016
Power Sensor	Anritsu	MA2411A	0917072	07/07/2016
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40	101073	07/19/2016

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	01/25/2016
EMI Test Receiver	R&S	ESCI	100064	06/03/2016
Bilog Antenna	Sunol Sciences	JB3	A030105	08/05/2016
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 012635	980151	06/04/2016
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)			

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / 30M~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.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

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

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 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, ridged waveguide, horn and/or Loop. 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.

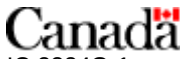
Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

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

5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.

5.4 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-247, 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

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.

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	ASUS	M5200AE	5BN0AG019631	PD9WM3B210 0	N/A	AC I/P: Unshielded, 1.8m with a core DC O/P: Unshielded, 1.8m

Remark:

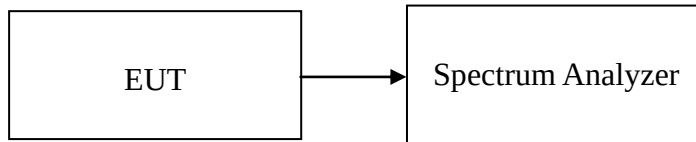
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7. FCC PART 15 REQUIREMENTS & RSS-247 REQUIREMENTS

7.1 99% BANDWIDTH

Test Configuration

TEST PROCEDURE



The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold.

TEST RESULTS

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
36	5180	17.3920
44	5220	17.7634
48	5240	17.5471

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
36	5180	17.8111
44	5220	17.8560
48	5240	17.8278

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
36	5180	17.8987
44	5220	17.8597
48	5240	17.8246

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
38	5190	36.2767
46	5230	36.2606

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

Channel	Frequency (MHz)	99% Bandwidth (MHz)
38	5190	36.1719
46	5230	36.1668

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
42	5210	76.0192

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
42	5210	75.9763

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	99% Bandwidth (MHz)
52	5260	17.5551
56	5280	17.7024
64	5320	17.4054

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
52	5260	17.9116
56	5280	17.7972
64	5320	17.8402

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
52	5260	17.8295
56	5280	17.7876
64	5320	17.7933

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
54	5270	36.3174
62	5310	36.2964

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
54	5270	36.1674
62	5310	36.1654

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
58	5290	75.7802

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
58	5290	75.7356

Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz

Channel	Frequency (MHz)	99% Bandwidth (MHz)
100	5500	17.3555
116	5580	17.7023
140	5700	17.3371
144	5720	16.8176

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
100	5500	17.8539
116	5580	17.8516
140	5700	17.8032
144	5720	17.9882

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
100	5500	18.0439
116	5580	17.8993
140	5700	17.7901
144	5720	17.7488

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 0

Channel	Frequency (MHz)	99% Bandwidth (MHz)
102	5510	36.1069
118	5590	36.9233
134	5670	36.4020
142	5710	36.2013

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 1

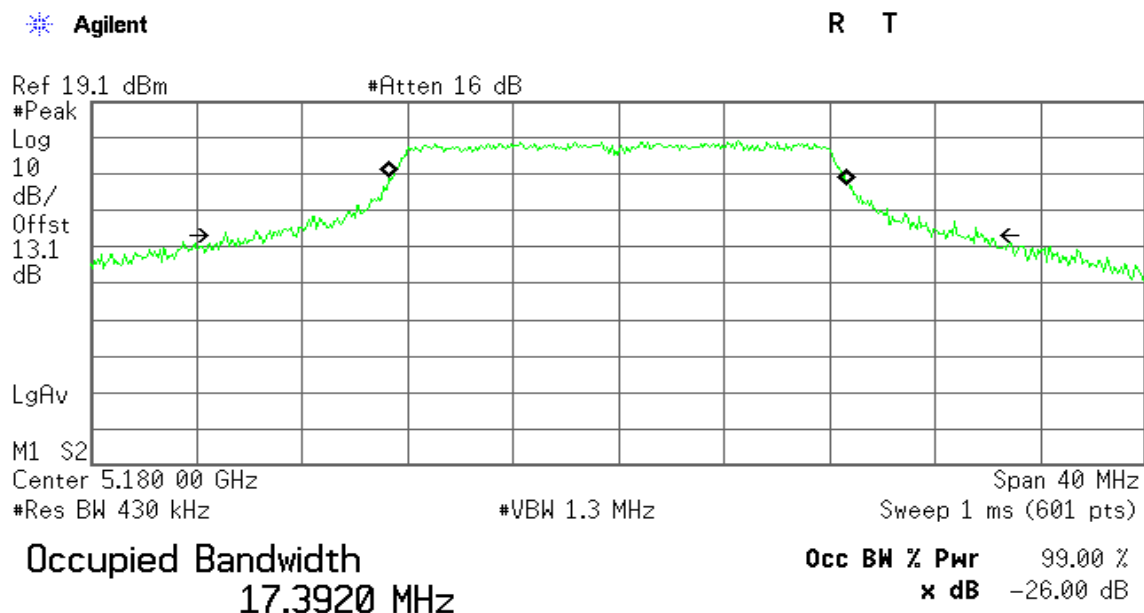
Channel	Frequency (MHz)	99% Bandwidth (MHz)
102	5510	36.3751
118	5590	36.3156
134	5670	36.2256
142	5710	36.1712

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 0

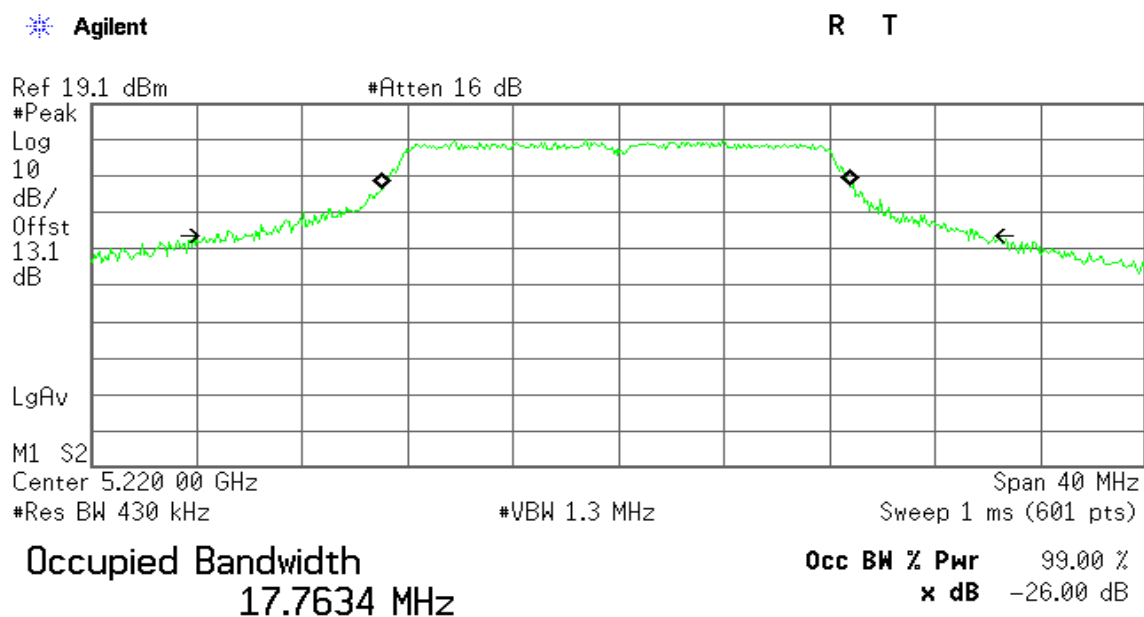
Channel	Frequency (MHz)	99% Bandwidth (MHz)
106	5530	75.8542
122	5610	76.8355
138	5690	75.7467

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
106	5530	76.0491
122	5610	78.1100
138	5690	75.7323

Test Plot**IEEE 802.11a mode / 5180 ~ 5240MHz****99% Bandwidth (5180 MHz)**

Transmit Freq Error -20.520 kHz
x dB Bandwidth 28.705 MHz

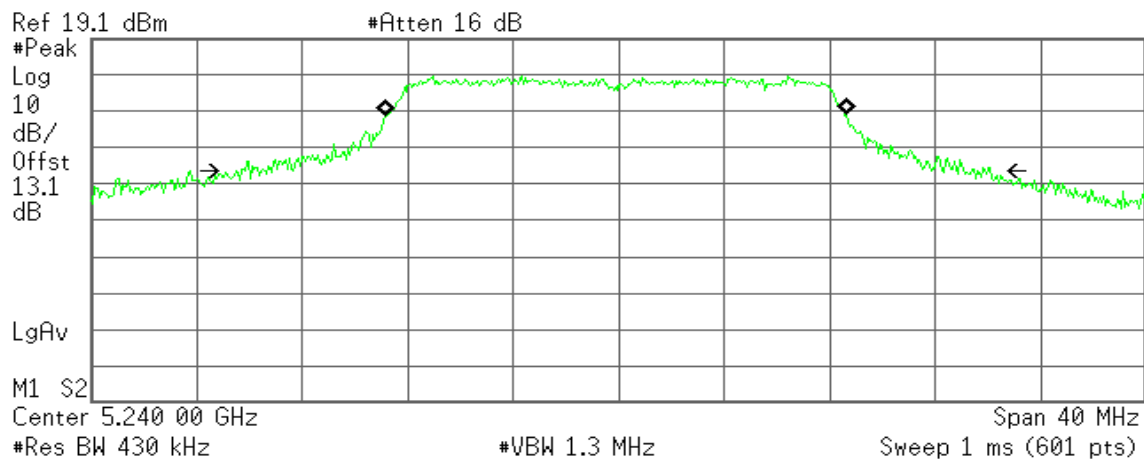
99% Bandwidth (5220 MHz)

Transmit Freq Error -94.538 kHz
x dB Bandwidth 28.837 MHz

99% Bandwidth (5240 MHz)

Agilent

R T

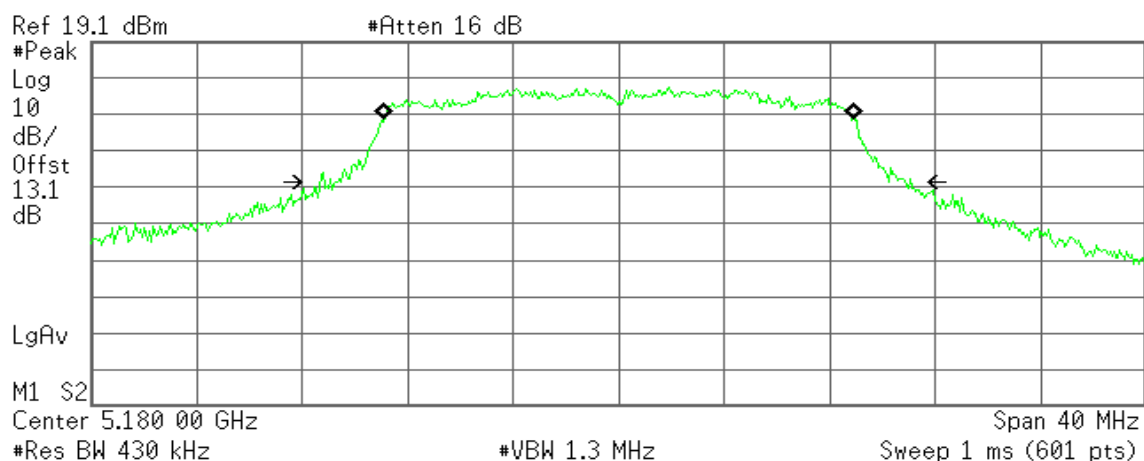


Transmit Freq Error -96.462 kHz
x dB Bandwidth 28.560 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0**99% Bandwidth (5180 MHz)**

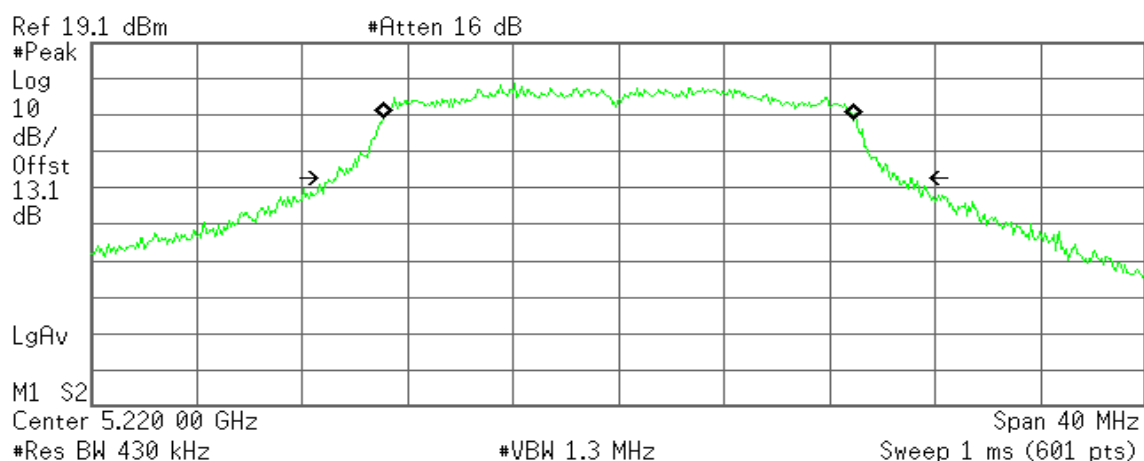
Agilent

R T

**Occupied Bandwidth**
17.8111 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -5.024 kHz
x dB Bandwidth 22.411 MHz**99% Bandwidth (5220 MHz)**

Agilent

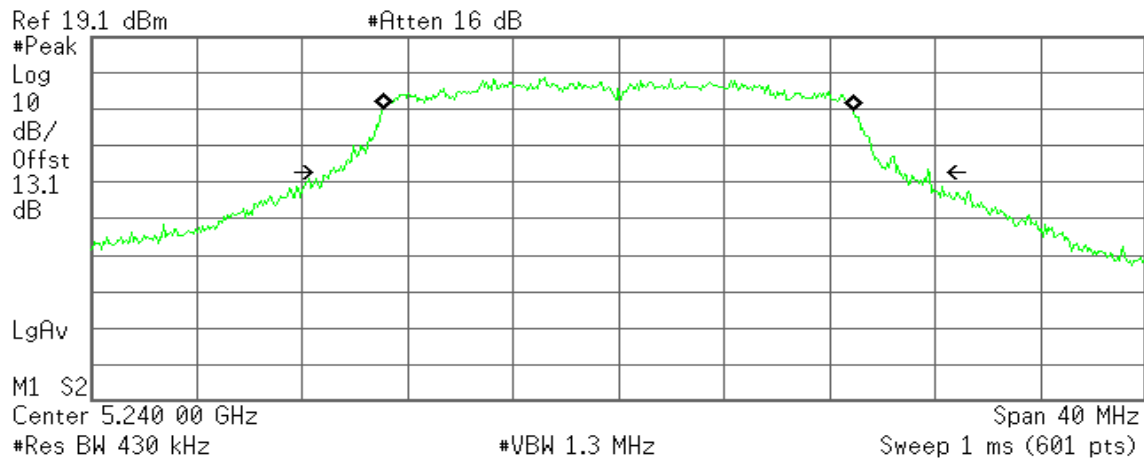
R T

**Occupied Bandwidth**
17.8560 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** 2.696 kHz
x dB Bandwidth 21.855 MHz

99% Bandwidth (5240 MHz)

Agilent

R T

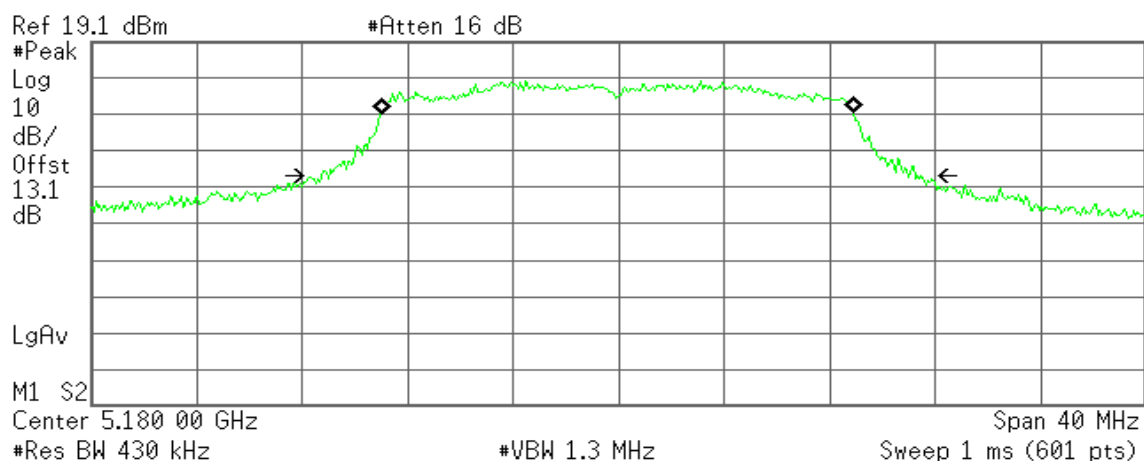


Transmit Freq Error -4.381 kHz
x dB Bandwidth 22.727 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1**99% Bandwidth (5180 MHz)**

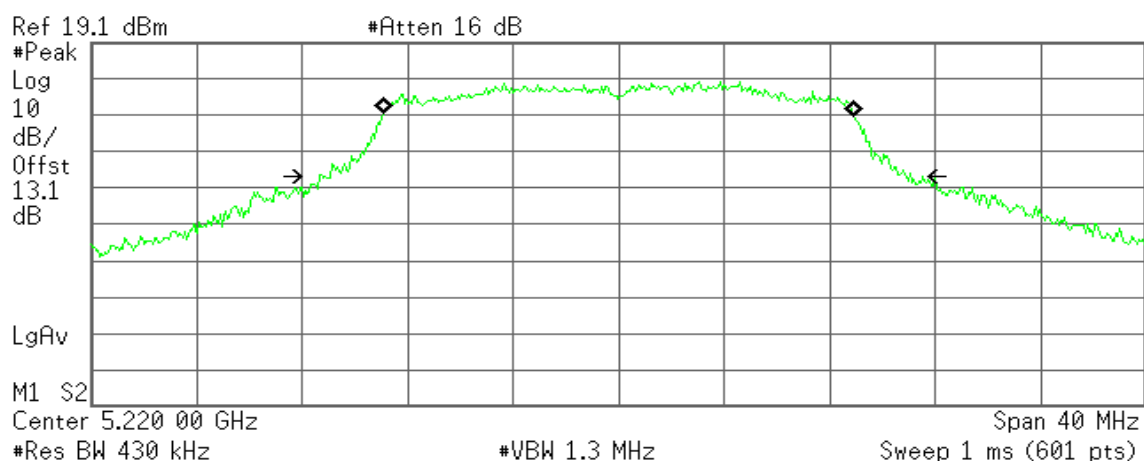
Agilent

R T

**Occupied Bandwidth**
17.8987 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -31.228 kHz
x dB Bandwidth 22.740 MHz**99% Bandwidth (5220 MHz)**

Agilent

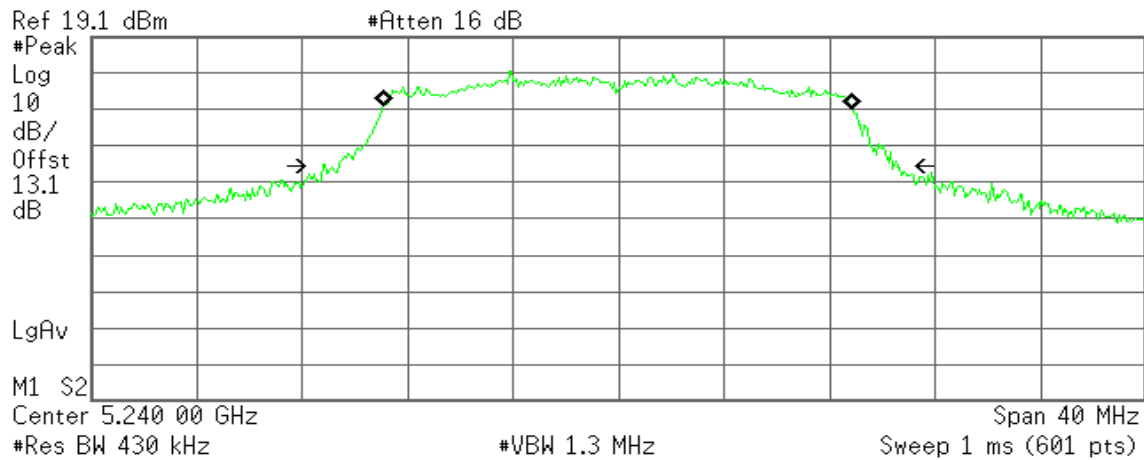
R T

**Occupied Bandwidth**
17.8597 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** 4.428 kHz
x dB Bandwidth 22.439 MHz

99% Bandwidth (5240 MHz)

Agilent

R T

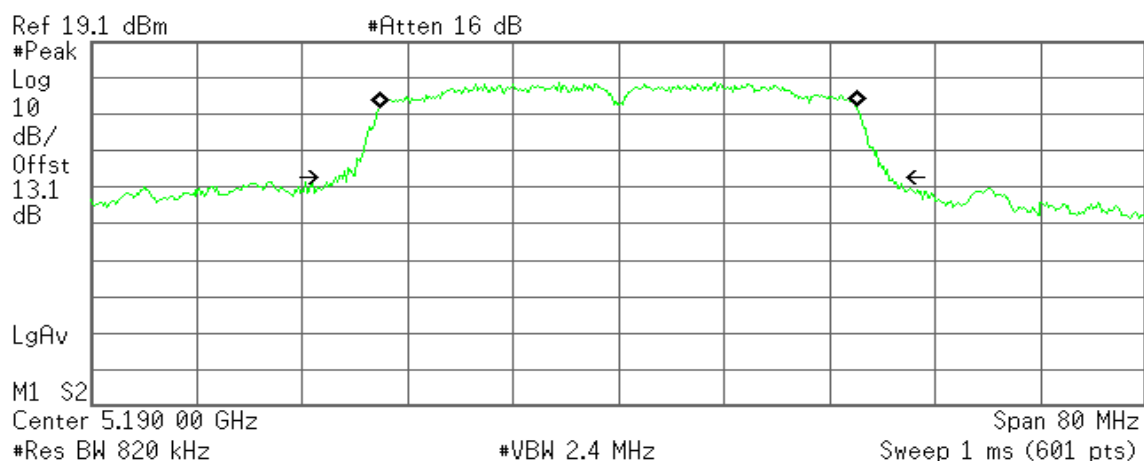


Transmit Freq Error -19.207 kHz
x dB Bandwidth 21.784 MHz

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0**99% Bandwidth (5190 MHz)**

Agilent

R T

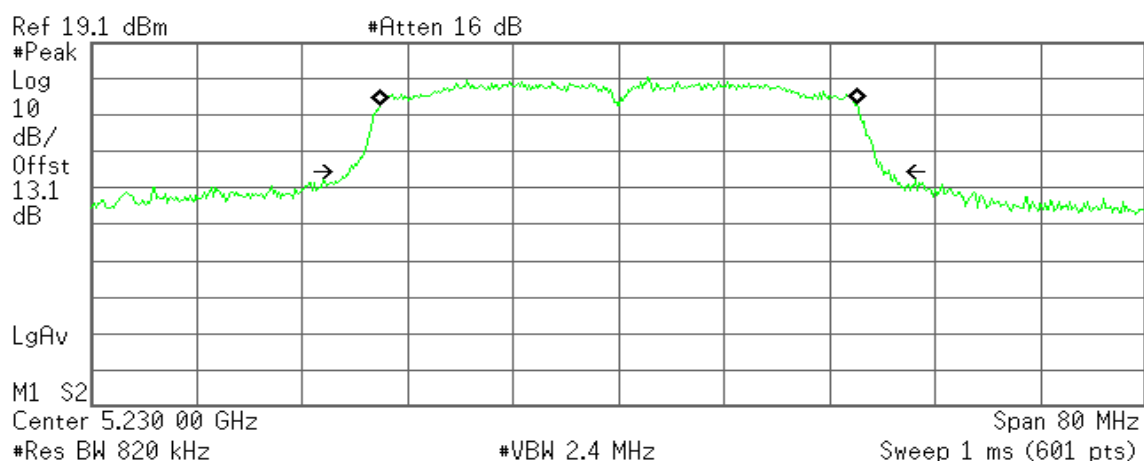


Transmit Freq Error -59.486 kHz
x dB Bandwidth 42.017 MHz

99% Bandwidth (5230 MHz)

Agilent

R T

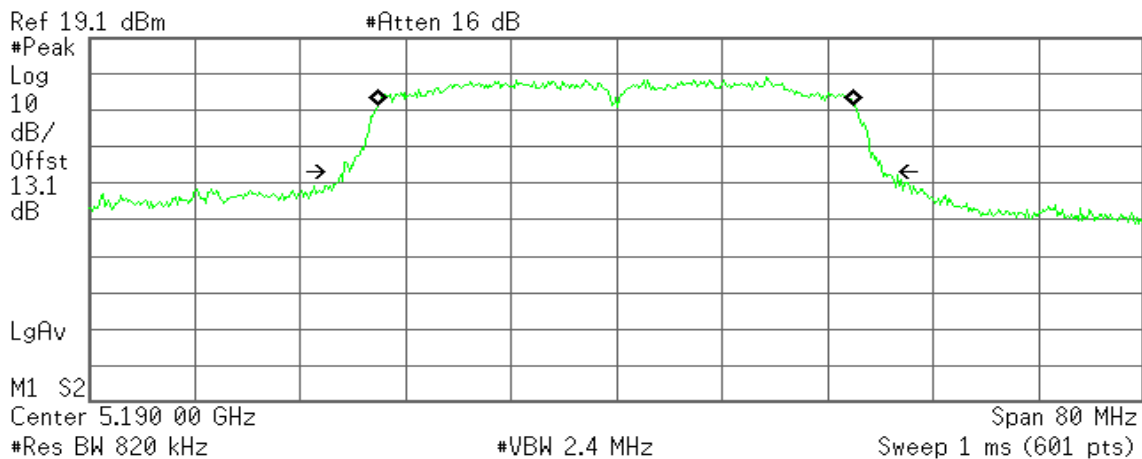


Transmit Freq Error -44.475 kHz
x dB Bandwidth 40.995 MHz

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1**99% Bandwidth (5190 MHz)**

Agilent

R T



Occupied Bandwidth
36.1719 MHz

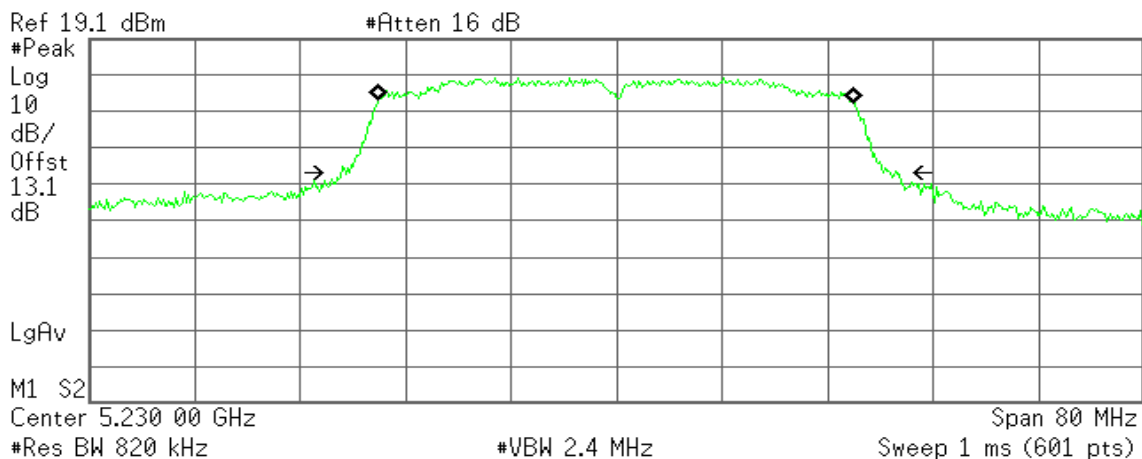
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -43.597 kHz
x dB Bandwidth 40.929 MHz

99% Bandwidth (5230 MHz)

Agilent

R T



Occupied Bandwidth
36.1668 MHz

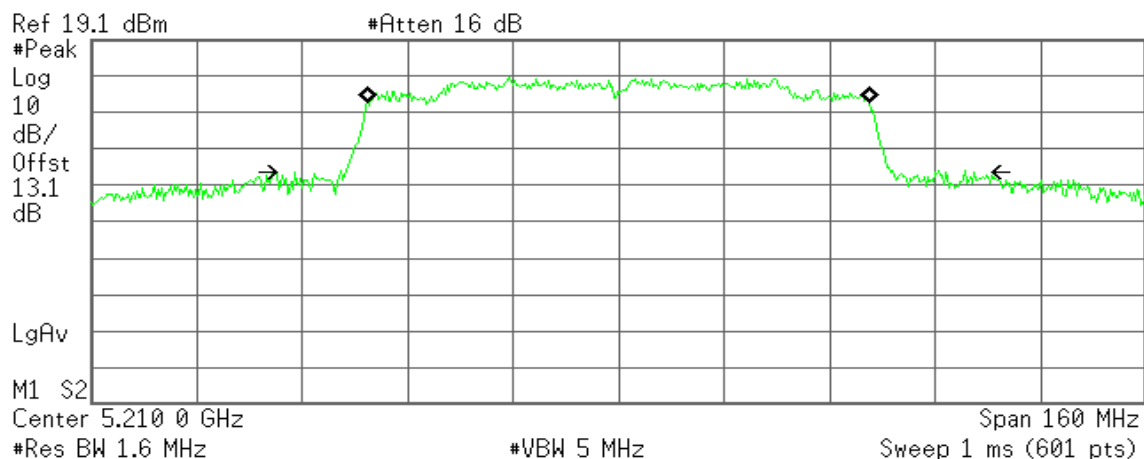
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -42.012 kHz
x dB Bandwidth 42.149 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 0**99% Bandwidth (5210 MHz)**

* Agilent

R T



Occupied Bandwidth
76.0192 MHz

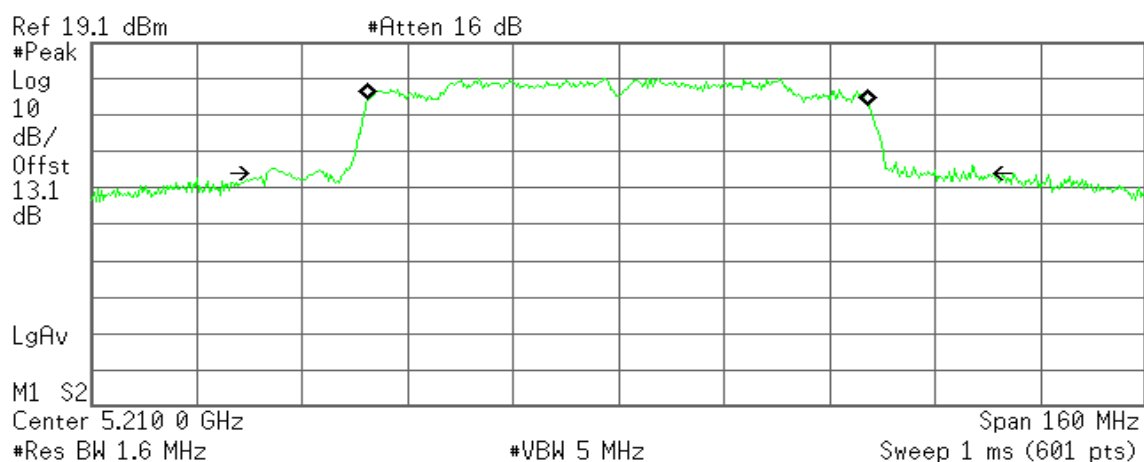
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 9.387 kHz
x dB Bandwidth 102.960 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 1**99% Bandwidth (5210 MHz)**

* Agilent

R T



Occupied Bandwidth
75.9763 MHz

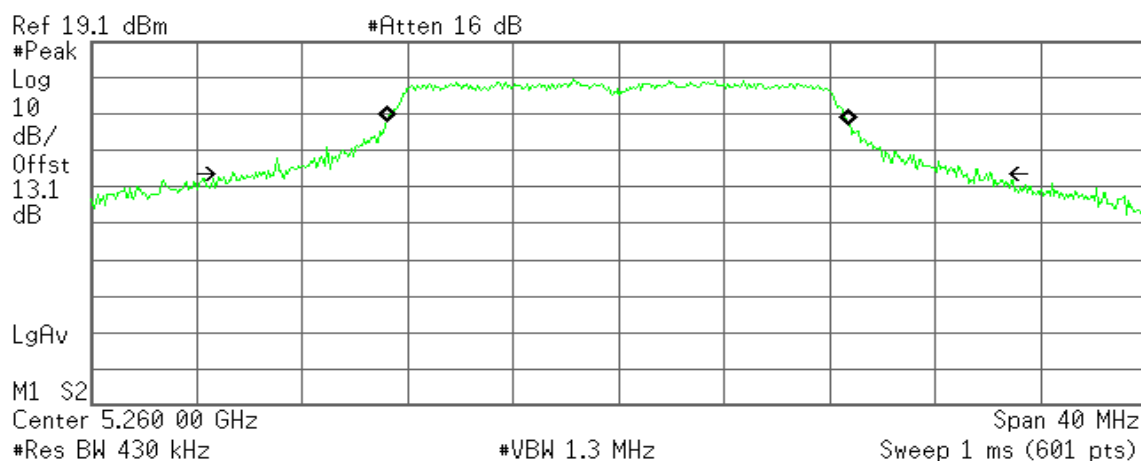
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -83.996 kHz
x dB Bandwidth 107.273 MHz

IEEE 802.11a mode / 5260 ~ 5320MHz**99% Bandwidth (5260 MHz)**

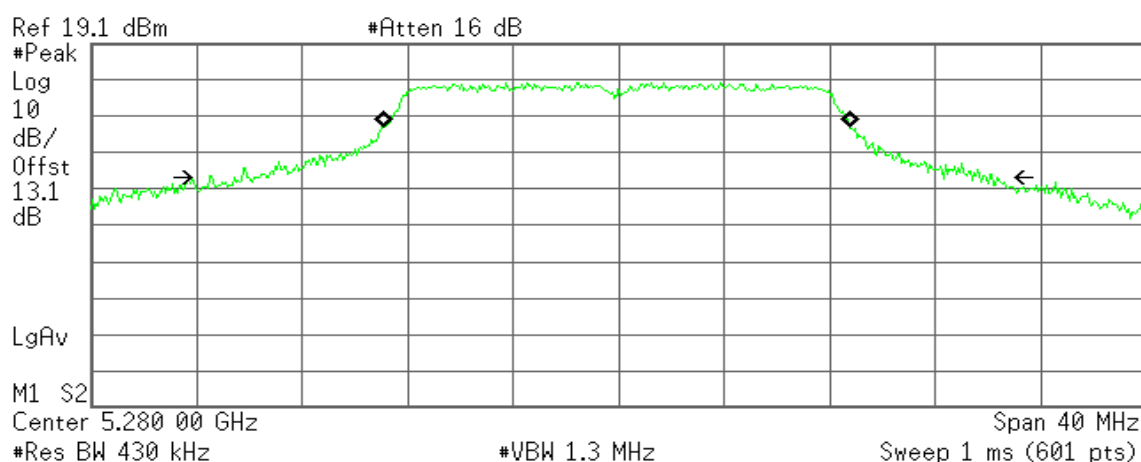
* Agilent

R T

**Occupied Bandwidth****17.5551 MHz****Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -52.429 kHz
x dB Bandwidth 28.751 MHz**99% Bandwidth (5280 MHz)**

* Agilent

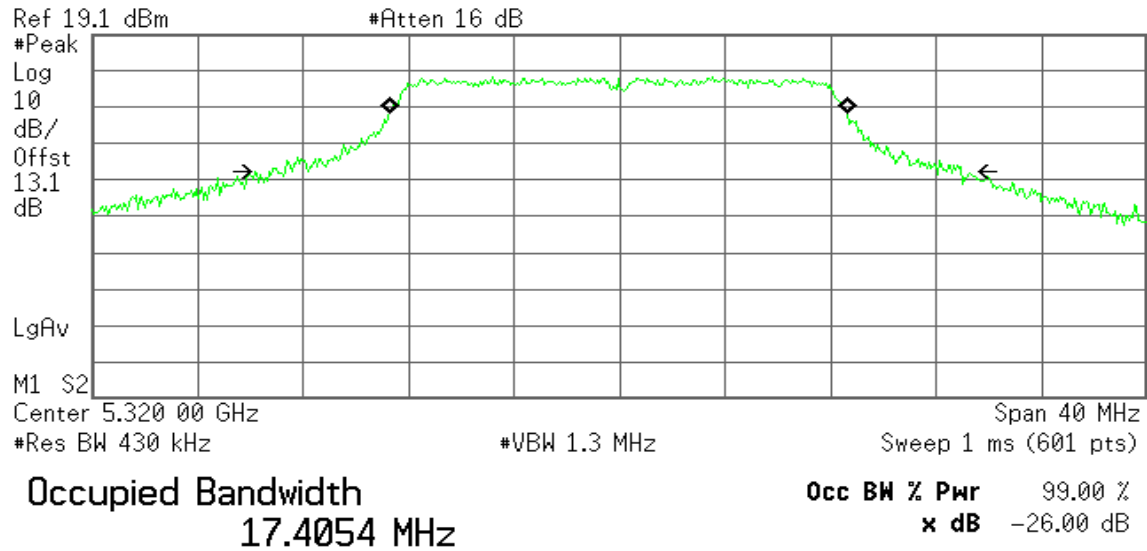
R T

**Occupied Bandwidth****17.7024 MHz****Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -52.445 kHz
x dB Bandwidth 29.820 MHz

99% Bandwidth (5320 MHz)

Agilent

R T

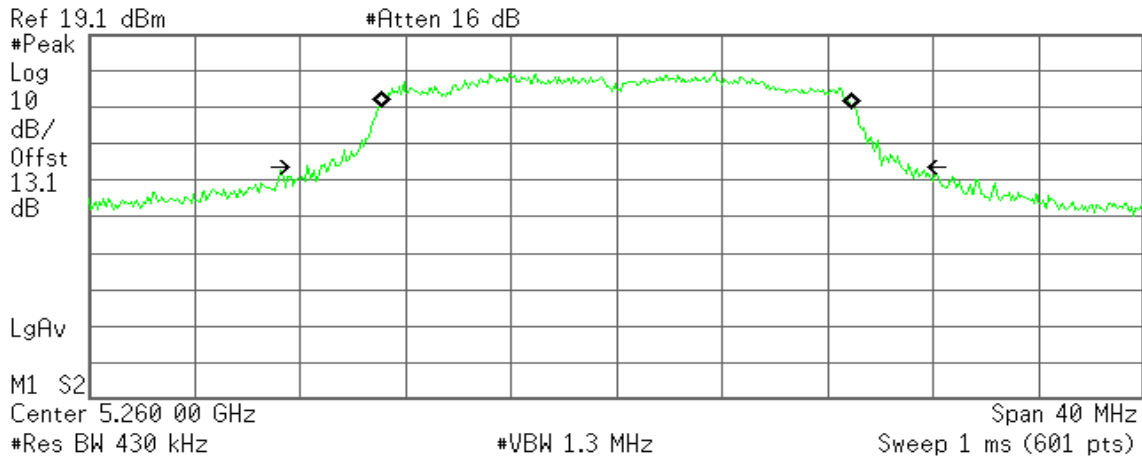


Transmit Freq Error -50.249 kHz
x dB Bandwidth 26.233 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0**99% Bandwidth (5260 MHz)**

Agilent

R T



Occupied Bandwidth
17.9116 MHz

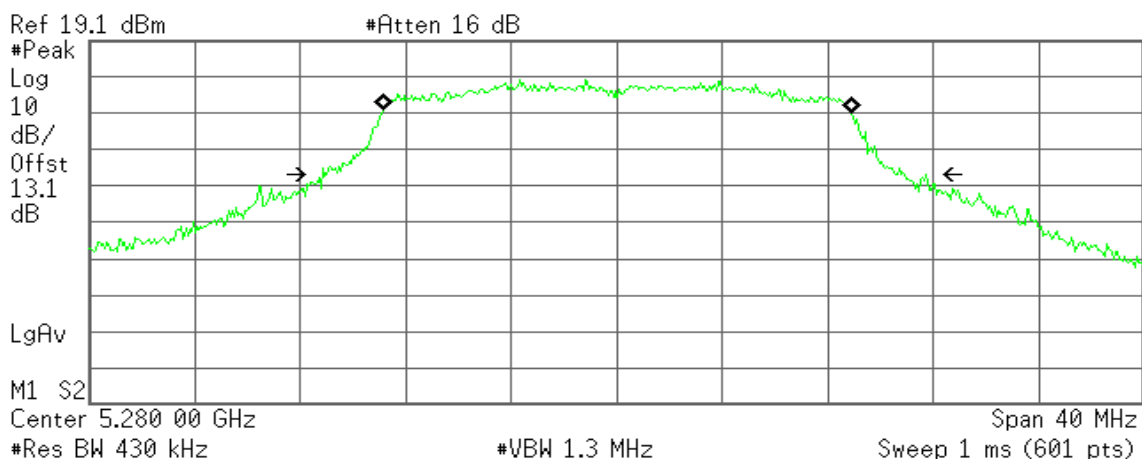
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.328 kHz
x dB Bandwidth 22.843 MHz

99% Bandwidth (5280 MHz)

Agilent

R T



Occupied Bandwidth
17.7972 MHz

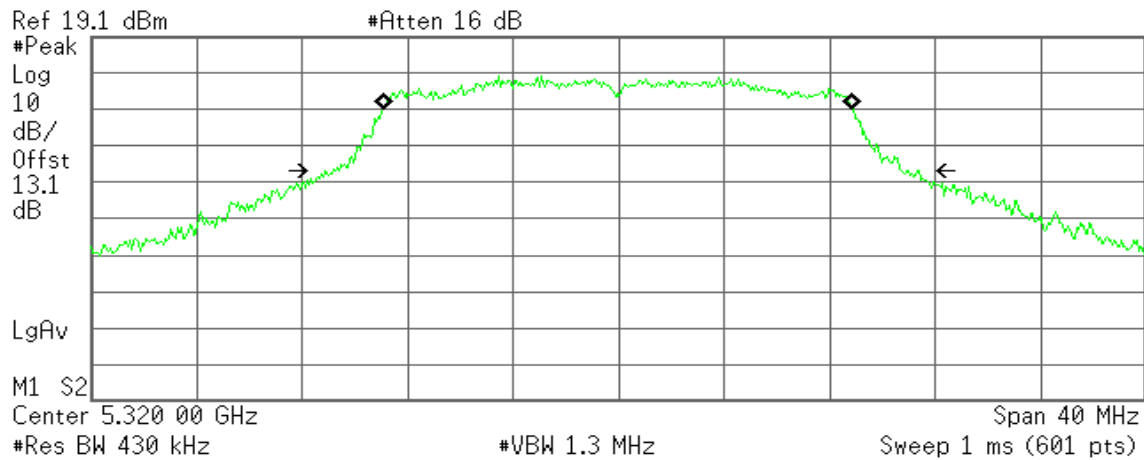
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 12.629 kHz
x dB Bandwidth 22.898 MHz

99% Bandwidth (5320 MHz)

Agilent

R T



Occupied Bandwidth
17.8402 MHz

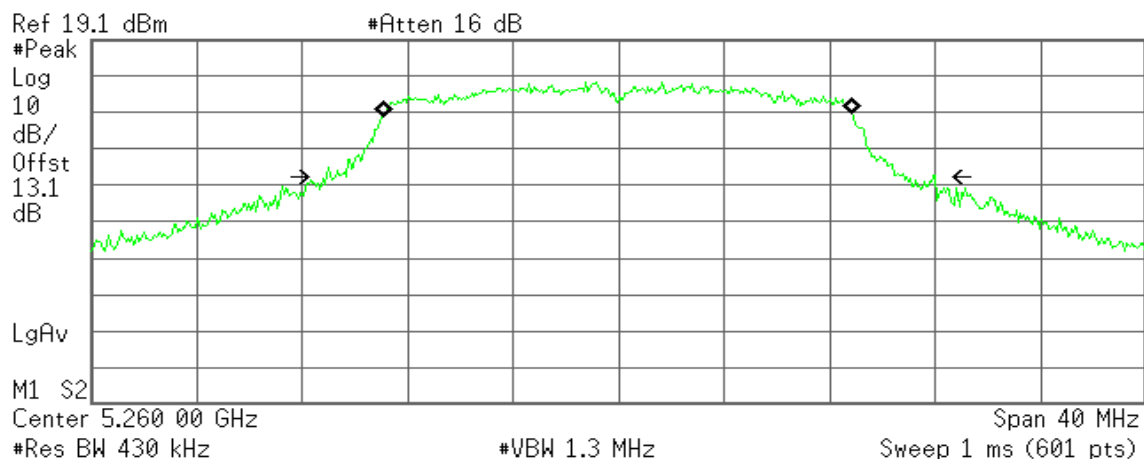
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -38.653 kHz
x dB Bandwidth 22.542 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1**99% Bandwidth (5260 MHz)**

Agilent

R T



Occupied Bandwidth
17.8295 MHz

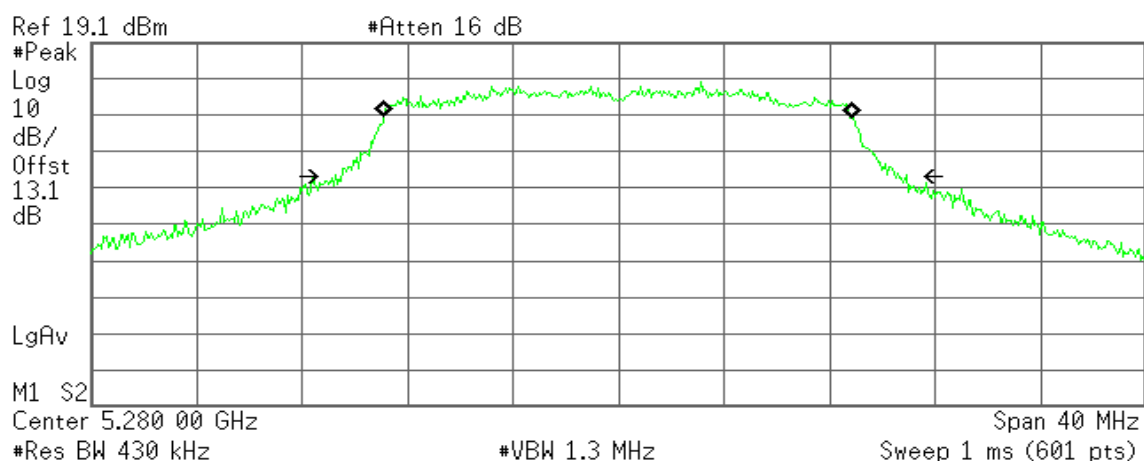
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -21.760 kHz
x dB Bandwidth 23.092 MHz

99% Bandwidth (5280 MHz)

Agilent

R T



Occupied Bandwidth
17.7876 MHz

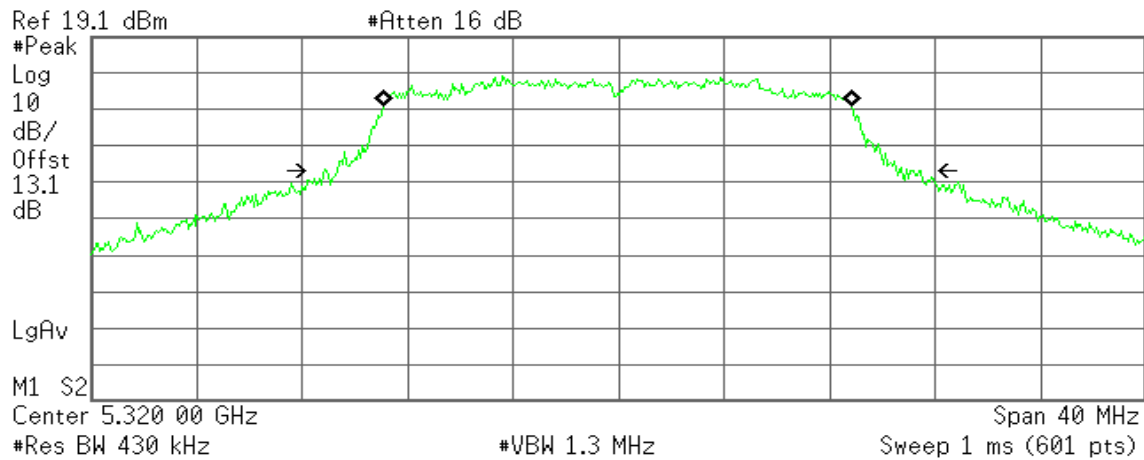
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -17.329 kHz
x dB Bandwidth 21.692 MHz

99% Bandwidth (5320 MHz)

Agilent

R T



Occupied Bandwidth
17.7933 MHz

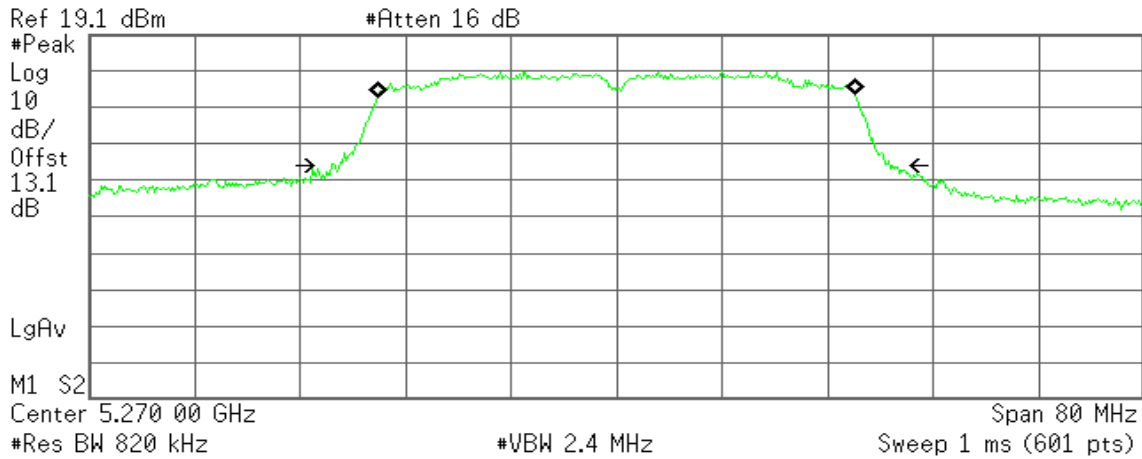
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -21.225 kHz
x dB Bandwidth 22.645 MHz

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0**99% Bandwidth (5270 MHz)**

Agilent

R T

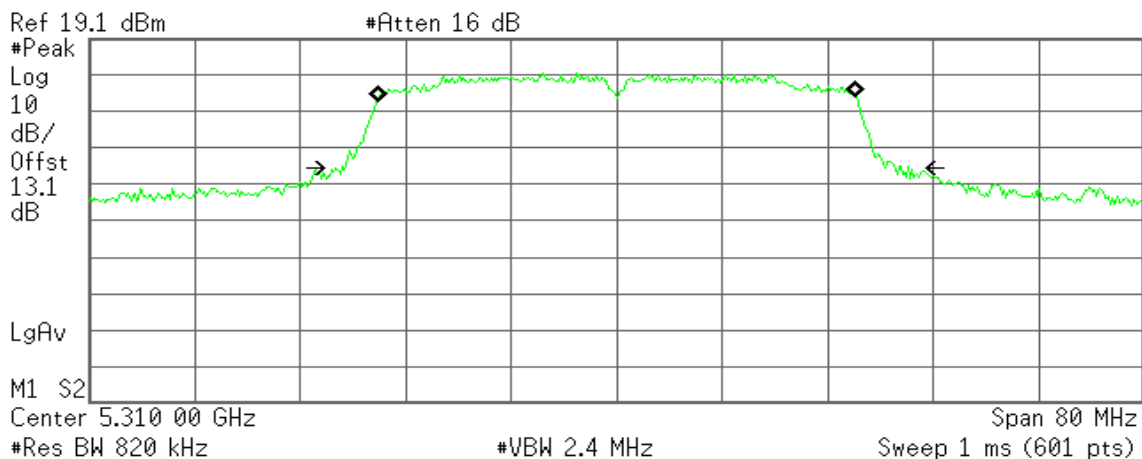


Transmit Freq Error -25.010 kHz
x dB Bandwidth 42.621 MHz

99% Bandwidth (5310 MHz)

Agilent

R T

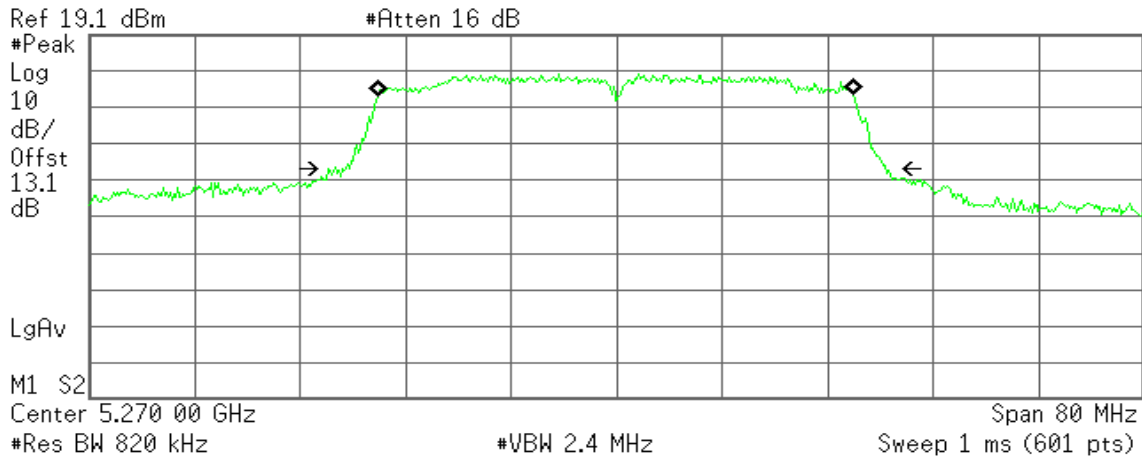


Transmit Freq Error 22.484 kHz
x dB Bandwidth 43.010 MHz

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1**99% Bandwidth (5270 MHz)**

Agilent

R T

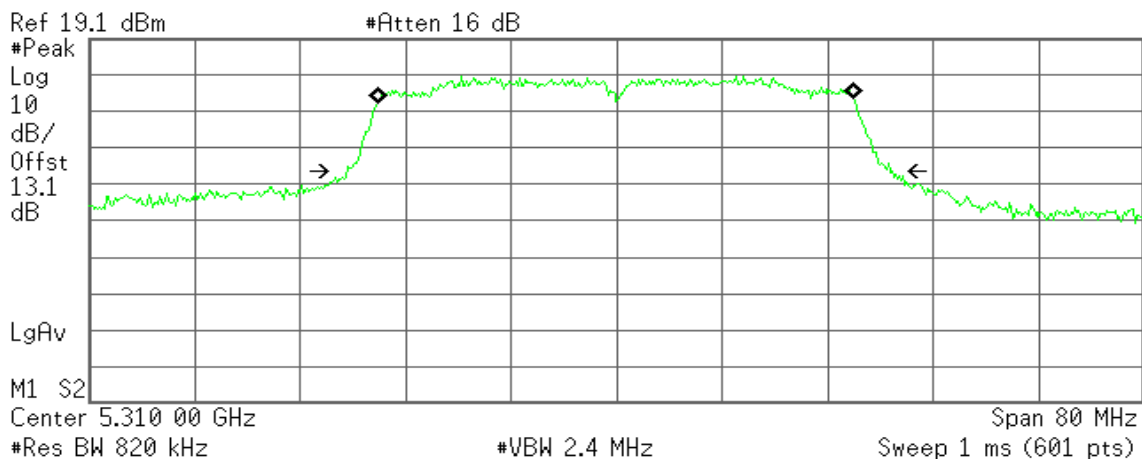


Transmit Freq Error -61.410 kHz
x dB Bandwidth 41.855 MHz

99% Bandwidth (5310 MHz)

Agilent

R T

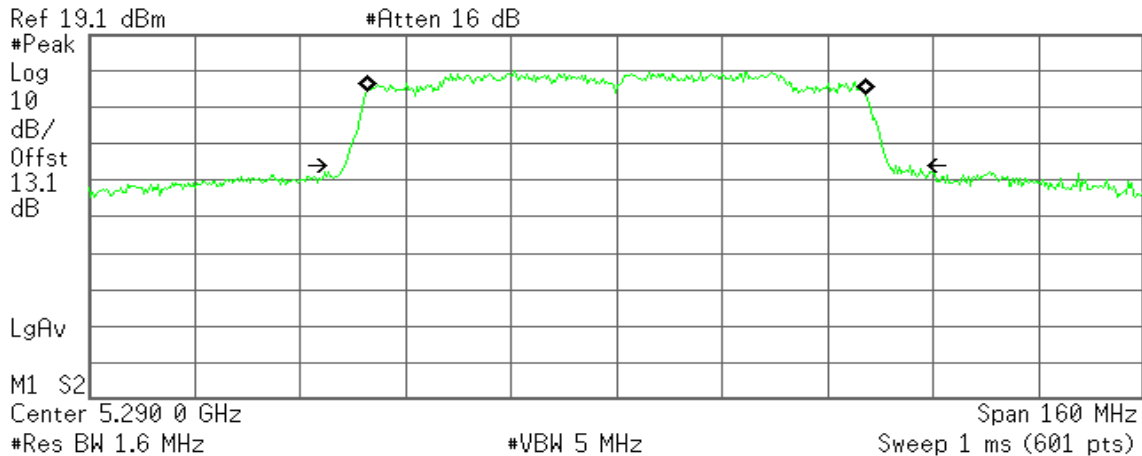


Transmit Freq Error -35.653 kHz
x dB Bandwidth 41.261 MHz

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0**99% Bandwidth (5290 MHz)**

