

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:
 March 11, 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-1603-F020-1
HCT FRN: 0005866421
IC Recognition No.: 5944A-5

FCC ID :ZNFH850

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

Model(s): LG-H850

Additional Model(s): LGH850, H850, LG-H850K, LGH850K, H850K, LG-H850AR, LGH850AR, H850AR

EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN, NFC

Modulation type OFDM

FCC Classification: Unlicensed National Information Infrastructure(UNII)

FCC Rule Part(s): Part 15.407

Band	Mode	Channel Bandwidth (MHz)	Frequency Range (MHz)	Power (dBm)	Power (W)
UNII1	802.11a	20	5180 – 5240	13.56	0.0227
	802.11n	20	5180 – 5240	13.28	0.0213
	802.11n	40	5190 - 5230	11.72	0.0149
	802.11ac	20	5180 – 5240	13.34	0.0216
	802.11ac	40	5190 - 5230	11.72	0.0149
	802.11ac	80	5210	11.05	0.0127
UNII2A	802.11a	20	5260 – 5320	13.47	0.0222
	802.11n	20	5260 – 5320	13.21	0.0209
	802.11n	40	5270 – 5310	11.81	0.0152
	802.11ac	20	5260 – 5320	13.20	0.0209
	802.11ac	40	5270 – 5310	11.65	0.0146
	802.11ac	80	5290	11.85	0.0153
UNII2C	802.11a	20	5500 – 5720	13.50	0.0224
	802.11n	20	5500 – 5720	13.18	0.0208
	802.11n	40	5510 – 5710	11.72	0.0149
	802.11ac	20	5500 – 5720	13.26	0.0212
	802.11ac	40	5510 – 5710	11.56	0.0143
	802.11ac	80	5530 – 5690	11.29	0.0135
UNII3	802.11a	20	5745 – 5825	13.59	0.0229
	802.11n	20	5745 – 5825	13.28	0.0213
	802.11n	40	5755 – 5795	11.65	0.0146
	802.11ac	20	5745 – 5825	13.30	0.0214
	802.11ac	40	5755 – 5795	11.73	0.0149
	802.11ac	80	5775	11.84	0.0153

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
: Seul Ki Lee
Test Engineer of RF Team



Approved by
:Sang Jun Lee
Manager of RF Team

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1603-F020	March 04, 2016	- First Approval Report
HCT-R-1603-F020-1	March 22, 2016	- Add the note for Straddle channel Limit on Page 34 and 69 - Revised the limit for Straddle channel on Page 83, 86 and 88

Table of Contents

1. GENERAL INFORMATION	5
2. EUT DESCRIPTION	5
3. TEST METHODOLOGY	6
3.1 EUT CONFIGURATION	6
3.2 EUT EXERCISE	6
3.3 GENERAL TEST PROCEDURES	6
3.4 DESCRIPTION OF TEST MODES	6
4. INSTRUMENT CALIBRATION.....	7
5. FACILITIES AND ACCREDITATIONS	7
5.1 FACILITIES	7
5.2 EQUIPMENT	7
6. ANTENNA REQUIREMENTS	7
7. SUMMARY OF TEST RESULTS	8
8. TEST RESULT	9
8.1 DUTY CYCLE.....	9
8.2EMISSION BANDWIDTH AND MINIMUM EMISSION BANDWIDTH MEASUREMENT	1 2
8.3OUTPUT POWER MEASUREMENT.....	3 4
8.4POWER SPECTRAL DENSITY	6 9
8.5 FREQUENCY STABILITY.	8 9
8.6 RADIATED MEASUREMENT.....	1 0 1
8.6.1 RADIATED SPURIOUS EMISSIONS.....	1 0 1
8.6.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS	1 6 9
8.7POWERLINE CONDUCTED EMISSIONS	1 9 0
9. LIST OF TEST EQUIPMENT	1 9 5
9.1 LIST OF TEST EQUIPMENT(Conducted Test)	1 9 5
9.2 LIST OF TEST EQUIPMENT(Radiated Test).....	1 9 6

1. GENERAL INFORMATION

Applicant: LG Electronics MobileComm U.S.A., Inc
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID: ZNFH850
EUT Type: GSM/WCDMA/LTE Phone with Bluetooth, WLAN, NFC
Model name(s): LG-H850
Additional Model name(s): LGH850, H850, LG-H850K, LGH850K, H850K, LG-H850AR, LGH850AR, H850AR
Date(s) of Tests: January 27, 2016 ~ February 23, 2016
Place of Tests: HCT Co., Ltd.
 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
 (IC Recognition No. : 5944A-5)

2. EUT DESCRIPTION

Model Name	LG-H850	
Additional Model name(s):	LGH850, H850, LG-H850K, LGH850K, H850K, LG-H850AR, LGH850AR, H850AR	
EUT Type	GSM/WCDMA/LTE Phone with Bluetooth, WLAN, NFC	
Power Supply	DC 3.85 V	
Battery Infomation	Model: BL-43D1F 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:LS Mtron Co. Ltd. Antenna type: INTERNAL ANTENNA Peak Gain : -5.71 dBi (5180~5240 UNII1 BAND) / -6.22 dBi (5260~5325 UNII2A BAND) -7.39 dBi (5500~5720 UNII2C BAND) / -7.83 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. SUMMARY OF TEST RESULTS

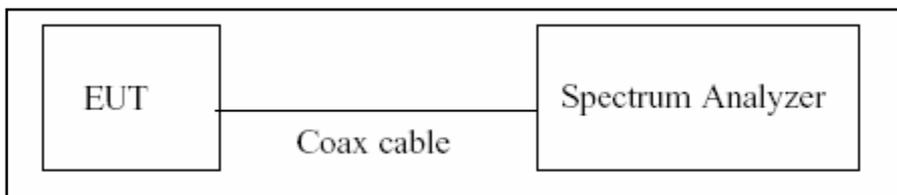
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	N/A	CONDUCTED	PASS
6 dB Bandwidth	§15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§15.407(a)(1)	<250 mW (5150-5250 MHz) < 250 mW or 11+10 loglog ₁₀ (BW) dBm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

8. TEST RESULT

8.1 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	2.790	2.810	0.99288256	0.031
	9	1.865	1.885	0.98938992	0.046
	12	1.410	1.430	0.98601399	0.061
	18	0.945	0.965	0.97927461	0.091
	24	0.720	0.740	0.97297297	0.119
	36	0.480	0.505	0.95049505	0.221
	48	0.368	0.389	0.94601542	0.241
	54	0.328	0.349	0.93982808	0.270
802.11n_20 MHz BW	MCS 0	2.595	2.615	0.99235182	0.033
	MCS 1	1.320	1.340	0.98507463	0.065
	MCS 2	0.895	0.915	0.97814208	0.096
	MCS 3	0.680	0.700	0.97142857	0.126
	MCS 4	0.465	0.485	0.95876289	0.183
	MCS 5	0.356	0.377	0.94429708	0.249
	MCS 6	0.325	0.345	0.94202899	0.259
	MCS 7	0.292	0.313	0.93290735	0.302
802.11n_40 MHz BW	MCS 0	2.486	2.509	0.99083300	0.040
	MCS 1	1.266	1.281	0.98829040	0.051
	MCS 2	0.851	0.873	0.97479954	0.111
	MCS 3	0.647	0.670	0.96567164	0.152
	MCS 4	0.444	0.467	0.95074946	0.219
	MCS 5	0.344	0.366	0.93989071	0.269
	MCS 6	0.310	0.330	0.93939394	0.272
	MCS 7	0.286	0.306	0.93464052	0.294

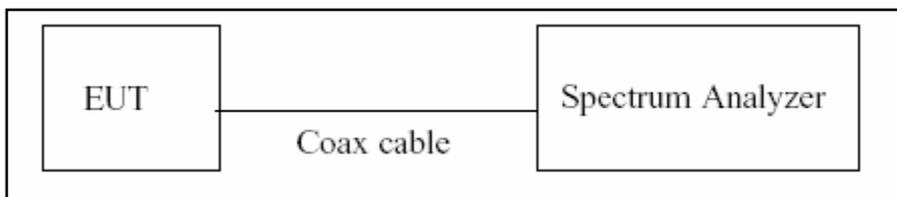
Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ac_20 MHz BW	MCS 0	2.599	2.622	0.99122807	0.038
	MCS 1	1.326	1.348	0.98367953	0.071
	MCS 2	0.888	0.911	0.97475302	0.111
	MCS 3	0.685	0.708	0.96751412	0.143
	MCS 4	0.468	0.489	0.95705521	0.191
	MCS 5	0.366	0.387	0.94573643	0.242
	MCS 6	0.330	0.348	0.94827586	0.231
	MCS 7	0.300	0.321	0.93457944	0.294
802.11ac_40 MHz BW	MCS 8	0.258	0.279	0.92473118	0.340
	MCS 0	2.490	2.510	0.99203187	0.035
	MCS 1	1.266	1.288	0.98291925	0.075
	MCS 2	0.851	0.873	0.97479954	0.111
	MCS 3	0.655	0.670	0.97761194	0.098
	MCS 4	0.447	0.468	0.95512821	0.199
	MCS 5	0.348	0.369	0.94308943	0.254
	MCS 6	0.312	0.333	0.93693694	0.283
	MCS 7	0.288	0.309	0.93203883	0.306
	MCS 8	0.246	0.267	0.92134831	0.356
802.11ac_80 MHz BW	MCS 9	0.225	0.246	0.91463415	0.388
	MCS 0	1.168	1.190	0.98151261	0.081
	MCS 1	0.602	0.625	0.96320000	0.163
	MCS 2	0.420	0.442	0.95022624	0.222
	MCS 3	0.326	0.346	0.94219653	0.259
	MCS 4	0.234	0.252	0.92857143	0.322
	MCS 5	0.186	0.206	0.90291262	0.444
	MCS 6	0.170	0.189	0.89947090	0.460
	MCS 7	0.158	0.177	0.89265537	0.493
	MCS 8	0.138	0.157	0.87898089	0.560
MCS 9	0.128	0.149	0.85906040	0.660	

8.2 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.
3. In case of UNII channels 142 and 144, this device is satisfied with KDB644545 D03.

■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 $\geq 3 \times$ 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	21.146	N/A	Pass
5200	40	21.229	N/A	Pass
5240	48	21.016	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	21.162	N/A	Pass
5300	60	20.815	N/A	Pass
5320	64	21.100	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	21.026	N/A	Pass
5580	116	21.254	N/A	Pass
5720	144	21.169	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

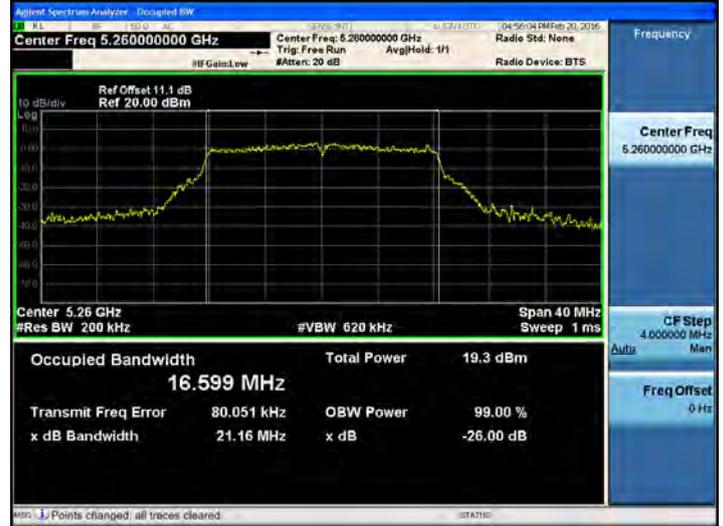
802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.260	N/A	Pass
5785	157	21.177	N/A	Pass
5825	165	21.237	N/A	Pass

TEST Plot for 802.11a _20MHz BW

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 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	21.387	N/A	Pass
5200	40	21.257	N/A	Pass
5240	48	21.101	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	21.251	N/A	Pass
5300	60	21.378	N/A	Pass
5320	64	21.246	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n 20M BW

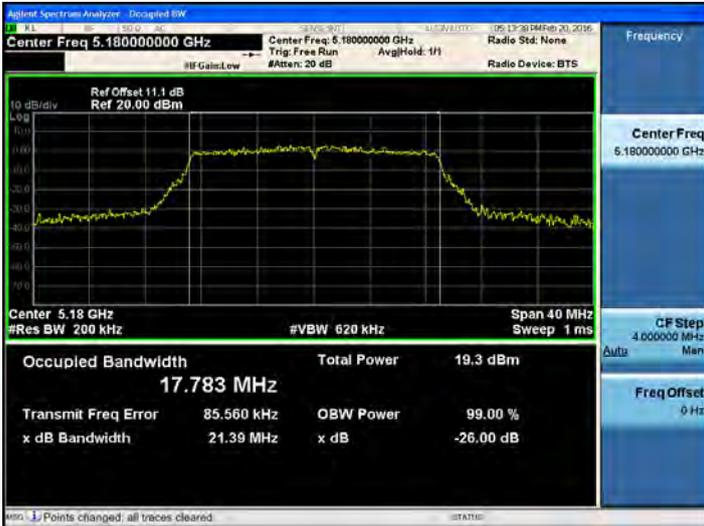
802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.389	N/A	Pass
5580	116	21.276	N/A	Pass
5720	144	21.249	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n 20M BW

