

FCC UNII REPORT

FCC Certification

Applicant Name:

SAMSUNG Electronics Co.,Ltd.

Date of Issue:

March 28, 2016

Test Site/Location:

HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Address:

129, Samsung-ro, Yeongtong-gu, Suwon-si,

Report No.: HCT-R-1603-F075-1

HCT FRN: 0005866421

Gyeonggi-do, 16677, Rep. of Korea

IC Recognition No.: 5944A-5

FCC ID : A3LSMJ700T
APPLICANT : SAMSUNG Electronics Co.,Ltd.
Model(s):

SM-J700T

Additional Model(s):

SM-J700T1

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_20MHz	5180 – 5240	16.46	0.0443
	802.11n_20MHz	5180 – 5240	16.14	0.0411
	802.11n_40MHz	5190 – 5230	15.22	0.0333
	802.11ac_20MHz	5180 – 5240	16.20	0.0417
	802.11ac_40MHz	5190 – 5230	15.19	0.0330
	802.11ac_80MHz	5210	8.86	0.0077
UNII2A	802.11a_20MHz	5260 – 5320	16.70	0.0468
	802.11n_20MHz	5260 – 5320	16.43	0.0440
	802.11n_40MHz	5270 – 5310	15.41	0.0348
	802.11ac_20MHz	5260 – 5320	16.44	0.0441
	802.11ac_40MHz	5270 – 5310	15.41	0.0348
	802.11ac_80MHz	5290	8.92	0.0078
UNII2C	802.11a_20MHz	5500 – 5720	16.35	0.0432
	802.11n_20MHz	5500 – 5720	16.05	0.0403
	802.11n_40MHz	5510 – 5710	15.25	0.0335
	802.11ac_20MHz	5500 – 5720	16.07	0.0405
	802.11ac_40MHz	5510 – 5710	15.36	0.0344
	802.11ac_80MHz	5530 – 5690	14.37	0.0274
UNII3	802.11a_20MHz	5745 – 5825	16.21	0.0418
	802.11n_20MHz	5745 – 5825	16.01	0.0399
	802.11n_40MHz	5755 – 5795	14.96	0.0313
	802.11ac_20MHz	5745 – 5825	15.90	0.0389
	802.11ac_40MHz	5755 – 5795	15.10	0.0324
	802.11ac_80MHz	5775	8.03	0.0064

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
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Test Engineer of RF Team



Approved by
: Sang Jun Lee

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1603-F075	March 15, 2016	- First Approval Report
HCT-R-1603-F075-1	March 28, 2016	- Revised the measured PSD plot on page 73.

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1. GENERAL INFORMATION

Applicant: SAMSUNG Electronics Co.,Ltd.
Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID: A3LSMJ700T
EUT Type: Mobile Phone
Model (s): SM-J700T
Additional Model(s): SM-J700T1
Date(s) of Tests: February 25, 2016 ~ March 28, 2016
Place of Tests: HCT Co., Ltd.
 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

2. EUT DESCRIPTION

Model	SM-J700T	
Additional Model	SM-J700T1	
EUT Type	Mobile Phone	
Power Supply	DC 3.8 V	
Battery Information	Model: EB-BJ700BBU Type: Li-ion Battery	
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	Manufacturer: PARTRON Antenna type: INTERNAL ANTENNA Peak Gain : 0.07 dBi (5180~5240 UNII1 BAND) / 1.4 dBi (5260~5320 UNII2A BAND) 0.74 dBi (5500~5720 UNII2C BAND) / 0.06 dBi (5745~5825 UNII3 BAND)	

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01 dated January 08, 2016 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) were used in the measurement. For 802.11ac, KDB644545 D03 v01 dated August 14, 2014.

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 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)

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. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$ 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)	6.07

8. SUMMARY OF TEST RESULTS

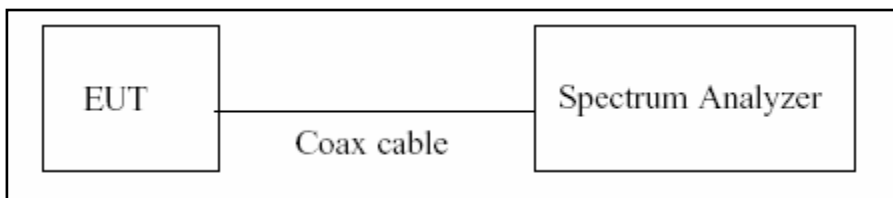
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	CONDUCTED	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)(1)	< 250 mW (5150-5250 MHz) < 250 mW or 11+10 log log ₁₀ (BW) 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) <-17 dBm/MHz EIRP within 5715-5725 MHz and 5850-5860 MHz (UNII3) <-27 dBm/MHz EIRP outside 5715-5860 MHz (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 $RBW \geq EBW$ if possible; otherwise, set RBW to the largest available value. Set $VBW \geq RBW$. 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 $T \leq 16.7$ 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, issued 01/08/2016)

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 $T \leq 6.25$ microseconds. ($50/6.25 = 8$)

The zero-span method was used because 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 ($\geq$ 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 = $10 \cdot \log(1/\text{Duty Cycle})$

Duty Cycle Factor

Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11a	6	1.425	1.530	0.93137255	0.309
	9	0.960	1.065	0.90140845	0.451
	12	0.725	0.830	0.87349398	0.587
	18	0.490	0.595	0.82352941	0.843
	24	0.372	0.474	0.78481013	1.052
	36	0.256	0.358	0.71508380	1.456
	48	0.196	0.298	0.65771812	1.820
	54	0.180	0.282	0.63829787	1.950
802.11n_20 MHz BW	MCS 0	1.340	1.440	0.93055556	0.313
	MCS 1	0.685	0.790	0.86708861	0.619
	MCS 2	0.470	0.575	0.81739130	0.876
	MCS 3	0.363	0.464	0.78232759	1.066
	MCS 4	0.256	0.357	0.71708683	1.444
	MCS 5	0.199	0.300	0.66333333	1.783
	MCS 6	0.184	0.286	0.64335664	1.915
	MCS 7	0.167	0.268	0.62313433	2.054
802.11n_40 MHz BW	MCS 0	0.665	0.766	0.86814621	0.614
	MCS 1	0.352	0.453	0.77704194	1.096
	MCS 2	0.248	0.349	0.71060172	1.484
	MCS 3	0.196	0.297	0.65993266	1.805
	MCS 4	0.144	0.245	0.58775510	2.308
	MCS 5	0.116	0.217	0.53456221	2.720
	MCS 6	0.108	0.209	0.51674641	2.867
	MCS 7	0.100	0.201	0.49751244	3.032

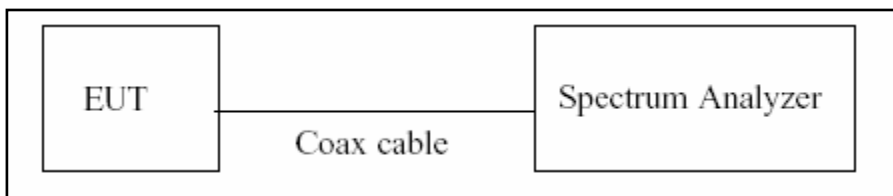
Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ac_20 MHz BW	MCS 0	1.344	1.446	0.92946058	0.318
	MCS 1	0.693	0.795	0.87169811	0.596
	MCS 2	0.477	0.576	0.82812500	0.819
	MCS 3	0.369	0.471	0.78343949	1.060
	MCS 4	0.261	0.363	0.71900826	1.433
	MCS 5	0.204	0.306	0.66666667	1.761
	MCS 6	0.188	0.289	0.65051903	1.867
	MCS 7	0.176	0.277	0.63537906	1.970
	MCS 8	0.151	0.253	0.59683794	2.241
802.11ac_40 MHz BW	MCS 0	0.668	0.770	0.86753247	0.617
	MCS 1	0.356	0.458	0.77729258	1.094
	MCS 2	0.252	0.354	0.71186441	1.476
	MCS 3	0.200	0.300	0.66666667	1.761
	MCS 4	0.148	0.248	0.59677419	2.242
	MCS 5	0.120	0.221	0.54298643	2.652
	MCS 6	0.112	0.214	0.52336449	2.812
	MCS 7	0.108	0.209	0.51674641	2.867
	MCS 8	0.100	0.201	0.49751244	3.032
	MCS 9	0.092	0.193	0.47668394	3.218
802.11ac_80 MHz BW	MCS 0	0.332	0.433	0.76674365	1.153
	MCS 1	0.188	0.289	0.65051903	1.867
	MCS 2	0.144	0.245	0.58775510	2.308
	MCS 3	0.116	0.217	0.53456221	2.720
	MCS 4	0.096	0.198	0.48484848	3.144
	MCS 5	0.081	0.182	0.44505495	3.516
	MCS 6	0.076	0.177	0.42937853	3.672
	MCS 7	0.072	0.173	0.41618497	3.807
	MCS 8	0.068	0.169	0.40236686	3.954
	MCS 9	0.064	0.166	0.38554217	4.139

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(issued 01/08/2016), 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, issued 01/08/2016)

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, issued 01/08/2016)

1. RBW = 100 kHz
2. VBW $\geq$ 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 level 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	20.834	N/A	Pass
5200	40	21.503	N/A	Pass
5240	48	21.367	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	21.138	N/A	Pass
5300	60	21.314	N/A	Pass
5320	64	21.311	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

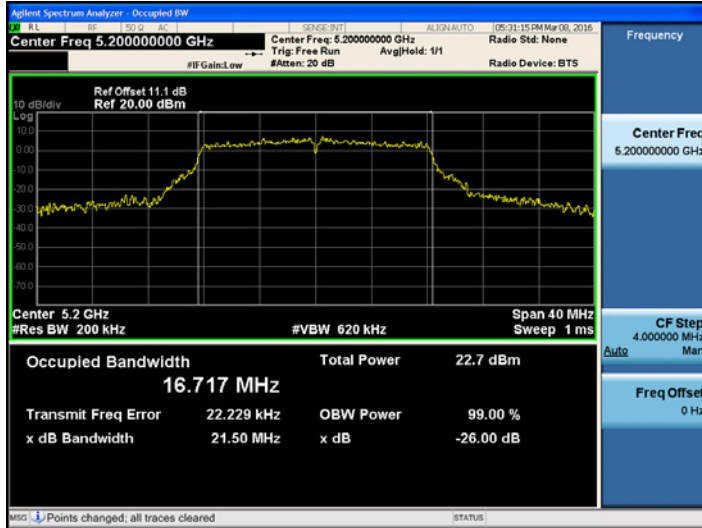
802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	20.726	N/A	Pass
5580	116	21.154	N/A	Pass
5700	140	21.305	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

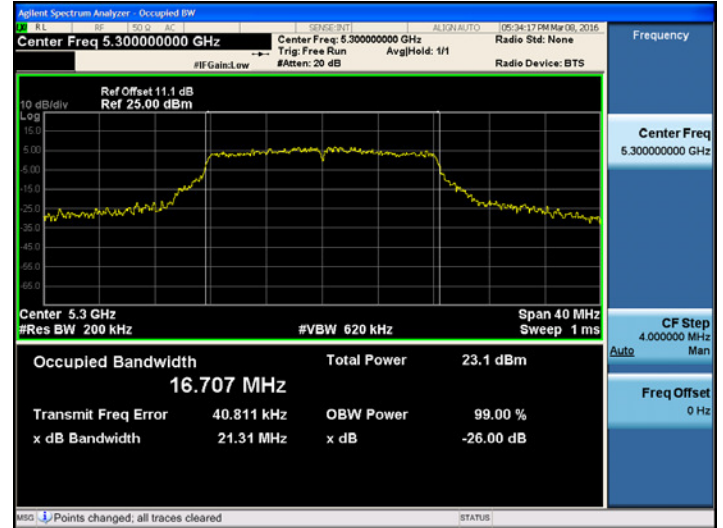
802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.170	N/A	Pass
5785	157	20.901	N/A	Pass
5825	165	21.011	N/A	Pass

