HCT CO.,LTD.

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FCC UNII REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
April 23, 2018
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-RF-1804-FC036

FCC ID:	**A3LSMG8750**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model: SM-G8750
EUT Type: Mobile Phone
Modulation type OFDM
FCC Classification: Unlicensed National Information Infrastructure(UNII)
FCC Rule Part(s): Part 15.407

Band	Mode	Frequency Range (MHz)	Power (dBm)	Power (W)
UNII1	802.11a	5180 – 5240	17.58	0.05734
	802.11n_HT20	5180 – 5240	15.90	0.03888
	802.11n_HT40	5190 - 5230	15.65	0.03673
	802.11ac_VHT20	5180 – 5240	14.58	0.02870
	802.11ac_VHT40	5190 - 5230	14.90	0.03092
	802.11ac_VHT80	5210	14.29	0.02688
UNII2A	802.11a	5260 – 5320	17.20	0.05251
	802.11n_HT20	5260 – 5320	15.46	0.03517
	802.11n_HT40	5270 – 5310	15.52	0.03566
	802.11ac_VHT20	5260 – 5320	14.44	0.02782
	802.11ac_VHT40	5270 – 5310	14.70	0.02948
	802.11ac_VHT80	5290	14.71	0.02955
UNII2C	802.11a	5500 – 5720	17.69	0.05869
	802.11n_HT20	5500 – 5720	15.86	0.03851
	802.11n_HT40	5510 – 5710	16.10	0.04077
	802.11ac_VHT20	5500 – 5720	14.72	0.02964
	802.11ac_VHT40	5510 – 5710	15.24	0.03345
	802.11ac_VHT80	5530 – 5690	15.48	0.03531
UNII3	802.11a	5745 – 5825	17.68	0.05858
	802.11n_HT20	5745 – 5825	16.25	0.04221
	802.11n_HT40	5755 – 5795	16.02	0.03998
	802.11ac_VHT20	5745 – 5825	14.88	0.03074
	802.11ac_VHT40	5755 – 5795	15.11	0.03241
	802.11ac_VHT80	5775	14.90	0.03093

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by : Jung Ki Lim
Engineer of Telecommunication testing center

Approved by : Jong Seok Lee
Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1804-FC036	April 23, 2018	- First Approval Report

Table of Contents

1. GENERAL INFORMATION 5

2. EUT DESCRIPTION 5

3. TEST METHODOLOGY 6

3.1 EUT CONFIGURATION 6
3.2 EUT EXERCISE 6
3.3 GENERAL TEST PROCEDURES 6
3.4 DESCRIPTION OF TEST MODES 6

4. INSTRUMENT CALIBRATION 7

5. FACILITIES AND ACCREDITATIONS 7

5.1 FACILITIES 7
5.2 EQUIPMENT 7

6. ANTENNA REQUIREMENTS 7

7. MEASUREMENT UNCERTAINTY 8

8. SUMMARY OF TEST RESULTS 9

9. TEST RESULT 10

9.1 DUTY CYCLE 10
9.2 EMISSION BANDWIDTH AND MINIMUM EMISSION BANDWIDTH MEASUREMENT 13
9.3 OUTPUT POWER MEASUREMENT 35
9.4 POWER SPECTRAL DENSITY 70
9.5 FREQUENCY STABILITY. 90
9.6 RADIATED MEASUREMENT 102
9.6.1 RADIATED SPURIOUS EMISSIONS. 102
9.6.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS 175
9.7 POWERLINE CONDUCTED EMISSIONS 195

10. LIST OF TEST EQUIPMENT 204

10.1 LIST OF TEST EQUIPMENT(Conducted Test) 204
10.2 LIST OF TEST EQUIPMENT(Radiated Test) 205

1. GENERAL INFORMATION

Applicant:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMG8750
EUT Type:	Mobile Phone
Model:	SM-G8750
Date(s) of Tests:	March 30, 2018 ~ April 23, 2018
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

2. EUT DESCRIPTION

Model	SM-G8750	
EUT Type	Mobile Phone	
Power Supply	DC 4.00 V	
Frequency Range	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1) / 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5720 MHz (UNII 2C) / 5745 MHz - 5825 MHz (UNII 3)
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1) / 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5710 MHz (UNII 2C) / 5755 MHz - 5795 MHz (UNII 3)
	80 MHz BW:	5210 MHz (UNII 1) / 5290 MHz (UNII 2A)/ 5530 MHz - 5690 MHz (UNII 2C) / 5775 MHz (UNII 3)
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1) / 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5720 MHz (UNII 2C) / 5745 MHz - 5825 MHz (UNII 3)
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1) / 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5710 MHz (UNII 2C) / 5755 MHz - 5795 MHz (UNII 3)
	80 MHz BW:	5210 MHz (UNII 1) / 5290 MHz (UNII 2A)/ 5530 MHz - 5690 MHz (UNII 2C) / 5775 MHz (UNII 3)
Modulation Type	OFDM(802.11a, 802.11n, 802.11ac)	
Antenna Specification	Antenna type: LDS + Frame Peak Gain : -4.59 dBi (UNII 1) / -4.22 dBi(UNII 2A) / -3.99 dBi(UNII 2C) / -4.67 dBi(UNII 3)	

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3.75 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 of ANSI C63.10. (Version: 2013)

Conducted Antenna Terminal

See Section from 8.1 to 8.4.(KDB 789033 D02 v02r01)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2006).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203, §15.407

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.

* The E.U.T Complies with the requirement of §15.203, §15.407

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of *k* = 2 to indicate a 95 % level of confidence.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70

8. SUMMARY OF TEST RESULTS

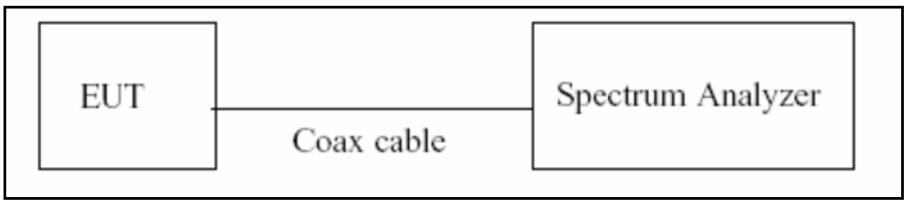
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	CONDUCTED	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)(1)	< 250 mW (5150-5250 MHz) < 250 mW or 11+10 log $\log_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $\log_{10}$ (BW) dBm (5470-5725 MHz) <1 W (5725-5850 MHz)		PASS
Peak Power Spectral Density	§15.407(a)(1),(5)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS
Frequency Stability	§15.407(g)	NA		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207	<FCC 15.207 limits		PASS
Undesirable Emissions	§15.407(b)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 9.6.1 (UNII 3)	RADIATED	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

9. TEST RESULT

9.1 DUTY CYCLE

The zero-span mode on a spectrum analyzer or EMI receiver ,if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/*T*, where *T* is defined in section B)1)a), and the number of sweep points across duration *T* exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if *T* ≤ 16.7 microseconds.)

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, (B.2 in KDB 789033 D02 v02r01)

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)

The zero-span method was used becaure all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/*T*.

1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10*log(1/Duty Cycle)

▣ Duty Cycle Factor

Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11a	6	1.432	1.527	0.93775167	0.279
	9	0.960	1.056	0.90981432	0.410
	12	0.728	0.822	0.88535719	0.529
	18	0.492	0.593	0.82992136	0.810
	24	0.377	0.468	0.80481633	0.943
	36	0.256	0.351	0.72973004	1.368
	48	0.200	0.292	0.68606343	1.636
	54	0.180	0.287	0.62723512	2.026
Mode	**MCS INDEX**	**T_{on} (ms)**	**T_{total} (ms)**	**Duty Cycle**	**Duty Cycle Factor (dB)**
802.11n_HT20	0	1.340	1.446	0.92647272	0.332
	1	0.688	0.794	0.86649874	0.622
	2	0.473	0.567	0.83408061	0.788
	3	0.364	0.458	0.79472934	0.998
	4	0.256	0.347	0.73780451	1.321
	5	0.200	0.307	0.65103571	1.864
	6	0.184	0.277	0.66259363	1.788
	7	0.168	0.263	0.63841033	1.949
802.11n_HT40	0	0.665	0.752	0.88368750	0.537
	1	0.354	0.439	0.80614843	0.936
	2	0.249	0.335	0.74255767	1.293
	3	0.197	0.294	0.66888082	1.747
	4	0.145	0.229	0.63310565	1.985
	5	0.117	0.203	0.57777778	2.382
	6	0.109	0.193	0.56476684	2.481
	7	0.101	0.185	0.54594595	2.629

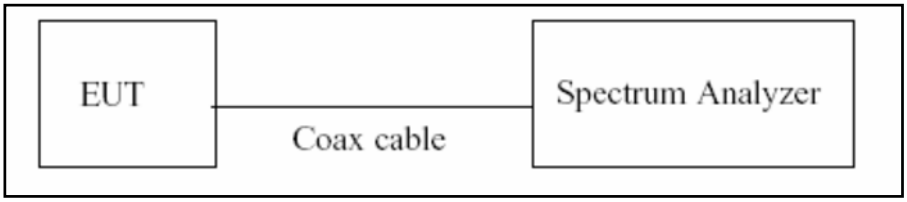
Mode	MCS INDEX	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ac_VHT20	MCS 0	1.350	1.435	0.94076655	0.265
	MCS 1	0.696	0.788	0.88324873	0.539
	MCS 2	0.476	0.578	0.82352941	0.843
	MCS 3	0.368	0.456	0.80701754	0.931
	MCS 4	0.260	0.346	0.75144509	1.241
	MCS 5	0.204	0.290	0.70344828	1.528
	MCS 6	0.188	0.275	0.68363636	1.652
	MCS 7	0.173	0.259	0.66731141	1.757
	MCS 8	0.152	0.237	0.64135021	1.929
802.11ac_ VHT40	MCS 0	0.674	0.758	0.88918206	0.510
	MCS 1	0.357	0.442	0.80910326	0.920
	MCS 2	0.253	0.339	0.74631268	1.271
	MCS 3	0.201	0.285	0.70526316	1.516
	MCS 4	0.150	0.233	0.64261168	1.921
	MCS 5	0.121	0.209	0.57894737	2.374
	MCS 6	0.113	0.198	0.56818182	2.455
	MCS 7	0.105	0.189	0.55702918	2.541
	MCS 8	0.097	0.181	0.53591160	2.709
	MCS 9	0.089	0.175	0.50857143	2.936
802.11ac_ VHT80	MCS 0	0.612	0.712	0.85987351	0.656
	MCS 1	0.329	0.420	0.78333333	1.061
	MCS 2	0.233	0.320	0.72750000	1.382
	MCS 3	0.185	0.285	0.64850615	1.881
	MCS 4	0.137	0.222	0.61486486	2.112
	MCS 5	0.112	0.199	0.56281407	2.496
	MCS 6	0.105	0.189	0.55291005	2.573
	MCS 7	0.101	0.186	0.54032258	2.673
	MCS 8	0.089	0.175	0.50571429	2.961
	MCS 9	0.085	0.173	0.48843931	3.112

9.2 EMISSION BANDWIDTH AND MINIMUM EMISSION BANDWIDTH MEASUREMENT

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033 D02 v02r01, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE (26dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.
The Spectrum Analyzer is set to(C.1 in KDB 789033 D02 v02r01)

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Note : We tested 26 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 26 dB.

1. In order to simplify the report, attached plots were only the most wide channel.
2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.

▣ TEST PROCEDURE (for the band 5.725-5.85 GHz, 6 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to(C.2 in KDB 789033 D02 v02r01)

1. RBW = 100 kHz
2. VBW ≥ 3*RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum lever measured in the fundamental emission.

Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

▣ TEST RESULTS for 802.11a

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	20.95	N/A	Pass
5200	40	21.35	N/A	Pass
5240	48	21.37	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.33	N/A	Pass
5300	60	22.09	N/A	Pass
5320	64	21.27	N/A	Pass

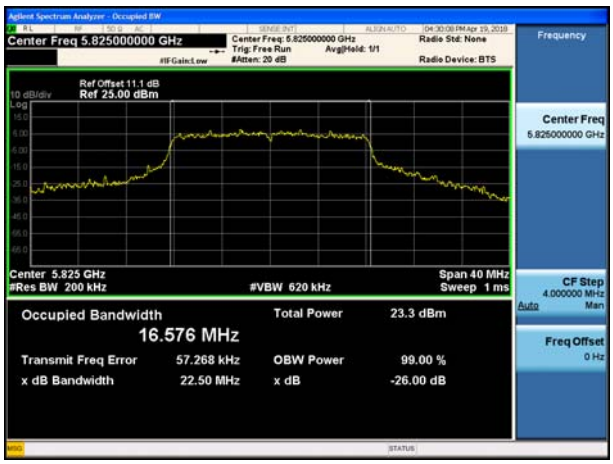
Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.07	N/A	Pass
5600	120	22.05	N/A	Pass
5720	144	21.37	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.27	N/A	Pass
5785	157	21.57	N/A	Pass
5825	165	22.50	N/A	Pass

▣ TEST Plot for 802.11a

802.11a UNII 1 BAND 26dB Bandwidth (CH 48)	802.11a UNII 2A BAND 26dB Bandwidth (CH 60)
802.11a UNII 2C BAND 26dB Bandwidth (CH100)	**802.11a UNII 3 BAND 26dB Bandwidth (CH 165)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS for 802.11n_HT20

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	21.80	N/A	Pass
5200	40	21.75	N/A	Pass
5240	48	21.79	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.79	N/A	Pass
5300	60	22.09	N/A	Pass
5320	64	21.50	N/A	Pass

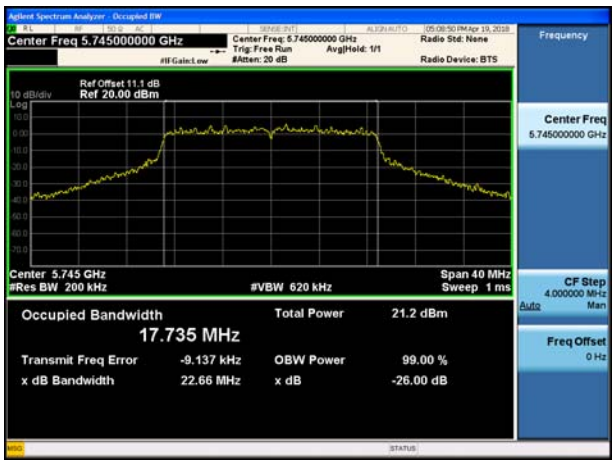
Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.68	N/A	Pass
5600	120	23.01	N/A	Pass
5720	144	22.52	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT20

802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	22.66	N/A	Pass
5785	157	21.42	N/A	Pass
5825	165	22.09	N/A	Pass

▣ TEST Plot for 802.11n_HT20

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 60)
802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 120)	**802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 149)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS for 802.11ac_VHT20

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	21.66	N/A	Pass
5200	40	22.92	N/A	Pass
5240	48	23.07	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.07	N/A	Pass
5300	60	21.63	N/A	Pass
5320	64	22.08	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.12	N/A	Pass
5600	120	22.28	N/A	Pass
5720	144	22.41	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	22.35	N/A	Pass
5785	157	22.42	N/A	Pass
5825	165	22.16	N/A	Pass

▣ TEST Plot for 802.11ac_VHT20

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 48)	802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)	**802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)**

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS for 802.11n_HT40

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	40.69	N/A	Pass
5230	46	41.13	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	41.12	N/A	Pass
5310	62	41.21	N/A	Pass

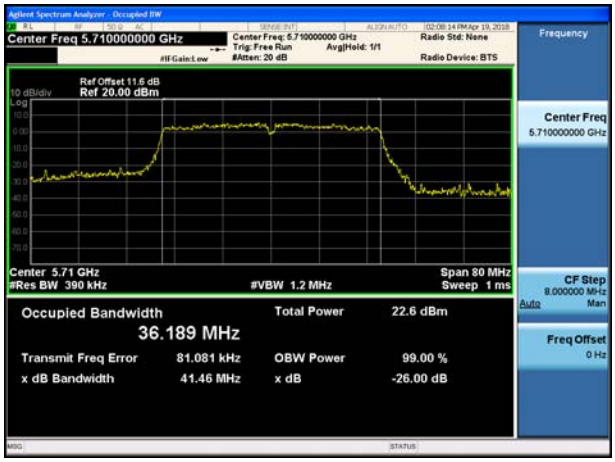
Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	41.26	N/A	Pass
5590	118	40.75	N/A	Pass
5710	142	41.46	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	40.80	N/A	Pass
5795	159	41.15	N/A	Pass

▣ TEST Plot for 802.11n_HT40

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)	802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 62)
802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 142)	**802.11n_HT40 UNII 3 BAND 26dB Bandwidth (CH 159)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS for 802.11ac_VHT40

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	41.08	N/A	Pass
5230	46	40.94	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	40.73	N/A	Pass
5310	62	40.88	N/A	Pass

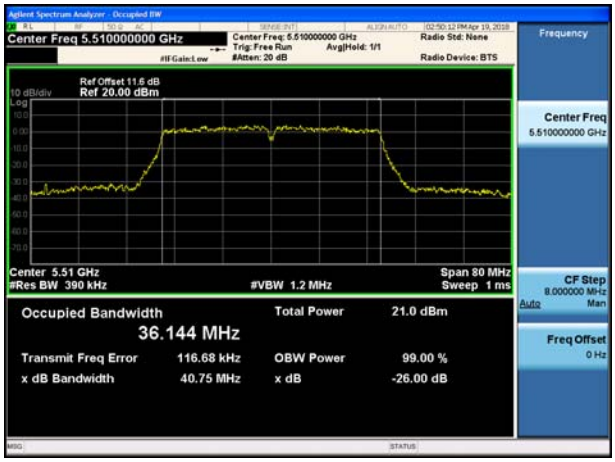
Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	40.75	N/A	Pass
5590	118	40.65	N/A	Pass
5710	142	40.68	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	41.03	N/A	Pass
5795	159	40.99	N/A	Pass

▣ TEST Plot for 802.11ac_VHT40

802.11ac_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11ac_VHT40 UNII 2A BAND 26dB Bandwidth (CH 62)
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)	**802.11ac_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

▣ TEST RESULTS for 802.11ac_VHT80

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5210	42	82.94	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5290	58	83.08	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5530	106	82.49	N/A	Pass
5610	122	83.36	N/A	Pass
5690	138	82.33	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

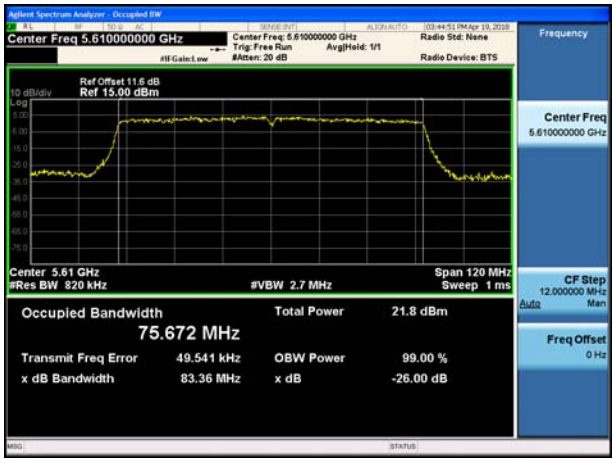
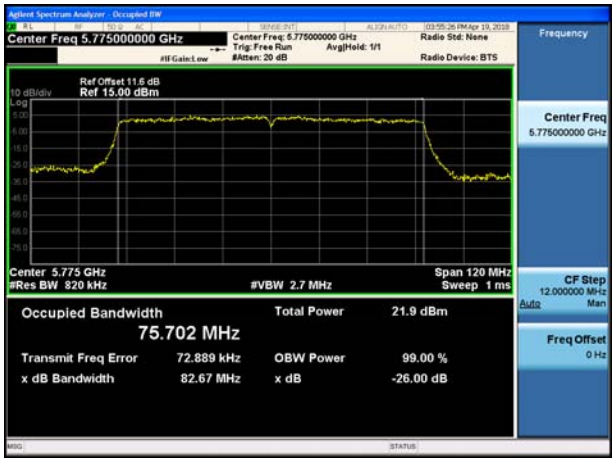
802.11ac_VHT80 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	82.67	N/A	Pass

Note :

1. In order to simplify the report, attached plots were only the most wide channel.

2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.

▣ TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)	802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth(CH 58)
802.11ac_VHT80 UNII 2C BAND 26dB Bandwidth(CH 122)	**802.11ac_VHT80 UNII 3 BAND 26dB Bandwidth(CH 155)**
	

Note : In order to simplify the report, attached plots were only the most wide channel.

Conducted 6 dB Bandwidth

▣ TEST RESULTS for 802.11a/n_HT20/ac_VHT20

Conducted 6 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	13.90	0.5	Pass
5785	157	15.20	0.5	Pass
5825	165	15.10	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11n_HT20

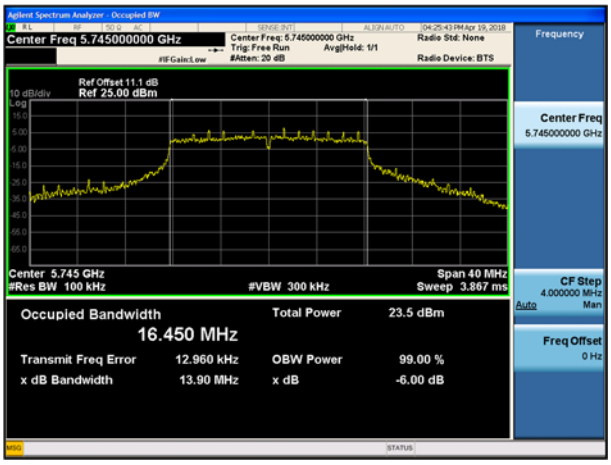
802.11n_HT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.97	0.5	Pass
5785	157	15.44	0.5	Pass
5825	165	15.14	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_VHT20

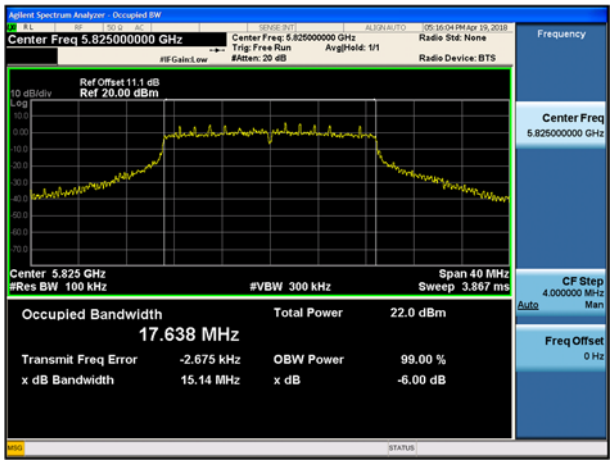
802.11ac_VHT20 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	15.48	0.5	Pass
5785	157	15.99	0.5	Pass
5825	165	16.87	0.5	Pass

▣ TEST PlotS for 802.11a/n_HT20/ac_VHT20

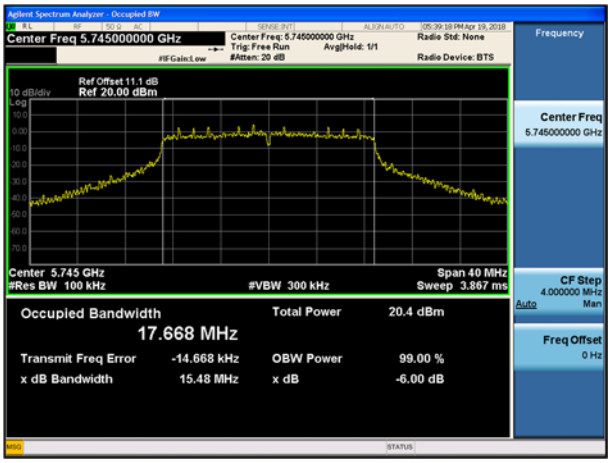
802.11a UNII 3 BAND 6dB Bandwidth (CH.149)



802.11n_HT20 UNII 3 BAND 6dB Bandwidth(CH.165)



802.11ac_VHT20 UNII 3 BAND 6dB Bandwidth(CH.149)



Note : In order to simplify the report, attached plots were only the most narrow channel.

▣ TEST RESULTS for 802.11n_HT40/ac_VHT40

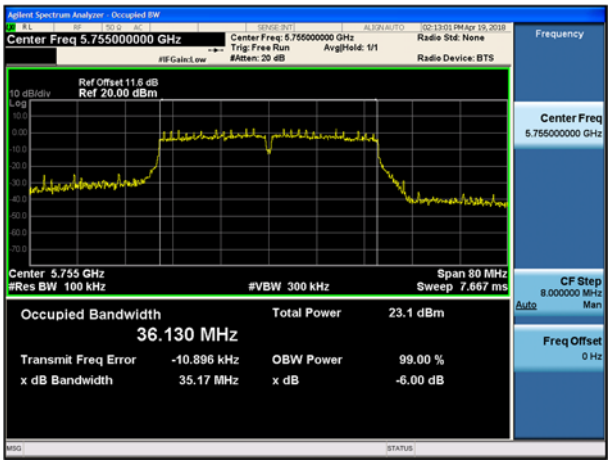
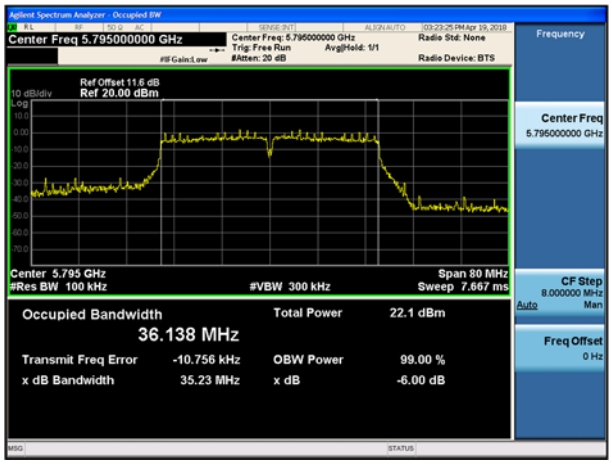
Conducted 6 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.17	0.5	Pass
5795	159	35.25	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.30	0.5	Pass
5795	159	35.23	0.5	Pass

▣ TEST Plot for 802.11n_HT40/ac_VHT40

802.11n_HT40 UNII 3 BAND 6dB Bandwidth(CH.151)	802.11ac_VHT40 UNII 3 BAND 6dB Bandwidth(CH.159)
	

Note : In order to simplify the report, attached plots were only the most narrow channel.

