FCC 47 CFR PART 15 SUBPART E

UNII 802.11a/n/ac

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, ANT+, NFC and WPT

MODEL NUMBER : SM-G973F/DS, SM-G973F, SM-G973X

FCC ID: A3LSMG973F

REPORT NUMBER: 4788725460-E4V2

ISSUE DATE: DEC 26, 2018

Prepared for
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ACCREDITED
Testing Laboratory

TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	12/20/18	Initial issue	Junwhan Lee
V2	12/26/18	Updated to address TCB's question	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, ANT+, NFC and WPT
MODEL NUMBER:	SM-G973F/DS, SM-G973F, SM-G973X
SERIAL NUMBER:	R38KA0BCW9H, R38KA0BCW8E (CONDUCTED) R38KA0BE04H, R38KA0BE5CF, R38KA0BE3PA, R38K8065W1D (RADIATED);
DATE TESTED:	OCT 19, 2018 - DEC 26, 2018;

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 789033 D02 General UNII Test Procedures New Rules v02r01
4. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
5. KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02
6. KDB 662911 D01 v02r01
7. ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☒ Chamber 2
☒ Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at http://www.iasonline.org/PDF/TL/TL-637.pdf.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	3.86 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, ANT+, NFC and WPT. This test report addresses the NII (UNII 802.11a/n/ac) operational mode.

WiFi MIMO Condition

Frequency	Mode	Antenna 1	Antenna 2
2.4GHz	802.11g	TX / RX	TX / RX
	802.11g MIMO	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11n MIMO	TX / RX	TX / RX
	802.11ax	TX / RX	TX / RX
	802.11ax MIMO	TX / RX	TX / RX
5 GHz	802.11a	TX / RX	TX / RX
	802.11a MIMO	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11n MIMO	TX / RX	TX / RX
	802.11ac	TX / RX	TX / RX
	802.11ac MIMO	TX / RX	TX / RX
	802.11ax	TX / RX	TX / RX
	802.11ax MIMO	TX / RX	TX / RX

Simultaneous TX Condition (RSDB)

	# TX	5GHz WIFI [dBm]		2.4GHz WIFI [dBm]	
		Ant1	Ant2	Ant1	Ant2
2.4 GHz + 5 GHz RSDB Only	2	A	-	-	B
	2	-	A	B	-
	2	A	-	B	-
	2	-	A	-	B
2.4 GHz + 5 GHz RSDB & MIMO	3	A	A	B	-
	3	A	A	-	B
	3	A	-	B	B
	3	-	A	B	B
2.4 GHz + 5 GHz RSDB MIMO	4	A	A	B	B

Simultaneous TX Condition Bluetooth with 5GHz WIFI (Not RSDB)

	# TX	5GHz WIFI		2.4GHz BT
		ANT1	ANT2	ANT1
2.4GHz BT+5GHz WIFI (Not RSBD)	2	A	-	B
	2	-	A	B
	3	A	A	B

Spurious Emissions for Simultaneous Transmission were reported on the section 11.5.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Frequency Range [MHz]	Mode	Output Power [dBm]		Output Power [mW]	
		Antenna1	Antenna2	Antenna1	Antenna2
5180 - 5240	802.11a MIMO	17.24		52.97	
	802.11n HT20 MIMO	17.15		51.88	
5190 - 5230	802.11n HT40 MIMO	17.22		52.72	
5210	802.11ac VHT80 MIMO	16.12		40.93	
5260 - 5320	802.11a MIMO	17.46		55.72	
	802.11n HT20 MIMO	17.49		56.10	
5270 - 5310	802.11n HT40 MIMO	17.55		56.89	
5290	802.11ac VHT80 MIMO	16.20		41.69	
5500 - 5720	802.11a MIMO	18.45		69.98	
	802.11n HT20 MIMO	18.47		70.31	
5510 - 5710	802.11n HT40 MIMO	17.47		55.85	
5530 - 5690	802.11ac VHT80 MIMO	16.39		43.55	
5745 - 5825	802.11a MIMO	19.43		87.70	
	802.11n HT20 MIMO	19.42		87.50	
5755 - 5795	802.11n HT40 MIMO	17.17		52.12	
5775	802.11ac VHT80 MIMO	16.39		43.55	

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna, with a maximum gain of:

Frequency Range [MHz]	Antenna Gain [dBi]	
	Antenna 1	Antenna 2
UNII 1 5150 – 5250	-8.4	-7.3
UNII 2A 5250 – 5350	-7.4	-7.2
UNII 2C 5470 – 5725	-7.1	-6.5
UNII 3 5725 – 5850	-7.1	-6.8

5.4. List of test reduction and modes covering other modes:

The output power on covered modes is equal to or less than one referenced.

UNII 1

5150 - 5250 MHz Authorized Frequency Band		
Frequency Range [MHz]	**Mode**	**Covered by**
5180 - 5240	802.11a legacy 1TX	802.11a 2TX CDD
5180 - 5240	802.11HT20 1TX	802.11n HT20 2TX CDD
5180 - 5240	802.11HT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5180 - 5240	802.11ac VHT20 1TX	802.11n HT20 2TX CDD
5180 - 5240	802.11ac VHT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5190 - 5230	802.11n HT40 1TX	802.11n HT40 2TX CDD
5190 - 5230	802.11n HT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5190 - 5230	802.11ac VHT40 1TX	802.11n HT40 2TX CDD
5190 - 5230	802.11ac VHT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5210	802.11ac VHT80 1TX	802.11ac VHT80 2TX CDD
5210	802.11ac VHT80 2TX SDM/STBC	802.11ac VHT80 2TX CDD

UNII 2A

5250 - 5350 MHz Authorized Frequency Band		
Frequency Range [MHz]	**Mode**	**Covered by**
5260 - 5320	802.11a legacy 1TX	802.11a 2TX CDD
5260 - 5320	802.11HT20 1TX	802.11n HT20 2TX CDD
5260 - 5320	802.11HT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5260 - 5320	802.11ac VHT20 1TX	802.11n HT20 2TX CDD
5260 - 5320	802.11ac VHT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5270 - 5310	802.11n HT40 1TX	802.11n HT40 2TX CDD
5270 - 5310	802.11n HT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5270 - 5310	802.11ac VHT40 1TX	802.11n HT40 2TX CDD
5270 - 5310	802.11ac VHT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5290	802.11ac VHT80 1TX	802.11ac VHT80 2TX CDD
5290	802.11ac VHT80 2TX SDM/STBC	802.11ac VHT80 2TX CDD

UNII 2C

5470 - 5725 MHz Authorized Frequency Band		
Frequency Range [MHz]	**Mode**	**Covered by**
5500 - 5720	802.11a legacy 1TX	802.11a 2TX CDD
5500 - 5720	802.11HT20 1TX	802.11n HT20 2TX CDD
5500 - 5720	802.11HT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5500 - 5720	802.11ac VHT20 1TX	802.11n HT20 2TX CDD
5500 - 5720	802.11ac VHT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5510 - 5710	802.11n HT40 1TX	802.11n HT40 2TX CDD
5510 - 5710	802.11n HT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5510 - 5710	802.11ac VHT40 1TX	802.11n HT40 2TX CDD
5510 - 5710	802.11ac VHT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5530 - 5690	802.11ac VHT80 1TX	802.11ac VHT80 2TX CDD
5530 - 5690	802.11ac VHT80 2TX SDM/STBC	802.11ac VHT80 2TX CDD

UNII 3

5725 - 5850 MHz Authorized Frequency Band		
Frequency Range [MHz]	**Mode**	**Covered by**
5745 - 5825	802.11a legacy 1TX	802.11a 2TX CDD
5745 - 5825	802.11HT20 1TX	802.11n HT20 2TX CDD
5745 - 5825	802.11HT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5745 - 5825	802.11ac VHT20 1TX	802.11n HT20 2TX CDD
5745 - 5825	802.11ac VHT20 2TX SDM/STBC	802.11n HT20 2TX CDD
5755 - 5795	802.11n HT40 1TX	802.11n HT40 2TX CDD
5755 - 5795	802.11n HT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5755 - 5795	802.11ac VHT40 1TX	802.11n HT40 2TX CDD
5755 - 5795	802.11ac VHT40 2TX SDM/STBC	802.11n HT40 2TX CDD
5775	802.11ac VHT80 1TX	802.11ac VHT80 2TX CDD
5775	802.11ac VHT80 2TX SDM/STBC	802.11ac VHT80 2TX CDD

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

Based on the baseline scan, the worst-case data rates were:

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0
802.11ac VHT80mode: MCS0

NOTE : Some radiated test results performed on the 1Tx antenna condition is worst, so test report described all radiated test results.(Antenna 1-1Tx, Antenna 2-1Tx, Antenna ALL 2Tx CDD)

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA200	R37KB5B03T1SE3	N/A
Data Cable	SAMSUNG	EP-DG970BBE	N/A	N/A
Earphone	SAMSUNG	EO-IG955	N/A	N/A

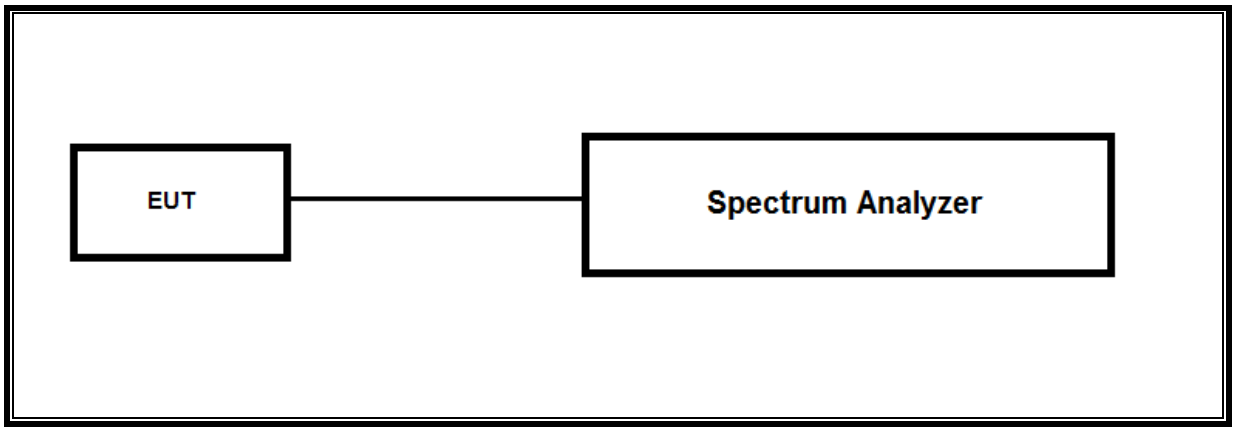
I/O CABLE

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.1m	N/A
2	Audio	2	Mini-Jack	Unshielded	1.2m	N/A

