FCC REPORT

Applicant:	Quantum Creations LLC.
Address of Applicant:	15705 NW 13th Ave, Miami Gardens, Miami Beach, Florida 33169, United States
Manufacturer/Factory:	MELE TECHNOLOGIES(SHENZHEN) CO.,LTD
Address of Manufacturer/Factory:	1F, Bldg#2, 28 Cuijing Road, Pingshan District, Shenzhen, PR China.

Equipment Under Test (EUT)

Product Name:	Access 3
Model No.:	A-1198-AA3, A-1198-AA3-1, A-1198-AA3-2, A-1198-AA3-3, A-1198-AA3-4, A-1198-AA3-5, A-1198-AA3-6, A-1198-AA3-7, A-1198-AA3-8, A-1198-AA3-9
Trade Mark:	AZULLE
FCC ID:	2AFJI20181198
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	August 28, 2018
Date of Test:	August 28-September 07, 2018
Date of report issue:	September 07, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*September 07, 2018*	*Original*

Prepared By: *Tiger Chen* ***Date:*** *September 07, 2018*

Project Engineer

Check By: *Robinson Lo* ***Date:*** *September 07, 2018*

Reviewer

3 Contents

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	PASS
AC Power Line Conducted Emission	15.207	PASS
Peak Transmit Power	15.407(a)(1)	PASS
Power Spectral Density	15.407(a)(1)	PASS
Undesirable Emission	15.407(b)(6), 15.205/15.209	PASS
Radiated Emission	15.205/15.209	PASS
Band Edge	15.407(b)(1)	PASS
Frequency Stability	15.407(g)	PASS

Remark:

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 40GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			
Remark: Test according to ANSI C63.10:2013 and ANSI C63.4:2014			

5 General Information

5.1 General Description of EUT

Product Name:	Access 3
Model No.:	A-1198-AA3, A-1198-AA3-1, A-1198-AA3-2, A-1198-AA3-3, A-1198-AA3-4, A-1198-AA3-5, A-1198-AA3-6, A-1198-AA3-7, A-1198-AA3-8, A-1198-AA3-9
Test Model No:	A-1198-AA3
Serial No.:	000001
Test sample(s) ID:	GTS201808000194-1
Sample(s) Status:	Engineer sample
Hardware Version:	V1.1
Software Version:	V1.1
Operation Frequency:	802.11a/802.11n(HT20)/802.11ac(HT20): 5180MHz ~ 5240MHz; 802.11n(HT40)/ 802.11ac(HT40): 5190MHz ~ 5230MHz 802.11ac(HT80): 5210MHz
Channel numbers:	802.11a/802.11n(HT20)/802.11ac(HT20): 4; 802.11n(HT40)/ 802.11ac(HT40): 2 802.11ac(HT80): 1
Channel separation:	802.11a/802.11n(HT20)/802.11ac(HT20): 20MHz; 802.11n(HT40)/ 802.11ac(HT40): 40MHz 802.11ac(HT80): 80MHz
Modulation technology:	OFDM
Antenna Type:	Integral Antenna
Antenna gain:	2dBi (declare by manufacturer)
Power supply:	SWITCHING ADAPTOR Model No.: FJ-SW0503000N Input: AC 100-240V, 50/60Hz, 0.6A Max Output: DC 5V, 3000mA

Operation Frequency each of channel @ 5G Band							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz
38	5190MHz	42	5210MHz	46	5230MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)		
	5G Band		
	802.11 a/n(HT20)/ac(HT20)	802.11 n(HT40)/ac(HT40)	802.11 ac(HT80)
Lowest channel	5180MHz	5190MHz	---
Middle channel	5200MHz	---	5210
Highest channel	5240MHz	5230MHz	---

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation. EUT was test with max duty cycle at its maximum power control level.
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

5.3 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. Has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

5.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.5 Description of Support Units

None.

5.6 Deviation from Standards

None.

5.7 Additional Instructions

EUT Fixed Frequency Settings:

Special test software was pre-built-in by manufacturer.			
Mode	Channel	Frequency (MHz)	Level Set
OFDM	CH36	5180	TX level : default
	CH38	5190	
	CH40	5200	
	CH42	5210	
	CH44	5220	
	CH46	5230	
	CH48	5240	

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019

Conducted:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 27 2018	June. 26 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 27 2018	June. 26 2019
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 27 2018	June. 26 2019
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 27 2018	June. 26 2019
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 27 2018	June. 26 2019
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 27 2018	June. 26 2019
8	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
9	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 27 2018	June. 26 2019

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

7 Test results and Measurement Data

7.1 Antenna requirement:

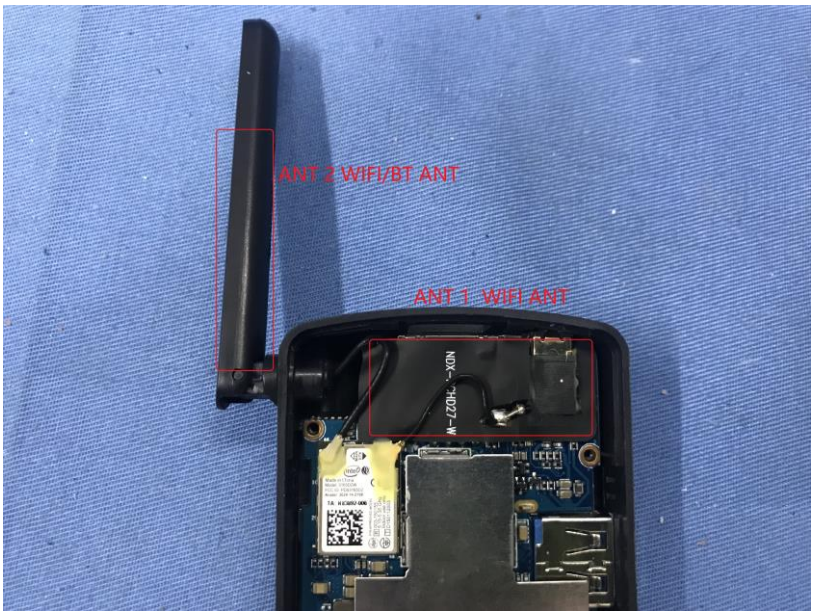
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

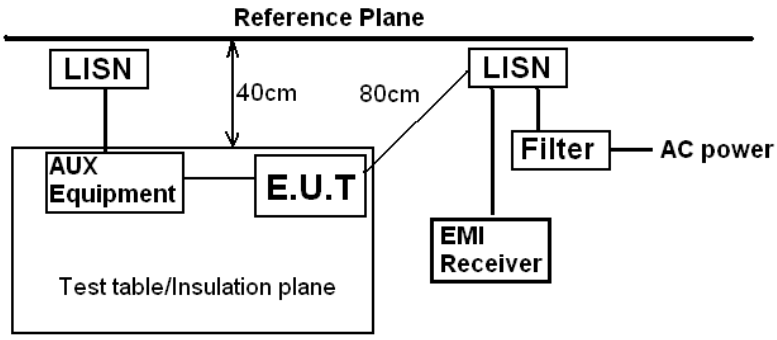
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

E.U.T Antenna:	

The antenna is integral antenna, the best case gain of the main antenna is 2dBi



7.2 Conducted Emissions

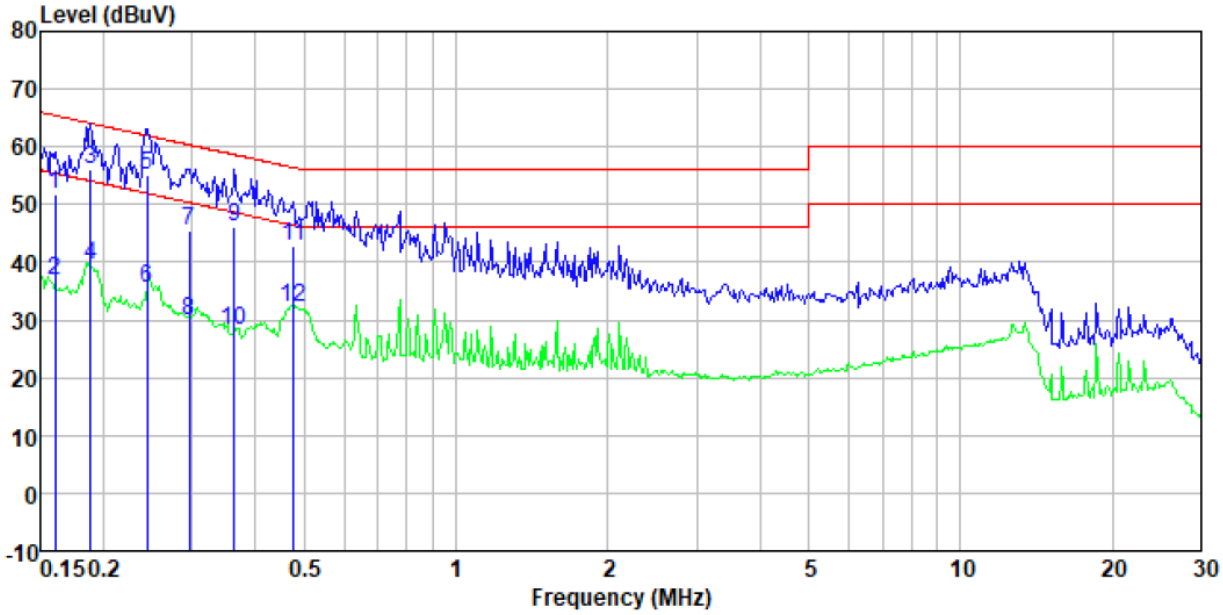
<table>
<tr><td>Test Requirement:</td><td colspan="6">FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td colspan="6">ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="6">150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td colspan="6">Class B</td></tr>
<tr><td>Receiver setup:</td><td colspan="6">RBW=9KHz, VBW=30KHz</td></tr>
<tr><td>Limit:</td><td colspan="6"><table><tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr><tr><td>Quasi-peak</td><td>Average</td></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>* Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test procedure</td><td colspan="6">The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</td></tr>
<tr><td>Test setup:</td><td colspan="6"> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test environment:</td><td>Temp.:</td><td>25 °C</td><td>Humid.:</td><td>52%</td><td>Press.:</td><td>1 012mbar</td></tr>
<tr><td>Test Instruments:</td><td colspan="6">Refer to section 6.0 for details</td></tr>
<tr><td>Test mode:</td><td colspan="6">Refer to section 5.2 for details</td></tr>
<tr><td>Test voltage:</td><td colspan="6">AC120V 60Hz</td></tr>
<tr><td>Test results:</td><td colspan="6">Pass</td></tr>
</table>

