

# FCC REPORT

**Applicant:** Beat A/S

**Address of Applicant:** Klingseyvej 15B, 2720 Vanløse, Denmark

**Manufacturer/Factory:** MELE TECHNOLOGIES(SHENZHEN) CO.,LTD

**Address of Manufacturer/Factory:** 1F, Bldg#2, 28 Cuijing Road, Pingshan District, Shenzhen, PR China.

**Equipment Under Test (EUT)**

Product Name: Mini PC

Model No.: MIB 12

**FCC ID:** 2AFGT-MIB12

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

**Date of sample receipt:** August 31, 2018

**Date of Test:** September 01-10, 2018

**Date of report issued:** September 11, 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	September 11, 2018	Original

Prepared By:

*Bill. Yuan*  
Project Engineer

Date:

September 11, 2018

Check By:

*Andy. Wu*  
Reviewer

Date:

September 11, 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

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013.

### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	$\pm 4.34\text{dB}$	(1)
Radiated Emission	30MHz ~ 1000MHz	$\pm 4.24\text{dB}$	(1)
Radiated Emission	1GHz ~ 40GHz	$\pm 4.68\text{dB}$	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	$\pm 3.45\text{dB}$	(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:	Mini PC
Model No.:	MIB 12
Serial No.:	0000001
Hardware Version:	PCG35-GML1-272-V1.10
Software Version:	V4.0.0
Test sample(s) ID:	GTS201808000235-1
Sample(s) Status:	Engineer sample
Operation Frequency:	802.11a/802.11n(HT20)/802.11ac(HT20): 5745MHz ~ 5825MHz 802.11n(HT40)/ 802.11ac(HT40): 5755MHz ~ 5795MHz 802.11ac(HT80): 5775MHz
Channel numbers:	802.11a/802.11n(HT20)/802.11ac(HT20): 5 802.11n(HT40)/ 802.11ac(HT40): 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:	Integral Antenna
Antenna gain:	Main Antenna: 2.00dBi (Max.), for TX/RX (Bluetooth and WLAN) Aux Antenna: 2.00dBi(Max.), for TX/RX (WLAN) Two antennas cannot synchronous transmission.
Power supply:	SWITCHING ADAPTER MODEL:ADS-25D-12 12024E INPUT: AC 100-240V, 50/60Hz, Max 0.7A OUTPUT: DC 12V, 2.0A

Operation Frequency each of channel							
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)		
	802.11 a/n/ac(HT20)	802.11 n/ac(HT40)	802.11ac(HT80)
Lowest channel	5745	5755	
Middle channel	5785		5775
Highest channel	5825	5795	

## 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.

Mode	Data rate
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.

## 5.4 Test Facility

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

- **FCC —Registration No.:381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

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

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. Has been

Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

## 5.5 Test Location

All tests were performed at:

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

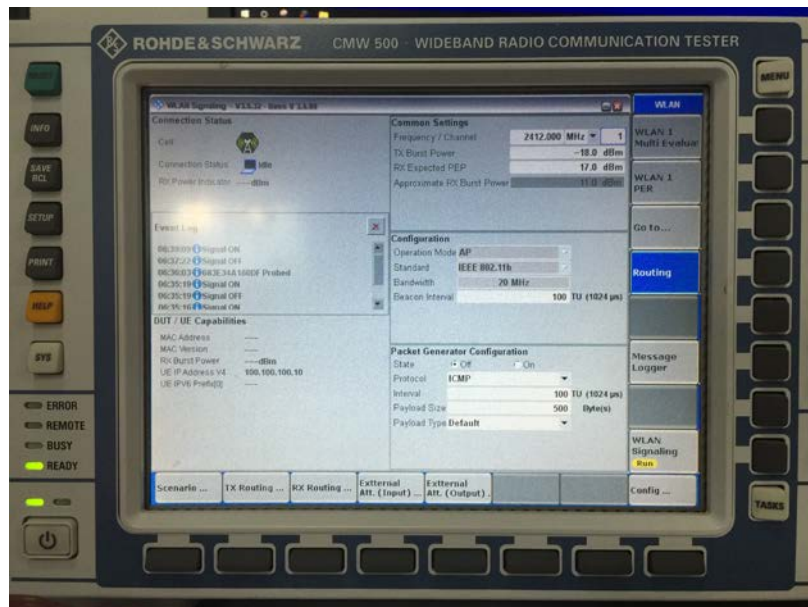
Tel: 0755-27798480

Fax: 0755-27798960

## 5.6 Additional Instructions

EUT Fixed Frequency Settings:

Power level setup			
Support Units	Description	Manufacturer	Model
	Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500
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


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	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
9	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 27 2018	June. 26 2019

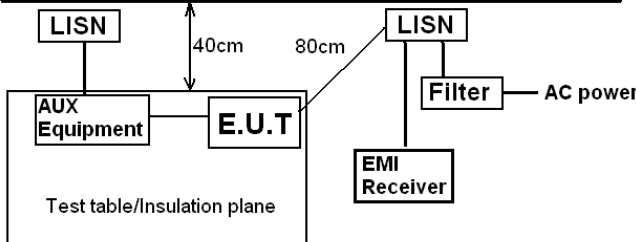
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

## 7 Test results and Measurement Data

### 7.1 Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203
<p>15.203 requirement:</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>The Main and Aux antenna is integral antenna, the best case gain of the antenna is 2.00dBi.</p> <p>Two antennas cannot synchronous transmission.</p>	
	

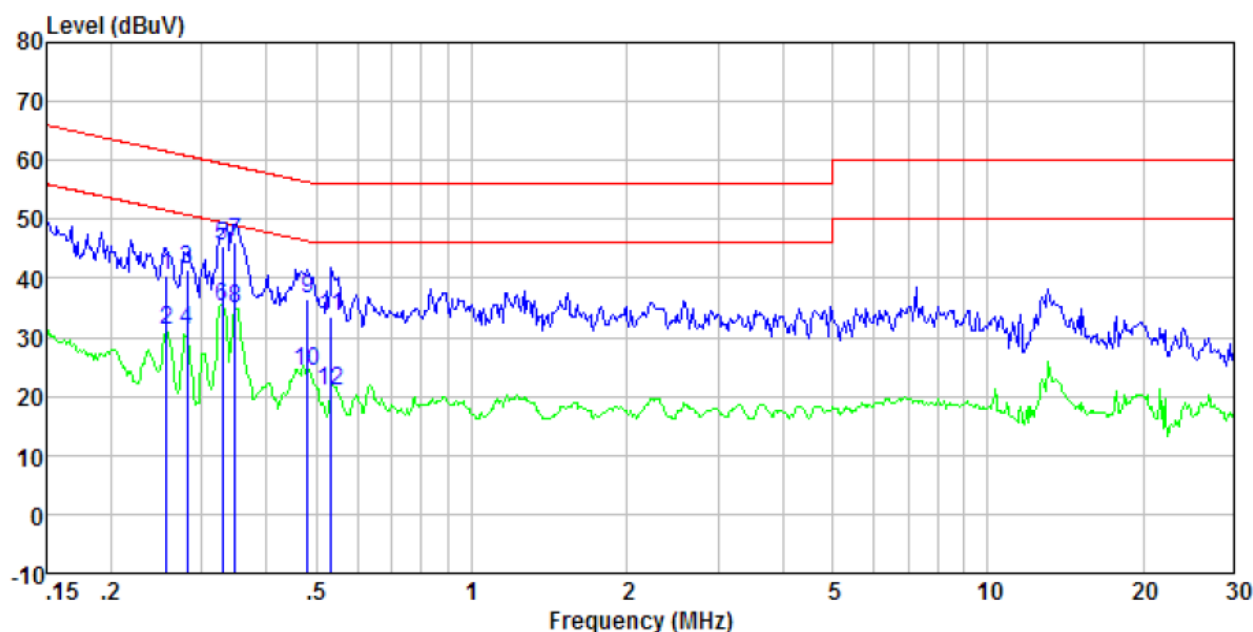
## 7.2 Conducted Emissions

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:	<div><p style="text-align: center;"><b>Reference Plane</b></p><p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>			
Test procedure:	<div><div>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.</div><div>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).</div><div>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.</div></div>			
Test Instruments:	Refer to section 6.0 for details			
Test mode:	Refer to section 5.2 for details			
Test voltage:	AC 120V, 60Hz			
Test results:	Pass			

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

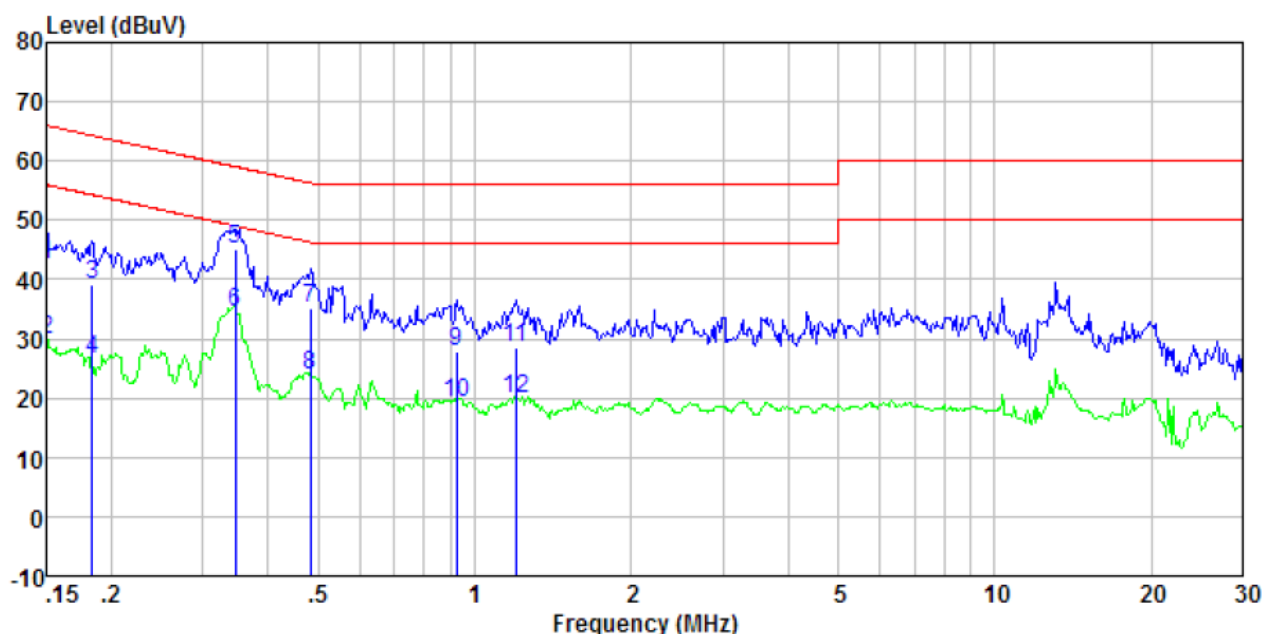
## Measurement data

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



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.26	39.93	0.40	0.10	40.43	61.56	-21.13	QP
0.26	30.62	0.40	0.10	31.12	51.56	-20.44	Average
0.28	40.96	0.40	0.10	41.46	60.81	-19.35	QP
0.28	30.82	0.40	0.10	31.32	50.81	-19.49	Average
0.33	44.88	0.38	0.10	45.36	59.49	-14.13	QP
0.33	34.56	0.38	0.10	35.04	49.49	-14.45	Average
0.35	45.53	0.37	0.10	46.00	59.00	-13.00	QP
0.35	34.23	0.37	0.10	34.70	49.00	-14.30	Average
0.48	35.91	0.32	0.11	36.34	56.32	-19.98	QP
0.48	23.84	0.32	0.11	24.27	46.32	-22.05	Average
0.53	33.06	0.30	0.11	33.47	56.00	-22.53	QP
0.53	20.39	0.30	0.11	20.80	46.00	-25.20	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>

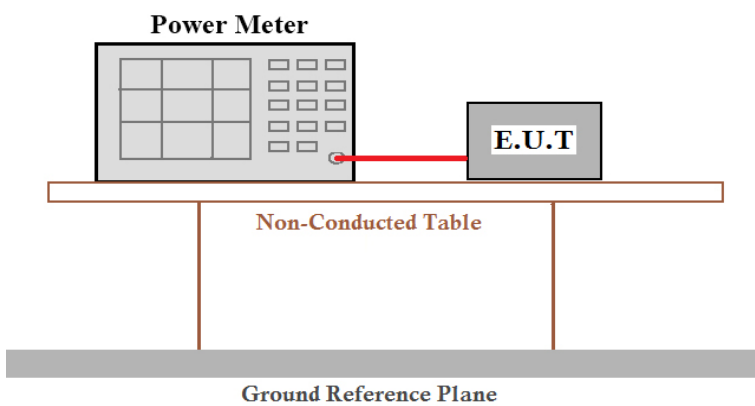


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	41.86	0.40	0.07	42.33	66.00	-23.67	QP
0.15	29.31	0.40	0.07	29.78	56.00	-26.22	Average
0.18	38.76	0.40	0.10	39.26	64.33	-25.07	QP
0.18	26.11	0.40	0.10	26.61	54.33	-27.72	Average
0.35	44.69	0.38	0.10	45.17	59.05	-13.88	QP
0.35	34.10	0.38	0.10	34.58	49.05	-14.47	Average
0.48	34.61	0.32	0.11	35.04	56.27	-21.23	QP
0.48	23.59	0.32	0.11	24.02	46.27	-22.25	Average
0.92	27.57	0.21	0.15	27.93	56.00	-28.07	QP
0.92	18.87	0.21	0.15	19.23	46.00	-26.77	Average
1.20	28.16	0.20	0.16	28.52	56.00	-27.48	QP
1.20	19.59	0.20	0.16	19.95	46.00	-26.05	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:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement Data