■ TEST Plot for 802.11a

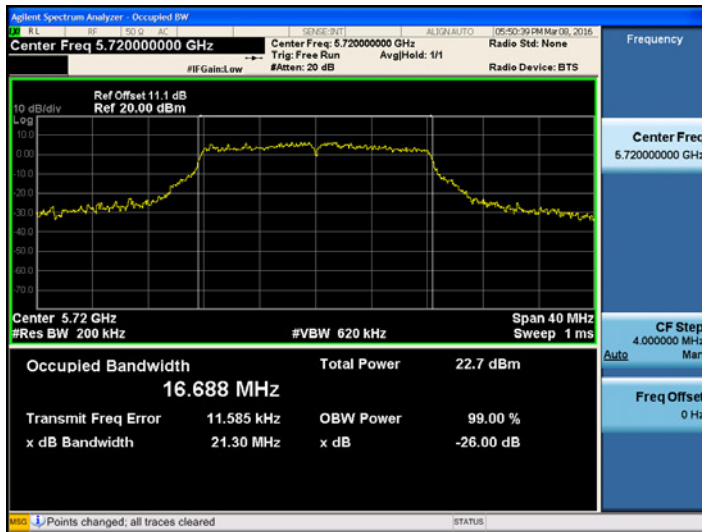
802.11a UNII 1 BAND 26dB Bandwidth (CH40)



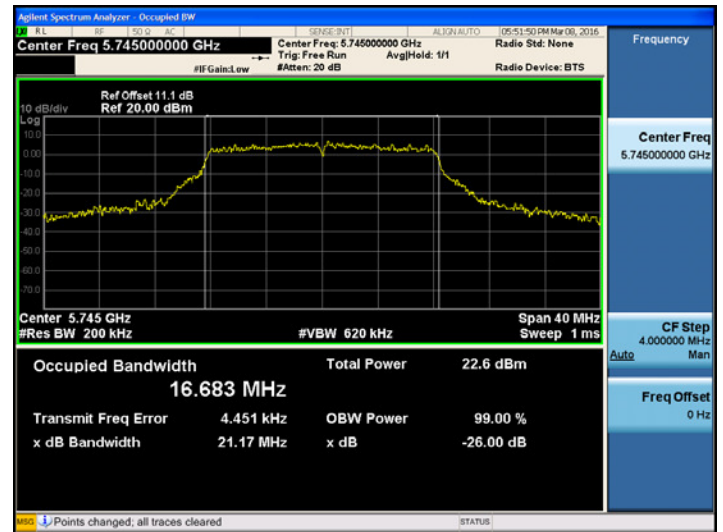
802.11a UNII 2A BAND 26dB Bandwidth (CH 60)



802.11a UNII 2C BAND 26dB Bandwidth (CH144)



802.11a 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 802.11n _20MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n 20M BW

802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	21.256	N/A	Pass
5200	40	22.327	N/A	Pass
5240	48	21.595	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n 20M BW

802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.840	N/A	Pass
5300	60	21.350	N/A	Pass
5320	64	21.334	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n 20M BW

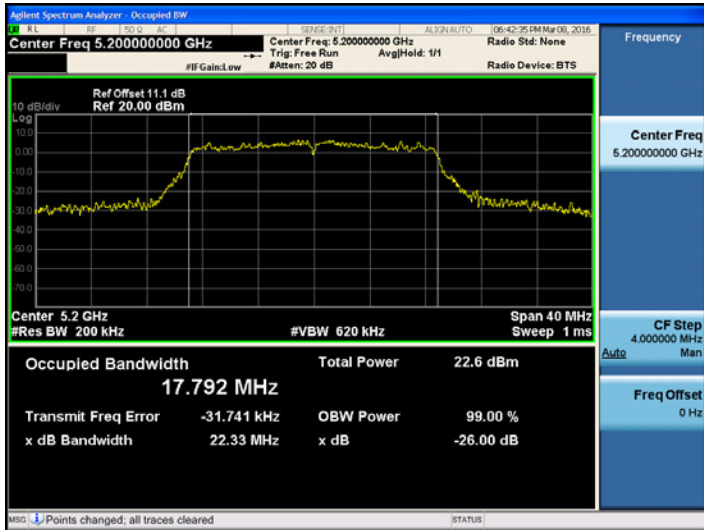
802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.271	N/A	Pass
5580	116	21.344	N/A	Pass
5700	140	21.472	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n 20M BW

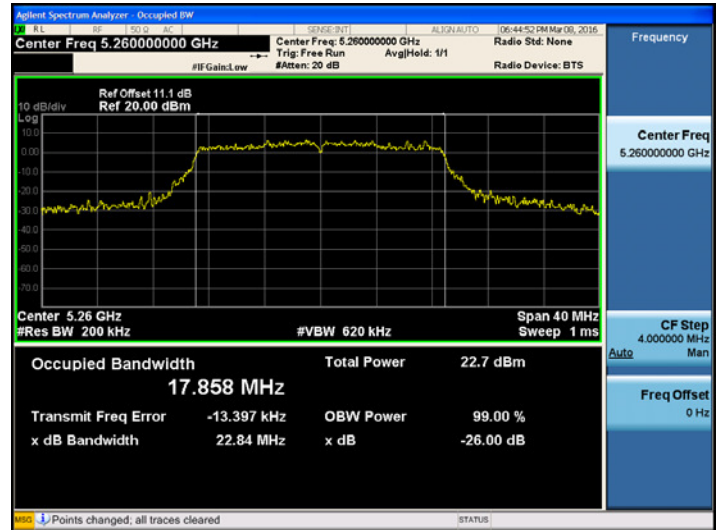
802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.387	N/A	Pass
5785	157	21.390	N/A	Pass
5825	165	21.064	N/A	Pass

■ TEST Plot for 802.11n _20MHz BW

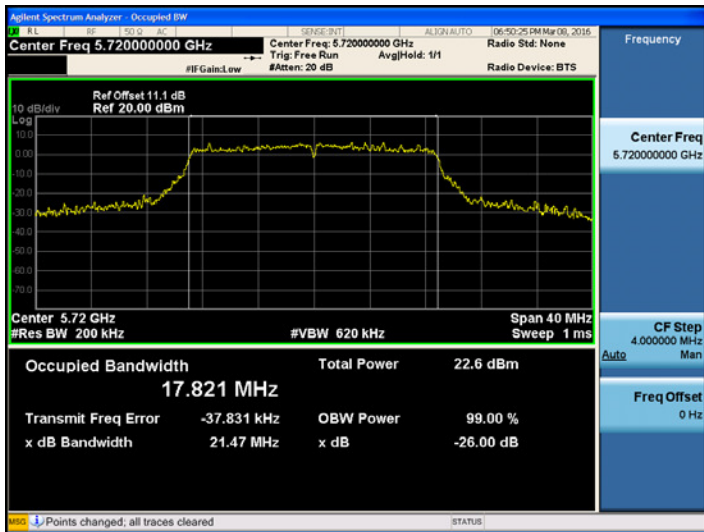
802.11n_20 MHz BW UNII 1 BAND 26dB Bandwidth(CH 40)



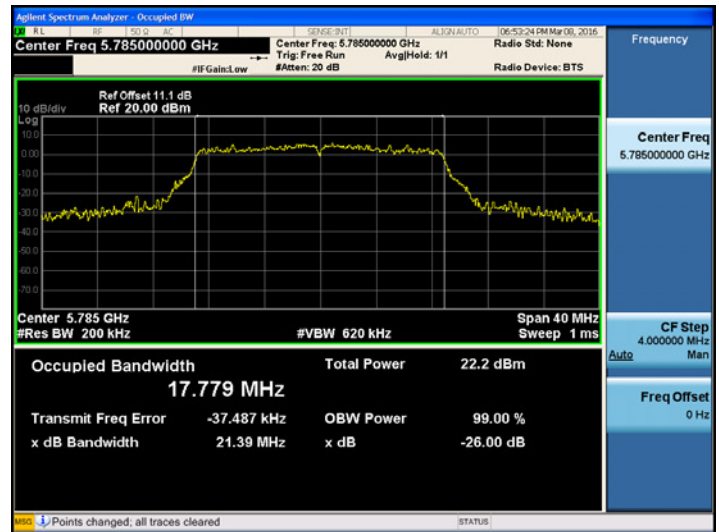
802.11n_20 MHz BW UNII 2A BAND 26dB Bandwidth(CH 52)



802.11n_20 MHz BW UNII 2C BAND 26dB Bandwidth(CH 144)



802.11n_20 MHz BW 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 802.11ac _20MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11ac 20M BW

802.11ac (20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	21.322	N/A	Pass
5200	40	21.343	N/A	Pass
5240	48	21.620	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac 20M BW

802.11ac (20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	23.213	N/A	Pass
5300	60	22.063	N/A	Pass
5320	64	21.713	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac 20M BW

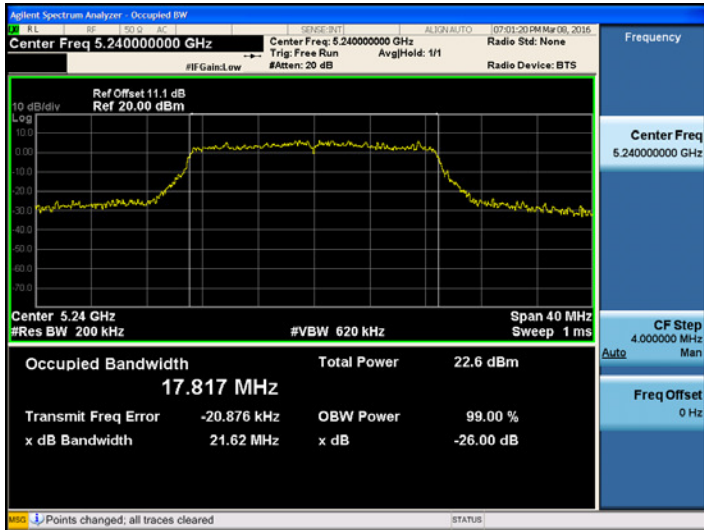
802.11ac (20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.383	N/A	Pass
5580	116	21.322	N/A	Pass
5700	140	21.345	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac 20M BW

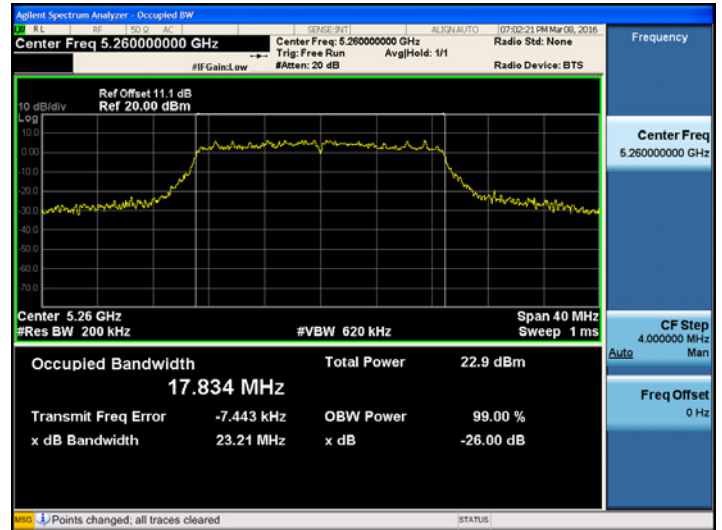
802.11ac (20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.960	N/A	Pass
5785	157	21.430	N/A	Pass
5825	165	21.274	N/A	Pass