Measurement Data

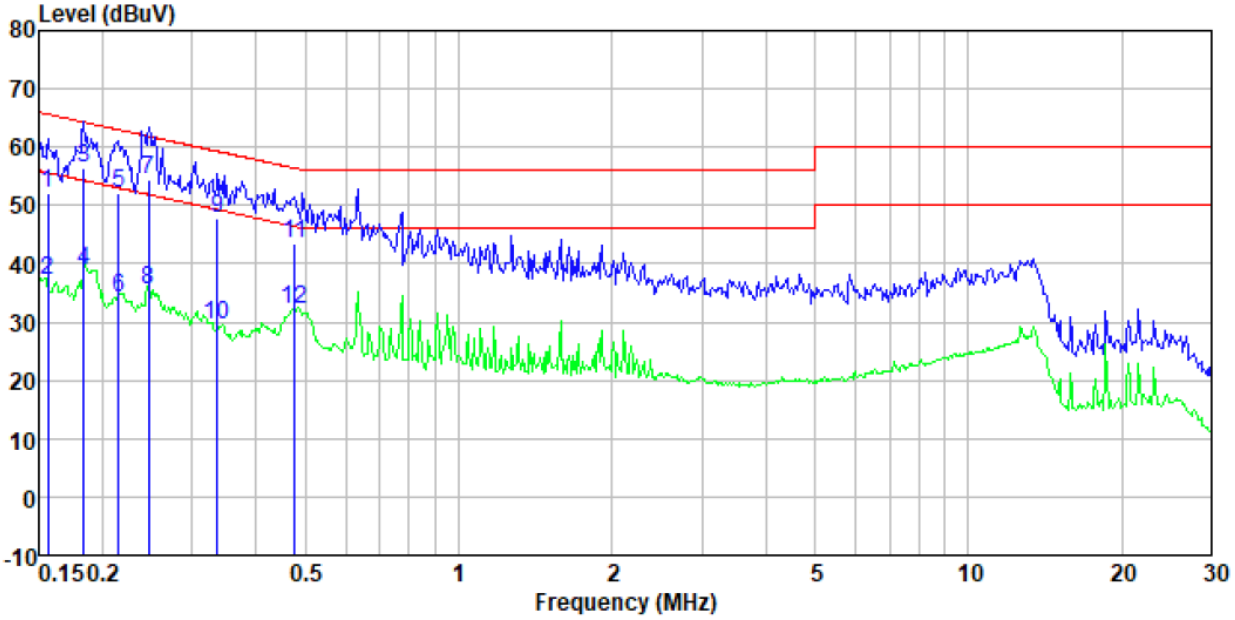
An initial pre-scan was performed on the line and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Test mode:	WiFi mode	Probe:	Line



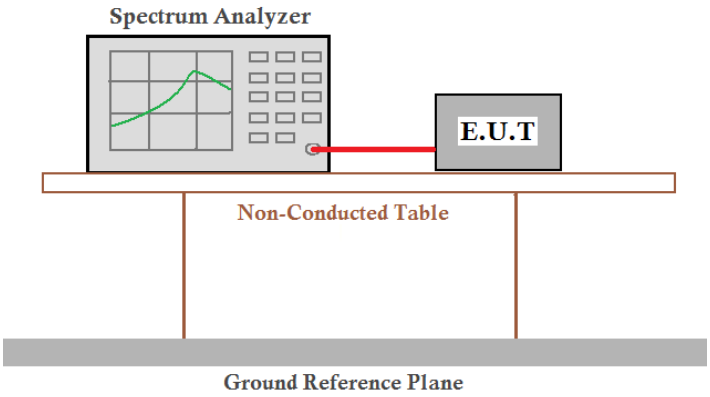
Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dBuV	dBuV	dB	
0.16	51.17	0.40	0.08	51.65	65.43	-13.78	QP
0.16	36.22	0.40	0.08	36.70	55.43	-18.73	Average
0.19	55.60	0.40	0.10	56.10	64.11	-8.01	QP
0.19	38.88	0.40	0.10	39.38	54.11	-14.73	Average
0.24	54.51	0.40	0.11	55.02	61.95	-6.93	QP
0.24	34.98	0.40	0.11	35.49	51.95	-16.46	Average
0.30	45.00	0.40	0.10	45.50	60.37	-14.87	QP
0.30	29.46	0.40	0.10	29.96	50.37	-20.41	Average
0.36	45.73	0.37	0.10	46.20	58.65	-12.45	QP
0.36	27.84	0.37	0.10	28.31	48.65	-20.34	Average
0.48	42.51	0.32	0.11	42.94	56.41	-13.47	QP
0.48	31.90	0.32	0.11	32.33	46.41	-14.08	Average

Test mode:	WiFi mode	Probe:	Neutral



Freq	Reading level	LISN/ISN factor	Cable loss	Level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dBuV	dBuV	dB	
0.16	51.59	0.40	0.08	52.07	65.65	-13.58	QP
0.16	36.56	0.40	0.08	37.04	55.65	-18.61	Average
0.18	55.84	0.40	0.10	56.34	64.33	-7.99	QP
0.18	38.31	0.40	0.10	38.81	54.33	-15.52	Average
0.22	51.59	0.40	0.11	52.10	63.01	-10.91	QP
0.22	33.53	0.40	0.11	34.04	53.01	-18.97	Average
0.25	54.04	0.40	0.10	54.54	61.86	-7.32	QP
0.25	35.15	0.40	0.10	35.65	51.86	-16.21	Average
0.34	47.24	0.38	0.10	47.72	59.31	-11.59	QP
0.34	28.94	0.38	0.10	29.42	49.31	-19.89	Average
0.48	43.08	0.32	0.11	43.51	56.41	-12.90	QP
0.48	31.78	0.32	0.11	32.21	46.41	-14.20	Average

7.3 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	N/A
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data:

ANT:1

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Occupied Bandwidth (MHz)		
		802.11a	802.11n(HT20)	802.11ac(HT20)	802.11a	802.11n(HT20)	802.11ac(HT20)
36	5180.00	16.603	17.664	17.687	25.329	23.800	22.383
40	5200.00	16.632	17.664	17.666	25.766	25.176	22.393
48	5240.00	16.415	17.831	17.835	20.547	27.771	28.243

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(HT40)	802.11n(HT40)	802.11ac(HT40)
38	5190.00	36.091	36.094	49.257	46.596
46	5230.00	36.118	36.136	45.624	50.367

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
		802.11ac(HT80)	802.11ac(HT80)
42	5210.00	75.013	80.069

ANT:2

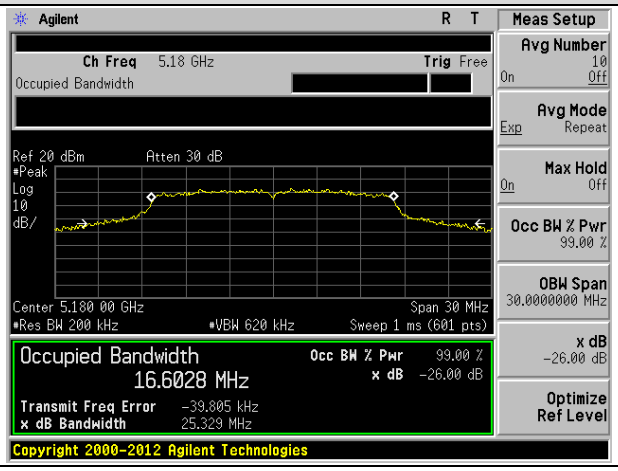
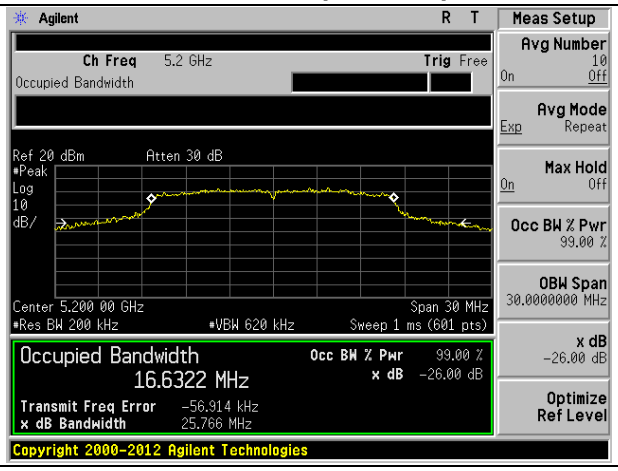
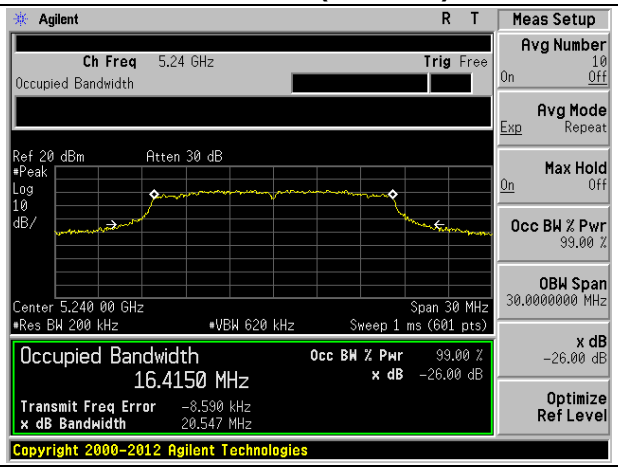
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Occupied Bandwidth (MHz)		
		802.11a	802.11n(HT20)	802.11ac(HT20)	802.11a	802.11n(HT20)	802.11ac(HT20)
36	5180.00	16.540	17.682	17.676	23.886	23.380	23.929
40	5200.00	16.568	17.697	17.671	24.177	23.087	22.967
48	5240.00	16.417	17.829	17.803	20.530	26.252	29.060

