Nemko Korea Co., Ltd.

155 & 159, Osan-Ro, Mohyeon-Eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 KOREA, REPUBLIC OF
TEL:+82 31 330-1700 FAX:+82 31 322 2332

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant :
Harman International Industries, Inc.
8500 Balboa Blvd, Northridge, CA,
91329, USA
Attn. : Nicholas Clarke

Dates of Issue : Sep 20, 2019
Test Report No. : NK-19-R-169
Test Site : Nemko Korea Co., Ltd.

FCC ID	**APILUXASTR01**
Brand Name	**HARMAN**
Contact Person	**Harman International Industries, Inc.** **8500 Balboa Blvd, Northridge, CA,** **91329, USA** **Nicholas Clarke** **Telephone No. : +44 1223 203270**

Applied Standard:	FCC 47 CFR Part 15.407
Classification:	Unlicensed National Information Infrastructure (NII)
EUT Type:	WiFi Platform Module

The device bearing the brand name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Sep. 20. 2019

Tested By : Wonjae Song
Engineer

Sep. 20. 2019

Reviewed By : Seungyong Shin
Technical Manager

TABLE OF CONTENTS

1. SCOPE

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 15.

Responsible Party :	Harman International Industries, Inc. 8500 Balboa Blvd, Northidge, CA, 91329, USA
Contact Person :	Nicholas Clarke
Manufacturer :	Anam Electronics Co., Ltd. 27, Digital-ro 27ga-gil, Guro-gu, Seoul, 08375, Republic of Korea

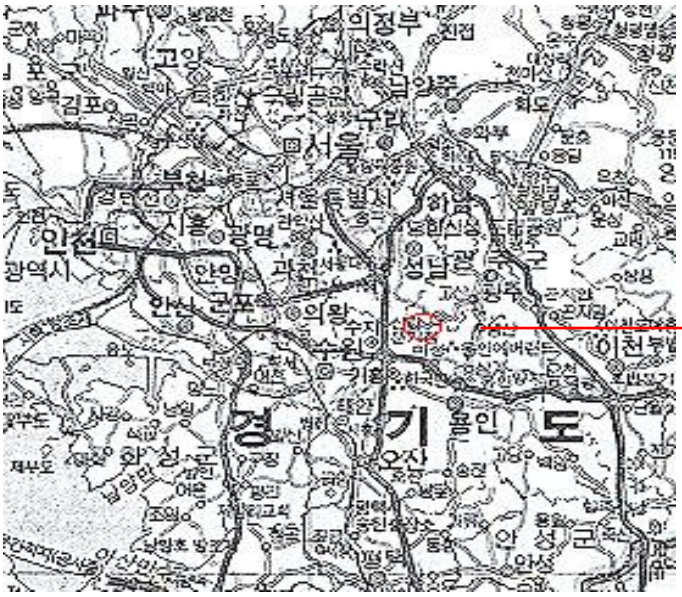
- FCC ID: APILUXASTR01
- Model: LUXASTR01
- Variant Model: -
- Brand Name: HARMAN
- EUT Type: WiFi Platform Module
- Classification: Unlicensed National Information Infrastructure (NII)
- Applied Standard: FCC 47 CFR Part 15.407
- Test Procedure(s): 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E”.
- Dates of Test: Aug 8, 2019 ~ Sep 3, 2019
- Place of Tests: Nemko Korea Co., Ltd.

2. INTRODUCTION

2.1 Test facility

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2014), the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013) was used in determining radiated and conducted emissions emanating from **Harman International Industries, Inc. FCC ID : APILUXASTR01** and **IC : 6132A-LUXASTR01.**

These measurement tests were conducted at ***Nemko Korea Co., Ltd. EMC Laboratory*** .
The site address 155 & 159, Osan-Ro, Mohyeon- Eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 KOREA, REPULIC OF.
The area of Nemko Korea Corporation Ltd. EMC Test Site is located in a mountain area at 80 km (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 km (18miles) south-southeast from central Seoul.
It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures.
The detailed description of the measurement facility was found to be in compliance with the requirements of ANSI C63.4-2014 according to §2.948.



Nemko Korea Co., Ltd.
EMC Lab.
155 & 159, Osan-Ro, Mohyeon-Eup,
Cheoin-Gu, Yongin-Si, Gyeonggi-Do
16885 KOREA, REPUBLIC OF
Tel)+82-31-330-1700
Fax)+82-31-322-2332

Fig. 1. The map above shows the Seoul in Korea vicinity area.
The map also shows Nemko Korea Corporation Ltd. EMC Lab. and Incheon Airport.

2.2 Accreditation and listing

Accreditation type		Accreditation number
	CAB Accreditation for DOC	Designation No. KR0026
	KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)	Registration No. 155
Industry Canada	Canada IC Registered site	Site No. 2040E
	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
	EMC CBTL	-
	KCC(RRL)Designated Lab.	Registration No. KR0026

3. TEST CONDITIONS & EUT INFORMATION

3.1 Operation During Test

The EUT is the SISO, CDD, MIMO transceiver which is module supporting the 802.11a/b/g/n/ac mode (802.11a/b/g/n(20,40MHz)/ac(20,40,80MHz) : 1TX/1RX, 2TX/2RX).
The Laptop was used to control the EUT to transmit the wanted TX channel continuously (duty cycle< 98%) by the testing program (TeraTerm) supported by manufacturer.
The operating voltage of EUT was 5.0 Vdc supplied from jig board connected to USB port on Laptop PC.
The EUT was tested at the lowest, middle and the highest channels with the maximum output power in accordance with the manufacturer's specifications. The worst data were recorded in the report.

3.1.1 Table of test power setting

Frequency	Mode	Power setting Level (1TX)	Power setting Level (2TX)
5180 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5220 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5240 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5190 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5230 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5210 MHz	802.11ac (80 MHz)	Default	Default
5260 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5300 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default

Frequency	Mode	Power setting Level (1TX)	Power setting Level (2TX)
5320 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5270 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5310 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5290 MHz	802.11ac (80 MHz)	Default	Default
5500 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5600 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5700 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5510 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5590 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5670 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5530 MHz	802.11ac (80 MHz)	Default	Default
5610 MHz	802.11ac (80 MHz)	Default	Default
5745 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5785 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default

Frequency	Mode	Power setting Level (1TX)	Power setting Level (2TX)
5825 MHz	802.11a	Default	-
	802.11n (20 MHz)	Default	Default
	802.11ac (20 MHz)	Default	Default
5755 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5795 MHz	802.11n (40 MHz)	Default	Default
	802.11ac (40 MHz)	Default	Default
5775 MHz	802.11ac (80 MHz)	Default	Default

3.1.2 Table of test channels

Frequency band	Mode	Test Channel (CH)	Frequency (MHz)
U-NII-1	802.11a,n,ac (20MHz)	36	5180
		44	5220
		48	5240
	802.11n,ac (40MHz)	38	5190
		46	5230
	802.11ac (80MHz)	42	5210
U-NII-2A	802.11a,n,ac (20MHz)	52	5260
		60	5300
		64	5320
	802.11n,ac (40MHz)	54	5270
		62	5310
	802.11ac (80MHz)	58	5290
U-NII-2C	802.11a,n,ac (20MHz)	100	5500
		120	5600
		140	5700
	802.11n,ac (40MHz)	102	5510
		118	5590
		134	5670
	802.11ac (80MHz)	106	5530
		122	5610

Frequency band	Mode	Test Channel (CH)	Frequency (MHz)
U-NII-3	802.11a,n,ac (20MHz)	149	5745
		157	5785
		165	5825
	802.11n,ac (40MHz)	151	5755
		159	5795
	802.11ac (80MHz)	155	5775

3.1.3 Antenna information:

Frequency band	Mode	Data rate	Antenna TX mode	Support CDD	Support MIMO
5 GHz	802.11a	All	■ 1TX, □ 2TX	□ Yes, ■ No	□ Yes, ■ No
	802.11n (20 MHz)	MCS 0~7	■ 1TX, ■ 2TX	■ Yes, □ No	□ Yes, ■ No
		MCS 8~15	□ 1TX, ■ 2TX	□ Yes, ■ No	■ Yes, □ No
	802.11n (40 MHz)	MCS 0~7	■ 1TX, ■ 2TX	■ Yes, □ No	□ Yes, ■ No
		MCS 8~15	□ 1TX, ■ 2TX	□ Yes, ■ No	■ Yes, □ No
5 GHz	802.11ac (20 MHz)	MCS0NSS1~ MCS8NSS1	■ 1TX, ■ 2TX	■ Yes, □ No	□ Yes, ■ No
		MCS0NSS2~ MCS8NSS2	□ 1TX, ■ 2TX	□ Yes, ■ No	■ Yes, □ No
	802.11ac (40 MHz)	MCS0NSS1~ MCS9NSS1	■ 1TX, ■ 2TX	■ Yes, □ No	□ Yes, ■ No
		MCS0NSS2~ MCS9NSS2	□ 1TX, ■ 2TX	□ Yes, ■ No	■ Yes, □ No
	802.11ac (80 MHz)	MCS0NSS1~ MCS9NSS1	■ 1TX, ■ 2TX	■ Yes, □ No	□ Yes, ■ No
		MCS0NSS2~ MCS9NSS2	□ 1TX, ■ 2TX	□ Yes, ■ No	■ Yes, □ No

Note :

1. CDD mode is Cyclic Delay Diversity mode.
2. For 802.11n(20 MHz),EUT support CDD mode for MCS0~7 and MIMO mode for MCS8~15.
3. For 802.11n(40 MHz),EUT support CDD mode for MCS0~7 and MIMO mode for MCS8~15.
4. For 802.11ac(20 MHz),EUT support CDD mode for MCS0NSS1~MCS8NSS1 and MIMO mode for MCS0NSS2~MCS8NSS2.
5. For 802.11ac(40 MHz),EUT support CDD mode for MCS0NSS1~MCS9NSS1 and MIMO mode for MCS0NSS2~MCS9NSS2.
6. For 802.11ac(80 MHz),EUT support CDD mode for MCS0NSS1~MCS9NSS1 and MIMO mode for MCS0NSS2~MCS9NSS2.
7. CDD mode, N_{SS}=1, MIMO mode, N_{SS}= 2, where N_{SS} = number of spatial streams.
8. MIMO mode means SM-MIMO transmission.

3.1.4 Additional Information Related to Testing

The cable and attenuator loss from 30MHz to 26.5GHz was reflected in spectrum analyzer with correction factor for all conducted testing.

3.1.5 Table of test modes

Test Items	Mode	*Data rate (Mbps)	Test Channel (CH)	Antenna
Conducted Emissions	802.11ac (40 MHz)	MCS0NSS1	38	Ant 1
Radiated Emissions	802.11ac (40 MHz)	MCS0NSS1	38	Ant 1
26 dB Bandwidth	802.11a	6	36/44/48 52/60/64 100/120/140 149/157/165	Ant 1
	802.11n (20 MHz)	MCS0		Ant 1
	802.11ac (20 MHz)	MCS0NSS1		Ant 1
	802.11n (40 MHz)	MCS0	38/46 54/62 102/118/134 151/159	Ant 1
	802.11ac (40 MHz)	MCS0NSS1		Ant 1
	802.11ac (80 MHz)	MCS0NSS1	42/58/106 122/155	Ant 1
6 dB Bandwidth	802.11a	6	149 157/165	Ant 1
	802.11n (20 MHz)	MCS0		Ant 1

6 dB Bandwidth	802.11ac (20 MHz)	MCS0NSS1		Ant 1
	802.11n (40 MHz)	MCS0	151/159	Ant 1
	802.11ac (40 MHz)	MCS0NSS1		Ant 1
	802.11ac (80 MHz)	MCS0NSS1	155	Ant 1
Maximum conducted Output Power	802.11a	6	36/44/48 52/60/64 100/120/140 149/157/165	Ant 0, Ant 1
	802.11n (20 MHz)	MCS0		Ant 0, Ant 1
	802.11ac (20 MHz)	MCS0NSS1		Ant 0, Ant 1
	802.11n (40 MHz)	MCS0	38/46 54/62 102/118/134 151/159	Ant 0, Ant 1
	802.11ac (40 MHz)	MCS0NSS1		Ant 0, Ant 1
	802.11ac (80 MHz)	MCS0NSS1	42/58/106 122/155	Ant 0, Ant 1
Power Spectral Density	802.11a	6	36/44/48 52/60/64 100/120/140 149/157/165	Ant 1
	802.11n (20 MHz)	MCS0		Ant 1
	802.11ac (20 MHz)	MCS0NSS1		Ant 1
	802.11n (40 MHz)	MCS0	38/46 54/62 102/118/134 151/159	Ant 1
	802.11ac (40 MHz)	MCS0NSS1		Ant 1
	802.11ac (80 MHz)	MCS0NSS1	42/58/106 122/155	Ant 1
Radiated Spurious Emission	802.11ac (20 MHz)	MCS0NSS1	36/44/48 52/60/64 100/120/140 149/157/165	Ant 1
Radiated Band edge Emission	802.11ac (20 MHz)	MCS0NSS1	36/48 52/64 100/140 149/165	Ant 1

Radiated Band edge Emission	802.11ac (40 MHz)	MCS0NSS1	38/46 54/62 102/134 151/159	Ant 1
	802.11ac (80 MHz)	MCS0NSS1	42/58/106 122/155	Ant 1

Note :

*1. *The worst data rate was determined by the conducted output power that generates the highest emission performing pre-scan testing in all data rates of each mode.*

3.1.6 Table of actual operating channels

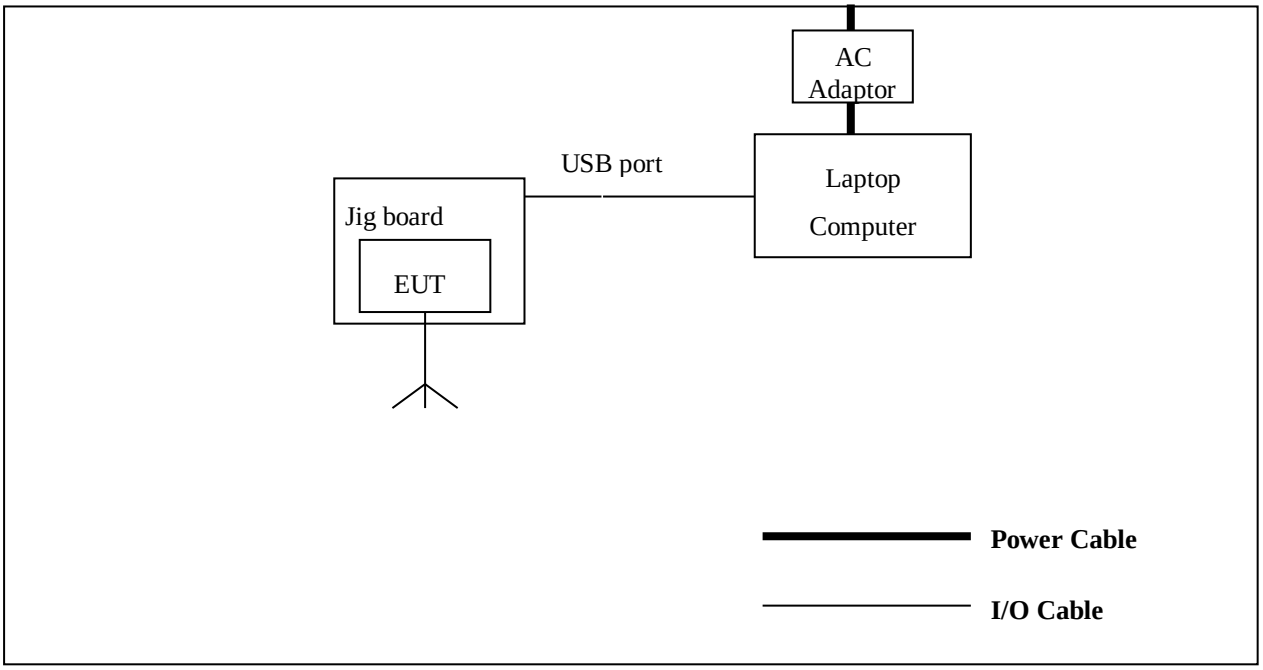
Frequency band	Bandwidth	channel	Frequency (MHz)
UNII-1	20MHz	36	5180
		40	5200
		44	5220
		48	5240
	40MHz	38	5190
		46	5230
	80MHz	42	5210
U-NII-2A	20MHz	52	5260
		56	5280
		60	5300
		64	5320
	40MHz	54	5270
		62	5310
	80MHz	58	5290
U-NII-2C	20MHz	100	5500
		104	5520
		108	5540
		112	5560
		116	5580
		120	5600
		124	5620

U-NII-2C	20MHz	128	5640
		132	5660
		136	5680
		140	5700
	40MHz	102	5510
		110	5550
		118	5590
		126	5630
		134	5670
	80MHz	106	5530
		122	5610
UNII-3	20MHz	149	5745
		153	5765
		157	5785
		161	5805
		165	5825
	40MHz	151	5755
		159	5795
	80MHz	155	5775

3.2 Support Equipment

EUT	Harman International Industries, Inc. Model : LUXASTR01	S/N: N/A
Laptop Computer	HP Model : G62-355TU	FCC DOC S/N : CNF0489WDT
AC/DC Adapter	HP Model : PPP009D 1.5 m unshielded power cable	FCC DOC S/N : WBGSV0ACXZH162

3.3 Setup Drawing



3.4 EUT Information

The EUT is the **Harman International Industries, Inc. WiFi Platform Module FCC ID: APILUXASTR01, IC: 6132A-LUXASTR01.**

Specifications:

EUT Type	WiFi Platform Module
Model Name	LUXASTR01
Variant Model Name	-
Brand Name	HARMAN
Frequency of Operation	For U-NII-1 Band 802.11a,n,ac(20 MHz): 5180 MHz ~ 5240 MHz 802.11n,ac(40 MHz): 5190 MHz ~ 5230 MHz 802.11ac(80 MHz): 5210 MHz For U-NII-2A Band 802.11a,n,ac(20 MHz): 5260 MHz ~ 5320 MHz 802.11n,ac(40 MHz): 5270 MHz ~ 5310 MHz 802.11ac(80 MHz): 5290 MHz For U-NII-2C Band 802.11a,n,ac(20 MHz): 5500 MHz ~ 5700 MHz 802.11n,ac(40 MHz): 5510 MHz ~ 5670 MHz 802.11ac(80 MHz): 5530 MHz For U-NII-3 Band 802.11a,n,ac(20 MHz): 5745 MHz ~ 5825 MHz 802.11n,ac(40 MHz): 5755 MHz ~ 5795 MHz 802.11ac(80 MHz): 5775 MHz
Maximum Conducted Output Power	For U-NII-1 Band 802.11a : 7.77 dBm 802.11n(20 MHz) : 10.91 dBm 802.11n(40 MHz) : 13.54 dBm 802.11ac(20 MHz) : 10.83 dBm 802.11ac(40 MHz) : 13.53 dBm 802.11ac(80 MHz) : 10.72 dBm For U-NII-2A Band 802.11a : 14.96 dBm 802.11n(20 MHz) : 17.75 dBm 802.11n(40 MHz) : 16.80 dBm 802.11ac(20 MHz) : 17.85 dBm 802.11ac(40 MHz) : 16.82 dBm 802.11ac(80 MHz) : 11.96 dBm For U-NII-2C Band 802.11a : 11.98 dBm 802.11n(20 MHz) : 14.90 dBm 802.11n(40 MHz) : 16.79 dBm 802.11ac(20 MHz) : 14.80 dBm 802.11ac(40 MHz) : 16.79 dBm 802.11ac(80 MHz) : 14.73 dBm

	For U-NII-3 Band 802.11a : 11.08 dBm 802.11n(20 MHz) : 14.08 dBm 802.11n(40 MHz) : 16.57 dBm 802.11ac(20 MHz) : 14.14 dBm 802.11ac(40 MHz) : 16.55 dBm 802.11ac(80 MHz) : 13.87 dBm
FCC Classification	Unlicensed National Information Infrastructure (NII)
Number of Channels	For U-NII-1 Band 802.11a,n,ac(20 MHz): 4ch 802.11n,ac(40 MHz): 2ch 802.11ac(80 MHz): 1ch For U-NII-2A Band 802.11a,n,ac(20 MHz): 4ch 802.11n,ac(40 MHz): 2ch 802.11ac(80 MHz): 1ch For U-NII-2C Band 802.11a,n,ac(20 MHz): 11ch 802.11n,ac(40 MHz): 5ch 802.11ac(80 MHz): 2ch For U-NII-3 Band 802.11a,n,ac(20 MHz): 5ch 802.11n,ac(40 MHz): 2ch 802.11ac(80 MHz): 1ch
Modulations	OFDM(BPSK,QPSK,16QAM,64QAM, 256QAM) for 802.11a,n,ac
Antenna Gain (peak)	Ant : 2.79 dBi
Beamforming Gain	802.11n/ac(20,40 MHz) : 3.01 dBi
Antenna Setup	802.11a/n(20,40MHz)/ac(20,40,80MHz) : 1TX / 1RX, 2TX / 2RX
Voltage	5 Vdc
Temperature Range	-10 ℃ ~ +70 ℃
Size (W x H x D)	About 69.6 mm x 50 mm x 4 mm
Weight	About 21 g
Remarks	-

4. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specification:

Name of Test	FCC Paragraph No.	Result	Remark
Conducted Emission	15.207	Complies	
Radiated Emission	15.209	Complies	
26 dB Spectrum Bandwidth and 99% Occupied bandwidth	15.407(a)	Complies	
6 dB Bandwidth	15.407(e)	Complies	
Maximum Conducted Output Power	15.407(a)	Complies	
Power Spectral Density	15.407(a)	Complies	
Radiated Spurious Emission	15.407(b)	Complies	
DFS	15.407(h)	Complies	
Maximum Permissible Exposure	1.1307(b)	Complies	

5. RECOMMENDATION/CONCLUSION

The data collected shows that the **Harman International Industries, Inc. WiFi Platform Module FCC ID: APILUXASTR01, IC: 6132A-LUXASTR01** is in compliance with Part 15.247 of the FCC Rule and RSS-247 Issue 2 of the IC Specification.

6. ANTENNA REQUIREMENTS

§15.203 of the FCC Rules part 15 Subpart C
: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The antenna of the **Harman International Industries, Inc. WiFi Platform Module FCC ID: APILUXASTR01, IC: 6132A-LUXASTR01** is **permanently attached** and there are no provisions for connection to an external antenna. It complies with the requirement of §15.203.

Directional gain was be calculated according to "**662911 D01 Multiple Transmitter Output v02r01**" and would be found at end of average output power and PSD results in this report.

Used Anetnna		
Model name	Max. gain (dBi)	
	2.4GHz	5GHz
CSA3A020Z	1.83	2.79

7. DESCRIPTION OF TESTS

7.1 Conducted Emissions

The Line conducted emission test facility is located inside a 4 x 7 x 2.5 meter shielded enclosure. It is manufactured by EM engineering. The shielding effectiveness of the shielded room is in accordance with MIL-STD-285 or NSA 65-6. A 1 m x 1.5 m wooden table 0.8 m height is placed 0.4 m away from the vertical wall and 1.5 m away from the side of wall of the shielded room. Rohde & Schwarz (ESH3-Z5) and (ESH2-Z5) of the 50 ohm/50 µH Line Impedance Stabilization Network (LISN) are bonded to the shielded room. The EUT is powered from the Rohde & Schwarz LISN (ESH3-Z5) and the support equipment is powered from the Rohde & Schwarz LISN (ESH2-Z5). Power to the LISNs are filtered by high-current high insertion loss Power line filters. The purpose of filter is to attenuate ambient signal interference and this filter is also bonded to shielded enclosure. All electrical cables are shielded by tinned copper zipper tubing with inner diameter of 1 / 2 ". If DC power device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the LISNs, All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentinefashion) to a 1 meter length. Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The spectrum was scanned from 150 kHz to 30 MHz with 200 msec sweep time. The frequency producing the maximum level was re-examined using the EMI test receiver. (Rohde & Schwarz ESCS30). The detector functions were set to CISPR quasi-peak mode & average mode. The bandwidth of receiver was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by; switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and of support equipment, and powering the monitor from the floor mounted outlet box and computer aux AC outlet, if applicable; whichever determined the worst case emission.
Each EME reported was calibrated using the R&S signal generator.

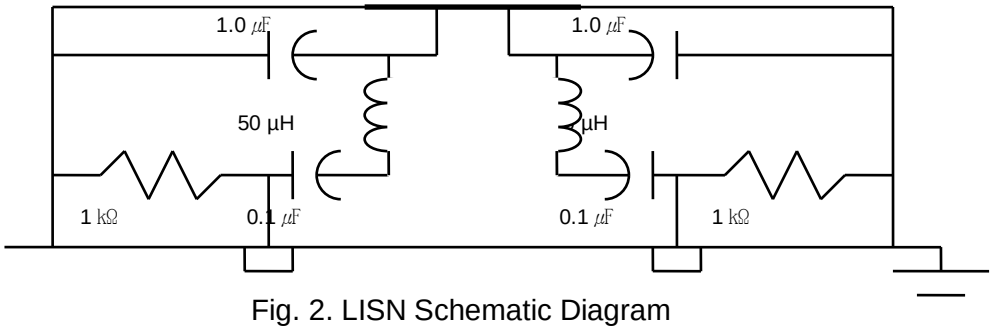


Fig. 2. LISN Schematic Diagram

7.2 Radiated Emissions

The measurement was performed at the test site that is specified in accordance with ANSI C63.10-2013.
The spurious emission was scanned from 9 kHz to 30 MHz using Loop Antenna(Rohde&Schwarz, HFH2-Z2) and 30 to 1000 MHz using Trilog broadband test antenna(Schwarzbeck, VULB 9163). Above 1 GHz, Horn antenna (Schwarzbeck BBHA 9120D: up to 18 GHz, Q-par Angus QSH20S20 : 18 to 26.5 GHz, Q-par Angus QSH22K20 : 26.5 to 40 GHz) was used.
For emissions testing at below 1GHz, The test equipment was placed on turntable with 0.8 m above ground. For emission measurements above 1 GHz, The test equipment was placed on turntable with 1.5 m above ground. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The EUT, cable, wire arrangement and mode of operation that has the highest amplitude relative to the limit was selected. Then, the turn table was rotated from 0˚ to 360˚ and an antenna mast was moved from 1 m to 4 m height to maximize the suspected highest amplitude signal. The final maximized level was recorded.

Unwanted emissions in the restricted bands

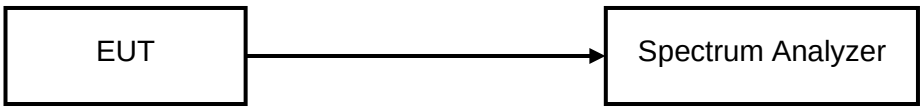
At frequencies below 1000 MHz, measurements performed using the CISPR quasi-peak detection.
At frequencies above 1000 MHz, measurements performed using the peak and average measurement procedures described in KDB “789033 D02 General UNII Test Procedures New Rules v02r01”in section G)5) and G)6). Peak emission levels was measured by setting the analyzer RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Trace mode = max hold. Average emission levels was measured using the “Method VB” by setting the analyzer RBW = 1 MHz, VBW = 10 kHz (VBW ≤ RBW/100), Detector = Peak , if the EUT is configured to transmit with duty cycle ≥ 98 percent. When the duty cycle ≤ 98 percent, VBW ≥ 1/T(T = minimum transmission duration over which the transmitter is on) was used, and allow max hold to run for at least 50 times (1/duty cycle) traces.

Unwanted emissions outside of the restricted bands

At frequencies below 1000 MHz, measurements performed using the CISPR quasi-peak detection.
At frequencies above 1000 MHz, measurements performed using the peak measurement procedures described in KDB “789033 D02 General UNII Test Procedures New Rules v02r01” in section G)5). Peak emission levels was measured by setting the analyzer RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Trace mode = max hold. If the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

7.3 26 dB Bandwidth and 99% Occupied bandwidth

Test Setup

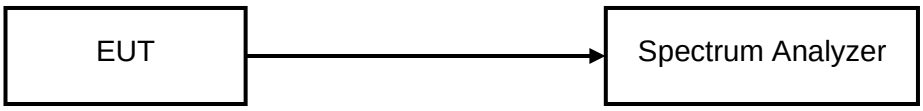


Test Procedure

EUTs 26 dB bandwidth is measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.
The spectrum analyzer setting is as follows.
RBW = approximately 1 % of the emission bandwidth
VBW ≥ 3 x RBW
Detector = Peak
Trace mode = max hold
Sweep = auto couple
The bandwidth measurement function on the spectrum analyzer is used to measure the 26 dB bandwidth and 99% occupied bandwidth.

7.4 6 dB Bandwidth

Test Setup

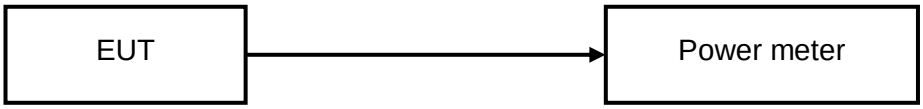


Test Procedure

EUTs 6 dB bandwidth is measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.
The spectrum analyzer setting is as follows.
RBW = 100 kHz
VBW > 3 x RBW
Detector = Peak
Trace mode = max hold
Sweep = auto couple
The bandwidth measurement function on the spectrum analyzer is used to measure the 6 dB bandwidth.

7.5 Maximum Conducted Output Power (average)

Test Setup

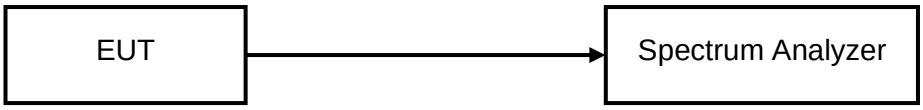


Test Procedure

EUTs Maximum Conducted Output Power (average) is measured at low, middle, high channels with a Power meter connected to the antenna terminal while the EUTs operating at its maximum power control level.
Add 10 log (1/x), where x is the duty cycle

7.6 Maximum Power Spectral Density (average)

Test Setup

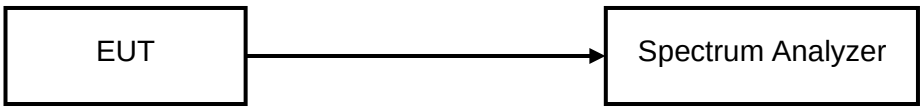


Test Procedure

EUTs Maximum Power Spectral Density (average) is measured at low, middle, high channels with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level.
Measure the duty cycle, x, of the transmitter output signal
The spectrum analyzer setting is as follows.
Span = encompass the EBW of the signal.
RBW = 1 MHz for UNII-1, 2A, 2C band or 500kHz for UNII-3 band
VBW ≥ 3 RBW
Number of points in sweep ≥ 2 Span / RBW
Sweep time = auto
Detector = RMS
Trace average at least 100 traces in power averaging mode
Use the peak search function on the instrument to find the peak of the spectrum.

7.7 Duty Cycle

Test Setup



Test Procedure

EUTs duty cycle are measured at middle channel with a spectrum analyzer connected to the antenna terminal while the EUTs operating at its maximum power control level. The spectrum analyzer setting is as follows.

Center frequency = Center frequency of the transmission
Span = zero
RBW = 8 MHz
VBW = 8 MHz
Detector = peak
Sweep time = at least 3 ms
Sweep mode = Single
The marker function on the spectrum analyzer is used to determine the duty cycle

The results of the duty cycle measurement according to the above test procedure

	Data rate	On time (ms)	On + Off time (ms)	Duty Cycle (%)	Duty Factor (dB)
a mode	6Mbps	2.057	2.090	98.4	0.07
n(20MHz) mode	MCS0	1.918	1.961	97.8	0.10
n(40MHz) mode	MCS0	0.941	0.977	96.3	0.16
ac(20MHz) mode	MCS0	1.933	1.963	98.4	0.07
ac(40MHz) mode	MCS0	0.944	0.984	95.9	0.19
ac(80MHz) mode	MCS0	0.452	0.489	92.4	0.34

8. TEST DATA

8.1 Conducted Emissions

FCC §15.207

Result

Frequency	Level (dBµV)		*) Factor	**) Line	Limit (dBµV)		Margin (dB)	
(MHz)	Q-Peak	Average	(dB)		Q-Peak	Average	Q-Peak	Average
0.15	37.1	23.4	10.40	L	66.0	56.0	28.9	32.6
0.19	43.3	33.3	10.40	N	63.9	53.9	20.6	20.6
0.24	36.8	29.9	10.40	N	62.0	52.0	25.2	22.1
0.39	35.2	28.4	10.40	N	58.1	48.1	22.9	19.7
0.44	30.4	24.9	10.40	N	57.0	47.0	26.6	22.1
19.02	30.2	22.5	11.30	L	60.0	50.0	29.8	27.5

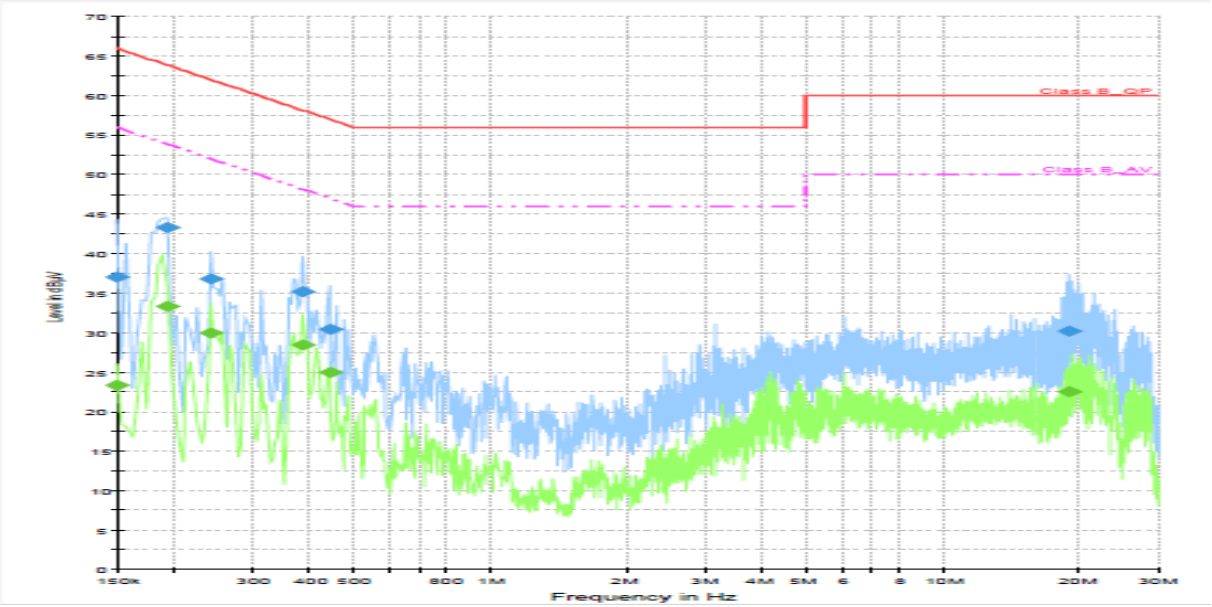
Line Conducted Emissions Tabulated Data

Notes:

1. Measurements using CISPR quasi-peak mode & average mode.
2. All modes of operation were investigated and the worst -case emission are reported. See attached Plots.
*3. *) Factor = LISN + Cable Loss*
*4. **) LINE : L = Line , N = Neutral*
5. The limit is on FCC §15.207(a)

PLOTS OF EMISSIONS

Conducted Emission at the Mains port (Line + Neutral)_ac(40) mode 5190MHz



TEST DATA

8.2 Radiated Emissions

FCC §15.209

Frequency (MHz)	Reading (dBµV/m)	Pol* (H/V)	Antenna Heights (cm)	Turntable Angles (°)	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
63.63	54.01	H	100	298	-24.6	29.4	40.0	10.6
68.26	57.78	H	100	276	-26.1	31.7	40.0	8.3
71.71	58.27	H	100	248	-27.1	31.2	40.0	8.8
155.99	59.28	H	100	235	-27.5	31.8	43.5	11.7
167.96	66.05	H	100	9	-26.9	39.2	43.5	4.4
239.90	58.64	V	100	169	-22.6	36.0	46.0	10.0
249.97	60.69	V	100	176	-22.4	38.3	46.0	7.7

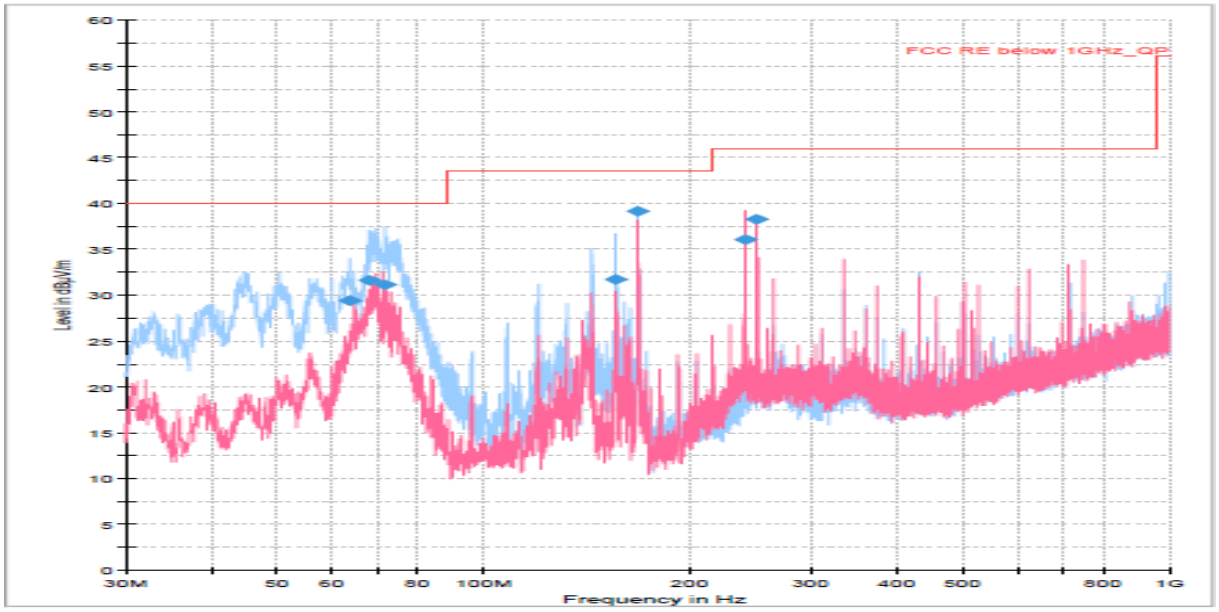
Radiated Measurements at 3meters

Notes:

1. *All modes were measured and the worst-case emission was reported.*
2. *The radiated limits are shown on Figure 3. Above 1 GHz the limit is 500 µV/m.*
3. **Pol. H = Horizontal, V = Vertical*
4. ***AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.*
5. *Measurements using CISPR quasi-peak mode below 1 GHz.*
6. *The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.*
7. *Lowest channel (5190MHz) in ac (40MHz) mode is the worst case.*
8. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).*
9. *The limit is on the FCC §15.209.*

PLOTS OF EMISSIONS

Radiated emission below 1GHz_ ac (40MHz) mode_ 5190 MHz



8.3 26 dB Bandwidth and 99 % Occupied bandwidth

8.3.1 26 dB Bandwidth and 99 % Occupied bandwidth – U-NII-1 band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5180	21.14	16.69
Middle	5220	21.01	16.66
Highest	5240	21.01	16.65

802.11n (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5180	21.45	17.83
Middle	5220	21.42	17.84
Highest	5240	21.54	17.83

802.11n (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5190	39.82	36.23
Highest	5230	39.41	36.23

TEST DATA

802.11ac (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5180	21.31	17.84
Middle	5220	21.49	17.83
Highest	5240	21.69	17.84

802.11ac (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5190	39.66	36.23
Highest	5230	39.70	36.19

802.11ac (80 MHz) mode

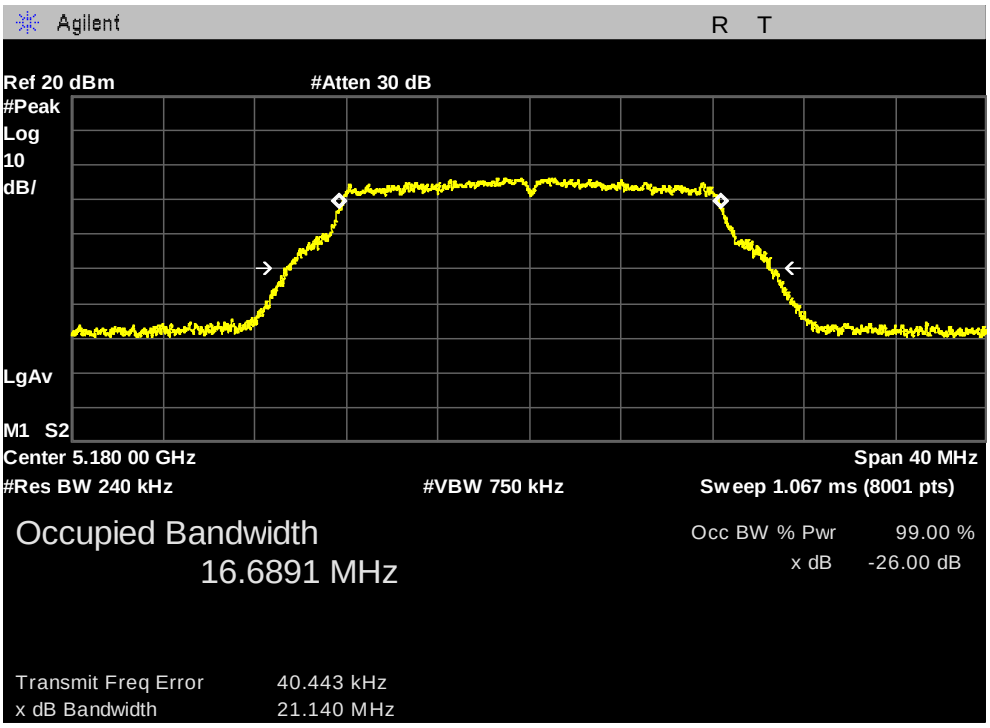
Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Middle	5210	81.23	75.49

Note:
The worst ant port was determined by the conducted output power that generates the highest emission performing pre-scan testing in all ant port of each mode.

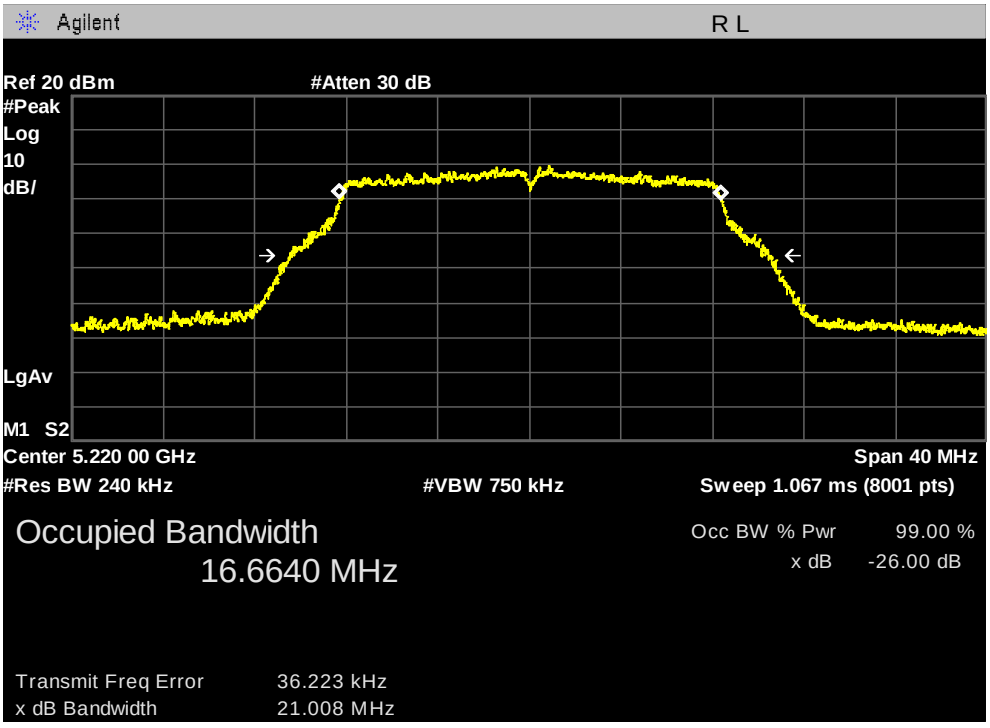
PLOTS OF EMISSIONS

802.11a mode

26 dB Bandwidth, Lowest Channel (5180 MHz)

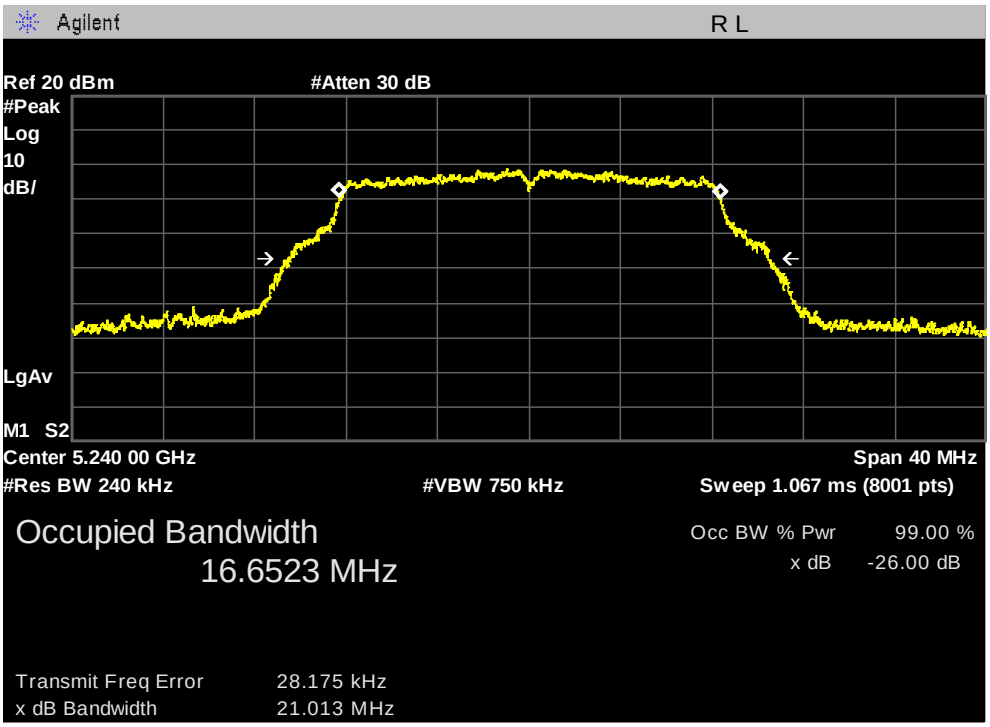


26 dB Bandwidth, Middle Channel (5220 MHz)



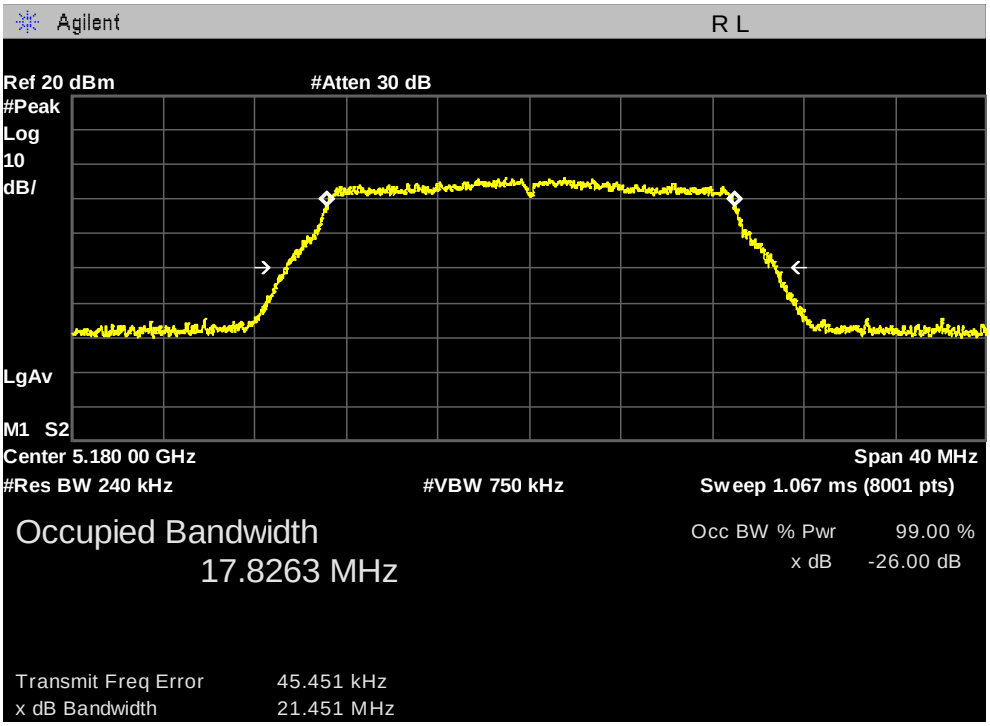
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5240 MHz)



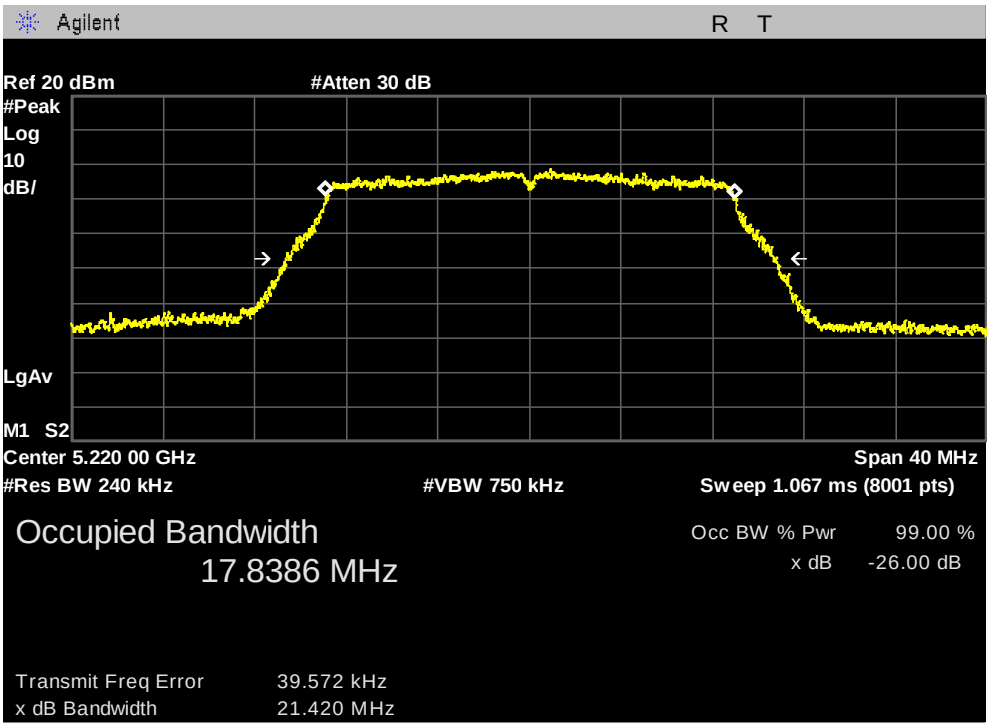
802.11n (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5180 MHz)

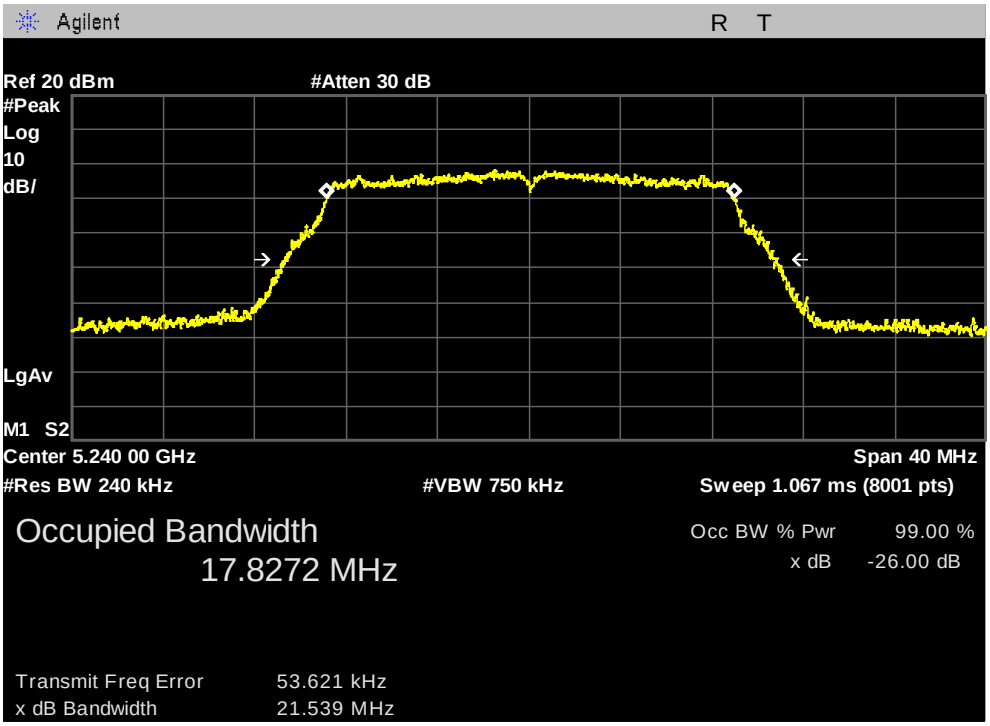


PLOTS OF EMISSIONS

26 dB Bandwidth, Middle Channel (5220 MHz)



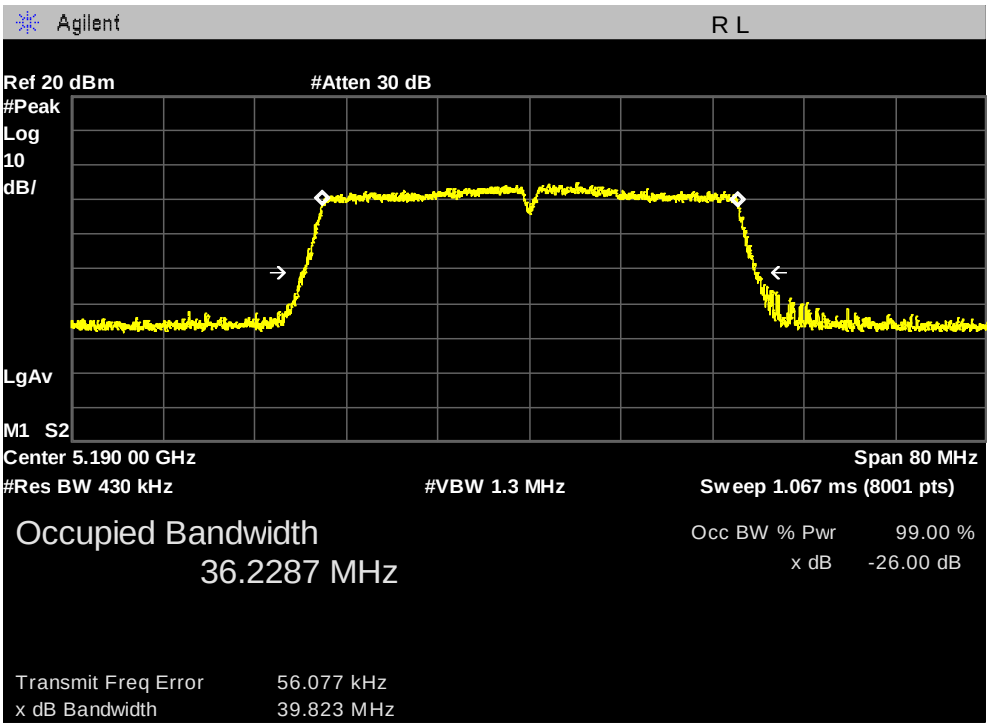
26 dB Bandwidth, Highest Channel (5240 MHz)



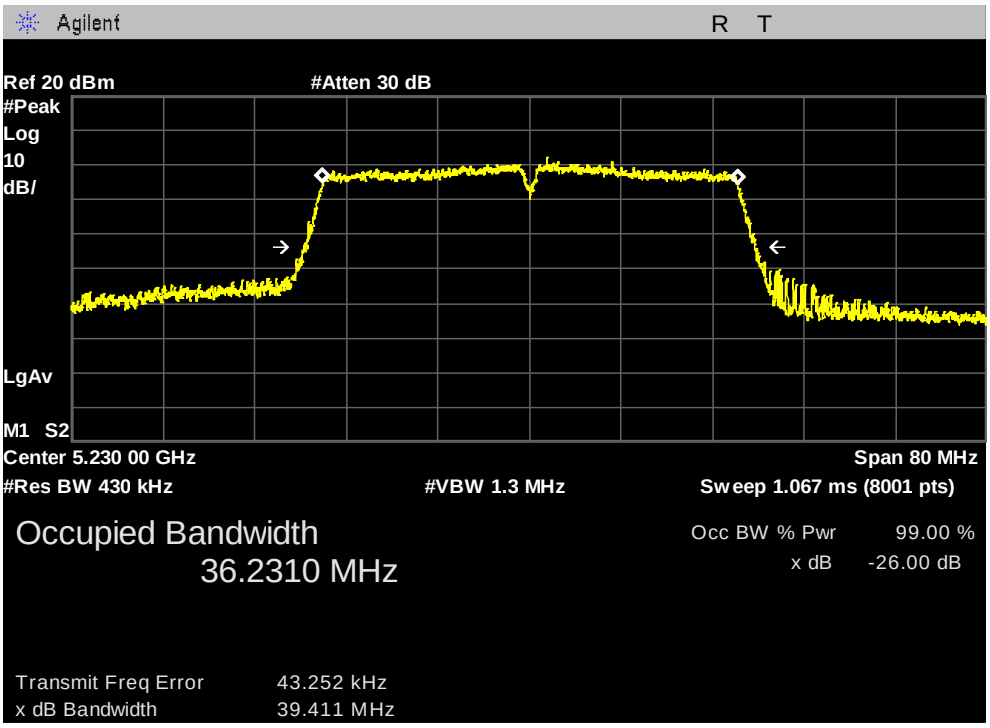
PLOTS OF EMISSIONS

802.11n (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5190 MHz)



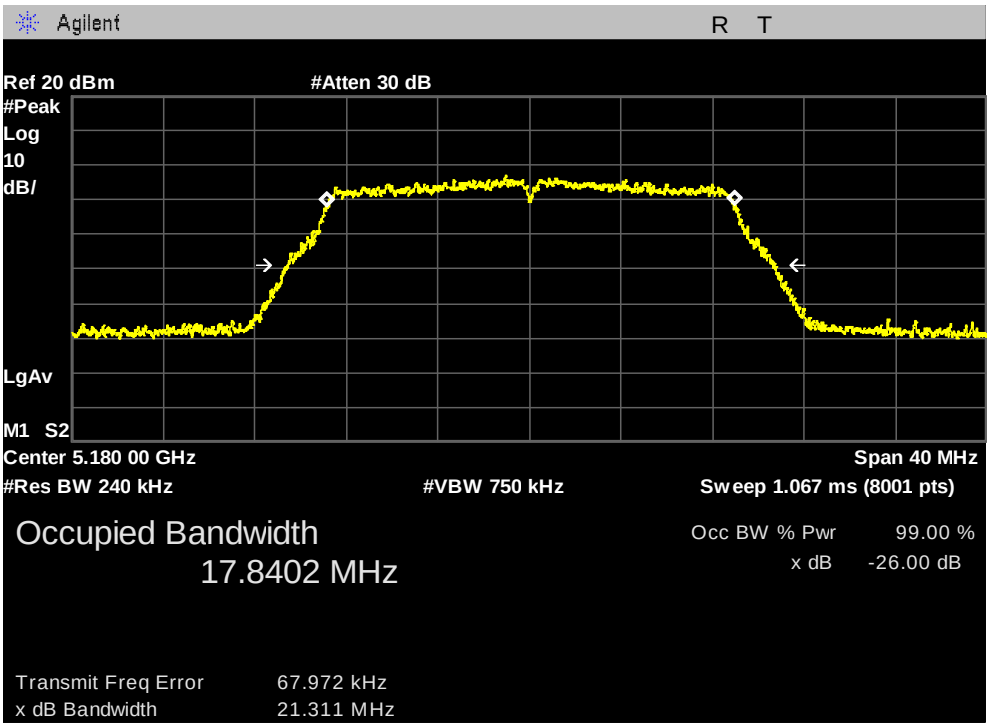
26 dB Bandwidth, Highest Channel (5230 MHz)



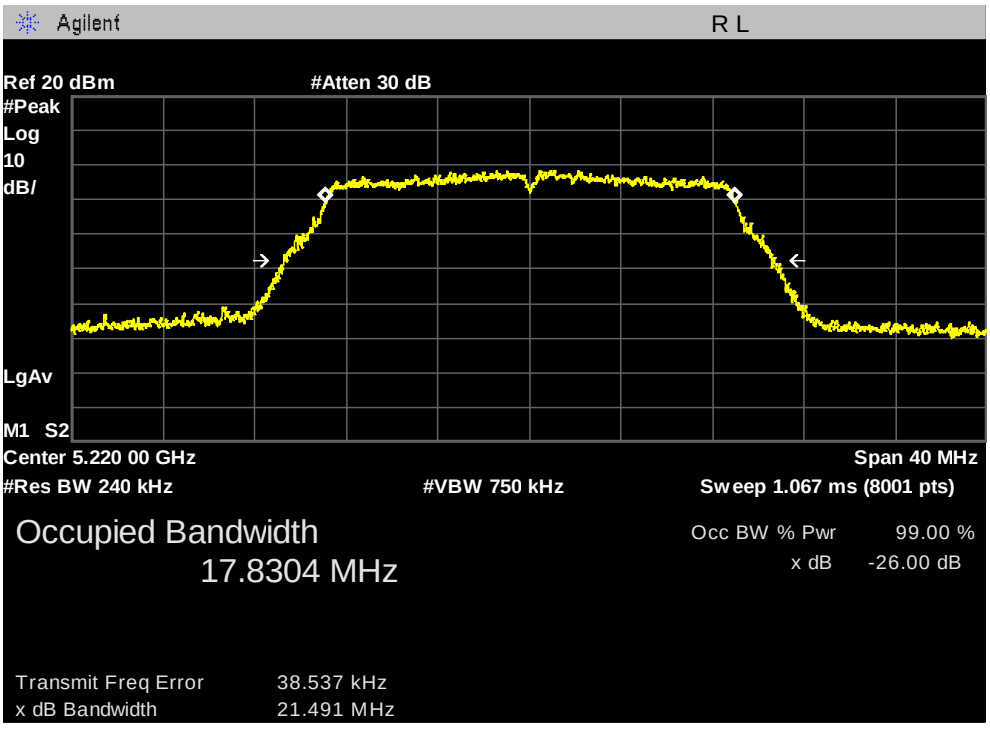
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5180 MHz)

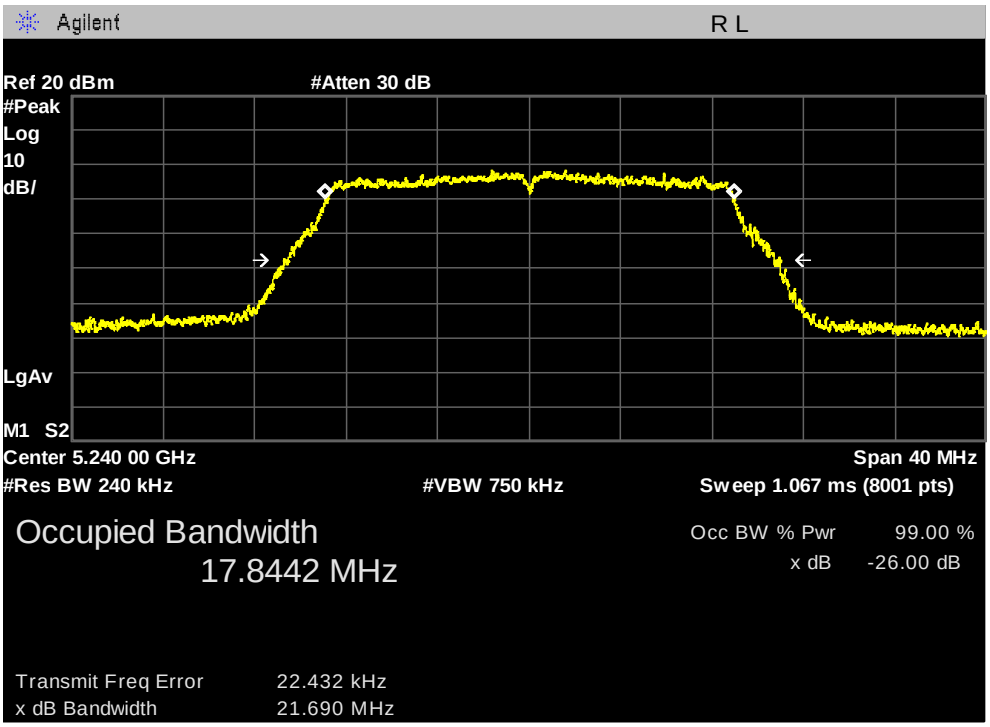


26 dB Bandwidth, Middle Channel (5220 MHz)



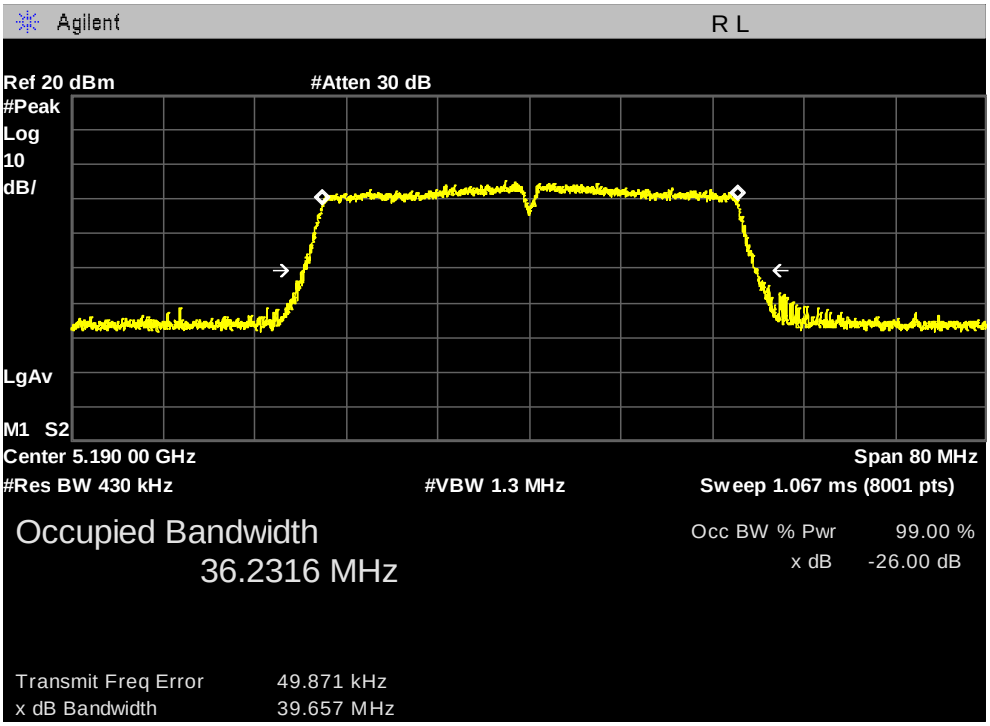
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5240 MHz)



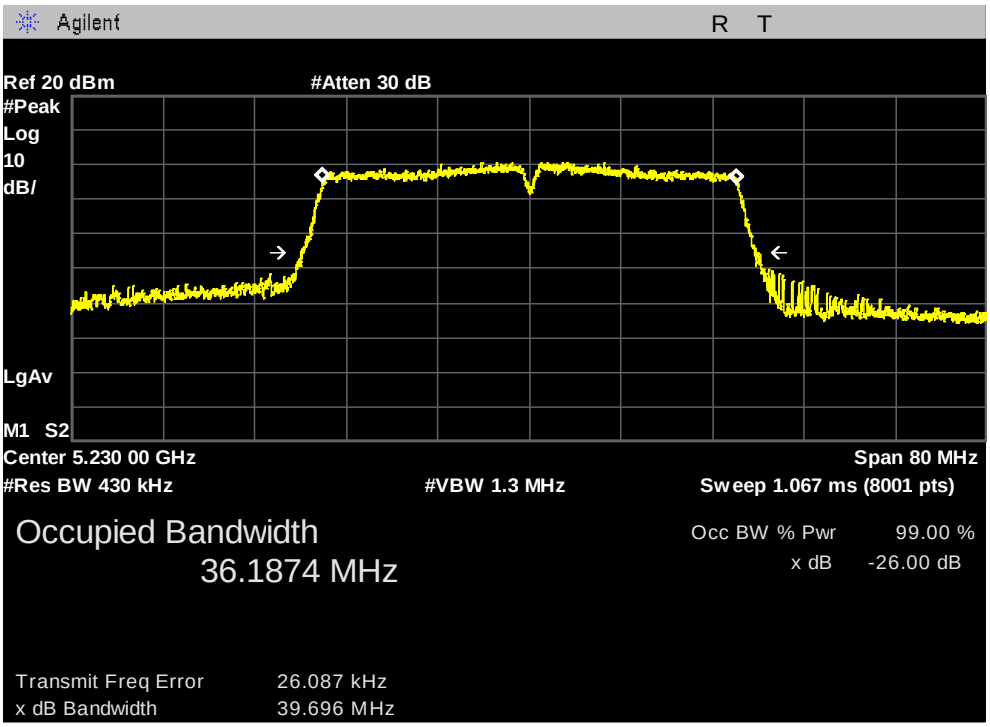
802.11ac (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5190 MHz)



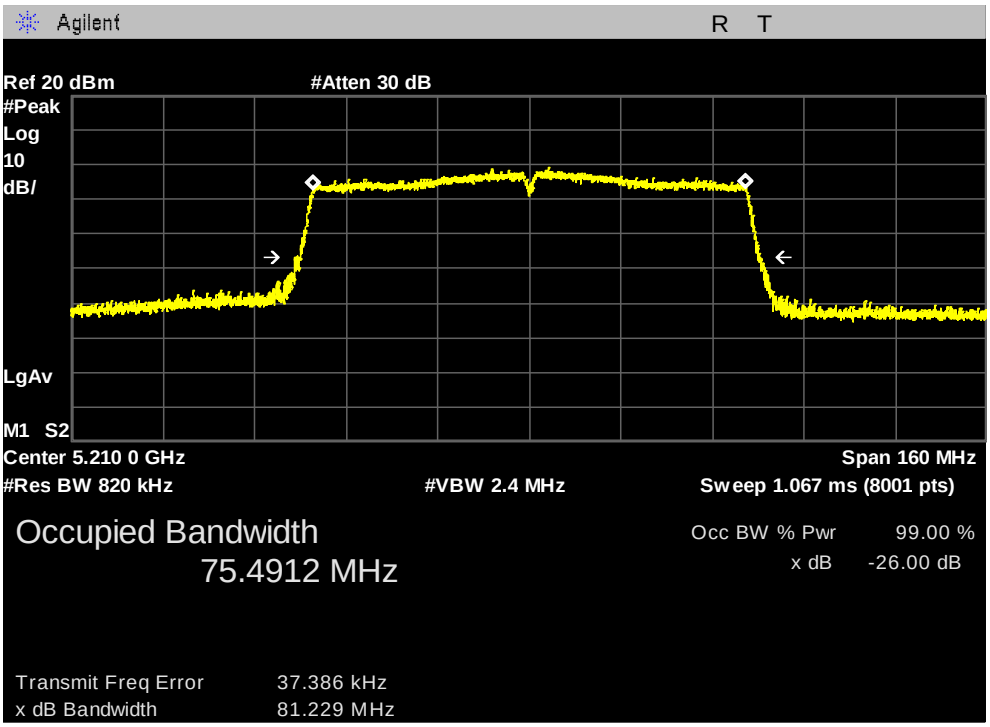
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5230 MHz)



802.11ac (80 MHz) mode

26 dB Bandwidth, Channel (5210 MHz)



8.3.2 26 dB Bandwidth and 99 % Occupied bandwidth – U-NII-2A band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5260	21.23	16.72
Middle	5300	21.18	16.75
Highest	5320	21.35	16.71

802.11n (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5260	22.13	17.91
Middle	5300	23.78	17.91
Highest	5320	21.50	17.86

802.11n (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5190	42.73	36.36
Highest	5230	40.01	36.20

TEST DATA

802.11ac (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5260	22.60	17.94
Middle	5300	21.72	17.89
Highest	5320	21.49	17.84

802.11ac (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5190	39.76	36.25
Highest	5230	39.75	36.20

802.11ac (80 MHz) mode

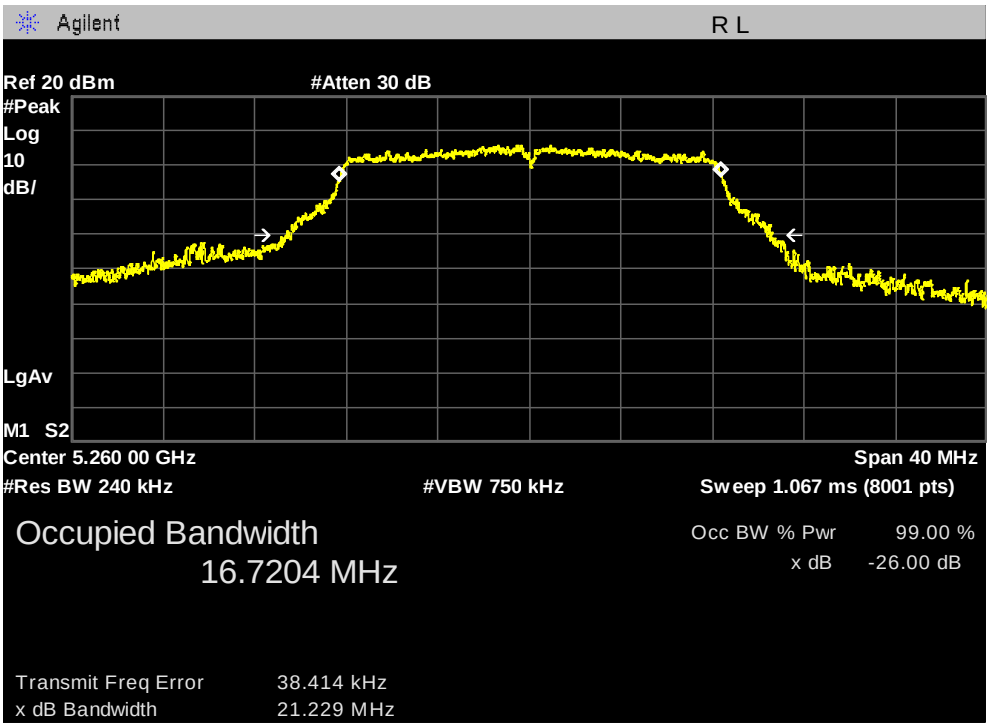
Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Middle	5290	80.85	75.45

Note:
The worst ant port was determined by the conducted output power that generates the highest emission performing pre-scan testing in all ant port of each mode.

