Test Report

Curtis-Straus LLC, *a wholly owned subsidiary of BV CPS*

Report No	ER2499-8
Client	Harman International Industries, Inc.
Address	30001 Cabot Drive Novi, MI 48377
Phone	248-254-7751
Items tested	G31 MID
FCC ID	2AHPN-BE2833
IC	6434C-BE2833
FRN	0026894154
Equipment Type	Unlicensed National Information Infrastructure Device
Equipment Code	NII
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.407, ISED Canada RSS-247 Issue 2
Test Dates	August 25 - October 12, 2017
Results	As detailed within this report
Prepared by	Zachary Johnson – Test Engineer
Authorized by	Yunus Faziloglu – Sr. EMC Engineer
Issue Date	10\26\2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 24 of this report.

Contents

Report REV Sep-08-2017 - YF

Summary

This test report supports an application for certification of a transmitter operating pursuant to:
CFR Title 47 FCC Part 15.407, ISED Canada RSS-247 Issue 2

The product is the G31 MID. This report covers the 5GHz Wifi portion of the device. It is a transmitter that operates in the following bands:
5.15GHz – 5.25GHz
5.725GHz – 5.85GHz

Antenna Type: Switching PCB trace antenna
Gain: Maximum 3.2dBi in 5GHz-6GHz frequency band.

We found that the product met the above requirements without modification.

Test samples were received in good condition.

Test Methodology

All testing was performed according to the following rules/procedures/documents;
CFR Title 47 FCC Part 15.407, RSS-247 Issue 2, RSS-Gen Issue 4, FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 and ANSI C63.10-2013.

Radiated emissions were maximized by measuring the device in normal operating position, as well as varying the test antenna's height and polarity.

EUT operating voltage is 11-16V DC

The following bandwidths were used during radiated spurious and AC line conducted emissions testing.

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-40GHz	1MHz	3MHz

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	R2499		
Company:	Harman International Industries, Inc.		
Company Address:	30001 Cabot Drive		
	Novi, MI, 48377		
Contact:	Mark Bowman		
	MN	**PN**	**SN**
EUT:	G31 MID	--	--
EUT Description:	Car Stereo System		

EUT Components	**MN**	**SN**
Back up camera	--	--
FM/AM antenna	--	--

Support Equipment	**MN**	**SN**
CS Supplied Laptop.	--	--
USB to Ethernet Converter	--	--
13.5Vdc Power Supply	--	--

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
DC main	Power DC	2	2	Power DC	No	No	1.2	in	yes	
Audio		1	1	-	Yes	No	3	in	yes	
USB	USB	3	1	USB	Yes	No	1	in	yes	
xm/Dab connector		1	1	Coaxial	Yes	No	1.2	in	yes	
FM/AM antenna	-	1	1		Yes	No	0.4	in	yes	
Back up camera		1	1		Yes	No	0.3	in	yes	
Next Gen port	-	1	0	-				in	no	

Software Operating Mode Description:

EUT will be operating in a test mode for Immunity tests, RX for non intentional REMI, and Constant TX internal mode for Spurious.

Performance Criteria:

EUT will connect to CMW and preform less than 10% PER during test.BT- EUT will connect to tablet or CMW over bluetooth and stay connected at appropriate distance.

Statement of Conformity

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	4		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
8.3			15.203	EUT employs Switching PCB trace antenna with maximum 3.2dBi gain.
8.10			15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable
8.8			15.207	N/A. Unit is powered by a vehicle battery only.

Refer to Appendix A of this report for antenna port conducted measurements.

Test Results

Radiated Spurious Emissions

LIMITS

[15.407(b)(6)]: Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
[15.407(b)(7)]: *The provisions of §15.205 apply to intentional radiators operating under this section.*
[15.407(b)(1)]: For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz
[15.407(b)(4)(i)]: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge

RSS-247 Issue 2 Section 6.2.1.2: For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p
RSS-247 Issue 2 Section 6.2.4.2: Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:
27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;
15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
-27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

Device was measured in normal operating position.

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company					Work Order - R2499				
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC				
30-1000MHz Vertical Data					Test Site - CH 2				
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar				
802.11a 20MHz 9Mbps CH 157									
Frequency	Raw QP Reading	Correction Factor	Adjusted QP Amplitude	Limit	Margin Req 1	Test Results Req 1	Worst Margin Req 1		
MHz	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)		
475.91	24.1	-9.6	14.6	46	-31.5	PASS			
478.033	24.5	-9.5	15	46	-31.1	PASS			
479.237	23	-9.5	13.5	46	-32.5	PASS			
482.142	24.7	-9.5	15.2	46	-30.8	PASS			
719.574	22.9	-6.3	16.6	46	-29.4	PASS	-29.4		
960.063	23.5	-3	20.5	54	-33.5	PASS			

Curtis Straus - a Bureau Veritas Company					Work Order - R2499				
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC				
30-1000MHz Horizontal Data					Test Site - CH 2				
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar				
802.11a 20MHz 9Mbps CH 157									
Frequency	Raw QP Reading	Correction Factor	Adjusted QP Amplitude	Limit	Margin Req 1	Test Results Req 1	Worst Margin Req 1		
MHz	(dBµV)	(dB/m)	(dBµV/m)	(dbµV/m)	(dB)	(Pass/Fail)			
166.238	23.3	-16.7	6.6	43.5	-36.9	PASS			
168.204	23.5	-16.8	6.7	43.5	-36.8	PASS			
479.913	22.6	-9.5	13.1	46	-32.9	PASS			
719.215	23.4	-6.3	17.1	46	-28.9	PASS			
957.332	22.4	-3.1	19.4	46	-26.6	PASS	-26.6		
960.176	22.4	-3	19.4	54	-34.6	PASS			

30-1000MHz Center Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Vertical Data					Test Site - CH 2										
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar										
802.11a 20MHz 9Mbps CH 149															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)	(dB)
2416.2	34.8	26.7	12.3	47.1	39.1	74	-26.9	PASS	54	-14.9	PASS	285	208		
2463.1	35.5	26.5	12.4	48	39	74	-26	PASS	54	-15	PASS	225	131		
5180.4	32.6	23.4	21.8	54.3	45.2	74	-19.7	PASS	54	-8.8	PASS	125	111		-8.8
5251.9	34.4	23	22	56.4	44.9	74	-17.6	PASS	54	-9.1	PASS	105	179	-17.6	
5262	31.7	22.8	22	53.7	44.8	74	-20.3	PASS	54	-9.2	PASS	203	145		

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Horizontal Data					Test Site - CH 2										
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar										
802.11a 20MHz 9Mbps CH 149															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)	(dB)
2410.6	35.3	26.5	12.3	47.6	38.9	74	-26.4	PASS	54	-15.1	PASS	100	73		
2425.2	35.2	25.3	12.4	47.5	37.6	74	-26.5	PASS	54	-16.4	PASS	192	43		
2460.5	34.1	26.4	12.4	46.6	38.9	74	-27.4	PASS	54	-15.1	PASS	208	279		
5181.6	30.2	23.5	21.8	52	45.3	74	-22	PASS	54	-8.7	PASS	275	307		-8.7
5263.6	32.3	22.9	22	54.3	44.9	74	-19.7	PASS	54	-9.1	PASS	100	17	-19.7	

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Vertical Data					Test Site - CH 2										
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar										
802.11a 20MHz 9Mbps CH 157															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)	(dB)
2415.7	49.1	25.9	12.3	61.4	38.2	74	-12.6	PASS	54	-15.8	PASS	210	77	-12.6	
2464.8	34.6	25.6	12.4	47.1	38.1	74	-26.9	PASS	54	-15.9	PASS	125	99		
3856.6	34.9	28.4	18.8	53.7	47.2	74	-20.3	PASS	54	-6.8	PASS	109	306		-6.7
5181.1	31.7	23.5	21.8	53.5	45.3	74	-20.5	PASS	54	-8.7	PASS	125	77		
5263.3	31.5	22.9	22	53.5	44.9	74	-20.5	PASS	54	-9.1	PASS	183	184		

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Horizontal Data					Test Site - CH 2										
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar										
802.11a 20MHz 9Mbps CH 157															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)	(dB)
1729.4	32.2	23.5	12.2	44.3	35.6	74	-29.7	PASS	54	-18.4	PASS	100	18		
2412.9	34	25.9	12.3	46.4	38.3	74	-27.6	PASS	54	-15.7	PASS	187	81		
2461.7	37.1	25.7	12.4	49.6	38.1	74	-24.4	PASS	54	-15.9	PASS	175	32		
5183.6	35.5	23.4	21.8	57.2	45.2	74	-16.8	PASS	54	-8.8	PASS	125	224	-16.8	-8.8
5265	32.8	22.9	22	54.8	44.9	74	-19.2	PASS	54	-9.1	PASS	289	131		

1-6GHz Mid Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Vertical Data					Test Site - CH 2										
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar										
802.11a 20MHz 9Mbps CH 165															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)	(dB)
2416.4	34.2	25.4	12.3	46.5	37.8	74	-27.5	PASS	54	-16.2	PASS	297	249		
2460.6	35.4	25.3	12.4	47.9	37.7	74	-26.1	PASS	54	-16.3	PASS	196	6		
3883.1	34.5	28.6	19	53.5	47.6	74	-20.5	PASS	54	-6.4	PASS	105	320	-20.5	-6.4

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Horizontal Data					Test Site - CH 2										
Operator: CCH					Temp; Humid; Pres - 23.4°C; 38%RH; 1026mBar										
802.11a 20MHz 9Mbps CH 165															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dBµV/m)	(dB)	(Pass/Fail	(cm)	(degrees)	(dB)	(dB)
2414.9	32.7	25.4	12.3	45.1	37.7	74	-28.9	PASS	54	-16.3	PASS	175	17		
2423.3	35.1	25.3	12.4	47.5	37.6	74	-26.5	PASS	54	-16.4	PASS	300	85		
2461	35.1	25.2	12.4	47.6	37.6	74	-26.4	PASS	54	-16.4	PASS	275	121		
3883.3	35.6	28.3	19	54.6	47.3	74	-19.4	PASS	54	-6.7	PASS	116	307	-19.4	-6.7

1-6GHz High Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 13.8V DC										
6-18GHz Vertical Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.1°C; 34%RH; 1010mBar										
5g Wifi Channel 149 802.11n20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Worst Peak Margin	Adjusted Avg Amplitude	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Worst Avg Margin	Antenna Height	EUT Azimuth
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(cm)	(degrees)
13618.5	28.4	18.9	28.8	57.2	83.5	-26.3	PASS		47.7	63.5	-15.8	PASS		100	16
15405.1	30.4	20.5	25	55.4	83.5	-28.1	PASS		45.5	63.5	-18	PASS		200	272
16596.9	30.7	21.7	28.1	58.8	83.5	-24.7	PASS		49.9	63.5	-13.6	PASS		131	165
17016.4	29.5	21.3	30.6	60.1	83.5	-23.4	PASS		51.9	63.5	-11.6	PASS		103	148
17661.4	30.6	21	36.7	67.3	83.5	-16.2	PASS	-16.2	57.7	63.5	-5.8	PASS	-5.8	145	95
17977	29.4	20.4	36.5	65.9	83.5	-17.6	PASS		57	63.5	-6.5	PASS		167	168

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 13.8V DC										
6-18GHz Horizontal Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.1°C; 34%RH; 1010mBar										
5g Wifi Channel 149 802.11n20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Test Results	Worst Peak Margin	Adjusted Avg Amplitude	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Test Results	Worst Avg Margin	Antenna Height	EUT Azimuth
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(cm)	(degrees)
7991.9	26.4	16.7	21.9	48.3	83.5	-35.2	PASS		38.6	63.5	-24.9	PASS		178	239
14113.6	27.3	18.3	29.3	56.6	83.5	-26.9	PASS		47.6	63.5	-15.9	PASS		100	329
17658.6	32.3	21.1	36.7	68.9	83.5	-14.6	PASS	-14.6	57.8	63.5	-5.7	PASS	-5.7	176	74

6-18GHz Low Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 13.8V DC										
6-18GHz Vertical Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.1°C; 34%RH; 1010mBar										
5g Wifi Channel 157 802.11n20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Worst Peak Margin	Adjusted Avg Amplitude	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Worst Avg Margin	Antenna Height	EUT Azimuth
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(cm)	(degrees)
13618.5	28.4	18.9	28.8	57.2	83.5	-26.3	PASS		47.7	63.5	-15.8	PASS		100	16
15405.1	30.4	20.5	25	55.4	83.5	-28.1	PASS		45.5	63.5	-18	PASS		200	272
16596.9	30.7	21.7	28.1	58.8	83.5	-24.7	PASS		49.9	63.5	-13.6	PASS		131	165
17016.4	29.5	21.3	30.6	60.1	83.5	-23.4	PASS		51.9	63.5	-11.6	PASS		103	148
17661.4	30.6	21	36.7	67.3	83.5	-16.2	PASS	-16.2	57.7	63.5	-5.8	PASS	-5.8	145	95
17977	29.4	20.4	36.5	65.9	83.5	-17.6	PASS		57	63.5	-6.5	PASS		167	168

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 13.8V DC										
6-18GHz Horizontal Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.1°C; 34%RH; 1010mBar										
5g Wifi Channel 157 802.11n20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Test Results	Worst Peak Margin	Adjusted Avg Amplitude	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Test Results	Worst Avg Margin	Antenna Height	EUT Azimuth
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(cm)	(degrees)
7991.9	26.4	16.7	21.9	48.3	83.5	-35.2	PASS		38.6	63.5	-24.9	PASS		178	239
14113.6	27.3	18.3	29.3	56.6	83.5	-26.9	PASS		47.6	63.5	-15.9	PASS		100	329
17658.6	32.3	21.1	36.7	68.9	83.5	-14.6	PASS	-14.6	57.8	63.5	-5.7	PASS	-5.7	176	74

6-18GHz Mid Channel

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 13.8V DC										
6-18GHz Vertical Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.1°C; 34%RH; 1010mBar										
5g Wifi Channel 165 802.11n20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Results	Worst Peak Margin	Adjusted Avg Amplitude	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Results	Worst Avg Margin	Antenna Height	EUT Azimuth
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(cm)	(degrees)
13618.5	28.4	18.9	28.8	57.2	83.5	-26.3	PASS		47.7	63.5	-15.8	PASS		100	16
15405.1	30.4	20.5	25	55.4	83.5	-28.1	PASS		45.5	63.5	-18	PASS		200	272
16596.9	30.7	21.7	28.1	58.8	83.5	-24.7	PASS		49.9	63.5	-13.6	PASS		131	165
17016.4	29.5	21.3	30.6	60.1	83.5	-23.4	PASS		51.9	63.5	-11.6	PASS		103	148
17661.4	30.6	21	36.7	67.3	83.5	-16.2	PASS	-16.2	57.7	63.5	-5.8	PASS	-5.8	145	95
17977	29.4	20.4	36.5	65.9	83.5	-17.6	PASS		57	63.5	-6.5	PASS		167	168

Curtis Straus - a Bureau Veritas Company					Work Order - R2499										
Radiated Emissions Electric Field 1m Distance					EUT Power Input - 13.8V DC										
6-18GHz Horizontal Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.1°C; 34%RH; 1010mBar										
5g Wifi Channel 165 802.11n20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_109_ClassB_Peak	Peak Margin	Peak Test Results	Worst Peak Margin	Adjusted Avg Amplitude	Av Lim: FCC_pt15_109_ClassB_AVG	Avg Margin	Avg Test Results	Worst Avg Margin	Antenna Height	EUT Azimuth
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail	(dB)	(cm)	(degrees)
7991.9	26.4	16.7	21.9	48.3	83.5	-35.2	PASS		38.6	63.5	-24.9	PASS		178	239
14113.6	27.3	18.3	29.3	56.6	83.5	-26.9	PASS		47.6	63.5	-15.9	PASS		100	329
17658.6	32.3	21.1	36.7	68.9	83.5	-14.6	PASS	-14.6	57.8	63.5	-5.7	PASS	-5.7	176	74

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz	1686	I	12/21/2018
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Blue	0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	5/9/2018
2311 PA	1-1000MHz	PAM-103	COM-POWER	441174	2311	II	2/4/2017
2444 PA	9KHz-6GHz	BBV9744	SCWARZBECK	67	2444	I	10/2/2018
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/28/2019
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018
TH A#2082		HTC-1	HDE		2082	II	3/23/2018
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**
Asset #1509	9kHz - 18GHz		Florida RF			II	10/2/2018
Asset #1522	9kHz - 18GHz		Florida RF			II	2/11/2018
Asset #2052	9kHz - 18GHz		Florida RF			II	3/5/2018
Asset #2053	9kHz - 18GHz		Florida RF			II	10/30/3017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

6-18GHz High Channel

Radiated Emissions Table

Date: 17-Oct-17 **Company:** Harman International **Work Order:** R2499

Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC

Temp: 24.2°C **Humidity:** 42% **Pressure:** 1010mbar

Frequency Range: 18-26.5GHz **Measurement Distance:** 0.1 m

Notes: No emissions Found **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
No Emissions Found									---	---	---	---	---	---

Table Result: Pass by N/A dB ***Worst Freq:*** N/A MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2324 **Cable 2:** --- **Cable 3:** ---

Analyzer: Gold **Preamp:** 18-26.5GHz **Antenna:** 18-26.5GHz Horn **Preselector:** ---

CSsoft Radiated Emissions Calculator v 1.017.188

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Rev. 9/20/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	2/28/2018	2/28/2017
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz	1686	I	12/21/2018	12/21/2016
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	10/16/2017	9/16/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Meteorological Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset 2324	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 001	2324	II	8/19/2018	8/19/2017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Emissions Table

Date: 17-Oct-17 **Company:** Harman International **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 42% **Pressure:** 1010mbar
Frequency Range: 26.5-40GHz **Measurement Distance:** 0.1 m
Notes: No emissions Found **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
o Emissions Found									---	---	---	---	---	---

Table Result: Pass by N/A dB ***Worst Freq:*** N/A MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2323 **Cable 2:** Asset #2324 **Cable 3:** ---
Analyzer: Gold **Preamp:** 40GHz Mixer **Antenna:** 40GHz Mixer **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.195
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Rev. 10/18/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	2/28/2018	2/28/2017

Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016

Mixers/Diplexers	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Mixer / Horn	26.5-40 GHz	11970A	Agilent	3003A10230	2154	I	3/12/2019	3/12/2016

Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2084		HTC-1	HDE		2084	II	3/23/2018	3/23/2017

Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset 2323	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 002	2323	II	8/19/2018	8/19/2017
Asset 2324	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 001	2324	II	8/19/2018	8/19/2017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Radiated Band Edge

Radiated Emissions Table

Date: 30-Sep-17 **Company:** Harman International **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.1°C **Humidity:** 47% **Pressure:** 1009mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11ac 80MHz MCS 1 UNII1 **EUT Max Freq:**
Power set to 53

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
Low band				---	---	---	---	---	---	---	---	---	---	---
V Max	5192.2	58.7		0.0	33.7	5.0			74.0			54.0		
V	5150.0	23.4	15.1	0.0	33.7	5.1	62.2	53.9	74.0	-11.8	Pass	54.0	-0.1	Pass
V	5143.6	25.6	14.8	0.0	33.6	5.1	64.3	53.5	74.0	-9.7	Pass	54.0	-0.5	Pass
V	5134.8	24.6	13.8	0.0	33.6	5.1	63.3	52.5	74.0	-10.7	Pass	54.0	-1.5	Pass
V	5128.4	24.6	13.0	0.0	33.6	5.1	63.3	51.7	74.0	-10.7	Pass	54.0	-2.3	Pass
V	5125.7	24.5	12.8	0.0	33.6	5.1	63.2	51.5	74.0	-10.8	Pass	54.0	-2.5	Pass
High Band				---	---	---	---	---	---	---	---	---	---	---
V Max	5192.2	58.7		0.0	33.7	5.0			74.0			54.0		
V	5350.0	13.0	9.4	0.0	34.0	5.4	52.4	48.8	74.0	-21.6	Pass	54.0	-5.2	Pass
V	5403.6	18.5	9.2	0.0	34.0	5.5	58.0	48.7	74.0	-16.0	Pass	54.0	-5.3	Pass

Table Result: Pass by -0.1 dB ***Worst Freq:*** 5150.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: 1170725 **Preamp:** none **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.190

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 30-Sep-17 **Company:** Harman International **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.1°C **Humidity:** 47% **Pressure:** 1009mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11ac 80MHz MCS 1 UNII3 **EUT Max Freq:**
Power set to 53

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
Low Band														
V Max	5748.0	53.7		0.0	33.8	5.6			74.0			54.0		
H Max	5748.0	50.2		0.0	33.8	5.6			74.0			54.0		
V	5725.0	19.5	12.0	0.0	33.8	5.6	58.9	51.4	74.0	-15.1	Pass	54.0	-2.6	Pass
V	5718.5	23.4	11.7	0.0	33.8	5.6	62.8	51.1	74.0	-11.2	Pass	54.0	-2.9	Pass
High Band				---	---	---	---	---	---	---	---	---	---	---
V Max	5748.0	53.7		0.0	33.8	5.6			74.0			54.0		
H Max	5748.0	50.2		0.0	33.8	5.6			74.0			54.0		
V	5850.0	15.8	9.9	0.0	33.9	5.7	55.4	49.5	74.0	-18.6	Pass	54.0	-4.5	Pass
V	5860.1	20.0	9.1	0.0	33.9	5.7	59.6	48.7	74.0	-14.4	Pass	54.0	-5.3	Pass

Table Result: Pass by -2.6 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** none **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.190

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 02-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 34% **Pressure:** 1017mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11ac 40MHz UNII 1 Power set to 58 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11ac40 Low pwr 58														
V Max	5185.1	64.0												
H Max	5185.1	58.2												
V	5150.0	24.9	13.6	0.0	33.7	5.1	63.7	53.5	74.0	-10.3	Pass	54.0	-0.5	Pass
V	5145.7	31.1	12.5	0.0	33.6	5.1	69.8	52.3	74.0	-4.2	Pass	54.0	-1.7	Pass
V	5148.5	30.2	13.0	0.0	33.6	5.1	68.9	52.8	74.0	-5.1	Pass	54.0	-1.2	Pass
V	5145.0	29.4	12.1	0.0	33.6	5.1	68.1	51.9	74.0	-5.9	Pass	54.0	-2.1	Pass
V	5143.5	27.8	11.7	0.0	33.6	5.1	66.5	51.5	74.0	-7.5	Pass	54.0	-2.5	Pass
802.11ac40 High pwr 58														
V Max	5233.0	63												
H Max	5226.9	56.8												
V	5350.0	15.1	6.7	0.0	34.0	5.4	54.5	47.2	74.0	-19.5	Pass	54.0	-6.8	Pass
V	5398.5	18.0	6.7	0.0	34.0	5.5	57.5	47.3	74.0	-16.5	Pass	54.0	-6.7	Pass

Table Result: Pass by -0.5 dB ***Worst Freq:*** 5150.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 02-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 34% **Pressure:** 1017mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11ac 40MHz Unii3 Power set to 51 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
802.11ac40 Low PWR 50														
V max	5742.9	60												
H max	5765.1	57.1												
V	5725.0	25.6	13.1	0.0	33.8	5.6	65.0	53.1	74.0	-9.0	Pass	54.0	-0.9	Pass
V	5720.3	27.6	12.1	0.0	33.8	5.6	67.0	52.1	74.0	-7.0	Pass	54.0	-1.9	Pass
V	5724.2	27.1	13.0	0.0	33.8	5.6	66.5	53.0	74.0	-7.5	Pass	54.0	-1.0	Pass
V	5718.1	27.0	11.4	0.0	33.8	5.6	66.4	51.4	74.0	-7.6	Pass	54.0	-2.6	Pass
V	5709.2	26.0	8.6	0.0	33.8	5.6	65.4	48.6	74.0	-8.6	Pass	54.0	-5.4	Pass
802.11ac 40 High														
V max	5798.8	59												
H max	5780.6	56.7												
V	5850.0	15.1	6.9	0.0	33.9	5.7	54.7	47.1	74.0	-19.3	Pass	54.0	-6.9	Pass
V	5876.7	18.4	6.7	0.0	33.9	5.7	58.0	46.9	74.0	-16.0	Pass	54.0	-7.1	Pass

Table Result: Pass by -0.9 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 02-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 34% **Pressure:** 1017mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11n40 unii3 Power set to 48 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
802.11n40 Low PWR 48														
V Max	5746.9	53.7												
H Max	5758.3	51.1												
V	5725.0	22.3	11.3	0.0	33.8	5.6	61.7	51.3	74.0	-12.3	Pass	54.0	-2.7	Pass
V	5722.1	26.2	10.7	0.0	33.8	5.6	65.6	50.7	74.0	-8.4	Pass	54.0	-3.3	Pass
V	5717.2	25.6	9.6	0.0	33.8	5.6	65.0	49.6	74.0	-9.0	Pass	54.0	-4.4	Pass
V	5724.4	25.6	11.3	0.0	33.8	5.6	65.0	51.3	74.0	-9.0	Pass	54.0	-2.7	Pass
V	5720.1	24.5	10.4	0.0	33.8	5.6	63.9	50.4	74.0	-10.1	Pass	54.0	-3.6	Pass
802.11n40 High PWR 48														
V Max	5792.3	56.8												
H Max	5801.1	55.3												
V	5850.0	14.6	7.1	0.0	33.9	5.7	54.2	47.3	74.0	-19.8	Pass	54.0	-6.7	Pass
V	8566.0	18.6	7.3	0.0	37.5	6.0	62.1	51.4	74.0	-11.9	Pass	54.0	-2.6	Pass

Table Result: Pass by -2.7 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 02-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 34% **Pressure:** 1017mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11n40 unii1 Power set to 57 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
802.11n40 Low PWR 57														
V Max	5185.4	62.5												
H Max	5185.7	57.2												
V	5150.0	32.0	13.8	0.0	33.7	5.1	70.8	53.7	74.0	-3.2	Pass	54.0	-0.3	Pass
V	5145.7	27.34	12.5	0.0	33.6	5.1	66.0	52.3	74.0	-8.0	Pass	54.0	-1.7	Pass
V	5141.7	30.3	11.0	0.0	33.6	5.1	69.0	50.8	74.0	-5.0	Pass	54.0	-3.2	Pass
V	5147.7	29.9	13.1	0.0	33.6	5.1	68.6	52.9	74.0	-5.4	Pass	54.0	-1.1	Pass
802.11n40 High PWR 57														
V Max	5221.9	62.8												
H Max	5224.1	60.4												
V	5350.0	14.7	6.8	0.0	34.0	5.4	54.1	47.3	74.0	-19.9	Pass	54.0	-6.7	Pass
V	5425.2	17.5	6.7	0.0	34.0	5.5	57.0	47.3	74.0	-17.0	Pass	54.0	-6.7	Pass

Table Result: Pass by -0.3 dB ***Worst Freq:*** 5150.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 03-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 38% **Pressure:** 1026mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11n 20MHz UNII 1 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
unii1				---	---	---	---	---	---	---	---	---	---	---
802.11n 20				---	---	---	---	---	---	---	---	---	---	---
Low				---	---	---	---	---	---	---	---	---	---	---
V Max	5177.3	68.6		0.0	33.7	5.1	---	---	74.0	---	---	54.0	---	---
H Max	5177.9	59.1		0.0	33.7	5.0	---	---	74.0	---	---	54.0	---	---
V	5150.0	24.5	14.9	0.0	33.7	5.1	63.3	53.7	74.0	-10.7	Pass	54.0	-0.3	Pass
V	5148.8	25.9	14.6	0.0	33.6	5.1	64.6	53.3	74.0	-9.4	Pass	54.0	-0.7	Pass
V	5060.9	24.9	12.6	0.0	33.4	5.1	63.4	51.1	74.0	-10.6	Pass	54.0	-2.9	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V max	5146.5	68.6		0.0	33.6	5.1	---	---	74.0	---	---	54.0	---	---
H Max	5237.7	60.5		0.0	33.8	5.1	---	---	74.0	---	---	54.0	---	---
V	5350.0	21.0	12.5	0.0	34.0	5.4	60.4	51.9	74.0	-13.6	Pass	54.0	-2.1	Pass
V	5356.2	23.8	12.5	0.0	34.0	5.4	63.2	51.9	74.0	-10.8	Pass	54.0	-2.1	Pass

Table Result: Pass by -0.3 dB ***Worst Freq:*** 5150.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 03-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 38% **Pressure:** 1026mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11n 20MHz UNII 3 Power Set to 50 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
pwr = 50				---	---	---	---	---	---	---	---	---	---	---
V Max	5749.6	64.4		0.0	33.8	5.6	---	---	74.0	---	---	54.0	---	---
H Max	5749.9	60.0		0.0	33.8	5.6	---	---	74.0	---	---	54.0	---	---
V	5725.0	27.7	13.9	0.0	33.8	5.6	67.1	53.3	74.0	-6.9	Pass	54.0	-0.7	Pass
V	5723.3	27.1	12.2	0.0	33.8	5.6	66.5	51.6	74.0	-7.5	Pass	54.0	-2.4	Pass
				---	---	---	---	---	---	---	---	---	---	---
High pwr = 50				---	---	---	---	---	---	---	---	---	---	---
V Max	5829.8	63.8		0.0	33.9	5.7	---	---	74.0	---	---	54.0	---	---
H Max	5827.9	57.1		0.0	33.9	5.7	---	---	74.0	---	---	54.0	---	---
V	5850.0	13.9	8.1	0.0	33.9	5.7	53.5	47.7	74.0	-20.5	Pass	54.0	-6.3	Pass
V	5862.6	19.0	7.5	0.0	33.9	5.7	58.6	47.1	74.0	-15.4	Pass	54.0	-6.9	Pass

Table Result: Pass by -0.7 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 03-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 38% **Pressure:** 1026mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11ac 20MHz UNII 1 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
unii 1				---	---	---	---	---	---	---	---	---	---	---
802.11ac 20				---	---	---	---	---	---	---	---	---	---	---
Low				---	---	---	---	---	---	---	---	---	---	---
V Max	5178.4	69.5		0.0	33.7	5.0	---	---	74.0	---	---	54.0	---	---
H Max	5181.8	60.7		0.0	33.7	5.0	---	---	74.0	---	---	54.0	---	---
V	5150.0	19.9	12.5	0.0	33.7	5.1	58.7	51.3	74.0	-15.3	Pass	54.0	-2.7	Pass
V	5149.7	25.0	12.6	0.0	33.7	5.1	63.8	51.4	74.0	-10.2	Pass	54.0	-2.6	Pass
V	5092.1	20.9	10.5	0.0	33.5	5.1	59.5	49.1	74.0	-14.5	Pass	54.0	-4.9	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V max	5237.7	69.2		0.0	33.8	5.1	---	---	74.0	---	---	54.0	---	---
H max	5238.4	61.4		0.0	33.8	5.1	---	---	74.0	---	---	54.0	---	---
V	5350.0	13.2	7.0	0.0	34.0	5.4	52.6	46.4	74.0	-21.4	Pass	54.0	-7.6	Pass
V	5357.3	17.9	7.1	0.0	34.0	5.4	57.3	46.5	74.0	-16.7	Pass	54.0	-7.5	Pass
V	5428.1	18.1	6.5	0.0	34.0	5.5	57.6	46.0	74.0	-16.4	Pass	54.0	-8.0	Pass

Table Result: Pass by -2.7 dB ***Worst Freq:*** 5150.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 03-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.2°C **Humidity:** 38% **Pressure:** 1026mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11ac 20MHz UNII 3 **EUT Max Freq:**
Power Set t0 50

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
V Max	5724.3	63.9		0.0	33.8	5.6	---	---	74.0	---	---	54.0	---	---
H Max	5750.4	57.4'		0.0	33.8	5.6	---	---	74.0	---	---	54.0	---	---
V	5725.0	27.6	14.3	0.0	33.8	5.6	67.0	53.7	74.0	-7.0	Pass	54.0	-0.3	Pass
V	5723.6	30.1	11.9	0.0	33.8	5.6	69.5	51.3	74.0	-4.5	Pass	54.0	-2.7	Pass
V	5722.6	28.2	11.9	0.0	33.8	5.6	67.6	51.3	74.0	-6.4	Pass	54.0	-2.7	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V max	5823.2	62.6		0.0	33.8	5.7	---	---	74.0	---	---	54.0	---	---
H Max	5832.4	61.1		0.0	33.9	5.7	---	---	74.0	---	---	54.0	---	---
V	5850.0	21.8	8.2	0.0	33.9	5.7	61.4	47.8	74.0	-12.6	Pass	54.0	-6.2	Pass
V	5899.9	18.5	9.0	0.0	34.0	5.7	58.2	48.7	74.0	-15.8	Pass	54.0	-5.3	Pass