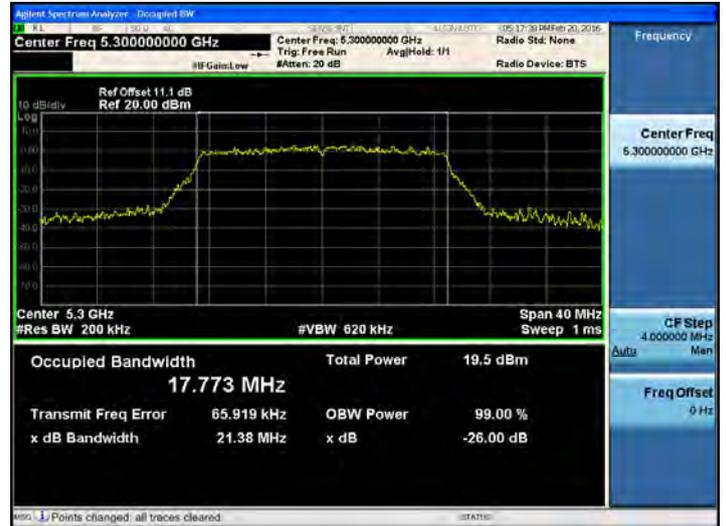
802.11n(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.522	N/A	Pass
5785	157	21.554	N/A	Pass
5825	165	21.570	N/A	Pass

TEST Plot for 802.11n _20MHz BW

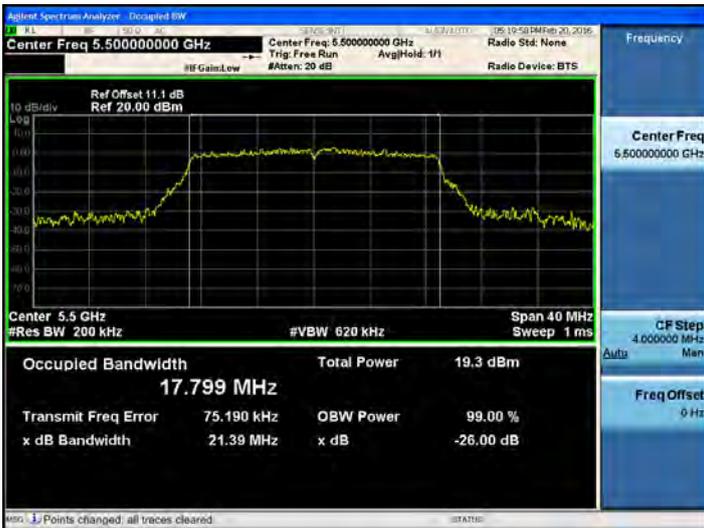
802.11n_20 MHz BW UNII 1 BAND 26dB Bandwidth(CH 36)



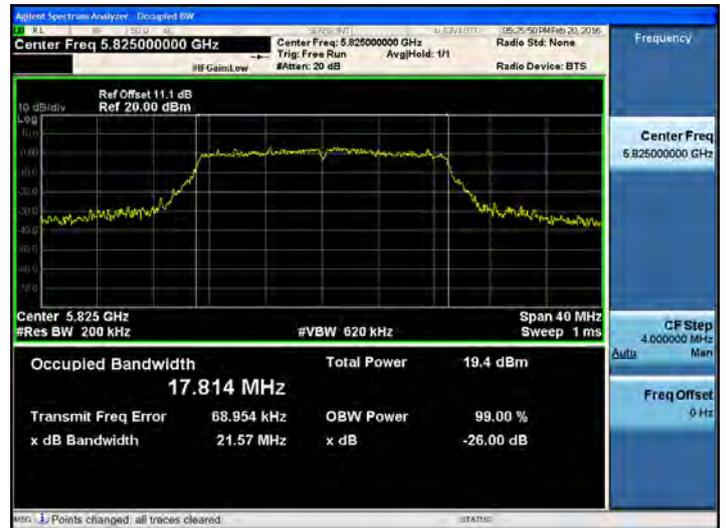
802.11n_20 MHz BW UNII 2A BAND 26dB Bandwidth(CH60)



802.11n_20 MHz BW UNII 2C BAND 26dB Bandwidth(CH 100)



802.11n_20 MHz BW UNII 3 BAND 26dB Bandwidth(CH 165)



Note :

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

■TEST RESULTS for802.11ac_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	21.320	N/A	Pass
5200	40	21.392	N/A	Pass
5240	48	21.185	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	21.296	N/A	Pass
5300	60	21.283	N/A	Pass
5320	64	21.541	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac 20M BW

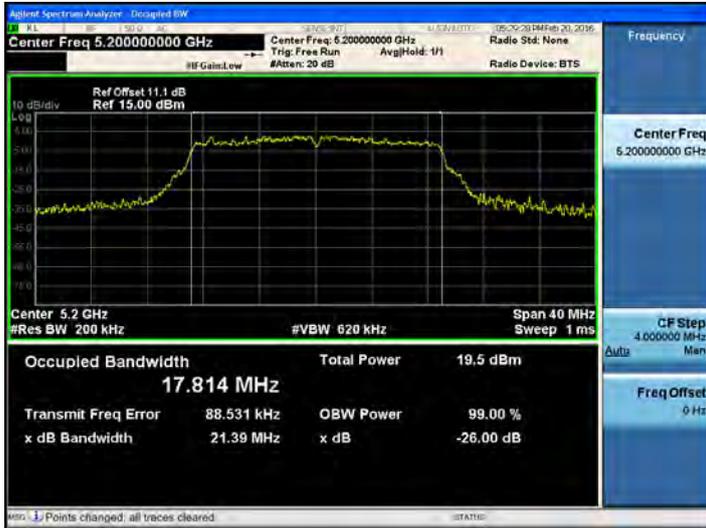
802.11ac(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.448	N/A	Pass
5580	116	21.961	N/A	Pass
5720	144	21.261	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac 20M BW

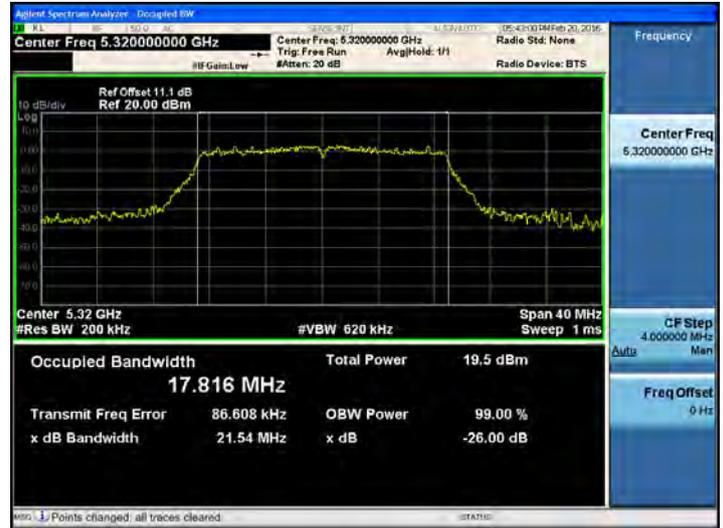
802.11ac(20MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	21.509	N/A	Pass
5785	157	21.266	N/A	Pass
5825	165	21.246	N/A	Pass

TEST Plot for 802.11ac _20MHz BW

802.11ac_20 MHz BW UNII 1 BAND 26dB Bandwidth(CH 40)



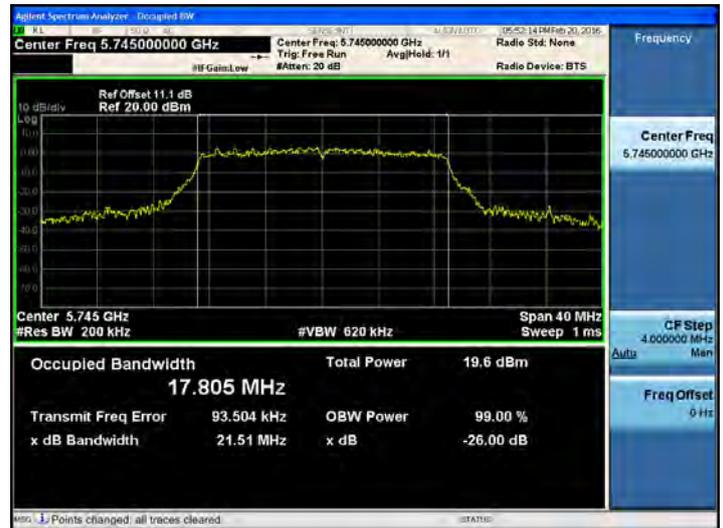
802.11ac_20 MHz BW UNII 2A BAND 26dB Bandwidth(CH64)



802.11ac_20 MHz BW UNII 2C BAND 26dB Bandwidth(CH 116)



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 for802.11n_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	39.427	N/A	Pass
5230	46	39.383	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	39.377	N/A	Pass
5310	62	39.799	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	39.648	N/A	Pass
5550	110	39.569	N/A	Pass
5710	142	39.537	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n_40 M BW

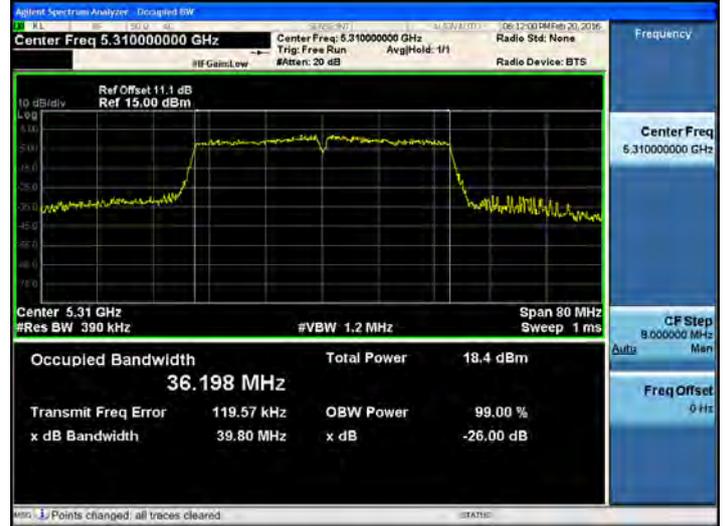
802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	39.595	N/A	Pass
5795	159	39.598	N/A	Pass

TEST Plot for 802.11n_40MHz BW

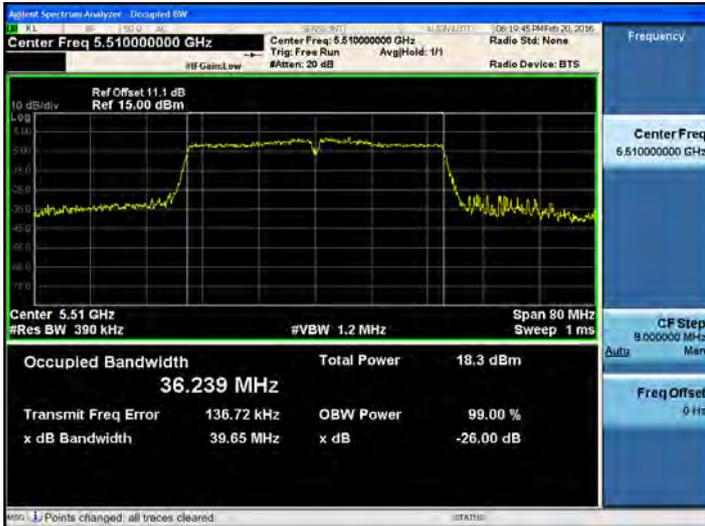
802.11n_40 MHz BW UNII 1 BAND 26dB Bandwidth(CH 38)



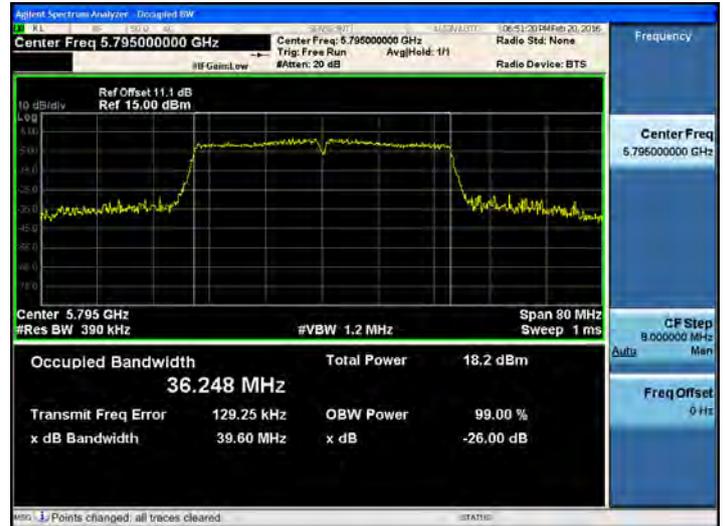
802.11n_40 MHz BW UNII 2A BAND 26dB Bandwidth (CH 62)