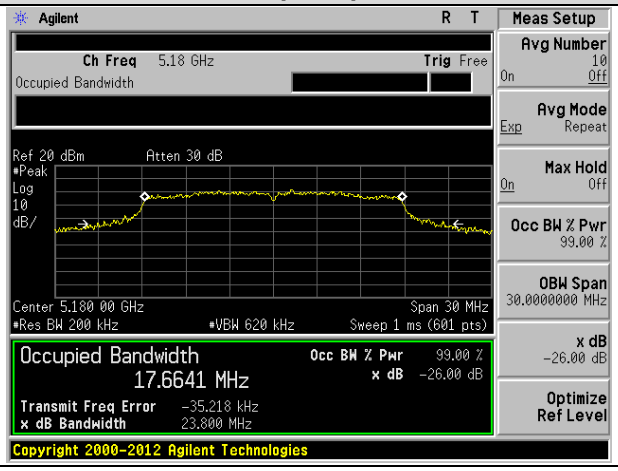
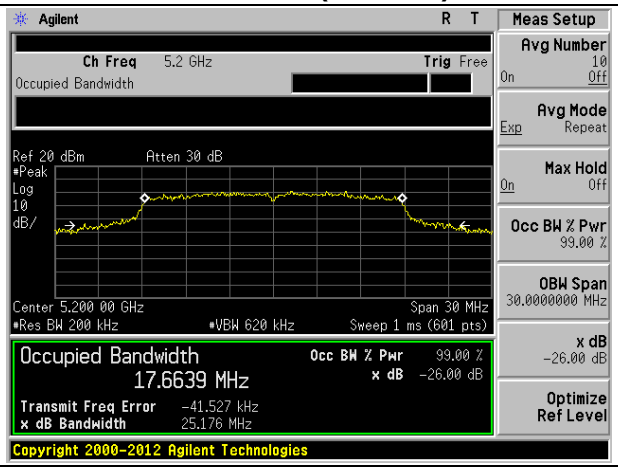
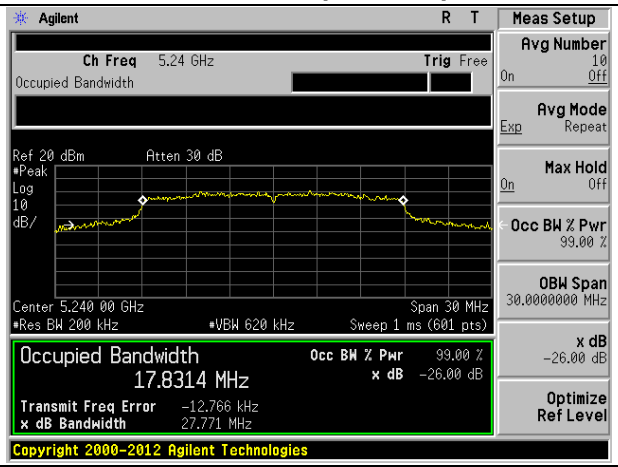
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(HT40)	802.11n(HT40)	802.11ac(HT40)
38	5190.00	36.070	36.105	46.108	46.506
46	5230.00	36.133	36.102	47.857	48.066

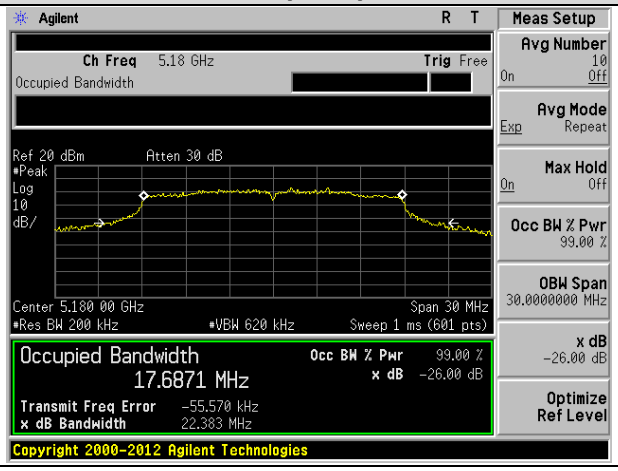
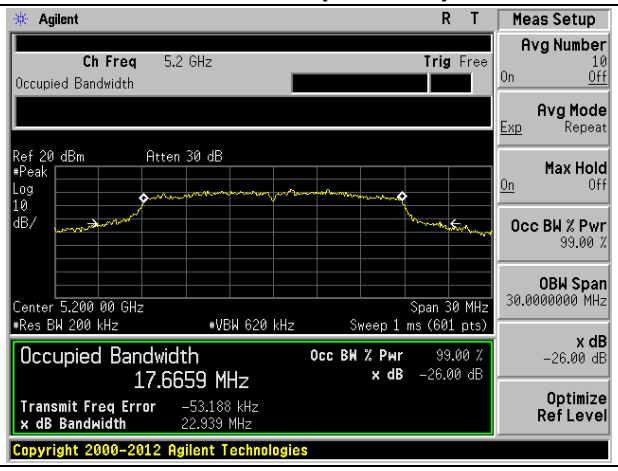
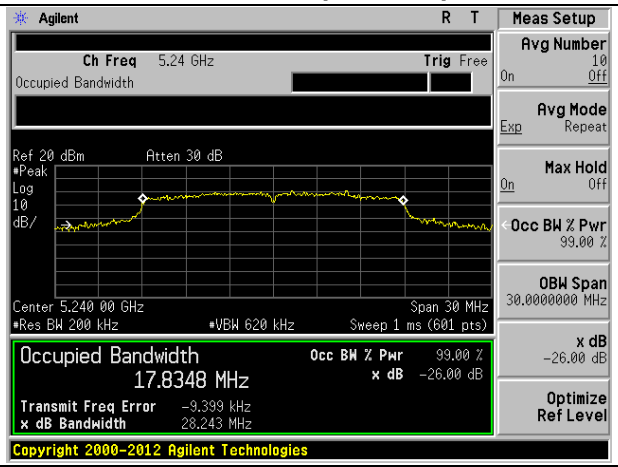
CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
		802.11ac(HT80)	802.11ac(HT80)
42	5210.00	75.144	80.344

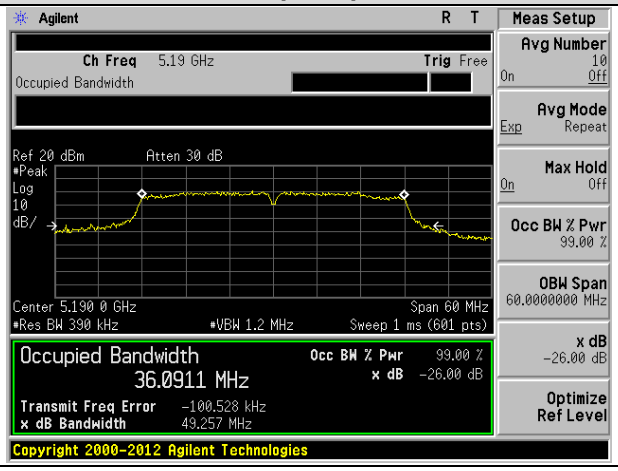
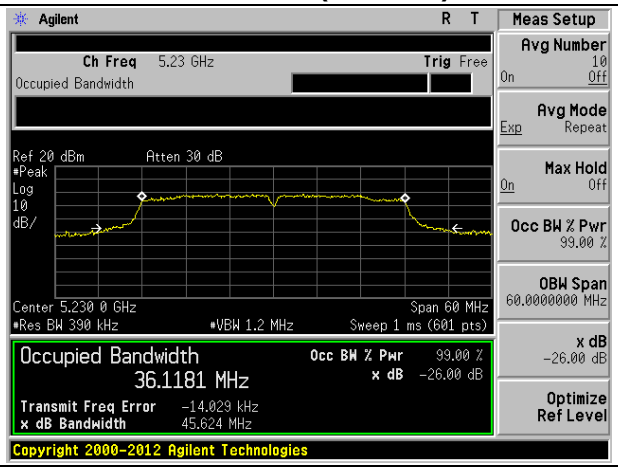
Test plots as followed:

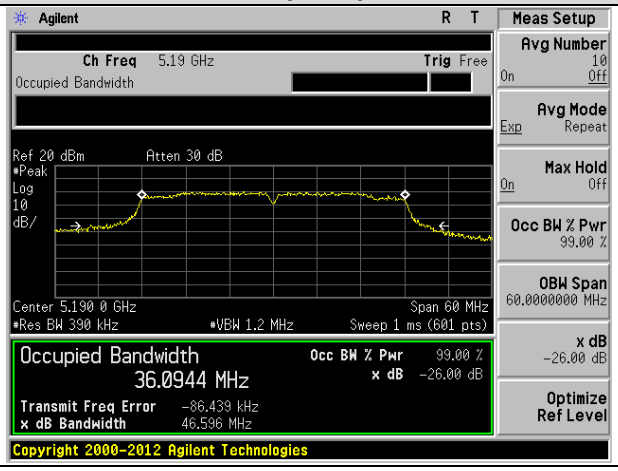
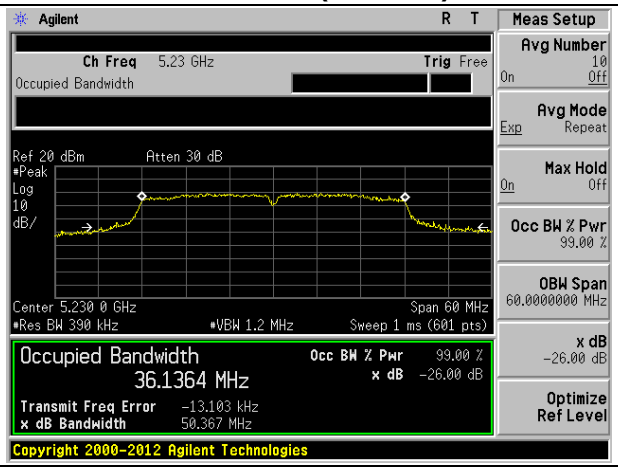
ANT:1