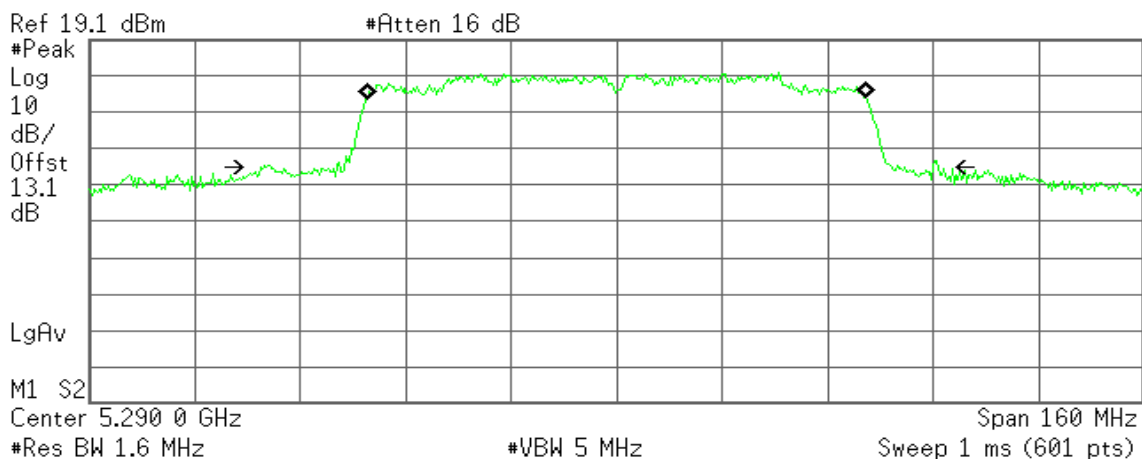
* Agilent

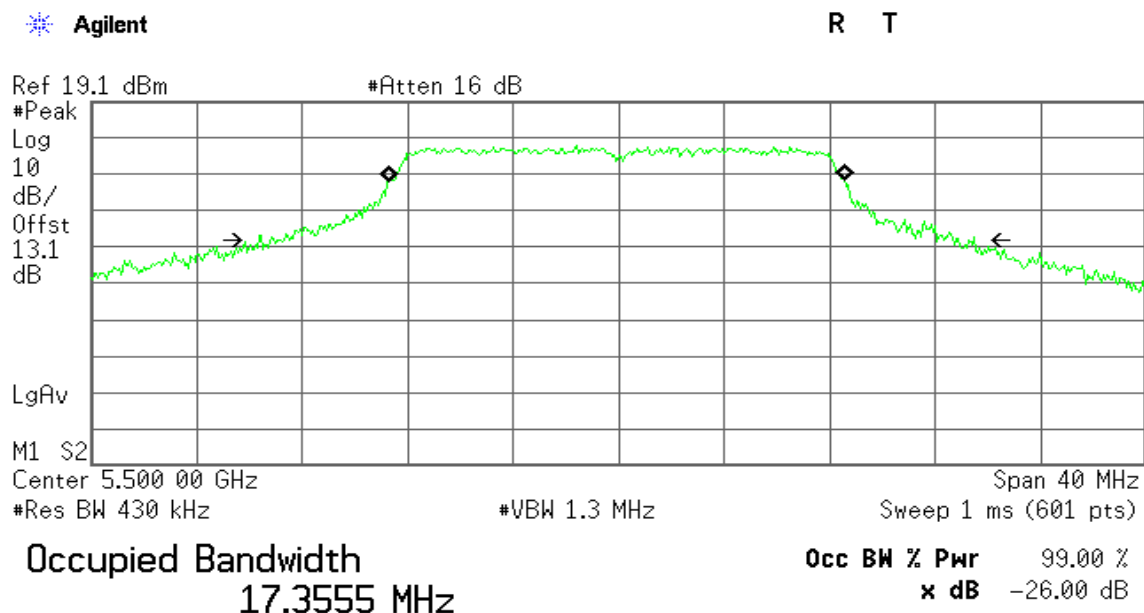
R T

**Occupied Bandwidth**
75.7802 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -43.728 kHz
x dB Bandwidth 85.874 MHz**IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 1****99% Bandwidth (5290 MHz)**

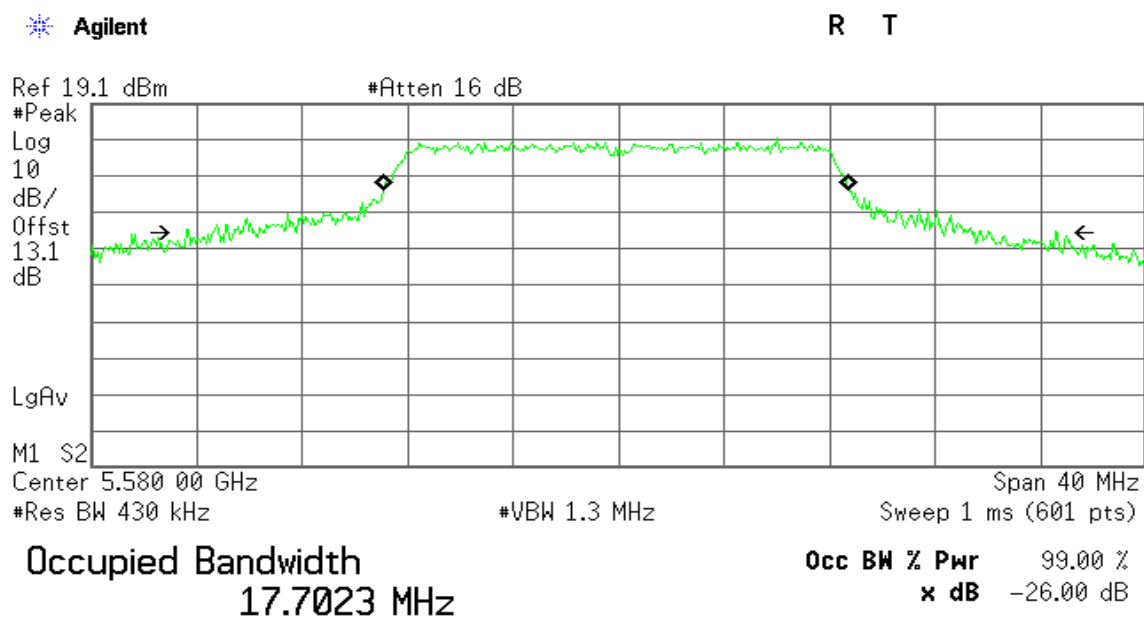
* Agilent

R T

**Occupied Bandwidth**
75.7356 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -4.173 kHz
x dB Bandwidth 102.643 MHz

Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz**99% Bandwidth (5500 MHz)**

Transmit Freq Error -81.345 kHz
x dB Bandwidth 27.121 MHz

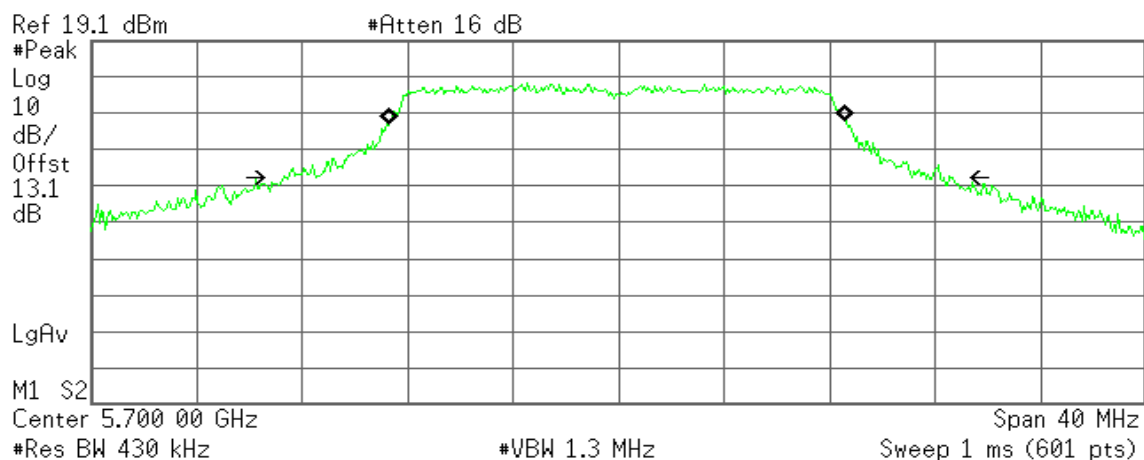
99% Bandwidth (5580 MHz)

Transmit Freq Error -91.845 kHz
x dB Bandwidth 33.066 MHz

99% Bandwidth (5700 MHz)

Agilent

R T



Occupied Bandwidth
17.3371 MHz

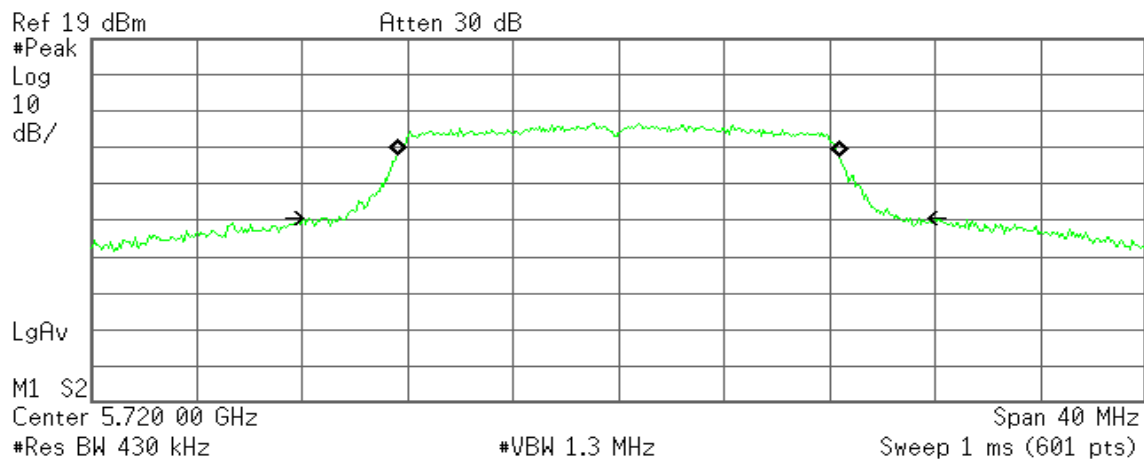
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -39.654 kHz
x dB Bandwidth 25.375 MHz

99% Bandwidth (5720 MHz)

Agilent

R T



Occupied Bandwidth
16.8176 MHz

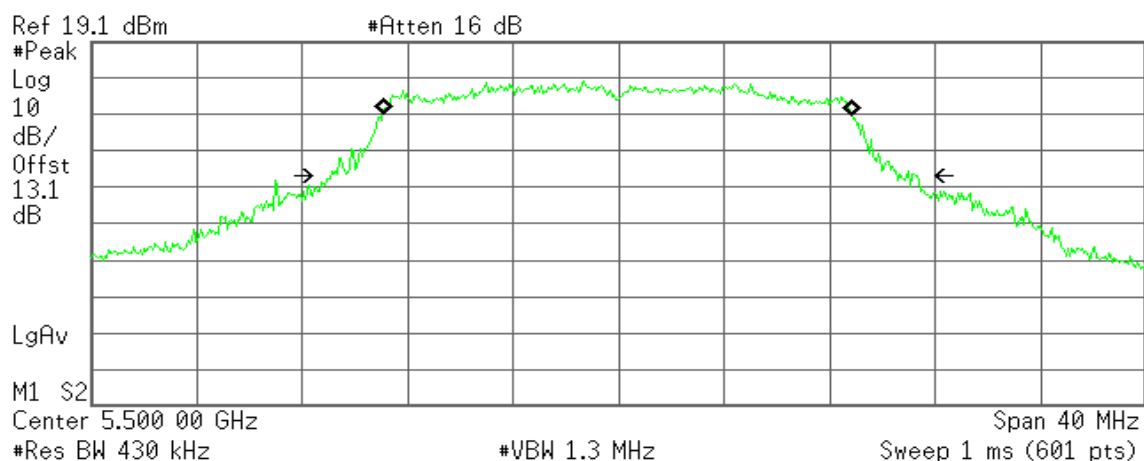
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -13.574 kHz
x dB Bandwidth 22.346 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 0**99% Bandwidth (5500 MHz)**

Agilent

R T



Occupied Bandwidth
17.8539 MHz

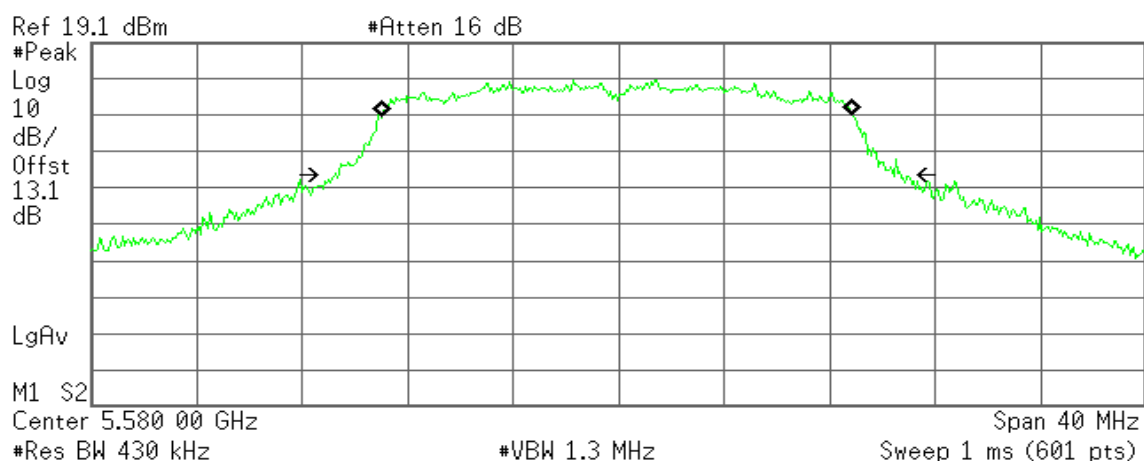
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -34.931 kHz
x dB Bandwidth 22.248 MHz

99% Bandwidth (5580 MHz)

Agilent

R T



Occupied Bandwidth
17.8516 MHz

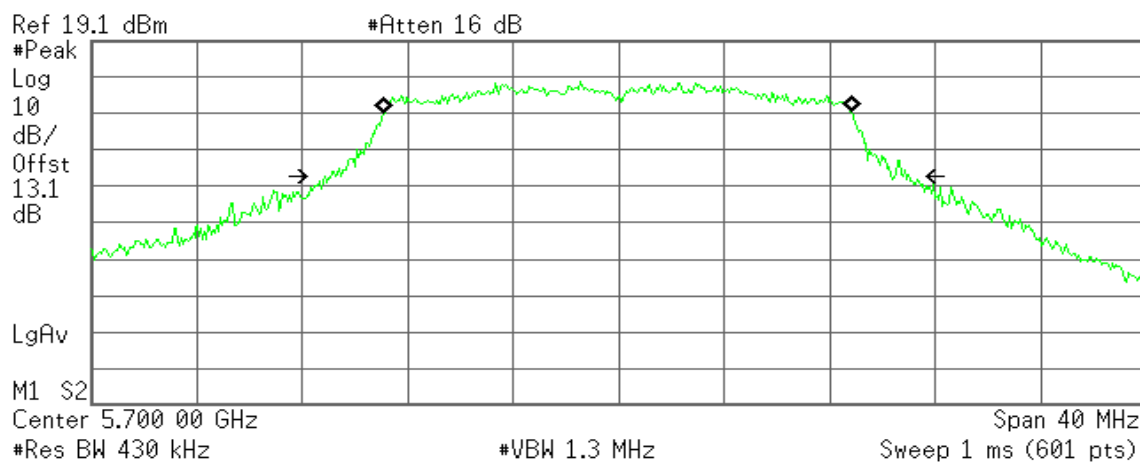
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -58.778 kHz
x dB Bandwidth 21.461 MHz

99% Bandwidth (5700MHz)

Agilent

R T



Occupied Bandwidth
17.8032 MHz

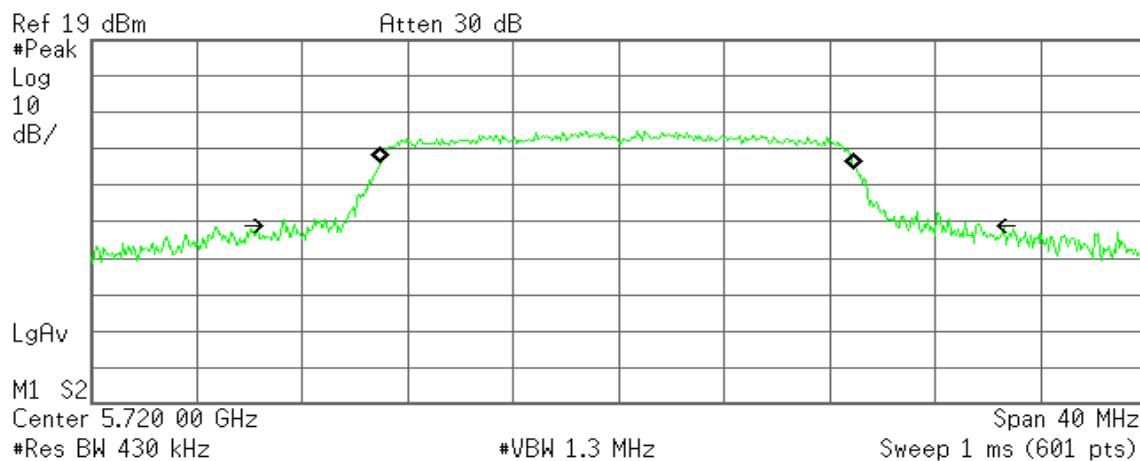
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -40.800 kHz
x dB Bandwidth 22.170 MHz

99% Bandwidth (5720MHz)

Agilent

R T



Occupied Bandwidth
17.9882 MHz

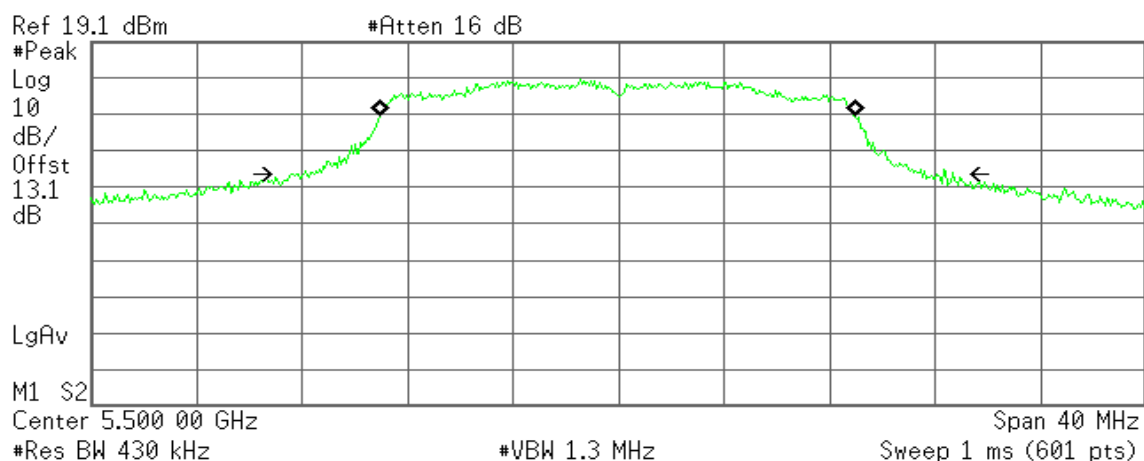
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -55.588 kHz
x dB Bandwidth 26.458 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 1**99% Bandwidth (5500 MHz)**

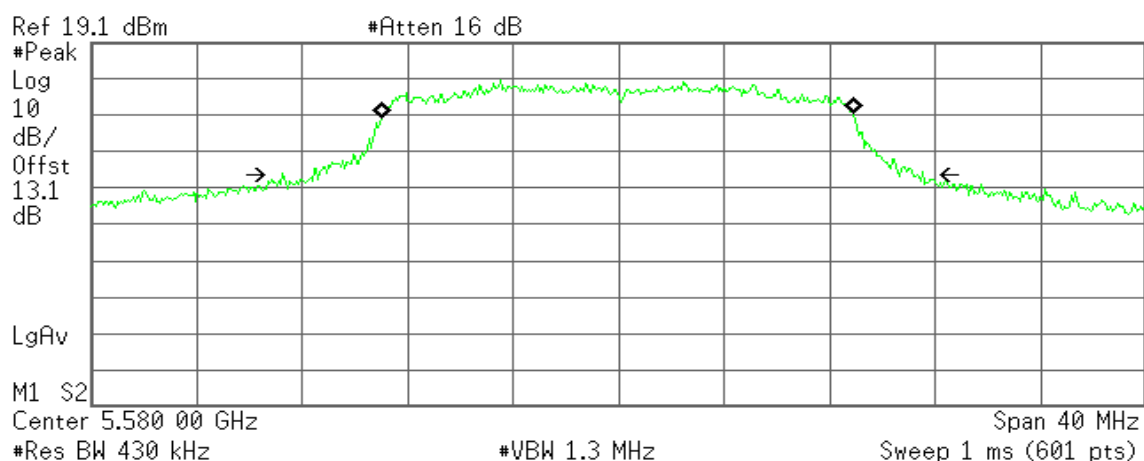
Agilent

R T

**Occupied Bandwidth**
18.0439 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -30.965 kHz
x dB Bandwidth 25.120 MHz**99% Bandwidth (5580 MHz)**

Agilent

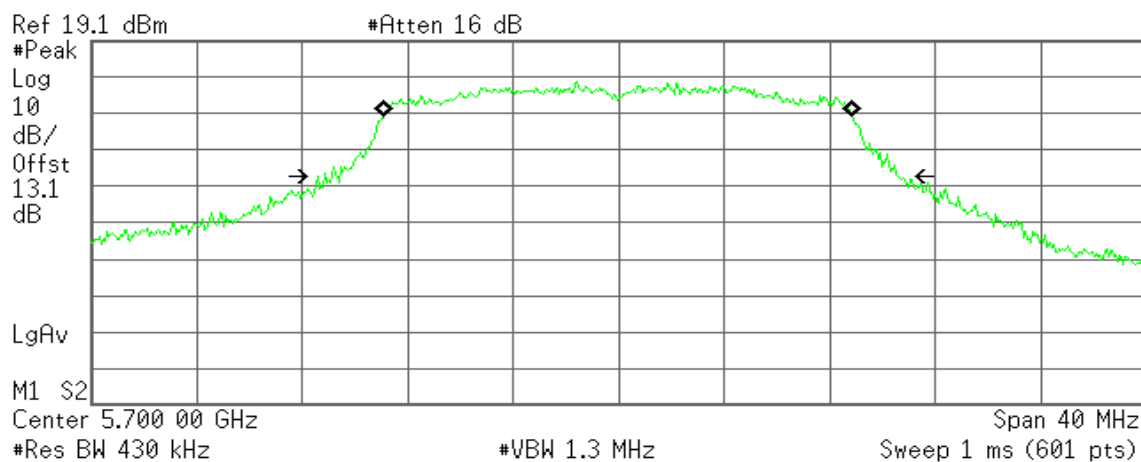
R T

**Occupied Bandwidth**
17.8993 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -44.733 kHz
x dB Bandwidth 24.296 MHz

99% Bandwidth (5700 MHz)

Agilent

R T



Occupied Bandwidth
17.7901 MHz

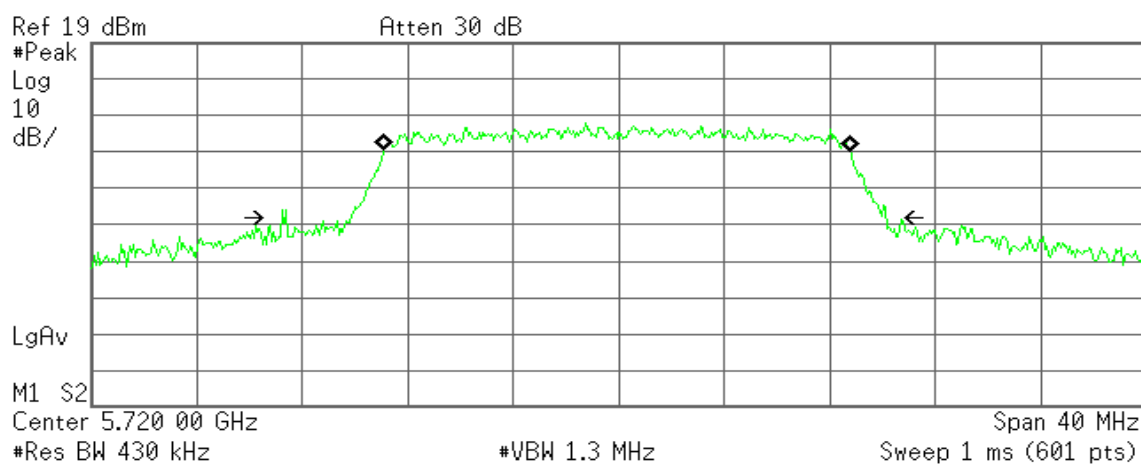
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -31.841 kHz
x dB Bandwidth 21.753 MHz

99% Bandwidth (5720 MHz)

Agilent

R T



Occupied Bandwidth
17.7488 MHz

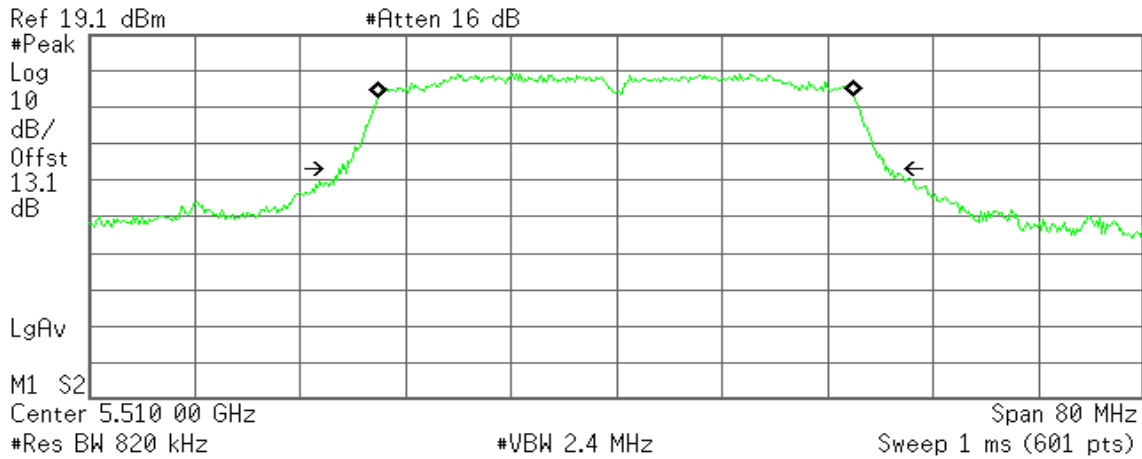
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -57.864 kHz
x dB Bandwidth 22.944 MHz

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 0**99% Bandwidth (5510 MHz)**

Agilent

R T



Occupied Bandwidth
36.1069 MHz

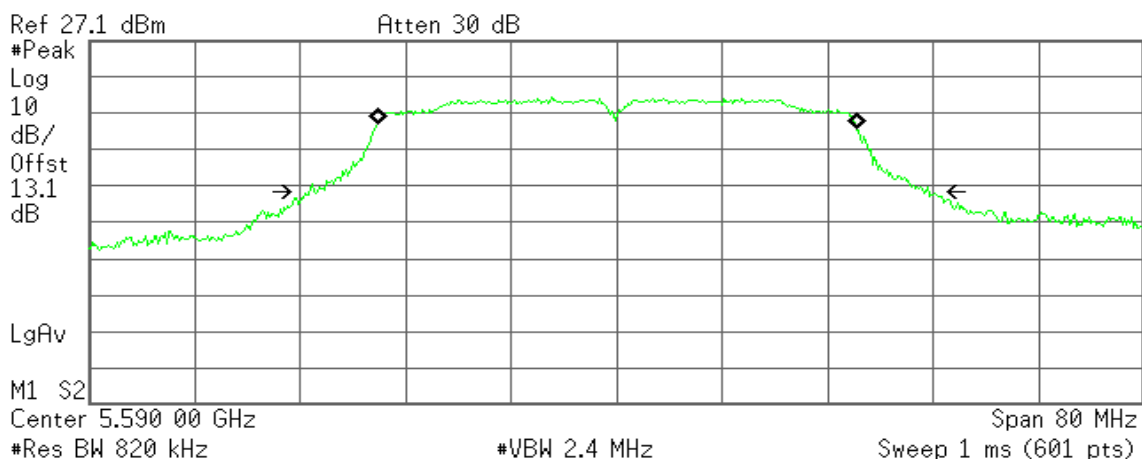
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -37.048 kHz
x dB Bandwidth 41.449 MHz

99% Bandwidth (5590 MHz)

Agilent

R T



Occupied Bandwidth
36.9233 MHz

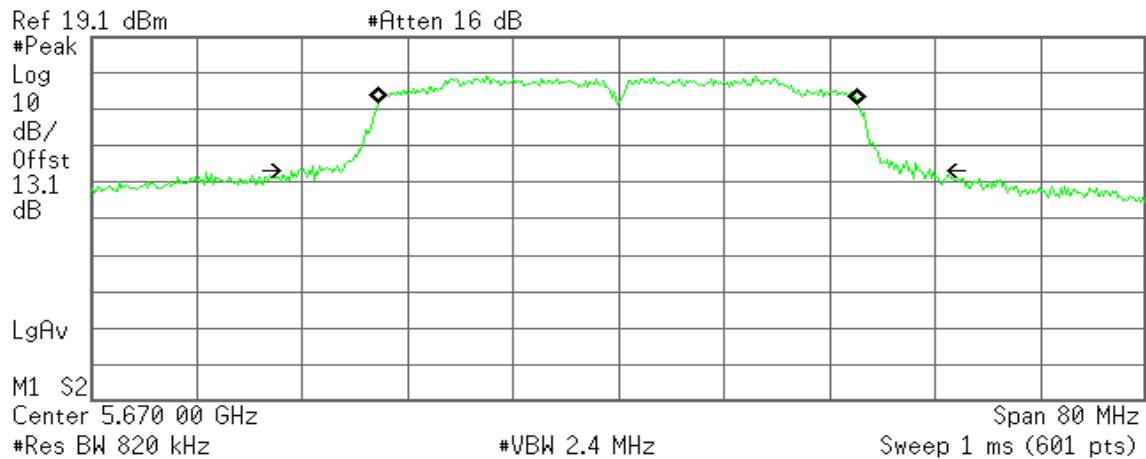
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 24.458 kHz
x dB Bandwidth 46.989 MHz

99% Bandwidth (5670 MHz)

Agilent

R T

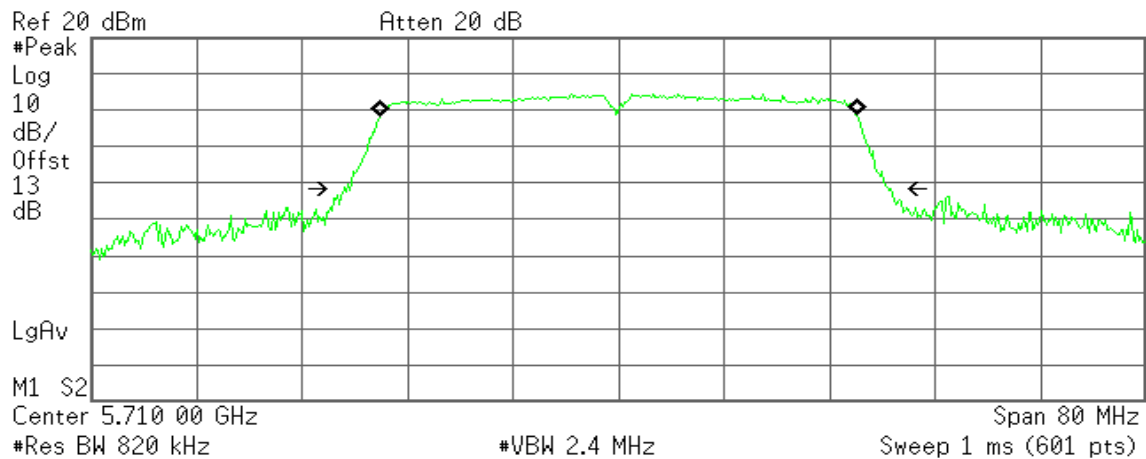


Transmit Freq Error -50.869 kHz
x dB Bandwidth 47.908 MHz

99% Bandwidth (5710 MHz)

Agilent

R T

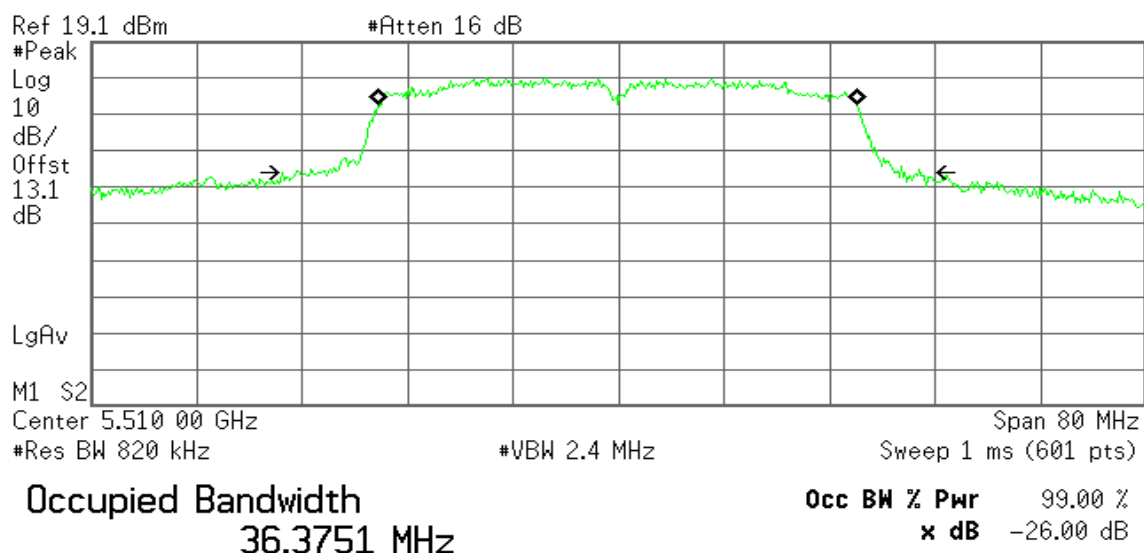


Transmit Freq Error -15.045 kHz
x dB Bandwidth 41.525 MHz

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 1**99% Bandwidth (5510 MHz)**

Agilent

R T

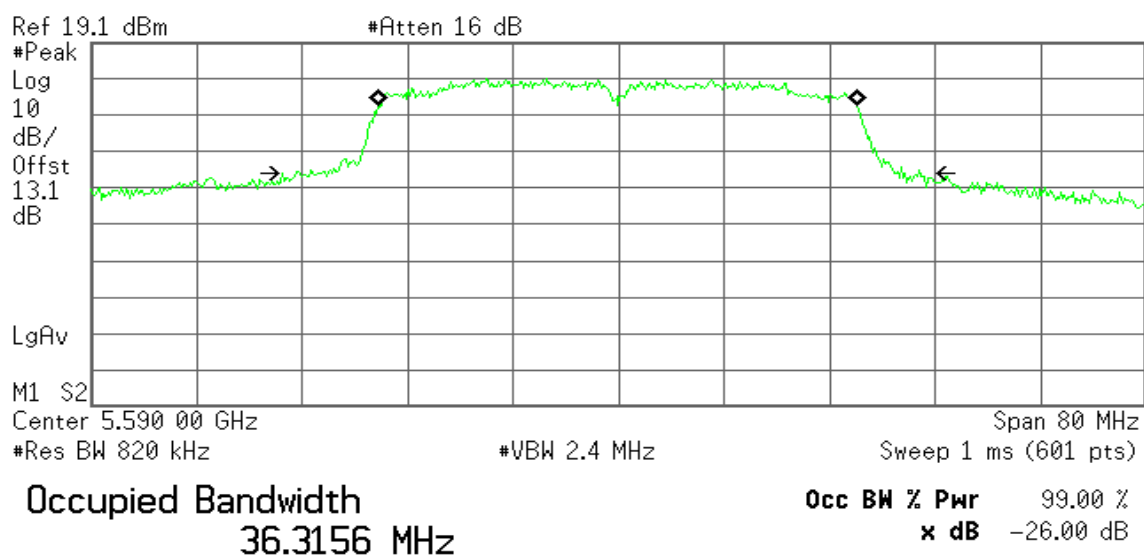


Transmit Freq Error -111.505 kHz
x dB Bandwidth 47.302 MHz

99% Bandwidth (5590 MHz)

Agilent

R T

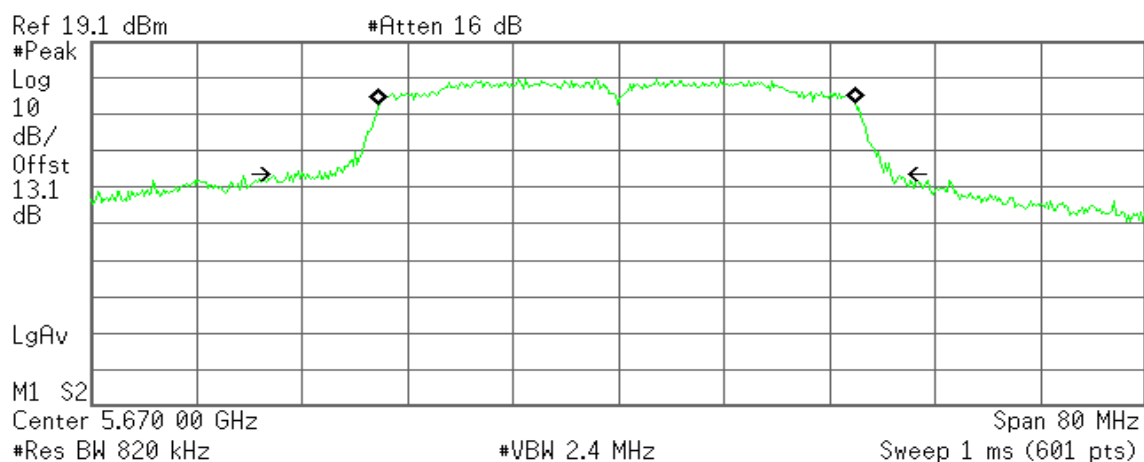


Transmit Freq Error -111.105 kHz
x dB Bandwidth 47.232 MHz

99% Bandwidth (5670 MHz)

Agilent

R T



Occupied Bandwidth
36.2256 MHz

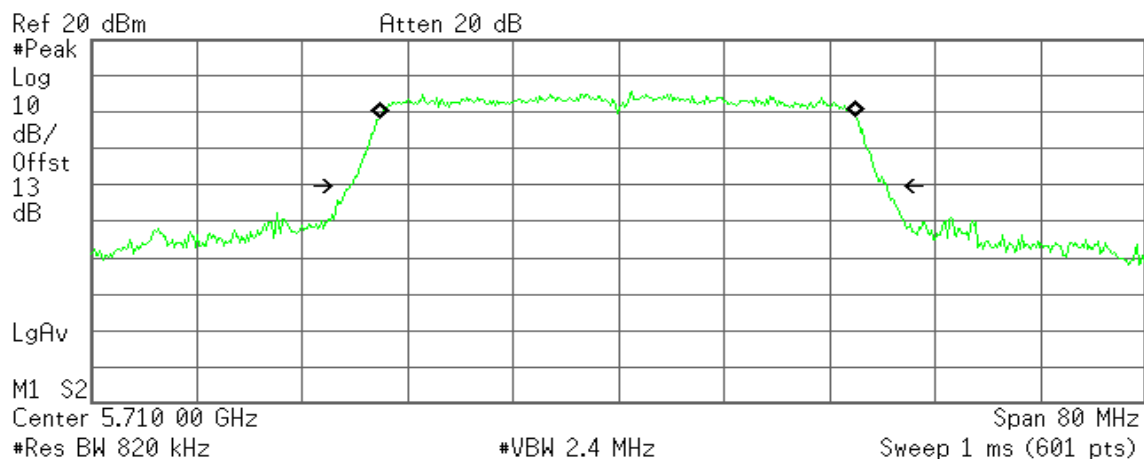
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -90.399 kHz
x dB Bandwidth 45.749 MHz

99% Bandwidth (5710MHz)

Agilent

R T



Occupied Bandwidth
36.1712 MHz

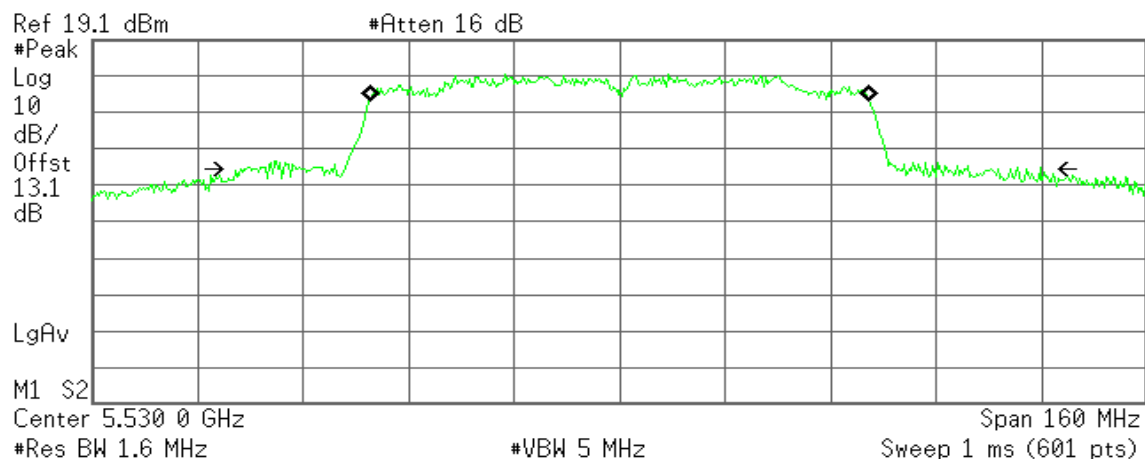
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -89.594 kHz
x dB Bandwidth 40.723 MHz

IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz/ Chain 0**99% Bandwidth (5530 MHz)**

* Agilent

R T

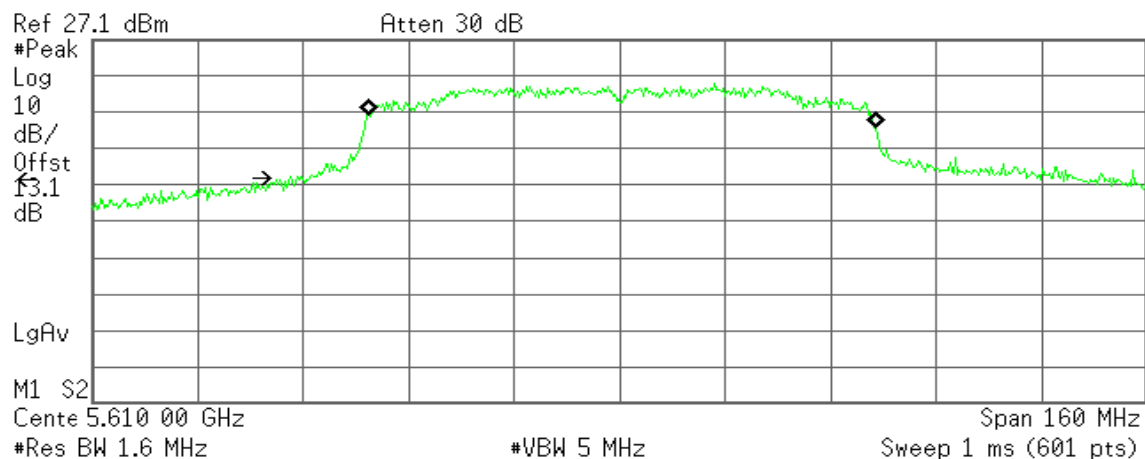


Transmit Freq Error 38.214 kHz
x dB Bandwidth 121.134 MHz

99% Bandwidth (5610 MHz)

* Agilent

R T

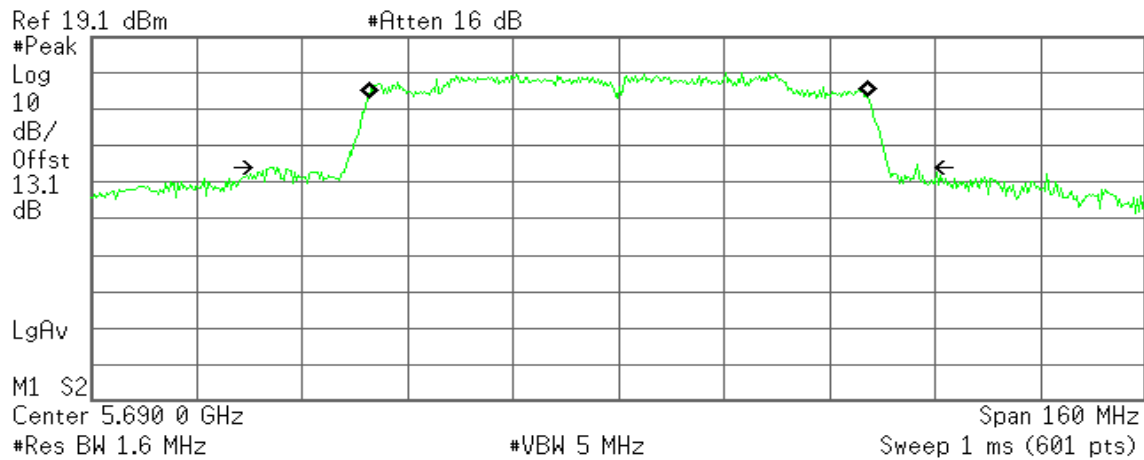


Transmit Freq Error 416.002 kHz
x dB Bandwidth 128.062 MHz

99% Bandwidth (5690 MHz)

Agilent

R T

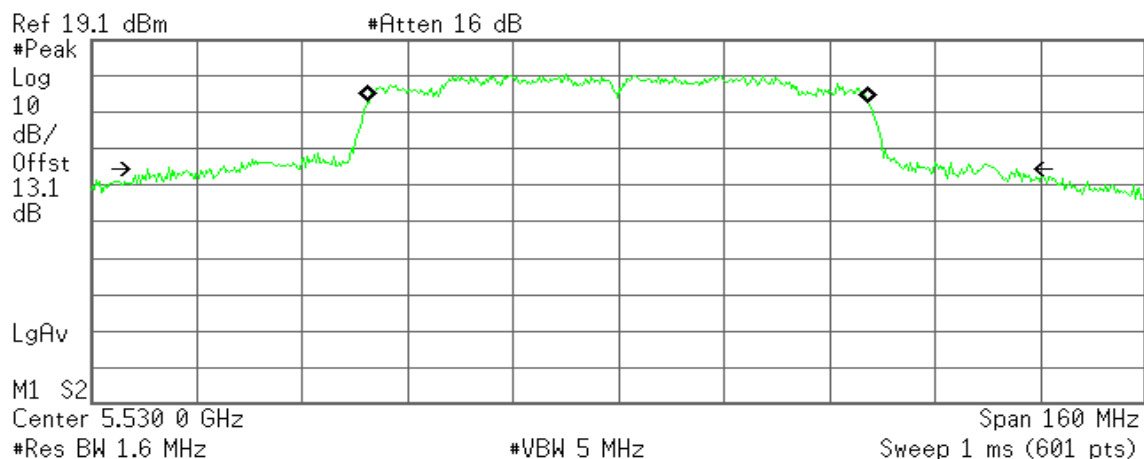


Transmit Freq Error -76.628 kHz
x dB Bandwidth 98.344 MHz

IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz/ Chain 1**99% Bandwidth (5530 MHz)**

* Agilent

R T

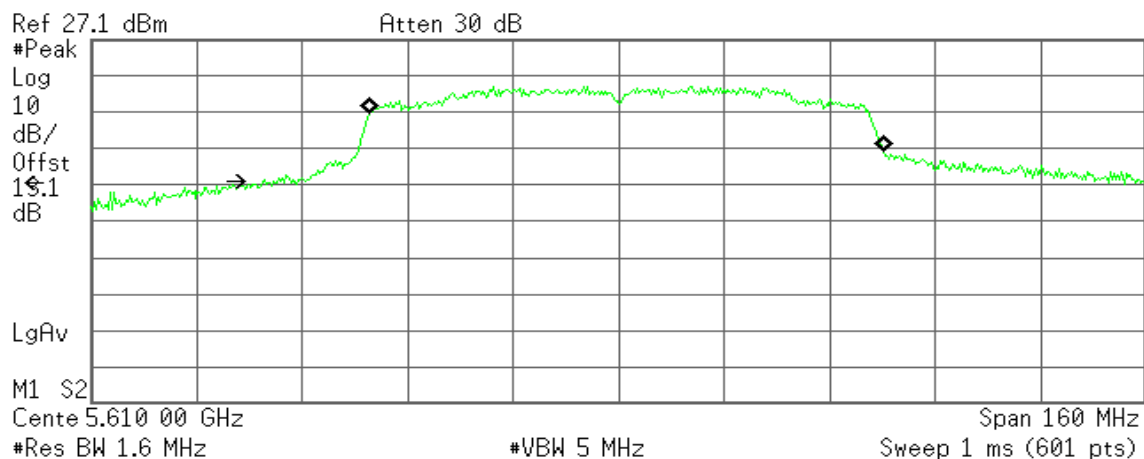


Transmit Freq Error -122.310 kHz
x dB Bandwidth 131.790 MHz

99% Bandwidth (5610 MHz)

* Agilent

R T

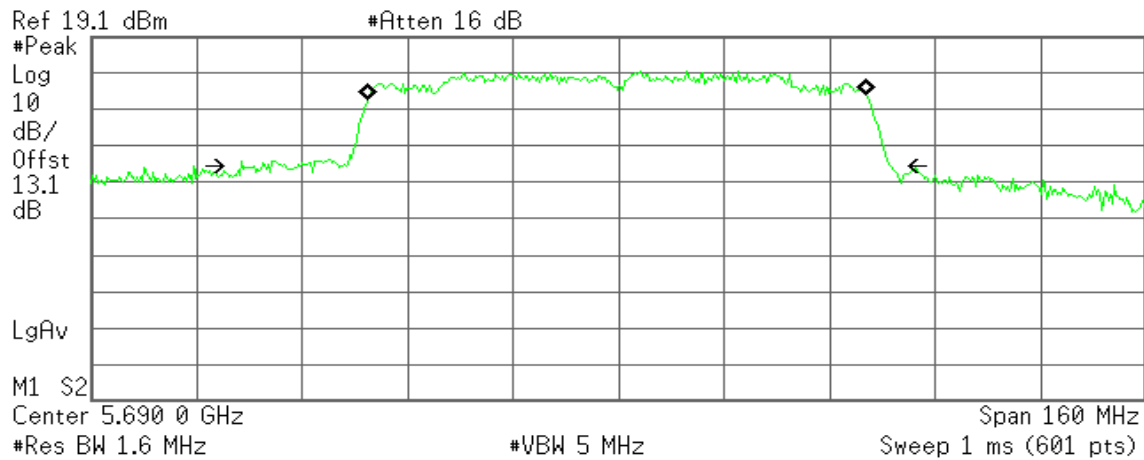


Transmit Freq Error 1.209 MHz
x dB Bandwidth 133.340 MHz

99% Bandwidth (5690 MHz)

Agilent

R T



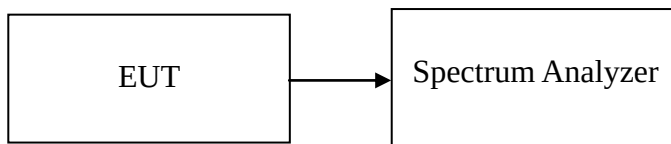
Transmit Freq Error -154.767 kHz
x dB Bandwidth 98.497 MHz

7.2 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)	26db Bandwidth (MHz)
36	5180	28.705
44	5220	28.837
48	5240	28.560

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

Channel	Frequency (MHz)	26db Bandwidth (MHz)
36	5180	22.411
44	5220	21.855
48	5240	22.727

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

Channel	Frequency (MHz)	26db Bandwidth (MHz)
36	5180	22.740
44	5220	22.439
48	5240	21.784

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

Channel	Frequency (MHz)	26db Bandwidth (MHz)
38	5190	42.017
46	5230	40.995

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

Channel	Frequency (MHz)	26db Bandwidth (MHz)
38	5190	40.929
46	5230	42.149

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
42	5210	102.960

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
42	5210	107.273

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	26db Bandwidth (MHz)
52	5260	28.751
56	5280	29.820
64	5320	26.233

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
52	5180	22.843
56	5260	22.898
64	5320	22.542

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
52	5180	23.092
56	5260	21.692
64	5320	22.645

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
54	5270	42.621
62	5310	43.010

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
54	5270	41.855
62	5310	41.261

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
58	5290	85.874

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
58	5290	102.643

Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz

Channel	Frequency (MHz)	26db Bandwidth (MHz)
100	5500	27.121
116	5580	33.066
140	5700	25.375
144	5720 (Band III)	18.8
144	5720 (Band IV)	10.8

BAND III = mark 2 – 3R=18.8

BAND IV = (3R+3Δ) - mark 2=10.8

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
100	5500	22.248
116	5580	21.461
140	5700	22.170
144	5720 (Band III)	18.87
144	5720 (Band IV)	10.6

BAND III = mark 2 – 3R=18.87

BAND IV = (3R+3Δ) - mark 2=10.6

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
100	5500	25.120
116	5580	24.296
140	5700	21.753
144	5720 (Band III)	16.6
144	5720 (Band IV)	5.47

BAND III = mark 2 – 3R=16.6

BAND IIII = (3R+3Δ) - mark2=5.47

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
102	5510	41.449
118	5590	46.989
134	5670	47.908
142	5710 (Band III)	35.4
142	5710 (Band IV)	5.67

BAND III = mark 2 – 3R=35.4

BAND IV = (3R+3Δ) - mark2=5.67

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
102	5510	47.302
118	5590	47.232
134	5670	45.749
142	5710 (Band III)	35.27
142	5710 (Band IV)	5.13

BAND III = mark 2 - 3R=35.27

BAND IV = (3R+3Δ) – mark 2=5.13

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 0

Channel	Frequency (MHz)	26db Bandwidth (MHz)
106	5530	121.134
122	5610	128.062
138	5690 (Band III)	75.8
138	5690 (Band IV)	5.8

BAND III = mark 2 - 3R=75.8

BAND IV = (3R+3Δ) – mark 2=5.8

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 1

Channel	Frequency (MHz)	26db Bandwidth (MHz)
106	5530	131.790
122	5610	133.340
138	5690 (Band III)	87.8
138	5690 (Band IV)	6.9

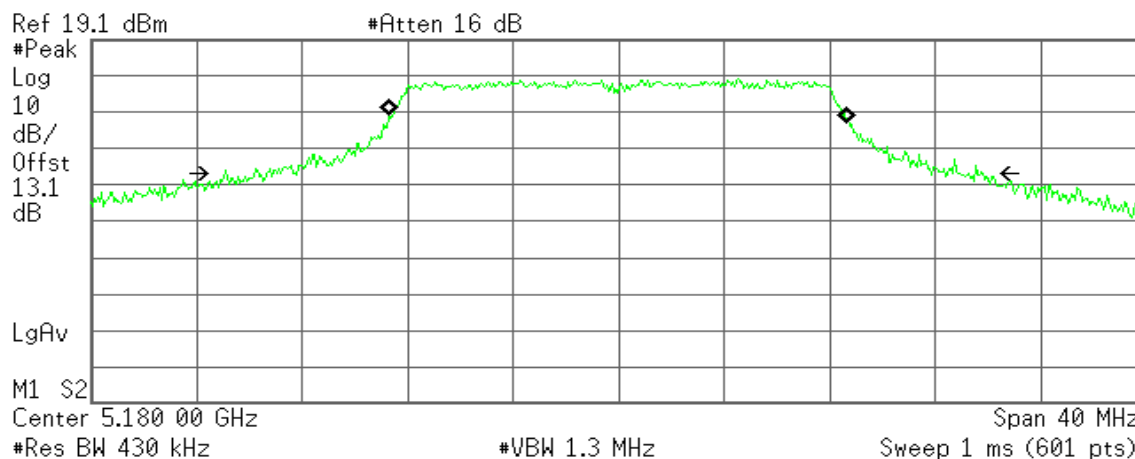
BAND III = mark 2 - 3R=87.8

BAND IV = (3R+3Δ) – mark 2=6.9

Test Plot**IEEE 802.11a for 5180 ~ 5240MHz****5180 MHz**

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R T



Occupied Bandwidth
17.3920 MHz

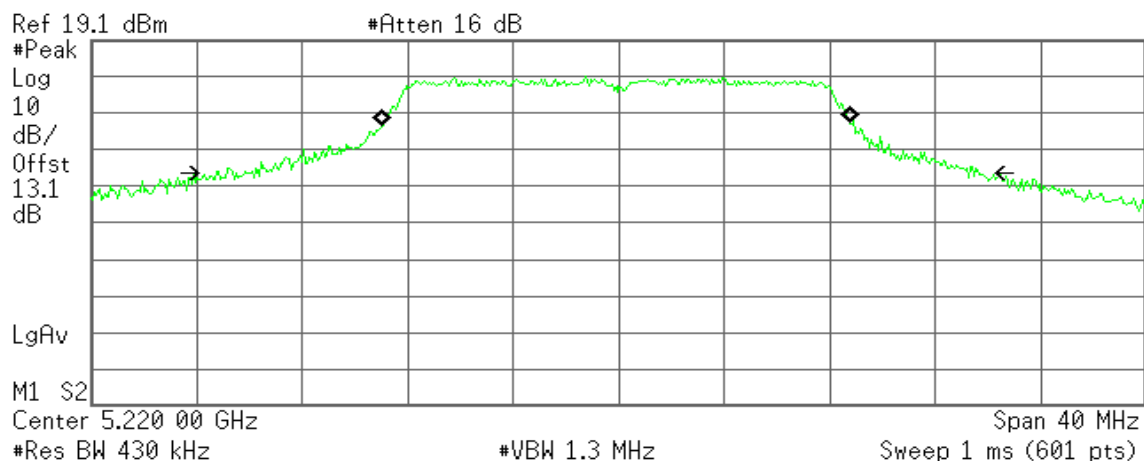
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -20.520 kHz
x dB Bandwidth 28.705 MHz

