

# FCC REPORT

**Applicant:** Shenzhen Scope Corporation Limited

**Address of Applicant:** 12-13F, Block C2, Nanshan Zhiyuan, No 1001, Xueyuan Road, Nanshan District, Shenzhen, China

**Manufacturer:** Shenzhen Scope Corporation Limited

**Address of Manufacturer:** 12-13F, Block C2, Nanshan Zhiyuan, No 1001, Xueyuan Road, Nanshan District, Shenzhen, China

**Factory:** Youke Digital Technology(Hui zhou)Co.,Ltd

**Address of Factory:** Queens Village,Zhelong Town, Huiyang District,Huizhou City, China

**Equipment Under Test (EUT)**

Product Name: tabletPC

Model No.: F503V, SP1099, SP1068, SP1068A, SP1068B, SP1228, SP1228A, SP1028BYK1018, YK1019, YK1028, YK1029, YK1058, YK1059, SP1017V, SP1017Z, SP1089, SP1099X, sp1089x, F503X(X=A-Z, Xonly indicate the different client model and color)

Trade Mark: SCOPE

**FCC ID:** 2AQNASCOPESP

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart E Section 15.407

**Date of sample receipt:** July 16, 2018

**Date of Test:** July 17-23, 2018

**Date of report issued:** July 24, 2018

**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	July 24, 2018	Original

Prepared By:

*Bill. Yuan*

Project Engineer

Date:

July 24, 2018

Check By:

*Andy. Wu*

Reviewer

Date:

July 24, 2018

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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
Conducted Peak Output Power	15.407(a)(3)	Pass
Channel Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407(a)(3)	Pass
Band Edge	15.407(b)(4)	Pass
Spurious Emission	15.205/15.209/15.407(b)(4)	Pass
Frequency Stability	15.407(g)	Pass

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

*Remark: Test according to ANSI C63.10:2013.*

### 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%.			

## 5 General Information

### 5.1 General Description of EUT

Product Name:	tabletPC
Model No.:	F503V, SP1099, SP1068, SP1068A, SP1068B, SP1228, SP1228A, SP1028BYK1018, YK1019, YK1028, YK1029, YK1058, YK1059, SP1017V, SP1017Z, SP1089, SP1099X, sp1089x, F503X(X=A-Z, Xonly indicate the different client model and color)
Test Model No:	F503V
<i>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.</i>	
Serial No.:	ML5RROKK4G
Test sample(s) ID:	GTS201807000096-1
Sample(s) Status:	Engineer sample
Hardware version:	RK3368H_TABLET_F503V_LPDDR3P132SD4_V20
Software version:	F503V_NOMDM_1.0.0_ZS080_20180416.0932
Operation Frequency:	802.11a/802.11n(HT20)/802.11ac(HT20) @5.8G Band: 5745MHz ~ 5825MHz 802.11n(HT40)/ 802.11ac(HT40) @ 5.8G Band: 5755MHz ~ 5795MHz 802.11ac(HT80): 5775MHz
Channel numbers:	802.11a/802.11n(HT20)/802.11ac(HT20) @5.8G Band: 5 802.11n(HT40)/ 802.11ac(HT40) @ 5.8G Band: 2 802.11ac(HT80): 1
Channel bandwidth:	802.11a/802.11n(HT20)/802.11ac(HT20) : 20MHz 802.11n(HT40)/802.11ac(HT40) : 40MHz 802.11ac(HT80): 80MHz
Modulation technology:	802.11a/802.11n(H20)/802.11n(H40)/802.11ac(HT20)/802.11ac(HT40) /802.11ac(HT80): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Internal Antenna
Antenna gain:	2.00dBi(declare by applicant)
Power supply:	Adapter 1: Model:SR-C60502000U1 Input: AC100-240V, 50/60Hz, 0.35A Max Output: DC 5V 2000mA Adapter 2: Model:JHD-AP013U-050200BB-A Input: AC100-240V, 50/60Hz, 0.35A Max Output: DC 5V 2000mA Battery: PL4060103P Model:SR-C60502000U1 DC 3.7V, 6500mAh

Operation Frequency each of channel @ 5.8G Band							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	153	5765MHz	155	5775MHz
157	5785MHz	159	5795MHz	161	5805MHz	163	5815MHz
165	5825MHz						

**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)		
	5.8G Band		
	802.11 a/n/ac(HT20)	802.11 n/ac(HT40)	802.11ac(HT80)
Lowest channel	5745	5755	<del>5775</del>
Middle channel	5785	<del>5795</del>	5775
Highest channel	5825	5795	<del>5775</del>

## 5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
<i>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.</i>	

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:	
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
<b>Mode</b>	<b>Data rate</b>
802.11a	6Mbps
802.11n(HT20)	6.5Mbps
802.11n(HT40)	13Mbps
802.11ac(HT20)	6.5Mbps
802.11ac(HT40)	13.5Mbps
802.11ac(HT80)	29.3Mbps

## 5.3 Description of Support Units

None.
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## 5.4 Test Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> <li>● <b>FCC —Registration No.:381383</b> 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.</li> <li>● <b>Industry Canada (IC) —Registration No.: 9079A-2</b> 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.</li> </ul>
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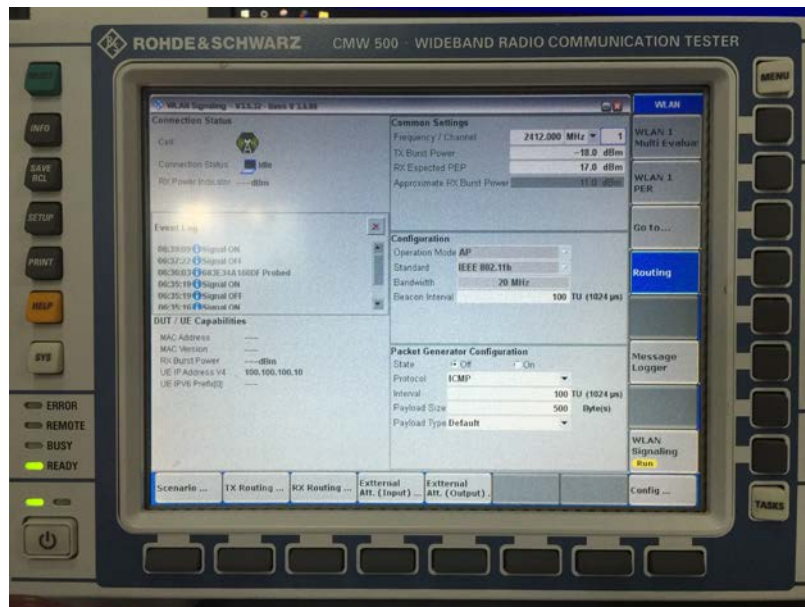
## 5.5 Test Location

All tests were performed at:
<p>Global United Technology Services Co., Ltd. No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China Tel: 0755-27798480 Fax: 0755-27798960</p>

## 5.6 Additional Instructions

EUT Fixed Frequency Settings:

Power level setup			
Support Units	Description	Manufacturer	Model
		Wideband Radio Communication Tester	Rohde & Schwarz
Mode	Channel	Frequency (MHz)	Level Set
OFDM	CH149	5745	TX level : default
	CH151	5755	
	CH155	5775	
	CH157	5785	
	CH159	5795	
	CH165	5825	





## 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

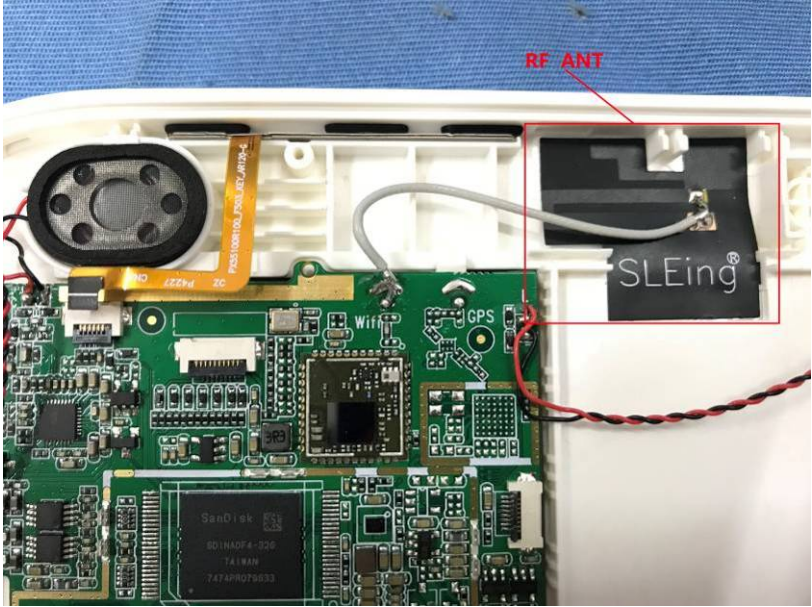
<b>Conducted Emission</b>						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Coaxial Switch	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

<b>Conducted:</b>						
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

<b>General used equipment:</b>						
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

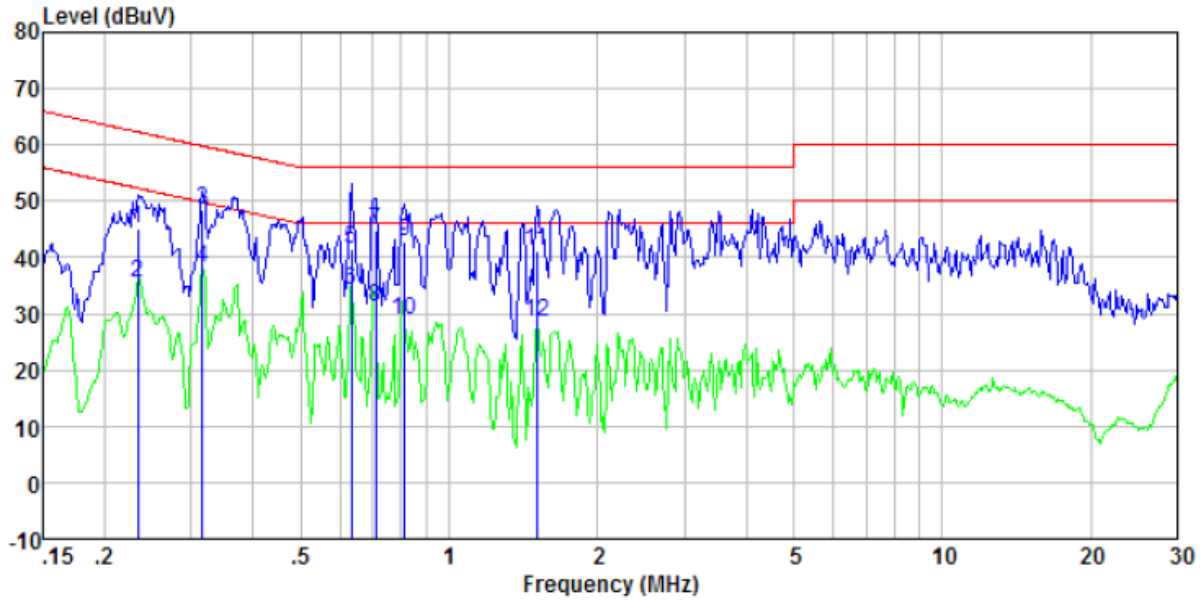
<b>Standard requirement:</b>	FCC Part15 C Section 15.203
<p><i>15.203 requirement:</i></p> <p><i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna 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.</i></p>	
<b>E.U.T Antenna:</b>	
<p><i>The antenna is internal antenna. The best case gain of the antenna is 2.00dBi.</i></p>  <p>The image shows the internal components of a device. A green PCB is visible with various components including a speaker, a microphone, and a main processor. A black antenna is mounted on the PCB, connected to a cable. The antenna is labeled 'RF ANT' in red text. The PCB also has labels for 'WiFi' and 'GPS'. A black component labeled 'SLEing' is visible on the right side of the PCB. The device is housed in a white plastic casing.</p>	