Table Result: Pass by -0.3 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 04-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 38% **Pressure:** 1026mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11a 20MHz UNII 1 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Unii 1				---	---	---	---	---	---	---	---	---	---	---
802.11a 20				---	---	---	---	---	---	---	---	---	---	---
Low				---	---	---	---	---	---	---	---	---	---	---
V max	5176.0	65.0		0.0	33.7	5.1	---	---	74.0	---	---	54.0	---	---
H max	5182.8	55.48		0.0	33.7	5.0	---	---	74.0	---	---	54.0	---	---
V	5150.0	15.4	7.7	0.0	33.7	5.1	54.2	46.5	74.0	-19.8	Pass	54.0	-7.5	Pass
V	5101.1	20.4	9.2	0.0	33.6	5.1	59.1	47.9	74.0	-14.9	Pass	54.0	-6.1	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V max	5235.6	64.4		0.0	33.8	5.1	---	---	74.0	---	---	54.0	---	---
H max	5233.8	55.1		0.0	33.8	5.1	---	---	74.0	---	---	54.0	---	---
V	5350.0	14.1	7.0	0.0	34.0	5.4	53.5	46.4	74.0	-20.5	Pass	54.0	-7.6	Pass
V	5359.1	17.5	7.0	0.0	34.0	5.4	56.9	46.4	74.0	-17.1	Pass	54.0	-7.6	Pass

Table Result: Pass by -6.1 dB ***Worst Freq:*** 5101.1 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Radiated Emissions Table

Date: 04-Oct-17 **Company:** Harman International Industries, Inc. **Work Order:** R2499
Engineer: Chris Hamel **EUT Desc:** G31 MID **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 38% **Pressure:** 1026mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 802.11a 20MHz UNII 3 **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Low				---	---	---	---	---	---	---	---	---	---	---
V max	5747.6	59.7		0.0	33.8	5.6	---	---	74.0	---	---	54.0	---	---
H max	5743.1	55.8		0.0	33.8	5.6	---	---	74.0	---	---	54.0	---	---
V	5725.0	14.1	7.0	0.0	33.8	5.6	53.5	46.4	74.0	-20.5	Pass	54.0	-7.6	Pass
V	5723.8	20.3	6.9	0.0	33.8	5.6	59.7	46.3	74.0	-14.3	Pass	54.0	-7.7	Pass
				---	---	---	---	---	---	---	---	---	---	---
unii3				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V max	5831.6	58.8		0.0	33.9	5.7	---	---	74.0	---	---	54.0	---	---
H max	5833.8	52.2		0.0	33.9	5.7	---	---	74.0	---	---	54.0	---	---
V	5850.0	13.0	7.0	0.0	33.9	5.7	52.6	46.6	74.0	-21.4	Pass	54.0	-7.4	Pass
V	5907.1	20.0	8.1	0.0	34.0	5.7	59.7	47.8	74.0	-14.3	Pass	54.0	-6.2	Pass

Table Result: Pass by -6.2 dB ***Worst Freq:*** 5907.1 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2052 **Cable 2:** Asset #2053 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Orange Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.191

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Rev. 10/22/2017

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017

Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Orange Horn	1-18GHz	3115	EMCO	0004-6123	390	I	10/13/2018
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019

Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018
TH A#2082		HTC-1	HDE		2082	II	3/23/2018

Cables	Range	Mfr	Cat	Calibration Due
Asset #2052	9kHz - 18GHz	Florida RF	II	3/5/2018
Asset #2053	9kHz - 18GHz	Florida RF	II	10/30/3017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

AC Line Conducted Emissions

LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

**EUT is powered by a vehicle battery only.

Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) NIST CISPR	 5.6dB 4.6dB	 N/A 5.2dB (Ucispr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions NIST CISPR	 3.9dB 3.6dB	 N/A 3.6dB (Ucispr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation: • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	 3.4% 0.3dB	 5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS** (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.
14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.
Rev.160009121(2)_#684340 v14CS

Appendix A:

CFR Title 47 FCC Part §15.407 and ISED Canada RSS-247 Issue 2

DUT Information

Model:	G31 MID
Manufacturer:	Harman International Industries, Inc
Serial Number:	047

U-NII-1

Mode	Channel	Frequency
802.11a 802.11n(HT20) 802.11ac(VHT20)	36	5180
802.11n(HT40) 802.11ac(VHT40)	38	5190
802.11a 802.11n(HT20) 802.11ac(VHT20)	40	5200
802.11ac(VHT80)	42	5210
802.11a 802.11n(HT20) 802.11ac(VHT20)	44	5220
802.11n(HT40) 802.11ac(VHT40)	46	5230
802.11a 802.11n(HT20) 802.11ac(VHT20)	48	5240

U-NII-3

Mode	Channel	Frequency
802.11a 802.11n(HT20) 802.11ac(VHT20)	149	5745
802.11n(HT40) 802.11ac(VHT40)	151	5755
802.11a 802.11n(HT20) 802.11ac(VHT20)	153	5765
802.11ac(VHT80)	155	5775
802.11a 802.11n(HT20) 802.11ac(VHT20)	157	5785
802.11n(HT40) 802.11ac(VHT40)	159	5795
802.11a 802.11n(HT20) 802.11ac(VHT20)	161	5805
802.11a 802.11n(HT20) 802.11ac(VHT20)	165	5825

Antenna Gain:

Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
5000	-5.17	30.40	2.38
5100	-4.64	34.38	1.53
5200	-5.31	29.44	1.20
5300	-4.23	37.74	3.20
5400	-4.53	35.27	2.78
5500	-6.30	23.46	0.01
5600	-5.00	31.62	2.00
5700	-4.98	31.75	1.19
5800	-4.78	33.30	1.35
5900	-4.66	34.21	0.55
6000	-4.61	34.56	1.57

Number of transmission chains 1
Equipment Type Unlicensed National Information Infrastructure Device (NII)

Test Equipment Used: R&S TS8997 Test System

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
FSV40 Signal Generator	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/30/2018	6/30/2017
Signal Generators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
SMBV100A Vector Signal Generator	9KHz-6GHz	SMBV100A	ROHDE & SCHWARZ	261919	2201	I	6/26/2018	6/26/2017
SMB100A Signal Generator	100kHz-40GHz	SMB100A	ROHDE & SCHWARZ	179846	2434	I	5/30/2018	5/30/2017
R&S®OSP120 with R&S®OSP-B157	30MHz-18GHz	OSP120	ROHDE & SCHWARZ	101674		I	6/1/2018	6/1/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2052	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
DUT1	30MHz-26GHz		Micro-Coax			II	6/21/2018	6/21/2017
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
10dB Attenuator-01 Brown	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017
10dB Attenuator-02 Yellow	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017
Wideband Radio Communication Tester	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
(Rental)CMW500	DC to 6GHz	CMW500	ROHDE & SCHWARZ	155905		I	6/2/2018	6/2/2017

Test Results Summary

UNII-1 (5150MHz – 5250MHz)

Test	Frequency (MHz)	802.11a	802.11n(HT20)	802.11ac (VHT20)
Average Output Power	5180/5200/5240	PASS	PASS	PASS
Power Spectral Density	5180/5200/5240	PASS	PASS	PASS
DTS Bandwidth (6dB)	5180/5200/5240	PASS	PASS	PASS
Occupied Channel Bandwidth 99%	5180/5200/5240	PASS	PASS	PASS
		802.11n(HT40)	802.11ac(VHT40)	
Average Output Power	5190/5230	PASS	PASS	
Power Spectral Density	5190/5230	PASS	PASS	
DTS Bandwidth (6dB)	5190/5230	PASS	PASS	
Occupied Channel Bandwidth 99%	5190/5230	PASS	PASS	
		802.11ac(VHT80)		
Average Output Power	5210	PASS		
Power Spectral Density	5210	PASS		
DTS Bandwidth (6dB)	5210	PASS		
Occupied Channel Bandwidth 99%	5210	PASS		

UNII-3 (5725MHz – 5850MHz)

Test	Frequency (MHz)	802.11a	802.11n(HT20)	802.11ac (VHT20)
Average Output Power	5745/5785/5825	PASS	PASS	PASS
Power Spectral Density	5745/5785/5825	PASS	PASS	PASS
DTS Bandwidth (6dB)	5745/5785/5825	PASS	PASS	PASS
Occupied Channel Bandwidth 99%	5745/5785/5825	PASS	PASS	PASS
		802.11n(HT40)	802.11ac(VHT40)	
Average Output Power	5755/5795	PASS	PASS	
Peak Power Spectral Density	5755/5795	PASS	PASS	
DTS Bandwidth (6dB)	5755/5795	PASS	PASS	
Occupied Channel Bandwidth 99%	5755/5795	PASS	PASS	
		802.11ac(VHT80)		
Average Output Power	5775	PASS		
Peak Power Spectral Density	5775	PASS		
DTS Bandwidth (6dB)	5775	PASS		
Occupied Channel Bandwidth 99%	5775	PASS		

Average Output Power (Gated)

Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.E.3.b.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

FCC U-NII-1

Limit is 250mW (23.97dBm) for client devices with antenna gains less than 6dBi.

802.11a (Power Setting: Default)

Data Rate	Gated RMS (dBm) 5180 MHz	Gated RMS (dBm) 5200 MHz	Gated RMS (dBm) 5240 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	11.897	12.012	11.579	23.97	90.530
9 Mbps	11.892	11.94	11.602	23.97	90.525
12 Mbps	11.838	11.989	11.516	23.97	87.807
18 Mbps	11.894	11.934	11.579	23.97	83.056
24 Mbps	10.258	10.392	9.972	23.97	78.765
36 Mbps	9.298	9.395	8.995	23.97	71.915
48 Mbps	9.248	9.319	8.976	23.97	66.134
54 Mbps	9.22	9.279	8.8	23.97	64.261

802.11n(HT20) (Power Setting: Default)

Data Rate	Gated RMS (dBm) 5180 MHz	Gated RMS (dBm) 5200 MHz	Gated RMS (dBm) 5240 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	12.026	11.965	11.581	23.97	93.017
MCS1	11.858	11.913	11.571	23.97	87.290
MCS2	11.799	11.87	11.56	23.97	82.494
MCS3	10.294	10.41	9.942	23.97	78.382
MCS4	9.184	9.337	9.015	23.97	71.899
MCS5	9.264	9.25	8.85	23.97	66.650
MCS6	9.246	9.261	8.87	23.97	64.800
MCS7	9.313	9.289	8.879	23.97	62.682

802.11ac(VHT20) (Power Setting: Default)

Data Rate	Gated RMS (dBm) 5180 MHz	Gated RMS (dBm) 5200 MHz	Gated RMS (dBm) 5240 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.8	11.949	11.5531	23.97	93.047
MCS1	11.857	11.976	11.541	23.97	87.333
MCS2	11.816	11.926	11.491	23.97	82.590
MCS3	10.351	10.338	9.935	23.97	78.599
MCS4	9.712	9.327	8.987	23.97	72.163
MCS5	9.258	9.245	8.838	23.97	66.975
MCS6	9.312	9.289	8.874	23.97	65.232
MCS7	9.32	9.297	8.891	23.97	63.197
MCS8	7.452	7.575	7.187	23.97	60.298

802.11n(HT40) (Power Setting: 57)

Data Rate	Gated RMS (dBm) 5190 MHz	Gated RMS (dBm) 5230 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.474	11.383	23.97	86.885
MCS1	11.484	11.449	23.97	77.835
MCS2	11.285	11.299	23.97	71.251
MCS3	11.351	11.366	23.97	66.233
MCS4	11.437	11.46	23.97	59.078
MCS5	11.205	11.229	23.97	53.743
MCS6	11.338	11.326	23.97	51.957
MCS7	11.237	11.264	23.97	50.071

802.11ac(VHT40) (Power Setting: 58)

Data Rate	Gated RMS (dBm) 5190 MHz	Gated RMS (dBm) 5230 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	10.832	10.831	23.97	86.944
MCS1	10.867	10.87	23.97	78.018
MCS2	10.963	10.971	23.97	71.557
MCS3	10.997	11.02	23.97	66.700
MCS4	11.071	11.64	23.97	59.707
MCS5	11.134	11.168	23.97	54.562
MCS6	11.126	11.144	23.97	52.872
MCS7	11.139	11.154	23.97	51.052
MCS8	11.172	11.196	23.97	49.079
MCS9	11.186	11.216	23.97	46.906

802.11ac(VHT80) (Power Setting: 53)

Data Rate	Gated RMS (dBm) 5210 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.419	23.97	76.820
MCS1	11.538	23.97	65.392
MCS2	11.589	23.97	58.408
MCS3	11.64	23.97	54.501
MCS4	11.737	23.97	48.009
MCS5	11.798	23.97	45.077
MCS6	11.74	23.97	43.325
MCS7	11.781	23.97	42.016
MCS8	11.804	23.97	40.681
MCS9	11.824	23.97	39.195

RSS-247 U-NII-1

Per RSS-247 Issue 2 Section 6.2.1.1, limit for OEM devices installed in vehicles: Maximum EIRP shall not exceed 30mW or 1.76 + 10*log B, where B is 99% OBW in MHz
Devices must also be capable of reducing power by 3dB
For modulations with less than 20MHz 99% OBW; 802.11a, 802.11n(HT20) and 802.11ac(VHT20), worst case 99% OBW of 16MHz is assumed with resulting conservative limit of 13.8dBm.
For modulations with more than 20MHz 99% OBW; 802.11n(HT40), 802.11ac(VHT40) and 802.11ac(VHT80), the limit is 30mW (14.7dBm)

802.11a

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	11.911	1.266	13.18	13.8	8.332	3.579	Default	68
9 Mbps	11.88	1.266	13.15	13.8	8.326	3.554	Default	68
12 Mbps	11.844	1.266	13.11	13.8	8.38	3.464	Default	68
18 Mbps	10.295	1.266	11.56	13.8	6.904	3.391	64	74
24 Mbps	9.472	1.266	10.74	13.8	6.298	3.174	64	76
36 Mbps	9.556	1.266	10.82	13.8	6.368	3.188	64	76
48 Mbps	9.722	1.266	10.99	13.8	6.517	3.205	64	76
54 Mbps	8.129	1.266	9.40	13.8	4.827	3.302	64	82
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	11.913	1.2	13.11	13.8	8.615	3.298	Default	68
9 Mbps	11.9	1.2	13.10	13.8	8.631	3.269	Default	68
12 Mbps	11.954	1.2	13.15	13.8	8.68	3.274	Default	68
18 Mbps	10.592	1.2	11.79	13.8	7.211	3.381	64	74
24 Mbps	9.763	1.2	10.96	13.8	6.599	3.164	64	76
36 Mbps	9.87	1.2	11.07	13.8	6.691	3.179	64	76
48 Mbps	10.029	1.2	11.23	13.8	6.811	3.218	64	76
54 Mbps	8.426	1.2	9.63	13.8	5.122	3.304	64	82
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	11.581	2	13.58	13.8	8.474	3.107	Default	68
9 Mbps	11.576	2	13.58	13.8	8.478	3.098	Default	68
12 Mbps	11.514	2	13.51	13.8	8.447	3.067	Default	68
18 Mbps	10.445	2	12.45	13.8	7.03	3.415	64	74
24 Mbps	9.635	2	11.64	13.8	5.968	3.667	64	76
36 Mbps	9.712	2	11.71	13.8	6.059	3.653	64	76
48 Mbps	9.88	2	11.88	13.8	6.697	3.183	64	76
54 Mbps	8.29	2	10.29	13.8	4.98	3.31	64	82

802.11n(HT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	11.906	1.266	13.17	13.8	8.155	3.751	Default	70
MCS1	11.844	1.266	13.11	13.8	8.753	3.091	Default	70
MCS2	10.634	1.266	11.90	13.8	7.63	3.004	60	73
MCS3	10.707	1.266	11.97	13.8	7.511	3.196	60	73
MCS4	10.299	1.266	11.57	13.8	7.119	3.18	62	75
MCS5	9.981	1.266	11.25	13.8	6.805	3.176	64	76
MCS6	10.035	1.266	11.30	13.8	6.826	3.209	64	76
MCS7	9.548	1.266	10.81	13.8	6.334	3.214	66	78
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	12.309	1.2	13.51	13.8	8.432	3.877	Default	70
MCS1	11.959	1.2	13.16	13.8	8.943	3.016	Default	70
MCS2	10.923	1.2	12.12	13.8	7.787	3.136	60	73
MCS3	10.987	1.2	12.19	13.8	7.827	3.16	60	73
MCS4	10.555	1.2	11.76	13.8	7.432	3.123	62	75
MCS5	10.286	1.2	11.49	13.8	7.099	3.187	64	76
MCS6	10.322	1.2	11.52	13.8	7.127	3.195	64	76
MCS7	9.843	1.2	11.04	13.8	6.641	3.202	66	78
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	11.511	2	13.51	13.8	8.303	3.208	Default	70
MCS1	11.530	2	13.53	13.8	8.164	3.366	Default	70
MCS2	10.769	2	12.77	13.8	7.646	3.123	60	73
MCS3	10.833	2	12.83	13.8	7.673	3.16	60	73
MCS4	10.432	2	12.43	13.8	7.289	3.143	62	75
MCS5	10.144	2	12.14	13.8	6.979	3.165	64	76
MCS6	10.171	2	12.17	13.8	6.994	3.177	64	76
MCS7	9.712	2	11.71	13.8	6.507	3.205	66	78

802.11ac(VHT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	11.923	1.266	13.19	13.8	8.152	3.771	Default	70
MCS1	10.987	1.266	12.25	13.8	7.933	3.054	58	71
MCS2	11.070	1.266	12.34	13.8	8.012	3.058	58	71
MCS3	11.135	1.266	12.40	13.8	8.036	3.099	58	71
MCS4	10.795	1.266	12.06	13.8	7.767	3.028	58	72
MCS5	10.627	1.266	11.89	13.8	7.391	3.236	60	74
MCS6	9.819	1.266	11.09	13.8	6.604	3.215	61	77
MCS7	9.375	1.266	10.64	13.8	6.186	3.189	65	79
MCS8	9.403	1.266	10.67	13.8	6.189	3.214	67	79

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	11.971	1.2	13.17	13.8	8.455	3.516	Default	70
MCS1	11.269	1.2	12.47	13.8	8.236	3.033	58	71
MCS2	11.336	1.2	12.54	13.8	8.295	3.041	58	71
MCS3	11.400	1.2	12.60	13.8	8.349	3.051	58	71
MCS4	11.098	1.2	12.30	13.8	8.061	3.037	58	72
MCS5	10.917	1.2	12.12	13.8	7.685	3.232	60	74
MCS6	10.101	1.2	11.30	13.8	6.912	3.189	61	77
MCS7	9.655	1.2	10.86	13.8	6.49	3.165	65	79
MCS8	9.687	1.2	10.89	13.8	6.507	3.18	67	79

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	11.525	2	13.53	13.8	8.322	3.203	Default	70
MCS1	11.109	2	13.11	13.8	8.108	3.001	58	71
MCS2	11.181	2	13.18	13.8	8.162	3.019	58	71
MCS3	11.262	2	13.26	13.8	8.213	3.049	58	71
MCS4	10.943	2	12.94	13.8	7.94	3.003	58	72
MCS5	10.770	2	12.77	13.8	7.58	3.19	60	74
MCS6	9.947	2	11.95	13.8	6.801	3.146	61	77
MCS7	9.529	2	11.53	13.8	6.37	3.159	65	79
MCS8	9.538	2	11.54	13.8	6.396	3.142	67	79

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	12.309	1.233	13.54	14.7	9.204	3.105	Default	66
MCS1	12.388	1.233	13.62	14.7	9.321	3.067	Default	66
MCS2	11.969	1.233	13.20	14.7	8.805	3.164	54	68
MCS3	12.036	1.233	13.27	14.7	8.871	3.165	54	68
MCS4	12.153	1.233	13.39	14.7	8.435	3.718	56	70
MCS5	12.23	1.233	13.46	14.7	8.498	3.732	56	70
MCS6	11.379	1.233	12.61	14.7	8.253	3.126	58	71
MCS7	10.984	1.233	12.22	14.7	7.729	3.255	60	73
Data Rate	Gated RMS (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	12.055	1.8	13.86	14.7	9.021	3.034	Default	66
MCS1	11.962	1.8	13.76	14.7	8.931	3.031	Default	66
MCS2	11.994	1.8	13.79	14.7	8.833	3.161	54	68
MCS3	12.048	1.8	13.85	14.7	8.926	3.122	54	68
MCS4	11.859	1.8	13.66	14.7	8.48	3.379	56	70
MCS5	11.673	1.8	13.47	14.7	8.534	3.139	56	70
MCS6	11.414	1.8	13.21	14.7	8.272	3.142	58	71
MCS7	11.016	1.8	12.82	14.7	7.78	3.236	60	73

802.11ac(VHT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	12.33	1.233	13.56	14.7	8.883	3.447	Default	60
MCS1	12.382	1.233	13.62	14.7	8.891	3.491	Default	60
MCS2	12.235	1.233	13.47	14.7	8.872	3.363	Default	60
MCS3	10.49	1.233	11.72	14.7	7.419	3.071	Default	65
MCS4	9.455	1.233	10.69	14.7	6.288	3.167	Default	70
MCS5	9.316	1.233	10.55	14.7	6.304	3.012	Default	70
MCS6	9.366	1.233	10.60	14.7	5.568	3.798	Default	73
MCS7	9.401	1.233	10.63	14.7	5.580	3.821	Default	73
MCS8	7.316	1.233	8.55	14.7	3.699	3.617	Default	80
MCS9	8.351	1.233	9.58	14.7	5.148	3.203	Default	75
Data Rate	Gated RMS (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	12.07	1.8	13.87	14.7	8.694	3.376	Default	60
MCS1	12.153	1.8	13.95	14.7	8.674	3.479	Default	60
MCS2	11.979	1.8	13.78	14.7	8.648	3.331	Default	60
MCS3	10.26	1.8	12.06	14.7	7.129	3.131	Default	65
MCS4	9.292	1.8	11.09	14.7	6.200	3.092	Default	70
MCS5	9.047	1.8	10.85	14.7	6.014	3.033	Default	70
MCS6	9.075	1.8	10.88	14.7	5.609	3.466	Default	73
MCS7	9.091	1.8	10.89	14.7	5.629	3.462	Default	73
MCS8	7.162	1.8	8.96	14.7	3.724	3.438	Default	80
MCS9	7.159	1.8	8.96	14.7	4.108	3.051	Default	75

802.11ac(VHT80)

Data Rate	Gated RMS (dBm) 5210 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	11.809	1.4	13.21	14.7	8.694	3.115	Default	60
MCS1	11.917	1.4	13.32	14.7	8.702	3.215	Default	60
MCS2	11.804	1.4	13.20	14.7	8.092	3.712	Default	60
MCS3	10.203	1.4	11.60	14.7	6.893	3.31	Default	65
MCS4	9.136	1.4	10.54	14.7	5.661	3.475	Default	70
MCS5	9.39	1.4	10.79	14.7	5.692	3.698	Default	70
MCS6	9.222	1.4	10.62	14.7	5.716	3.506	Default	70
MCS7	9.245	1.4	10.65	14.7	5.736	3.509	Default	70
MCS8	7.128	1.4	8.53	14.7	3.562	3.566	Default	78
MCS9	7.1	1.4	8.50	14.7	3.588	3.512	Default	78

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802.11a (Power Setting: Default)

Data Rate	Gated RMS (dBm) 5745 MHz	Gated RMS (dBm) 5785 MHz	Gated RMS (dBm) 5825 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	12.465	12.622	12.853	30	93.435
9 Mbps	12.785	12.983	13.284	30	90.521
12 Mbps	12.594	12.889	13.126	30	87.816
18 Mbps	12.554	12.861	13.113	30	83.065
24 Mbps	11.174	11.631	11.663	30	78.777
36 Mbps	10.309	10.738	10.782	30	71.929
48 Mbps	10.447	10.752	10.922	30	66.162
54 Mbps	10.411	10.573	10.861	30	64.279

802.11n(HT20) (Power Setting: 50)

Data Rate	Gated RMS (dBm) 5745 MHz	Gated RMS (dBm) 5785 MHz	Gated RMS (dBm) 5825 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	12.745	12.716	12.745	30	93.023
MCS1	12.775	12.75	12.781	30	87.299
MCS2	12.839	12.807	12.845	30	82.504
MCS3	12.888	12.85	12.893	30	78.392
MCS4	12.99	12.949	12.963	30	71.916
MCS5	13.026	12.991	13.017	30	66.665
MCS6	13.059	13.019	13.037	30	64.820
MCS7	13.074	13.038	13.042	30	62.705

802.11ac(VHT20) (Power Setting: 50)

Data Rate	Gated RMS (dBm) 5745 MHz	Gated RMS (dBm) 5785 MHz	Gated RMS (dBm) 5825 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	12.85	13.269	13.353	30	93.047
MCS1	12.845	12.81	12.85	30	87.340
MCS2	12.916	12.883	12.921	30	82.6
MCS3	13.01	12.966	12.976	30	78.591
MCS4	13.06	13.018	13.06	30	72.186
MCS5	13.118	13.063	13.09	30	66.983
MCS6	13.149	13.104	13.126	30	65.262
MCS7	13.182	13.122	13.142	30	63.211
MCS8	13.228	13.156	13.169	30	60.339

802.11n(HT40) (Power Setting: 48)

Data Rate	Gated RMS (dBm) 5755 MHz	Gated RMS (dBm) 5795 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	12.695	12.524	30	86.895
MCS1	12.792	12.614	30	77.848
MCS2	12.853	12.666	30	71.267
MCS3	12.89	12.698	30	66.234
MCS4	12.951	12.771	30	59.095
MCS5	13.014	12.815	30	53.767
MCS6	13.419	13.251	30	51.995
MCS7	13.433	13.251	30	50.088

802.11ac(VHT40) (Power Setting: 51)

Data Rate	Gated RMS (dBm) 5755 MHz	Gated RMS (dBm) 5795 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	12.56	12.377	30	86.951
MCS1	12.634	12.433	30	78.029
MCS2	12.699	12.513	30	71.574
MCS3	12.774	12.555	30	66.715
MCS4	12.808	12.615	30	59.731
MCS5	12.845	12.654	30	54.589
MCS6	12.864	12.671	30	52.898
MCS7	12.892	12.703	30	51.065
MCS8	12.916	12.715	30	49.084
MCS9	13.21	12.806	30	46.947

802.11ac(VHT80) (Power Setting: 53)

Data Rate	Gated RMS (dBm) 5775 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.712	30	76.821
MCS1	11.805	30	65.285
MCS2	11.851	30	58.401
MCS3	11.901	30	53.818
MCS4	11.961	30	48.042
MCS5	12.002	30	44.592
MCS6	12.01	30	43.372
MCS7	12.038	30	42.046
MCS8	12.046	30	40.717
MCS9	13.396	30	40.716

Power Spectral Density

Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.F

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

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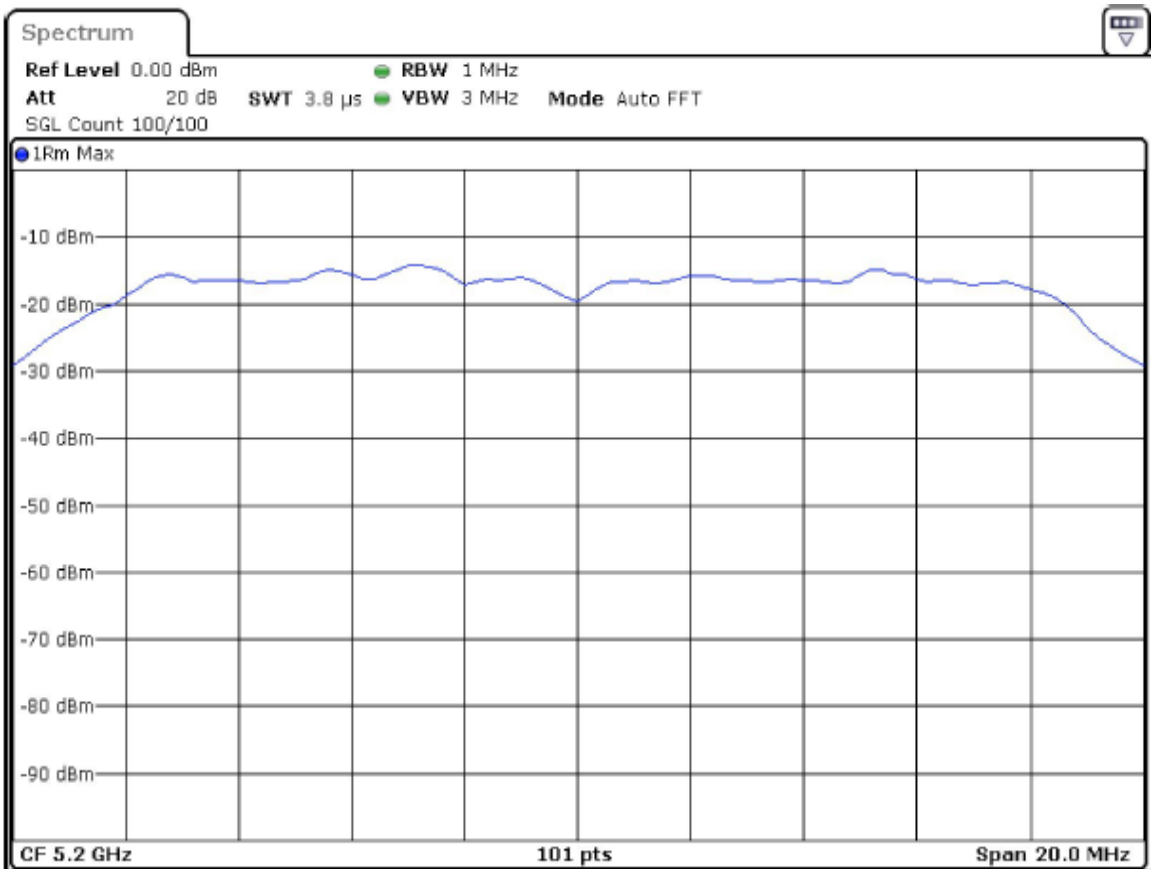
802.11a

Data Rate	PSD (dBm) 5180 MHz	PSD (dBm) 5200 MHz	PSD (dBm) 5240 MHz	Limit (dBm)
6 Mbps	8.398	8.270	7.572	11
9 Mbps	8.354	8.467	7.738	11
12 Mbps	7.967	7.599	8.423	11
18 Mbps	9.399	9.788	9.265	11
24 Mbps	8.038	7.928	7.533	11
36 Mbps	7.400	7.407	6.981	11
48 Mbps	6.981	7.589	7.343	11
54 Mbps	7.622	7.784	7.423	11