#### Main Antenna:

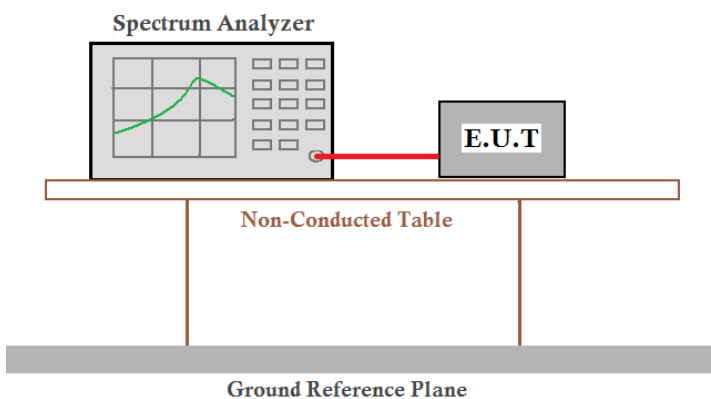
Test CH	Peak Output Power (dBm)						Limit(dBm)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	12.79	12.87	12.83	9.83	9.77	---	30.00	Pass
Middle	12.75	12.84	12.81	---	---	7.52		
Highest	12.81	12.86	12.87	9.52	9.75	---		

#### Aux Antenna:

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	12.45	12.47	12.53	9.76	9.45	---	30.00	Pass
Middle	12.52	12.41	12.45	---	---	7.18		
Highest	12.54	12.49	12.48	9.71	9.48	---		

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

#### Aux Antenna:

Test CH	Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.394	16.058	16.271	35.691	35.528	---	>500	Pass
Middle	16.362	16.289	16.385	---	---	75.450		
Highest	15.924	16.083	16.367	35.246	33.244	---		

#### Main Antenna:

Test CH	Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	16.590	15.780	15.776	35.250	35.234	---	>500	Pass
Middle	16.305	15.748	16.086	---	---	75.488		
Highest	16.075	16.043	16.327	35.488	35.797	---		

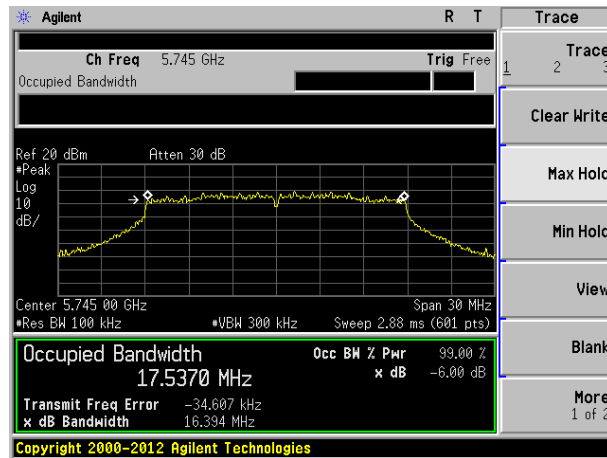
Remark: "---" is not applicable



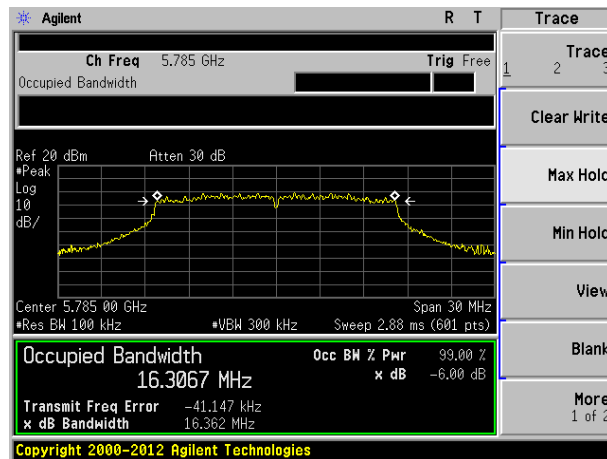
Test plot as follows:

Aux Antenna:

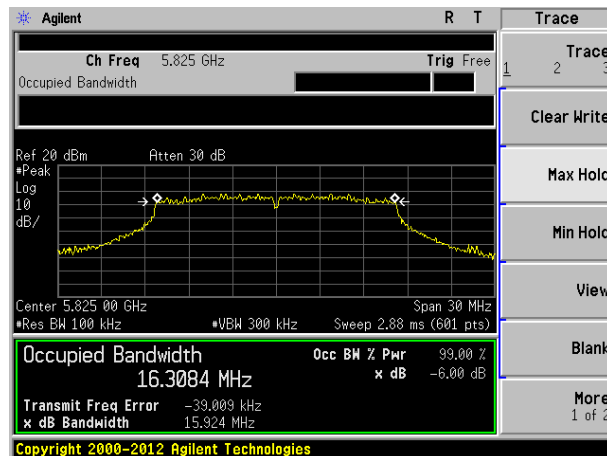
Test mode: 802.11a



Lowest channel

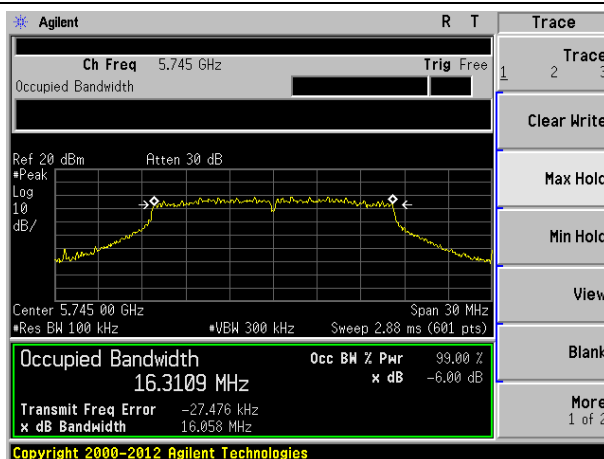


Middle channel

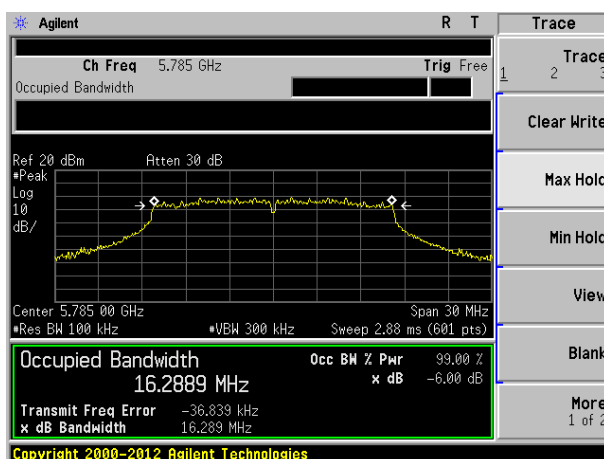


Highest channel

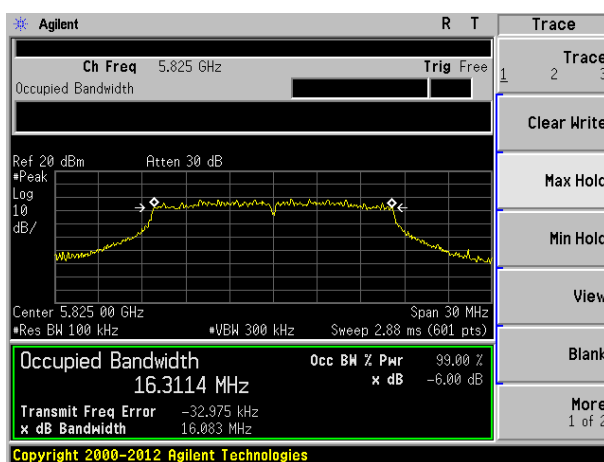
Test mode: 802.11n(HT20)



Lowest channel

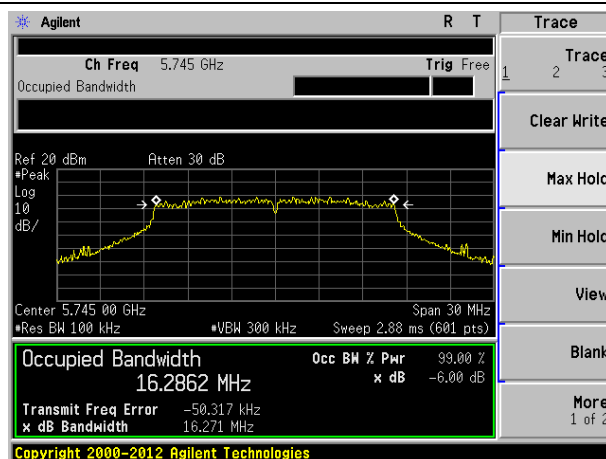


Middle channel

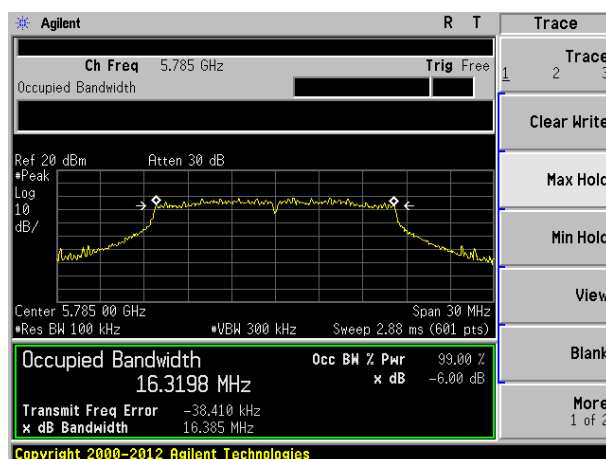


Highest channel

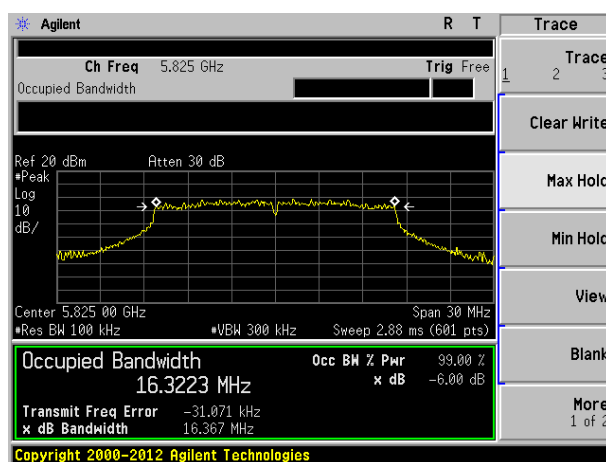
Test mode: 802.11ac(HT20)



Lowest channel

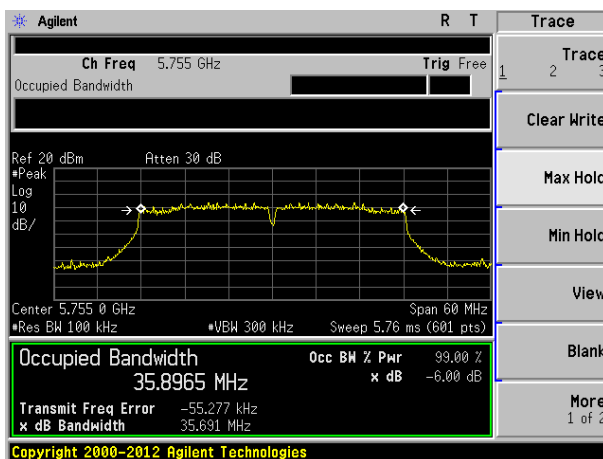


Middle channel

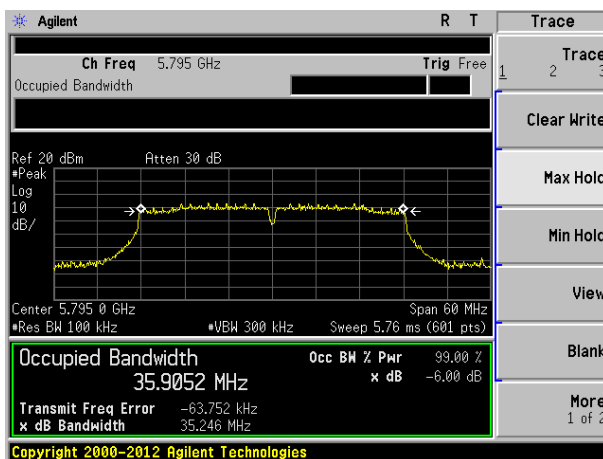


Highest channel

Test mode: 802.11n(HT40)

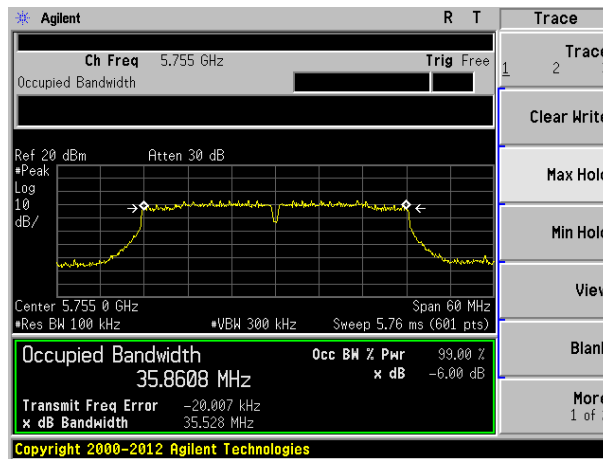


Lowest channel

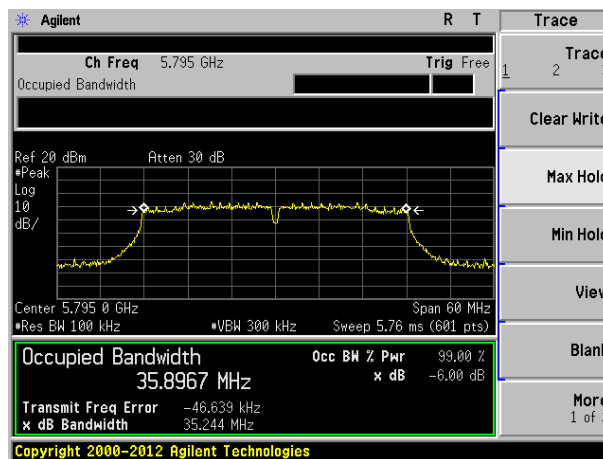


Highest channel

Test mode: 802.11ac(HT40)