■ TEST Plot for 802.11ac _20MHz BW

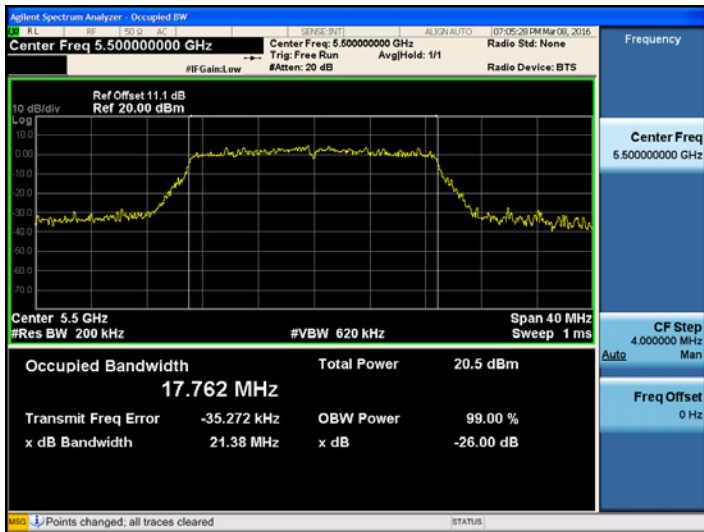
802.11ac_20 MHz BW UNII 1 BAND 26dB Bandwidth(CH 48)



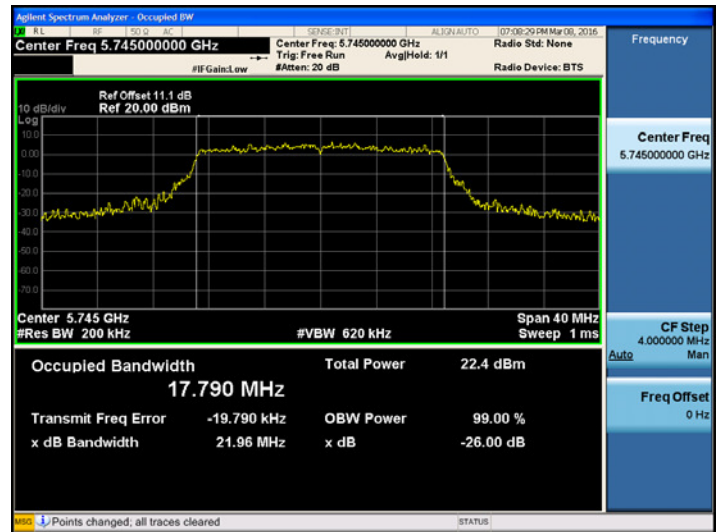
802.11ac_20 MHz BW UNII 2A BAND 26dB Bandwidth(CH 52)



802.11ac_20 MHz BW UNII 2C BAND 26dB Bandwidth(CH 100)



802.11ac_20 MHz BW 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 802.11n_40MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n_40 M BW

802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	39.607	N/A	Pass
5230	46	43.826	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_40 M BW

802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	43.584	N/A	Pass
5310	62	39.531	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_40 M BW

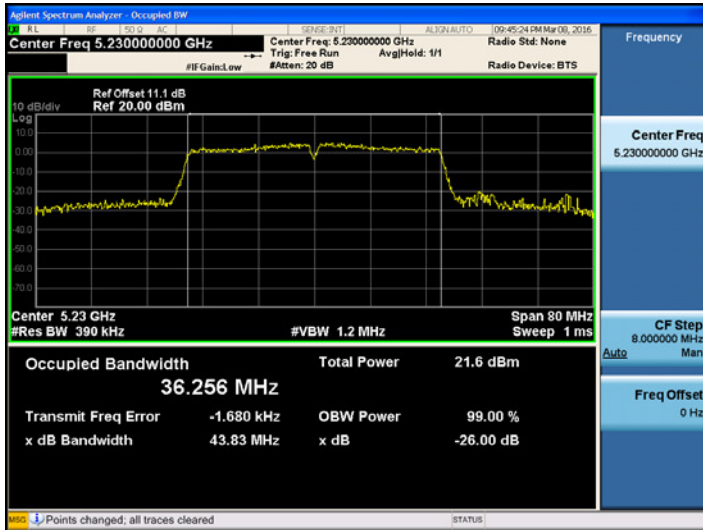
802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	39.599	N/A	Pass
5550	110	39.855	N/A	Pass
5710	142	43.907	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_40 M BW

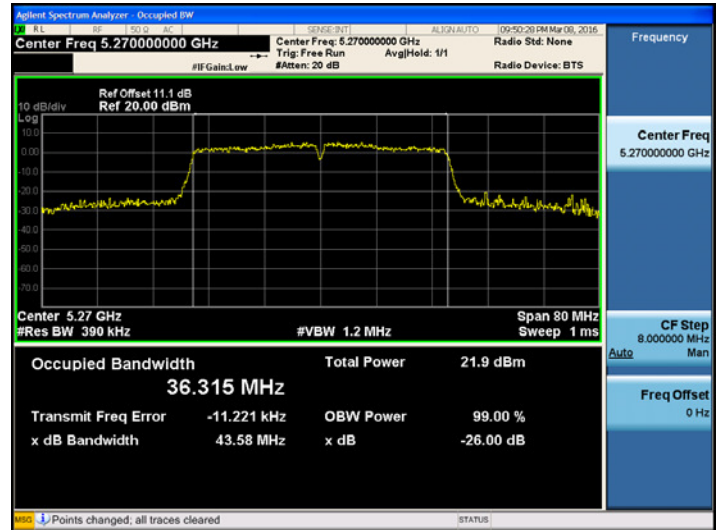
802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	39.443	N/A	Pass
5795	159	39.528	N/A	Pass

■ TEST Plot for 802.11n_40MHz BW

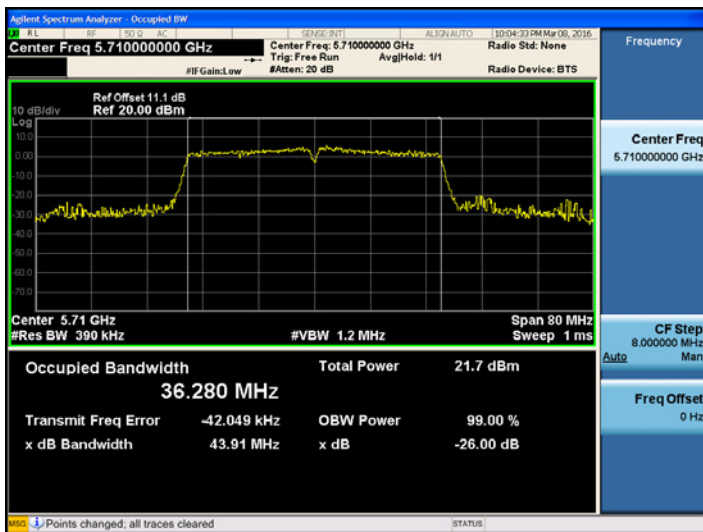
802.11n_40 MHz BW UNII 1 BAND 26dB Bandwidth(CH 46)



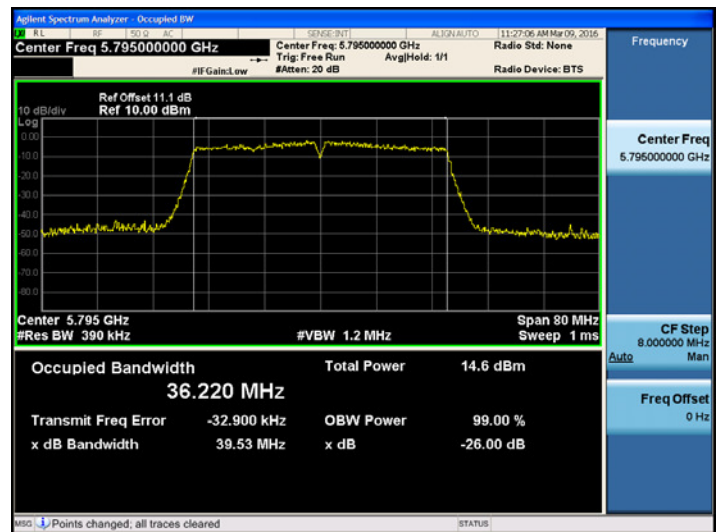
802.11n_40 MHz BW UNII 2A BAND 26dB Bandwidth (CH 54)



802.11n_40 MHz BW UNII 2C BAND 26dB Bandwidth(CH 142)



802.11n_40 MHz BW 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_40MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11ac_40 M BW

802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	39.981	N/A	Pass
5230	46	41.670	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_40 M BW

802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	39.849	N/A	Pass
5310	62	39.665	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_40 M BW

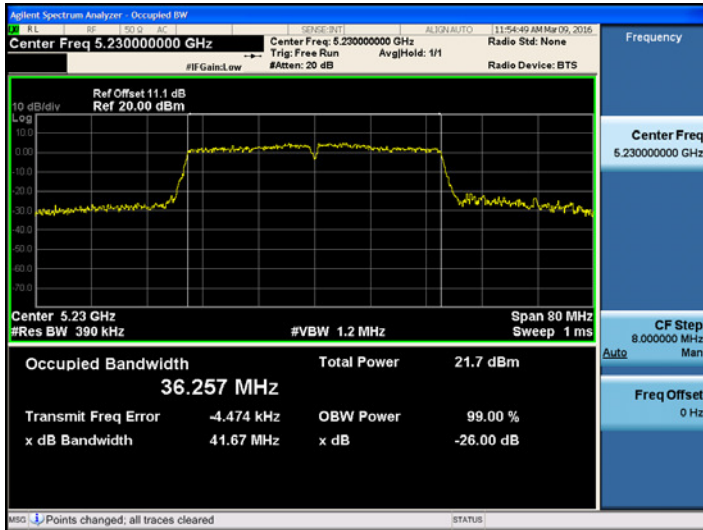
802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	39.853	N/A	Pass
5550	110	39.664	N/A	Pass
5710	142	39.722	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_40 M BW

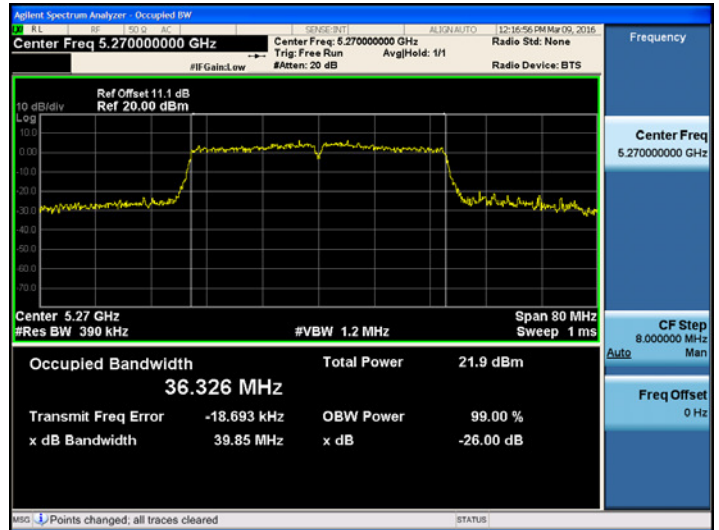
802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	39.653	N/A	Pass
5795	159	39.459	N/A	Pass

