HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

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

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
July 08, 2014

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

Report No.: HCT-R-1407-F005-3

HCT FRN: 0005866421

IC Recognition No.: 5944A-3

FCC ID	**: ZNFV480**
IC	**: 2703C-V480**
APPLICANT	**: LG Electronics MobileComm U.S.A., Inc.**

FCC/ IC Model(s):	LG-V480
Additional FCC/ IC Model(s):	LGV480, V480
EUT Type:	2.4/5GHz BT/WiFi Tablet
Max. RF Output Power:	Wi-Fi 802.11a (5180~5240) (8.33 dBm)/ Wi-Fi 802.11a (5260~5320) (8.80 dBm)/ Wi-Fi 802.11a (5500~5700) (8.70 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (7.42 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(7.83 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(7.60 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (6.72 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (6.75 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (7.78 dBm)
Frequency Range:	20 MHz BW: 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C) 40 MHz BW: 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5670 MHz (UNII 2C)
Modulation type	OFDM
FCC Classification:	Unlicensed National Information Infrastructure(UNII)
FCC Rule Part(s):	Part 15.407
IC Rule :	RSS-210 Issue 8 , RSS-GEN Issue 3

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1407-F005	July 01, 2014	- First Approval Report
HCT-R-1407-F005-1	July 01, 2014	- Revised the IC Rule on Page 1
HCT-R-1407-F005-2	July 04, 2014	- Retest the 20dB Bandwidth
HCT-R-1407-F005-3	July 08, 2014	- Add the Band Edge Plot for 5250 MHz on Page 126-128

Table of Contents

1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFV480
IC:	2703C-V480
EUT Type:	2.4/5GHz BT/WiFi Tablet
FCC/IC Model name(s):	LG-V480
Additional FCC/IC Model name(s):	LGV480, V480
Date(s) of Tests:	June 17, 2014 ~ July 04, 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	2.4/5GHz BT/WiFi Tablet	
FCC/IC Model Name	LG-V480	
Additional FCC/ IC Model Name	LGV480, V480	
Power Supply	DC 3.7 V	
Frequency Range	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C) where) Not supported 5600 MHz – 5640 MHz
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5670 MHz (UNII 2C) where) Not supported 5590 MHz – 5630 MHz
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/ 5500 MHz - 5700 MHz (UNII 2C) where) Not supported 5600 MHz – 5640 MHz
	40 MHz BW:	5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/ 5510 MHz - 5670 MHz (UNII 2C) where) Not supported 5590 MHz – 5630 MHz
Max. RF Output Power:	Wi-Fi 802.11a (5180~5240) (8.33 dBm)/ Wi-Fi 802.11a (5260~5320) (8.80 dBm)/ Wi-Fi 802.11a (5500~5700) (8.70 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (7.42 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(7.83 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(7.60 dBm)/ Wi-Fi 802.11n_40 MHz BW(5190~5230) (6.72 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (6.75 dBm)/ Wi-Fi 802.11n_40 MHz BW (5510~5670) (7.78 dBm)	
Modulation Type	OFDM(802.11a, 802.11n_20 MHz, 802.11n_40 MHz)	
Antenna Specification	Manufacturer: ace technologyA Antenna type: Planar Inverted F Antenna Peak Gain : -1.83 dBi	

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, §15.407, RSS-GEN 7.1.2

“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 directional gain of this E.U.T antenna exceeds 6 dBi
* The E.U.T Complies with the requirement of §15.203, §15.407, RSS-GEN 7.1.2

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)	< 50 mW or 4+10 log $_{10}$ (BW) dBm (5150-5250 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5470-5725 MHz) Whichever power is less		PASS
Peak Power Spectral Density	§15.407(a)(1), (5)	<4 dBm/ MHz (5150-5250) <11 dBm/ MHz (5250-5350) <11 dBm/ MHz (5470-5725)		PASS
Peak Excursion	§15.407(a)(6)	<13 dB/ MHz maximum difference		PASS
Frequency Stability	§15.407(g)	NA		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

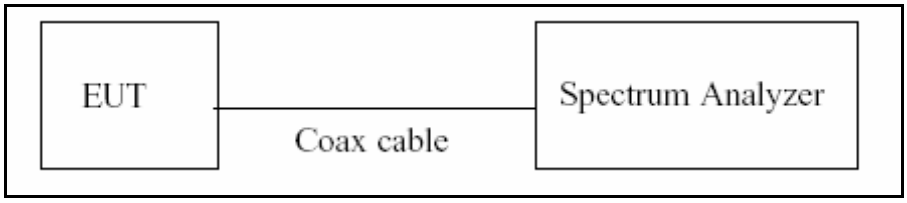
Test Description	IC Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth(IC)	RSS-GEN 4.6.1	NA	CONDUCTED	PASS
Maximum Conducted Output Power,	RSS-210 [A9.2]	< 250 mW or 11+10 log $_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $_{10}$ (BW) dBm (5470-5600 & 5650-5725 MHz) Whichever power is less		PASS
Maximum e.i.r.p		< 200 mW or 10+10 log $_{10}$ (BW) dBm (5150-5250 MHz) < 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		
Peak Power Spectral Density	RSS-210 [A9.2]	<10 dBm/ MHz(e.i.r.p.) (5150-5250) <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 according 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

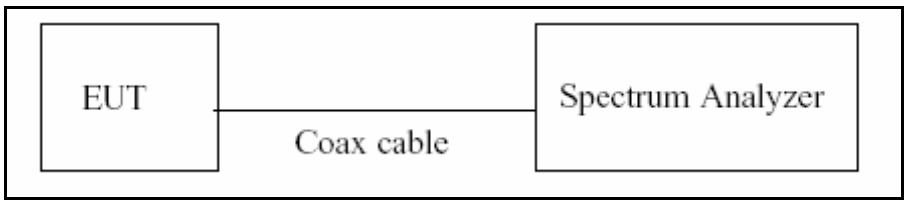
Mode	Data Rate	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor
802.11a Mode	6	2.030	2.130	0.95305164	0.209
	9	1.359	1.458	0.93209877	0.305
	12	1.028	1.126	0.91296625	0.395
	18	0.692	0.790	0.87594937	0.575
	24	0.522	0.622	0.83922830	0.761
	36	0.355	0.454	0.78193833	1.068
	48	0.272	0.370	0.73513514	1.336
	54	0.243	0.342	0.71052632	1.484
802.11n Mode 20 MHz BW	6.5	1.875	1.974	0.94984802	0.223
	13	0.951	1.050	0.90571429	0.430
	19.5	0.644	0.742	0.86792453	0.615
	26	0.488	0.586	0.83276451	0.795
	39	0.335	0.434	0.77188940	1.124
	52	0.256	0.353	0.72521246	1.395
	58.5	0.231	0.330	0.70000000	1.549
	65	0.211	0.310	0.68064516	1.671
802.11n Mode 40 MHz BW	13.5	0.916	1.020	0.89803922	0.467
	27	0.471	0.572	0.82342657	0.844
	40.5	0.322	0.423	0.76122931	1.185
	54	0.247	0.347	0.71181556	1.476
	81	0.175	0.275	0.63636364	1.963
	108	0.136	0.236	0.57627119	2.394
	121.5	0.122	0.223	0.54708520	2.619
	135	0.116	0.216	0.53703704	2.700

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(C 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 %.

Note : We tested 26 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 26 dB.

▣ TEST RESULTS

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	21.97	N/A	Pass
5200	40	21.63	N/A	Pass
5240	48	21.68	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.02	N/A	Pass
5300	60	21.87	N/A	Pass
5320	64	21.74	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.50	N/A	Pass
5580	116	21.68	N/A	Pass
5700	140	21.58	N/A	Pass

▣ TEST RESULTS

20 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.			
5180	36	22.09	N/A	Pass
5200	40	22.00	N/A	Pass
5240	48	22.10	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	22.18	N/A	Pass
5300	60	22.42	N/A	Pass
5320	64	22.02	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.10	N/A	Pass
5580	116	22.20	N/A	Pass
5700	140	22.31	N/A	Pass

40 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5190	38	43.40	N/A	Pass
5230	46	43.09	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5270	54	43.13	N/A	Pass
5310	62	42.38	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5510	102	42.74	N/A	Pass
5550	110	42.77	N/A	Pass
5670	134	44.07	N/A	Pass

Note :

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

▣ 20 dB BW TEST RESULTS(Additional Test)

Conducted 20 dB Bandwidth Measurements for 802.11a

802.11a Mode				Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]		Channel No.				
5240		48		18.32	N/A	Pass
Voltage Power (VDC)	Temp. (℃)	Fre. (MHz)	Ch. No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
100%	-30	5260	52	18.37	N/A	Pass
100%	+50			18.43	N/A	Pass
100%	+20(Ref)			18.35	N/A	Pass
115%				18.46	N/A	Pass
Batt. Endpoint				18.46	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_20 MHz BW

802.11a Mode				Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]		Channel No.				
5240		48		19.22	N/A	Pass
Voltage Power (VDC)	Temp. (℃)	Fre. (MHz)	Ch. No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
100%	-30	5260	52	19.34	N/A	Pass
100%	+50			19.25	N/A	Pass
100%	+20(Ref)			19.26	N/A	Pass
115%				19.18	N/A	Pass
Batt. Endpoint				19.35	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_40 MHz BW

802.11a Mode				Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]		Channel No.				
5230		46		37.73	N/A	Pass
Voltage Power (VDC)	Temp. (℃)	Fre. (MHz)	Ch. No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
100%	-30	5270	54	37.65	N/A	Pass
100%	+50			37.78	N/A	Pass
100%	+20(Ref)			37.84	N/A	Pass
115%				37.79	N/A	Pass
Batt. Endpoint				37.72	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5660	132	19.48	N/A	Pass

Conducted 20 dB Bandwidth Measurements for 802.11n_20 MHz BW

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5660	132	19.90	N/A	Pass

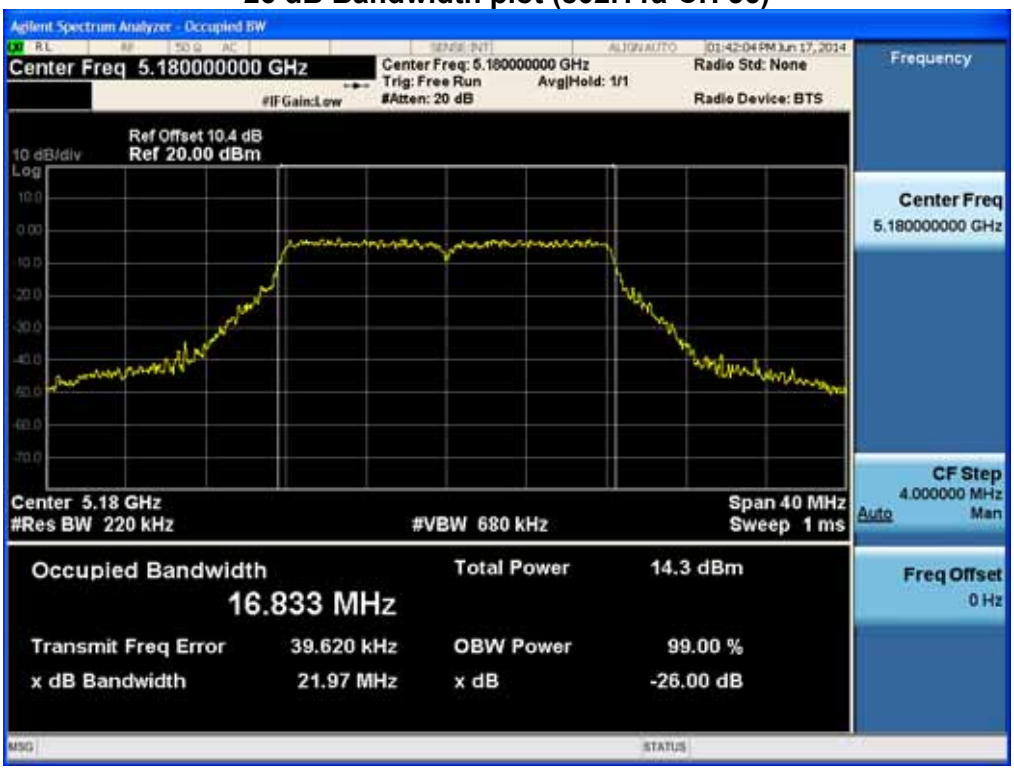
Conducted 20 dB Bandwidth Measurements for 802.11n_40 MHz BW

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5670	134	39.33	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. Also, we performed the 20 dB BW test to prove that no part of the fundamental emissions of any channel 132 and 134 signal lies within the TDWR band.

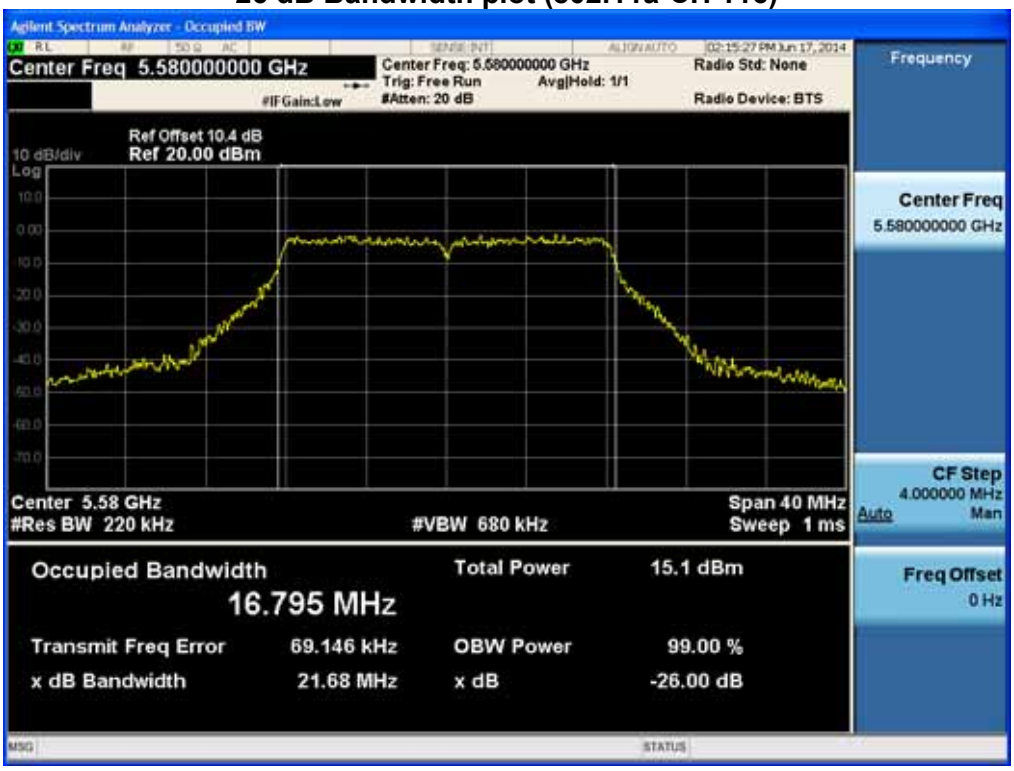
▣ RESULT PLOTS

26 dB Bandwidth plot (802.11a-CH 36)



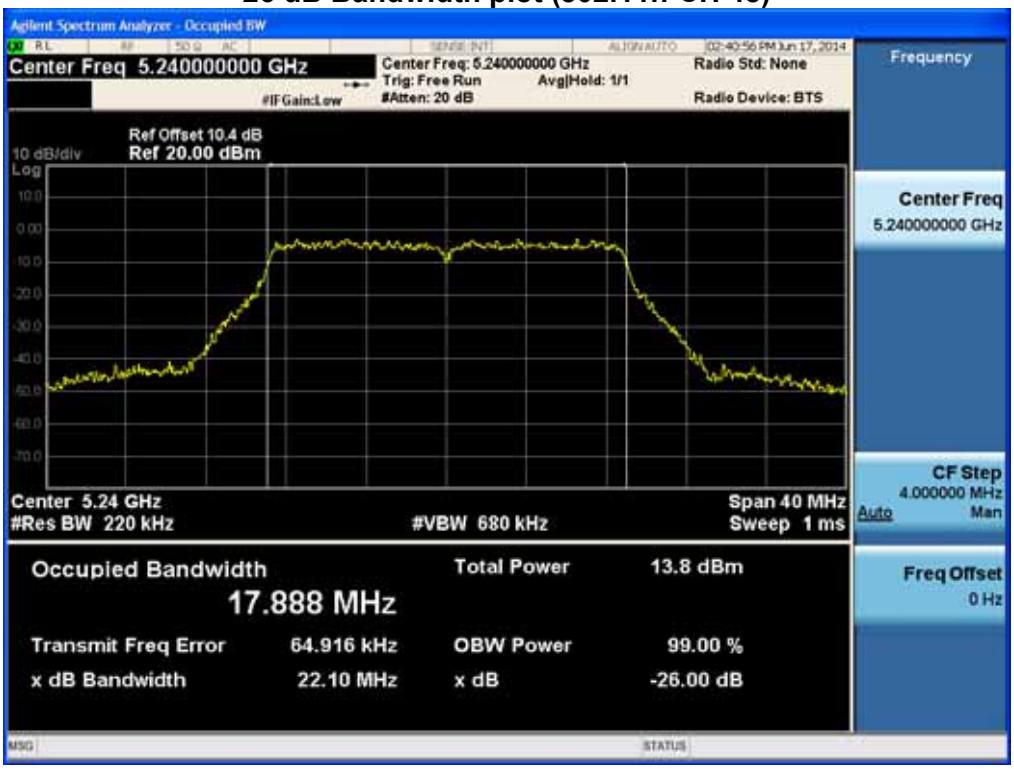
26 dB Bandwidth plot (802.11a-CH 52)

26 dB Bandwidth plot (802.11a-CH 116)