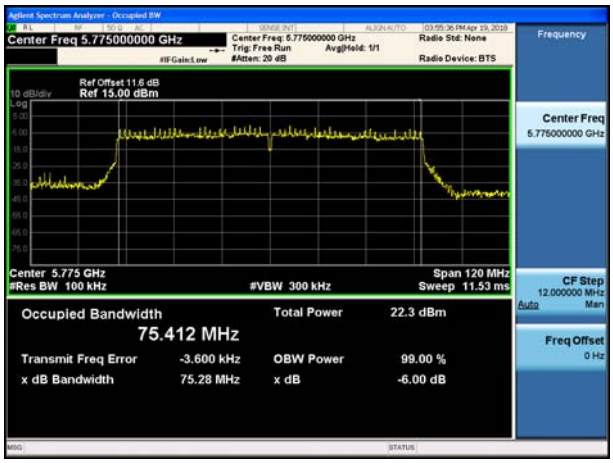
▣ TEST RESULTS for 802.11ac_VHT80

Conducted 6 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80 Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.28	0.5	Pass

▣ TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 3 BAND 6dB Bandwidth (CH.155)



▣ Straddle channels TEST RESULTS

Conducted Bandwidth Measurements for 802.11a/n_HT20/ac_VHT20 (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11a	5720	144	14.68	N/A	Pass
802.11n			15.68	N/A	Pass
802.11ac			15.52	N/A	Pass

Conducted Bandwidth Measurements for 802.11a/n_HT20/ac_VHT20 (UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11a	5720	144	5.20	N/A	Pass
802.11n			5.76	N/A	Pass
802.11ac			5.56	N/A	Pass

▣ Straddle channels TEST Plot for 802.11a/n_HT20/ac_VHT20

802.11a CH.144 Bandwidth	802.11n_HT20 CH.144 Bandwidth
802.11ac_VHT20 CH.144 Bandwidth	

▣ Straddle channels TEST RESULTS

Conducted Bandwidth Measurements for 802.11n_HT40/ac_VHT40 (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11n	5710	142	35.24	N/A	Pass
802.11ac			35.24	N/A	Pass

Conducted Bandwidth Measurements for 802.11n_HT40/ac_VHT40 (UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11n	5710	142	5.64	N/A	Pass
802.11ac			5.40	N/A	Pass

▣ Straddle channels TEST Plot for 802.11n_HT40/ac_VHT40

802.11n_HT40 CH.142 Bandwidth	802.11ac_VHT40 CH.142 Bandwidth

▣ Straddle channels TEST RESULTS

Conducted Bandwidth Measurements for 802.11ac_VHT80 (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11ac	5690	138	76.04	N/A	Pass

Conducted Bandwidth Measurements for 802.11ac_VHT80 (UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11ac	5690	138	6.04	N/A	Pass

▣ Straddle channels TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 CH.138 Bandwidth

9.3 OUTPUT POWER MEASUREMENT

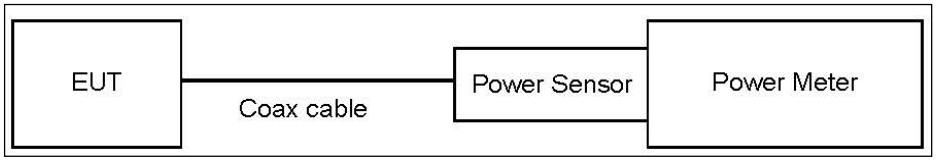
Test Requirements and limit, §15.407(a)(1)

A transmitter antenna terminal of EUT is connected to the input of a Power meter or Spectrum Analyzer .Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

▣ Limit

Band	Mode	Limit (dBm)
UNII 1, 2A, 2C	802.11a,n,ac	23.98
UNII 3	802.11a,n,ac	30.00

▣ TEST CONFIGURATION(20 MHz BW)



▣ TEST PROCEDURE(20 MHz BW)

▪ Average Power (Procedure E.3.a in KDB 789033 D02 v02r01).

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

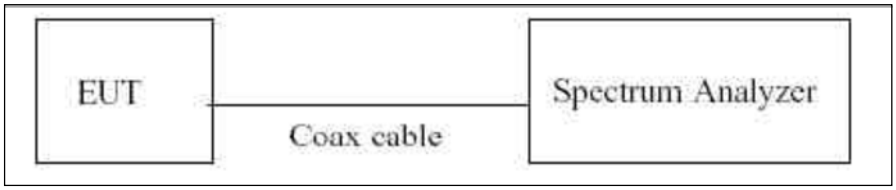
Note :

1. Actual value of loss for the attenuator and cable combination is below table.

Mod	Loss(dB)
802.11a/ 802.11n(HT20)/ 802.11ac(VHT20)	11.1
802.11n(HT40)/ 802.11ac(VHT40)/ 802.11ac(VHT80)	11.6

(Actual value of loss for the attenuator and cable combination)

▣ TEST CONFIGURATION(40 MHz BW & 80 MHz BW)



▣ TEST PROCEDURE(40 MHz BW & 80 MHz BW)

▪ Average Power

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function. We tested according to Method SA-2 in KDB 789033 D02 v02r01.

The Spectrum Analyzer is set to

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW ≥ 3 MHz.
5. Number of points in sweep ≥ 2*span/RBW.
6. Sweep time = auto.
7. Detector = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. Add 10log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

▣ Sample Calculation (Conducted)

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Note: 1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Spectrum offset = Attenuator loss + Cable loss

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1, 2A, 2C, 3	11.6

(Actual value of loss for the attenuator and cable combination)

802.11a (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5180~5240)

802.11a Mode		Power Level Setting	Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5180	36	18	6	16.00	0.28	16.28	23.98
			9	15.90	0.41	16.31	23.98
			12	15.73	0.53	16.26	23.98
			18	16.33	0.81	17.14	23.98
			24	16.00	0.94	16.94	23.98
			36	15.75	1.37	17.12	23.98
			48	15.53	1.64	17.17	23.98
			54	15.37	2.03	17.39	23.98
5200	40	18	6	16.36	0.28	16.64	23.98
			9	16.11	0.41	16.52	23.98
			12	15.98	0.53	16.51	23.98
			18	16.64	0.81	17.45	23.98
			24	16.22	0.94	17.16	23.98
			36	16.00	1.37	17.37	23.98
			48	15.78	1.64	17.42	23.98
			54	15.56	2.03	17.58	23.98
5240	48	18	6	15.99	0.28	16.27	23.98
			9	15.87	0.41	16.28	23.98
			12	15.70	0.53	16.23	23.98
			18	16.33	0.81	17.14	23.98
			24	15.99	0.94	16.93	23.98
			36	15.72	1.37	17.09	23.98
			48	15.47	1.64	17.11	23.98
			54	15.37	2.03	17.39	23.98

802.11a (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5260~5320)

802.11a Mode		Power Level Setting	Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	18	6	15.84	0.28	16.12	23.98
			9	15.77	0.41	16.18	23.98
			12	15.60	0.53	16.12	23.98
			18	16.15	0.81	16.96	23.98
			24	15.89	0.94	16.84	23.98
			36	15.59	1.37	16.96	23.98
			48	15.40	1.64	17.04	23.98
			54	15.18	2.03	17.20	23.98
5300	60	18	6	15.78	0.28	16.06	23.98
			9	15.58	0.41	15.99	23.98
			12	15.46	0.53	15.99	23.98
			18	16.05	0.81	16.86	23.98
			24	15.70	0.94	16.64	23.98
			36	15.43	1.37	16.80	23.98
			48	15.22	1.64	16.85	23.98
			54	15.03	2.03	17.05	23.98
5320	64	18	6	15.80	0.28	16.08	23.98
			9	15.71	0.41	16.12	23.98
			12	15.53	0.53	16.06	23.98
			18	16.20	0.81	17.01	23.98
			24	15.77	0.94	16.71	23.98
			36	15.60	1.37	16.97	23.98
			48	15.39	1.64	17.02	23.98
			54	15.18	2.03	17.20	23.98

802.11a (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5500~5720)

802.11a Mode		Power Level Setting	Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	18	6	15.74	0.28	16.02	23.98
			9	15.62	0.41	16.03	23.98
			12	15.47	0.53	16.00	23.98
			18	15.89	0.81	16.70	23.98
			24	15.56	0.94	16.50	23.98
			36	15.29	1.37	16.66	23.98
			48	15.19	1.64	16.83	23.98
			54	14.96	2.03	16.99	23.98
5600	120	18	6	16.16	0.28	16.44	23.98
			9	15.96	0.41	16.37	23.98
			12	15.84	0.53	16.37	23.98
			18	16.40	0.81	17.21	23.98
			24	16.01	0.94	16.95	23.98
			36	15.77	1.37	17.14	23.98
			48	15.51	1.64	17.15	23.98
			54	15.38	2.03	17.41	23.98
5720	144	18	6	16.55	0.28	16.83	23.98
			9	16.38	0.41	16.79	23.98
			12	16.25	0.53	16.78	23.98
			18	16.72	0.81	17.53	23.98
			24	16.33	0.94	17.27	23.98
			36	16.03	1.37	17.40	23.98
			48	15.81	1.64	17.45	23.98
			54	15.66	2.03	17.69	23.98

802.11a (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11a Mode: 5745~5825)

802.11a Mode		Power Level Setting	Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5745	149	18	6	16.58	0.28	16.86	30
			9	16.38	0.41	16.79	30
			12	16.23	0.53	16.75	30
			18	16.74	0.81	17.55	30
			24	16.33	0.94	17.28	30
			36	16.02	1.37	17.39	30
			48	15.82	1.64	17.46	30
			54	15.65	2.03	17.68	30
5785	157	18	6	16.34	0.28	16.62	30
			9	16.14	0.41	16.55	30
			12	16.02	0.53	16.55	30
			18	16.52	0.81	17.33	30
			24	16.13	0.94	17.07	30
			36	15.85	1.37	17.22	30
			48	15.61	1.64	17.24	30
			54	15.42	2.03	17.44	30
5825	165	18	6	16.51	0.28	16.79	30
			9	16.36	0.41	16.77	30
			12	16.23	0.53	16.76	30
			18	16.69	0.81	17.50	30
			24	16.30	0.94	17.24	30
			36	15.98	1.37	17.35	30
			48	15.79	1.64	17.43	30
			54	15.60	2.03	17.62	30

802.11n_HT20 (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5180~5240)

802.11n_HT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5180	36	16	0	14.02	0.33	14.35	23.98
			1	13.65	0.62	14.27	23.98
			2	14.39	0.79	15.18	23.98
			3	14.11	1.00	15.11	23.98
			4	14.03	1.32	15.36	23.98
			5	13.82	1.86	15.68	23.98
			6	13.76	1.79	15.54	23.98
			7	13.56	1.95	15.51	23.98
5200	40	16	0	14.33	0.33	14.66	23.98
			1	13.95	0.62	14.57	23.98
			2	14.67	0.79	15.46	23.98
			3	14.48	1.00	15.48	23.98
			4	14.33	1.32	15.65	23.98
			5	14.03	1.86	15.90	23.98
			6	13.93	1.79	15.72	23.98
			7	13.77	1.95	15.72	23.98
5240	48	16	0	14.14	0.33	14.47	23.98
			1	13.76	0.62	14.39	23.98
			2	14.48	0.79	15.27	23.98
			3	14.29	1.00	15.29	23.98
			4	14.17	1.32	15.49	23.98
			5	13.84	1.86	15.70	23.98
			6	13.78	1.79	15.57	23.98
			7	13.55	1.95	15.49	23.98

802.11n_HT20 (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5260~5320)

802.11n_HT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	16	0	13.84	0.33	14.17	23.98
			1	13.49	0.62	14.11	23.98
			2	14.22	0.79	15.01	23.98
			3	14.00	1.00	14.99	23.98
			4	13.87	1.32	15.19	23.98
			5	13.60	1.86	15.46	23.98
			6	13.55	1.79	15.34	23.98
			7	13.36	1.95	15.31	23.98
5300	60	16	0	13.71	0.33	14.04	23.98
			1	13.36	0.62	13.98	23.98
			2	14.06	0.79	14.84	23.98
			3	13.80	1.00	14.80	23.98
			4	13.71	1.32	15.03	23.98
			5	13.45	1.86	15.31	23.98
			6	13.37	1.79	15.16	23.98
			7	13.20	1.95	15.14	23.98
5320	64	16	0	13.73	0.33	14.06	23.98
			1	13.42	0.62	14.04	23.98
			2	14.14	0.79	14.92	23.98
			3	13.94	1.00	14.93	23.98
			4	13.84	1.32	15.16	23.98
			5	13.58	1.86	15.44	23.98
			6	13.51	1.79	15.29	23.98
			7	13.29	1.95	15.24	23.98

802.11n_HT20 (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5500~5720)

