HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu Suwon-si,
Gyeonggi-do, 443-742 Rep. of Korea

Date of Issue:
June 30, 2014
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, Korea
Report No.: HCT-R-1405-F042-3
HCT FRN: 0005866421
IC Recognition No.: 5944A-3

FCC ID	**: A3LWEA412I**
IC	**: 649E-WEA412I**
APPLICANT	**: SAMSUNG Electronics Co., Ltd.**

FCC/IC Model(s):	WEA412i
EUT Type:	WLAN Access Point
Max. RF Output Power: Service Port 0	Wi-Fi 802.11a (5260~5320) (14.98 dBm)/ Wi-Fi 802.11a (5500~5720) (15.44 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(15.86 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5720)(17.41 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (10.10 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5710) (16.56 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5260~5320) (14.73 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5500~5720) (17.38 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5270~5310) (9.15 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5510~5710) (16.70 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5290) (8.54 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5530~5690) (16.87 dBm)
Max. RF Output Power: Service Port 1	Wi-Fi 802.11a (5260~5320) (14.66 dBm)/ Wi-Fi 802.11a (5500~5720) (15.19 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(15.73 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5720)(17.25 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (10.04 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5710) (16.73 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5260~5320) (14.71 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5500~5720) (17.22 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5270~5310) (9.20 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5510~5710) (16.80 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5290) (8.63 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5530~5690) (16.88 dBm)
Frequency Range:	20 MHz BW: 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5720 MHz (UNII 2C) 40 MHz BW: 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5710 MHz (UNII 2C) 80 MHz BW: 5290 MHz (UNII 2A)/ 5530 MHz - 5690 MHz (UNII 2C)
Modulation type:	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(UNII)
FCC Rule Part(s):	Part 15.407
IC Rule(s):	RSS-GEN Issue 3(December 2010), RSS-210 Issue 8(December 2010)

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
: Jong Seok Lee
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1405-F042	May 29, 2014	- First Approval Report
HCT-R-1405-F042-1	June 18, 2014	- Add the Conducted Power with TPC
HCT-R-1405-F042-2	June 20, 2014	- Updated the KDB version for 802.11ac
HCT-R-1405-F042-3	June 30, 2014	- Updated the note for 802.11ac on Page 103, 121 - Adding the TPC information

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1. GENERAL INFORMATION

Applicant:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea
FCC ID:	A3LWEA412I
IC:	649E-WEA412I
EUT Type:	WLAN Access Point
FCC/ IC Model name(s):	WEA412i
Date(s) of Tests:	April 05, 2014 ~ May 27, 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	WLAN Access Point	
FCC/ IC Model Name	WEA412i	
Power Supply	AC adaptor : 100 V ~ 240 V, POE : DC 48 V	
Frequency Range	TX_20 MHz BW:	5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5720 MHz (UNII 2C)
	40 MHz BW:	5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5710 MHz (UNII 2C)
	80 MHz BW:	5290 MHz (UNII 2A)/ 5530 MHz - 5690 MHz (UNII 2C)
	RX_20 MHz BW:	5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5720 MHz (UNII 2C)
	40 MHz BW:	5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5710 MHz (UNII 2C)
	80 MHz BW:	5290 MHz (UNII 2A)/ 5530 MHz - 5690 MHz (UNII 2C)
Max. RF Output Power: Service Port 0	Wi-Fi 802.11a (5260~5320) (14.98 dBm)/ Wi-Fi 802.11a (5500~5720) (15.44 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(15.86 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5720)(17.41 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (10.10 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5710) (16.56 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5260~5320) (14.73 dBm)/ Wi-Fi 802.11ac_20 MHz BW (5500~5720) (17.38 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5270~5310) (9.15 dBm)/ Wi-Fi 802.11ac_40 MHz BW (5510~5710) (16.70 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5290) (8.54 dBm)/ Wi-Fi 802.11ac_80 MHz BW (5530~5690) (16.87 dBm)	
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Modulation Type	OFDM(802.11a, 802.11n, 802.11ac)	
Antenna Specification	Manufacturer: ACE Technology Antenna type: Internal Antenna Peak Gain : cf. Section 6	

2.1 EUT OPERATING MODE

▣ Operating mode

Port	Mode	Operating Mode	Operating Ant.
Service	802.11a,n,ac	SISO	Ant 0
			Ant 1
		MIMO	Ant 0 & 1

Note :

1. This EUT is supported the AC adaptor and POE. Because worst case is AC adaptor, so we attached only the results for AC adaptor.
2. In case of radiation test, we have done all test case. Worst case is Ant 0 & 1 for service. So, we attached the results of only worst case.

3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D01 General UNII Test Procedures Old Rules v01r04 dated June 06, 2014 entitled " Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E" and the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) were used in the measurement.

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

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

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 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

▣ Directional Gain Calculations

▪ If any transmit signals are correlated with each other(802.11a,n,ac),

Directional gain = $10*\log[(10^{G1/20} + 10^{G2/20}+\ldots+10^{GN/20})^2/N]$ dBi

▪ If all transmit signals are completely uncorrelated with each other(802.11n,ac)

Directional gain = $10*\log[(10^{G1/10} + 10^{G2/10}+\ldots+10^{GN/10})/N]$ dBi

▣ Antenna Gain

CDD mode(UNII 2A)

Service	Antenna Gain	Ant 0	6.62 dBi
		Ant 1	6.17 dBi
	Directional Antenna Gain	Ant 0 & 1	9.41 dBi(802.11a,n,ac)

CDD mode(UNII 2C)

Service	Antenna Gain	Ant 0	5.71 dBi
		Ant 1	5.32 dBi
	Directional Antenna Gain	Ant 0 & 1	8.53 dBi(802.11a,n,ac)

Note : This EUT is supported CDD and SDM for 802.11n, ac. So, we applied the CDD mode for antenna gain. Because highest gain is CDD mode and worst case is CDD mode.

7. SUMMARY OF TEST RESULTS

7.1 FCC Part

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§15.407 (for Power Measurement)	NA	CONDUCTED	PASS
Maximum Conducted Output Power,	§15.407(a)(1)	< 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)	<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		NA
AC Conducted Emissions 150 kHz-30 MHz	§15.207	<FCC 15.207 limits		NA
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

7.2 IC Part

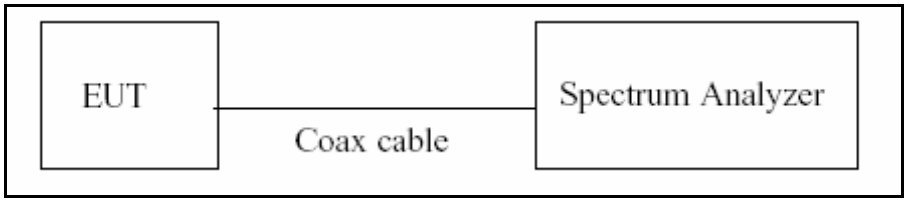
Test Description	IC Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth(IC)	RSS-GEN 4.6.1	NA	CONDUCTED	PASS
Maximum Conducted Output Power and Maximum e.i.r.p	RSS-210 [A9.2]	Conducted: < 250 mW or 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5470-5600 & 5650-5725 MHz) Whichever power is less e.i.r.p. : < 1 W or 17+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 1 W or 17+10 log $_{10}$ (BW) dBm (5470-5600 & 5650-5725 MHz) Whichever power is less		PASS
Peak Power Spectral Density	RSS-210 [A9.2]	<11 dBm/ MHz (5250-5350) <11 dBm/ MHz (5470-5600 & 5650-5725 MHz)		PASS
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, Section 7.2.4	RSS-GEN section 7.2.4 table 4		NA
Undesirable Emissions	RSS-210 [A8.5]	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5600 MHz 5650-5725 MHz)	RADIATED	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-GEN, Section 7.2.3	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS
Receiver Spurious Emissions	RSS-GEN, Section 7.2.3	cf. Section 8.8.3		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 06/06/2014)
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

Service Port

Mode	Data Rate	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor
802.11a	6	2.060	2.170	0.94930876	0.226
	9	1.360	1.450	0.93793103	0.278
	12	1.025	1.095	0.93607306	0.287
	18	0.680	0.730	0.93150685	0.308
	24	0.524	0.558	0.93906810	0.273
	36	0.354	0.386	0.91709845	0.376
	48	0.272	0.302	0.90066225	0.454
	54	0.238	0.270	0.88148148	0.548
802.11n_HT20	6.5	1.920	2.015	0.95285360	0.210
	13	0.981	1.026	0.95614035	0.195
	19.5	0.664	0.698	0.95128940	0.217
	26	0.508	0.532	0.95488722	0.200
	39	0.352	0.376	0.93617021	0.286
	52	0.272	0.296	0.91891892	0.367
	58.5	0.248	0.272	0.91176471	0.401
	65	0.228	0.252	0.90476190	0.435
802.11n_HT40	13.5	0.944	1.042	0.90595010	0.429
	27	0.492	0.540	0.91111111	0.404
	40.5	0.339	0.373	0.90884718	0.415
	54	0.264	0.288	0.91666667	0.378
	81	0.188	0.212	0.88679245	0.522
	108	0.152	0.175	0.86857143	0.612
	121.5	0.140	0.163	0.85889571	0.661
	135	0.128	0.152	0.84210526	0.746

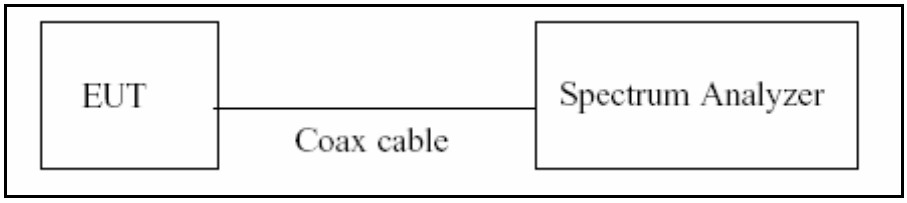
Mode	Data Rate	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11ac_VHT20	6.5	1.920	2.015	0.95285360	0.210
	13	0.981	1.026	0.95614035	0.195
	19.5	0.664	0.698	0.95128940	0.217
	26	0.508	0.532	0.95488722	0.200
	39	0.352	0.376	0.93617021	0.286
	52	0.272	0.296	0.91891892	0.367
	58.5	0.248	0.272	0.91176471	0.401
	65	0.228	0.252	0.90476190	0.435
	78	0.200	0.228	0.87478109	0.581
802.11ac_VHT40	13.5	0.944	1.042	0.90595010	0.429
	27	0.492	0.540	0.91111111	0.404
	40.5	0.339	0.373	0.90987124	0.410
	54	0.264	0.288	0.91826087	0.370
	81	0.188	0.212	0.88747045	0.518
	108	0.152	0.175	0.86643836	0.623
	121.5	0.140	0.163	0.85661765	0.672
	135	0.128	0.152	0.84356436	0.739
	162	0.116	0.144	0.80416667	0.947
	180	0.112	0.140	0.79928571	0.973
802.11ac_VHT80	29.3	0.459	0.488	0.94057377	0.266
	58.5	0.251	0.280	0.89767442	0.469
	87.8	0.180	0.209	0.86330935	0.638
	117	0.148	0.176	0.83863636	0.764
	175.5	0.112	0.140	0.79871060	0.976
	234	0.096	0.124	0.76975060	1.136
	263.3	0.088	0.116	0.75537403	1.218
	292.5	0.084	0.113	0.74742451	1.264
	351	0.076	0.104	0.72974013	1.368
	390	0.072	0.100	0.71740000	1.442

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 06/06/2014), 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 06/06/2014)

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 %.

Service Port Ant.0

▣ 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.			
5260	52	20.44	N/A	Pass
5300	60	19.87	N/A	Pass
5320	64	19.86	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	19.57	N/A	Pass
5580	116	20.69	N/A	Pass
5720	144	20.70	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	23.53	N/A	Pass
5300	60	20.01	N/A	Pass
5320	64	20.15	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	20.21	N/A	Pass
5580	116	20.64	N/A	Pass
5720	144	23.58	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	20.35	N/A	Pass
5300	60	20.34	N/A	Pass
5320	64	20.46	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	20.52	N/A	Pass
5580	116	26.54	N/A	Pass
5720	144	28.26	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.			
5270	54	39.74	N/A	Pass
5310	62	39.71	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	39.54	N/A	Pass
5550	110	39.82	N/A	Pass
5710	142	54.67	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	39.46	N/A	Pass
5310	62	39.55	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	39.36	N/A	Pass
5550	110	39.91	N/A	Pass
5710	142	59.33	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.			
5290	58	81.68	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	82.14	N/A	Pass
5690	138	117.0	N/A	Pass

Service Port Ant.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.			
5260	52	19.65	N/A	Pass
5300	60	19.54	N/A	Pass
5320	64	19.84	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	20.03	N/A	Pass
5580	116	20.39	N/A	Pass
5720	144	20.56	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	27.50	N/A	Pass
5300	60	20.25	N/A	Pass
5320	64	20.13	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	20.19	N/A	Pass
5580	116	20.84	N/A	Pass
5720	144	22.34	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	20.26	N/A	Pass
5300	60	20.20	N/A	Pass
5320	64	20.24	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.			
5500	100	20.26	N/A	Pass
5580	116	20.38	N/A	Pass
5720	144	25.40	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.			
5270	54	39.67	N/A	Pass
5310	62	39.64	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	39.57	N/A	Pass
5550	110	39.49	N/A	Pass
5710	142	58.08	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	39.63	N/A	Pass
5310	62	39.59	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	39.65	N/A	Pass
5550	110	40.28	N/A	Pass
5710	142	57.72	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.			
5290	58	82.20	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	82.12	N/A	Pass
5690	138	116.30	N/A	Pass

Note :

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

Service Port Ant.0

▣ 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.			
5250	52	18.40	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.			
5250	52	19.16	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.			
5250	52	19.16	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.			
5260	54	37.57	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.			
5260	54	37.64	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.			
5270	58	78.30	N/A	Pass

Note : We performed the 20 dB BW test to prove that no part of the fundamental emissions of any UNII2 band signal lies within the UNII band 1.

Service Port Ant.1

▣ 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.			
5250	52	18.19	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.			
5250	52	19.00	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.			
5250	52	19.00	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.			
5260	54	37.63	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.			
5260	54	37.69	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.			
5270	58	78.33	N/A	Pass

Note : We performed the 20 dB BW test to prove that no part of the fundamental emissions of any UNII2 band signal lies within the UNII band 1.

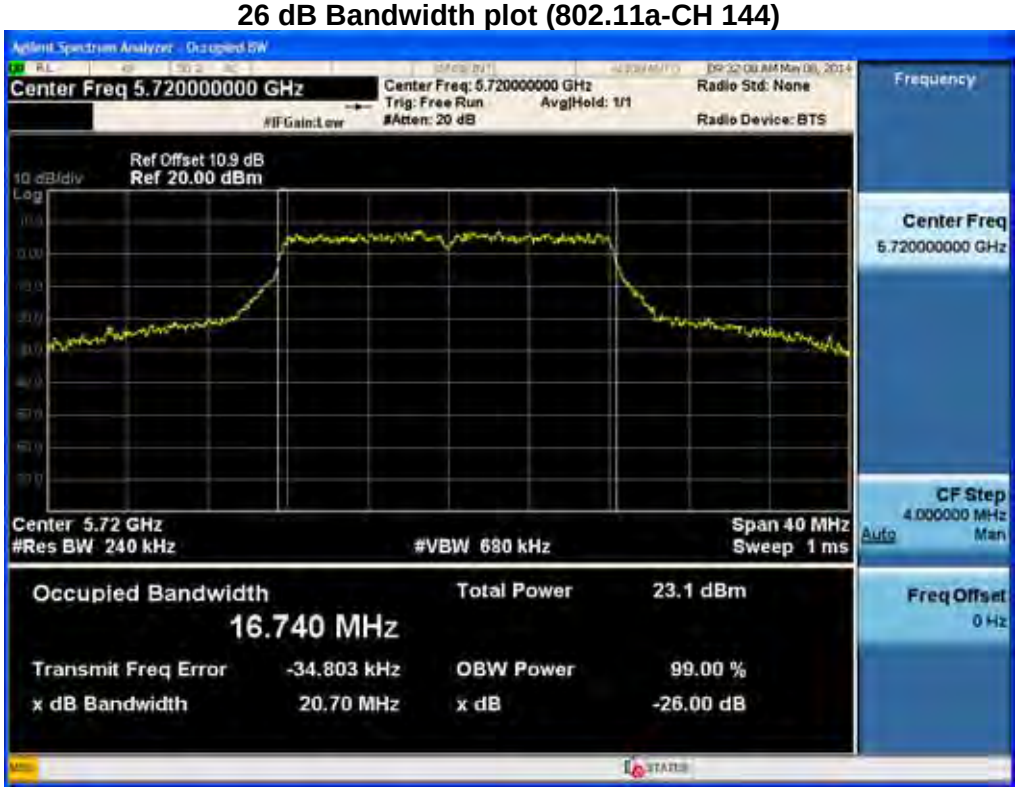
Service Port Ant.0

▣ RESULT PLOTS

20 MHz BW

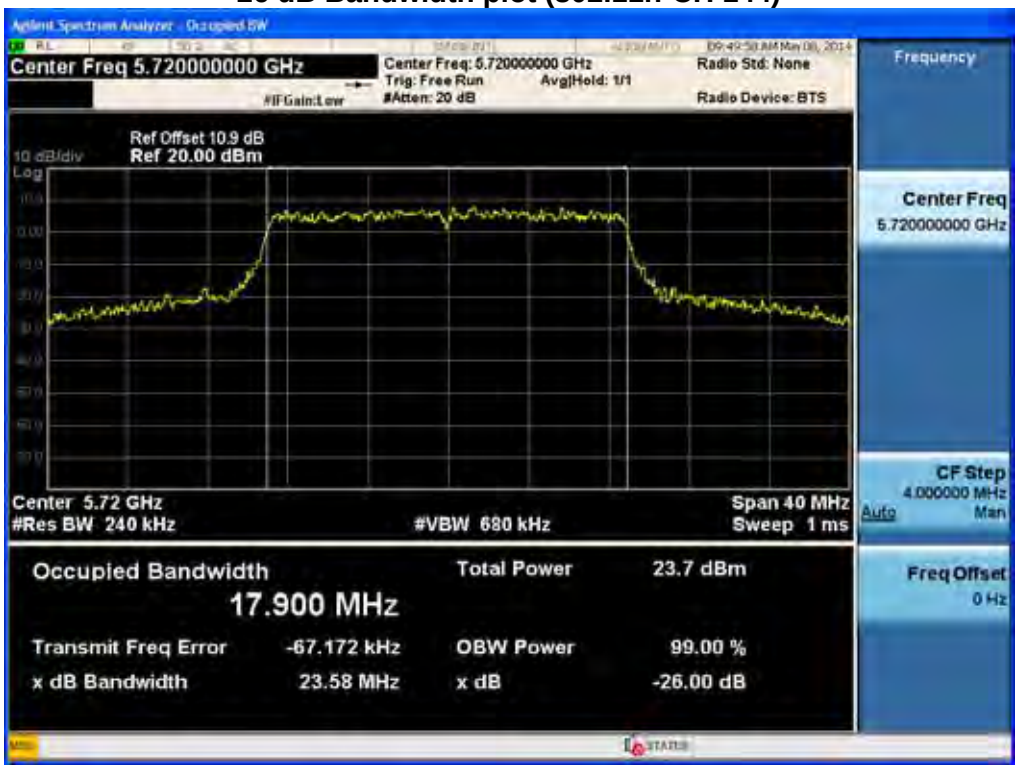
26 dB Bandwidth plot (802.11a-CH 52)

26 dB Bandwidth plot (802.11a-CH 144)



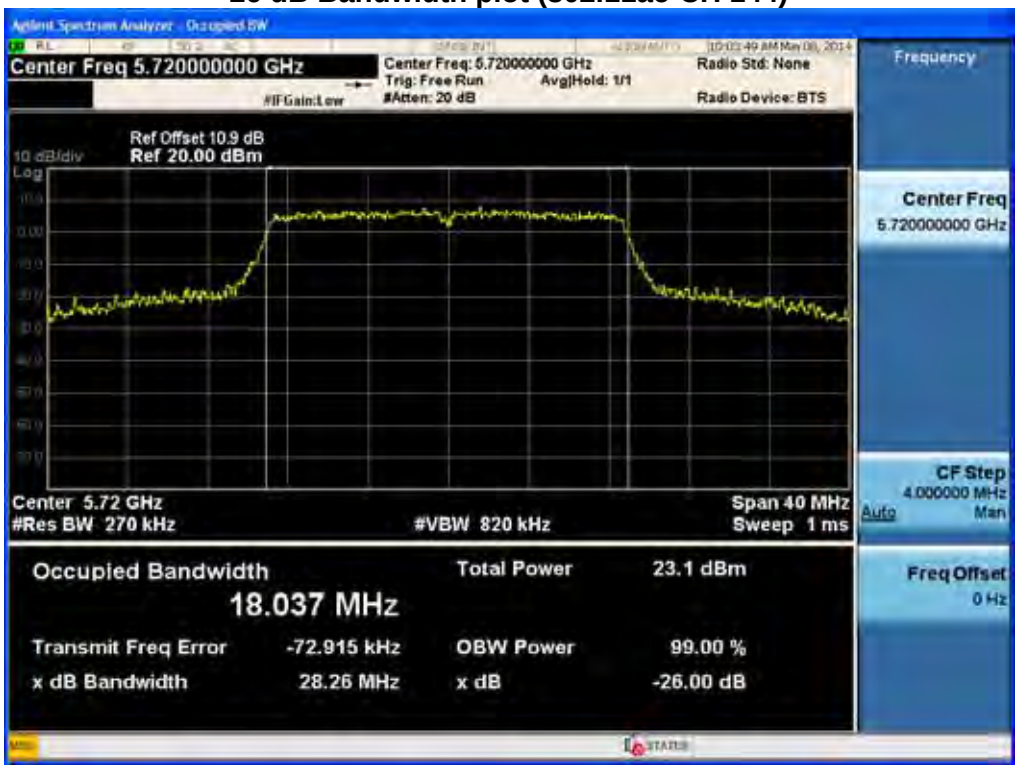
26 dB Bandwidth plot (802.11n-CH 52)

26 dB Bandwidth plot (802.11n-CH 144)



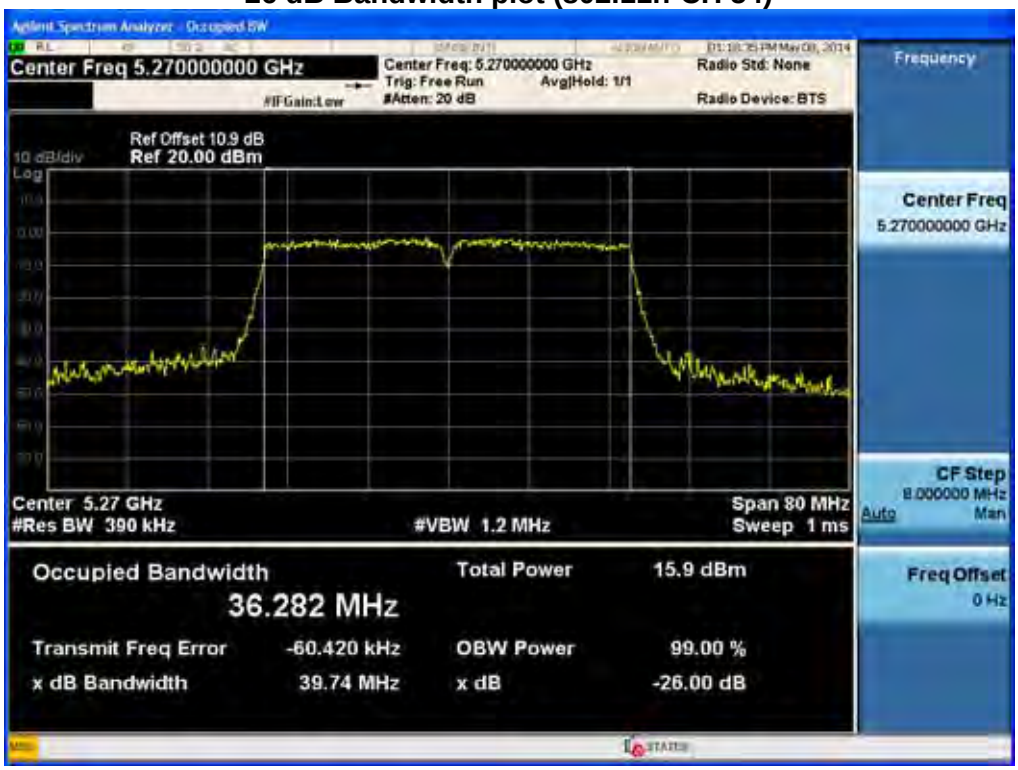
26 dB Bandwidth plot (802.11ac-CH 64)

26 dB Bandwidth plot (802.11ac-CH 144)

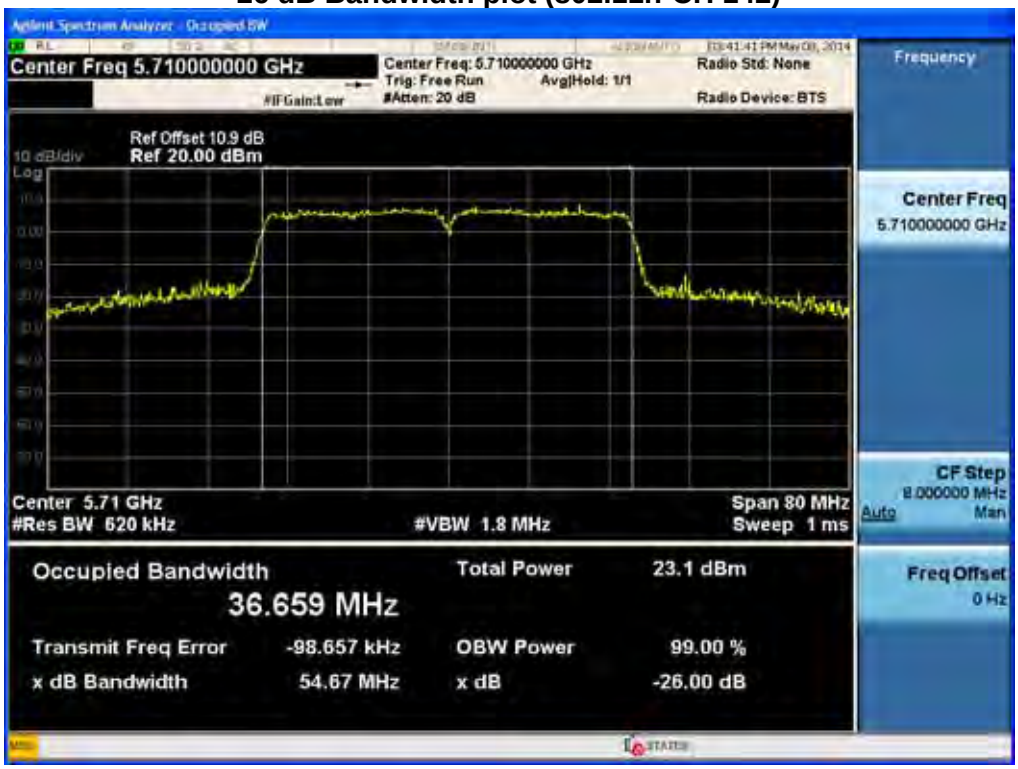


40 MHz BW

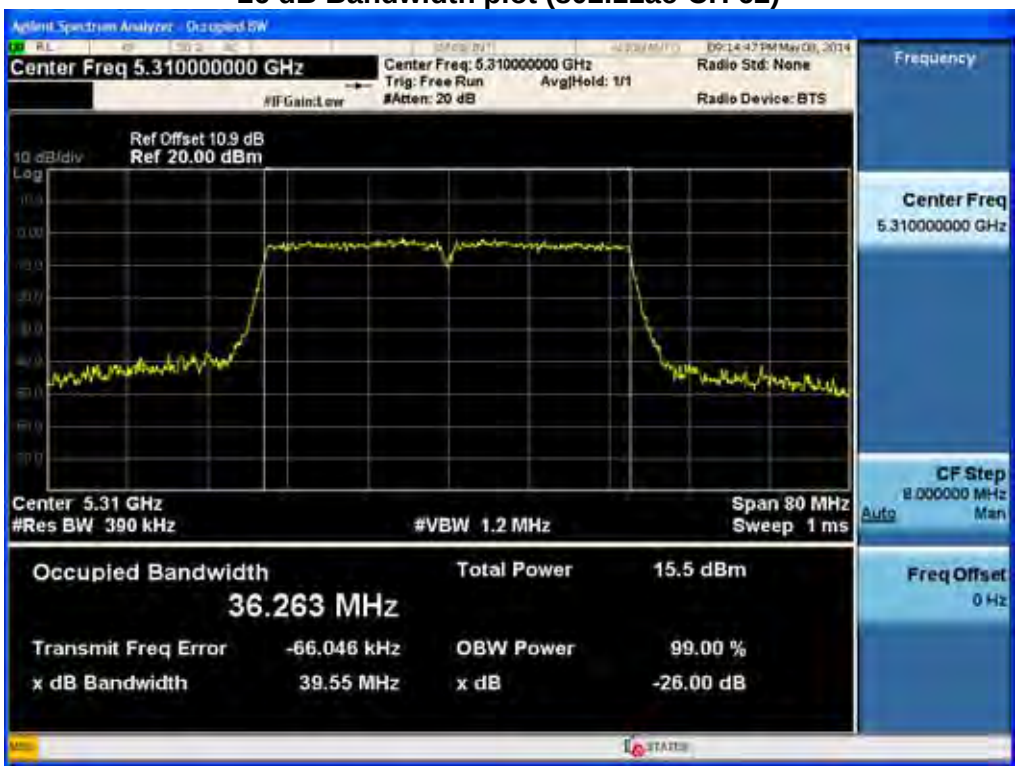
26 dB Bandwidth plot (802.11n-CH 54)



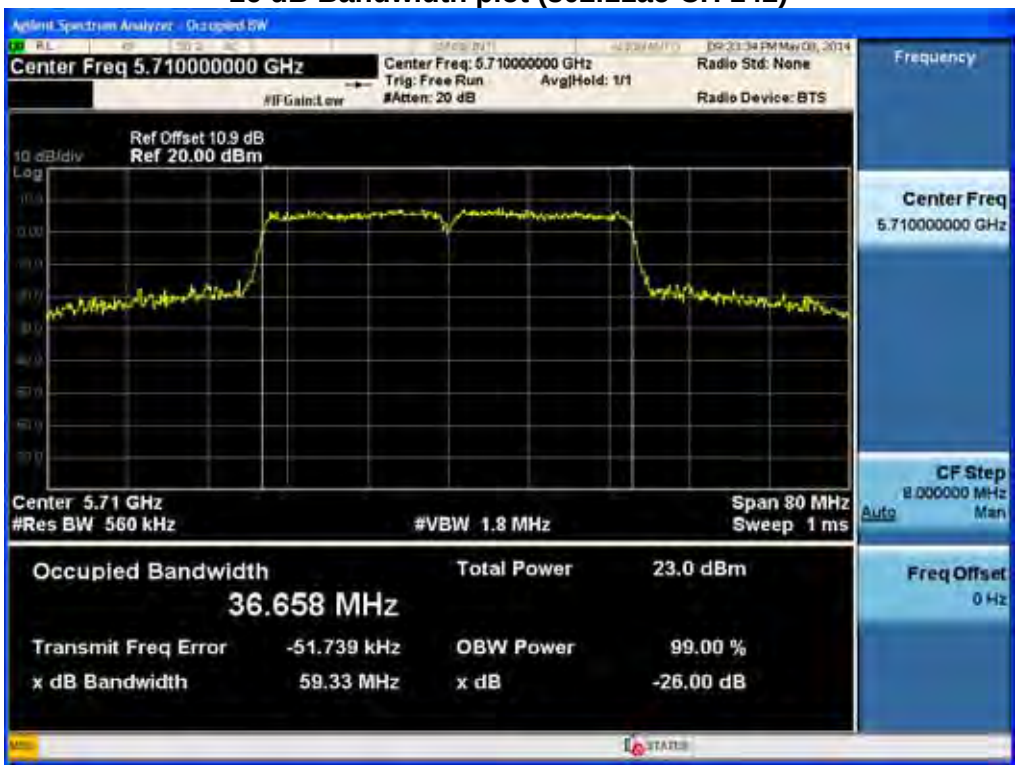
26 dB Bandwidth plot (802.11n-CH 142)



26 dB Bandwidth plot (802.11ac-CH 62)

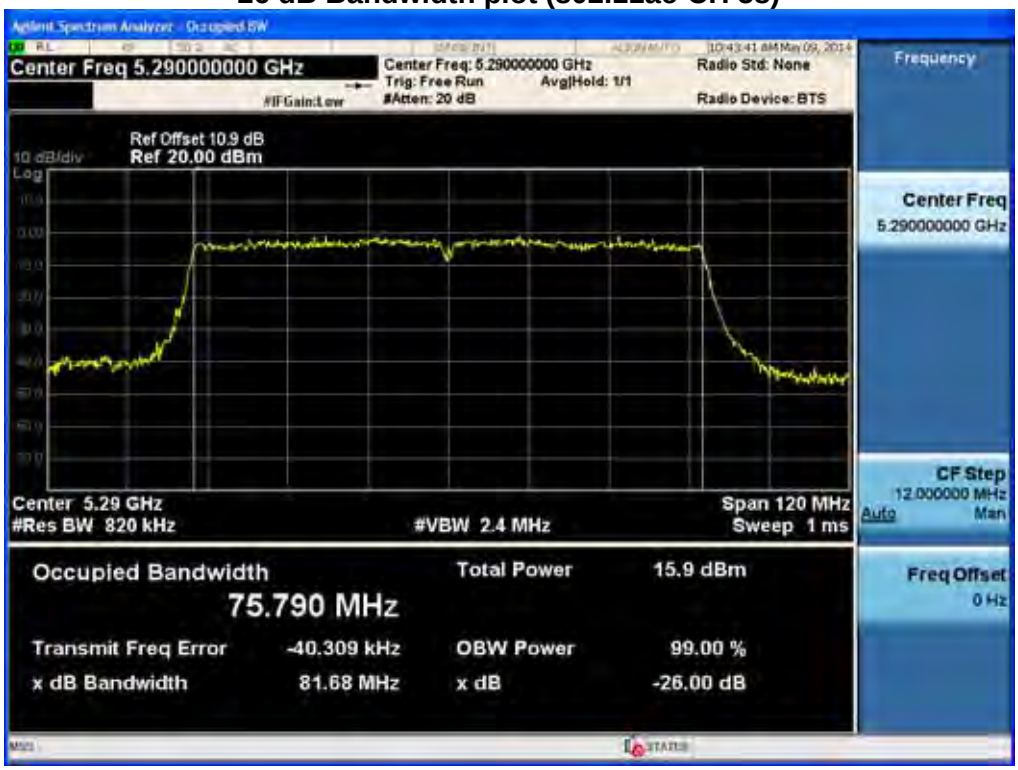


26 dB Bandwidth plot (802.11ac-CH 142)

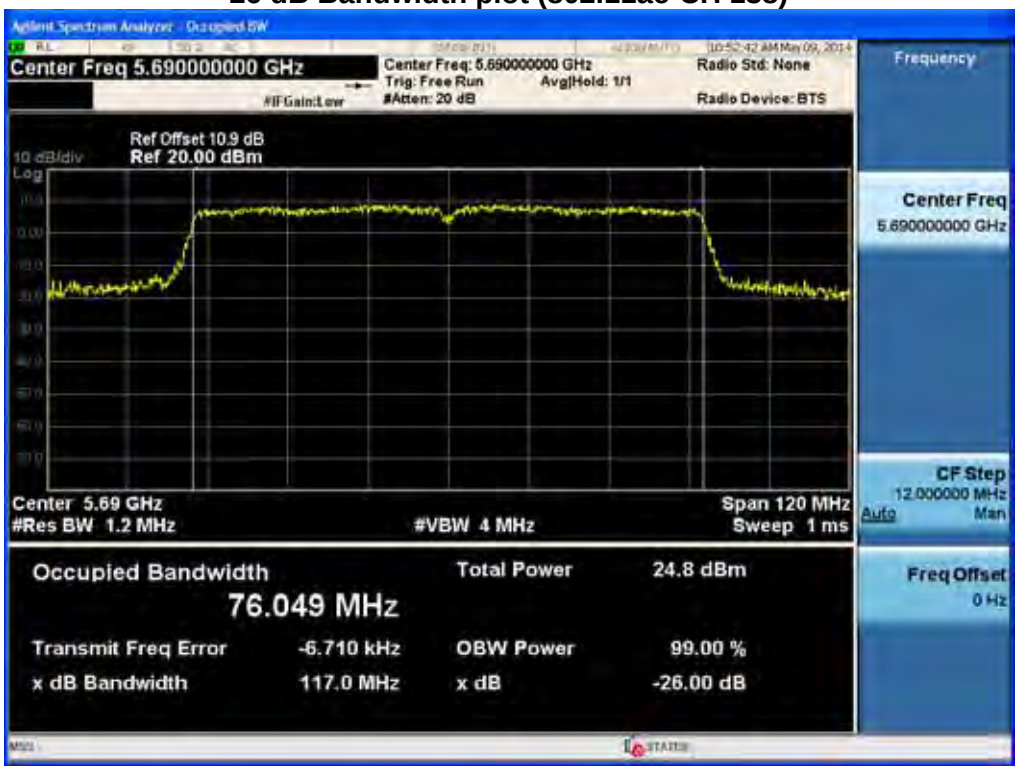


80 MHz BW

26 dB Bandwidth plot (802.11ac-CH 58)



26 dB Bandwidth plot (802.11ac-CH 138)



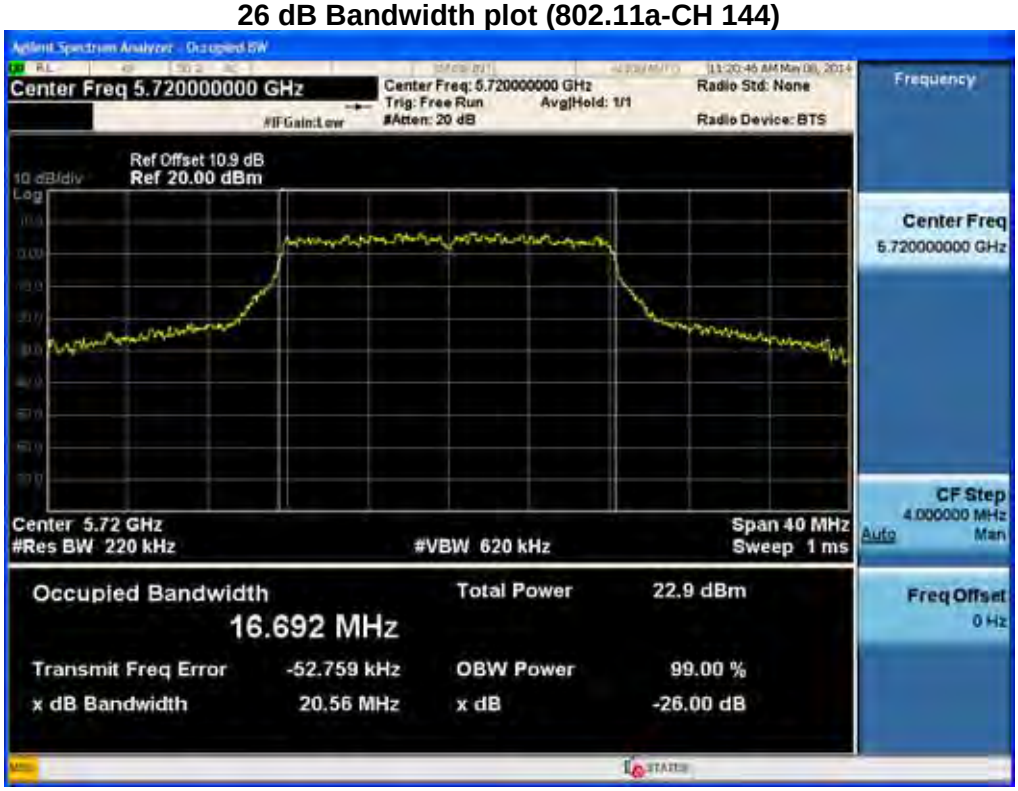
Service Port Ant.1

▣ RESULT PLOTS

20 MHz BW

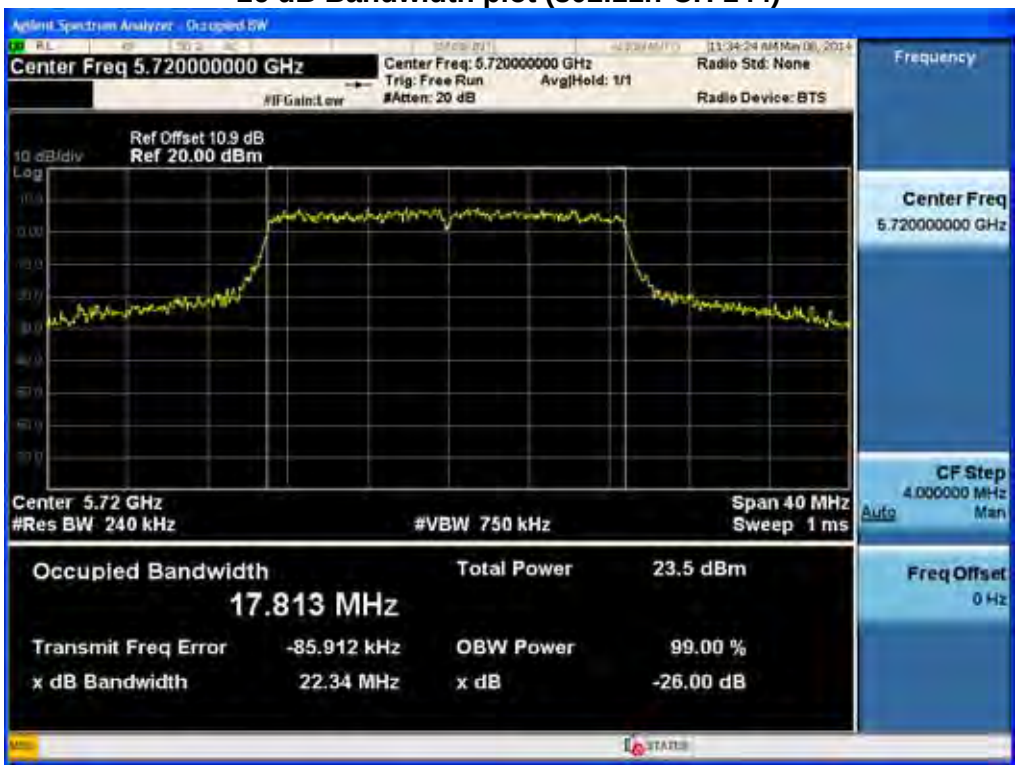
26 dB Bandwidth plot (802.11a-CH 64)