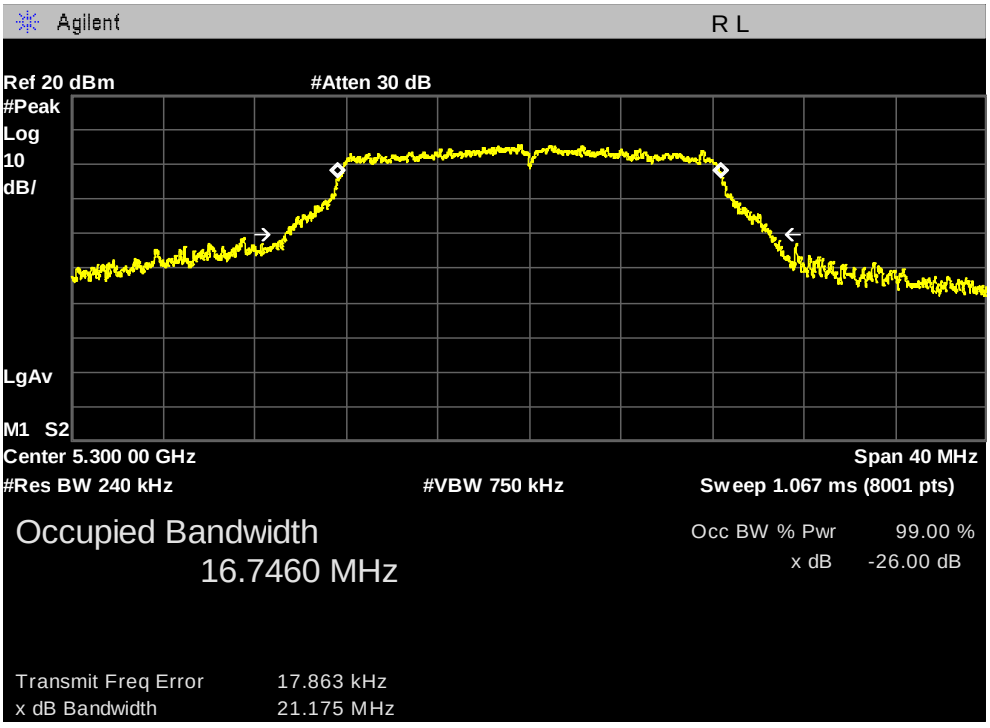
PLOTS OF EMISSIONS

802.11a mode

26 dB Bandwidth, Lowest Channel (5260 MHz)

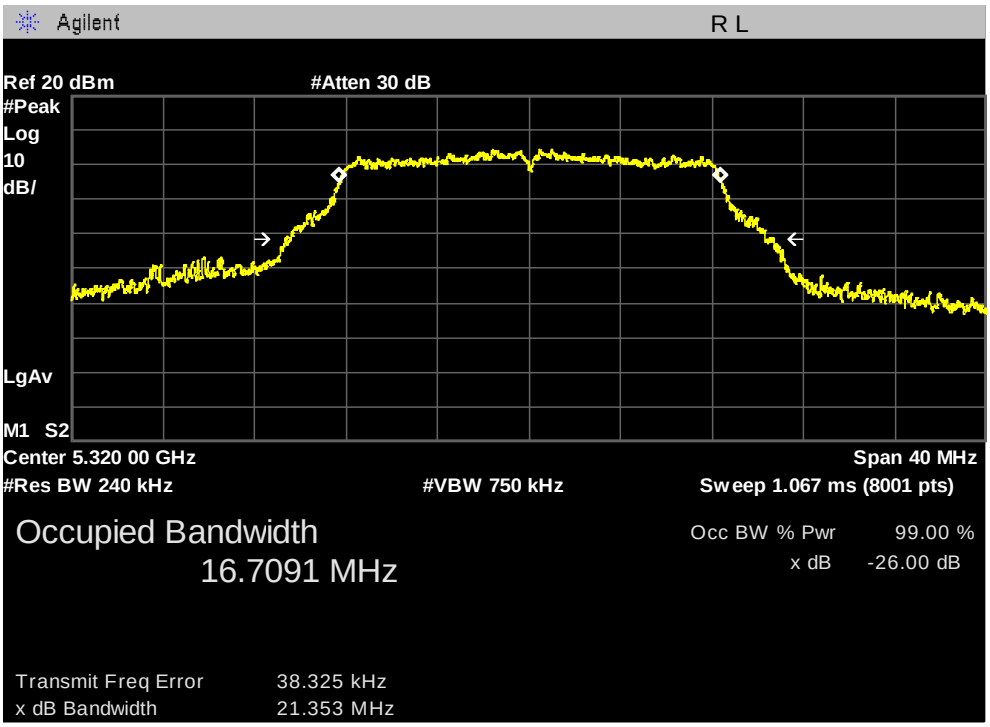


26 dB Bandwidth, Middle Channel (5300 MHz)



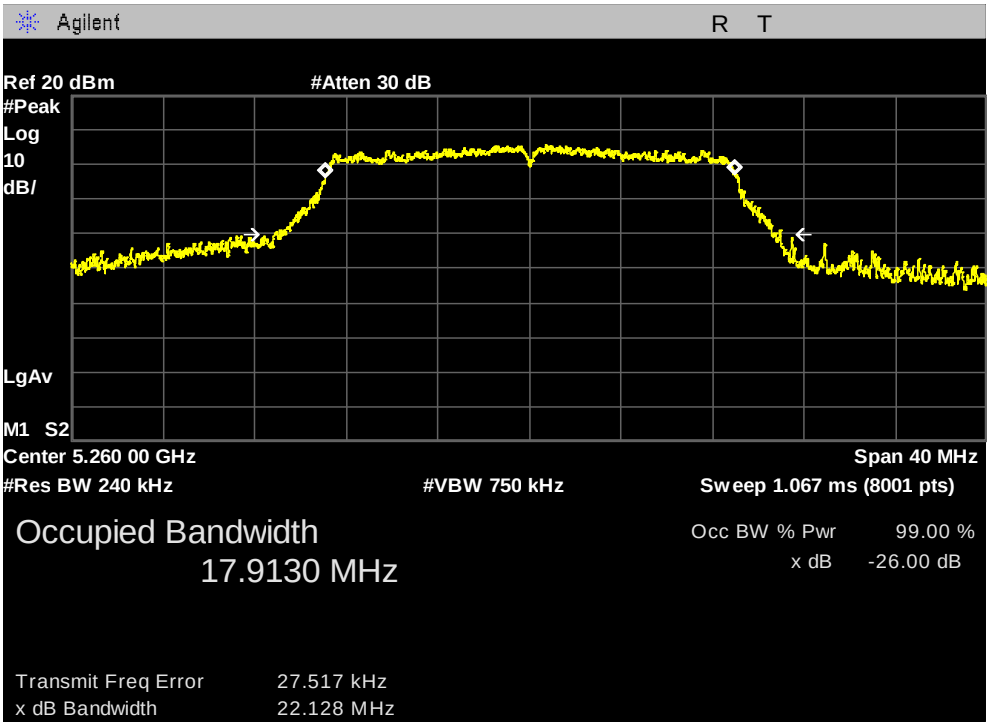
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5320 MHz)



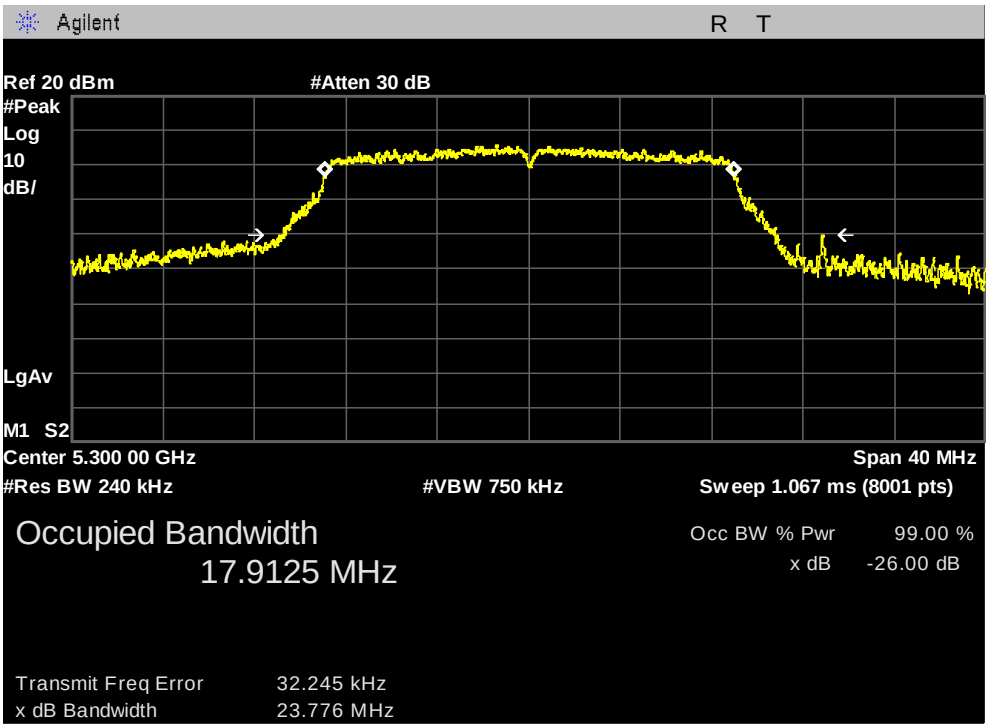
802.11n (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5260 MHz)

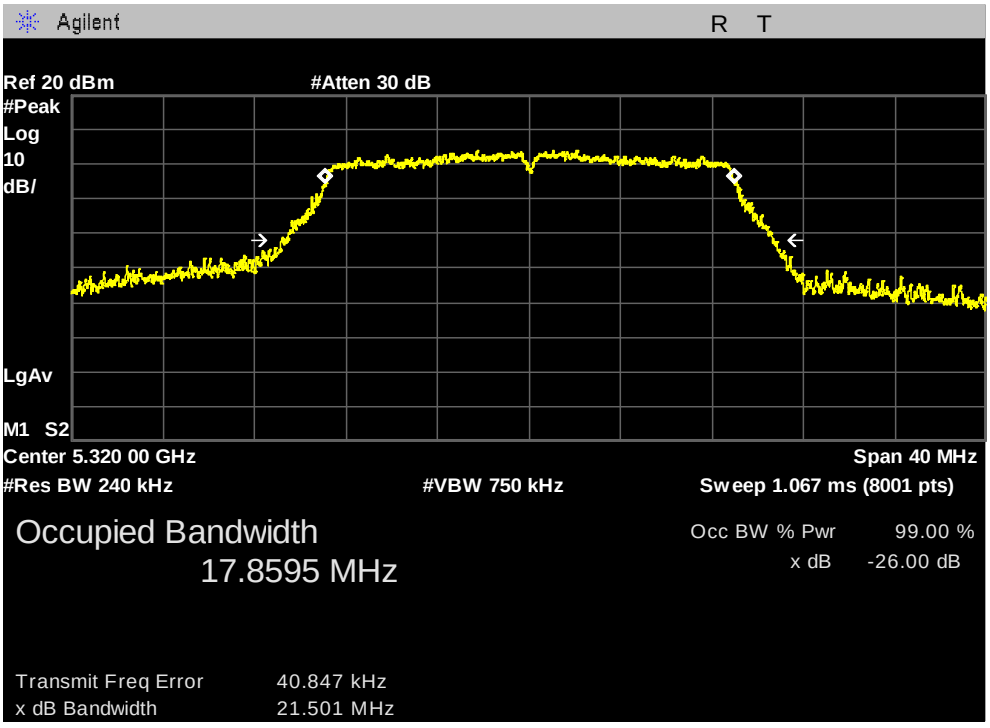


PLOTS OF EMISSIONS

26 dB Bandwidth, Middle Channel (5300 MHz)



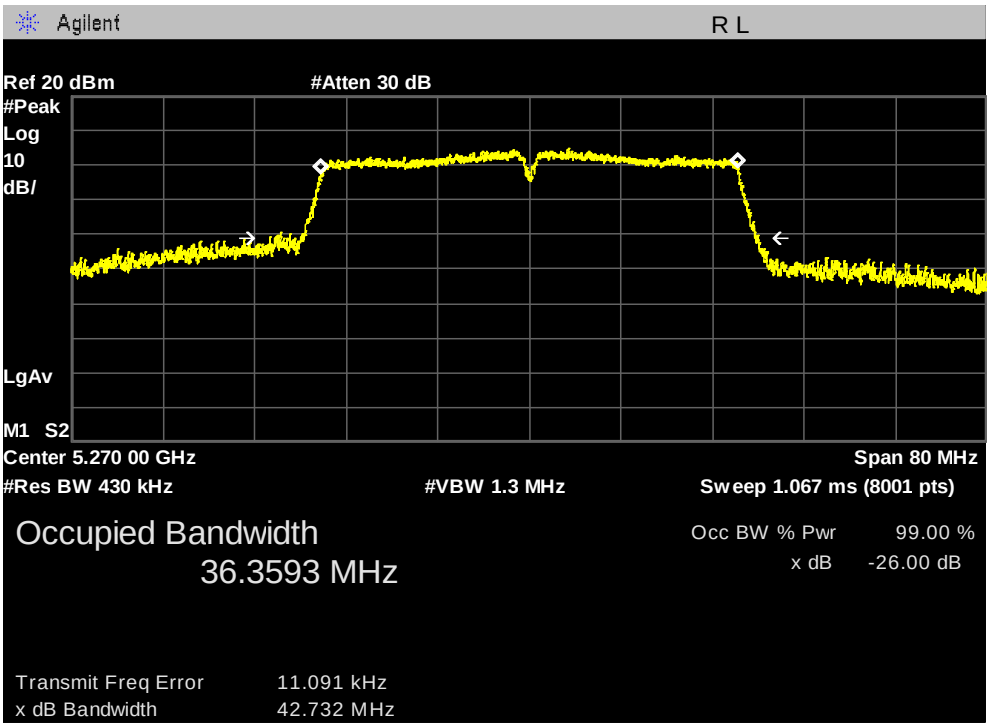
26 dB Bandwidth, Highest Channel (5320 MHz)



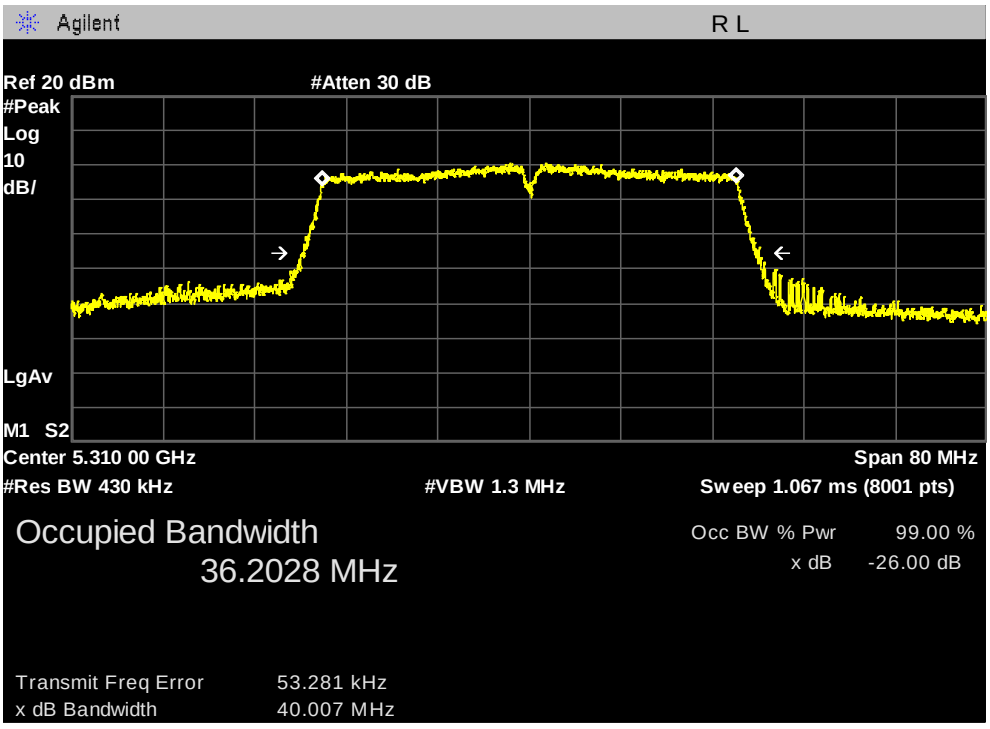
PLOTS OF EMISSIONS

802.11n (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5270 MHz)



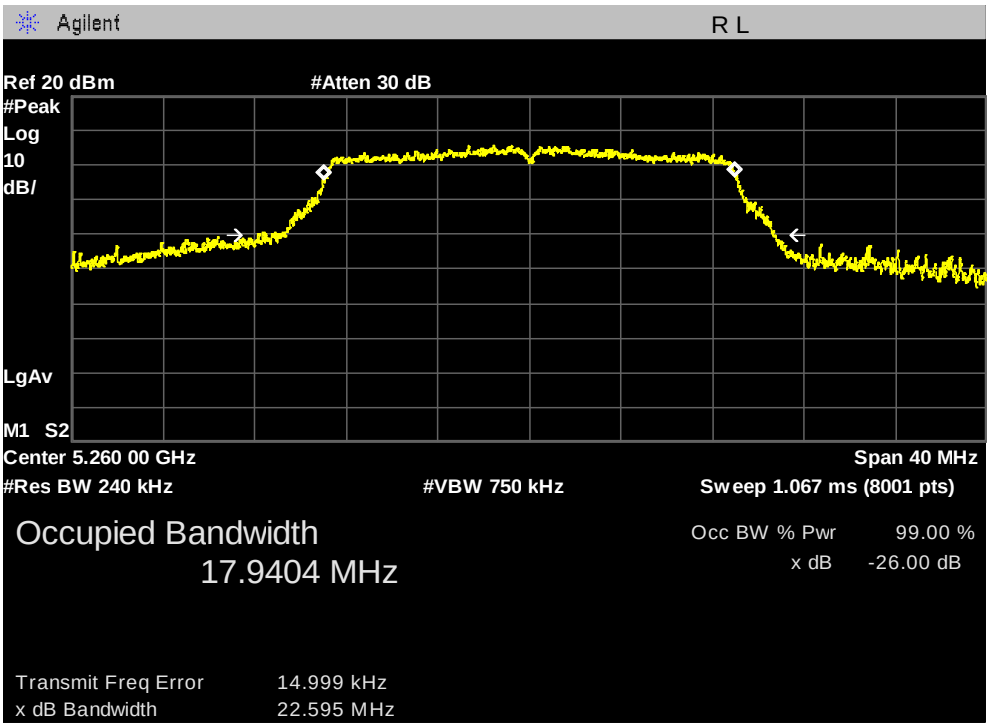
26 dB Bandwidth, Highest Channel (5310 MHz)



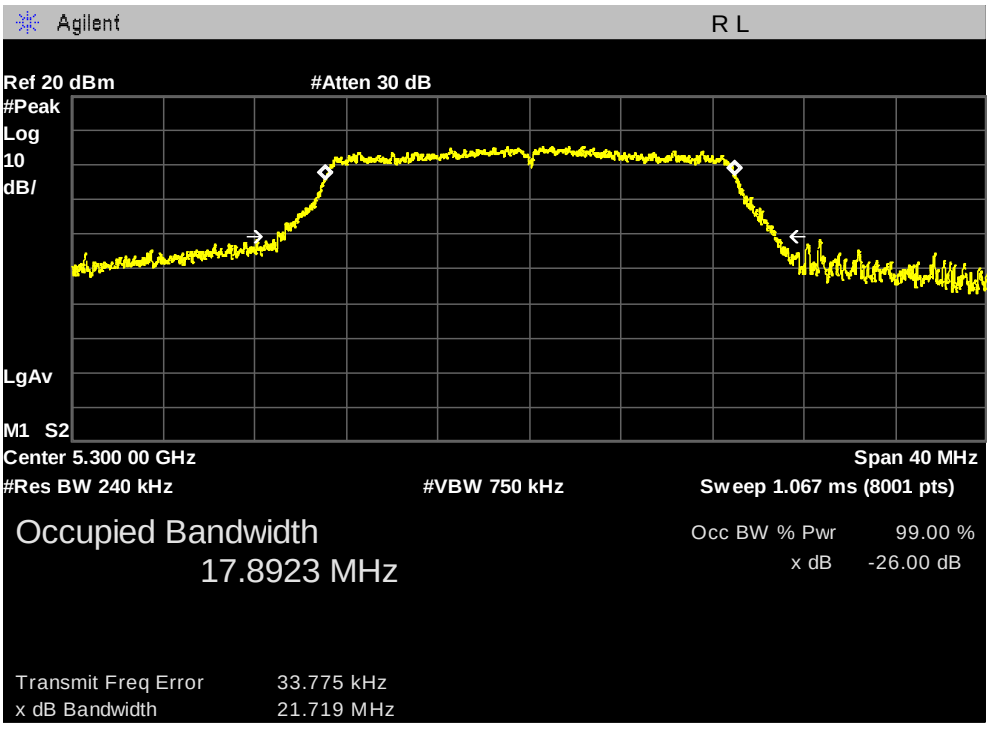
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5260 MHz)

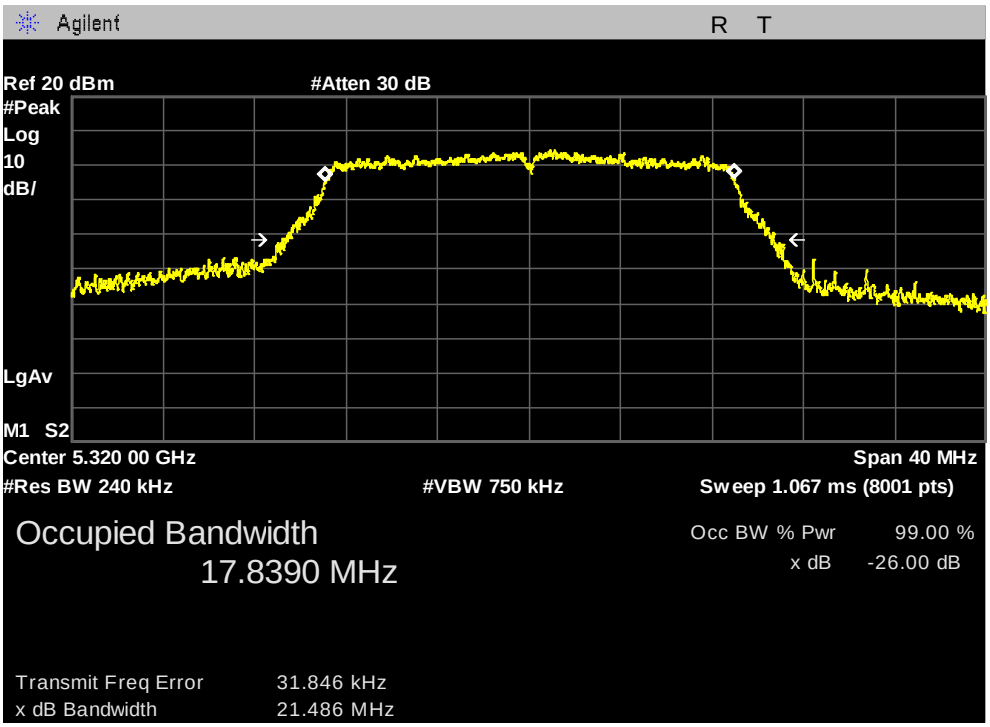


26 dB Bandwidth, Middle Channel (5300 MHz)



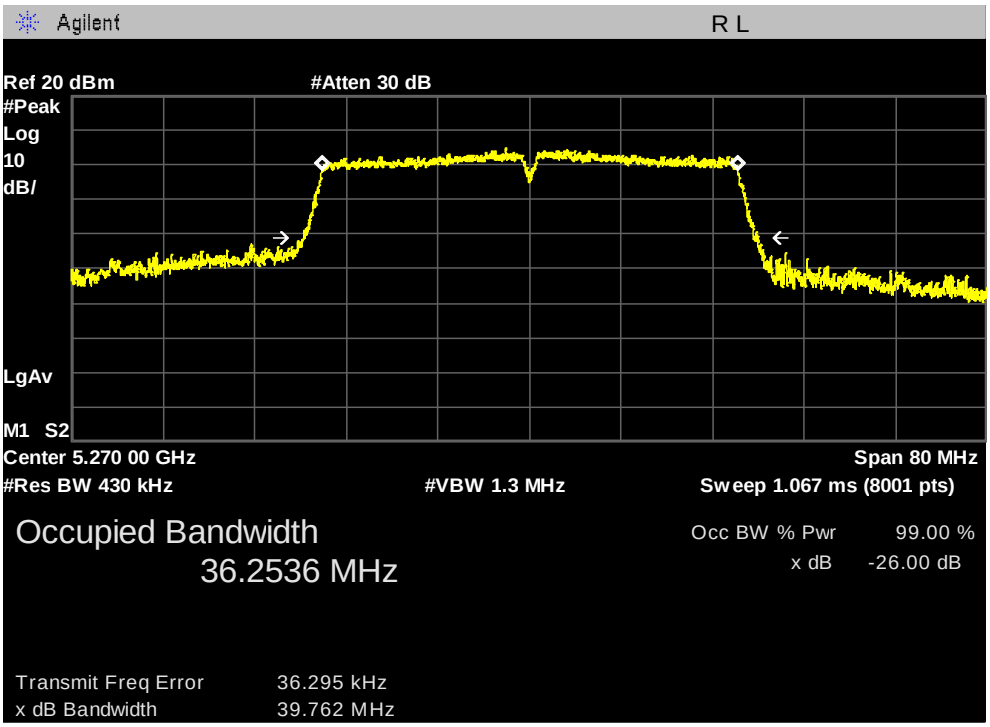
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5320 MHz)



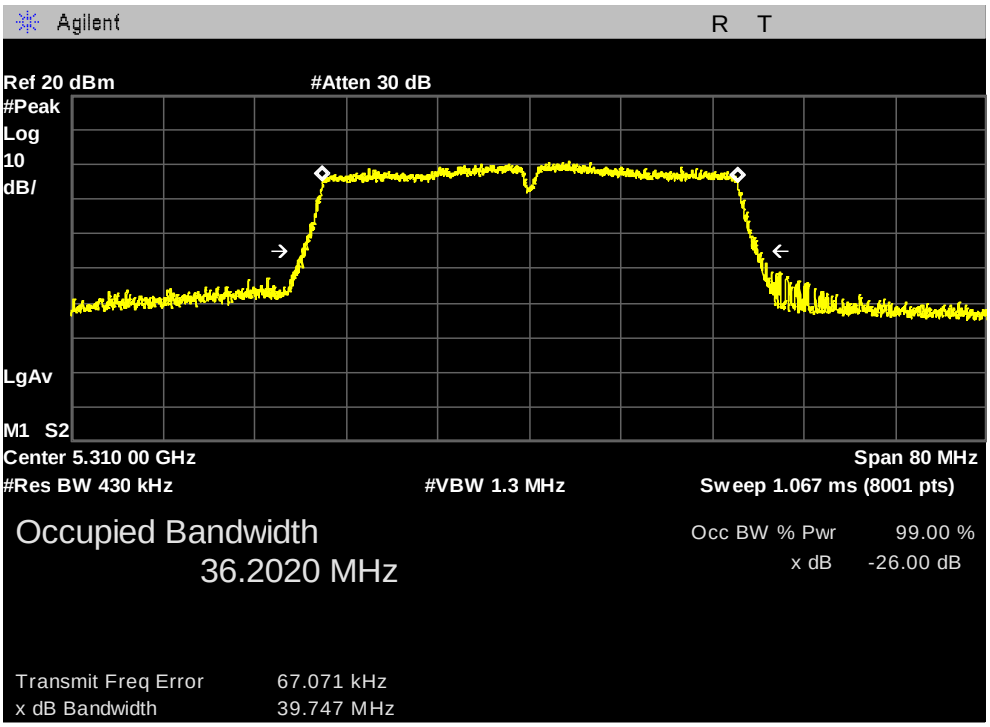
802.11ac (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5270 MHz)



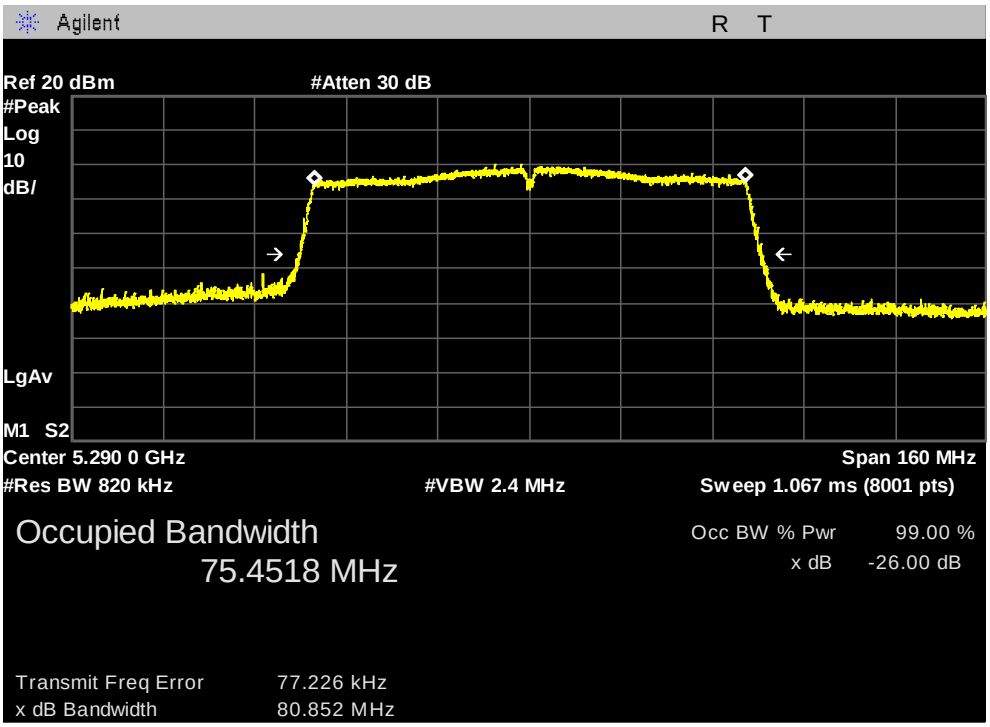
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5310 MHz)



802.11ac (80 MHz) mode

26 dB Bandwidth, Channel (5290 MHz)



8.3.3 26 dB Bandwidth and 99 % Occupied bandwidth – U-NII-2C band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel, Straddle channel

802.11a mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5500	21.06	16.69
Middle	5600	21.13	16.70
Highest	5700	21.32	16.69

802.11n (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5500	21.47	17.86
Middle	5600	21.47	17.83
Highest	5700	21.51	17.85

802.11n (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5510	39.85	36.20
Middle	5590	39.62	36.27
Highest	5670	39.73	36.28

TEST DATA

802.11ac (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5500	21.31	17.87
Middle	5600	21.46	17.84
Highest	5700	21.55	17.88

802.11ac (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5510	39.70	36.20
Middle	5590	40.03	36.30
Highest	5670	43.16	36.30

802.11ac (80 MHz) mode

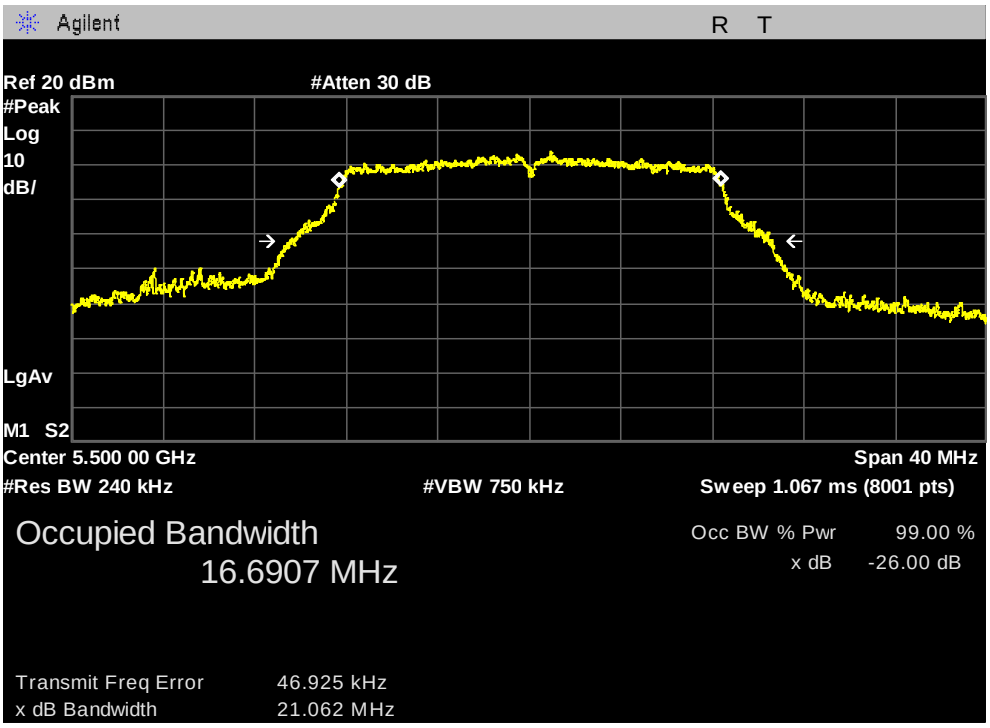
Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5530	81.15	75.42
Highest	5610	81.46	75.46

Note:
The worst ant port was determined by the conducted output power that generates the highest emission performing pre-scan testing in all ant port of each mode.

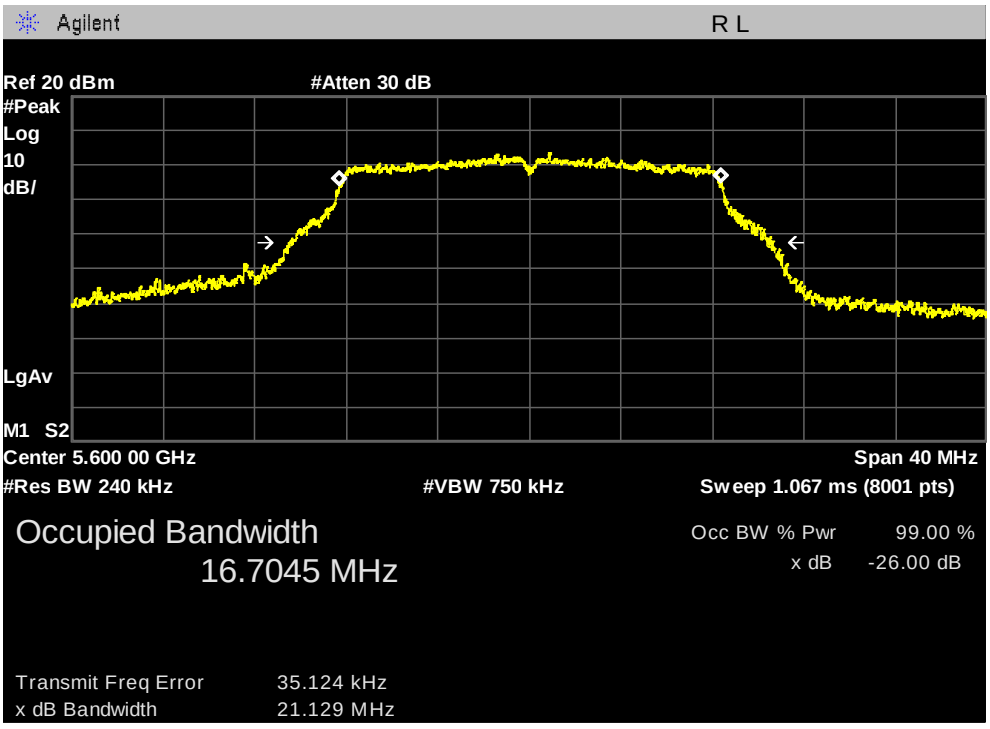
PLOTS OF EMISSIONS

802.11a mode

26 dB Bandwidth, Lowest Channel (5500 MHz)

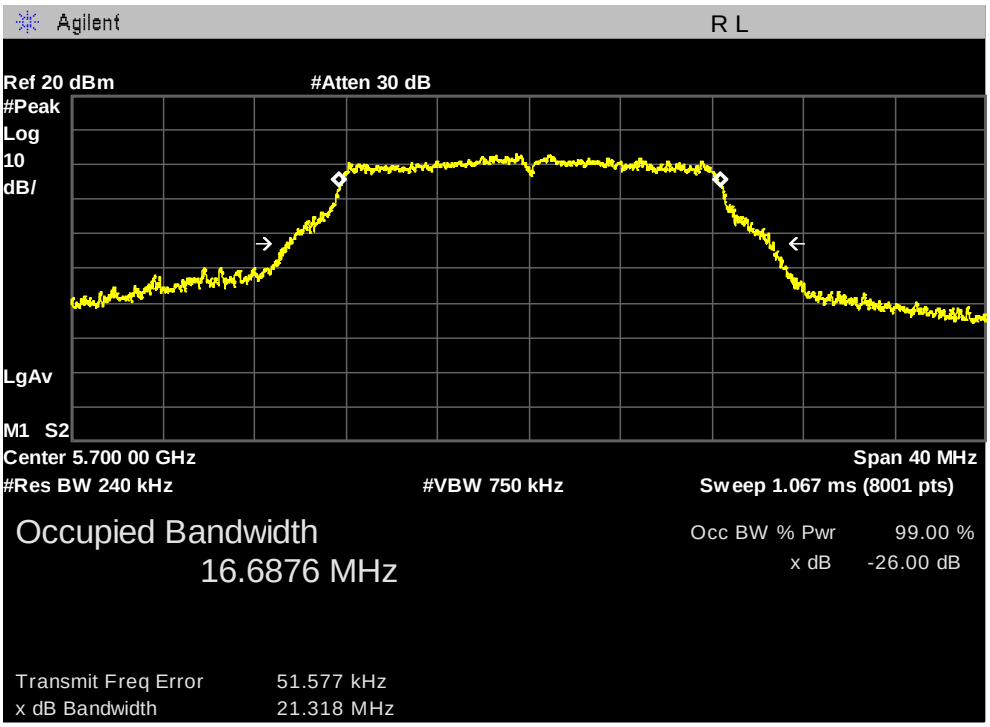


26 dB Bandwidth, Middle Channel (5600 MHz)



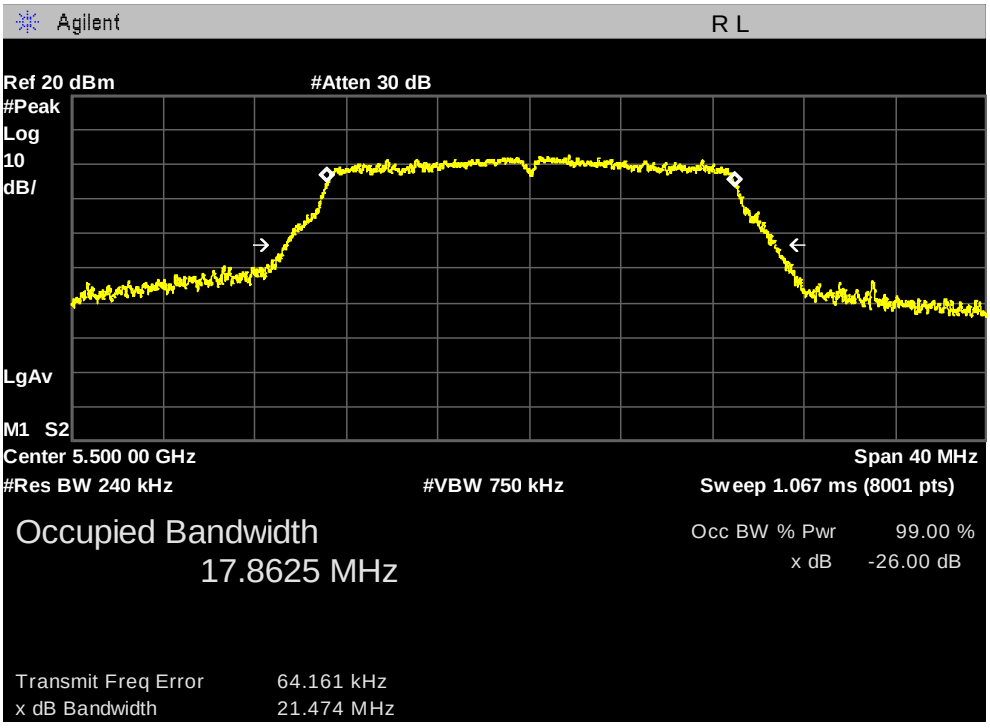
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5700 MHz)



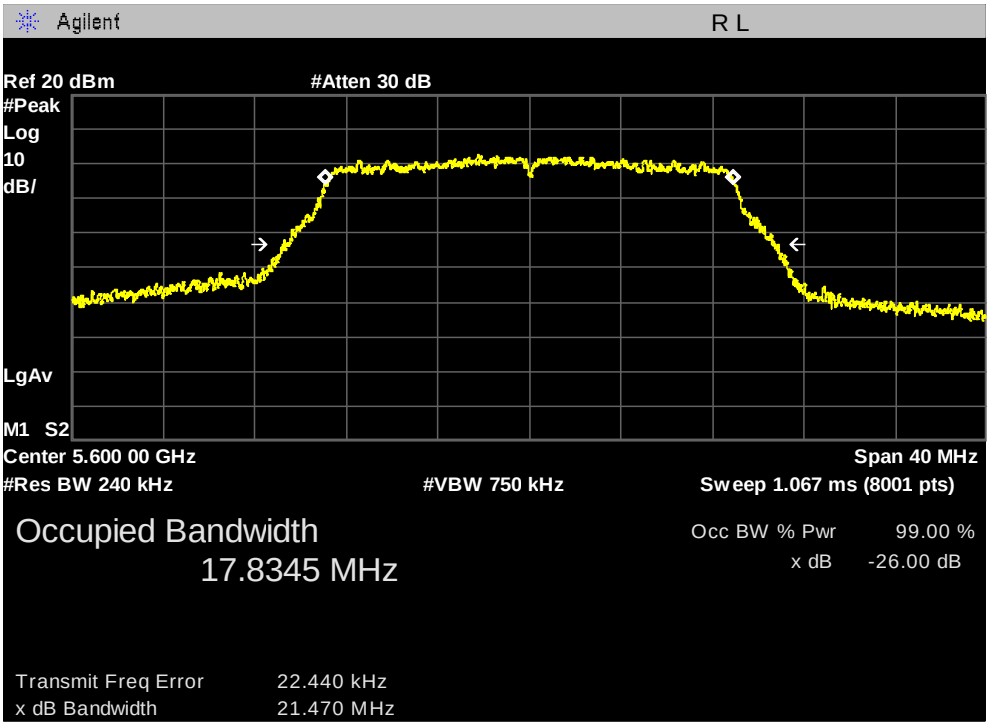
802.11n (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5500 MHz)

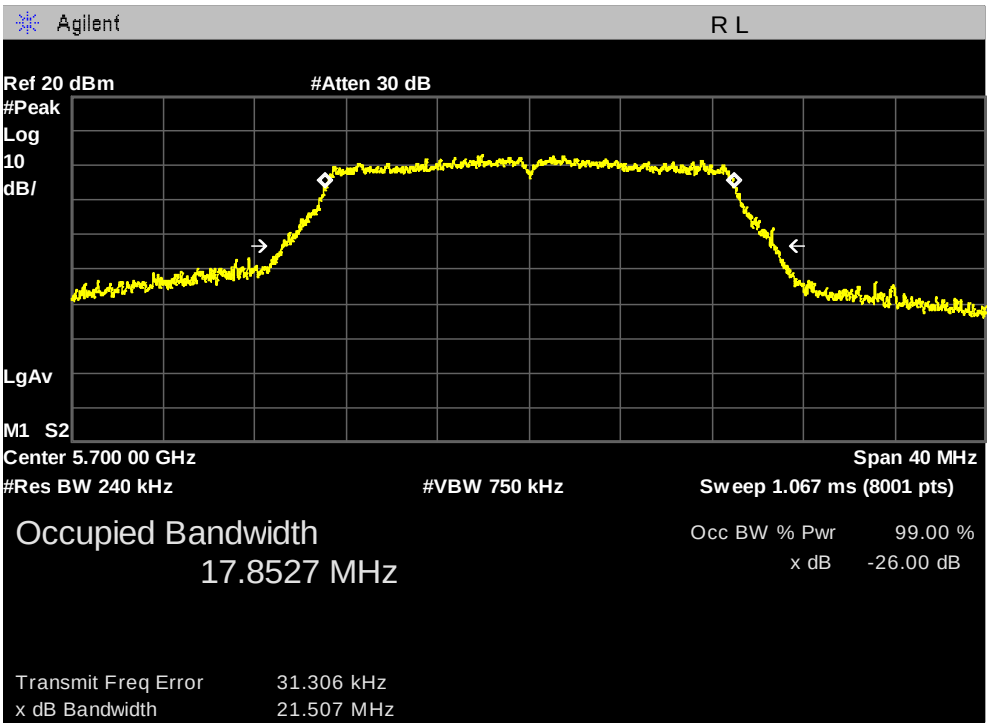


PLOTS OF EMISSIONS

26 dB Bandwidth, Middle Channel (5600 MHz)



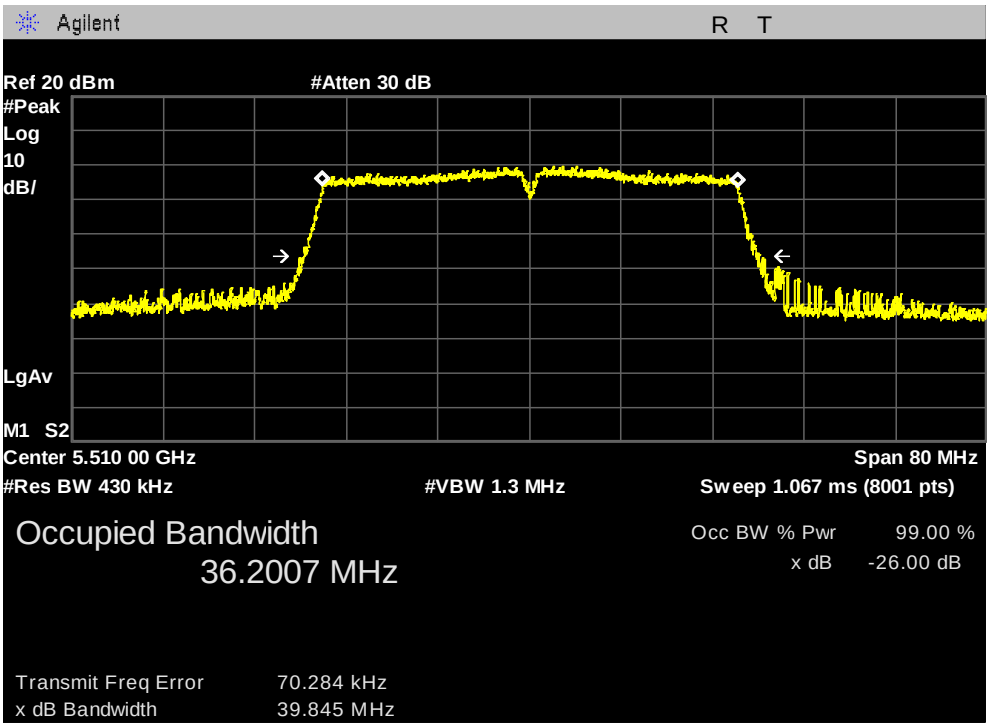
26 dB Bandwidth, Highest Channel (5700 MHz)



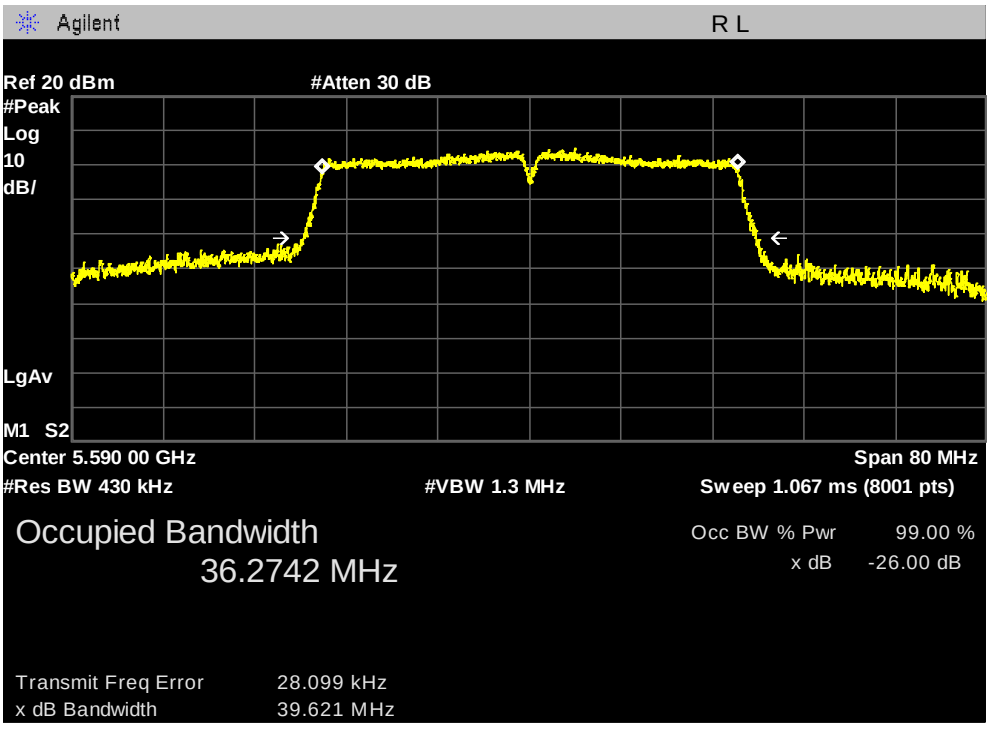
PLOTS OF EMISSIONS

802.11n (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5510 MHz)

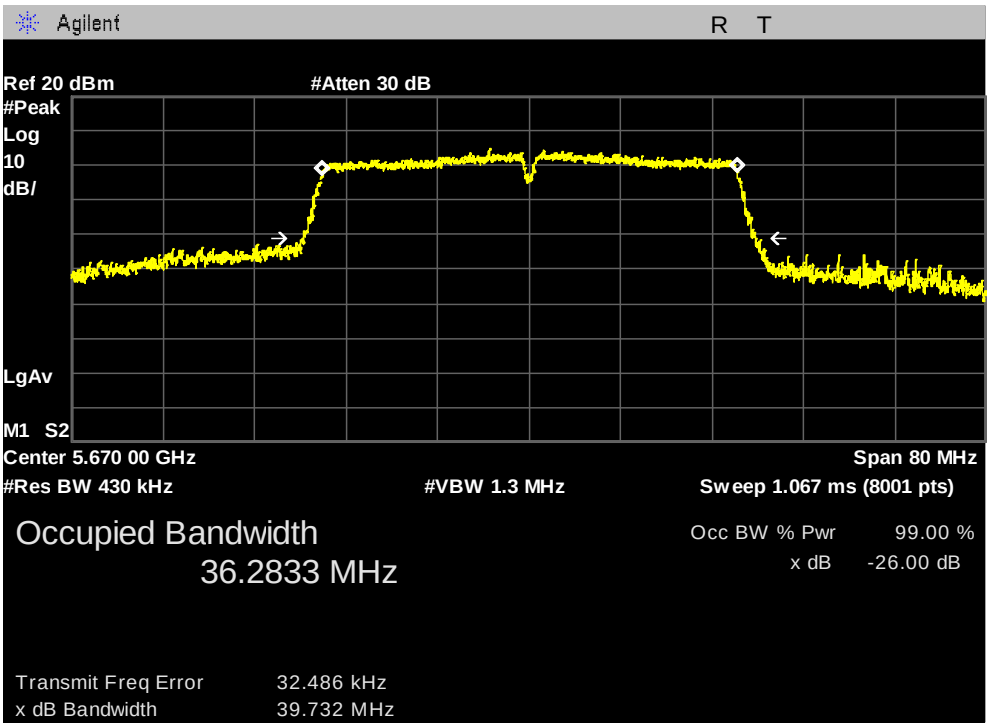


26 dB Bandwidth, Middle Channel (5590 MHz)



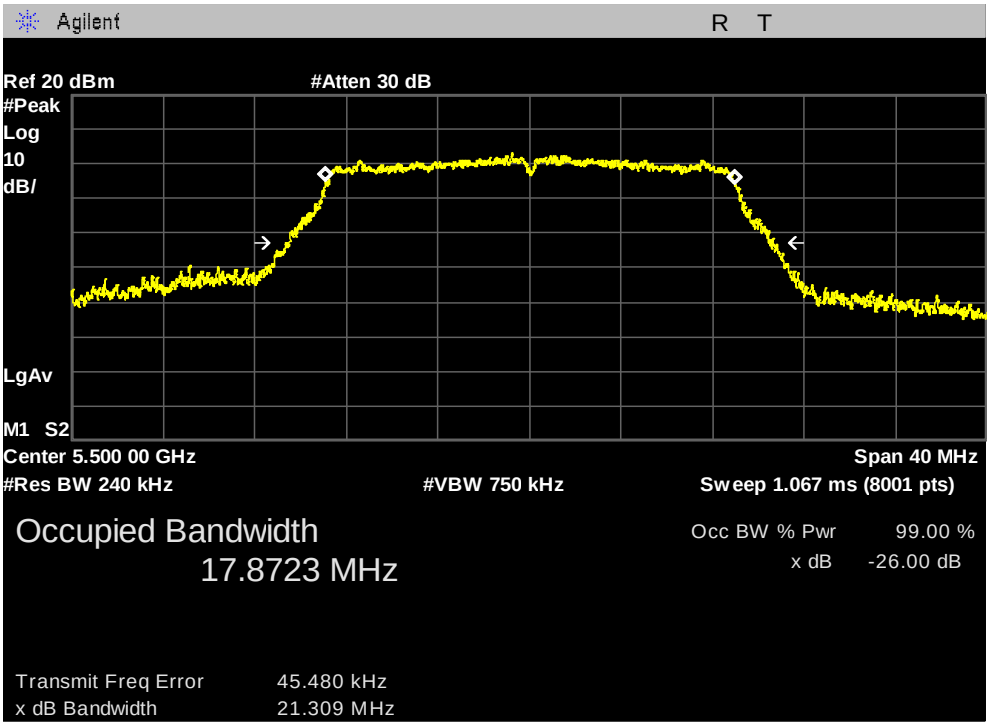
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5670 MHz)



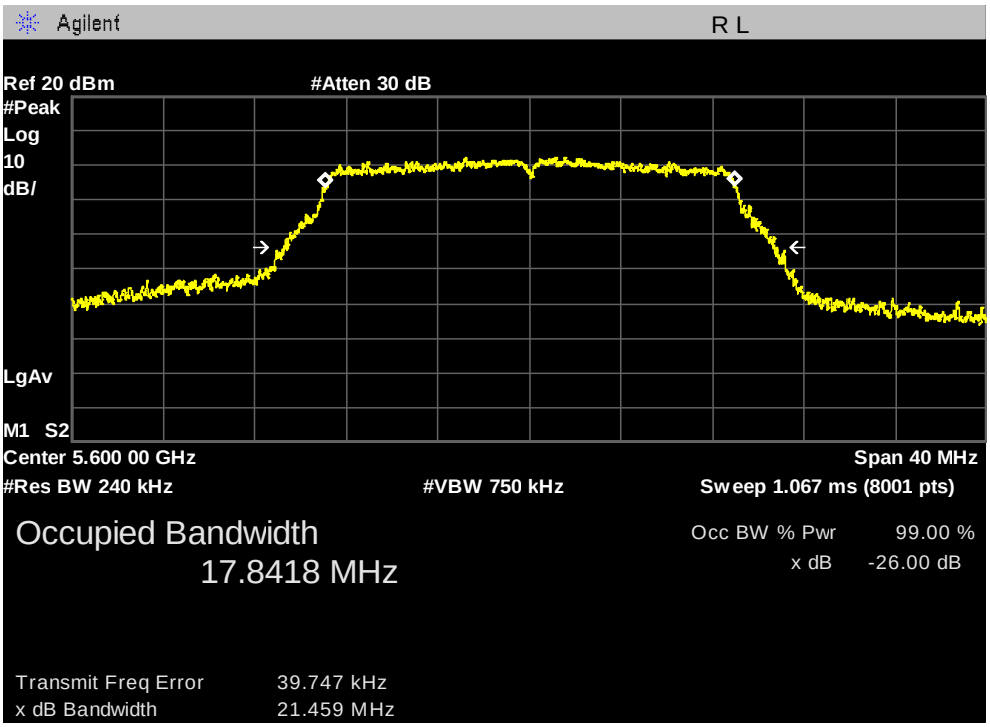
802.11ac (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5500 MHz)

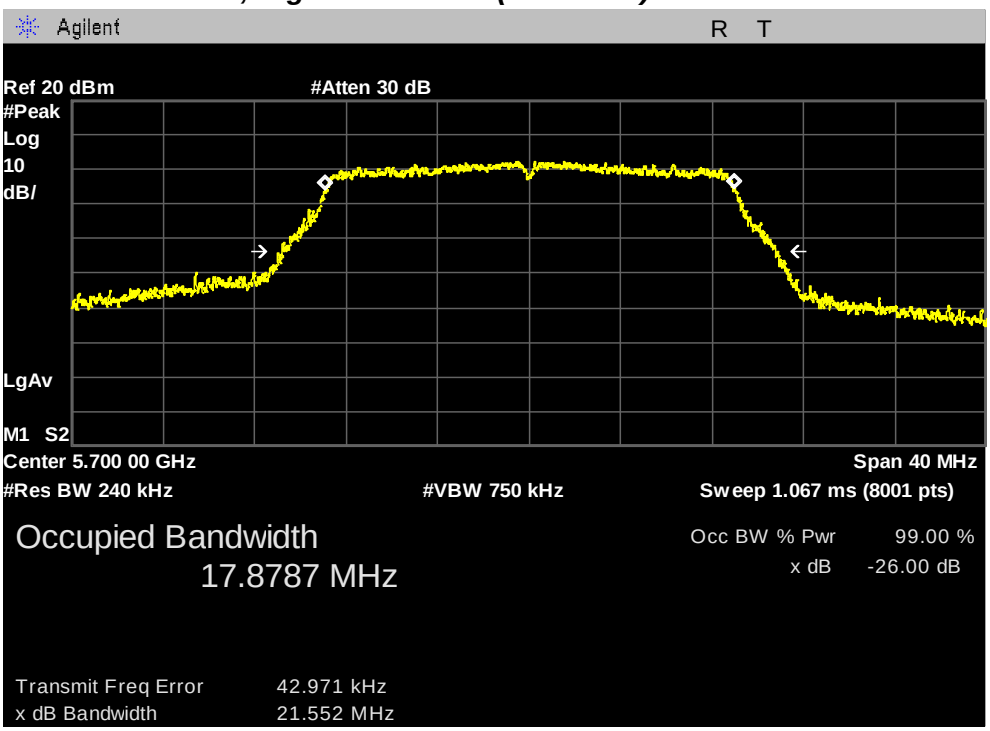


PLOTS OF EMISSIONS

26 dB Bandwidth, Middle Channel (5600 MHz)



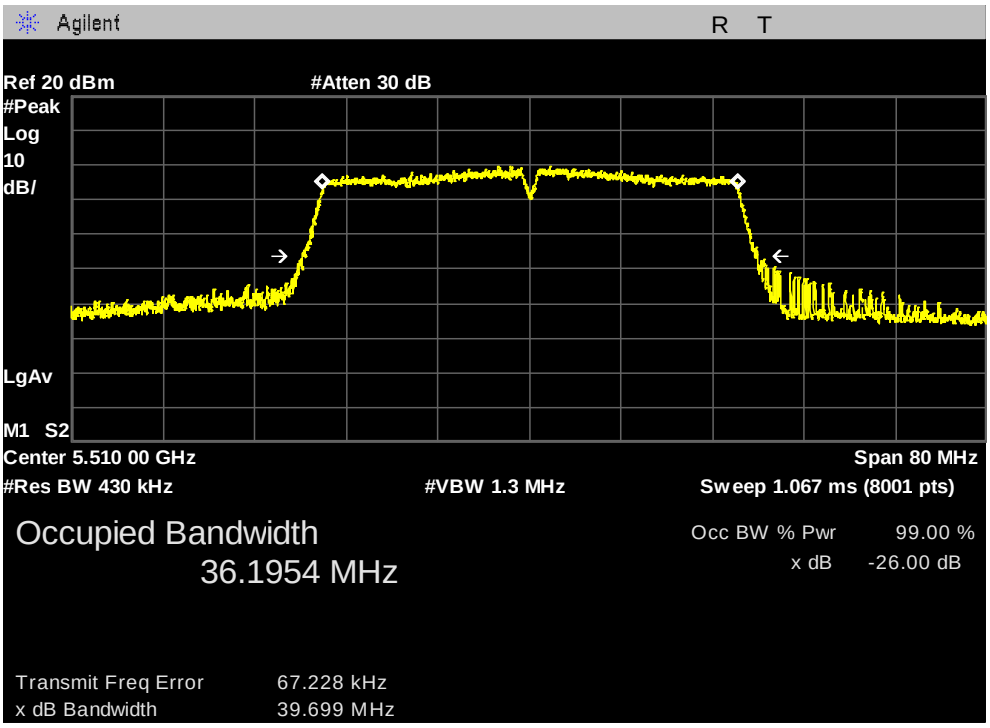
26 dB Bandwidth, Highest Channel (5700 MHz)



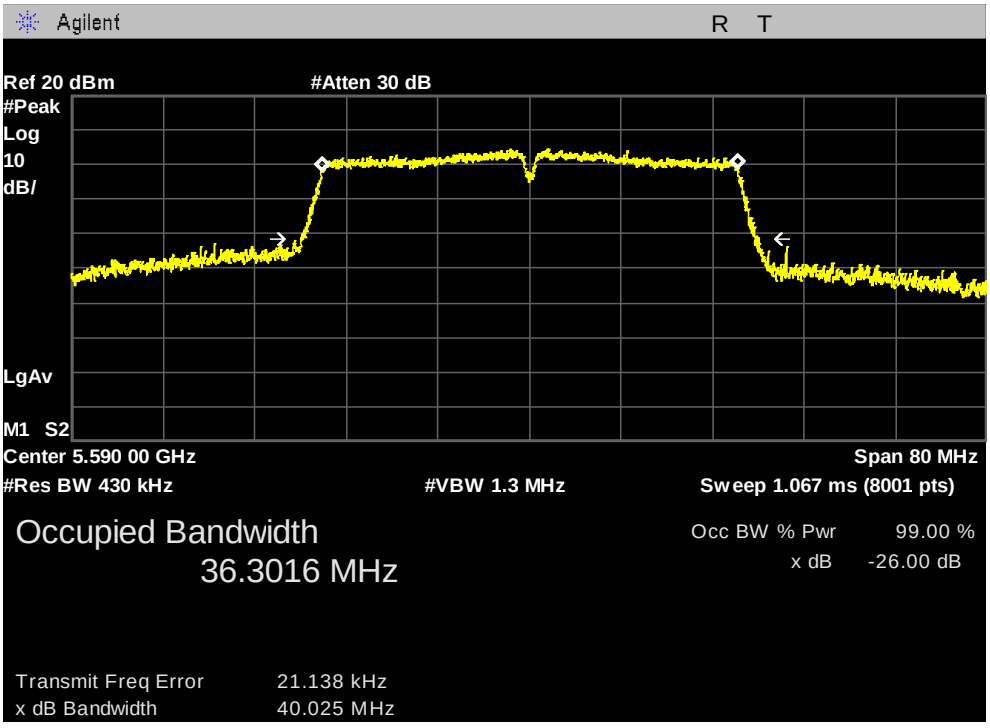
PLOTS OF EMISSIONS

802.11ac (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5510 MHz)

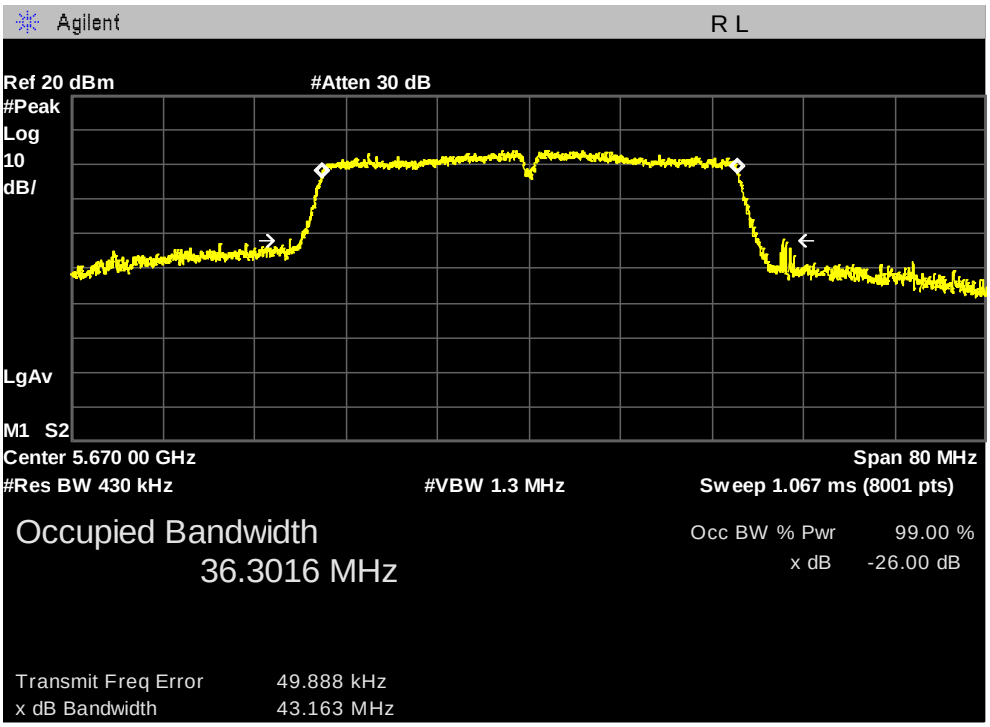


26 dB Bandwidth, Middle Channel (5590 MHz)



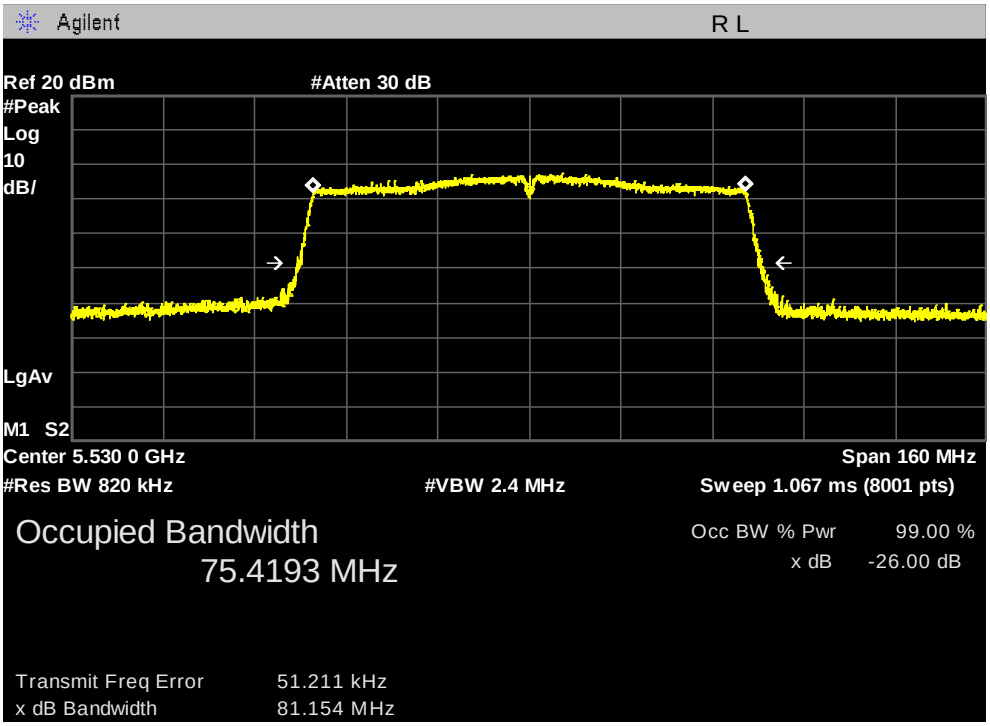
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5670 MHz)



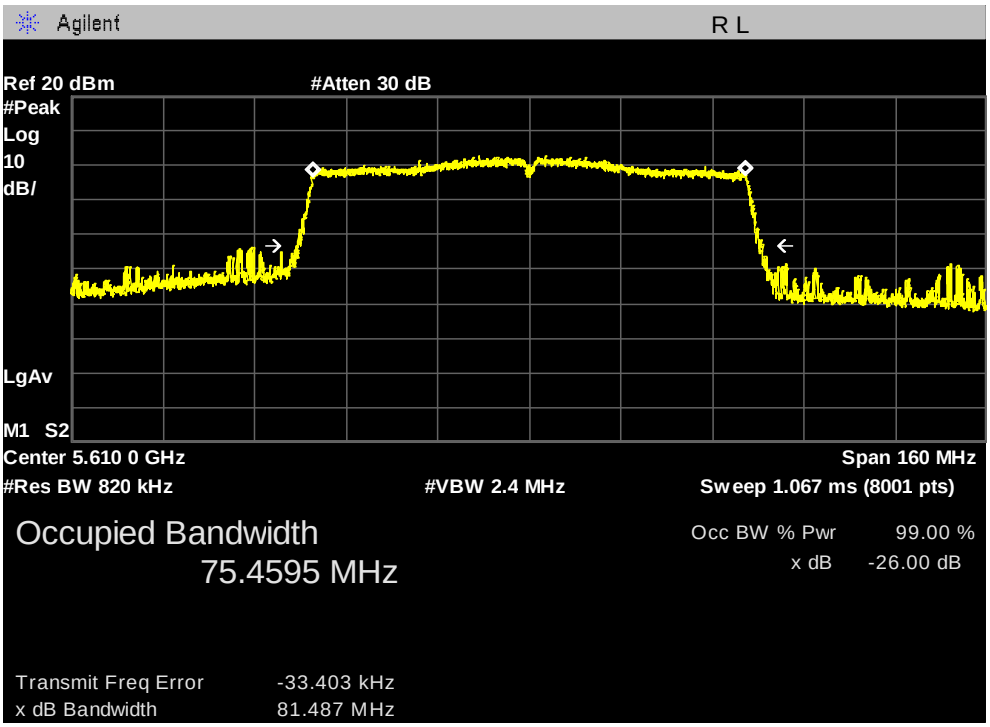
802.11ac (80 MHz) mode

26 dB Bandwidth, Lowest Channel (5530 MHz)



PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5610 MHz)



8.3.4 26 dB Bandwidth and 99 % Occupied bandwidth – U-NII-3 band

FCC §15.407(a)

Test Mode : Set to Straddle channel, Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5745	21.22	16.68
Middle	5785	21.21	16.70
Highest	5825	21.04	16.67

802.11n (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5745	21.56	17.85
Middle	5785	21.52	17.86
Highest	5825	21.47	17.85

802.11n (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5755	43.35	36.34
Highest	5795	42.95	36.32

TEST DATA

802.11ac (20 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5745	21.57	17.85
Middle	5785	21.51	17.86
Highest	5825	21.40	17.83

802.11ac (40 MHz) mode

Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Lowest	5755	40.30	36.29
Highest	5795	41.60	36.28

802.11ac (80 MHz) mode

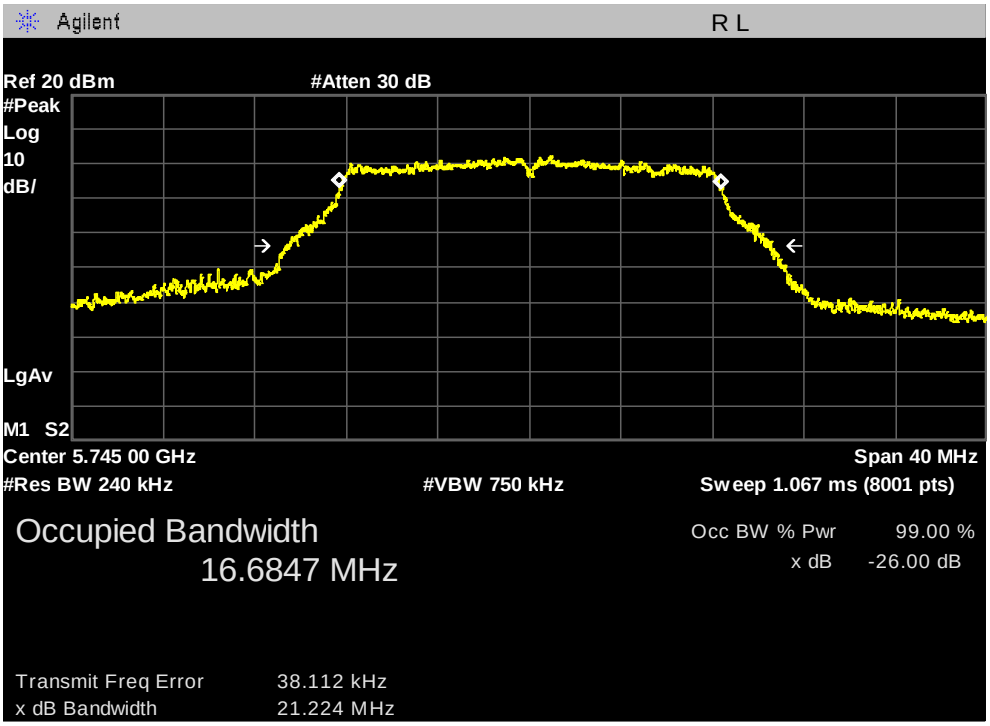
Channel	Frequency (MHz)	26 dB Bandiwidth (MHz)	99% Occupied Bandwidth (MHz)
Middle	5775	81.64	75.56

Note:
The worst ant port was determined by the conducted output power that generates the highest emission performing pre-scan testing in all ant port of each mode.