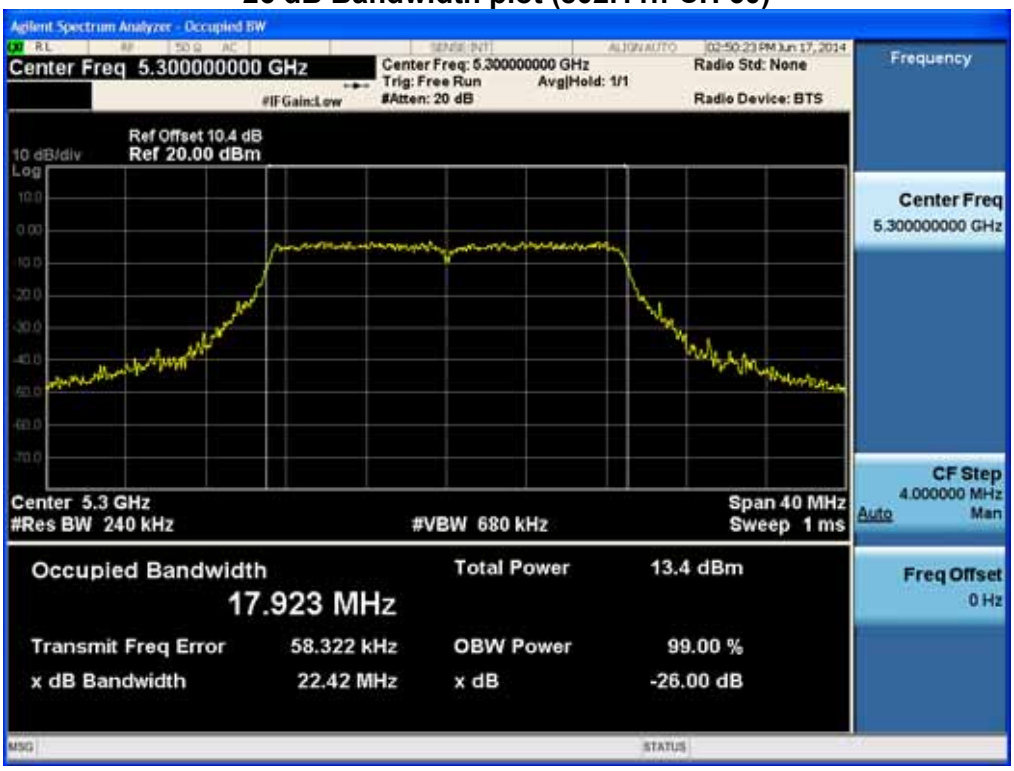


20 MHz BW

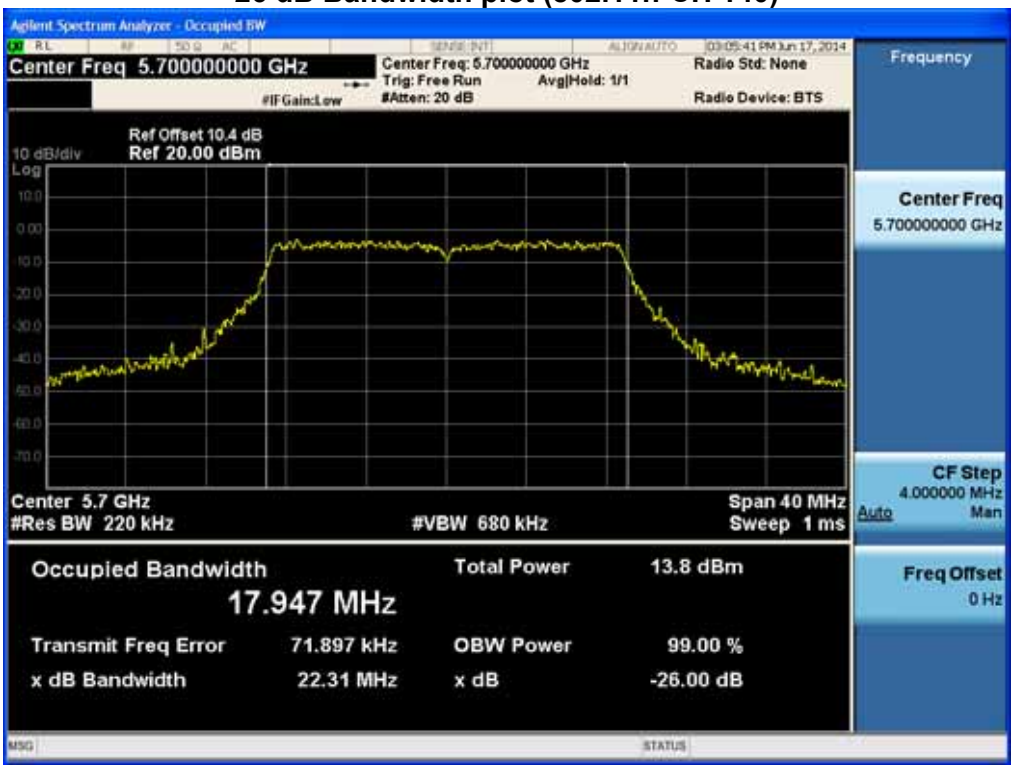
26 dB Bandwidth plot (802.11n-CH 48)



26 dB Bandwidth plot (802.11n-CH 60)

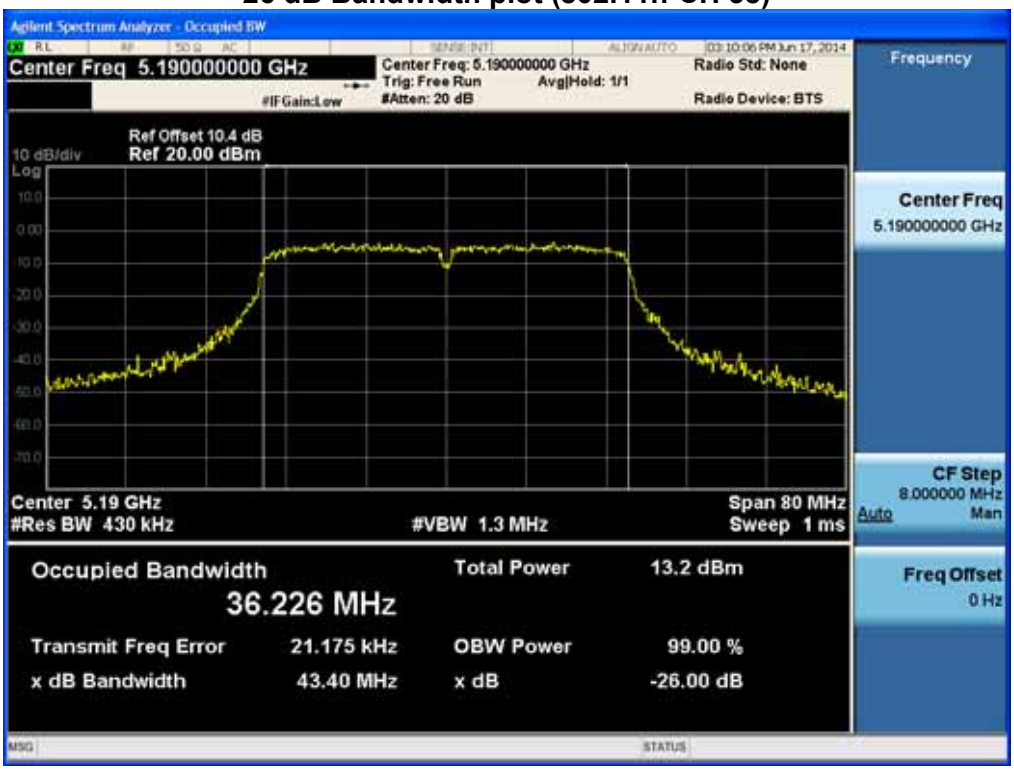


26 dB Bandwidth plot (802.11n-CH 140)

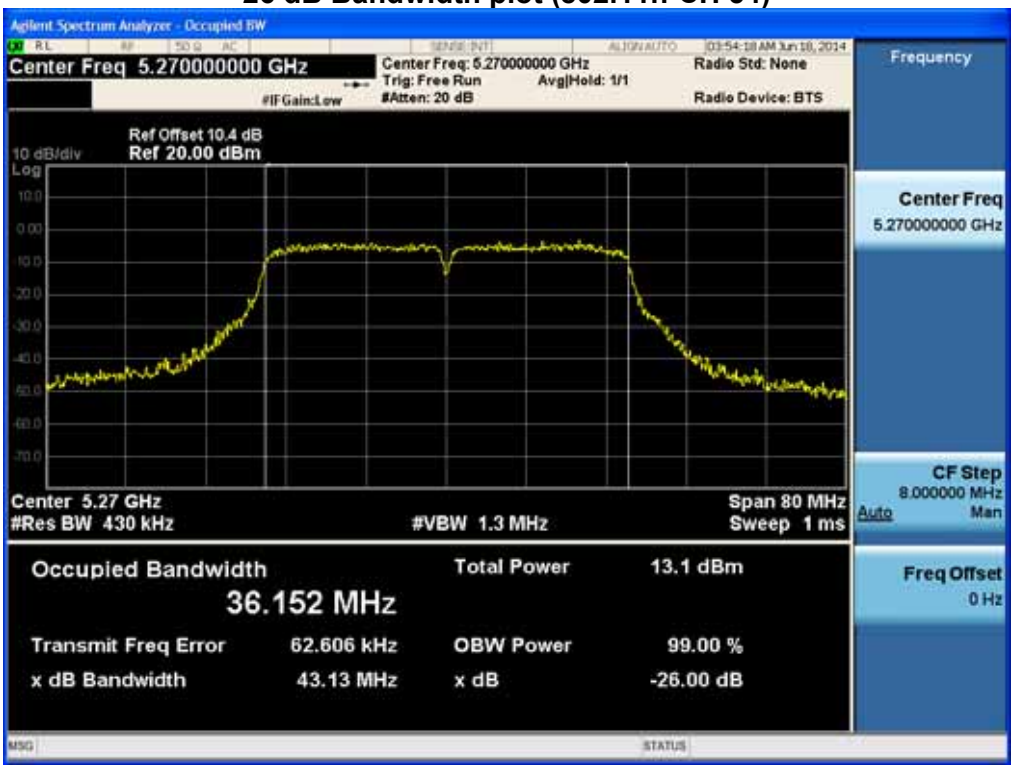


40 MHz BW

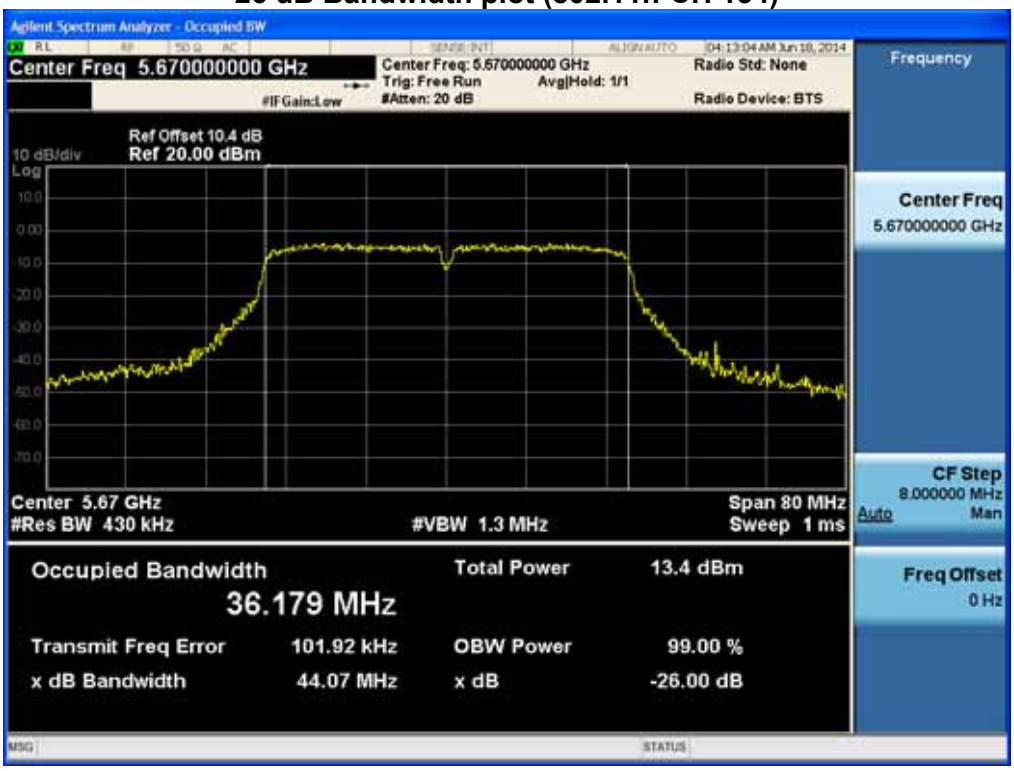
26 dB Bandwidth plot (802.11n-CH 38)



26 dB Bandwidth plot (802.11n-CH 54)



26 dB Bandwidth plot (802.11n-CH 134)



▣ RESULT PLOTS(20 dB Bandwidth)

20 dB Bandwidth plot (802.11a-CH 48)

20 dB Bandwidth plot (802.11a-CH 52 / 100% / -30℃)

20 dB Bandwidth plot (802.11a-CH 52 / 100% / 50°C)

20 dB Bandwidth plot (802.11a-CH 52 / 100% / 20°C)

20 dB Bandwidth plot (802.11a-CH 52 / 115% / 20℃)

20 dB Bandwidth plot (802.11a-CH 52 / 85% / 20℃)

20 dB Bandwidth plot (802.11n-CH 48)

20 dB Bandwidth plot (802.11n-CH 52 / 100% / -30℃)

20 dB Bandwidth plot (802.11n-CH 52 / 100% / 50℃)

20 dB Bandwidth plot (802.11n-CH 52 / 100% / 20℃)

20 dB Bandwidth plot (802.11n-CH 52 / 115% / 20℃)

20 dB Bandwidth plot (802.11n-CH 52 / 85% / 20℃)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 46)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54 / 100% / -30℃)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54 / 100% / 50℃)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54 / 100% / 20℃)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54 / 115% / 20℃)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 54 / 85% / 20℃)

20 dB Bandwidth plot (802.11a-CH 132)

20 dB Bandwidth plot (802.11n-CH 132)

20 dB Bandwidth plot (802.11n_40 MHz BW-CH 134)

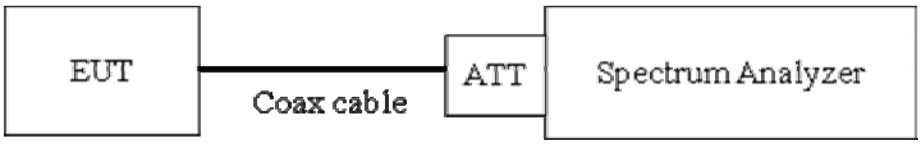
8.3 99% BANDWIDTH MEASUREMENT

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

Conducted 99% Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5180	36	17.077
5200	40	17.071
5240	48	16.953
5260	52	17.061
5300	60	17.008
5320	64	16.941
5500	100	16.911
5580	116	17.025
5700	140	16.981

Conducted 99% Bandwidth Measurements for 802.11n_20 MHz BW

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5180	36	18.148
5200	40	18.014
5240	48	18.023
5260	52	18.050
5300	60	18.039
5320	64	18.090
5500	100	18.052
5580	116	18.007
5700	140	18.054

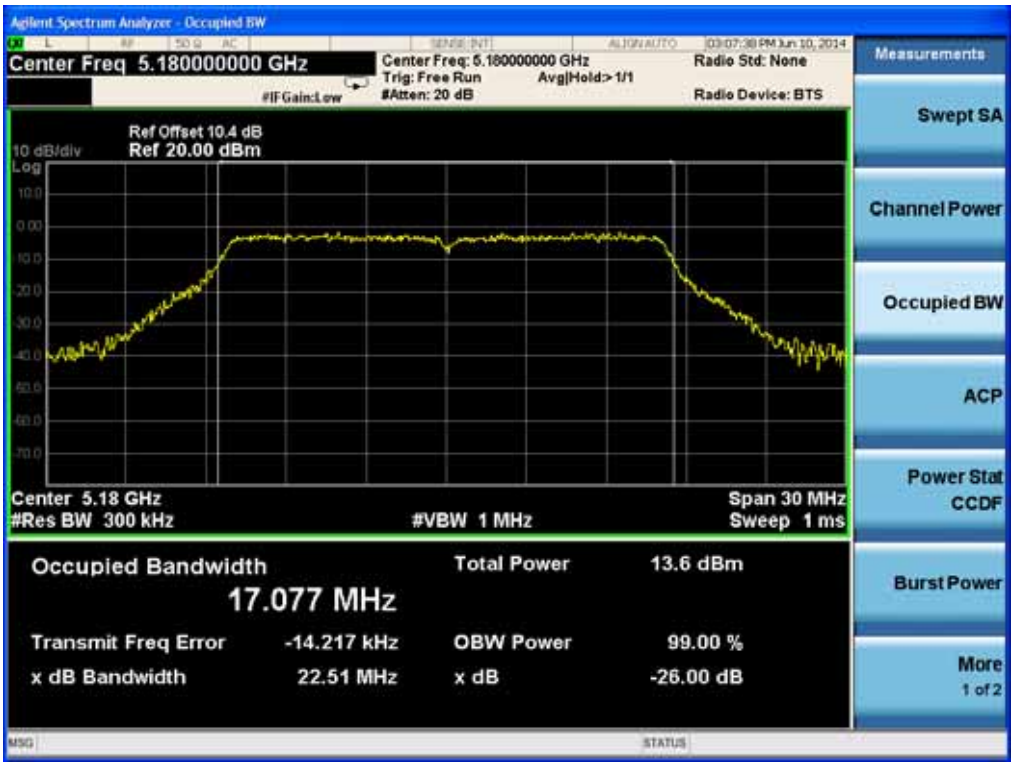
Conducted 99% Bandwidth Measurements for 802.11n_40 MHz BW

802.11n Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5190	38	36.859
5230	46	36.499
5270	54	36.483
5310	62	36.361
5510	102	36.457
5550	110	36.341
5670	134	36.417

Note :

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

99% Bandwidth plot (802.11a-CH36)



99% Bandwidth plot (802.11a-CH52)

99% Bandwidth plot (802.11a-CH116)

99% Bandwidth plot (802.11n-CH36)_20 MHz BW

99% Bandwidth plot (802.11n-CH64)_20 MHz BW

99% Bandwidth plot (802.11n-CH140)_20 MHz BW

99% Bandwidth plot (802.11n-CH38)_40 MHz BW

99% Bandwidth plot (802.11n-CH54)_40 MHz BW

99% Bandwidth plot (802.11n-CH102)_40 MHz BW

8.4 OUTPUT POWER MEASUREMENT

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

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

In the 5.15 – 5.25 GHz band, the maximum permissible conducted output power is the lesser of 50 mW (16.99 dBm) and 4 dBm + 10 log $_{10}$ (26 dB BW).

In the 5.25 – 5.35 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and 11 dBm + 10 log $_{10}$ (26 dB BW).

In the 5.47 – 5.725 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and 11 dBm + 10 log $_{10}$ (26 dB BW).

▣ Limit

1. Maximum Conducted Output Power :

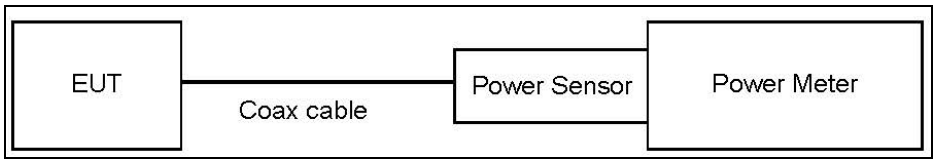
Band	Mode	Limit (dBm)
UNII 1	802.11a,n	16.99(Only FCC)
UNII 2A	802.11a,n	23.98(FCC and IC)
UNII 2C	802.11a,n	23.98(FCC and IC)

2. Maximum EIRP(for IC) :

Band	Mode	Limit (dBm)
UNII 1	802.11a,n	23.01
UNII 2A	802.11a,n	30
UNII 2C	802.11a,n	30

Note : The gap of Conducted limit and EIRP limit is about 6 dB. The antenna gain of EUT is not exceed 6 dBi. 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.