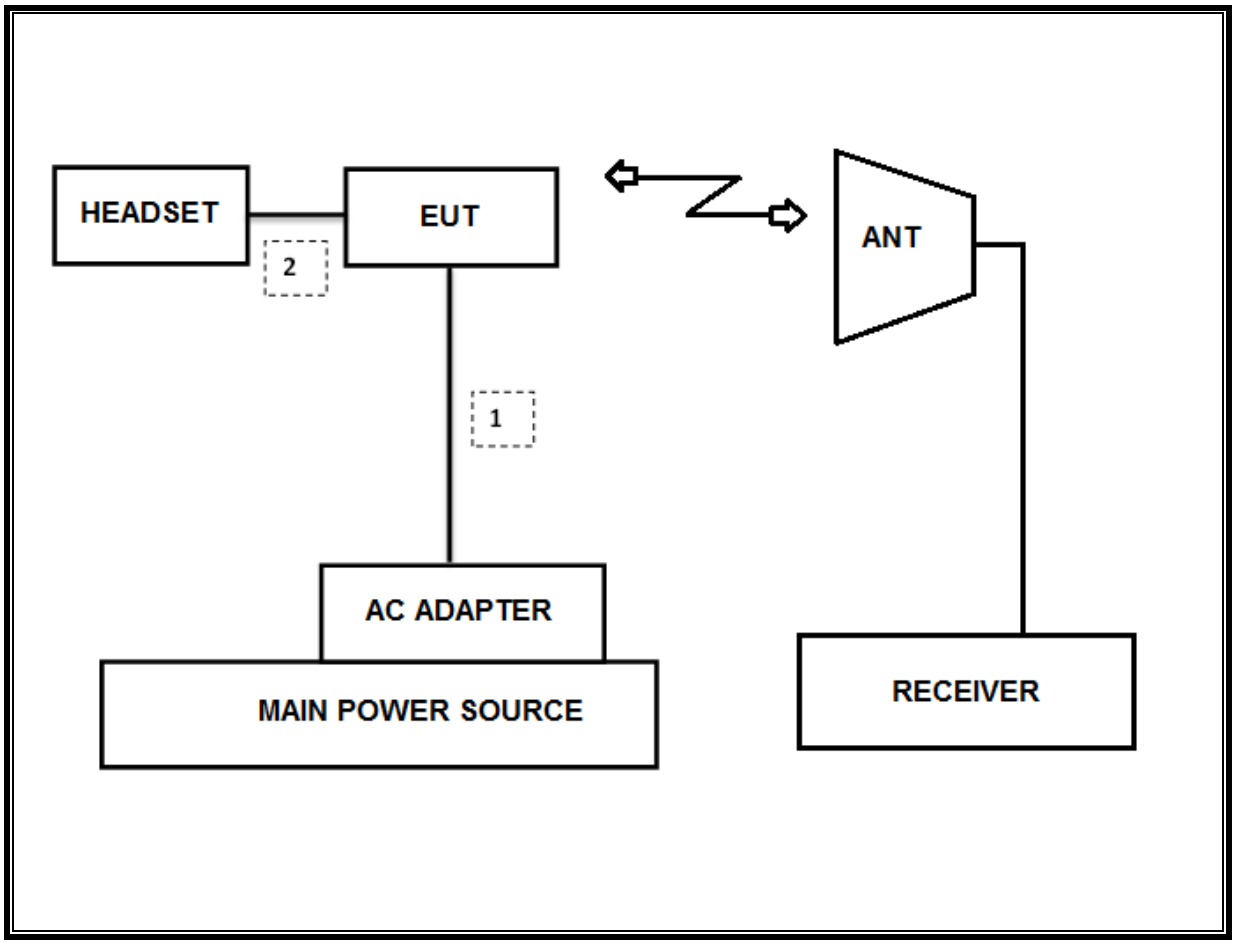
TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software exercised the EUT to enable NII mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**New Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00167211	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168724	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00205959	08-04-20
Antenna, Horn, 40 GHz	ETS	3116C	00166155	12-04-19
Antenna, Horn, 40 GHz	ETS	3116C	00168645	12-04-19
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	08-09-19
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-07-19
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-07-19
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-06-19
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-07-19
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-07-19
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-07-19
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-07-19
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-06-19
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	08-06-19
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-07-19
Attenuator	PASTERNACK	PE7087-10	A001	08-08-19
Attenuator	PASTERNACK	PE7087-10	A008	08-08-19
Attenuator	PASTERNACK	PE7004-10	2	08-07-19
Attenuator	PASTERNACK	PE7087-10	A009	08-08-19
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-06-19
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-06-19
EMI Test Receive, 44 GHz	R&S	ESW44	101590	08-06-19
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-06-19
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-07-19
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-07-19
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-06-19
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-07-19
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-07-19
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-06-19
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-07-19
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-07-19
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-06-19
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-26-19
LISN	R&S	ENV-216	101837	08-09-19

UL Software			
Description	**Manufacturer**	**Model**	**Version**
Radiated software	UL	UL EMC	Ver 9.5
AC Line Conducted software	UL	UL EMC	Ver 9.5

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.407(e)	6dB Band width (5.8Ghz)	500KHz	Condcuted	PASS
15.407 (a)(2)	TX Cond. Power 5.15-2.25, 5.25-5.35 & 5.47-5.725	<24dBm or 11+10Log(OBW)		PASS
15.407 (a)(3)	TX Cond. Power 5.725-5.825	< 30dBm or 17+10Log(OBW)		PASS
15.407 (a)(5)	PSD (5.2,5.3,5.5GHz)	<11dBm		PASS
15.407 (a)(5)	PSD (5.8GHz)	30dBm per 500kHz		PASS
15.207 (a)	AC Power Line conducted emissions	Section 10	Radiated	PASS
15.407 (b) & 15.209	Radiated Spurious Emission	< 54dBuV/m		PASS
15.407 (h)(2)	Dynamic Frequency Selection	N/A	Condcuted	PASS

8. MEASUREMENT METHODS

On-Time and Duty Cycle : KDB 789033 D02 v02r01, Section B.

6dB Emission BW : KDB 789033 D02 v02r01, Section C.2.

26dB Emission BW : KDB 789033 D02 v02r01, Section C.1.

99% Occupied BW : KDB 789033 D02 v02r01, Section D.

Conducted Output Power : KDB 789033 D02 v02r01, Section E.3.a(Method PM)

Conducted Output Power for Straddle Channel (ch144/142/138 for 20/40/80MHz BW):

KDB 789033 D02 v02r01, Section E.2.d(Method SA-2)

Power Spectral Density : KDB 789033 D02 v02r01, Section F.

Unwanted emissions in restricted bands : KDB 789033 D02 v02r01, Section G.

Unwanted emissions in non-restricted bands : KDB 789033 D02 v02r01, Section G.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2.

9. REFERENCE MEASUREMENTS RESULTS

9.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B [msec)	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
802.11a	5.483	5.583	0.982	98.2%	0.00	0.010
802.11n HT20	5.08	5.179	0.981	98.1%	0.00	0.010
802.11n HT40	5.479	5.579	0.982	98.2%	0.00	0.010
802.11ac VHT80	5.226	5.328	0.981	98.1%	0.00	0.010

LIMITS

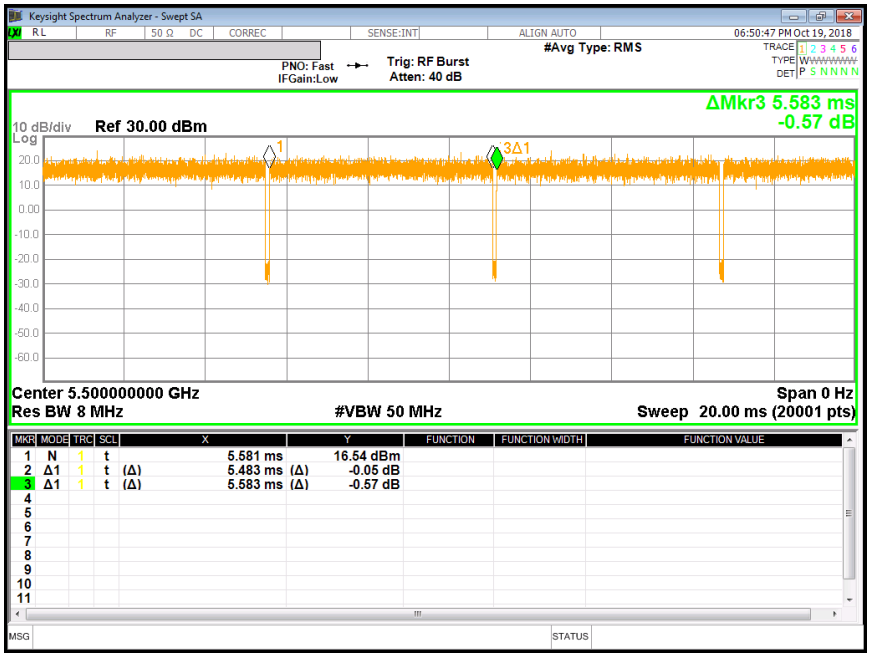
None; for reporting purposes only.

PROCEDURE

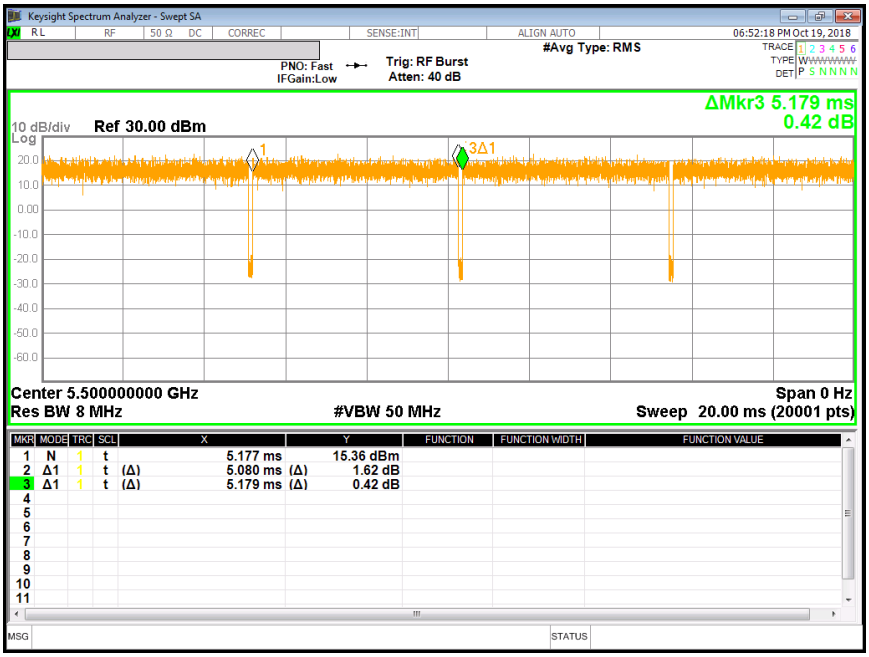
KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

