Test Report

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

Report No	ES0621-3
Client	Harman International Industries, Incorporated
Address	30001 Cabot Drive Novi MI 48377
Phone	1-248-785-2513
Items tested	PV602
FCC ID	2AHPN-BE2841
IC	6434C-BE2841
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	03/30/2018 to 04/25/2018
Results	As detailed within this report
Prepared by	Christopher Hamel – EMC Engineer
Authorized by	Yunus Fazilioglu – Sr. Engineer
Issue Date	5/16/2018
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 28 of this report.

Contents

Report REV Sep-08-2017 - YF

Summary

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

The product is the “PV602” automotive infotainment unit with Bluetooth and WLAN. It is a transmitter that operates in the following bands:
5.15GHz – 5.25GHz
5.725GHz – 5.85GHz
This report is for the 5GHz WLAN portion of the device only.

Antenna Type: PCB Trace
Peak Gain: 3.72dBi

There are two variants to the product with the same model number:

HVIN (Model)	**FVIN**	**Remarks**
PV602	SOC: BR_RC1_R12.0.0_R18102A	Tested variant
PV602	SOC: NA_18.1.1	No hardware differences from the tested variant above. Only non-RF related software differences as follows: • Updated AM/FM tuner range and step size for North American markets • Removal of backup camera from software (external camera will not be connected), rear view mirror will have RVC display instead (not connected to the head unit) • HMI tweaks to follow NHTSA guidelines

Test samples were received in good condition.
We found that the product met the above requirements without modifications.

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 tested in the installation orientation of the device in a vehicle. Emissions were maximized by rotating the device and varying the test antenna's height and polarity.
EUT operating voltage is 13.8V DC from a vehicle battery, therefore AC line conducted emissions requirements are not applicable.

Following bandwidths were used during radiated spurious emissions testing.

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

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	S0621		
Company:	Harman International Industries, Incorporated		
Company Address:	30001 Cabot Drive		
	Novi, MI, 48377		
Contact:	Sarah Rowland		
	MN	**PN**	**SN**
EUT:	PV602		
EUT Description:	Car Stereo Head Unit		
EUT Max Frequency:	5825 MHz		
EUT Min Frequency:	5825 MHz		

EUT Components	**MN**	**SN**
PV602	FCC	
PV602	FCC Conducted	

Support Equipment	**MN**	**SN**
CS Supplied laptop		
USB to Ethernet converter		

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
Power	other	2	2	other	No	No	1	in	yes	
FM/AM	other	1	1	Coaxial	Yes	No	0.1	in	yes	
Back up camera	other	1	1	other	No	No	1	in	yes	
USB	USB	1	1	USB	Yes	No	1	in	yes	
Vehicle port	other	1	1	other	No	No	1	in	yes	

Software Operating Mode Description:

EUT will operate in constant TX mode for WiFi spurious emissions via client supplied test mode where channels and data rates are selectable.
EUT will operate in constant TX mode for BT spurious emissions with a link to CMW communication tester where channels and packet types are selectable.

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 PCB trace antenna with 3.72dBi peak 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. Vehicle battery powered 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.

MEASUREMENTS / RESULTS

UNII-1 Band

Worst case mode found to be 802.11a 54Mbps

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 30-1000MHz
Operator: cch
Notes:
802.11a 20MHz 54Mbps mid Channel (44) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_209 (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)
30.315	27.1	-1.6	25.5	40	-14.5	PASS	-14.5	40	-14.5	PASS
83.447	32.1	-15	17.1	40	-22.9	PASS		40	-22.9	PASS
122.683	28.8	-8.7	20.1	43.5	-23.4	PASS		43.5	-23.4	PASS
222.86	31.9	-11.5	20.4	46	-25.6	PASS		46	-25.6	PASS
266.195	32.7	-9.3	23.4	46	-22.6	PASS		46	-22.6	PASS
920.266	27.9	3	30.9	46	-15.1	PASS		46	-15.1	PASS

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 30-1000MHz
Operator: cch
Notes:
802.11a 20MHz 54Mbps mid Channel (44) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_209 (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)
30.461	26.9	-1.7	25.2	40	-14.8	PASS	-14.8	40	-14.8	PASS
54.032	39.5	-15.6	23.9	40	-16.1	PASS		40	-16.1	PASS
83.883	39.3	-15.1	24.2	40	-15.8	PASS		40	-15.8	PASS
692.995	30.2	-0.7	29.5	46	-16.5	PASS		46	-16.5	PASS
742.514	29.6	-0.2	29.4	46	-16.6	PASS		46	-16.6	PASS
911.827	28	2.8	30.8	46	-15.2	PASS		46	-15.2	PASS

30-1000MHz Mid Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps Low Channel (36) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
1439.3	39.2	28.3	1.7	40.8	74	-33.2	PASS		29.9	54	-24.1	PASS	
4770.1	33.9	24.5	13	46.9	74	-27.1	PASS		37.5	54	-16.5	PASS	
5496.9	35.3	25.4	13.9	49.2	74	-24.8	PASS	-24.8	39.2	54	-14.8	PASS	-14.8

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps Low Channel (36) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1188.1	36.2	29.3	0.3	36.5	74	-37.5	PASS		29.6	54	-24.4	PASS	
1438.6	42.8	31.1	1.7	44.4	74	-29.6	PASS		32.8	54	-21.2	PASS	
1474.9	34.3	24.3	1.8	36.1	74	-37.9	PASS		26.1	54	-27.9	PASS	
3563.7	36.6	26.3	9.9	46.5	74	-27.5	PASS		36.2	54	-17.8	PASS	
4575.7	33.7	24.8	12.5	46.2	74	-27.8	PASS		37.3	54	-16.7	PASS	
5488	33.9	25.3	14.1	48.1	74	-25.9	PASS	-25.9	39.5	54	-14.5	PASS	-14.5

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company	Work Order - S0621
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Horizontal Data	Test Site - CH2
Operator: cch	Conditions - 23.4°C; 24%RH; 1020mBar
Notes:	Witnessed by - N/A
802.11a 20MHz 54Mbps mid Channel (44) unii 1	EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
1438	40.4	28.9	1.7	42	74	-32	PASS		30.5	54	-23.5	PASS	
1730.8	32.1	24.4	3.3	35.4	74	-38.6	PASS		27.7	54	-26.3	PASS	
2415.3	35	25.8	6	41	74	-33	PASS		31.8	54	-22.2	PASS	
4822.7	32.5	24.7	12.5	45	74	-29	PASS	-29	37.2	54	-16.8	PASS	-16.8

Curtis Straus - a Bureau Veritas Company	Work Order - S0621
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Vertical Data	Test Site - CH2
Operator: cch	Conditions - 23.4°C; 24%RH; 1020mBar
Notes:	Witnessed by - N/A
802.11a 20MHz 54Mbps mid Channel (44) unii 1	EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1438.9	42.1	28.5	1.7	43.7	74	-30.3	PASS		30.2	54	-23.8	PASS	
1583.5	34.7	25.7	2.2	36.9	74	-37.1	PASS		27.9	54	-26.1	PASS	
3563.7	37.3	27.2	9.9	47.2	74	-26.8	PASS		37.1	54	-16.9	PASS	
4587.6	35.5	24.8	12.5	48	74	-26	PASS	-26	37.4	54	-16.6	PASS	
5496.1	33.3	25.4	13.9	47.2	74	-26.8	PASS		39.2	54	-14.8	PASS	-14.8

1-6GHz Mid Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps high Channel (48) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
1439.9	41.6	29.5	1.7	43.3	74	-30.7	PASS		31.2	54	-22.8	PASS	
2433.3	35.6	25.8	5.9	41.5	74	-32.5	PASS		31.7	54	-22.3	PASS	
2466.9	35.2	25.8	6.3	41.6	74	-32.4	PASS		32.1	54	-21.9	PASS	
4946.4	33.4	24.9	13	46.5	74	-27.5	PASS		37.9	54	-16.1	PASS	
5499.8	34.9	25.4	13.8	48.7	74	-25.3	PASS	-25.3	39.2	54	-14.8	PASS	-14.8

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps high Channel (48) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1439	42	30.5	1.7	43.6	74	-30.4	PASS		32.2	54	-21.8	PASS	
2400.5	37.1	31.6	6.1	43.2	74	-30.8	PASS		37.7	54	-16.3	PASS	
2440.6	34.9	26.3	6	40.9	74	-33.1	PASS		32.3	54	-21.7	PASS	
2464.3	34.7	25.7	6.3	41	74	-33	PASS		32	54	-22	PASS	
4506.8	34.9	24	12.6	47.5	74	-26.5	PASS		36.6	54	-17.4	PASS	
5484	33.6	25.3	14.3	47.9	74	-26.1	PASS	-26.1	39.5	54	-14.5	PASS	-14.5

1-6GHz High Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps Low Channel (36) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)
15385.9	42.2	32.2	14.8	57	83.5	-26.5	PASS		47	63.5	-16.5	PASS
17983.9	41.3	32.3	19.7	61	83.5	-22.5	PASS	-22.5	52.1	63.5	-11.4	PASS

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps Low Channel (36) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)
16414.5	40.8	31.4	16.6	57.4	83.5	-26.1	PASS		48	63.5	-15.5	PASS
17980.9	41.6	32.2	19.7	61.3	83.5	-22.2	PASS	-22.2	52	63.5	-11.5	PASS

6-18GHz Low Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps mid Channel (44) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)
15385.9	42.2	32.2	14.8	57	83.5	-26.5	PASS		47	63.5	-16.5	PASS
17983.9	41.3	32.3	19.7	61	83.5	-22.5	PASS	-22.5	52.1	63.5	-11.4	PASS

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps mid Channel (44) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)
14968.4	42	32.8	13.7	55.7	83.5	-27.8	PASS		46.4	63.5	-17.1	PASS
15478.7	40.5	31.6	14.7	55.2	83.5	-28.3	PASS		46.3	63.5	-17.2	PASS
17127.3	41.2	32	17.1	58.4	83.5	-25.1	PASS		49.1	63.5	-14.4	PASS
17982.4	41	32.3	19.7	60.8	83.5	-22.7	PASS	-22.7	52	63.5	-11.5	PASS

6-18GHz Mid Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps high Channel (48) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)
15314.4	41.3	32.6	14.4	55.6	83.5	-27.9	PASS		46.9	63.5	-16.6	PASS
16984.1	40.9	31.6	17.3	58.2	83.5	-25.3	PASS		48.9	63.5	-14.6	PASS
17945.8	40.4	32.2	19.5	59.9	83.5	-23.6	PASS	-23.6	51.7	63.5	-11.8	PASS

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 54Mbps high Channel (48) unii 1

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)
12900.6	38.6	29.9	14.2	52.8	83.5	-30.7	PASS		44	63.5	-19.5	PASS
15371.7	42	31.8	14.7	56.7	83.5	-26.8	PASS		46.5	63.5	-17	PASS
17385.5	42.7	32.6	17.5	60.2	83.5	-23.3	PASS		50.1	63.5	-13.4	PASS
17955.2	42.9	31.9	19.6	62.5	83.5	-21	PASS	-21	51.5	63.5	-12	PASS

6-18GHz High Channel

Radiated Emissions Table

Date: 20-Apr-18 **Company:** Harman international **Work Order:** S0621
Engineer: Chris hamel **EUT Desc:** PV602 **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 24% **Pressure:** 1020mBar
Frequency Range: 18-40GHz **Measurement Distance:** 0.1m
Notes: No Emissions found **EUT Max Freq:**
Tested 802.11a 20MHz 54Mbps all 3 channels UNII 1

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

Test Site: EMI Chamber 2 **Cable 1:** Asset #2323 **Cable 2:** --- **Cable 3:** ---
Analyzer: Brown **Preamp:** 18-26.5GHz **Antenna:** 18-26.5GHz Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203 Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Test Site: EMI Chamber 2 **Cable 1:** Asset #2323 **Cable 2:** Asset #2324 **Cable 3:** ---
Analyzer: Brown **Preamp:** 40GHz Mixer **Antenna:** 40GHz Mixer **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203 Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

18-40GHz All Channels

UNII-3 Band

Worst case mode found to be 802.11a 36Mbps

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 30-1000MHz
Operator: cch
Notes:
802.11a 20MHz 36Mbps middle Channel (157) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_209 (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)
30.315	27.1	-1.6	25.5	40	-14.5	PASS	-14.5	40	-14.5	PASS	-14.5
83.447	32.1	-15	17.1	40	-22.9	PASS		40	-22.9	PASS	
122.683	28.8	-8.7	20.1	43.5	-23.4	PASS		43.5	-23.4	PASS	
222.86	31.9	-11.5	20.4	46	-25.6	PASS		46	-25.6	PASS	
266.195	32.7	-9.3	23.4	46	-22.6	PASS		46	-22.6	PASS	
920.266	27.9	3	30.9	46	-15.1	PASS		46	-15.1	PASS	

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 30-1000MHz
Operator: cch
Notes:
802.11a 20MHz 36Mbps middle Channel (157) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_209 (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)
30.461	26.9	-1.7	25.2	40	-14.8	PASS	-14.8	40	-14.8	PASS	-14.8
54.032	39.5	-15.6	23.9	40	-16.1	PASS		40	-16.1	PASS	
83.883	39.3	-15.1	24.2	40	-15.8	PASS		40	-15.8	PASS	
692.995	30.2	-0.7	29.5	46	-16.5	PASS		46	-16.5	PASS	
742.514	29.6	-0.2	29.4	46	-16.6	PASS		46	-16.6	PASS	
911.827	28	2.8	30.8	46	-15.2	PASS		46	-15.2	PASS	

30-1000MHz Mid Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps Low Channel (149) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
2461.9	35.9	25.9	6.3	42.2	74	-31.8	PASS		32.2	54	-21.8	PASS	
5189.3	34.6	25	12.6	47.2	74	-26.8	PASS		37.5	54	-16.5	PASS	
5258.5	34.5	24.4	12.4	46.9	74	-27.1	PASS		36.8	54	-17.2	PASS	
5265.9	33.5	24.3	12.4	45.8	74	-28.2	PASS		36.7	54	-17.3	PASS	
5281.7	34.7	24.3	12.3	47	74	-27	PASS		36.6	54	-17.4	PASS	
5578.1	34	25.6	13.8	47.8	74	-26.2	PASS	-26.2	39.4	54	-14.6	PASS	-14.6

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps Low Channel (149) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1437.5	37.9	26.4	1.7	39.6	74	-34.4	PASS		28	54	-26	PASS	
1478.5	32.6	24.4	1.8	34.4	74	-39.6	PASS		26.2	54	-27.8	PASS	
2399.7	37.7	30.8	6.2	43.8	74	-30.2	PASS		37	54	-17	PASS	
2463.3	35.8	25.9	6.3	42.2	74	-31.8	PASS		32.2	54	-21.8	PASS	
5187.7	34.1	24.9	12.5	46.6	74	-27.4	PASS		37.4	54	-16.6	PASS	
5571.4	35.3	25.6	13.7	49	74	-25	PASS	-25	39.3	54	-14.7	PASS	-14.7

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company	Work Order - S0621
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Horizontal Data	Test Site - CH2
Operator: cch	Conditions - 23.4°C; 24%RH; 1020mBar
Notes:	Witnessed by - N/A
802.11a 20MHz 36Mbps middle Channel (157) unii 3	EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
1439.9	40.4	29.3	1.7	42.1	74	-31.9	PASS		31	54	-23	PASS	
1797.9	34.8	24.5	3.9	38.7	74	-35.3	PASS		28.4	54	-25.6	PASS	
2455.8	35.4	25.9	6.2	41.6	74	-32.4	PASS		32.2	54	-21.8	PASS	
4633.3	34.2	24.8	11.5	45.7	74	-28.3	PASS		36.3	54	-17.7	PASS	
5581.8	35.7	25.6	13.9	49.6	74	-24.4	PASS	-24.4	39.5	54	-14.5	PASS	-14.5

Curtis Straus - a Bureau Veritas Company	Work Order - S0621
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Vertical Data	Test Site - CH2
Operator: cch	Conditions - 23.4°C; 24%RH; 1020mBar
Notes:	Witnessed by - N/A
802.11a 20MHz 36Mbps middle Channel (157) unii 3	EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1440.1	39.2	28.1	1.7	40.9	74	-33.1	PASS		29.8	54	-24.2	PASS	
1916.7	35.4	25.9	5	40.4	74	-33.6	PASS		30.9	54	-23.1	PASS	
2400.1	38.9	31.6	6.2	45.1	74	-28.9	PASS		37.7	54	-16.3	PASS	
2460.7	34.3	26.1	6.3	40.6	74	-33.4	PASS		32.4	54	-21.6	PASS	
5186.6	34.2	24.9	12.5	46.8	74	-27.2	PASS		37.4	54	-16.6	PASS	
5554.4	36.2	25.5	13.3	49.6	74	-24.4	PASS	-24.4	38.9	54	-15.1	PASS	-15.1

1-6GHz Mid Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 1-6GHz
Operator: cch
Notes:
802.11a 20MHz 36Mbps high Channel (165) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Margin to Peak Limit (dB)	Peak Limit Results (Pass/Fail)	Peak Limit Worst Margin (dB)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Margin to Avg Limit (dB)	Avg Limit Results (Pass/Fail)	Avg Limit Worst Margin (dB)
1439.88	41.2	1.7	42.9	74	-31.1	PASS		54	-11.1	PASS	
2412.25	38.5	6.1	44.6	74	-29.4	PASS		54	-9.4	PASS	
2461.88	39	6.3	45.4	74	-28.6	PASS		54	-8.6	PASS	
5567.5	34.1	13.6	47.7	74	-26.3	PASS	-26.3	54	-6.3	PASS	-6.3