■ TEST Plot for 802.11ac_40MHz BW

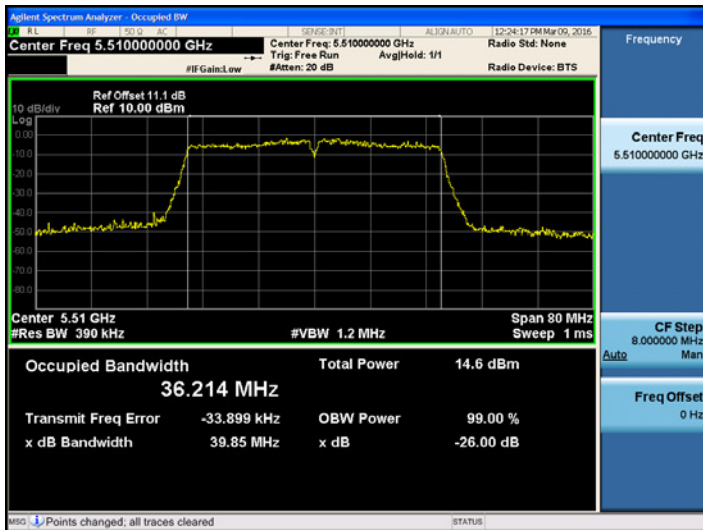
802.11ac_40 MHz BW UNII 1 BAND 26dB Bandwidth(CH 46)



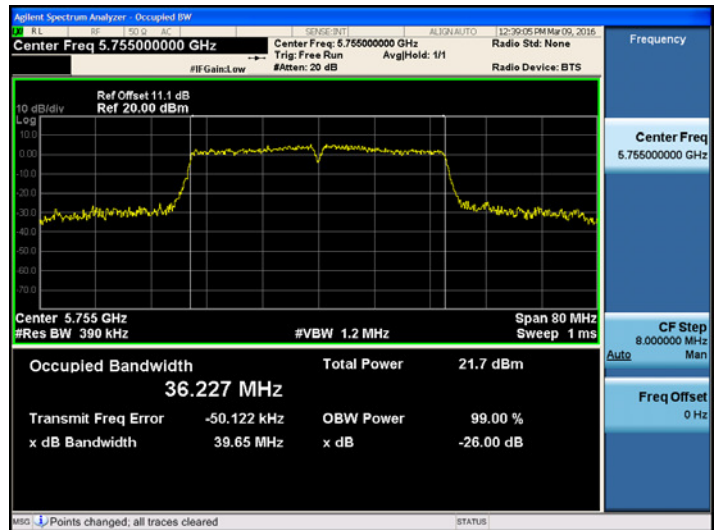
802.11ac_40 MHz BW UNII 2A BAND 26dB Bandwidth (CH 54)



802.11ac_40 MHz BW UNII 2C BAND 26dB Bandwidth(CH 102)



802.11ac_40 MHz BW 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_80MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11ac_80M BW

802.11ac(80M) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5210	42	80.666	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_80M BW

802.11ac(80M) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5290	58	81.188	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_80M BW

802.11ac(80M) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5530	106	80.750	N/A	Pass
5610	122	81.597	N/A	Pass
5690	138	80.982	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_80M BW

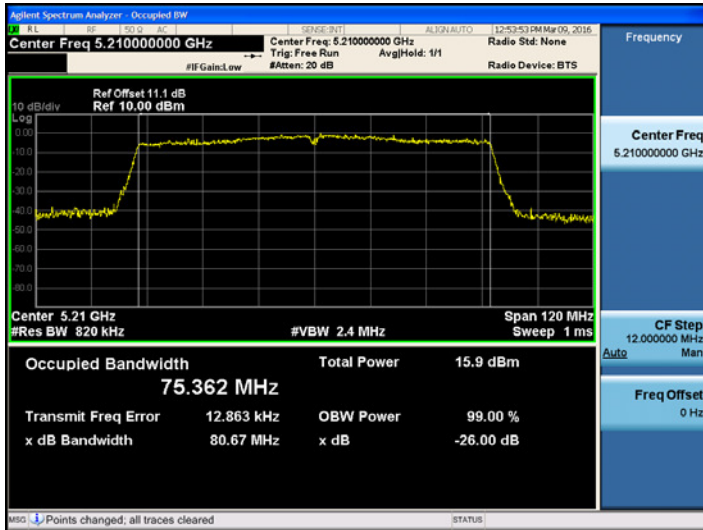
802.11ac(80M) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	80.888	N/A	Pass

Note :

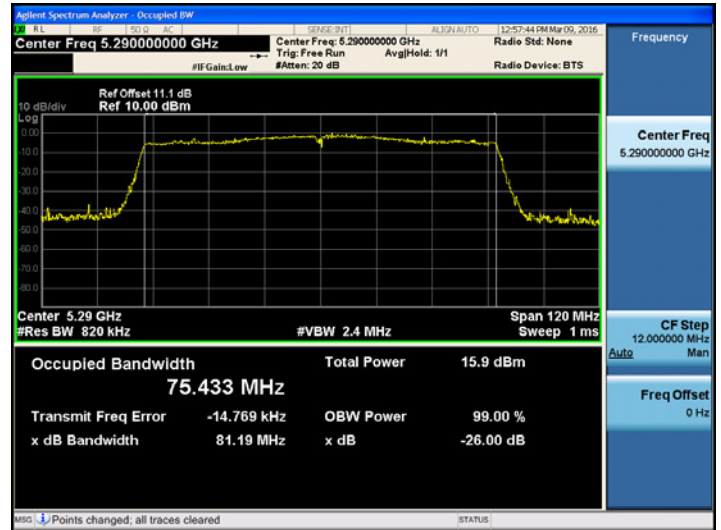
1. In order to simplify the report, attached plots were only the most wide channel.
2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.

■ TEST Plot for 802.11ac_80MHz BW

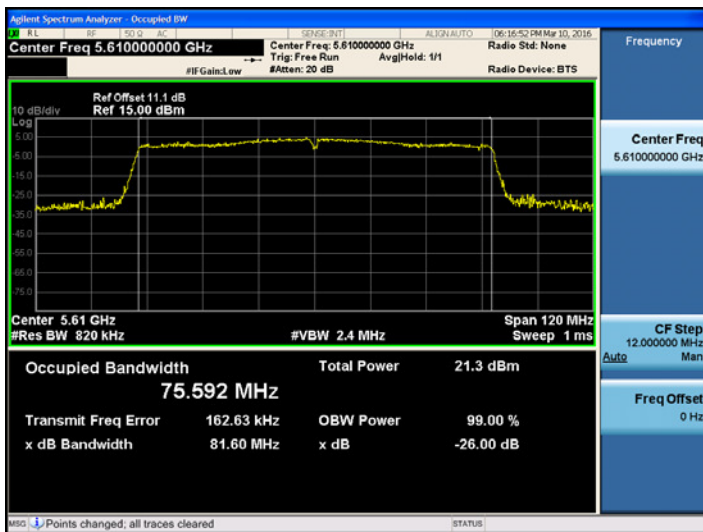
802.11ac_80 MHz BW UNII 1 BAND 26dB Bandwidth(CH 42)



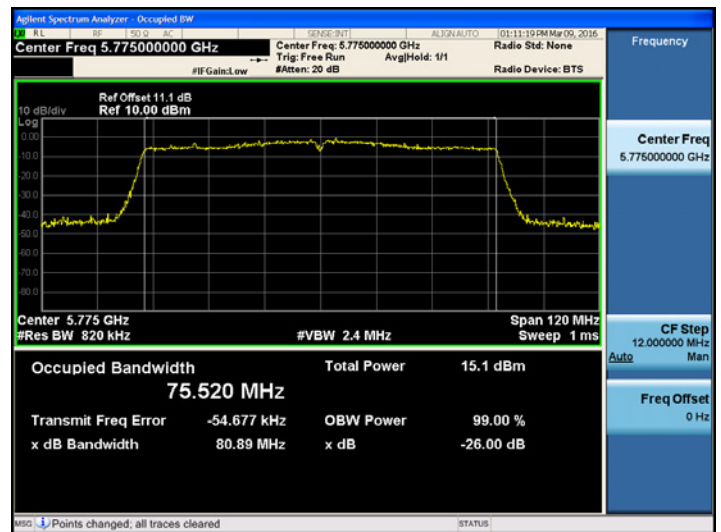
802.11ac_80 MHz BW UNII 2A BAND 26dB Bandwidth(CH 58)



802.11ac_80 MHz BW UNII 2C BAND 26dB Bandwidth(CH 122)



802.11ac_80 MHz BW UNII 3 BAND 26dB Bandwidth(CH 155)



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

■ TEST RESULTS for 802.11a/n/ac _20MHz BW

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	16.377	0.5	Pass
5785	157	16.325	0.5	Pass
5825	165	16.347	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11n_20MHz BW

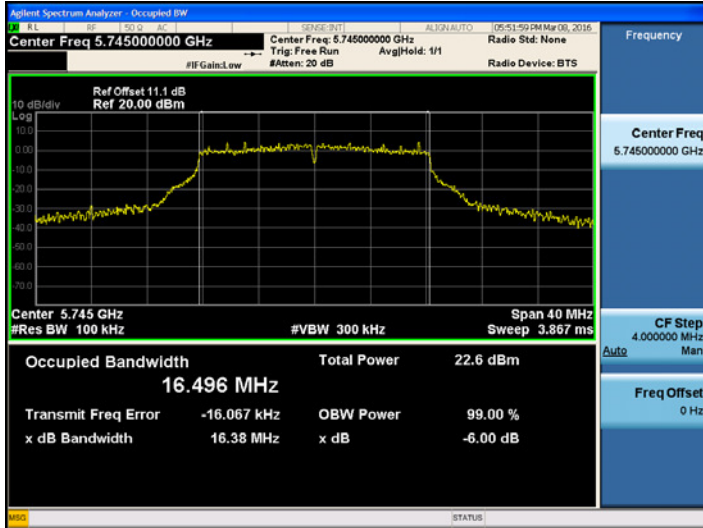
802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.580	0.5	Pass
5785	157	17.332	0.5	Pass
5825	165	16.832	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_20MHz BW

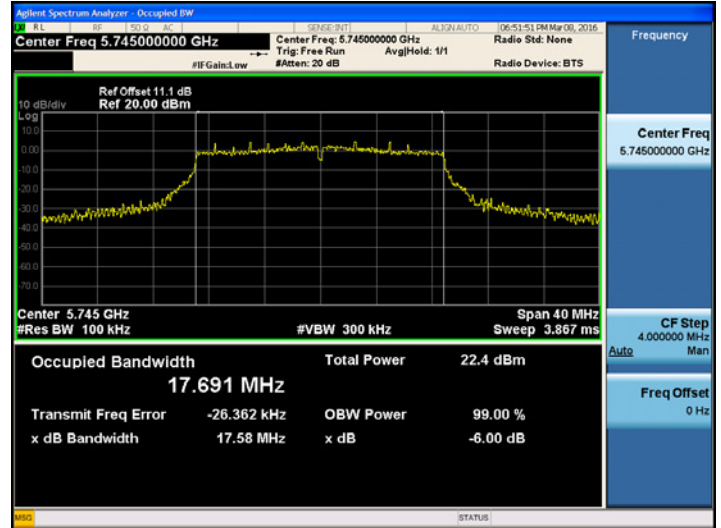
802.11ac(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.552	0.5	Pass
5785	157	16.958	0.5	Pass
5825	165	17.198	0.5	Pass