802.11n_40 MHz BW UNII 2C BAND 26dB Bandwidth(CH 102)



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	39.683	N/A	Pass
5230	46	39.627	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	39.778	N/A	Pass
5310	62	39.830	N/A	Pass

Conducted 26 dB Bandwidth Measurements for802.11ac_40 M BW

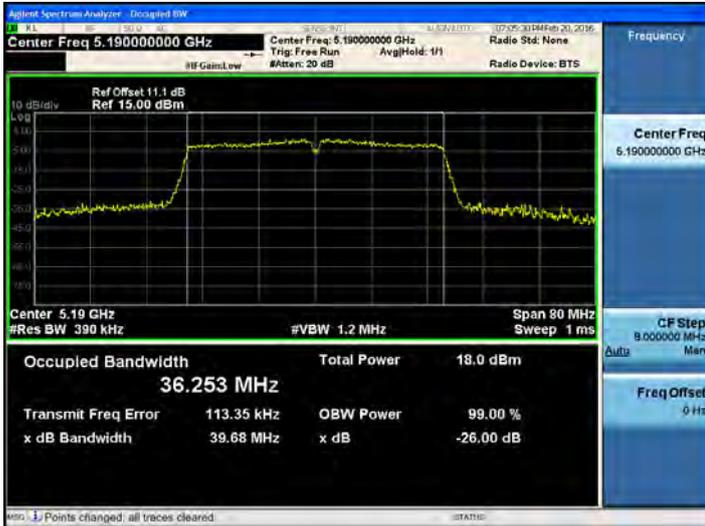
802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	39.863	N/A	Pass
5550	110	39.613	N/A	Pass
5710	142	39.767	N/A	Pass

Conducted 26 dB Bandwidth Measurements for802.11ac_40 M BW

802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	39.934	N/A	Pass
5795	159	39.589	N/A	Pass

TEST Plot for 802.11ac_40MHz BW

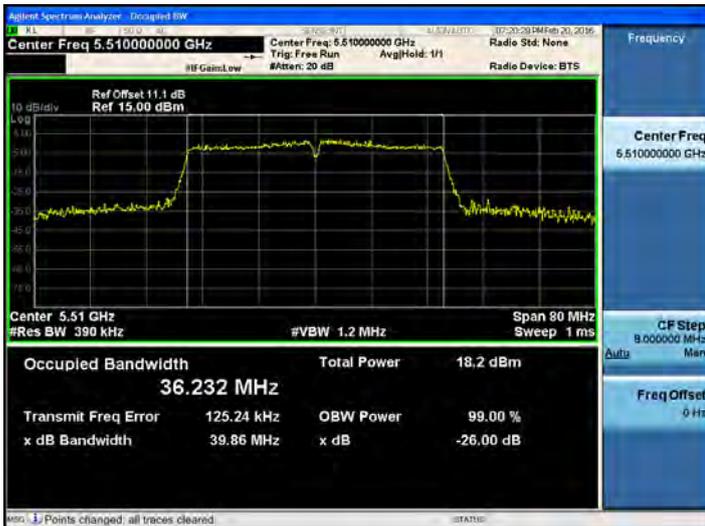
802.11ac_40 MHz BW UNII 1 BAND 26dB Bandwidth(CH 38)



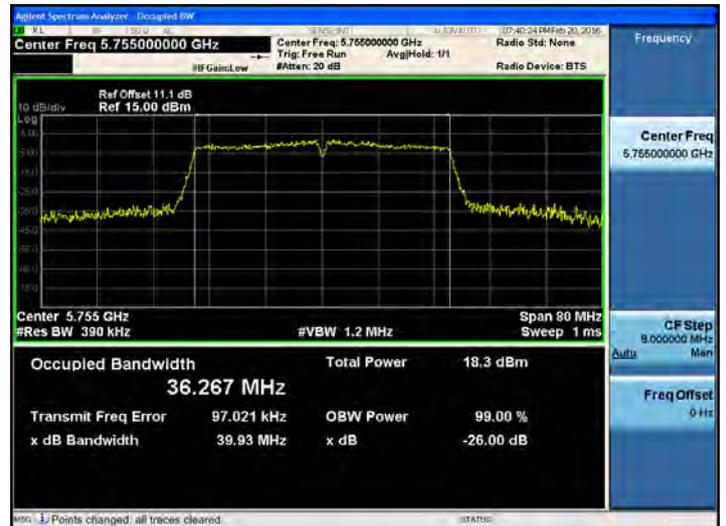
802.11ac_40 MHz BW UNII 2A BAND 26dB Bandwidth(CH 62)



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	81.340	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	80.988	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	80.974	N/A	Pass
5690	138	81.083	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	81.228	N/A	Pass

Note :

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

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 138)



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.

Conducted 6 dB Bandwidth

■TEST RESULTS for 802.11a/n/ac_20MHz BW

Conducted 6 dB Bandwidth Measurements for 802.11a

802.11aMode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.362	0.5	Pass
5785	157	16.399	0.5	Pass
5825	165	16.352	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	17.597	0.5	Pass
5785	157	17.609	0.5	Pass
5825	165	17.565	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_20 MHz BW

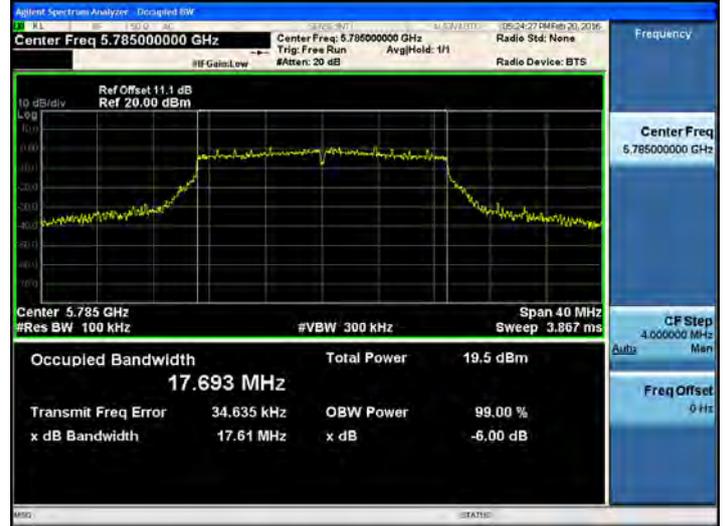
802.11ac(20MHz)Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.602	0.5	Pass
5785	157	17.586	0.5	Pass
5825	165	17.138	0.5	Pass

TEST Plot for 802.11a/n/ac_20MHz BW

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



802.11n_20 MHz BW UNII 3 BAND 6dB Bandwidth(CH.157)



802.11ac_20 MHz BW UNII 3 BAND 6dB Bandwidth(CH.165)



Note :

1. 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 for802.11n_40MHz BW

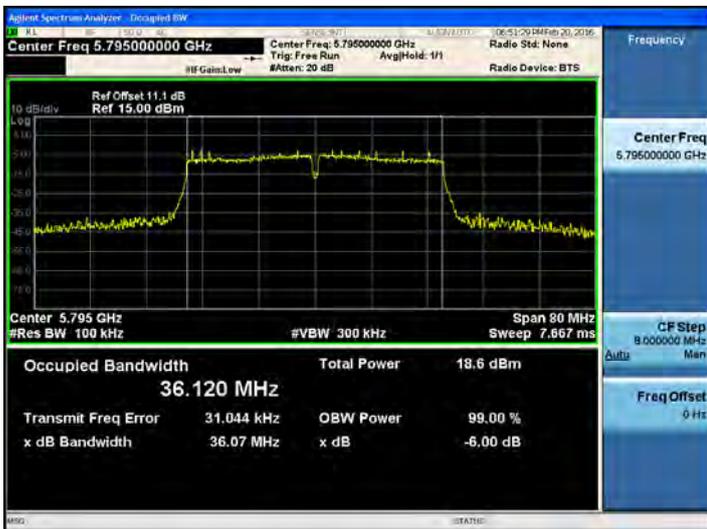
802.11n(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.757	0.5	Pass
5795	159	36.070	0.5	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_40 MHz BW

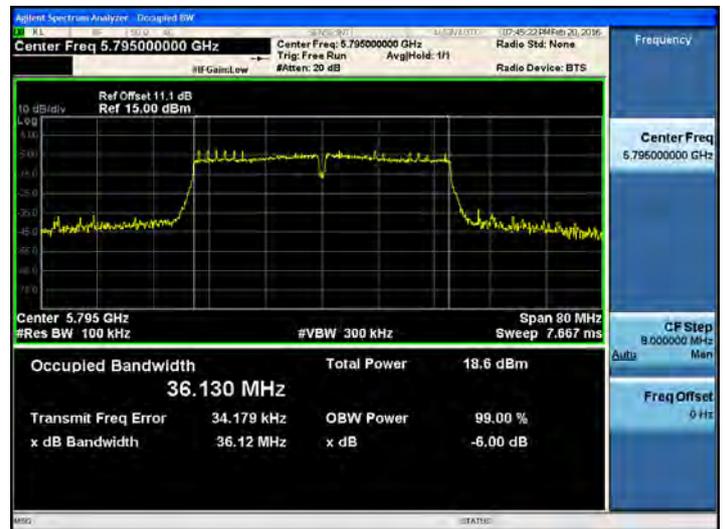
802.11ac(40MHz) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.921	0.5	Pass
5795	159	36.118	0.5	Pass

TEST Plot for 802.11n/ac_40MHz BW

802.11n_40 MHz BW UNII 3 BAND 6dB Bandwidth(CH.159)



802.11ac_40 MHz BW UNII 3 BAND 6dB Bandwidth(CH.159)



Note :

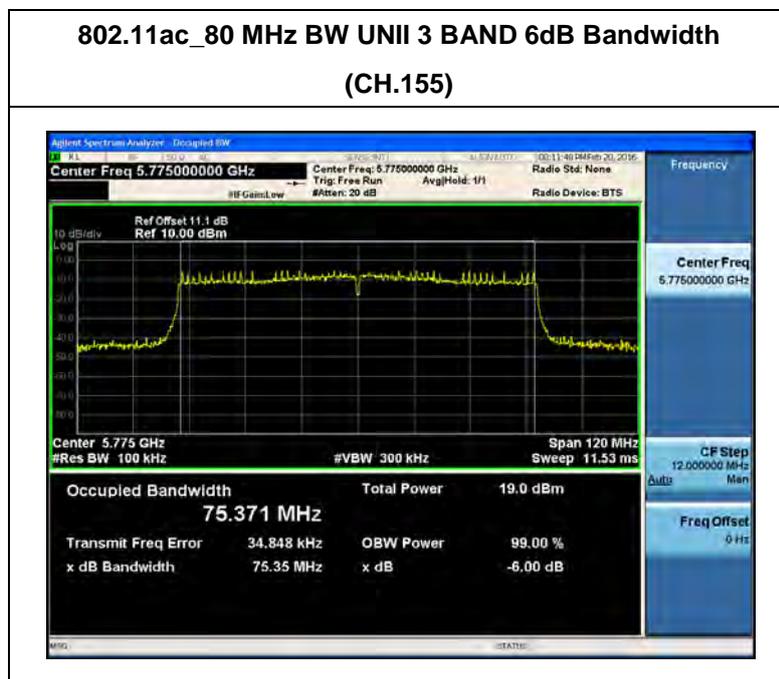
1. In order to simplify the report, attached plots were only the most wide channel.

