HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

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

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
June 02, 2014

Test Site/Location:
HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

Report No.: HCT-R-1406-F007

HCT FRN: 0005866421

FCC ID	**: ZNFLGL24**
APPLICANT	**: LG Electronics MobileComm U.S.A., Inc.**

FCC Model(s):	LGL24
EUT Type:	Cellular/PCS GSM, Cellular WCDMA, LTE Phone with Bluetooth/WLAN/NFC
Max. RF Output Power:	Wi-Fi 802.11a (5180~5240) (11.84 dBm)/ Wi-Fi 802.11a (5260~5320) (11.55 dBm)/ Wi-Fi 802.11a (5500~5700) (11.25 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (11.13 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.91 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(10.16 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (9.83 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (9.99 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (9.26 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5180~5240) (11.21 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5260~5320) (11.05 dBm)/ Wi-Fi 802.11ac_20 MHz (5500~5700) (10.31 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5190~5230) (9.99 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5270~5310) (9.99 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5510~5670) (9.17 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5210) (9.84 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5290) (9.66 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5530~5690) (8.76 dBm)
Frequency Range:	20 MHz BW: 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) 40 MHz BW: 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 2e) 80 MHz BW: 5210 MHz(UNII 1)/ 5290 MHz(UNII 2)/ 5530 MHz - 5690 MHz(UNII 2e)
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(UNII)
FCC Rule Part(s):	Part 15.407

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
: Kyoung Houn Seo
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1406-F007	June 02, 2014	- First Approval Report

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1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFLGL24
EUT Type:	Cellular/PCS GSM, Cellular WCDMA, LTE Phone with Bluetooth/WLAN/NFC
Model name(s):	LGL24
Date(s) of Tests:	May 02, 2014 ~ May 30, 2014
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. (IC Recognition No. : 5944A-3)

2. EUT DESCRIPTION

EUT Type	Cellular/PCS GSM, Cellular WCDMA, LTE Phone with Bluetooth/WLAN/NFC	
FCC Model Name	LGL24	
Power Supply	DC 3.8 V	
Battery type	Li-ion Battery(Standard)	
Frequency Range	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) where) Not supported 5600 MHz – 5640 MHz
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 2e) where) Not supported 5590 MHz – 5630 MHz
	80 MHz BW:	5210 MHz(UNII 1)/ 5290 MHz(UNII 2)/ 5530 MHz - 5690 MHz(UNII 2e) where) Not supported 5610 MHz
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) where) Not supported 5600 MHz – 5640 MHz
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2)/ 5510 MHz - 5670 MHz (UNII 2e) where) Not supported 5590 MHz – 5630 MHz
	80 MHz BW:	5210 MHz(UNII 1)/ 5290 MHz(UNII 2)/ 5530 MHz - 5690 MHz(UNII 2e) where) Not supported 5610 MHz
Max. RF Output Power:	Wi-Fi 802.11a (5180~5240) (11.84 dBm)/ Wi-Fi 802.11a (5260~5320) (11.55 dBm)/ Wi-Fi 802.11a (5500~5700) (11.25 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (11.13 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(10.91 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(10.16 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (9.83 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (9.99 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (9.26 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5180~5240) (11.21 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5260~5320) (11.05 dBm)/ Wi-Fi 802.11ac_20 MHz (5500~5700) (10.31 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5190~5230) (9.99 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5270~5310) (9.99 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5510~5670) (9.17 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5210) (9.84 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5290) (9.66 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5530~5690) (8.76 dBm)	
Modulation Type	OFDM(802.11a, 802.11n, 802.11ac)	
Antenna Specification	Manufacturer: Ace Technology Antenna type:BUILT-IN Antenna Peak Gain : -3.70 dBi	

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D01 General UNII Test Procedures v01r03 dated April 08, 2013 entitled " Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices, the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) – Part 15, Subpart E" were used in the measurement.
For 802.11ac, KDB644545 D01 v01r01 dated April 08, 2013.

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 13.1.4.1 of ANSI C63.4. (Version :2003) 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. 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 13.1.4.1 of ANSI C63.4. (Version: 2003)

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

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 :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated February 28, 2014 (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:

“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

7. SUMMARY OF TEST RESULTS

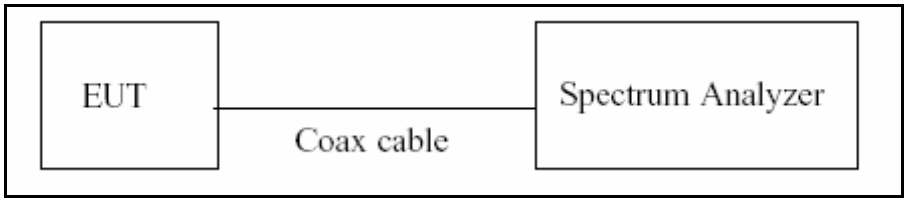
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
TRANSMITTER MODE(TX)				
26dB Bandwidth	NA	NA	CONDUCTED	PASS
Maximum Conducted Output Power	§15.407(a)(1)	< 50 mW or 4+10 log $_{10}$ (BW) dBm (5150-5250 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5470-5725 MHz) Whichever power is less		PASS
Peak Power Spectral Density	§15.407(a)(1), (5)	<4 dBm/ MHz (5150-5250) <11 dBm/ MHz (5250-5350) <11 dBm/ MHz (5470-5725)		PASS
Peak Excursion	§15.407(a)(6)	<13 dB/ MHz maximum difference		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)(1), (2), (3)	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	RADIATED	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 5.407(b)(1), (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 ≥ 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 accroding to the zero-span measurement method, B)2) in KDB 789033(issued 04/08/2013)
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	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor
802.11a	6	2.030	2.130	0.95305164	0.209
	9	1.360	1.460	0.93150685	0.308
	12	1.026	1.125	0.91200000	0.400
	18	0.687	0.789	0.87072243	0.601
	24	0.522	0.622	0.83922830	0.761
	36	0.354	0.454	0.77973568	1.081
	48	0.271	0.371	0.73045822	1.364
	54	0.243	0.343	0.70845481	1.497
802.11n_20 MHz BW	6.5	1.880	1.980	0.94949495	0.225
	13	0.950	1.050	0.90476190	0.435
	19.5	0.640	0.740	0.86486486	0.631
	26	0.488	0.586	0.83276451	0.795
	39	0.336	0.436	0.77064220	1.131
	52	0.254	0.354	0.71751412	1.442
	58.5	0.231	0.330	0.70000000	1.549
	65	0.211	0.310	0.68064516	1.671
802.11n_40 MHz BW	13.5	0.920	1.020	0.90196078	0.448
	27	0.472	0.572	0.82517483	0.835
	40.5	0.322	0.423	0.76122931	1.185
	54	0.247	0.348	0.70977011	1.489
	81	0.175	0.275	0.63636364	1.963
	108	0.135	0.235	0.57446809	2.407
	121.5	0.123	0.223	0.55156951	2.584
	135	0.115	0.215	0.53488372	2.717

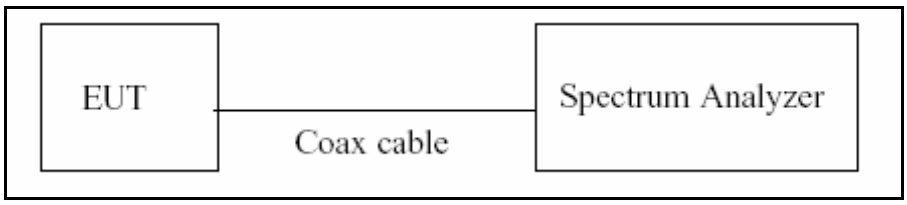
Mode	Data Rate	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ac_20 MHz BW	6.5	0.975	1.074	0.90782123	0.420
	13	0.508	0.606	0.83828383	0.766
	19.5	0.350	0.450	0.77777778	1.091
	26	0.276	0.374	0.73796791	1.320
	39	0.195	0.294	0.66326531	1.783
	52	0.159	0.258	0.61627907	2.102
	58.5	0.143	0.241	0.59336100	2.267
	65	0.136	0.234	0.58119658	2.357
	78	0.120	0.218	0.55045872	2.593
5.8 GHz Band 802.11ac_40 MHz BW	13.5	0.491	0.590	0.83220339	0.798
	27	0.267	0.366	0.72950820	1.370
	40.5	0.191	0.291	0.65635739	1.829
	54	0.155	0.255	0.60784314	2.162
	81	0.115	0.215	0.53488372	2.717
	108	0.099	0.199	0.49748744	3.032
	121.5	0.091	0.191	0.47643979	3.220
	135	0.087	0.187	0.46524064	3.323
	162	0.080	0.180	0.44444444	3.522
	180	0.076	0.175	0.43428571	3.622
5.8 GHz Band 802.11ac_80 MHz BW	29.3	0.247	0.347	0.71181556	1.476
	58.5	0.144	0.244	0.59016393	2.290
	87.8	0.111	0.212	0.52358491	2.810
	117	0.092	0.192	0.47916667	3.195
	175.5	0.076	0.176	0.43181818	3.647
	234	0.067	0.168	0.39880952	3.992
	263.3	0.064	0.164	0.39024390	4.087
	292.5	0.063	0.164	0.38414634	4.155
	351	0.059	0.159	0.37106918	4.305
	390	0.055	0.156	0.35256410	4.528

8.2 26 dB 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(issued 04/08/2013), 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

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to(Page 3 in KDB 789033, issued 04/08/2013)

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 peak 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 %.

▣ TEST RESULTS

20 MHz BW

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	21.98	N/A	Pass
5200	40	22.33	N/A	Pass
5240	48	21.96	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	22.02	N/A	Pass
5300	60	21.80	N/A	Pass
5320	64	22.02	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	21.85	N/A	Pass
5580	116	21.75	N/A	Pass
5700	140	21.87	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	22.04	N/A	Pass
5200	40	22.16	N/A	Pass
5240	48	21.86	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.96	N/A	Pass
5300	60	22.09	N/A	Pass
5320	64	22.50	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.10	N/A	Pass
5580	116	22.45	N/A	Pass
5700	140	22.00	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	21.88	N/A	Pass
5200	40	21.98	N/A	Pass
5240	48	21.94	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.95	N/A	Pass
5300	60	21.96	N/A	Pass
5320	64	21.93	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.02	N/A	Pass
5580	116	21.94	N/A	Pass
5700	140	21.83	N/A	Pass

40 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	42.71	N/A	Pass
5230	46	42.65	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	42.49	N/A	Pass
5310	62	42.88	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	42.61	N/A	Pass
5550	110	43.40	N/A	Pass
5670	134	42.86	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	42.23	N/A	Pass
5230	46	42.45	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	42.70	N/A	Pass
5310	62	42.24	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	42.18	N/A	Pass
5550	110	42.04	N/A	Pass
5670	134	42.40	N/A	Pass

80 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5210	42	83.02	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5290	58	83.22	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5530	106	84.12	N/A	Pass
5690	138	83.55	N/A	Pass

Note :

1. **In order to simplify the report, attached plots were only the most wide channel.**
2. **We applied the 15.407 for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r01.**

▣ 20 dB BW TEST RESULTS(Additional Test)

Conducted 20 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5240	48	19.32	N/A	Pass
5260	52	19.60	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_20 MHz BW

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5240	48	19.87	N/A	Pass
5260	52	19.91	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11ac_20 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5240	48	19.91	N/A	Pass
5260	52	19.92	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_40 MHz BW

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5230	46	39.47	N/A	Pass
5270	54	39.37	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11ac_40 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5230	46	38.84	N/A	Pass
5270	54	38.83	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11ac_80 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5290	58	79.62	N/A	Pass
5530	106	79.30	N/A	Pass

Note : We performed the 20 dB BW test for highest channel in UNII1 band and lowest channel in UNII2 band to prove that no part of the fundamental emissions of any UNII1 and UNII2 band signals lies within the each band. Also, we performed the 20 dB BW test to prove that no part of the fundamental emissions of any channel 132 and 134 signal lies within the TDWR band. And 2C band signal lies within the frequency range 5600-5650 MHz(Terminal Doppler Weather Radars (TDWRs)) according to KDB 443999 D01 v01 and KDB 644545 D01 v01r01

▣ 20 dB BW TEST RESULTS(Additional Test)

Conducted 20 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5660	132	19.37	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_20 MHz BW

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5660	132	19.73	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11ac_20 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5660	132	19.94	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_40 MHz BW

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5670	134	38.91	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11ac_40 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5670	134	38.80	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11ac_80 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5690	138	79.31	N/A	Pass

Note : We performed the 20 dB BW test to prove that no part of the fundamental emissions of any UNII 2C band signal lies within the frequency range 5600-5650 MHz(Terminal Doppler Weather Radars (TDWRs)) according to KDB 443999 D01 v01 and KDB 644545 D01 v01r01

▣ RESULT PLOTS

20 MHz BW

26 dB Bandwidth plot (802.11a-CH 40)

26 dB Bandwidth plot (802.11a-CH 64)

26 dB Bandwidth plot (802.11a-CH 140)

26 dB Bandwidth plot (802.11n-CH 40)

26 dB Bandwidth plot (802.11n-CH 64)

26 dB Bandwidth plot (802.11n-CH 116)

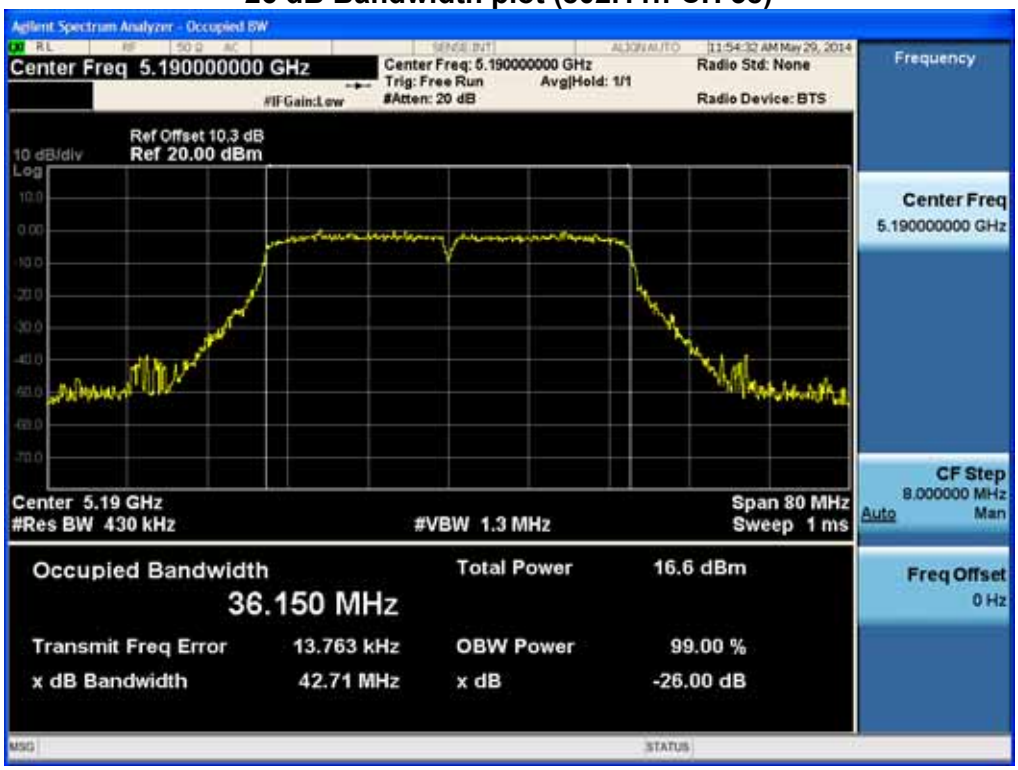
26 dB Bandwidth plot (802.11ac-CH 40)

26 dB Bandwidth plot (802.11ac-CH 60)

26 dB Bandwidth plot (802.11ac-CH 100)

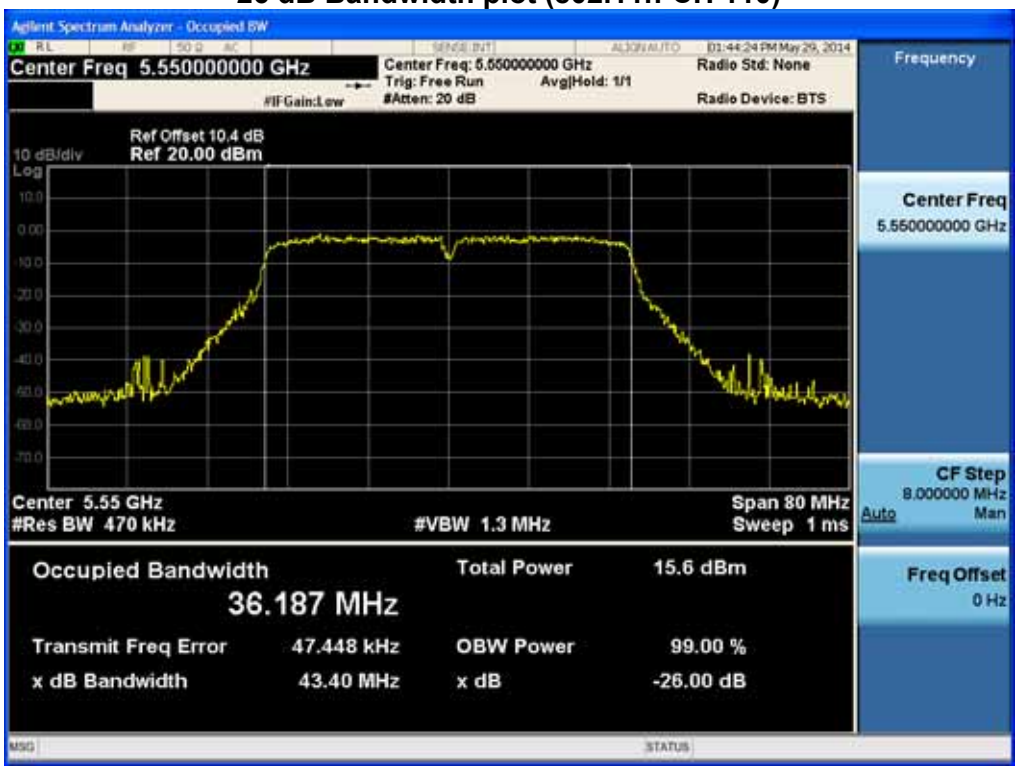
40 MHz BW

26 dB Bandwidth plot (802.11n-CH 38)

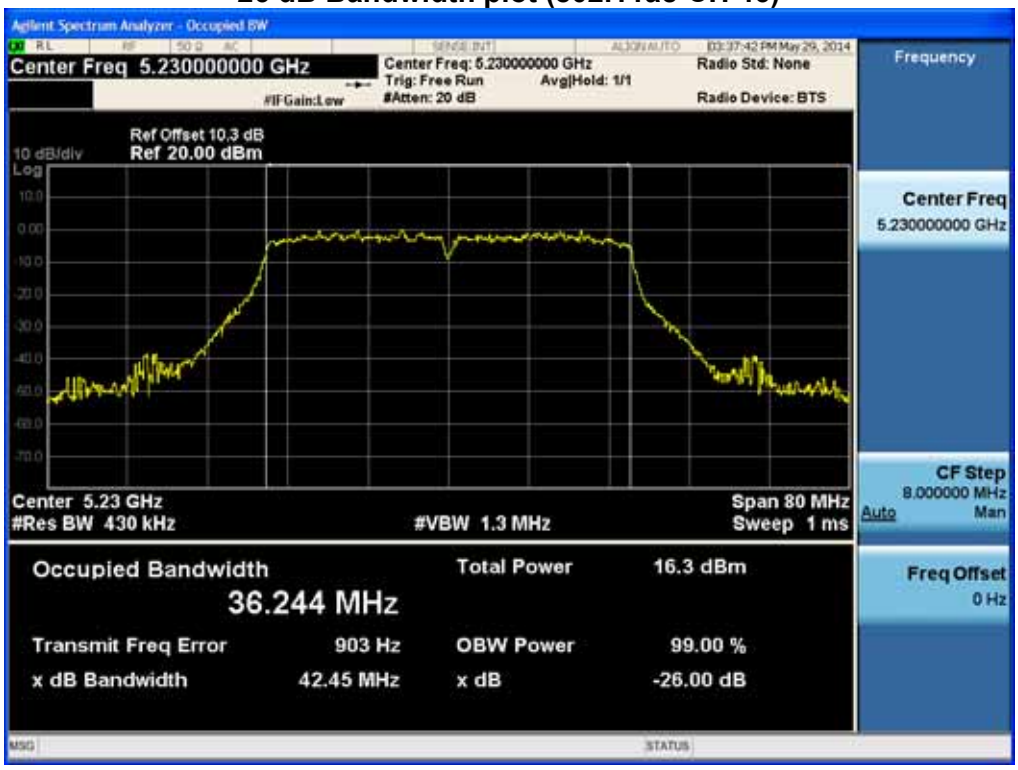


26 dB Bandwidth plot (802.11n-CH 62)

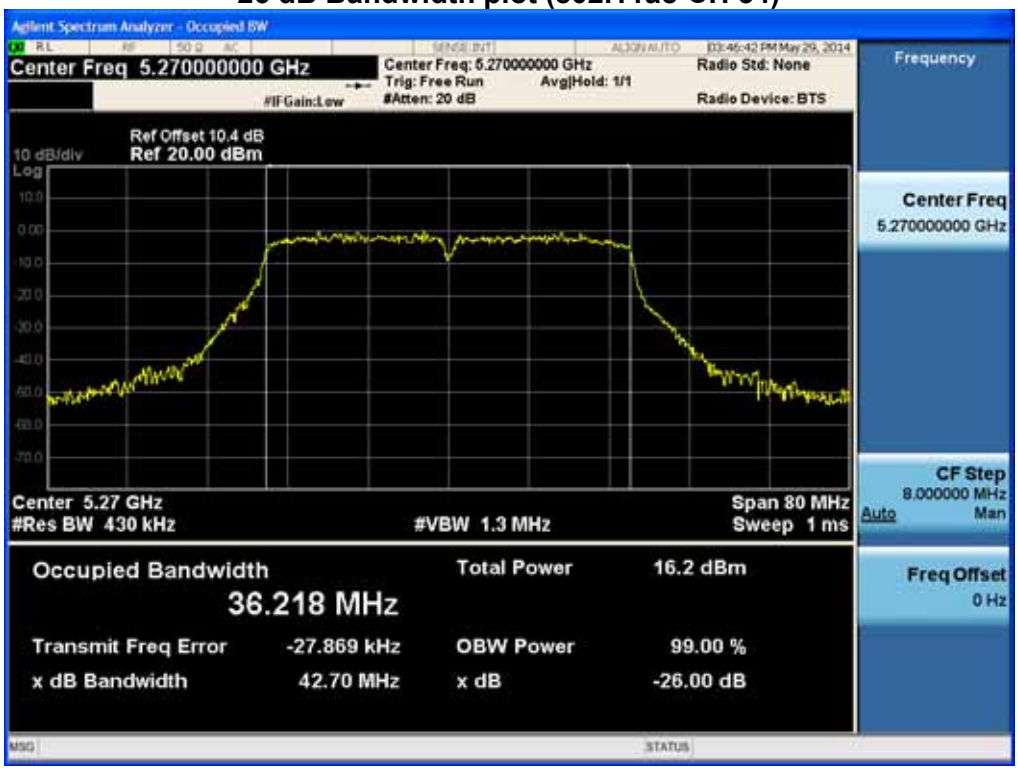
26 dB Bandwidth plot (802.11n-CH 110)