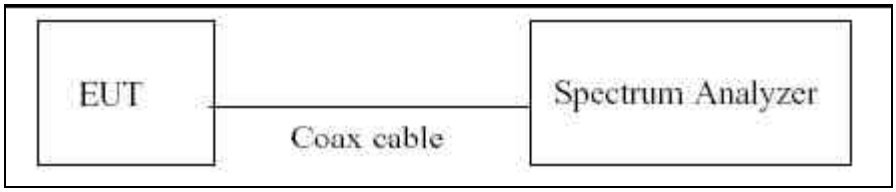
Note :

1. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5190	10.29
	5200	10.28
	5230	10.29
	5240	10.34
UNII 2	5260	10.37
	5270	10.38
	5300	10.40
	5310	10.39
	5320	10.39
UNII 2e	5500	10.35
	5510	10.36
	5550	10.41
	5580	10.43
	5670	10.43

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

▣ TEST CONFIGURATION(40 MHz BW)



▣ TEST PROCEDURE(40 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.

▣ 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

Note :

1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5190	10.29
	5200	10.28
	5230	10.29
	5240	10.34
UNII 2	5260	10.37
	5270	10.38
	5300	10.40
	5310	10.39
	5320	10.39
UNII 2e	5500	10.35
	5510	10.36
	5550	10.41
	5580	10.43
	5670	10.43

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

▣ TEST RESULTS

20 MHz BW

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6	7.57	0.209	7.78	16.99
		9	7.47	0.305	7.77	16.99
		12	7.34	0.395	7.73	16.99
		18	7.19	0.575	7.77	16.99
		24	6.98	0.761	7.74	16.99
		36	6.68	1.068	7.75	16.99
		48	6.29	1.336	7.62	16.99
		54	6.17	1.484	7.65	16.99
5200	40	6	8.04	0.209	8.25	16.99
		9	7.87	0.305	8.18	16.99
		12	7.86	0.395	8.26	16.99
		18	7.73	0.575	8.31	16.99
		24	7.44	0.761	8.20	16.99
		36	6.99	1.068	8.06	16.99
		48	6.74	1.336	8.07	16.99
		54	6.72	1.484	8.20	16.99
5240	48	6	8.12	0.209	8.33	16.99
		9	7.96	0.305	8.26	16.99
		12	7.92	0.395	8.31	16.99
		18	7.69	0.575	8.27	16.99
		24	7.49	0.761	8.25	16.99
		36	7.05	1.068	8.12	16.99
		48	6.77	1.336	8.11	16.99
		54	6.66	1.484	8.15	16.99

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6	7.44	0.209	7.65	23.98
		9	7.33	0.305	7.64	23.98
		12	7.27	0.395	7.67	23.98
		18	7.05	0.575	7.63	23.98
		24	6.81	0.761	7.58	23.98
		36	6.44	1.068	7.51	23.98
		48	6.11	1.336	7.44	23.98
		54	6.00	1.484	7.48	23.98
5300	60	6	7.70	0.209	7.91	23.98
		9	7.58	0.305	7.89	23.98
		12	7.52	0.395	7.92	23.98
		18	7.28	0.575	7.85	23.98
		24	7.17	0.761	7.93	23.98
		36	6.74	1.068	7.81	23.98
		48	6.34	1.336	7.67	23.98
		54	6.24	1.484	7.72	23.98
5320	64	6	8.59	0.209	8.80	23.98
		9	8.47	0.305	8.78	23.98
		12	8.32	0.395	8.72	23.98
		18	8.13	0.575	8.70	23.98
		24	7.89	0.761	8.65	23.98
		36	7.54	1.068	8.61	23.98
		48	7.17	1.336	8.50	23.98
		54	7.07	1.484	8.56	23.98

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

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6	8.28	0.209	8.49	23.98
		9	8.13	0.305	8.44	23.98
		12	8.13	0.395	8.53	23.98
		18	7.97	0.575	8.54	23.98
		24	7.74	0.761	8.50	23.98
		36	7.51	1.068	8.58	23.98
		48	6.92	1.336	8.26	23.98
		54	6.90	1.484	8.38	23.98
5580	116	6	8.46	0.209	8.67	23.98
		9	8.40	0.305	8.70	23.98
		12	8.22	0.395	8.61	23.98
		18	7.86	0.575	8.44	23.98
		24	7.70	0.761	8.46	23.98
		36	7.44	1.068	8.50	23.98
		48	6.95	1.336	8.28	23.98
		54	6.79	1.484	8.27	23.98
5700	140	6	8.29	0.209	8.50	23.98
		9	8.05	0.305	8.35	23.98
		12	7.93	0.395	8.33	23.98
		18	7.79	0.575	8.37	23.98
		24	7.62	0.761	8.38	23.98
		36	7.13	1.068	8.20	23.98
		48	6.89	1.336	8.22	23.98
		54	6.67	1.484	8.15	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6.5	6.82	0.223	7.05	16.99
		13	6.59	0.430	7.02	16.99
		19.5	6.44	0.615	7.05	16.99
		26	6.16	0.795	6.95	16.99
		39	5.76	1.124	6.89	16.99
		52	5.44	1.395	6.84	16.99
		58.5	5.27	1.549	6.82	16.99
		65	5.21	1.671	6.88	16.99
5200	40	6.5	5.95	0.223	6.17	16.99
		13	5.75	0.430	6.18	16.99
		19.5	5.60	0.615	6.22	16.99
		26	5.43	0.795	6.23	16.99
		39	4.93	1.124	6.05	16.99
		52	4.66	1.395	6.06	16.99
		58.5	4.60	1.549	6.15	16.99
		65	4.36	1.671	6.03	16.99
5240	48	6.5	7.19	0.223	7.42	16.99
		13	6.97	0.430	7.40	16.99
		19.5	6.62	0.615	7.23	16.99
		26	6.48	0.795	7.27	16.99
		39	6.00	1.124	7.13	16.99
		52	5.75	1.395	7.14	16.99
		58.5	5.47	1.549	7.02	16.99
		65	5.37	1.671	7.04	16.99

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6.5	6.26	0.223	6.49	23.98
		13	6.10	0.430	6.53	23.98
		19.5	5.80	0.615	6.41	23.98
		26	5.60	0.795	6.39	23.98
		39	5.24	1.124	6.37	23.98
		52	4.80	1.395	6.20	23.98
		58.5	4.61	1.549	6.16	23.98
		65	4.64	1.671	6.31	23.98
5300	60	6.5	6.65	0.223	6.87	23.98
		13	6.48	0.430	6.91	23.98
		19.5	6.34	0.615	6.95	23.98
		26	5.85	0.795	6.64	23.98
		39	5.63	1.124	6.76	23.98
		52	5.38	1.395	6.77	23.98
		58.5	5.26	1.549	6.81	23.98
		65	4.89	1.671	6.56	23.98
5320	64	6.5	7.61	0.223	7.83	23.98
		13	7.28	0.430	7.71	23.98
		19.5	7.13	0.615	7.74	23.98
		26	6.87	0.795	7.67	23.98
		39	6.47	1.124	7.59	23.98
		52	6.20	1.395	7.59	23.98
		58.5	6.01	1.549	7.56	23.98
		65	5.98	1.671	7.65	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6.5	7.38	0.223	7.60	23.98
		13	6.97	0.430	7.40	23.98
		19.5	6.75	0.615	7.37	23.98
		26	6.41	0.795	7.20	23.98
		39	6.02	1.124	7.14	23.98
		52	5.79	1.395	7.19	23.98
		58.5	5.67	1.549	7.22	23.98
		65	5.61	1.671	7.28	23.98
5580	116	6.5	7.24	0.223	7.47	23.98
		13	7.05	0.430	7.48	23.98
		19.5	6.86	0.615	7.47	23.98
		26	6.54	0.795	7.33	23.98
		39	6.18	1.124	7.30	23.98
		52	5.91	1.395	7.30	23.98
		58.5	5.75	1.549	7.30	23.98
		65	5.54	1.671	7.21	23.98
5700	140	6.5	7.09	0.223	7.31	23.98
		13	6.86	0.430	7.29	23.98
		19.5	6.60	0.615	7.21	23.98
		26	6.59	0.795	7.39	23.98
		39	6.07	1.124	7.19	23.98
		52	5.63	1.395	7.03	23.98
		58.5	5.63	1.549	7.18	23.98
		65	5.28	1.671	6.95	23.98

40 MHz BW

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5190	38	13.5	6.25	0.467	6.72	16.99
		27	5.71	0.844	6.55	16.99
		40.5	5.41	1.185	6.59	16.99
		54	4.82	1.476	6.30	16.99
		81	4.38	1.963	6.35	16.99
		108	3.81	2.394	6.21	16.99
		121.5	3.66	2.619	6.28	16.99
		135	3.53	2.700	6.23	16.99
5230	46	13.5	6.00	0.467	6.46	16.99
		27	5.50	0.844	6.34	16.99
		40.5	5.21	1.185	6.39	16.99
		54	4.79	1.476	6.26	16.99
		81	4.35	1.963	6.32	16.99
		108	3.75	2.394	6.15	16.99
		121.5	3.70	2.619	6.32	16.99
		135	3.58	2.700	6.28	16.99

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5270	54	13.5	6.17	0.467	6.64	23.98
		27	5.85	0.844	6.69	23.98
		40.5	5.55	1.185	6.74	23.98
		54	4.97	1.476	6.45	23.98
		81	4.29	1.963	6.25	23.98
		108	3.92	2.394	6.31	23.98
		121.5	3.70	2.619	6.32	23.98
		135	3.57	2.700	6.27	23.98
5310	62	13.5	6.27	0.467	6.73	23.98
		27	5.82	0.844	6.67	23.98
		40.5	5.57	1.185	6.75	23.98
		54	5.20	1.476	6.68	23.98
		81	4.60	1.963	6.56	23.98
		108	3.87	2.394	6.26	23.98
		121.5	3.64	2.619	6.25	23.98
		135	3.51	2.700	6.21	23.98

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

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5510	102	13.5	7.17	0.467	7.64	23.98
		27	6.70	0.844	7.54	23.98
		40.5	6.39	1.185	7.58	23.98
		54	5.90	1.476	7.38	23.98
		81	5.34	1.963	7.30	23.98
		108	4.94	2.394	7.34	23.98
		121.5	4.70	2.619	7.32	23.98
		135	4.44	2.700	7.14	23.98
5550	110	13.5	7.31	0.467	7.78	23.98
		27	6.85	0.844	7.69	23.98
		40.5	6.55	1.185	7.74	23.98
		54	5.95	1.476	7.43	23.98
		81	5.52	1.963	7.48	23.98
		108	5.15	2.394	7.54	23.98
		121.5	4.78	2.619	7.40	23.98
		135	4.61	2.700	7.31	23.98
5670	134	13.5	6.50	0.467	6.97	23.98
		27	6.15	0.844	6.99	23.98
		40.5	5.66	1.185	6.84	23.98
		54	5.47	1.476	6.94	23.98
		81	4.76	1.963	6.72	23.98
		108	4.14	2.394	6.53	23.98
		121.5	3.98	2.619	6.60	23.98
		135	3.92	2.700	6.62	23.98

Note : In order to simplify the report, attached plots were only the highest conducted power channel.

▣ RESULT PLOTS 40 MHz BW

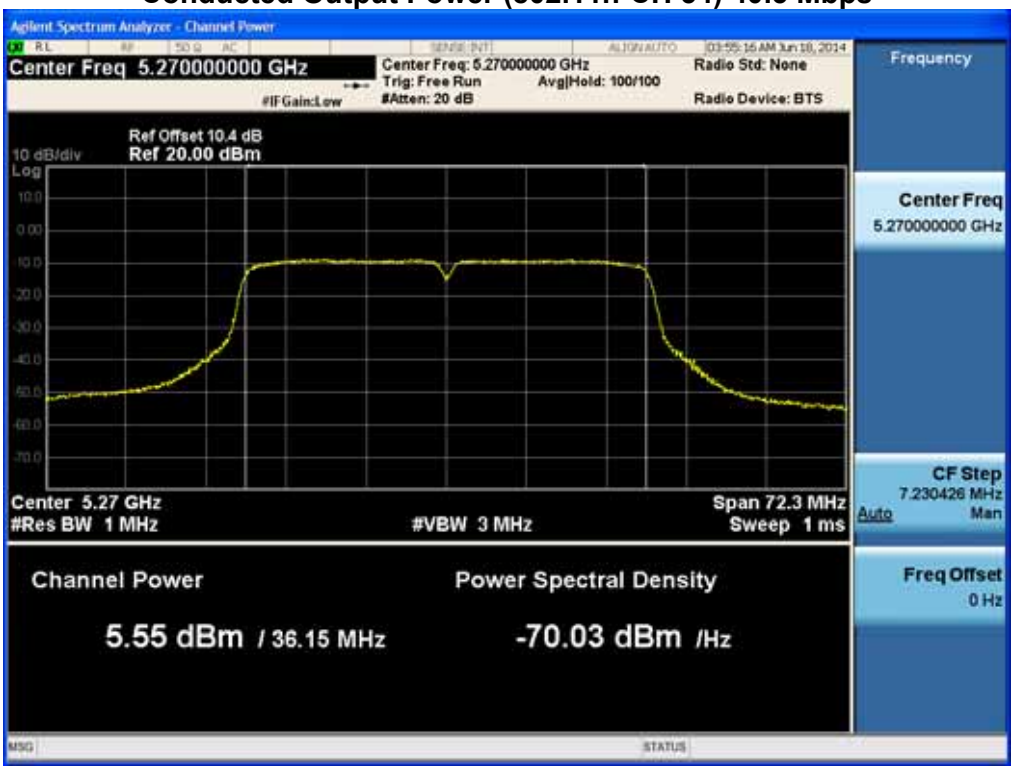
(5190 MHz ~5230 MHz)

Conducted Output Power (802.11n-CH 38) 13.5 Mbps

Conducted Output Power (802.11n-CH 46) 13.5 Mbps

(5270 MHz ~5310 MHz)

Conducted Output Power (802.11n-CH 54) 40.5 Mbps



Conducted Output Power (802.11n-CH 62) 40.5 Mbps

(5510 MHz ~5670 MHz)

Conducted Output Power (802.11n-CH 102) 13.5 Mbps

Conducted Output Power (802.11n-CH 110) 13.5 Mbps

Conducted Output Power (802.11n-CH 134) 27 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.

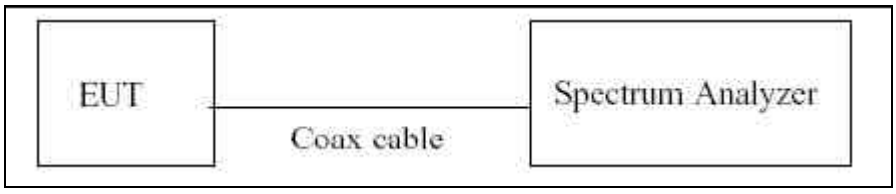
▣ Limit

1. Maximum Power Spectral Density :

Band	Mode	Limit (dBm)
UNII 1	802.11a,n	4(FCC), 10(e.i.r.p. for IC)
UNII 2A	802.11a,n	11(FCC and IC)
UNII 2C	802.11a,n	11(FCC and IC)

Note : In case of UNII 1, The gap of PSD limit and EIRP Spectral Density limit is about 6 dB. The antenna gain of EUT is not exceed 6 dBi. Therefore, if PSD is pass, EIRP Spectral Densityis also pass. So, we attached only PSD table.

▣ 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 (Conducted)

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

▣ Sample Calculation (EIRP)

EIRP Spectral Density = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor + Ant gain

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5190	10.29
	5200	10.28
	5230	10.29
	5240	10.34
UNII 2	5260	10.37
	5270	10.38
	5300	10.40
	5310	10.39
	5320	10.39
UNII 2e	5500	10.35
	5510	10.36
	5550	10.41
	5580	10.43
	5670	10.43
	5700	10.30

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

▣ TEST RESULTS

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11a	-3.563	0.208836	-3.354	4	Pass
5200	40		-3.118	0.57521	-2.543	4	Pass
5240	48		-2.918	0.208836	-2.709	4	Pass
5260	52		-3.754	0.395453	-3.359	11	Pass
5300	60		-3.497	0.761199	-2.736	11	Pass
5320	64		-2.479	0.208836	-2.270	11	Pass
5500	100		-2.812	1.068275	-1.744	11	Pass
5580	116		-2.722	0.305381	-2.417	11	Pass
5700	140		-2.876	0.208836	-2.667	11	Pass

Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11n 20MHz BW	-4.511	0.61518	-3.896	4	Pass
5200	40		-5.379	0.794778	-4.584	4	Pass
5240	48		-4.200	0.223459	-3.977	4	Pass
5260	52		-5.093	0.430088	-4.663	11	Pass
5300	60		-4.764	0.61518	-4.149	11	Pass
5320	64		-3.783	0.223459	-3.560	11	Pass
5500	100		-2.847	0.223459	-2.624	11	Pass
5580	116		-3.811	0.430088	-3.381	11	Pass
5700	140		-4.222	0.794778	-3.427	11	Pass

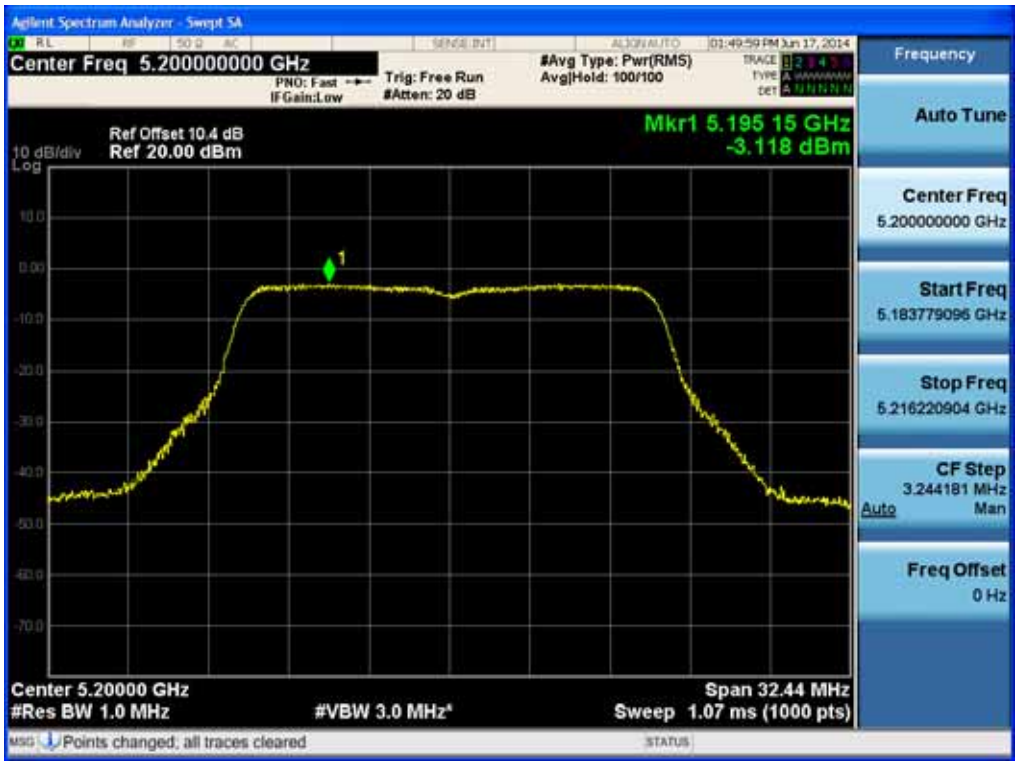
Conducted Power Density Measurements

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5190	38	802.11n 40MHz BW	-8.290	0.467047	-7.823	4	Pass
5230	46		-8.261	0.467047	-7.794	4	Pass
5270	54		-8.011	1.184845	-6.826	11	Pass
5310	62		-8.044	1.184845	-6.859	11	Pass
5510	102		-7.259	0.467047	-6.792	11	Pass
5550	110		-7.216	0.467047	-6.749	11	Pass
5670	134		-7.894	0.843751	-7.050	11	Pass

Note : In order to simplify the report, attached plots were only the highest PSD channel.