## 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, Sweep time=auto		
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 setup:	<p><i>Remark</i>  E.U.T: Equipment Under Test  LISN: Line Impedance Stabilization Network  Test table height=0.8m</p>		
Test procedure:	<ol style="list-style-type: none"> <li>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>3. 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.</li> </ol>		
Test Instruments:	Refer to section 6.0 for details		
Test mode:	Refer to section 5.2 for details		
Test results:	Pass		

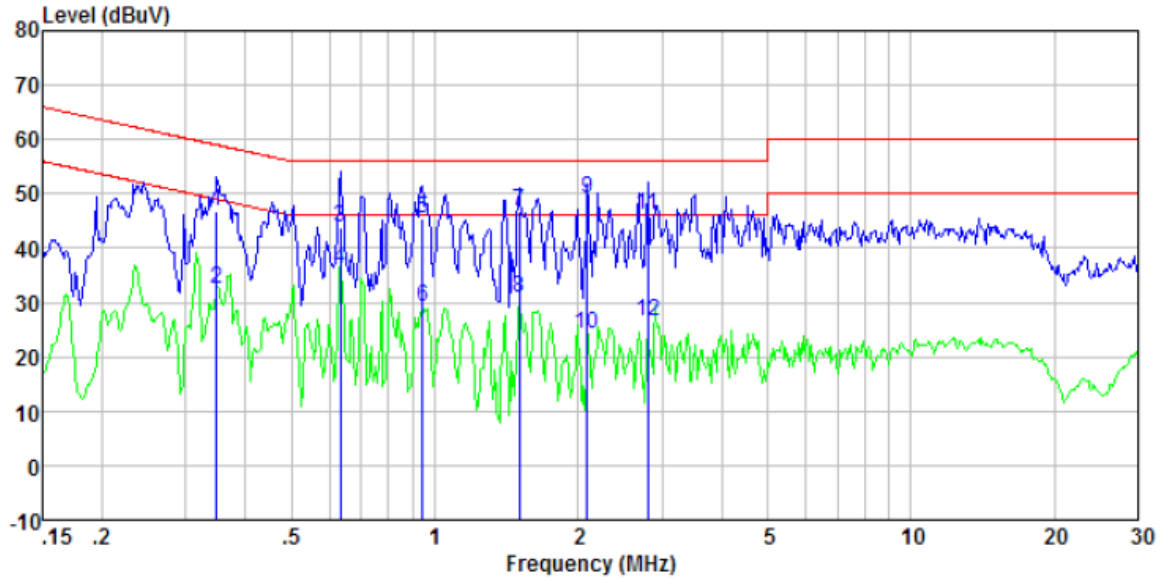
**Measurement data**

<b>Mode:</b>	<b>Transmitting mode</b>	<b>Test by:</b>	<b>Bill</b>
<b>Temp./Hum.(%RH):</b>	<b>26°C/56%RH</b>	<b>Probe:</b>	<b>Line</b>



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.23	44.54	0.40	0.11	45.05	62.30	-17.25	QP
0.23	34.87	0.40	0.11	35.38	52.30	-16.92	Average
0.32	47.94	0.39	0.10	48.43	59.80	-11.37	QP
0.32	37.78	0.39	0.10	38.27	49.80	-11.53	Average
0.63	41.14	0.28	0.12	41.54	56.00	-14.46	QP
0.63	33.74	0.28	0.12	34.14	46.00	-11.86	Average
0.71	44.50	0.26	0.13	44.89	56.00	-11.11	QP
0.71	30.68	0.26	0.13	31.07	46.00	-14.93	Average
0.81	42.41	0.23	0.14	42.78	56.00	-13.22	QP
0.81	28.49	0.23	0.14	28.86	46.00	-17.14	Average
1.50	40.80	0.20	0.16	41.16	56.00	-14.84	QP
1.50	28.32	0.20	0.16	28.68	46.00	-17.32	Average

<b>Mode:</b>	<b>Transmitting mode</b>	<b>Test by:</b>	<b>Bill</b>
<b>Temp./Hum.(%RH):</b>	<b>26°C/56%RH</b>	<b>Probe:</b>	<b>Neutral</b>

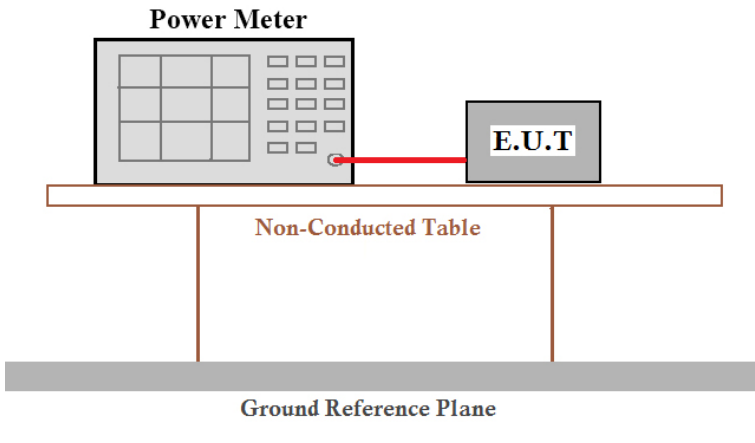


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.35	46.45	0.37	0.10	46.92	59.00	-12.08	QP
0.35	32.03	0.37	0.10	32.50	49.00	-16.50	Average
0.63	43.42	0.28	0.12	43.82	56.00	-12.18	QP
0.63	35.81	0.28	0.12	36.21	46.00	-9.79	Average
0.94	44.96	0.21	0.15	45.32	56.00	-10.68	QP
0.94	28.92	0.21	0.15	29.28	46.00	-16.72	Average
1.50	46.48	0.20	0.16	46.84	56.00	-9.16	QP
1.50	30.41	0.20	0.16	30.77	46.00	-15.23	Average
2.09	48.79	0.20	0.18	49.17	56.00	-6.83	QP
2.09	23.70	0.20	0.18	24.08	46.00	-21.92	Average
2.79	45.84	0.20	0.19	46.23	56.00	-9.77	QP
2.79	26.07	0.20	0.19	26.46	46.00	-19.54	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
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both *limits and measurement with the average detector receiver is unnecessary.*

### 7.3 Conducted Peak Output Power

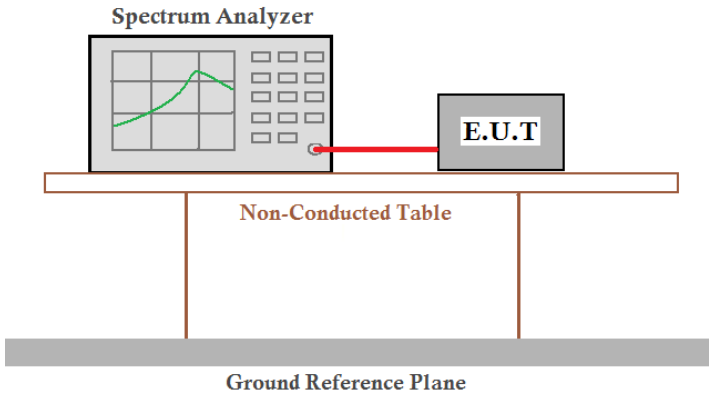
Test Requirement:	FCC Part15 E Section 15.407(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. A Power Meter is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which sits on a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

#### Measurement Data

Test CH	Peak Output Power (dBm)						Limit(dBm)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	7.63	7.82	7.95	7.72	7.57	---	30.00	Pass
Middle	7.66	7.97	7.91	---	---	6.07		
Highest	7.62	7.43	7.36	7.69	7.56	---		

Remark: “---“ is not applicable

## 7.4 Channel Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(e)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	>500KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement Data

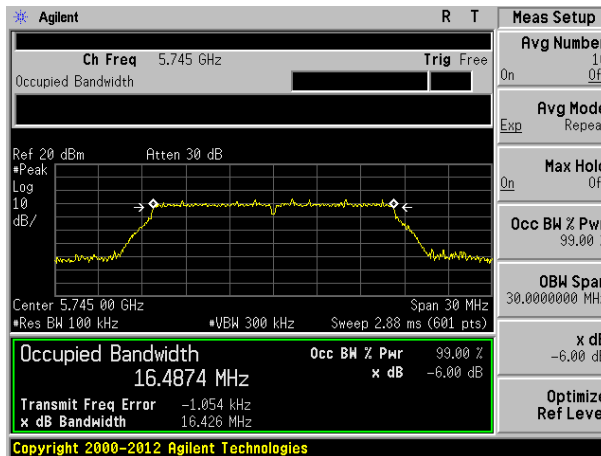
5.8G Band								
Test CH	Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n(H T20)	802.11ac(HT20)	802.11n(H T40)	802.11ac(HT40)	802.11ac(HT80)		
Lowest	16.426	15.159	15.180	35.130	35.110	---	>500	Pass
Middle	16.433	15.184	15.167	---	---	75.419		
Highest	16.420	15.163	15.335	35.024	35.100	---		

Remark: “---“ is not applicable

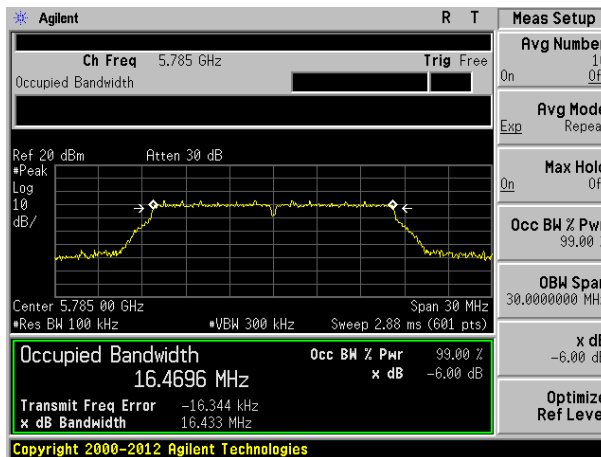
Test plot as follows:



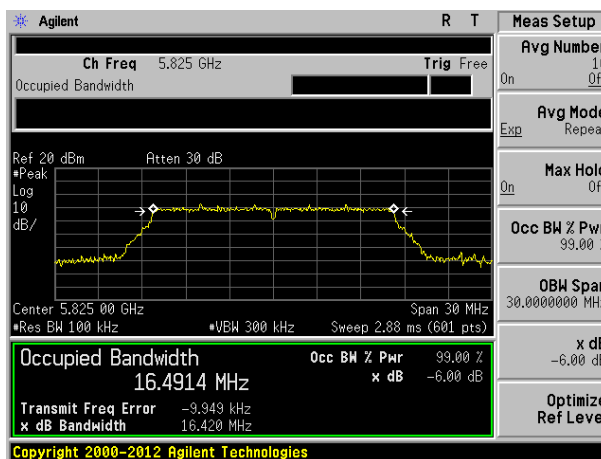
Test mode: 802.11a



Lowest channel

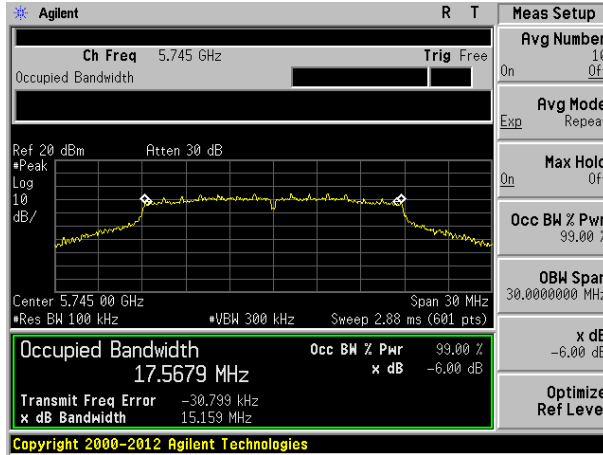


Middle channel

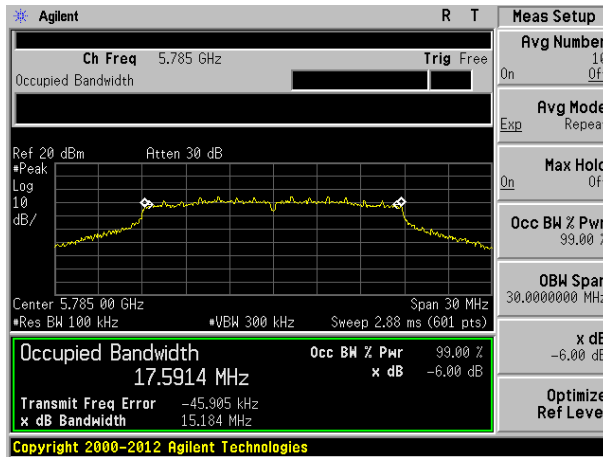


Highest channel

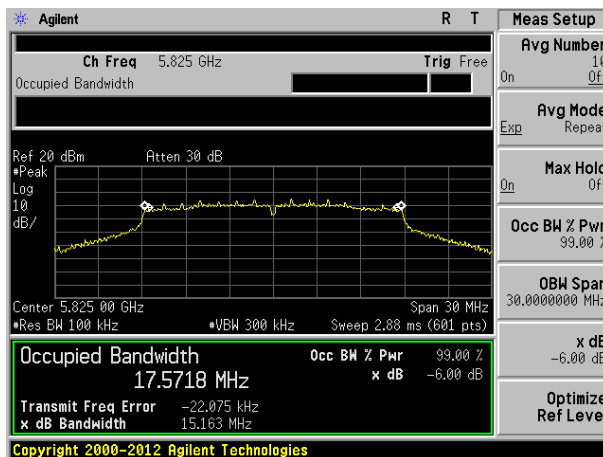
Test mode: 802.11n(HT20) @ 5.8G Band



Lowest channel

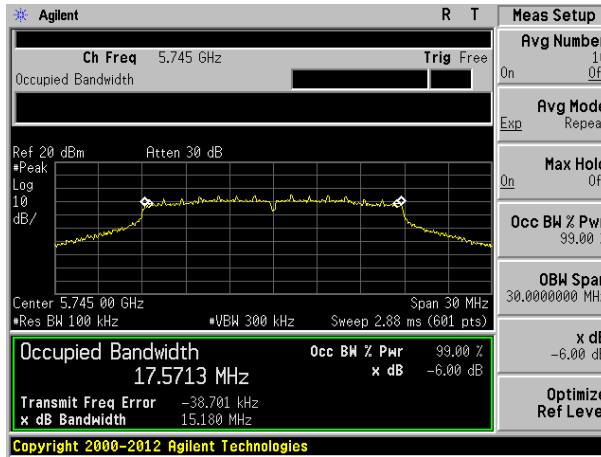


Middle channel

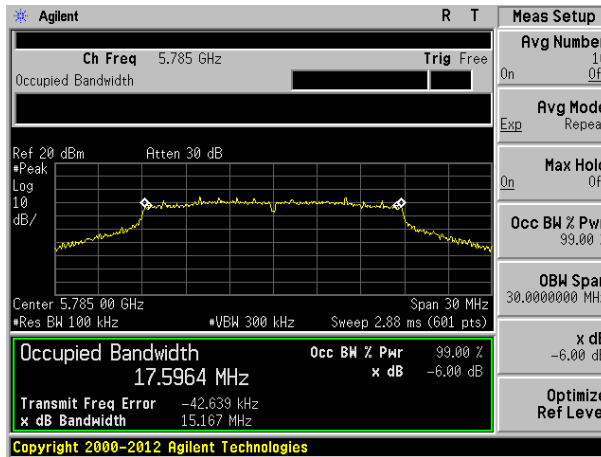


Highest channel

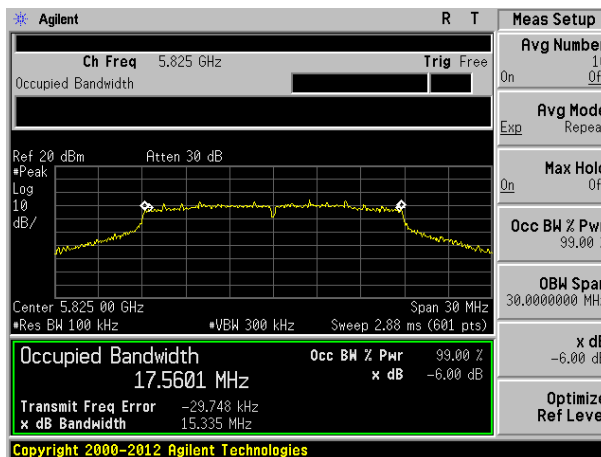
Test mode: 802.11ac(HT20) @ 5.8G Band



Lowest channel

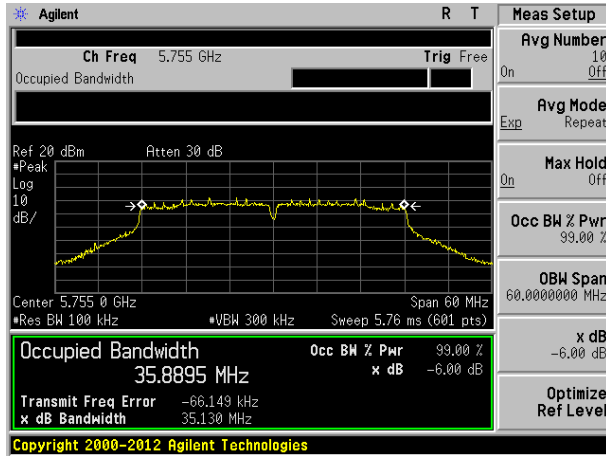


Middle channel

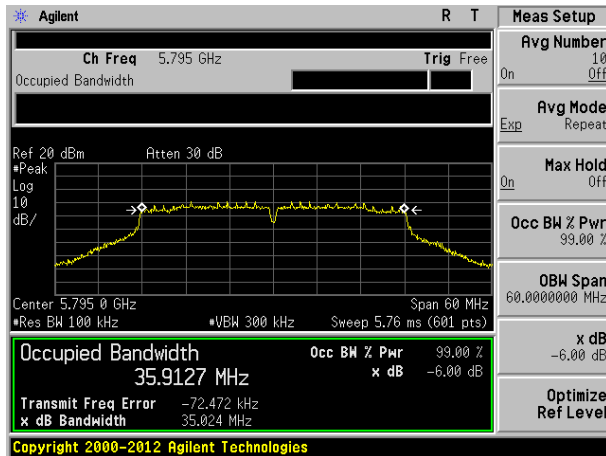


Highest channel

Test mode: 802.11n(HT40) @ 5.8G Band

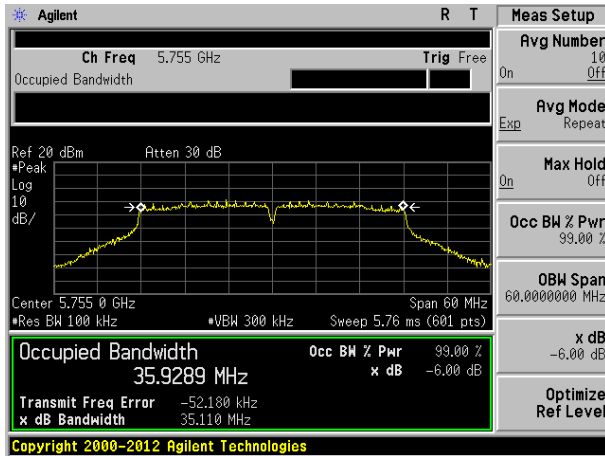


Lowest channel

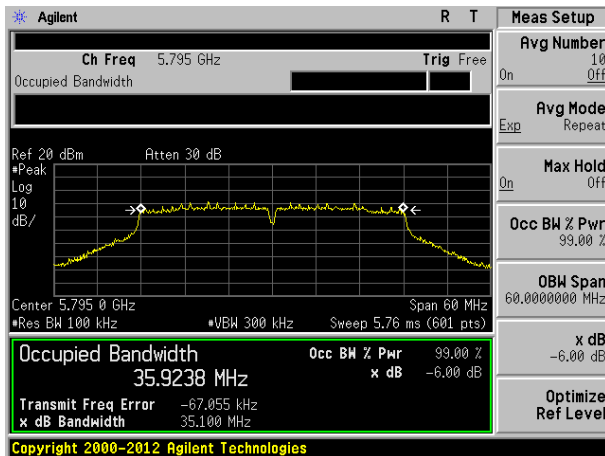


Highest channel

Test mode:802.11ac(HT40) @ 5.8G Band

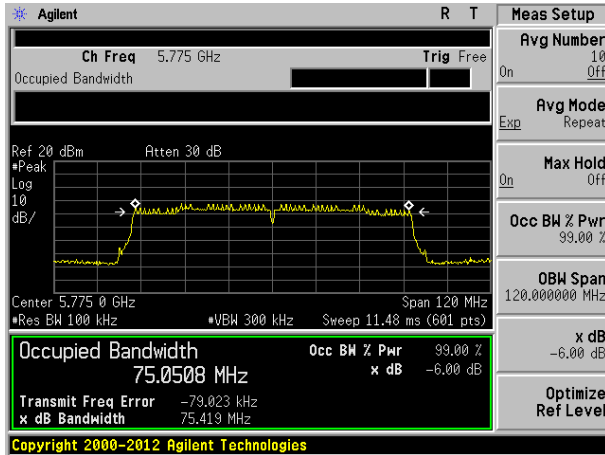


Lowest channel

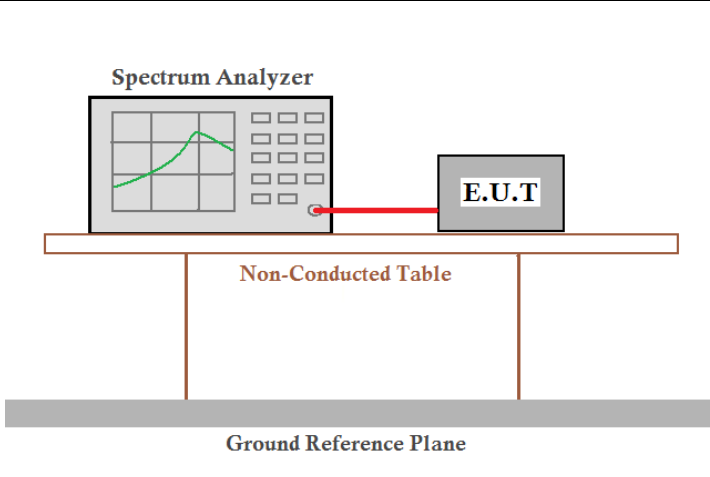


Highest channel

Test mode: 802.11ac(HT80) @ 5.8G Band



