

TEST REPORT

Applicant: Shanghai Goodview Electronics Technology Co., Ltd.

Address of Applicant: Room 866, NO.888, West Huanhu 2 Road, NanhuiXincheng Town, Pudong, 201306

Manufacturer/Factory: Shanghai Goodview Electronics Technology Co., Ltd.

Address of Manufacturer/Factory: Room 866, NO.888, West Huanhu 2 Road, NanhuiXincheng Town, Pudong, 201306

Equipment Under Test (EUT)

Product Name: Interactive white board/LCD Digital Display

Model No.: GM*****(*can use 0-9, A-Z, or blank, just different in customer code, software and sales area)

Trade Mark: GOODVIEW

FCC ID: 2AVB8GMS

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

Date of sample receipt: March 24, 2020

Date of Test: March 26, 2020- April 08, 2020

Date of report issued: April 09, 2020

Test Result : PASS *

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

Authorized Signature:

A circular blue stamp with the text "GLOBAL UNITED TECHNOLOGY SERVICES" around the perimeter and "GTS" in the center. Overlaid on the stamp is a handwritten signature in black ink that appears to read "Robinson Lo".

Robinson Lo

Laboratory Manager

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

2 Version

Version No.	Date	Description
00	April 09, 2020	Original

Prepared By:



Date:

April 2, 2020

Project Engineer

Check By:



Date:

April 2, 2020

Reviewer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
4.1 MEASUREMENT UNCERTAINTY	4
5 GENERAL INFORMATION	5
5.1 GENERAL DESCRIPTION OF EUT	5
5.2 TEST MODE	7
5.3 DESCRIPTION OF SUPPORT UNITS	7
5.4 DEVIATION FROM STANDARDS	7
5.5 ABNORMALITIES FROM STANDARD CONDITIONS	7
5.6 TEST FACILITY	7
5.7 TEST LOCATION	7
5.8 ADDITIONAL INSTRUCTIONS	8
6 TEST INSTRUMENTS LIST	9
7 TEST RESULTS AND MEASUREMENT DATA	11
7.1 ANTENNA REQUIREMENT	11
7.2 CONDUCTED EMISSIONS	12
7.3 CONDUCTED PEAK OUTPUT POWER	15
7.4 CHANNEL BANDWIDTH	17
7.5 POWER SPECTRAL DENSITY	26
7.6 BAND EDGE	36
7.6.1 Radiated Emission Method	36
7.7 SPURIOUS EMISSION	43
7.7.1 Radiated Emission Method	43
7.8 FREQUENCY STABILITY	52
8 TEST SETUP PHOTO	55
9 EUT CONSTRUCTIONAL DETAILS	55

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	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(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:	Interactive white board/LCD Digital Display
Model No.:	GM65S4
Serial No.:	N/A
Hardware Version:	KJD66A-REV.B
Software Version:	GV-MSD648-Android-2GX16G-DOUBLEWIFI-UHD-S4.5.5
Test sample(s) ID:	GTS202004000060-1
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
Channel numbers:	802.11a/802.11n(HT20)/ 802.11ac(HT20): 5 802.11n(HT40)/ 802.11ac(HT40): 2
Channel bandwidth:	802.11a/802.11n(HT20)/ 802.11ac(HT20): 20MHz 802.11n(HT40)/ 802.11ac(HT40) : 40MHz
Modulation technology:	Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Integral Antenna
Antenna gain:	All Antenna :5.0dBi(Declare by applicant)
Power supply:	AC 120-240V 50/60Hz

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(HT20)/ac(HT20)	802.11 n(HT40)/ac(HT40)	/
Lowest channel	5745	5755	/
Middle channel	5785		
Highest channel	5825		

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) /ac(HT20)	6.5Mbps
802.11n(HT40)/ ac(HT40)	13Mbps

5.3 Description of Support Units

None.

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 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.

- **IC —Registration No.: 9079A**

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

- **NVLAP (LAB CODE:600179-0)**

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

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,
Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

5.8 Additional Instructions

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

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

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.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 26 2019	June. 25 2020
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 26 2019	June. 25 2020
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. 26 2019	June. 25 2020
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 26 2019	June. 25 2020
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 26 2019	June. 25 2020

RF Conducted Test:						
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. 26 2019	June. 25 2020
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 26 2019	June. 25 2020
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 26 2019	June. 25 2020
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 26 2019	June. 25 2020
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 26 2019	June. 25 2020
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 26 2019	June. 25 2020
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 26 2019	June. 25 2020

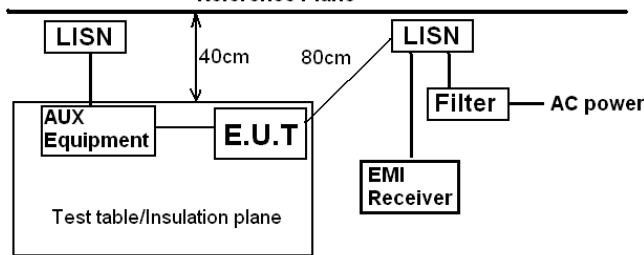
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<i>15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	
<i>The antennas are integral antenna, the best case gain of the antennas are 5.0dBi, reference to the appendix II for details</i>	