26 dB Bandwidth plot (802.11ac-CH 46)



26 dB Bandwidth plot (802.11ac-CH 54)



26 dB Bandwidth plot (802.11ac-CH 142)

80 MHz BW

26 dB Bandwidth plot (802.11ac-CH 42)

26 dB Bandwidth plot (802.11ac-CH 58)

26 dB Bandwidth plot (802.11ac-CH 106)

▣ RESULT PLOTS(20 dB Bandwidth)

20 MHz BW

20 dB Bandwidth plot (802.11a-CH 48)

20 dB Bandwidth plot (802.11a-CH 52)

20 dB Bandwidth plot (802.11n-CH 48)

20 dB Bandwidth plot (802.11n-CH 52)

20 dB Bandwidth plot (802.11ac-CH 48)

20 dB Bandwidth plot (802.11ac-CH 52)

40 MHz BW

20 dB Bandwidth plot (802.11n_CH 46)

20 dB Bandwidth plot (802.11n_CH 54)

20 dB Bandwidth plot (802.11ac_CH 46)

20 dB Bandwidth plot (802.11ac_CH 54)

80 MHz BW

20 dB Bandwidth plot (802.11ac-CH 58)

20 dB Bandwidth plot (802.11ac_CH 106)

20 MHz BW

20 dB Bandwidth plot (802.11a-CH 132)

20 dB Bandwidth plot (802.11n-CH 132)

20 dB Bandwidth plot (802.11ac-CH 132)

40 MHz BW

20 dB Bandwidth plot (802.11n_CH 134)

20 dB Bandwidth plot (802.11ac_CH 134)

20 dB Bandwidth plot (802.11ac_CH 138)

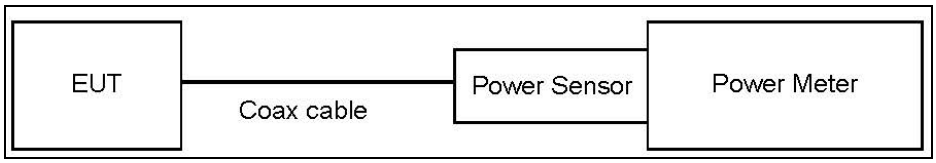
8.3 OUTPUT POWER MEASUREMENT

Test Requirements and limit, §15.247(b)(3)

A transmitter antenna terminal of EUT is connected to the input of a Spectrum Analyzer. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies. In the 5.15 – 5.25 GHz band, the maximum permissible conducted output power is the lesser of 50 mW ((16.99 dBm) and 4 dBm + 10 log $_{10}$ (26 dB BW)
frequencies. In the 5.25 – 5.35 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and 11 dBm + 10 log $_{10}$ (26 dB BW)
frequencies. In the 5.47 – 5.725 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and 11 dBm + 10 log $_{10}$ (26 dB BW)

Limit : 802.11a_UNII-1 = 16.99 dBm
802.11n_UNII-1_20 MHz BW = 16.99 dBm
802.11n_UNII-1_40 MHz BW = 16.99 dBm
802.11ac_UNII-1_20 MHz BW =16.99 dBm
802.11ac_UNII-1_40 MHz BW =16.99 dBm
802.11ac_UNII-1_80 MHz BW =16.99 dBm
802.11a_UNII-2 = 23.98 dBm
802.11n_UNII-2_20 MHz BW = 23.98dBm
802.11n_UNII-2_40 MHz BW = 23.98 dBm
802.11ac_UNII-2_20 MHz BW =23.98 dBm
802.11ac_UNII-2_40 MHz BW =23.98 dBm
802.11ac_UNII-2_80 MHz BW =23.98 dBm
802.11a_UNII-2e = 23.98dBm
802.11n_UNII-2e_20 MHz BW = 23.98 dBm
802.11n_UNII-2e_40 MHz BW = 23.98 dBm
802.11ac_UNII-2e_20 MHz BW =23.98 dBm
802.11ac_UNII-2e_40 MHz BW =23.98 dBm
802.11ac_UNII-2e_80 MHz BW =23.98 dBm

▣ TEST CONFIGURATION(20 MHz BW)



▣ TEST PROCEDURE(20 MHz BW)

We tested according to Method E)3)a) in KDB 789033(issued 04/08/2013).

▪ Average Power

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.

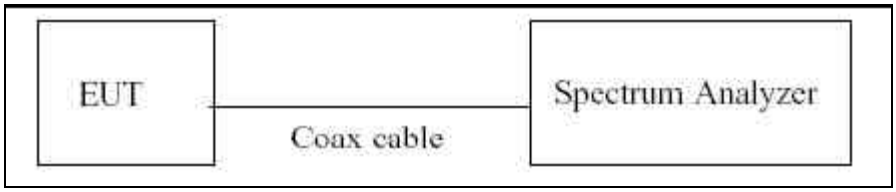
Note :

1. 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	Frequency(MHz)	Loss(dB)
UNII 1	5180	20.30
	5190	20.29
	5200	20.28
	5230	20.29
	5240	20.34
UNII 2	5260	20.37
	5270	20.38
	5300	20.40
	5310	20.39
	5320	20.39
UNII 2e	5500	20.35
	5510	20.36
	5550	20.41
	5580	20.43
	5670	20.43

(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)

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 04/08/2013).

The Spectrum Analyzer is set to

▪ Average Power

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

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

Output Power = 10 dBm + 20 dB + 0.8 dB + 0.21 dB = 31.01 dBm

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. 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	Frequency(MHz)	Loss(dB)
UNII 1	5180	20.30
	5190	20.29
	5200	20.28
	5230	20.29
	5240	20.34
UNII 2	5260	20.37
	5270	20.38
	5300	20.40
	5310	20.39
	5320	20.39
UNII 2e	5500	20.35
	5510	20.36
	5550	20.41
	5580	20.43
	5670	20.43

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

▣ TEST RESULTS

20 MHz BW

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6	11.64	0.209	11.84	16.99
		9	11.53	0.308	11.84	16.99
		12	11.35	0.400	11.75	16.99
		18	11.17	0.601	11.77	16.99
		24	11.01	0.761	11.77	16.99
		36	10.72	1.081	11.80	16.99
		48	10.29	1.364	11.65	16.99
		54	10.08	1.497	11.58	16.99
5200	40	6	11.32	0.209	11.53	16.99
		9	11.22	0.308	11.53	16.99
		12	11.04	0.400	11.44	16.99
		18	10.83	0.601	11.43	16.99
		24	10.74	0.761	11.50	16.99
		36	10.31	1.081	11.39	16.99
		48	10.10	1.364	11.47	16.99
		54	9.96	1.497	11.46	16.99
5240	48	6	11.17	0.209	11.38	16.99
		9	11.05	0.308	11.36	16.99
		12	10.99	0.400	11.39	16.99
		18	10.86	0.601	11.46	16.99
		24	10.65	0.761	11.41	16.99
		36	10.43	1.081	11.51	16.99
		48	10.05	1.364	11.42	16.99
		54	9.90	1.497	11.39	16.99

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6	11.23	0.209	11.44	23.98
		9	11.24	0.308	11.55	23.98
		12	11.11	0.400	11.51	23.98
		18	10.92	0.601	11.52	23.98
		24	10.77	0.761	11.53	23.98
		36	10.39	1.081	11.47	23.98
		48	10.15	1.364	11.52	23.98
		54	9.95	1.497	11.45	23.98
5300	60	6	10.90	0.209	11.10	23.98
		9	10.66	0.308	10.97	23.98
		12	10.72	0.400	11.12	23.98
		18	10.44	0.601	11.04	23.98
		24	10.24	0.761	11.00	23.98
		36	9.99	1.081	11.07	23.98
		48	9.59	1.364	10.95	23.98
		54	9.56	1.497	11.05	23.98
5320	64	6	10.61	0.209	10.82	23.98
		9	10.35	0.308	10.66	23.98
		12	10.42	0.400	10.82	23.98
		18	10.30	0.601	10.90	23.98
		24	10.07	0.761	10.83	23.98
		36	9.77	1.081	10.85	23.98
		48	9.41	1.364	10.77	23.98
		54	9.31	1.497	10.80	23.98

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6	10.12	0.209	10.32	23.98
		9	10.11	0.308	10.42	23.98
		12	10.00	0.400	10.40	23.98
		18	9.83	0.601	10.43	23.98
		24	9.54	0.761	10.30	23.98
		36	9.23	1.081	10.31	23.98
		48	9.01	1.364	10.37	23.98
		54	8.88	1.497	10.38	23.98
5580	116	6	10.95	0.209	11.16	23.98
		9	10.94	0.308	11.25	23.98
		12	10.75	0.400	11.15	23.98
		18	10.58	0.601	11.18	23.98
		24	10.33	0.761	11.09	23.98
		36	10.01	1.081	11.10	23.98
		48	9.73	1.364	11.10	23.98
		54	9.62	1.497	11.12	23.98
5700	140	6	10.62	0.209	10.83	23.98
		9	10.41	0.308	10.71	23.98
		12	10.46	0.400	10.86	23.98
		18	10.25	0.601	10.85	23.98
		24	10.08	0.761	10.84	23.98
		36	9.68	1.081	10.77	23.98
		48	9.40	1.364	10.76	23.98
		54	9.31	1.497	10.80	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6.5	10.88	0.225	11.10	16.99
		13	10.69	0.435	11.13	16.99
		19.5	10.38	0.631	11.01	16.99
		26	10.15	0.795	10.95	16.99
		39	9.89	1.131	11.02	16.99
		52	9.64	1.442	11.08	16.99
		58.5	9.52	1.549	11.07	16.99
		65	9.41	1.671	11.08	16.99
5200	40	6.5	10.65	0.225	10.87	16.99
		13	10.49	0.435	10.93	16.99
		19.5	10.35	0.631	10.98	16.99
		26	10.15	0.795	10.94	16.99
		39	9.87	1.131	11.00	16.99
		52	9.41	1.442	10.86	16.99
		58.5	9.40	1.549	10.95	16.99
		65	9.19	1.671	10.86	16.99
5240	48	6.5	10.67	0.225	10.90	16.99
		13	10.38	0.435	10.81	16.99
		19.5	10.23	0.631	10.86	16.99
		26	10.04	0.795	10.83	16.99
		39	9.65	1.131	10.78	16.99
		52	9.34	1.442	10.79	16.99
		58.5	9.26	1.549	10.81	16.99
		65	9.19	1.671	10.86	16.99

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6.5	10.64	0.225	10.87	23.98
		13	10.48	0.435	10.91	23.98
		19.5	10.27	0.631	10.90	23.98
		26	9.85	0.795	10.65	23.98
		39	9.65	1.131	10.78	23.98
		52	9.36	1.442	10.80	23.98
		58.5	9.28	1.549	10.83	23.98
		65	9.13	1.671	10.81	23.98
5300	60	6.5	10.22	0.225	10.45	23.98
		13	10.02	0.435	10.45	23.98
		19.5	9.75	0.631	10.38	23.98
		26	9.47	0.795	10.27	23.98
		39	9.21	1.131	10.34	23.98
		52	8.95	1.442	10.39	23.98
		58.5	8.92	1.549	10.47	23.98
		65	8.65	1.671	10.32	23.98
5320	64	6.5	10.05	0.225	10.27	23.98
		13	9.85	0.435	10.28	23.98
		19.5	9.67	0.631	10.30	23.98
		26	9.53	0.795	10.33	23.98
		39	9.23	1.131	10.36	23.98
		52	8.93	1.442	10.37	23.98
		58.5	8.73	1.549	10.28	23.98
		65	8.74	1.671	10.41	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6.5	9.58	0.225	9.80	23.98
		13	9.39	0.435	9.83	23.98
		19.5	9.23	0.631	9.86	23.98
		26	9.04	0.795	9.84	23.98
		39	8.67	1.131	9.80	23.98
		52	8.27	1.442	9.72	23.98
		58.5	8.21	1.549	9.76	23.98
		65	8.15	1.671	9.82	23.98
5580	116	6.5	9.86	0.225	10.08	23.98
		13	9.69	0.435	10.12	23.98
		19.5	9.53	0.631	10.16	23.98
		26	9.26	0.795	10.05	23.98
		39	8.93	1.131	10.06	23.98
		52	8.53	1.442	9.97	23.98
		58.5	8.45	1.549	10.00	23.98
		65	8.44	1.671	10.11	23.98
5700	140	6.5	9.68	0.225	9.90	23.98
		13	9.47	0.435	9.91	23.98
		19.5	9.33	0.631	9.96	23.98
		26	9.14	0.795	9.94	23.98
		39	8.77	1.131	9.91	23.98
		52	8.46	1.442	9.90	23.98
		58.5	8.47	1.549	10.02	23.98
		65	8.18	1.671	9.85	23.98

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6.5	10.71	0.420	11.13	16.99
		13	10.34	0.766	11.11	16.99
		19.5	10.12	1.091	11.21	16.99
		26	9.84	1.320	11.15	16.99
		39	9.38	1.783	11.16	16.99
		52	8.99	2.102	11.10	16.99
		58.5	8.79	2.267	11.06	16.99
		65	8.70	2.357	11.06	16.99
		78	8.48	2.593	11.07	16.99
5200	40	6.5	10.61	0.420	11.03	16.99
		13	10.27	0.766	11.04	16.99
		19.5	10.02	1.091	11.11	16.99
		26	9.57	1.320	10.89	16.99
		39	9.16	1.783	10.95	16.99
		52	8.99	2.102	11.09	16.99
		58.5	8.86	2.267	11.13	16.99
		65	8.70	2.357	11.05	16.99
		78	8.43	2.593	11.02	16.99
5240	48	6.5	10.54	0.420	10.96	16.99
		13	10.09	0.766	10.86	16.99
		19.5	9.81	1.091	10.90	16.99
		26	9.67	1.320	10.99	16.99
		39	9.26	1.783	11.04	16.99
		52	8.88	2.102	10.98	16.99
		58.5	8.67	2.267	10.94	16.99
		65	8.62	2.357	10.98	16.99
		78	8.36	2.593	10.96	16.99

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6.5	10.53	0.420	10.95	16.99
		13	10.21	0.766	10.97	16.99
		19.5	9.95	1.091	11.05	16.99
		26	9.63	1.320	10.95	16.99
		39	9.24	1.783	11.03	16.99
		52	8.88	2.102	10.98	16.99
		58.5	8.76	2.267	11.03	16.99
		65	8.61	2.357	10.97	16.99
		78	8.33	2.593	10.93	16.99
5300	60	6.5	10.08	0.420	10.50	16.99
		13	9.85	0.766	10.62	16.99
		19.5	9.51	1.091	10.60	16.99
		26	9.19	1.320	10.51	16.99
		39	8.72	1.783	10.50	16.99
		52	8.49	2.102	10.59	16.99
		58.5	8.34	2.267	10.60	16.99
		65	8.10	2.357	10.46	16.99
		78	7.84	2.593	10.43	16.99
5320	64	6.5	9.89	0.420	10.31	16.99
		13	9.55	0.766	10.31	16.99
		19.5	9.30	1.091	10.39	16.99
		26	9.07	1.320	10.39	16.99
		39	8.27	1.783	10.05	16.99
		52	8.34	2.102	10.45	16.99
		58.5	8.05	2.267	10.32	16.99
		65	7.95	2.357	10.31	16.99
		78	7.69	2.593	10.28	16.99

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6.5	9.55	0.420	9.97	16.99
		13	9.16	0.766	9.92	16.99
		19.5	8.91	1.091	10.01	16.99
		26	8.43	1.320	9.75	16.99
		39	7.98	1.783	9.77	16.99
		52	7.83	2.102	9.94	16.99
		58.5	7.62	2.267	9.88	16.99
		65	7.58	2.357	9.93	16.99
		78	7.31	2.593	9.90	16.99
5580	116	6.5	9.77	0.420	10.19	16.99
		13	9.47	0.766	10.24	16.99
		19.5	9.16	1.091	10.25	16.99
		26	8.81	1.320	10.13	16.99
		39	8.34	1.783	10.12	16.99
		52	8.20	2.102	10.31	16.99
		58.5	7.93	2.267	10.20	16.99
		65	7.81	2.357	10.17	16.99
		78	7.56	2.593	10.16	16.99
5700	140	6.5	9.64	0.420	10.06	16.99
		13	9.37	0.766	10.14	16.99
		19.5	8.98	1.091	10.07	16.99
		26	8.64	1.320	9.96	16.99
		39	8.17	1.783	9.95	16.99
		52	8.02	2.102	10.12	16.99
		58.5	7.82	2.267	10.08	16.99
		65	7.69	2.357	10.05	16.99
		78	7.45	2.593	10.04	16.99

40 MHz BW

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.5	9.26	0.448	9.71	16.99
		27	8.99	0.835	9.82	16.99
		40.5	8.65	1.185	9.83	16.99
		54	8.29	1.489	9.78	16.99
		81	7.56	1.963	9.52	16.99
		108	7.35	2.407	9.76	16.99
		121.5	7.11	2.584	9.69	16.99
		135	7.01	2.717	9.73	16.99
5230	46	13.5	9.37	0.448	9.82	16.99
		27	8.95	0.835	9.78	16.99
		40.5	8.59	1.185	9.77	16.99
		54	8.26	1.489	9.75	16.99
		81	7.85	1.963	9.81	16.99
		108	7.40	2.407	9.81	16.99
		121.5	7.21	2.584	9.79	16.99
		135	7.09	2.717	9.81	16.99

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5270	54	13.5	9.49	0.448	9.94	23.98
		27	9.12	0.835	9.95	23.98
		40.5	8.71	1.185	9.89	23.98
		54	8.46	1.489	9.95	23.98
		81	7.94	1.963	9.90	23.98
		108	7.57	2.407	9.98	23.98
		121.5	7.41	2.584	9.99	23.98
		135	7.23	2.717	9.95	23.98
5310	62	13.5	9.26	0.448	9.70	23.98
		27	8.94	0.835	9.78	23.98
		40.5	8.59	1.185	9.77	23.98
		54	8.11	1.489	9.60	23.98
		81	7.73	1.963	9.69	23.98
		108	7.31	2.407	9.72	23.98
		121.5	7.02	2.584	9.61	23.98
		135	6.91	2.717	9.62	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5510	102	13.5	8.53	0.448	8.97	23.98
		27	8.02	0.835	8.85	23.98
		40.5	7.83	1.185	9.01	23.98
		54	7.38	1.489	8.87	23.98
		81	7.00	1.963	8.96	23.98
		108	6.62	2.407	9.03	23.98
		121.5	6.41	2.584	8.99	23.98
		135	6.20	2.717	8.92	23.98
5550	110	13.5	8.65	0.448	9.10	23.98
		27	8.32	0.835	9.16	23.98
		40.5	8.03	1.185	9.22	23.98
		54	7.71	1.489	9.20	23.98
		81	7.30	1.963	9.26	23.98
		108	6.75	2.407	9.16	23.98
		121.5	6.49	2.584	9.08	23.98
		135	6.42	2.717	9.14	23.98
5670	134	13.5	8.54	0.448	8.98	23.98
		27	8.23	0.835	9.06	23.98
		40.5	7.82	1.185	9.00	23.98
		54	7.58	1.489	9.07	23.98
		81	6.99	1.963	8.96	23.98
		108	6.58	2.407	8.99	23.98
		121.5	6.44	2.584	9.02	23.98
		135	6.34	2.717	9.06	23.98

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.5	9.14	0.798	9.93	16.99
		27	8.53	1.370	9.90	16.99
		40.5	8.09	1.829	9.92	16.99
		54	7.66	2.162	9.82	16.99
		81	7.19	2.717	9.91	16.99
		108	6.89	3.032	9.92	16.99
		121.5	6.64	3.220	9.86	16.99
		135	6.29	3.323	9.61	16.99
		162	6.09	3.522	9.61	16.99
		180	6.00	3.622	9.62	16.99
5230	46	13.5	9.15	0.798	9.95	16.99
		27	8.49	1.370	9.86	16.99
		40.5	8.14	1.829	9.97	16.99
		54	7.72	2.162	9.88	16.99
		81	7.24	2.717	9.96	16.99
		108	6.90	3.032	9.93	16.99
		121.5	6.71	3.220	9.93	16.99
		135	6.58	3.323	9.90	16.99
		162	6.46	3.522	9.99	16.99
		180	6.28	3.622	9.90	16.99

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5270	54	13.5	9.06	0.798	9.86	16.99
		27	8.37	1.370	9.74	16.99
		40.5	8.10	1.829	9.93	16.99
		54	7.65	2.162	9.81	16.99
		81	7.21	2.717	9.93	16.99
		108	6.92	3.032	9.95	16.99
		121.5	6.72	3.220	9.94	16.99
		135	6.67	3.323	9.99	16.99
		162	6.46	3.522	9.99	16.99
		180	6.26	3.622	9.88	16.99
5310	62	13.5	8.77	0.798	9.56	16.99
		27	8.26	1.370	9.63	16.99
		40.5	7.81	1.829	9.64	16.99
		54	7.26	2.162	9.43	16.99
		81	6.92	2.717	9.64	16.99
		108	6.62	3.032	9.65	16.99
		121.5	6.48	3.220	9.70	16.99
		135	6.35	3.323	9.67	16.99
		162	6.19	3.522	9.71	16.99
		180	6.14	3.622	9.76	16.99

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5510	102	13.5	7.99	0.798	8.79	16.99
		27	7.53	1.370	8.90	16.99
		40.5	6.96	1.829	8.79	16.99
		54	6.59	2.162	8.75	16.99
		81	6.08	2.717	8.80	16.99
		108	5.82	3.032	8.85	16.99
		121.5	5.68	3.220	8.90	16.99
		135	5.47	3.323	8.80	16.99
		162	5.37	3.522	8.89	16.99
		180	5.35	3.622	8.98	16.99
5550	110	13.5	8.22	0.798	9.02	16.99
		27	7.74	1.370	9.11	16.99
		40.5	7.26	1.829	9.09	16.99
		54	6.73	2.162	8.90	16.99
		81	6.29	2.717	9.00	16.99
		108	6.00	3.032	9.03	16.99
		121.5	5.88	3.220	9.10	16.99
		135	5.70	3.323	9.02	16.99
		162	5.56	3.522	9.08	16.99
		180	5.55	3.622	9.17	16.99
5670	134	13.5	8.11	0.798	8.91	16.99
		27	7.54	1.370	8.91	16.99
		40.5	6.96	1.829	8.79	16.99
		54	6.69	2.162	8.86	16.99
		81	6.25	2.717	8.96	16.99
		108	5.92	3.032	8.95	16.99
		121.5	5.86	3.220	9.08	16.99
		135	5.62	3.323	8.94	16.99
		162	5.52	3.522	9.04	16.99
		180	5.33	3.622	8.95	27.27

