Spectrum REPORT

Applicant:	SHENZHEN CYX TECHNOLOGY CO.,LTD
Address of Applicant:	5/F,one buildings, xiazao industrial zone, zaohe road, Longhua District, Shenzhen, China
Manufacturer:	SHENZHEN CYX TECHNOLOGY CO.,LTD
Address of Manufacturer:	5/F,one buildings, xiazao industrial zone, zaohe road, Longhua District, Shenzhen, China
Factory:	Shenzhen Chuang Ying Xin Technology Co., Ltd.
Address of Factory:	5/F,one buildings, xiazao industrial zone, zaohe road, Longhua District, Shenzhen, China

Equipment Under Test (EUT)

Product Name:	TV BOX
Model No.:	A95X MAX, A95X F1, A95X F2, A95X F1 Pro, A95X F2 Pro, A95X Plus, A95X F3, A95X F5, A95X F6, A95X F3 Pro, A95X F5 Pro, A95X F6 Pro, X95 Plus
Trade Mark	CYX
FCC ID:	2AHTK-A95XMAX
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	April 10, 2019
Date of Test:	April 11-23, 2019
Date of report issue:	April 24, 2019
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	*April 24, 2019*	*Original*

Prepared By: ***Date:*** *April 24, 2019*

Project Engineer

Check By: ***Date:*** *April 24, 2019*

Reviewer

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4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203	PASS
AC Power Line Conducted Emission	FCC part 15.207	PASS
Peak Transmit Power	FCC part 15.407(a)(1)	PASS
Power Spectral Density	FCC part 15.407(a)(1)	PASS
Undesirable Emission	FCC part 15.407(b)(6), 15.205/15.209	PASS
Radiated Emission	FCC part 15.205/15.209	PASS
Band Edge	FCC part 15.407(b)(1)	PASS
Frequency Stability	FCC part 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:	TV BOX
Model No.:	A95X MAX, A95X F1, A95X F2, A95X F1 Pro, A95X F2 Pro, A95X Plus, A95X F3, A95X F5, A95X F6, A95X F3 Pro, A95X F5 Pro, A95X F6 Pro, X95 Plus
Test Model No:	A95X MAX
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are color and model name for commercial purpose.	
Serial No.:	681DEF10EAC1
Hardware Version:	95XMAXV_V81
Software Version:	A95X_MAX-8.1.0
Test sample(s) ID:	GTS201904000075-1
Sample(s) Status:	Engineer sample
Operation Frequency:	Mode / Frequency Range(MHz) / Number of channels IEEE 802.11a / 5180-5240 / 4 IEEE 802.11n/ac 20MHz / 5180-5240 / 4 IEEE 802.11n/ac 40MHz / 5190-5230 / 2 IEEE 802.11ac 80MHz / 5210 / 1
Modulation technology:	OFDM
Antenna Type:	Integral Antenna
Antenna gain:	1.0dBi
Power supply:	Power Supply Model: R122-0502500ED Input: AC 100-240V, 50/60Hz, 0.4A Output: DC 5V/2.5A

Channel list for 802.11a/n/ac(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

Channel list for 802.11n(HT40)/ac(HT40)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz				

Channel list for 802.11ac(HT80)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210MHz						

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation..

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.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11a/n/ac(HT20)	6/6.5 Mbps
802.11n/ac(HT40)	13.5 Mbps
802.11ac(HT80)	29.3 Mbps

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.

● **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.

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

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

Test Software	Special test command provided by manufacturer
Power level setup	Default

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
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 20 2018	Oct. 19 2019
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 20 2018	Oct. 19 2019
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 20 2018	Oct. 19 2019
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	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

RF 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	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 27 2018	June. 26 2019

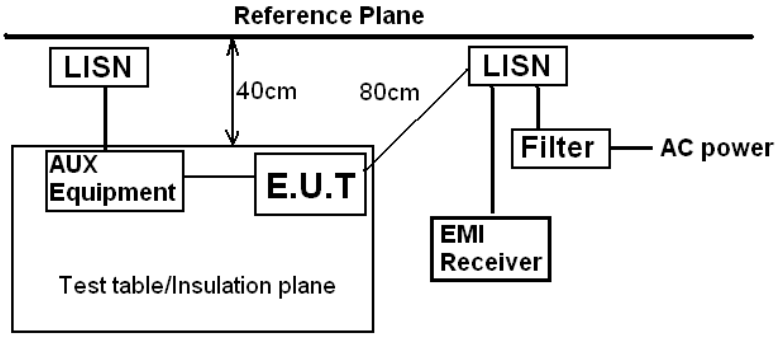
General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

7 Test results and Measurement Data

7.1 Antenna requirement:

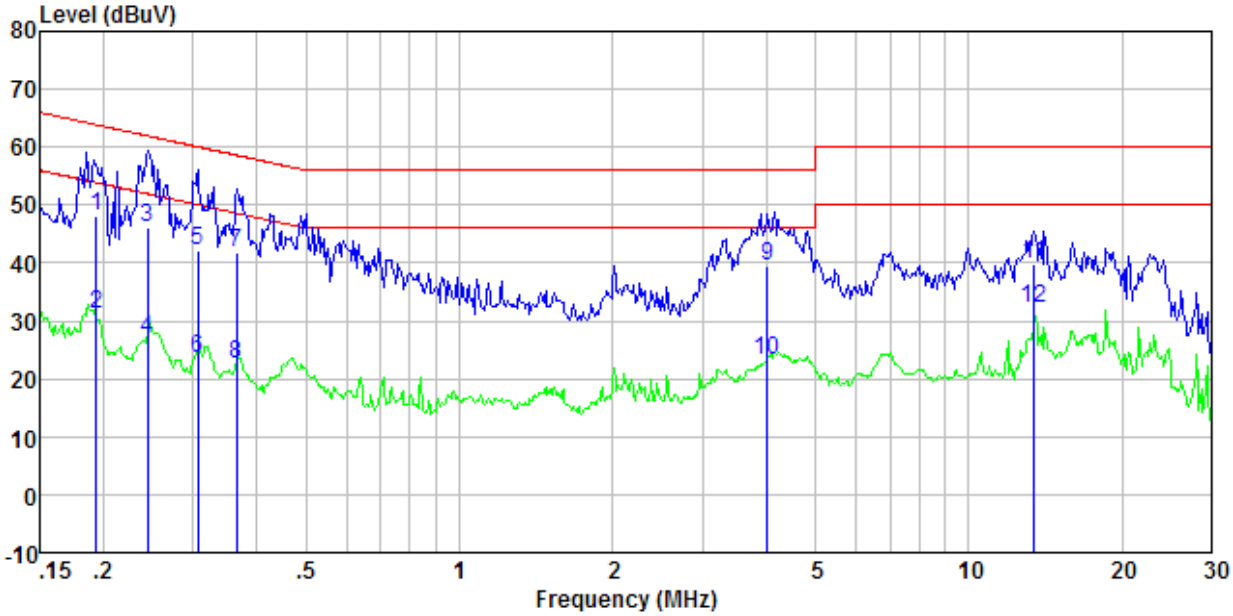
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling 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 antennas are 2.0dBi, reference to the appendix II for details	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test procedure	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.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test environment:	Temp.: 25 °C / Humid.: 52% / Press.: 1012mbar
Test voltage:	AC 120V, 60Hz
Test results:	Pass

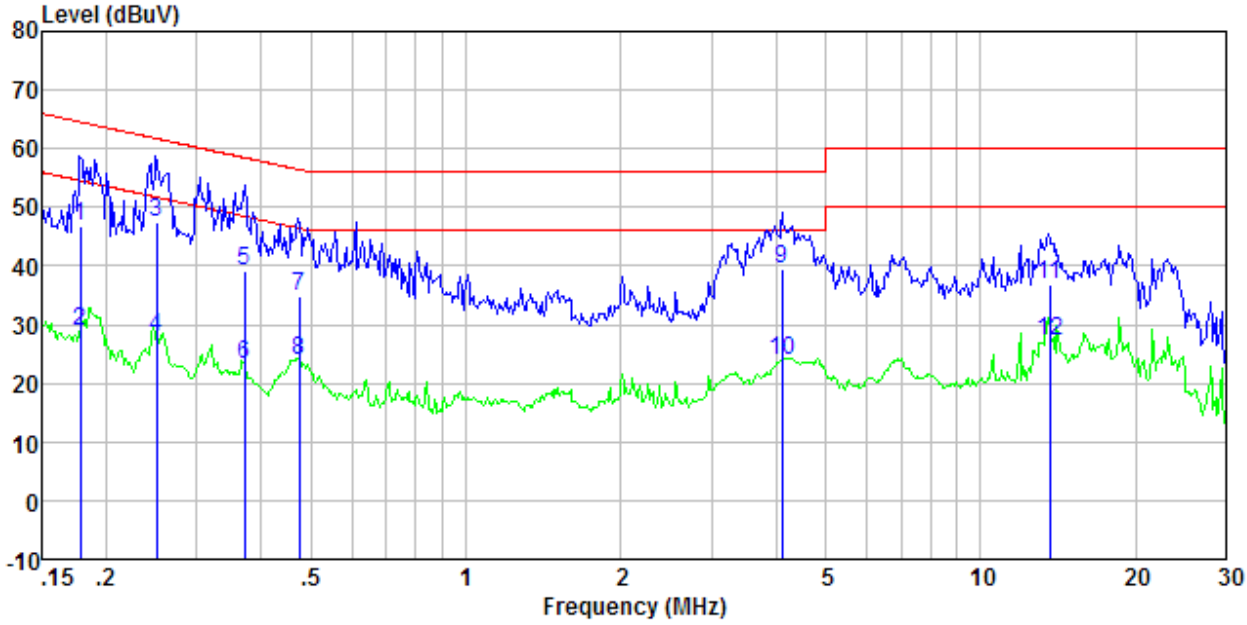
Measurement data:

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.19	47.49	0.40	0.11	48.00	63.89	-15.89	QP
0.19	30.66	0.40	0.11	31.17	53.89	-22.72	Average
0.24	45.65	0.40	0.11	46.16	61.95	-15.79	QP
0.24	26.31	0.40	0.11	26.82	51.95	-25.13	Average
0.31	41.48	0.40	0.10	41.98	60.06	-18.08	QP
0.31	23.19	0.40	0.10	23.69	50.06	-26.37	Average
0.37	41.25	0.37	0.10	41.72	58.61	-16.89	QP
0.37	22.17	0.37	0.10	22.64	48.61	-25.97	Average
4.03	39.05	0.20	0.18	39.43	56.00	-16.57	QP
4.03	22.92	0.20	0.18	23.30	46.00	-22.70	Average
13.48	39.51	0.20	0.21	39.92	60.00	-20.08	QP
13.48	31.73	0.20	0.21	32.14	50.00	-17.86	Average

Neutral:

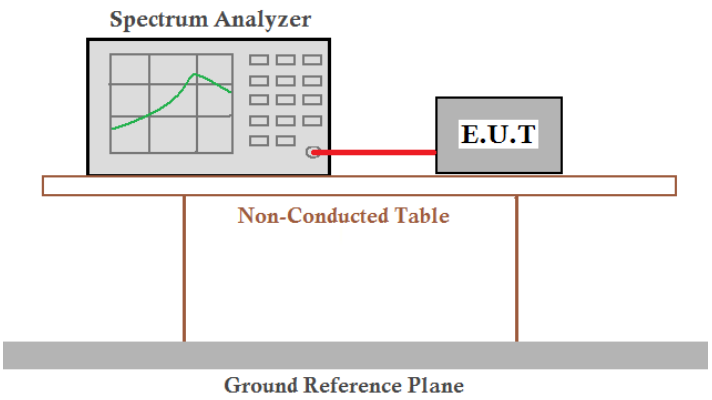


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.18	46.40	0.40	0.09	46.89	64.55	-17.66	QP
0.18	28.51	0.40	0.09	29.00	54.55	-25.55	Average
0.25	47.07	0.40	0.10	47.57	61.73	-14.16	QP
0.25	27.43	0.40	0.10	27.93	51.73	-23.80	Average
0.37	38.80	0.36	0.10	39.26	58.47	-19.21	QP
0.37	22.63	0.36	0.10	23.09	48.47	-25.38	Average
0.47	34.28	0.32	0.11	34.71	56.45	-21.74	QP
0.47	23.53	0.32	0.11	23.96	46.45	-22.49	Average
4.11	39.04	0.20	0.18	39.42	56.00	-16.58	QP
4.11	23.64	0.20	0.18	24.02	46.00	-21.98	Average
13.62	36.46	0.20	0.21	36.87	60.00	-23.13	QP
13.62	26.66	0.20	0.21	27.07	50.00	-22.93	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss*

7.3 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement :	FCC Part15 E Section 15.407
Test Method :	KDB 789033 D02 v02r01
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

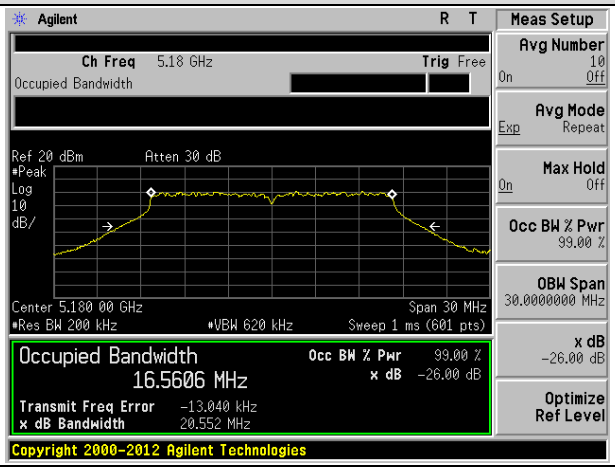
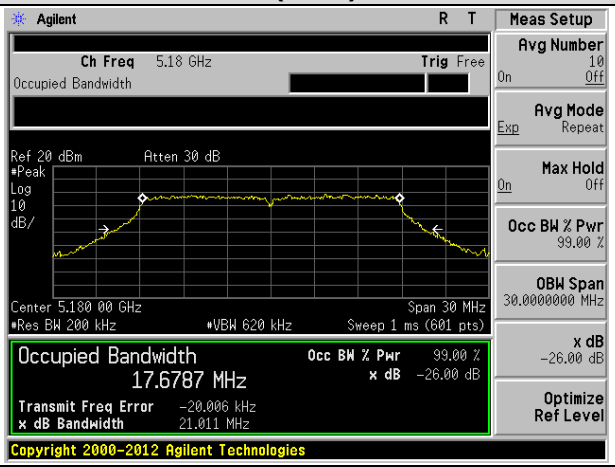
Measurement Data:

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	16.5606	17.6787	17.6538	20.552	21.011	21.138
40	5200	16.5079	17.6672	17.6738	20.453	21.225	21.255
48	5240	16.5356	17.6485	17.6817	20.375	21.327	20.962

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	36.5928	36.3137	45.807	42.997
46	5230	36.8288	36.3685	56.334	43.351

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Occupied Bandwidth (MHz)
		802.11ac(HT80)	802.11ac(HT80)
42	5210	75.1196	80.526

Test plots as followed:

802.11a mode	802.11n(HT20) mode
	
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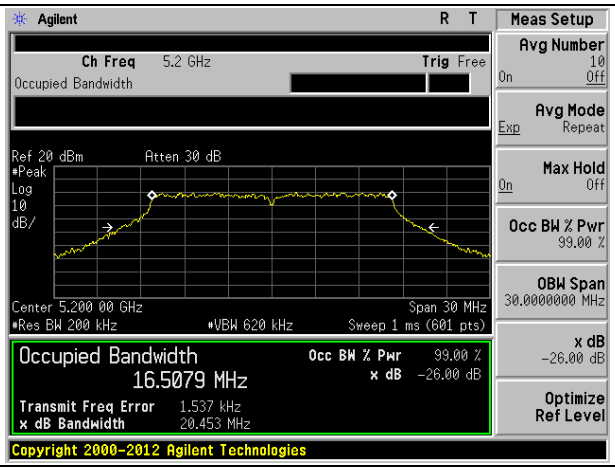	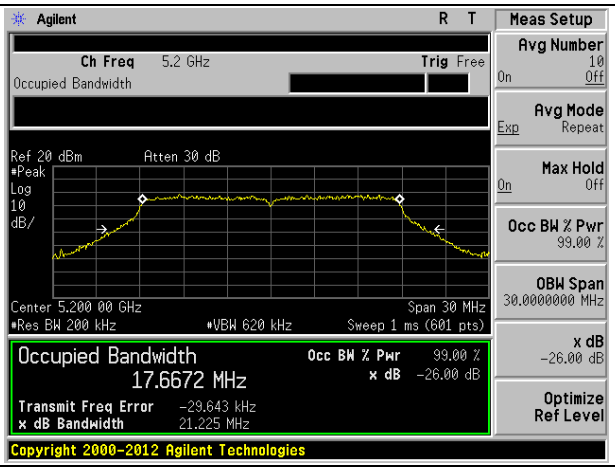
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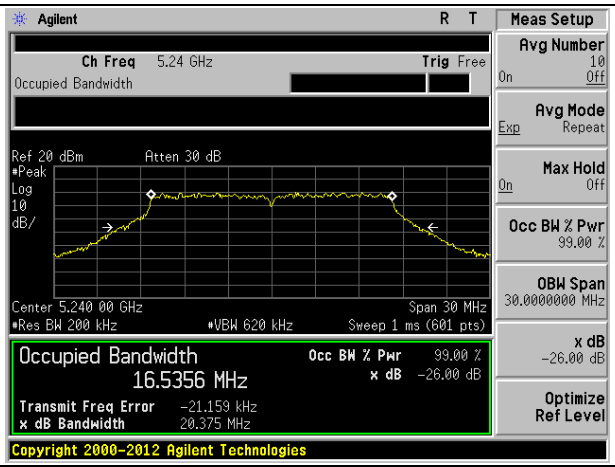
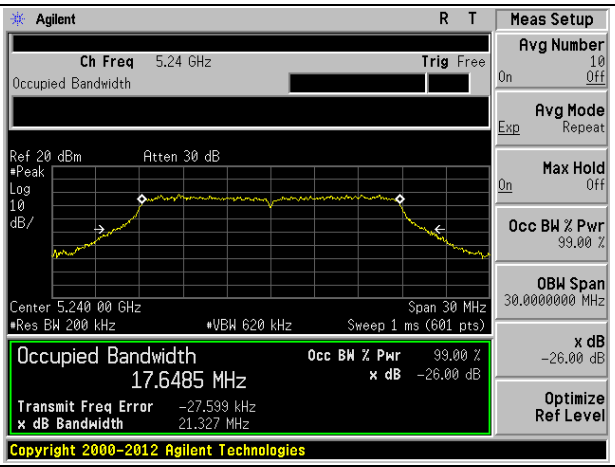
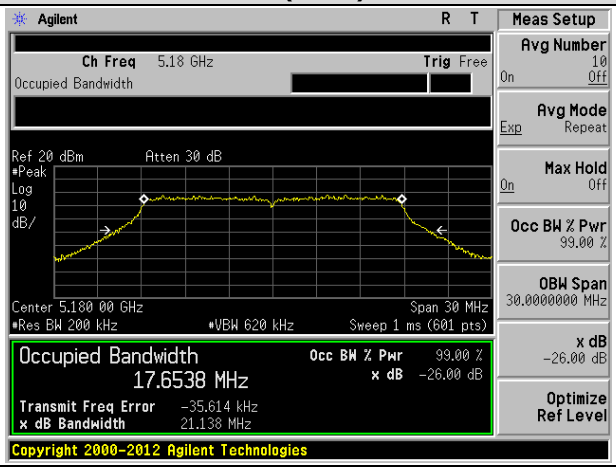
	