5220 MHz

Agilent

R T



Occupied Bandwidth
17.7634 MHz

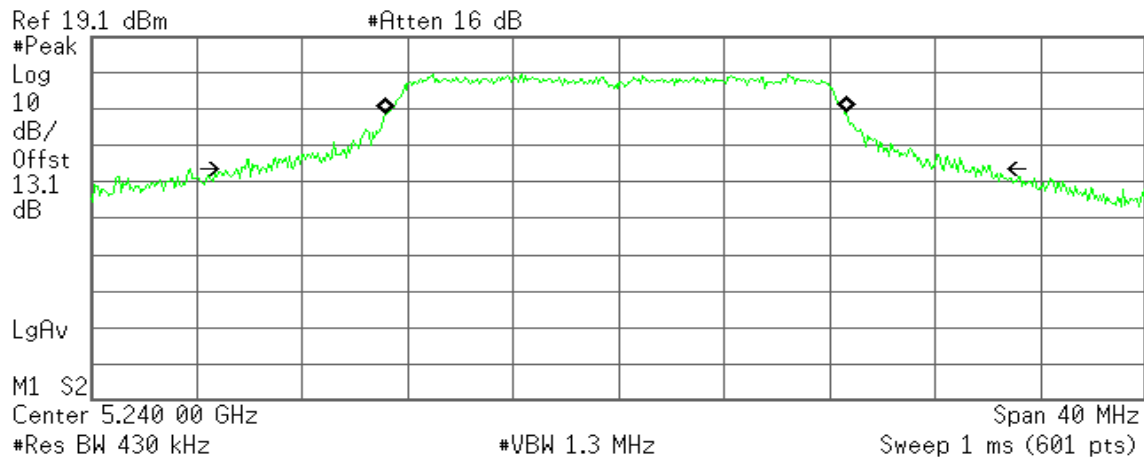
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -94.538 kHz
x dB Bandwidth 28.837 MHz

5240 MHz

Agilent

R T

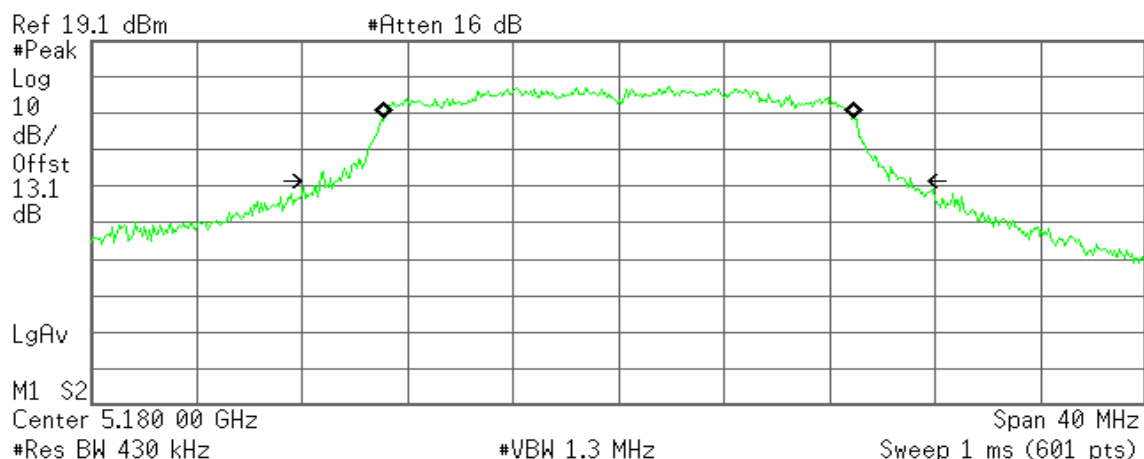


Transmit Freq Error -96.462 kHz
x dB Bandwidth 28.560 MHz

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

* Agilent

R T



Occupied Bandwidth
17.8111 MHz

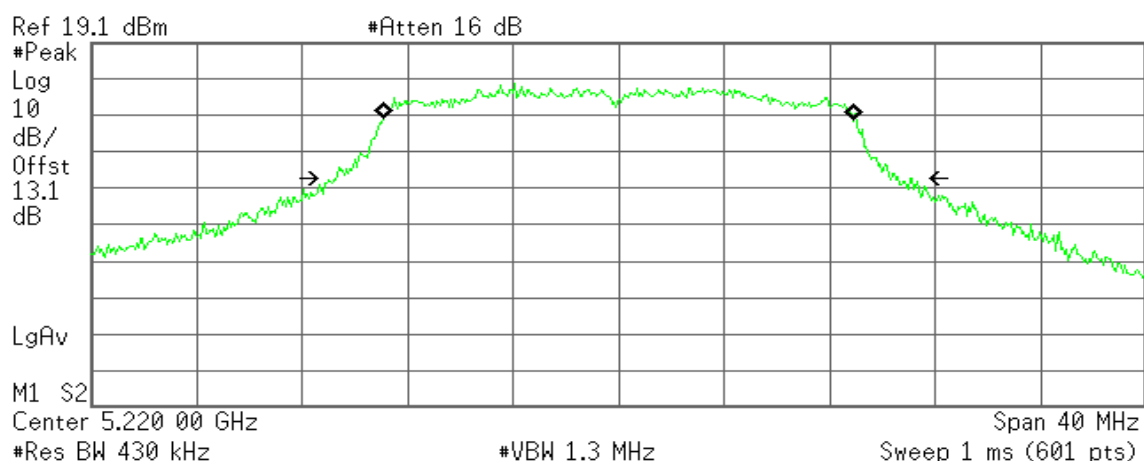
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -5.024 kHz
x dB Bandwidth 22.411 MHz

5220 MHz

* Agilent

R T



Occupied Bandwidth
17.8560 MHz

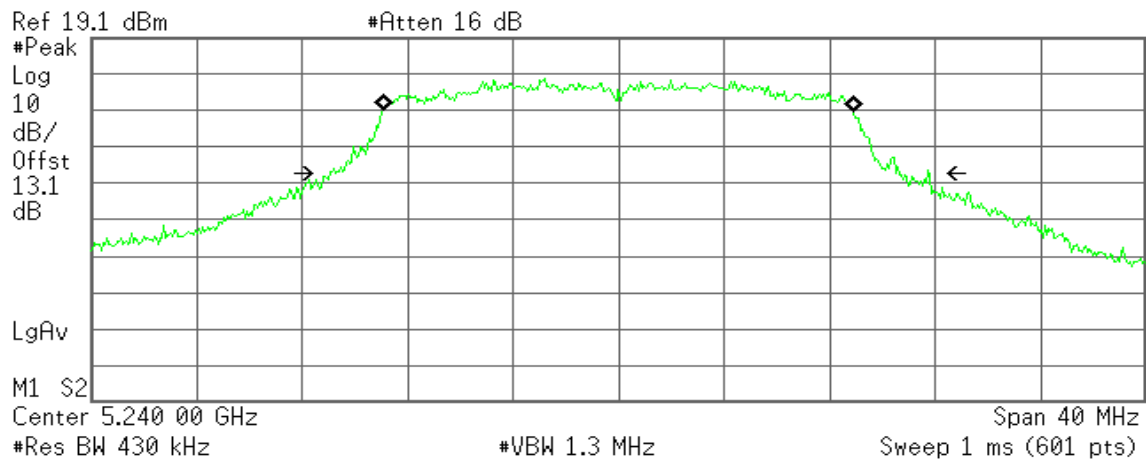
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 2.696 kHz
x dB Bandwidth 21.855 MHz

5240 MHz

Agilent

R T

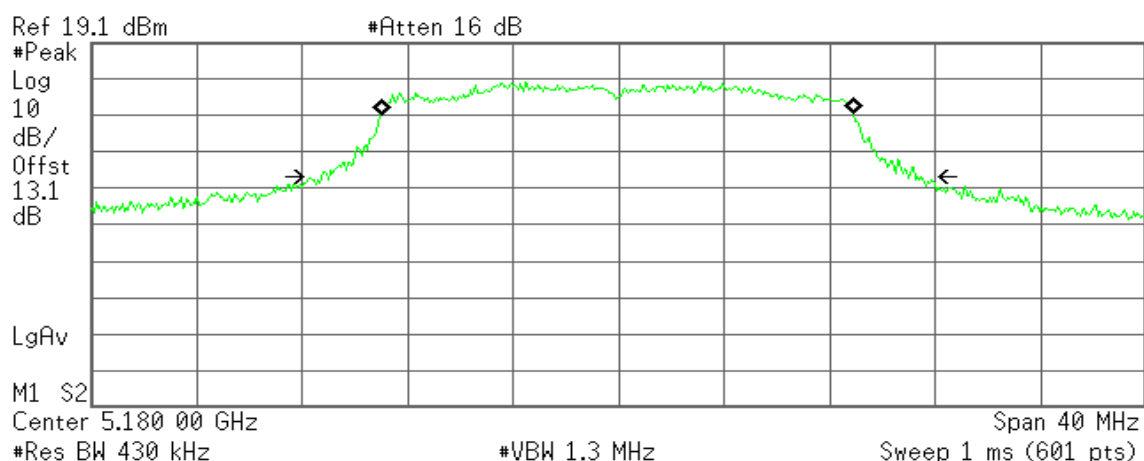


Transmit Freq Error -4.381 kHz
x dB Bandwidth 22.727 MHz

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

* Agilent

R T



Occupied Bandwidth
17.8987 MHz

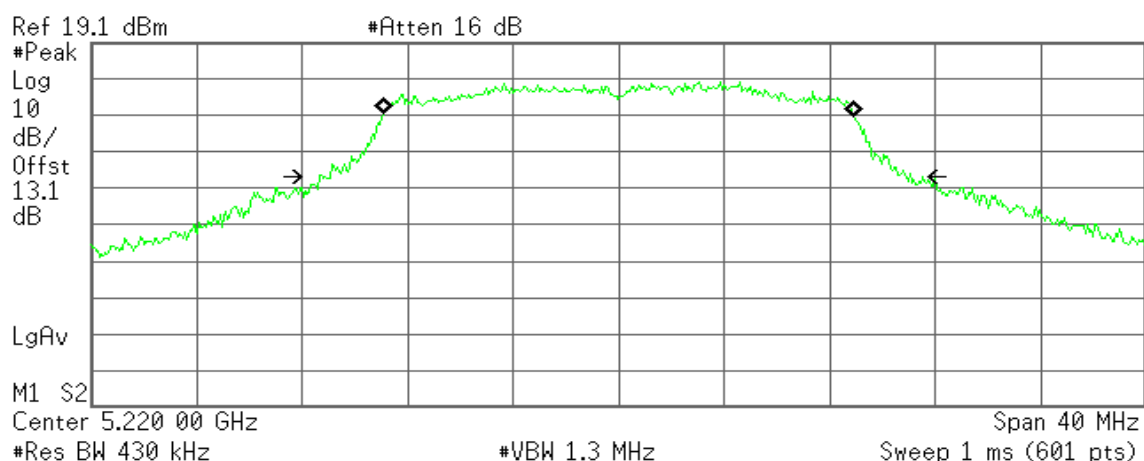
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -31.228 kHz
x dB Bandwidth 22.740 MHz

5220 MHz

* Agilent

R T



Occupied Bandwidth
17.8597 MHz

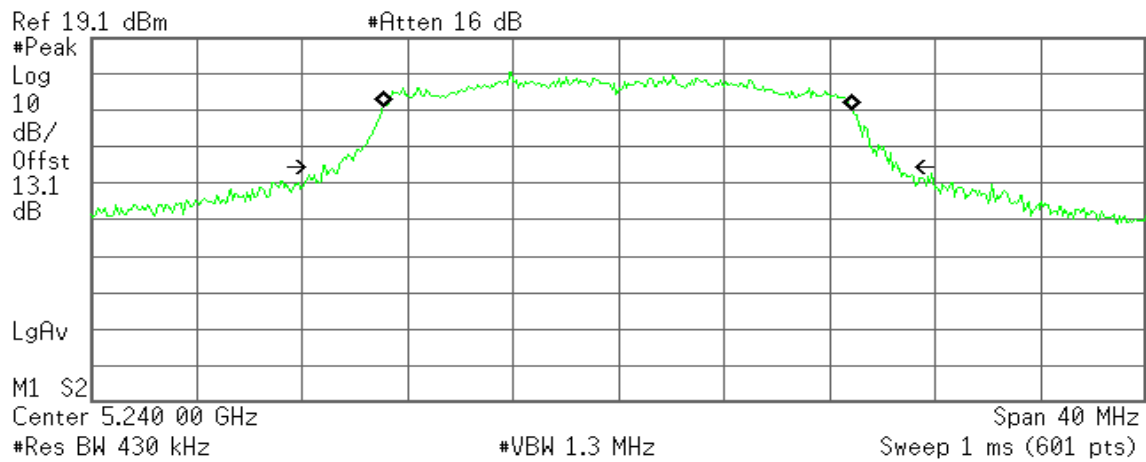
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 4.428 kHz
x dB Bandwidth 22.439 MHz

5240 MHz

Agilent

R T



Occ BW % Pwr 99.00 %

x dB -26.00 dB

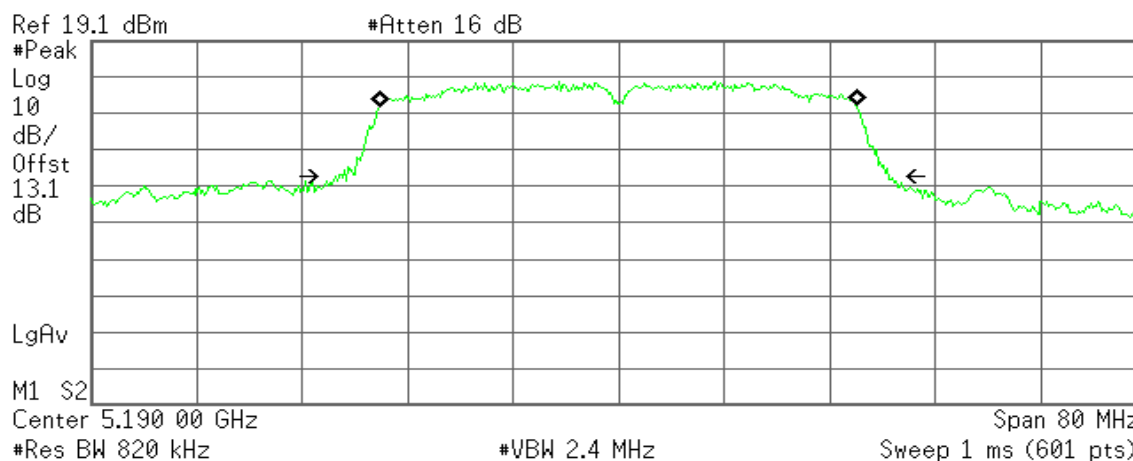
Transmit Freq Error -19.207 kHz

x dB Bandwidth 21.784 MHz

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

* Agilent

R T



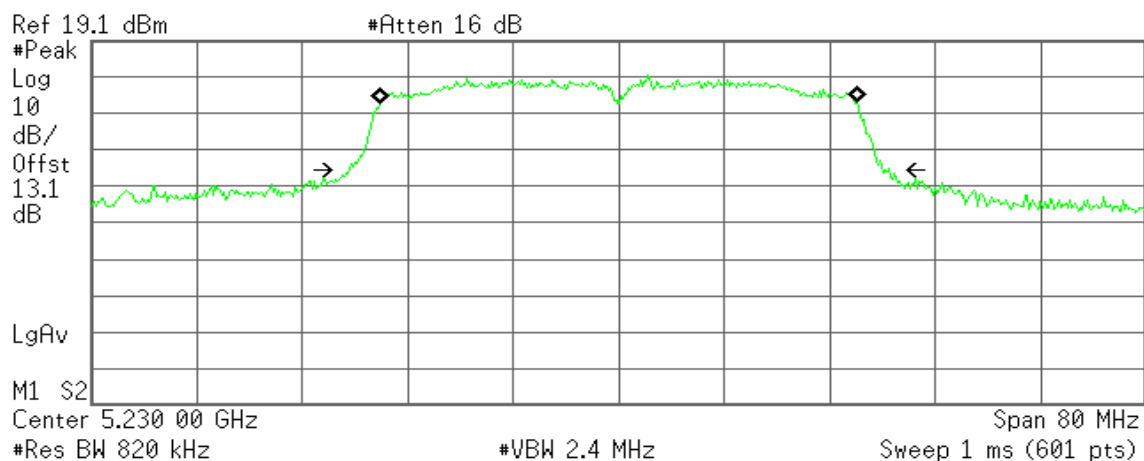
Transmit Freq Error -59.486 kHz

x dB Bandwidth 42.017 MHz

5230 MHz

* Agilent

R T



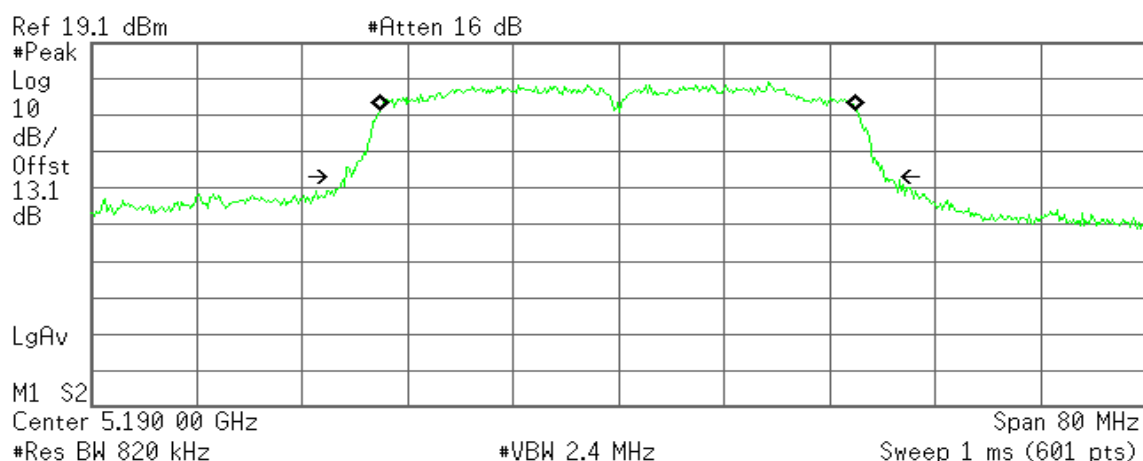
Transmit Freq Error -44.475 kHz

x dB Bandwidth 40.995 MHz

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

Agilent

R T



Occupied Bandwidth
36.1719 MHz

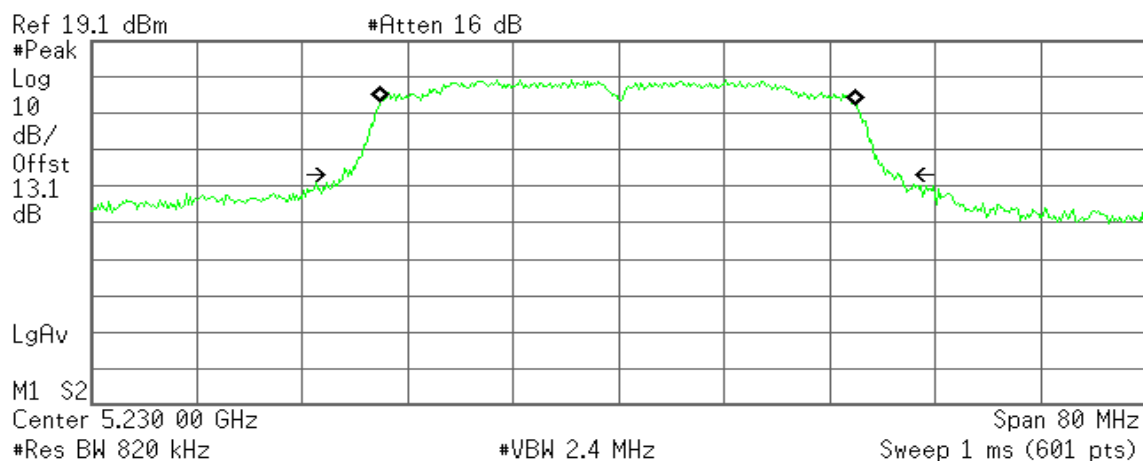
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -43.597 kHz
x dB Bandwidth 40.929 MHz

5230 MHz

Agilent

R T



Occupied Bandwidth
36.1668 MHz

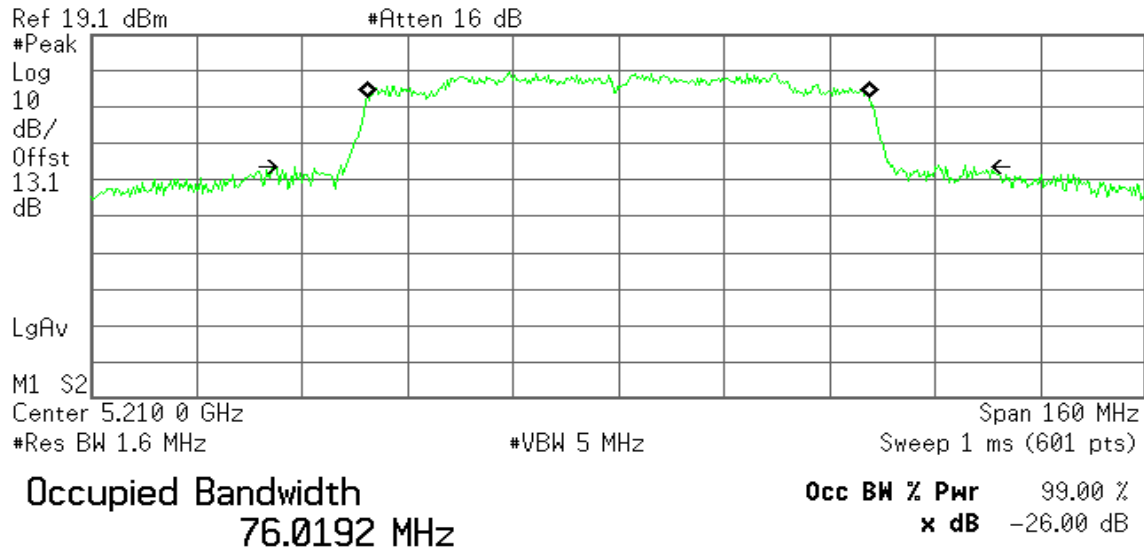
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -42.012 kHz
x dB Bandwidth 42.149 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 0**5210 MHz**

Agilent

R T

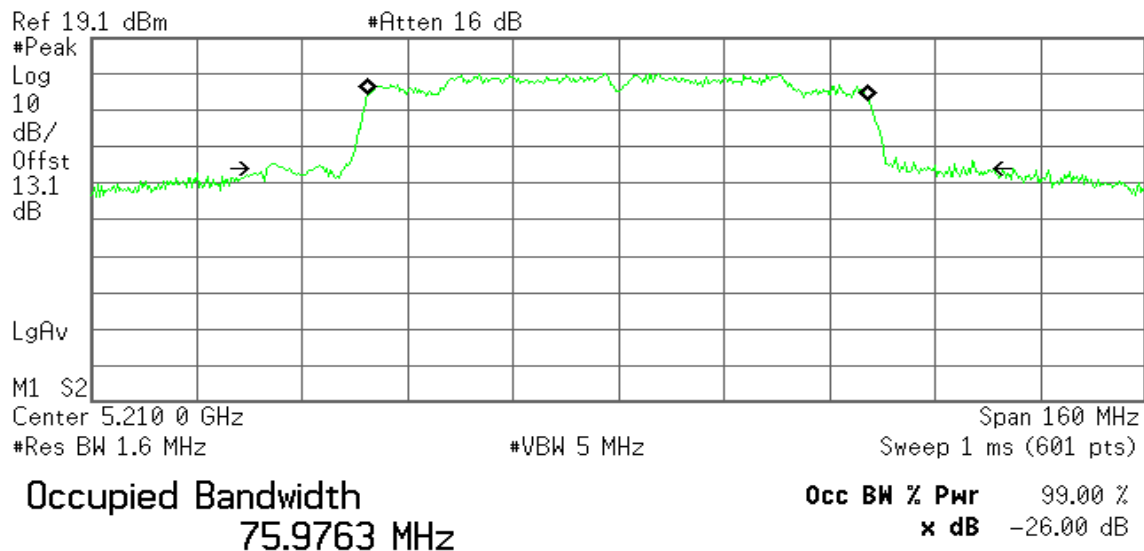


Transmit Freq Error 9.387 kHz
x dB Bandwidth 102.960 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 1**5210 MHz**

Agilent

R T

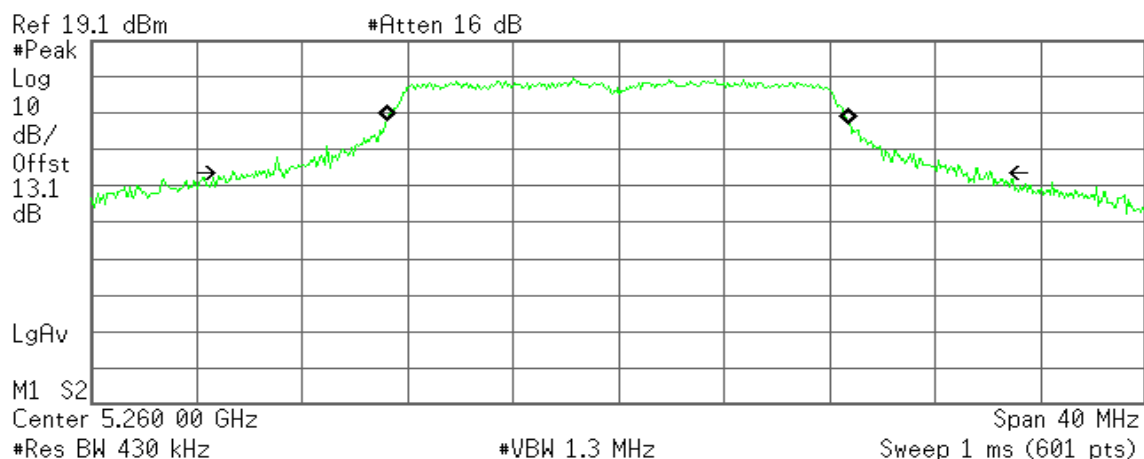


Transmit Freq Error -83.996 kHz
x dB Bandwidth 107.273 MHz

IEEE 802.11a mode / 5260 ~ 5320MHz**5260 MHz**

Agilent

R T



Occupied Bandwidth
17.5551 MHz

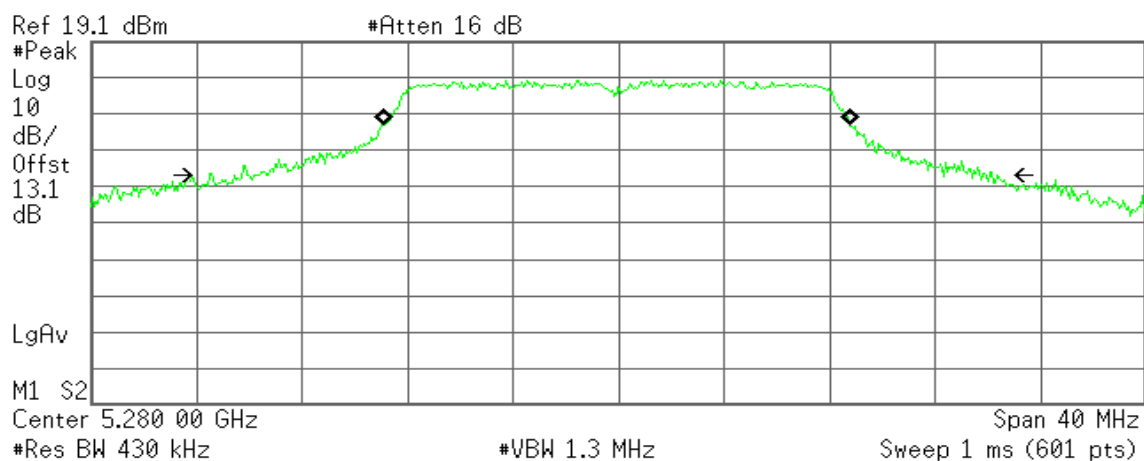
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -52.429 kHz
x dB Bandwidth 28.751 MHz

5280 MHz

Agilent

R T



Occupied Bandwidth
17.7024 MHz

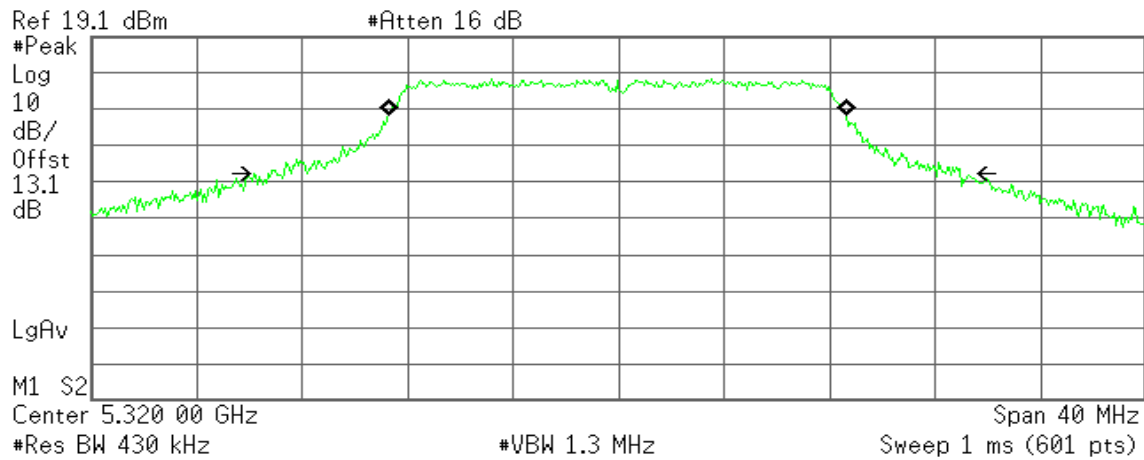
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -52.445 kHz
x dB Bandwidth 29.820 MHz

5320 MHz

Agilent

R T

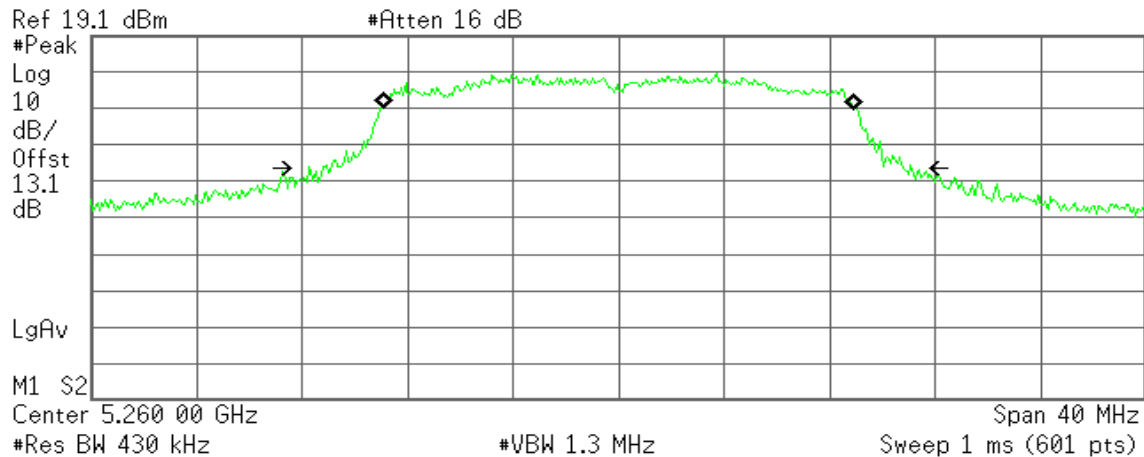


Transmit Freq Error -50.249 kHz
x dB Bandwidth 26.233 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0**5260 MHz**

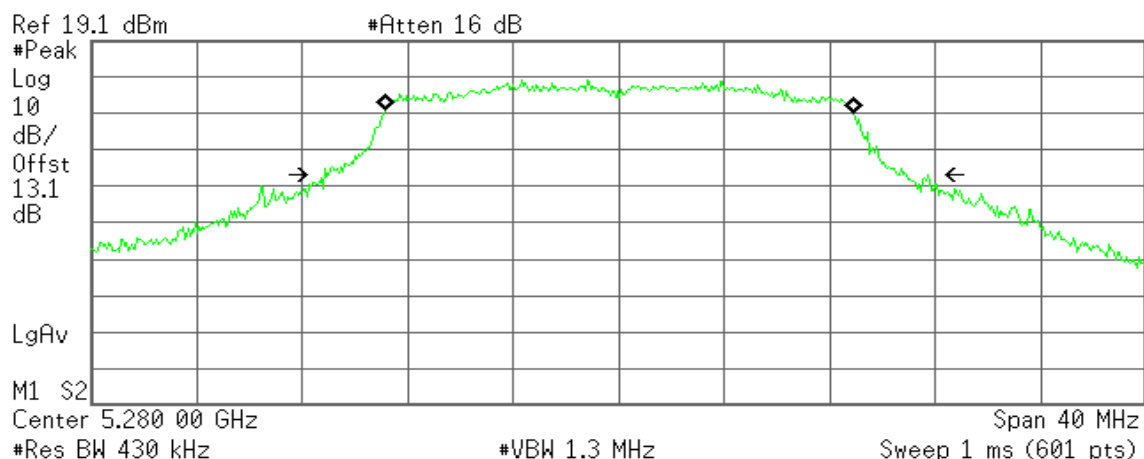
* Agilent

R T

**Occupied Bandwidth****17.9116 MHz****Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** 2.328 kHz
x dB Bandwidth 22.843 MHz**5280 MHz**

* Agilent

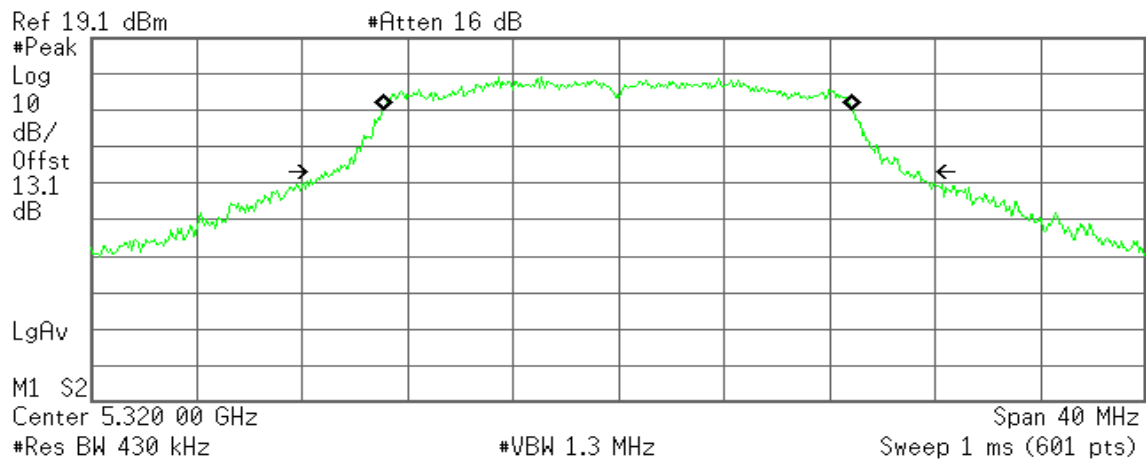
R T

**Occupied Bandwidth****17.7972 MHz****Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** 12.629 kHz
x dB Bandwidth 22.898 MHz

5320 MHz

Agilent

R T



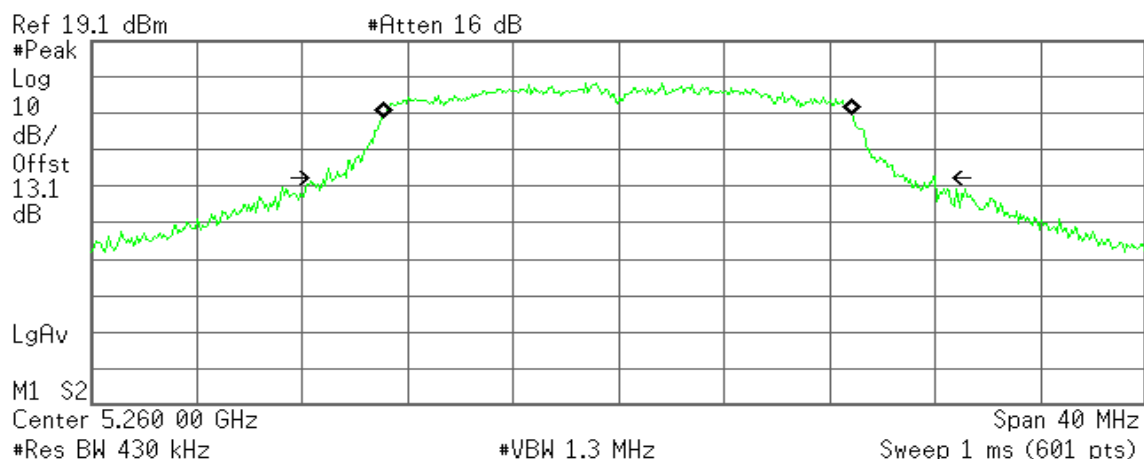
Transmit Freq Error -38.653 kHz

x dB Bandwidth 22.542 MHz

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1**5260 MHz**

* Agilent

R T

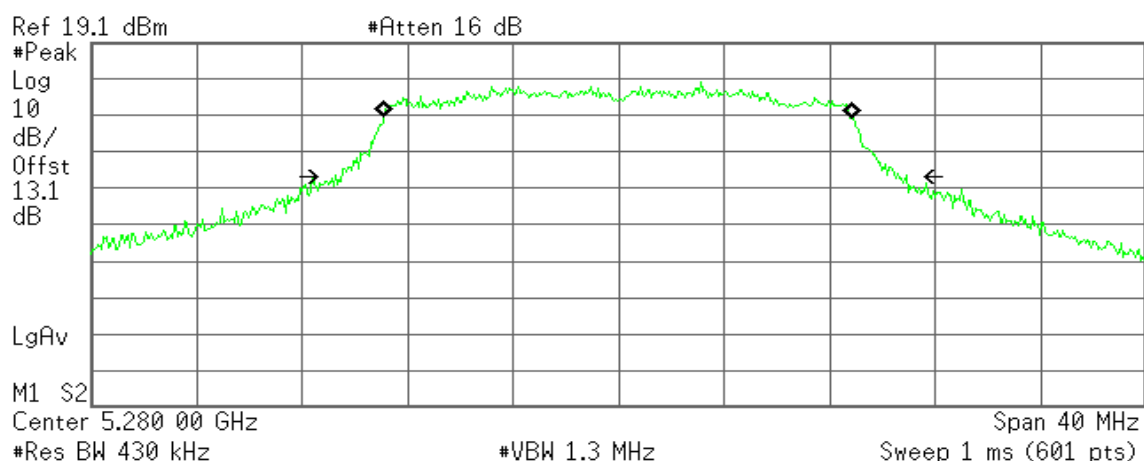


Transmit Freq Error -21.760 kHz
x dB Bandwidth 23.092 MHz

5280 MHz

* Agilent

R T

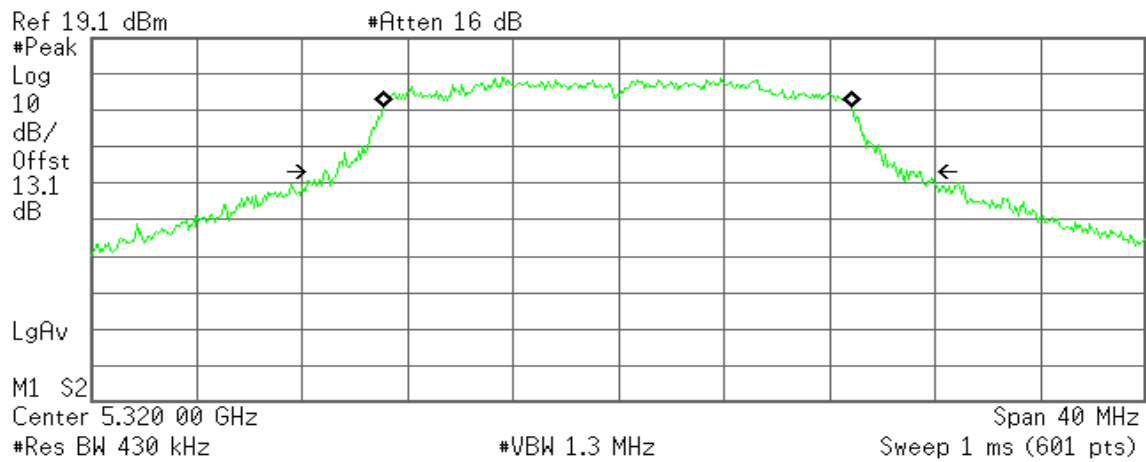


Transmit Freq Error -17.329 kHz
x dB Bandwidth 21.692 MHz

5320 MHz

Agilent

R T



Occupied Bandwidth
17.7933 MHz

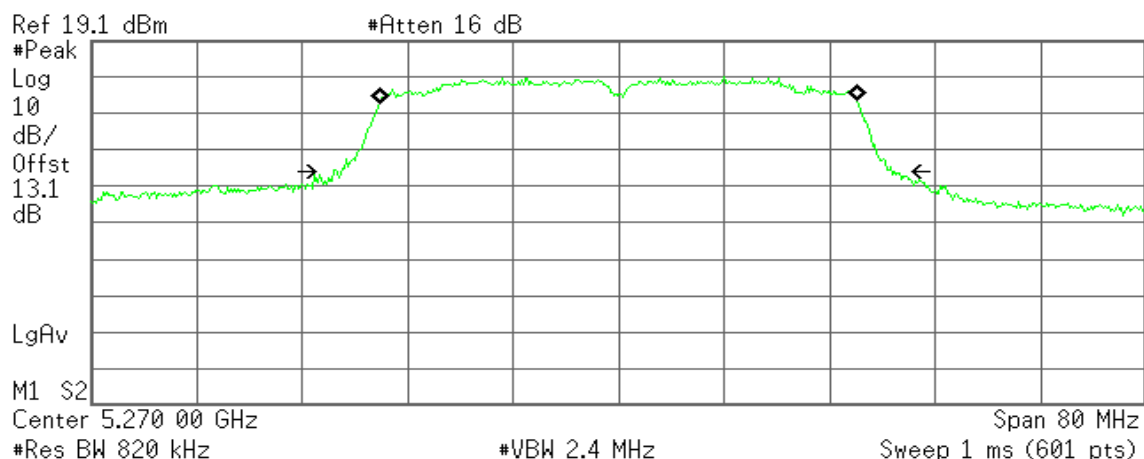
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -21.225 kHz
x dB Bandwidth 22.645 MHz

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0**5270 MHz**

Agilent

R T

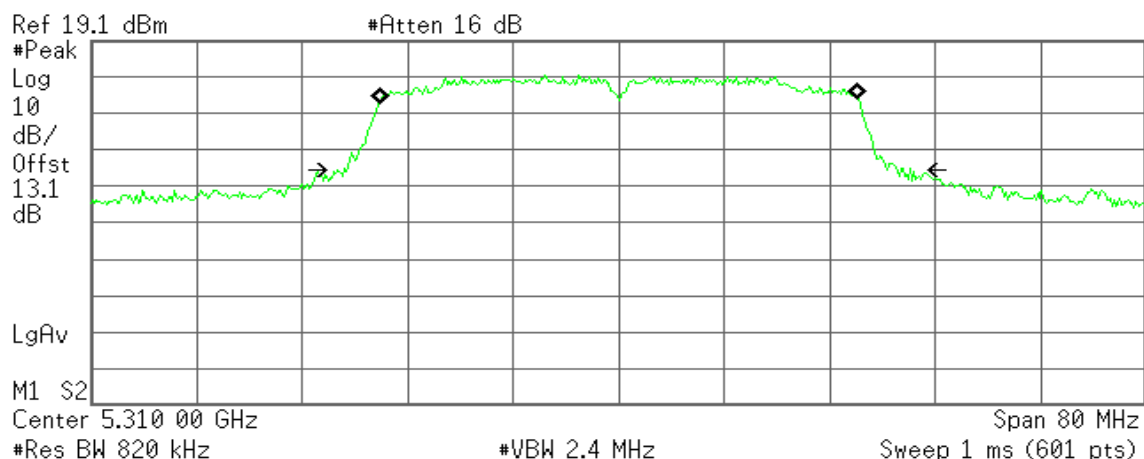


Transmit Freq Error -25.010 kHz
x dB Bandwidth 42.621 MHz

5310 MHz

Agilent

R T

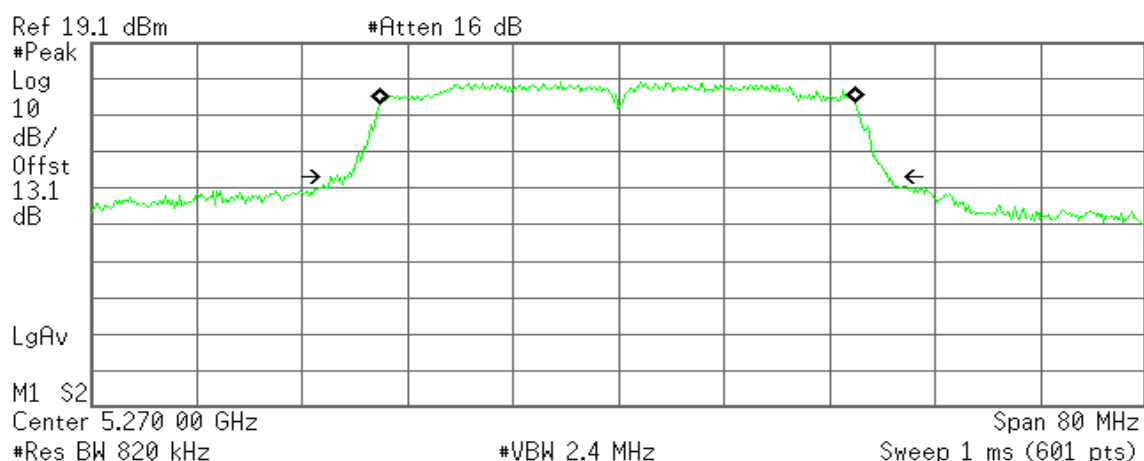


Transmit Freq Error 22.484 kHz
x dB Bandwidth 43.010 MHz

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1**5270 MHz**

Agilent

R T



Occupied Bandwidth
36.1674 MHz

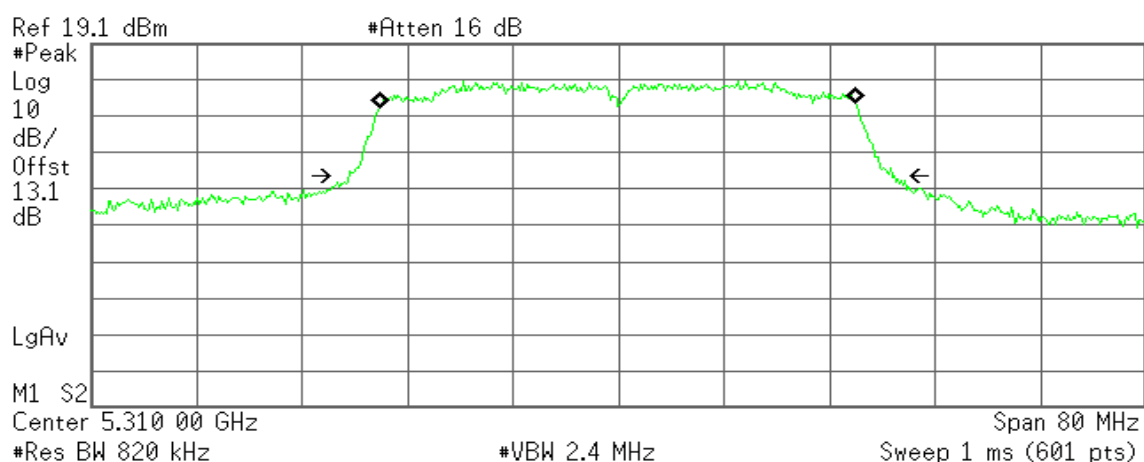
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -61.410 kHz
x dB Bandwidth 41.855 MHz

5310 MHz

Agilent

R T



Occupied Bandwidth
36.1654 MHz

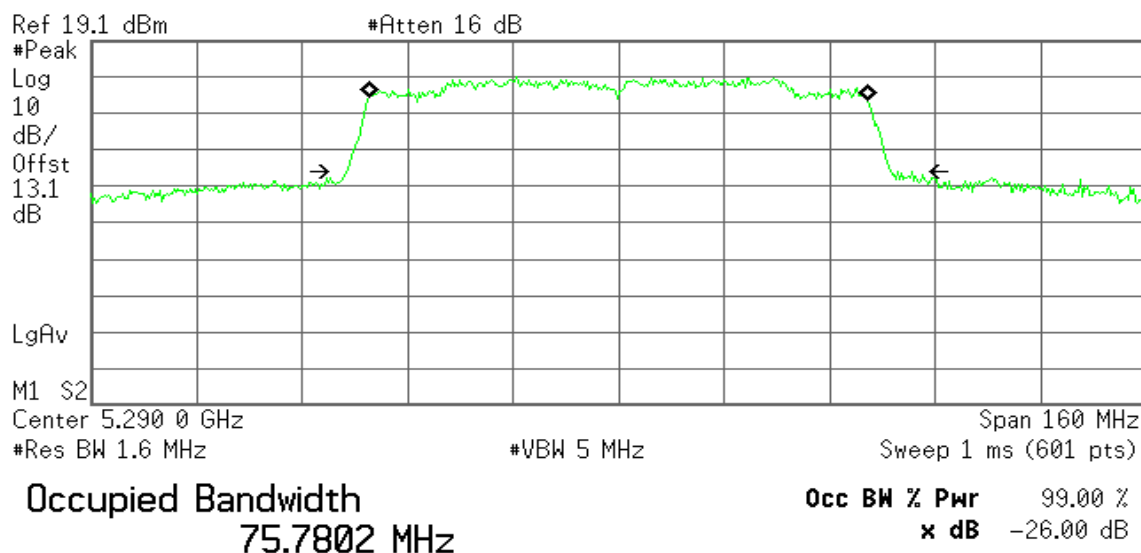
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -35.653 kHz
x dB Bandwidth 41.261 MHz

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0**5290 MHz**

Agilent

R T

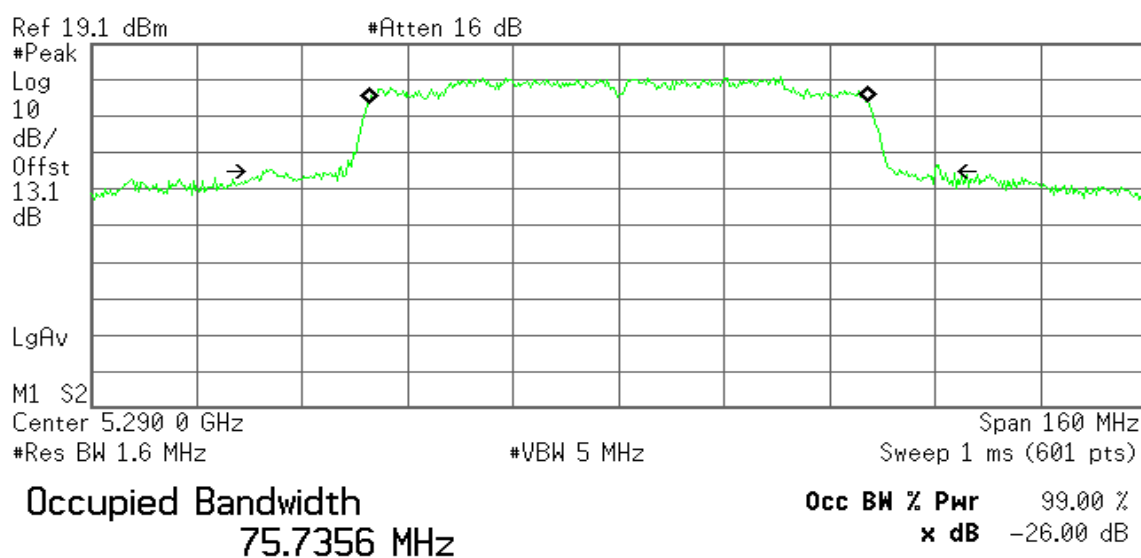


Transmit Freq Error -43.728 kHz
x dB Bandwidth 85.874 MHz

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 1**5290 MHz**

Agilent

R T

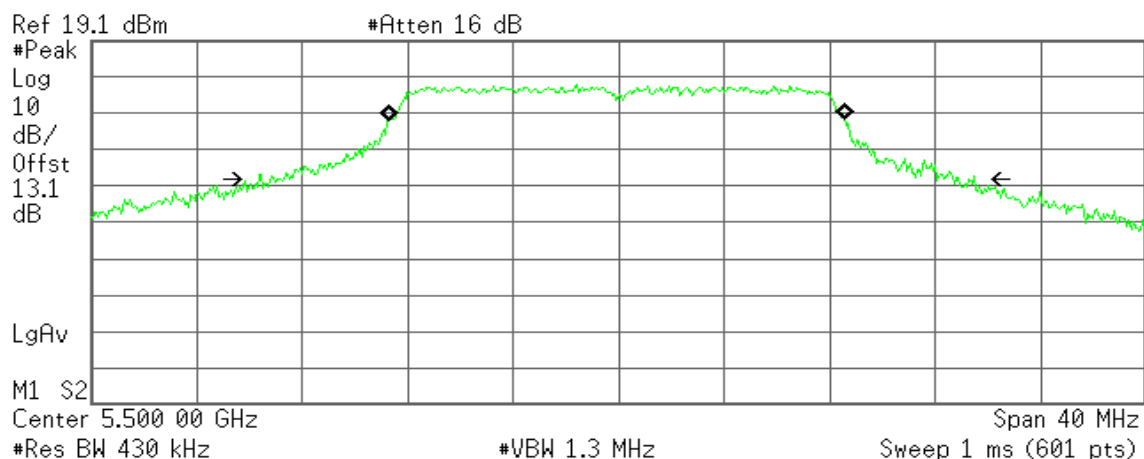


Transmit Freq Error -4.173 kHz
x dB Bandwidth 102.643 MHz

Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz**5500 MHz**

Agilent

R T



Occupied Bandwidth
17.3555 MHz

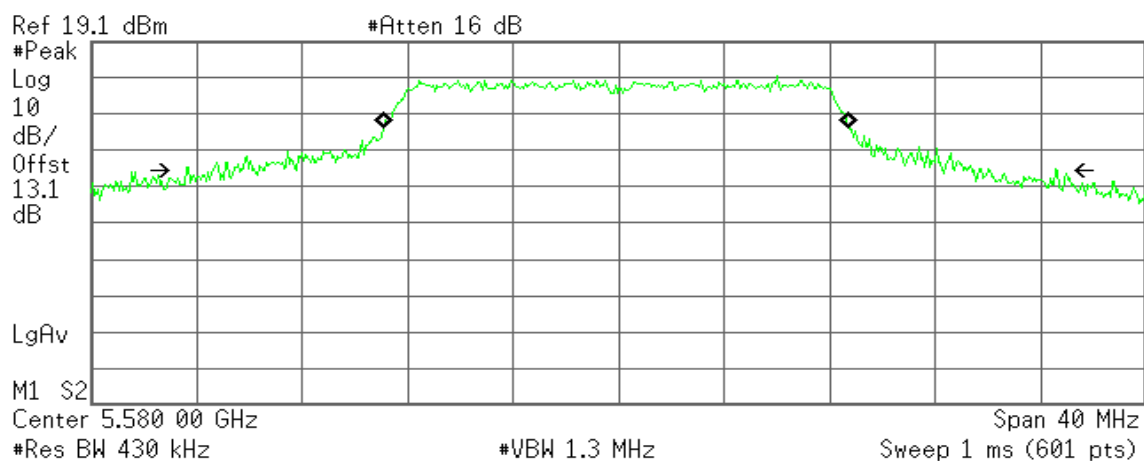
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -81.345 kHz
x dB Bandwidth 27.121 MHz