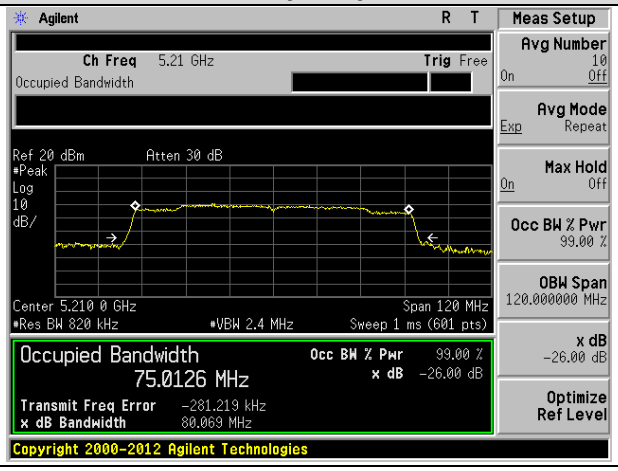
802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

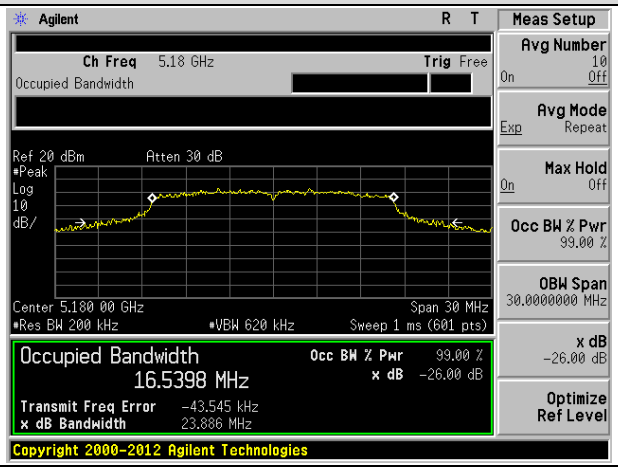
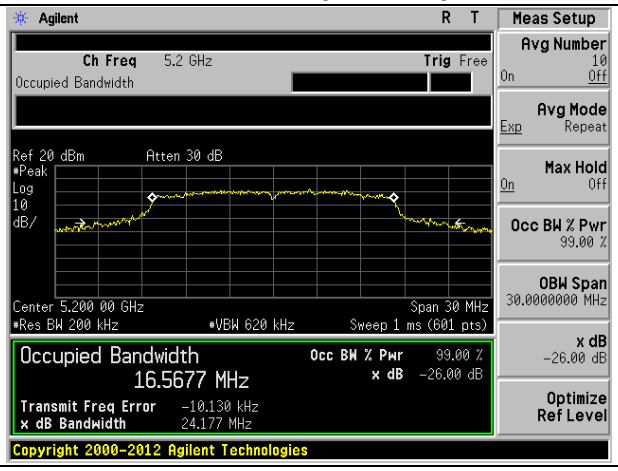
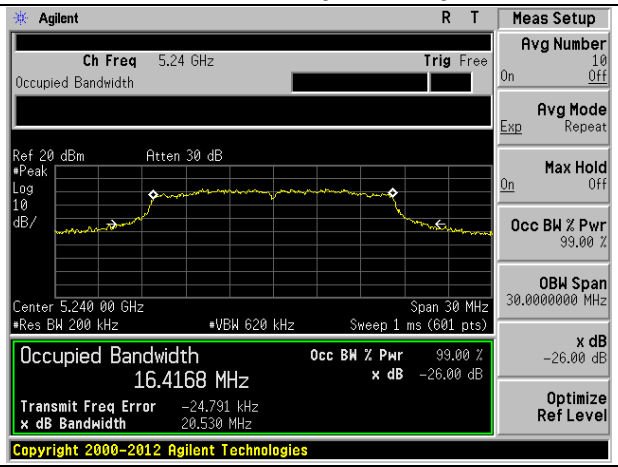
802.11ac(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

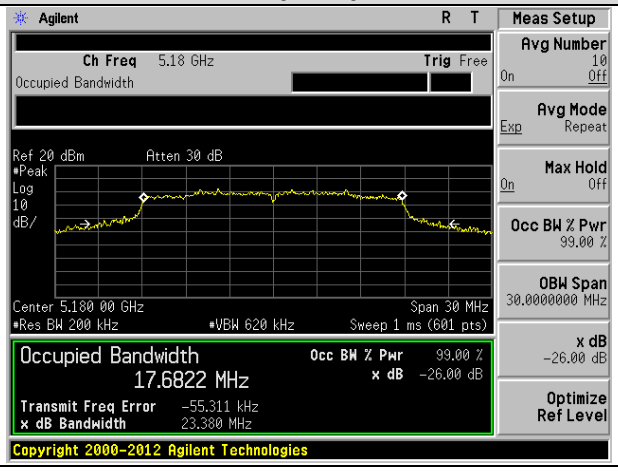
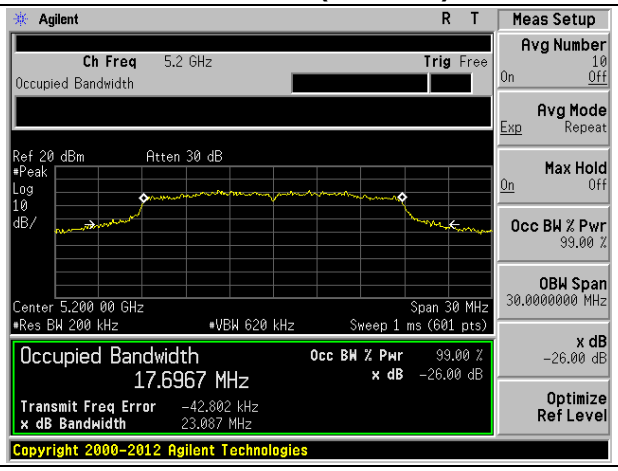
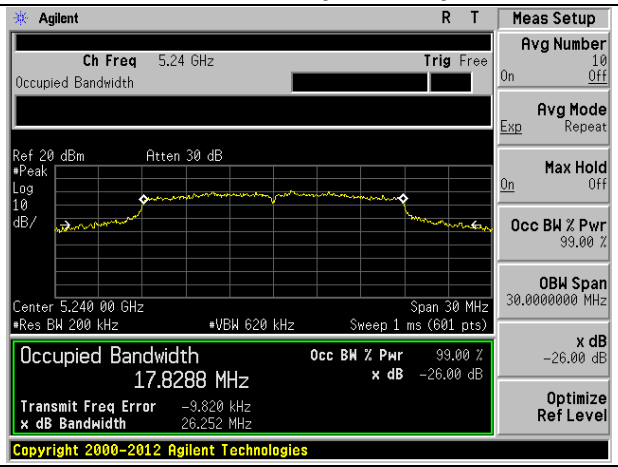
802.11n(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

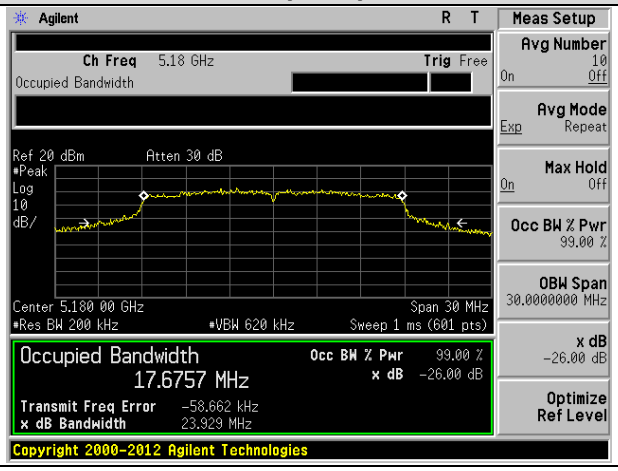
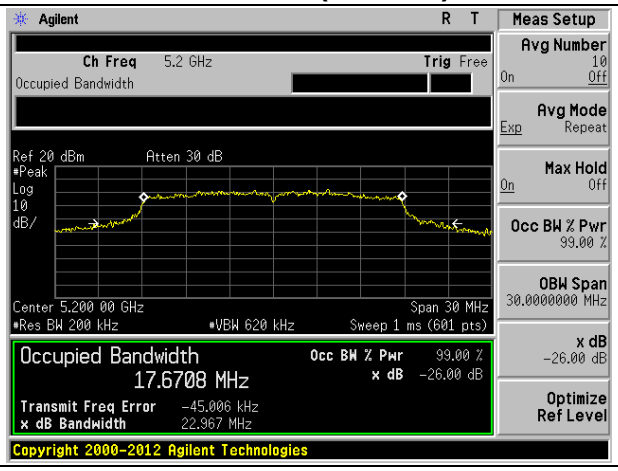
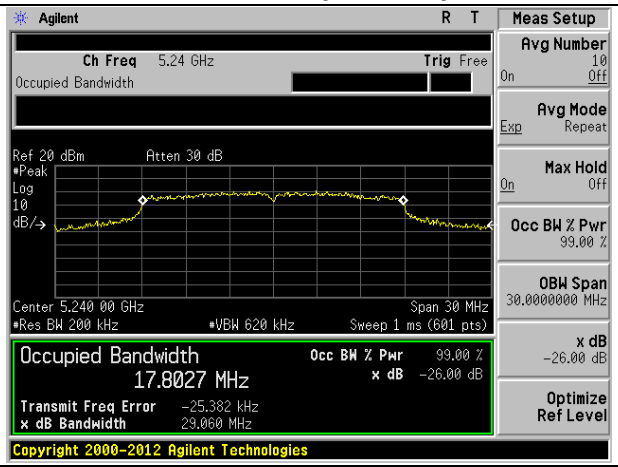
802.11ac(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