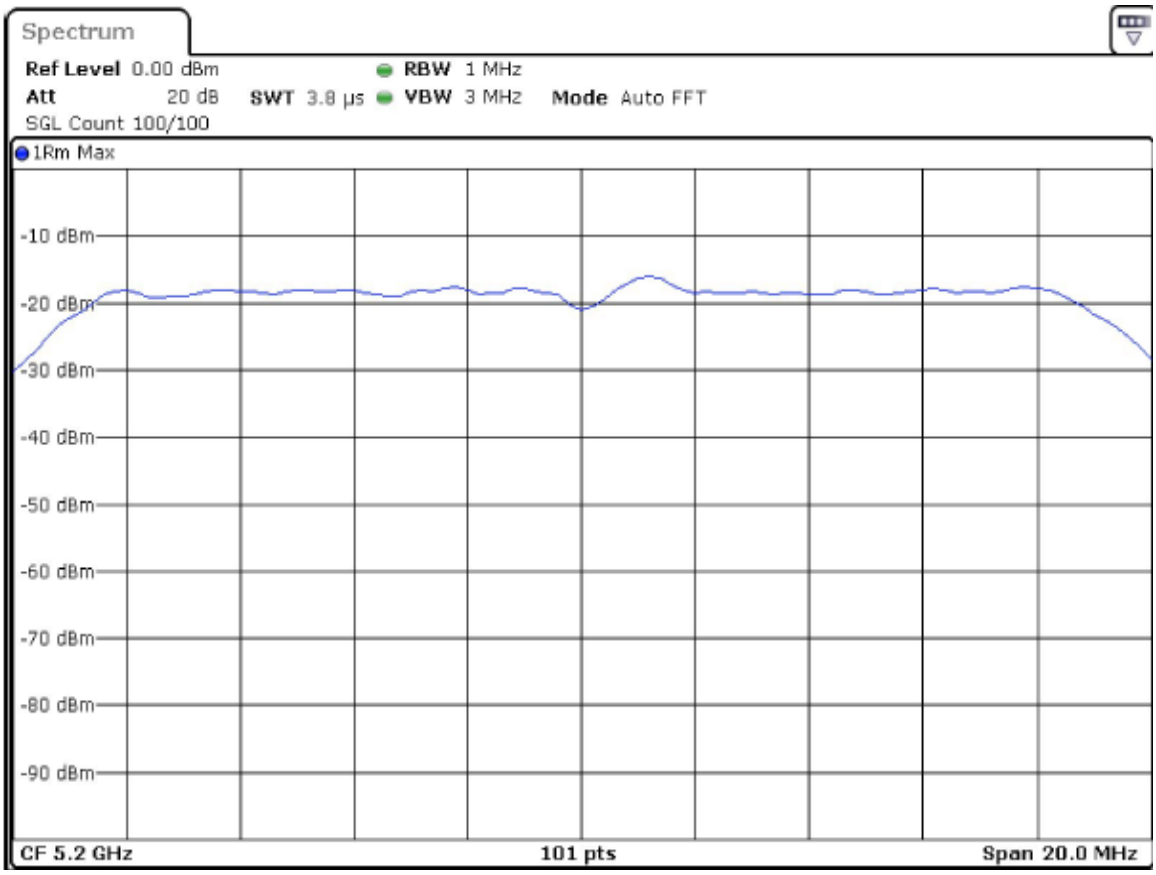
802.11a 18 Mbps 5200MHz



802.11n(HT20)

Data Rate	Peak PSD (dBm) 5180 MHz	Peak PSD (dBm) 5200 MHz	Peak PSD (dBm) 5240 MHz	Limit (dBm)
MCS0	7.605	7.653	7.428	11
MCS1	7.305	7.523	6.513	11
MCS2	7.461	7.583	8.535	11
MCS3	7.122	7.326	7.352	11
MCS4	6.348	6.734	6.338	11
MCS5	7.740	7.041	6.893	11
MCS6	6.802	8.997	6.332	11
MCS7	7.085	7.511	7.030	11

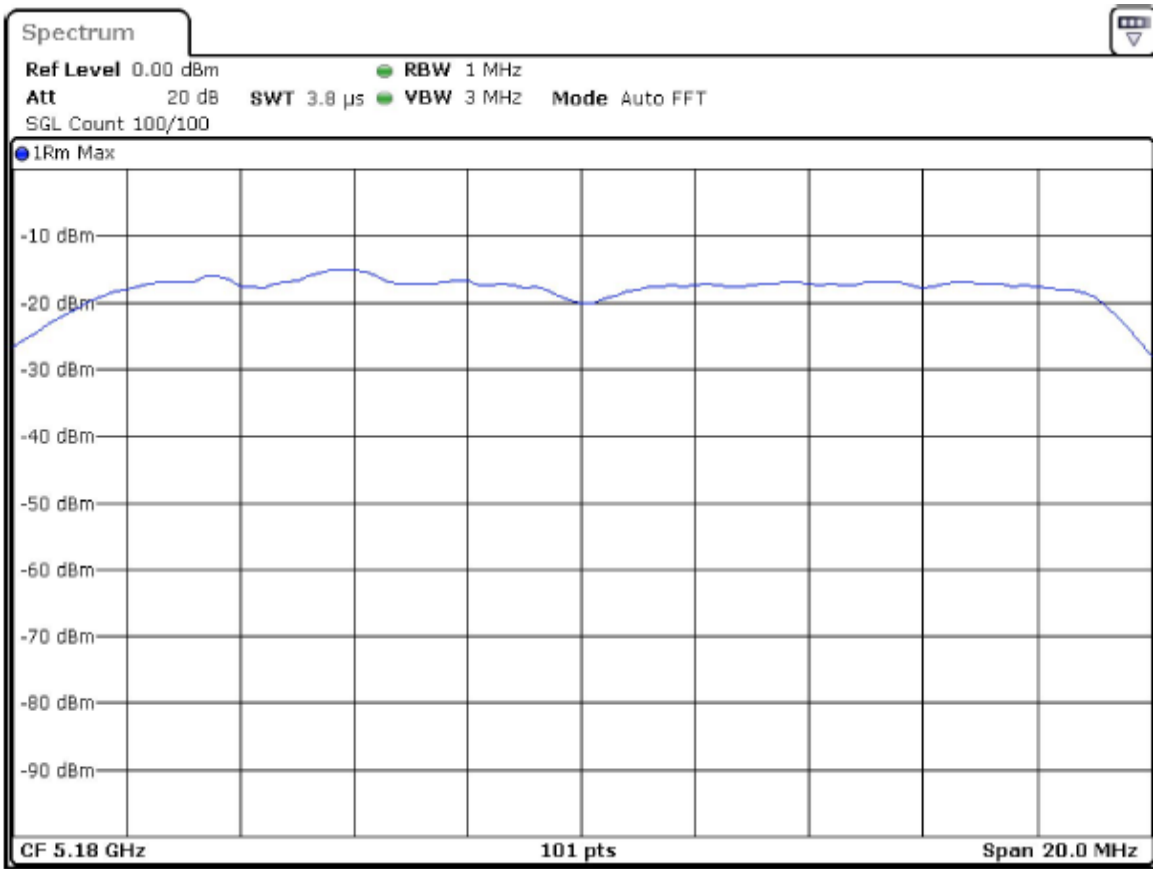
802.11n(HT20) MCS6 5200MHz



802.11ac(VHT20)

Data Rate	Peak PSD (dBm) 5180 MHz	Peak PSD (dBm) 5200 MHz	Peak PSD (dBm) 5240 MHz	Limit (dBm)
MCS0	7.626	7.688	7.589	11
MCS1	8.507	8.178	7.782	11
MCS2	8.894	8.261	7.570	11
MCS3	6.972	7.062	7.838	11
MCS4	6.198	7.525	6.528	11
MCS5	8.372	6.429	6.349	11
MCS6	7.028	7.024	7.8	11
MCS7	7.188	6.897	6.796	11
MCS8	5.480	5.397	5.956	11
MCS9	3.965	4.453	0.7	11

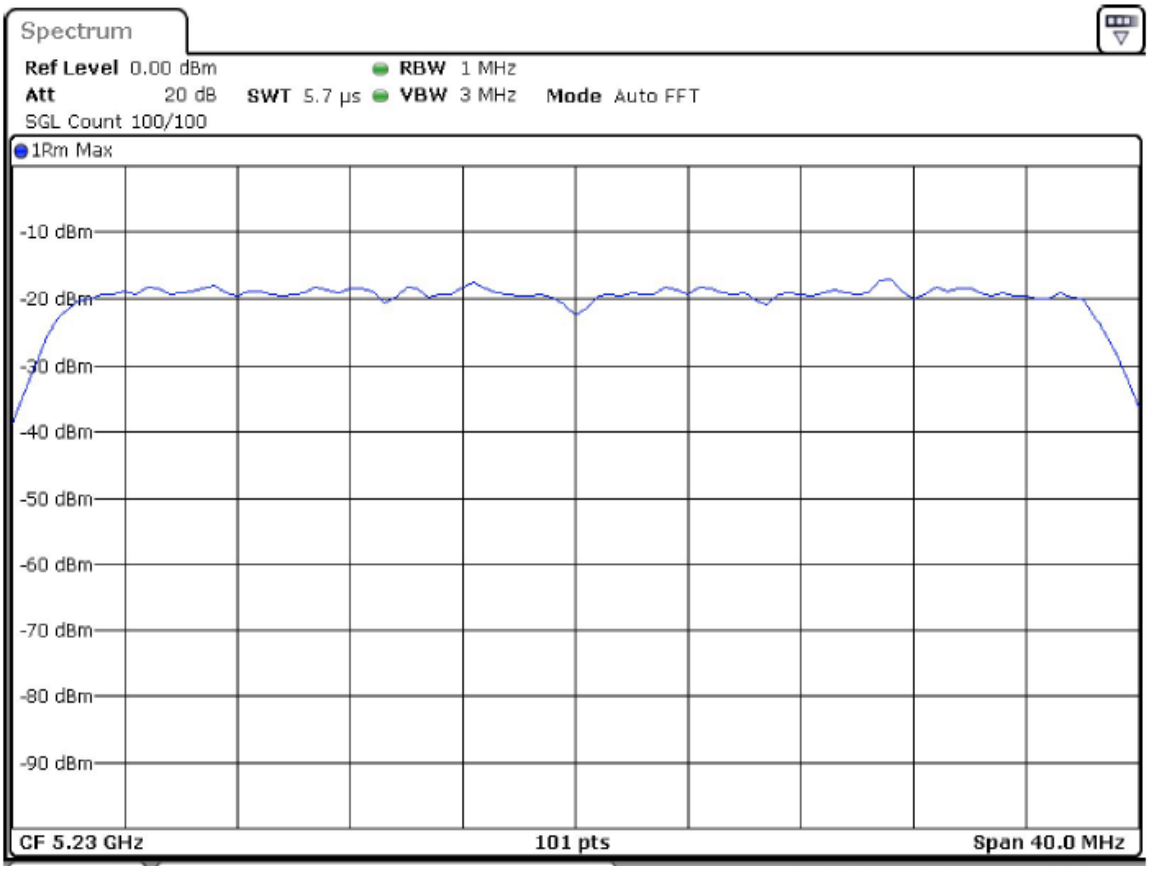
802.11ac(VHT20) MCS2 5180MHz



802.11n(HT40)

Data Rate	Peak PSD (dBm) 5190 MHz	Peak PSD (dBm) 5230 MHz	Limit (dBm)
MCS0	5.759	5.374	11
MCS1	6.528	6.707	11
MCS2	6.686	7.469	11
MCS3	6.074	5.705	11
MCS4	5.525	4.996	11
MCS5	6.915	6.306	11
MCS6	6.137	5.807	11
MCS7	6.704	5.535	11

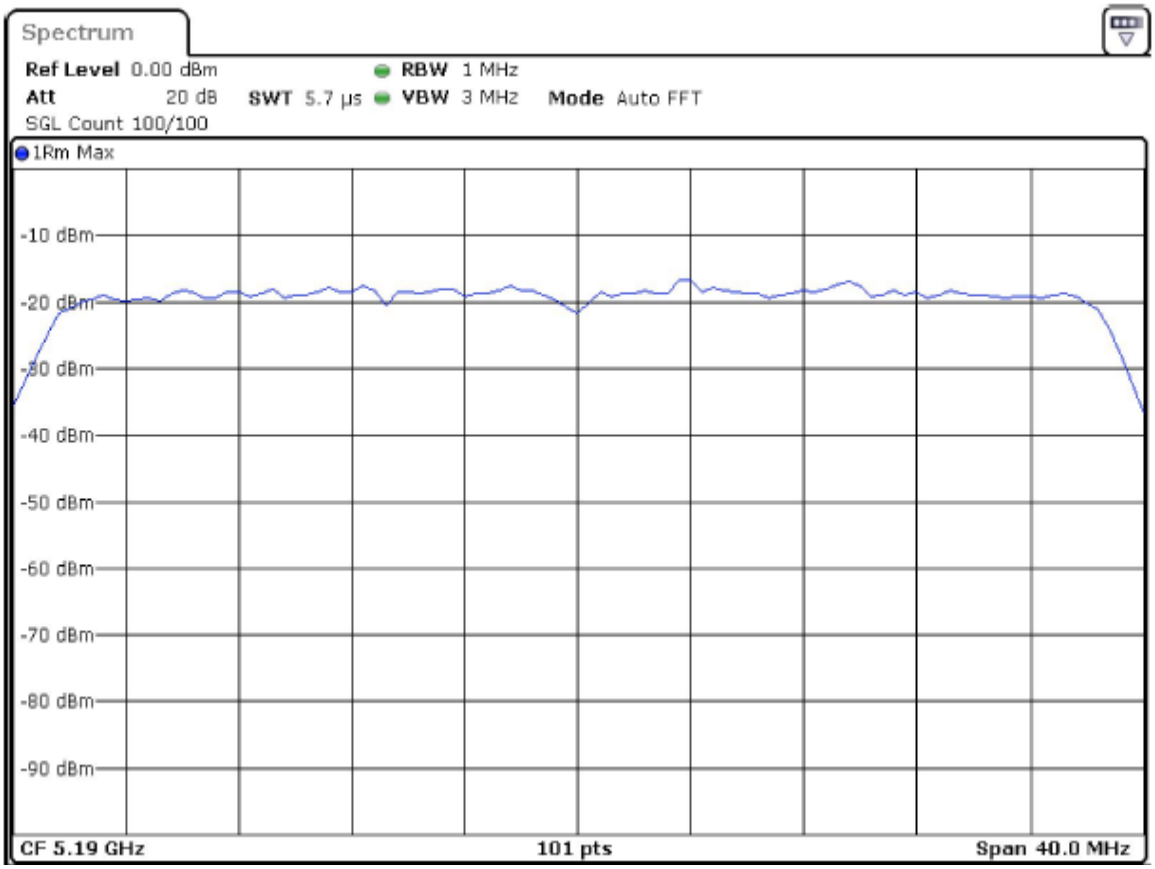
802.11n(HT40) MCS2 5230MHz



802.11ac(VHT40)

Data Rate	Peak PSD (dBm) 5190 MHz	Peak PSD (dBm) 5230 MHz	Limit (dBm)
MCS0	5.901	5.674	11
MCS1	7.484	7.343	11
MCS2	6.753	6.231	11
MCS3	7.034	5.836	11
MCS4	5.350	4.893	11
MCS5	5.906	5.296	11
MCS6	6.258	5.540	11
MCS7	5.883	6.640	11
MCS8	4.239	4.510	11
MCS9	4.660	3.892	11

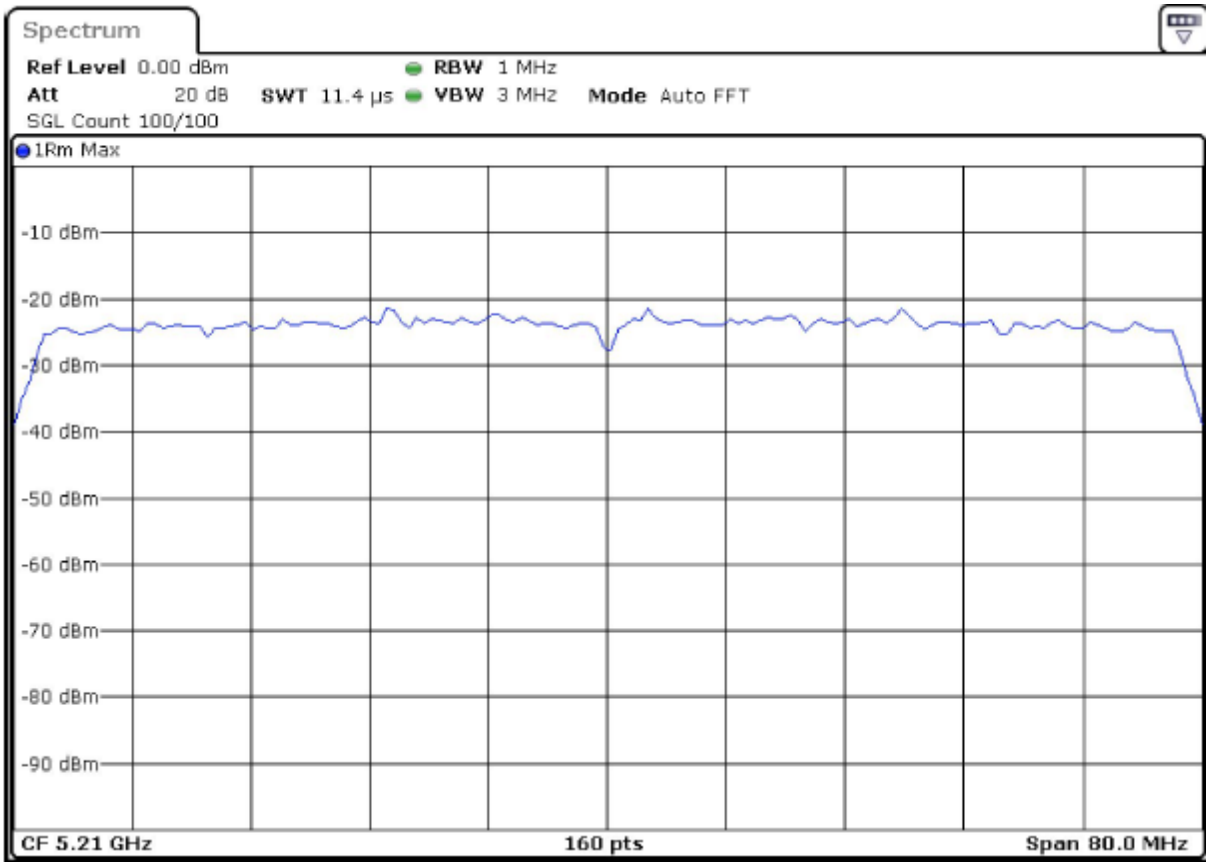
802.11ac(VHT40) MCS1 5190MHz



802.11ac(VHT80)

Data Rate	Peak PSD (dBm) 5210 MHz	Limit (dBm)
MCS0	0.207	11
MCS1	1.162	11
MCS2	2.312	11
MCS3	4.382	11
MCS4	2.798	11
MCS5	3.207	11
MCS6	3.338	11
MCS7	3.617	11
MCS8	1.707	11
MCS9	1.772	11

802.11ac(VHT80) MCS3 5210MHz



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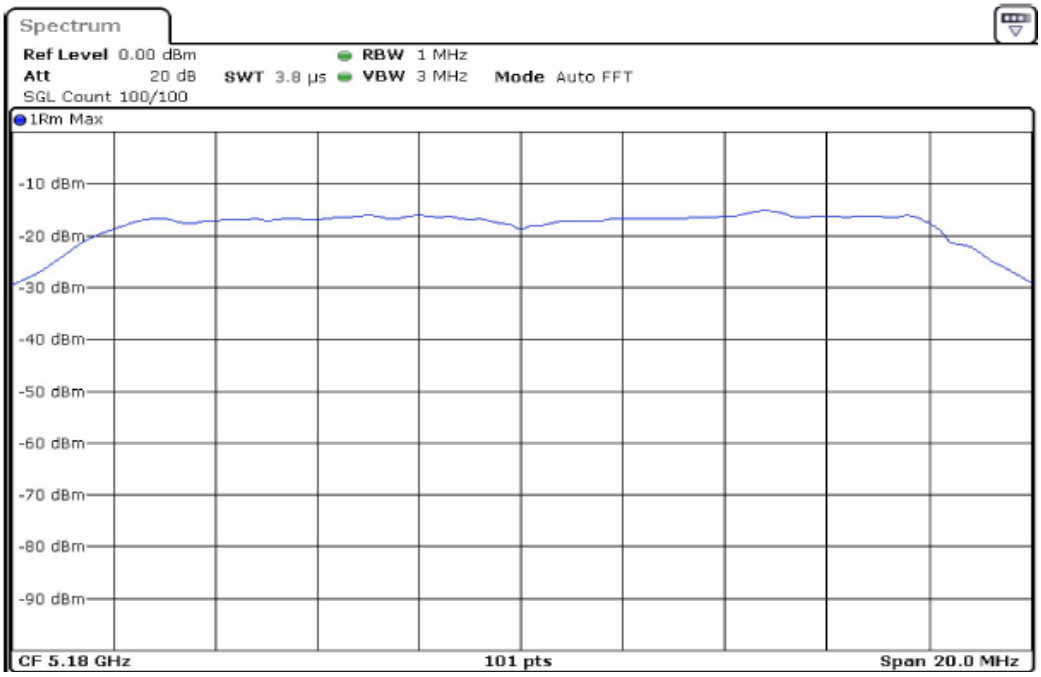
802.11a

Data Rate	PSD (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5180 MHz	Limit (dBm)
6 Mbps	8.397	1.266	9.663	10
9 Mbps	8.462	1.266	9.728	10
12 Mbps	8.657	1.266	9.923	10
18 Mbps	8.176	1.266	9.442	10
24 Mbps	6.493	1.266	7.759	10
36 Mbps	7.682	1.266	8.948	10
48 Mbps	7.948	1.266	9.214	10
54 Mbps	6.561	1.266	7.827	10

Data Rate	PSD (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5200 MHz	Limit (dBm)
6 Mbps	8.046	1.2	9.246	10
9 Mbps	8.211	1.2	9.411	10
12 Mbps	8.277	1.2	9.477	10
18 Mbps	8.142	1.2	9.342	10
24 Mbps	7.327	1.2	8.527	10
36 Mbps	7.9	1.2	9.1	10
48 Mbps	8.16	1.2	9.36	10
54 Mbps	7.12	1.2	8.32	10

Data Rate	PSD (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5240 MHz	Limit (dBm)
6 Mbps	7.852	2	9.852	10
9 Mbps	7.727	2	9.727	10
12 Mbps	7.778	2	9.778	10
18 Mbps	7.204	2	9.204	10
24 Mbps	7.108	2	9.108	10
36 Mbps	7.748	2	9.748	10
48 Mbps	7.898	2	9.898	10
54 Mbps	6.717	2	8.717	10

802.11a 12 Mbps 5180MHz



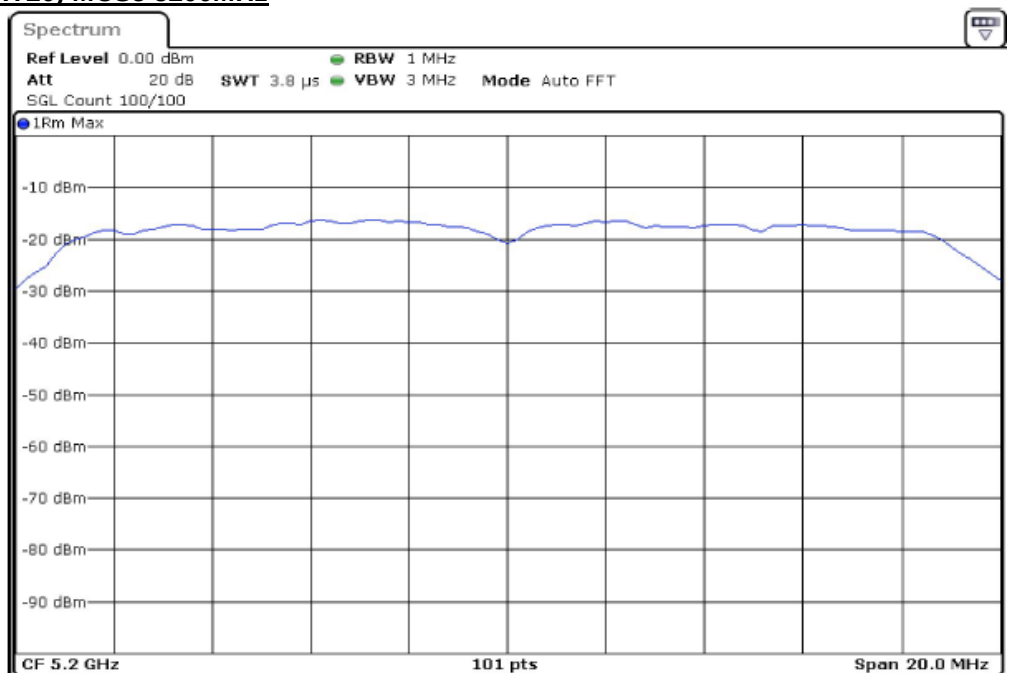
802.11n(HT20)

Data Rate	PSD (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5180 MHz	Limit (dBm)
MCS0	7.635	1.266	8.901	10
MCS1	8.174	1.266	9.44	10
MCS2	6.892	1.266	8.158	10
MCS3	7.439	1.266	8.705	10
MCS4	7.735	1.266	9.001	10
MCS5	8.308	1.266	9.574	10
MCS6	7.881	1.266	9.147	10
MCS7	8.24	1.266	9.506	10

Data Rate	PSD (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5200 MHz	Limit (dBm)
MCS0	7.934	1.2	9.134	10
MCS1	8.557	1.2	9.757	10
MCS2	7.567	1.2	8.767	10
MCS3	8.032	1.2	9.232	10
MCS4	7.892	1.2	9.092	10
MCS5	8.624	1.2	9.824	10
MCS6	7.973	1.2	9.173	10
MCS7	7.882	1.2	9.082	10

Data Rate	PSD (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5240 MHz	Limit (dBm)
MCS0	7.145	2	9.145	10
MCS1	7.868	2	9.868	10
MCS2	7.769	2	9.769	10
MCS3	7.743	2	9.743	10
MCS4	7.762	2	9.762	10
MCS5	7.289	2	9.289	10
MCS6	7.853	2	9.853	10
MCS7	7.758	2	9.758	10

802.11n(HT20) MCS5 5200MHz



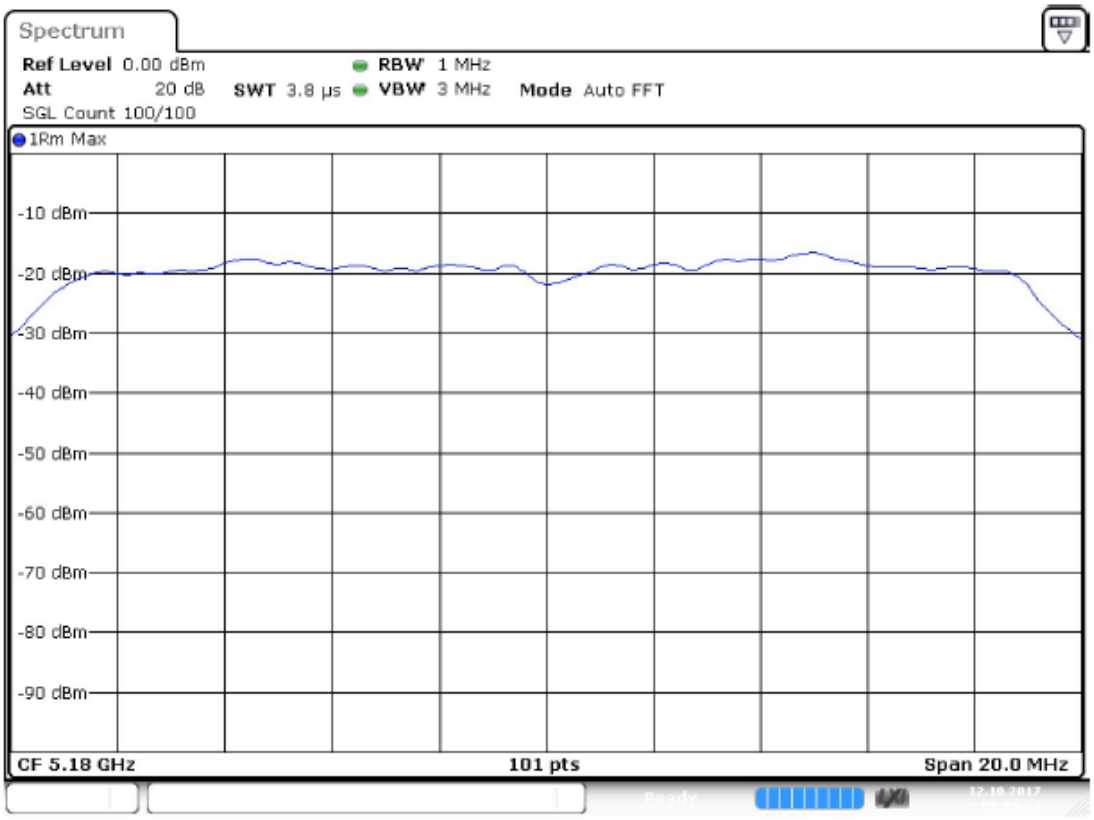
802.11ac(VHT20)

Data Rate	PSD (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5180 MHz	Limit (dBm)
MCS0	7.561	1.266	8.827	10
MCS1	7.192	1.266	8.458	10
MCS2	7.509	1.266	8.775	10
MCS3	8.093	1.266	9.359	10
MCS4	8.126	1.266	9.392	10
MCS5	5.138	1.266	6.404	10
MCS6	7.752	1.266	9.018	10
MCS7	6.926	1.266	8.192	10
MCS8	8.679	1.266	9.945	10
MCS9	6.397	1.266	7.663	10

Data Rate	PSD (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5200 MHz	Limit (dBm)
MCS0	7.795	1.2	8.995	10
MCS1	7.545	1.2	8.745	10
MCS2	8.336	1.2	9.536	10
MCS3	8.585	1.2	9.785	10
MCS4	8.172	1.2	9.372	10
MCS5	4.808	1.2	6.008	10
MCS6	8.729	1.2	9.929	10
MCS7	7.632	1.2	8.832	10
MCS8	8.512	1.2	9.712	10
MCS9	6.65	1.2	7.85	10

Data Rate	PSD (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5240 MHz	Limit (dBm)
MCS0	7.519	2	9.519	10
MCS1	7.265	2	9.265	10
MCS2	7.908	2	9.908	10
MCS3	7.886	2	9.886	10
MCS4	7.842	2	9.842	10
MCS5	4.954	2	6.954	10
MCS6	7.746	2	9.746	10
MCS7	7.674	2	9.674	10
MCS8	7.716	2	9.716	10
MCS9	6.517	2	8.517	10

802.11ac(VHT20) MCS8 5180MHz



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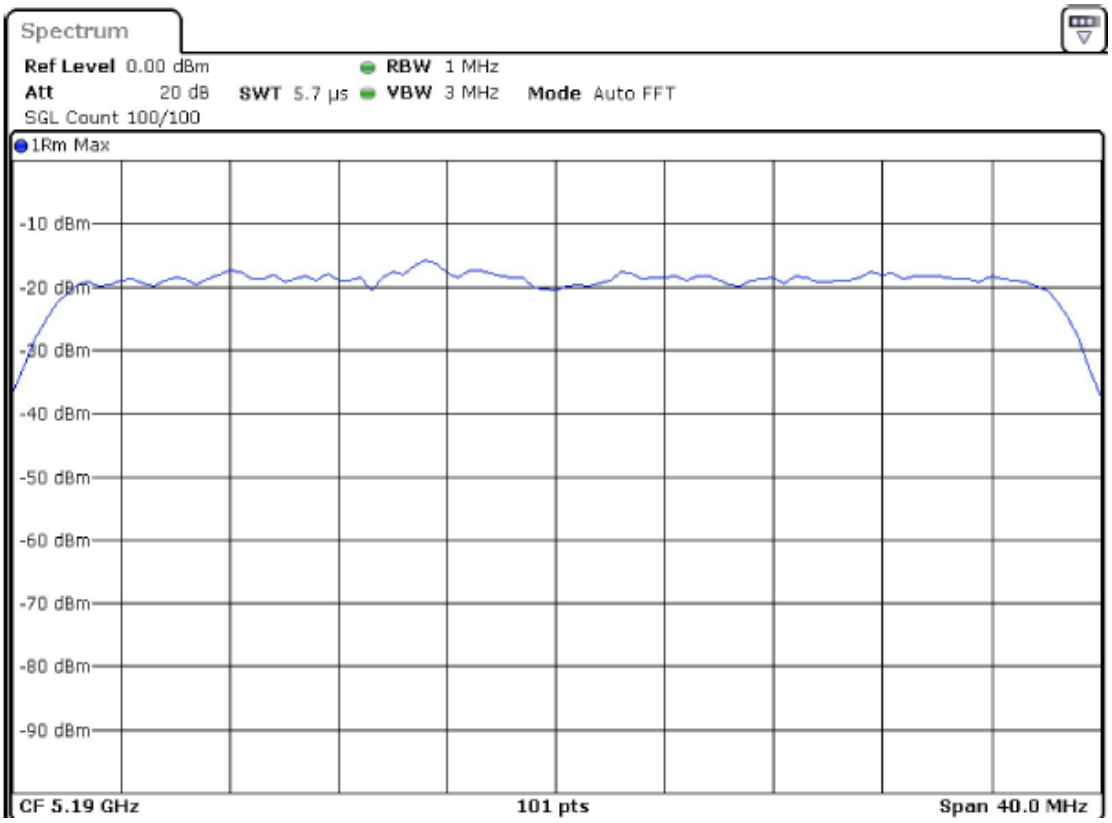
802.11n(HT40)