5580 MHz

Agilent

R T



Occupied Bandwidth
17.7023 MHz

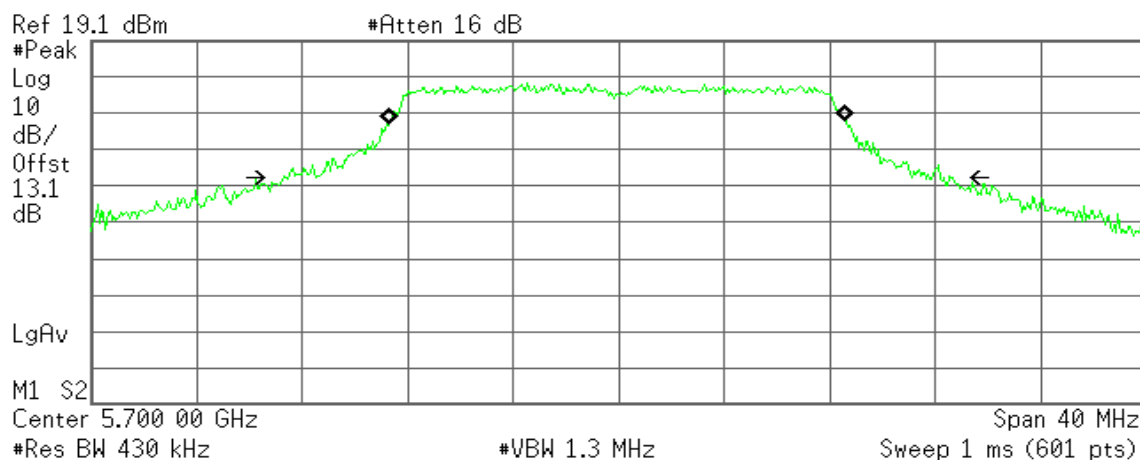
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -91.845 kHz
x dB Bandwidth 33.066 MHz

5700 MHz

Agilent

R T



Occupied Bandwidth
17.3371 MHz

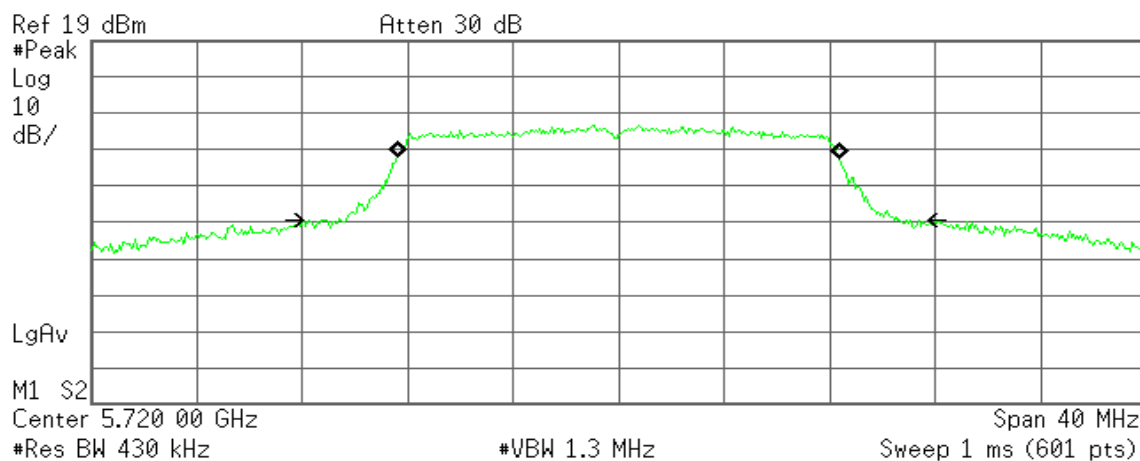
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -39.654 kHz
x dB Bandwidth 25.375 MHz

5720 MHz (Band III)

Agilent

R T



Occupied Bandwidth
16.8176 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -13.574 kHz
x dB Bandwidth 22.346 MHz

5720 MHz (Band IV)

Agilent

R T

▲ Mkr3 29.60 MHz
-1.33 dB

Ref 19 dBm

Atten 20 dB

Peak

Log

10

dB/

Offst

13

dB

DI

-18.5

dBm

LgAv

M1 S2

Center 5.720 00 GHz

Span 40 MHz

#Res BW 430 kHz

#VBW 1.3 MHz

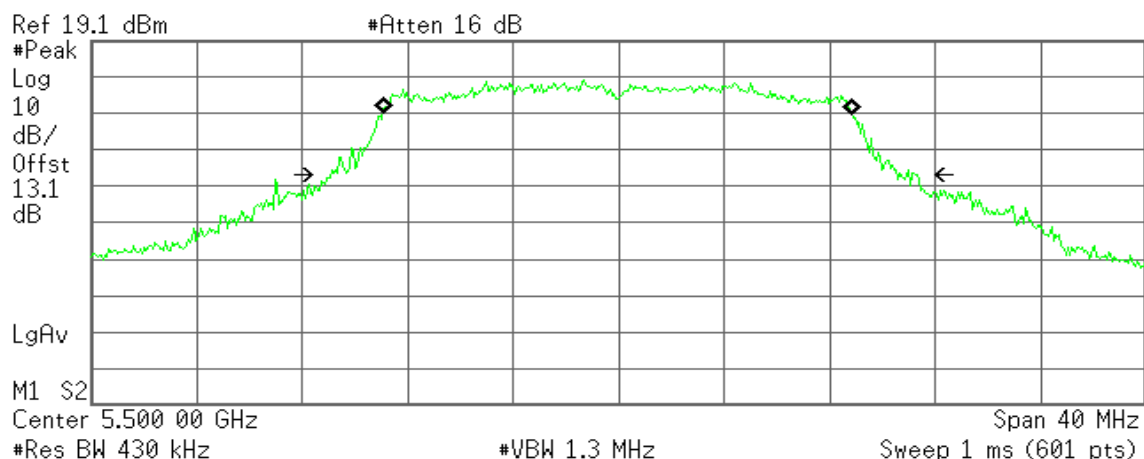
Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.717 13 GHz	7.50 dBm
2	(1)	Freq	5.725 00 GHz	5.70 dBm
3R	(1)	Freq	5.706 20 GHz	-17.53 dBm
3Δ	(1)	Freq	29.60 MHz	-1.33 dB

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 0**5500 MHz**

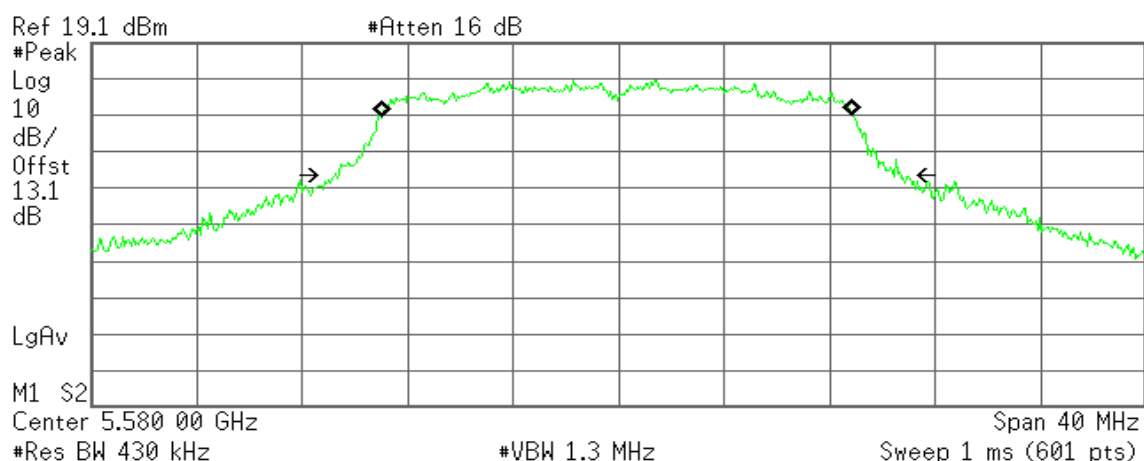
Agilent

R T

**Occupied Bandwidth**
17.8539 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -34.931 kHz
x dB Bandwidth 22.248 MHz**5580 MHz**

Agilent

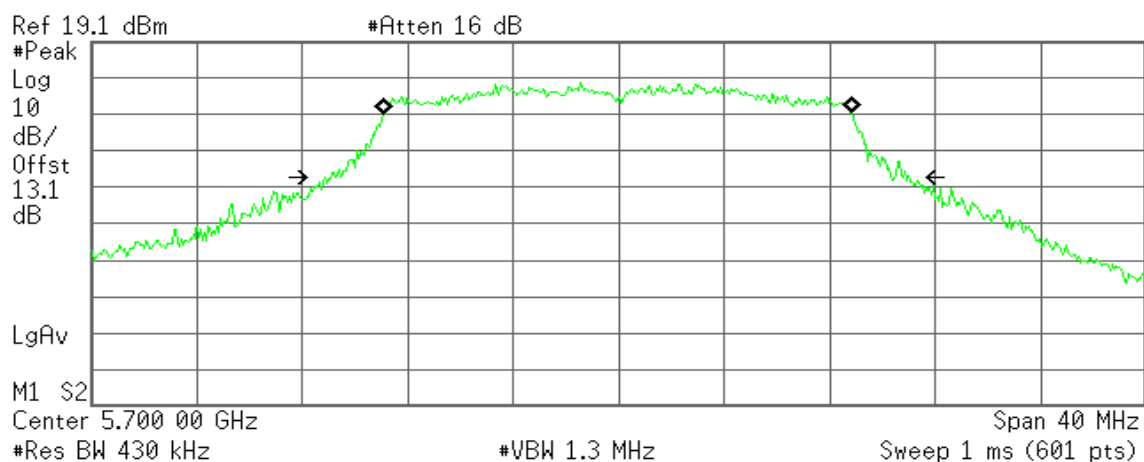
R T

**Occupied Bandwidth**
17.8516 MHz**Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -58.778 kHz
x dB Bandwidth 21.461 MHz

5700 MHz

Agilent

R T

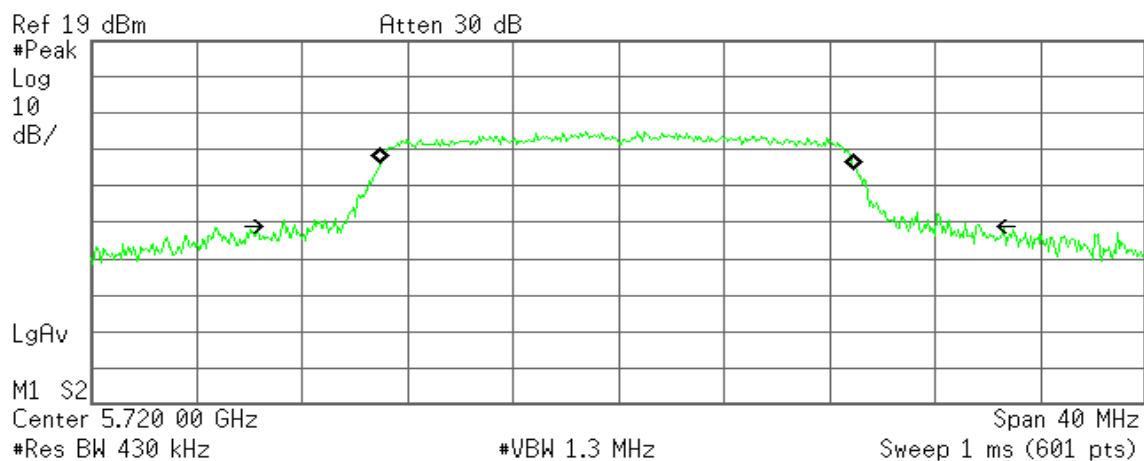


Transmit Freq Error -40.800 kHz
x dB Bandwidth 22.170 MHz

5720 MHz (Band III)

Agilent

R T



Transmit Freq Error -55.588 kHz
x dB Bandwidth 26.458 MHz

5720 MHz (Band IV)

Agilent

R T

▲ Mkr3 29.47 MHz
-0.01 dB

Ref 21 dBm

Atten 20 dB

#Peak

Log

10

dB/

Offst

13

dB

DI

-17.5

dBm

LgAv

M1 S2

Center 5.720 00 GHz

Span 40 MHz

#Res BW 430 kHz

#VBW 1.3 MHz

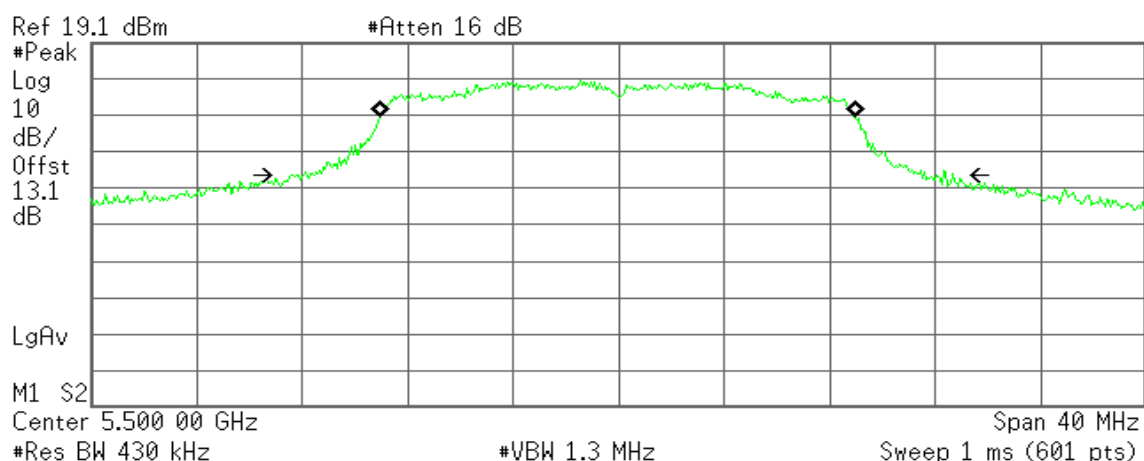
Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.721 40 GHz	8.53 dBm
2	(1)	Freq	5.725 00 GHz	5.96 dBm
3R	(1)	Freq	5.706 13 GHz	-17.77 dBm
3Δ	(1)	Freq	29.47 MHz	-0.01 dB

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 1**5500 MHz**

* Agilent

R T

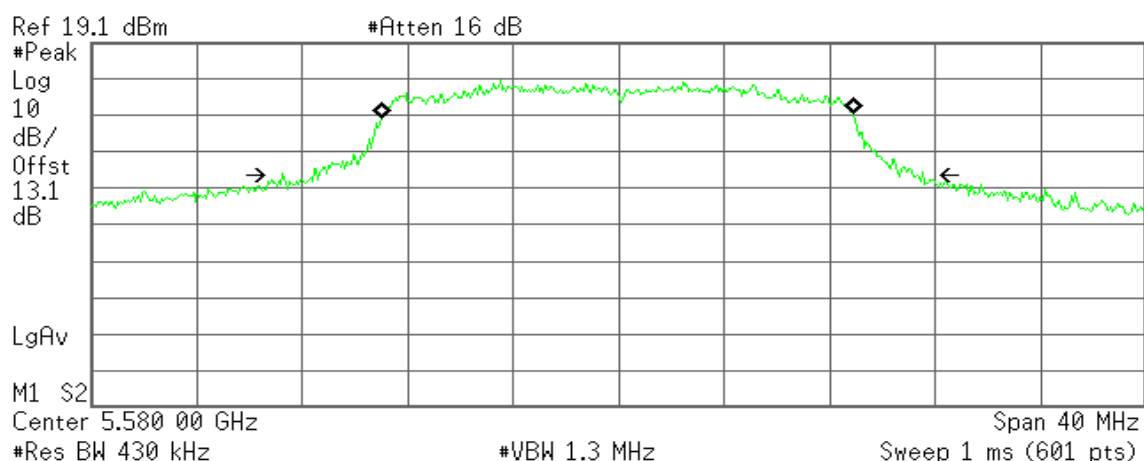


Transmit Freq Error -30.965 kHz
x dB Bandwidth 25.120 MHz

5580 MHz

* Agilent

R T

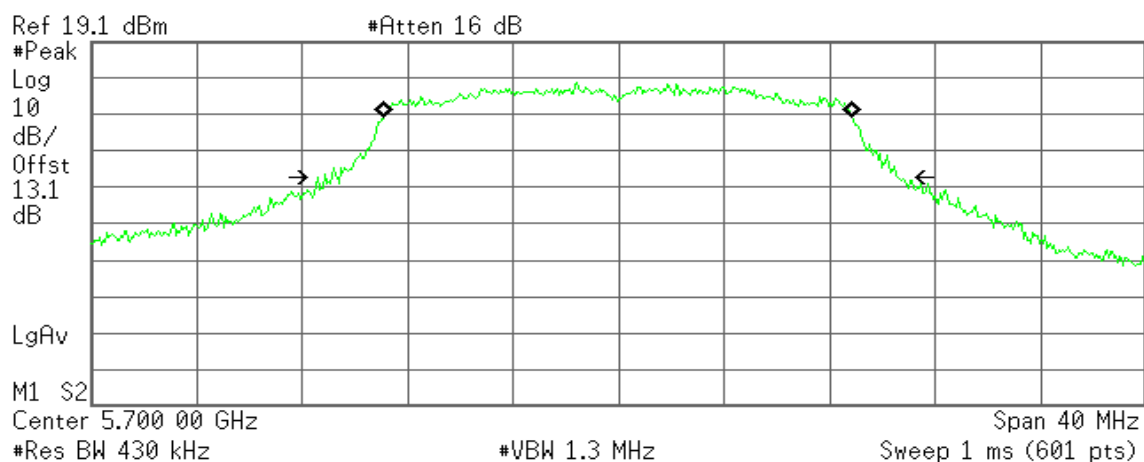


Transmit Freq Error -44.733 kHz
x dB Bandwidth 24.296 MHz

5700 MHz

Agilent

R T

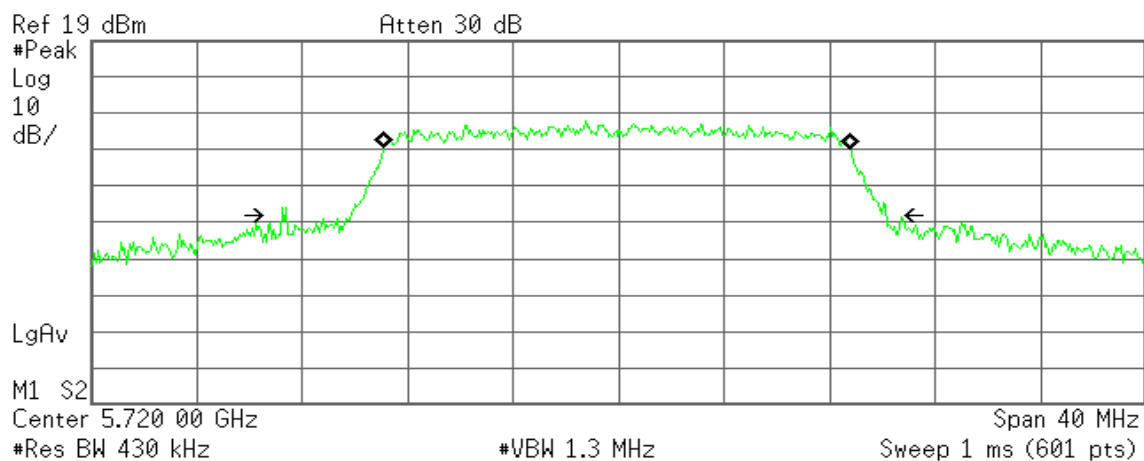


Transmit Freq Error -31.841 kHz
x dB Bandwidth 21.753 MHz

5720 MHz (Band III)

Agilent

R T



Transmit Freq Error -57.864 kHz
x dB Bandwidth 22.944 MHz

5720 MHz (Band IV)

Agilent

R T

▲ Mkr3 22.07 MHz
-0.26 dB

Ref 21 dBm

Atten 20 dB

#Peak

Log

10

dB/

Offst

13

dB

DI

-17.8

dBm

LgAv

M1 S2

Center 5.720 00 GHz

Span 40 MHz

#Res BW 430 kHz

#VBW 1.3 MHz

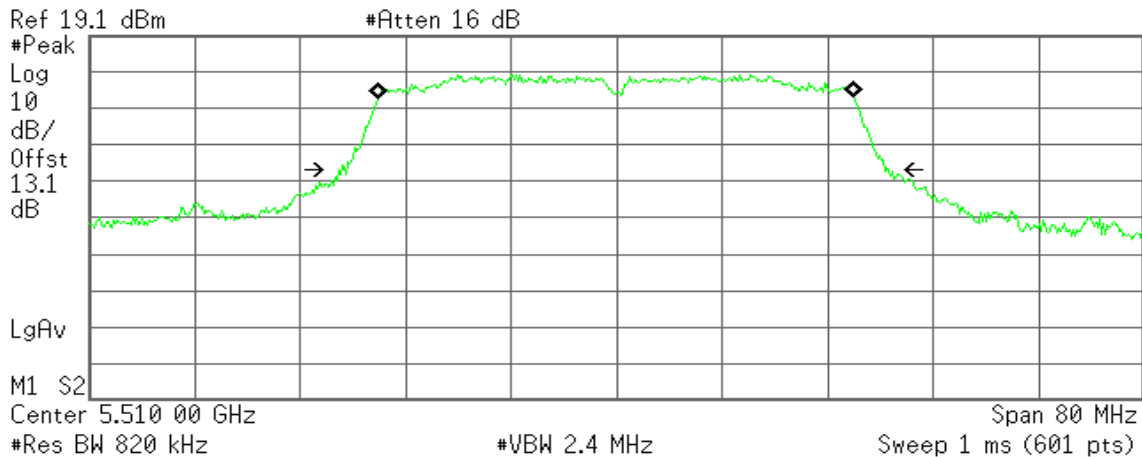
Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.716 80 GHz	8.25 dBm
2	(1)	Freq	5.725 00 GHz	7.45 dBm
3R	(1)	Freq	5.708 40 GHz	-18.68 dBm
3▲	(1)	Freq	22.07 MHz	-0.26 dB

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 0**5510 MHz**

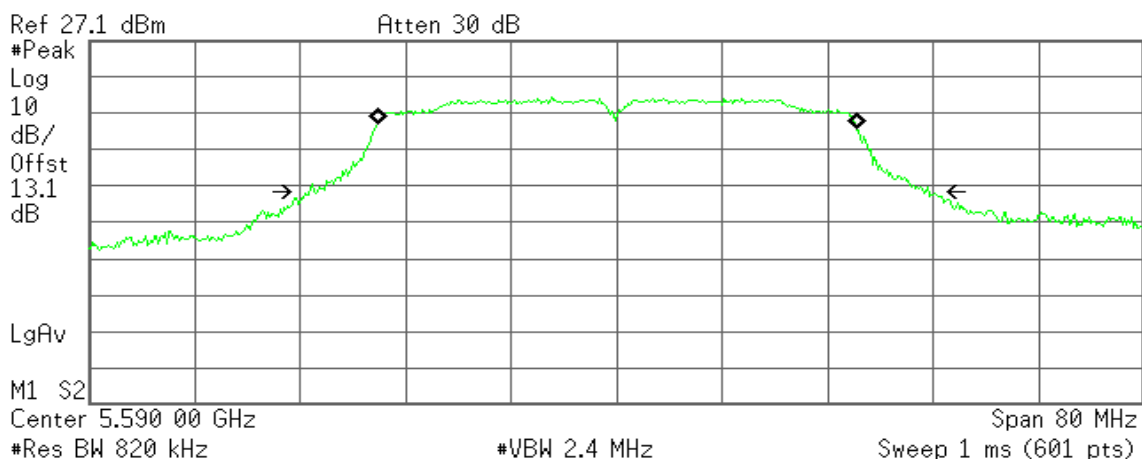
Agilent

R T

**Occupied Bandwidth****36.1069 MHz****Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** -37.048 kHz
x dB Bandwidth 41.449 MHz**5590 MHz**

.9 Agilent

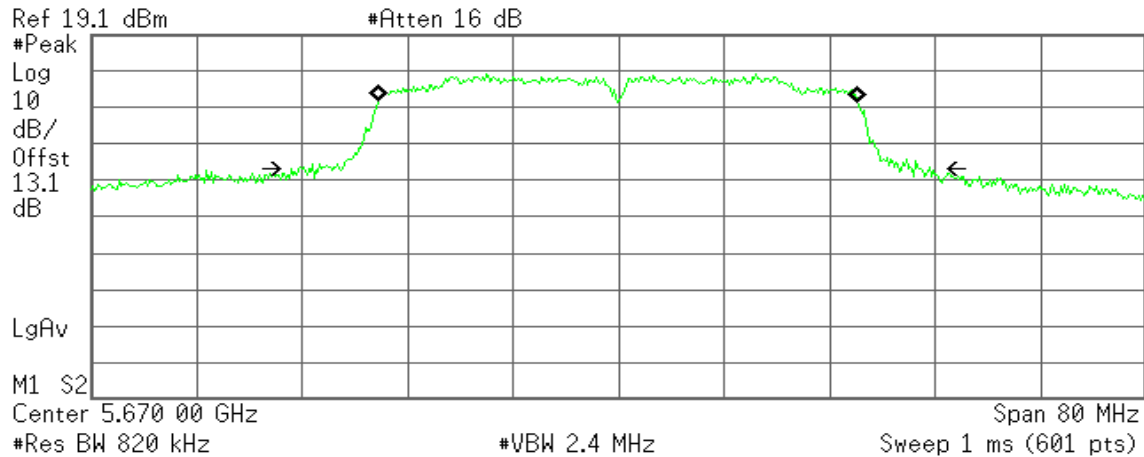
R T

**Occupied Bandwidth****36.9233 MHz****Occ BW % Pwr** 99.00 %
x dB -26.00 dB**Transmit Freq Error** 24.458 kHz
x dB Bandwidth 46.989 MHz

5670 MHz

Agilent

R T

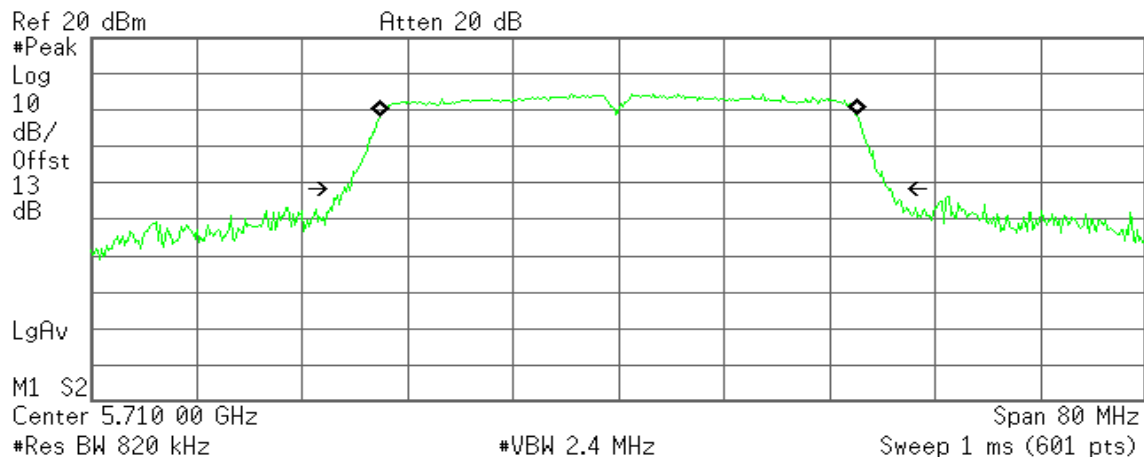


Transmit Freq Error -50.869 kHz
x dB Bandwidth 47.908 MHz

5710 MHz (Band III)

Agilent

R T



Transmit Freq Error -15.045 kHz
x dB Bandwidth 41.525 MHz

5710 MHz (Band IV)

Agilent

R T

▲ Mkr3 41.07 MHz

0.09 dB

Ref 21 dBm

Atten 20 dB

#Peak

Log

10

dB/

Offst

13

dB

DI

-23.6

dBm

LgAv

M1 S2

Center 5.710 00 GHz

Span 80 MHz

#Res BW 820 kHz

#VBW 2.4 MHz

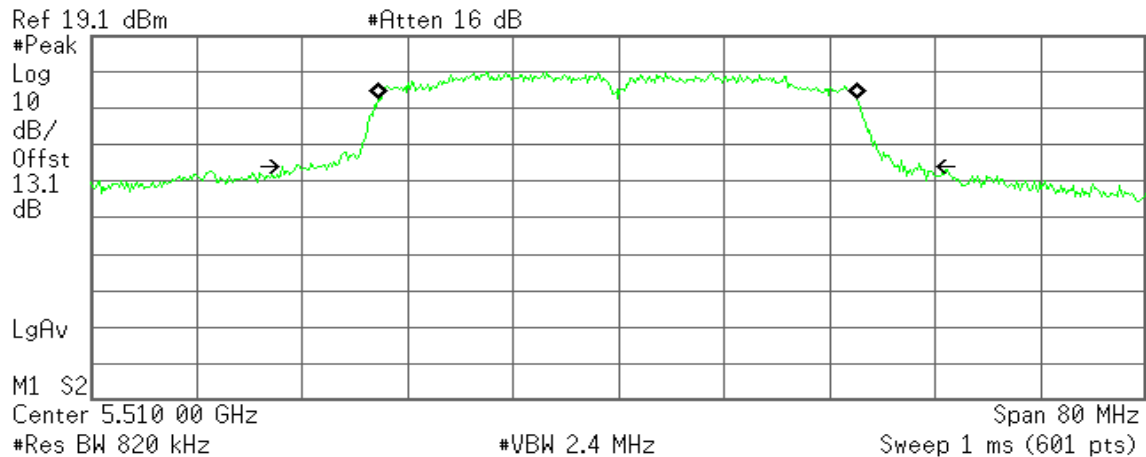
Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.705 60 GHz	2.39 dBm
2	(1)	Freq	5.725 00 GHz	0.19 dBm
3R	(1)	Freq	5.689 60 GHz	-23.28 dBm
3Δ	(1)	Freq	41.07 MHz	0.09 dB

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 1**5510 MHz**

* Agilent

R T

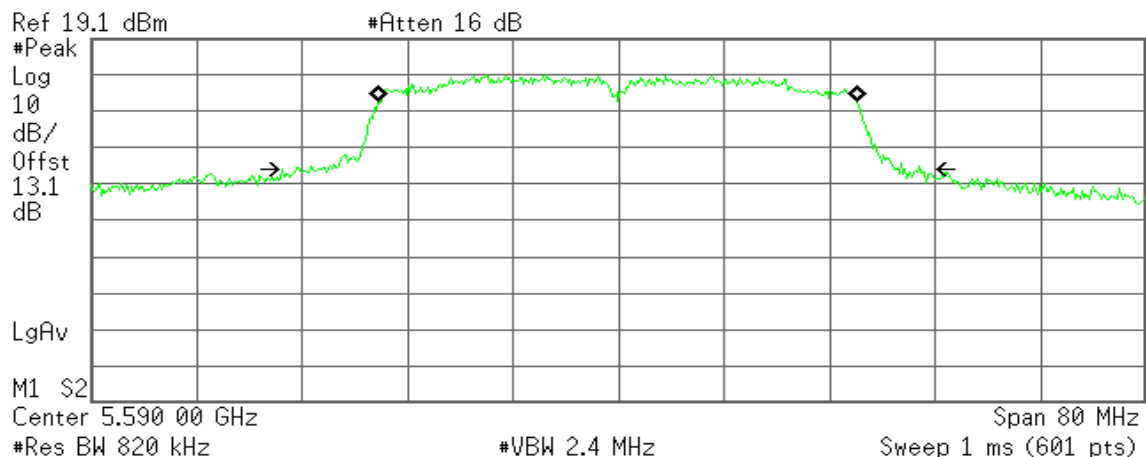


Transmit Freq Error -111.505 kHz
x dB Bandwidth 47.302 MHz

5590 MHz

* Agilent

R T

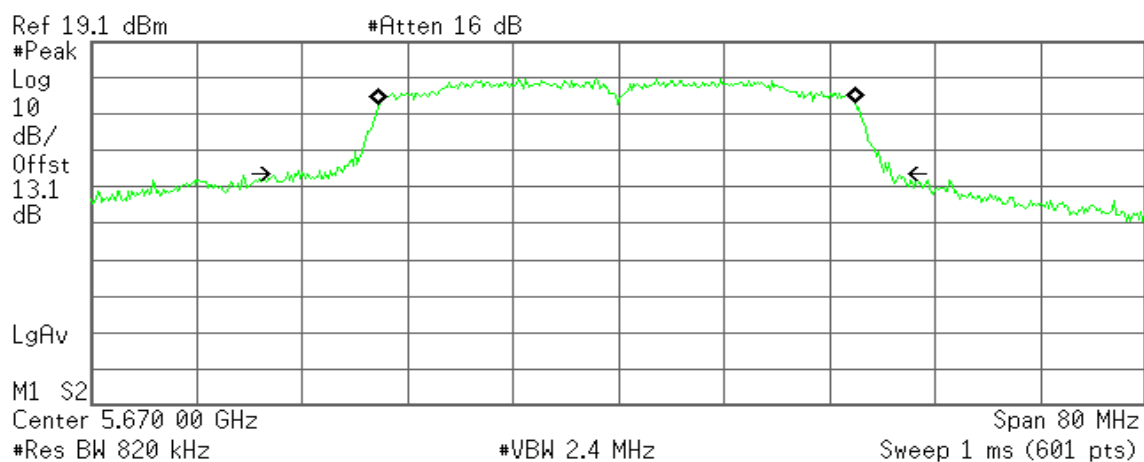


Transmit Freq Error -111.105 kHz
x dB Bandwidth 47.232 MHz

5670 MHz

Agilent

R T



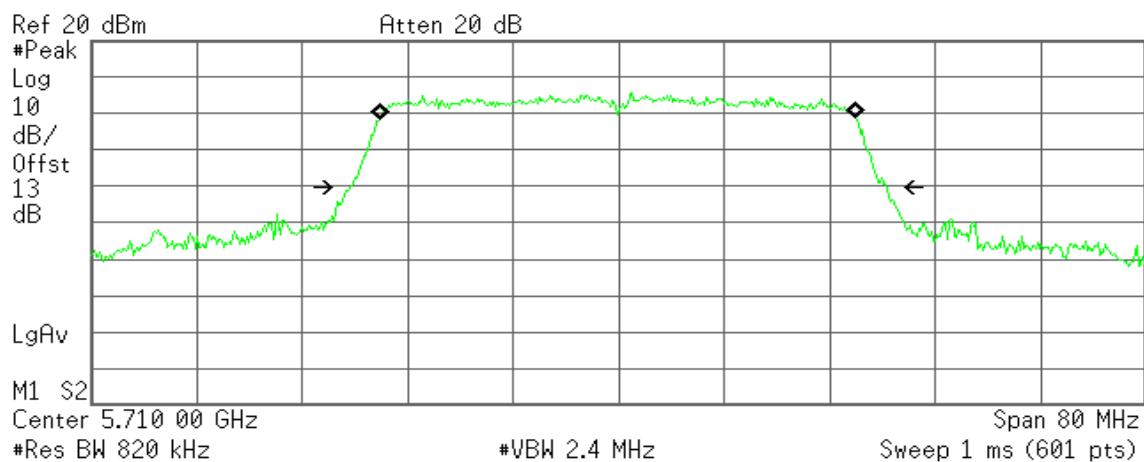
Transmit Freq Error -90.399 kHz

x dB Bandwidth 45.749 MHz

5710 MHz (Band III)

Agilent

R T



Transmit Freq Error -89.594 kHz

x dB Bandwidth 40.723 MHz

5710 MHz (Band IV)

Agilent

R T

▲ Mkr3 40.40 MHz
1.45 dB

Ref 21 dBm

Atten 20 dB

#Peak

Log

10

dB/

Offst

13

dB

DI

-23.0

dBm

LgAv

M1 S2

Center 5.710 00 GHz

Span 80 MHz

#Res BW 820 kHz

#VBW 2.4 MHz

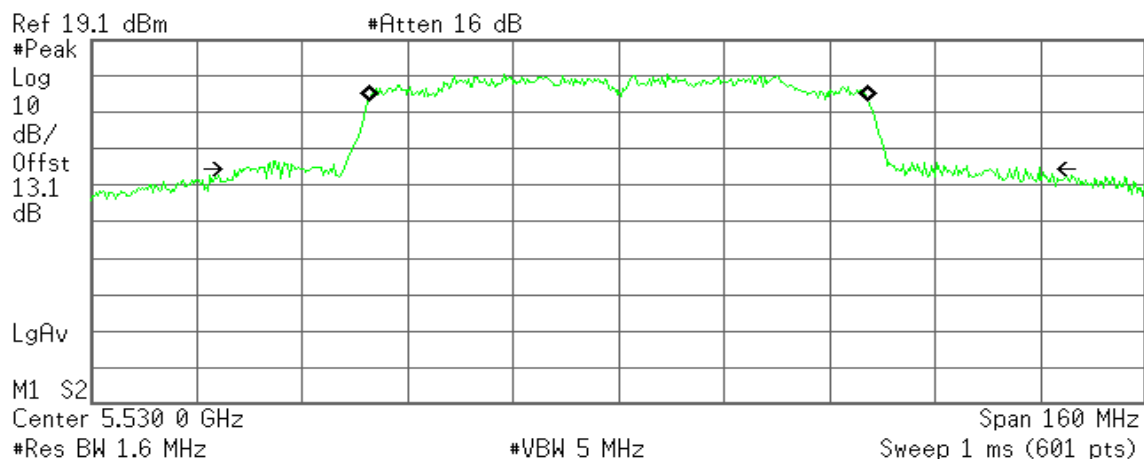
Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.703 07 GHz	3.26 dBm
2	(1)	Freq	5.725 00 GHz	1.28 dBm
3R	(1)	Freq	5.689 73 GHz	-23.68 dBm
3Δ	(1)	Freq	40.40 MHz	1.45 dB

IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz/ Chain 0**5530 MHz**

✱ Agilent

R T

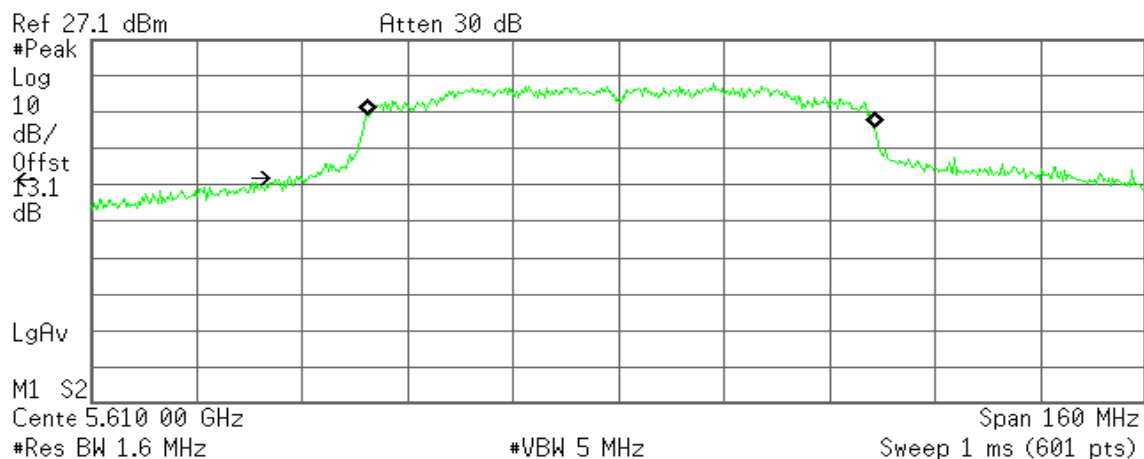


Transmit Freq Error 38.214 kHz
x dB Bandwidth 121.134 MHz

5610 MHz

✱ Agilent

R T

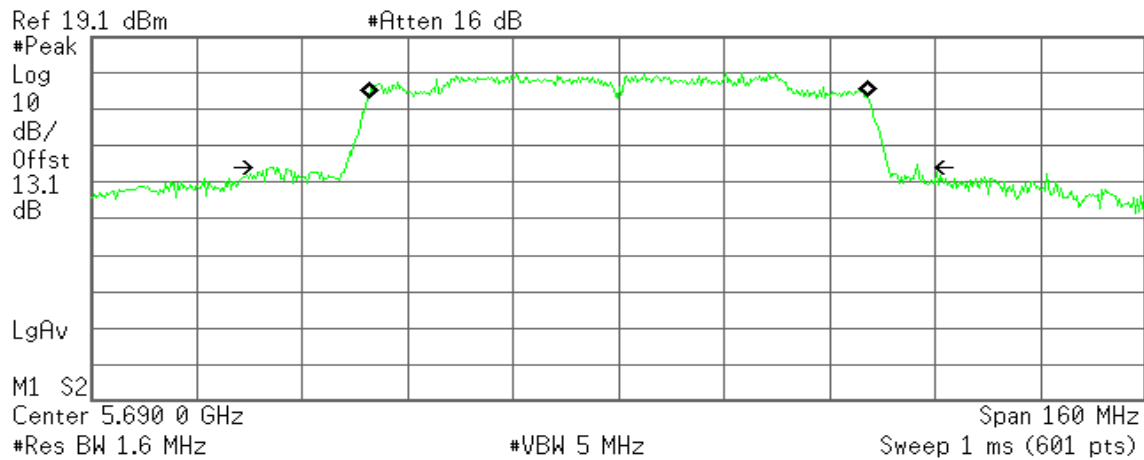


Transmit Freq Error 416.002 kHz
x dB Bandwidth 128.062 MHz

5690 MHz (Band III)

Agilent

R T



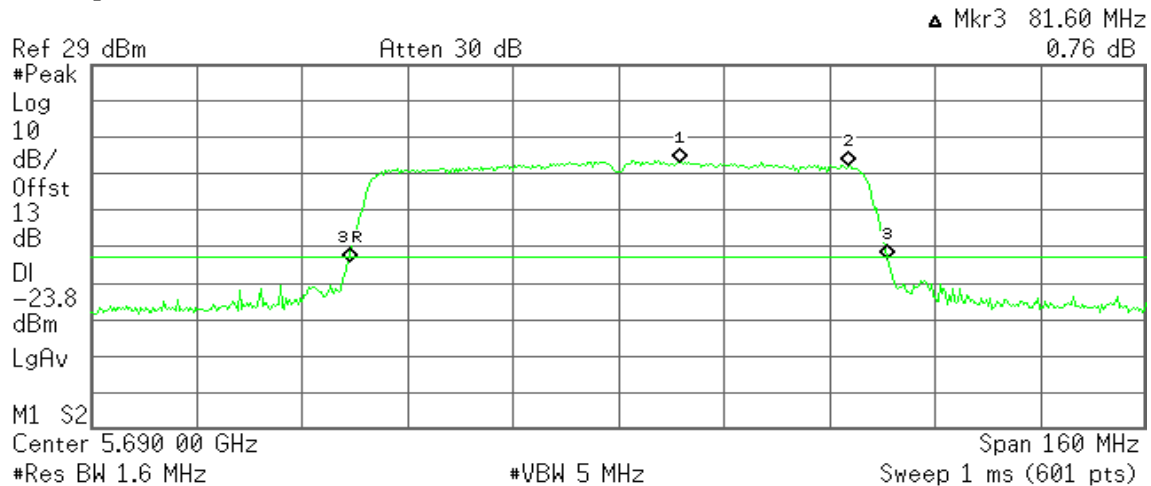
Transmit Freq Error -76.628 kHz

x dB Bandwidth 98.344 MHz

5690 MHz (Band IV)

Agilent

R T

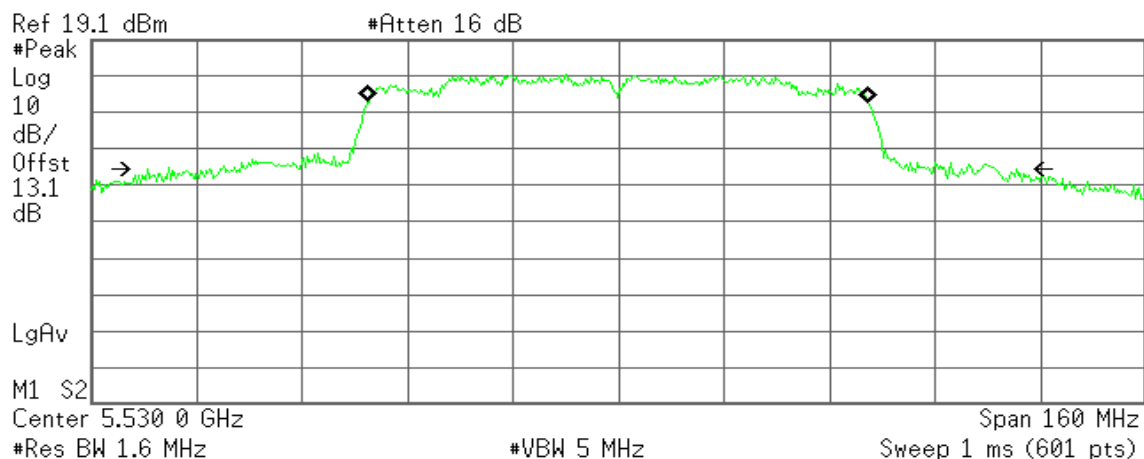


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.699 33 GHz	2.17 dBm
2	(1)	Freq	5.725 00 GHz	1.10 dBm
3R	(1)	Freq	5.649 20 GHz	-25.14 dBm
3Δ	(1)	Freq	81.60 MHz	0.76 dB

IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz/ Chain 1**5530 MHz**

* Agilent

R T

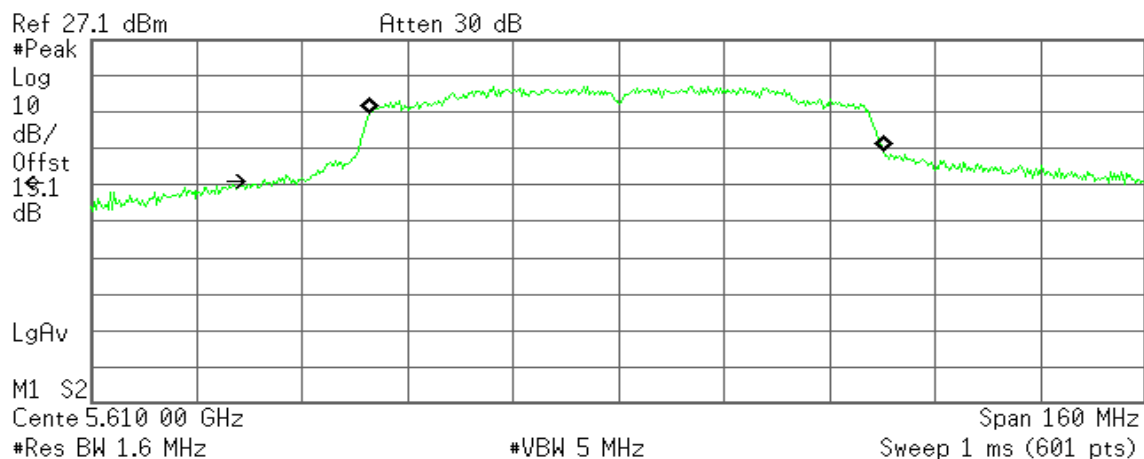


Transmit Freq Error -122.310 kHz
x dB Bandwidth 131.790 MHz

5610 MHz

* Agilent

R T

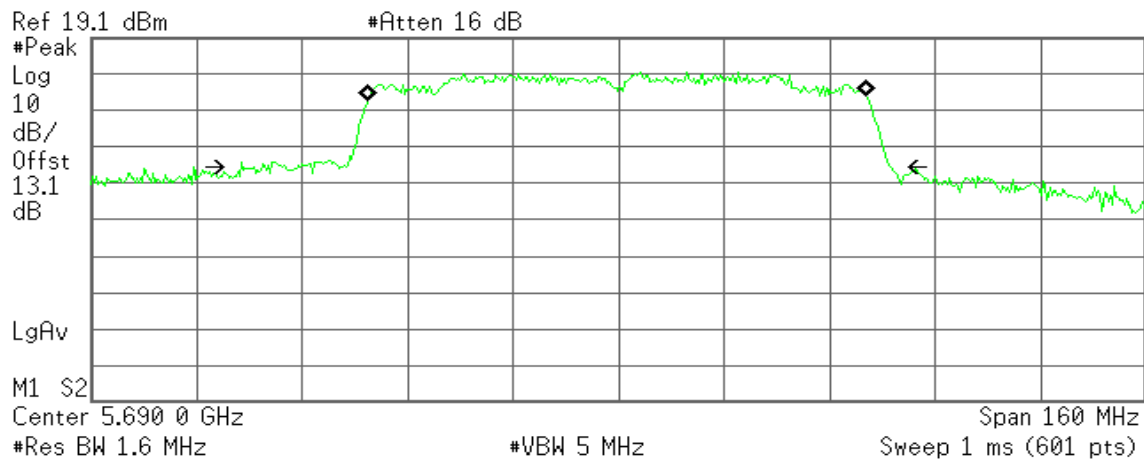


Transmit Freq Error 1.209 MHz
x dB Bandwidth 133.340 MHz

5690 MHz (Band III)

Agilent

R T



Occupied Bandwidth

75.7323 MHz

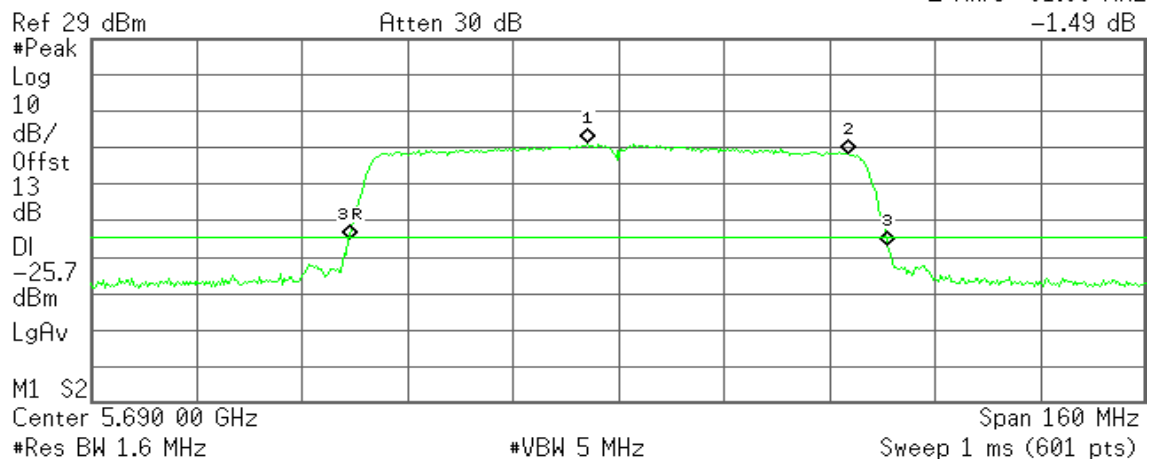
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -154.767 kHz
x dB Bandwidth 98.497 MHz

5690 MHz (Band IV)

Agilent

R T



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.685 20 GHz	0.31 dBm
2	(1)	Freq	5.725 00 GHz	-2.39 dBm
3R	(1)	Freq	5.649 20 GHz	-26.18 dBm
3Δ	(1)	Freq	81.60 MHz	-1.49 dB

7.3 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

According to §15.407(a)

For the band 5.15-5.25 GHz, 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz.

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

According to RSS-247,

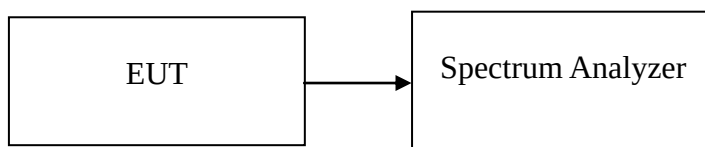
- (1) For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
- (2) For the band 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

The peak power shall not exceed the limit as follow:

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)	Maximum Conducted Output Power (dBm)	FCC Limit (dBm)	IC EIRP (mW)	IC Limit (mW)
36	5180	*14.86	24.00	109.53	200
44	5220	14.86	24.00	109.53	200
48	5240	14.76	24.00	107.03	200

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	FCC Limit (dBm)	IC EIRP (mW)	IC Limit (mW)
36	5180	10.91	10.64	*13.79	21.45	171.07	200
44	5220	10.49	10.62	13.56	21.45	162.56	200
48	5240	10.52	10.59	13.56	21.45	162.55	200

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	FCC Limit (dBm)	IC EIRP (mW)	IC Limit (mW)
38	5190	11.34	11.06	14.21	21.45	188.63	200
46	5230	11.24	11.36	*14.31	21.45	192.94	200

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	FCC Limit (dBm)	IC EIRP (mW)	IC Limit (mW)
42	5210	10.75	10.66	*13.72	21.45	168.31	200

Remark:

1. Total Output Power (w) = Chain 0 ($10^{(\text{Output Power}/10)/1000}$) + Chain 1 ($10^{(\text{Output Power}/10)/1000}$)
2. The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 21.45dBm.

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
52	5260	*14.86	24.00
56	5280	14.86	24.00
64	5320	14.66	24.00

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
52	5260	14.56	14.73	*17.66	21.45
56	5280	14.52	14.72	17.63	21.45
64	5320	14.59	14.49	17.55	21.45

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
54	5270	12.60	12.76	15.69	21.45
62	5310	12.80	12.65	*15.73	21.45

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
58	5290	12.75	12.65	*15.71	21.45

Remark:

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

2. The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 21.45dBm.

Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
100	5500	*14.76	24.00
116	5580	14.66	24.00
140	5700	14.66	24.00
144	5720	14.07 (Band III)	24.00
144	5720	6.89 (Band IV)	30.00

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
100	5500	14.57	14.75	17.67	21.45
116	5580	14.52	14.75	17.65	21.45
140	5700	14.80	14.74	*17.78	21.45
144	5720	14.20	9.87	15.56 (Band III)	21.45
144	5720	7.91	8.83	11.40 (Band IV)	27.45

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
102	5510	12.50	12.71	15.61	21.45
118	5590	12.62	12.65	15.64	21.45
134	5670	12.80	12.65	*15.73	21.45
142	5710	11.67	12.51	15.12 (Band III)	21.45
142	5710	1.04	2.18	4.66 (Band IV)	27.45

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
106	5530	12.75	12.65	15.71	21.45
138	5610	12.65	12.85	*15.76	21.45
138	5690	13.10	10.64	15.05 (Band III)	21.45
138	5690	-0.55	-4.18	-1.01 (Band IV)	27.45

Remark:

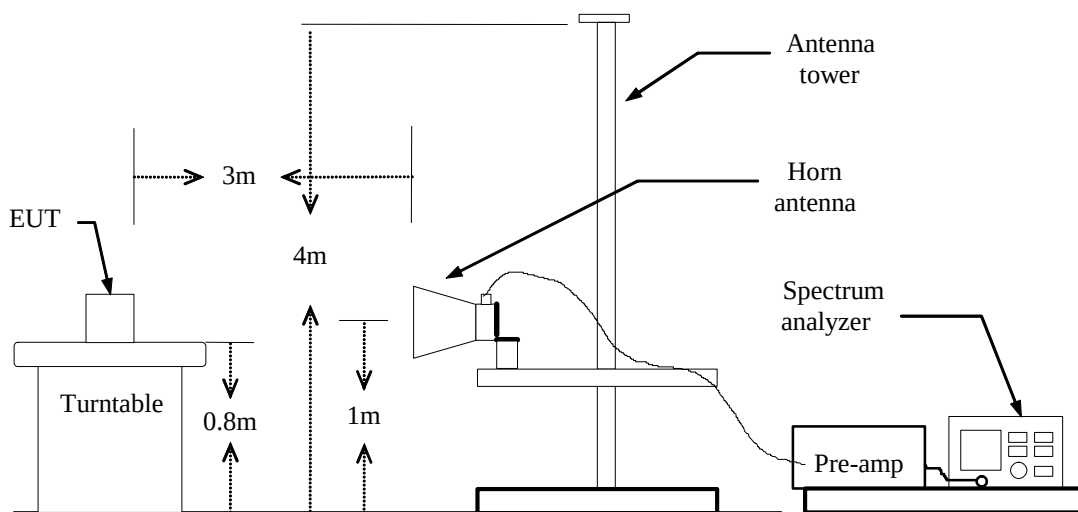
1. Total Output Power (w) = Chain 0 ($10^{(\text{Output Power}/10)/1000}$) + Chain 1 ($10^{(\text{Output Power}/10)/1000}$)
2. Band III: The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 21.45dBm.
3. Band IV: The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 27.45 dBm.

