Test Report

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

Report No	ER1905-9
Client	Harman International Industries, Inc. Mark Bowman
Address	30001 Cabot Drive Novi, MI 48377
Phone	248-254-7751
Items tested	INFO3 CSM MY19 HIGH
FCC ID	2AHPN-BE2829
IC	6434C-BE2829
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 12th to September 6th, 2017
Results	As detailed within this report
Prepared by	Zachary Johnson – Test Engineer
Authorized by	Yunus Faziloglu – Sr. EMC Engineer
Issue Date	11/9/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 21 of this report.

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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 INFO3 CSM MY19 HIGH. It is a transmitter that operates in the following bands:

5180MHz – 5240MHz

5745MHz – 5825MHz

Antenna Type: Single switching PCB trace antenna

Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Max Gain (dBi)
5160	55,73	-2,5391	5
5240	57,12	-2,4321	4,36
5320	62,09	-2,0698	4,47
5400	62,57	-2,0363	4,2
5480	60,01	-2,2178	3,96
5560	62,66	-2,0301	4,36
5640	57,28	-2,4200	3,8
5720	61,75	-2,0936	4,58
5840	59,52	-2,2534	4,2

Maximum Gain: 5.0 dBi

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 rotating the device around 3 orthogonal planes (X, Y and Z) and worst case emissions observed in X orientation (laying flat).

EUT operating voltage is 9-16V 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:	R1905		
Company:	Harman International Industries, Incorporated		
Company Address:	30001 Cabot Drive		
	Novi, MI, 48377		
Contact:	Mark Bowman		
	MN	**PN**	**SN**
EUT:	INFO3 CSM MY19 HIGH	--	Sample 1
EUT Description:	GM MY 19 – High Car Stereo		

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	comment
Antenna Ports	other	4	0					in	not used for permissive change test.
LVDS Harness	other	1	1	other	No	No	1	in	
USB	USB	2	2	USB	No	No	2	in	
Wiring Harness	Power DC	2	2	other	No	No	2	in	

Software Operating Mode Description:

EUT runs an internal test mode that generates WIFI signal.

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 single switching PCB trace antenna with 5dBi maximum 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. EUT 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.

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) and worst case emissions observed in X orientation (laying flat). All the results below are for the worst case orientation only.

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company				Work Order - R1509									
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC									
30-1000MHz Vertical Data				Test Site - CH1									
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar									
5G WIFI CH40 20MHz													
Frequency	Raw QP Reading	Correction Factor	Adjusted QP Amplitude	Limit Req 1	Margin Req 1	Test Results Req 1	Limit Req 2	Margin Req 2	Test Results Req 2	Antenna Height	EUT Azimuth	Worst Margin Req 1	Worst Margin Req 2
MHz	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
30.648	38.7	-14.7	24	40	-16	PASS	40	-16	PASS	100	80		
130.761	52.5	-21.1	31.4	43.5	-12.1	PASS	43.5	-12.1	PASS	100	72	-12.1	-12.1
548.38	45.2	-15.2	30	46	-16	PASS	46	-16	PASS	125	7		
552.888	45.5	-15	30.5	46	-15.5	PASS	46	-15.5	PASS	108	11		
764.897	41.7	-11.5	30.1	46	-15.9	PASS	46	-15.9	PASS	143	203		
913.755	40.8	-9.1	31.7	46	-14.3	PASS	46	-14.3	PASS	101	20		

Curtis Straus - a Bureau Veritas Company				Work Order - R1509									
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC									
30-1000MHz Horizontal Data				Test Site - CH1									
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar									
5G WIFI CH40 20MHz													
Frequency	Raw QP Reading	Correction Factor	Adjusted QP Amplitude	Limit Req 1	Margin Req 1	Test Results Req 1	Limit Req 2	Margin Req 2	Test Results Req 2	Antenna Height	EUT Azimuth	Worst Margin Req 1	Worst Margin Req 2
MHz	(dBµV)	(dB/m)	(dBµV/m)	(dbµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
30.902	39	-14.9	24.1	40	-15.9	PASS	40	-15.9	PASS	144	146		
130.161	47.8	-21.1	26.7	43.5	-16.8	PASS	43.5	-16.8	PASS	246	240		
456.764	49.8	-16.6	33.2	46	-12.8	PASS	46	-12.8	PASS	105	300	-12.8	-12.8
783.048	41.4	-11.3	30.1	46	-15.9	PASS	46	-15.9	PASS	111	0		
848.042	42.9	-10.6	32.3	46	-13.8	PASS	46	-13.8	PASS	146	128		
913.72	41.9	-9.1	32.9	46	-13.1	PASS	46	-13.1	PASS	100	317		

30-1000MHz Channel 40

Curtis Straus - a Bureau Veritas Company				Work Order - R1509										
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC										
1-6GHz Vertical Data				Test Site - CH1										
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar										
5G WIFI CH36 20MHz														
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
1724.9	33.7	23.5	12.8	46.4	36.3	74	-27.6	PASS	54	-17.7	PASS	183	59		
5977	34.8	24.3	22.9	57.8	47.3	74	-16.2	PASS	54	-6.7	PASS	217	205	-16.2	-6.7

Curtis Straus - a Bureau Veritas Company				Work Order - R1509										
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC										
1-6GHz Horizontal Data				Test Site - CH1										
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar										
5G WIFI CH36 20MHz														
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
5811.5	32.8	23.8	22.5	55.4	46.3	74	-18.6	PASS	54	-7.7	PASS	275	335	-18.6	-7.7

1-6GHz Channel 36

Curtis Straus - a Bureau Veritas Company				Work Order - R1509										
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC										
1-6GHz Vertical Data				Test Site - CH1										
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar										
5G WIFI CH40 20MHz														
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
5742.2	32.1	24	22.6	54.7	46.6	74	-19.3	PASS	54	-7.4	PASS	116	198		-7.4
5754.7	32.2	24	22.5	54.8	46.5	74	-19.2	PASS	54	-7.4	PASS	100	183	-19.2	

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC											
1-6GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH40 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
5989.4	34	24.4	23	57	47.3	74	-17	PASS	54	-6.6	PASS	275	157	-17	-6.6

1-6GHz Channel 40

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH48 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
16889.9	31.7	20.8	33.7	65.4	54.5	83.5	-18.1	PASS	63.5	-9	PASS	138	147	-18.1	-9

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH48 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
7659.5	25	16.3	25.9	50.8	42.2	83.5	-32.7	PASS	63.5	-21.3	PASS	174	124		
17983.5	28.7	19.9	35.2	63.9	55.2	83.5	-19.6	PASS	63.5	-8.3	PASS	116	271	-19.6	-8.3

1-6GHz Channel 48

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC											
1-6GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH149 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
1305.6	33.4	25.9	11.4	44.8	37.4	74	-29.2	PASS	54	-16.6	PASS	178	3		
1434.9	34	25.8	11.2	45.2	37	74	-28.8	PASS	54	-16.9	PASS	114	228		
5880	31.5	23.3	22.7	54.2	46	74	-19.7	PASS	54	-7.9	PASS	125	220	-19.7	-7.9

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC											
1-6GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH149 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
1305.6	33.8	26.1	11.4	45.3	37.6	74	-28.7	PASS	54	-16.4	PASS	118	289		
1435.1	34.4	26.5	11.2	45.6	37.7	74	-28.4	PASS	54	-16.3	PASS	204	322		
5964.1	32	23.8	22.9	54.9	46.8	74	-19	PASS	54	-7.2	PASS	207	278	-19	-7.2

1-6GHz Channel 149

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC											
1-6GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH157 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
1109.9	35.3	29.1	9.2	44.6	38.4	74	-29.4	PASS	54	-15.6	PASS	115	10		
1305.2	35	25.9	11.4	46.5	37.3	74	-27.5	PASS	54	-16.7	PASS	225	3		
1372	31.5	24.8	11.3	42.8	36.2	74	-31.2	PASS	54	-17.8	PASS	175	25		
1435.1	35.6	28	11.2	46.9	39.2	74	-27.1	PASS	54	-14.7	PASS	211	60		
5744.1	32.8	23.7	22.6	55.4	46.2	74	-18.6	PASS	54	-7.8	PASS	175	195	-18.6	-7.8

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC											
1-6GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH157 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
1305.4	35.4	26.5	11.4	46.8	38	74	-27.2	PASS	54	-16	PASS	211	336		
1421.3	37.4	24.3	11.3	48.7	35.6	74	-25.3	PASS	54	-18.4	PASS	115	7		
1435.9	36.6	28.2	11.2	47.8	39.4	74	-26.2	PASS	54	-14.6	PASS	125	12		
3856.7	34.8	28.6	17.9	52.7	46.5	74	-21.3	PASS	54	-7.5	PASS	116	189		-7.5
5738.5	34	23.6	22.6	56.6	46.2	74	-17.4	PASS	54	-7.8	PASS	225	108	-17.4	
5759.1	32.1	23.6	22.5	54.7	46.1	74	-19.3	PASS	54	-7.9	PASS	100	314		

1-6GHz Channel 157

Curtis Straus - a Bureau Veritas Company					Work Order - R1509										
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC										
1-6GHz Vertical Data					Test Site - CH1										
Operator: CCH					Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar										
5G WIFI CH165 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
1304.8	32.8	25	11.4	44.3	36.4	74	-29.7	PASS	54	-17.6	PASS	110	9		
1435	34.3	25.6	11.2	45.5	36.8	74	-28.4	PASS	54	-17.2	PASS	104	39		
2438.7	34.8	25.3	14.6	49.4	39.9	74	-24.6	PASS	54	-14.1	PASS	300	299		
2461.4	35.1	25.2	14.6	49.8	39.8	74	-24.2	PASS	54	-14.2	PASS	125	55		
5580.6	32.5	24.2	22.1	54.6	46.3	74	-19.4	PASS	54	-7.7	PASS	125	67	-19.4	-7.7

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC											
1-6GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH165 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Antenna Height	EUT Azimuth	Worst Peak Margin	Worst Average Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)
1305.4	36.2	28.2	11.4	47.6	39.6	74	-26.4	PASS	54	-14.4	PASS	198	323		
1728.6	32.5	23.2	12.8	45.3	36	74	-28.7	PASS	54	-17.9	PASS	295	197		
1867.3	31.7	23.8	14.4	46.1	38.2	74	-27.9	PASS	54	-15.8	PASS	283	32		
1907.3	34	24	14.6	48.6	38.6	74	-25.4	PASS	54	-15.4	PASS	295	163		
5800.5	32.8	23.5	22.5	55.3	46	74	-18.6	PASS	54	-8	PASS	103	200	-18.6	-8

1-6GHz Channel 165

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH36 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
16731.1	31	21	33.7	64.6	54.7	83.5	-18.9	PASS	63.5	-8.8	PASS	100	21	-18.9	-8.8

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH36 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
17992.8	30.5	19.9	35.3	65.8	55.2	83.5	-17.7	PASS	63.5	-8.3	PASS	105	134	-17.7	-8.3

6-18GHz Channel 36

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH40 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
17999.2	27.6	19.9	35.3	62.9	55.2	83.5	-20.6	PASS	63.5	-8.3	PASS	119	125	-20.6	-8.3

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH40 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
7058	26.6	16.4	25.8	52.5	42.2	83.5	-31	PASS	63.5	-21.3	PASS	131	225		
17950.1	29.4	20	35	64.4	55	83.5	-19.1	PASS	63.5	-8.5	PASS	109	38	-19.1	-8.5

6-18GHz Channel 40

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH48 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
16889.9	31.7	20.8	33.7	65.4	54.5	83.5	-18.1	PASS	63.5	-9	PASS	138	147	-18.1	-9

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.3°C; 56%RH; 1001mBar											
5G WIFI CH48 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
7659.5	25	16.3	25.9	50.8	42.2	83.5	-32.7	PASS	63.5	-21.3	PASS	174	124		
17983.5	28.7	19.9	35.2	63.9	55.2	83.5	-19.6	PASS	63.5	-8.3	PASS	116	271	-19.6	-8.3

6-18GHz Channel 48

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH149 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
11490.8	25.3	16.6	28.6	53.8	45.2	83.5	-29.7	PASS	63.5	-18.3	PASS	200	228		
17964.8	28.9	19.9	35.1	64	55	83.5	-19.5	PASS	63.5	-8.5	PASS	168	164	-19.5	-8.5

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH149 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
6223.8	28.3	19.8	24.1	52.4	43.9	83.5	-31.1	PASS	63.5	-19.6	PASS	175	294		
11488.9	42.4	32.2	28.6	71	60.8	83.5	-12.5	PASS	63.5	-2.7	PASS	192	271	-12.5	-2.7
16492	30.8	20.9	33.5	64.3	54.4	83.5	-19.2	PASS	63.5	-9.1	PASS	182	289		

6-18GHz Channel 149

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH157 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
16550.1	30.4	20.9	33.5	63.8	54.4	83.5	-19.7	PASS	63.5	-9.1	PASS	200	325	-19.7	-9.1

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH157 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
No Emissions Found															

6-18GHz Channel 157

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Vertical Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH165 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	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)
17968.5	29.8	19.7	35.1	64.9	54.9	83.5	-18.6	PASS	63.5	-8.6	PASS	100	38	-18.6	-8.6

Curtis Straus - a Bureau Veritas Company				Work Order - R1509											
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC											
6-18GHz Horizontal Data				Test Site - CH1											
Operator: CCH				Temp; Humid; Pres - 24.6°C; 50%RH; 1006mBar											
5G WIFI CH165 20MHz															
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test 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)
17933.8	30.6	19.8	34.9	65.5	54.7	83.5	-18	PASS	63.5	-8.8	PASS	100	212	-18	-8.8

6-18GHz Channel 165

Radiated Emissions Table

Date: 09-Sep-17 **Company:** Harman International **Work Order:** R1509
Engineer: Chris Hamel **EUT Desc:** GM MY 19 High mod **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.1°C **Humidity:** 35% **Pressure:** 1006mBar
Frequency Range: 18-26.5GHz **Measurement Distance:** 0.1 m
Notes: 802.11a CH 157 **EUT Max Freq:**
No Emissions Found.

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 1 **Cable 1:** Asset #2329 **Cable 2:** --- **Cable 3:** ---
Analyzer: Asset #1328 **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

Radiated Emissions Table

Date: 09-Sep-17 **Company:** Harman International **Work Order:** R1509
Engineer: Chris Hamel **EUT Desc:** GM MY 19 High mod **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.1°C **Humidity:** 35% **Pressure:** 1006mBar
Frequency Range: 26.5-40GHz **Measurement Distance:** 0.1 m
Notes: 802.11a CH 157 **EUT Max Freq:**
No Emissions Found.

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 1 **Cable 1:** Asset #2329 **Cable 2:** Asset #2328 **Cable 3:** ---
Analyzer: Asset #1328 **Preamp:** 40GHz Mixer **Antenna:** 40GHz Mixer **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.188

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

18-40GHz Channel 157

Radiated Emissions Table

Date: 09-Sep-17 **Company:** Harman International **Work Order:** R1509
Engineer: Chris Hamel **EUT Desc:** GM MY 19 High mod **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.1°C **Humidity:** 35% **Pressure:** 1006mBar
Frequency Range: 18-26.5GHz **Measurement Distance:** 0.1 m
Notes: 802.11n CH 40 **EUT Max Freq:**
No Emissions Found.

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)
				---	---	---	---	---	---	---	---	---	---	---

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

Test Site: EMI Chamber 1 **Cable 1:** Asset #2329 **Cable 2:** --- **Cable 3:** ---
Analyzer: Asset #1328 **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

Radiated Emissions Table

Date: 09-Sep-17 **Company:** Harman International **Work Order:** R1509
Engineer: Chris Hamel **EUT Desc:** GM MY 19 High mod **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 24.1°C **Humidity:** 35% **Pressure:** 1006mBar
Frequency Range: 26.5-40GHz **Measurement Distance:** 0.1 m
Notes: 802.11n CH 40 **EUT Max Freq:**
No Emissions Found.

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)
				---	---	---	---	---	---	---	---	---	---	---

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

Test Site: EMI Chamber 1 **Cable 1:** Asset #2329 **Cable 2:** Asset #2328 **Cable 3:** ---
Analyzer: Asset #1328 **Preamp:** 40GHz Mixer **Antenna:** 40GHz Mixer **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.188

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

18-40GHz Channel 40

Radiated Band Edge

Radiated Emissions Table

Date: 12-Sep-17 **Company:** Harman International **Work Order:** R1905
Engineer: Chris Hamel **EUT Desc:** GM MY 19 High **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 36% **Pressure:** 1010mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: 5G Wifi unii1 **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)
80MHz low 802.11ac														
Vmax	5201.4	71.0		18.3	34.2	5.6	92.5	---	---	---	---	54.0	---	---
Hmax	5219.2	74.8		18.3	34.2	5.6	96.3	---	---	---	---	54.0	---	---
H	5150.0	37.4	26.7	18.4	34.2	5.4	58.6	47.9	74.0	-15.4	Pass	54.0	-6.1	Pass
H	5145.8	40.4	25.4	18.5	34.2	5.4	61.5	46.5	74.0	-12.5	Pass	54.0	-7.5	Pass
H	5141.0	40.3	24.7	18.5	34.2	5.4	61.4	45.8	74.0	-12.6	Pass	54.0	-8.2	Pass
				---	---	---	---	---	---	---	---	---	---	---
80MHz High 802.11ac														
Vmax	5201.4	71.0		18.3	34.2	5.6	92.5	---	---	---	---	54.0	---	---
Hmax	5219.2	74.8		18.3	34.2	5.6	96.3	---	---	---	---	54.0	---	---
H	5350.0	30.63	21.5	18.2	34.3	5.8	52.5	43.4	74.0	-21.5	Pass	54.0	-10.6	Pass
H	5263.2	41.3	24.6	18.3	34.3	5.7	63.0	46.3	74.0	-11.0	Pass	54.0	-7.7	Pass
H	5268.1	38.9	24.2	18.3	34.3	5.7	60.6	45.9	74.0	-13.4	Pass	54.0	-8.1	Pass
H	5256.7	44.5	24.5	18.3	34.3	5.7	66.2	46.2	74.0	-7.8	Pass	54.0	-7.8	Pass
				---	---	---	---	---	---	---	---	---	---	---
40MHz Low 802.11n														
Vmax	5203.7	74.4		18.3	34.2	5.6	95.9	---	---	---	---	54.0	---	---
Hmax	5203.5	77.3		18.3	34.2	5.6	98.8	---	---	---	---	54.0	---	---
H	5150.0	38.1	25.4	18.4	34.2	5.4	59.3	46.6	74.0	-14.7	Pass	54.0	-7.4	Pass
H	5145.5	40.1	22.2	18.5	34.2	5.4	61.2	43.3	74.0	-12.8	Pass	54.0	-10.7	Pass
				---	---	---	---	---	---	---	---	---	---	---
40MHz High 802.11n														
Vmax	5244.1	72.9		18.3	34.2	5.6	94.4	---	---	---	---	54.0	---	---
Hmax	5243.2	75.8		18.3	34.2	5.6	97.3	---	---	---	---	54.0	---	---
H	5350.0	29.1	21.0	18.2	34.3	5.8	51.0	42.9	74.0	-23.0	Pass	54.0	-11.1	Pass
H	5253.0	45.7	26.7	18.3	34.3	5.7	67.4	48.4	74.0	-6.6	Pass	54.0	-5.6	Pass
H	5258.4	44.1	25.4	18.3	34.3	5.7	65.8	47.1	74.0	-8.2	Pass	54.0	-6.9	Pass
H	5262.8	40.9	24.7	18.3	34.3	5.7	62.6	46.4	74.0	-11.4	Pass	54.0	-7.6	Pass
				---	---	---	---	---	---	---	---	---	---	---
20MHz Low 802.11n														
Vmax	5176.6	76.6		---	---	---	---	---	---	---	---	54.0	---	---
Hmax	5176.4	79.8		---	---	---	---	---	---	---	---	54.0	---	---
H	5150.0	32.2	22.6	18.4	34.2	5.4	53.4	43.8	74.0	-20.6	Pass	54.0	-10.2	Pass
H	5096.5	34.3	23.5	18.6	34.2	5.3	55.2	44.4	74.0	-18.8	Pass	54.0	-9.6	Pass
				---	---	---	---	---	---	---	---	---	---	---
20MHz High 802.11n														
Vmaz				---	---	---	---	---	---	---	---	---	---	---
Hmax				---	---	---	---	---	---	---	---	---	---	---
H	5350.0	31.0	21.3	18.2	34.3	5.8	52.9	43.2	74.0	-21.1	Pass	54.0	-10.8	Pass
H	5254.9	50.3	27.2	18.3	34.3	5.7	72.0	48.9	74.0	-2.0	Pass	54.0	-5.1	Pass
H	5259.0	46.0	25.1	18.3	34.3	5.7	67.7	46.8	74.0	-6.3	Pass	54.0	-7.2	Pass
H	5326.5	37.3	24.7	18.3	34.4	5.8	59.2	46.6	74.0	-14.8	Pass	54.0	-7.4	Pass

Table Result: Pass by -5.1 dB ***Worst Freq:*** 5254.9 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** Asset #1517 **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.188

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

Radiated Emissions Table

Date: 11-Sep-17 **Company:** Harman International **Work Order:** R1905
Engineer: Chris Hamel **EUT Desc:** GM MY 19 High **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.0°C **Humidity:** 36% **Pressure:** 1006mBar
Frequency Range: **Measurement Distance:** 3 m
Notes: UNII-3 **EUT Max Freq:**
All emissions corrected for Dutycycle if applicable.

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)
80MHz Low 802.11ac				---	---	---	---	---	---	---	---	---	---	---
Vmax	5773.0	73.9		---	---	---	---	---	---	---	---	---	---	---
Hmax	5773.0	75.2		---	---	---	---	---	---	---	---	---	---	---
H	5725.0	35.0	24.8	18.4	34.7	6.2	57.5	47.3	74.0	-16.5	Pass	54.0	-6.7	Pass
H	5720.3	42.3	24.7	18.4	34.7	6.2	64.8	47.2	74.0	-9.2	Pass	54.0	-6.8	Pass
H	5715.1	38.6	24.3	18.4	34.7	6.2	61.1	46.8	74.0	-12.9	Pass	54.0	-7.2	Pass
H	5690.7	38.2	23.8	18.4	34.7	6.2	60.7	46.3	74.0	-13.3	Pass	54.0	-7.7	Pass
				---	---	---	---	---	---	---	---	---	---	---
80MHz High802.11ac				---	---	---	---	---	---	---	---	---	---	---
Vmax	5773.0	73.9		---	---	---	---	---	---	---	---	---	---	---
Hmax	5773.0	75.2		---	---	---	---	---	---	---	---	---	---	---
H	5850.0	34.5	24.3	18.3	34.9	6.0	57.1	46.9	74.0	-16.9	Pass	54.0	-7.1	Pass
H	5865.0	37.9	23.7	18.2	34.9	6.0	60.6	46.4	74.0	-13.4	Pass	54.0	-7.6	Pass
				---	---	---	---	---	---	---	---	---	---	---
40MHz Low 802.11ac				---	---	---	---	---	---	---	---	---	---	---
Vmax	5740.7	78.2		---	---	---	---	---	---	---	---	---	---	---
Hmax	5740.9	79.0		---	---	---	---	---	---	---	---	---	---	---
H	5725.0	43.8	27.4	18.4	34.7	6.2	66.3	49.9	74.0	-7.7	Pass	54.0	-4.1	Pass
H	5717.4	44.2	25.1	18.4	34.7	6.2	66.7	47.6	74.0	-7.3	Pass	54.0	-6.4	Pass
H	5712.4	42.1	25.2	18.4	34.7	6.2	64.6	47.7	74.0	-9.4	Pass	54.0	-6.3	Pass
				---	---	---	---	---	---	---	---	---	---	---
40MHz High 802.11ac				---	---	---	---	---	---	---	---	---	---	---
Vmax	5786.8	78.0		---	---	---	---	---	---	---	---	---	---	---
Hmax	5787.4	78.1		---	---	---	---	---	---	---	---	---	---	---
H	5850.0	33.1	21.4	18.3	34.9	6.0	55.7	44.0	74.0	-18.3	Pass	54.0	-10.0	Pass
				---	---	---	---	---	---	---	---	---	---	---
20MHz Low 802.11a				---	---	---	---	---	---	---	---	---	---	---
Vmax	5746.1	78.6		---	---	---	---	---	---	---	---	---	---	---
Hmax	5742.4	82.2		---	---	---	---	---	---	---	---	---	---	---
H	5725.0	36.8	26.7	18.4	34.7	6.2	59.3	49.2	74.0	-14.7	Pass	54.0	-4.8	Pass
H	5662.0	35.9	23.2	18.4	34.6	6.1	58.2	45.5	74.0	-15.8	Pass	54.0	-8.5	Pass
H	5656.7	35.3	23.3	18.4	34.6	6.1	57.6	45.6	74.0	-16.4	Pass	54.0	-8.4	Pass
H	5672.2	34.7	23.1	18.4	34.7	6.1	57.1	45.5	74.0	-16.9	Pass	54.0	-8.5	Pass
				---	---	---	---	---	---	---	---	---	---	---
20MHz High 802.11a				---	---	---	---	---	---	---	---	---	---	---
Vmax	5826.8	79.6		---	---	---	---	---	---	---	---	---	---	---
Hmax	5827.2	81.4		---	---	---	---	---	---	---	---	---	---	---
H	5850.0	34.8	24.1	18.3	34.9	6.0	57.4	46.7	74.0	-16.6	Pass	54.0	-7.3	Pass
H	5904.8	39.1	26.9	18.2	35.0	5.9	61.8	49.6	74.0	-12.2	Pass	54.0	-4.4	Pass
H	5897.9	36.4	26.6	18.2	35.0	5.9	59.1	49.3	74.0	-14.9	Pass	54.0	-4.7	Pass
H	5913.0	35.5	26.8	18.2	35.0	5.9	58.2	49.5	74.0	-15.8	Pass	54.0	-4.5	Pass

Table Result: Pass by -4.1 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054 **Cable 3:** ---
Analyzer: Rental SA#4 **Preamp:** Asset #1517 **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.188

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

Test Equipment Used:

Rev. 9/25/2017								
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	I	12/21/2018	12/21/2016
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
2311 PA	1-1000MHz	PAM-103	COM-POWER	441175	2311	II	2/4/2018	2/4/2017
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-Brown Bilog	30-2000MHz	JB1	Sunol	A0032406	1218	I	1/13/2019	1/13/2017
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#2081		HTC-1	HDE		2081	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #1509	9kHz - 18GHz		Florida RF			II	10/2/2017	10/2/2016
Asset #1522	9kHz - 18GHz		Florida RF			II	2/11/2018	2/11/2017
Asset #2051	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2054	9kHz - 18GHz		Florida RF			II	10/30/3017	10/30/2016
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.								

30-1000MHz Radiated Emissions

Rev. 9/25/2017								
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	I	12/21/2018	12/21/2016
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
1517 HF Preamp	1-20GHz	CS	CS	N/A	1517	II	9/14/2017	8/14/2016
2119 BRF	0.009-18000MHz	BRM50705	Micro-Tronics	G086	2119	II	11/26/2017	11/26/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017
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#2081		HTC-1	HDE		2081	II	3/23/2018	3/23/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2054	9kHz - 18GHz		Florida RF			II	10/30/3017	10/30/2016
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.								

