HCT CO.,LTD
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
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FCC UNII REPORT

FCC Certification

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
April 29, 2016
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-R-1604-F066-1
HCT FRN: 0005866421
IC Recognition No.: 5944A-5

FCC ID : ZNFNSO

APPLICANT :LG Electronics MobileComm U.S.A., Inc.

Model(s): KT1601
EUT Type: Tablet with WLAN and Bluetooth
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	13.26	0.0212
	802.11n_HT20	5180 – 5240	9.91	0.0098
	802.11n_HT40	5190 - 5230	9.38	0.0087
	802.11ac_VHT20	5180 – 5240	9.72	0.0094
	802.11ac_VHT40	5190 - 5230	9.59	0.0091
	802.11ac_VHT80	5210	8.77	0.0075
UNII2A	802.11a	5260 – 5320	13.44	0.0221
	802.11n_HT20	5260 – 5320	10.02	0.0100
	802.11n_HT40	5270 – 5310	9.42	0.0087
	802.11ac_VHT20	5260 – 5320	9.79	0.0095
	802.11ac_VHT40	5270 – 5310	9.74	0.0094
	802.11ac_VHT80	5290	8.87	0.0077
UNII2C	802.11a	5500 – 5700	13.56	0.0227
	802.11n_HT20	5500 – 5700	9.89	0.0097
	802.11n_HT40	5510 – 5670	9.44	0.0088
	802.11ac_VHT20	5500 – 5700	9.78	0.0095
	802.11ac_VHT40	5510 – 5670	9.64	0.0092
	802.11ac_VHT80	5530	8.91	0.0078
UNII3	802.11a	5745 – 5825	13.31	0.0214
	802.11n_HT20	5745 – 5825	9.95	0.0099
	802.11n_HT40	5755 – 5795	9.48	0.0089
	802.11ac_VHT20	5745 – 5825	9.78	0.0095
	802.11ac_VHT40	5755 – 5795	9.67	0.0093
	802.11ac_VHT80	5775	8.76	0.0075

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	**Approved by**
: Seul Ki Lee	**: Jong Seok Lee**
Test Engineer of RF Team	**Manager of RF Team**

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1604-F066	April 25, 2016	- First Approval Report
HCT-R-1604-F066-1	April 29, 2016	- Revised the frequency ranges.

Table of Contents

1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFNSO
EUT Type:	Tablet with WLAN and Bluetooth
Model (s):	KT1601
Date(s) of Tests:	March 29, 2016 ~ April 18, 2016
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

2. EUT DESCRIPTION

Model	KT1601	
EUT Type	Tablet with WLAN and Bluetooth	
Power Supply	DC 3.85 V	
Battery Infomation	Model: BL-T20J_KD Type: Li-ion Polymer	
Frequency Range	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C)/ 5745 MHz - 5825 MHz (UNII 3), Not supported 5600 MHz – 5650 MHz
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5670 MHz (UNII 2C) / 5755 MHz - 5795 MHz (UNII 3) Not supported 5600 MHz – 5650 MHz
	80 MHz BW:	5210 MHz(UNII 1)/ 5290 MHz(UNII 2A)/ 5530 MHz (UNII 2C)/ 5775 MHz (UNII 3) Not supported 5600 MHz – 5650 MHz
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C)/ 5745 MHz - 5825 MHz (UNII 3) Not supported 5600 MHz – 5650 MHz
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5670 MHz (UNII 2C) / 5755 MHz - 5795 MHz (UNII 3) Not supported 5600 MHz – 5650 MHz
	80 MHz BW:	5210 MHz(UNII 1)/ 5290 MHz(UNII 2A)/ 5530 MHz (UNII 2C)/ 5775 MHz (UNII 3) Not supported 5600 MHz – 5650 MHz
Modulation Type	OFDM(802.11a, 802.11n, 802.11ac)	
Antenna Specification	Manufacturer: Ace technology. Antenna type:INTERNAL ANTENNA Peak Gain : -1.02 dBi (5180~5240 UNII1 BAND) / -0.68 dBi (5260~5320 UNII2A BAND) 0.69 dBi (5500~5700 UNII2C BAND) / 2.00 dBi (5745~5825 UNII3 BAND)	

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02 dated April 08, 2016 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.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 mabove 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 D02 v01r02)

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 (±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

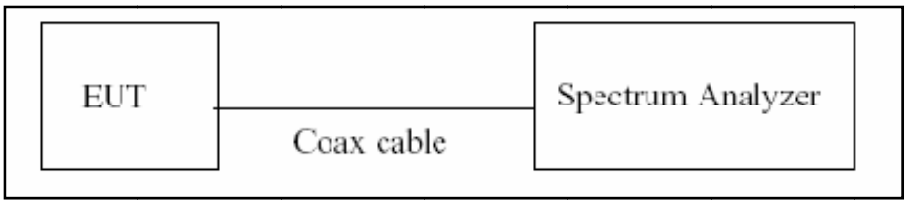
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	CONDUCTED	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)(1)	<250 mW (5150-5250 MHz) < 250 mW or 11+10 loglog $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 loglog $_{10}$ (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 ≥ 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 v01r02)

The largest availble 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 availble 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	2.040	2.055	0.99270073	0.032
	9	1.363	1.383	0.98553868	0.063
	12	1.023	1.043	0.98082454	0.084
	18	0.693	0.708	0.97881356	0.093
	24	0.526	0.546	0.96336996	0.162
	36	0.355	0.373	0.95174263	0.215
	48	0.272	0.289	0.94117647	0.263
	54	0.243	0.260	0.93461538	0.294
Mode	**MCS INDEX**	**T_{on} (ms)**	**T_{total} (ms)**	**Duty Cycle**	**Duty Cycle Factor (dB)**
802.11n_20 MHz BW	0	1.878	1.898	0.98946259	0.046
	1	0.957	0.977	0.97952917	0.090
	2	0.648	0.668	0.97005988	0.132
	3	0.496	0.511	0.97064579	0.129
	4	0.335	0.353	0.94900850	0.227
	5	0.255	0.274	0.93065693	0.312
	6	0.232	0.251	0.92430279	0.342
	7	0.210	0.228	0.92105263	0.357
802.11n_40 MHz BW	0	1.247	1.265	0.98577075	0.062
	1	0.637	0.656	0.97103659	0.128
	2	0.432	0.450	0.96000000	0.177
	3	0.334	0.352	0.94886364	0.228
	4	0.226	0.248	0.91129032	0.403
	5	0.181	0.200	0.90500000	0.434
	6	0.161	0.180	0.89444444	0.484
	7	0.149	0.168	0.88690476	0.521

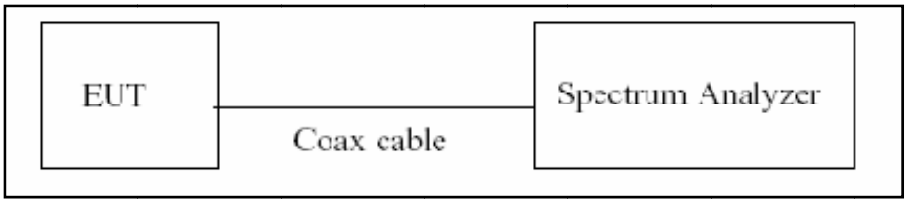
Mode	MCS INDEX	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ac_20 MHz BW	0	0.976	0.995	0.98090452	0.084
	1	0.508	0.526	0.96577947	0.151
	2	0.353	0.369	0.95663957	0.193
	3	0.276	0.295	0.93559322	0.289
	4	0.194	0.210	0.92380952	0.344
	5	0.160	0.178	0.89887640	0.463
	6	0.145	0.162	0.89506173	0.481
	7	0.136	0.154	0.88311688	0.540
	8	0.120	0.138	0.86956522	0.607
802.11ac_40 MHz BW	0	0.491	0.510	0.96274510	0.165
	1	0.268	0.286	0.93706294	0.282
	2	0.191	0.210	0.90952381	0.412
	3	0.157	0.176	0.89204545	0.496
	4	0.116	0.135	0.85925926	0.659
	5	0.116	0.135	0.85925926	0.659
	6	0.092	0.111	0.82882883	0.815
	7	0.088	0.107	0.82242991	0.849
	8	0.080	0.100	0.80000000	0.969
	9	0.077	0.096	0.80208333	0.958
802.11ac_80 MHz BW	0	0.249	0.268	0.92910448	0.319
	1	0.145	0.165	0.87878788	0.561
	2	0.113	0.132	0.85606061	0.675
	3	0.092	0.113	0.81415929	0.893
	4	0.076	0.096	0.79166667	1.015
	5	0.068	0.088	0.77272727	1.120
	6	0.064	0.084	0.76190476	1.181
	7	0.064	0.084	0.76190476	1.181
	8	0.061	0.080	0.76250000	1.178
	9	0.056	0.076	0.73684211	1.326

9.2EMISSION 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 v01r02, 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 v01r02)

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 UNII3band 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 v01r02)

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	21.71	N/A	Pass
5200	40	21.83	N/A	Pass
5240	48	21.41	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	21.81	N/A	Pass
5300	60	21.18	N/A	Pass
5320	64	21.65	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	21.44	N/A	Pass
5580	116	22.03	N/A	Pass
5700	140	21.88	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	21.51	N/A	Pass
5785	157	21.62	N/A	Pass
5825	165	21.43	N/A	Pass

▣TEST Plot for 802.11a

802.11a UNII 1 BAND 26dB Bandwidth (CH40)	802.11a UNII 2A BAND 26dB Bandwidth (CH52)
	
