FCC Test Report

Applicant	:	**WeHome Technology Company Limited**
Address	:	**Room 12A, Kiu Fu Comm Building, 300 Lockhart Road, Wan Chai, Hong Kong**
Product Name	:	**ROLA Mini Companion Robot**
Report Date	:	**Aug. 05, 2024**

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	WeHome Technology Company Limited
Manufacturer	:	Fuzhi Technology (Shenzhen) Co., Ltd.
Product Name	:	ROLA Mini Companion Robot
Model No.	:	ROLA Mini
Trade Mark	:	ENABOT
Rating(s)	:	Input: 5V⎓3A(with DC 3.6V, 5000mAh battery inside)
Test Standard(s)	**:**	**47 CFR Part 15E** **ANSI C63.10: 2020**
Test Method(s)	**:**	**KDB 789033 D02 General UNII Test Procedures New Rules v02r01** **KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02** **KDB 905462 D03 Client Without DFS New Rules v01r02**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the 47 CFR Part 15E requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt	Jun. 13, 2024
Date of Test	Jun. 13, 2024 ~ Jul. 04, 2024
Prepared By	(TuTu Hong)
Approved & Authorized Signer	(Edward Pan)

Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Aug. 05, 2024

1. General Information

1.1. Client Information

Applicant	:	WeHome Technology Company Limited
Address	:	Room 12A, Kiu Fu Comm Building, 300 Lockhart Road, Wan Chai, Hong Kong
Manufacturer	:	Fuzhi Technology (Shenzhen) Co., Ltd.
Address	:	Room 302,Building 10,Qianhai E-Hub,Shenzhen,Guangdong,China
Factory	:	HUIZHOU SANHUA INDUSTRIAL CO., LTD.
Address	:	ZONE 14, HUIZHOU ZHONGKAI HI-TECH DEVELOPMENT ZONE, HUIZHOU, GUANGDONG, P.R.CHINA

1.2. Description of Device (EUT)

Product Name	:	ROLA Mini Companion Robot
Model No.	:	ROLA Mini
Trade Mark	:	ENABOT
Test Power Supply	:	AC 120V, 60Hz for Adapter/DC 3.6V battery inside
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Mode	:	☒ a ☒ n(HT20) ☐ n(HT40) ☒ ac(VHT20) ☐ ac(VHT40) ☐ ac(VHT80) ☐ ac(VHT160) ☐ ax(HEW20) ☐ ax(HEW40) ☐ ax(HEW80) ☐ ax(HEW160)
Device Type	:	☐ Outdoor AP ☐ Indoor AP ☐ Point-to-point AP ☒ Client
TPC Function	:	☐ With TPC ☒ Without TPC
DFS Type	:	☒ Slave without radar detection ☐ Slave with radar detection ☐ Master
Operation Frequency	:	☒ Wi-Fi 5.2G: 5150~5250MHz ☒ Wi-Fi 5.3G: 5250~5350MHz ☐ Wi-Fi 5.6G: 5470~5725MHz ☐ Wi-Fi 5.8G: 5725~5850MHz
Number of Channel	:	Wi-Fi 5.2G: ☒ 4 Channels for 20MHz bandwidth (5180-5240MHz) ☐ 2 Channels for 40MHz bandwidth (5190-5230MHz) ☐ 1 Channels for 80MHz bandwidth (5210MHz)

		Wi-Fi 5.3G: ☒4 Channels for 20MHz bandwidth (5260-5320MHz) ☐2 Channels for 40MHz bandwidth (5270-5310MHz) ☐1 Channels for 80MHz bandwidth (5290MHz)
Modulation Type	:	☒802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) ☒802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) ☒802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) ☐802.11ax: OFDMA(BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Antenna Type	:	FPC antenna
Antenna Gain(Peak)	:	Wi-Fi 5.2G: 2.02dBi Wi-Fi 5.3G: 1.35dBi
Remark: 1) All of the RF specification are provided by customer. 2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
Adapter	Model: MDY-11-EX Input: 100-240VAC,50-60Hz, 0.7A Output: 5V⎓ 3A,9V⎓ 3A,12V⎓ 2.25A,20V⎓ 1.35A,11V⎓ 3A
ROG Rapture Quad-band Gaming Router	Manufacturer: ASUSTeK Computer Inc Model No.: GT-AXE16000 FCC ID: MSQ-RTAX5D00 IC: 3568A-RTAX5D00

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

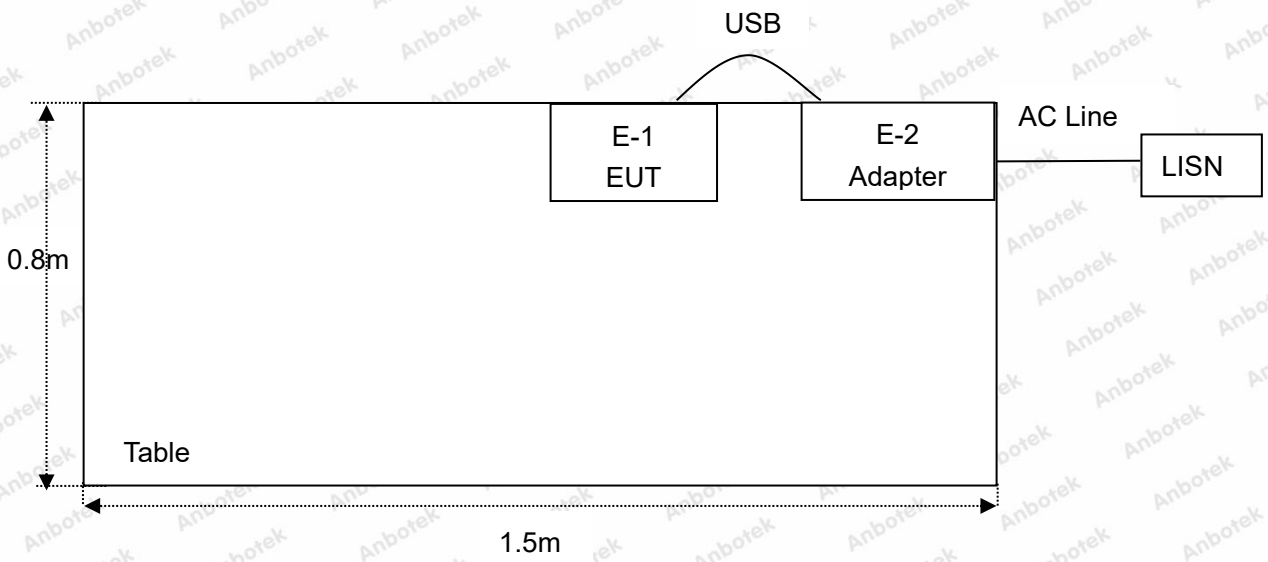
Frequency Band	Mode	Test channel	Frequency (MHz)
5.2GHz	OFDM, OFDMA 802.11a/n(HT20)/ ac(VHT20)	CH 36	5180MHz
		CH 40	5200MHz
		CH 48	5240MHz
5.3GHz	OFDM, OFDMA 802.11a/n(HT20)/ ac(VHT20)	CH 52	5260MHz
		CH 60	5300MHz
		CH 64	5320MHz

Note:

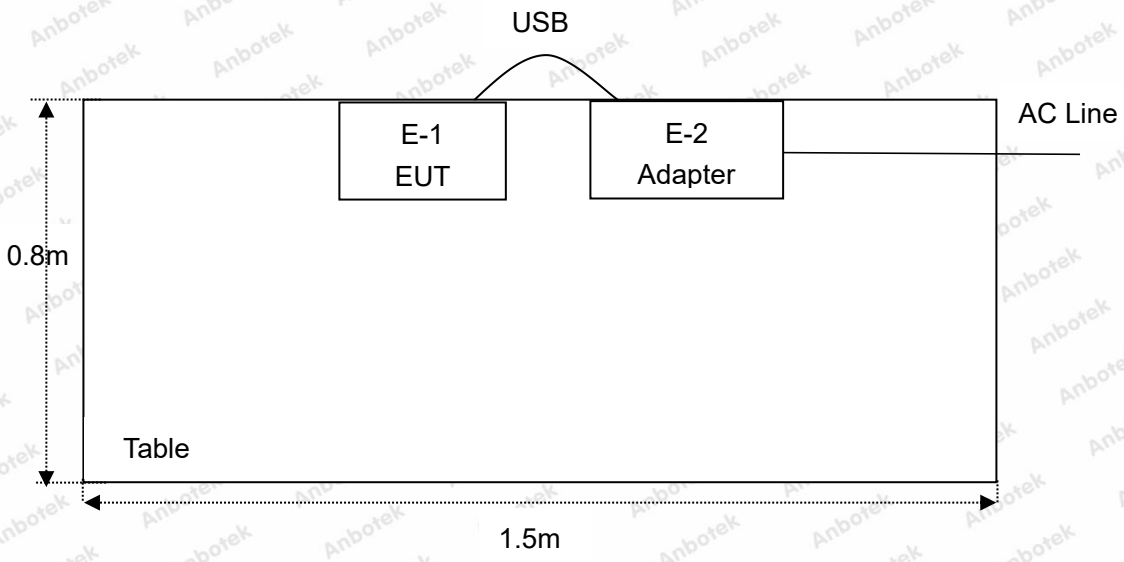
1. The measurements are performed at the highest, middle, lowest available channels.
2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.
3. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB
4. The EUT was programmed to be in continuously transmitting mode.