9.2. DUTY CYCLE PLOTS

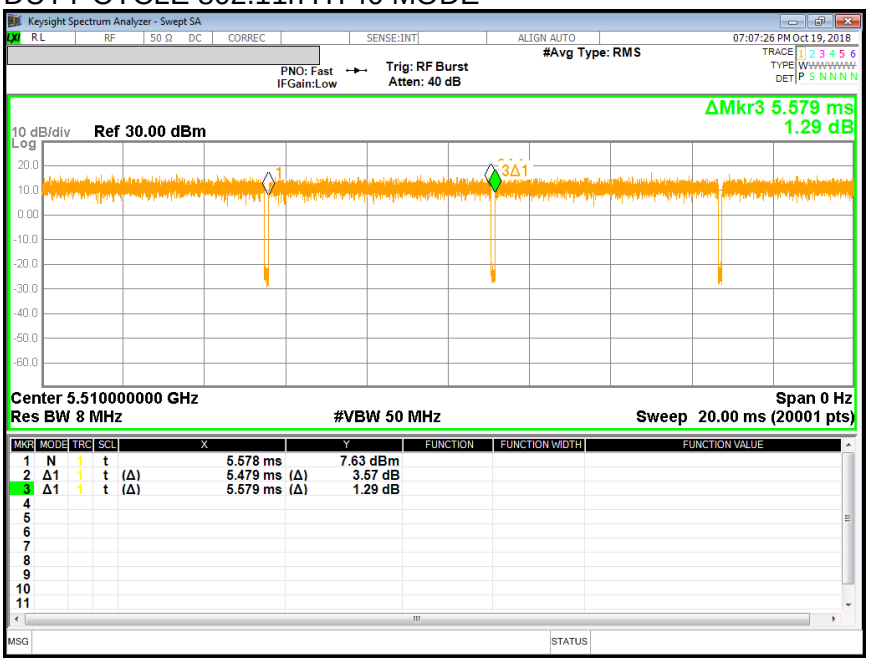
DUTY CYCLE 802.11a MODE



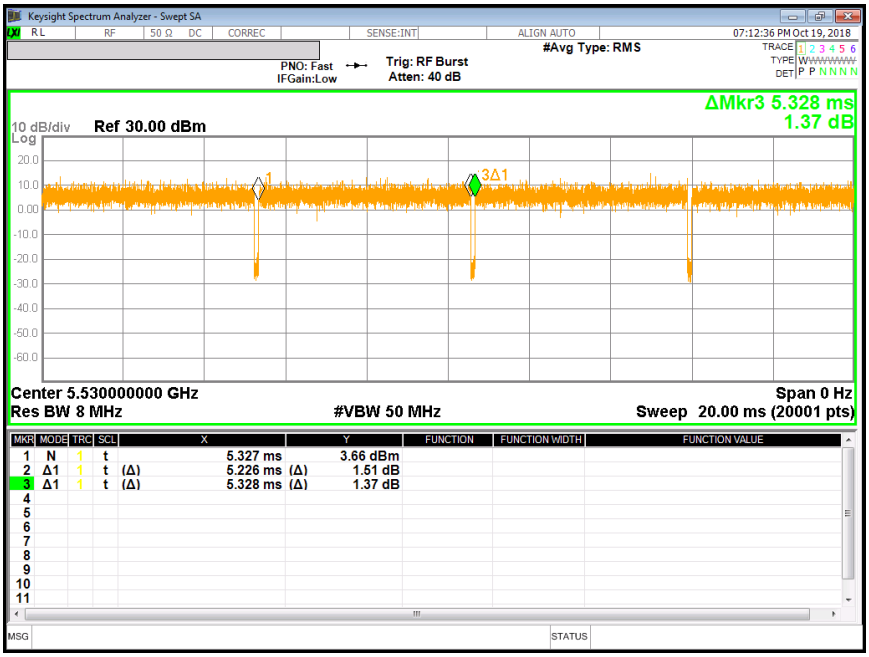
DUTY CYCLE 802.11n HT20 MODE



DUTY CYCLE 802.11n HT40 MODE



DUTY CYCLE 802.11ac VHT80 MODE



9.3. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.

NOTE

- Calculation for 26dB Bandwidth of UNII-2C and UNII-3 Straddle Channel

ex) Fundamental frequency : 5720MHz
  - 26dB BW : 20.58MHz
  - Turning Frequency : 5725MHz
  - 26dB Bandwidth of UNII-2C band Portion
    = (5725 – (5720 - (20.58 / 2)) = 15.29 MHz
  - 26dB Bandwidth of UNII-3 band Portion
    = (5720 + (20.58 / 2) -5725) = 5.29 MHz

- 26 dB Bandwidth test were performed each antenna port on SISO mode.

RESULTS

9.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5180	21.07	21.31
Mid	5200	21.16	21.28
High	5240	21.09	21.33
Worst		21.33	

9.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5180	21.39	21.44
Mid	5200	21.46	21.47
High	5240	21.24	21.28
Worst		21.47	

9.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5190	40.05	39.78
High	5230	40.23	41.16
Worst		41.16	

9.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Middle	5210	81.50	81.84
Worst		81.84	

9.3.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5260	21.33	21.21
Mid	5300	21.12	21.24
High	5320	21.36	20.91
Worst		21.36	

9.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5260	21.24	21.46
Mid	5300	21.29	21.49
High	5320	21.49	21.32
Worst		21.49	

9.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5270	39.55	39.83
High	5310	41.44	41.27
Worst		41.44	

9.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Middle	5290	82.19	82.03
Worst		82.19	

9.3.9. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5500	21.24	21.20
Mid	5580	21.01	21.37
High	5700	21.04	21.17
Straddle	5720	15.66	15.55
Worst		21.37	

9.3.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5500	21.43	21.35
Mid	5580	21.44	21.38
High	5700	21.34	21.25
Straddle	5720	15.66	15.65
Worst		21.44	

9.3.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5510	39.34	40.20
Mid	5590	40.71	39.70
High	5670	39.81	40.06
Straddle	5710	34.86	34.83
Worst		40.71	

9.3.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Low	5530	83.41	81.90
High	5610	81.57	81.65
Staddle	5690	75.95	75.64
Worst		83.41	

9.3.13. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Straddle	5720	5.66	5.55
Low	5745	21.25	21.12
Mid	5785	21.14	21.23
High	5825	21.25	21.02
Worst		21.25	

9.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Straddle	5720	5.66	5.65
Low	5745	21.23	21.40
Mid	5785	21.17	21.53
High	5825	21.45	21.38
Worst		21.53	

9.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Straddle	5710	4.86	4.83
Low	5755	39.71	40.09
High	5795	39.58	39.74
Worst		40.09	

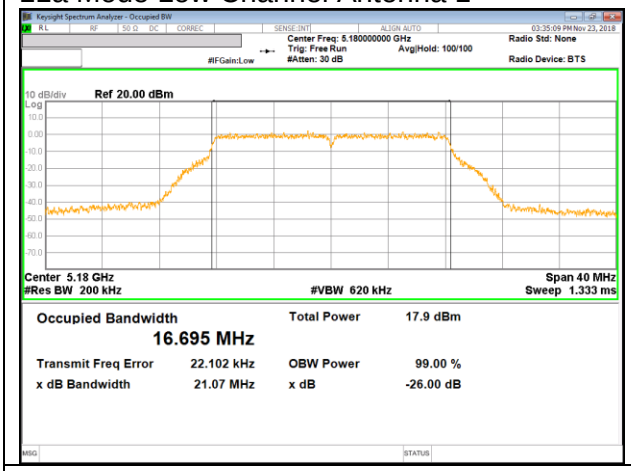
9.3.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency [MHz]	26 dB Bandwidth [MHz]	
		Antenna 1	Antenna 2
Straddle	5690	5.95	5.64
Middle	5775	82.42	81.77
Worst		82.42	