802.11a UNII 2C BAND 26dB Bandwidth (CH116)	**802.11a 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_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	21.78	N/A	Pass
5200	40	21.97	N/A	Pass
5240	48	21.90	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	21.84	N/A	Pass
5300	60	21.73	N/A	Pass
5320	64	22.20	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	22.32	N/A	Pass
5580	116	21.77	N/A	Pass
5700	140	21.78	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	22.15	N/A	Pass
5785	157	21.84	N/A	Pass
5825	165	21.99	N/A	Pass

▣TEST Plot for802.11n _HT20

802.11n_HT20UNII 1 BAND 26dB Bandwidth(CH 40)	802.11n_HT20UNII 2A BAND 26dB Bandwidth(CH64)
	
802.11n_HT20UNII 2C BAND 26dB Bandwidth(CH 100)	**802.11n_HT20UNII 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	21.88	N/A	Pass
5200	40	21.70	N/A	Pass
5240	48	21.74	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.78	N/A	Pass
5300	60	21.72	N/A	Pass
5320	64	21.81	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.72	N/A	Pass
5580	116	21.80	N/A	Pass
5700	140	21.76	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT20

802.11ac_VHT20Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.96	N/A	Pass
5785	157	21.81	N/A	Pass
5825	165	21.79	N/A	Pass

▣TEST Plot for 802.11ac_VHT20

802.11ac_VHT20 UNII 1 BAND 26dB Bandwidth(CH 36)	802.11ac_VHT20 UNII 2A BAND 26dB Bandwidth(CH64)
	
802.11ac_VHT20UNII 2C BAND 26dB Bandwidth(CH 116)	**802.11ac_VHT20UNII 3 BAND 26dB Bandwidth(CH 149)**
	

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

▣TEST RESULTS for802.11n_HT40

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	42.68	N/A	Pass
5230	46	42.19	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	42.58	N/A	Pass
5310	62	42.89	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	43.07	N/A	Pass
5550	110	42.35	N/A	Pass
5670	134	42.67	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_HT40

802.11n_HT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	42.50	N/A	Pass
5795	159	42.26	N/A	Pass

▣TEST Plot for802.11n_HT40

802.11n_HT40 UNII 1 BAND 26dB Bandwidth(CH 38)	802.11n_HT40UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11n_HT40UNII 2C BAND 26dB Bandwidth(CH 102)	**802.11n_HT40UNII 3 BAND 26dB Bandwidth (CH 151)**
	

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

▣TEST RESULTSfor 802.11ac_VHT40

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	42.05	N/A	Pass
5230	46	42.12	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	41.95	N/A	Pass
5310	62	42.00	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	42.13	N/A	Pass
5550	110	42.24	N/A	Pass
5670	134	41.77	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT40

802.11ac_VHT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	41.91	N/A	Pass
5795	159	42.29	N/A	Pass

▣TEST Plot for 802.11ac_VHT40

802.11ac_VHT40UNII 1 BAND 26dB Bandwidth(CH 46)	802.11ac_VHT40UNII 2A BAND 26dB Bandwidth (CH 62)
	
802.11ac_VHT40UNII 2C BAND 26dB Bandwidth(CH 110)	**802.11ac_VHT40UNII 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_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	83.83	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5290	58	83.84	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5530	106	83.82	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac_VHT80

802.11ac_VHT80Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	83.78	N/A	Pass

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

▣TEST Plot for 802.11ac_VHT80

802.11ac_VHT80UNII 1 BAND 26dB Bandwidth(CH 42)	802.11ac_VHT80 UNII 2A BAND 26dB Bandwidth(CH 58)
	
802.11ac_VHT80UNII 2C BAND 26dB Bandwidth(CH 106)	**802.11ac_VHT80UNII 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, 802.11n_HT20, 802.11ac_VHT20

Conducted 6 dB Bandwidth Measurements for 802.11a

802.11aMode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.44	0.5	Pass
5785	157	16.42	0.5	Pass
5825	165	16.42	0.5	Pass

Conducted 6 dB Bandwidth Measurements for802.11n_HT20

802.11n_HT20Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.64	0.5	Pass
5785	157	17.63	0.5	Pass
5825	165	17.63	0.5	Pass

Conducted 6 dB Bandwidth Measurements for802.11ac_VHT20

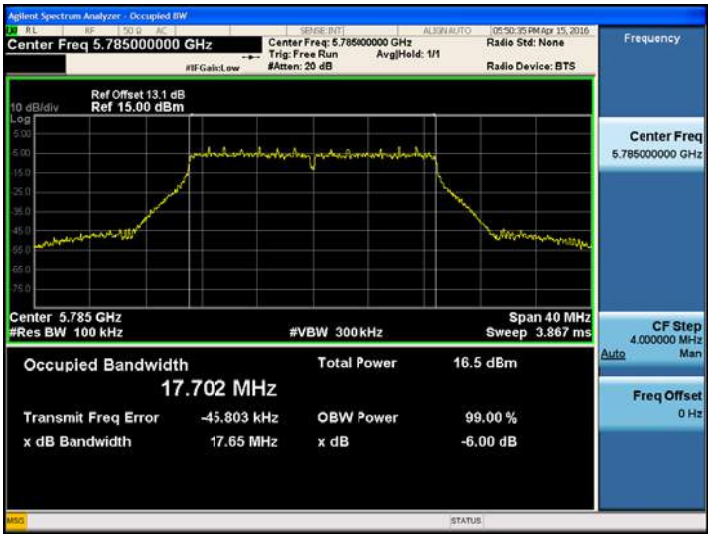
802.11ac_VHT20Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.64	0.5	Pass
5785	157	17.65	0.5	Pass
5825	165	17.63	0.5	Pass

▣TEST Plot for 802.11a, 802.11n_HT20, 802.11ac_VHT20

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

802.11n_HT20 UNII 3 BAND 6dB Bandwidth(CH.149)

802.11ac_VHT20 UNII 3 BAND 6dB Bandwidth(CH.157)



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

▣TEST RESULTS for 802.11n_HT40, 802.11ac_VHT40

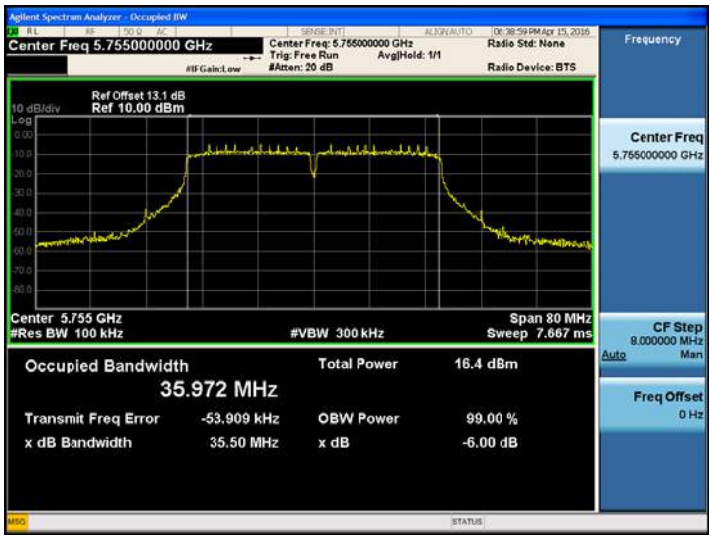
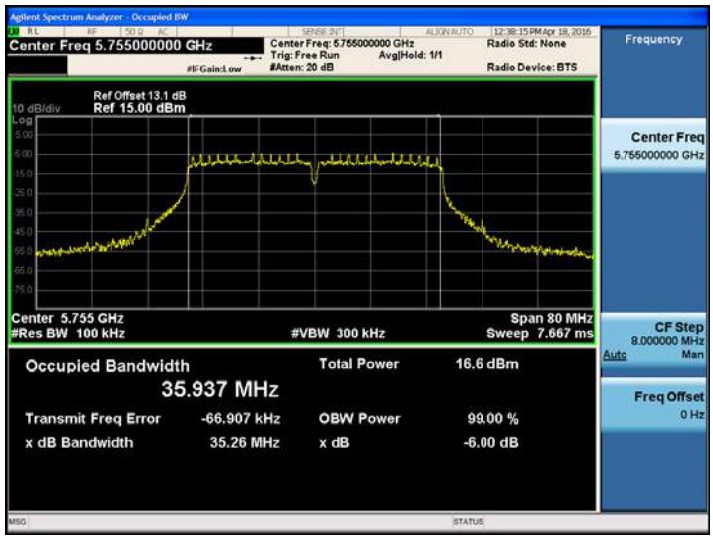
Conducted 6 dB Bandwidth Measurements for802.11n_HT40

802.11n_HT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.50	0.5	Pass
5795	159	35.17	0.5	Pass

Conducted 6 dB Bandwidth Measurements for802.11ac_VHT40

802.11ac_VHT40Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.26	0.5	Pass
5795	159	35.18	0.5	Pass

▣TEST Plot for 802.11n_HT40, 802.11ac_VHT40

802.11n_HT40 UNII 3 BAND 6dB Bandwidth(CH.151)	802.11ac_VHT40 BW UNII 3 BAND 6dB 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 6 dB Bandwidth Measurements for802.11ac_80MHz BW

802.11ac_VHT80Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	74.02	0.5	Pass

▣TEST Plot for 802.11ac_VHT80

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

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

9.3OUTPUT POWER MEASUREMENT

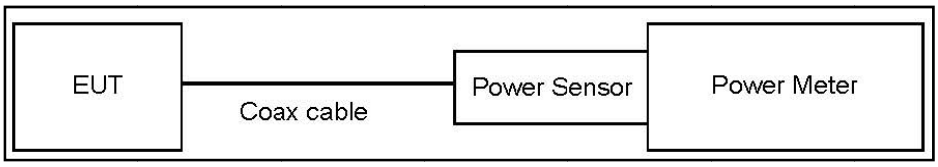
Test Requirements and limit, §15.407(a)(1)

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	802.11a,n,ac	23.98
UNII 2A		23.98
UNII 2C		23.98
UNII 3		30.00

▣ TEST CONFIGURATION(20 MHz BW)



▣TEST PROCEDURE(20 MHz BW)

▪ Average Power(Procedure E.3.a in KDB 789033 D02 v01r02).