80 MHz BW

Conducted Output Power Measurements (802.11ac Mode: 5210)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5210	42	29.3	8.22	1.476	9.70	16.99
		58.5	7.25	2.290	9.54	16.99
		87.8	6.85	2.810	9.66	16.99
		117	6.49	3.195	9.68	16.99
		175.5	5.92	3.647	9.57	16.99
		234	5.85	3.992	9.84	16.99
		263.3	5.43	4.087	9.51	16.99
		292.5	5.66	4.155	9.81	16.99
		351	5.44	4.305	9.74	16.99
		390	5.14	4.528	9.66	16.99

Conducted Output Power Measurements (802.11ac Mode: 5290)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5290	58	29.3	7.97	1.476	9.45	16.99
		58.5	7.07	2.290	9.36	16.99
		87.8	6.73	2.810	9.54	16.99
		117	6.28	3.195	9.48	16.99
		175.5	5.80	3.647	9.45	16.99
		234	5.67	3.992	9.66	16.99
		263.3	5.29	4.087	9.38	16.99
		292.5	5.34	4.155	9.49	16.99
		351	5.12	4.305	9.43	16.99
		390	5.05	4.528	9.58	16.99

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

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5530	106	29.3	6.93	1.476	8.41	16.99
		58.5	6.22	2.290	8.51	16.99
		87.8	5.58	2.810	8.39	16.99
		117	5.20	3.195	8.39	16.99
		175.5	4.68	3.647	8.33	16.99
		234	4.64	3.992	8.63	16.99
		263.3	4.34	4.087	8.43	16.99
		292.5	4.45	4.155	8.61	16.99
		351	4.18	4.305	8.49	16.99
		390	4.02	4.528	8.55	16.99
5690	138	29.3	7.13	1.476	8.60	16.99
		58.5	6.31	2.290	8.60	16.99
		87.8	5.90	2.810	8.71	16.99
		117	5.31	3.195	8.50	16.99
		175.5	4.78	3.647	8.43	16.99
		234	4.62	3.992	8.62	16.99
		263.3	4.65	4.087	8.74	16.99
		292.5	4.54	4.155	8.70	16.99
		351	4.46	4.305	8.76	16.99
		390	4.17	4.528	8.69	16.99

Note :

1. **In order to simplify the report, attached plots were only the highest conducted power channel and data rate.**
2. **We applied the 15.407 for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r01.**

40 MHz BW

▣ RESULT PLOTS (5190 MHz ~5230 MHz)

Conducted Output Power (802.11n-CH 38) 40.5 Mbps

▣ RESULT PLOTS (5270 MHz ~5310 MHz)

Conducted Output Power (802.11n-CH 54) 121.5 Mbps

▣ RESULT PLOTS (5510 MHz ~5670 MHz)

Conducted Output Power (802.11n-CH 110) 81 Mbps

▣ RESULT PLOTS (5190 ~ 5230 MHz)

Conducted Output Power (802.11ac-CH 46) 162 Mbps

▣ RESULT PLOTS (5270 ~ 5310 MHz)

Conducted Output Power (802.11ac-CH 54) 135 Mbps

▣ RESULT PLOTS (5510 ~ 5670 MHz)

Conducted Output Power (802.11ac-CH 110) 180 Mbps

80 MHz BW

▣ RESULT PLOTS (5210 MHz)

Conducted Output Power (802.11ac-CH 42) 234 Mbps

▣ RESULT PLOTS (5290 MHz)

Conducted Output Power (802.11ac-CH 58) 234 Mbps

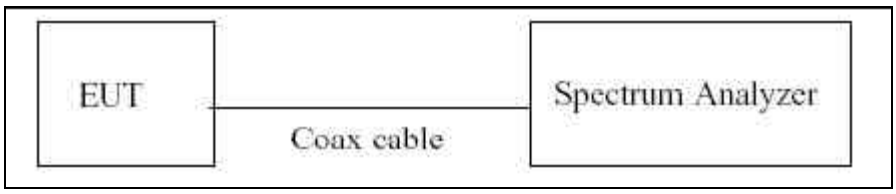
▣ RESULT PLOTS (5530 MHz ~ 5690 MHz)

Conducted Output Power (802.11ac-CH 138) 351 Mbps

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 4 dBm/ MHz in the 5.15 GHz – 5.25 GHz band and 11 dBm/ MHz in the 5.25 GHz – 5.35 GHz and 5.47 GHz – 5.725 GHz bands

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to Method in KDB 789033(issued 04/08/2013).

The spectrum analyzer is set to :

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz.
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	Frequency(MHz)	Loss(dB)
UNII 1	5180	20.30
	5190	20.29
	5200	20.28
	5230	20.29
	5240	20.34
UNII 2	5260	20.37
	5270	20.38
	5300	20.40
	5310	20.39
	5320	20.39
UNII 2e	5500	20.35
	5510	20.36
	5550	20.41
	5580	20.43
	5670	20.43
	5700	20.30

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

▣ 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	0.195	0.209	0.404	4	Pass
5200	40		0.085	0.209	0.294	4	Pass
5240	48		-0.342	1.081	0.739	4	Pass
5260	52	802.11a	0.085	0.308	0.393	11	Pass
5300	60		-0.364	0.400	0.036	11	Pass
5320	64		-0.659	0.601	-0.058	11	Pass
5500	100	802.11a	-1.349	0.601	-0.748	11	Pass
5580	116		-0.437	0.308	-0.129	11	Pass
5700	140		-0.642	0.400	-0.242	11	Pass

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 20MHz BW	-0.664	0.435	-0.229	4	Pass
5200	40		-1.032	1.131	0.099	4	Pass
5240	48		-0.986	0.225	-0.355	4	Pass
5260	52	802.11n 20MHz BW	-0.937	0.435	-0.502	11	Pass
5300	60		-2.070	1.549	-0.521	11	Pass
5320	64		-2.426	1.671	-0.755	11	Pass
5500	100	802.11n 20MHz BW	-1.982	0.631	-1.351	11	Pass
5580	116		-1.923	0.631	-1.292	11	Pass
5700	140		-2.854	1.549	-1.305	11	Pass

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	-1.000	1.091	0.091	4	Pass
5200	40		-2.287	2.267	-0.020	4	Pass
5240	48		-2.147	1.783	-0.364	4	Pass
5260	52	802.11ac 20MHz BW	-1.008	1.091	0.083	11	Pass
5300	60		-1.510	0.766	-0.744	11	Pass
5320	64		-2.830	2.102	-0.728	11	Pass
5500	100	802.11ac 20MHz BW	-2.337	1.091	-1.246	11	Pass
5580	116		-2.686	2.102	-0.584	11	Pass
5700	140		-1.628	0.766	-0.862	11	Pass

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	-5.060	1.185	-3.875	4	Pass
5230	46		-4.498	0.448	-4.050	4	Pass
5270	54	802.11n 40MHz BW	-5.316	2.584	-2.732	11	Pass
5310	62		-5.168	0.835	-4.333	11	Pass
5510	102	802.11n 40MHz BW	-7.328	2.407	-4.921	11	Pass
5550	110		-6.795	1.963	-4.832	11	Pass
5670	134		-6.763	1.489	-5.274	11	Pass

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	-6.429	0.798	-5.631	4	Pass
5230	46		-6.727	3.522	-3.205	4	Pass
5270	54	802.11ac 40MHz BW	-6.783	3.323	-3.460	11	Pass
5310	62		-7.673	3.622	-4.051	11	Pass
5510	102	802.11ac 40MHz BW	-8.445	3.622	-4.823	11	Pass
5550	110		-7.955	3.622	-4.333	11	Pass
5670	134		-7.982	3.220	-4.762	11	Pass

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	-10.522	3.992	-6.530	4	Pass
5290	58	802.11ac 80MHz BW	-11.015	3.992	-7.023	11	Pass
5530	106	802.11ac 80MHz BW	-11.477	3.992	-7.485	11	Pass
5690	138	802.11ac 80MHz BW	-11.960	4.305	-7.655	11	Pass

Note :

1. **In order to simplify the report, attached plots were only the highest PSD channel.**
2. **We applied the 15.407 for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r01.**

▣ RESULT PLOTS

20 MHz BW

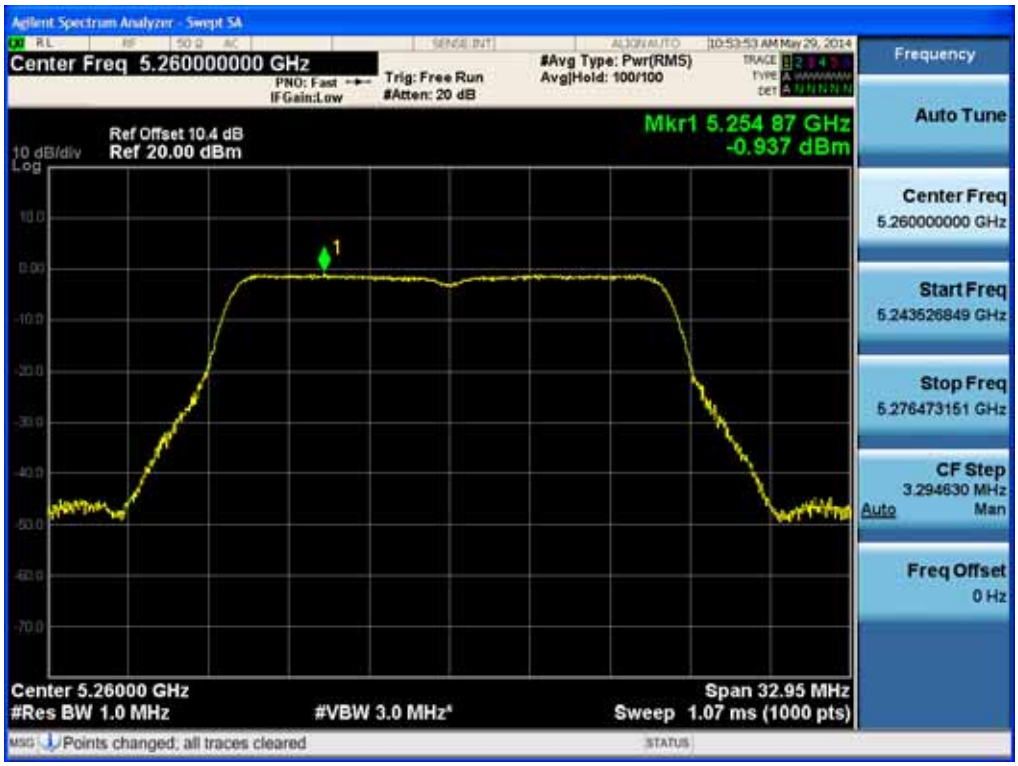
Power Spectral Density (802.11a-CH 48)

Power Spectral Density (802.11a-CH 52)

Power Spectral Density (802.11a-CH 116)

Power Spectral Density (802.11n-CH 40)

Power Spectral Density (802.11n-CH 52)



Power Spectral Density (802.11n-CH 116)

Power Spectral Density (802.11ac-CH 36)

Power Spectral Density (802.11ac-CH 52)

Power Spectral Density (802.11ac-CH 116)

40 MHz BW

Power Spectral Density (802.11n-CH 38)

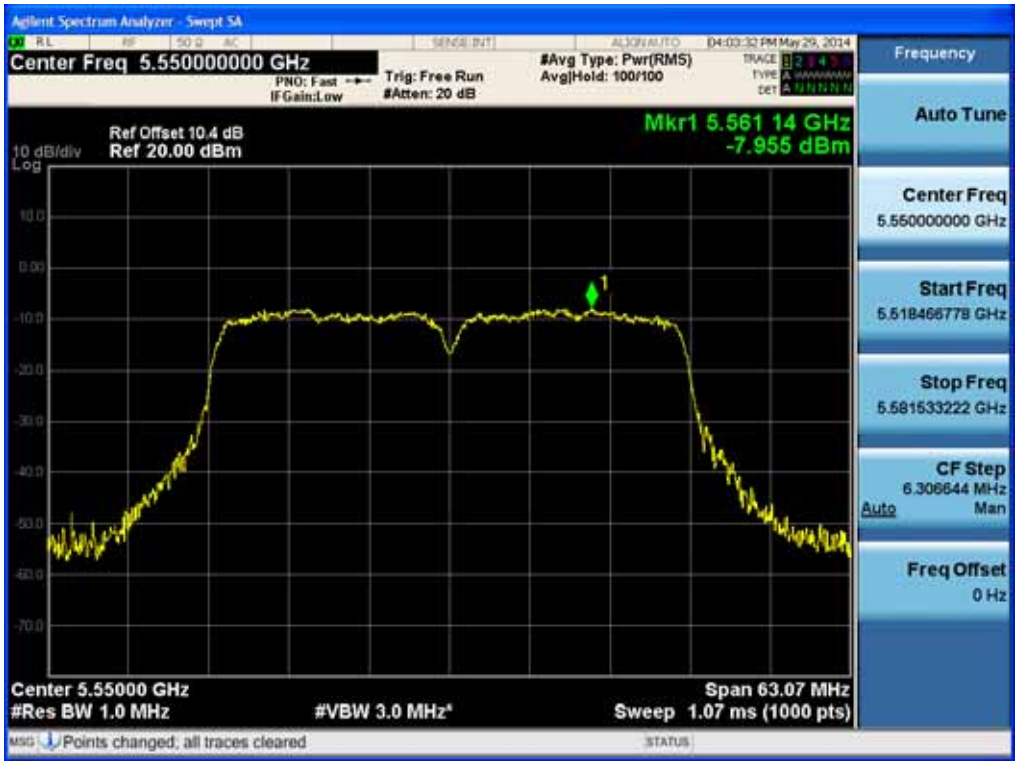
Power Spectral Density (802.11n-CH 54)

Power Spectral Density (802.11n-CH 110)

Power Spectral Density (802.11ac-CH 46)

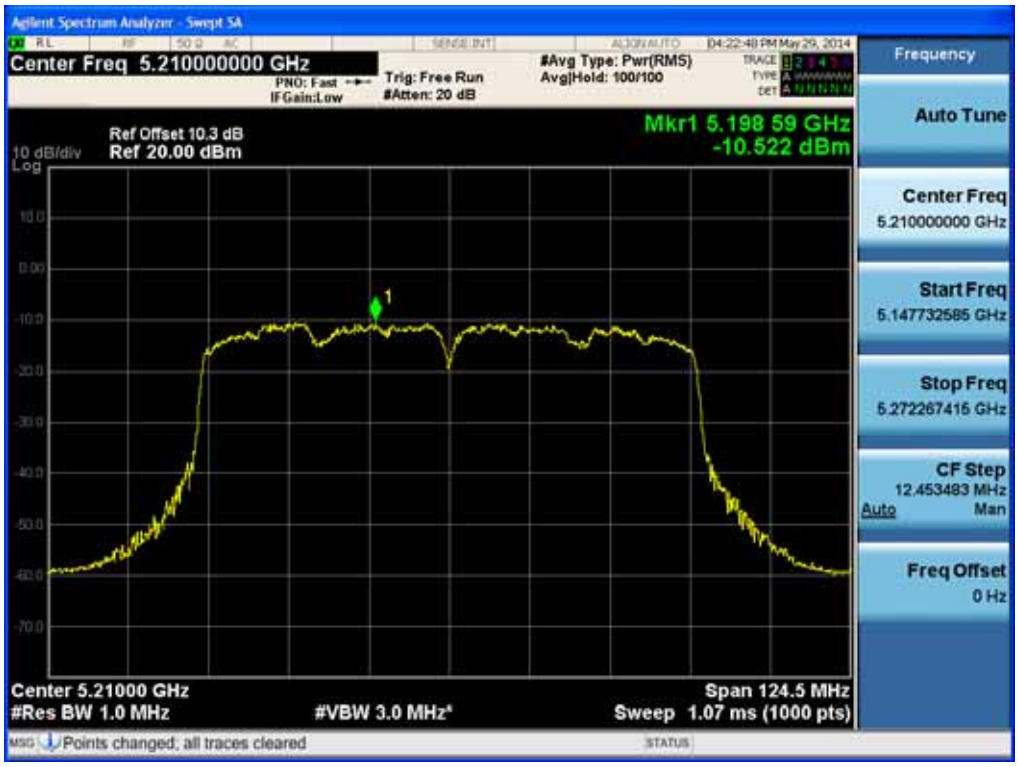
Power Spectral Density (802.11ac-CH 54)

Power Spectral Density (802.11ac-CH 110)



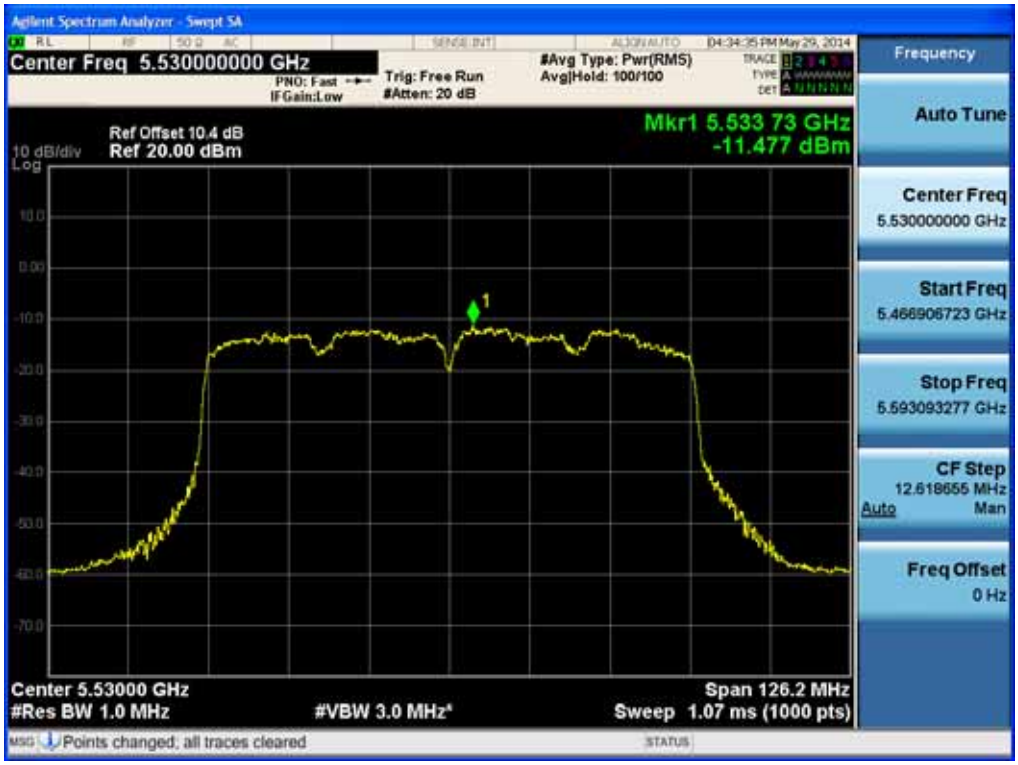
80 MHz BW

Power Spectral Density (802.11ac-CH 42)



Power Spectral Density (802.11ac-CH 58)

Power Spectral Density (802.11ac-CH 106)

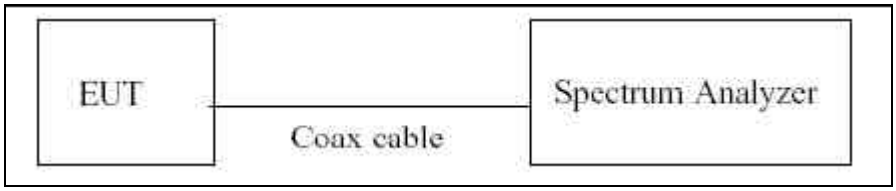


Power Spectral Density (802.11ac-CH 138)

8.5 PEAK EXCURSION RATIO

The spectrum analyzer was connected to the antenna terminal while the EUT was operating in the continuous transmission mode at the appropriate center frequencies. The largest permissible difference between the modulation envelope(measured using a peak hold function) and the maximum conducted output power 13 dB/MHz.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to KDB 789033(issued 04/08/2013).

The spectrum analyzer is set to :

1. Span = Set the span to view the entire emission bandwidth.
2. RBW = 1 MHz
3. VBW ≥ 3 MHz
4. Detector Mode = Peak
5. Trace Mode = Max hold
6. Allow the sweeps to continue until the trace stabilizes.
7. Use the peak search function to find the peak of the spectrum.
8. Use the procedure to measure the PPSD
9. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

Note :

1. 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.
4. We applied the 15.407 for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r01.