## 7.5 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

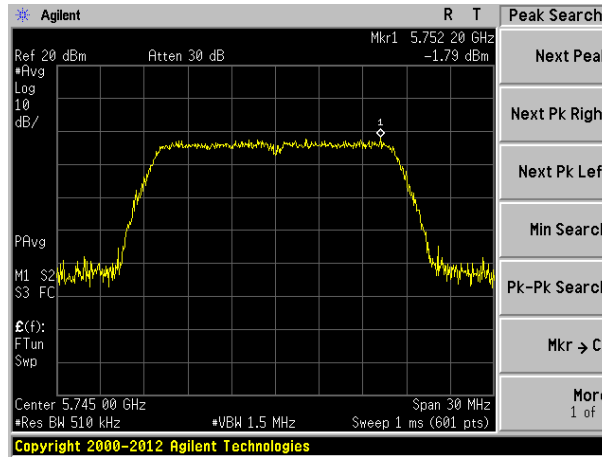
### Measurement Data

5.8G Band								
Test CH	Power Spectral Density (dBm)						Limit (dBm/500kHz)	Result
	802.11a	802.11n(HT 20)	802.11ac(H T20)	802.11n(HT 40)	802.11ac(H T40)	802.11ac(H T80)		
Lowest	-1.79	-1.82	-1.52	-5.61	-4.42	---	30.00	Pass
Middle	-1.93	-3.35	-2.47	---	---	-12.16		
Highest	-1.98	-1.84	-1.36	-6.05	-5.93	---		

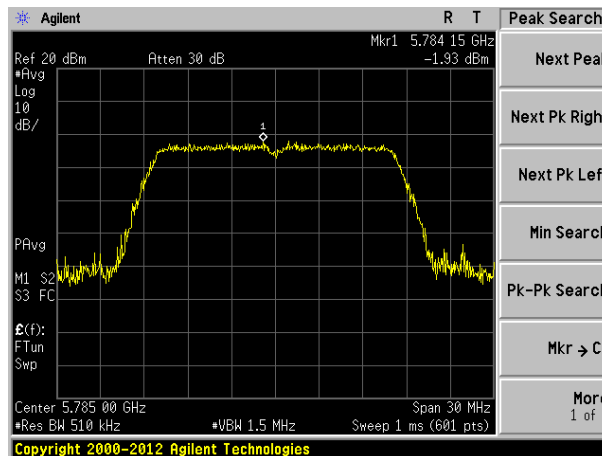
Remark: "---" is not applicable

Test plot as follows:

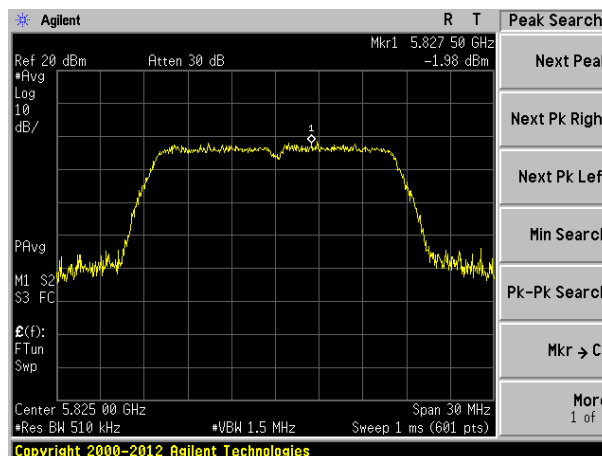
Test mode: 802.11a



Lowest channel

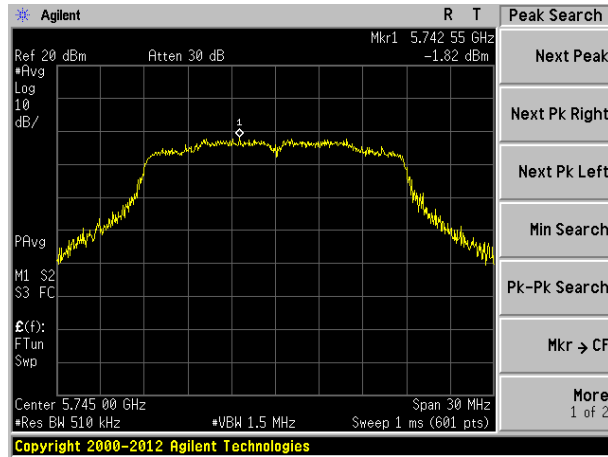


Middle channel

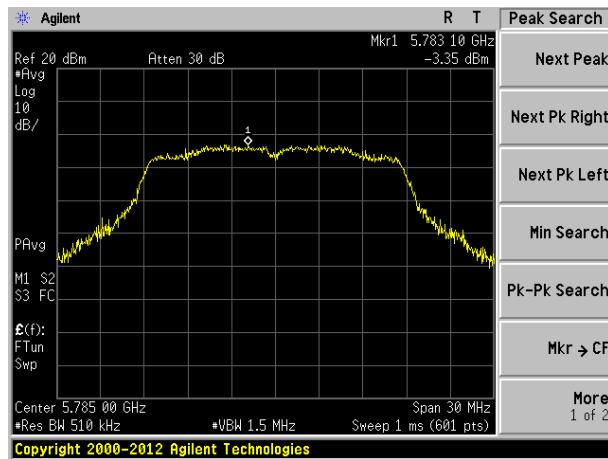


Highest channel

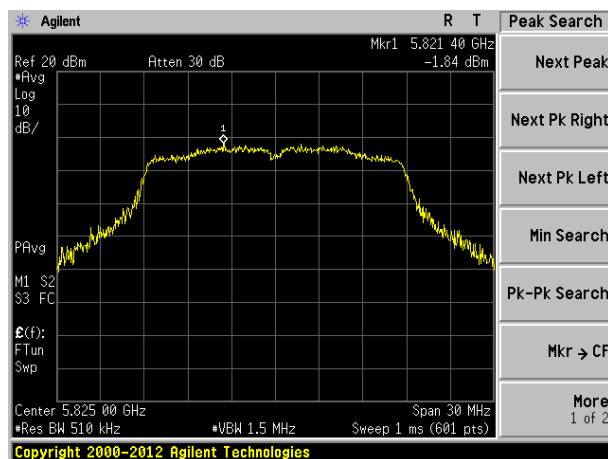
Test mode: 802.11n(HT20) @ 5.8G Band



Lowest channel



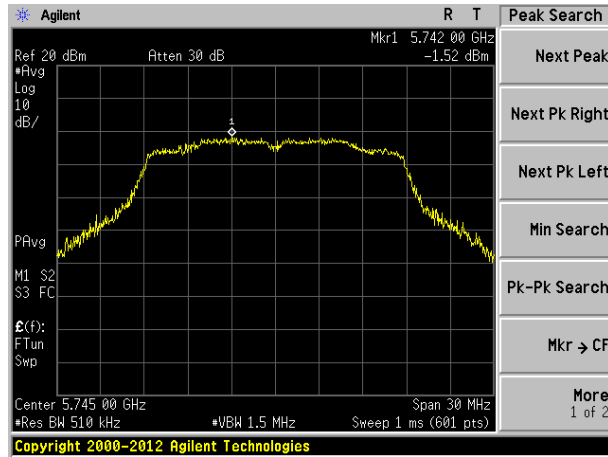
Middle channel



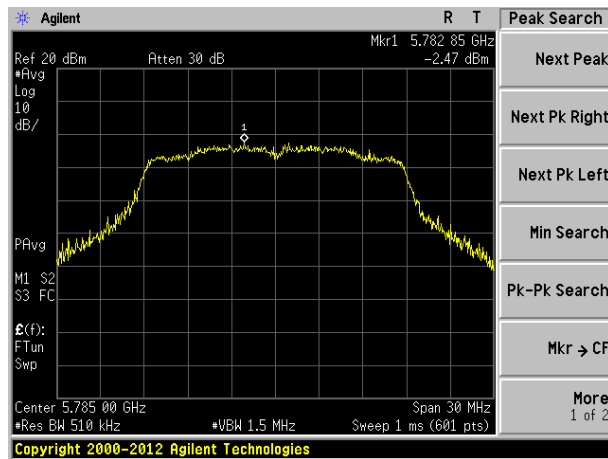
Highest channel



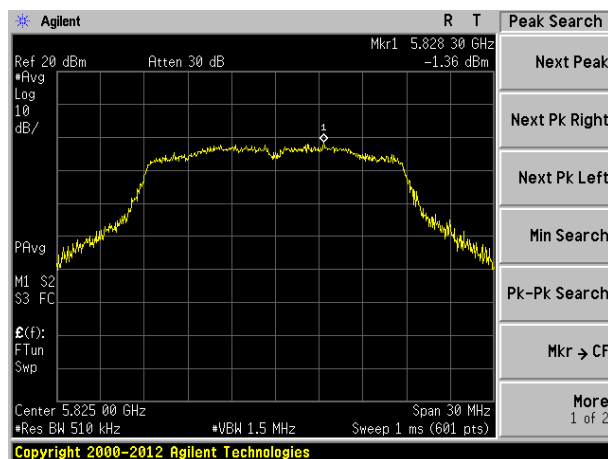
Test mode: 802.11ac(HT20)