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
1-6GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps high Channel (165) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 24, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1124.7	37.6	28.4	-0.1	37.5	74	-36.5	PASS		28.3	54	-25.7	PASS	
1437.8	41.6	30	1.7	43.3	74	-30.7	PASS		31.7	54	-22.3	PASS	
1916.5	34.3	25.1	5	39.3	74	-34.7	PASS		30.1	54	-23.9	PASS	
2464.4	35.4	26	6.3	41.8	74	-32.2	PASS		32.4	54	-21.6	PASS	
5577.1	33.8	25.6	13.8	47.6	74	-26.4	PASS	-26.4	39.4	54	-14.6	PASS	-14.6

1-6GHz High Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps Low Channel (149) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)
15979.4	41.3	32.4	16	57.3	83.5	-26.2	PASS		48.4	63.5	-15.1	PASS	
16382.3	42.4	33	16.5	58.9	83.5	-24.6	PASS		49.5	63.5	-14	PASS	
17993.4	42.3	32.2	19.8	62.1	83.5	-21.4	PASS	-21.4	52	63.5	-11.5	PASS	-11.5

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps Low Channel (149) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
15285.1	41.8	32.6	14.3	56.1	83.5	-27.4	PASS		46.9	63.5	-16.6	PASS	
15958.5	43.5	32.6	15.9	59.4	83.5	-24.1	PASS		48.5	63.5	-15	PASS	
16388.9	41.1	32.7	16.5	57.7	83.5	-25.8	PASS		49.3	63.5	-14.2	PASS	
17981.3	41.5	32.1	19.7	61.2	83.5	-22.3	PASS	-22.3	51.8	63.5	-11.7	PASS	-11.7

6-18GHz Low Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps middle Channel (157) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)
16368.1	42	33.2	16.4	58.5	83.5	-25	PASS		49.6	63.5	-13.9	PASS	
17168.9	41	32.1	17.2	58.2	83.5	-25.3	PASS		49.3	63.5	-14.2	PASS	
17989.1	41	32.2	19.8	60.8	83.5	-22.7	PASS	-22.7	52	63.5	-11.5	PASS	-11.5

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps middle Channel (157) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
15967	41.2	32.6	15.9	57.2	83.5	-26.3	PASS		48.5	63.5	-15	PASS	
16370.3	41.5	33.3	16.5	58	83.5	-25.5	PASS		49.8	63.5	-13.7	PASS	
17999.2	40.4	32.1	19.8	60.2	83.5	-23.3	PASS	-23.3	51.9	63.5	-11.6	PASS	-11.6

6-18GHz Mid Channel

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Horizontal Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps high Channel (165) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)
16389.2	42	32.8	16.5	58.5	83.5	-25	PASS		49.4	63.5	-14.1	PASS	
17977	42.2	32	19.7	61.9	83.5	-21.6	PASS	-21.6	51.7	63.5	-11.8	PASS	-11.8

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 1m Distance
6-18GHz Vertical Data
Operator: cch
Notes:
802.11a 20MHz 36Mbps high Channel (165) unii 3

Work Order - S0621
EUT Power Input - 13.8V DC
Test Site - CH2
Conditions - 23.4°C; 24%RH; 1020mBar
Witnessed by - N/A
EUT Maximum Frequency - 5825

Data Taken at April 22, 2018

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_209_Peak (dBµV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	Av Lim: FCC_pt15_209_Average (dBµV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
16009.6	39.8	32.1	16.1	56	83.5	-27.5	PASS		48.3	63.5	-15.2	PASS	
16368.9	42.8	33.4	16.5	59.3	83.5	-24.2	PASS		49.8	63.5	-13.7	PASS	
17152.6	41.6	32	17.2	58.8	83.5	-24.7	PASS		49.2	63.5	-14.3	PASS	
17965	41	31.9	19.6	60.6	83.5	-22.9	PASS	-22.9	51.5	63.5	-12	PASS	-12

6-18GHz High Channel

Radiated Emissions Table

Date: 20-Apr-18 **Company:** Harman international **Work Order:** S0621
Engineer: Chris hamel **EUT Desc:** PV602 **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 24% **Pressure:** 1020mBar
Frequency Range: 18-40GHz **Measurement Distance:** 0.1m
Notes: No Emissions found **EUT Max Freq:**
Tested 802.11a 20MHz 36Mbps all 3 channels UNII 3

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

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

Test Site: EMI Chamber 2 **Cable 1:** Asset #2323 **Cable 2:** --- **Cable 3:** ---
Analyzer: Brown **Preamp:** 18-26.5GHz **Antenna:** 18-26.5GHz Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203 Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

Test Site: EMI Chamber 2 **Cable 1:** Asset #2323 **Cable 2:** Asset #2324 **Cable 3:** ---
Analyzer: Brown **Preamp:** 40GHz Mixer **Antenna:** 40GHz Mixer **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203 Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

18-40GHz All Channels

Rev. 4/17/2018							
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	7/26/2018
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	11/16/2018
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	4/10/2019
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	I	12/21/2018
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018
EMI Chamber 2	719150	2762A-7	A-0015	30-1000MHz	1686	I	12/21/2018
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018
Mixers/Diplexers	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Mixer / Horn	26.5-40 GHz	11970A	Agilent	3003A10230	2154	I	3/12/2019
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
2443 PA	9KHz-6GHz	BBV9744	SCWARZBECK	63	2443	I	2/5/2019
2444 PA	9KHz-6GHz	BBV9744	SCWARZBECK	67	2444	I	2/5/2019
2111 HF Preamp	0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/19/2018
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	10/16/2018
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/28/2019
Orange Horn	1-18GHz	3115	EMCO	0004-6123	390	I	10/13/2018
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	4/28/2018
THA#2084		HTC-1	HDE		2084	II	3/22/2019
THA#2085		HTC-1	HDE		2085	II	3/22/2019
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**
Asset #2456	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2458	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2459	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2466	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2480	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2323	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 002	2323	II	8/19/2018
Asset #2324	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 001	2324	II	8/19/2018
2489(6dB)	9KHz-18GHz					II	11/27/2018
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.							

Test Equipment Used

Radiated Band Edge

Radiated Emissions Table

Date: 20-Apr-18 **Company:** Harman international **Work Order:** S0621
Engineer: Chris hamel **EUT Desc:** PV602 **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 24% **Pressure:** 1020mBar
Frequency Range: 5050-5950MHz **Measurement Distance:** 1 m
Notes: 802.11a unii1 54Mbps 802.11a unii3 36Mbps **EUT Max Freq:**

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
UNII 1														
Low				---	---	---	---	---	---	---	---	---	---	---
V Max		65.8		---	---	---	---	---	---	---	---	---	---	---
H Max		66.3		---	---	---	---	---	---	---	---	---	---	---
H	5150.0	24.0	10.2	0.0	34.5	4.5	63.0	49.2	83.5	-20.5	Pass	63.5	-14.3	Pass
H	5068.0	26.23	13.8	0.0	34.4	4.5	65.1	52.7	83.5	-18.4	Pass	63.5	-10.8	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V Max		65.2		---	---	---	---	---	---	---	---	---	---	---
H Max		69.2		---	---	---	---	---	---	---	---	---	---	---
H	5350.0	21.5	9.8	0.0	34.7	4.9	61.1	49.4	83.5	-22.4	Pass	63.5	-14.1	Pass
H	5444.4	25.6	12.4	0.0	34.8	5.0	65.4	52.2	83.5	-18.1	Pass	63.5	-11.3	Pass
				---	---	---	---	---	---	---	---	---	---	---
UNII3				---	---	---	---	---	---	---	---	---	---	---
Low				---	---	---	---	---	---	---	---	---	---	---
V Max		59.9		---	---	---	---	---	---	---	---	---	---	---
H Max		67.3		---	---	---	---	---	---	---	---	---	---	---
H	5725.0	27.6	14.9	0.0	35.0	5.3	67.9	55.2	83.5	-15.6	Pass	63.5	-8.3	Pass
H	5703.4	25.5	11.7	0.0	34.9	5.3	65.7	51.9	83.5	-17.8	Pass	63.5	-11.6	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V Max	65.7			0.0	---	0.4	---	---	69.5	---	---	49.5	---	---
H Max	68.4			0.0	---	0.5	---	---	69.5	---	---	49.5	---	---
H	5850.0	21.2	12.1	0.0	35.3	5.4	61.9	52.8	83.5	-21.6	Pass	63.5	-10.7	Pass
H	5878.2	26.0	13.4	0.0	35.3	5.4	66.7	54.1	83.5	-16.8	Pass	63.5	-9.4	Pass

Table Result: Pass by -8.3 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2458 **Cable 2:** Asset #2459 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203

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

802.11a UNII1 and UNII 3 Worst Case Data Rates

Radiated Emissions Table

Date: 20-Apr-18 **Company:** Harman international **Work Order:** S0621
Engineer: Chris hamel **EUT Desc:** PV602 **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 24% **Pressure:** 1020mBar
Frequency Range: 5050-5950MHz **Measurement Distance:** 1 m
Notes: 802.11n20 unii1 MCS4 **EUT Max Freq:**
802.11n20 unii3 MCS6

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
UNII 1														
Low				---	---	---	---	---	---	---	---	---	---	---
V Max	62.9			0.0	---	0.4	---	---	69.5	---	---	49.5	---	---
H Max	67.2			0.0	---	0.5	---	---	69.5	---	---	49.5	---	---
H	5150.0	22.5	12.4	0.0	34.5	4.5	61.5	51.4	83.5	-22.0	Pass	63.5	-12.1	Pass
H	5130.0	25.6	14.0	0.0	34.4	4.5	64.5	52.9	83.5	-19.0	Pass	63.5	-10.6	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V Max				---	---	---	---	---	---	---	---	---	---	---
H Max				---	---	---	---	---	---	---	---	---	---	---
H	5350.0	22.0	12.2	0.0	34.7	4.9	61.6	51.8	83.5	-21.9	Pass	63.5	-11.7	Pass
H	5401.0	24.8	13.1	0.0	34.8	5.0	64.6	52.9	83.5	-18.9	Pass	63.5	-10.6	Pass
				---	---	---	---	---	---	---	---	---	---	---
UNII 3														
Low				---	---	---	---	---	---	---	---	---	---	---
V Max		59.3		---	---	---	---	---	---	---	---	---	---	---
H Max		66.1		---	---	---	---	---	---	---	---	---	---	---
H	5725.0	29.3	16.7	0.0	35.0	5.3	69.6	57.0	83.5	-13.9	Pass	63.5	-6.5	Pass
H	5663.4	26.4	14.1	0.0	34.9	5.2	66.5	54.2	83.5	-17.0	Pass	63.5	-9.3	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V Max				---	---	---	---	---	---	---	---	---	---	---
H Max			67.2	---	---	---	---	---	---	---	---	---	---	---
H	5850.0	22.8	10.4	0.0	35.3	5.4	63.5	51.1	83.5	-20.0	Pass	63.5	-12.4	Pass
H	5940.0	25.4	13.6	0.0	35.4	5.4	66.2	54.4	83.5	-17.3	Pass	63.5	-9.1	Pass

Table Result: Pass by -6.5 dB ***Worst Freq:*** 5725.0 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2458 **Cable 2:** Asset #2459 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203

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

802.11n (HT20) UNII 1 and UNII 3 Worst Case Data Rates

Radiated Emissions Table

Date: 20-Apr-18 **Company:** Harman international **Work Order:** S0621
Engineer: Chris hamel **EUT Desc:** PV602 **EUT Operating Voltage/Frequency:** 13.8V DC
Temp: 23.4°C **Humidity:** 24% **Pressure:** 1020mBar
Frequency Range: 5050-5950MHz **Measurement Distance:** 1 m
Notes: 802.11n40 unii1 MCS2 **EUT Max Freq:**
802.11n40 unii3 MCS6

Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBµV)	Average Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBµV/m)	Adjusted Avg Reading (dBµV/m)	FCC Class B High Frequency - Peak Limit (dBµV/m)	FCC Class B High Frequency - Peak Margin (dB)	FCC Class B High Frequency - Peak Result (Pass/Fail)	FCC Class B High Frequency - Average Limit (dBµV/m)	FCC Class B High Frequency - Average Margin (dB)	FCC Class B High Frequency - Average Result (Pass/Fail)
UNII 1														
Low				---	---	---	---	---	---	---	---	---	---	---
V Max		67.0		---	---	---	---	---	---	---	---	---	---	---
H Max		63.2		---	---	---	---	---	---	---	---	---	---	---
V	5150.0	23.0	13.2	0.0	34.5	4.5	62.0	52.2	83.5	-21.5	Pass	63.5	-11.3	Pass
V	5145.0	28.0	15.4	0.0	34.4	4.5	66.9	54.3	83.5	-16.6	Pass	63.5	-9.2	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V Max		66.7		---	---	---	---	---	---	---	---	---	---	---
H Max		65.1		---	---	---	---	---	---	---	---	---	---	---
v	5350.0	21.5	11.9	0.0	34.7	4.9	61.1	51.5	83.5	-22.4	Pass	63.5	-12.0	Pass
v	5447.3	24.4	12.1	0.0	34.8	5.1	64.3	52.0	83.5	-19.2	Pass	63.5	-11.5	Pass
				---	---	---	---	---	---	---	---	---	---	---
UNII 3														
Low				---	---	---	---	---	---	---	---	---	---	---
V Max		64.4		---	---	---	---	---	---	---	---	---	---	---
H Max		58.2		---	---	---	---	---	---	---	---	---	---	---
V	5725.0	24.9	15.2	0.0	35.0	5.3	65.2	55.5	83.5	-18.3	Pass	63.5	-8.0	Pass
V	5719.8	27.5	16.4	0.0	35.0	5.3	67.8	56.7	83.5	-15.7	Pass	63.5	-6.8	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V Max		62.5		---	---	---	---	---	---	---	---	---	---	---
H Max		56.0		---	---	---	---	---	---	---	---	---	---	---
V	5850.0	19.5	11.9	0.0	35.3	5.4	60.2	52.6	83.5	-23.3	Pass	63.5	-10.9	Pass
V	5949.3	25.3	13.2	0.0	35.4	5.4	66.1	54.0	83.5	-17.4	Pass	63.5	-9.5	Pass

Table Result: Pass by -6.8 dB ***Worst Freq:*** 5719.8 MHz

Test Site: EMI Chamber 2 **Cable 1:** Asset #2458 **Cable 2:** Asset #2459 **Cable 3:** ---
Analyzer: Rental SA#3 **Preamp:** None **Antenna:** Blue Horn **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.203

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

802.11n (HT40) UNII 1 and UNII 3 Worst Case Data Rates

Rev. 4/17/2018

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	11/16/2018
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	4/10/2019
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
Orange Horn	1-18GHz	3115	EMCO	0004-6123	390	I	10/13/2018
Blue Hom	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**
TH A#2084		HTC-1	HDE		2084	II	3/22/2019
TH A#2085		HTC-1	HDE		2085	II	3/22/2019
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**
Asset #2456	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2458	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2459	9KHz-18GHz		MegaPhase			II	10/29/2018
Asset #2480	9KHz-18GHz		MegaPhase			II	10/29/2018
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.							

Test Equipment Used

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. Vehicle battery powered only.

Measurement Uncertainty

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

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

Conditions Of Testing

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

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

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

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

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

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

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

Appendix A

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

DUT Information

Model:	PV602
Manufacturer:	Harman International Industries, Inc.
Serial Number:	34670010475
Software Version:	SOC: BR_RC1_R12.0.0_R18102A

U-NII-1

Mode	Channel	Frequency
802.11a 802.11n(HT20)	36	5180
802.11n(HT40)	38	5190
802.11a 802.11n(HT20)	40	5200
802.11a 802.11n(HT20)	44	5220
802.11n(HT40)	46	5230
802.11a 802.11n(HT20)	48	5240

U-NII-3

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

Antenna Gain:

5.15-5.95GHz Peak Gain: 3.72dBi

BT Wlan Antenna							
Frequency	Efficiency	Efficiency . dB	Peak Gain	Frequency	Efficiency	fficiency . d	Peak Gain
2400	36%	-4.41	0.53	5150	34%	-4.62	1.36
2410	37%	-4.29	0.72	5200	34%	-4.68	0.95
2420	38%	-4.21	0.72	5250	33%	-4.78	0.96
2430	39%	-4.08	0.83	5300	32%	-5.00	0.55
2440	40%	-4.03	0.80	5350	30%	-5.22	1.03
2450	40%	-3.96	1.01	5400	27%	-5.63	1.09
2460	40%	-3.93	1.24	5450	27%	-5.74	1.01
2470	41%	-3.88	1.46	5550	25%	-5.99	1.85
2480	43%	-3.71	1.93	5600	27%	-5.63	2.46
2490	44%	-3.59	2.17	5650	31%	-5.04	3.33
2500	44%	-3.55	2.33	5700	32%	-5.00	3.24
AVG	40%	-3.97	1.25	5750	34%	-4.65	3.61
				5800	34%	-4.74	3.46
				5850	36%	-4.46	3.72
				5900	34%	-4.73	3.64
				5950	32%	-4.96	3.29
				AVG	31%	-5.05	2.22

Number of transmission chains 1

Equipment Type Unlicensed National Information Infrastructure Device (NII)

Test Equipment Used:

Rev. 3/27/2018								
Spectrum Analyzers / Receivers /Preselectors	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
FSV40 Signal/Spectrum Analyzer	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/30/2018	6/30/2017
Signal Generators/Comparaison Noise Emitter	**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
Power/Noise Meters		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
OSP - open switch and control platform	30MHz-18GHz	OSP120	ROHDE & SCHWARZ	101674		I	6/1/2018	6/1/2017
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
DUT1	30MHz-26GHz		Micro-Coax			II	6/21/2018	6/21/2017
DUT2	30MHz-26GHz		Micro-Coax			II	6/22/2018	6/22/2017
DUT3	30MHz-26GHz		Micro-Coax			II	6/23/2018	6/23/2017
DUT4	30MHz-26GHz		Micro-Coax			II	6/24/2018	6/24/2017
Attenuators / Couplers	**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
10dB Attenuator-03 Red	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017
10dB Attenuator-04 orange	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017
API - 30dB 20W Attenuator	9KHz-40GHz	89-30-11	API Weinschel	703	2121	I	3/23/2019	3/23/2018
Directional Coupler	0.5GHz-18GHz	UDC	AA MCS	001040		II	8/11/2018	8/11/2017
Communication Tester	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
CMW500 Wideband Radio Communication Tester	DC to 6GHz	CMW500	ROHDE & SCHWARZ	155905		I	6/2/2018	6/2/2017
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Temp/Humidity Chamber #18		EPX-2H	Espec	137664	1645	I	1/5/2019	1/5/2018
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.								