26 dB Bandwidth plot (802.11a-CH 144)



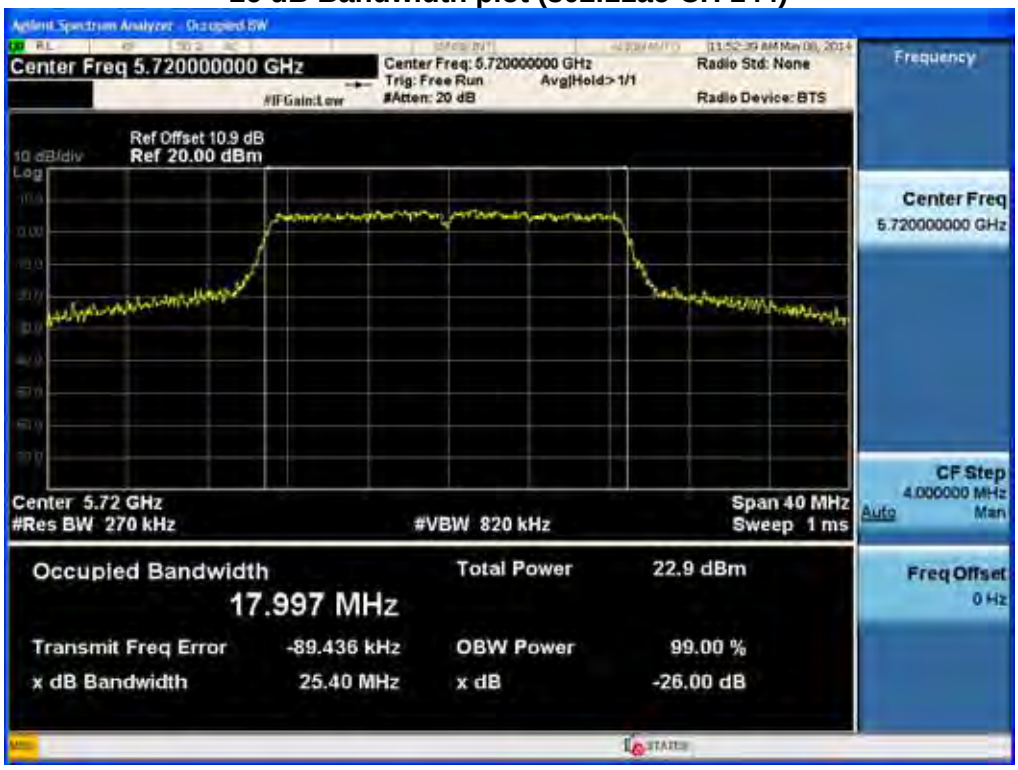
26 dB Bandwidth plot (802.11n-CH 52)

26 dB Bandwidth plot (802.11n-CH 144)



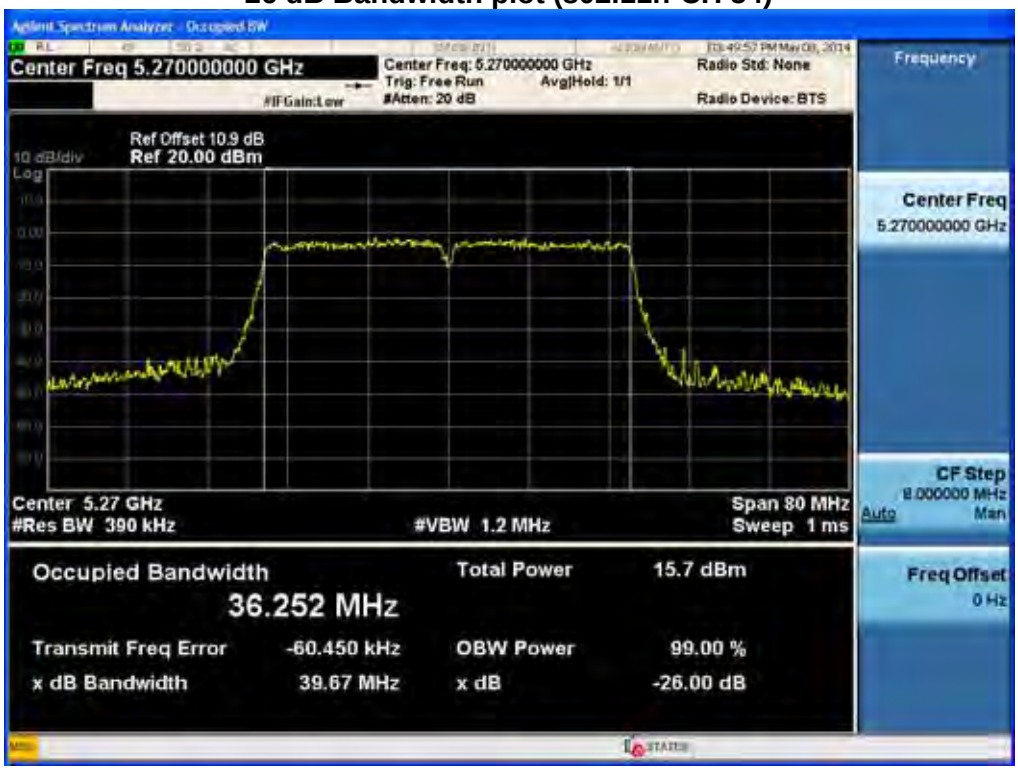
26 dB Bandwidth plot (802.11ac-CH 52)

26 dB Bandwidth plot (802.11ac-CH 144)

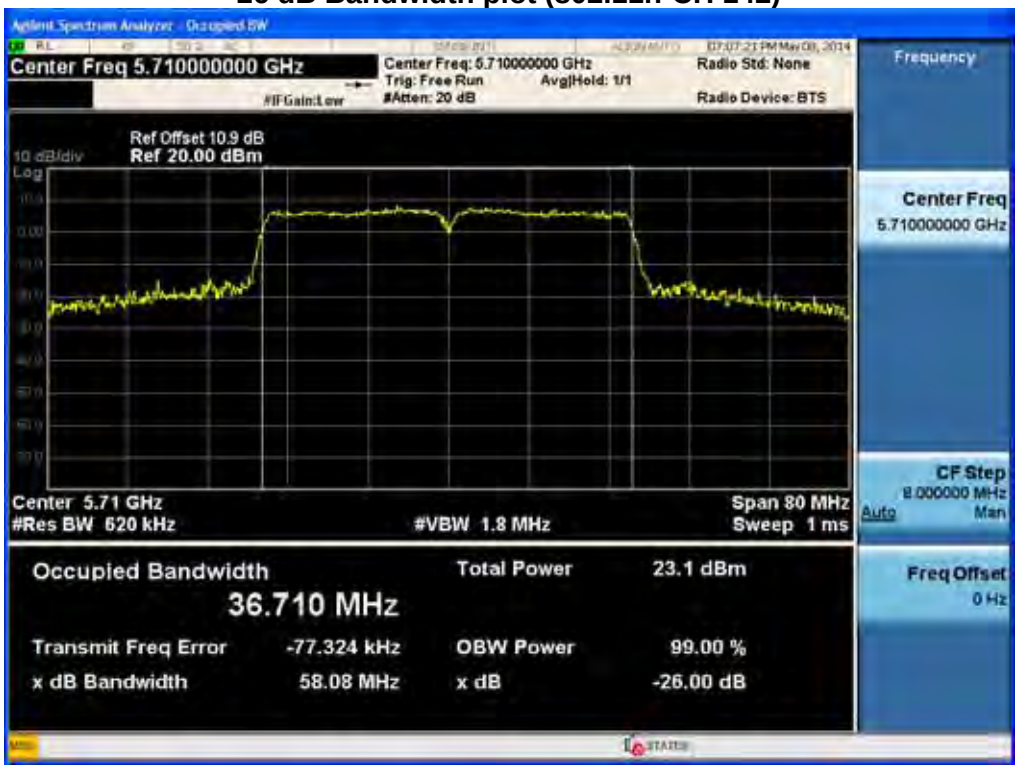


40 MHz BW

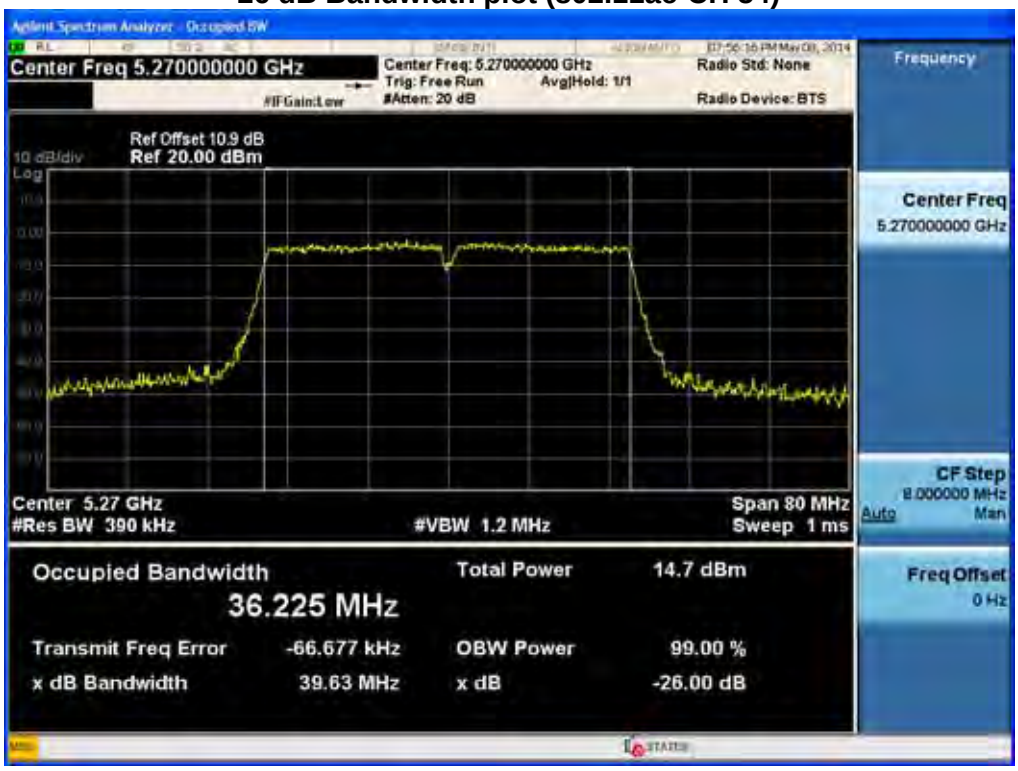
26 dB Bandwidth plot (802.11n-CH 54)



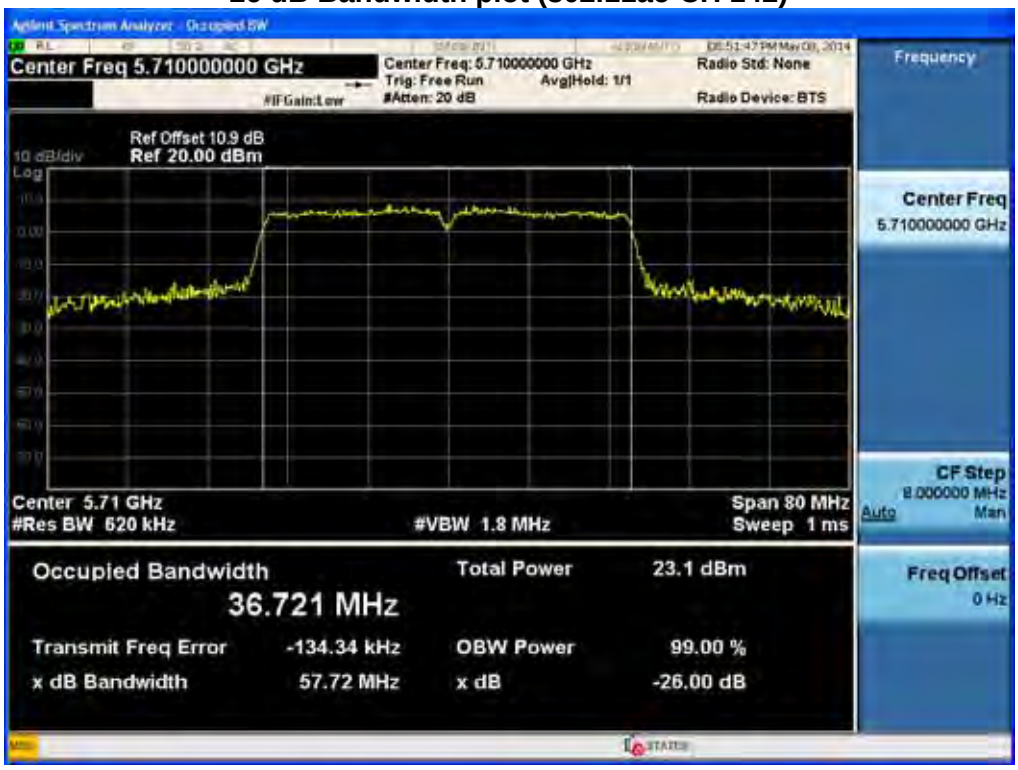
26 dB Bandwidth plot (802.11n-CH 142)



26 dB Bandwidth plot (802.11ac-CH 54)

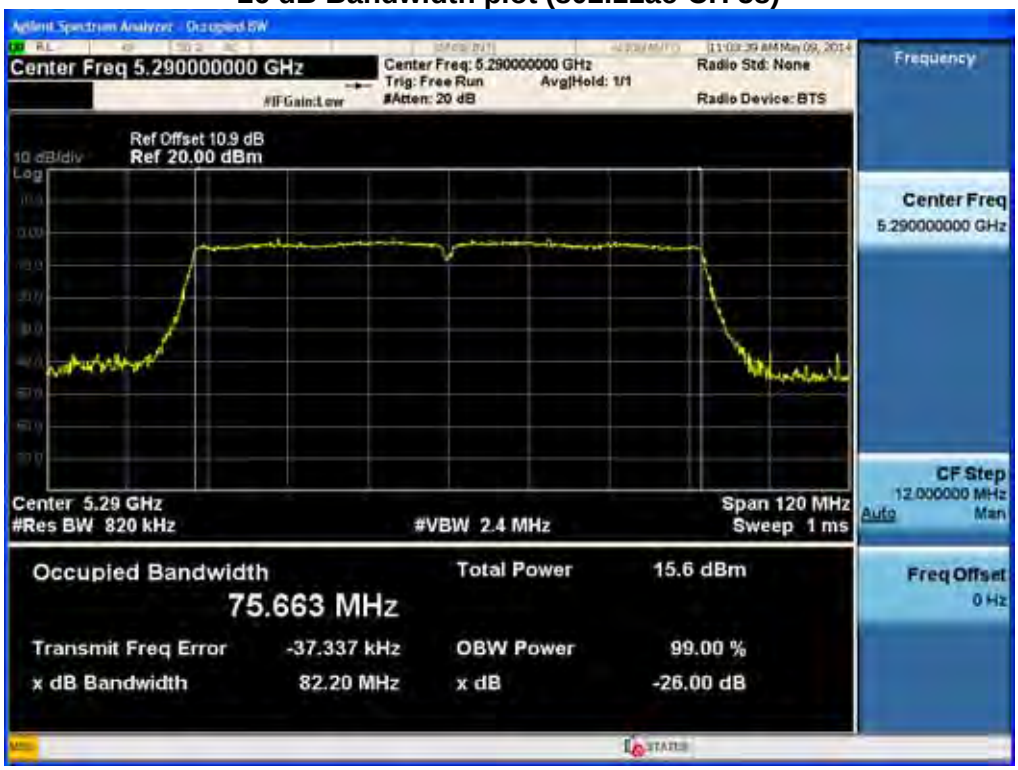


26 dB Bandwidth plot (802.11ac-CH 142)

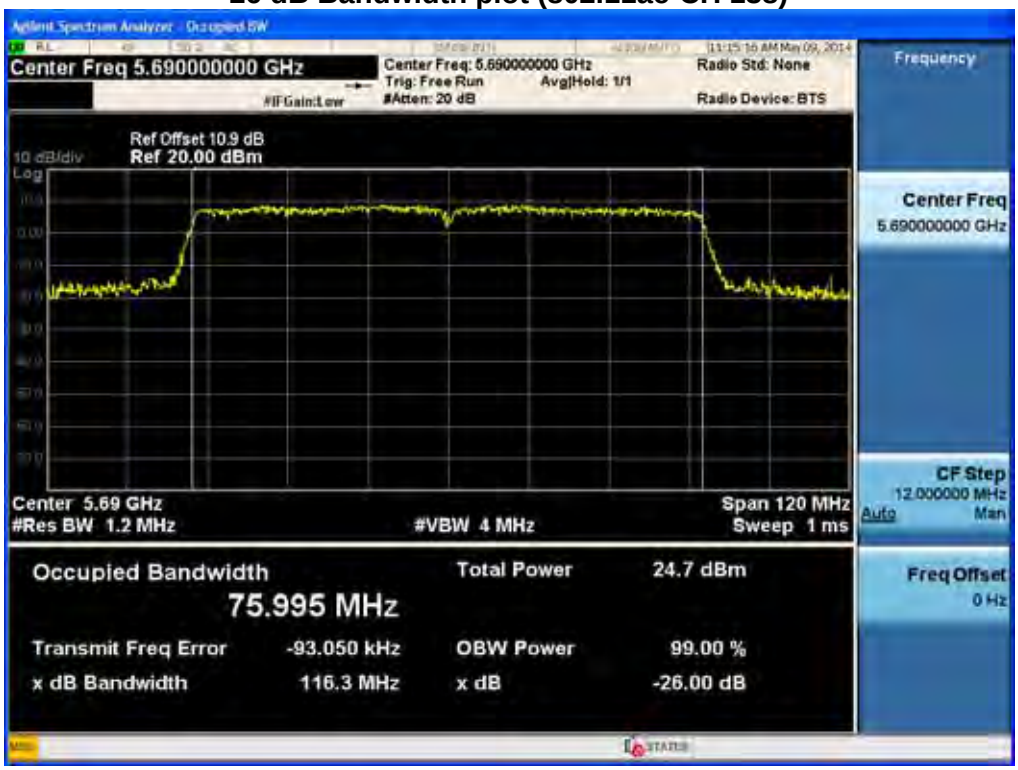


80 MHz BW

26 dB Bandwidth plot (802.11ac-CH 58)



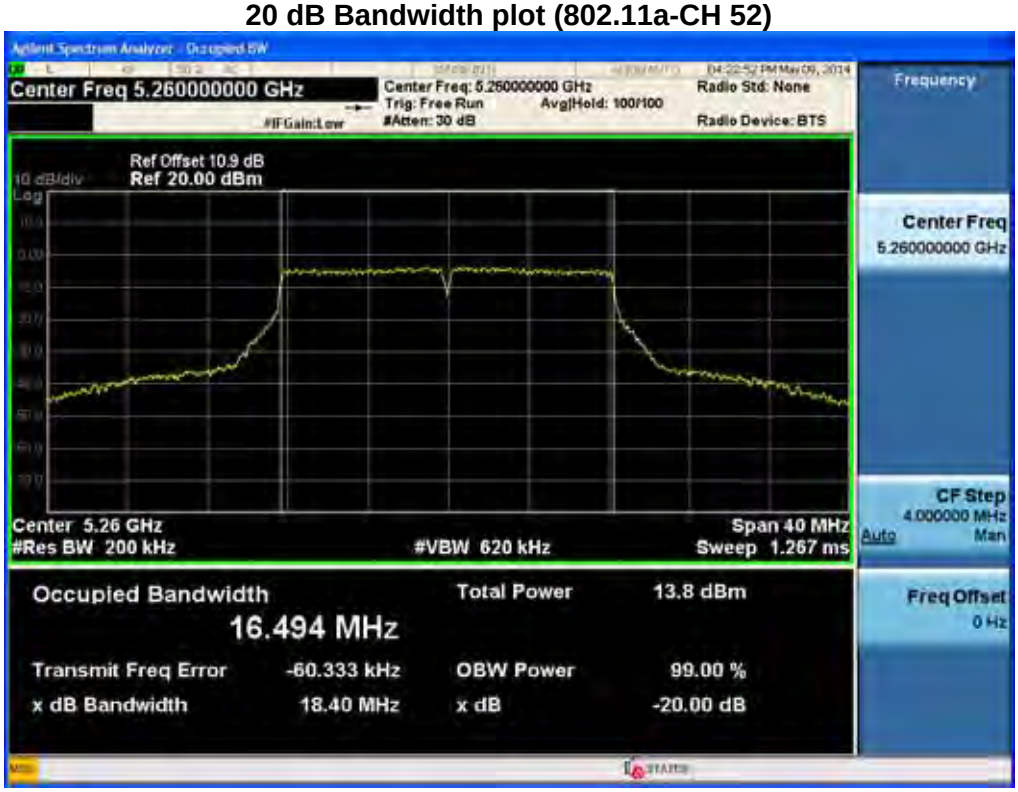
26 dB Bandwidth plot (802.11ac-CH 138)



Service Port Ant.0

▣ RESULT PLOTS(20 dB Bandwidth)

20 dB Bandwidth plot (802.11a-CH 52)



20 dB Bandwidth plot (802.11n-CH 52)

20 dB Bandwidth plot (802.11ac-CH 52)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54)

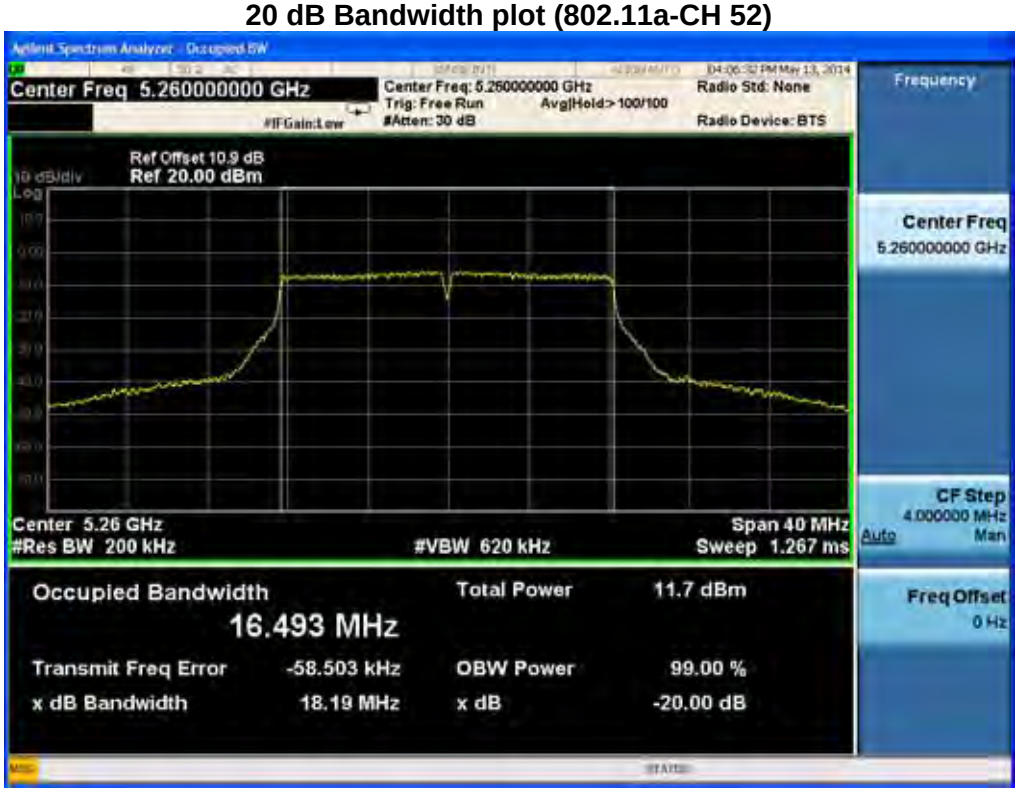
20 dB Bandwidth plot (802.11ac_40 MHz BW-CH 54)

20 dB Bandwidth plot (802.11ac_80 MHz BW-CH 58)

Service Port Ant.1

▣ RESULT PLOTS(20 dB Bandwidth)

20 dB Bandwidth plot (802.11a-CH 52)



20 dB Bandwidth plot (802.11n-CH 52)

20 dB Bandwidth plot (802.11ac-CH 52)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54)

20 dB Bandwidth plot (802.11ac_40 MHz BW-CH 54)

20 dB Bandwidth plot (802.11ac_80 MHz BW-CH 58)

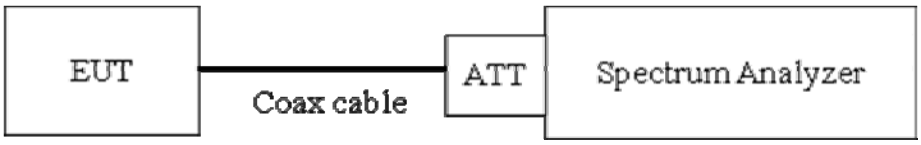
8.3 99% BANDWIDTH MEASUREMENT

limit

None; for IC reporting purposes only

The 99 % bandwidth is used to determine the conducted power limits(for IC).

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to as close to 1% of the selected span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RBW = 1% of the total span

VBW ≥ 3 x RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

Service Port Ant.0

▣ TEST RESULTS

20 MHz BW

Conducted 99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	16.530
5300	60	16.536
5320	64	16.533

Conducted 99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	16.531
5580	116	16.533
5720	144	16.528

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	17.700
5300	60	17.704
5320	64	17.701

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	17.709
5580	116	17.711
5720	144	17.706

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	17.723
5300	60	17.724
5320	64	17.720

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	17.740
5580	116	17.742
5720	144	17.741

40 MHz BW

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5270	54	36.400
5310	62	36.402

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5510	102	36.335
5550	110	36.339
5710	142	36.331

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5270	54	36.400
5310	62	36.403

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5510	102	36.387
5550	110	36.389
5710	142	36.384

80 MHz BW

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5290	58	75.835

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5530	106	75.998
5690	138	75.992

Service Port Ant.1

▣ TEST RESULTS

20 MHz BW

Conducted 99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	16.504
5300	60	16.506
5320	64	16.503

Conducted 99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	16.511
5580	116	16.512
5720	144	16.510

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	17.700
5300	60	17.702
5320	64	17.701

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	17.689
5580	116	17.691
5720	144	17.687

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5260	52	17.694
5300	60	17.695
5320	64	17.690

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5500	100	17.700
5580	116	17.705
5720	144	17.701

40 MHz BW

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5270	54	36.454
5310	62	36.458

Conducted 99% Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5510	102	36.421
5550	110	36.425
5710	142	36.419

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5270	54	36.404
5310	62	36.406

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5510	102	36.370
5550	110	36.371
5710	142	36.368

80 MHz BW

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5290	58	75.882

Conducted 99% Bandwidth Measurements for 802.11ac

802.11ac Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5530	106	75.920
5690	138	75.918

Note :

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

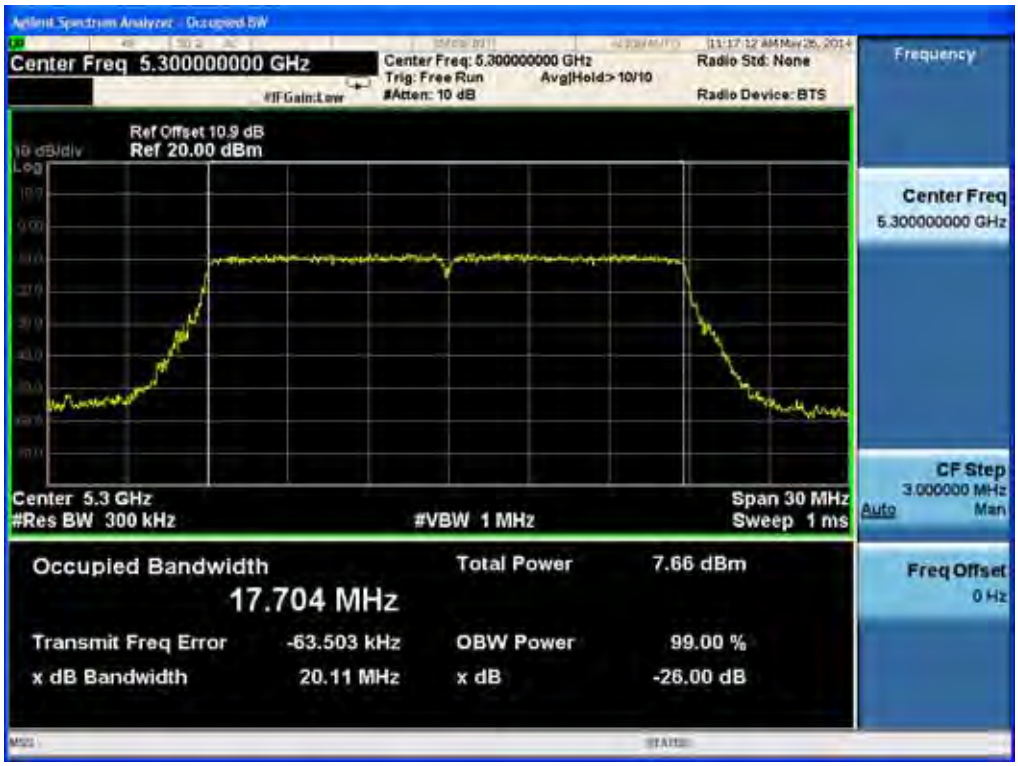
▣ RESULT PLOTS(99 % Bandwidth)

Service Port Ant.0

99% Bandwidth plot (802.11a-CH60)

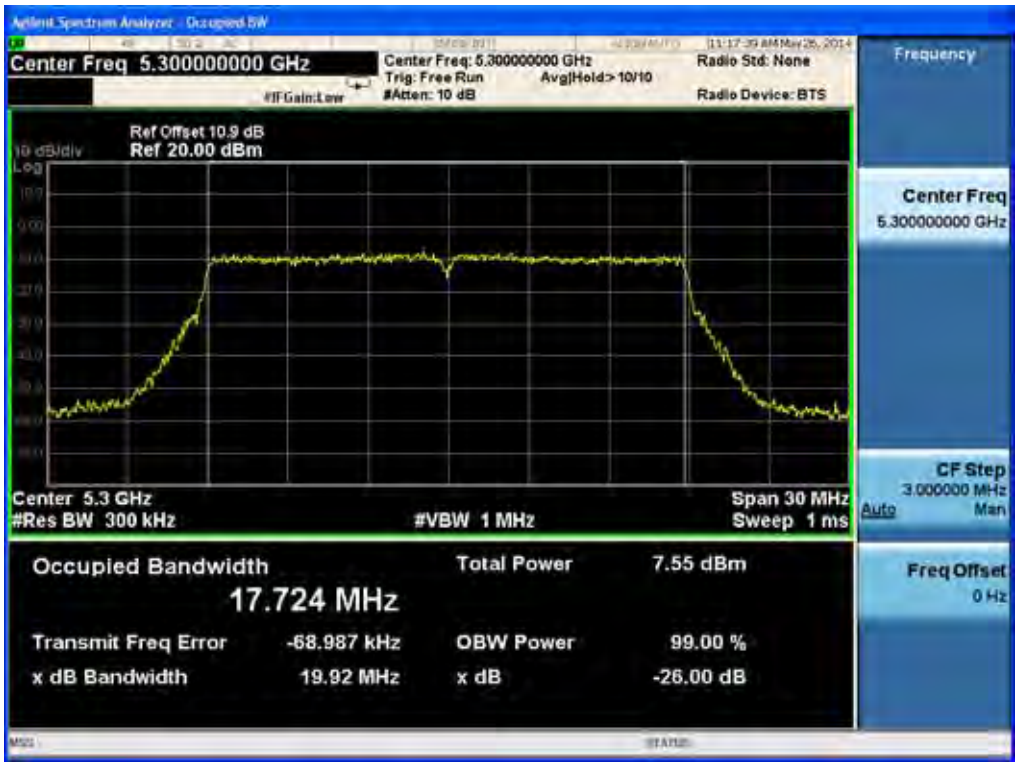
99% Bandwidth plot (802.11a-CH116)

99% Bandwidth plot (802.11n-CH60)



99% Bandwidth plot (802.11n-CH116)

99% Bandwidth plot (802.11ac-CH60)



99% Bandwidth plot (802.11ac-CH116)

40 MHz BW

99% Bandwidth plot (802.11n-CH62)

99% Bandwidth plot (802.11n-CH110)

99% Bandwidth plot (802.11ac-CH62)

99% Bandwidth plot (802.11ac-CH110)

80 MHz BW

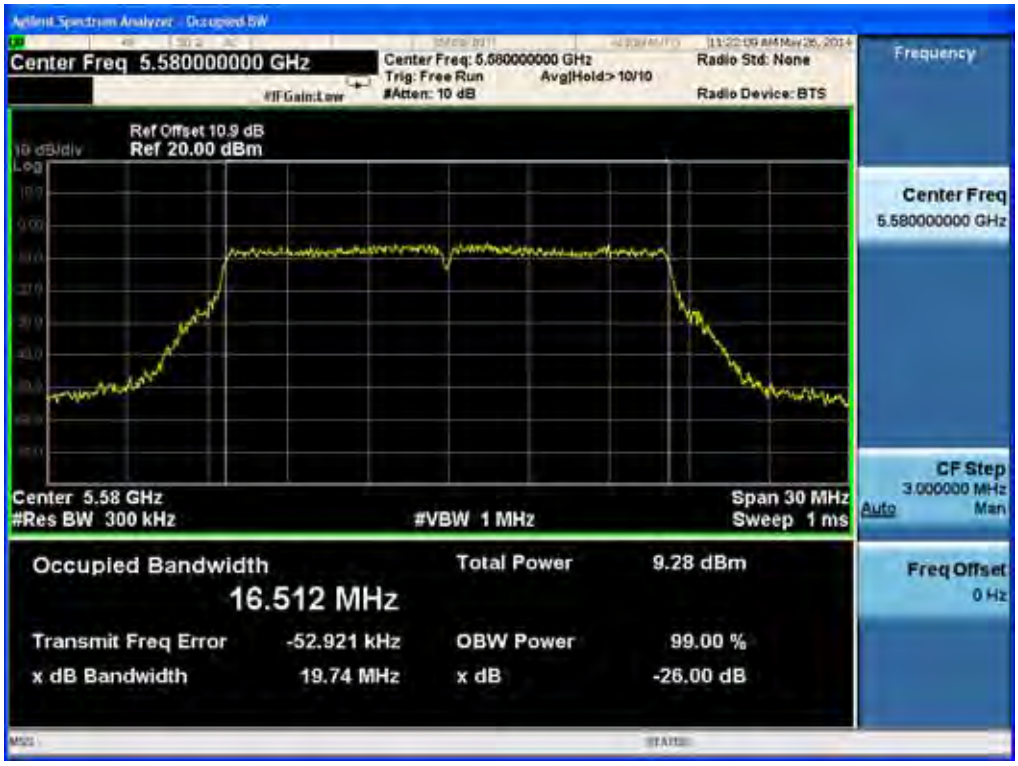
99% Bandwidth plot (802.11ac-CH58)

99% Bandwidth plot (802.11ac-CH106)

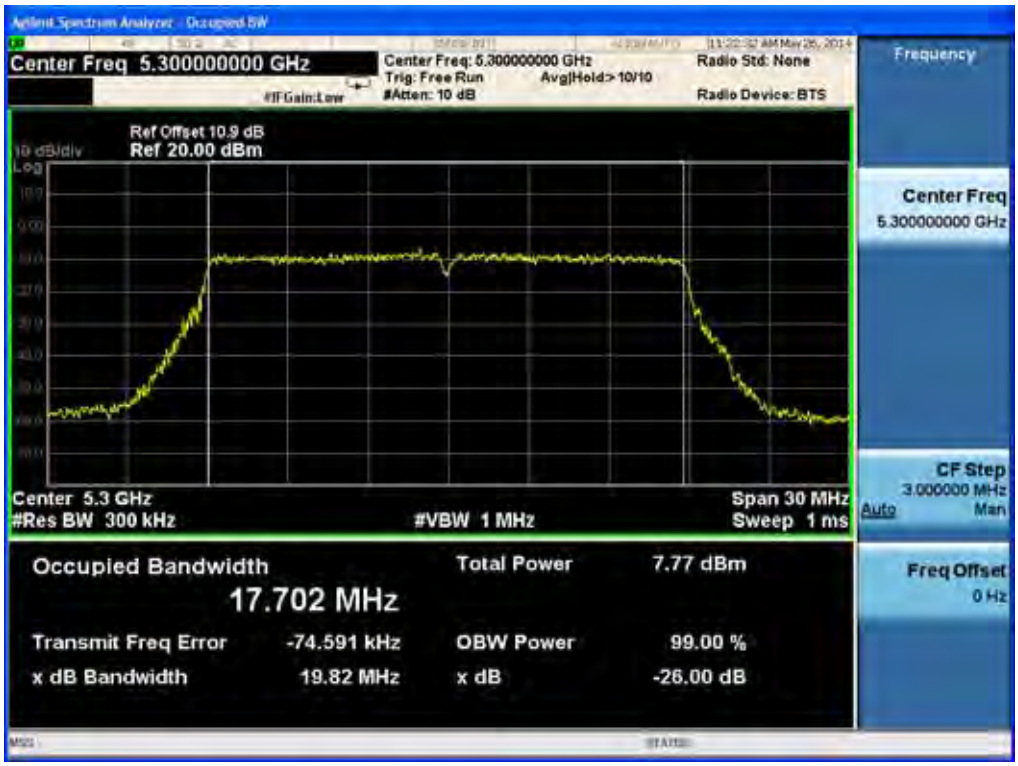
Service Port Ant.1

99% Bandwidth plot (802.11a-CH60)

99% Bandwidth plot (802.11a-CH116)

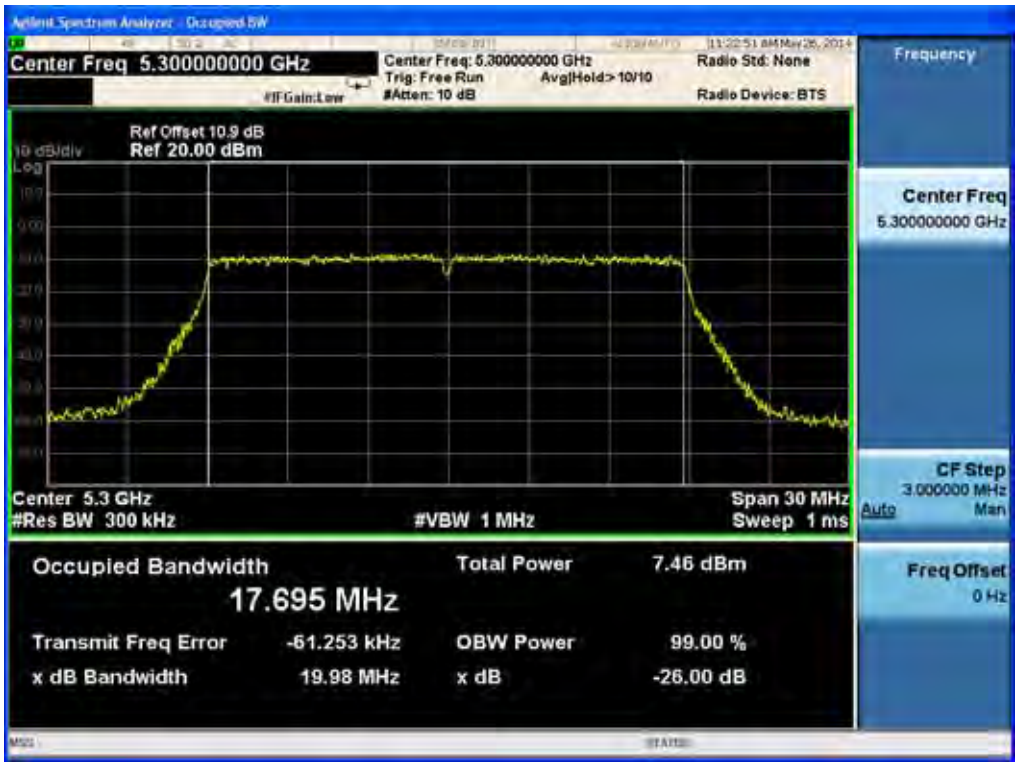


99% Bandwidth plot (802.11n-CH60)



99% Bandwidth plot (802.11n-CH116)

99% Bandwidth plot (802.11ac-CH60)



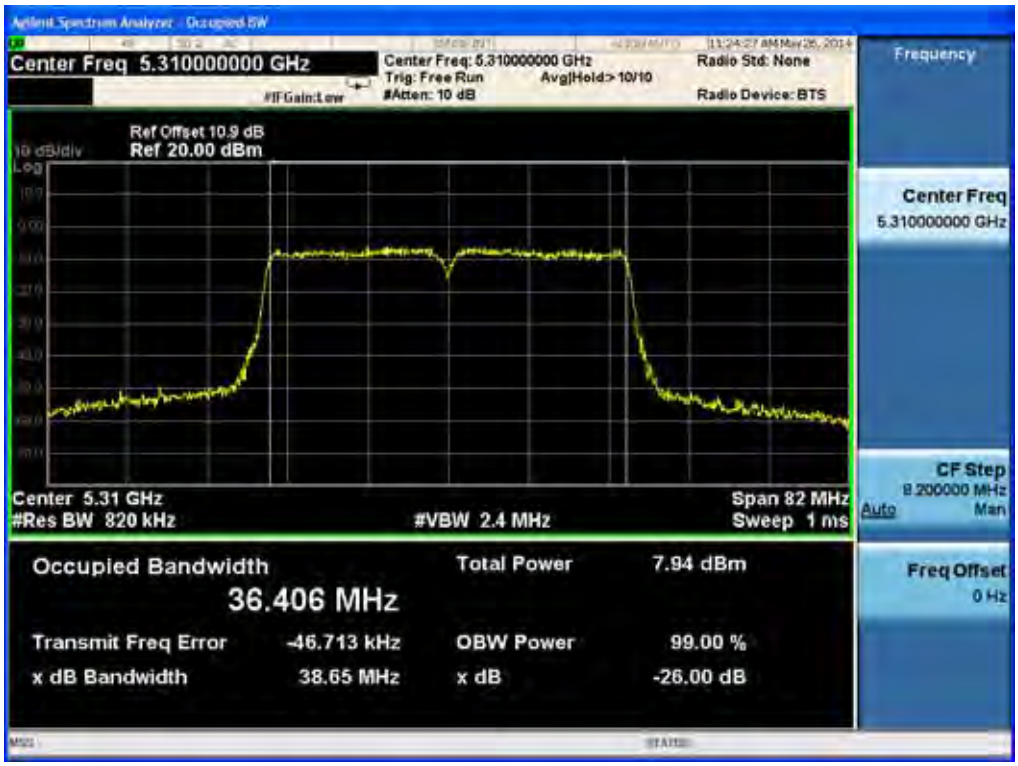
99% Bandwidth plot (802.11ac-CH116)

40 MHz BW

99% Bandwidth plot (802.11n-CH62)

99% Bandwidth plot (802.11n-CH110)

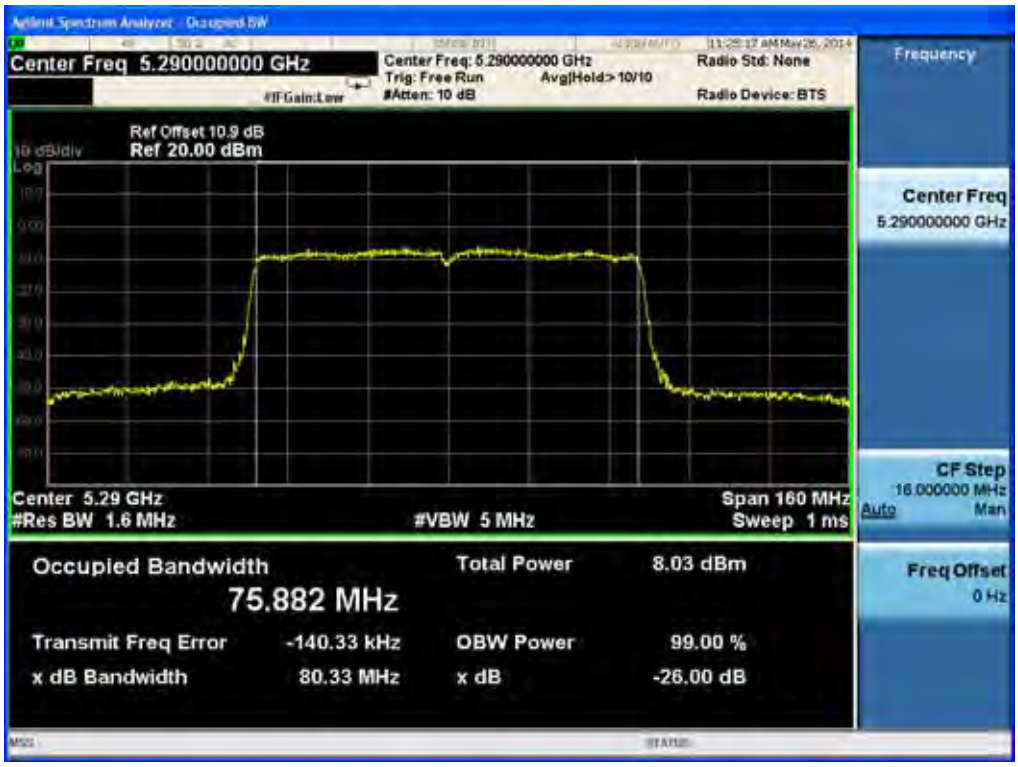
99% Bandwidth plot (802.11ac-CH62)



99% Bandwidth plot (802.11ac-CH110)

80 MHz BW

99% Bandwidth plot (802.11ac-CH58)



99% Bandwidth plot (802.11ac-CH106)

8.4 OUTPUT POWER MEASUREMENT

Test Requirements and limit, §15.247(b)(3) & RSS-210

The transmitter output is connected to the input of a RF power sensor or spectrum analyzer. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

▣ **Limit(CDD)**

1. Maximum Conducted Output Power(for FCC & IC)

Service Port

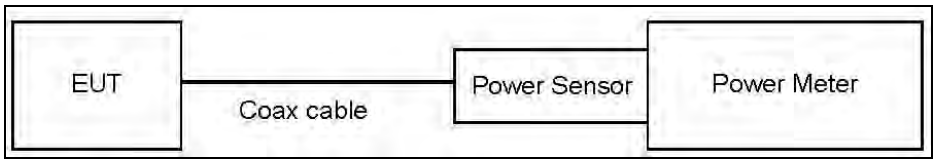
Operating Mode	Band	Mode	Ant. Port	Ant. Gain (dBi)	Limit (dBm)
SISO	UNII 2A	802.11a,n,ac	0	6.62	23.36
			1	6.17	23.81
	UNII 2C	802.11a,n,ac	0	5.71	23.98
			1	5.32	23.98
MIMO(2 TX)	UNII 2A	802.11a,n,ac	0 & 1	9.41	20.57
	UNII 2C	802.11a,n,ac	0 & 1	8.53	21.45

Note : Above the limits is calculated according to antenna gain. Because antenna gain is higher than 6 dBi.