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.

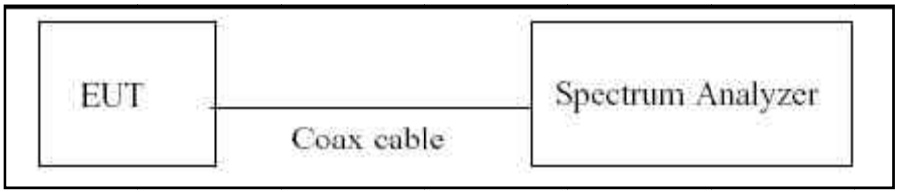
Note :

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)

▣ 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 v01r02.

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	11.1

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

UNII 1 BAND

▣TEST RESULTS

Conducted Output Power Measurements (802.11a Mode)

802.11aMode		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	13.17	0.03	13.20	23.98
		9	13.14	0.06	13.20	23.98
		12	13.12	0.08	13.20	23.98
		18	13.08	0.09	13.17	23.98
		24	13.04	0.16	13.20	23.98
		36	12.96	0.21	13.17	23.98
		48	12.71	0.26	12.97	23.98
		54	12.68	0.29	12.97	23.98
5200	40	6	13.14	0.03	13.17	23.98
		9	13.06	0.06	13.12	23.98
		12	13.10	0.08	13.18	23.98
		18	13.10	0.09	13.19	23.98
		24	12.96	0.16	13.12	23.98
		36	12.90	0.21	13.11	23.98
		48	12.81	0.26	13.07	23.98
		54	12.84	0.29	13.13	23.98
5240	48	6	13.18	0.03	13.21	23.98
		9	13.20	0.06	13.26	23.98
		12	13.18	0.08	13.26	23.98
		18	13.15	0.09	13.24	23.98
		24	13.08	0.16	13.24	23.98
		36	13.01	0.21	13.22	23.98
		48	12.96	0.26	13.22	23.98
		54	12.89	0.29	13.18	23.98

UNII 2A BAND

▣TEST RESULTS

Conducted Output Power Measurements (802.11aMode)

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	13.34	0.03	13.37	23.98
		9	13.29	0.06	13.35	23.98
		12	13.31	0.08	13.39	23.98
		18	13.26	0.09	13.35	23.98
		24	13.18	0.16	13.34	23.98
		36	13.12	0.21	13.33	23.98
		48	13.05	0.26	13.31	23.98
		54	13.01	0.29	13.30	23.98
5300	60	6	13.38	0.03	13.41	23.98
		9	13.35	0.06	13.41	23.98
		12	13.34	0.08	13.42	23.98
		18	13.26	0.09	13.35	23.98
		24	13.27	0.16	13.43	23.98
		36	13.14	0.21	13.35	23.98
		48	13.05	0.26	13.31	23.98
		54	13.03	0.29	13.32	23.98
5320	64	6	13.41	0.03	13.44	23.98
		9	13.38	0.06	13.44	23.98
		12	13.30	0.08	13.38	23.98
		18	13.31	0.09	13.40	23.98
		24	13.23	0.16	13.39	23.98
		36	13.17	0.21	13.38	23.98
		48	13.06	0.26	13.32	23.98
		54	13.04	0.29	13.33	23.98

UNII 2C BAND

▣TEST RESULTS

Conducted Output Power Measurements (802.11aMode)

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	13.49	0.03	13.52	23.98
		9	13.47	0.06	13.53	23.98
		12	13.48	0.08	13.56	23.98
		18	13.38	0.09	13.47	23.98
		24	13.33	0.16	13.49	23.98
		36	13.31	0.21	13.52	23.98
		48	13.15	0.26	13.41	23.98
		54	13.16	0.29	13.45	23.98
5580	116	6	13.38	0.03	13.41	23.98
		9	13.30	0.06	13.36	23.98
		12	13.22	0.08	13.30	23.98
		18	13.27	0.09	13.36	23.98
		24	13.18	0.16	13.34	23.98
		36	13.07	0.21	13.28	23.98
		48	13.06	0.26	13.32	23.98
		54	12.95	0.29	13.24	23.98
5700	140	6	13.35	0.03	13.38	23.98
		9	13.29	0.06	13.35	23.98
		12	13.25	0.08	13.33	23.98
		18	13.24	0.09	13.33	23.98
		24	13.17	0.16	13.33	23.98
		36	13.13	0.21	13.34	23.98
		48	13.04	0.26	13.30	23.98
		54	12.99	0.29	13.28	23.98

UNII 3 BAND

▣TEST RESULTS

Conducted Output Power Measurements (802.11a Mode)

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	13.27	0.03	13.30	30
		9	13.22	0.06	13.28	30
		12	13.20	0.08	13.28	30
		18	13.16	0.09	13.25	30
		24	13.09	0.16	13.25	30
		36	13.07	0.21	13.28	30
		48	12.98	0.26	13.24	30
		54	12.95	0.29	13.24	30
5785	157	6	13.21	0.03	13.24	30
		9	13.18	0.06	13.24	30
		12	13.15	0.08	13.23	30
		18	13.12	0.09	13.21	30
		24	13.05	0.16	13.21	30
		36	13.00	0.21	13.21	30
		48	12.93	0.26	13.19	30
		54	12.88	0.29	13.17	30
5825	165	6	13.28	0.03	13.31	30
		9	13.18	0.06	13.24	30
		12	13.20	0.08	13.28	30
		18	13.17	0.09	13.26	30
		24	13.09	0.16	13.25	30
		36	13.06	0.21	13.27	30
		48	12.96	0.26	13.22	30
		54	12.86	0.29	13.15	30

UNII 1 BAND

▣TEST RESULTS

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

802.11n_HT20 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	9.80	0.05	9.85	23.98
		1	9.77	0.09	9.86	23.98
		2	9.78	0.13	9.91	23.98
		3	9.64	0.13	9.77	23.98
		4	9.57	0.23	9.80	23.98
		5	9.49	0.31	9.80	23.98
		6	9.48	0.34	9.82	23.98
		7	9.39	0.36	9.75	23.98
5200	40	0	9.76	0.05	9.81	23.98
		1	9.74	0.09	9.83	23.98
		2	9.68	0.13	9.81	23.98
		3	9.57	0.13	9.70	23.98
		4	9.54	0.23	9.77	23.98
		5	9.44	0.31	9.75	23.98
		6	9.40	0.34	9.74	23.98
		7	9.36	0.36	9.72	23.98
5240	48	0	9.68	0.05	9.73	23.98
		1	9.67	0.09	9.76	23.98
		2	9.62	0.13	9.75	23.98
		3	9.57	0.13	9.70	23.98
		4	9.45	0.23	9.68	23.98
		5	9.41	0.31	9.72	23.98
		6	9.38	0.34	9.72	23.98
		7	9.31	0.36	9.67	23.98

802.11n_HT20 BW (UNII 2A)

▣TEST RESULTS

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

802.11n_HT20 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	9.72	0.05	9.77	23.98
		1	9.69	0.09	9.78	23.98
		2	9.71	0.13	9.84	23.98
		3	9.57	0.13	9.70	23.98
		4	9.53	0.23	9.76	23.98
		5	9.45	0.31	9.76	23.98
		6	9.37	0.34	9.71	23.98
		7	9.34	0.36	9.70	23.98
5300	60	0	9.74	0.05	9.79	23.98
		1	9.70	0.09	9.79	23.98
		2	9.68	0.13	9.81	23.98
		3	9.57	0.13	9.70	23.98
		4	9.54	0.23	9.77	23.98
		5	9.45	0.31	9.76	23.98
		6	9.41	0.34	9.75	23.98
		7	9.38	0.36	9.74	23.98
5320	64	0	9.97	0.05	10.02	23.98
		1	9.88	0.09	9.97	23.98
		2	9.83	0.13	9.96	23.98
		3	9.79	0.13	9.92	23.98
		4	9.69	0.23	9.92	23.98
		5	9.59	0.31	9.90	23.98
		6	9.60	0.34	9.94	23.98
		7	9.56	0.36	9.92	23.98

802.11n_HT20 BW (UNII 2C)

▣TEST RESULTS

Conducted Output Power Measurements (802.11n_HT20 Mode: 5500~5700)

802.11n_HT20 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	9.79	0.05	9.84	23.98
		1	9.72	0.09	9.81	23.98
		2	9.71	0.13	9.84	23.98
		3	9.65	0.13	9.78	23.98
		4	9.56	0.23	9.79	23.98
		5	9.50	0.31	9.81	23.98
		6	9.46	0.34	9.80	23.98
		7	9.40	0.36	9.76	23.98
5580	116	0	9.84	0.05	9.89	23.98
		1	9.79	0.09	9.88	23.98
		2	9.74	0.13	9.87	23.98
		3	9.66	0.13	9.79	23.98
		4	9.53	0.23	9.76	23.98
		5	9.44	0.31	9.75	23.98
		6	9.46	0.34	9.80	23.98
		7	9.43	0.36	9.79	23.98
5700	140	0	9.77	0.05	9.82	23.98
		1	9.69	0.09	9.78	23.98
		2	9.68	0.13	9.81	23.98
		3	9.61	0.13	9.74	23.98
		4	9.57	0.23	9.80	23.98
		5	9.43	0.31	9.74	23.98
		6	9.39	0.34	9.73	23.98
		7	9.35	0.36	9.71	23.98