Test Results Summary

UNII-1

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

UNII-3

Test	Frequency (MHz)	802.11a	802.11n(HT20)
Average Output Power	5745/5785/5825	PASS	PASS
Power Spectral Density	5745/5785/5825	PASS	PASS
DTS Bandwidth (6dB)	5745/5785/5825	PASS	PASS
Occupied Channel Bandwidth 99%	5745/5785/5825	PASS	PASS
		802.11n(HT40)	
Average Output Power	5755/5795	PASS	
Power Spectral Density	5755/5795	PASS	
DTS Bandwidth (6dB)	5755/5795	PASS	
Occupied Channel Bandwidth 99%	5755/5795	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	10.089	9.751	9.957	23.97	98.529
9 Mbps	10.017	9.889	9.896	23.97	97.820
12 Mbps	10.382	9.792	10.407	23.97	97.152
18 Mbps	9.909	9.839	10.028	23.97	95.846
24 Mbps	10.099	9.886	9.95	23.97	94.619
36 Mbps	9.679	9.427	9.918	23.97	92.306
48 Mbps	10.131	9.859	10.035	23.97	90.344
54 Mbps	10.659	10.573		23.97	89.401

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	10.027	9.84	10.114	23.97	98.426
MCS1	9.773	9.707	9.716	23.97	96.990
MCS2	10.101	9.938	10.118	23.97	95.668
MCS3	10.292	9.939	9.998	23.97	94.458
MCS4	10	9.885	10.006	23.97	92.308
MCS5	10.137	9.467	10.101	23.97	90.350
MCS6	10.225	9.932	10.067	23.97	89.598
MCS7	9.778	9.522	10.088	23.97	88.715

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Gated RMS (dBm) 5230 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	9.803	9.946	23.97	96.879
MCS1	9.838	9.847	23.97	94.292
MCS2	9.941	9.896	23.97	92.079
MCS3	9.957	10.014	23.97	87.088
MCS4	10.006	9.94	23.97	87.094
MCS5	9.955	9.955	23.97	84.501
MCS6	10.049	10.015	23.97	83.540
MCS7	10.008	10.002	23.97	82.456

RSS-247 UNII-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, dBm, whichever is less (where B is 99% OBW in MHz).
In addition devices must be capable of reducing power by at least 3dB below the maximum permitted EIRP of 30mW, which is 11.77dBm.
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 (14.77dBm)

802.11a

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	10.089	1.114	11.203	13.8	n/a	n/a	Default	n/a
9 Mbps	10.017	1.114	11.131	13.8	n/a	n/a	Default	n/a
12 Mbps	10.382	1.114	11.496	13.8	n/a	n/a	Default	n/a
18 Mbps	9.909	1.114	11.023	13.8	n/a	n/a	Default	n/a
24 Mbps	10.099	1.114	11.213	13.8	n/a	n/a	Default	n/a
36 Mbps	9.679	1.114	10.793	13.8	n/a	n/a	Default	n/a
48 Mbps	10.131	1.114	11.245	13.8	n/a	n/a	Default	n/a
54 Mbps	10.123	1.114	11.237	13.8	n/a	n/a	Default	n/a
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	9.751	0.95	10.701	13.8	n/a	n/a	Default	n/a
9 Mbps	9.889	0.95	10.839	13.8	n/a	n/a	Default	n/a
12 Mbps	9.792	0.95	10.742	13.8	n/a	n/a	Default	n/a
18 Mbps	9.839	0.95	10.789	13.8	n/a	n/a	Default	n/a
24 Mbps	9.886	0.95	10.836	13.8	n/a	n/a	Default	n/a
36 Mbps	9.427	0.95	10.377	13.8	n/a	n/a	Default	n/a
48 Mbps	9.859	0.95	10.809	13.8	n/a	n/a	Default	n/a
54 Mbps	9.919	0.95	10.869	13.8	n/a	n/a	Default	n/a
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
6 Mbps	9.957	0.958	10.915	13.8	n/a	n/a	Default	n/a
9 Mbps	9.896	0.958	10.854	13.8	n/a	n/a	Default	n/a
12 Mbps	10.407	0.958	11.365	13.8	n/a	n/a	Default	n/a
18 Mbps	10.028	0.958	10.986	13.8	n/a	n/a	Default	n/a
24 Mbps	9.95	0.958	10.908	13.8	n/a	n/a	Default	n/a
36 Mbps	9.918	0.958	10.876	13.8	n/a	n/a	Default	n/a
48 Mbps	10.035	0.958	10.993	13.8	n/a	n/a	Default	n/a
54 Mbps	10.155	0.958	11.113	13.8	n/a	n/a	Default	n/a

802.11n(HT20)

Data Rate	Gated RMS (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	10.027	1.114	11.141	13.8	n/a	n/a	Default	n/a
MCS1	9.773	1.114	10.887	13.8	n/a	n/a	Default	n/a
MCS2	10.101	1.114	11.215	13.8	n/a	n/a	Default	n/a
MCS3	10.292	1.114	11.406	13.8	n/a	n/a	Default	n/a
MCS4	10	1.114	11.114	13.8	n/a	n/a	Default	n/a
MCS5	10.137	1.114	11.251	13.8	n/a	n/a	Default	n/a
MCS6	10.225	1.114	11.339	13.8	n/a	n/a	Default	n/a
MCS7	9.778	1.114	10.892	13.8	n/a	n/a	Default	n/a
Data Rate	Gated RMS (dBm) 5200 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	9.84	0.95	10.79	13.8	n/a	n/a	Default	n/a
MCS1	9.707	0.95	10.657	13.8	n/a	n/a	Default	n/a
MCS2	9.938	0.95	10.888	13.8	n/a	n/a	Default	n/a
MCS3	9.939	0.95	10.889	13.8	n/a	n/a	Default	n/a
MCS4	9.885	0.95	10.835	13.8	n/a	n/a	Default	n/a
MCS5	9.467	0.95	10.417	13.8	n/a	n/a	Default	n/a
MCS6	9.932	0.95	10.882	13.8	n/a	n/a	Default	n/a
MCS7	9.522	0.95	10.472	13.8	n/a	n/a	Default	n/a
Data Rate	Gated RMS (dBm) 5240 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	10.114	0.958	11.072	13.8	n/a	n/a	Default	n/a
MCS1	9.716	0.958	10.674	13.8	n/a	n/a	Default	n/a
MCS2	10.118	0.958	11.076	13.8	n/a	n/a	Default	n/a
MCS3	9.998	0.958	10.956	13.8	n/a	n/a	Default	n/a
MCS4	10.006	0.958	10.964	13.8	n/a	n/a	Default	n/a
MCS5	10.101	0.958	11.059	13.8	n/a	n/a	Default	n/a
MCS6	10.067	0.958	11.025	13.8	n/a	n/a	Default	n/a
MCS7	10.088	0.958	11.046	13.8	n/a	n/a	Default	n/a

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	9.803	1.032	10.835	14.77	n/a	n/a	Default	n/a
MCS1	9.838	1.032	10.87	14.77	n/a	n/a	Default	n/a
MCS2	9.941	1.032	10.973	14.77	n/a	n/a	Default	n/a
MCS3	9.957	1.032	10.989	14.77	n/a	n/a	Default	n/a
MCS4	10.006	1.032	11.038	14.77	n/a	n/a	Default	n/a
MCS5	9.955	1.032	10.987	14.77	n/a	n/a	Default	n/a
MCS6	10.049	1.032	11.081	14.77	n/a	n/a	Default	n/a
MCS7	10.008	1.032	11.04	14.77	n/a	n/a	Default	n/a
Data Rate	Gated RMS (dBm) 5230 MHz	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Gated RMS (dBm) with TPC	Difference	Power Setting Nominal	Power Setting with TPC
MCS0	9.946	0.956	10.902	14.77	n/a	n/a	Default	n/a
MCS1	9.847	0.956	10.803	14.77	n/a	n/a	Default	n/a
MCS2	9.896	0.956	10.852	14.77	n/a	n/a	Default	n/a
MCS3	10.014	0.956	10.97	14.77	n/a	n/a	Default	n/a
MCS4	9.94	0.956	10.896	14.77	n/a	n/a	Default	n/a
MCS5	9.955	0.956	10.911	14.77	n/a	n/a	Default	n/a
MCS6	10.015	0.956	10.971	14.77	n/a	n/a	Default	n/a
MCS7	10.002	0.956	10.958	14.77	n/a	n/a	Default	n/a

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	9.484	9.87	9.942	30	98.533
9 Mbps	9.462	9.559	9.535	30	97.827
12 Mbps	8.533	8.791	9.313	30	97.164
18 Mbps	9.239	9.569	9.694	30	95.868
24 Mbps	9.81	9.488	10.264	30	94.616
36 Mbps	9.476	9.609	10.12	30	92.310
48 Mbps	9.568	9.391	9.852	30	90.360
54 Mbps	9.53	9.225	9.757	30	89.422

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	8.287	8.333	9.2	30	98.434
MCS1	8.871	8.73	9.348	30	98.230
MCS2	8.592	8.808	9.12	30	95.700
MCS3	8.366	8.649	8.92	30	94.487
MCS4	8.481	8.921	9.417	30	92.173
MCS5	8.541	8.767	8.996	30	90.411
MCS6	8.317	8.742	9.041	30	89.680
MCS7	8.383	8.748	9.384	30	88.790

802.11n(HT40)

Data Rate	Gated RMS (dBm) 5755 MHz	Gated RMS (dBm) 5795 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	8.75	8.962	30	96.893
MCS1	8.622	8.851	30	94.330
MCS2	8.516	8.695	30	92.153
MCS3	8.647	8.745	30	90.283
MCS4	8.643	8.811	30	87.210
MCS5	8.631	8.808	30	84.636
MCS6	8.653	8.831	30	83.693
MCS7	8.821	8.839	30	82.590

Power Spectral Density

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

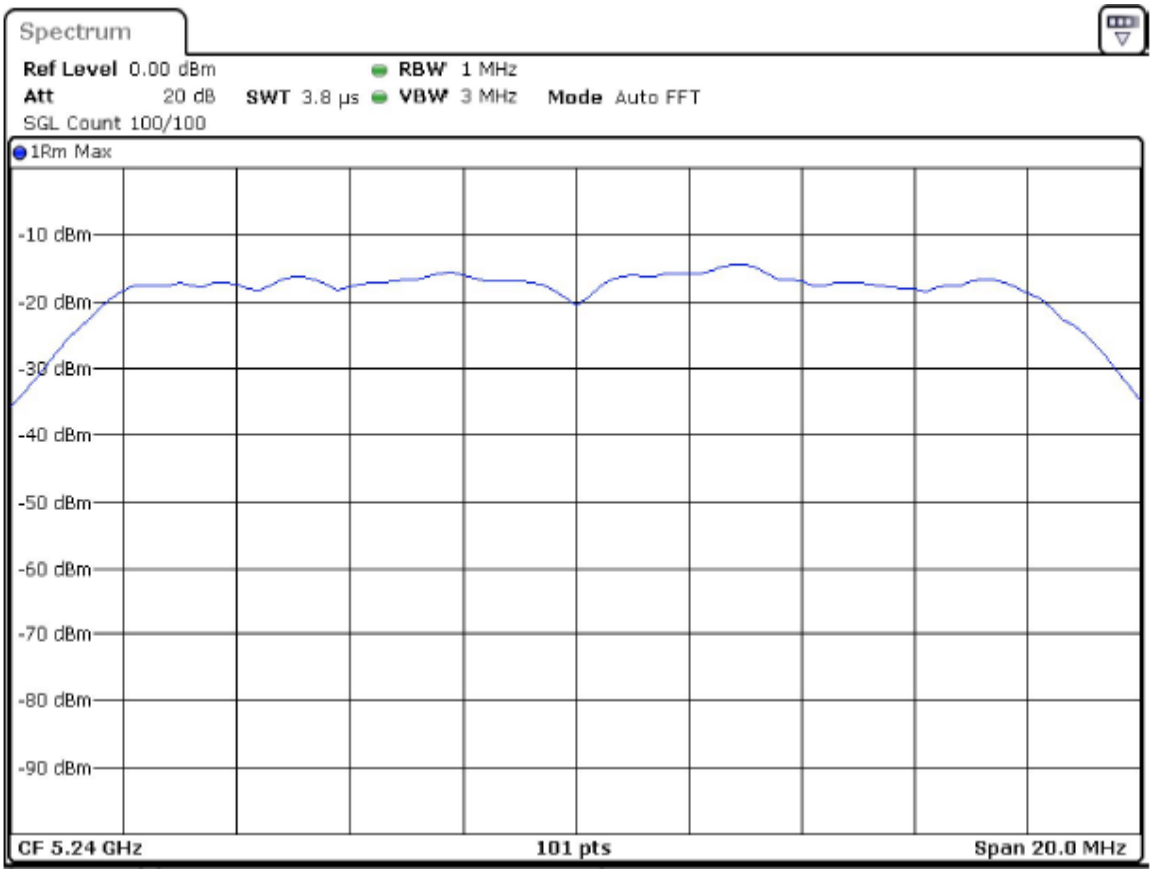
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

FCC UNII-1

802.11a

Data Rate	Peak PSD (dBm) 5180 MHz	Peak PSD (dBm) 5200 MHz	Peak PSD (dBm) 5240 MHz	Limit (dBm)
6 Mbps	6.143	7.119	6.615	11
9 Mbps	6.327	7.307	6.708	11
12 Mbps	7.189	6.425	6.169	11
18 Mbps	7.134	6.778	7.240	11
24 Mbps	7.598	7.042	7.340	11
36 Mbps	8.222	8.298	9.005	11
48 Mbps	7.020	7.111	7.756	11
54 Mbps	8.644	8.149	9.001	11

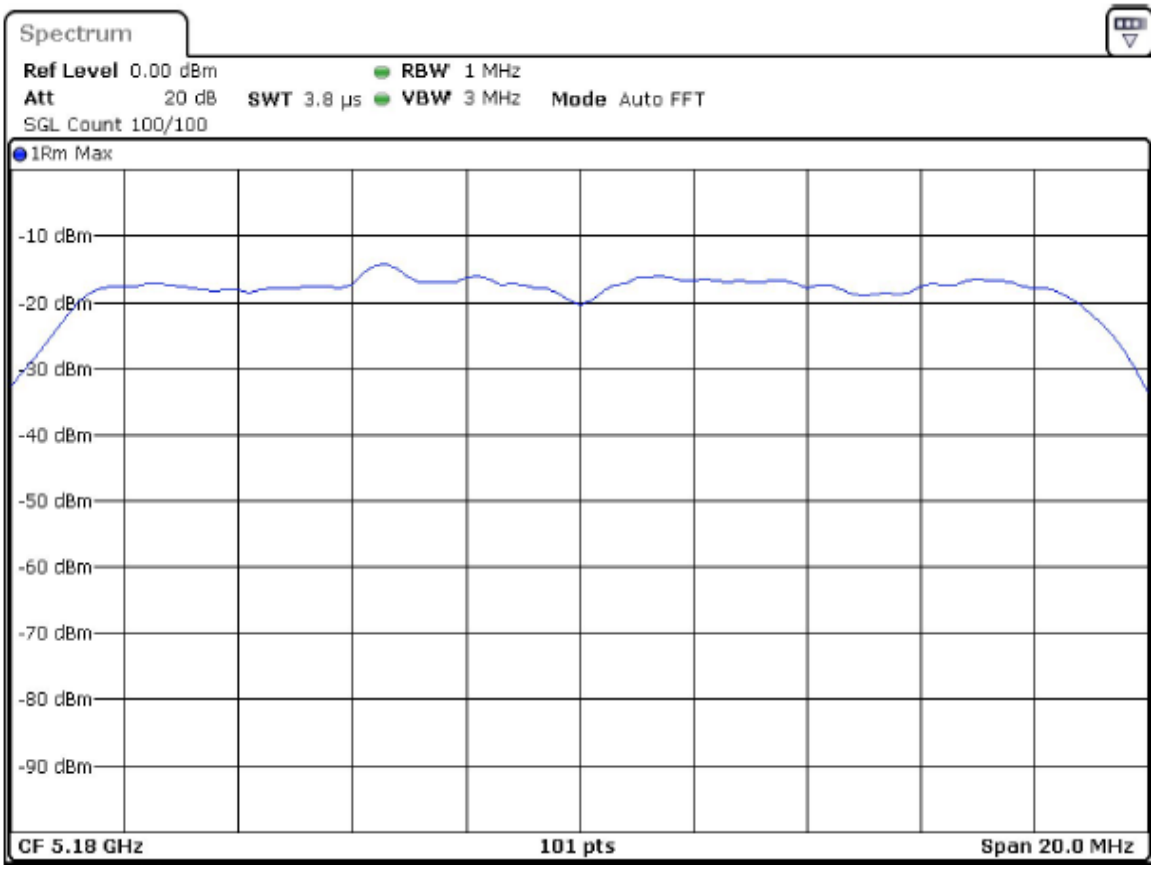
802.11a 36Mbps 5240MHz



802.11n(HT20)

Data Rate	Peak PSD (dBm) 5180 MHz	Peak PSD (dBm) 5200 MHz	Peak PSD (dBm) 5240 MHz	Limit (dBm)
MCS0	6.063	5.878	6.760	11
MCS1	6.909	6.097	6.839	11
MCS2	7.160	6.687	7.534	11
MCS3	8.702	6.652	6.855	11
MCS4	7.169	6.702	6.623	11
MCS5	7.805	7.024	7.146	11
MCS6	7.2	7.146	7.413	11
MCS7	8.028	7.990	7.758	11