1-18GHz Radiated Emissions

Rev. 9/25/2017								
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
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
HF (Yellow)	18-26.5GHz	34-18002650-60-8	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/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#2078		HTC-1	HDE		2078	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

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

18-26.5GHz Radiated Emissions

Rev. 9/25/2017

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

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#2078	HTC-1	HDE		2078	II	3/23/2018	3/23/2017

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

26.5-40GHz Radiated Emissions

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

N/A. 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:

ER1905-9 Appendix A

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

DUT Information

Model:	MY19 HIGH
Manufacturer:	Harman International Industries, Inc.
Serial Number:	016

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:

5 GHz band

Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Max Gain (dBi)
5160	55,73	-2,5391	5
5240	57,12	-2,4321	4,36
5320	62,09	-2,0698	4,47
5400	62,57	-2,0363	4,2
5480	60,01	-2,2178	3,96
5560	62,66	-2,0301	4,36
5640	57,28	-2,4200	3,8
5720	61,75	-2,0936	4,58
5840	59,52	-2,2534	4,2

Number of transmission chains 1

Equipment Type Unlicensed National Information Infrastructure Device (NII)

Test Equipment Used:

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

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

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 UNII-1

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

802.11a

Data Rate	Gated RMS (dBm) 5180 MHz	Gated RMS (dBm) 5200 MHz	Gated RMS (dBm) 5240 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	7.577	7.944	8.156	23.97	98.452
9 Mbps	7.587	7.893	8.155	23.97	97.802
12 Mbps	7.558	8.016	8.141	23.97	97.146
18 Mbps	7.634	7.757	8.158	23.97	95.803
24 Mbps	7.695	7.911	8.246	23.97	94.511
36 Mbps	7.592	8.007	8.133	23.97	92.240
48 Mbps	7.609	8.017	8.270	23.97	90.040
54 Mbps	7.566	7.822	8.137	23.97	89.027

802.11n(HT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Gated RMS (dBm) 5200 MHz	Gated RMS (dBm) 5240 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	8.138	8.416	8.807	23.97	98.414
MCS1	8.026	8.412	8.566	23.97	96.950
MCS2	7.660	7.920	8.340	23.97	95.600
MCS3	7.484	8.029	8.307	23.97	94.316
MCS4	7.474	7.882	8.123	23.97	91.983
MCS5	7.729	7.925	8.146	23.97	89.828
MCS6	7.623	7.967	8.162	23.97	88.915
MCS7	7.540	7.942	8.221	23.97	88.051

802.11ac(VHT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Gated RMS (dBm) 5200 MHz	Gated RMS (dBm) 5240 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	6.321	6.461	6.809	23.97	98.425
MCS1	6.213	6.553	6.789	23.97	96.961
MCS2	6.190	6.690	6.929	23.97	95.639
MCS3	6.183	6.677	6.757	23.97	94.375
MCS4	6.208	6.403	6.775	23.97	92.016
MCS5	6.218	6.429	6.779	23.97	90.077
MCS6	6.004	6.627	6.698	23.97	89.191
MCS7	5.940	6.347	6.681	23.97	88.363
MCS8	6.122	6.323	6.685	23.97	86.619

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Gated RMS (dBm) 5230 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	4.475	4.920	23.97	96.838
MCS1	4.618	4.971	23.97	94.148
MCS2	5.940	6.460	23.97	91.715
MCS3	5.937	6.478	23.97	89.615
MCS4	5.962	6.296	23.97	86.044
MCS5	5.974	6.531	23.97	83.351
MCS6	6.007	6.340	23.97	82.100
MCS7	5.988	6.303	23.97	80.759

802.11ac(VHT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Gated RMS (dBm) 5230 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	5.904	6.486	23.97	96.862
MCS1	5.888	6.477	23.97	94.224
MCS2	5.853	6.163	23.97	91.841
MCS3	5.777	6.247	23.97	89.689
MCS4	5.551	6.092	23.97	86.212
MCS5	5.784	6.098	23.97	83.598
MCS6	5.573	6.100	23.97	82.600
MCS7	5.495	6.160	23.97	81.116
MCS8	5.486	6.372	23.97	79.141
MCS9	5.783	6.097	23.97	78.494

802.11ac(VHT80)

Data Rate	Gated RMS (dBm) 5210 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	5.428	23.97	93.777
MCS1	5.373	23.97	89.943
MCS2	5.084	23.97	85.548
MCS3	6.296	23.97	82.982
MCS4	6.439	23.97	78.555
MCS5	6.297	23.97	75.897
MCS6	6.272	23.97	74.488
MCS7	6.282	23.97	73.501
MCS8	6.282	23.97	71.355
MCS9	5.089	23.97	70.188

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)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	7.577	4.840	12.417	13.8	9.190	3.227	Default	11
9 Mbps	7.587	4.840	12.427	13.8	9.106	3.321	Default	11
12 Mbps	7.558	4.840	12.398	13.8	8.988	3.410	Default	11
18 Mbps	7.634	4.840	12.474	13.8	9.171	3.303	Default	11
24 Mbps	7.695	4.840	12.535	13.8	9.077	3.458	Default	11
36 Mbps	7.592	4.840	12.432	13.8	9.072	3.360	Default	11
48 Mbps	7.609	4.840	12.449	13.8	9.277	3.172	Default	11
54 Mbps	7.566	4.840	12.406	13.8	9.196	3.210	Default	11
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	7.944	4.680	12.624	13.8	9.332	3.292	Default	11
9 Mbps	7.893	4.680	12.573	13.8	9.344	3.229	Default	11
12 Mbps	8.016	4.680	12.696	13.8	9.331	3.365	Default	11
18 Mbps	7.757	4.680	12.437	13.8	9.312	3.125	Default	11
24 Mbps	7.911	4.680	12.591	13.8	9.435	3.156	Default	11
36 Mbps	8.007	4.680	12.687	13.8	9.196	3.491	Default	11
48 Mbps	8.017	4.680	12.697	13.8	9.452	3.245	Default	11
54 Mbps	7.822	4.680	12.502	13.8	9.188	3.314	Default	11
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	8.156	4.360	12.516	13.8	9.175	3.341	Default	11
9 Mbps	8.155	4.360	12.515	13.8	9.172	3.343	Default	11
12 Mbps	8.141	4.360	12.501	13.8	9.204	3.297	Default	11
18 Mbps	8.158	4.360	12.518	13.8	9.226	3.292	Default	11
24 Mbps	8.246	4.360	12.606	13.8	9.126	3.480	Default	11
36 Mbps	8.133	4.360	12.493	13.8	9.148	3.345	Default	11
48 Mbps	8.270	4.360	12.630	13.8	9.219	3.411	Default	11
54 Mbps	8.137	4.360	12.497	13.8	9.102	3.395	Default	11

802.11n(HT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	8.138	4.840	12.978	13.8	9.547	3.431	Default	11
MCS1	8.026	4.840	12.866	13.8	9.515	3.351	Default	11
MCS2	7.660	4.840	12.500	13.8	9.100	3.400	Default	11
MCS3	7.484	4.840	12.324	13.8	9.188	3.136	Default	11
MCS4	7.474	4.840	12.314	13.8	9.005	3.309	Default	11
MCS5	7.729	4.840	12.569	13.8	9.139	3.430	Default	11
MCS6	7.623	4.840	12.463	13.8	9.288	3.175	Default	11
MCS7	7.540	4.840	12.380	13.8	9.175	3.205	Default	11
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	8.416	4.680	13.096	13.8	9.833	3.263	Default	11
MCS1	8.412	4.680	13.092	13.8	9.827	3.265	Default	11
MCS2	7.920	4.680	12.600	13.8	9.200	3.400	Default	11
MCS3	8.029	4.680	12.709	13.8	9.405	3.304	Default	11
MCS4	7.882	4.680	12.562	13.8	9.227	3.335	Default	11
MCS5	7.925	4.680	12.605	13.8	9.259	3.346	Default	11
MCS6	7.967	4.680	12.647	13.8	9.209	3.438	Default	11
MCS7	7.942	4.680	12.622	13.8	9.176	3.446	Default	11
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	8.807	4.360	13.167	13.8	9.877	3.290	Default	11
MCS1	8.566	4.360	12.926	13.8	9.603	3.323	Default	11
MCS2	8.340	4.360	12.700	13.8	9.300	3.400	Default	11
MCS3	8.307	4.360	12.667	13.8	9.102	3.565	Default	11
MCS4	8.123	4.360	12.483	13.8	9.247	3.236	Default	11
MCS5	8.146	4.360	12.506	13.8	9.233	3.273	Default	11
MCS6	8.162	4.360	12.522	13.8	9.192	3.330	Default	11
MCS7	8.221	4.360	12.581	13.8	9.269	3.312	Default	11

802.11ac(VHT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	6.321	4.840	11.161	13.8	7.722	3.439	Default	11
MCS1	6.213	4.840	11.053	13.8	7.606	3.447	Default	11
MCS2	6.190	4.840	11.030	13.8	7.560	3.470	Default	11
MCS3	6.183	4.840	11.023	13.8	7.646	3.377	Default	11
MCS4	6.208	4.840	11.048	13.8	7.596	3.452	Default	11
MCS5	6.218	4.840	11.058	13.8	7.716	3.342	Default	11
MCS6	6.004	4.840	10.844	13.8	7.188	3.656	Default	11
MCS7	5.940	4.840	10.780	13.8	7.060	3.720	Default	11
MCS8	6.122	4.840	10.962	13.8	7.424	3.538	Default	11
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	6.461	4.680	11.141	13.8	7.882	3.259	Default	11
MCS1	6.553	4.680	11.233	13.8	7.966	3.267	Default	11
MCS2	6.690	4.680	11.370	13.8	8.340	3.030	Default	11
MCS3	6.677	4.680	11.357	13.8	8.314	3.043	Default	11
MCS4	6.403	4.680	11.083	13.8	7.566	3.517	Default	11
MCS5	6.429	4.680	11.109	13.8	7.818	3.291	Default	11
MCS6	6.627	4.680	11.307	13.8	8.114	3.193	Default	11
MCS7	6.347	4.680	11.027	13.8	7.554	3.473	Default	11
MCS8	6.323	4.680	11.003	13.8	7.606	3.397	Default	11
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	6.809	4.360	11.169	13.8	8.038	3.131	Default	11
MCS1	6.789	4.360	11.149	13.8	7.998	3.151	Default	11
MCS2	6.929	4.360	11.289	13.8	8.278	3.011	Default	11
MCS3	6.757	4.360	11.117	13.8	7.934	3.183	Default	11
MCS4	6.775	4.360	11.135	13.8	8.070	3.065	Default	11
MCS5	6.779	4.360	11.139	13.8	7.978	3.161	Default	11
MCS6	6.698	4.360	11.058	13.8	7.816	3.242	Default	11
MCS7	6.681	4.360	11.041	13.8	7.782	3.259	Default	11
MCS8	6.685	4.360	11.045	13.8	7.790	3.255	Default	11

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	4.475	4.760	9.235	14.7	5.413	3.822	Default	11
MCS1	4.618	4.760	9.378	14.7	5.694	3.684	Default	11
MCS2	5.940	4.760	10.700	14.7	7.000	3.700	Default	11
MCS3	5.937	4.760	10.697	14.7	7.194	3.503	Default	11
MCS4	5.962	4.760	10.722	14.7	7.244	3.478	Default	11
MCS5	5.974	4.760	10.734	14.7	7.168	3.566	Default	11
MCS6	6.007	4.760	10.767	14.7	7.234	3.533	Default	11
MCS7	5.988	4.760	10.748	14.7	7.396	3.352	Default	11
Data Rate	Gated RMS (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	4.920	4.440	9.360	14.7	5.731	3.629	Default	11
MCS1	4.971	4.440	9.411	14.7	5.622	3.789	Default	11
MCS2	6.460	4.440	10.900	14.7	7.500	3.400	Default	11
MCS3	6.478	4.440	10.918	14.7	7.536	3.382	Default	11
MCS4	6.296	4.440	10.736	14.7	7.172	3.564	Default	11
MCS5	6.531	4.440	10.971	14.7	7.742	3.229	Default	11
MCS6	6.340	4.440	10.780	14.7	7.360	3.420	Default	11
MCS7	6.303	4.440	10.743	14.7	7.286	3.457	Default	11

802.11ac(VHT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	5.904	4.760	10.664	14.7	7.128	3.536	Default	11
MCS1	5.888	4.760	10.648	14.7	6.896	3.752	Default	11
MCS2	5.853	4.760	10.613	14.7	6.826	3.787	Default	11
MCS3	5.777	4.760	10.537	14.7	6.674	3.863	Default	11
MCS4	5.551	4.760	10.311	14.7	6.422	3.889	Default	11
MCS5	5.784	4.760	10.544	14.7	6.688	3.856	Default	11
MCS6	5.573	4.760	10.333	14.7	6.466	3.867	Default	11
MCS7	5.495	4.760	10.255	14.7	6.410	3.845	Default	11
MCS8	5.486	4.760	10.246	14.7	6.292	3.954	Default	11
MCS9	5.783	4.760	10.543	14.7	6.786	3.757	Default	11
Data Rate	Gated RMS (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	6.486	4.440	10.926	14.7	7.552	3.374	Default	11
MCS1	6.477	4.440	10.917	14.7	7.534	3.383	Default	11
MCS2	6.163	4.440	10.603	14.7	7.006	3.597	Default	11
MCS3	6.247	4.440	10.687	14.7	7.074	3.613	Default	11
MCS4	6.092	4.440	10.532	14.7	6.864	3.668	Default	11
MCS5	6.098	4.440	10.538	14.7	6.776	3.762	Default	11
MCS6	6.100	4.440	10.540	14.7	6.880	3.660	Default	11
MCS7	6.160	4.440	10.600	14.7	7.000	3.600	Default	11
MCS8	6.372	4.440	10.812	14.7	7.424	3.388	Default	11
MCS9	6.097	4.440	10.537	14.7	6.874	3.663	Default	11

802.11ac(VHT80)

Data Rate	Gated RMS (dBm) 5210 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	EIRP (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	5.428	4.6	10.028	14.7	5.956	4.072	Default	11
MCS1	5.373	4.6	9.973	14.7	5.846	4.127	Default	11
MCS2	5.084	4.6	9.684	14.7	5.368	4.316	Default	11
MCS3	6.296	4.6	10.896	14.7	7.792	3.104	Default	12
MCS4	6.439	4.6	11.039	14.7	7.978	3.061	Default	12
MCS5	6.297	4.6	10.897	14.7	7.794	3.103	Default	12
MCS6	6.272	4.6	10.872	14.7	7.744	3.128	Default	12
MCS7	6.282	4.6	10.882	14.7	7.764	3.118	Default	12
MCS8	6.282	4.6	10.882	14.7	7.764	3.118	Default	12
MCS9	5.089	4.6	9.689	14.7	5.378	4.311	Default	12

FCC and RSS-247 UNII-3

802.11a

Data Rate	Gated RMS (dBm) 5745 MHz	Gated RMS (dBm) 5785 MHz	Gated RMS (dBm) 5825 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	11.397	11.62	11.946	30	98.529
9 Mbps	11.375	11.583	11.857	30	97.146
12 Mbps	11.493	11.546	11.764	30	96.106
18 Mbps	11.528	11.578	11.85	30	95.792
24 Mbps	11.51	11.524	11.813	30	94.509
36 Mbps	11.362	11.526	11.778	30	92.238
48 Mbps	11.519	11.651	11.716	30	90.078
54 Mbps	11.386	11.49	11.717	30	89.015

802.11n(HT20)

Data Rate	Gated RMS (dBm) 5745 MHz	Gated RMS (dBm) 5785 MHz	Gated RMS (dBm) 5825 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.369	11.567	11.614	30	98.417
MCS1	11.107	11.577	11.635	30	96.959
MCS2	11.381	11.571	11.848	30	95.612
MCS3	11.34	11.573	11.885	30	94.325
MCS4	11.465	11.567	11.862	30	92.00
MCS5	11.41	11.582	11.668	30	89.863
MCS6	11.393	11.576	11.664	30	88.896
MCS7	11.407	11.532	11.883	30	88.077

802.11ac(VHT20)

Data Rate	Gated RMS (dBm) 5745 MHz	Gated RMS (dBm) 5785 MHz	Gated RMS (dBm) 5825 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.496	11.513	11.688	30	97.338
MCS1	11.491	11.54	11.822	30	96.048
MCS2	11.339	11.511	11.807	30	95.596
MCS3	11.486	11.653	11.92	30	93.612
MCS4	11.496	11.494	11.816	30	92.181
MCS5	11.351	11.555	11.774	30	87.038
MCS6	11.34	11.477	11.743	30	85.252
MCS7	11.523	11.528	11.829	30	83.212
MCS8	11.522	11.559	11.828	30	80.351

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5755 MHz	Gated RMS (dBm) 5795 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.193	11.205	30	96.851
MCS1	11.021	11.039	30	94.130
MCS2	11.066	11.228	30	91.743
MCS3	11.001	10.991	30	90.386
MCS4	11.02	11.008	30	86.070
MCS5	11.004	11.167	30	83.378
MCS6	11.003	11.046	30	82.105
MCS7	11.049	11.015	30	80.801

802.11ac(VHT40)

Data Rate	Gated RMS (dBm) 5755 MHz	Gated RMS (dBm) 5795 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.256	11.333	30	96.869
MCS1	11.226	11.127	30	94.238
MCS2	11.228	11.27	30	91.845
MCS3	10.96	11.136	30	89.714
MCS4	10.958	11.286	30	86.240
MCS5	10.917	11.226	30	83.652
MCS6	10.963	11.207	30	82.639
MCS7	11.084	11.284	30	81.175
MCS8	11.045	11.276	30	79.196
MCS9	11.035	11.155	30	76.869

802.11ac(VHT80)

Data Rate	Gated RMS (dBm) 5775 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.285	30	93.789
MCS1	11.268	30	89.163
MCS2	11.267	30	85.591
MCS3	11.258	30	82.955
MCS4	11.243	30	78.852
MCS5	11.242	30	75.962
MCS6	11.159	30	74.530
MCS7	11.243	30	73.589
MCS8	11.241	30	71.412
MCS9	11.273	30	70.241

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

FCC UNII-1

	Data Rate	Gated PSD(dBm) 5180 MHz	Gated PSD(dBm) 5200 MHz	Gated PSD(dBm) 5240 MHz	Limit (dBm)
802.11a	48 Mbps	4.914	4.060	4.537	11
802.11n(HT20)	MCS0	3.322	4.541	3.586	11
802.11ac(VHT20)	MCS2	3.212	5.227	5.040	11
	Data Rate	Gated PSD (dBm) 5190 MHz	Gated PSD (dBm) 5230 MHz		Limit (dBm)
802.11n(HT40)	MCS5	1.992	2.327		11
802.11ac(VHT40)	MCS0	3.365	3.092		11
	Data Rate	Gated PSD (dBm) 5210 MHz			Limit (dBm)
802.11ac(VHT80)	MCS4	3.029			11

RSS-247 UNII-1

	Data Rate	PSD (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5180 MHz	Limit (dBm)
802.11a	48Mbps	4.914	4.840	9.754	10
802.11n(HT20)	MCS0	3.322	4.840	8.162	10
802.11ac(VHT20)	MCS2	3.212	4.840	8.052	10

	Data Rate	PSD (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5200 MHz	Limit (dBm)
802.11a	48Mbps	4.060	4.680	8.740	10
802.11n(HT20)	MCS0	4.541	4.680	9.221	10
802.11ac(VHT20)	MCS2	5.227	4.680	9.907	10

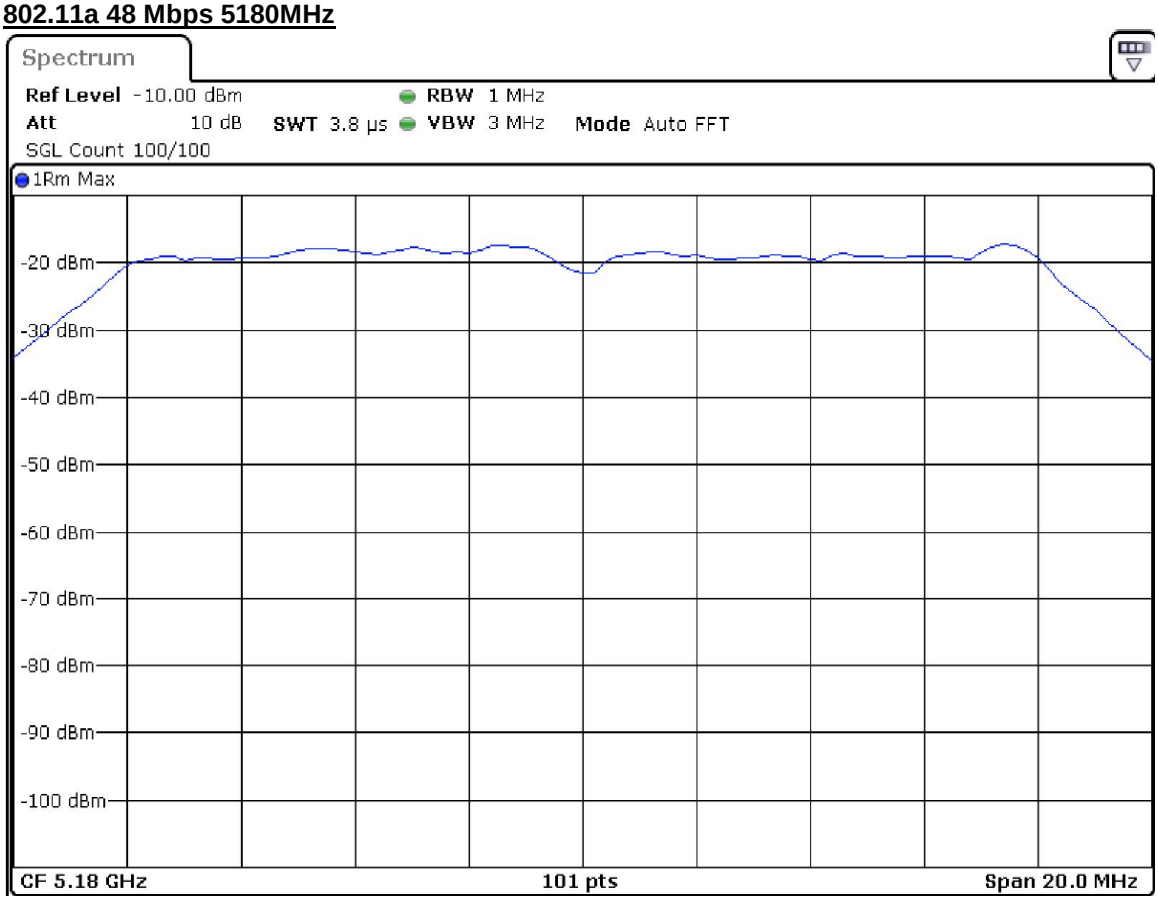
	Data Rate	PSD (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5240 MHz	Limit (dBm)
802.11a	48Mbps	4.537	4.360	8.897	10
802.11n(HT20)	MCS0	3.586	4.360	7.946	10
802.11ac(VHT20)	MCS2	5.040	4.360	9.4	10

	Data Rate	PSD (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5190 MHz	Limit (dBm)
802.11n(HT40)	MCS5	1.992	4.760	6.752	10
802.11ac(VHT40)	MCS0	3.365	4.760	8.125	10

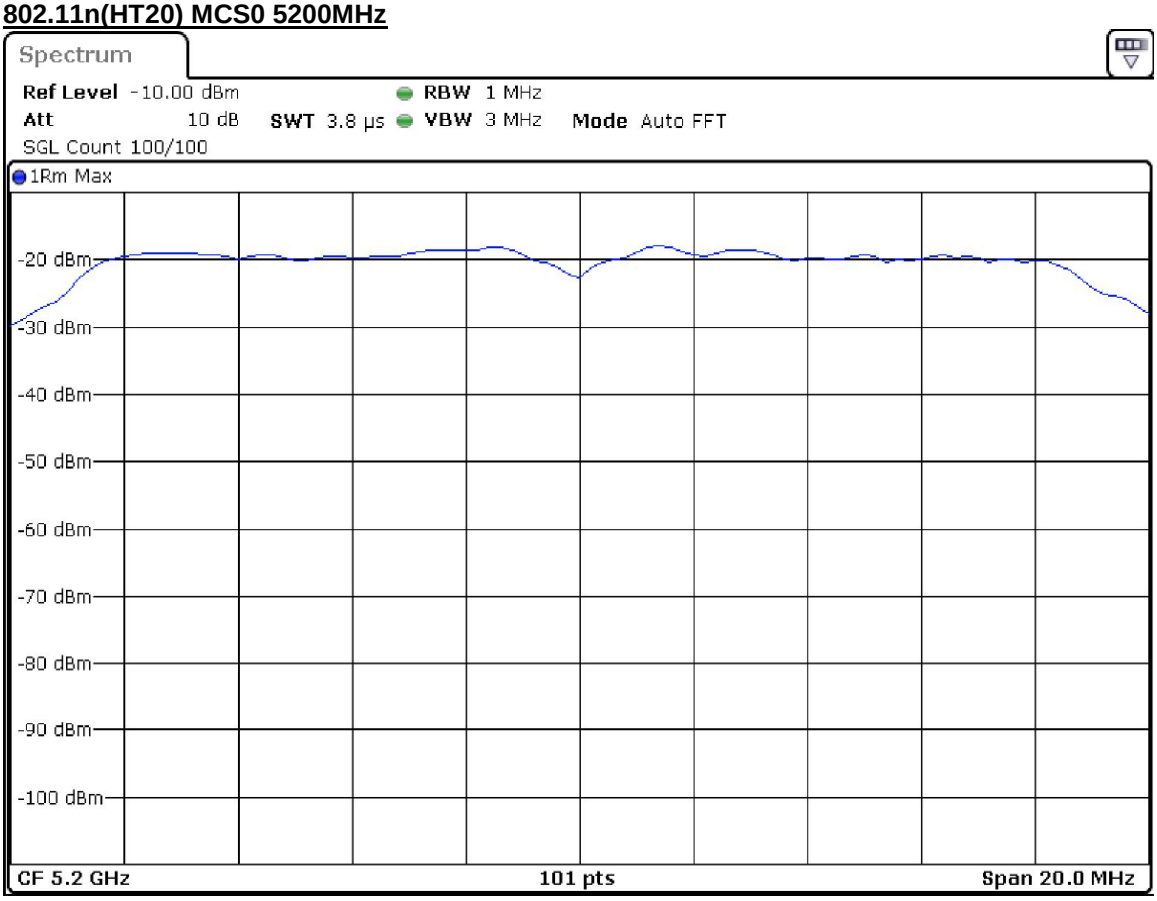
	Data Rate	PSD (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5230 MHz	Limit (dBm)
802.11n(HT40)	MCS5	2.327	4.44	6.767	10
802.11ac(VHT40)	MCS0	3.092	4.44	7.532	10

	Data Rate	PSD (dBm) 5210 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5210 MHz	Limit (dBm)
802.11ac(VHT80)	MCS4	3.029	4.6	7.629	10