802.11n_HT20 BW (UNII 3)

▣TEST RESULTS

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

802.11n_HT20 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	9.75	0.05	9.80	30
		1	9.77	0.09	9.86	30
		2	9.63	0.13	9.76	30
		3	9.55	0.13	9.68	30
		4	9.46	0.23	9.69	30
		5	9.39	0.31	9.70	30
		6	9.35	0.34	9.69	30
		7	9.32	0.36	9.68	30
5785	157	0	9.90	0.05	9.95	30
		1	9.80	0.09	9.89	30
		2	9.79	0.13	9.92	30
		3	9.70	0.13	9.83	30
		4	9.63	0.23	9.86	30
		5	9.53	0.31	9.84	30
		6	9.49	0.34	9.83	30
		7	9.43	0.36	9.79	30
5825	165	0	9.72	0.05	9.77	30
		1	9.72	0.09	9.81	30
		2	9.66	0.13	9.79	30
		3	9.59	0.13	9.72	30
		4	9.49	0.23	9.72	30
		5	9.36	0.31	9.67	30
		6	9.33	0.34	9.67	30
		7	9.39	0.36	9.75	30

802.11ac_HT20 (UNII 1)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_HT20 Mode: 5180~5240)

802.11ac_HT20 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	9.61	0.08	9.69	23.98
		1	9.53	0.15	9.68	23.98
		2	9.46	0.19	9.65	23.98
		3	9.28	0.29	9.57	23.98
		4	9.14	0.34	9.48	23.98
		5	9.18	0.46	9.64	23.98
		6	9.12	0.48	9.60	23.98
		7	9.04	0.54	9.58	23.98
		8	8.93	0.61	9.54	23.98
5200	40	0	9.64	0.08	9.72	23.98
		1	9.53	0.15	9.68	23.98
		2	9.42	0.19	9.61	23.98
		3	9.34	0.29	9.63	23.98
		4	9.21	0.34	9.55	23.98
		5	9.19	0.46	9.65	23.98
		6	9.13	0.48	9.61	23.98
		7	9.10	0.54	9.64	23.98
		8	8.93	0.61	9.54	23.98
5240	48	0	9.56	0.08	9.64	23.98
		1	9.52	0.15	9.67	23.98
		2	9.45	0.19	9.64	23.98
		3	9.31	0.29	9.60	23.98
		4	9.17	0.34	9.51	23.98
		5	9.18	0.46	9.64	23.98
		6	9.10	0.48	9.58	23.98
		7	9.05	0.54	9.59	23.98
		8	8.92	0.61	9.53	23.98

802.11ac_HT20 (UNII 2A)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_HT20 Mode: 5260~5320)

802.11ac_HT20 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	9.63	0.08	9.71	23.98
		1	9.55	0.15	9.70	23.98
		2	9.47	0.19	9.66	23.98
		3	9.41	0.29	9.70	23.98
		4	9.24	0.34	9.58	23.98
		5	9.22	0.46	9.68	23.98
		6	9.16	0.48	9.64	23.98
		7	9.09	0.54	9.63	23.98
		8	9.00	0.61	9.61	23.98
5300	60	0	9.66	0.08	9.74	23.98
		1	9.58	0.15	9.73	23.98
		2	9.52	0.19	9.71	23.98
		3	9.35	0.29	9.64	23.98
		4	9.26	0.34	9.60	23.98
		5	9.24	0.46	9.70	23.98
		6	9.15	0.48	9.63	23.98
		7	9.10	0.54	9.64	23.98
		8	9.02	0.61	9.63	23.98
5320	64	0	9.71	0.08	9.79	23.98
		1	9.58	0.15	9.73	23.98
		2	9.55	0.19	9.74	23.98
		3	9.43	0.29	9.72	23.98
		4	9.28	0.34	9.62	23.98
		5	9.27	0.46	9.73	23.98
		6	9.21	0.48	9.69	23.98
		7	9.14	0.54	9.68	23.98
		8	9.01	0.61	9.62	23.98

802.11ac_HT20 (UNII 2C)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_HT20 Mode: 5500~5700)

802.11ac_HT20 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	9.66	0.08	9.74	23.98
		1	9.54	0.15	9.69	23.98
		2	9.52	0.19	9.71	23.98
		3	9.37	0.29	9.66	23.98
		4	9.24	0.34	9.58	23.98
		5	9.23	0.46	9.69	23.98
		6	9.14	0.48	9.62	23.98
		7	9.10	0.54	9.64	23.98
		8	8.98	0.61	9.59	23.98
5580	116	0	9.68	0.08	9.76	23.98
		1	9.57	0.15	9.72	23.98
		2	9.54	0.19	9.73	23.98
		3	9.44	0.29	9.73	23.98
		4	9.31	0.34	9.65	23.98
		5	9.28	0.46	9.74	23.98
		6	9.20	0.48	9.68	23.98
		7	9.14	0.54	9.68	23.98
		8	9.07	0.61	9.68	23.98
5700	140	0	9.67	0.08	9.75	23.98
		1	9.63	0.15	9.78	23.98
		2	9.54	0.19	9.73	23.98
		3	9.43	0.29	9.72	23.98
		4	9.27	0.34	9.61	23.98
		5	9.27	0.46	9.73	23.98
		6	9.18	0.48	9.66	23.98
		7	9.05	0.54	9.59	23.98
		8	8.99	0.61	9.60	23.98

802.11ac_VHT20 BW (UNII 3)

▣TEST RESULTS

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

802.11ac_VHT20 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	9.70	0.08	9.78	30
		1	9.58	0.15	9.73	30
		2	9.49	0.19	9.68	30
		3	9.42	0.29	9.71	30
		4	9.24	0.34	9.58	30
		5	9.26	0.46	9.72	30
		6	9.16	0.48	9.64	30
		7	9.08	0.54	9.62	30
		8	8.94	0.61	9.55	30
5785	157	0	9.68	0.08	9.76	30
		1	9.62	0.15	9.77	30
		2	9.58	0.19	9.77	30
		3	9.41	0.29	9.70	30
		4	9.32	0.34	9.66	30
		5	9.31	0.46	9.77	30
		6	9.16	0.48	9.64	30
		7	9.10	0.54	9.64	30
		8	8.96	0.61	9.57	30
5825	165	0	9.64	0.08	9.72	30
		1	9.56	0.15	9.71	30
		2	9.54	0.19	9.73	30
		3	9.37	0.29	9.66	30
		4	9.22	0.34	9.56	30
		5	9.19	0.46	9.65	30
		6	9.14	0.48	9.62	30
		7	9.06	0.54	9.60	30
		8	9.00	0.61	9.61	30

802.11n_HT40 BW (UNII 1)

▣TEST RESULTS

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

802.11n_HT40 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	9.16	0.06	9.22	23.98
		1	9.15	0.13	9.28	23.98
		2	9.12	0.18	9.30	23.98
		3	8.87	0.23	9.10	23.98
		4	8.84	0.40	9.24	23.98
		5	8.74	0.43	9.17	23.98
		6	8.66	0.48	9.15	23.98
		7	8.64	0.52	9.16	23.98
5230	46	0	9.23	0.06	9.29	23.98
		1	9.25	0.13	9.38	23.98
		2	9.14	0.18	9.32	23.98
		3	9.03	0.23	9.26	23.98
		4	8.90	0.40	9.30	23.98
		5	8.75	0.43	9.19	23.98
		6	8.73	0.48	9.21	23.98
		7	8.68	0.52	9.20	23.98

802.11n_HT40 (UNII 2A)

▣TEST RESULTS

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

802.11n_HT40 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	9.19	0.06	9.25	23.98
		1	9.23	0.13	9.36	23.98
		2	9.15	0.18	9.33	23.98
		3	9.05	0.23	9.28	23.98
		4	8.88	0.40	9.29	23.98
		5	8.78	0.43	9.21	23.98
		6	8.74	0.48	9.22	23.98
		7	8.69	0.52	9.21	23.98
5310	62	0	9.21	0.06	9.28	23.98
		1	9.29	0.13	9.42	23.98
		2	9.14	0.18	9.31	23.98
		3	9.02	0.23	9.25	23.98
		4	8.92	0.40	9.32	23.98
		5	8.84	0.43	9.27	23.98
		6	8.77	0.48	9.25	23.98
		7	8.71	0.52	9.23	23.98

802.11n_HT40 (UNII 2C)

▣TEST RESULTS

Conducted Output Power Measurements (802.11n_HT40 Mode: 5510~5670)