5240	**5240**

802.11ac(HT20) mode



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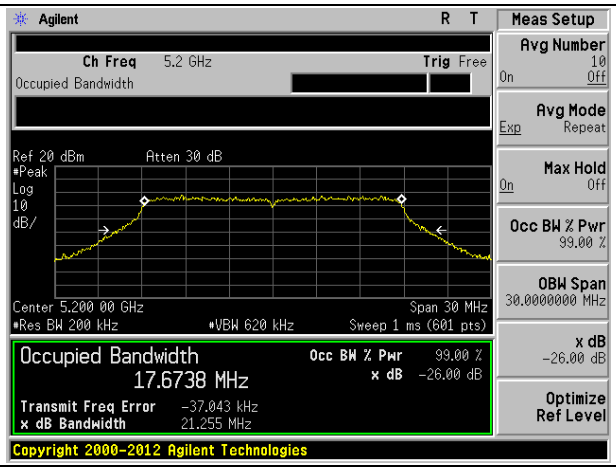

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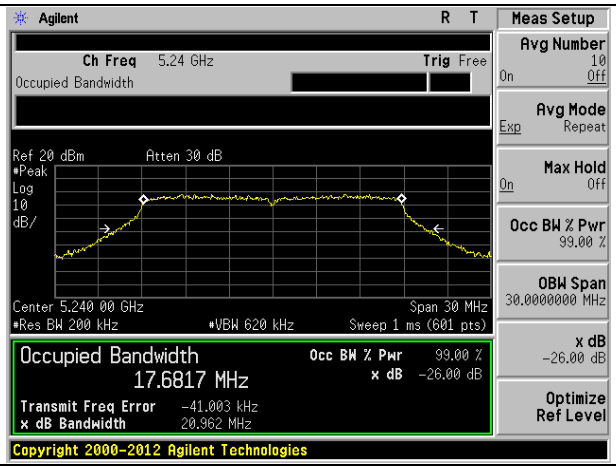
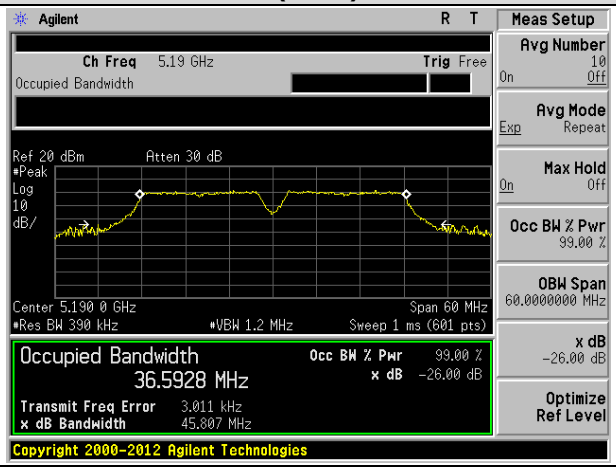
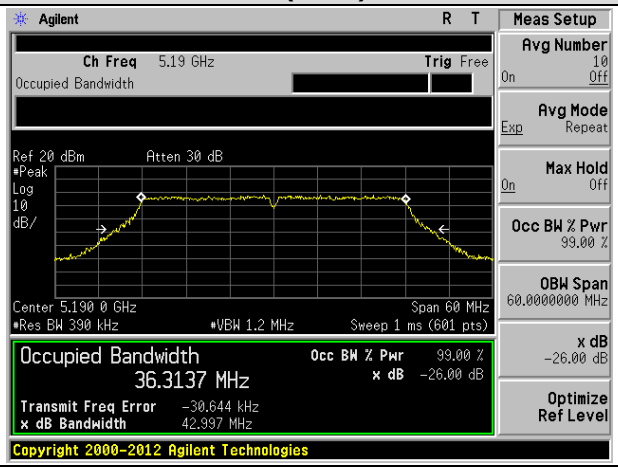
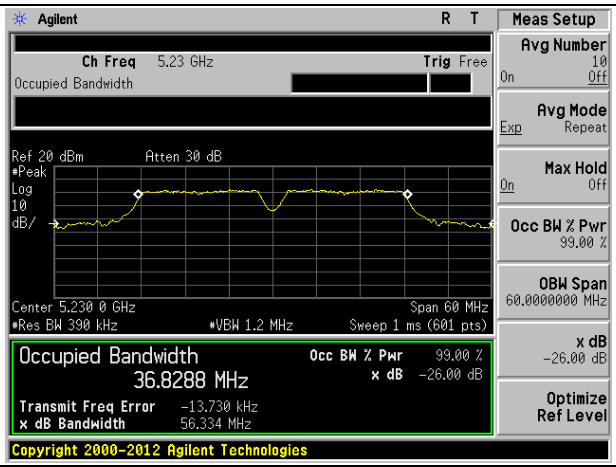
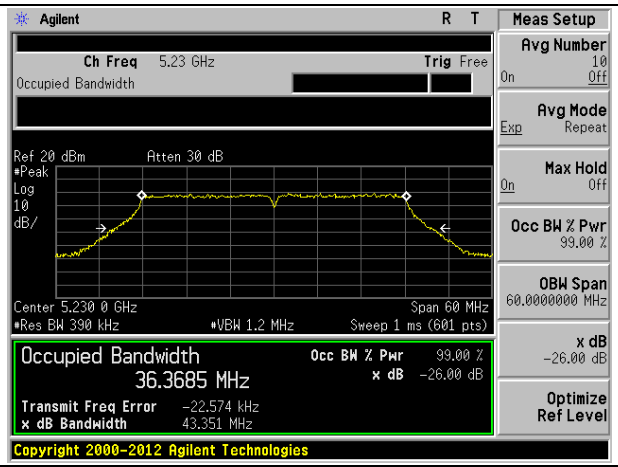
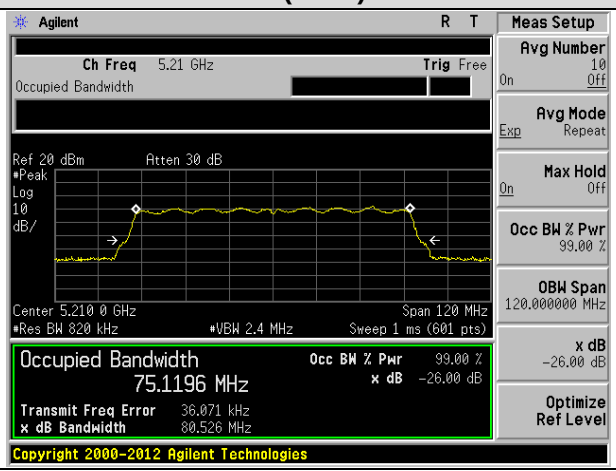
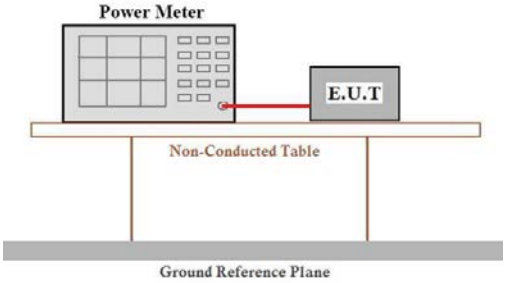


5240

802.11n(HT40) mode	802.11ac(HT40) mode
	
5190	**5190**
	
5230	**5230**

802.11ac(HT80) mode	
	
5210	

7.4 Peak Transmit Power

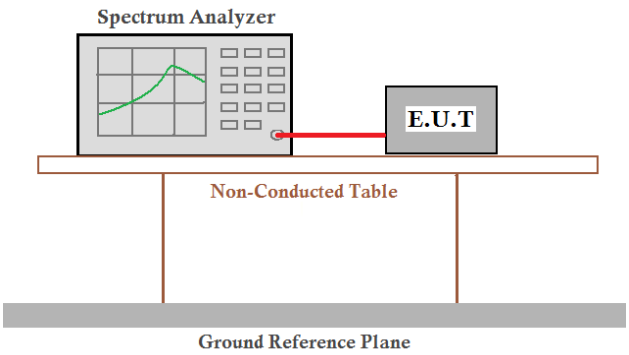
Test Requirement	FCC Part15 E Section 15.407
Test Method :	KDB 789033 D02 v02r01
Limit:	<table><tr><th>Frequency band (MHz)</th><th>Limit</th></tr><tr><td rowspan="2">5150-5250</td><td>≤1W(30dBm) for master device</td></tr><tr><td>≤250mW(23.98dBm) for client device</td></tr><tr><td>5250-5350</td><td>≤250mW(23.98dBm) for client device or 11dBm+10logB*</td></tr><tr><td>5470-5725</td><td>≤250mW(23.98dBm) for client device or 11dBm+10logB*</td></tr><tr><td colspan="2">Remark: *Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</td></tr></table>
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 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Modulation	Duty cycle	Duty Factor
802.11a	98.8%	0.05
802.11n(HT20)	98.8%	0.05
802.11n(HT40)	97.5%	0.11
802.11ac(HT20)	98.9%	0.05
802.11ac(HT40)	97.4%	0.11
802.11ac(HT80)	95.2%	0.21