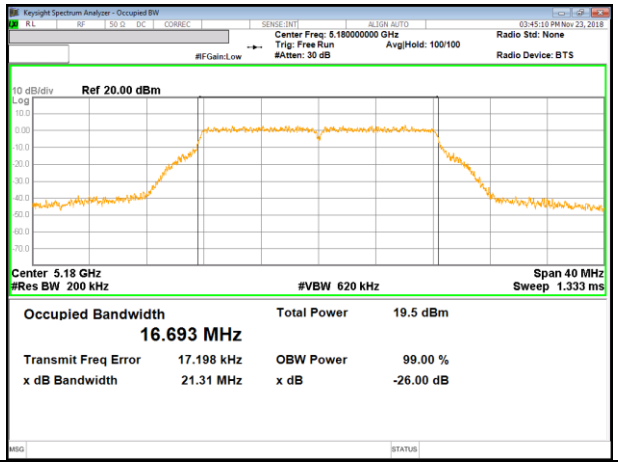
9.3.17. 26 dB BANDWIDTH PLOTS

UNII 5.2 GHz IEEE 802.11a mode

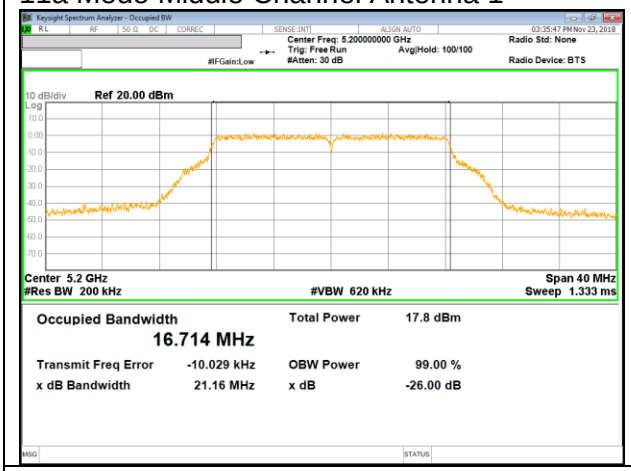
11a Mode Low Channel Antenna 1



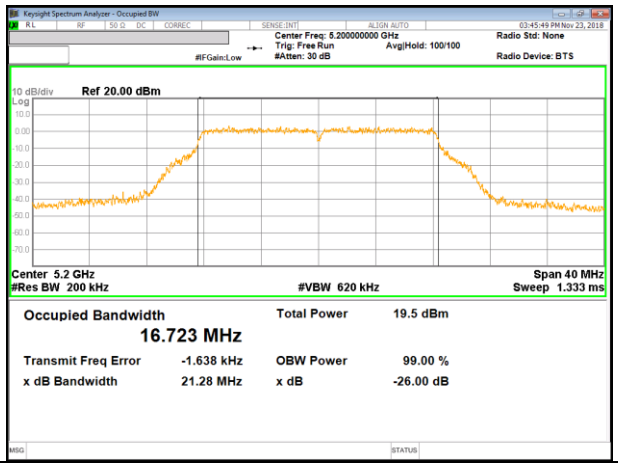
11a Mode Low Channel Antenna 2



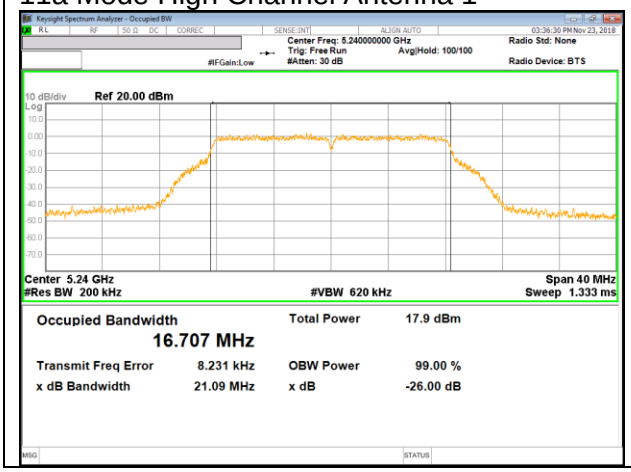
11a Mode Middle Channel Antenna 1



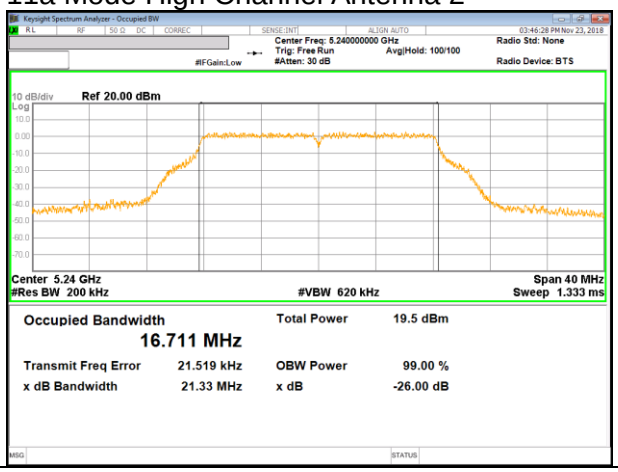
11a Mode Middle Channel Antenna 2



11a Mode High Channel Antenna 1

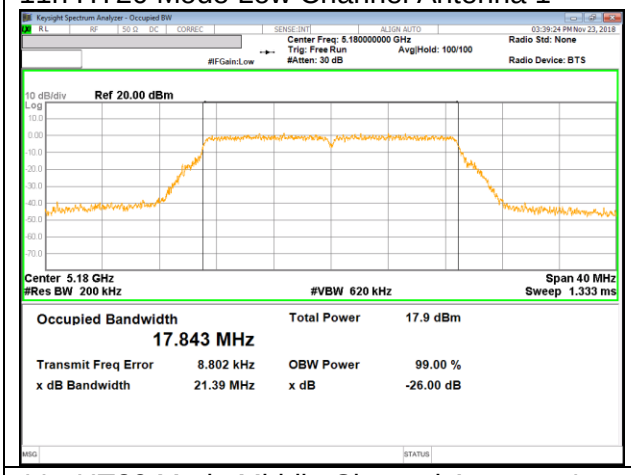


11a Mode High Channel Antenna 2

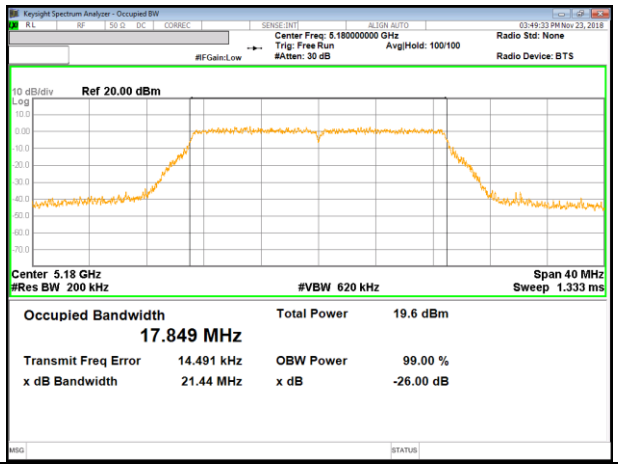


UNII 5.2 GHz IEEE 802.11n HT20 mode

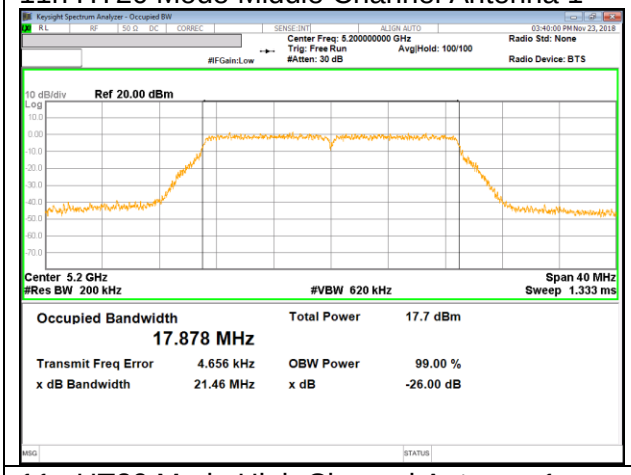
11n HT20 Mode Low Channel Antenna 1



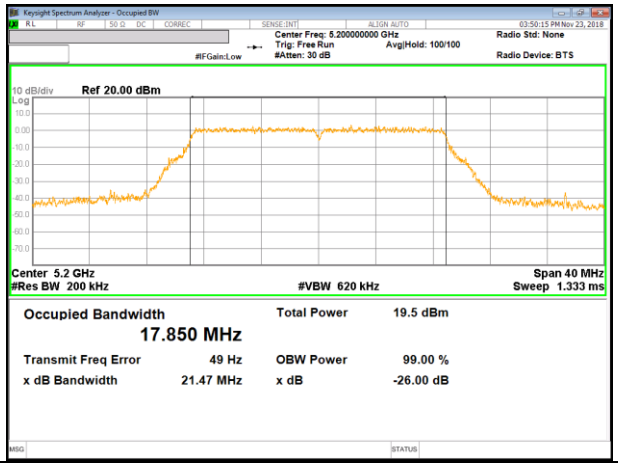
11n HT20 Mode Low Channel Antenna 2



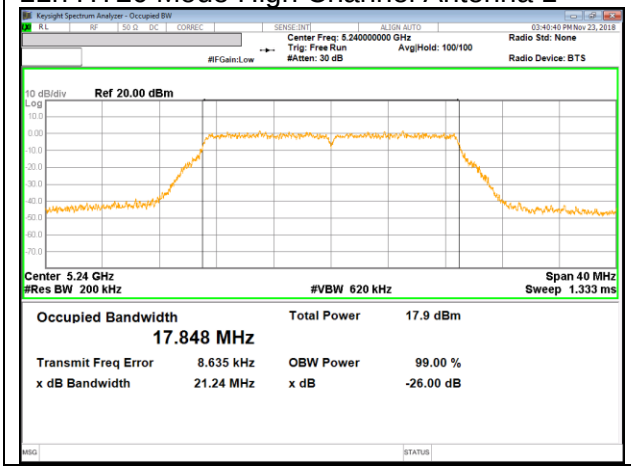
11n HT20 Mode Middle Channel Antenna 1



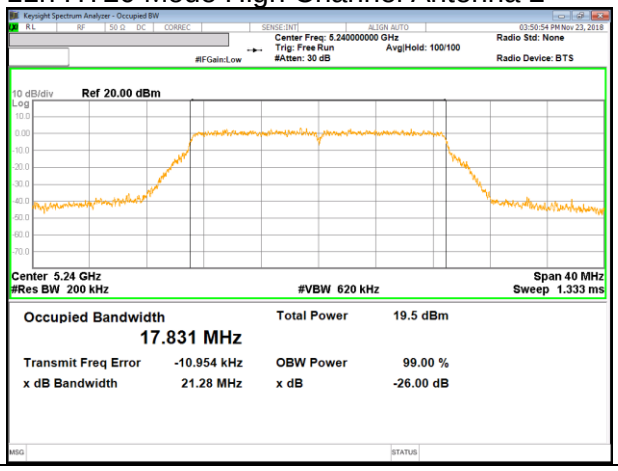
11n HT20 Mode Middle Channel Antenna 2



11n HT20 Mode High Channel Antenna 1

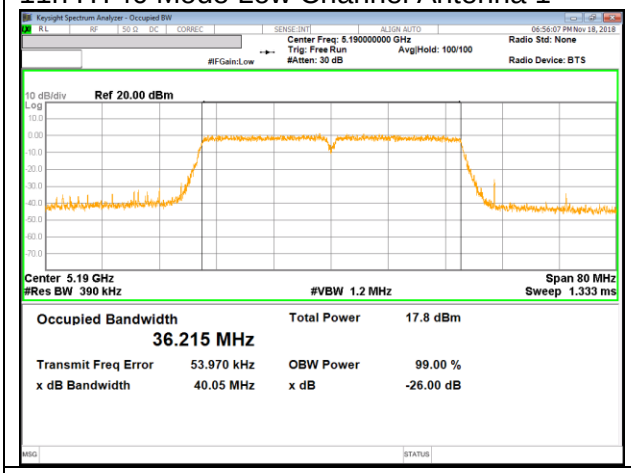


11n HT20 Mode High Channel Antenna 2

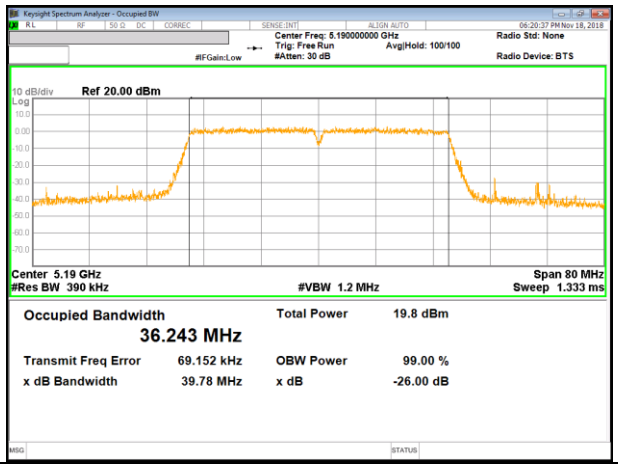


UNII 5.2 GHz IEEE 802.11n HT40 mode

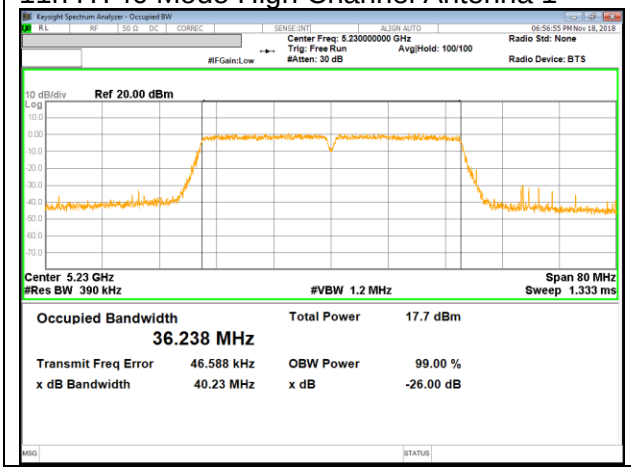
11n HT40 Mode Low Channel Antenna 1



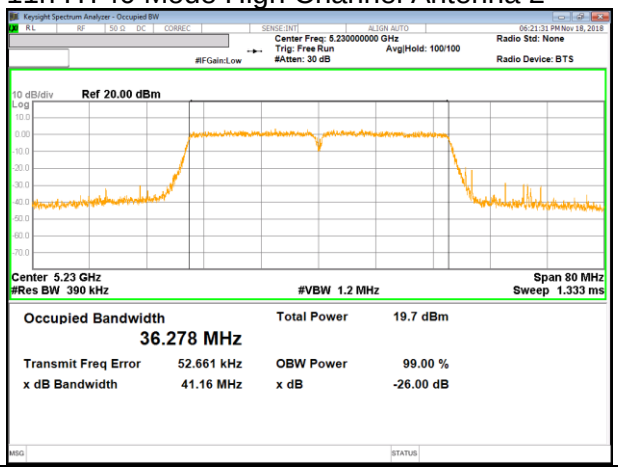