Lowest channel

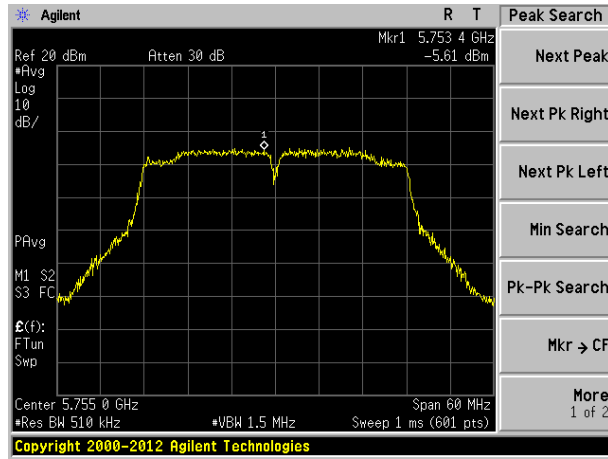


Middle channel

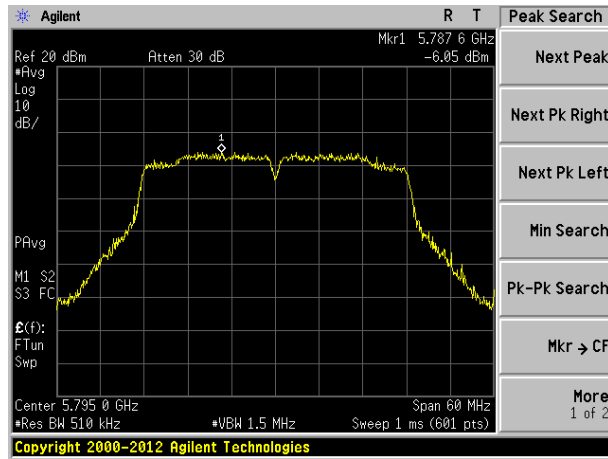


Highest channel

Test mode: 802.11n(HT40) @ 5.8G Band

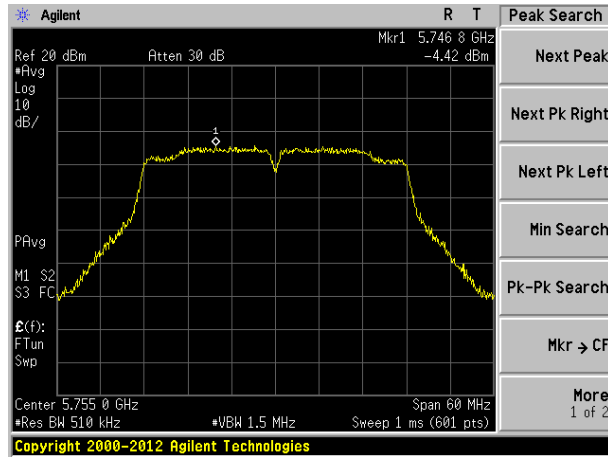


Lowest channel

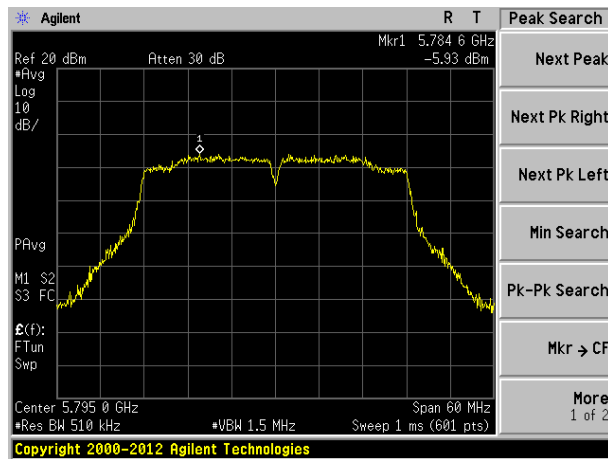


Highest channel

Test mode: 802.11ac(HT40)

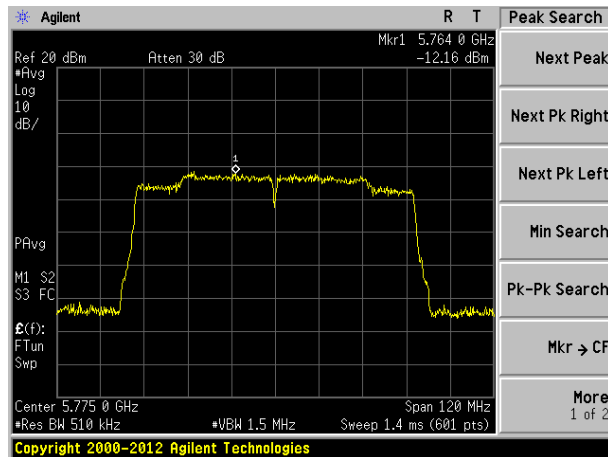


Lowest channel



Highest channel

Test mode: 802.11ac(HT80)



Middle channel

## 7.6 Band edges

### 7.6.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	9kHz to 40GHz, only worse case is reported				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	Above 1GHz	Peak RMS	1MHz 1MHz	3MHz 3MHz	Peak RMS
Limit:	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.				
Test setup:					
Test Procedure:	<ol style="list-style-type: none"> <li>1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>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.</li> <li>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.</li> <li>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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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-</li> </ol>				

	<p>peak or average method as specified and then reported in a data sheet.</p> <p>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

*Remark:*

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*
4. *According to KDB 789033 D02v02r01 section G) 1) d), for measurements above 1000 MHz @3m distance, the limit of field strength is computed as follows:*

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2;$$

$$E[\text{dBuV/m}] = -27 + 95.2 = 68.2\text{dBuV/m}.$$

$$E[\text{dBuV/m}] = 10 + 95.2 = 105.2\text{dBuV/m}.$$

$$E[\text{dBuV/m}] = 15.6 + 95.2 = 110.8\text{dBuV/m}.$$

$$E[\text{dBuV/m}] = 27 + 95.2 = 122.2\text{dBuV/m}$$

**Measurement data:**

*Remark: The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*

IEEE 802.11a								
Peak value:								
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
5650.00	36.66	32.36	9.72	23.83	54.91	68.20	-13.29	Horizontal
5700.00	37.06	32.50	9.79	23.84	55.51	105.20	-49.69	Horizontal
5720.00	37.22	32.53	9.81	23.85	55.71	110.80	-55.09	Horizontal
5725.00	44.62	32.53	9.83	23.86	62.36	122.20	-59.08	Horizontal
5850.00	41.51	32.70	9.99	23.87	60.21	122.20	-61.87	Horizontal
5855.00	35.13	32.72	9.99	23.88	53.96	110.80	-56.84	Horizontal
5875.00	37.11	32.74	10.04	23.89	56.00	105.20	-49.20	Horizontal
5925.00	36.83	32.80	10.11	23.90	55.84	68.20	-12.36	Horizontal
5650.00	36.60	32.36	9.72	23.83	54.85	68.20	-13.35	Vertical
5700.00	35.54	32.50	9.79	23.84	53.99	105.20	-51.21	Vertical
5720.00	36.52	32.53	9.81	23.85	55.01	110.80	-55.79	Vertical
5725.00	43.86	32.53	9.83	23.86	62.36	122.20	-59.84	Vertical
5850.00	41.39	32.70	9.99	23.87	60.21	122.20	-61.99	Vertical
5855.00	35.34	32.72	9.99	23.88	54.17	110.80	-56.63	Vertical
5875.00	36.17	32.74	10.04	23.89	55.06	105.20	-50.14	Vertical
5925.00	36.70	32.80	10.11	23.90	55.71	68.20	-12.49	Vertical

IEEE 802.11n HT20								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	36.17	32.36	9.72	23.83	54.42	68.20	-13.78	Horizontal
5700.00	36.95	32.50	9.79	23.84	55.40	105.20	-49.80	Horizontal
5720.00	37.10	32.53	9.81	23.85	55.59	110.80	-55.21	Horizontal
5725.00	44.59	32.53	9.83	23.86	63.09	122.20	-59.11	Horizontal
5850.00	41.48	32.70	9.99	23.87	60.30	122.20	-61.90	Horizontal
5855.00	36.73	32.72	9.99	23.88	55.56	110.80	-55.24	Horizontal
5875.00	36.23	32.74	10.04	23.89	55.12	105.20	-50.08	Horizontal
5925.00	36.14	32.80	10.11	23.90	55.15	68.20	-13.05	Horizontal
5650.00	36.86	32.36	9.72	23.83	55.11	68.20	-13.09	Vertical
5700.00	36.90	32.50	9.79	23.84	55.35	105.20	-49.85	Vertical
5720.00	35.78	32.53	9.81	23.85	54.27	110.80	-56.53	Vertical
5725.00	44.07	32.53	9.83	23.86	62.57	122.20	-59.63	Vertical
5850.00	41.21	32.70	9.99	23.87	60.03	122.20	-62.17	Vertical
5855.00	36.17	32.72	9.99	23.88	55.00	110.80	-55.80	Vertical
5875.00	36.53	32.74	10.04	23.89	55.42	105.20	-49.78	Vertical
5925.00	36.03	32.80	10.11	23.90	55.04	68.20	-13.16	Vertical

<b>IEEE 802.11ac HT20</b>								
<b>Peak value:</b>								
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
5650.00	36.48	32.36	9.72	23.83	54.73	68.20	-13.47	Horizontal
5700.00	36.42	32.50	9.79	23.84	54.87	105.20	-50.33	Horizontal
5720.00	36.24	32.53	9.81	23.85	54.73	110.80	-56.07	Horizontal
5725.00	43.98	32.53	9.83	23.86	62.48	122.20	-59.72	Horizontal
5850.00	40.85	32.70	9.99	23.87	59.67	122.20	-62.53	Horizontal
5855.00	36.68	32.72	9.99	23.88	55.51	110.80	-55.29	Horizontal
5875.00	36.14	32.74	10.04	23.89	55.03	105.20	-50.17	Horizontal
5925.00	36.15	32.80	10.11	23.90	55.16	68.20	-13.04	Horizontal
5650.00	36.29	32.36	9.72	23.83	54.54	68.20	-13.66	Vertical
5700.00	36.50	32.50	9.79	23.84	54.95	105.20	-50.25	Vertical
5720.00	36.74	32.53	9.81	23.85	55.23	110.80	-55.57	Vertical
5725.00	44.87	32.53	9.83	23.86	63.37	122.20	-58.83	Vertical
5850.00	41.76	32.70	9.99	23.87	60.58	122.20	-61.62	Vertical
5855.00	36.35	32.72	9.99	23.88	55.18	110.80	-55.62	Vertical
5875.00	36.32	32.74	10.04	23.89	55.21	105.20	-49.99	Vertical
5925.00	36.46	32.80	10.11	23.90	55.47	68.20	-12.73	Vertical



<b>IEEE 802.11n HT40</b>								
<b>Peak value:</b>								
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
5650.00	36.03	32.36	9.72	23.83	54.28	68.20	-13.92	Horizontal
5700.00	36.21	32.50	9.79	23.84	54.66	105.20	-50.54	Horizontal
5720.00	36.24	32.53	9.81	23.85	54.73	110.80	-56.07	Horizontal
5725.00	39.05	32.53	9.83	23.86	57.55	122.20	-64.65	Horizontal
5850.00	38.47	32.70	9.99	23.87	57.29	122.20	-64.91	Horizontal
5855.00	36.02	32.72	9.99	23.88	54.85	110.80	-55.95	Horizontal
5875.00	35.83	32.74	10.04	23.89	54.72	105.20	-50.48	Horizontal
5925.00	36.49	32.80	10.11	23.90	55.50	68.20	-12.70	Horizontal
5650.00	36.15	32.36	9.72	23.83	54.40	68.20	-13.80	Vertical
5700.00	35.79	32.50	9.79	23.84	54.24	105.20	-50.96	Vertical
5720.00	36.53	32.53	9.81	23.85	55.02	110.80	-55.78	Vertical
5725.00	44.16	32.53	9.83	23.86	62.66	122.20	-59.54	Vertical
5850.00	40.79	32.70	9.99	23.87	59.61	122.20	-62.59	Vertical
5855.00	36.23	32.72	9.99	23.88	55.06	110.80	-55.74	Vertical
5875.00	36.37	32.74	10.04	23.89	55.26	105.20	-49.94	Vertical
5925.00	35.78	32.80	10.11	23.90	54.79	68.20	-13.41	Vertical