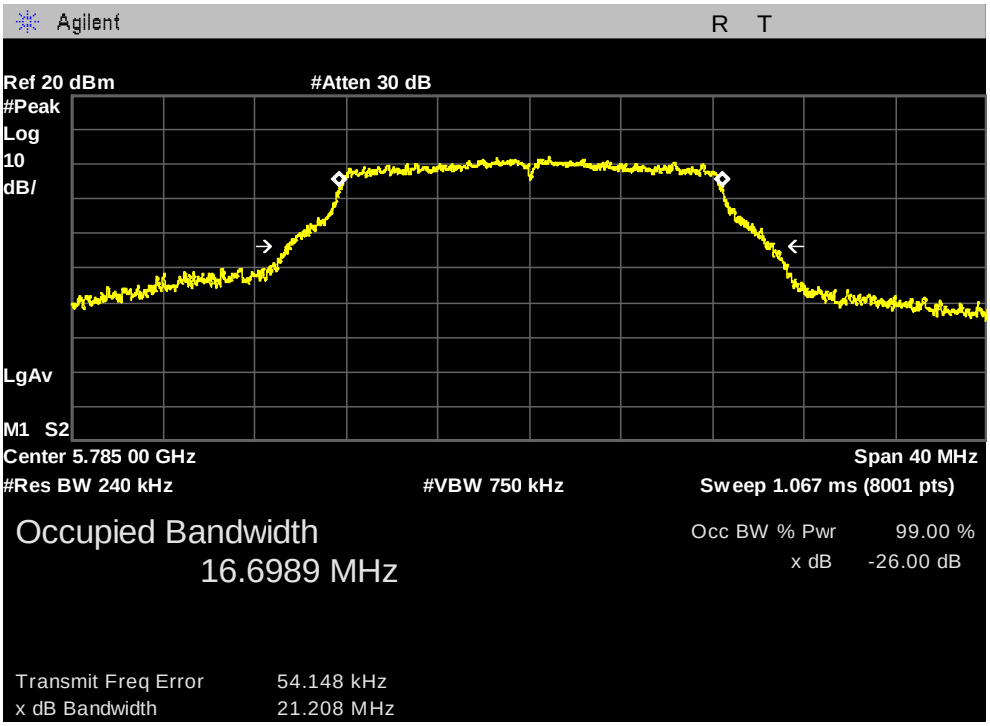
PLOTS OF EMISSIONS

802.11a mode

26 dB Bandwidth, Lowest Channel (5745 MHz)

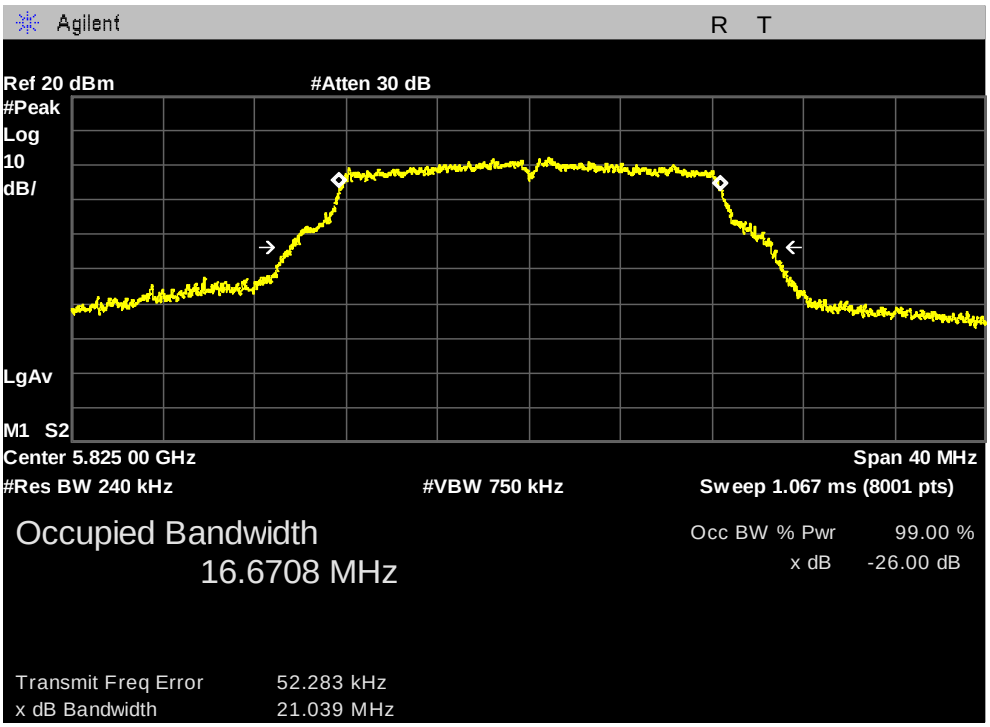


26 dB Bandwidth, Middle Channel (5785 MHz)



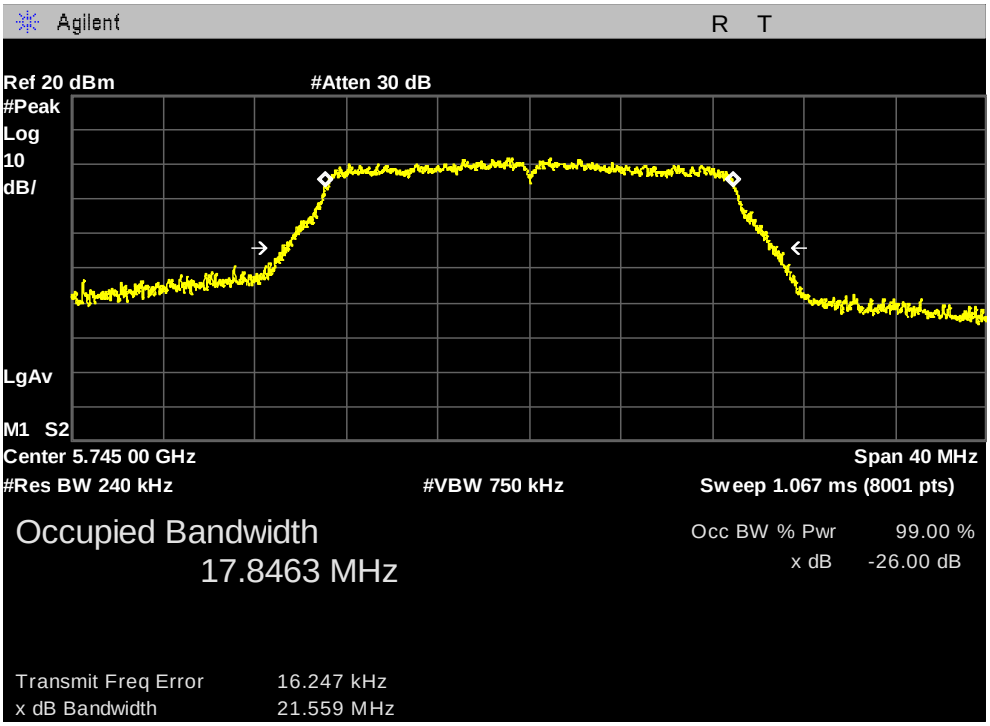
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5825 MHz)



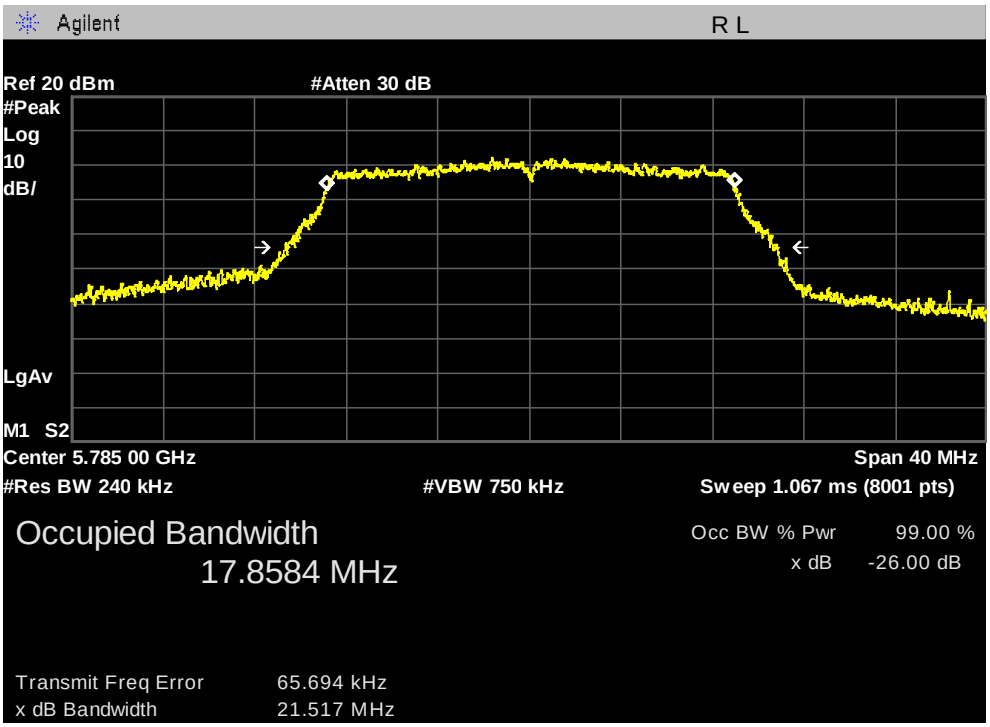
802.11n (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5745 MHz)

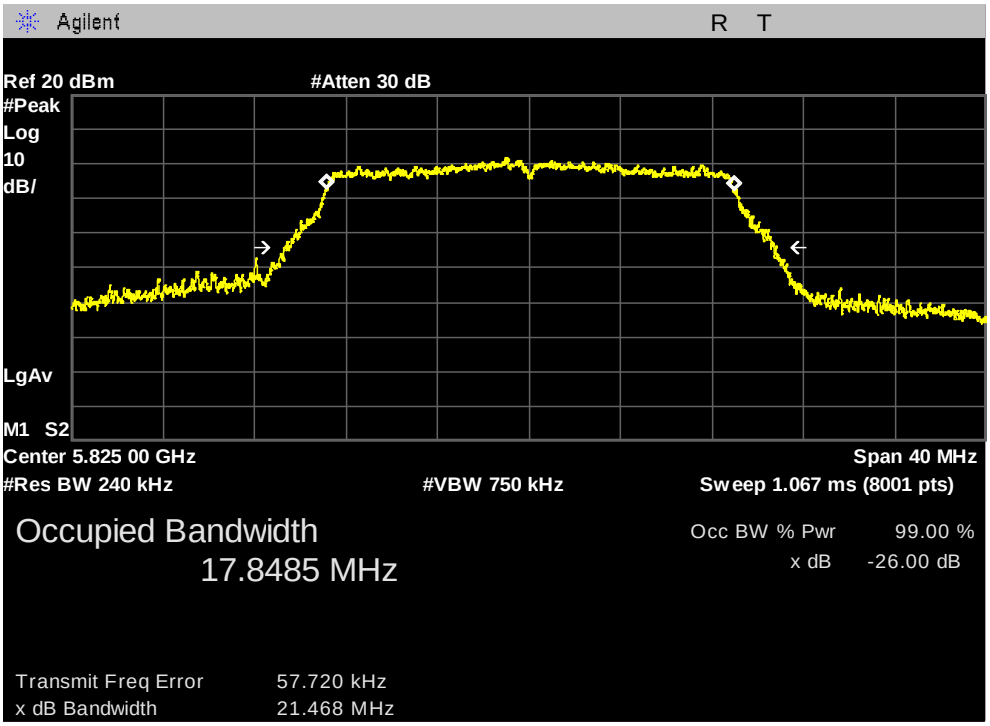


PLOTS OF EMISSIONS

26 dB Bandwidth, Middle Channel (5785 MHz)



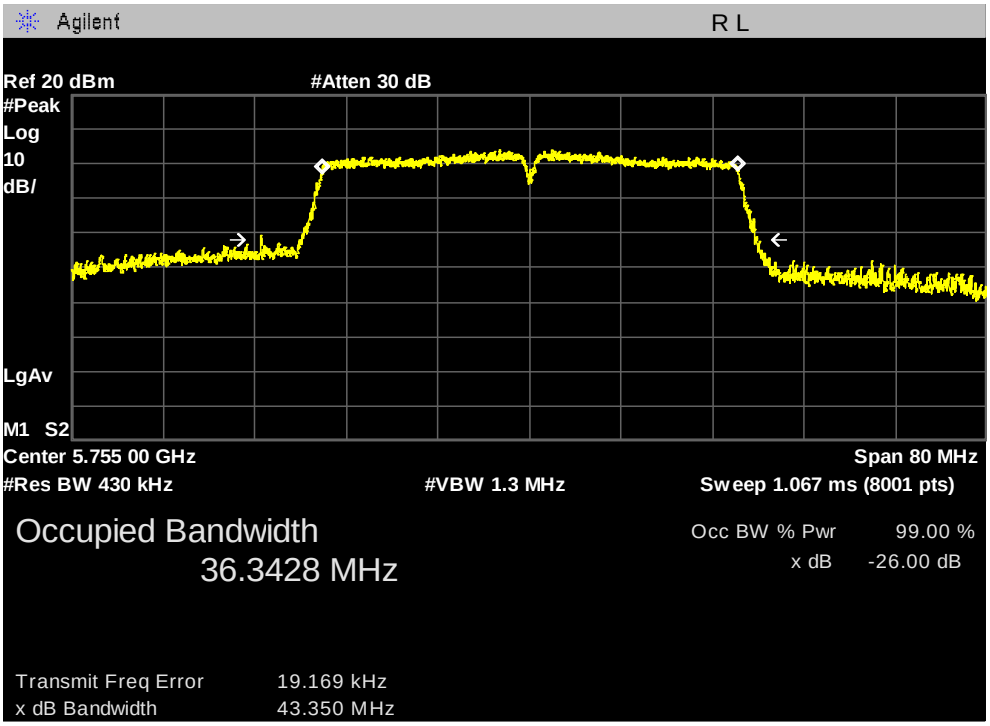
26 dB Bandwidth, Highest Channel (5825 MHz)



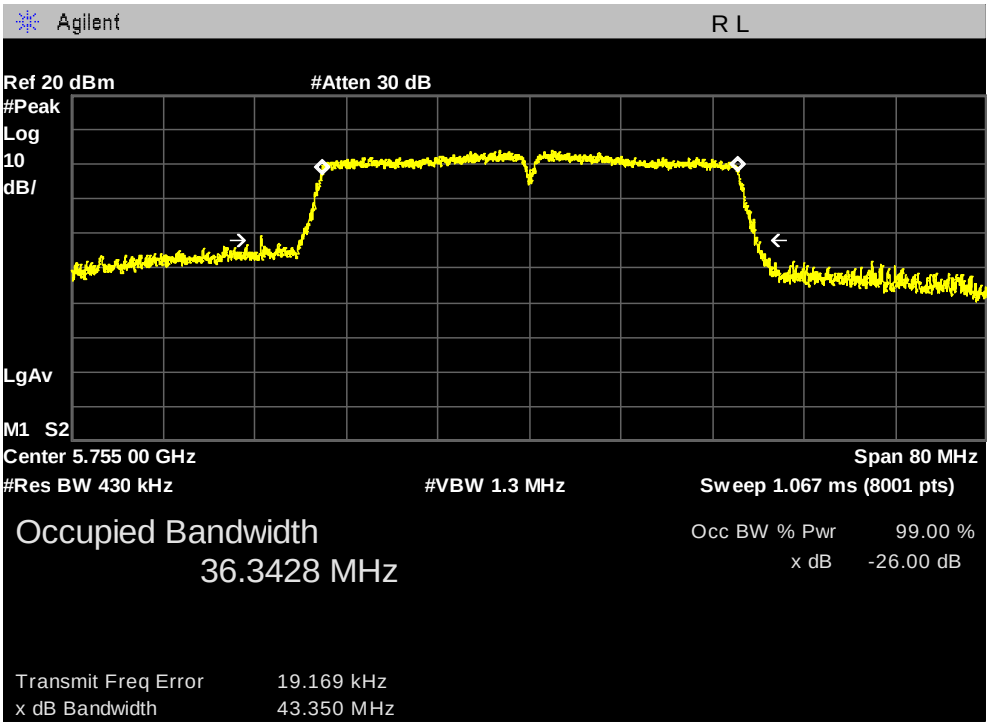
PLOTS OF EMISSIONS

802.11n (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5755 MHz)



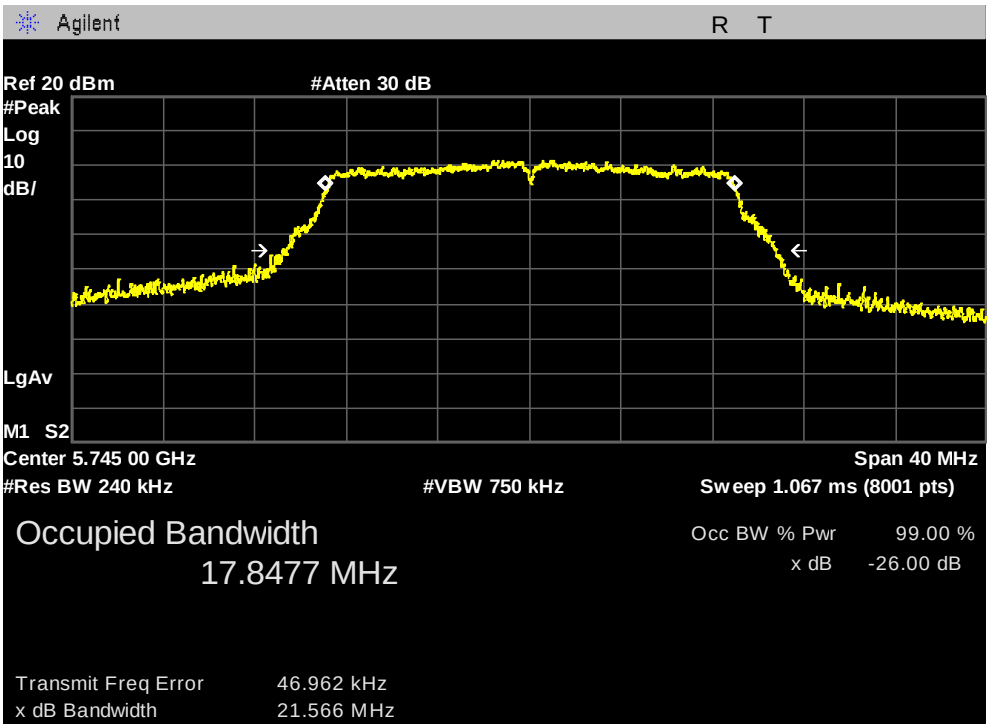
26 dB Bandwidth, Highest Channel (5795 MHz)



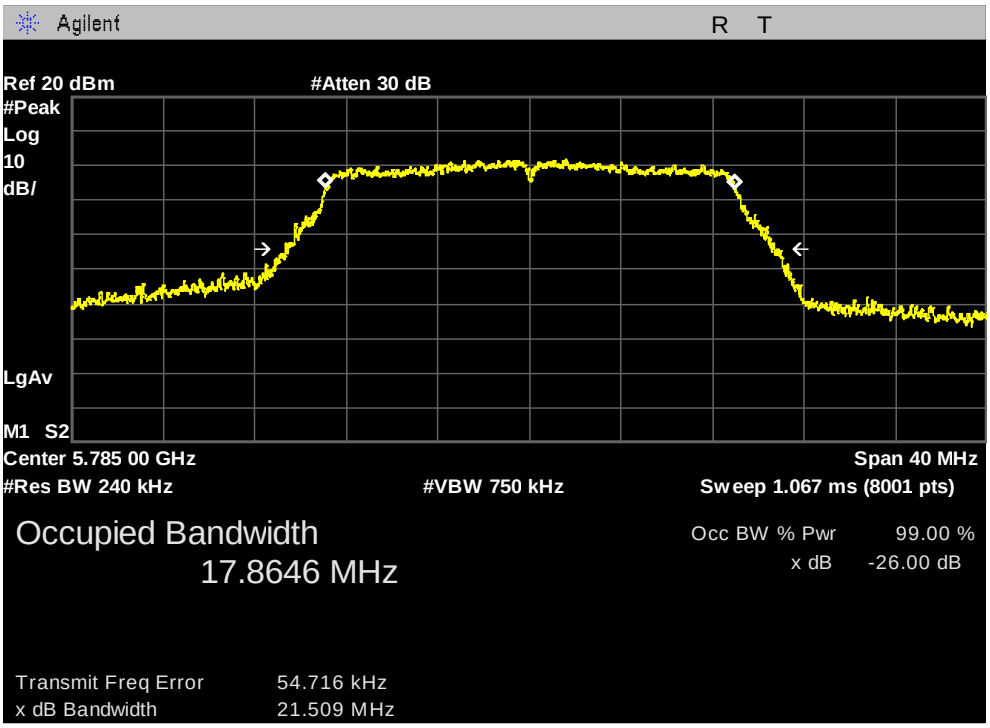
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode

26 dB Bandwidth, Lowest Channel (5745 MHz)

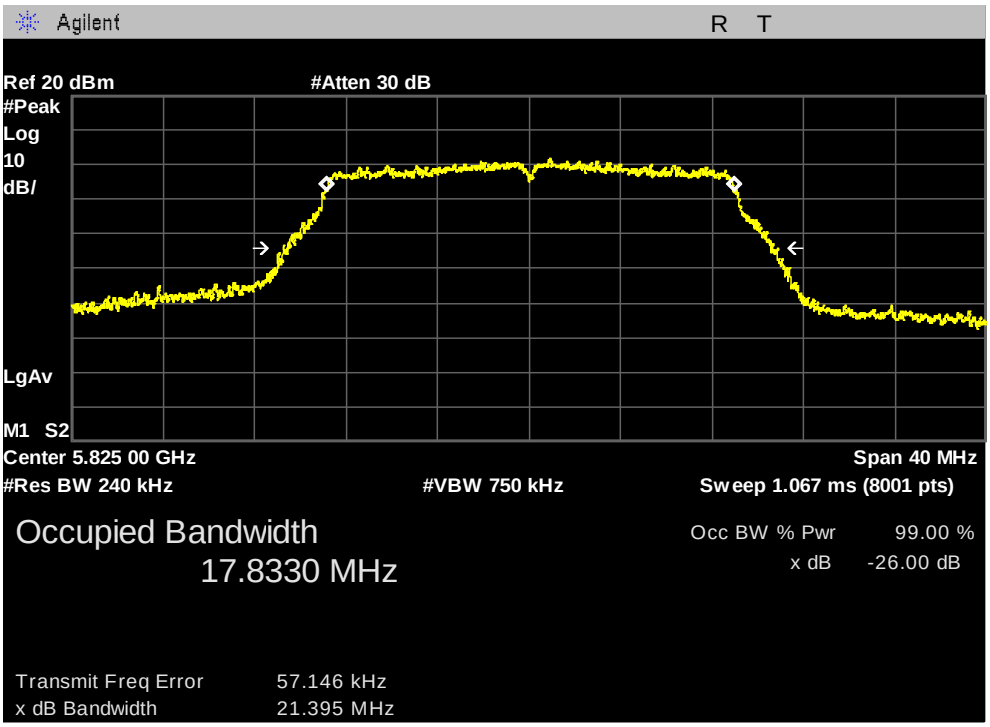


26 dB Bandwidth, Middle Channel (5785 MHz)



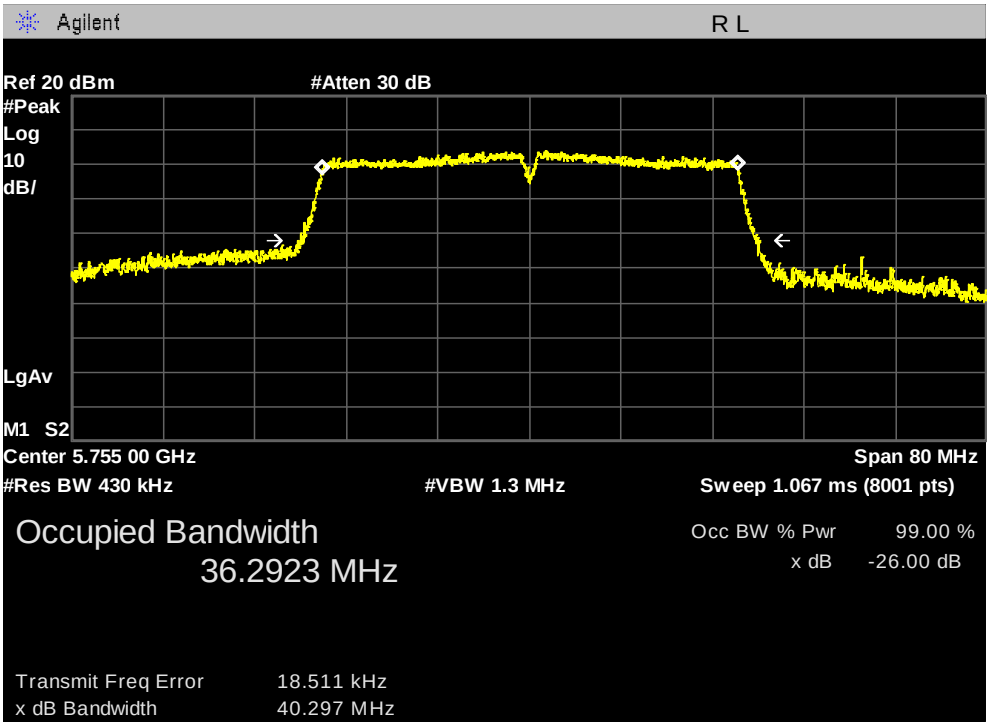
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5825 MHz)



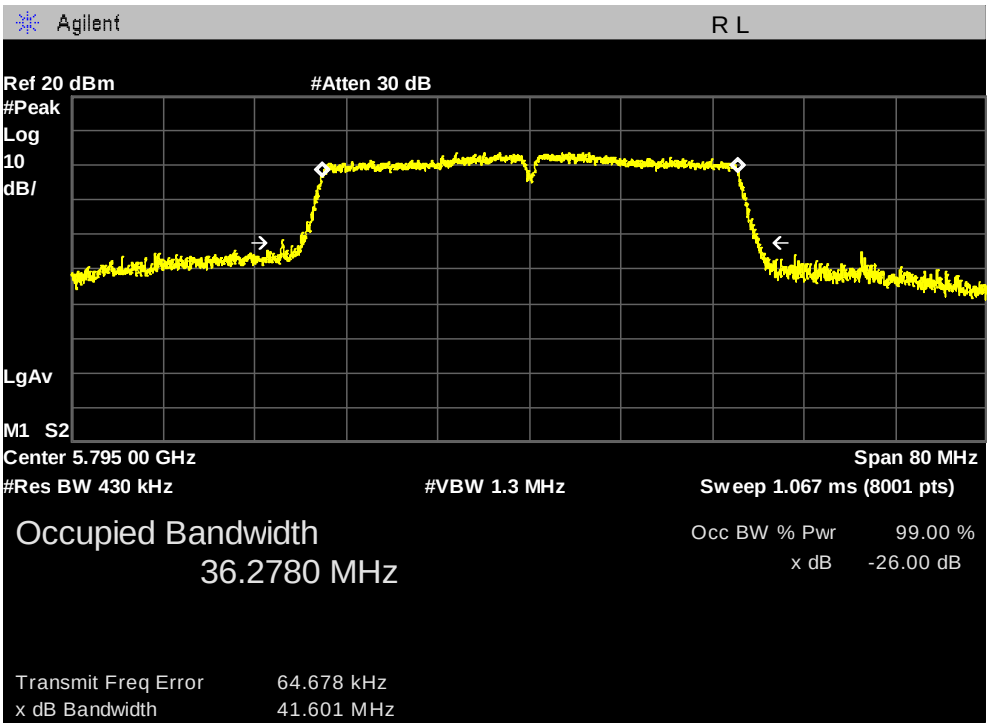
802.11ac (40 MHz) mode

26 dB Bandwidth, Lowest Channel (5755 MHz)



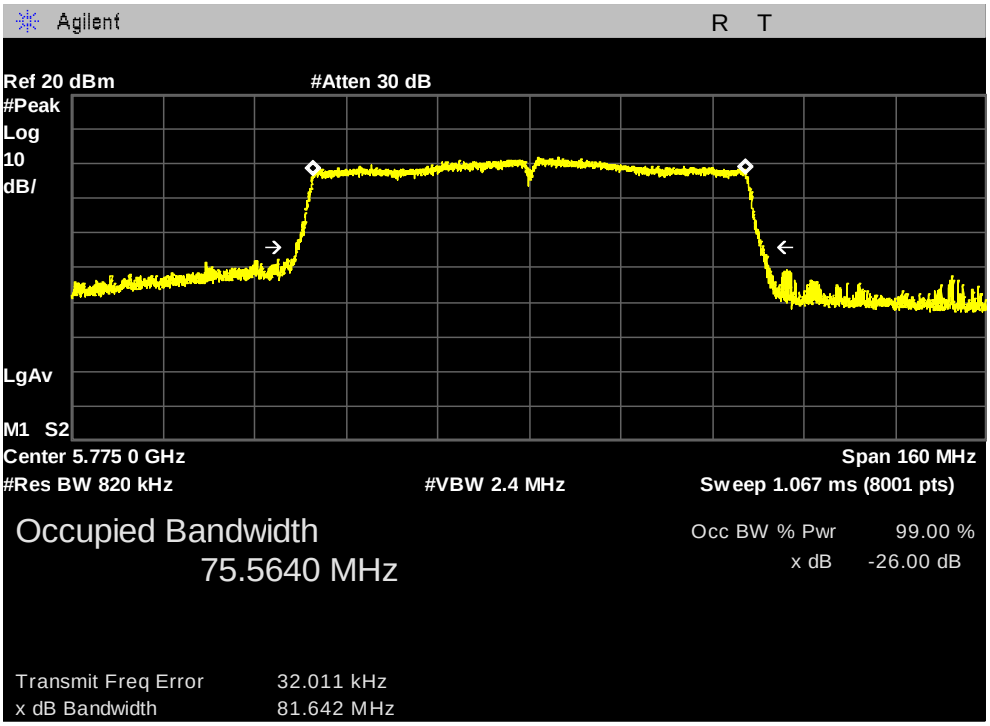
PLOTS OF EMISSIONS

26 dB Bandwidth, Highest Channel (5795 MHz)



802.11ac (80 MHz) mode

26 dB Bandwidth, Middle Channel (5775 MHz)



8.4 6 dB Bandwidth – UNII-3 band

FCC §15.407(e)

Test Mode : Set to Straddle channel, Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)
Lowest	5745	16.34	500.0
Middle	5785	16.33	
Highest	5825	16.32	

802.11n (20 MHz) mode

Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)
Lowest	5745	17.56	500.0
Middle	5785	17.54	
Highest	5825	17.31	

802.11n (40 MHz) mode

Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)
Lowest	5755	36.30	500.0
Highest	5795	36.08	

TEST DATA

802.11ac (20 MHz) mode

Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)
Lowest	5745	17.54	500.0
Middle	5785	17.56	
Highest	5825	17.54	

802.11ac (40 MHz) mode

Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)
Lowest	5755	36.31	500.0
Highest	5795	36.29	

802.11ac (80 MHz) mode

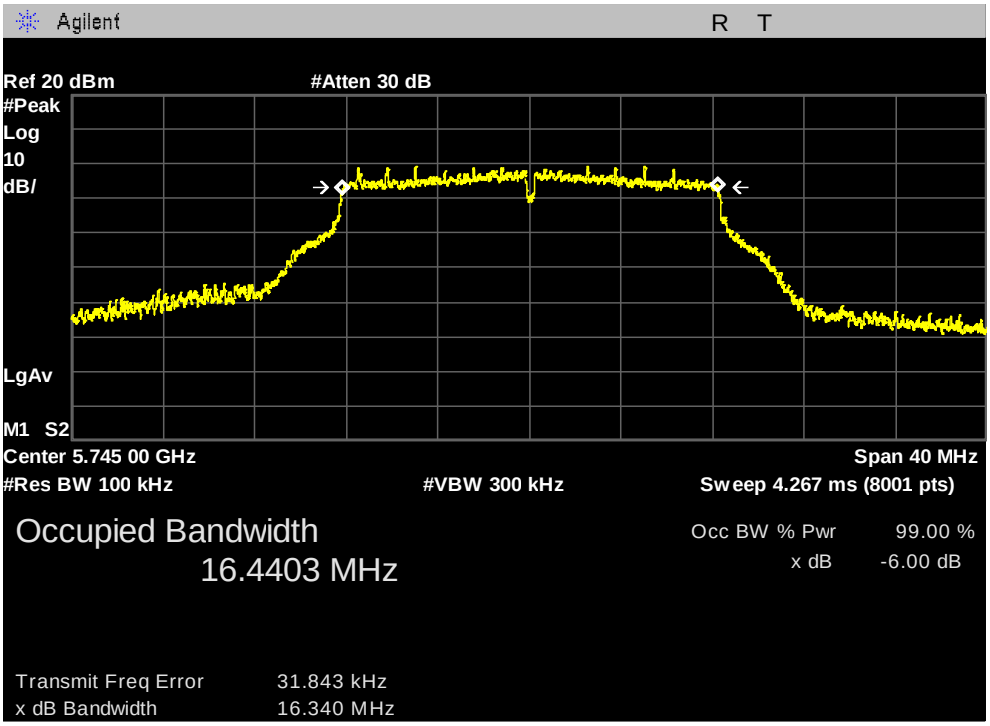
Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)
Middle	5775	75.56	500.0

Note:
The worst ant port was determined by the conducted output power that generates the highest emission performing pre-scan testing in all ant port of each mode.

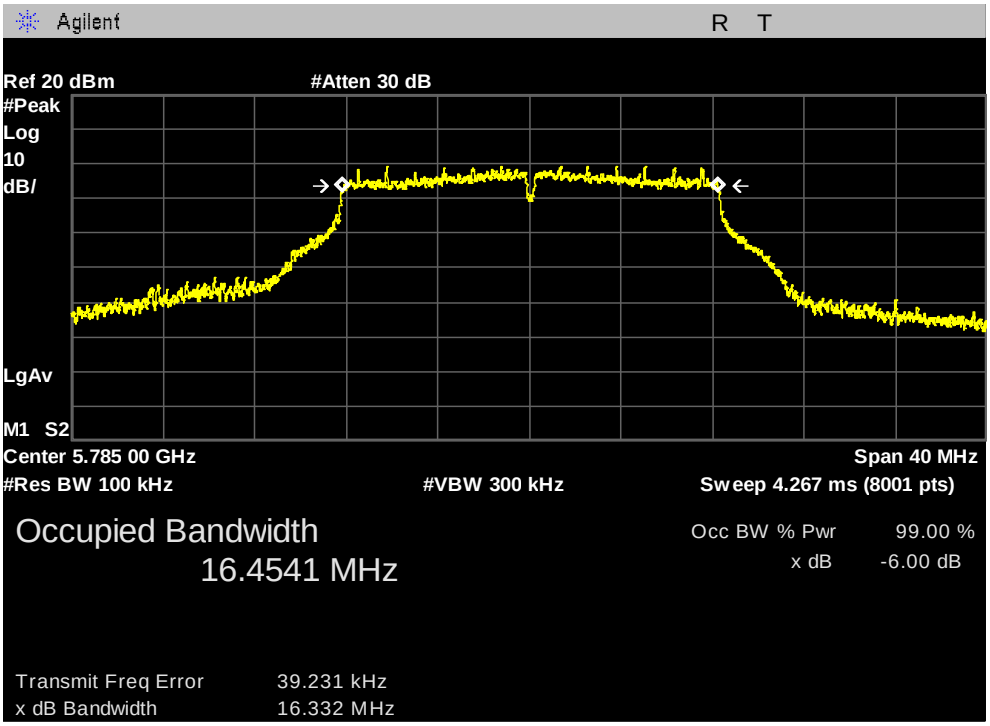
PLOTS OF EMISSIONS

802.11a mode

6 dB Bandwidth, Lowest Channel (5745 MHz)

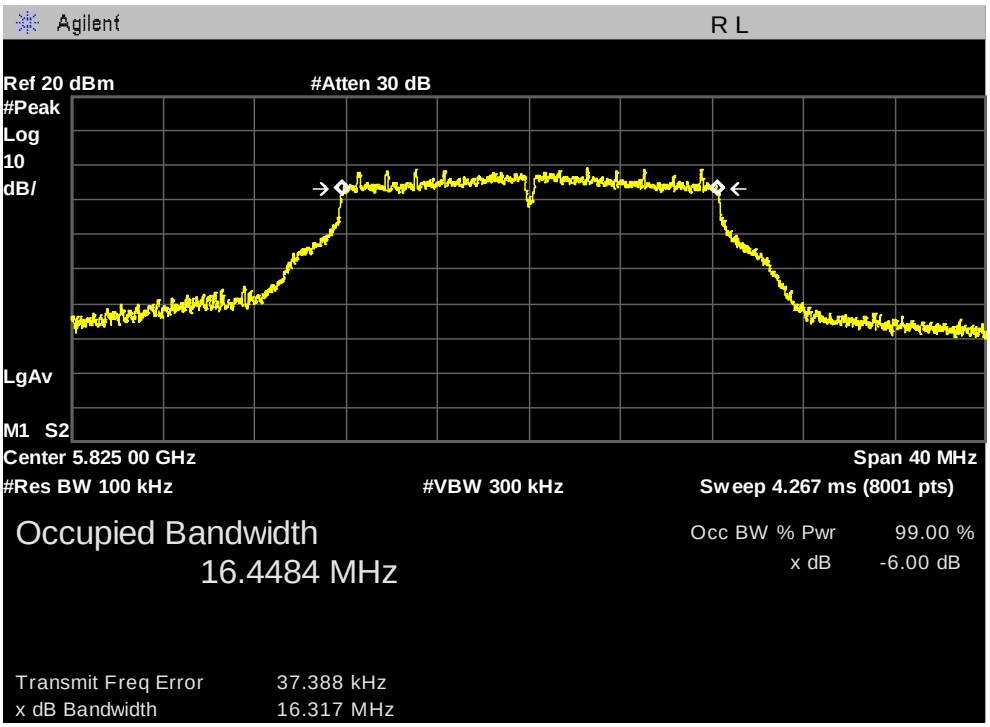


6 dB Bandwidth, Middle Channel (5785 MHz)



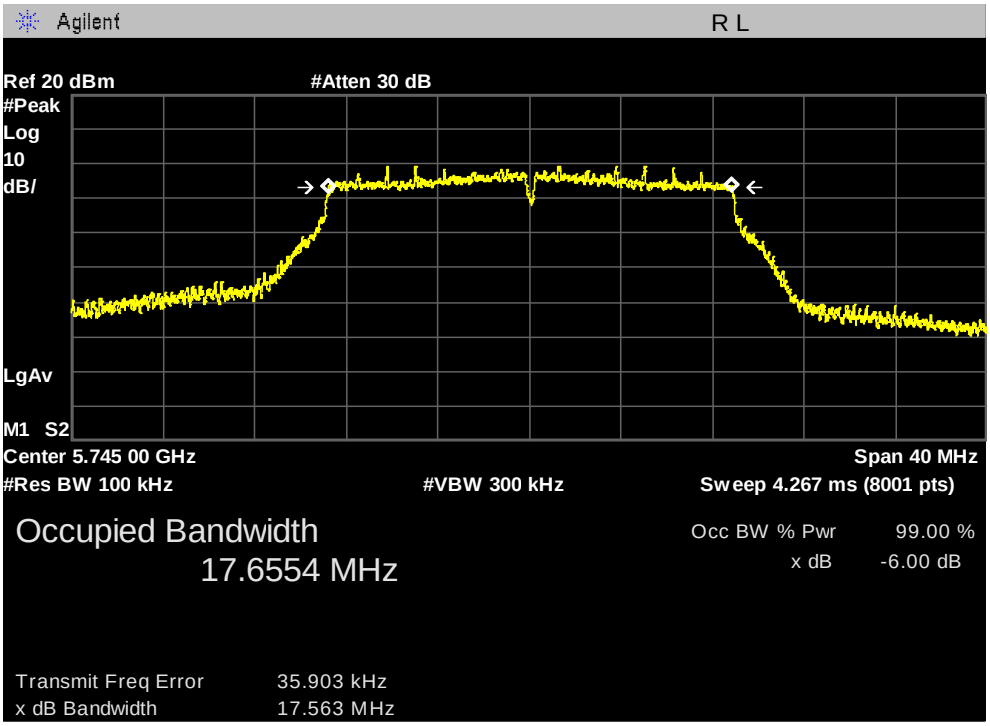
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (5825 MHz)



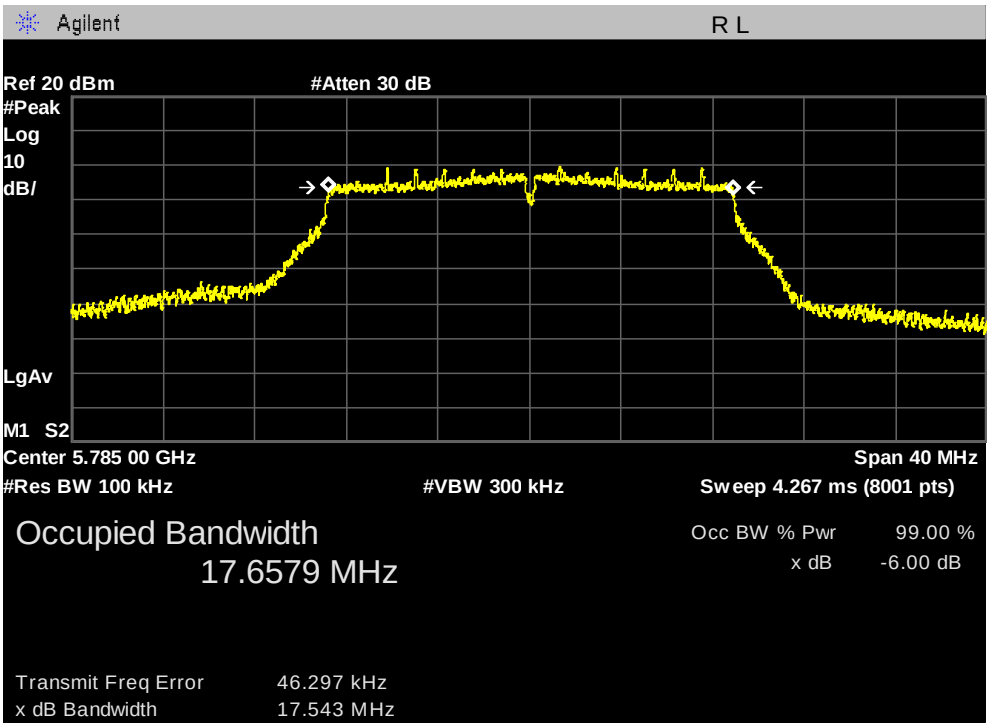
802.11n (20 MHz) mode

6 dB Bandwidth, Lowest Channel (5745 MHz)

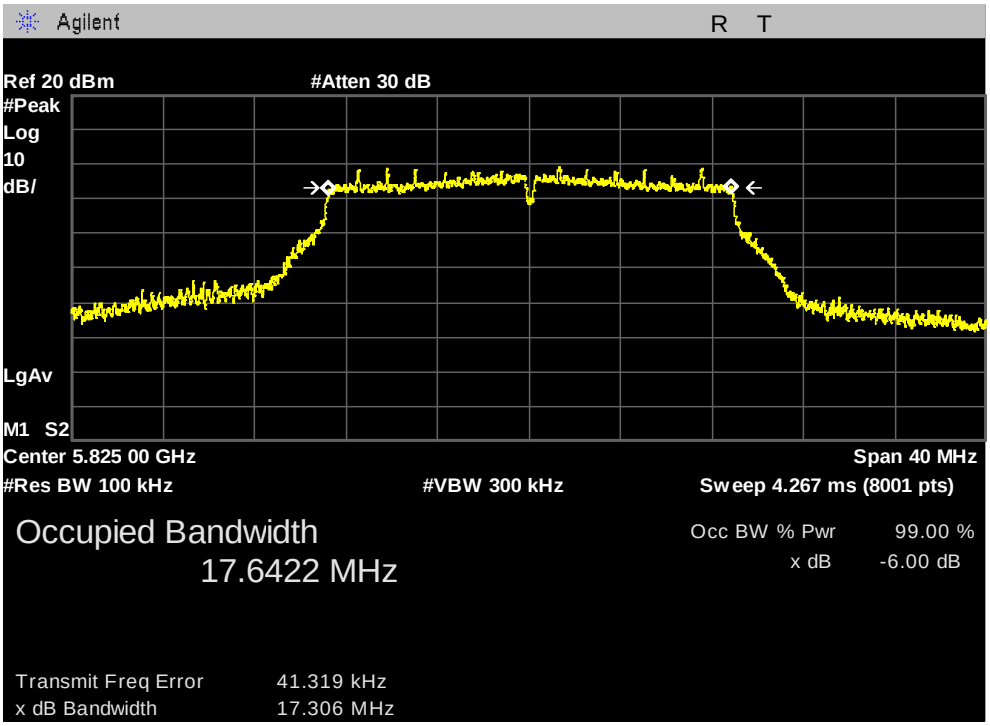


PLOTS OF EMISSIONS

6 dB Bandwidth, Middle Channel (5785 MHz)



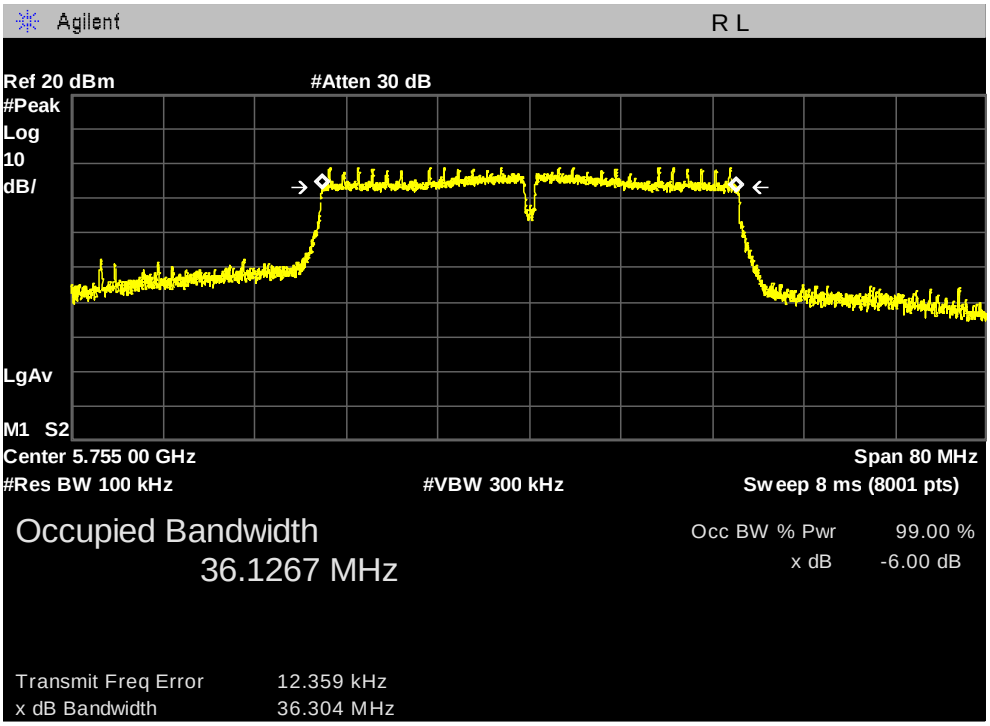
6 dB Bandwidth, Highest Channel (5825 MHz)



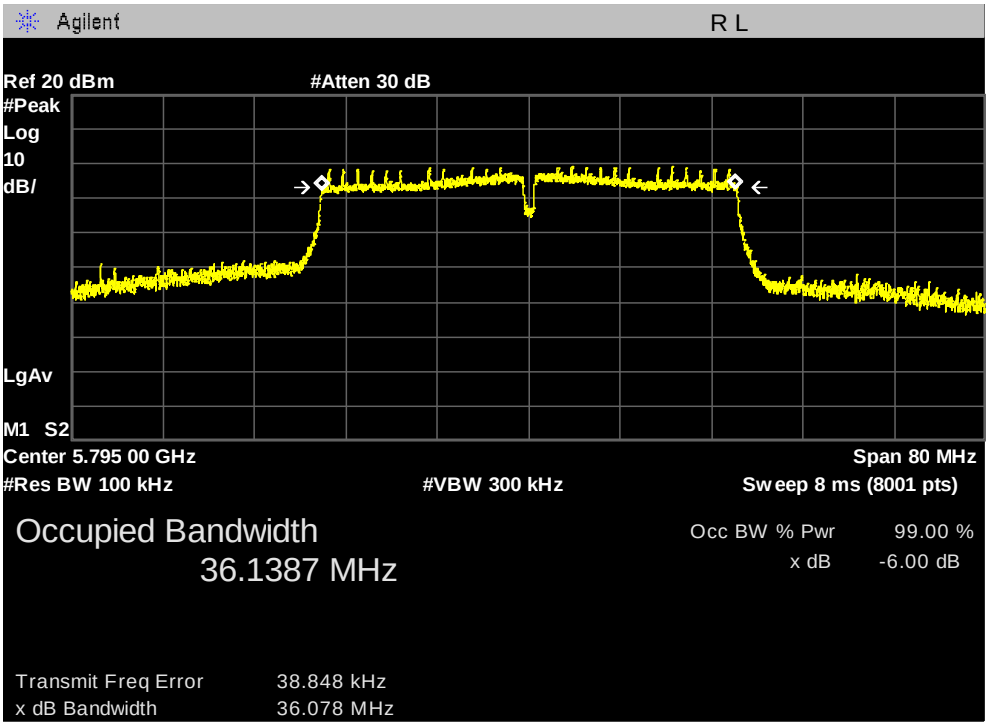
PLOTS OF EMISSIONS

802.11n (40 MHz) mode

6 dB Bandwidth, Lowest Channel (5755 MHz)



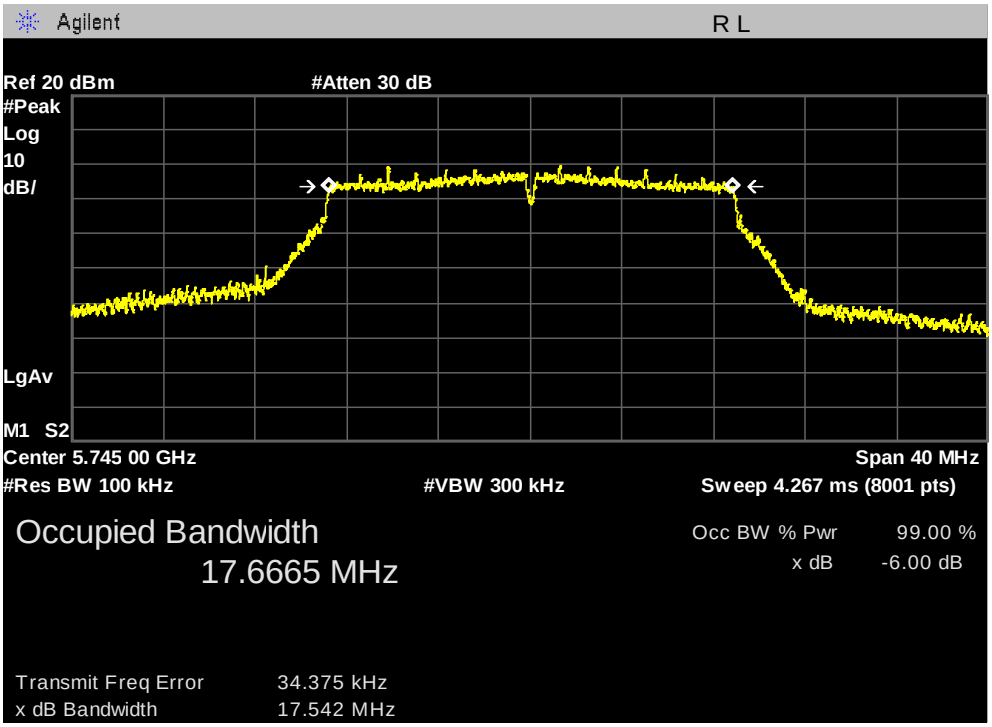
6 dB Bandwidth, Highest Channel (5795 MHz)



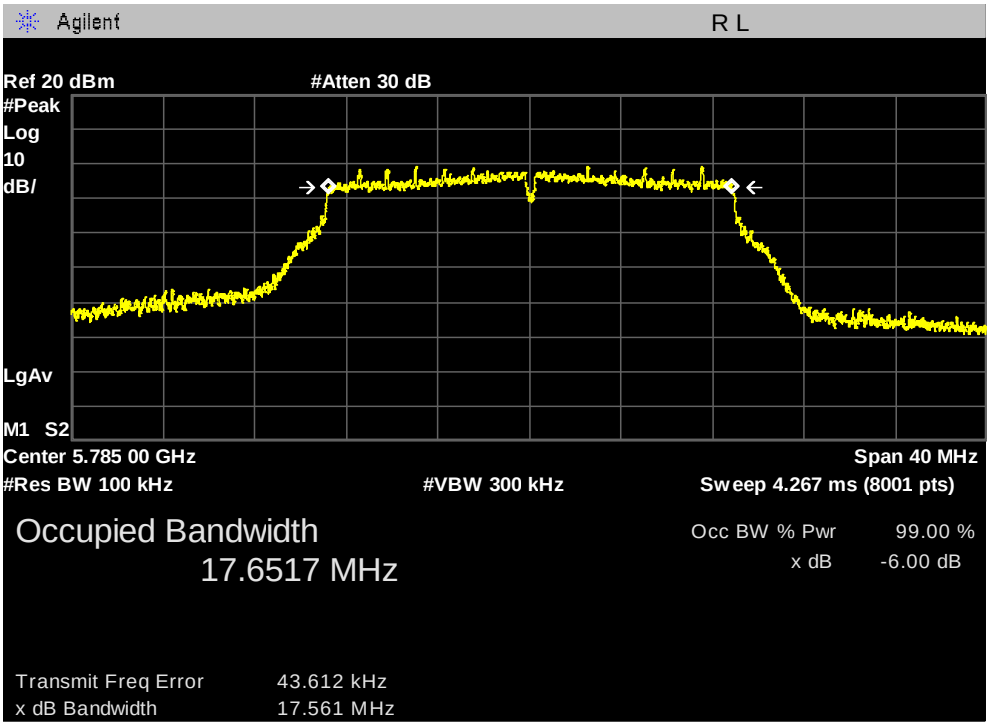
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode

6 dB Bandwidth, Lowest Channel (5745 MHz)

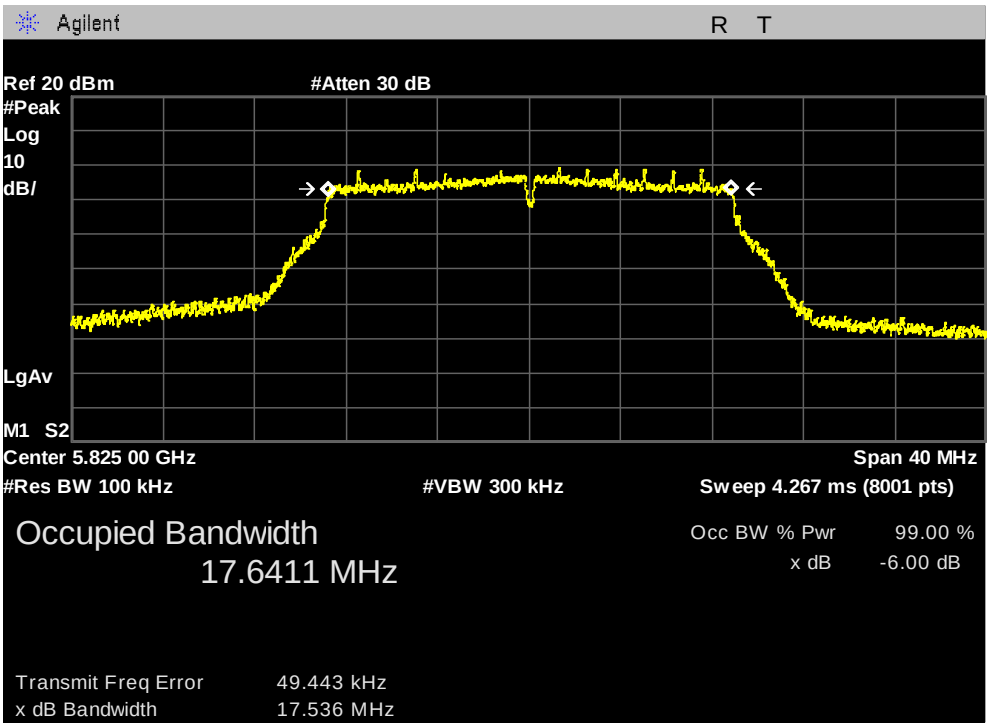


6 dB Bandwidth, Middle Channel (5785 MHz)



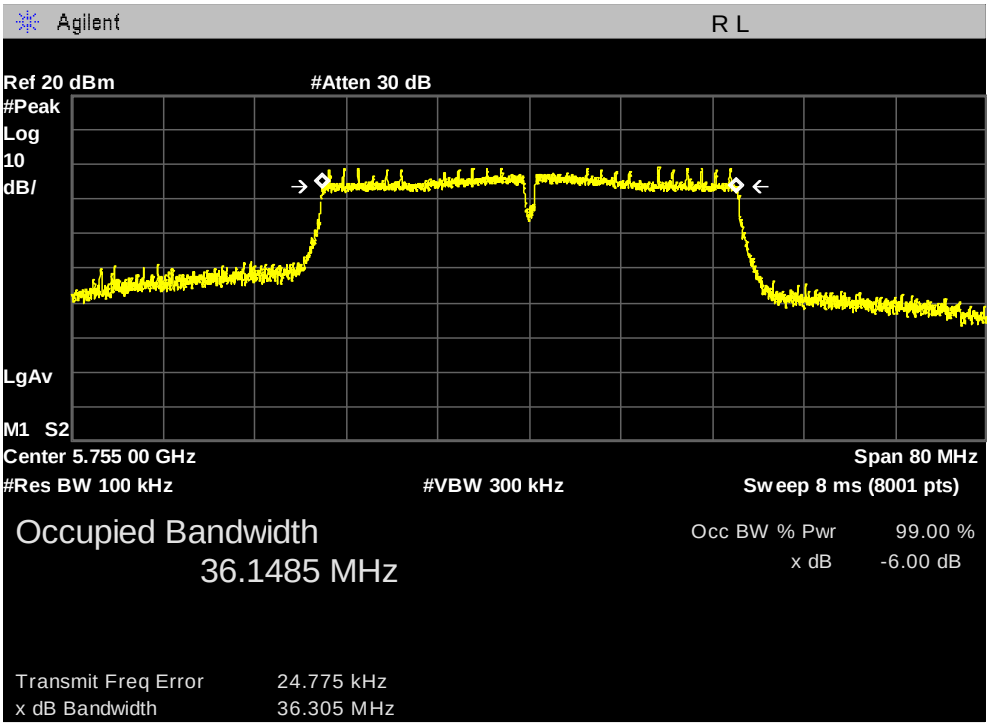
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (5825 MHz)



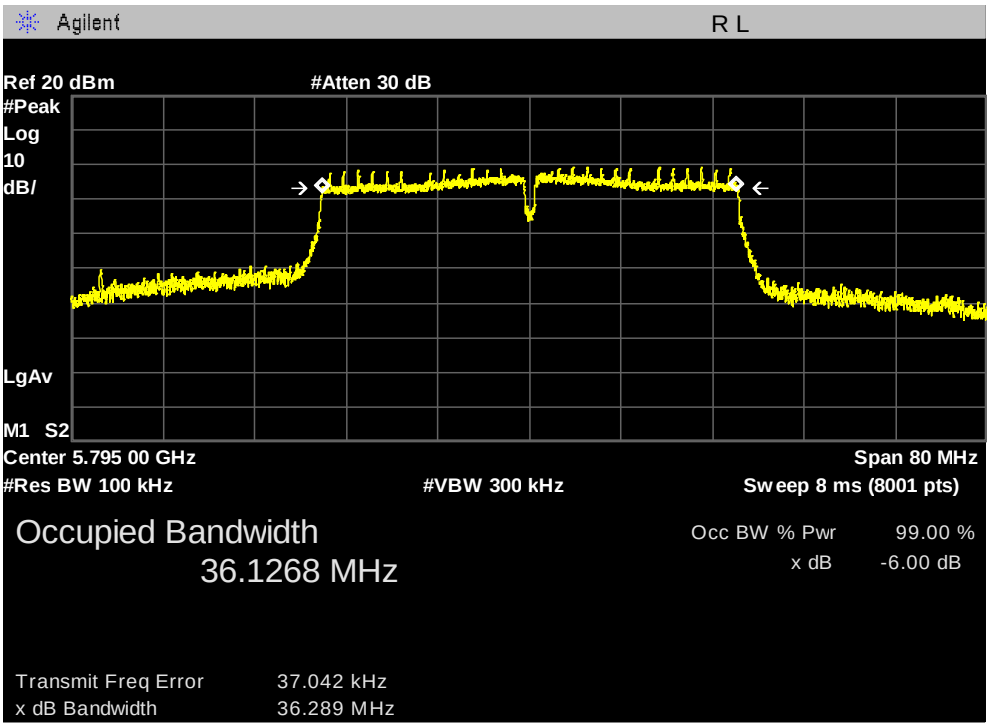
802.11ac (40 MHz) mode

6 dB Bandwidth, Lowest Channel (5755 MHz)



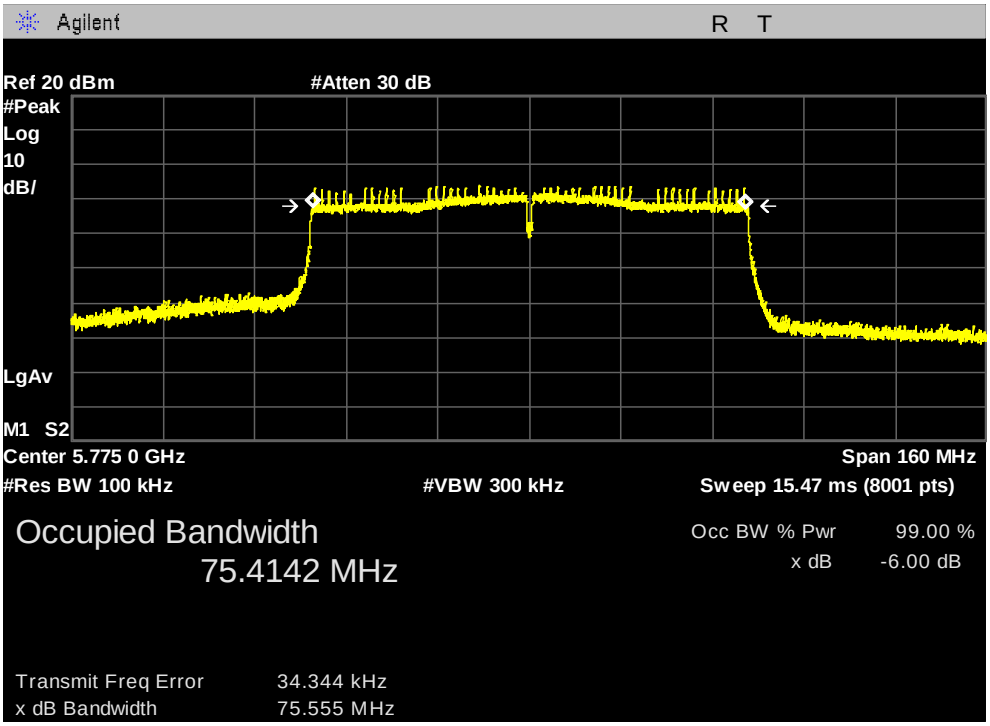
PLOTS OF EMISSIONS

6 dB Bandwidth, Highest Channel (5795 MHz)



802.11ac (80 MHz) mode

6 dB Bandwidth, Middle Channel (5775 MHz)



8.5 Maximum Conducted Output Power (average)

8.5.1 Maximum Conducted Output Power – U-NII-1 band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5180	5.6	0.07	5.67	23.98
Middle	5220	7.77	0.07	7.84	23.98
Highest	5240	7.70	0.07	7.77	23.98

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5180	5.49	0.10	5.59	23.98
Middle	5220	7.69	0.10	7.79	23.98
Highest	5240	7.49	0.10	7.59	23.98

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5180	5.46	5.82	0.10	8.75	23.98
Middle	5220	7.83	7.78	0.10	10.92	23.98
Highest	5240	7.64	7.68	0.10	10.77	23.98

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5190	4.12	0.16	4.28	23.98
Highest	5230	10.03	0.16	10.19	23.98

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5190	4.09	4.98	0.16	7.73	23.98
Highest	5230	10.25	10.49	0.16	13.54	23.98

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5180	5.52	0.07	5.59	23.98
Middle	5220	7.66	0.07	7.73	23.98
Highest	5240	7.47	0.07	7.54	23.98

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5180	5.59	6.02	0.07	8.89	23.98
Middle	5220	7.68	7.79	0.07	10.82	23.98
Highest	5240	7.69	7.82	0.07	10.84	23.98

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5190	4.13	0.19	4.32	23.98
Highest	5230	10.27	0.19	10.46	23.98

TEST DATA

802.11ac (40MHz) mode _2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5190	4.12	5.24	0.19	7.92	23.98
Highest	5230	10.21	10.45	0.19	13.53	23.98

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Middle	5210	7.16	0.34	7.50	23.98

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Middle	5210	7.40	7.34	0.34	10.72	23.98

TEST DATA

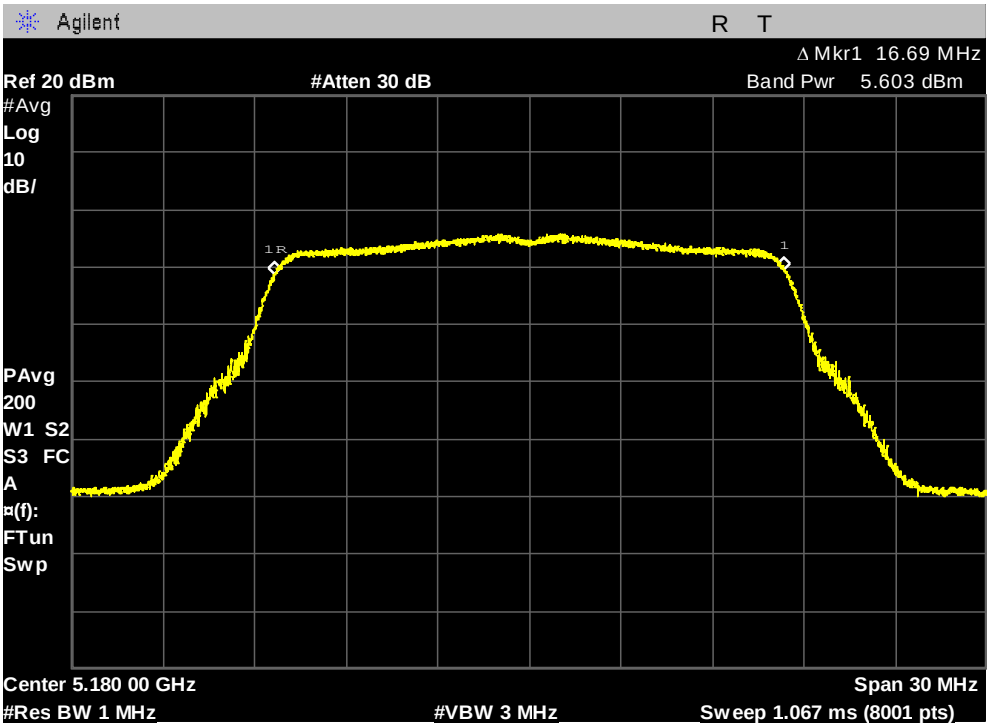
Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor*
2. *Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}*
3. *For CDD transmission, directional gain is.* ***2.79 dBi.***
   For MIMO transmission, directional gain is ***2.79 dBi.***
   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
   For power measurements on IEEE 802.11 devices employing CDD, directional gain is as follows,
   Directional gain = G_{ANT} + Array Gain = 2.79 dBi + 0 dB = 2.79 dBi.
   Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
   Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.
   For power measurements on all devices employing MIMO, directional gain is as follows,
   ***Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi = 2.79 dBi + 10 log(2/2) dB = 2.79 dBi**.*
   where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. *For n(20MHz, 40MHz),ac (20MHz,40MHz,80MHz) mode, Beamforming gain is 3.01 dBi*
5. *The following equation was used for spectrum offset:*
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

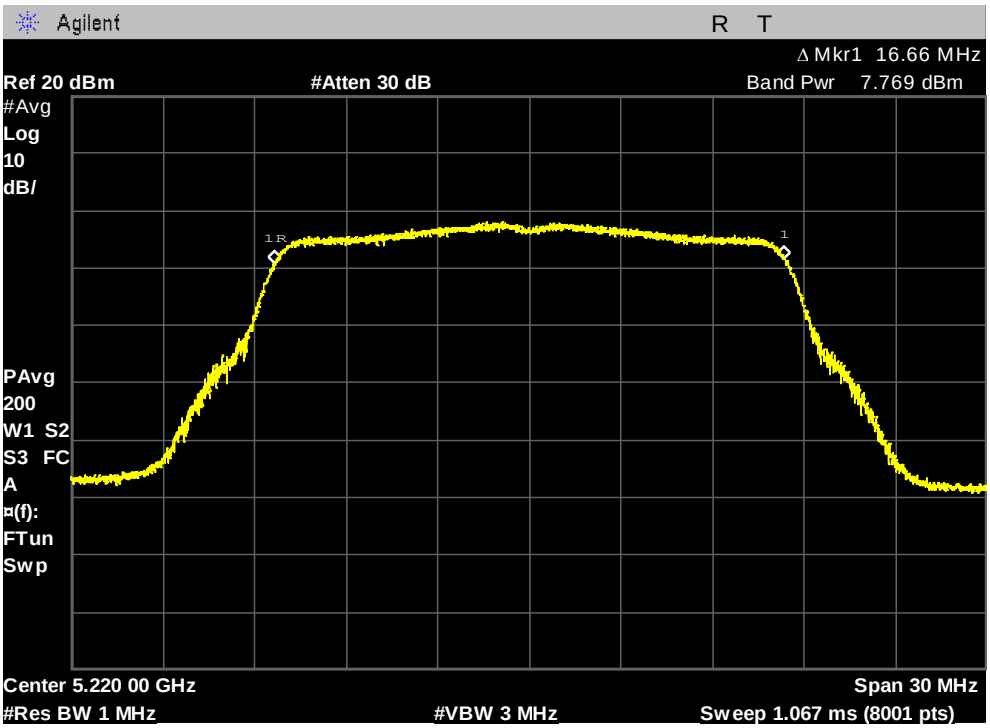
PLOTS OF EMISSIONS

802.11a mode

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

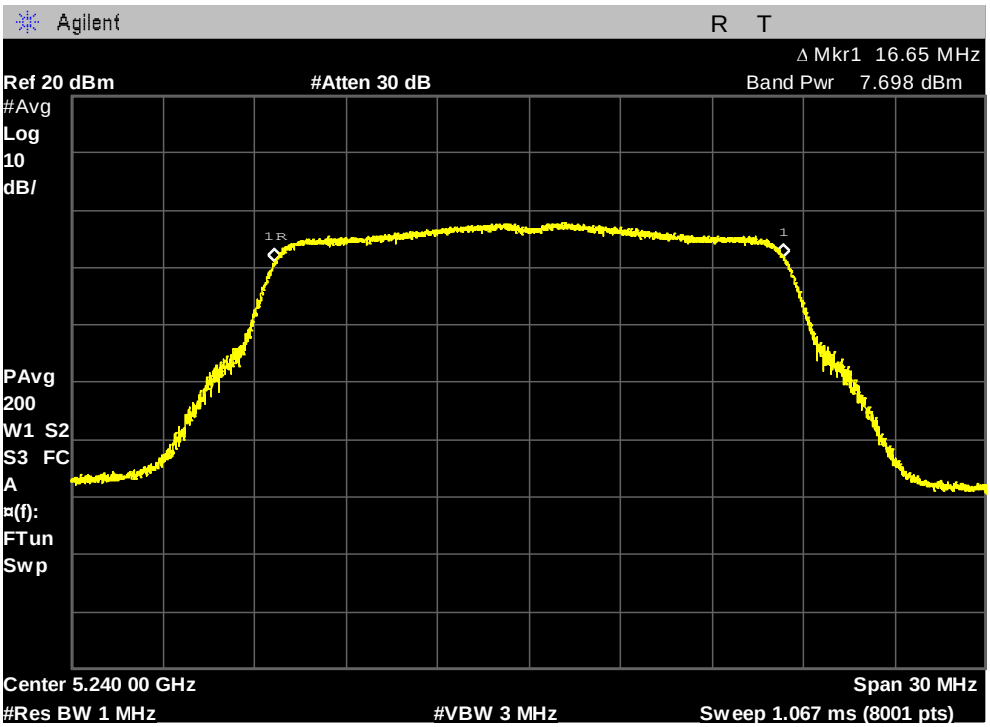


Maximum Conducted Output Power, Middle Channel (5220 MHz)



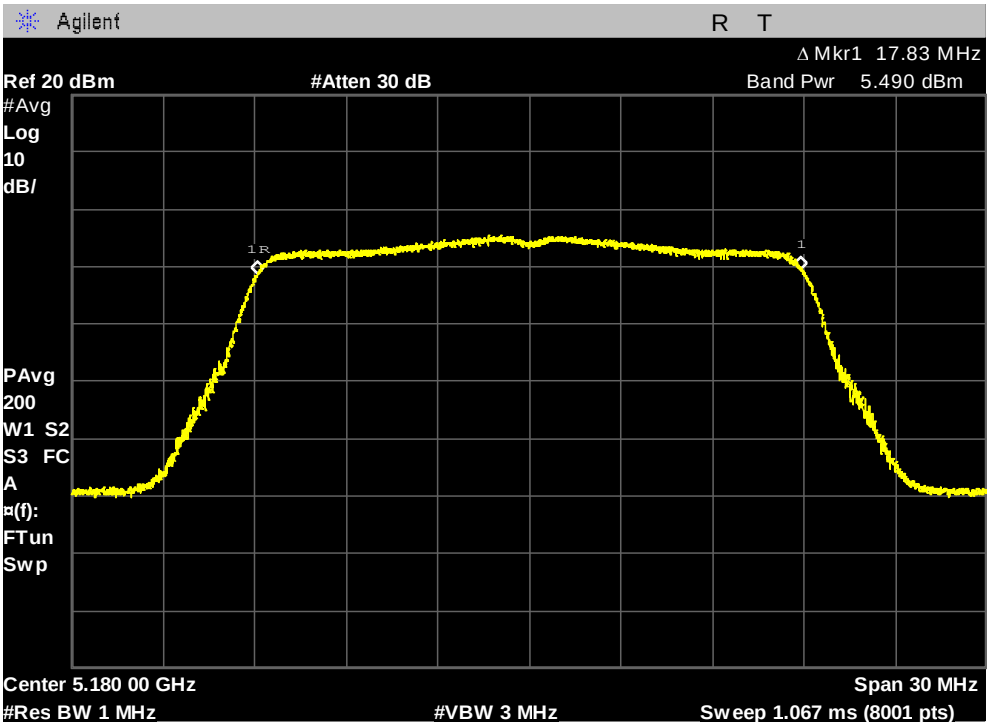
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5240 MHz)



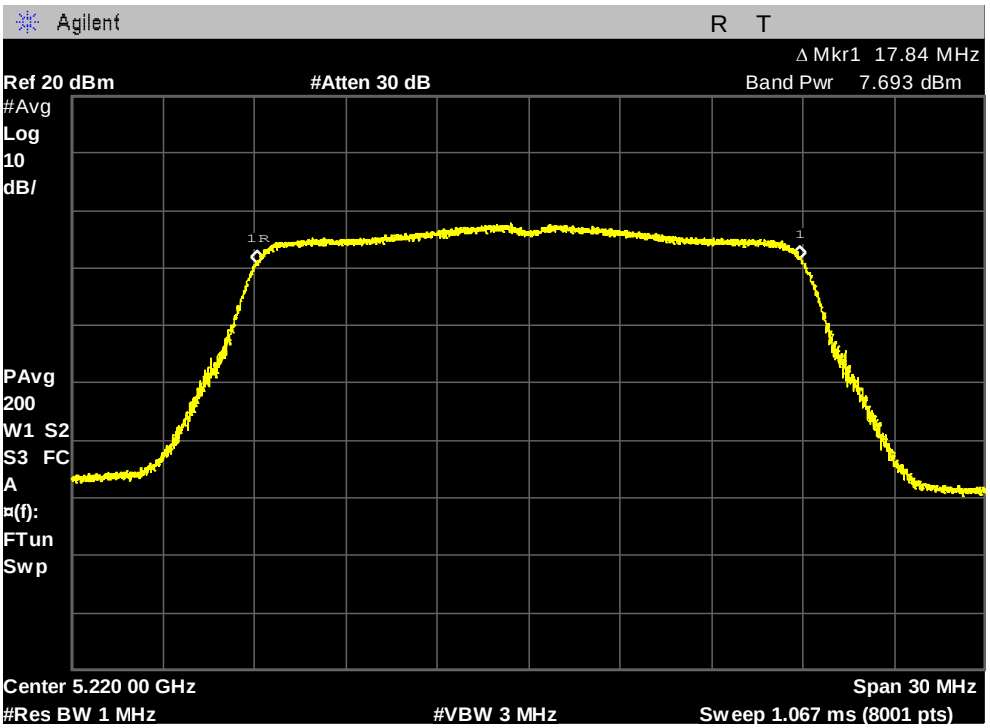
802.11n(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

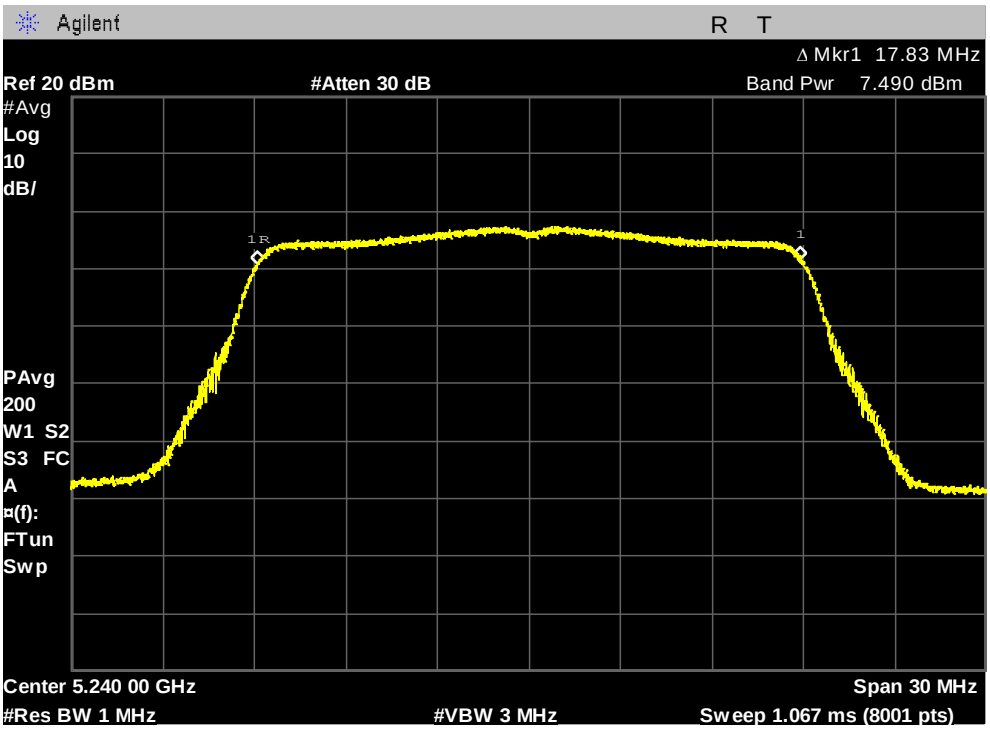


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5220 MHz)



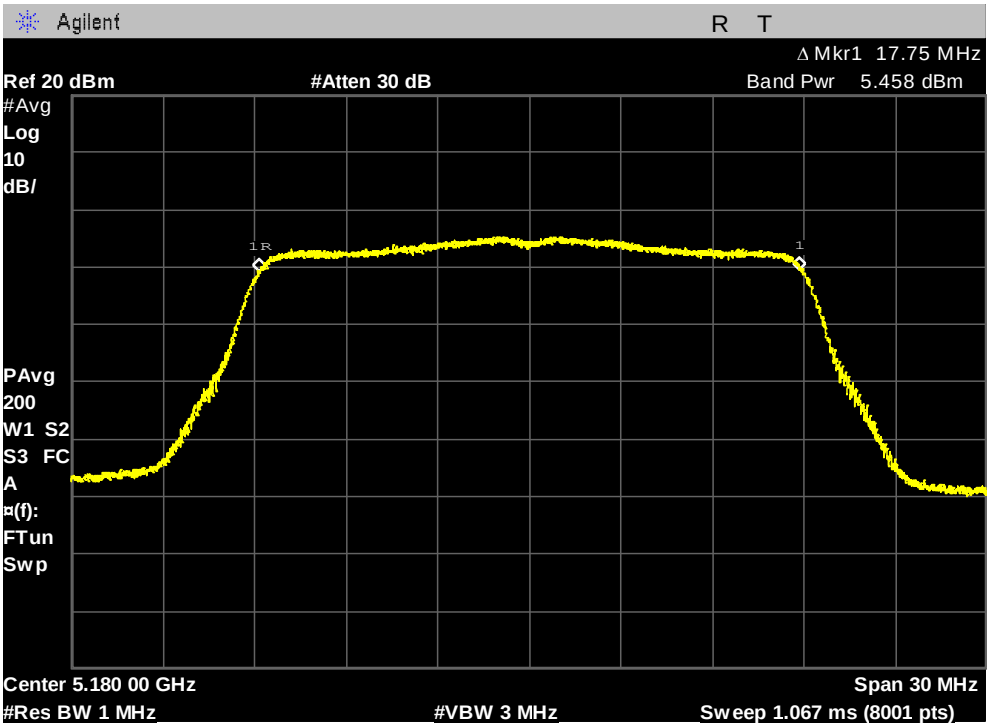
Maximum Conducted Output Power, Highest Channel (5240 MHz)



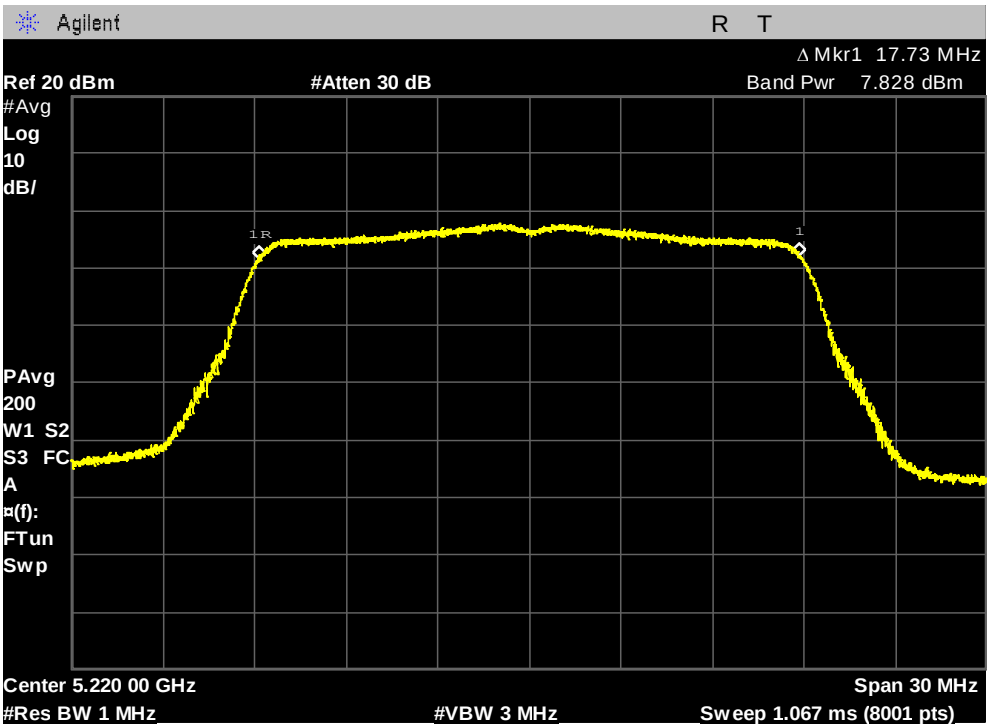
PLOTS OF EMISSIONS

802.11n(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

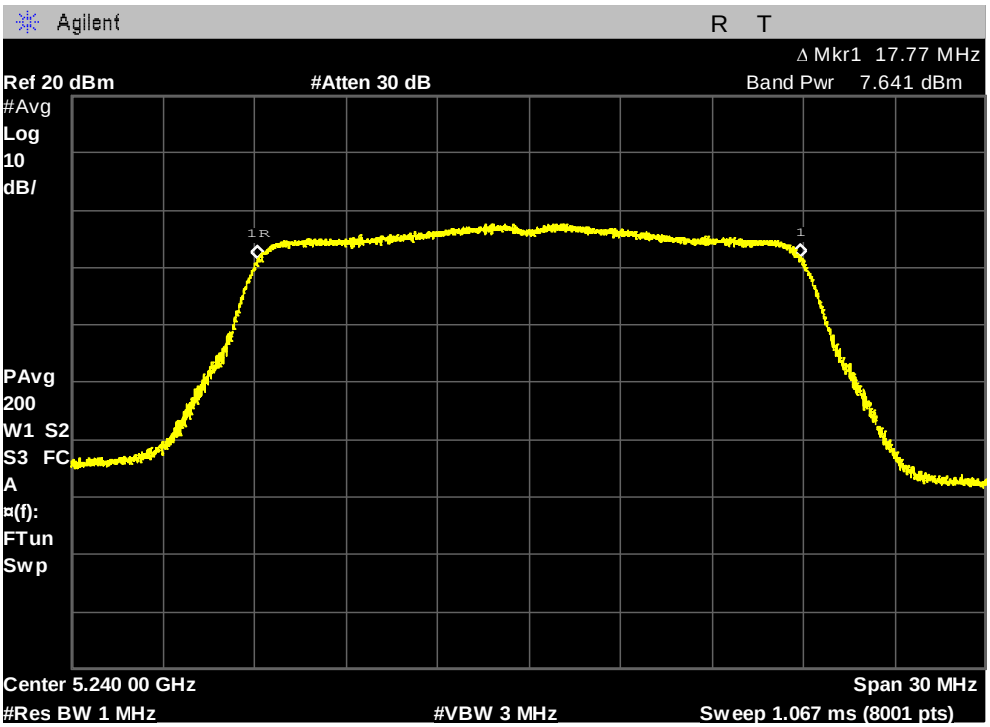


Maximum Conducted Output Power, Middle Channel (5220 MHz)