11n HT40 Mode Low Channel Antenna 2



11n HT40 Mode High Channel Antenna 1

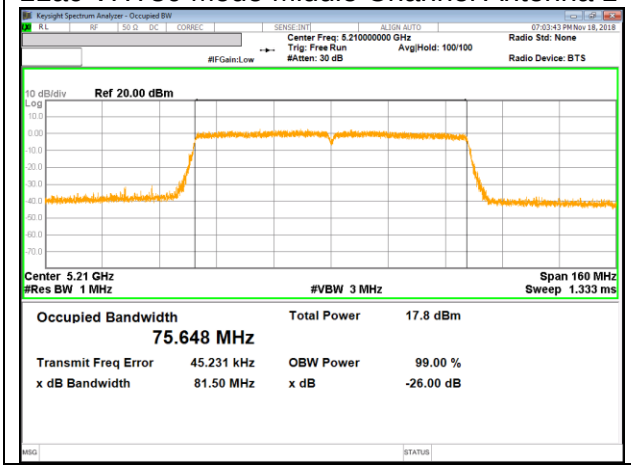


11n HT40 Mode High Channel Antenna 2

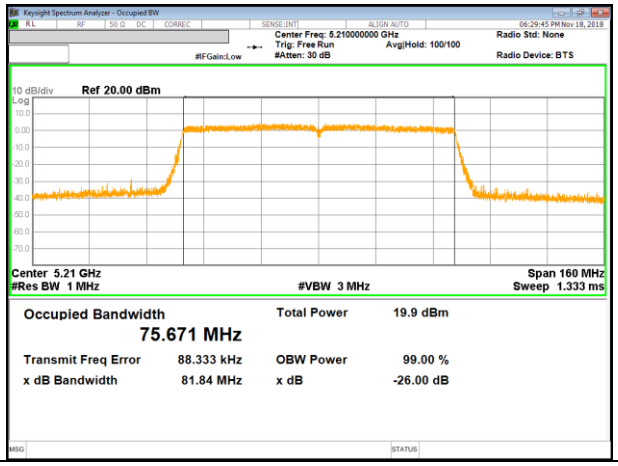


UNII 5.2 GHz IEEE 802.11ac VHT80 mode

11ac VHT80 Mode Middle Channel Antenna 1

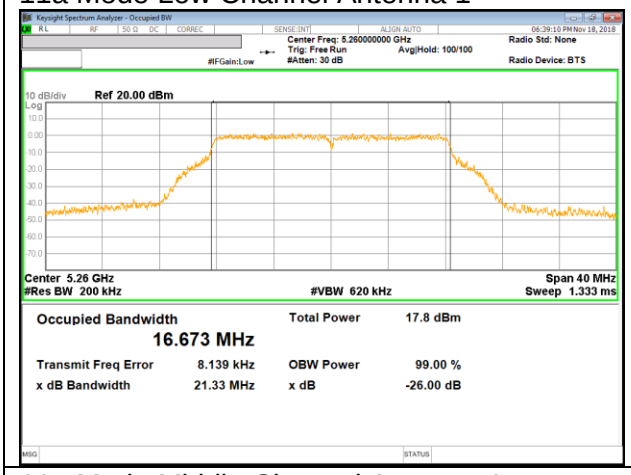


11ac VHT80 Mode Middle Channel Antenna 2

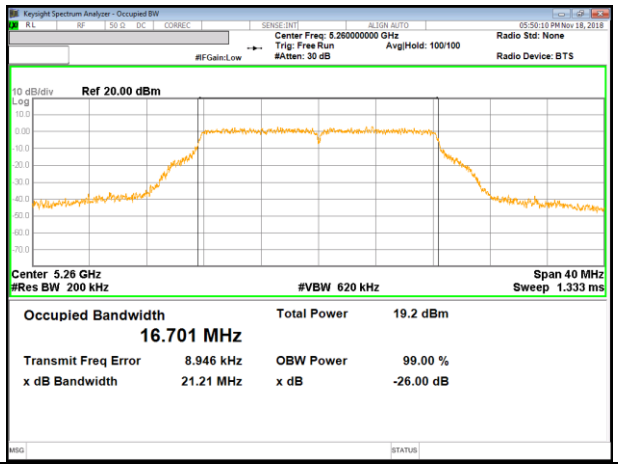


UNII 5.3 GHz IEEE 802.11a mode

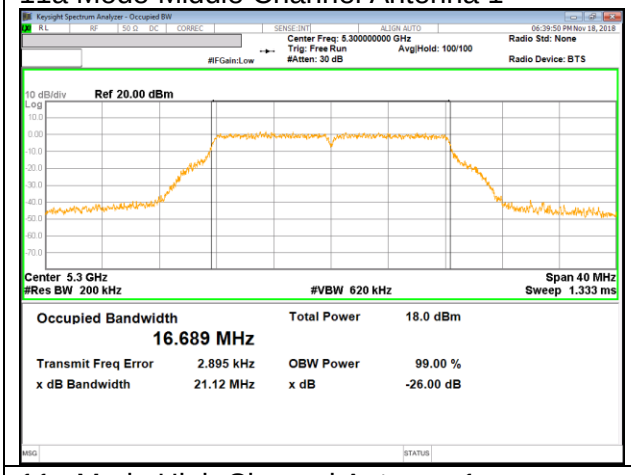
11a Mode Low Channel Antenna 1



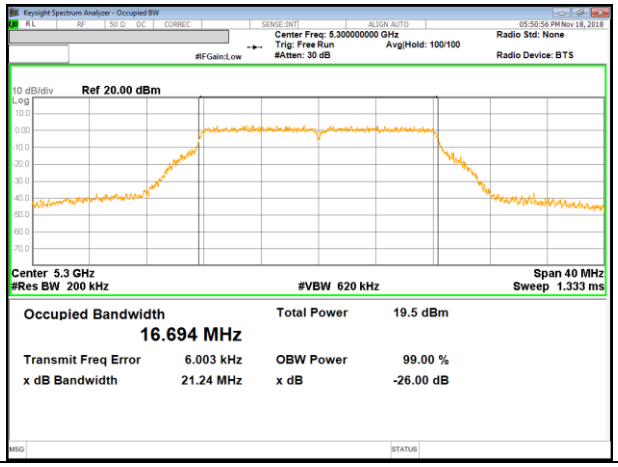
11a Mode Low Channel Antenna 2



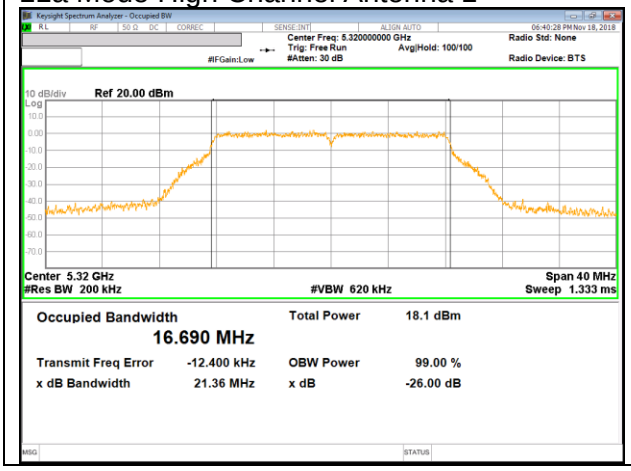
11a Mode Middle Channel Antenna 1



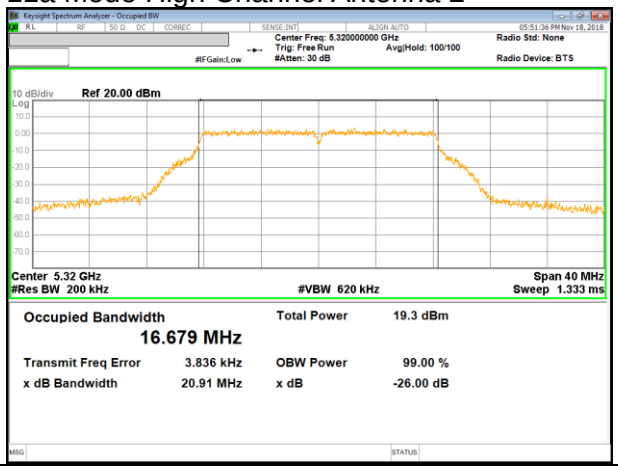
11a Mode Middle Channel Antenna 2



11a Mode High Channel Antenna 1

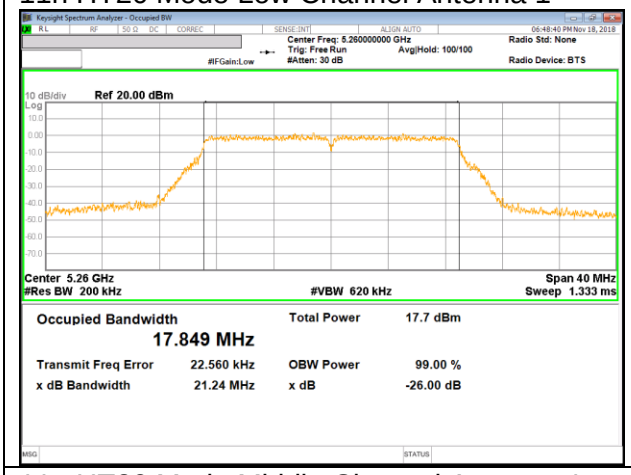


11a Mode High Channel Antenna 2

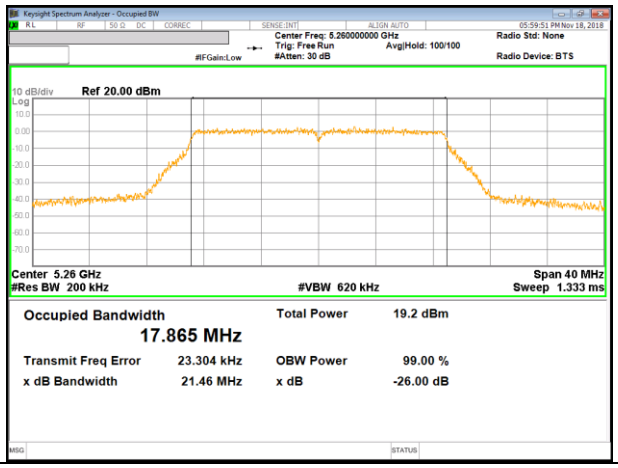


UNII 5.3 GHz IEEE 802.11n HT20 mode

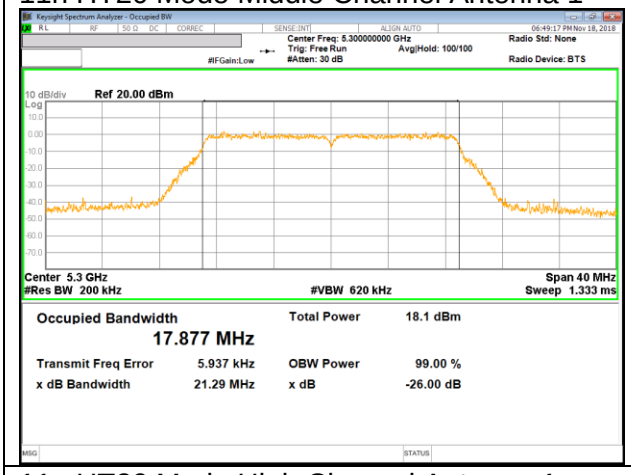
11n HT20 Mode Low Channel Antenna 1



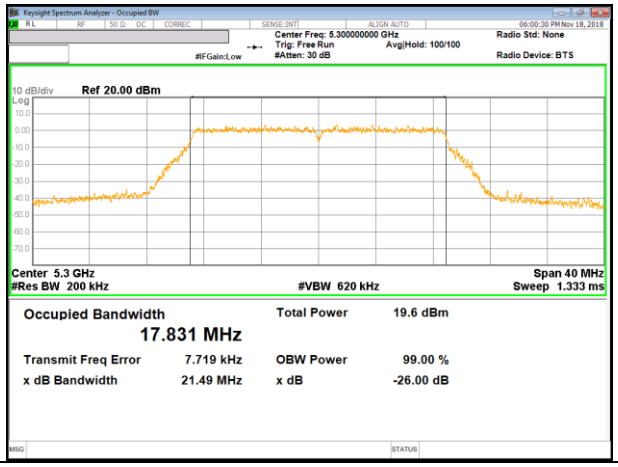
11n HT20 Mode Low Channel Antenna 2



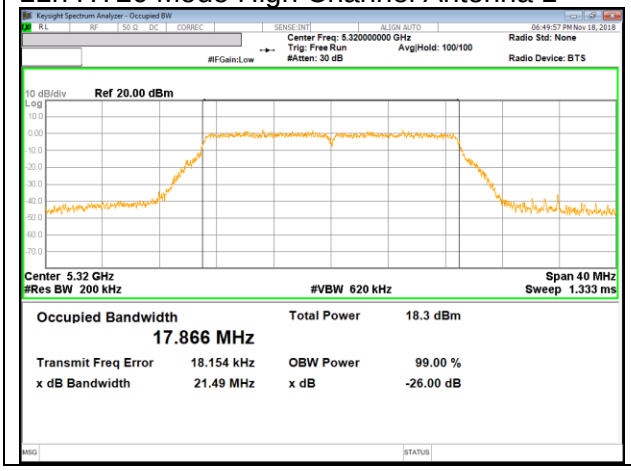
11n HT20 Mode Middle Channel Antenna 1



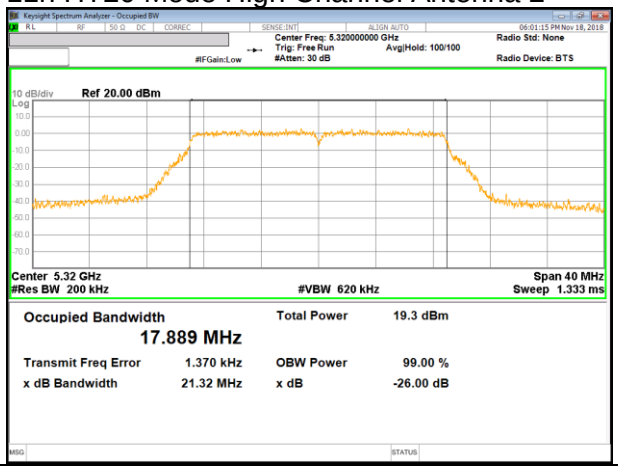