802.11n_HT40 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	9.25	0.06	9.31	23.98
		1	9.16	0.13	9.28	23.98
		2	9.16	0.18	9.34	23.98
		3	9.03	0.23	9.26	23.98
		4	8.83	0.40	9.24	23.98
		5	8.85	0.43	9.29	23.98
		6	8.74	0.48	9.22	23.98
		7	8.70	0.52	9.22	23.98
5550	110	0	9.38	0.06	9.44	23.98
		1	9.25	0.13	9.37	23.98
		2	9.24	0.18	9.41	23.98
		3	9.10	0.23	9.33	23.98
		4	8.96	0.40	9.36	23.98
		5	8.86	0.43	9.29	23.98
		6	8.82	0.48	9.30	23.98
		7	8.80	0.52	9.32	23.98
5670	134	0	9.30	0.06	9.36	23.98
		1	9.27	0.13	9.40	23.98
		2	9.19	0.18	9.37	23.98
		3	9.08	0.23	9.31	23.98
		4	8.92	0.40	9.32	23.98
		5	8.82	0.43	9.26	23.98
		6	8.70	0.48	9.19	23.98
		7	8.73	0.52	9.25	23.98

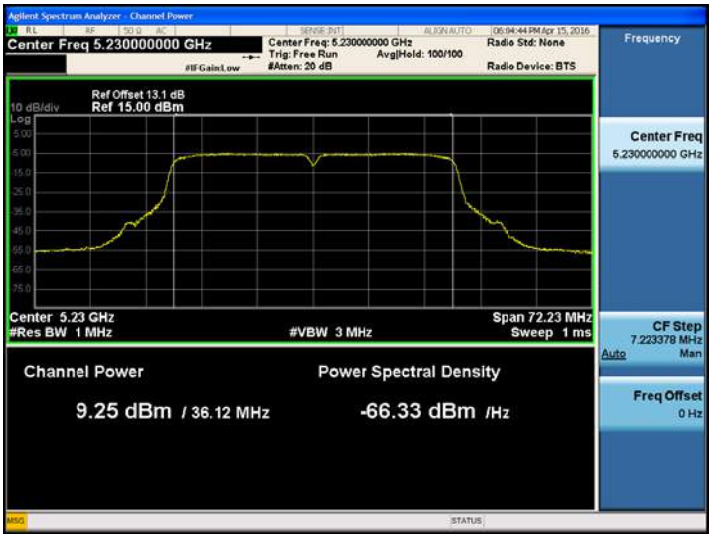
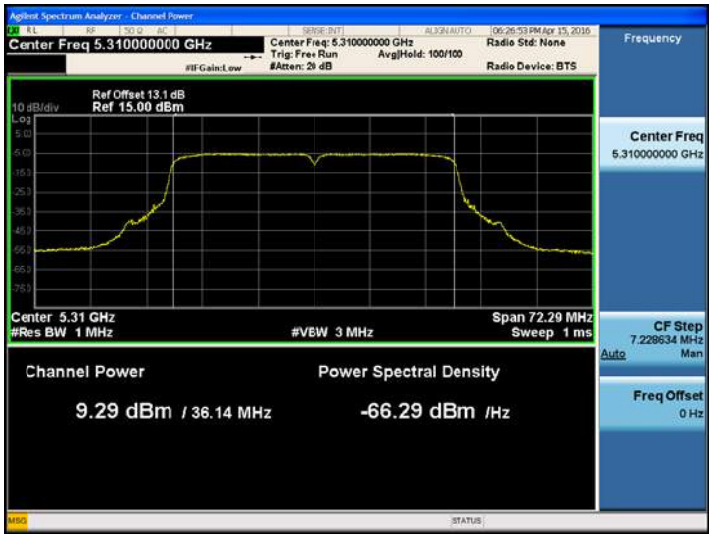
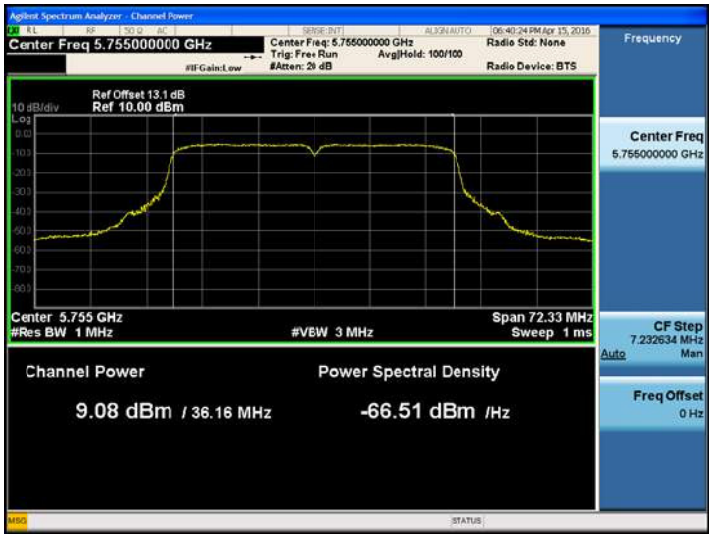
802.11n_HT40 (UNII 3)

▣TEST RESULTS

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

802.11n_HT40 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	9.32	0.06	9.38	30
		1	9.30	0.13	9.43	30
		2	9.30	0.18	9.48	30
		3	9.17	0.23	9.40	30
		4	9.08	0.40	9.48	30
		5	8.98	0.43	9.42	30
		6	8.91	0.48	9.40	30
		7	8.78	0.52	9.30	30
5795	159	0	9.18	0.06	9.24	30
		1	9.26	0.13	9.38	30
		2	9.23	0.18	9.41	30
		3	9.03	0.23	9.26	30
		4	8.97	0.40	9.37	30
		5	8.84	0.43	9.28	30
		6	8.84	0.48	9.32	30
		7	8.68	0.52	9.20	30

▣TEST Plot _802.11n_HT40

802.11n_HT40 UNII 1 BAND Average Power (5190 MHz ~5230 MHz) CH 46MCS1	802.11n_HT40 UNII 2A BAND Average Power (5270 MHz ~5310 MHz) CH 62 MCS1
	
802.11n_HT40 UNII 2C BAND Average Power (5510 MHz ~5670 MHz) CH 110MCS0	**802.11n_HT40 UNII 3 BAND Average Power (5755 MHz ~5795 MHz) CH 151MCS4**
	

802.11ac_VHT40 (UNII 1)

▣TEST RESULTS

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

802.11ac_VHT40 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	9.40	0.16	9.56	23.98
		1	9.30	0.28	9.58	23.98
		2	9.11	0.41	9.52	23.98
		3	8.78	0.50	9.28	23.98
		4	8.72	0.66	9.38	23.98
		5	8.64	0.66	9.30	23.98
		6	8.54	0.82	9.35	23.98
		7	8.64	0.85	9.49	23.98
		8	8.37	0.97	9.34	23.98
		9	8.43	0.96	9.39	23.98
5230	46	0	9.30	0.16	9.46	23.98
		1	9.29	0.28	9.57	23.98
		2	9.17	0.41	9.58	23.98
		3	9.01	0.50	9.51	23.98
		4	8.78	0.66	9.43	23.98
		5	8.82	0.66	9.48	23.98
		6	8.66	0.82	9.48	23.98
		7	8.72	0.85	9.57	23.98
		8	8.18	0.97	9.15	23.98
		9	8.64	0.96	9.59	23.98

802.11ac_VHT40 (UNII 2A)

▣TEST RESULTS

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

802.11ac_VHT40 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	9.38	0.16	9.54	23.98
		1	9.31	0.28	9.59	23.98
		2	9.17	0.41	9.58	23.98
		3	9.01	0.50	9.50	23.98
		4	8.91	0.66	9.57	23.98
		5	8.74	0.66	9.40	23.98
		6	8.71	0.82	9.52	23.98
		7	8.60	0.85	9.45	23.98
		8	8.59	0.97	9.56	23.98
		9	8.60	0.96	9.56	23.98
5310	62	0	9.30	0.16	9.47	23.98
		1	9.30	0.28	9.58	23.98
		2	9.10	0.41	9.52	23.98
		3	8.97	0.50	9.47	23.98
		4	8.86	0.66	9.52	23.98
		5	8.86	0.66	9.52	23.98
		6	8.76	0.82	9.57	23.98
		7	8.75	0.85	9.60	23.98
		8	8.67	0.97	9.64	23.98
		9	8.79	0.96	9.74	23.98

802.11ac_VHT40 (UNII 2C)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT40 Mode: 5510~5670)

802.11ac_VHT40 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	9.41	0.16	9.57	23.98
		1	8.97	0.28	9.26	23.98
		2	9.15	0.41	9.56	23.98
		3	8.71	0.50	9.20	23.98
		4	8.61	0.66	9.27	23.98
		5	8.57	0.66	9.22	23.98
		6	8.44	0.82	9.26	23.98
		7	8.36	0.85	9.21	23.98
		8	8.43	0.97	9.40	23.98
		9	8.43	0.96	9.39	23.98
5550	110	0	9.43	0.16	9.59	23.98
		1	9.29	0.28	9.58	23.98
		2	9.16	0.41	9.57	23.98
		3	9.01	0.50	9.50	23.98
		4	8.72	0.66	9.38	23.98
		5	8.57	0.66	9.23	23.98
		6	8.67	0.82	9.49	23.98
		7	8.54	0.85	9.39	23.98
		8	8.61	0.97	9.58	23.98
		9	8.62	0.96	9.58	23.98
5670	134	0	9.34	0.16	9.51	23.98
		1	9.30	0.28	9.58	23.98
		2	9.19	0.41	9.60	23.98
		3	8.98	0.50	9.48	23.98
		4	8.98	0.66	9.64	23.98
		5	8.88	0.66	9.54	23.98
		6	8.62	0.82	9.43	23.98
		7	8.76	0.85	9.61	23.98
		8	8.63	0.97	9.60	23.98
		9	8.58	0.96	9.53	23.98