1.5. Description Of Test Setup

CE



RE



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Jan. 18, 2024	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jan. 18, 2024	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 12, 2023	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Jan. 23, 2024	1 Year
5.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 12, 2023	1 Year
6.	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	Jan. 17, 2024	1 Year
7.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	Oct. 23, 2022	3 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 12, 2023	1 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 12, 2023	1 Year
11.	Pre-amplifier	SONOMA	310N	186860	Jan. 17, 2024	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 12, 2023	1 Year
14.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 12, 2023	1 Year
15.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 12, 2023	1 Year
16.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 20, 2023	1 Year
17.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 16, 2023	1 Year
18.	Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102150	May. 06, 2024	1 Year
19.	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	104209	Oct. 12, 2023	1 Year

1.7. Measurement Uncertainty

Parameter	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	3.8dB
Occupied Bandwidth	925Hz
Conducted Output Power	0.76dB
Conducted Spurious Emission	1.24dB
Power Spectral Density	0.76dB
Radiated spurious emissions (Below 30MHz)	3.53dB
Radiated spurious emissions (30MHz~1GHz)	Horizontal: 3.92dB; Vertical: 4.52dB
Radiated spurious emissions (above 1GHz)	1G-6GHz: 4.78dB; 6G-18GHz: 4.88dB 18G-40GHz: 5.68dB
The measurement uncertainty and decision risk evaluated according to AB/WI-RF-F-032. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

1.9. Disclaimer

1. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
2. The test report is invalid if there is any evidence and/or falsification.
3. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
4. This document may not be altered or revised in any way unless done so by Anbotek and all revisions are duly noted in the revisions section.
5. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
6. The authenticity of the information provided by the customer is the responsibility of the customer and the laboratory is not responsible for its authenticity.

The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Summary of Test Results

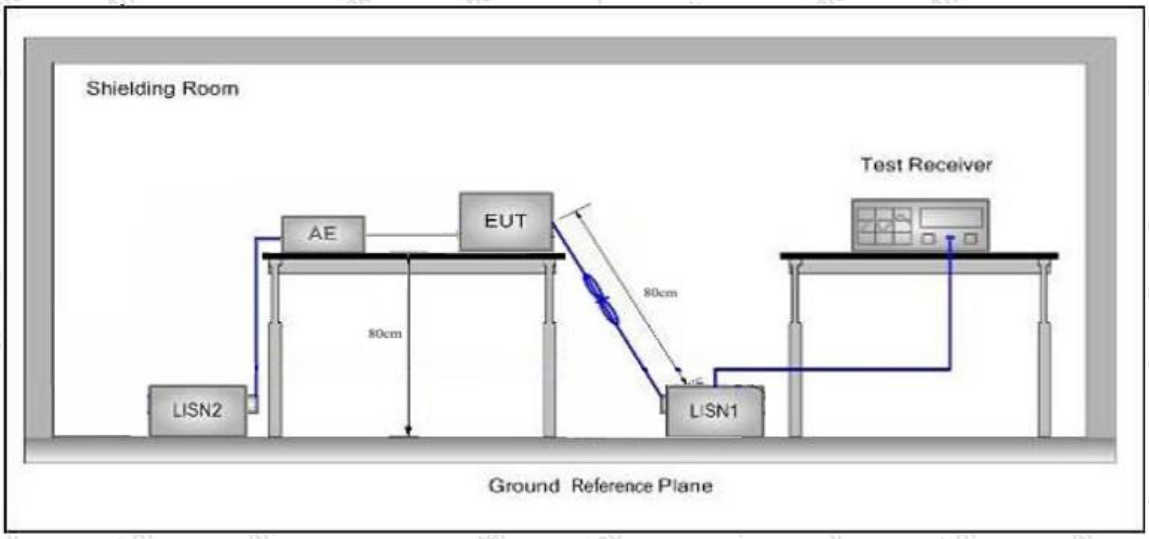
Standard	Test Type	Result
15.207 & 15.407(b)	Conducted Emission	PASS
15.205 & 15.209 & 15.407(b)	Radiated Spurious Emission and Restricted Band	PASS
15.407(b)	Conducted Band Edge	PASS
15.407(a) & 2.1049	26dB Bandwidth & 99% Occupied Bandwidth	PASS
15.407(e)	Minimum 6dB Bandwidth (5.725-5.85GHz Band)	N/A
15.407(a)	Maximum Conducted Output Power	PASS
15.407(a)	Maximum Power Spectral Density	PASS
15.407(g)	Frequency Stability	PASS
15.407(h)	DFS Detection Thresholds	PASS
15.407(h)	Channel Move Time, Channel Closing Transmission Time	PASS
15.203	Antenna Requirement	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207 & 15.407(b)		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

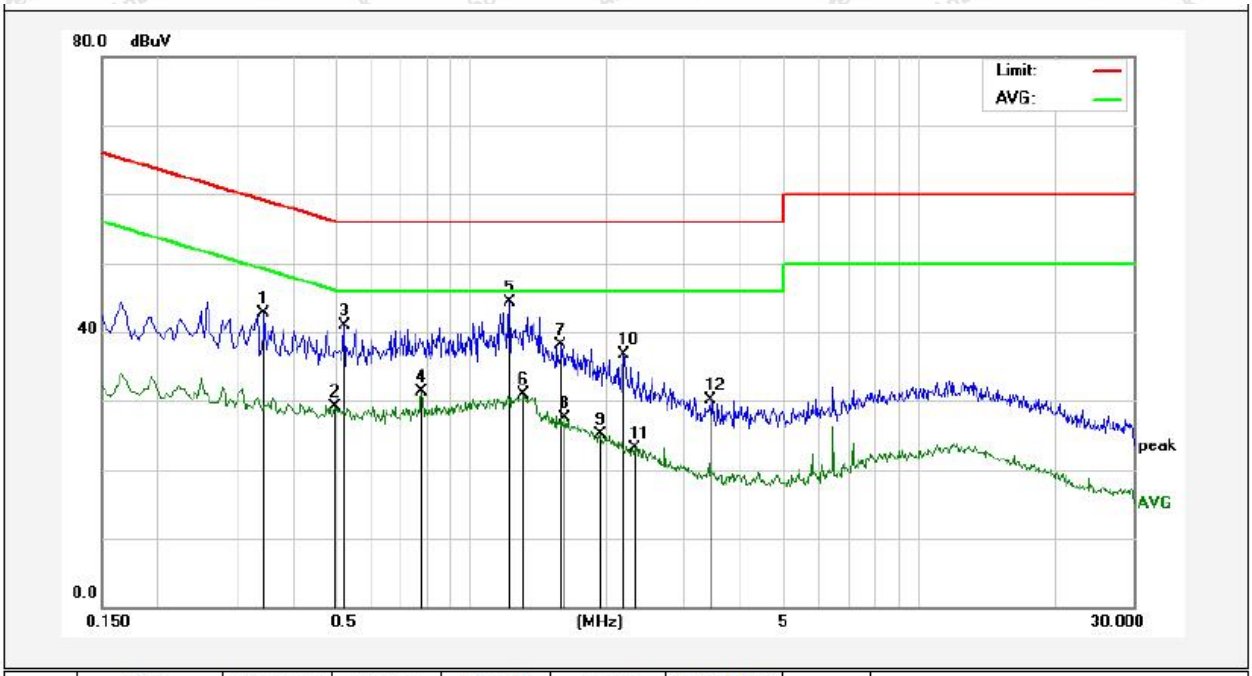
3.4. Test Data

During the test, pre-scan all modes, only the worst case is recorded in the report.

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case AC 120V/60Hz.