■ **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	75.347	0.5	Pass

■ **TEST Plot for 802.11ac_80MHz BW**



Note :

1. 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	15.56	N/A	Pass
802.11n			15.72	N/A	Pass
802.11ac			15.68	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	5.72	N/A	Pass
802.11n			5.60	N/A	Pass
802.11ac			5.68	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	34.72	N/A	Pass
802.11ac			34.88	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	4.96	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**

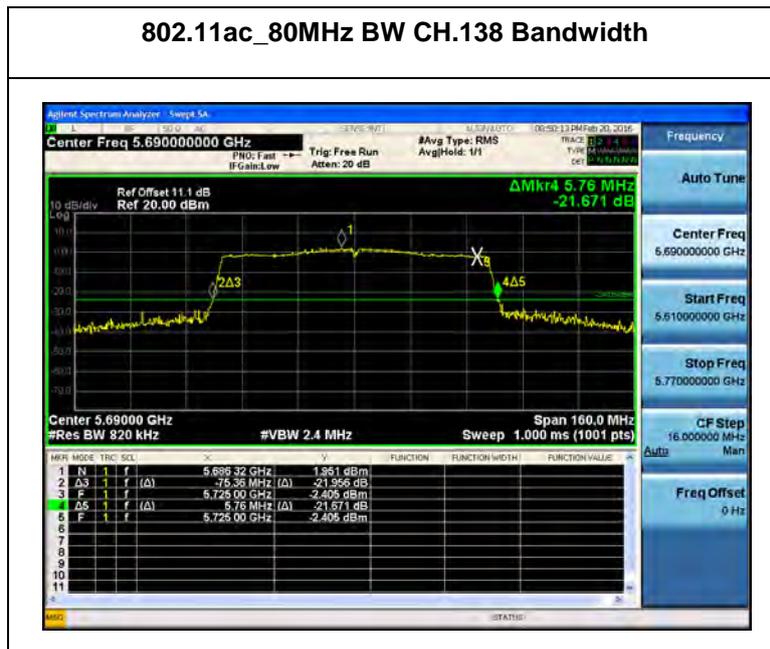
Conducted Bandwidth Measurements for 802.11ac_80MHz BW (UNII 2C Band)

Mode	Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
802.11ac	5690	138	75.36	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	5.76	N/A	Pass

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



8.3 OUTPUT POWER MEASUREMENT

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

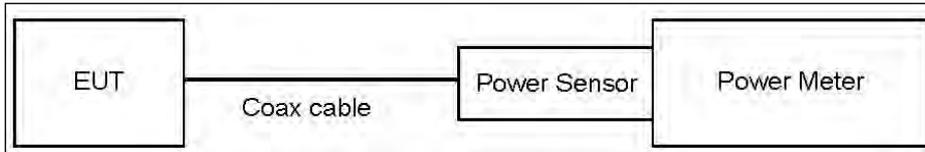
A transmitter antenna terminal of EUT is connected to the input of a Power meter or Spectrum Analyzer. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

■ 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 :

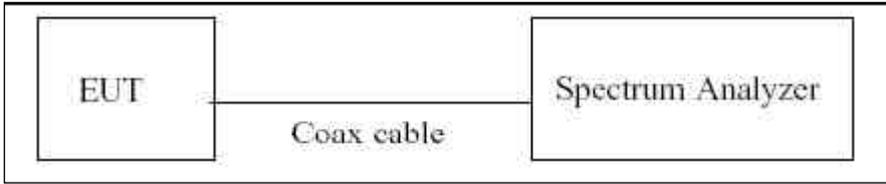
1. Actual value of loss for the attenuator and cable combination is below table.

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 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)

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

802.11a_20MHz BW (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	13.53	0.03	13.56	23.98
		9	13.50	0.05	13.55	23.98
		12	13.46	0.06	13.52	23.98
		18	13.45	0.09	13.54	23.98
		24	13.41	0.12	13.53	23.98
		36	13.31	0.22	13.53	23.98
		48	13.32	0.24	13.56	23.98
		54	13.23	0.27	13.50	23.98
5200	40	6	13.46	0.03	13.49	23.98
		9	13.47	0.05	13.52	23.98
		12	13.40	0.06	13.46	23.98
		18	13.37	0.09	13.46	23.98
		24	13.33	0.12	13.45	23.98
		36	13.21	0.22	13.43	23.98
		48	13.31	0.24	13.55	23.98
		54	13.25	0.27	13.52	23.98
5240	48	6	13.51	0.03	13.54	23.98
		9	13.45	0.05	13.50	23.98
		12	13.45	0.06	13.51	23.98
		18	13.42	0.09	13.51	23.98
		24	13.37	0.12	13.49	23.98
		36	13.28	0.22	13.50	23.98
		48	13.32	0.24	13.56	23.98
		54	13.19	0.27	13.46	23.98

802.11a _20MHz BW (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	13.27	0.03	13.30	23.98
		9	13.25	0.05	13.30	23.98
		12	13.23	0.06	13.29	23.98
		18	13.20	0.09	13.29	23.98
		24	13.33	0.12	13.45	23.98
		36	13.25	0.22	13.47	23.98
		48	13.10	0.24	13.34	23.98
		54	13.01	0.27	13.28	23.98
5300	60	6	13.37	0.03	13.40	23.98
		9	13.35	0.05	13.40	23.98
		12	13.34	0.06	13.40	23.98
		18	13.30	0.09	13.39	23.98
		24	13.27	0.12	13.39	23.98
		36	12.99	0.22	13.21	23.98
		48	13.22	0.24	13.46	23.98
		54	13.08	0.27	13.35	23.98
5320	64	6	13.16	0.03	13.19	23.98
		9	13.36	0.05	13.41	23.98
		12	13.35	0.06	13.41	23.98
		18	13.31	0.09	13.40	23.98
		24	13.27	0.12	13.39	23.98
		36	12.98	0.22	13.20	23.98
		48	13.23	0.24	13.47	23.98
		54	13.13	0.27	13.40	23.98

802.11a _20MHz BW (UNII 2C)

■TEST RESULTS

Conducted Output Power Measurements (802.11aMode: 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	13.42	0.03	13.45	23.98
		9	13.28	0.05	13.33	23.98
		12	13.33	0.06	13.39	23.98
		18	13.29	0.09	13.38	23.98
		24	13.26	0.12	13.38	23.98
		36	13.28	0.22	13.50	23.98
		48	13.20	0.24	13.44	23.98
		54	13.19	0.27	13.46	23.98
5580	116	6	13.23	0.03	13.26	23.98
		9	13.20	0.05	13.25	23.98
		12	13.19	0.06	13.25	23.98
		18	13.15	0.09	13.24	23.98
		24	13.09	0.12	13.21	23.98
		36	13.02	0.22	13.24	23.98
		48	13.07	0.24	13.31	23.98
		54	12.94	0.27	13.21	23.98
5720	144	6	12.87	0.03	12.90	23.98
		9	12.88	0.05	12.93	23.98
		12	12.87	0.06	12.93	23.98
		18	12.88	0.09	12.97	23.98
		24	12.81	0.12	12.93	23.98
		36	12.79	0.22	13.01	23.98
		48	12.78	0.24	13.02	23.98
		54	12.66	0.27	12.93	23.98