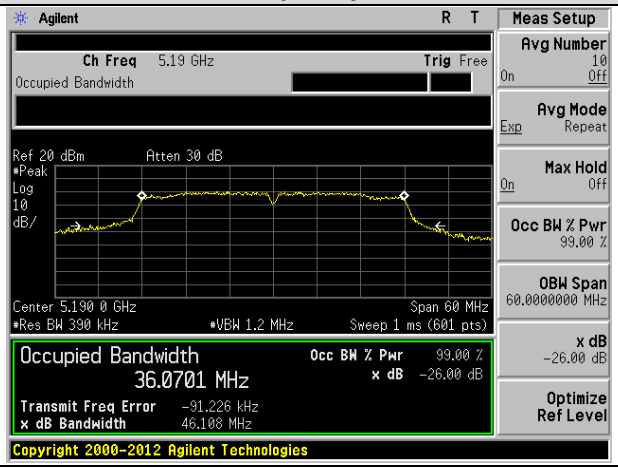
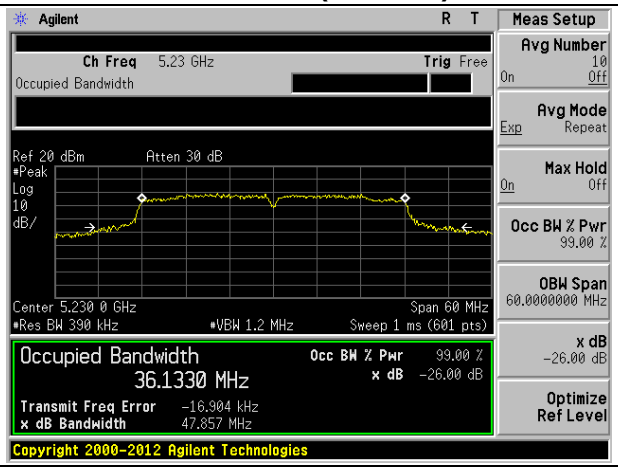
802.11ac(HT80) mode

Channel 40 (5210MHz)

ANT:2

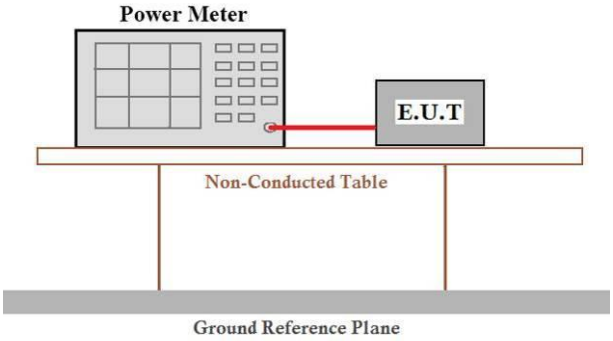
802.11a mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11ac(HT20) mode

Channel 36 (5180MHz)

Channel 40 (5200MHz)

Channel 48 (5240MHz)

802.11n(HT40) mode

Channel 38 (5190MHz)

Channel 46 (5230MHz)

7.4 Peak Transmit Power

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 250mW.
Test setup:	
Test procedure:	**Measurement using an RF average power meter** (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle. b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level. c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five. (ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B). (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter. (iv) Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

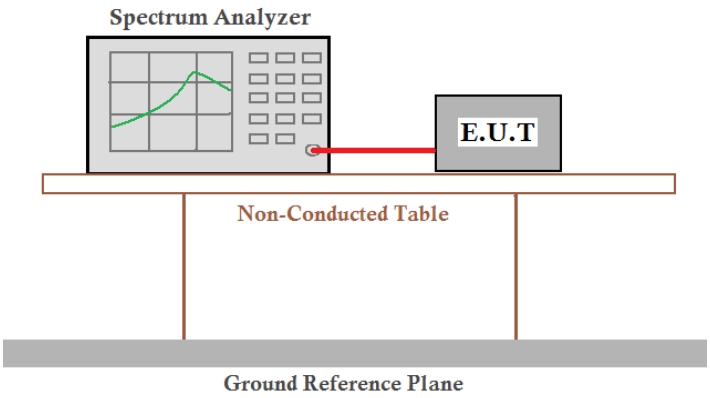
802.11a(HT20) mode (SISO)								
CH No.	Frequency (MHz)	Measured Power (dBm)					Limit (dBm)	Result
		ANT1	ANT2	Duty Factor	Total ANT1 Output Power (dBm)	Total ANT2 Output Power (dBm)		
36	5180.00	12.24	11.98	0.08	12.32	12.06	24	Pass
40	5200.00	10.11	11.82	0.08	10.19	11.90	24	Pass
48	5240.00	12.37	11.56	0.08	12.45	11.64	24	Pass

ANT1 + ANT2:

802.11n(HT20) mode (MIMO)									
CH No.	Frequency (MHz)	Measured Power (dBm)					Output Power (dBm)	Limit (dBm)	Result
		ANT1	ANT2	Duty Factor	Total ANT1	Total ANT2			
36	5180.00	13.03	11.12	0.08	13.11	11.20	15.27	24	Pass
40	5200.00	12.76	10.36	0.08	12.84	10.44	14.81	24	Pass
48	5240.00	11.98	10.09	0.08	12.06	10.17	14.23	24	Pass
802.11ac(HT20) mode (MIMO)									
CH No.	Frequency (MHz)	Measured Power (dBm)					Output Power (dBm)	Limit (dBm)	Result
		ANT1	ANT2	Duty Factor	Total ANT1	Total ANT2			
36	5180.00	11.88	10.20	0.08	11.96	10.28	14.21	24	Pass
40	5200.00	10.96	10.34	0.08	11.04	10.42	13.75	24	Pass
48	5240.00	10.75	10.73	0.08	10.83	10.81	13.83	24	Pass
802.11n(HT40) mode (MIMO)									
CH No.	Frequency (MHz)	Measured Power (dBm)					Output Power (dBm)	Limit (dBm)	Result
		ANT1	ANT2	Duty Factor	Total ANT1	Total ANT2			
38	5190.00	12.19	11.03	0.08	12.27	11.11	14.74	24	Pass
46	5230.00	11.37	10.72	0.08	11.45	10.80	14.13	24	Pass
802.11ac(HT40) mode (MIMO)									
CH No.	Frequency (MHz)	Measured Power (dBm)					Output Power (dBm)	Limit (dBm)	Result
		ANT1	ANT2	Duty Factor	Total ANT1	Total ANT2			
38	5190.00	12.07	11.77	0.08	12.15	11.85	15.01	24	Pass
46	5230.00	12.48	10.02	0.08	12.56	10.10	14.51	24	Pass
802.11ac(HT80) mode (MIMO)									
CH No.	Frequency (MHz)	Measured Power (dBm)					Output Power (dBm)	Limit (dBm)	Result
		ANT1	ANT2	Duty Factor	Total ANT1	Total ANT2			
42	5210.00	12.48	11.26	0.08	12.56	11.34	15.00	24	Pass

Note: Output Power = Measured Power + Duty Factor
Duty Factor = 10 log (1/Duty Cycle)

7.5 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	11dBm/MHz
Test setup:	
Test procedure:	1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. 2) Use the peak search function on the instrument to find the peak of the spectrum. 3) Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum. b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. 4) The result is the PSD.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

ANT:1

802.11a mode (SISO)					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	6.01	6.09	11.00	Pass
40	5200.00	5.91	6.09	11.00	Pass
48	5240.00	4.62	6.09	11.00	Pass

ANT:2

802.11a mode (SISO)					
Channel No.	Frequency (MHz)	Measured PPSD (dBm/MHz)	Total PPSD (dBm/MHz)	Limit (dBm/MHz)	Result
36	5180.00	5.58	5.66	11.00	Pass
40	5200.00	5.72	5.80	11.00	Pass
48	5240.00	5.70	5.78	11.00	Pass

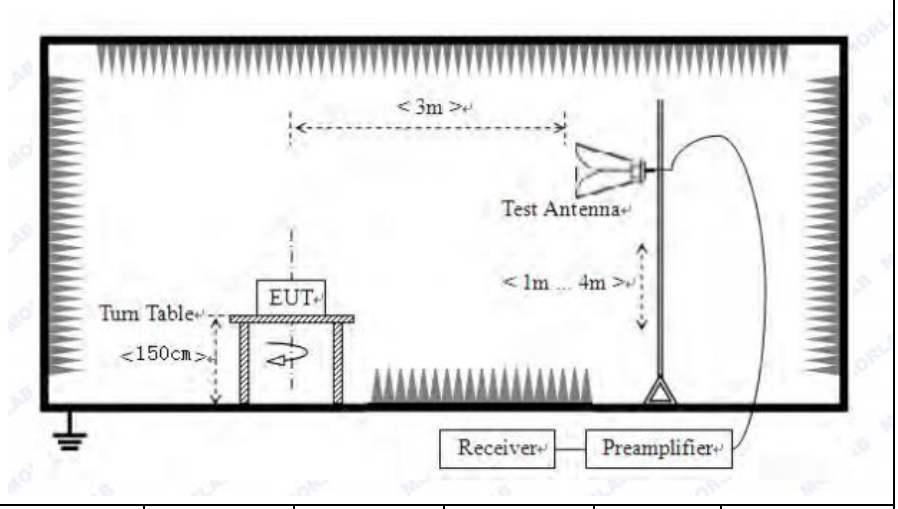
ANT 1+ANT 2

802.11n(HT20) mode (MIMO)						
Channel No.	Frequency (MHz)	ANT 1 Total PPSD (dBm/MHz)	ANT 2 Total PPSD (dBm/MHz)	Total	(dBm/MHz)	Result
36	5180.00	5.26	4.83	8.06	11.00	Pass
40	5200.00	3.96	3.94	6.96	11.00	Pass
48	5240.00	3.66	3.38	6.53	11.00	Pass
802.11ac(HT20) mode (MIMO)						
Channel No.	Frequency (MHz)	ANT 1 Total PPSD (dBm/MHz)	ANT 2 Total PPSD (dBm/MHz)	Total	(dBm/MHz)	Result
36	5180.00	4.86	4.82	7.85	11.00	Pass
40	5200.00	5.38	5.55	8.48	11.00	Pass
48	5240.00	3.85	4.43	7.16	11.00	Pass
802.11n(HT40) mode (MIMO)						
Channel No.	Frequency (MHz)	ANT 1 Total PPSD (dBm/MHz)	ANT 2 Total PPSD (dBm/MHz)	Total	(dBm/MHz)	Result
38	5190.00	1.08	1.17	4.14	11.00	Pass
46	5230.00	0.37	0.20	3.30	11.00	Pass
802.11ac(HT40) mode (MIMO)						
Channel No.	Frequency (MHz)	ANT 1 Total PPSD (dBm/MHz)	ANT 2 Total PPSD (dBm/MHz)	Total	(dBm/MHz)	Result
38	5190.00	1.10	1.37	4.25	11.00	Pass
46	5230.00	-0.54	-0.32	2.45	11.00	Pass
802.11ac(HT80) mode (MIMO)						
Channel No.	Frequency (MHz)	ANT 1 Total PPSD (dBm/MHz)	ANT 2 Total PPSD (dBm/MHz)	Total	(dBm/MHz)	Result
42	5210.00	-2.24	-0.21	1.90	11.00	Pass