2. Maximum EIRP(for & IC) : 1 W(Service Port)

Note : The limits of conducted power were applied the antenna gain. Therefore, if conducted power is pass, EIRP is also pass. So, we attached only conducted power table.

▣ TEST CONFIGURATION(20 MHz BW)



▣ TEST PROCEDURE(20 MHz BW)

We tested according to Method E)3)a) in KDB 789033(issued 06/06/2014).

▪ 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.

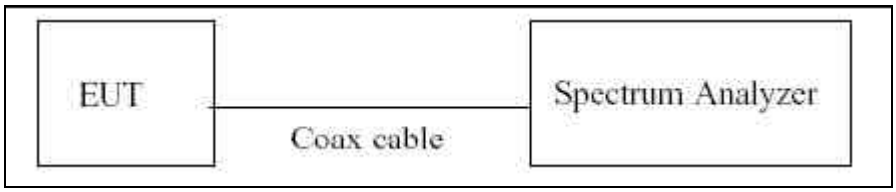
Note :

1. We apply to the offset in the UNII 2A/2C band that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table. We used the particular cable type that is supported by manufacture.

Band	Loss(dB)
UNII 2A	10.9
UNII 2C	10.9

(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 06/06/2014).

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.

Note :

1. We apply to the offset in the UNII 2A/2C band that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table. We used the particular cable type that is supported by manufacture.

Band	Loss(dB)
UNII 2A	10.9
UNII 2C	10.9

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

▣ Sample Calculation (Conducted)

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

▣ Sample Calculation (EIRP)

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

8.4.1 TRANSMIT POWER CONTROL(TPC)

U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

TPC is required as the device operates at above 500 mW EIRP and This UNII device comply the FCC TPC requirement.

Service Port

▣ **TEST RESULTS_Ant.0**

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	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	6	14.46	0.226	14.68	-	23.36
		9	14.53	0.278	14.80	-	23.36
		12	14.69	0.287	14.98	8.64	23.36
		18	14.50	0.308	14.81	-	23.36
		24	14.41	0.273	14.69	-	23.36
		36	14.42	0.376	14.80	-	23.36
		48	14.50	0.454	14.96	-	23.36
		54	14.32	0.548	14.86	-	23.36
5300	60	6	6.74	0.226	6.97	-	23.36
		9	6.73	0.278	7.01	-	23.36
		12	6.63	0.287	6.91	-	23.36
		18	6.66	0.308	6.97	-	23.36
		24	6.53	0.273	6.80	-	23.36
		36	6.69	0.376	7.06	-	23.36
		48	6.62	0.454	7.07	0.79	23.36
		54	6.40	0.548	6.95	-	23.36
5320	64	6	7.81	0.226	8.04	-	23.36
		9	7.65	0.278	7.93	-	23.36
		12	7.69	0.287	7.97	-	23.36
		18	7.63	0.308	7.94	-	23.36
		24	7.64	0.273	7.91	-	23.36
		36	7.57	0.376	7.95	-	23.36
		48	7.60	0.454	8.06	1.74	23.36
		54	7.43	0.548	7.97	-	23.36

▣ TEST RESULTS_Ant.1

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	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	6	14.19	0.226	14.42	-	23.81
		9	14.27	0.278	14.55	-	23.81
		12	14.18	0.287	14.47	-	23.81
		18	14.20	0.308	14.51	-	23.81
		24	14.25	0.273	14.52	-	23.81
		36	14.15	0.376	14.53	-	23.81
		48	14.17	0.454	14.63	-	23.81
		54	14.12	0.548	14.66	8.41	23.81
5300	60	6	6.50	0.226	6.73	-	23.81
		9	6.51	0.278	6.79	-	23.81
		12	6.58	0.287	6.86	-	23.81
		18	6.52	0.308	6.82	-	23.81
		24	6.48	0.273	6.75	-	23.81
		36	6.42	0.376	6.80	-	23.81
		48	6.30	0.454	6.76	-	23.81
		54	6.33	0.548	6.87	0.45	23.81
5320	64	6	7.29	0.226	7.51	-	23.81
		9	7.62	0.278	7.90	1.66	23.81
		12	7.42	0.287	7.71	-	23.81
		18	7.34	0.308	7.65	-	23.81
		24	7.43	0.273	7.70	-	23.81
		36	7.33	0.376	7.71	-	23.81
		48	7.36	0.454	7.82	-	23.81
		54	7.23	0.548	7.78	-	23.81

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

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

802.11a Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5260	52	6	17.56	20.57
		9	17.69	20.57
		12	17.74	20.57
		18	17.67	20.57
		24	17.62	20.57
		36	17.68	20.57
		48	17.81	20.57
		54	17.77	20.57
5300	60	6	9.86	20.57
		9	9.91	20.57
		12	9.90	20.57
		18	9.91	20.57
		24	9.79	20.57
		36	9.94	20.57
		48	9.93	20.57
		54	9.92	20.57
5320	64	6	10.79	20.57
		9	10.93	20.57
		12	10.85	20.57
		18	10.81	20.57
		24	10.82	20.57
		36	10.84	20.57
		48	10.95	20.57
		54	10.89	20.57

▣ TEST RESULTS_Ant.0

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	6	7.88	0.226	8.10	-	23.98
		9	7.83	0.278	8.11	-	23.98
		12	7.86	0.287	8.14	-	23.98
		18	7.80	0.308	8.10	-	23.98
		24	7.91	0.273	8.18	-	23.98
		36	7.70	0.376	8.07	-	23.98
		48	7.75	0.454	8.21	-	23.98
		54	7.80	0.548	8.35	2.11	23.98
5580	116	6	13.83	0.226	14.06	-	23.98
		9	13.79	0.278	14.07	-	23.98
		12	13.82	0.287	14.11	-	23.98
		18	13.6	0.308	13.91	-	23.98
		24	13.76	0.273	14.03	-	23.98
		36	13.74	0.376	14.12	-	23.98
		48	13.8	0.454	14.25	7.93	23.98
		54	13.49	0.548	14.04	-	23.98
5720	144	6	15.17	0.226	15.40	-	23.98
		9	15.08	0.278	15.36	-	23.98
		12	15.15	0.287	15.44	9.16	23.98
		18	15.06	0.308	15.37	-	23.98
		24	15.06	0.273	15.33	-	23.98
		36	15.03	0.376	15.41	-	23.98
		48	14.95	0.454	15.40	-	23.98
		54	14.88	0.548	15.43	-	23.98

▣ TEST RESULTS_Ant.1

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	6	8.07	0.226	8.29	-	23.98
		9	8.16	0.278	8.44	2.12	23.98
		12	7.88	0.287	8.17	-	23.98
		18	8.01	0.308	8.32	-	23.98
		24	7.89	0.273	8.17	-	23.98
		36	7.84	0.376	8.21	-	23.98
		48	7.94	0.454	8.40	-	23.98
		54	7.74	0.548	8.29	-	23.98
5580	116	6	13.79	0.226	14.02	-	23.98
		9	13.83	0.278	14.11	-	23.98
		12	13.87	0.287	14.16	-	23.98
		18	13.84	0.308	14.15	-	23.98
		24	13.69	0.273	13.96	-	23.98
		36	13.79	0.376	14.17	-	23.98
		48	13.85	0.454	14.30	7.96	23.98
		54	13.69	0.548	14.24	-	23.98
5720	144	6	14.81	0.226	15.04	-	23.98
		9	14.83	0.278	15.11	-	23.98
		12	14.9	0.287	15.19	8.94	23.98
		18	14.67	0.308	14.98	-	23.98
		24	14.61	0.273	14.88	-	23.98
		36	14.55	0.376	14.93	-	23.98
		48	14.64	0.454	15.09	-	23.98
		54	14.48	0.548	15.03	-	23.98

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

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

802.11a Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5500	100	6	11.21	21.45
		9	11.29	21.45
		12	11.17	21.45
		18	11.22	21.45
		24	11.19	21.45
		36	11.15	21.45
		48	11.32	21.45
		54	11.33	21.45
5580	116	6	17.05	21.45
		9	17.10	21.45
		12	17.15	21.45
		18	17.04	21.45
		24	17.01	21.45
		36	17.16	21.45
		48	17.29	21.45
		54	17.15	21.45
5720	144	6	18.23	21.45
		9	18.25	21.45
		12	18.33	21.45
		18	18.19	21.45
		24	18.12	21.45
		36	18.19	21.45
		48	18.26	21.45
		54	18.24	21.45

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5260~5320)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	6.5	15.62	0.210	15.83	-	23.36
		13	15.60	0.195	15.79	-	23.36
		19.5	15.64	0.217	15.86	9.52	23.36
		26	15.55	0.200	15.75	-	23.36
		39	15.49	0.286	15.77	-	23.36
		52	15.40	0.367	15.77	-	23.36
		58.5	15.41	0.401	15.81	-	23.36
		65	15.38	0.435	15.81	-	23.36
5300	60	6.5	8.54	0.210	8.75	-	23.36
		13	8.55	0.195	8.75	-	23.36
		19.5	8.51	0.217	8.72	-	23.36
		26	8.73	0.200	8.93	2.48	23.36
		39	8.57	0.286	8.85	-	23.36
		52	8.51	0.367	8.88	-	23.36
		58.5	8.44	0.401	8.84	-	23.36
		65	8.44	0.435	8.88	-	23.36
5320	64	6.5	7.72	0.210	7.93	-	23.36
		13	7.68	0.195	7.88	-	23.36
		19.5	7.56	0.217	7.78	-	23.36
		26	7.58	0.200	7.78	-	23.36
		39	7.50	0.286	7.79	-	23.36
		52	7.65	0.367	8.02	-	23.36
		58.5	7.48	0.401	7.88	-	23.36
		65	7.60	0.435	8.03	1.53	23.36

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5260~5320)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	6.5	15.52	0.210	15.73	9.51	23.81
		13	15.33	0.195	15.53	-	23.81
		19.5	15.25	0.216	15.46	-	23.81
		26	15.31	0.200	15.51	-	23.81
		39	15.15	0.287	15.44	-	23.81
		52	15.18	0.360	15.54	-	23.81
		58.5	15.11	0.391	15.50	-	23.81
		65	15.06	0.435	15.49	-	23.81
5300	60	6.5	8.42	0.210	8.63	-	23.81
		13	8.32	0.195	8.52	-	23.81
		19.5	8.33	0.216	8.55	-	23.81
		26	8.44	0.200	8.65	-	23.81
		39	8.22	0.287	8.51	-	23.81
		52	8.27	0.360	8.63	-	23.81
		58.5	8.28	0.391	8.68	2.40	23.81
		65	8.16	0.435	8.59	-	23.81
5320	64	6.5	7.56	0.210	7.77	-	23.81
		13	7.49	0.195	7.68	-	23.81
		19.5	7.62	0.216	7.84	-	23.81
		26	7.27	0.200	7.47	-	23.81
		39	7.52	0.287	7.81	-	23.81
		52	7.42	0.360	7.78	-	23.81
		58.5	7.46	0.391	7.85	-	23.81
		65	7.46	0.435	7.90	1.56	23.81

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5260~5320)

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5260	52	6.5	18.79	20.57
		13	18.67	20.57
		19.5	18.67	20.57
		26	18.64	20.57
		39	18.62	20.57
		52	18.67	20.57
		58.5	18.67	20.57
		65	18.66	20.57
5300	60	6.5	11.70	20.57
		13	11.65	20.57
		19.5	11.65	20.57
		26	11.80	20.57
		39	11.69	20.57
		52	11.77	20.57
		58.5	11.77	20.57
		65	11.75	20.57
5320	64	6.5	10.86	20.57
		13	10.79	20.57
		19.5	10.82	20.57
		26	10.64	20.57
		39	10.81	20.57
		52	10.91	20.57
		58.5	10.88	20.57
		65	10.98	20.57

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5500~5720)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	6.5	9.70	0.210	9.91	-	23.98
		13	9.63	0.195	9.83	-	23.98
		19.5	9.74	0.217	9.95	-	23.98
		26	9.87	0.200	10.07	-	23.98
		39	9.75	0.286	10.04	-	23.98
		52	9.77	0.367	10.13	-	23.98
		58.5	9.74	0.401	10.14	3.79	23.98
		65	9.60	0.435	10.04	-	23.98
5580	116	6.5	16.17	0.210	16.38	-	23.98
		13	16.14	0.195	16.34	-	23.98
		19.5	16.32	0.217	16.54	-	23.98
		26	16.15	0.200	16.35	-	23.98
		39	16.07	0.286	16.36	-	23.98
		52	16.24	0.367	16.60	10.40	23.98
		58.5	15.99	0.401	16.39	-	23.98
		65	15.93	0.435	16.36	-	23.98
5720	144	6.5	17.03	0.210	17.24	-	23.98
		13	17.15	0.195	17.34	-	23.98
		19.5	17.11	0.217	17.33	-	23.98
		26	17.12	0.200	17.32	-	23.98
		39	17.03	0.286	17.32	-	23.98
		52	16.91	0.367	17.27	-	23.98
		58.5	16.99	0.401	17.40	-	23.98
		65	16.97	0.435	17.41	11.27	23.98

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5500~5720)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	6.5	10.07	0.210	10.28	3.88	23.98
		13	9.89	0.195	10.09	-	23.98
		19.5	9.87	0.216	10.09	-	23.98
		26	9.86	0.200	10.06	-	23.98
		39	9.87	0.287	10.15	-	23.98
		52	9.91	0.360	10.27	-	23.98
		58.5	9.72	0.391	10.11	-	23.98
		65	9.75	0.435	10.19	-	23.98
5580	116	6.5	16.49	0.210	16.70	10.42	23.98
		13	16.34	0.195	16.53	-	23.98
		19.5	16.24	0.216	16.46	-	23.98
		26	16.34	0.200	16.54	-	23.98
		39	16.31	0.287	16.60	-	23.98
		52	16.27	0.360	16.63	-	23.98
		58.5	16.22	0.391	16.61	-	23.98
		65	16.10	0.435	16.54	-	23.98
5720	144	6.5	16.93	0.210	17.14	-	23.98
		13	16.91	0.195	17.11	-	23.98
		19.5	17.01	0.216	17.23	-	23.98
		26	16.98	0.200	17.18	-	23.98
		39	16.92	0.287	17.21	-	23.98
		52	16.89	0.360	17.25	10.98	23.98
		58.5	16.80	0.391	17.19	-	23.98
		65	16.78	0.435	17.21	-	23.98

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5500~5720)

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5500	100	6.5	13.11	21.45
		13	12.97	21.45
		19.5	13.03	21.45
		26	13.08	21.45
		39	13.11	21.45
		52	13.21	21.45
		58.5	13.14	21.45
		65	13.13	21.45
5580	116	6.5	19.55	21.45
		13	19.45	21.45
		19.5	19.51	21.45
		26	19.46	21.45
		39	19.49	21.45
		52	19.63	21.45
		58.5	19.51	21.45
		65	19.46	21.45
5720	144	6.5	20.20	21.45
		13	20.24	21.45
		19.5	20.29	21.45
		26	20.26	21.45
		39	20.28	21.45
		52	20.27	21.45
		58.5	20.31	21.45
		65	20.32	21.45

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11ac_20 MHz BW Mode: 5260~5320)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	6.5	14.51	0.210	14.72	-	23.36
		13	14.48	0.195	14.68	-	23.36
		19.5	14.44	0.217	14.66	-	23.36
		26	14.43	0.200	14.63	-	23.36
		39	14.31	0.286	14.60	-	23.36
		52	14.28	0.367	14.64	-	23.36
		58.5	14.33	0.401	14.73	8.35	23.36
		65	14.21	0.435	14.64	-	23.36
		78	14.11	0.581	14.69	-	23.36
5300	60	6.5	8.74	0.210	8.95	2.51	23.36
		13	8.66	0.195	8.86	-	23.36
		19.5	8.64	0.217	8.86	-	23.36
		26	8.54	0.200	8.75	-	23.36
		39	8.34	0.286	8.63	-	23.36
		52	8.49	0.367	8.86	-	23.36
		58.5	8.36	0.401	8.76	-	23.36
		65	8.27	0.435	8.70	-	23.36
		78	8.36	0.581	8.94	-	23.36
5320	64	6.5	7.94	0.210	8.15	1.65	23.36
		13	7.84	0.195	8.04	-	23.36
		19.5	7.80	0.217	8.02	-	23.36
		26	7.44	0.200	7.64	-	23.36
		39	7.46	0.286	7.75	-	23.36
		52	7.62	0.367	7.99	-	23.36
		58.5	7.29	0.401	7.69	-	23.36
		65	7.55	0.435	7.99	-	23.36
		78	7.24	0.581	7.82	-	23.36

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11ac_20 MHz BW Mode: 5260~5320)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5260	52	6.5	14.50	0.210	14.71	8.22	23.81
		13	14.24	0.195	14.44	-	23.81
		19.5	14.23	0.216	14.45	-	23.81
		26	14.15	0.200	14.35	-	23.81
		39	14.15	0.287	14.43	-	23.81
		52	14.06	0.360	14.42	-	23.81
		58.5	13.96	0.391	14.35	-	23.81
		65	13.98	0.435	14.41	-	23.81
		78	13.86	0.581	14.44	-	23.81
5300	60	6.5	8.39	0.210	8.60	-	23.81
		13	8.32	0.195	8.51	-	23.81
		19.5	8.46	0.216	8.68	2.40	23.81
		26	8.24	0.200	8.44	-	23.81
		39	8.25	0.287	8.53	-	23.81
		52	8.23	0.360	8.59	-	23.81
		58.5	8.22	0.391	8.61	-	23.81
		65	8.07	0.435	8.51	-	23.81
		78	8.06	0.581	8.64	-	23.81
5320	64	6.5	7.56	0.210	7.77	-	23.81
		13	7.70	0.195	7.89	1.47	23.81
		19.5	7.47	0.216	7.69	-	23.81
		26	7.42	0.200	7.62	-	23.81
		39	7.33	0.287	7.61	-	23.81
		52	7.42	0.360	7.78	-	23.81
		58.5	7.17	0.391	7.56	-	23.81
		65	7.15	0.435	7.59	-	23.81
		78	7.02	0.581	7.60	-	23.81

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11ac_20 MHz BW Mode: 5260~5320)

802.11ac Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5260	52	6.5	17.73	20.57
		13	17.57	20.57
		19.5	17.57	20.57
		26	17.50	20.57
		39	17.53	20.57
		52	17.54	20.57
		58.5	17.55	20.57
		65	17.54	20.57
		78	17.58	20.57
5300	60	6.5	11.79	20.57
		13	11.70	20.57
		19.5	11.78	20.57
		26	11.61	20.57
		39	11.59	20.57
		52	11.74	20.57
		58.5	11.70	20.57
		65	11.62	20.57
		78	11.80	20.57
5320	64	6.5	10.97	20.57
		13	10.98	20.57
		19.5	10.87	20.57
		26	10.64	20.57
		39	10.69	20.57
		52	10.90	20.57
		58.5	10.64	20.57
		65	10.80	20.57
		78	10.72	20.57

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11ac_20 MHz BW Mode: 5500~5720)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5500	100	6.5	8.96	0.210	9.17	-	23.98
		13	9.05	0.195	9.24	-	23.98
		19.5	8.86	0.217	9.07	-	23.98
		26	8.98	0.200	9.18	-	23.98
		39	8.63	0.286	8.92	-	23.98
		52	8.87	0.367	9.24	-	23.98
		58.5	8.72	0.401	9.13	-	23.98
		65	8.79	0.435	9.22	-	23.98
		78	8.76	0.581	9.34	3.07	23.98
5580	116	6.5	16.29	0.210	16.50	10.05	23.98
		13	16.13	0.195	16.33	-	23.98
		19.5	16.17	0.217	16.38	-	23.98
		26	16.12	0.200	16.32	-	23.98
		39	16.02	0.286	16.30	-	23.98
		52	15.98	0.367	16.35	-	23.98
		58.5	15.92	0.401	16.32	-	23.98
		65	16.02	0.435	16.45	-	23.98
		78	15.78	0.581	16.36	-	23.98
5720	144	6.5	17.17	0.210	17.38	11.10	23.98
		13	17.12	0.195	17.31	-	23.98
		19.5	17.14	0.217	17.36	-	23.98
		26	17.07	0.200	17.27	-	23.98
		39	17.02	0.286	17.30	-	23.98
		52	16.92	0.367	17.29	-	23.98
		58.5	16.87	0.401	17.27	-	23.98
		65	16.90	0.435	17.34	-	23.98
		78	16.76	0.581	17.34	-	23.98

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11ac _20 MHz BW Mode: 5500~5720)

802.11ac Mode							
Frequency [MHz]	Channel No.	Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
5500	100	6.5	9.01	0.210	9.22	2.90	23.98
		13	9.00	0.195	9.20	-	23.98
		19.5	9.00	0.216	9.22	-	23.98
		26	8.91	0.200	9.11	-	23.98
		39	8.78	0.287	9.07	-	23.98
		52	8.75	0.360	9.11	-	23.98
		58.5	8.71	0.391	9.11	-	23.98
		65	8.73	0.435	9.16	-	23.98
		78	8.62	0.581	9.20	-	23.98
5580	116	6.5	16.40	0.210	16.61	-	23.98
		13	16.36	0.195	16.55	-	23.98
		19.5	16.37	0.216	16.58	-	23.98
		26	16.21	0.200	16.41	-	23.98
		39	16.14	0.287	16.43	-	23.98
		52	16.15	0.360	16.51	-	23.98
		58.5	15.99	0.391	16.38	-	23.98
		65	16.04	0.435	16.48	-	23.98
		78	16.05	0.581	16.63	10.36	23.98
5720	144	6.5	17.01	0.210	17.22	10.94	23.98
		13	16.96	0.195	17.15	-	23.98
		19.5	17.01	0.216	17.22	-	23.98
		26	16.89	0.200	17.09	-	23.98
		39	16.74	0.287	17.02	-	23.98
		52	16.78	0.360	17.14	-	23.98
		58.5	16.81	0.391	17.20	-	23.98
		65	16.70	0.435	17.14	-	23.98
		78	16.59	0.581	17.17	-	23.98

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11ac _20 MHz BW Mode: 5500~5720)

802.11ac Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5500	100	6.5	12.21	21.45
		13	12.23	21.45
		19.5	12.16	21.45
		26	12.16	21.45
		39	12.01	21.45
		52	12.19	21.45
		58.5	12.13	21.45
		65	12.20	21.45
		78	12.28	21.45
5580	116	6.5	19.57	21.45
		13	19.45	21.45
		19.5	19.49	21.45
		26	19.38	21.45
		39	19.38	21.45
		52	19.44	21.45
		58.5	19.36	21.45
		65	19.48	21.45
		78	19.51	21.45
5720	144	6.5	20.31	21.45
		13	20.24	21.45
		19.5	20.30	21.45
		26	20.19	21.45
		39	20.17	21.45
		52	20.23	21.45
		58.5	20.25	21.45
		65	20.25	21.45
		78	20.27	21.45

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11n_40 MHz BW Mode:5270~5310)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5270	54	13.5	8.70	0.429	9.13	-	23.36
		27	8.78	0.404	9.19	-	23.36
		40.5	8.83	0.415	9.25	-	23.36
		54	8.90	0.378	9.28	-	23.36
		81	8.77	0.522	9.29	-	23.36
		108	8.68	0.612	9.29	-	23.36
		121.5	8.57	0.661	9.23	-	23.36
		135	8.55	0.746	9.30	3.05	23.36
5310	62	13.5	9.45	0.429	9.87	-	23.36
		27	9.54	0.404	9.94	-	23.36
		40.5	9.57	0.415	9.99	-	23.36
		54	9.59	0.378	9.97	-	23.36
		81	9.51	0.522	10.04	-	23.36
		108	9.40	0.612	10.02	-	23.36
		121.5	9.37	0.661	10.03	-	23.36
		135	9.35	0.746	10.10	3.76	23.36

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11n_40 MHz BW Mode:5270~5310)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5270	54	13.5	8.65	0.429	9.08	-	23.81
		27	8.76	0.404	9.17	2.89	23.81
		40.5	8.53	0.410	8.94	-	23.81
		54	8.60	0.370	8.97	-	23.81
		81	8.49	0.518	9.01	-	23.81
		108	8.36	0.623	8.98	-	23.81
		121.5	8.49	0.672	9.16	-	23.81
		135	8.41	0.739	9.14	-	23.81
5310	62	13.5	9.49	0.429	9.92	-	23.81
		27	9.56	0.404	9.96	-	23.81
		40.5	9.54	0.410	9.95	-	23.81
		54	9.54	0.370	9.91	-	23.81
		81	9.52	0.518	10.04	3.80	23.81
		108	9.39	0.623	10.01	-	23.81
		121.5	9.31	0.672	9.98	-	23.81
		135	9.23	0.739	9.97	-	23.81

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11n_40 MHz BW Mode:5270~5310)

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5270	54	13.5	12.12	20.57
		27	12.19	20.57
		40.5	12.11	20.57
		54	12.14	20.57
		81	12.16	20.57
		108	12.15	20.57
		121.5	12.21	20.57
		135	12.23	20.57
5310	62	13.5	12.91	20.57
		27	12.96	20.57
		40.5	12.98	20.57
		54	12.95	20.57
		81	13.05	20.57
		108	13.03	20.57
		121.5	13.02	20.57
		135	13.05	20.57

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11n_40 MHz BW Mode:5510~5710)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5510	102	13.5	5.25	0.429	5.68	-	23.98
		27	5.29	0.404	5.70	-	23.98
		40.5	5.32	0.415	5.74	--	23.98
		54	5.40	0.378	5.78	-	23.98
		81	5.33	0.522	5.85	-0.57	23.98
		108	5.21	0.612	5.82	-	23.98
		121.5	5.12	0.661	5.78	-	23.98
		135	5.09	0.746	5.83	-	23.98
5550	110	13.5	12.56	0.429	12.99	-	23.98
		27	12.56	0.404	12.96	-	23.98
		40.5	12.59	0.415	13.00	-	23.98
		54	12.67	0.378	13.05	-	23.98
		81	12.42	0.522	12.94	-	23.98
		108	12.43	0.612	13.04	-	23.98
		121.5	12.41	0.661	13.07	-	23.98
		135	12.37	0.746	13.11	6.82	23.98
5710	142	13.5	16.08	0.429	16.51	-	23.98
		27	16.13	0.404	16.53	-	23.98
		40.5	16.01	0.415	16.43	-	23.98
		54	16.15	0.378	16.52	-	23.98
		81	15.98	0.522	16.51	-	23.98
		108	15.95	0.612	16.56	10.11	23.98
		121.5	15.80	0.661	16.46	-	23.98
		135	15.71	0.746	16.45	-	23.98

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11n_40 MHz BW Mode:5510~5710)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5510	102	13.5	5.86	0.429	6.29	-	23.98
		27	5.65	0.404	6.06	-	23.98
		40.5	5.69	0.410	6.10	-	23.98
		54	5.65	0.370	6.02	-	23.98
		81	5.65	0.518	6.17	-	23.98
		108	5.81	0.623	6.43	-0.05	23.98
		121.5	5.53	0.672	6.20	-	23.98
		135	5.50	0.739	6.24	-	23.98
5550	110	13.5	12.91	0.429	13.34	-	23.98
		27	12.91	0.404	13.31	-	23.98
		40.5	12.90	0.410	13.31	-	23.98
		54	12.92	0.370	13.29	-	23.98
		81	12.81	0.518	13.33	-	23.98
		108	12.77	0.623	13.39	-	23.98
		121.5	12.70	0.672	13.37	-	23.98
		135	12.70	0.739	13.43	7.04	23.98
5710	142	13.5	16.30	0.429	16.73	10.39	23.98
		27	16.20	0.404	16.61	-	23.98
		40.5	16.17	0.410	16.58	-	23.98
		54	16.21	0.370	16.58	-	23.98
		81	16.11	0.518	16.63	-	23.98
		108	15.99	0.623	16.61	-	23.98
		121.5	15.96	0.672	16.63	-	23.98
		135	15.91	0.739	16.65	-	23.98

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11n_40 MHz BW Mode:5510~5710)

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5510	102	13.5	9.01	21.45
		27	8.89	21.45
		40.5	8.93	21.45
		54	8.91	21.45
		81	9.02	21.45
		108	9.15	21.45
		121.5	9.01	21.45
		135	9.05	21.45
5550	110	13.5	16.18	21.45
		27	16.15	21.45
		40.5	16.17	21.45
		54	16.18	21.45
		81	16.15	21.45
		108	16.23	21.45
		121.5	16.23	21.45
		135	16.28	21.45
5710	142	13.5	19.63	21.45
		27	19.58	21.45
		40.5	19.52	21.45
		54	19.56	21.45
		81	19.58	21.45
		108	19.60	21.45
		121.5	19.56	21.45
		135	19.56	21.45

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5270~5310)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5270	54	13.5	8.01	0.429	8.44	2.16	23.36
		27	7.87	0.404	8.27	-	23.36
		40.5	7.64	0.410	8.05	-	23.36
		54	7.54	0.370	7.91	-	23.36
		81	7.72	0.518	8.24	-	23.36
		108	7.60	0.623	8.22	-	23.36
		121.5	7.28	0.672	7.95	-	23.36
		135	7.08	0.739	7.82	-	23.36
		162	7.08	0.947	8.03	-	23.36
		180	7.41	0.973	8.38	-	23.36
5310	62	13.5	8.72	0.429	9.15	2.94	23.36
		27	8.63	0.404	9.03	-	23.36
		40.5	8.58	0.410	8.99	-	23.36
		54	8.50	0.370	8.87	-	23.36
		81	8.38	0.518	8.90	-	23.36
		108	8.26	0.623	8.88	-	23.36
		121.5	8.17	0.672	8.84	-	23.36
		135	8.15	0.739	8.89	-	23.36
		162	7.99	0.947	8.94	-	23.36
		180	8.04	0.973	9.01	-	23.36

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5270~5310)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5270	54	13.5	7.92	0.429	8.35	-	23.81
		27	7.84	0.404	8.24	-	23.81
		40.5	7.96	0.410	8.37	2.07	23.81
		54	7.66	0.370	8.03	-	23.81
		81	7.54	0.518	8.05	-	23.81
		108	7.41	0.623	8.03	-	23.81
		121.5	7.37	0.672	8.04	-	23.81
		135	7.54	0.739	8.28	-	23.81
		162	7.34	0.947	8.29	-	23.81
		180	7.13	0.973	8.11	-	23.81
5310	62	13.5	8.76	0.429	9.19	-	23.81
		27	8.67	0.404	9.07	-	23.81
		40.5	8.77	0.410	9.18	-	23.81
		54	8.51	0.370	8.88	-	23.81
		81	8.52	0.518	9.04	-	23.81
		108	8.25	0.623	8.88	-	23.81
		121.5	8.22	0.672	8.89	-	23.81
		135	8.16	0.739	8.90	-	23.81
		162	8.03	0.947	8.98	-	23.81
		180	8.22	0.973	9.20	2.95	23.81

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5270~5310)

802.11ac BW Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5270	54	13.5	11.41	20.57
		27	11.27	20.57
		40.5	11.22	20.57
		54	10.98	20.57
		81	11.16	20.57
		108	11.14	20.57
		121.5	11.01	20.57
		135	11.07	20.57
		162	11.17	20.57
		180	11.26	20.57
5310	64	13.5	12.18	20.57
		27	12.06	20.57
		40.5	12.10	20.57
		54	11.89	20.57
		81	11.98	20.57
		108	11.89	20.57
		121.5	11.88	20.57
		135	11.91	20.57
		162	11.97	20.57
		180	12.12	20.57

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5510~5710)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5510	102	13.5	7.61	0.429	8.03	1.85	23.98
		27	7.24	0.404	7.65	-	23.98
		40.5	7.51	0.410	7.92	-	23.98
		54	7.39	0.370	7.76	-	23.98
		81	7.22	0.518	7.74	-	23.98
		108	7.18	0.623	7.80	-	23.98
		121.5	7.02	0.672	7.69	-	23.98
		135	7.05	0.739	7.78	-	23.98
		162	6.95	0.947	7.90	-	23.98
		180	6.81	0.973	7.79	-	23.98
5550	110	13.5	13.65	0.429	14.08	7.91	23.98
		27	13.59	0.404	13.99	-	23.98
		40.5	13.52	0.410	13.93	-	23.98
		54	13.43	0.370	13.80	-	23.98
		81	13.30	0.518	13.82	-	23.98
		108	13.19	0.623	13.82	-	23.98
		121.5	13.13	0.672	13.81	-	23.98
		135	13.09	0.739	13.83	-	23.98
		162	12.88	0.947	13.83	-	23.98
		180	12.99	0.973	13.97	-	23.98
5710	142	13.5	16.27	0.429	16.70	10.55	23.98
		27	16.11	0.404	16.51	-	23.98
		40.5	16.03	0.410	16.44	-	23.98
		54	16.03	0.370	16.40	-	23.98
		81	15.85	0.518	16.36	-	23.98
		108	15.72	0.623	16.34	-	23.98
		121.5	15.66	0.672	16.33	-	23.98
		135	15.60	0.739	16.34	-	23.98
		162	15.48	0.947	16.42	-	23.98
		180	15.47	0.973	16.44	-	23.98

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5510~5710)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5510	102	13.5	8.11	0.429	8.54	2.24	23.98
		27	7.93	0.404	8.34	-	23.98
		40.5	7.97	0.410	8.38	-	23.98
		54	7.88	0.370	8.25	-	23.98
		81	7.73	0.518	8.25	-	23.98
		108	7.63	0.623	8.25	-	23.98
		121.5	7.60	0.672	8.27	-	23.98
		135	7.51	0.739	8.25	-	23.98
		162	7.39	0.947	8.34	-	23.98
		180	7.38	0.973	8.35	-	23.98
5550	110	13.5	14.19	0.429	14.62	8.37	23.98
		27	14.10	0.404	14.50	-	23.98
		40.5	13.99	0.410	14.40	-	23.98
		54	13.92	0.370	14.29	-	23.98
		81	13.79	0.518	14.30	-	23.98
		108	13.63	0.623	14.25	-	23.98
		121.5	13.62	0.672	14.29	-	23.98
		135	13.54	0.739	14.28	-	23.98
		162	13.39	0.947	14.34	-	23.98
		180	13.38	0.973	14.35	-	23.98
5710	142	13.5	16.37	0.429	16.80	10.56	23.98
		27	16.24	0.404	16.65	-	23.98
		40.5	16.17	0.410	16.58	-	23.98
		54	16.11	0.370	16.48	-	23.98
		81	16.01	0.518	16.53	-	23.98
		108	15.87	0.623	16.49	-	23.98
		121.5	15.81	0.672	16.48	-	23.98
		135	15.72	0.739	16.46	-	23.98
		162	15.67	0.947	16.61	-	23.98
		180	15.60	0.973	16.57	-	23.98

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5510~5710)

802.11ac BW Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5510	102	13.5	11.30	21.45
		27	11.02	21.45
		40.5	11.17	21.45
		54	11.02	21.45
		81	11.01	21.45
		108	11.04	21.45
		121.5	11.00	21.45
		135	11.03	21.45
		162	11.14	21.45
		180	11.09	21.45
5550	110	13.5	17.37	21.45
		27	17.26	21.45
		40.5	17.18	21.45
		54	17.06	21.45
		81	17.08	21.45
		108	17.05	21.45
		121.5	17.07	21.45
		135	17.07	21.45
		162	17.10	21.45
		180	17.17	21.45
5710	142	13.5	19.76	21.45
		27	19.59	21.45
		40.5	19.52	21.45
		54	19.45	21.45
		81	19.46	21.45
		108	19.43	21.45
		121.5	19.42	21.45
		135	19.41	21.45
		162	19.53	21.45
		180	19.52	21.45

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11ac_80 MHz BW Mode: 5290)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5290	58	29.3	8.14	0.266	8.41	-	23.36
		58.5	8.01	0.469	8.48	-	23.36
		87.8	7.89	0.638	8.53	-	23.36
		117	7.77	0.764	8.53	-	23.36
		175.5	7.55	0.976	8.52	-	23.36
		234	7.40	1.136	8.53	-	23.36
		263.3	7.27	1.218	8.49	-	23.36
		292.5	7.24	1.264	8.50	-	23.36
		351	7.12	1.368	8.49	-	23.36
		390	7.09	1.442	8.54	2.26	23.36

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11ac_80 MHz BW Mode: 5290)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5290	58	29.3	8.18	0.266	8.45	-	23.81
		58.5	8.05	0.469	8.52	-	23.81
		87.8	7.85	0.638	8.49	-	23.81
		117	7.76	0.764	8.52	-	23.81
		175.5	7.56	0.976	8.54	-	23.81
		234	7.40	1.136	8.54	-	23.81
		263.3	7.42	1.218	8.63	2.39	23.81
		292.5	7.23	1.264	8.49	-	23.81
		351	7.16	1.368	8.53	-	23.81
		390	7.16	1.442	8.60	-	23.81

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11ac_80 MHz BW Mode: 5290)

802.11ac BW Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5290	58	29.3	11.44	20.57
		58.5	11.51	20.57
		87.8	11.52	20.57
		117	11.54	20.57
		175.5	11.54	20.57
		234	11.55	20.57
		263.3	11.57	20.57
		292.5	11.51	20.57
		351	11.52	20.57
		390	11.58	20.57

▣ TEST RESULTS_Ant.0

Conducted Output Power Measurements (802.11ac _80 MHz BW Mode: 5530~5690)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5530	106	29.3	6.10	0.266	6.37	-	23.98
		58.5	5.98	0.469	6.45	-	23.98
		87.8	5.68	0.638	6.32	-	23.98
		117	5.59	0.764	6.35	-	23.98
		175.5	5.43	0.976	6.40	-	23.98
		234	5.36	1.136	6.50	-	23.98
		263.3	5.22	1.218	6.43	-	23.98
		292.5	5.25	1.264	6.52	-	23.98
		351	5.15	1.368	6.52	-	23.98
		390	5.09	1.442	6.54	0.19	23.98
5690	138	29.3	16.49	0.266	16.76	-	23.98
		58.5	16.32	0.469	16.79	-	23.98
		87.8	16.18	0.638	16.81	-	23.98
		117	16.06	0.764	16.82	-	23.98
		175.5	15.84	0.976	16.81	-	23.98
		234	15.71	1.136	16.85	-	23.98
		263.3	15.60	1.218	16.81	-	23.98
		292.5	15.55	1.264	16.81	-	23.98
		351	15.44	1.368	16.81	-	23.98
		390	15.42	1.442	16.87	10.45	23.98

▣ TEST RESULTS_Ant.1

Conducted Output Power Measurements (802.11ac _80 MHz BW Mode: 5530~5690)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Output Power with TPC (dBm)	Limit (dBm)
Frequency [MHz]	Channel No.						
5530	106	29.3	6.22	0.266	6.48	-	23.98
		58.5	6.19	0.469	6.66	-	23.98
		87.8	6.08	0.638	6.72	-	23.98
		117	5.92	0.764	6.68	-	23.98
		175.5	5.82	0.976	6.80	-	23.98
		234	5.69	1.136	6.82	0.60	23.98
		263.3	5.57	1.218	6.79	-	23.98
		292.5	5.53	1.264	6.80	-	23.98
		351	5.37	1.368	6.74	-	23.98
		390	5.27	1.442	6.71	-	23.98
5690	138	29.3	16.44	0.266	16.70	-	23.98
		58.5	16.27	0.469	16.74	-	23.98
		87.8	16.12	0.638	16.76	-	23.98
		117	16.12	0.764	16.88	10.64	23.98
		175.5	15.81	0.976	16.79	-	23.98
		234	15.70	1.136	16.84	-	23.98
		263.3	15.59	1.218	16.80	-	23.98
		292.5	15.54	1.264	16.80	-	23.98
		351	15.42	1.368	16.79	-	23.98
		390	15.39	1.442	16.83	-	23.98

▣ TEST RESULTS_Sum Data of Ant.0 and Ant.1

Conducted Output Power Measurements (802.11ac _80 MHz BW Mode: 5530~5690)

802.11ac BW Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5530	106	29.3	9.44	21.45
		58.5	9.57	21.45
		87.8	9.53	21.45
		117	9.53	21.45
		175.5	9.61	21.45
		234	9.67	21.45
		263.3	9.62	21.45
		292.5	9.67	21.45
		351	9.64	21.45
		390	9.64	21.45
5690	138	29.3	19.74	21.45
		58.5	19.78	21.45
		87.8	19.80	21.45
		117	19.86	21.45
		175.5	19.81	21.45
		234	19.86	21.45
		263.3	19.82	21.45
		292.5	19.82	21.45
		351	19.81	21.45
		390	19.86	21.45

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(UNII2C Limit: more stringent than UNII3) for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r02.**

40 MHz BW

▣ RESULT PLOTS_Ant.0 (5270 MHz ~5310 MHz)

Conducted Output Power (802.11n-CH 62) 135 Mbps

▣ RESULT PLOTS_Ant.1 (5270 MHz ~5310 MHz)

Conducted Output Power (802.11n-CH 62) 81 Mbps

▣ RESULT PLOTS_Ant.0 (5510 MHz ~5710 MHz)

Conducted Output Power (802.11n-CH 142) 108 Mbps

▣ RESULT PLOTS_Ant.1 (5510 MHz ~5710 MHz)

Conducted Output Power (802.11n-CH 142) 13.5 Mbps

▣ RESULT PLOTS_Ant.0 (5270 MHz ~5310 MHz)

Conducted Output Power (802.11ac-CH 62) 13.5 Mbps

▣ RESULT PLOTS_Ant.1 (5270 MHz ~5310 MHz)

Conducted Output Power (802.11ac-CH 62) 180 Mbps

▣ RESULT PLOTS_Ant.0 (5510 MHz ~5710 MHz)

Conducted Output Power (802.11ac-CH 142) 13.5 Mbps

▣ RESULT PLOTS_Ant.1 (5510 MHz ~5710 MHz)

Conducted Output Power (802.11ac-CH 142) 13.5Mbps

80 MHz BW

▣ RESULT PLOTS_Ant.0 (5290 MHz)

Conducted Output Power (802.11ac-CH 58) 390 Mbps

▣ RESULT PLOTS_Ant.1 (5290 MHz)

Conducted Output Power (802.11ac-CH 58) 263.3 Mbps

▣ RESULT PLOTS_Ant.0 (5530 MHz ~5690 MHz)

Conducted Output Power (802.11ac-CH 138) 390 Mbps

▣ RESULT PLOTS_Ant.1 (5530 MHz ~5690 MHz)

Conducted Output Power (802.11ac-CH 138) 117 Mbps

8.5 POWER SPECTRAL DENSITY

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. The maximum permissible peak power spectral density is 11 dBm/ MHz in the 5.25 GHz – 5.35 GHz and 5.47 GHz – 5.725 GHz bands

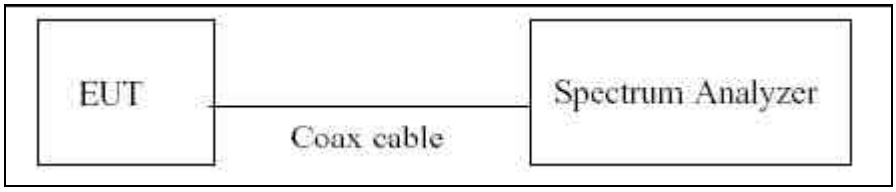
▣ Limit(CDD)

Service Port

Operating Mode	Band	Mode	Ant. Port	Ant. Gain (dBi)	Limit (dBm)
SISO	UNII 2A	802.11a,n,ac	0	6.62	10.38
			1	6.17	10.83
	UNII 2C	802.11a,n,ac	0	5.71	11
			1	5.32	11
MIMO(2 TX)	UNII 2A	802.11a,n,ac	0 & 1	9.41	7.59
	UNII 2C	802.11a,n,ac	0 & 1	8.53	8.47

Note : Above the limits is calculated according to antenna gain. Because antenna gain is higher than 6 dBi.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

We tested according to Method in KDB 789033(issued 06/06/2014).