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	20.30
	5190	20.29
	5200	20.28
	5230	20.29
	5240	20.34
UNII 2	5260	20.37
	5270	20.38
	5300	20.40
	5310	20.39
	5320	20.39
UNII 2e	5500	20.35
	5510	20.36
	5550	20.41
	5580	20.43
	5670	20.43
	5700	20.30

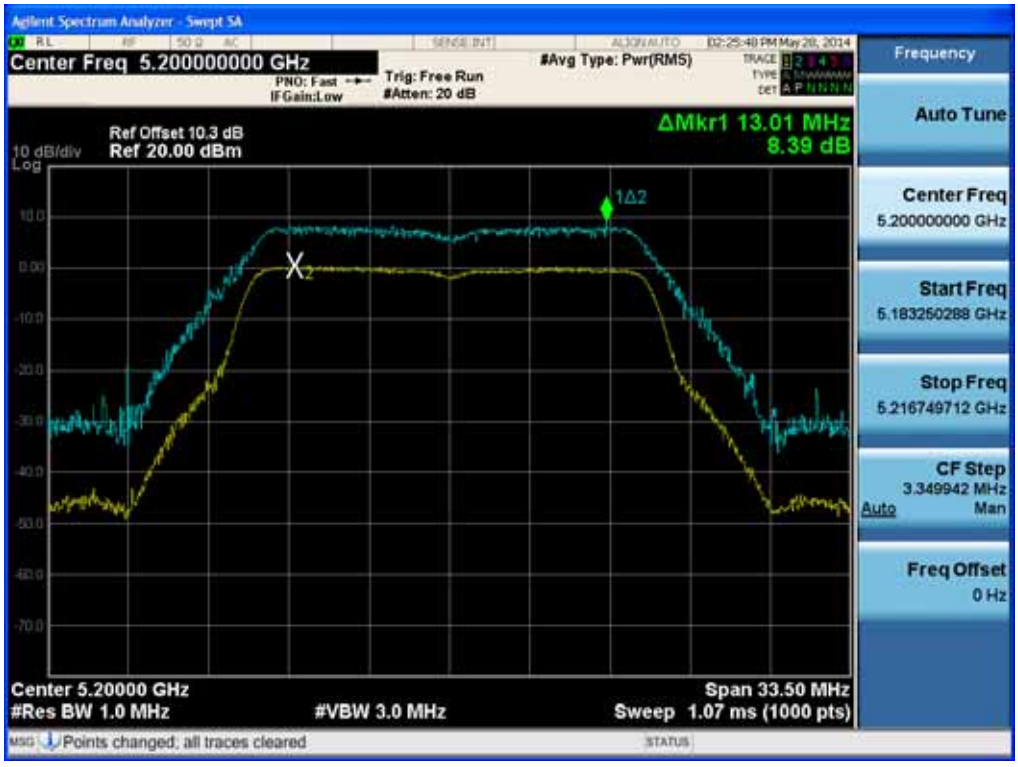
(Actual value of loss for the attenuator and cable combination)

▣ RESULT PLOTS

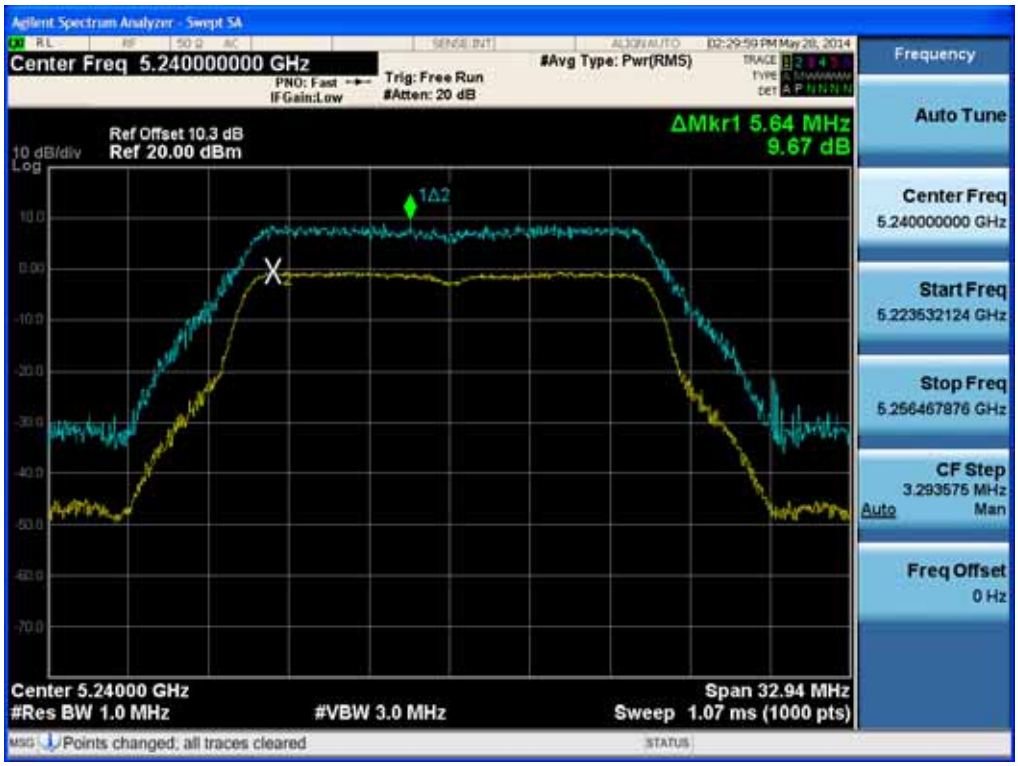
20 MHz BW

Peak Excursion Ratio (802.11a-CH 36)

Peak Excursion Ratio (802.11a-CH 40)

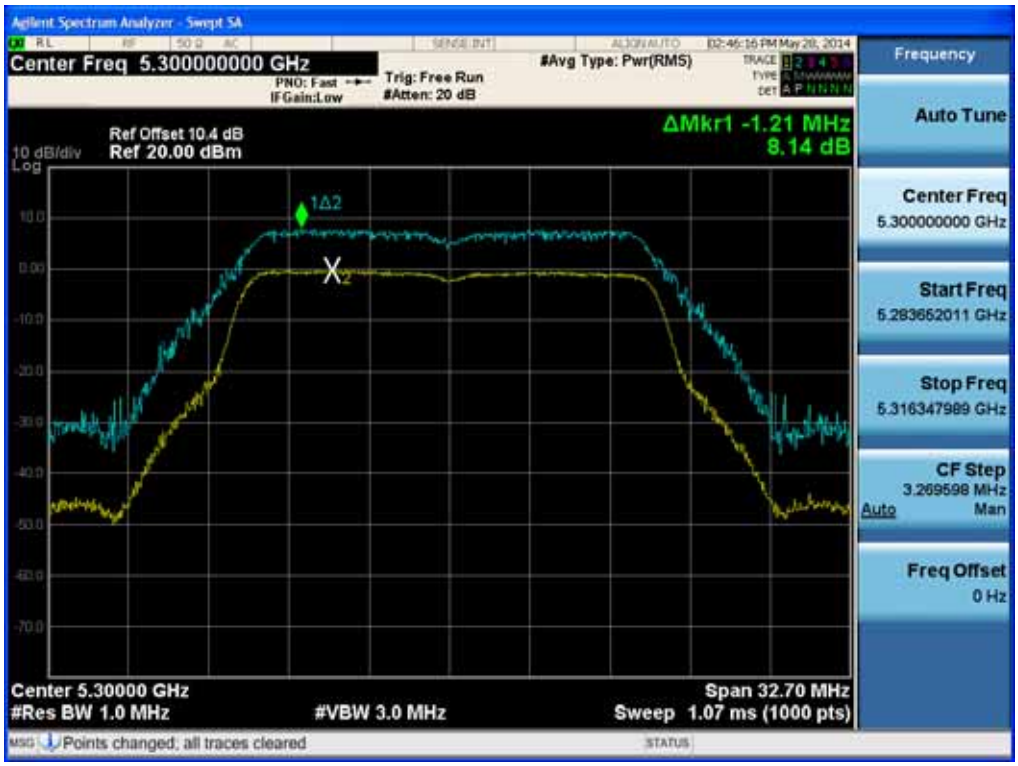


Peak Excursion Ratio (802.11a-CH 48)

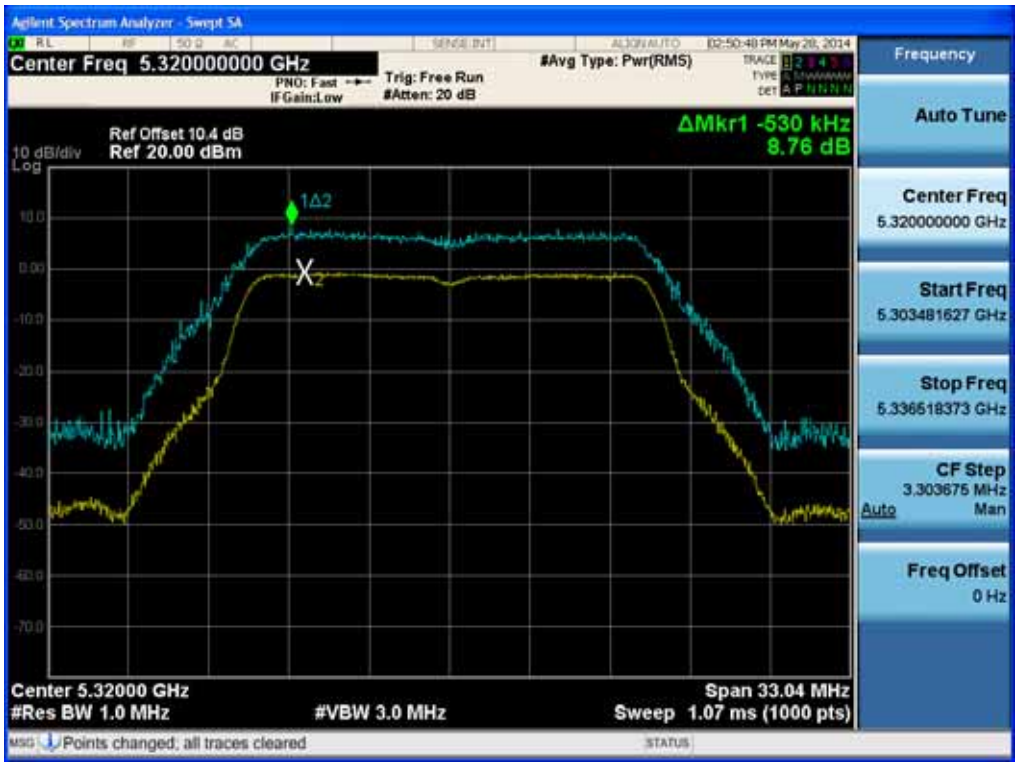


Peak Excursion Ratio (802.11a-CH 52)

Peak Excursion Ratio (802.11a-CH 60)

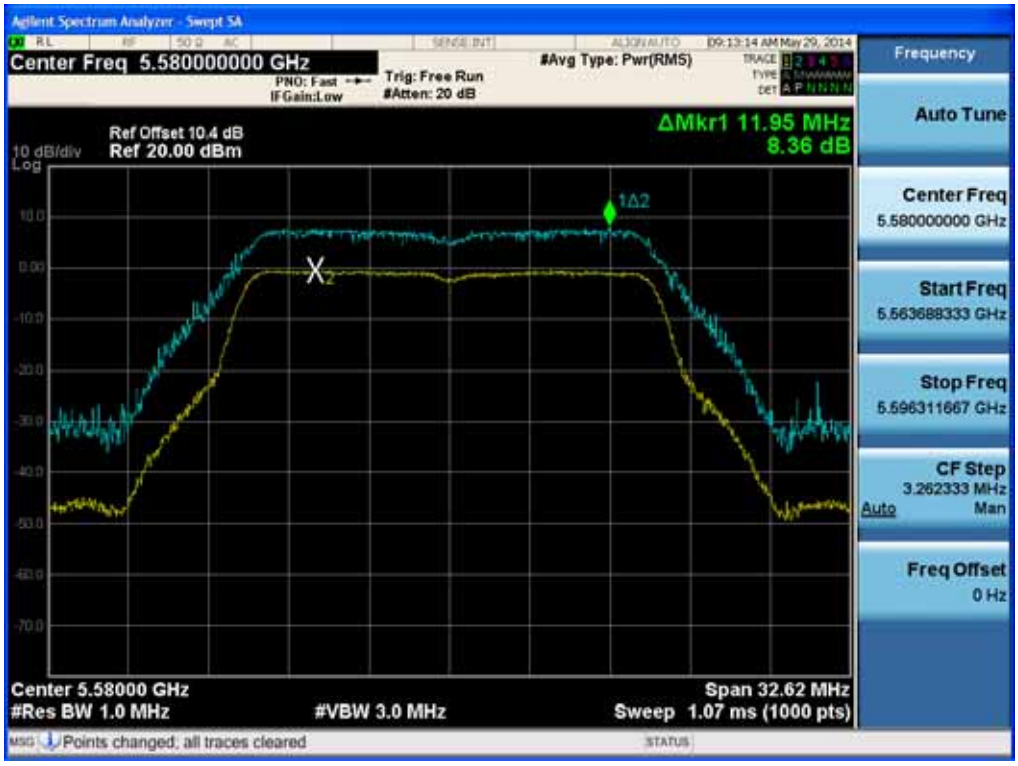


Peak Excursion Ratio (802.11a-CH 64)

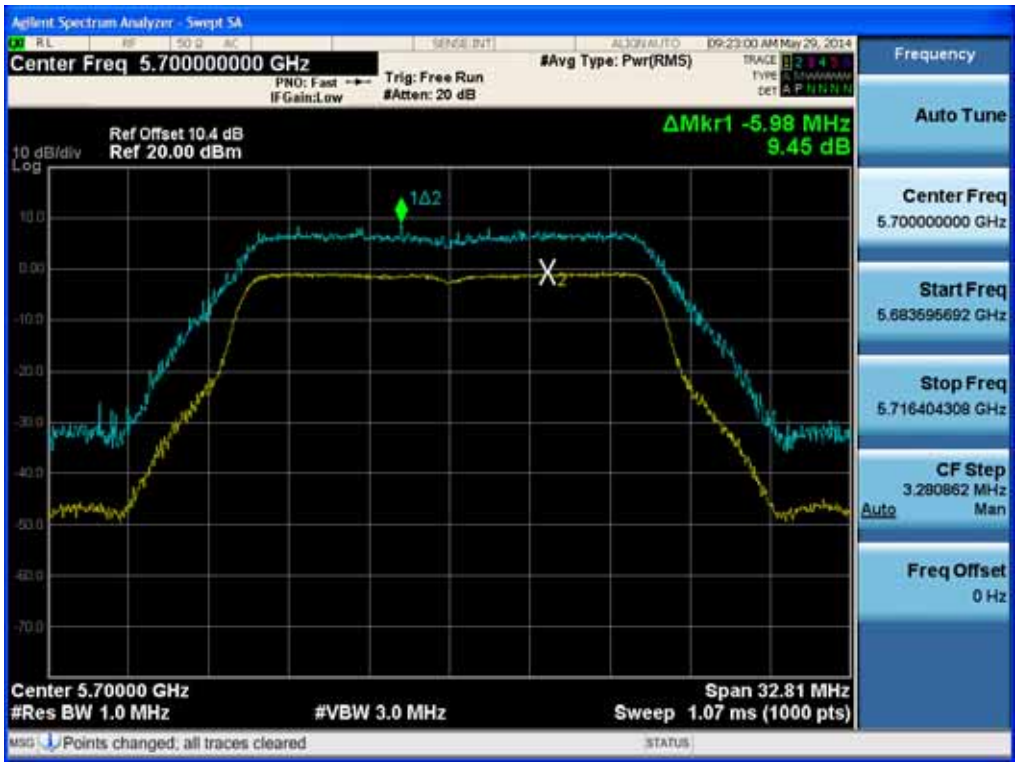


Peak Excursion Ratio (802.11a-CH 100)

Peak Excursion Ratio (802.11a-CH 116)



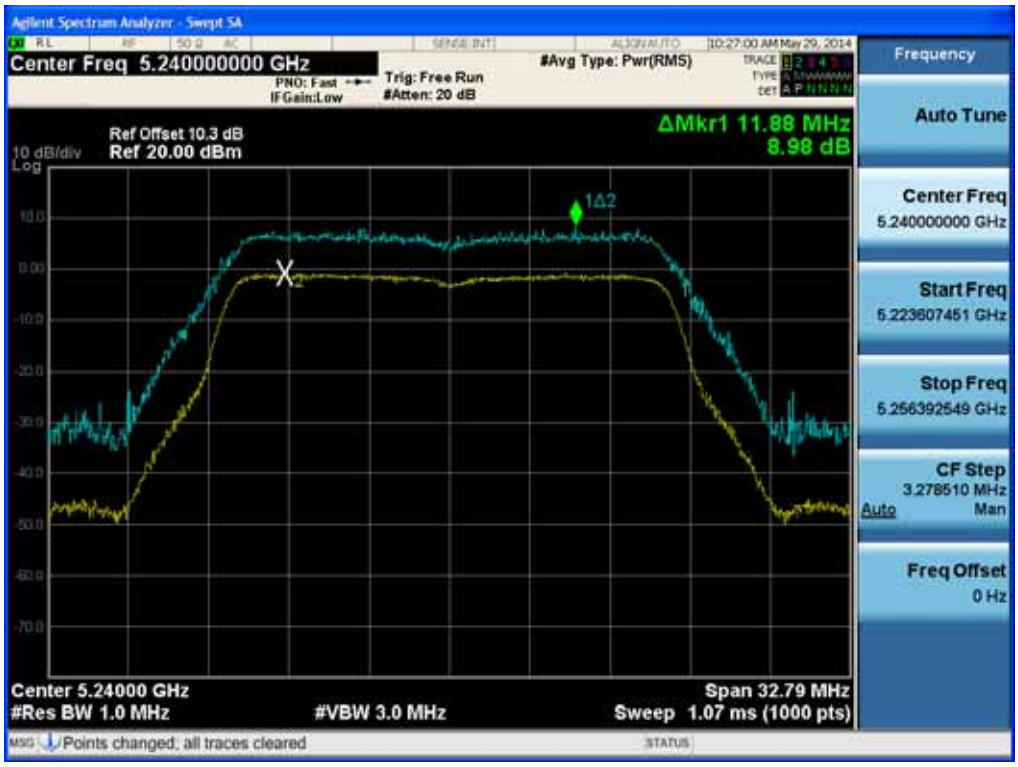
Peak Excursion Ratio (802.11a-CH 140)



Peak Excursion Ratio (802.11n-CH 36)

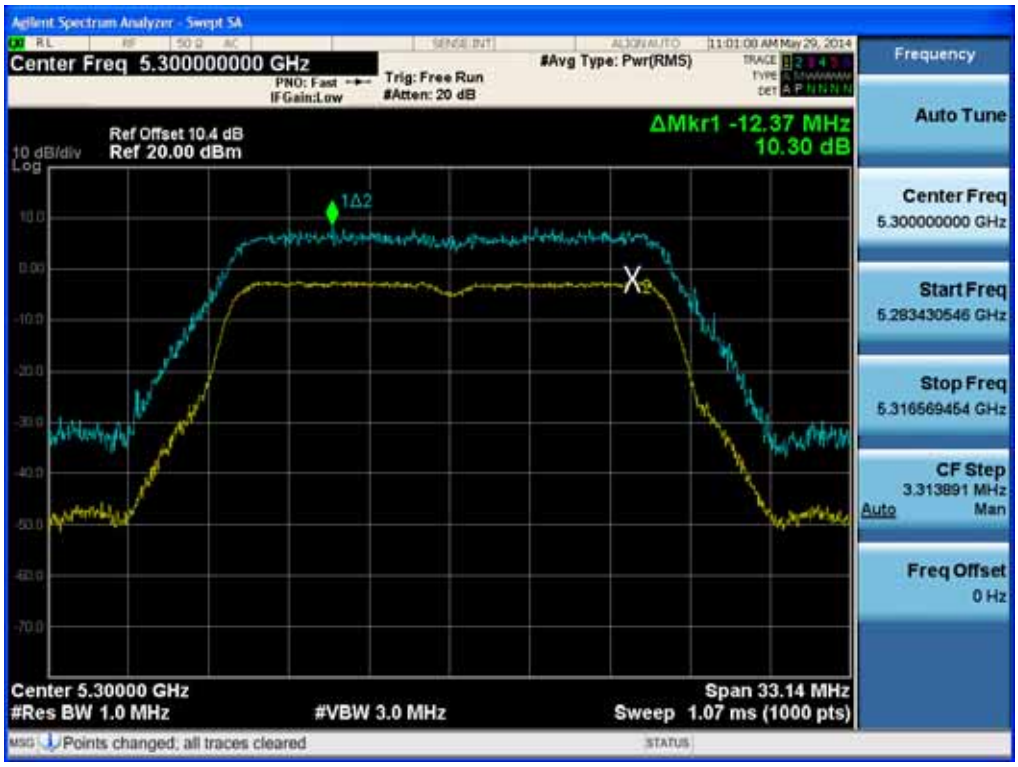
Peak Excursion Ratio (802.11n-CH 40)

Peak Excursion Ratio (802.11n-CH 48)

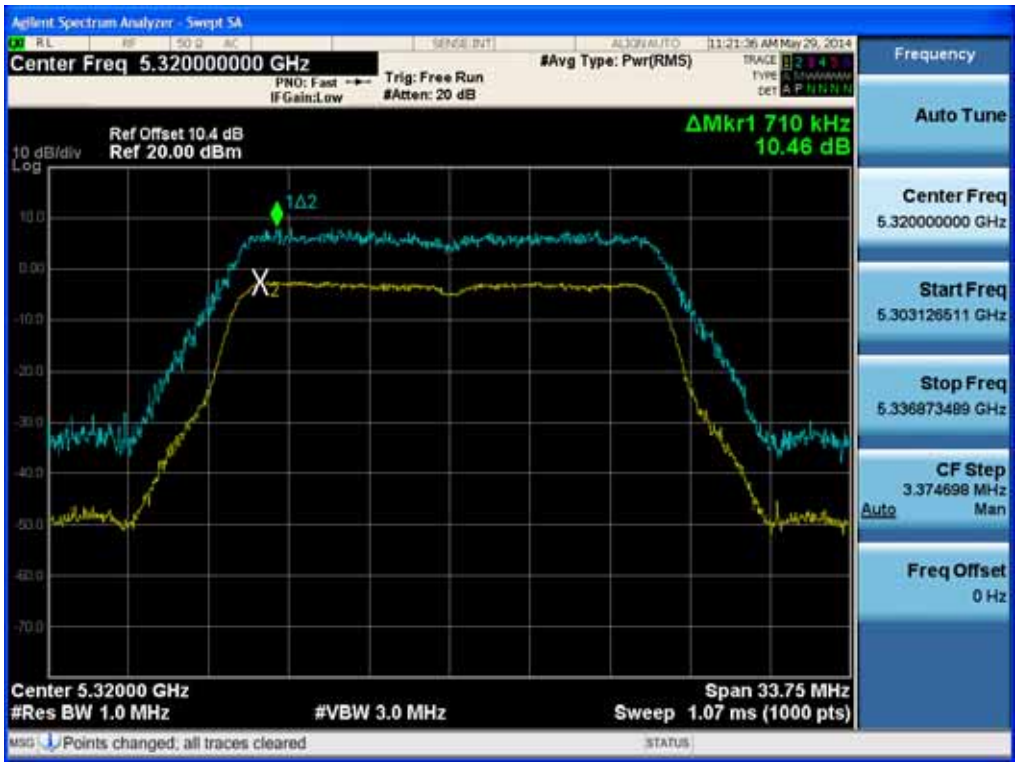


Peak Excursion Ratio (802.11n-CH 52)

Peak Excursion Ratio (802.11n-CH 60)

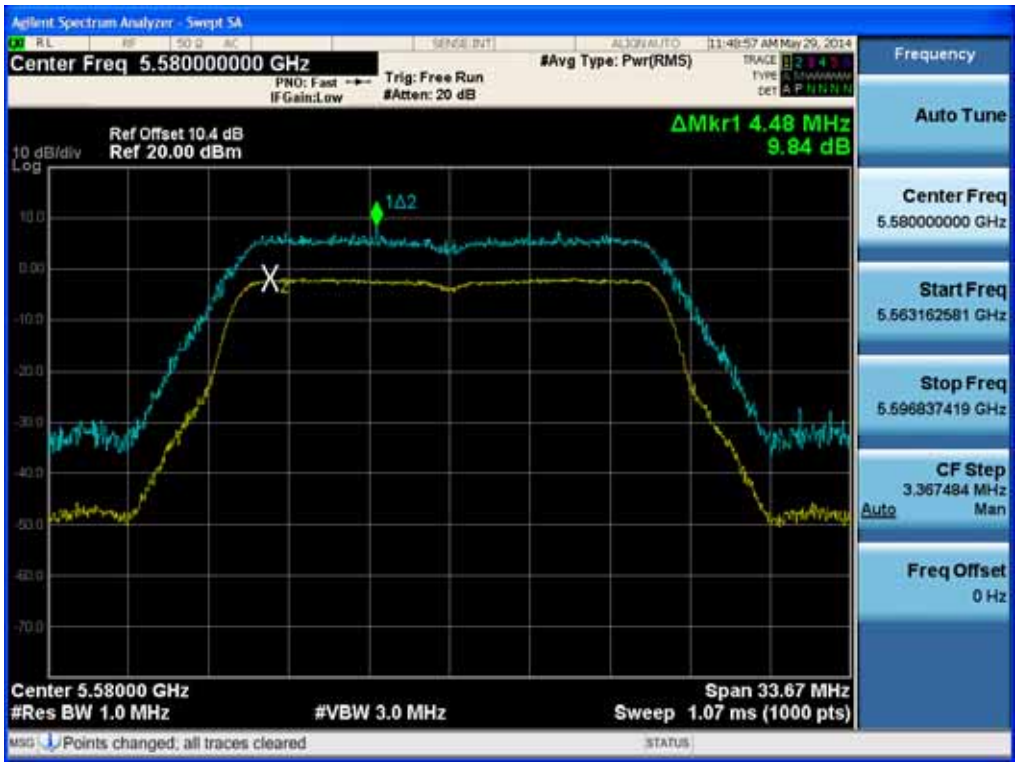


Peak Excursion Ratio (802.11n-CH 64)