Note: Total PPSD = Measured PPSD + 10 log (1/Duty Cycle)

7.6 Band Edge

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407 and 5.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>68.2</td><td>Peak Value</td></tr>
</table>
Undesirable emission limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.
</td></tr>
<tr><td>Test Procedure:</td><td>
a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data
</td></tr>
</table>

	sheet.					
Test setup:	Above 1GHz 					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

Remark:

All antennas have been test and only the worst case antenna 2 was report

According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:

E[dBuV/m] = EIRP[dBm] + 95.2;

For example, if EIRP = -27dBm

E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Measurement Data:

802.11a(HT20)					Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5150.00	42.85	31.56	8.99	37.58	45.82	68.20	-22.38	V	PK
5150.00	33.64	31.56	8.99	37.58	36.61	54.00	-17.39	V	AV
5150.00	48.23	31.56	8.99	37.58	51.20	68.20	-17.00	H	PK
5150.00	37.17	31.56	8.99	37.58	40.14	54.00	-13.86	H	AV

802.11a(HT20)					Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5350.00	44.43	31.64	9.29	37.29	48.07	68.20	-20.13	V	PK
5350.00	37.35	31.64	9.29	37.29	40.99	54.00	-13.01	V	AV
5350.00	47.38	31.64	9.29	37.29	51.02	68.20	-17.18	H	PK
5350.00	35.21	31.64	9.29	37.29	38.85	54.00	-15.15	H	AV

802.11n(HT20)					Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5150.00	47.78	31.56	8.99	37.58	50.75	68.20	-17.45	V	PK
5150.00	36.16	31.56	8.99	37.58	39.13	54.00	-14.87	V	AV
5150.00	45.54	31.56	8.99	37.58	48.51	68.20	-19.69	H	PK
5150.00	36.02	31.56	8.99	37.58	38.99	54.00	-15.01	H	AV

802.11n(HT20)					Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5350.00	43.78	31.64	9.29	37.29	47.42	68.20	-20.78	V	PK
5350.00	36.68	31.64	9.29	37.29	40.32	54.00	-13.68	V	AV
5350.00	45.92	31.64	9.29	37.29	49.56	68.20	-18.64	H	PK
5350.00	36.63	31.64	9.29	37.29	40.27	54.00	-13.73	H	AV

802.11ac(HT20)					Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5150.00	42.68	31.56	8.99	37.58	45.65	68.20	-22.55	V	PK
5150.00	33.75	31.56	8.99	37.58	36.72	54.00	-17.28	V	AV
5150.00	47.78	31.56	8.99	37.58	50.75	68.20	-17.45	H	PK
5150.00	36.89	31.56	8.99	37.58	39.86	54.00	-14.14	H	AV

802.11ac(HT20)					Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5350.00	44.00	31.64	9.29	37.29	47.64	68.20	-20.56	V	PK
5350.00	37.55	31.64	9.29	37.29	41.19	54.00	-12.81	V	AV
5350.00	47.15	31.64	9.29	37.29	50.79	68.20	-17.41	H	PK
5350.00	35.01	31.64	9.29	37.29	38.65	54.00	-15.35	H	AV

802.11n(HT40)					Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5150.00	47.90	31.56	8.99	37.58	50.87	68.20	-17.33	V	PK
5150.00	35.48	31.56	8.99	37.58	38.45	54.00	-15.55	V	AV
5150.00	45.21	31.56	8.99	37.58	48.18	68.20	-20.02	H	PK
5150.00	35.38	31.56	8.99	37.58	38.35	54.00	-15.65	H	AV

802.11n(HT40)					Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5350.00	43.26	31.64	9.29	37.29	46.90	68.20	-21.30	V	PK
5350.00	36.46	31.64	9.29	37.29	40.10	54.00	-13.90	V	AV
5350.00	46.46	31.64	9.29	37.29	50.10	68.20	-18.10	H	PK
5350.00	37.19	31.64	9.29	37.29	40.83	54.00	-13.17	H	AV

802.11ac(HT40)					Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5150.00	43.25	31.56	8.99	37.58	46.22	68.20	-21.98	V	PK
5150.00	34.12	31.56	8.99	37.58	37.09	54.00	-16.91	V	AV
5150.00	47.91	31.56	8.99	37.58	50.88	68.20	-17.32	H	PK
5150.00	37.24	31.56	8.99	37.58	40.21	54.00	-13.79	H	AV

802.11ac(HT40)					Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5350.00	43.59	31.64	9.29	37.29	47.23	68.20	-20.97	V	PK
5350.00	37.12	31.64	9.29	37.29	40.76	54.00	-13.24	V	AV
5350.00	46.67	31.64	9.29	37.29	50.31	68.20	-17.89	H	PK
5350.00	35.27	31.64	9.29	37.29	38.91	54.00	-15.09	H	AV

802.11ac(HT80)					Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5150.00	47.42	31.56	8.99	37.58	50.39	68.20	-17.81	V	PK
5150.00	35.72	31.56	8.99	37.58	38.69	54.00	-15.31	V	AV
5150.00	44.87	31.56	8.99	37.58	47.84	68.20	-20.36	H	PK
5150.00	35.36	31.56	8.99	37.58	38.33	54.00	-15.67	H	AV

802.11ac(HT80)					Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Pol.	Det.
5350.00	43.37	31.64	9.29	37.29	47.01	68.20	-21.19	V	PK
5350.00	36.20	31.64	9.29	37.29	39.84	54.00	-14.16	V	AV
5350.00	46.51	31.64	9.29	37.29	50.15	68.20	-18.05	H	PK
5350.00	37.05	31.64	9.29	37.29	40.69	54.00	-13.31	H	AV

7.7 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 40GHz
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver setup:

Frequency	Detector	RBW	VBW	Value
9kHz-150KHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	AV	1MHz	3MHz	Average Value

Limit:

Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

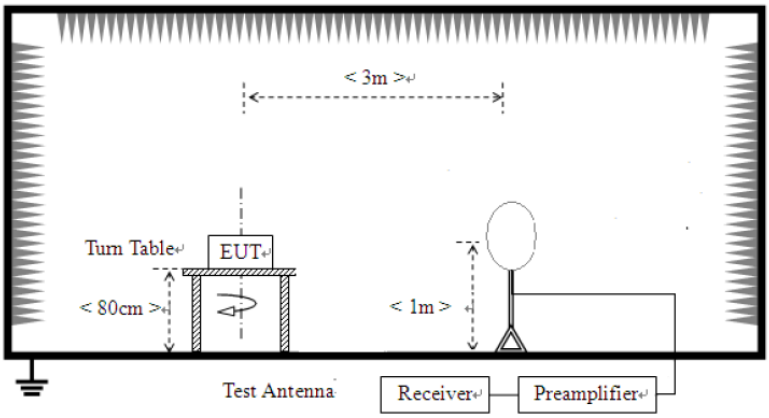
Test Procedure:

Substitution method was performed to determine the actual ERP emission levels of the EUT.
The following test procedure as below:

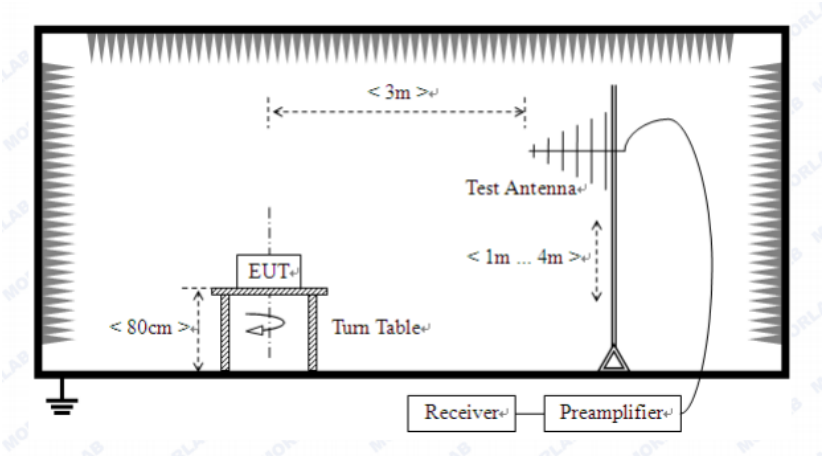
1>.Below 1GHz test procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that

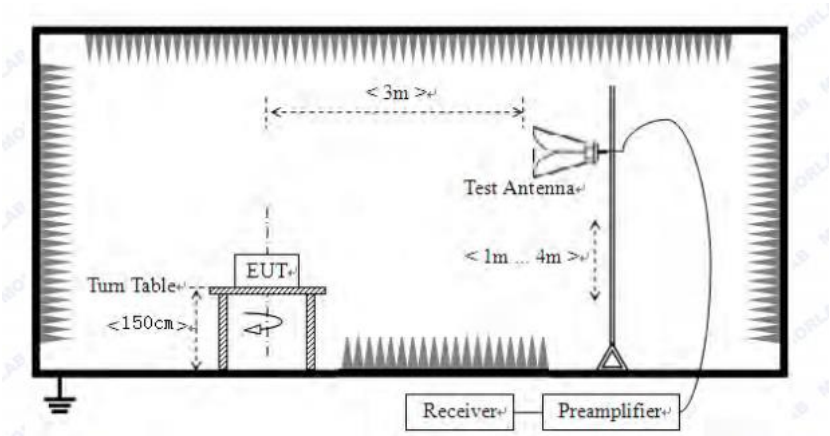
	did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 2>.Above 1GHz test procedure: 1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test. 4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. 5. Repeat step 4 for test frequency with the test antenna polarized horizontally. 6. Remove the transmitter and replace it with a substitution antenna 7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. 8. Repeat step 7 with both antennas horizontally polarized for each test frequency. 9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) where: Pg is the generator output power into the substitution antenna.
Test setup:	For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test voltage:	AC120V 60Hz					
Test results:	Pass					