802.11a mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	11.37	0.05	11.42	23.98	Pass
40	5200	11.82	0.05	11.87	23.98	Pass
48	5240	11.97	0.05	12.02	23.98	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	11.80	0.05	11.85	23.98	Pass
40	5200	11.66	0.05	11.71	23.98	Pass
48	5240	11.79	0.05	11.84	23.98	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
36	5180	11.65	0.05	11.70	23.98	Pass
40	5200	11.33	0.05	11.38	23.98	Pass
48	5240	11.69	0.05	11.74	23.98	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190	11.75	0.11	11.86	23.98	Pass
46	5230	11.87	0.11	11.98	23.98	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
38	5190	11.08	0.11	11.19	23.98	Pass
46	5230	11.03	0.11	11.14	23.98	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	Result
42	5210	9.34	0.21	9.55	23.98	Pass

7.5 Power Spectral Density

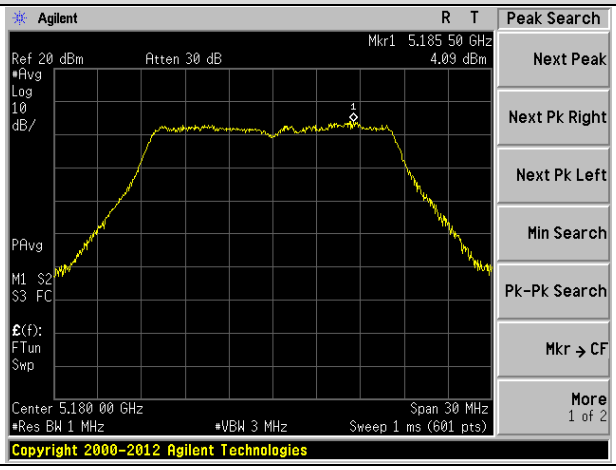
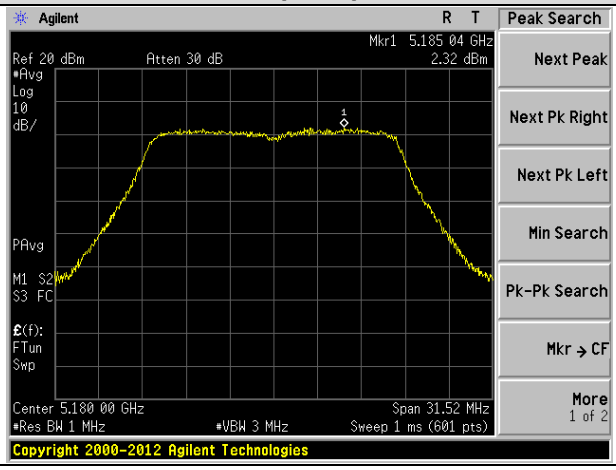
Test Requirement:	FCC Part15 E Section 15.407
Test Method :	KDB 789033 D02 v02r01
Limit:	Frequency band (MHz) / Limit 5150-5250: ≤17dBm in 1MHz for master device; ≤11dBm in 1MHz for client device 5250-5350: ≤11dBm in 1MHz for client device 5470-5725: ≤11dBm in 1MHz for client device Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.
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 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Modulation	Duty cycle	Duty Factor
802.11a	98.8%	0.05
802.11n(HT20)	98.8%	0.05
802.11n(HT40)	97.5%	0.11
802.11ac(HT20)	98.9%	0.05
802.11ac(HT40)	97.4%	0.11
802.11ac(HT80)	95.2%	0.21

802.11a mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	4.09	0.05	4.14	11	Pass
40	5200	3.29	0.05	3.34	11	Pass
48	5240	4.84	0.05	4.89	11	Pass
802.11n(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	2.32	0.05	2.37	11	Pass
40	5200	2.61	0.05	2.66	11	Pass
48	5240	3.38	0.05	3.43	11	Pass
802.11ac(HT20) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
36	5180	0.81	0.05	0.86	11	Pass
40	5200	1.66	0.05	1.71	11	Pass
48	5240	2.21	0.05	2.26	11	Pass
802.11n(HT40) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
38	5190	2.55	0.11	2.66	11	Pass
46	5230	3.33	0.11	3.44	11	Pass
802.11 ac(HT40) mode						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
38	5190	0.30	0.11	0.41	11	Pass
46	5230	0.60	0.11	0.71	11	Pass
802.11 ac(HT80)						
CH No.	Frequency (MHz)	Measured PSD (dBm/MHz)	Duty Factor	Total PSD Power(dBm/MHz)	Limit (dBm/MHz)	Result
42	5210	-0.94	0.21	-0.73	11	Pass

Test plots as followed:

802.11a mode	802.11n(HT20) mode
	
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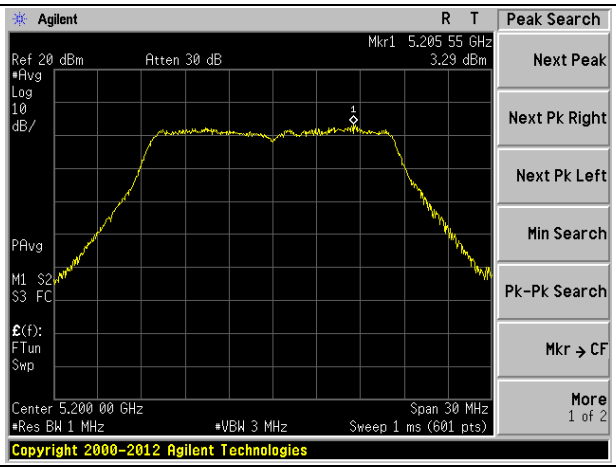
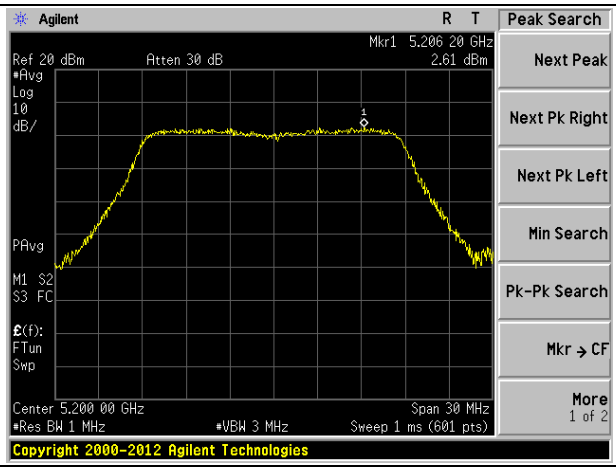
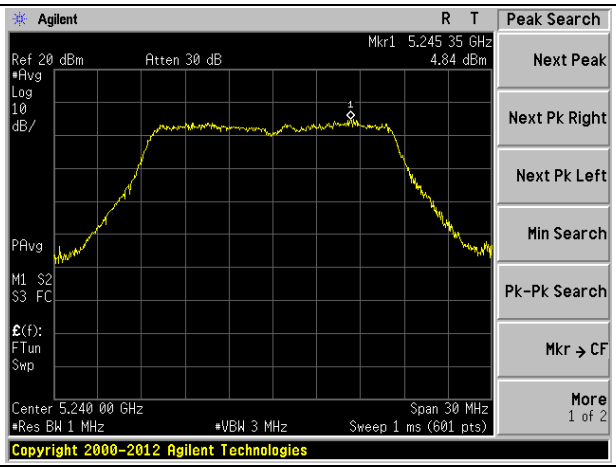
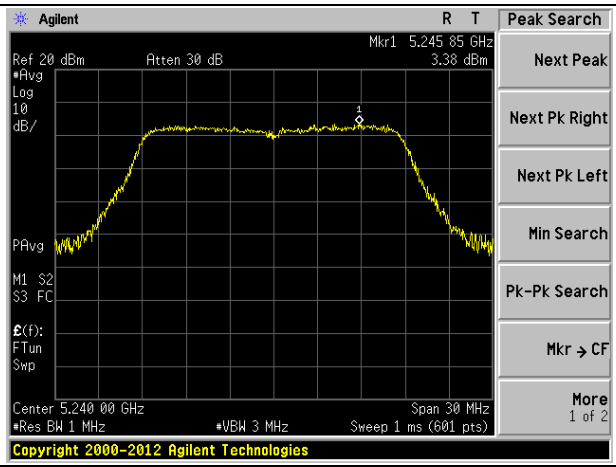
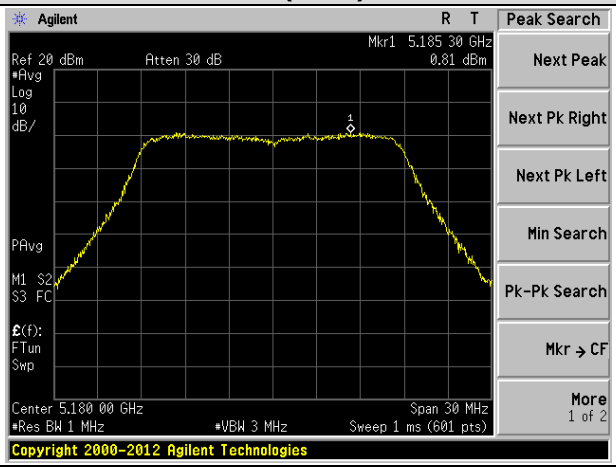
	