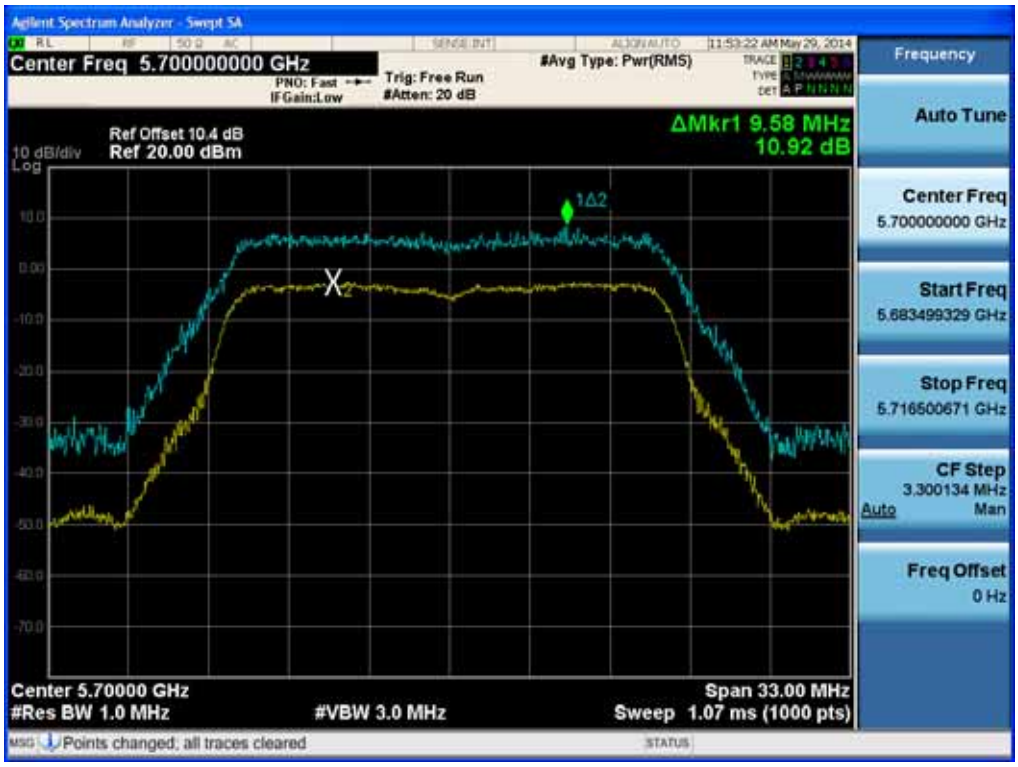


Peak Excursion Ratio (802.11n-CH 100)

Peak Excursion Ratio (802.11n-CH 116)



Peak Excursion Ratio (802.11n-CH 140)



20 MHz BW

Peak Excursion Ratio (802.11ac-CH 36)

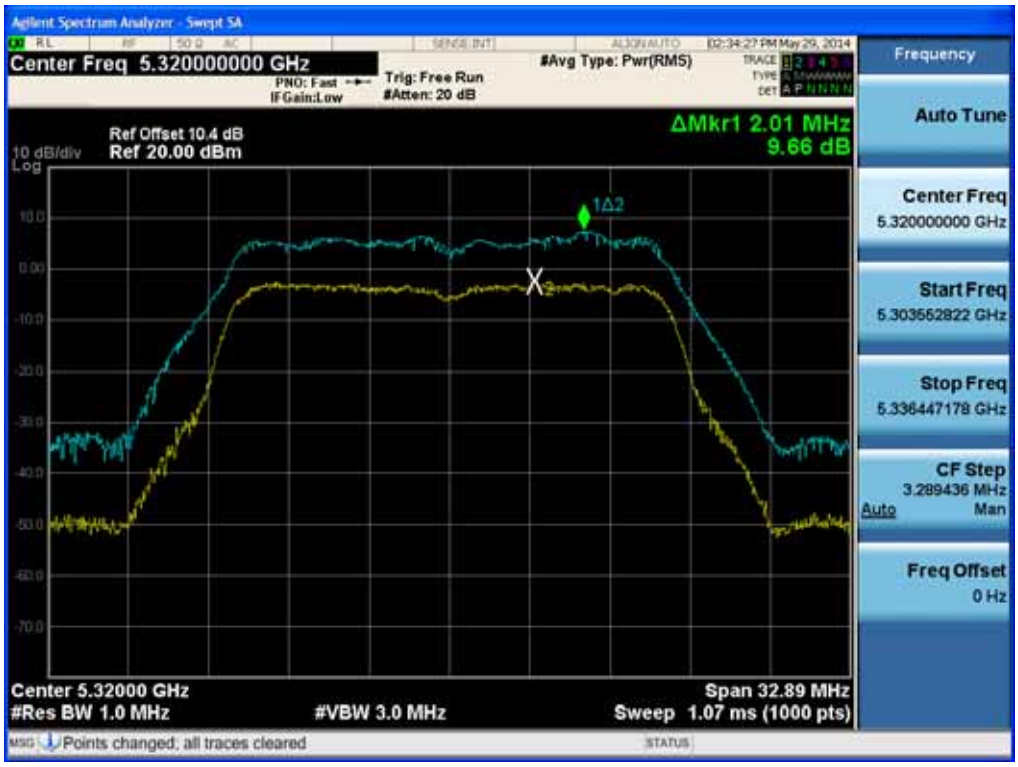
Peak Excursion Ratio (802.11ac-CH 40)

Peak Excursion Ratio (802.11ac-CH 48)

Peak Excursion Ratio (802.11ac-CH 52)

Peak Excursion Ratio (802.11ac-CH 60)

Peak Excursion Ratio (802.11ac-CH 64)



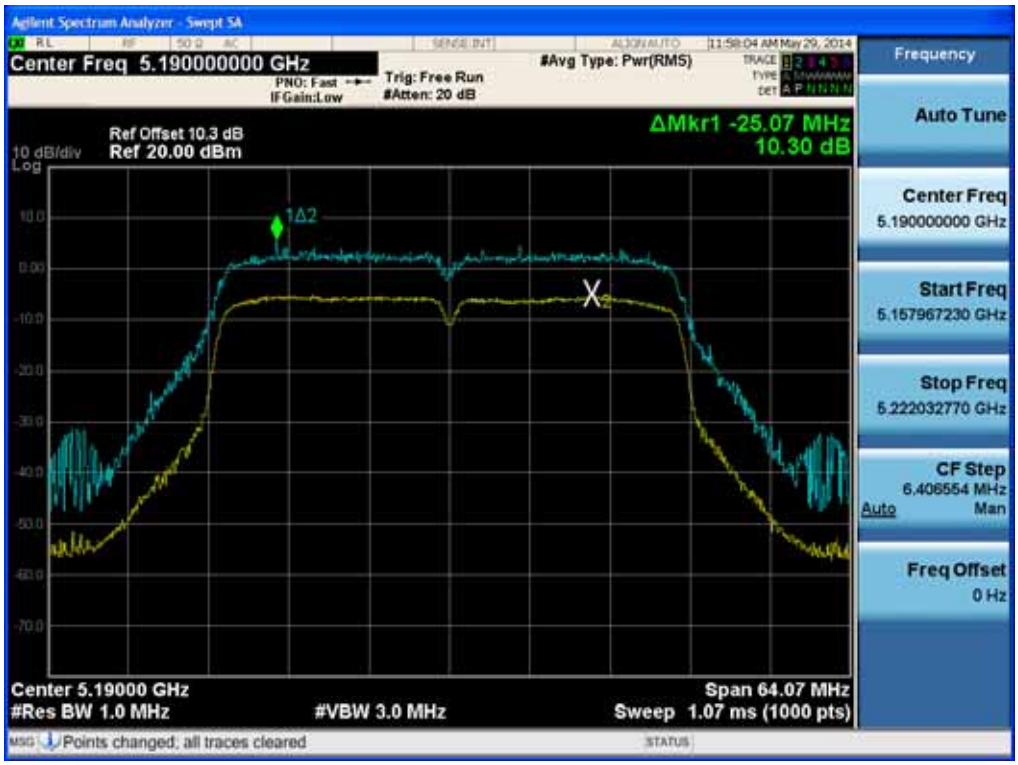
Peak Excursion Ratio (802.11ac-CH 100)

Peak Excursion Ratio (802.11ac-CH 116)

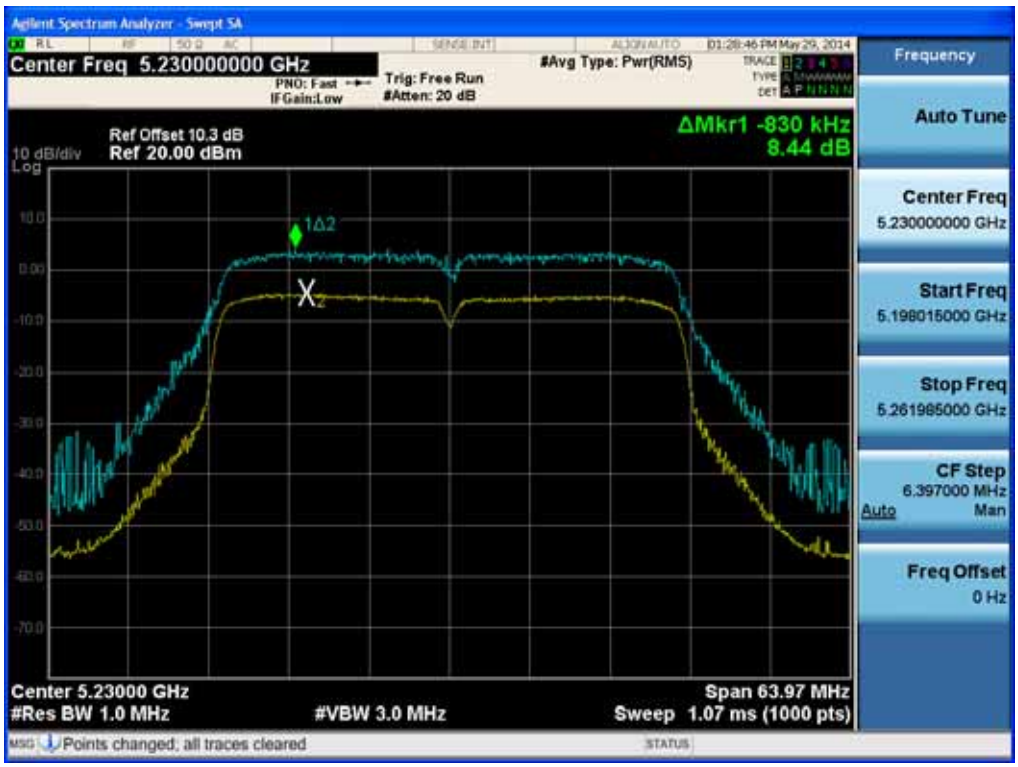
Peak Excursion Ratio (802.11ac-CH 140)

40 MHz BW

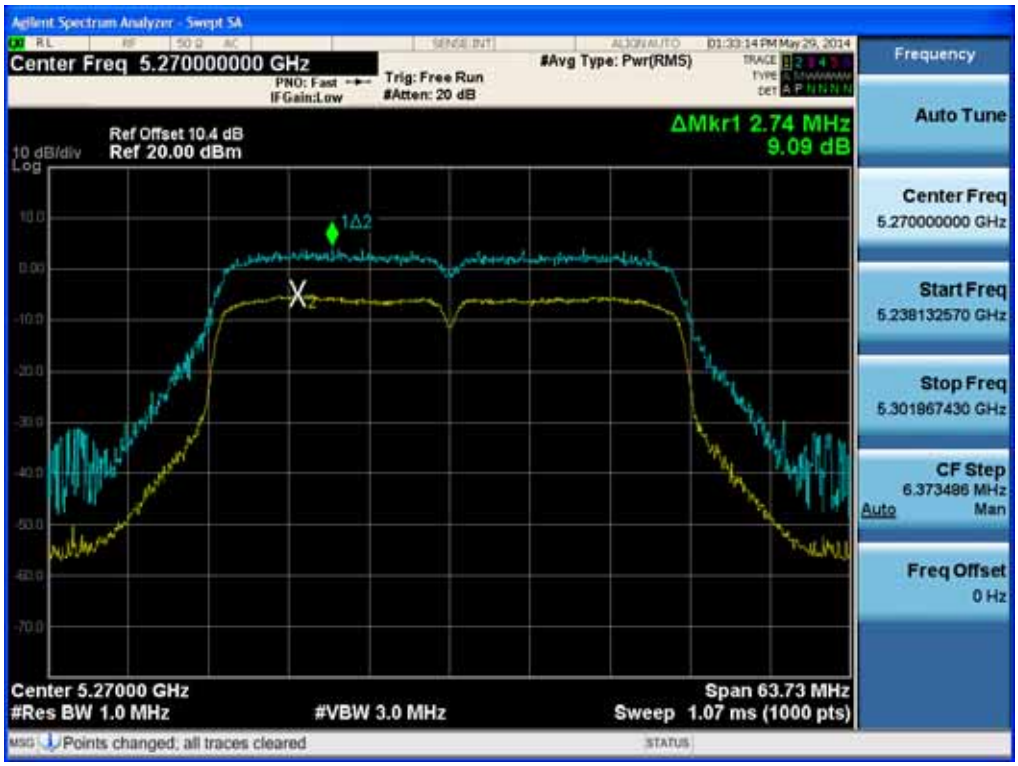
Peak Excursion Ratio (802.11n-CH 38)



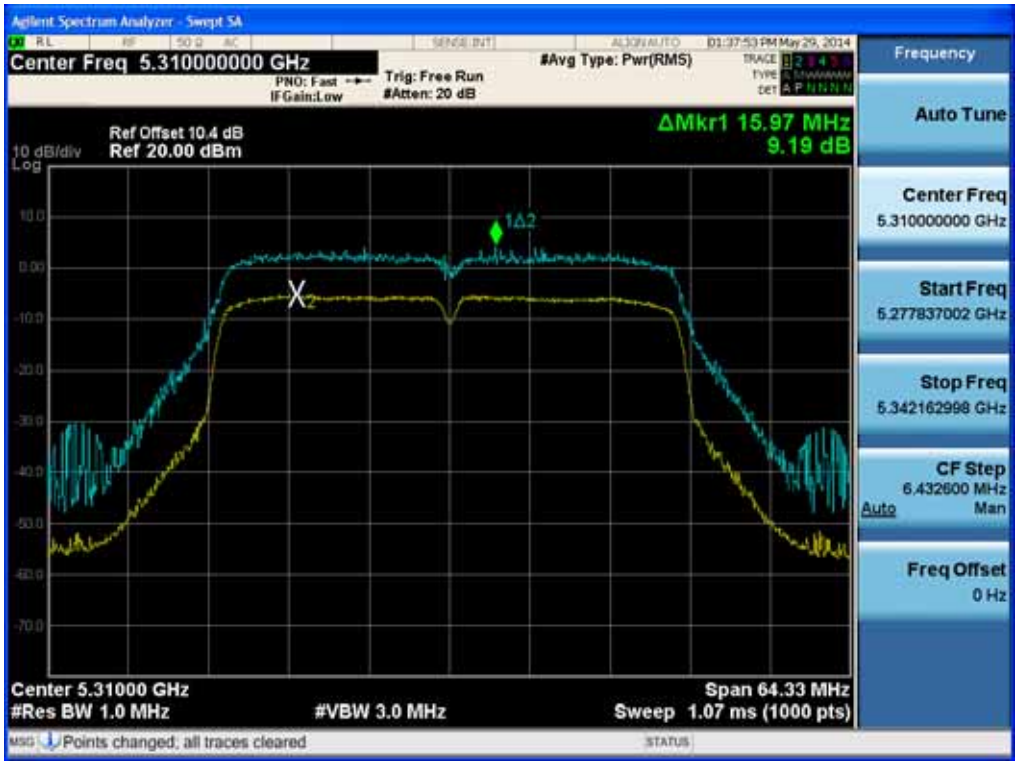
Peak Excursion Ratio (802.11n-CH 46)



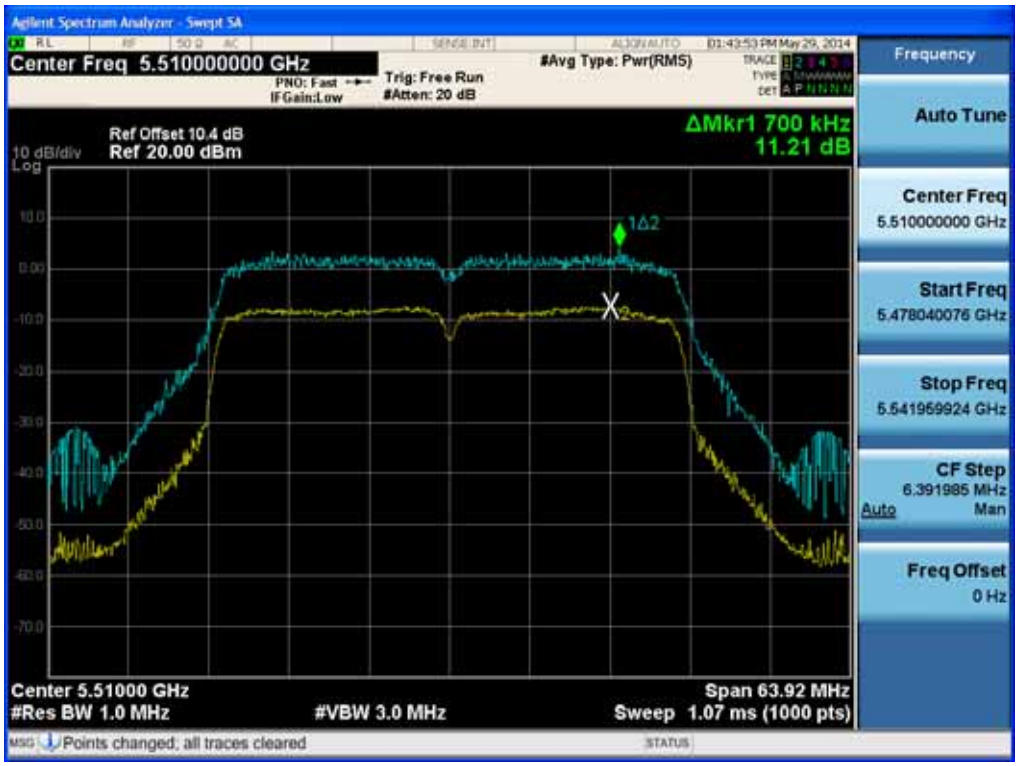
Peak Excursion Ratio (802.11n-CH 54)



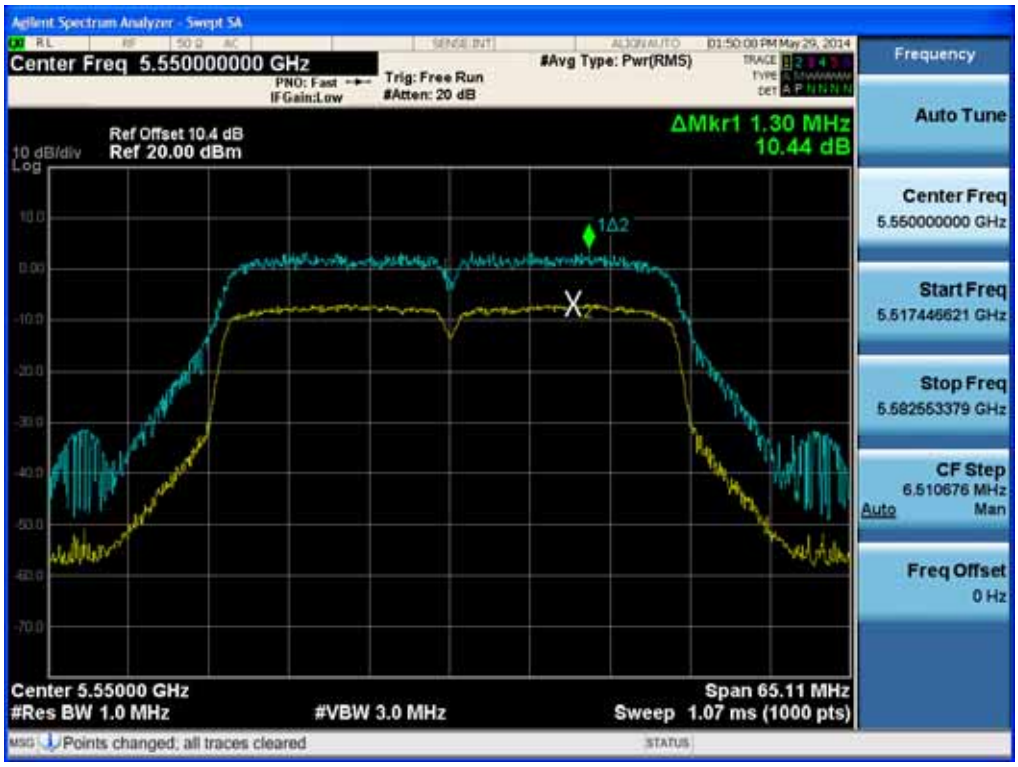
Peak Excursion Ratio (802.11n-CH 62)



Peak Excursion Ratio (802.11n-CH 102)



Peak Excursion Ratio (802.11n-CH 110)