802.11n_HT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	16	0	13.52	0.33	13.85	23.98
			1	13.16	0.62	13.78	23.98
			2	13.87	0.79	14.66	23.98
			3	13.63	1.00	14.63	23.98
			4	13.52	1.32	14.84	23.98
			5	13.19	1.86	15.06	23.98
			6	13.12	1.79	14.91	23.98
			7	12.96	1.95	14.91	23.98
5600	120	16	0	13.99	0.33	14.32	23.98
			1	13.63	0.62	14.25	23.98
			2	14.35	0.79	15.14	23.98
			3	14.11	1.00	15.10	23.98
			4	13.98	1.32	15.30	23.98
			5	13.69	1.86	15.56	23.98
			6	13.61	1.79	15.40	23.98
			7	13.42	1.95	15.36	23.98
5720	144	16	0	14.35	0.33	14.68	23.98
			1	13.98	0.62	14.60	23.98
			2	14.77	0.79	15.56	23.98
			3	14.57	1.00	15.56	23.98
			4	14.38	1.32	15.70	23.98
			5	13.99	1.86	15.86	23.98
			6	13.93	1.79	15.71	23.98
			7	13.78	1.95	15.73	23.98

802.11n_HT20 (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5745~5825)

802.11n_HT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5745	149	16	0	14.37	0.33	14.70	30
			1	14.01	0.62	14.63	30
			2	14.74	0.79	15.53	30
			3	14.55	1.00	15.55	30
			4	14.32	1.32	15.64	30
			5	14.00	1.86	15.86	30
			6	13.95	1.79	15.74	30
			7	13.76	1.95	15.71	30
5785	157	16	0	14.64	0.33	14.97	30
			1	14.23	0.62	14.86	30
			2	15.02	0.79	15.81	30
			3	14.76	1.00	15.75	30
			4	14.57	1.32	15.89	30
			5	14.21	1.86	16.08	30
			6	14.15	1.79	15.94	30
			7	13.98	1.95	15.93	30
5825	165	16	0	14.74	0.33	15.08	30
			1	14.39	0.62	15.01	30
			2	15.14	0.79	15.92	30
			3	14.94	1.00	15.94	30
			4	14.71	1.32	16.03	30
			5	14.39	1.86	16.25	30
			6	14.28	1.79	16.07	30
			7	14.12	1.95	16.07	30

802.11ac_VHT20 (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT20 Mode: 5180~5240)

802.11ac_VHT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5180	36	15	0	13.13	0.27	13.40	23.98
			1	12.78	0.54	13.32	23.98
			2	13.50	0.84	14.34	23.98
			3	13.26	0.93	14.19	23.98
			4	13.19	1.24	14.43	23.98
			5	12.95	1.53	14.48	23.98
			6	12.87	1.65	14.52	23.98
			7	12.66	1.76	14.42	23.98
			8	12.53	1.93	14.46	23.98
5200	40	15	0	13.17	0.27	13.44	23.98
			1	12.84	0.54	13.38	23.98
			2	13.55	0.84	14.39	23.98
			3	13.33	0.93	14.26	23.98
			4	13.25	1.24	14.49	23.98
			5	12.96	1.53	14.49	23.98
			6	12.93	1.65	14.58	23.98
			7	12.75	1.76	14.51	23.98
			8	12.60	1.93	14.53	23.98
5240	48	15	0	13.07	0.27	13.33	23.98
			1	12.71	0.54	13.25	23.98
			2	13.42	0.84	14.26	23.98
			3	13.18	0.93	14.11	23.98
			4	13.12	1.24	14.36	23.98
			5	12.86	1.53	14.39	23.98
			6	12.80	1.65	14.45	23.98
			7	12.65	1.76	14.40	23.98
			8	12.45	1.93	14.37	23.98

802.11ac_VHT20 (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT20 Mode: 5260~5320)

802.11ac_VHT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	15	0	12.96	0.27	13.23	23.98
			1	12.60	0.54	13.14	23.98
			2	13.28	0.84	14.12	23.98
			3	13.09	0.93	14.02	23.98
			4	13.03	1.24	14.27	23.98
			5	12.75	1.53	14.28	23.98
			6	12.69	1.65	14.34	23.98
			7	12.51	1.76	14.27	23.98
			8	12.30	1.93	14.23	23.98
5300	60	15	0	13.06	0.27	13.33	23.98
			1	12.66	0.54	13.20	23.98
			2	13.33	0.84	14.17	23.98
			3	13.12	0.93	14.05	23.98
			4	13.09	1.24	14.34	23.98
			5	12.75	1.53	14.28	23.98
			6	12.65	1.65	14.31	23.98
			7	12.49	1.76	14.25	23.98
			8	12.30	1.93	14.23	23.98
5320	64	15	0	13.12	0.27	13.38	23.98
			1	12.78	0.54	13.32	23.98
			2	13.44	0.84	14.28	23.98
			3	13.24	0.93	14.17	23.98
			4	13.20	1.24	14.44	23.98
			5	12.82	1.53	14.34	23.98
			6	12.74	1.65	14.40	23.98
			7	12.56	1.76	14.32	23.98
			8	12.37	1.93	14.30	23.98

802.11ac_VHT20 (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT20 Mode: 5500~5720)

802.11ac_VHT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	15	0	12.85	0.27	13.12	23.98
			1	12.53	0.54	13.07	23.98
			2	13.22	0.84	14.06	23.98
			3	12.97	0.93	13.90	23.98
			4	12.85	1.24	14.09	23.98
			5	12.52	1.53	14.05	23.98
			6	12.44	1.65	14.09	23.98
			7	12.28	1.76	14.04	23.98
			8	12.10	1.93	14.03	23.98
5600	120	15	0	13.10	0.27	13.37	23.98
			1	12.83	0.54	13.37	23.98
			2	13.50	0.84	14.34	23.98
			3	13.30	0.93	14.23	23.98
			4	13.16	1.24	14.40	23.98
			5	12.89	1.53	14.42	23.98
			6	12.82	1.65	14.47	23.98
			7	12.63	1.76	14.39	23.98
			8	12.46	1.93	14.39	23.98
5720	144	15	0	13.44	0.27	13.71	23.98
			1	13.06	0.54	13.60	23.98
			2	13.76	0.84	14.60	23.98
			3	13.53	0.93	14.46	23.98
			4	13.44	1.24	14.68	23.98
			5	13.13	1.53	14.66	23.98
			6	13.07	1.65	14.72	23.98
			7	12.91	1.76	14.66	23.98
			8	12.74	1.93	14.67	23.98

802.11ac_VHT20 (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT20 Mode: 5745~5825)

802.11ac_VHT20 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5745	149	15	0	13.24	0.27	13.51	30
			1	12.89	0.54	13.43	30
			2	13.59	0.84	14.44	30
			3	13.37	0.93	14.30	30
			4	13.23	1.24	14.47	30
			5	12.90	1.53	14.43	30
			6	12.85	1.65	14.51	30
			7	12.68	1.76	14.44	30
			8	12.51	1.93	14.44	30
5785	157	15	0	13.44	0.27	13.70	30
			1	13.04	0.54	13.58	30
			2	13.76	0.84	14.61	30
			3	13.64	0.93	14.57	30
			4	13.57	1.24	14.81	30
			5	13.22	1.53	14.75	30
			6	13.17	1.65	14.82	30
			7	13.00	1.76	14.75	30
			8	12.81	1.93	14.74	30
5825	165	15	0	13.51	0.27	13.78	30
			1	13.14	0.54	13.68	30
			2	13.82	0.84	14.66	30
			3	13.61	0.93	14.54	30
			4	13.51	1.24	14.75	30
			5	13.29	1.53	14.82	30
			6	13.22	1.65	14.88	30
			7	13.10	1.76	14.85	30
			8	12.87	1.93	14.80	30

802.11n_HT40 (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT40 Mode: 5190~5230)

802.11n_HT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5190	38	16	0	14.79	0.54	15.32	23.98
			1	14.35	0.94	15.29	23.98
			2	14.02	1.29	15.31	23.98
			3	13.69	1.75	15.43	23.98
			4	13.31	1.99	15.30	23.98
			5	12.87	2.38	15.25	23.98
			6	12.78	2.48	15.26	23.98
			7	12.61	2.63	15.23	23.98
5230	46	16	0	14.93	0.54	15.46	23.98
			1	14.64	0.94	15.57	23.98
			2	14.29	1.29	15.58	23.98
			3	13.90	1.75	15.65	23.98
			4	13.55	1.99	15.53	23.98
			5	13.12	2.38	15.50	23.98
			6	13.01	2.48	15.49	23.98
			7	12.82	2.63	15.45	23.98

802.11n_HT40 (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT40 Mode: 5270~5310)

802.11n_HT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5270	54	16	0	14.80	0.54	15.34	23.98
			1	14.38	0.94	15.32	23.98
			2	14.06	1.29	15.35	23.98
			3	13.71	1.75	15.46	23.98
			4	13.39	1.99	15.38	23.98
			5	13.04	2.38	15.42	23.98
			6	12.92	2.48	15.40	23.98
			7	12.78	2.63	15.41	23.98
5310	62	16	0	14.83	0.54	15.37	23.98
			1	14.52	0.94	15.45	23.98
			2	14.16	1.29	15.45	23.98
			3	13.78	1.75	15.52	23.98
			4	13.50	1.99	15.49	23.98
			5	13.05	2.38	15.44	23.98
			6	12.97	2.48	15.45	23.98
			7	12.80	2.63	15.43	23.98

802.11n_HT40 (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT40 Mode: 5510~5710)

802.11n_HT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5510	102	16	0	14.56	0.54	15.10	23.98
			1	14.11	0.94	15.05	23.98
			2	13.80	1.29	15.09	23.98
			3	13.43	1.75	15.17	23.98
			4	13.16	1.99	15.14	23.98
			5	12.74	2.38	15.12	23.98
			6	12.64	2.48	15.12	23.98
			7	12.50	2.63	15.12	23.98
5550	110	16	0	15.01	0.54	15.55	23.98
			1	14.59	0.94	15.52	23.98
			2	14.26	1.29	15.55	23.98
			3	13.93	1.75	15.68	23.98
			4	13.47	1.99	15.46	23.98
			5	13.14	2.38	15.52	23.98
			6	13.10	2.48	15.59	23.98
			7	12.85	2.63	15.48	23.98
5670	134	16	0	15.45	0.54	15.99	23.98
			1	15.11	0.94	16.05	23.98
			2	14.73	1.29	16.02	23.98
			3	14.36	1.75	16.10	23.98
			4	14.01	1.99	16.00	23.98
			5	13.55	2.38	15.93	23.98
			6	13.52	2.48	16.00	23.98
			7	13.37	2.63	15.99	23.98

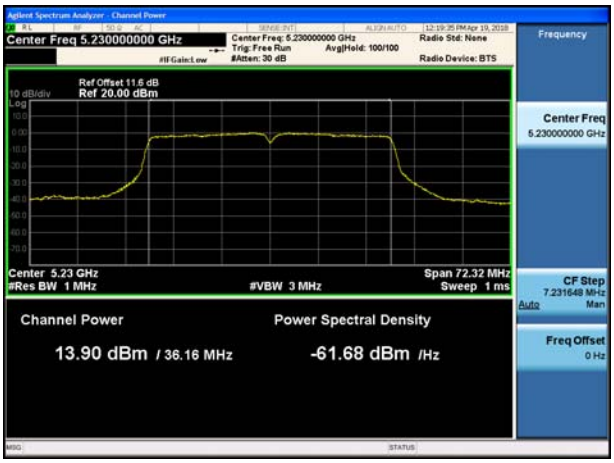
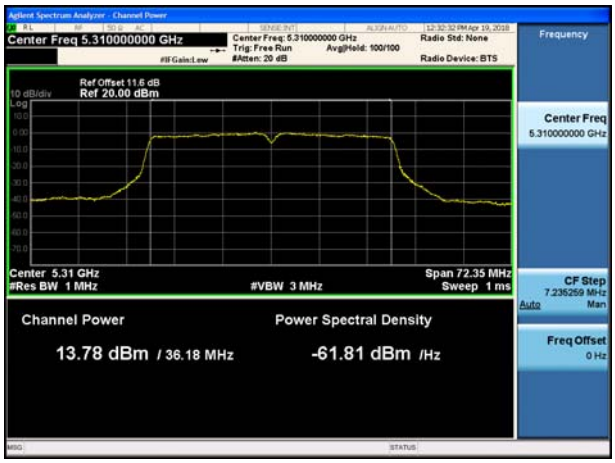
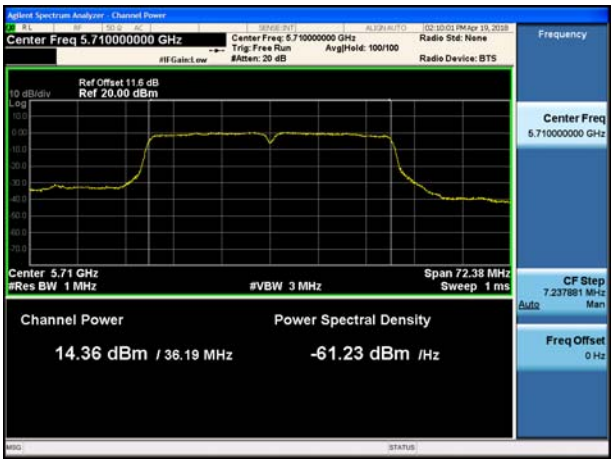
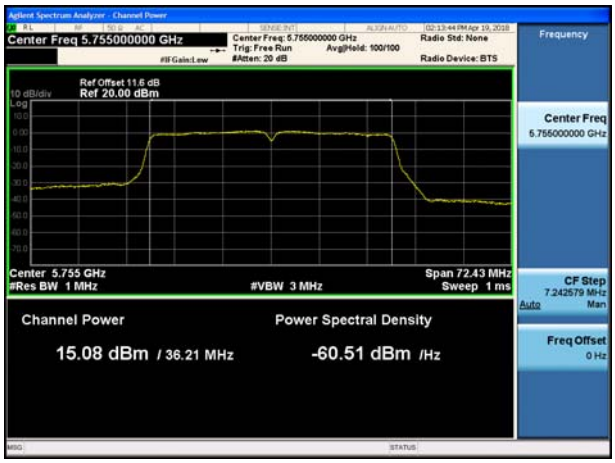
802.11n_HT40 (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11n_HT40 Mode: 5755~5795)