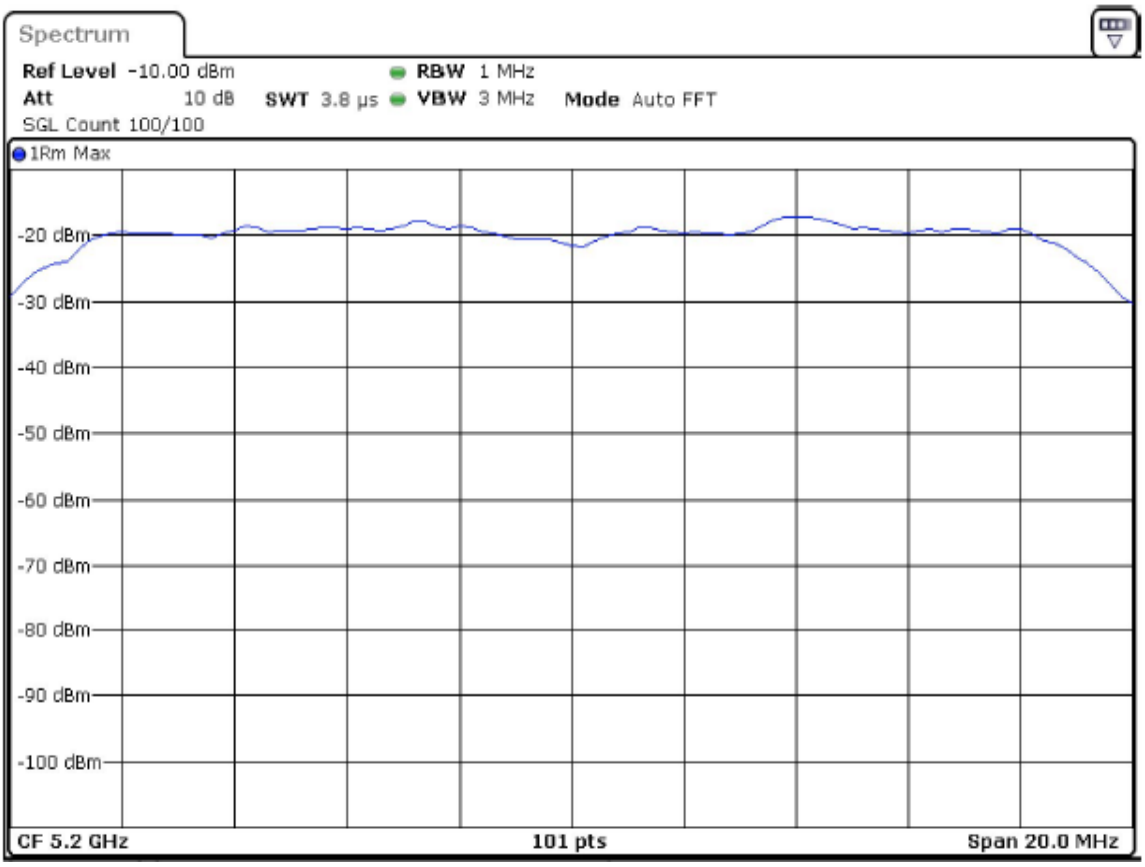
802.11a 48 Mbps 5180MHz



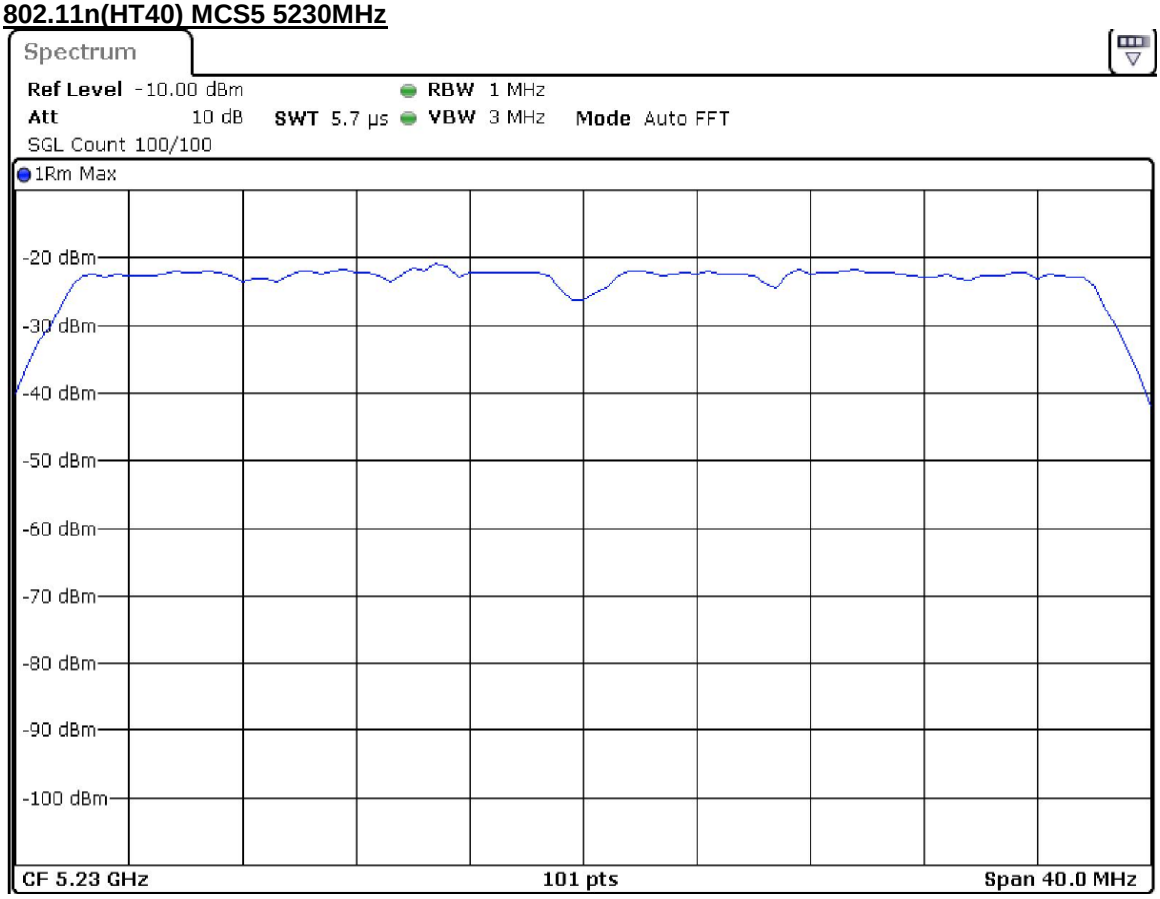
802.11n(HT20) MCS0 5200MHz



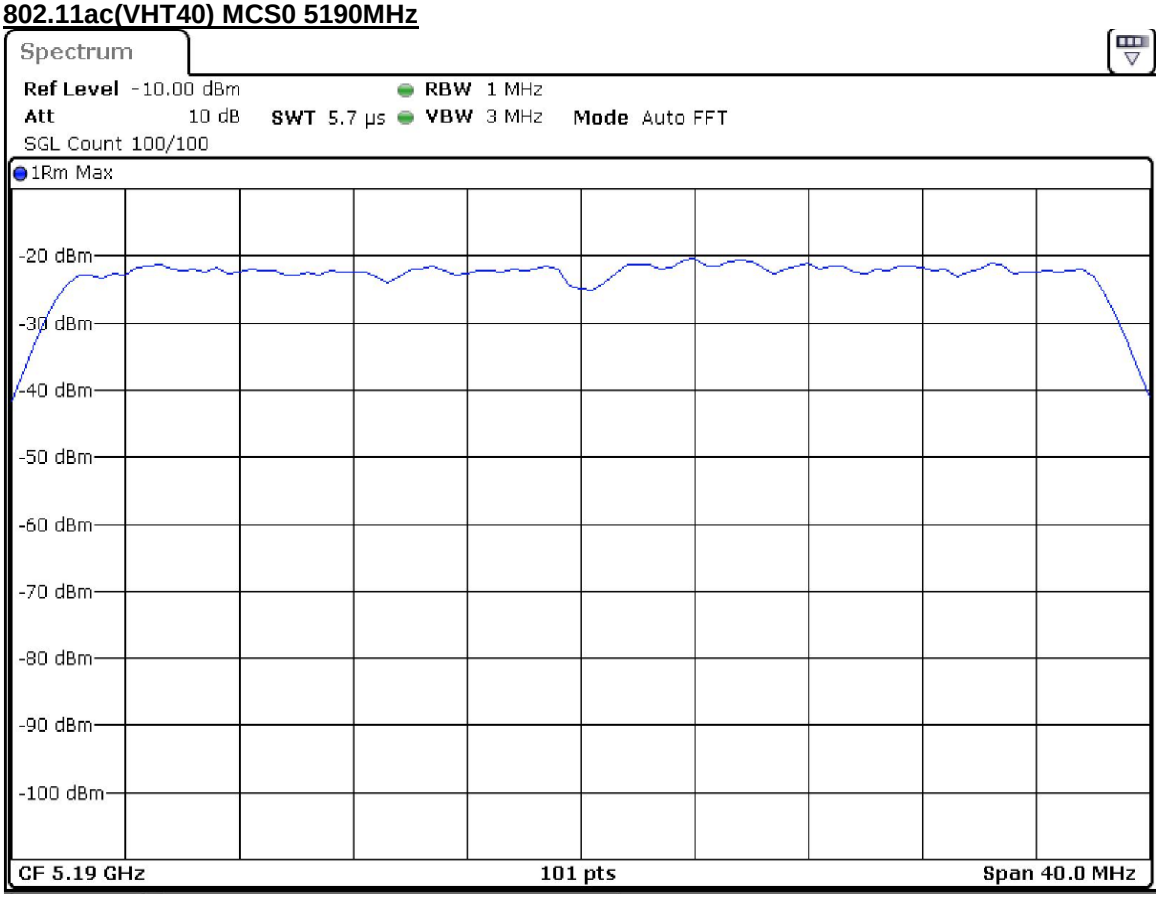
802.11ac(VHT20) MCS2 5200MHz



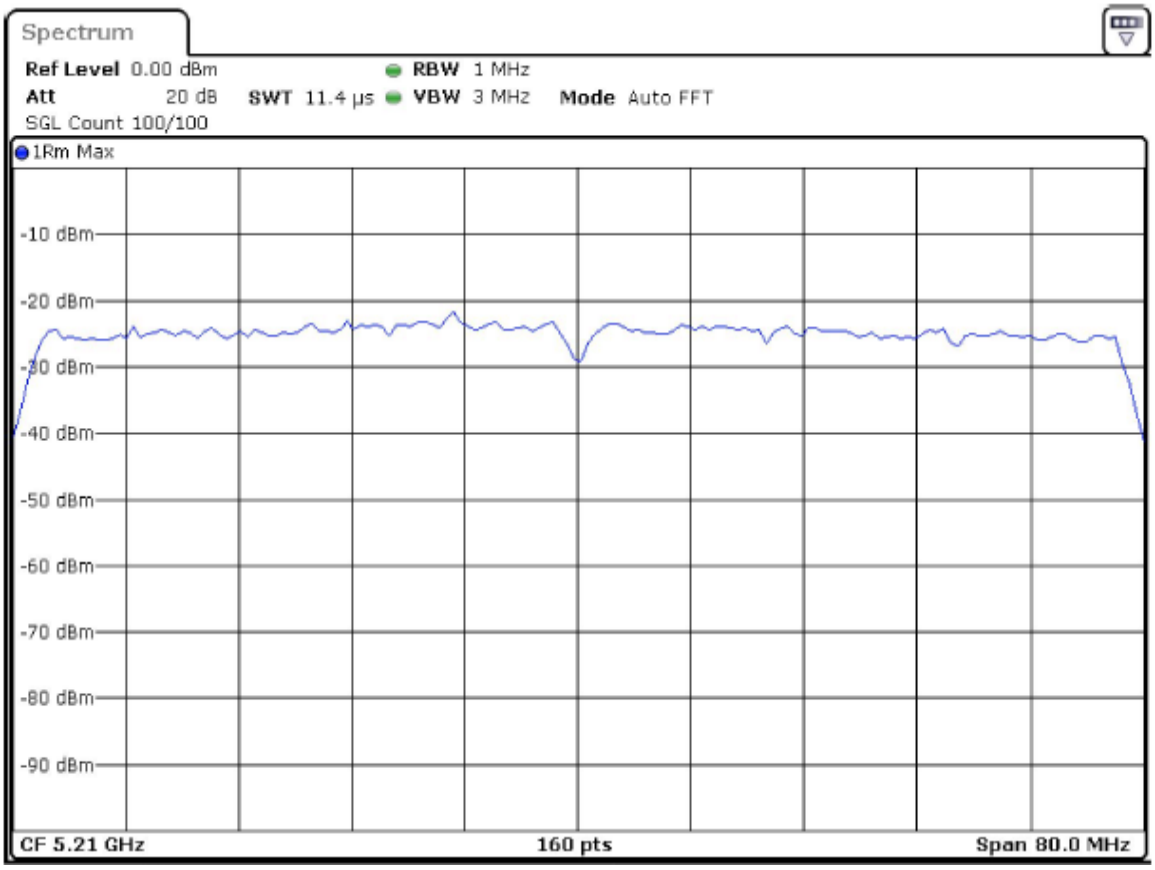
802.11n(HT40) MCS5 5230MHz



802.11ac(VHT40) MCS0 5190MHz



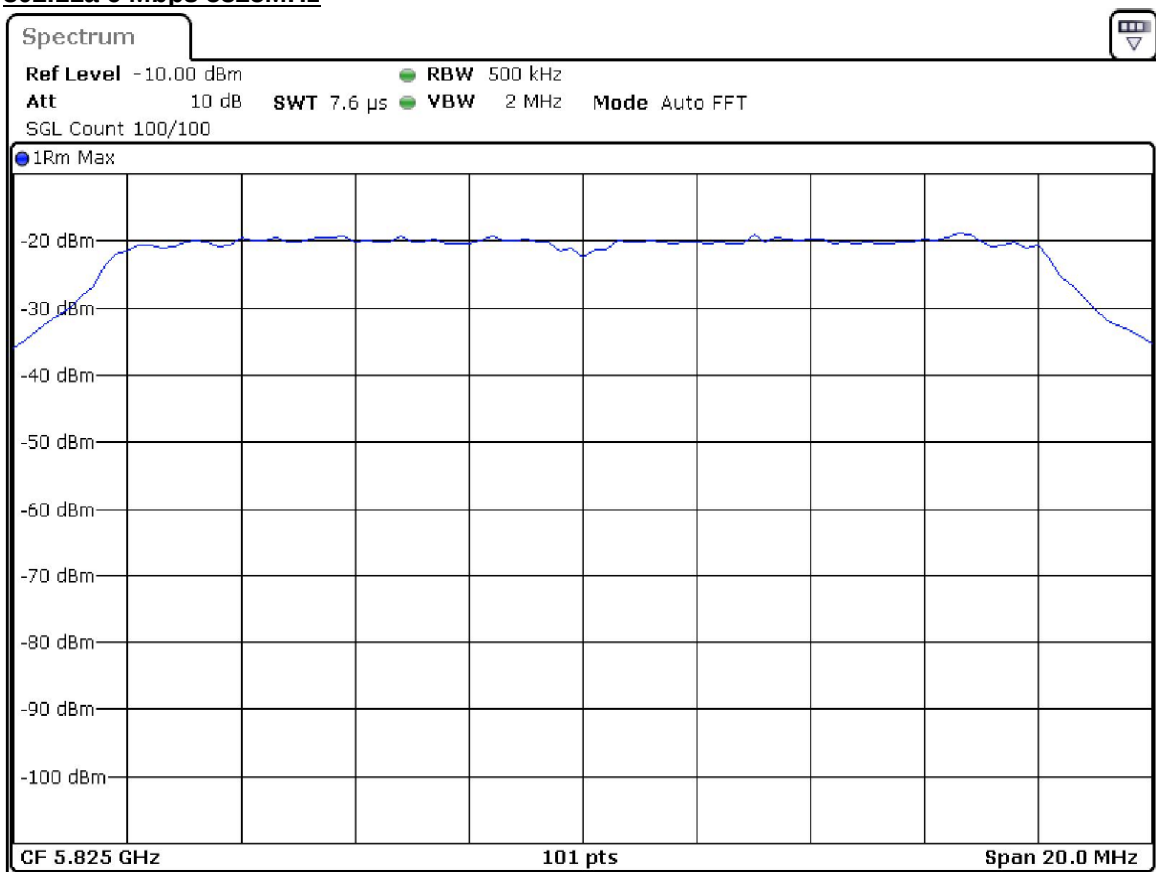
802.11ac(VHT80) MCS4 5210MHz



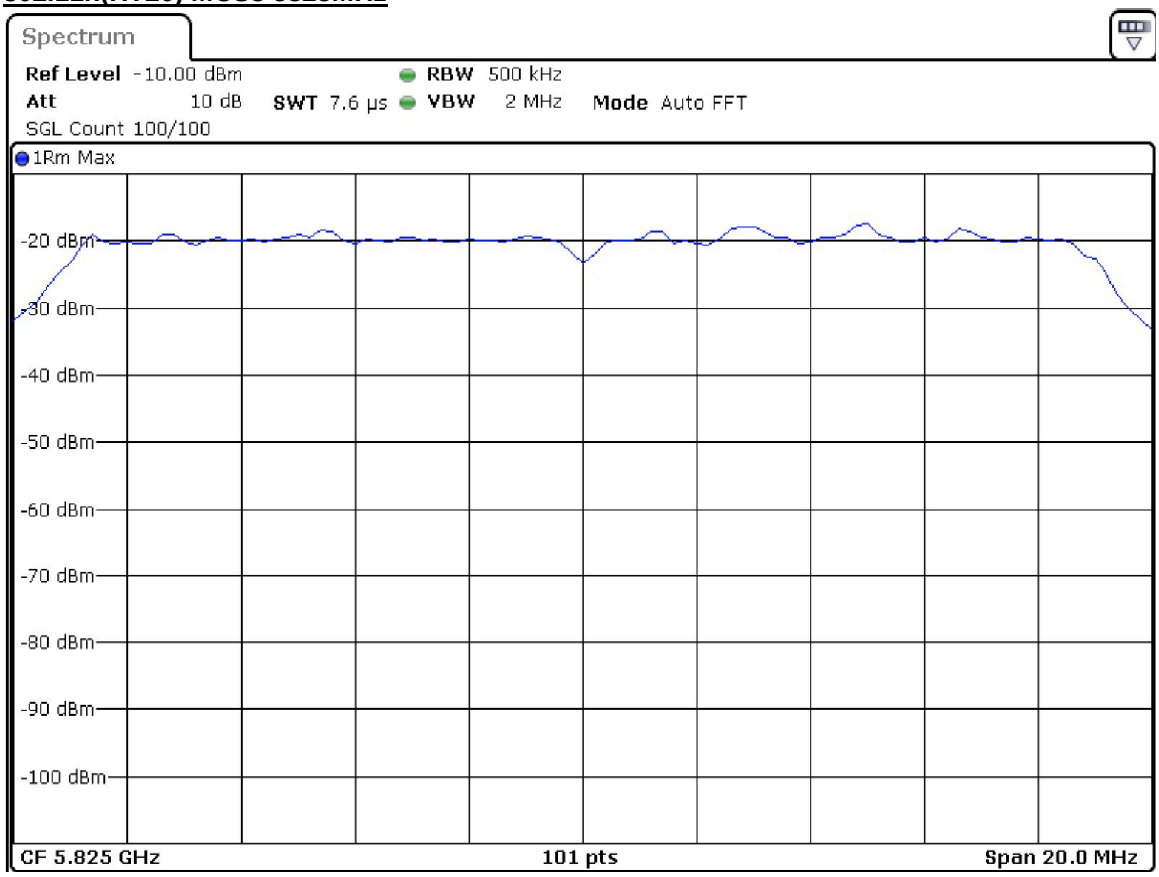
FCC and RSS-247 UNII-3

	Data Rate	Peak PSD (dBm) 5745 MHz	Peak PSD (dBm) 5785 MHz	Peak PSD (dBm) 5825 MHz	Limit (dBm)
802.11a	6 Mbps	4.031	4.321	4.425	30
802.11n(HT20)	MCS3	5.081	5.561	6.038	30
802.11ac(VHT20)	MCS3	5.212	5.040	5.227	30
	Data Rate	Peak PSD (dBm) 5755 MHz	Peak PSD (dBm) 5795 MHz		Limit (dBm)
802.11n(HT40)	MCS2	1.465	2.408		30
802.11ac(VHT40)	MCS0	1.325	1.222		30
	Data Rate	Peak PSD (dBm) 5755 MHz			Limit (dBm)
802.11ac(VHT80)	MCS0	1.325			30