■ TEST Plot for 802.11a/n/ac_20MHz BW

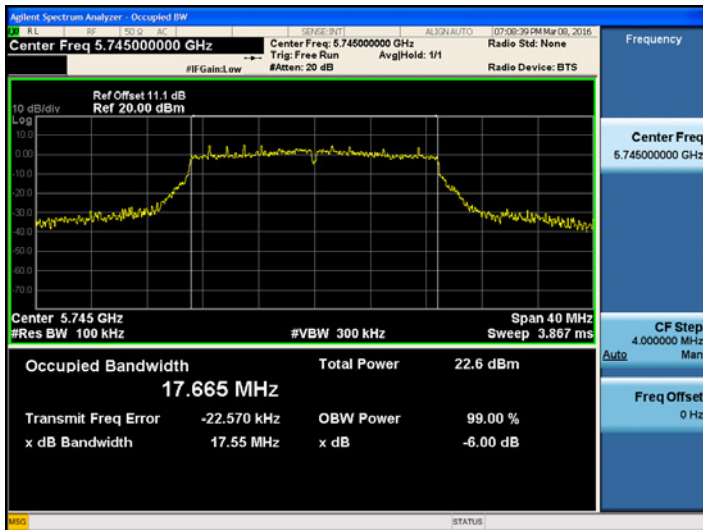
802.11a UNII 3 BAND 6dB Bandwidth (CH.149)



802.11n_20 MHz BW UNII 3 BAND 6dB Bandwidth(CH.149)



802.11ac_20 MHz BW UNII 3 BAND 6dB Bandwidth(CH.149)



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

■ **TEST RESULTS for 802.11n/ac_40MHz BW**

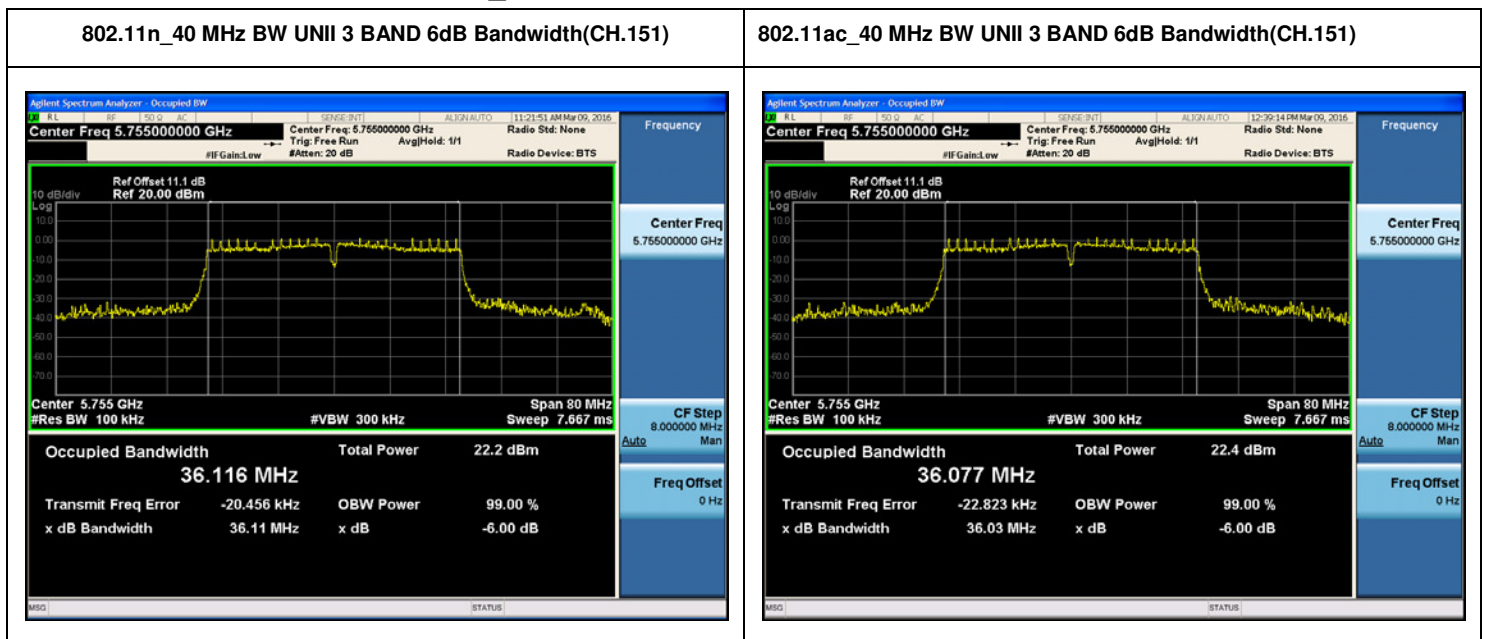
Conducted 6 dB Bandwidth Measurements for 802.11n_40MHz BW

802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.110	0.5	Pass
5795	159	35.752	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_40MHz BW

802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.027	0.5	Pass
5795	159	36.006	0.5	Pass

■ **TEST Plot for 802.11n/ac_40MHz BW**



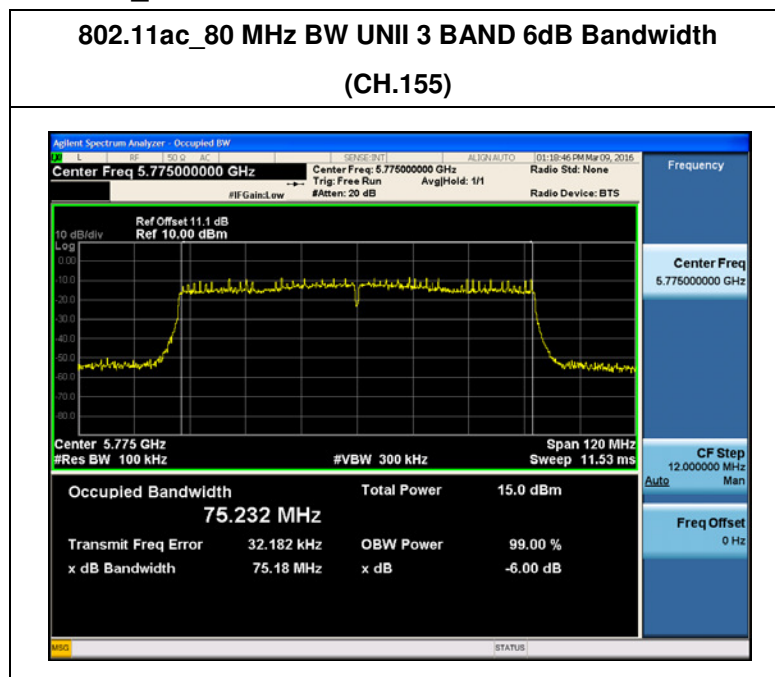
Note : In order to simplify the report, attached plots were only the most wide channel.

■ **TEST RESULTS for 802.11ac_80MHz BW**

Conducted 6 dB Bandwidth Measurements for 802.11ac_80MHz BW

802.11ac(80MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.180	0.5	Pass

■ **TEST Plot for 802.11ac_80MHz BW**



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

Straddle channels TEST RESULTS

Conducted Bandwidth Measurements for 802.11a/n/ac_20MHz BW (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11a	5720	144	15.64	N/A	Pass
802.11n			15.64	N/A	Pass
802.11ac			15.80	N/A	Pass

Conducted Bandwidth Measurements for 802.11a/n_20MHz BW (UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11a	5720	144	5.56	N/A	Pass
802.11n			5.64	N/A	Pass
802.11ac			5.72	N/A	Pass

■ Straddle channels TEST Plot for 802.11a/n/ac_20MHz BW

802.11a CH.144 Bandwidth



802.11n_20MHz BW CH.144 Bandwidth



802.11ac CH.144 Bandwidth



■ **Straddle channels TEST RESULTS**

Conducted Bandwidth Measurements for 802.11n/ac_40MHz BW (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11n	5710	142	34.98	N/A	Pass
802.11ac			34.98	N/A	Pass

Conducted Bandwidth Measurements for 802.11n/ac_40MHz BW (UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11n	5710	142	4.80	N/A	Pass
802.11ac			4.80	N/A	Pass

■ **Straddle channels TEST Plot for 802.11n/ac_40MHz BW**

802.11n_40MHz BW CH.142 Bandwidth



802.11ac_40MHz BW CH.142 Bandwidth



■ **Straddle channels TEST RESULTS**

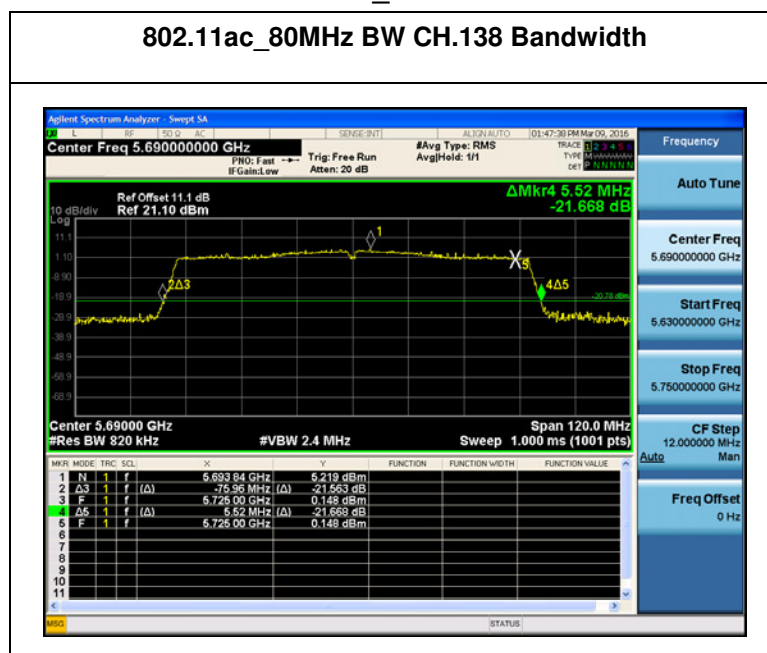
Conducted Bandwidth Measurements for 802.11ac_80MHz BW (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11ac	5690	138	75.96	N/A	Pass

Conducted Bandwidth Measurements for 802.11ac_80MHz BW (UNII 3 Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11ac	5690	138	5.52	N/A	Pass

■ **Straddle channels TEST Plot for 802.11ac_80MHz BW**



9.3 OUTPUT POWER MEASUREMENT

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

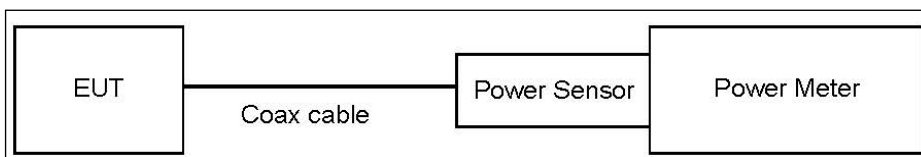
A transmitter antenna terminal of EUT is connected to the input of a Power meter or Spectrum Analyzer .Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

■ Limit

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

Note : According to KDB644545 D03 v01, the limit on maximum conducted output power in each U-NII band for straddle channel is computed based on the portion of the emission bandwidth contained within that band.