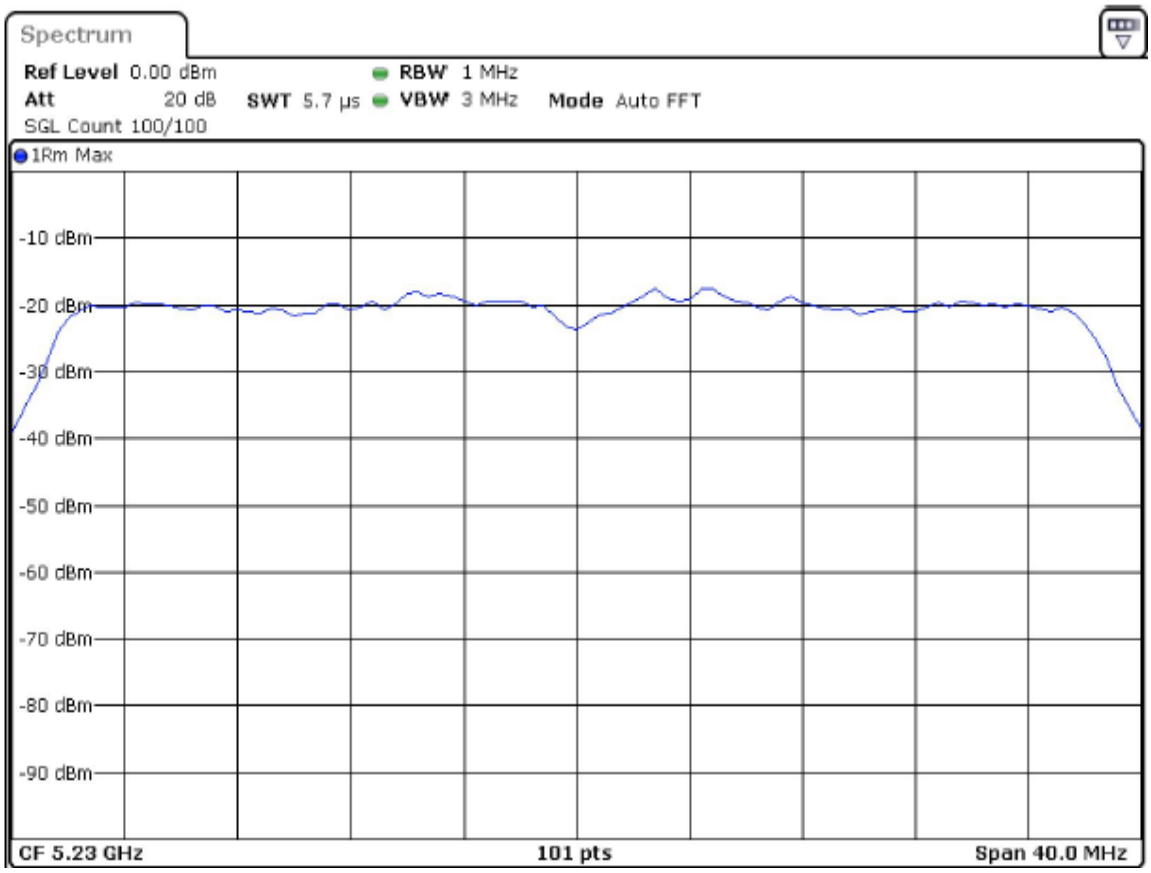
802.11n(HT20) MCS3 5180 MHz



802.11n(HT40)

Data Rate	Peak PSD (dBm) 5190 MHz	Peak PSD (dBm) 5230 MHz	Limit (dBm)
MCS0	3.867	3.623	11
MCS1	3.335	3.868	11
MCS2	4.276	4.796	11
MCS3	4.963	4.340	11
MCS4	5.053	5.485	11
MCS5	5.307	5.629	11
MCS6	5.654	5.950	11
MCS7	4.764	5.871	11

802.11n(HT40) MCS6 5230MHz

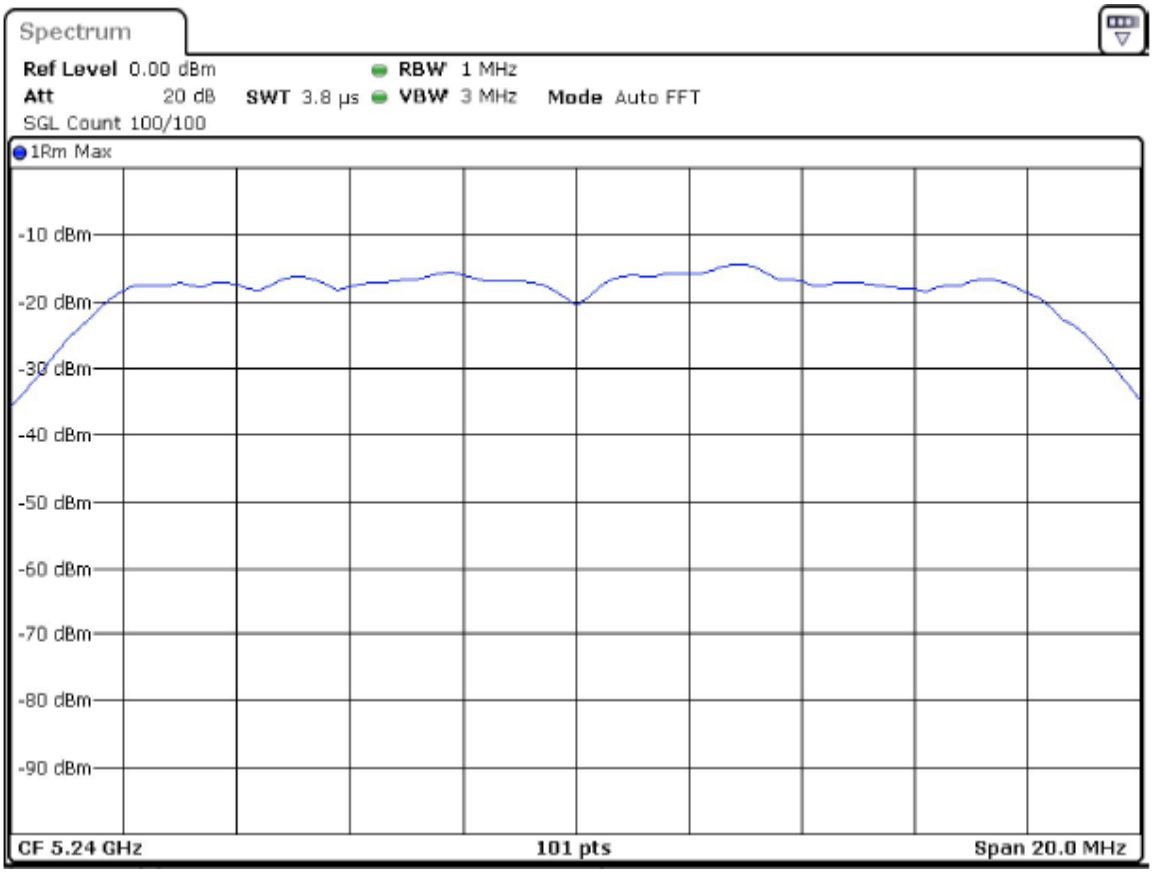


RSS-247 UNII-1

802.11a

Data Rate	PSD (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5180 MHz	Limit (dBm)
6 Mbps	6.143	1.114	7.257	10
9 Mbps	6.327	1.114	7.441	10
12 Mbps	7.189	1.114	8.303	10
18 Mbps	7.134	1.114	8.248	10
24 Mbps	7.598	1.114	8.712	10
36 Mbps	8.222	1.114	9.336	10
48 Mbps	7.020	1.114	8.134	10
54 Mbps	8.644	1.114	9.758	10
Data Rate	**PSD (dBm) 5200 MHz**	**Antenna Gain (dBi)**	**EIRP PSD (dBm) 5200 MHz**	**Limit (dBm)**
6 Mbps	7.119	0.95	8.069	10
9 Mbps	7.307	0.95	8.257	10
12 Mbps	6.425	0.95	7.375	10
18 Mbps	6.778	0.95	7.728	10
24 Mbps	7.042	0.95	7.992	10
36 Mbps	8.298	0.95	9.248	10
48 Mbps	7.111	0.95	8.061	10
54 Mbps	8.149	0.95	9.099	10
Data Rate	**PSD (dBm) 5240 MHz**	**Antenna Gain (dBi)**	**EIRP PSD (dBm) 5240 MHz**	**Limit (dBm)**
6 Mbps	6.615	0.958	7.573	10
9 Mbps	6.708	0.958	7.666	10
12 Mbps	6.169	0.958	7.127	10
18 Mbps	7.240	0.958	8.198	10
24 Mbps	7.340	0.958	8.298	10
36 Mbps	9.005	0.958	9.963	10
48 Mbps	7.756	0.958	8.714	10
54 Mbps	9.001	0.958	9.959	10

802.11a 36Mbps 5240MHz

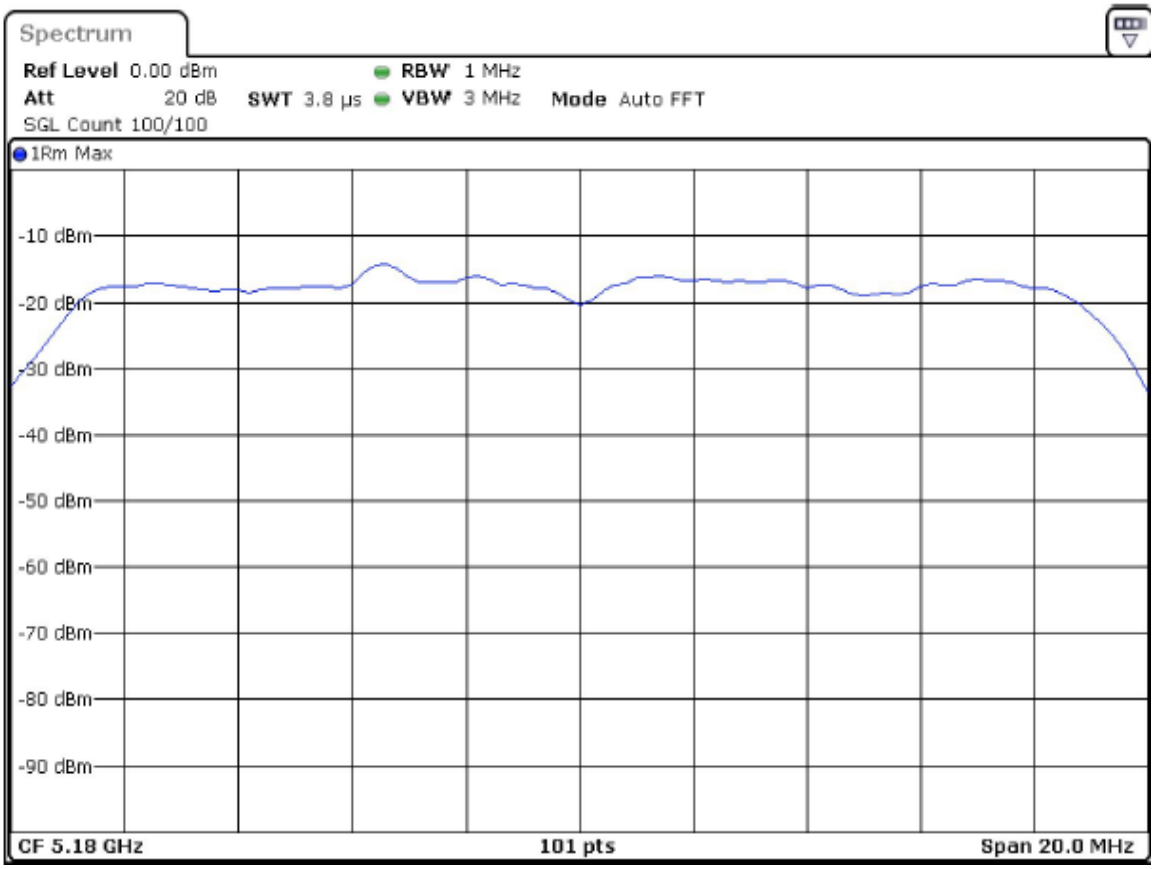


802.11n(HT20)

Data Rate	PSD (dBm) 5180 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5180 MHz	Limit (dBm)
MCS0	6.063	1.114	7.177	10
MCS1	6.909	1.114	8.023	10
MCS2	7.160	1.114	8.274	10
MCS3	8.702	1.114	9.816	10
MCS4	7.169	1.114	8.283	10
MCS5	7.805	1.114	8.919	10
MCS6	7.2	1.114	8.314	10
MCS7	8.028	1.114	9.142	10
Data Rate	**PSD (dBm) 5200 MHz**	**Antenna Gain (dBi)**	**EIRP PSD (dBm) 5200 MHz**	**Limit (dBm)**
MCS0	5.878	0.95	6.828	10
MCS1	6.097	0.95	7.047	10
MCS2	6.687	0.95	7.637	10
MCS3	6.652	0.95	7.602	10
MCS4	6.702	0.95	7.652	10
MCS5	7.024	0.95	7.974	10
MCS6	7.146	0.95	8.096	10
MCS7	7.990	0.95	8.94	10
Data Rate	**PSD (dBm) 5240 MHz**	**Antenna Gain (dBi)**	**EIRP PSD (dBm) 5240 MHz**	**Limit (dBm)**
MCS0	6.760	0.958	7.718	10
MCS1	6.839	0.958	7.797	10
MCS2	7.534	0.958	8.492	10
MCS3	6.855	0.958	7.813	10
MCS4	6.623	0.958	7.581	10
MCS5	7.146	0.958	8.104	10
MCS6	7.413	0.958	8.371	10

MCS7	7.758	0.958	8.716	10

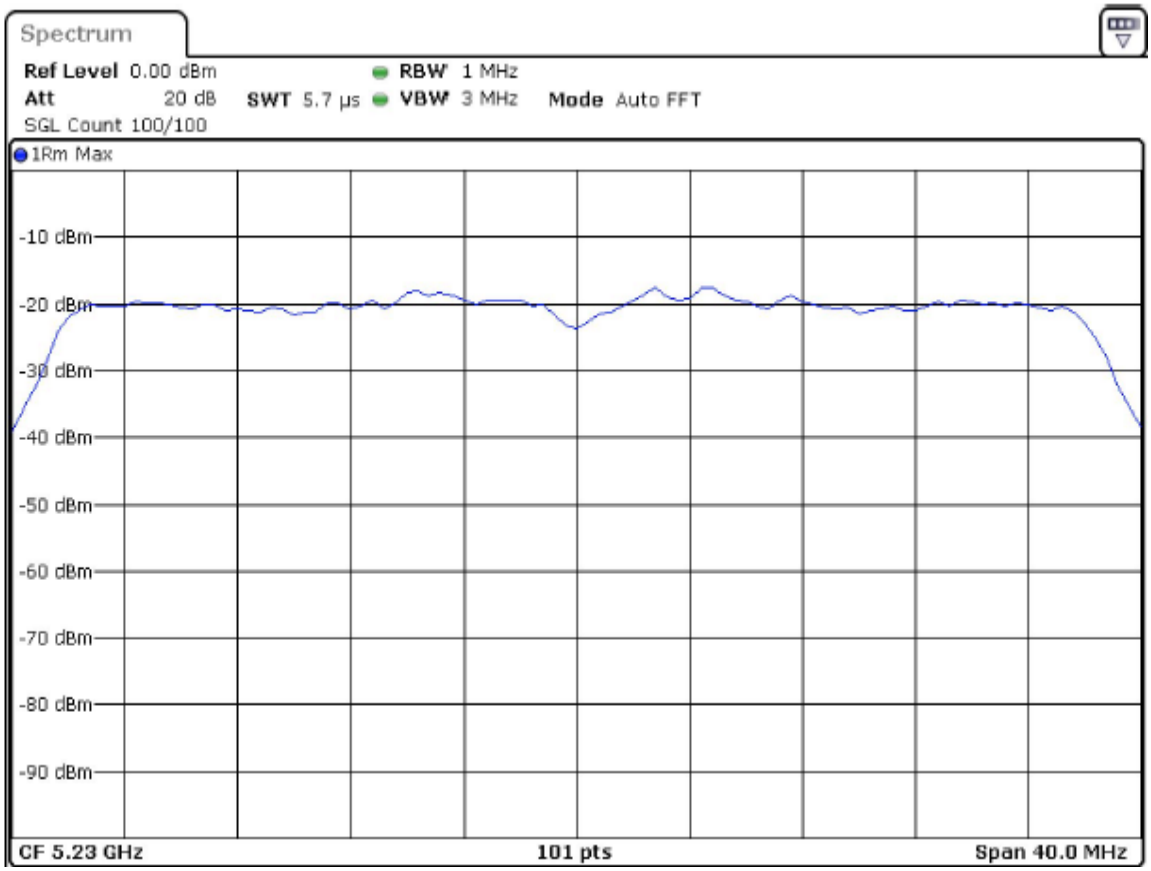
802.11n(HT20) MCS3 5180 MHz



802.11n(HT40)

Data Rate	PSD (dBm) 5190 MHz	Antenna Gain (dBi)	EIRP PSD (dBm) 5190 MHz	Limit (dBm)
MCS0	3.867	1.032	4.899	10
MCS1	3.335	1.032	4.367	10
MCS2	4.276	1.032	5.308	10
MCS3	4.963	1.032	5.995	10
MCS4	5.053	1.032	6.085	10
MCS5	5.307	1.032	6.339	10
MCS6	5.654	1.032	6.686	10
MCS7	4.764	1.032	5.796	10
Data Rate	**PSD (dBm) 5230 MHz**	**Antenna Gain (dBi)**	**EIRP PSD (dBm) 5230 MHz**	**Limit (dBm)**
MCS0	3.623	0.956	4.579	10
MCS1	3.868	0.956	4.824	10
MCS2	4.796	0.956	5.752	10
MCS3	4.340	0.956	5.296	10
MCS4	5.485	0.956	6.441	10
MCS5	5.629	0.956	6.585	10
MCS6	5.950	0.956	6.906	10
MCS7	5.871	0.956	6.827	10