11n HT20 Mode Middle Channel Antenna 2



11n HT20 Mode High Channel Antenna 1

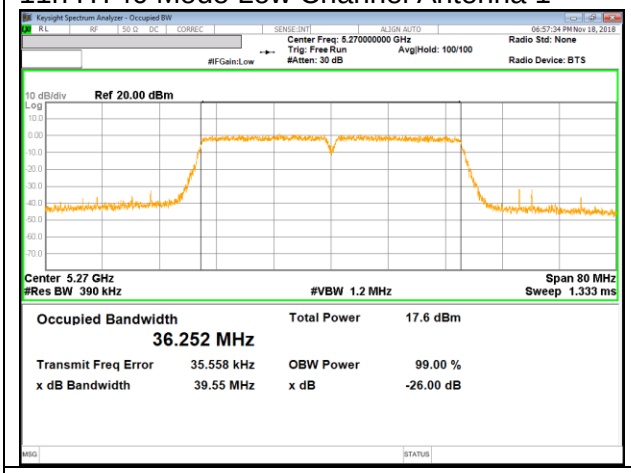


11n HT20 Mode High Channel Antenna 2

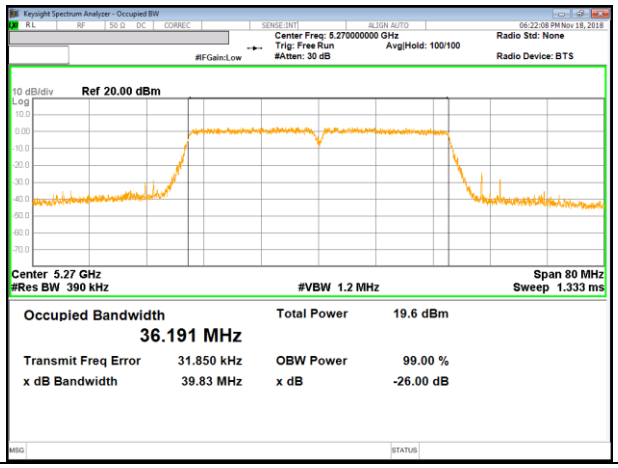


UNII 5.3 GHz IEEE 802.11n HT40 mode

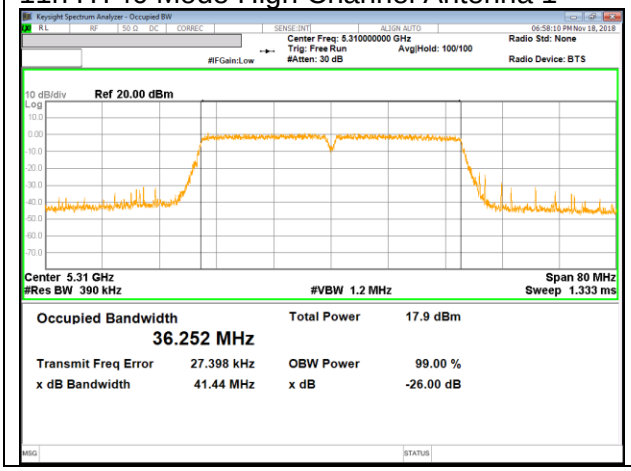
11n HT40 Mode Low Channel Antenna 1



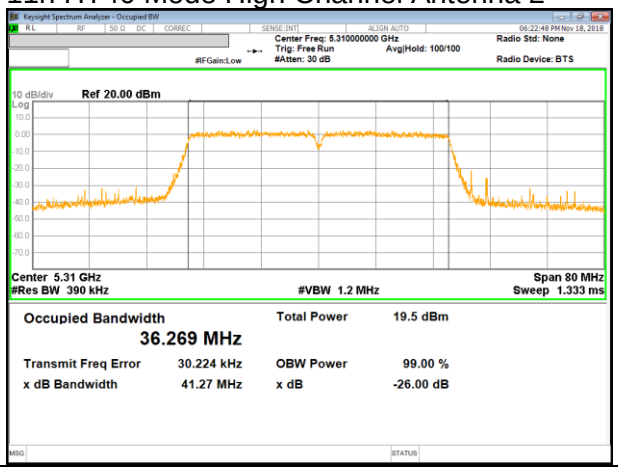
11n HT40 Mode Low Channel Antenna 2



11n HT40 Mode High Channel Antenna 1

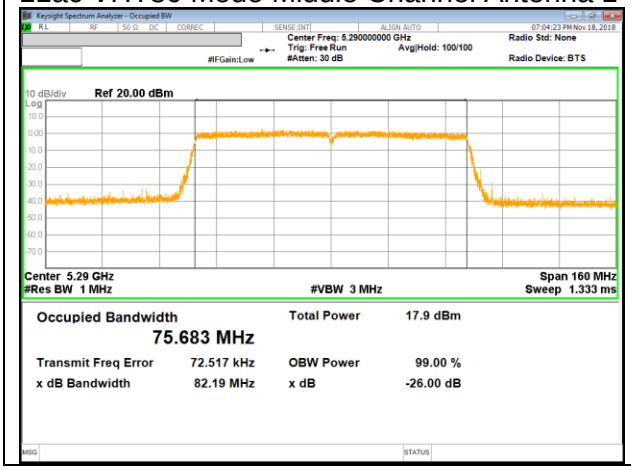


11n HT40 Mode High Channel Antenna 2

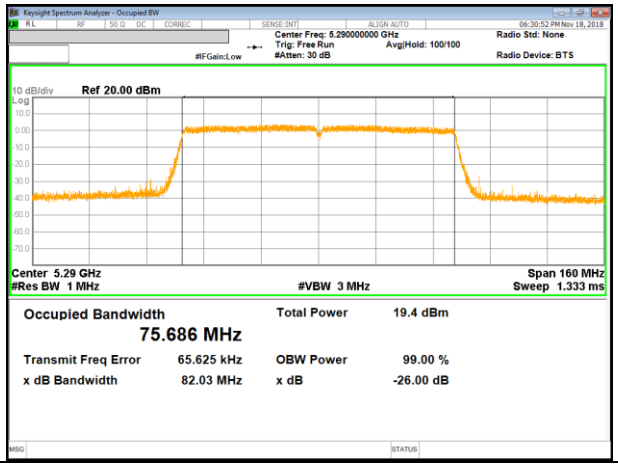


UNII 5.3 GHz IEEE 802.11ac VHT80 mode

11ac VHT80 Mode Middle Channel Antenna 1

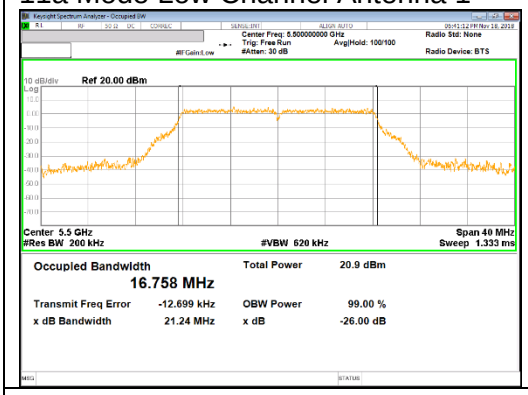


11ac VHT80 Mode Middle Channel Antenna 2

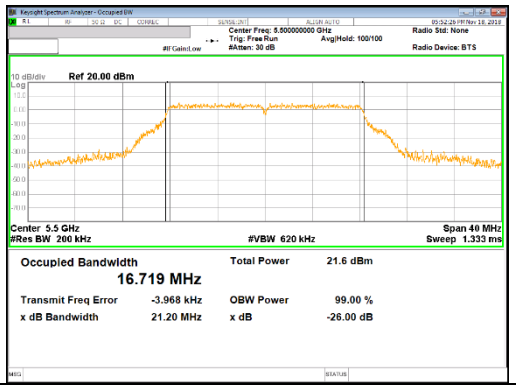


UNII 5.5 GHz IEEE 802.11a mode

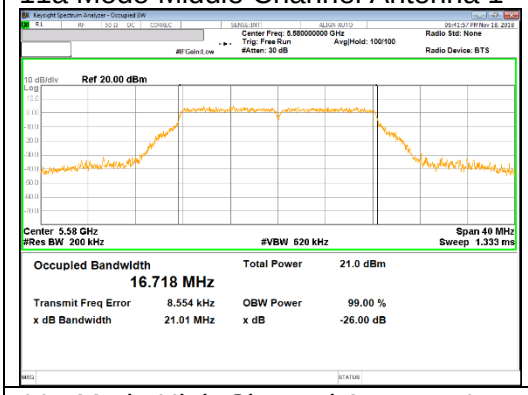
11a Mode Low Channel Antenna 1



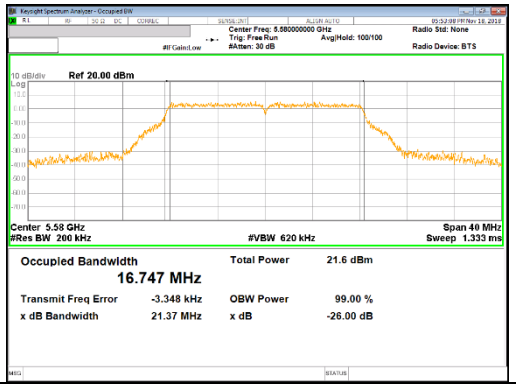
11a Mode Low Channel Antenna 2



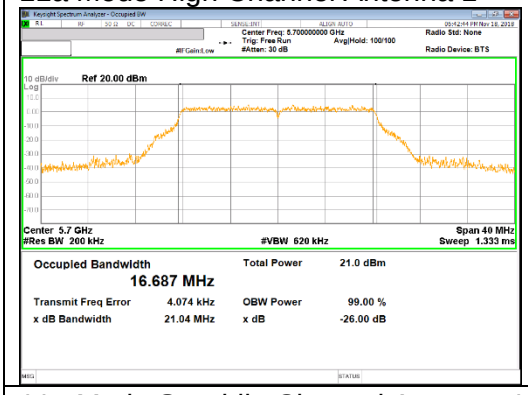
11a Mode Middle Channel Antenna 1



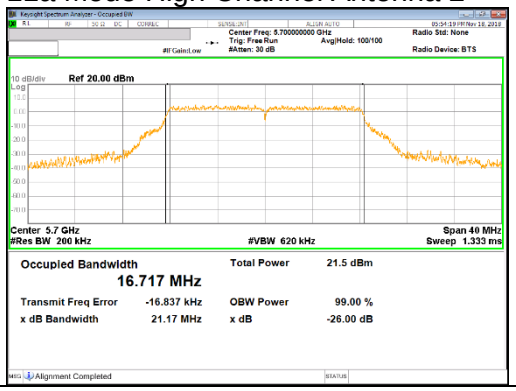
11a Mode Middle Channel Antenna 2



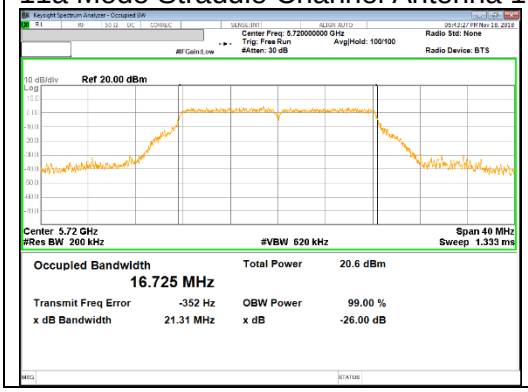
11a Mode High Channel Antenna 1



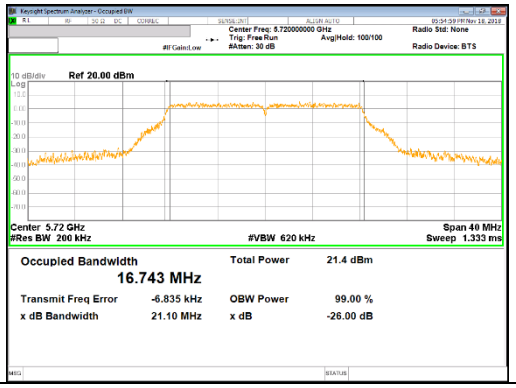