Conducted Emission Test Data

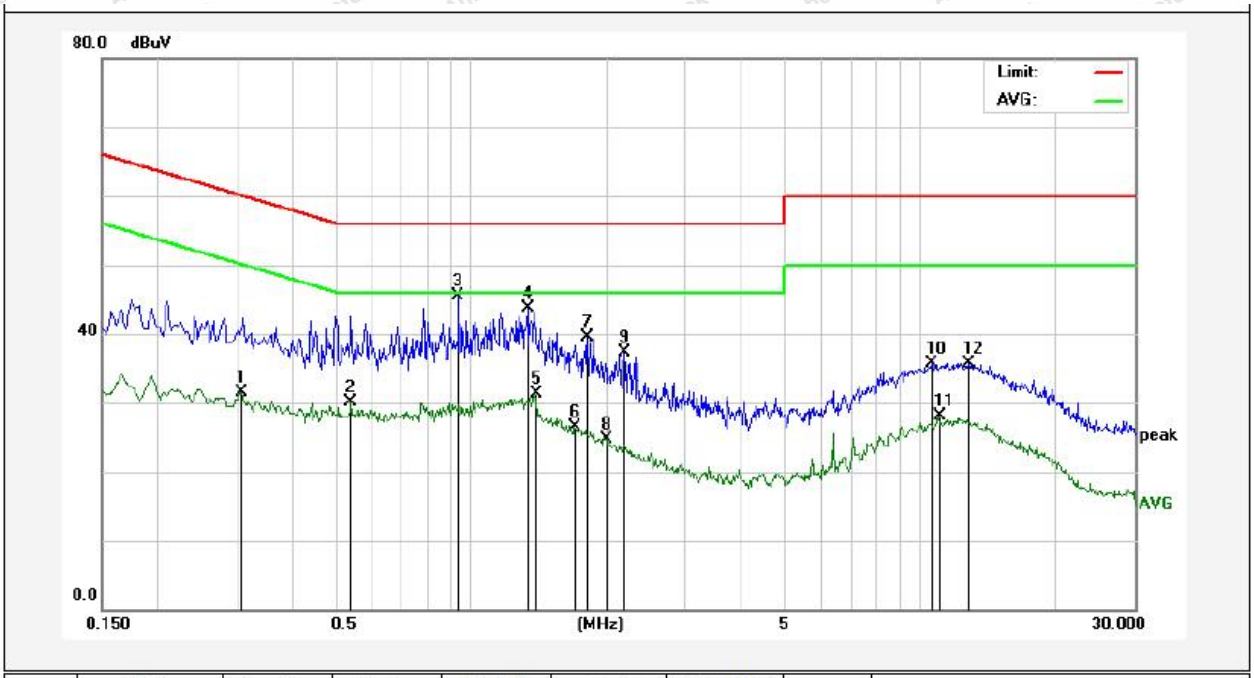
Test Site:	1# Shielded Room
Operating Condition:	802.11n(HT20) 5180MHz
Test Specification:	AC 120V, 60Hz for Adapter
Comment:	Live Line
Temp.(℃)/Hum.(%RH):	23.5℃/65%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.3460	24.86	17.83	42.69	59.06	-16.37	QP	
2	0.4980	11.16	17.86	29.02	46.03	-17.01	AVG	
3	0.5220	23.09	17.86	40.95	56.00	-15.05	QP	
4	0.7780	13.45	17.87	31.32	46.00	-14.68	AVG	
5	1.2180	26.49	17.85	44.34	56.00	-11.66	QP	
6	1.3140	13.05	17.86	30.91	46.00	-15.09	AVG	
7	1.5859	20.31	17.85	38.16	56.00	-17.84	QP	
8	1.6260	9.68	17.85	27.53	46.00	-18.47	AVG	
9	1.9460	7.25	17.85	25.10	46.00	-20.90	AVG	
10	2.1900	18.79	17.85	36.64	56.00	-19.36	QP	
11	2.3140	5.32	17.85	23.17	46.00	-22.83	AVG	
12	3.4300	12.30	17.85	30.15	56.00	-25.85	QP	

Conducted Emission Test Data

Test Site:	1# Shielded Room
Operating Condition:	802.11n(HT20) 5180MHz
Test Specification:	AC 120V, 60Hz for Adapter
Comment:	Neutral Line
Temp.(℃)/Hum.(%RH):	23.5℃/65%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.3060	13.76	17.84	31.60	50.08	-18.48	AVG	
2	0.5380	12.33	17.86	30.19	46.00	-15.81	AVG	
3	0.9340	27.67	17.86	45.53	56.00	-10.47	QP	
4	1.3340	25.81	17.86	43.67	56.00	-12.33	QP	
5	1.3860	13.54	17.86	31.40	46.00	-14.60	AVG	
6	1.6900	8.56	17.85	26.41	46.00	-19.59	AVG	
7	1.8100	21.56	17.86	39.42	56.00	-16.58	QP	
8	1.9980	6.94	17.85	24.79	46.00	-21.21	AVG	
9	2.1940	19.43	17.85	37.28	56.00	-18.72	QP	
10	10.5659	17.68	17.99	35.67	60.00	-24.33	QP	
11	10.9700	10.04	18.01	28.05	50.00	-21.95	AVG	
12	12.8340	17.65	18.07	35.72	60.00	-24.28	QP	

4. Radiation Spurious Emission and Restricted Band Test

4.1. Test Standard and Limit

Radiated Spurious Emission					
Test Standard	FCC Part15 C Section 15.205 & 15.209 & 15.407(b)				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	68.2	Peak	3
Band Edge					
Test Standard	15.407(b)				
Test Limit	Operating Band	Frequency	EIRP Limit	Remark	
	5150-5250MHz	Out of operation band	-27dBm/MHz(68.2dBuV/m)@3m	Peak	
	5250-5350MHz	Out of operation band	-27dBm/MHz(68.2dBuV/m)@3m	Peak	
	5470-5725MHz	Out of operation band	-27dBm/MHz(68.2dBuV/m)@3m	Peak	
	5725-5850 MHz	Below 5.65GHz	-27dBm/MHz(68.2dBuV/m)@3m	Peak	
		5.65GHz-5.7GHz	-27*dBm/MHz to 10dBm/MHz (68.2* dBuV/m to 105.6dBuV/m)	Peak	
		5.7GHz-5.72GHz	10*dBm/MHz to 15.6dBm/MHz (105.6*dBuV/m to 110.8dBuV/m)	Peak	
		5.72GHz-5.725GHz	15.6*dBm/MHz to 27dBm/MHz (110.8dBuV/m to* 122.2dBuV/m)	Peak	
		5.85GHz-5.855GHz	27dBm/MHz to 15.6*dBm/MHz (122.2dBuV/m to110.8* dBuV/m)	Peak	

		5.855GHz-5.875GHz	15.6dBm/MHz to 10*dBm/MHz (110.8dBuV/m to 105.6* dBuV/m	Peak
		5.875GHz-5.925GHz	10dBm/MHz to -27*dBm/MHz (105.6dBuV/m to 68.2* dBuV/m)	Peak
		Above 5.925GHz	-27 dBm/MHz(68.2dBuV/m)@3m	Peak

Remark:

(1)The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

(3)Above 1GHz limit:E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]=-27dBm.