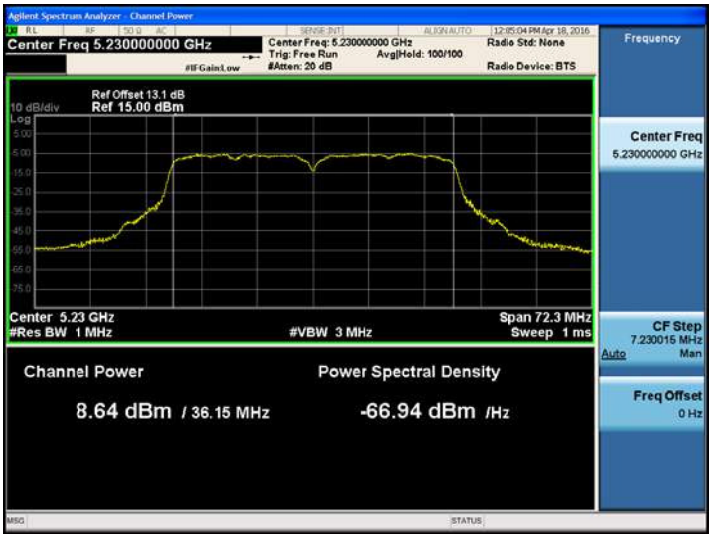
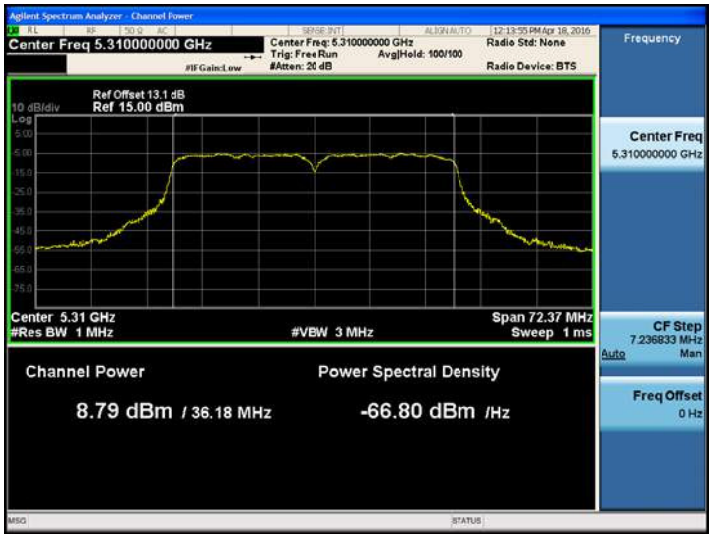
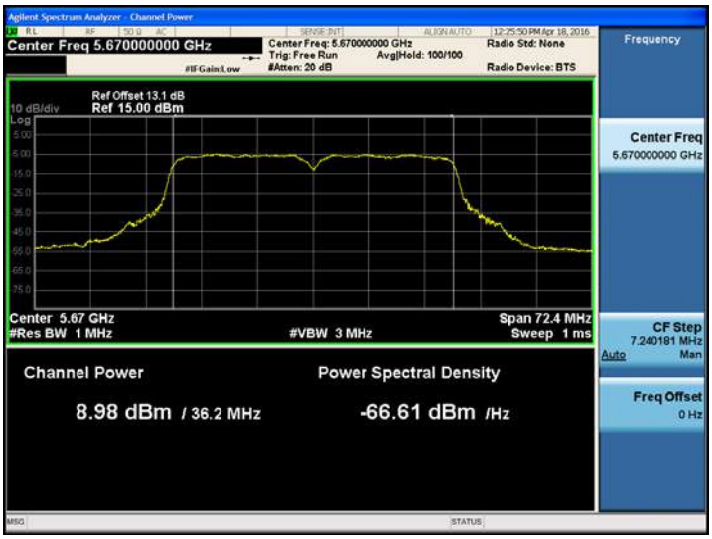
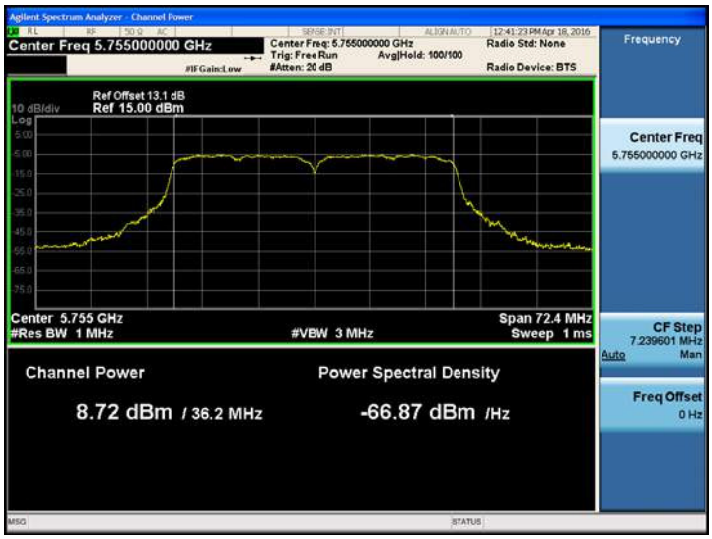
802.11ac_VHT40 (UNII 3)

▣TEST RESULTS

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

802.11ac_VHT40 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	9.38	0.16	9.55	30
		1	9.36	0.28	9.64	30
		2	9.25	0.41	9.66	30
		3	9.07	0.50	9.56	30
		4	8.84	0.66	9.50	30
		5	8.87	0.66	9.53	30
		6	8.74	0.82	9.56	30
		7	8.60	0.85	9.45	30
		8	8.63	0.97	9.60	30
		9	8.72	0.96	9.67	30
5795	159	0	9.39	0.16	9.56	30
		1	9.38	0.28	9.66	30
		2	9.25	0.41	9.66	30
		3	9.04	0.50	9.54	30
		4	8.80	0.66	9.46	30
		5	8.89	0.66	9.55	30
		6	8.79	0.82	9.61	30
		7	8.68	0.85	9.53	30
		8	8.70	0.97	9.67	30
		9	8.69	0.96	9.65	30

▣TEST Plot _802.11ac_VHT40

802.11ac_VHT40 UNII 1 BAND Average Power (5190 MHz ~5230 MHz) CH 46 MCS9	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 ~5670 MHz) CH 134MCS4	**802.11ac_VHT40 UNII 3 BAND Average Power (5755 MHz ~5795 MHz) CH 151 MCS9**
	

802.11ac_VHT80 (UNII 1)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 Mode: 5210)

802.11ac_VHT80 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	0	8.43	0.32	8.75	22.09
		1	8.16	0.56	8.72	22.09
		2	8.03	0.67	8.70	22.09
		3	7.84	0.89	8.73	22.09
		4	7.56	1.01	8.58	22.09
		5	7.65	1.12	8.77	22.09
		6	7.54	1.18	8.72	22.09
		7	7.52	1.18	8.70	22.09
		8	7.43	1.18	8.60	22.09
		9	7.37	1.33	8.70	22.09

802.11ac_VHT80 (UNII 2A)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 Mode: 5290)

802.11ac_VHT80 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5290	58	0	8.55	0.32	8.87	23.98
		1	8.23	0.56	8.79	23.98
		2	8.09	0.67	8.76	23.98
		3	7.93	0.89	8.82	23.98
		4	7.76	1.01	8.77	23.98
		5	7.72	1.12	8.84	23.98
		6	7.56	1.18	8.74	23.98
		7	7.67	1.18	8.85	23.98
		8	7.57	1.18	8.75	23.98
		9	7.46	1.33	8.79	23.98

802.11ac_VHT80 (UNII 2C)

▣TEST RESULTS

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

802.11ac_VHT80 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5530	106	0	8.52	0.32	8.84	23.98
		1	8.34	0.56	8.90	23.98
		2	8.13	0.67	8.80	23.98
		3	7.97	0.89	8.87	23.98
		4	7.78	1.01	8.79	23.98
		5	7.79	1.12	8.91	23.98
		6	7.61	1.18	8.79	23.98
		7	7.65	1.18	8.83	23.98
		8	7.57	1.18	8.75	23.98
		9	7.43	1.33	8.75	23.98