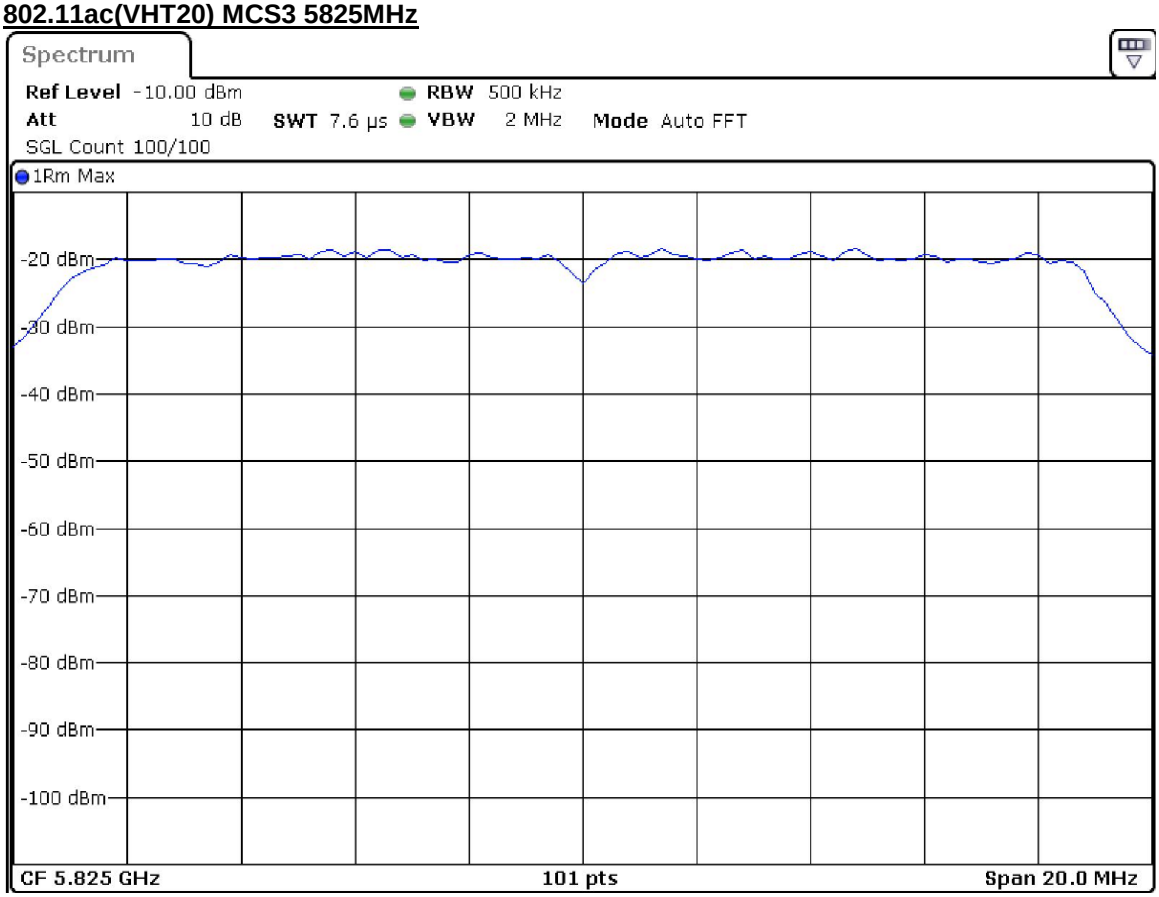
802.11a 6 Mbps 5825MHz



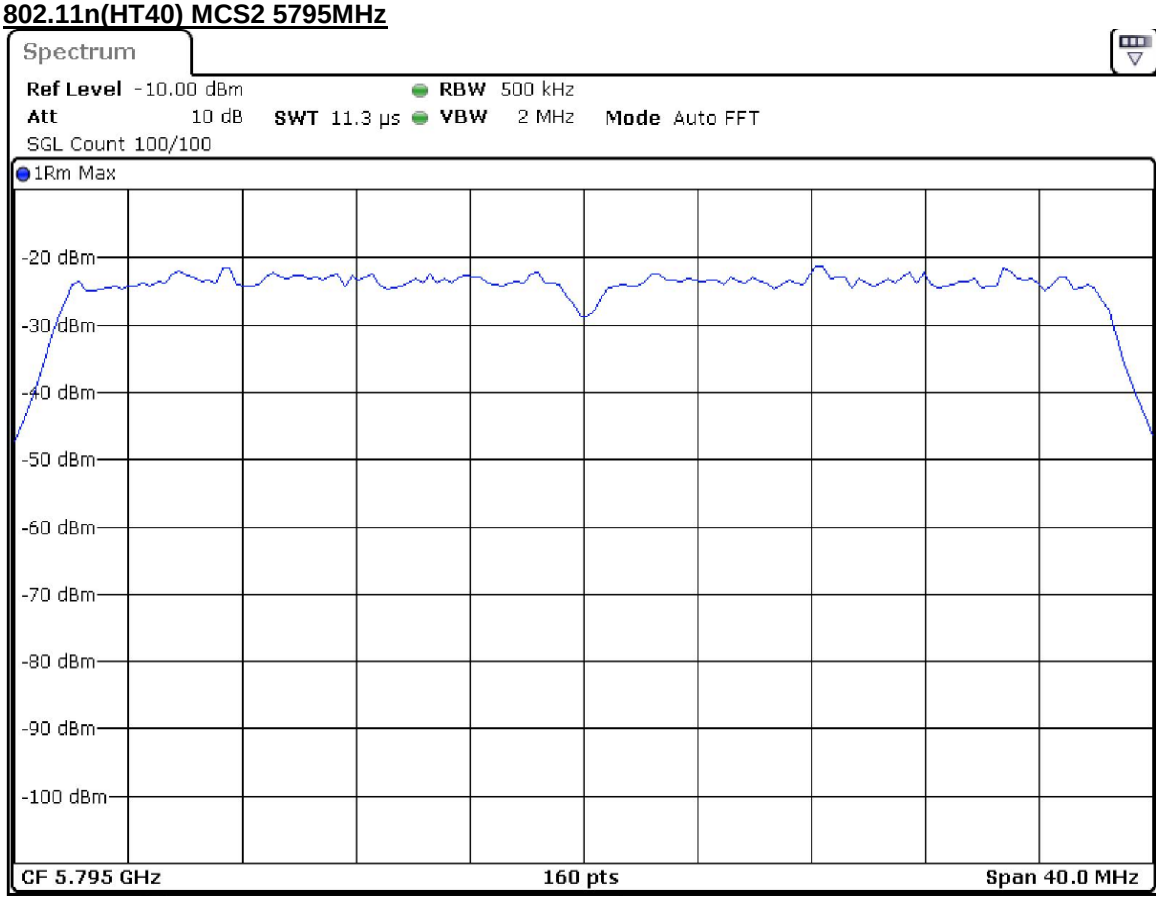
802.11n(HT20) MCS3 5825MHz



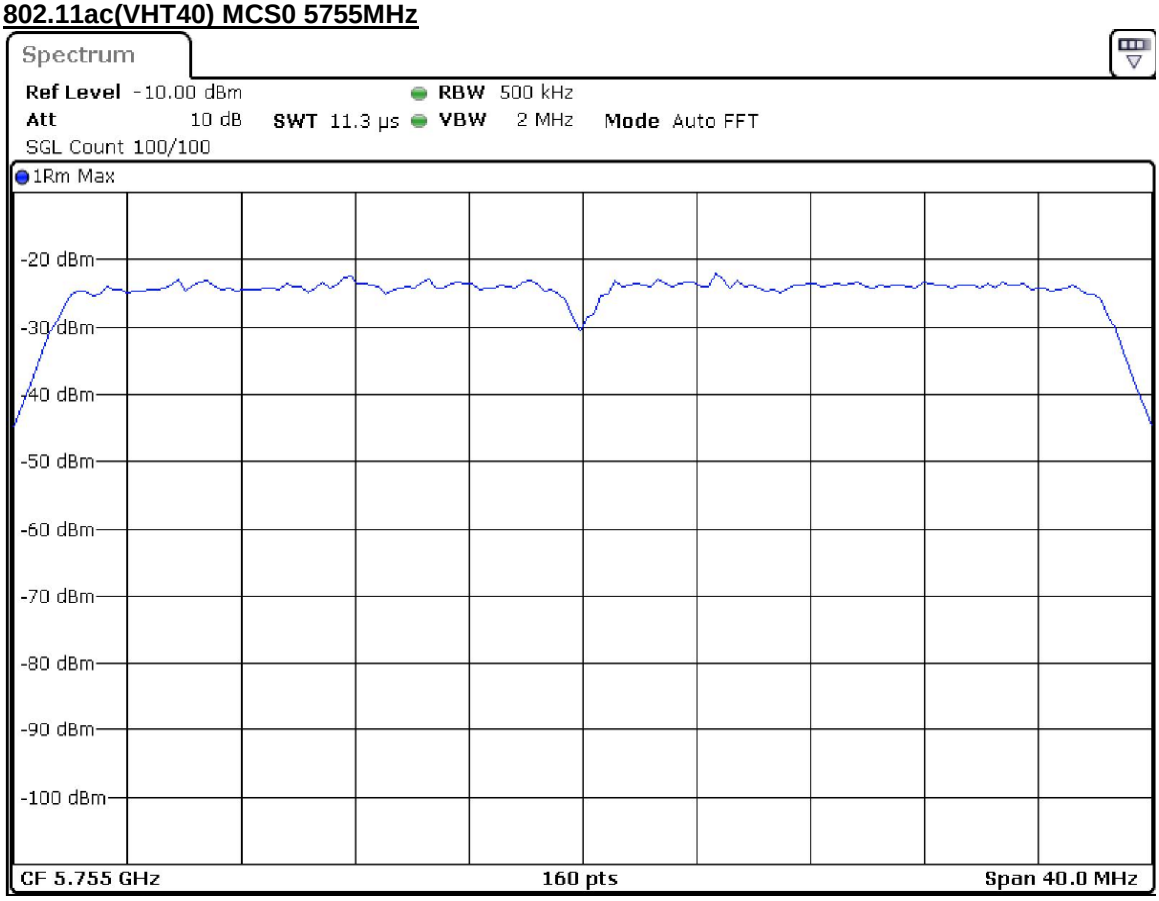
802.11ac(VHT20) MCS3 5825MHz



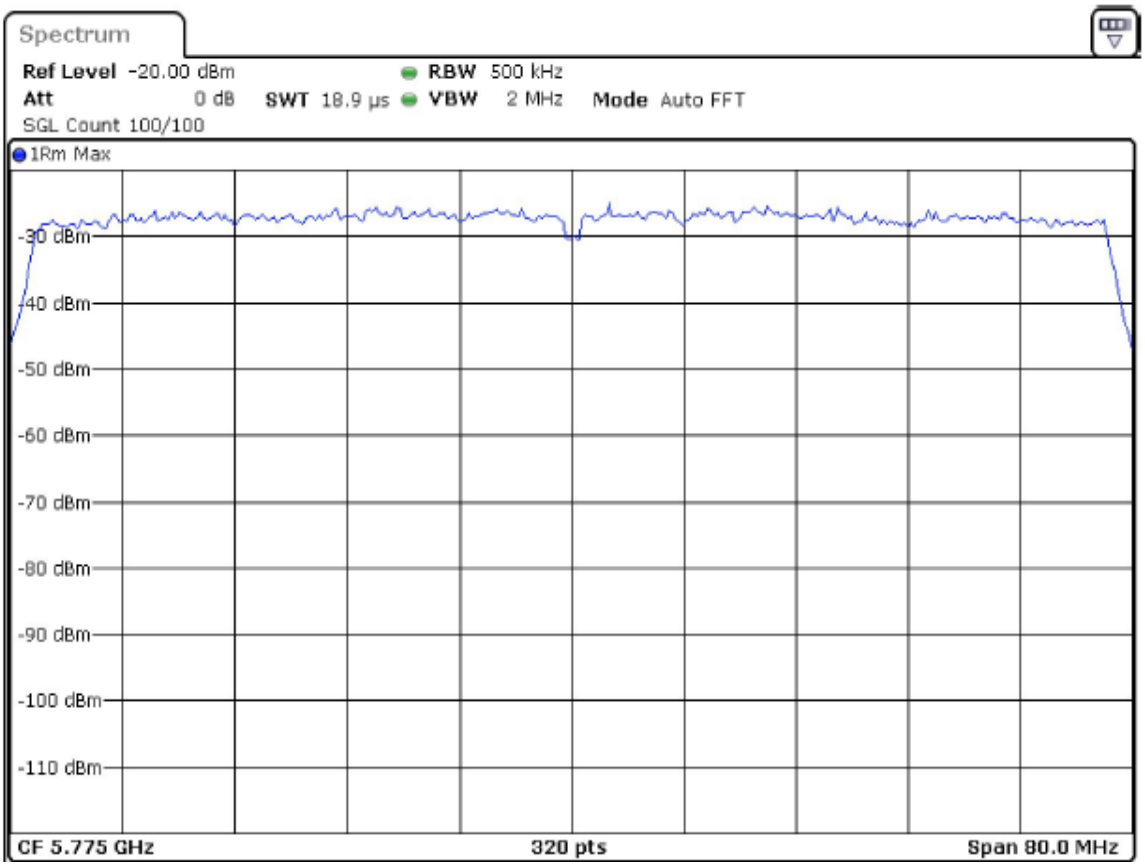
802.11n(HT40) MCS2 5795MHz



802.11ac(VHT40) MCS0 5755MHz



802.11ac(VHT80) MCS0 5775MHz



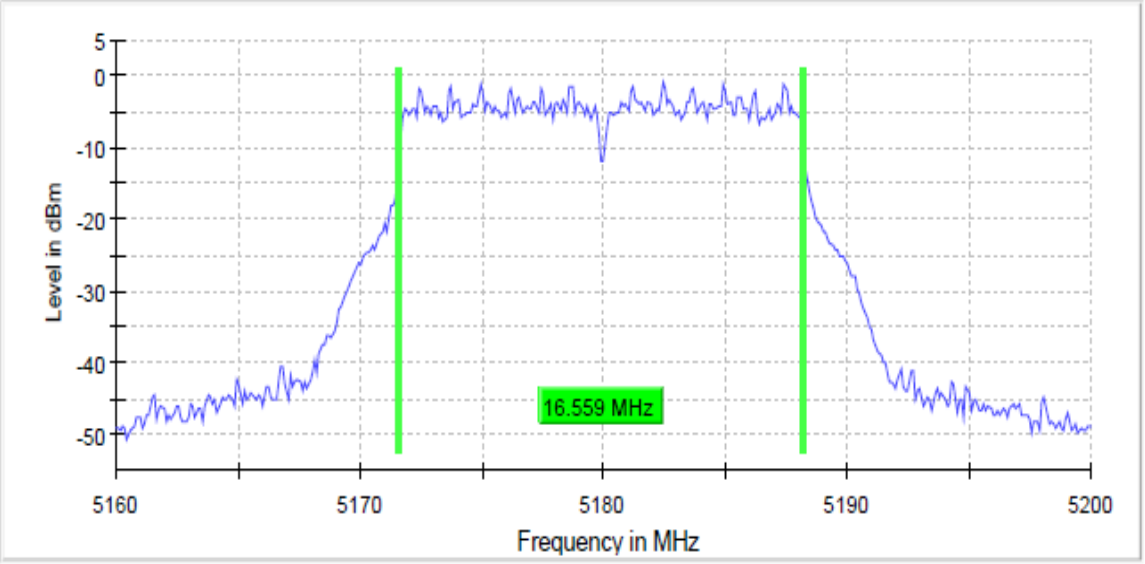
DTS Bandwidth (6dB)

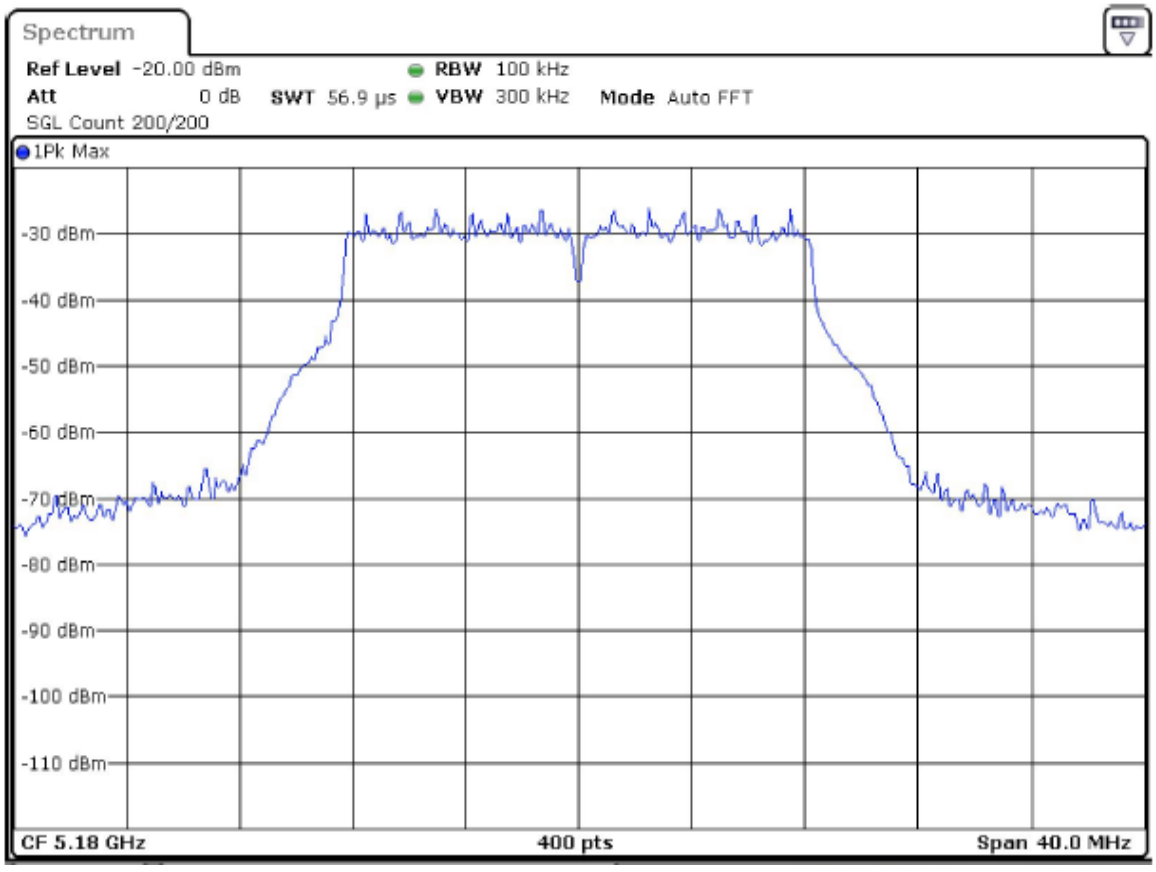
Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.C.2.
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

FCC/RSS-247 UNII-1

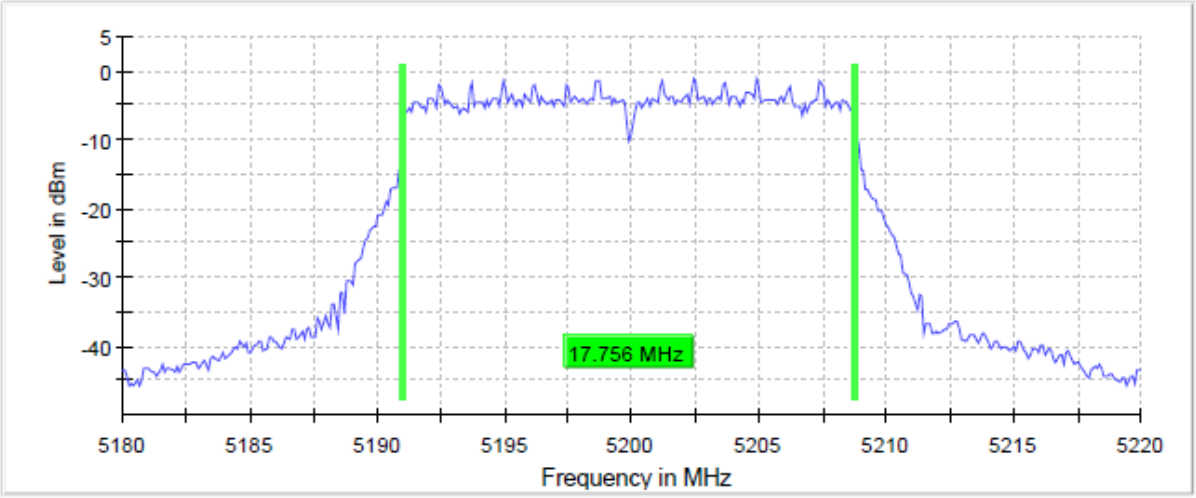
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11a 48 Mbps	5180.000	16.558603	0.5	5171.620948	5188.179551
802.11n(HT20) MSC0	5180.000	17.755611	0.5	5171.022444	5188.778055
802.11ac(VHT20) MCS2	5180.000	17.855361	0.5	5171.022444	5188.877805
802.11n(HT40) MSC5	5190.000	36.454432	0.5	5171.722846	5208.177278
802.11ac(VHT40) MCS0	5190.000	36.654183	0.5	5171.622971	5208.277154
802.11a 48 Mbps	5200.000	16.558603	0.5	5191.620948	5208.179551
802.11n(HT20) MSC0	5200.000	17.755611	0.5	5191.022444	5208.778055
802.11ac(VHT20) MCS2	5200.000	17.855361	0.5	5191.022444	5208.877805
802.11ac(VHT80) MCS4	5210.000	76.552155	0.5	5171.623985	5248.176140
802.11n(HT40) MSC5	5230.000	36.454432	0.5	5211.722846	5248.177278
802.11ac(VHT40) MCS0	5230.000	36.654183	0.5	5211.622971	5248.277154
802.11a 48 Mbps	5240.000	16.558603	0.5	5231.620948	5248.179551
802.11n(HT20) MSC0	5240.000	17.755611	0.5	5231.022444	5208.778055
802.11ac(VHT20) MCS2	5240.000	17.855361	0.5	5231.022444	5248.877805