5200	**5200**
	
5240	**5240**

802.11ac(HT20) mode	
	
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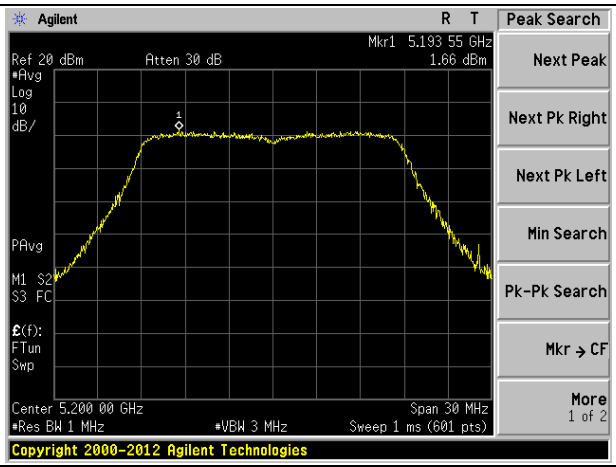
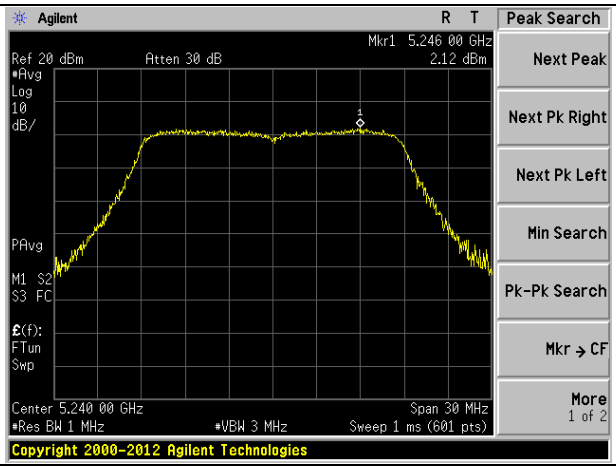
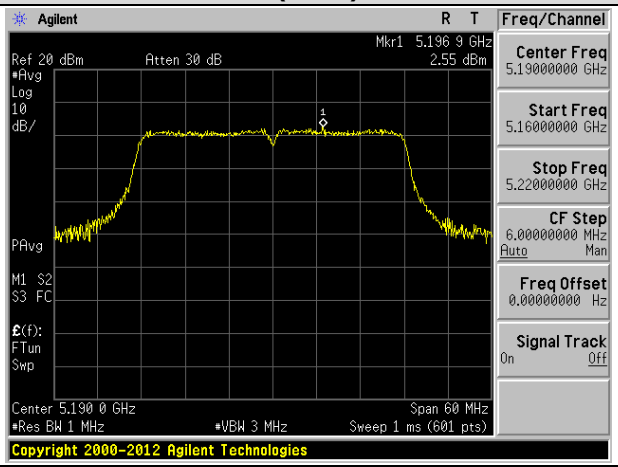
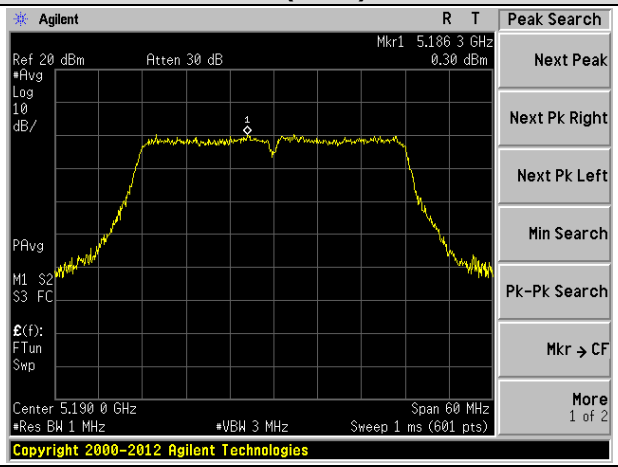
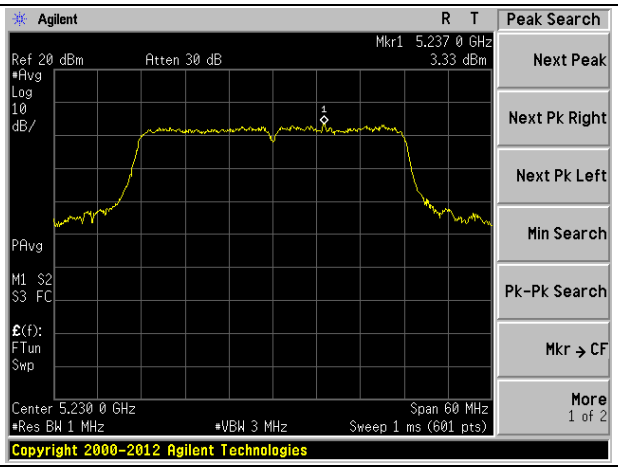
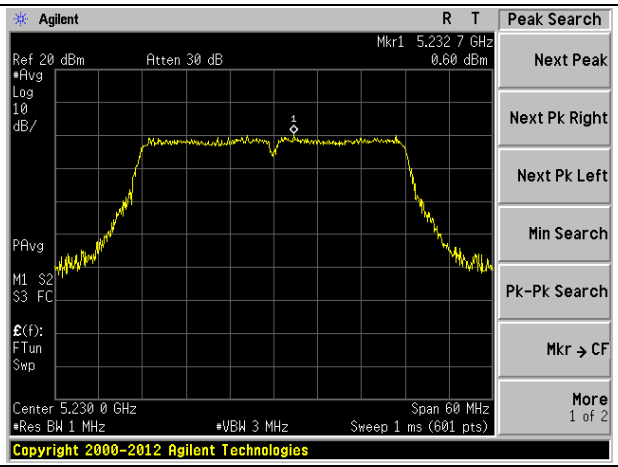
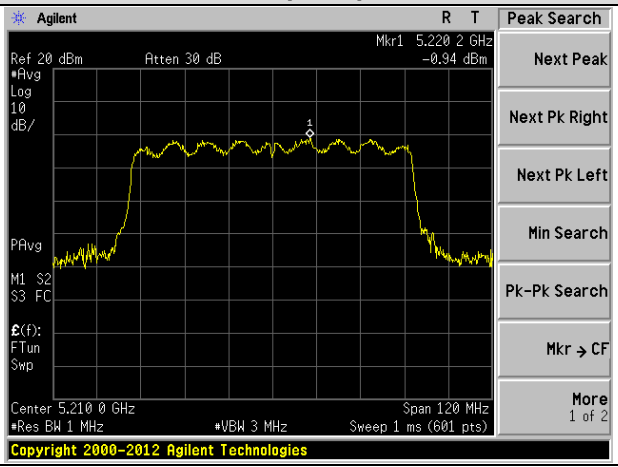
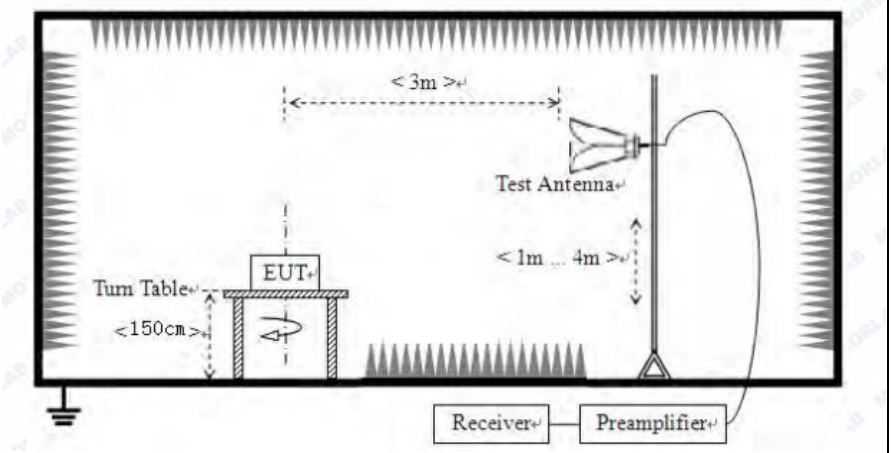
	
5200	
	
5240	

802.11n(HT40) mode	802.11ac(HT40) mode
	
5190	5190
	
5230	5230

802.11ac(HT80) mode	
	
5210	

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><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></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><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></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
</td></tr>
</table>

	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.
Test setup:	For radiated emissions above 1GHz 
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remarks:

1. *Only the worst case Main Antenna test data.*
2. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*
5. *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)				PK				
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
5150.00	43.40	32.07	8.99	37.49	46.97	68.2	-21.23	Horizontal
5350.00	45.72	31.75	9.29	37.2	49.56	68.2	-18.64	Horizontal
5150.00	46.44	32.07	8.99	37.49	50.01	68.2	-18.19	Vertical
5350.00	43.59	31.75	9.29	37.2	47.43	68.2	-20.77	Vertical

802.11a(HT20)				AV				
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
5150.00	37.16	32.07	8.99	37.49	40.73	54.00	-13.27	Horizontal
5350.00	32.41	31.75	9.29	37.2	36.25	54.00	-17.75	Horizontal
5150.00	35.44	32.07	8.99	37.49	39.01	54.00	-14.99	Vertical
5350.00	31.85	31.75	9.29	37.2	35.69	54.00	-18.31	Vertical

802.11n(HT20)				PK				
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
5150.00	46.68	32.07	8.99	37.49	50.25	68.2	-17.95	Horizontal
5350.00	47.03	31.75	9.29	37.2	50.87	68.2	-17.33	Horizontal
5150.00	42.41	32.07	8.99	37.49	45.98	68.2	-22.22	Vertical
5350.00	44.86	31.75	9.29	37.2	48.7	68.2	-19.5	Vertical

802.11n(HT20)				AV				
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
5150.00	33.56	32.07	8.99	37.49	37.13	54.00	-16.87	Horizontal
5350.00	34.46	31.75	9.29	37.2	38.3	54.00	-15.7	Horizontal
5150.00	34.33	32.07	8.99	37.49	37.9	54.00	-16.1	Vertical
5350.00	31.52	31.75	9.29	37.2	35.36	54.00	-18.64	Vertical

802.11ac(HT20)				PK				
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
5150.00	44.75	32.07	8.99	37.49	48.32	68.2	-19.88	Horizontal
5350.00	43.20	31.75	9.29	37.2	47.04	68.2	-21.16	Horizontal
5150.00	41.80	32.07	8.99	37.49	45.37	68.2	-22.83	Vertical
5350.00	43.72	31.75	9.29	37.2	47.56	68.2	-20.64	Vertical