4.2. Test Setup

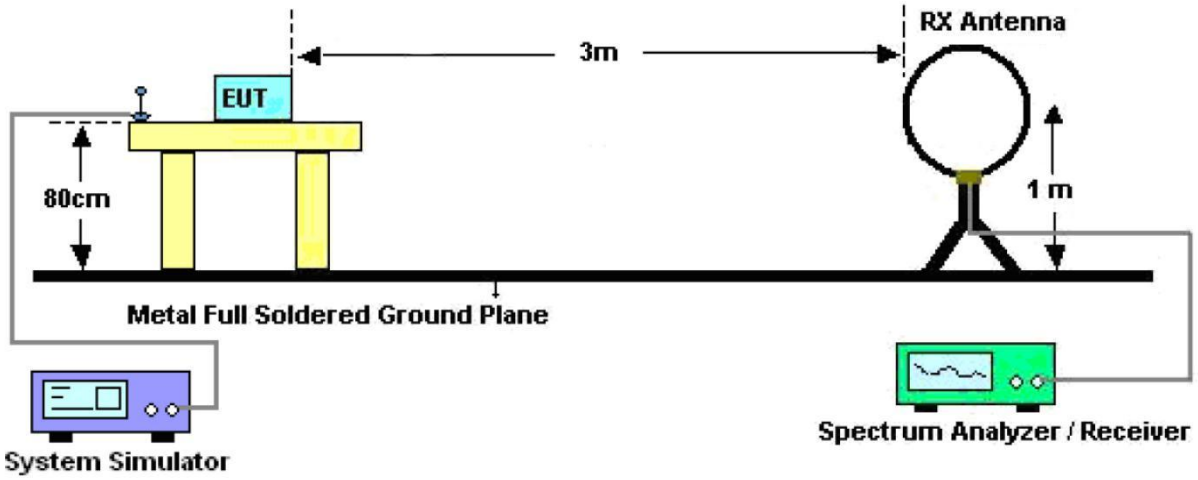


Figure 1. Below 30MHz

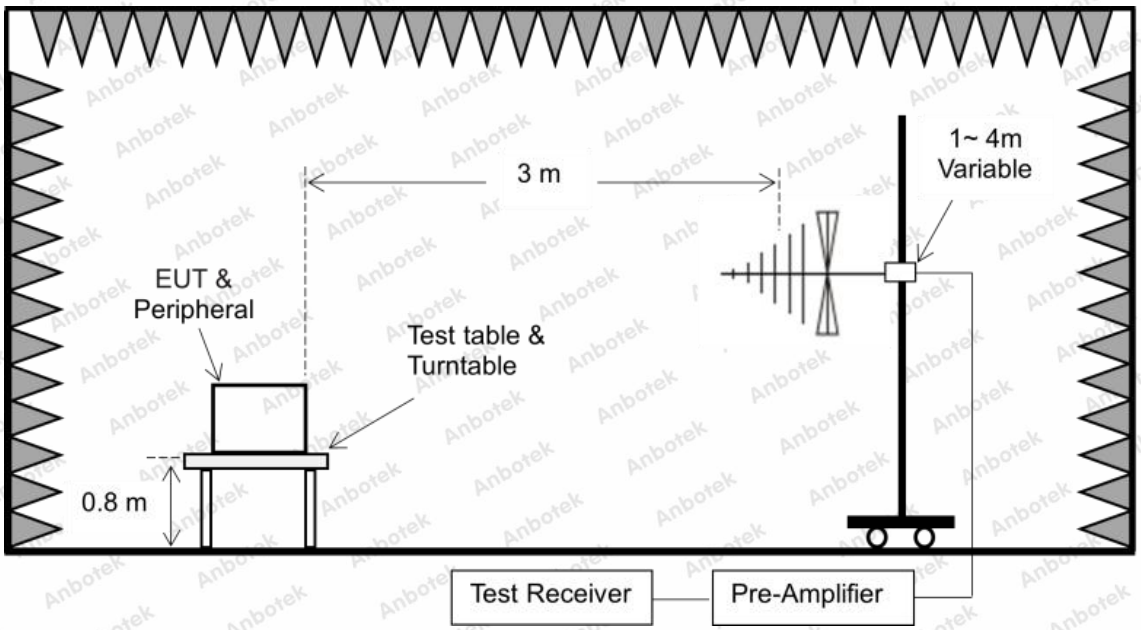


Figure 2. 30MHz to 1GHz

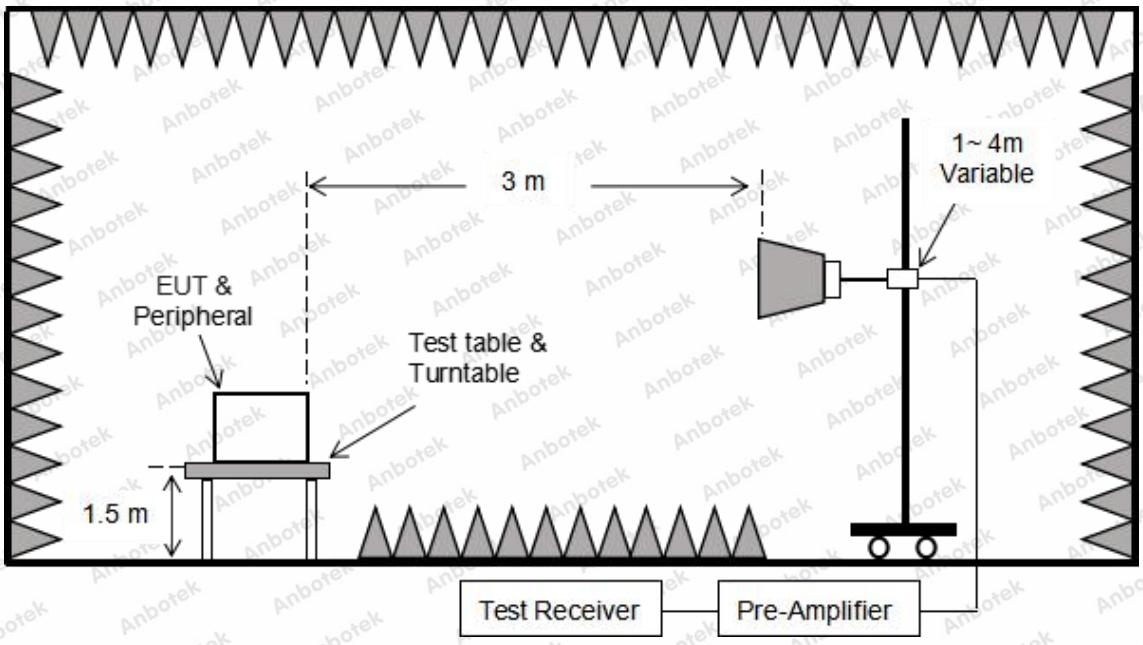


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz, Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

Pass

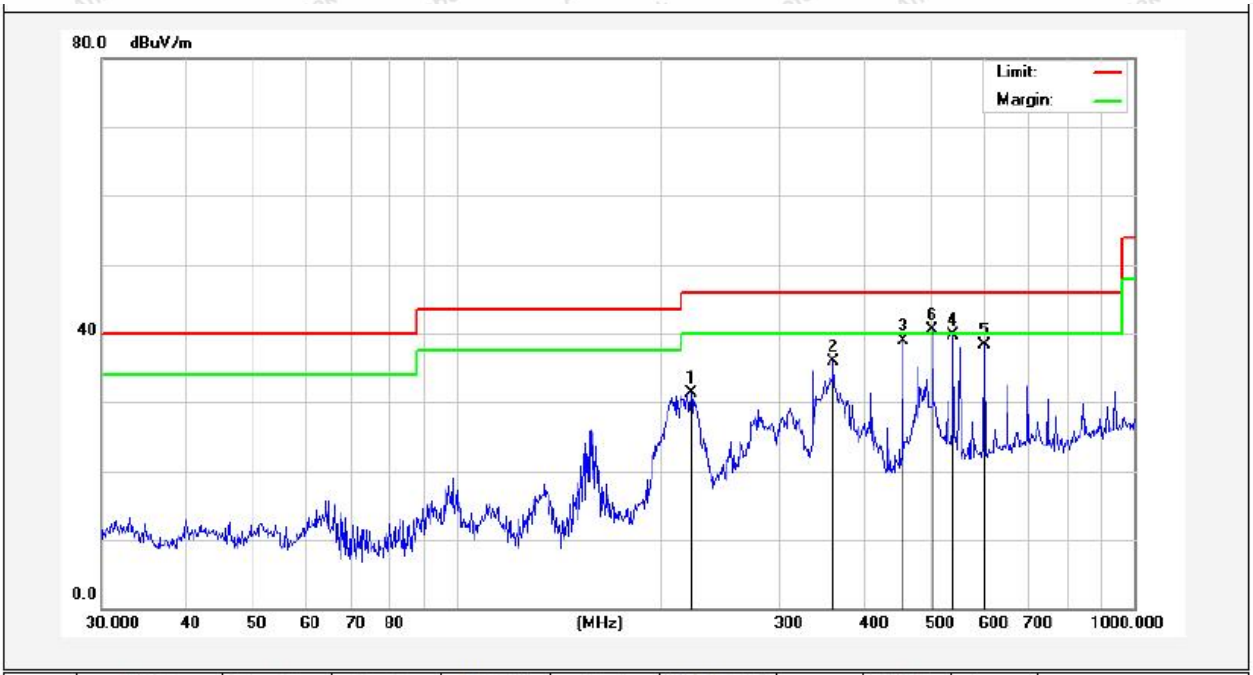
During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all the modes, only the worst case is recorded in the report.