7.4 BAND EDGES MEASUREMENT

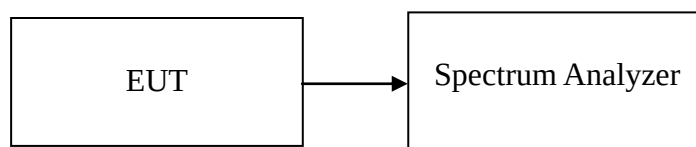
LIMIT

According to §15.407 & RSS-247 §, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



For Conducted



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=VBW=1MHz / 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: = 64%, VBW= 3KHz
IEEE 802.11ac VHT 80 MHz mode: = 26%, VBW= 15KHz
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.
6. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant

For Conducted

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

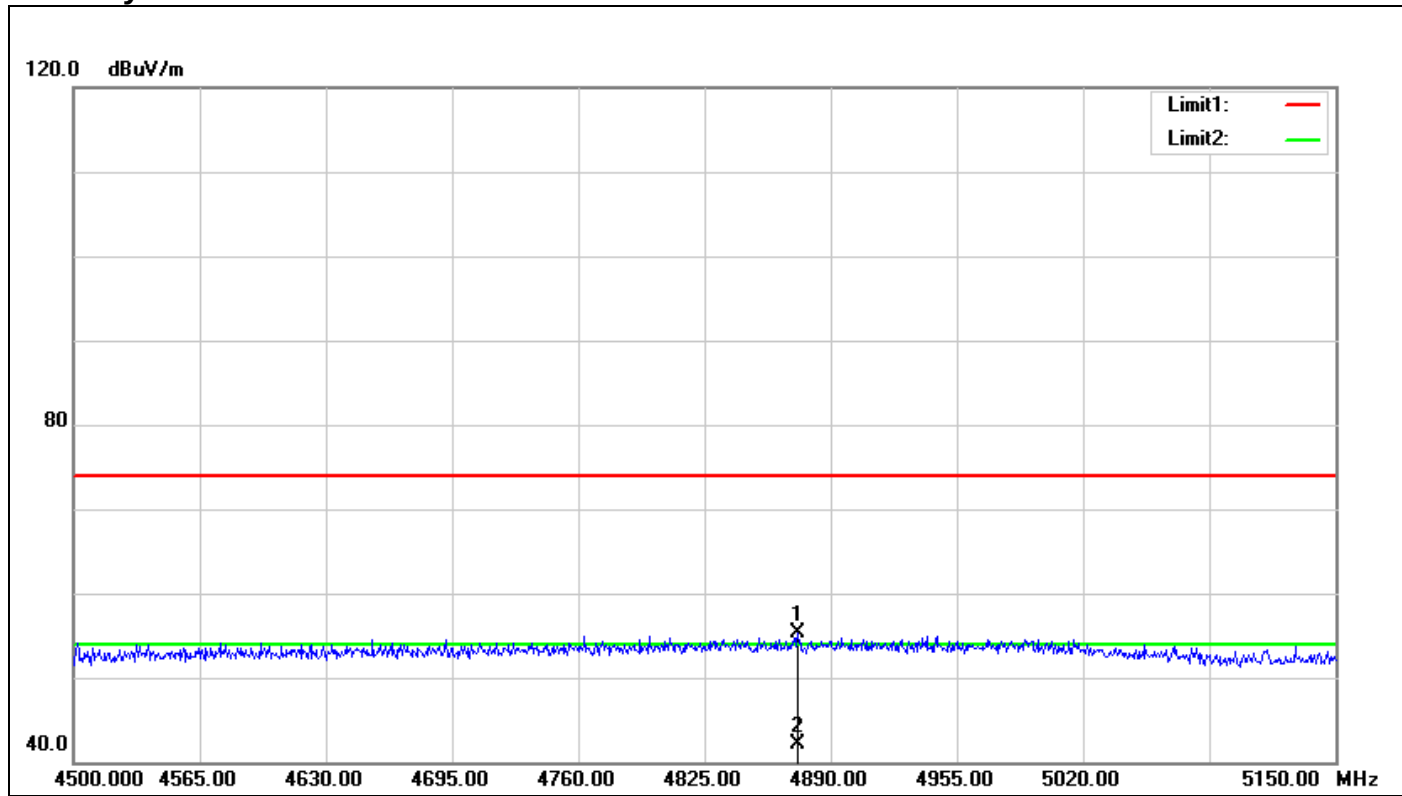
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

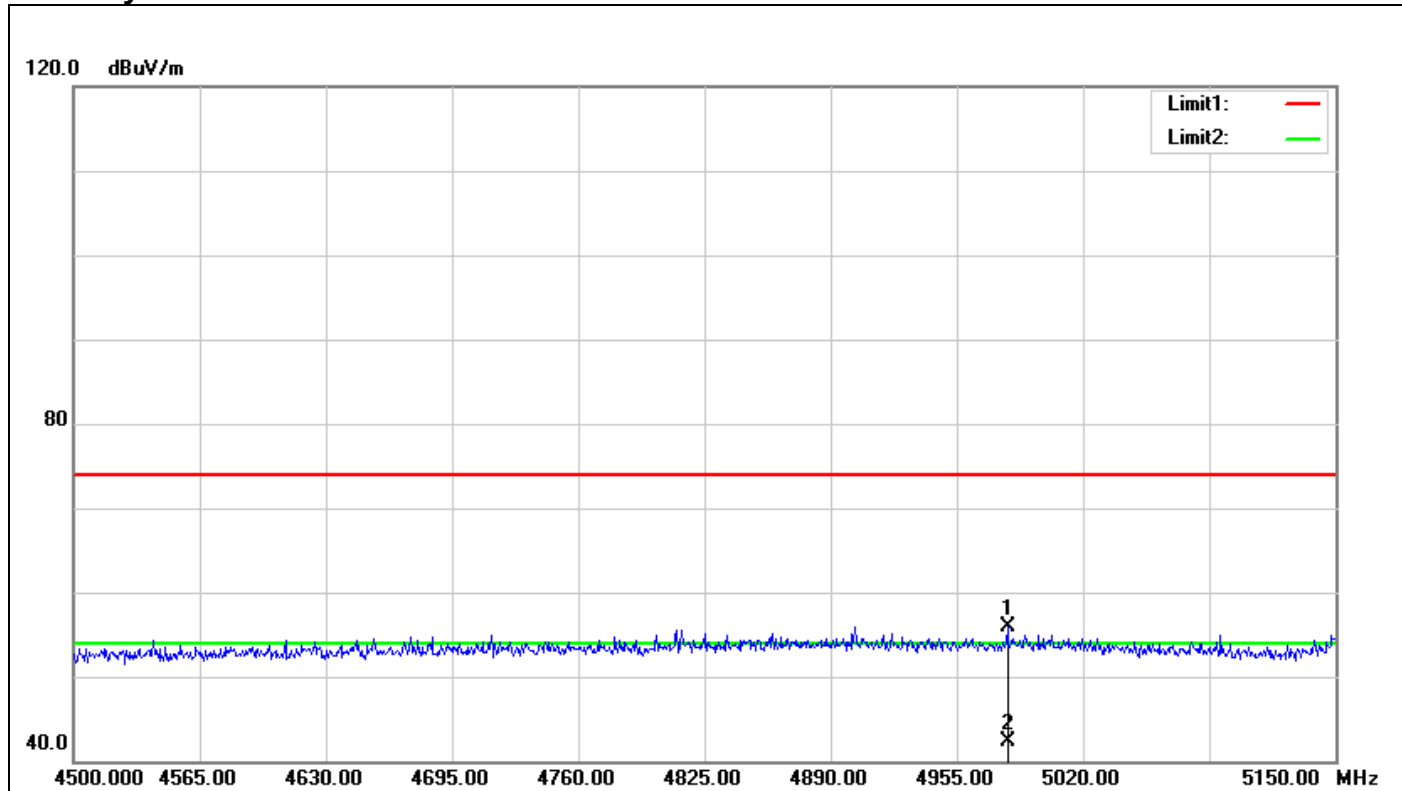
Band Edges (IEEE 802.11a mode / CH 5180 MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	4873.100	51.32	3.93	55.25	74.00	-18.75	100	277	peak
2	4873.100	38.16	3.93	42.09	54.00	-11.91	100	277	AVG

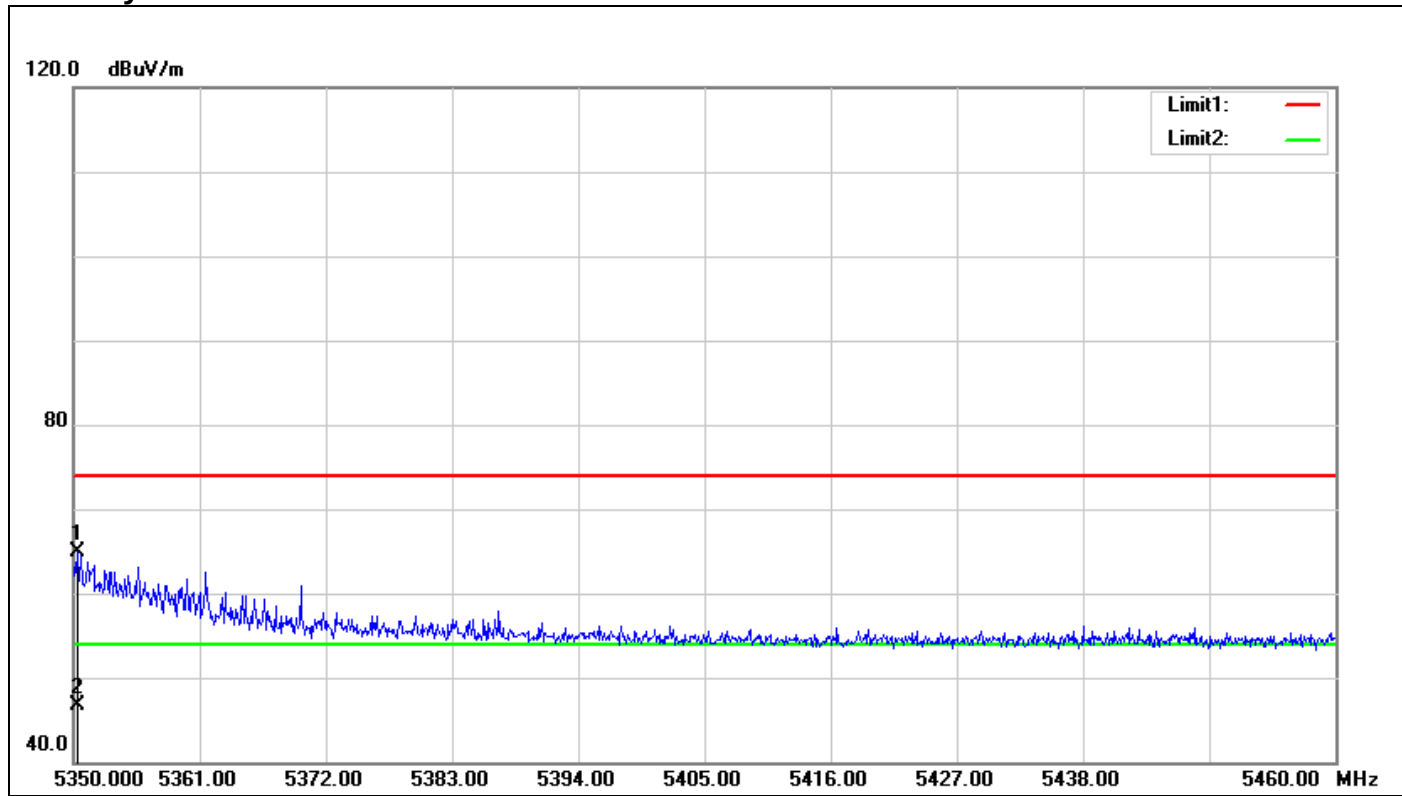
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	4981.000	51.96	3.94	55.90	74.00	-18.10	100	243	peak
2	4981.000	38.46	3.94	42.40	54.00	-11.60	100	243	AVG

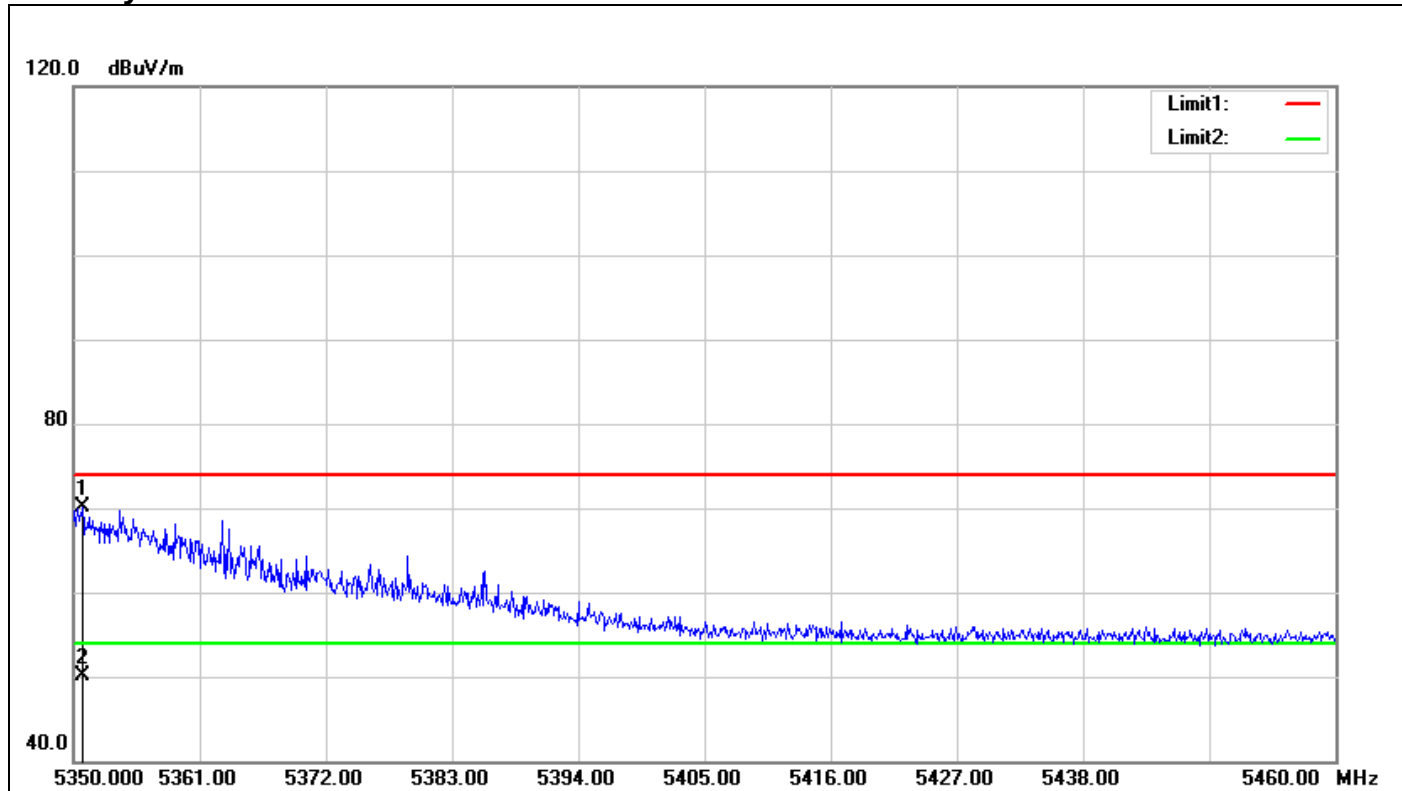
Band Edges (IEEE 802.11a mode / CH 5320 MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5350.330	59.55	5.31	64.86	74.00	-9.14	100	82	peak
2	5350.330	41.32	5.31	46.63	54.00	-7.37	100	82	AVG

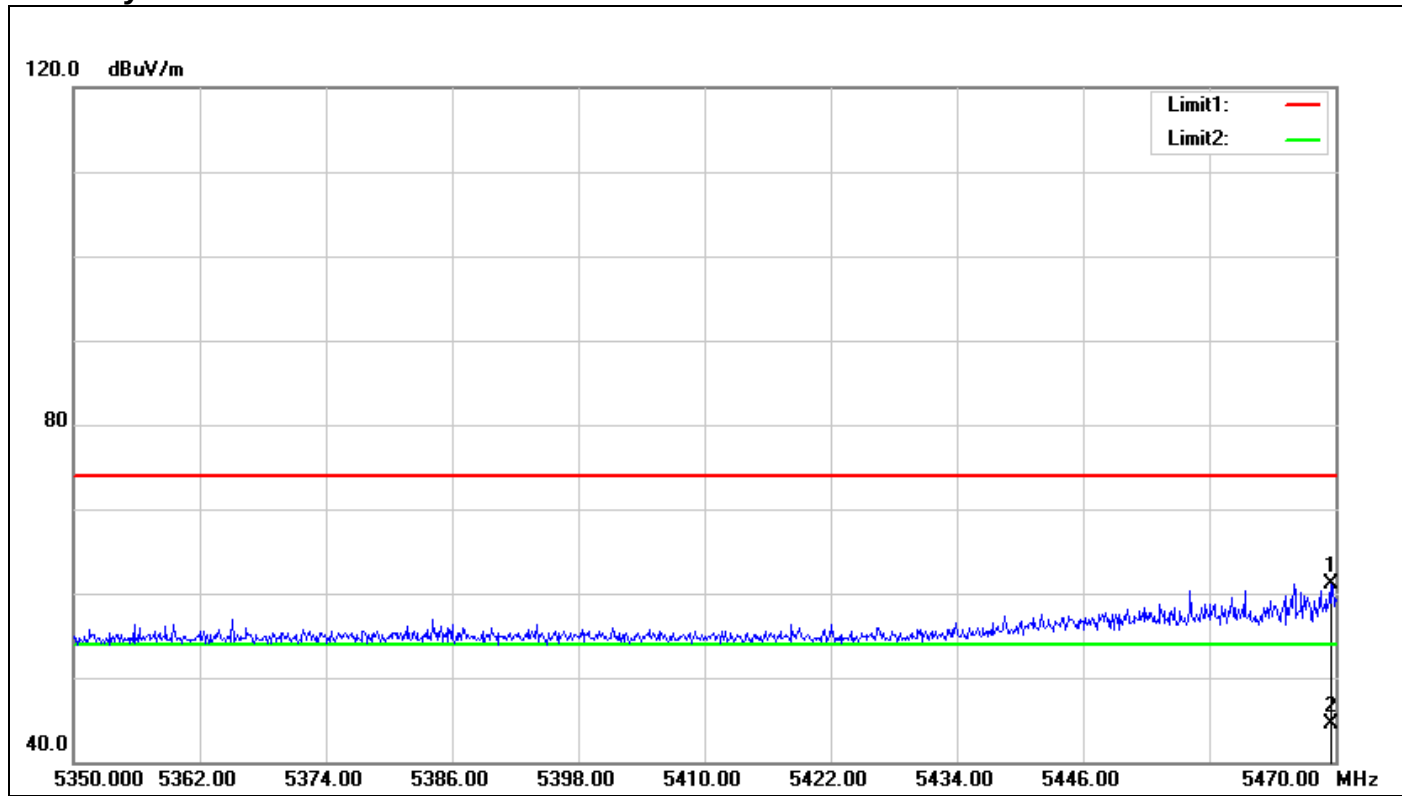
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5350.770	64.78	5.32	70.10	74.00	-3.90	100	45	peak
2	5350.770	44.87	5.32	50.19	54.00	-3.81	100	45	AVG

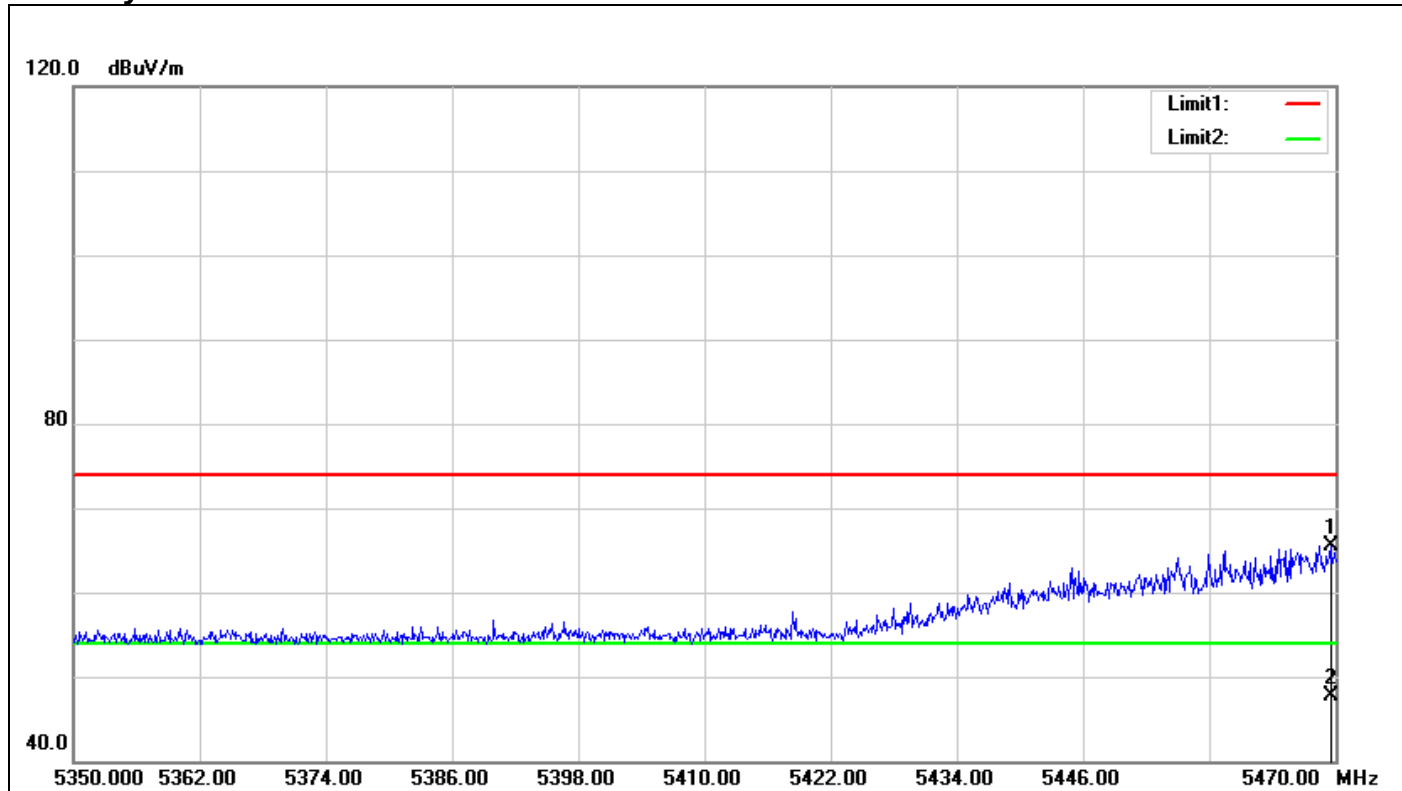
Band Edges (IEEE 802.11a mode / CH 5500 MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5469.520	55.73	5.39	61.12	74.00	-12.88	100	42	peak
2	5469.520	39.17	5.39	44.56	54.00	-9.44	100	42	AVG

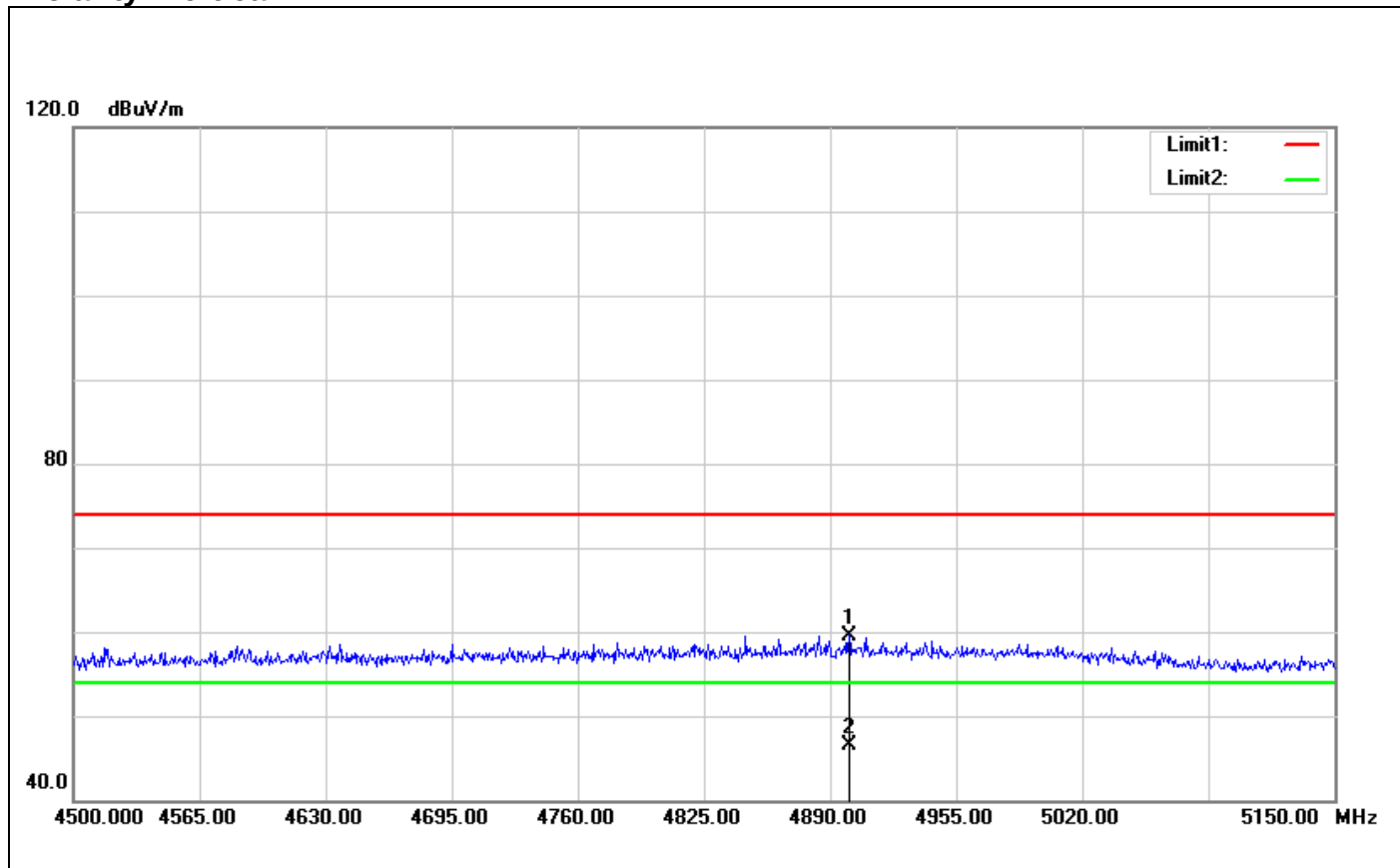
Polarity: Horizontal



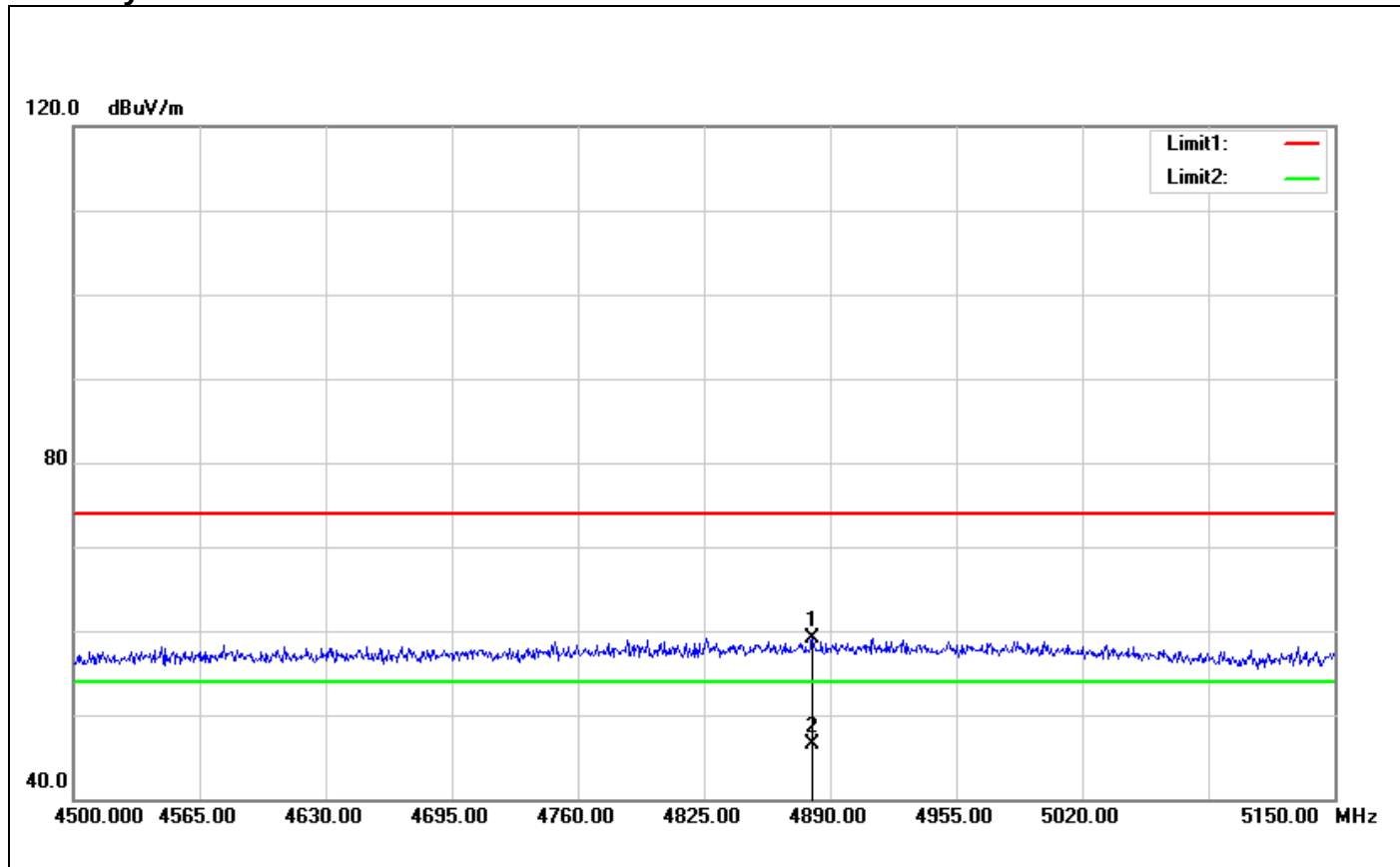
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5469.520	60.19	5.39	65.58	74.00	-8.42	100	53	peak
2	5469.520	42.22	5.39	47.61	54.00	-6.39	100	53	AVG

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

Polarity: Vertical



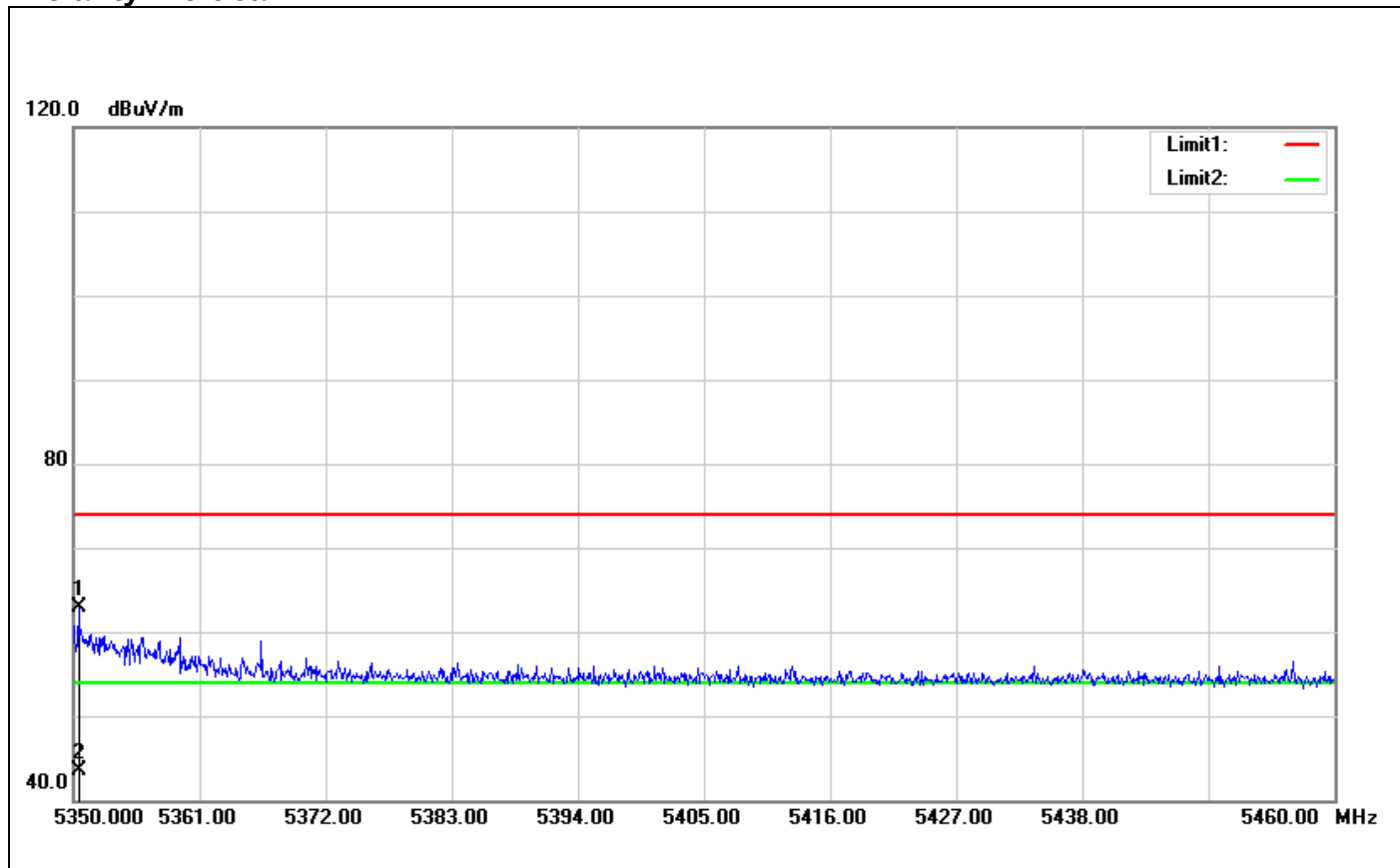
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	4899.750	55.72	3.88	59.60	74.00	-14.40	100	288	peak
2	4899.750	42.56	3.88	46.44	54.00	-7.56	100	288	AVG

Polarity: Horizontal

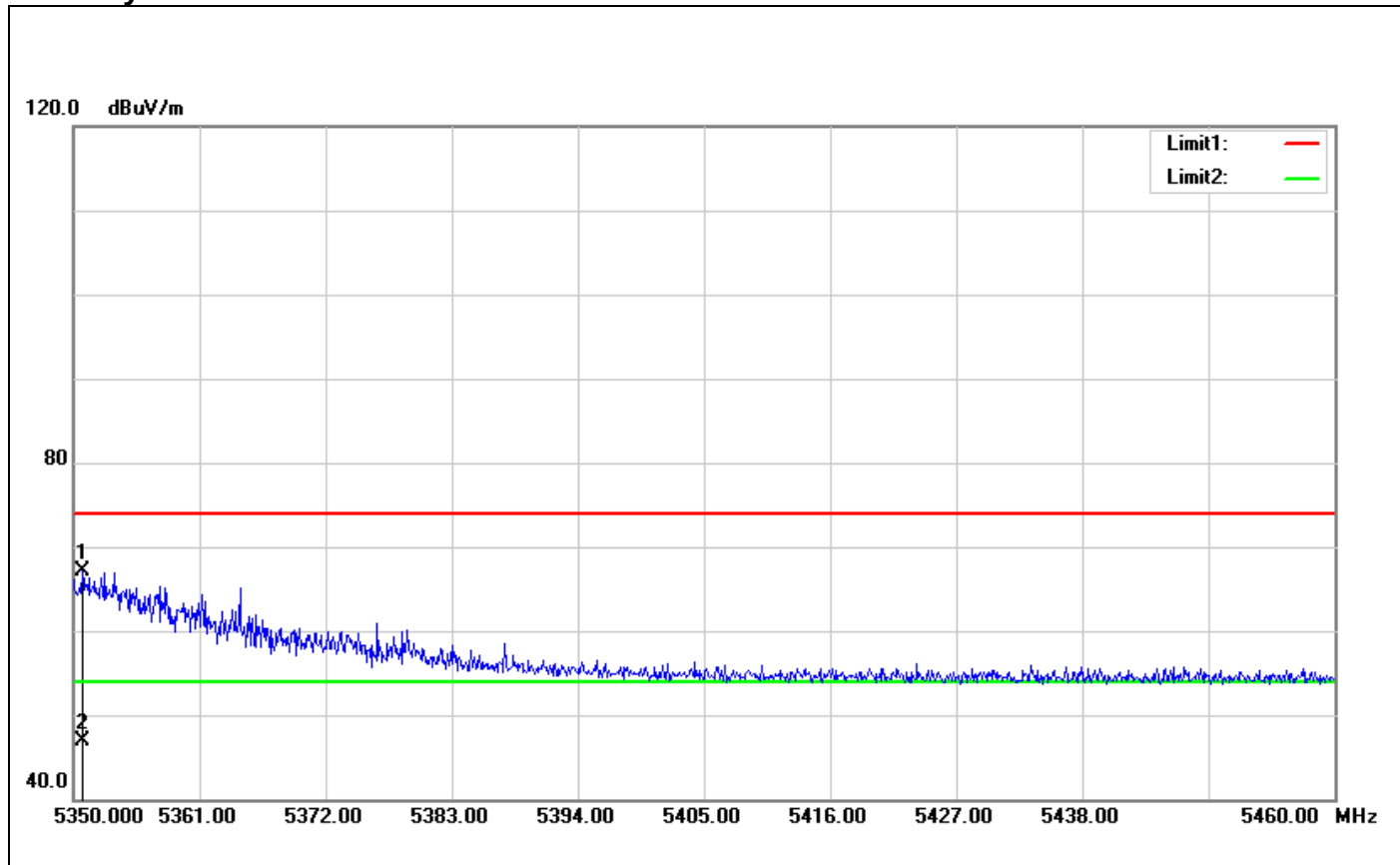
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	4880.900	55.27	3.91	59.18	74.00	-14.82	100	142	peak
2	4880.900	42.54	3.91	46.45	54.00	-7.55	100	142	AVG

Band Edges (IEEE 802.11n HT 20 MHz Channel mode / CH 5320 MHz)

Polarity: Vertical



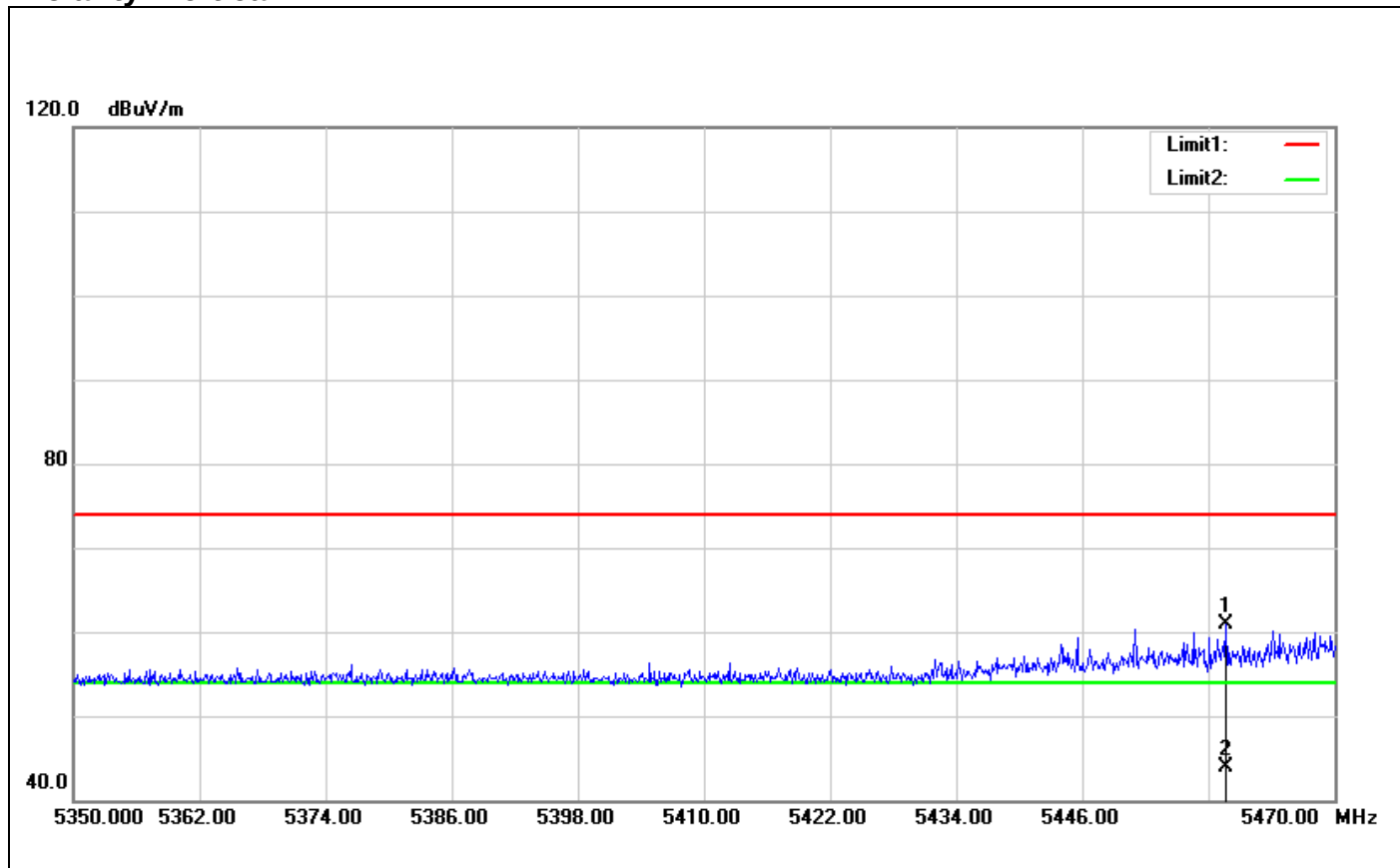
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.440	57.58	5.31	62.89	74.00	-11.11	100	119	peak
2	5350.440	38.28	5.31	43.59	54.00	-10.41	100	119	AVG

Polarity: Horizontal

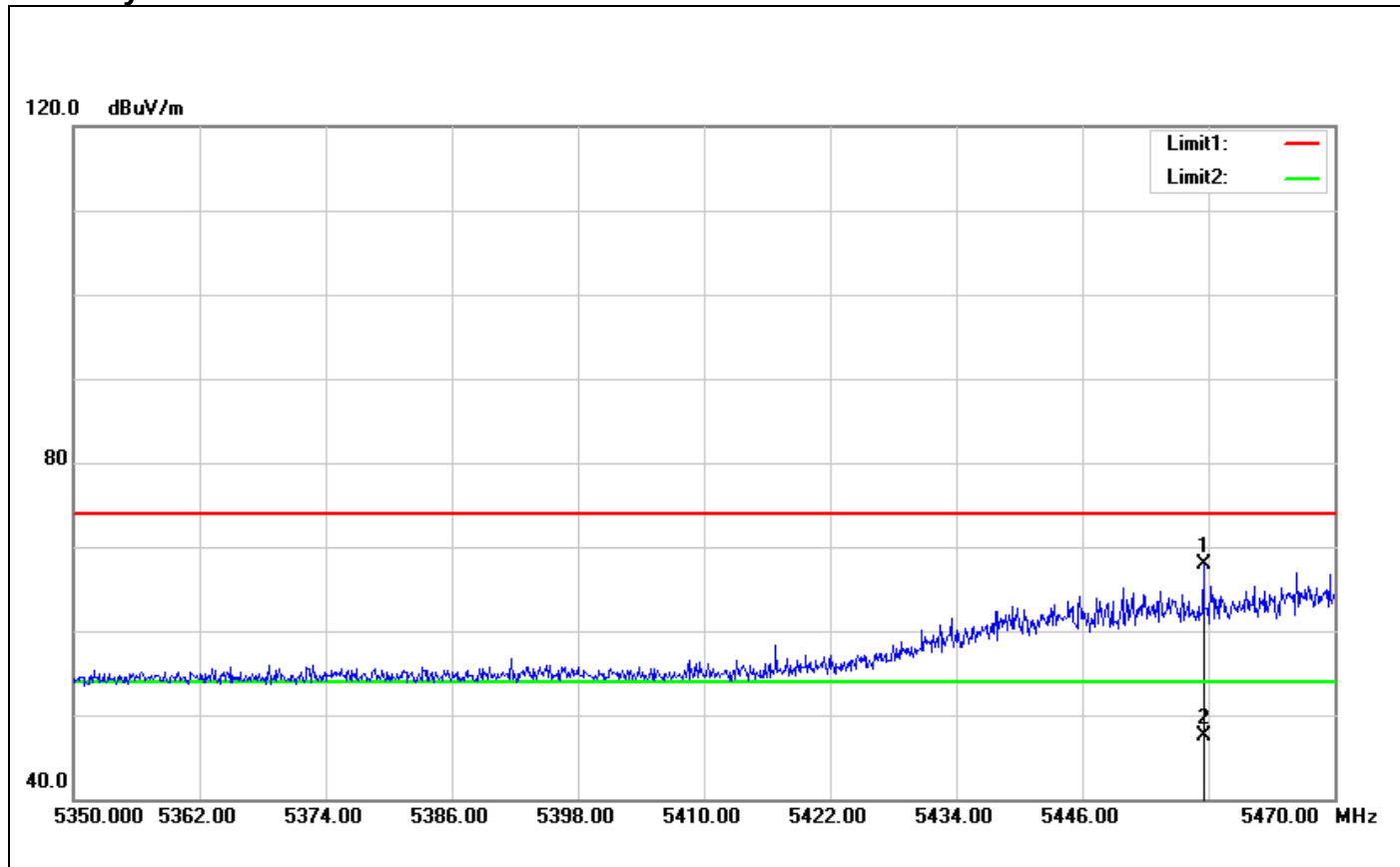
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.770	61.86	5.32	67.18	74.00	-6.82	100	204	peak
2	5350.770	41.64	5.32	46.96	54.00	-7.04	100	204	AVG

Band Edges (IEEE 802.11n HT 20 MHz Channel mode / CH 5500 MHz)

Polarity: Vertical



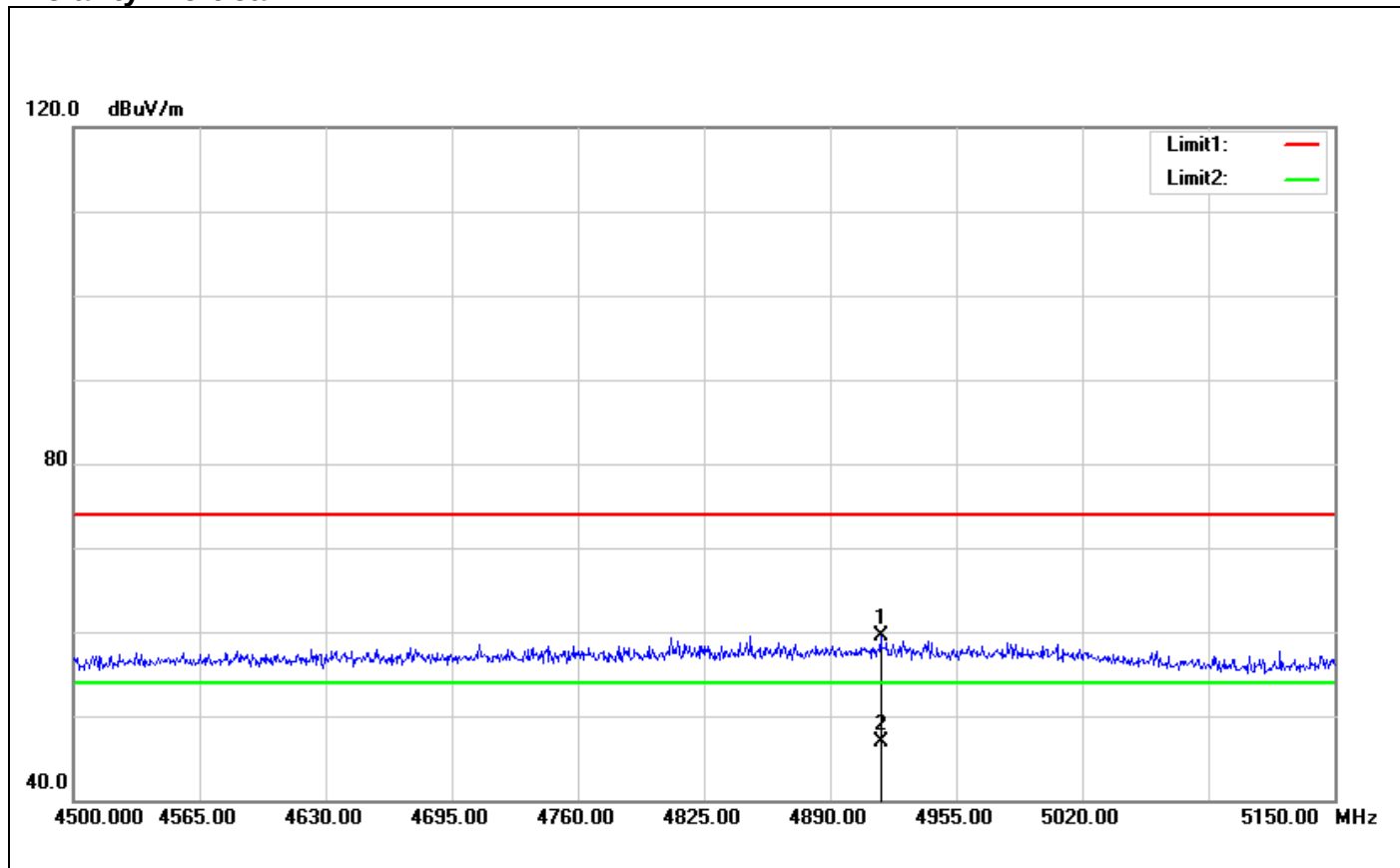
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5459.680	55.45	5.44	60.89	74.00	-13.11	100	79	peak
2	5459.680	38.38	5.44	43.82	54.00	-10.18	100	79	AVG

Polarity: Horizontal

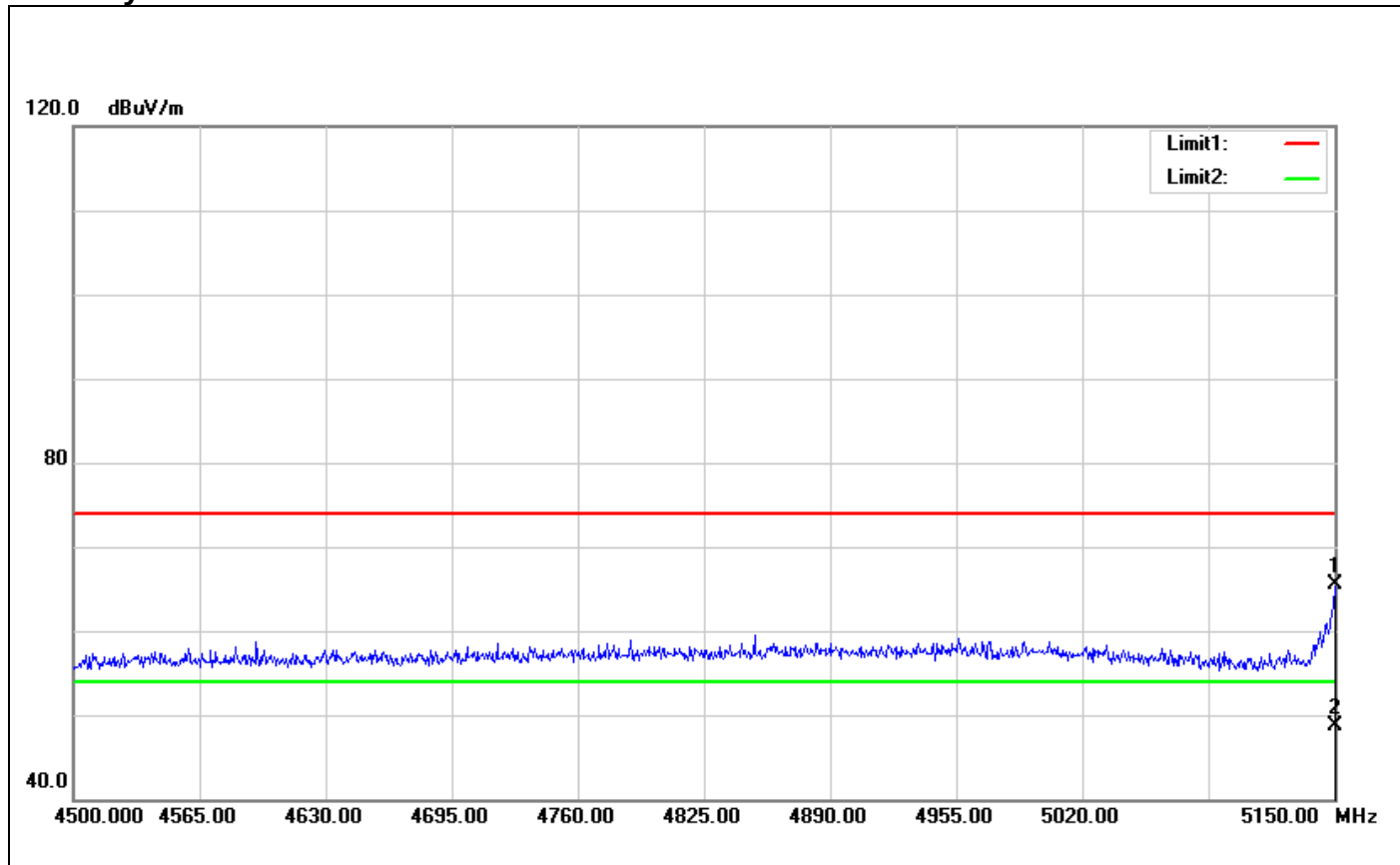
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5457.520	62.43	5.45	67.88	74.00	-6.12	100	40	peak
2	5457.520	42.02	5.45	47.47	54.00	-6.53	100	40	AVG

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

Polarity: Vertical



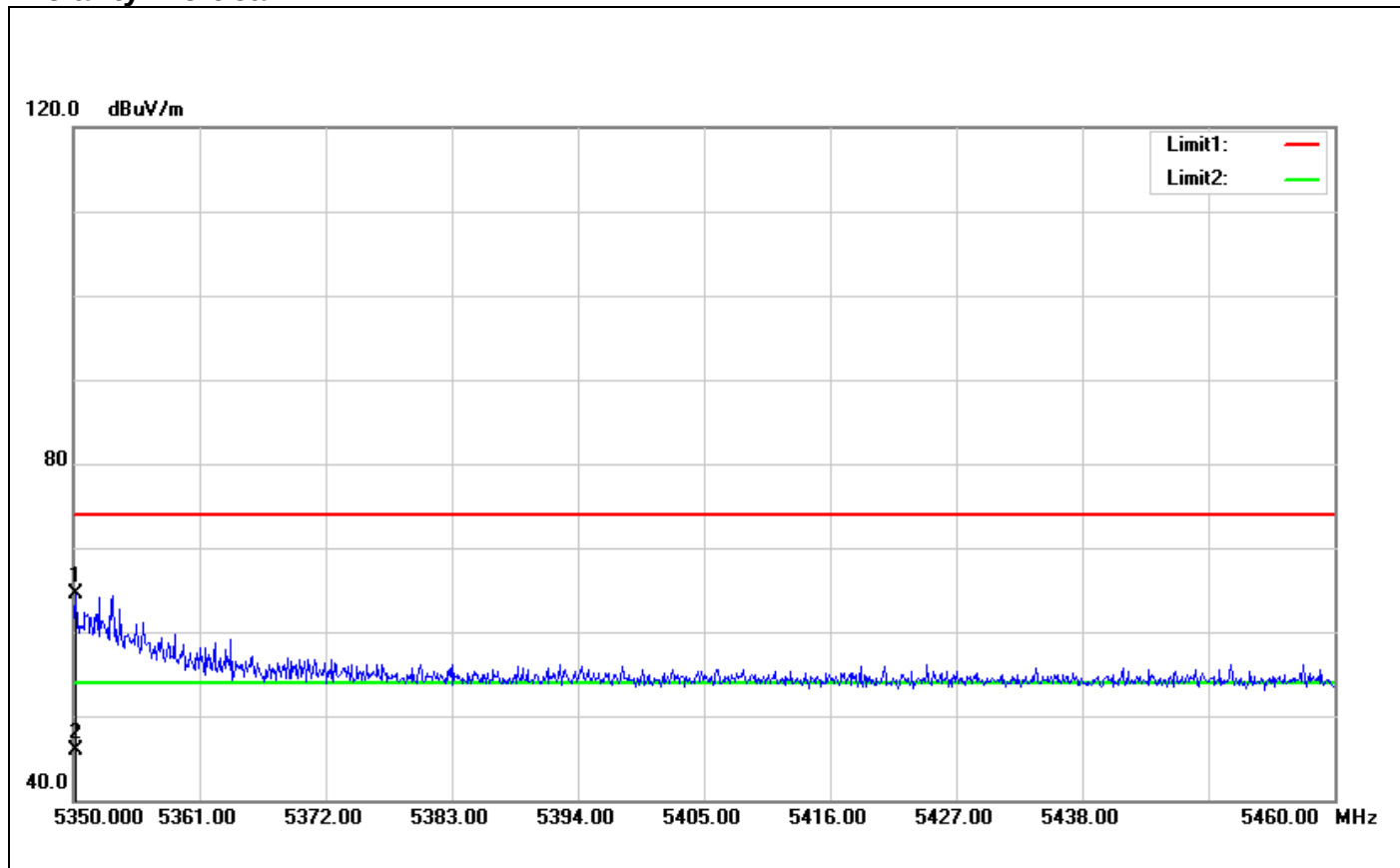
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	4916.000	55.61	3.89	59.50	74.00	-14.50	100	219	peak
2	4916.000	42.97	3.89	46.86	54.00	-7.14	100	219	AVG