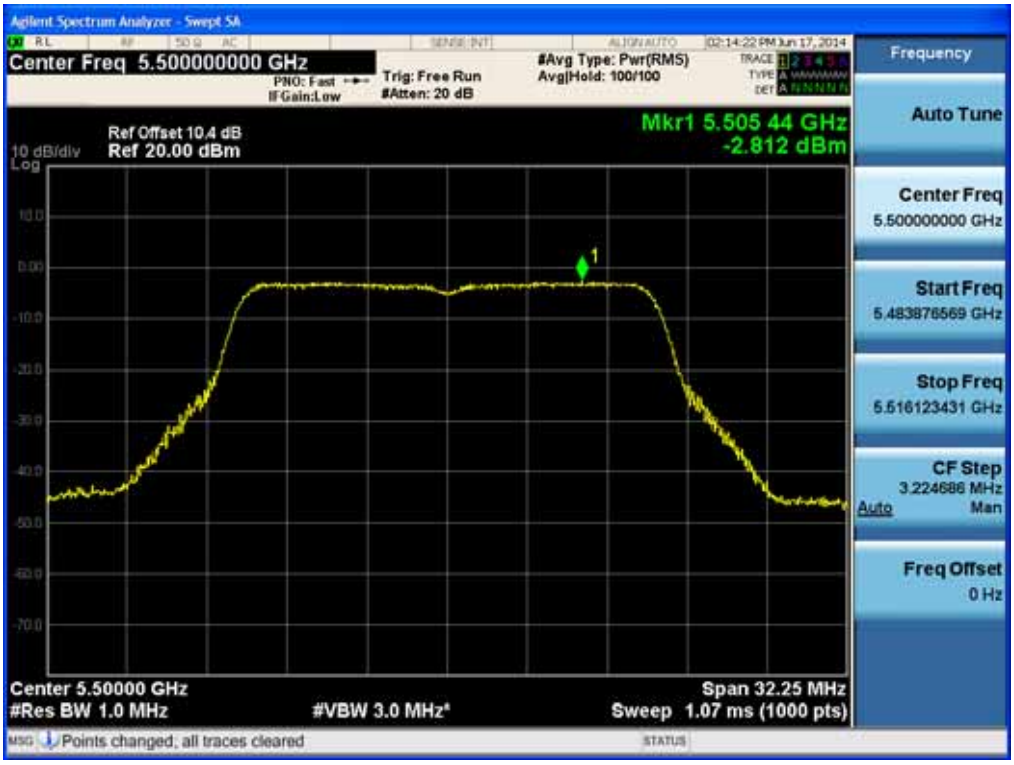
▣ RESULT PLOTS
20 MHz BW

Power Spectral Density (802.11a-CH 40)



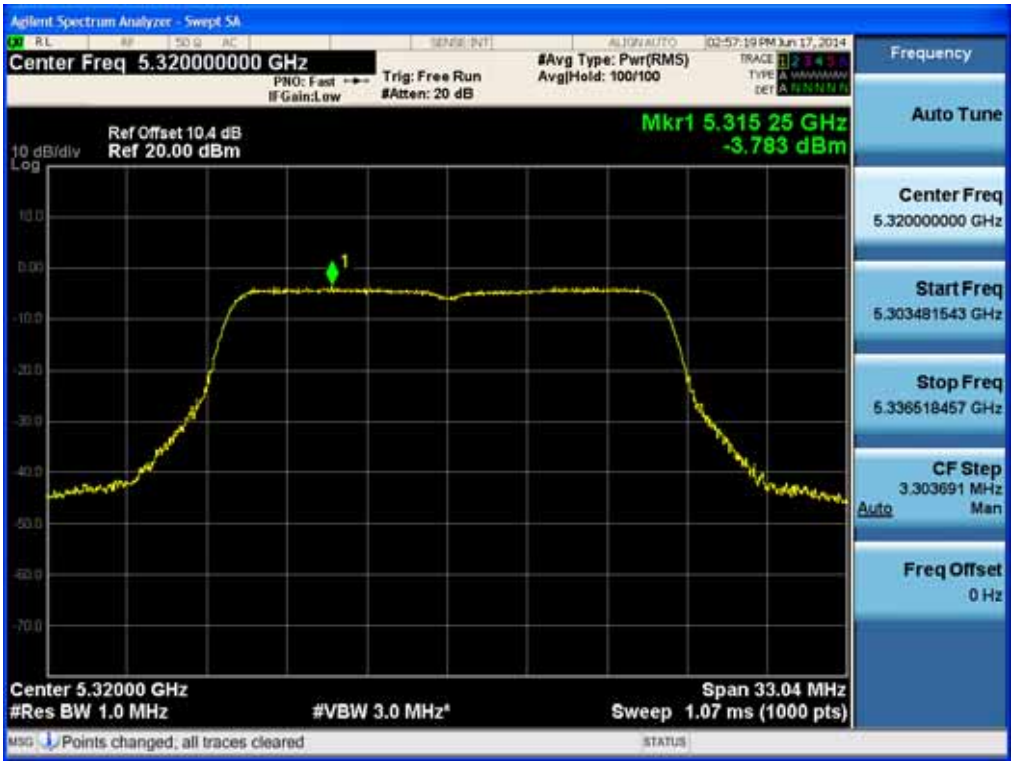
Power Spectral Density (802.11a-CH 64)

Power Spectral Density (802.11a-CH 100

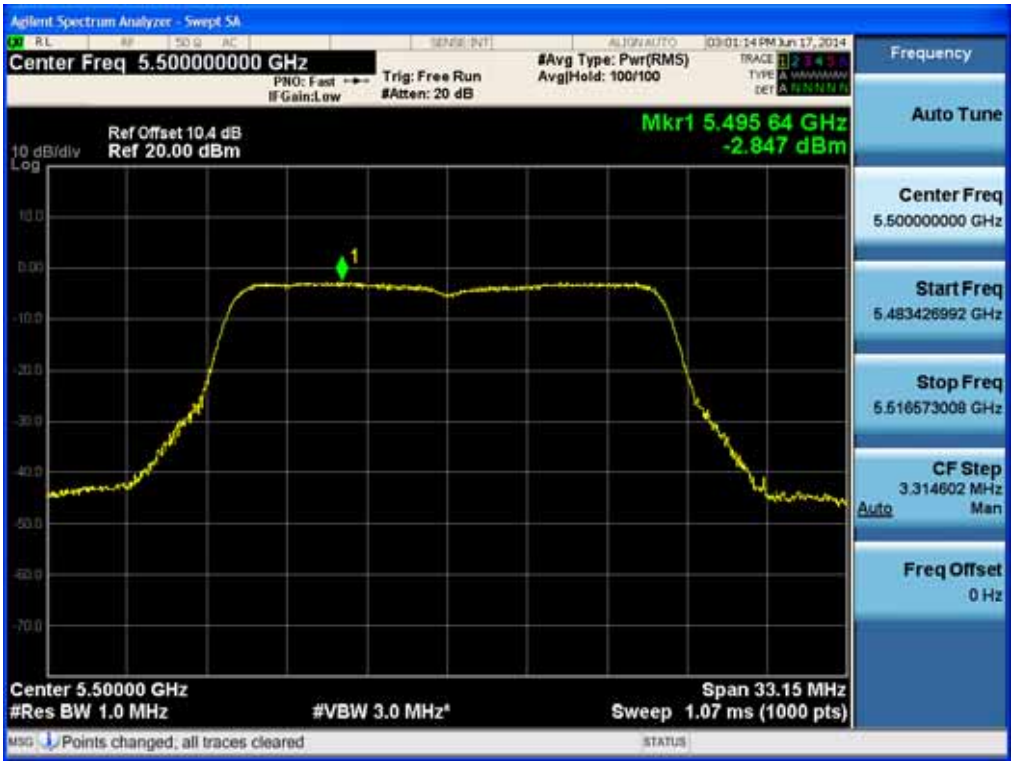


Power Spectral Density (802.11n-CH 36)

Power Spectral Density (802.11n-CH 64)

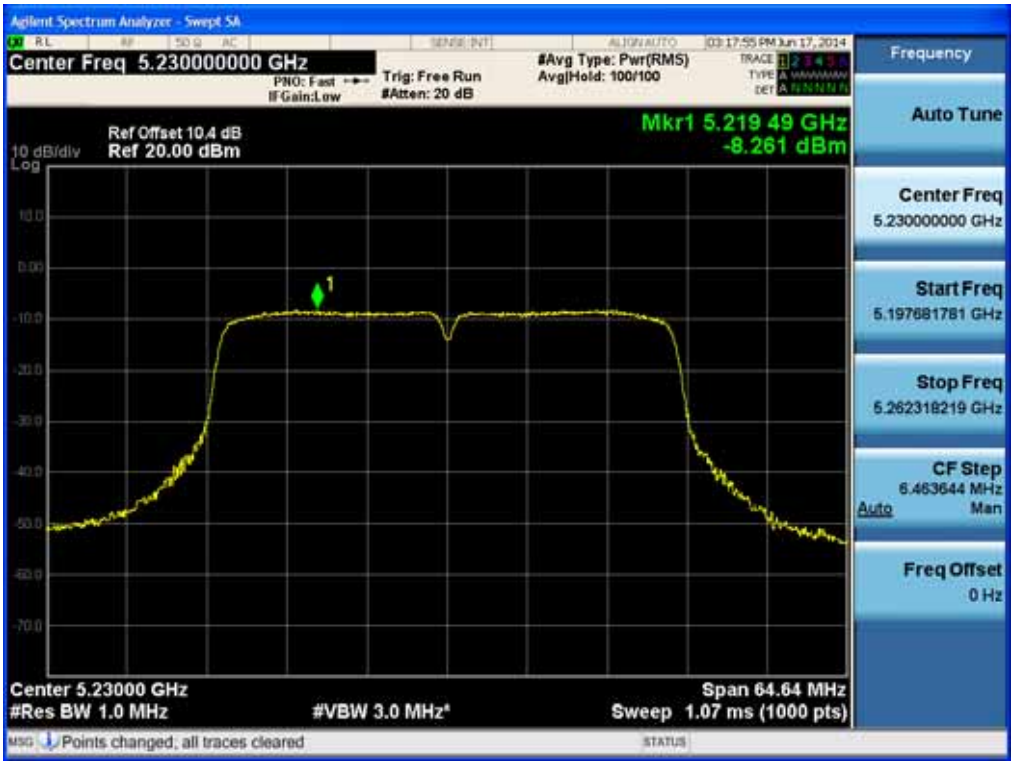


Power Spectral Density (802.11n-CH 100)



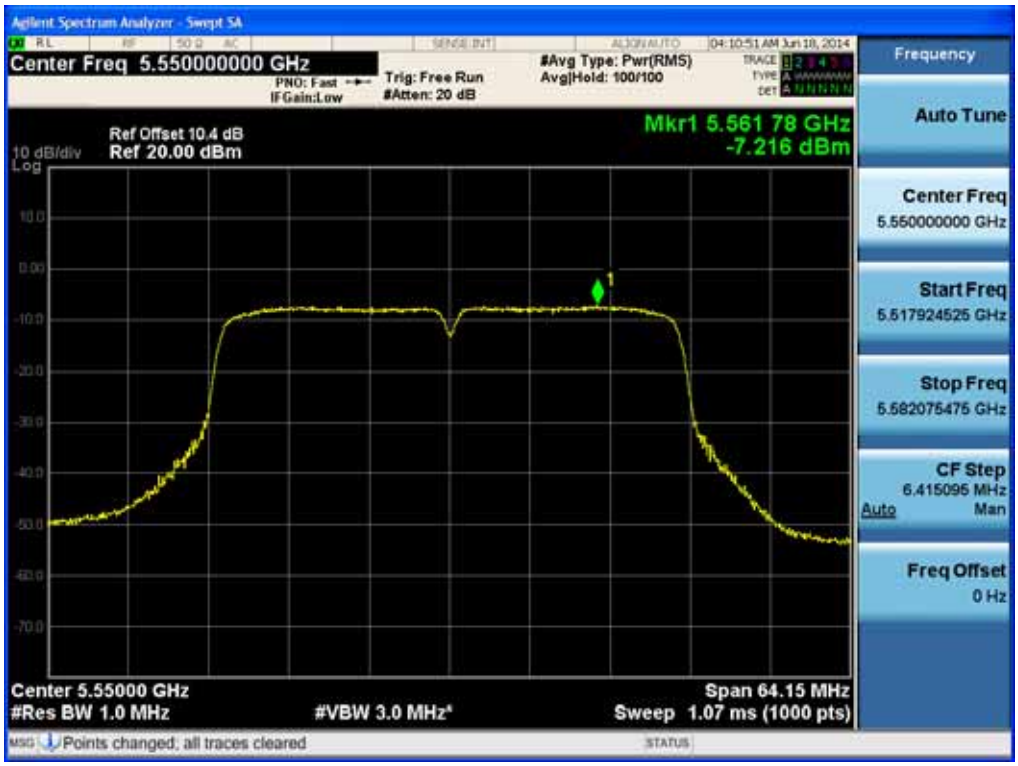
40 MHz BW

Power Spectral Density (802.11n-CH 46)



Power Spectral Density (802.11n-CH 54)

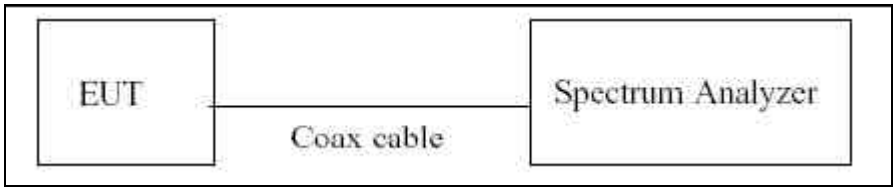
Power Spectral Density (802.11n-CH 110)



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 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

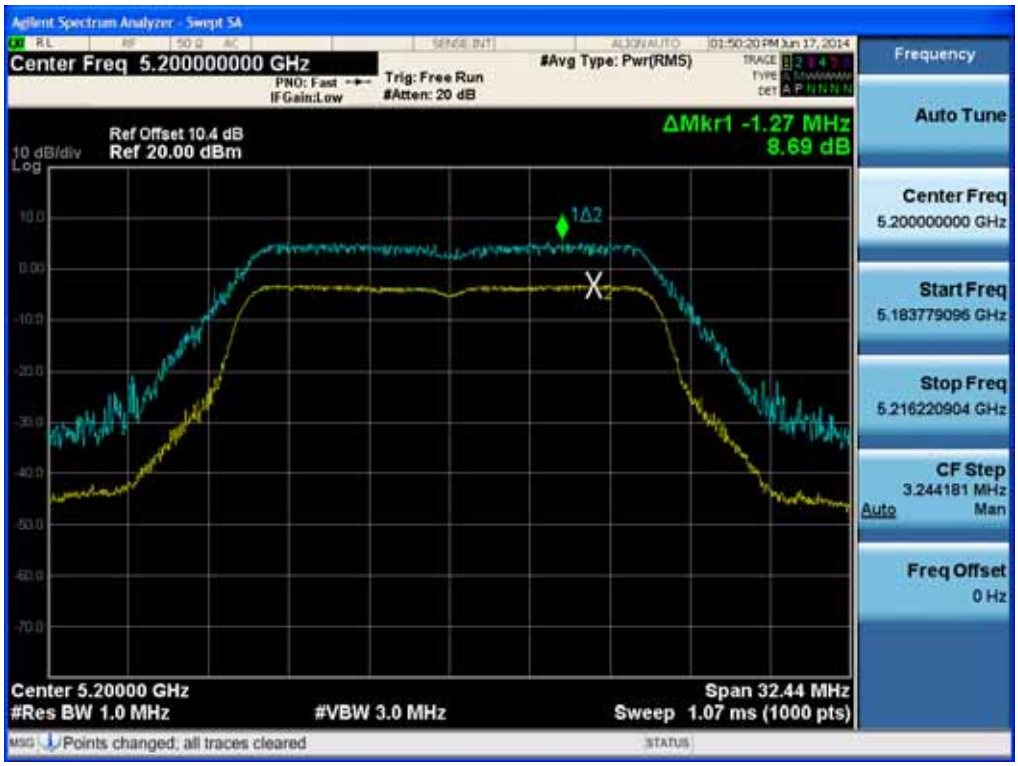
Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5190	10.29
	5200	10.28
	5230	10.29
	5240	10.34
UNII 2	5260	10.37
	5270	10.38
	5300	10.40
	5310	10.39
	5320	10.39
UNII 2e	5500	10.35
	5510	10.36
	5550	10.41
	5580	10.43
	5670	10.43
	5700	10.30