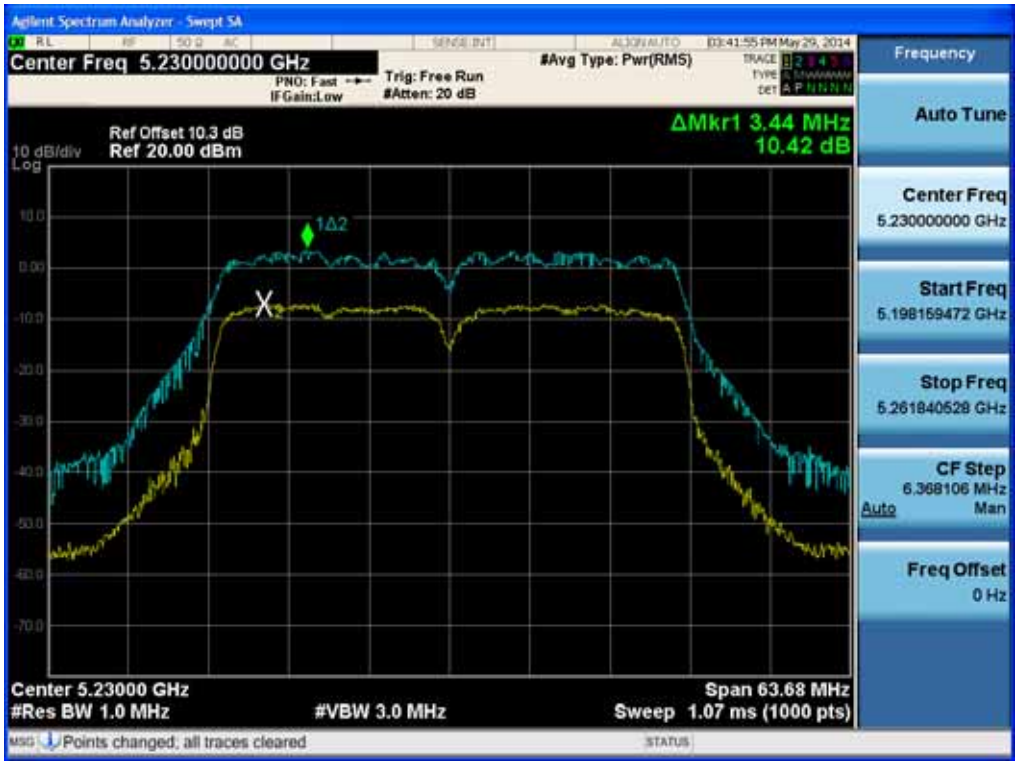


Peak Excursion Ratio (802.11n-CH 134)

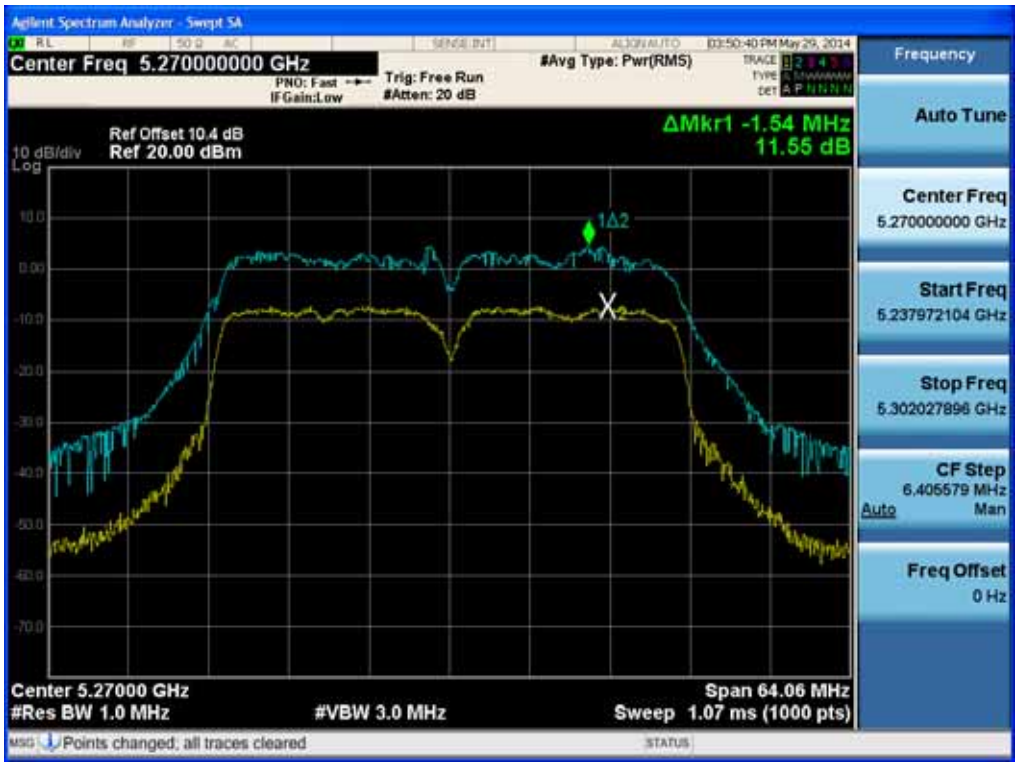
40 MHz BW

Peak Excursion Ratio (802.11ac-CH 38)

Peak Excursion Ratio (802.11ac-CH 46)

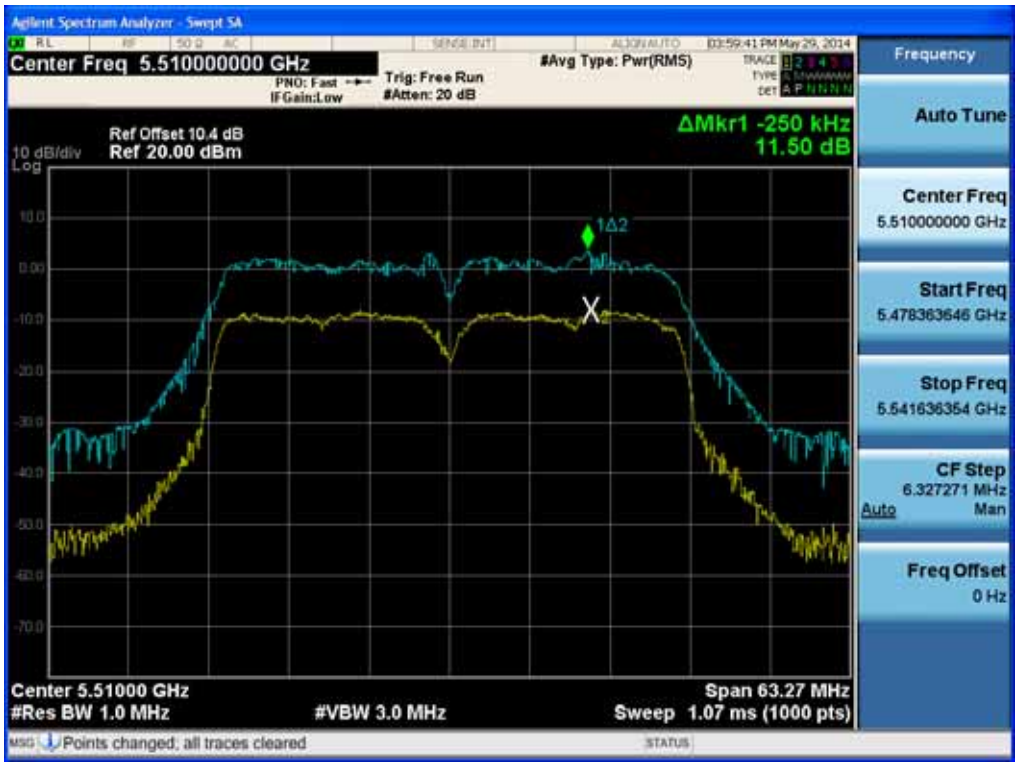


Peak Excursion Ratio (802.11ac-CH 54)

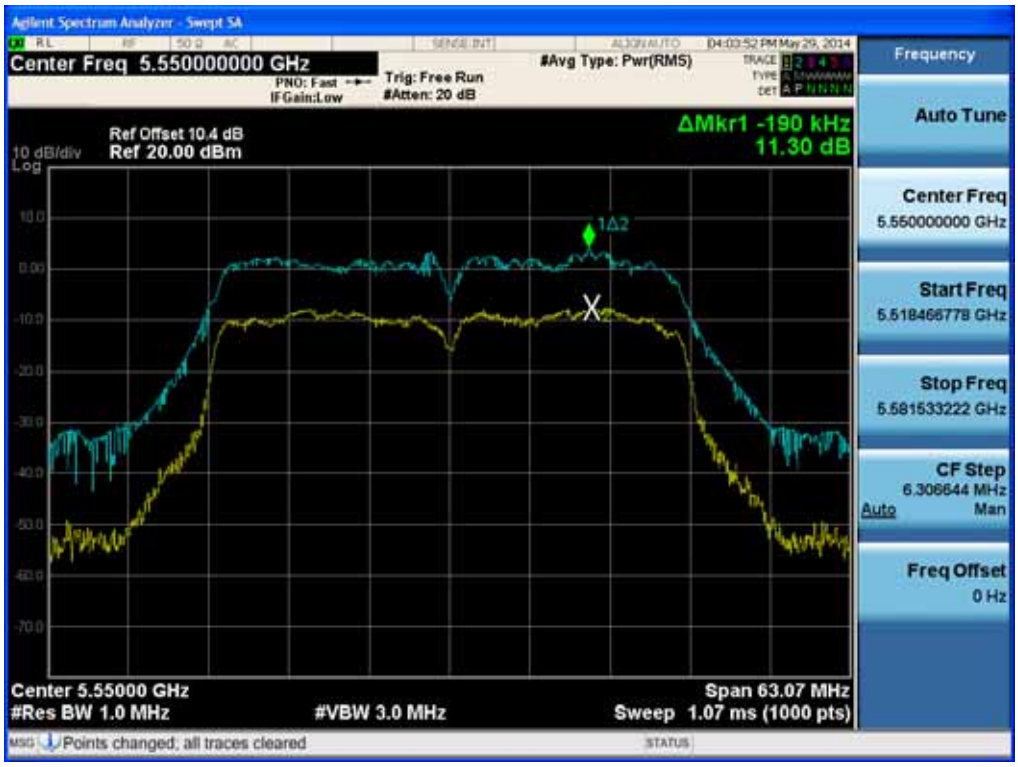


Peak Excursion Ratio (802.11ac-CH 62)

Peak Excursion Ratio (802.11ac-CH 102)



Peak Excursion Ratio (802.11ac-CH 110)

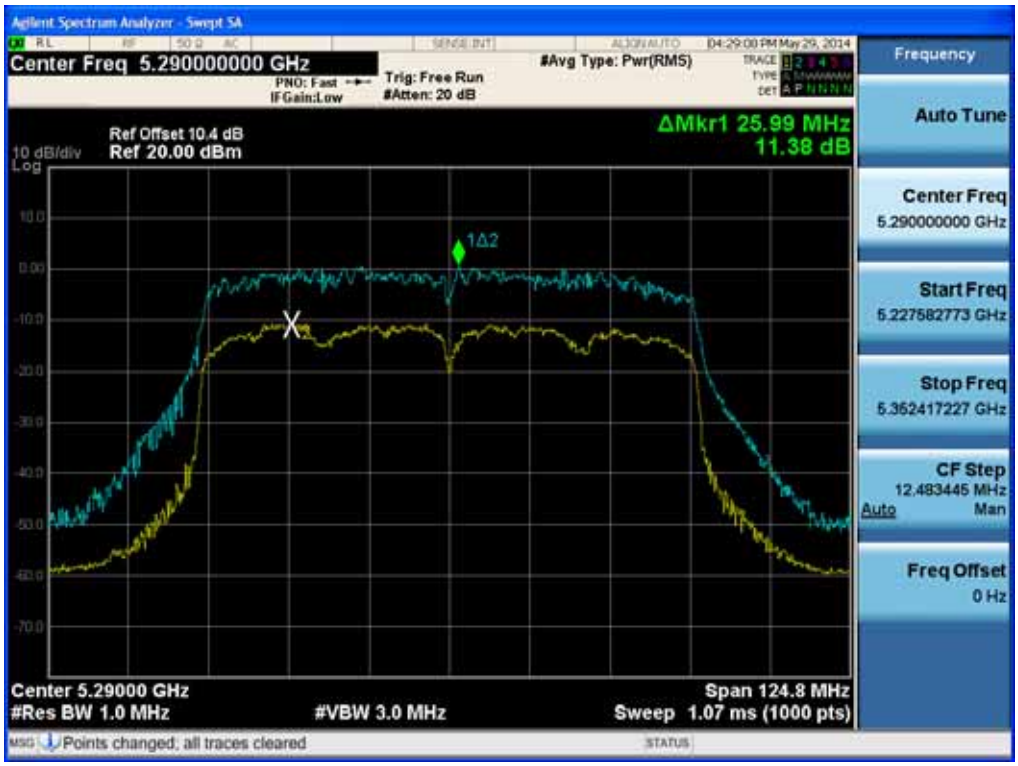


Peak Excursion Ratio (802.11ac-CH 134)

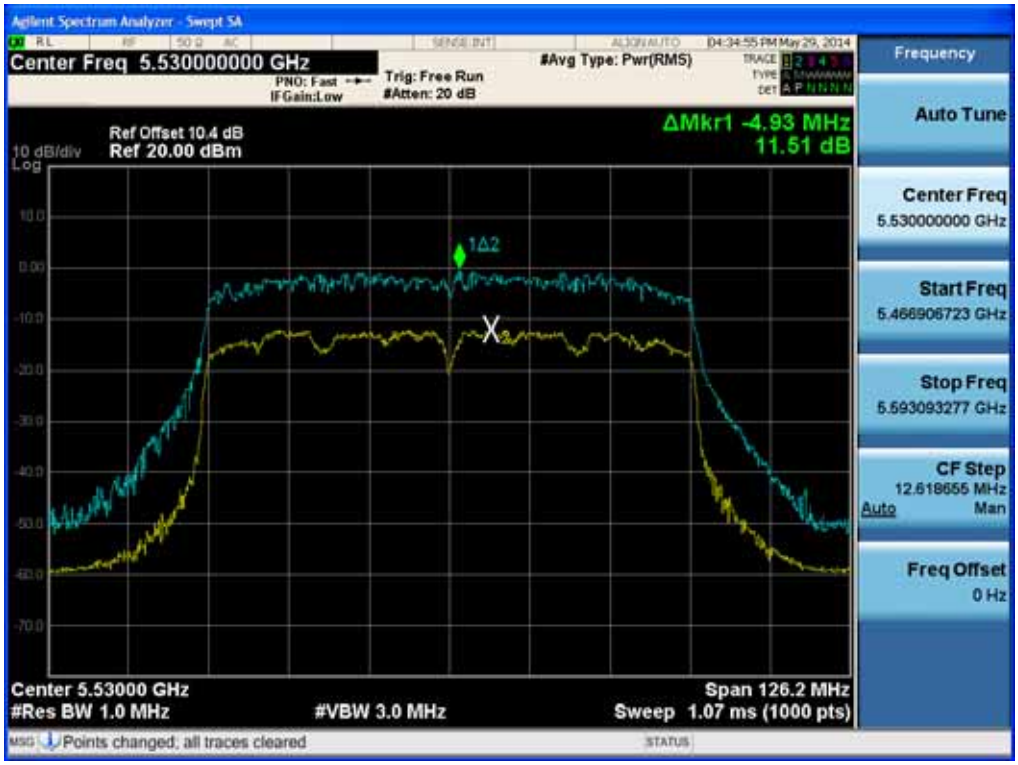
80 MHz BW

Peak Excursion Ratio (802.11ac-CH 42)

Peak Excursion Ratio (802.11ac-CH 58)



Peak Excursion Ratio (802.11ac-CH 106)



Peak Excursion Ratio (802.11ac-CH 138)

8.6 FREQUENCY STABILITY.

The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C. The temperature was incremented by 10 °C 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: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 180 020.30	0.00
100%		-30	5 179 991.09	-29.21
100%		-20	5 179 999.80	-20.50
100%		-10	5 180 017.65	-2.65
100%		0	5 180 026.19	5.89
100%		10	5 180 031.18	10.88
100%		30	5 180 043.88	23.58
100%		40	5 180 058.94	38.64
100%		50	5 180 065.69	45.39
115%	4.37	20	5 180 043.48	23.18
Batt. Endpoint	3.23	20	5 180 032.97	12.67

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 2

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 260 018.50	0.00
100%		-30	5 259 991.19	-27.31
100%		-20	5 260 001.66	-16.84
100%		-10	5 260 012.65	-5.85
100%		0	5 260 023.16	4.66
100%		+10	5 260 029.87	11.37
100%		+30	5 260 039.73	21.23
100%		+40	5 260 054.24	35.74
100%		+50	5 260 060.66	42.16
115%	4.37	+20	5 260 039.04	20.54
Batt. Endpoint	3.23	+20	5 260 030.49	11.99

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.

OPERATING BAND: UNII Band 3

OPERATING FREQUENCY: 5,550,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 500 019.50	0.00
100%		-30	5 499 994.34	-25.16
100%		-20	5 500 004.62	-14.88
100%		-10	5 500 017.66	-1.84
100%		0	5 500 023.89	4.39
100%		+10	5 500 029.62	10.12
100%		+30	5 500 037.66	18.16
100%		+40	5 500 051.19	31.69
100%		+50	5 500 060.36	40.86
115%	4.37	+20	5 500 040.69	21.19
Batt. Endpoint	3.23	+20	5 500 029.08	9.58

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: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 190 018.00	0.00
100%		-30	5 189 995.85	-22.15
100%		-20	5 190 002.52	-15.48
100%		-10	5 190 016.95	-1.05
100%		0	5 190 027.12	9.12
100%		+10	5 190 034.14	16.14
100%		+30	5 190 038.05	20.05
100%		+40	5 190 059.66	41.66
100%		+50	5 190 062.86	44.86
115%	4.37	+20	5 190 039.14	21.14
Batt. Endpoint	3.23	+20	5 190 035.58	17.58

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 2

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 270 018.50	0.00
100%		-30	5 269 994.19	-24.31
100%		-20	5 270 001.62	-16.88
100%		-10	5 270 014.94	-3.56
100%		0	5 270 022.55	4.05
100%		+10	5 270 027.97	9.47
100%		+30	5 270 040.18	21.68
100%		+40	5 270 051.68	33.18
100%		+50	5 270 061.34	42.84
115%	4.37	+20	5 270 039.72	21.22
Batt. Endpoint	3.23	+20	5 270 030.28	11.78

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: 5,510,000,000 Hz

CHANNEL: 102

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 510 019.50	0.00
100%		-30	5 509 997.33	-22.17
100%		-20	5 510 000.12	-19.38
100%		-10	5 510 017.15	-2.35
100%		0	5 510 022.98	3.48
100%		+10	5 510 028.05	8.55
100%		+30	5 510 037.84	18.34
100%		+40	5 510 048.98	29.48
100%		+50	5 510 060.25	40.75
115%	4.37	+20	5 510 039.69	20.19
Batt. Endpoint	3.23	+20	5 510 033.46	13.96

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.

80 MHz BW

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,210,000,000 Hz

CHANNEL: 42

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 210 018.50	0.00
100%		-30	5 209 998.97	-19.53
100%		-20	5 210 003.19	-15.31
100%		-10	5 210 013.82	-4.68
100%		0	5 210 020.88	2.38
100%		+10	5 210 026.93	8.43
100%		+30	5 210 038.68	20.18
100%		+40	5 210 048.64	30.14
100%		+50	5 210 059.63	41.13
115%	4.37	+20	5 210 039.18	20.68
Batt. Endpoint	3.23	+20	5 210 032.08	13.58

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 2

OPERATING FREQUENCY: 5,290,000,000 Hz

CHANNEL: 58

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 290 019.00	0.00
100%		-30	5 289 999.62	-19.38
100%		-20	5 290 003.82	-15.18
100%		-10	5 290 014.53	-4.47
100%		0	5 290 021.19	2.19
100%		+10	5 290 027.24	8.24
100%		+30	5 290 039.05	20.05
100%		+40	5 290 048.89	29.89
100%		+50	5 290 059.97	40.97
115%	4.37	+20	5 290 039.48	20.48
Batt. Endpoint	3.23	+20	5 290 032.29	13.29

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: 5,530,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 530 021.00	0.00
100%		-30	5 530 002.45	-18.55
100%		-20	5 530 006.71	-14.29
100%		-10	5 530 016.87	-4.13
100%		0	5 530 022.97	1.97
100%		+10	5 530 029.05	8.05
100%		+30	5 530 040.95	19.95
100%		+40	5 530 050.38	29.38
100%		+50	5 530 060.85	39.85
115%	4.37	+20	5 530 040.87	19.87
Batt. Endpoint	3.23	+20	5 530 033.88	12.88

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.

8.7 RADIATED MEASUREMENT

8.7.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209, §15.407

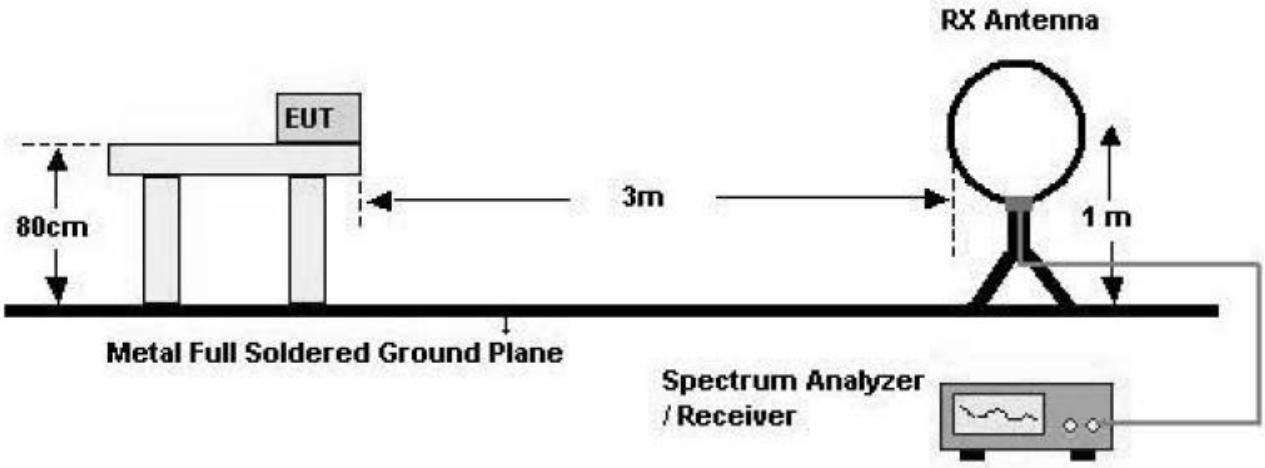
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

▣ §15.407, KDB 789033

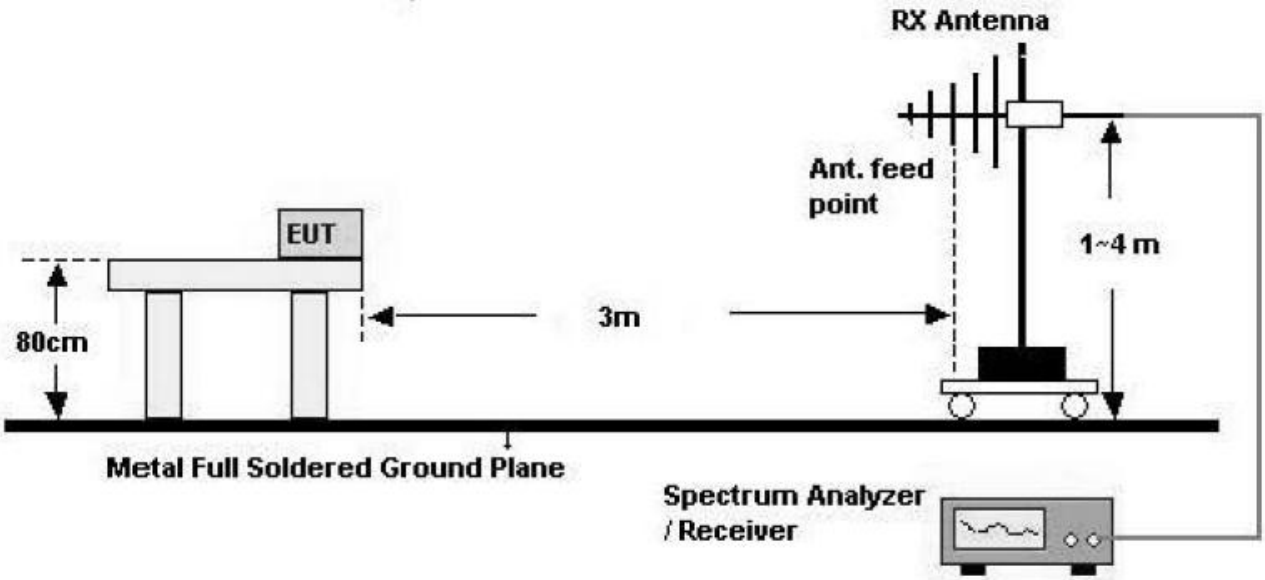
All harmonics that do not lie in a restricted band are subject to a peak limit of -27 dBm/MHz. At a distance of 3 meters the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2 dB to the EIRP limit of -27 dBm/MHz to obtain the limit for out of band spurious emissions of 68.2 dBμV/m.