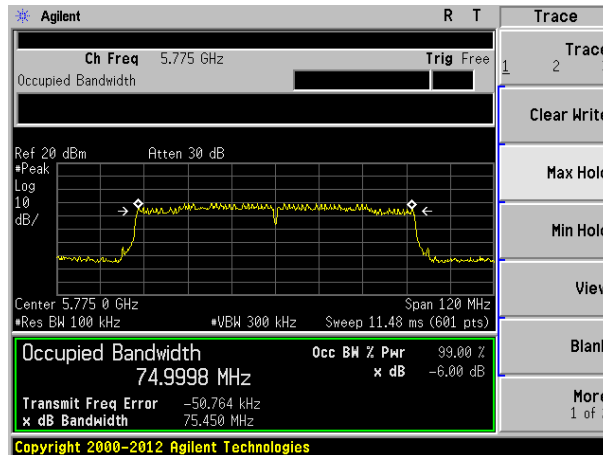


Lowest channel



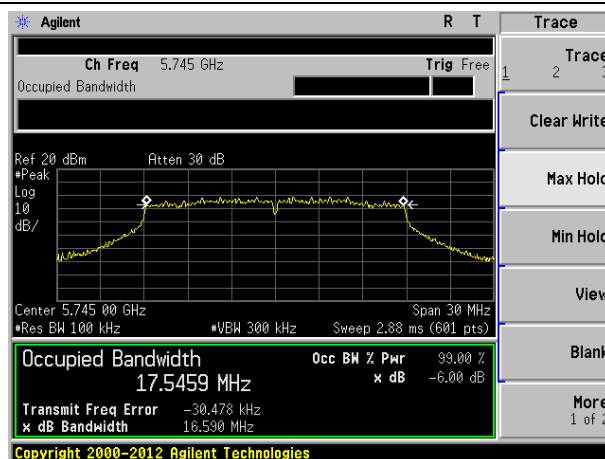
Highest channel

Test mode: 802.11ac(HT80)

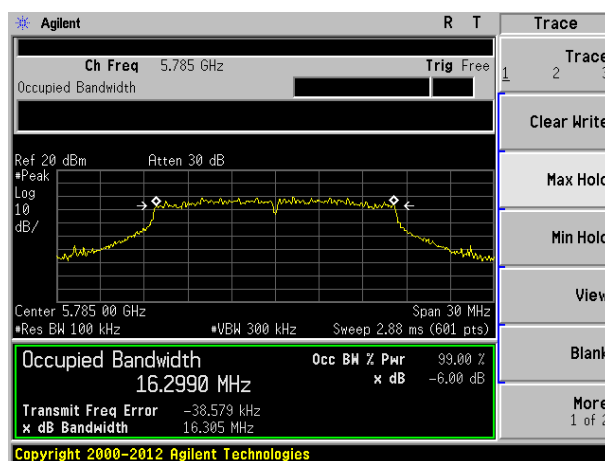


## Main Antenna:

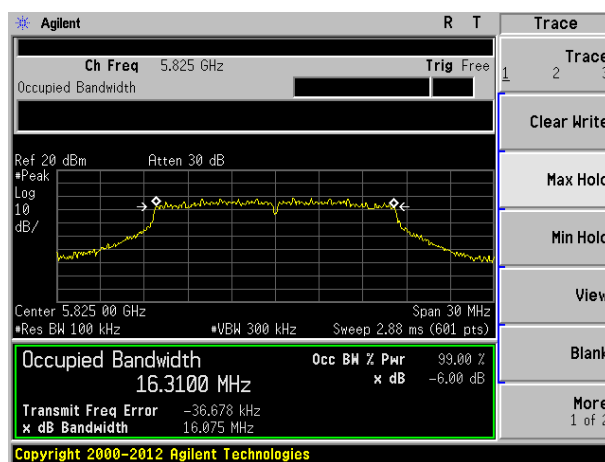
Test mode: 802.11a



Lowest channel

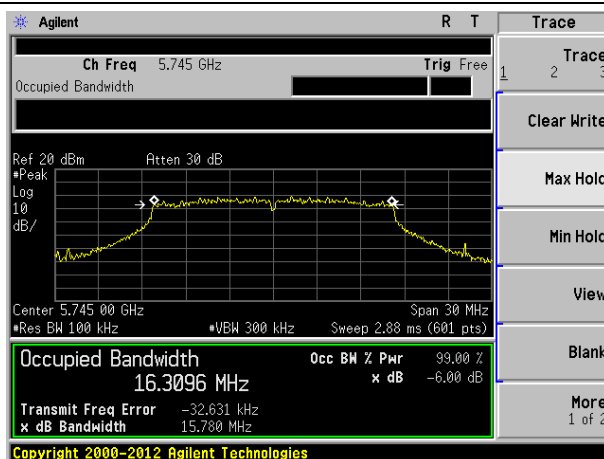


Middle channel

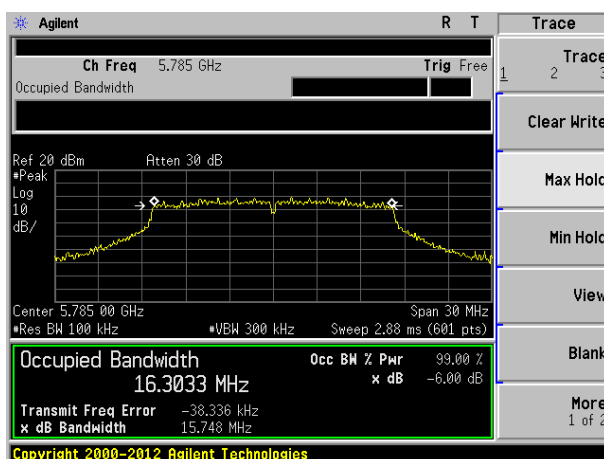


Highest channel

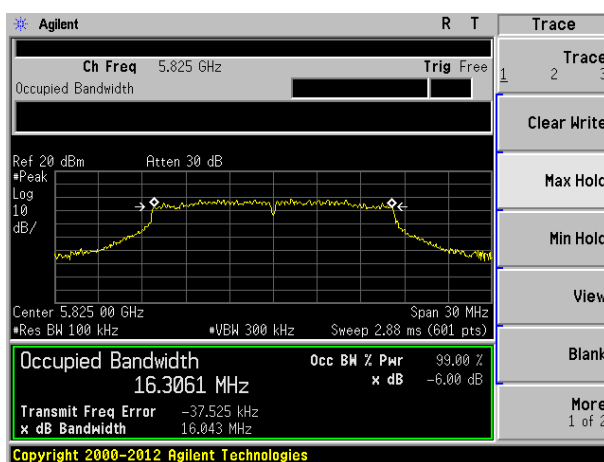
Test mode: 802.11n(HT20)



Lowest channel

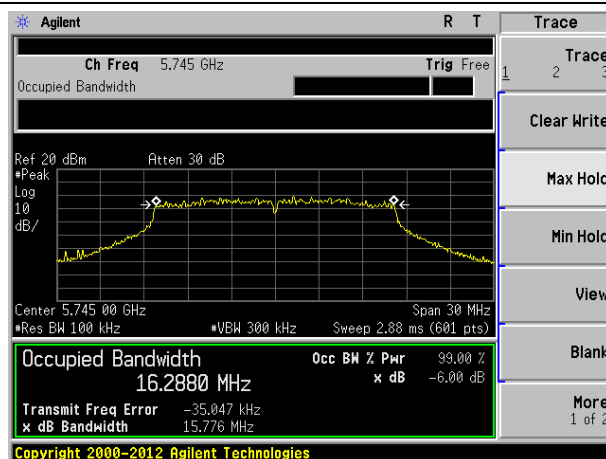


Middle channel

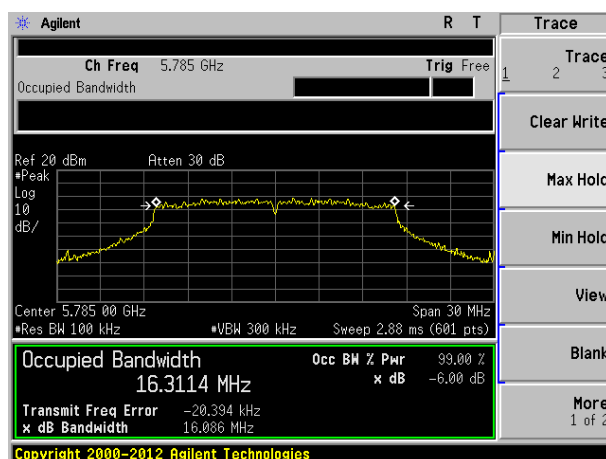


Highest channel

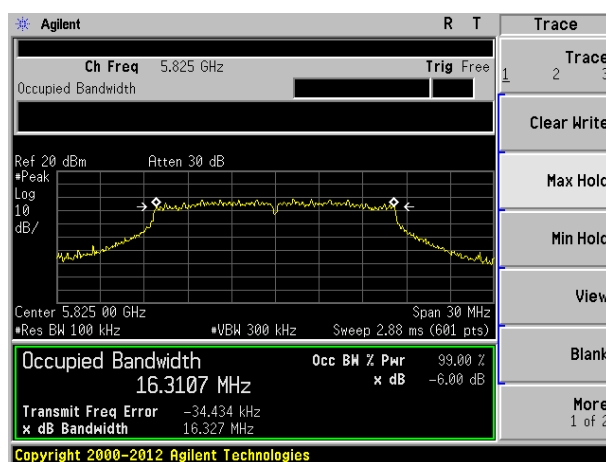
Test mode: 802.11ac(HT20)



Lowest channel



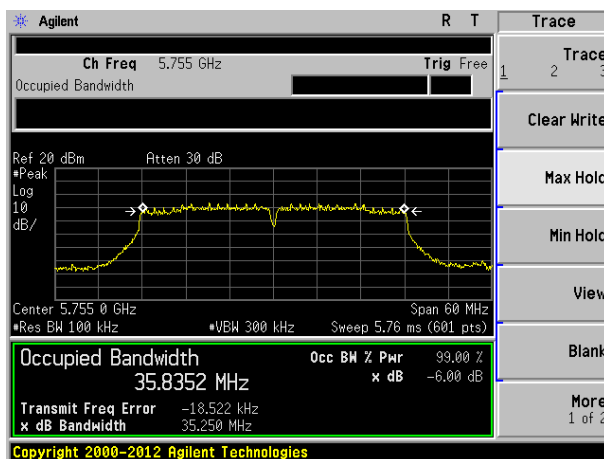
Middle channel



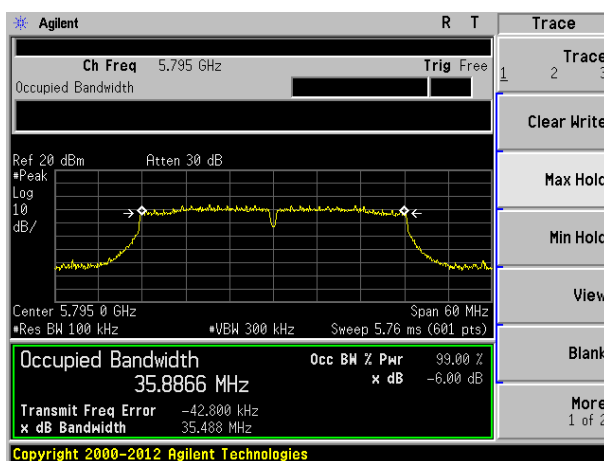
Highest channel



Test mode: 802.11n(HT40)

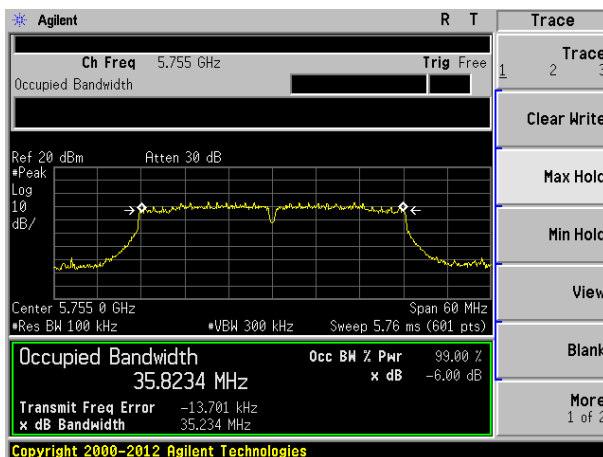


Lowest channel

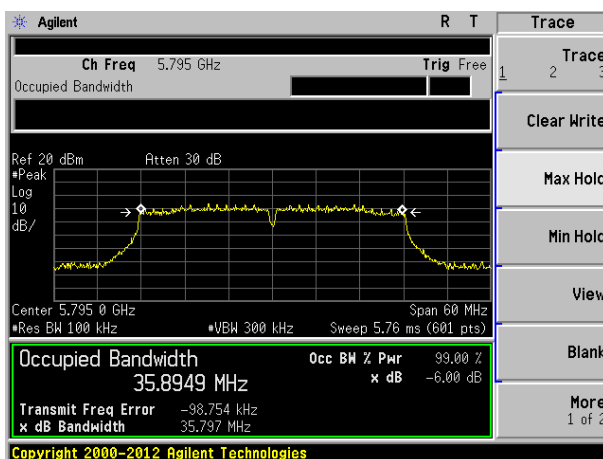


Highest channel

Test mode: 802.11ac(HT40)