802.11ac(HT20)				AV				
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
5150.00	31.79	32.07	8.99	37.49	35.36	54.00	-18.64	Horizontal
5350.00	37.74	31.75	9.29	37.2	41.58	54.00	-12.42	Horizontal
5150.00	31.41	32.07	8.99	37.49	34.98	54.00	-19.02	Vertical
5350.00	35.53	31.75	9.29	37.2	39.37	54.00	-14.63	Vertical

802.11n(HT40)				PK				
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
5150.00	46.12	32.07	8.99	37.49	49.69	68.2	-18.51	Horizontal
5350.00	42.46	31.75	9.29	37.2	46.3	68.2	-21.9	Horizontal
5150.00	44.87	32.07	8.99	37.49	48.44	68.2	-19.76	Vertical
5350.00	43.70	31.75	9.29	37.2	47.54	68.2	-20.66	Vertical

802.11n(HT40)				AV				
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
5150.00	33.48	32.07	8.99	37.49	37.05	54.00	-16.95	Horizontal
5350.00	33.43	31.75	9.29	37.2	37.27	54.00	-16.73	Horizontal
5150.00	31.31	32.07	8.99	37.49	34.88	54.00	-19.12	Vertical
5350.00	37.07	31.75	9.29	37.2	40.91	54.00	-13.09	Vertical

802.11ac(HT40)				PK				
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
5150.00	42.09	32.07	8.99	37.49	45.66	68.2	-22.54	Horizontal
5350.00	41.24	31.75	9.29	37.2	45.08	68.2	-23.12	Horizontal
5150.00	43.77	32.07	8.99	37.49	47.34	68.2	-20.86	Vertical
5350.00	44.88	31.75	9.29	37.2	48.72	68.2	-19.48	Vertical

802.11ac(HT40)				AV				
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
5150.00	31.49	32.07	8.99	37.49	35.06	54.00	-18.94	Horizontal
5350.00	35.73	31.75	9.29	37.2	39.57	54.00	-14.43	Horizontal
5150.00	35.45	32.07	8.99	37.49	39.02	54.00	-14.98	Vertical
5350.00	35.03	31.75	9.29	37.2	38.87	54.00	-15.13	Vertical

802.11ac(HT80)				PK				
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
5150.00	42.04	32.07	8.99	37.49	45.61	68.2	-22.59	Horizontal
5350.00	46.64	31.75	9.29	37.2	50.48	68.2	-17.72	Horizontal
5150.00	42.18	32.07	8.99	37.49	45.75	68.2	-22.45	Vertical
5350.00	44.09	31.75	9.29	37.2	47.93	68.2	-20.27	Vertical

802.11ac(HT80)				AV				
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
5150.00	36.55	32.07	8.99	37.49	40.12	54.00	-13.88	Horizontal
5350.00	35.60	31.75	9.29	37.2	39.44	54.00	-14.56	Horizontal
5150.00	34.53	32.07	8.99	37.49	38.1	54.00	-15.9	Vertical
5350.00	34.14	31.75	9.29	37.2	37.98	54.00	-16.02	Vertical

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:

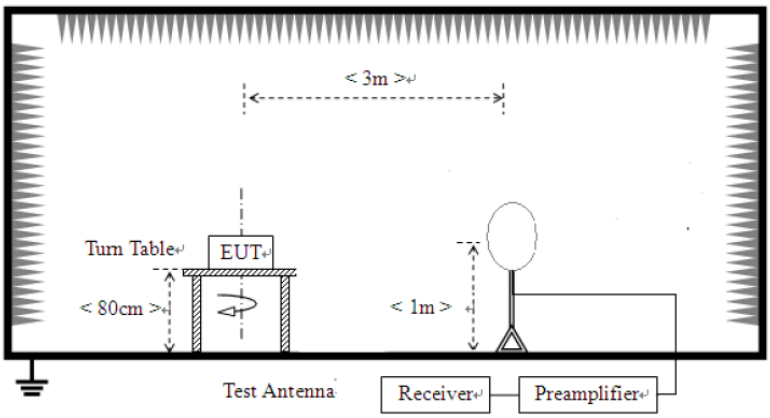
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

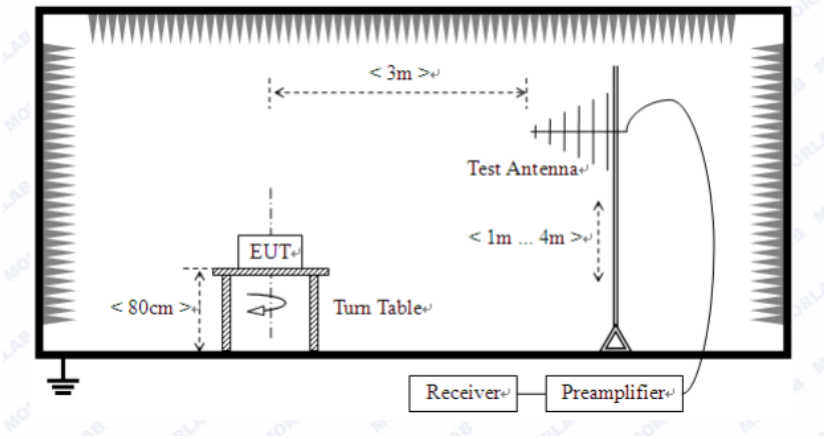
Test Procedure:

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:

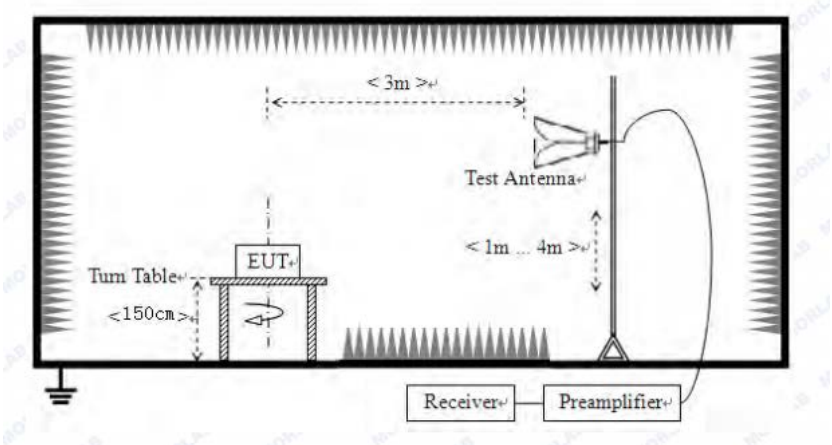
1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, 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 Instruments:	Refer to section 5.10 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. *Only the worst case Main Antenna test data.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

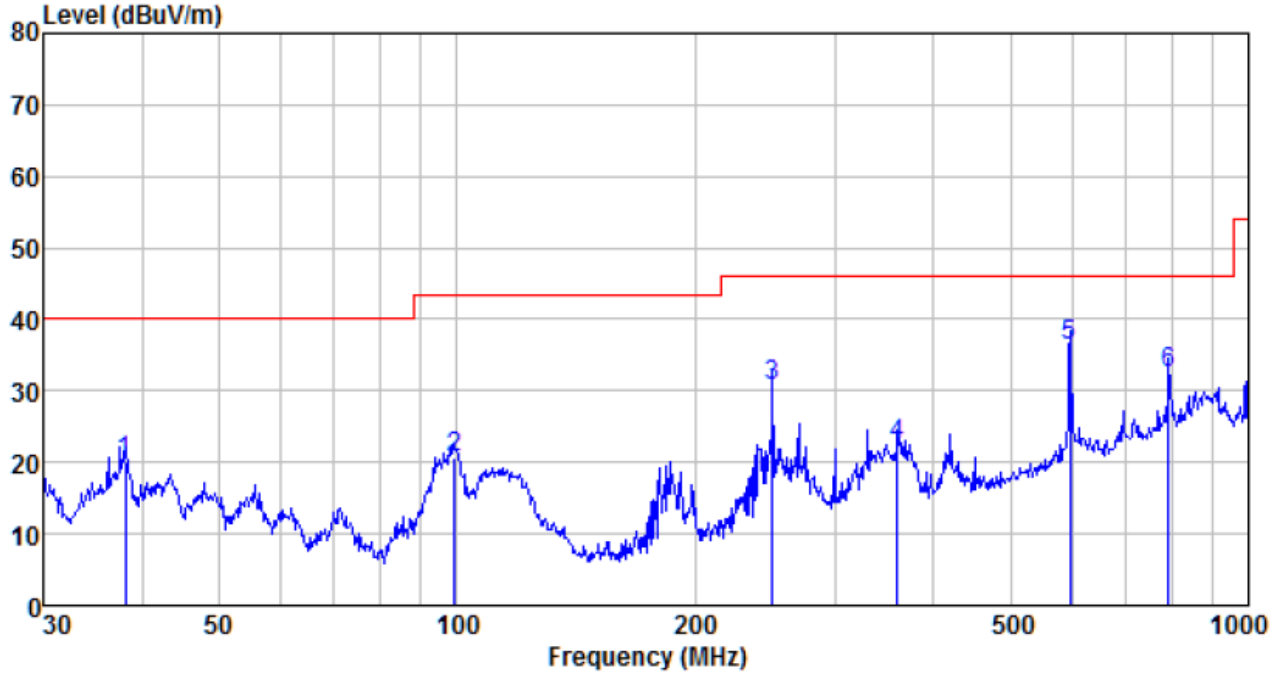
Measurement Data:

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.