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

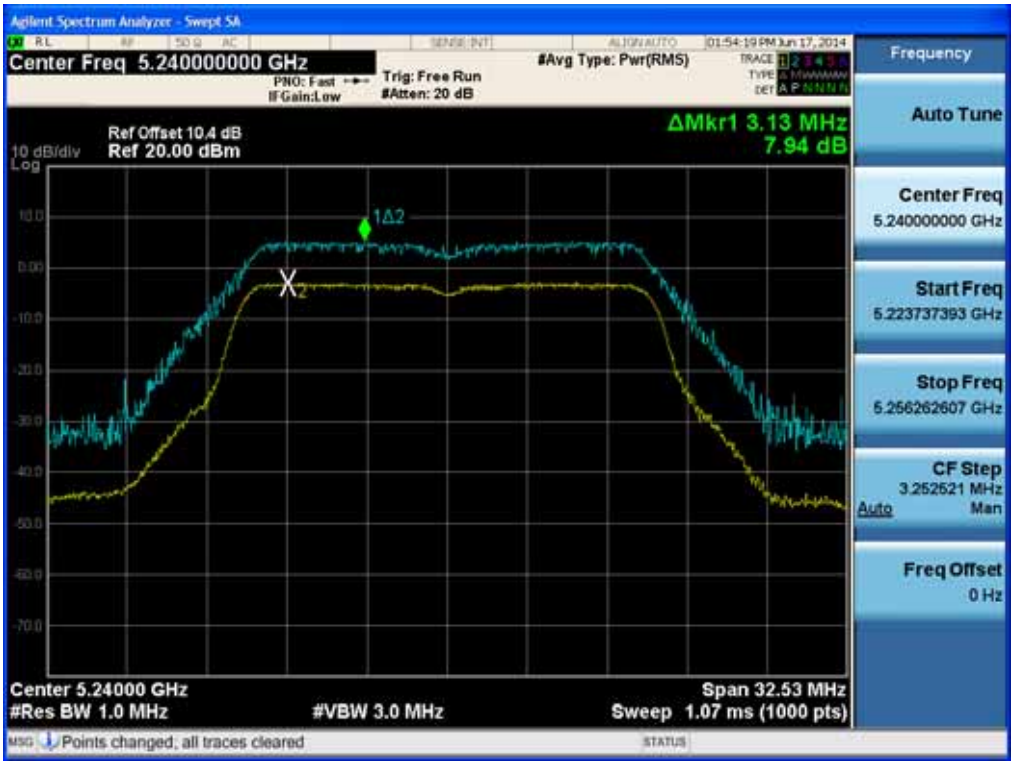
▣ RESULT PLOTS

Peak Excursion Ratio (802.11a-CH 36)

Peak Excursion Ratio (802.11a-CH 40)

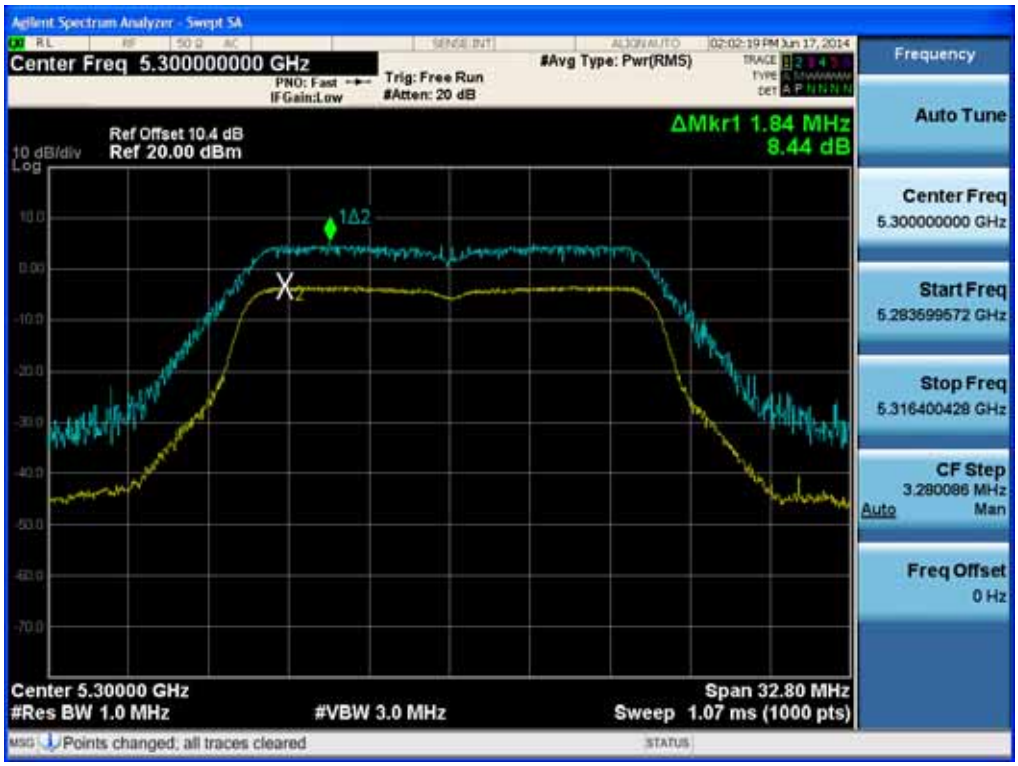


Peak Excursion Ratio (802.11a-CH 48)

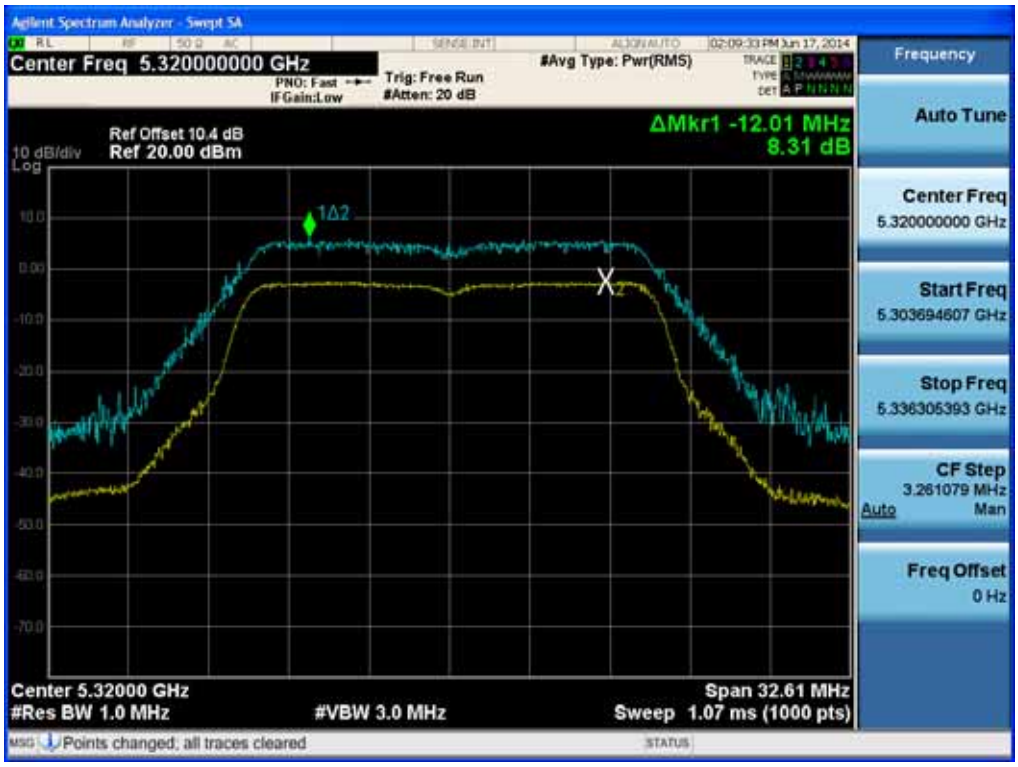


Peak Excursion Ratio (802.11a-CH 52)

Peak Excursion Ratio (802.11a-CH 60)

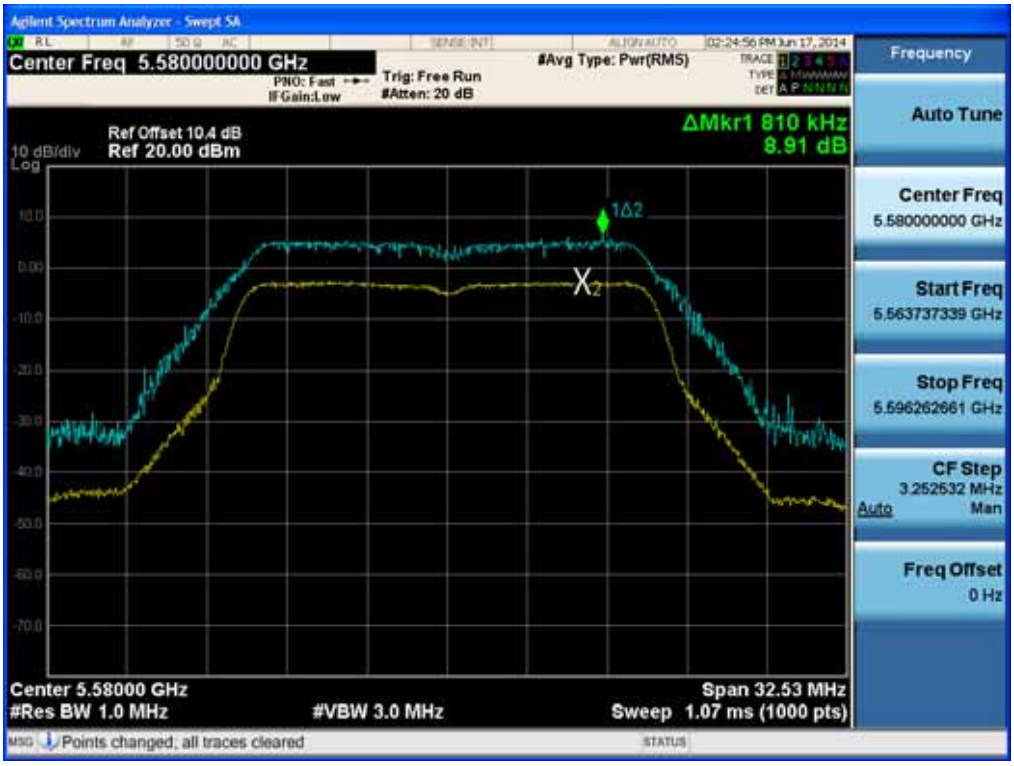


Peak Excursion Ratio (802.11a-CH 64)

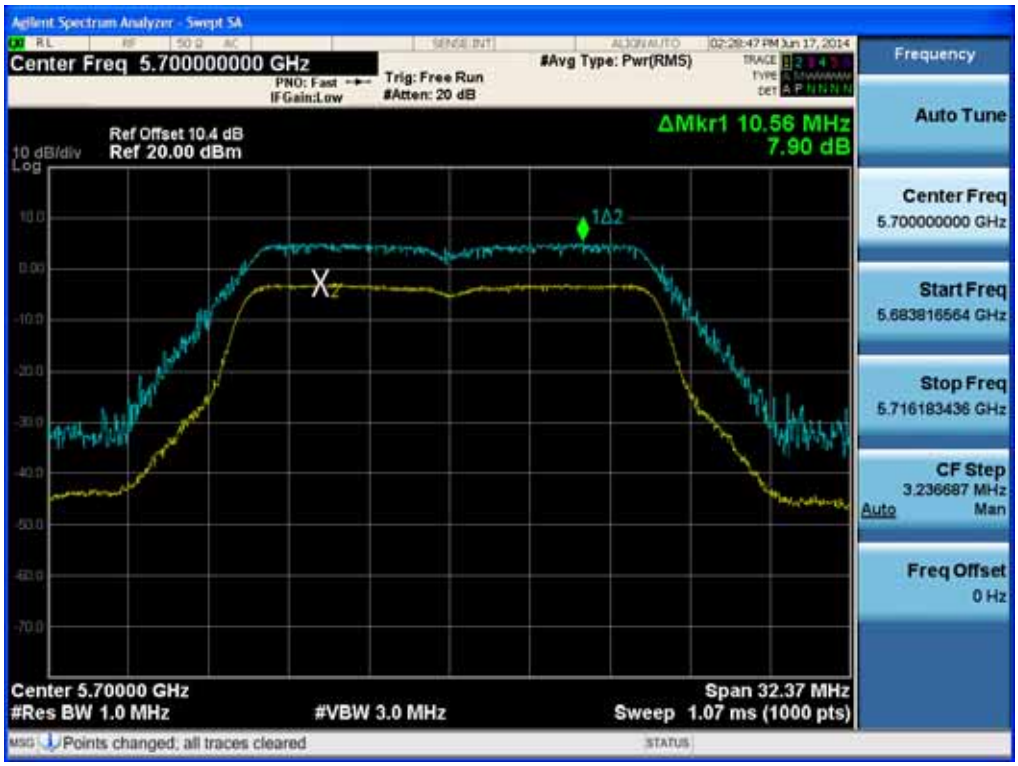


Peak Excursion Ratio (802.11a-CH 100)

Peak Excursion Ratio (802.11a-CH 116)



Peak Excursion Ratio (802.11a-CH 140)

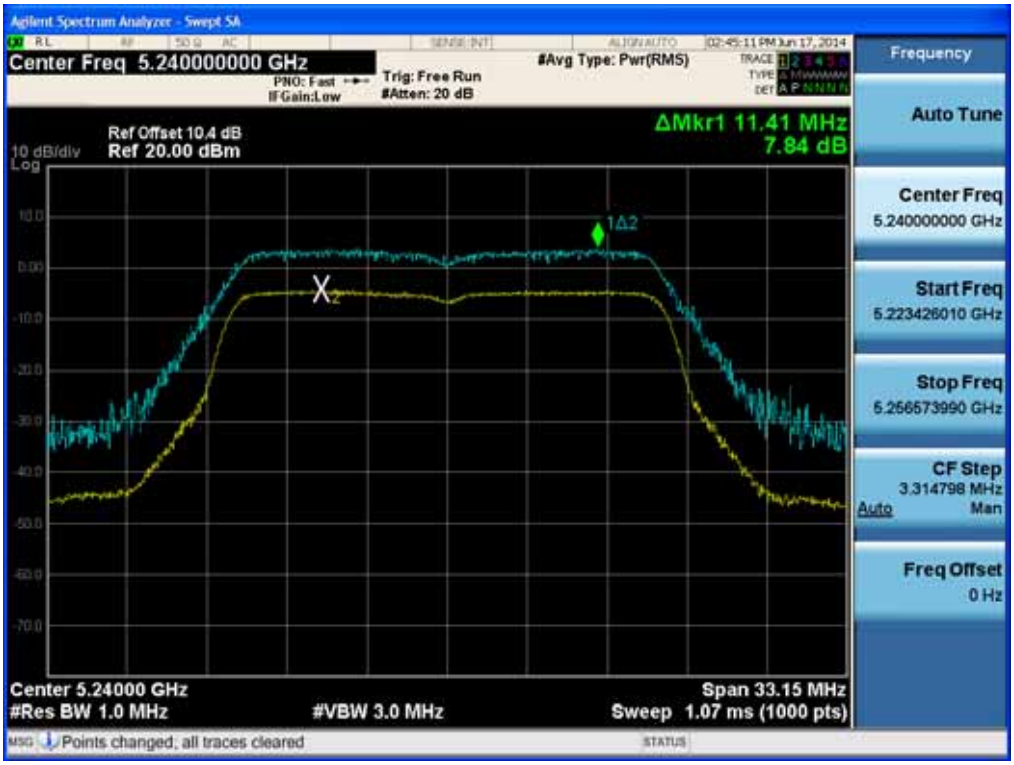


20 MHz BW

Peak Excursion Ratio (802.11n-CH 36)

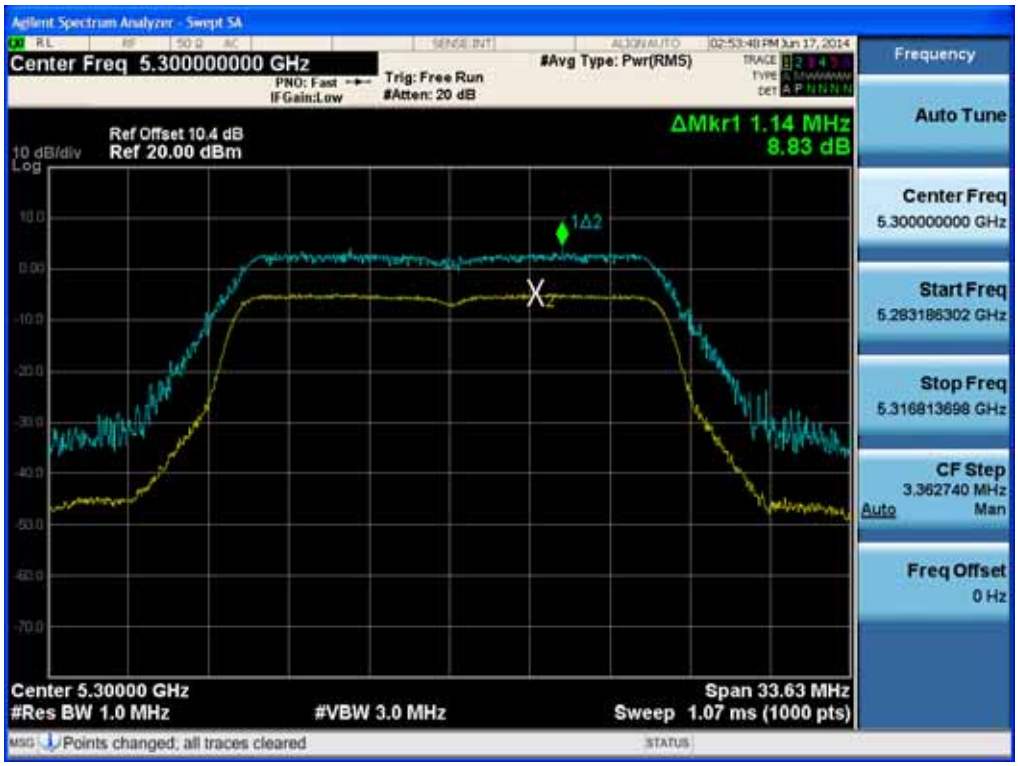
Peak Excursion Ratio (802.11n-CH 40)

Peak Excursion Ratio (802.11n-CH 48)

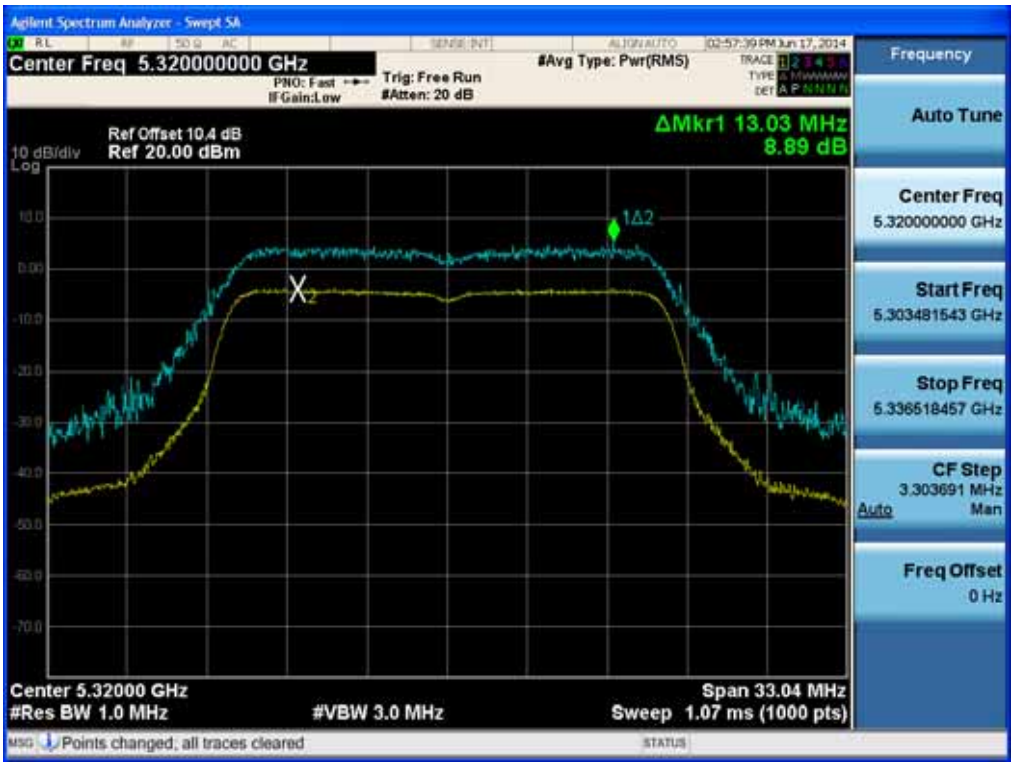


Peak Excursion Ratio (802.11n-CH 52)