■ TEST CONFIGURATION(20 MHz BW)



■ TEST PROCEDURE(20 MHz BW)

- Average Power (Procedure E.3.a in KDB 789033, issued 01/08/2016).
 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 :

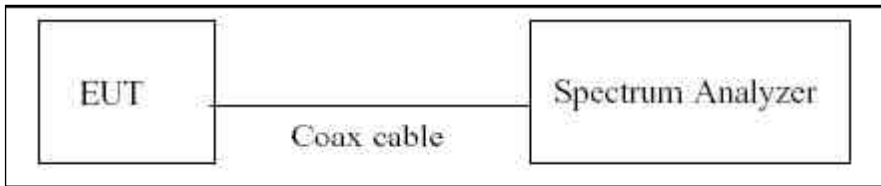
1. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1, 2A, 2C, 3	11.1

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

2. In case of UNII channels 138, 142 and 144, this device is satisfied with KDB644545 D03.

■ 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(issued 01/08/2016).

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 $10\log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

■ 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	11.1

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

4. In case of UNII channels 138, 142 and 144, this device is satisfied with KDB644545 D03.

802.11a (UNII 1)

■ TEST RESULTS

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

802.11a(20MHz) Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6	14.10	0.31	14.41	23.98
		9	14.01	0.45	14.46	23.98
		12	13.88	0.59	14.47	23.98
		18	13.73	0.84	14.57	23.98
		24	13.19	1.05	14.24	23.98
		36	12.82	1.46	14.28	23.98
		48	12.58	1.82	14.40	23.98
		54	12.41	1.95	14.36	23.98
5200	40	6	15.98	0.31	16.29	23.98
		9	15.81	0.45	16.26	23.98
		12	15.66	0.59	16.25	23.98
		18	15.50	0.84	16.34	23.98
		24	15.21	1.05	16.26	23.98
		36	14.61	1.46	16.07	23.98
		48	14.42	1.82	16.24	23.98
		54	14.28	1.95	16.23	23.98
5240	48	6	16.15	0.31	16.46	23.98
		9	15.88	0.45	16.33	23.98
		12	15.85	0.59	16.44	23.98
		18	15.59	0.84	16.43	23.98
		24	15.32	1.05	16.37	23.98
		36	14.73	1.46	16.19	23.98
		48	14.53	1.82	16.35	23.98
		54	14.40	1.95	16.35	23.98

802.11a (UNII 2A)

■ TEST RESULTS

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

802.11a Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6	16.25	0.31	16.56	23.98
		9	16.15	0.45	16.60	23.98
		12	16.01	0.59	16.60	23.98
		18	15.72	0.84	16.56	23.98
		24	15.50	1.05	16.55	23.98
		36	15.11	1.46	16.57	23.98
		48	14.68	1.82	16.50	23.98
		54	14.75	1.95	16.70	23.98
5300	60	6	16.23	0.31	16.54	23.98
		9	16.06	0.45	16.51	23.98
		12	15.91	0.59	16.50	23.98
		18	15.77	0.84	16.61	23.98
		24	15.54	1.05	16.59	23.98
		36	14.94	1.46	16.40	23.98
		48	14.71	1.82	16.53	23.98
		54	14.63	1.95	16.58	23.98
5320	64	6	14.31	0.31	14.62	23.98
		9	14.23	0.45	14.68	23.98
		12	14.13	0.59	14.72	23.98
		18	13.87	0.84	14.71	23.98
		24	13.55	1.05	14.60	23.98
		36	13.17	1.46	14.63	23.98
		48	12.82	1.82	14.64	23.98
		54	12.69	1.95	14.64	23.98

802.11a (UNII 2C)

■ TEST RESULTS

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

802.11a Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6	13.86	0.31	14.17	23.98
		9	13.77	0.45	14.22	23.98
		12	13.58	0.59	14.17	23.98
		18	13.40	0.84	14.24	23.98
		24	13.19	1.05	14.24	23.98
		36	12.62	1.46	14.08	23.98
		48	12.33	1.82	14.15	23.98
		54	12.11	1.95	14.06	23.98
5580	116	6	15.94	0.31	16.25	23.98
		9	15.76	0.45	16.21	23.98
		12	15.71	0.59	16.30	23.98
		18	15.36	0.84	16.20	23.98
		24	15.13	1.05	16.18	23.98
		36	14.65	1.46	16.11	23.98
		48	14.40	1.82	16.22	23.98
		54	14.29	1.95	16.24	23.98
5720	144	6	16.04	0.31	16.35	23.98
		9	15.70	0.45	16.15	23.98
		12	15.67	0.59	16.26	23.98
		18	15.39	0.84	16.23	23.98
		24	15.15	1.05	16.20	23.98
		36	14.76	1.46	16.22	23.98
		48	14.48	1.82	16.30	23.98
		54	14.26	1.95	16.21	23.98

802.11a (UNII 3)

■ TEST RESULTS

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

802.11a (20MHz) Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	6	15.81	0.31	16.12	30
		9	15.58	0.45	16.03	30
		12	15.59	0.59	16.18	30
		18	15.37	0.84	16.21	30
		24	14.91	1.05	15.96	30
		36	14.53	1.46	15.99	30
		48	14.30	1.82	16.12	30
		54	14.19	1.95	16.14	30
5785	157	6	15.74	0.31	16.05	30
		9	15.58	0.45	16.03	30
		12	15.54	0.59	16.13	30
		18	15.31	0.84	16.15	30
		24	15.04	1.05	16.09	30
		36	14.46	1.46	15.92	30
		48	14.23	1.82	16.05	30
		54	14.15	1.95	16.10	30
5825	165	6	13.91	0.31	14.22	30
		9	13.76	0.45	14.21	30
		12	13.62	0.59	14.21	30
		18	13.39	0.84	14.23	30
		24	12.94	1.05	13.99	30
		36	12.59	1.46	14.05	30
		48	12.35	1.82	14.17	30
		54	12.20	1.95	14.15	30

802.11n_20MHz BW (UNII 1)

■ TEST RESULTS

Conducted Output Power Measurements (802.11n_20M BW Mode: 5180~5240)

802.11n(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	0	13.62	0.31	13.93	23.98
		1	13.37	0.62	13.99	23.98
		2	12.95	0.88	13.83	23.98
		3	12.76	1.07	13.83	23.98
		4	12.45	1.44	13.89	23.98
		5	12.16	1.78	13.94	23.98
		6	12.06	1.92	13.98	23.98
		7	11.92	2.05	13.97	23.98
5200	40	0	15.53	0.31	15.84	23.98
		1	15.31	0.62	15.93	23.98
		2	15.12	0.88	16.00	23.98
		3	14.73	1.07	15.80	23.98
		4	14.41	1.44	15.85	23.98
		5	14.14	1.78	15.92	23.98
		6	14.05	1.92	15.97	23.98
		7	13.90	2.05	15.95	23.98
5240	48	0	15.70	0.31	16.01	23.98
		1	15.50	0.62	16.12	23.98
		2	15.25	0.88	16.13	23.98
		3	15.04	1.07	16.11	23.98
		4	14.59	1.44	16.03	23.98
		5	14.29	1.78	16.07	23.98
		6	14.20	1.92	16.12	23.98
		7	14.09	2.05	16.14	23.98

802.11n _20MHz BW (UNII 2A)

■ TEST RESULTS

Conducted Output Power Measurements (802.11n_20M BW Mode: 5260~5320)

802.11n(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	0	15.86	0.31	16.17	23.98
		1	15.64	0.62	16.26	23.98
		2	15.44	0.88	16.32	23.98
		3	15.26	1.07	16.33	23.98
		4	14.84	1.44	16.28	23.98
		5	14.55	1.78	16.33	23.98
		6	14.39	1.92	16.31	23.98
		7	14.28	2.05	16.33	23.98
5300	60	0	15.94	0.31	16.25	23.98
		1	15.71	0.62	16.33	23.98
		2	15.44	0.88	16.32	23.98
		3	15.30	1.07	16.37	23.98
		4	14.84	1.44	16.28	23.98
		5	14.60	1.78	16.38	23.98
		6	14.51	1.92	16.43	23.98
		7	14.23	2.05	16.28	23.98
5320	64	0	14.01	0.31	14.32	23.98
		1	13.71	0.62	14.33	23.98
		2	13.57	0.88	14.45	23.98
		3	13.30	1.07	14.37	23.98
		4	12.95	1.44	14.39	23.98
		5	12.57	1.78	14.35	23.98
		6	12.48	1.92	14.40	23.98
		7	12.34	2.05	14.39	23.98

802.11n _20MHz BW (UNII 2C)

■ TEST RESULTS

Conducted Output Power Measurements (802.11n_20M BW Mode: 5500~5720)

802.11n(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	0	13.62	0.31	13.93	23.98
		1	13.38	0.62	14.00	23.98
		2	13.15	0.88	14.03	23.98
		3	12.74	1.07	13.81	23.98
		4	12.48	1.44	13.92	23.98
		5	12.16	1.78	13.94	23.98
		6	12.11	1.92	14.03	23.98
		7	11.97	2.05	14.02	23.98
5580	116	0	15.51	0.31	15.82	23.98
		1	15.28	0.62	15.90	23.98
		2	15.09	0.88	15.97	23.98
		3	14.92	1.07	15.99	23.98
		4	14.61	1.44	16.05	23.98
		5	14.14	1.78	15.92	23.98
		6	14.06	1.92	15.98	23.98
		7	13.98	2.05	16.03	23.98
5720	144	0	15.70	0.31	16.01	23.98
		1	15.34	0.62	15.96	23.98
		2	15.15	0.88	16.03	23.98
		3	14.90	1.07	15.97	23.98
		4	14.58	1.44	16.02	23.98
		5	14.17	1.78	15.95	23.98
		6	14.07	1.92	15.99	23.98
		7	13.99	2.05	16.04	23.98

802.11n _20MHz BW (UNII 3)

■ TEST RESULTS

Conducted Output Power Measurements (802.11n_20M BW Mode: 5745~5825)

802.11n(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	0	15.55	0.31	15.86	30
		1	15.15	0.62	15.77	30
		2	14.96	0.88	15.84	30
		3	14.78	1.07	15.85	30
		4	14.49	1.44	15.93	30
		5	14.09	1.78	15.87	30
		6	14.09	1.92	16.01	30
		7	13.82	2.05	15.87	30
5785	157	0	15.52	0.31	15.83	30
		1	15.25	0.62	15.87	30
		2	14.86	0.88	15.74	30
		3	14.72	1.07	15.79	30
		4	14.46	1.44	15.90	30
		5	14.09	1.78	15.87	30
		6	14.02	1.92	15.94	30
		7	13.80	2.05	15.85	30
5825	165	0	13.51	0.31	13.82	30
		1	13.15	0.62	13.77	30
		2	12.97	0.88	13.85	30
		3	12.80	1.07	13.87	30
		4	12.52	1.44	13.96	30
		5	12.20	1.78	13.98	30
		6	12.01	1.92	13.93	30
		7	11.85	2.05	13.90	30

802.11ac _20MHz BW (UNII 1)

■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_20M BW Mode: 5180~5240)

802.11ac(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	0	13.65	0.32	13.97	23.98
		1	13.33	0.60	13.93	23.98
		2	13.12	0.82	13.94	23.98
		3	12.95	1.06	14.01	23.98
		4	12.64	1.43	14.07	23.98
		5	12.37	1.76	14.13	23.98
		6	12.28	1.87	14.15	23.98
		7	12.13	1.97	14.10	23.98
		8	11.95	2.24	14.19	23.98
5200	40	0	15.72	0.32	16.04	23.98
		1	15.30	0.60	15.90	23.98
		2	15.06	0.82	15.88	23.98
		3	14.85	1.06	15.91	23.98
		4	14.57	1.43	16.00	23.98
		5	14.27	1.76	16.03	23.98
		6	14.13	1.87	16.00	23.98
		7	14.06	1.97	16.03	23.98
		8	13.81	2.24	16.05	23.98
5240	48	0	15.87	0.32	16.19	23.98
		1	15.48	0.60	16.08	23.98
		2	15.20	0.82	16.02	23.98
		3	14.99	1.06	16.05	23.98
		4	14.68	1.43	16.11	23.98
		5	14.40	1.76	16.16	23.98
		6	14.33	1.87	16.20	23.98
		7	14.20	1.97	16.17	23.98
		8	13.95	2.24	16.19	23.98