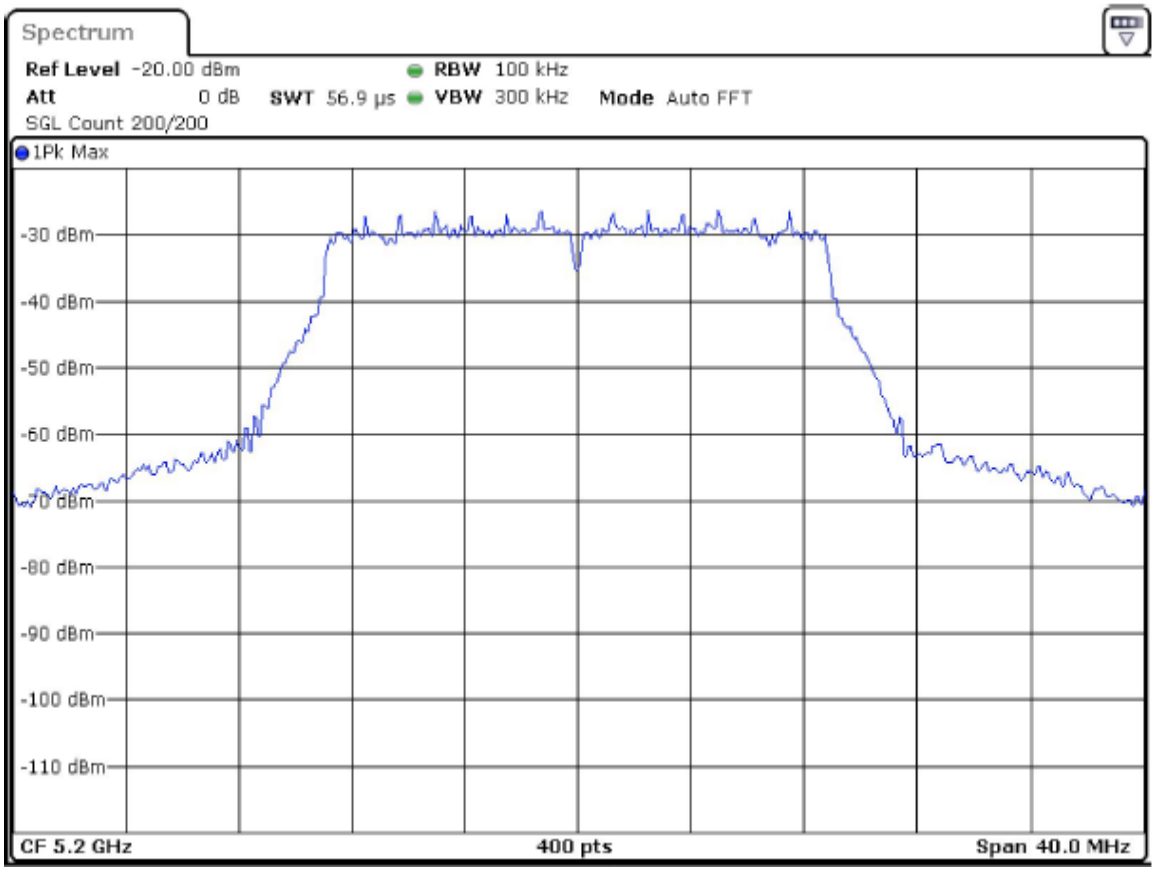
802.11a 48 Mb/s 5180MHz



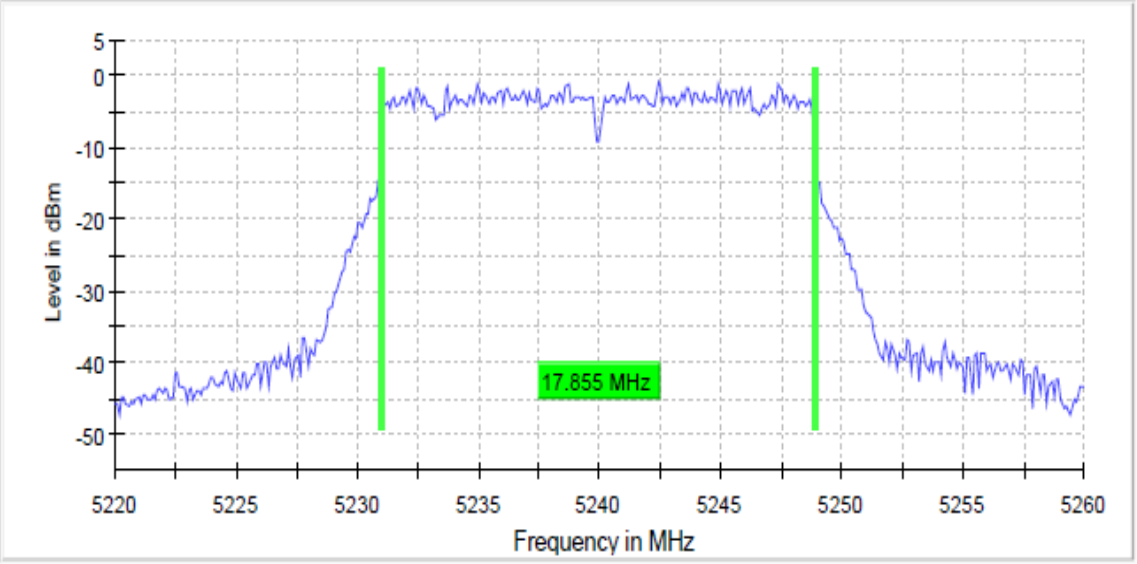


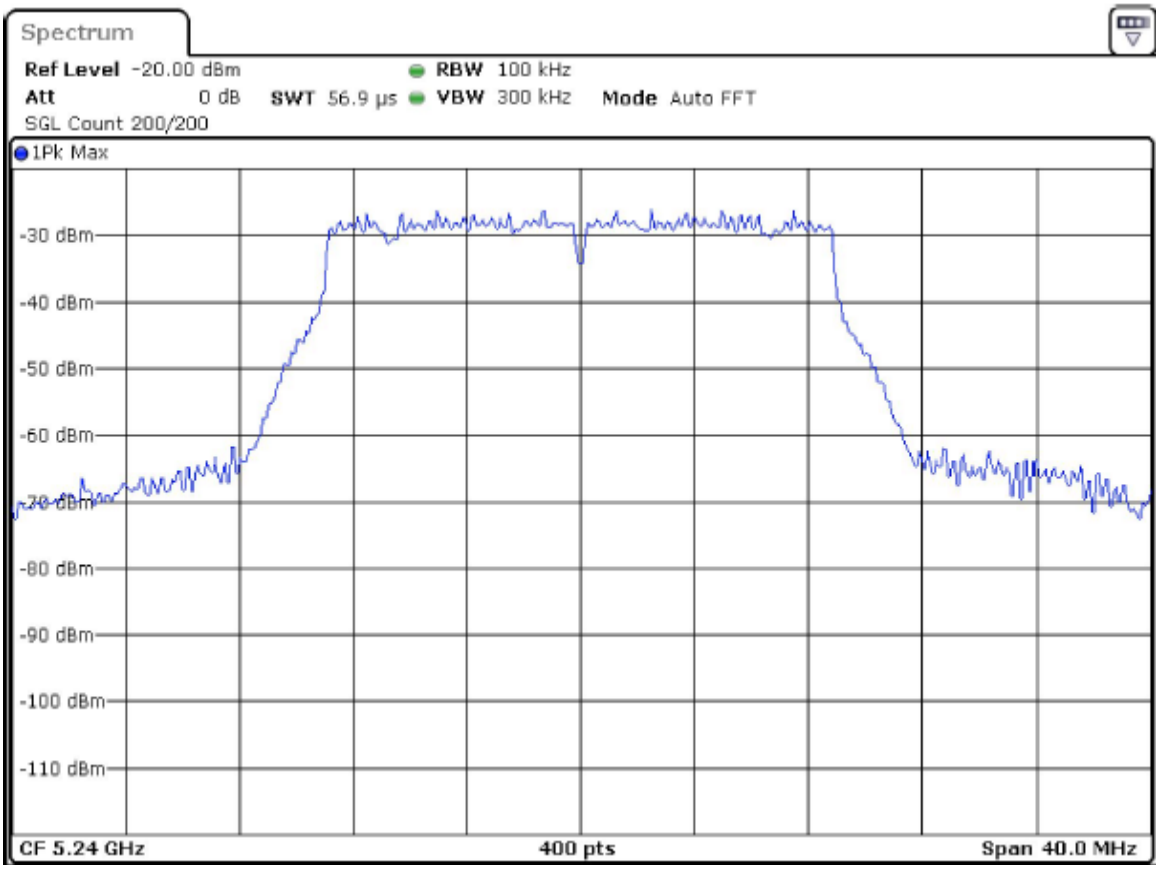
802.11n(HT20) MCS0 5200MHz



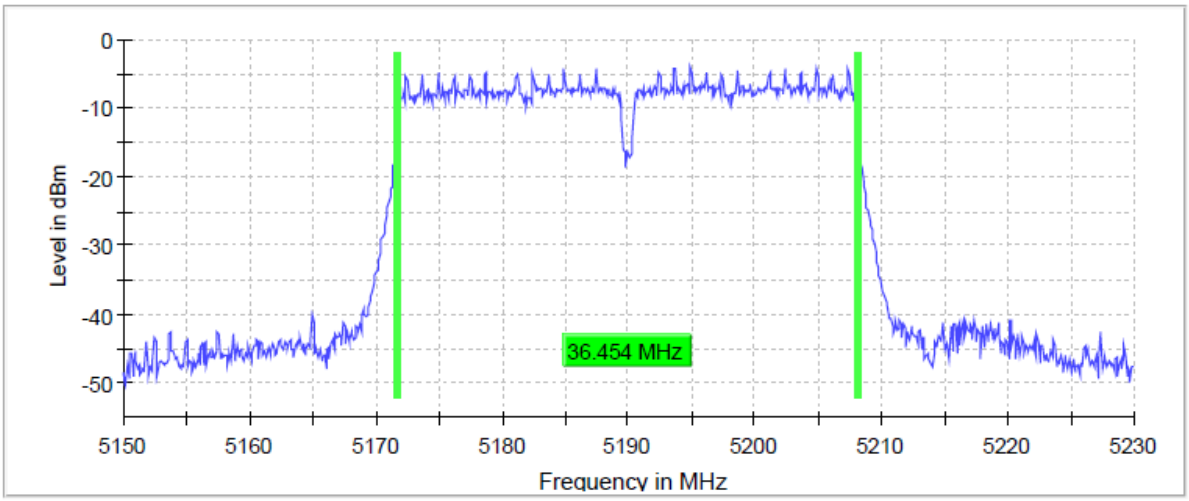


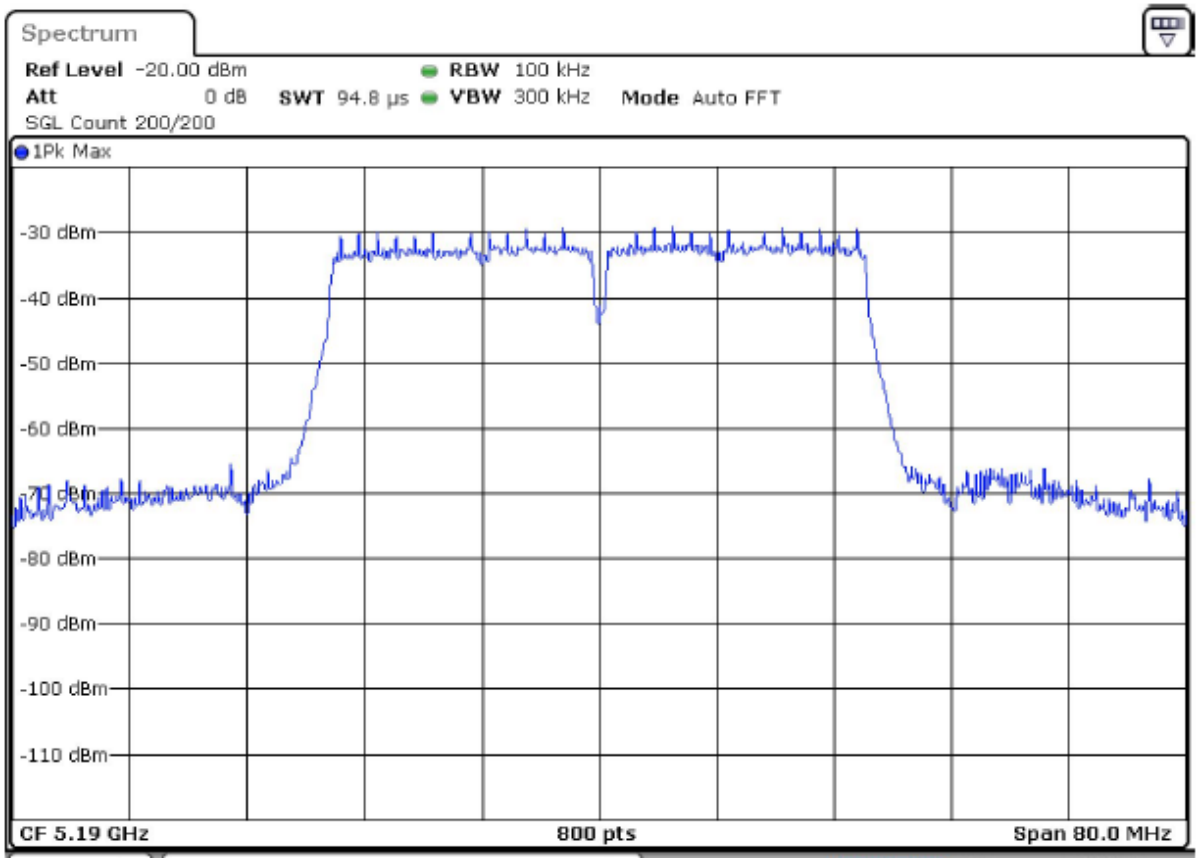
802.11ac(VHT20) MCS2 5240MHz



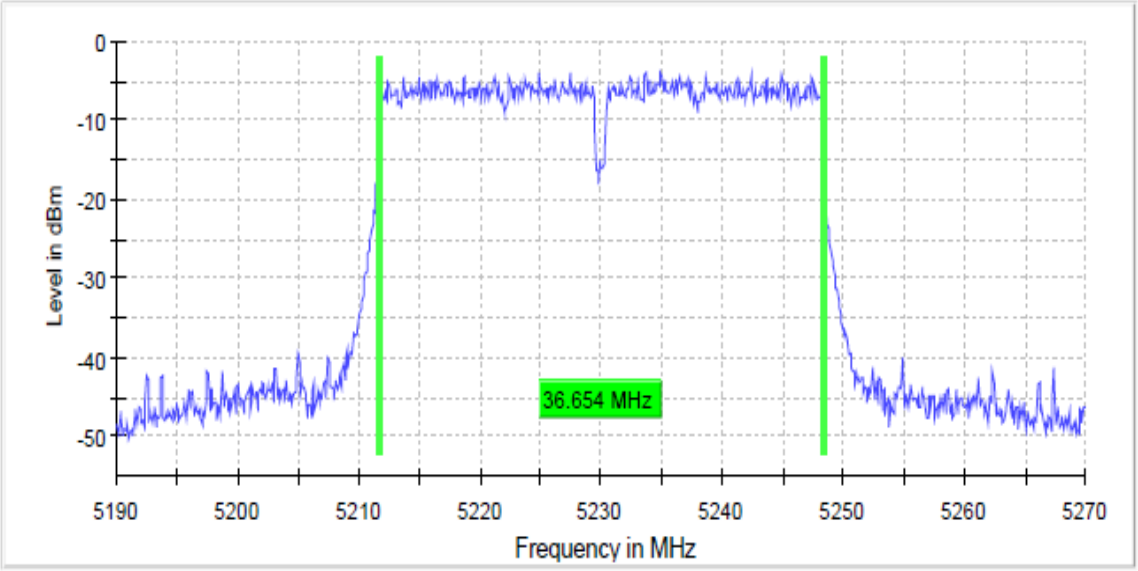


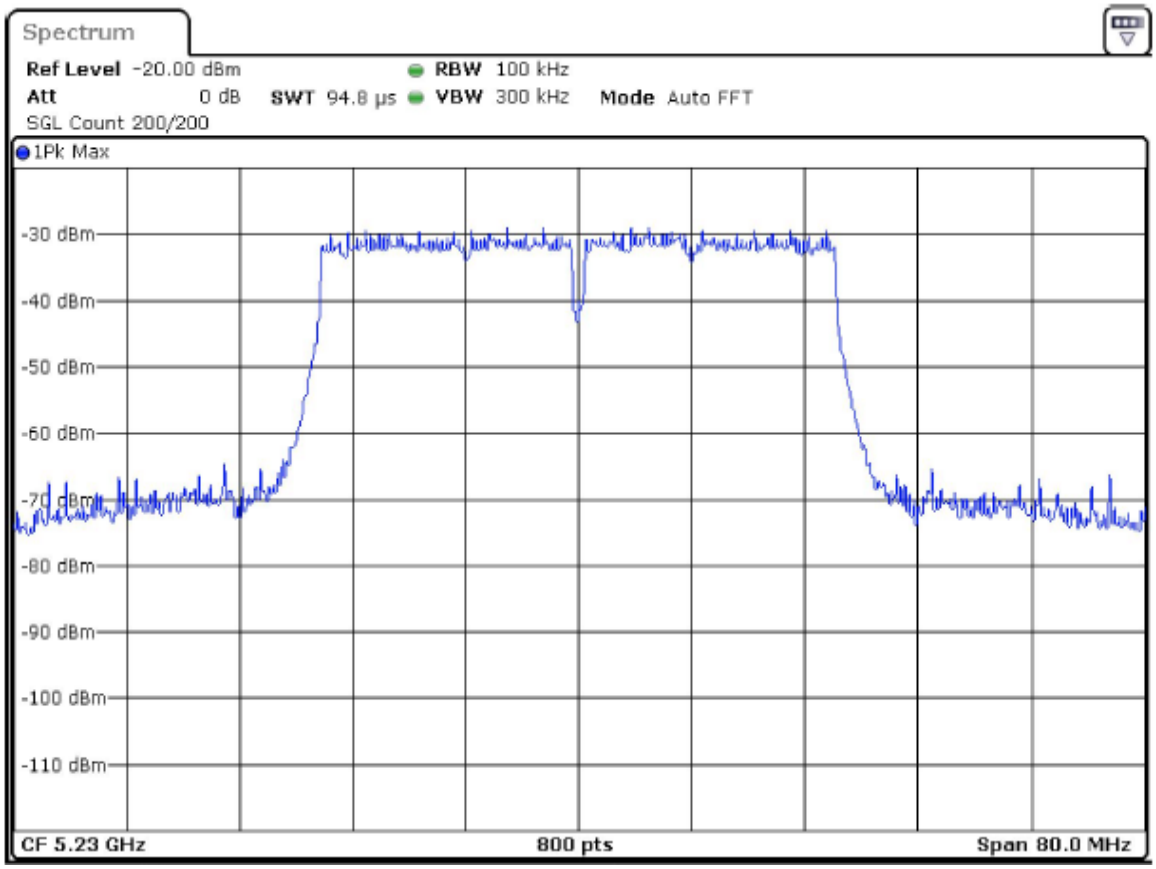
802.11n(HT40) MCS5 5190MHz



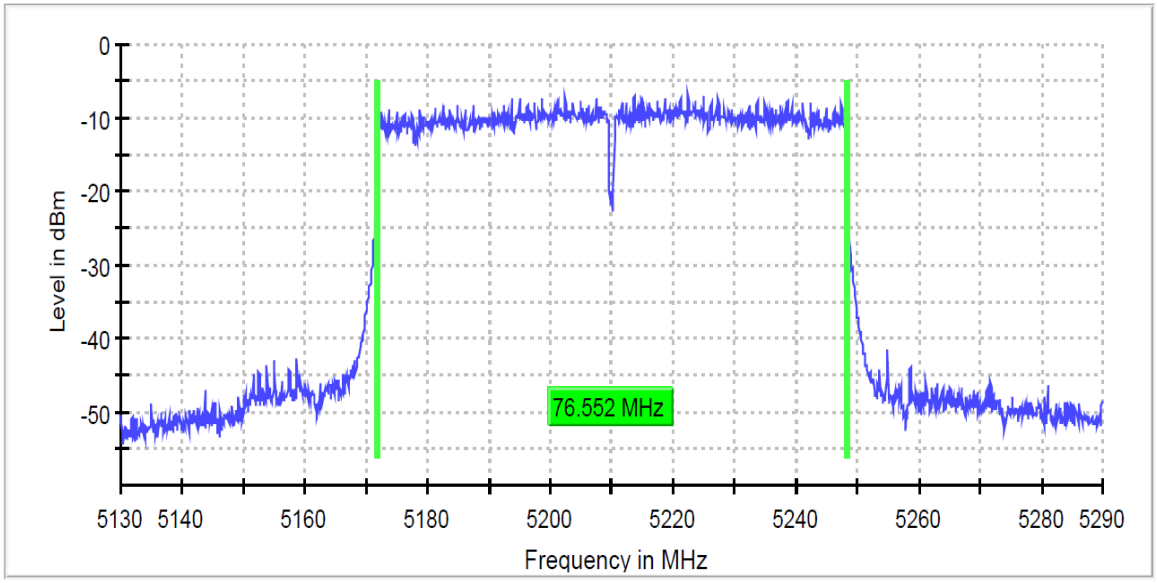


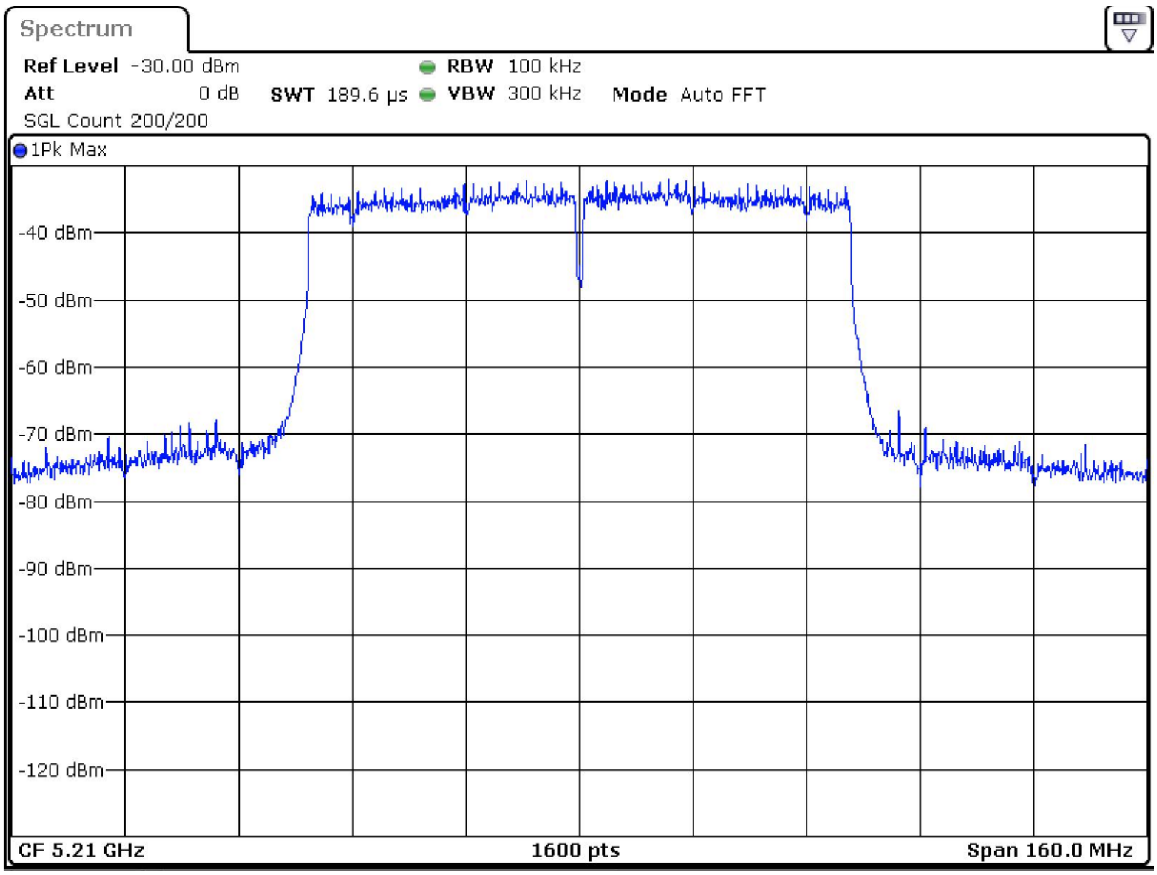
802.11ac(VHT40) MCS0 5230MHz





802.11ac(VHT80) MCS4 5210MHz

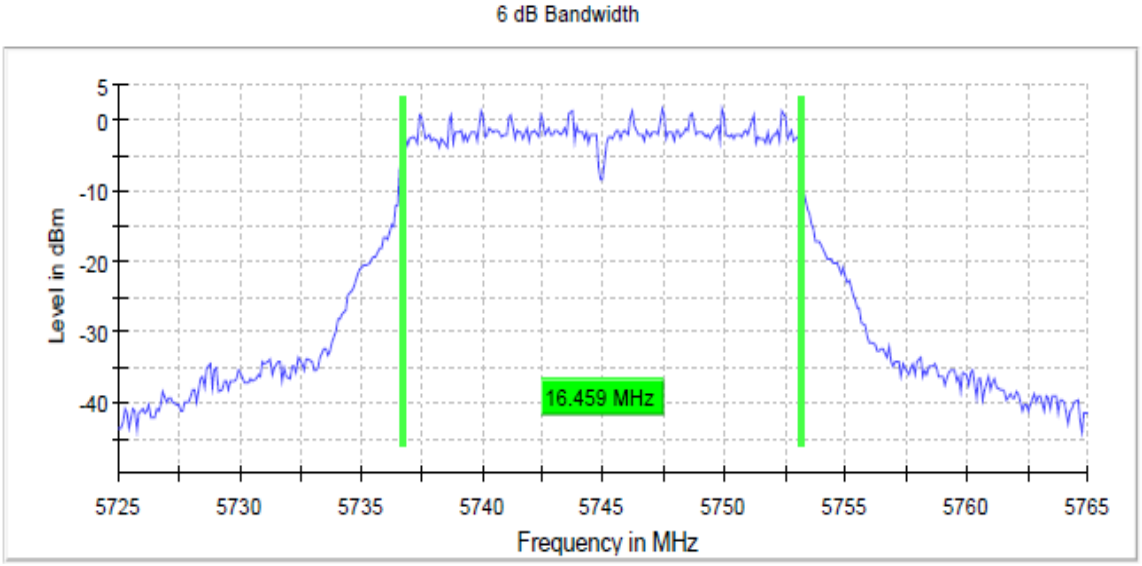


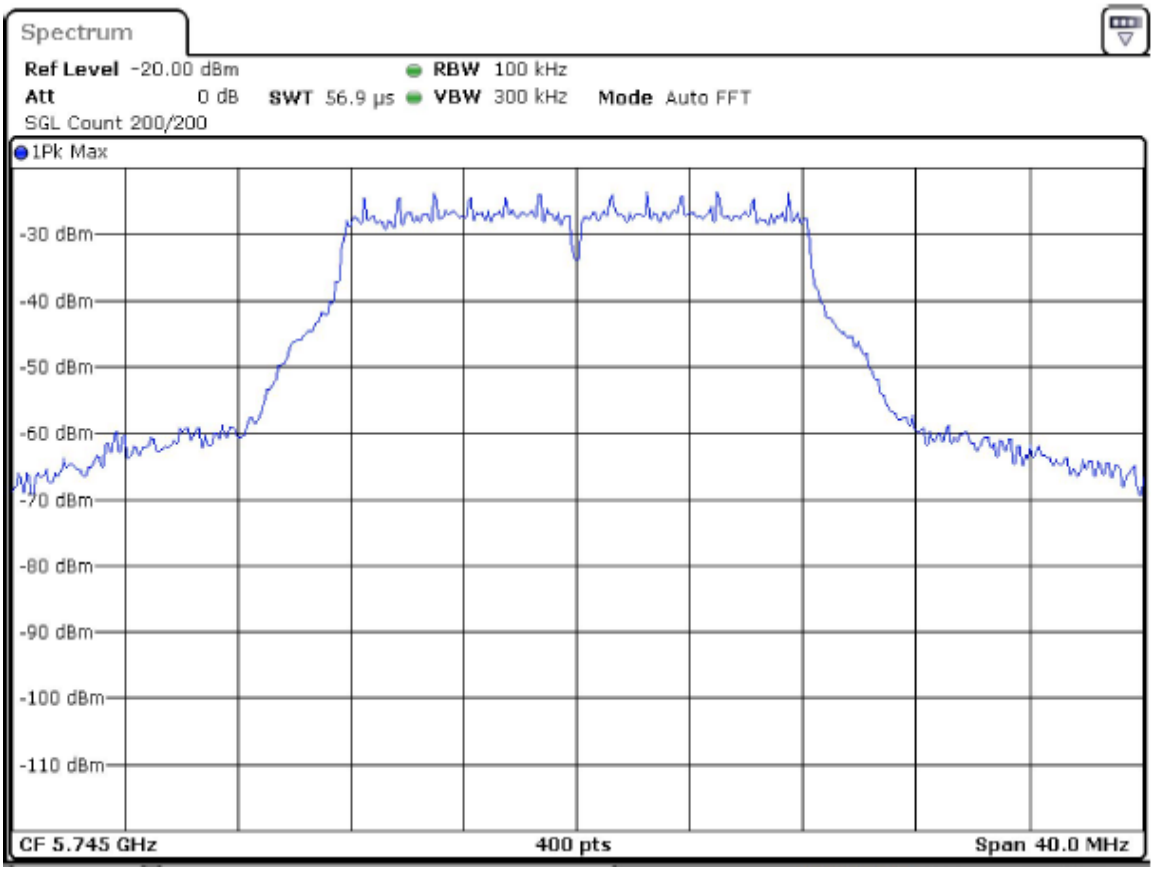


FCC/RSS-247 UNII-3

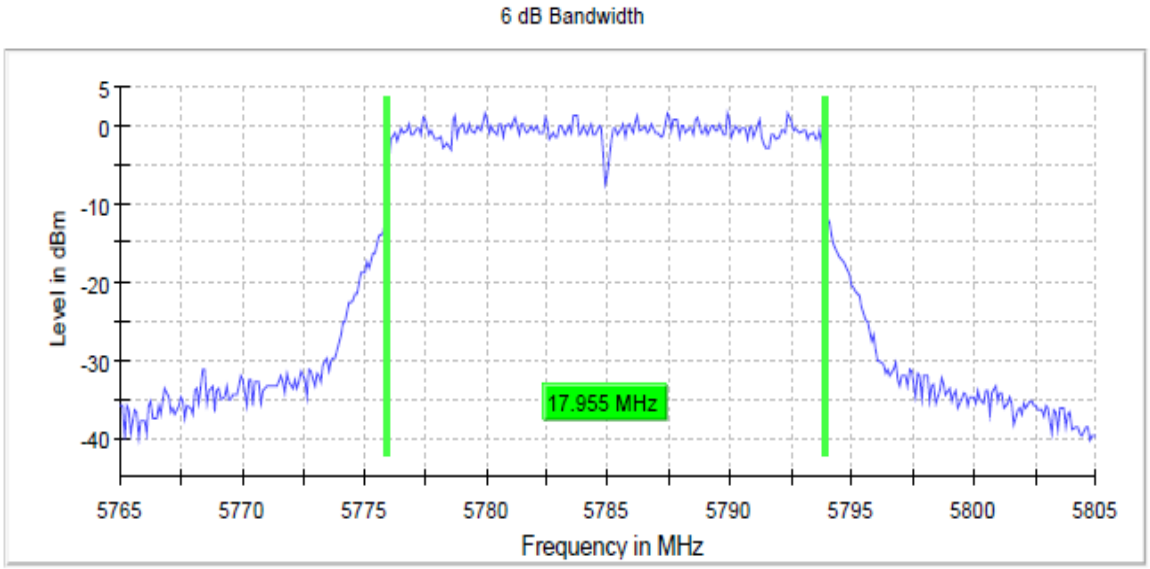
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11a 6 Mbps	5745.00	16.458853	0.5	5736.720698	5753.179551
802.11n(HT20) MSC3	5745.00	17.855361	0.5	5736.022444	5753.877805
802.11ac(VHT20) MCS3	5745.00	17.855361	0.5	5736.022444	5753.877805
802.11n(HT40) MSC2	5755.00	36.554307	0.5	5736.622971	5773.177278
802.11ac(VHT40) MCS0	5755.00	36.454432	0.5	5736.722846	5773.177278
802.11ac(VHT80) MCS0	5775.00	76.452217	0.5	5736.723923	5813.176140
802.11a 6 Mbps	5785.00	16.458853	0.5	5776.720698	5793.179551
802.11n(HT20) MSC3	5785.00	17.955112	0.5	5775.922693	5793.877805
802.11ac(VHT20) MCS3	5785.00	17.855361	0.5	5776.022444	5793.877805
802.11n(HT40) MSC2	5795.00	36.554307	0.5	5776.622971	5813.177278
802.11ac(VHT40) MCS0	5795.00	36.454432	0.5	5776.722846	5813.177278
802.11a 6 Mbps	5825.00	16.458853	0.5	5816.720698	5833.179551
802.11n(HT20) MSC3	5825.00	17.855361	0.5	5816.022444	5833.877805
802.11ac(VHT20) MCS3	5825.00	17.855361	0.5	5816.022444	5833.877805