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 UNII 2A/2C band that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table. We used the particular cable type that is supported by manufacture.

Band	Loss(dB)
UNII 2	10.9
UNII 2e	10.9

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

Service Port Ant.0

▣ 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
5260	52	802.11a	3.071	0.286903	3.358	10.38	Pass
5300	60		-4.675	0.45438	-4.221		Pass
5320	64		-4.808	0.45438	-4.354		Pass
5500	100	802.11a	-4.269	0.547868	-3.721	11	Pass
5580	116		2.975	0.45438	3.429		Pass
5720	144		4.456	0.286903	4.743		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
5260	52	802.11n 20MHz BW	3.779	0.216873	3.996	10.38	Pass
5300	60		-3.243	0.200479	-3.043		Pass
5320	64		-4.417	0.434657	-3.982		Pass
5500	100	802.11n 20MHz BW	-2.617	0.401172	-2.216	11	Pass
5580	116		4.328	0.367228	4.695		Pass
5720	144		5.096	0.434657	5.531		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
5260	52	802.11ac 20MHz BW	2.680	0.401172	3.081	10.38	Pass
5300	60		-3.264	0.209738	-3.054		Pass
5320	64		-4.402	0.209738	-4.192		Pass
5500	100	802.11ac 20MHz BW	-3.518	0.581006	-2.937	11	Pass
5580	116		4.286	0.209738	4.496		Pass
5720	144		5.301	0.209738	5.511		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
5270	54	802.11n 40MHz BW	-5.535	0.746336	-4.789	10.38	Pass
5310	62		-4.506	0.746336	-3.760		Pass
5510	102	802.11n 40MHz BW	-8.724	0.52178	-8.202	11	Pass
5550	110		-1.538	0.746336	-0.792		Pass
5710	142		2.119	0.611945	2.731		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
5270	54	802.11ac 40MHz BW	-6.199	0.428957	-5.770	10.38	Pass
5310	62		-4.915	0.428957	-4.486		Pass
5510	102	802.11ac 40MHz BW	-6.158	0.428957	-5.729	11	Pass
5550	110		-0.330	0.428957	0.099		Pass
5710	142		2.034	0.428957	2.463		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
5290	58	802.11ac 80MHz BW	-9.682	1.442386	-8.240	10.38	Pass
5530	106	802.11ac 80MHz BW	-11.507	1.442386	-10.065	11	Pass
5690	138	802.11ac 80MHz BW	-1.129	1.442386	0.313		Pass

Service Port Ant.1

▣ 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
5260	52	802.11a	2.925	0.547868	3.473	10.83	Pass
5300	60		-5.278	0.547868	-4.730		Pass
5320	64		-5.179	0.278291	-4.901		Pass
5500	100	802.11a	-4.062	0.278291	-3.784	11	Pass
5580	116		3.288	0.45438	3.742		Pass
5720	144		4.229	0.286903	4.516		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
5260	52	802.11n 20MHz BW	3.382	0.209738	3.592	10.83	Pass
5300	60		-3.569	0.391431	-3.178		Pass
5320	64		-4.553	0.435384	-4.118		Pass
5500	100	802.11n 20MHz BW	-2.252	0.209738	-2.042	11	Pass
5580	116		4.373	0.209738	4.583		Pass
5720	144		5.005	0.359886	5.365		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
5260	52	802.11ac 20MHz BW	2.348	0.209738	2.558	10.83	Pass
5300	60		-3.632	0.215661	-3.416		Pass
5320	64		-4.619	0.194784	-4.424		Pass
5500	100	802.11ac 20MHz BW	-3.238	0.215661	-3.022	11	Pass
5580	116		4.290	0.581006	4.871		Pass
5720	144		5.124	0.209738	5.334		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
5270	54	802.11n 40MHz BW	-5.571	0.404287	-5.167	10.83	Pass
5310	62		-4.347	0.518461	-3.829		Pass
5510	102	802.11n 40MHz BW	-8.462	0.622623	-7.839	11	Pass
5550	110		-1.301	0.738818	-0.562		Pass
5710	142		2.123	0.428957	2.552		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
5270	54	802.11ac 40MHz BW	-6.111	0.410201	-5.701	10.83	Pass
5310	62		-5.584	0.972979	-4.611		Pass
5510	102	802.11ac 40MHz BW	-5.857	0.428957	-5.428	11	Pass
5550	110		0.423	0.428957	0.852		Pass
5710	142		2.180	0.428957	2.609		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
5290	58	802.11ac 80MHz BW	-9.247	1.218379	-8.029	10.83	Pass
5530	106	802.11ac 80MHz BW	-11.156	1.1365	-10.020	11	Pass
5690	138	802.11ac 80MHz BW	-1.170	0.764263	-0.406		Pass

Sum Data of Service Port Ant.0 and Ant.1

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result		
			Power Density (dBm)	Limit (dBm)	Pass/Fail
5260	52	802.11a	6.43	7.59	Pass
5300	60		-1.46		Pass
5320	64		-1.61		Pass
5500	100	802.11a	-0.74	8.47	Pass
5580	116		6.60		Pass
5720	144		7.64		Pass

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result		
			Power Density (dBm)	Limit (dBm)	Pass/Fail
5260	52	802.11n 20MHz BW	6.81	7.59	Pass
5300	60		-0.10		Pass
5320	64		-1.04		Pass
5500	100	802.11n 20MHz BW	0.88	8.47	Pass
5580	116		7.65		Pass
5720	144		8.46		Pass

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result		
			Power Density (dBm)	Limit (dBm)	Pass/Fail
5260	52	802.11ac 20MHz BW	5.84	7.59	Pass
5300	60		-0.22		Pass
5320	64		-1.30		Pass
5500	100	802.11ac 20MHz BW	0.03	8.47	Pass
5580	116		7.70		Pass
5720	144		8.43		Pass

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result		
			Power Density (dBm)	Limit (dBm)	Pass/Fail
5270	54	802.11n 40MHz BW	-1.96	7.59	Pass
5310	62		-0.78		Pass
5510	102	802.11n 40MHz BW	-5.01	8.47	Pass
5550	110		2.33		Pass
5710	142		5.65		Pass

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result		
			Power Density (dBm)	Limit (dBm)	Pass/Fail
5270	54	802.11ac 40MHz BW	-2.73	7.59	Pass
5310	62		-1.54		Pass
5510	102	802.11ac 40MHz BW	-2.57	8.47	Pass
5550	110		3.50		Pass
5710	142		5.55		Pass

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result		
			Power Density (dBm)	Limit (dBm)	Pass/Fail
5290	58	802.11ac 80MHz BW	-5.12	7.49	Pass
5530	106		-7.03	8.47	Pass
5690	138		2.98		Pass

Note :

1. **In order to simplify the report, attached plots were only the highest PSD.**
2. **We applied the 15.407(UNII2C Limit: more stringent than UNII3) for Ch.144, 142 and 138 in 802.11ac according to KDB 644545 D01 v01r02.**

Service Port Ant.0

▣ RESULT PLOTS

20 MHz BW

Power Spectral Density (802.11a-CH 52)

Power Spectral Density (802.11a-CH 60)

Power Spectral Density (802.11a-CH 64)

Power Spectral Density (802.11a-CH 100)

Power Spectral Density (802.11a-CH 116)

Power Spectral Density (802.11a-CH 144)

Power Spectral Density (802.11n-CH 52)

Power Spectral Density (802.11n-CH 60)

Power Spectral Density (802.11n-CH 64)

Power Spectral Density (802.11n-CH 100)

Power Spectral Density (802.11n-CH 116)

Power Spectral Density (802.11n-CH 144)

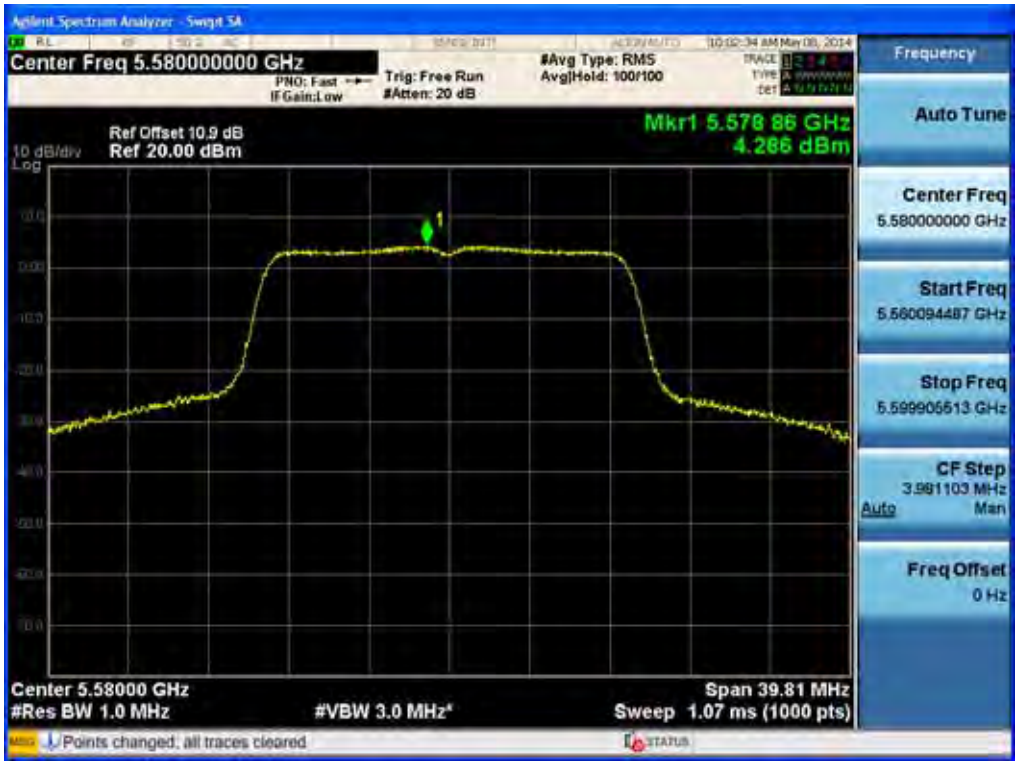
Power Spectral Density (802.11ac-CH 52)

Power Spectral Density (802.11ac-CH 60)

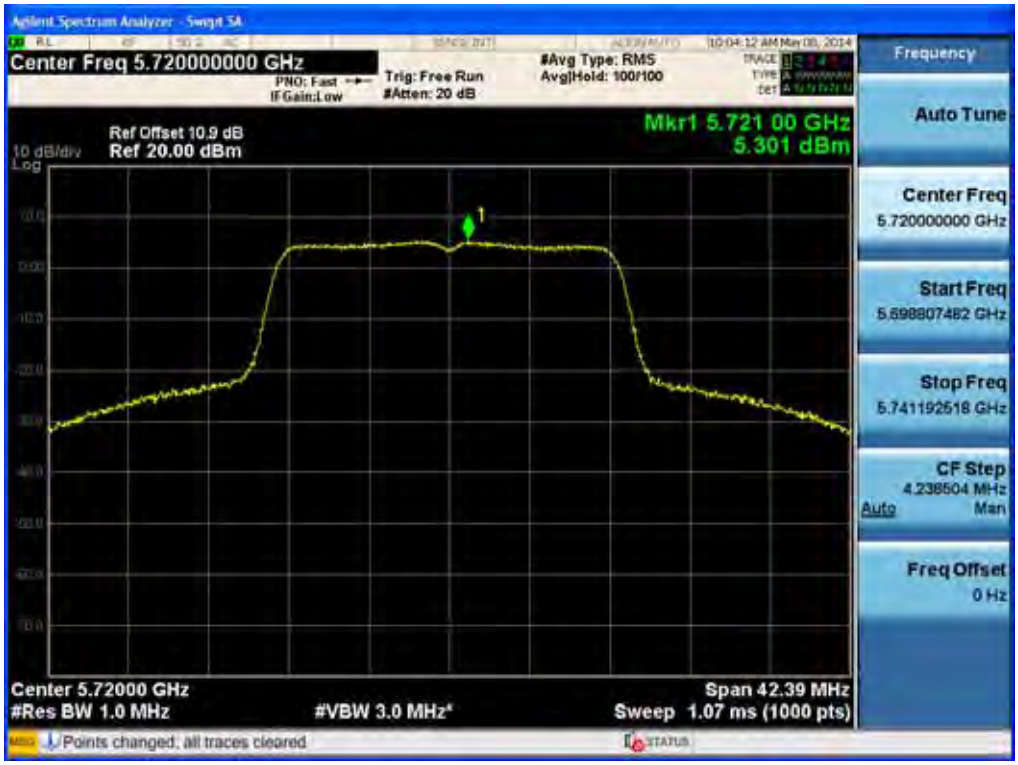
Power Spectral Density (802.11ac-CH 64)

Power Spectral Density (802.11ac-CH 100)

Power Spectral Density (802.11ac-CH 116)



Power Spectral Density (802.11ac-CH 144)

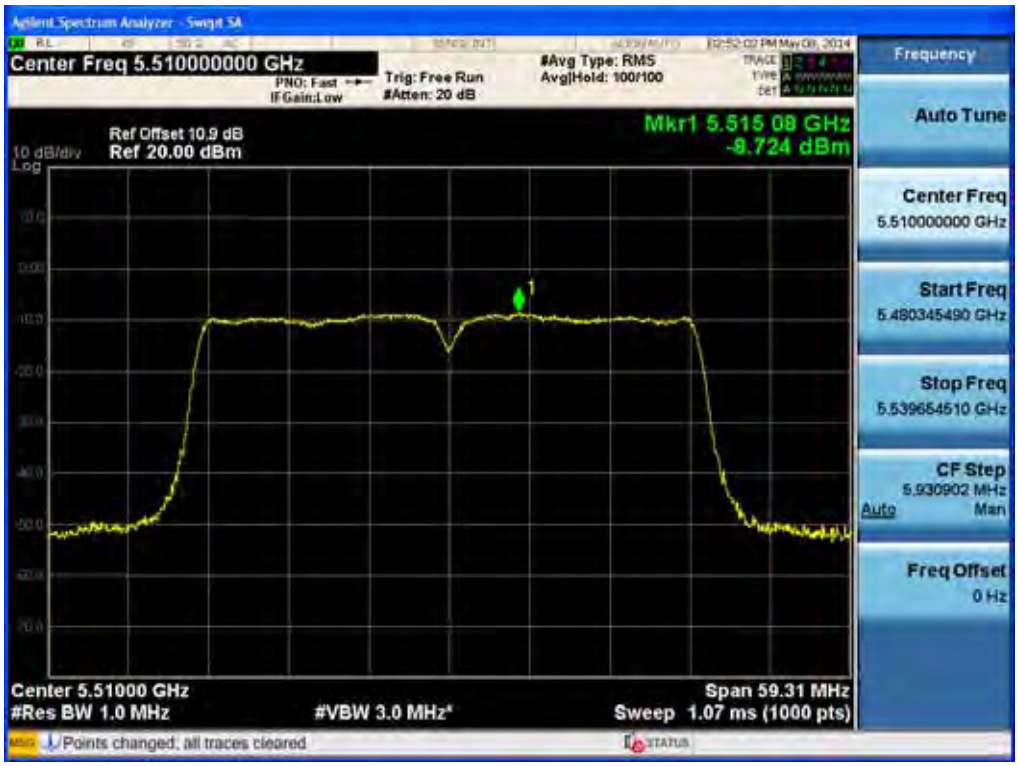


40 MHz BW

Power Spectral Density (802.11n-CH 54)

Power Spectral Density (802.11n-CH 62)

Power Spectral Density (802.11n-CH 102)



Power Spectral Density (802.11n-CH 110)

Power Spectral Density (802.11n-CH 142)

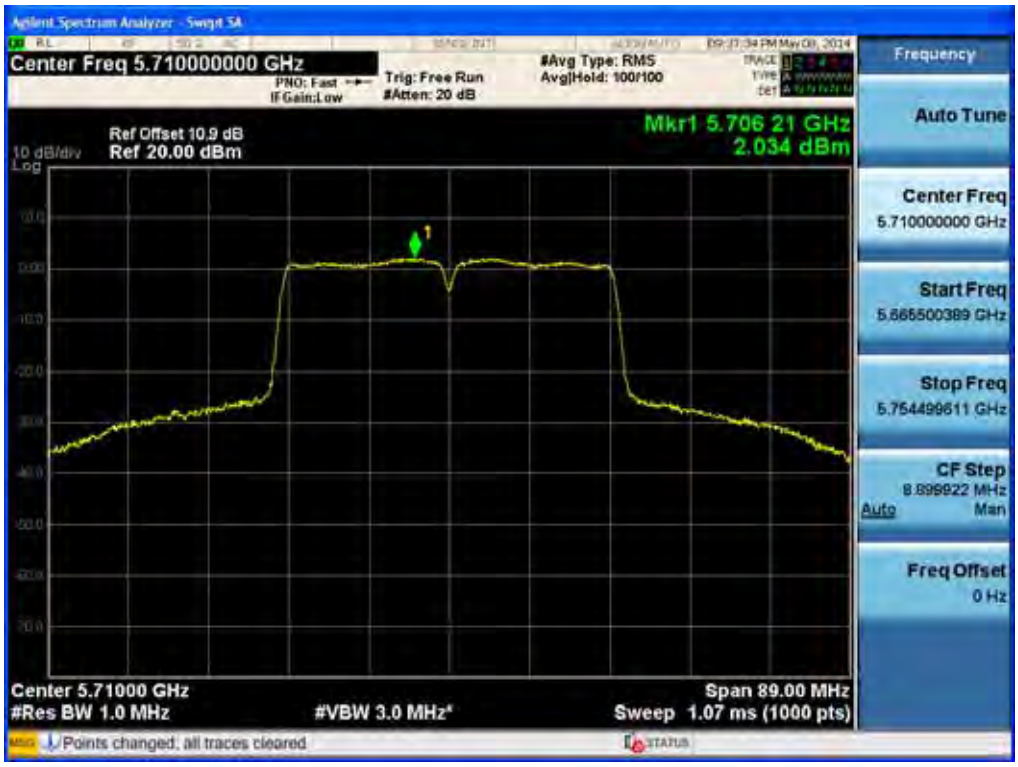
Power Spectral Density (802.11ac-CH 54)

Power Spectral Density (802.11ac-CH 62)

Power Spectral Density (802.11ac-CH 102)

Power Spectral Density (802.11ac-CH 110)

Power Spectral Density (802.11ac-CH 142)



80 MHz BW

Power Spectral Density (802.11ac-CH 58)

Power Spectral Density (802.11ac-CH 106)

Power Spectral Density (802.11ac-CH 138)

Service Port Ant.1

▣ RESULT PLOTS

20 MHz BW

Power Spectral Density (802.11a-CH 52)

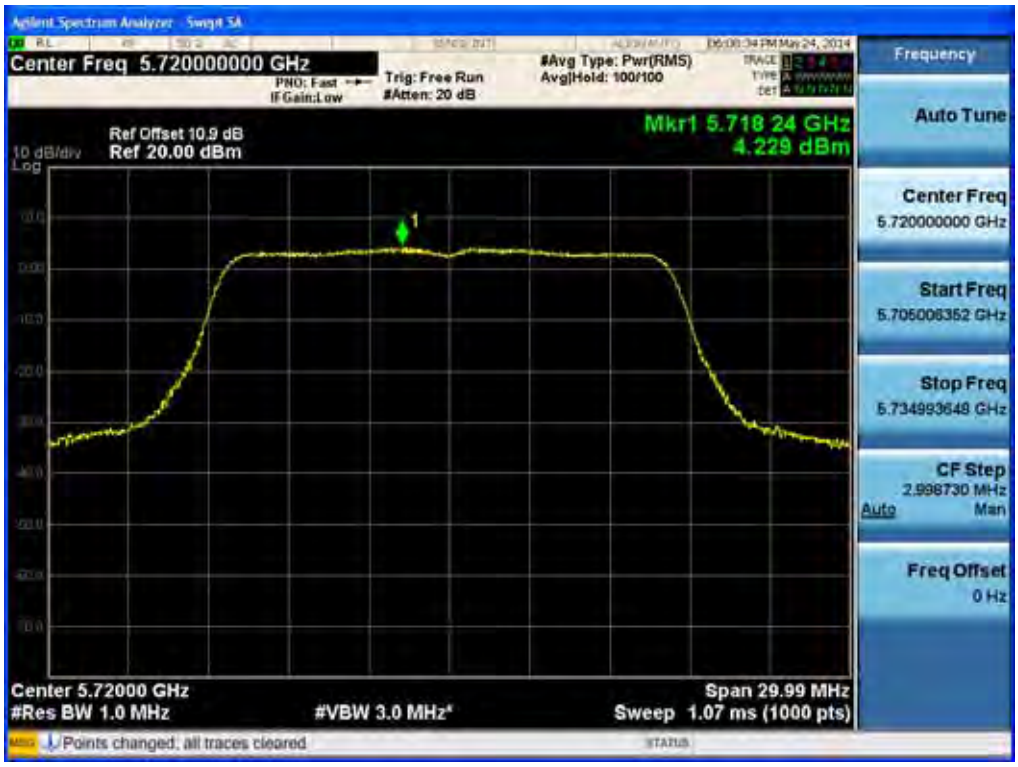
Power Spectral Density (802.11a-CH 60)

Power Spectral Density (802.11a-CH 64)

Power Spectral Density (802.11a-CH 100)

Power Spectral Density (802.11a-CH 116)

Power Spectral Density (802.11a-CH 144)

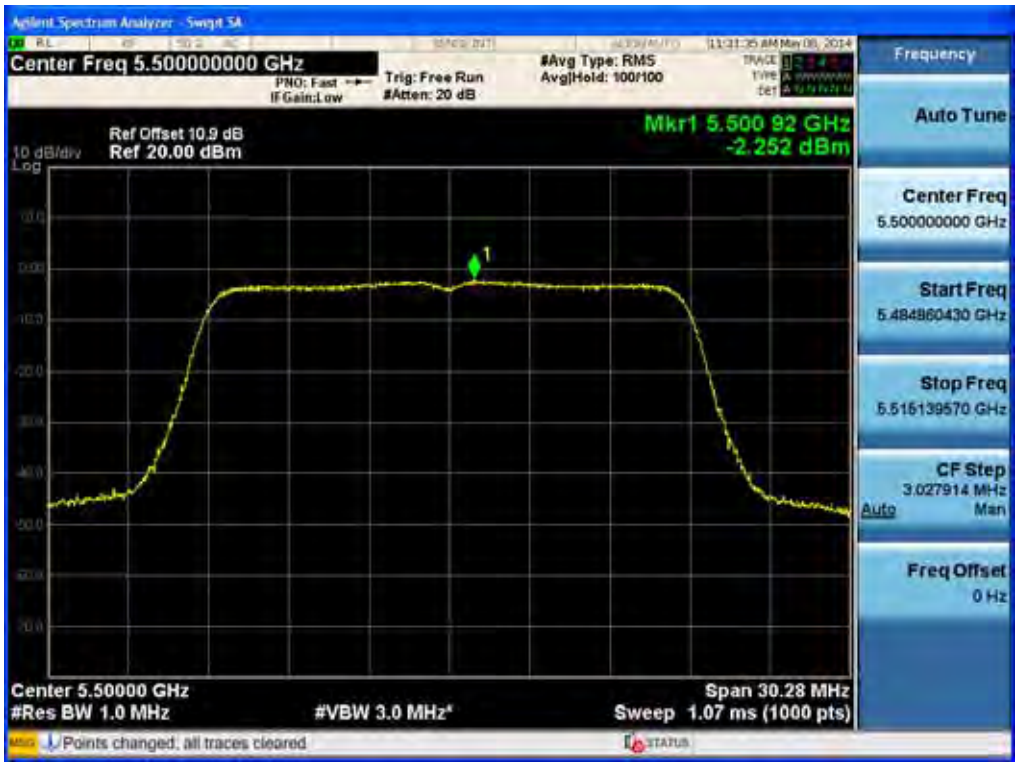


Power Spectral Density (802.11n-CH 52)

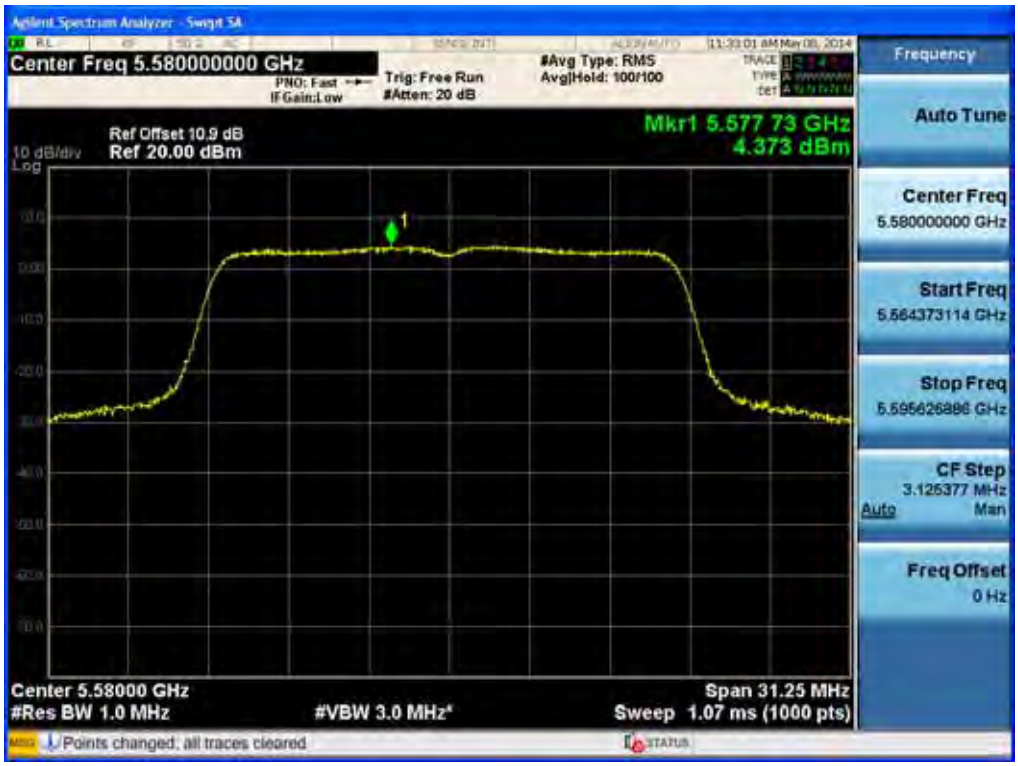
Power Spectral Density (802.11n-CH 60)

Power Spectral Density (802.11n-CH 64)

Power Spectral Density (802.11n-CH 100)



Power Spectral Density (802.11n-CH 116)



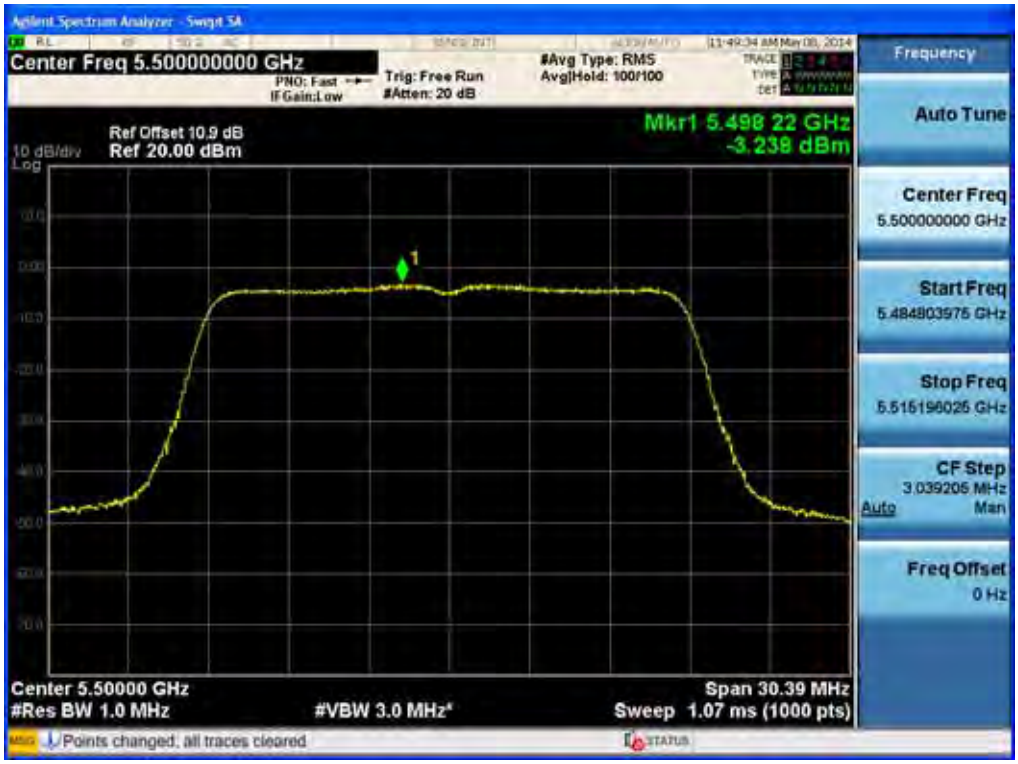
Power Spectral Density (802.11n-CH 144)

Power Spectral Density (802.11ac-CH 52)

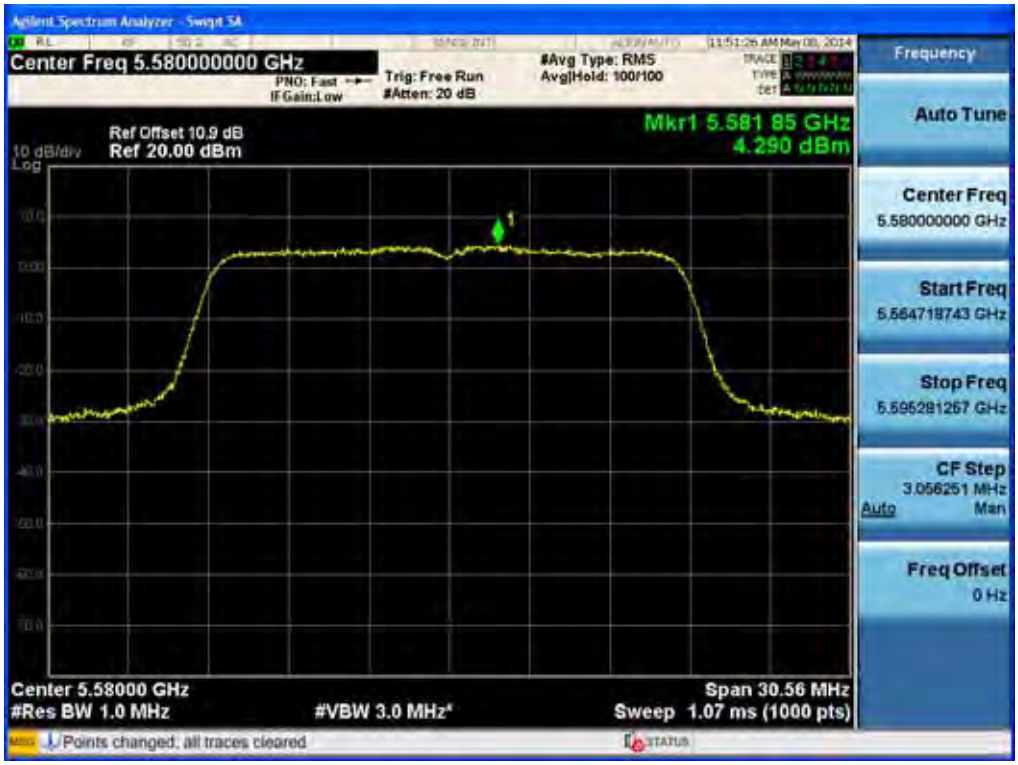
Power Spectral Density (802.11ac-CH 60)

Power Spectral Density (802.11ac-CH 64)

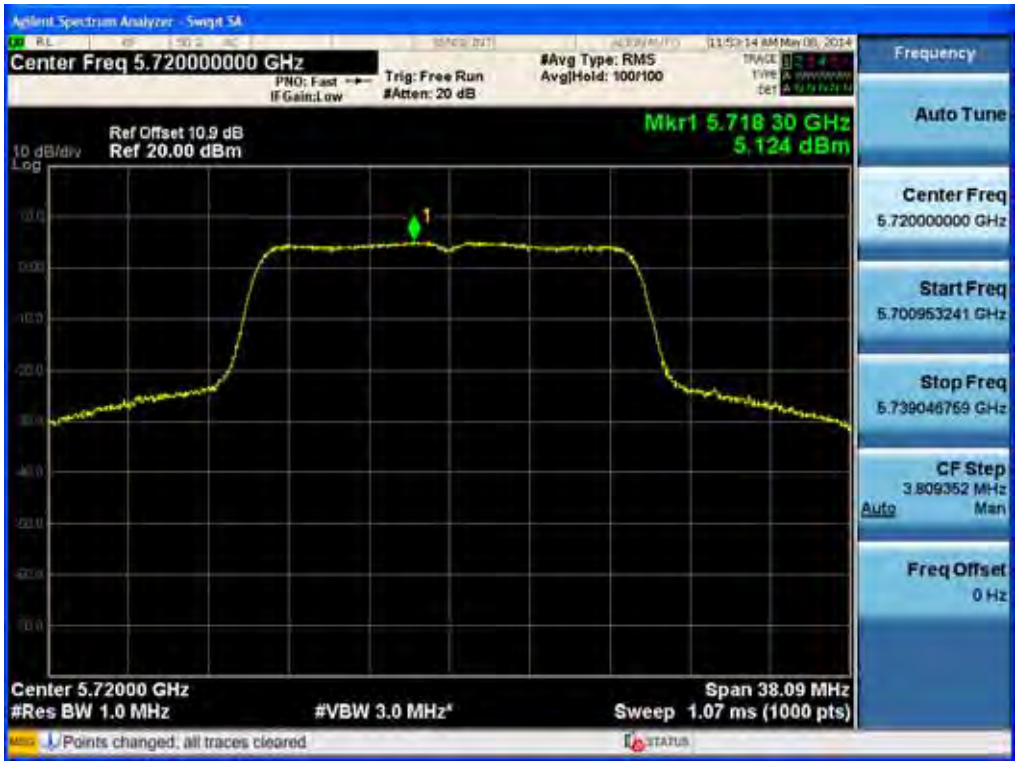
Power Spectral Density (802.11ac-CH 100)



Power Spectral Density (802.11ac-CH 116)



Power Spectral Density (802.11ac-CH 144)

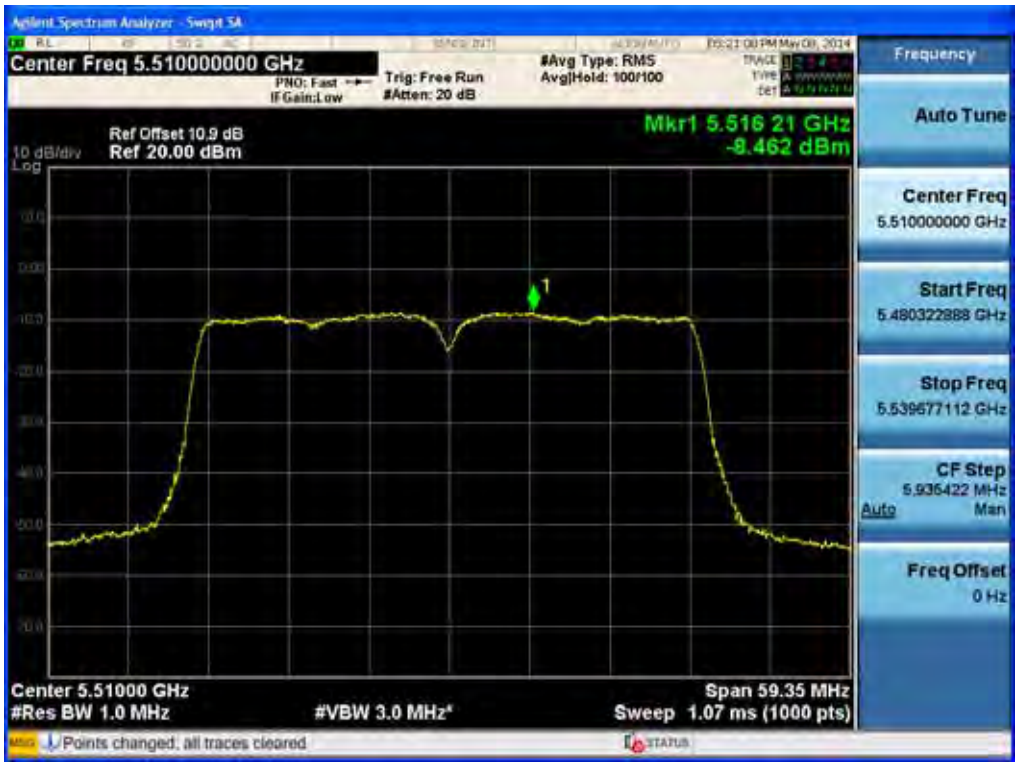


40 MHz BW

Power Spectral Density (802.11n-CH 54)

Power Spectral Density (802.11n-CH 62)

Power Spectral Density (802.11n-CH 102)



Power Spectral Density (802.11n-CH 110)

Power Spectral Density (802.11n-CH 142)

Power Spectral Density (802.11ac-CH 54)

Power Spectral Density (802.11ac-CH 62)

Power Spectral Density (802.11ac-CH 102)

Power Spectral Density (802.11ac-CH 110)

Power Spectral Density (802.11ac-CH 142)

80 MHz BW

Power Spectral Density (802.11ac-CH 58)

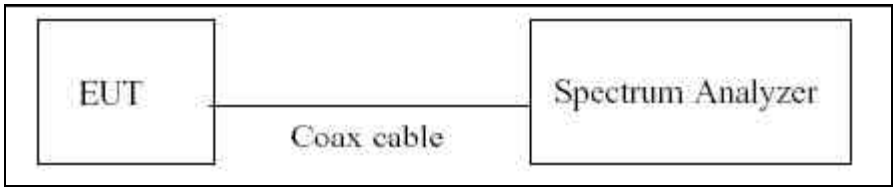
Power Spectral Density (802.11ac-CH 106)

Power Spectral Density (802.11ac-CH 138)

8.6 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 06/06/2014).