Test Results (30~1000MHz)

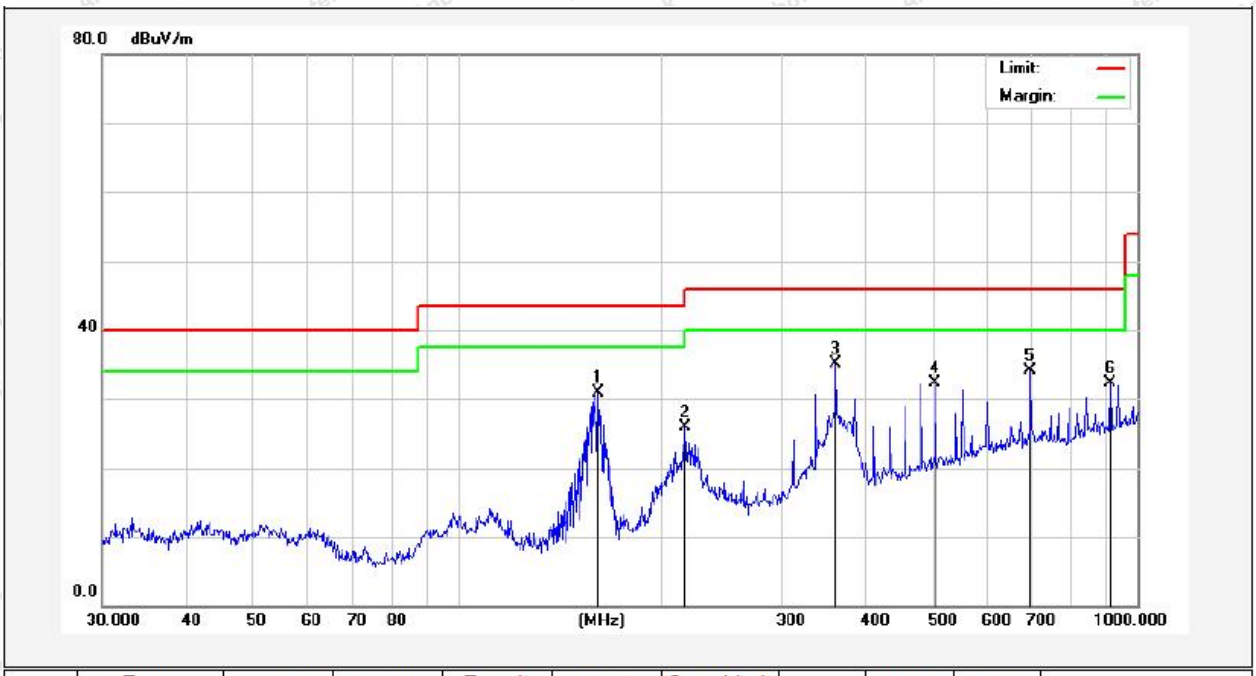
Test Mode:	802.11n(HT20) 5180MHz
Power Source:	AC 120V, 60Hz for Adapter
Polarization:	Vertical
Temp.(℃)/Hum.(%RH):	22.5℃/50%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	222.1698	50.28	-18.99	31.29	46.00	-14.71	QP			
2	360.4476	50.41	-14.57	35.84	46.00	-10.16	QP			
3	455.9058	51.90	-13.05	38.85	46.00	-7.15	QP			
4	541.3725	51.02	-11.36	39.66	46.00	-6.34	QP			
5	601.4265	48.01	-9.71	38.30	46.00	-7.70	QP			
6	504.7062	52.81	-12.32	40.49	46.00	-5.51	QP			

Test Results (30~1000MHz)

Test Mode:	802.11n(HT20) 5180MHz
Power Source:	AC 120V, 60Hz for Adapter
Polarization:	Horizontal
Temp.(℃)/Hum.(%RH):	22.5℃/50%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	160.9089	53.17	-22.30	30.87	43.50	-12.63	QP			
2	216.0240	45.14	-19.28	25.86	46.00	-20.14	QP			
3	360.4476	49.75	-14.57	35.18	46.00	-10.82	QP			
4	504.7062	44.54	-12.32	32.22	46.00	-13.78	QP			
5	696.8567	43.08	-9.00	34.08	46.00	-11.92	QP			
6	912.8620	38.75	-6.52	32.23	46.00	-13.77	QP			

Test Results (Above 1000MHz)

Test Mode: IEEE 802.11n(HT20)							
Test channel: Low CH							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
10360.00	31.33	23.81	55.14	68.20	-13.06	V	Peak
15540.00	32.54	28.68	61.22	68.20	-6.98	V	Peak
10360.00	31.54	23.81	55.35	68.20	-12.85	H	Peak
15540.00	32.68	28.68	61.36	68.20	-6.84	H	Peak
10360.00	20.590	23.81	44.40	54.00	-9.60	V	AVG
15540.00	21.553	28.68	50.23	54.00	-3.77	V	AVG
10360.00	20.726	23.81	44.54	54.00	-9.46	H	AVG
15540.00	21.427	28.68	50.11	54.00	-3.89	H	AVG
Test channel: Middle CH							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
10400.00	30.69	23.81	54.50	68.20	-13.70	V	Peak
15600.00	32.07	29.13	61.20	68.20	-7.00	V	Peak
10400.00	31.03	23.81	54.84	68.20	-13.36	H	Peak
15600.00	32.20	29.13	61.33	68.20	-6.87	H	Peak
10400.00	20.860	23.81	44.67	54.00	-9.33	V	AVG
15600.00	21.673	29.13	50.80	54.00	-3.20	V	AVG
10400.00	20.716	23.81	44.53	54.00	-9.47	H	AVG
15600.00	21.507	29.13	50.64	54.00	-3.36	H	AVG
Test channel: High CH							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
10480.00	30.26	23.80	54.06	68.20	-14.14	V	Peak
15720.00	31.55	30.03	61.58	68.20	-6.62	V	Peak
10480.00	30.67	23.80	54.47	68.20	-13.73	H	Peak
15720.00	31.11	30.03	61.14	68.20	-7.06	H	Peak
10480.00	19.53	23.80	43.33	54.00	-10.67	V	AVG
15720.00	20.43	30.03	50.46	54.00	-3.54	V	AVG
10480.00	19.93	23.80	43.73	54.00	-10.27	H	AVG
15720.00	20.30	30.03	50.33	54.00	-3.67	H	AVG

Remark:

1. During the test, pre-scan all the modes, and found the 802.11n(HT20) mode is worse case , the report only record this mode.
2. Result =Reading + Factor
3. Test frequency are from 1GHz to 40GHz, the amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

Radiated Band Edge: 5.2G&5.3G

Test Mode: IEEE 802.11a							
Test channel: Lowest							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
5150.00	36.81	15.99	52.80	68.20	-15.40	H	Peak
5150.00	38.85	15.99	54.84	68.20	-13.36	V	Peak
5150.00	26.79	15.99	42.78	54.00	-11.22	H	AVG
5150.00	28.80	15.99	44.79	54.00	-9.21	V	AVG
Test channel: Highest							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
5350.00	37.30	16.43	53.73	68.20	-14.47	H	Peak
5350.00	40.14	16.43	56.57	68.20	-11.63	V	Peak
5350.00	28.57	16.43	45.00	54.00	-9.00	H	AVG
5350.00	29.52	16.43	45.95	54.00	-8.05	V	AVG

Remark: 1. Result =Reading + Factor

Test Mode: IEEE 802.11n(HT20)							
Test channel: Lowest							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
5150.00	35.82	15.99	51.81	68.20	-16.39	H	Peak
5150.00	37.17	15.99	53.16	68.20	-15.05	V	Peak
5150.00	26.54	15.99	42.53	54.00	-11.47	H	AVG
5150.00	27.54	15.99	43.53	54.00	-10.47	V	AVG
Test channel: Highest							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
5350.00	37.61	16.43	54.04	68.20	-14.16	H	Peak
5350.00	38.68	16.43	55.11	68.20	-13.09	V	Peak
5350.00	27.63	16.43	44.06	54.00	-9.95	H	AVG
5350.00	29.03	16.43	45.46	54.00	-8.54	V	AVG

Remark: 1. Result =Reading + Factor

Test Mode: IEEE 802.11ac(VHT20)							
Test channel: Lowest							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
5150.00	36.73	15.99	52.72	68.20	-15.48	H	Peak
5150.00	38.45	15.99	54.44	68.20	-13.76	V	Peak
5150.00	26.45	15.99	42.44	54.00	-11.56	H	AVG
5150.00	28.58	15.99	44.57	54.00	-9.43	V	AVG
Test channel: Highest							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	Antenna Pol.	Detector
5350.00	37.77	16.43	54.20	68.20	-14.00	H	Peak
5350.00	38.03	16.43	54.46	68.20	-13.74	V	Peak
5350.00	27.65	16.43	44.08	54.00	-9.92	H	AVG
5350.00	28.15	16.43	44.58	54.00	-9.42	V	AVG

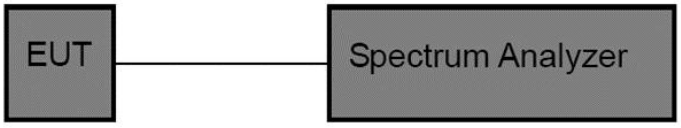
Remark: 1. Result =Reading + Factor

5. Maximum Conducted Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.407(a)	
Test Limit	5.15 - 5.25GHz	1) Outdoor AP The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if GTx>6dBi, then Pout =30-(GTx-6). e.i.r.p. at any elevation angle above 30 degrees≤125mW (21dBm) 2) Indoor AP The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if GTx>6dBi, then Pout =30-(GTx-6). 3) Point-to-point AP The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if GTx>23dBi, then Pout =30-(GTx-23). 4) Client devices The maximum conducted output power (Pout) shall not exceed the lesser of 250W (23.98dBm). if GTx>6dBi, then Pout =24-(GTx-6).
	5.25 - 5.35GHz	The maximum conducted output power (Pout) shall not exceed the lesser of 250mW (24dBm) or 11dBm+10 log B, where B is the 26dB emission bandwith in MHz. if GTx>6dBi, then Pout =24-(GTx-6).
	5.47- 5.725GHz	The maximum conducted output power (Pout) shall not exceed the lesser of 250mW (23.98dBm) or 11dBm+10 log B, where B is the 26dB emission bandwith in MHz. if GTx>6dBi, then Pout =24-(GTx-6).
	5.725 - 5.85GHz	1) Point-to-multipoint systems (P2M) The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if GTx>6dBi, then Pout =30-(GTx-6). 2) Point-to-point systems (P2P) The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm).