802.11n(HT40) MCS6 5230MHz

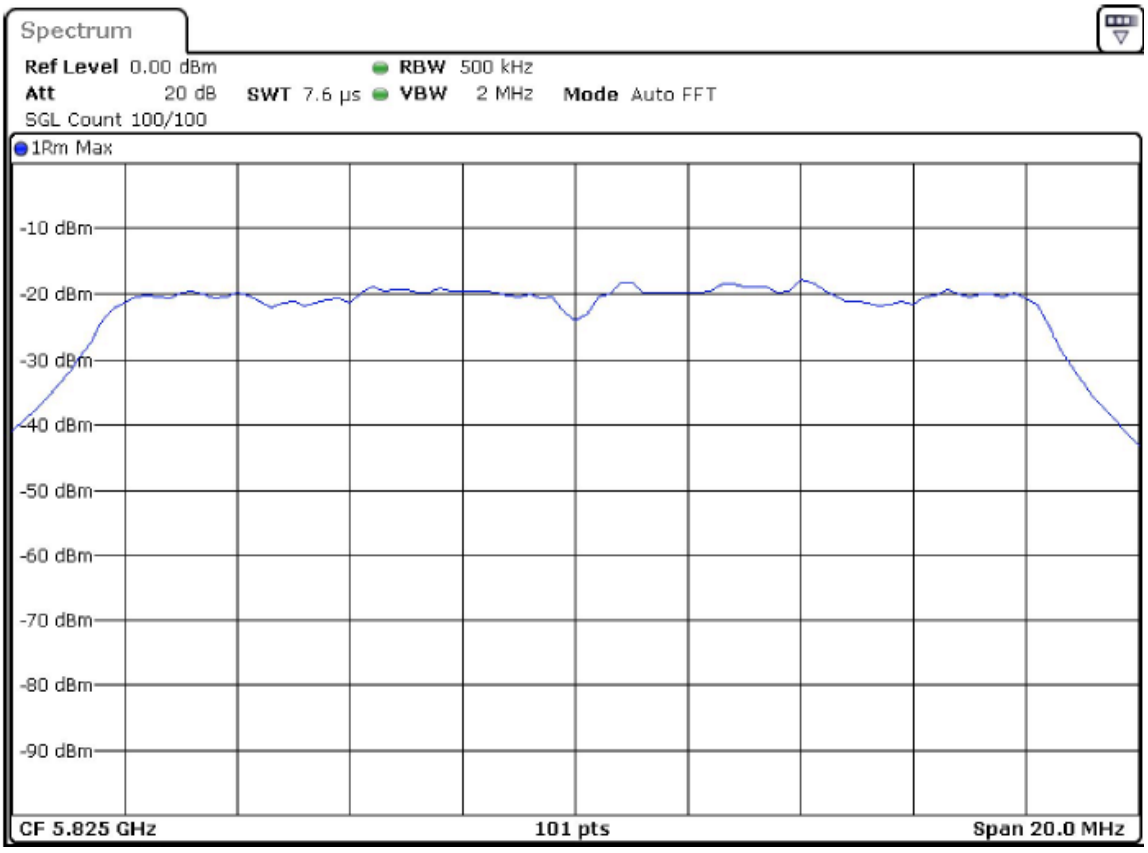


FCC and RSS-247 UNII-3

802.11a

Data Rate	Peak PSD (dBm) 5745 MHz	Peak PSD (dBm) 5785 MHz	Peak PSD (dBm) 5825 MHz	Limit (dBm)
6 Mbps	3.446	2.378	3.359	30.0
9 Mbps	3.108	2.905	3.141	30.0
12 Mbps	2.504	2.823	2.768	30.0
18 Mbps	3.999	3.484	3.944	30.0
24 Mbps	5.040	5.022	5.347	30.0
36 Mbps	4.330	4.614	5.080	30.0
48 Mbps	4.162	4.064	4.567	30.0
54 Mbps	4.544	4.429	4.373	30.0

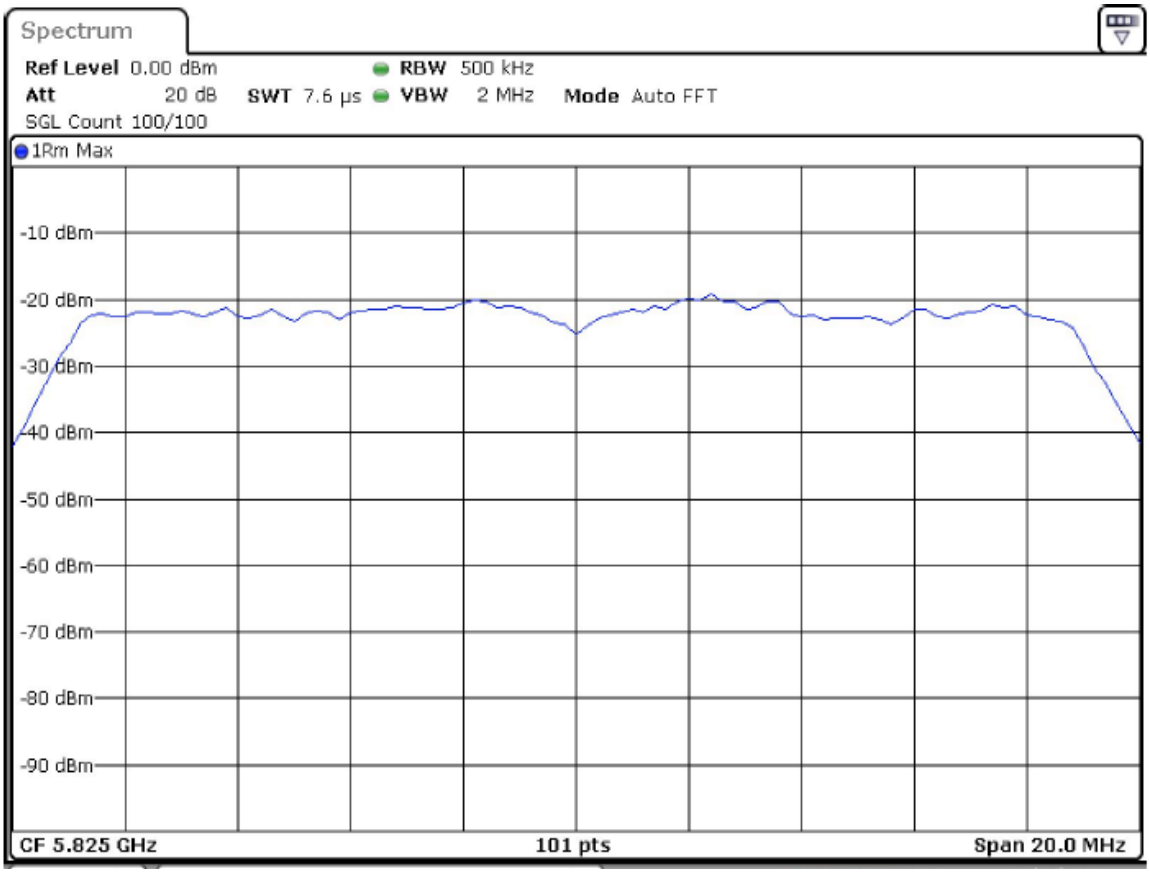
802.11a 24 Mbps 5825MHz



802.11n(HT20)

Data Rate	Peak PSD (dBm) 5745 MHz	Peak PSD (dBm) 5785 MHz	Peak PSD (dBm) 5825 MHz	Limit (dBm)
MCS0	2.639	2.126	3.24	30
MCS1	1.542	1.539	1.948	30
MCS2	2.607	1.895	2.394	30
MCS3	2.164	2.253	2.924	30
MCS4	3.193	2.733	4.068	30
MCS5	3.101	3.867	3.736	30
MCS6	2.859	2.511	3.219	30
MCS7	2.980	3.327	3.938	30

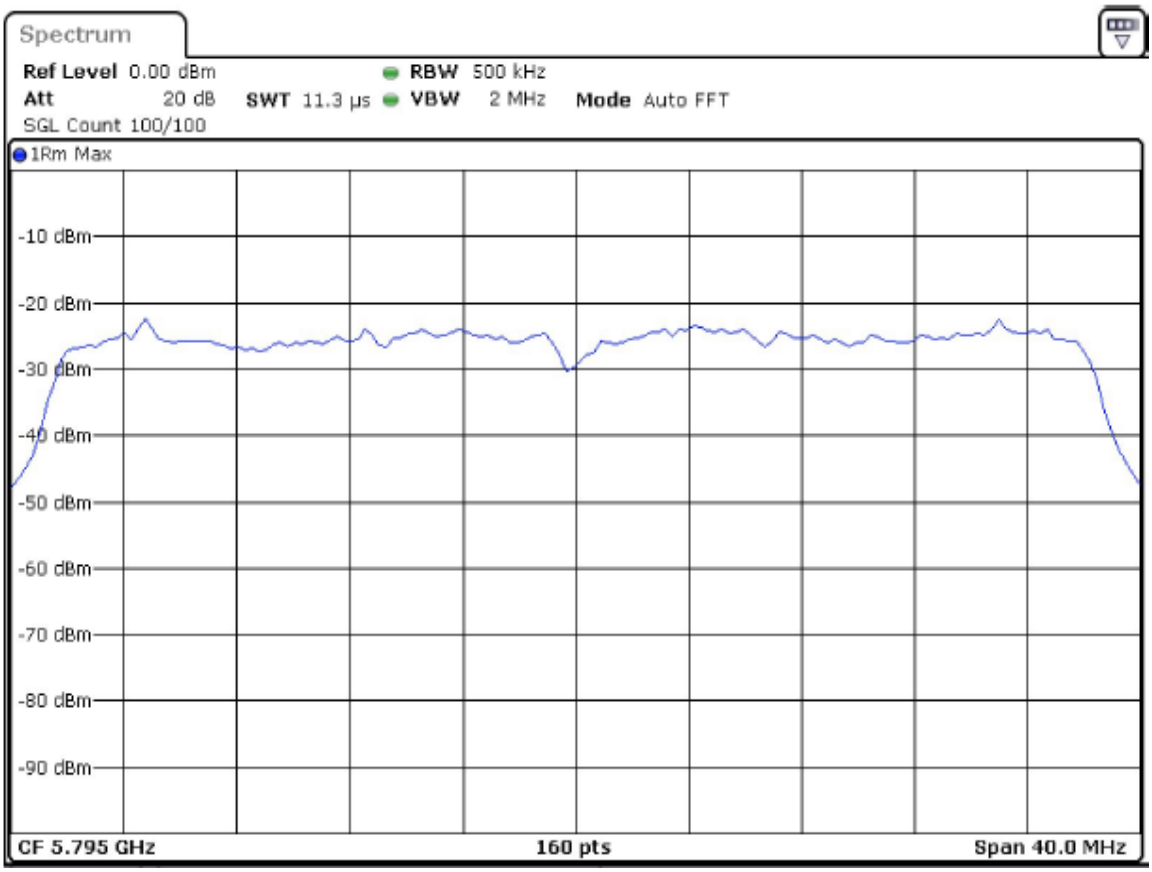
802.11n(HT20) MCS4 5825MHz



802.11n(HT40)

Data Rate	Peak PSD (dBm) 5755 MHz	Peak PSD (dBm) 5795 MHz	Limit (dBm)
MCS0	-0.833	-1.430	30
MCS1	0.855	0.550	30
MCS2	-0.444	-0.150	30
MCS3	0.591	0.290	30
MCS4	0.346	0.480	30
MCS5	0.812	1.346	30
MCS6	0.718	0.830	30
MCS7	1.028	0.324	30

802.11n(HT40) MCS5 5795MHz



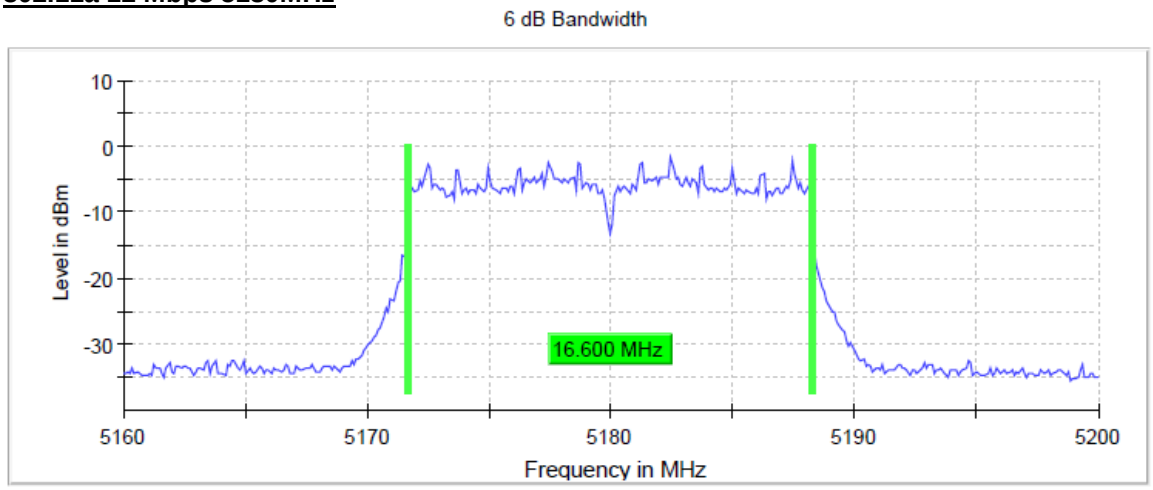
DTS Bandwidth (6dB)

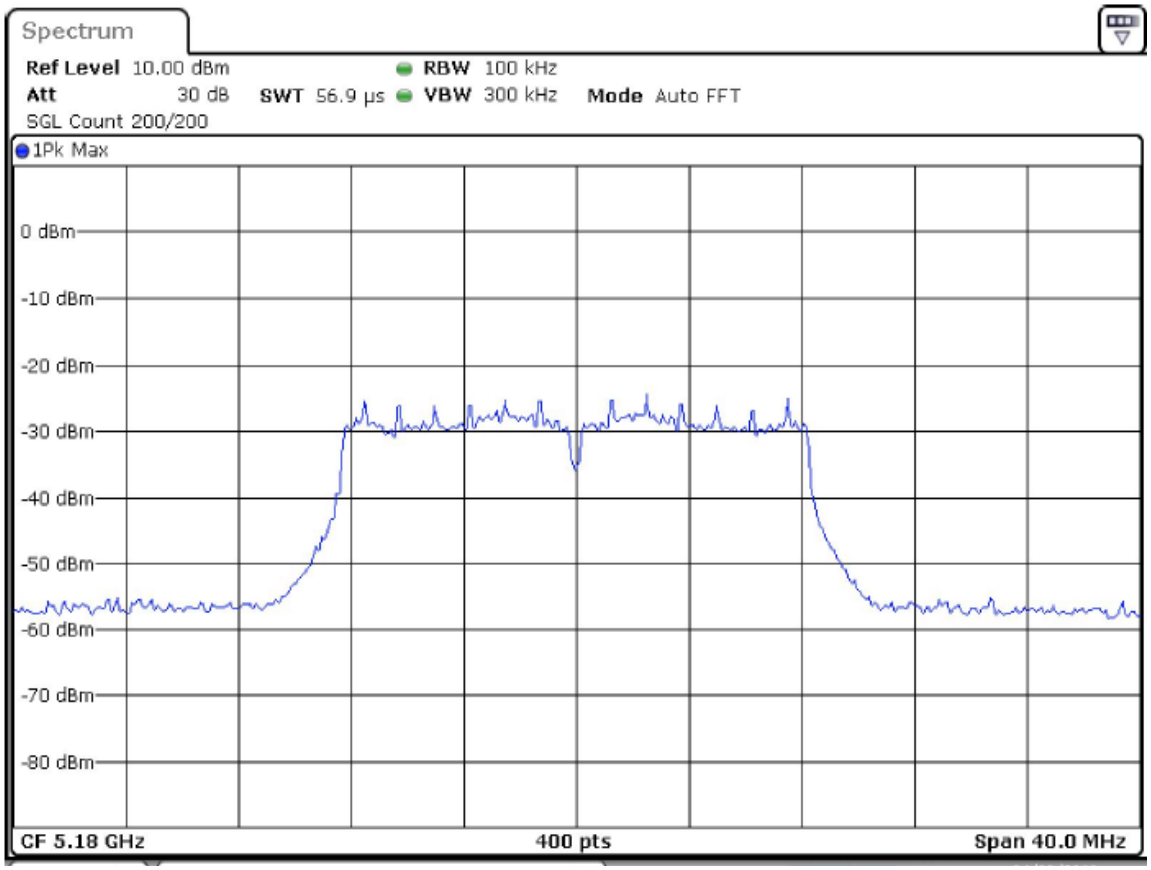
Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.C.2.
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