Data Rate	PSD (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5190 MHz	Limit (dBm)
MCS0	6.044	1.233	7.277	10
MCS1	8.304	1.233	9.537	10
MCS2	7.328	1.233	8.561	10
MCS3	7.224	1.233	8.457	10
MCS4	8.02	1.233	9.253	10
MCS5	5.592	1.233	6.825	10
MCS6	8.006	1.233	9.239	10
MCS7	7.375	1.233	8.608	10

Data Rate	PSD (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5230 MHz	Limit (dBm)
MCS0	5.676	1.8	7.476	10
MCS1	6.746	1.8	8.546	10
MCS2	6.696	1.8	8.496	10
MCS3	7.568	1.8	9.368	10
MCS4	7.727	1.8	9.527	10
MCS5	5.527	1.8	7.327	10
MCS6	7.437	1.8	9.237	10
MCS7	7.625	1.8	9.425	10

802.11n(HT40) MCS1 5190MHz

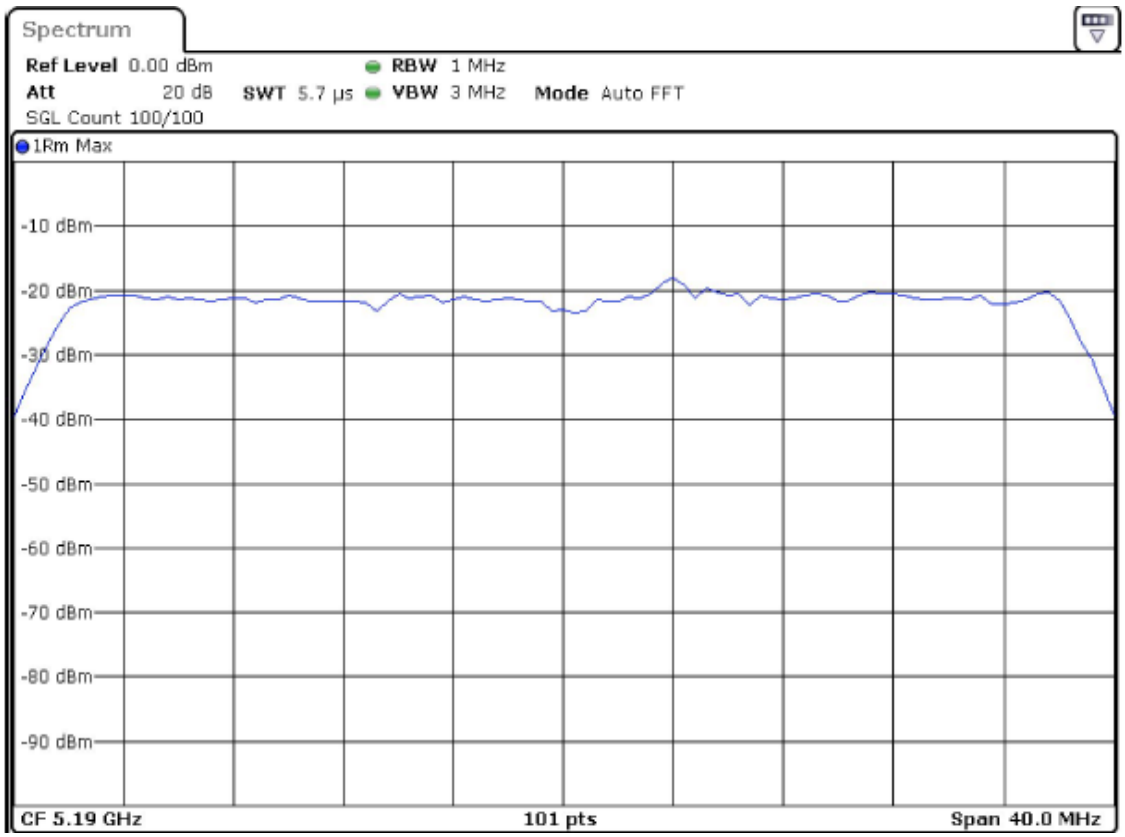


802.11ac(VHT40)

Data Rate	PSD (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5190 MHz	Limit (dBm)
MCS0	5.694	1.233	6.927	10
MCS1	7.558	1.233	8.791	10
MCS2	6.957	1.233	8.190	10
MCS3	6.915	1.233	8.148	10
MCS4	5.902	1.233	7.135	10
MCS5	5.067	1.233	6.300	10
MCS6	6.814	1.233	8.047	10
MCS7	7.953	1.233	9.186	10
MCS8	5.694	1.233	6.927	10
MCS9	7.558	1.233	8.791	10

Data Rate	PSD (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5230 MHz	Limit (dBm)
MCS0	6.202	1.8	8.002	10
MCS1	7.284	1.8	9.084	10
MCS2	6.661	1.8	8.461	10
MCS3	6.000	1.8	7.800	10
MCS4	5.080	1.8	6.880	10
MCS5	4.812	1.8	6.612	10
MCS6	5.674	1.8	7.474	10
MCS7	5.746	1.8	7.546	10
MCS8	6.202	1.8	8.002	10
MCS9	7.284	1.8	9.084	10

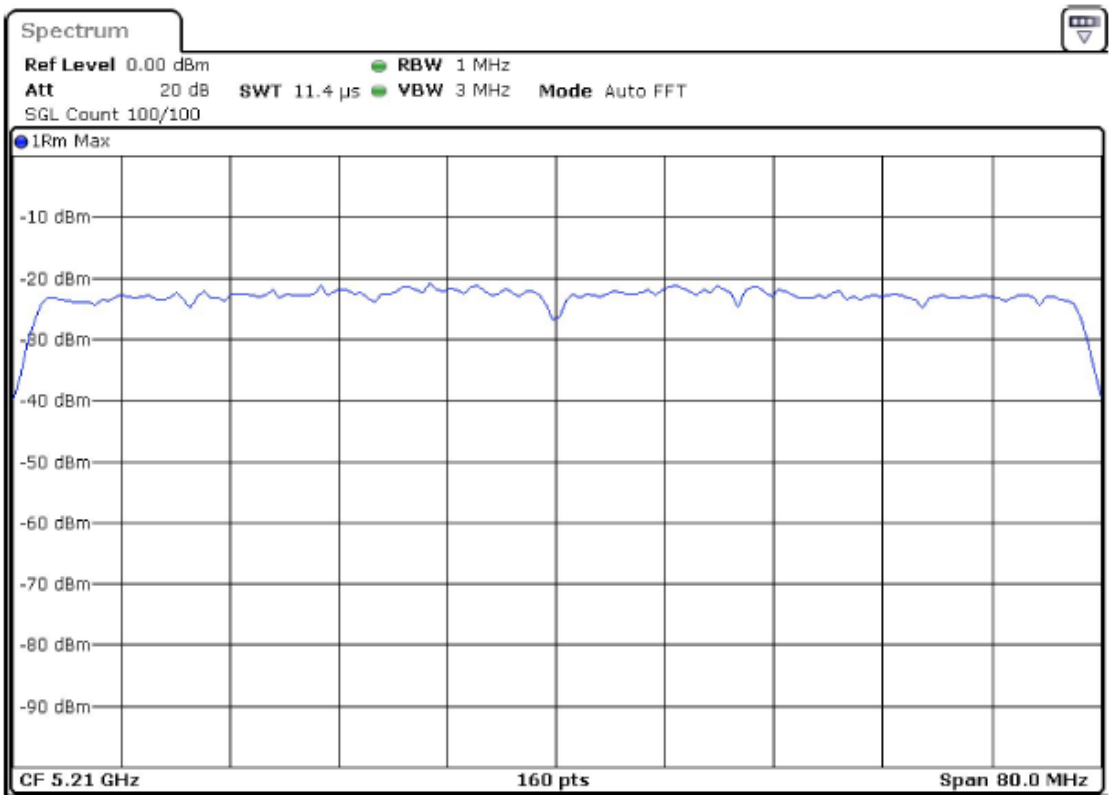
802.11ac(VHT40) MCS7 5190MHz



802.11ac(VHT80)

Data Rate	PSD (dBm) 5210 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5210 MHz	Limit (dBm)
MCS0	3.593	1.4	4.993	10
MCS1	4.291	1.4	5.691	10
MCS2	4.593	1.4	5.993	10
MCS3	3.895	1.4	5.295	10
MCS4	2.812	1.4	4.212	10
MCS5	3.856	1.4	5.256	10
MCS6	3.946	1.4	5.346	10
MCS7	4.565	1.4	5.965	10
MCS8	1.635	1.4	3.035	10
MCS9	1.940	1.4	3.340	10

802.11ac(VHT80) MCS2 5210MHz



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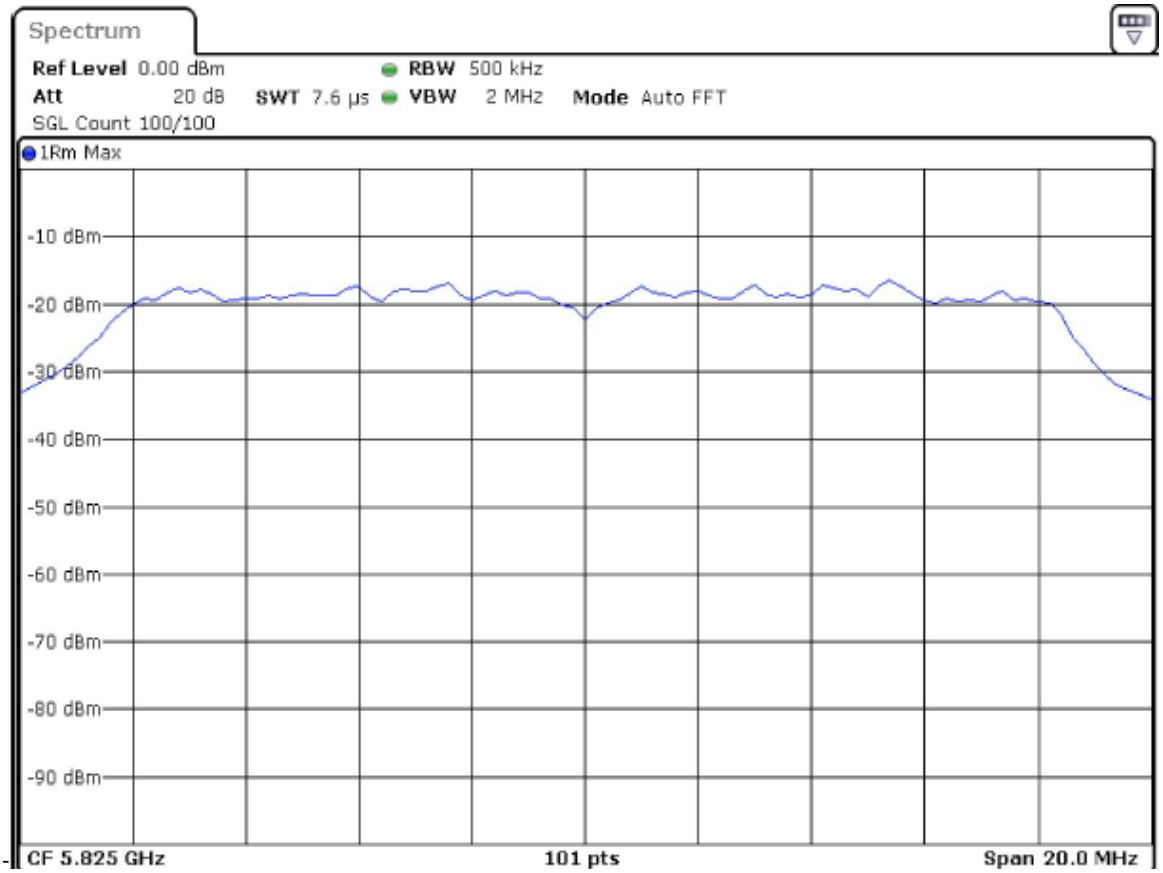
802.11a

Data Rate	Peak PSD (dBm) 5745 MHz	Peak PSD (dBm) 5785 MHz	Peak PSD (dBm) 5825 MHz	Limit (dBm)
6 Mbps	4.877	5.182	5.191	30.0
9 Mbps	7.502	7.359	7.023	30.0
12 Mbps	6.236	6.547	6.785	30.0
18 Mbps	7.309	7.326	7.509	30.0
24 Mbps	5.693	5.992	6.211	30.0
36 Mbps	5.496	5.970	5.900	30.0
48 Mbps	5.527	5.915	5.950	30.0
54 Mbps	5.609	5.502	5.860	30.0

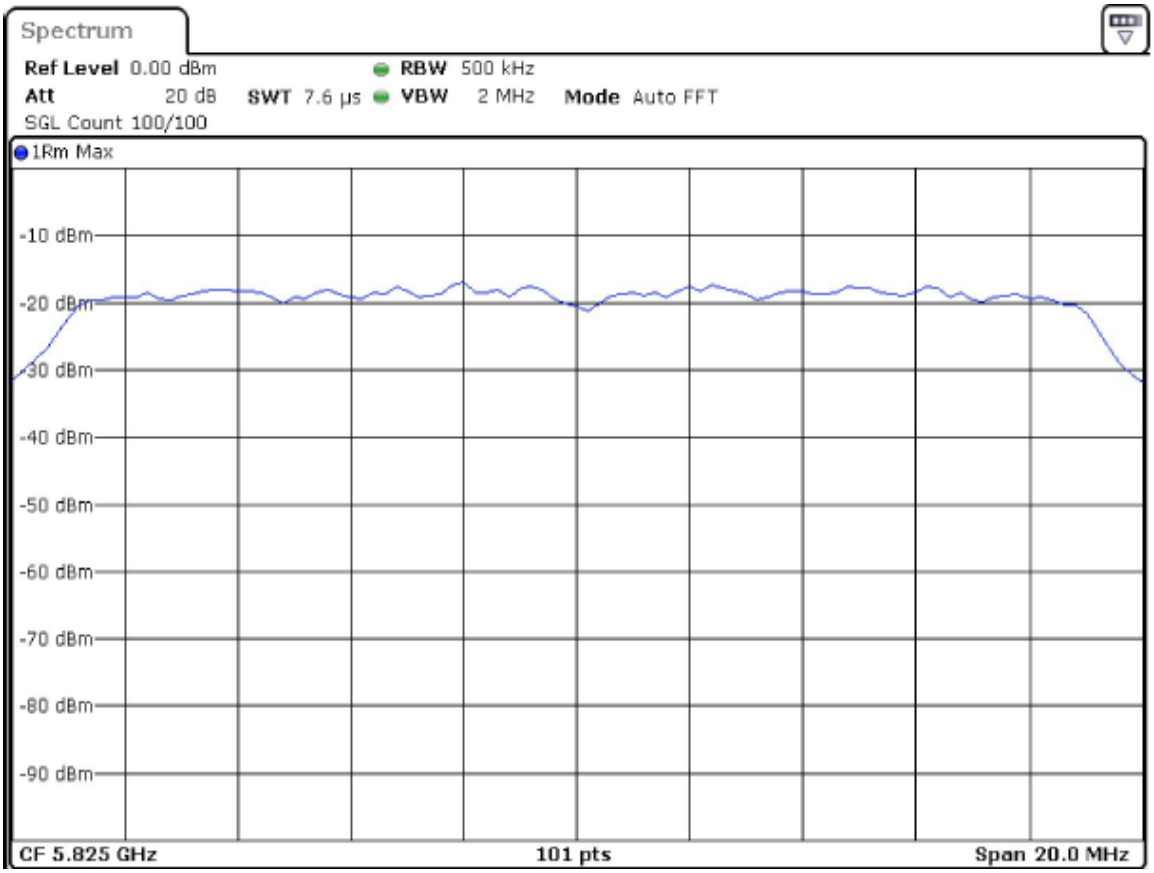
802.11a 18 Mbps 5825MHz



802.11n(HT20)

Data Rate	Peak PSD (dBm) 5745 MHz	Peak PSD (dBm) 5785 MHz	Peak PSD (dBm) 5825 MHz	Limit (dBm)
MCS0	4.516	5.156	5.513	30
MCS1	6.875	6.327	6.216	30
MCS2	6.374	6.238	7.048	30
MCS3	6.513	5.718	6.324	30
MCS4	5.279	5.143	4.940	30
MCS5	5.682	5.855	5.074	30
MCS6	5.75	5.724	6.048	30
MCS7	5.724	6.047	5.510	30

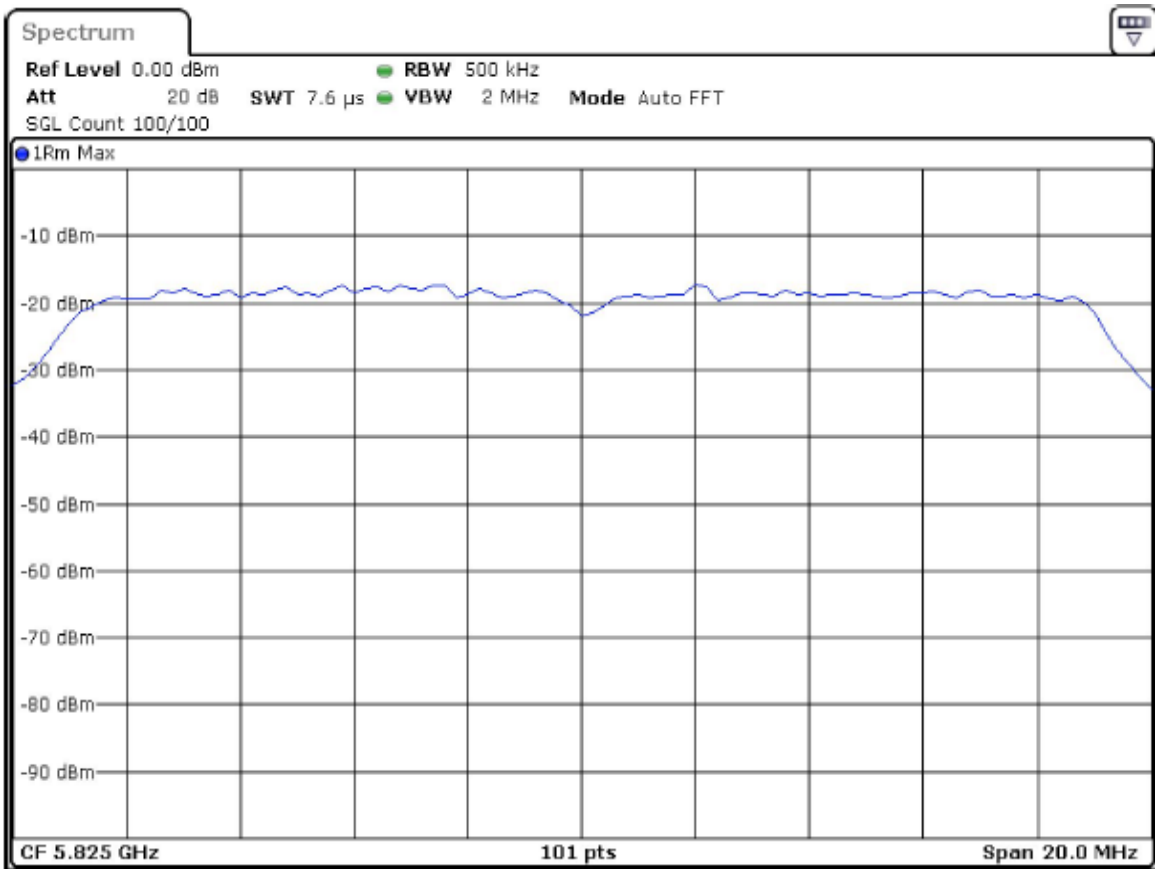
802.11n(HT20) MCS2 5825MHz



802.11ac(VHT20)

Data Rate	Peak PSD (dBm) 5745 MHz	Peak PSD (dBm) 5785 MHz	Peak PSD (dBm) 5825 MHz	Limit (dBm)
MCS0	5.718	5.013	5.182	30
MCS1	5.385	6.767	6.818	30
MCS2	6.470	6.346	6.831	30
MCS3	6.739	6.448	5.694	30
MCS4	5.214	5.95	5.356	30
MCS5	5.786	5.541	6.452	30
MCS6	5.620	5.533	6.184	30
MCS7	5.529	4.674	5.925	30
MCS8	4.553	4.509	4.891	30

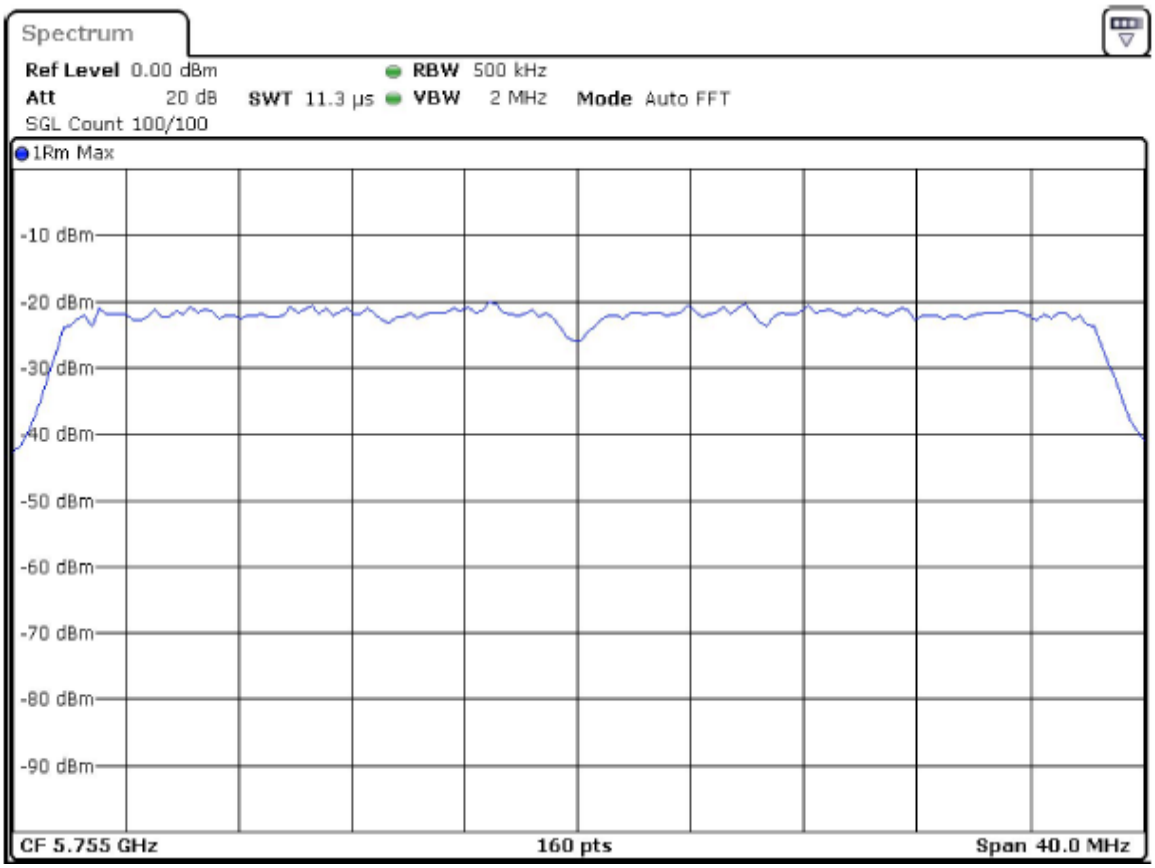
802.11ac(VHT20) MCS2 5825MHz



802.11n(HT40)

Data Rate	Peak PSD (dBm) 5755 MHz	Peak PSD (dBm) 5795 MHz	Limit (dBm)
MCS0	2.783	3.387	30
MCS1	4.251	4.348	30
MCS2	4.655	4.410	30
MCS3	3.669	3.741	30
MCS4	3.663	2.970	30
MCS5	3.494	3.868	30
MCS6	4.517	3.641	30
MCS7	4.023	3.689	30

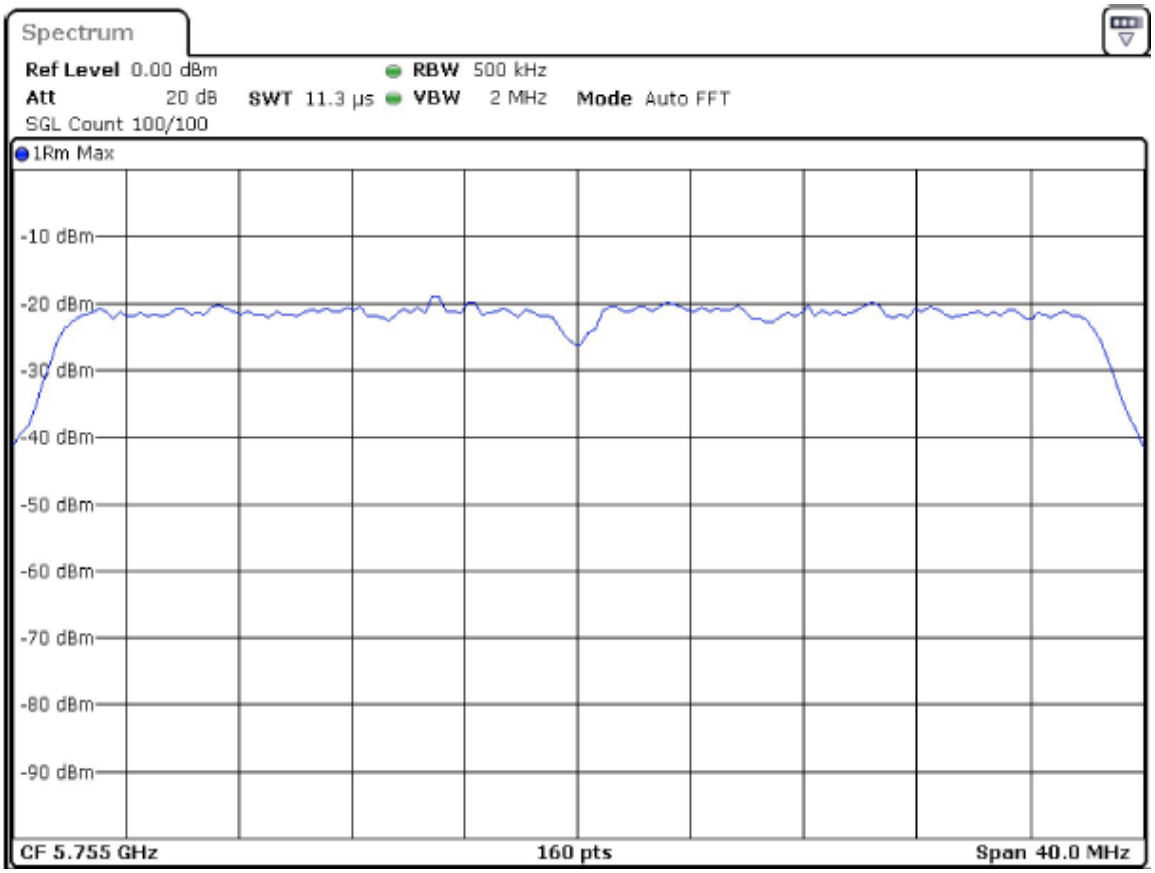
802.11n(HT40) MCS2 5755MHz



802.11ac(VHT40)

Data Rate	Peak PSD (dBm) 5755 MHz	Peak PSD (dBm) 5795 MHz	Limit (dBm)
MCS0	3.449	3.268	30
MCS1	5.454	5.419	30
MCS2	4.788	4.489	30
MCS3	4.578	3.693	30
MCS4	3.227	3.163	30
MCS5	3.551	3.314	30
MCS6	3.598	3.377	30
MCS7	3.630	4.908	30
MCS8	1.750	1.468	30
MCS9	3.188	3.244	30

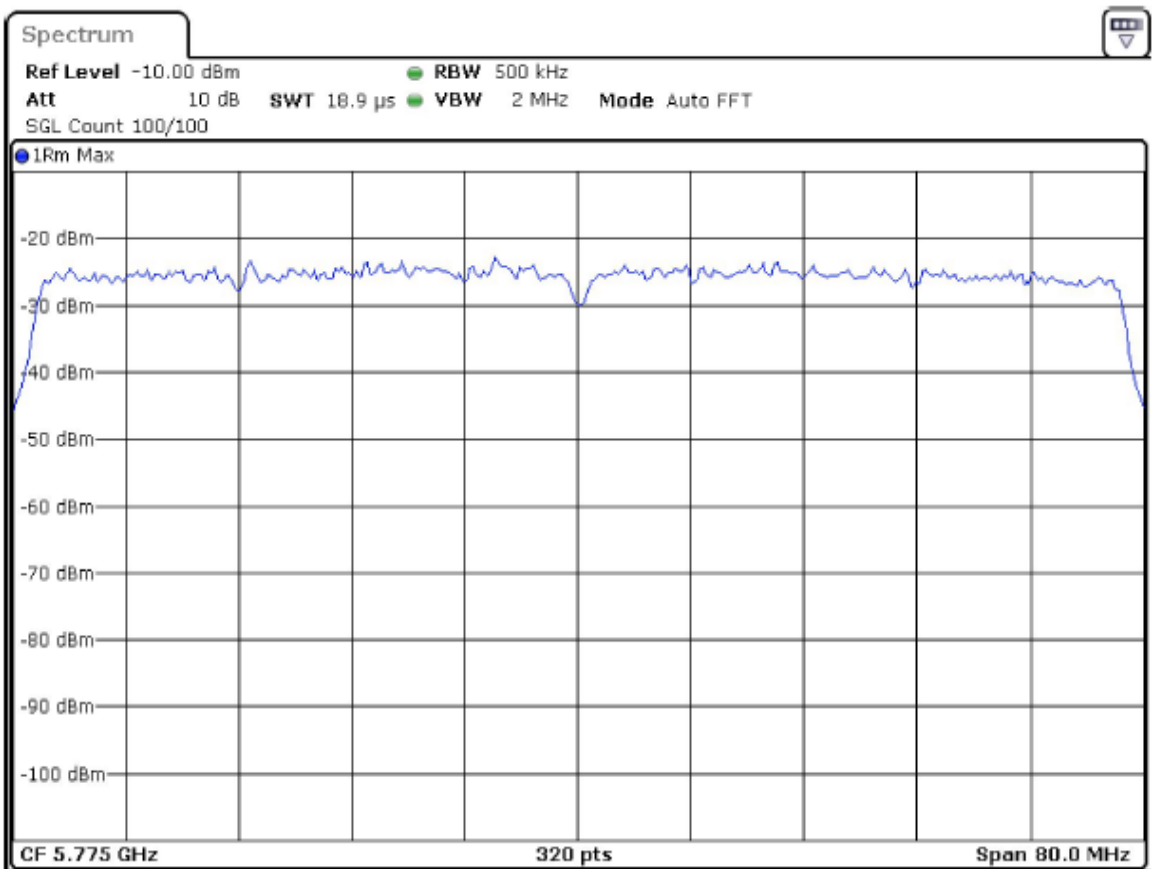
802.11ac(VHT40) MCS1 5755MHz



802.11ac(VHT80)

Data Rate	Peak PSD (dBm) 5775 MHz	Limit (dBm)
MCS0	0.763	30
MCS1	2.211	30
MCS2	2.704	30
MCS3	2.026	30
MCS4	0.968	30
MCS5	0.928	30
MCS6	0.879	30
MCS7	1.304	30
MCS8	-0.398	30
MCS9	-0.123	30