11a Mode High Channel Antenna 2



11a Mode Straddle Channel Antenna 1

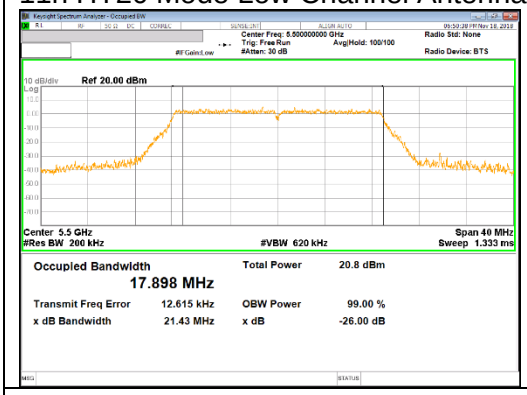


11a Mode Straddle Channel Antenna 2

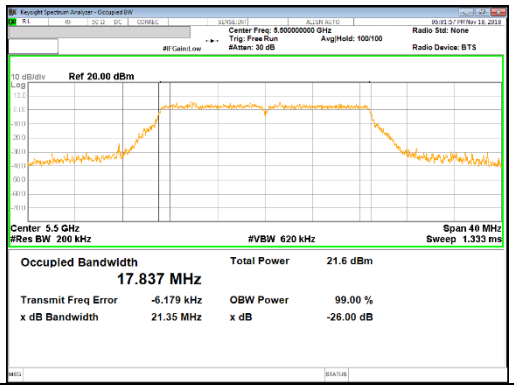


UNII 5.5 GHz IEEE 802.11n HT20 mode

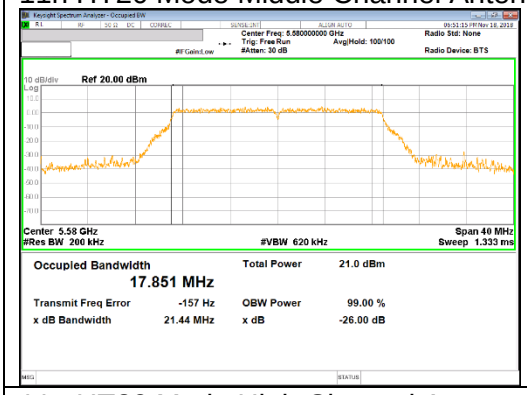
11n HT20 Mode Low Channel Antenna 1



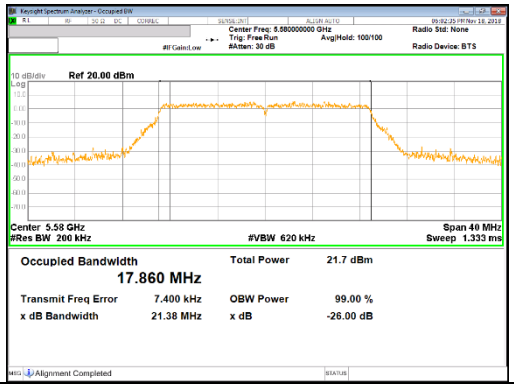
11n HT20 Mode Low Channel Antenna 2



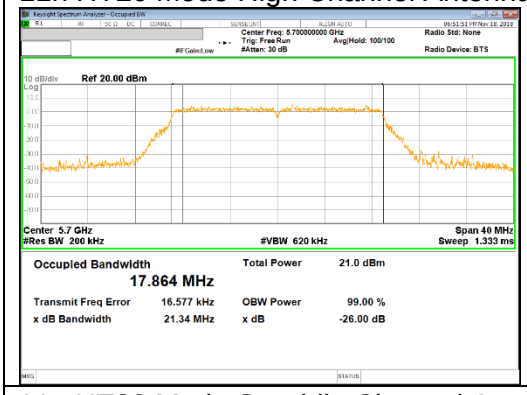
11n HT20 Mode Middle Channel Antenna 1



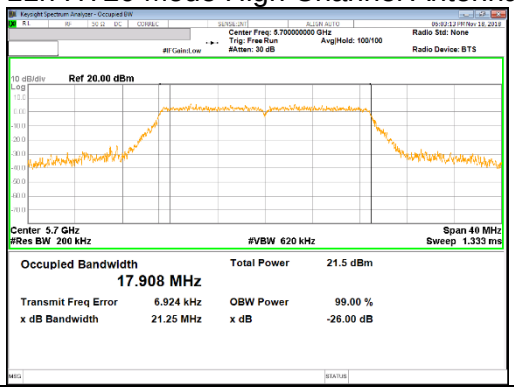
11n HT20 Mode Middle Channel Antenna 2



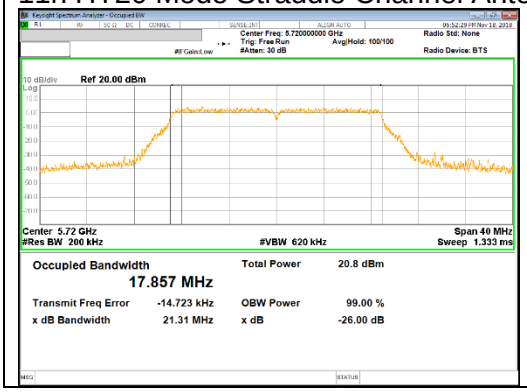
11n HT20 Mode High Channel Antenna 1



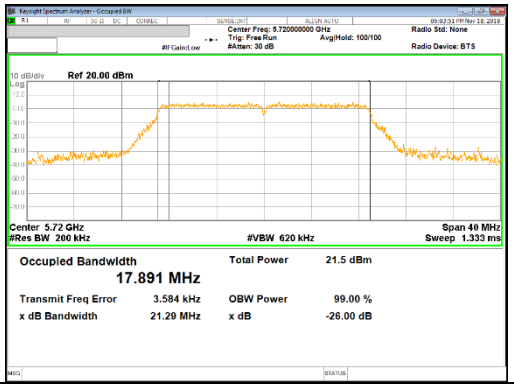
11n HT20 Mode High Channel Antenna 2



11n HT20 Mode Straddle Channel Antenna 1

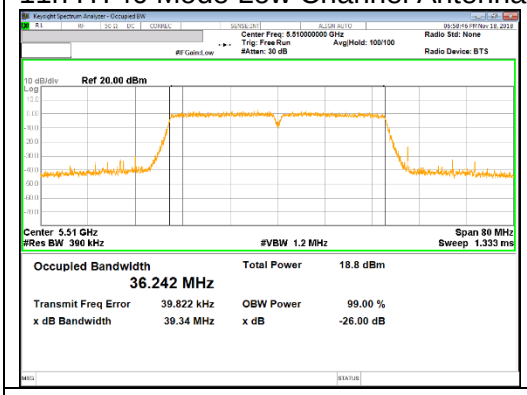


11n HT20 Mode Straddle Channel Antenna 2

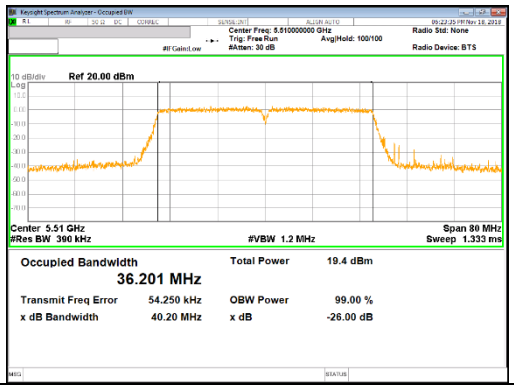


UNII 5.5 GHz IEEE 802.11n HT40 mode

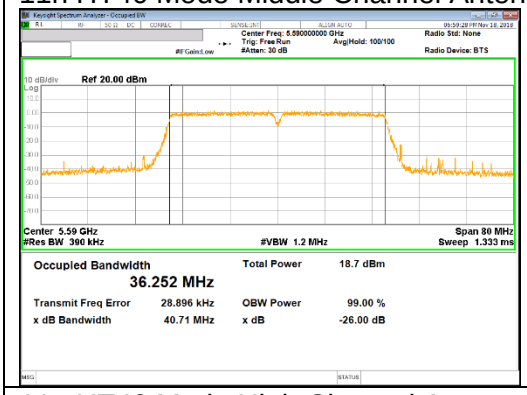
11n HT40 Mode Low Channel Antenna 1



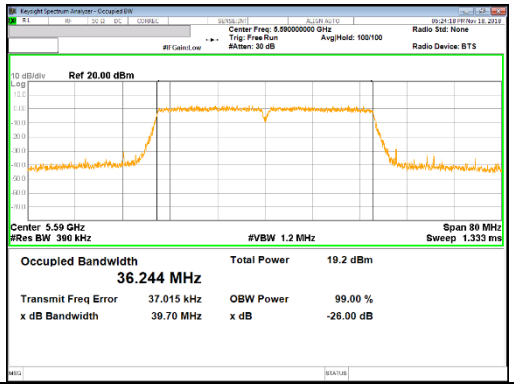
11n HT40 Mode Low Channel Antenna 2



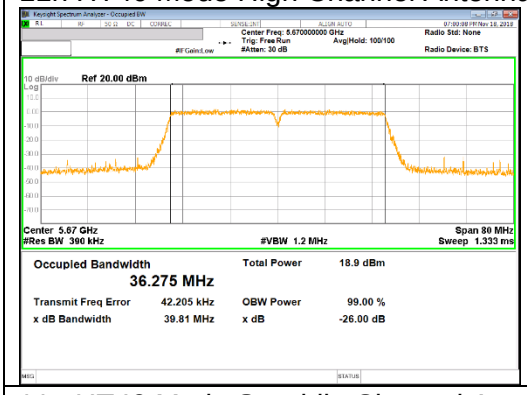
11n HT40 Mode Middle Channel Antenna 1



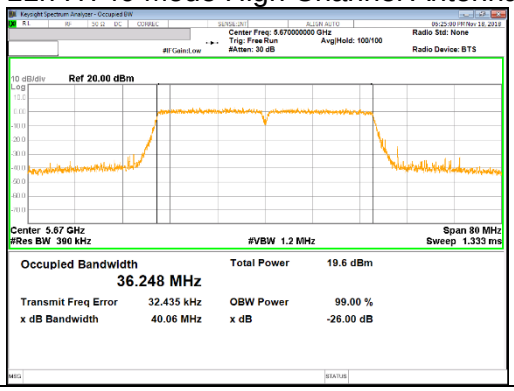
11n HT40 Mode Middle Channel Antenna 2