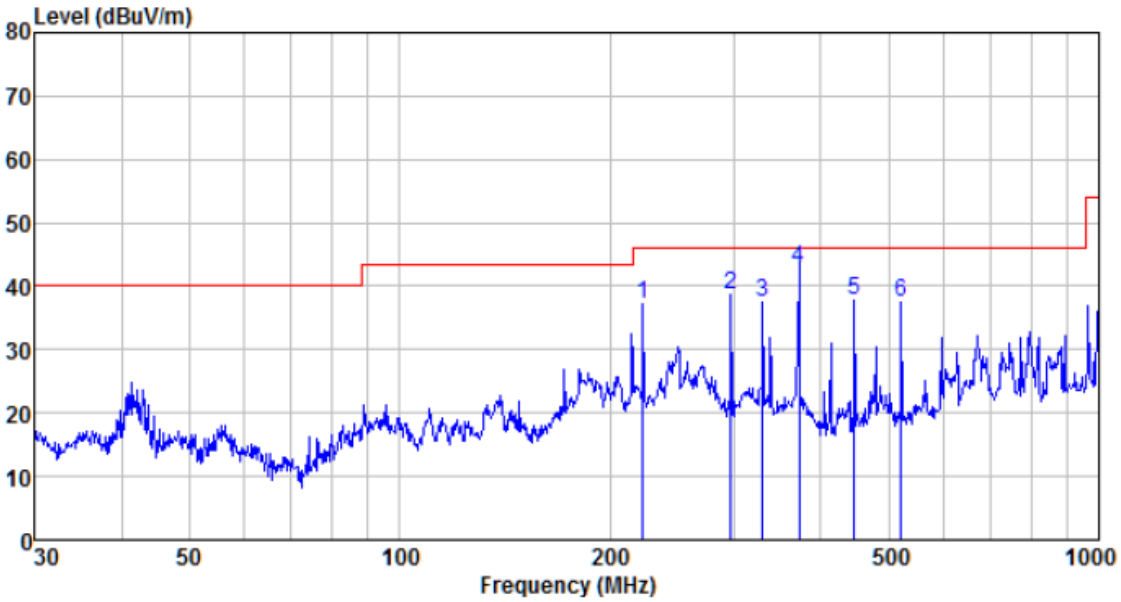
Measurement Data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

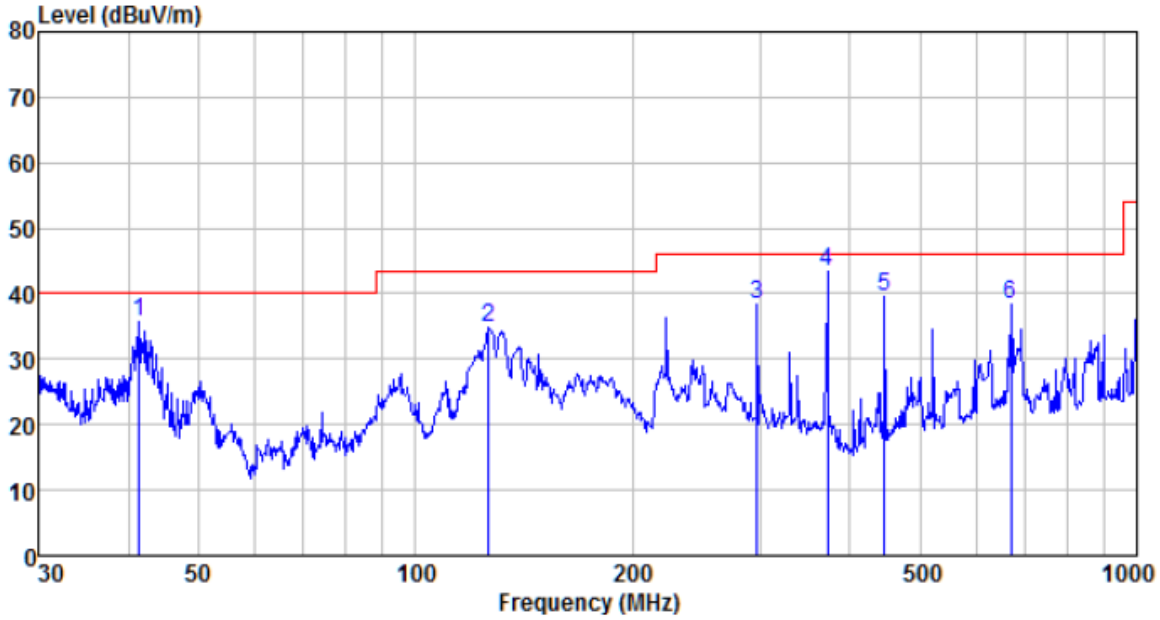
30MHz~ 1GHz

Test mode:	WiFi mode	Probe:	Horizontal



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
222.950	61.29	11.27	1.98	37.35	37.19	46.00	-8.81	QP
297.224	60.17	13.53	2.35	37.42	38.63	46.00	-7.37	QP
330.195	58.21	14.18	2.52	37.45	37.46	46.00	-8.54	QP
372.005	62.60	14.89	2.72	37.49	42.72	46.00	-3.28	QP
446.414	56.04	16.28	3.07	37.52	37.87	46.00	-8.13	QP
520.888	53.86	17.80	3.39	37.52	37.53	46.00	-8.47	QP

Test mode:	WiFi mode	Probe:	Vertical



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
41.422	58.52	12.22	0.68	35.75	35.67	40.00	-4.33	QP
126.329	61.61	8.66	1.41	36.93	34.75	43.50	-8.75	QP
297.224	59.92	13.53	2.35	37.42	38.38	46.00	-7.62	QP
372.005	63.24	14.89	2.72	37.49	43.36	46.00	-2.64	QP
446.414	57.60	16.28	3.07	37.52	39.43	46.00	-6.57	QP
668.142	52.53	19.57	3.97	37.60	38.47	46.00	-7.53	QP

Above 1GHz:

ANT 1: 802.11a(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	28.98	38.96	14.62	35.64	46.92	74.00	-27.08	Vertical
15540	27.25	38.40	17.66	35.35	47.96	74.00	-26.04	Vertical
10360	29.56	38.96	14.62	35.64	47.50	74.00	-26.50	Horizontal
15540	28.60	38.40	17.66	35.35	49.31	74.00	-24.69	Horizontal

802.11a(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	28.05	39.01	14.63	35.67	46.02	74.00	-27.98	Vertical
15600	26.30	38.30	17.67	35.36	46.91	74.00	-27.09	Vertical
10400	27.84	39.01	14.63	35.67	45.81	74.00	-28.19	Horizontal
15600	27.86	38.30	17.67	35.36	48.47	74.00	-25.53	Horizontal

802.11a(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	26.29	39.15	14.68	35.78	44.34	74.00	-29.66	Vertical
15720	27.44	38.00	17.73	35.37	47.80	74.00	-26.20	Vertical
10480	27.26	39.15	14.68	35.78	45.31	74.00	-28.69	Horizontal
15720	27.35	38.00	17.73	35.37	47.71	74.00	-26.29	Horizontal

ANT 2: 802.11a(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	28.78	38.96	14.62	35.64	46.72	74.00	-27.28	Vertical
15540	27.10	38.40	17.66	35.35	47.81	74.00	-26.19	Vertical
10360	29.43	38.96	14.62	35.64	47.37	74.00	-26.63	Horizontal
15540	28.36	38.40	17.66	35.35	49.07	74.00	-24.93	Horizontal

802.11a(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	27.74	39.01	14.63	35.67	45.71	74.00	-28.29	Vertical
15600	26.26	38.30	17.67	35.36	46.87	74.00	-27.13	Vertical
10400	27.56	39.01	14.63	35.67	45.53	74.00	-28.47	Horizontal
15600	27.65	38.30	17.67	35.36	48.26	74.00	-25.74	Horizontal

802.11a(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	26.22	39.15	14.68	35.78	44.27	74.00	-29.73	Vertical
15720	27.23	38.00	17.73	35.37	47.59	74.00	-26.41	Vertical
10480	27.22	39.15	14.68	35.78	45.27	74.00	-28.73	Horizontal
15720	27.15	38.00	17.73	35.37	47.51	74.00	-26.49	Horizontal

MIMO:

802.11n(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	28.91	38.96	14.62	35.64	46.85	74.00	-27.15	Vertical
15540	27.20	38.40	17.66	35.35	47.91	74.00	-26.09	Vertical
10360	29.52	38.96	14.62	35.64	47.46	74.00	-26.54	Horizontal
15540	28.52	38.40	17.66	35.35	49.23	74.00	-24.77	Horizontal

802.11n(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	27.94	39.01	14.63	35.67	45.91	74.00	-28.09	Vertical
15600	26.29	38.30	17.67	35.36	46.90	74.00	-27.10	Vertical
10400	27.75	39.01	14.63	35.67	45.72	74.00	-28.28	Horizontal
15600	27.79	38.30	17.67	35.36	48.40	74.00	-25.60	Horizontal

802.11n(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	26.26	39.15	14.68	35.78	44.31	74.00	-29.69	Vertical
15720	27.37	38.00	17.73	35.37	47.73	74.00	-26.27	Vertical
10480	27.24	39.15	14.68	35.78	45.29	74.00	-28.71	Horizontal
15720	27.28	38.00	17.73	35.37	47.64	74.00	-26.36	Horizontal

802.11ac(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360	29.16	38.96	14.62	35.64	47.10	74.00	-26.90	Vertical
15540	27.37	38.40	17.66	35.35	48.08	74.00	-25.92	Vertical
10360	29.67	38.96	14.62	35.64	47.61	74.00	-26.39	Horizontal
15540	28.82	38.40	17.66	35.35	49.53	74.00	-24.47	Horizontal

802.11ac(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400	28.31	39.01	14.63	35.67	46.28	74.00	-27.72	Vertical
15600	26.34	38.30	17.67	35.36	46.95	74.00	-27.05	Vertical
10400	28.08	39.01	14.63	35.67	46.05	74.00	-27.95	Horizontal
15600	28.04	38.30	17.67	35.36	48.65	74.00	-25.35	Horizontal

802.11ac(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480	26.35	39.15	14.68	35.78	44.40	74.00	-29.60	Vertical
15720	27.63	38.00	17.73	35.37	47.99	74.00	-26.01	Vertical
10480	27.29	39.15	14.68	35.78	45.34	74.00	-28.66	Horizontal
15720	27.53	38.00	17.73	35.37	47.89	74.00	-26.11	Horizontal