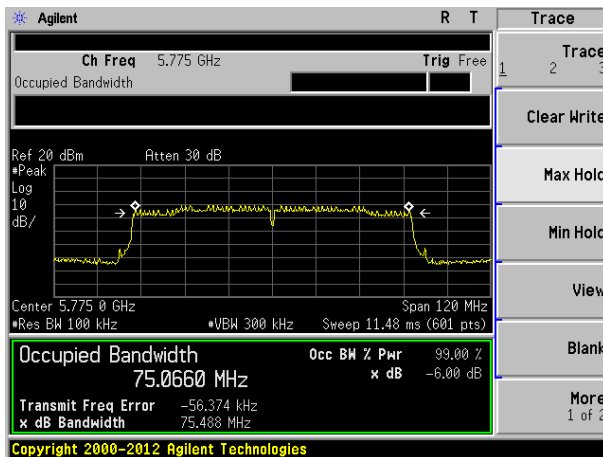


Lowest channel

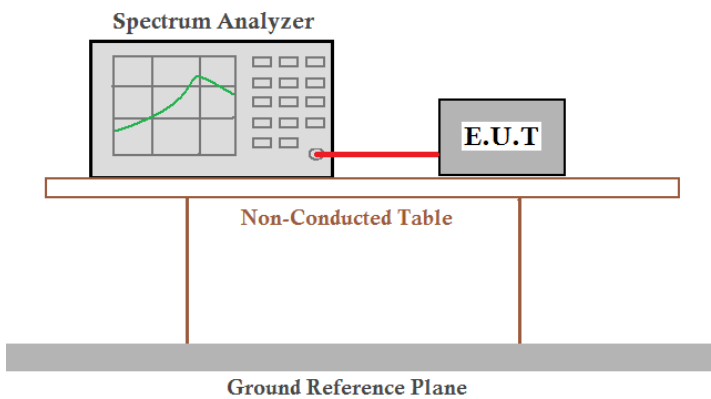


Highest channel

Test mode: 802.11ac(HT80)



## 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:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement Data

#### Aux Antenna:

Test CH	Power Spectral Density (dBm)						Limit (dBm/500k Hz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	4.37	4.30	4.87	-2.70	-2.51	---	30.00	Pass
Middle	4.07	4.10	3.53	---	---	-8.38		
Highest	3.74	4.00	3.42	-2.48	-3.38	---		

#### Main Antenna:

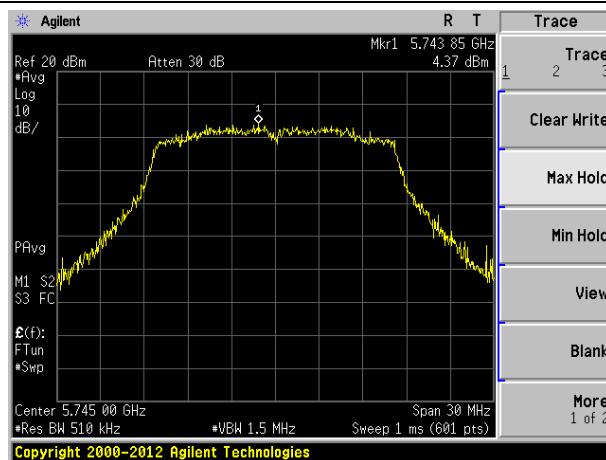
Test CH	Power Spectral Density (dBm)						Limit (dBm/500k Hz)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	3.78	3.36	3.40	-2.20	-2.53	---	30.00	Pass
Middle	4.76	4.17	3.97	---	---	-7.40		
Highest	3.17	4.02	4.40	-1.87	-2.20	---		

Remark: "---"is not applicable

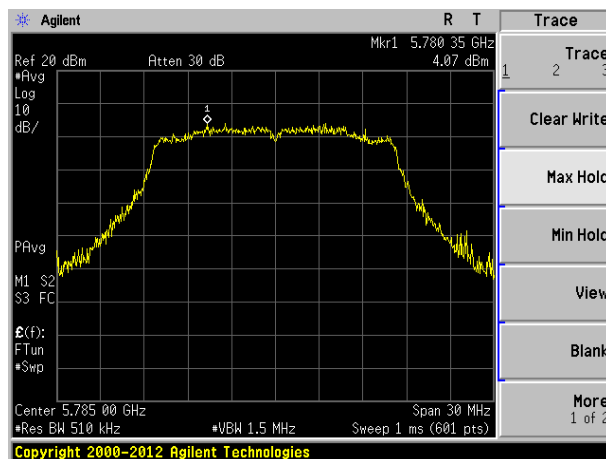
Test plot as follows:

Aux Antenna:

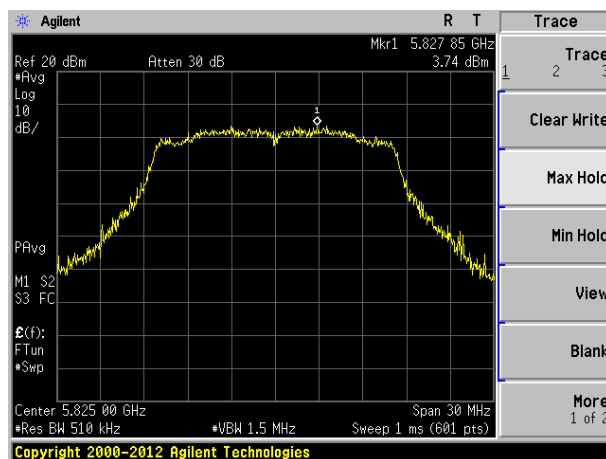
Test mode: 802.11a



Lowest channel

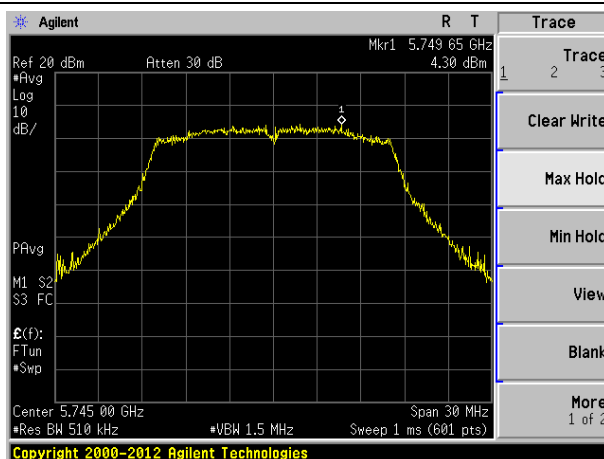


Middle channel

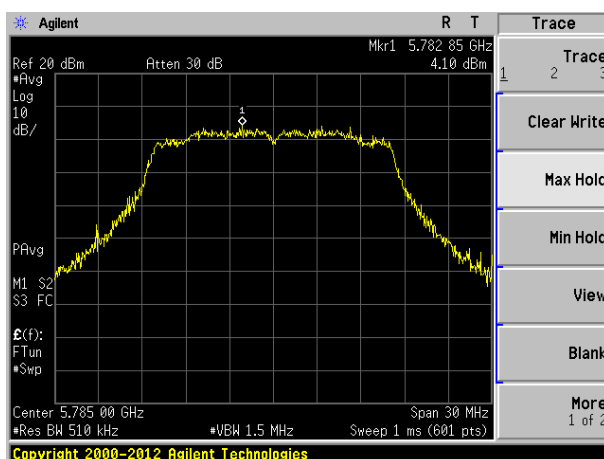


Highest channel

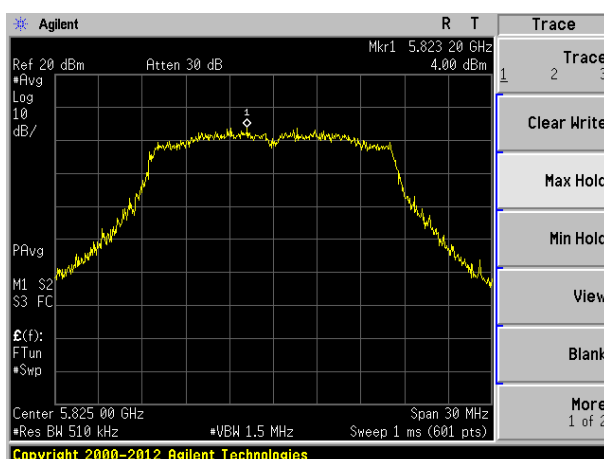
Test mode: 802.11n(HT20)



Lowest channel

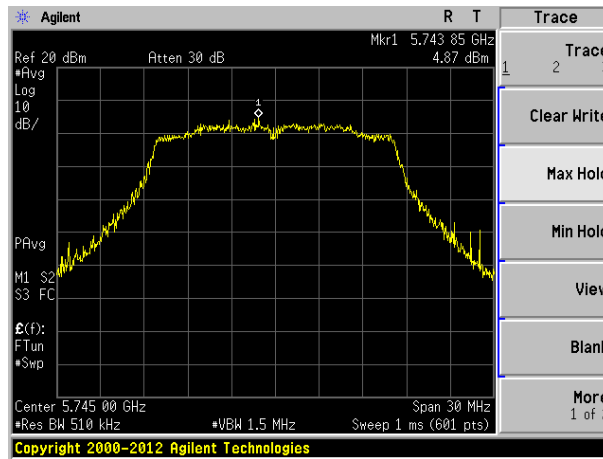


Middle channel

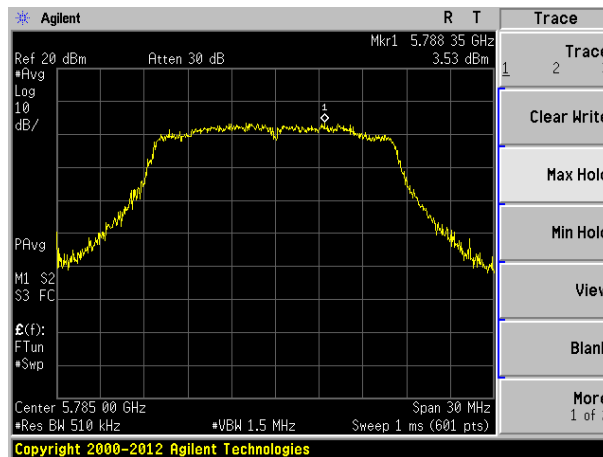


Highest channel

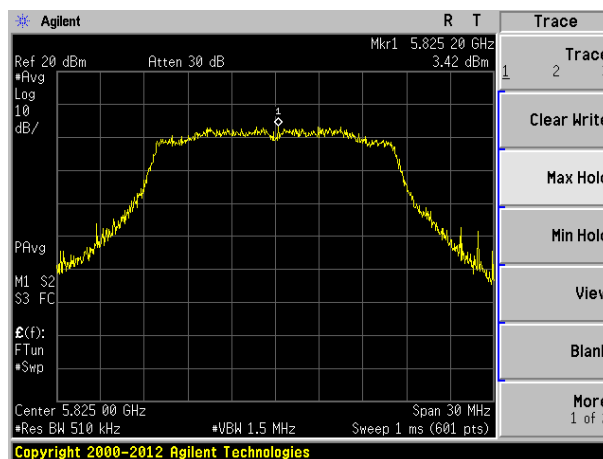
Test mode: 802.11ac(HT20)



Lowest channel

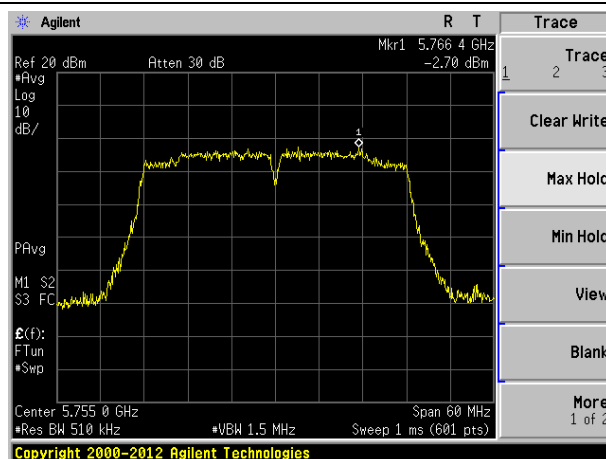


Middle channel

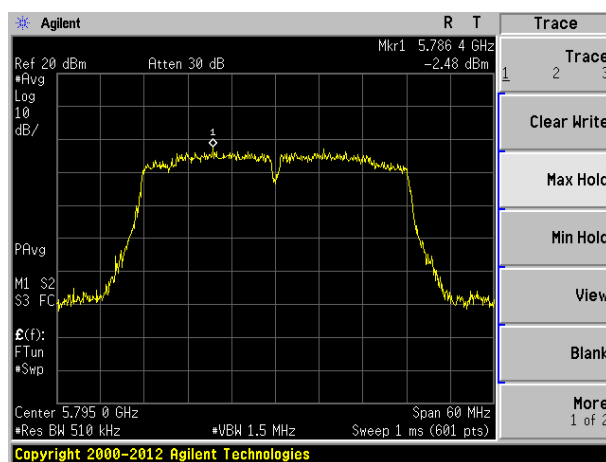


Highest channel

Test mode: 802.11n(HT40)