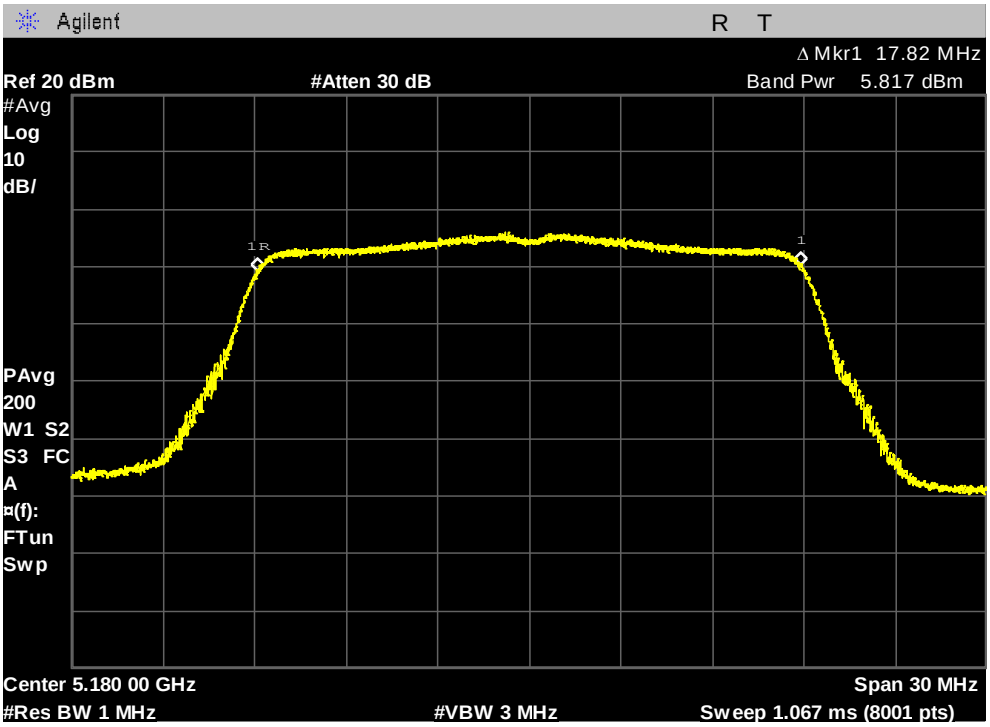
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5240 MHz)



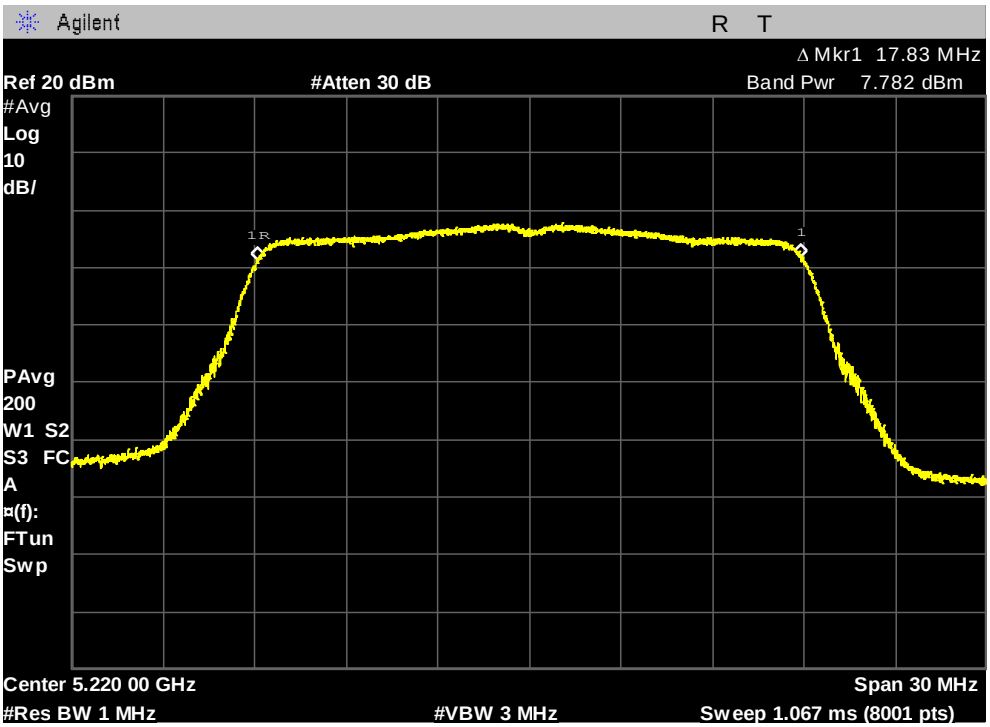
802.11n(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

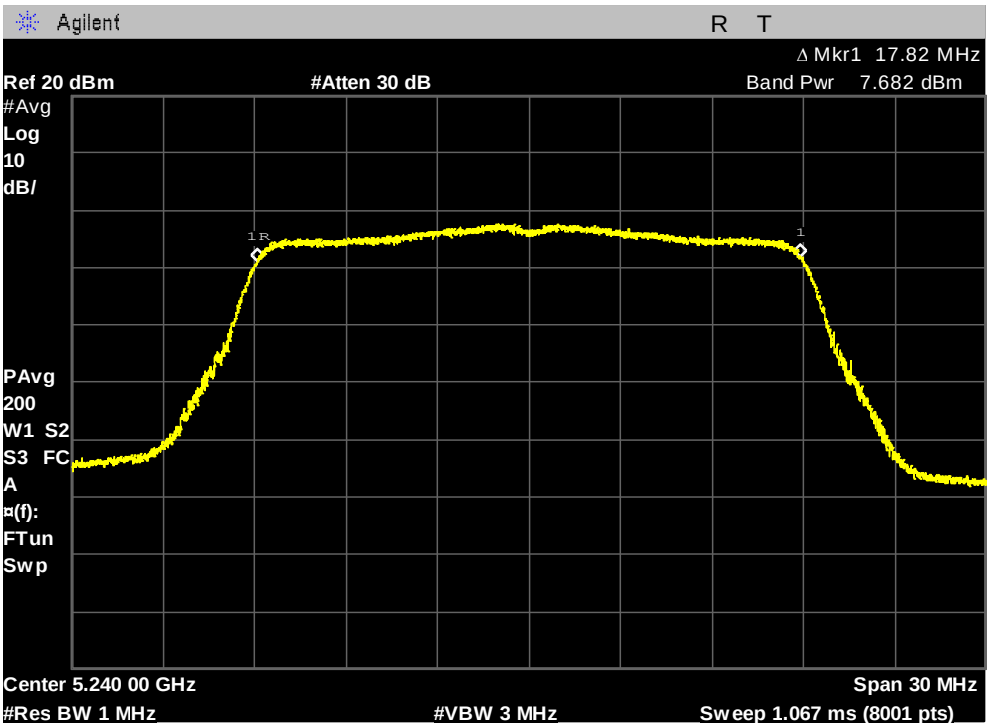


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5220 MHz)



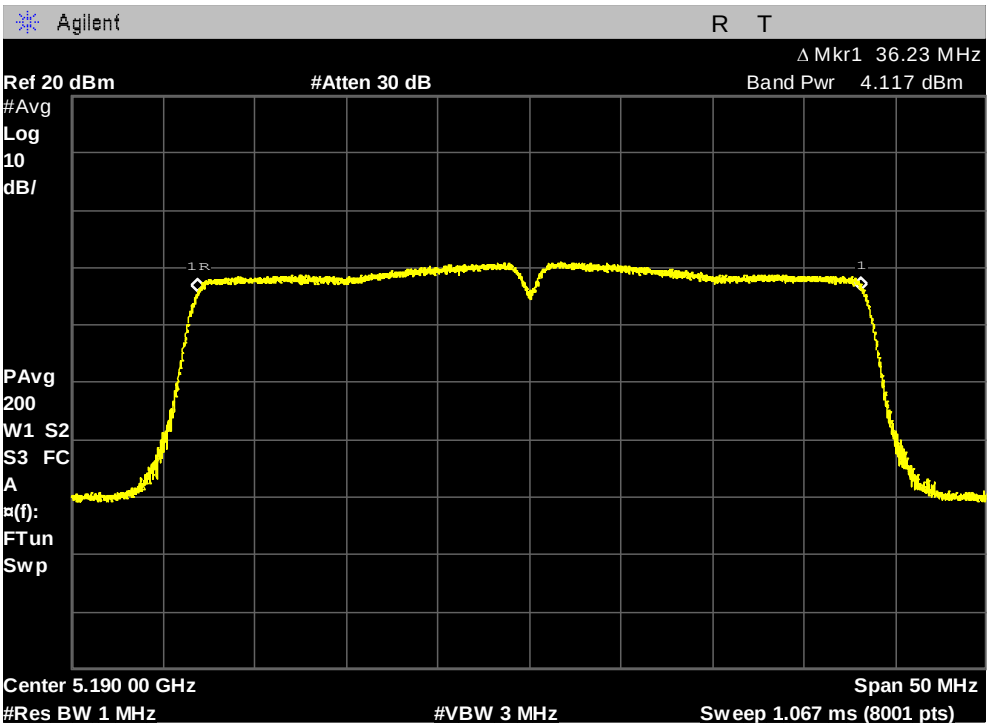
Maximum Conducted Output Power, Highest Channel (5240 MHz)



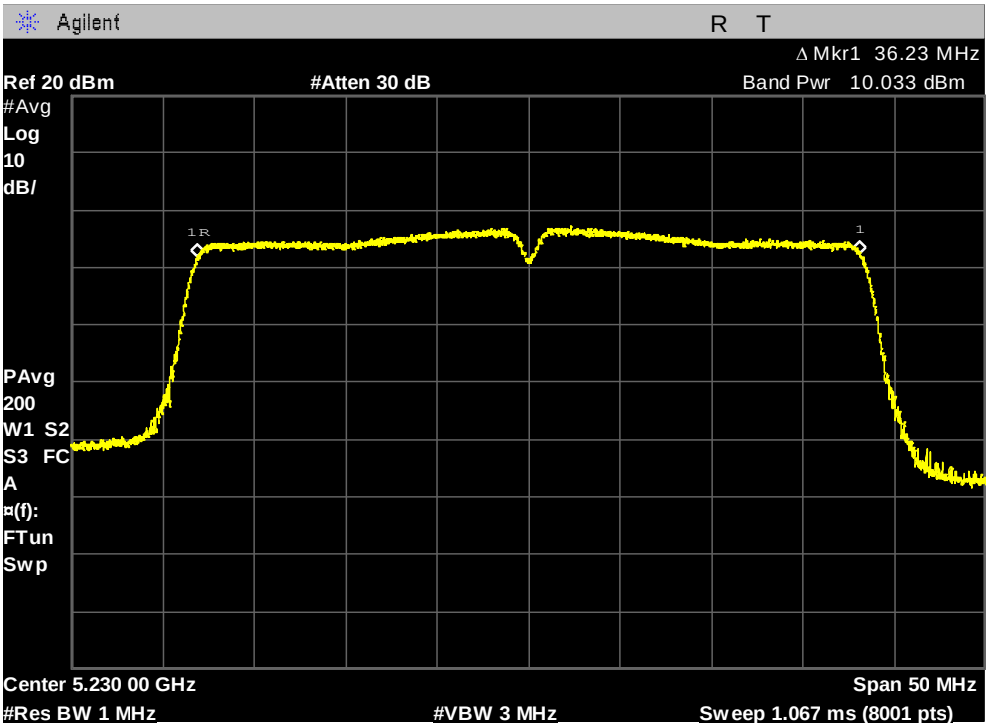
PLOTS OF EMISSIONS

802.11n(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5190 MHz)



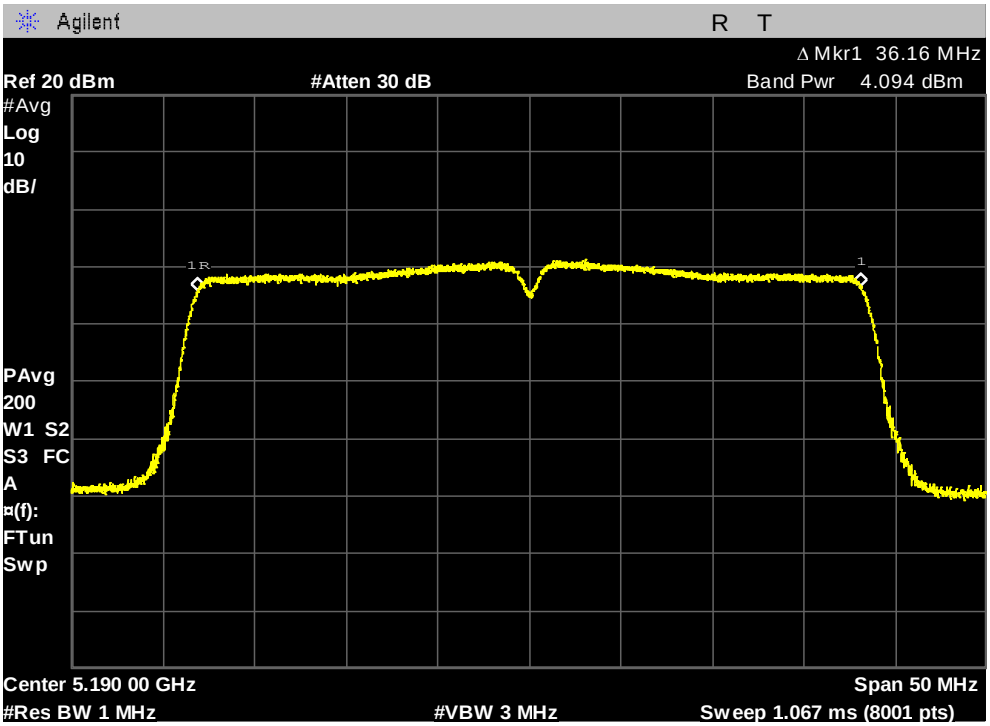
Maximum Conducted Output Power, Highest Channel (5230 MHz)



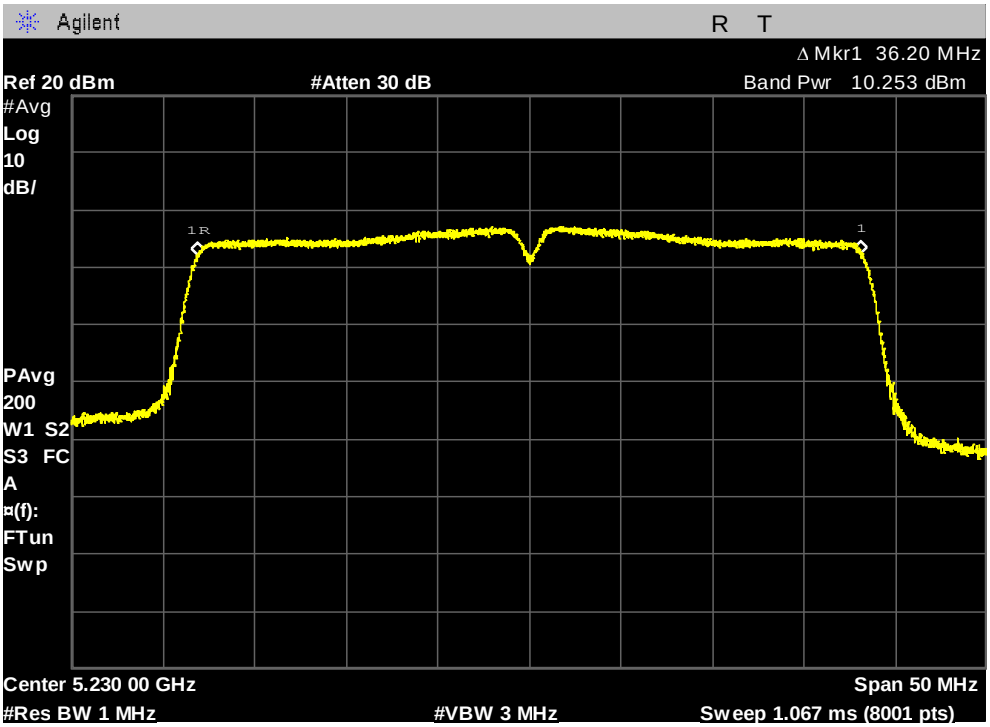
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5190 MHz)



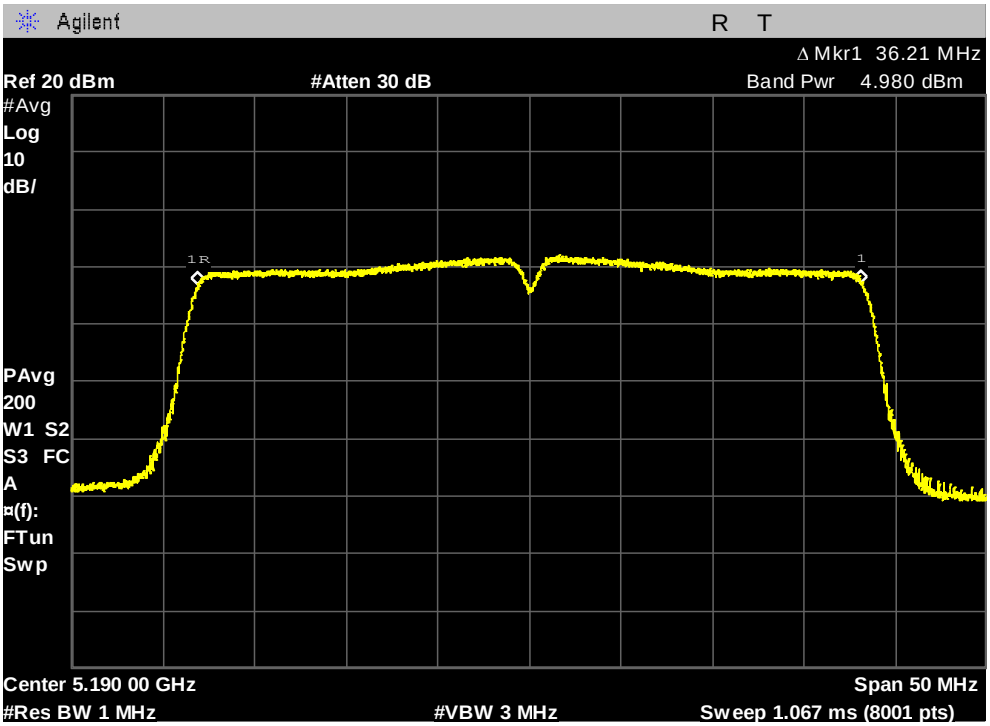
Maximum Conducted Output Power, Highest Channel (5230 MHz)



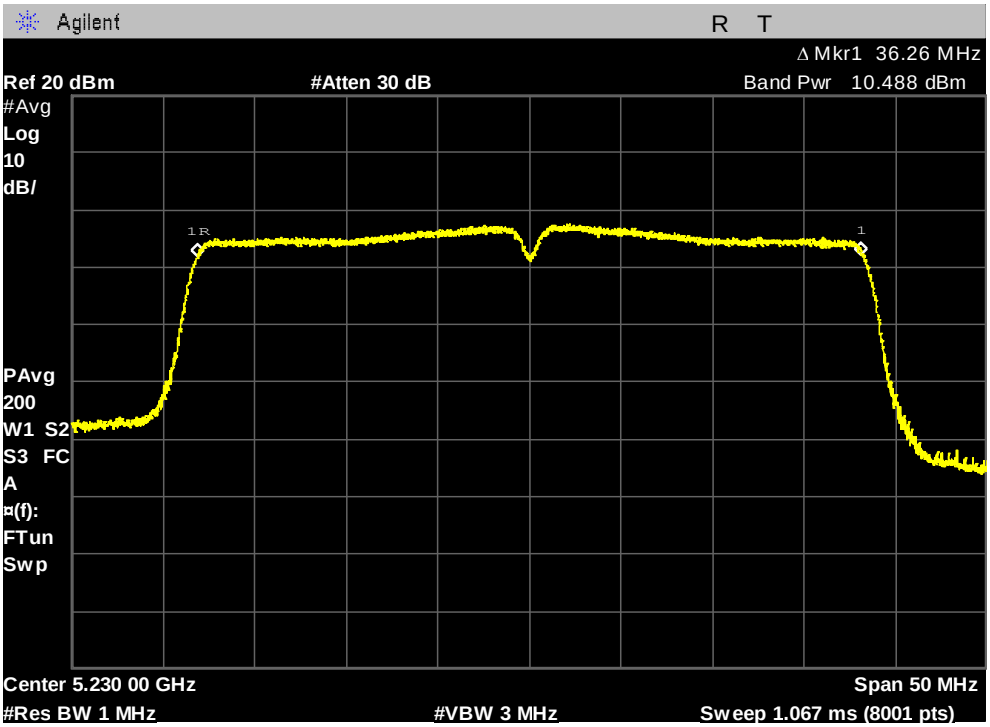
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5190 MHz)



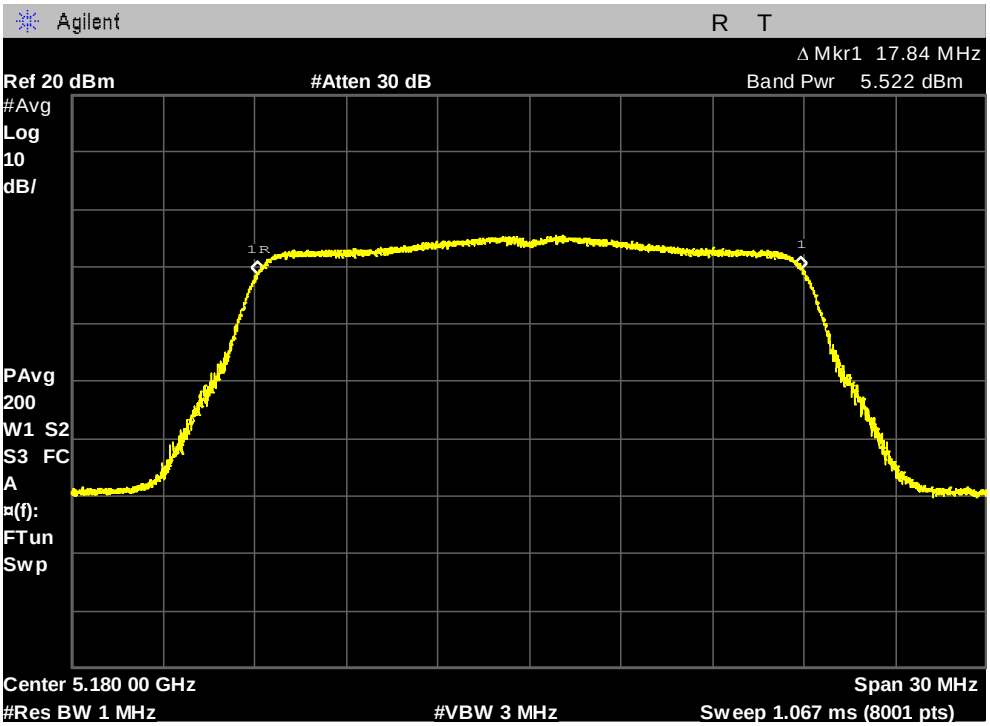
Maximum Conducted Output Power, Highest Channel (5230 MHz)



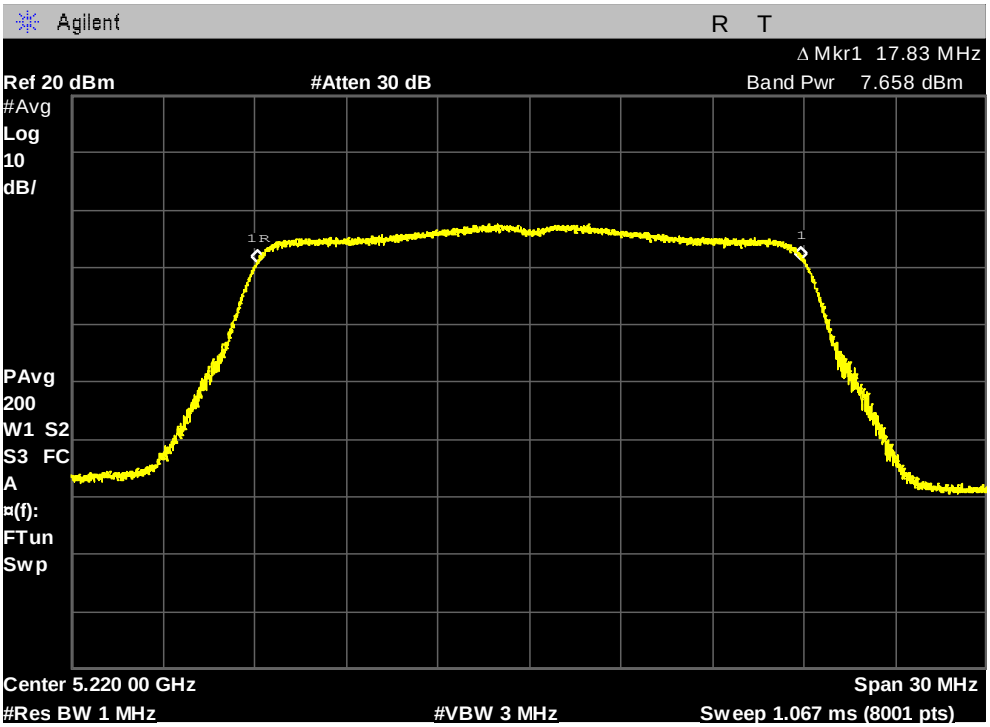
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

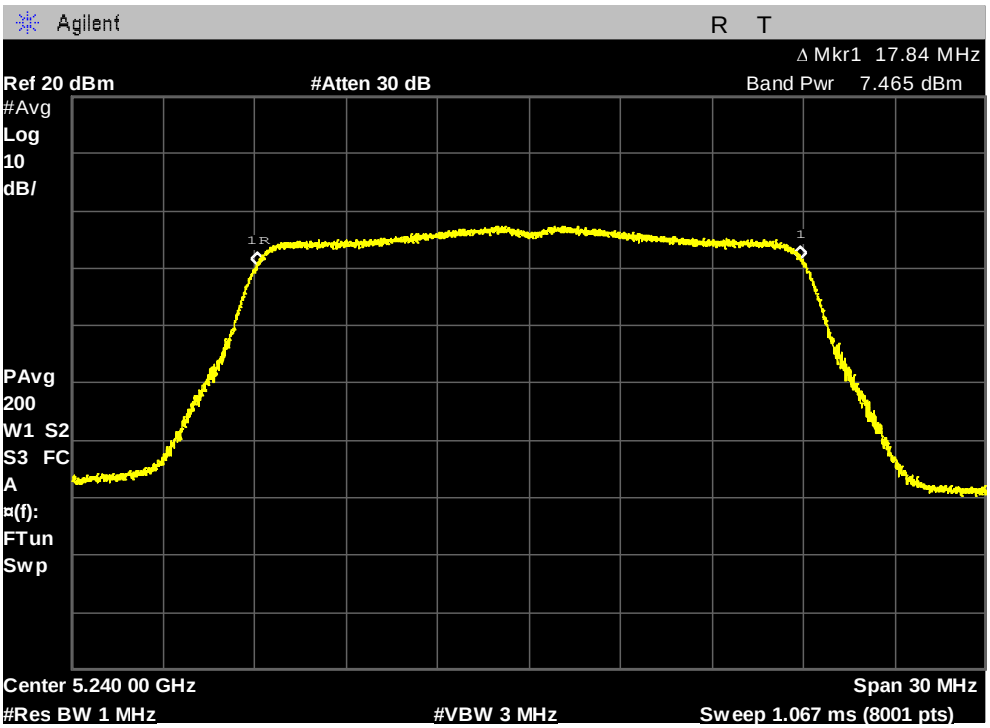


Maximum Conducted Output Power, Middle Channel (5220 MHz)



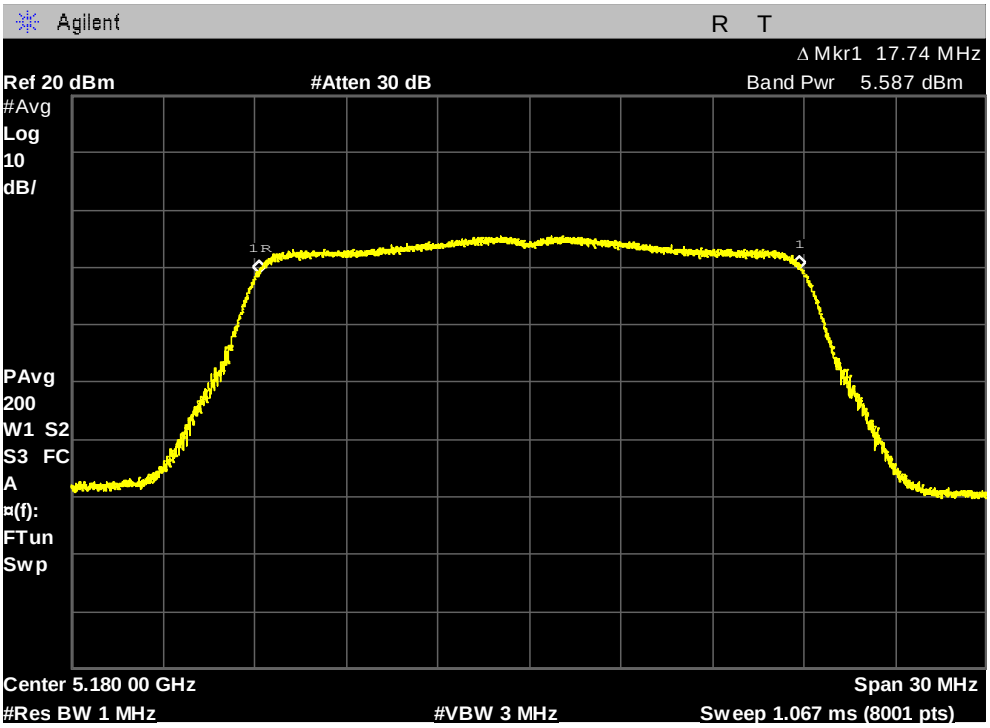
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5240 MHz)



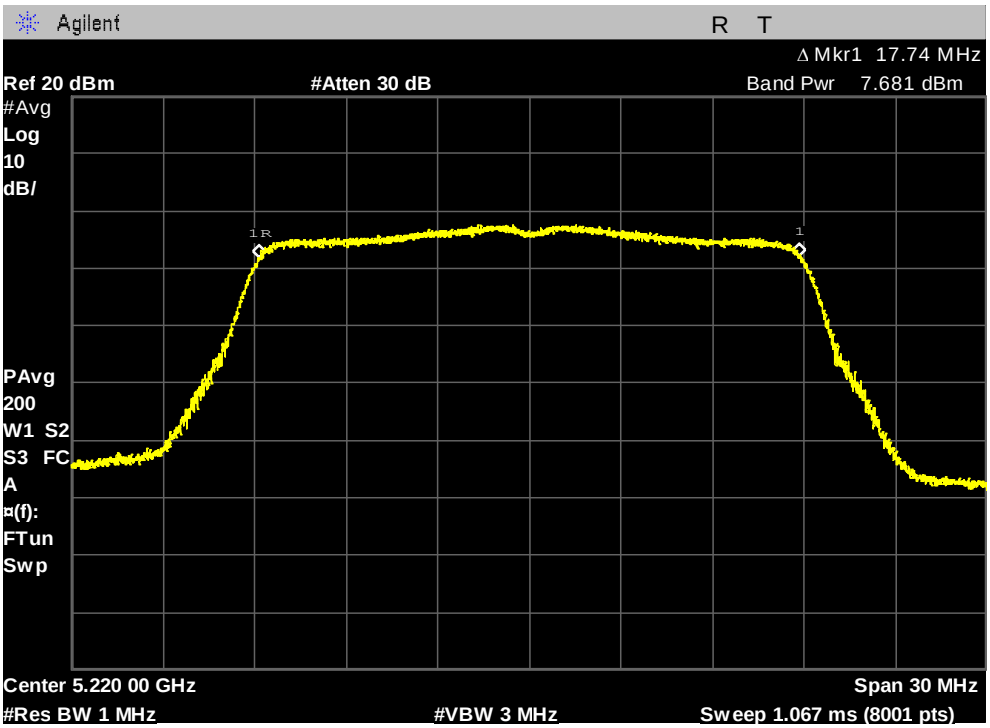
802.11ac(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

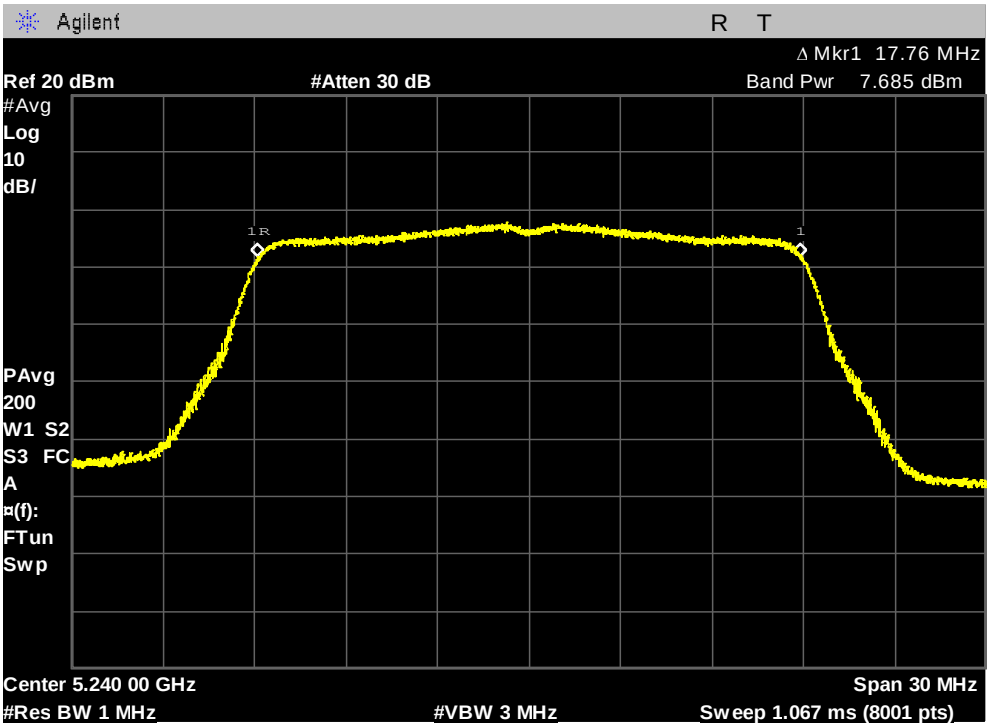


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5220 MHz)



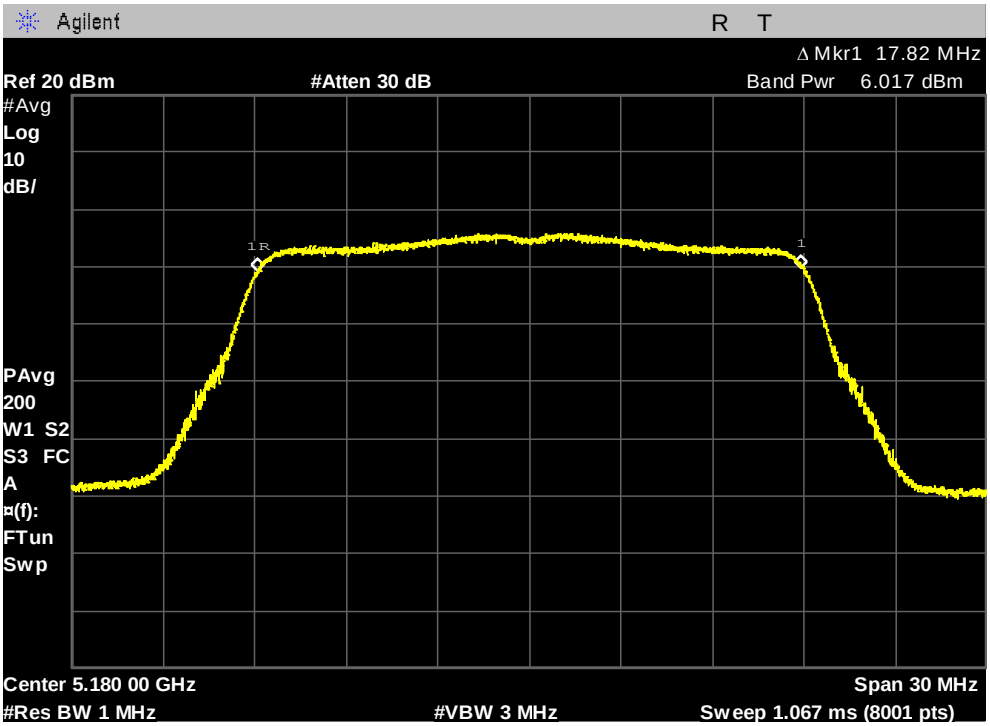
Maximum Conducted Output Power, Highest Channel (5240 MHz)



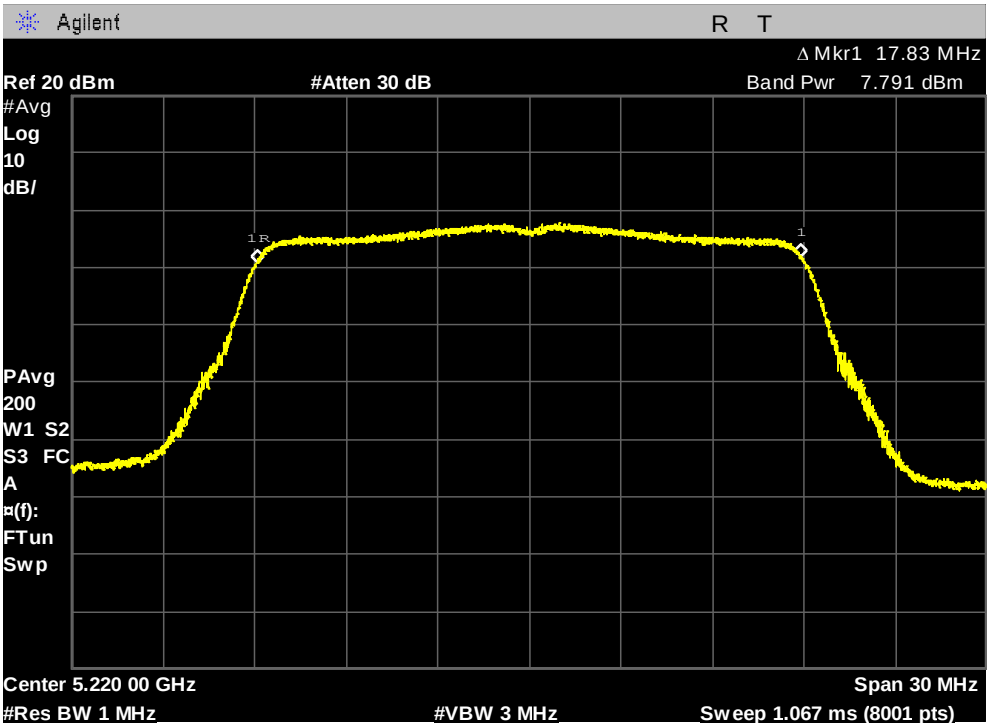
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5180 MHz)

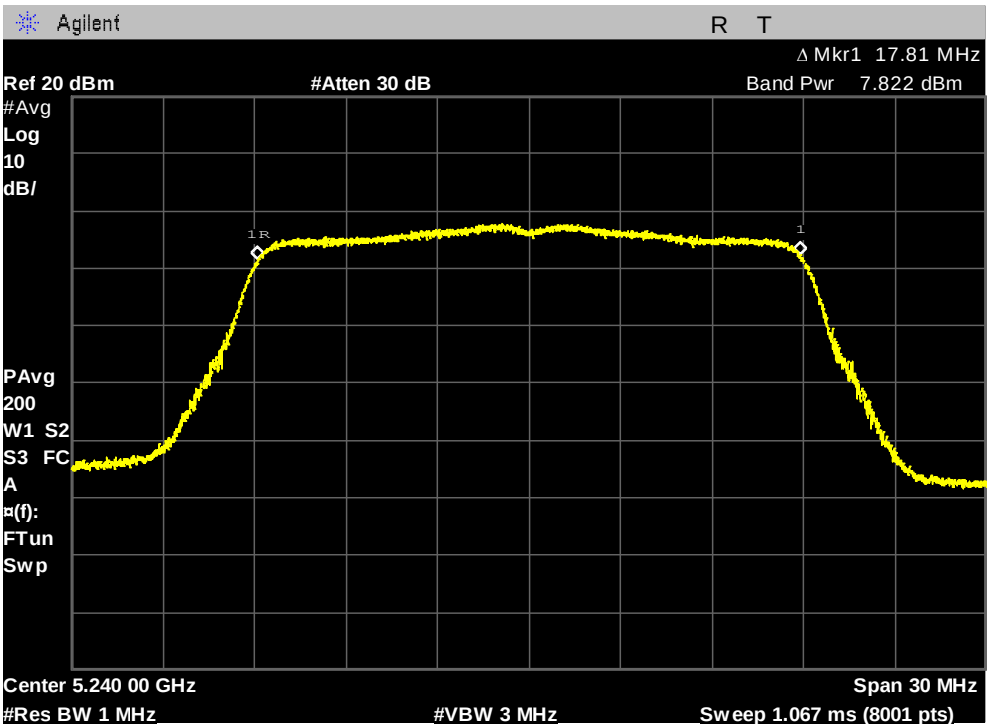


Maximum Conducted Output Power, Middle Channel (5220 MHz)



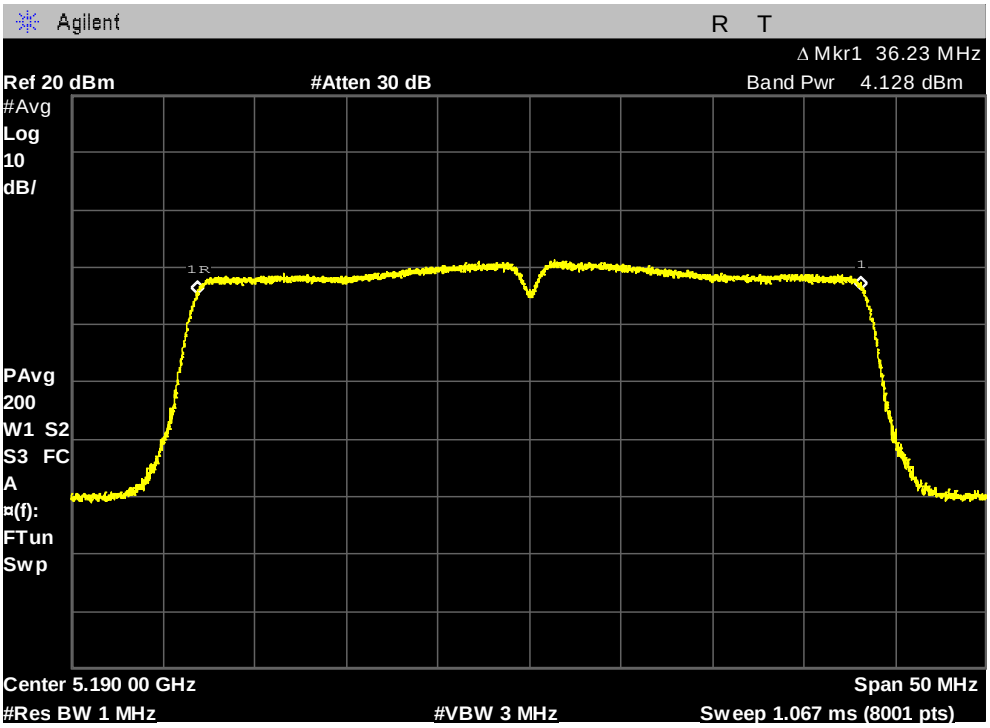
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5240 MHz)



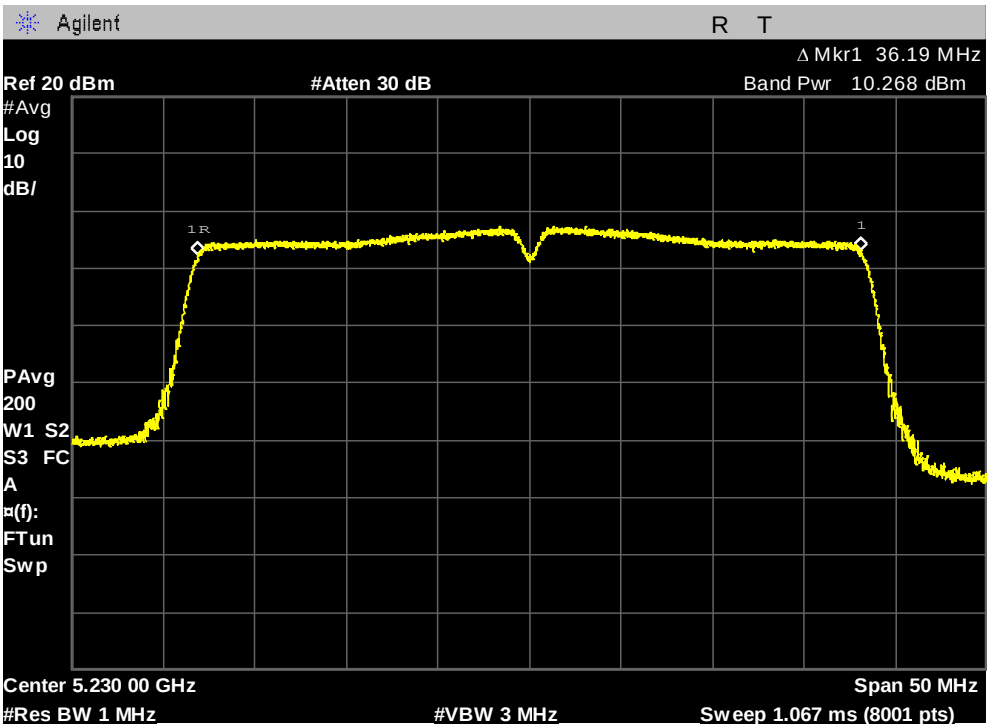
802.11ac(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5190 MHz)



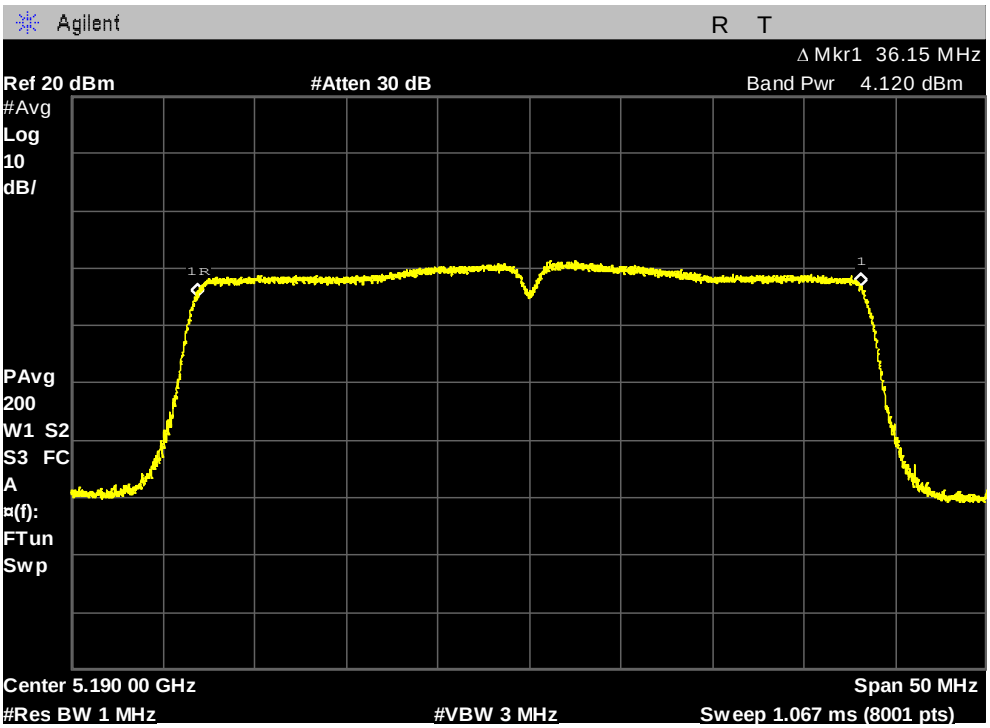
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5230 MHz)



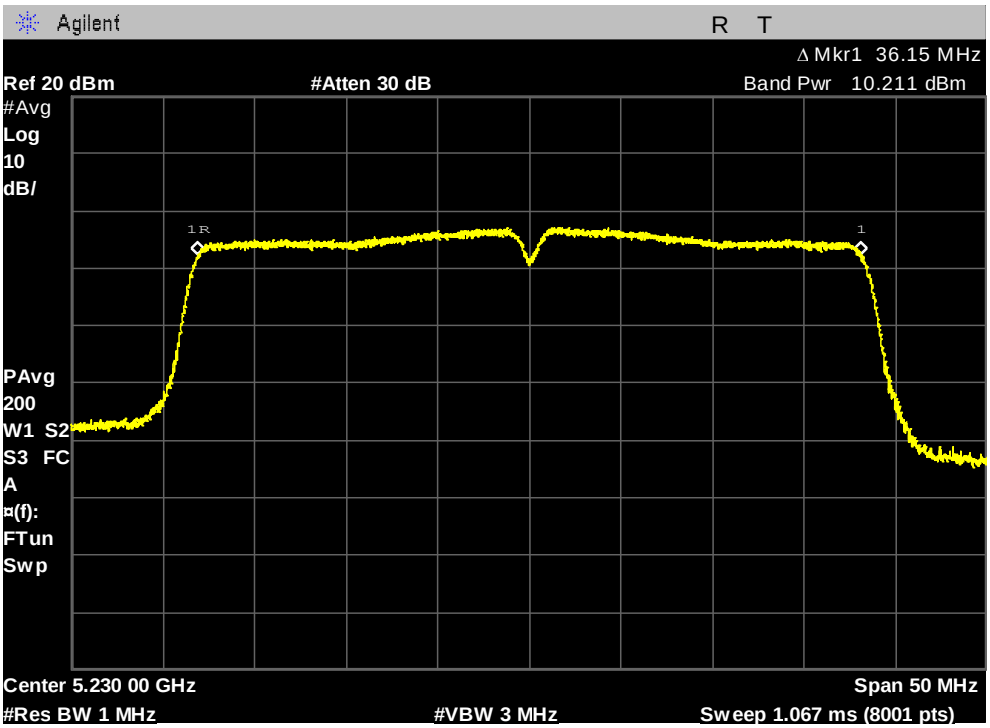
802.11ac(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5190 MHz)



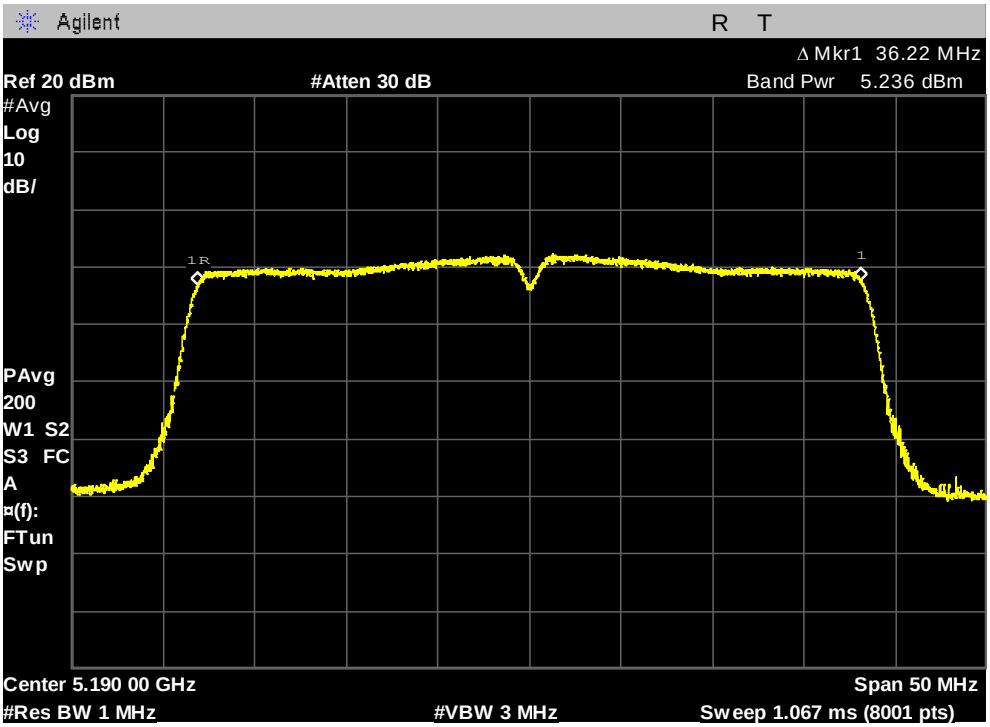
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5230 MHz)



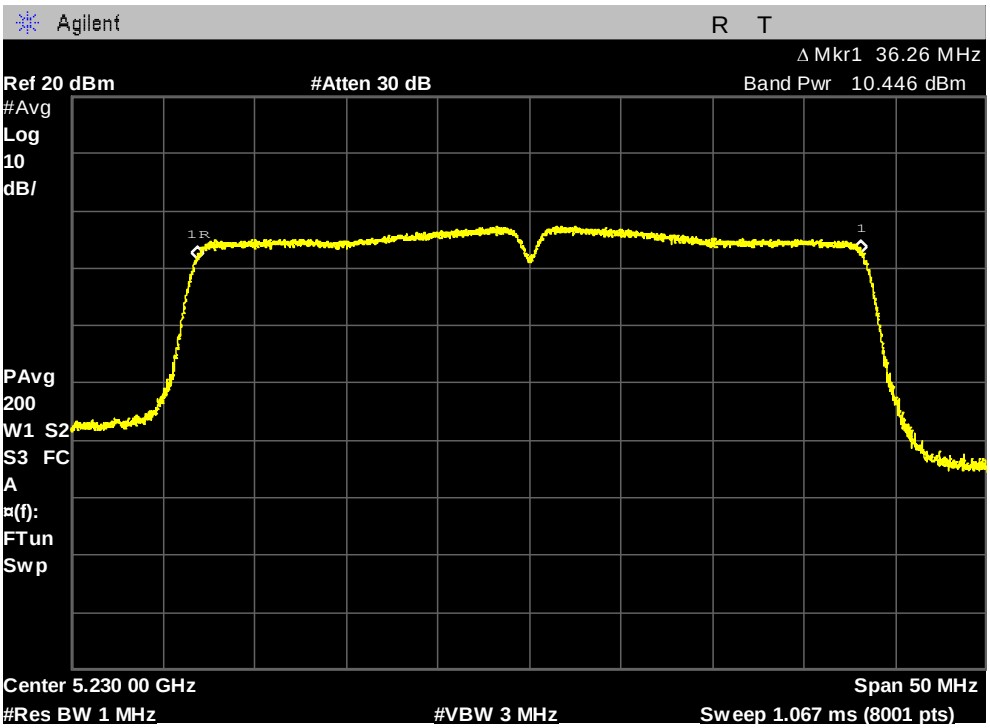
802.11ac(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5190 MHz)



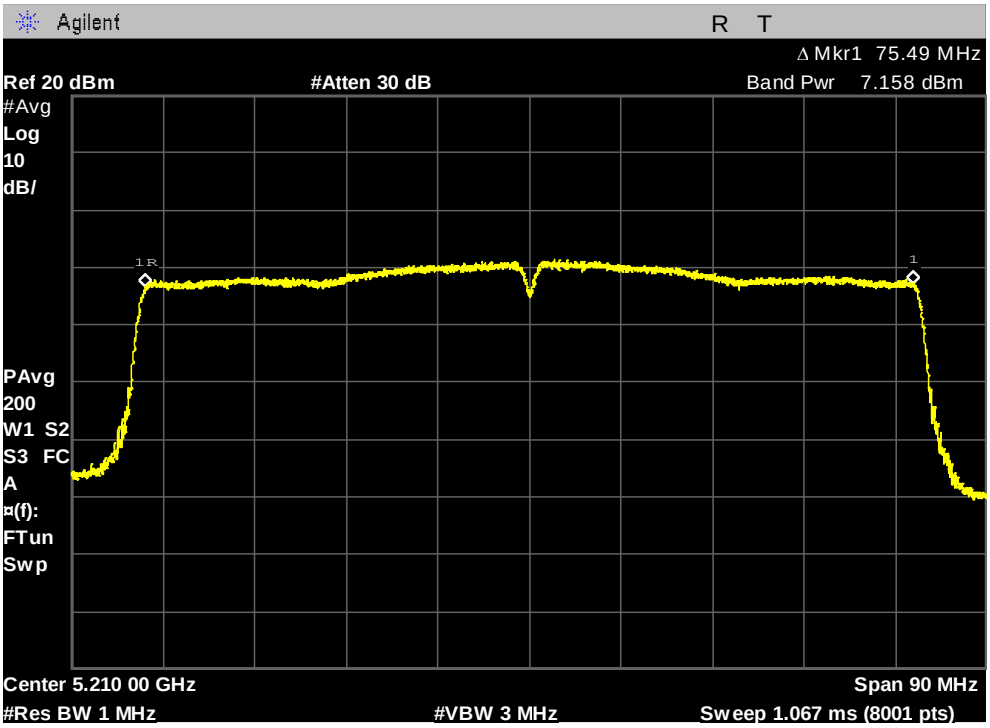
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5230 MHz)



802.11ac(80MHz) mode 1TX

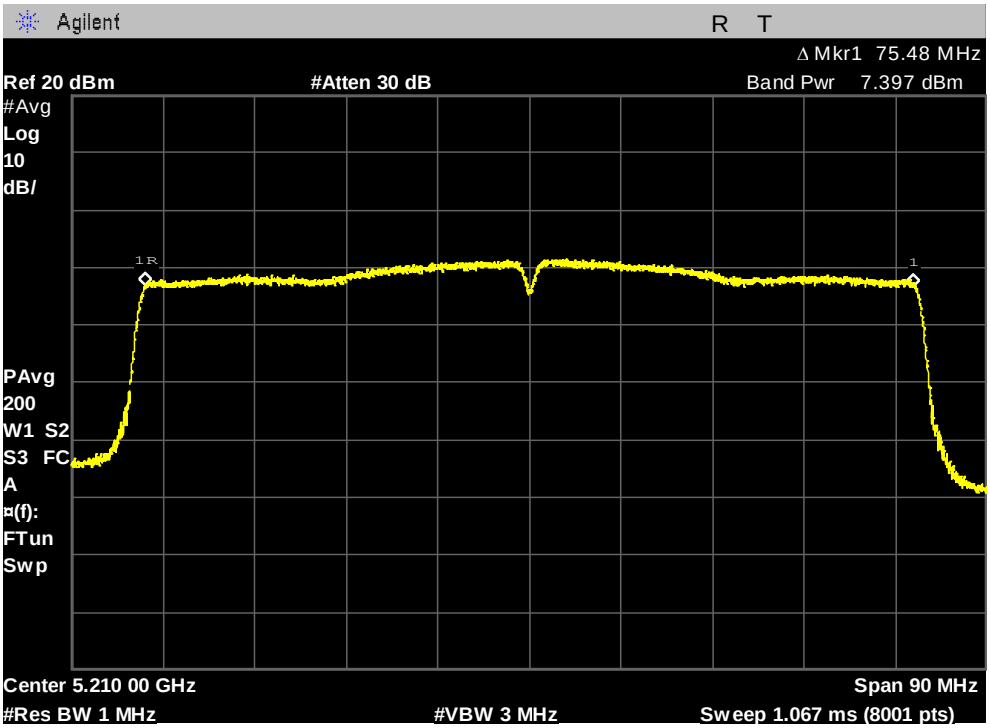
Maximum Conducted Output Power, Middle Channel (5210 MHz)



PLOTS OF EMISSIONS

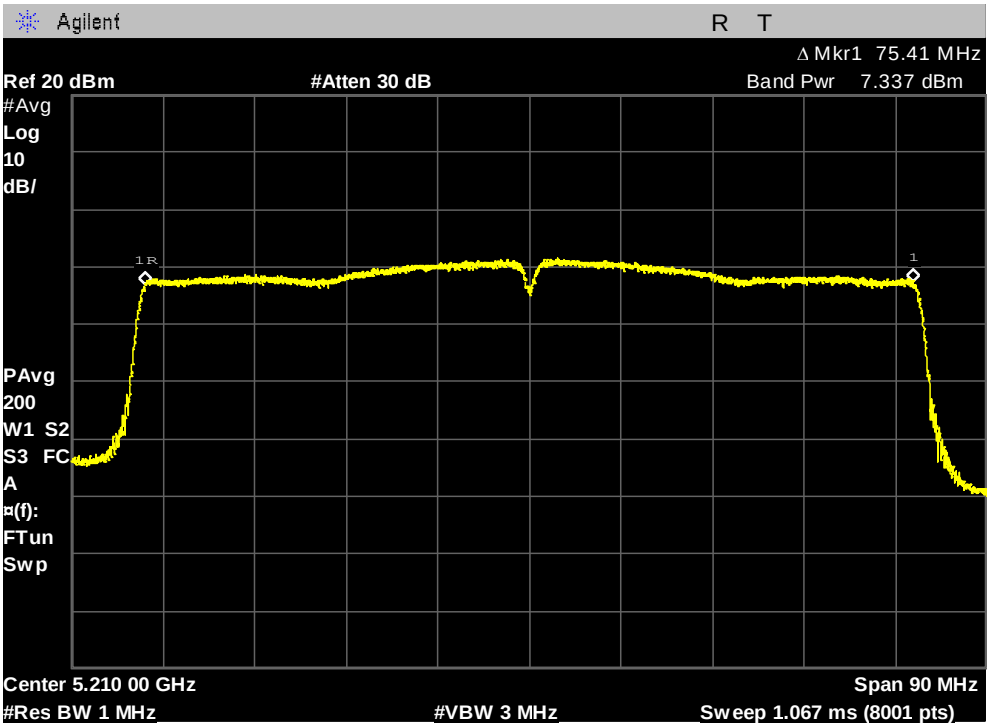
802.11ac(80MHz) mode 2TX ANT0

Maximum Conducted Output Power, Middle Channel (5210 MHz)



802.11ac(80MHz) mode 2TX ANT1

Maximum Conducted Output Power, Middle Channel (5210 MHz)



8.5.2 Maximum Conducted Output Power – U-NII-2A band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5260	14.84	0.07	14.91	23.98
Middle	5300	14.89	0.07	14.96	23.98
Highest	5320	13.19	0.07	13.26	23.98

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5260	14.87	0.08	14.95	23.98
Middle	5300	14.76	0.08	14.84	23.98
Highest	5320	13.21	0.08	13.29	23.98

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5260	14.92	14.39	0.08	17.75	23.43
Middle	5300	14.67	14.37	0.08	17.61	23.43
Highest	5320	13.34	12.19	0.08	15.89	23.43

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5270	13.87	0.16	14.03	23.98
Highest	5310	9.96	0.16	10.12	23.98

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5270	13.84	13.40	0.16	16.80	23.98
Highest	5310	10.03	10.68	0.16	13.54	23.98

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5260	14.85	0.08	14.93	23.98
Middle	5300	14.67	0.08	14.75	23.98
Highest	5320	13.13	0.08	13.21	23.98

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5260	14.95	14.56	0.08	17.85	23.98
Middle	5300	14.94	14.33	0.08	17.74	23.98
Highest	5320	13.23	12.13	0.08	15.81	23.98

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5270	13.82	0.16	13.98	23.98
Highest	5310	9.98	0.16	10.14	23.98

TEST DATA

802.11ac (40MHz) mode _2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5270	13.97	13.31	0.16	16.82	23.98
Highest	5310	9.98	10.67	0.16	13.51	23.98

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Middle	5290	8.49	0.32	8.81	23.98

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Middle	5290	8.77	8.49	0.32	11.96	23.98

TEST DATA

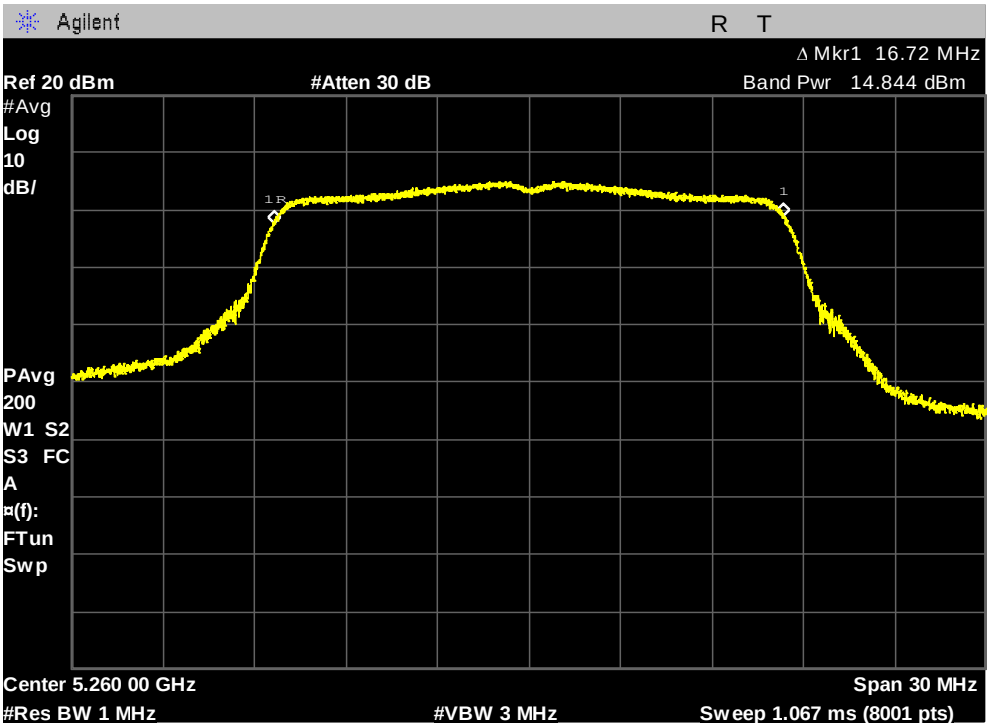
Note:

1. Maximum Conducted (average) Power = Measured conducted power + Duty Factor
2. Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10} + 10^{(Chain 2 Power + duty factor)/10}+ 10^{(Chain 3 Power + duty factor)/10}]
3. For CDD transmission, directional gain is. ***2.59 dBi.***
   For MIMO transmission, directional gain is ***2.59 dBi.***
   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
   For power measurements on IEEE 802.11 devices employing CDD, directional gain is as follows,
   Directional gain = G_{ANT} + Array Gain = 2.59 dBi + 0 dB = 2.59 dBi.
   Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
   Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.
   For power measurements on all devices employing MIMO, directional gain is as follows,
   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi = 2.59 dBi + 10 log(2/2) dB = 2.59 dBi.
   where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. FCC conducted output power limit = 250 mW or 11 dBm + 10 log B, whichever power is less.
   B is the 26 dB emission bandwidth in megahertz.
5. For n(20MHz, 40MHz),ac (20MHz,40MHz,80MHz) mode, Beamforming gain is 3.01 dBi
6. The following equation was used for spectrum offset:
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)
7. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW (26.99dBm) for FCC.