802.11n_HT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5755	151	16	0	15.27	0.54	15.80	30
			1	15.08	0.94	16.02	30
			2	14.68	1.29	15.97	30
			3	14.21	1.75	15.95	30
			4	13.86	1.99	15.84	30
			5	13.55	2.38	15.93	30
			6	13.45	2.48	15.93	30
			7	13.20	2.63	15.83	30
5795	159	16	0	15.27	0.54	15.81	30
			1	14.94	0.94	15.88	30
			2	14.54	1.29	15.83	30
			3	14.23	1.75	15.98	30
			4	13.90	1.99	15.88	30
			5	13.44	2.38	15.82	30
			6	13.40	2.48	15.88	30
			7	13.22	2.63	15.85	30

▣ TEST Plot _802.11n_HT40

802.11n_HT40 UNII 1 BAND Average Power (5190 MHz ~5230 MHz) CH 46 MCS3	802.11n_HT40 UNII 2A BAND Average Power (5270 MHz ~5310 MHz) CH 62 MCS3
	
802.11n_HT40 UNII 2C BAND Average Power (5510 MHz ~5710 MHz) CH 142 MCS3	**802.11n_HT40 UNII 3 BAND Average Power (5755 MHz ~5795 MHz) CH 151 MCS1**
	

802.11ac_VHT40 (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT40 Mode: 5190~5230)

802.11ac_VHT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5190	38	15	0	14.19	0.51	14.70	23.98
			1	13.77	0.92	14.69	23.98
			2	13.42	1.27	14.69	23.98
			3	13.07	1.52	14.58	23.98
			4	12.76	1.92	14.69	23.98
			5	12.50	2.37	14.88	23.98
			6	12.26	2.46	14.72	23.98
			7	12.16	2.54	14.70	23.98
			8	12.04	2.71	14.75	23.98
			9	11.83	2.94	14.77	23.98
5230	46	15	0	14.28	0.51	14.79	23.98
			1	13.87	0.92	14.79	23.98
			2	13.54	1.27	14.81	23.98
			3	13.26	1.52	14.78	23.98
			4	12.89	1.92	14.81	23.98
			5	12.53	2.37	14.90	23.98
			6	12.41	2.46	14.87	23.98
			7	12.25	2.54	14.79	23.98
			8	12.16	2.71	14.87	23.98
			9	11.89	2.94	14.83	23.98

802.11ac_VHT40 (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT40 Mode: 5270~5310)

802.11ac_VHT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5270	54	15	0	13.92	0.51	14.43	23.98
			1	13.55	0.92	14.47	23.98
			2	13.21	1.27	14.48	23.98
			3	12.88	1.52	14.39	23.98
			4	12.61	1.92	14.53	23.98
			5	12.27	2.37	14.64	23.98
			6	12.17	2.46	14.63	23.98
			7	12.00	2.54	14.54	23.98
			8	11.88	2.71	14.59	23.98
			9	11.61	2.94	14.55	23.98
5310	62	15	0	14.03	0.51	14.54	23.98
			1	13.71	0.92	14.63	23.98
			2	13.32	1.27	14.59	23.98
			3	13.03	1.52	14.55	23.98
			4	12.69	1.92	14.61	23.98
			5	12.32	2.37	14.69	23.98
			6	12.18	2.46	14.64	23.98
			7	12.03	2.54	14.57	23.98
			8	11.94	2.71	14.65	23.98
			9	11.76	2.94	14.70	23.98

802.11ac_VHT40 (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT40 Mode: 5510~5710)

802.11ac_VHT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5510	102	15	0	13.96	0.51	14.47	23.98
			1	13.47	0.92	14.39	23.98
			2	13.11	1.27	14.38	23.98
			3	12.68	1.52	14.19	23.98
			4	12.40	1.92	14.32	23.98
			5	12.06	2.37	14.44	23.98
			6	11.88	2.46	14.33	23.98
			7	11.73	2.54	14.27	23.98
			8	11.67	2.71	14.38	23.98
			9	11.45	2.94	14.39	23.98
5590	118	15	0	14.28	0.51	14.79	23.98
			1	13.90	0.92	14.82	23.98
			2	13.58	1.27	14.86	23.98
			3	13.22	1.52	14.74	23.98
			4	12.85	1.92	14.77	23.98
			5	12.43	2.37	14.80	23.98
			6	12.41	2.46	14.87	23.98
			7	12.36	2.54	14.90	23.98
			8	12.27	2.71	14.98	23.98
			9	12.11	2.94	15.05	23.98
5710	142	15	0	14.69	0.51	15.20	23.98
			1	14.25	0.92	15.17	23.98
			2	13.90	1.27	15.17	23.98
			3	13.51	1.52	15.03	23.98
			4	13.17	1.92	15.09	23.98
			5	12.71	2.37	15.08	23.98
			6	12.67	2.46	15.12	23.98
			7	12.50	2.54	15.04	23.98
			8	12.39	2.71	15.10	23.98
			9	12.31	2.94	15.24	23.98

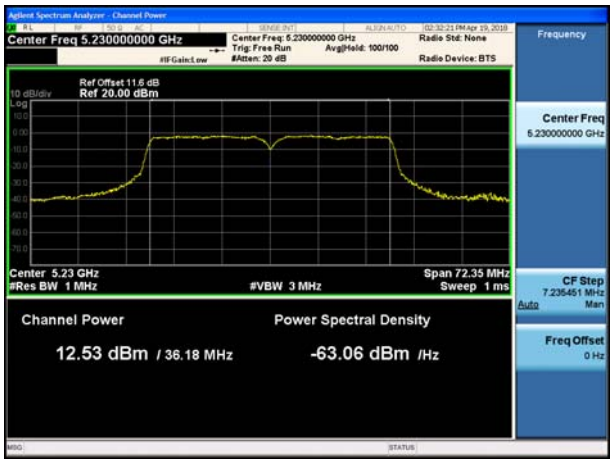
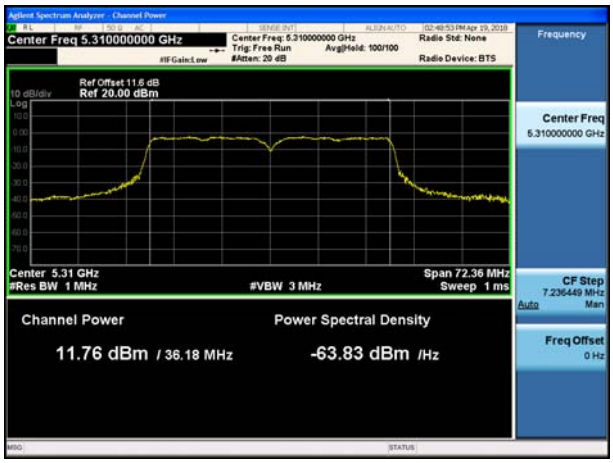
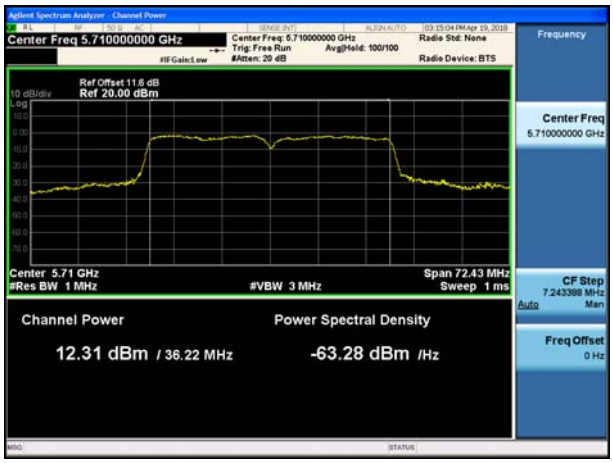
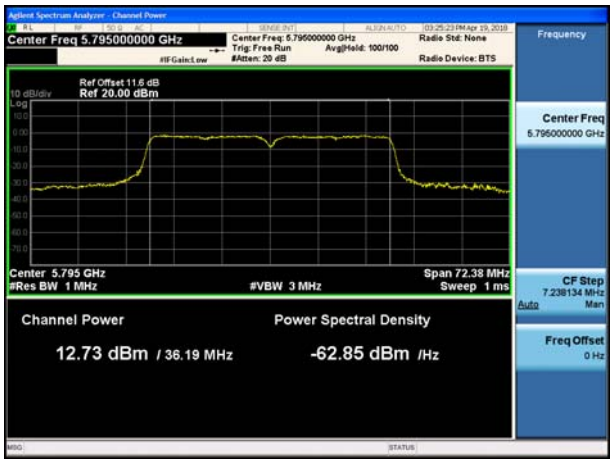
802.11ac_VHT40 (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT40 Mode: 5755~5795)

802.11ac_VHT40 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5755	151	15	0	14.50	0.51	15.01	30
			1	13.99	0.92	14.91	30
			2	13.60	1.27	14.87	30
			3	13.24	1.52	14.76	30
			4	12.89	1.92	14.81	30
			5	12.57	2.37	14.95	30
			6	12.52	2.46	14.98	30
			7	12.25	2.54	14.79	30
			8	12.19	2.71	14.90	30
			9	11.95	2.94	14.89	30
5795	159	15	0	14.29	0.51	14.80	30
			1	13.90	0.92	14.82	30
			2	13.56	1.27	14.83	30
			3	13.22	1.52	14.74	30
			4	12.99	1.92	14.91	30
			5	12.73	2.37	15.11	30
			6	12.60	2.46	15.05	30
			7	12.39	2.54	14.93	30
			8	12.27	2.71	14.98	30
			9	12.02	2.94	14.96	30

▣ TEST Plot _802.11ac_VHT40

802.11ac_VHT40 UNII 1 BAND Average Power (5190 MHz ~5230 MHz) CH 46 MCS5	802.11ac_VHT40 UNII 2A BAND Average Power (5270 MHz ~5310 MHz) CH 62 MCS9
	
802.11ac_VHT40 UNII 2C BAND Average Power (5510 MHz ~5710 MHz) CH 142 MCS9	**802.11ac_VHT40 UNII 3 BAND Average Power (5755 MHz ~5795 MHz) CH 159 MCS5**
	

802.11ac_VHT80 (UNII 1)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 Mode: 5210)

802.11ac_VHT80 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5210	42	14	0	13.11	0.66	13.77	23.98
			1	12.88	1.06	13.94	23.98
			2	12.55	1.38	13.93	23.98
			3	12.19	1.88	14.07	23.98
			4	12.06	2.11	14.18	23.98
			5	11.80	2.50	14.29	23.98
			6	11.64	2.57	14.21	23.98
			7	11.53	2.67	14.21	23.98
			8	11.23	2.96	14.19	23.98
			9	11.10	3.11	14.21	23.98

802.11ac_VHT80 (UNII 2A)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 Mode: 5290)

802.11ac_VHT80 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5290	58	15	0	13.69	0.66	14.35	23.98
			1	13.33	1.06	14.39	23.98
			2	13.07	1.38	14.45	23.98
			3	12.68	1.88	14.56	23.98
			4	12.43	2.11	14.54	23.98
			5	12.08	2.50	14.58	23.98
			6	12.03	2.57	14.60	23.98
			7	11.98	2.67	14.66	23.98
			8	11.72	2.96	14.68	23.98
			9	11.59	3.11	14.71	23.98

802.11ac_VHT80 (UNII 2C)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 Mode: 5530 MHz – 5690 MHz)

802.11ac_VHT80 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5530	106	15	0	13.72	0.66	14.38	23.98
			1	13.41	1.06	14.47	23.98
			2	13.14	1.38	14.52	23.98
			3	12.82	1.88	14.70	23.98
			4	12.54	2.11	14.66	23.98
			5	12.26	2.50	14.76	23.98
			6	12.18	2.57	14.75	23.98
			7	12.05	2.67	14.72	23.98
			8	11.76	2.96	14.72	23.98
			9	11.58	3.11	14.70	23.98
5610	122	15	0	13.79	0.66	14.45	23.98
			1	13.44	1.06	14.50	23.98
			2	13.24	1.38	14.62	23.98
			3	12.91	1.88	14.80	23.98
			4	12.64	2.11	14.75	23.98
			5	12.19	2.50	14.69	23.98
			6	12.14	2.57	14.71	23.98
			7	12.06	2.67	14.73	23.98
			8	11.80	2.96	14.76	23.98
			9	11.67	3.11	14.79	23.98
5690	138	15	0	14.40	0.66	15.06	23.98
			1	14.19	1.06	15.25	23.98
			2	13.80	1.38	15.18	23.98
			3	13.50	1.88	15.38	23.98
			4	13.22	2.11	15.33	23.98
			5	12.83	2.50	15.33	23.98
			6	12.79	2.57	15.36	23.98
			7	12.71	2.67	15.39	23.98
			8	12.46	2.96	15.42	23.98
			9	12.37	3.11	15.48	23.98