5.2. Test Setup



5.3. Test Procedure

1. Measure the duty cycle D of the transmitter output signal.
2. Set span to encompass the entire 99% OBW of the signal.

3. Set RBW = 1 MHz.
4. Set VBW ≥ [3 × RBW].
5. Number of points in sweep ≥ [2 × span / RBW].
6. Sweep time = auto.
7. Detector = RMS
8. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
9. Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
10. Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

5.4. Test Data

Pass

Please refer to Appendix C of the Appendix Test Data.

Additional test for duty cycle.

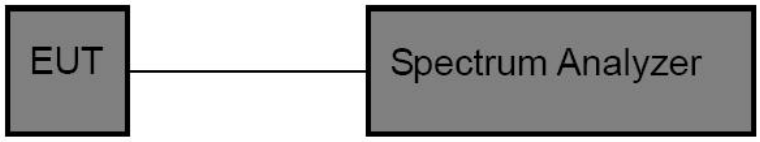
Please refer to Appendix B of the Appendix Test Data.

6. 26dB Bandwidth & 99% Occupied Bandwidth Test

6.1. Test Standard

Test Standard	FCC Part15 C Section 15.407(a) & 2.1049
Test Limit	N/A

6.2. Test Setup



6.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:

   26 dB &99%bandwidth
   RBW = approximately 1% of the emission bandwidth;
   Set the VBW＞RBW;
   Detector= Peak
   Trace mode= Max hold.
   Sweep- auto couple.
4. Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer.
5. Repeat until all the rest channels are investigated.

6.4. Test Data

Pass

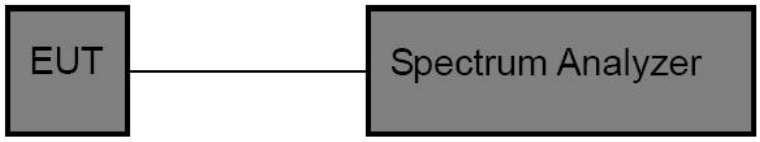
Please refer to Appendix A1&A2 of the Appendix Test Data.

7. Minimum 6dB Bandwidth Test

7.1. Test Standard

Test Standard	FCC Part15 C Section 15.407(e)
Test Limit	≥500 kHz

7.2. Test Setup



7.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

4. Set the spectrum analyzer as:

6 dB bandwidth
RBW = approximately 1% of the emission bandwidth;
Set the VBW＞RBW;
Detector= Peak
Trace mode= Max hold.
Sweep- auto couple.

4. Measure the maximum width of the emission that is 6dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer.

5. Repeat until all the rest channels are investigated.

7.4. Test Data

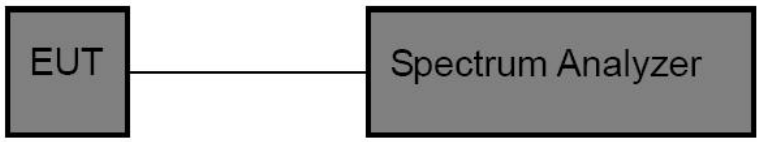
Not Applicable. This test only for 5.725-5.85GHz Band.

8. Maximum Power Spectral Density Test

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.407(a)	
Test Limit	5.15 - 5.25GHz	1) Outdoor AP The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz. if GTx>6dBi, then PSD =17-(GTx-6). 2) Indoor AP The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz. if GTx>6dBi, then PSD =17-(GTx-6). 3) Point-to-point AP The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz. if GTx>23dBi, then PSD =17-(GTx-23). 4) Client devices The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz. if GTx>6dBi, then PSD =11-(GTx-6).
	5.25 - 5.35GHz	The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz. if GTx>6dBi, then PSD =11-(GTx-6).
	5.47- 5.725GHz	The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz. if GTx>6dBi, then PSD =11-(GTx-6).
	5.725 - 5.85GHz	1) Point-to-multipoint systems (P2M) The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz. if GTx>6dBi, then PSD =30-(GTx-6). 2) Point-to-point systems (P2P) The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.

8.2. Test Setup



8.3. Test Procedure

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz).

1. The EUT is directly connected to the spectrum analyzer;

2. Set RBW =1MHz;

3. Set VBW ≥ 3 RBW=3MHz;

3. Set the span to encompass the entire emissions bandwidth (EBW) of the signal;

5. Detector=RMS;

6. Sweep time= auto couple;

7. Trace mode=max. hold;

8.4. Test Data

Pass

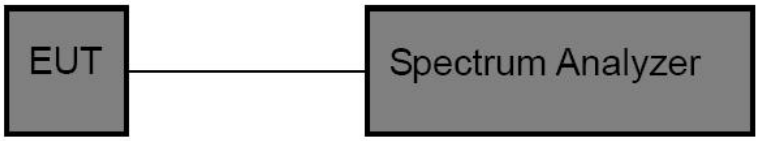
Please refer to Appendix D of the Appendix Test Data.

9. Conducted Band Edge Test

9.1. Test Standard and Limit

Test Standard	15.407(b)			
Test Limit	Operating Band	Frequency	EIRP Limit	Remark
	5150-5250MHz	Out of operation band	-27dBm/MHz	Peak
	5250-5350MHz	Out of operation band	-27dBm/MHz	Peak
	5470-5725MHz	Out of operation band	-27dBm/MHz	Peak
	5725-5850 MHz	Below 5.65GHz	-27dBm/MHz	Peak
		5.65GHz-5.7GHz	-27dBm/MHz to 10dBm/MHz	Peak
		5.7GHz-5.72GHz	10dBm/MHz to 15.6dBm/MHz	Peak
		5.72GHz-5.725GHz	15.6dBm/MHz to 27dBm/MHz	Peak
		5.85GHz-5.855GHz	27dBm/MHz to 15.6dBm/MHz	Peak
		5.855GHz-5.875GHz	15.6dBm/MHz to 10dBm/MHz	Peak
		5.875GHz-5.925GHz	10dBm/MHz to -27dBm/MHz	Peak
		Above 5.925GHz	-27dBm/MHz	Peak

9.2. Test Setup



9.3. Test Procedure

Using the following spectrum analyzer setting:

1. Set the RBW = 1MHz.
2. Set the VBW = 3MHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

9.4. Test Data

Pass

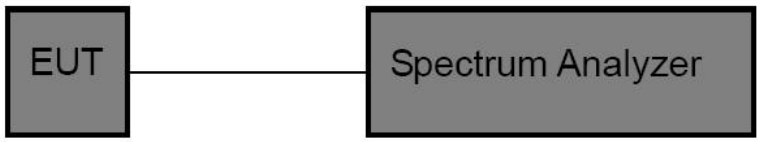
Please refer to Appendix E of the Appendix Test Data.

10. Frequency Stability

10.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.407(g)
Test Limit	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

10.2. Test Setup



10.3. Test Procedure

The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

10.4. Test Data

Pass

Please to see the following pages.