UNII-1

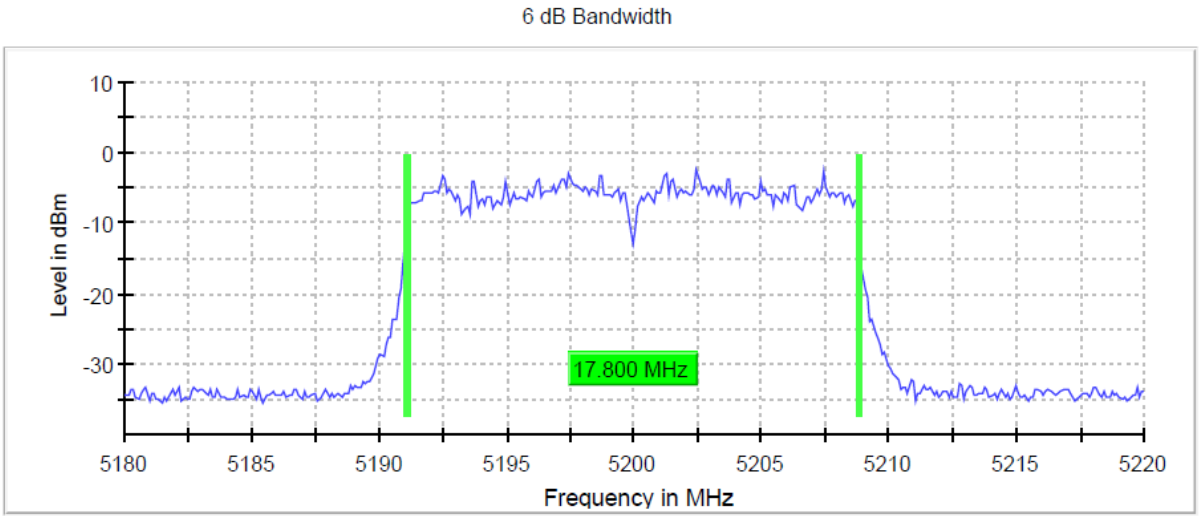
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11a 12 Mbps	5180.000	16.600000	0.5	5171.650000	5188.250000
802.11n(HT20) MSC3	5180.000	17.800000	0.5	5171.050000	5188.850000
802.11n(HT40) MSC6	5190.000	36.600000	0.5	5171.650000	5208.250000
802.11a 12 Mbps	5200.000	16.600000	0.5	5191.650000	5208.250000
802.11n(HT20) MSC3	5200.000	17.800000	0.5	5191.050000	5208.850000
802.11n(VHT40) MCS6	5230.000	36.600000	0.5	5211.650000	5248.250000
802.11a 12 Mbps	5240.000	16.600000	0.5	5231.650000	5248.250000
802.11n(HT20) MSC3	5240.000	17.800000	0.5	5231.050000	5248.850000

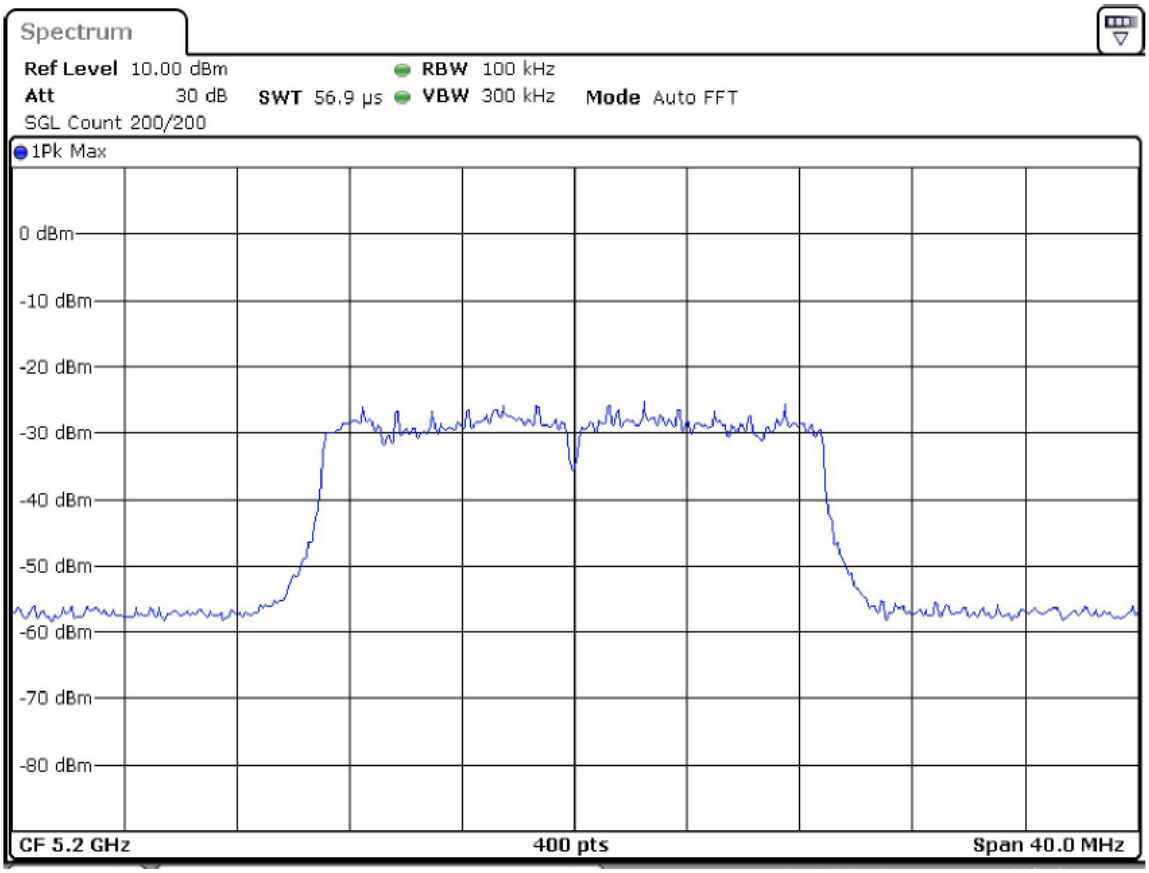
802.11a 12 Mbps 5180MHz



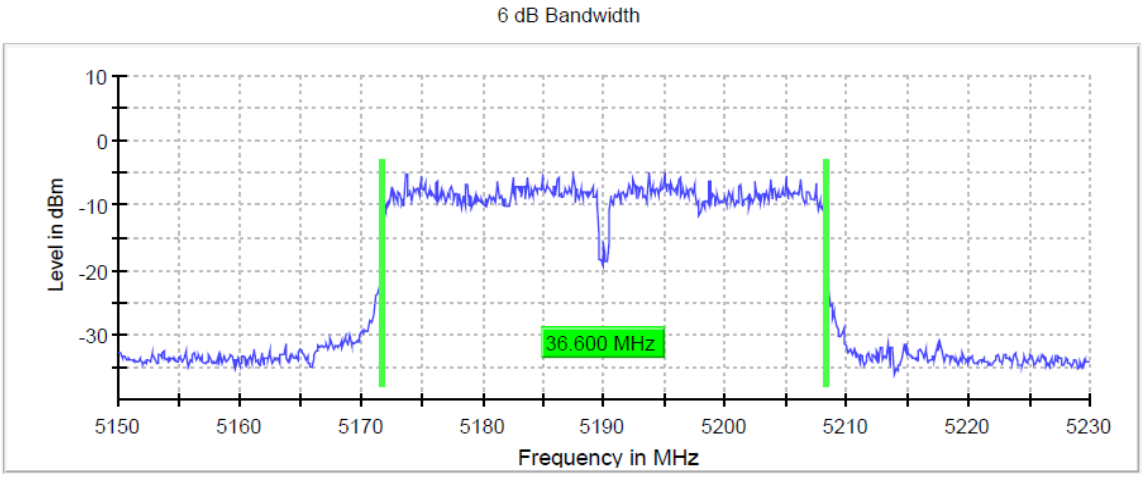


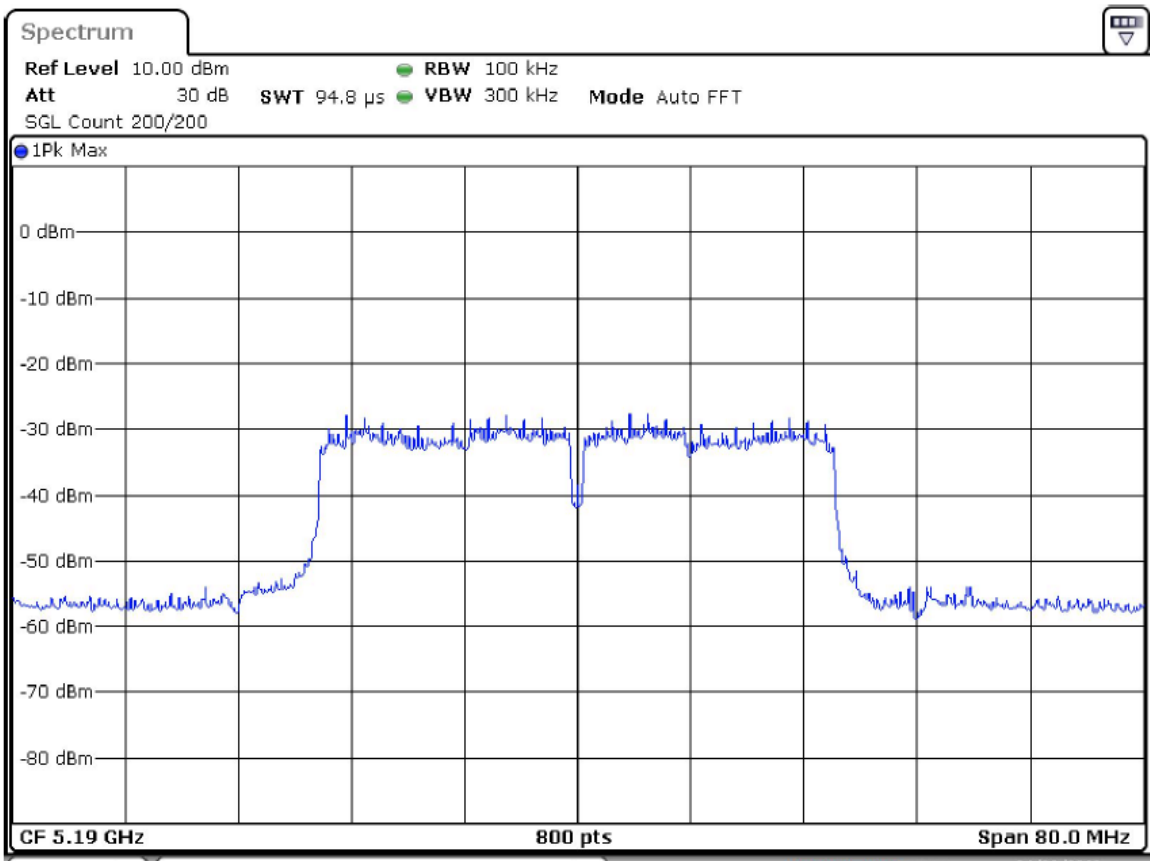
802.11n(HT20) MCS3 5200MHz





802.11n(HT40) MCS6 5190 MHz

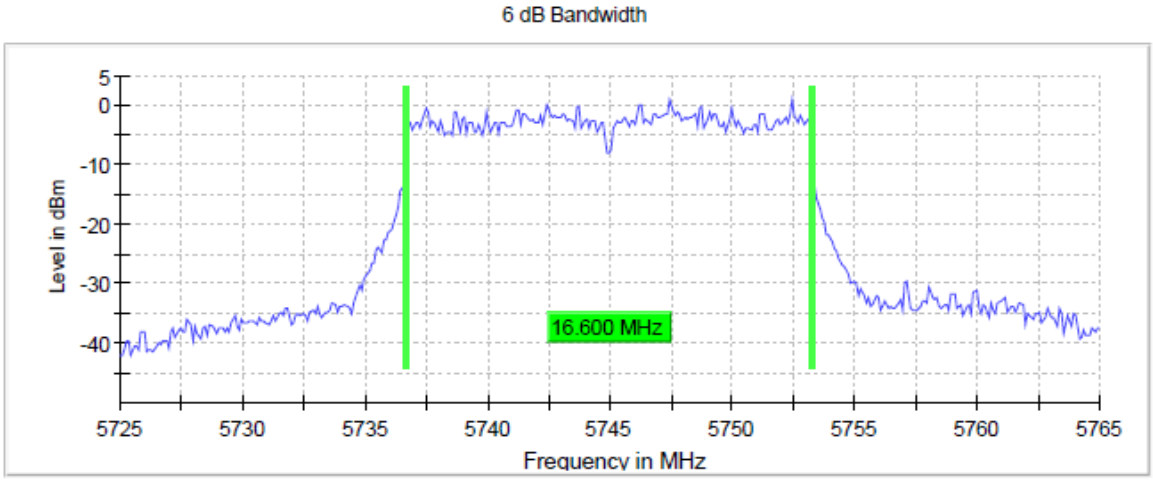


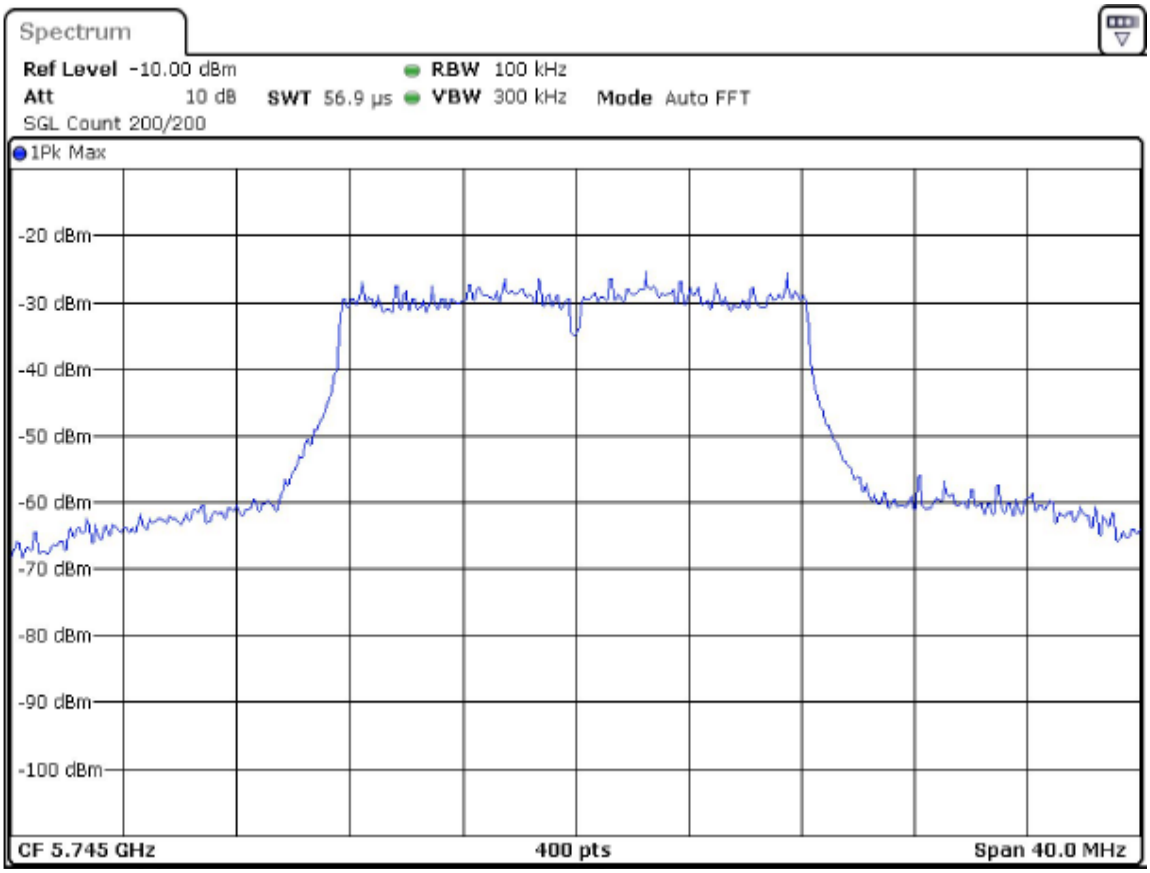


UNII-3

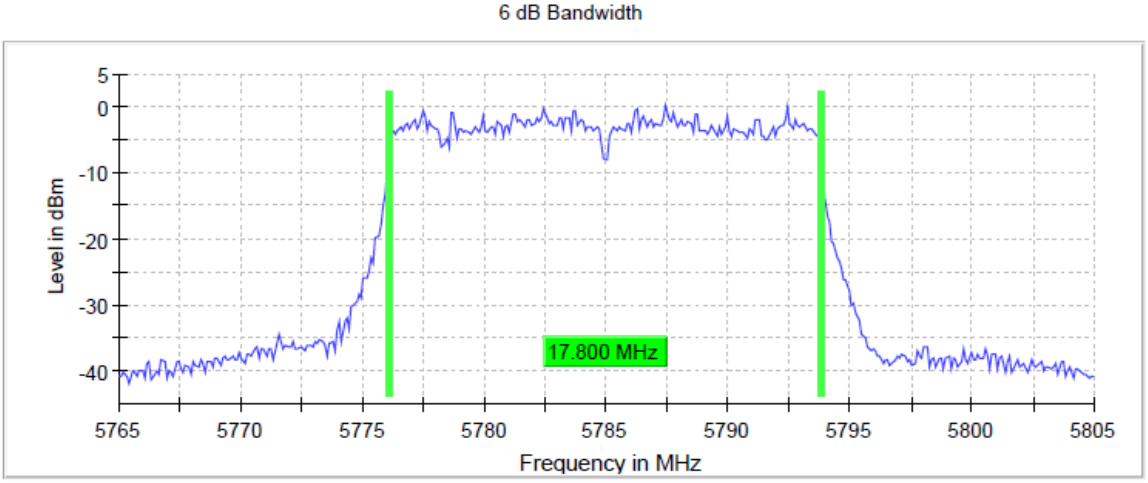
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11a 24 Mbps	5745.00	16.600000	0.5	5736.650000	5753.250000
802.11n(HT20) MSC4	5745.00	17.800000	0.5	5736.050000	5753.850000
802.11n(HT40) MSC0	5755.00	35.700000	0.5	5737.250000	5772.950000
802.11a 24 Mbps	5785.00	16.600000	0.5	5776.650000	5793.250000
802.11n(HT20) MSC4	5785.00	17.800000	0.5	5776.050000	5793.850000
802.11n(HT40) MSC0	5795.00	35.900000	0.5	5777.050000	5812.950000
802.11a 24 Mbps	5825.00	16.600000	0.5	5816.650000	5833.250000
802.11n(HT20) MSC4	5825.00	17.800000	0.5	5816.050000	5833.850000