802.11ac(VHT80) MCS2 5775MHz



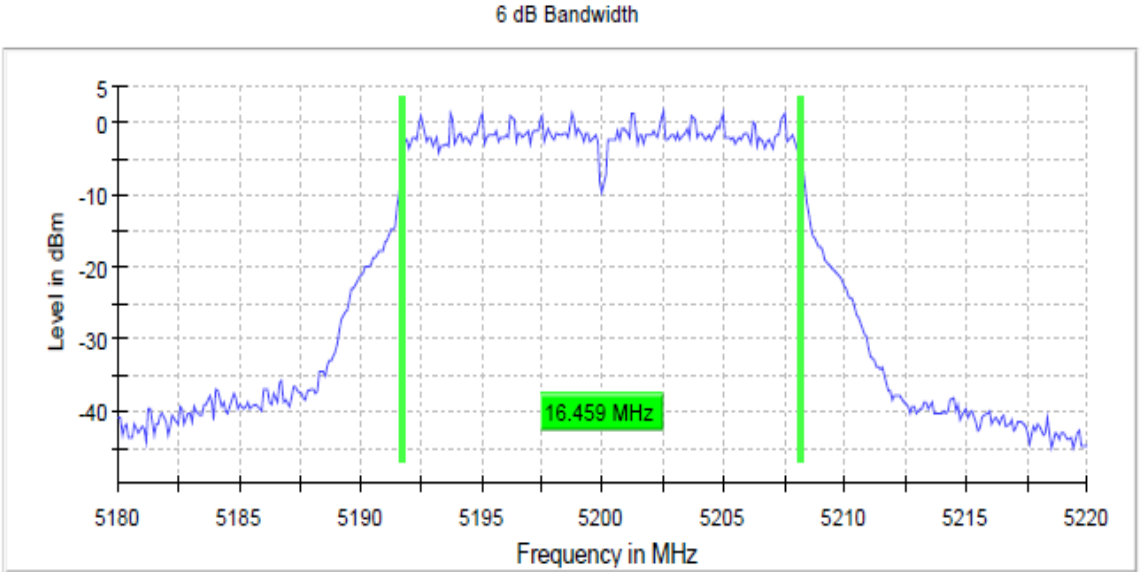
DTS Bandwidth (6dB)

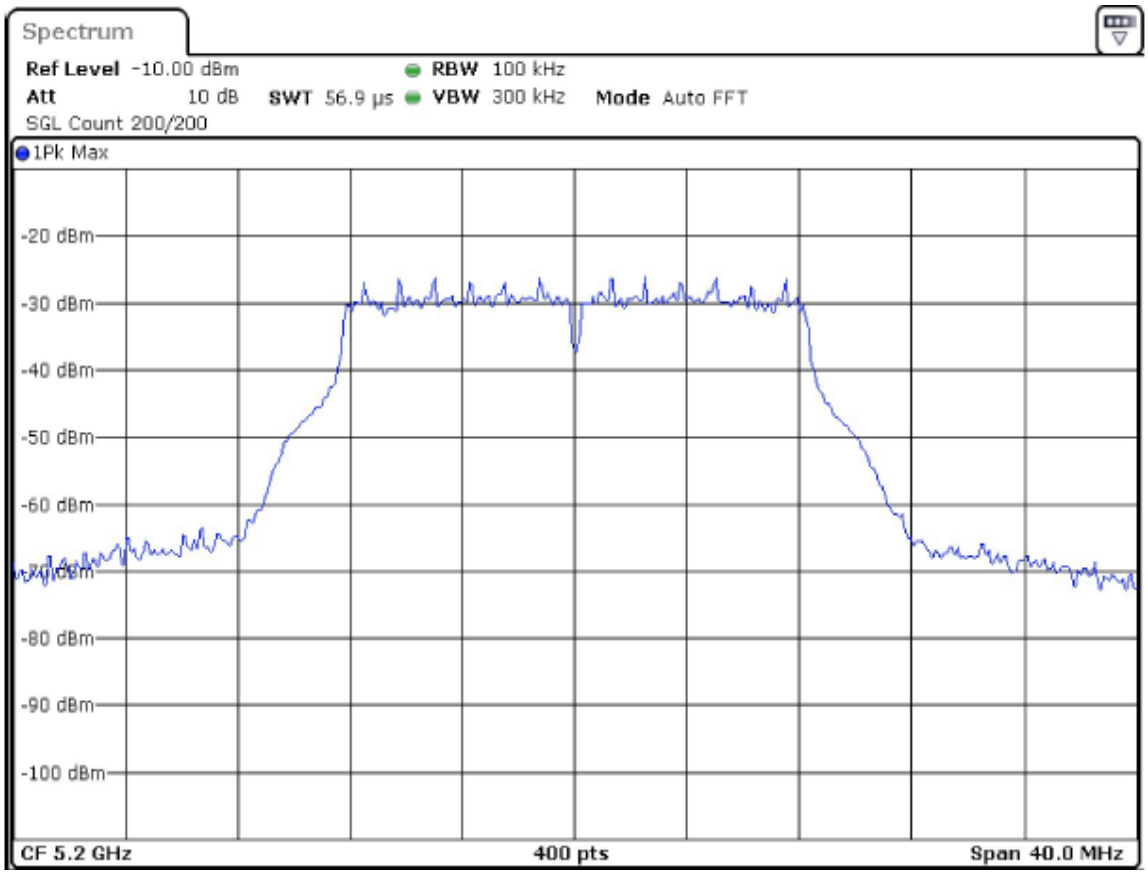
Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.C.2.
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

FCC/RSS-247 UNII-1

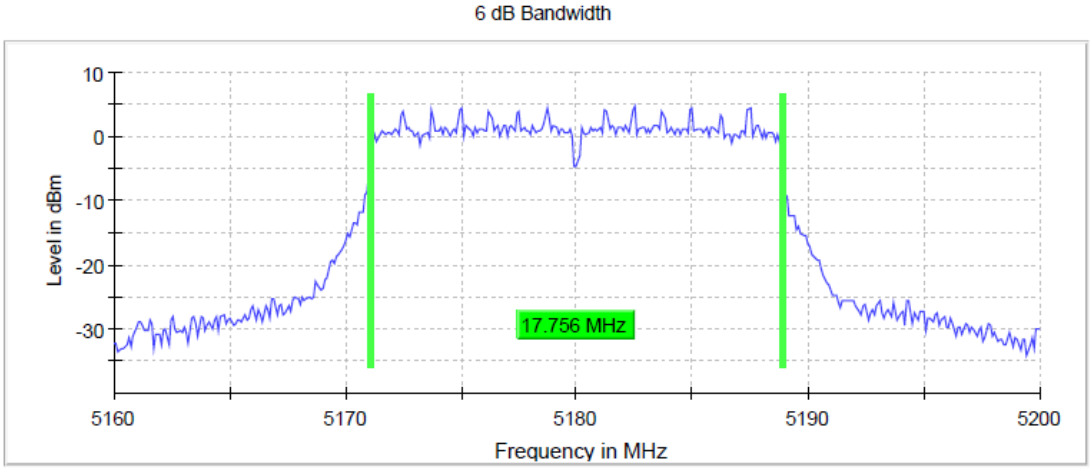
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11a 6 Mb/s	5180.000	16.558604	0.5	5171.720698	5188.279302
802.11n(HT20) MSC0	5180.000	17.755610	0.5	5171.122195	5188.877805
802.11ac(VHT20) MCS1	5180.000	17.855361	0.5	5171.022444	5188.877805
802.11n(HT40) MSC1	5190.000	36.554308	0.5	5171.722846	5208.277154
802.11ac(VHT40) MCS4	5190.000	36.554308	0.5	5171.722846	5208.277154
802.11a 6 Mb/s	5200.000	16.458853	0.5	5191.720698	5208.179551
802.11n(HT20) MSC0	5200.000	17.755610	0.5	5191.122195	5208.877805
802.11ac(VHT20) MCS1	5200.000	17.855361	0.5	5191.022444	5208.877805
802.11ac(VHT80) MCS9	5210.000	76.452217	0.5	5171.723923	5248.176140
802.11n(HT40) MSC1	5230.000	36.654183	0.5	5211.622971	5248.277154
802.11ac(VHT40) MCS4	5230.000	36.654183	0.5	5211.622971	5248.277154
802.11a 6 Mb/s	5240.000	16.458853	0.5	5231.720698	5248.179551
802.11n(HT20) MSC0	5240.000	17.755610	0.5	5231.122195	5248.877805
802.11ac(VHT20) MCS1	5240.000	17.855361	0.5	5231.022444	5248.877805