802.11ac _20MHz BW (UNII 2A)

■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_20M BW Mode: 5260~5320)

802.11ac(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	0	15.88	0.32	16.20	23.98
		1	15.70	0.60	16.30	23.98
		2	15.52	0.82	16.34	23.98
		3	15.33	1.06	16.39	23.98
		4	14.86	1.43	16.29	23.98
		5	14.60	1.76	16.36	23.98
		6	14.51	1.87	16.38	23.98
		7	14.36	1.97	16.33	23.98
		8	14.19	2.24	16.43	23.98
5300	60	0	16.02	0.32	16.34	23.98
		1	15.78	0.60	16.38	23.98
		2	15.55	0.82	16.37	23.98
		3	15.21	1.06	16.27	23.98
		4	14.95	1.43	16.38	23.98
		5	14.64	1.76	16.40	23.98
		6	14.54	1.87	16.41	23.98
		7	14.47	1.97	16.44	23.98
		8	14.09	2.24	16.33	23.98
5320	64	0	14.04	0.32	14.36	23.98
		1	13.77	0.60	14.37	23.98
		2	13.57	0.82	14.39	23.98
		3	13.39	1.06	14.45	23.98
		4	13.01	1.43	14.44	23.98
		5	12.65	1.76	14.41	23.98
		6	12.56	1.87	14.43	23.98
		7	12.47	1.97	14.44	23.98
		8	12.21	2.24	14.45	23.98

802.11ac _20MHz BW (UNII 2C)

■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_20M BW Mode: 5500~5720)

802.11ac(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	0	13.55	0.32	13.87	23.98
		1	13.30	0.60	13.90	23.98
		2	12.94	0.82	13.76	23.98
		3	12.78	1.06	13.84	23.98
		4	12.41	1.43	13.84	23.98
		5	12.13	1.76	13.89	23.98
		6	12.05	1.87	13.92	23.98
		7	11.90	1.97	13.87	23.98
		8	11.75	2.24	13.99	23.98
5580	116	0	15.48	0.32	15.80	23.98
		1	15.28	0.60	15.88	23.98
		2	15.06	0.82	15.88	23.98
		3	14.85	1.06	15.91	23.98
		4	14.57	1.43	16.00	23.98
		5	14.07	1.76	15.83	23.98
		6	14.00	1.87	15.87	23.98
		7	13.95	1.97	15.92	23.98
		8	13.69	2.24	15.93	23.98
5720	144	0	15.55	0.32	15.87	23.98
		1	15.26	0.60	15.86	23.98
		2	15.10	0.82	15.92	23.98
		3	14.86	1.06	15.92	23.98
		4	14.53	1.43	15.96	23.98
		5	14.20	1.76	15.96	23.98
		6	14.00	1.87	15.87	23.98
		7	14.10	1.97	16.07	23.98
		8	13.74	2.24	15.98	23.98

802.11ac _20MHz BW (UNII 3)

■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_20M BW Mode: 5745~5825)

802.11ac(20MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	0	15.51	0.32	15.83	30
		1	15.16	0.60	15.76	30
		2	14.99	0.82	15.81	30
		3	14.70	1.06	15.76	30
		4	14.40	1.43	15.83	30
		5	14.11	1.76	15.87	30
		6	14.03	1.87	15.90	30
		7	13.86	1.97	15.83	30
		8	13.61	2.24	15.85	30
5785	157	0	15.52	0.32	15.84	30
		1	15.23	0.60	15.83	30
		2	14.95	0.82	15.77	30
		3	14.76	1.06	15.82	30
		4	14.32	1.43	15.75	30
		5	14.12	1.76	15.88	30
		6	13.99	1.87	15.86	30
		7	13.90	1.97	15.87	30
		8	13.54	2.24	15.78	30
5825	165	0	13.38	0.32	13.70	30
		1	13.16	0.60	13.76	30
		2	12.98	0.82	13.80	30
		3	12.84	1.06	13.90	30
		4	12.53	1.43	13.96	30
		5	12.18	1.76	13.94	30
		6	12.08	1.87	13.95	30
		7	11.96	1.97	13.93	30
		8	11.77	2.24	14.01	30

802.11n_40MHz BW (UNII 1)

■ TEST RESULTS

Conducted Output Power Measurements (802.11n_40M BW Mode: 5190~5230)

802.11n(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	0	7.85	0.61	8.47	23.98
		1	7.52	1.10	8.61	23.98
		2	7.21	1.48	8.69	23.98
		3	6.90	1.81	8.70	23.98
		4	6.28	2.31	8.59	23.98
		5	5.88	2.72	8.60	23.98
		6	5.76	2.87	8.63	23.98
		7	5.59	3.03	8.62	23.98
5230	46	0	14.48	0.61	15.10	23.98
		1	14.04	1.10	15.14	23.98
		2	13.62	1.48	15.10	23.98
		3	13.42	1.81	15.22	23.98
		4	12.72	2.31	15.02	23.98
		5	12.37	2.72	15.09	23.98
		6	12.30	2.87	15.16	23.98
		7	12.14	3.03	15.17	23.98

802.11n _40MHz BW (UNII 2A)

■ TEST RESULTS

Conducted Output Power Measurements (802.11n_40M BW Mode: 5270~5310)

802.11n(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5270	54	0	14.59	0.61	15.21	23.98
		1	14.21	1.10	15.30	23.98
		2	13.73	1.48	15.22	23.98
		3	13.43	1.81	15.24	23.98
		4	12.99	2.31	15.30	23.98
		5	12.64	2.72	15.36	23.98
		6	12.43	2.87	15.30	23.98
		7	12.38	3.03	15.41	23.98
5310	62	0	8.34	0.61	8.96	23.98
		1	7.67	1.10	8.77	23.98
		2	7.30	1.48	8.78	23.98
		3	7.04	1.81	8.84	23.98
		4	6.57	2.31	8.87	23.98
		5	6.23	2.72	8.95	23.98
		6	6.12	2.87	8.99	23.98
		7	5.95	3.03	8.98	23.98

802.11n_40MHz BW (UNII 2C)
■ TEST RESULTS
Conducted Output Power Measurements (802.11n_40M BW Mode: 5510~5710)

802.11n(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5510	102	0	7.43	0.61	8.05	23.98
		1	6.78	1.10	7.87	23.98
		2	6.44	1.48	7.92	23.98
		3	6.21	1.81	8.02	23.98
		4	5.54	2.31	7.84	23.98
		5	5.13	2.72	7.85	23.98
		6	5.03	2.87	7.89	23.98
		7	4.87	3.03	7.90	23.98
5550	110	0	14.62	0.61	15.23	23.98
		1	13.95	1.10	15.05	23.98
		2	13.67	1.48	15.15	23.98
		3	13.39	1.81	15.20	23.98
		4	12.87	2.31	15.18	23.98
		5	12.32	2.72	15.04	23.98
		6	12.19	2.87	15.06	23.98
		7	12.11	3.03	15.14	23.98
5710	142	0	14.62	0.61	15.24	23.98
		1	14.01	1.10	15.10	23.98
		2	13.70	1.48	15.18	23.98
		3	13.41	1.81	15.21	23.98
		4	12.94	2.31	15.25	23.98
		5	12.46	2.72	15.18	23.98
		6	12.38	2.87	15.25	23.98
		7	12.16	3.03	15.19	23.98

802.11n_40MHz BW (UNII 3)

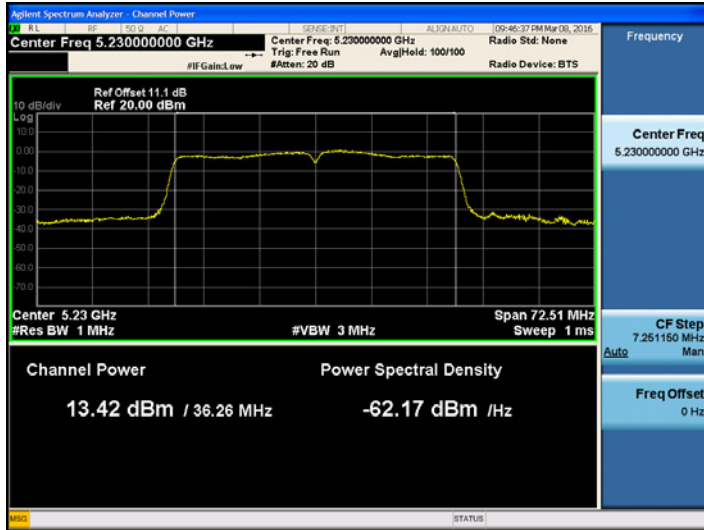
■ TEST RESULTS

Conducted Output Power Measurements (802.11n_40M BW Mode: 5755~5795)

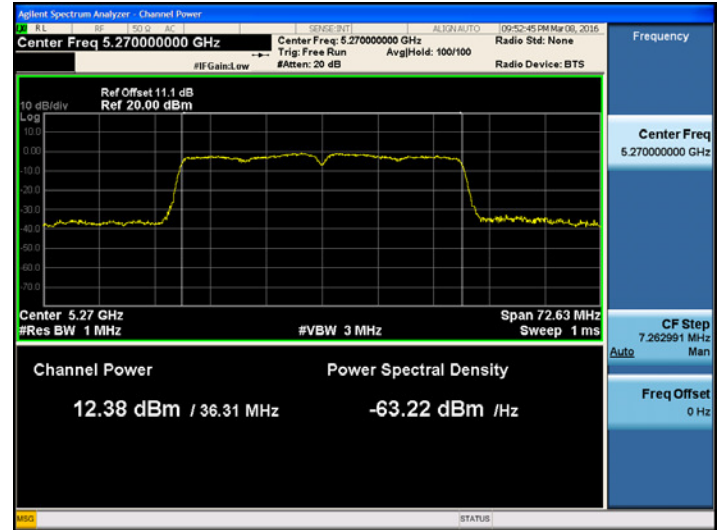
802.11n(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5755	151	0	14.35	0.61	14.96	30
		1	13.71	1.10	14.80	30
		2	13.46	1.48	14.94	30
		3	13.06	1.81	14.87	30
		4	12.49	2.31	14.80	30
		5	12.10	2.72	14.82	30
		6	12.02	2.87	14.89	30
		7	11.89	3.03	14.92	30
5795	159	0	7.43	0.61	8.04	30
		1	7.05	1.10	8.14	30
		2	6.52	1.48	8.01	30
		3	6.17	1.81	7.98	30
		4	5.79	2.31	8.09	30
		5	5.47	2.72	8.19	30
		6	5.38	2.87	8.24	30
		7	5.18	3.03	8.21	30