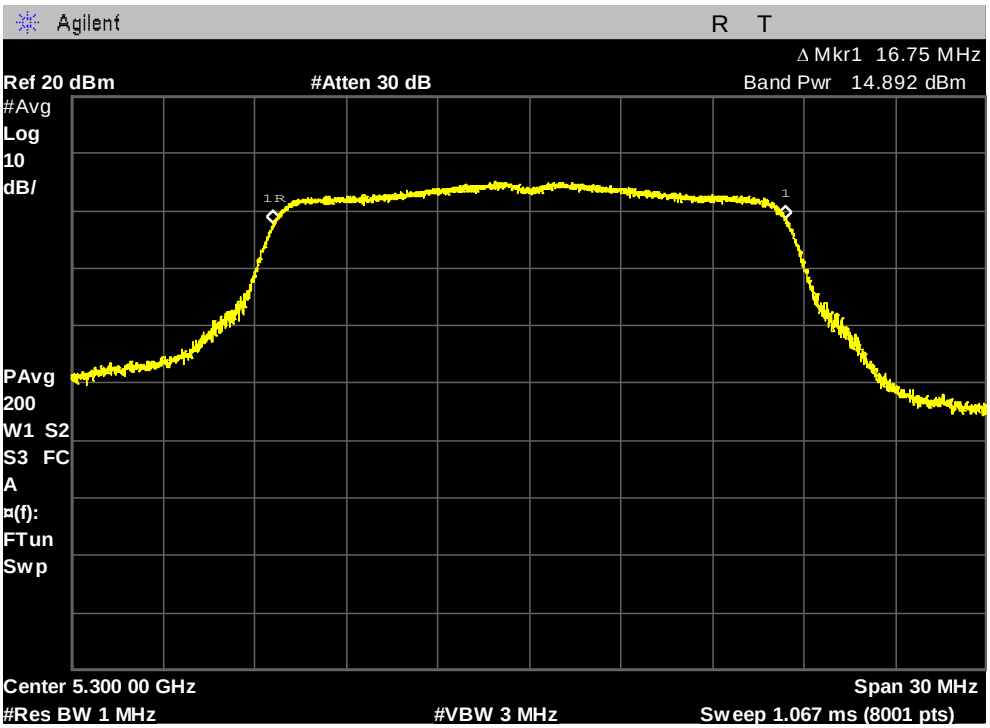
PLOTS OF EMISSIONS

802.11a mode

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

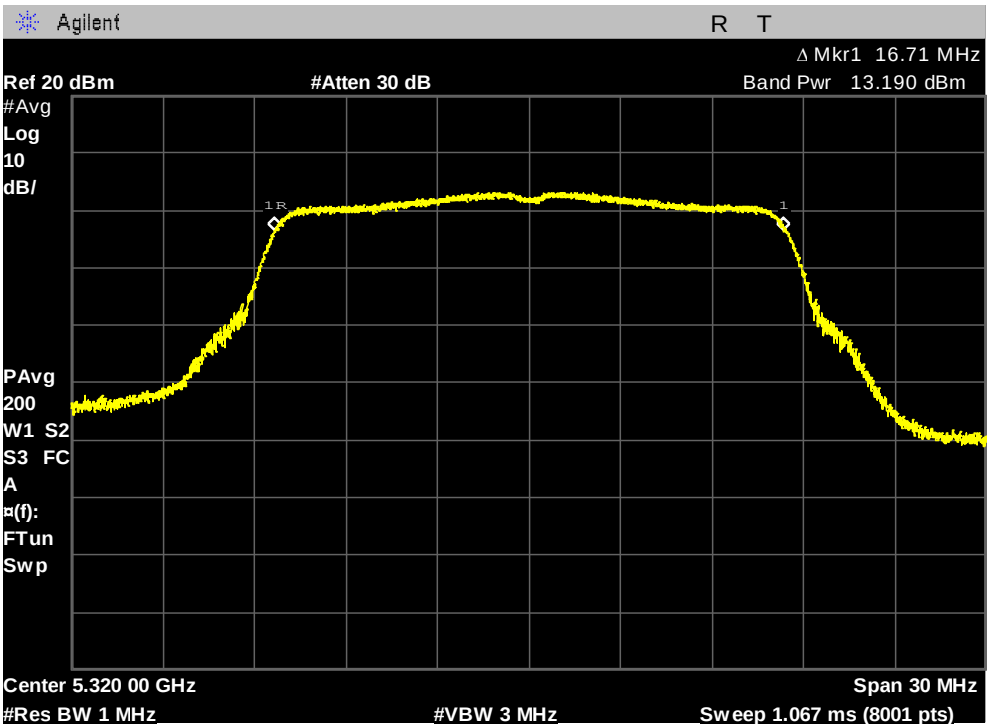


Maximum Conducted Output Power, Middle Channel (5300 MHz)



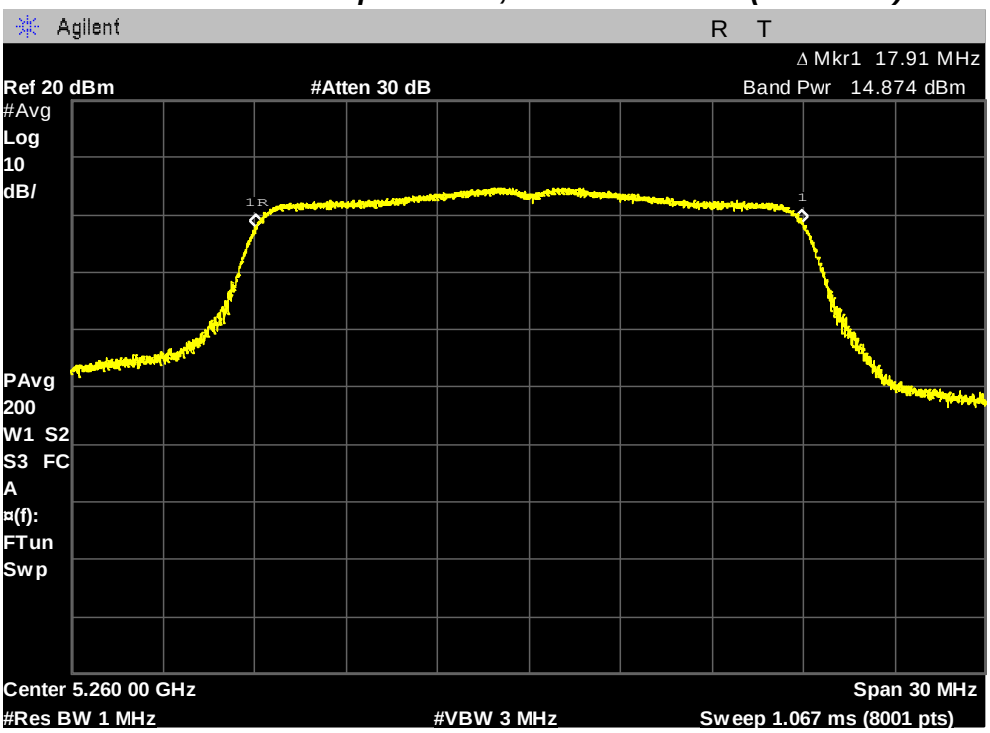
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5320 MHz)



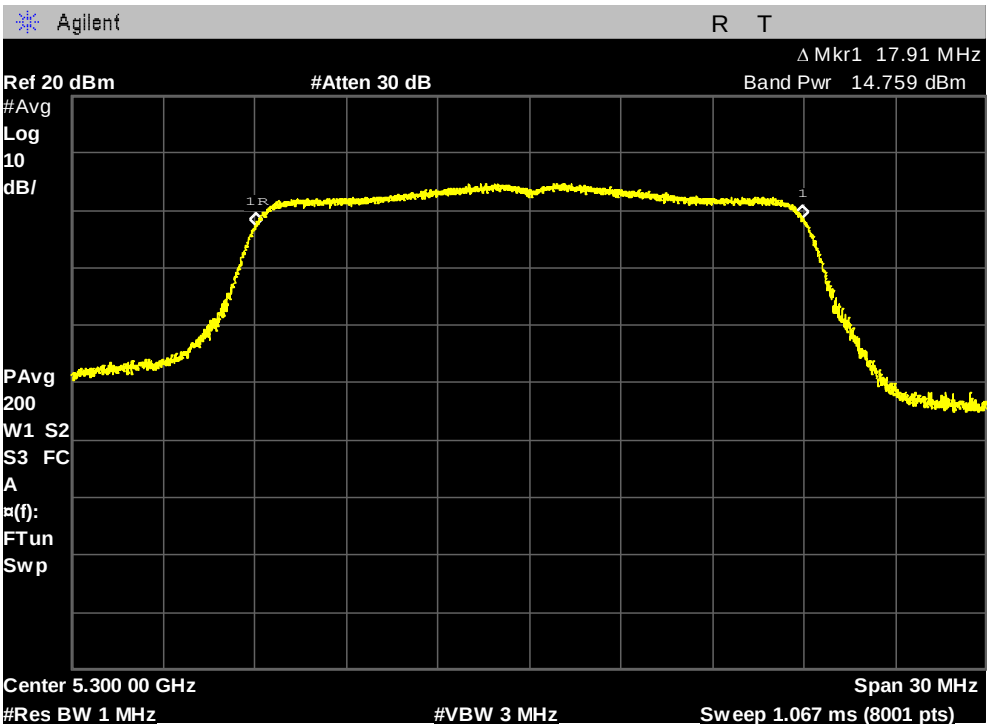
802.11n(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

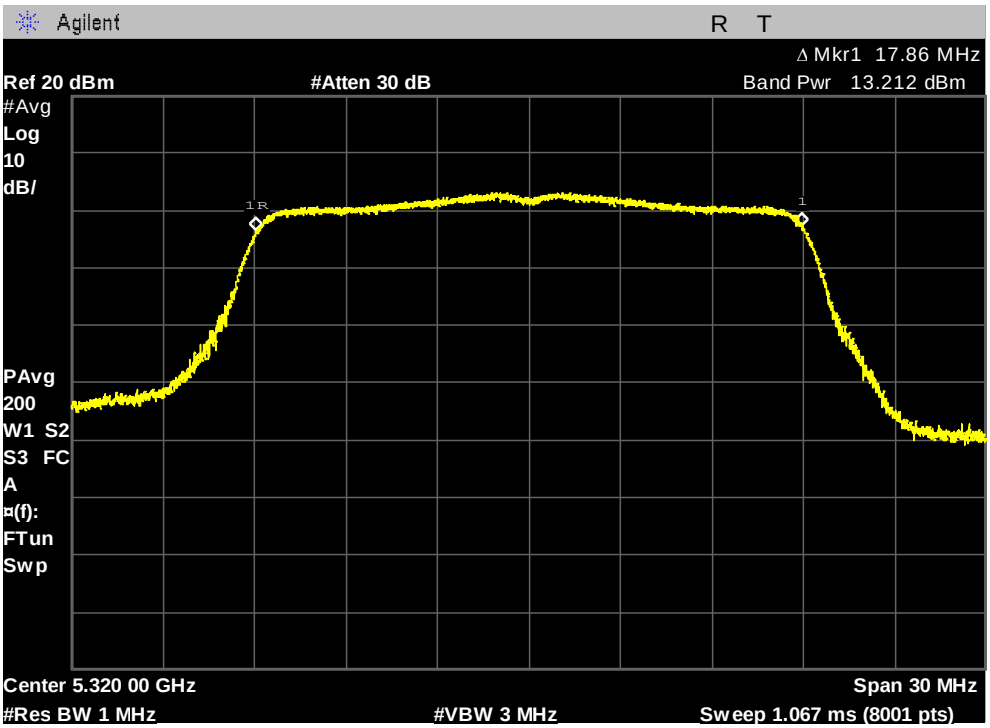


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5300 MHz)



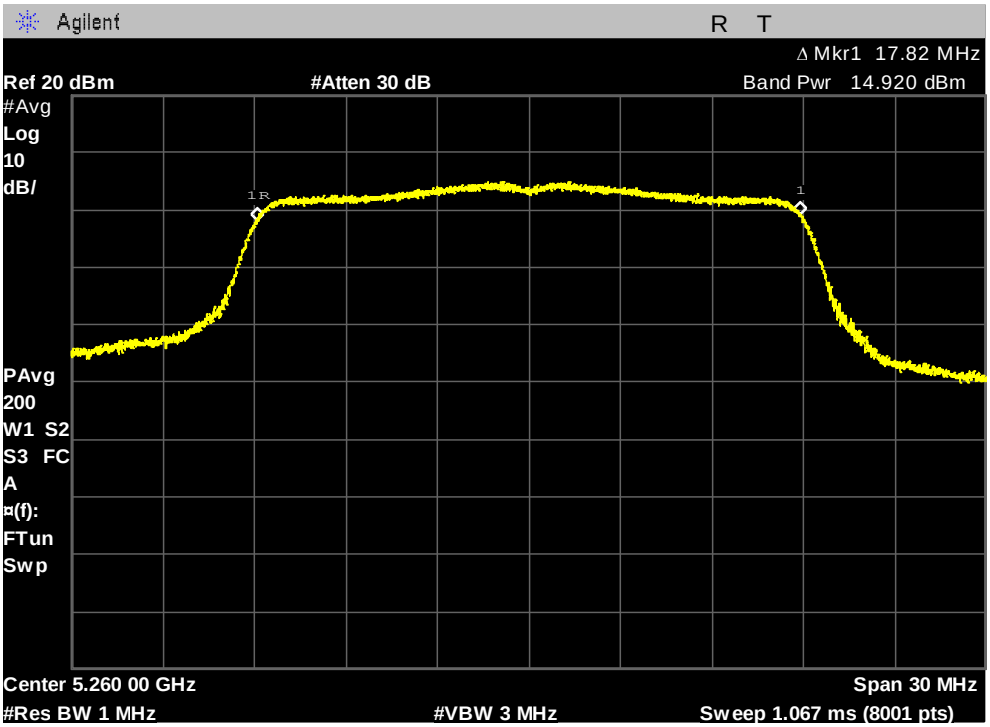
Maximum Conducted Output Power, Highest Channel (5320 MHz)



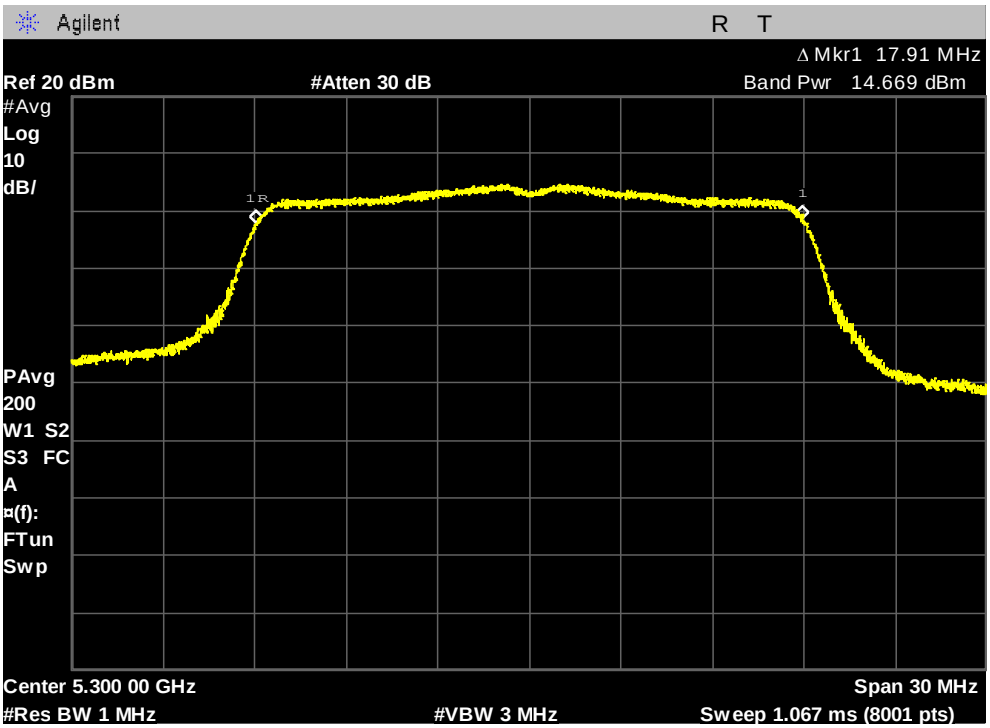
PLOTS OF EMISSIONS

802.11n(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

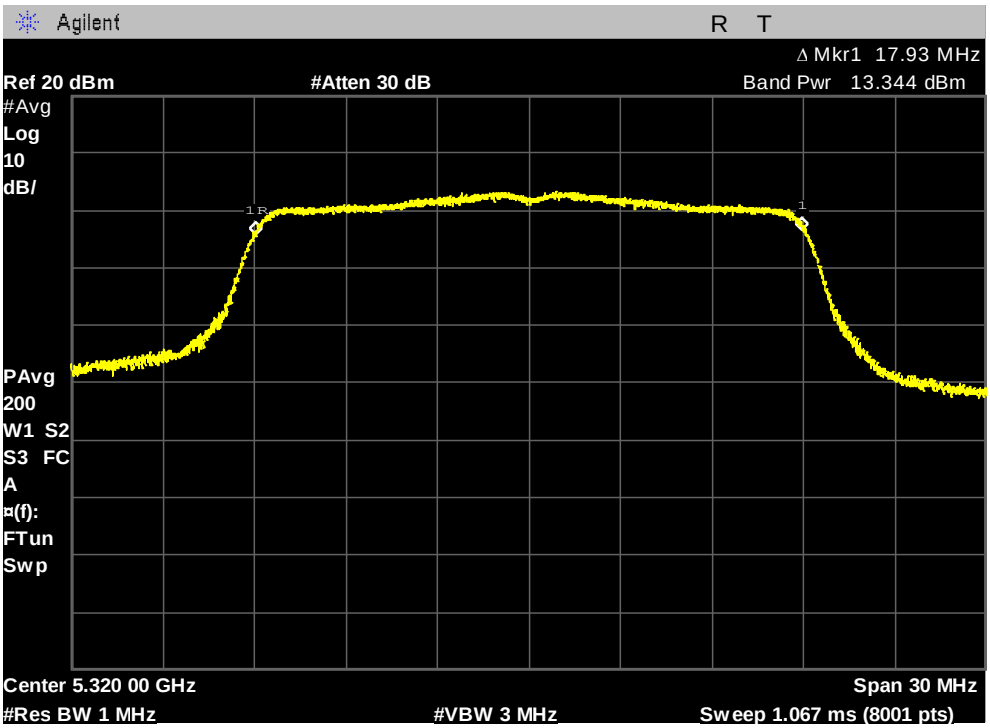


Maximum Conducted Output Power, Middle Channel (5300 MHz)



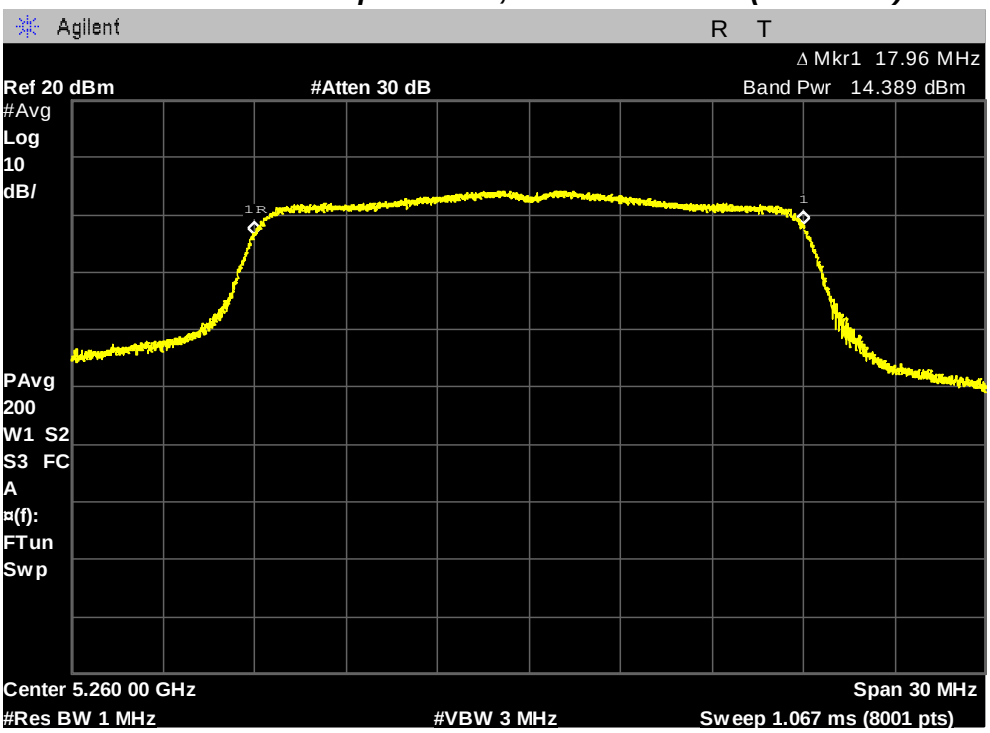
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5320 MHz)



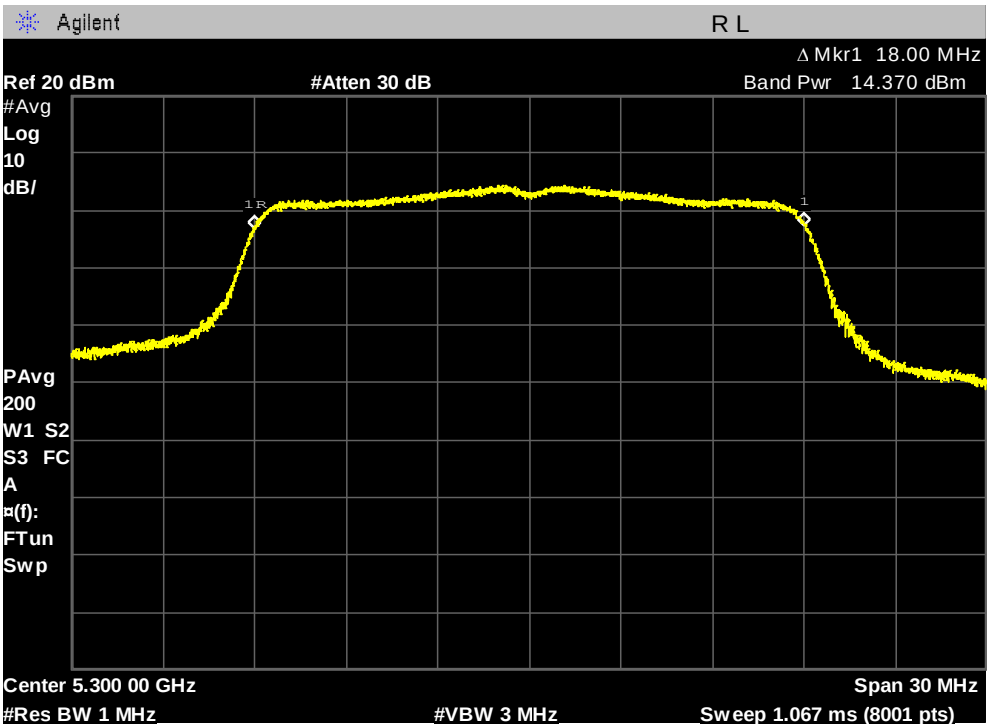
802.11n(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

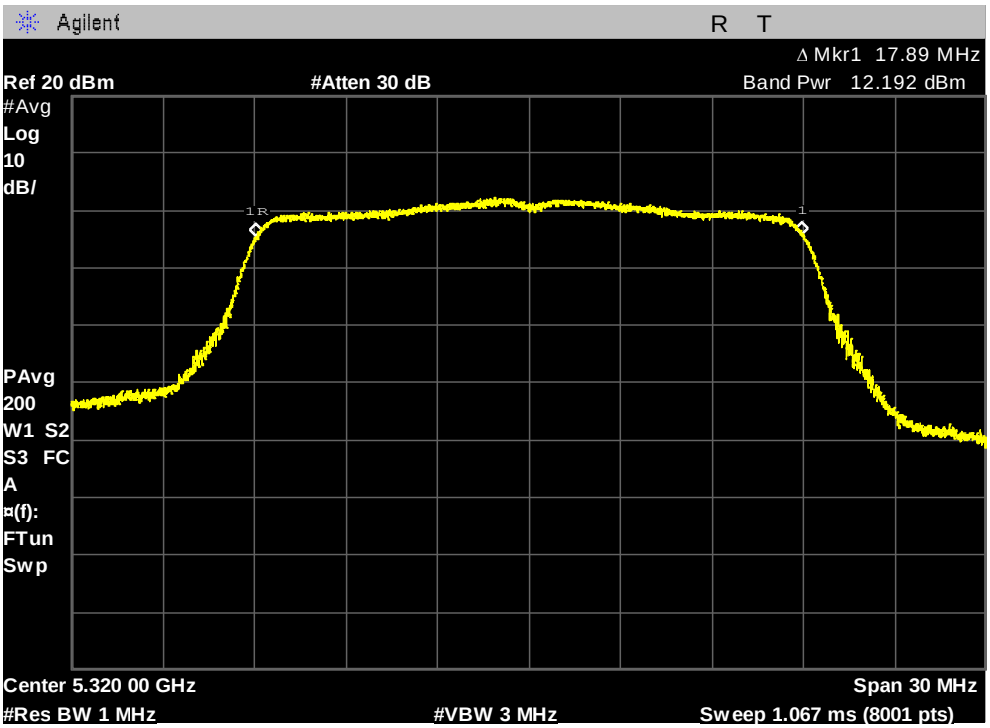


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5300 MHz)



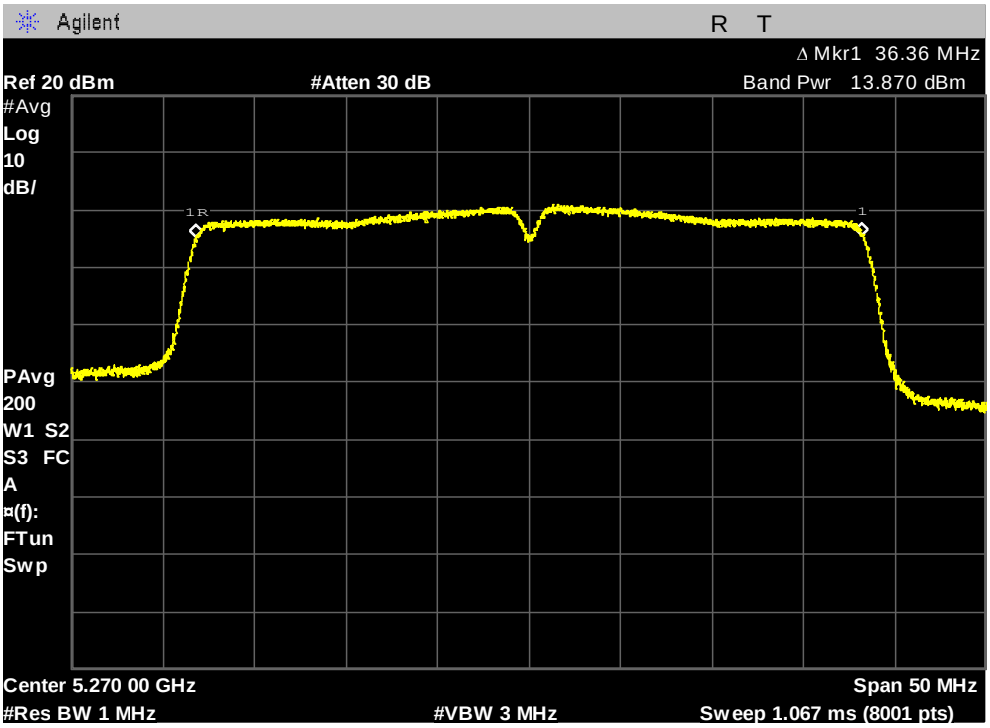
Maximum Conducted Output Power, Highest Channel (5320 MHz)



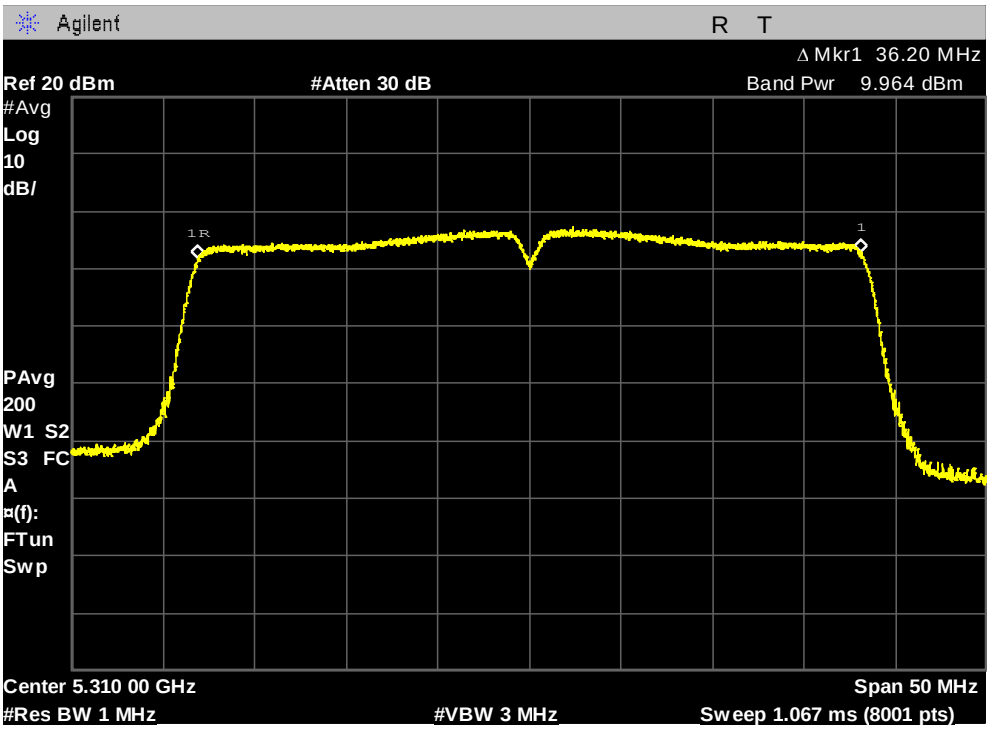
PLOTS OF EMISSIONS

802.11n(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5270 MHz)



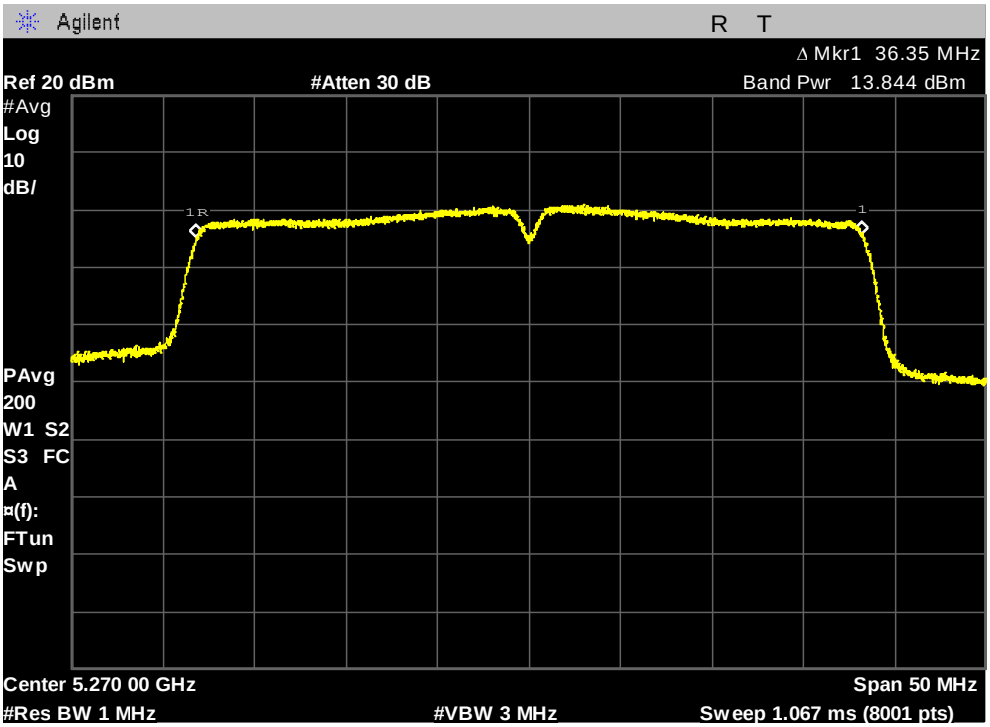
Maximum Conducted Output Power, Highest Channel (5310 MHz)



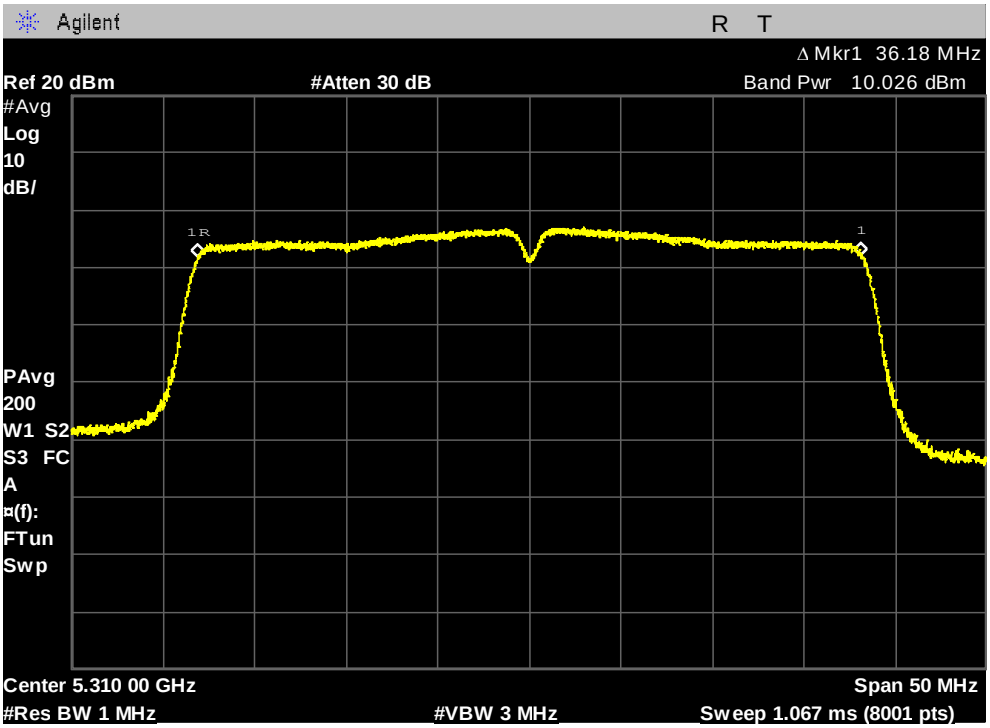
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5270 MHz)



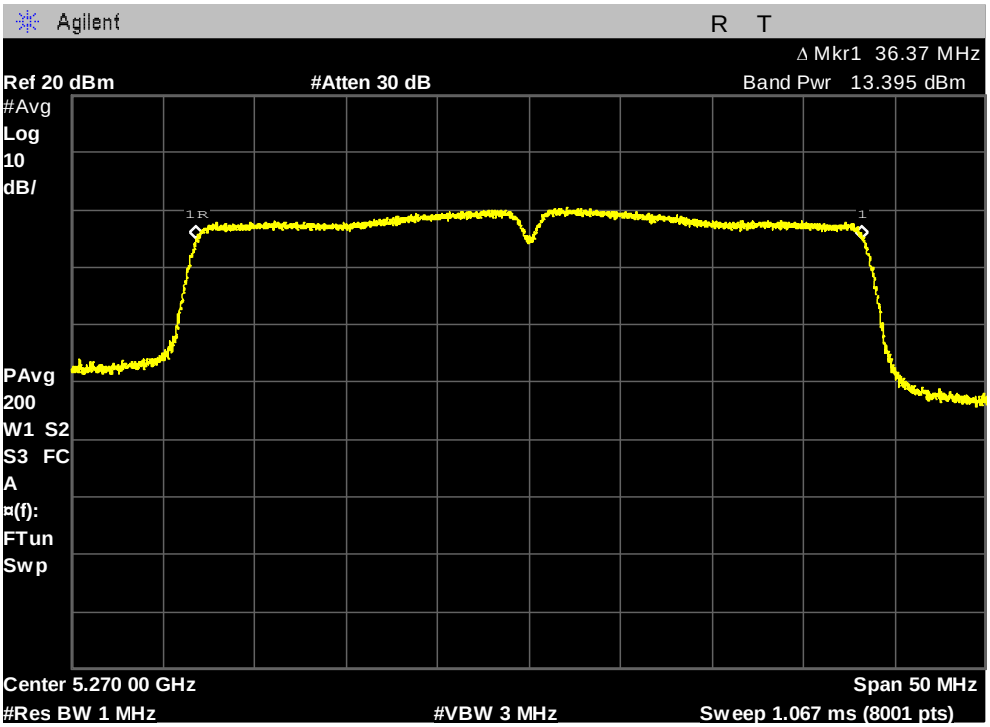
Maximum Conducted Output Power, Highest Channel (5310 MHz)



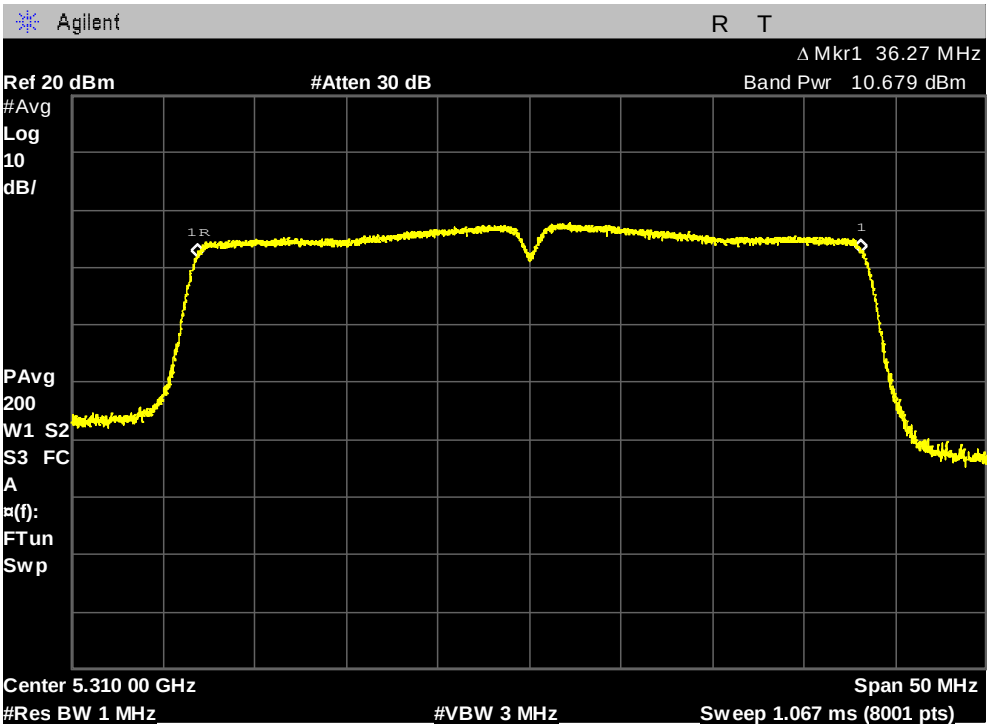
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5270 MHz)



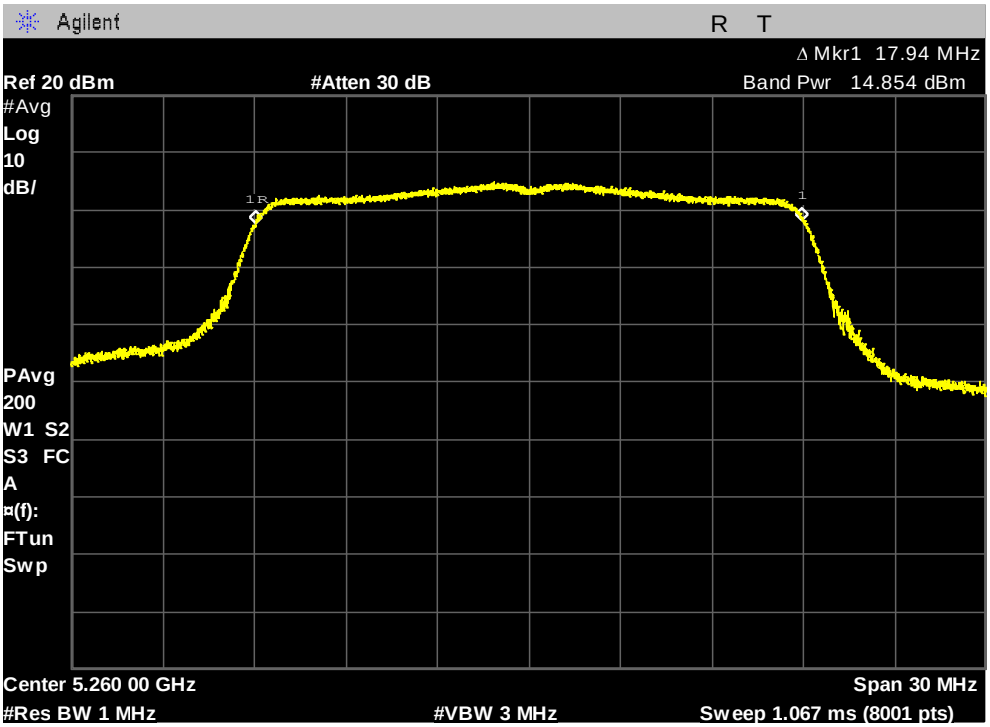
Maximum Conducted Output Power, Highest Channel (5310 MHz)



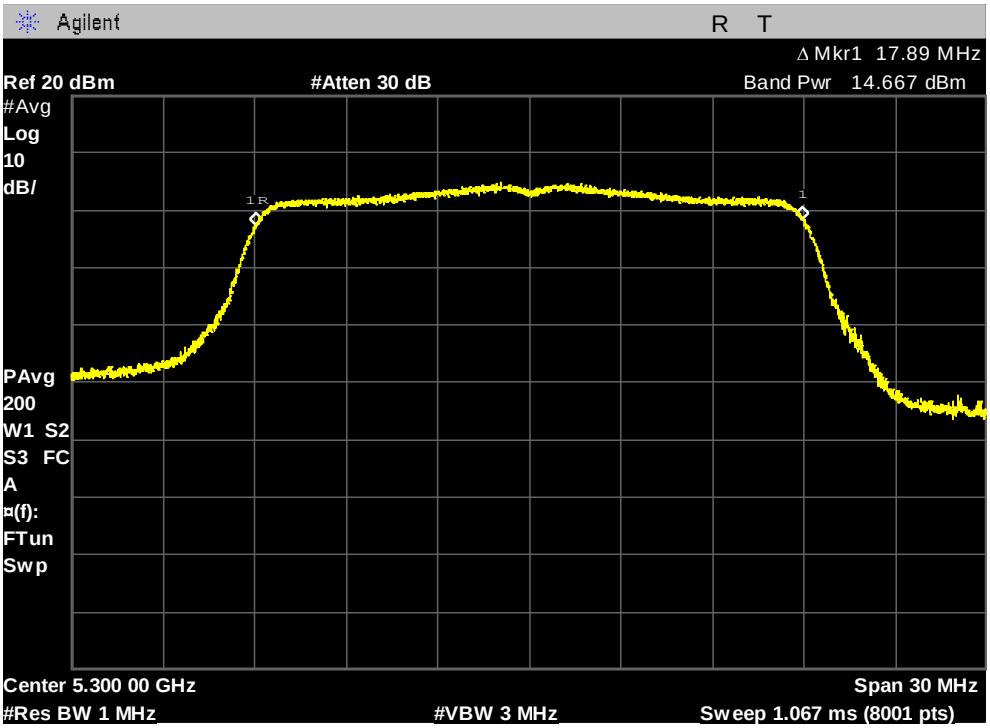
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

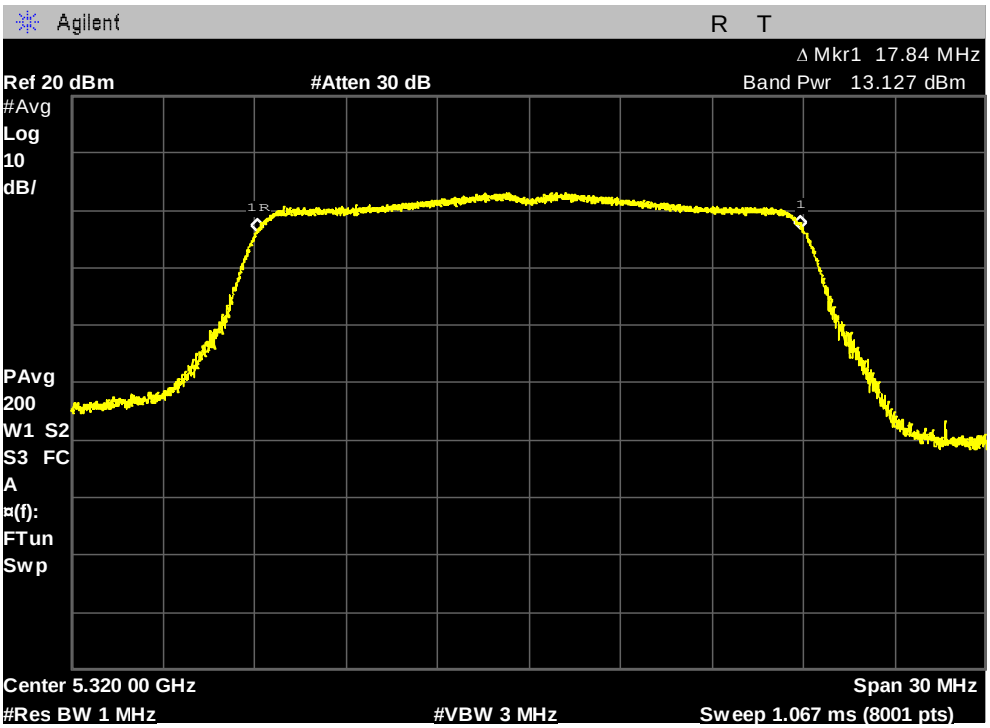


Maximum Conducted Output Power, Middle Channel (5300 MHz)



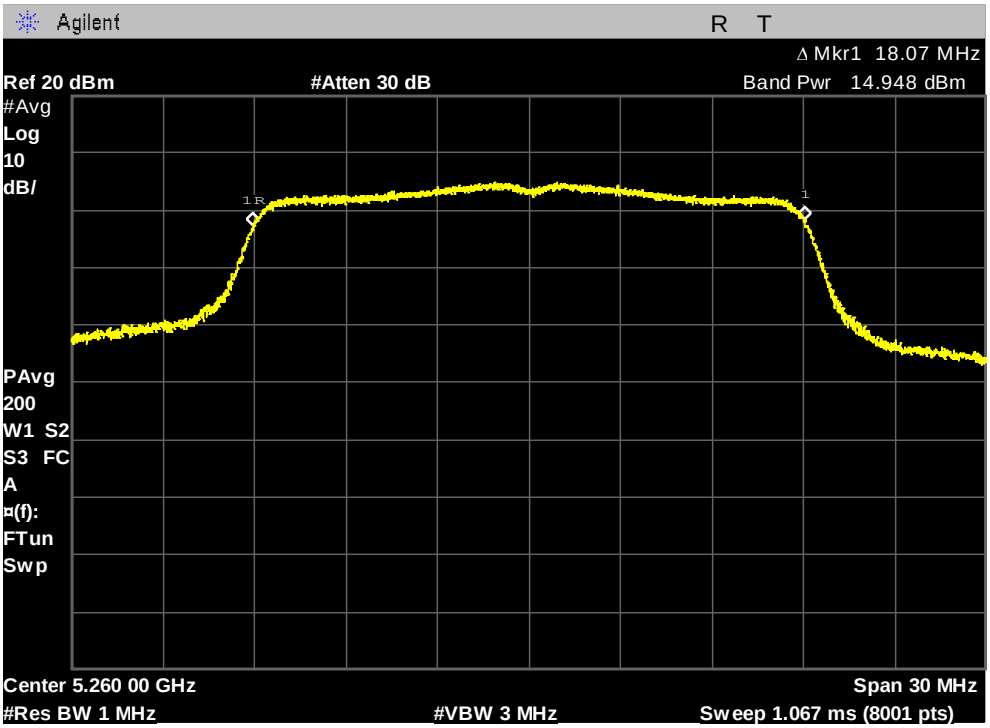
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5320 MHz)



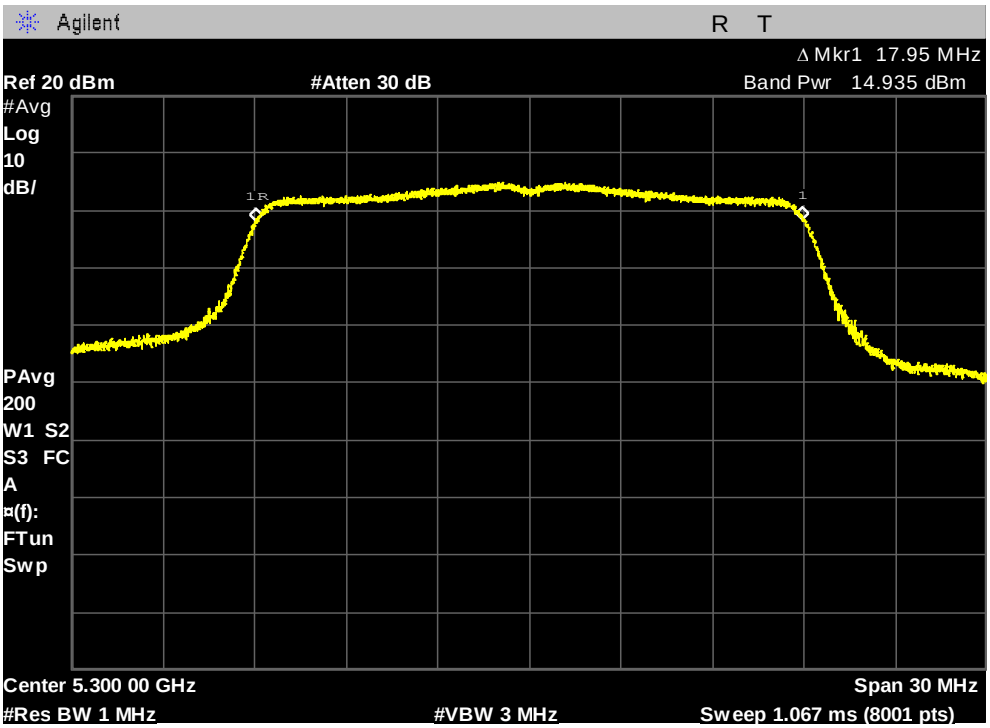
802.11ac(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

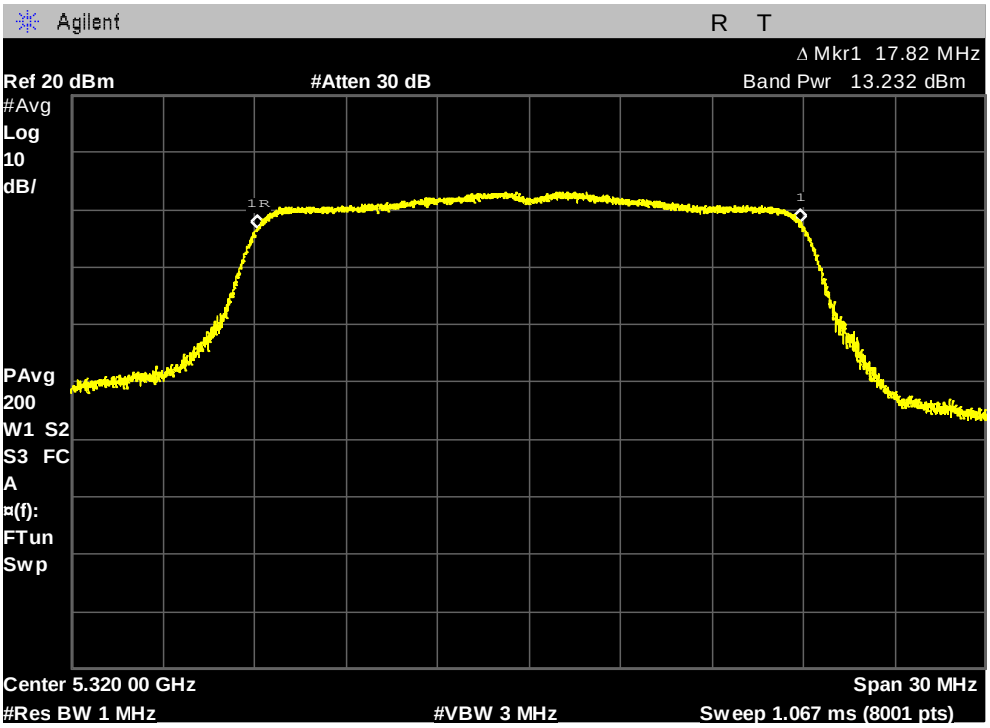


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5300 MHz)



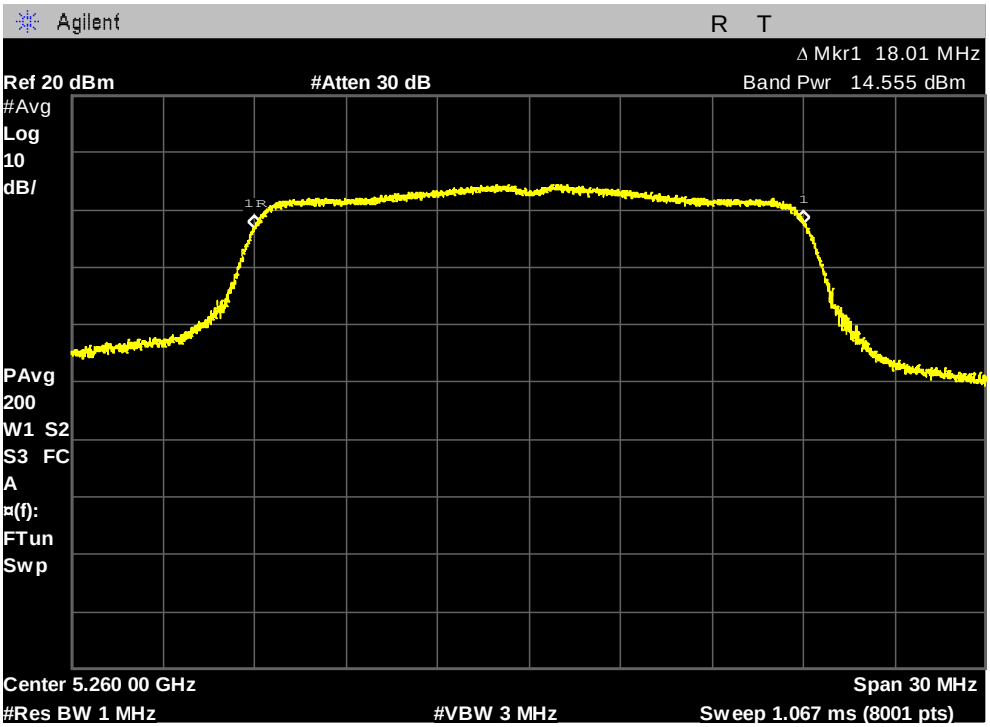
Maximum Conducted Output Power, Highest Channel (5320 MHz)



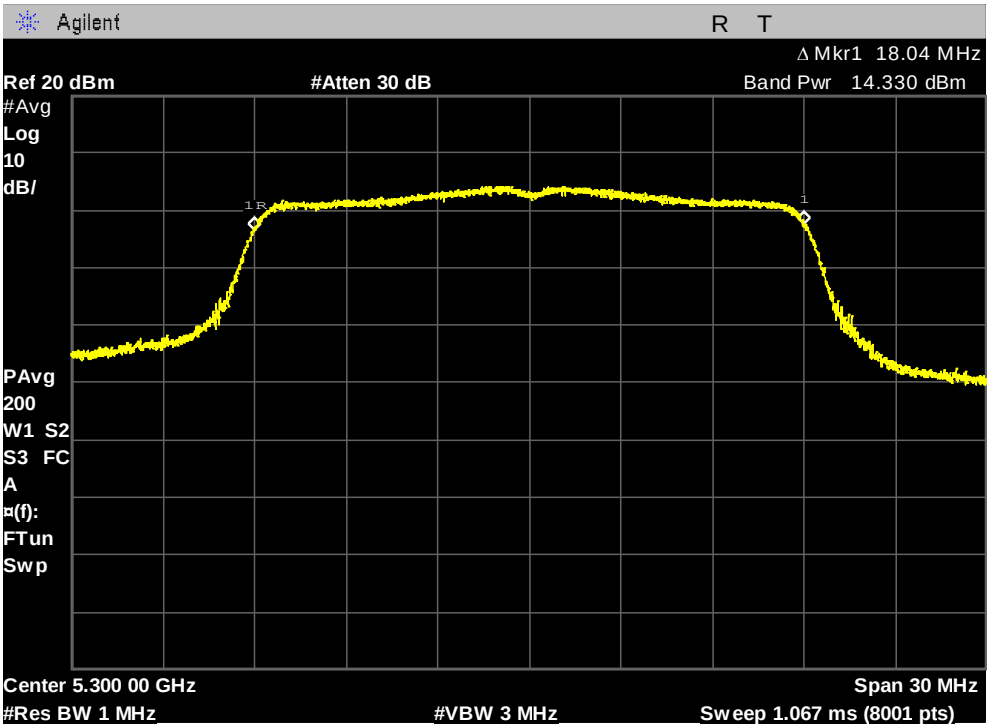
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5260 MHz)

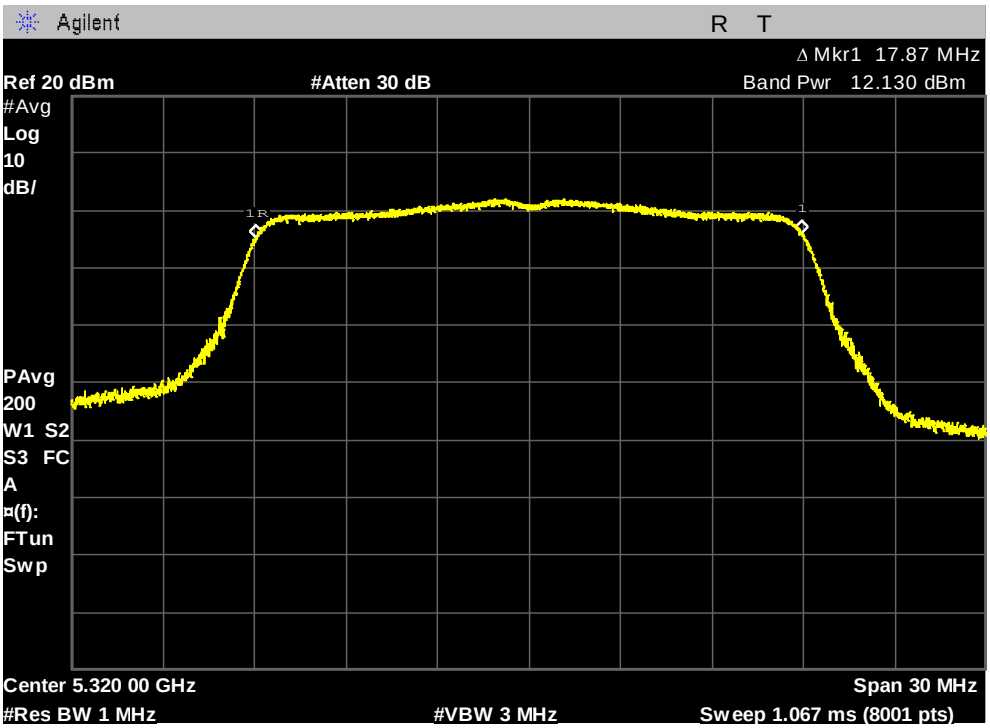


Maximum Conducted Output Power, Middle Channel (5300 MHz)



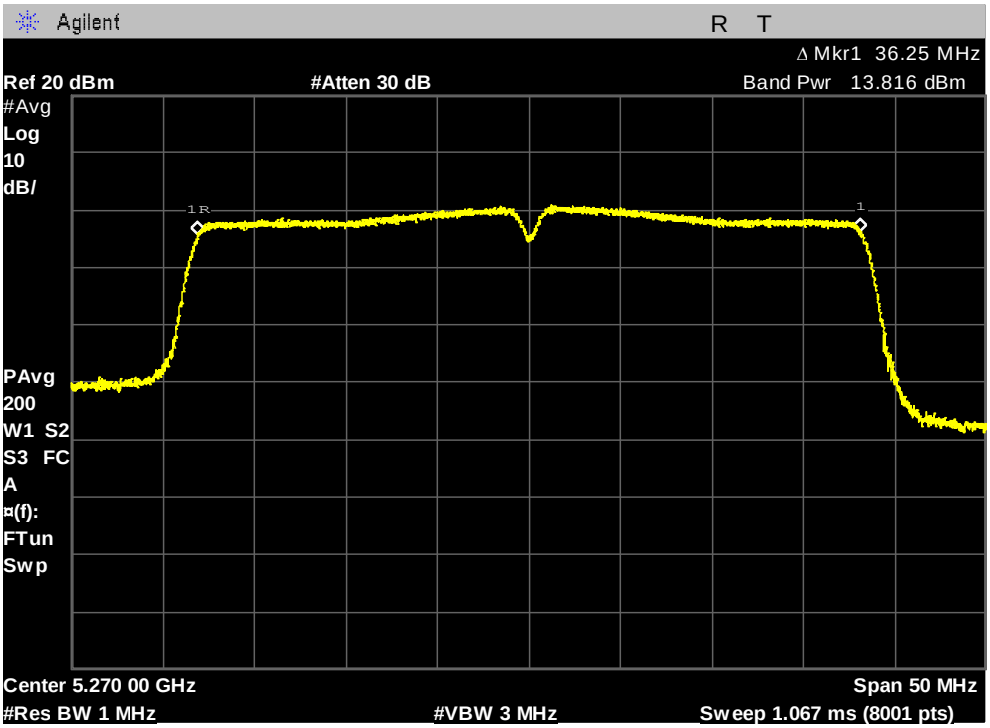
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5320 MHz)



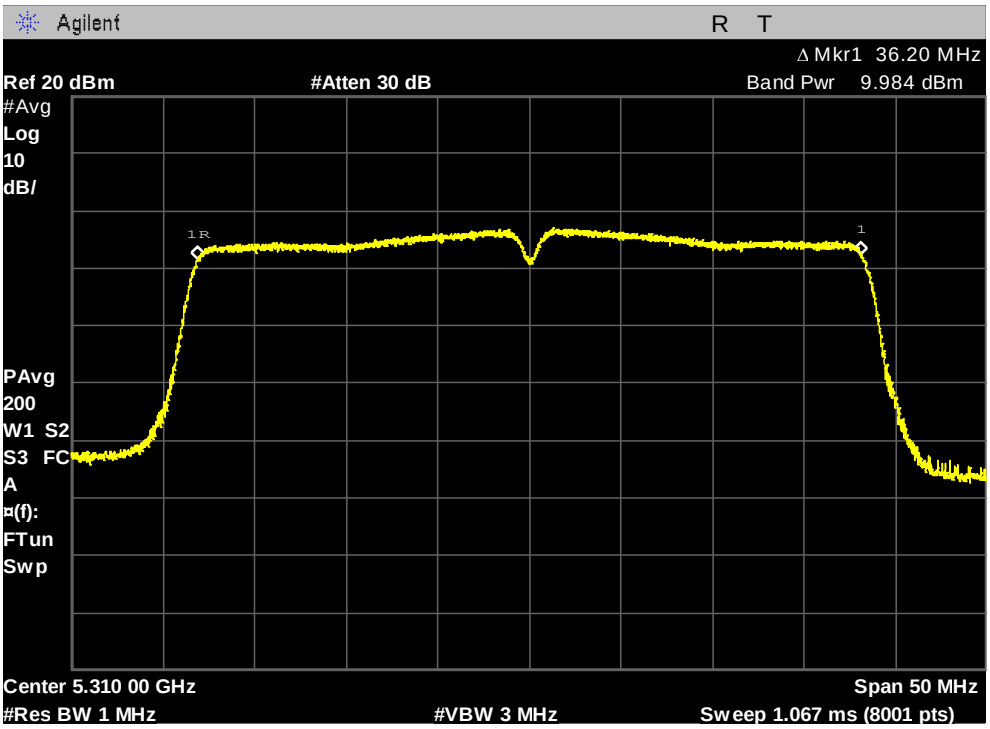
802.11ac(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5270 MHz)



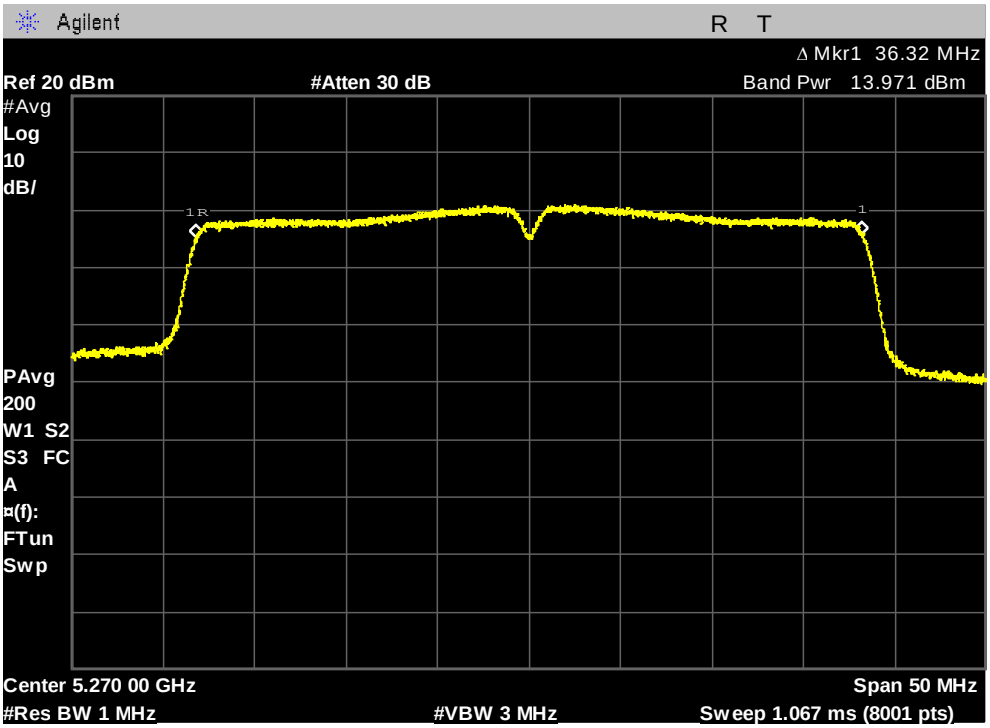
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5310 MHz)



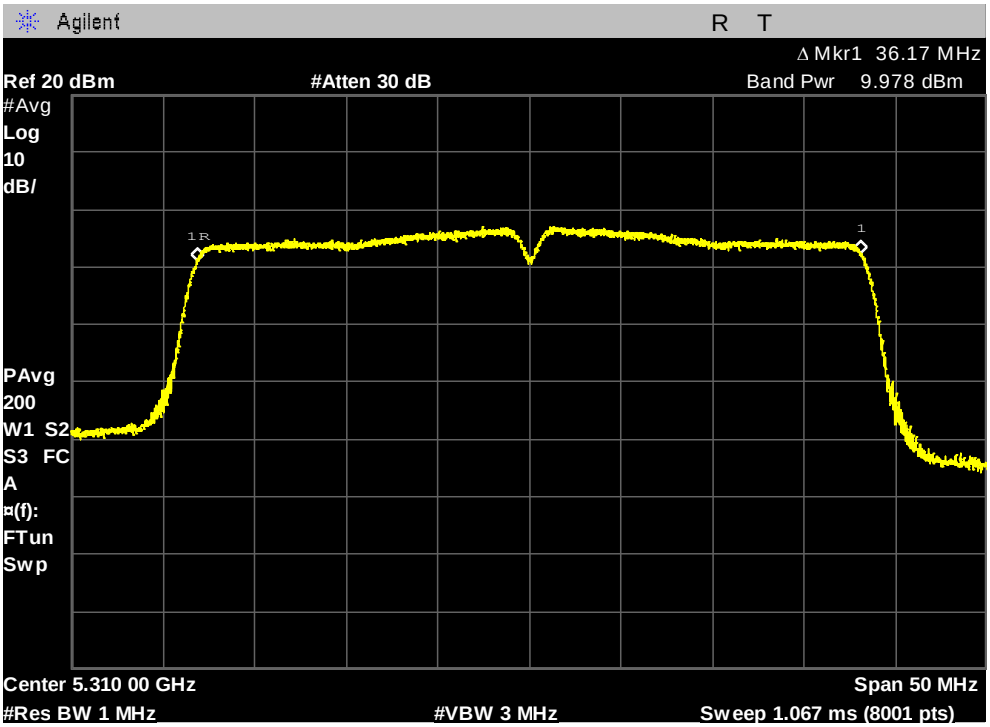
802.11ac(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5270 MHz)



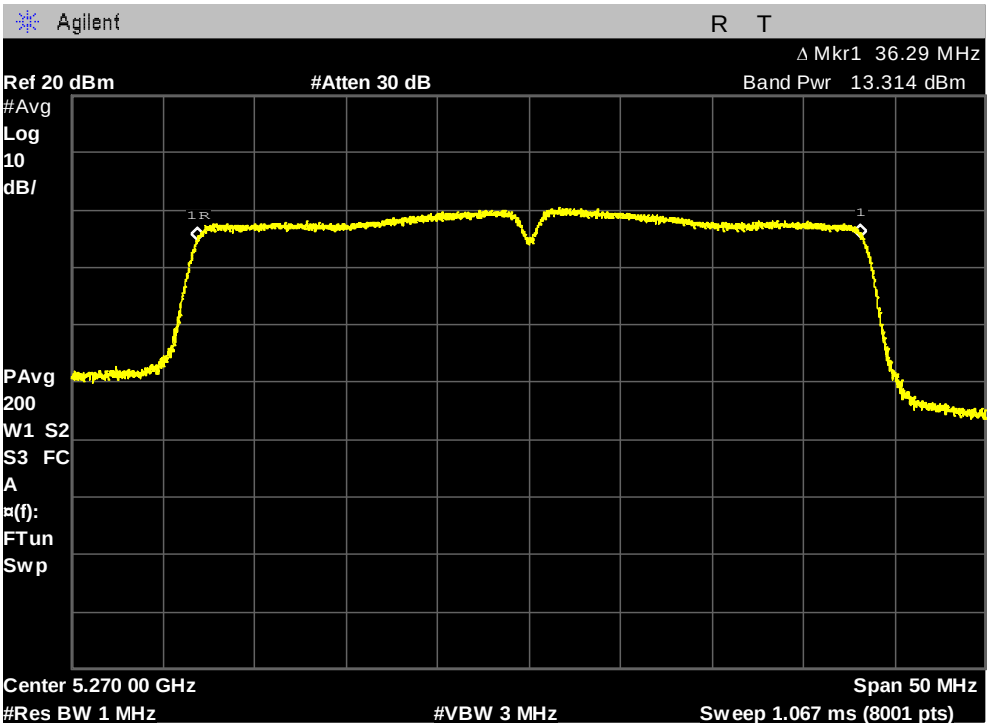
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5310 MHz)



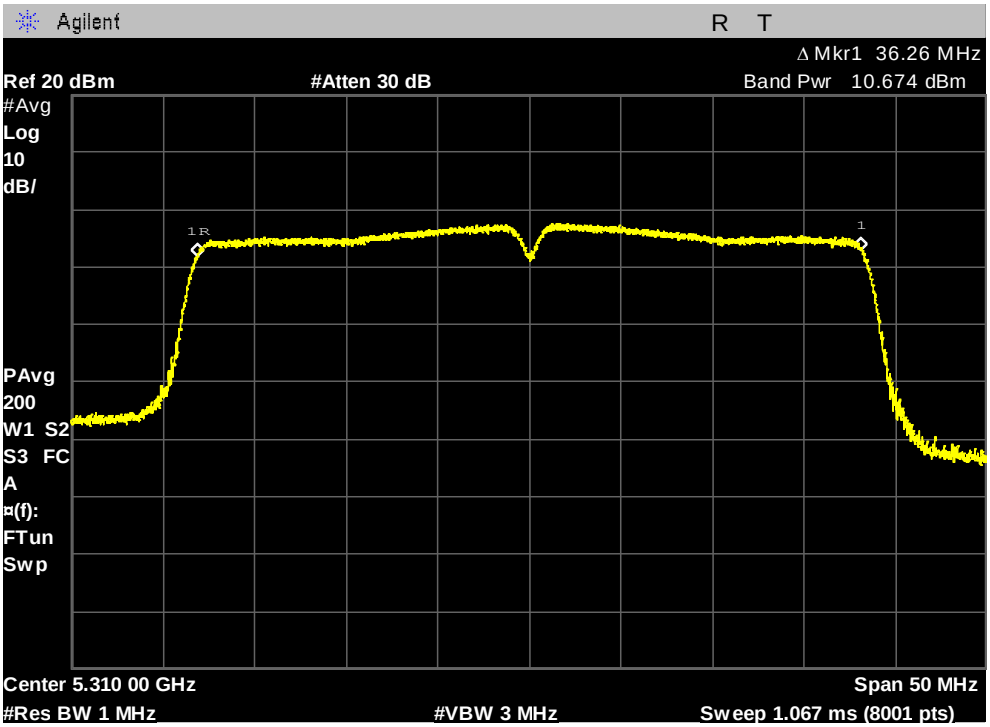
802.11ac(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5270 MHz)



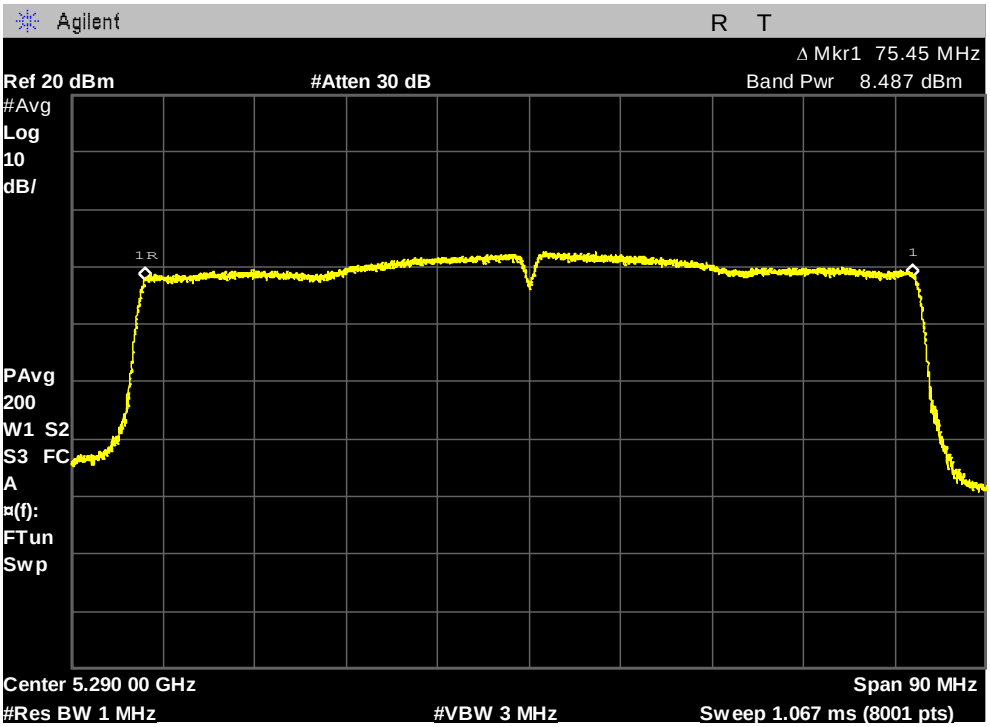
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5310 MHz)



802.11ac(80MHz) mode 1TX

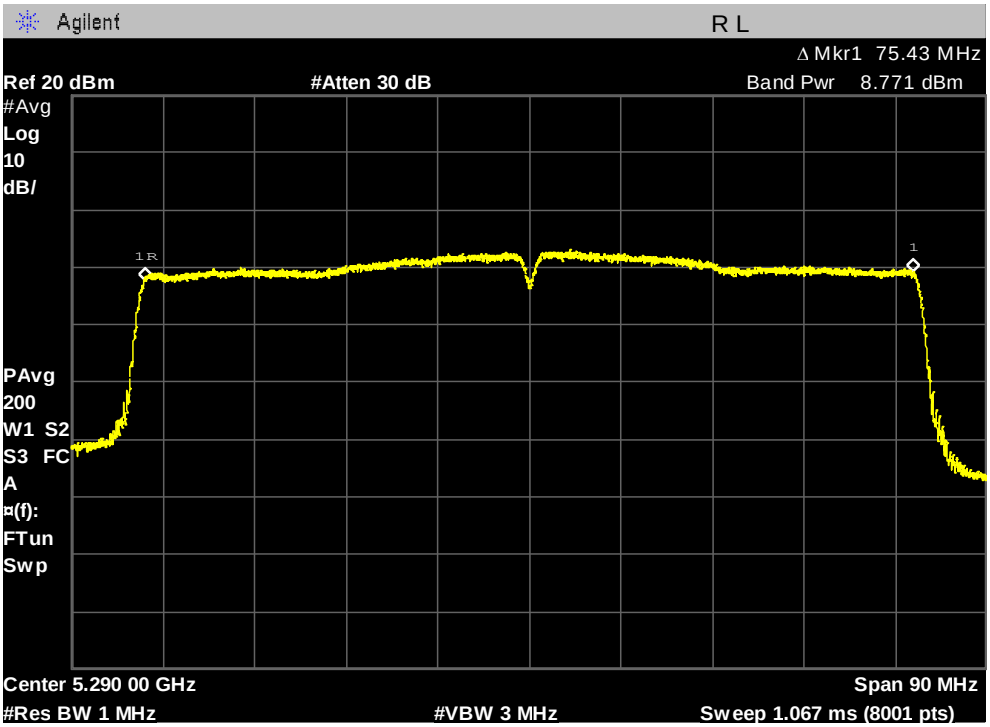
Maximum Conducted Output Power, Middle Channel (5290 MHz)



PLOTS OF EMISSIONS

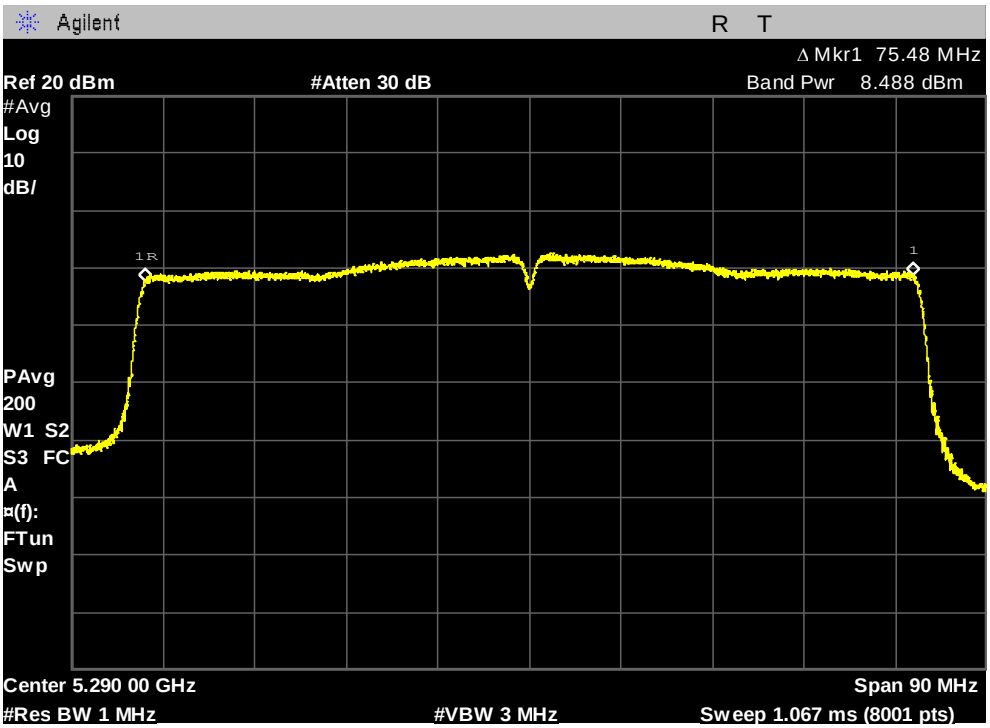
802.11ac(80MHz) mode 2TX ANT0

Maximum Conducted Output Power, Middle Channel (5290 MHz)



802.11ac(80MHz) mode 2TX ANT1

Maximum Conducted Output Power, Middle Channel (5290 MHz)



8.5.3 Maximum Conducted Output Power – U-NII-2C band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel, Straddle channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5500	11.69	0.08	11.77	23.98
Middle	5600	11.71	0.08	11.79	23.98
Highest	5700	11.89	0.08	11.97	23.98

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5500	11.82	0.07	11.89	23.98
Middle	5600	11.55	0.07	11.62	23.98
Highest	5700	11.76	0.07	11.83	23.98

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5500	11.63	11.25	0.07	14.52	23.98
Middle	5600	11.56	11.47	0.07	14.60	23.98
Highest	5700	11.95	11.67	0.07	14.89	23.98

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5510	9.05	0.21	9.26	23.98
Middle	5590	13.71	0.21	13.92	23.98
Highest	5670	13.62	0.21	13.83	23.98

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5510	8.95	9.08	0.21	12.24	23.98
Middle	5590	13.7	13.41	0.21	16.78	23.98
Highest	5670	13.75	13.38	0.21	16.79	23.98

TEST DATA

802.11ac (20MHz) mode – 1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5500	11.7	0.07	11.77	23.98
Middle	5600	11.58	0.07	11.65	23.98
Highest	5700	11.89	0.07	11.96	23.98

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5500	11.5	11.45	0.07	14.56	23.98
Middle	5600	11.53	11.34	0.07	14.52	23.98
Highest	5700	11.89	11.55	0.07	14.80	23.98

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5510	8.92	0.16	9.08	23.98
Middle	5590	13.74	0.16	13.90	23.98
Highest	5670	13.63	0.16	13.79	23.98

TEST DATA

802.11ac (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5510	8.85	9.19	0.16	12.19	23.98
Middle	5590	13.85	13.36	0.16	16.78	23.98
Highest	5670	13.78	13.33	0.16	16.73	23.98

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5530	6.06	0.31	6.37	23.98
Highest	5610	11.44	0.31	11.75	23.98

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5530	6.27	6.77	0.31	9.85	23.98
Highest	5610	11.45	11.37	0.31	14.73	23.98

TEST DATA

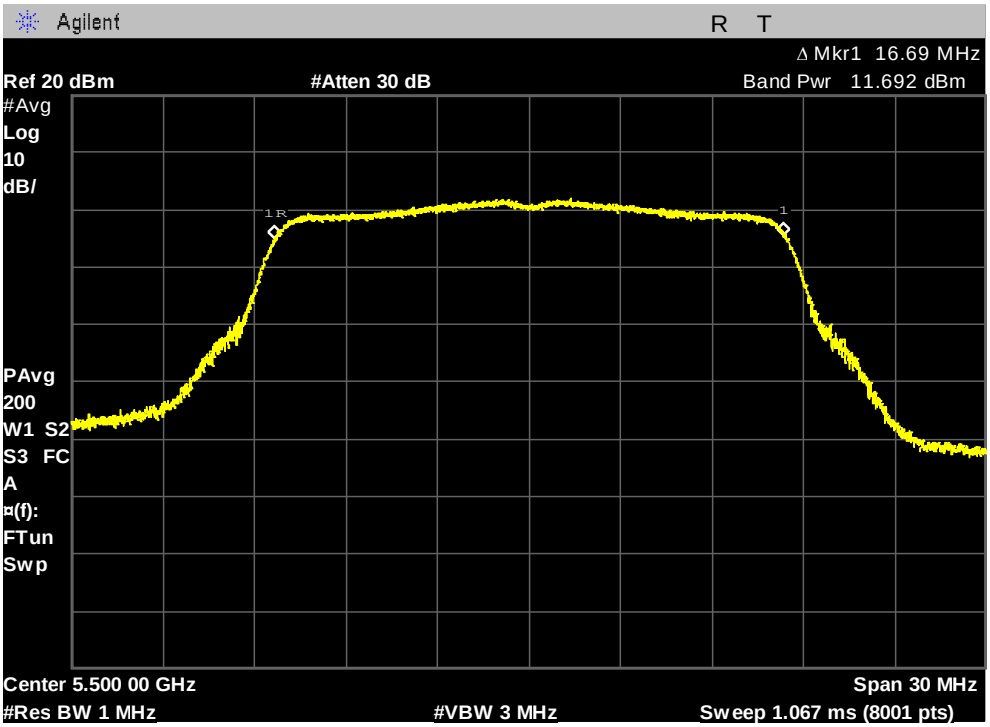
Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor*
2. *Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}*
3. *For CDD transmission, directional gain is.* ***2.79 dBi.***
   For MIMO transmission, directional gain is ***2.79 dBi.***
   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
   For power measurements on IEEE 802.11 devices employing CDD, directional gain is as follows,
   Directional gain = G_{ANT} + Array Gain = 2.59 dBi + 0 dB = 2.79 dBi.
   Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
   Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.
   For power measurements on all devices employing MIMO, directional gain is as follows,
   ***Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi = 2.59 dBi + 10 log(2/2) dB = 2.79 dBi**.*
   where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. *FCC conducted output power limit = 250 mW or 11 dBm + 10 log B, whichever power is less.*
   B is the 26 dB emission bandwidth in megahertz.
5. *For n(20MHz, 40MHz),ac (20MHz,40MHz,80MHz) mode, Beamforming gain is 3.01 dBi*
6. *The following equation was used for spectrum offset:*
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)
7. *A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW (26.99dBm) for FCC.*

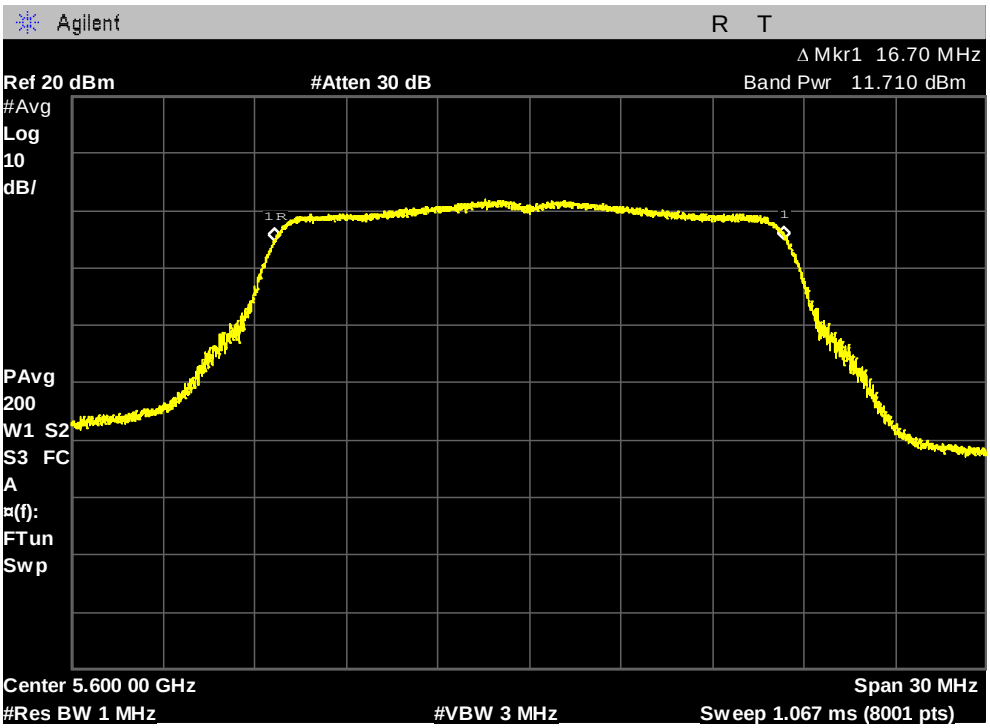
PLOTS OF EMISSIONS

802.11a mode

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

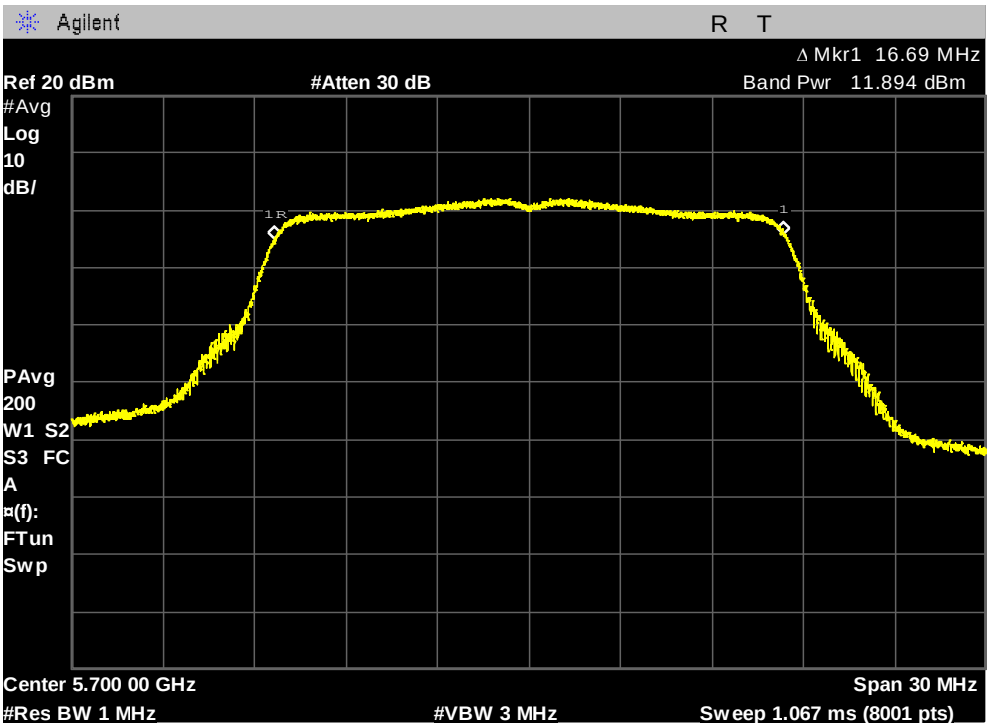


Maximum Conducted Output Power, Middle Channel (5600 MHz)