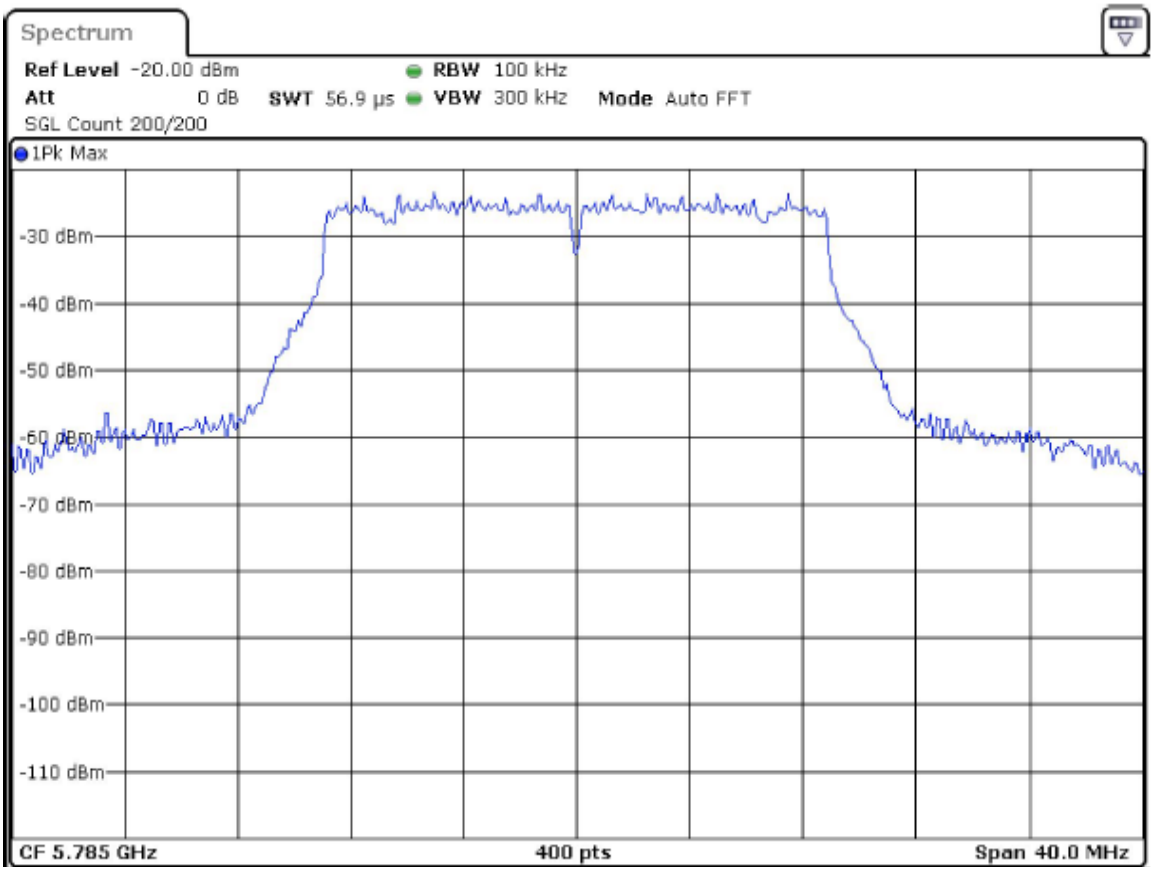
802.11a 6 Mbps
5745MHz



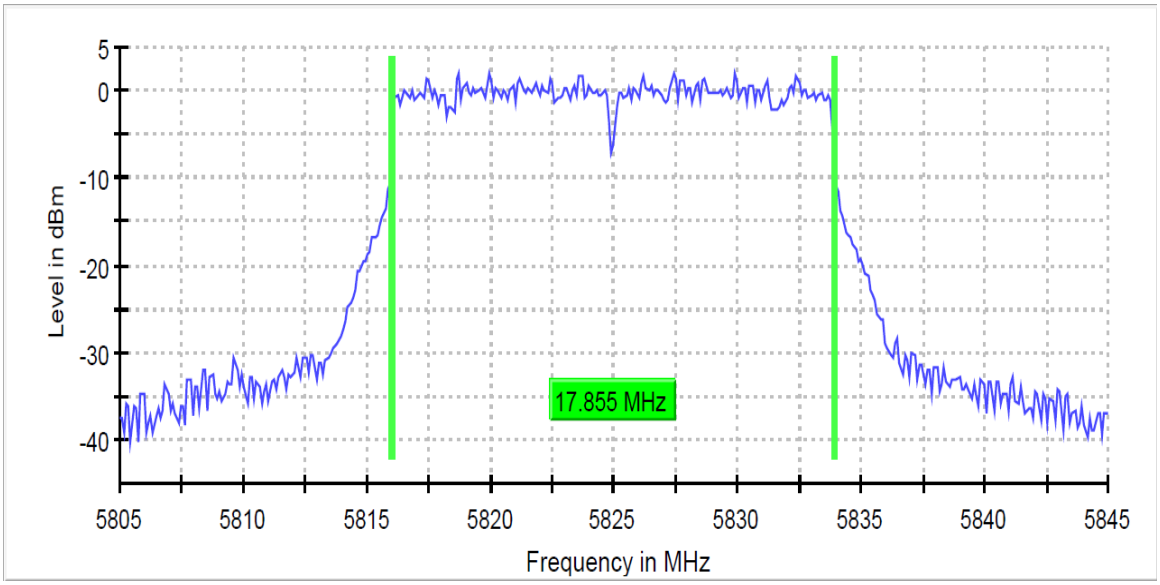


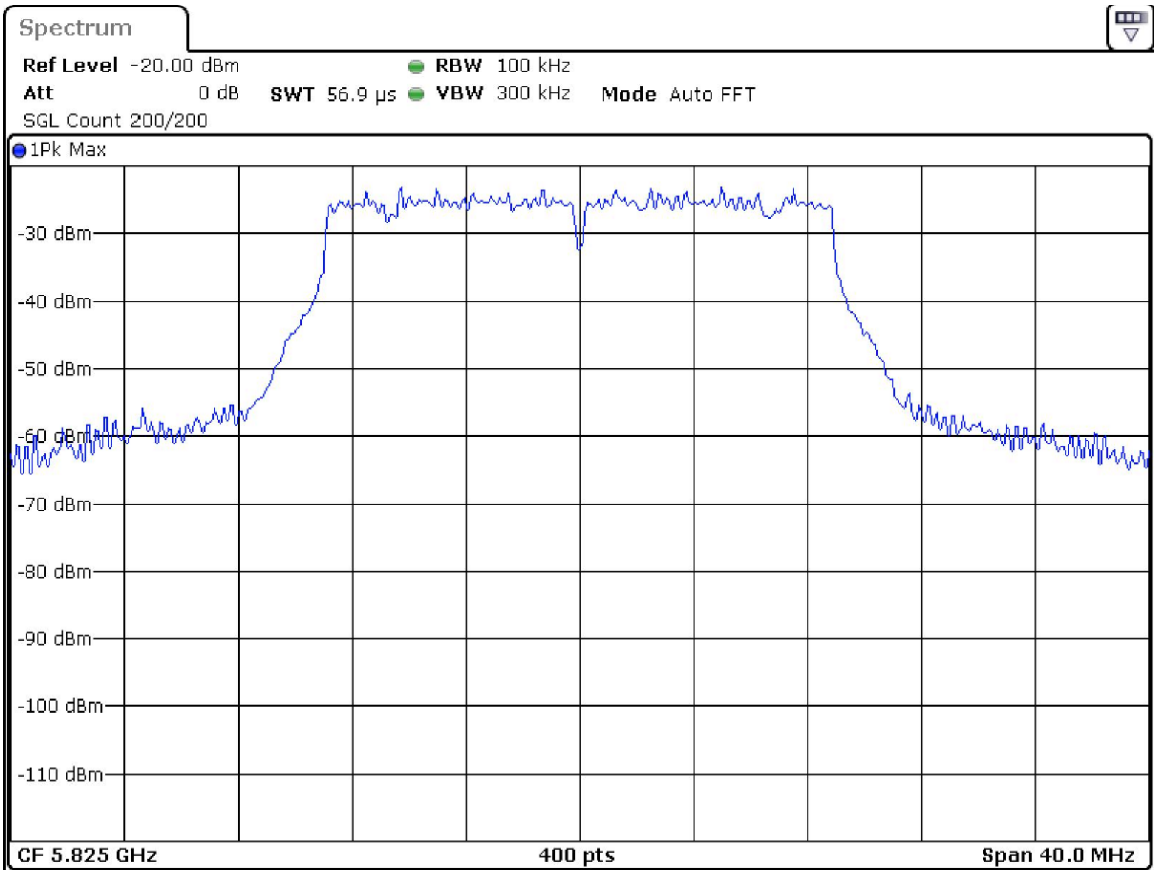
802.11n(HT20) MCS3 5785MHz



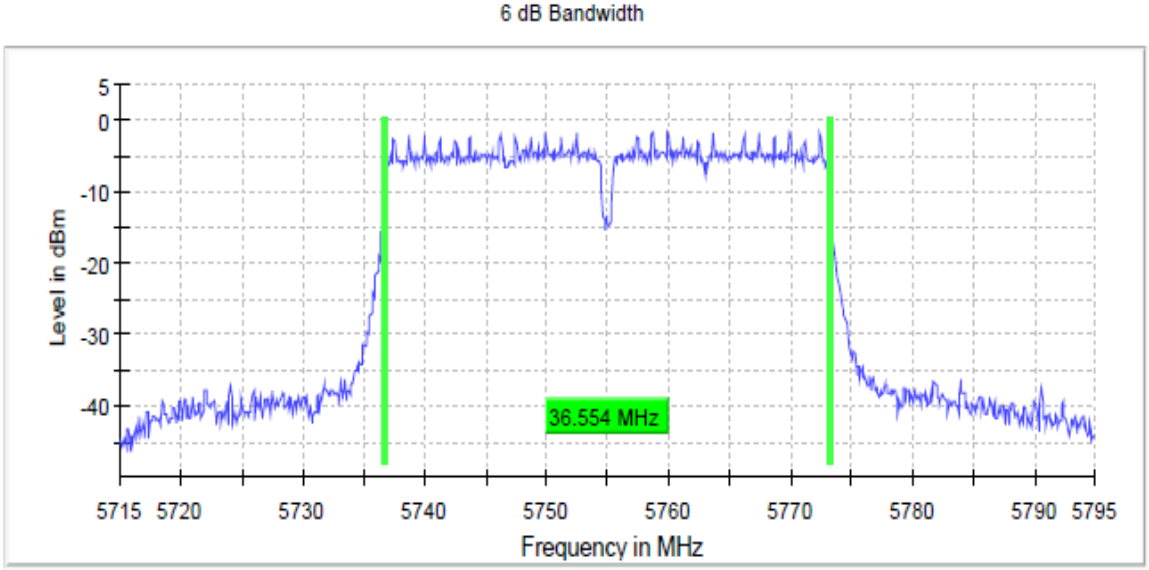


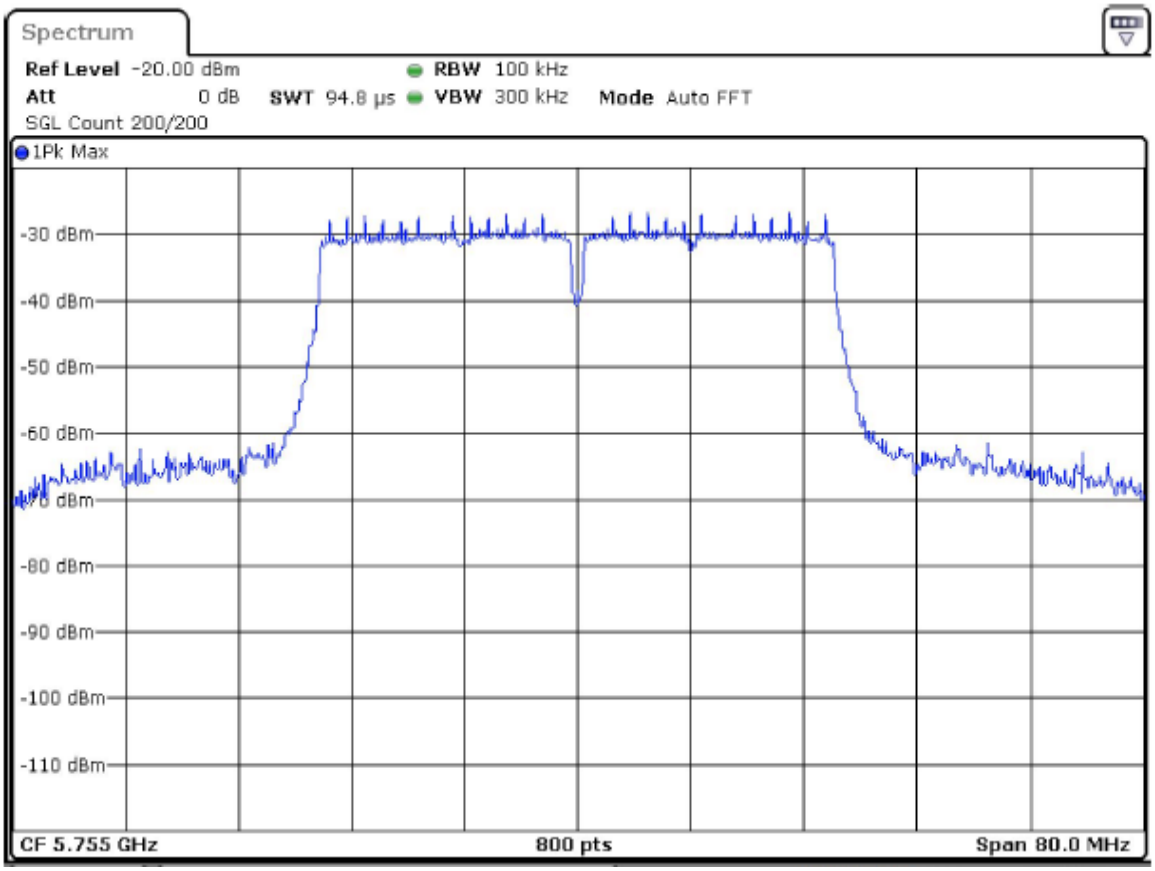
802.11ac(VHT20) MCS3 5825MHz



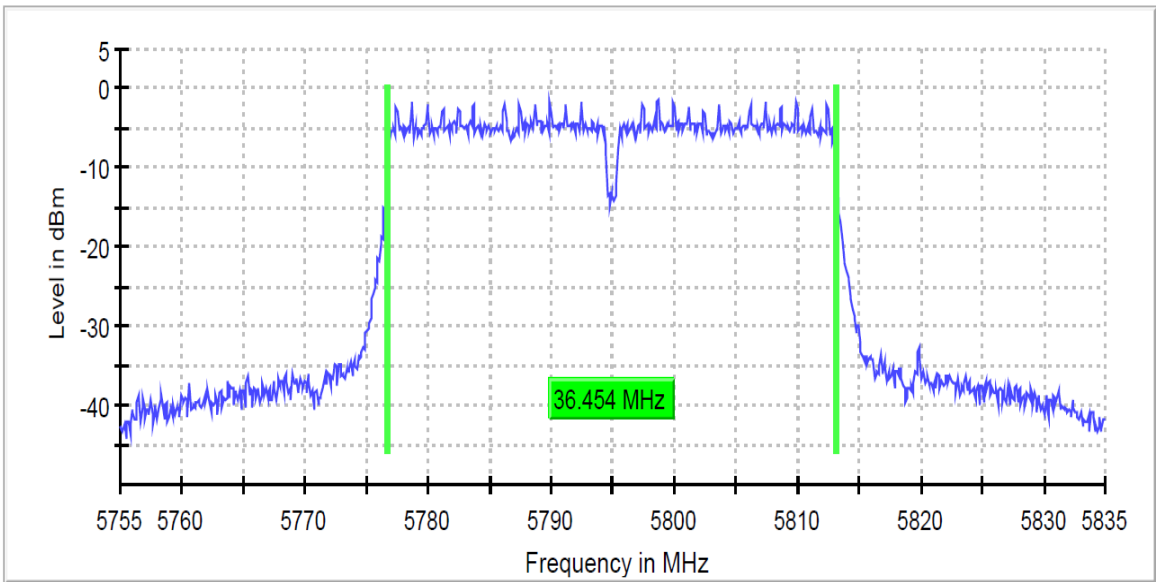


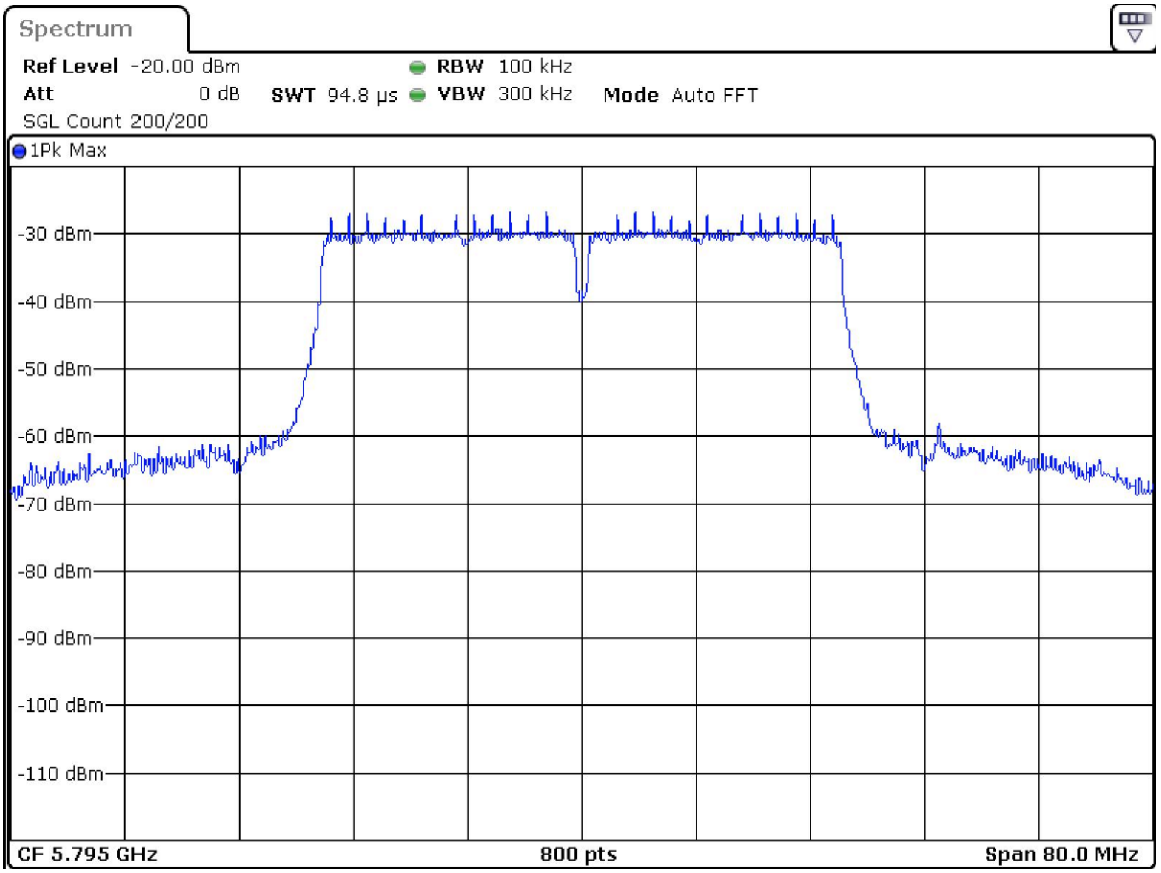
802.11n(HT40) MCS2 5755MHz



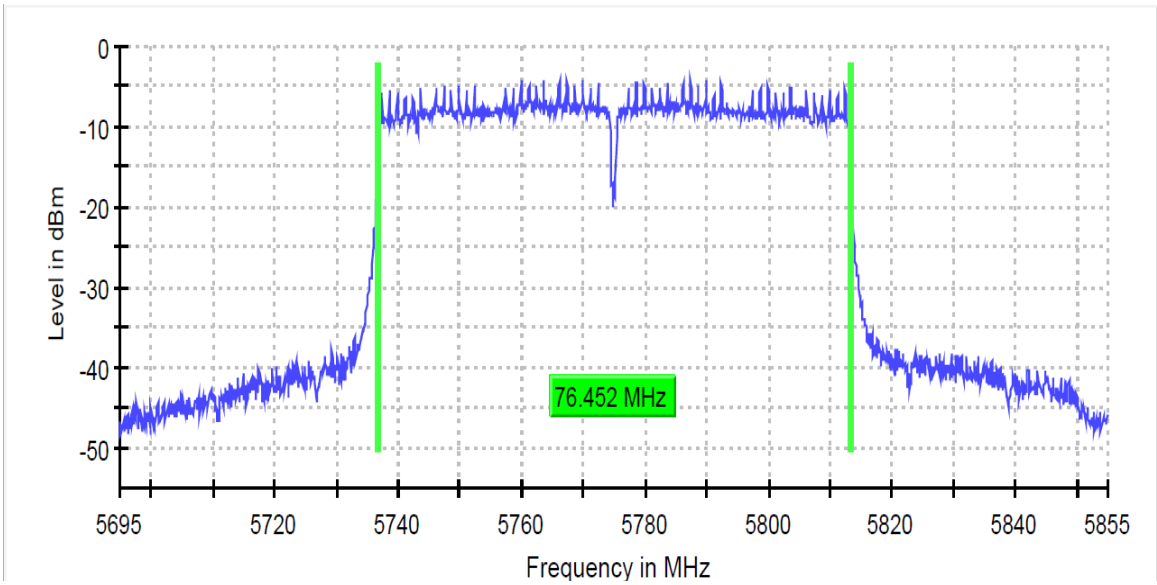


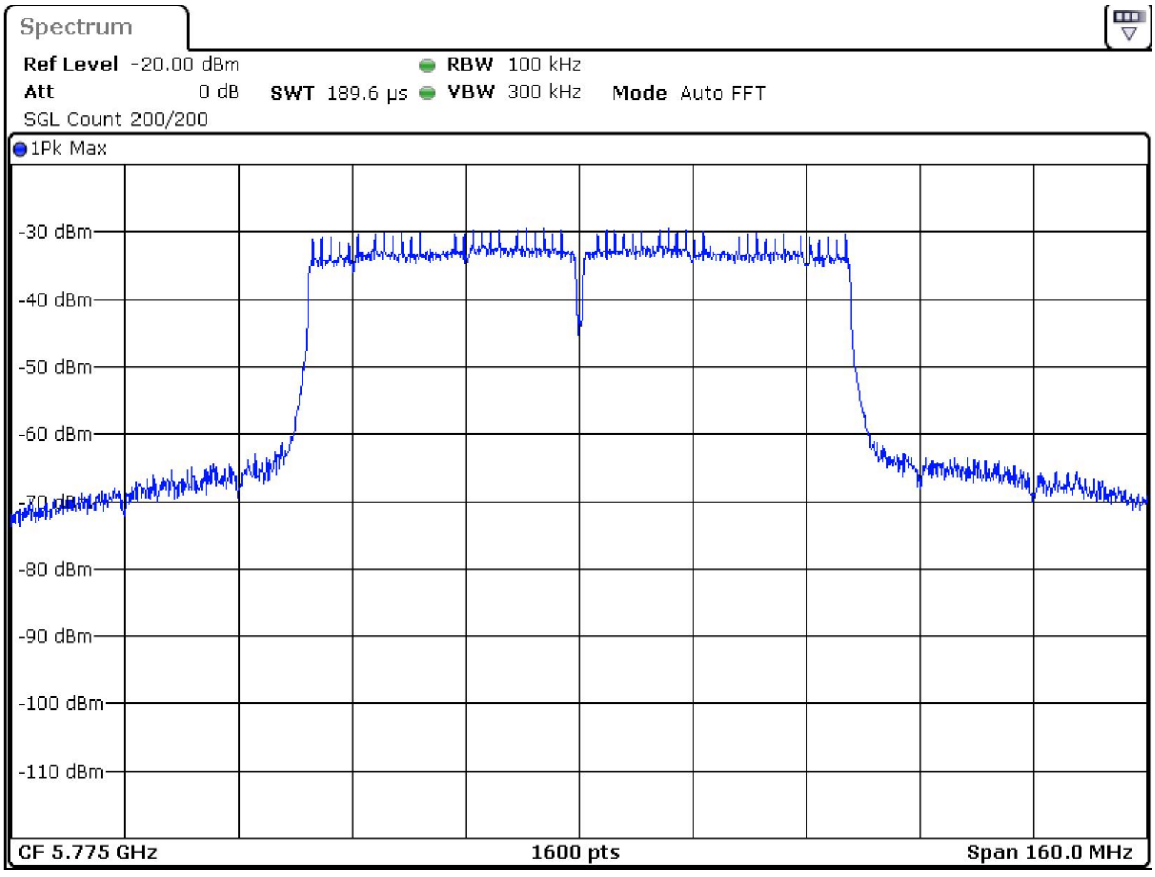
802.11ac(VHT40) MCS0 5795MHz





802.11ac(HT80) MCS0 5775MHz





Occupied Channel Bandwidth 99%

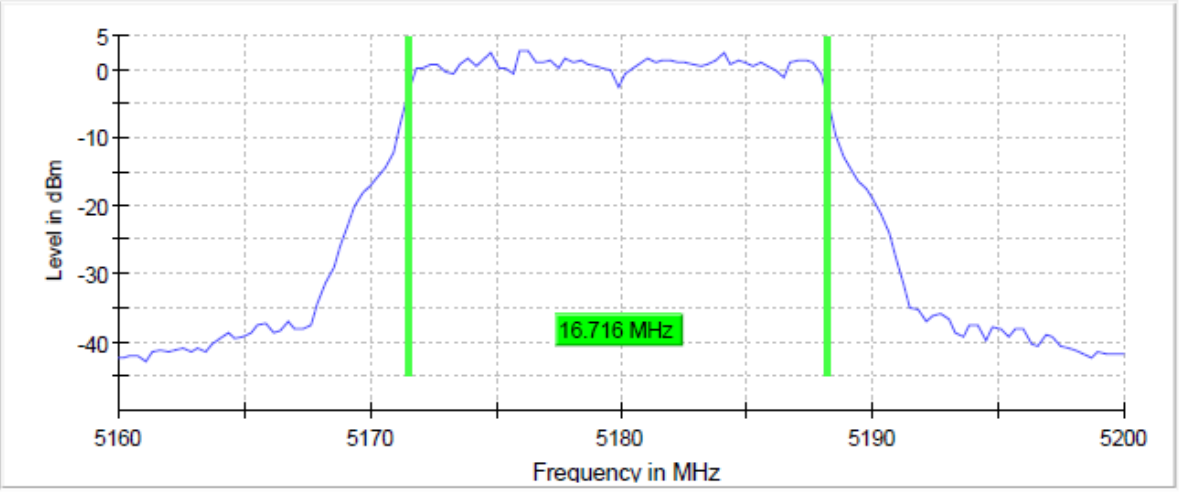
Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.D.

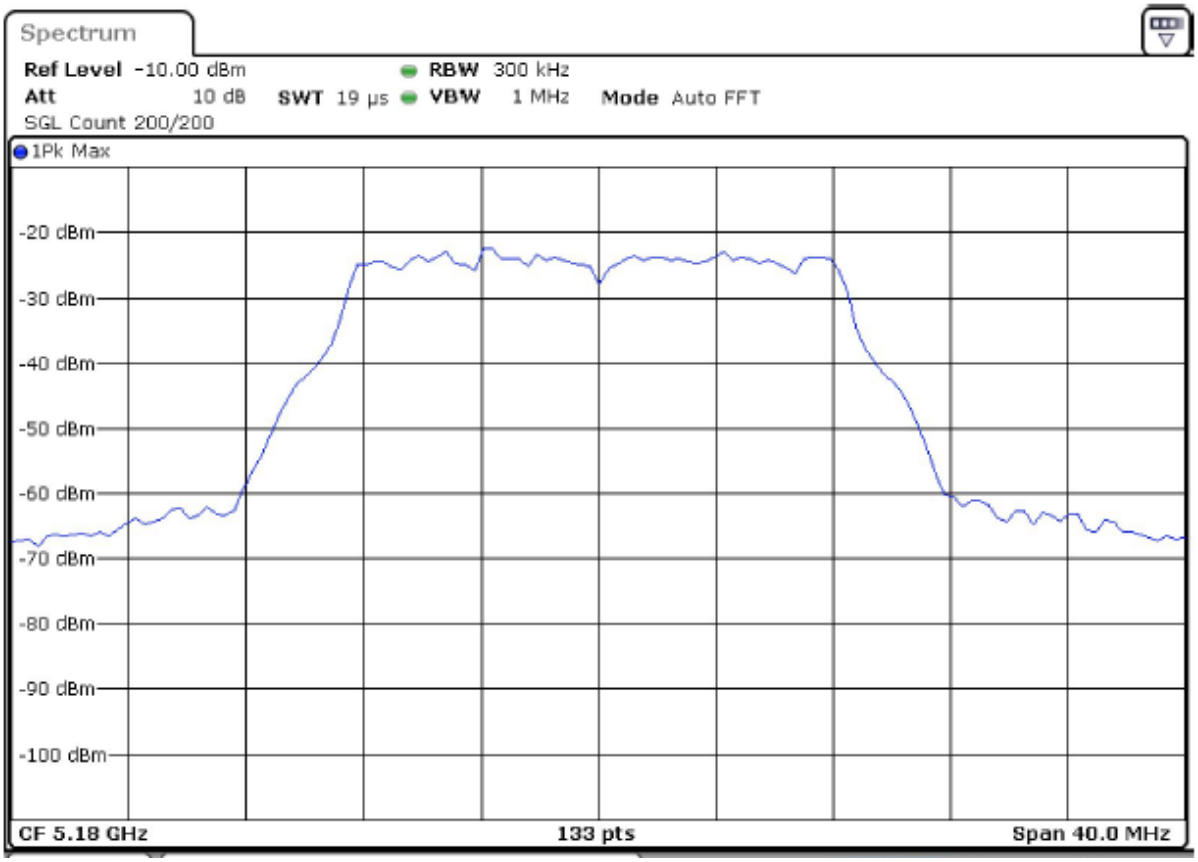
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

FCC/RSS-247 UNII-1

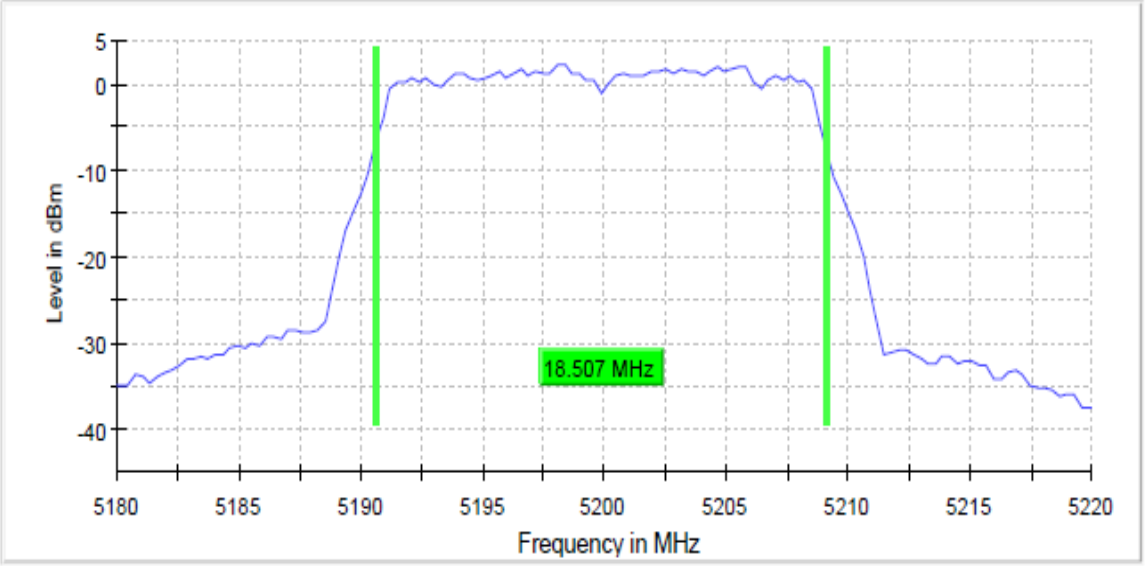
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Band Limits
802.11a 48 Mbps	5180.000	16.716418	5171.492537	5188.208955	5150-5250
802.11n(HT20) MSC0	5180.000	18.507463	5170.597015	5189.104478	5150-5250
802.11ac(VHT20) MCS2	5180.000	17.910448	5170.895522	5188.805970	5150-5250
802.11n(HT40) MSC5	5190.000	36.273292	5171.614907	5207.888199	5150-5250
802.11ac(HT40) MCS0	5190.000	36.273292	5171.614907	5207.888199	5150-5250
802.11a 48 Mbps	5200.000	16.716418	5191.492537	5208.208955	5150-5250
802.11n(HT20) MSC0	5200.000	18.507463	5190.597015	5209.104478	5150-5250
802.11ac(VHT20) MCS2	5200.000	17.910448	5190.895522	5208.80597	5150-5250
802.11ac(VHT80) MCS4	5210.000	76.521739	5171.242236	5247.763975	5150-5250
802.11n(HT40) MSC5	5230.000	36.273292	5211.614907	5247.888199	5150-5250
802.11ac(VHT40) MCS0	5230.000	36.273292	5211.614907	5247.888199	5150-5250
802.11a 48 Mbps	5240.000	16.716418	5231.492537	5248.208955	5150-5250
802.11n(HT20) MSC0	5240.000	18.507463	5230.597015	5249.104478	5150-5250
802.11ac(VHT20) MCS2	5240.000	17.910448	5230.895522	5248.805970	5150-5250