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 UNII 2A/2C band that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table. We used the particular cable type that is supported by manufacture.

Band	Loss(dB)
UNII 2	10.9
UNII 2e	10.9

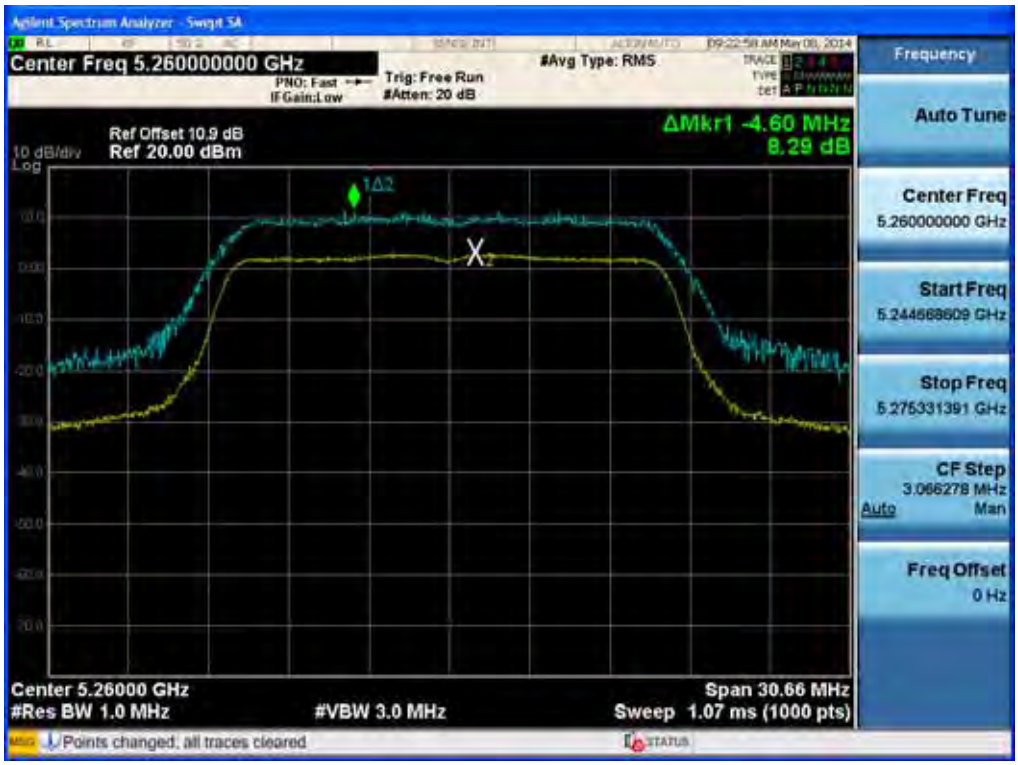
(Actual value of loss for the attenuator and cable combination)

Service Port Ant.0

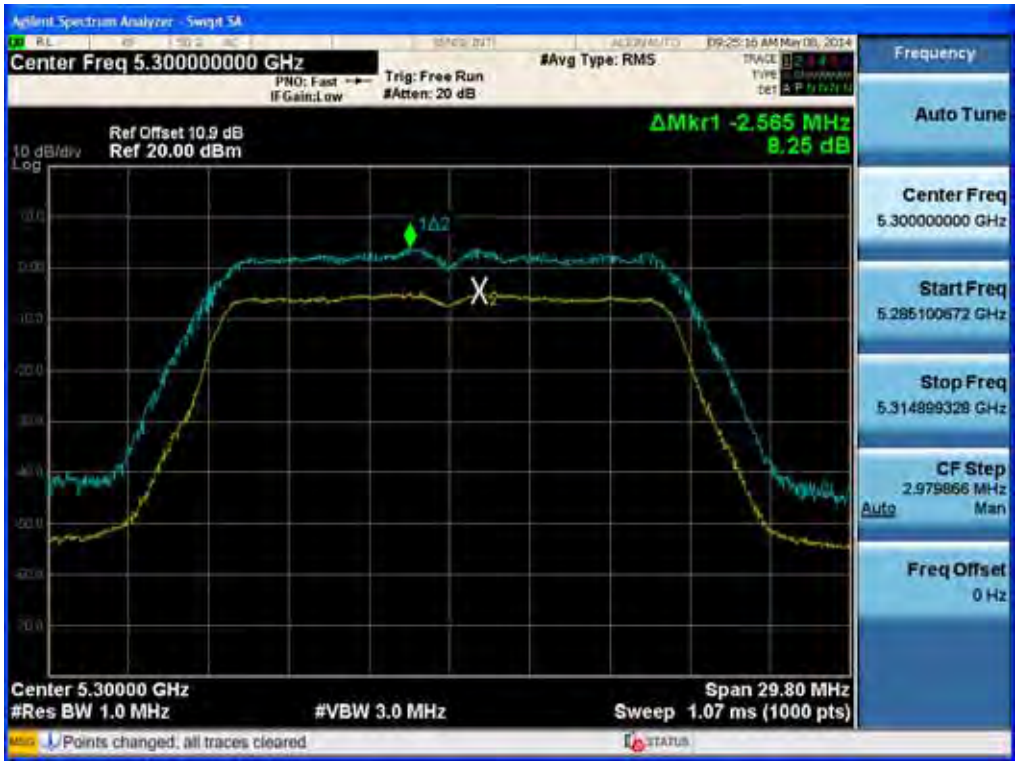
▣ RESULT PLOTS

20 MHz BW

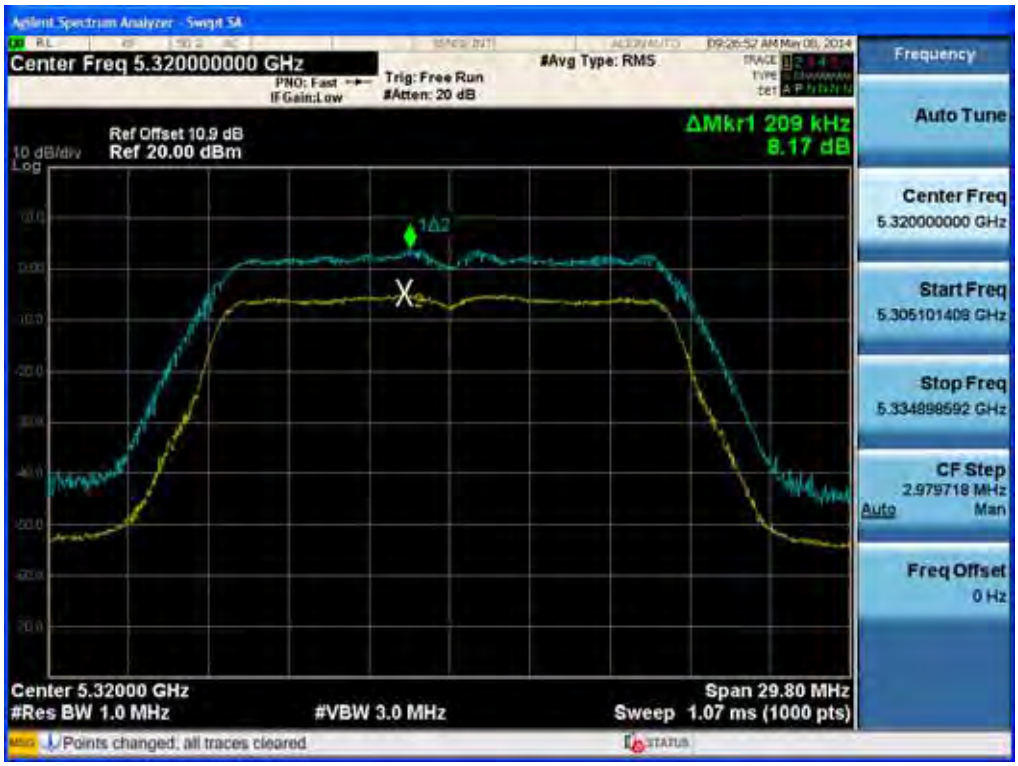
Peak Excursion Ratio (802.11a-CH 52)



Peak Excursion Ratio (802.11a-CH 60)

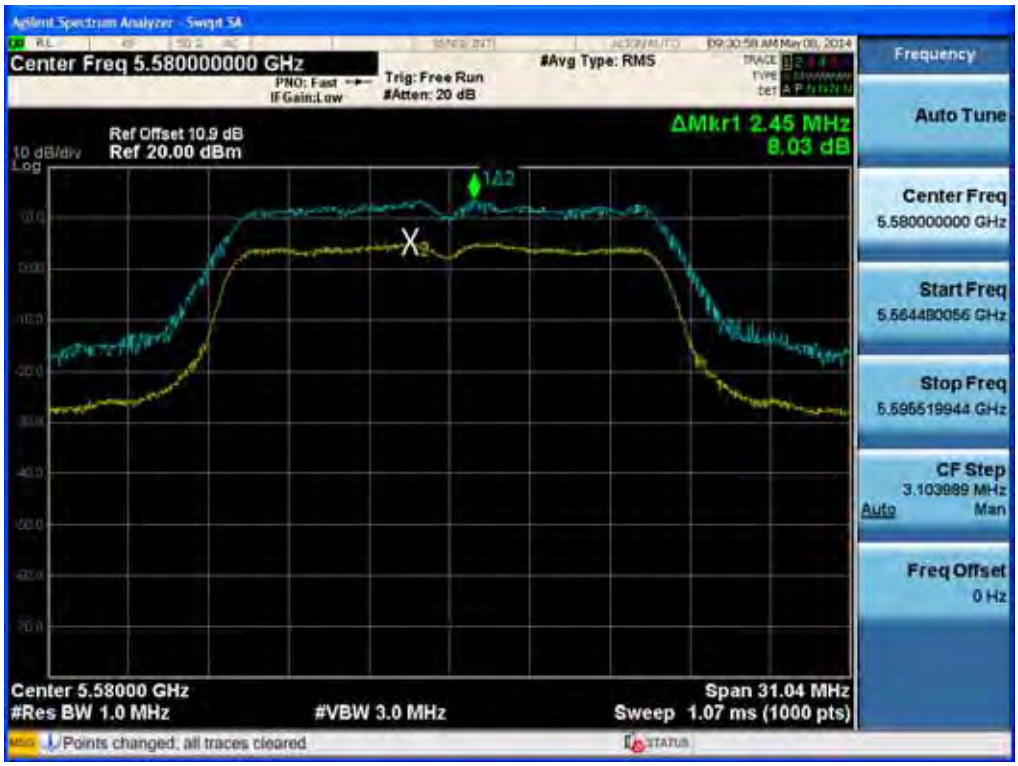


Peak Excursion Ratio (802.11a-CH 64)

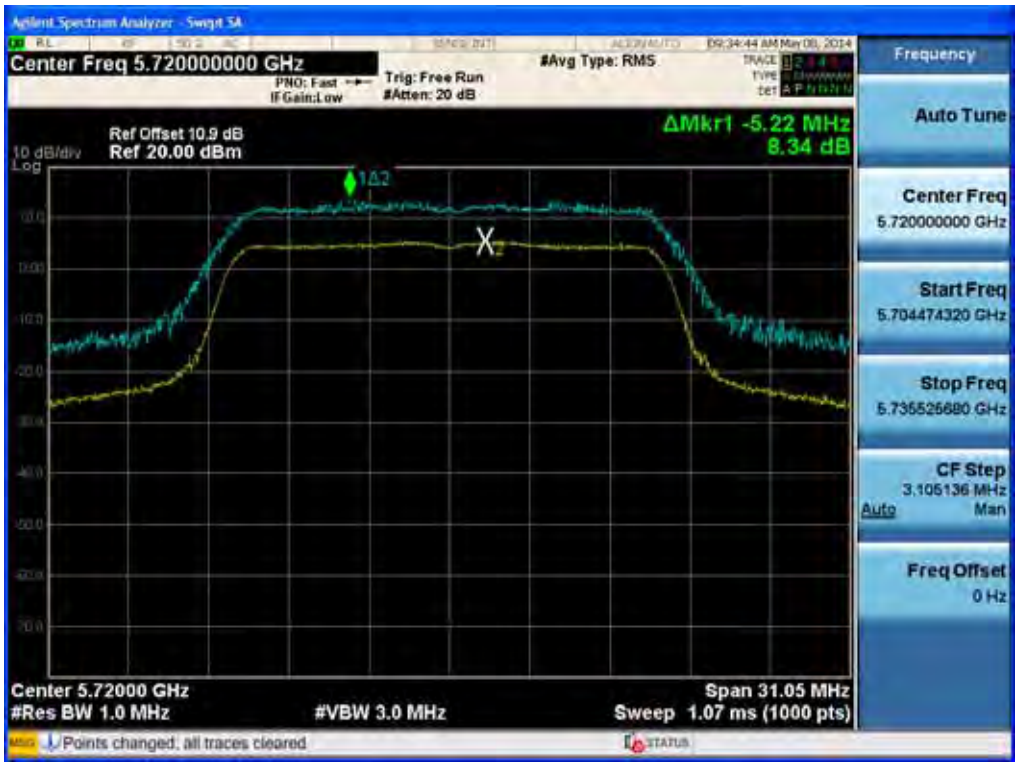


Peak Excursion Ratio (802.11a-CH 100)

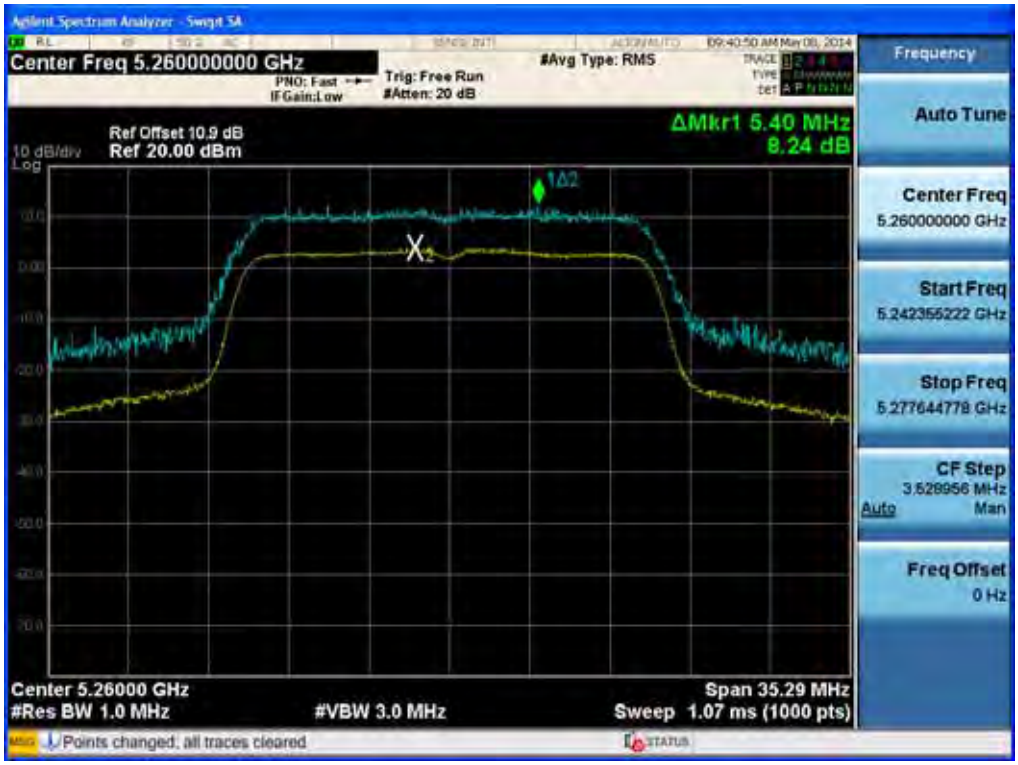
Peak Excursion Ratio (802.11a-CH 116)



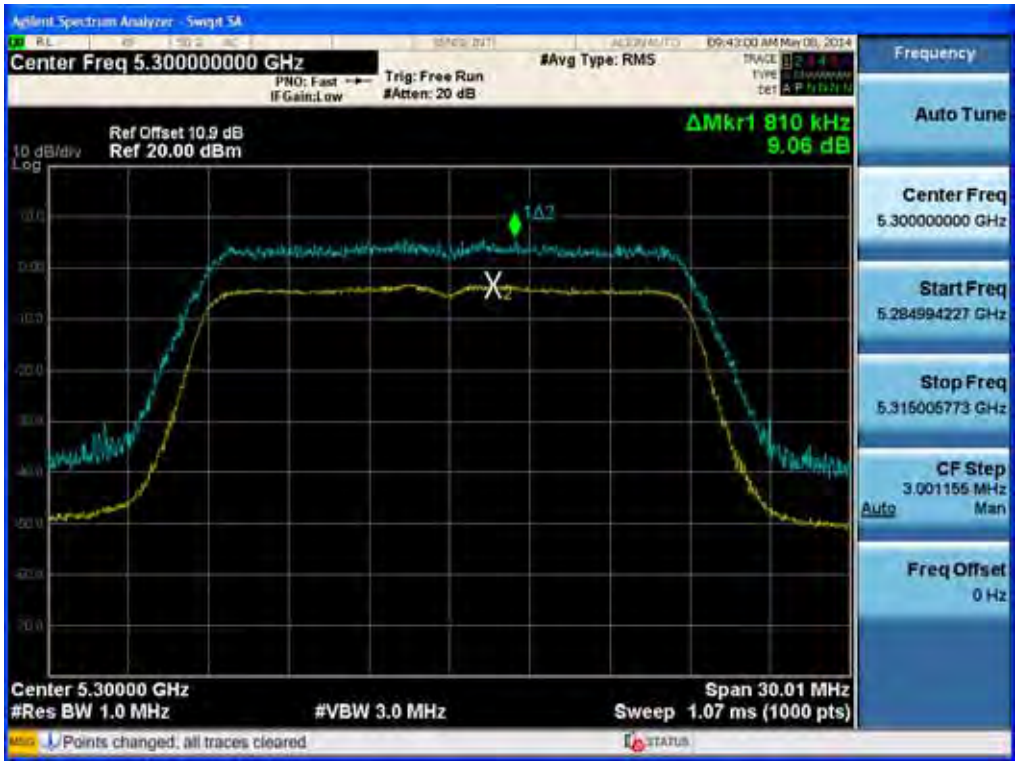
Peak Excursion Ratio (802.11a-CH 144)



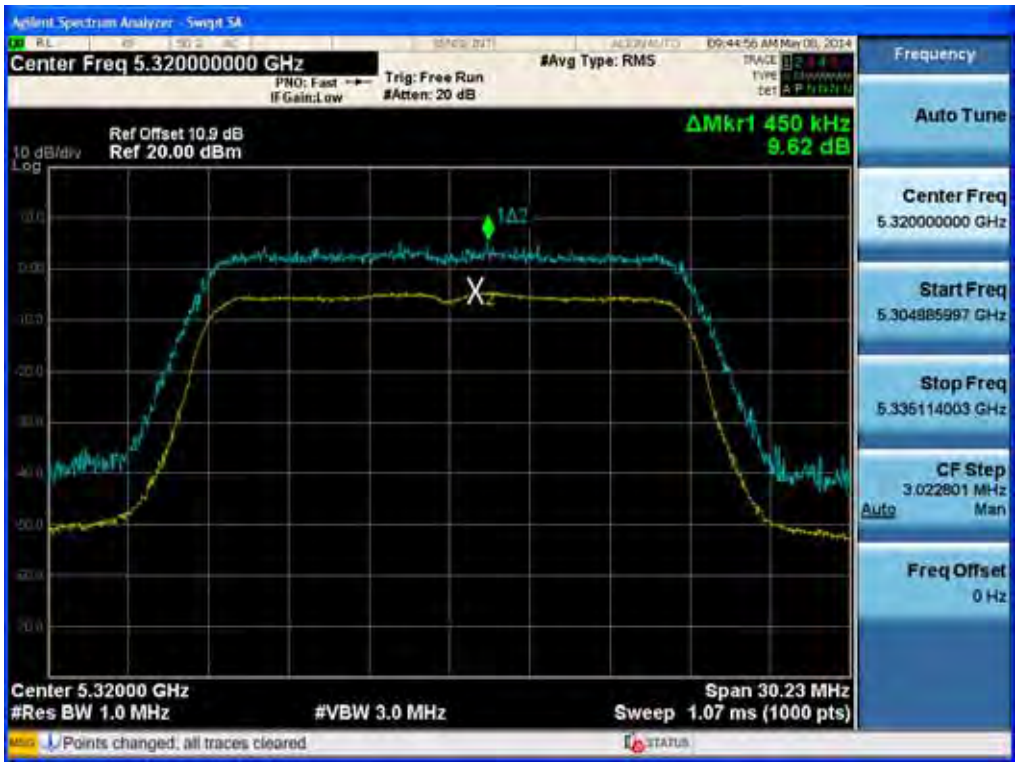
Peak Excursion Ratio (802.11n-CH 52)



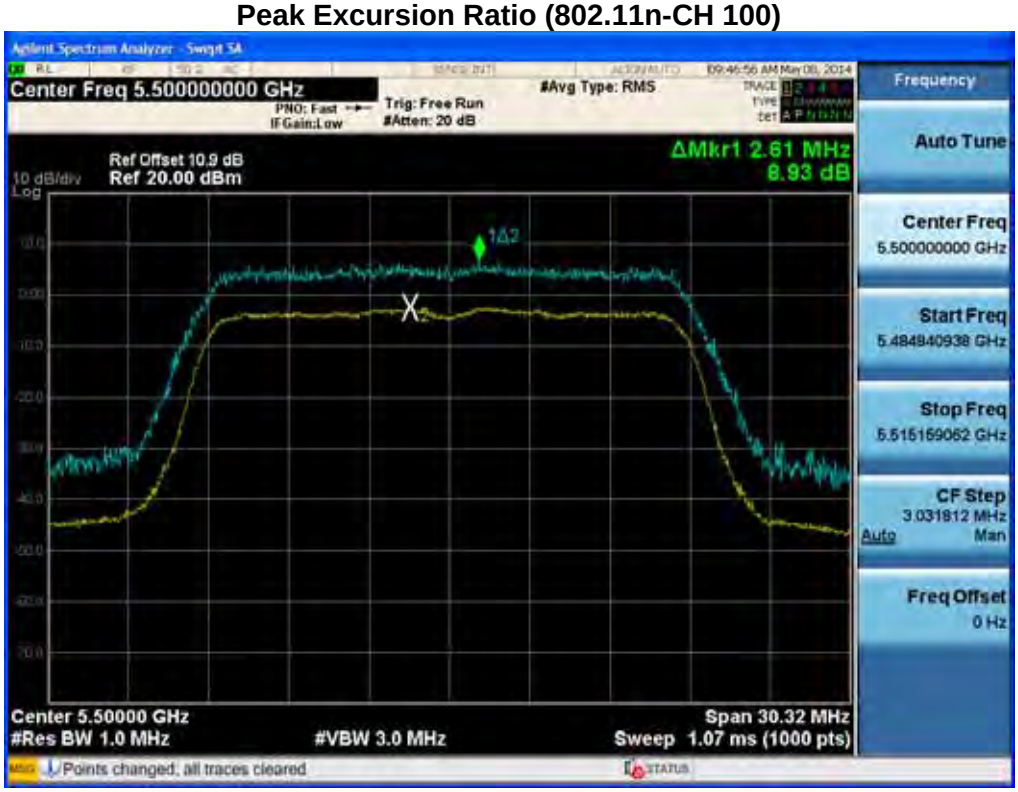
Peak Excursion Ratio (802.11n-CH 60)



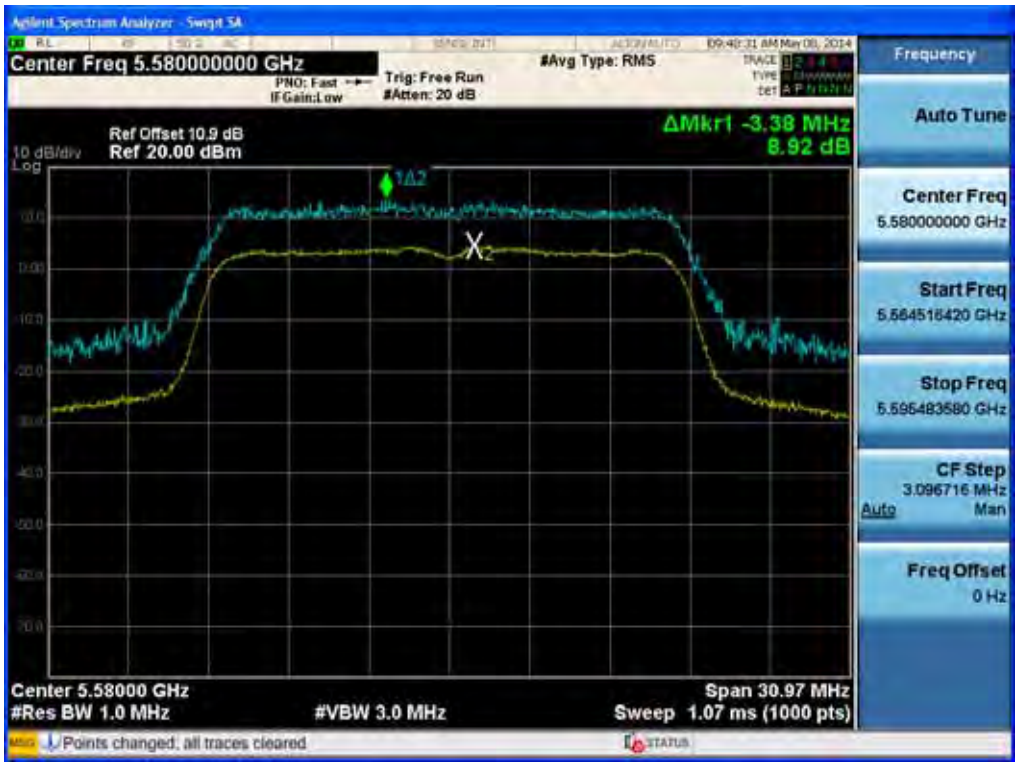
Peak Excursion Ratio (802.11n-CH 64)



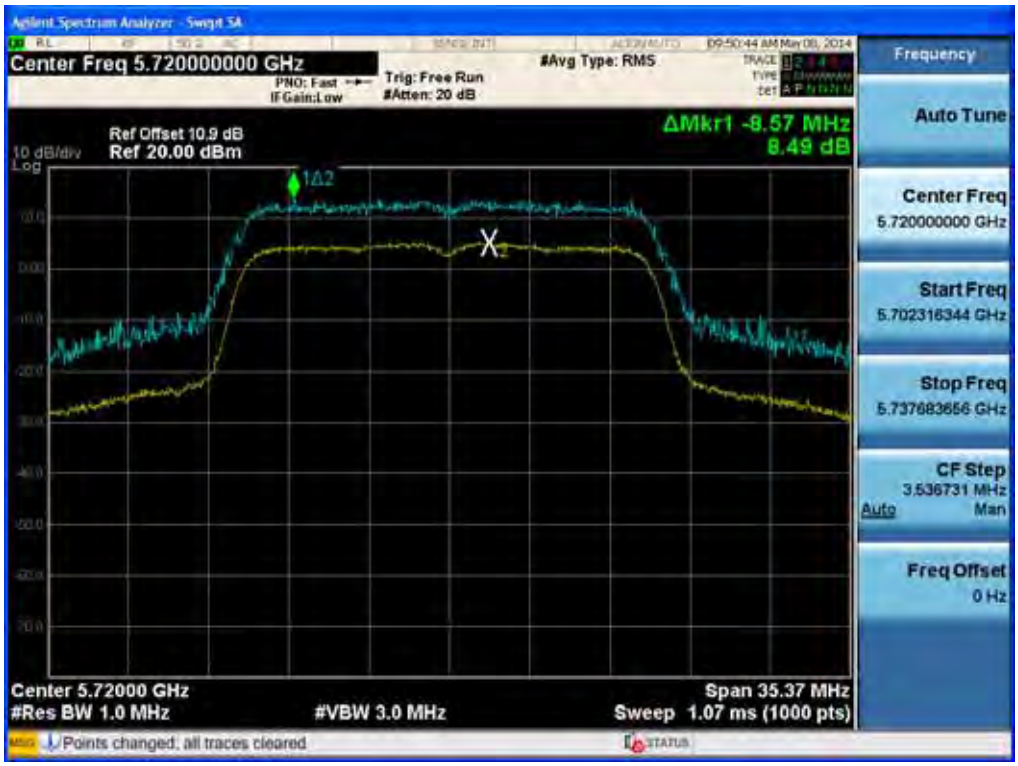
Peak Excursion Ratio (802.11n-CH 100)



Peak Excursion Ratio (802.11n-CH 116)

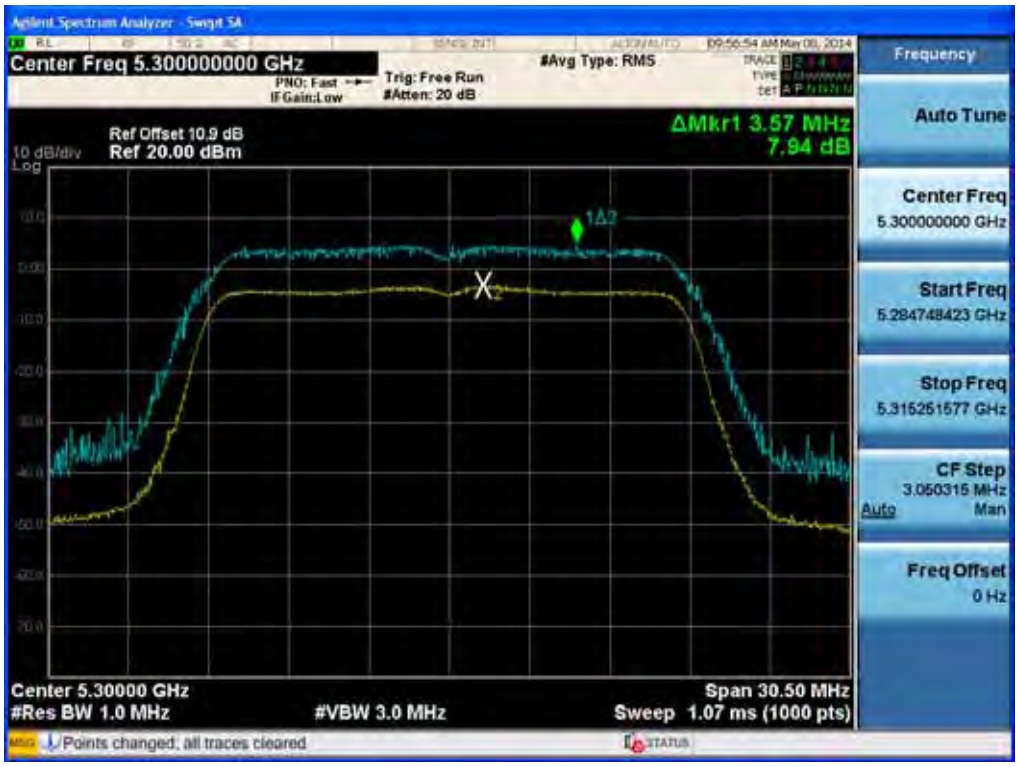


Peak Excursion Ratio (802.11n-CH 144)



Peak Excursion Ratio (802.11ac-CH 52)

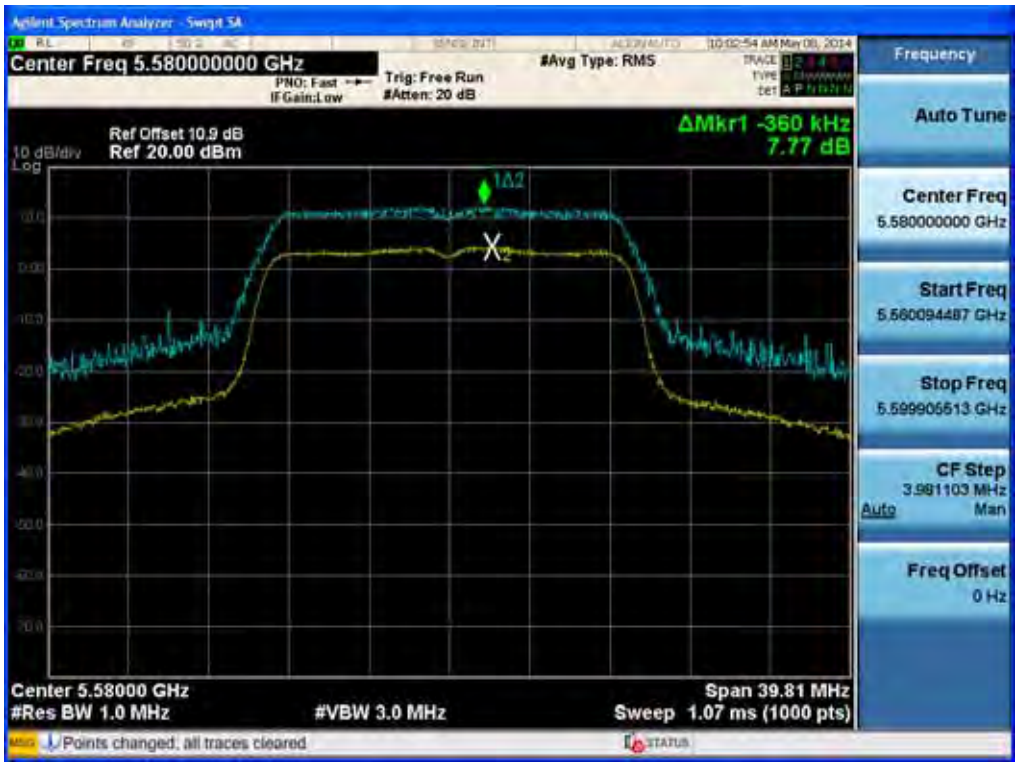
Peak Excursion Ratio (802.11ac-CH 60)



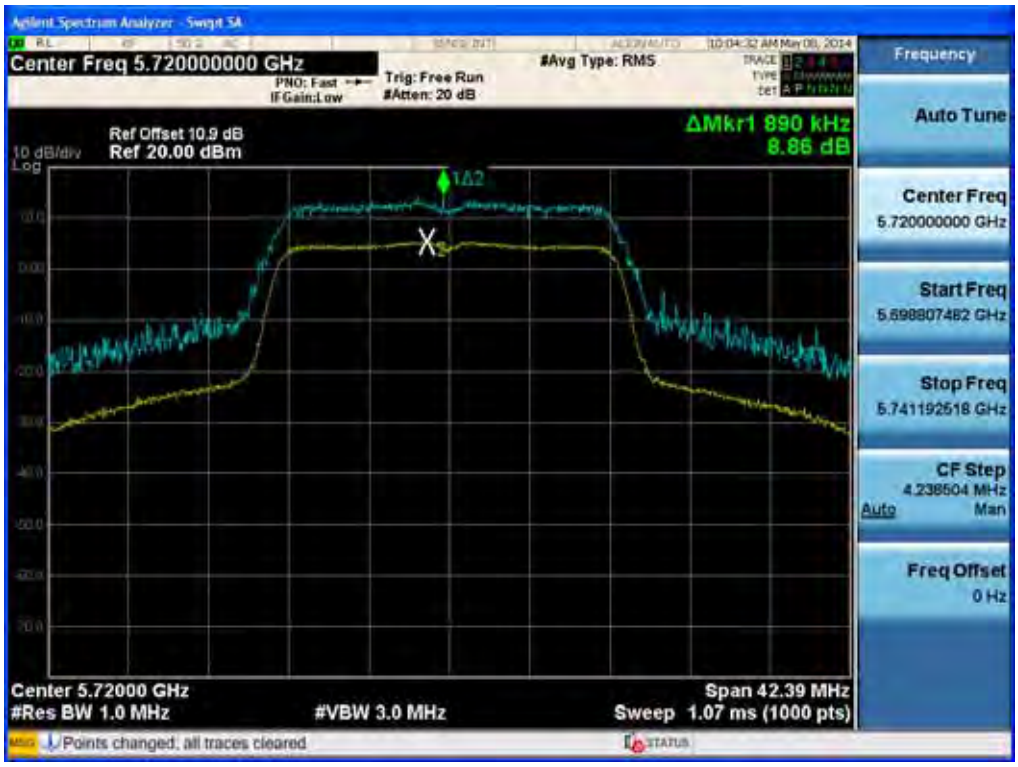
Peak Excursion Ratio (802.11ac-CH 64)

Peak Excursion Ratio (802.11ac-CH 100)

Peak Excursion Ratio (802.11ac-CH 116)

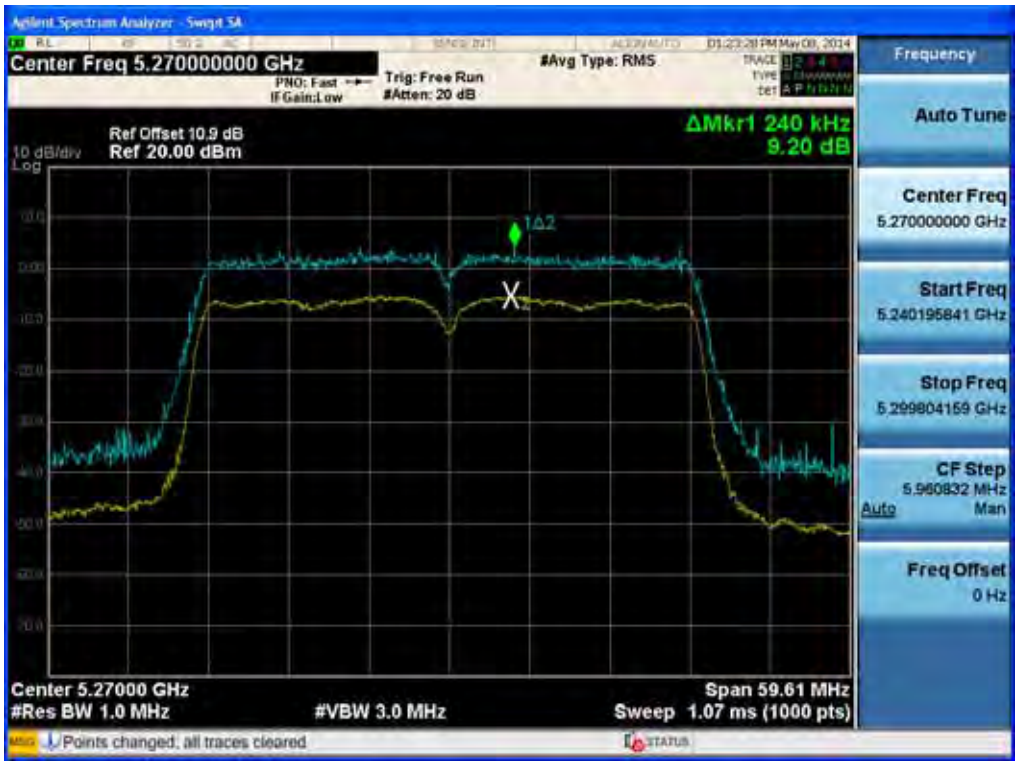


Peak Excursion Ratio (802.11ac-CH 144)

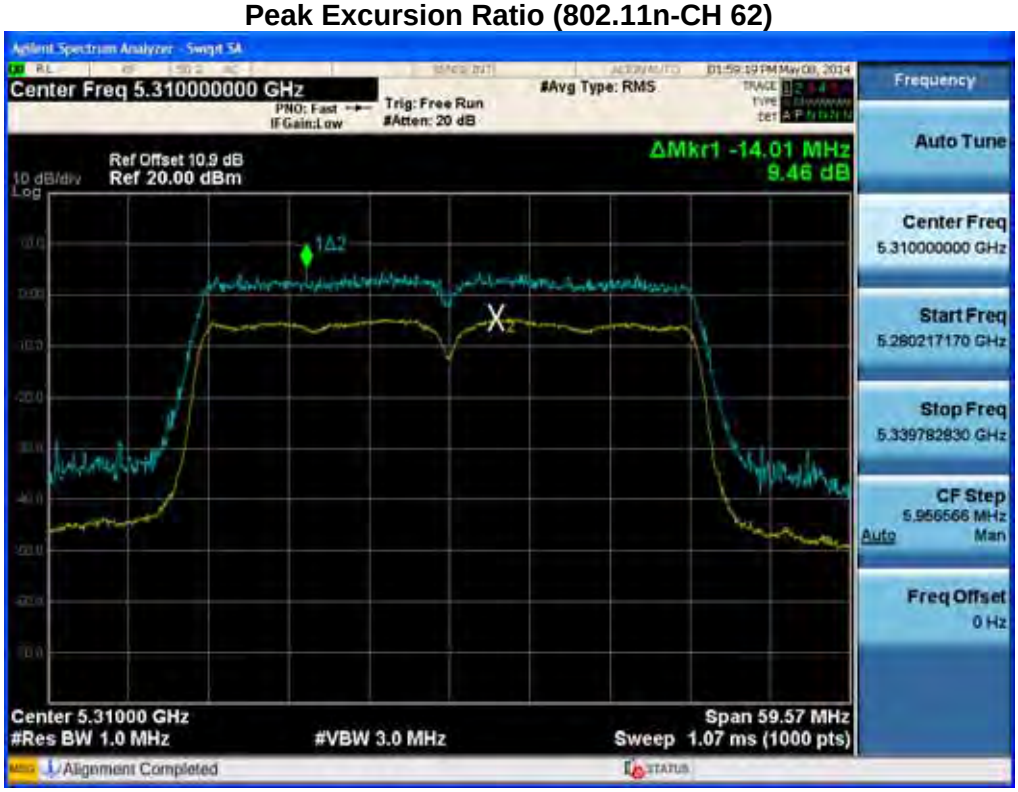


40MHz BW

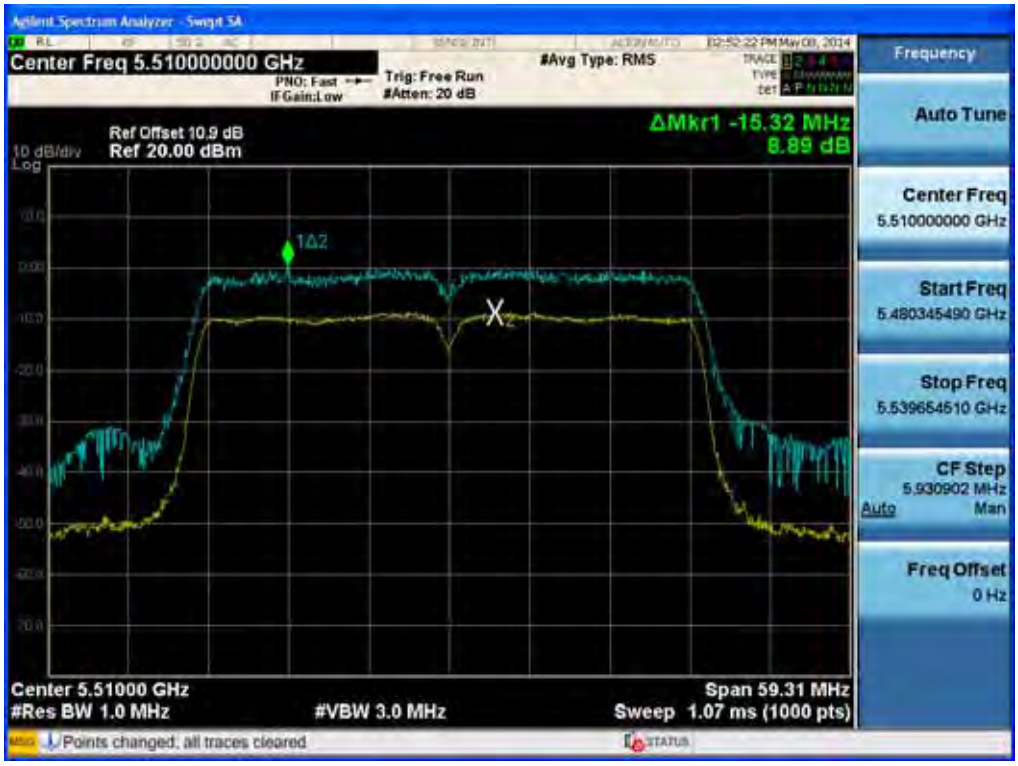
Peak Excursion Ratio (802.11n-CH 54)