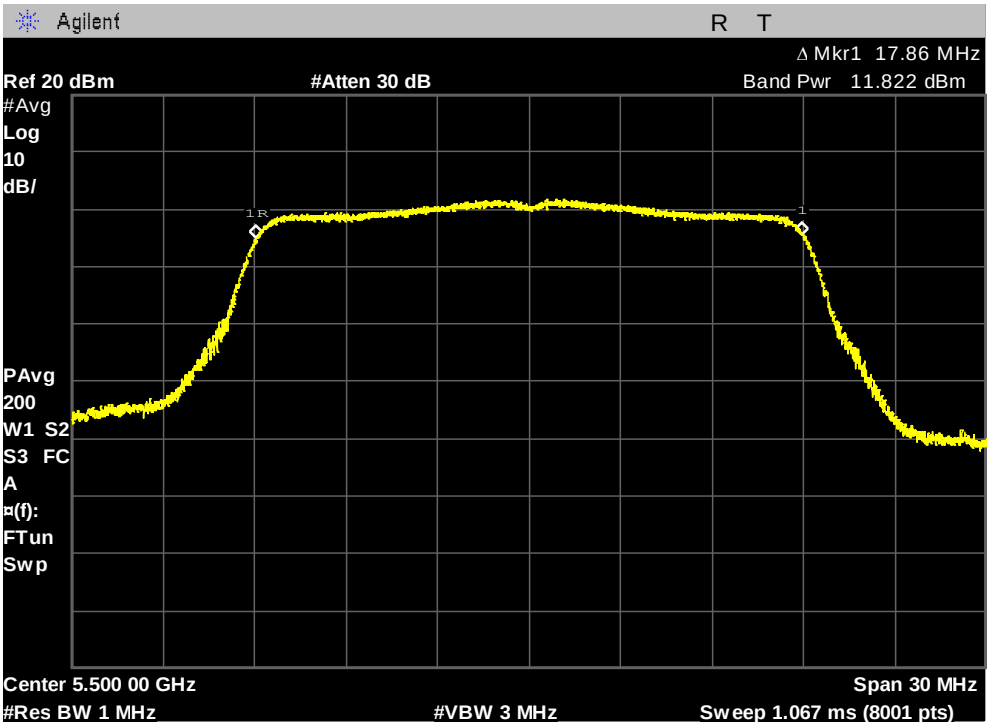
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



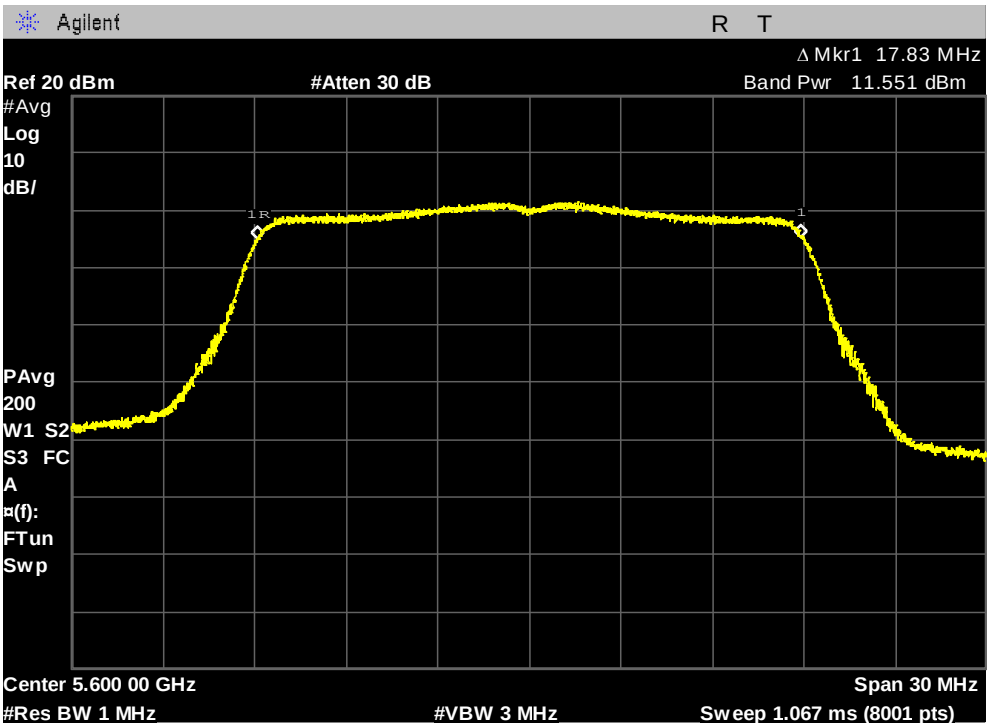
802.11n(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

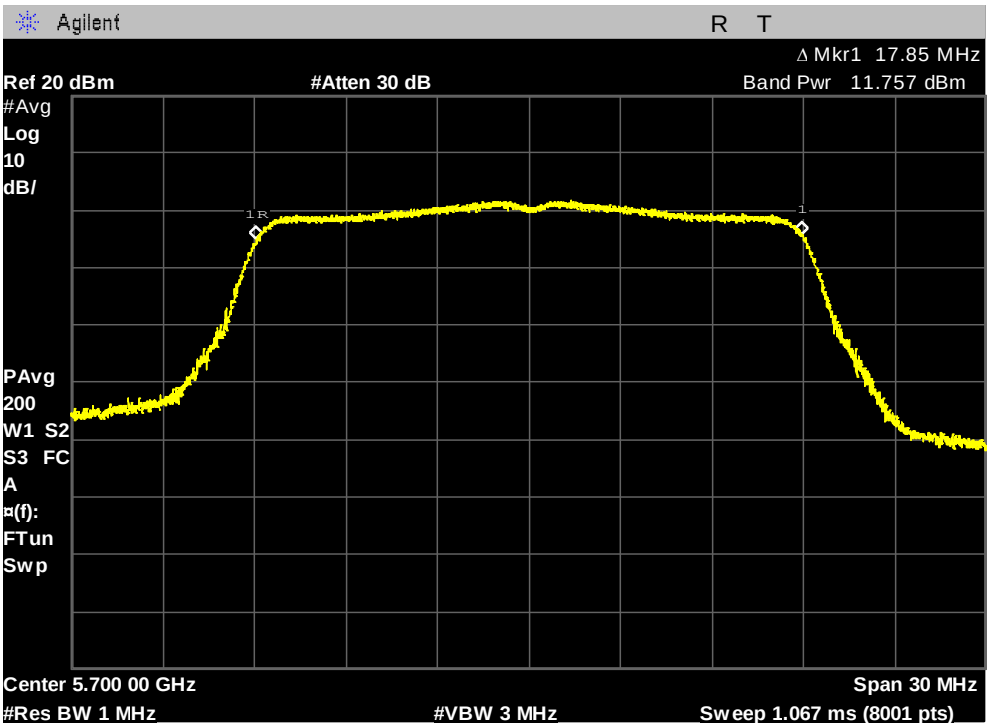


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5600 MHz)



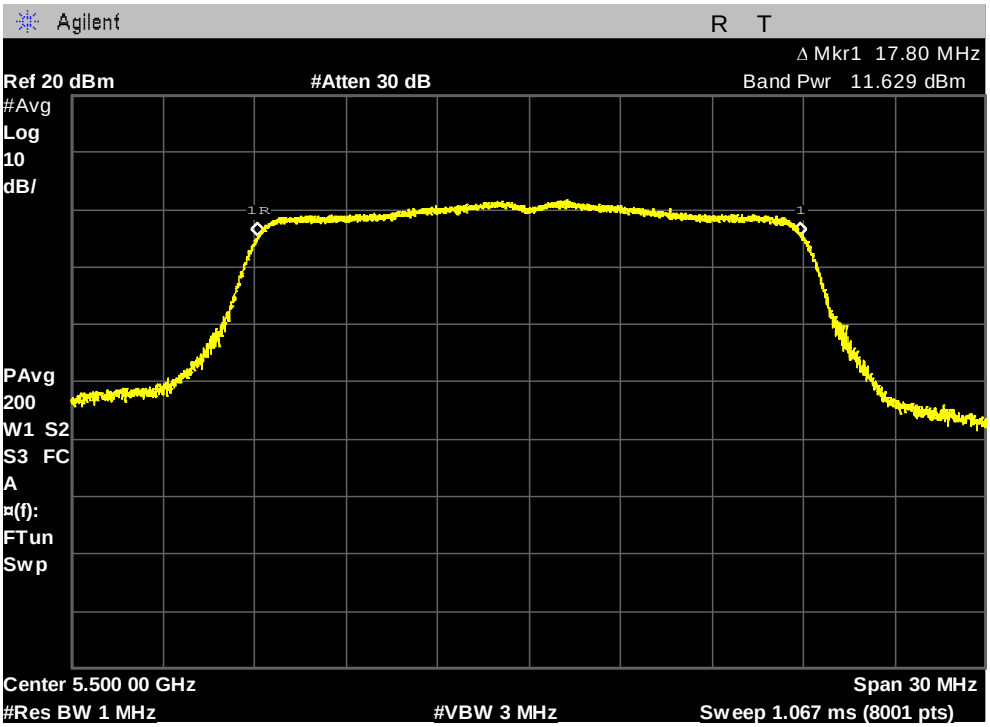
Maximum Conducted Output Power, Highest Channel (5700 MHz)



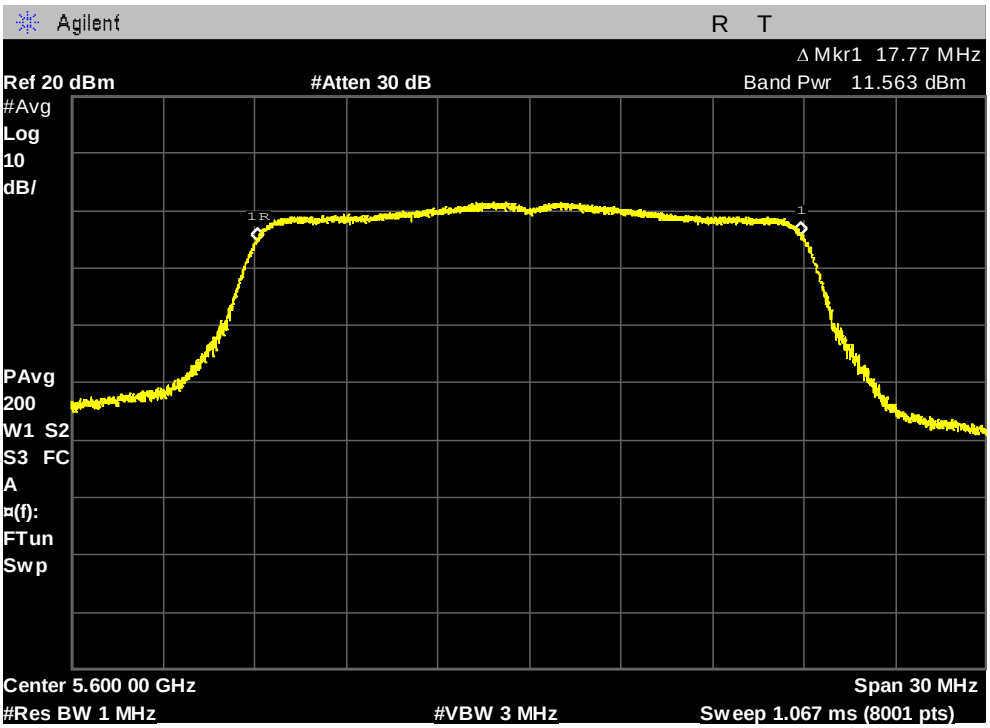
PLOTS OF EMISSIONS

802.11n(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

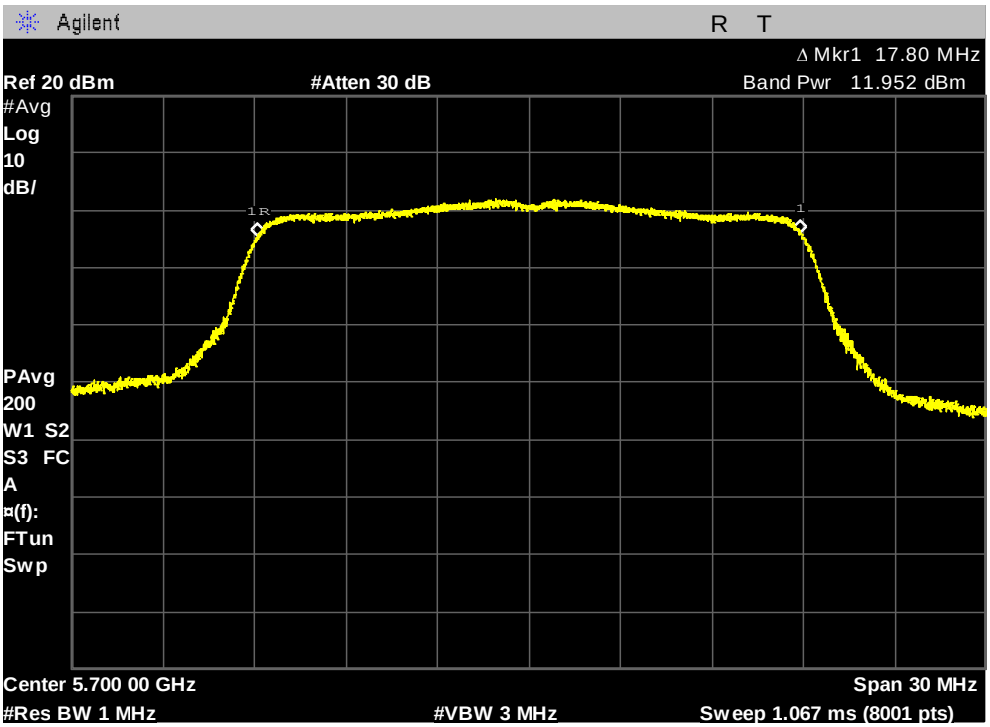


Maximum Conducted Output Power, Middle Channel (5600 MHz)



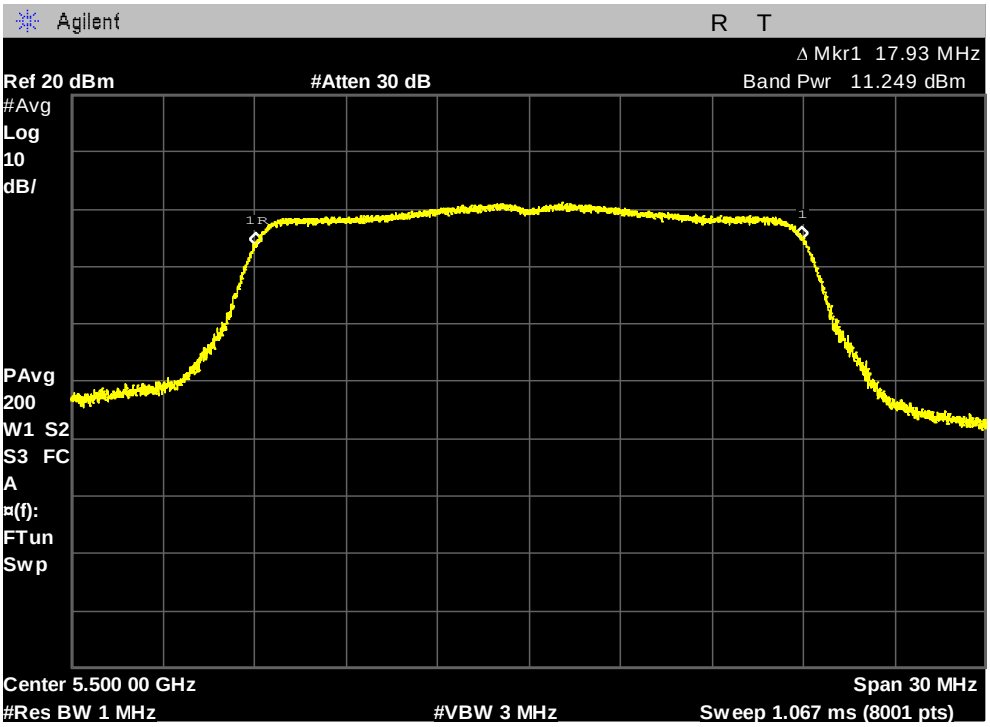
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



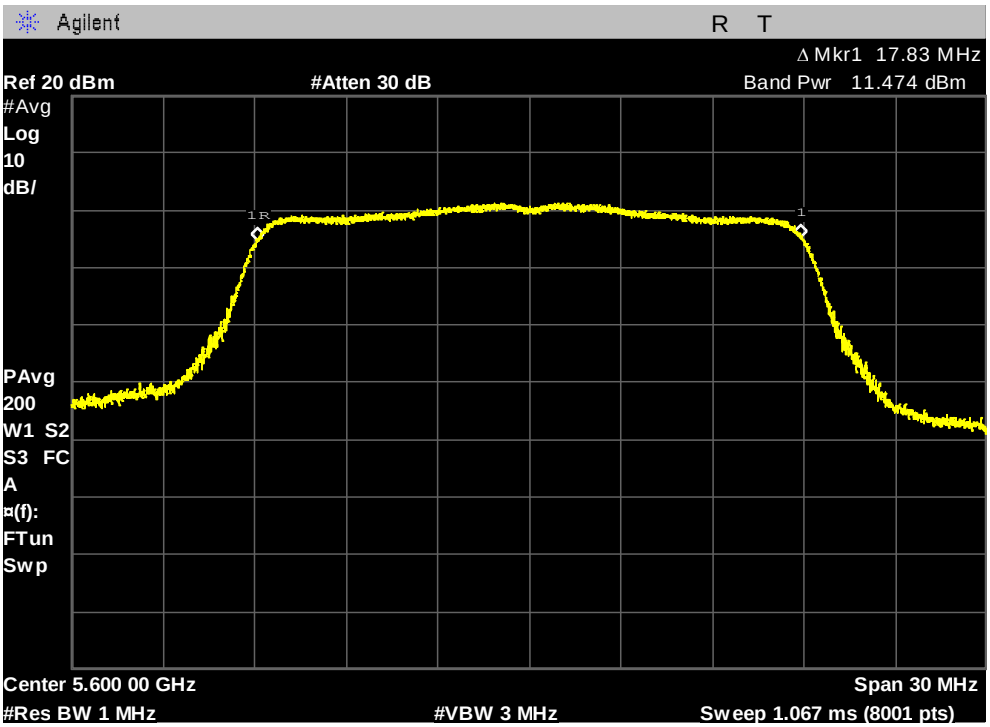
802.11n(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

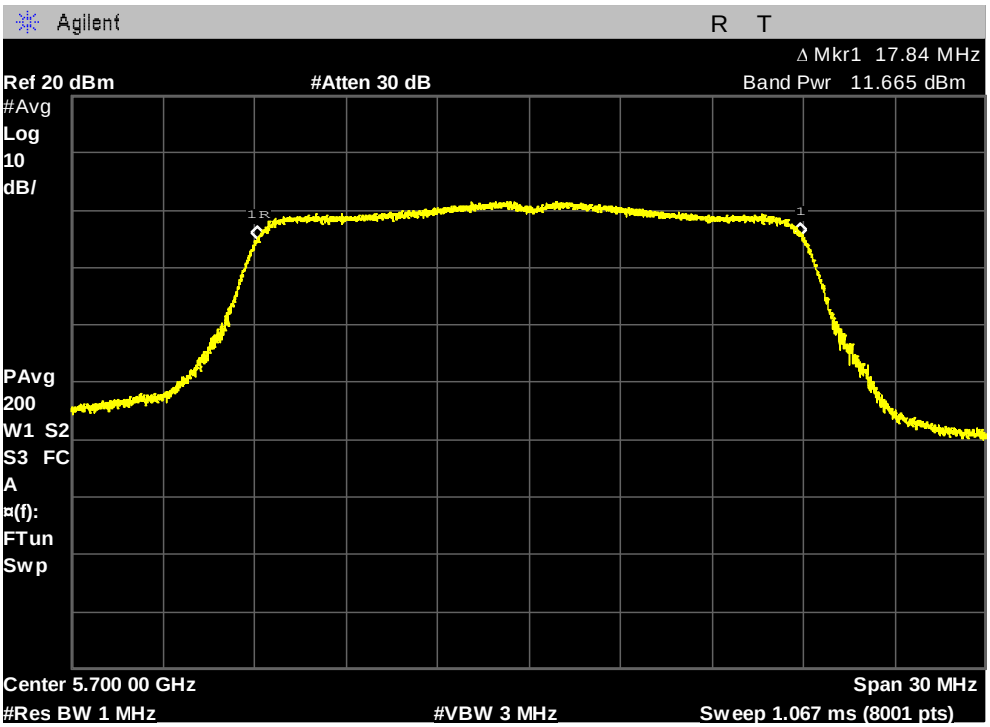


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5600 MHz)



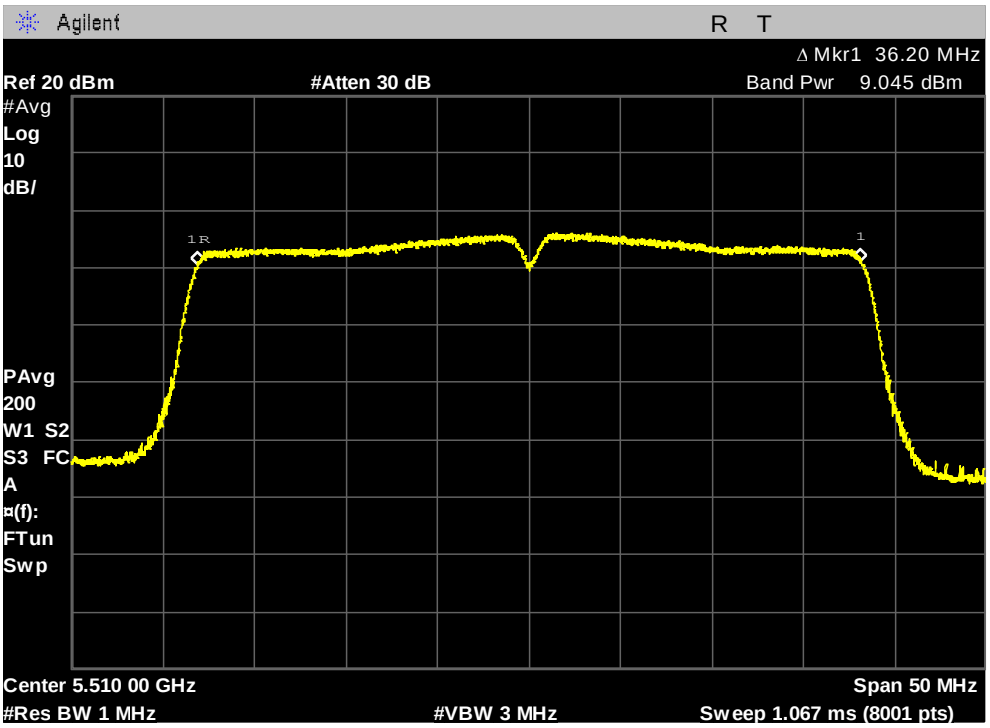
Maximum Conducted Output Power, Highest Channel (5700 MHz)



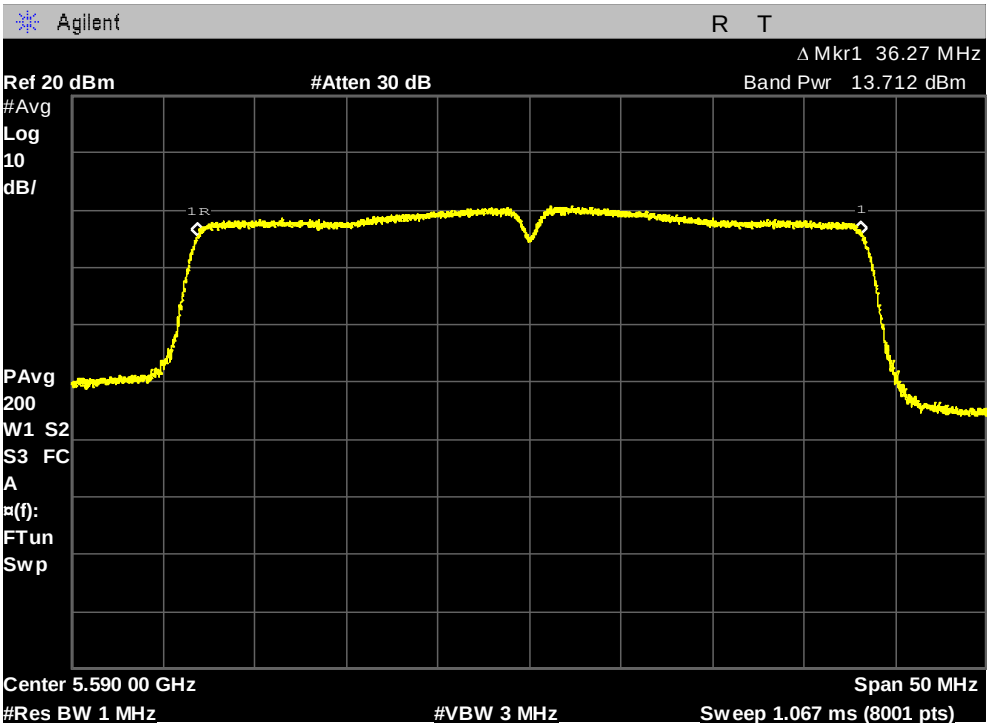
PLOTS OF EMISSIONS

802.11n(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

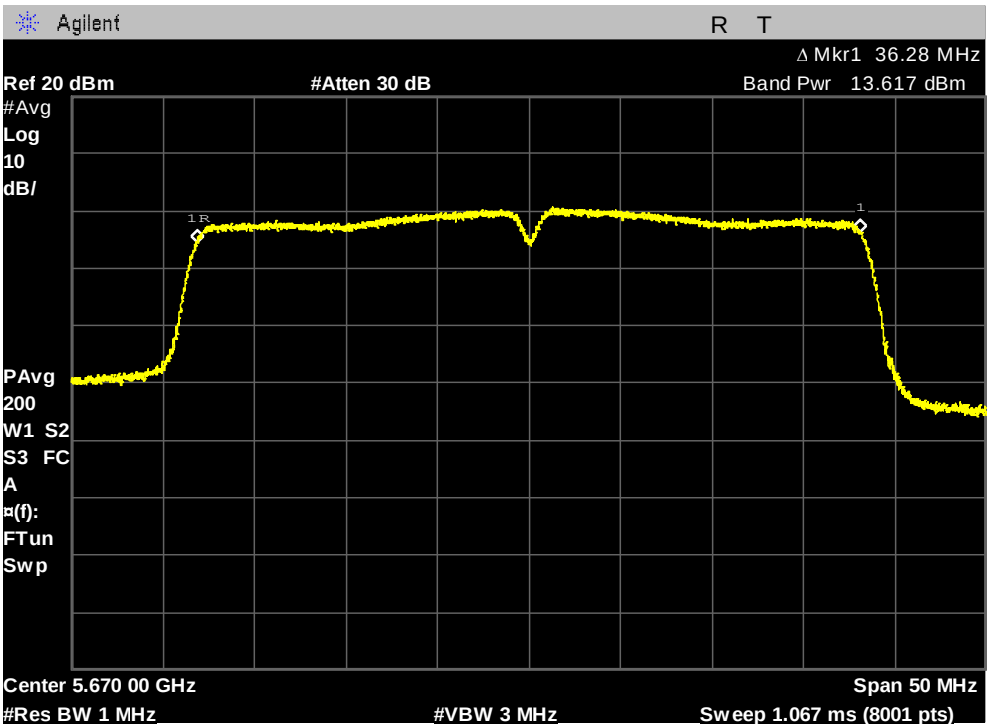


Maximum Conducted Output Power, Middle Channel (5590 MHz)



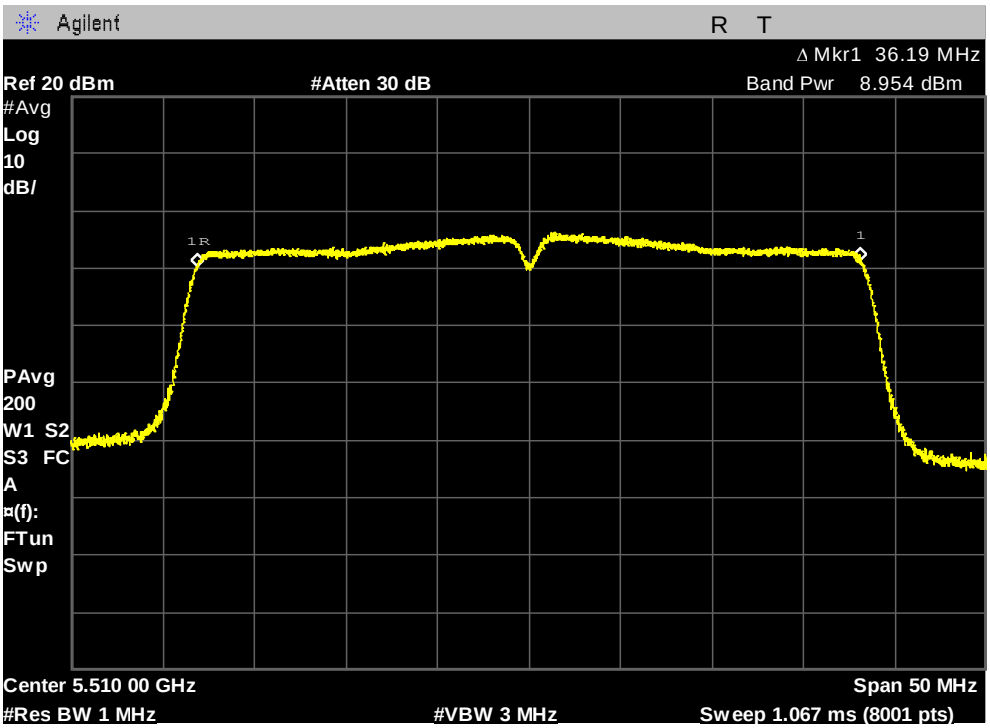
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



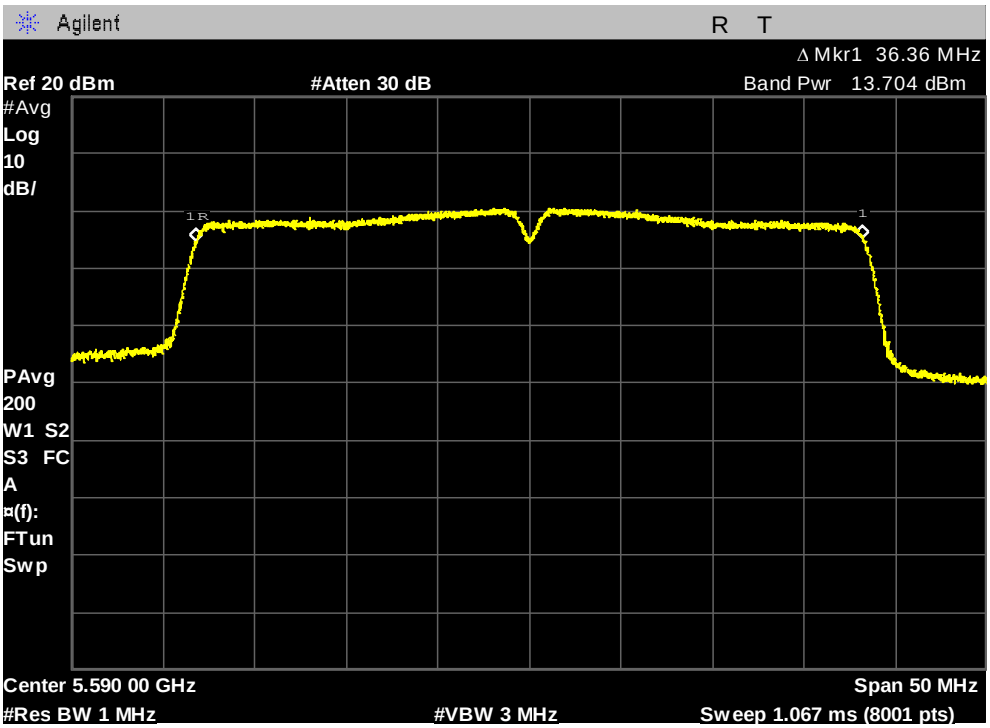
802.11n(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

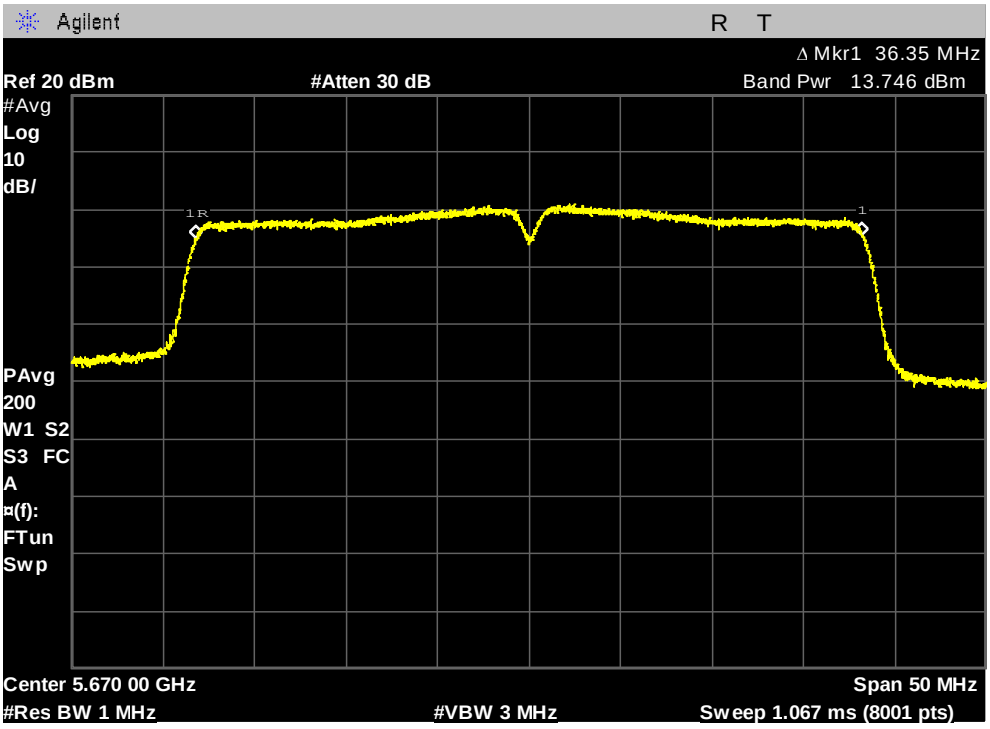


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5590 MHz)



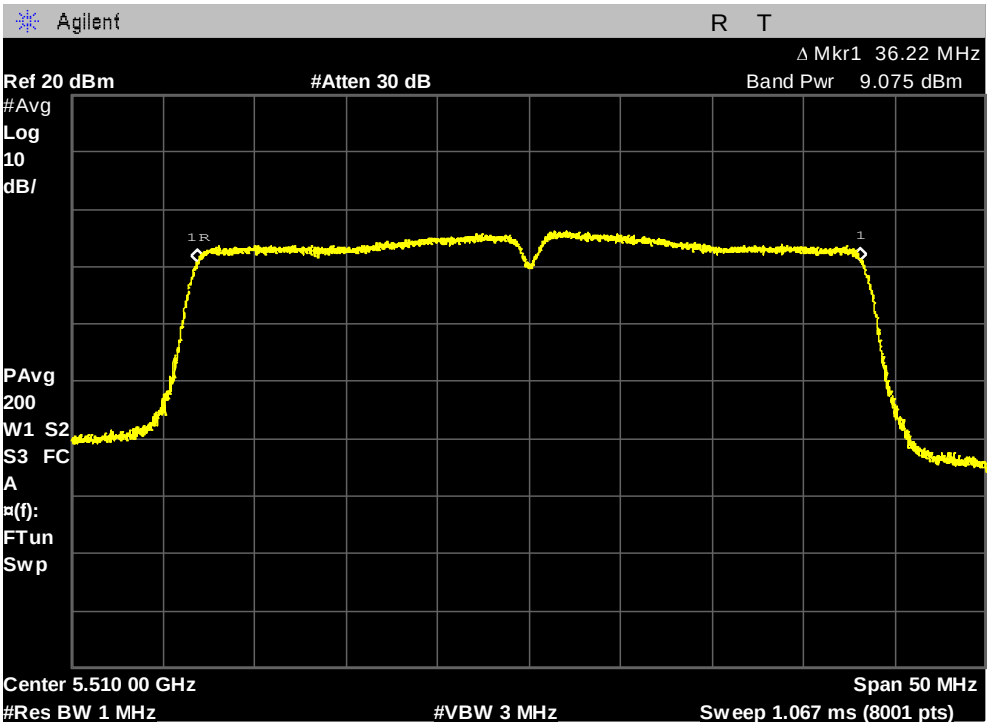
Maximum Conducted Output Power, Highest Channel (5670 MHz)



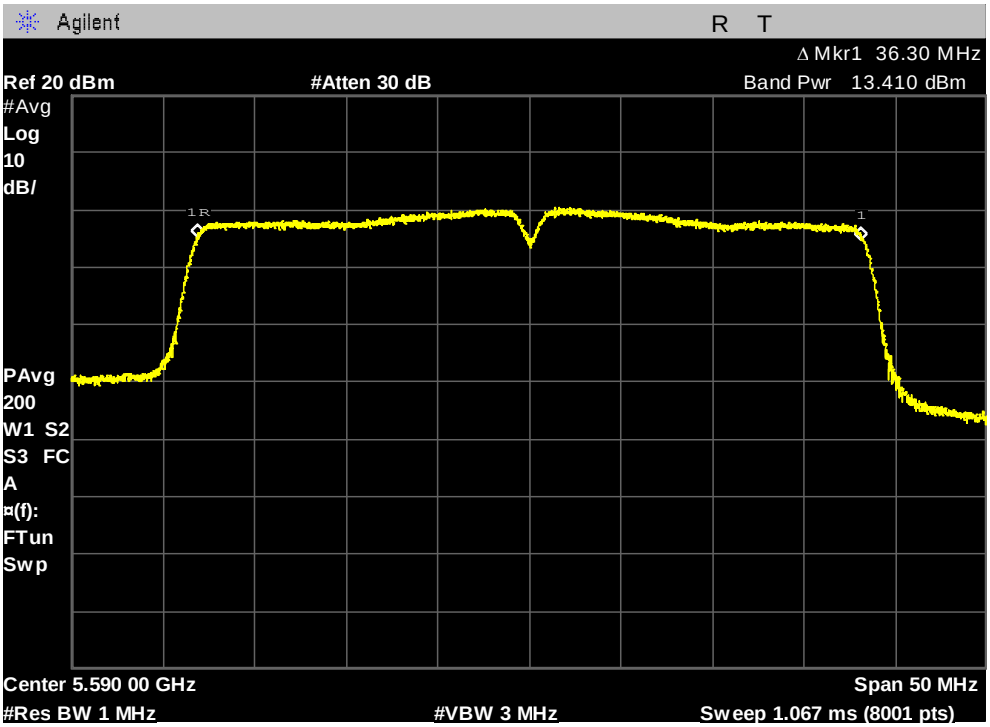
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

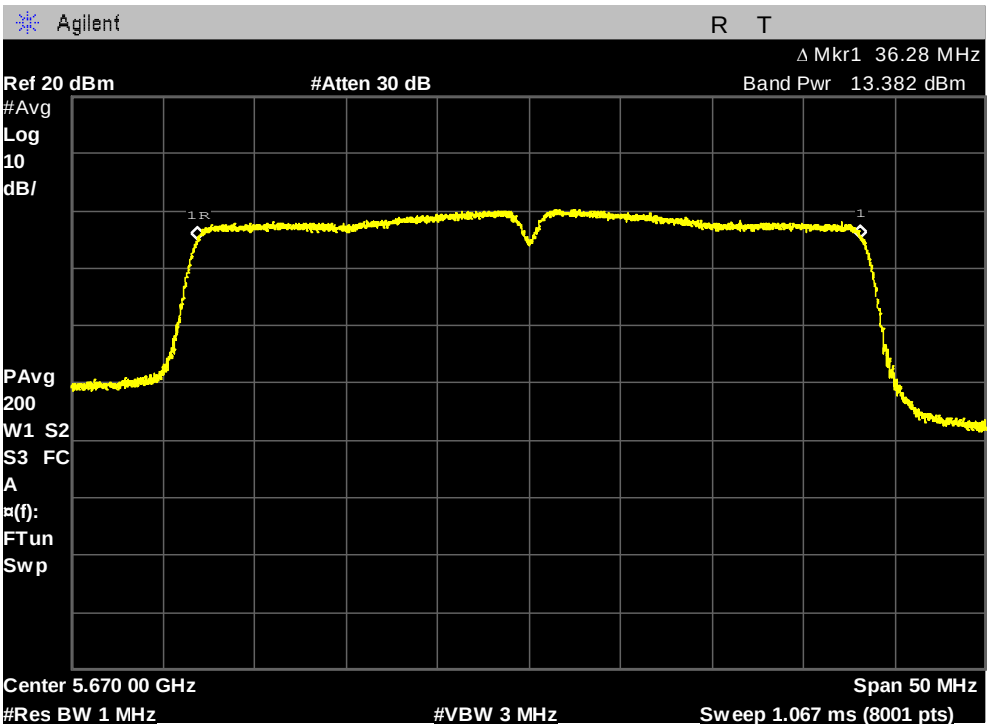


Maximum Conducted Output Power, Middle Channel (5590 MHz)



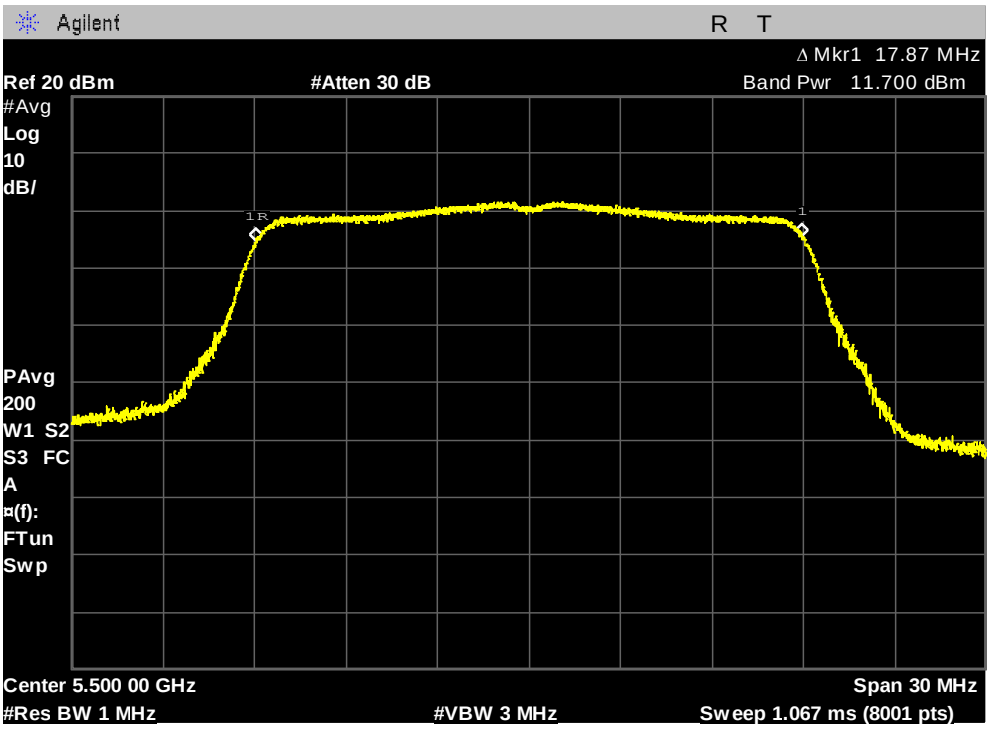
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



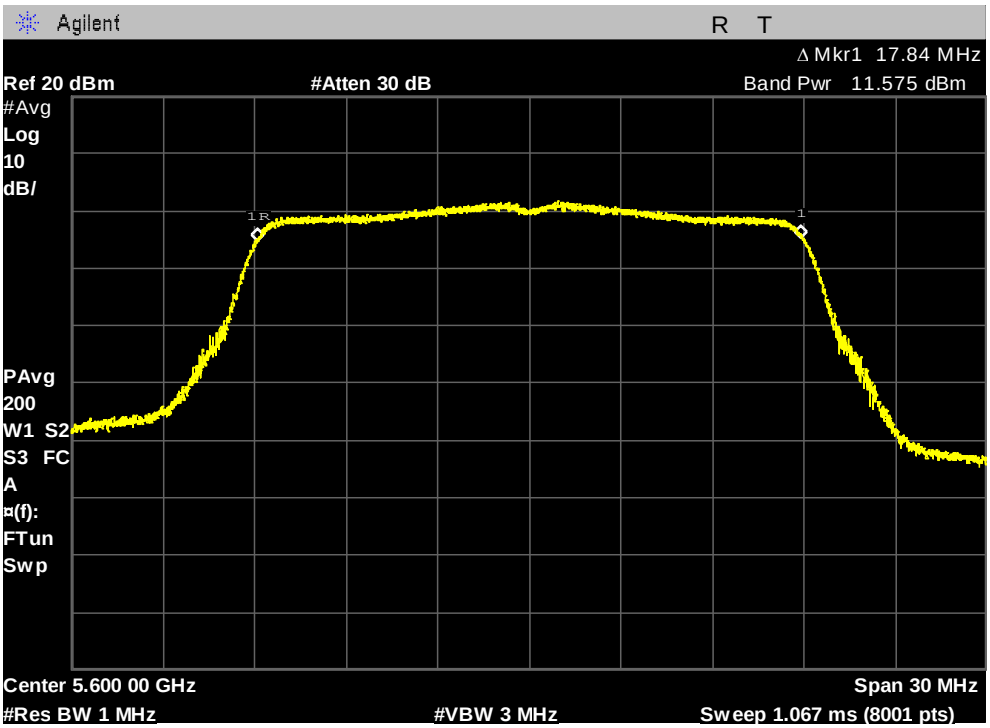
802.11ac(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

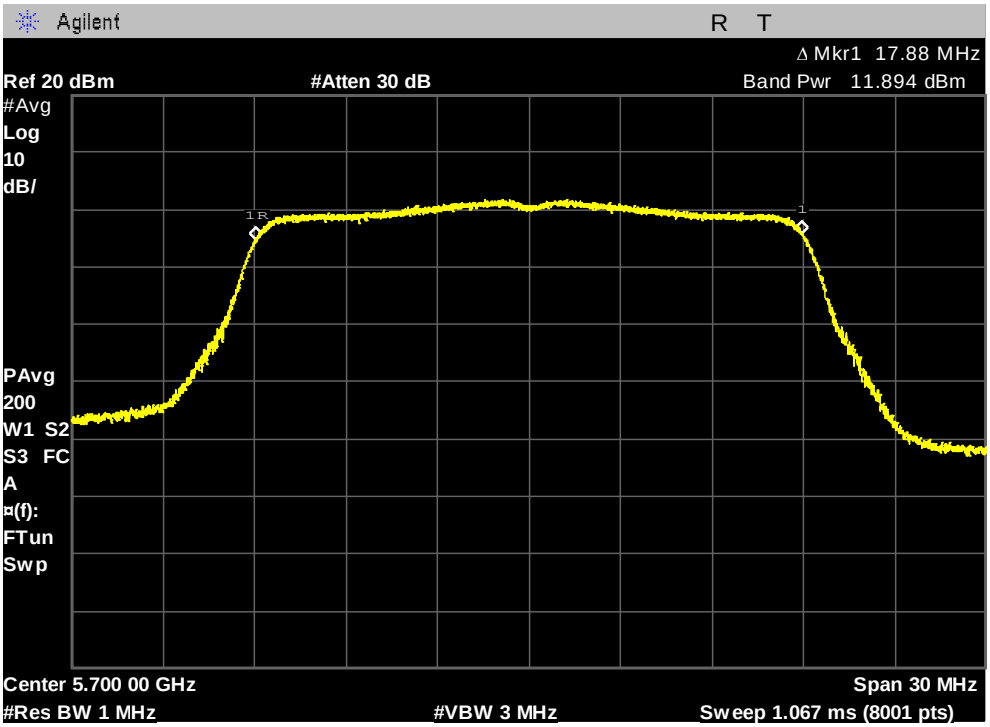


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5600 MHz)



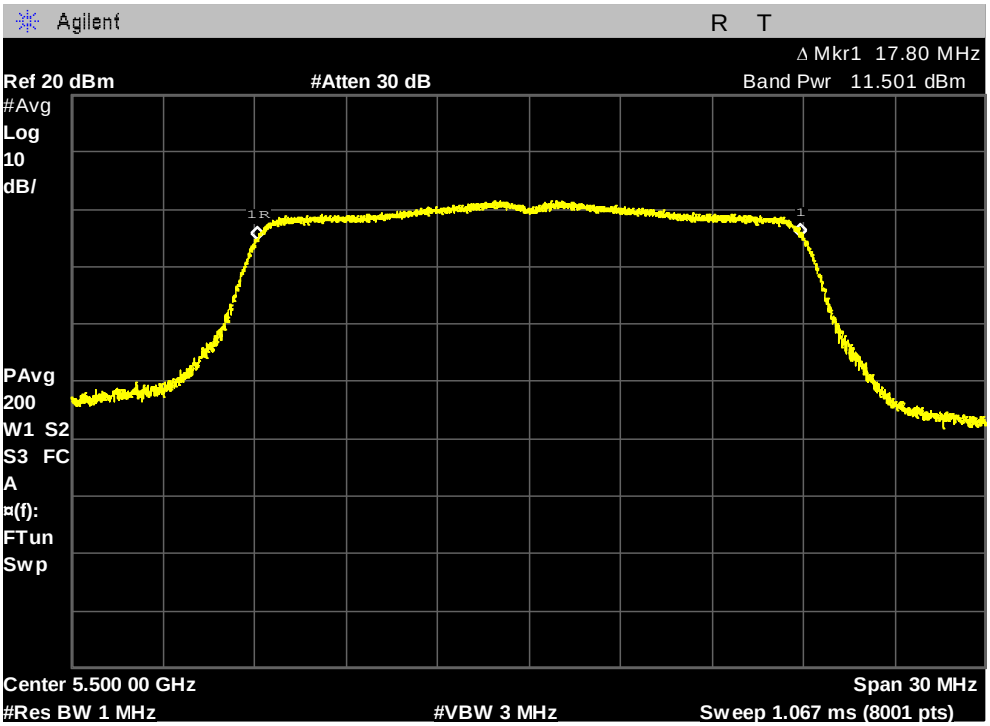
Maximum Conducted Output Power, Highest Channel (5700 MHz)



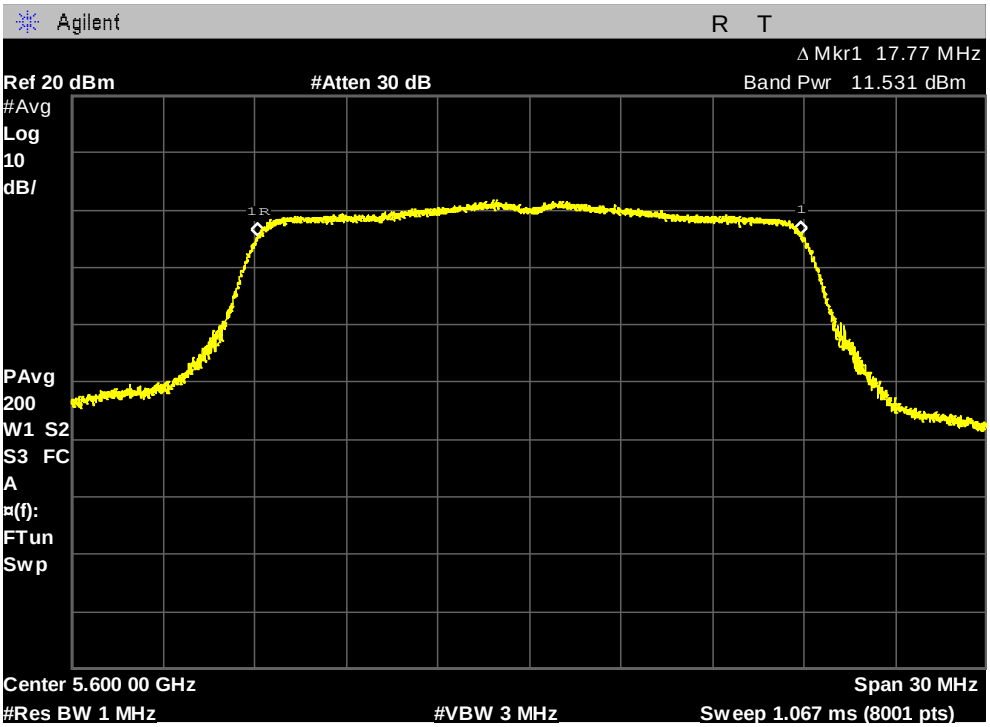
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

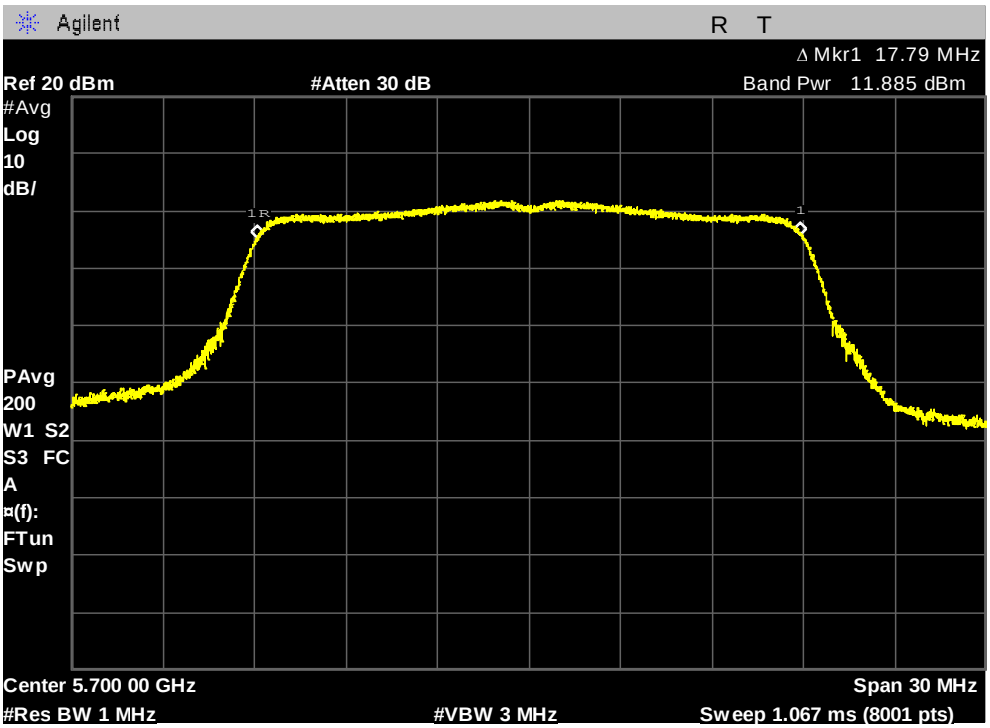


Maximum Conducted Output Power, Middle Channel (5600 MHz)



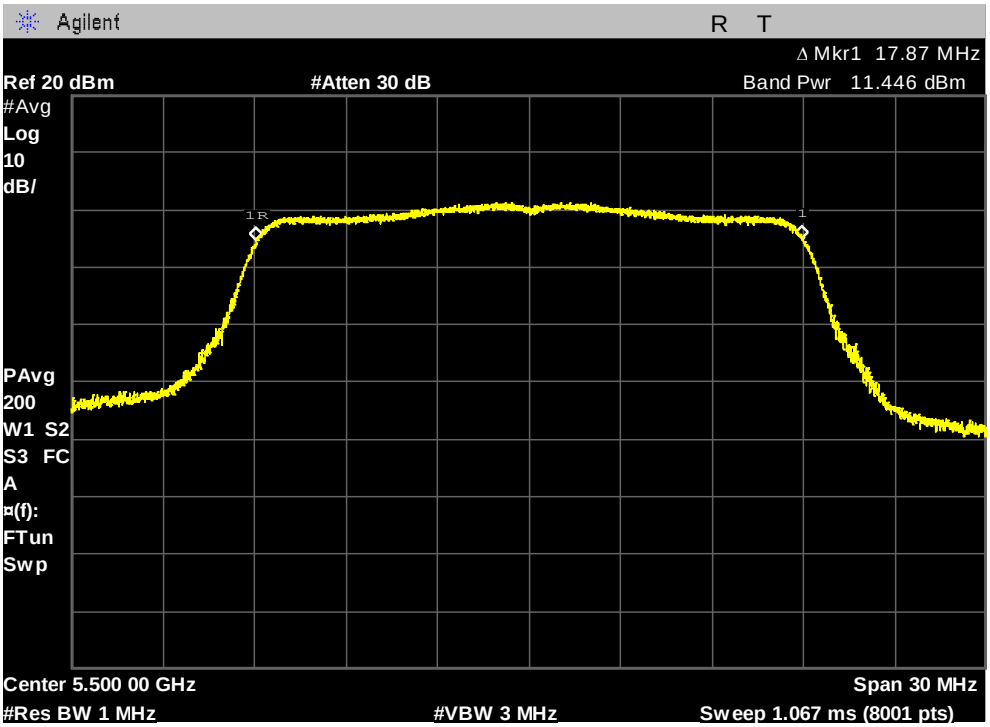
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



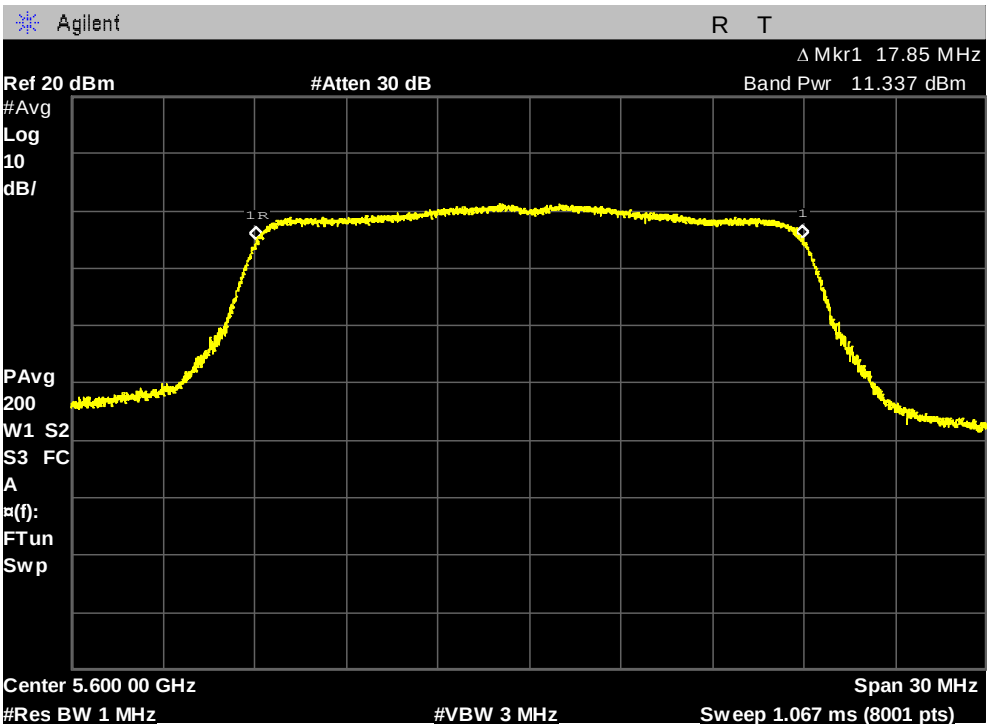
802.11ac(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

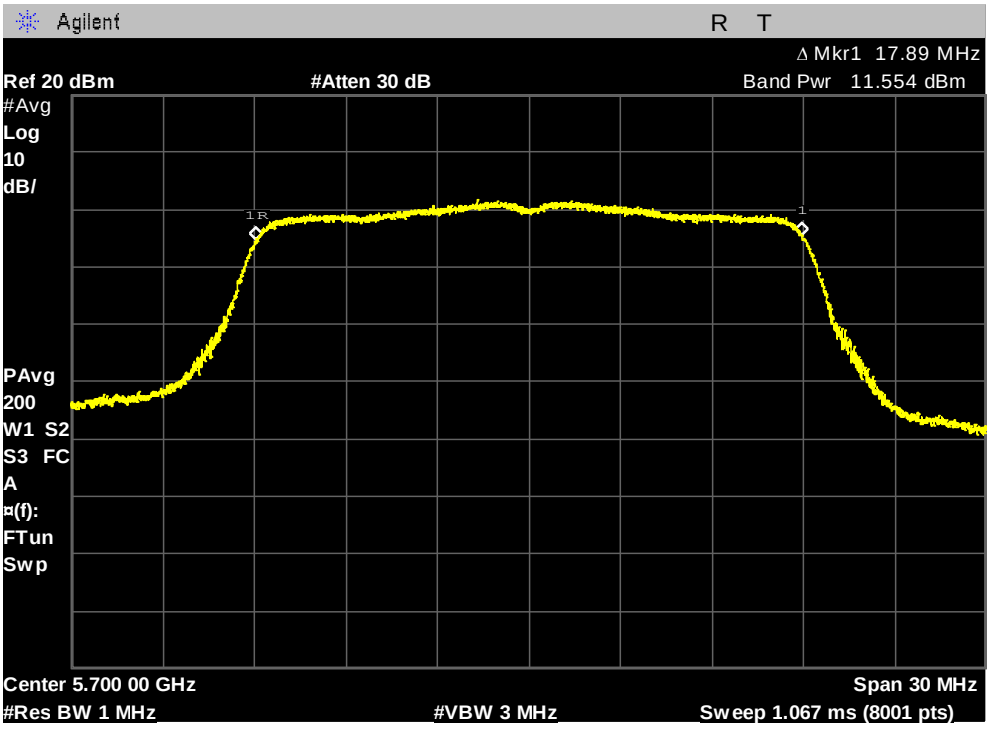


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5600 MHz)



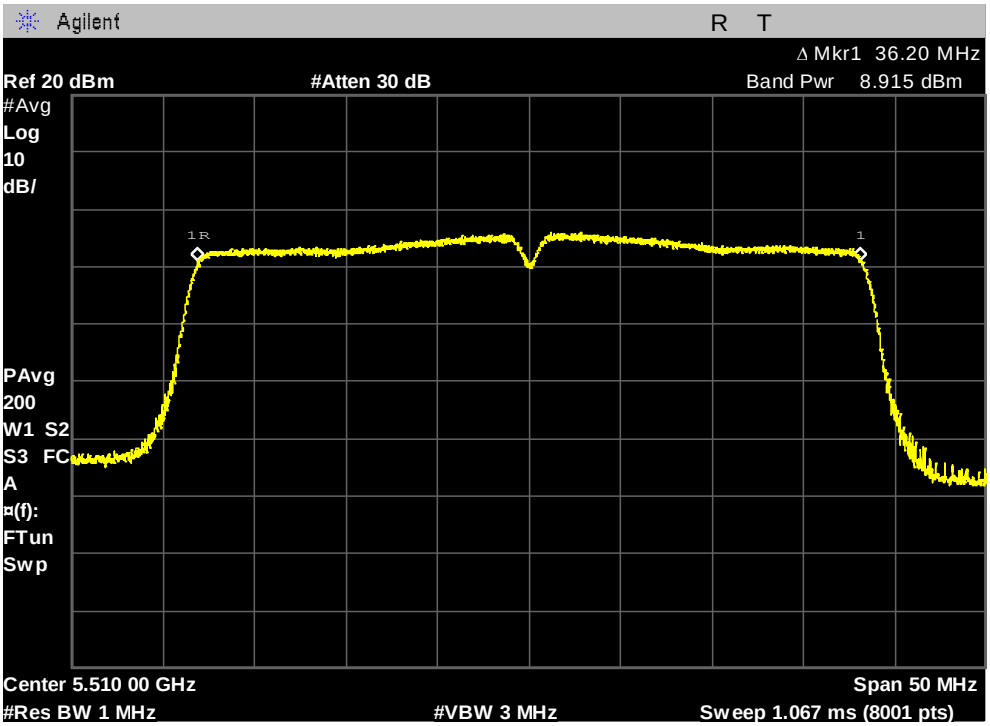
Maximum Conducted Output Power, Highest Channel (5700 MHz)



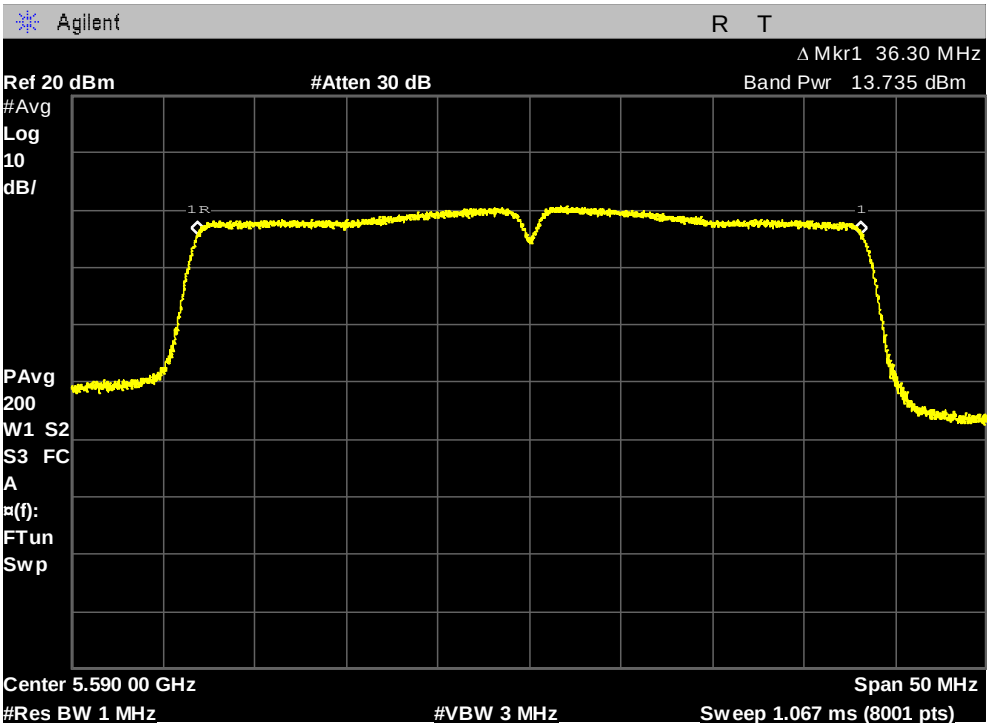
PLOTS OF EMISSIONS

802.11ac(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

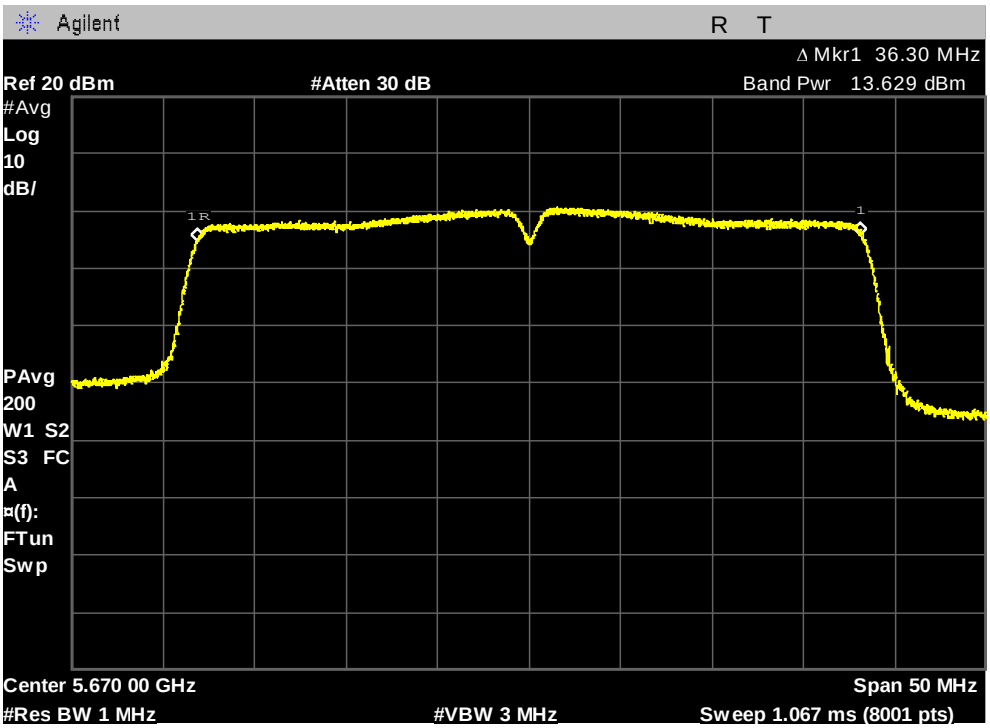


Maximum Conducted Output Power, Middle Channel (5590 MHz)



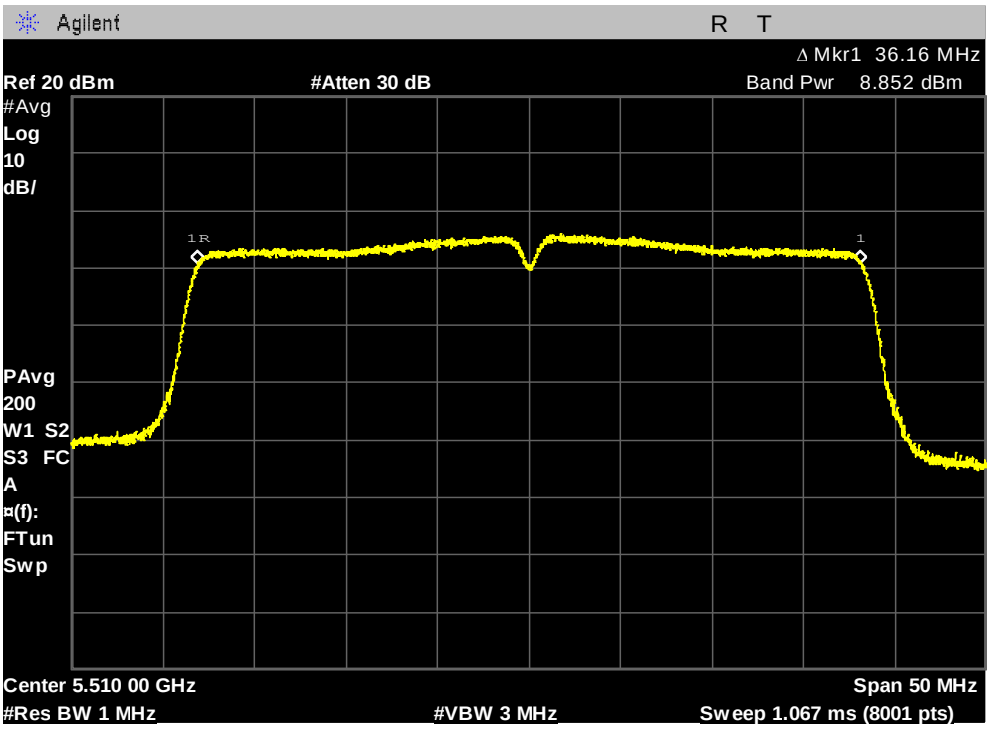
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



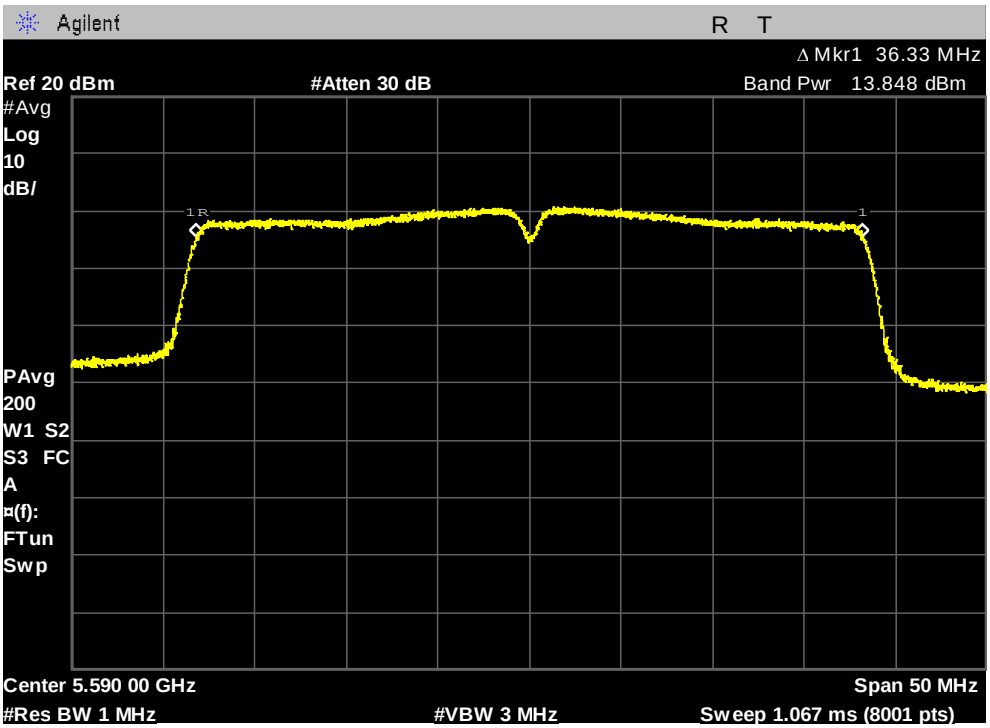
802.11ac(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

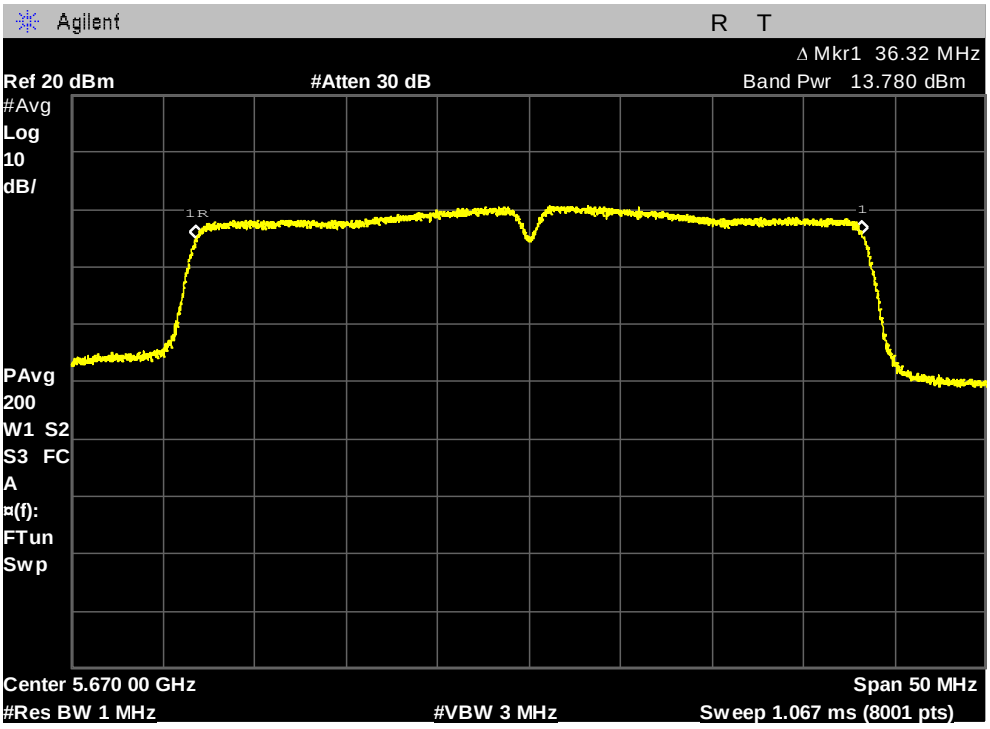


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5590 MHz)