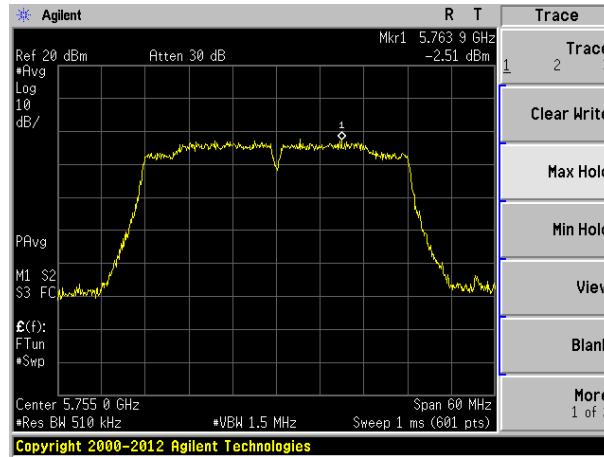


Lowest channel

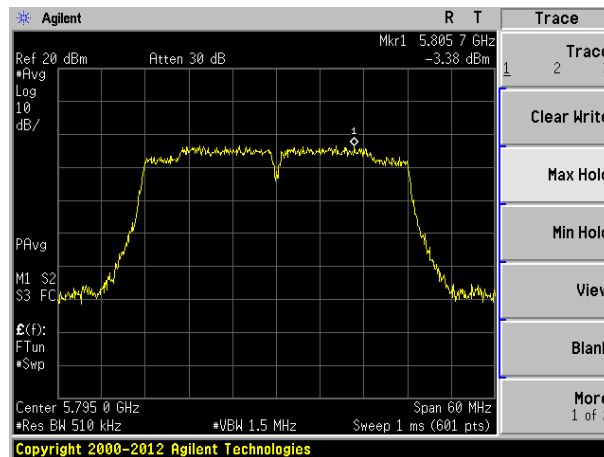


Highest channel

Test mode: 802.11ac(HT40)

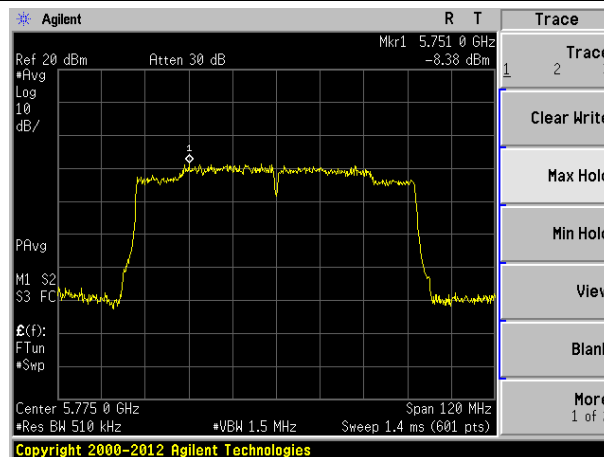


Lowest channel



Highest channel

Test mode: 802.11ac(HT80)

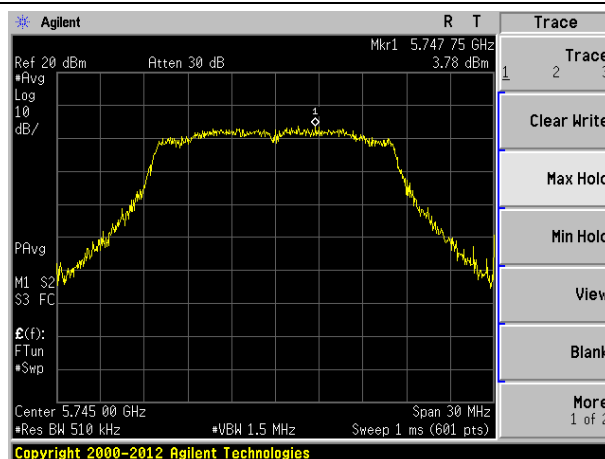


Middle channel

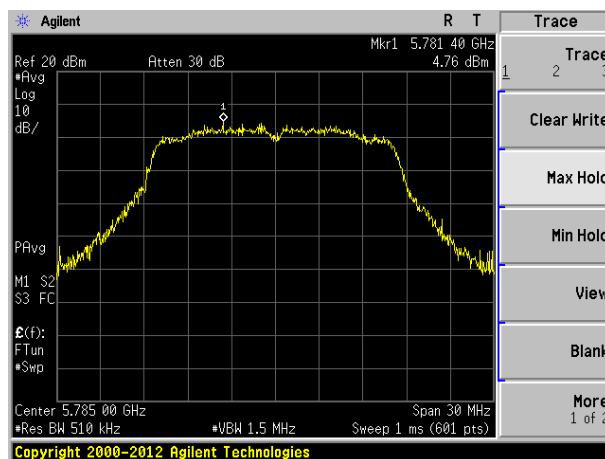


## Main Antenna:

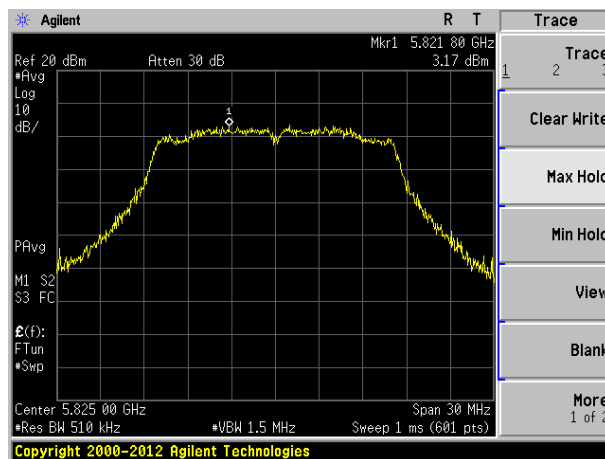
Test mode: 802.11a



Lowest channel

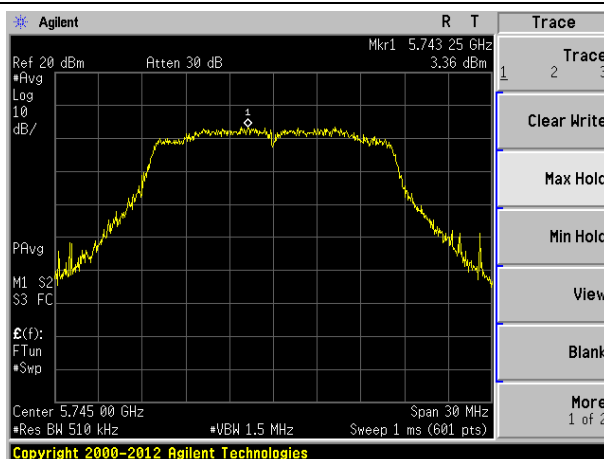


Middle channel

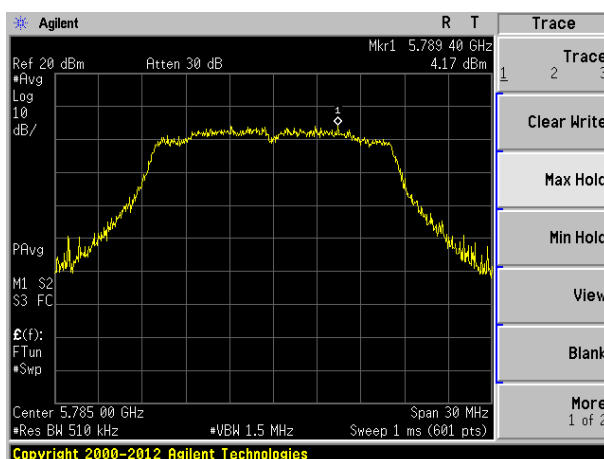


Highest channel

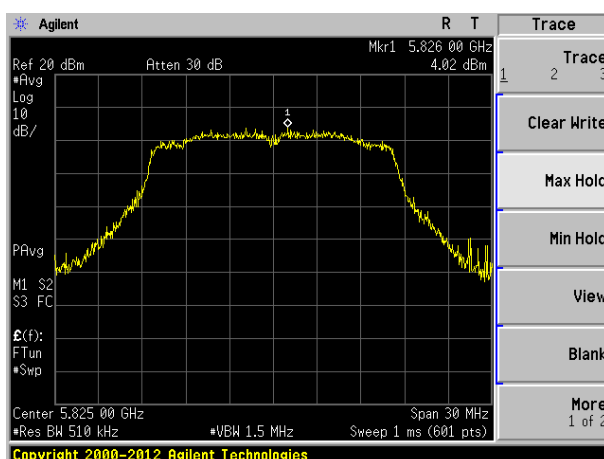
Test mode: 802.11n(HT20)



Lowest channel

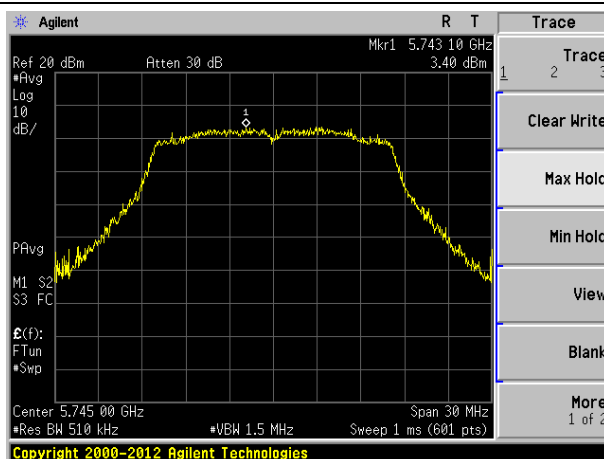


Middle channel

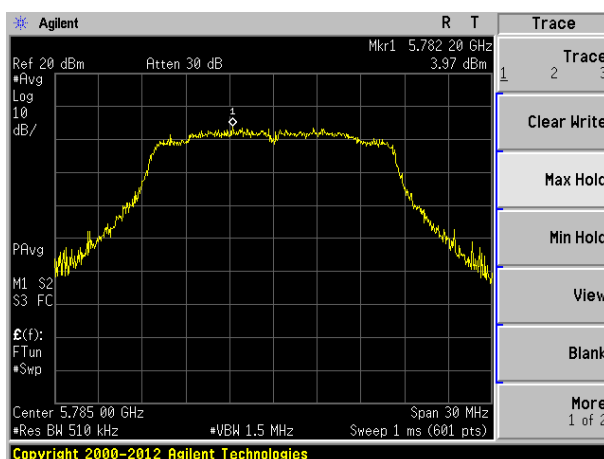


Highest channel

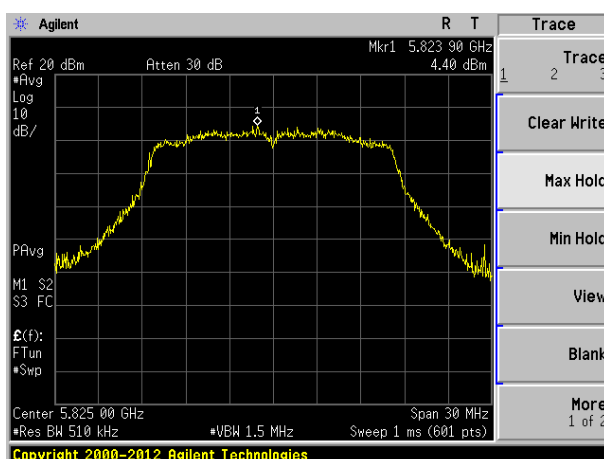
Test mode: 802.11ac(HT20)



Lowest channel

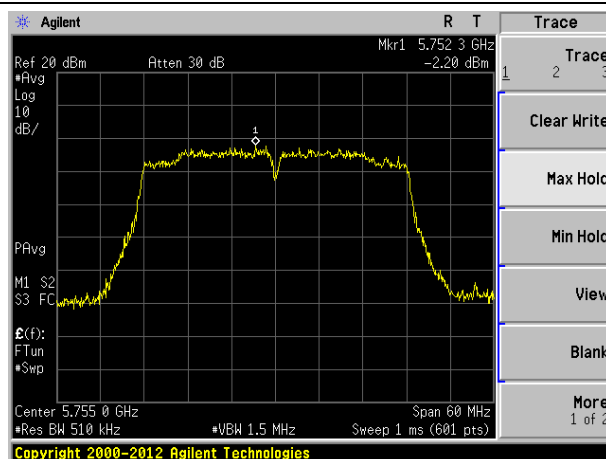


Middle channel

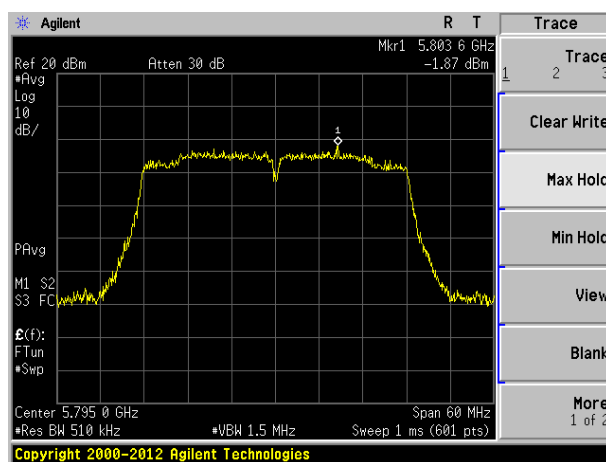


Highest channel

Test mode: 802.11n(HT40)

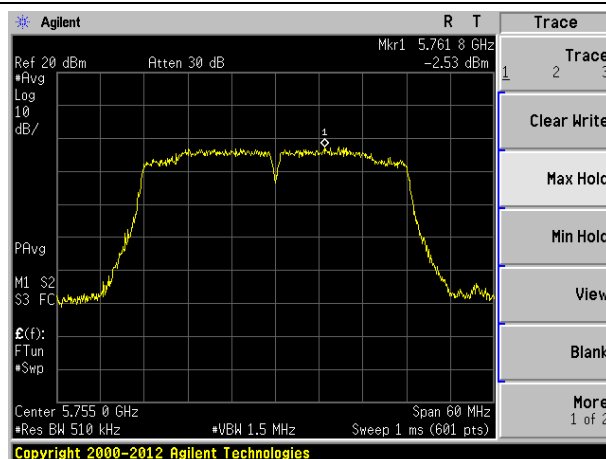


Lowest channel

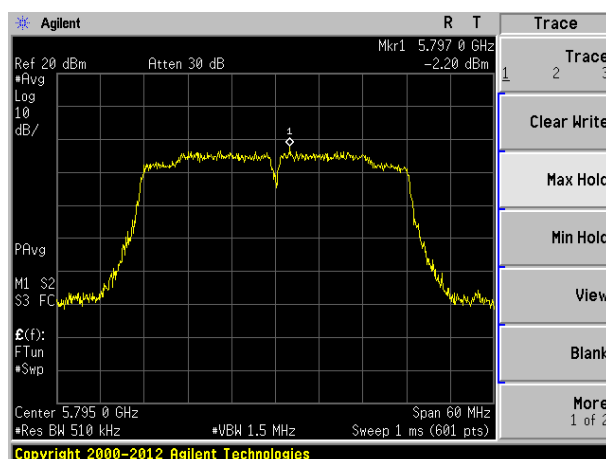


Highest channel

Test mode: 802.11ac(HT40)