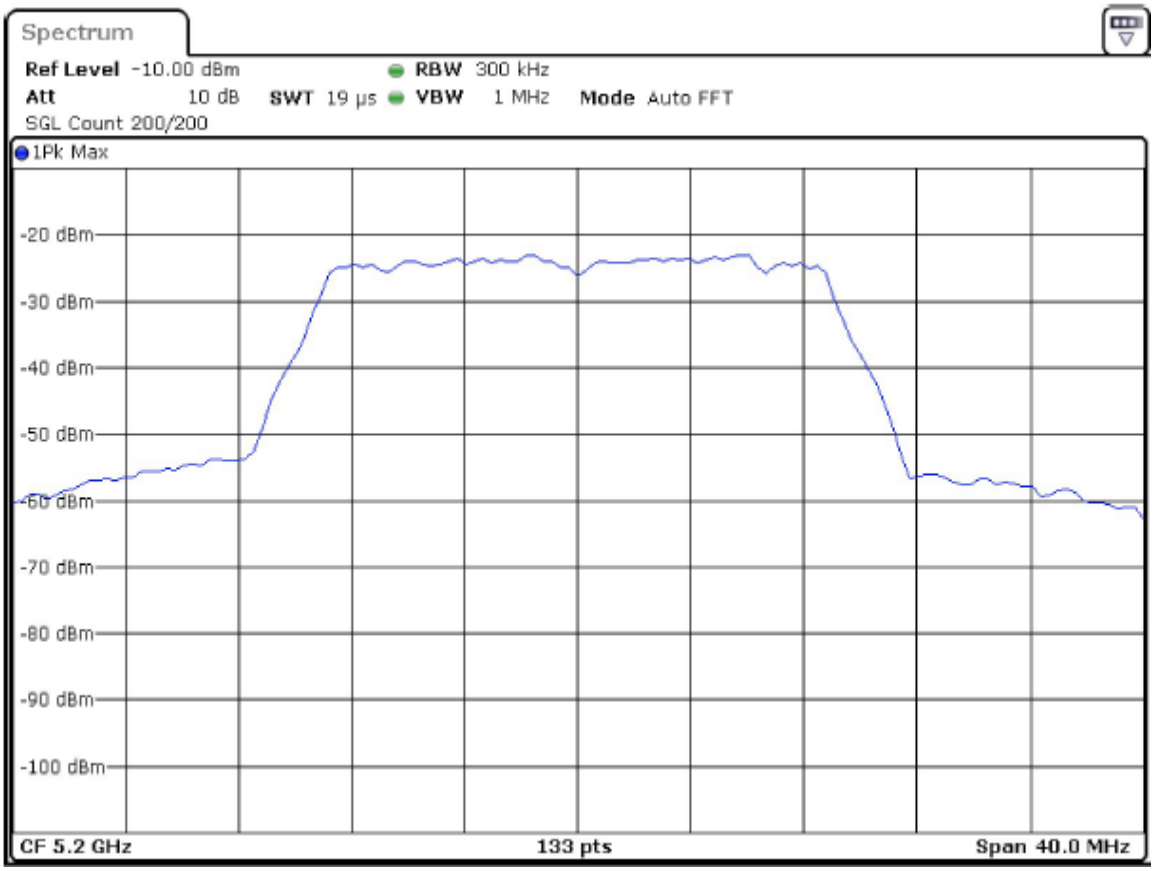
802.11a 48 Mbps 5180MHz



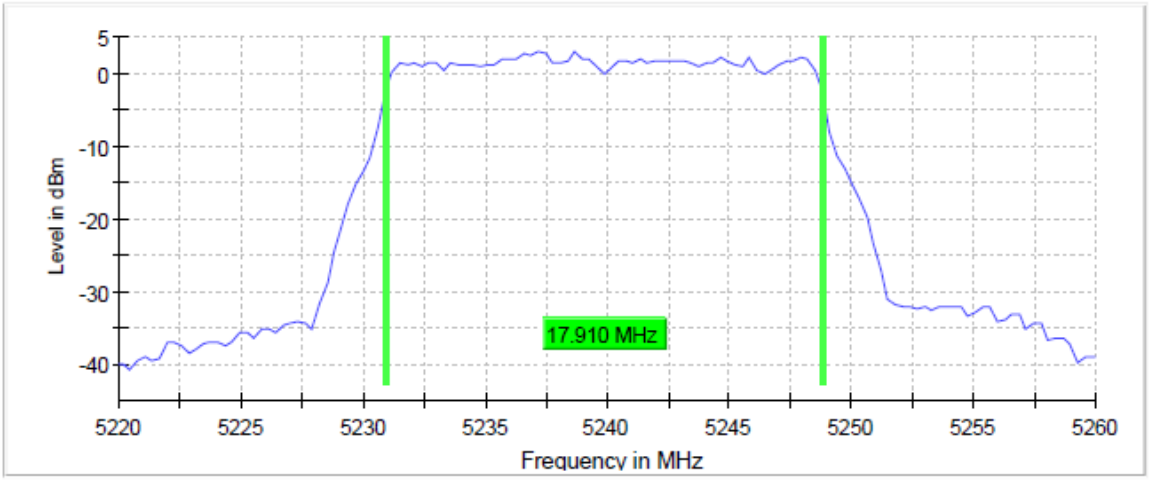


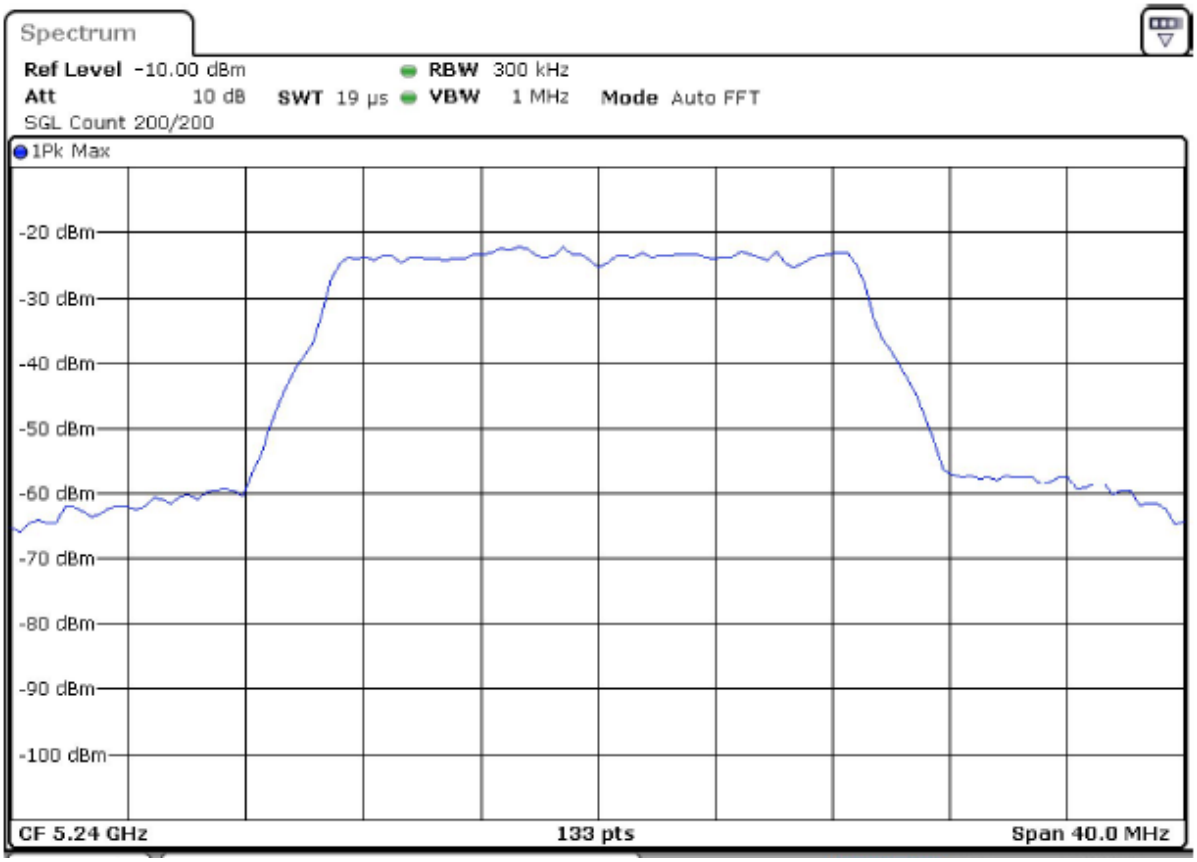
802.11n(HT20) MCS0 5200MHz



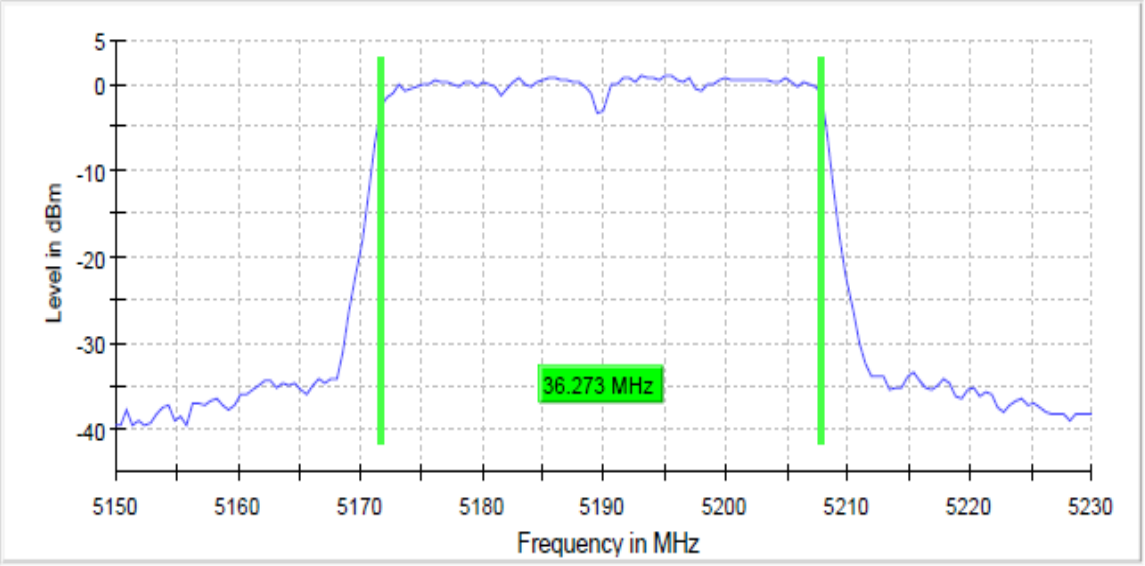


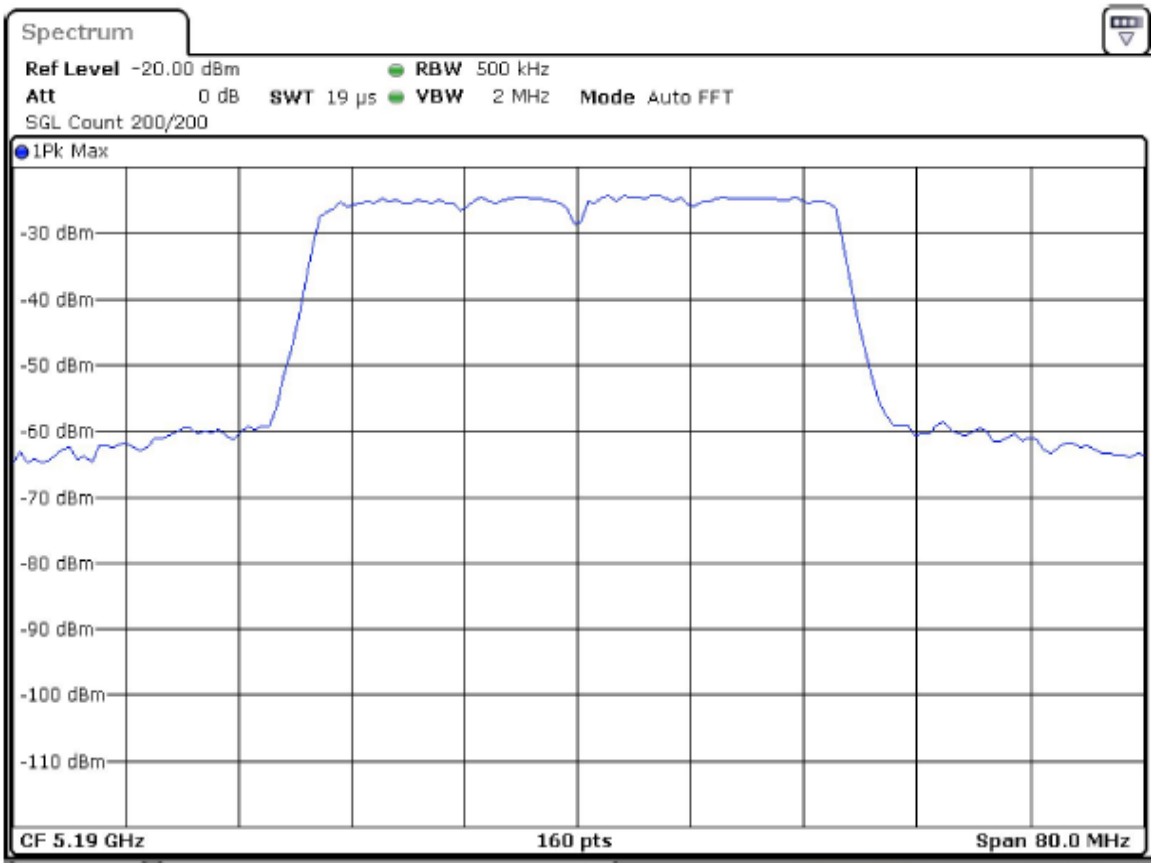
802.11ac(VHT20) MCS2 5240MHz



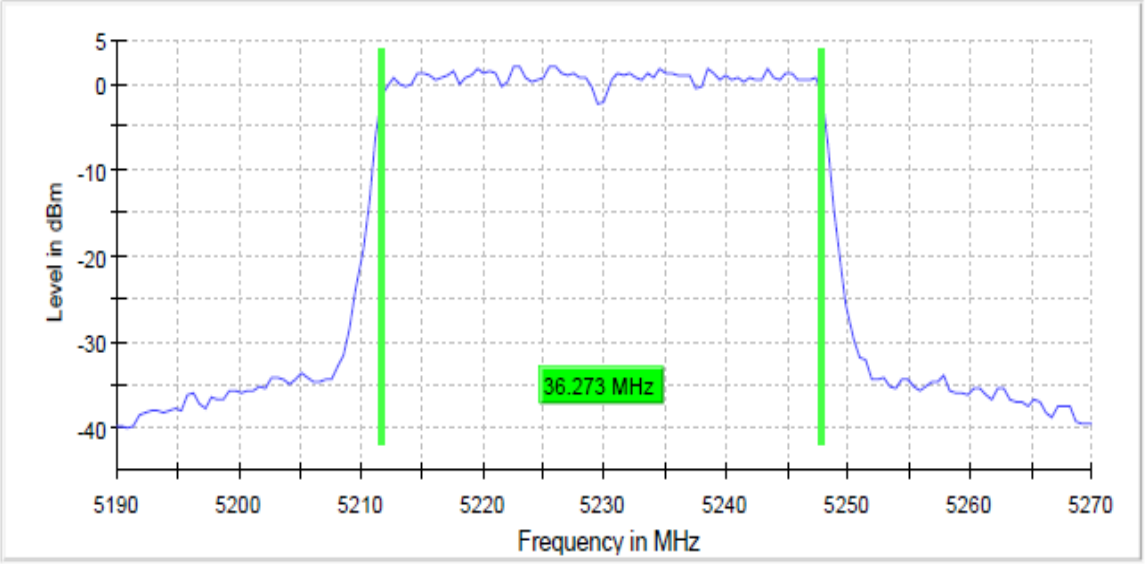


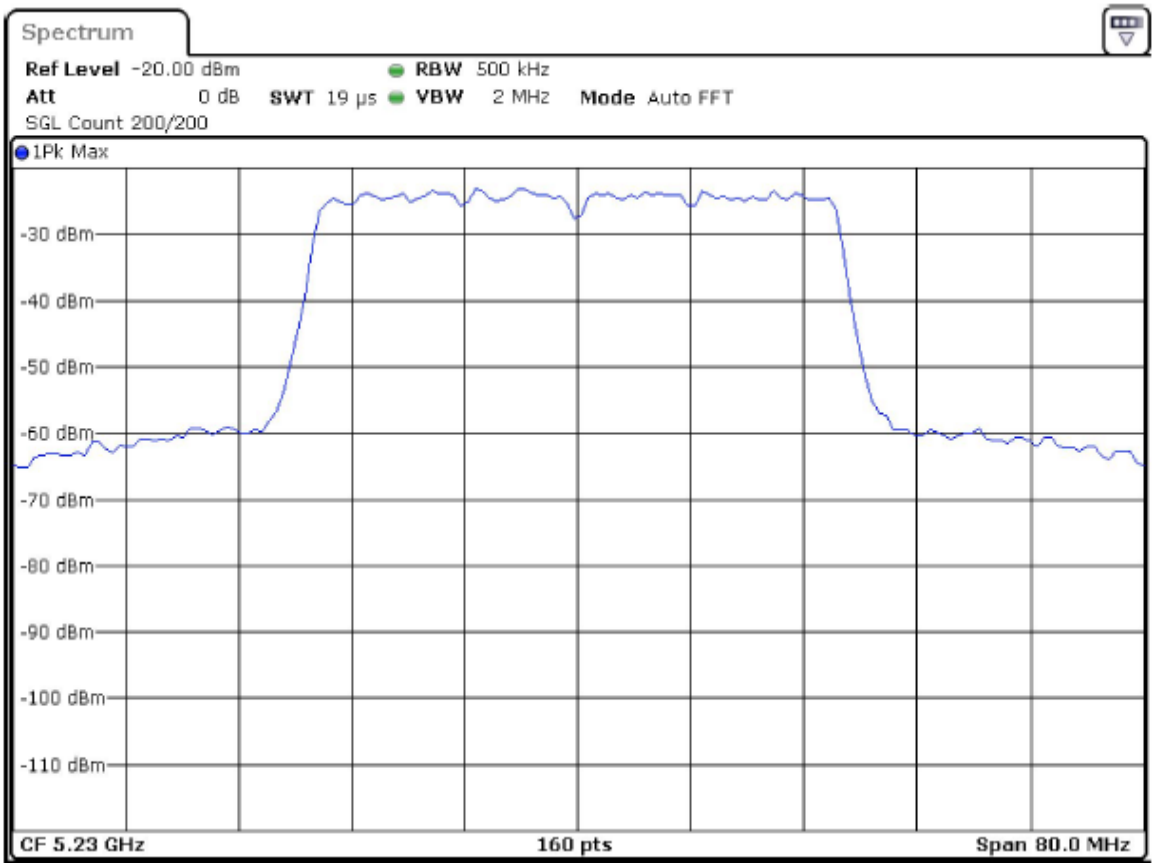
802.11n(HT40) MCS5 5190MHz



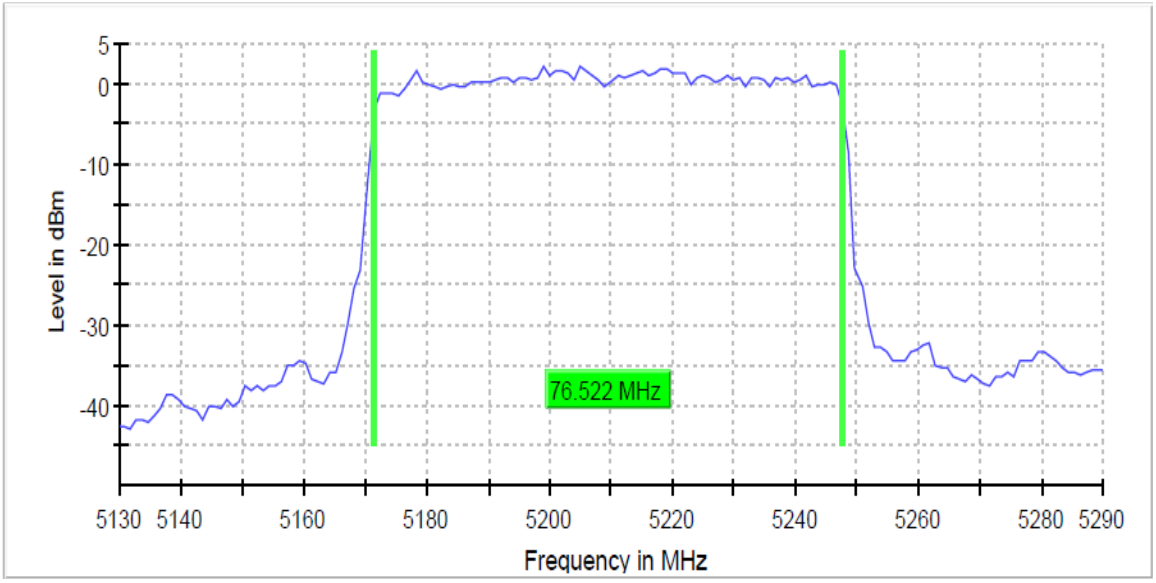


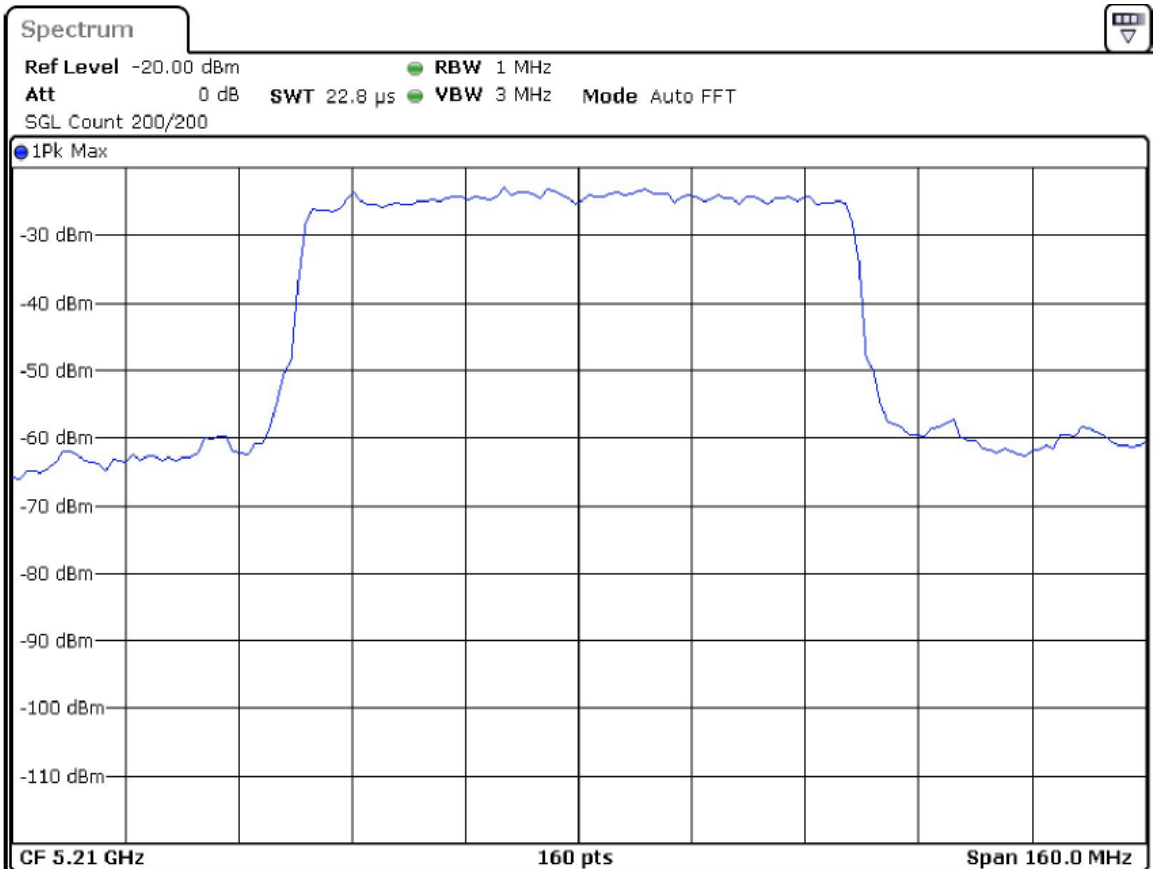
802.11ac(VHT40) MCS0 5230MHz





802.11ac(VHT80) MCS4 5210MHz

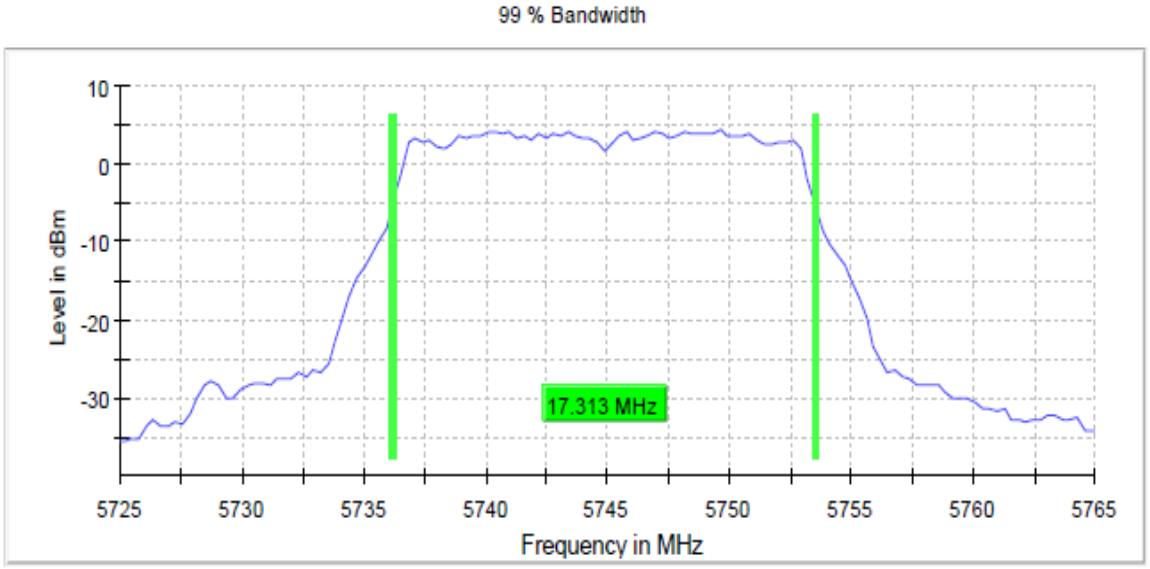


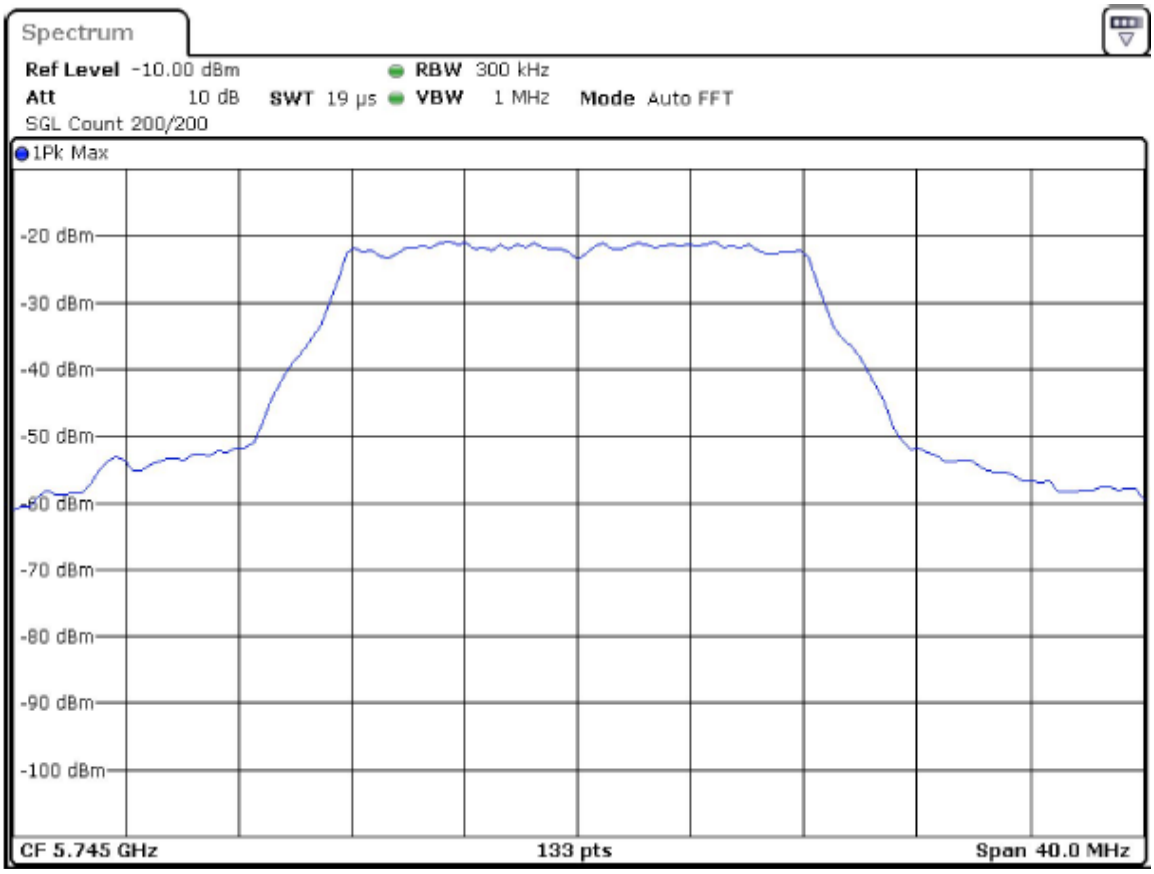


FCC/RSS-247 UNII-3

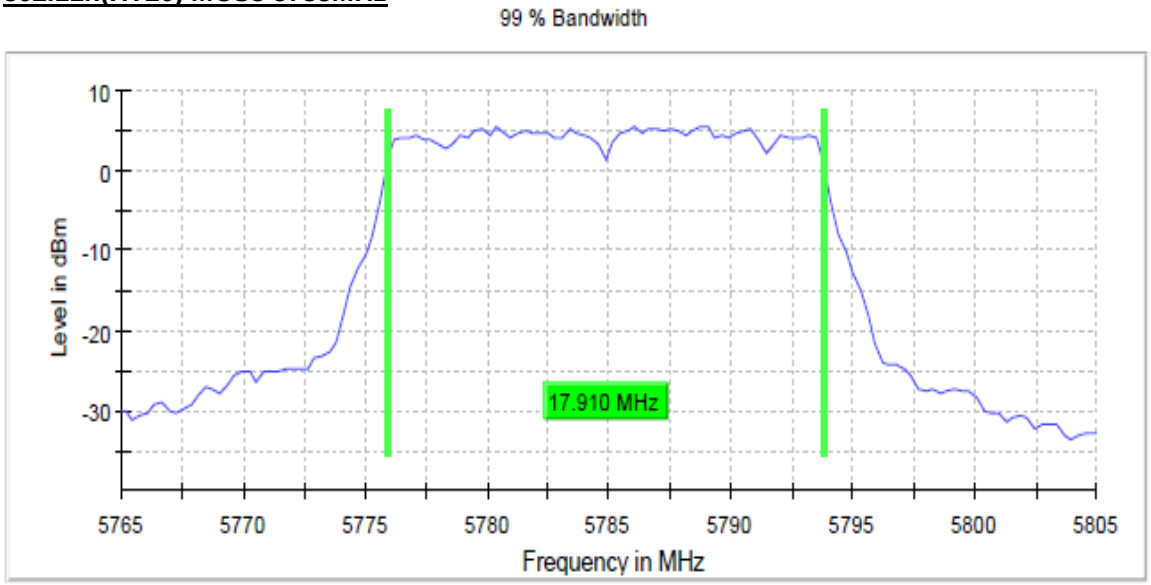
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Band Limits
802.11a 6 Mbps	5745.00	17.313433	5736.194030	5753.507463	5725-5850
802.11n(HT20) MSC3	5745.00	17.910448	5735.895522	5753.805970	5725-5850
802.11ac(VHT20) MCS3	5745.00	18.208955	5735.597015	5753.805970	5725-5850
802.11n(HT40) MSC2	5755.00	36.273292	5736.614907	5772.888199	5725-5850
802.11ac(HT40) MCS0	5755.00	36.273292	5736.614907	5772.888199	5725-5850