802.11a _20MHz BW (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	13.38	0.03	13.41	30
		9	13.39	0.05	13.44	30
		12	13.34	0.06	13.40	30
		18	13.28	0.09	13.37	30
		24	13.26	0.12	13.38	30
		36	13.37	0.22	13.59	30
		48	13.26	0.24	13.50	30
		54	13.16	0.27	13.43	30
5785	157	6	13.44	0.03	13.47	30
		9	13.46	0.05	13.51	30
		12	13.42	0.06	13.48	30
		18	13.42	0.09	13.51	30
		24	13.37	0.12	13.49	30
		36	13.26	0.22	13.48	30
		48	13.25	0.24	13.49	30
		54	13.15	0.27	13.42	30
5825	165	6	13.48	0.03	13.51	30
		9	13.46	0.05	13.51	30
		12	13.45	0.06	13.51	30
		18	13.29	0.09	13.38	30
		24	13.27	0.12	13.39	30
		36	13.16	0.22	13.38	30
		48	13.33	0.24	13.57	30
		54	13.10	0.27	13.37	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	13.08	0.03	13.11	23.98
		1	13.13	0.07	13.20	23.98
		2	13.04	0.10	13.14	23.98
		3	13.03	0.13	13.16	23.98
		4	12.94	0.18	13.12	23.98
		5	12.92	0.25	13.17	23.98
		6	12.87	0.26	13.13	23.98
		7	12.92	0.30	13.22	23.98
5200	40	0	13.13	0.03	13.16	23.98
		1	13.12	0.07	13.19	23.98
		2	13.01	0.10	13.11	23.98
		3	13.02	0.13	13.15	23.98
		4	13.03	0.18	13.21	23.98
		5	12.91	0.25	13.16	23.98
		6	12.90	0.26	13.16	23.98
		7	12.92	0.30	13.22	23.98
5240	48	0	13.21	0.03	13.24	23.98
		1	13.17	0.07	13.24	23.98
		2	13.15	0.10	13.25	23.98
		3	13.10	0.13	13.23	23.98
		4	13.09	0.18	13.27	23.98
		5	13.01	0.25	13.26	23.98
		6	13.02	0.26	13.28	23.98
		7	12.98	0.30	13.28	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	13.18	0.03	13.21	23.98
		1	12.92	0.07	12.99	23.98
		2	13.05	0.10	13.15	23.98
		3	13.05	0.13	13.18	23.98
		4	12.91	0.18	13.09	23.98
		5	12.85	0.25	13.10	23.98
		6	12.89	0.26	13.15	23.98
		7	12.86	0.30	13.16	23.98
5300	60	0	12.99	0.03	13.02	23.98
		1	12.93	0.07	13.00	23.98
		2	12.89	0.10	12.99	23.98
		3	12.94	0.13	13.07	23.98
		4	12.87	0.18	13.05	23.98
		5	12.83	0.25	13.08	23.98
		6	12.81	0.26	13.07	23.98
		7	12.75	0.30	13.05	23.98
5320	64	0	13.00	0.03	13.03	23.98
		1	12.99	0.07	13.06	23.98
		2	12.97	0.10	13.07	23.98
		3	12.94	0.13	13.07	23.98
		4	12.84	0.18	13.02	23.98
		5	12.84	0.25	13.09	23.98
		6	12.78	0.26	13.04	23.98
		7	12.75	0.30	13.05	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	13.12	0.03	13.15	23.98
		1	13.06	0.07	13.13	23.98
		2	13.08	0.10	13.18	23.98
		3	12.90	0.13	13.03	23.98
		4	12.95	0.18	13.13	23.98
		5	12.78	0.25	13.03	23.98
		6	12.90	0.26	13.16	23.98
		7	12.85	0.30	13.15	23.98
5580	116	0	12.81	0.03	12.84	23.98
		1	12.79	0.07	12.86	23.98
		2	12.83	0.10	12.93	23.98
		3	12.76	0.13	12.89	23.98
		4	12.71	0.18	12.89	23.98
		5	12.75	0.25	13.00	23.98
		6	12.61	0.26	12.87	23.98
		7	12.62	0.30	12.92	23.98
5720	144	0	12.52	0.03	12.55	23.98
		1	12.67	0.07	12.74	23.98
		2	12.59	0.10	12.69	23.98
		3	12.62	0.13	12.75	23.98
		4	12.53	0.18	12.71	23.98
		5	12.49	0.25	12.74	23.98
		6	12.49	0.26	12.75	23.98
		7	12.46	0.30	12.76	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	13.18	0.03	13.21	30
		1	13.16	0.07	13.23	30
		2	13.11	0.10	13.21	30
		3	12.93	0.13	13.06	30
		4	13.08	0.18	13.26	30
		5	13.03	0.25	13.28	30
		6	13.01	0.26	13.27	30
		7	12.91	0.30	13.21	30
5785	157	0	13.00	0.03	13.03	30
		1	13.02	0.07	13.09	30
		2	12.99	0.10	13.09	30
		3	13.12	0.13	13.25	30
		4	12.88	0.18	13.06	30
		5	12.80	0.25	13.05	30
		6	12.81	0.26	13.07	30
		7	12.88	0.30	13.18	30
5825	165	0	13.07	0.03	13.10	30
		1	13.05	0.07	13.12	30
		2	13.05	0.10	13.15	30
		3	13.00	0.13	13.13	30
		4	12.96	0.18	13.14	30
		5	12.93	0.25	13.18	30
		6	12.85	0.26	13.11	30
		7	12.86	0.30	13.16	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	13.05	0.04	13.09	23.98
		1	13.03	0.07	13.10	23.98
		2	12.99	0.11	13.10	23.98
		3	13.06	0.14	13.20	23.98
		4	13.05	0.19	13.24	23.98
		5	12.98	0.24	13.22	23.98
		6	12.98	0.23	13.21	23.98
		7	12.88	0.29	13.17	23.98
		8	12.91	0.34	13.25	23.98
5200	40	0	13.16	0.04	13.20	23.98
		1	13.12	0.07	13.19	23.98
		2	13.10	0.11	13.21	23.98
		3	13.07	0.14	13.21	23.98
		4	13.01	0.19	13.20	23.98
		5	12.97	0.24	13.21	23.98
		6	12.84	0.23	13.07	23.98
		7	12.89	0.29	13.18	23.98
		8	12.90	0.34	13.24	23.98
5240	48	0	13.25	0.04	13.29	23.98
		1	13.20	0.07	13.27	23.98
		2	13.01	0.11	13.12	23.98
		3	13.18	0.14	13.32	23.98
		4	13.15	0.19	13.34	23.98
		5	12.85	0.24	13.09	23.98
		6	12.84	0.23	13.07	23.98
		7	13.04	0.29	13.33	23.98
		8	12.76	0.34	13.10	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	13.04	0.04	13.08	23.98
		1	12.98	0.07	13.05	23.98
		2	12.99	0.11	13.10	23.98
		3	12.95	0.14	13.09	23.98
		4	12.87	0.19	13.06	23.98
		5	12.84	0.24	13.08	23.98
		6	12.81	0.23	13.04	23.98
		7	12.77	0.29	13.06	23.98
		8	12.73	0.34	13.07	23.98
5300	60	0	12.90	0.04	12.94	23.98
		1	12.90	0.07	12.97	23.98
		2	12.85	0.11	12.96	23.98
		3	12.84	0.14	12.98	23.98
		4	12.78	0.19	12.97	23.98
		5	12.80	0.24	13.04	23.98
		6	12.70	0.23	12.93	23.98
		7	12.91	0.29	13.20	23.98
		8	12.65	0.34	12.99	23.98
5320	64	0	12.95	0.04	12.99	23.98
		1	12.92	0.07	12.99	23.98
		2	12.90	0.11	13.01	23.98
		3	12.87	0.14	13.01	23.98
		4	12.82	0.19	13.01	23.98
		5	12.79	0.24	13.03	23.98
		6	12.78	0.23	13.01	23.98
		7	12.73	0.29	13.02	23.98
		8	12.70	0.34	13.04	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	13.10	0.04	13.14	23.98
		1	13.05	0.07	13.12	23.98
		2	13.07	0.11	13.18	23.98
		3	13.00	0.14	13.14	23.98
		4	12.99	0.19	13.18	23.98
		5	12.79	0.24	13.03	23.98
		6	12.86	0.23	13.09	23.98
		7	12.97	0.29	13.26	23.98
5580	116	0	12.81	0.04	12.85	23.98
		1	12.84	0.07	12.91	23.98
		2	12.82	0.11	12.93	23.98
		3	12.79	0.14	12.93	23.98
		4	12.65	0.19	12.84	23.98
		5	12.67	0.24	12.91	23.98
		6	12.66	0.23	12.89	23.98
		7	12.60	0.29	12.89	23.98
5720	144	0	12.69	0.04	12.73	23.98
		1	12.66	0.07	12.73	23.98
		2	12.61	0.11	12.72	23.98
		3	12.60	0.14	12.74	23.98
		4	12.54	0.19	12.73	23.98
		5	12.52	0.24	12.76	23.98
		6	12.47	0.23	12.70	23.98
		7	12.41	0.29	12.70	23.98
		8	12.41	0.34	12.75	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	13.20	0.04	13.24	30
		1	13.13	0.07	13.20	30
		2	12.97	0.11	13.08	30
		3	13.08	0.14	13.22	30
		4	13.11	0.19	13.30	30
		5	13.06	0.24	13.30	30
		6	12.79	0.23	13.02	30
		7	12.84	0.29	13.13	30
		8	12.81	0.34	13.15	30
5785	157	0	13.06	0.04	13.10	30
		1	13.00	0.07	13.07	30
		2	13.02	0.11	13.13	30
		3	12.98	0.14	13.12	30
		4	12.94	0.19	13.13	30
		5	12.87	0.24	13.11	30
		6	12.87	0.23	13.10	30
		7	12.86	0.29	13.15	30
		8	12.84	0.34	13.18	30
5825	165	0	13.13	0.04	13.17	30
		1	13.13	0.07	13.20	30
		2	13.07	0.11	13.18	30
		3	13.10	0.14	13.24	30
		4	13.03	0.19	13.22	30
		5	12.98	0.24	13.22	30
		6	12.97	0.23	13.20	30
		7	12.91	0.29	13.20	30
		8	12.88	0.34	13.22	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	11.45	0.04	11.49	23.98
		1	11.45	0.05	11.50	23.98
		2	11.42	0.11	11.53	23.98
		3	10.44	0.15	10.59	23.98
		4	10.39	0.22	10.61	23.98
		5	10.33	0.27	10.60	23.98
		6	10.33	0.27	10.60	23.98
		7	10.33	0.29	10.62	23.98
5230	46	0	11.65	0.04	11.69	23.98
		1	11.63	0.05	11.68	23.98
		2	11.61	0.11	11.72	23.98
		3	10.62	0.15	10.77	23.98
		4	10.62	0.22	10.84	23.98
		5	10.59	0.27	10.86	23.98
		6	10.56	0.27	10.83	23.98
		7	10.47	0.29	10.77	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	11.55	0.04	11.59	23.98
		1	11.50	0.05	11.56	23.98
		2	11.44	0.11	11.55	23.98
		3	10.45	0.15	10.60	23.98
		4	10.37	0.22	10.59	23.98
		5	10.66	0.27	10.93	23.98
		6	10.53	0.27	10.80	23.98
		7	10.65	0.29	10.94	23.98
5310	62	0	11.76	0.04	11.80	23.98
		1	11.55	0.05	11.60	23.98
		2	11.69	0.11	11.81	23.98
		3	10.77	0.15	10.92	23.98
		4	10.60	0.22	10.82	23.98
		5	10.58	0.27	10.85	23.98
		6	10.64	0.27	10.91	23.98
		7	10.54	0.29	10.83	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	11.68	0.04	11.72	23.98
		1	11.60	0.05	11.66	23.98
		2	11.57	0.11	11.68	23.98
		3	10.61	0.15	10.76	23.98
		4	10.54	0.22	10.75	23.98
		5	10.54	0.27	10.81	23.98
		6	10.46	0.27	10.73	23.98
		7	10.38	0.29	10.67	23.98
5550	110	0	11.52	0.04	11.56	23.98
		1	11.33	0.05	11.38	23.98
		2	11.27	0.11	11.39	23.98
		3	10.45	0.15	10.60	23.98
		4	10.45	0.22	10.67	23.98
		5	10.36	0.27	10.63	23.98
		6	10.35	0.27	10.62	23.98
		7	10.36	0.29	10.66	23.98
5710	142	0	11.05	0.04	11.09	23.98
		1	11.13	0.05	11.18	23.98
		2	11.08	0.11	11.19	23.98
		3	10.07	0.15	10.22	23.98
		4	9.87	0.22	10.09	23.98
		5	9.88	0.27	10.15	23.98
		6	9.82	0.27	10.09	23.98
		7	9.82	0.29	10.12	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	11.53	0.04	11.57	30
		1	11.55	0.05	11.60	30
		2	11.49	0.11	11.60	30
		3	10.49	0.15	10.64	30
		4	10.46	0.22	10.68	30
		5	10.39	0.27	10.66	30
		6	10.31	0.27	10.59	30
		7	10.32	0.29	10.62	30
5795	159	0	11.56	0.04	11.60	30
		1	11.58	0.05	11.64	30
		2	11.54	0.11	11.65	30
		3	10.58	0.15	10.73	30
		4	10.50	0.22	10.72	30
		5	10.46	0.27	10.72	30
		6	10.42	0.27	10.69	30
		7	10.40	0.29	10.70	30

☐ TEST Plot for 802.11n_40MHz BW

**802.11n_40 MHz BW UNII 1 BAND Average Power
(5190 MHz ~5230 MHz) CH 46MCS2**



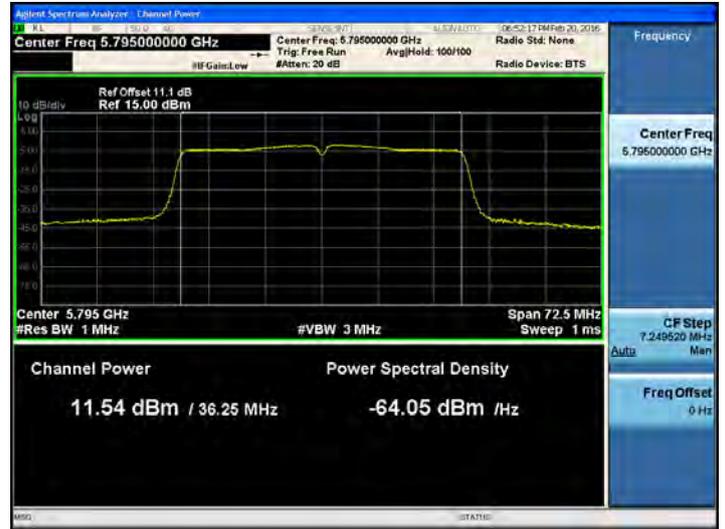
**802.11n_40 MHz BW UNII 2A BAND Average Power
(5270 MHz ~5310 MHz) CH 62MCS2**



**802.11n_40 MHz BW UNII 2C BAND Average Power
(5510 MHz ~5710 MHz) CH 102MCS0**



**802.11n_40 MHz BW UNII 3 BAND Average Power
(5755 MHz ~5795 MHz) CH 159MCS2**



802.11ac_40 MHz 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	11.32	0.03	11.35	23.98
		1	11.31	0.07	11.39	23.98
		2	11.35	0.11	11.46	23.98
		3	10.41	0.10	10.50	23.98
		4	10.36	0.20	10.55	23.98
		5	10.34	0.25	10.60	23.98
		6	10.30	0.28	10.58	23.98
		7	10.30	0.31	10.60	23.98
		8	10.23	0.36	10.58	23.98
		9	10.19	0.39	10.58	23.98
5230	46	0	11.65	0.03	11.68	23.98
		1	11.61	0.07	11.69	23.98
		2	11.61	0.11	11.72	23.98
		3	10.67	0.10	10.77	23.98
		4	10.55	0.20	10.75	23.98
		5	10.51	0.25	10.77	23.98
		6	10.45	0.28	10.74	23.98
		7	10.46	0.31	10.77	23.98
		8	10.43	0.36	10.79	23.98
		9	10.38	0.39	10.77	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	11.57	0.03	11.60	23.98
		1	11.36	0.07	11.43	23.98
		2	11.45	0.11	11.56	23.98
		3	10.55	0.10	10.65	23.98
		4	10.49	0.20	10.69	23.98
		5	10.45	0.25	10.71	23.98
		6	10.36	0.28	10.65	23.98
		7	10.40	0.31	10.70	23.98
		8	10.26	0.36	10.61	23.98
		9	10.31	0.39	10.70	23.98
5310	62	0	11.60	0.03	11.63	23.98
		1	11.58	0.07	11.65	23.98
		2	11.41	0.11	11.52	23.98
		3	10.51	0.10	10.61	23.98
		4	10.43	0.20	10.63	23.98
		5	10.44	0.25	10.69	23.98
		6	10.39	0.28	10.68	23.98
		7	10.42	0.31	10.73	23.98
		8	10.27	0.36	10.62	23.98
		9	10.32	0.39	10.70	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	11.51	0.03	11.54	23.98
		1	11.36	0.07	11.43	23.98
		2	11.45	0.11	11.56	23.98
		3	10.39	0.10	10.48	23.98
		4	10.33	0.20	10.53	23.98
		5	10.28	0.25	10.54	23.98
		6	10.26	0.28	10.54	23.98
		7	10.26	0.31	10.56	23.98
		8	10.21	0.36	10.57	23.98
		9	10.18	0.39	10.57	23.98
5590	118	0	11.34	0.03	11.37	23.98
		1	11.27	0.07	11.35	23.98
		2	11.24	0.11	11.35	23.98
		3	10.38	0.10	10.48	23.98
		4	10.36	0.20	10.56	23.98
		5	10.25	0.25	10.51	23.98
		6	10.25	0.28	10.54	23.98
		7	10.30	0.31	10.61	23.98
		8	10.20	0.36	10.55	23.98
		9	10.20	0.39	10.58	23.98
5710	142	0	11.15	0.03	11.19	23.98
		1	11.26	0.07	11.34	23.98
		2	11.20	0.11	11.31	23.98
		3	10.19	0.10	10.29	23.98
		4	10.17	0.20	10.37	23.98
		5	10.02	0.25	10.28	23.98
		6	10.09	0.28	10.38	23.98
		7	10.05	0.31	10.36	23.98
		8	9.97	0.36	10.33	23.98
		9	10.06	0.39	10.45	23.98