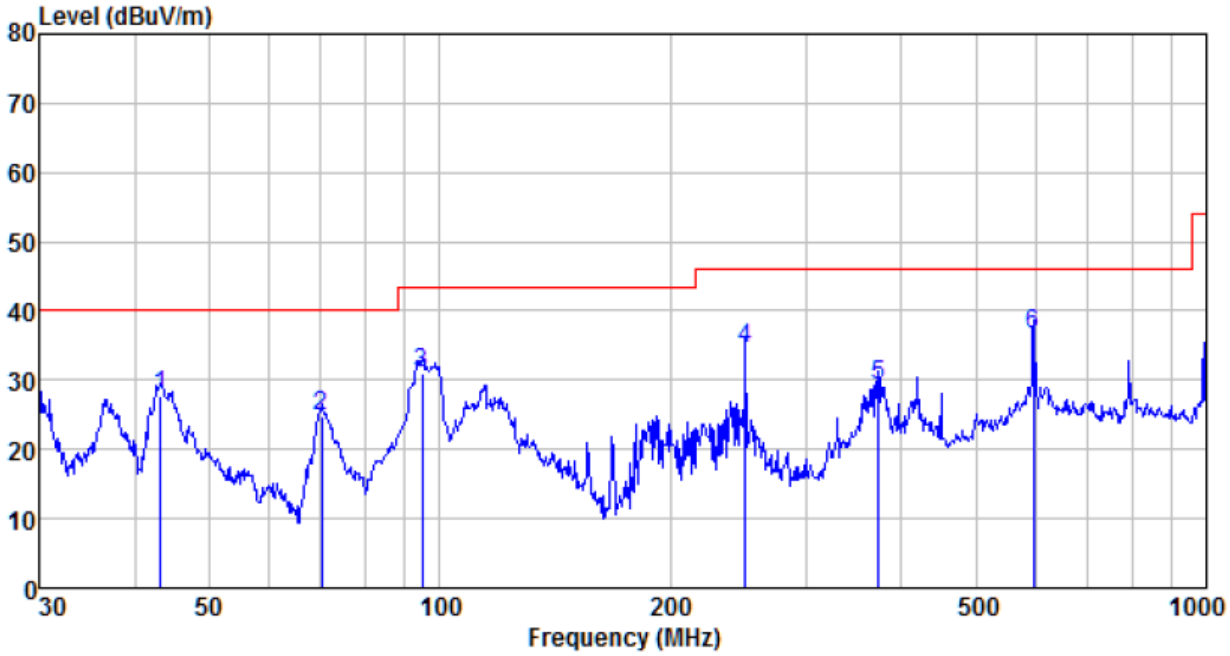
30MHz~ 1GHz

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
38.078	43.15	11.89	0.64	35.55	20.13	40.00	-19.87	QP
99.180	44.21	12.13	1.18	36.71	20.81	43.50	-22.69	QP
250.301	53.86	12.18	2.12	37.38	30.78	46.00	-15.22	QP
360.448	42.64	14.70	2.67	37.48	22.53	46.00	-23.47	QP
595.133	50.74	19.39	3.70	37.54	36.29	46.00	-9.71	QP
793.396	44.52	21.28	4.43	37.62	32.61	46.00	-13.39	QP

Vertical:



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
43.202	50.54	12.23	0.70	35.84	27.63	40.00	-12.37	QP
70.090	52.67	7.50	0.94	36.44	24.67	40.00	-15.33	QP
94.760	55.18	11.45	1.15	36.68	31.10	43.50	-12.40	QP
250.301	57.47	12.18	2.12	37.38	34.39	46.00	-11.61	QP
373.311	49.13	14.89	2.73	37.50	29.25	46.00	-16.75	QP
595.133	51.15	19.39	3.70	37.54	36.70	46.00	-9.30	QP

Above 1GHz:

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
10360.00	32.64	39.67	14.62	32.65	54.28	74.00	-19.72	Vertical
15540.00	32.65	38.6	17.66	34.46	54.45	74.00	-19.55	Vertical
10360.00	32.02	39.67	14.62	32.65	53.66	74.00	-20.34	Horizontal
15540.00	31.96	38.6	17.66	34.46	53.76	74.00	-20.24	Horizontal

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
10360.00	22.38	39.67	14.62	32.65	44.02	54.00	-9.98	Vertical
15540.00	22.83	38.6	17.66	34.46	44.63	54.00	-9.37	Vertical
10360.00	19.55	39.67	14.62	32.65	41.19	54.00	-12.81	Horizontal
15540.00	21.81	38.6	17.66	34.46	43.61	54.00	-10.39	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
10400.00	33.93	39.75	14.63	32.71	55.6	74.00	-18.4	Vertical
15600.00	36.41	38.33	17.67	34.17	58.24	74.00	-15.76	Vertical
10400.00	32.88	39.75	14.63	32.71	54.55	74.00	-19.45	Horizontal
15600.00	36.21	38.33	17.67	34.17	58.04	74.00	-15.96	Horizontal

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
10400.00	19.61	39.75	14.63	32.71	41.28	54.00	-12.72	Vertical
15600.00	21.27	38.33	17.67	34.17	43.10	54.00	-10.90	Vertical
10400.00	20.07	39.75	14.63	32.71	41.74	54.00	-12.26	Horizontal
15600.00	22.84	38.33	17.67	34.17	44.67	54.00	-9.33	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
10480.00	32.62	39.82	14.68	32.86	54.26	74.00	-19.74	Vertical
15720.00	35.35	38.09	17.73	33.66	57.51	74.00	-16.49	Vertical
10480.00	37.51	39.82	14.68	32.86	59.15	74.00	-14.85	Horizontal
15720.00	37.47	38.09	17.73	33.66	59.63	74.00	-14.37	Horizontal

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
10480.00	19.30	39.82	14.68	32.86	40.94	54.00	-13.06	Vertical
15720.00	20.27	38.09	17.73	33.66	42.43	54.00	-11.57	Vertical
10480.00	20.98	39.82	14.68	32.86	42.62	54.00	-11.38	Horizontal
15720.00	22.20	38.09	17.73	33.66	44.36	54.00	-9.64	Horizontal

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
10360.00	34.67	39.67	14.62	32.65	56.31	74.00	-17.69	Vertical
15540.00	31.42	38.6	17.66	34.46	53.22	74.00	-20.78	Vertical
10360.00	34.90	39.67	14.62	32.65	56.54	74.00	-17.46	Horizontal
15540.00	31.53	38.6	17.66	34.46	53.33	74.00	-20.67	Horizontal

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
10360.00	22.13	39.67	14.62	32.65	43.77	54.00	-10.23	Vertical
15540.00	21.56	38.6	17.66	34.46	43.36	54.00	-10.64	Vertical
10360.00	20.20	39.67	14.62	32.65	41.84	54.00	-12.16	Horizontal
15540.00	19.29	38.6	17.66	34.46	41.09	54.00	-12.91	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
10400.00	37.18	39.75	14.63	32.71	58.85	74.00	-15.15	Vertical
15600.00	35.36	38.33	17.67	34.17	57.19	74.00	-16.81	Vertical
10400.00	34.32	39.75	14.63	32.71	55.99	74.00	-18.01	Horizontal
15600.00	32.22	38.33	17.67	34.17	54.05	74.00	-19.95	Horizontal

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
10400.00	19.83	39.75	14.63	32.71	41.50	54.00	-12.50	Vertical
15600.00	20.44	38.33	17.67	34.17	42.27	54.00	-11.73	Vertical
10400.00	22.75	39.75	14.63	32.71	44.42	54.00	-9.58	Horizontal
15600.00	20.37	38.33	17.67	34.17	42.20	54.00	-11.80	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
10480.00	35.07	39.82	14.68	32.86	56.71	74.00	-17.29	Vertical
15720.00	36.85	38.09	17.73	33.66	59.01	74.00	-14.99	Vertical
10480.00	35.40	39.82	14.68	32.86	57.04	74.00	-16.96	Horizontal
15720.00	33.29	38.09	17.73	33.66	55.45	74.00	-18.55	Horizontal

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
10480.00	22.12	39.82	14.68	32.86	43.76	54.00	-10.24	Vertical
15720.00	19.05	38.09	17.73	33.66	41.21	54.00	-12.79	Vertical
10480.00	19.42	39.82	14.68	32.86	41.06	54.00	-12.94	Horizontal
15720.00	21.12	38.09	17.73	33.66	43.28	54.00	-10.72	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
10360.00	37.04	39.67	14.62	32.65	58.68	74.00	-15.32	Vertical
15540.00	35.63	38.6	17.66	34.46	57.43	74.00	-16.57	Vertical
10360.00	33.76	39.67	14.62	32.65	55.4	74.00	-18.6	Horizontal
15540.00	36.29	38.6	17.66	34.46	58.09	74.00	-15.91	Horizontal

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
10360.00	19.92	39.67	14.62	32.65	41.56	54.00	-12.44	Vertical
15540.00	21.81	38.6	17.66	34.46	43.61	54.00	-10.39	Vertical
10360.00	21.55	39.67	14.62	32.65	43.19	54.00	-10.81	Horizontal
15540.00	19.22	38.6	17.66	34.46	41.02	54.00	-12.98	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
10400.00	32.99	39.75	14.63	32.71	54.66	74.00	-19.34	Vertical
15600.00	31.53	38.33	17.67	34.17	53.36	74.00	-20.64	Vertical
10400.00	37.03	39.75	14.63	32.71	58.7	74.00	-15.3	Horizontal
15600.00	35.91	38.33	17.67	34.17	57.74	74.00	-16.26	Horizontal

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
10400.00	20.38	39.75	14.63	32.71	42.05	54.00	-11.95	Vertical
15600.00	21.64	38.33	17.67	34.17	43.47	54.00	-10.53	Vertical
10400.00	20.65	39.75	14.63	32.71	42.32	54.00	-11.68	Horizontal
15600.00	21.03	38.33	17.67	34.17	42.86	54.00	-11.14	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
10480.00	33.78	39.82	14.68	32.86	55.42	74.00	-18.58	Vertical
15720.00	36.07	38.09	17.73	33.66	58.23	74.00	-15.77	Vertical
10480.00	31.48	39.82	14.68	32.86	53.12	74.00	-20.88	Horizontal
15720.00	34.77	38.09	17.73	33.66	56.93	74.00	-17.07	Horizontal