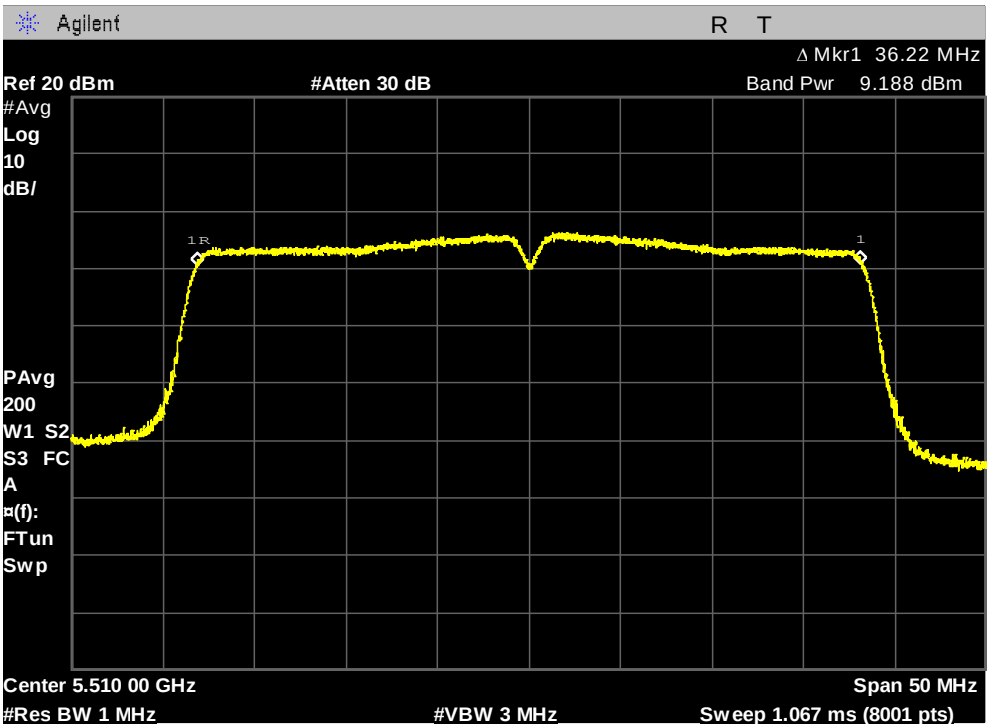
Maximum Conducted Output Power, Highest Channel (5670 MHz)



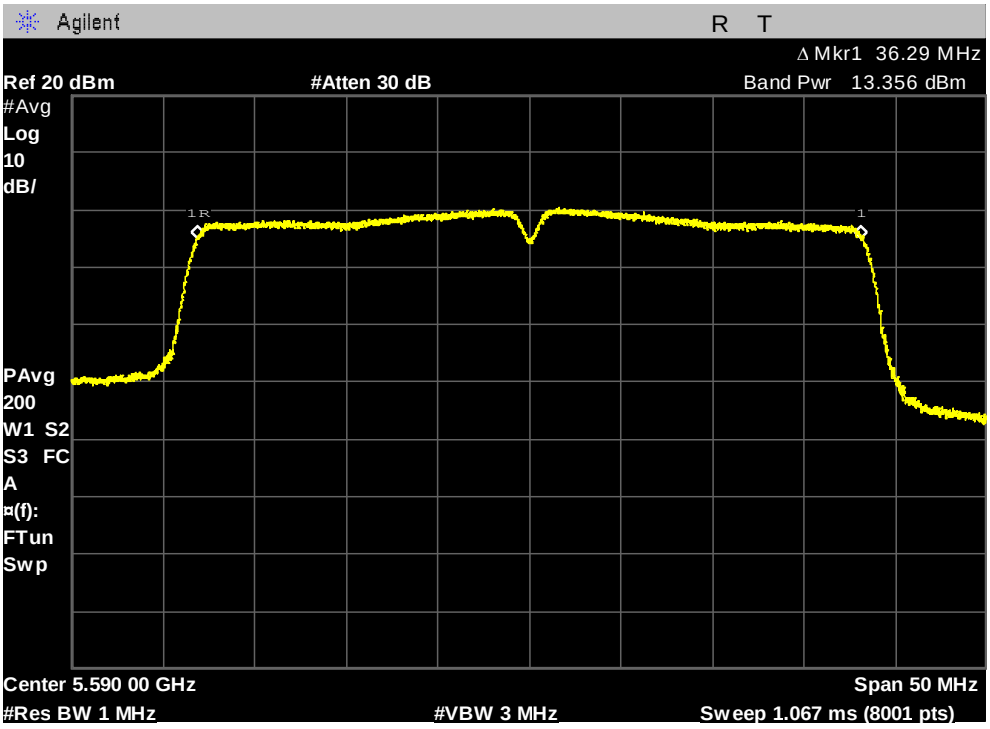
PLOTS OF EMISSIONS

802.11ac(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

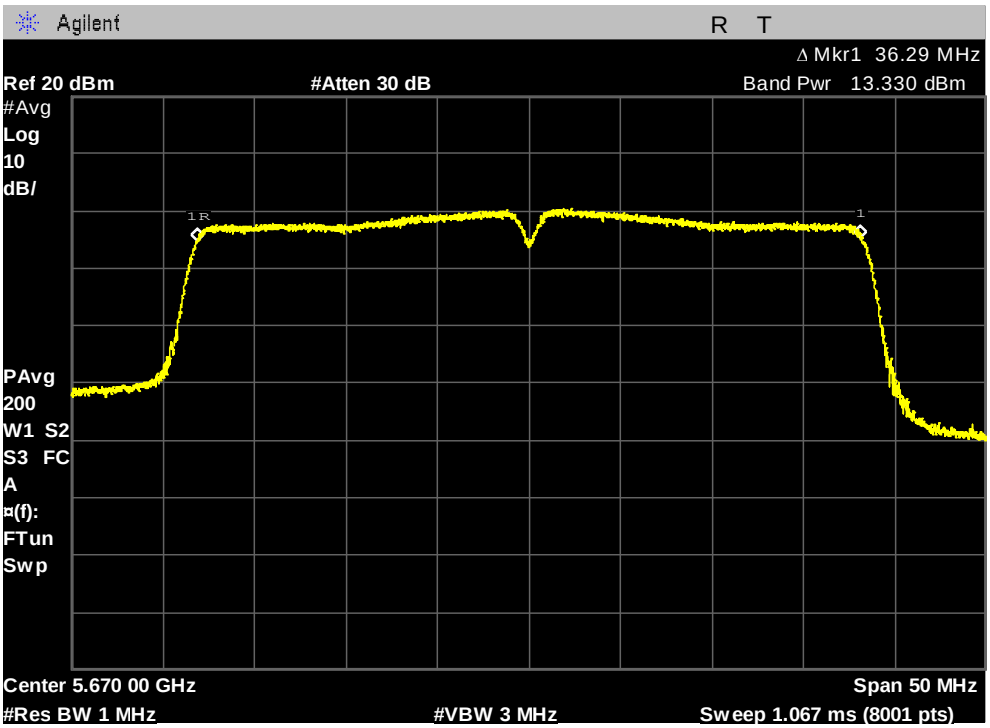


Maximum Conducted Output Power, Middle Channel (5590 MHz)



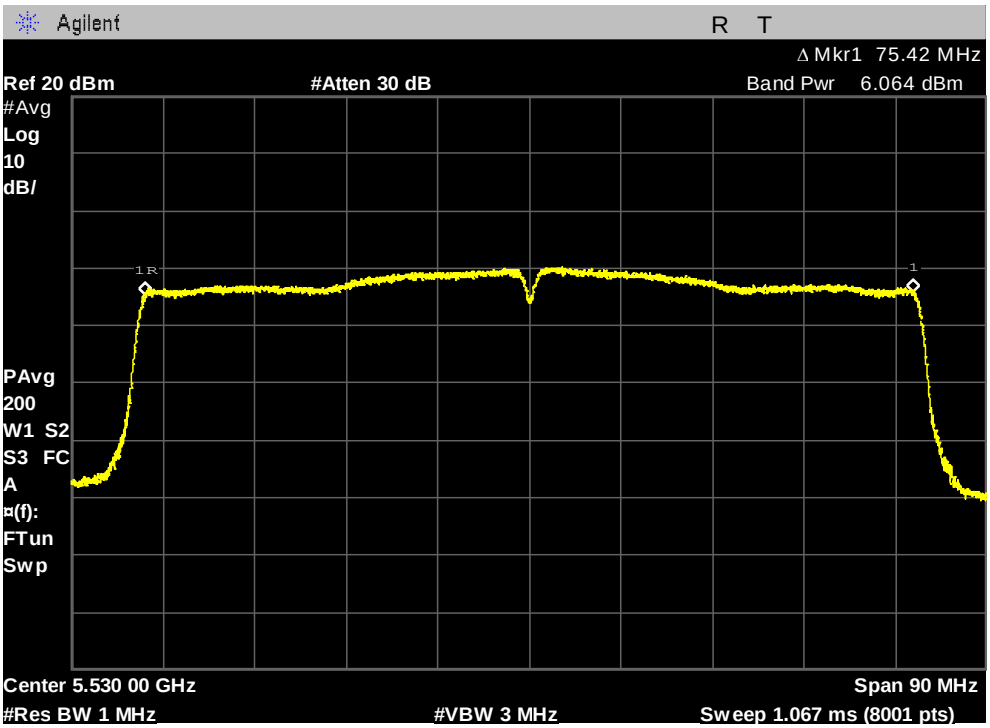
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



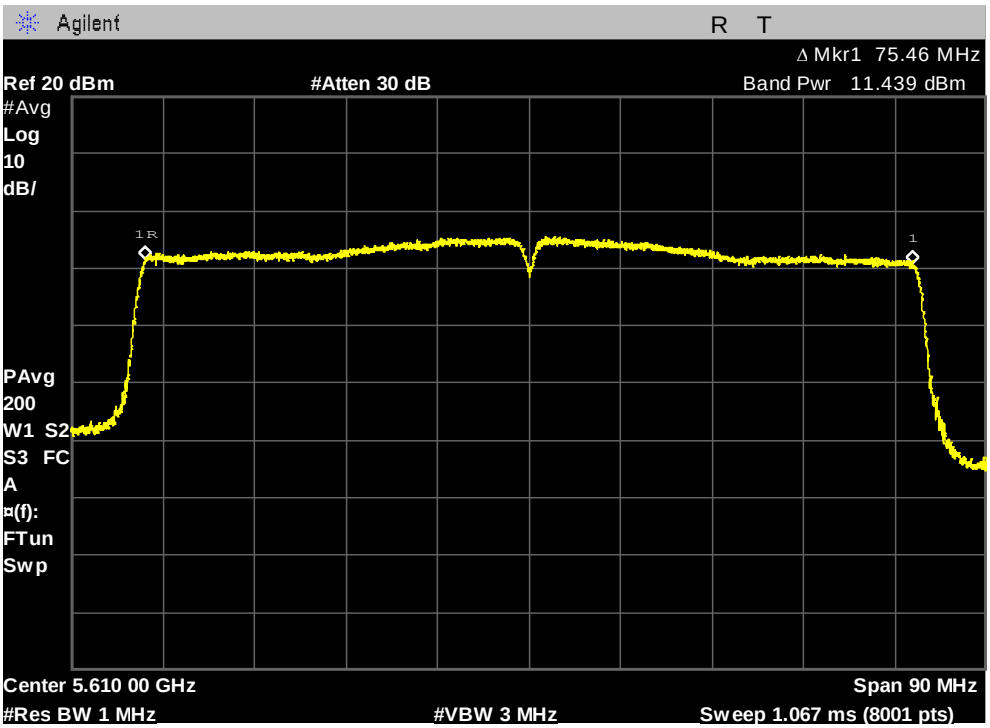
802.11ac(80MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5530 MHz)



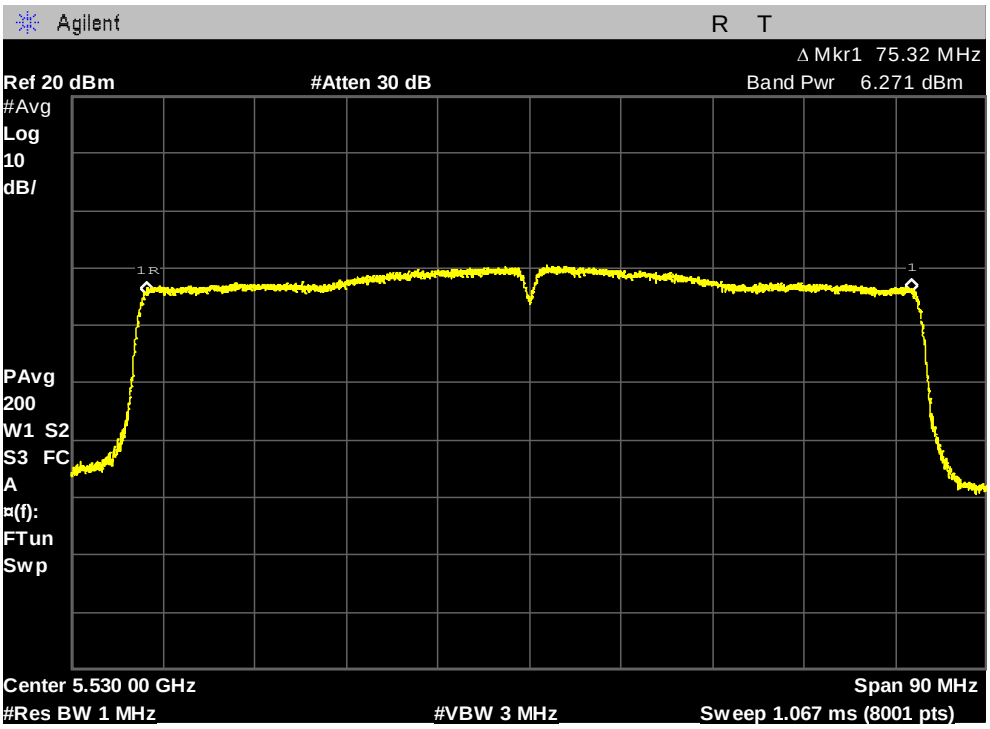
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5610 MHz)



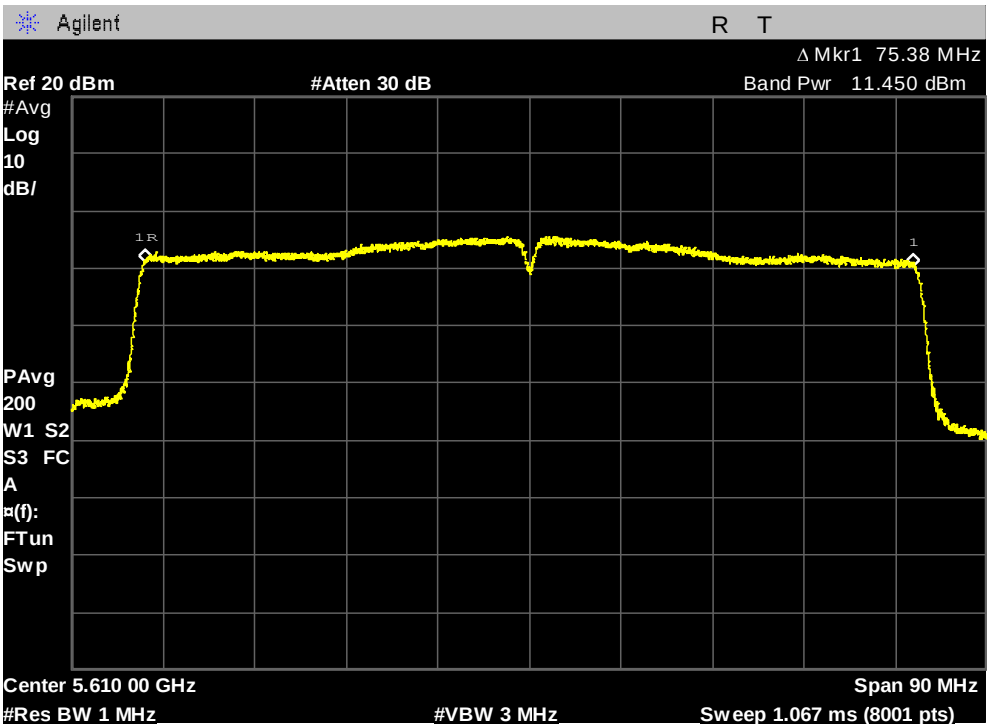
802.11ac(80MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5530 MHz)



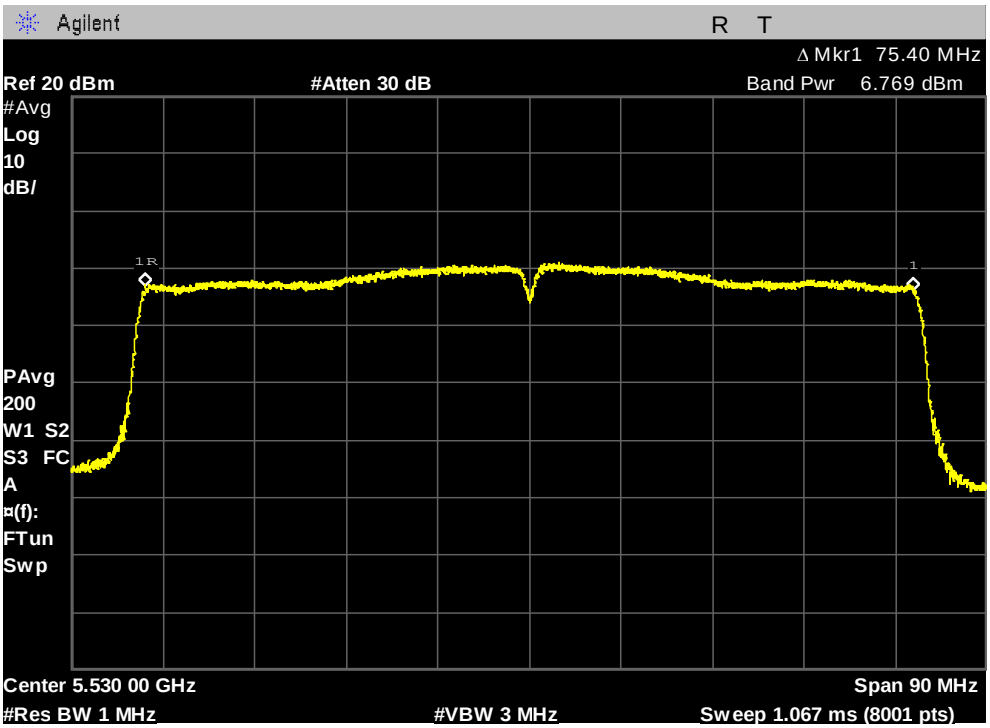
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5610 MHz)



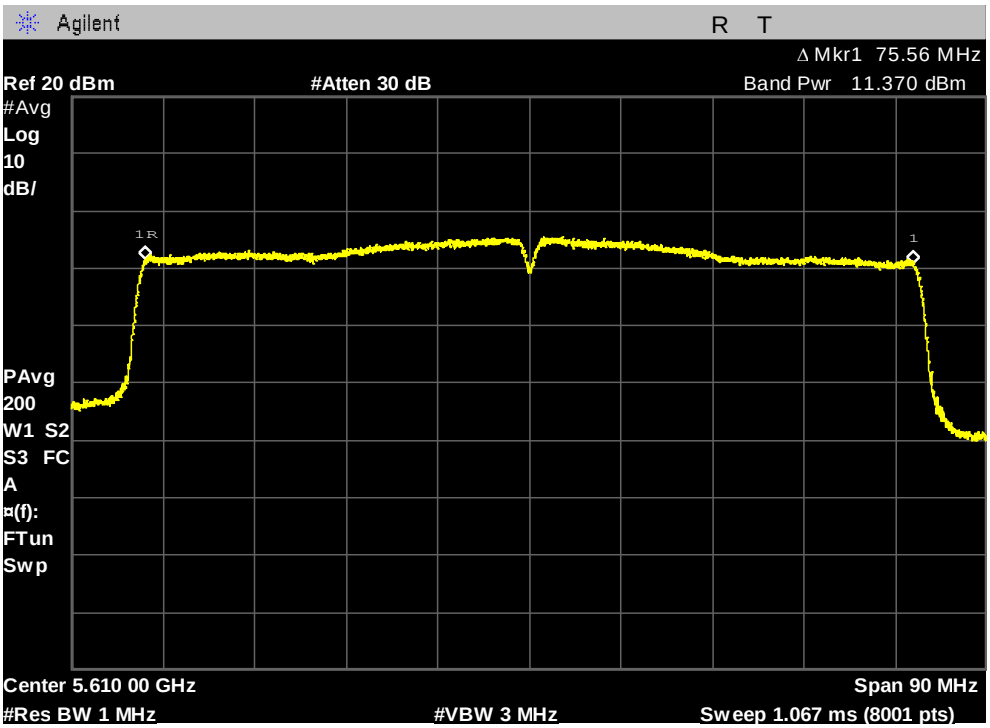
802.11ac(80MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5530 MHz)



PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5610 MHz)



8.5.4 Maximum Conducted Output Power – U-NII-3 band

FCC §15.407(a)

Test Mode : Set to Straddle channel, Lowest channel, Middle channel and Highest channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5745	10.82	0.07	10.89	30.00
Middle	5785	11.01	0.07	11.08	30.00
Highest	5825	10.59	0.07	10.66	30.00

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5745	10.72	0.09	10.81	30.00
Middle	5785	10.81	0.09	10.90	30.00
Highest	5825	10.35	0.09	10.44	30.00

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5745	10.52	10.68	0.09	13.70	30.00
Middle	5785	10.89	11.08	0.09	14.09	30.00
Highest	5820	10.40	11.08	0.09	13.85	30.00

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5755	13.36	0.21	13.57	30.00
Highest	5795	13.35	0.21	13.56	30.00

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5755	13.4	13.3	0.21	16.57	30.00
Highest	5795	13.39	13.32	0.21	16.58	30.00

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5745	10.7	0.09	10.79	30.00
Middle	5785	10.88	0.09	10.97	30.00
Highest	5825	10.46	0.09	10.55	30.00

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5745	10.81	10.77	0.09	13.89	30.00
Middle	5785	10.98	11.10	0.09	14.14	30.00
Highest	5825	10.67	11.13	0.09	14.01	30.00

802.11ac (40MHz) mode _1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Lowest	5755	13.46	0.20	13.66	30.00
Highest	5795	13.28	0.20	13.48	30.00

TEST DATA

802.11ac (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Lowest	5755	13.3	13.37	0.20	16.55	30.00
Highest	5795	13.49	13.19	0.20	16.55	30.00

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured conducted power (dBm)	Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
Middle	5775	10.74	0.37	11.11	30.00

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)	FCC Limit (dBm)
		Ant 0	Ant 1		Total output power	
Middle	5775	10.86	10.08	0.37	13.87	30.00

TEST DATA

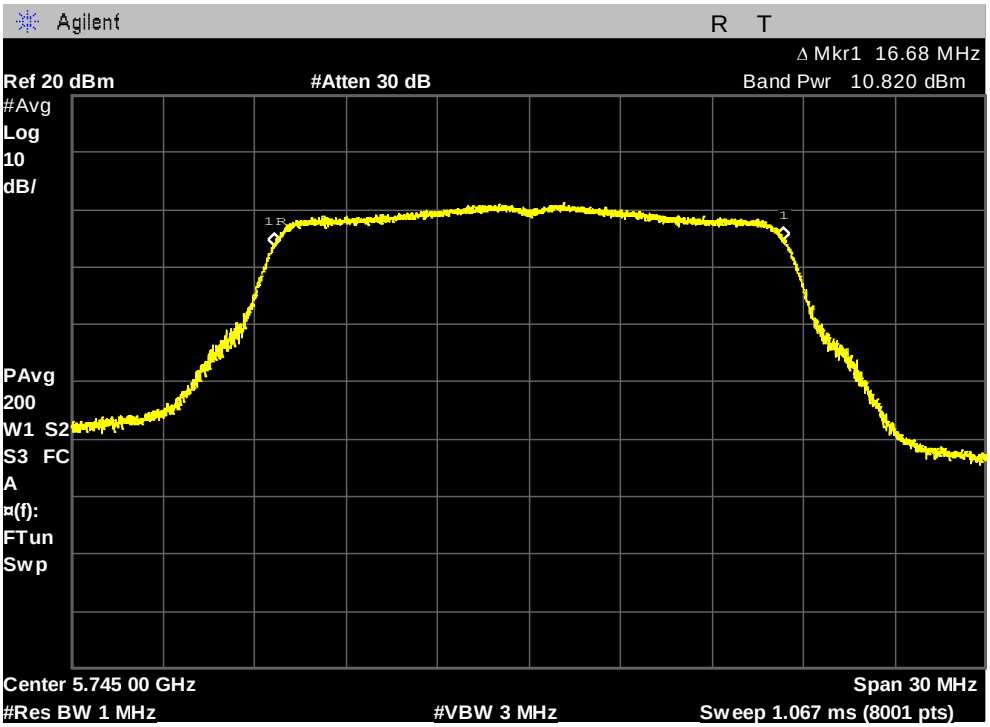
Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor*
2. *Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}*
3. *For CDD transmission, directional gain is.* ***2.79 dBi.***
   For MIMO transmission, directional gain is ***2.79 dBi.***
   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
   For power measurements on IEEE 802.11 devices employing CDD, directional gain is as follows,
   Directional gain = G_{ANT} + Array Gain = 2.79 dBi + 0 dB = 2.79 dBi.
   Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
   Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
   Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.
   For power measurements on all devices employing MIMO, directional gain is as follows,
   ***Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi = 2.79 dBi + 10 log(2/2) dB = 2.79 dBi**.*
   where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. *For n(20MHz, 40MHz),ac (20MHz,40MHz,80MHz) mode, Beamforming gain is 3.01 dBi*
5. *The following equation was used for spectrum offset:*
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

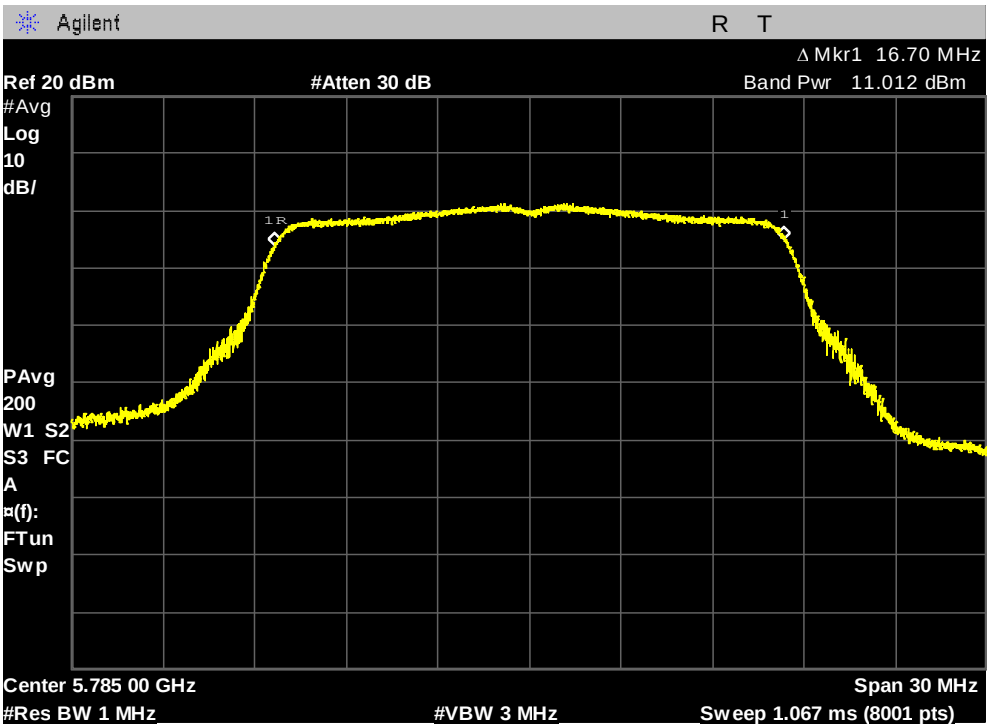
PLOTS OF EMISSIONS

802.11a mode

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

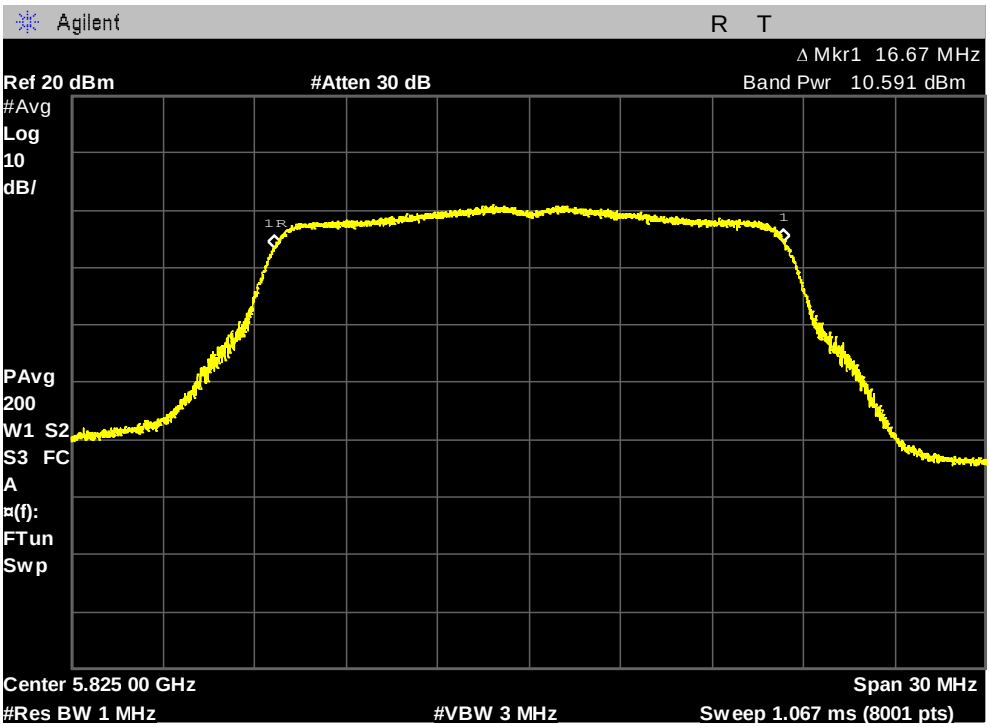


Maximum Conducted Output Power, Middle Channel (5785 MHz)



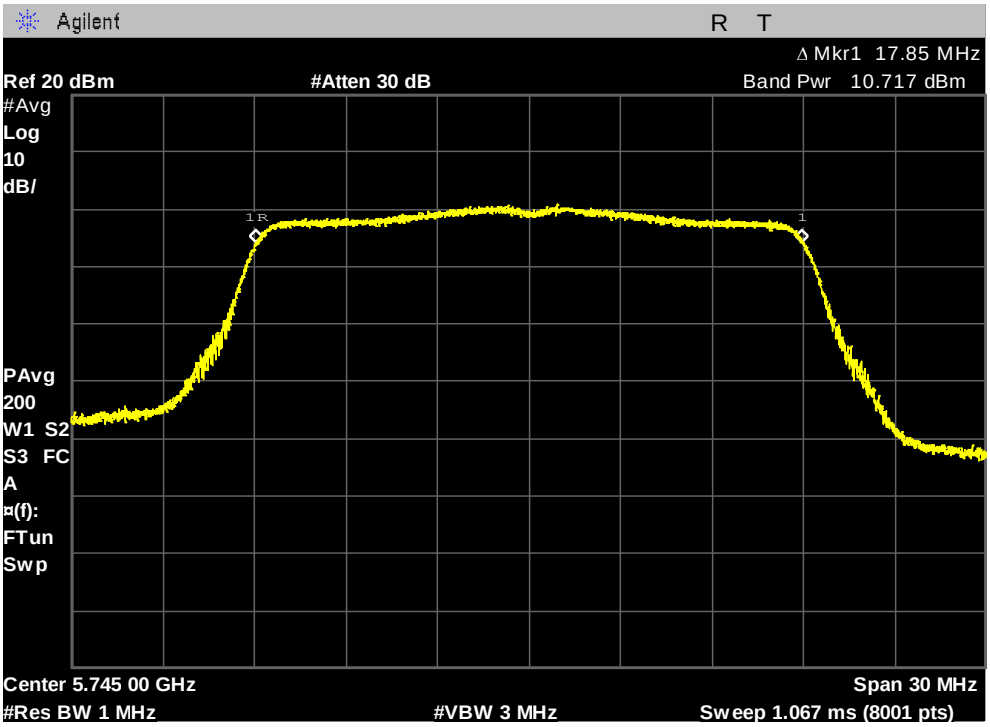
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5825 MHz)



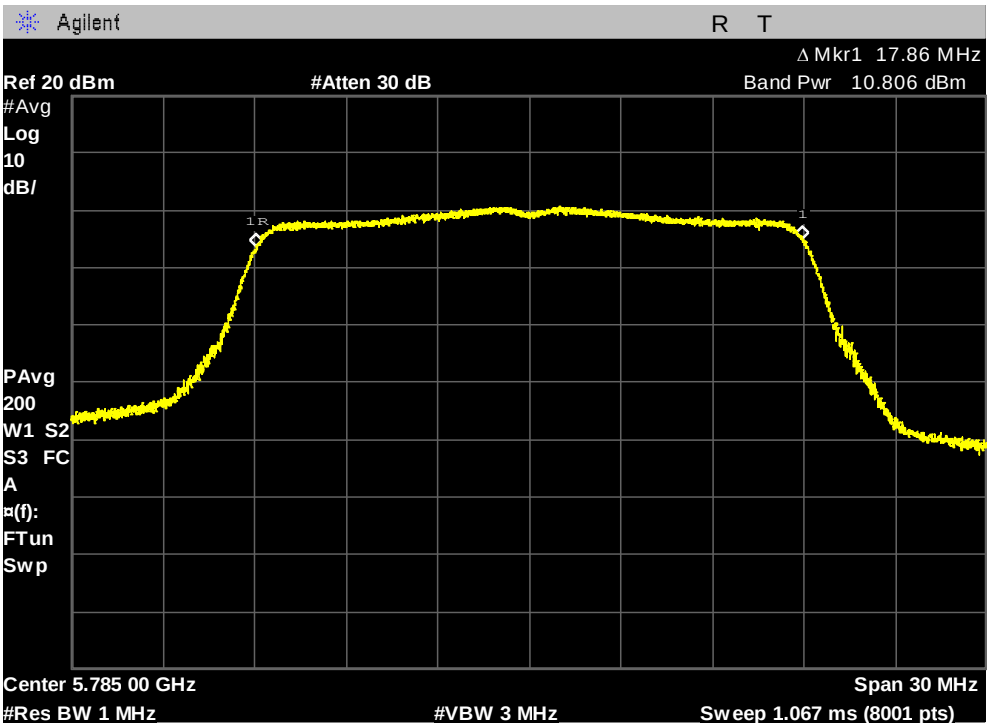
802.11n(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

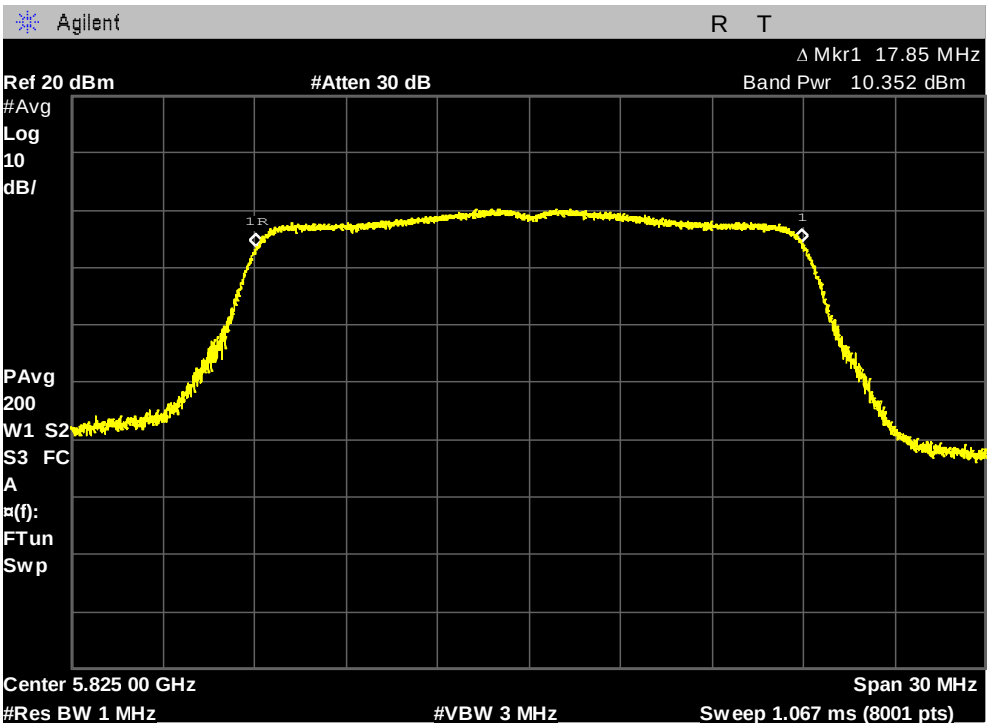


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5785 MHz)



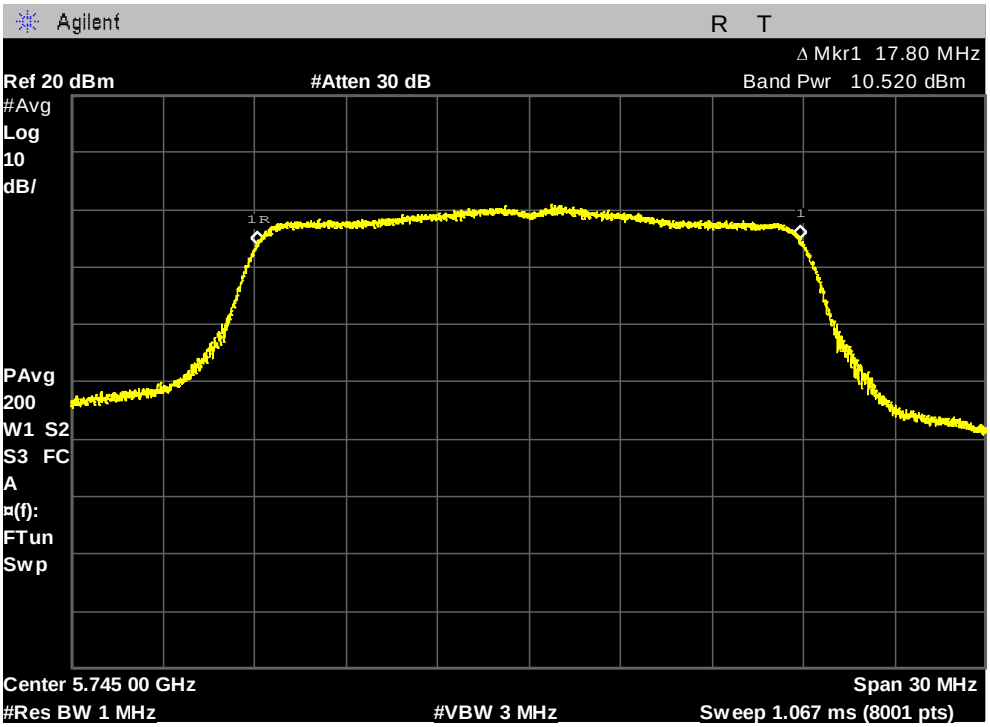
Maximum Conducted Output Power, Highest Channel (5825 MHz)



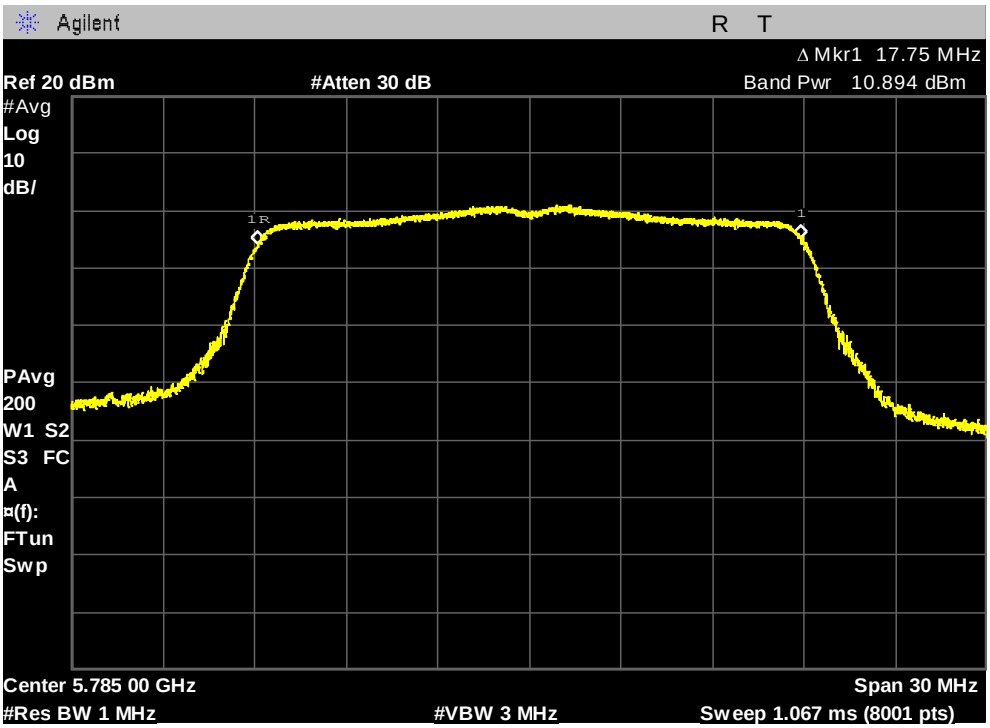
PLOTS OF EMISSIONS

802.11n(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

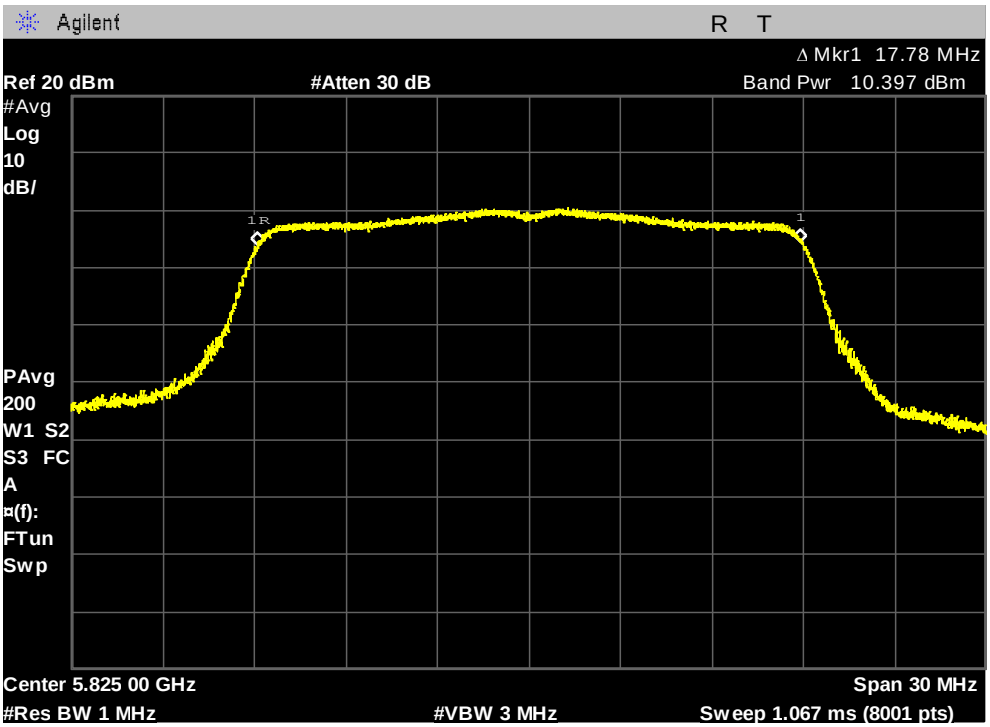


Maximum Conducted Output Power, Middle Channel (5785 MHz)



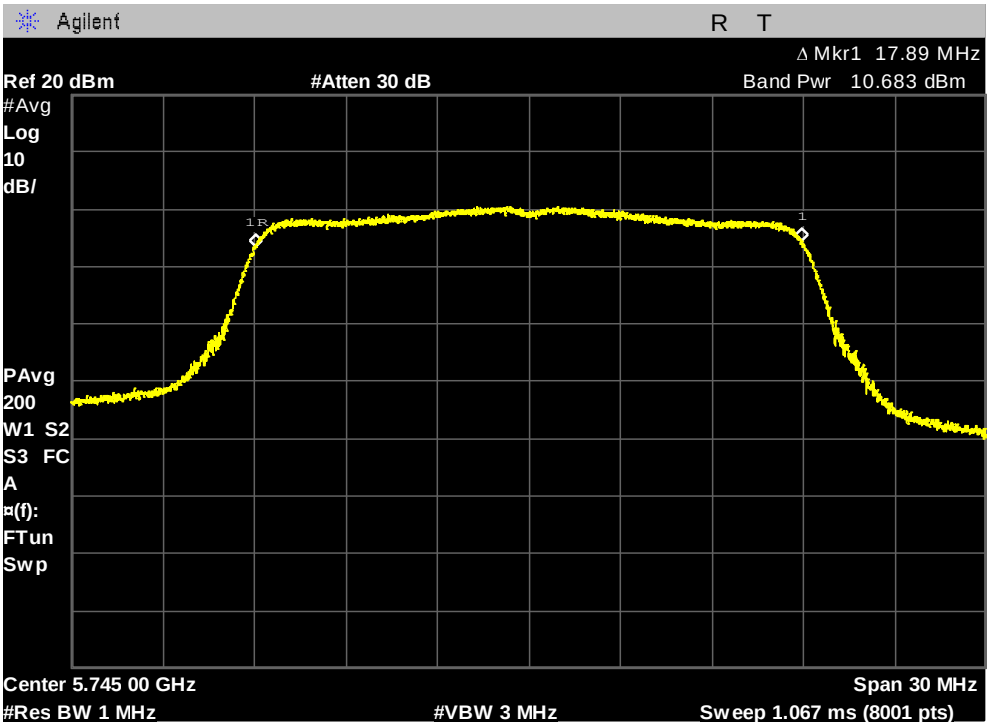
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5825 MHz)



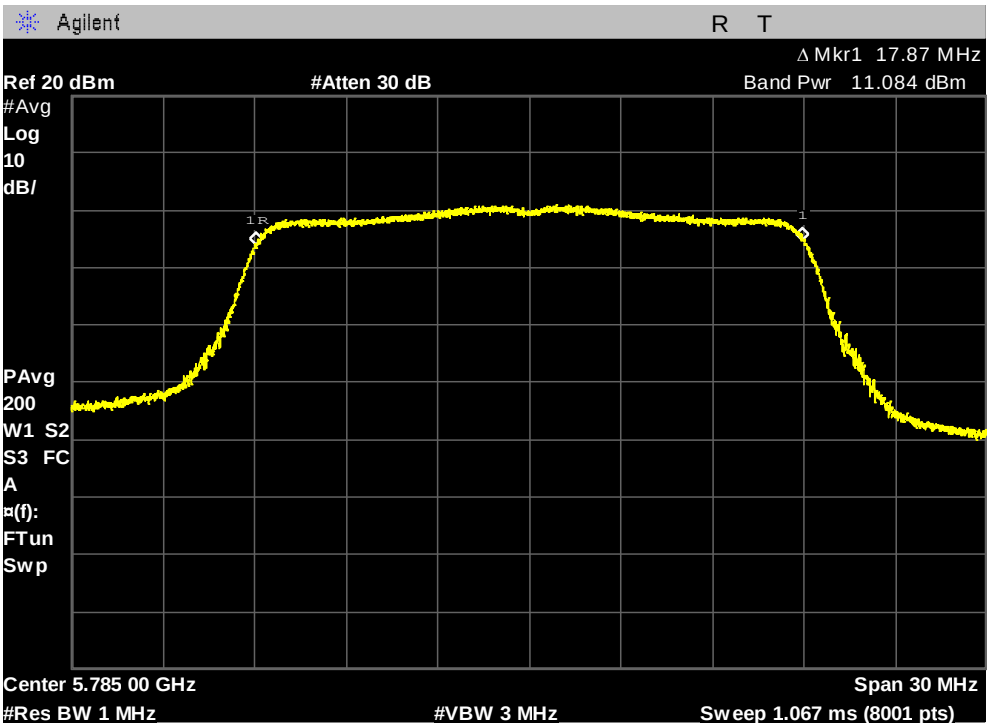
802.11n(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

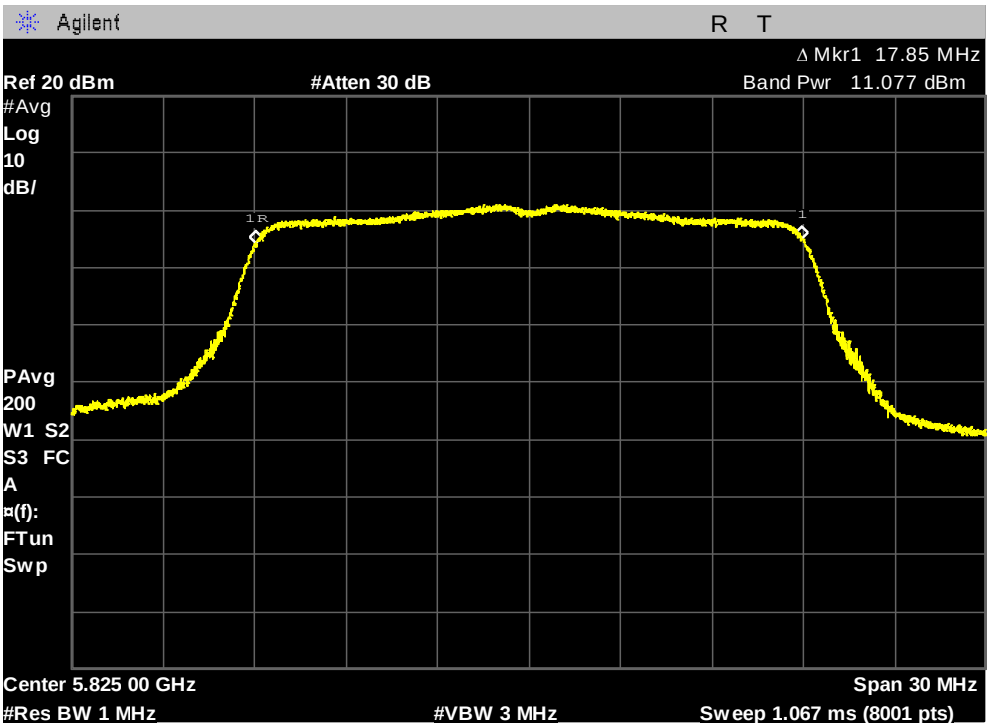


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5785 MHz)



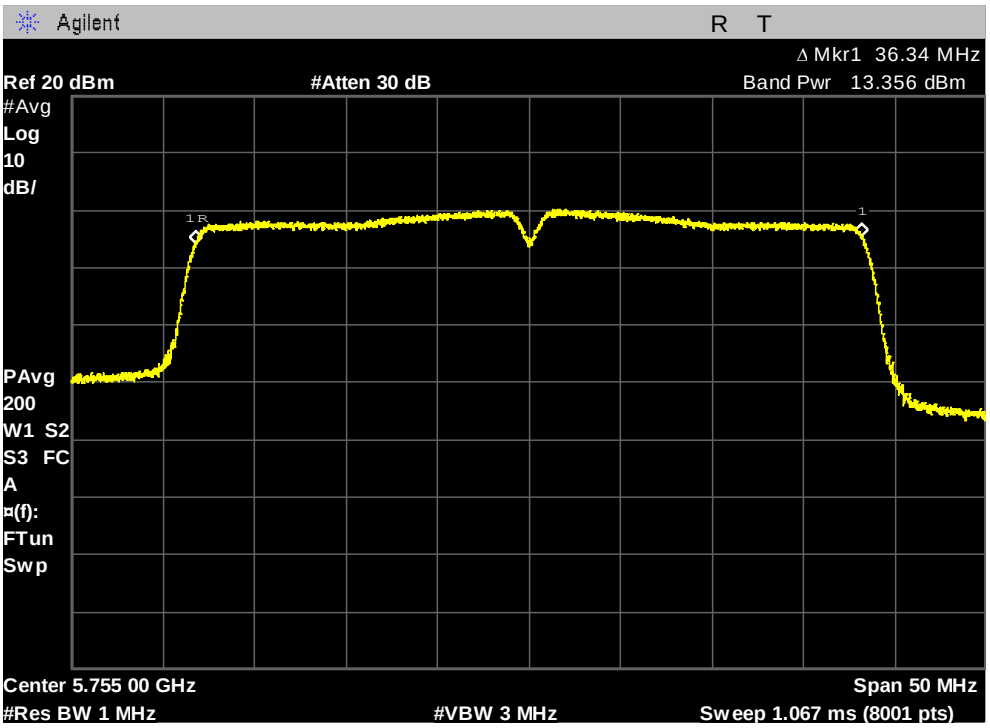
Maximum Conducted Output Power, Highest Channel (5825 MHz)



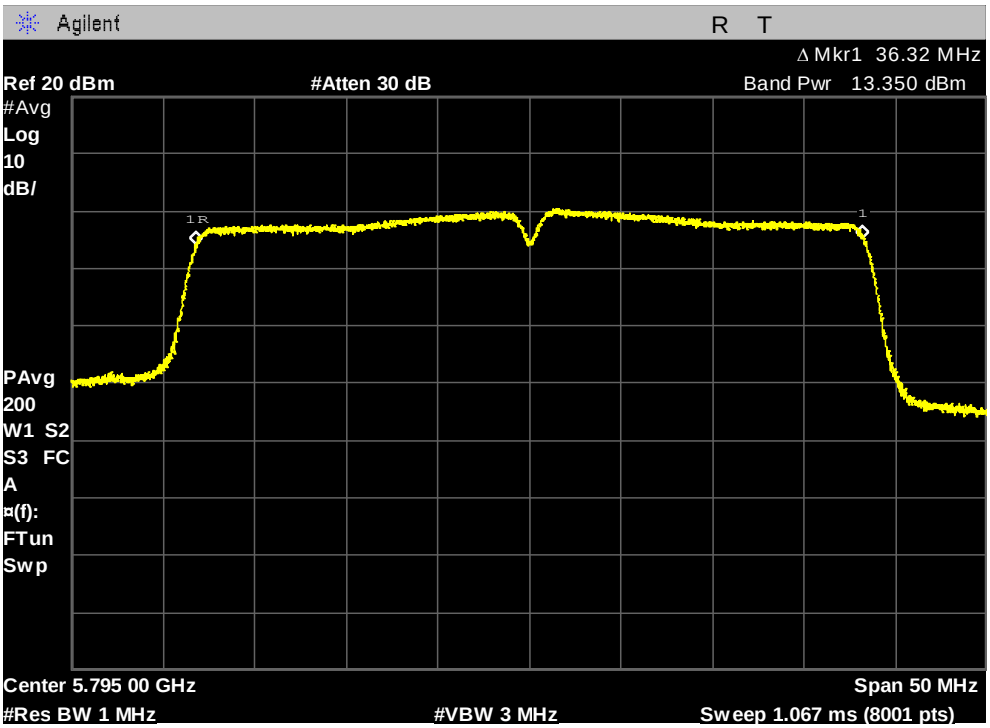
PLOTS OF EMISSIONS

802.11n(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5755 MHz)



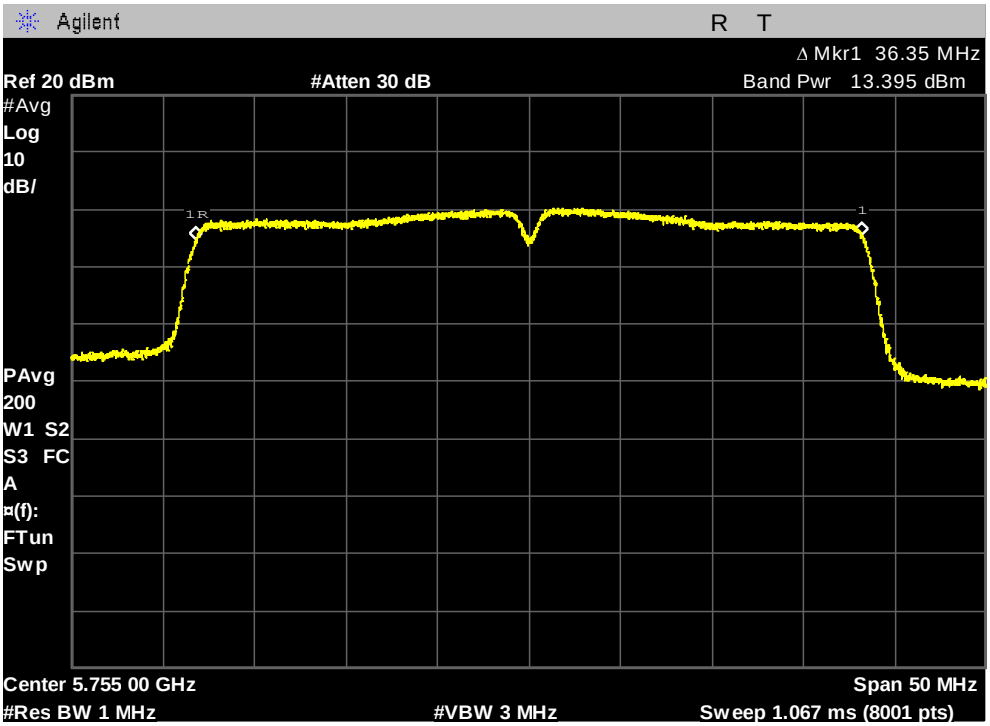
Maximum Conducted Output Power, Highest Channel (5795 MHz)



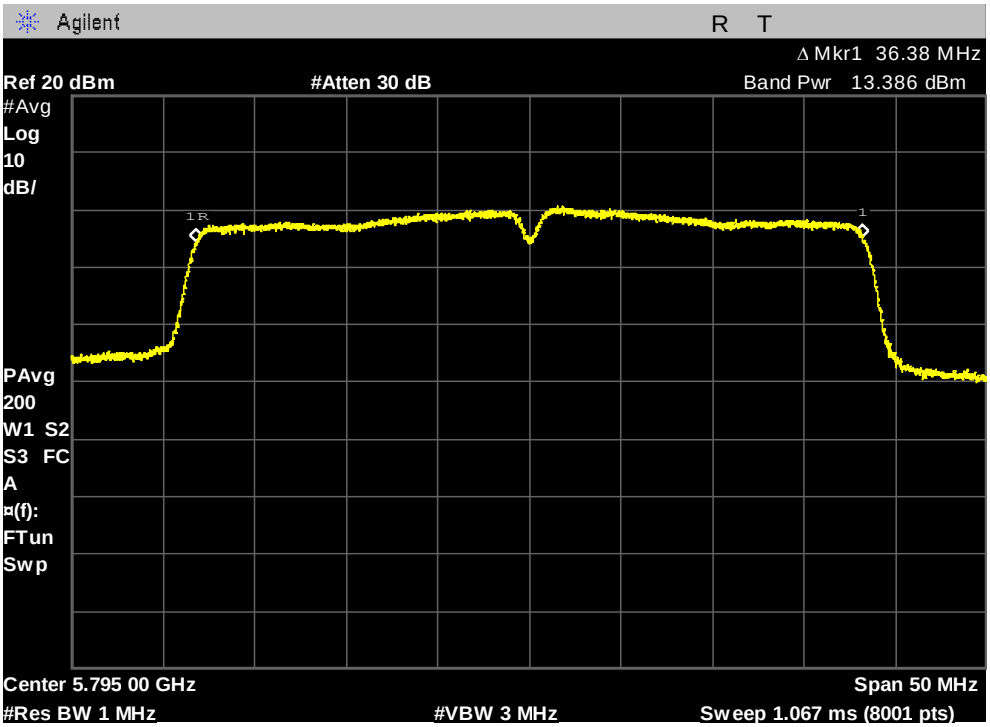
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5755 MHz)



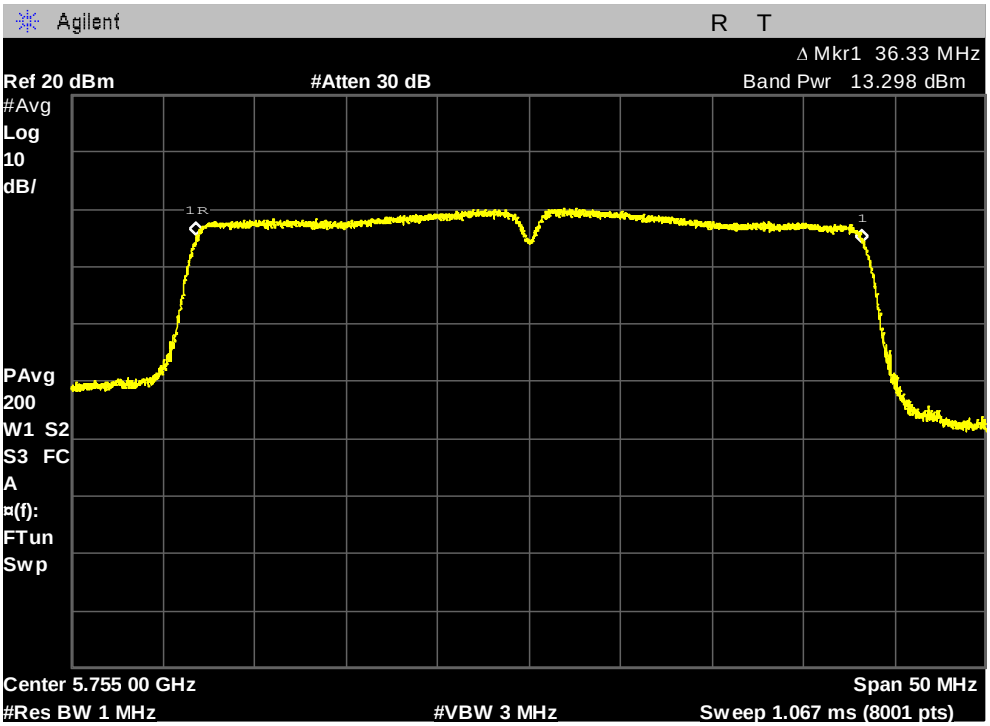
Maximum Conducted Output Power, Highest Channel (5795 MHz)



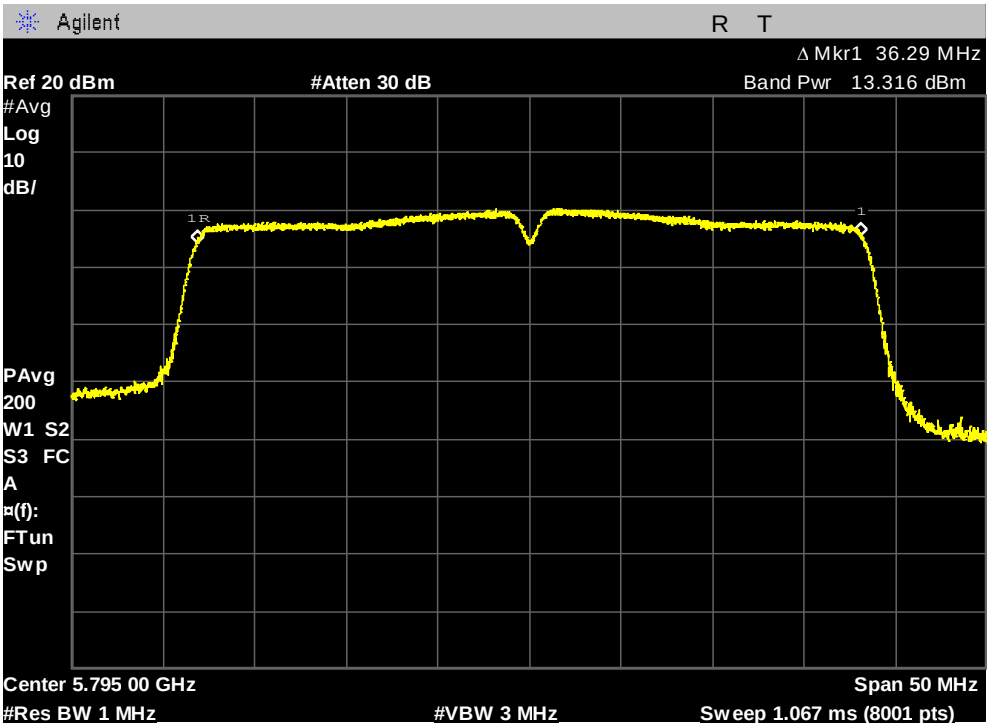
PLOTS OF EMISSIONS

802.11n(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5755 MHz)



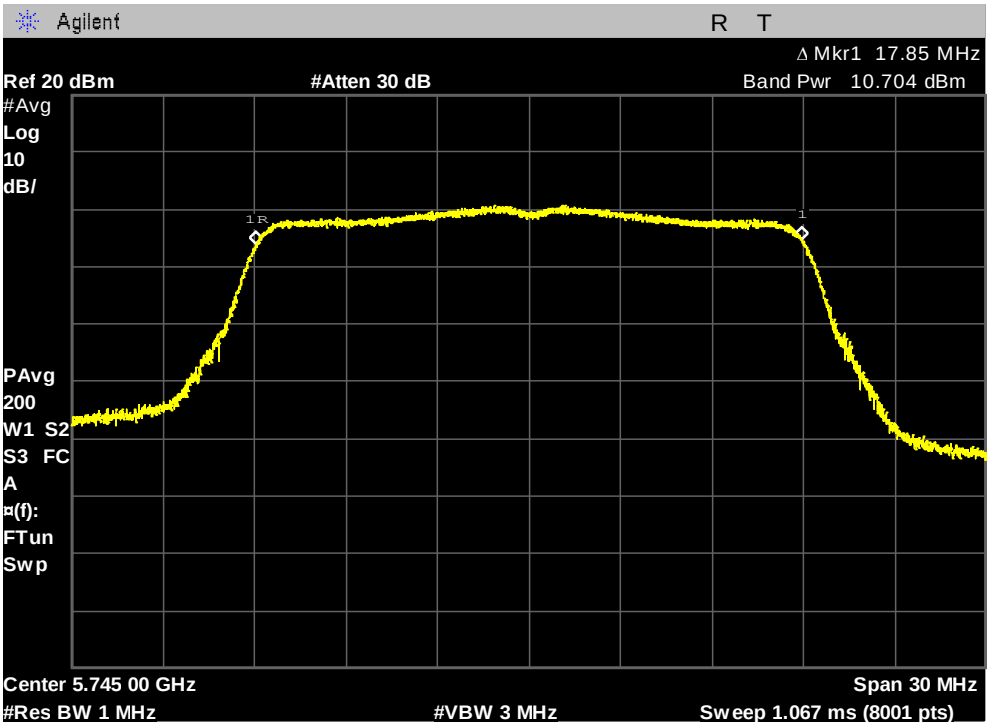
Maximum Conducted Output Power, Highest Channel (5795 MHz)



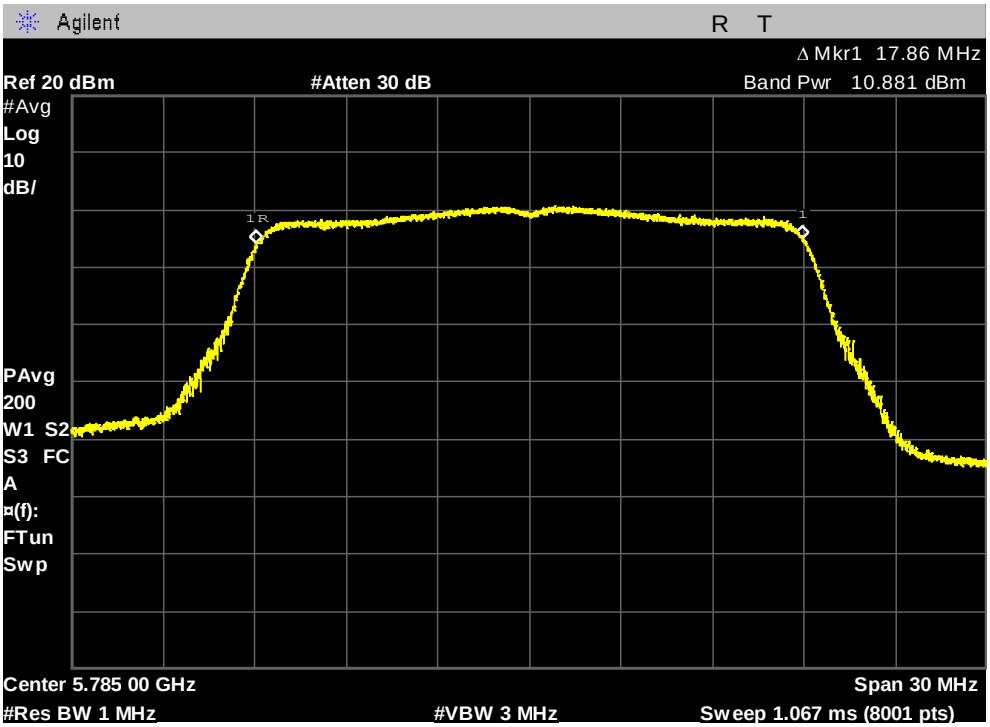
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

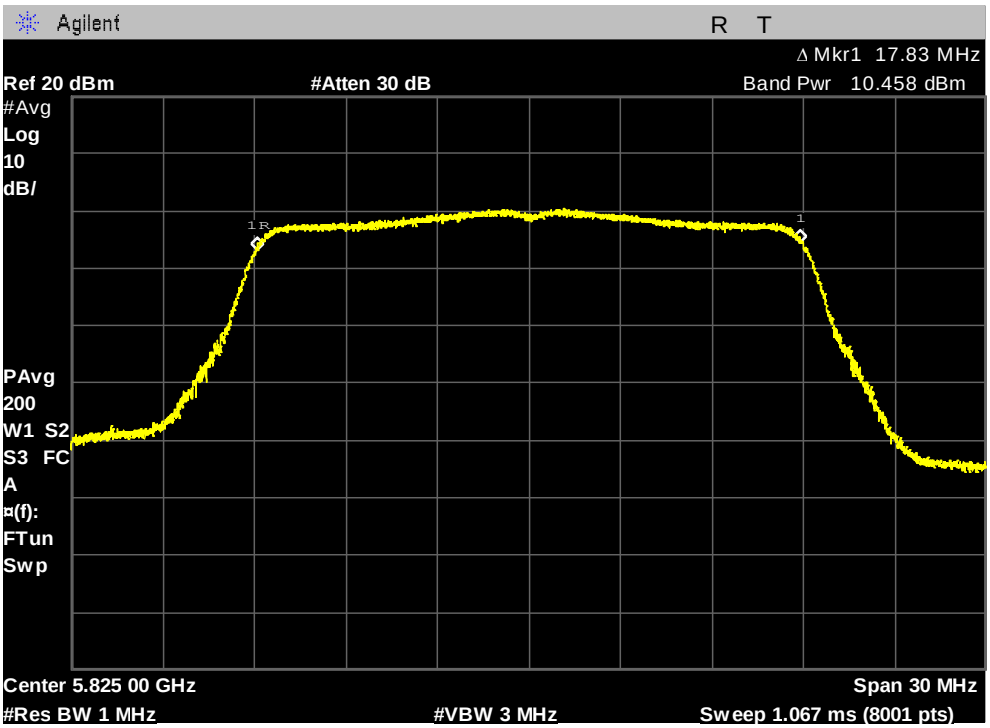


Maximum Conducted Output Power, Middle Channel (5785 MHz)



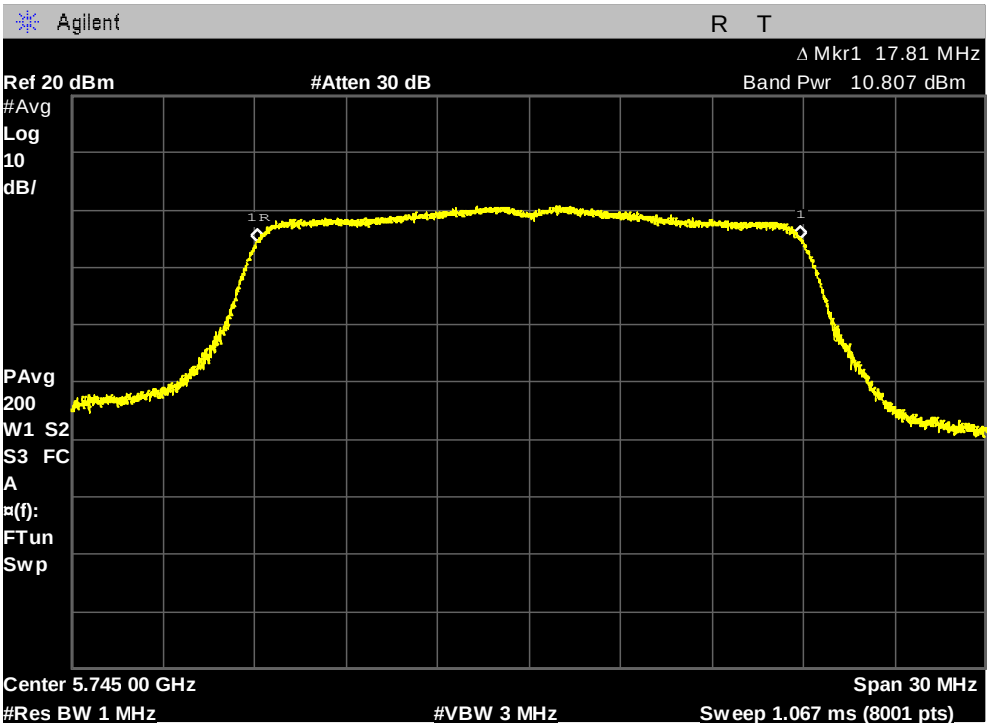
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5825 MHz)



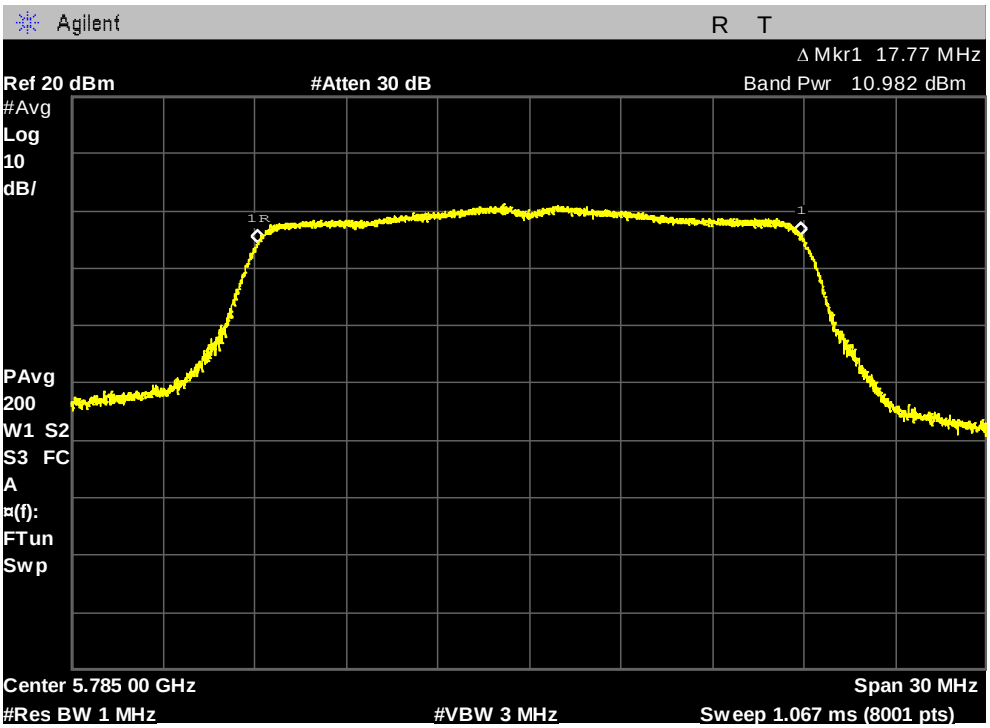
802.11ac(20MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

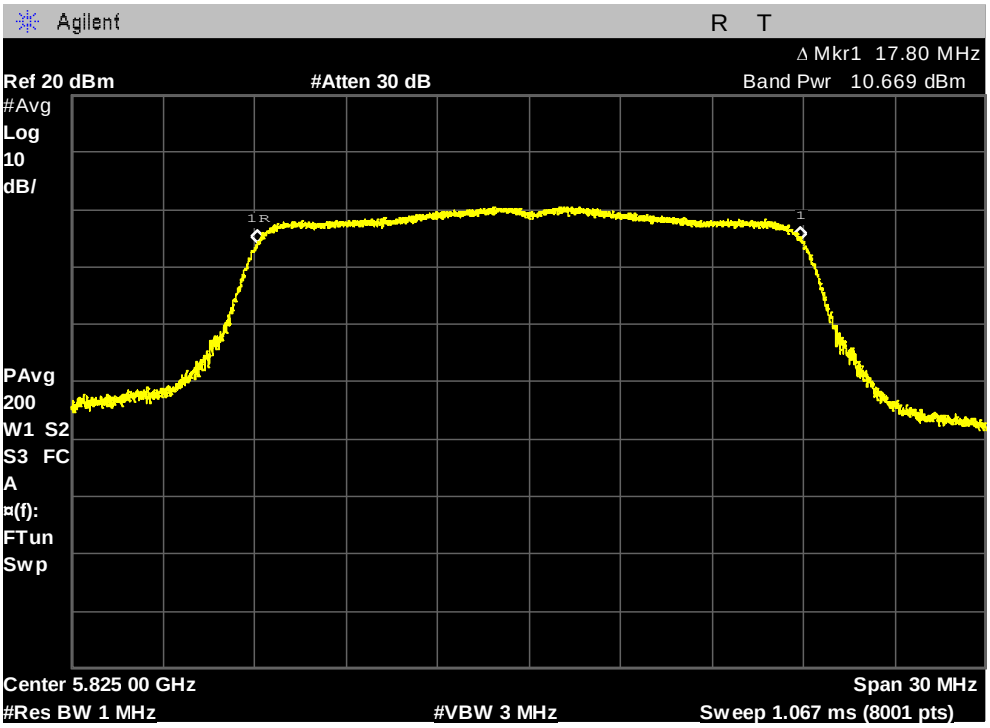


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5785 MHz)