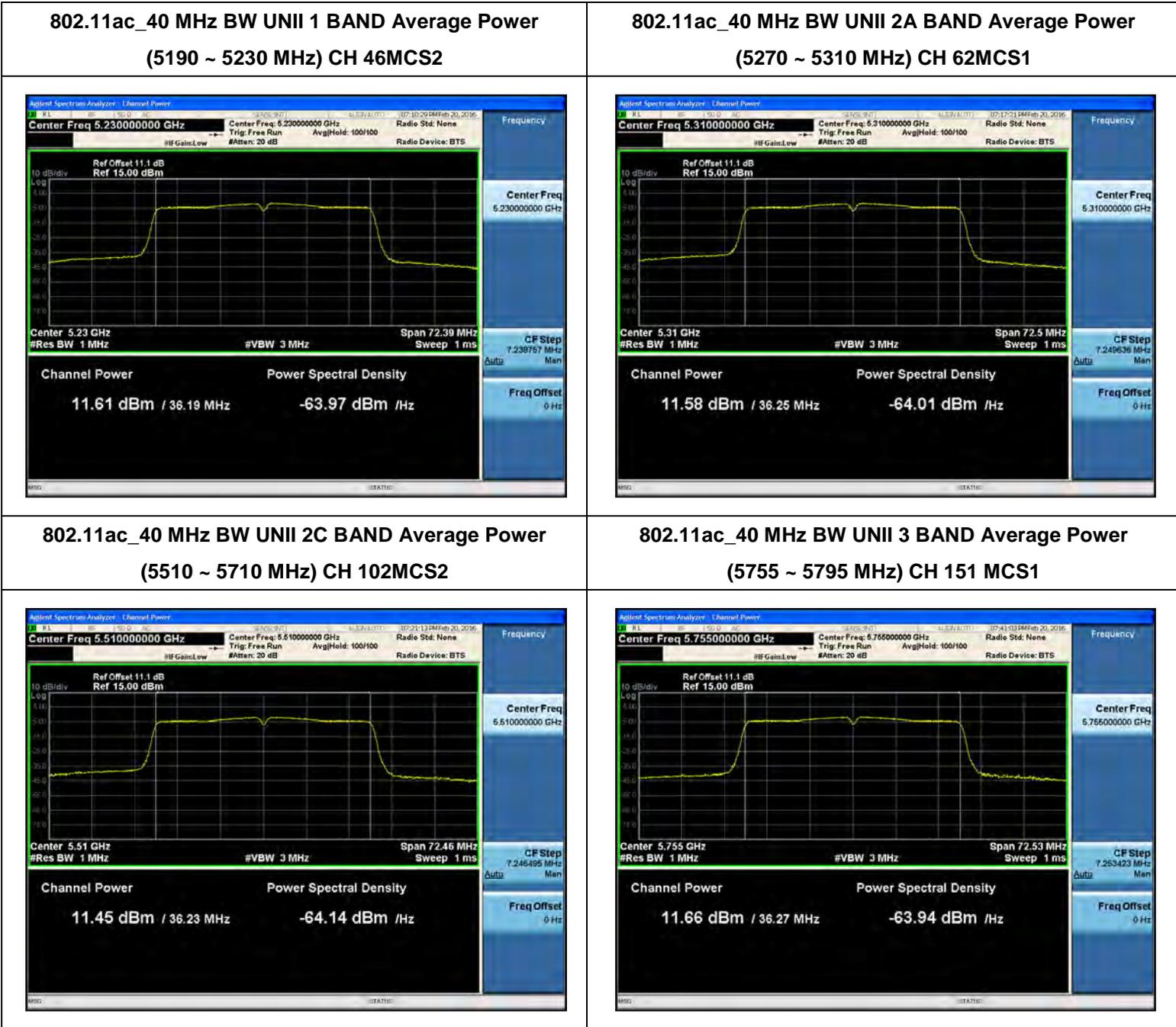
802.11ac _40MHz BW (UNII 3)

■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	11.65	0.03	11.69	30
		1	11.66	0.07	11.73	30
		2	11.59	0.11	11.70	30
		3	10.61	0.10	10.71	30
		4	10.52	0.20	10.72	30
		5	10.50	0.25	10.76	30
		6	10.47	0.28	10.76	30
		7	10.40	0.31	10.71	30
		8	10.39	0.36	10.75	30
		9	10.39	0.39	10.78	30
5795	159	0	11.55	0.03	11.59	30
		1	11.53	0.07	11.60	30
		2	11.51	0.11	11.62	30
		3	10.63	0.10	10.73	30
		4	10.54	0.20	10.74	30
		5	10.53	0.25	10.79	30
		6	10.51	0.28	10.79	30
		7	10.54	0.31	10.85	30
		8	10.42	0.36	10.78	30
		9	10.41	0.39	10.80	30

☐ TEST Plot for 802.11ac_40MHz BW



802.11ac_80 MHz BW (UNII 1)

■TEST RESULTS

Conducted Output Power Measurements (802.11ac_80MHz Mode: 5210)

802.11ac(80MHz) 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	10.92	0.08	11.00	23.98
		1	10.85	0.16	11.02	23.98
		2	10.83	0.22	11.05	23.98
		3	8.35	0.26	8.61	23.98
		4	8.24	0.32	8.57	23.98
		5	8.13	0.44	8.57	23.98
		6	8.13	0.46	8.59	23.98
		7	8.10	0.49	8.60	23.98
		8	7.98	0.56	8.54	23.98
		9	7.99	0.66	8.65	23.98

802.11ac_80MHz BW (UNII 2A)

■TEST RESULTS

Conducted Output Power Measurements (802.11ac_80MHz Mode: 5290)

802.11ac(80MHz) 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	11.66	0.08	11.74	23.98
		1	11.46	0.16	11.63	23.98
		2	11.63	0.22	11.85	23.98
		3	10.60	0.26	10.85	23.98
		4	10.52	0.32	10.84	23.98
		5	10.42	0.44	10.87	23.98
		6	10.29	0.46	10.75	23.98
		7	10.29	0.49	10.78	23.98
		8	10.19	0.56	10.75	23.98
		9	10.20	0.66	10.86	23.98

802.11ac _80MHz BW (UNII 2C)

■TEST RESULTS

Conducted Output Power Measurements (802.11ac_80MHz Mode: 5530 ~ 5690 MHz)

802.11ac(80MHz) 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	11.02	0.08	11.10	23.98
		1	10.99	0.16	11.15	23.98
		2	10.98	0.22	11.20	23.98
		3	7.62	0.26	7.88	23.98
		4	7.56	0.32	7.88	23.98
		5	7.48	0.44	7.92	23.98
		6	7.42	0.46	7.88	23.98
		7	7.39	0.49	7.88	23.98
		8	7.31	0.56	7.87	23.98
		9	7.31	0.66	7.97	23.98
5690	138	0	11.07	0.08	11.15	23.98
		1	11.09	0.16	11.25	23.98
		2	11.07	0.22	11.29	23.98
		3	10.06	0.26	10.31	23.98
		4	9.94	0.32	10.26	23.98
		5	9.87	0.44	10.31	23.98
		6	9.85	0.46	10.31	23.98
		7	9.76	0.49	10.26	23.98
		8	9.71	0.56	10.27	23.98
		9	9.68	0.66	10.34	23.98

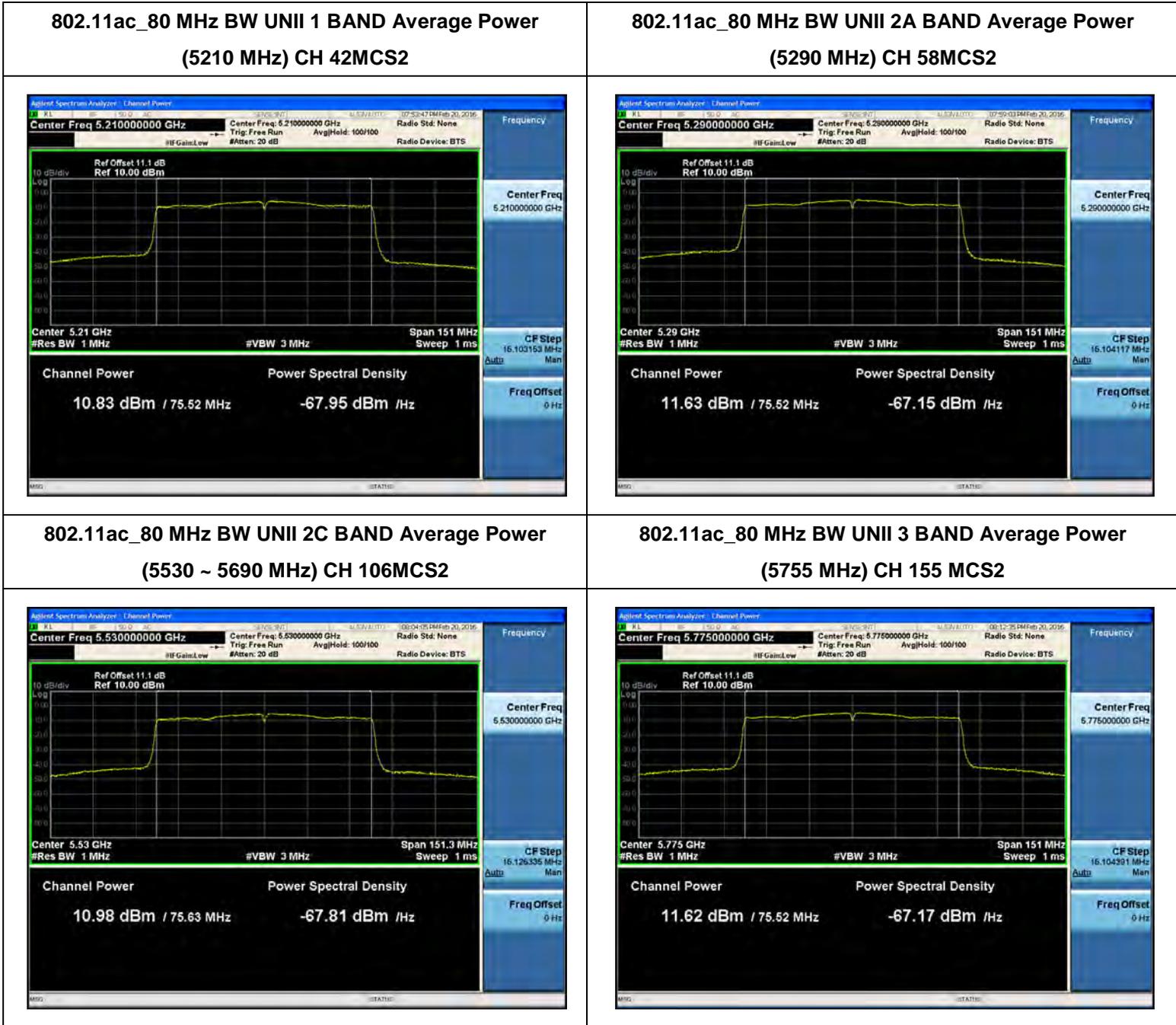
802.11ac _80MHz BW (UNII 3)

■TEST RESULTS

Conducted Output Power Measurements (802.11ac_80MHz Mode: 5775 MHz)

802.11ac(80MHz) 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	1	11.66	0.08	11.74	30
		2	11.66	0.16	11.82	30
		3	11.62	0.22	11.84	30
		4	10.68	0.26	10.94	30
		5	10.59	0.32	10.91	30
		6	10.41	0.44	10.86	30
		7	10.47	0.46	10.93	30
		8	10.38	0.49	10.87	30
		9	10.31	0.56	10.87	30
		10	10.30	0.66	10.96	30

TEST Plot for 802.11ac_80MHz BW



■ Straddle channels TEST RESULTS

Conducted Output Power Measurements (802.11a/n/ac _20M Mode: UNII 2C Band 5720MHz)

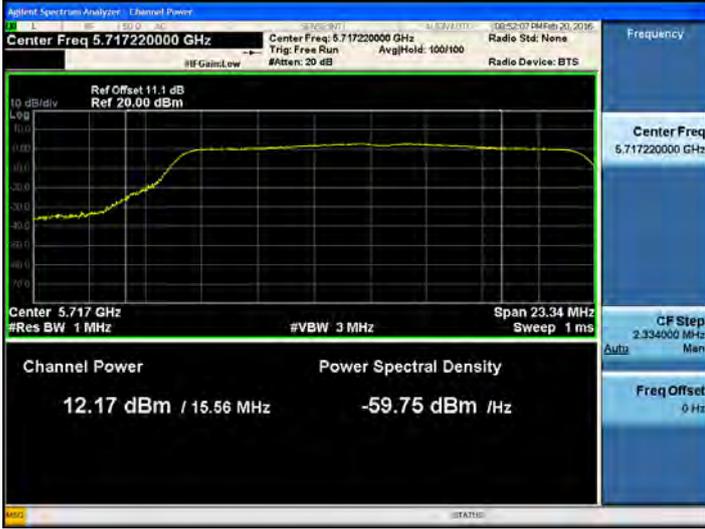
Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11a	5720	144	12.17	0.27	12.44	22.62
802.11n			11.69	0.30	11.99	22.66
802.11ac			11.73	0.34	12.07	22.71

Conducted Output Power Measurements (802.11a/n/ac _20M Mode: UNII 3 Band 5720MHz)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11a	5720	144	4.86	0.27	5.13	24.29
802.11n			4.93	0.30	5.23	24.19
802.11ac			4.96	0.34	5.30	24.05