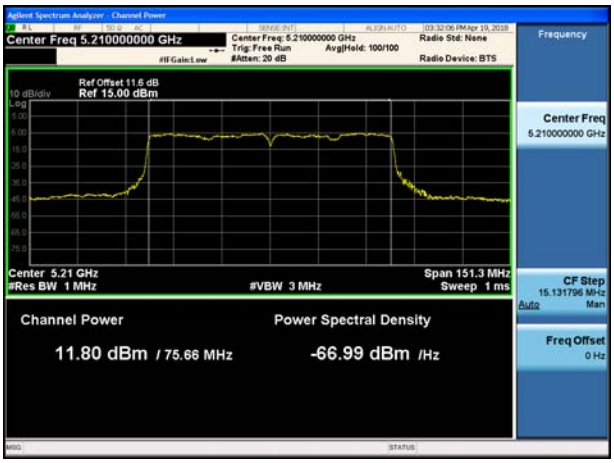
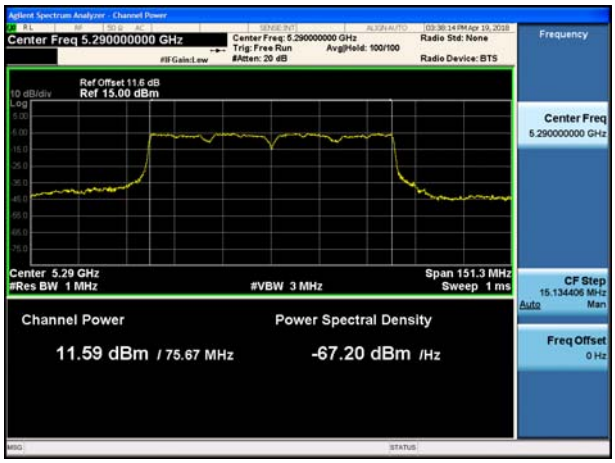
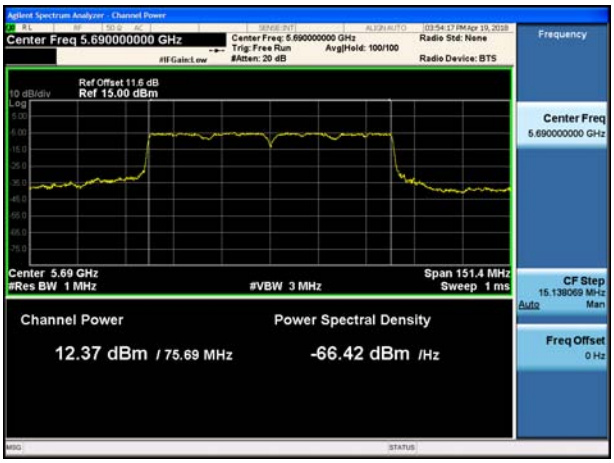
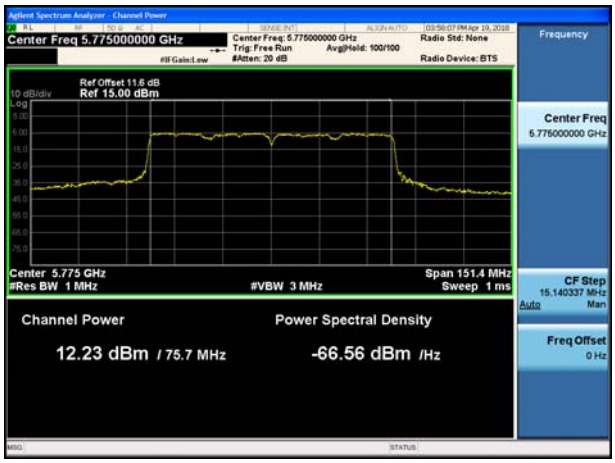
802.11ac_VHT80 (UNII 3)

▣ TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 Mode: 5775 MHz)

802.11ac_VHT80 Mode		Power Level Setting	MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.						
5775	155	15	0	13.88	0.66	14.54	30
			1	13.62	1.06	14.68	30
			2	13.23	1.38	14.61	30
			3	12.95	1.88	14.83	30
			4	12.64	2.11	14.75	30
			5	12.28	2.50	14.77	30
			6	12.24	2.57	14.81	30
			7	12.23	2.67	14.90	30
			8	11.92	2.96	14.89	30
			9	11.79	3.11	14.90	30

▣ TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 1 BAND Average Power (5210 MHz) CH 42 MCS5	802.11ac_VHT80 UNII 2A BAND Average Power (5290 MHz) CH 58 MCS9
	
802.11ac_VHT80 UNII 2C BAND Average Power (5530 MHz – 5690 MHz) CH 138 MCS9	**802.11ac_VHT80 UNII 3 BAND Average Power (5775 MHz) CH 155 MCS7**
	

▣Straddle channels TEST RESULTS

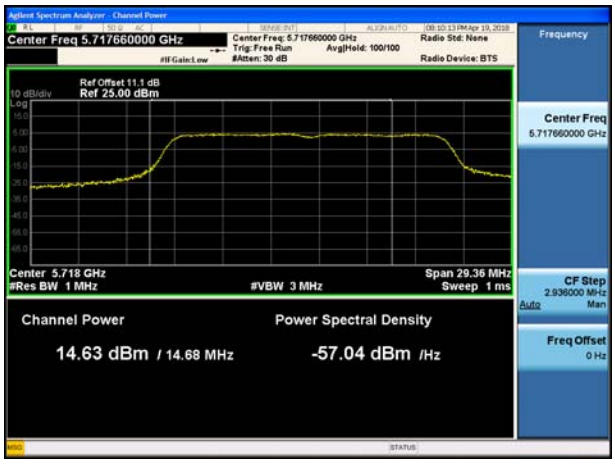
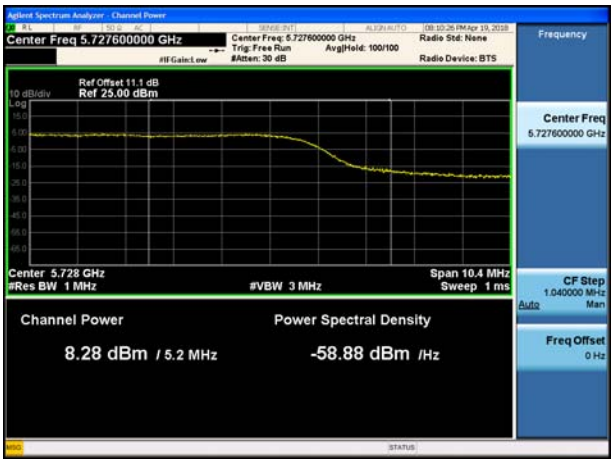
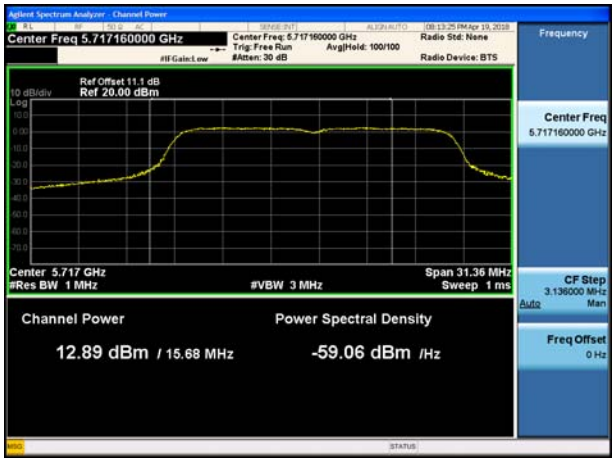
Conducted Output Power Measurements (802.11a/n_HT20/ac_VHT20 Mode: UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11a	5720	144	14.63	2.026	16.66	22.66
802.11n			12.89	1.864	14.75	22.66
802.11ac			11.82	1.652	13.47	22.66

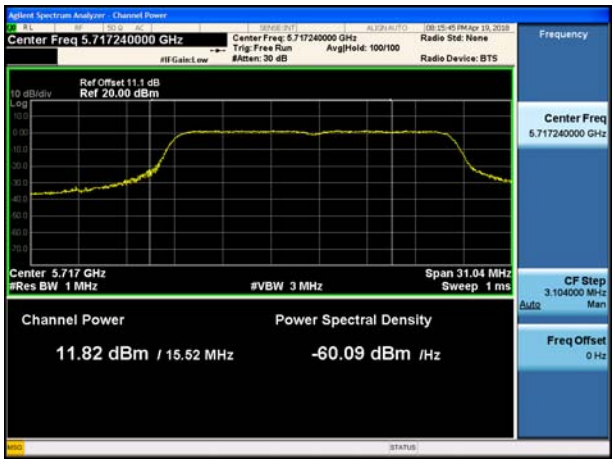
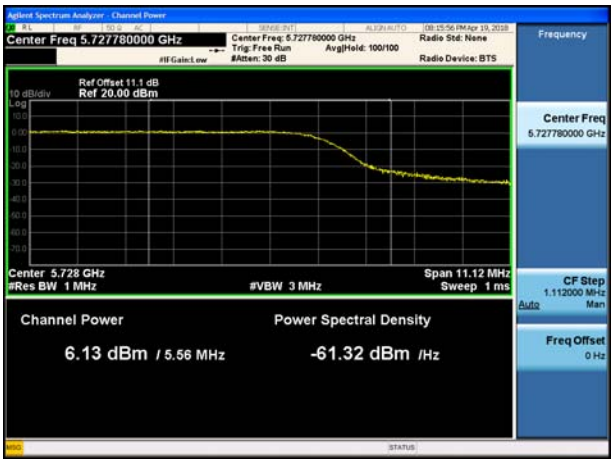
Conducted Output Power Measurements (802.11a/n_HT20/ac_VHT20 Mode: UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11a	5720	144	8.28	2.026	10.31	24.18
802.11n			7.06	1.864	8.92	24.18
802.11ac			6.13	1.652	7.78	24.18

▣Straddle channels TEST Plot for 802.11a/n_HT20

802.11a UNII 2C Band Average Power CH.144	802.11a UNII 3 Band Average Power CH.144
	
802.11n_HT20 UNII 2C Band Average Power CH.144	**802.11n_HT20 UNII 3 Band Average Power CH.144**
	

▣Straddle channels TEST Plot for 802.11ac_VHT20

802.11ac_VHT20 UNII 2C Band Average Power CH.144	802.11ac_VHT20 UNII 3 Band Average Power CH.144
	

▣Straddle channels TEST RESULTS

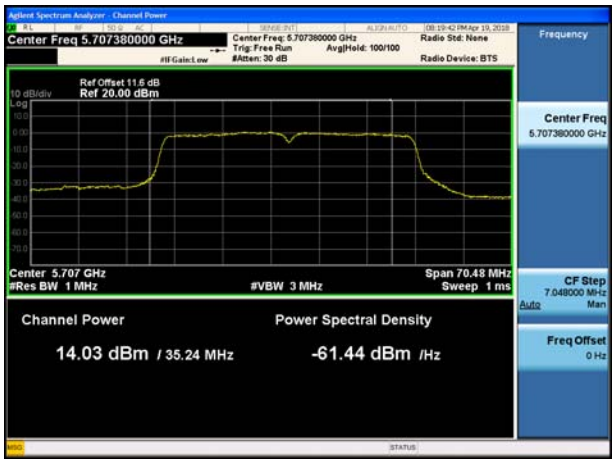
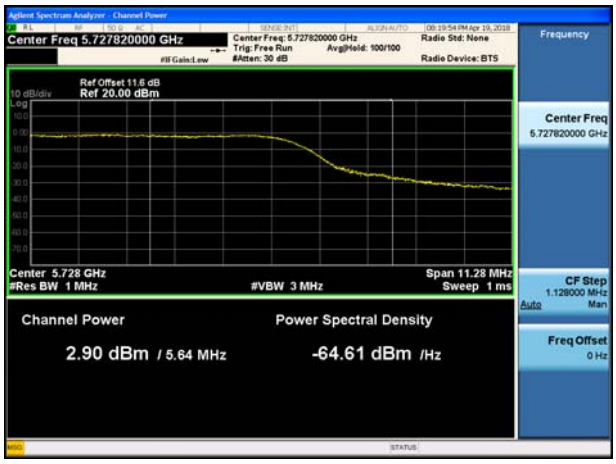
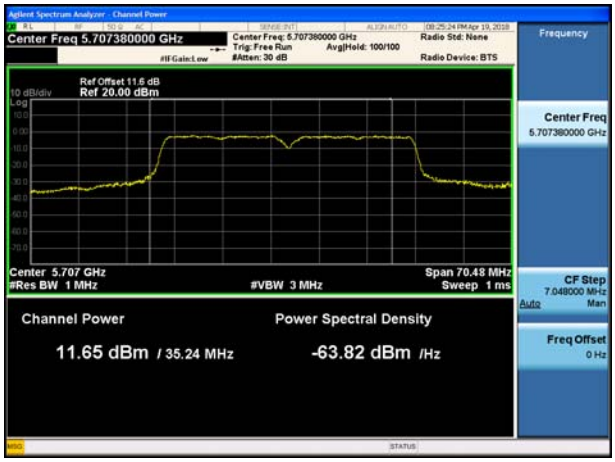
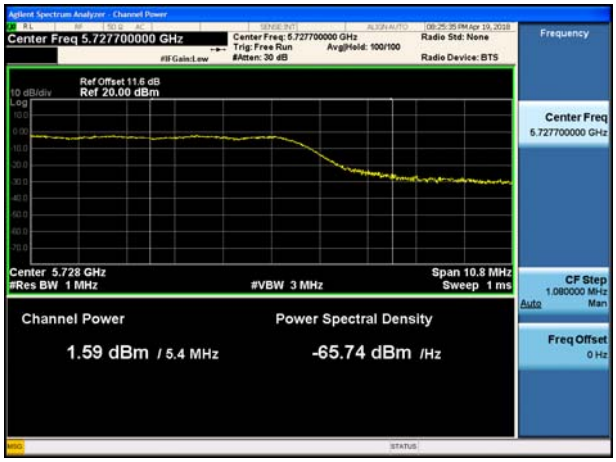
Conducted Output Power Measurements (802.11n_HT40/ac_VHT40 Mode: UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11n	5710	142	14.03	1.747	15.78	22.66
802.11ac			11.65	2.936	14.59	22.66