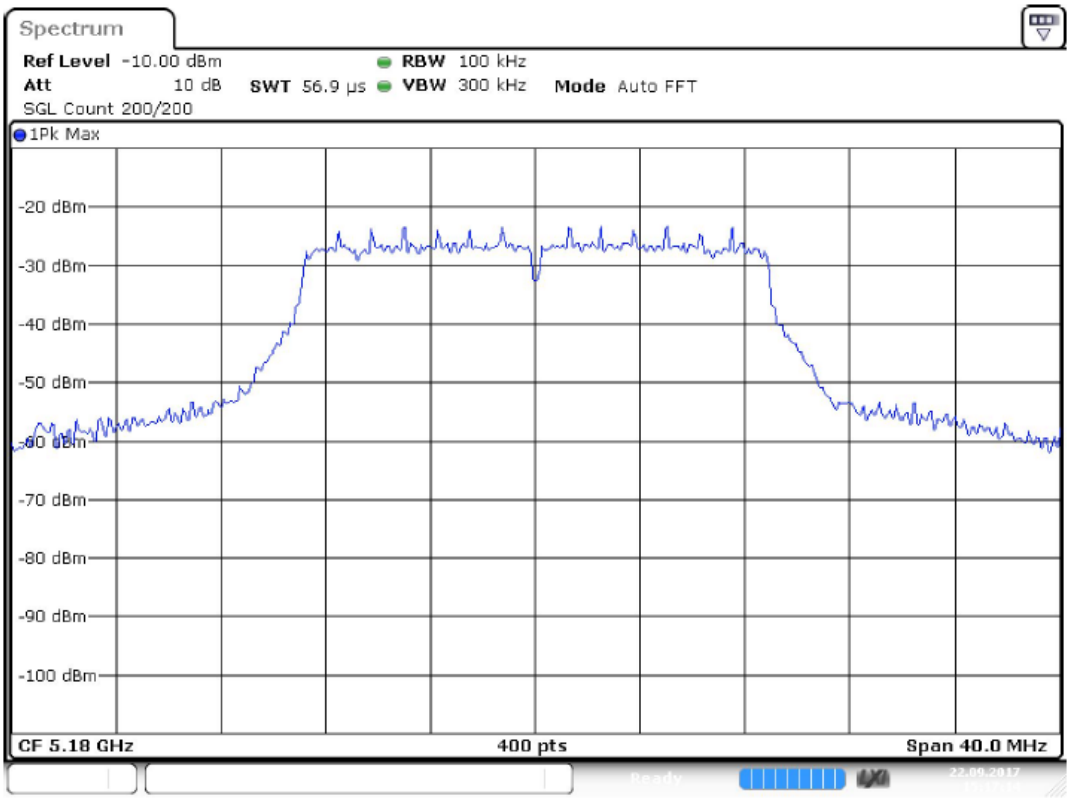
802.11a 6 Mb/s 5200MHz



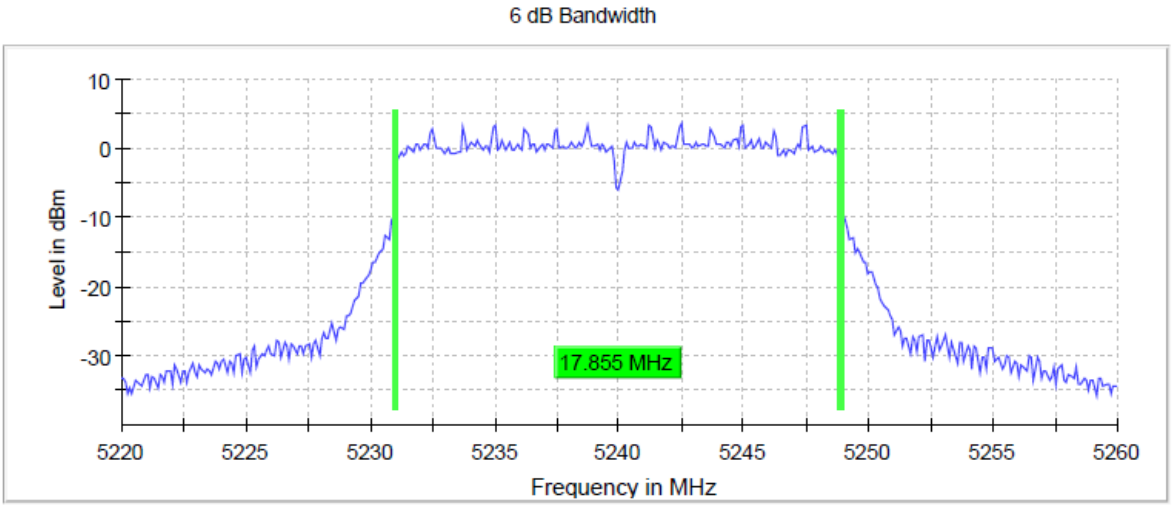


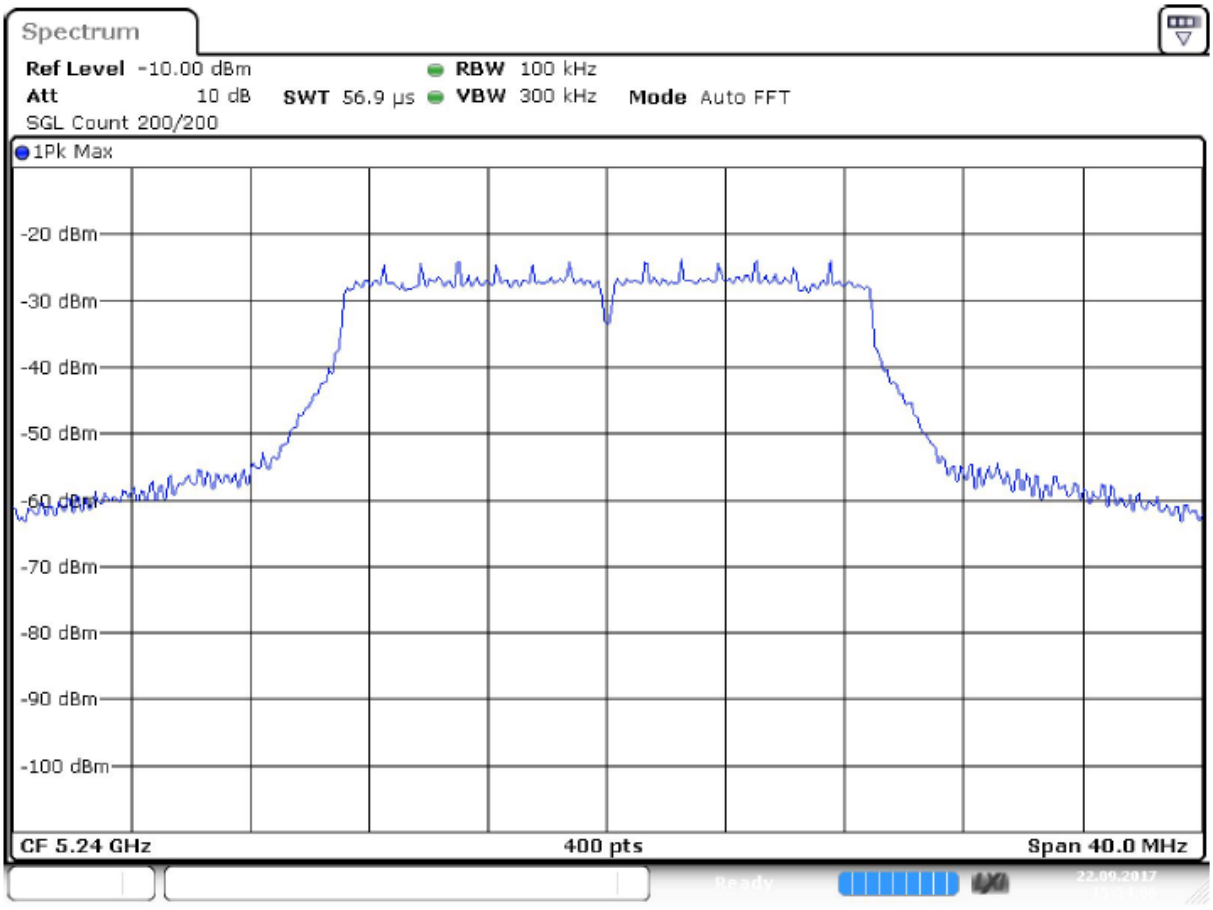
802.11n(HT20) MCS0 5180MHz



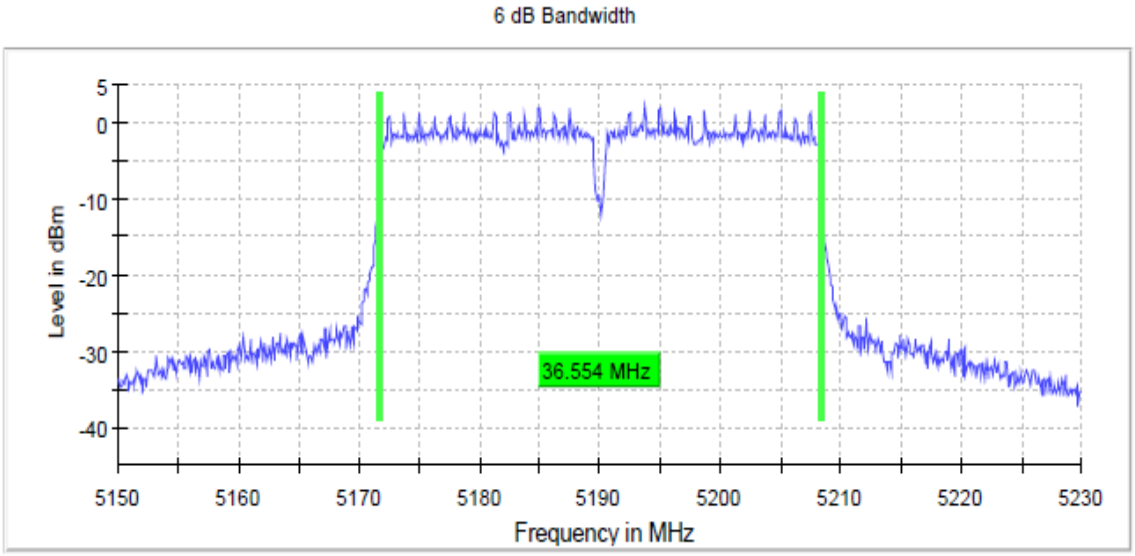


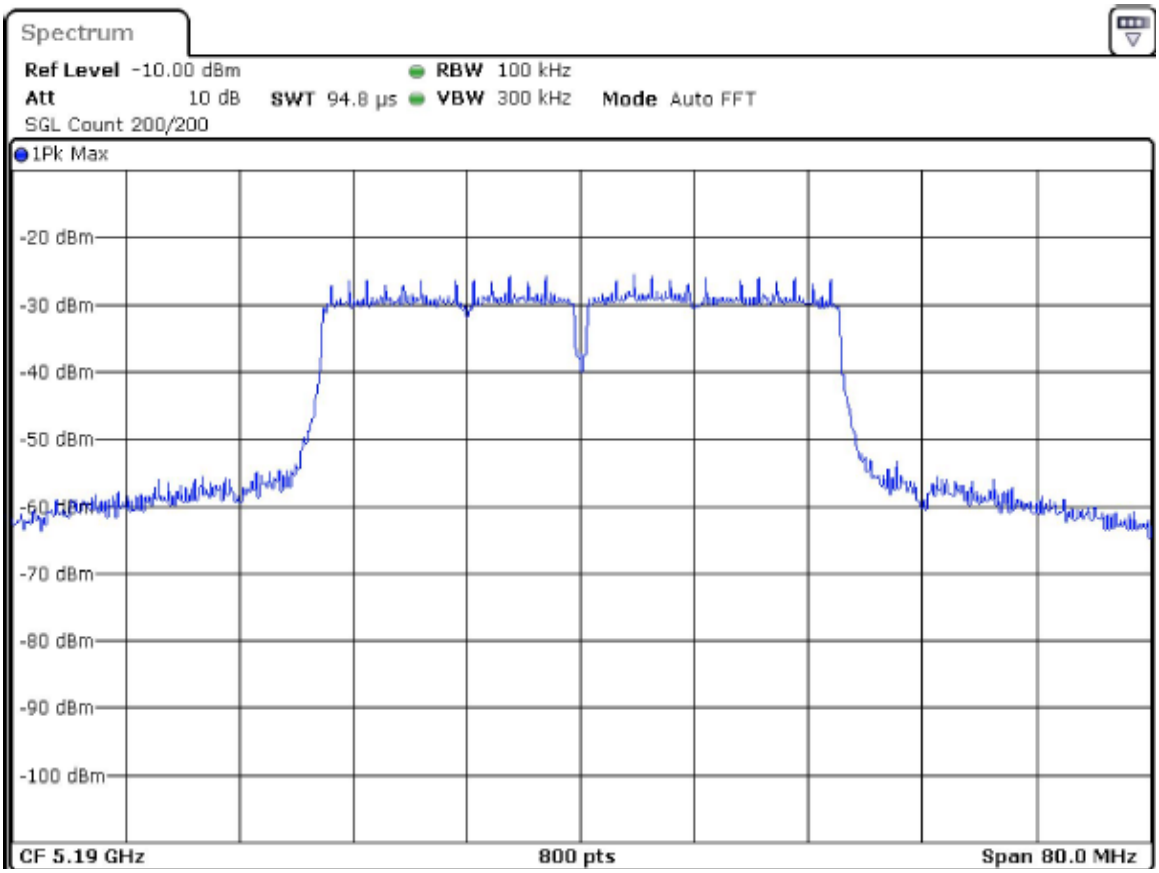
802.11ac(VHT20) MCS1 5240MHz



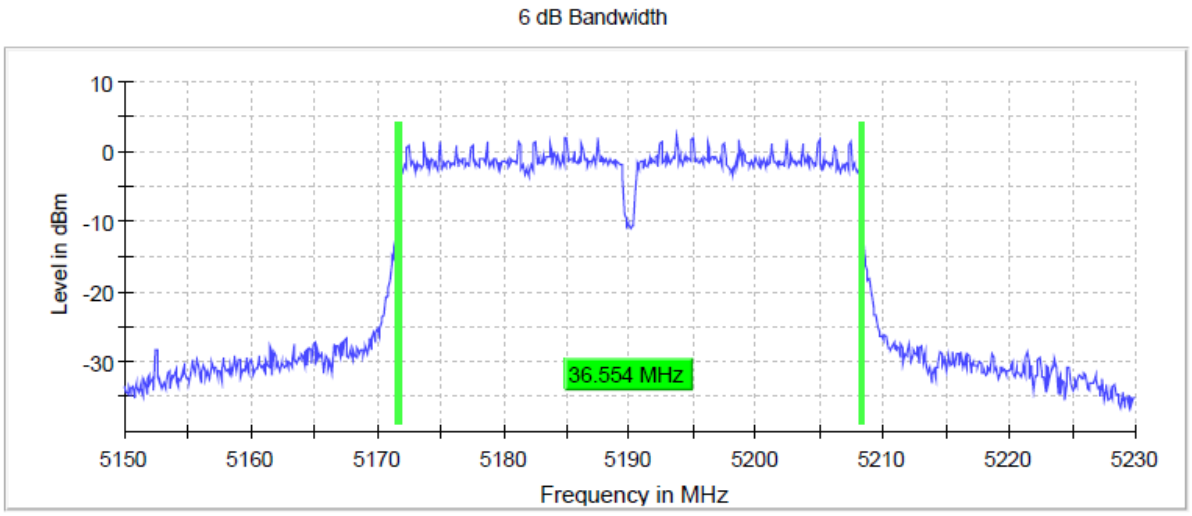


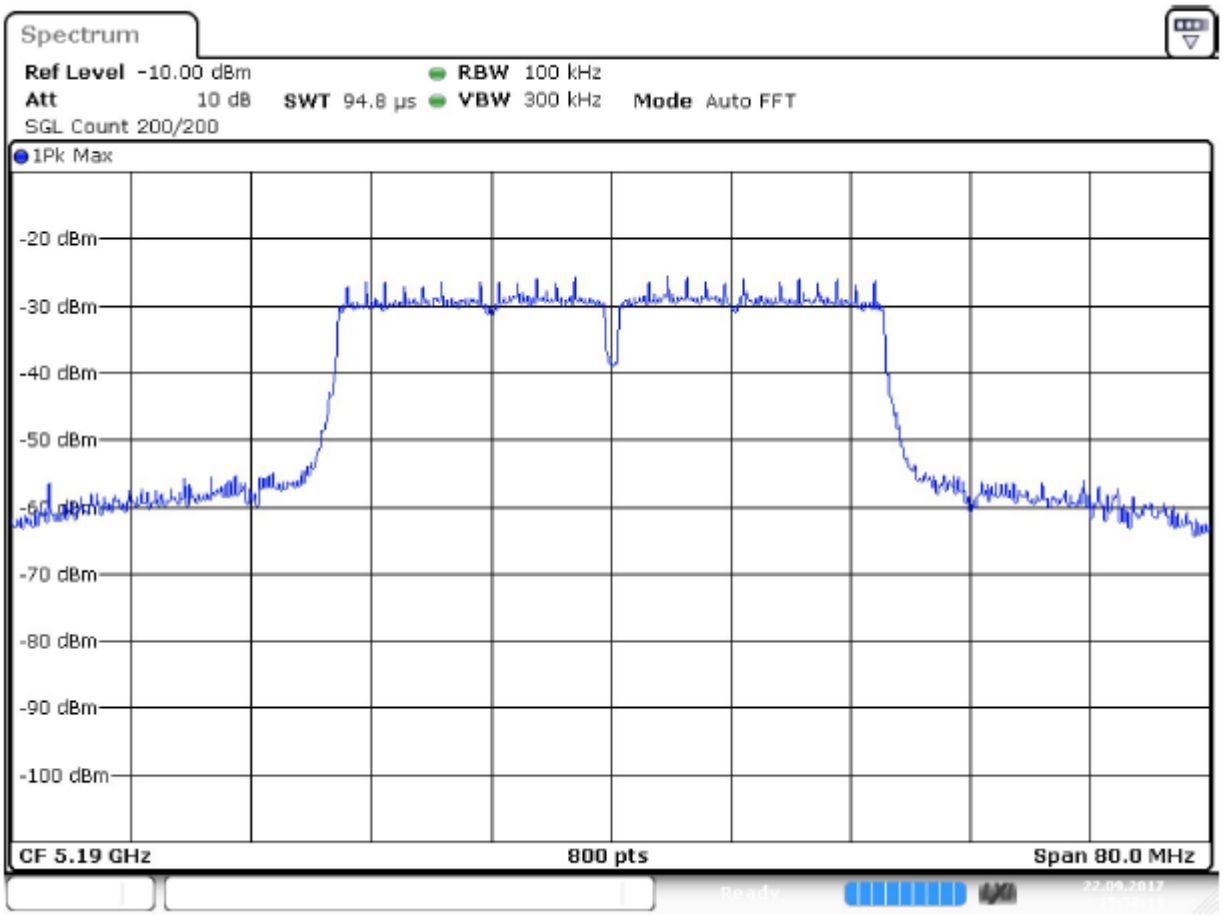
802.11n(HT40) MCS1 5190MHZ



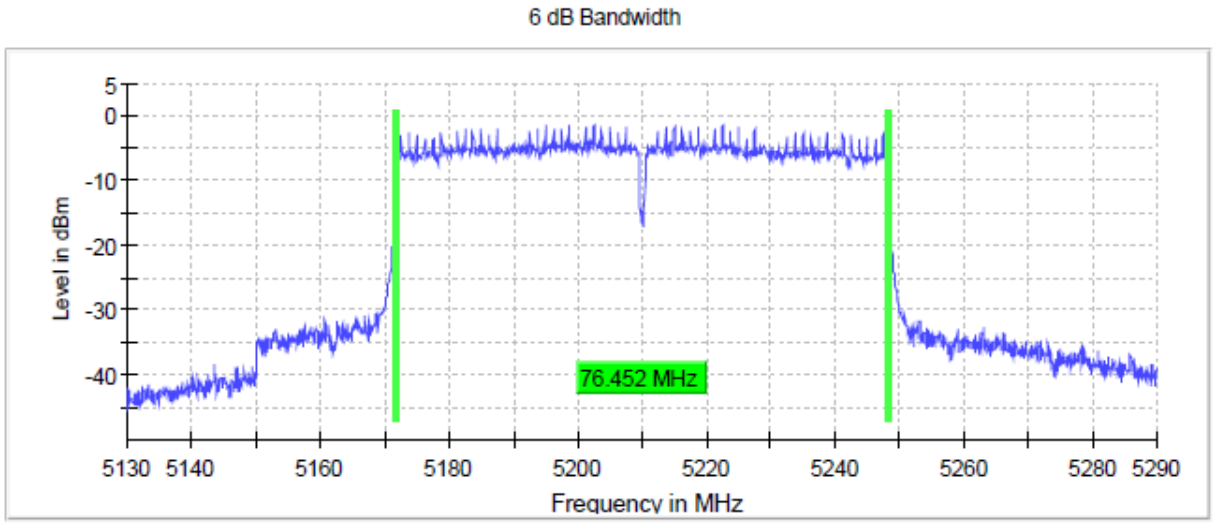


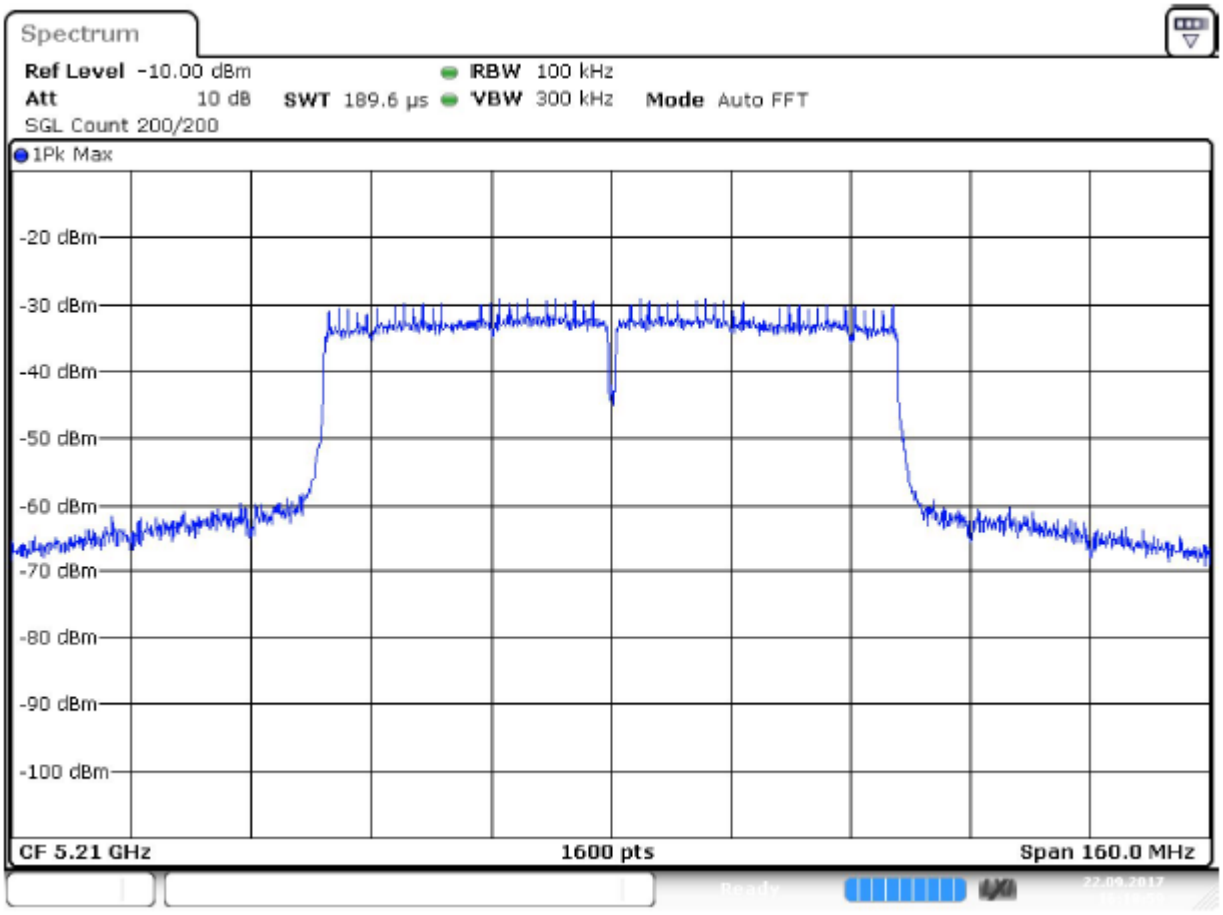
802.11ac(VHT40) MCS4 5190MHz





802.11ac(VHT80) MCS9 5210MHZ

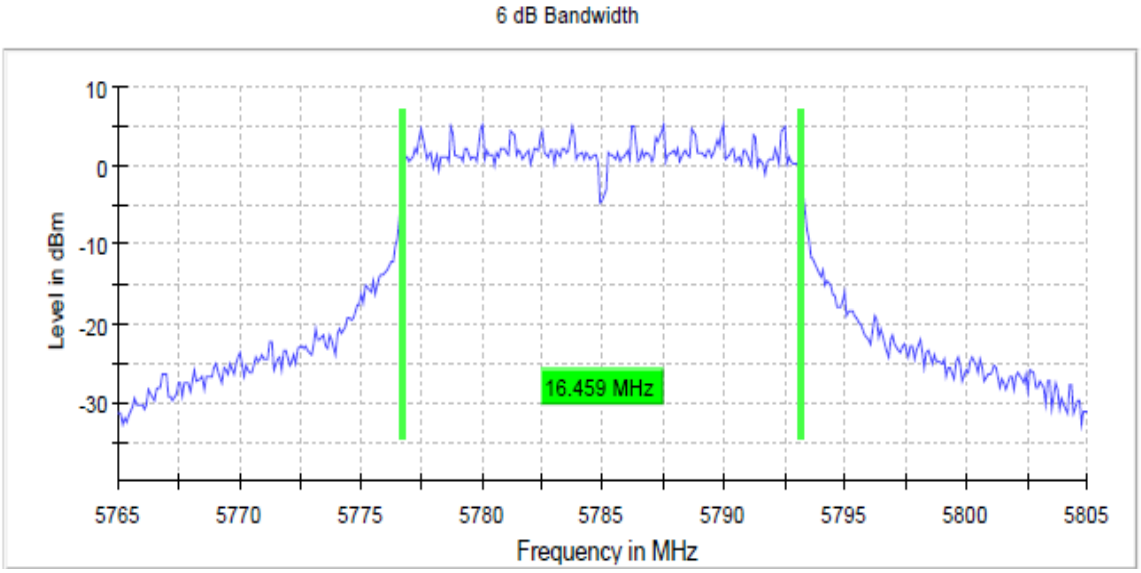


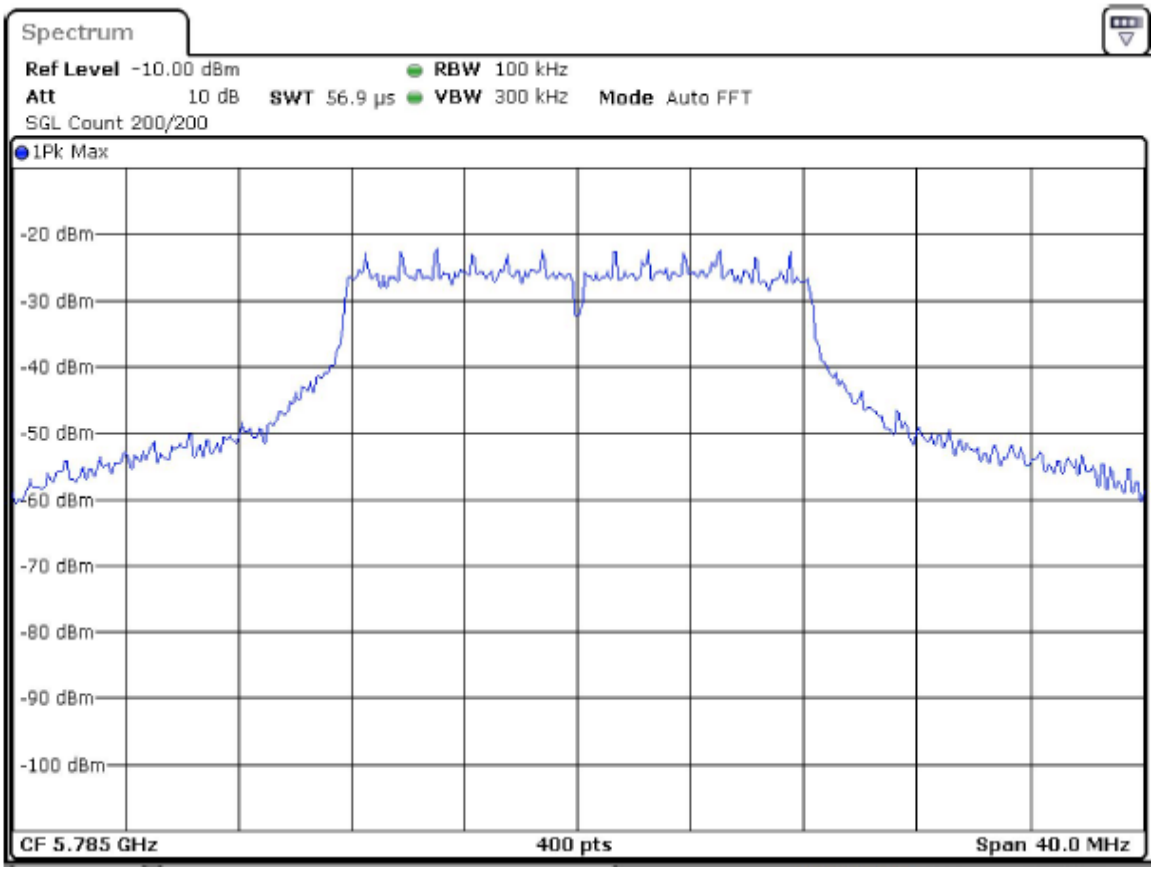


FCC/RSS-247 UNII-3

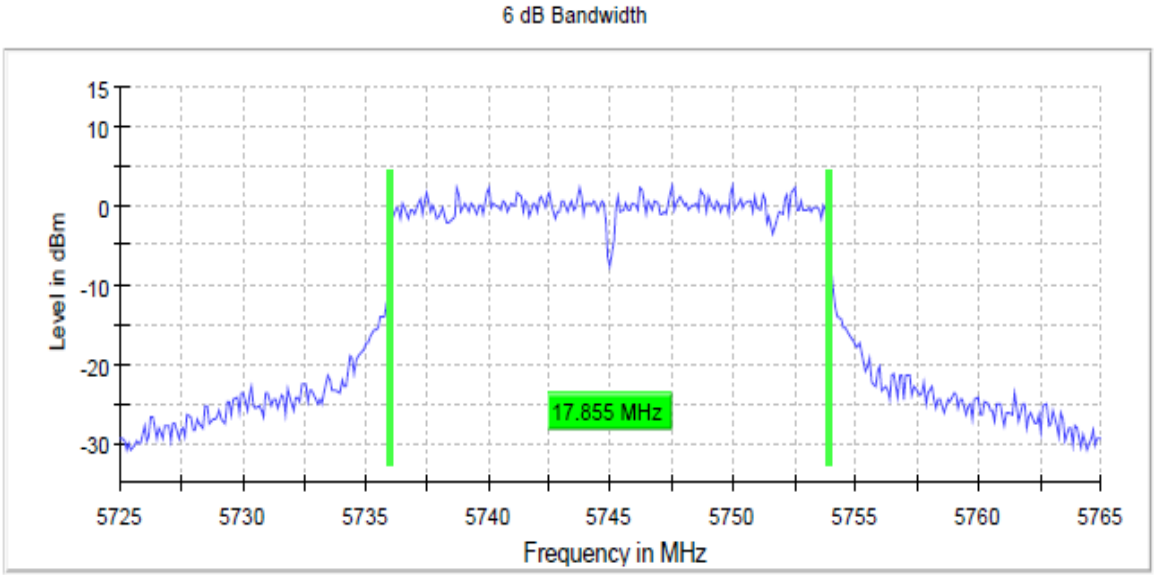
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11a 9 Mb/s	5745.00	16.458853	0.5	5736.720698	5753.179551
802.11n(HT20) MSC7	5745.00	17.855361	0.5	5736.022444	5753.877805
802.11ac(VHT20) MCS0	5745.00	17.855361	0.5	5776.022444	5793.877805
802.11n(HT40) MSC7	5755.00	36.454432	0.5	5736.722846	5773.177278
802.11ac(VHT40) MCS9	5755.00	36.454432	0.5	5736.722846	5773.177278
802.11ac(VHT80) MCS9	5775.00	76.452217	0.5	5736.723923	5813.176140
802.11a 9 Mb/s	5785.00	16.458853	0.5	5776.720698	5793.179551
802.11n(HT20) MSC7	5785.00	17.855361	0.5	5776.022444	5793.877805
802.11ac(VHT20) MCS0	5785.00	17.855361	0.5	5776.022444	5793.877805
802.11n(HT40) MSC7	5795.00	36.454432	0.5	5776.722846	5813.177278
802.11ac(VHT40) MCS9	5795.00	36.454432	0.5	5776.722846	5776.722846
802.11a 9 Mb/s	5825.00	16.458853	0.5	5816.720698	5833.179551
802.11n(HT20) MSC7	5825.00	17.855361	0.5	5816.022444	5833.877805
802.11ac(VHT20) MCS0	5825.00	17.855361	0.5	5816.022444	5833.877805

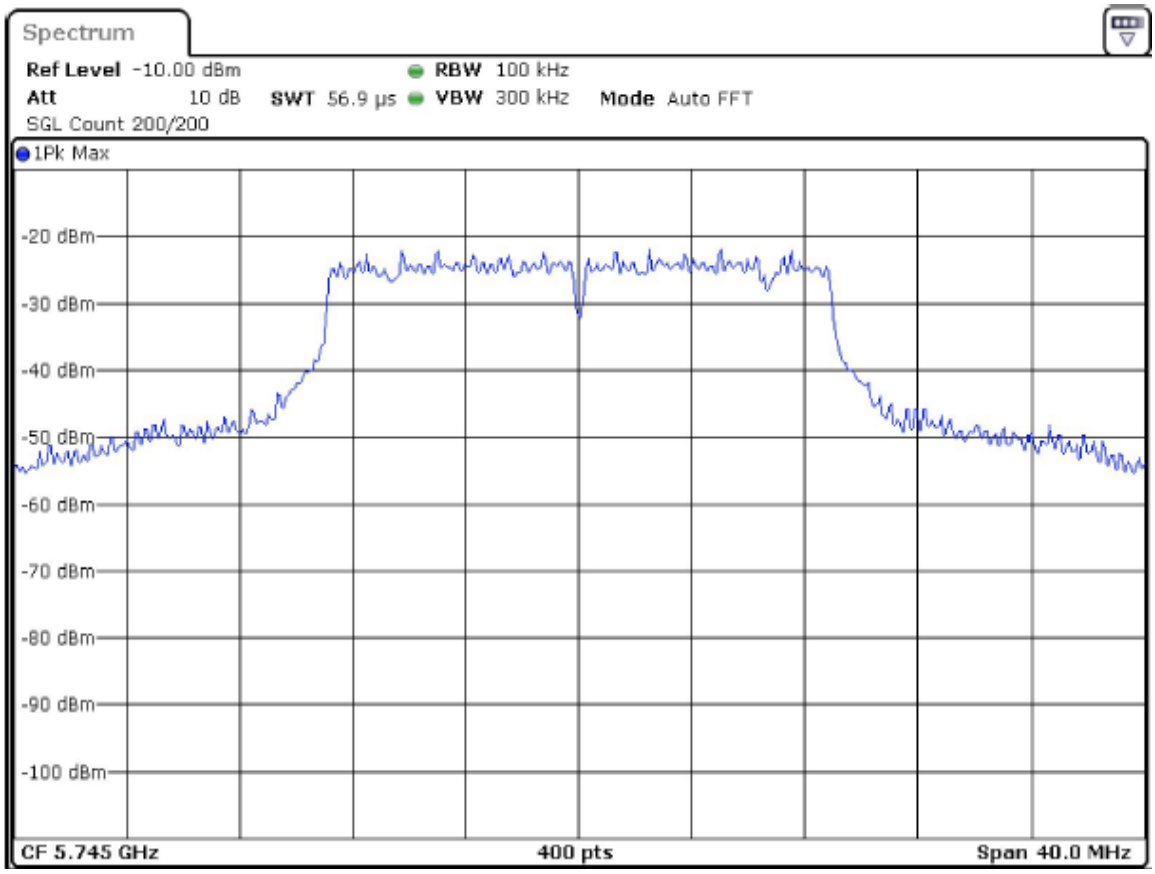
802.11a 9 Mb/s 5785MHz



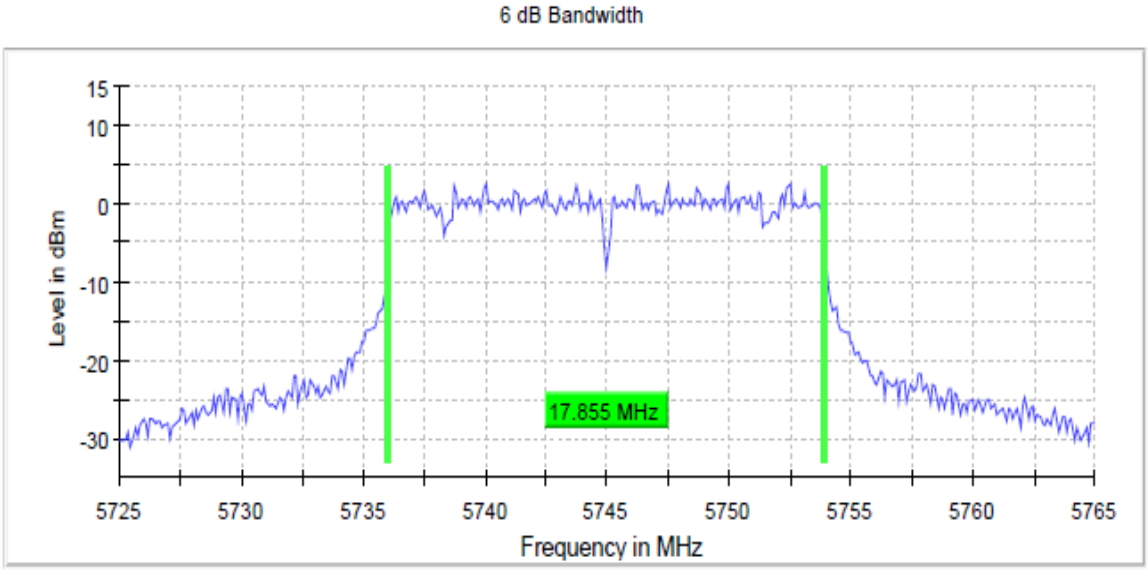


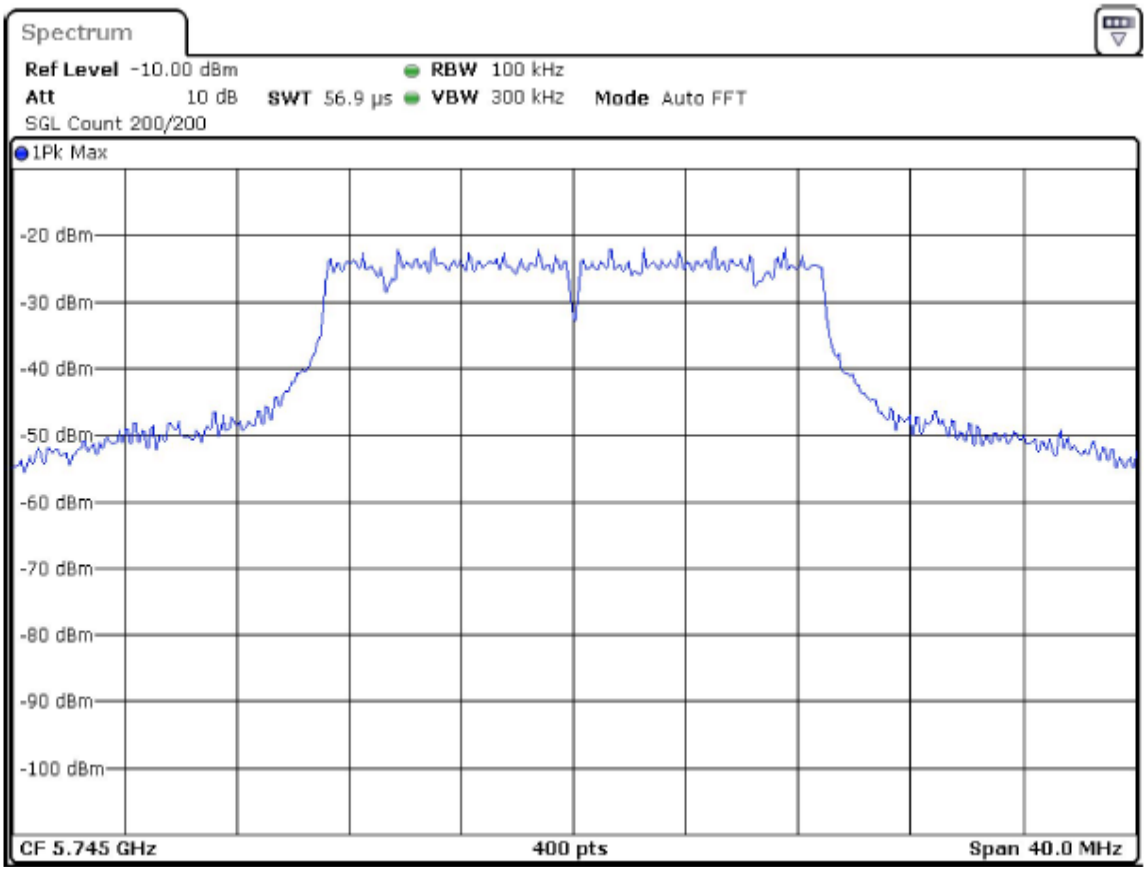
802.11n(HT20) MCS7 5745MHz



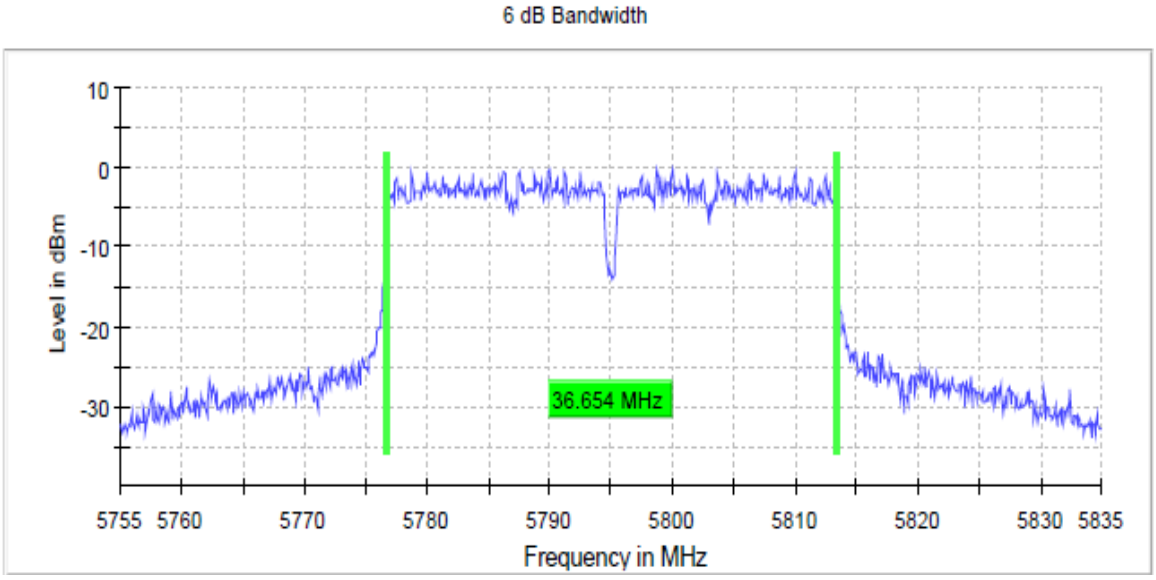


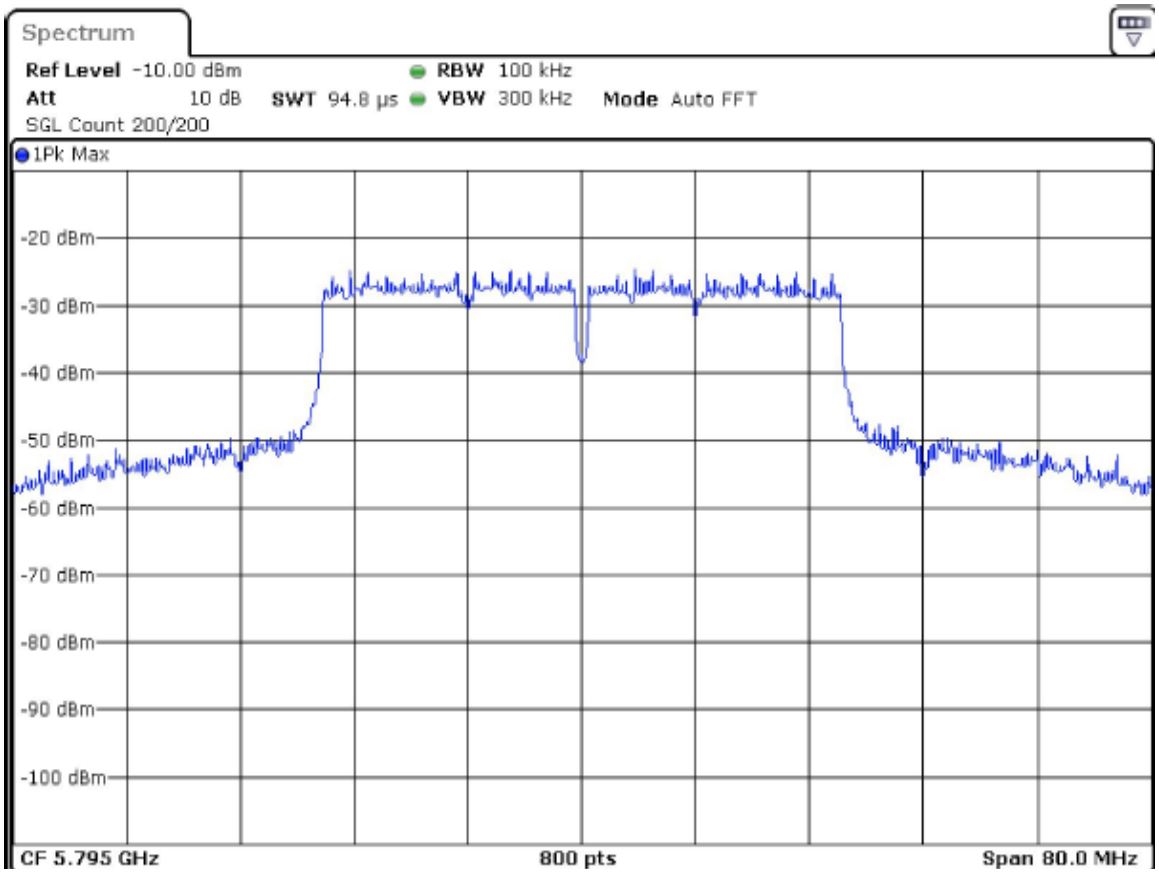
802.11ac(VHT20) MCS0 5745MHz



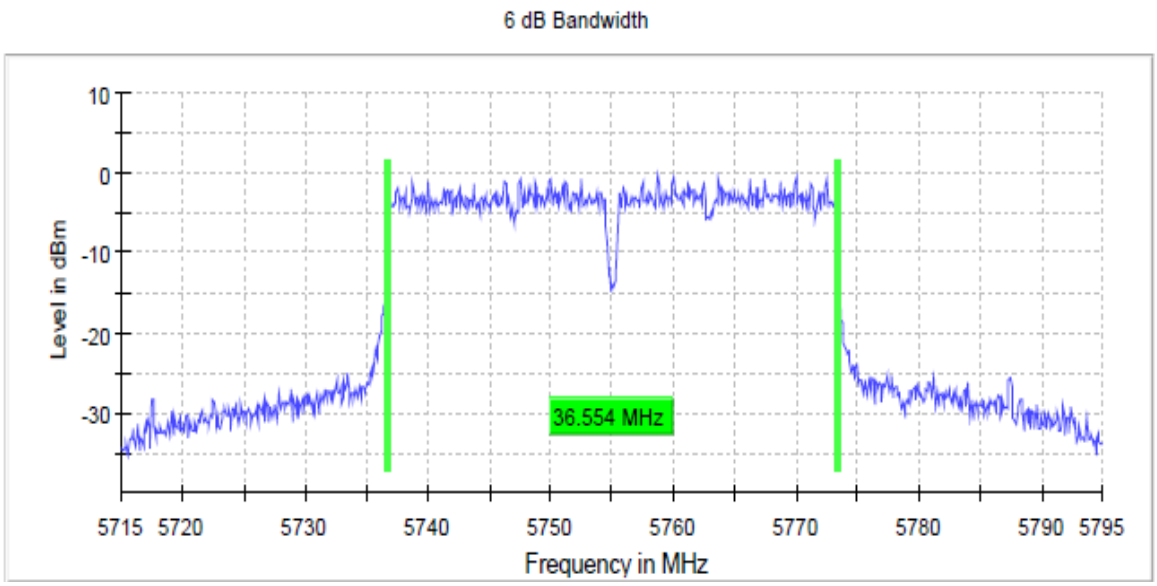


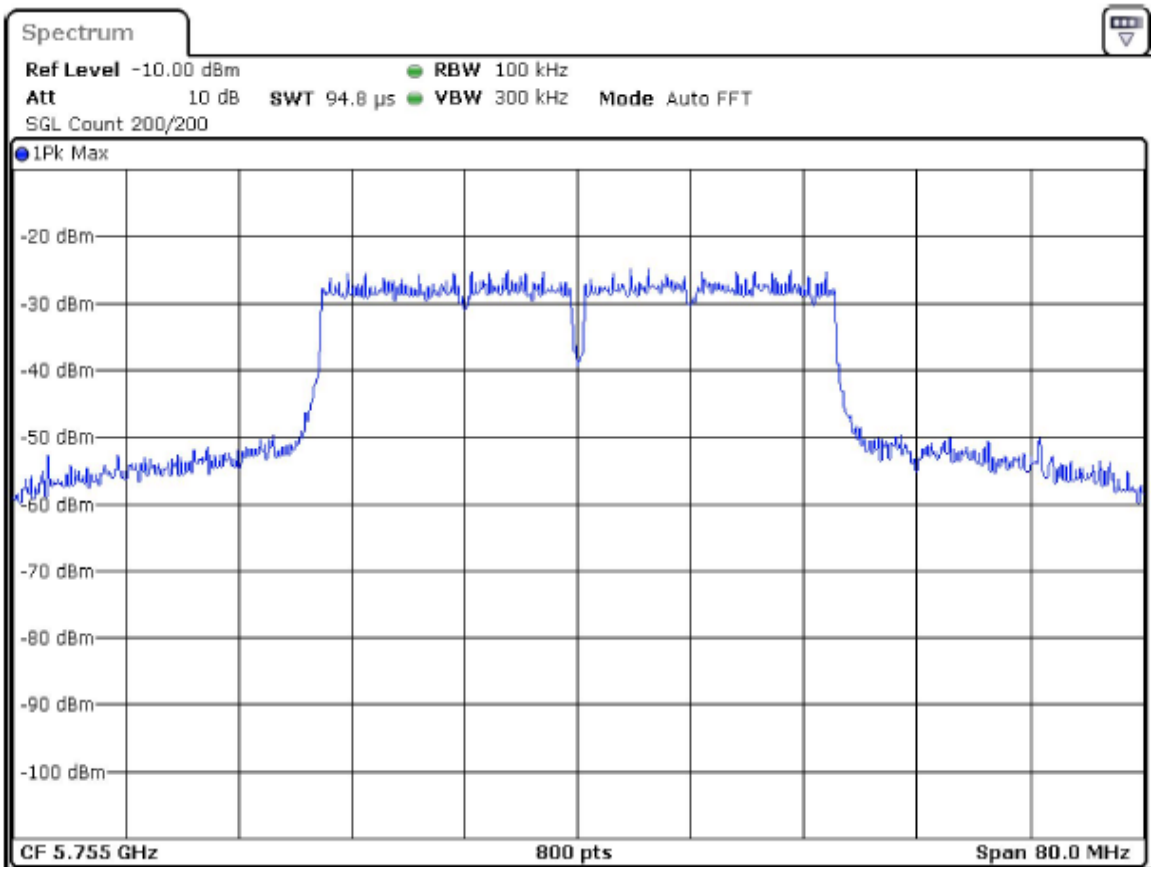
802.11n(HT40) MCS7 5795MHz





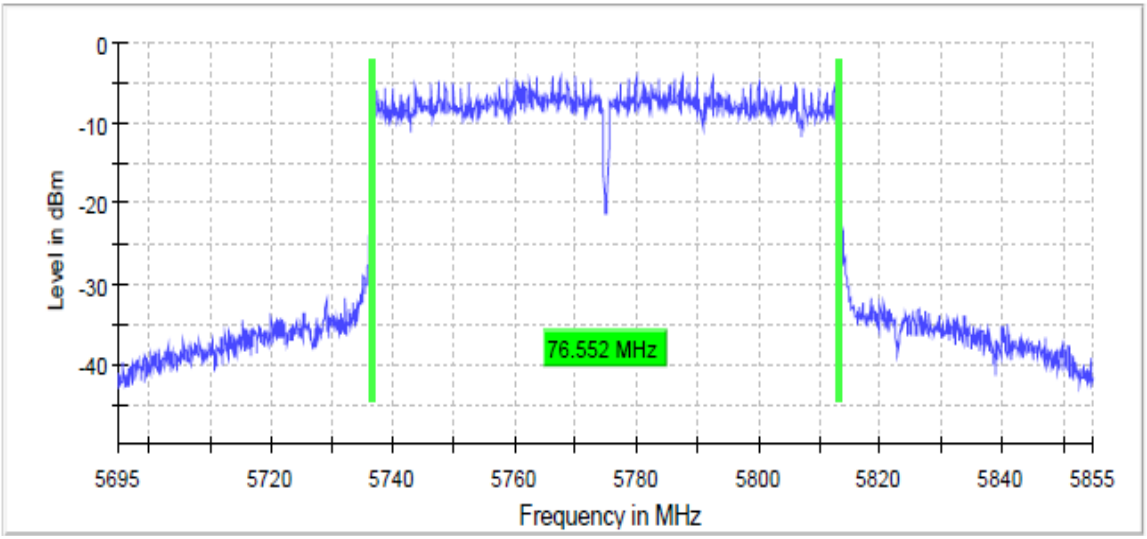
802.11ac(VHT40) MCS9 5755MHz

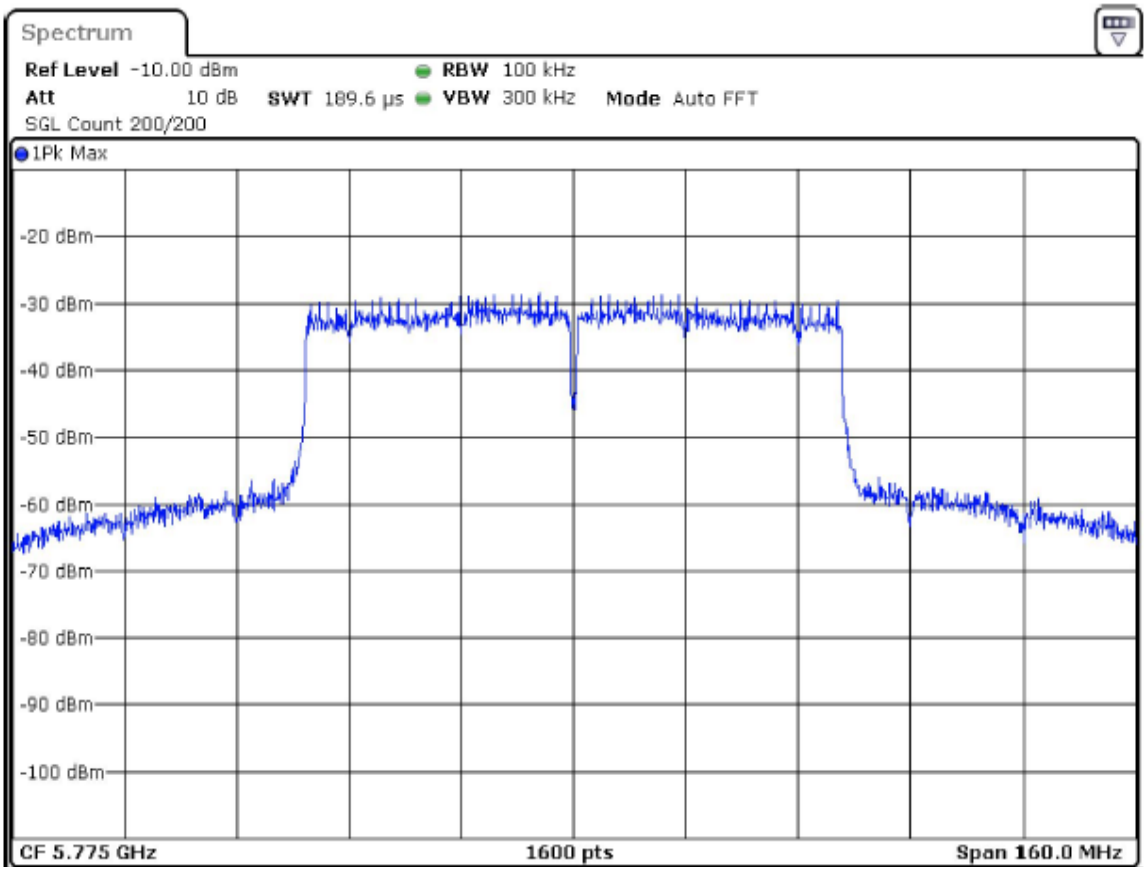




802.11ac(VHT80) MCS9 5775MHZ

6 dB Bandwidth





Occupied Channel Bandwidth 99%

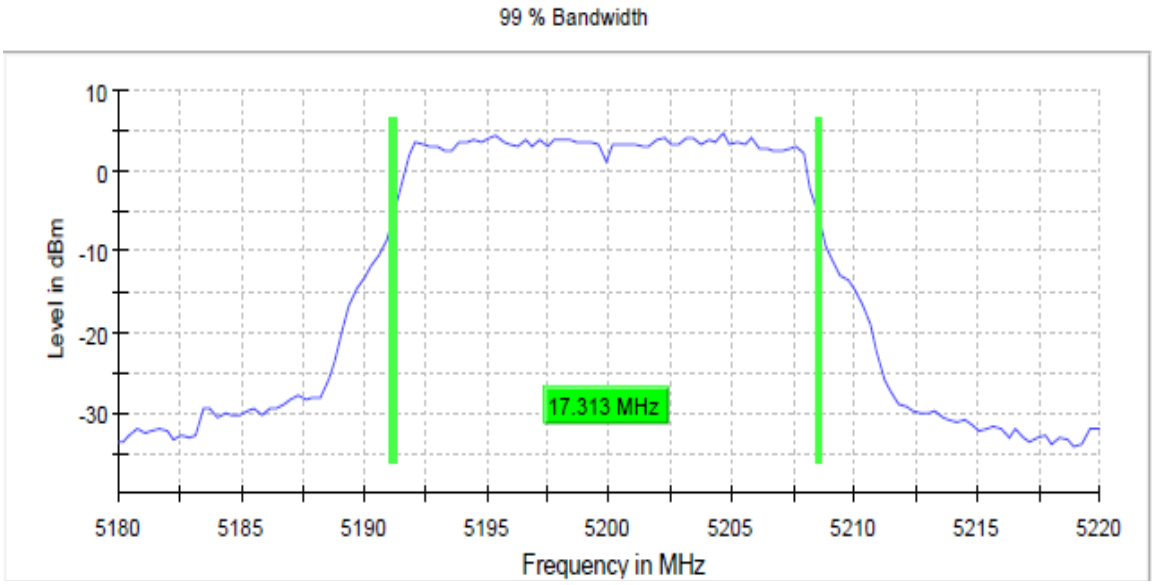
Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.D.