Polarity: Horizontal

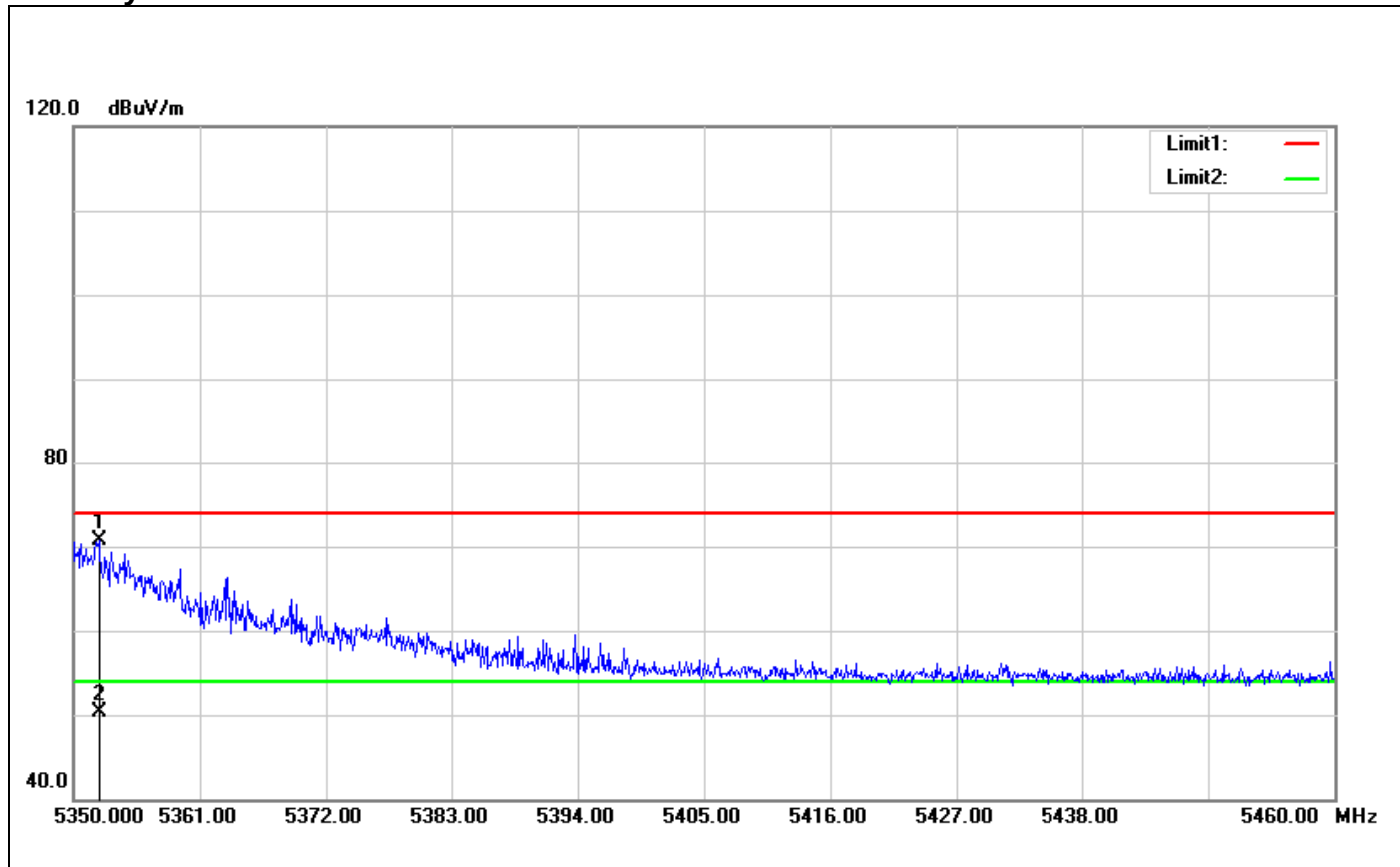
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	62.37	3.04	65.41	74.00	-8.59	100	94	peak
2	5150.000	45.59	3.04	48.63	54.00	-5.37	100	94	AVG

Band Edges (IEEE 802.11n HT 40 MHz mode / CH 5310 MHz)

Polarity: Vertical



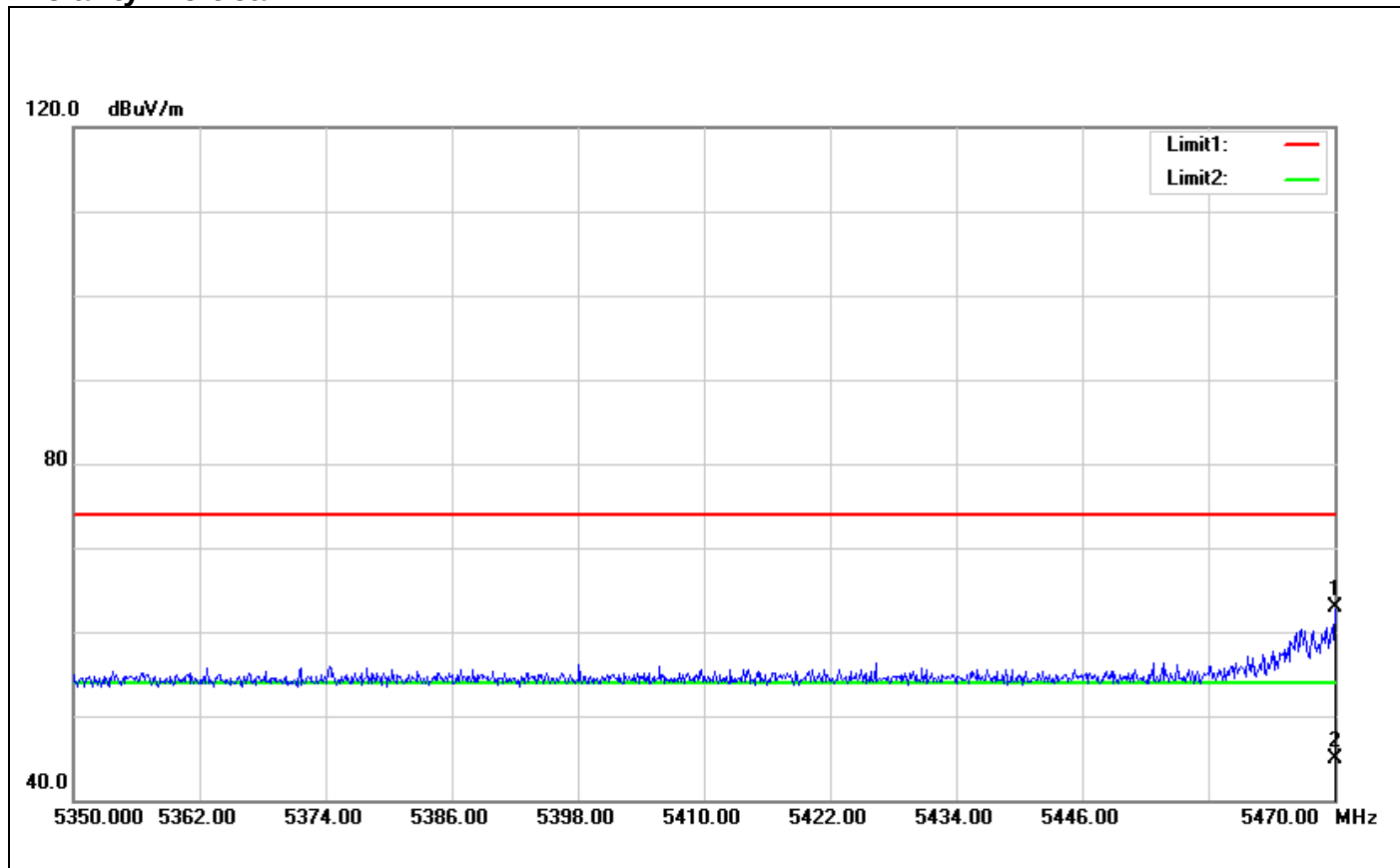
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.220	59.27	5.31	64.58	74.00	-9.42	100	354	peak
2	5350.220	40.66	5.31	45.97	54.00	-8.03	100	354	AVG

Polarity: Horizontal

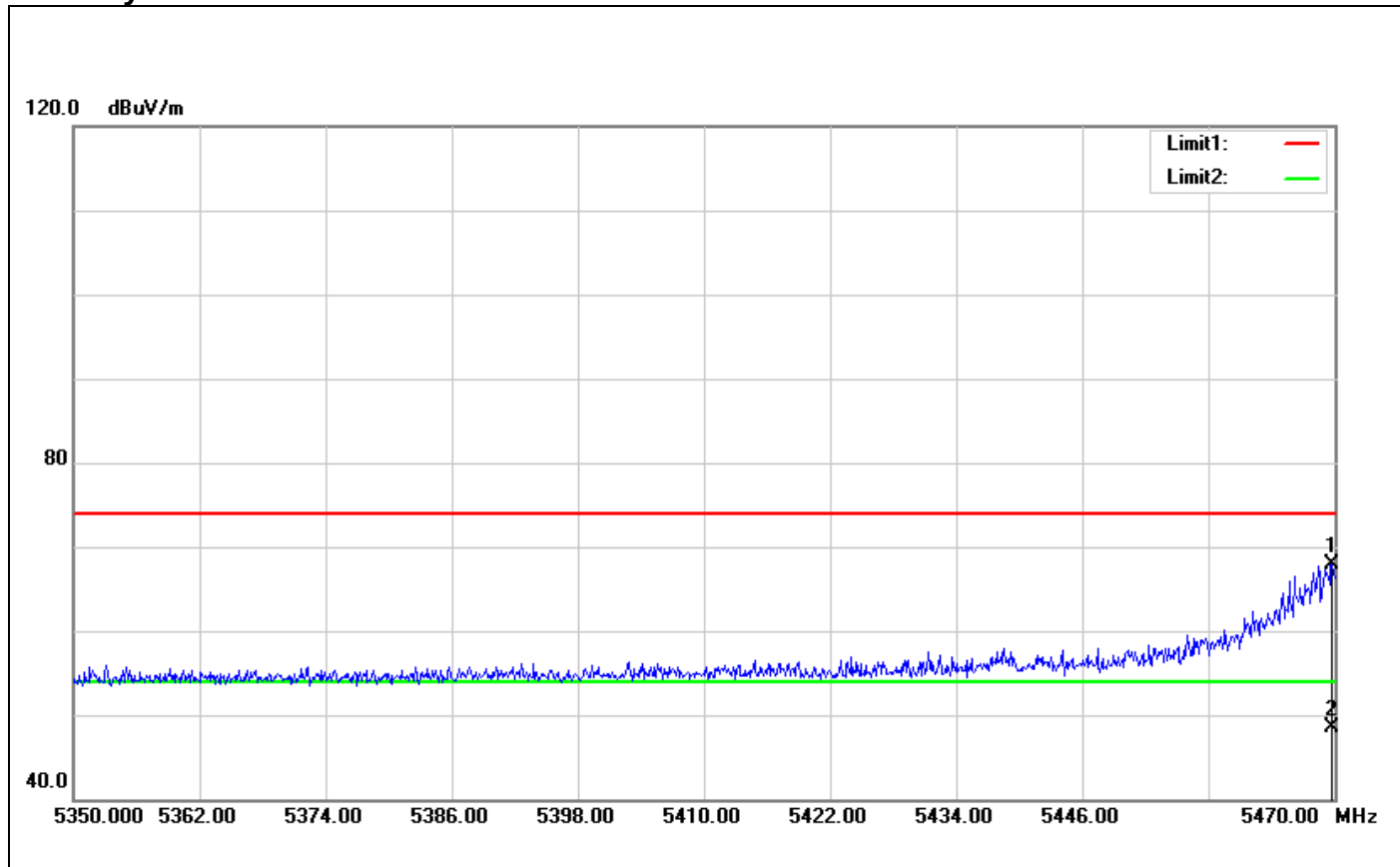
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5352.200	65.40	5.33	70.73	74.00	-3.27	100	270	peak
2	5352.200	44.99	5.33	50.32	54.00	-3.68	100	270	AVG

Band Edges (IEEE 802.11n HT 40 MHz mode / CH 5510 MHz)

Polarity: Vertical



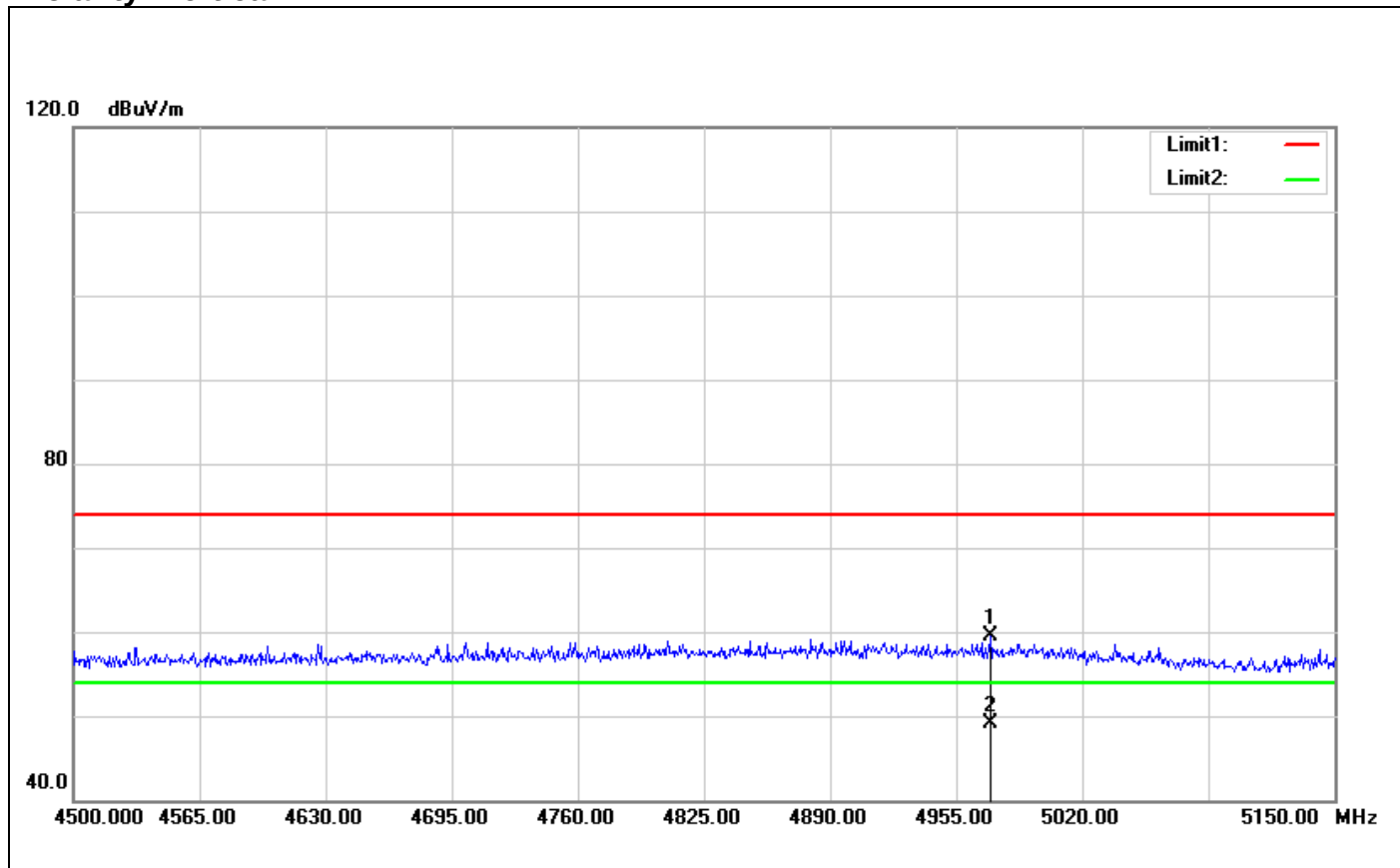
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5470.000	57.60	5.39	62.99	74.00	-11.01	100	97	peak
2	5470.000	39.61	5.39	45.00	54.00	-9.00	100	97	AVG

Polarity: Horizontal

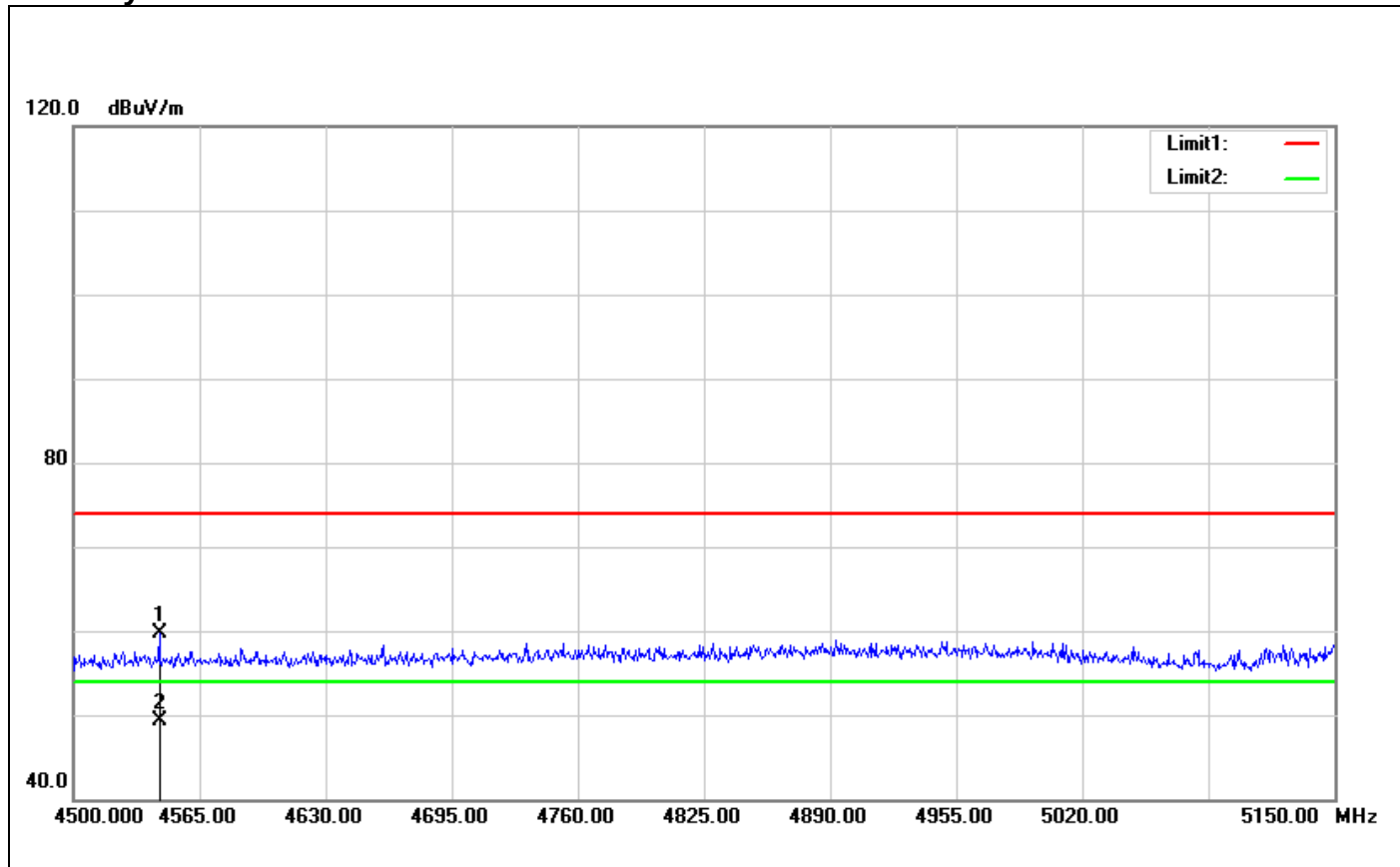
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5469.760	62.58	5.39	67.97	74.00	-6.03	100	104	peak
2	5469.760	43.14	5.39	48.53	54.00	-5.47	100	104	AVG

Band Edges (IEEE 802.11ac VHT 80 MHz mode / CH 5210 MHz)

Polarity: Vertical



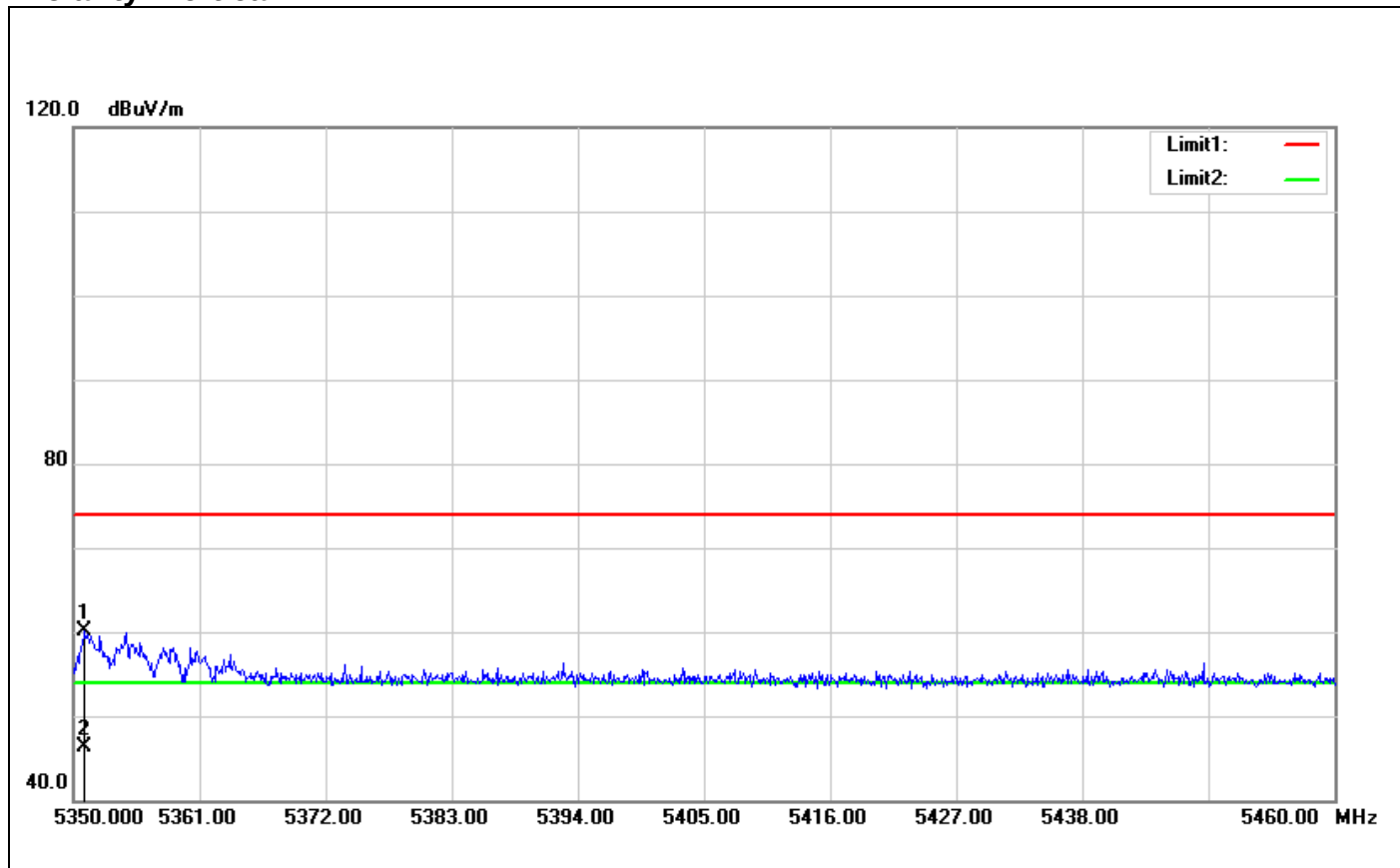
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	4972.550	55.50	3.94	59.44	74.00	-14.56	100	233	peak
2	4972.550	45.09	3.94	49.03	54.00	-4.97	100	233	AVG

Polarity: Horizontal

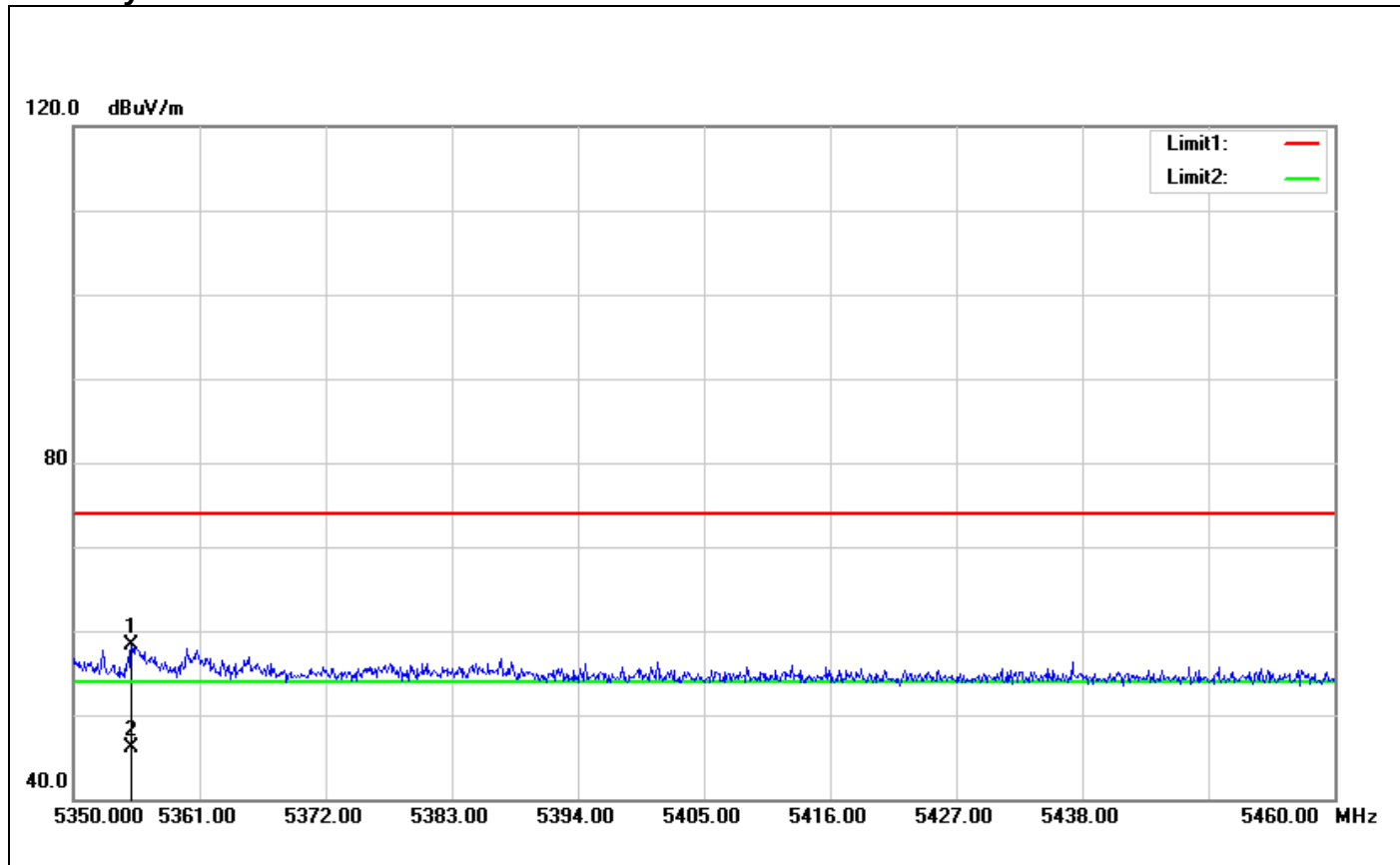
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	4544.200	56.36	3.32	59.68	74.00	-14.32	100	313	peak
2	4544.200	45.88	3.32	49.20	54.00	-4.80	100	313	AVG

Band Edges (IEEE 802.11ac VHT 80 MHz mode / CH 5290 MHz)

Polarity: Vertical



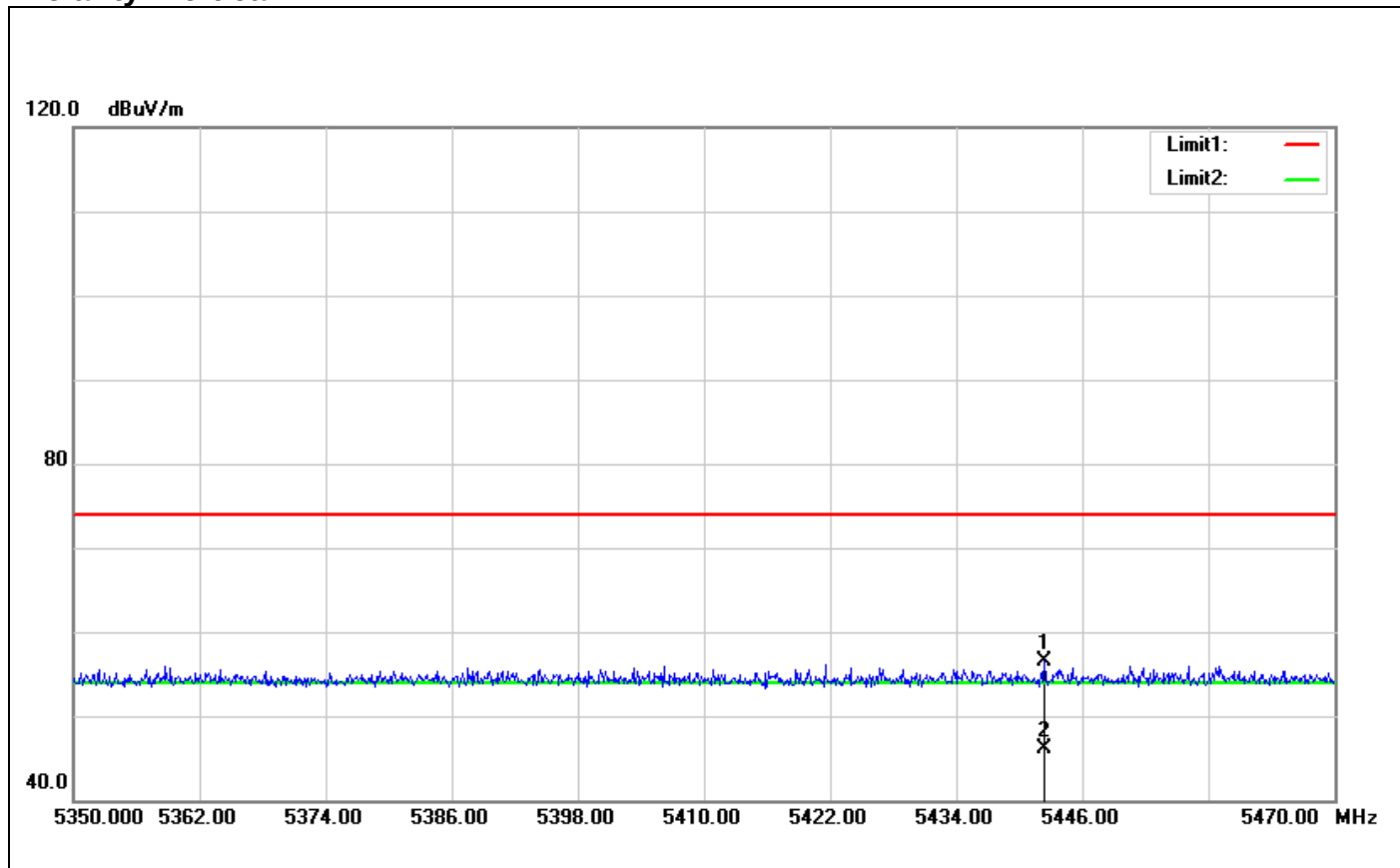
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.990	54.82	5.32	60.14	74.00	-13.86	100	96	peak
2	5350.990	41.07	5.32	46.39	54.00	-7.61	100	96	AVG

Polarity: Horizontal

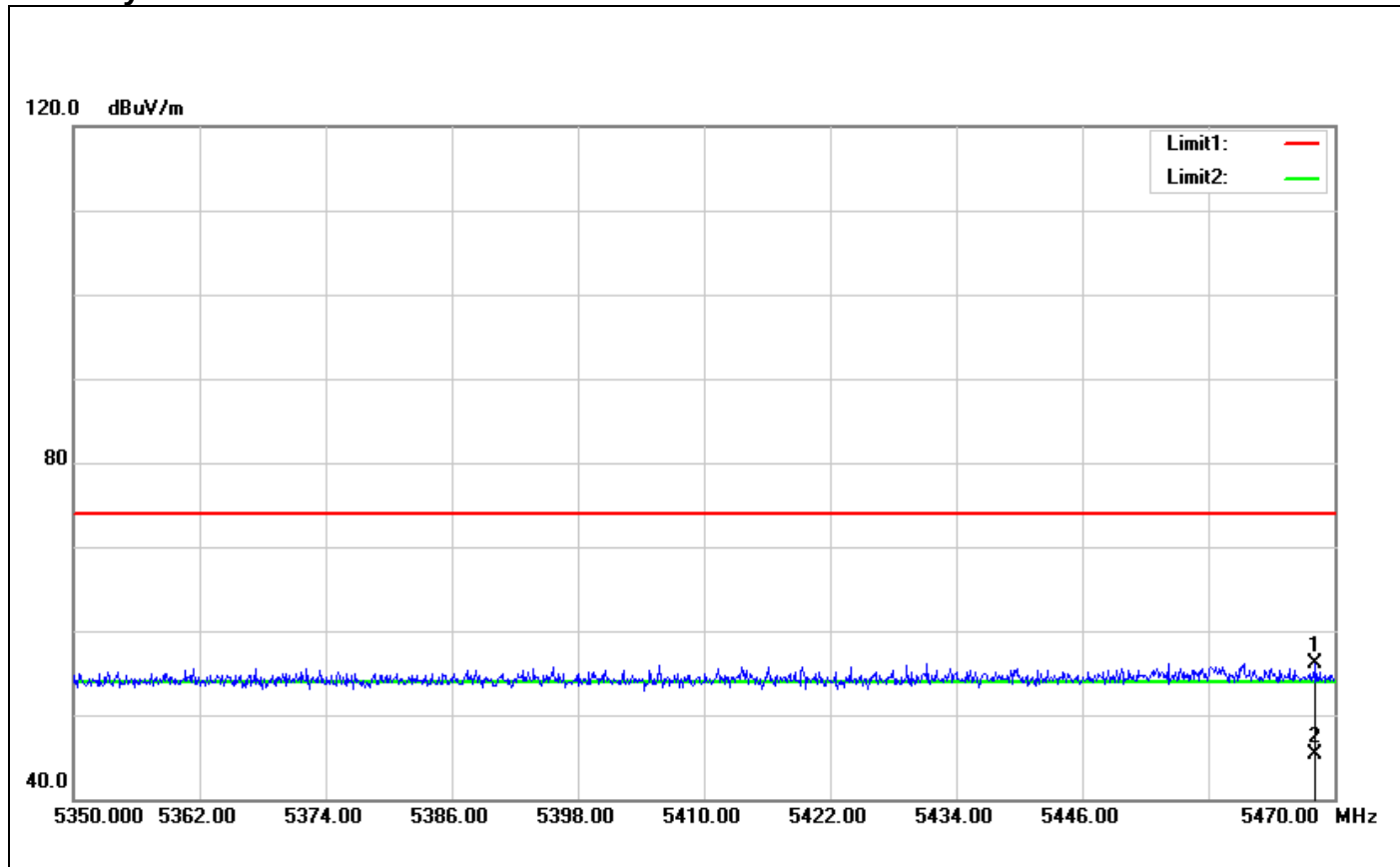
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5355.060	52.92	5.35	58.27	74.00	-15.73	100	114	peak
2	5355.060	40.73	5.35	46.08	54.00	-7.92	100	114	AVG

Band Edges (IEEE 802.11ac VHT 80 MHz mode / CH 5530 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	5442.400	51.07	5.52	56.59	74.00	-17.41	100	0	peak
2	5442.400	40.67	5.52	46.19	54.00	-7.81	100	0	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	5468.200	50.75	5.40	56.15	74.00	-17.85	100	152	peak
2	5468.200	39.85	5.40	45.25	54.00	-8.75	100	152	AVG

7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

According to §15.407(a)

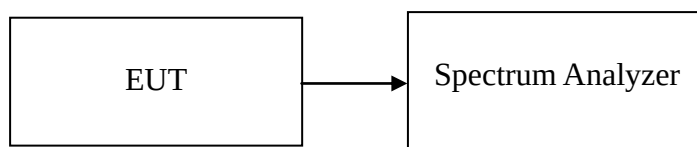
- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 11dBm in any 1MHz band.
- (2) For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11dBm in any 1MHz band.

According to RSS-247,

- (1) The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
- (2) The power spectral density shall not exceed 11 dBm in any 1.0 MHz 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)	PPSD (dBm)	Limit (dBm)	Margin	Result
36	5180	3.24	11.00	-7.76	PASS
44	5220	2.83	11.00	-8.17	PASS
48	5240	2.86	11.00	-8.14	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
36	5180	1.94	2.11	5.04	8.45	-3.41	PASS
44	5220	1.35	1.61	4.49	8.45	-3.96	PASS
48	5240	1.77	1.97	4.88	8.45	-3.57	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
38	5190	-4.22	-3.78	-0.98	8.45	-9.43	PASS
46	5230	-3.89	-3.28	-0.56	8.45	-9.01	PASS

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
42	5210	-1.92	-4.54	-0.03	8.45	-8.48	PASS

Remark:

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

2. The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 8.45dBm.

Test mode: IEEE 802.11a mode/ 5260 ~ 5320MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
52	5260	2.89	11.00	-8.11	PASS
56	5280	3.15	11.00	-7.85	PASS
64	5320	2.49	11.00	-8.51	PASS

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
52	5260	2.03	1.57	4.82	8.45	-3.63	PASS
56	5280	1.74	1.70	4.73	8.45	-3.72	PASS
64	5320	1.34	1.38	4.37	8.45	-4.08	PASS

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
54	5270	-3.29	-4.43	-0.81	8.45	-9.26	PASS
62	5310	-3.63	-4.38	-0.98	8.45	-9.43	PASS

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
58	5290	-3.03	-2.71	0.14	8.45	-8.31	PASS

Remark:

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

2. The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 8.45dBm.

Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
100	5500	2.69	11.00	-8.31	PASS
116	5580	1.97	11.00	-9.03	PASS
140	5700	2.42	11.00	-8.58	PASS
144	5720 (Band III)	2.02	11.00	-8.98	PASS
144	5720 (Band IV)	-1.17	30.00/500kHz	-31.17	PASS

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz

Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
100	5500	1.75	0.89	4.35	8.45	-4.1	PASS
116	5580	1.38	1.27	4.34	8.45	-4.11	PASS
140	5700	1.55	1.07	4.33	8.45	-4.12	PASS
144	5720 (Band III)	2.18	2.32	5.26	8.45	-3.19	PASS
144	5720 (Band IV)	-2.48	-2.55	0.50	27.45/500kHz	-26.95	PASS

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz

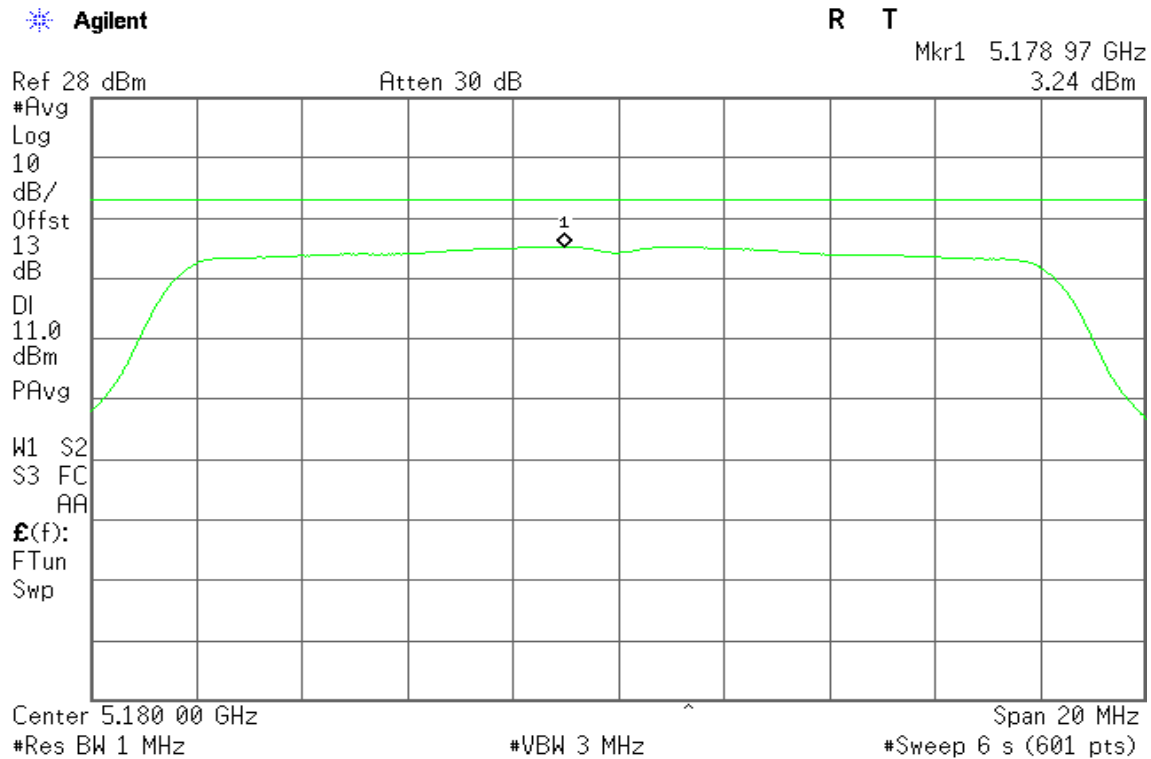
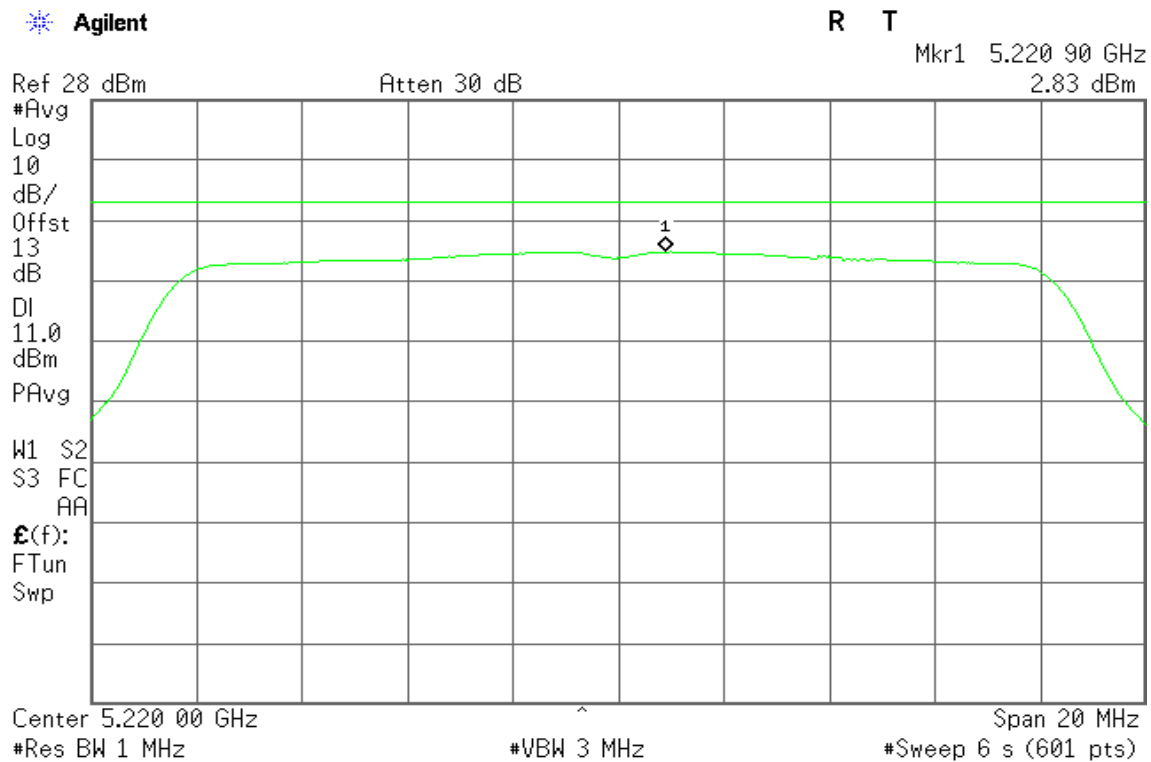
Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
102	5510	-4.00	-4.55	-1.26	8.45	-9.71	PASS
118	5590	-3.91	-4.23	-1.06	8.45	-9.51	PASS
134	5670	-4.46	-4.30	-1.37	8.45	-9.82	PASS
142	5710 (Band III)	-1.87	-1.51	1.32	8.45	-7.13	PASS
142	5710 (Band IV)	-14.34	-13.64	-10.97	27.45/500kHz	-38.42	PASS

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz

Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
106	5530	-5.30	-0.50	0.74	8.45	-7.71	PASS
122	5610	-1.35	-2.50	1.12	8.45	-7.33	PASS
138	5690 (Band III)	-1.43	-2.93	0.89	8.45	-7.56	PASS
138	5690 (Band IV)	-13.90	-17.68	-12.38	27.45/500kHz	-39.83	PASS

Remark:

1. Total PSD (dBm) = $10 \cdot \log(10^{(\text{Chain 0 PSD} / 10)} + 10^{(\text{Chain 1 PSD} / 10)})$
2. Band III: The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 8.45dBm.
3. Band IV: The maximum antenna gain is 8.55dBi; therefore the reduction due to antenna gain is 2.55dBi, so the limit is 27.45 dBm.

Test Plot**IEEE 802.11a mode / 5180 ~ 5240MHz****5180 MHz****5220 MHz**

5240 MHz

Agilent

R T

Mkr1 5.240 90 GHz
2.86 dBm

Ref 28 dBm

Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

11.0

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

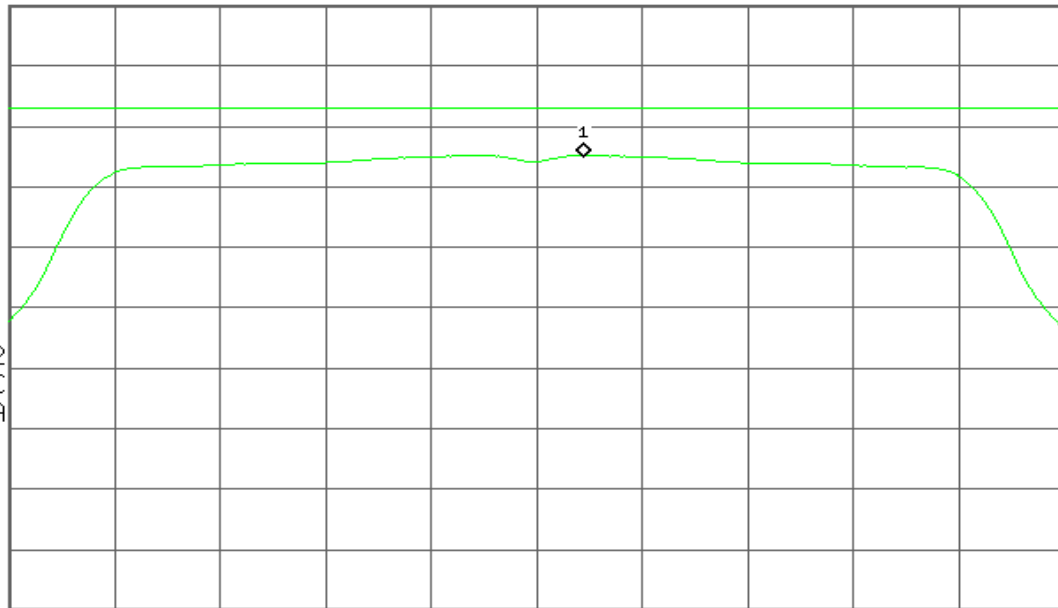
Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



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

* Agilent

R T

Mkr1 5.178 87 GHz
1.94 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

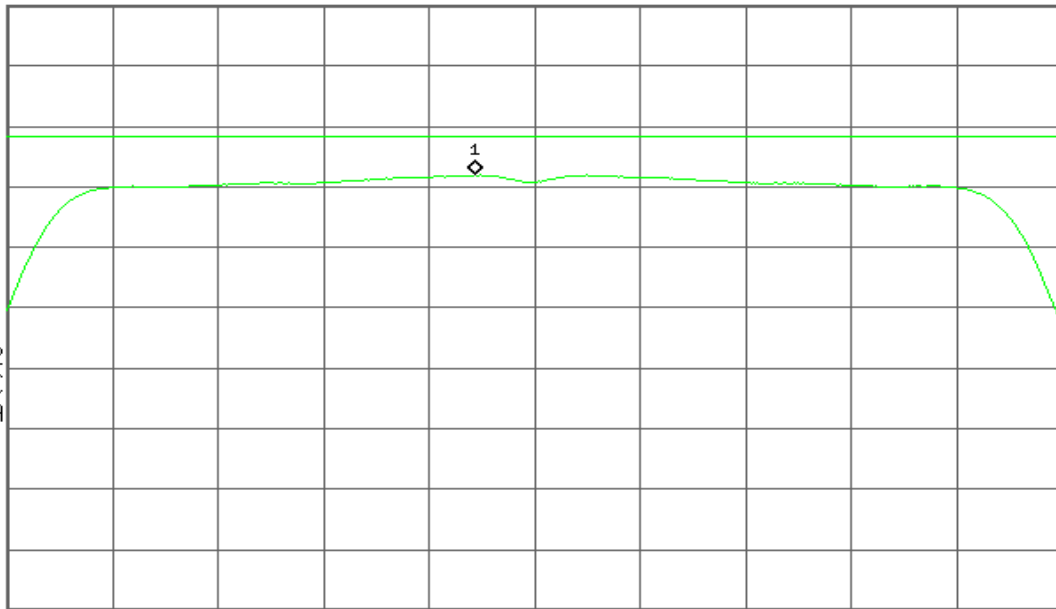
S3 FC

AA

E(f):

FTun

Swp



Center 5.180 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5220 MHz

* Agilent

R T

Mkr1 5.220 97 GHz
1.35 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

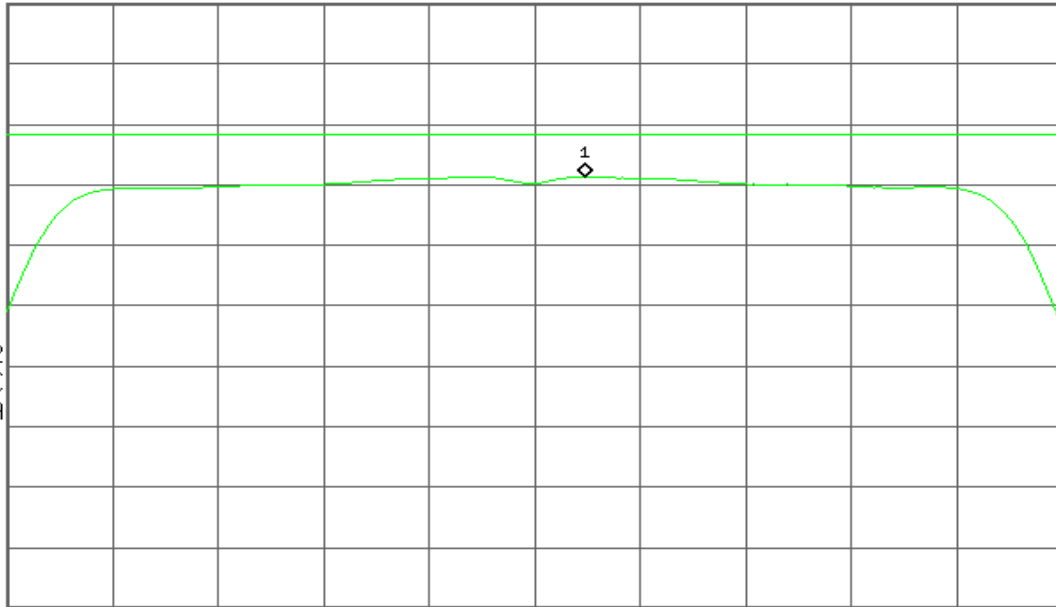
S3 FC

AA

E(f):

FTun

Swp



Center 5.220 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5240 MHz

Agilent

R T

Mkr1 5.240 97 GHz
1.77 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

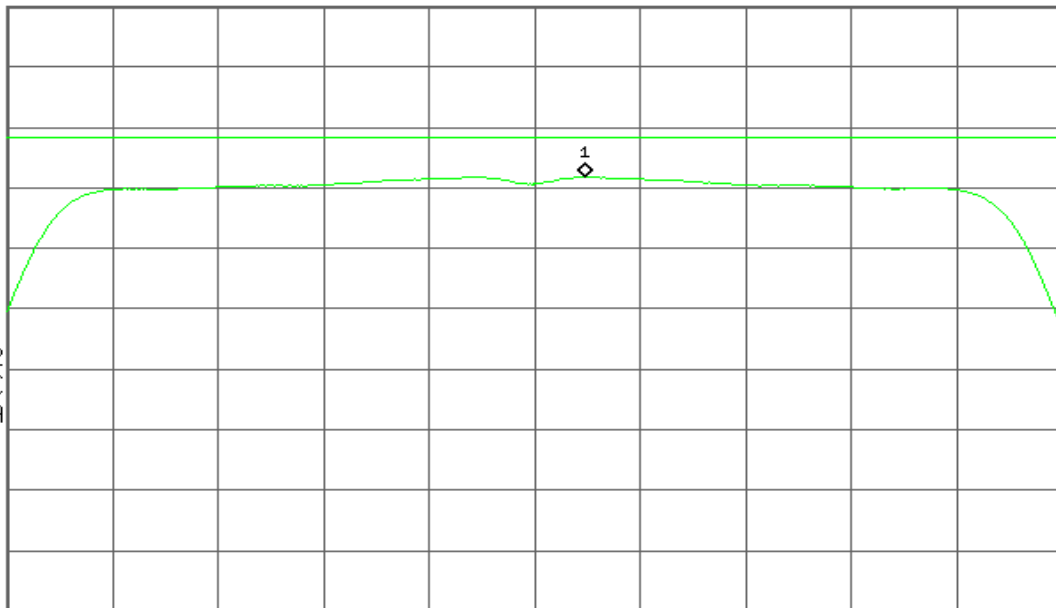
Center 5.240 00 GHz

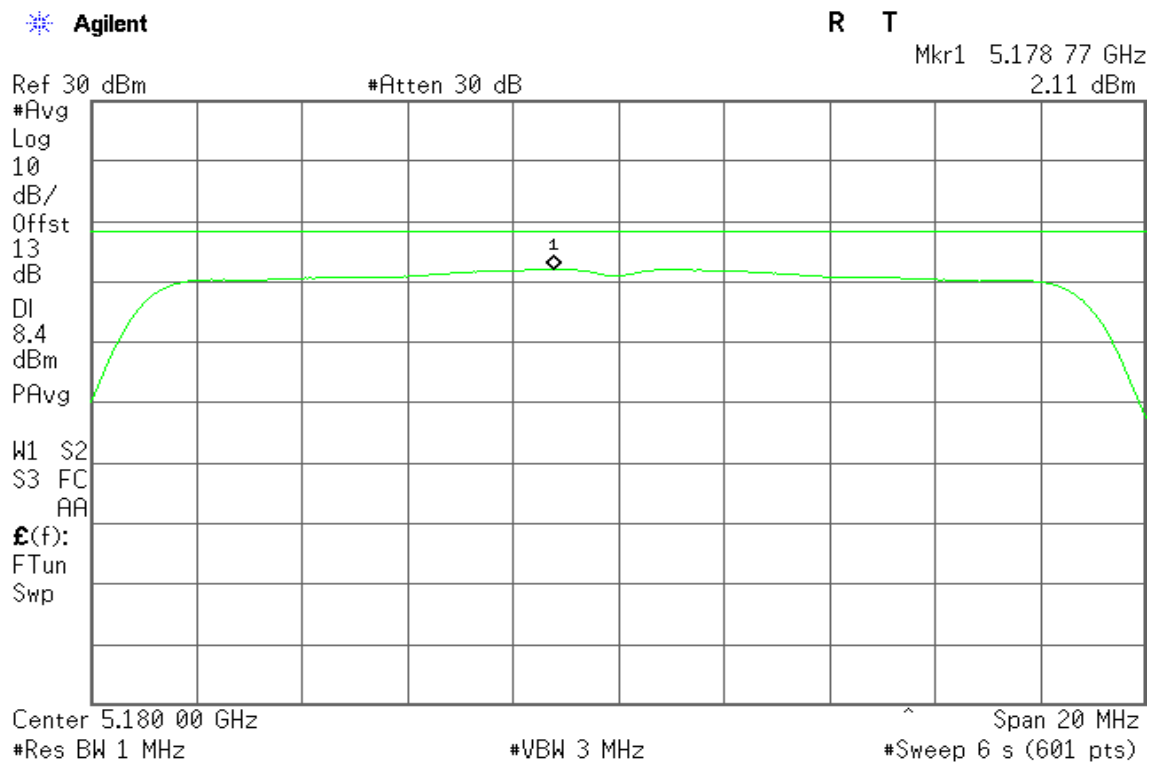
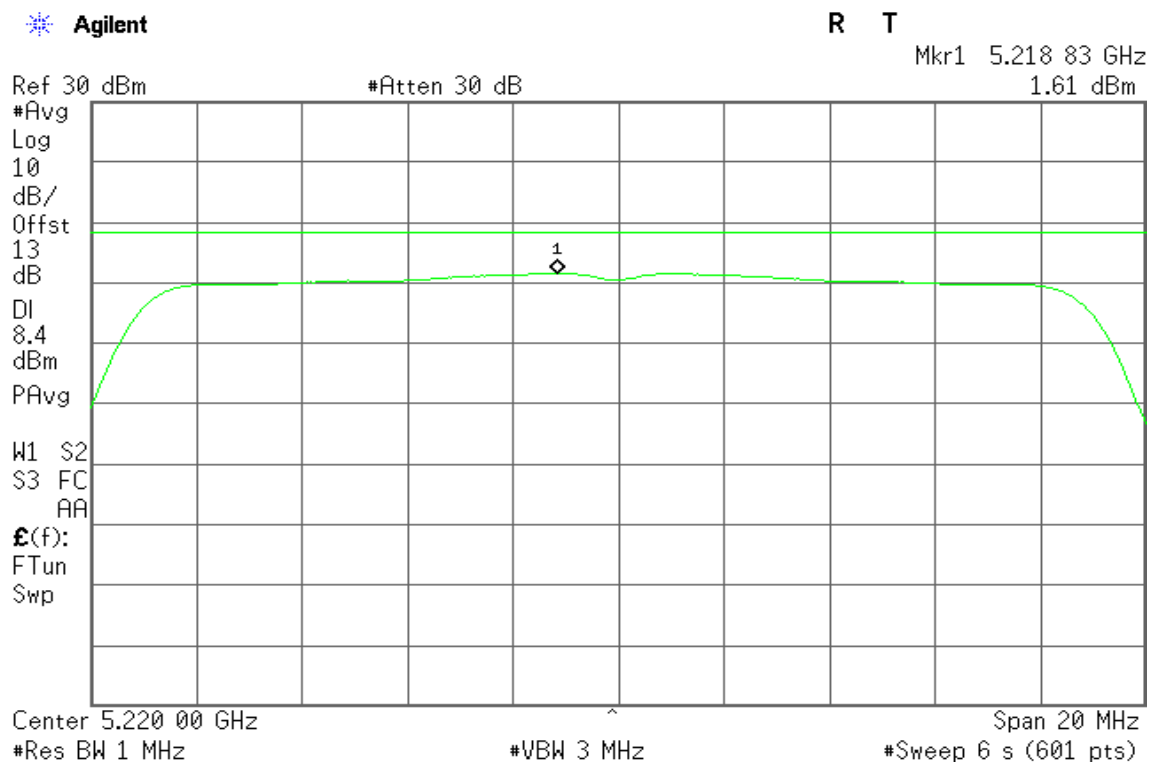
#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1**5180 MHz****5220 MHz**