Conducted Output Power Measurements (802.11n_HT40/ac_VHT40 Mode: UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11n	5710	142	2.90	1.747	4.65	24.18
802.11ac			1.59	2.936	4.53	24.18

▣Straddle channels TEST Plot for 802.11n_HT40/ac_VHT40

802.11n_HT40 UNII 2C Band Average Power CH.142	802.11n_HT40 UNII 3 Band Average Power CH.142
	
802.11ac_VHT40 UNII 2C Band Average Power CH.142	**802.11ac_VHT40 UNII 3 Band Average Power CH.142**
	

▣Straddle channels TEST RESULTS

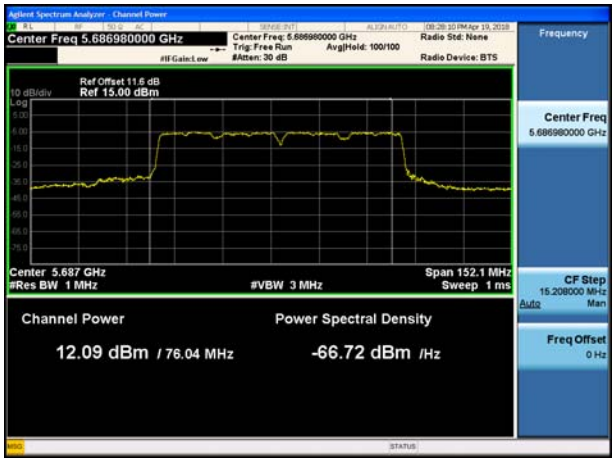
Conducted Output Power Measurements (802.11ac_VHT80 Mode: UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11ac	5690	138	12.09	3.112	15.20	22.66

Conducted Output Power Measurements (802.11ac_VHT80 Mode: UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11ac	5690	138	-1.30	3.112	1.81	24.18

▣Straddle channels TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 2C Band Average Power CH.138	802.11ac_VHT80 UNII 3 Band Average Power CH.138
	

9.4 POWER SPECTRAL DENSITY

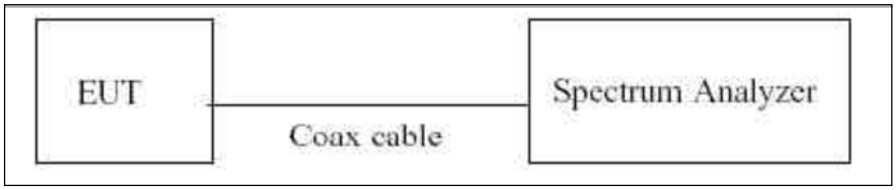
The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. The maximum permissible peak power spectral density is 11 dBm/ MHz for UNII 1,2A, 2C and 30 dBm/500 kHz for UNII 3.

▣ Limit

Power Spectral Density

Band	Mode	Limit
UNII 1	802.11a,n,ac	11 dBm/MHz
UNII 2A	802.11a,n,ac	11 dBm/MHz
UNII 2C	802.11a,n,ac	11 dBm/MHz
UNII 3	802.11a,n,ac	30 dBm/500 kHz

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to Method in KDB 789033 D02 v02r01.

The spectrum analyzer is set to :

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
3. VBW ≥ 3 MHz
4. Number of points in sweep ≥ 2*span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.

▣ Sample Calculation

PSD = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Output Power = 5 dBm + 10 dB + 0.8 dB + 0.21 dB = 16.01 dBm

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Mod	Loss(dB)
802.11a/ 802.11n(HT20)/ 802.11ac(VHT20)	11.1
802.11n(HT40)/ 802.11ac(VHT40)/ 802.11ac(VHT80)	11.6

(Actual value of loss for the attenuator and cable combination)

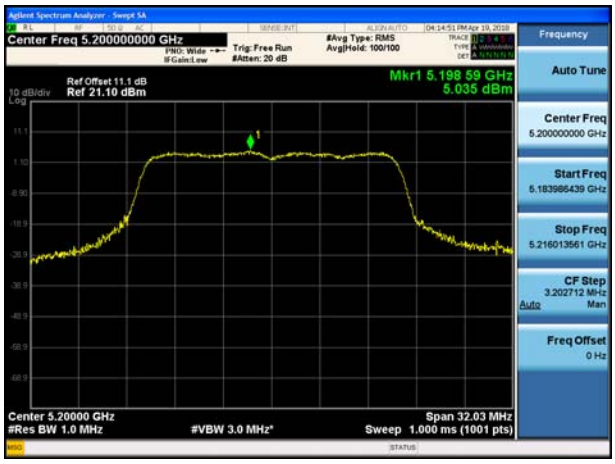
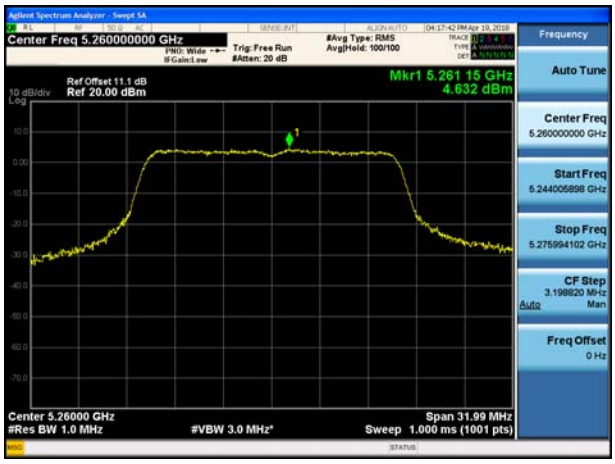
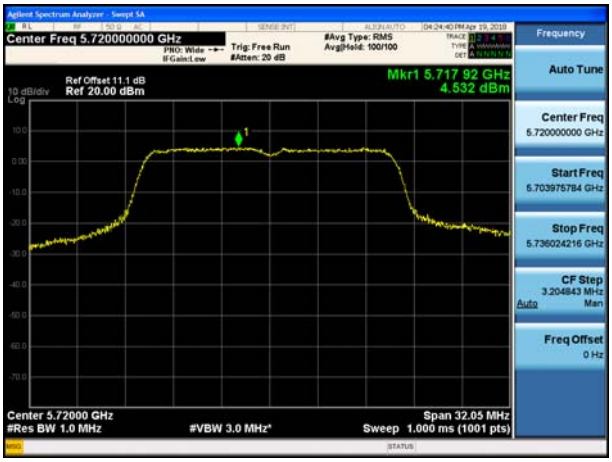
▣ 802.11a

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11a	4.361	2.026	6.387	11	Pass
5200	40		5.035	2.026	7.061		Pass
5240	48		4.613	2.026	6.639		Pass
5260	52		4.632	2.026	6.658	11	Pass
5300	60		4.572	2.026	6.598		Pass
5320	64		4.407	2.026	6.433		Pass
5500	100		3.999	2.026	6.025	11	Pass
5600	120		4.330	2.026	6.356		Pass
5720	144		4.532	2.026	6.558		Pass
5745	149		2.022	2.026	4.048	30	Pass
5785	157		1.830	2.026	3.856		Pass
5825	165		1.930	2.026	3.956		Pass

▣ TEST Plot for 802.11a

802.11a UNII 1 BAND PSD CH 40	802.11a UNII 2A BAND PSD CH 52
	
802.11a UNII 2C BAND PSD CH 144	**802.11a UNII 3 BAND PSD CH 149**
	

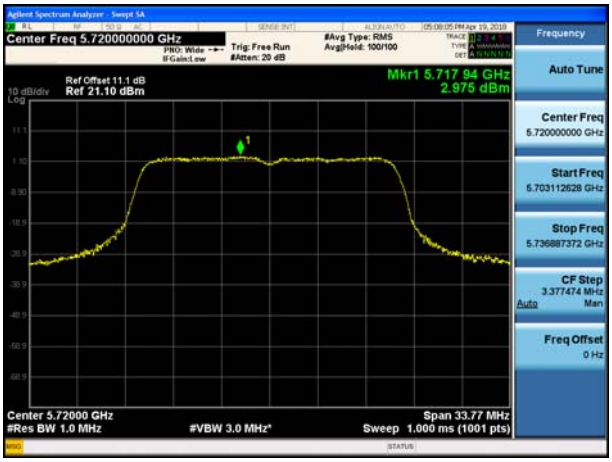
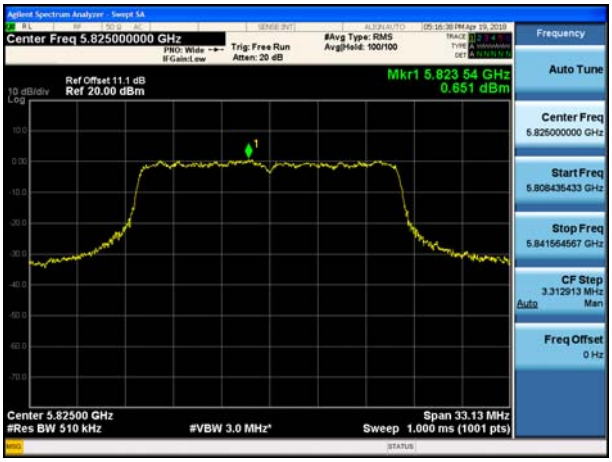
▣802.11n_HT20

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11n _HT20	2.408	1.864	4.272	11	Pass
5200	40		2.415	1.864	4.279		Pass
5240	48		2.713	1.864	4.577		Pass
5260	52		2.360	1.864	4.224	11	Pass
5300	60		2.924	1.864	4.788		Pass
5320	64		2.402	1.864	4.266		Pass
5500	100		2.132	1.864	3.996	11	Pass
5600	120		2.509	1.864	4.373		Pass
5720	144		2.975	1.864	4.839		Pass
5745	149		0.132	1.864	1.996	30	Pass
5785	157		0.481	1.864	2.345		Pass
5825	165		0.651	1.864	2.515		Pass

▣ TEST Plot for 802.11n_HT20

802.11n_HT20 UNII 1 BAND PSD CH 48	802.11n_HT20 UNII 2A BAND PSD CH 60
802.11n_HT20 UNII 2C BAND PSD CH 144	**802.11n_HT20 UNII 3 BAND PSD CH 165**
	

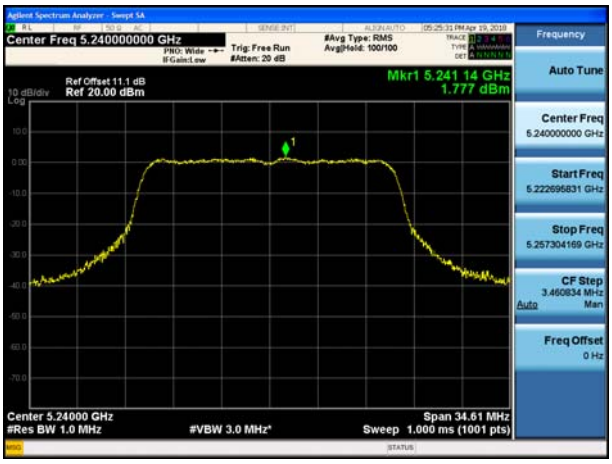
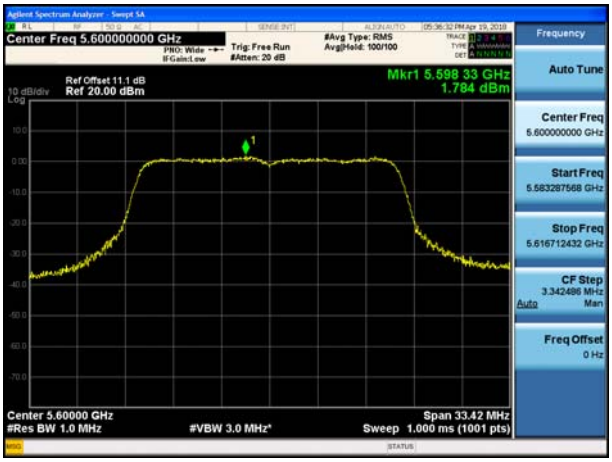
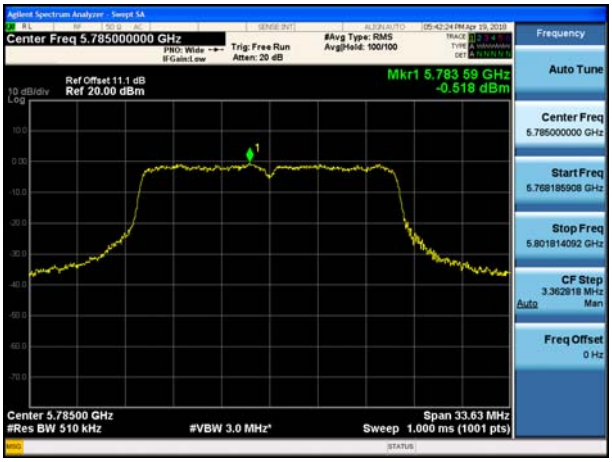
▣802.11ac_VHT20