802.11ac(VHT80) MCS0	5775.00	76.521739	5736.242236	5812.763975	5725-5850
802.11a 6 Mbps	5785.00	17.313433	5776.194030	5793.507463	5725-5850
802.11n(HT20) MSC3	5785.00	17.910448	5775.895522	5793.805970	5725-5850
802.11ac(VHT20) MCS3	5785.00	17.910448	5775.895522	5793.805970	5725-5850
802.11n(HT40) MSC2	5795.00	36.273292	5776.614907	5812.888199	5725-5850
802.11ac(VHT40) MCS0	5795.00	36.273292	5776.614907	5812.888199	5725-5850
802.11a 6 Mbps	5825.00	17.313433	5816.194030	5833.507463	5725-5850
802.11n(HT20) MSC3	5825.00	17.910448	5815.895522	5833.805970	5725-5850
802.11ac(VHT20) MCS3	5825.00	17.910448	5815.895522	5833.805970	5725-5850

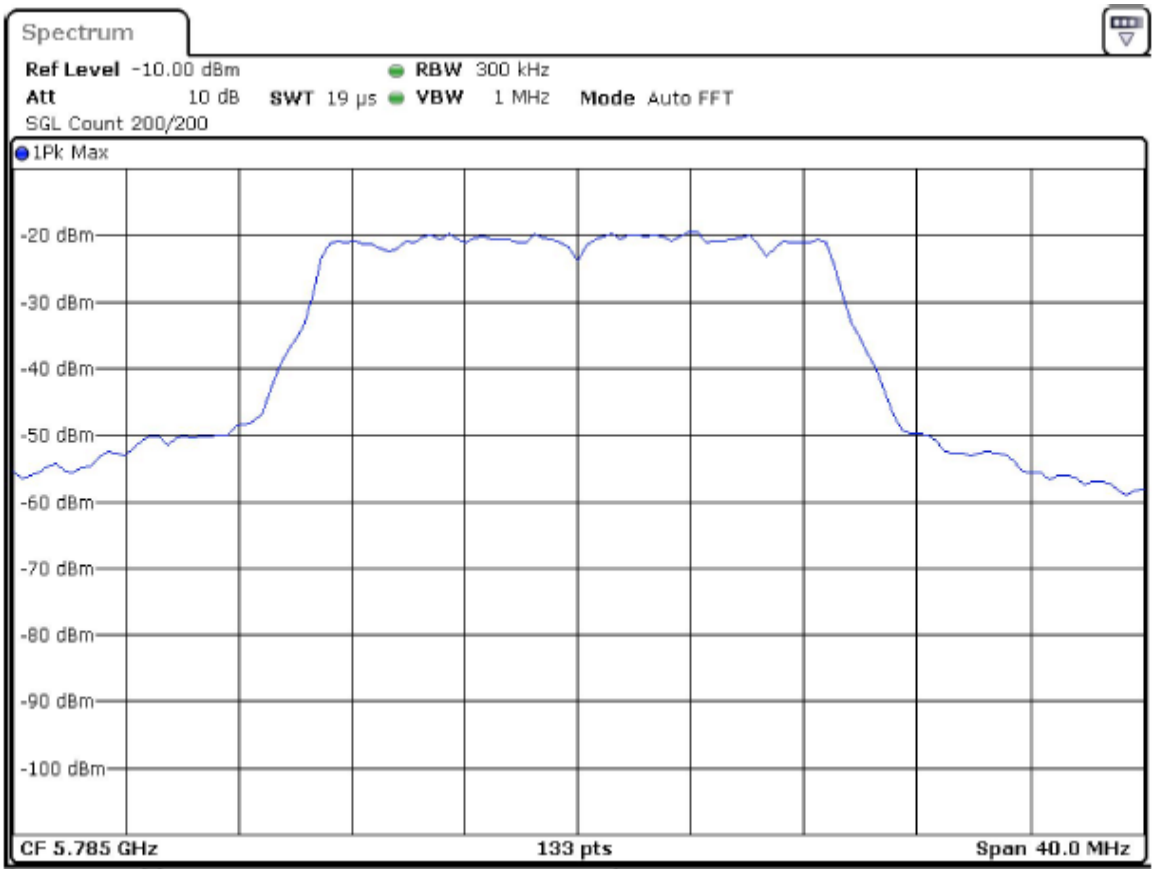
802.11a 6 Mbps
5745MHz



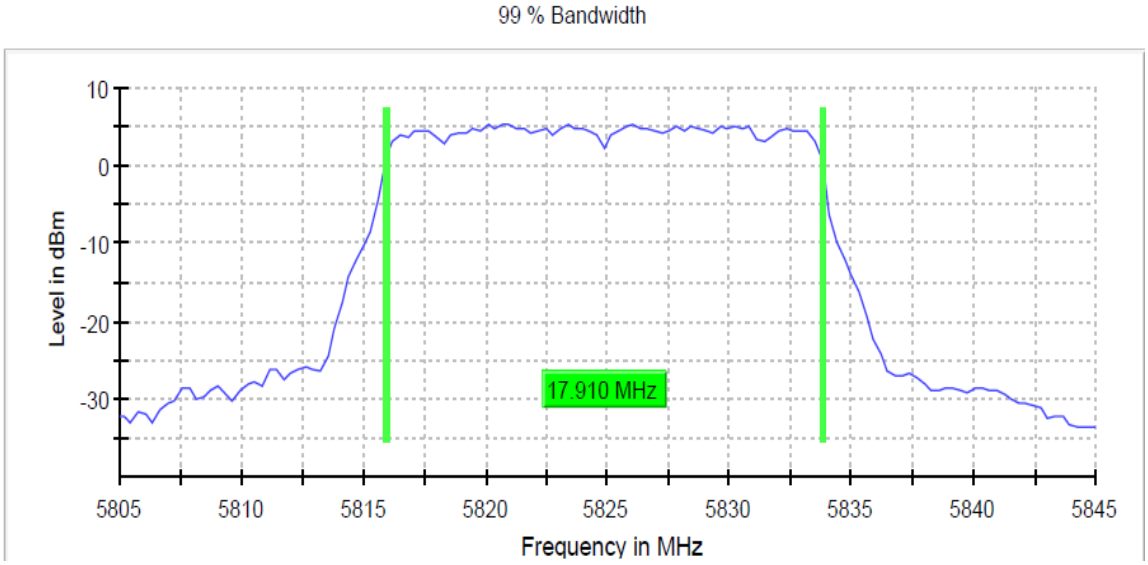


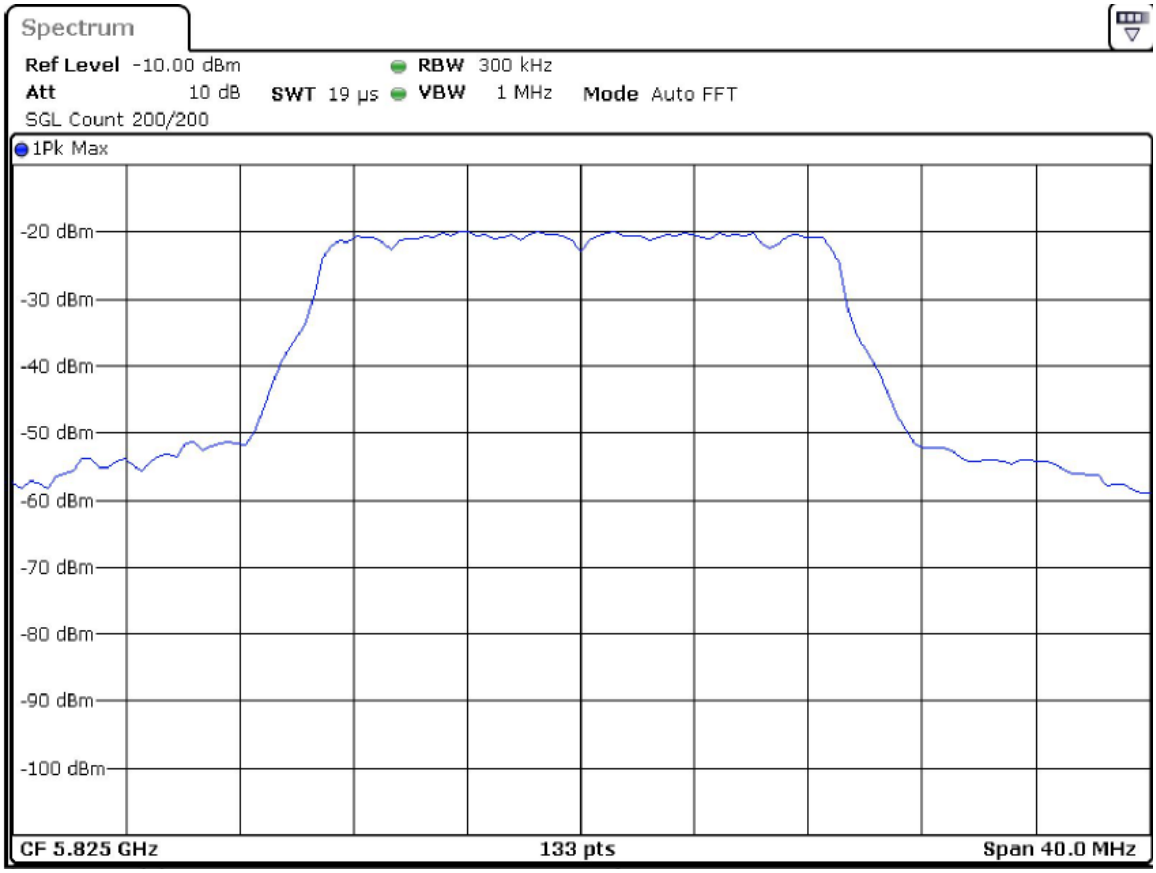
802.11n(HT20) MCS3 5785MHz



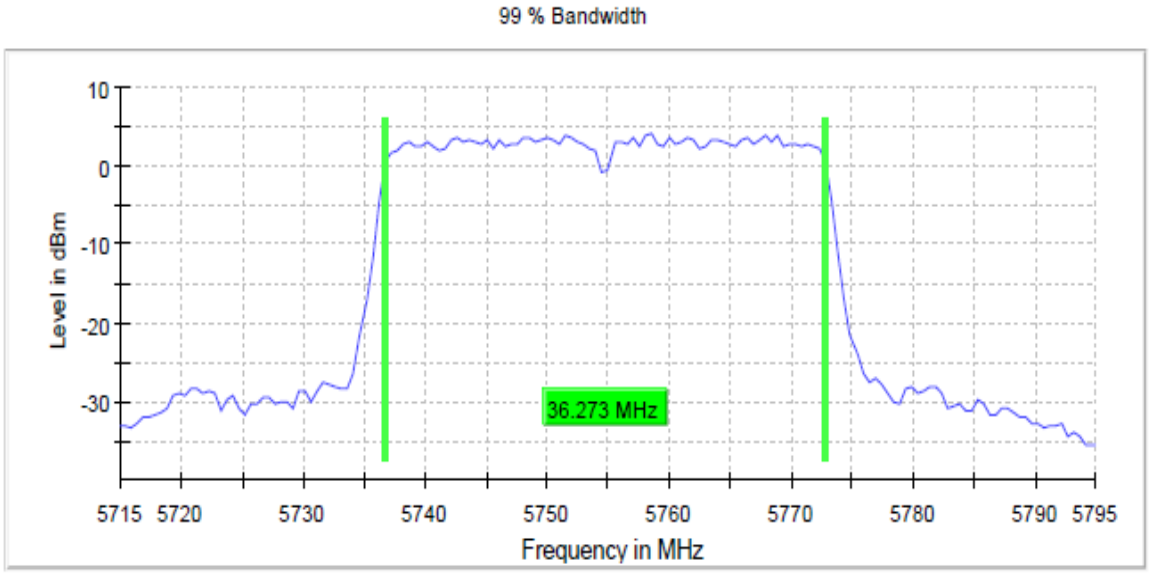


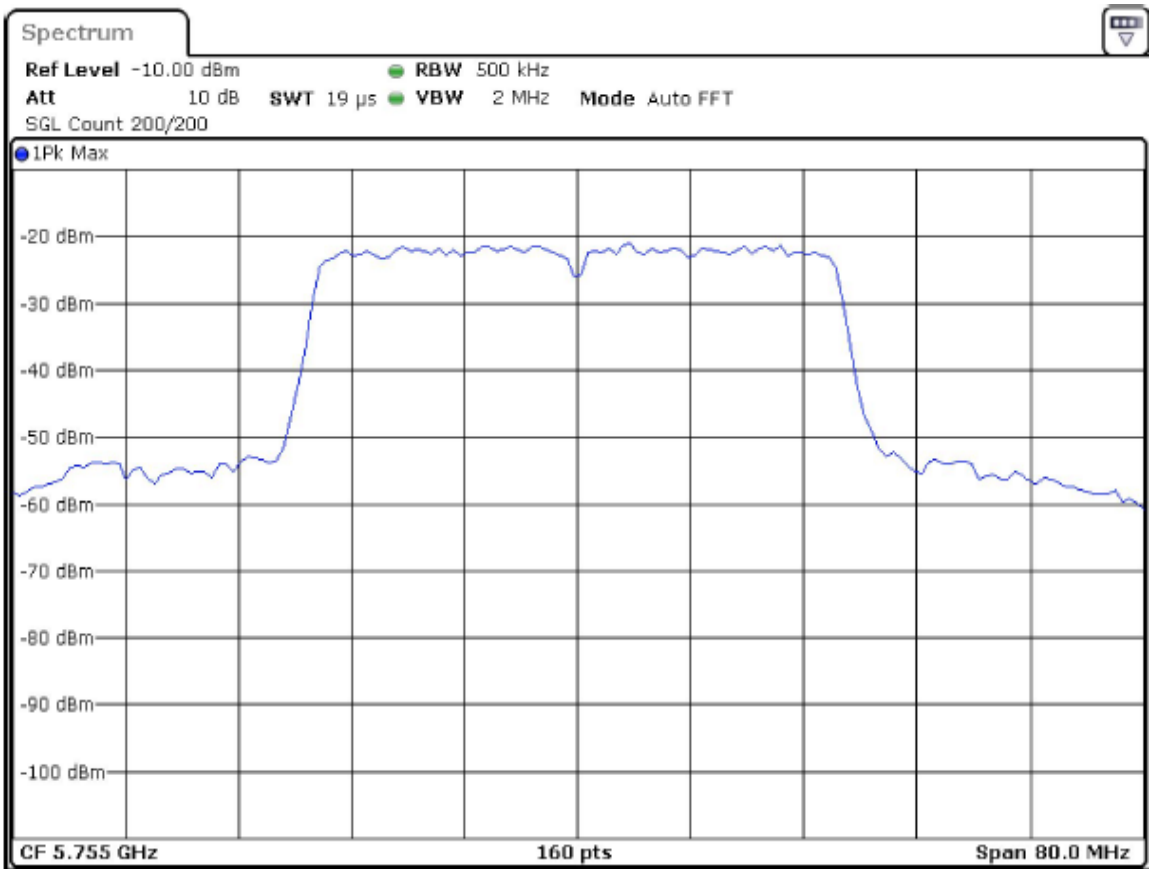
802.11ac(VHT20) MCS3 5825MHz



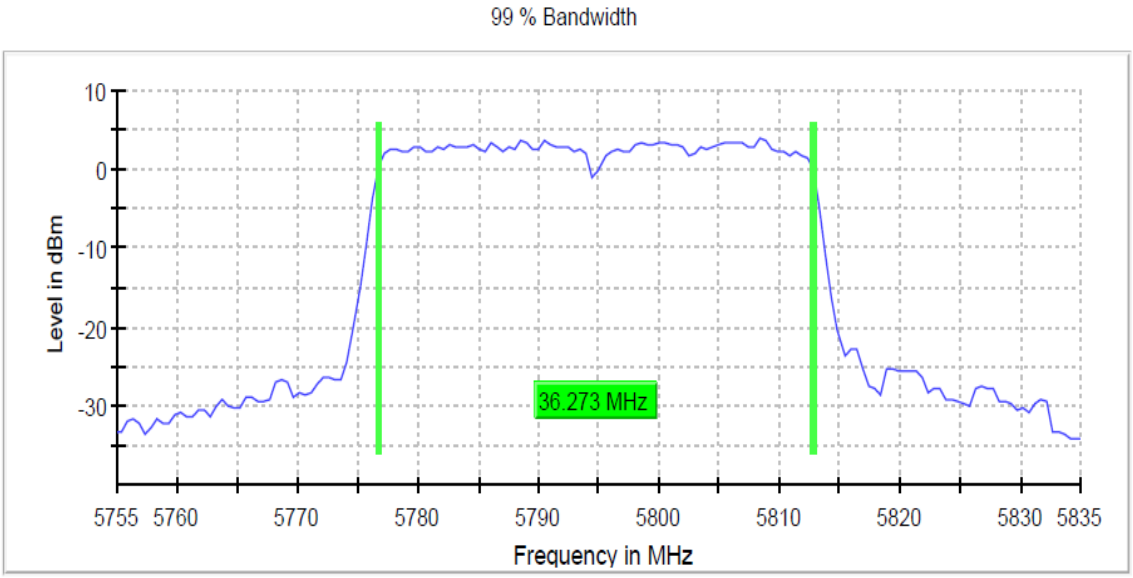


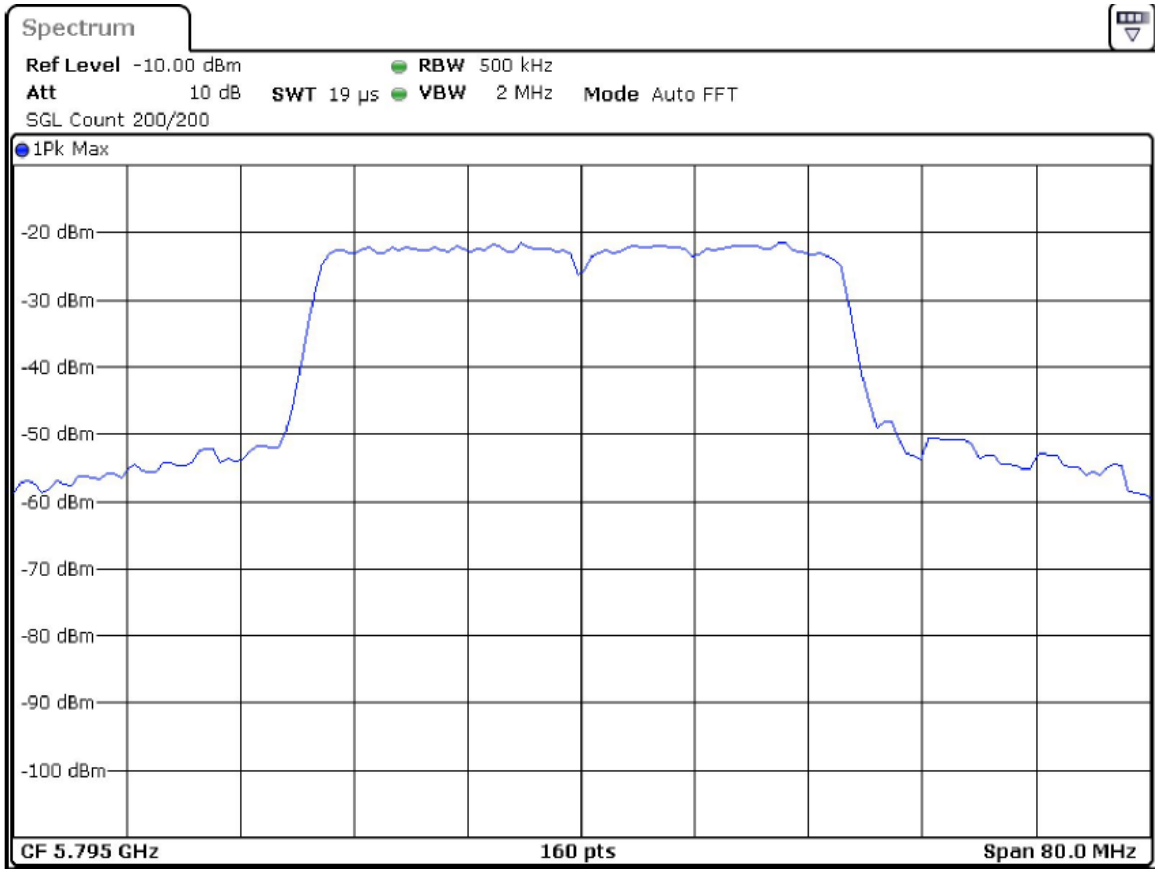
802.11n(HT40) MCS2 5755MHz





802.11ac(VHT40) MCS0 5795MHz





802.11ac(VHT80) MCS0 5775MHz