☐ Straddle channels TEST Plot for 802.11a/n/ac _20MHz BW

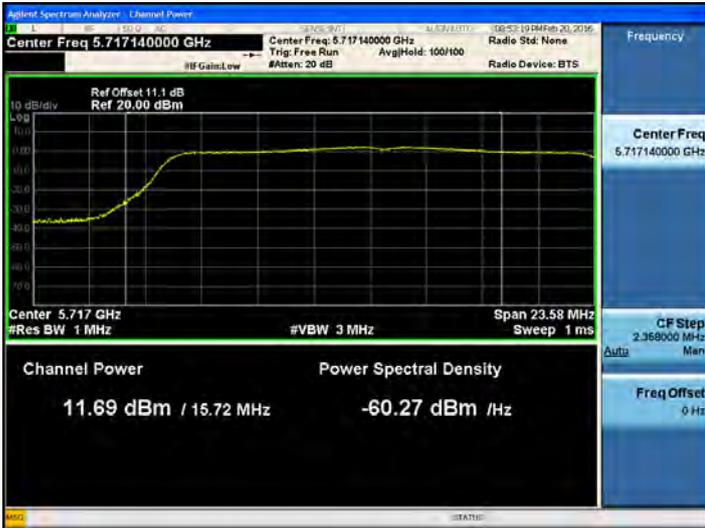
802.11a UNII 2C Band Average Power CH.144



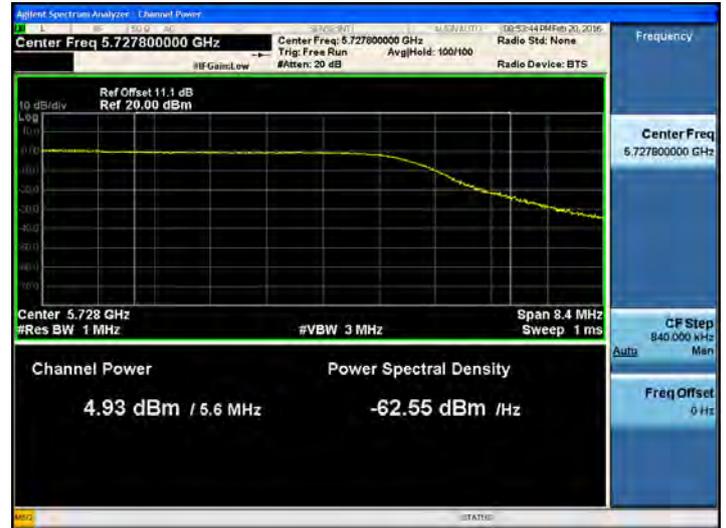
802.11a UNII 3 Band Average Power CH.144



802.11n_20MHz BW UNII 2C Band Average Power CH.144

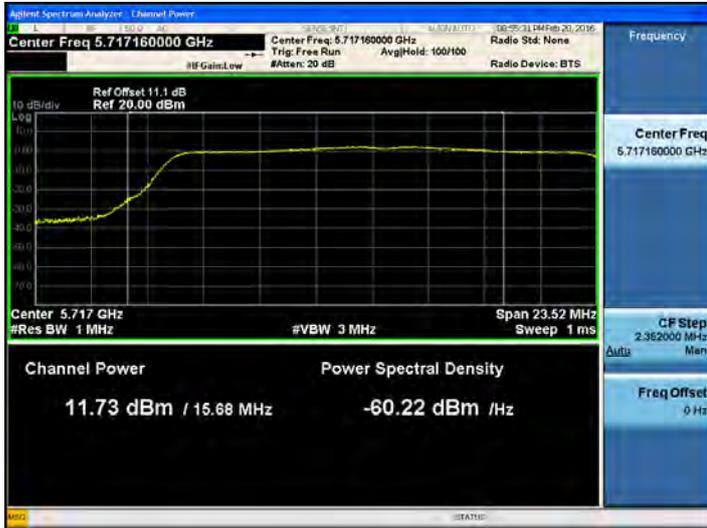


802.11n_20MHz BW UNII 3 Band Average Power CH.144



▣ Straddle channels TEST Plot for 802.11ac _20MHz BW

802.11ac UNII 2C Band Average Power CH.144



802.11ac UNII 3 Band Average Power CH.144



■ **Straddle channels TEST RESULTS**

Conducted Output Power Measurements (802.11n/ac _40M Mode: UNII 2C Band 5710MHz)

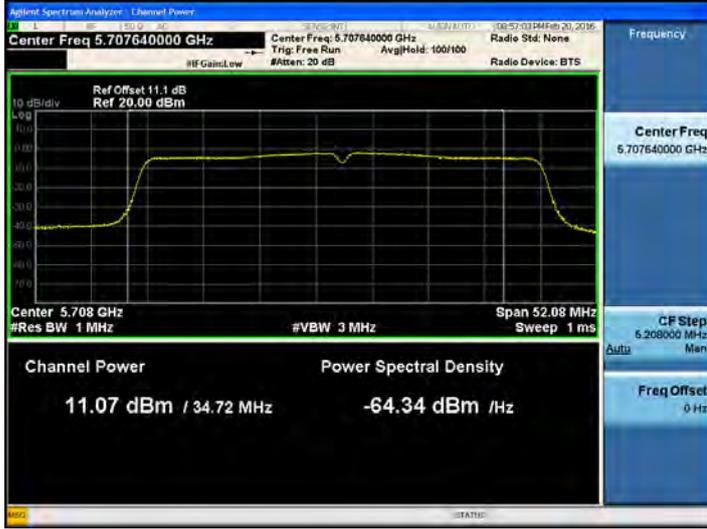
Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11n	5710	142	11.07	0.29	11.36	23.40
802.11ac			11.09	0.39	11.48	23.42

Conducted Output Power Measurements (802.11n/ac_40M Mode: UNII 3 Band 5710MHz)

Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11n	5710	142	-0.17	0.29	0.12	20.97
802.11ac			-0.20	0.39	0.19	20.83

Straddle channels TEST Plot for 802.11n/ac _40MHz BW

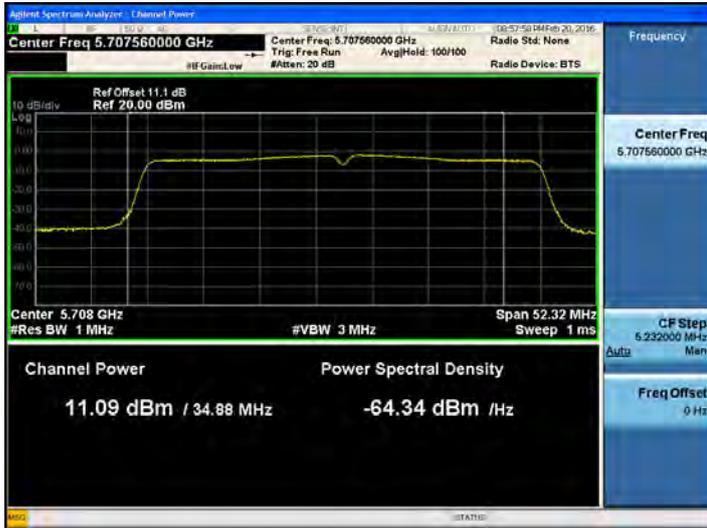
802.11n_40MHz BW UNII 2C Band Average Power CH.142



802.11n_40MHz BW UNII 3 Band Average Power CH.142



802.11ac_40MHz BW UNII 2C Band Average Power CH.142



802.11ac_40MHz BW UNII 3 Band Average Power CH.142



Straddle channels TEST RESULTS

Conducted Output Power Measurements (802.11ac _80M Mode: UNII 2C Band 5690MHz)

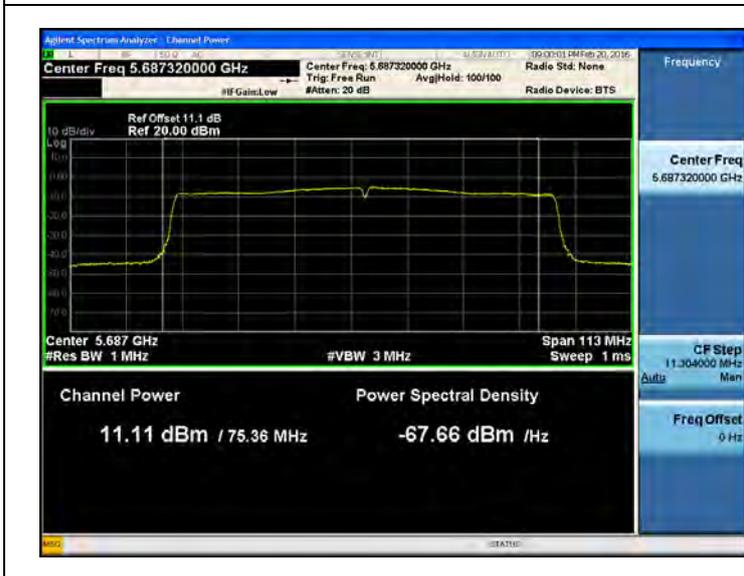
Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11ac	5690	138	11.11	0.66	11.77	23.66

Conducted Output Power Measurements (802.11ac _80M Mode: UNII 3 Band 5690MHz)

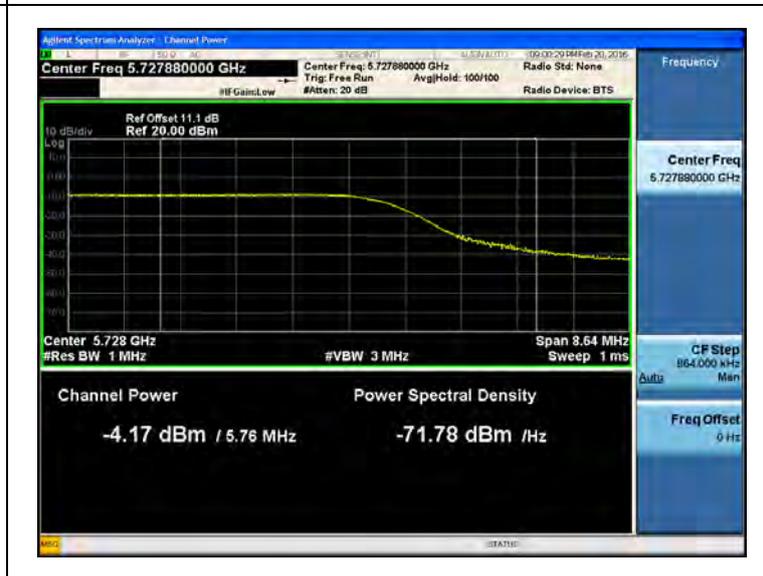
Mode	Frequency [MHz]	Channel No.	Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
802.11ac	5690	138	-4.17	0.66	-3.51	18.51

Straddle channels TEST Plot for 802.11ac _80MHz BW

802.11ac_80MHz BW UNII 2C Band Average Power CH.138



802.11ac_80MHz BW UNII 3 Band Average Power CH.138



8.4 POWER SPECTRAL DENSITY

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

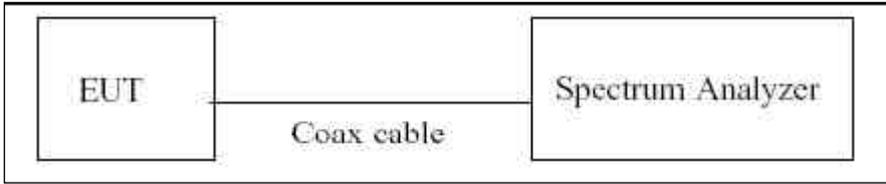
▣ **Limit**

Power Spectral Density

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

Note : Note : According to KDB644545 D03 v01, emission for straddle channels in each band shall comply with the PSD limits applicable to that band under the appropriate rule section.

■ TEST CONFIGURATION



■ TEST PROCEDURE

We tested according to Method in KDB 789033(issued 01/08/2016).