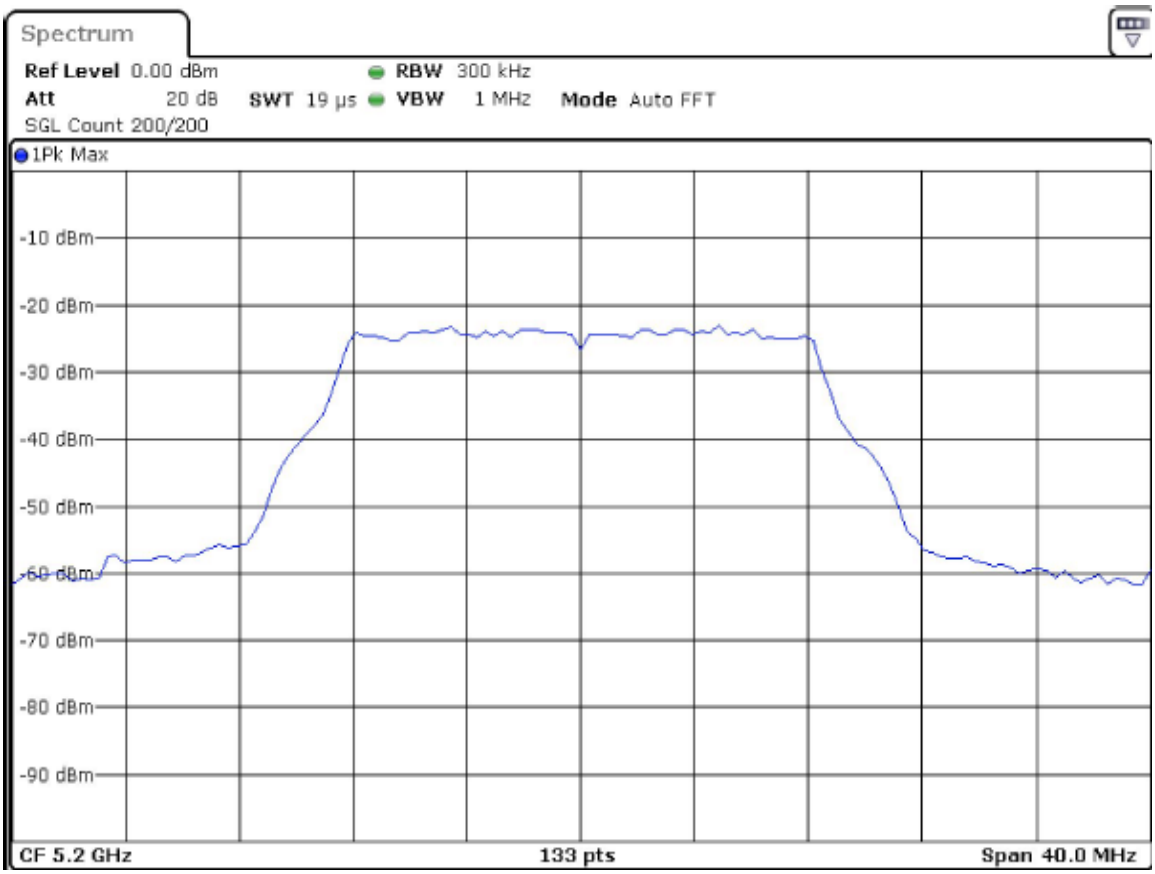
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

U-NII-1

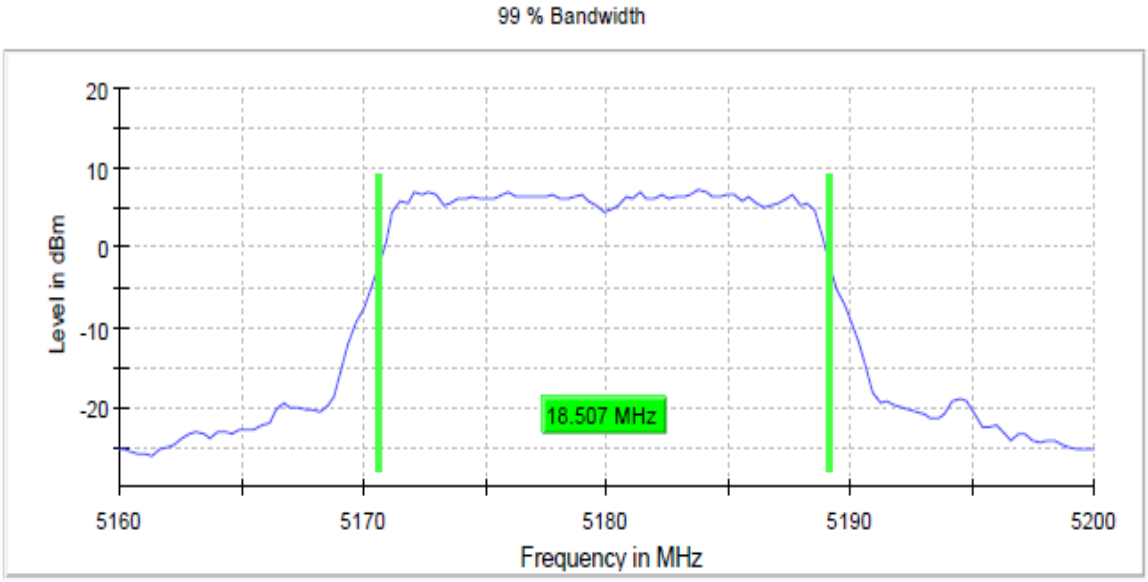
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Band Limits
802.11a 6 Mb/s	5180.000	17.313433	5171.194030	5188.507463	5150-5250
802.11n(HT20) MSC0	5180.000	18.507463	5170.597015	5189.104478	5150-5250
802.11ac(VHT20) MCS1	5180.000	17.910448	5170.895522	5188.805970	5150-5250
802.11n(HT40) MSC1	5190.000	36.770186	5171.614907	5208.385093	5150-5250
802.11ac(VHT40) MCS4	5190.000	36.273292	5171.614907	5207.888199	5150-5250
802.11a 6 Mb/s	5200.000	17.313433	5191.194030	5208.507463	5150-5250
802.11n(HT20) MSC0	5200.000	18.208956	5190.895522	5209.104478	5150-5250
802.11ac(VHT20) MCS1	5200.000	17.910448	5190.895522	5208.805970	5150-5250
802.11ac(VHT80) MCS9	5210.000	76.521739	5171.242236	5247.763975	5150-5250
802.11n(HT40) MSC1	5230.000	36.273292	5211.614907	5247.888199	5150-5250
802.11ac(VHT40) MCS4	5230.000	36.770186	5211.614907	5248.385093	5150-5250
802.11a 6 Mb/s	5240.000	17.313433	5231.194030	5248.507463	5150-5250
802.11n(HT20) MSC0	5240.000	18.208956	5230.895522	5249.104478	5150-5250
802.11ac(VHT20) MCS1	5240.000	18.208956	5230.895522	5249.104478	5150-5250