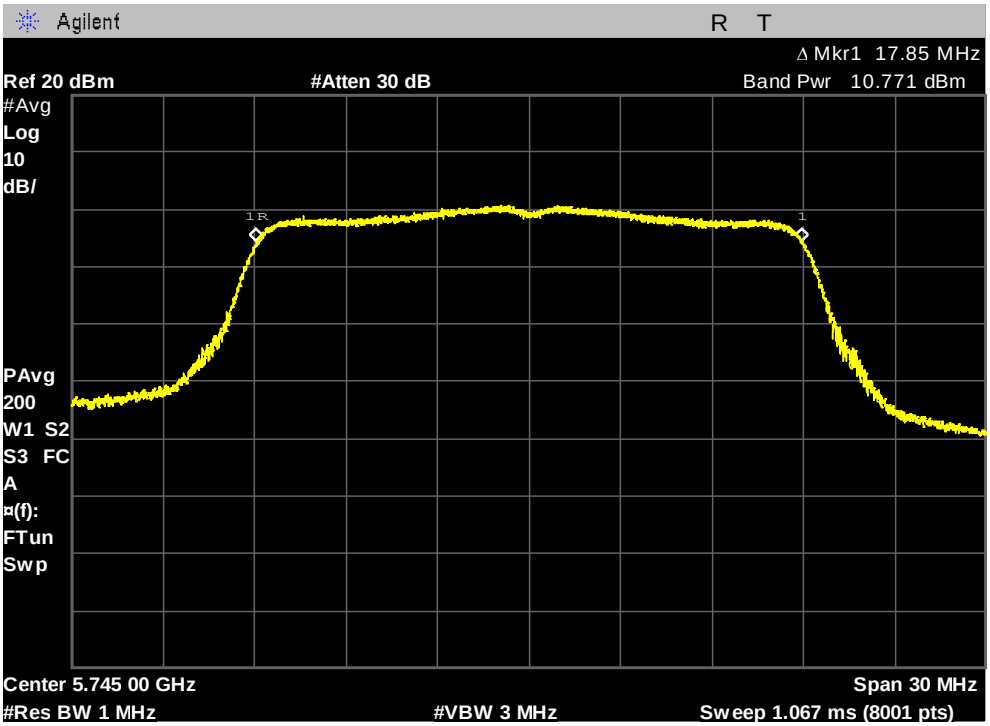
Maximum Conducted Output Power, Highest Channel (5825 MHz)



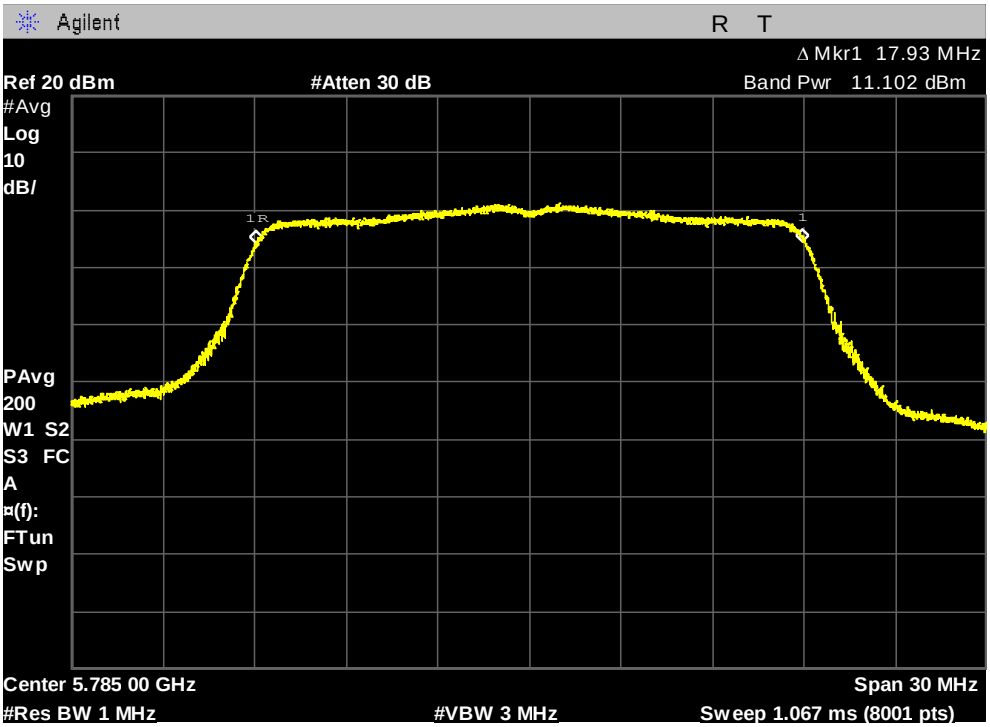
PLOTS OF EMISSIONS

802.11ac(20MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5745 MHz)

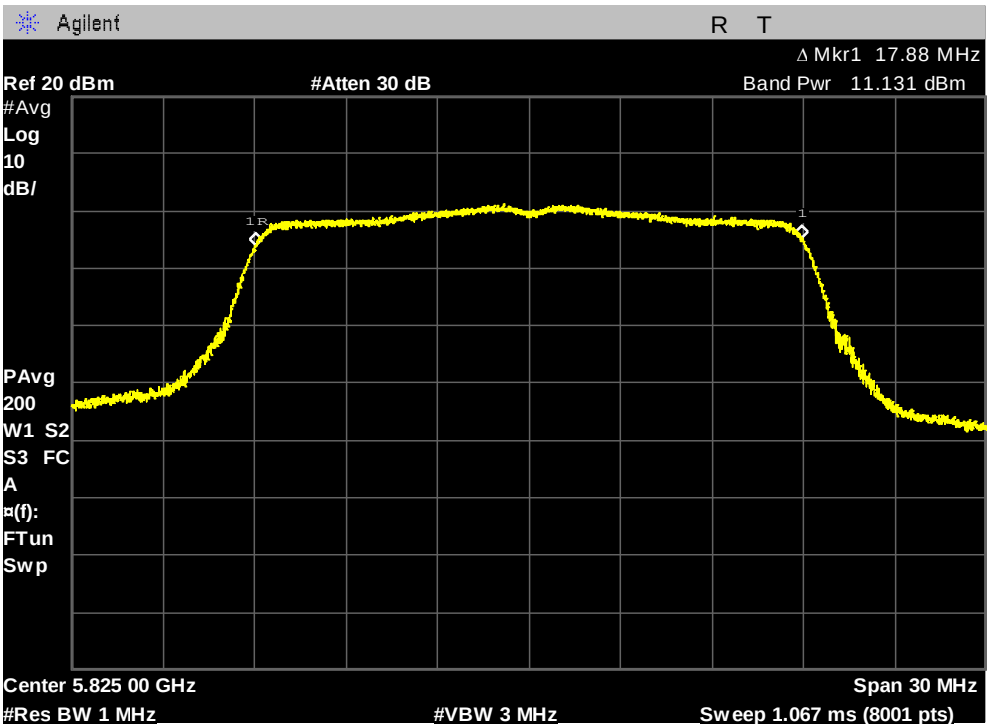


Maximum Conducted Output Power, Middle Channel (5785 MHz)



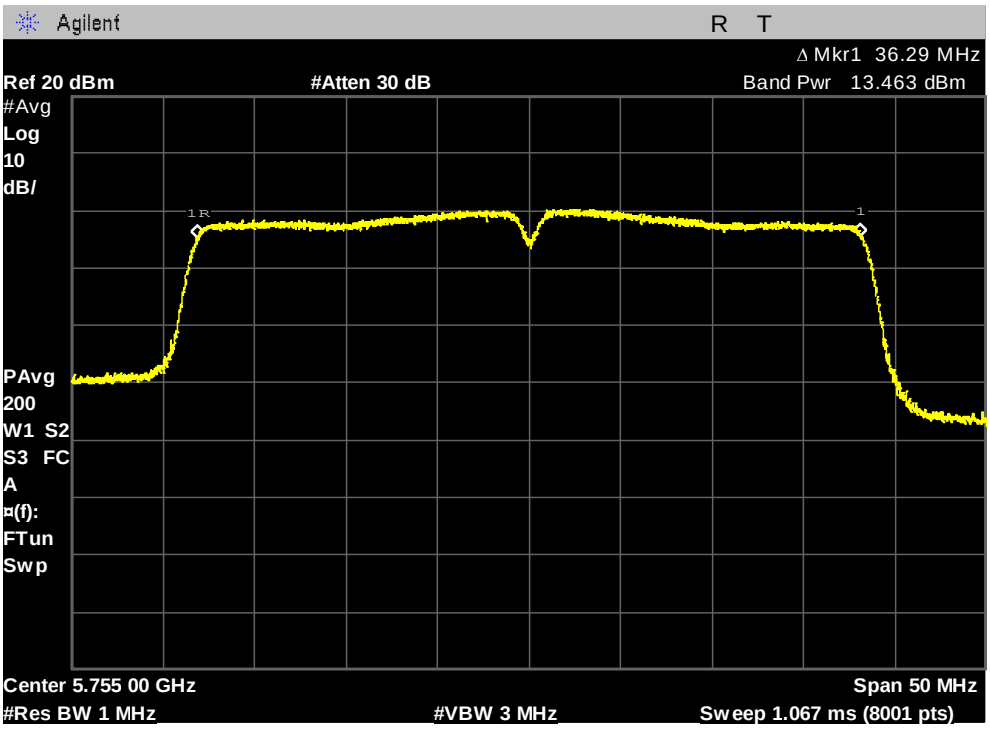
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5825 MHz)



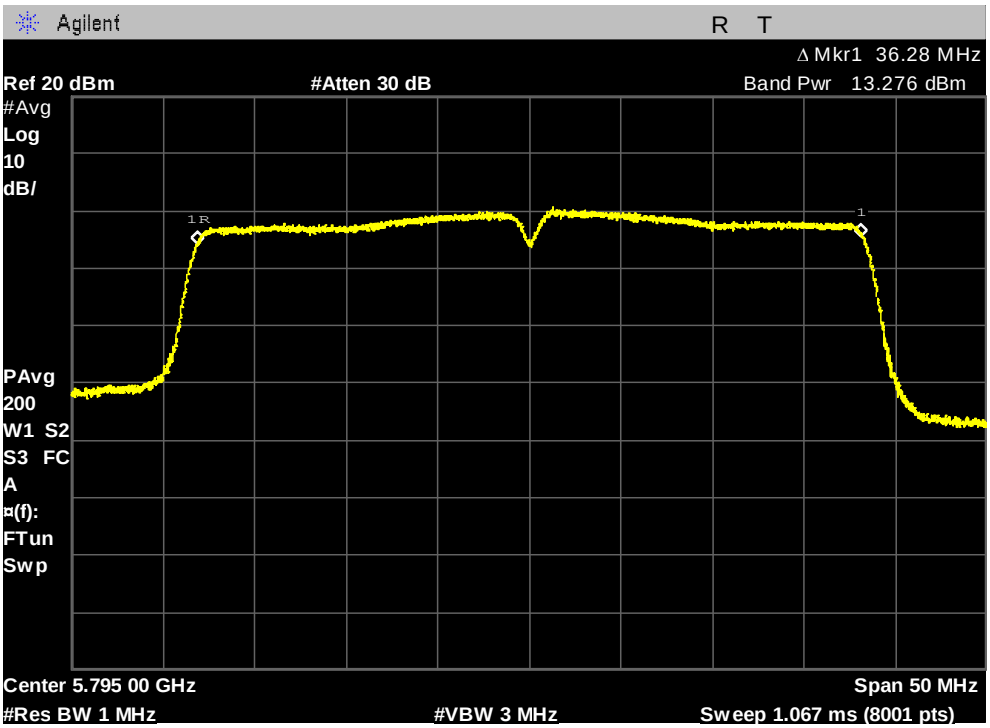
802.11ac(40MHz) mode 1TX

Maximum Conducted Output Power, Lowest Channel (5755 MHz)



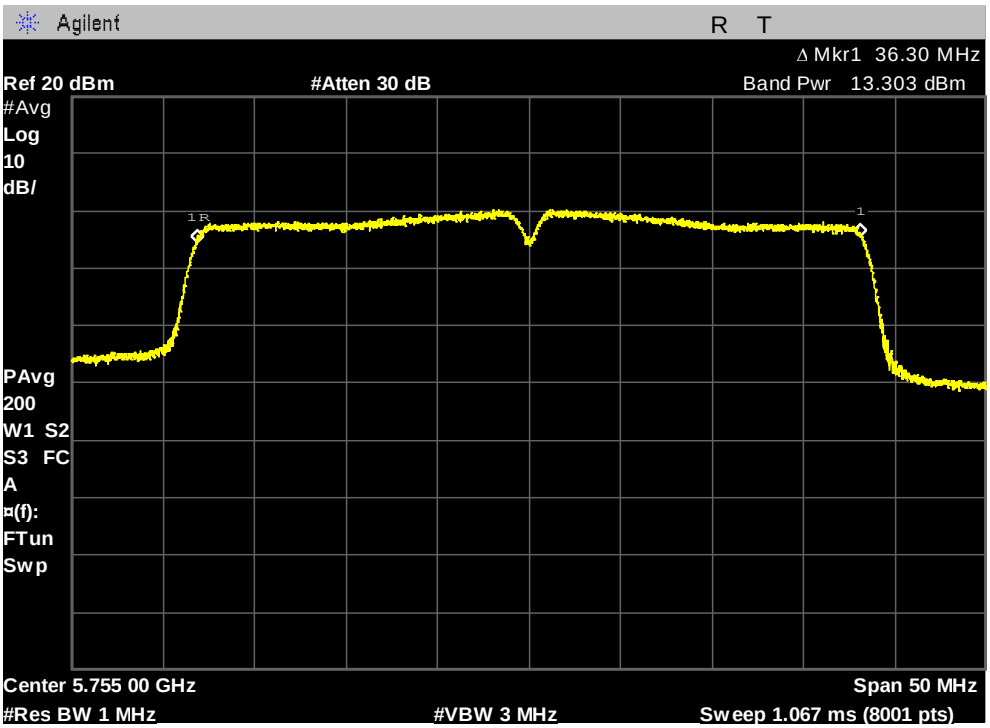
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5795 MHz)



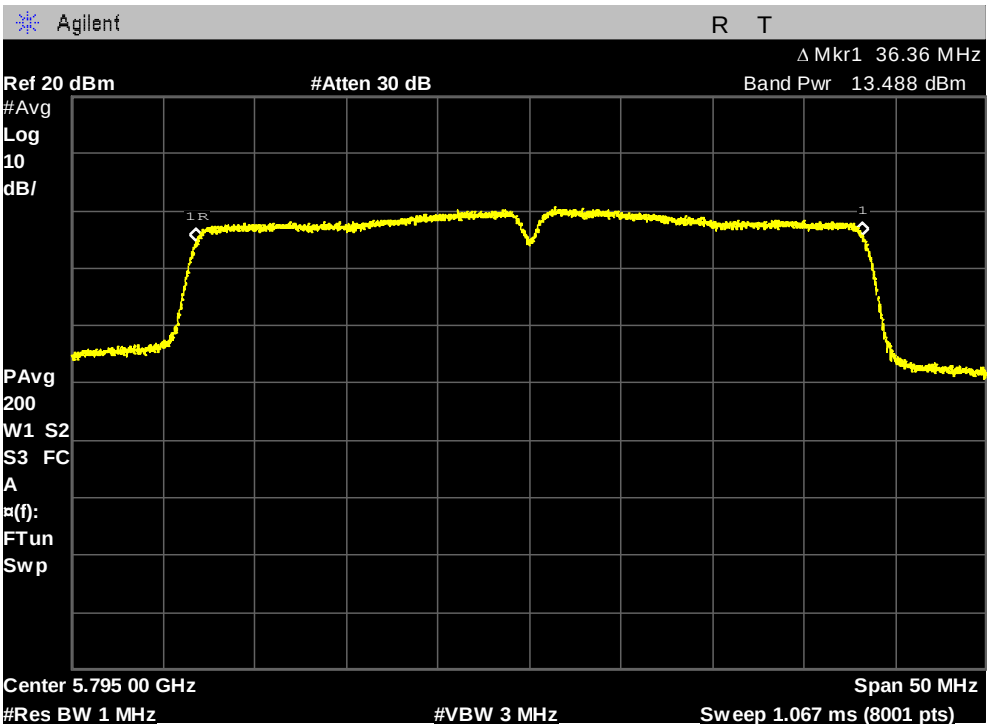
802.11ac(40MHz) mode 2TX ANT0

Maximum Conducted Output Power, Lowest Channel (5755 MHz)



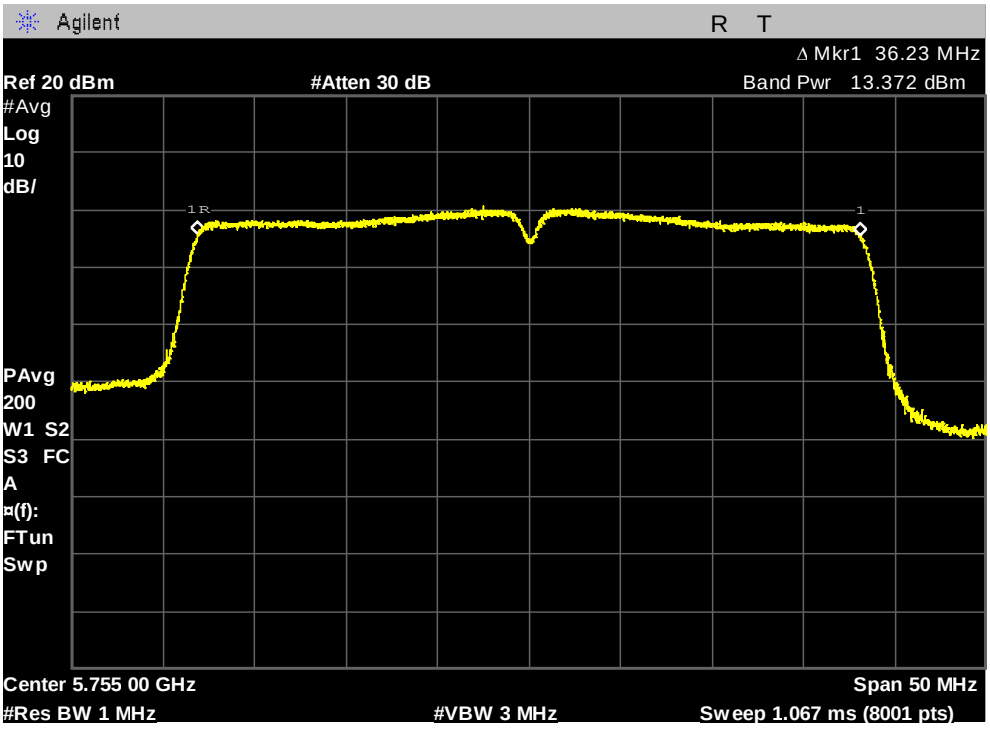
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5795 MHz)



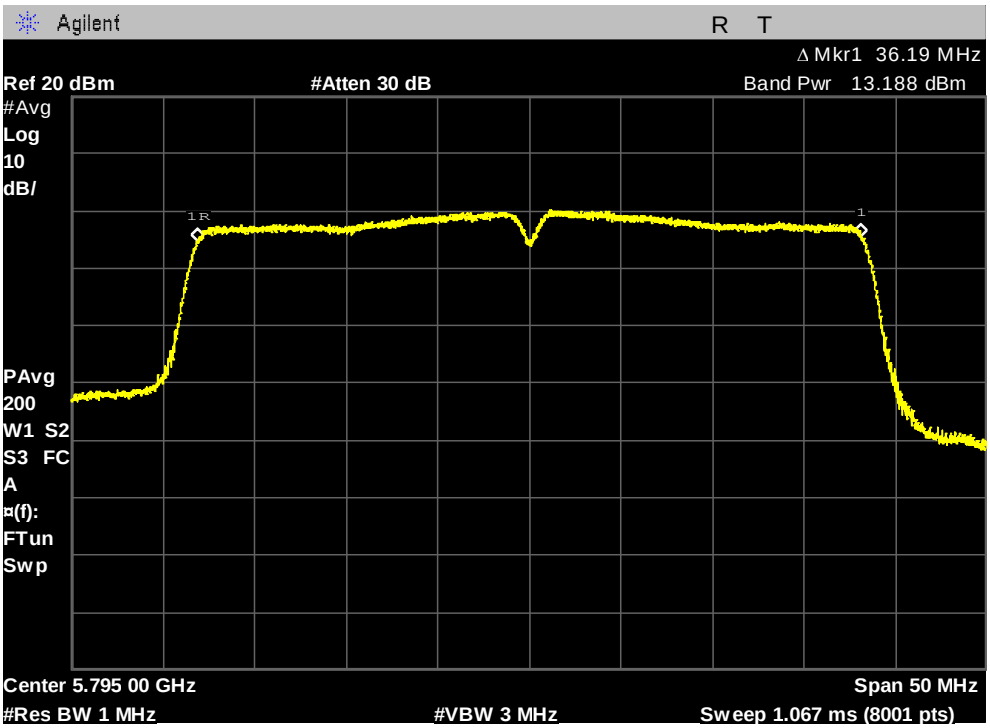
802.11ac(40MHz) mode 2TX ANT1

Maximum Conducted Output Power, Lowest Channel (5755 MHz)



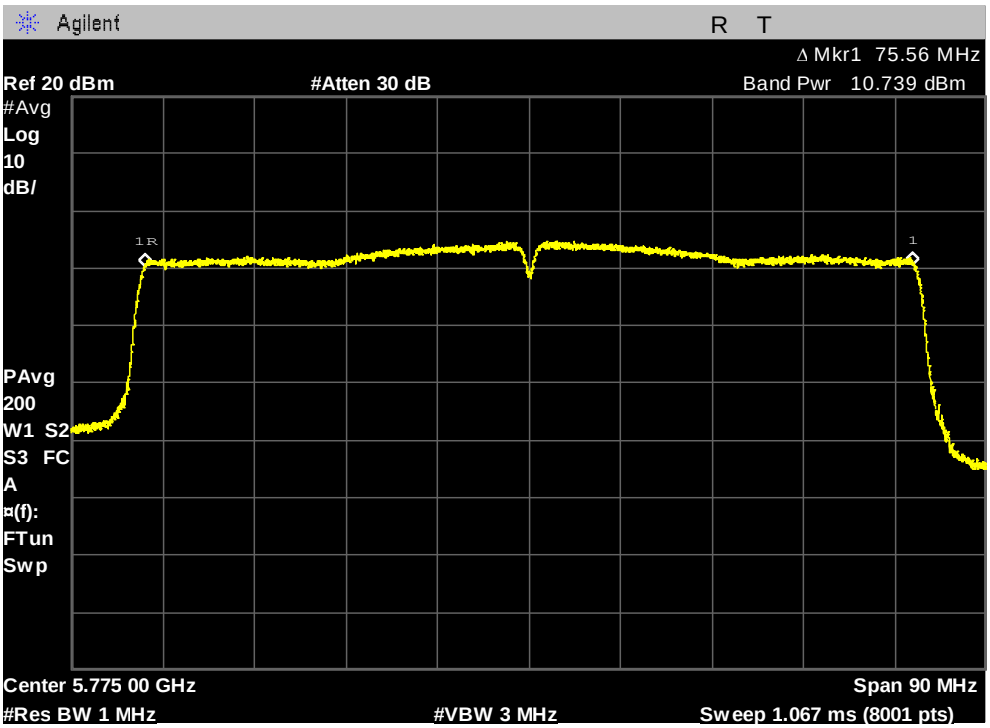
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5795 MHz)



802.11ac(80MHz) mode 1TX

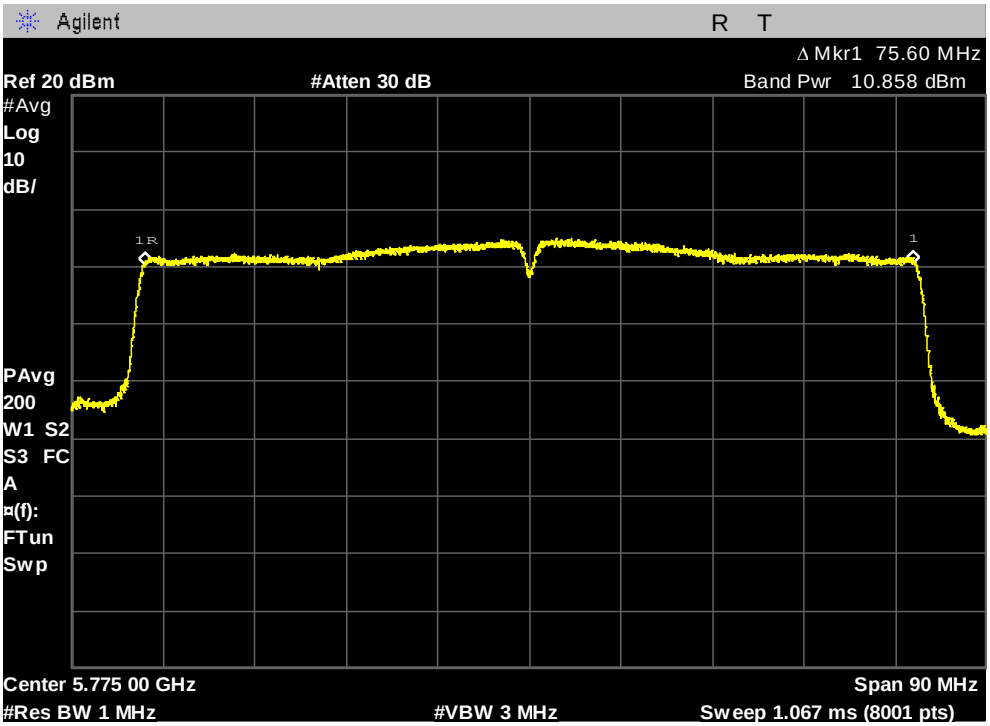
Maximum Conducted Output Power, Middle Channel (5775 MHz)



PLOTS OF EMISSIONS

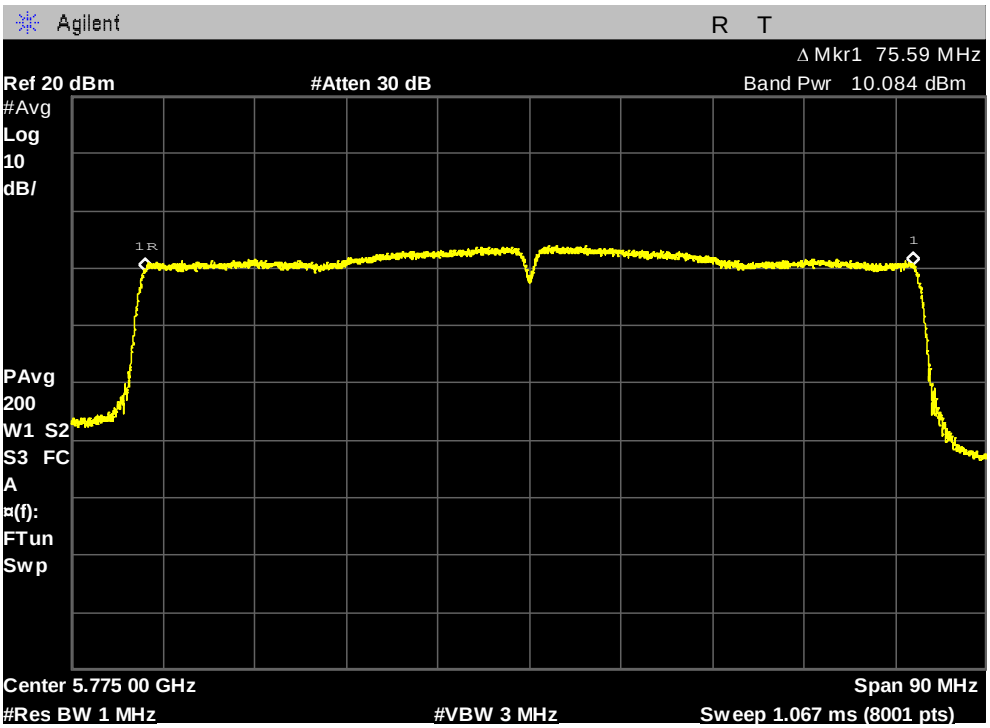
802.11ac(80MHz) mode 2TX ANT0

Maximum Conducted Output Power, Middle Channel (5775 MHz)



802.11ac(80MHz) mode 2TX ANT1

Maximum Conducted Output Power, Middle Channel (5775 MHz)



8.6 Maximum Power Spectral Density (average)

8.6.1 Maximum Power Spectral Density – U-NII-1 band

FCC §15.407(a)

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5180	-4.29	0.07	-4.22	11.00
Middle	5220	-1.9	0.07	-1.83	11.00
Highest	5240	-2.02	0.07	-1.95	11.00

802.11n (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5180	-4.64	0.10	-4.54	11.00
Middle	5220	-2.12	0.10	-2.02	11.00
Highest	5240	-2.61	0.10	-2.51	11.00

TEST DATA

802.11n (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5180	-4.55	0.10	-1.44	11.00
Middle	5220	-2.36	0.10	0.75	11.00
Highest	5240	-2.52	0.10	0.59	11.00

802.11n (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5190	-9.06	0.16	-8.90	11.00
Highest	5230	-2.91	0.16	-2.75	11.00

802.11n (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5190	-8.68	0.16	-5.51	11.00
Highest	5230	-2.66	0.16	0.51	11.00

TEST DATA

802.11ac (20MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5180	-4.43	0.07	-4.36	11.00
Middle	5220	-2.5	0.07	-2.43	11.00
Highest	5240	-2.78	0.07	-2.71	11.00

802.11ac (20MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5180	-4.46	0.07	-1.38	11.00
Middle	5220	-2.16	0.07	0.92	11.00
Highest	5240	-2.37	0.07	0.71	11.00

802.11ac (40MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Lowest	5190	-8.87	0.19	-8.68	11.00
Highest	5230	-3.03	0.19	-2.84	11.00

TEST DATA

802.11ac (40MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Lowest	5190	-8.81	0.19	-5.61	11.00
Highest	5230	-2.83	0.19	0.37	11.00

802.11ac (80MHz) mode_1TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
Middle	5210	-8.56	0.34	-8.22	11.00

802.11ac (80MHz) mode_2TX

Channel	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor (dB)	Maximum PSD (dBm/MHz)	FCC Limit (dBm/MHz)
				Total PSD	
Middle	5210	-8.64	0.34	-5.29	11.00

TEST DATA

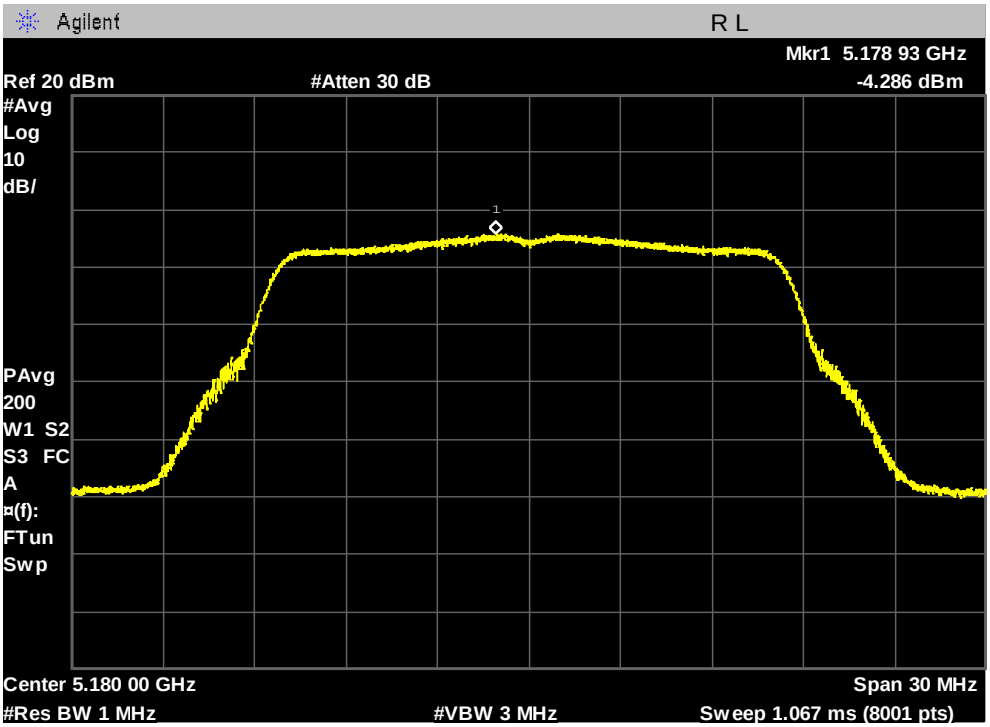
Note:

1. *Maximum PSD = Measured PSD + Duty Factor*
2. *"Measure and add 10 log(N_{ANT}) dB, where N_{ANT} is the number of outputs" was used for measuring in-band Total PSD.*
   Total PSD = Measured PSD + duty factor + 10 log(N_{ANT})
3. *For CDD transmission, directional gain is.* ***5.80 dBi***
   For MIMO transmission, directional gain is ***2.79 dBi****.*
   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.
   For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,
   Directional gain = GANT + Array Gain = 2.79 dBi + 3.01 dB = 5.80 dBi
   Array Gain = 10 log(N_{ANT}/N_{SS}) dB = 10 log(2/1) = 3.01 dB.
   where N_{SS} = the number of independent spatial streams of data and GANT is the antenna gain in dBi.
   For CDD mode of this device, NSS=1.
   For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,
   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi = 2.79 dBi + 10 log(2/2) dB = 2.79 dBi*.*
   where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi
   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. *For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.*
5. *Power Spectral Density(PSD) was measured by same method with conducted output power according to II.F.1 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01.*
6. *The following equation was used for spectrum offset:*
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

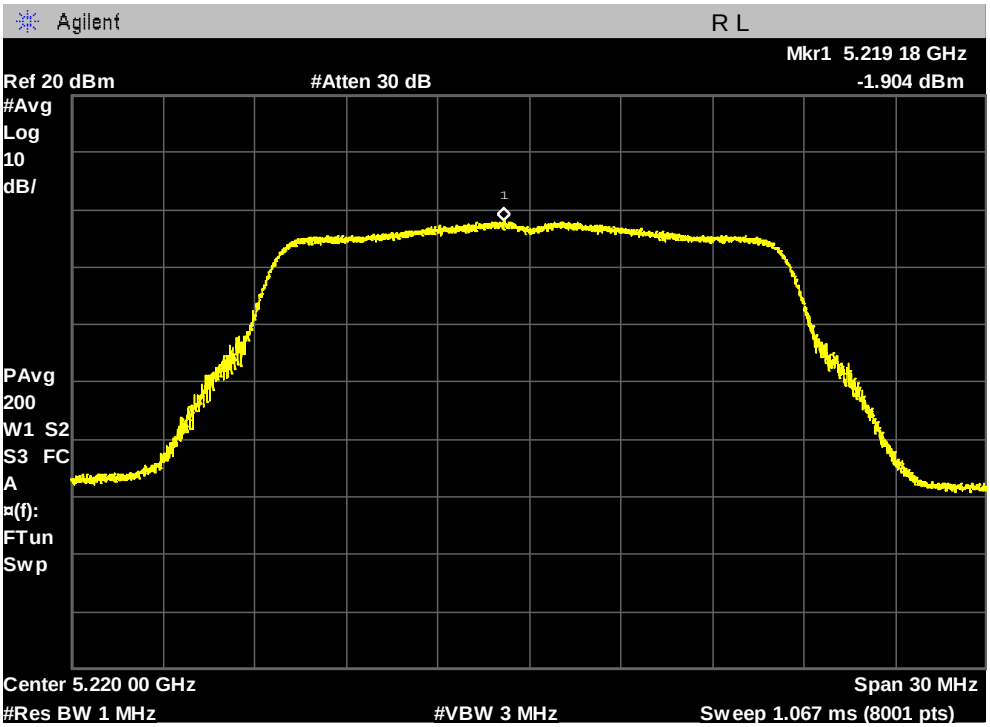
PLOTS OF EMISSIONS

802.11a mode 1TX

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

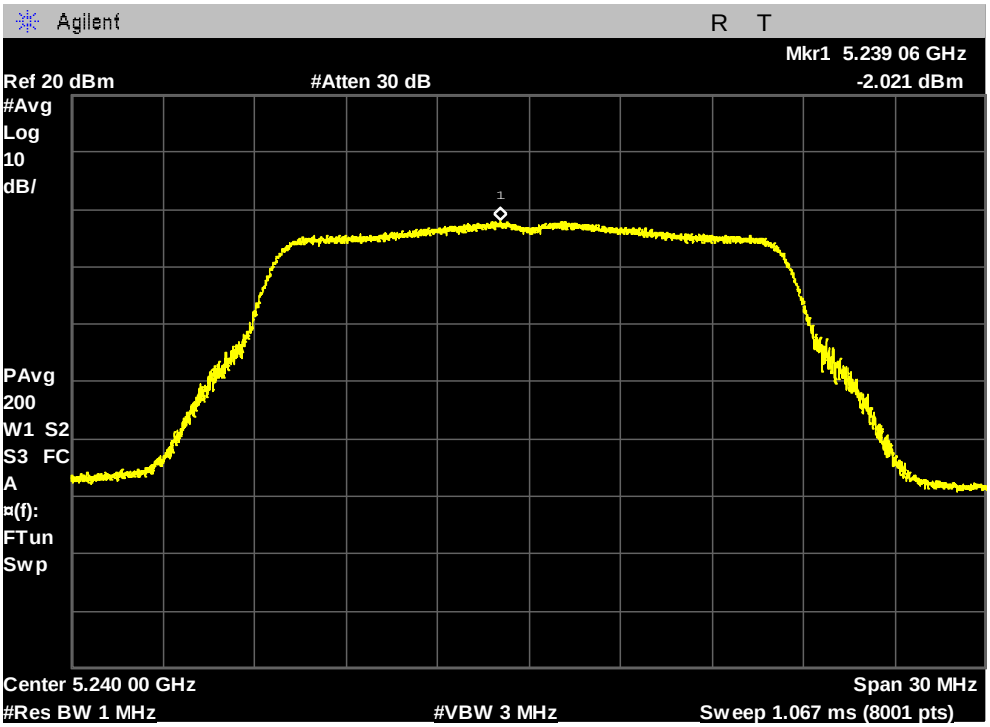


Maximum Power Spectral Density, Middle Channel (5220 MHz)



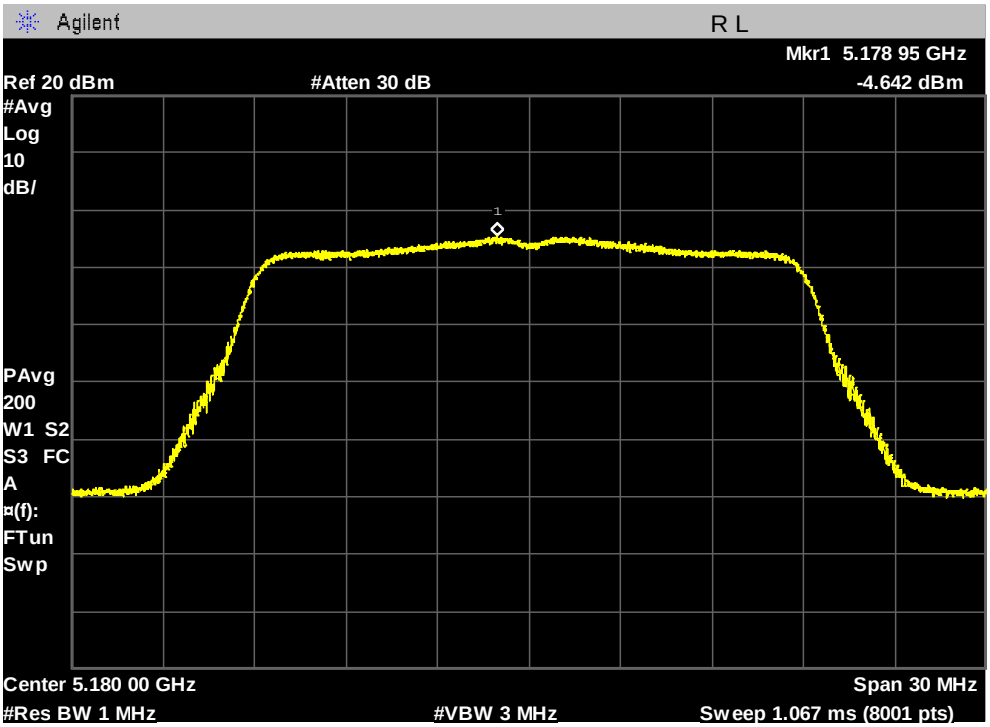
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



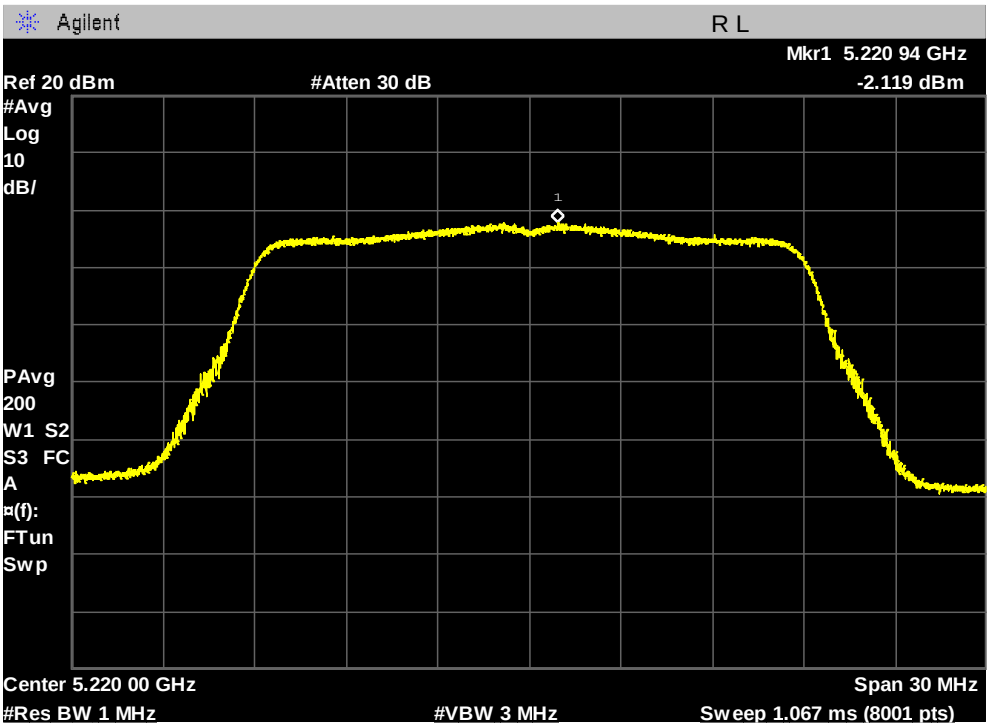
802.11n (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

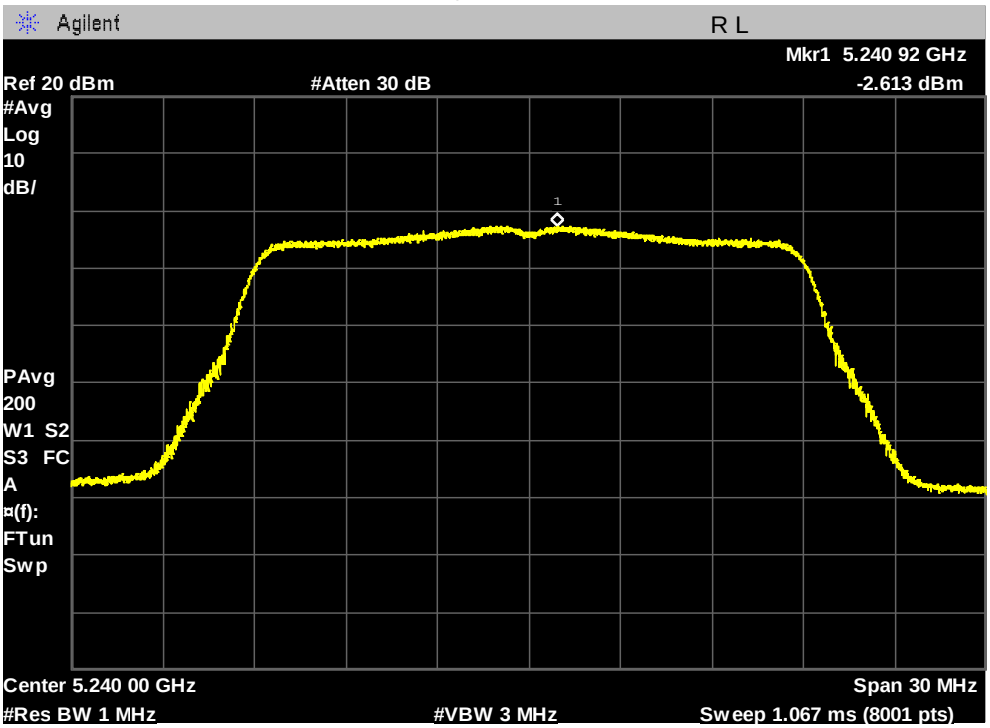


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



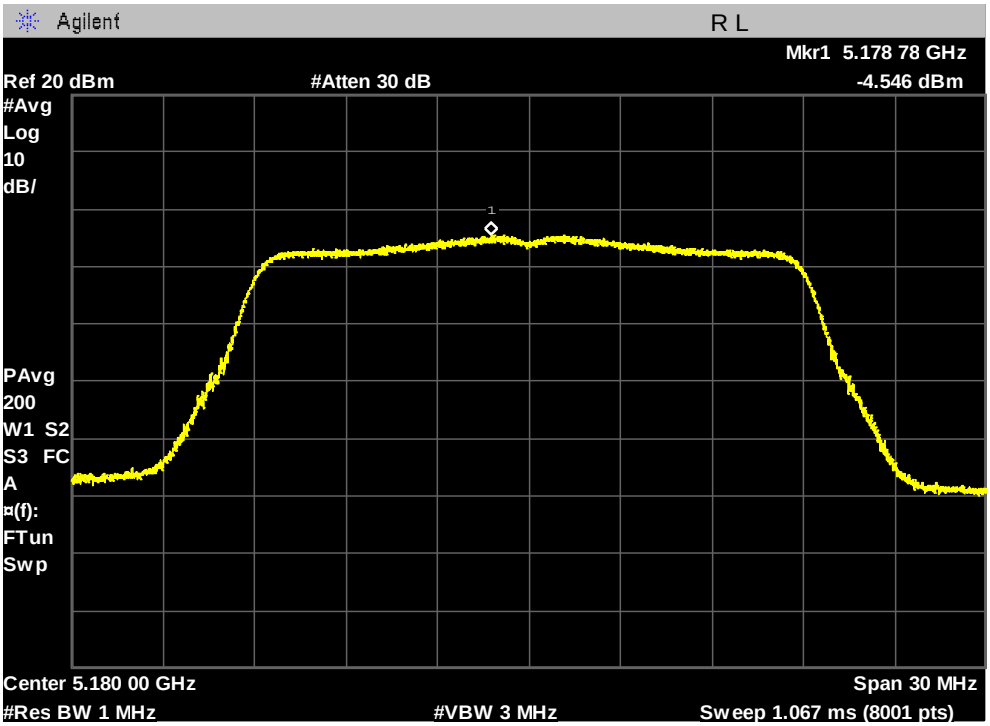
Maximum Power Spectral Density, Highest Channel (5240 MHz)



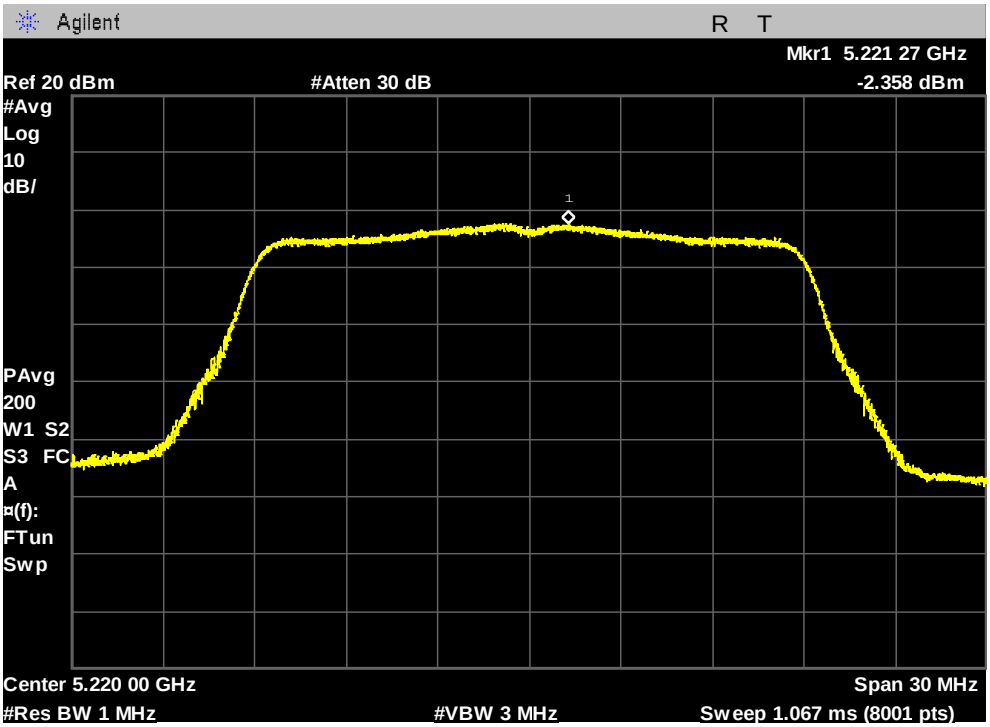
PLOTS OF EMISSIONS

802.11n (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

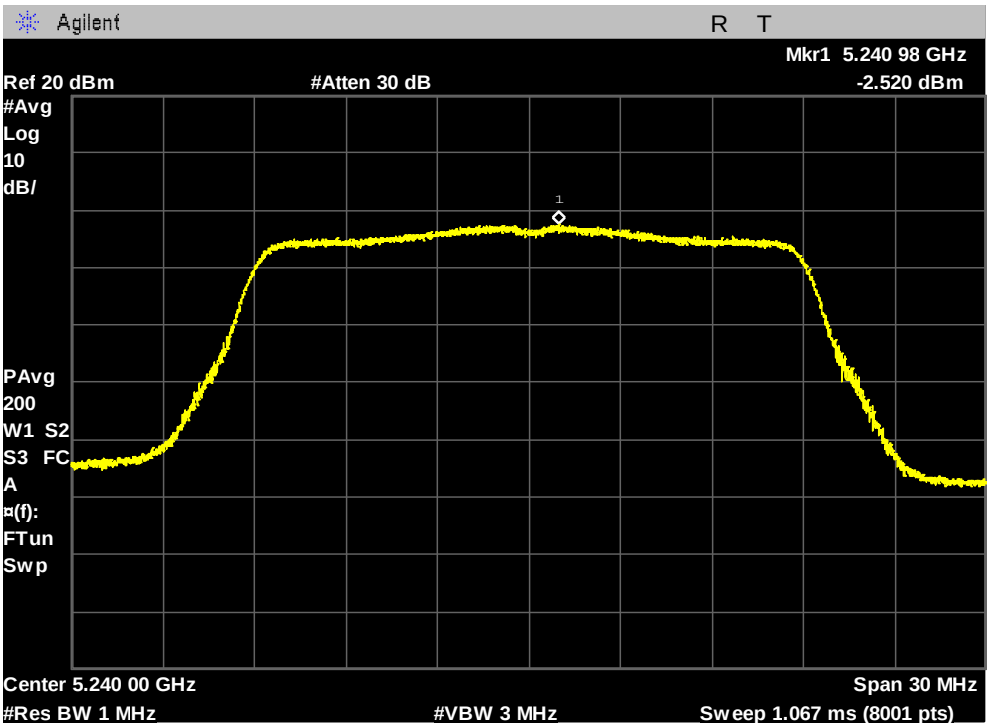


Maximum Power Spectral Density, Middle Channel (5220 MHz)



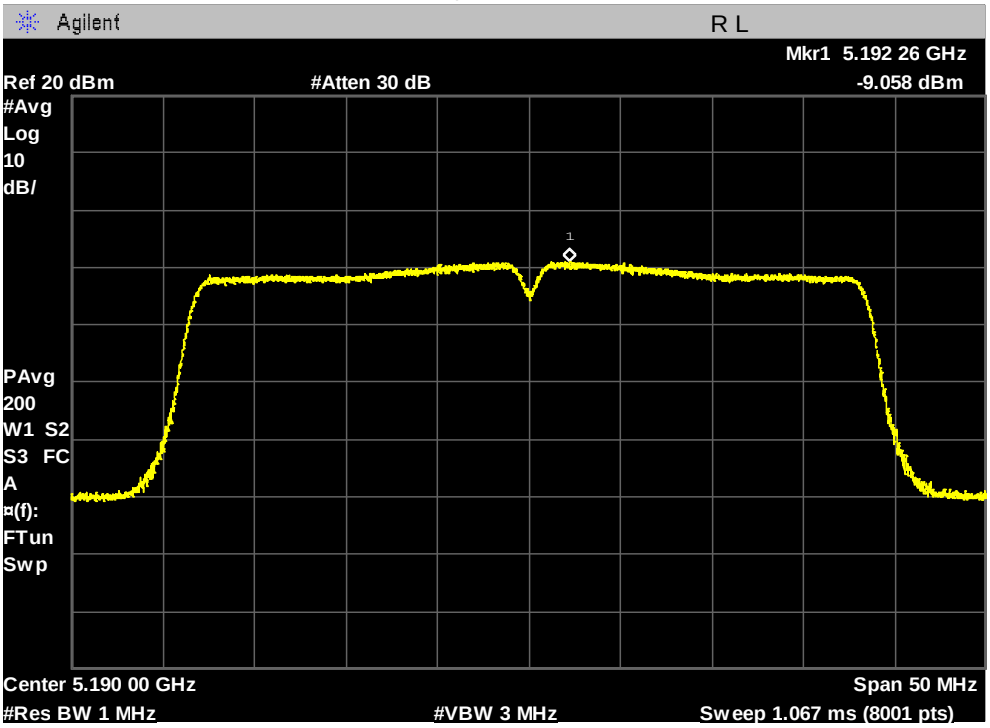
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



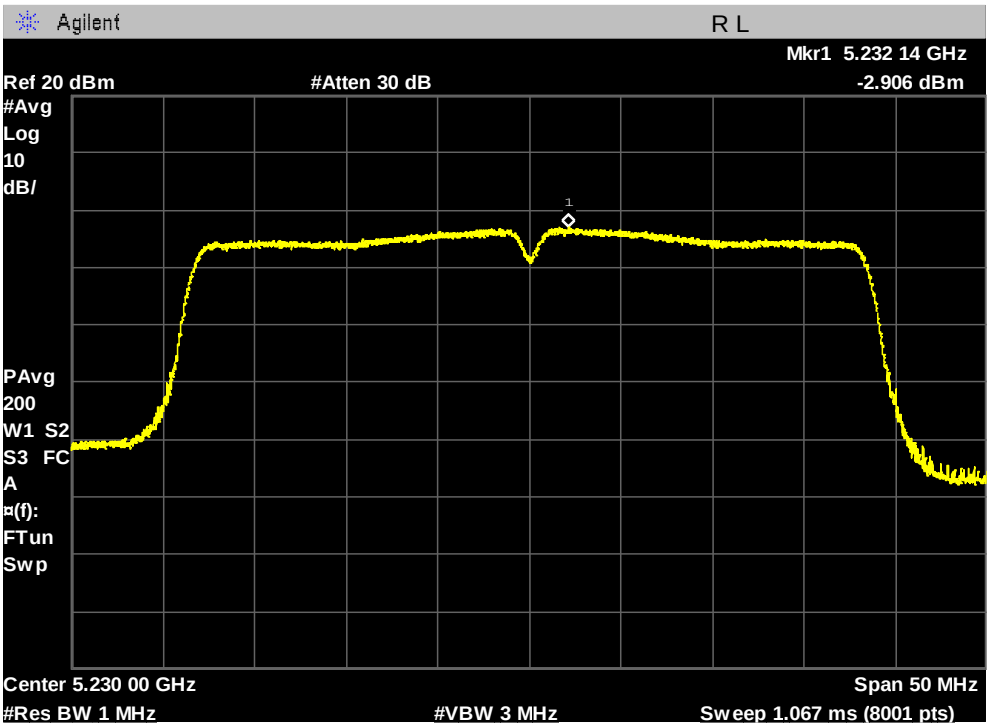
802.11n (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



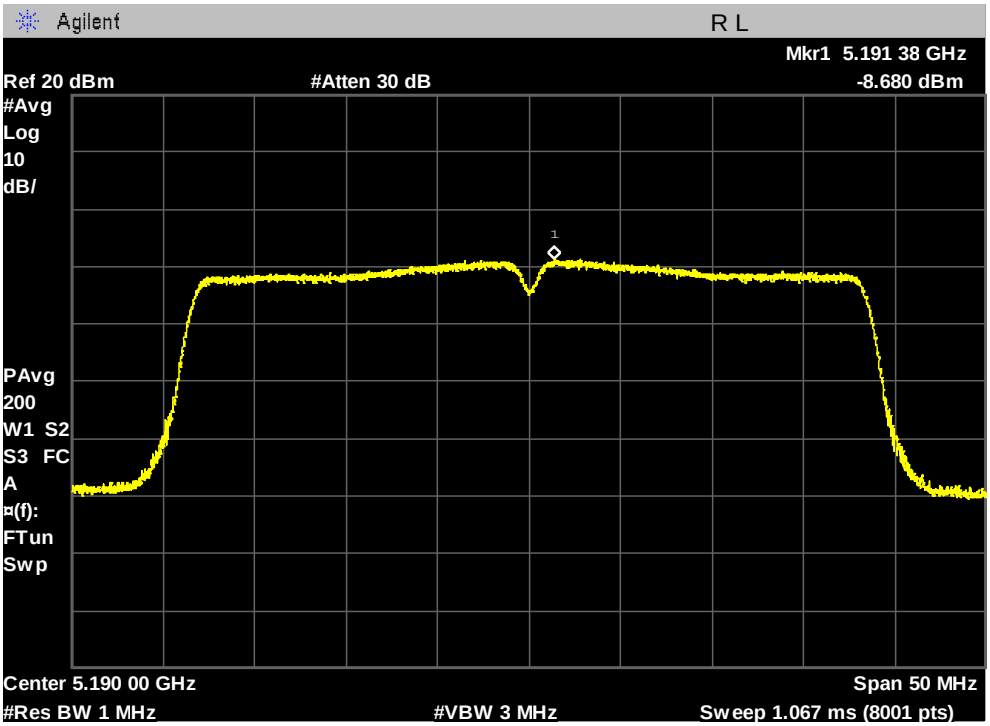
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5230 MHz)



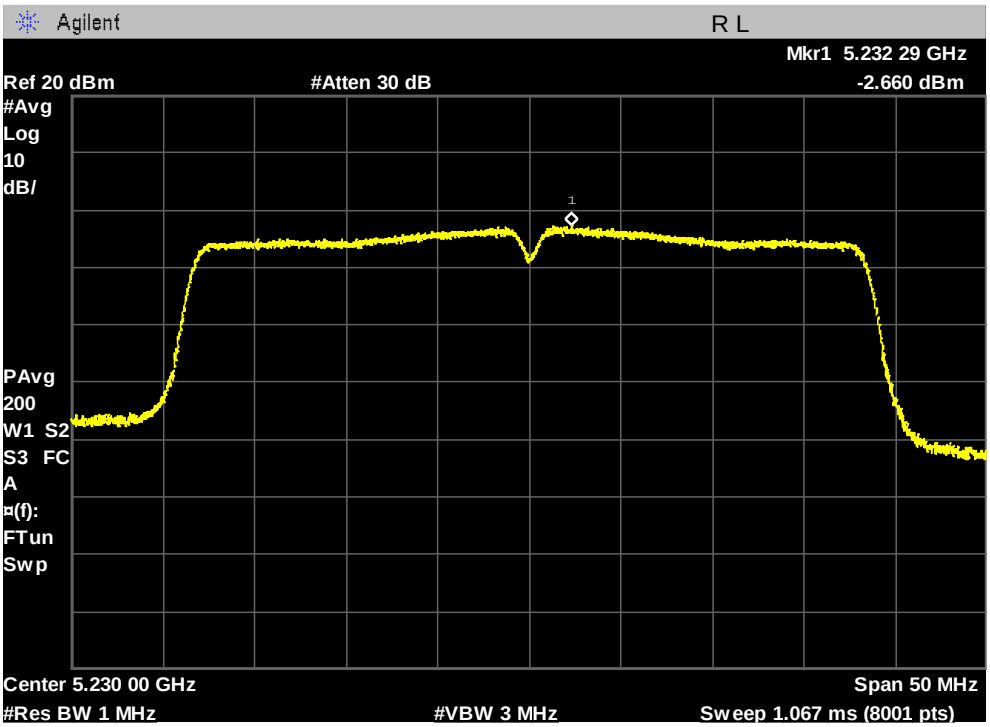
802.11n (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



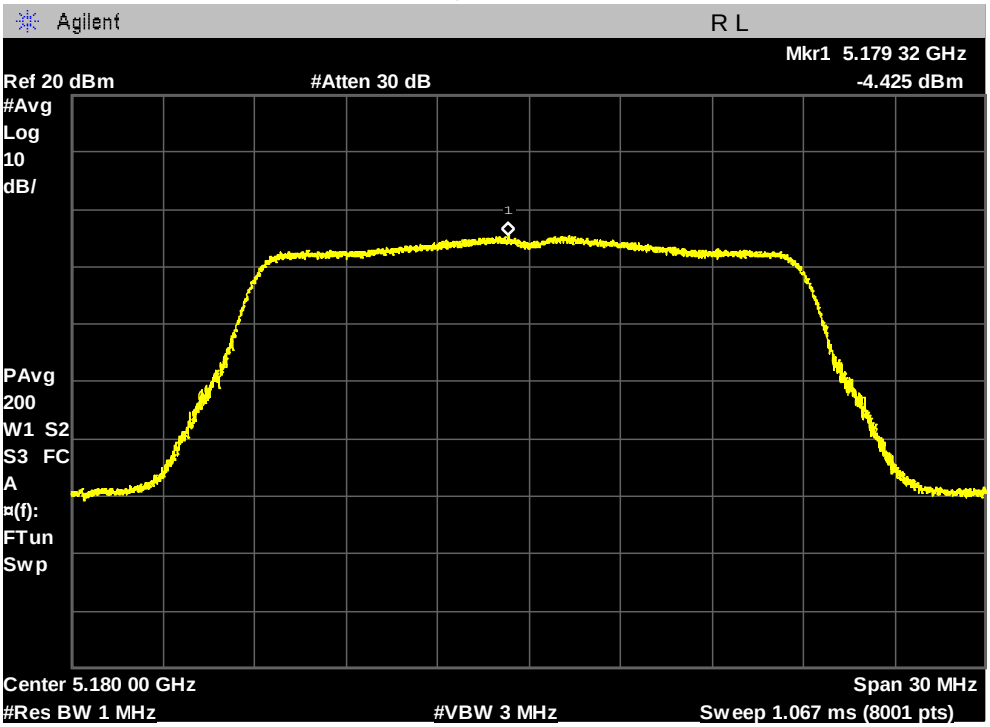
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5230 MHz)



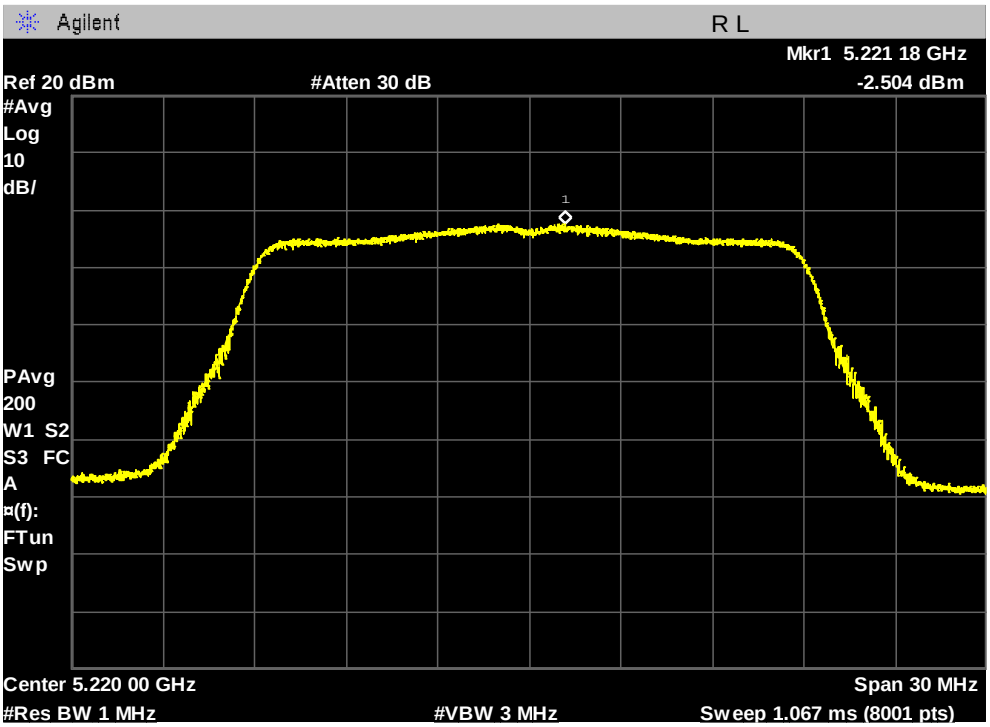
802.11ac (20 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

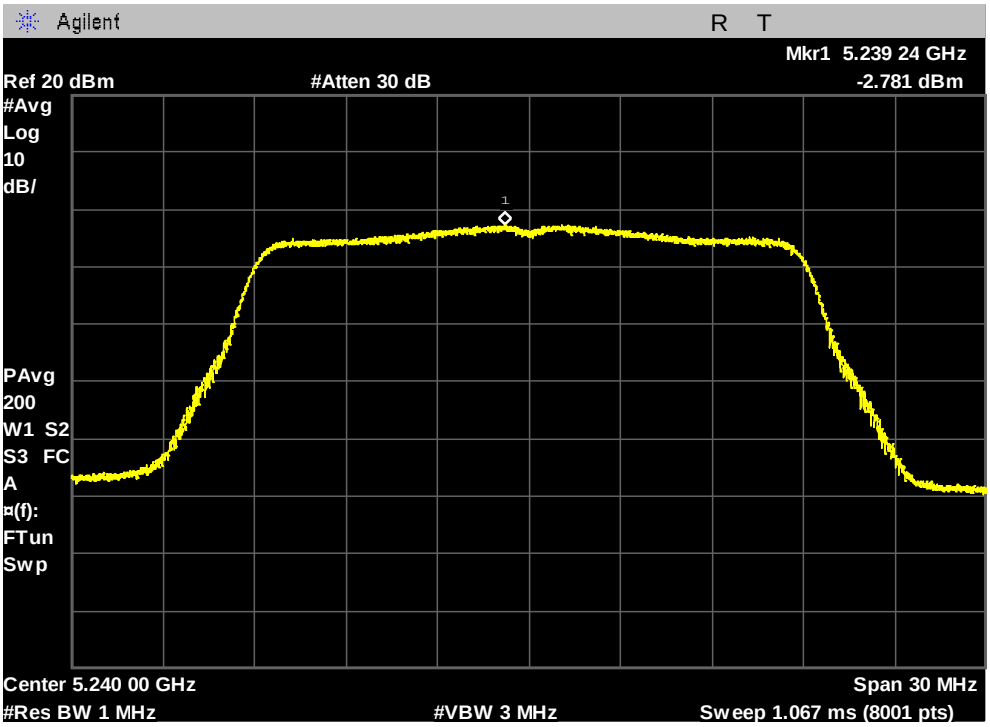


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



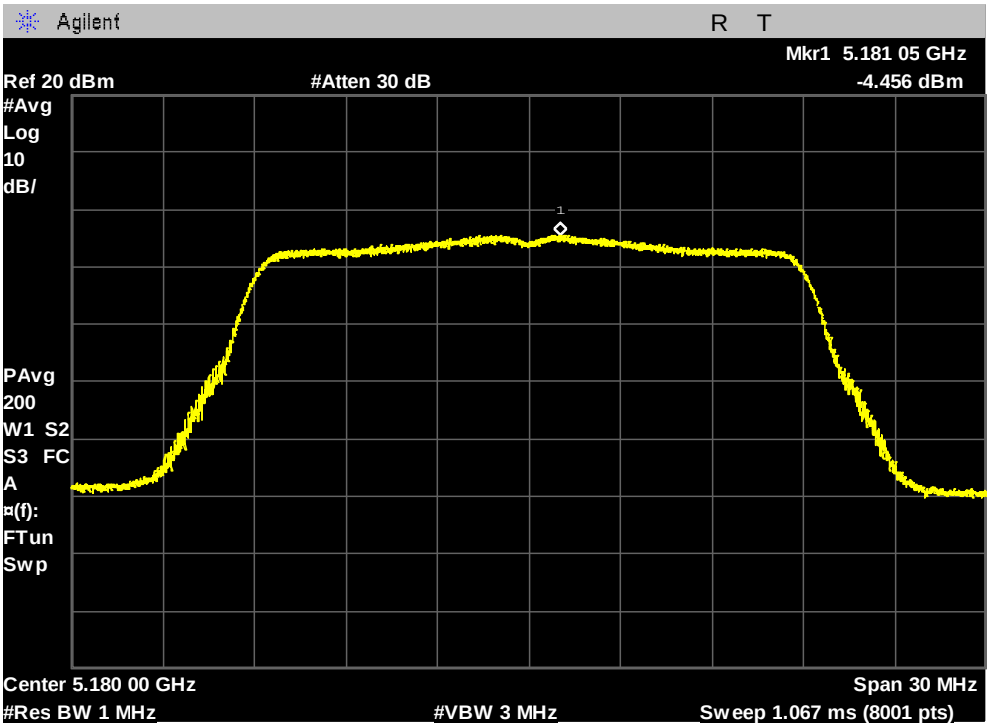
Maximum Power Spectral Density, Highest Channel (5240 MHz)



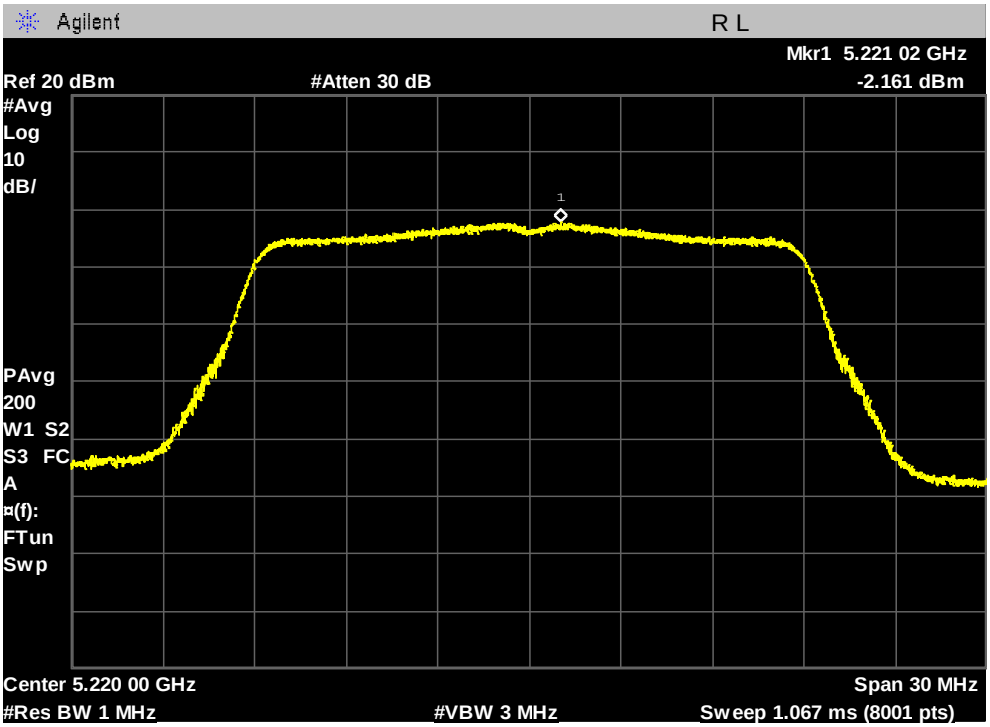
PLOTS OF EMISSIONS

802.11ac (20 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

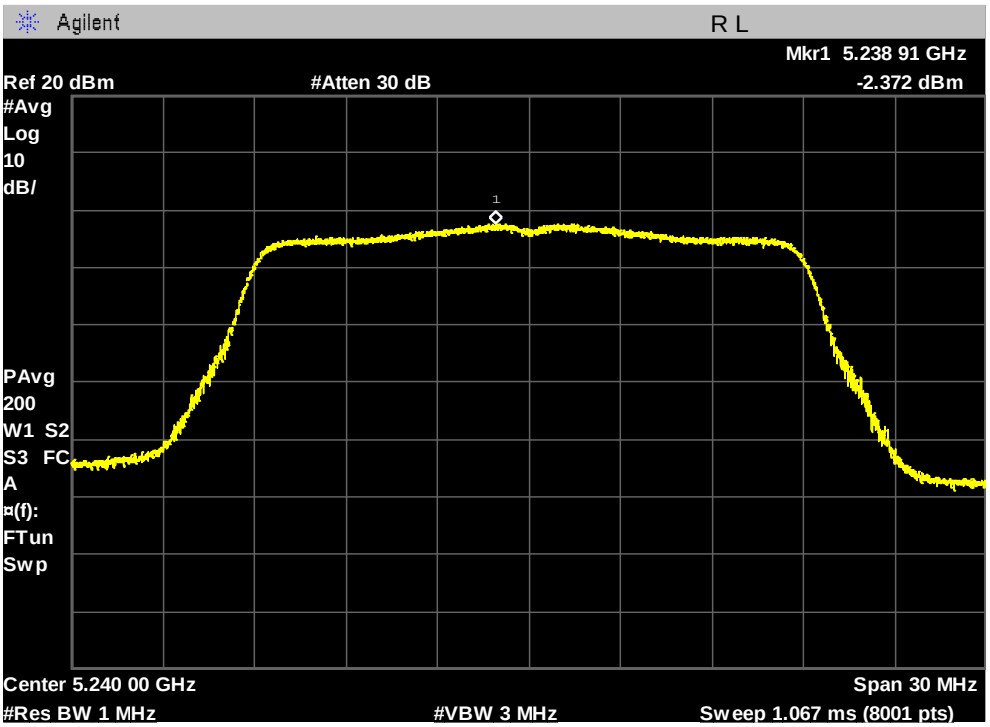


Maximum Power Spectral Density, Middle Channel (5220 MHz)



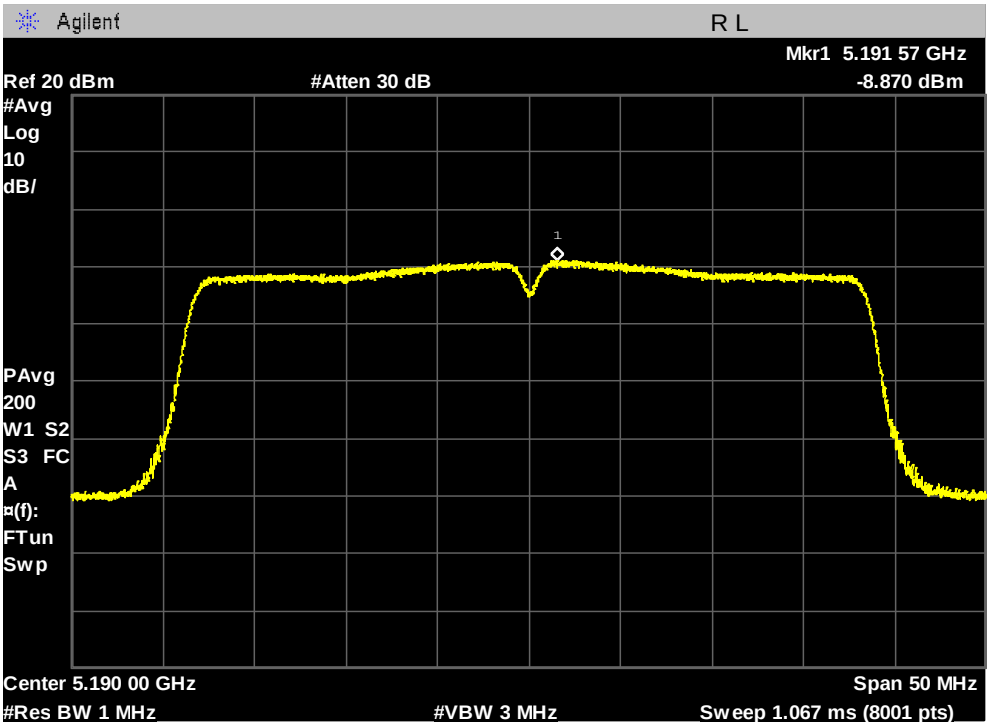
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



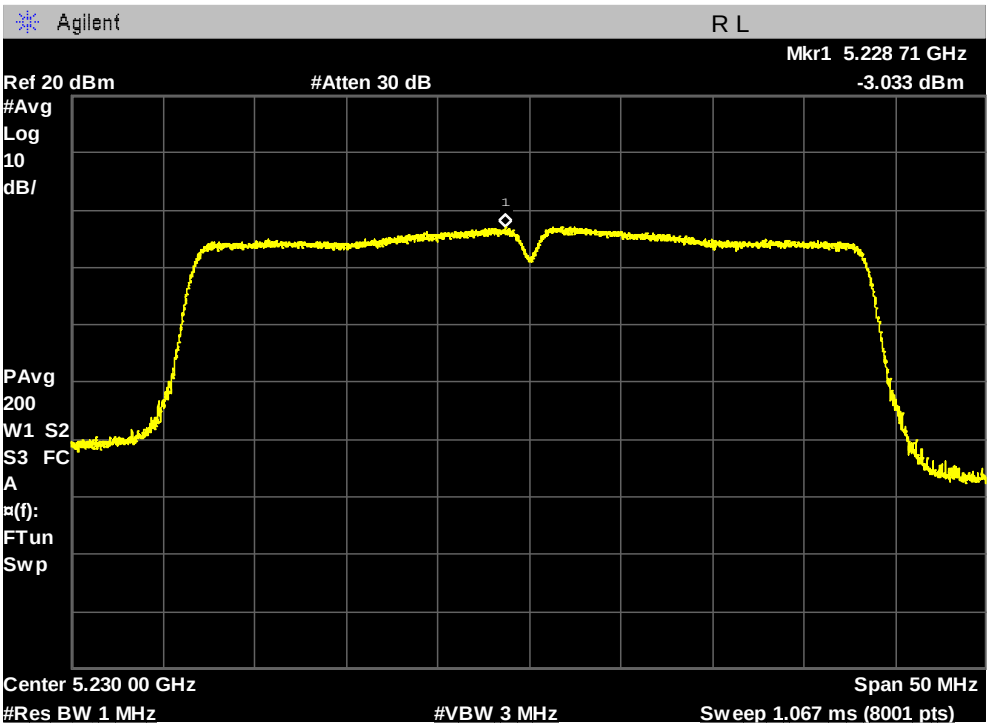
802.11ac (40 MHz) mode 1TX

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5230 MHz)



802.11ac (40 MHz) mode 2TX

Maximum Power Spectral Density, Lowest Channel (5190 MHz)