5240 MHz

Agilent

R T

Mkr1 5.239 03 GHz
1.97 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

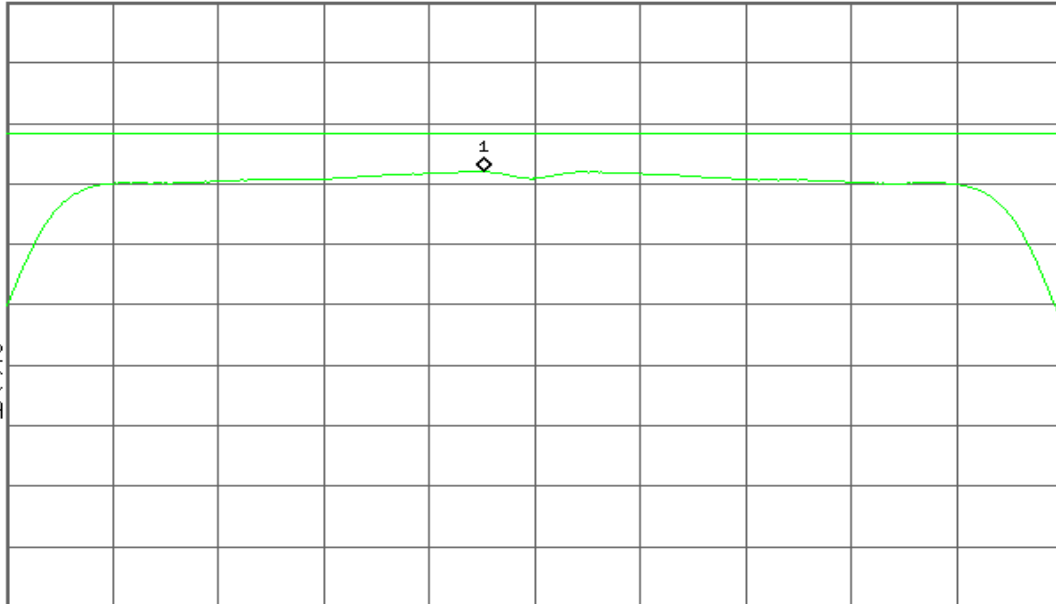
Center 5.240 00 GHz

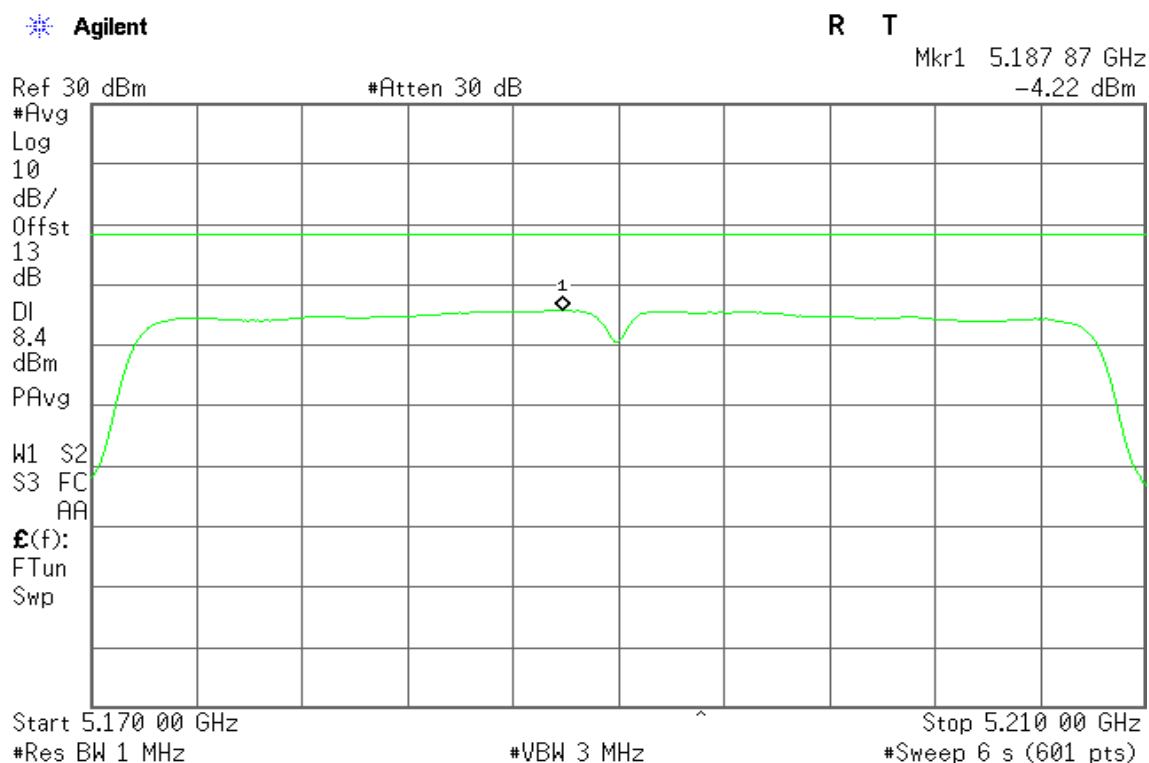
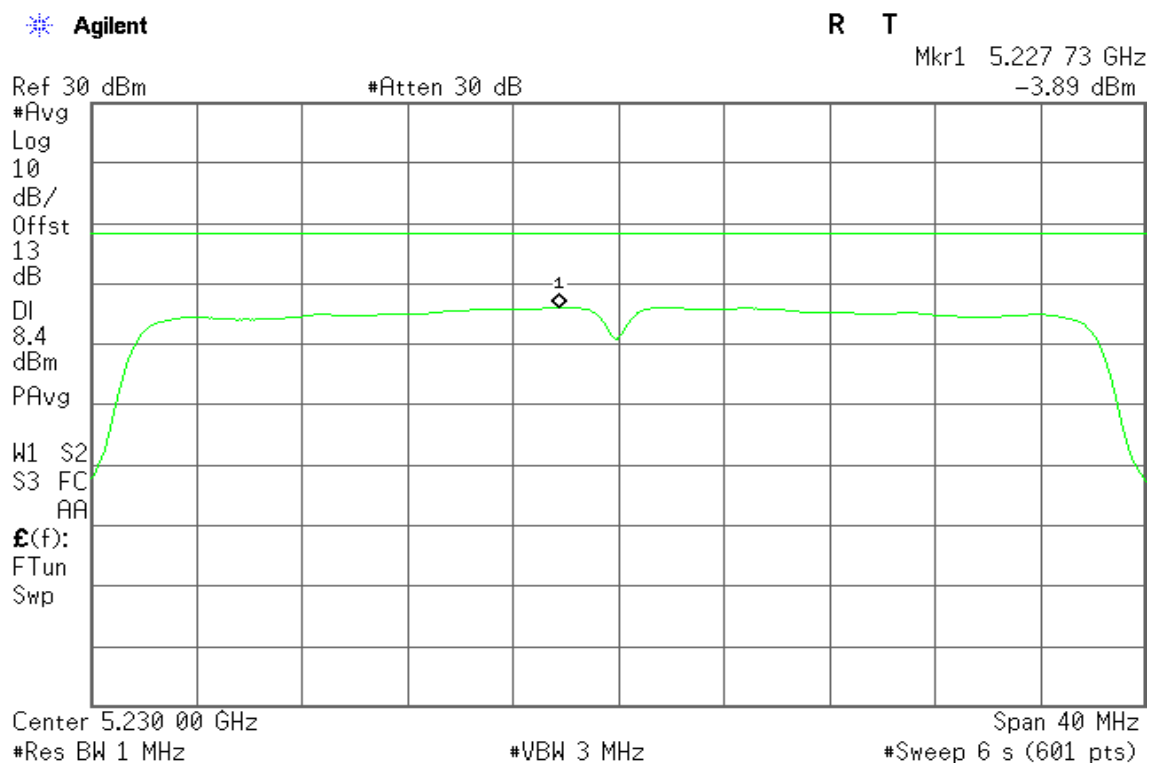
#Res BW 1 MHz

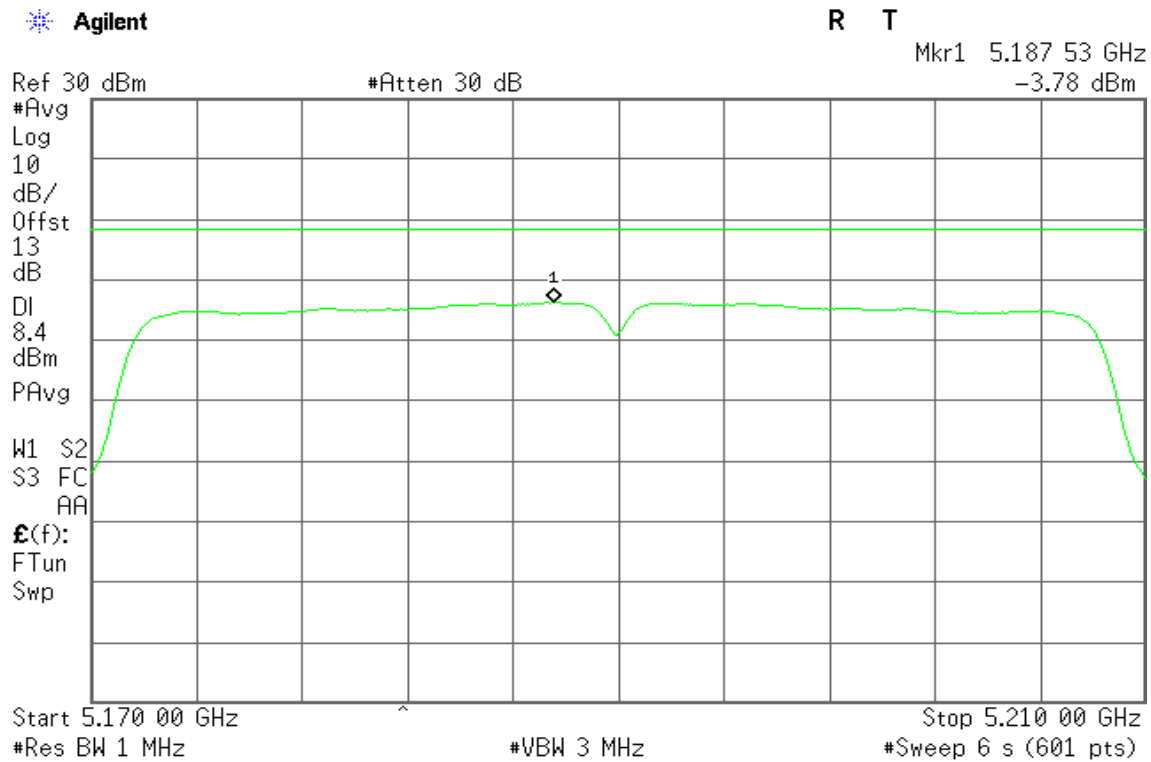
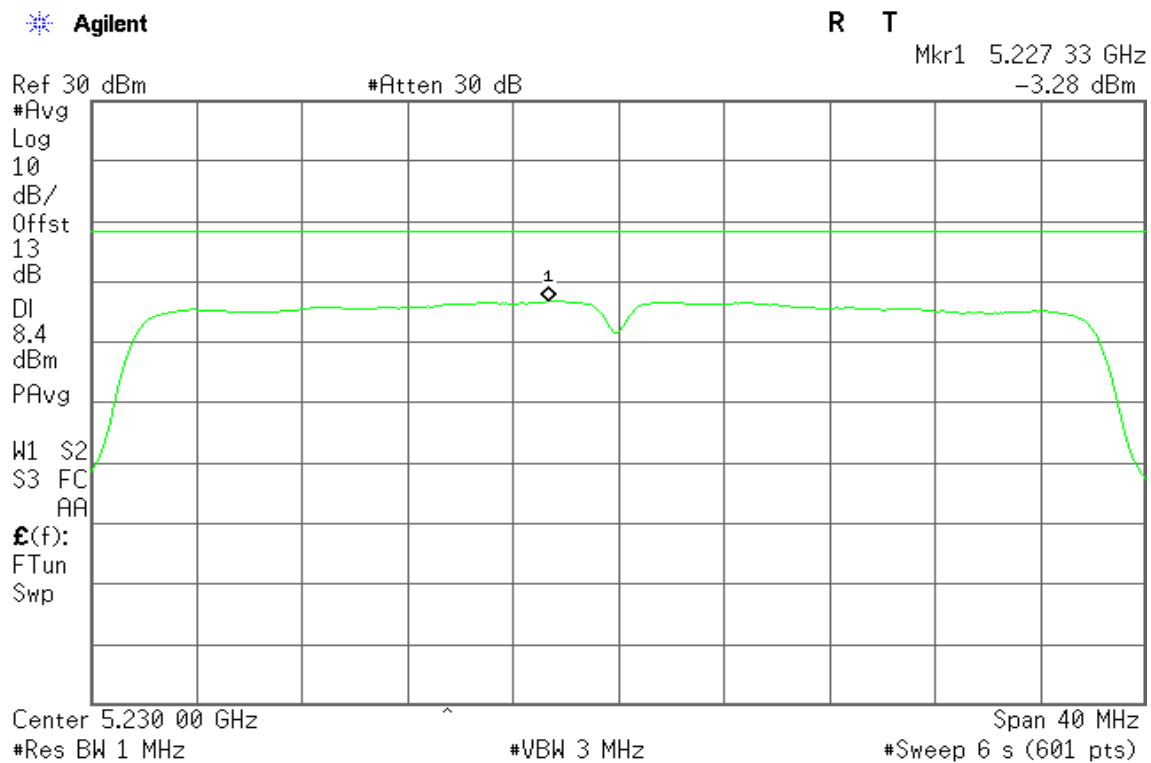
#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



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

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

IEEE 802.11ac VHT 80 MHz mode / 5210MHz/ Chain 0**5210 MHz**

Agilent

R T

Mkr1 5.217 87 GHz

-1.92 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

LgAv

W1 S2

S3 FC

AA

E(f):

FTun

Swp

Center 5.210 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 6 s (601 pts)

Span 80 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz/ Chain 1**5210 MHz**

Agilent

R T

Mkr1 5.217 87 GHz

-4.54 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

LgAv

W1 S2

S3 FC

AA

E(f):

FTun

Swp

Center 5.210 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 6 s (601 pts)

Span 80 MHz

IEEE 802.11a mode / 5260 ~ 5320MHz**5260 MHz**

Agilent

R T

Mkr1 5.259 03 GHz
2.89 dBm

Ref 28 dBm

Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

11.0

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

Center 5.260 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5280 MHz

Agilent

R T

Mkr1 5.280 90 GHz
3.15 dBm

Ref 28 dBm

Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

11.0

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

Center 5.280 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5320 MHz

Agilent

R T

Mkr1 5.320 97 GHz
2.49 dBm

Ref 28 dBm

Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

11.0

dBm

PAvg

W1 S2

S3 FC

AA

£(f):

FTun

Swp

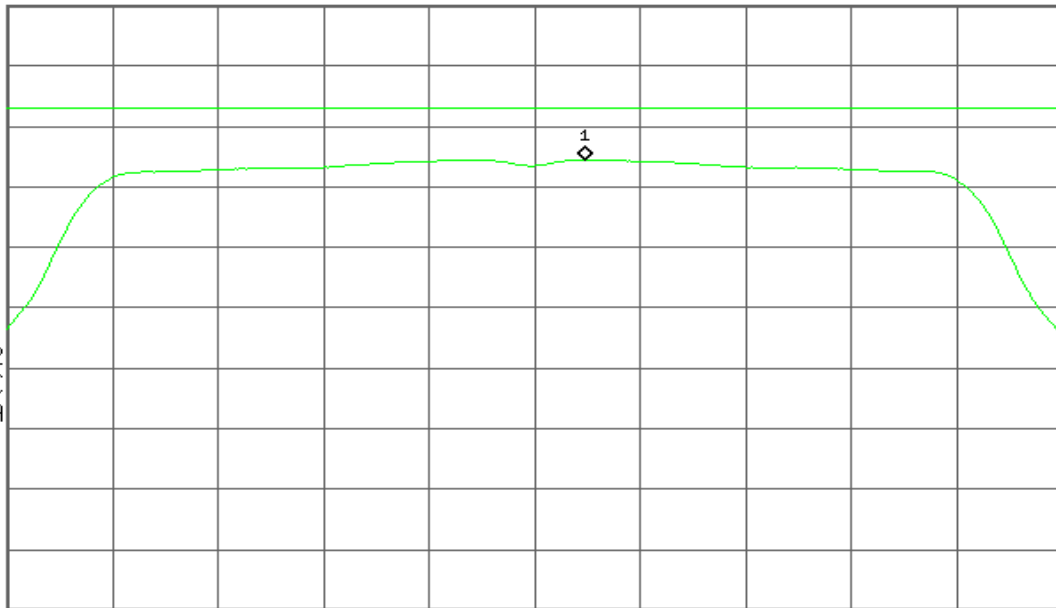
Center 5.320 00 GHz

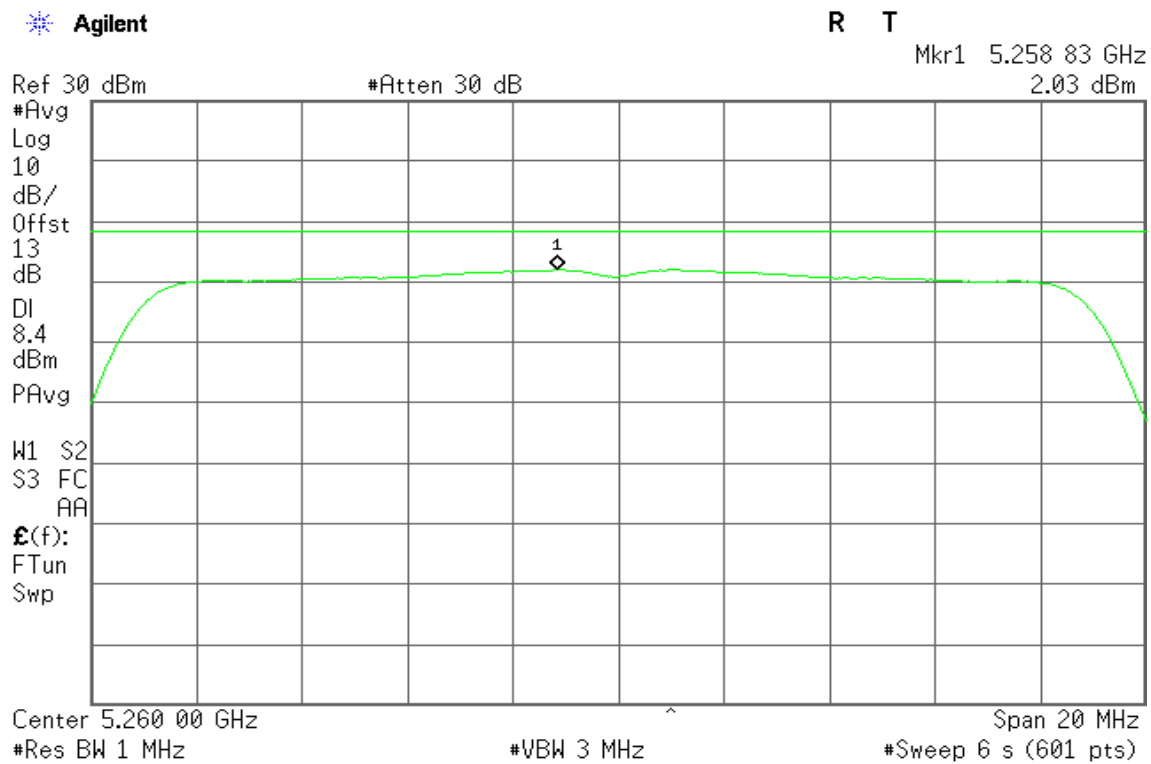
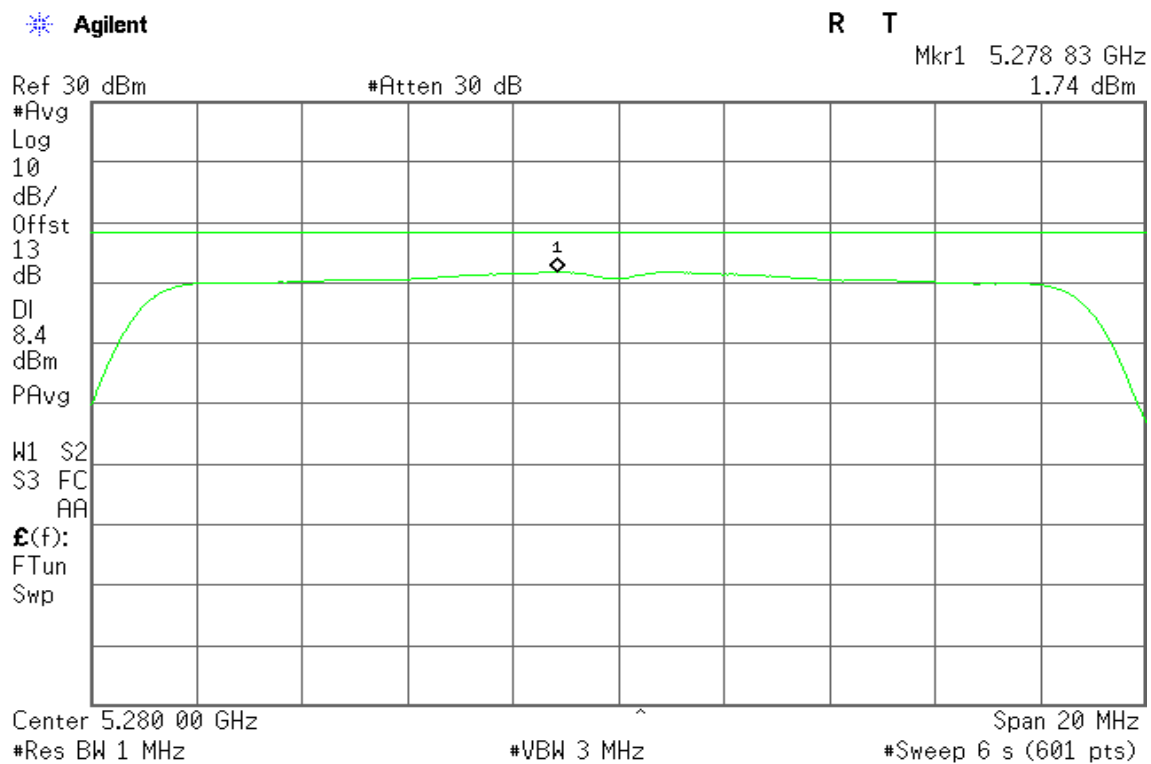
#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0**5260 MHz****5280 MHz**

5320 MHz

Agilent

R T

Mkr1 5.320 90 GHz
1.34 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

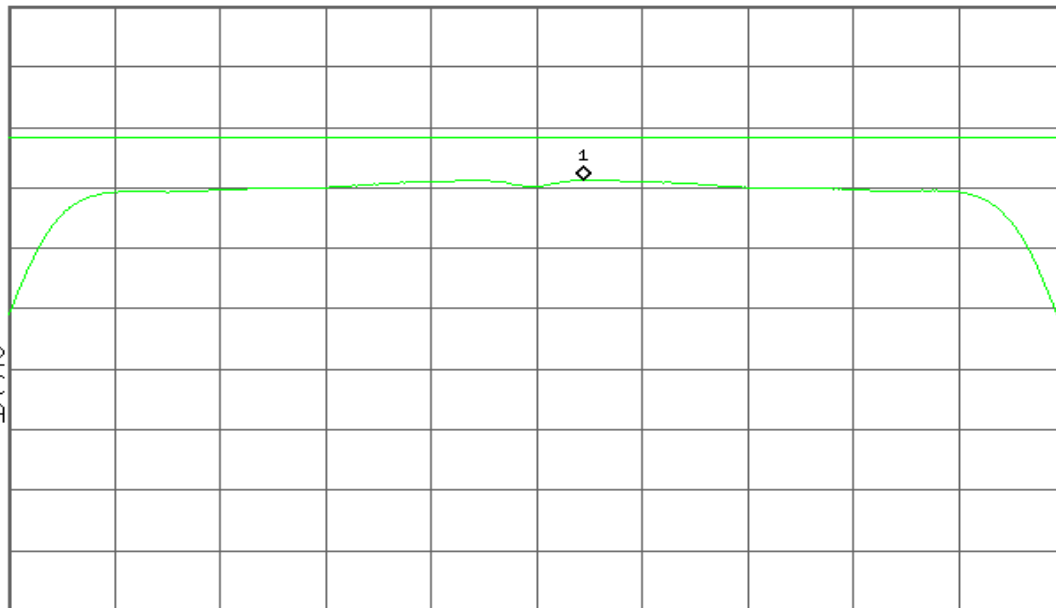
Center 5.320 00 GHz

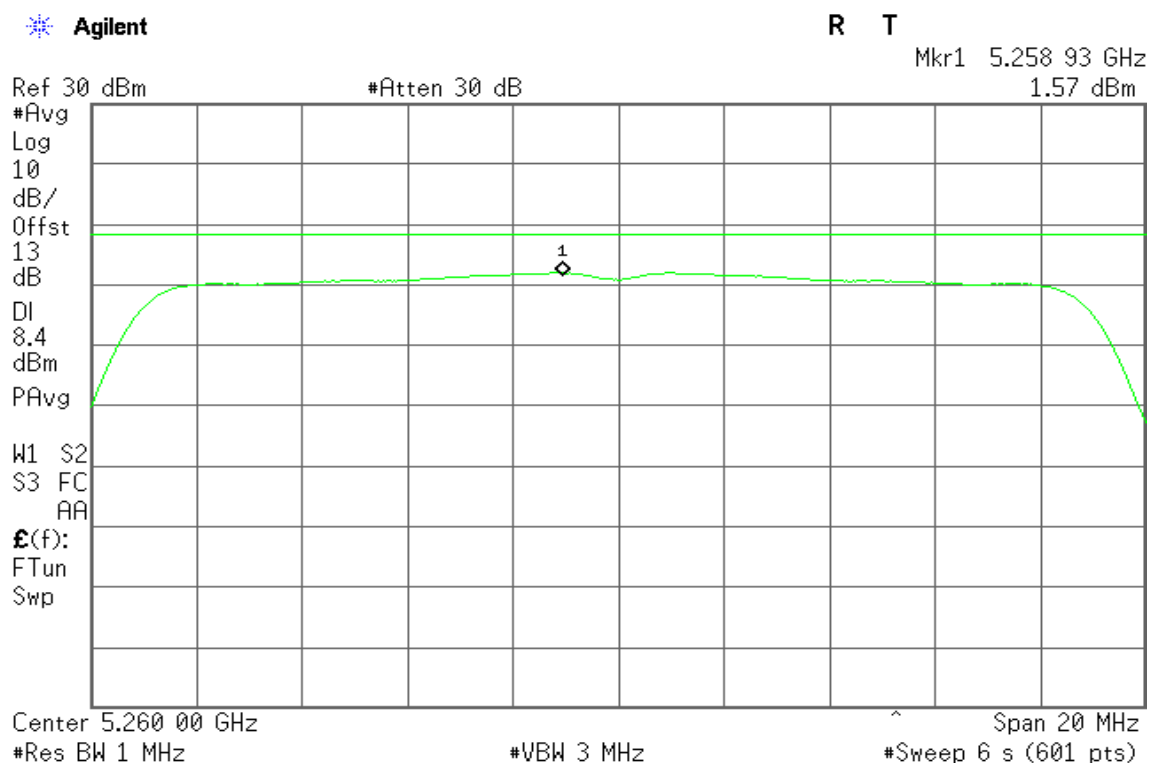
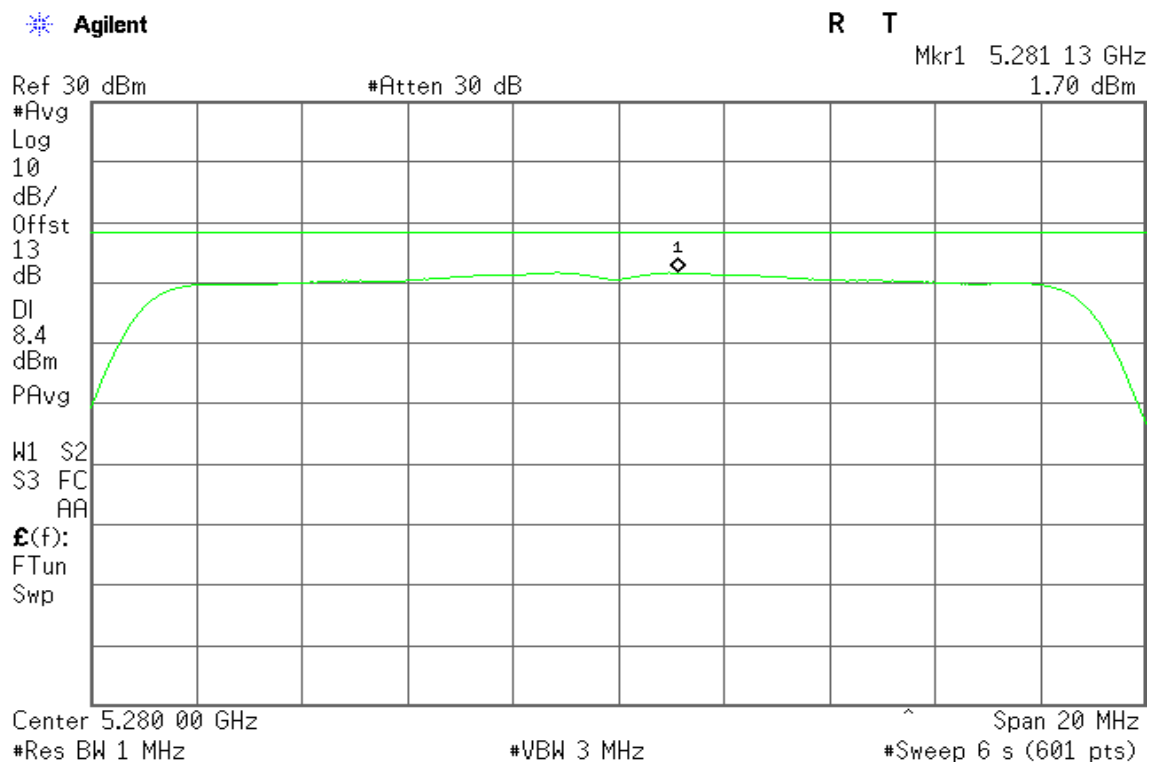
#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1**5260 MHz****5280 MHz**

5320 MHz

Agilent

R T

Mkr1 5.318 77 GHz
1.38 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

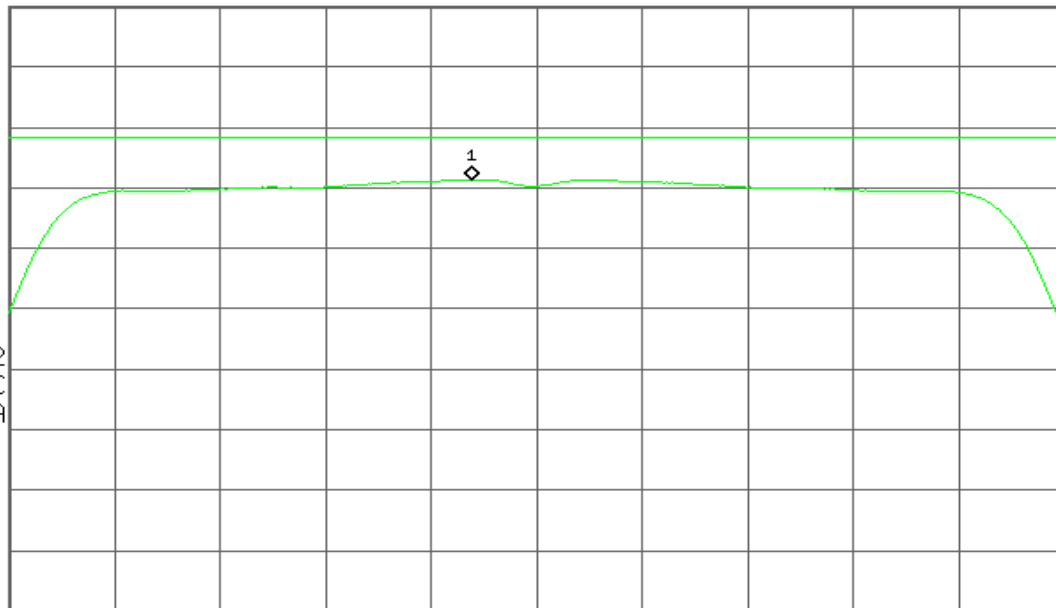
Center 5.320 00 GHz

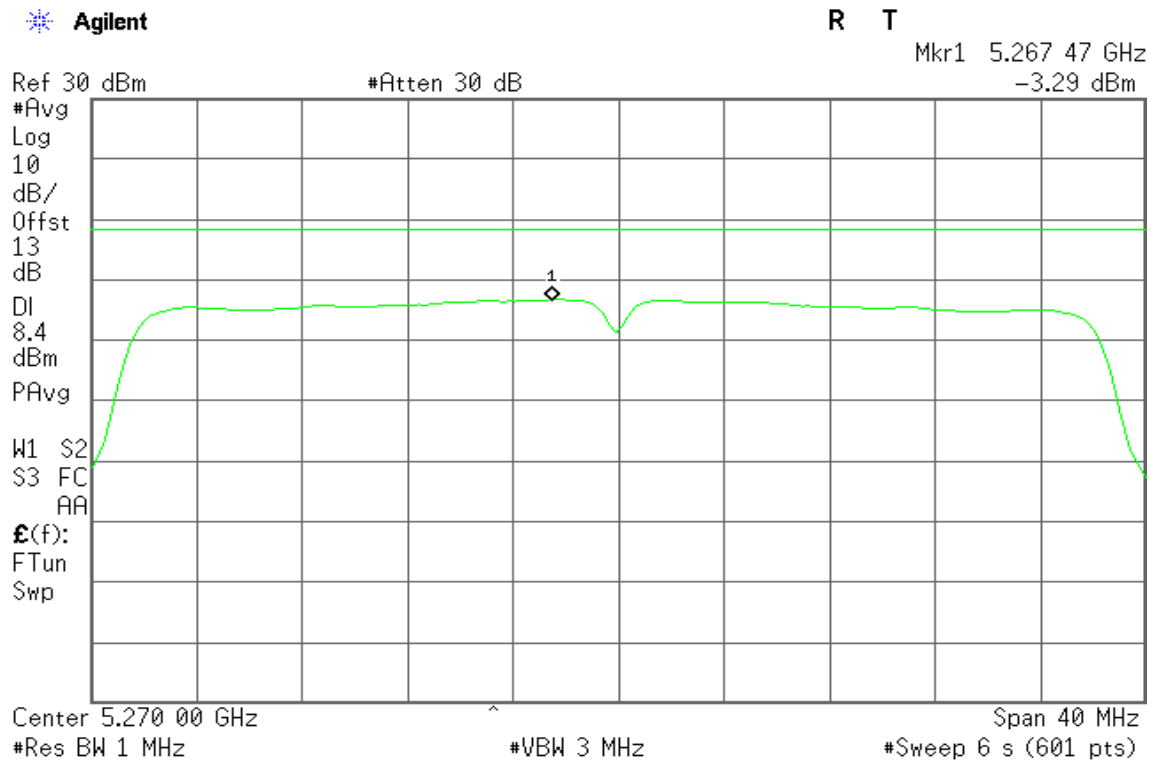
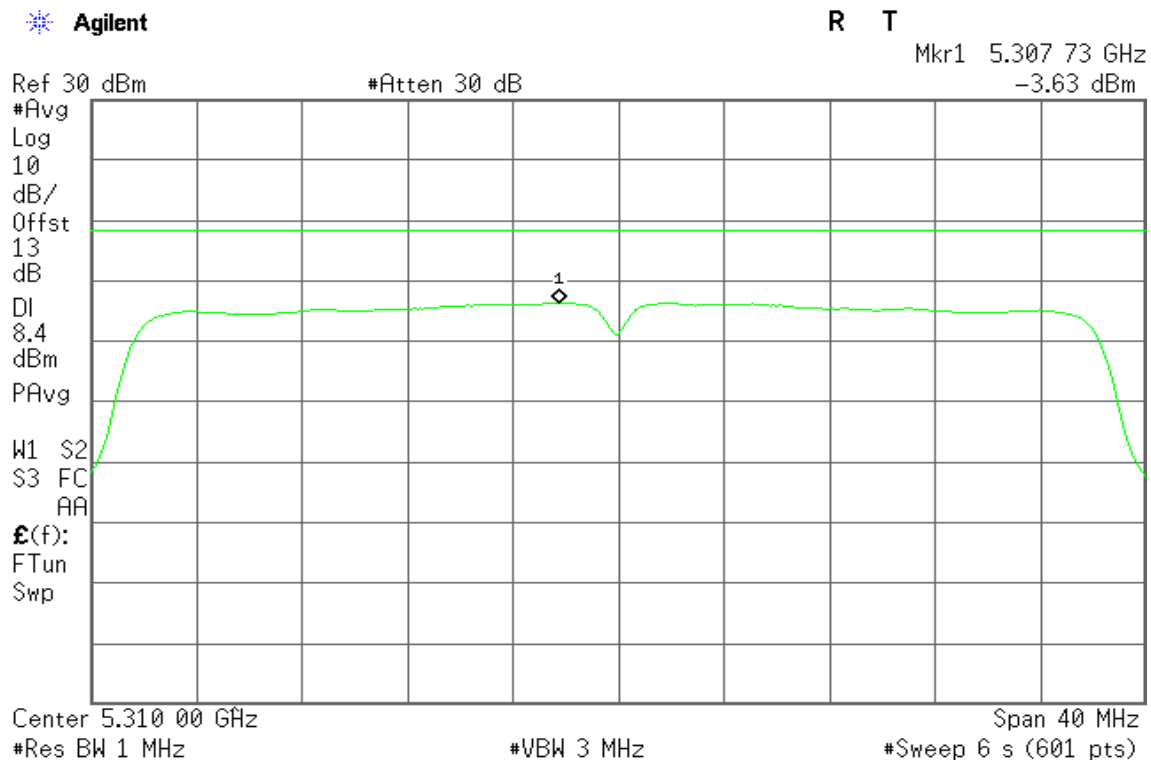
#Res BW 1 MHz

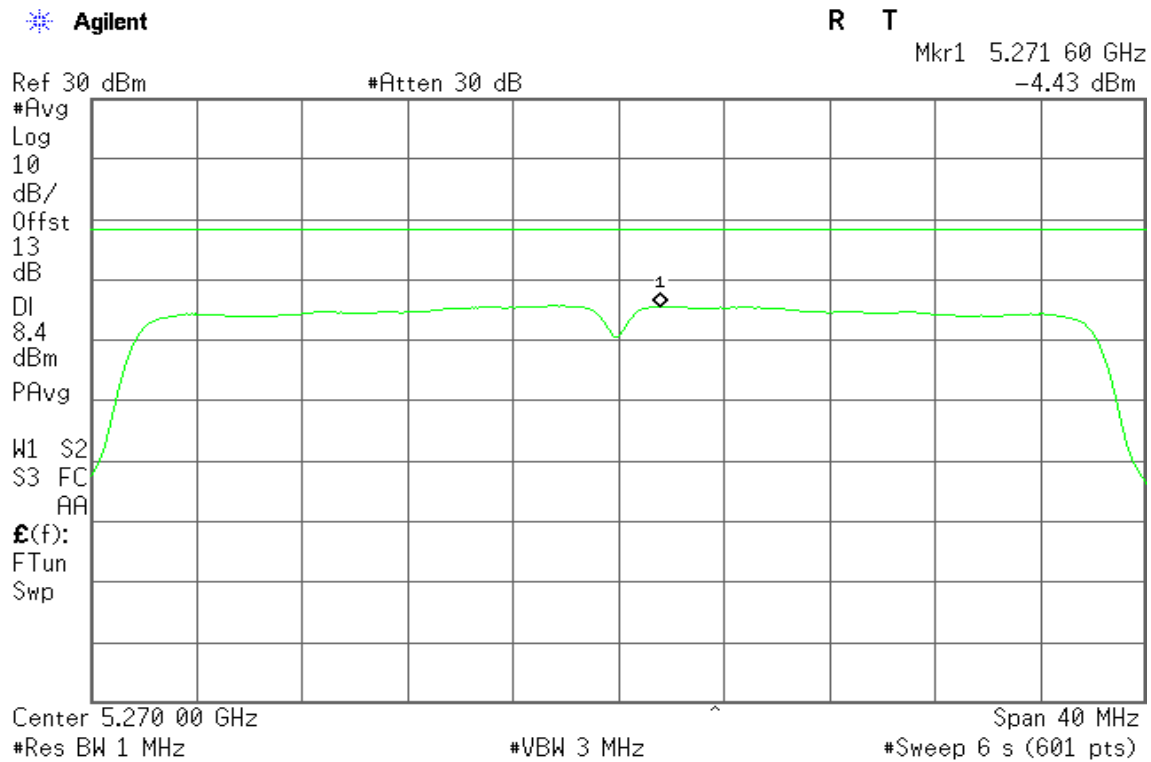
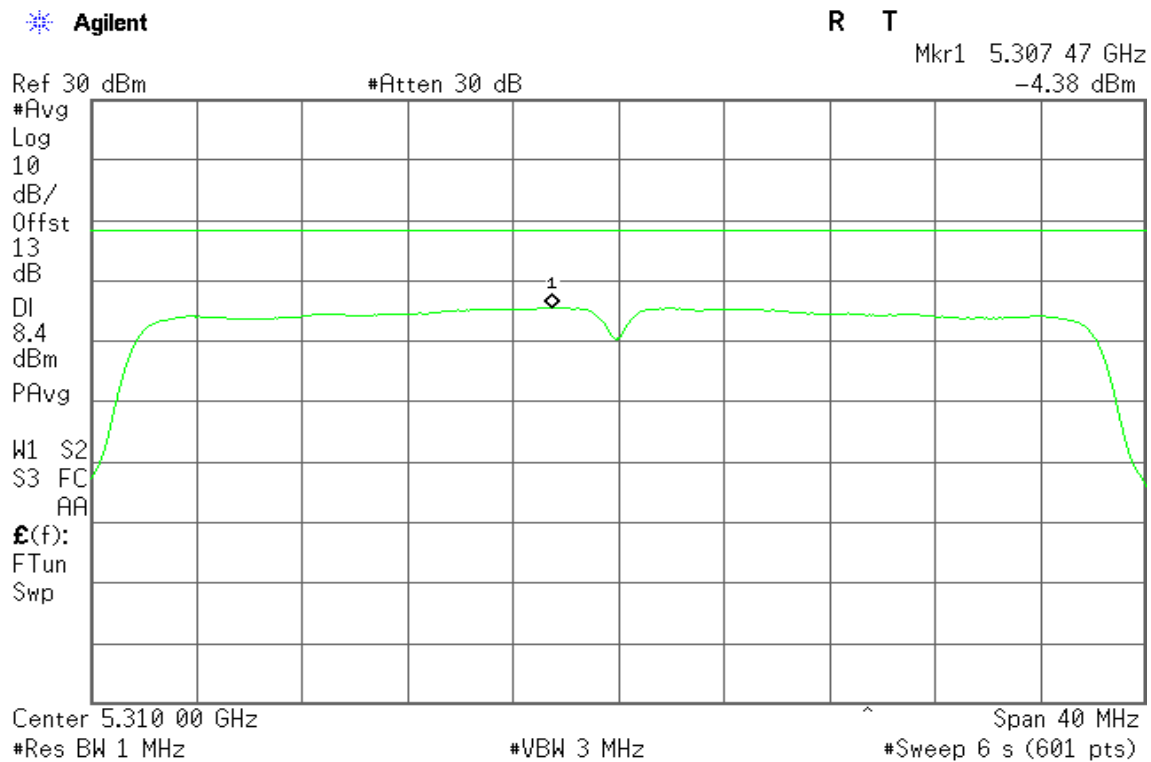
#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)



IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0**5270 MHz****5310 MHz**

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1**5270 MHz****5310 MHz**

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0**5290 MHz**

Agilent

R T

Mkr1 5.296 93 GHz
-3.03 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

11.0

dBm

#PAvg

M1 S2

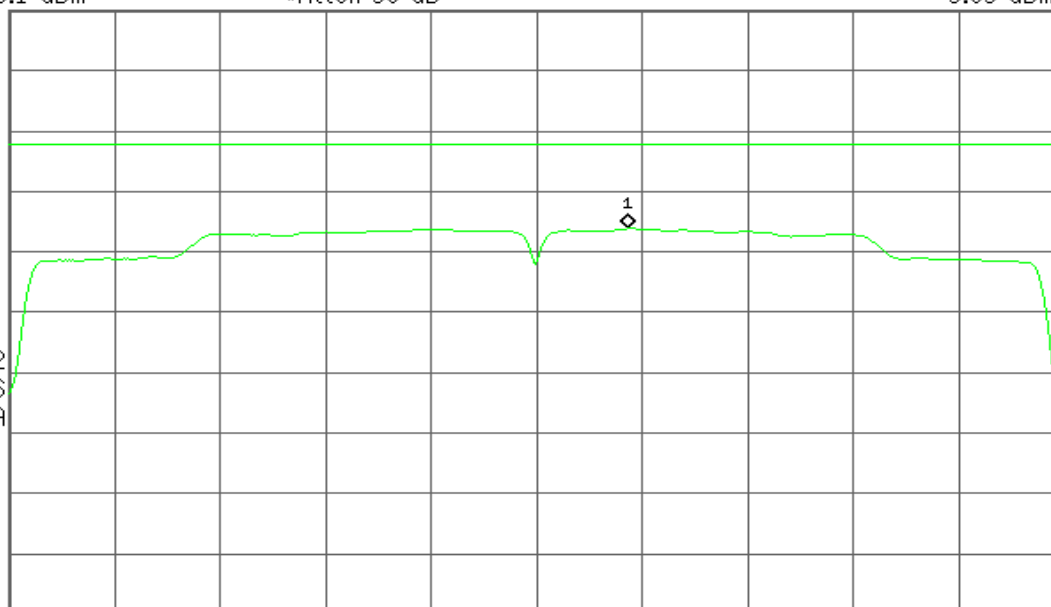
S3 FS

AA

£(f):

FTun

Swp



Center 5.290 00 GHz

Span 80 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 6 s (601 pts)

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 1**5290 MHz**

Agilent

R T

Mkr1 5.294 00 GHz
-2.71 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

LgAv

W1 S2

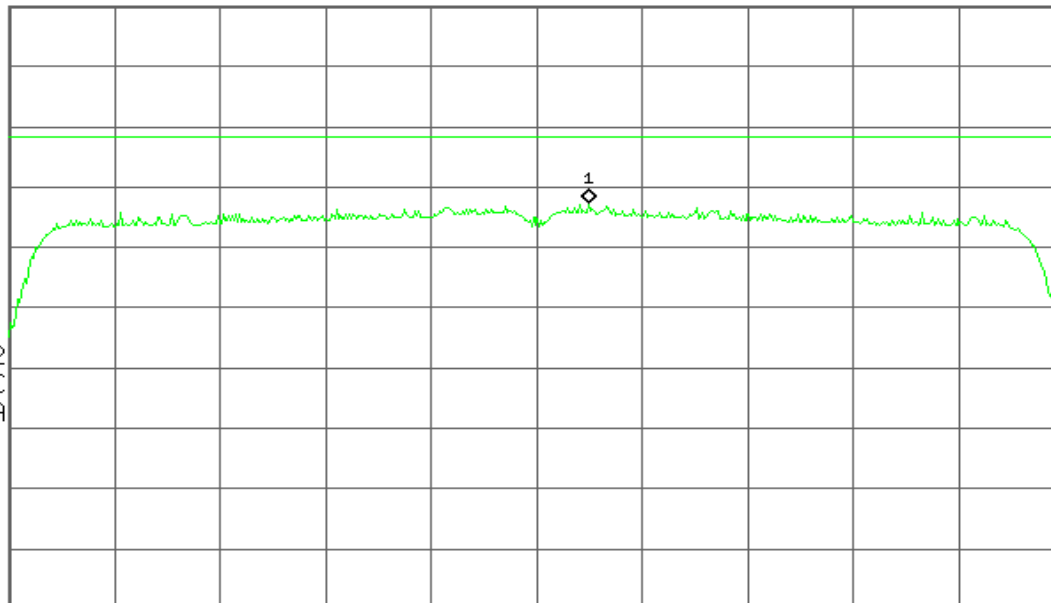
S3 FC

AA

£(f):

FTun

Swp



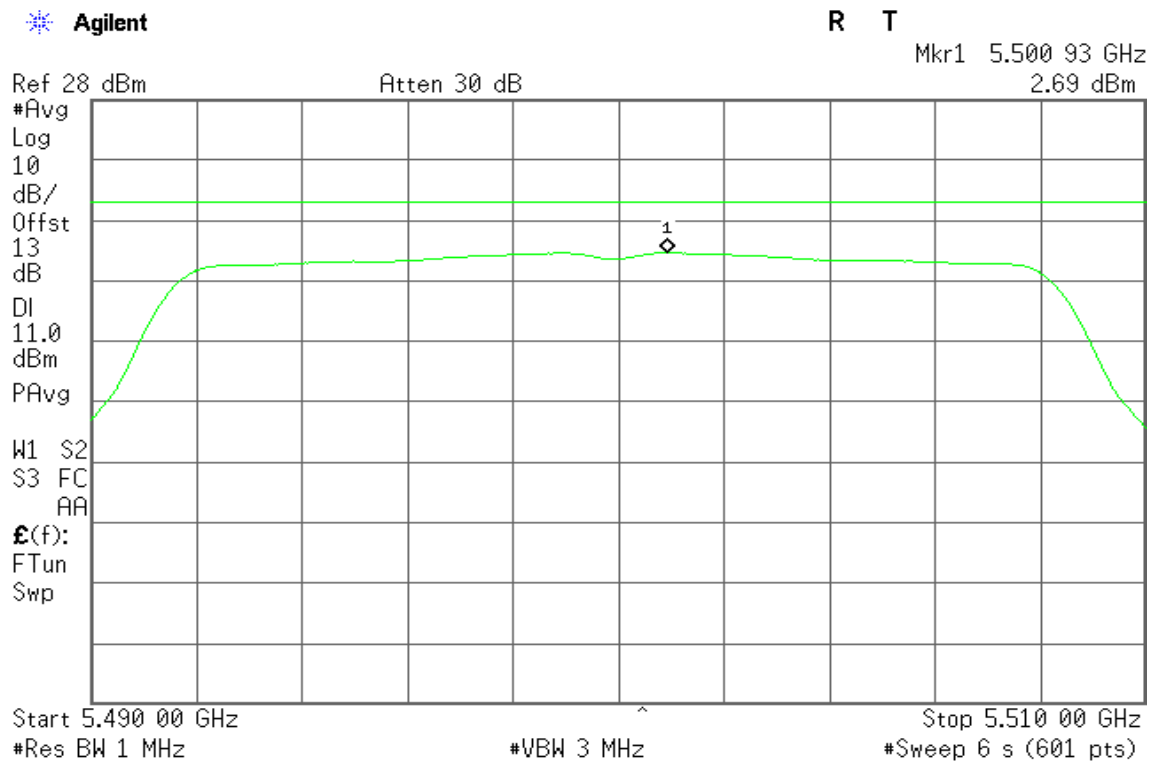
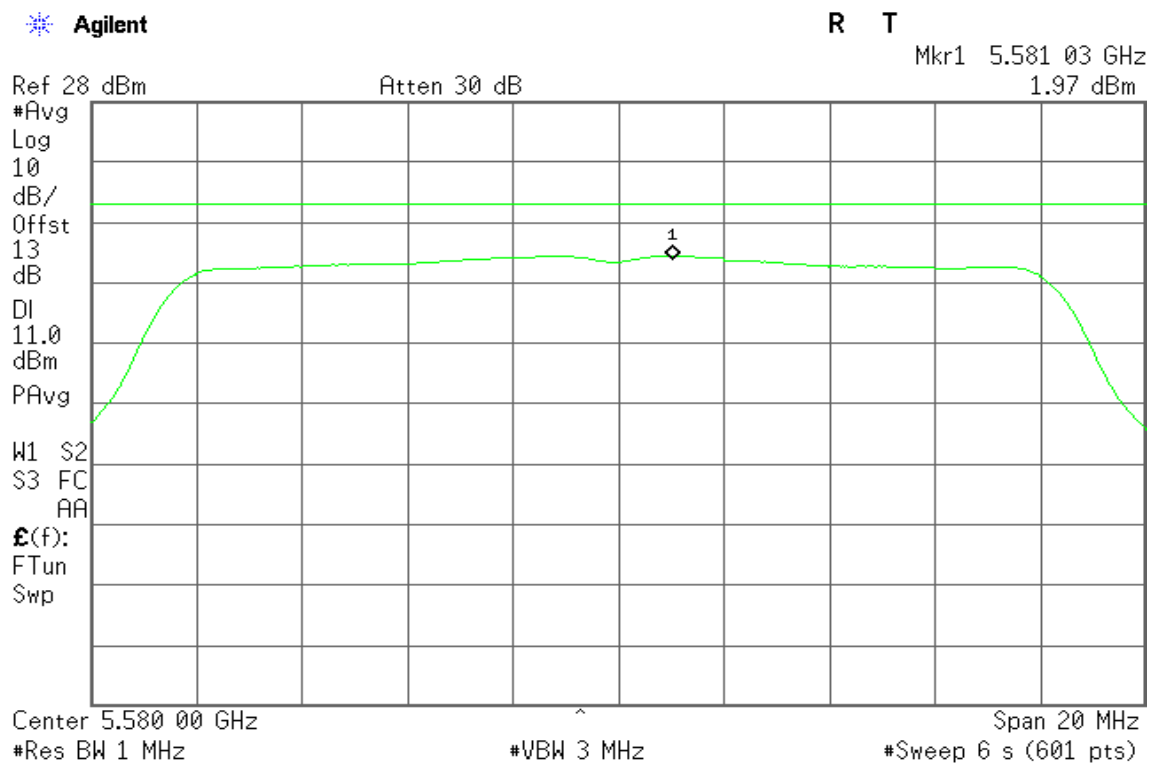
Center 5.290 00 GHz

Span 80 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 6 s (601 pts)

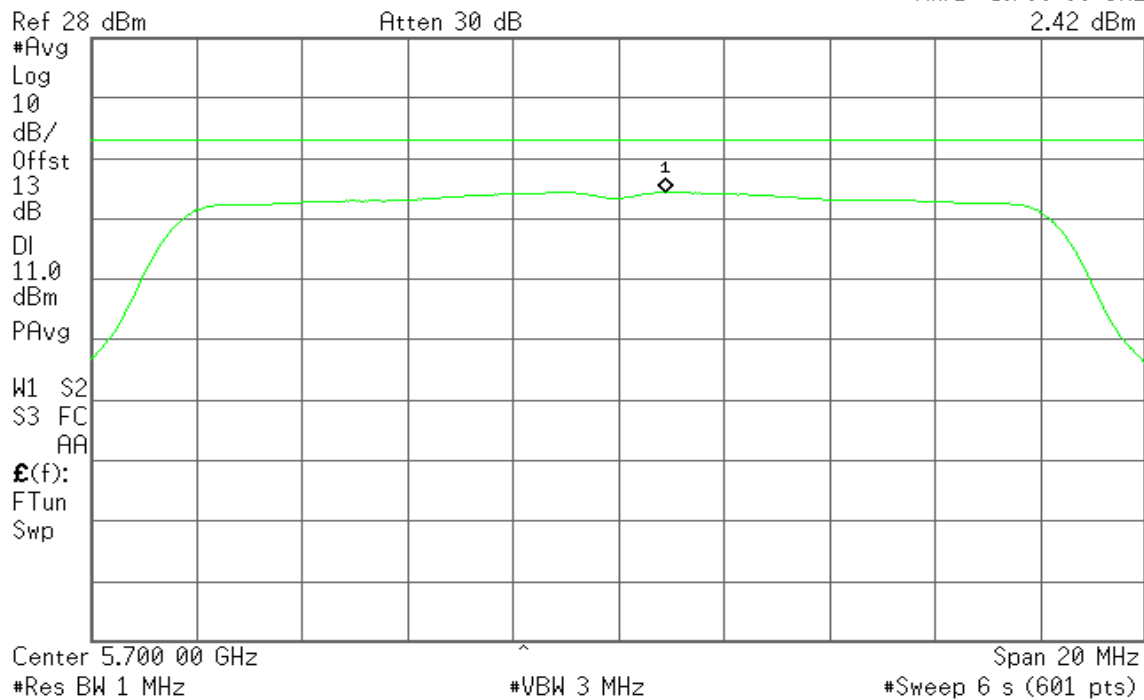
Test mode: IEEE 802.11a mode / 5500 ~ 5720MHz**5500 MHz****5580 MHz**