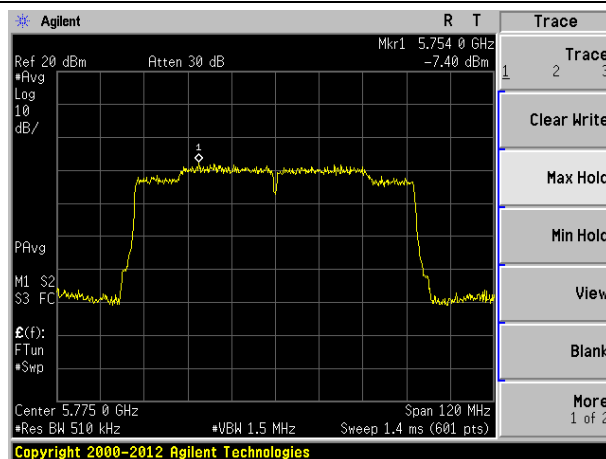


Lowest channel



Highest channel

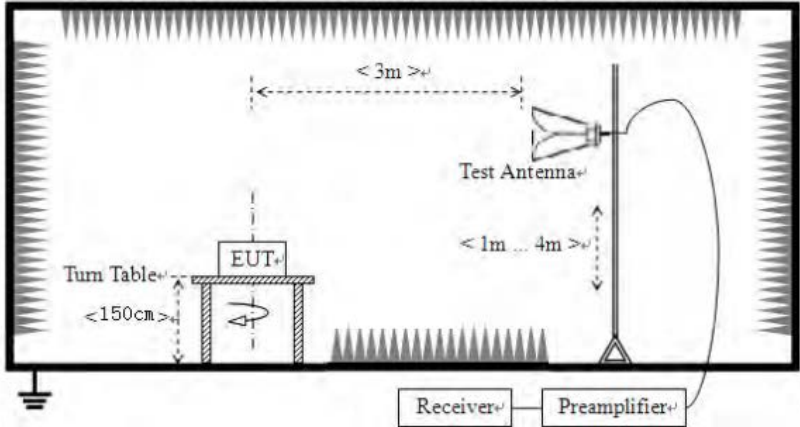
Test mode: 802.11ac(HT80)



Middle channel

## 7.6 Band edge

### 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	1MHz	3MHz	Peak
		RMS	1MHz	3MHz	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>				

	peak or average method as specified and then reported in a data sheet. 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.
Test Instruments:	Refer to section 6.0 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 D02v02r01 section G) 1) d),for measurements above 1000 MHz @3m distance, the limit of field strength is computed as follows:  
 $E[dBuV/m] = EIRP[dBm] + 95.2;$   
 $E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.$   
 $E[dBuV/m] = 10 + 95.2 = 105.2dBuV/m.$   
 $E[dBuV/m] = 15.6 + 95.2 = 110.8dBuV/m.$   
 $E[dBuV/m] = 27 + 95.2 = 122.2dBuV/m$

## Measurement data:

IEEE 802.11a								
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	37.03	32.36	9.72	23.83	55.28	68.20	-12.92	Horizontal
5700.00	37.43	32.50	9.79	23.84	55.88	105.20	-49.32	Horizontal
5720.00	37.59	32.53	9.81	23.85	56.08	110.80	-54.72	Horizontal
5725.00	45.07	32.53	9.83	23.86	63.57	122.20	-58.63	Horizontal
5850.00	41.93	32.70	9.99	23.87	60.75	122.20	-61.45	Horizontal
5855.00	36.89	32.72	9.99	23.88	55.72	110.80	-55.08	Horizontal
5875.00	38.97	32.74	10.04	23.89	57.86	105.20	-47.34	Horizontal
5925.00	38.67	32.80	10.11	23.90	57.68	68.20	-10.52	Horizontal
5650.00	38.43	32.36	9.72	23.83	56.68	68.20	-11.52	Vertical
5700.00	38.03	32.50	9.79	23.84	56.48	105.20	-48.72	Vertical
5720.00	39.08	32.53	9.81	23.85	57.57	110.80	-53.23	Vertical
5725.00	46.93	32.53	9.83	23.86	65.43	122.20	-56.77	Vertical
5850.00	44.29	32.70	9.99	23.87	63.11	122.20	-59.09	Vertical
5855.00	37.11	32.72	9.99	23.88	55.94	110.80	-54.86	Vertical
5875.00	37.98	32.74	10.04	23.89	56.87	105.20	-48.33	Vertical
5925.00	38.54	32.80	10.11	23.90	57.55	68.20	-10.66	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	37.62	32.36	9.72	23.83	55.87	68.20	-12.33	Horizontal
5700.00	38.43	32.50	9.79	23.84	56.88	105.20	-48.32	Horizontal
5720.00	38.58	32.53	9.81	23.85	57.07	110.80	-53.73	Horizontal
5725.00	46.37	32.53	9.83	23.86	64.87	122.20	-57.33	Horizontal
5850.00	43.55	32.70	9.99	23.87	62.37	122.20	-59.83	Horizontal
5855.00	38.57	32.72	9.99	23.88	57.40	110.80	-53.40	Horizontal
5875.00	38.04	32.74	10.04	23.89	56.93	105.20	-48.27	Horizontal
5925.00	37.95	32.80	10.11	23.90	56.96	68.20	-11.24	Horizontal
5650.00	38.70	32.36	9.72	23.83	56.95	68.20	-11.25	Vertical
5700.00	37.64	32.50	9.79	23.84	56.09	105.20	-49.11	Vertical
5720.00	36.50	32.53	9.81	23.85	54.99	110.80	-55.81	Vertical
5725.00	44.95	32.53	9.83	23.86	63.45	122.20	-58.75	Vertical
5850.00	42.03	32.70	9.99	23.87	60.85	122.20	-61.35	Vertical
5855.00	37.62	32.72	9.99	23.88	56.45	110.80	-54.35	Vertical
5875.00	37.99	32.74	10.04	23.89	56.88	105.20	-48.32	Vertical
5925.00	37.47	32.80	10.11	23.90	56.48	68.20	-11.72	Vertical

IEEE 802.11ac 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	38.31	32.36	9.72	23.83	56.56	68.20	-11.64	Horizontal
5700.00	38.27	32.50	9.79	23.84	56.72	105.20	-48.48	Horizontal
5720.00	38.08	32.53	9.81	23.85	56.57	110.80	-54.23	Horizontal
5725.00	46.16	32.53	9.83	23.86	64.66	122.20	-57.54	Horizontal
5850.00	42.82	32.70	9.99	23.87	61.64	122.20	-60.56	Horizontal
5855.00	38.47	32.72	9.99	23.88	57.30	110.80	-53.50	Horizontal
5875.00	38.10	32.74	10.04	23.89	56.99	105.20	-48.21	Horizontal
5925.00	37.99	32.80	10.11	23.90	57.00	68.20	-11.20	Horizontal
5650.00	38.03	32.36	9.72	23.83	56.28	68.20	-11.92	Vertical
5700.00	38.26	32.50	9.79	23.84	56.71	105.20	-48.49	Vertical
5720.00	38.35	32.53	9.81	23.85	56.84	110.80	-53.96	Vertical
5725.00	47.05	32.53	9.83	23.86	65.55	122.20	-56.65	Vertical
5850.00	43.74	32.70	9.99	23.87	62.56	122.20	-59.64	Vertical
5855.00	38.55	32.72	9.99	23.88	57.38	110.80	-53.42	Vertical
5875.00	38.27	32.74	10.04	23.89	57.16	105.20	-48.04	Vertical
5925.00	38.29	32.80	10.11	23.90	57.30	68.20	-10.90	Vertical

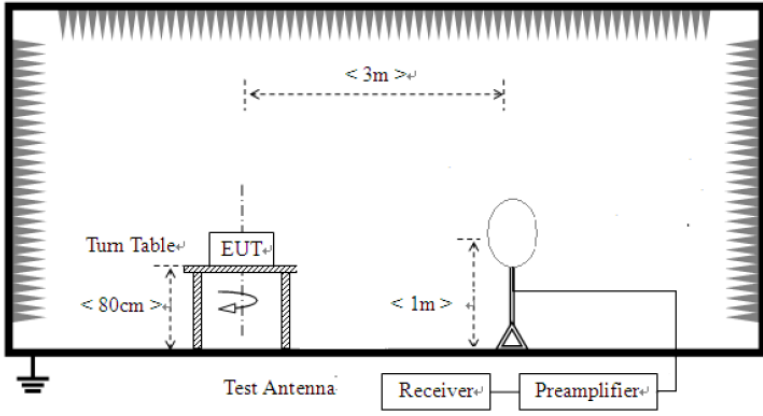
<b>IEEE 802.11n HT40</b>								
<b>Peak value:</b>								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	38.30	32.36	9.72	23.83	56.55	68.20	-11.65	Horizontal
5700.00	38.25	32.50	9.79	23.84	56.70	105.20	-48.50	Horizontal
5720.00	37.74	32.53	9.81	23.85	56.23	110.80	-54.57	Horizontal
5725.00	41.20	32.53	9.83	23.86	59.70	122.20	-62.50	Horizontal
5850.00	39.99	32.70	9.99	23.87	58.81	122.20	-63.39	Horizontal
5855.00	37.90	32.72	9.99	23.88	56.73	110.80	-54.07	Horizontal
5875.00	36.94	32.74	10.04	23.89	55.83	105.20	-49.37	Horizontal
5925.00	38.20	32.80	10.11	23.90	57.21	68.20	-10.99	Horizontal
5650.00	38.15	32.36	9.72	23.83	56.40	68.20	-11.80	Vertical
5700.00	36.84	32.50	9.79	23.84	55.29	105.20	-49.91	Vertical
5720.00	38.04	32.53	9.81	23.85	56.53	110.80	-54.27	Vertical
5725.00	46.52	32.53	9.83	23.86	65.02	122.20	-57.18	Vertical
5850.00	42.17	32.70	9.99	23.87	60.99	122.20	-61.21	Vertical
5855.00	38.10	32.72	9.99	23.88	56.93	110.80	-53.87	Vertical
5875.00	37.88	32.74	10.04	23.89	56.77	105.20	-48.43	Vertical
5925.00	37.26	32.80	10.11	23.90	56.27	68.20	-11.93	Vertical

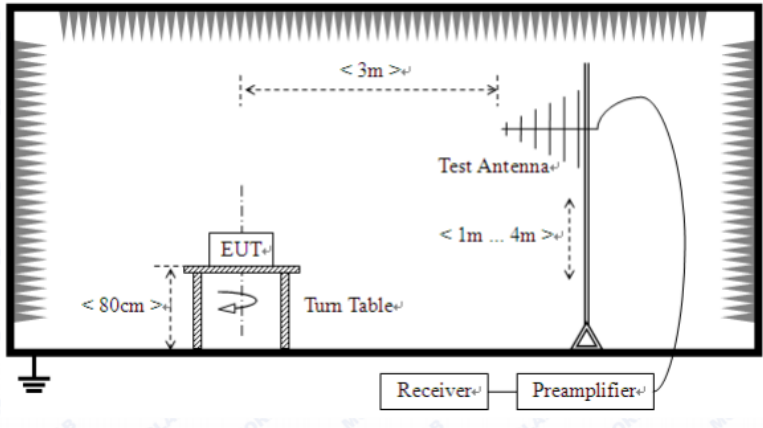
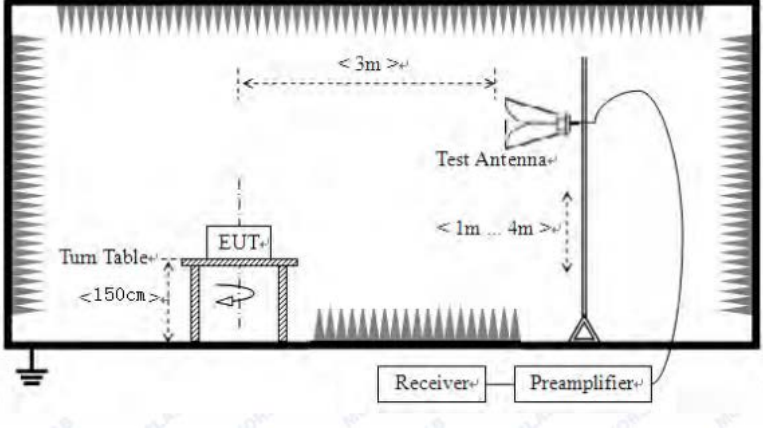
<b>IEEE 802.11ac HT40</b>								
<b>Peak value:</b>								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	38.38	32.36	9.72	23.83	56.63	68.20	-11.57	Horizontal
5700.00	38.47	32.50	9.79	23.84	56.92	105.20	-48.28	Horizontal
5720.00	38.73	32.53	9.81	23.85	57.22	110.80	-53.58	Horizontal
5725.00	46.38	32.53	9.83	23.86	64.88	122.20	-57.32	Horizontal
5850.00	43.60	32.70	9.99	23.87	62.42	122.20	-59.78	Horizontal
5855.00	38.67	32.72	9.99	23.88	57.50	110.80	-53.30	Horizontal
5875.00	38.37	32.74	10.04	23.89	57.26	105.20	-47.94	Horizontal
5925.00	38.04	32.80	10.11	23.90	57.05	68.20	-11.15	Horizontal
5650.00	38.59	32.36	9.72	23.83	56.84	68.20	-11.36	Vertical
5700.00	38.18	32.50	9.79	23.84	56.63	105.20	-48.57	Vertical
5720.00	38.59	32.53	9.81	23.85	57.08	110.80	-53.72	Vertical
5725.00	46.57	32.53	9.83	23.86	65.07	122.20	-57.13	Vertical
5850.00	43.83	32.70	9.99	23.87	62.65	122.20	-59.55	Vertical
5855.00	38.04	32.72	9.99	23.88	56.87	110.80	-53.93	Vertical
5875.00	38.55	32.74	10.04	23.89	57.44	105.20	-47.76	Vertical
5925.00	38.04	32.80	10.11	23.90	57.05	68.20	-11.15	Vertical