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11ac _VHT20	1.454	1.652	3.106	11	Pass
5200	40		1.625	1.652	3.277		Pass
5240	48		1.777	1.652	3.429		Pass
5260	52		1.593	1.652	3.245	11	Pass
5300	60		1.792	1.241	3.033		Pass
5320	64		2.115	1.241	3.356		Pass
5500	100		1.190	1.652	2.842	11	Pass
5600	120		1.784	1.652	3.436		Pass
5720	144		1.764	1.652	3.416		Pass
5745	149		-0.745	1.652	0.907	30	Pass
5785	157		-0.518	1.652	1.134		Pass
5825	165		-0.670	1.652	0.982		Pass

▣ TEST Plot for 802.11ac_VHT20

802.11ac_VHT20 UNII 1 BAND PSD CH 48	802.11ac_VHT20 UNII 2A BAND PSD CH 64
	
802.11ac_VHT20 UNII 2C BAND PSD CH 120	**802.11ac_VHT20 UNII 3 BAND PSD CH 157**
	

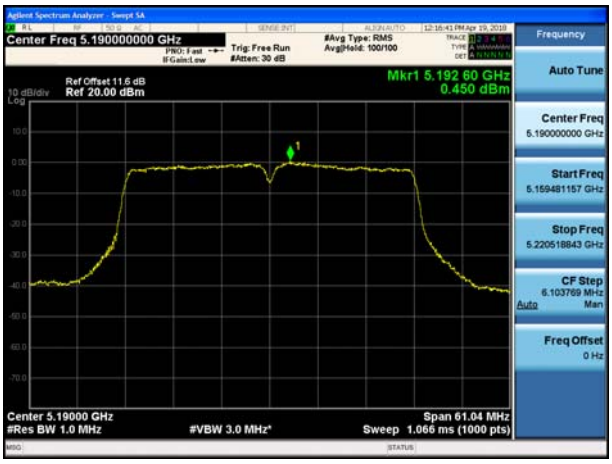
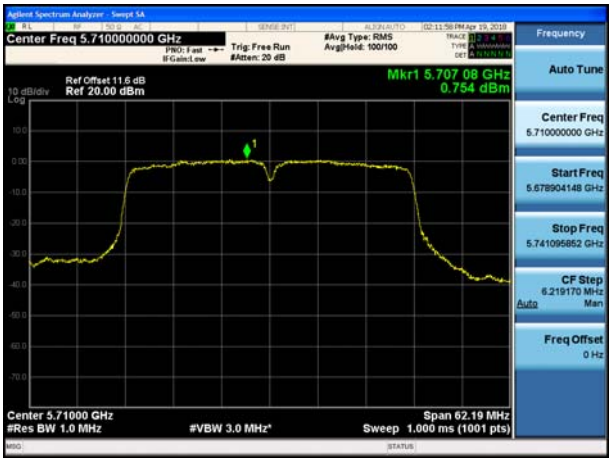
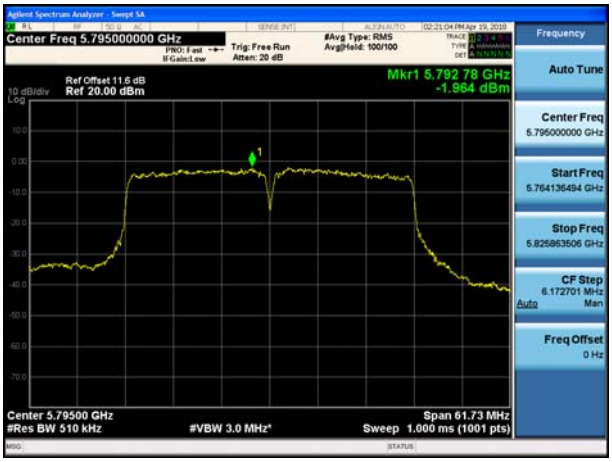
▣ 802.11n_HT40

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5190	38	802.11n _HT40	0.450	1.747	2.197	11	Pass
5230	46		0.189	1.747	1.936		Pass
5270	54		0.098	1.747	1.845	11	Pass
5310	62		0.077	1.747	1.824		Pass
5510	102		-0.076	1.747	1.671	11	Pass
5590	118		0.598	1.747	2.345		Pass
5710	142		0.754	1.747	2.501		Pass
5755	151		-1.294	0.936	-0.358	30	Pass
5795	159		-1.964	1.747	-0.217		Pass

▣ TEST Plot for 802.11n_HT40

802.11n_HT40 UNII 1 BAND PSD CH 38	802.11n_HT40 UNII 2A BAND PSD CH 54
	
802.11n_HT40 UNII 2C BAND PSD CH 142	**802.11n_HT40 UNII 3 BAND PSD CH 159**
	

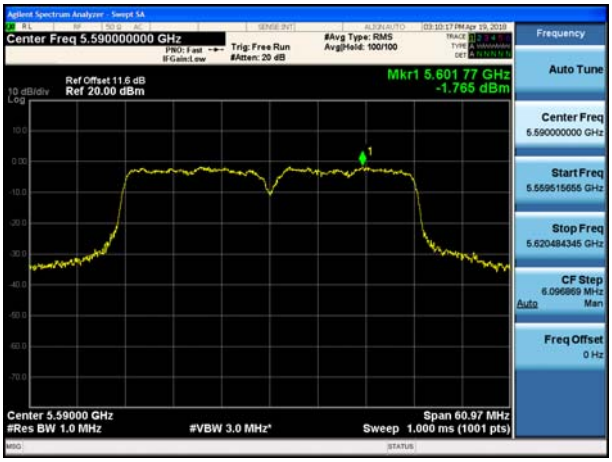
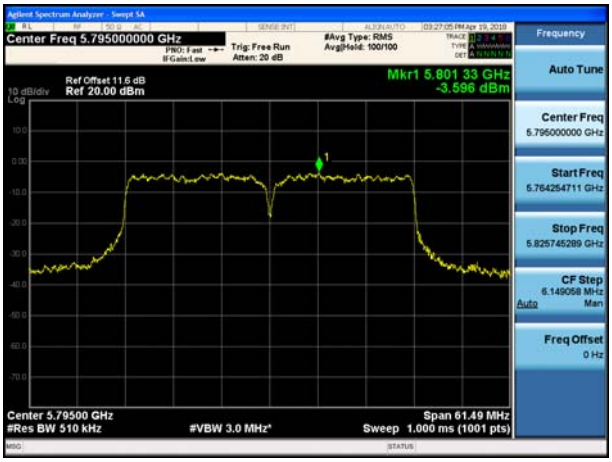
▣ 802.11ac_VHT40

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5190	38	802.11ac _VHT40	-1.560	2.374	0.814	11	Pass
5230	46		-1.470	2.374	0.904		Pass
5270	54		-0.921	2.374	1.453	11	Pass
5310	62		-2.082	2.936	0.854		Pass
5510	102		0.196	0.510	0.706	11	Pass
5590	118		-1.765	2.936	1.171		Pass
5710	142		-1.826	2.936	1.110		Pass
5755	151		-1.907	0.510	-1.397	30	Pass
5795	159		-3.596	2.374	-1.222		Pass

▣ TEST Plot for 802.11ac_VHT40

802.11ac_VHT40 UNII 1 BAND PSD CH 46	802.11ac_VHT40 UNII 2A BAND PSD CH 54
802.11ac_VHT40 UNII 2C BAND PSD CH 118	**802.11ac_VHT40 UNII 3 BAND PSD CH 159**
	

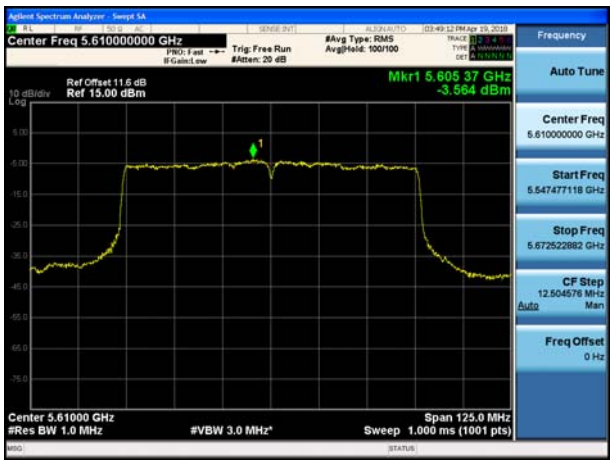
▣ 802.11ac_VHT80

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5210	42	802.11ac _VHT80	-5.573	2.496	-3.077	11	Pass
5290	58		-5.537	3.112	-2.425	11	Pass
5530	106		-4.981	2.496	-2.485	11	Pass
5610	122		-3.564	1.881	-1.683	11	Pass
5690	138		-4.517	3.112	-1.405	11	Pass
5775	155		-7.289	2.673	-4.616	30	Pass

▣ TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 1 BAND PSD CH 42	802.11ac_VHT80 UNII 2A BAND PSD CH 58
802.11ac_VHT80 UNII 2C BAND PSD CH 106	**802.11ac_VHT80 UNII 3 BAND PSD CH 122**
	
802.11ac_VHT80 UNII 2C BAND PSD CH 138	**802.11ac_VHT80 UNII 3 BAND PSD CH 155**

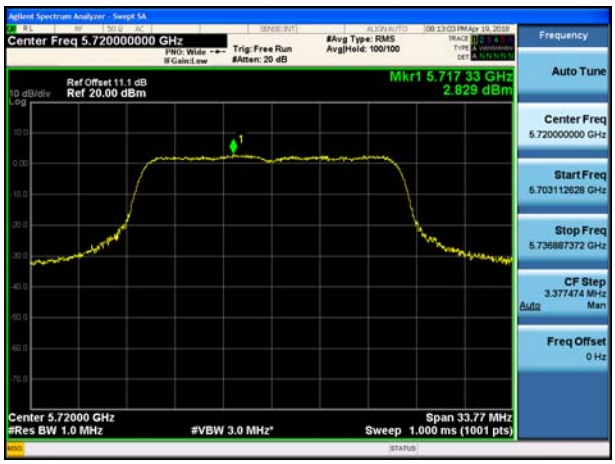
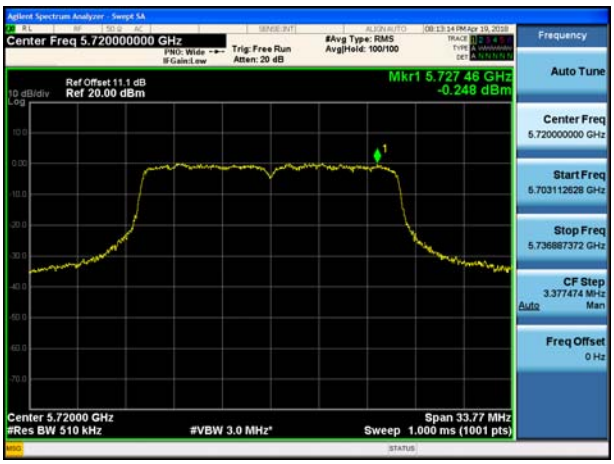
▣Straddle channels TEST RESULTS for 802.11a/n_HT20/ac_VHT20

Conducted Power Density Measurements (UNII 2C Band)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	4.856	2.026	6.882	11	Pass
		802.11n	2.829	1.864	4.693	11	Pass
		802.11ac	2.112	1.652	3.764	11	Pass

Conducted Power Density Measurements (UNII 3 Band)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	1.698	2.026	3.724	30	Pass
		802.11n	-0.248	1.864	1.616	30	Pass
		802.11ac	-1.036	1.652	0.616	30	Pass

▣Straddle channels TEST Plot for 802.11a/n_HT20/ac_VHT20

802.11a UNII 2C Band PSD CH.144	802.11a UNII 3 Band PSD CH.144
802.11n_HT20 UNII 2C Band PSD CH.144	**802.11n_HT20 UNII 3 Band PSD CH.144**