Peak Excursion Ratio (802.11n-CH 62)

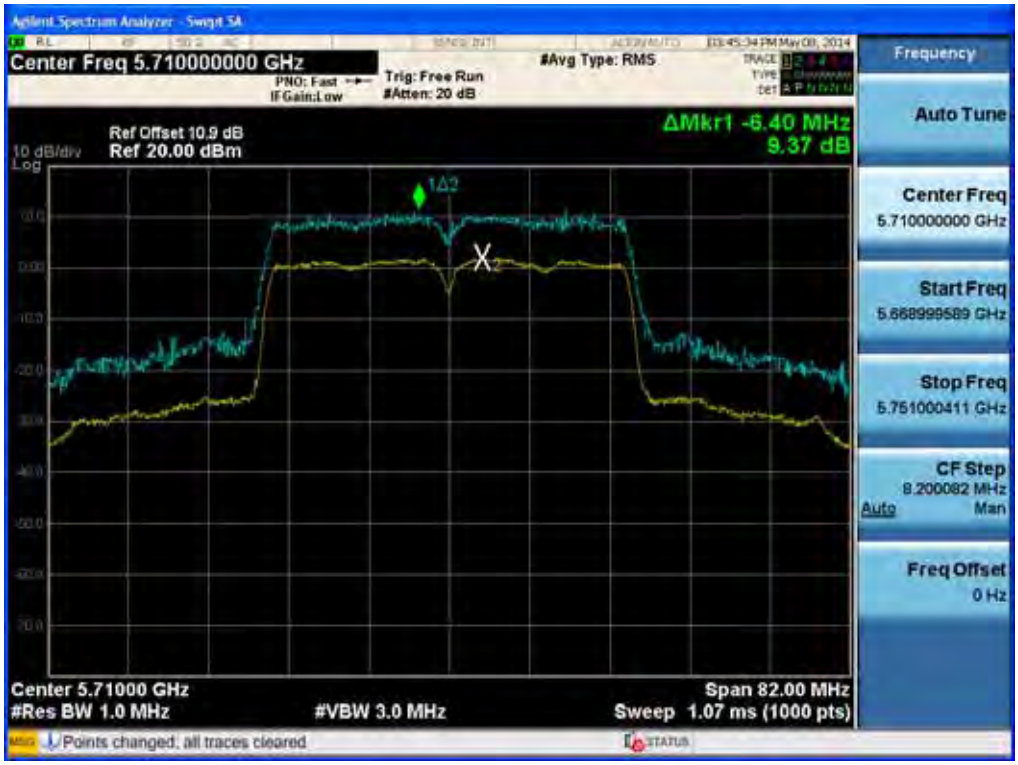


Peak Excursion Ratio (802.11n-CH 102)

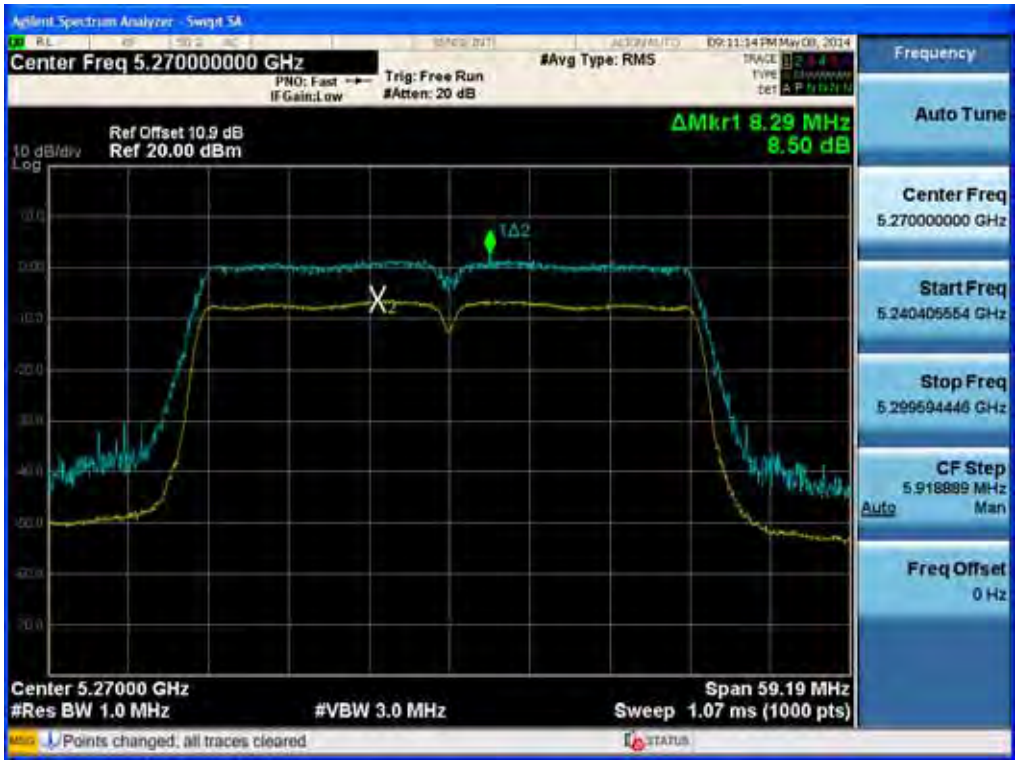


Peak Excursion Ratio (802.11n-CH 110)

Peak Excursion Ratio (802.11n-CH 142)

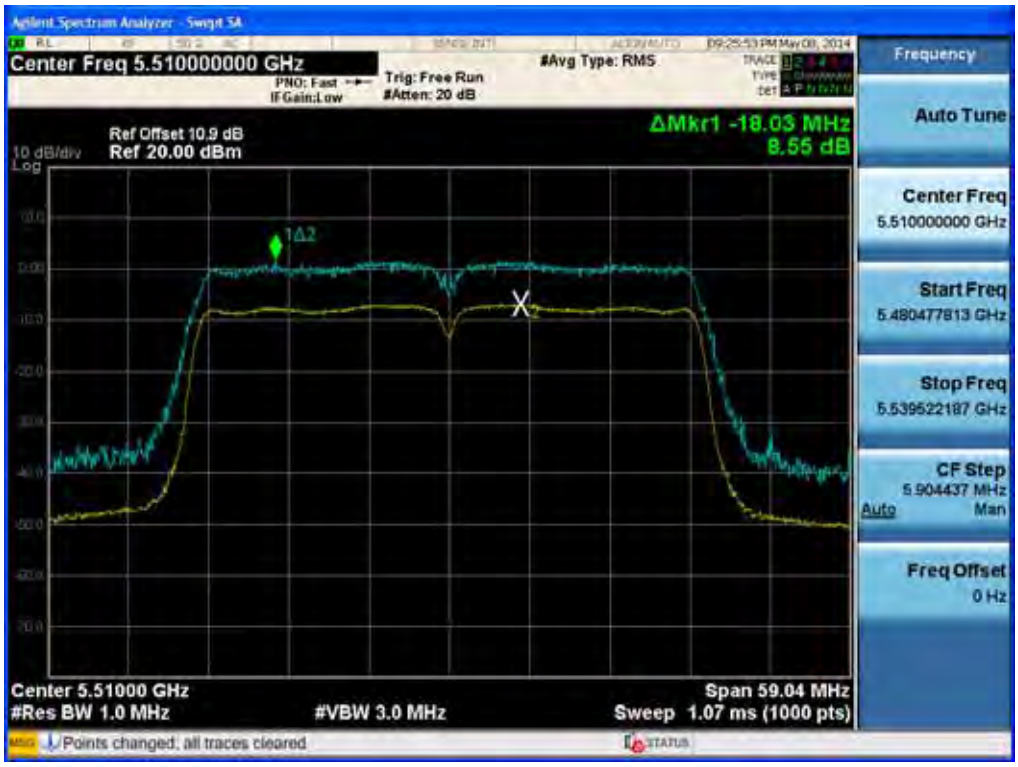


Peak Excursion Ratio (802.11ac-CH 54)

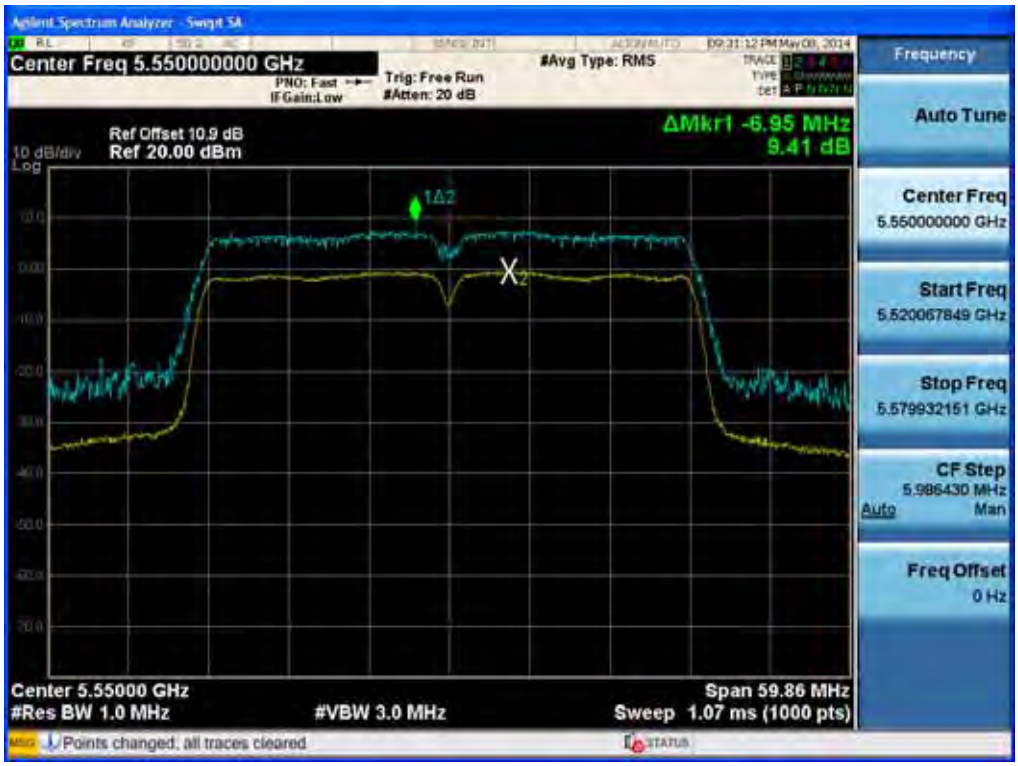


Peak Excursion Ratio (802.11ac-CH 62)

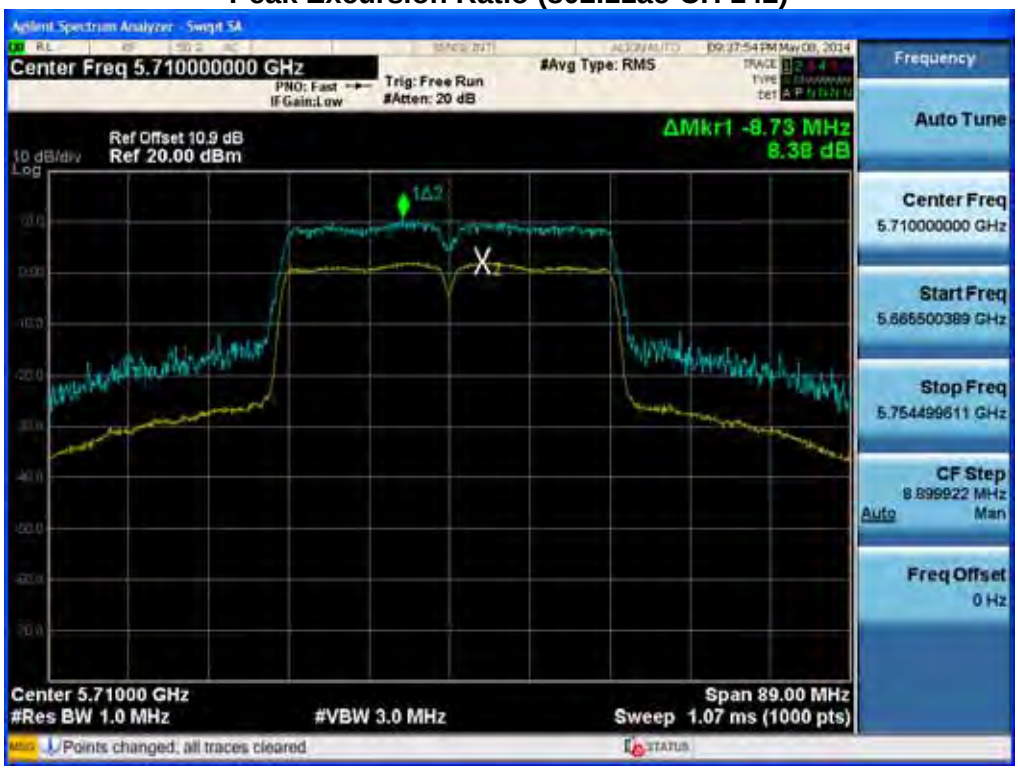
Peak Excursion Ratio (802.11ac-CH 102)



Peak Excursion Ratio (802.11ac-CH 110)

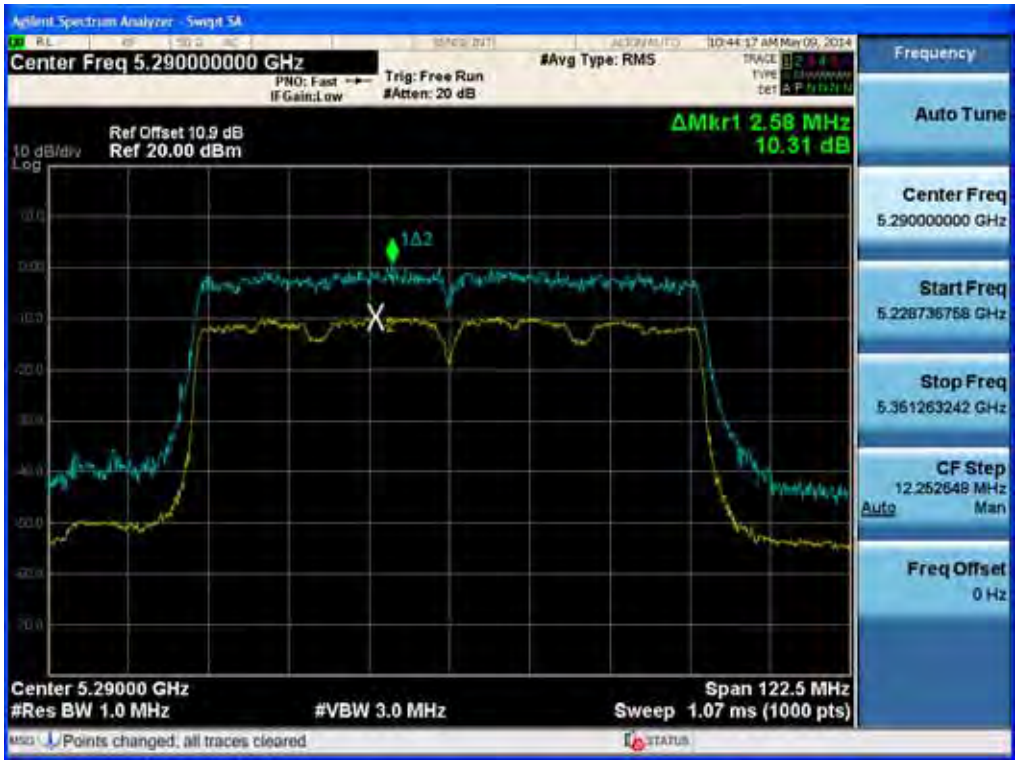


Peak Excursion Ratio (802.11ac-CH 142)

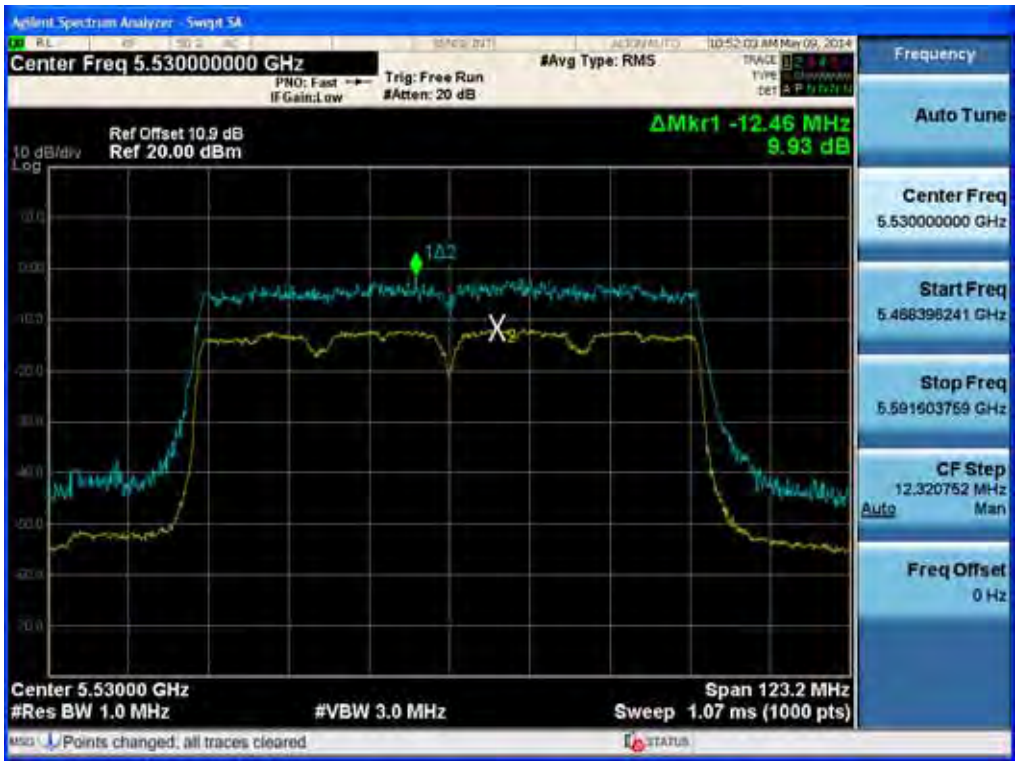


80 MHz BW

Peak Excursion Ratio (802.11ac-CH 58)



Peak Excursion Ratio (802.11ac-CH 106)



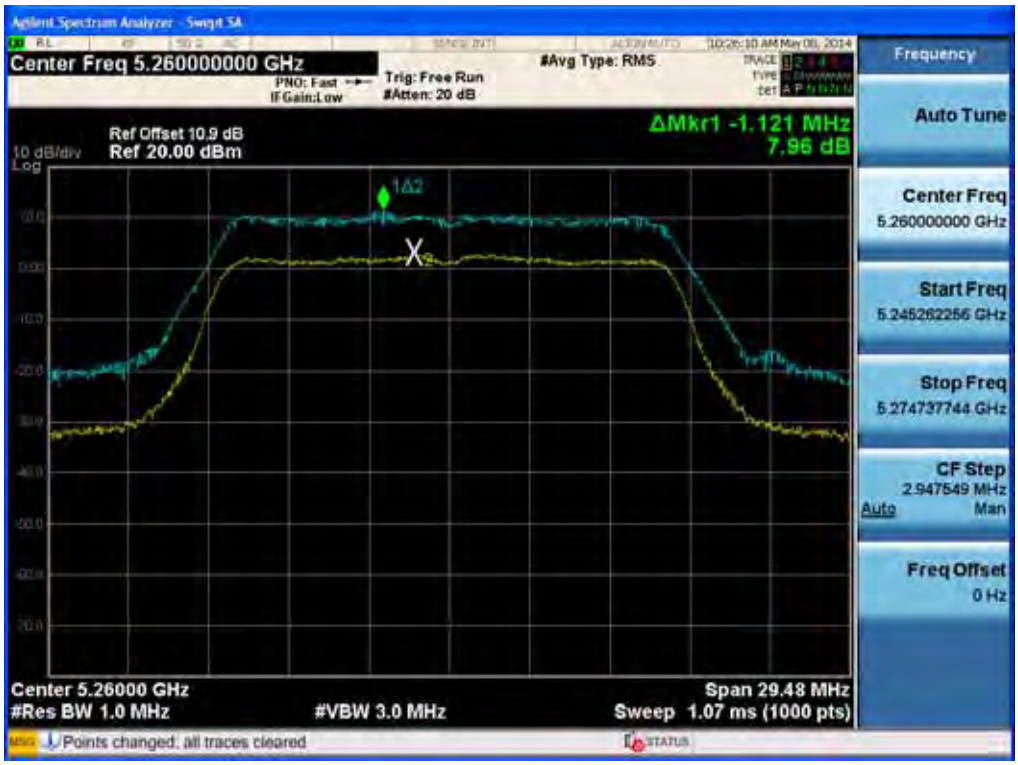
Peak Excursion Ratio (802.11ac-CH 138)

Service Port Ant.1

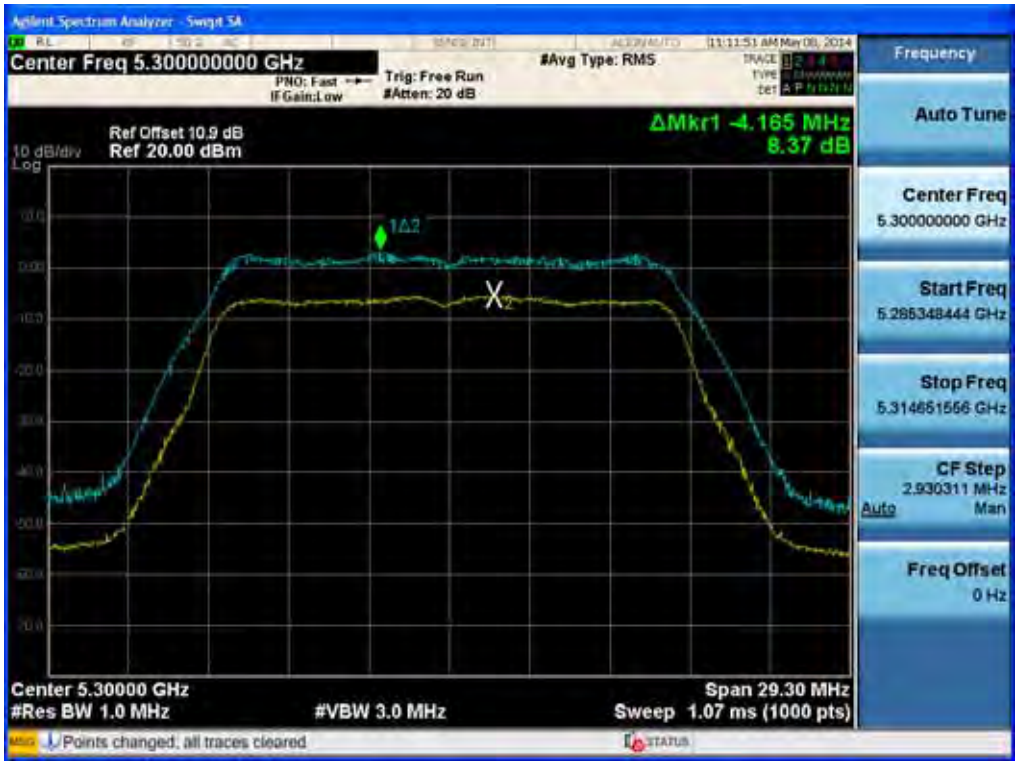
▣ RESULT PLOTS

20 MHz BW

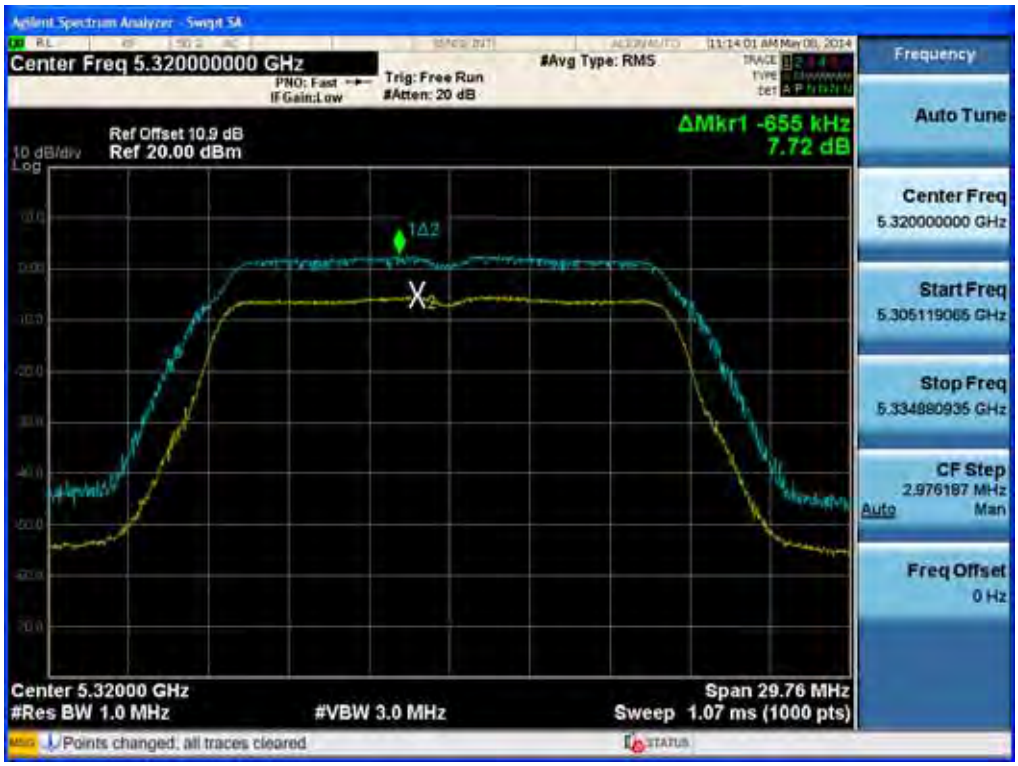
Peak Excursion Ratio (802.11a-CH 52)



Peak Excursion Ratio (802.11a-CH 60)

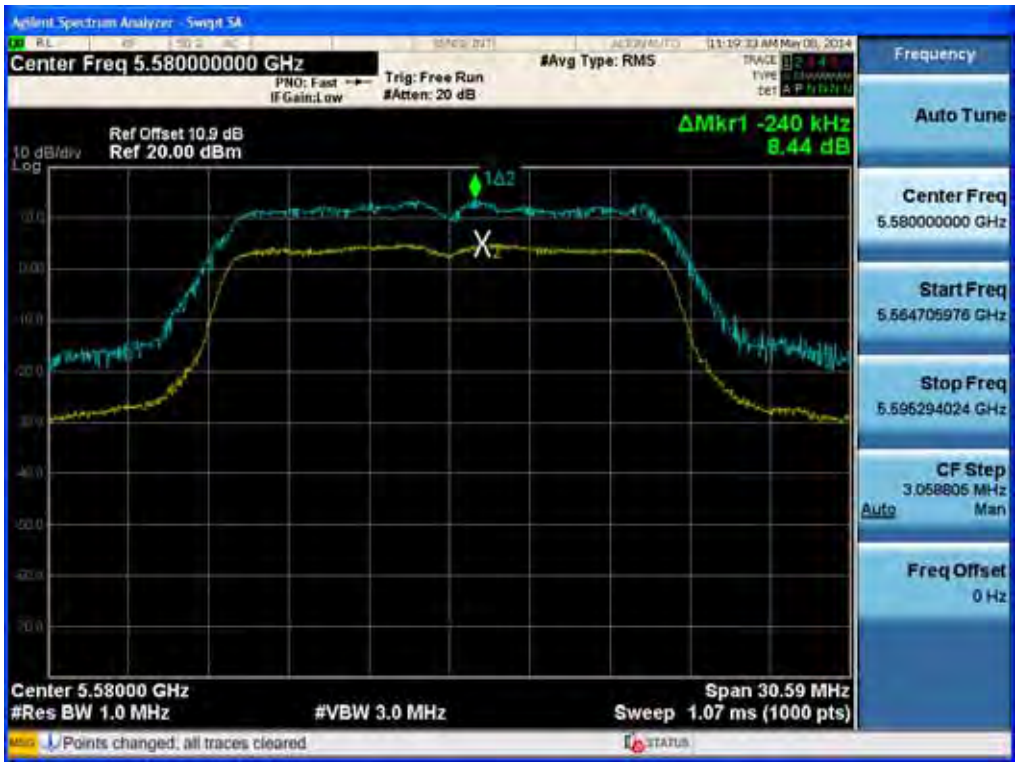


Peak Excursion Ratio (802.11a-CH 64)

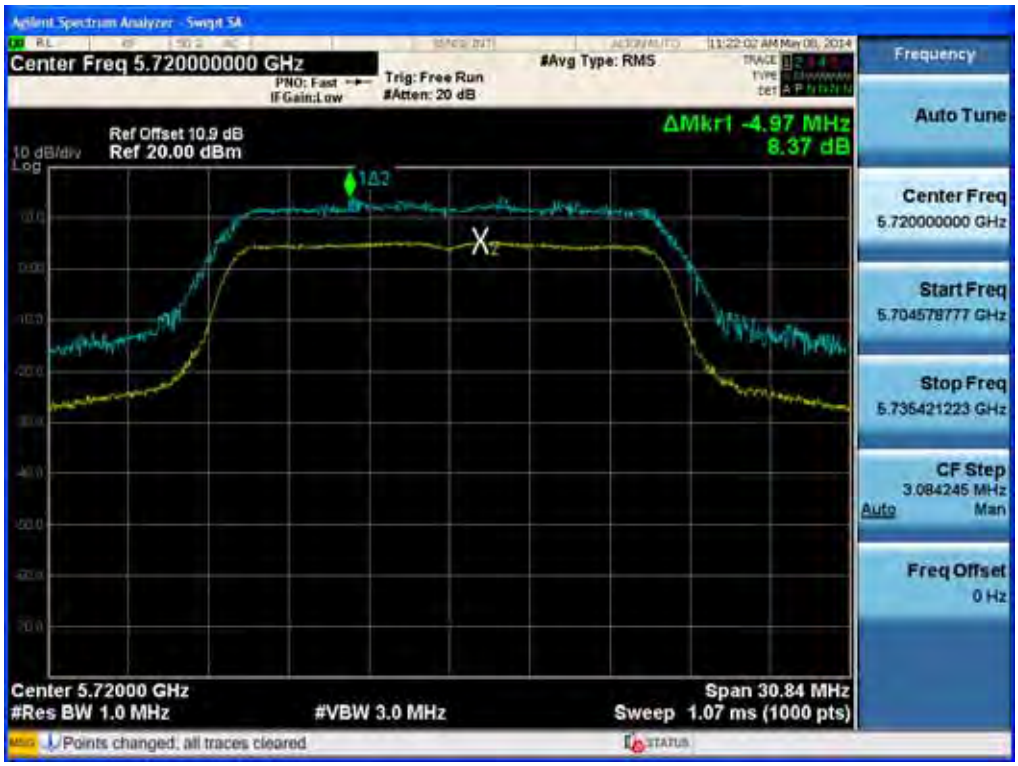


Peak Excursion Ratio (802.11a-CH 100)

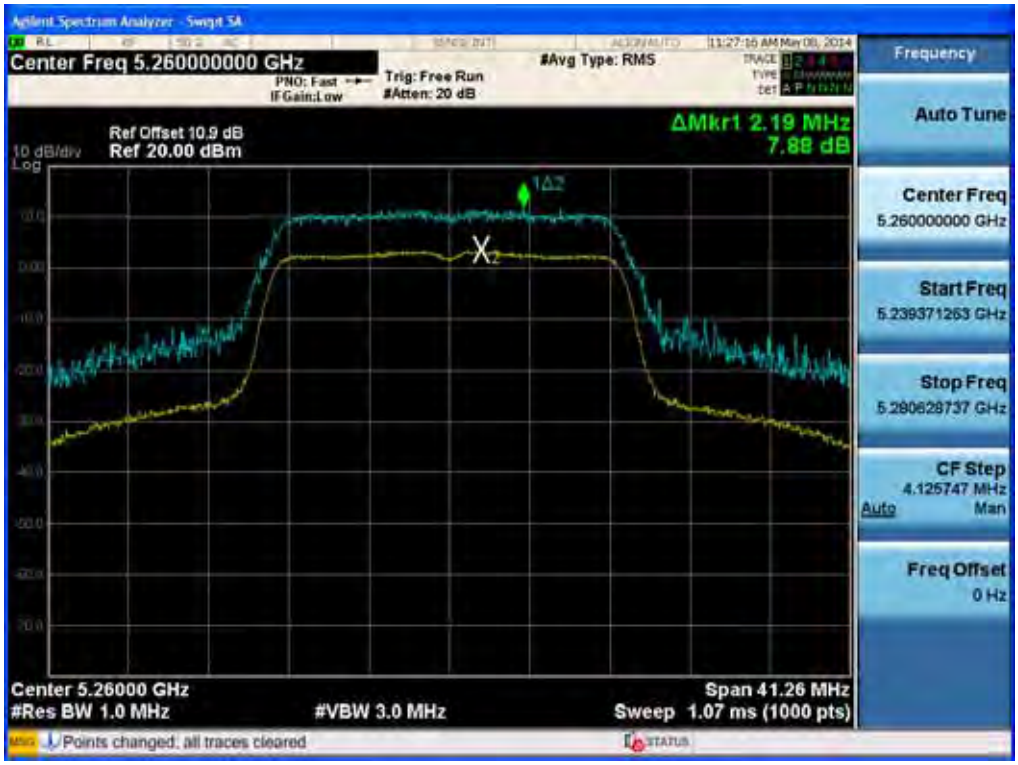
Peak Excursion Ratio (802.11a-CH 116)



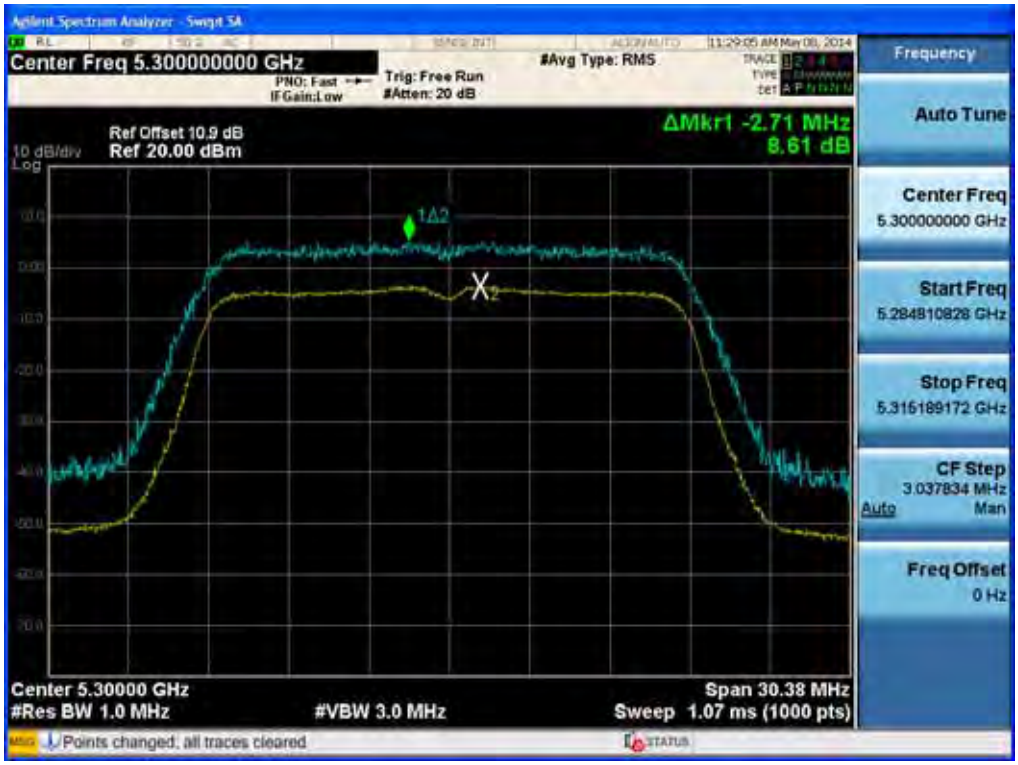
Peak Excursion Ratio (802.11a-CH 144)



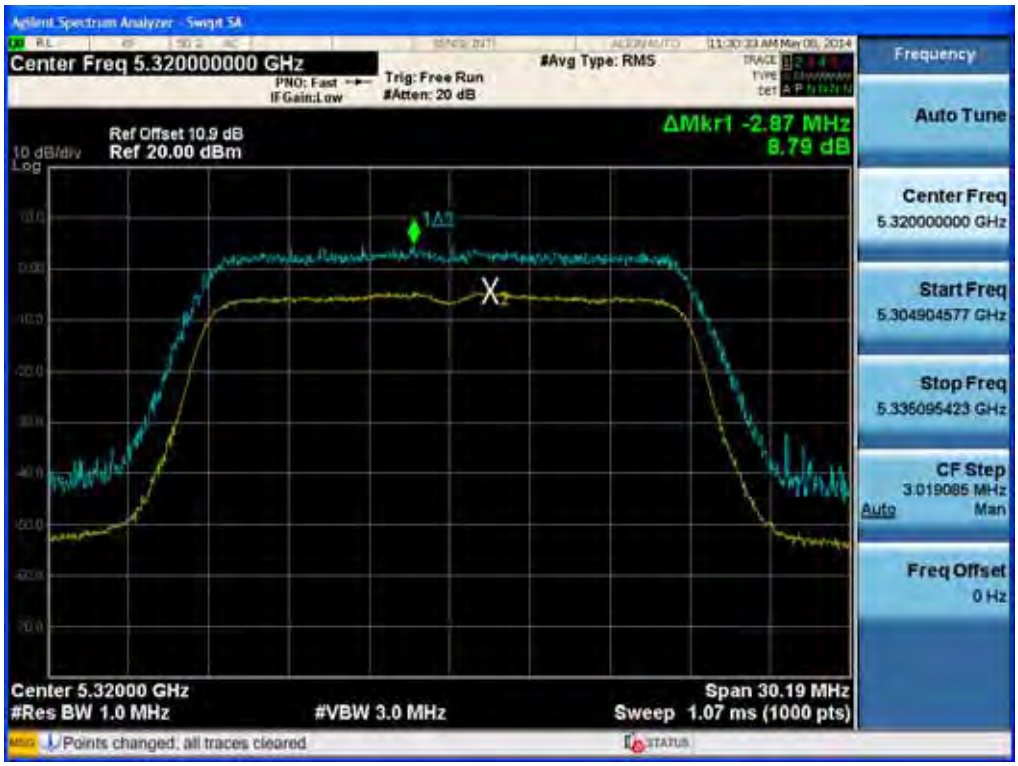
Peak Excursion Ratio (802.11n-CH 52)



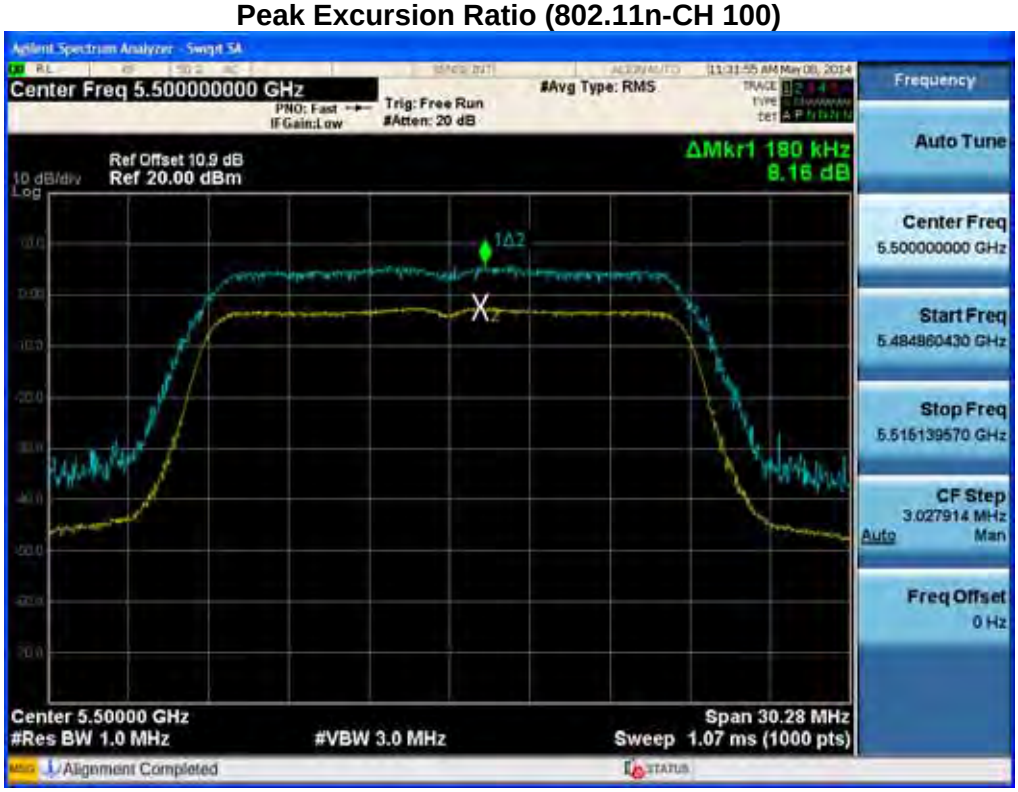
Peak Excursion Ratio (802.11n-CH 60)