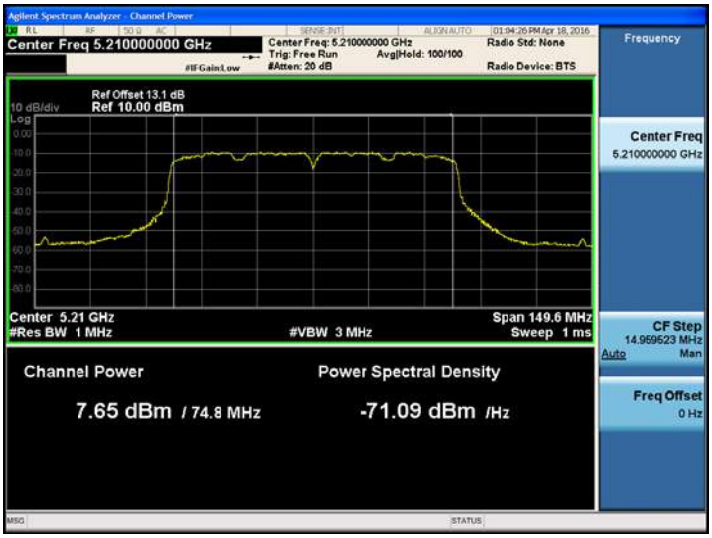
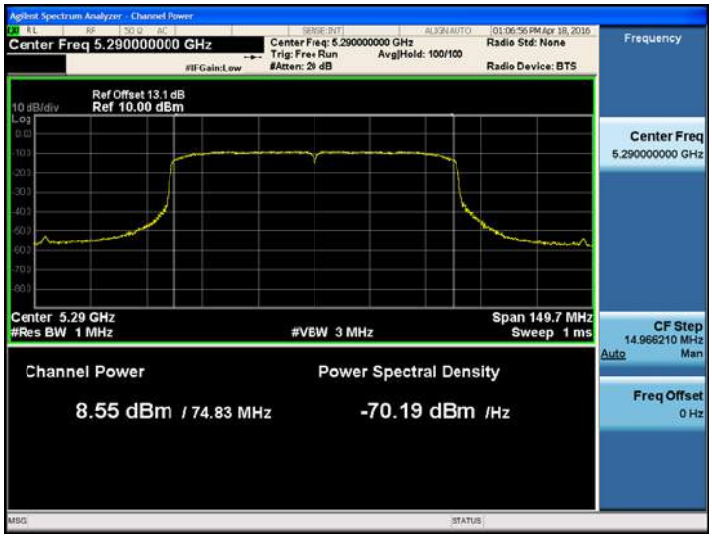
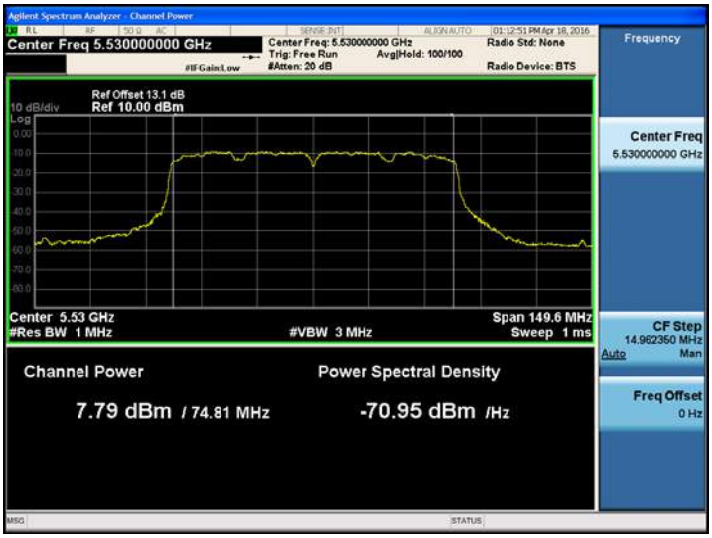
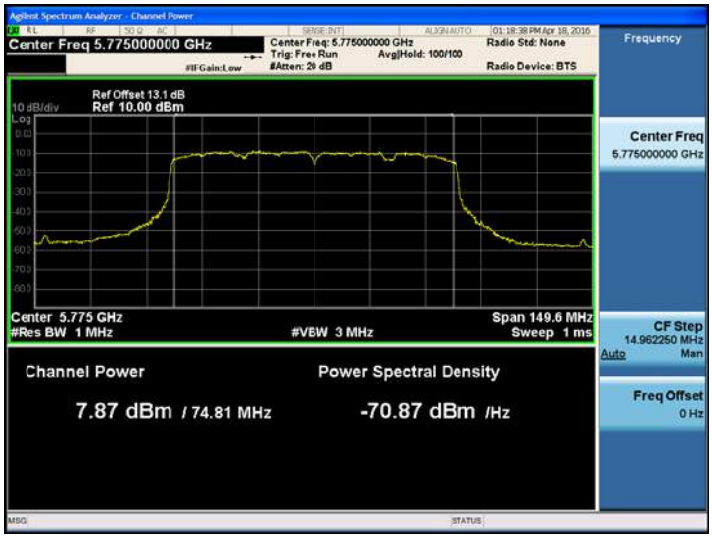
802.11ac_VHT80 (UNII 3)

▣TEST RESULTS

Conducted Output Power Measurements (802.11ac_VHT80 : 5775 MHz)

802.11ac_VHT80 Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
Frequency [MHz]	Channel No.					
5775	155	0	8.38	0.32	8.70	30
		1	8.13	0.56	8.69	30
		2	7.97	0.67	8.65	30
		3	7.87	0.89	8.76	30
		4	7.61	1.01	8.62	30
		5	7.52	1.12	8.64	30
		6	7.29	1.18	8.47	30
		7	7.49	1.18	8.67	30
		8	7.39	1.18	8.57	30
		9	7.26	1.33	8.59	30

▣TEST Plot for 802.11ac_VHT80

802.11ac_VHT80 UNII 1 BAND Average Power (5210 MHz) CH 42MCS5	802.11ac_VHT80 UNII 2A BAND Average Power (5290 MHz) CH 58MCS0
	
802.11ac_VHT80 UNII 2C BAND Average Power (5530MHz) CH 106MCS5	**802.11ac_VHT80 UNII 3 BAND Average Power (5755 MHz) CH 155 MCS3**
	

9.4POWER SPECTRAL DENSITY

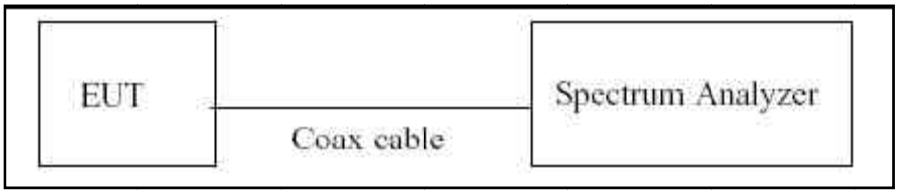
The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. The maximum permissible peak power spectral density is 11 dBm/ MHz for UNII 1,2A, 2C and 30 dBm/500 kHz for UNII 3.

▣Limit

Power Spectral Density

Band	Mode	Limit
UNII 1	802.11 a,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 v01r02

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.

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

(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	1.688	0.084	1.772	11	Pass
5200	40		1.622	0.093	1.715		Pass
5240	48		2.015	0.084	2.099		Pass
5260	52		1.783	0.084	1.867	11	Pass
5300	60		2.114	0.162	2.276		Pass
5320	64		1.959	0.063	2.022		Pass
5500	100		1.912	0.084	1.996	11	Pass
5580	116		1.907	0.032	1.939		Pass
5700	140		1.858	0.032	1.890		Pass
5745	149		-1.008	0.032	-0.976	30	Pass
5785	157		-0.739	0.063	-0.676		Pass
5825	165		-0.790	0.032	-0.758		Pass

▣TEST Plot for 802.11a

802.11a UNII 1 BAND PSD CH 48	802.11a UNII 2A BAND PSD CH 60
	
802.11a UNII 2C BAND PSD CH 100	**802.11a UNII 3 BAND PSD CH 157**
	

▣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	-1.909	0.132	-1.777	11	Pass
5200	40		-1.939	0.090	-1.849		Pass
5240	48		-1.884	0.090	-1.794		Pass
5260	52		-1.720	0.132	-1.588	11	Pass
5300	60		-1.711	0.132	-1.579		Pass
5320	64		-1.582	0.046	-1.536		Pass
5500	100		-1.756	0.132	-1.624	11	Pass
5580	116		-1.677	0.046	-1.631		Pass
5700	140		-1.573	0.046	-1.527		Pass
5745	149		-4.532	0.090	-4.442	30	Pass
5785	157		-4.387	0.046	-4.341		Pass
5825	165		-4.498	0.090	-4.408		Pass

▣TEST Plot for 802.11n_HT20

802.11n_HT20 UNII 1 BAND PSD CH 36	802.11n_HT20 UNII 2A BAND PSD CH64
	
802.11n_HT20 BW UNII 2C BAND PSD CH 140	**802.11n_HT20 UNII 3 BAND PSD CH 157**
	

▣802.11ac_VHT20 BW

▣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	-2.170	0.084	-2.086	11	Pass
5200	40		-1.977	0.084	-1.893		Pass
5240	48		-2.047	0.151	-1.896		Pass
5260	52		-1.878	0.084	-1.794	11	Pass
5300	60		-1.783	0.084	-1.699		Pass
5320	64		-1.676	0.084	-1.592		Pass
5500	100		-1.933	0.084	-1.849	11	Pass
5580	116		-1.710	0.084	-1.626		Pass
5700	140		-2.010	0.151	-1.859		Pass
5745	149		-4.520	0.084	-4.436	30	Pass
5785	157		-4.118	0.463	-3.655		Pass
5825	165		-4.832	0.193	-4.639		Pass

▣TEST Plot for 802.11ac_VHT20

802.11ac_VHT20 UNII 1 BAND PSD CH 40	802.11ac_VHT20UNII 2A BAND PSD CH 64
	
802.11ac_VHT20UNII 2C BAND PSD CH 116	**802.11ac_VHT20UNII 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	-5.237	0.177	-5.060	11	Pass
5230	46		-5.084	0.128	-4.956		Pass
5270	54		-5.203	0.128	-5.075	11	Pass
5310	62		-4.870	0.128	-4.742		Pass
5510	102		-5.319	0.177	-5.142	11	Pass
5500	110		-4.853	0.062	-4.791		Pass
5670	134		-4.911	0.128	-4.783		Pass
5755	151		-7.973	0.403	-7.570	30	Pass
5795	159		-7.752	0.177	-7.575		Pass