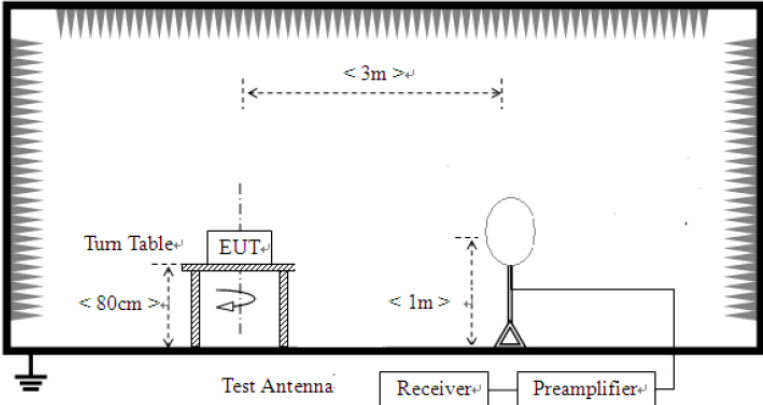
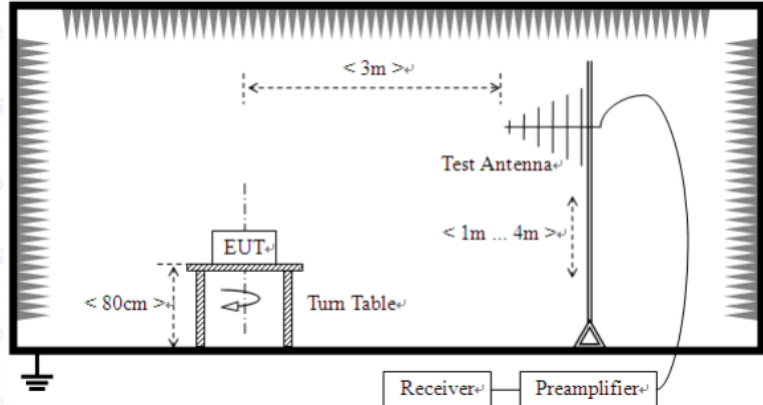
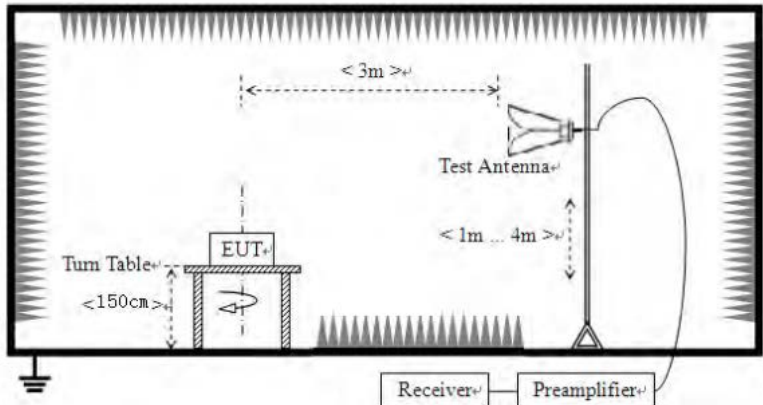
IEEE 802.11ac HT40								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	36.48	32.36	9.72	23.83	54.73	68.20	-13.47	Horizontal
5700.00	36.14	32.50	9.79	23.84	54.59	105.20	-50.61	Horizontal
5720.00	36.19	32.53	9.81	23.85	54.68	110.80	-56.12	Horizontal
5725.00	44.48	32.53	9.83	23.86	62.98	122.20	-59.22	Horizontal
5850.00	41.31	32.70	9.99	23.87	60.13	122.20	-62.07	Horizontal
5855.00	36.33	32.72	9.99	23.88	55.16	110.80	-55.64	Horizontal
5875.00	36.16	32.74	10.04	23.89	55.05	105.20	-50.15	Horizontal
5925.00	36.42	32.80	10.11	23.90	55.43	68.20	-12.77	Horizontal
5650.00	36.50	32.36	9.72	23.83	54.75	68.20	-13.45	Vertical
5700.00	36.36	32.50	9.79	23.84	54.81	105.20	-50.39	Vertical
5720.00	36.87	32.53	9.81	23.85	55.36	110.80	-55.44	Vertical
5725.00	44.26	32.53	9.83	23.86	62.76	122.20	-59.44	Vertical
5850.00	41.07	32.70	9.99	23.87	59.89	122.20	-62.31	Vertical
5855.00	36.97	32.72	9.99	23.88	55.80	110.80	-55.00	Vertical
5875.00	36.18	32.74	10.04	23.89	55.07	105.20	-50.13	Vertical
5925.00	36.86	32.80	10.11	23.90	55.87	68.20	-12.33	Vertical

IEEE 802.11ac HT80								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	36.56	32.36	9.72	23.83	54.81	68.20	-13.39	Horizontal
5700.00	35.90	32.50	9.79	23.84	54.35	105.20	-50.85	Horizontal
5720.00	35.81	32.53	9.81	23.85	54.30	110.80	-56.50	Horizontal
5725.00	44.62	32.53	9.83	23.86	63.12	122.20	-59.08	Horizontal
5850.00	41.22	32.70	9.99	23.87	60.04	122.20	-62.16	Horizontal
5855.00	35.90	32.72	9.99	23.88	54.73	110.80	-56.07	Horizontal
5875.00	35.89	32.74	10.04	23.89	54.78	105.20	-50.42	Horizontal
5925.00	36.13	32.80	10.11	23.90	55.14	68.20	-13.06	Horizontal
5650.00	36.34	32.36	9.72	23.83	54.59	68.20	-13.61	Vertical
5700.00	36.60	32.50	9.79	23.84	55.05	105.20	-50.15	Vertical
5720.00	36.47	32.53	9.81	23.85	54.96	110.80	-55.84	Vertical
5725.00	43.97	32.53	9.83	23.86	62.47	122.20	-59.73	Vertical
5850.00	41.02	32.70	9.99	23.87	59.84	122.20	-62.36	Vertical
5855.00	36.49	32.72	9.99	23.88	55.32	110.80	-55.48	Vertical
5875.00	35.72	32.74	10.04	23.89	54.61	105.20	-50.59	Vertical
5925.00	36.54	32.80	10.11	23.90	55.55	68.20	-12.65	Vertical

## 7.7 Spurious Emission

### 7.7.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 40GHz				
Test site:	Measurement Distance: 3m				
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		
	Frequency	Limit (dBm/MHz)	Remark		
	Above 1GHz	-27.0	Peak Value		

<p>Test setup:</p>	<p>For radiated emissions from 9kHz to 30MHz</p>  <p>For radiated emissions from 30MHz to 1GHz</p>  <p>For radiated emissions above 1GHz</p> 
<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>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</li> </ol>

	<p>of the highest radiation.</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.</li> </ol>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

**Measurement Data:**

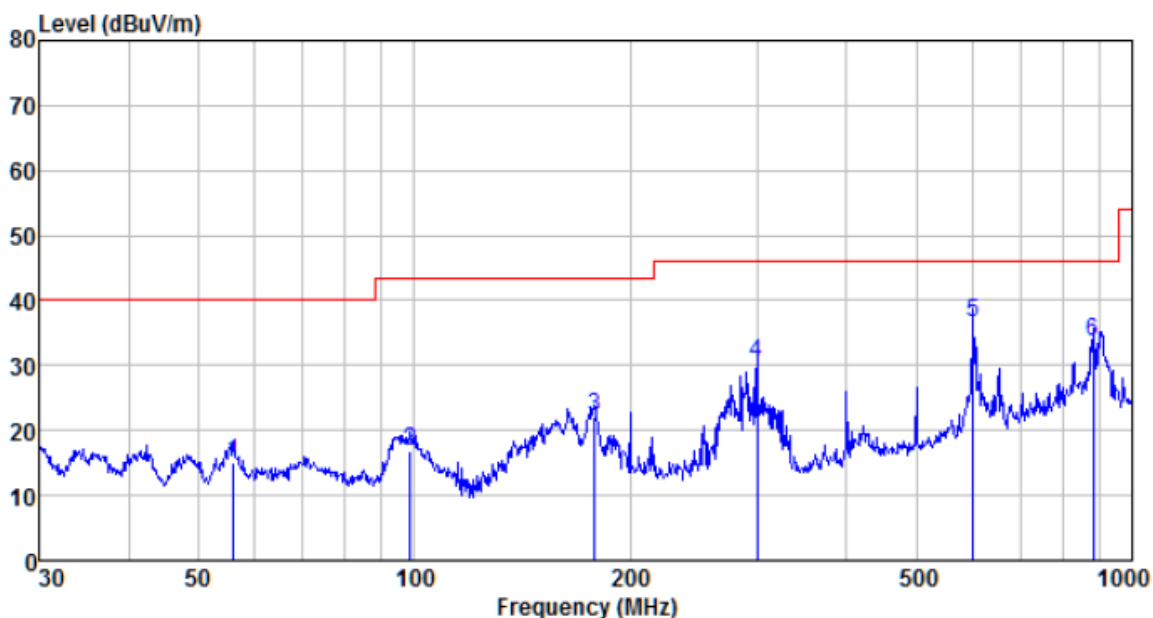
**9 kHz ~ 30 MHz**

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.

## Below 1GHz

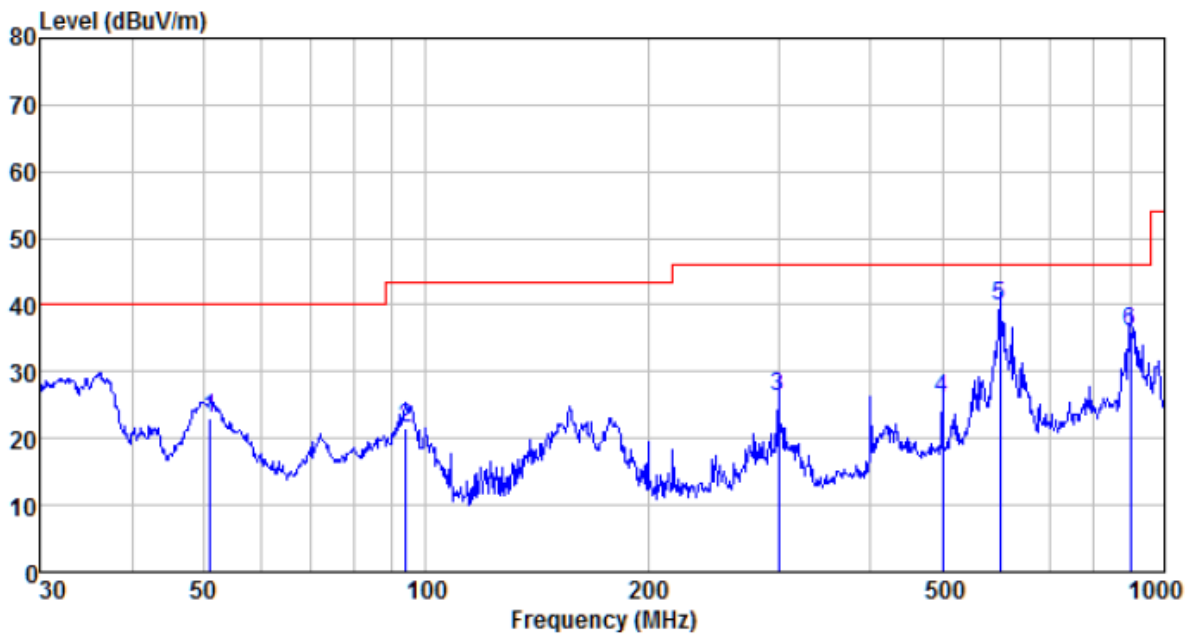
Only the data of worst case at each channel plan (nominal bandwidth =20MHz, 40MHz, 80MHz) is reported.