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
10480.00	21.48	39.82	14.68	32.86	43.12	54.00	-10.88	Vertical
15720.00	20.71	38.09	17.73	33.66	42.87	54.00	-11.13	Vertical
10480.00	21.37	39.82	14.68	32.86	43.01	54.00	-10.99	Horizontal
15720.00	22.13	38.09	17.73	33.66	44.29	54.00	-9.71	Horizontal

802.11nHT40) 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)	polarization
10380.00	31.66	39.71	14.63	32.68	53.32	74.00	-20.68	Vertical
15570.00	34.78	38.46	17.67	34.32	56.59	74.00	-17.41	Vertical
10380.00	34.12	39.71	14.63	32.68	55.78	74.00	-18.22	Horizontal
15570.00	31.87	38.46	17.67	34.32	53.68	74.00	-20.32	Horizontal

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
10380.00	22.73	39.71	14.63	32.68	44.39	54.00	-9.61	Vertical
15570.00	20.64	38.46	17.67	34.32	42.45	54.00	-11.55	Vertical
10380.00	22.81	39.71	14.63	32.68	44.47	54.00	-9.53	Horizontal
15570.00	21.65	38.46	17.67	34.32	43.46	54.00	-10.54	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)	polarization
10460.00	31.39	39.75	14.65	32.74	53.05	74.00	-20.95	Vertical
15690.00	31.41	38.33	17.69	34.03	53.4	74.00	-20.6	Vertical
10460.00	37.28	39.75	14.65	32.74	58.94	74.00	-15.06	Horizontal
15690.00	31.78	38.33	17.69	34.03	53.77	74.00	-20.23	Horizontal

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
10460.00	22.18	39.75	14.65	32.74	43.84	54.00	-10.16	Vertical
15690.00	21.30	38.33	17.69	34.03	43.29	54.00	-10.71	Vertical
10460.00	20.73	39.75	14.65	32.74	42.39	54.00	-11.61	Horizontal
15690.00	19.32	38.33	17.69	34.03	41.31	54.00	-12.69	Horizontal

802.11acHT40) 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)	polarization
10380.00	32.10	39.71	14.63	32.68	53.76	74.00	-20.24	Vertical
15570.00	35.10	38.46	17.67	34.32	56.91	74.00	-17.09	Vertical
10380.00	32.05	39.71	14.63	32.68	53.71	74.00	-20.29	Horizontal
15570.00	37.64	38.46	17.67	34.32	59.45	74.00	-14.55	Horizontal

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
10380.00	21.26	39.71	14.63	32.68	42.92	54.00	-11.08	Vertical
15570.00	20.29	38.46	17.67	34.32	42.10	54.00	-11.90	Vertical
10380.00	19.42	39.71	14.63	32.68	41.08	54.00	-12.92	Horizontal
15570.00	19.85	38.46	17.67	34.32	41.66	54.00	-12.34	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)	polarization
10460.00	35.60	39.75	14.65	32.74	57.26	74.00	-16.74	Vertical
15690.00	34.58	38.33	17.69	34.03	56.57	74.00	-17.43	Vertical
10460.00	34.01	39.75	14.65	32.74	55.67	74.00	-18.33	Horizontal
15690.00	31.58	38.33	17.69	34.03	53.57	74.00	-20.43	Horizontal

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
10460.00	19.87	39.75	14.65	32.74	41.53	54.00	-12.47	Vertical
15690.00	20.32	38.33	17.69	34.03	42.31	54.00	-11.69	Vertical
10460.00	20.37	39.75	14.65	32.74	42.03	54.00	-11.97	Horizontal
15690.00	22.41	38.33	17.69	34.03	44.40	54.00	-9.60	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)	polarization
10420.00	32.72	39.82	14.66	32.8	54.4	74.00	-19.6	Vertical
15630.00	31.09	38.09	17.71	33.81	53.08	74.00	-20.92	Vertical
10420.00	31.78	39.82	14.66	32.8	53.46	74.00	-20.54	Horizontal
15630.00	32.80	38.09	17.71	33.81	54.79	74.00	-19.21	Horizontal

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
10420.00	19.59	39.82	14.66	32.80	41.27	54.00	-12.73	Vertical
15630.00	22.90	38.09	17.71	33.81	44.89	54.00	-9.11	Vertical
10420.00	19.33	39.82	14.66	32.80	41.01	54.00	-12.99	Horizontal
15630.00	22.46	38.09	17.71	33.81	44.45	54.00	-9.55	Horizontal

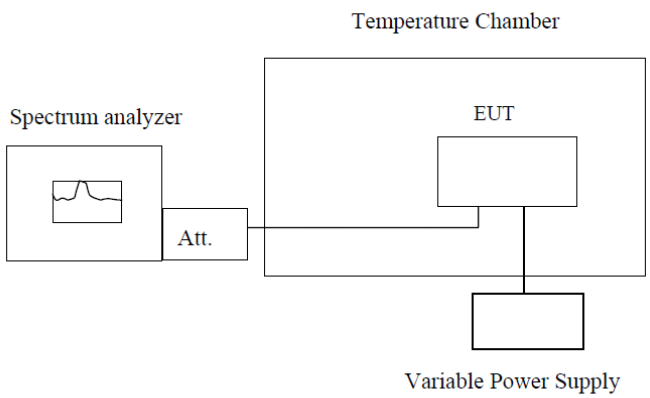
Notes:

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 5.10 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.									
Worse Case Operating Frequency：5180MHz									
Temp. (°C)	Power Supply (VAC)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	120	5180.3395	Pass	5180.1668	Pass	5180.8190	Pass	5180.1022	Pass
-20	120	5180.3697	Pass	5180.5536	Pass	5180.6288	Pass	5180.1404	Pass
-10	120	5180.9589	Pass	5180.2400	Pass	5180.9847	Pass	5180.4731	Pass
0	120	5180.7284	Pass	5180.5794	Pass	5180.5866	Pass	5180.6074	Pass
10	120	5180.1204	Pass	5180.7446	Pass	5180.9445	Pass	5180.2781	Pass
20	120	5180.4574	Pass	5180.3048	Pass	5180.1482	Pass	5180.6072	Pass
30	120	5180.7036	Pass	5180.8427	Pass	5180.0686	Pass	5180.3678	Pass
40	120	5180.4417	Pass	5180.9214	Pass	5180.9732	Pass	5180.9719	Pass
50	120	5180.7291	Pass	5180.3598	Pass	5180.2240	Pass	5180.0174	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5180MHz									
Temp. (°C)	Power Supply (VAC)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	108	5180.3366	Pass	5180.8495	Pass	5180.3246	Pass	5180.9641	Pass
25	120	5180.2464	Pass	5180.9527	Pass	5180.8710	Pass	5180.6521	Pass
25	132	5180.9793	Pass	5180.1002	Pass	5180.1811	Pass	5180.1177	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5190MHz									
Temp. (°C)	Power Supply (VAC)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	120	5190.9113	Pass	5190.3360	Pass	5190.9613	Pass	5190.5151	Pass
-20	120	5190.8694	Pass	5190.5770	Pass	5190.3259	Pass	5190.6624	Pass
-10	120	5190.3042	Pass	5190.6648	Pass	5190.3489	Pass	5190.0821	Pass
0	120	5190.5990	Pass	5190.5906	Pass	5190.3529	Pass	5190.5323	Pass
10	120	5190.8571	Pass	5190.9929	Pass	5190.6061	Pass	5190.0378	Pass
20	120	5190.7987	Pass	5190.3494	Pass	5190.2478	Pass	5190.3924	Pass
30	120	5190.0233	Pass	5190.6778	Pass	5190.7851	Pass	5190.5586	Pass
40	120	5190.4471	Pass	5190.5953	Pass	5190.8063	Pass	5190.9433	Pass
50	120	5190.5328	Pass	5190.1122	Pass	5190.5755	Pass	5190.8891	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5190MHz									
Temp. (°C)	Power Supply (VAC)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	108	5190.7925	Pass	5190.6707	Pass	5190.8717	Pass	5190.2245	Pass
25	120	5190.9334	Pass	5190.1786	Pass	5190.2787	Pass	5190.8561	Pass
25	132	5190.4124	Pass	5190.6865	Pass	5190.9074	Pass	5190.1008	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5210MHz									
Temp. (°C)	Power Supply (VAC)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	120	5210.6354	Pass	5210.2231	Pass	5210.3693	Pass	5210.0530	Pass
-20	120	5210.2182	Pass	5210.0745	Pass	5210.8485	Pass	5210.1833	Pass
-10	120	5210.3502	Pass	5210.2000	Pass	5210.7567	Pass	5210.5888	Pass
0	120	5210.2467	Pass	5210.2682	Pass	5210.6437	Pass	5210.2662	Pass
10	120	5210.1967	Pass	5210.4890	Pass	5210.0749	Pass	5210.4697	Pass
20	120	5210.5873	Pass	5210.2314	Pass	5210.2019	Pass	5210.7777	Pass
30	120	5210.4892	Pass	5210.1883	Pass	5210.3029	Pass	5210.5354	Pass
40	120	5210.2618	Pass	5210.1441	Pass	5210.2896	Pass	5210.8349	Pass
50	120	5210.6382	Pass	5210.0057	Pass	5210.3979	Pass	5210.8841	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5210MHz									
Temp. (°C)	Power Supply (VAC)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	108	5210.4957	Pass	5210.6433	Pass	5210.3390	Pass	5210.8626	Pass
25	120	5210.3052	Pass	5210.1274	Pass	5210.8628	Pass	5210.5506	Pass
25	132	5210.5824	Pass	5210.5268	Pass	5210.5215	Pass	5180.2494	Pass

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

---END---