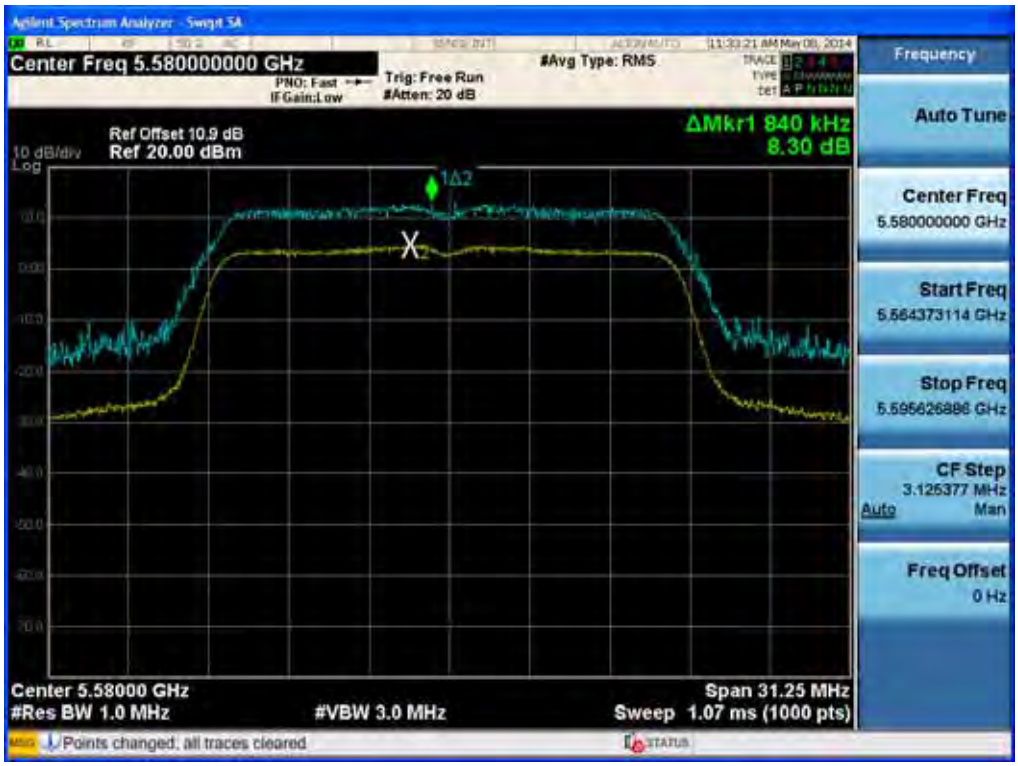
Peak Excursion Ratio (802.11n-CH 64)



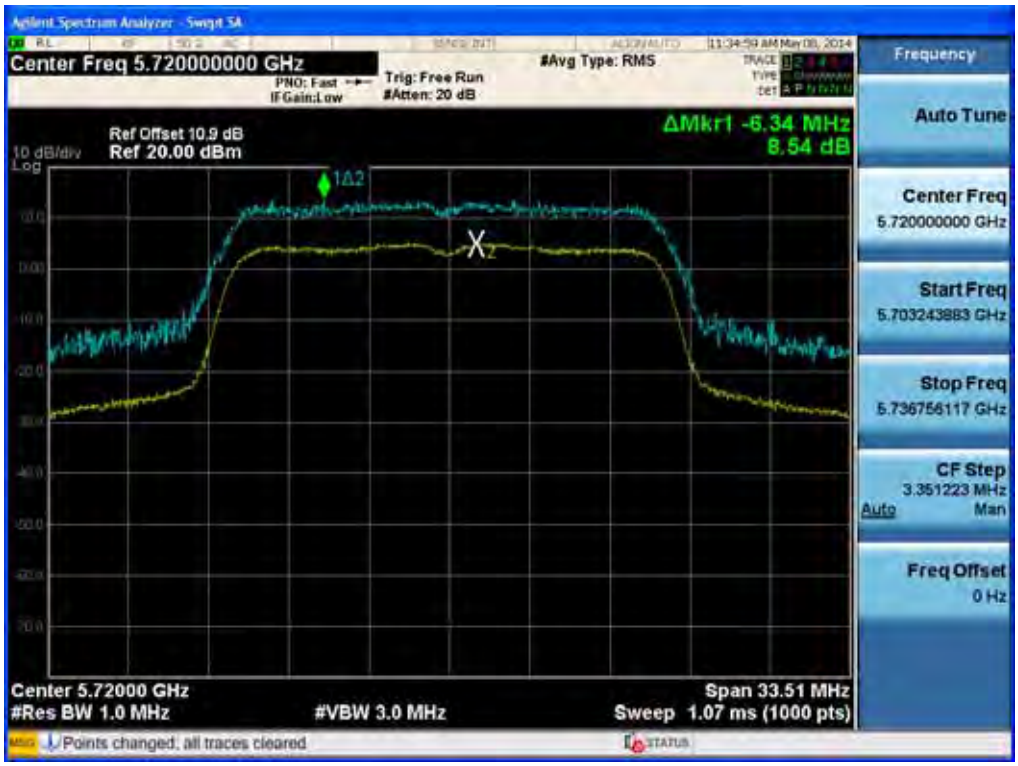
Peak Excursion Ratio (802.11n-CH 100)



Peak Excursion Ratio (802.11n-CH 116)

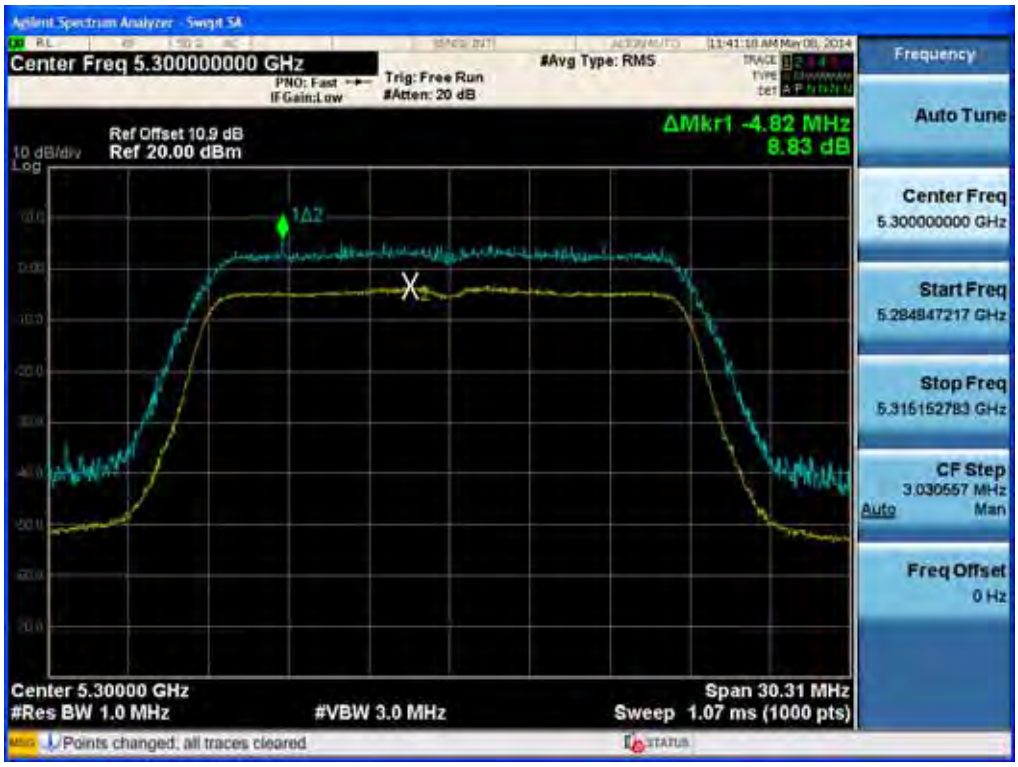


Peak Excursion Ratio (802.11n-CH 144)

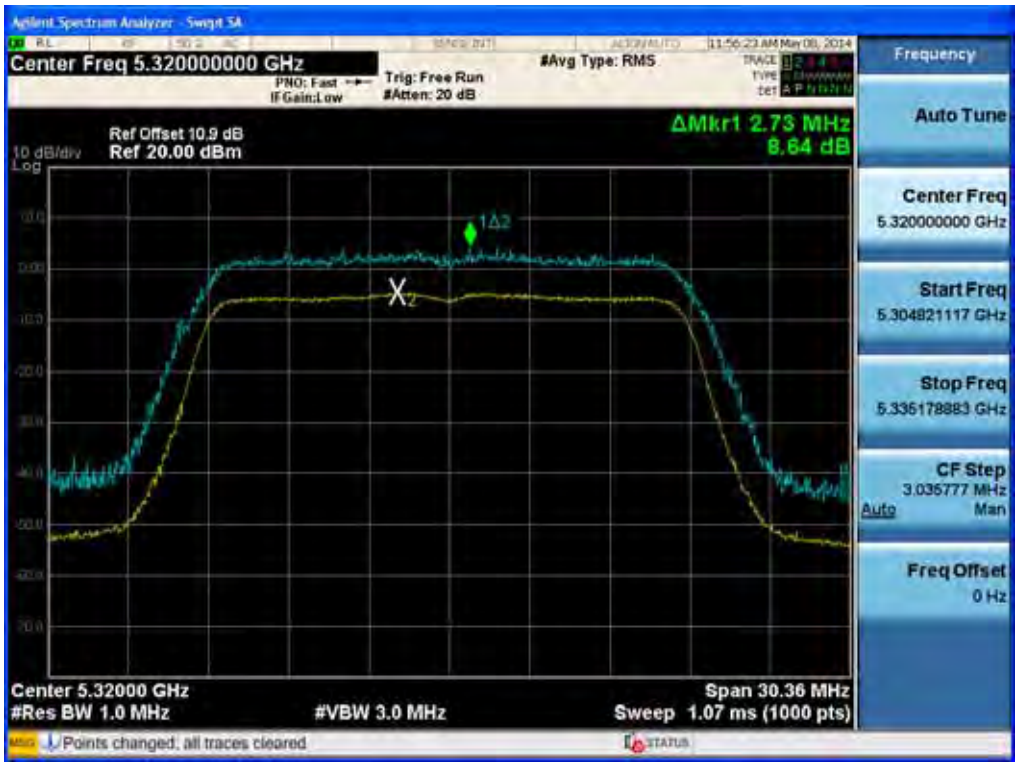


Peak Excursion Ratio (802.11ac-CH 52)

Peak Excursion Ratio (802.11ac-CH 60)

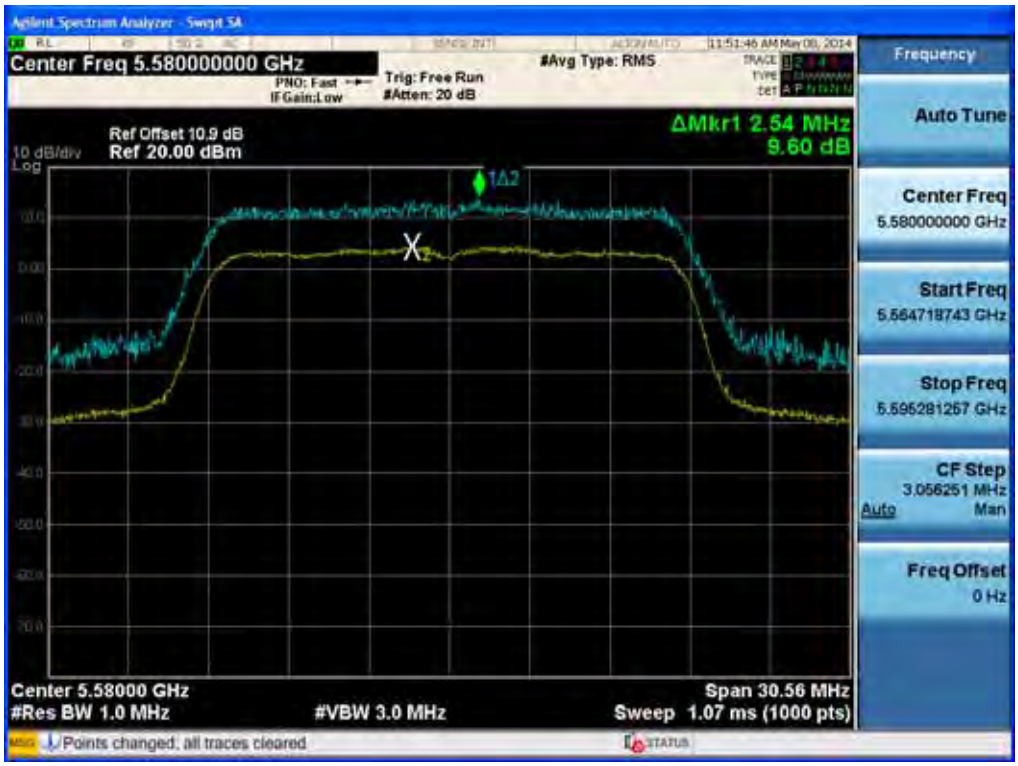


Peak Excursion Ratio (802.11ac-CH 64)

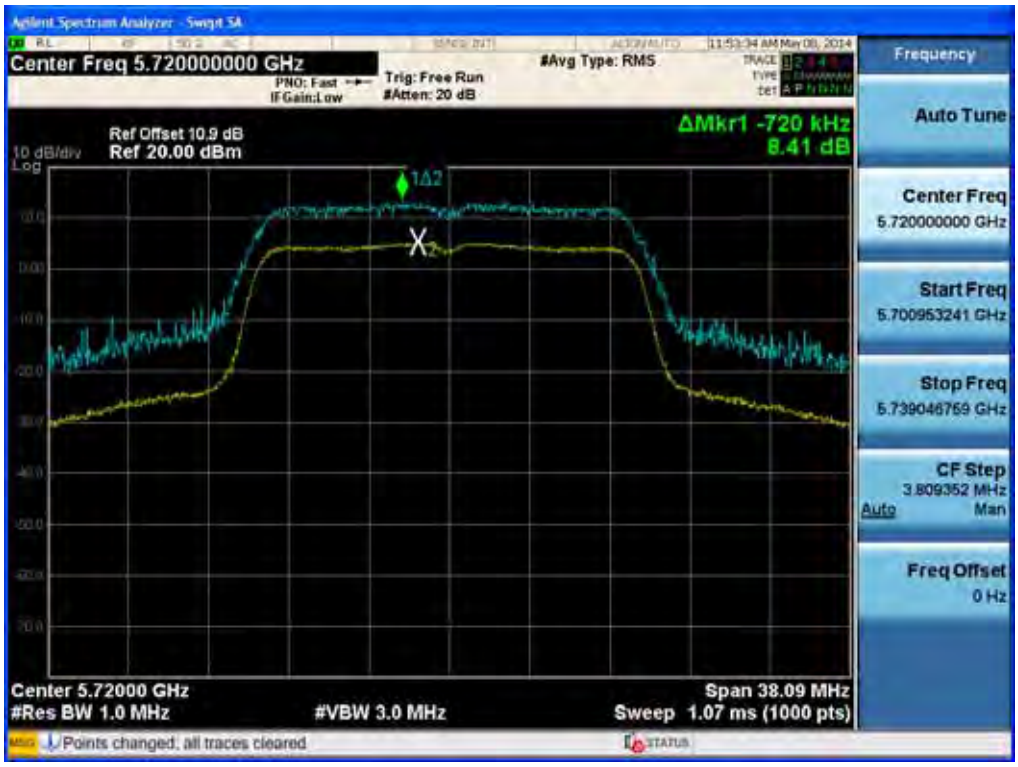


Peak Excursion Ratio (802.11ac-CH 100)

Peak Excursion Ratio (802.11ac-CH 116)

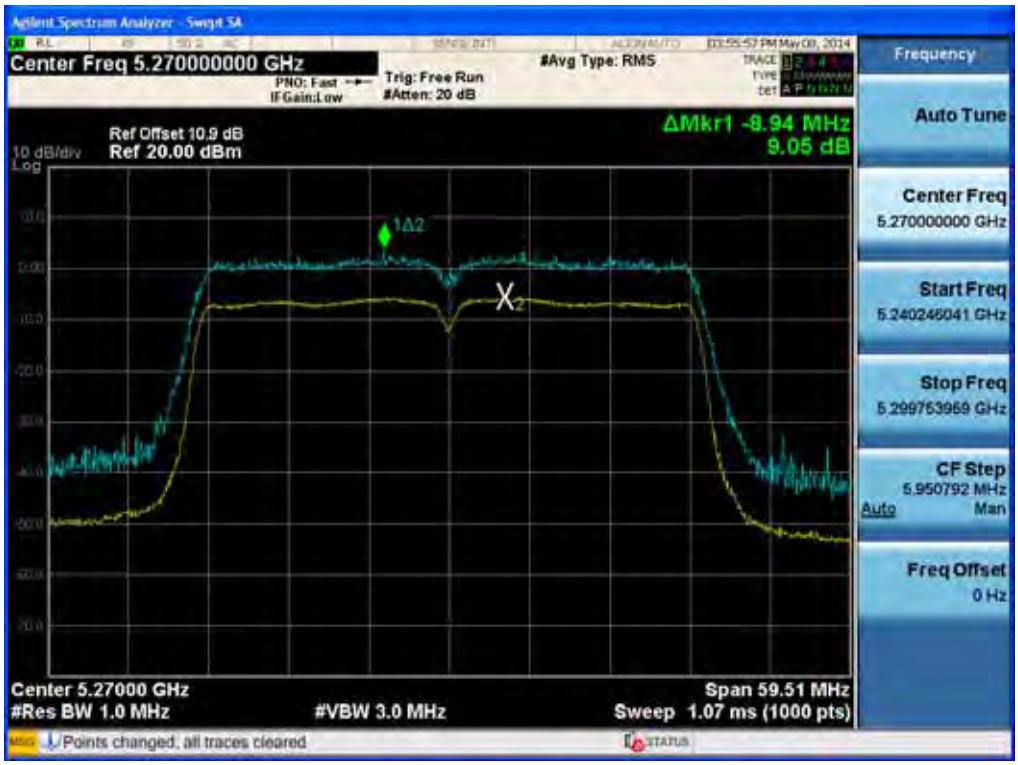


Peak Excursion Ratio (802.11ac-CH 144)



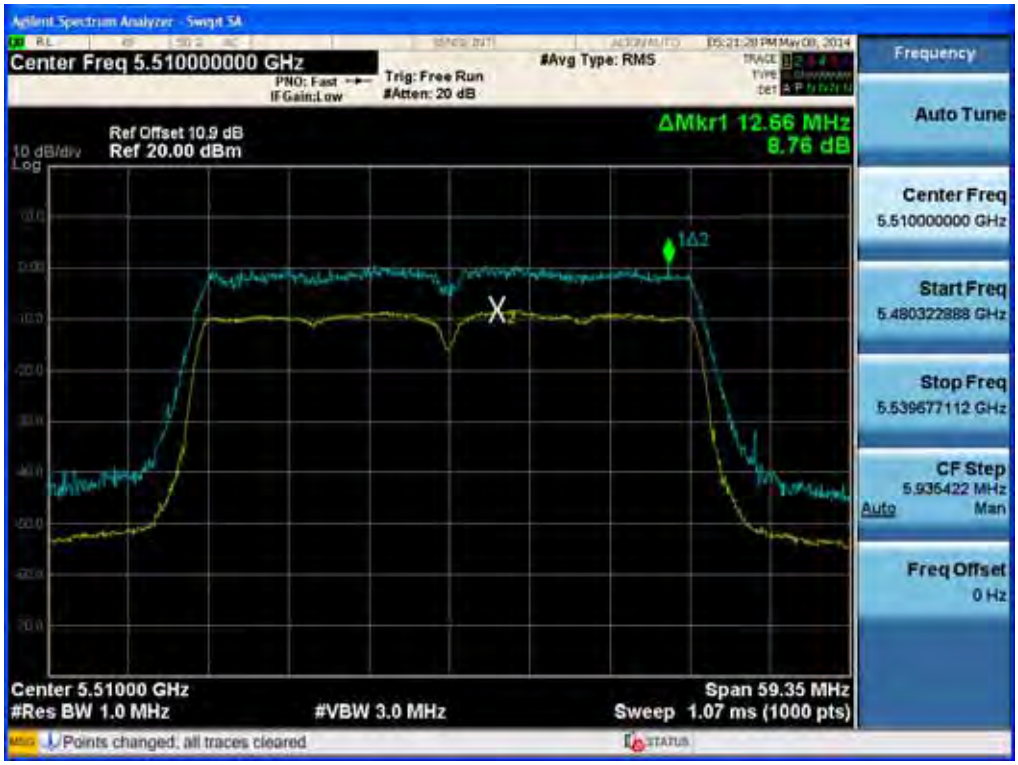
40MHz BW

Peak Excursion Ratio (802.11n-CH 54)

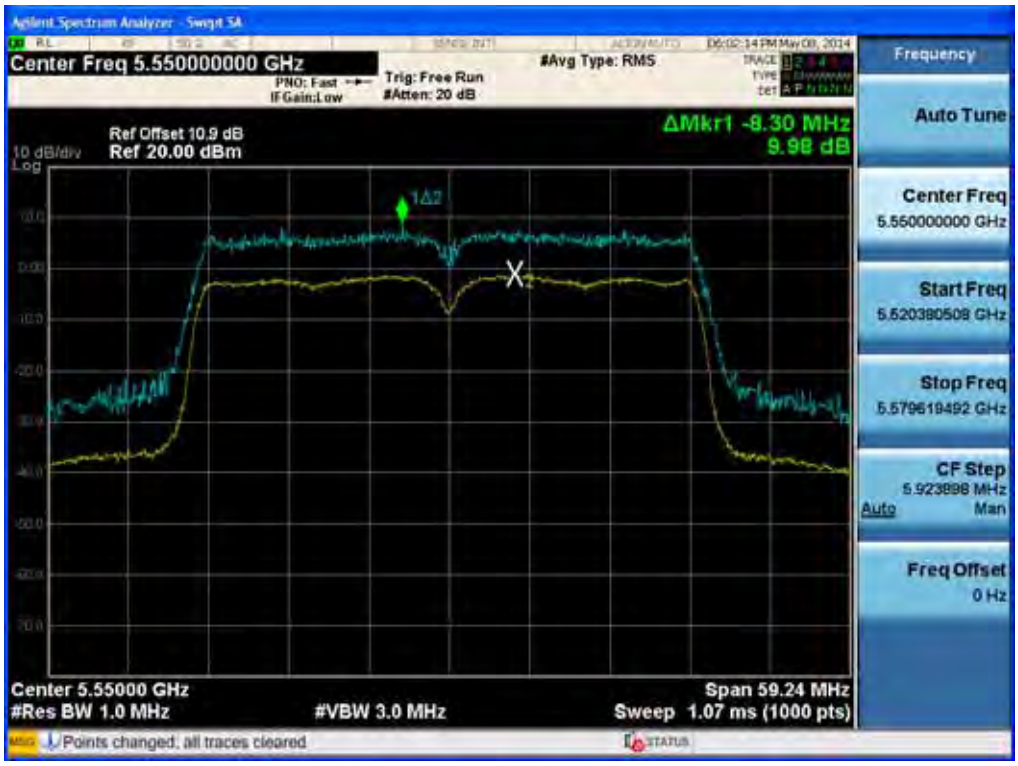


Peak Excursion Ratio (802.11n-CH 62)

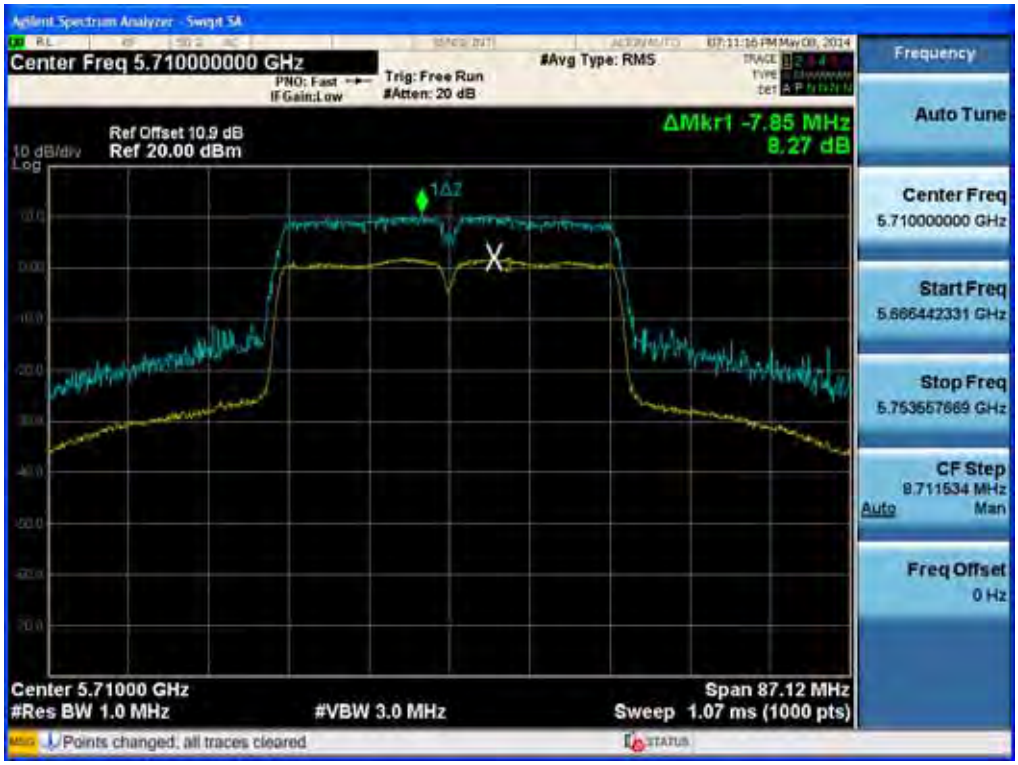
Peak Excursion Ratio (802.11n-CH 102)



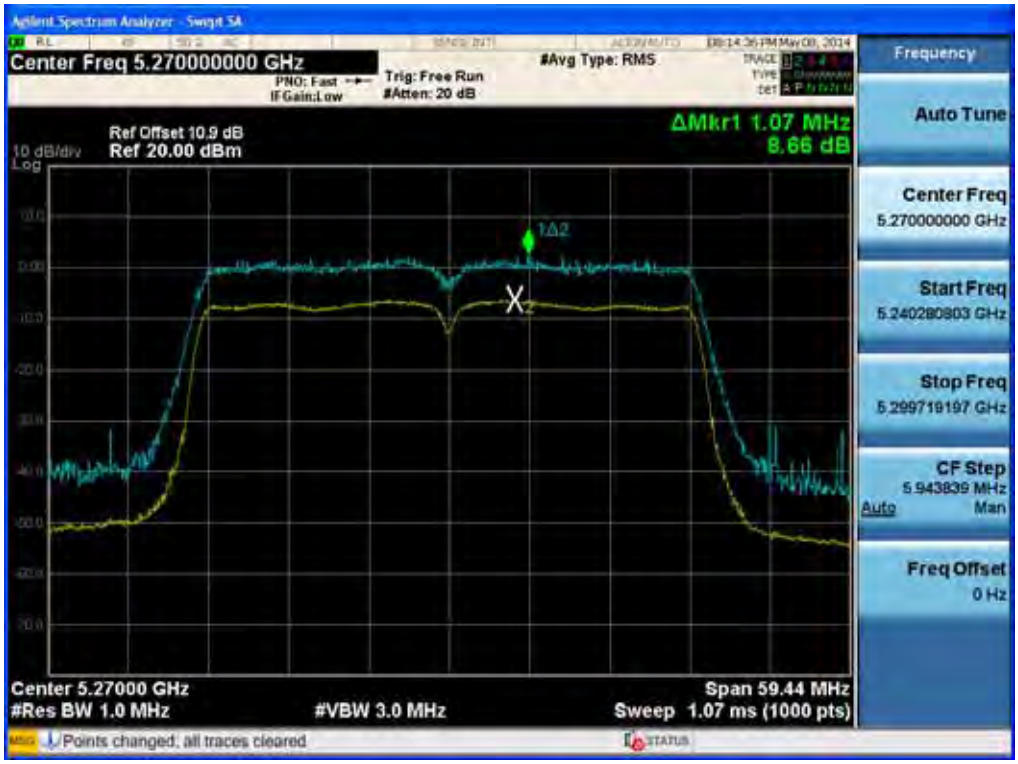
Peak Excursion Ratio (802.11n-CH 110)



Peak Excursion Ratio (802.11n-CH 142)

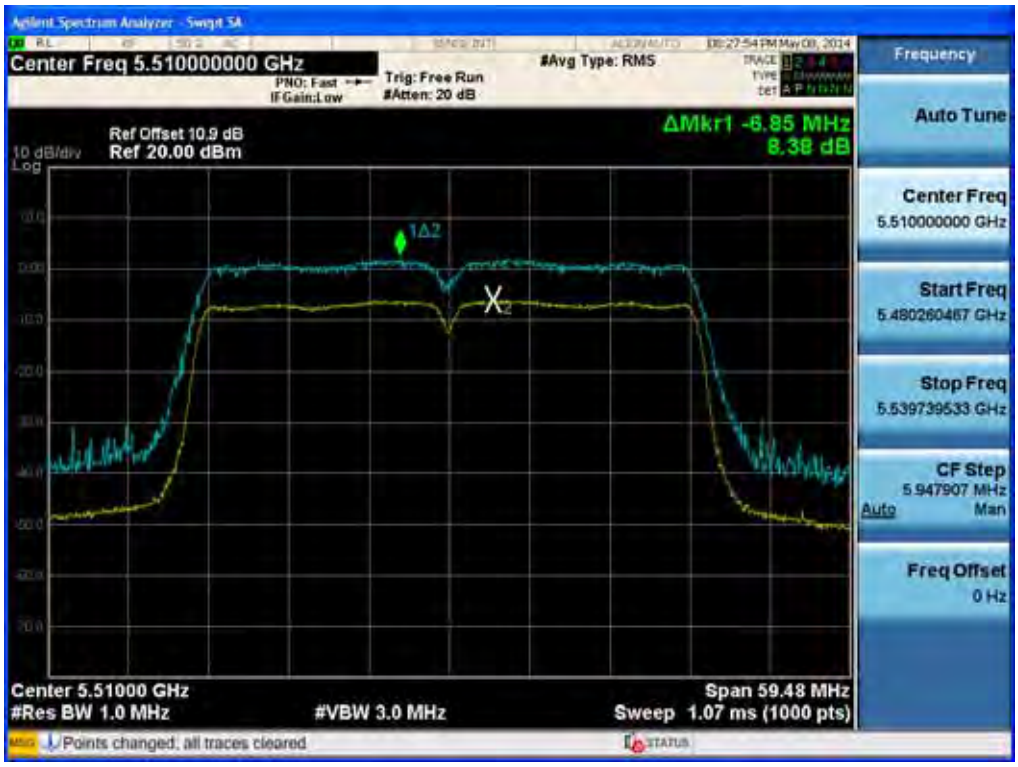


Peak Excursion Ratio (802.11ac-CH 54)

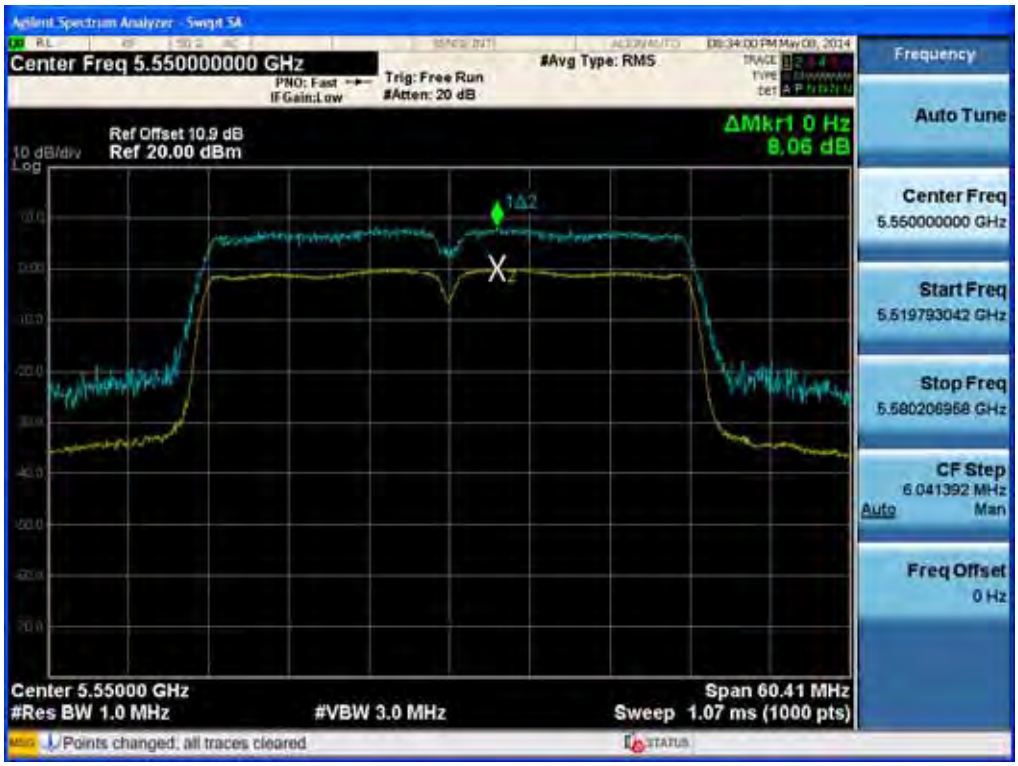


Peak Excursion Ratio (802.11ac-CH 62)

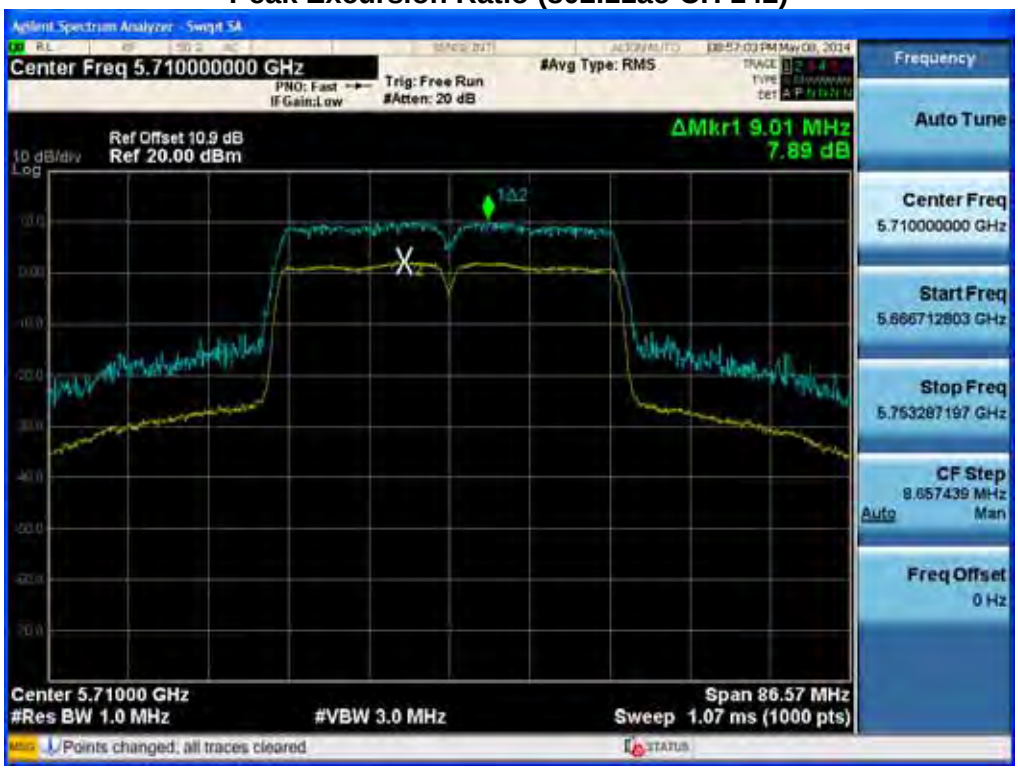
Peak Excursion Ratio (802.11ac-CH 102)



Peak Excursion Ratio (802.11ac-CH 110)

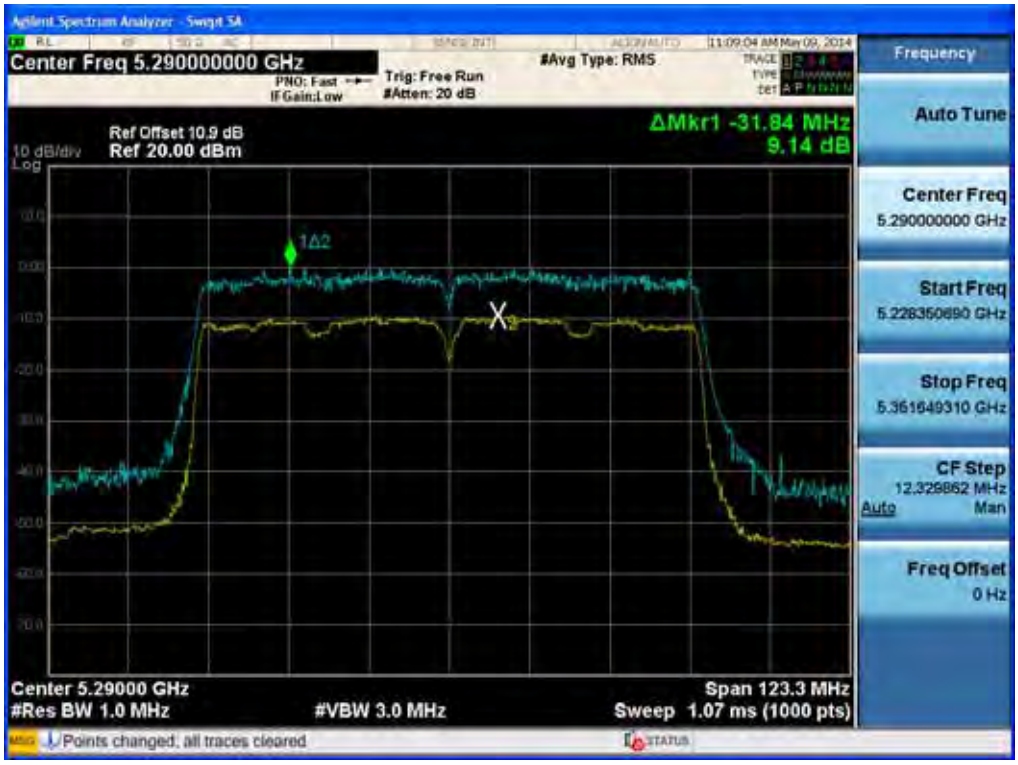


Peak Excursion Ratio (802.11ac-CH 142)

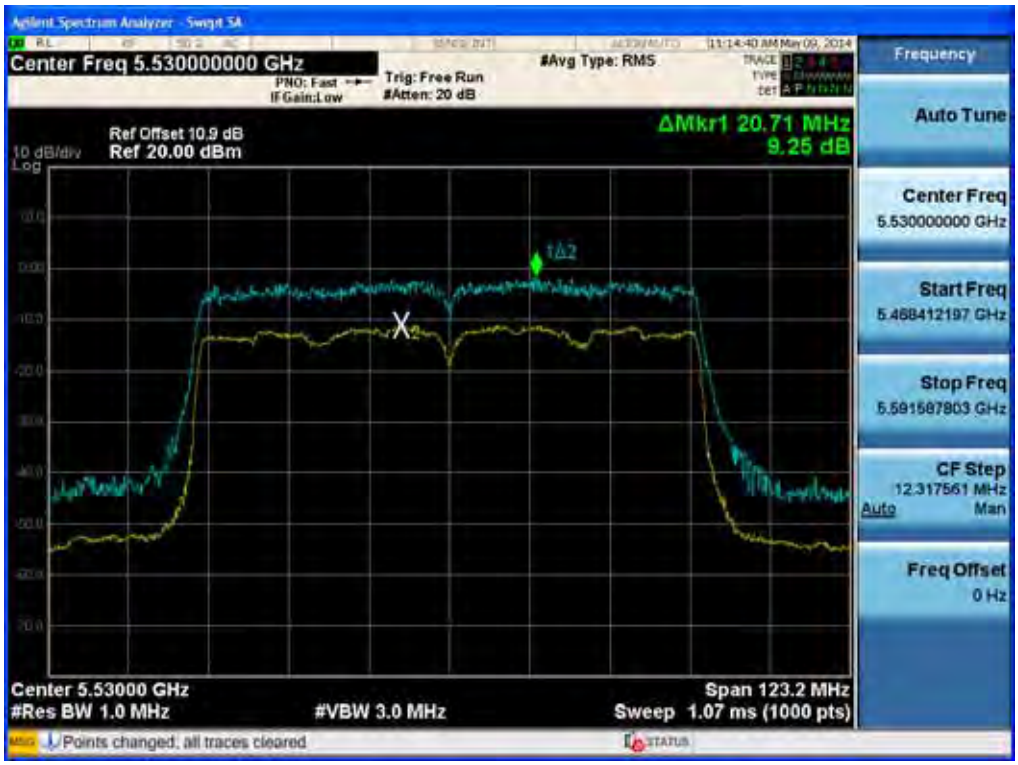


80 MHz BW

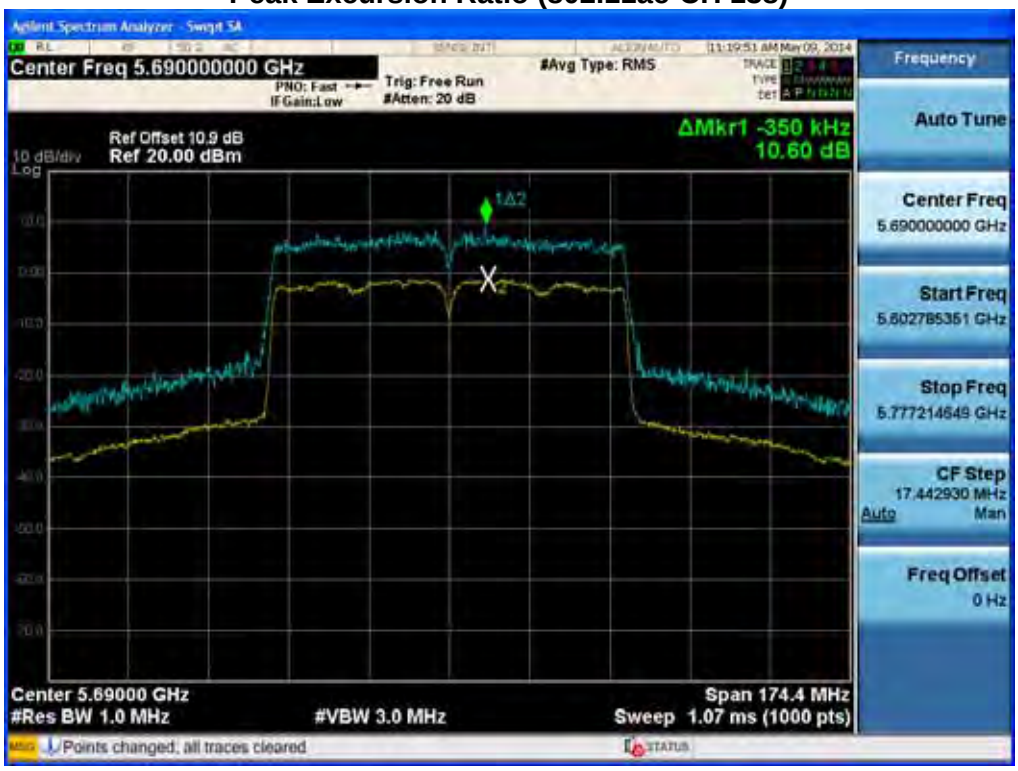
Peak Excursion Ratio (802.11ac-CH 58)



Peak Excursion Ratio (802.11ac-CH 106)



Peak Excursion Ratio (802.11ac-CH 138)



8.7 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 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 220 VAC

Voltage (%)	Power (VAC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100	220	+20(Ref)	5 259 912	-87.7
100		-30	5 259 983	-17.5
100		-20	5 259 982	-18.3
100		-10	5 259 966	-33.9
100		0	5 259 957	-43.2
100		+10	5 259 940	-59.8
100		+30	5 259 922	-77.6
100		+40	5 259 931	-69.0
100		+50	5 259 946	-54.0
115	253	+20	5 259 978	-22.0
Batt. Endpoint	187	+20	5 259 987	-13.0

Note:

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

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 220 VAC

Voltage (%)	Power (VAC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100	220	+20(Ref)	5 499 904	-95.7
100		-30	5 499 964	-36.5
100		-20	5 499 952	-48.3
100		-10	5 499 950	-49.9
100		0	5 499 955	-45.2
100		+10	5 499 942	-57.8
100		+30	5 499 926	-73.6
100		+40	5 499 920	-80.0
100		+50	5 499 920	-80.0
115	253	+20	5 499 965	-35.0
Batt. Endpoint	187	+20	5 499 980	-20.0

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 2A

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 220 VAC

Voltage (%)	Power (VAC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100	220	+20(Ref)	5 269 964	-35.7
100		-30	5 269 971	-29.5
100		-20	5 269 974	-26.3
100		-10	5 269 966	-33.9
100		0	5 269 967	-33.2
100		+10	5 269 961	-38.8
100		+30	5 269 940	-59.6
100		+40	5 269 921	-79.0
100		+50	5 269 919	-81.0
115	253	+20	5 269 977	-23.0
Batt. Endpoint	187	+20	5 269 986	-14.0

Note:

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

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,510,000,000 Hz

CHANNEL: 102

REFERENCE VOLTAGE: 220 VAC

Voltage (%)	Power (VAC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100	220	+20(Ref)	5 509 958	-41.7
100		-30	5 509 975	-25.5
100		-20	5 509 979	-21.3
100		-10	5 509 972	-27.9
100		0	5 509 968	-32.2
100		+10	5 509 964	-35.8
100		+30	5 509 942	-57.6
100		+40	5 509 923	-77.0
100		+50	5 509 908	-92.0
115	253	+20	5 509 975	-25.0
Batt. Endpoint	187	+20	5 509 982	-18.0

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 2A

OPERATING FREQUENCY: 5,290,000,000 Hz

CHANNEL: 58

REFERENCE VOLTAGE: 220 VAC

Voltage (%)	Power (VAC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100	220	+20(Ref)	5 289 932	-67.7
100		-30	5 289 963	-37.5
100		-20	5 289 972	-28.3
100		-10	5 289 960	-39.9
100		0	5 289 947	-53.2
100		+10	5 289 931	-68.8
100		+30	5 289 935	-64.6
100		+40	5 289 925	-75.0
100		+50	5 289 906	-94.0
115	253	+20	5 289 966	-34.0
Batt. Endpoint	187	+20	5 289 979	-21.0

Note:

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

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,530,000,000 Hz

CHANNEL: 106

REFERENCE VOLTAGE: 220 VAC

Voltage (%)	Power (VAC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100	220	+20(Ref)	5 529 948	-51.7
100		-30	5 529 981	-19.5
100		-20	5 529 985	-15.3
100		-10	5 529 979	-20.9
100		0	5 529 974	-26.2
100		+10	5 529 966	-33.8
100		+30	5 529 948	-51.6
100		+40	5 529 932	-68.0
100		+50	5 529 904	-96.0
115	253	+20	5 529 975	-25.0
Batt. Endpoint	187	+20	5 529 983	-17.0

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.