▣TEST Plot for 802.11n_HT40

802.11n_HT40 UNII 1 BAND PSD CH 46	802.11n_HT40 UNII 2A BAND PSD CH 62
	
802.11n_HT40 UNII 2C BAND PSD CH 134	**802.11n_HT40 UNII 3 BAND PSD CH 151**
	

▣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	-4.975	0.282	-4.693	11	Pass
5230	46		-4.889	0.958	-3.931		Pass
5270	54		-5.005	0.282	-4.723	11	Pass
5310	62		-4.949	0.958	-3.991		Pass
5510	102		-5.136	0.165	-4.971	11	Pass
5500	110		-4.740	0.165	-4.575		Pass
5670	134		-4.939	0.659	-4.280		Pass
5755	151		-7.404	0.958	-6.446	30	Pass
5795	159		-7.513	0.969	-6.544		Pass

▣TEST Plot for 802.11ac_VHT40

802.11ac_VHT40 UNII 1 BAND PSD CH 46	802.11ac_VHT40UNII 2A BAND PSD CH 62
	
802.11ac_VH40UNII 2C BAND PSD CH 134	**802.11ac_VHT40UNII 3 BAND PSD CH 151**
	

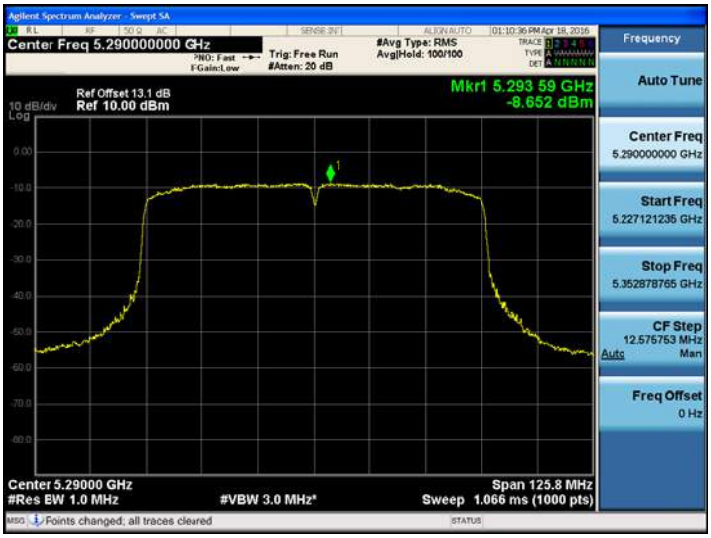
▣802.11ac_VHT80

▣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	-9.302	1.120	-8.182	11	Pass
5290	58		-8.652	0.319	-8.333		Pass
5530	106		-8.811	1.120	-7.691		Pass
5775	155		-11.183	0.893	-10.290	30	Pass

▣TEST Plot for 802.11ac_VHT80

802.11ac_VHT80UNII 1 BAND PSD CH 42	802.11ac_VHT80UNII 2A BAND PSD CH 58
	
802.11ac_VHT80UNII 2C BAND PSD CH 106	**802.11ac_VHT80UNII 3 BAND PSD CH 155**
	

9.5 FREQUENCY STABILITY.

The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30℃ and 50℃. The temperature was incremented by 10 ℃ intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

20 MHz BW

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5179957.20	-42.80
100%		-30	5179946.84	-53.16
100%		-20	5179949.73	-50.27
100%		-10	5179951.69	-48.31
100%		0	5179954.38	-45.62
100%		+10	5179955.32	-44.68
100%		+30	5179962.44	-37.56
100%		+40	5179965.82	-34.18
100%		+50	5179968.74	-31.26
Batt. Max.point	4.4	+20	5179960.51	-39.49
Batt. Endpoint	3.6	+20	5179959.72	-40.28

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5259956.36	-43.64
100%		-30	5259939.88	-60.12
100%		-20	5259942.39	-57.61
100%		-10	5259945.41	-54.59
100%		0	5259948.38	-51.62
100%		+10	5259951.26	-48.74
100%		+30	5259959.72	-40.28
100%		+40	5259963.08	-36.92
100%		+50	5259966.79	-33.21
Batt. Max.point	4.4	+20	5259959.90	-40.10
Batt. Endpoint	3.6	+20	5259958.88	-41.12

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5499954.12	-45.88
100%		-30	5499937.76	-62.24
100%		-20	5499942.34	-57.66
100%		-10	5499945.38	-54.62
100%		0	5499949.87	-50.13
100%		+10	5499952.21	-47.79
100%		+30	5499957.74	-42.26
100%		+40	5499960.52	-39.48
100%		+50	5499962.45	-37.55
Batt. Max.point	4.4	+20	5499956.65	-43.35
Batt. Endpoint	3.6	+20	5499955.82	-44.18

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5744951.95	-48.05
100%		-30	5744935.85	-64.15
100%		-20	5744939.72	-60.28
100%		-10	5744942.59	-57.41
100%		0	5744946.71	-53.29
100%		+10	5744949.85	-50.15
100%		+30	5744957.19	-42.81
100%		+40	5744961.38	-38.62
100%		+50	5744963.84	-36.16
Batt. Max.point	4.4	+20	5744954.84	-45.16
Batt. Endpoint	3.6	+20	5744952.15	-47.85

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

40 MHz BW

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,190,000,000 Hz

CHANNEL: 38

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5189956.45	-43.55
100%		-30	5189938.77	-61.23
100%		-20	5189941.58	-58.42
100%		-10	5189944.05	-55.95
100%		0	5189947.13	-52.87
100%		+10	5189952.64	-47.36
100%		+30	5189959.85	-40.15
100%		+40	5189962.06	-37.94
100%		+50	5189965.38	-34.62
Batt. Max.point	4.4	+20	5189954.29	-45.71
Batt. Endpoint	3.6	+20	5189955.33	-44.67

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5269955.86	-44.14
100%		-30	5269935.77	-64.23
100%		-20	5269940.53	-59.47
100%		-10	5269943.18	-56.82
100%		0	5269946.76	-53.24
100%		+10	5269951.34	-48.66
100%		+30	5269957.87	-42.13
100%		+40	5269961.01	-38.99
100%		+50	5269963.88	-36.12
Batt. Max.point	4.4	+20	5269953.19	-46.81
Batt. Endpoint	3.6	+20	5269954.25	-45.75

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,510,000,000 Hz

CHANNEL: 102

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5509953.79	-46.21
100%		-30	5509941.51	-58.49
100%		-20	5509944.38	-55.62
100%		-10	5509947.52	-52.48
100%		0	5509948.38	-51.62
100%		+10	5509951.24	-48.76
100%		+30	5509956.73	-43.27
100%		+40	5509959.07	-40.93
100%		+50	5509961.50	-38.50
Batt. Max.point	4.4	+20	5509954.16	-45.84
Batt. Endpoint	3.6	+20	5509953.49	-46.51

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,755,000,000 Hz

CHANNEL: 151

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5754951.71	-48.29
100%		-30	5754934.52	-65.48
100%		-20	5754937.67	-62.33
100%		-10	5754942.16	-57.84
100%		0	5754945.38	-54.62
100%		+10	5754948.52	-51.48
100%		+30	5754954.78	-45.22
100%		+40	5754958.35	-41.65
100%		+50	5754961.55	-38.45
Batt. Max.point	4.4	+20	5754953.25	-46.75
Batt. Endpoint	3.6	+20	5754953.01	-46.99

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

80 MHz BW

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,210,000,000 Hz

CHANNEL: 42

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5209956.10	-43.90
100%		-30	5209939.88	-60.12
100%		-20	5209941.45	-58.55
100%		-10	5209945.69	-54.31
100%		0	5209948.15	-51.85
100%		+10	5209952.35	-47.65
100%		+30	5209959.85	-40.15
100%		+40	5209962.45	-37.55
100%		+50	5209965.07	-34.93
Batt. Max.point	4.4	+20	5209955.50	-44.50
Batt. Endpoint	3.6	+20	5209956.16	-43.84

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,290,000,000 Hz

CHANNEL: 58

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5289955.42	-44.58
100%		-30	5289935.52	-64.48
100%		-20	5289938.03	-61.97
100%		-10	5289942.58	-57.42
100%		0	5289946.34	-53.66
100%		+10	5289950.85	-49.15
100%		+30	5289958.97	-41.03
100%		+40	5289961.21	-38.79
100%		+50	5289965.72	-34.28
Batt. Max.point	4.4	+20	5289951.39	-48.61
Batt. Endpoint	3.6	+20	5289954.73	-45.27

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,530,000,000 Hz

CHANNEL: 106

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5529953.30	-46.70
100%		-30	5529933.48	-66.52
100%		-20	5529937.82	-62.18
100%		-10	5529942.36	-57.64
100%		0	5529947.65	-52.35
100%		+10	5529950.15	-49.85
100%		+30	5529957.82	-42.18
100%		+40	5529961.51	-38.49
100%		+50	5529964.53	-35.47
Batt. Max.point	4.4	+20	5529954.18	-45.82
Batt. Endpoint	3.6	+20	5529953.67	-46.33

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,775,000,000 Hz

CHANNEL: 155

REFERENCE VOLTAGE: 3.85 VDC

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (kHz)	Frequency Error (kHz)
100%	3.85	+20(Ref)	5774951.20	-48.80
100%		-30	5774936.23	-63.77
100%		-20	5774940.52	-59.48
100%		-10	5774943.67	-56.33
100%		0	5774946.22	-53.78
100%		+10	5774949.41	-50.59
100%		+30	5774953.45	-46.55
100%		+40	5774955.16	-44.84
100%		+50	5774958.32	-41.68
Batt. Max.point	4.4	+20	5774954.80	-45.20
Batt. Endpoint	3.6	+20	5774955.04	-44.96

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.