Test Configuration

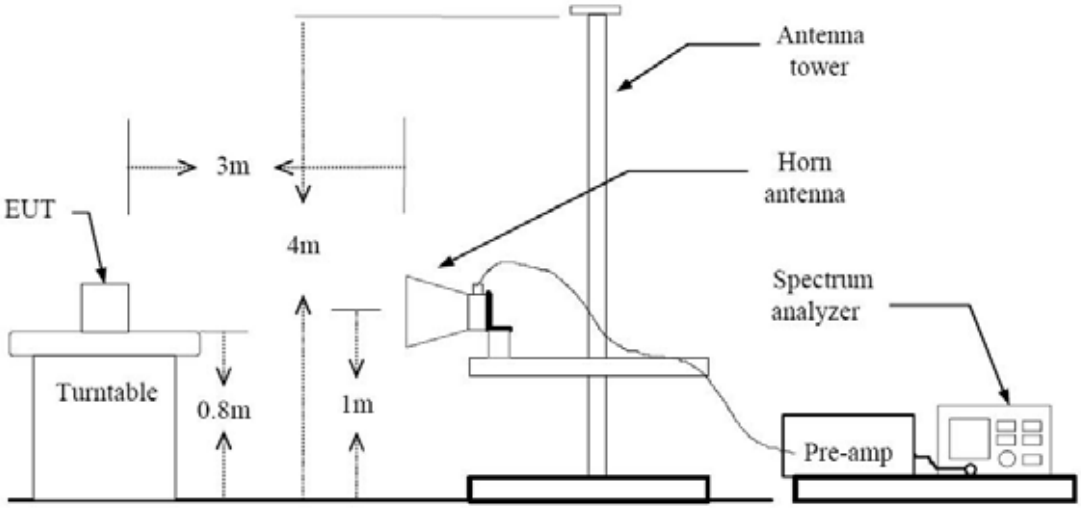
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

ANSI C63.4(2003)

Method H)5) in KDB 789033, issued 04/08/2013 (Peak)

Method H)6)d) in KDB 789033, issued 04/08/2013 (Average)

. Spectrum setting:

- Peak.

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = Peak
4. Sweep Time = auto
5. Trace mode = max hold
6. Allow sweeps to continue until the trace stabilizes.
7. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

- Average (Method VB :Averaging using reduced video bandwidth)

1. RBW = 1 MHz
2. VBW
   2.1. If the EUT is configured to transmit with duty cycle ≥ 98 percent, set VBW ≤ RBW/100(i.e., 10 kHz) but not less than 10 Hz.
   2.2. If the EUT duty cycle is < 98 percent, set VBW ≥ 1/T, where T is the minimum transmission duration.
3. The analyzer is set to linear detector mode.
4. Detector = Peak.

5. Sweep time = auto.
6. Trace mode = max hold.
7. Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimym number of traces by a factor of 1/x, where x is the duty cycle.

Note :

1. We used the case 2 for 802.11a/n_20/n_40/ac_20/ac_40/ac_80 to perform the average filed strength measurements for RSE and radiated band edge test.
2. The actual setting value of VBW for 802.11a/n_20/n_40/ac_20/ac_40/ac_80.
3. We applied the 15.407 for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r01.

Mode	Worst Data rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	6	2.030	2.130	95.31	493	1000
n_20	6.5	1.880	1.980	94.95	532	1000
n_40	13.5	0.920	1.020	90.20	1087	3000
ac_20	6.5	0.975	1.074	90.78	1026	1000
ac_40	13.5	0.491	0.590	83.22	2037	3000
ac_80	29.3	0.247	0.347	71.18	4049	3000

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dBμV	dB /m	dB	(H/V)	dBμV/m	dBμV/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dBμV	dB /m	dB	(H/V)	dBμV/m	dBμV/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	46.81	9.33	V	56.14	68.20	12.06	PK
15540	42.65	14.61	V	57.26	73.98	16.72	PK
15540	30.43	14.61	V	45.04	53.98	8.94	AV
10360	47.24	9.33	H	56.57	68.20	11.63	PK
15540	43.92	14.61	H	58.53	73.98	15.45	PK
15540	30.46	14.61	H	45.07	53.98	8.91	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	44.75	10.13	V	54.88	68.20	13.32	PK
15600	44.12	14.60	V	58.72	73.98	15.26	PK
15600	30.49	14.60	V	45.09	53.98	8.89	AV
10400	45.21	10.13	H	55.34	68.20	12.86	PK
15600	44.30	14.60	H	58.90	73.98	15.08	PK
15600	30.64	14.60	H	45.24	53.98	8.74	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	53.10	10.20	V	63.30	68.20	4.90	PK
15720	46.57	13.47	V	60.04	73.98	13.94	PK
15720	31.52	13.47	V	44.99	53.98	8.99	AV
10480	53.90	10.20	H	64.10	68.20	4.10	PK
15720	46.84	13.47	H	60.31	73.98	13.67	PK
15720	31.86	13.47	H	45.33	53.98	8.65	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	54.28	9.33	V	63.61	68.20	4.59	PK
15540	44.29	14.61	V	58.90	73.98	15.08	PK
15540	30.38	14.61	V	44.99	53.98	8.99	AV
10360	54.67	9.33	H	64.00	68.20	4.20	PK
15540	44.55	14.61	H	59.16	73.98	14.82	PK
15540	30.59	14.61	H	45.20	53.98	8.78	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	50.58	10.13	V	60.71	68.20	7.49	PK
15600	44.37	14.60	V	58.97	73.98	15.01	PK
15600	30.62	14.60	V	45.22	53.98	8.76	AV
10400	50.70	10.13	H	60.83	68.20	7.37	PK
15600	44.58	14.60	H	59.18	73.98	14.80	PK
15600	30.81	14.60	H	45.41	53.98	8.57	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	51.94	10.20	V	62.14	68.20	6.06	PK
15720	45.49	13.47	V	58.96	73.98	15.02	PK
15720	31.72	13.47	V	45.19	53.98	8.79	AV
10480	52.04	10.20	H	62.24	68.20	5.96	PK
15720	45.64	13.47	H	59.11	73.98	14.87	PK
15720	31.86	13.47	H	45.33	53.98	8.65	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10360	51.13	9.33	V	60.46	68.20	7.74	PK
15540	44.15	14.61	V	58.76	73.98	15.22	PK
15540	30.49	14.61	V	45.10	53.98	8.88	AV
10360	51.34	9.33	H	60.67	68.20	7.53	PK
15540	44.25	14.61	H	58.86	73.98	15.12	PK
15540	30.61	14.61	H	45.22	53.98	8.76	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10400	49.09	10.13	V	59.22	68.20	8.98	PK
15600	45.02	14.60	V	59.62	73.98	14.36	PK
15600	30.68	14.60	V	45.28	53.98	8.70	AV
10400	49.37	10.13	H	59.50	68.20	8.70	PK
15600	45.31	14.60	H	59.91	73.98	14.07	PK
15600	30.88	14.60	H	45.48	53.98	8.50	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10480	49.55	10.20	V	59.75	68.20	8.45	PK
15720	45.87	13.47	V	59.34	73.98	14.64	PK
15720	31.85	13.47	V	45.32	53.98	8.66	AV
10480	49.76	10.20	H	59.96	68.20	8.24	PK
15720	46.12	13.47	H	59.59	73.98	14.39	PK
15720	31.98	13.47	H	45.45	53.98	8.53	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10380	51.88	9.70	V	61.58	68.20	6.62	PK
15570	44.19	14.62	V	58.81	73.98	15.17	PK
15570	30.49	14.62	V	45.11	53.98	8.87	AV
10380	52.02	9.70	H	61.72	68.20	6.48	PK
15570	44.32	14.62	H	58.94	73.98	15.04	PK
15570	30.68	14.62	H	45.30	53.98	8.68	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5230 MHz
Channel No.	46 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10460	51.09	10.26	V	61.35	68.20	6.85	PK
15690	45.52	14.33	V	59.85	73.98	14.13	PK
15690	31.47	14.33	V	45.80	53.98	8.18	AV
10460	51.32	10.26	H	61.58	68.20	6.62	PK
15690	45.72	14.33	H	60.05	73.98	13.93	PK
15690	31.89	14.33	H	46.22	53.98	7.76	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10380	48.14	9.70	V	57.84	68.20	10.36	PK
15570	43.21	14.62	V	57.83	73.98	16.15	PK
15570	30.57	14.62	V	45.19	53.98	8.79	AV
10380	48.32	9.70	H	58.02	68.20	10.18	PK
15570	43.60	14.62	H	58.22	73.98	15.76	PK
15570	30.73	14.62	H	45.35	53.98	8.63	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 1
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5230 MHz
Channel No.	46 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10460	47.11	10.26	V	57.37	68.20	10.83	PK
15690	44.86	14.33	V	59.19	73.98	14.79	PK
15690	31.62	14.33	V	45.95	53.98	8.03	AV
10460	47.25	10.26	H	57.51	68.20	10.69	PK
15690	45.11	14.33	H	59.44	73.98	14.54	PK
15690	31.83	14.33	H	46.16	53.98	7.82	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	UNII 1
Operation Mode:	802.11ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5210 MHz
Channel No.	42 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10420	44.78	10.43	V	55.21	68.20	12.99	PK
15630	45.02	14.15	V	59.17	73.98	14.81	PK
15630	30.97	14.15	V	45.12	53.98	8.86	AV
10420	44.91	10.43	H	55.34	68.20	12.86	PK
15630	45.30	14.15	H	59.45	73.98	14.53	PK
15630	31.19	14.15	H	45.34	53.98	8.64	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_80 MHz BW. Worst case is 29.3 Mbps in 802.11ac_80 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5260 MHz
Channel No.	52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	52.68	10.38	V	63.06	68.20	5.14	PK
15780	45.18	14.38	V	59.56	73.98	14.42	PK
15780	31.37	14.38	V	45.75	53.98	8.23	AV
10520	52.93	10.38	H	63.31	68.20	4.89	PK
15780	45.51	14.38	H	59.89	73.98	14.09	PK
15780	31.91	14.38	H	46.29	53.98	7.69	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5300 MHz
Channel No.	60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	40.79	10.39	V	51.18	73.98	22.80	PK
10600	32.97	10.39	V	43.36	53.98	10.62	AV
15900	43.62	14.00	V	57.62	73.98	16.36	PK
15900	30.17	14.00	V	44.17	53.98	9.81	AV
10600	41.10	10.39	H	51.49	73.98	22.49	PK
10600	33.23	10.39	H	43.62	53.98	10.36	AV
15900	43.92	14.00	H	57.92	73.98	16.06	PK
15900	30.22	14.00	H	44.22	53.98	9.76	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	42.49	10.50	V	52.99	73.98	20.99	PK
10640	33.87	10.50	V	44.37	53.98	9.61	AV
15960	43.87	14.27	V	58.14	73.98	15.84	PK
15960	30.11	14.27	V	44.38	53.98	9.60	AV
10640	43.11	10.50	H	53.61	73.98	20.37	PK
10640	34.10	10.50	H	44.60	53.98	9.38	AV
15960	44.08	14.27	H	58.35	73.98	15.63	PK
15960	30.01	14.27	H	44.28	53.98	9.70	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5260 MHz
Channel No.	52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	50.03	10.38	V	60.41	68.20	7.79	PK
15780	44.98	14.38	V	59.36	73.98	14.62	PK
15780	31.39	14.38	V	45.77	53.98	8.21	AV
10520	50.25	10.38	H	60.63	68.20	7.57	PK
15780	45.29	14.38	H	59.67	73.98	14.31	PK
15780	31.75	14.38	H	46.13	53.98	7.85	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5300 MHz
Channel No.	60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	39.49	10.39	V	49.88	73.98	24.10	PK
10600	32.59	10.39	V	42.98	53.98	11.00	AV
15900	43.43	14.00	V	57.43	73.98	16.55	PK
15900	30.15	14.00	V	44.15	53.98	9.83	AV
10600	39.75	10.39	H	50.14	73.98	23.84	PK
10600	33.08	10.39	H	43.47	53.98	10.51	AV
15900	43.75	14.00	H	57.75	73.98	16.23	PK
15900	30.20	14.00	H	44.20	53.98	9.78	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	40.28	10.50	V	50.78	73.98	23.20	PK
10640	33.29	10.50	V	43.79	53.98	10.19	AV
15960	44.14	14.27	V	58.41	73.98	15.57	PK
15960	30.08	14.27	V	44.35	53.98	9.63	AV
10640	40.44	10.50	H	50.94	73.98	23.04	PK
10640	33.94	10.50	H	44.44	53.98	9.54	AV
15960	44.40	14.27	H	58.67	73.98	15.31	PK
15960	30.21	14.27	H	44.48	53.98	9.50	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5260 MHz
Channel No.	52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10520	48.54	10.38	V	58.92	68.20	9.28	PK
15780	46.02	14.38	V	60.40	73.98	13.58	PK
15780	31.29	14.38	V	45.67	53.98	8.31	AV
10520	48.71	10.38	H	59.09	68.20	9.11	PK
15780	46.35	14.38	H	60.73	73.98	13.25	PK
15780	31.78	14.38	H	46.16	53.98	7.82	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5300 MHz
Channel No.	60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10600	38.94	10.39	V	49.33	73.98	24.65	PK
10600	33.24	10.39	V	43.63	53.98	10.35	AV
15900	44.02	14.00	V	58.02	73.98	15.96	PK
15900	30.18	14.00	V	44.18	53.98	9.80	AV
10600	39.23	10.39	H	49.62	73.98	24.36	PK
10600	33.42	10.39	H	43.81	53.98	10.17	AV
15900	44.18	14.00	H	58.18	73.98	15.80	PK
15900	30.23	14.00	H	44.23	53.98	9.75	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10640	40.18	10.50	V	50.68	73.98	23.30	PK
10640	33.72	10.50	V	44.22	53.98	9.76	AV
15960	42.78	14.27	V	57.05	73.98	16.93	PK
15960	30.05	14.27	V	44.32	53.98	9.66	AV
10640	40.32	10.50	H	50.82	73.98	23.16	PK
10640	34.09	10.50	H	44.59	53.98	9.39	AV
15960	43.17	14.27	H	57.44	73.98	16.54	PK
15960	30.08	14.27	H	44.35	53.98	9.63	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5270 MHz
Channel No.	54 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10540	48.12	10.55	V	58.67	68.20	9.53	PK
15810	45.03	14.26	V	59.29	73.98	14.69	PK
15810	31.29	14.26	V	45.55	53.98	8.43	AV
10540	48.38	10.55	H	58.93	68.20	9.27	PK
15810	45.24	14.26	H	59.50	73.98	14.48	PK
15810	31.52	14.26	H	45.78	53.98	8.20	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10620	39.75	10.25	V	50.00	73.98	23.98	PK
10620	33.21	10.25	V	43.46	53.98	10.52	AV
15930	43.34	13.62	V	56.96	73.98	17.02	PK
15930	30.02	13.62	V	43.64	53.98	10.34	AV
10620	40.07	10.25	H	50.32	73.98	23.66	PK
10620	33.49	10.25	H	43.74	53.98	10.24	AV
15930	43.77	13.62	H	57.39	73.98	16.59	PK
15930	30.11	13.62	H	43.73	53.98	10.25	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5270 MHz
Channel No.	54 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10540	47.29	10.55	V	57.84	68.20	10.36	PK
15810	45.13	14.26	V	59.39	73.98	14.59	PK
15810	31.04	14.26	V	45.30	53.98	8.68	AV
10540	47.62	10.55	H	58.17	68.20	10.03	PK
15810	45.60	14.26	H	59.86	73.98	14.12	PK
15810	31.36	14.26	H	45.62	53.98	8.36	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10620	40.21	10.25	V	50.46	73.98	23.52	PK
10620	33.58	10.25	V	43.83	53.98	10.15	AV
15930	43.61	13.62	V	57.23	73.98	16.75	PK
15930	30.49	13.62	V	44.11	53.98	9.87	AV
10620	40.04	10.25	H	50.29	73.98	23.69	PK
10620	33.71	10.25	H	43.96	53.98	10.02	AV
15930	43.83	13.62	H	57.45	73.98	16.53	PK
15930	30.77	13.62	H	44.39	53.98	9.59	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band :	UNII 2
Operation Mode:	802.11ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5290 MHz
Channel No.	58 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
10580	45.97	10.42	V	56.39	68.20	11.81	PK
15870	43.89	13.96	V	57.85	73.98	16.13	PK
15870	32.74	13.96	V	46.70	53.98	7.28	AV
10580	46.39	10.42	H	56.81	68.20	11.39	PK
15870	44.10	13.96	H	58.06	73.98	15.92	PK
15870	33.12	13.96	H	47.08	53.98	6.90	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_80 MHz BW. Worst case is 13.5 Mbps in 802.11ac_80 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	40.72	11.28	V	52.00	73.98	21.98	PK
11000	35.48	11.28	V	46.76	53.98	7.22	AV
16500	44.57	14.19	V	58.76	68.20	9.44	PK
11000	41.49	11.28	H	52.77	73.98	21.21	PK
11000	36.30	11.28	H	47.58	53.98	6.40	AV
16500	44.98	14.19	H	59.17	68.20	9.03	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	41.24	11.10	V	52.34	73.98	21.64	PK
11160	35.81	11.10	V	46.91	53.98	7.07	AV
16740	45.11	15.70	V	60.81	68.20	7.39	PK
11160	41.72	11.10	H	52.82	73.98	21.16	PK
11160	36.45	11.10	H	47.55	53.98	6.43	AV
16740	45.31	15.70	H	61.01	68.20	7.19	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11400	43.92	10.97	V	54.89	73.98	19.09	PK
11400	35.51	10.97	V	46.48	53.98	7.50	AV
17100	45.37	17.82	V	63.19	68.20	5.01	PK
11400	44.29	10.97	H	55.26	73.98	18.72	PK
11400	35.98	10.97	H	46.95	53.98	7.03	AV
17100	45.63	17.82	H	63.45	68.20	4.75	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	40.75	11.28	V	52.03	73.98	21.95	PK
11000	35.27	11.28	V	46.55	53.98	7.43	AV
16500	44.38	14.19	V	58.57	68.20	9.63	PK
11000	41.16	11.28	H	52.44	73.98	21.54	PK
11000	35.74	11.28	H	47.02	53.98	6.96	AV
16500	44.84	14.19	H	59.03	68.20	9.17	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	40.68	11.10	V	51.78	73.98	22.20	PK
11160	34.24	11.10	V	45.34	53.98	8.64	AV
16740	44.61	15.70	V	60.31	68.20	7.89	PK
11160	40.83	11.10	H	51.93	73.98	22.05	PK
11160	34.92	11.10	H	46.02	53.98	7.96	AV
16740	44.94	15.70	H	60.64	68.20	7.56	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11400	43.48	10.97	V	54.45	73.98	19.53	PK
11400	35.67	10.97	V	46.64	53.98	7.34	AV
17100	45.19	17.82	V	63.01	68.20	5.19	PK
11400	43.79	10.97	H	54.76	73.98	19.22	PK
11400	36.03	10.97	H	47.00	53.98	6.98	AV
17100	45.45	17.82	H	63.27	68.20	4.93	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_20 MHz BW. Worst case is 6.5 Mbps in 802.11n_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11000	41.09	11.28	V	52.37	73.98	21.61	PK
11000	35.27	11.28	V	46.55	53.98	7.43	AV
16500	44.64	14.19	V	58.83	68.20	9.37	PK
11000	41.30	11.28	H	52.58	73.98	21.40	PK
11000	35.80	11.28	H	47.08	53.98	6.90	AV
16500	44.87	14.19	H	59.06	68.20	9.14	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band :	UNII 2e
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11160	40.21	11.10	V	51.31	73.98	22.67	PK
11160	34.79	11.10	V	45.89	53.98	8.09	AV
16740	44.78	15.70	V	60.48	68.20	7.72	PK
11160	40.42	11.10	H	51.52	73.98	22.46	PK
11160	35.02	11.10	H	46.12	53.98	7.86	AV
16740	45.03	15.70	H	60.73	68.20	7.47	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5720 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11440	43.11	10.97	V	54.08	73.98	19.90	PK
11440	35.29	10.97	V	46.26	53.98	7.72	AV
17160	44.68	17.82	V	62.50	68.20	5.70	PK
11440	43.35	10.97	H	54.32	73.98	19.66	PK
11440	35.79	10.97	H	46.76	53.98	7.22	AV
17160	44.94	17.82	H	62.76	68.20	5.44	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_20 MHz BW. Worst case is 6.5 Mbps in 802.11ac_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. We applied the 15.407 for Ch.144 in 802.11ac according to KDB 644545 D01 v01r01.