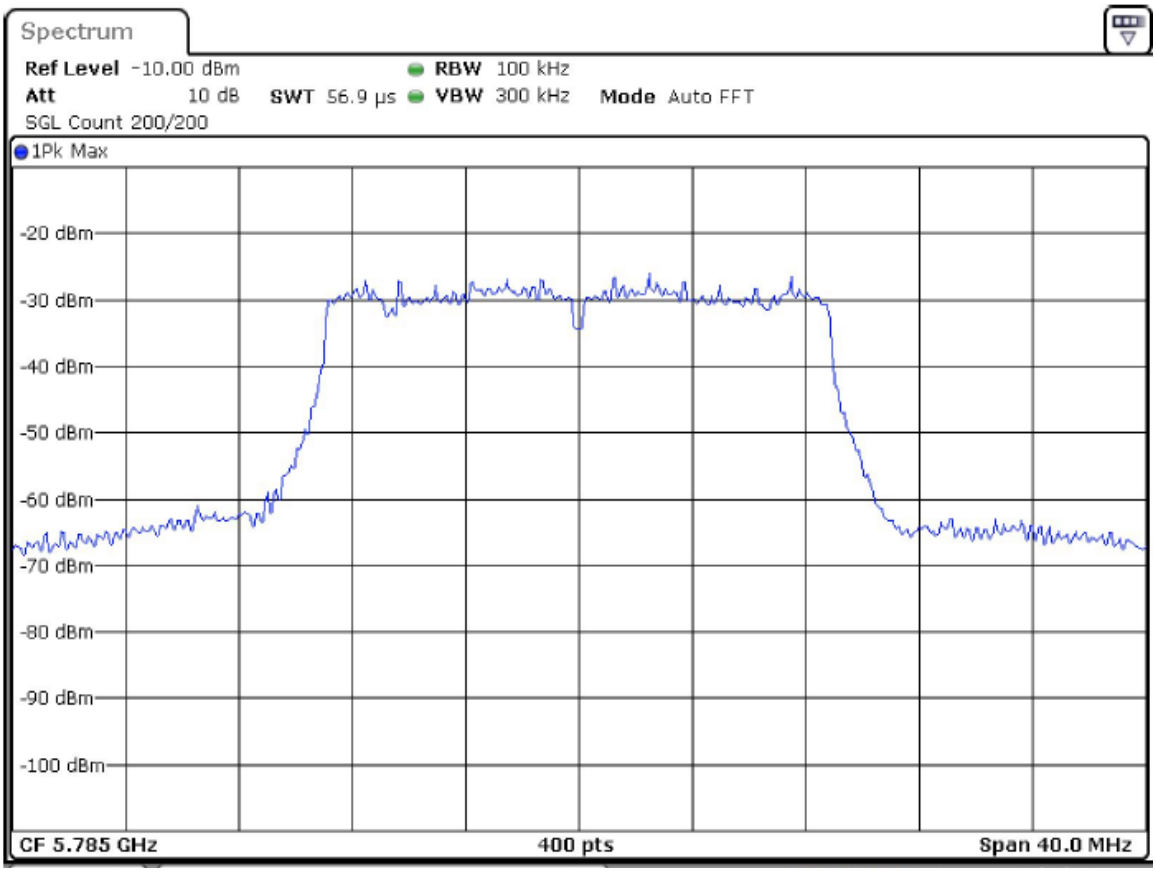
802.11a 24 Mbps 5745MHz



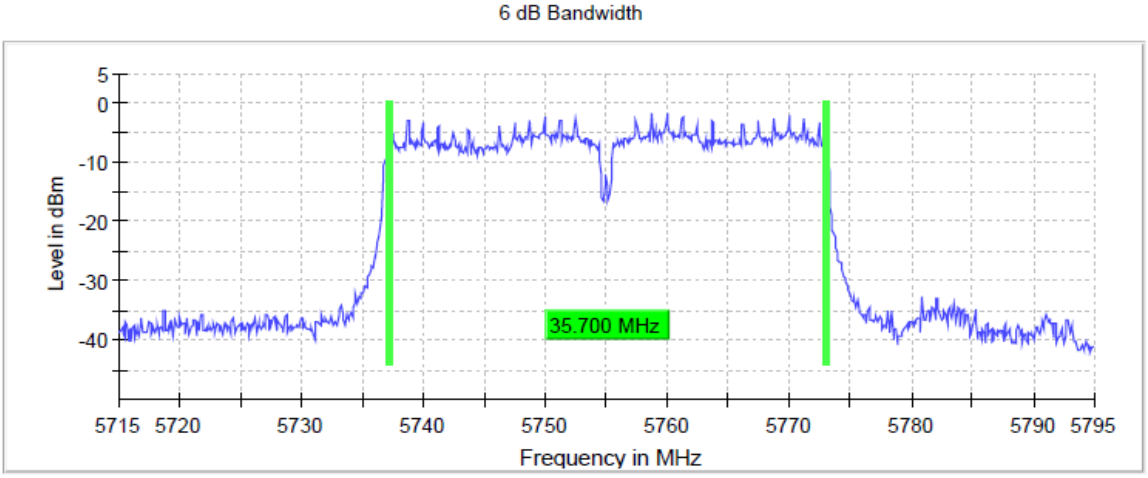


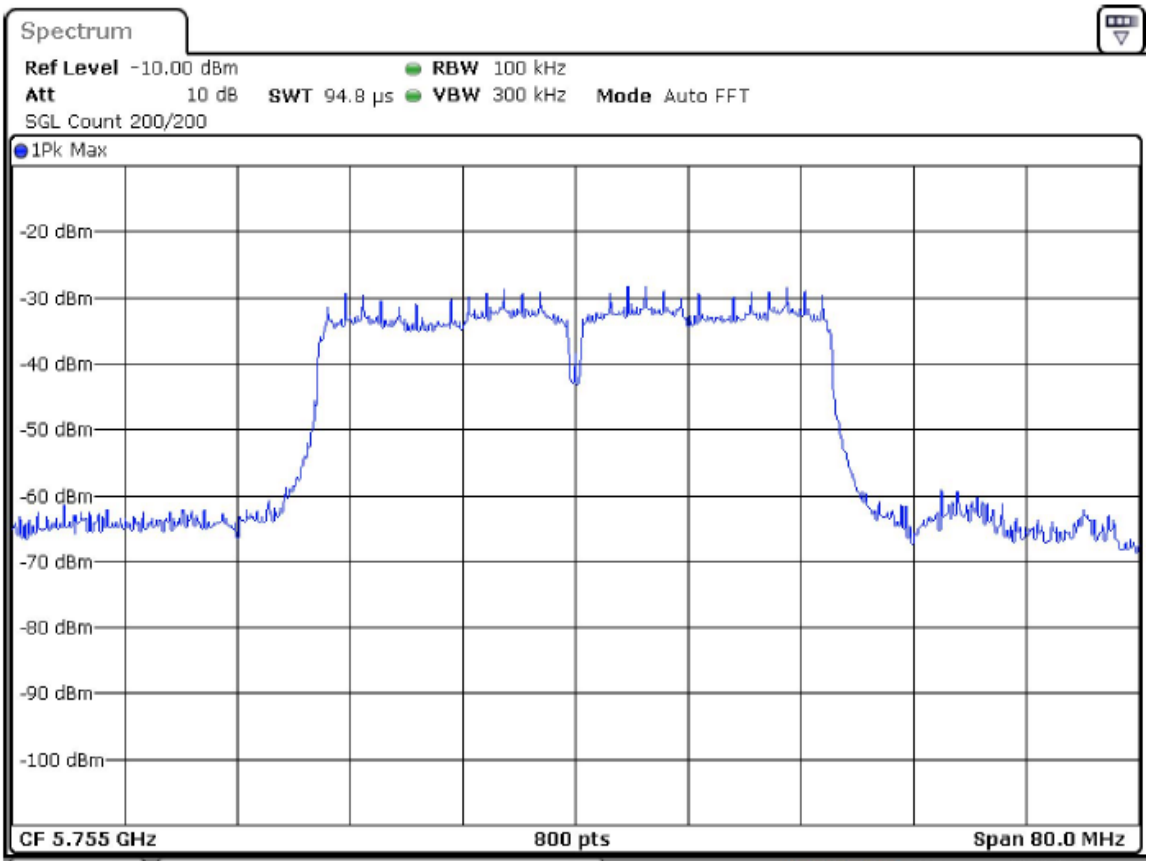
802.11n(HT20) MCS4 5785MHz





802.11n(HT40) MCS0 5755MHz





Occupied Channel Bandwidth 99%

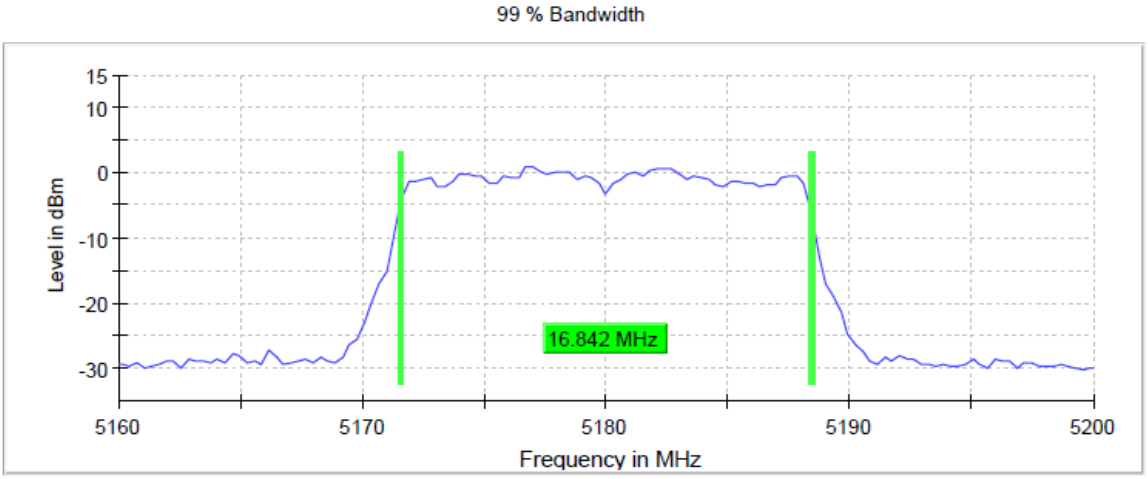
Tested according to FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 Section II.D.

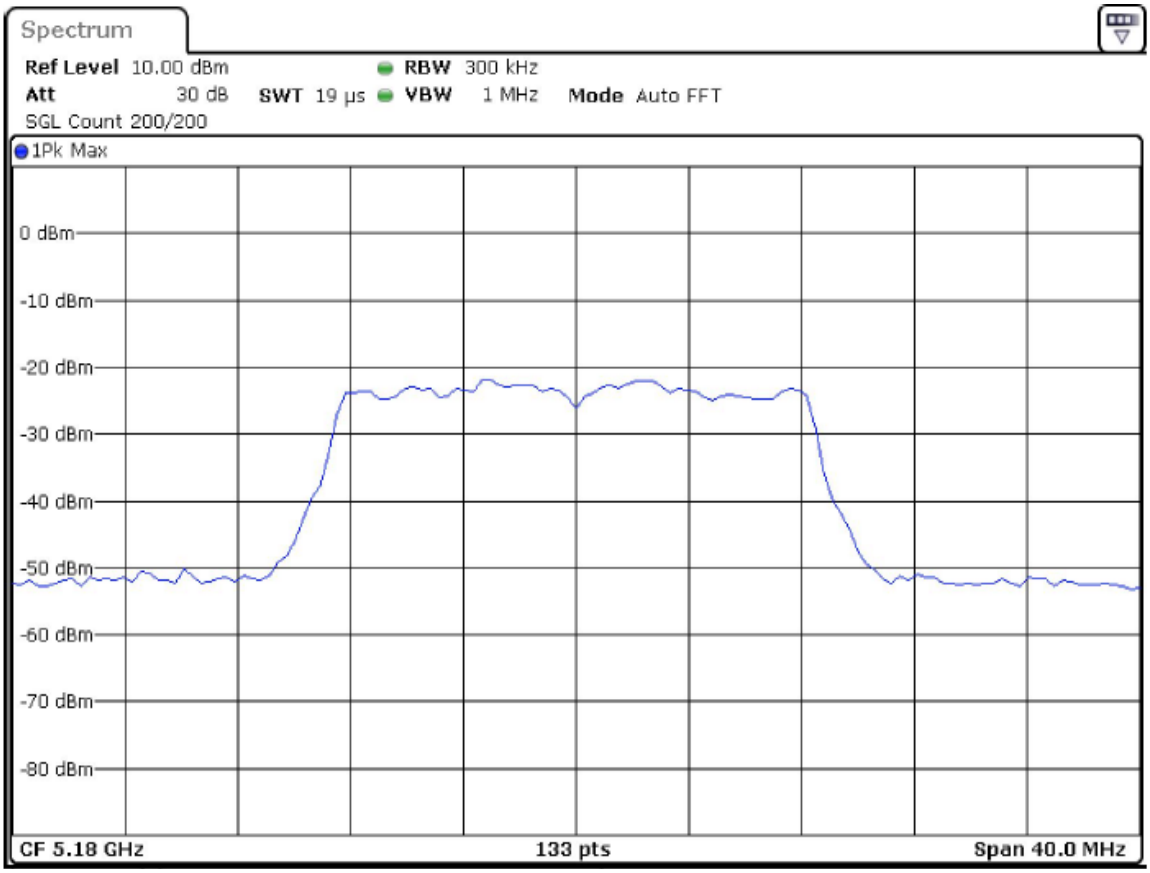
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

UNII-1

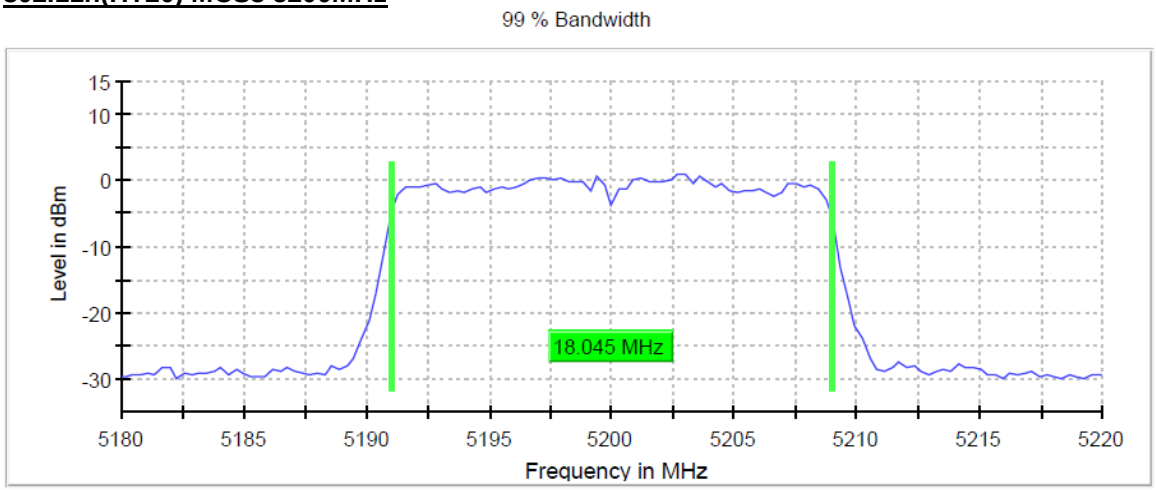
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Band Limits
802.11a 12 Mbps	5180.000	16.842106	5171.57894	5188.42105	5150-5250
802.11n(HT20) MSC3	5180.000	18.045112	5170.97744	5189.02255	5150-5250
802.11n(HT40) MSC6	5190.000	36.500000	5171.75000	5208.25000	5150-5250
802.11a 12 Mbps	5200.000	16.842106	5191.57894	5208.42105	5150-5250
802.11n(HT20) MSC3	5200.000	18.045112	5190.97744	5209.02255	5150-5250
802.11n(VHT40) MCS6	5230.000	36.500000	5211.75000	5248.25000	5150-5250
802.11a 12 Mbps	5240.000	16.842106	5231.57894	5248.42105	5150-5250
802.11n(HT20) MSC3	5240.000	18.045112	5230.97744	5249.02255	5150-5250