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_20MHz 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	802.11a	2.886	0.031	2.917	11	Pass
5200	40		3.185	0.241	3.426		Pass
5240	48		3.461	0.241	3.702		Pass
5260	52		2.957	0.221	3.178	11	Pass
5300	60		2.882	0.241	3.123		Pass
5320	64		3.100	0.241	3.341		Pass
5500	100		3.119	0.221	3.340	11	Pass
5580	116		2.768	0.241	3.009		Pass
5720	144		2.483	0.241	2.724		Pass
5745	149		0.229	0.221	0.450	30	Pass
5785	157		0.328	0.091	0.419		Pass
5825	165		0.462	0.241	0.703		Pass

TEST Plot for 802.11a 20MHz BW

802.11a_20MHz BW UNII 1 BAND PSD CH 48



802.11a_20MHz BW UNII 2A BAND PSD CH 64



802.11a_20MHz BW UNII 2C BAND PSD CH 100



802.11a_20MHz BW UNII 3 BAND PSD CH 165



■802.11n_20MHz 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	802.11n 20M BW	2.296	0.302	2.598	11	Pass
5200	40		1.751	0.302	2.053		Pass
5240	48		2.412	0.302	2.714		Pass
5260	52		2.476	0.033	2.509	11	Pass
5300	60		2.407	0.249	2.656		Pass
5320	64		2.403	0.249	2.652		Pass
5500	100		2.346	0.096	2.442	11	Pass
5580	116		2.088	0.249	2.337		Pass
5720	144		2.034	0.302	2.336		Pass
5745	149		-0.327	0.249	-0.078	30	Pass
5785	157		-0.364	0.126	-0.238		Pass
5825	165		-0.178	0.249	0.071		Pass

TEST Plot for 802.11n 20MHz BW

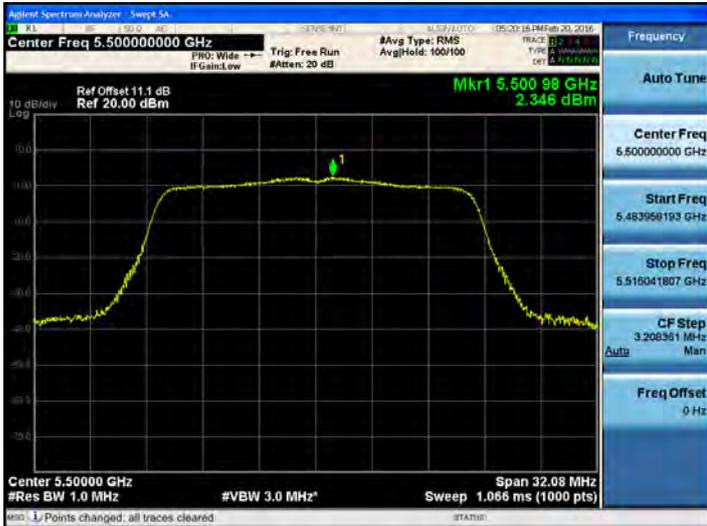
802.11n_20MHz BW UNII 1 BAND PSD CH 48



802.11n_20MHz BW UNII 2A BAND PSD CH60



802.11n_20MHz BW UNII 2C BAND PSD CH 100



802.11n_20MHz BW UNII 3 BAND PSD CH 165



■802.11ac_20MHz BW

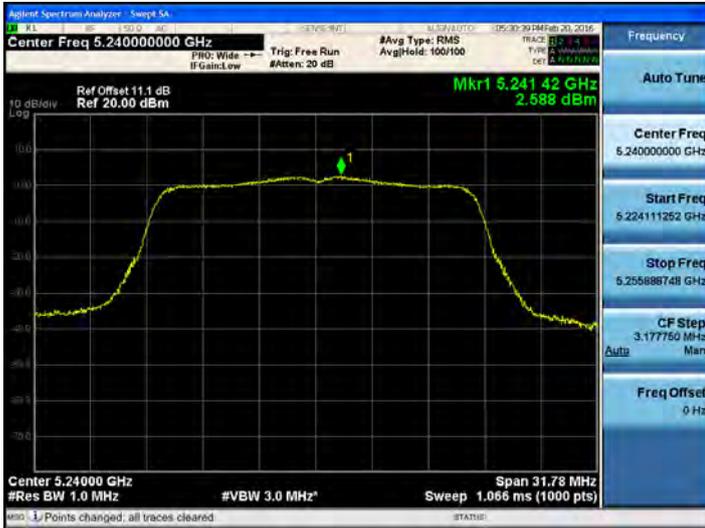
■TEST RESULTS

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 _20MHz BW	2.268	0.340	2.608	11	Pass
5200	40		2.437	0.340	2.777		Pass
5240	48		2.588	0.191	2.779		Pass
5260	52		2.627	0.111	2.738	11	Pass
5300	60		2.320	0.294	2.614		Pass
5320	64		2.423	0.340	2.763		Pass
5500	100		2.168	0.294	2.462	11	Pass
5580	116		2.165	0.143	2.308		Pass
5720	144		1.874	0.242	2.116		Pass
5745	149		-0.252	0.242	-0.010	30	Pass
5785	157		-0.557	0.340	-0.217		Pass
5825	165		0.001	0.143	0.144		Pass

TEST Plot for 802.11ac 20MHz BW

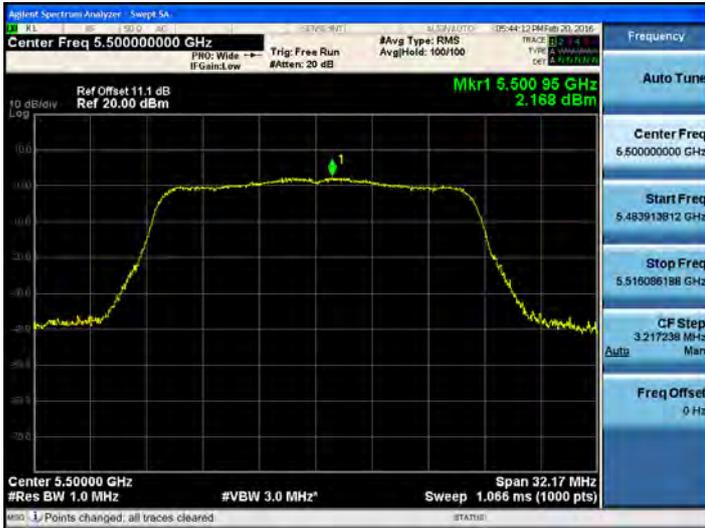
802.11ac_20MHz BW UNII 1 BAND PSD CH 48



802.11ac_20MHz BW UNII 2A BAND PSD CH 64



802.11ac_20MHz BW UNII 2C BAND PSD CH 100



802.11ac_20MHz BW UNII 3 BAND PSD CH 165



■802.11n_40MHz 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
5190	38	802.11n 40MHz BW	-1.907	0.111	-1.796	11	Pass
5230	46		-1.399	0.111	-1.288		Pass
5270	54		-1.588	0.040	-1.548	11	Pass
5310	62		-1.453	0.111	-1.342		Pass
5510	102		-1.703	0.040	-1.663	11	Pass
5550	110		-1.790	0.040	-1.750		Pass
5710	134		-2.357	0.111	-2.246		Pass
5755	151		-4.231	0.051	-4.180	30	Pass
5795	159		-4.141	0.111	-4.030		Pass

TEST Plot for 802.11n 40MHz BW

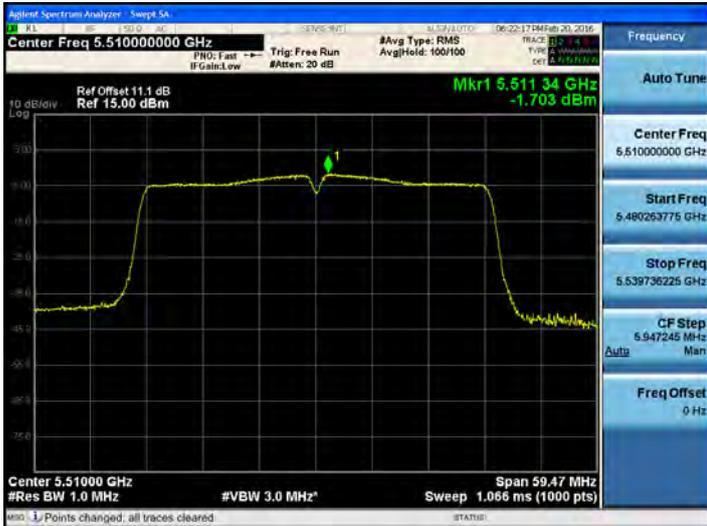
802.11n_40MHz BW UNII 1 BAND PSD CH 46



802.11n_40MHz BW UNII 2A BAND PSD CH 62



802.11n_40MHz BW UNII 2C BAND PSD CH 102



802.11n_40MHz BW UNII 3 BAND PSD CH 159



■802.11ac_40MHz BW

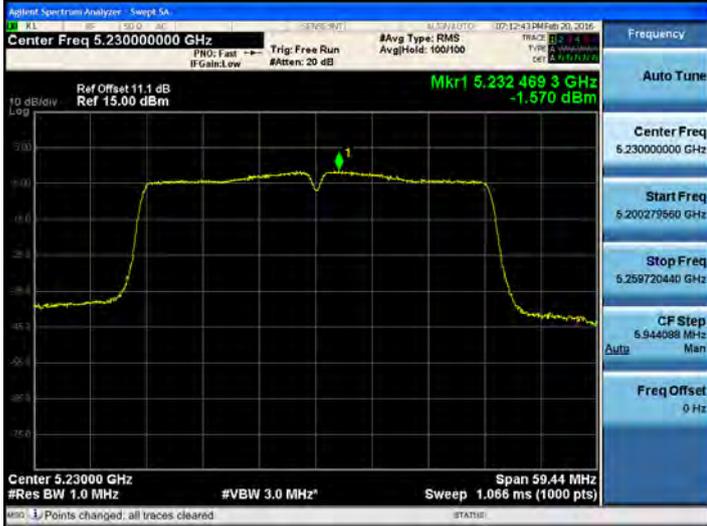
■TEST RESULTS

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
5190	38	802.11ac 40MHz BW	-1.949	0.111	-1.838	11	Pass
5230	46		-1.570	0.111	-1.459		Pass
5270	54		-1.617	0.035	-1.582	11	Pass
5310	62		-1.632	0.075	-1.557		Pass
5510	102		-1.931	0.111	-1.820	11	Pass
5550	110		-1.618	0.035	-1.583		Pass
5710	134		-1.932	0.075	-1.857		Pass
5755	151		-4.452	0.075	-4.377	30	Pass
5795	159		-4.454	0.111	-4.343		Pass

TEST Plot for 802.11ac_ 40MHz BW

802.11ac_40MHz BW UNII 1 BAND PSD CH 46



802.11ac_40MHz BW UNII 2A BAND PSD CH 62



802.11ac_40MHz BW UNII 2C BAND PSD CH 110



802.11ac_40MHz BW UNII 3 BAND PSD CH 159



■802.11ac_80MHz 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
5210	42	802.11ac 80MHz BW	-5.315	0.222	-5.093	11	Pass
5290	58		-4.675	0.222	-4.453	11	Pass
5530	106		-5.193	0.222	-4.971	11	Pass
5690	138		-5.243	0.222	-5.021		Pass
5775	155		-7.359	0.222	-7.137	30	Pass

TEST Plot for 802.11ac_80MHz BW

802.11ac_80MHz BW UNII 1 BAND PSD CH 42



802.11ac_80MHz BW UNII 2A BAND PSD CH 58



802.11ac_80MHz BW UNII 2C BAND PSD CH 106



802.11ac_80MHz BW UNII 3 BAND PSD CH 155



■ **Straddle channels TEST RESULTS**

Conducted Power Density Measurements (UNII 2C Band 5720MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	2.493	0.27	2.763	11	Pass
		802.11n	2.047	0.30	2.347	11	Pass
		802.11ac	2.170	0.34	2.510	11	Pass

Conducted Power Density Measurements (UNII 3 Band 5720MHz)

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5720	144	802.11a	-2.402	0.27	-2.132	30	Pass
		802.11n	-2.815	0.30	-2.515	30	Pass
		802.11ac	-3.393	0.34	-3.053	30	Pass

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

802.11a UNII 2C Band PSD CH.144



802.11a UNII 3 Band PSD CH.144



802.11n_20MHz BW UNII 2C Band PSD CH.144



802.11n_20MHz BW UNII 3 Band PSD CH.144



802.11ac_20MHz BW UNII 2C Band PSD CH.144



802.11ac_20MHz BW UNII 3 Band PSD CH.144



■ **Straddle channels TEST RESULTS**

Conducted Power Density Measurements (UNII 2C Band 5710MHz)

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
5710	142	802.11n	-2.057	0.29	-1.767	11	Pass
		802.11ac	-1.949	0.39	-1.559	11	Pass

Conducted Power Density Measurements (UNII 3 Band 5710MHz)

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
5710	142	802.11n	-7.488	0.29	-7.198	30	Pass
		802.11ac	-8.121	0.39	-7.731	30	Pass

☐ Straddle channels TEST Plot for 802.11n/ac _40MHz BW

802.11n_40MHz BW UNII 2C Band PSD CH.142



802.11n_40MHz BW UNII 3 Band PSD CH.142



802.11ac_40MHz BW UNII 2C Band PSD CH.142



802.11ac_40MHz BW UNII 3 Band PSD CH.142



Straddle channels TEST RESULTS

Conducted Power Density Measurements (UNII 2C Band 5690MHz)

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
5690	138	802.11ac	-5.364	0.66	-4.704	11	Pass

Conducted Power Density Measurements (UNII 3 Band 5690MHz)

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
5690	138	802.11ac	-11.562	0.66	-10.902	30	Pass

Straddle channels TEST Plot for 802.11ac _80MHz BW