■ TEST Plot _802.11n_40MHz BW

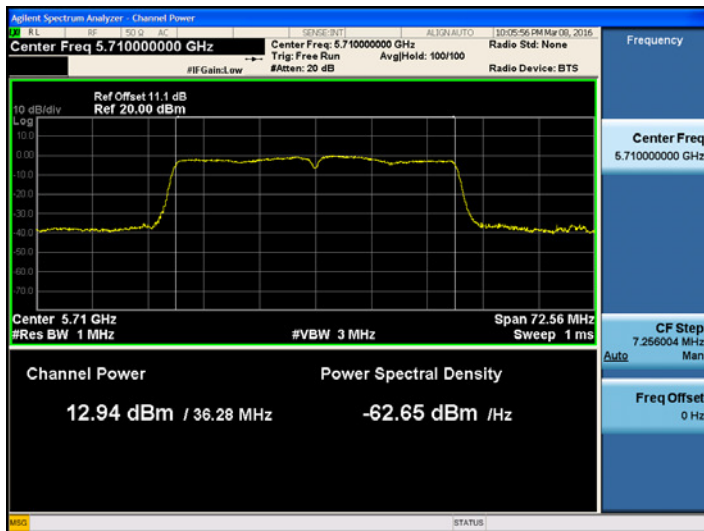
802.11n_40 MHz BW UNII 1 BAND Average Power
(5190 MHz ~5230 MHz) CH 46 MCS3



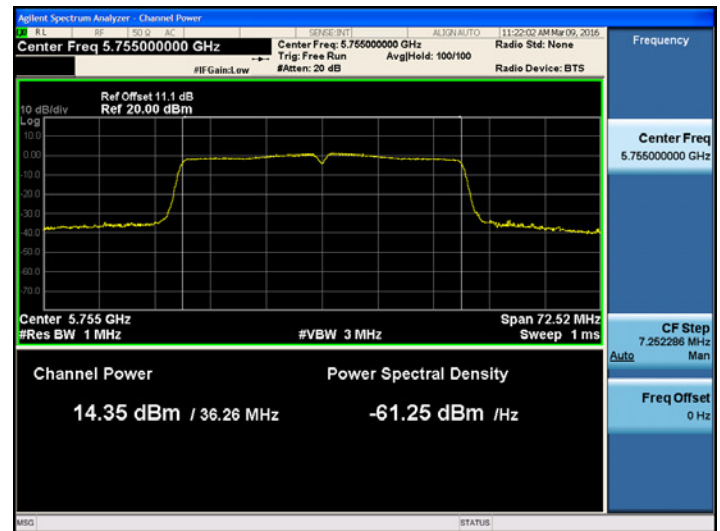
802.11n_40 MHz BW UNII 2A BAND Average Power
(5270 MHz ~5310 MHz) CH 54 MCS7



802.11n_40 MHz BW UNII 2C BAND Average Power
(5510 MHz ~5710 MHz) CH 142 MCS4



802.11n_40 MHz BW UNII 3 BAND Average Power
(5755 MHz ~5795 MHz) CH 151 MCS0



802.11ac _40MHz BW (UNII 1)

■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_40M BW Mode: 5190~5230)

802.11ac(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	0	7.81	0.62	8.43	23.98
		1	7.45	1.09	8.55	23.98
		2	7.08	1.48	8.55	23.98
		3	6.81	1.76	8.58	23.98
		4	6.24	2.24	8.49	23.98
		5	5.71	2.65	8.36	23.98
		6	5.62	2.81	8.43	23.98
		7	5.55	2.87	8.41	23.98
		8	5.40	3.03	8.43	23.98
		9	5.25	3.22	8.47	23.98
5230	46	0	14.51	0.62	15.13	23.98
		1	14.00	1.09	15.09	23.98
		2	13.55	1.48	15.03	23.98
		3	13.28	1.76	15.04	23.98
		4	12.90	2.24	15.14	23.98
		5	12.47	2.65	15.12	23.98
		6	12.36	2.81	15.18	23.98
		7	12.27	2.87	15.14	23.98
		8	12.16	3.03	15.19	23.98
		9	11.91	3.22	15.13	23.98

802.11ac_40MHz BW (UNII 2A)

TEST RESULTS

Conducted Output Power Measurements (802.11ac_40M BW Mode: 5270~5310)

802.11ac(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5270	54	0	14.67	0.62	15.29	23.98
		1	14.22	1.09	15.32	23.98
		2	13.94	1.48	15.41	23.98
		3	13.62	1.76	15.38	23.98
		4	13.06	2.24	15.30	23.98
		5	12.58	2.65	15.23	23.98
		6	12.49	2.81	15.30	23.98
		7	12.43	2.87	15.30	23.98
		8	12.30	3.03	15.33	23.98
		9	12.12	3.22	15.34	23.98
5310	62	0	8.09	0.62	8.70	23.98
		1	7.75	1.09	8.85	23.98
		2	7.44	1.48	8.91	23.98
		3	7.15	1.76	8.91	23.98
		4	6.73	2.24	8.98	23.98
		5	6.14	2.65	8.79	23.98
		6	5.99	2.81	8.80	23.98
		7	5.98	2.87	8.85	23.98
		8	5.80	3.03	8.83	23.98
		9	5.75	3.22	8.97	23.98

802.11ac_40MHz BW (UNII 2C)

■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_40M BW Mode: 5510~5710)

802.11ac(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5510	102	0	7.32	0.62	7.94	23.98
		1	6.97	1.09	8.06	23.98
		2	6.66	1.48	8.13	23.98
		3	6.38	1.76	8.14	23.98
		4	5.73	2.24	7.97	23.98
		5	5.35	2.65	8.00	23.98
		6	5.28	2.81	8.09	23.98
		7	5.14	2.87	8.01	23.98
		8	5.03	3.03	8.06	23.98
		9	4.90	3.22	8.12	23.98
5550	110	0	14.54	0.62	15.16	23.98
		1	14.21	1.09	15.31	23.98
		2	13.80	1.48	15.28	23.98
		3	13.36	1.76	15.12	23.98
		4	12.96	2.24	15.20	23.98
		5	12.62	2.65	15.27	23.98
		6	12.46	2.81	15.27	23.98
		7	12.42	2.87	15.29	23.98
		8	12.18	3.03	15.21	23.98
		9	12.05	3.22	15.27	23.98
5710	142	0	14.60	0.62	15.22	23.98
		1	14.21	1.09	15.30	23.98
		2	13.89	1.48	15.36	23.98
		3	13.43	1.76	15.19	23.98
		4	13.00	2.24	15.24	23.98
		5	12.66	2.65	15.31	23.98
		6	12.51	2.81	15.32	23.98
		7	12.46	2.87	15.33	23.98
		8	12.25	3.03	15.29	23.98
		9	12.04	3.22	15.26	23.98

802.11ac_40MHz BW (UNII 3)

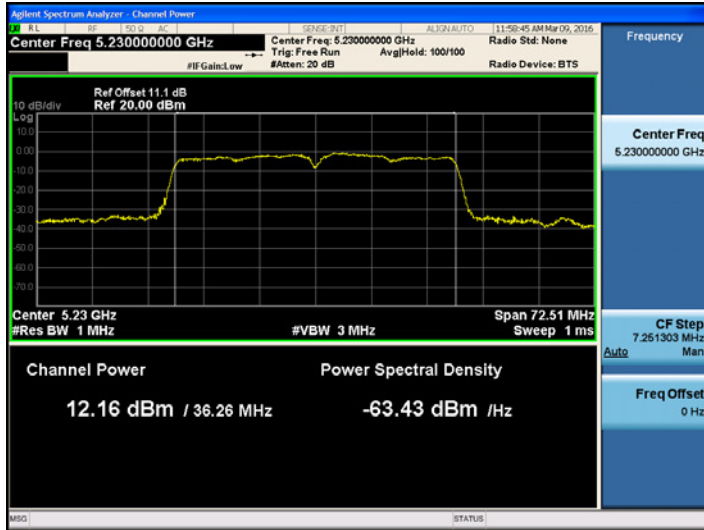
■ TEST RESULTS

Conducted Output Power Measurements (802.11ac_40M BW Mode: 5755~5795)

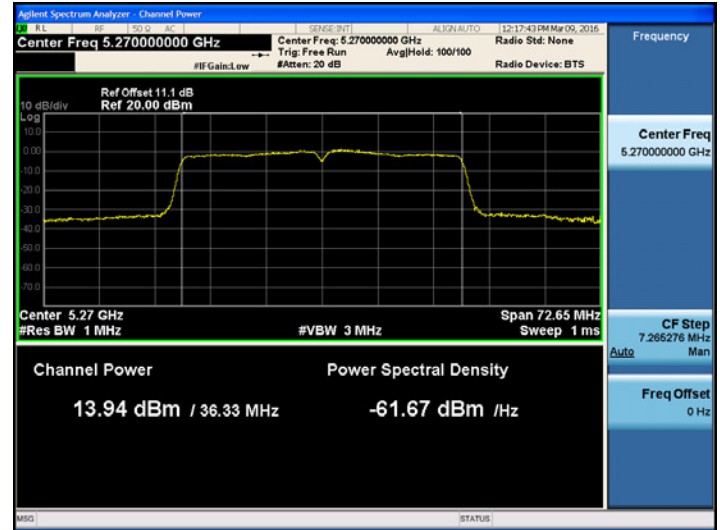
802.11ac(40MHz) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5755	151	0	14.49	0.62	15.10	30
		1	13.91	1.09	15.01	30
		2	13.58	1.48	15.06	30
		3	13.33	1.76	15.09	30
		4	12.67	2.24	14.91	30
		5	12.33	2.65	14.98	30
		6	12.19	2.81	15.00	30
		7	12.11	2.87	14.98	30
		8	12.06	3.03	15.09	30
		9	11.85	3.22	15.07	30
5795	159	0	7.62	0.62	8.24	30
		1	7.23	1.09	8.33	30
		2	6.69	1.48	8.17	30
		3	6.40	1.76	8.16	30
		4	6.01	2.24	8.25	30
		5	5.66	2.65	8.31	30
		6	5.31	2.81	8.12	30
		7	5.17	2.87	8.04	30
		8	5.37	3.03	8.40	30
		9	4.93	3.22	8.14	30

■ TEST Plot _802.11ac_40MHz BW

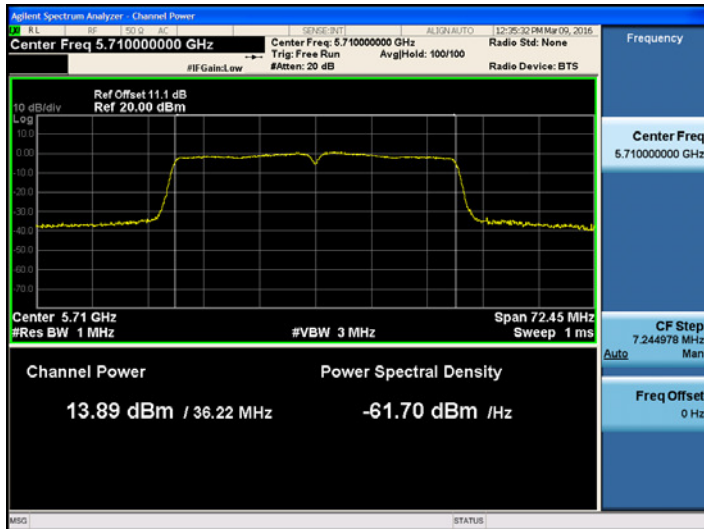
**802.11ac_40 MHz BW UNII 1 BAND Average Power
(5190 MHz ~5230 MHz) CH 46 MCS8**



**802.11ac_40 MHz BW UNII 2A BAND Average Power
(5270 MHz ~5310 MHz) CH 54 MCS2**



**802.11ac_40 MHz BW UNII 2C BAND Average Power
(5510 MHz ~5710 MHz) CH 142 MCS2**



**802.11ac_40 MHz BW UNII 3 BAND Average Power
(5755 MHz ~5795 MHz) CH 151 MCS0**