Test Mode: 5.2G							
Mode	TX Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit	Verdict
802.11a	SISO	5180	20	3.06	5180.06	5172 to 5188	Pass
				3.60	5180.10	5172 to 5188	Pass
				4.14	5180.08	5172 to 5188	Pass
			-30	3.60	5180.12	5172 to 5188	Pass
			-20	3.60	5180.12	5150 to 5250	Pass
			-10	3.60	5180.12	5150 to 5250	Pass
			0	3.60	5180.09	5150 to 5250	Pass
			10	3.60	5180.08	5150 to 5250	Pass
			30	3.60	5180.09	5150 to 5250	Pass
			40	3.60	5180.12	5150 to 5250	Pass
			50	3.60	5180.11	5172 to 5188	Pass
		5200	20	3.06	5200.12	5192 to 5208	Pass
				3.60	5200.02	5192 to 5208	Pass
				4.14	5200.05	5192 to 5208	Pass
			-30	3.60	5200.08	5192 to 5208	Pass
			-20	3.60	5200.03	5150 to 5250	Pass
			-10	3.60	5200.11	5150 to 5250	Pass
			0	3.60	5200.13	5150 to 5250	Pass
			10	3.60	5200.13	5150 to 5250	Pass
			30	3.60	5200.08	5150 to 5250	Pass
			40	3.60	5200.10	5150 to 5250	Pass
			50	3.60	5200.03	5192 to 5208	Pass
		5240	20	3.06	5240.00	5232 to 5248	Pass
				3.60	5240.03	5232 to 5248	Pass
				4.14	5240.07	5232 to 5248	Pass
			-30	3.60	5240.04	5232 to 5248	Pass
			-20	3.60	5240.03	5150 to 5250	Pass
			-10	3.60	5240.11	5150 to 5250	Pass
			0	3.60	5240.09	5150 to 5250	Pass
			10	3.60	5240.13	5150 to 5250	Pass
			30	3.60	5240.02	5150 to 5250	Pass
			40	3.60	5240.07	5150 to 5250	Pass
			50	3.60	5240.06	5232 to 5248	Pass
802.11n (HT20)	SISO	5180	20	3.06	5180.11	5172 to 5188	Pass
				3.60	5180.06	5172 to 5188	Pass
				4.14	5180.13	5172 to 5188	Pass
			-30	3.60	5180.02	5172 to 5188	Pass
			-20	3.60	5180.13	5150 to 5250	Pass
			-10	3.60	5180.10	5150 to 5250	Pass
			0	3.60	5180.09	5150 to 5250	Pass
			10	3.60	5180.13	5150 to 5250	Pass
			30	3.60	5180.08	5150 to 5250	Pass
			40	3.60	5180.07	5150 to 5250	Pass
			50	3.60	5180.09	5172 to 5188	Pass
		5200	20	3.06	5200.11	5192 to 5208	Pass
				3.60	5200.04	5192 to 5208	Pass
				4.14	5200.11	5192 to 5208	Pass
			-30	3.60	5200.07	5192 to 5208	Pass
			-20	3.60	5200.07	5150 to 5250	Pass
			-10	3.60	5200.10	5150 to 5250	Pass
			0	3.60	5200.02	5150 to 5250	Pass
			10	3.60	5200.03	5150 to 5250	Pass
			30	3.60	5200.02	5150 to 5250	Pass
			40	3.60	5200.07	5150 to 5250	Pass
			50	3.60	5200.07	5192 to 5208	Pass
		5240	20	3.06	5240.03	5232 to 5248	Pass

				3.60	5240.12	5232 to 5248	Pass
				4.14	5240.08	5232 to 5248	Pass
			-30	3.60	5240.02	5232 to 5248	Pass
			-20	3.60	5240.07	5150 to 5250	Pass
			-10	3.60	5240.05	5150 to 5250	Pass
			0	3.60	5240.10	5150 to 5250	Pass
			10	3.60	5240.11	5150 to 5250	Pass
			30	3.60	5240.13	5150 to 5250	Pass
			40	3.60	5240.10	5150 to 5250	Pass
			50	3.60	5240.11	5232 to 5248	Pass
802.11ac (VHT20)	SISO	5180	20	3.06	5180.11	5172 to 5188	Pass
				3.60	5180.07	5172 to 5188	Pass
				4.14	5180.05	5172 to 5188	Pass
			-30	3.60	5180.05	5172 to 5188	Pass
			-20	3.60	5180.08	5150 to 5250	Pass
			-10	3.60	5180.12	5150 to 5250	Pass
			0	3.60	5180.12	5150 to 5250	Pass
			10	3.60	5180.11	5150 to 5250	Pass
			30	3.60	5180.01	5150 to 5250	Pass
			40	3.60	5180.07	5150 to 5250	Pass
			50	3.60	5180.11	5172 to 5188	Pass
		5200	20	3.06	5200.06	5192 to 5208	Pass
				3.60	5200.09	5192 to 5208	Pass
				4.14	5200.11	5192 to 5208	Pass
			-30	3.60	5200.01	5192 to 5208	Pass
			-20	3.60	5200.09	5150 to 5250	Pass
			-10	3.60	5200.00	5150 to 5250	Pass
			0	3.60	5200.02	5150 to 5250	Pass
			10	3.60	5200.00	5150 to 5250	Pass
			30	3.60	5200.07	5150 to 5250	Pass
			40	3.60	5200.04	5150 to 5250	Pass
			50	3.60	5200.10	5192 to 5208	Pass
		5240	20	3.06	5240.10	5232 to 5248	Pass
				3.60	5240.07	5232 to 5248	Pass
				4.14	5240.11	5232 to 5248	Pass
			-30	3.60	5240.09	5232 to 5248	Pass
			-20	3.60	5240.09	5150 to 5250	Pass
			-10	3.60	5240.01	5150 to 5250	Pass
			0	3.60	5240.04	5150 to 5250	Pass
			10	3.60	5240.01	5150 to 5250	Pass
			30	3.60	5240.11	5150 to 5250	Pass
			40	3.60	5240.10	5150 to 5250	Pass
			50	3.60	5240.09	5232 to 5248	Pass

Test Mode: 5.3G							
Mode	TX Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit	Verdict
802.11a	SISO	5260	20	3.06	5260.13	5252 to 5268	Pass
				3.60	5260.05	5252 to 5268	Pass
				4.14	5260.07	5252 to 5268	Pass
			-30	3.06	5260.03	5252 to 5268	Pass
			-20	3.60	5260.05	5250 to 5350	Pass
			-10	3.60	5260.06	5250 to 5350	Pass
			0	3.60	5260.10	5250 to 5350	Pass
			10	3.60	5260.11	5250 to 5350	Pass
			30	3.60	5260.06	5250 to 5350	Pass
			40	3.60	5260.03	5250 to 5350	Pass
			50	3.60	5260.10	5252 to 5268	Pass
		5300	20	3.06	5300.10	5292 to 5308	Pass
				3.60	5300.03	5292 to 5308	Pass
				4.14	5300.11	5292 to 5308	Pass
			-30	3.06	5300.04	5292 to 5308	Pass
			-20	3.60	5300.09	5250 to 5350	Pass
			-10	3.60	5300.08	5250 to 5350	Pass
			0	3.60	5300.01	5250 to 5350	Pass
			10	3.60	5300.01	5250 to 5350	Pass
			30	3.60	5300.08	5250 to 5350	Pass
			40	3.60	5300.01	5250 to 5350	Pass
			50	3.60	5300.01	5292 to 5308	Pass
		5320	20	3.06	5320.12	5312 to 5328	Pass
				3.60	5320.06	5312 to 5328	Pass
				4.14	5320.05	5312 to 5328	Pass
			-30	3.06	5320.03	5312 to 5328	Pass
			-20	3.60	5320.08	5250 to 5350	Pass
			-10	3.60	5320.02	5250 to 5350	Pass
			0	3.60	5320.10	5250 to 5350	Pass
			10	3.60	5320.04	5250 to 5350	Pass
			30	3.60	5320.06	5250 to 5350	Pass
			40	3.60	5320.08	5250 to 5350	Pass
			50	3.60	5320.05	5312 to 5328	Pass
802.11n (HT20)	SISO	5260	20	3.06	5260.13	5252 to 5268	Pass
				3.60	5260.03	5252 to 5268	Pass
				4.14	5260.01	5252 to 5268	Pass
			-30	3.06	5260.09	5252 to 5268	Pass
			-20	3.60	5260.12	5250 to 5350	Pass
			-10	3.60	5260.00	5250 to 5350	Pass
			0	3.60	5260.02	5250 to 5350	Pass
			10	3.60	5260.08	5250 to 5350	Pass
			30	3.60	5260.09	5250 to 5350	Pass
			40	3.60	5260.06	5250 to 5350	Pass
			50	3.60	5260.08	5252 to 5268	Pass
		5300	20	3.06	5300.04	5292 to 5308	Pass
				3.60	5300.12	5292 to 5308	Pass
				4.14	5300.02	5292 to 5308	Pass
			-30	3.06	5300.04	5292 to 5308	Pass
			-20	3.60	5300.05	5250 to 5350	Pass
			-10	3.60	5300.09	5250 to 5350	Pass
			0	3.60	5300.10	5250 to 5350	Pass
			10	3.60	5300.12	5250 to 5350	Pass
			30	3.60	5300.06	5250 to 5350	Pass
			40	3.60	5300.03	5250 to 5350	Pass
			50	3.60	5300.06	5292 to 5308	Pass