Peak Excursion Ratio (802.11n-CH 60)

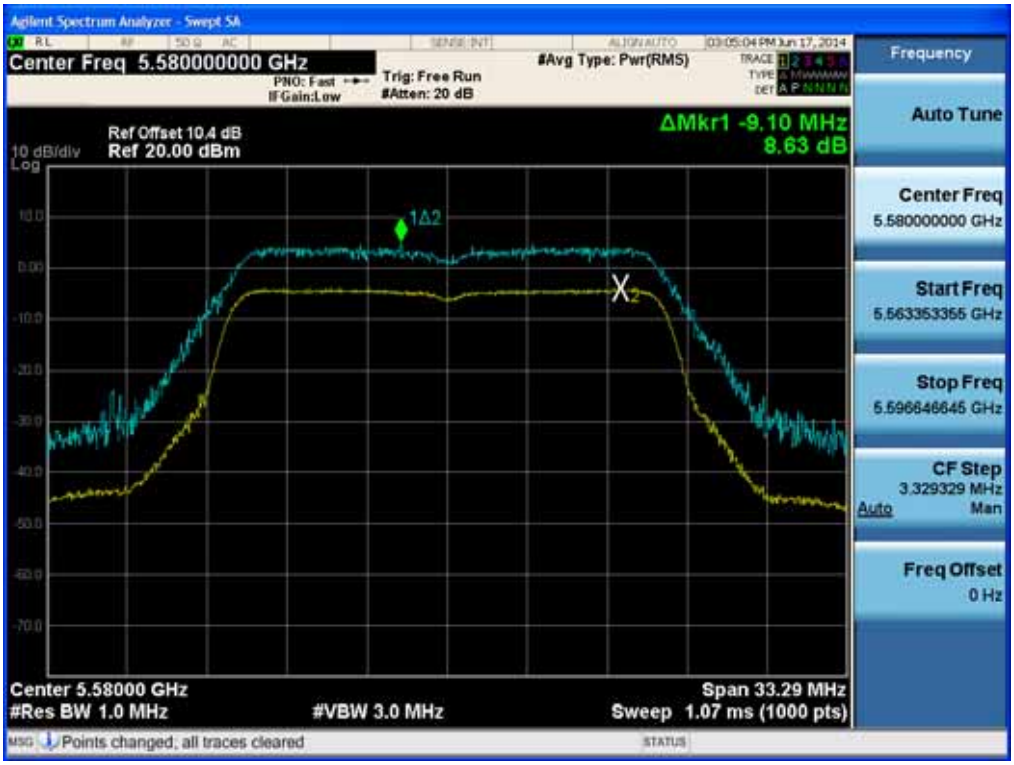


Peak Excursion Ratio (802.11n-CH 64)



Peak Excursion Ratio (802.11n-CH 100)

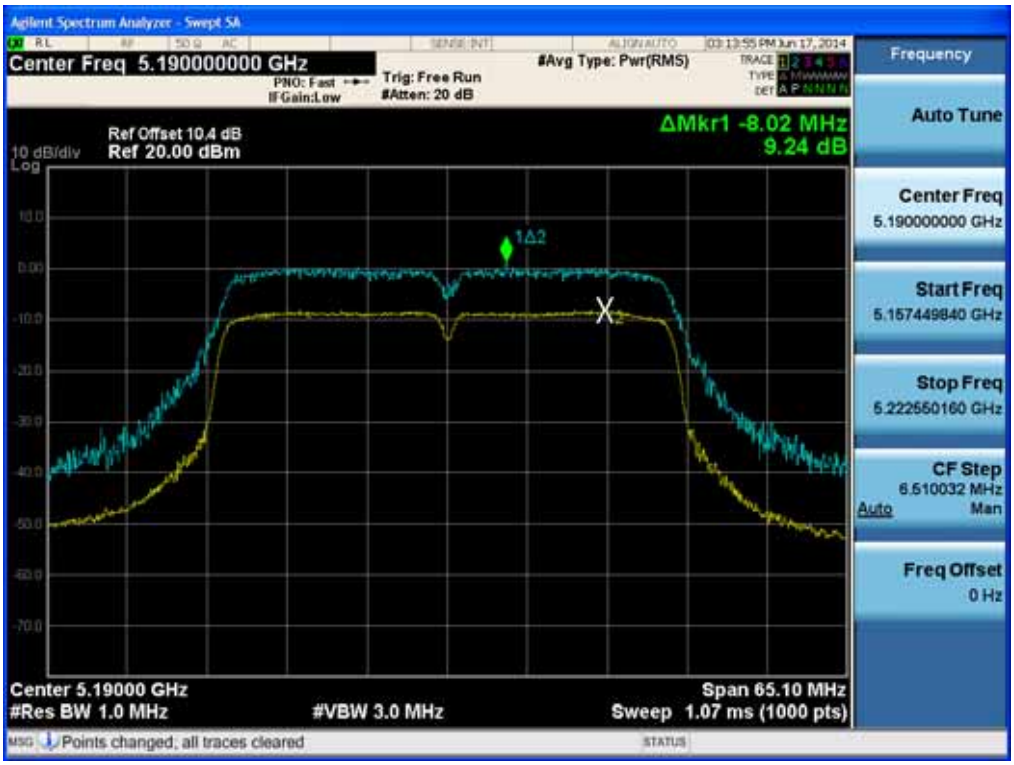
Peak Excursion Ratio (802.11n-CH 116)



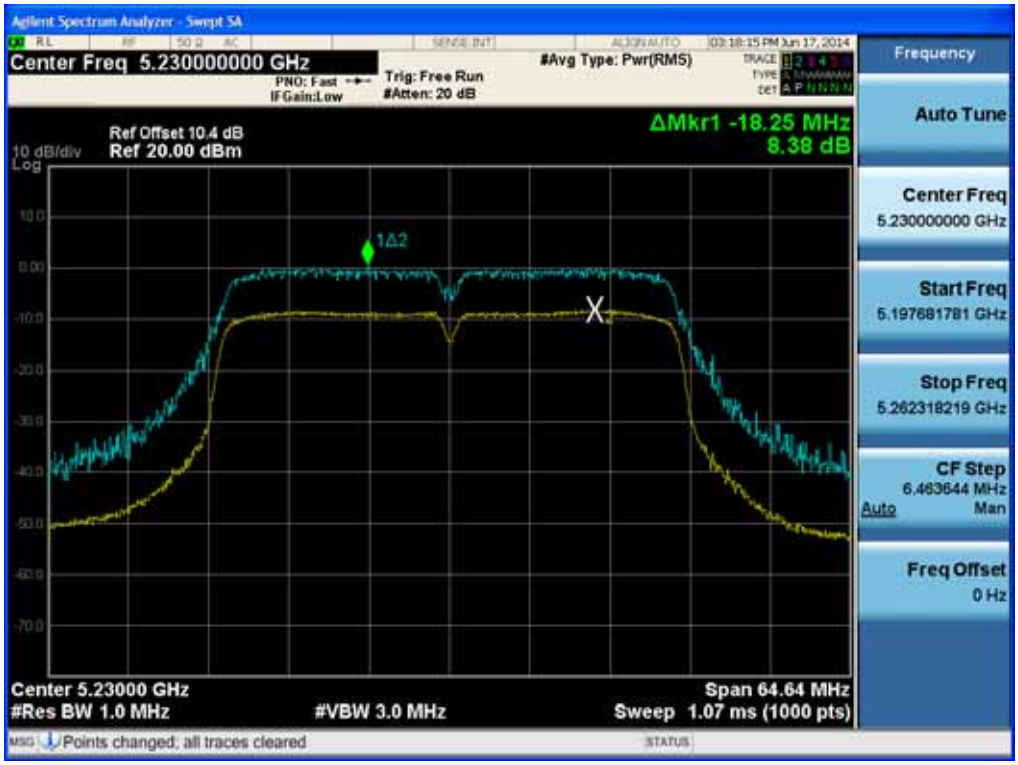
Peak Excursion Ratio (802.11n-CH 140)

40 MHz BW

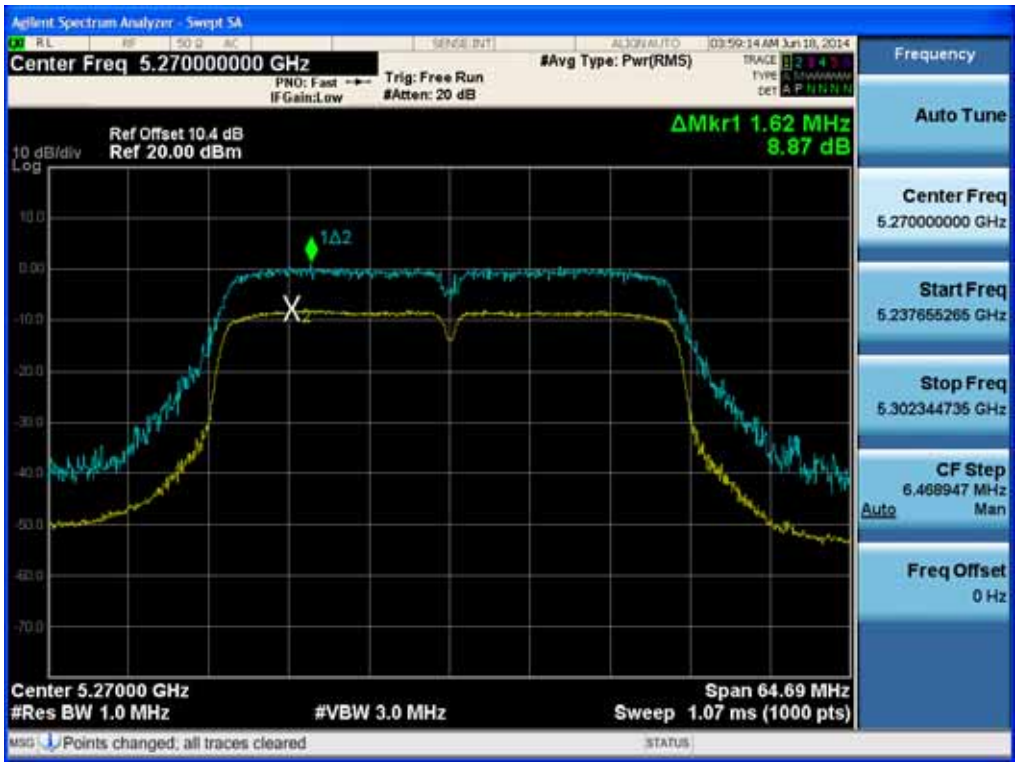
Peak Excursion Ratio (802.11n-CH 38)



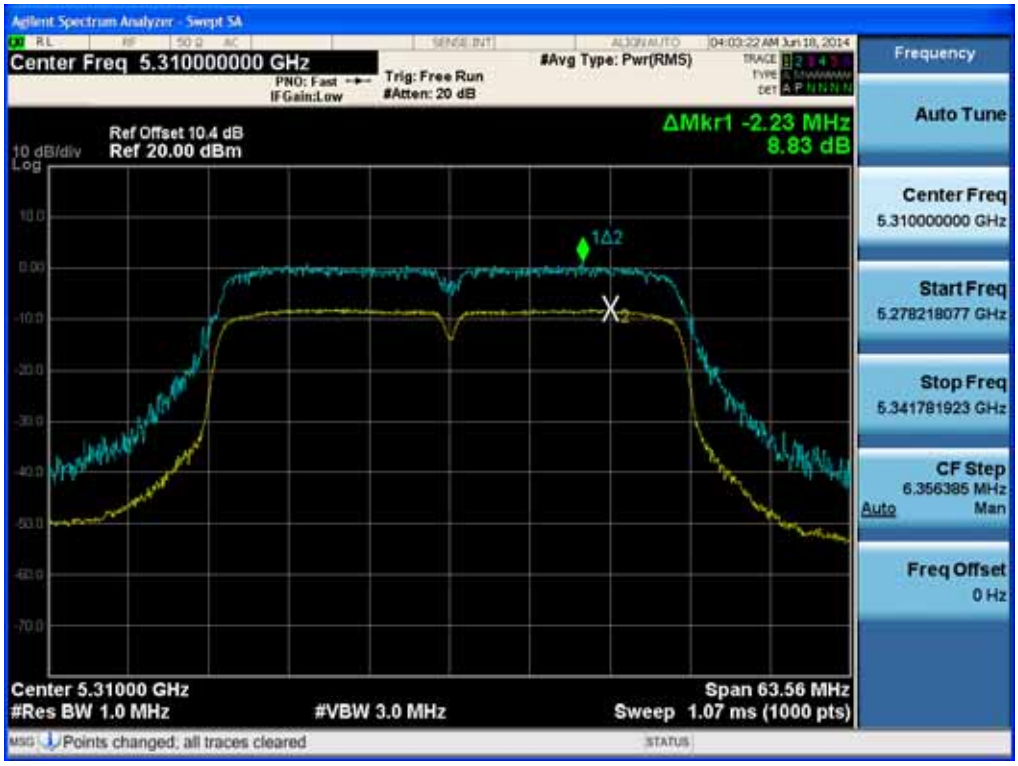
Peak Excursion Ratio (802.11n-CH 46)



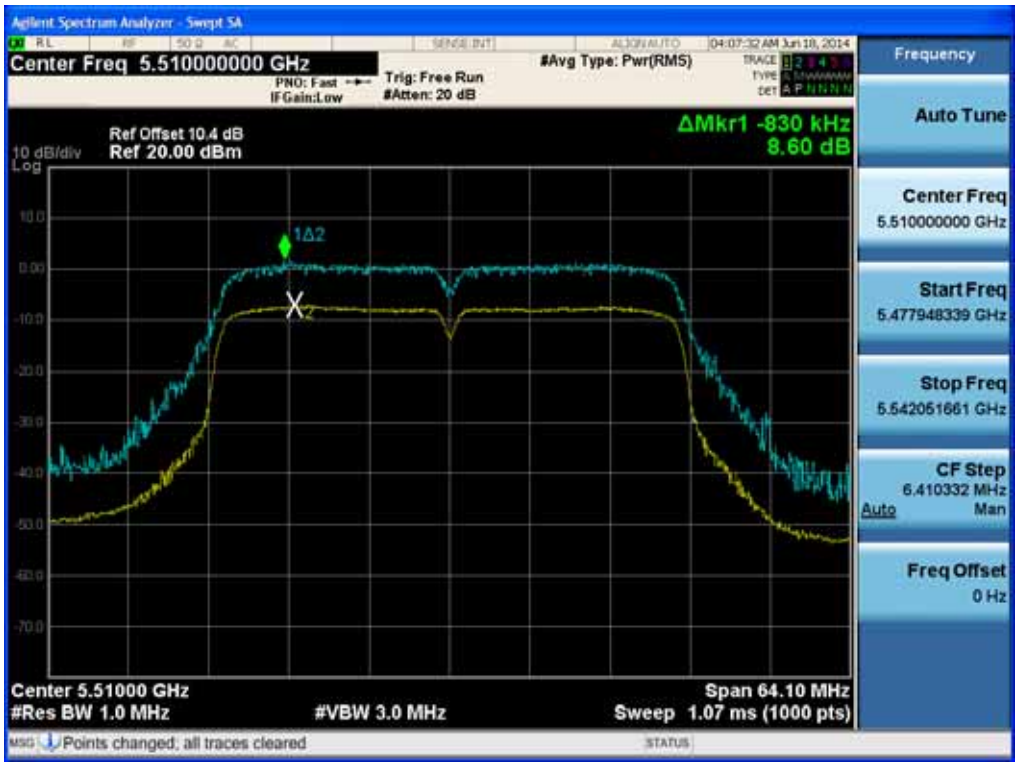
Peak Excursion Ratio (802.11n-CH 54)



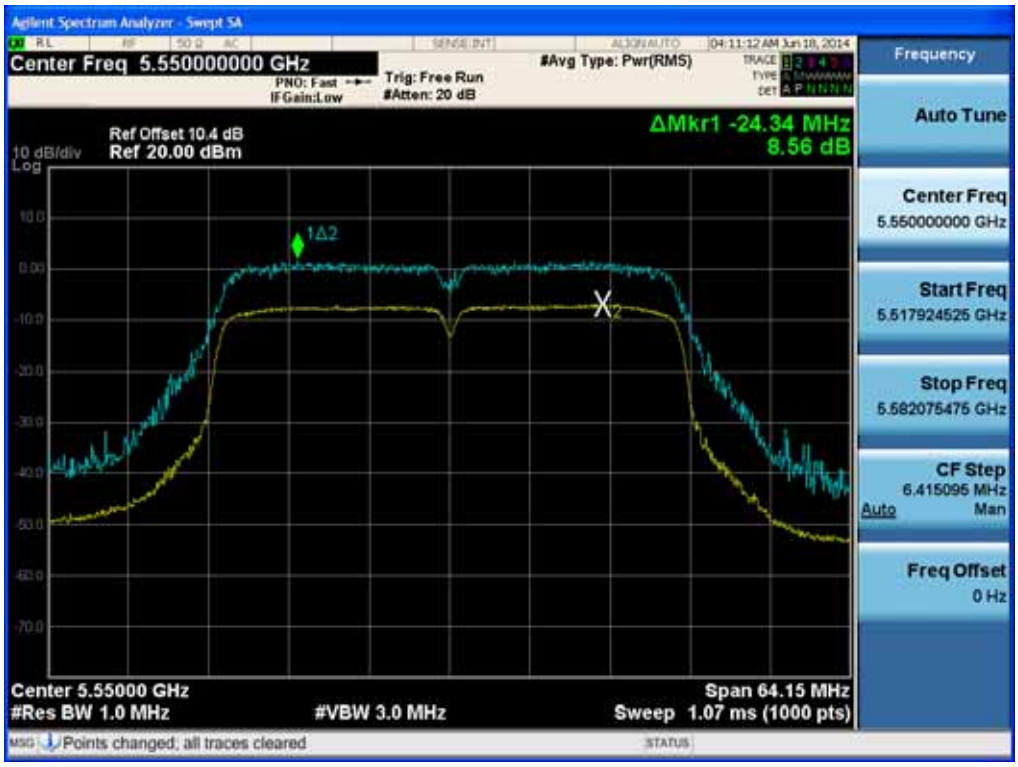
Peak Excursion Ratio (802.11n-CH 62)