<b>Mode:</b>	<b>Transmitting mode</b>	<b>Test by:</b>	<b>Bill</b>
<b>Temp./Hum.(%H):</b>	<b>26°C/56%RH</b>	<b>Polarization:</b>	<b>Horizontal</b>



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
56.001	38.97	11.67	0.83	36.27	15.20	40.00	-24.80	QP
98.833	40.51	11.73	1.18	36.71	16.71	43.50	-26.79	QP
178.133	48.83	8.70	1.73	37.23	22.03	43.50	-21.47	QP
300.367	51.96	13.50	2.36	37.42	30.40	46.00	-15.60	QP
601.427	51.24	19.30	3.73	37.54	36.73	46.00	-9.27	QP
881.407	44.36	22.04	4.79	37.60	33.59	46.00	-12.41	QP

<b>Mode:</b>	<b>Transmitting mode</b>	<b>Test by:</b>	<b>Bill</b>
<b>Temp./Hum.(%H):</b>	<b>26°C/56%RH</b>	<b>Polarization:</b>	<b>Vertical</b>



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
51.121	46.22	12.20	0.78	36.20	23.00	40.00	-17.00	QP
94.098	45.59	11.35	1.14	36.67	21.41	43.50	-22.09	QP
300.367	47.82	13.50	2.36	37.42	26.26	46.00	-19.74	QP
501.179	42.66	17.55	3.31	37.51	26.01	46.00	-19.99	QP
599.321	54.33	19.30	3.72	37.54	39.81	46.00	-6.19	QP
900.147	46.57	22.20	4.85	37.60	36.02	46.00	-9.98	QP



## Above 1GHz:

802.11a,11n(HT20),11ac(HT20),11n(HT40),11ac(HT40),11ac(HT80) all have been tested ,Only the data of worst case at each channel plan (nominal bandwidth =20MHz, 40MHz, 80MHz) is reported.

Test mode:		802.11a		Test channel:		lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11490	21.76	21.64	43.40	54(Note3)	-10.60	PK
V	17235	22.29	21.80	44.09	54(Note3)	-9.91	PK
H	11490	22.94	21.83	44.77	54(Note3)	-9.23	PK
H	17235	21.39	21.67	43.06	54(Note3)	-10.94	PK

Test mode:		802.11a		Test channel:		Middle	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11570	20.07	21.64	41.71	54(Note3)	-12.29	PK
V	17355	20.56	21.80	42.36	54(Note3)	-11.64	PK
H	11570	20.86	21.83	42.69	54(Note3)	-11.31	PK
H	17355	21.99	21.67	43.66	54(Note3)	-10.34	PK

Test mode:		802.11a		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11650	22.18	21.64	43.82	54(Note3)	-10.18	PK
V	17475	21.75	21.80	43.55	54(Note3)	-10.45	PK
H	11650	20.97	21.83	42.80	54(Note3)	-11.20	PK
H	17475	21.36	21.67	43.03	54(Note3)	-10.97	PK

Test mode:		802.11ac(HT40)		Test channel:		Lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11510	22.81	21.67	44.48	54(Note3)	-9.52	PK
V	17265	21.88	21.83	43.71	54(Note3)	-10.29	PK
H	11510	21.38	21.67	43.05	54(Note3)	-10.95	PK
H	17265	22.51	21.83	44.34	54(Note3)	-9.66	PK

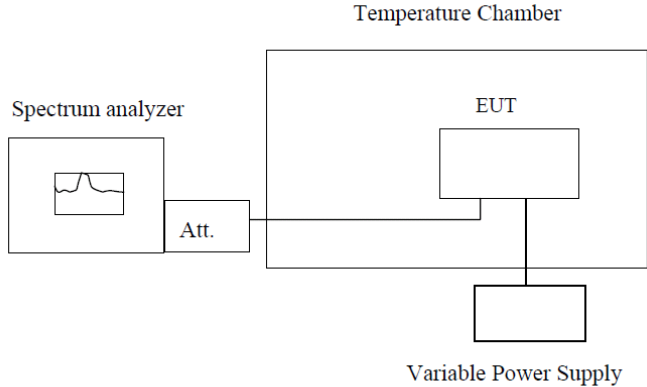
Test mode:		802.11ac(HT40)		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11590	21.99	21.67	43.66	54(Note3)	-10.34	PK
V	17385	21.84	21.83	43.67	54(Note3)	-10.33	PK
H	11590	22.47	21.67	44.14	54(Note3)	-9.86	PK
H	17385	22.33	21.83	44.16	54(Note3)	-9.84	PK

Test mode:		802.11ac(HT80)		Test channel:		Middle	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11550	20.97	21.65	42.62	54(Note3)	-11.38	PK
V	17325	20.84	21.81	42.65	54(Note3)	-11.35	PK
H	11550	21.20	21.65	42.85	54(Note3)	-11.15	PK
H	17325	22.32	21.81	44.13	54(Note3)	-9.87	PK

**Note:**

1. Measure Level = Reading Level + 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:	 <p style="text-align: center;"><b>Note :</b> Measurement setup for testing on Antenna connector</p>
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

**Measurement data:**

802.11a					
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	5745	5744.4989	5743.2709	5743.1212	5743.0394
	5785	5784.3628	5784.0829	5783.7386	5784.8869
	5825	5824.7973	5824.5797	5824.4646	5824.6761
-20	5745	5744.8032	5744.7481	5744.5100	5744.9326
	5785	5784.6529	5783.8655	5784.6013	5784.2995
	5825	5824.5040	5823.8171	5824.9284	5824.8859
-10	5745	5743.4440	5743.7885	5744.7446	5744.6463
	5785	5783.3995	5784.9589	5784.6577	5784.8808
	5825	5824.2238	5824.8792	5824.1925	5824.7965
0	5745	5744.6724	5744.5823	5744.9897	5744.3569
	5785	5784.1073	5784.4791	5784.3121	5784.2892
	5825	5823.2222	5823.4886	5824.9936	5824.0878
10	5745	5743.4894	5744.4168	5744.7516	5744.5204
	5785	5784.2825	5783.8846	5784.6582	5784.1931
	5825	5823.0627	5823.1765	5824.3444	5824.8051
20	5745	5743.4724	5743.8025	5744.1736	5744.8787
	5785	5784.6045	5783.7276	5783.1737	5784.1278
	5825	5824.3714	5824.2400	5823.8801	5824.2593
30	5745	5743.6372	5743.0155	5744.0877	5744.8138
	5785	5783.2427	5783.7314	5784.5845	5784.5748
	5825	5823.7786	5824.3992	5824.9698	5824.6216
40	5745	5744.0866	5744.1507	5743.5532	5744.9682
	5785	5784.5869	5783.0180	5783.4545	5784.9036
	5825	5823.3502	5823.6393	5824.1305	5824.4778
50	5745	5744.1514	5744.4325	5744.3335	5743.0983
	5785	5784.3897	5783.3753	5784.0591	5784.8482
	5825	5823.9031	5824.4012	5824.3822	5824.2202

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (DC)	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	5745	5743.1934	5744.8567	5744.0267	5744.4263
	5785	5784.7828	5784.8619	5783.1179	5783.0637
	5825	5823.0986	5823.8566	5824.4307	5823.9582
3.7	5745	5743.0314	5744.0165	5743.3199	5743.7133
	5785	5784.4604	5783.9186	5783.5991	5783.6211
	5825	5824.2171	5824.0623	5824.0532	5824.4999
4.1	5745	5743.6610	5744.2955	5743.2918	5744.6817
	5785	5783.8739	5783.3494	5783.2839	5783.2051
	5825	5823.6792	5823.5253	5823.2707	5824.7422

Note: The worst case is FL=5743.0155MHz, FH=5824.9936MHz

802.11n(HT20)					
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	5745	5745.5012	5743.1134	5744.4855	5746.0941
	5785	5785.2028	5783.3350	5784.5142	5785.3159
	5825	5825.3614	5824.7949	5824.2298	5825.9128
-20	5745	5745.5018	5744.8375	5744.2645	5745.9041
	5785	5785.0088	5784.6091	5784.2072	5785.1693
	5825	5825.9527	5824.3146	5824.2538	5825.5501
-10	5745	5745.5418	5744.1099	5744.8224	5745.1843
	5785	5785.3866	5784.1099	5784.8801	5785.4922
	5825	5825.1800	5824.5601	5824.7672	5825.6007
0	5745	5745.7584	5744.2596	5744.5990	5745.0812
	5785	5785.6642	5784.2504	5784.2605	5785.0779
	5825	5825.0356	5824.2977	5824.0146	5825.3267
10	5745	5745.9427	5744.6844	5744.6785	5745.5782
	5785	5785.6405	5784.5045	5784.1033	5785.8747
	5825	5825.5465	5824.3859	5824.5318	5825.2655
20	5745	5745.8888	5744.1807	5744.4246	5745.2224
	5785	5785.3895	5784.0325	5784.7931	5785.1762
	5825	5825.6973	5824.5360	5824.6273	5825.2384
30	5745	5745.1154	5744.4984	5744.2843	5745.4576
	5785	5785.1113	5784.0976	5784.7675	5785.4861
	5825	5825.4008	5824.0971	5824.6831	5825.1911
40	5745	5745.0096	5744.7079	5744.8779	5745.8413
	5785	5785.5815	5784.9092	5784.5020	5785.5492
	5825	5825.2678	5824.1145	5824.0527	5825.6099
50	5745	5745.7103	5744.0255	5744.1404	5745.5399
	5785	5785.5151	5784.9592	5784.2782	5785.0488
	5825	5825.5709	5824.0141	5824.3189	5825.6705

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (DC)	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	5745	5745.7478	5746.1064	5743.5164	5743.1654
	5785	5785.2985	5785.2987	5784.8440	5784.7898
	5825	5825.1357	5825.4069	5824.5060	5824.0374
3.7	5745	5745.1768	5745.7261	5744.6425	5744.4872
	5785	5785.2835	5785.3268	5784.0118	5784.0916
	5825	5825.8079	5825.1288	5824.5703	5824.8140
4.1	5745	5745.4501	5745.9143	5744.0925	5744.2307
	5785	5785.9007	5785.7434	5784.7649	5784.2805
	5825	5825.9288	5825.5346	5824.2153	5824.9687