Band :	UNII 2e
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11020	40.29	11.28	V	51.57	73.98	22.41	PK
11020	35.27	11.28	V	46.55	53.98	7.43	AV
16530	44.65	14.83	V	59.48	68.20	8.72	PK
11020	40.83	11.28	H	52.11	73.98	21.87	PK
11020	35.61	11.28	H	46.89	53.98	7.09	AV
16530	44.99	14.83	H	59.82	68.20	8.38	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5590 MHz
Channel No.	118 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11100	41.18	11.12	V	52.30	73.98	21.68	PK
11100	36.29	11.12	V	47.41	53.98	6.57	AV
16650	44.37	16.52	V	60.89	68.20	7.31	PK
11100	41.45	11.12	H	52.57	73.98	21.41	PK
11100	36.70	11.12	H	47.82	53.98	6.16	AV
16650	44.65	16.52	H	61.17	68.20	7.03	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band :	UNII 2e
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5670 MHz
Channel No.	134 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11340	42.98	10.86	V	53.84	73.98	20.14	PK
11340	37.34	10.86	V	48.20	53.98	5.78	AV
17010	44.78	18.15	V	62.93	68.20	5.27	PK
11340	43.23	10.86	H	54.09	73.98	19.89	PK
11340	37.93	10.86	H	48.79	53.98	5.19	AV
17010	45.06	18.15	H	63.21	68.20	4.99	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_40 MHz BW. Worst case is 13.5 Mbps in 802.11n_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11020	40.64	11.28	V	51.92	73.98	22.06	PK
11020	35.42	11.28	V	46.70	53.98	7.28	AV
16530	44.84	14.83	V	59.67	68.20	8.53	PK
11020	40.81	11.28	H	52.09	73.98	21.89	PK
11020	35.73	11.28	H	47.01	53.98	6.97	AV
16530	45.07	14.83	H	59.90	68.20	8.30	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5590 MHz
Channel No.	118 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11100	41.29	11.12	V	52.41	73.98	21.57	PK
11100	35.84	11.12	V	46.96	53.98	7.02	AV
16650	44.58	16.52	V	61.10	68.20	7.10	PK
11100	41.52	11.12	H	52.64	73.98	21.34	PK
11100	36.24	11.12	H	47.36	53.98	6.62	AV
16650	44.97	16.52	H	61.49	68.20	6.71	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5710 MHz
Channel No.	142 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11340	42.74	10.73	V	53.47	73.98	20.51	PK
11340	37.29	10.73	V	48.02	53.98	5.96	AV
17010	44.57	18.11	V	62.68	68.20	5.52	PK
11340	43.12	10.73	H	53.85	73.98	20.13	PK
11340	37.68	10.73	H	48.41	53.98	5.57	AV
17010	44.85	18.11	H	62.96	68.20	5.24	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_40 MHz BW. Worst case is 13.5 Mbps in 802.11ac_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. We applied the 15.407 for Ch.142 in 802.11ac according to KDB 644545 D01 v01r01.

Band :	UNII 2e
Operation Mode:	802.11ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5530 MHz
Channel No.	106 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11060	41.82	11.48	V	53.30	73.98	20.68	PK
11060	37.54	11.48	V	49.02	53.98	4.96	AV
16590	43.87	14.42	V	58.29	68.20	9.91	PK
11060	42.02	11.48	H	53.50	73.98	20.48	PK
11060	37.77	11.48	H	49.25	53.98	4.73	AV
16590	44.18	14.42	H	58.60	68.20	9.60	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11ac_80 MHz BW. Worst case is 13.5 Mbps in 802.11ac_80 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.7.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	56.94	-0.51	H	56.43	73.98	17.55	PK
5150	43.38	-0.51	H	42.87	53.98	11.11	AV
5150	57.32	-0.51	V	56.81	73.98	17.17	PK
5150	44.23	-0.51	V	43.72	53.98	10.26	AV

Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	54.44	-0.51	H	53.93	73.98	20.05	PK
5150	43.38	-0.51	H	42.87	53.98	11.11	AV
5150	54.85	-0.51	V	54.34	73.98	19.64	PK
5150	44.17	-0.51	V	43.66	53.98	10.32	AV

Band :	UNII 1
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	54.37	-0.51	H	53.86	73.98	20.12	PK
5150	43.51	-0.51	H	43.00	53.98	10.98	AV
5150	54.90	-0.51	V	54.39	73.98	19.59	PK
5150	43.97	-0.51	V	43.46	53.98	10.52	AV

Band :	UNII 1
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	58.93	-0.51	H	58.42	73.98	15.56	PK
5150	43.88	-0.51	H	43.37	53.98	10.61	AV
5150	58.35	-0.51	V	57.84	73.98	16.14	PK
5150	43.72	-0.51	V	43.21	53.98	10.77	AV

Band :	UNII 1
Operation Mode:	802.11 ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5190 MHz
Channel No.	38 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	65.35	-0.51	H	64.84	73.98	9.14	PK
5150	47.98	-0.51	H	47.47	53.98	6.51	AV
5150	67.71	-0.51	V	67.20	73.98	6.78	PK
5150	50.46	-0.51	V	49.95	53.98	4.03	AV

Band :	UNII 1
Operation Mode:	802.11 ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5210 MHz
Channel No.	42 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5150	67.61	-0.51	H	67.10	73.98	6.88	PK
5150	50.37	-0.51	H	49.86	53.98	4.12	AV
5150	57.45	-0.51	V	56.94	73.98	17.04	PK
5150	45.40	-0.51	V	44.89	53.98	9.09	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n/ac mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	54.28	-0.19	H	54.09	73.98	19.89	PK
5350	42.12	-0.19	H	41.93	53.98	12.05	AV
5350	54.81	-0.19	V	54.62	73.98	19.36	PK
5350	42.58	-0.19	V	42.39	53.98	11.59	AV

Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	55.72	-0.19	H	55.53	73.98	18.45	PK
5350	42.11	-0.19	H	41.92	53.98	12.06	AV
5350	56.16	-0.19	V	55.97	73.98	18.01	PK
5350	42.44	-0.19	V	42.25	53.98	11.73	AV

Band :	UNII 2
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	54.24	-0.19	H	54.05	73.98	19.93	PK
5350	42.12	-0.19	H	41.93	53.98	12.05	AV
5350	54.65	-0.19	V	54.46	73.98	19.52	PK
5350	42.41	-0.19	V	42.22	53.98	11.76	AV

Band :	UNII 2
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	69.58	-0.19	H	69.39	73.98	4.59	PK
5350	46.09	-0.19	H	45.90	53.98	8.08	AV
5350	69.61	-0.19	V	69.42	73.98	4.56	PK
5350	46.18	-0.19	V	45.99	53.98	7.99	AV

Band :	UNII 2
Operation Mode:	802.11 ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5310 MHz
Channel No.	62 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	63.11	-0.19	H	62.92	73.98	11.06	PK
5350	44.67	-0.19	H	44.48	53.98	9.50	AV
5350	63.58	-0.19	V	63.39	73.98	10.59	PK
5350	45.07	-0.19	V	44.88	53.98	9.10	AV

Band :	UNII 2
Operation Mode:	802.11 ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5290 MHz
Channel No.	58 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5350	63.85	-0.19	H	63.66	73.98	10.32	PK
5350	47.92	-0.19	H	47.73	53.98	6.25	AV
5350	64.06	-0.19	V	63.87	73.98	10.11	PK
5350	48.20	-0.19	V	48.01	53.98	5.97	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n/ac mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	56.08	0.38	H	56.46	73.98	17.52	PK
5460	42.96	0.38	H	43.34	53.98	10.64	AV
*5470	55.82	0.24	H	56.06	68.20	12.14	PK
5460	55.68	0.38	V	56.06	73.98	17.92	PK
5460	42.28	0.38	V	42.66	53.98	11.32	AV
*5470	55.57	0.24	V	55.81	68.20	12.39	PK

Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
*5725	62.15	1.05	H	63.20	68.20	5.01	PK
*5725	61.27	1.05	V	62.32	68.20	5.89	PK

Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	56.05	0.38	H	56.43	73.98	17.55	PK
5460	42.79	0.38	H	43.17	53.98	10.81	AV
*5470	54.73	0.24	H	54.97	68.20	13.23	PK
5460	55.76	0.38	V	56.14	73.98	17.84	PK
5460	42.38	0.38	V	42.76	53.98	11.22	AV
*5470	54.49	0.24	V	54.73	68.20	13.47	PK

Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
*5725	60.90	1.05	H	61.95	68.20	6.26	PK
*5725	59.21	1.05	V	60.26	68.20	7.95	PK

Band :	UNII 2e
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	54.71	0.38	H	55.09	73.98	18.89	PK
5460	43.01	0.38	H	43.39	53.98	10.59	AV
*5470	55.17	0.24	H	55.41	68.20	12.79	PK
5460	54.37	0.38	V	54.75	73.98	19.23	PK
5460	42.87	0.38	V	43.25	53.98	10.73	AV
*5470	54.78	0.24	V	55.02	68.20	13.18	PK

Band :	UNII 2e
Operation Mode:	802.11n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	54.40	0.38	H	54.78	73.98	19.20	PK
5460	41.31	0.38	H	41.69	53.98	12.29	AV
*5470	58.04	0.24	H	58.28	68.20	9.92	PK
5460	54.11	0.38	V	54.49	73.98	19.49	PK
5460	41.05	0.38	V	41.43	53.98	12.55	AV
*5470	57.67	0.24	V	57.91	68.20	10.29	PK

Band :	UNII 2e
Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5670 MHz
Channel No.	134 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
*5725	59.13	1.05	H	60.18	68.20	8.03	PK
*5725	58.78	1.05	V	59.83	68.20	8.38	PK

Band :	UNII 2e
Operation Mode:	802.11 ac_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5510 MHz
Channel No.	102 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	55.53	0.38	H	55.91	73.98	18.07	PK
5460	41.11	0.38	H	41.49	53.98	12.49	AV
*5470	62.25	0.24	H	62.49	68.20	5.71	PK
5460	55.28	0.38	V	55.66	73.98	18.32	PK
5460	40.96	0.38	V	41.34	53.98	12.64	AV
*5470	62.12	0.24	V	62.36	68.20	5.84	PK

Band :	UNII 2e
Operation Mode:	802.11 ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5530 MHz
Channel No.	106 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
5460	62.92	0.38	H	63.30	73.98	10.68	PK
5460	45.76	0.38	H	46.14	53.98	7.84	AV
*5470	64.30	0.24	H	64.54	68.20	3.66	PK
5460	62.58	0.38	V	62.96	73.98	11.02	PK
5460	45.29	0.38	V	45.67	53.98	8.31	AV
*5470	64.12	0.24	V	64.36	68.20	3.84	PK

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n/ac mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. '*' is radiated band edge test frequency(not restricted band emissions).

8.8 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for 6 Mbps, Ch.36 and 802.11a_HT20 mode in UNII 1. Because 802.11a_HT20 mode in UNII 1 is worst case.

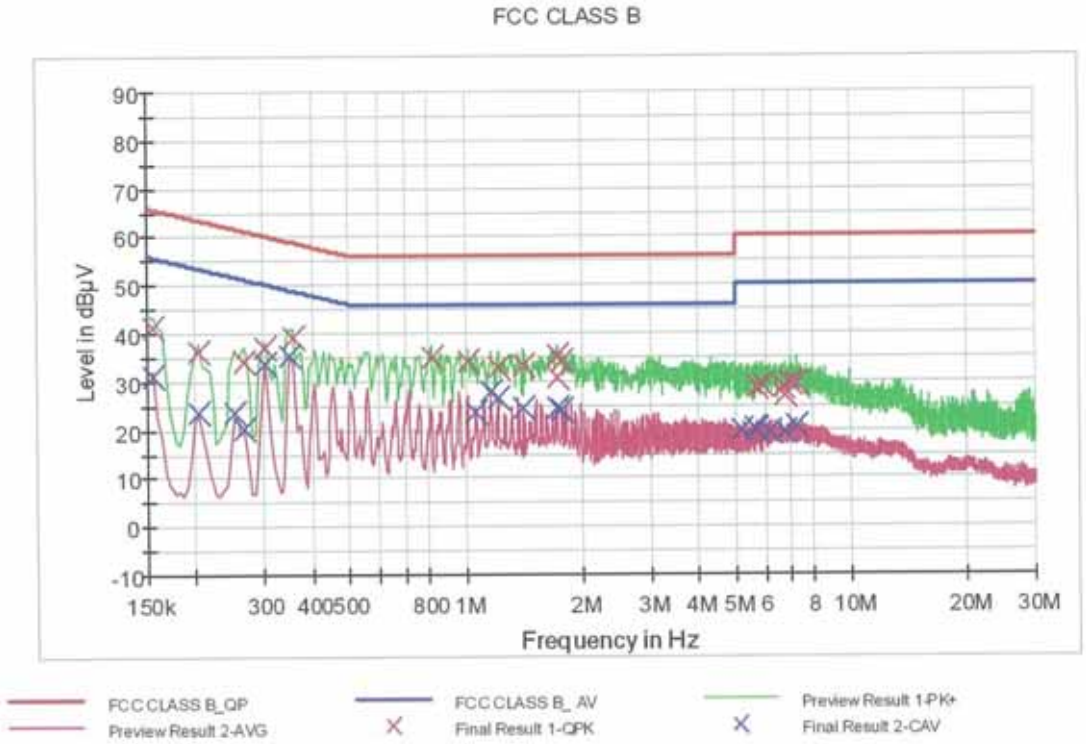
▣ RESULT PLOTS

Conducted Emissions (Line 1)

HCT TEST Report

Common Information

EUT:	LGL24
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN(5G)
Operator Name:	KH-SEO



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	41.3	9.000	Off	L1	9.7	24.5	65.8
0.204000	36.3	9.000	Off	L1	9.7	27.1	63.4
0.267000	33.9	9.000	Off	L1	9.7	27.3	61.2
0.303000	37.3	9.000	Off	L1	9.7	23.0	60.2
0.357000	39.1	9.000	Off	L1	9.7	19.7	58.8
0.815000	34.9	9.000	Off	L1	9.7	21.1	56.0
1.017500	34.3	9.000	Off	L1	9.7	21.7	56.0
1.215500	32.9	9.000	Off	L1	9.8	23.1	56.0
1.418000	33.4	9.000	Off	L1	9.8	22.6	56.0
1.728500	35.4	9.000	Off	L1	9.8	20.6	56.0
1.737500	30.8	9.000	Off	L1	9.8	25.2	56.0
1.773500	34.1	9.000	Off	L1	9.8	21.9	56.0
5.670500	28.7	9.000	Off	L1	10.2	31.3	60.0
5.873000	29.0	9.000	Off	L1	10.2	31.0	60.0
6.683000	28.7	9.000	Off	L1	10.2	31.3	60.0
6.737000	27.1	9.000	Off	L1	10.2	32.9	60.0

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Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
6.980000	29.4	9.000	Off	L1	10.3	30.6	60.0
7.182500	29.4	9.000	Off	L1	10.3	30.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	31.2	9.000	Off	L1	9.7	24.6	55.8
0.204000	23.8	9.000	Off	L1	9.7	29.6	53.4
0.253500	23.6	9.000	Off	L1	9.7	28.0	51.6
0.267000	20.4	9.000	Off	L1	9.7	30.8	51.2
0.303000	33.6	9.000	Off	L1	9.7	16.6	50.2
0.352500	35.2	9.000	Off	L1	9.7	13.7	48.9
1.067000	23.6	9.000	Off	L1	9.7	22.4	46.0
1.166000	27.9	9.000	Off	L1	9.8	18.1	46.0
1.215500	26.4	9.000	Off	L1	9.8	19.6	46.0
1.418000	24.3	9.000	Off	L1	9.8	21.7	46.0
1.724000	24.6	9.000	Off	L1	9.8	21.4	46.0
1.778000	24.2	9.000	Off	L1	9.8	21.8	46.0
5.216000	19.7	9.000	Off	L1	10.1	30.3	50.0
5.616500	20.2	9.000	Off	L1	10.1	29.8	50.0
5.670500	19.8	9.000	Off	L1	10.2	30.2	50.0
6.134000	19.6	9.000	Off	L1	10.2	30.4	50.0
6.737000	19.5	9.000	Off	L1	10.2	30.5	50.0
7.182500	20.7	9.000	Off	L1	10.3	29.3	50.0

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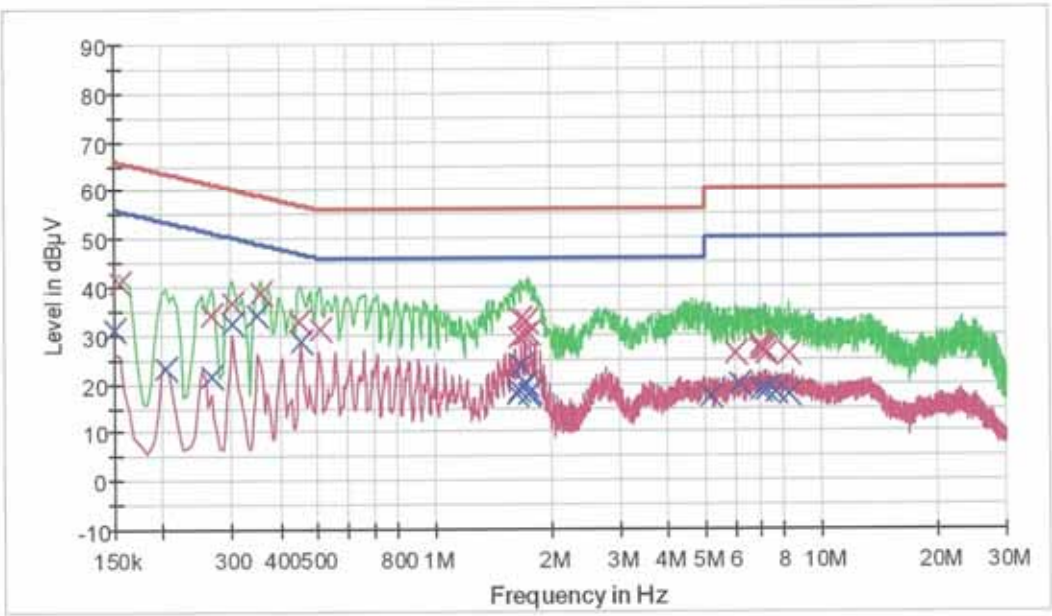
Conducted Emissions (Line 2)

HCT TEST Report

Common Information

EUT:	LGL24
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN(5G)
Operator Name:	KH-SEO

FCC CLASS B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	40.9	9.000	Off	N	9.7	24.9	65.8
0.267000	34.0	9.000	Off	N	9.7	27.2	61.2
0.303000	36.7	9.000	Off	N	9.7	23.5	60.2
0.357000	38.7	9.000	Off	N	9.7	20.1	58.8
0.451500	32.8	9.000	Off	N	9.7	24.0	56.8
0.509000	31.1	9.000	Off	N	9.7	24.9	56.0
1.652000	29.4	9.000	Off	N	9.8	26.6	56.0
1.661000	29.3	9.000	Off	N	9.8	26.7	56.0
1.679000	33.3	9.000	Off	N	9.8	22.7	56.0
1.701500	29.8	9.000	Off	N	9.8	26.2	56.0
1.733000	32.9	9.000	Off	N	9.8	23.1	56.0
1.755500	30.3	9.000	Off	N	9.8	25.7	56.0
6.008000	26.2	9.000	Off	N	10.2	33.8	60.0
6.944000	27.7	9.000	Off	N	10.3	32.3	60.0
6.953000	26.9	9.000	Off	N	10.3	33.1	60.0
7.119500	26.8	9.000	Off	N	10.3	33.2	60.0

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Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
7.164500	26.3	9.000	Off	N	10.3	33.7	60.0
8.267000	26.3	9.000	Off	N	10.3	33.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	31.0	9.000	Off	N	9.7	25.0	56.0
0.204000	23.4	9.000	Off	N	9.7	30.0	53.4
0.267000	21.4	9.000	Off	N	9.7	29.8	51.2
0.303000	32.3	9.000	Off	N	9.7	17.9	50.2
0.352500	34.2	9.000	Off	N	9.7	14.7	48.9
0.456000	28.8	9.000	Off	N	9.7	18.0	46.8
1.643000	17.8	9.000	Off	N	9.8	28.2	46.0
1.652000	18.5	9.000	Off	N	9.8	27.5	46.0
1.674500	23.6	9.000	Off	N	9.8	22.4	46.0
1.733000	19.7	9.000	Off	N	9.8	26.3	46.0
1.751000	17.7	9.000	Off	N	9.8	28.3	46.0
1.760000	18.2	9.000	Off	N	9.8	27.8	46.0
5.180000	17.3	9.000	Off	N	10.1	32.7	50.0
6.174500	20.0	9.000	Off	N	10.2	30.0	50.0
6.953000	18.6	9.000	Off	N	10.3	31.4	50.0
7.164500	18.4	9.000	Off	N	10.3	31.6	50.0
7.610000	18.3	9.000	Off	N	10.3	31.7	50.0
8.267000	17.9	9.000	Off	N	10.3	32.1	50.0

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9. LIST OF TEST EQUIPMENT

9.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	01/29/2014	Annual	01/29/2015	100073
Agilent	E4440A/ Spectrum Analyzer	04/09/2014	Annual	04/09/2015	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	05/23/2014	Annual	05/23/2015	MY51110063
Agilent	N1911A/Power Meter	01/24/2014	Annual	01/24/2015	MY45100523
Agilent	N1921A /POWER SENSOR	07/11/2013	Annual	07/11/2014	MY45241059
Hewlett Packard	11636B/Power Divider	10/22/2013	Annual	10/22/2014	11377
Agilent	87300B/Directional Coupler	12/18/2013	Annual	12/18/2014	3116A03621
Hewlett Packard	11667B / Power Splitter	01/27/2014	Annual	01/27/2015	10545
DIGITAL	EP-3010 /DC POWER SUPPLY	10/29/2013	Annual	10/29/2014	3110117
ITECH	IT6720 / DC POWER SUPPLY	11/05/2013	Annual	11/05/2014	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	04/24/2014	Annual	04/24/2015	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/07/2014	Annual	05/07/2015	100422
Agilent	8493C / Attenuator(10 dB)	07/24/2013	Annual	07/24/2014	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	10/28/2013	Annual	10/28/2014	BR0617
NAENG YEOL CO.LTD	NY-THR18750/ Temp & Humidity Chamber	10/30/2013	Annual	10/30/2014	NY-200912201A

Note: This equipment (N9020A/ SIGNAL ANALYZER) is used after 05/23/2014 and actual calibration date is 05/23/2014

This equipment (CBT / BLUETOOTH TESTER) is used after 05/07/2014 and actual calibration date is 05/07/2014

9.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Schwarzbeck	VULB 9160/ TRILOG Antenna	12/17/2012	Biennial	12/17/2014	3150
Rohde & Schwarz	ESCI / EMI TEST RECEIVER	01/24/2014	Annual	01/24/2015	100584
HD	MA240/ Antenna Position Tower	N/A	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	09/10/2013	Annual	09/10/2014	10094
CERNEX	CBL18265035 / POWER AMP	07/24/2013	Annual	07/24/2014	22966
CERNEX	CBL26405040 / POWER AMP	04/04/2014	Annual	04/04/2015	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	07/05/2013	Biennial	07/05/2015	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	10/30/2012	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	01/24/2014	Annual	01/24/2015	839117/011
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	02/03/2014	Annual	02/03/2015	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	04/09/2014	Annual	04/09/2015	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	04/04/2014	Annual	04/04/2015	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	06/24/2013	Annual	06/24/2014	1
TESCOM	TC-3000C / BLUETOOTH TESTER	04/24/2014	Annual	04/24/2015	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/07/2014	Annual	05/07/2015	100422
Rohde & Schwarz	LOOP ANTENNA	08/14/2012	Biennial	08/14/2014	100179
CERNEX	CBL06185030 / POWER AMP	07/24/2013	Annual	07/24/2014	22965
CERNEX	CBLU1183540 / POWER AMP	07/24/2013	Annual	07/24/2014	22964

Note:

This equipment (CBT / BLUETOOTH TESTER) is used after 05/07/2014 and actual calibration date is 05/07/2014