5700 MHz

Agilent

R T

Mkr1 5.700 90 GHz
2.42 dBm

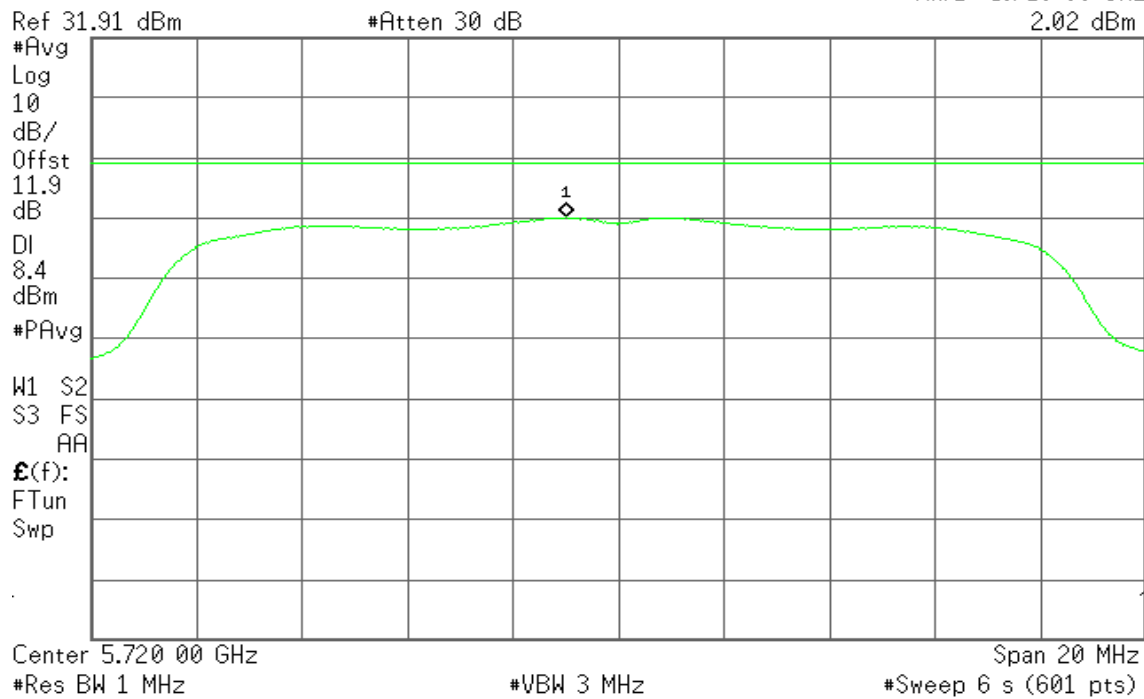


5720 MHz (Band III)

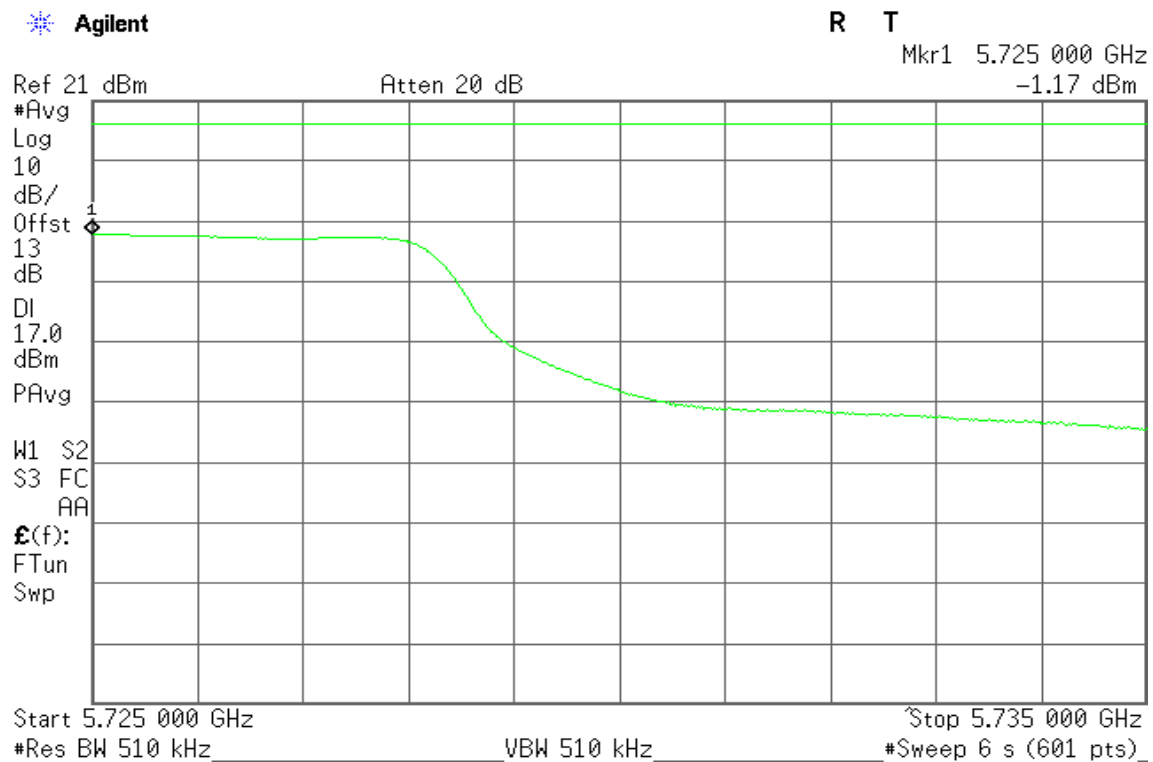
Agilent

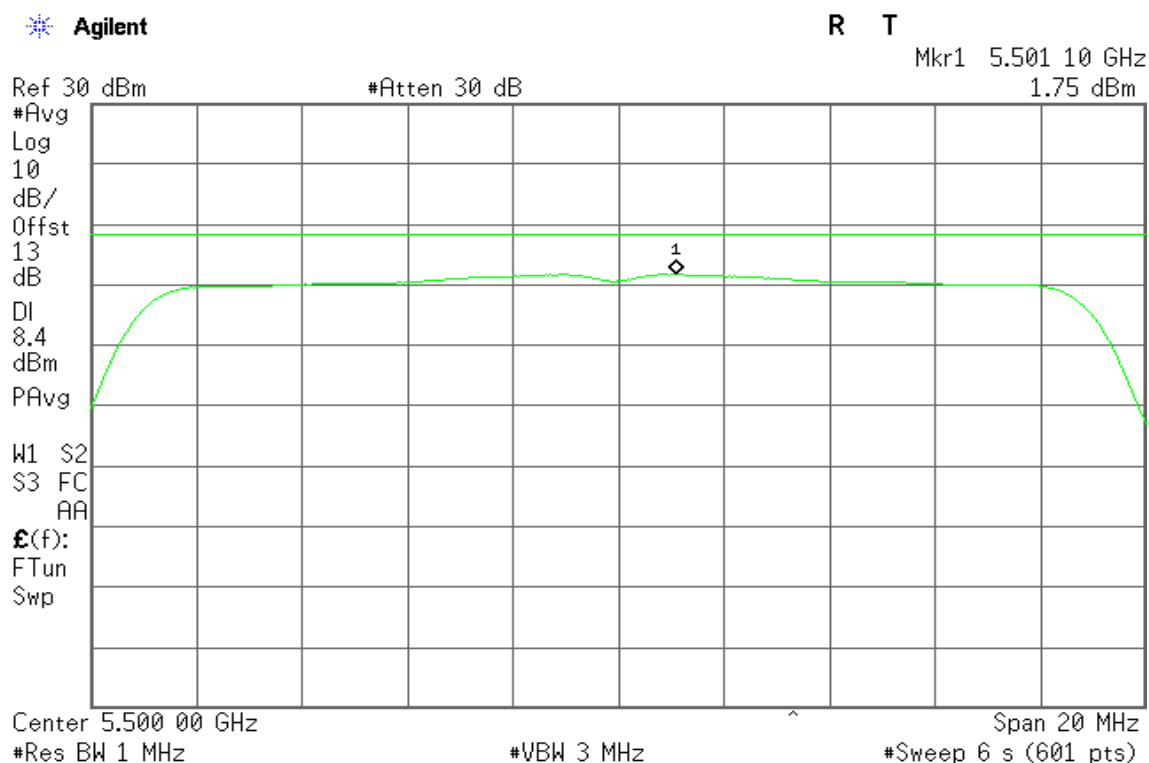
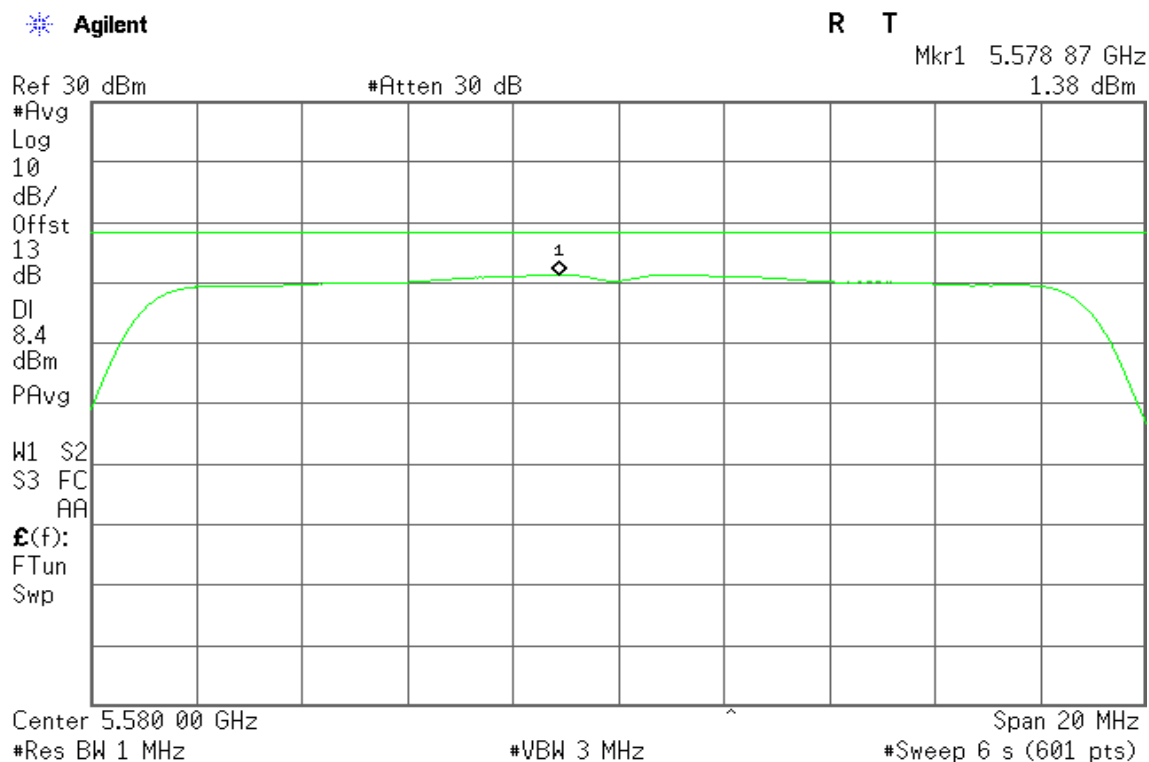
R T

Mkr1 5.719 00 GHz
2.02 dBm



5720 MHz (Band IV)



IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 0**5500 MHz****5580 MHz**

5700 MHz

Agilent

R T

Mkr1 5.701 03 GHz
1.55 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

£(f):

FTun

Swp

Center 5.700 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5720 MHz (Band III)

Agilent

R T

Mkr1 5.725 43 GHz
2.18 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.720 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5720 MHz (Band IV)

Agilent

R T

Mkr1 5.725 067 GHz
-2.48 dBm

Ref 21 dBm

Atten 20 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

17.0

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

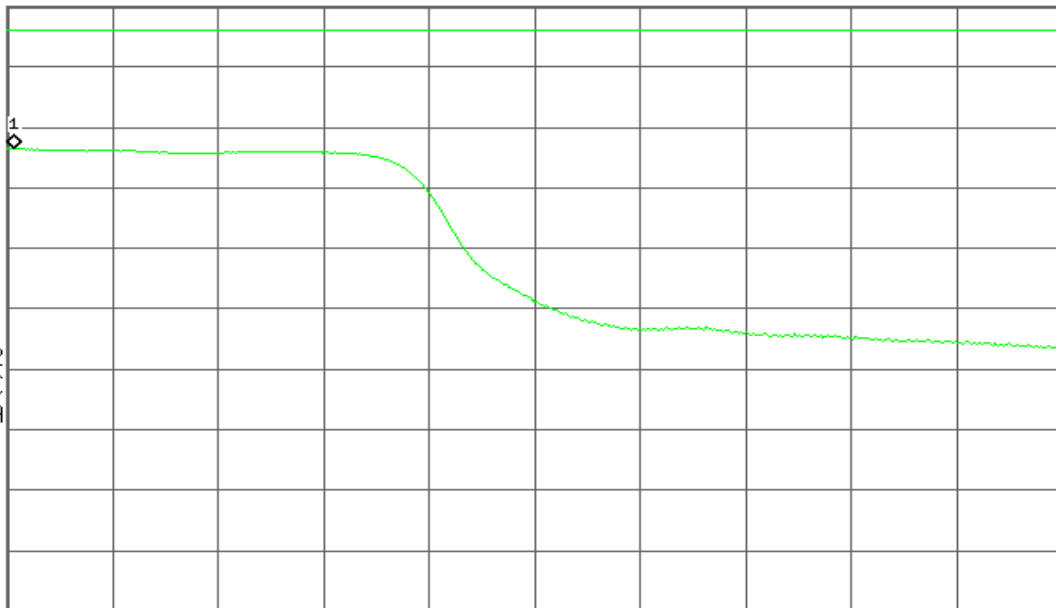
Start 5.725 000 GHz

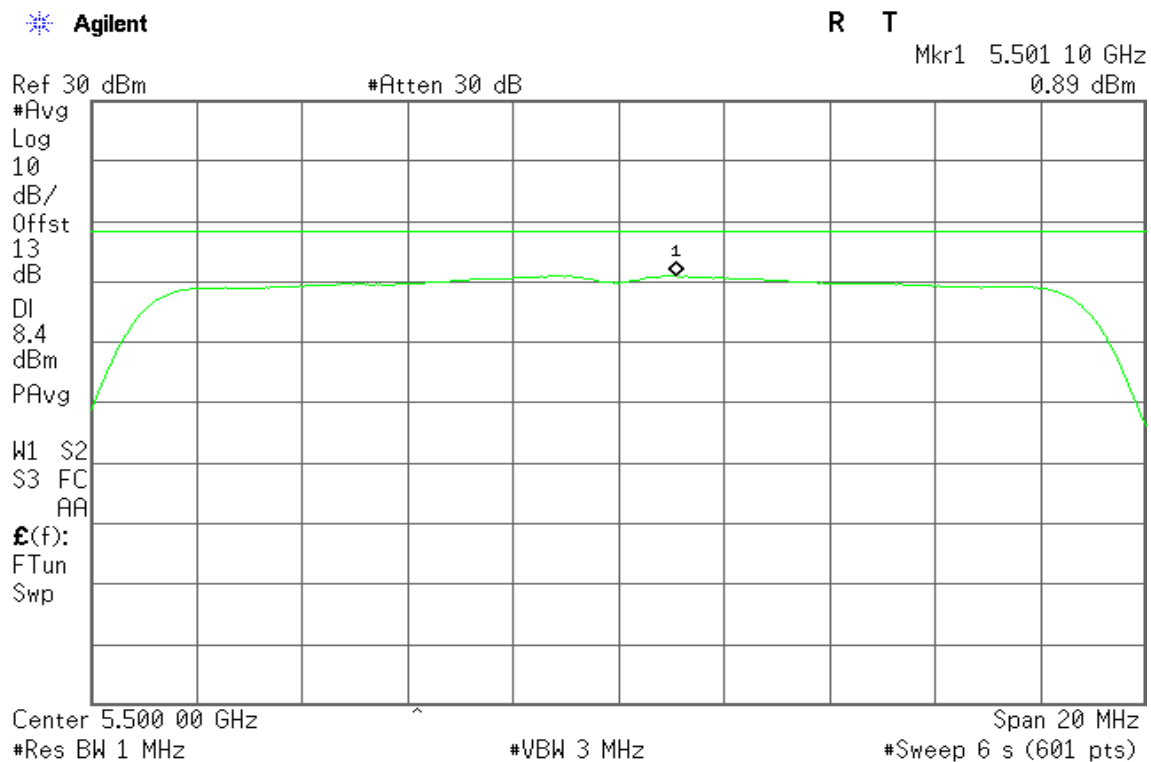
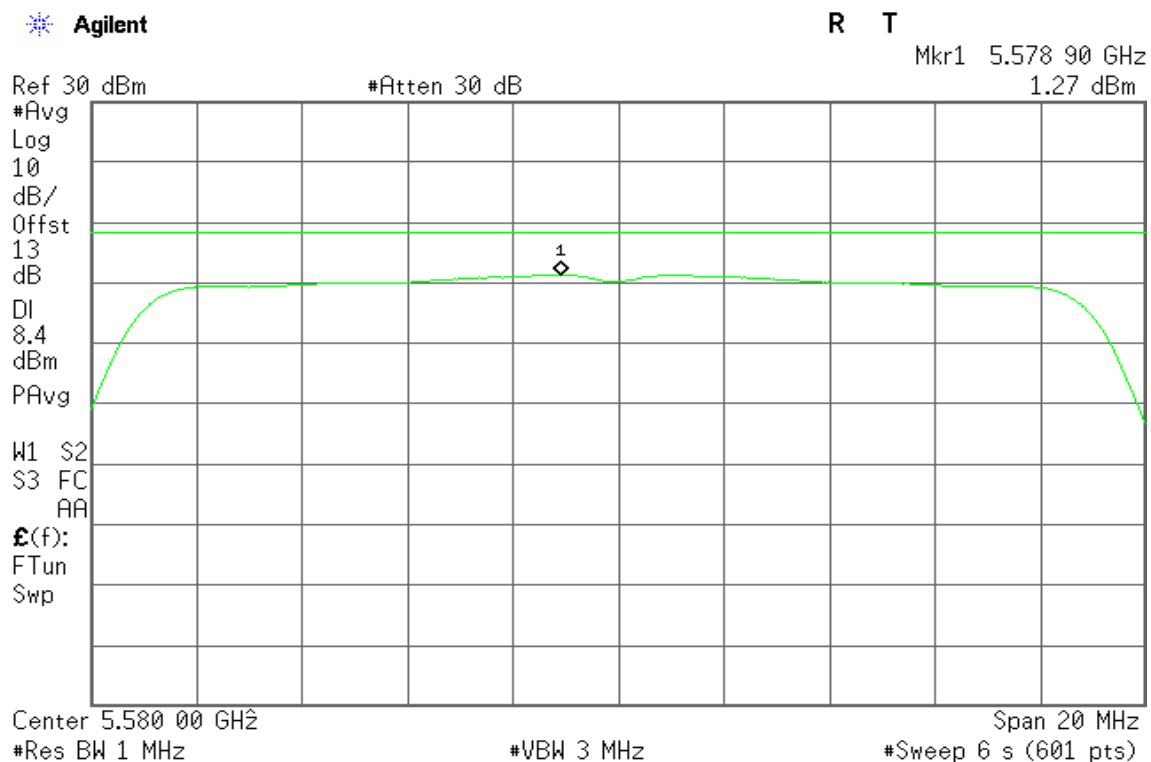
#Res BW 510 kHz

#VBW 1.6 MHz

Stop 5.735 000 GHz

#Sweep 6 s (601 pts)



IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5720MHz / Chain 1**5500 MHz****5580 MHz**

5700 MHz

Agilent

R T

Mkr1 5.698 93 GHz
1.07 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

£(f):

FTun

Swp

Center 5.700 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5720 MHz (Band III)

Agilent

R T

Mkr1 5.725 40 GHz
2.32 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.720 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 20 MHz

#Sweep 6 s (601 pts)

5720 MHz (Band IV)

Agilent

R T

Mkr1 5.725 033 GHz
-2.55 dBm

Ref 21 dBm

Atten 20 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

17.0

dBm

PAvg

W1 S2

S3 FC

AA

E(f):

FTun

Swp

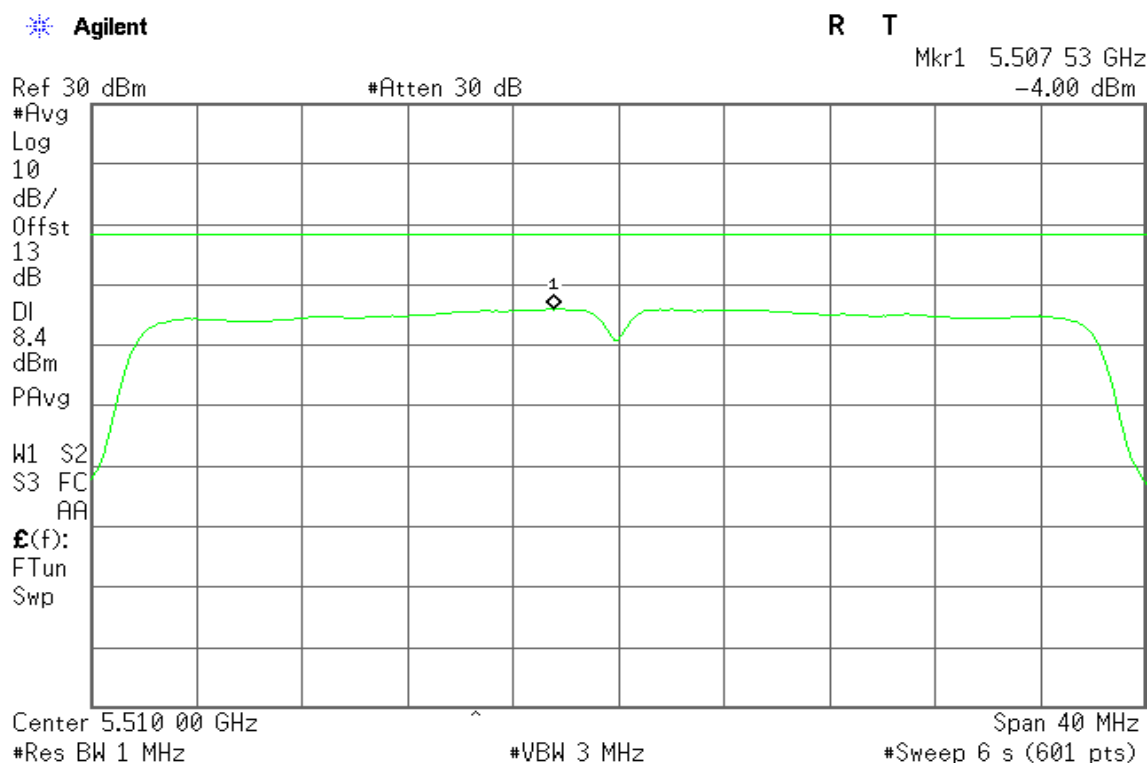
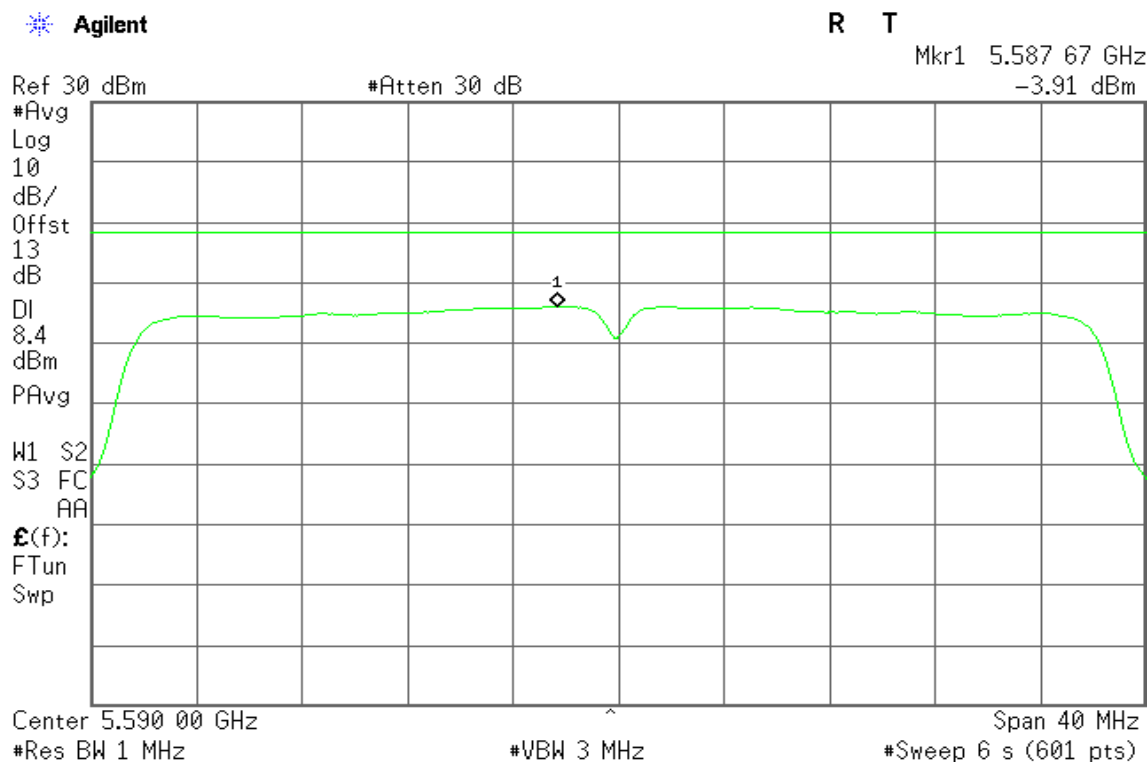
Start 5.725 000 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Stop 5.735 000 GHz

#Sweep 6 s (601 pts)

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 0**5510 MHz****5590 MHz**

5670 MHz

Agilent

R T

Mkr1 5.667 60 GHz
-4.46 dBm

Ref 30 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FC

AA

£(f):

FTun

Swp

Center 5.670 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz

#Sweep 6 s (601 pts)

5710 MHz (Band III)

Agilent

R T

Mkr1 5.724 60 GHz
-1.87 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

8.4

dBm

PAvg

W1 S2

S3 FS

AA

£(f):

FTun

Swp

Center 5.710 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz

#Sweep 6 s (601 pts)

5710 MHz (Band IV)

Agilent

R T

Mkr1 5.727 48 GHz
-14.34 dBm

Ref 31.2 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

11.2

dB

DI

30.0

dBm

PAvg

M1 S2

S3 FS

AA

E(f):

FTun

Swp

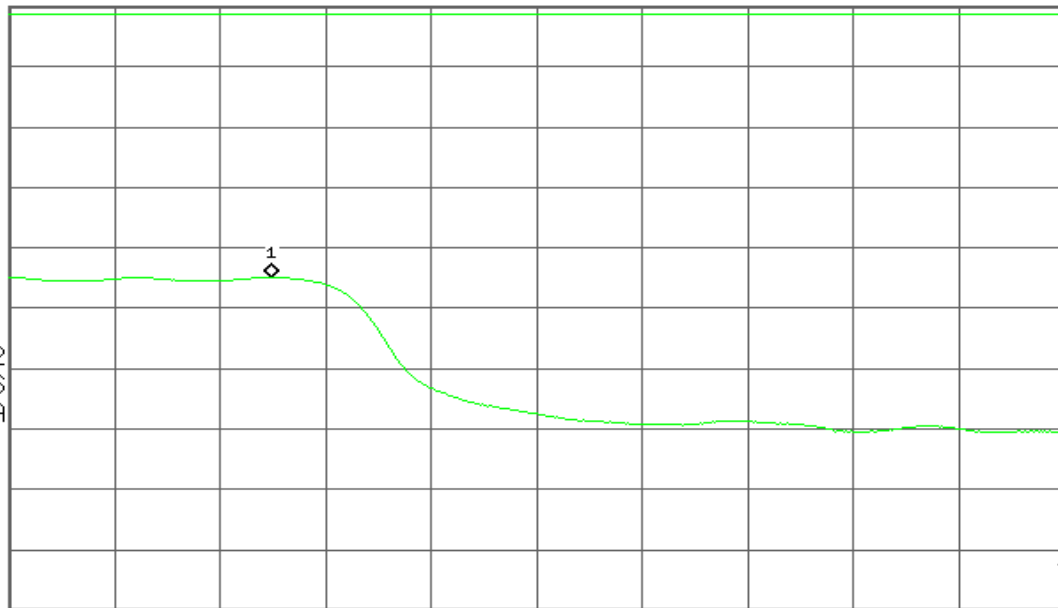
Start 5.725 00 GHz

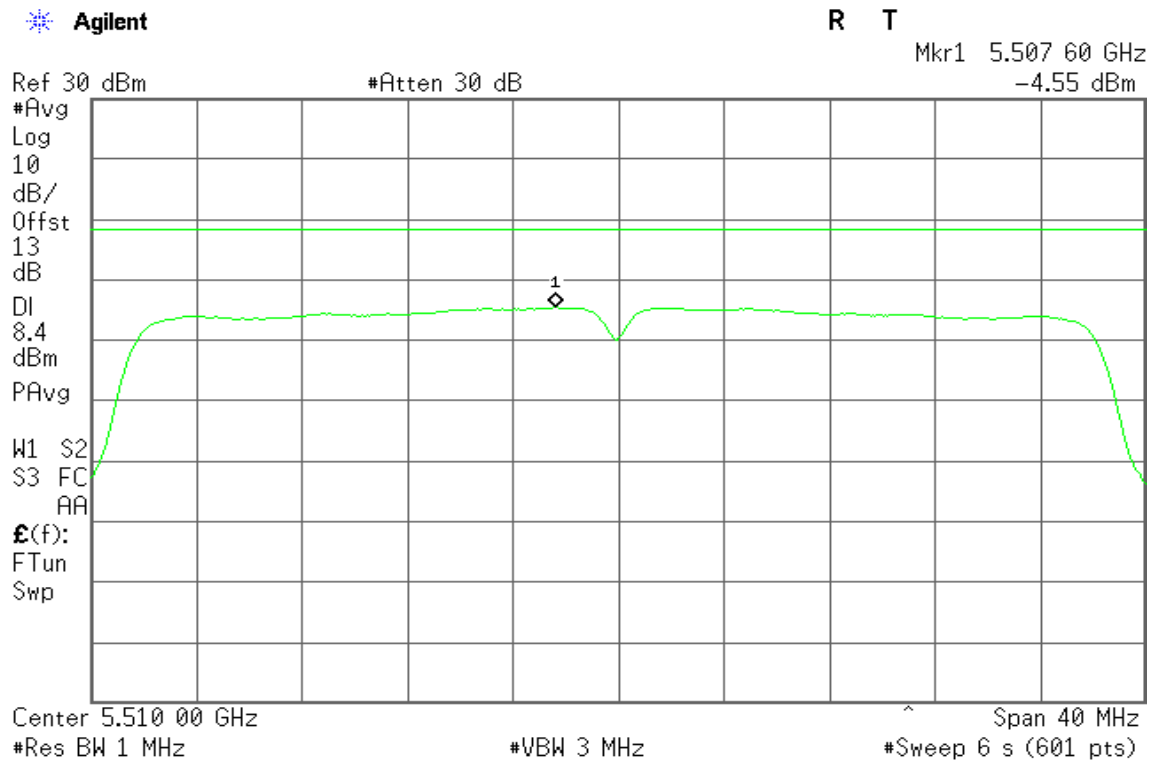
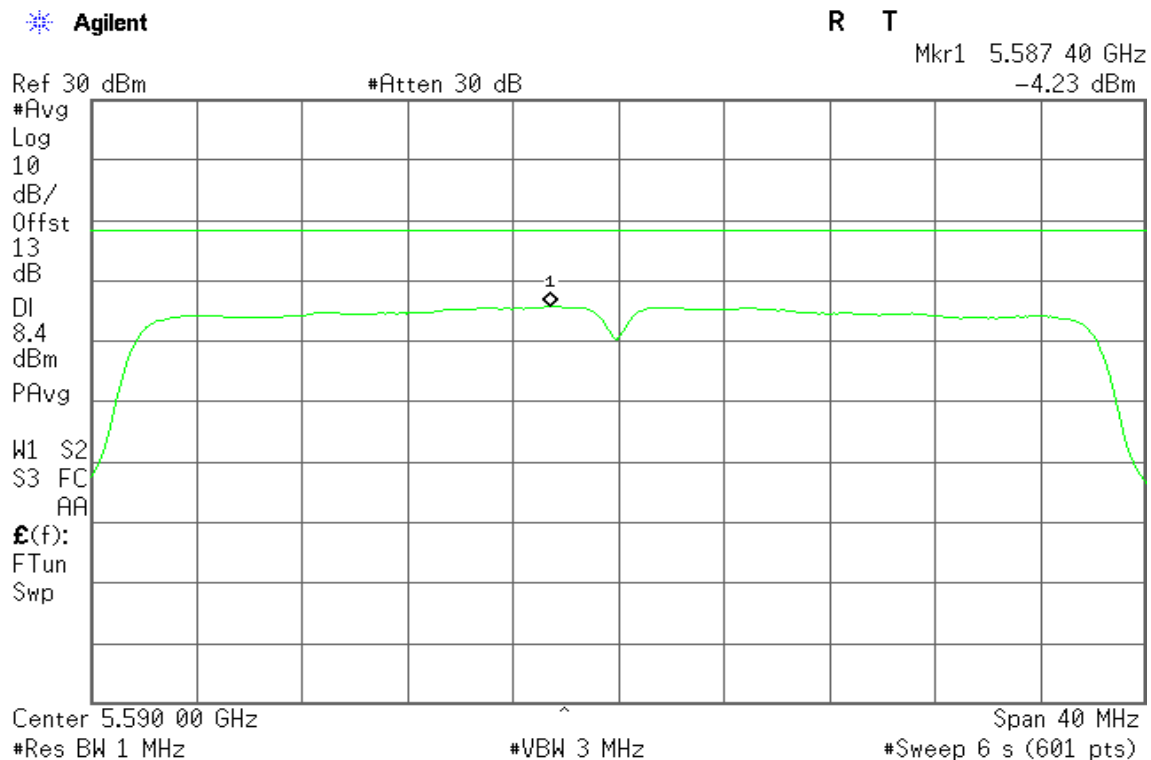
#Res BW 510 kHz

#VBW 1.6 MHz

Stop 5.735 00 GHz

#Sweep 6 s (601 pts)

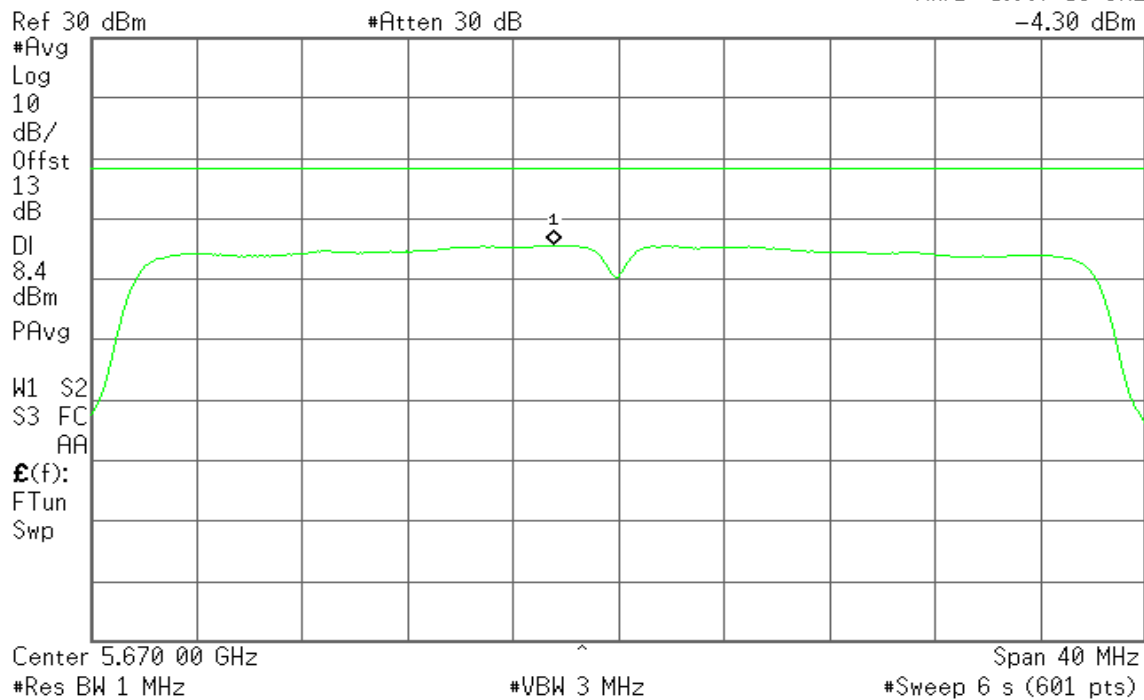


IEEE 802.11n HT 40 MHz mode / 5510 ~ 5710MHz / Chain 1**5510 MHz****5590 MHz**

5670 MHz

Agilent

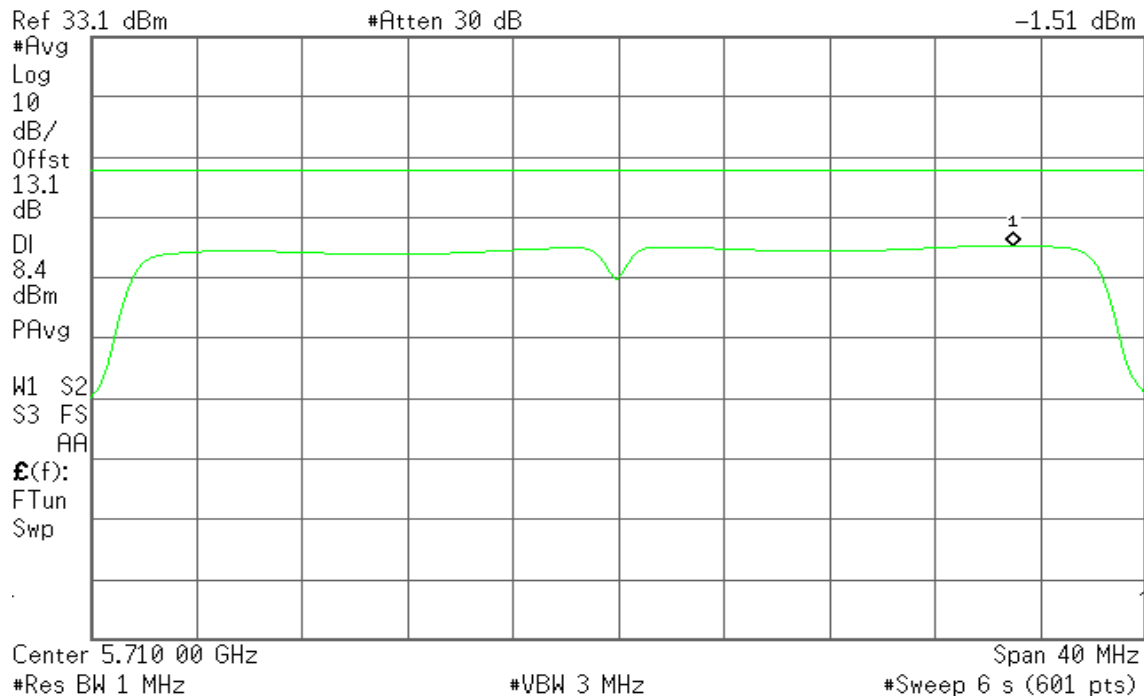
R T

Mkr1 5.667 53 GHz
-4.30 dBm

5710 MHz (Band III)

Agilent

R T

Mkr1 5.724 93 GHz
-1.51 dBm

5710 MHz (Band IV)

Agilent

R T

Mkr1 5.727 48 GHz
-13.64 dBm

Ref 31.2 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

11.2

dB

DI

30.0

dBm

PAvg

M1 S2

S3 FS

AA

E(f):

FTun

Swp

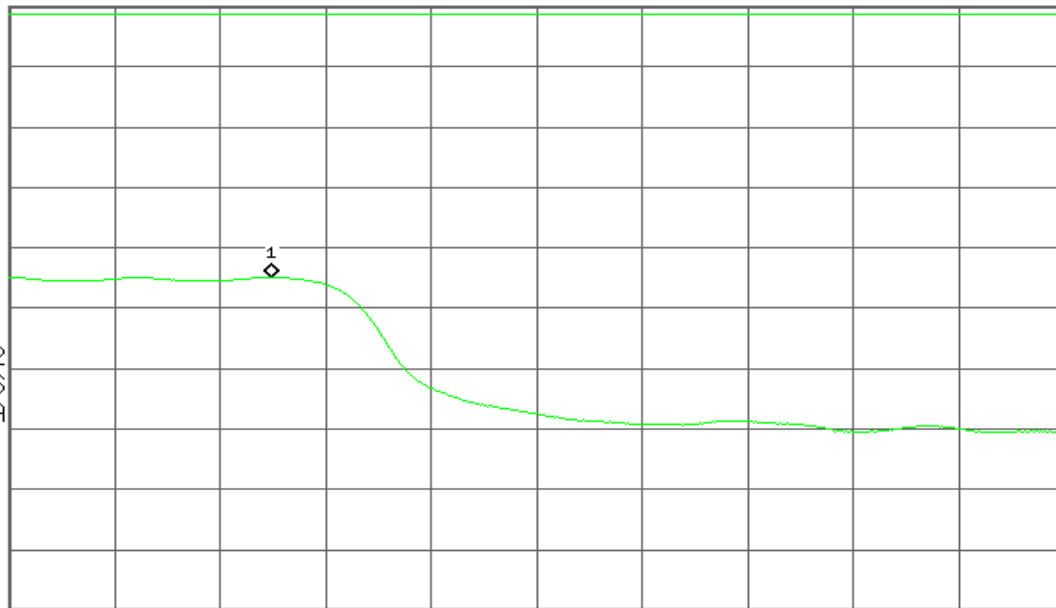
Start 5.725 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Stop 5.735 00 GHz

#Sweep 6 s (601 pts)



IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 0**5530 MHz**

* Agilent

R T

Mkr1 5.522 40 GHz
-5.30 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

11.0

dBm

#PAvg

M1 S2

S3 FS

AA

E(f):

FTun

Swp

Center 5.530 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 80 MHz

#Sweep 6 s (601 pts)

5610 MHz

* Agilent

R T

Mkr1 5.682 80 GHz
-1.35 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

11.0

dBm

#PAvg

M1 S2

S3 FS

AA

E(f):

FTun

Swp

Center 5.610 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 80 MHz

#Sweep 6 s (601 pts)

5690 MHz (Band III)

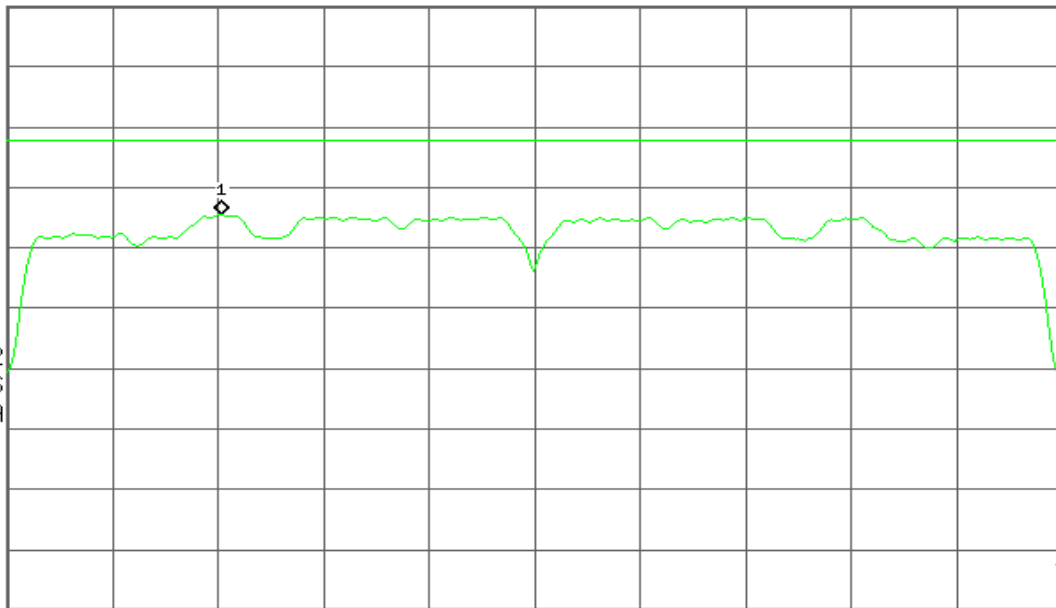
Agilent

R T

Mkr1 5.666 27 GHz
-1.43 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg
Log
10
dB/
Offst
13.1
dB
DI
8.4
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp

Center 5.690 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 80 MHz

#Sweep 6 s (601 pts)

5690 MHz (Band IV)

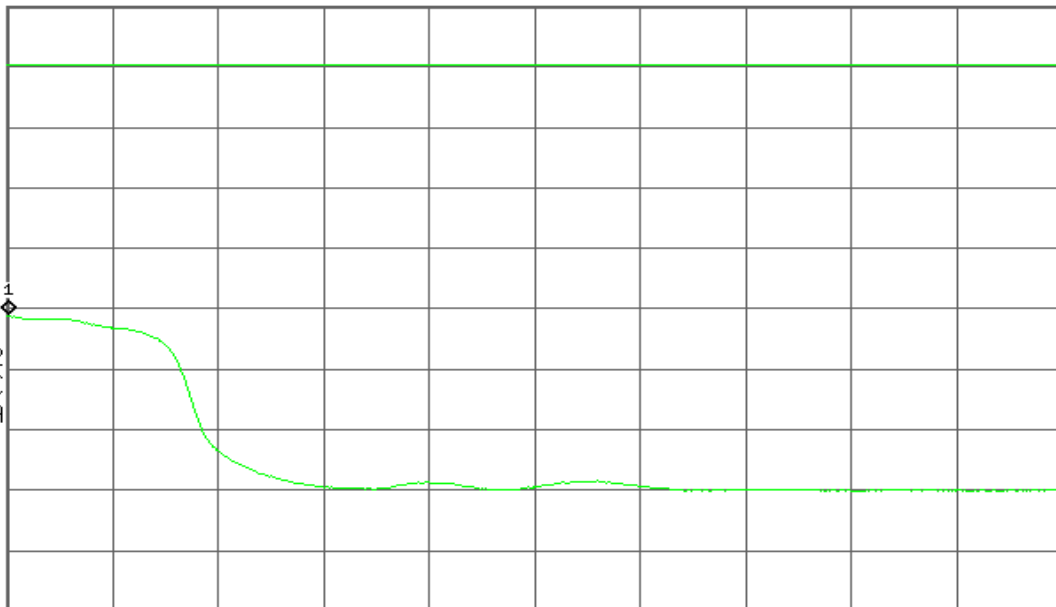
Agilent

R T

Mkr1 5.725 03 GHz
-13.90 dBm

Ref 37 dBm

Atten 40 dB

#Avg
Log
10
dB/
Offst
13
dB
DI
27.5
dBm
PAvg
W1 S2
S3 FC
AA
£(f):
FTun
Swp

Start 5.725 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

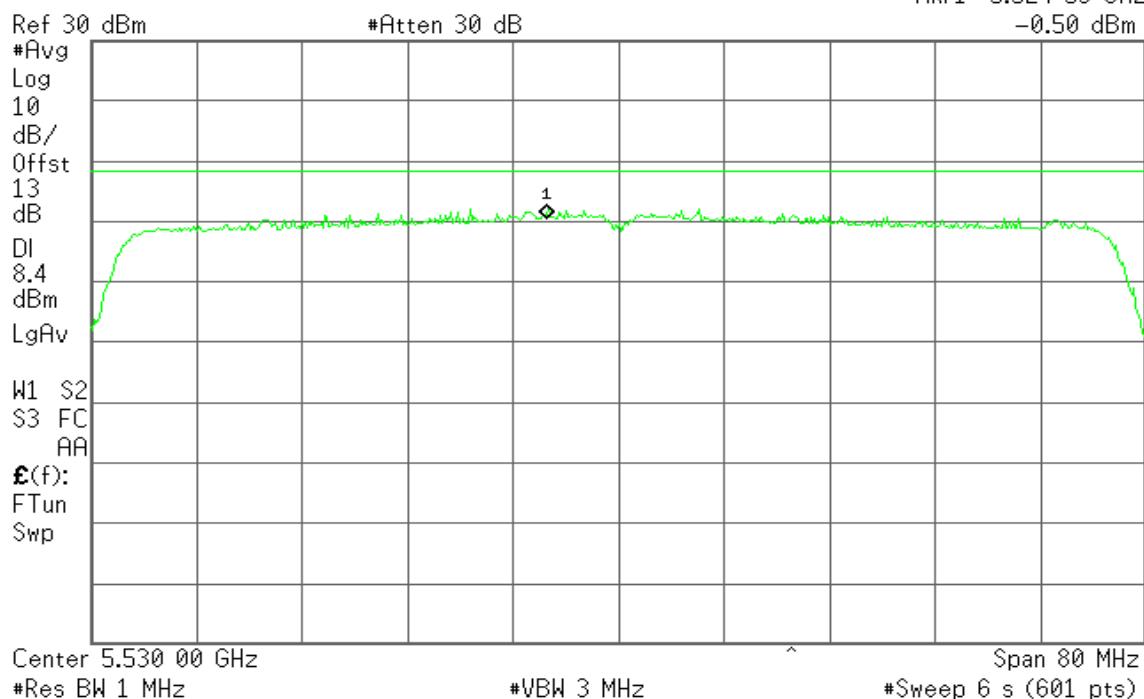
Stop 5.745 00 GHz

#Sweep 6 s (601 pts)

IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 1**5530 MHz**

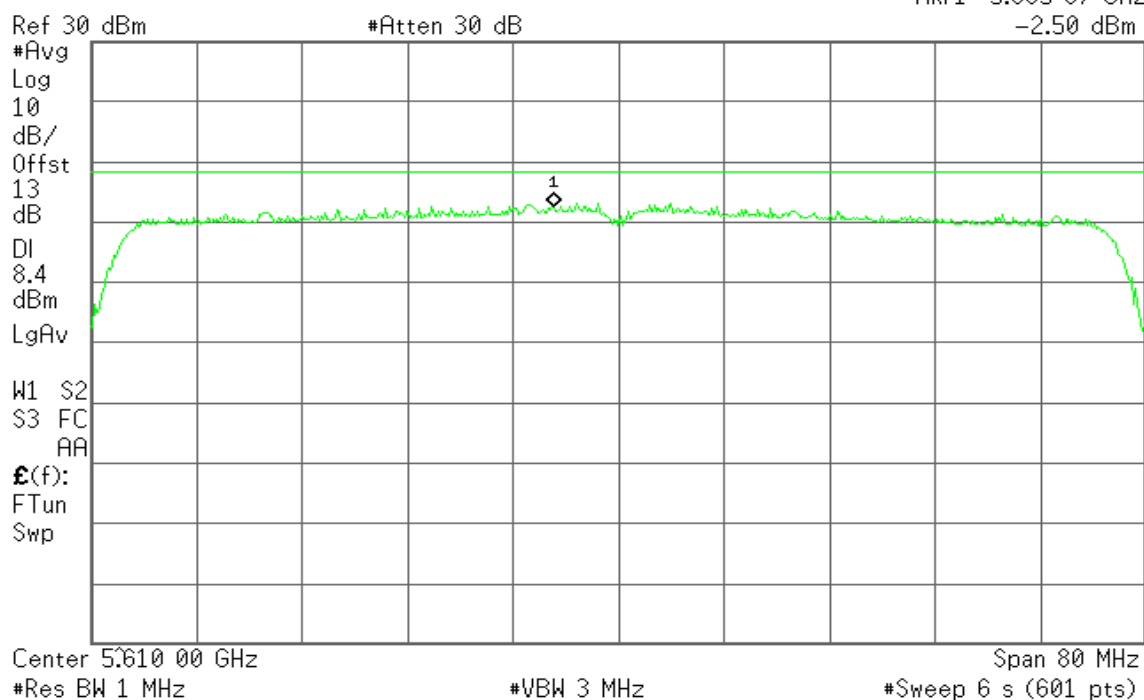
Agilent

R T

Mkr1 5.524 53 GHz
-0.50 dBm**5610 MHz**

Agilent

R T

Mkr1 5.605 07 GHz
-2.50 dBm

5690 MHz (Band III)

Agilent

R T

Mkr1 5.666 00 GHz
-2.93 dBm

Ref 33.1 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

8.4

dBm

#PAvg

W1 S2

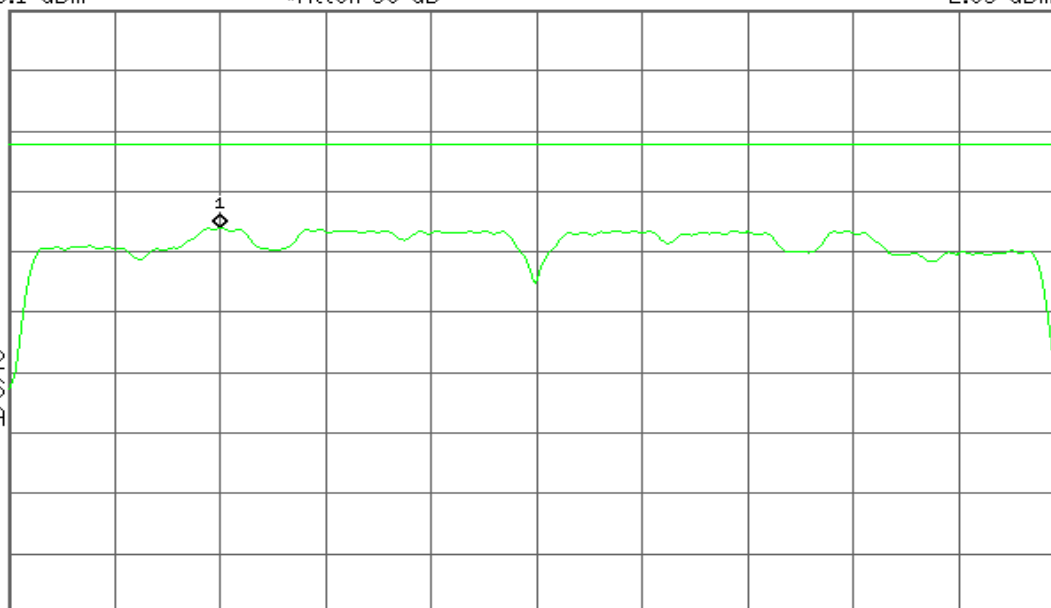
S3 FS

AA

£(f):

FTun

Swp



Center 5.690 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 80 MHz

#Sweep 6 s (601 pts)

5690 MHz (Band IV)

Agilent

R T

Mkr1 5.725 00 GHz
-17.68 dBm

Ref 37 dBm

Atten 40 dB

#Avg

Log

10

dB/

Offst

13

dB

DI

27.5

dBm

PAvg

W1 S2

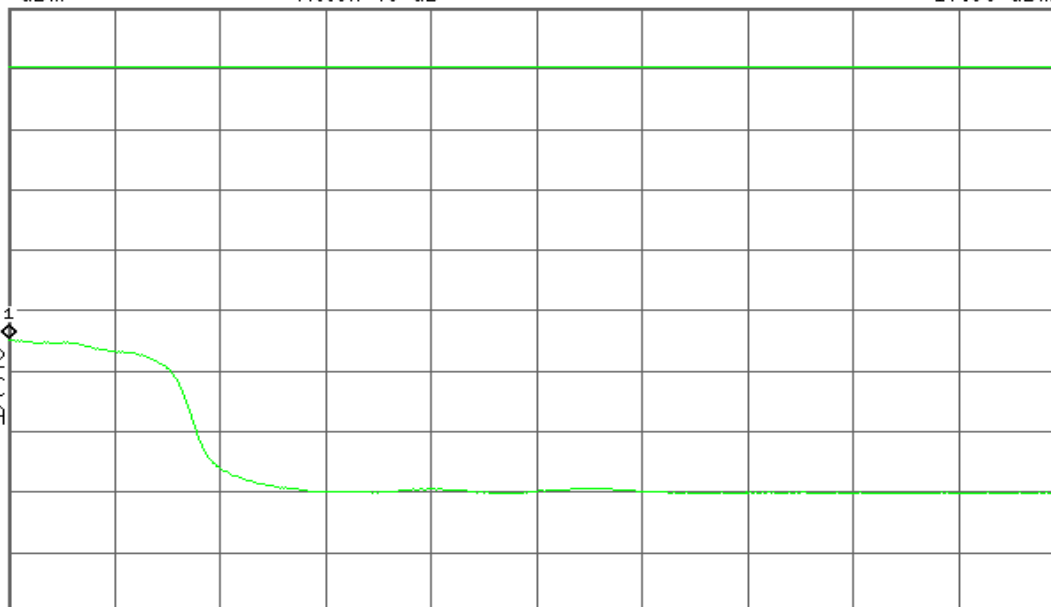
S3 FC

AA

£(f):

FTun

Swp



Start 5.725 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

Stop 5.745 00 GHz

#Sweep 6 s (601 pts)