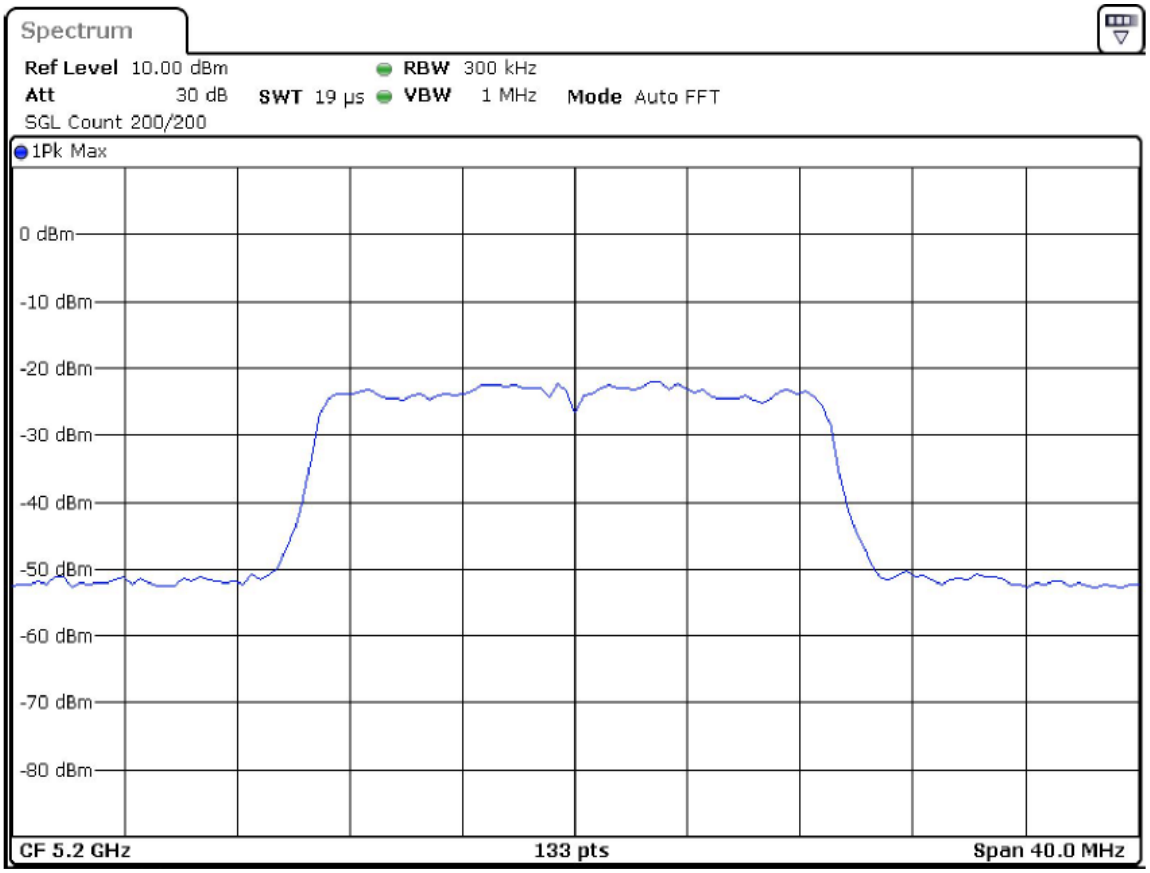
802.11a 12 Mbps 5180MHz



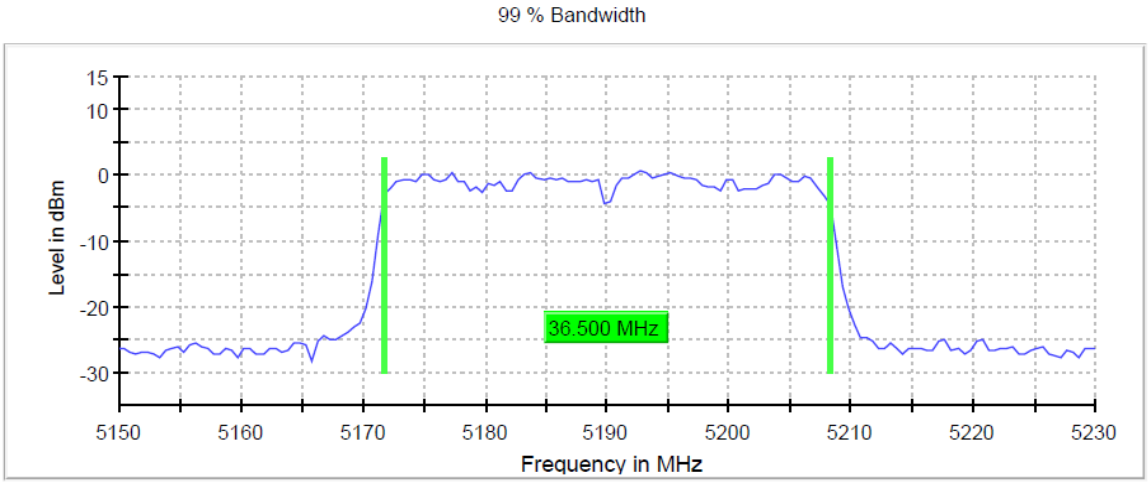


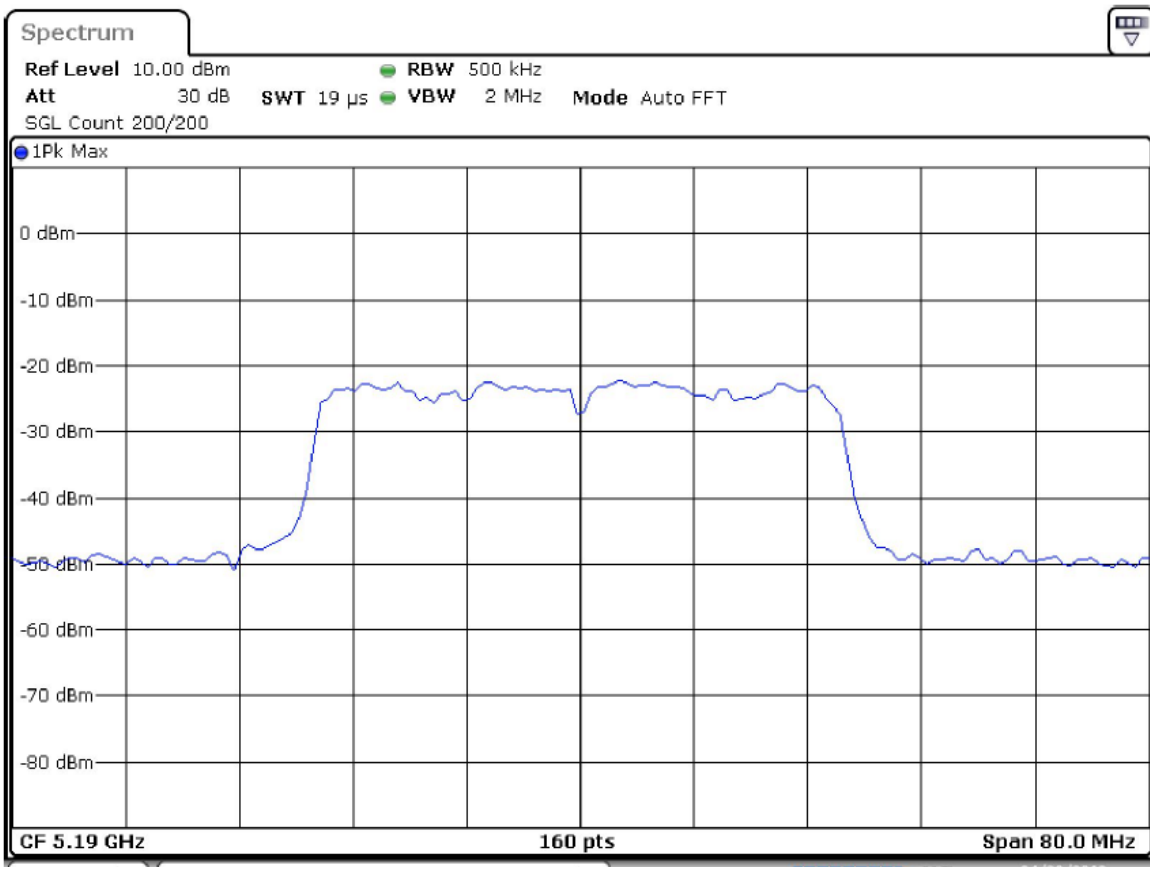
802.11n(HT20) MCS3 5200MHz





802.11n(HT40) MCS6 5190 MHz

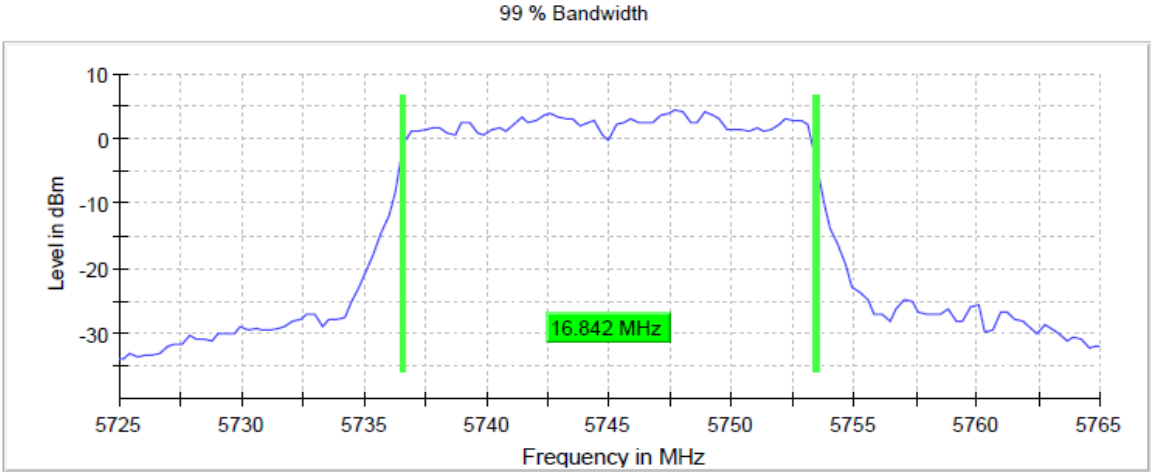


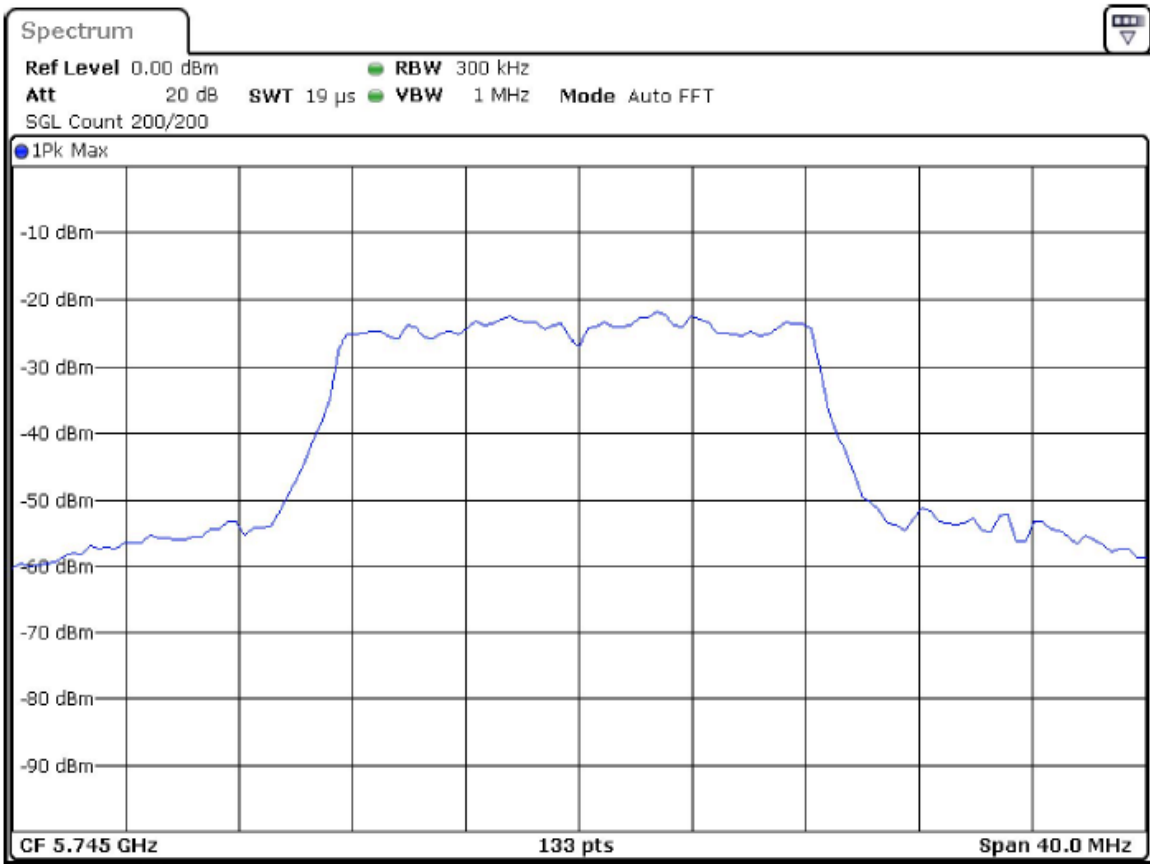


UNII-3

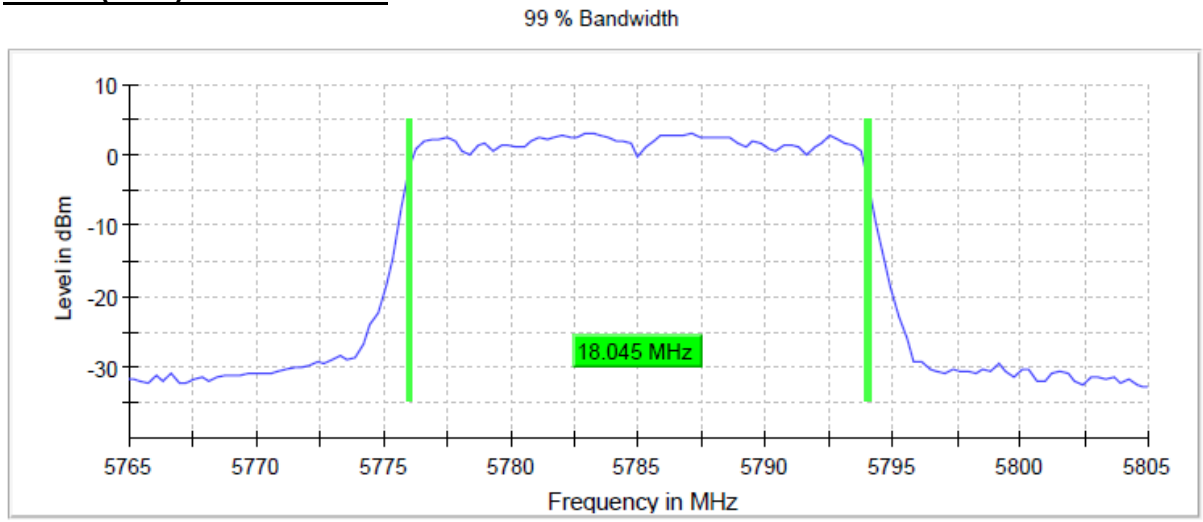
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Band Limits
802.11a 24 Mbps	5745.00	16.842106	5736.57894	5753.42105	5725-5850
802.11n(HT20) MSC4	5745.00	18.045112	5735.977444	5754.022556	5725-5850
802.11n(HT40) MSC0	5755.00	36.500000	5736.750000	5773.250000	5725-5850
802.11a 24 Mbps	5785.00	16.842106	5776.57894	5793.42105	5725-5850
802.11n(HT20) MSC4	5785.00	18.045112	5775.977444	5794.022556	5725-5850
802.11n(HT40) MSC0	5795.00	36.500000	5776.750000	5813.250000	5725-5850
802.11a 24 Mbps	5825.00	16.842106	5816.57894	5833.42105	5725-5850
802.11n(HT20) MSC4	5825.00	18.045112	5815.977444	5834.022556	5725-5850

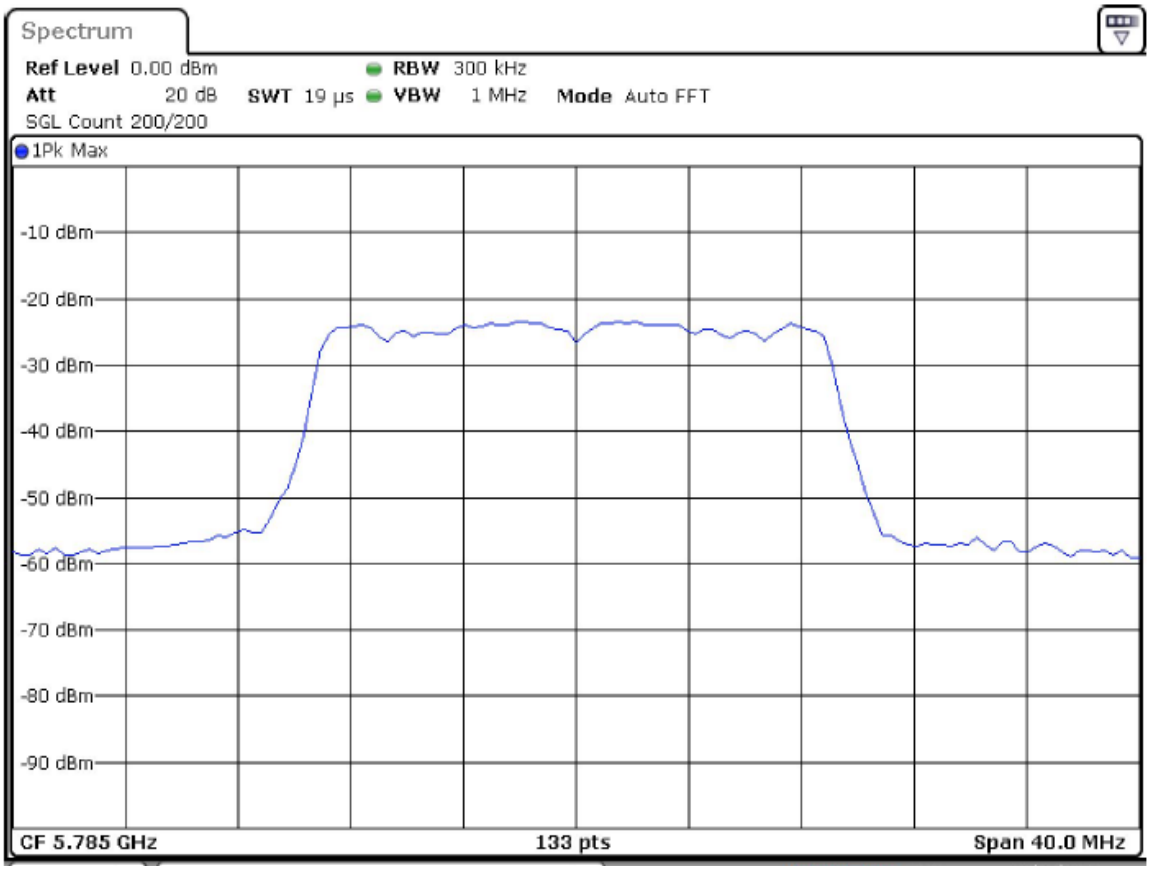
802.11a 24 Mbps 5745MHz





802.11n(HT20) MCS4 5785MHz





802.11n(HT40) MCS0 5755MHz