Peak Excursion Ratio (802.11n-CH 102)



Peak Excursion Ratio (802.11n-CH 110)



Peak Excursion Ratio (802.11n-CH 134)

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 1

OPERATING FREQUENCY: 5,180,000,000 Hz

CHANNEL: 36

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 179 942.80	0
100%		-30	5 180 023.50	80.70
100%		-20	5 180 015.80	73.00
100%		-10	5 180 011.90	69.10
100%		0	5 179 974.40	31.60
100%		+10	5 179 951.40	8.60
100%		+30	5 179 935.20	-7.60
100%		+40	5 179 930.50	-12.30
100%		+50	5 179 929.10	-13.70
115%	4.37	+20	5 179 953.40	10.60
Batt. Endpoint	3.23	+20	5 179 961.26	18.46

Note:

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

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 259 939.80	0
100%		-30	5 260 029.64	89.84
100%		-20	5 260 018.48	78.68
100%		-10	5 260 012.38	72.58
100%		0	5 259 984.20	44.40
100%		+10	5 259 955.32	15.52
100%		+30	5 259 938.75	-1.05
100%		+40	5 259 931.35	-8.45
100%		+50	5 259 930.36	-9.44
115%	4.37	+20	5 259 949.32	9.52
Batt. Endpoint	3.23	+20	5 259 959.81	20.01

Note:

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

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 499 937.00	0
100%		-30	5 500 026.84	89.84
100%		-20	5 500 022.17	85.17
100%		-10	5 500 016.84	79.84
100%		0	5 499 984.32	47.32
100%		+10	5 499 961.42	24.42
100%		+30	5 499 938.31	1.31
100%		+40	5 499 935.49	-1.51
100%		+50	5 499 928.36	-8.64
115%	4.37	+20	5 499 959.35	22.35
Batt. Endpoint	3.23	+20	5 499 968.42	31.42

Note:

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

40 MHz BW

OPERATING BAND: UNII Band 1

OPERATING FREQUENCY: 5,190,000,000 Hz

CHANNEL: 38

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 189 941.40	0
100%		-30	5 190 029.61	88.21
100%		-20	5 190 013.68	72.28
100%		-10	5 190 012.18	70.78
100%		0	5 189 971.64	30.24
100%		+10	5 189 955.32	13.92
100%		+30	5 189 940.34	-1.06
100%		+40	5 189 929.32	-12.08
100%		+50	5 189 927.11	-14.29
115%	4.37	+20	5 189 959.65	18.25
Batt. Endpoint	3.23	+20	5 189 974.03	32.63

Note:

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

OPERATING BAND: UNII Band 2A

OPERATING FREQUENCY: 5,270,000,000 Hz

CHANNEL: 54

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 269 940.80	0
100%		-30	5 270 034.62	93.82
100%		-20	5 270 016.58	74.78
100%		-10	5 270 011.80	71.00
100%		0	5 269 974.32	33.52
100%		+10	5 269 960.87	20.07
100%		+30	5 269 937.36	-3.44
100%		+40	5 269 930.89	-9.91
100%		+50	5 269 929.31	-11.49
115%	4.37	+20	5 269 960.24	19.44
Batt. Endpoint	3.23	+20	5 269 983.06	42.26

Note:

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

OPERATING BAND: UNII Band 2C

OPERATING FREQUENCY: 5,510,000,000 Hz

CHANNEL: 102

REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.80	+20(Ref)	5 509 937.80	0
100%		-30	5 510 039.46	101.66
100%		-20	5 510 024.51	86.71
100%		-10	5 510 013.58	75.78
100%		0	5 509 974.39	36.59
100%		+10	5 509 961.49	23.69
100%		+30	5 509 931.79	-6.01
100%		+40	5 509 927.66	-10.14
100%		+50	5 509 925.35	-12.45
115%	4.37	+20	5 509 975.21	37.41
Batt. Endpoint	3.23	+20	5 509 987.85	50.05

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

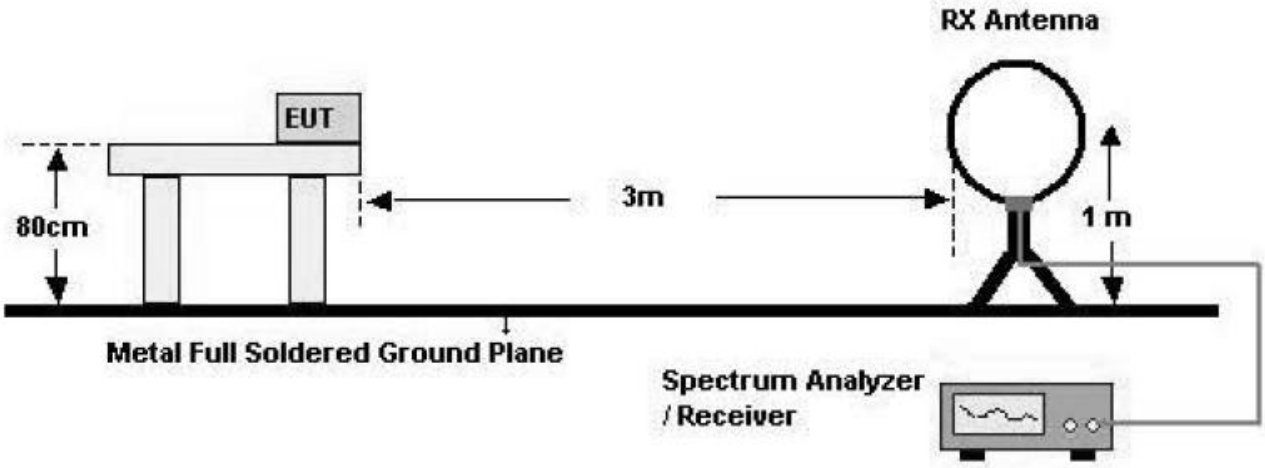
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

▣ §15.407, KDB 789033

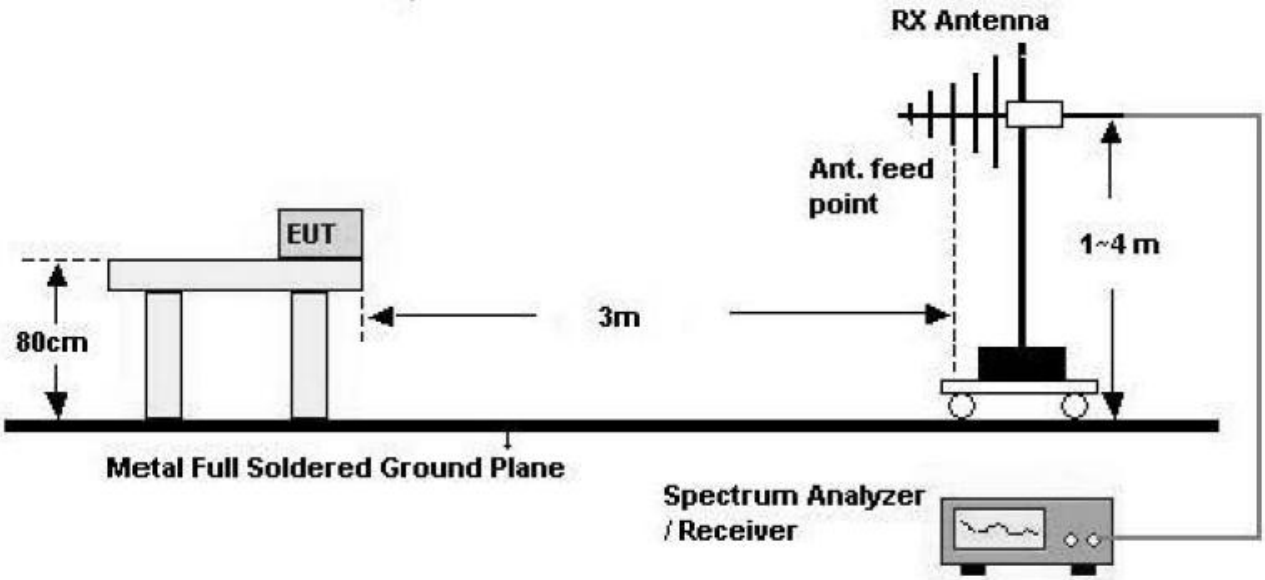
All harmonics that do not lie in a restricted band are subject to a peak limit of -27 dBm/MHz. At a distance of 3 meters the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2 dB to the EIRP limit of -27 dBm/MHz to obtain the limit for out of band spurious emissions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

Test Configuration

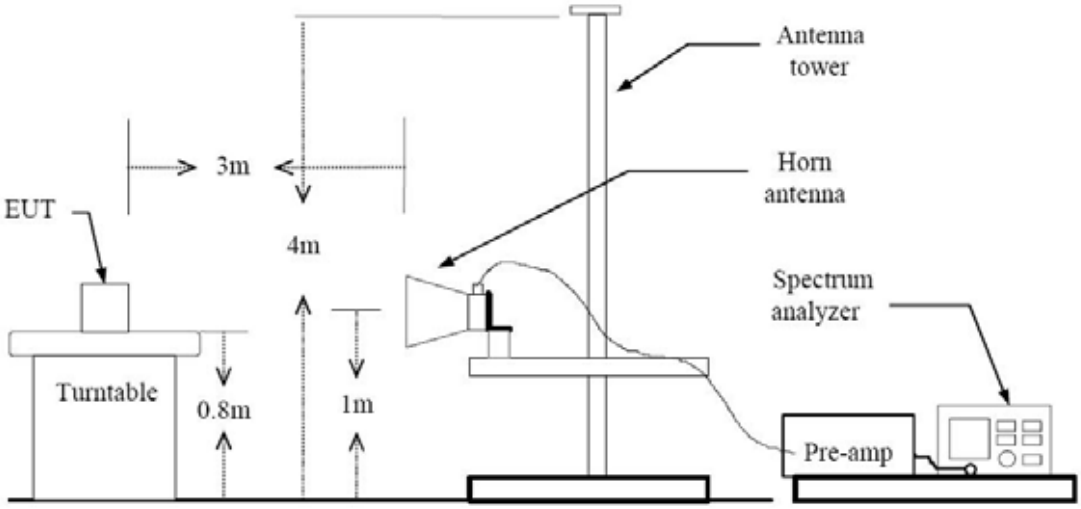
Below 30 MHz



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/g/n_20/n_40 mode to perform the average filed strength measurements.
2. The actual setting value of VBW for 802.11a/g/n_20/n_40

Mode	Worst Data rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	6	2.030	2.130	95.31	493	1000
n_20	6.5	1.875	1.974	94.98	533	1000
n_40	13.5	0.916	1.020	89.80	1092	3000

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

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

Notes:

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

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

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

Notes:

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

Above 1 GHz

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10360	62.06	-6.51	V	55.55	68.20	12.65	PK
15540	62.55	-6.42	V	56.13	73.98	17.85	PK
15540	48.77	-6.42	V	42.35	53.98	11.63	AV
10360	62.13	-6.51	H	55.62	68.20	12.58	PK
15540	62.68	-6.42	H	56.26	73.98	17.72	PK
15540	48.82	-6.42	H	42.40	53.98	11.58	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10400	62.68	-6.49	V	56.19	68.20	12.01	PK
15600	62.64	-7.15	V	55.49	73.98	18.49	PK
15600	48.86	-7.15	V	41.71	53.98	12.27	AV
10400	62.78	-6.49	H	56.29	68.20	11.91	PK
15600	62.84	-7.15	H	55.69	73.98	18.29	PK
15600	48.90	-7.15	H	41.75	53.98	12.23	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10480	62.59	-6.96	V	55.63	68.20	12.57	PK
15720	62.61	-6.62	V	55.99	73.98	17.99	PK
15720	48.40	-6.62	V	41.78	53.98	12.20	AV
10480	62.66	-6.96	H	55.70	68.20	12.50	PK
15720	62.72	-6.96	H	55.76	73.98	18.22	PK
15720	48.44	-6.62	H	41.82	53.98	12.16	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10360	62.10	-6.51	V	55.59	68.20	12.61	PK
15540	62.54	-6.42	V	56.12	73.98	17.86	PK
15540	48.80	-6.42	V	42.38	53.98	11.60	AV
10360	62.31	-6.51	H	55.80	68.20	12.40	PK
15540	62.66	-6.42	H	56.24	73.98	17.74	PK
15540	48.81	-6.42	H	42.39	53.98	11.59	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10400	62.66	-6.49	V	56.17	68.20	12.03	PK
15600	62.70	-7.15	V	55.55	73.98	18.43	PK
15600	48.88	-7.15	V	41.73	53.98	12.25	AV
10400	62.81	-6.49	H	56.32	68.20	11.88	PK
15600	62.88	-7.15	H	55.73	73.98	18.25	PK
15600	48.90	-7.15	H	41.75	53.98	12.23	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10480	62.61	-6.96	V	55.65	68.20	12.55	PK
15720	62.69	-6.62	V	56.07	73.98	17.91	PK
15720	48.42	-6.62	V	41.80	53.98	12.18	AV
10480	62.70	-6.96	H	55.74	68.20	12.46	PK
15720	62.70	-6.96	H	55.74	73.98	18.24	PK
15720	48.43	-6.62	H	41.81	53.98	12.17	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10380	62.18	-5.38	V	56.80	68.20	11.40	PK
15570	63.17	-6.41	V	56.76	73.98	17.22	PK
15570	48.67	-6.41	V	42.26	53.98	11.72	AV
10380	62.23	-5.38	H	56.85	68.20	11.35	PK
15570	63.57	-6.41	H	57.16	73.98	16.82	PK
15570	48.71	-6.41	H	42.30	53.98	11.68	AV

Notes:

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

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

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10460	62.38	-6.88	V	55.50	68.20	12.70	PK
15690	62.19	-6.64	V	55.55	73.98	18.43	PK
15690	48.30	-6.64	V	41.66	53.98	12.32	AV
10460	62.68	-6.88	H	55.80	68.20	12.40	PK
15690	62.24	-6.64	H	55.60	73.98	18.38	PK
15690	48.32	-6.64	H	41.68	53.98	12.30	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:	802.11 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	62.25	-6.52	V	55.73	68.20	12.47	PK
15780	62.28	-6.67	V	55.61	73.98	18.37	PK
15780	48.36	-6.67	V	41.69	53.98	12.29	AV
10520	63.27	-6.52	H	56.75	68.20	11.45	PK
15780	62.94	-6.67	H	56.27	73.98	17.71	PK
15780	48.46	-6.67	H	41.79	53.98	12.19	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	62.25	-6.72	V	55.53	73.98	18.45	PK
10600	48.53	-6.72	V	41.81	53.98	12.17	AV
15900	62.49	-7.00	V	55.49	73.98	18.49	PK
15900	48.66	-7.00	V	41.66	53.98	12.32	AV
10600	62.38	-6.72	H	55.66	73.98	18.32	PK
10600	48.58	-6.72	H	41.86	53.98	12.12	AV
15900	62.80	-7.00	H	55.80	73.98	18.18	PK
15900	48.69	-7.00	H	41.69	53.98	12.29	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	61.80	-6.43	V	55.37	73.98	18.61	PK
10640	48.00	-6.43	V	41.57	53.98	12.41	AV
15960	62.10	-6.93	V	55.17	73.98	18.81	PK
15960	48.42	-6.93	V	41.49	53.98	12.49	AV
10640	62.56	-6.43	H	56.13	73.98	17.85	PK
10640	48.04	-6.43	H	41.61	53.98	12.37	AV
15960	62.63	-6.93	H	55.70	73.98	18.28	PK
15960	48.52	-6.93	H	41.59	53.98	12.39	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 802.11a. 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	62.21	-6.52	V	55.69	68.20	12.51	PK
15780	62.47	-6.67	V	55.80	73.98	18.18	PK
15780	48.40	-6.67	V	41.73	53.98	12.25	AV
10520	63.30	-6.52	H	56.78	68.20	11.42	PK
15780	62.98	-6.67	H	56.31	73.98	17.67	PK
15780	48.45	-6.67	H	41.78	53.98	12.20	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_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	62.13	-6.72	V	55.41	73.98	18.57	PK
10600	48.55	-6.72	V	41.83	53.98	12.15	AV
15900	62.51	-7.00	V	55.51	73.98	18.47	PK
15900	48.67	-7.00	V	41.67	53.98	12.31	AV
10600	62.40	-6.72	H	55.68	73.98	18.30	PK
10600	48.57	-6.72	H	41.85	53.98	12.13	AV
15900	62.70	-7.00	H	55.70	73.98	18.28	PK
15900	48.70	-7.00	H	41.70	53.98	12.28	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	62.31	-6.43	V	55.88	73.98	18.10	PK
10640	47.99	-6.43	V	41.56	53.98	12.42	AV
15960	62.37	-6.93	V	55.44	73.98	18.54	PK
15960	48.45	-6.93	V	41.52	53.98	12.46	AV
10640	62.69	-6.43	H	56.26	73.98	17.72	PK
10640	48.03	-6.43	H	41.60	53.98	12.38	AV
15960	62.84	-6.93	H	55.91	73.98	18.07	PK
15960	48.50	-6.93	H	41.57	53.98	12.41	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:	802.11n_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	62.02	-5.77	V	56.25	68.20	11.95	PK
15810	62.11	-7.47	V	54.64	73.98	19.34	PK
15810	48.30	-7.47	V	40.83	53.98	13.15	AV
10540	62.16	-5.77	H	56.39	68.20	11.81	PK
15810	62.22	-7.47	H	54.75	73.98	19.23	PK
15810	48.36	-7.47	H	40.89	53.98	13.09	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	62.26	-6.36	V	55.90	73.98	18.08	PK
10620	48.60	-6.36	V	42.24	53.98	11.74	AV
15930	61.79	-6.77	V	55.02	73.98	18.96	PK
15930	48.25	-6.77	V	41.48	53.98	12.50	AV
10620	62.43	-6.36	H	56.07	73.98	17.91	PK
10620	48.62	-6.36	H	42.26	53.98	11.72	AV
15930	61.87	-6.77	H	55.10	73.98	18.88	PK
15930	48.27	-6.77	H	41.50	53.98	12.48	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 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	61.87	-5.06	V	56.81	73.98	17.17	PK
11000	48.44	-5.06	V	43.38	53.98	10.60	AV
16500	62.30	-4.35	V	57.95	68.20	10.25	PK
11000	62.37	-5.06	H	57.31	73.98	16.67	PK
11000	48.50	-5.06	H	43.44	53.98	10.54	AV
16500	62.53	-4.35	H	58.18	68.20	10.02	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	62.16	-5.55	V	56.61	73.98	17.37	PK
11160	48.36	-5.55	V	42.81	53.98	11.17	AV
16740	61.72	-3.73	V	57.99	68.20	10.21	PK
11160	62.39	-5.55	H	56.84	73.98	17.14	PK
11160	48.38	-5.55	H	42.83	53.98	11.15	AV
16740	61.77	-3.73	H	58.04	68.20	10.16	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	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	61.96	-6.08	V	55.88	73.98	18.10	PK
11400	48.24	-6.08	V	42.16	53.98	11.82	AV
17100	61.77	-0.85	V	60.92	68.20	7.28	PK
11400	62.13	-6.08	H	56.05	73.98	17.93	PK
11400	48.32	-6.08	H	42.24	53.98	11.74	AV
17100	61.80	-0.85	H	60.95	68.20	7.25	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 802.11a. 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	61.99	-5.06	V	56.93	73.98	17.05	PK
11000	48.45	-5.06	V	43.39	53.98	10.59	AV
16500	62.34	-4.35	V	57.99	68.20	10.21	PK
11000	62.18	-5.06	H	57.12	73.98	16.86	PK
11000	48.49	-5.06	H	43.43	53.98	10.55	AV
16500	62.61	-4.35	H	58.26	68.20	9.94	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	62.23	-5.55	V	56.68	73.98	17.30	PK
11160	48.35	-5.55	V	42.80	53.98	11.18	AV
16740	61.78	-3.73	V	58.05	68.20	10.15	PK
11160	62.37	-5.55	H	56.82	73.98	17.16	PK
11160	48.39	-5.55	H	42.84	53.98	11.14	AV
16740	61.83	-3.73	H	58.10	68.20	10.10	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	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.03	-6.08	V	55.95	73.98	18.03	PK
11400	48.29	-6.08	V	42.21	53.98	11.77	AV
17100	61.74	-0.85	V	60.89	68.20	7.31	PK
11400	62.18	-6.08	H	56.10	73.98	17.88	PK
11400	48.31	-6.08	H	42.23	53.98	11.75	AV
17100	61.83	-0.85	H	60.98	68.20	7.22	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:	802.11n_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	61.93	-5.86	V	56.07	73.98	17.91	PK
11020	48.06	-5.86	V	42.20	53.98	11.78	AV
16530	62.03	-3.75	V	58.28	68.20	9.92	PK
11020	62.16	-5.86	H	56.30	73.98	17.68	PK
11020	48.08	-5.86	H	42.22	53.98	11.76	AV
16530	62.11	-3.75	H	58.36	68.20	9.84	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	5550 MHz
Channel No.	110 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11100	62.12	-6.14	V	55.98	73.98	18.00	PK
11100	48.40	-6.14	V	42.26	53.98	11.72	AV
16650	61.91	-3.11	V	58.80	68.20	9.40	PK
11100	62.43	-6.14	H	56.29	73.98	17.69	PK
11100	48.41	-6.14	H	42.27	53.98	11.71	AV
16650	62.07	-3.11	H	58.96	68.20	9.24	PK