8.8 RADIATED MEASUREMENT.

8.8.1 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.

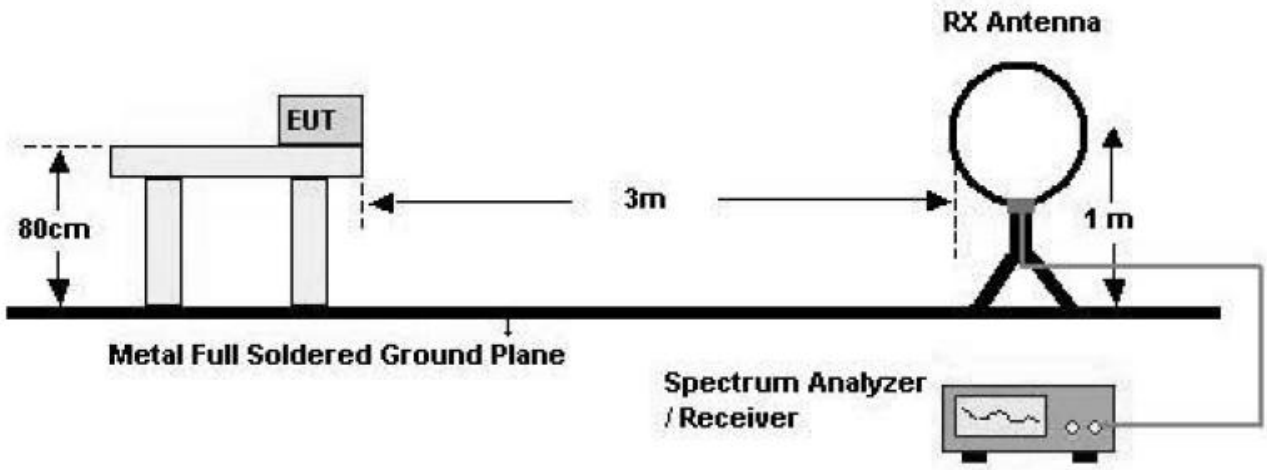
▣ Test case

Service	SISO	Ant 0
		Ant 1
	MIMO	Ant 0 & 1(Worst Case)

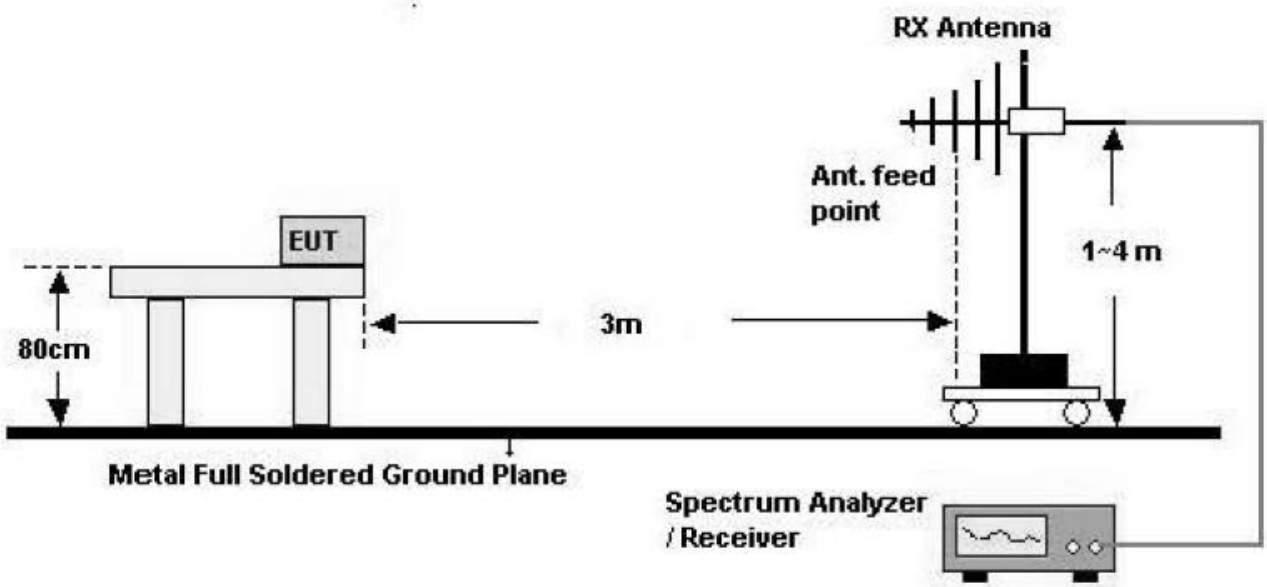
Note : We have done all test case. We attached the results of only worst case.

Test Configuration

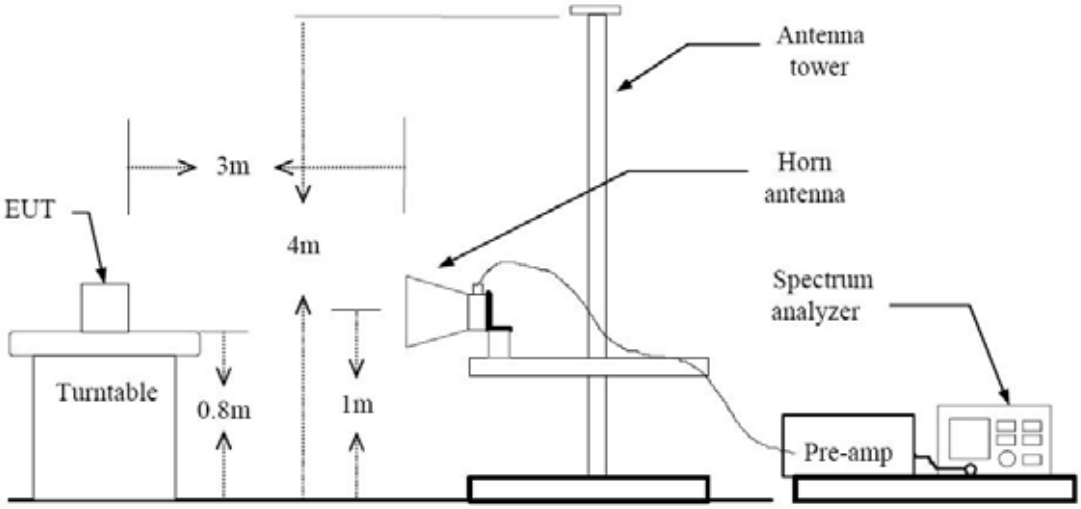
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

ANSI C63.4(2003)

Method H)5) in KDB 789033, issued 06/06/2014 (Peak)

Method H)6)d) in KDB 789033, issued 06/06/2014 (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.

Service

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	2.060	2.170	94.93	485	1000
n_20	6.5	1.920	2.015	95.29	521	1000
n_40	13.5	0.944	1.042	90.60	1059	3000
ac_20	6.5	1.920	2.015	95.29	521	1000
ac_40	13.5	0.944	1.042	90.60	1059	3000
ac_80	29.3	0.459	0.488	94.06	2179	3000

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	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
MHz	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

Service MIMO(Ant.0 & 1)

Band :	UNII 2A
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]	Detect
10520	66.33	-6.52	V	59.81	68.20	8.39	PK
15780	63.18	-6.67	V	56.51	73.98	17.47	PK
15780	49.77	-6.67	V	43.10	53.98	10.88	AV
10520	69.67	-6.52	H	63.15	68.20	5.05	PK
15780	63.29	-6.67	H	56.62	73.98	17.36	PK
15780	49.54	-6.67	H	42.87	53.98	11.11	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 2A
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]	Detect
10600	61.92	-6.72	V	55.20	73.98	18.78	PK
10600	48.51	-6.72	V	41.79	53.98	12.19	AV
15900	62.57	-7.00	V	55.57	73.98	18.41	PK
15900	49.26	-7.00	V	42.26	53.98	11.72	AV
10600	62.08	-6.72	H	55.36	73.98	18.62	PK
10600	48.61	-6.72	H	41.89	53.98	12.09	AV
15900	62.69	-7.00	H	55.69	73.98	18.29	PK
15900	49.34	-7.00	H	42.34	53.98	11.64	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 802.11a. 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 2A
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]	Detect
10640	62.36	-6.43	V	55.93	73.98	18.05	PK
10640	48.42	-6.43	V	41.99	53.98	11.99	AV
15960	63.10	-6.93	V	56.17	73.98	17.81	PK
15960	49.68	-6.93	V	42.75	53.98	11.23	AV
10640	62.51	-6.43	H	56.08	73.98	17.90	PK
10640	48.64	-6.43	H	42.21	53.98	11.77	AV
15960	63.27	-6.93	H	56.34	73.98	17.64	PK
15960	49.73	-6.93	H	42.80	53.98	11.18	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 2A
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]	Detect
10520	70.24	-6.52	V	63.72	68.20	4.48	PK
15780	62.45	-6.67	V	55.78	73.98	18.20	PK
15780	49.21	-6.67	V	42.54	53.98	11.44	AV
10520	71.17	-6.52	H	64.65	68.20	3.55	PK
15780	62.78	-6.67	H	56.11	73.98	17.87	PK
15780	49.30	-6.67	H	42.63	53.98	11.35	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 2A
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]	Detect
10600	62.28	-6.72	V	55.56	73.98	18.42	PK
10600	49.34	-6.72	V	42.62	53.98	11.36	AV
15900	62.33	-7.00	V	55.33	73.98	18.65	PK
15900	49.18	-7.00	V	42.18	53.98	11.80	AV
10600	62.39	-6.72	H	55.67	73.98	18.31	PK
10600	49.52	-6.72	H	42.80	53.98	11.18	AV
15900	62.58	-7.00	H	55.58	73.98	18.40	PK
15900	49.23	-7.00	H	42.23	53.98	11.75	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 802.11n_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 2A
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]	Detect
10640	62.22	-6.43	V	55.79	73.98	18.19	PK
10640	49.24	-6.43	V	42.81	53.98	11.17	AV
15960	62.58	-6.93	V	55.65	73.98	18.33	PK
15960	49.02	-6.93	V	42.09	53.98	11.89	AV
10640	62.62	-6.43	H	56.19	73.98	17.79	PK
10640	49.38	-6.43	H	42.95	53.98	11.03	AV
15960	62.65	-6.93	H	55.72	73.98	18.26	PK
15960	49.21	-6.93	H	42.28	53.98	11.70	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 802.11n_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 2A
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]	Detect
10520	69.91	-6.52	V	63.39	68.20	4.81	PK
15780	63.21	-6.67	V	56.54	73.98	17.44	PK
15780	50.15	-6.67	V	43.48	53.98	10.50	AV
10520	70.41	-6.52	H	63.89	68.20	4.31	PK
15780	63.37	-6.67	H	56.70	73.98	17.28	PK
15780	50.26	-6.67	H	43.59	53.98	10.39	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 2A
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]	Detect
10600	62.23	-6.72	V	55.51	73.98	18.47	PK
10600	49.10	-6.72	V	42.38	53.98	11.60	AV
15900	62.18	-7.00	V	55.18	73.98	18.80	PK
15900	49.02	-7.00	V	42.02	53.98	11.96	AV
10600	62.62	-6.72	H	55.90	73.98	18.08	PK
10600	49.21	-6.72	H	42.49	53.98	11.49	AV
15900	62.34	-7.00	H	55.34	73.98	18.64	PK
15900	49.10	-7.00	H	42.10	53.98	11.88	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 2A
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]	Detect
10640	65.41	-6.43	V	58.98	73.98	15.00	PK
10640	48.92	-6.43	V	42.49	53.98	11.49	AV
15960	62.24	-6.93	V	55.31	73.98	18.67	PK
15960	48.97	-6.93	V	42.04	53.98	11.94	AV
10640	62.57	-6.43	H	56.14	73.98	17.84	PK
10640	49.05	-6.43	H	42.62	53.98	11.36	AV
15960	62.59	-6.93	H	55.66	73.98	18.32	PK
15960	49.10	-6.93	H	42.17	53.98	11.81	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 2A
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]	Detect
10540	63.11	-5.77	V	57.34	68.20	10.86	PK
15810	63.02	-7.47	V	55.55	73.98	18.43	PK
15810	49.82	-7.47	V	42.35	53.98	11.63	AV
10540	63.19	-5.77	H	57.42	68.20	10.78	PK
15810	63.17	-7.47	H	55.70	73.98	18.28	PK
15810	49.93	-7.47	H	42.46	53.98	11.52	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 2A
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]	Detect
10620	63.54	-6.36	V	57.18	73.98	16.80	PK
10620	50.06	-6.36	V	43.70	53.98	10.28	AV
15930	62.58	-6.77	V	55.81	73.98	18.17	PK
15930	49.84	-6.77	V	43.07	53.98	10.91	AV
10620	63.71	-6.36	H	57.35	73.98	16.63	PK
10620	50.21	-6.36	H	43.85	53.98	10.13	AV
15930	62.63	-6.77	H	55.86	73.98	18.12	PK
15930	49.91	-6.77	H	43.14	53.98	10.84	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 2A
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]	Detect
10540	62.29	-5.77	V	56.52	68.20	11.68	PK
15810	62.89	-7.47	V	55.42	73.98	18.56	PK
15810	50.02	-7.47	V	42.55	53.98	11.43	AV
10540	62.35	-5.77	H	56.58	68.20	11.62	PK
15810	63.00	-7.47	H	55.53	73.98	18.45	PK
15810	50.08	-7.47	H	42.61	53.98	11.37	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 2A
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]	Detect
10620	62.27	-6.36	V	55.91	73.98	18.07	PK
10620	49.26	-6.36	V	42.90	53.98	11.08	AV
15930	62.84	-6.77	V	56.07	73.98	17.91	PK
15930	49.55	-6.77	V	42.78	53.98	11.20	AV
10620	62.51	-6.36	H	56.15	73.98	17.83	PK
10620	49.49	-6.36	H	43.13	53.98	10.85	AV
15930	62.92	-6.77	H	56.15	73.98	17.83	PK
15930	49.79	-6.77	H	43.02	53.98	10.96	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 2A
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]	Detect
10580	62.57	-5.70	V	56.87	68.20	11.33	PK
15870	64.07	-7.27	V	56.80	73.98	17.18	PK
15870	50.27	-7.27	V	43.00	53.98	10.98	AV
10580	62.91	-5.70	H	57.21	68.20	10.99	PK
15870	64.20	-7.27	H	56.93	73.98	17.05	PK
15870	50.44	-7.27	H	43.17	53.98	10.81	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 2C
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]	Detect
11000	62.16	-5.06	V	57.10	73.98	16.88	PK
11000	48.39	-5.06	V	43.33	53.98	10.65	AV
16500	63.07	-4.35	V	58.72	68.20	9.48	PK
11000	62.37	-5.06	H	57.31	73.98	16.67	PK
11000	48.51	-5.06	H	43.45	53.98	10.53	AV
16500	63.17	-4.35	H	58.82	68.20	9.38	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 802.11a. 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 2C
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]	Detect
11160	64.19	-5.55	V	58.64	73.98	15.34	PK
11160	49.13	-5.55	V	43.58	53.98	10.40	AV
16740	64.87	-3.73	V	61.14	68.20	7.06	PK
11160	64.30	-5.55	H	58.75	73.98	15.23	PK
11160	49.26	-5.55	H	43.71	53.98	10.27	AV
16740	64.95	-3.73	H	61.22	68.20	6.98	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 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5720 MHz
Channel No.	144 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.55	-6.08	V	56.47	73.98	17.51	PK
11400	48.68	-6.08	V	42.60	53.98	11.38	AV
17100	63.42	-0.85	V	62.57	68.20	5.63	PK
11400	62.69	-6.08	H	56.61	73.98	17.37	PK
11400	48.76	-6.08	H	42.68	53.98	11.30	AV
17100	63.61	-0.85	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 802.11a. 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 2C
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]	Detect
11000	62.17	-5.06	V	57.11	73.98	16.87	PK
11000	48.39	-5.06	V	43.33	53.98	10.65	AV
16500	63.13	-4.35	V	58.78	68.20	9.42	PK
11000	62.38	-5.06	H	57.32	73.98	16.66	PK
11000	48.65	-5.06	H	43.59	53.98	10.39	AV
16500	63.27	-4.35	H	58.92	68.20	9.28	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 2C
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]	Detect
11160	70.21	-5.55	V	64.66	73.98	9.32	PK
11160	54.10	-5.55	V	48.55	53.98	5.43	AV
16740	62.94	-3.73	V	59.21	68.20	8.99	PK
11160	71.00	-5.55	H	65.45	73.98	8.53	PK
11160	54.47	-5.55	H	48.92	53.98	5.06	AV
16740	63.13	-3.73	H	59.40	68.20	8.80	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 2C
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5720 MHz
Channel No.	144 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.23	-6.08	V	56.15	73.98	17.83	PK
11400	49.04	-6.08	V	42.96	53.98	11.02	AV
17100	62.89	-0.85	V	62.04	68.20	6.16	PK
11400	62.44	-6.08	H	56.36	73.98	17.62	PK
11400	49.16	-6.08	H	43.08	53.98	10.90	AV
17100	63.21	-0.85	H	62.36	68.20	5.84	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 2C
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]	Detect
11000	62.39	-5.06	V	57.33	73.98	16.65	PK
11000	48.75	-5.06	V	43.69	53.98	10.29	AV
16500	62.54	-4.35	V	58.19	68.20	10.01	PK
11000	62.54	-5.06	H	57.48	73.98	16.50	PK
11000	48.97	-5.06	H	43.91	53.98	10.07	AV
16500	62.68	-4.35	H	58.33	68.20	9.87	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 2C
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]	Detect
11160	69.19	-5.55	V	63.64	73.98	10.34	PK
11160	54.00	-5.55	V	48.45	53.98	5.53	AV
16740	62.58	-3.73	V	58.85	68.20	9.35	PK
11160	70.69	-5.55	H	65.14	73.98	8.84	PK
11160	54.08	-5.55	H	48.53	53.98	5.45	AV
16740	63.14	-3.73	H	59.41	68.20	8.79	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 2C
Operation Mode:	802.11 ac_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5720 MHz
Channel No.	144 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.86	-6.08	V	56.78	73.98	17.20	PK
11400	49.14	-6.08	V	43.06	53.98	10.92	AV
17100	62.76	-0.85	V	61.91	68.20	6.29	PK
11400	63.15	-6.08	H	57.07	73.98	16.91	PK
11400	49.21	-6.08	H	43.13	53.98	10.85	AV
17100	63.24	-0.85	H	62.39	68.20	5.81	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 v01r02.

Band :	UNII 2C
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]	Detect
11020	62.11	-5.86	V	56.25	73.98	17.73	PK
11020	49.01	-5.86	V	43.15	53.98	10.83	AV
16530	63.08	-3.75	V	59.33	68.20	8.87	PK
11020	62.15	-5.86	H	56.29	73.98	17.69	PK
11020	49.17	-5.86	H	43.31	53.98	10.67	AV
16530	63.21	-3.75	H	59.46	68.20	8.74	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 2C
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]	Detect
11180	62.34	-6.14	V	56.20	73.98	17.78	PK
11180	49.21	-6.14	V	43.07	53.98	10.91	AV
16770	63.26	-3.11	V	60.15	68.20	8.05	PK
11180	62.58	-6.14	H	56.44	73.98	17.54	PK
11180	49.49	-6.14	H	43.35	53.98	10.63	AV
16770	63.47	-3.11	H	60.36	68.20	7.84	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 2C
Operation Mode:	802.11n_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]	Detect
11340	62.17	-5.10	V	57.07	73.98	16.91	PK
11340	49.16	-5.10	V	44.06	53.98	9.92	AV
17010	62.43	-1.27	V	61.16	68.20	7.04	PK
11340	62.50	-5.10	H	57.40	73.98	16.58	PK
11340	49.23	-5.10	H	44.13	53.98	9.85	AV
17010	62.57	-1.27	H	61.30	68.20	6.90	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 2C
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]	Detect
11020	62.15	-5.86	V	56.29	73.98	17.69	PK
11020	49.13	-5.86	V	43.27	53.98	10.71	AV
16530	62.38	-3.75	V	58.63	68.20	9.57	PK
11020	62.32	-5.86	H	56.46	73.98	17.52	PK
11020	49.25	-5.86	H	43.39	53.98	10.59	AV
16530	62.46	-3.75	H	58.71	68.20	9.49	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 2C
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]	Detect
11180	62.29	-6.14	V	56.15	73.98	17.83	PK
11180	49.23	-6.14	V	43.09	53.98	10.89	AV
16770	63.17	-3.11	V	60.06	68.20	8.14	PK
11180	62.49	-6.14	H	56.35	73.98	17.63	PK
11180	49.38	-6.14	H	43.24	53.98	10.74	AV
16770	63.26	-3.11	H	60.15	68.20	8.05	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 2C
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]	Detect
11420	62.11	-6.07	V	56.04	73.98	17.94	PK
11420	49.04	-6.07	V	42.97	53.98	11.01	AV
17130	62.27	-0.81	V	61.46	68.20	6.74	PK
11420	62.48	-6.07	H	56.41	73.98	17.57	PK
11420	49.15	-6.07	H	43.08	53.98	10.90	AV
17130	62.78	-0.81	H	61.97	68.20	6.23	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 v01r02.

Band :	UNII 2C
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]	Detect
11060	61.84	-6.21	V	55.63	73.98	18.35	PK
11060	48.62	-6.21	V	42.41	53.98	11.57	AV
16590	63.10	-3.20	V	59.90	68.20	8.30	PK
11060	61.95	-6.21	H	55.74	73.98	18.24	PK
11060	48.82	-6.21	H	42.61	53.98	11.37	AV
16590	63.29	-3.20	H	60.09	68.20	8.11	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 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 2C
Operation Mode:	802.11ac_80 MHz BW
Transfer Rate:	29.3 Mbps
Operating Frequency	5690 MHz
Channel No.	138 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11380	61.64	-5.59	V	56.05	73.98	17.93	PK
11380	48.56	-5.59	V	42.97	53.98	11.01	AV
17070	63.15	-1.32	V	61.83	68.20	6.37	PK
11380	61.71	-5.59	H	56.12	73.98	17.86	PK
11380	48.87	-5.59	H	43.28	53.98	10.70	AV
17070	63.27	-1.32	H	61.95	68.20	6.25	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 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
7. We applied the 15.407 for Ch.138 in 802.11ac according to KDB 644545 D01 v01r02.

8.8.2 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)).

Service MIMO(Ant.0 & 1)

Band :	UNII 2A
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]	Detect
5350	53.31	9.28	H	62.59	73.98	11.39	PK
5350	41.58	9.28	H	50.86	53.98	3.12	AV
5350	52.49	9.28	V	61.77	73.98	12.21	PK
5350	41.46	9.28	V	50.74	53.98	3.24	AV

Band :	UNII 2A
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+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5350	51.96	9.28	H	61.24	73.98	12.74	PK
5350	41.06	9.28	H	50.34	53.98	3.64	AV
5350	51.59	9.28	V	60.87	73.98	13.11	PK
5350	39.81	9.28	V	49.09	53.98	4.89	AV

Band :	UNII 2A
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]	Detect
5350	52.42	9.28	H	61.70	73.98	12.28	PK
5350	41.04	9.28	H	50.32	53.98	3.66	AV
5350	52.17	9.28	V	61.45	73.98	12.53	PK
5350	40.59	9.28	V	49.87	53.98	4.11	AV

Band :	UNII 2A
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]	Detect
5350	61.56	9.28	H	70.84	73.98	3.14	PK
5350	41.30	9.28	H	50.58	53.98	3.40	AV
5350	60.77	9.28	V	70.05	73.98	3.93	PK
5350	41.51	9.28	V	50.79	53.98	3.19	AV

Band :	UNII 2A
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]	Detect
5350	60.37	9.28	H	69.65	73.98	4.33	PK
5350	41.28	9.28	H	50.56	53.98	3.42	AV
5350	58.31	9.28	V	67.59	73.98	6.39	PK
5350	41.60	9.28	V	50.88	53.98	3.10	AV

Band :	UNII 2A
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]	Detect
5350	58.10	9.28	H	67.38	73.98	6.60	PK
5350	40.64	9.28	H	49.92	53.98	4.06	AV
5350	61.06	9.28	V	70.34	73.98	3.64	PK
5350	40.91	9.28	V	50.19	53.98	3.79	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 2C
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]	Detect
5460	52.11	10.08	H	62.19	73.98	11.79	PK
5460	40.80	10.08	H	50.88	53.98	3.10	AV
*5470	51.41	9.95	H	61.36	68.20	6.84	PK
5460	51.08	10.08	V	61.16	73.98	12.82	PK
5460	39.68	10.08	V	49.76	53.98	4.22	AV
*5470	48.72	9.95	V	58.67	68.20	9.53	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5720 MHz
Channel No.	144 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	53.50	11.37	H	64.87	68.20	3.33	PK
*5725	53.24	11.37	V	64.61	68.20	3.59	PK

Band :	UNII 2C
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+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5460	52.22	10.08	H	62.30	73.98	11.68	PK
5460	40.38	10.08	H	50.46	53.98	3.52	AV
*5470	52.28	9.95	H	62.23	68.20	5.97	PK
5460	51.94	10.08	V	62.02	73.98	11.96	PK
5460	39.27	10.08	V	49.35	53.98	4.63	AV
*5470	50.19	9.95	V	60.14	68.20	8.06	PK

Band :	UNII 2C
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5720 MHz
Channel No.	144 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	53.30	11.37	H	64.67	68.20	3.53	PK
*5725	52.98	11.37	V	64.35	68.20	3.85	AV

Band :	UNII 2C
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]	Detect
5460	51.19	10.08	H	61.27	73.98	12.71	PK
5460	40.31	10.08	H	50.39	53.98	3.59	AV
*5470	52.22	9.95	H	62.17	68.20	6.03	PK
5460	51.00	10.08	V	61.08	73.98	12.90	PK
5460	40.10	10.08	V	50.18	53.98	3.80	AV
*5470	52.18	9.95	V	62.13	68.20	6.07	PK

Band :	UNII 2C
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]	Detect
5460	49.18	10.08	H	59.26	73.98	14.72	PK
5460	37.59	10.08	H	47.67	53.98	6.31	AV
*5470	53.41	9.95	H	63.36	68.20	4.84	PK
5460	49.03	10.08	V	59.11	73.98	14.87	PK
5460	37.21	10.08	V	47.29	53.98	6.69	AV
*5470	53.12	9.95	V	63.07	68.20	5.13	PK

Band :	UNII 2C
Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5710 MHz
Channel No.	142 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	53.53	11.37	H	64.90	68.20	3.30	PK
*5725	53.18	11.37	V	64.55	68.20	3.65	AV

Band :	UNII 2C
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]	Detect
5460	50.30	10.08	H	60.38	73.98	13.60	PK
5460	38.44	10.08	H	48.52	53.98	5.46	AV
*5470	55.07	9.95	H	65.02	68.20	3.18	PK
5460	50.17	10.08	V	60.25	73.98	13.73	PK
5460	38.19	10.08	V	48.27	53.98	5.71	AV
*5470	54.37	9.95	V	64.32	68.20	3.88	PK

Band :	UNII 2C
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]	Detect
5460	51.34	10.08	H	61.42	73.98	12.56	PK
5460	38.60	10.08	H	48.68	53.98	5.30	AV
*5470	54.82	9.95	H	64.77	68.20	3.43	PK
5460	49.95	10.08	V	60.03	73.98	13.95	PK
5460	36.66	10.08	V	46.74	53.98	7.24	AV
*5470	51.96	9.95	V	61.91	68.20	6.29	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)

8.8.3 RECEIVER SPURIOUS EMISSIONS

IC Rule(s)	**RSS-GEN**
Test Requirements:	**Blow the table**
Operating conditions:	**Under normal test conditions**
Method of testing:	**Radiated**
S/A. Settings:	**F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)** **F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)**
Mode of operation:	**Receive**

Frequency (MHz)	**Field Strength (microvolts/m at 3 meters)**
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500

Operation Mode: Receive:

30 MHz ~ 1 GHz

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

Above 1 GHz

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

8.9 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 65 Mbps, Ch.144 and 802.11n_20 MHz BW mode in UNII 2C_2 TX MIMO. Because the mode in UNII 2C is worst case.

▣ RESULT PLOTS

Conducted Emissions (Line 1)

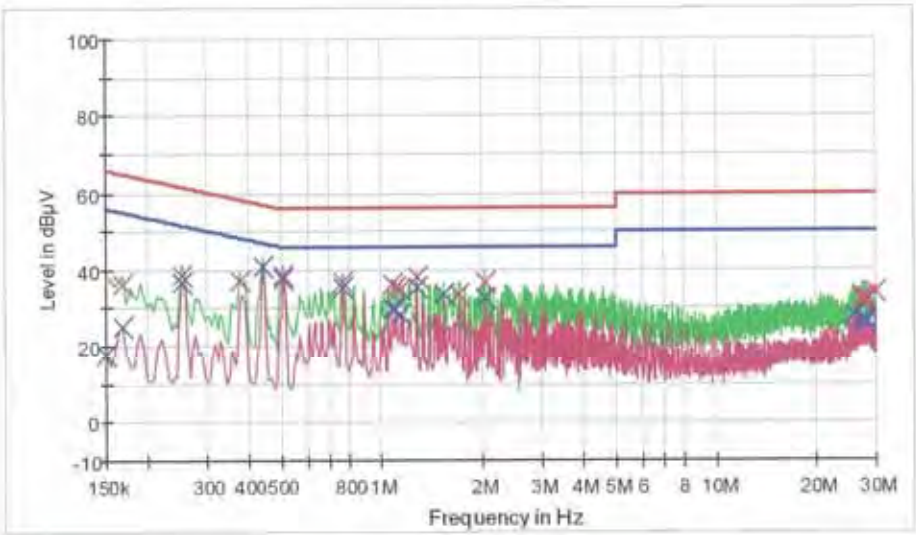
EMI Auto Test(2) 1 / 2

HCT TEST Report

Common Information

EUT:	WEA412I
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN MODE(UNII)
Operator Name:	JS LEE

FCC CLASS B



FCC CLASS B_QP — FCC CLASS B_AV — Preview Result 1-PK+
Preview Result 2-AVG — Final Result 1-QPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	36.0	9.000	Off	N	9.7	29.1	65.1
0.253500	38.5	9.000	Off	N	9.7	23.1	61.6
0.379500	37.2	9.000	Off	N	9.7	21.1	58.3
0.442500	41.0	9.000	Off	N	9.7	16.0	57.0
0.509000	38.8	9.000	Off	N	9.7	17.2	56.0
0.765500	36.7	9.000	Off	N	9.7	19.3	56.0
1.076000	36.1	9.000	Off	N	9.8	19.9	56.0
1.107500	35.4	9.000	Off	N	9.8	20.6	56.0
1.139000	34.9	9.000	Off	N	9.8	21.1	56.0
1.274000	37.9	9.000	Off	N	9.8	18.1	56.0
1.706000	33.2	9.000	Off	N	9.8	22.8	56.0
2.043500	36.7	9.000	Off	N	9.9	19.3	56.0
27.504500	32.7	9.000	Off	N	11.1	27.3	60.0
27.581000	31.7	9.000	Off	N	11.1	28.3	60.0
27.878000	31.3	9.000	Off	N	11.1	28.7	60.0
27.950000	32.3	9.000	Off	N	11.1	27.7	60.0

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EMI Auto Test(2) 2 / 2

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
28.026500	32.2	9.000	Off	N	11.1	27.8	60.0
30.000000	34.0	9.000	Off	N	11.2	26.0	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	17.8	9.000	Off	N	9.7	38.2	56.0
0.168000	25.2	9.000	Off	N	9.7	29.9	55.1
0.253500	36.6	9.000	Off	N	9.7	15.0	51.6
0.442500	41.0	9.000	Off	N	9.7	6.0	47.0
0.509000	37.4	9.000	Off	N	9.7	8.6	46.0
0.765500	35.4	9.000	Off	N	9.7	10.6	46.0
1.076000	29.6	9.000	Off	N	9.8	16.4	46.0
1.107500	29.9	9.000	Off	N	9.8	16.2	46.0
1.139000	28.5	9.000	Off	N	9.8	17.5	46.0
1.278500	35.4	9.000	Off	N	9.8	10.6	46.0
1.530500	33.2	9.000	Off	N	9.8	12.8	46.0
2.043500	32.7	9.000	Off	N	9.9	13.3	46.0
25.790000	27.8	9.000	Off	N	11.0	22.2	50.0
27.500000	26.8	9.000	Off	N	11.1	23.2	50.0
27.581000	25.9	9.000	Off	N	11.1	24.1	50.0
27.878000	25.7	9.000	Off	N	11.1	24.3	50.0
27.950000	26.8	9.000	Off	N	11.1	23.2	50.0
28.026500	27.0	9.000	Off	N	11.1	23.0	50.0

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Conducted Emissions (Line 2)

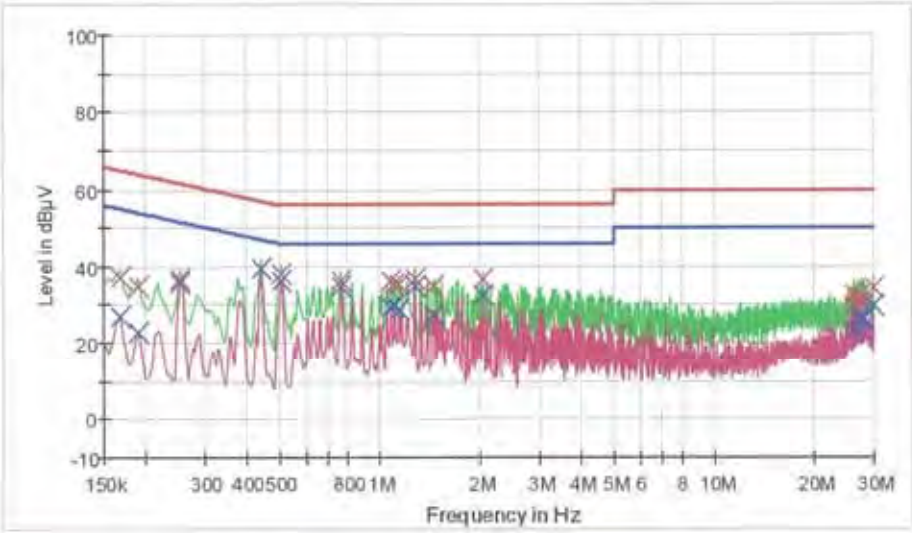
EMI Auto Test(2) 1 / 2

HCT TEST Report

Common Information

EUT:	WEA412I
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN MODE(UNII)
Operator Name:	JS LEE

FCC CLASS B



FCCCLASS B_QP
Preview Result 2-AVG
FCCCLASS B_AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	37.0	9.000	Off	L1	9.7	28.1	65.1
0.190500	34.8	9.000	Off	L1	9.7	29.2	64.0
0.253500	36.6	9.000	Off	L1	9.7	25.0	61.6
0.442500	39.4	9.000	Off	L1	9.7	17.6	57.0
0.509000	37.9	9.000	Off	L1	9.7	18.1	56.0
0.765500	36.2	9.000	Off	L1	9.7	19.8	56.0
1.076000	36.1	9.000	Off	L1	9.7	19.9	56.0
1.107500	35.4	9.000	Off	L1	9.8	20.6	56.0
1.139000	35.3	9.000	Off	L1	9.8	20.7	56.0
1.274000	36.8	9.000	Off	L1	9.8	19.2	56.0
1.454000	34.6	9.000	Off	L1	9.8	21.4	56.0
2.043500	36.7	9.000	Off	L1	9.9	19.3	56.0
26.222000	29.6	9.000	Off	L1	11.2	30.4	60.0
26.312000	32.7	9.000	Off	L1	11.2	27.3	60.0
26.902500	32.2	9.000	Off	L1	11.3	27.8	60.0
27.855500	29.6	9.000	Off	L1	11.3	30.4	60.0

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EMI Auto Test(2) 2 / 2

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
28.031000	31.5	9.000	Off	L1	11.3	28.5	60.0
30.000000	34.3	9.000	Off	L1	11.4	25.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	26.8	9.000	Off	L1	9.7	28.3	55.1
0.190500	22.8	9.000	Off	L1	9.7	31.2	54.0
0.253500	35.7	9.000	Off	L1	9.7	15.9	51.6
0.442500	39.4	9.000	Off	L1	9.7	7.6	47.0
0.509000	36.4	9.000	Off	L1	9.7	9.6	46.0
0.765500	34.9	9.000	Off	L1	9.7	11.1	46.0
1.076000	29.4	9.000	Off	L1	9.7	16.6	46.0
1.107500	29.9	9.000	Off	L1	9.8	16.1	46.0
1.139000	28.8	9.000	Off	L1	9.8	17.2	46.0
1.278500	34.7	9.000	Off	L1	9.8	11.3	46.0
1.454000	27.5	9.000	Off	L1	9.8	18.5	46.0
2.043500	32.7	9.000	Off	L1	9.9	13.3	46.0
26.222000	23.4	9.000	Off	L1	11.2	26.6	50.0
26.982500	26.5	9.000	Off	L1	11.3	23.5	50.0
27.261500	23.1	9.000	Off	L1	11.3	26.9	50.0
27.954500	26.6	9.000	Off	L1	11.3	23.4	50.0
28.031000	26.2	9.000	Off	L1	11.3	23.8	50.0
30.000000	29.9	9.000	Off	L1	11.4	20.1	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
Rohde & Schwarz	FSV40/Spectrum Analyzer	06/10/2013	Annual	06/10/2014	1307.9002K40-100931-NK
Agilent	N9020A/ SIGNAL ANALYZER	05/23/2013	Annual	05/23/2014	MY51110063
Agilent	N9020A/ SIGNAL ANALYZER	05/20/2013	Annual	05/20/2014	MY50510304
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
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
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

9.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Due	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	FSV40/Spectrum Analyzer	06/10/2013	Annual	06/10/2014	1307.9002K40-100931-NK
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
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