802.11n(HT40) 5190MHz

Frequency	Read	Antenna	Cable	Preamp	Level	Limit Line	Over	polarizatio

(MHz)	Level (dBuV)	Factor (dB/m)	Loss (dB)	Factor (dB)	(dBuV/m)	(dBuV/m)	Limit (dB)	n
10380	27.14	39.01	14.63	35.67	45.11	74.00	-28.89	Vertical
15570	26.43	38.30	17.67	35.36	47.04	74.00	-26.96	Vertical
10380	26.89	39.01	14.63	35.67	44.86	74.00	-29.14	Horizontal
15570	29.00	38.30	17.67	35.36	49.61	74.00	-24.39	Horizontal

802.11n(HT40) 5230MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatio n
10460	26.68	39.11	14.66	35.75	44.70	74.00	-29.30	Vertical
15690	27.22	38.10	17.71	35.37	47.66	74.00	-26.34	Vertical
10460	27.42	39.11	14.66	35.75	45.44	74.00	-28.56	Horizontal
15690	26.84	38.10	17.71	35.37	47.28	74.00	-26.72	Horizontal

802.11ac(HT40) 5190MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatio n
10380	27.38	39.01	14.63	35.67	45.35	74.00	-28.65	Vertical
15570	26.52	38.30	17.67	35.36	47.13	74.00	-26.87	Vertical
10380	27.00	39.01	14.63	35.67	44.97	74.00	-29.03	Horizontal
15570	29.13	38.30	17.67	35.36	49.74	74.00	-24.26	Horizontal

802.11ac(HT40) 5230MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatio n
10460	26.76	39.11	14.66	35.75	44.78	74.00	-29.22	Vertical
15690	27.38	38.10	17.71	35.37	47.82	74.00	-26.18	Vertical
10460	27.47	39.11	14.66	35.75	45.49	74.00	-28.51	Horizontal
15690	26.95	38.10	17.71	35.37	47.39	74.00	-26.61	Horizontal

802.11ac(HT80) 5210MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarizatio n
10380	28.47	39.06	14.65	35.71	46.47	74.00	-27.53	Vertical
15570	26.61	38.20	17.69	35.36	47.14	74.00	-26.86	Vertical
10380	29.29	39.06	14.65	35.71	47.29	74.00	-26.71	Horizontal
15570	28.13	38.20	17.69	35.36	48.66	74.00	-25.34	Horizontal

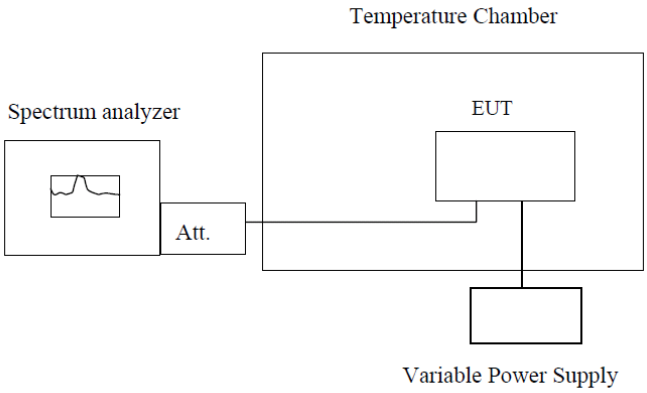
Note:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.

2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

7.8 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Frequency stability versus Temp.					
Power Supply: DC 3.7V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5180	5179.3900	5180.4302	5181.2834	5179.3409
	5200	5199.7358	5200.8922	5200.4664	5199.6501
	5220	5219.8152	5220.9935	5220.0400	5219.5366
	5240	5239.0317	**5240.8838**	5240.6395	5239.0413
-20	5180	5179.8594	5180.5304	5180.9920	5179.6644
	5200	5199.2254	5200.9459	5200.3614	5199.2621
	5220	5219.6799	5220.4225	5220.3316	5219.7227
	5240	5239.8509	5240.6913	5240.4697	5239.3872
-10	5180	5179.4833	5180.9986	5180.7941	5179.6366
	5200	5199.1111	5200.7852	5200.4042	5199.7067
	5220	5219.5915	5220.4426	5220.8519	5219.6115
	5240	5239.8505	5240.2472	5240.8283	5239.6368
0	5180	5179.9053	5180.8093	5180.5005	5179.0738
	5200	5199.5049	5200.1406	5200.5802	5199.0456
	5220	5219.5402	5220.4818	5220.9114	5219.1127
	5240	5239.1087	5240.6540	5240.1344	5239.7148
10	5180	5179.7970	5180.1279	5180.6510	5179.5427
	5200	5199.7431	5200.1663	5200.7023	5199.2366
	5220	5219.4983	5220.1503	5220.8579	5219.5115
	5240	5239.6791	5240.3988	5240.6535	5239.1430
20	5180	5179.1699	5180.5235	5180.0540	**5179.0170**
	5200	5199.5293	5200.6272	5200.5161	5199.7583
	5220	5219.2271	5220.0538	5220.5960	5219.9666
	5240	5239.9081	5240.7387	5240.3496	5239.6423
30	5180	5179.9892	5180.9680	5180.8311	5179.2188
	5200	5199.0612	5200.8695	5200.9199	5199.8172
	5220	5219.1244	5220.9173	5220.7411	5219.3485
	5240	5239.4150	5240.7036	5240.6642	5239.0037
40	5180	5179.5698	5180.2898	5180.2626	5179.9924
	5200	5199.9012	5200.0612	5200.7691	5199.7898
	5220	5219.3615	5220.3309	5220.5997	5219.4002
	5240	5239.1021	5240.3280	5240.6689	5239.0056
50	5180	5179.6074	5180.9497	5180.8072	5179.8478
	5200	5199.8604	5200.7754	5200.4974	5199.8040
	5220	5219.0129	5220.3957	5220.9845	5219.9772
	5240	5239.5926	5240.5795	5240.2278	5239.5200

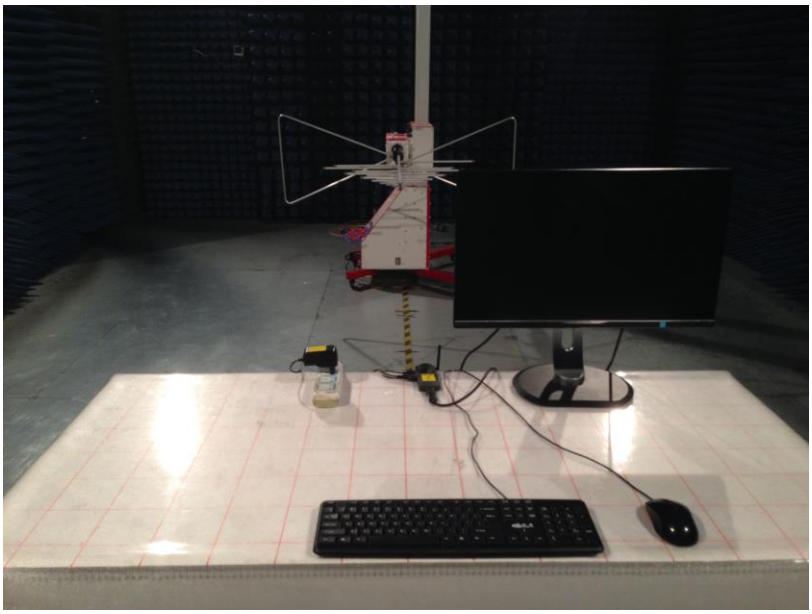
F_L=5179.017MHz; F_H=5240.8838MHz

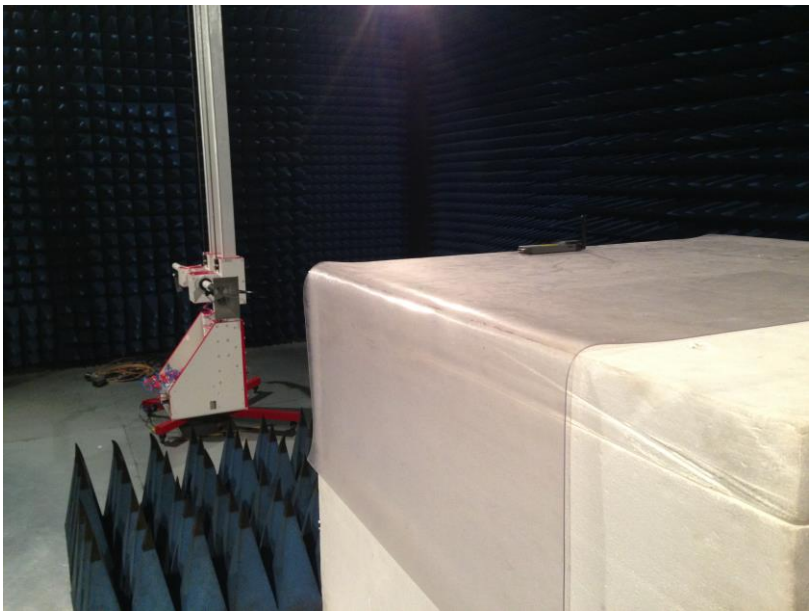
Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VDC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
3.3	5180	5182.0173	5180.4796	5176.6915	5178.2778
	5200	5201.6467	5200.9769	5196.8010	5198.5261
	5220	5220.9301	5220.2484	5219.3765	5219.6535
	5240	5240.6515	5240.8189	5239.8425	5239.8743
3.7	5180	5180.6673	5180.5956	5179.5673	5179.5044
	5200	5200.7179	5200.5907	5199.0971	5199.5995
	5220	5220.9683	5220.8501	5219.8751	5219.3421
	5240	**5240.9025**	5240.5040	5239.7319	5239.3985
4.1	5180	5180.4227	5180.0247	**5179.4972**	5179.8079
	5200	5200.1771	5200.5086	5199.2319	5199.7188
	5220	5220.1390	5220.9114	5219.5367	5219.9357
	5240	5240.7299	5240.3372	5239.9980	5239.9725

F_L=5179.4972MHz;F_H=5240.9025MHz

8 Test Setup Photo

Radiated Emission





Conducted Emission

9 EUT Constructional Details

Reference to the test report No. GTS201808000194F01

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