<b>IEEE 802.11ac HT80</b>								
<b>Peak value:</b>								
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	37.55	32.36	9.72	23.83	55.80	68.20	-12.40	Horizontal
5700.00	35.75	32.50	9.79	23.84	54.20	105.20	-51.00	Horizontal
5720.00	36.06	32.53	9.81	23.85	54.55	110.80	-56.25	Horizontal
5725.00	45.64	32.53	9.83	23.86	64.14	122.20	-58.06	Horizontal
5850.00	42.20	32.70	9.99	23.87	61.02	122.20	-61.18	Horizontal
5855.00	36.02	32.72	9.99	23.88	54.85	110.80	-55.95	Horizontal
5875.00	35.92	32.74	10.04	23.89	54.81	105.20	-50.39	Horizontal
5925.00	37.23	32.80	10.11	23.90	56.24	68.20	-11.96	Horizontal
5650.00	37.12	32.36	9.72	23.83	55.37	68.20	-12.83	Vertical
5700.00	37.53	32.50	9.79	23.84	55.98	105.20	-49.22	Vertical
5720.00	37.22	32.53	9.81	23.85	55.71	110.80	-55.09	Vertical
5725.00	44.66	32.53	9.83	23.86	63.16	122.20	-59.04	Vertical
5850.00	42.17	32.70	9.99	23.87	60.99	122.20	-61.21	Vertical
5855.00	37.07	32.72	9.99	23.88	55.90	110.80	-54.90	Vertical
5875.00	35.97	32.74	10.04	23.89	54.86	105.20	-50.34	Vertical
5925.00	36.89	32.80	10.11	23.90	55.90	68.20	-12.30	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		
Test setup:	For radiated emissions from 9kHz to 30MHz				
	 <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 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</li> </ol>

	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. 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
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.

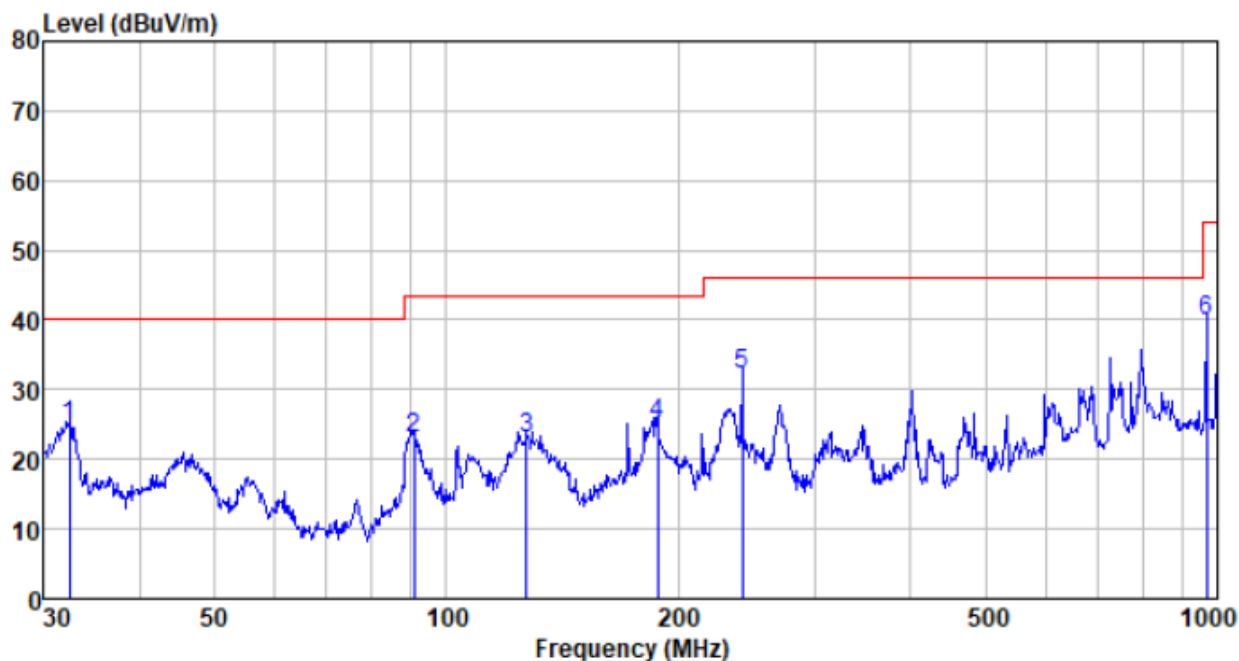
**Measurement Data:****9 kHz ~ 30 MHz**

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.



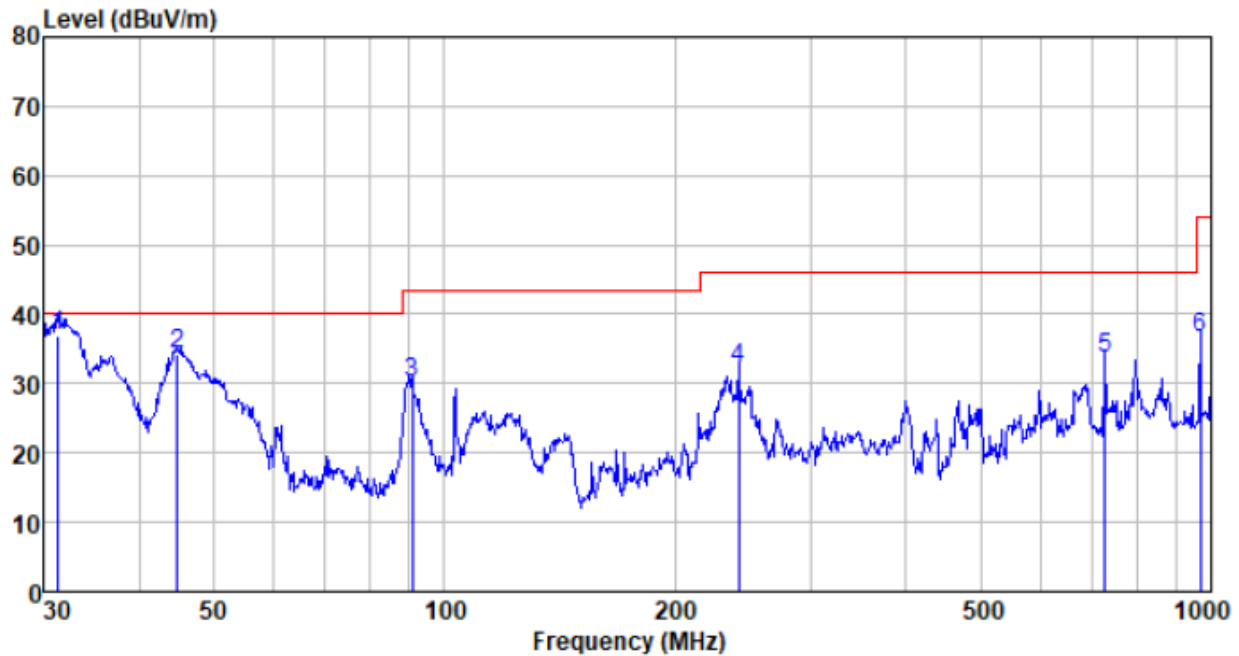
## Below 1GHz

Mode:	Transmitting mode	Test by:	Bill
Temp./Hum.(%H):	26°C/56%RH	Polarization:	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
32.406	48.09	11.25	0.58	35.18	24.74	40.00	-15.26	QP
90.855	47.74	10.84	1.12	36.65	23.05	43.50	-20.45	QP
127.218	50.07	8.51	1.41	36.93	23.06	43.50	-20.44	QP
187.753	51.02	9.65	1.78	37.27	25.18	43.50	-18.32	QP
241.676	55.62	11.89	2.08	37.37	32.22	46.00	-13.78	QP
968.934	49.56	22.59	5.11	37.54	39.72	54.00	-14.28	QP

Mode:	Transmitting mode	Test by:	Bill
Temp./Hum.(%RH):	26°C/56%RH	Polarization:	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
31.399	60.10	11.23	0.57	35.11	36.79	40.00	-3.21	QP
44.901	57.06	12.25	0.72	35.93	34.10	40.00	-5.90	QP
90.855	54.77	10.84	1.12	36.65	30.08	43.50	-13.42	QP
241.676	55.44	11.89	2.08	37.37	32.04	46.00	-13.96	QP
726.805	46.98	20.10	4.19	37.63	33.64	46.00	-12.36	QP
968.934	46.51	22.59	5.11	37.54	36.67	54.00	-17.33	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	23.05	21.64	44.69	54(Note3)	-9.31	PK
V	17235	22.83	21.80	44.63	54(Note3)	-9.37	PK
H	11490	22.94	21.83	44.77	54(Note3)	-9.23	PK
H	17235	22.16	21.67	43.83	54(Note3)	-10.17	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	23.70	21.64	45.34	54(Note3)	-8.66	PK
V	17355	24.23	21.80	46.03	54(Note3)	-7.97	PK
H	11570	22.36	21.83	44.19	54(Note3)	-9.81	PK
H	17355	22.20	21.67	43.87	54(Note3)	-10.13	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	20.07	21.64	41.71	54(Note3)	-12.29	PK
V	17475	19.90	21.80	41.70	54(Note3)	-12.30	PK
H	11650	18.87	21.83	40.70	54(Note3)	-13.30	PK
H	17475	20.26	21.67	41.93	54(Note3)	-12.07	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	21.78	21.67	43.45	54(Note3)	-10.55	PK
V	17265	21.24	21.83	43.07	54(Note3)	-10.93	PK
H	11510	20.90	21.67	42.57	54(Note3)	-11.43	PK
H	17265	22.31	21.83	44.14	54(Note3)	-9.86	PK

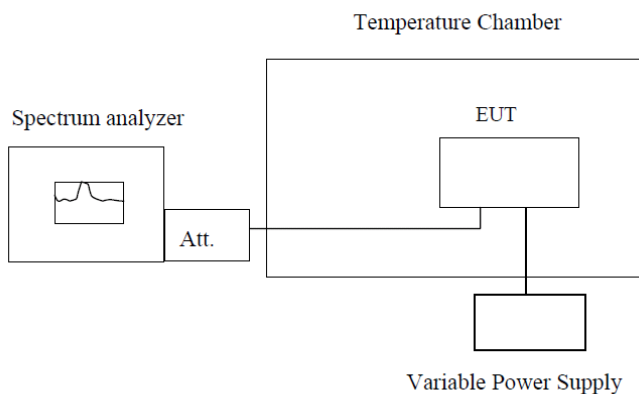
Test mode:		802.11ac(HT40)		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11590	20.71	21.67	42.38	54(Note3)	-11.62	PK
V	17385	20.66	21.83	42.49	54(Note3)	-11.51	PK
H	11590	21.99	21.67	43.66	54(Note3)	-10.34	PK
H	17385	21.07	21.83	42.90	54(Note3)	-11.10	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	20.88	21.65	42.53	54(Note3)	-11.47	PK
V	17325	20.84	21.81	42.65	54(Note3)	-11.35	PK
H	11550	20.71	21.65	42.36	54(Note3)	-11.64	PK
H	17325	21.70	21.81	43.51	54(Note3)	-10.49	PK

## Notes:

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><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: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5744.8014	5744.8140	5743.3980	5744.1965
	5785	5783.3377	5783.4112	5784.0043	5783.4288
	5825	5823.3200	5823.2223	5824.6242	5823.8538
-20	5745	5744.8943	5744.2597	5744.1807	5744.9620
	5785	5783.3027	5783.7193	5784.7175	5784.6224
	5825	5824.8836	5823.4371	5824.8739	5824.9912
-10	5745	5743.3206	5743.0753	5744.7796	5744.2418
	5785	5784.8713	5784.1519	5784.9858	5784.5398
	5825	5824.3984	5824.9383	5824.5089	5824.8958
0	5745	5744.0242	5743.1726	5744.6591	5744.0560
	5785	5784.1786	5783.8531	5784.1359	5784.1291
	5825	5823.7015	5824.3763	5823.8222	5823.2378
10	5745	5744.6493	5744.3918	5743.2709	5743.4214
	5785	5784.1571	5784.5601	5784.5230	5784.4952
	5825	5823.7766	5823.8855	5823.3684	5824.1325
20	5745	5744.3049	5744.1485	5744.8414	5744.9668
	5785	5783.7750	5784.3750	5784.3529	5783.1566
	5825	5823.6778	5824.1405	5824.7747	5824.1907
30	5745	5743.0802	5744.5871	5744.5149	5744.0196
	5785	5784.5487	5783.3890	5784.3686	5784.4469
	5825	5823.1002	5823.2067	5824.8058	5824.8620
40	5745	5744.2914	5744.3020	5744.5771	5743.5973
	5785	5784.4934	5784.4272	5784.3443	5784.9102
	5825	5823.0915	5823.4772	5824.6330	5824.0825
50	5745	5744.7401	5744.8767	5743.5729	5743.0326
	5785	5783.0340	5783.1735	5784.1498	5784.9101
	5825	5823.9149	5824.9812	5823.2892	5824.1889