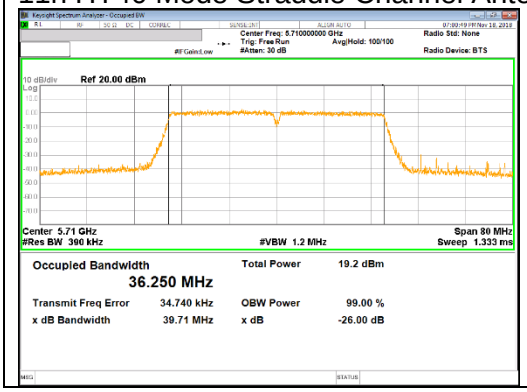
11n HT40 Mode High Channel Antenna 1



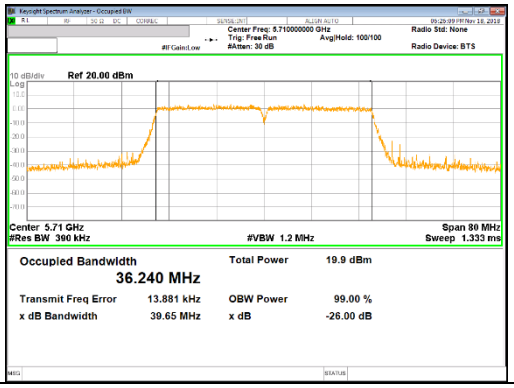
11n HT40 Mode High Channel Antenna 2



11n HT40 Mode Straddle Channel Antenna 1

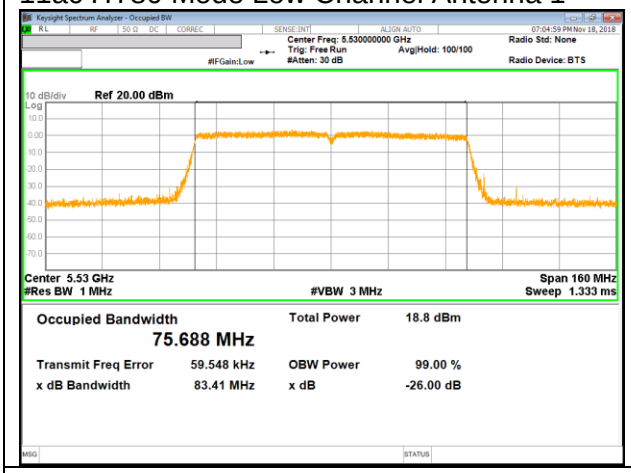


11n HT40 Mode Straddle Channel Antenna 2

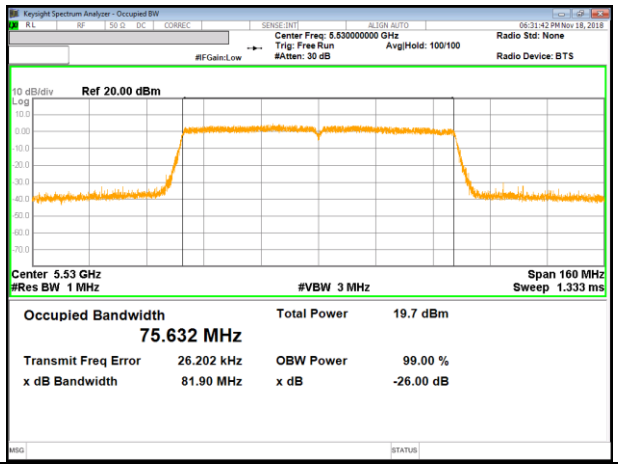


UNII 5.5 GHz IEEE 802.11ac VHT80 mode

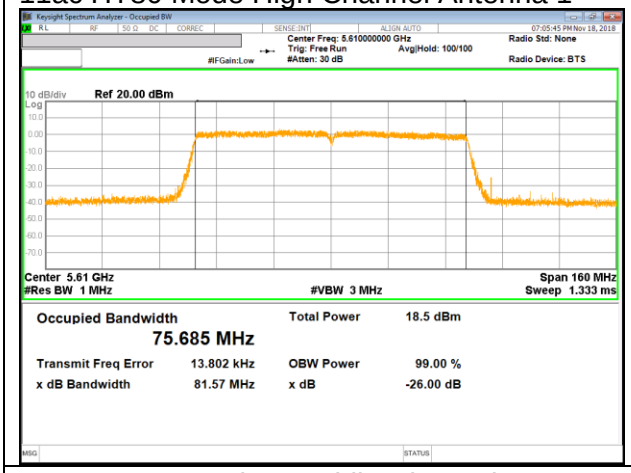
11ac HT80 Mode Low Channel Antenna 1



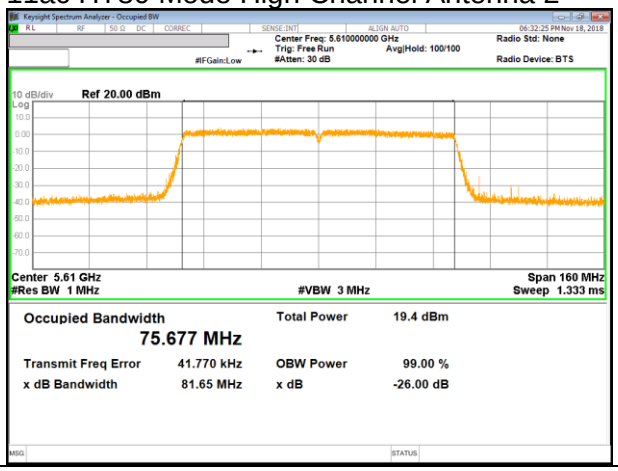
11ac HT80 Mode Low Channel Antenna 2



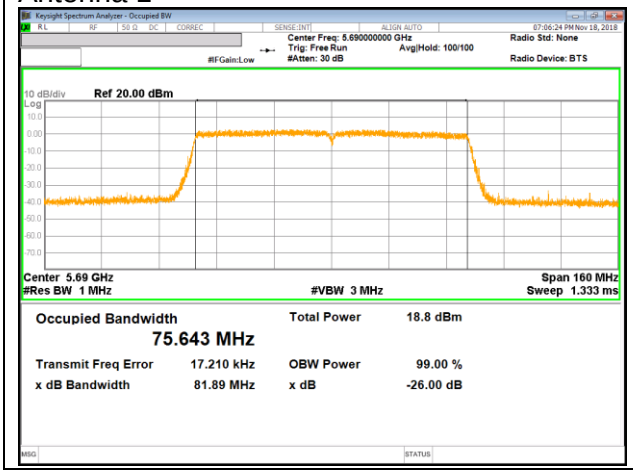
11ac HT80 Mode High Channel Antenna 1



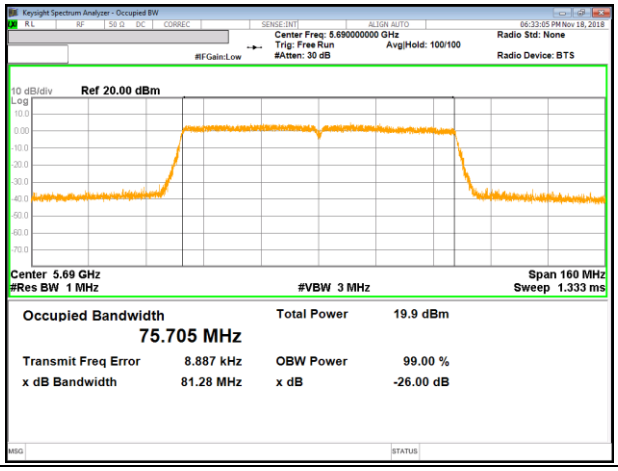
11ac HT80 Mode High Channel Antenna 2



11ac VHT80 Mode Straddle Channel Antenna 1

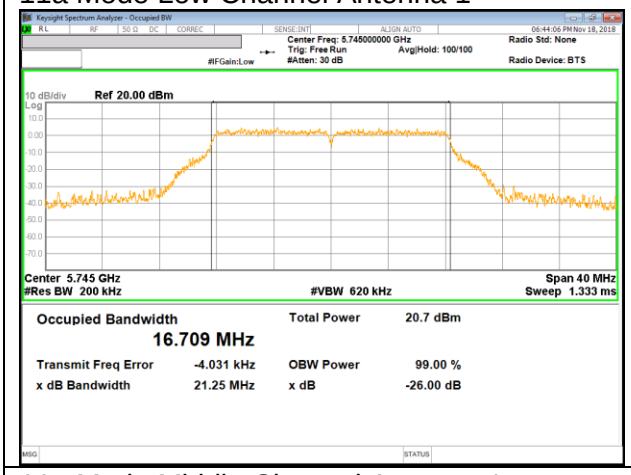


11ac VHT80 Mode Straddle Channel Antenna 2

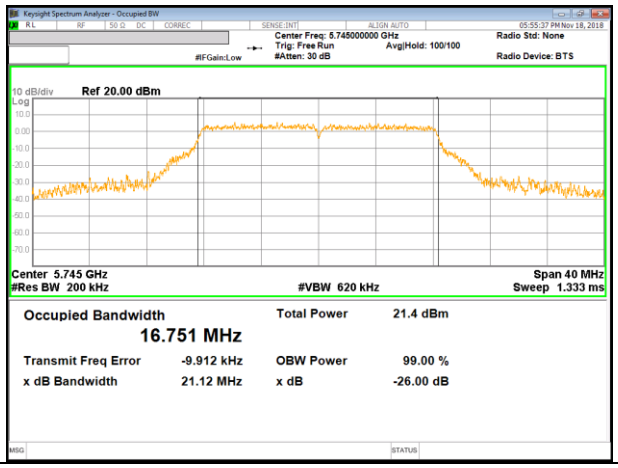


UNII 5.8 GHz IEEE 802.11a mode

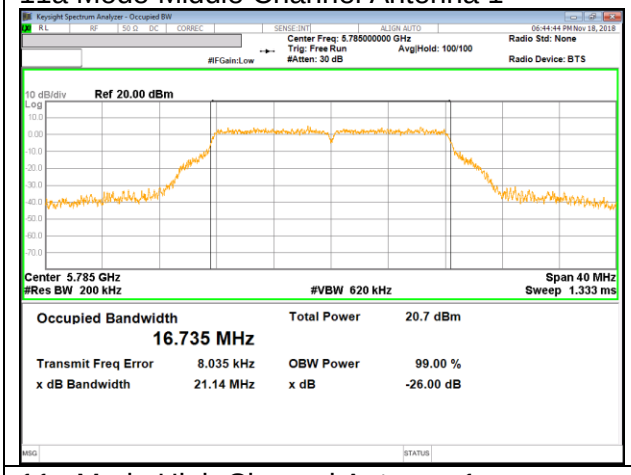
11a Mode Low Channel Antenna 1



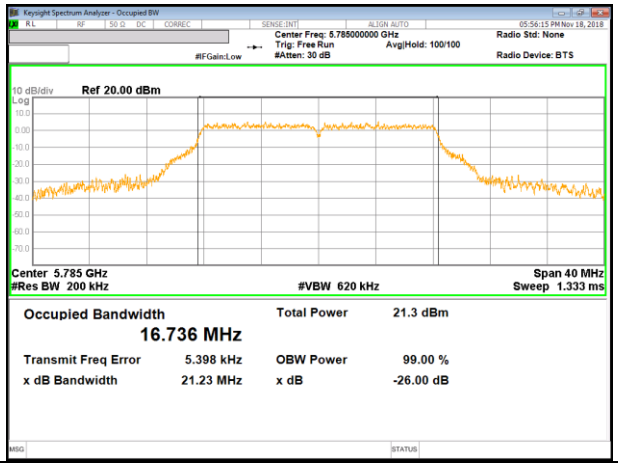
11a Mode Low Channel Antenna 2



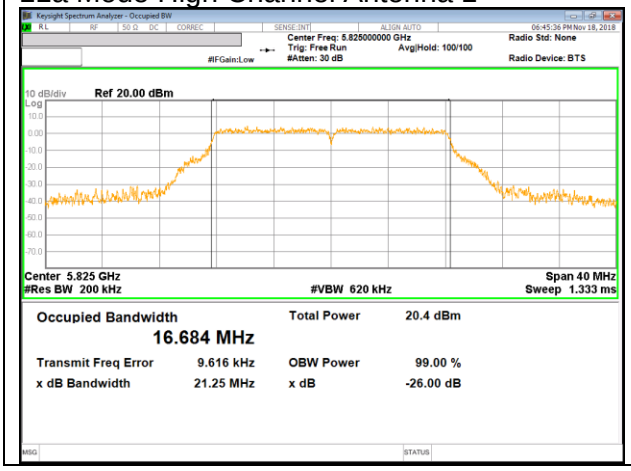
11a Mode Middle Channel Antenna 1



11a Mode Middle Channel Antenna 2



11a Mode High Channel Antenna 1



11a Mode High Channel Antenna 2