		5320	20	3.06	5320.08	5312 to 5328	Pass
				3.60	5320.07	5312 to 5328	Pass
				4.14	5320.03	5312 to 5328	Pass
			-30	3.06	5320.10	5312 to 5328	Pass
			-20	3.60	5320.05	5250 to 5350	Pass
			-10	3.60	5320.10	5250 to 5350	Pass
			0	3.60	5320.06	5250 to 5350	Pass
			10	3.60	5320.03	5250 to 5350	Pass
			30	3.60	5320.04	5250 to 5350	Pass
			40	3.60	5320.10	5250 to 5350	Pass
			50	3.60	5320.03	5312 to 5328	Pass
802.11ac (VHT20)	SISO	5260	20	3.06	5260.09	5252 to 5268	Pass
				3.60	5260.02	5252 to 5268	Pass
				4.14	5260.11	5252 to 5268	Pass
			-30	3.06	5260.02	5252 to 5268	Pass
			-20	3.60	5260.05	5250 to 5350	Pass
			-10	3.60	5260.03	5250 to 5350	Pass
			0	3.60	5260.07	5250 to 5350	Pass
			10	3.60	5260.11	5250 to 5350	Pass
			30	3.60	5260.05	5250 to 5350	Pass
			40	3.60	5260.08	5250 to 5350	Pass
			50	3.60	5260.06	5252 to 5268	Pass
		5300	20	3.06	5300.08	5292 to 5308	Pass
				3.60	5300.11	5292 to 5308	Pass
				4.14	5300.06	5292 to 5308	Pass
			-30	3.06	5300.03	5292 to 5308	Pass
			-20	3.60	5300.04	5250 to 5350	Pass
			-10	3.60	5300.13	5250 to 5350	Pass
			0	3.60	5300.09	5250 to 5350	Pass
			10	3.60	5300.01	5250 to 5350	Pass
			30	3.60	5300.04	5250 to 5350	Pass
			40	3.60	5300.05	5250 to 5350	Pass
			50	3.60	5300.08	5292 to 5308	Pass
		5320	20	3.06	5320.02	5312 to 5328	Pass
				3.60	5320.07	5312 to 5328	Pass
				4.14	5320.02	5312 to 5328	Pass
			-30	3.06	5320.05	5312 to 5328	Pass
			-20	3.60	5320.11	5250 to 5350	Pass
			-10	3.60	5320.05	5250 to 5350	Pass
			0	3.60	5320.01	5250 to 5350	Pass
			10	3.60	5320.05	5250 to 5350	Pass
			30	3.60	5320.09	5250 to 5350	Pass
			40	3.60	5320.07	5250 to 5350	Pass
			50	3.60	5320.08	5312 to 5328	Pass

11. DFS Detection Thresholds

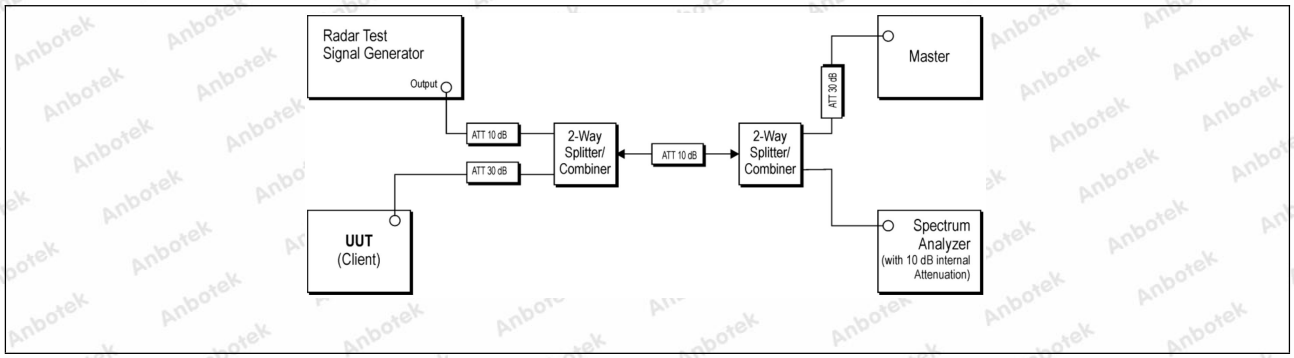
Test Requirement:	KDB 905462 D02, Clause 5.2 Table 3
Test Limit:	Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Test Method:	KDB 905462 D02, Clause 7.4.1.1
Procedure:	1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master 2) The interference Radar Detection Threshold Level is TH+ 0dBi +1dB that had been taken into account the output power range and antenna gain. 3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process, there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB. 4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was TH + 0dBi +1dB = -63dBm. Capture the spectrum analyzer plots on short pulse radar waveform. Note: TH=-64 dBm or -62 dBm

11.1. Test Setup



11.2. Test Data

Pass

Please refer to Appendix F of the Appendix Test Data.

12. Channel Move Time, Channel Closing Transmission Time

Test Requirement:	47 CFR Part 15.407(h)(2)(iii)
Test Limit:	Channel Move Time: within 10 seconds Channel Closing Transmission Time: 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. (The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.)
Test Method:	KDB 905462 D02, Clause 7.8.3
Procedure:	The steps below define the procedure to determine the above-mentioned parameters when a radar *Burst* with a level equal to the *DFS Detection Threshold* + 1dB is generated on the *Operating Channel* of the U-NII device *(In- Service Monitoring).* 1. One frequency will be chosen from the *Operating Channels* of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected. 2. In case the UUT is a U-NII device operating as a *Client Device* (with or without DFS), a U-NII device operating as a *Master Device* will be used to allow the UUT (Client device) to *Associate* with the *Master Device*. In case the UUT is a *Master Device*, a U-NII device operating as a *Client Device* will be used and it is assumed that the Client will *Associate* with the UUT (Master). In both cases for conducted tests, the *Radar Waveform* generator will be connected to the *Master Device*. For radiated tests, the emissions of the *Radar Waveform* generator will be directed towards the *Master Device*. If the *Master Device* has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing. 3. Stream the channel loading test file from the *Master Device* to the *Client Device* on the test *Channel* for the entire period of the test. 4. At time T0 the *Radar Waveform* generator sends a *Burst* of pulses for one of the Radar Type 0 in **Table 5** at levels defined in **Table 3**, on the *Operating Channel*. An additional 1 dB is added to the radar test signal to ensure it is at or above the *DFS Detection Threshold*, accounting for equipment variations/errors. 5. Observe the transmissions of the UUT at the end of the radar *Burst* on the

Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (*Channel Move Time)*. Measure and record the *Channel Move Time* and *Channel Closing Transmission Time* if radar detection occurs. **Figure 17** illustrates *Channel Closing Transmission Time.*

6. When operating as a *Master Device*, monitor the UUT for more than 30 minutes following instant T2 to verify that the UUT does not resume any transmissions on this *Channel.* Perform this test once and record the measurement result.

7. In case the UUT is a U-NII device operating as a *Client Device* with *In-Service Monitoring*, perform steps 1 to 6.

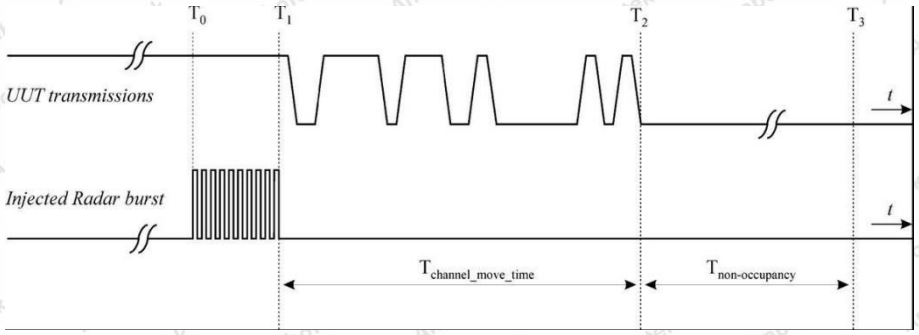
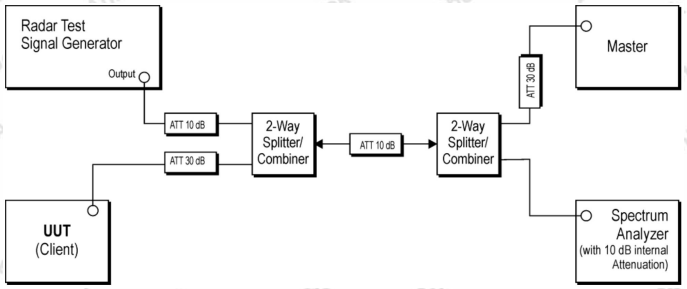


Figure 17: Example of Channel Closing Transmission Time & Channel Closing Time

7. The time for the EUT to fully restart up is 65s.

12.1. Test Setup



12.2. Test Data

Pass

Please refer to Appendix G of the Appendix Test Data.

13. Antenna Requirement

13.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /15.407
Requirement	1) 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.407 requirement: if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

13.2. Antenna Connected Construction

The antenna is a FPC antenna which permanently attached, and the best case gain of the Wi-Fi 5.2G: 2.02dBi; Wi-Fi 5.3G: 1.35dBi. It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_RF_RF

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

---------- End of Report ----------