Note: The worst case is FL=5743.1134MHz, FH=5825.9527MHz

802.11ac(HT20)					
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	5745	5744.9527	5744.1955	5744.8530	5744.4806
	5785	5784.0521	5784.3642	5784.2605	5784.0183
	5825	5824.4211	5824.0700	5824.7378	5824.6177
-20	5745	5744.4692	5744.0152	5744.1814	5744.3817
	5785	5784.4846	5784.3787	5784.0048	5784.3406
	5825	5824.2937	5824.4915	5824.1400	5824.4717
-10	5745	5744.2162	5744.4916	5744.6578	5744.0004
	5785	5784.4047	5784.0226	5784.4584	5784.3788
	5825	5824.5828	5824.3193	5824.4087	5824.4241
0	5745	5744.0293	5744.1016	5744.2712	5744.1018
	5785	5784.5701	5784.7451	5784.6675	5784.0218
	5825	5824.1256	5824.6774	5824.5769	5824.2270
10	5745	5744.4148	5744.9696	5744.3434	5744.8291
	5785	5784.4540	5784.5580	5784.0712	5784.1876
	5825	5824.6717	5824.0301	5824.5618	5824.2792
20	5745	5744.8607	5744.4031	5744.7704	5744.0021
	5785	5784.8649	5784.8459	5784.7716	5784.8825
	5825	5824.4790	5824.5918	5824.2690	5824.4011
30	5745	5744.3370	5744.6233	5744.6669	5744.2434
	5785	5784.7344	5784.5173	5784.7316	5784.0421
	5825	5824.2374	5824.9557	5824.9501	5824.9747
40	5745	5744.2706	5744.8776	5744.9932	5744.5963
	5785	5784.3297	5784.7318	5784.7086	5784.3707
	5825	5824.1703	5824.9186	5824.4820	5824.8275
50	5745	5744.5028	5744.9749	5744.5385	5744.4788
	5785	5784.6307	5784.4851	5784.0698	5784.6869
	5825	5824.7332	5824.7932	5824.3526	5824.4675

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (DC)	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	5745	5743.1130	5743.4990	5745.3187	5746.7109
	5785	5784.0891	5783.2478	5785.0694	5786.1248
	5825	5824.8362	5823.1234	5825.5614	5825.5227
3.7	5745	5744.6847	5744.6588	5745.5795	5745.3047
	5785	5784.6265	5784.8163	5785.0288	5785.5003
	5825	5824.6591	5824.0085	5825.3465	5825.1544
4.1	5745	5744.8619	5744.4613	5745.9706	5745.6052
	5785	5784.1569	5784.5168	5785.9865	5785.7812
	5825	5824.3377	5824.9880	5825.4173	5825.9529

Note: The worst case is FL=5743.1130MHz, FH=5825.9529MHz

802.11n(HT40)					
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	5755	5755.8958	5754.5930	5753.6487	5755.8242
	5795	5795.4702	5794.7651	5794.4670	5795.8204
-20	5755	5755.0203	5754.8156	5754.2396	5755.9246
	5795	5795.4515	5794.5920	5794.3291	5795.6271
-10	5755	5755.1025	5754.3044	5754.1826	5755.0754
	5795	5795.7819	5794.7973	5794.8343	5795.6612
0	5755	5755.2298	5754.3434	5754.7669	5755.4010
	5795	5795.5284	5794.2313	5794.3190	5795.9348
10	5755	5755.5938	5754.4069	5754.5741	5755.2666
	5795	5795.7395	5794.3364	5794.8494	5795.1950
20	5755	5755.7973	5754.8310	5754.4507	5755.8330
	5795	5795.1891	5794.4101	5794.3880	5795.9592
30	5755	5755.8771	5754.1890	5754.2917	5755.6613
	5795	5795.5988	5794.0847	5794.8163	5795.2629
40	5755	5755.4169	5754.3081	5754.4051	5755.7944
	5795	5795.0658	5794.9492	5794.9811	5795.9959
50	5755	5755.4399	5754.4423	5754.7082	5755.3822
	5795	5795.4369	5794.8452	5794.3807	5795.6208

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (DC)	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	5755	5755.4961	5753.1853	5755.9276	5754.2029
	5795	5795.0429	5793.2143	5795.4249	5794.8814
3.7	5755	5755.0950	5754.0368	5755.7713	5754.2046
	5795	5795.0513	5794.1185	5795.5609	5794.2679
4.1	5755	5755.1101	5754.0406	5755.7188	5754.7766
	5795	5795.9108	5794.7067	5795.6946	5794.1934

Note: The worst case is FL=5753.1853MHz, FH=5795.9959MHz

802.11ac(HT40)					
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	5755	5756.8694	5754.3852	5755.8529	5753.3286
	5795	5796.9347	5794.8004	5795.8646	5793.6683
-20	5755	5755.8962	5754.1478	5755.4406	5754.4215
	5795	5795.0669	5794.3725	5795.1479	5794.1994
-10	5755	5755.7072	5754.1274	5755.1773	5754.8011
	5795	5795.3975	5794.4790	5795.0468	5794.3241
0	5755	5755.2992	5754.1880	5755.8044	5754.1940
	5795	5795.0043	5794.9171	5795.1130	5794.8624
10	5755	5755.0967	5754.2169	5755.8060	5754.0074
	5795	5795.1835	5794.6036	5795.6743	5794.0586
20	5755	5755.3399	5754.8472	5755.4485	5754.5868
	5795	5795.0501	5794.6108	5795.5482	5794.7058
30	5755	5755.2617	5754.3509	5755.0808	5754.9075
	5795	5795.8284	5794.5679	5795.7708	5794.8854
40	5755	5755.5725	5754.4141	5755.6749	5754.0414
	5795	5795.8078	5794.3178	5795.0170	5794.5003
50	5755	5755.2458	5754.5466	5755.9440	5754.8886
	5795	5795.1847	5794.2609	5795.0069	5794.2178

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (AC)	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	5755	5755.2660	5753.1594	5756.9388	5753.7574
	5795	5795.0987	5793.0411	5796.8353	5793.3350
3.7	5755	5755.9375	5754.3596	5755.6128	5754.1398
	5795	5795.0925	5794.5230	5795.9008	5794.8308
4.1	5755	5755.9167	5754.9309	5755.8306	5754.3868
	5795	5795.6785	5794.1263	5795.2394	5794.9689

Note: The worst case is FL=5753.1594MHz, FH=5796.9347MHz



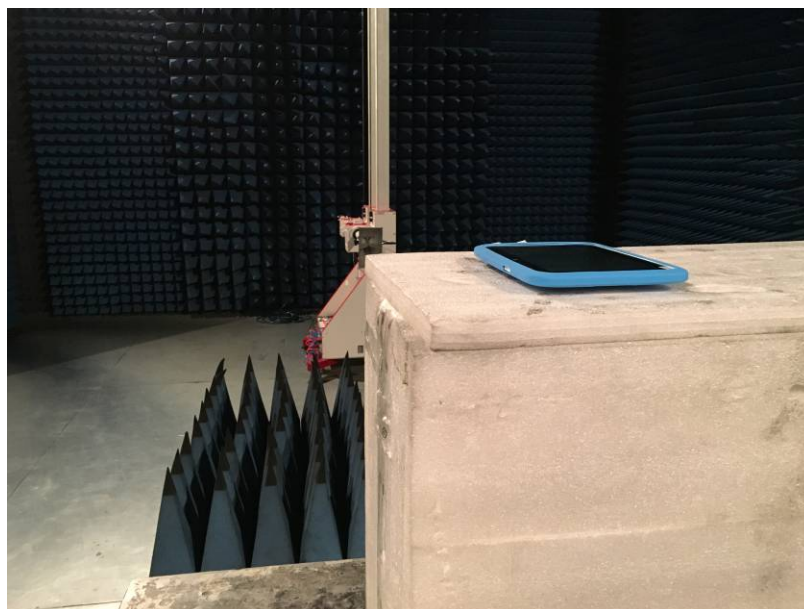
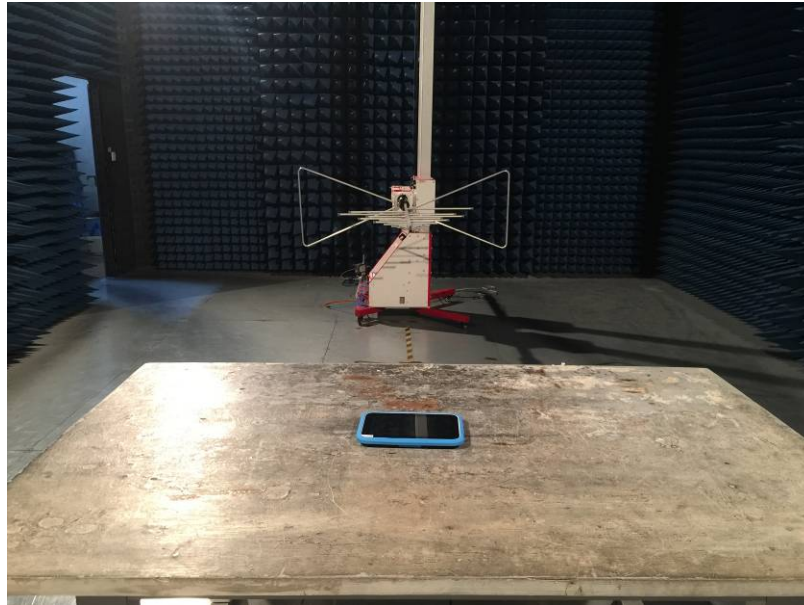
<b>802.11ac(HT80)</b>					
<b>Frequency stability versus Temp.</b>					
<b>Power Supply: DC 3.7V</b>					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5775	5776.1692	5775.2861	5773.3317	5774.1223
-20	5775	5775.1797	5775.6212	5773.0803	5774.2492
-10	5775	5775.1165	5775.0202	5774.5206	5774.1673
0	5775	5775.1508	5775.9872	5774.1132	5774.2834
10	5775	5775.4378	5775.8428	5774.1896	5774.9698
20	5775	5775.9044	5775.2072	5774.6959	5774.1502
30	5775	5775.6243	5775.4388	5774.2889	5774.9235
40	5775	5775.9567	5775.2579	5774.7615	5774.4866
50	5775	5775.0931	5775.2472	5774.9905	5774.5574

<b>Frequency stability versus Voltage</b>					
<b>Temperature: 25°C</b>					
Power Supply (AC)	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	5775	5774.7400	5776.1613	5775.6886	5776.7944
3.1	5775	5774.1302	5775.9568	5776.2768	5775.9870
4.1	5775	5773.7732	5775.6485	5776.6234	5776.5018

Note: The worst case is FL=5773.00803MHz, FH=5776.7944MHz

## 8 Test Setup Photo

Radiated Emission



## Conducted Emission



## 9 EUT Constructional Details

Reference to the test report No. GTS201807000096F01

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