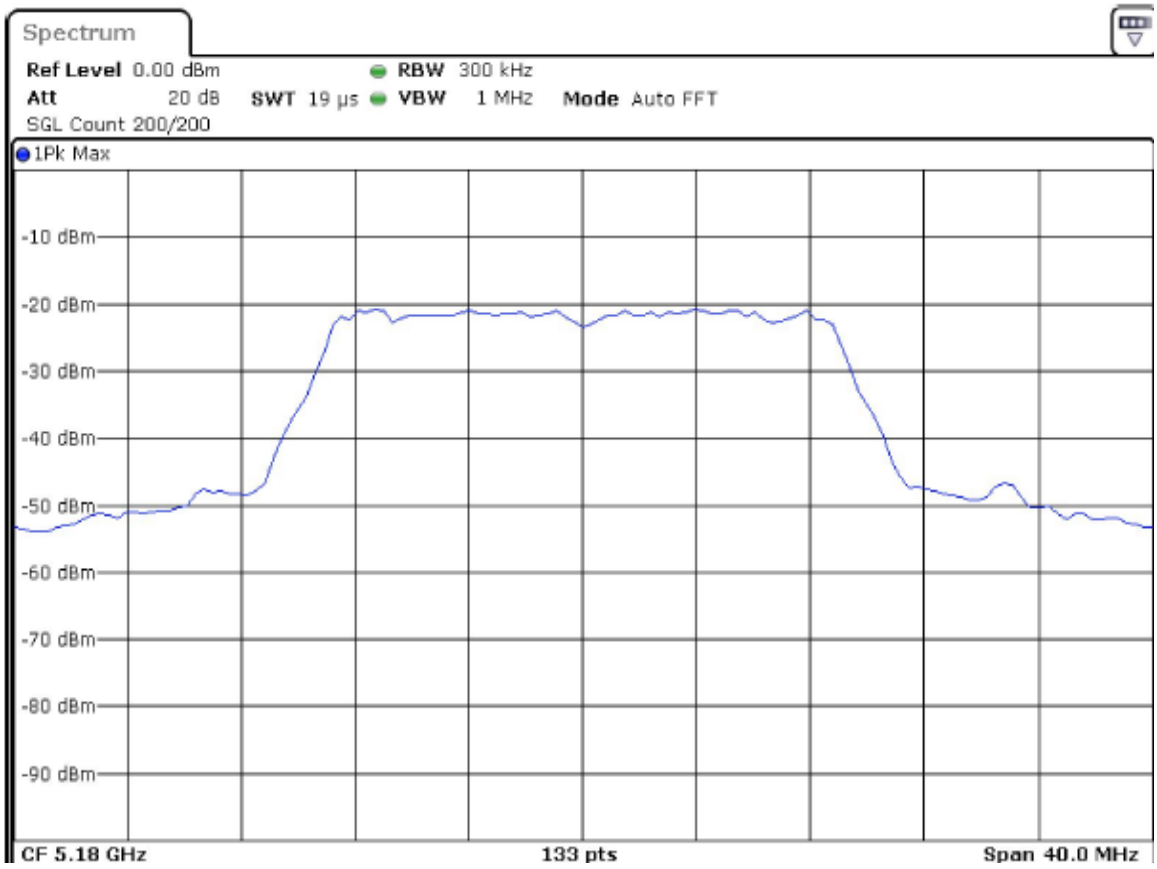
802.11a 6 Mb/s 5200MHz



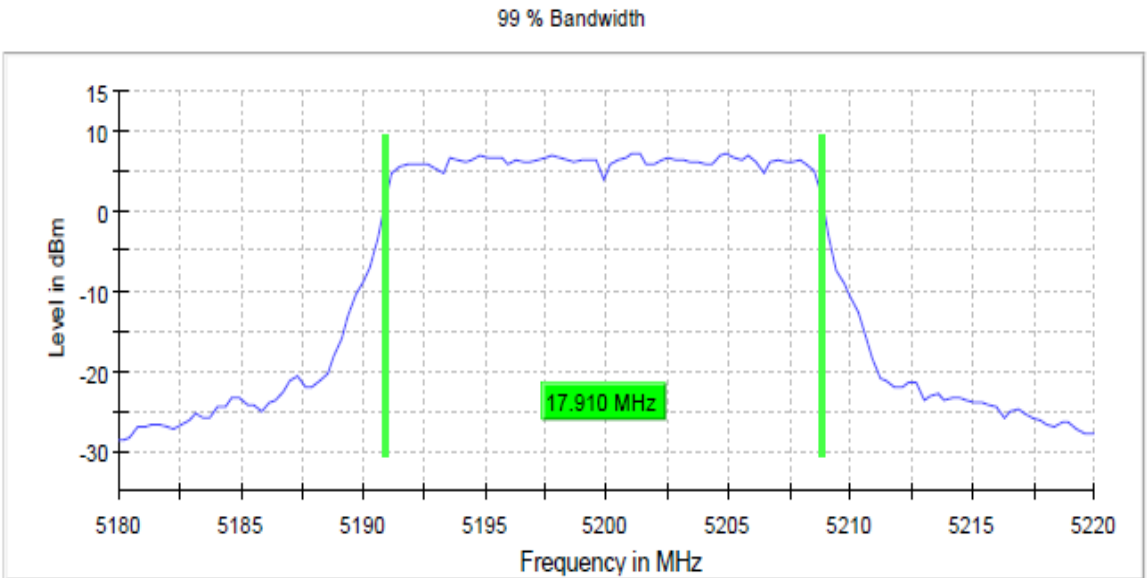


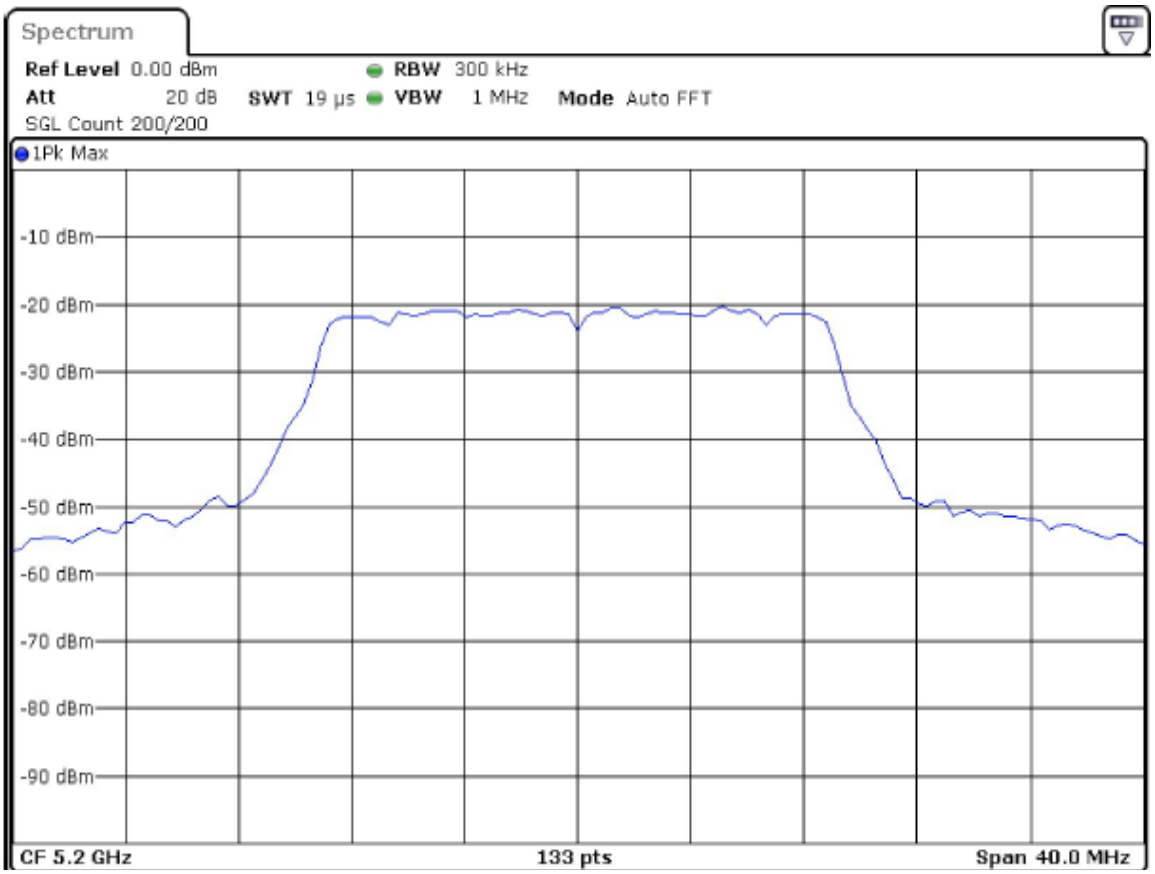
802.11n(HT20) MCS0 5180MHz



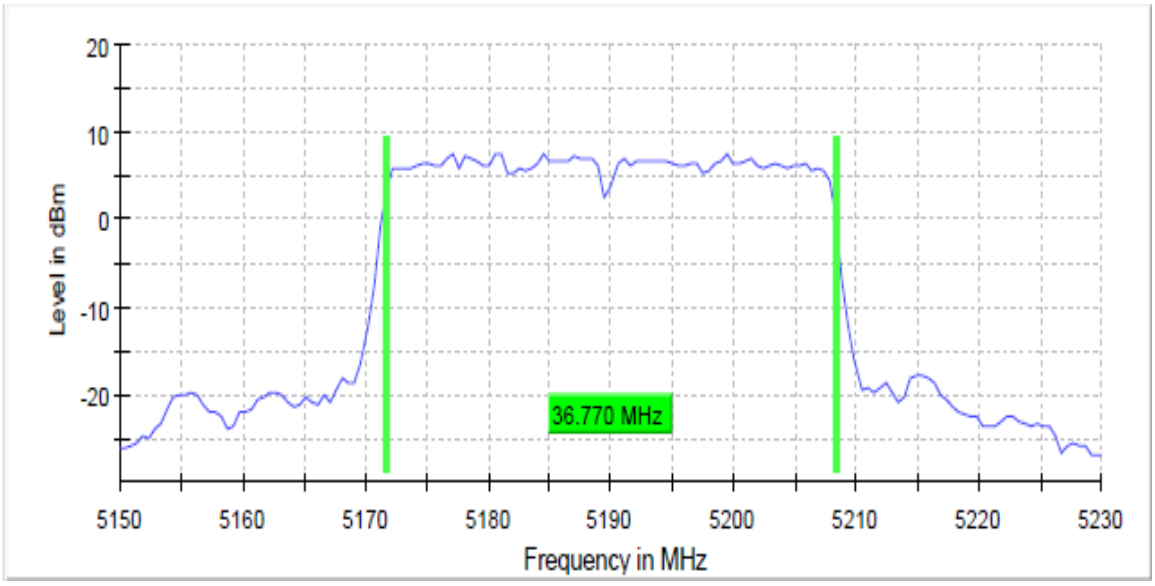


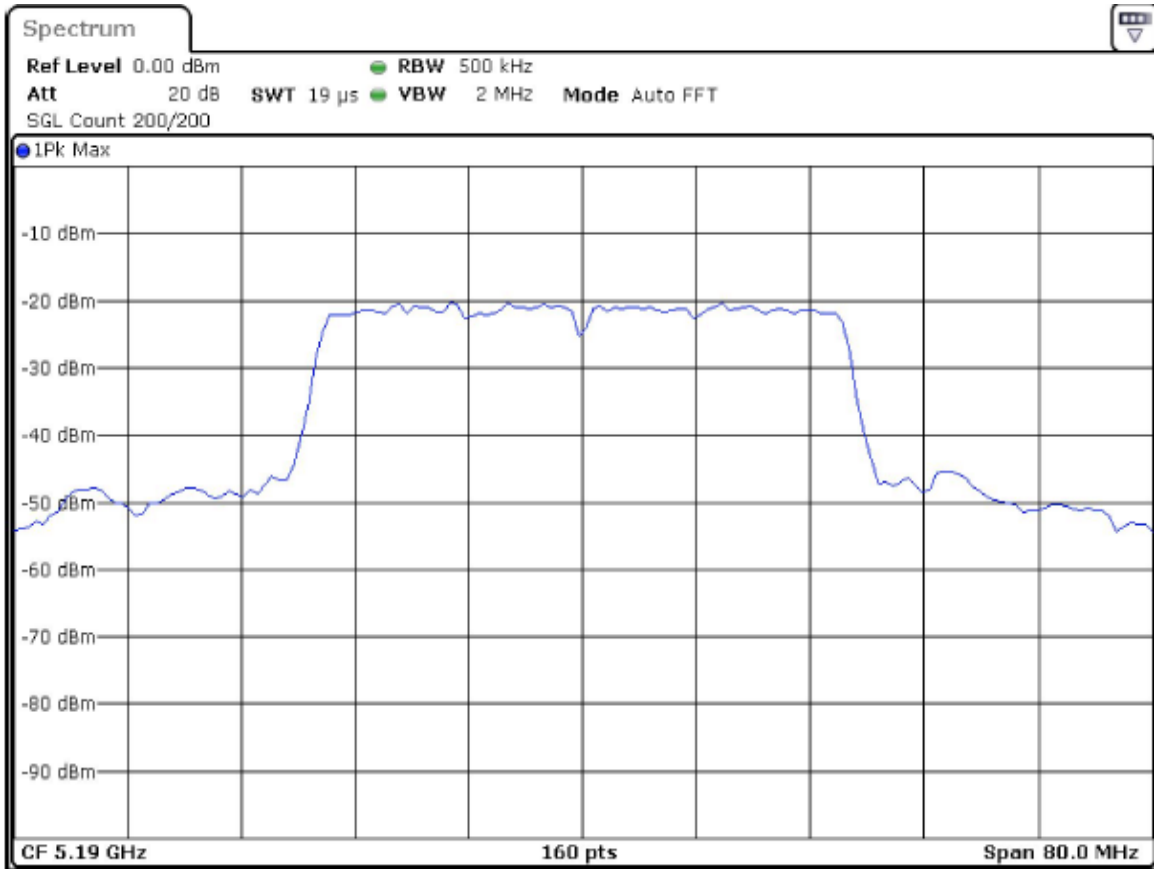
802.11ac(VHT20) MCS1 5200MHz



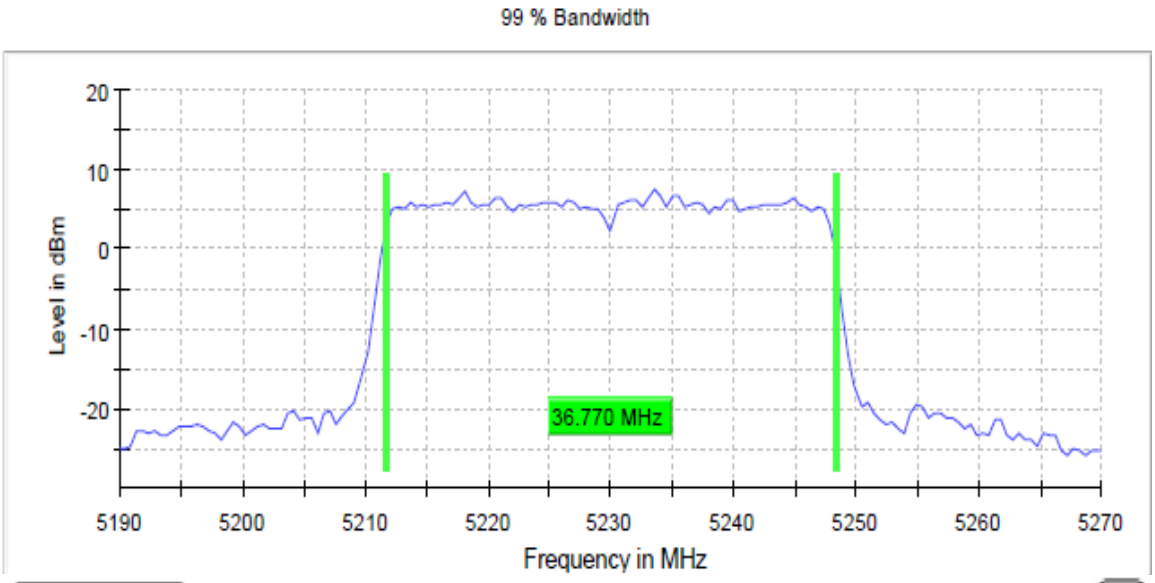


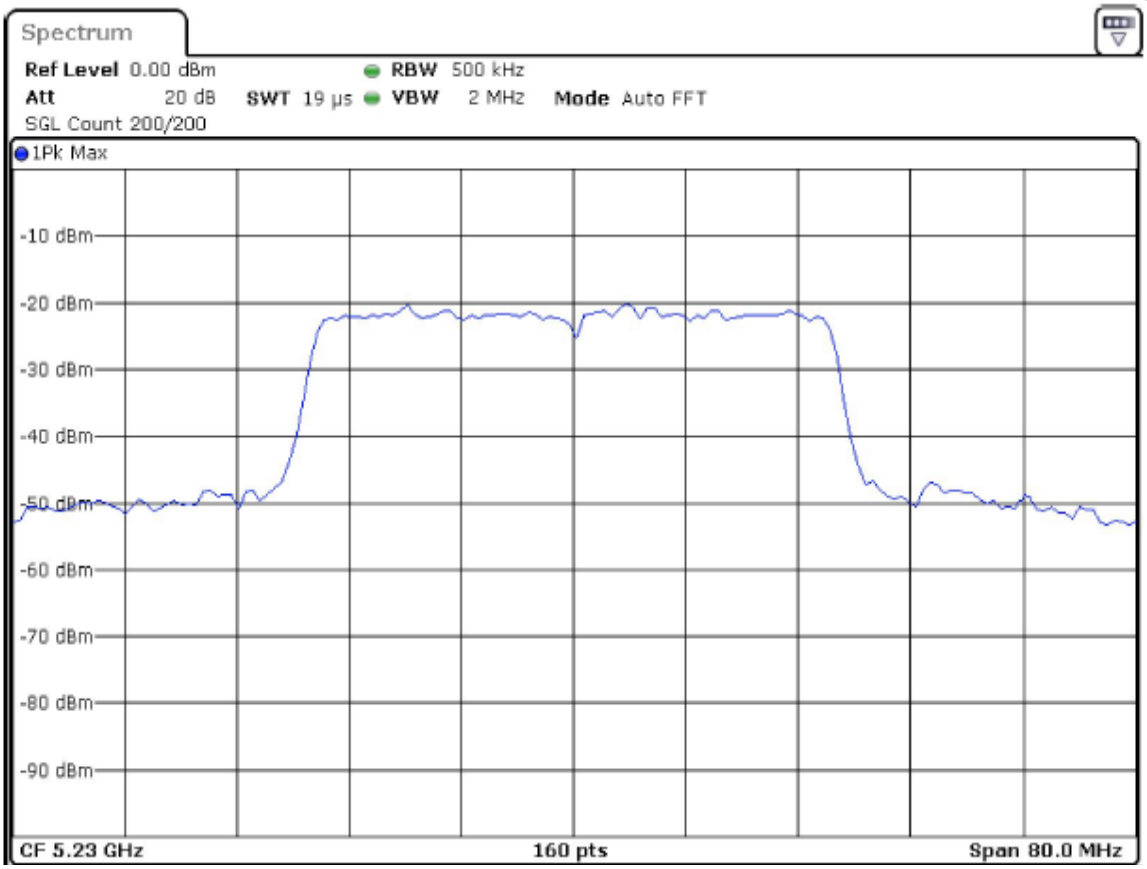
802.11n(HT40) MCS1 5190MHZ



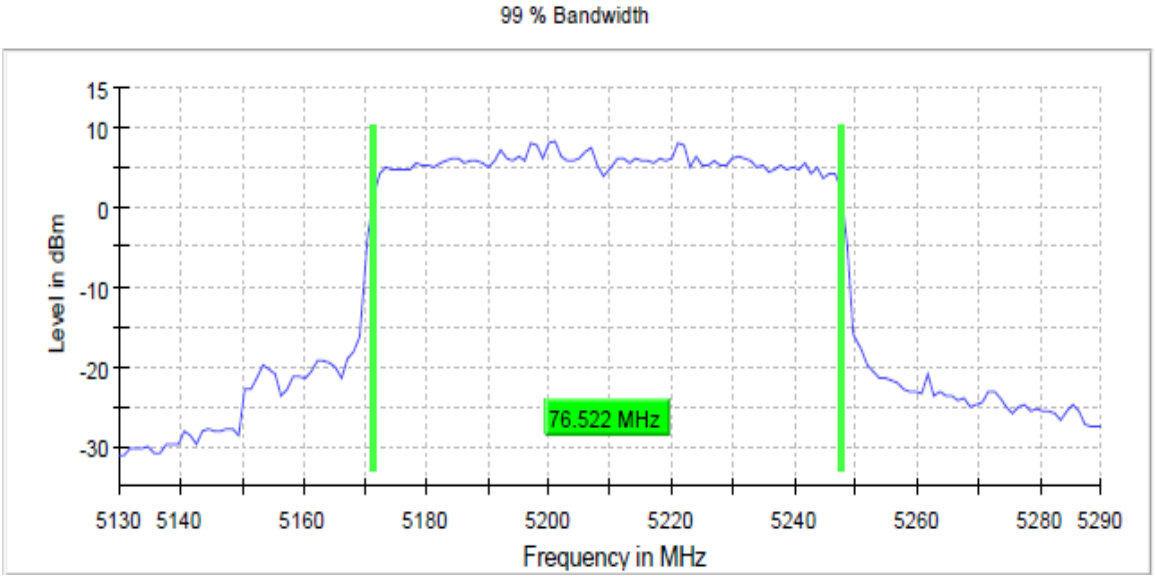


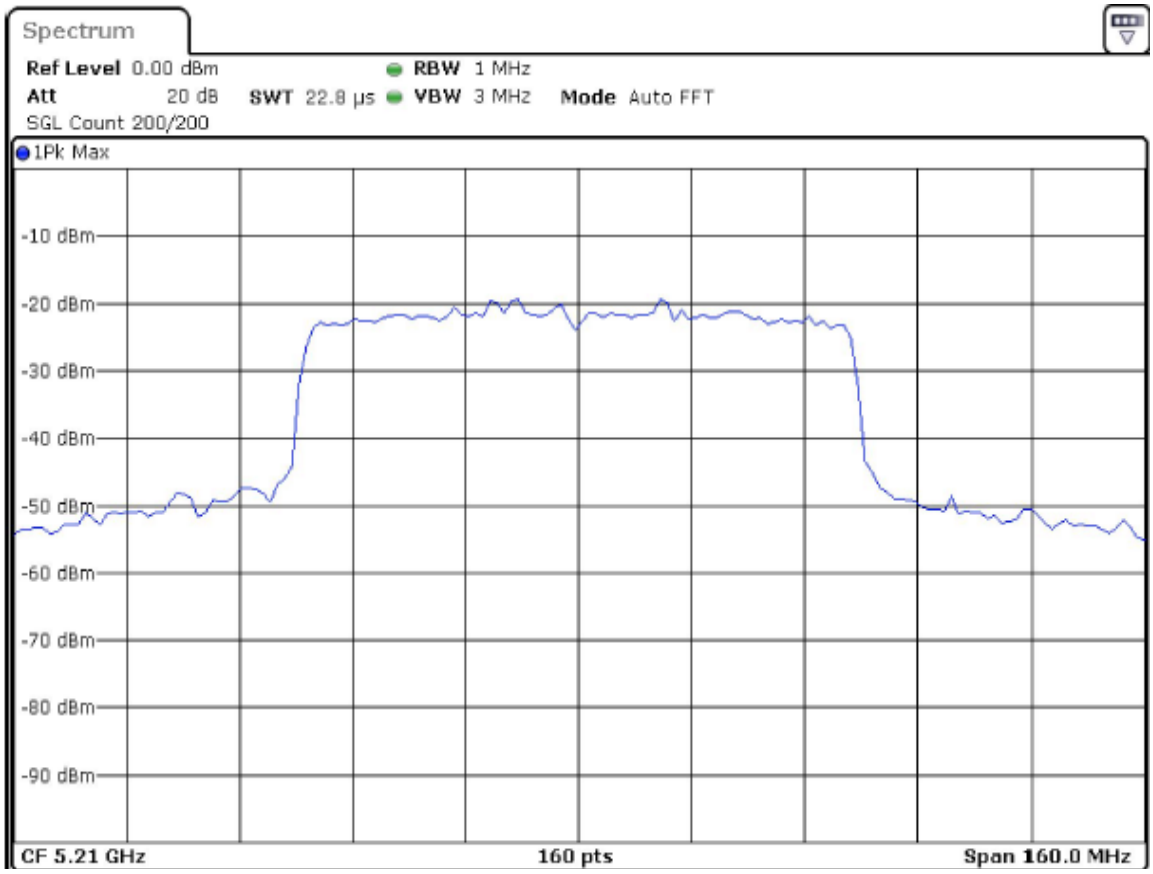
802.11ac(VHT40) MCS4 5230MHz





802.11ac(VHT80) MCS9 5210MHZ

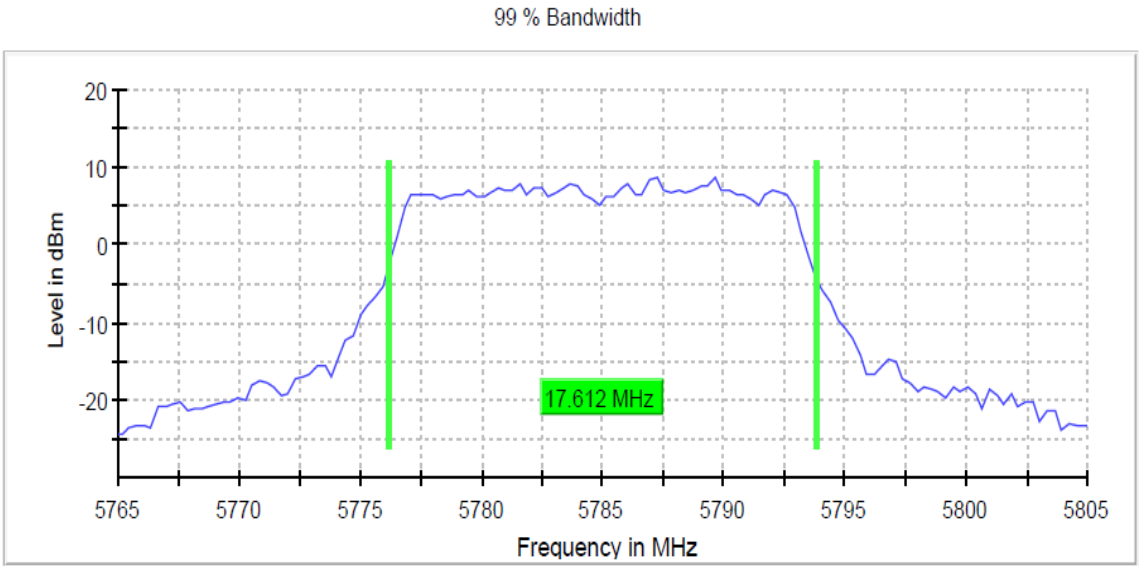


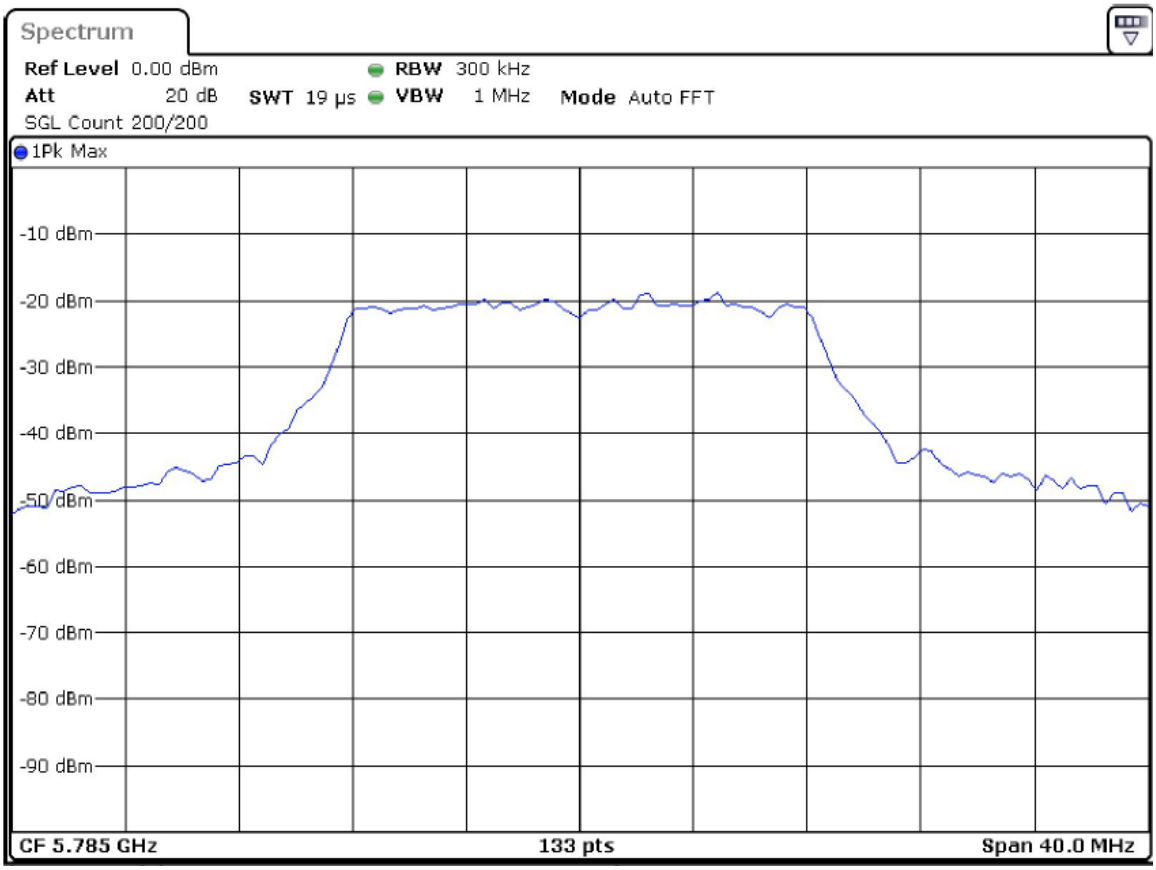


FCC U-NII-3

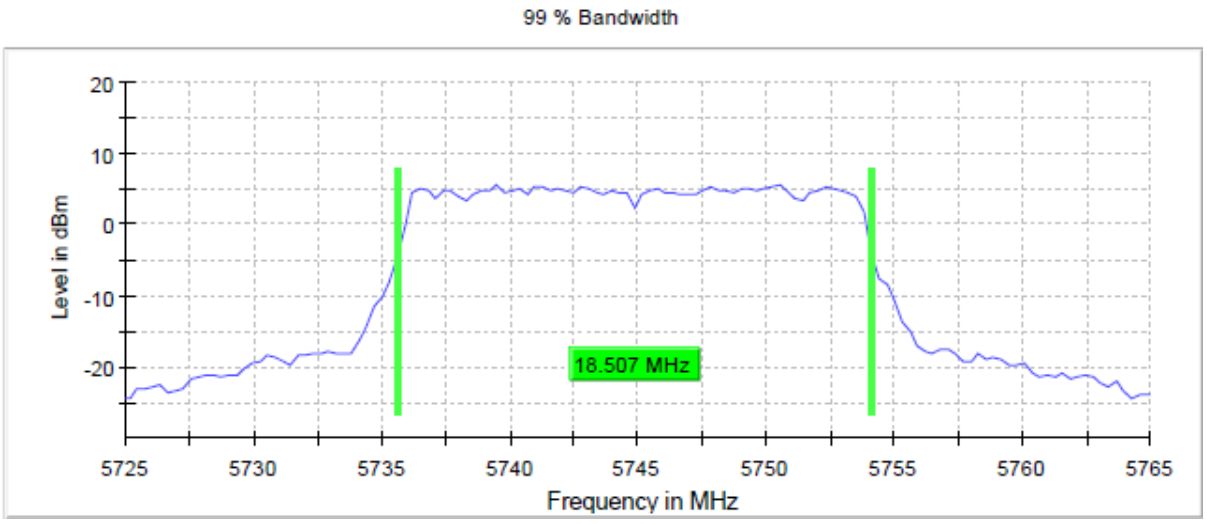
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Band Limits
802.11a 9 Mb/s	5745.00	17.611940	5736.194030	5753.805970	5725-5850
802.11n(HT20) MSC7	5745.00	18.507463	5735.597015	5754.104478	5725-5850
802.11ac(VHT20) MCS0	5745.00	18.507463	5735.597015	5754.104478	5725-5850
802.11n(HT40) MSC7	5755.00	37.267081	5736.118012	5773.385093	5725-5850
802.11ac(VHT40) MCS9	5755.00	37.267081	5736.118012	5773.385093	5725-5850
802.11ac(VHT80) MCS9	5775.00	76.521739	5736.242236	5812.763975	5725-5850
802.11a 9 Mb/s	5785.00	17.611940	5776.194030	5793.805970	5725-5850
802.11n(HT20) MSC7	5785.00	18.208956	5775.895522	5794.104478	5725-5850
802.11ac(VHT20) MCS0	5785.00	18.507463	5775.597015	5794.104478	5725-5850
802.11n(HT40) MSC7	5795.00	37.267081	5776.118012	5776.118012	5725-5850
802.11ac(VHT40) MCS9	5795.00	37.267081	5776.118012	5813.385093	5725-5850
802.11a 9 Mb/s	5825.00	17.611940	5816.194030	5833.805970	5725-5850
802.11n(HT20) MSC7	5825.00	18.507463	5815.597015	5834.104478	5725-5850
802.11ac(VHT20) MCS0	5825.00	18.507463	5815.597015	5834.104478	5725-5850

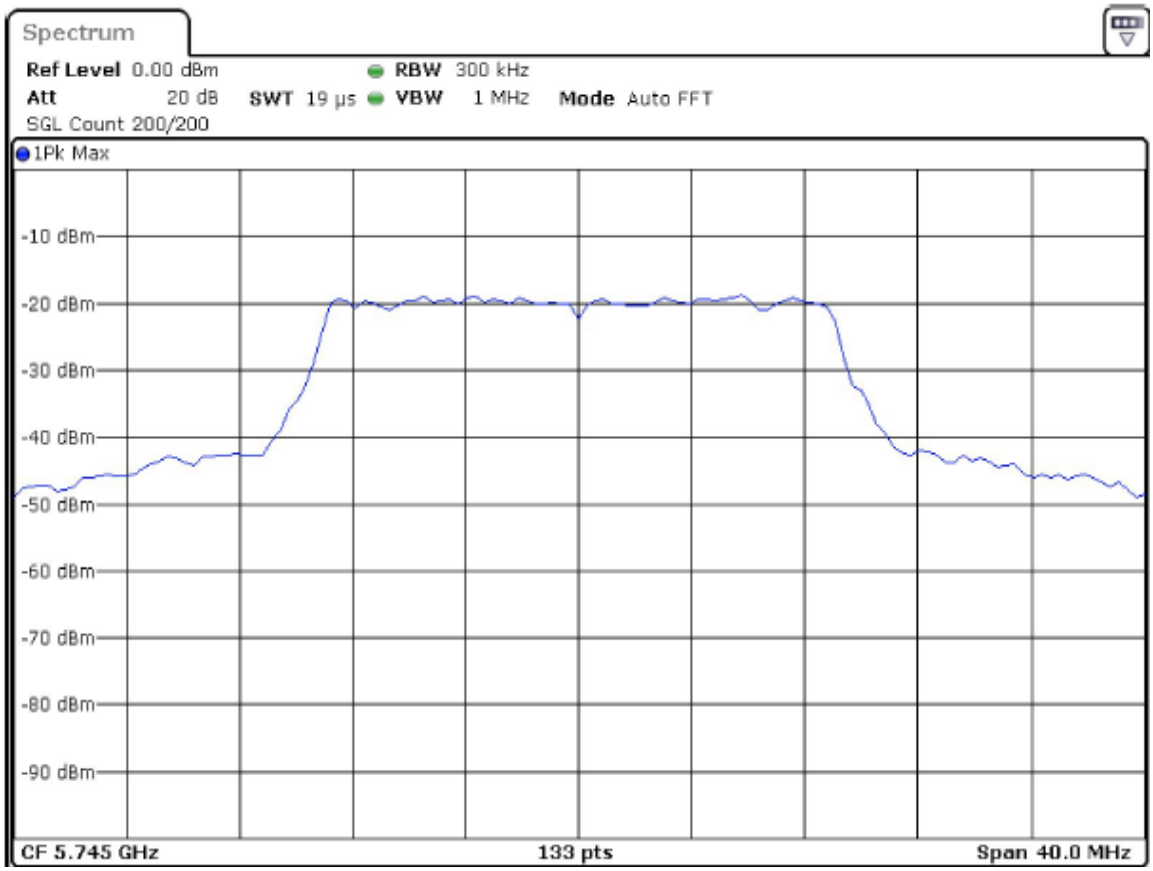
802.11a 9 Mb/s 5785MHz



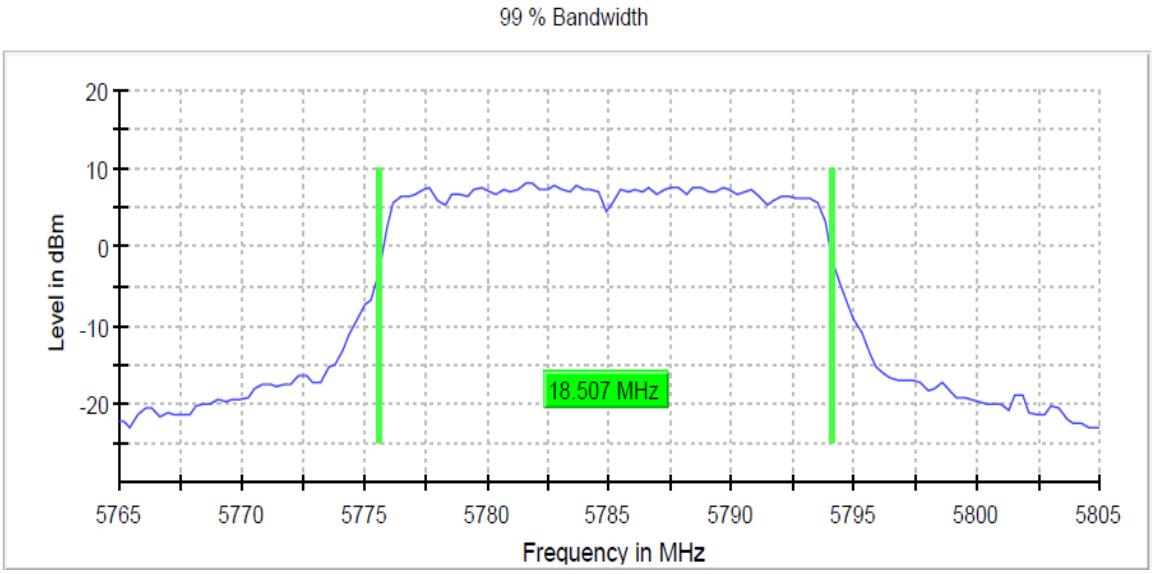


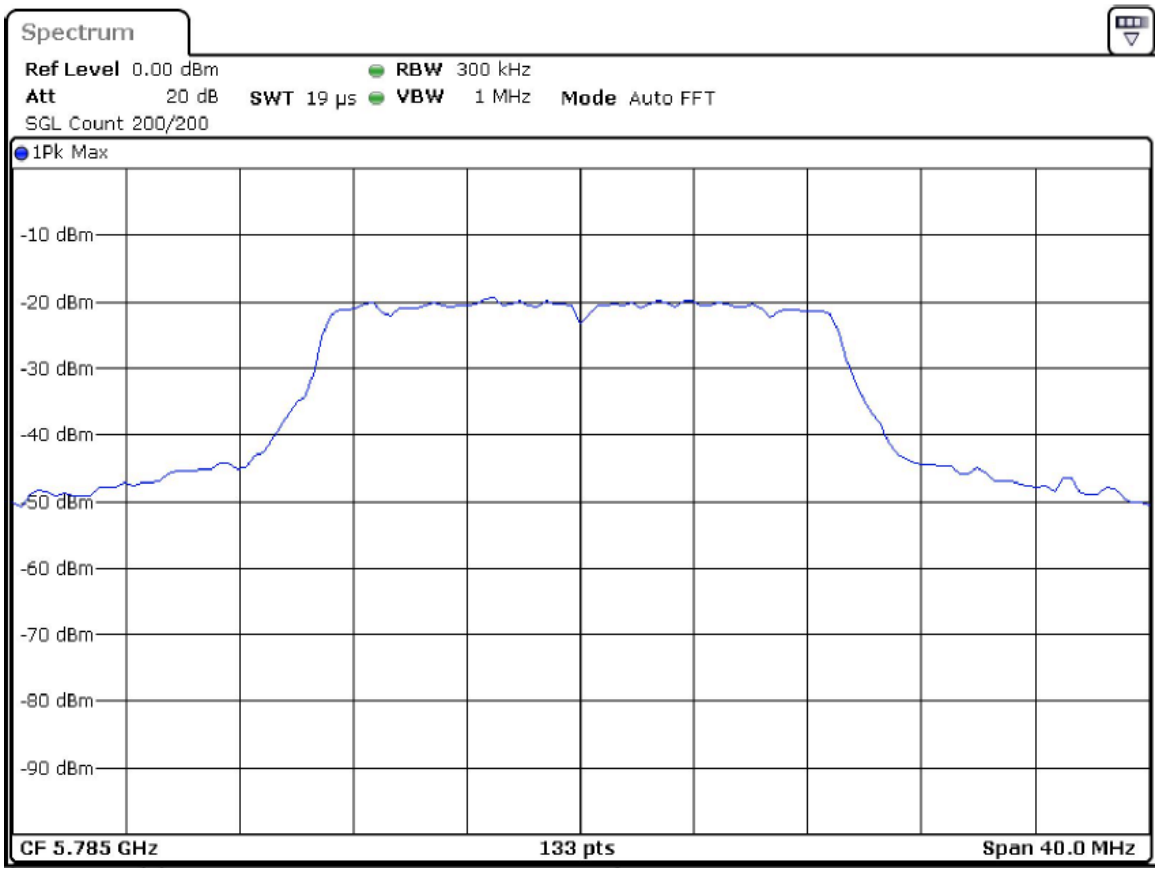
802.11n(HT20) MCS7 5745MHz



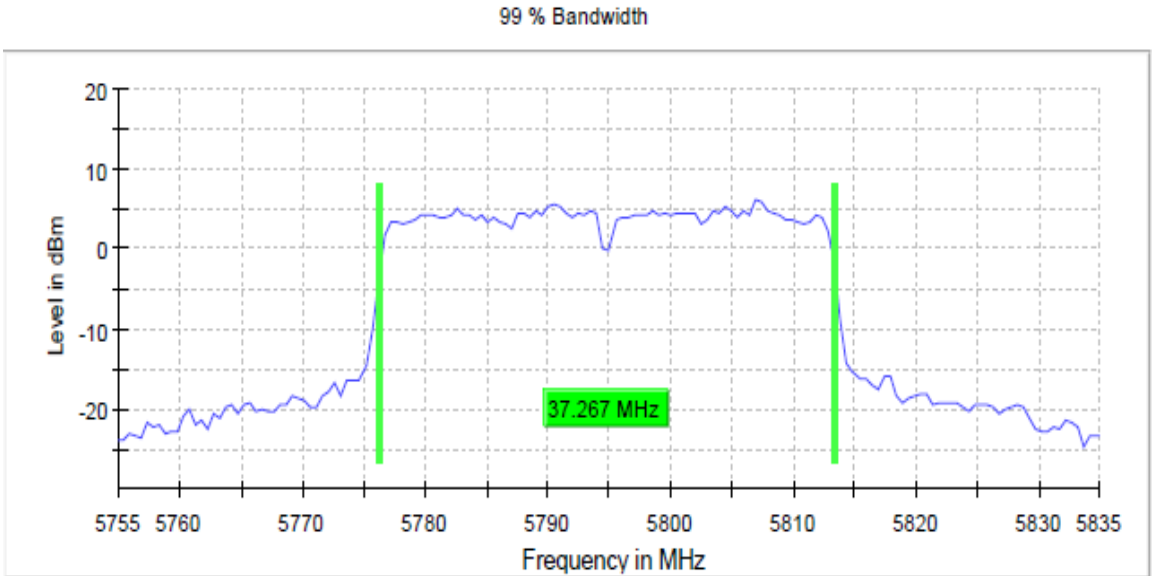


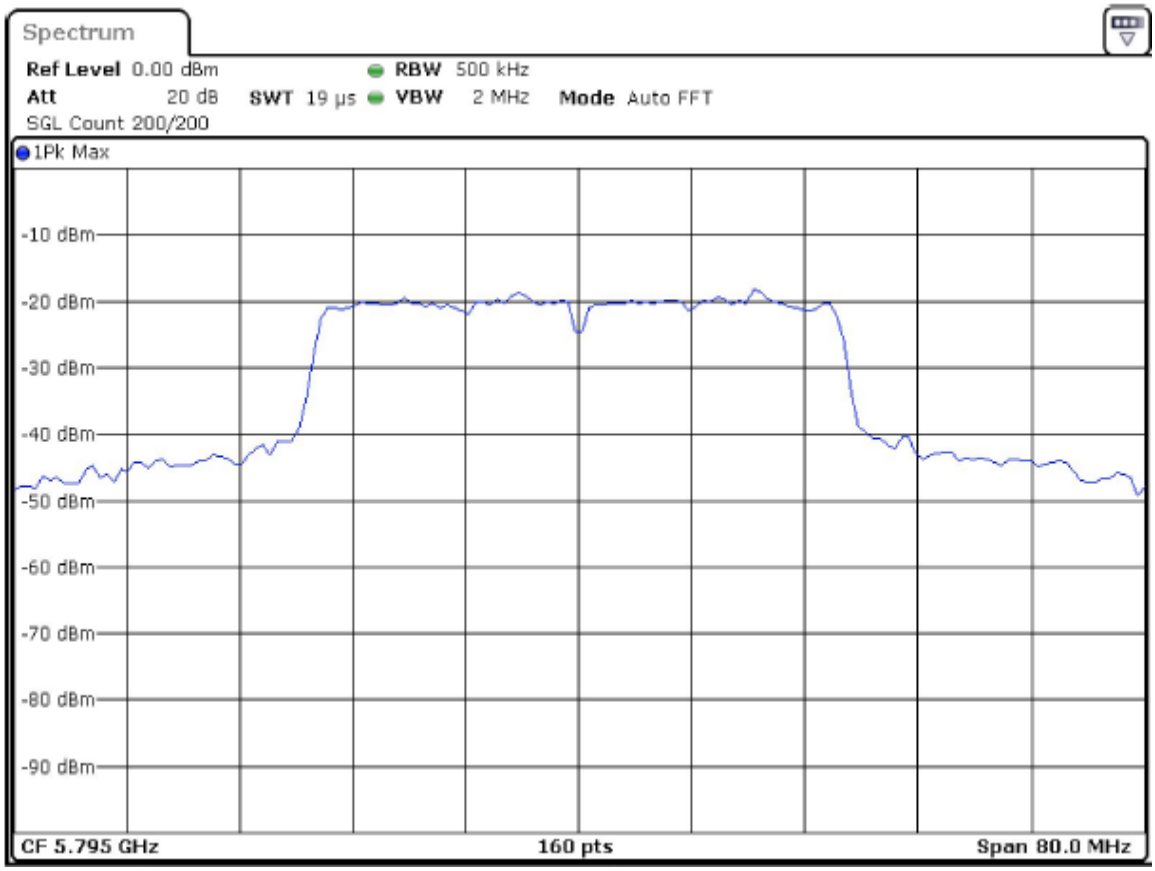
802.11ac(VHT20) MCS0 5785MHz



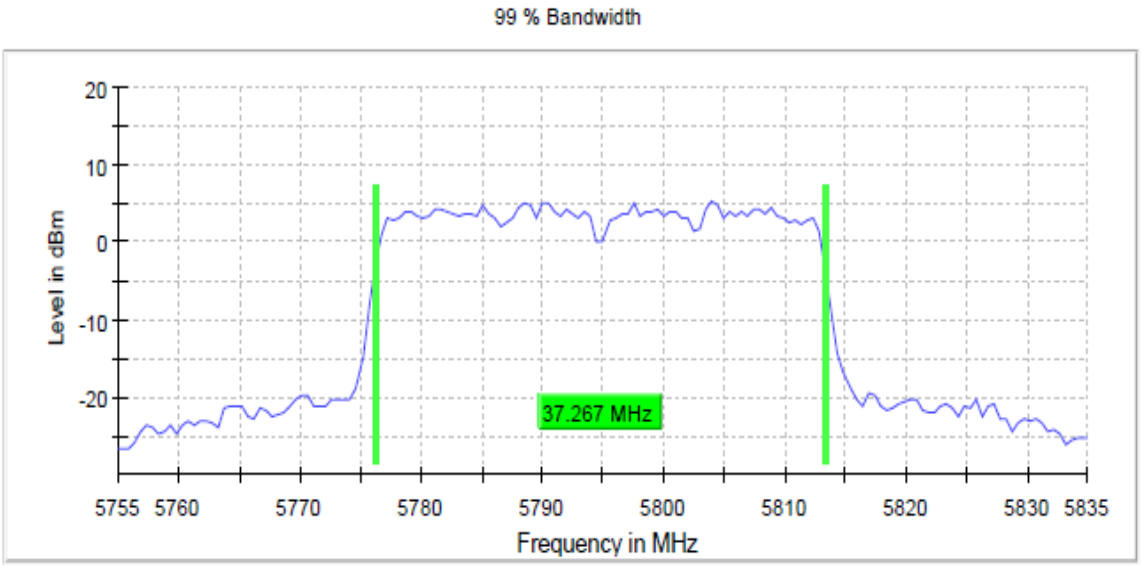


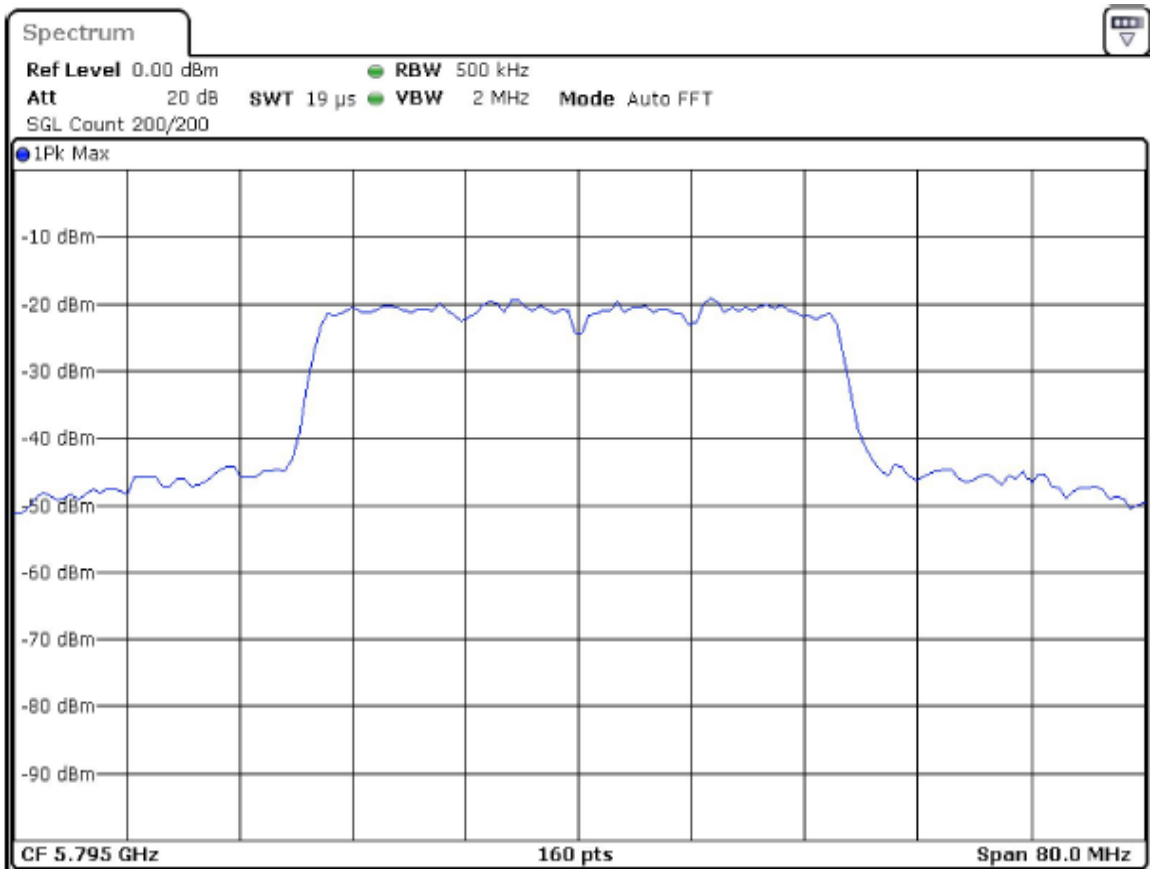
802.11n(HT40) MCS7 5795MHZ





802.11ac(VHT40) MCS9 5795MHz





802.11ac(VHT80) MCS9 5775MHZ

99 % Bandwidth