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n_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	5670 MHz
Channel No.	134 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11340	61.85	-5.10	V	56.75	73.98	17.23	PK
11340	48.25	-5.10	V	43.15	53.98	10.83	AV
17010	61.45	-1.27	V	60.18	68.20	8.02	PK
11340	62.17	-5.10	H	57.07	73.98	16.91	PK
11340	48.26	-5.10	H	43.16	53.98	10.82	AV
17010	61.68	-1.27	H	60.41	68.20	7.79	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 802.11n_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.

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)).

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

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	49.96	8.79	H	58.75	73.98	15.23	PK
5150	36.73	8.79	H	45.52	53.98	8.46	AV
5150	49.87	8.79	V	58.66	73.98	15.32	PK
5150	36.70	8.79	V	45.49	53.98	8.49	AV

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

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	49.63	8.79	H	58.42	73.98	15.56	PK
5150	36.87	8.79	H	45.66	53.98	8.32	AV
5150	49.54	8.79	V	58.33	73.98	15.65	PK
5150	36.85	8.79	V	45.64	53.98	8.34	AV

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

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	52.17	8.79	H	60.96	73.98	13.02	PK
5150	37.76	8.79	H	46.55	53.98	7.43	AV
5150	51.71	8.79	V	60.50	73.98	13.48	PK
5150	37.71	8.79	V	46.50	53.98	7.48	AV

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	49.57	9.28	H	58.85	73.98	15.13	PK
5350	36.36	9.28	H	45.64	53.98	8.34	AV
5350	50.19	9.28	V	59.47	73.98	14.51	PK
5350	36.38	9.28	V	45.66	53.98	8.32	AV

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

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5350	49.31	9.28	H	58.59	73.98	15.39	PK
5350	36.19	9.28	H	45.47	53.98	8.51	AV
5350	49.57	9.28	V	58.85	73.98	15.13	PK
5350	36.22	9.28	V	45.50	53.98	8.48	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	49.78	9.28	H	59.06	73.98	14.92	PK
5350	36.00	9.28	H	45.28	53.98	8.70	AV
5350	50.34	9.28	V	59.62	73.98	14.36	PK
5350	36.07	9.28	V	45.35	53.98	8.63	AV

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	48.84	10.08	H	58.92	73.98	15.06	PK
5460	35.72	10.08	H	45.80	53.98	8.18	AV
*5470	48.85	9.95	H	58.80	68.20	9.40	PK
5460	48.77	10.08	V	58.85	73.98	15.13	PK
5460	35.70	10.08	V	45.78	53.98	8.20	AV
*5470	48.73	9.95	V	58.68	68.20	9.52	PK

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

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	48.16	11.37	H	59.53	68.20	8.67	PK
*5725	47.76	11.37	V	59.13	68.20	9.07	PK

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

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5460	48.92	10.08	H	59.00	73.98	14.98	PK
5460	35.61	10.08	H	45.69	53.98	8.29	AV
*5470	48.91	9.95	H	58.86	68.20	9.34	PK
5460	48.63	10.08	V	58.71	73.98	15.27	PK
5460	35.54	10.08	V	45.62	53.98	8.36	AV
*5470	48.56	9.95	V	58.51	68.20	9.69	PK

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

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	47.60	11.37	H	58.97	68.20	9.23	PK
*5725	47.51	11.37	V	58.88	68.20	9.32	AV

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	48.45	10.08	H	58.53	73.98	15.45	PK
5460	35.58	10.08	H	45.66	53.98	8.32	AV
*5470	52.37	9.95	H	62.32	68.20	5.88	PK
5460	48.16	10.08	V	58.24	73.98	15.74	PK
5460	35.54	10.08	V	45.62	53.98	8.36	AV
*5470	52.02	9.95	V	61.97	68.20	6.23	PK

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

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	48.24	11.37	H	59.61	68.20	8.59	PK
*5725	47.97	11.37	V	59.34	68.20	8.86	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n.
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)

▣ Additional Test (Band Edge for 5250 MHz)

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

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

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

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
㎒	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
㎒	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 6 Mbps, Ch.64 and 802.11a_HT20 mode in UNII 2. Because 802.11a_HT20 mode in UNII 2 is worst case.

▣ RESULT PLOTS

Conducted Emissions (Line 1)

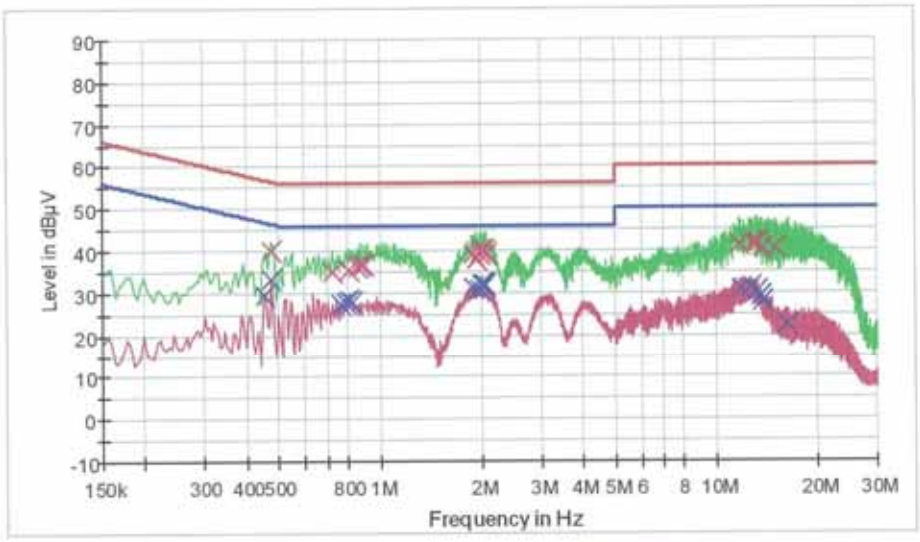
EMI Auto Test(2) 1 / 2

HCT TEST Report

Common Information

EUT:	LG-V480
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN MODE (5G)
Operator Name:	K.S. KANG

FCC CLASS B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.474000	39.8	9.000	Off	L1	9.7	16.6	56.4
0.720500	34.9	9.000	Off	L1	9.7	21.1	56.0
0.810500	35.3	9.000	Off	L1	9.7	20.7	56.0
0.855500	36.2	9.000	Off	L1	9.7	19.8	56.0
0.878000	36.6	9.000	Off	L1	9.7	19.4	56.0
0.900500	36.7	9.000	Off	L1	9.7	19.3	56.0
1.886000	39.3	9.000	Off	L1	9.8	16.7	56.0
1.940000	37.9	9.000	Off	L1	9.8	18.1	56.0
1.976000	39.0	9.000	Off	L1	9.8	17.0	56.0
1.994000	39.9	9.000	Off	L1	9.8	16.1	56.0
2.039000	39.9	9.000	Off	L1	9.9	16.1	56.0
2.066000	39.0	9.000	Off	L1	9.9	17.0	56.0
11.705000	41.3	9.000	Off	L1	10.5	18.7	60.0
12.902000	41.6	9.000	Off	L1	10.5	18.4	60.0
13.109000	41.6	9.000	Off	L1	10.6	18.4	60.0
13.307000	41.8	9.000	Off	L1	10.6	18.2	60.0

6/17/2014 10:15:53

EMI Auto Test(2) 2 / 2

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
13.671500	40.2	9.000	Off	L1	10.6	19.8	60.0
15.084500	40.4	9.000	Off	L1	10.7	19.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.456000	29.6	9.000	Off	L1	9.7	17.2	46.8
0.478500	33.3	9.000	Off	L1	9.7	13.1	46.4
0.765500	27.5	9.000	Off	L1	9.7	18.5	46.0
0.788000	27.9	9.000	Off	L1	9.7	18.1	46.0
0.810500	28.4	9.000	Off	L1	9.7	17.6	46.0
0.833000	27.8	9.000	Off	L1	9.7	18.2	46.0
1.886000	31.2	9.000	Off	L1	9.8	14.8	46.0
1.976000	30.8	9.000	Off	L1	9.8	15.2	46.0
1.994000	32.2	9.000	Off	L1	9.8	13.8	46.0
2.016500	32.1	9.000	Off	L1	9.9	13.9	46.0
2.039000	31.9	9.000	Off	L1	9.9	14.1	46.0
2.061500	31.4	9.000	Off	L1	9.9	14.6	46.0
11.903000	30.9	9.000	Off	L1	10.5	19.1	50.0
12.699500	31.3	9.000	Off	L1	10.5	18.7	50.0
13.307000	30.1	9.000	Off	L1	10.6	19.9	50.0
13.505000	29.2	9.000	Off	L1	10.6	20.8	50.0
13.698500	27.9	9.000	Off	L1	10.6	22.1	50.0
16.254500	22.4	9.000	Off	L1	10.7	27.6	50.0

6/17/2014 10:15:53

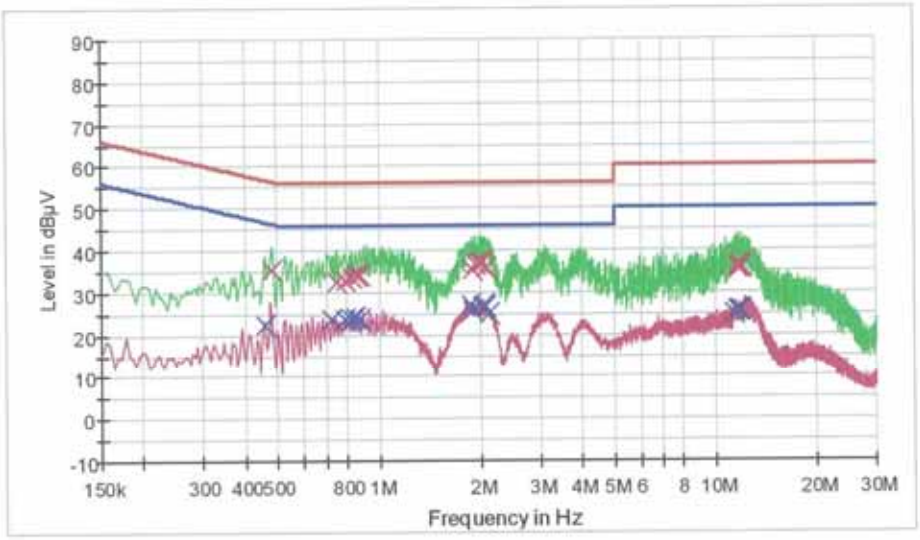
Conducted Emissions (Line 2)

HCT TEST Report

Common Information

EUT:	LG-V480
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN MODE (5G)
Operator Name:	K.S. KANG

FCC CLASS B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.483000	35.4	9.000	Off	N	9.7	20.9	56.3
0.747500	32.3	9.000	Off	N	9.7	23.7	56.0
0.788000	32.8	9.000	Off	N	9.7	23.2	56.0
0.833000	33.6	9.000	Off	N	9.8	22.4	56.0
0.855500	34.3	9.000	Off	N	9.8	21.7	56.0
0.878000	34.3	9.000	Off	N	9.8	21.7	56.0
1.890500	35.4	9.000	Off	N	9.8	20.6	56.0
1.931000	36.7	9.000	Off	N	9.9	19.3	56.0
1.976000	37.1	9.000	Off	N	9.9	18.9	56.0
1.998500	36.9	9.000	Off	N	9.9	19.1	56.0
2.021000	36.9	9.000	Off	N	9.9	19.1	56.0
2.084000	36.0	9.000	Off	N	9.9	20.0	56.0
11.529500	35.8	9.000	Off	N	10.4	24.2	60.0
11.542000	36.1	9.000	Off	N	10.5	23.9	60.0
11.555500	36.3	9.000	Off	N	10.5	23.7	60.0
11.822000	36.0	9.000	Off	N	10.5	24.0	60.0

EMI Auto Test(2) 2 / 2

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
11.898500	36.2	9.000	Off	N	10.5	23.8	60.0
11.912000	36.1	9.000	Off	N	10.5	23.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.460500	22.2	9.000	Off	N	9.7	24.5	46.7
0.725000	23.7	9.000	Off	N	9.7	22.3	46.0
0.788000	23.6	9.000	Off	N	9.7	22.4	46.0
0.833000	23.8	9.000	Off	N	9.8	22.2	46.0
0.851000	24.2	9.000	Off	N	9.8	21.8	46.0
0.878000	23.4	9.000	Off	N	9.8	22.6	46.0
1.863500	26.8	9.000	Off	N	9.8	19.2	46.0
1.890500	25.6	9.000	Off	N	9.8	20.4	46.0
2.021000	26.7	9.000	Off	N	9.9	19.3	46.0
2.061500	26.8	9.000	Off	N	9.9	19.2	46.0
2.084000	26.5	9.000	Off	N	9.9	19.5	46.0
2.111000	25.1	9.000	Off	N	9.9	20.9	46.0
11.286500	24.8	9.000	Off	N	10.4	25.2	50.0
11.529500	25.7	9.000	Off	N	10.4	24.3	50.0
11.700500	25.9	9.000	Off	N	10.5	24.1	50.0
11.727500	25.8	9.000	Off	N	10.5	24.2	50.0
11.867000	25.8	9.000	Off	N	10.5	24.2	50.0
11.912000	25.9	9.000	Off	N	10.5	24.1	50.0

6/17/2014 10:09:12

9. LIST OF TEST EQUIPMENT

9.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	01/29/2014	Annual	01/29/2015	100073
Agilent	E4440A/ Spectrum Analyzer	04/09/2014	Annual	04/09/2015	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	05/23/2014	Annual	05/23/2015	MY51110063
Agilent	N1911A/Power Meter	01/24/2014	Annual	01/24/2015	MY45100523
Agilent	N1921A /POWER SENSOR	07/11/2013	Annual	07/11/2014	MY45241059
Hewlett Packard	11636B/Power Divider	10/22/2013	Annual	10/22/2014	11377
Agilent	87300B/Directional Coupler	12/18/2013	Annual	12/18/2014	3116A03621
Hewlett Packard	11667B / Power Splitter	01/27/2014	Annual	01/27/2015	10545
DIGITAL	EP-3010 /DC POWER SUPPLY	10/29/2013	Annual	10/29/2014	3110117
ITECH	IT6720 / DC POWER SUPPLY	11/05/2013	Annual	11/05/2014	0100021562870011 99
TESCOM	TC-3000C / BLUETOOTH TESTER	04/11/2014	Annual	04/11/2015	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/07/2014	Annual	05/07/2015	100422
Agilent	8493C / Attenuator(10 dB)	07/24/2013	Annual	07/24/2014	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	10/28/2013	Annual	10/28/2014	BR0617

9.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Schwarzbeck	VULB 9160/ TRILOG Antenna	12/17/2012	Biennial	12/17/2014	3150
Rohde & Schwarz	ESCI / EMI TEST RECEIVER	01/24/2014	Annual	01/24/2015	100584
HD	MA240/ Antenna Position Tower	N/A	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	09/10/2013	Annual	09/10/2014	10094
CERNEX	CBL18265035 / POWER AMP	07/24/2013	Annual	07/24/2014	22966
CERNEX	CBL26405040 / POWER AMP	04/04/2014	Annual	04/04/2015	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	07/05/2013	Biennial	07/05/2015	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	10/30/2012	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	01/24/2014	Annual	01/24/2015	839117/011
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	02/03/2014	Annual	02/03/2015	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	04/09/2014	Annual	04/09/2015	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	04/04/2014	Annual	04/04/2015	29
TESCOM	TC-3000C / BLUETOOTH TESTER	04/11/2014	Annual	04/11/2015	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/07/2014	Annual	05/07/2015	100422
Rohde & Schwarz	LOOP ANTENNA	08/14/2012	Biennial	08/14/2014	100179
CERNEX	CBL06185030 / POWER AMP	07/24/2013	Annual	07/24/2014	22965
CERNEX	CBLU1183540 / POWER AMP	07/24/2013	Annual	07/24/2014	22964