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
108	5745	5743.0738	5744.4566	5744.2646	5744.8203
	5785	5783.6909	5784.1791	5784.5268	5783.5749
	5825	5824.7361	5824.0947	5823.0525	5823.4912
120	5745	5744.4177	5744.9369	5743.2497	5743.2105
	5785	5784.8877	5783.6284	5784.8650	5783.3228
	5825	5824.7017	5824.1125	5824.0963	5823.1118
132	5745	5743.5732	5744.1686	5744.3839	5743.8697
	5785	5783.6384	5783.7085	5783.2662	5784.8634
	5825	5823.4920	5824.9796	5824.6254	5824.8070

Note: The worst case is FL=5743.0620MHz, FH=5825.8521MHz

802.11n(HT20)					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5746.4747	5744.4323	5744.0484	5745.4725
	5785	5786.3213	5784.9562	5784.9417	5785.1676
	5825	5826.2021	5824.8265	5824.0212	5825.8289
-20	5745	5746.3015	5744.8677	5744.6842	5745.6976
	5785	5785.7848	5784.2571	5784.2328	5785.6711
	5825	5825.6365	5824.0848	5824.8041	5825.4275
-10	5745	5745.7506	5744.5010	5744.1579	5745.3701
	5785	5785.5855	5784.2216	5784.2486	5785.1228
	5825	5825.5831	5824.7153	5824.9153	5825.5210
0	5745	5745.1099	5744.1997	5744.7363	5745.0078
	5785	5785.7408	5784.4857	5784.4162	5785.0170
	5825	5825.7274	5824.8035	5824.0272	5825.1881
10	5745	5745.4612	5744.7358	5744.8205	5745.9025
	5785	5785.3116	5784.8382	5784.6151	5785.1634
	5825	5825.0868	5824.0268	5824.6339	5825.1539
20	5745	5745.3736	5744.9674	5744.2587	5745.0413
	5785	5785.9296	5784.9755	5784.8837	5785.9258
	5825	5825.5362	5824.8111	5824.3759	5825.5666
30	5745	5745.8270	5744.7688	5744.3841	5745.7450
	5785	5785.5745	5784.9536	5784.6610	5785.9878
	5825	5825.6669	5824.6915	5824.7266	5825.6848
40	5745	5745.5869	5744.3341	5744.2352	5745.7728
	5785	5785.4543	5784.4024	5784.7701	5785.8736
	5825	5825.7436	5824.5547	5824.2492	5825.0855
50	5745	5745.8157	5744.7411	5744.5716	5745.4093
	5785	5785.8540	5784.5423	5784.8293	5785.8966
	5825	5825.0192	5824.2408	5824.7880	5825.5595

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
108	5745	5746.9522	5745.3332	5743.1996	5743.0506
	5785	5785.0647	5785.8178	5783.6070	5784.3281
	5825	5825.7131	5825.4080	5823.3722	5824.0437
120	5745	5745.6073	5745.2859	5743.1021	5744.3899
	5785	5785.0858	5785.4996	5783.2800	5784.6157
	5825	5825.8459	5825.1755	5823.2442	5824.3243
132	5745	5745.4964	5745.7928	5743.4774	5744.3678
	5785	5785.0714	5785.7062	5784.7521	5784.5144
	5825	5825.5584	5825.3365	5824.2338	5824.9588

Note: The worst case is FL=5743.1335MHz, FH=5825.9593MHz

802.11ac(HT20)					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
-30	5745	5743.8890	5744.0868	5744.1371	5744.8248
	5785	5784.1946	5784.0007	5784.3124	5784.6639
	5825	5824.3762	5824.3736	5824.8645	5824.7313
-20	5745	5744.6807	5744.3945	5744.0632	5744.7625
	5785	5784.4287	5784.5005	5784.9381	5784.6855
	5825	5824.6097	5824.0813	5824.2783	5824.1706
-10	5745	5744.2369	5744.6599	5744.0717	5744.5479
	5785	5784.5895	5784.8280	5784.9936	5784.6369
	5825	5824.8842	5824.6013	5824.3111	5824.5110
0	5745	5744.9969	5744.0822	5744.8493	5744.7109
	5785	5784.9102	5784.0350	5784.2887	5784.1393
	5825	5824.7678	5824.3295	5824.8081	5824.0714
10	5745	5744.9194	5744.8784	5744.7356	5744.3113
	5785	5784.9751	5784.6328	5784.5771	5784.3530
	5825	5824.8892	5824.4744	5824.4202	5824.9661
20	5745	5744.8488	5744.2877	5744.5343	5744.6242
	5785	5784.7393	5784.4514	5784.2702	5784.2344
	5825	5824.6642	5824.7699	5824.9934	5824.7995
30	5745	5744.9169	5744.7842	5744.7444	5744.2187
	5785	5784.7729	5784.4557	5784.3131	5784.6337
	5825	5824.0199	5824.5230	5824.1594	5824.5326
40	5745	5744.8547	5744.2345	5744.0226	5744.0054
	5785	5784.7856	5784.0654	5784.7880	5784.6284
	5825	5824.9386	5824.8800	5824.0309	5824.0912
50	5745	5744.6171	5744.1851	5744.2371	5744.2972
	5785	5784.6577	5784.2049	5784.9552	5784.3247
	5825	5824.2348	5824.8279	5824.1617	5824.5041

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)
108	5745	5744.7383	5744.1874	5745.6850	5746.0269
	5785	5784.0205	5784.6296	5785.0746	5785.6113
	5825	5824.3581	5824.8607	5825.0717	5825.4813
120	5745	5744.5852	5744.1132	5745.2785	5745.3455
	5785	5784.8708	5784.3921	5785.9491	5785.0696
	5825	5824.5962	5824.6147	5825.9475	5825.4854
132	5745	5744.9075	5744.2014	5745.5097	5745.5057
	5785	5784.8889	5784.2128	5785.7975	5785.2057
	5825	5824.2693	5824.7998	5825.2059	5825.7169

Note: The worst case is FL=5743.1120MHz, FH=5825.9729MHz



802.11n(HT40)					
Frequency stability versus Temp.					
Power Supply: AC 120V					
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	5756.0944	5754.9981	5753.5913	5756.3694
	5795	5796.4946	5794.4432	5793.4142	5795.9411
-20	5755	5756.4338	5754.8898	5754.8986	5755.4247
	5795	5795.5726	5794.8951	5794.1237	5795.6445
-10	5755	5755.6920	5754.6693	5754.3942	5755.3213
	5795	5795.3648	5794.0061	5794.1214	5795.4140
0	5755	5755.9965	5754.5891	5754.9437	5755.1646
	5795	5795.2962	5794.8381	5794.3282	5795.1094
10	5755	5755.2364	5754.5542	5754.6917	5755.2615
	5795	5795.2656	5794.6647	5794.2147	5795.3367
20	5755	5755.5276	5754.8359	5754.9480	5755.0650
	5795	5795.1891	5794.3785	5794.0985	5795.4896
30	5755	5755.5278	5754.0948	5754.7039	5755.6450
	5795	5795.3882	5794.3882	5794.5335	5795.8518
40	5755	5755.5857	5754.0008	5754.4571	5755.5089
	5795	5795.6981	5794.0108	5794.4570	5795.3954
50	5755	5755.7240	5754.3222	5754.6472	5755.2870
	5795	5795.9088	5794.2614	5794.5626	5795.4704

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5755	5756.3772	5754.4130	5755.9976	5753.0786
	5795	5796.4828	5794.8470	5795.9432	5793.5658
120	5755	5755.2096	5754.3558	5755.0065	5753.8257
	5795	5795.1810	5794.9229	5795.0175	5794.4523
132	5755	5755.1566	5754.3416	5755.9008	5754.1515
	5795	5795.0583	5794.8892	5795.7591	5794.7276

Note: The worst case is FL=5753.0786MHz, FH=5795.9859MHz

802.11ac(HT40)					
Frequency stability versus Temp.					
Power Supply: AC 120V					
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	5755.8985	5754.8957	5755.1734	5753.2793
	5795	5795.1616	5794.9305	5795.6711	5794.9074
-20	5755	5755.3189	5754.9436	5755.8192	5754.7279
	5795	5795.0240	5794.6932	5795.2998	5794.9686
-10	5755	5755.9101	5754.3300	5755.9280	5754.9006
	5795	5795.7018	5794.0406	5795.9850	5794.9237
0	5755	5755.2445	5754.2777	5755.7976	5754.0348
	5795	5795.0762	5794.2396	5795.6185	5794.1423
10	5755	5755.8189	5754.6714	5755.4659	5754.6424
	5795	5795.9275	5794.9108	5795.8201	5794.0844
20	5755	5755.6557	5754.0564	5755.8887	5754.9605
	5795	5795.0656	5794.8243	5795.7329	5794.0080
30	5755	5755.7589	5754.5556	5755.7952	5754.5274
	5795	5795.1433	5794.7971	5795.2680	5794.1155
40	5755	5755.0134	5754.4961	5755.9168	5754.1506
	5795	5795.3841	5794.0700	5795.6144	5794.2495
50	5755	5755.4836	5754.2772	5755.5911	5754.4876
	5795	5795.7276	5794.4691	5795.4803	5794.0196

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (Vdc)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5755	5756.3928	5754.2199	5755.7356	5754.8399
	5795	5796.1199	5794.7697	5795.2078	5794.7018
120	5755	5756.8909	5754.6876	5755.8874	5754.8255
	5795	5795.0566	5794.5770	5795.9351	5794.7875
132	5755	5755.8785	5754.7215	5755.6346	5754.6649
	5795	5795.9686	5794.9470	5795.6529	5794.6147

Note: The worst case is FL=5753.1042MHz, FH=5796.7317MHz

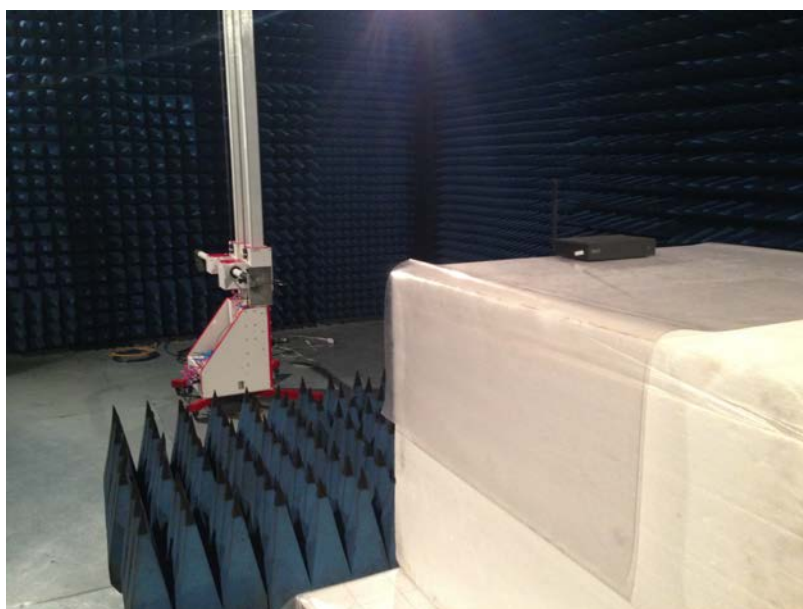
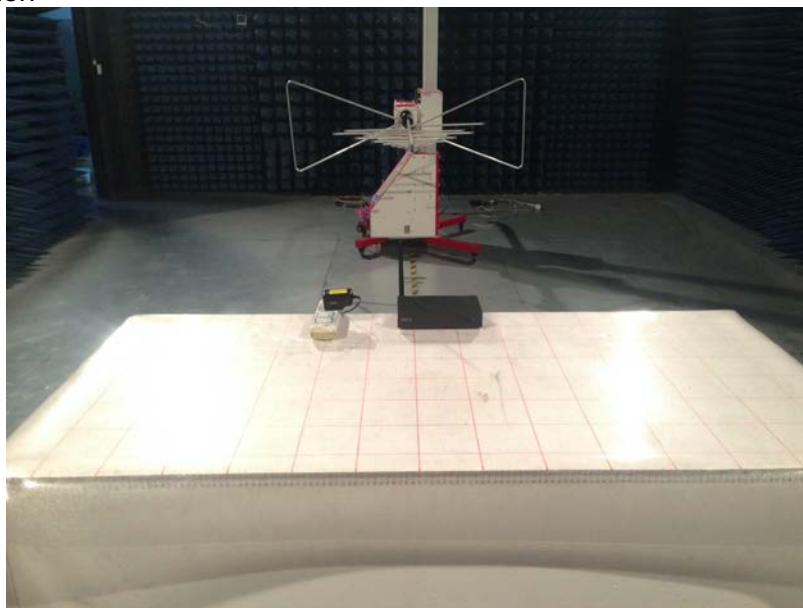
802.11ac(HT80)					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5775	5775.8083	5776.8127	5774.9922	5773.0493
-20	5775	5775.9384	5775.8759	5774.4951	5773.1228
-10	5775	5775.1677	5775.3734	5774.1955	5773.7287
0	5775	5775.3190	5775.9597	5774.0312	5773.5842
10	5775	5775.0804	5775.5046	5774.0177	5774.4700
20	5775	5775.9831	5775.3866	5774.1580	5774.2170
30	5775	5775.6324	5775.1966	5774.5766	5774.3838
40	5775	5775.0640	5775.9803	5774.2882	5774.2564
50	5775	5775.1976	5775.8063	5774.9905	5774.7945

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5775	5774.6090	5776.7158	5776.0871	5776.1252
120	5775	5774.0272	5776.1995	5775.5144	5776.4226
132	5775	5773.2907	5776.5438	5775.3575	5775.5550

Note: The worst case is FL=5773.1083MHz, FH=5776.8215MHz

## 8 Test Setup Photo

Radiated Emission



## Conducted Emission



## 9 EUT Constructional Details

Reference to the test report No. GTS201808000235F01

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