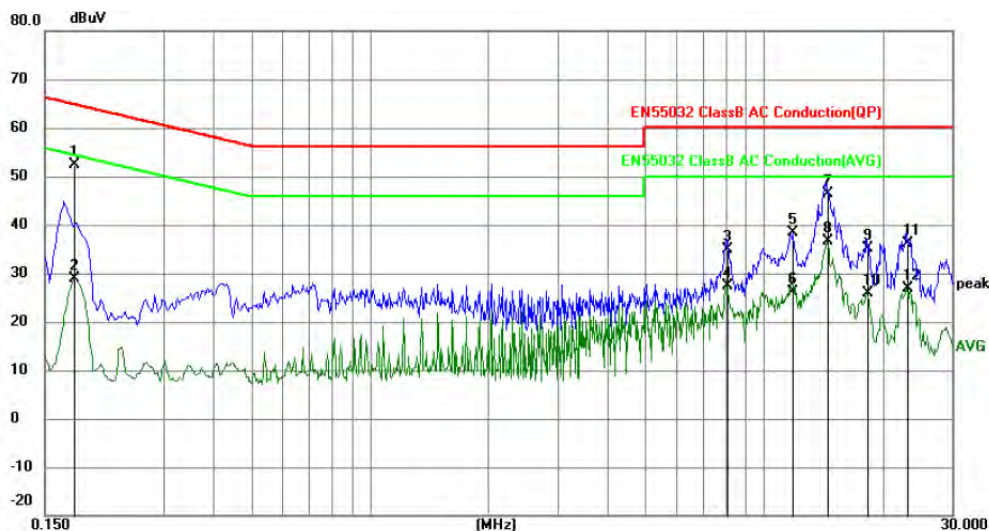
7.2 Conducted Emissions

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:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> * Decreases with the logarithm of the frequency.						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
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																		
Test setup:	Reference Plane  Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m																			
Test procedure:	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. 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). 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.																			
Test Instruments:	Refer to section 6.0 for details																			
Test mode:	Refer to section 5.2 for details																			
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar														
Test voltage:	AC 120V, 60Hz																			
Test results:	Pass																			

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

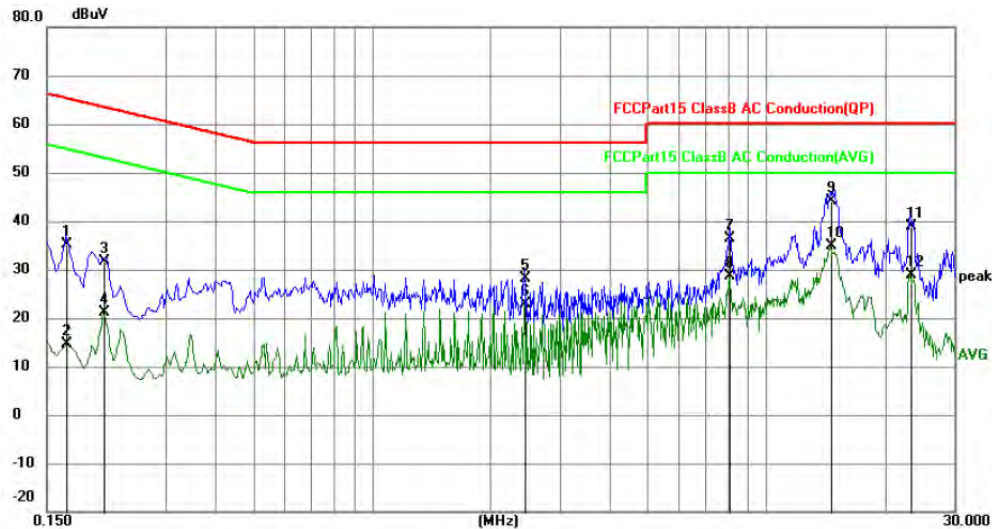
Measurement data

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1770	42.56	9.74	52.30	64.63	-12.33	QP
2	0.1770	19.04	9.74	28.78	54.63	-25.85	AVG
3	8.0385	24.80	10.20	35.00	60.00	-25.00	QP
4	8.0385	17.28	10.20	27.48	50.00	-22.52	AVG
5	11.7690	28.15	10.26	38.41	60.00	-21.59	QP
6	11.7690	15.84	10.26	26.10	50.00	-23.90	AVG
7	14.4465	36.20	10.20	46.40	60.00	-13.60	QP
8	14.4465	26.55	10.20	36.75	50.00	-13.25	AVG
9	18.2354	24.98	10.12	35.10	60.00	-24.90	QP
10	18.2354	15.80	10.12	25.92	50.00	-24.08	AVG
11	23.0415	26.02	10.18	36.20	60.00	-23.80	QP
12	23.0415	16.79	10.18	26.97	50.00	-23.03	AVG

Neutral:

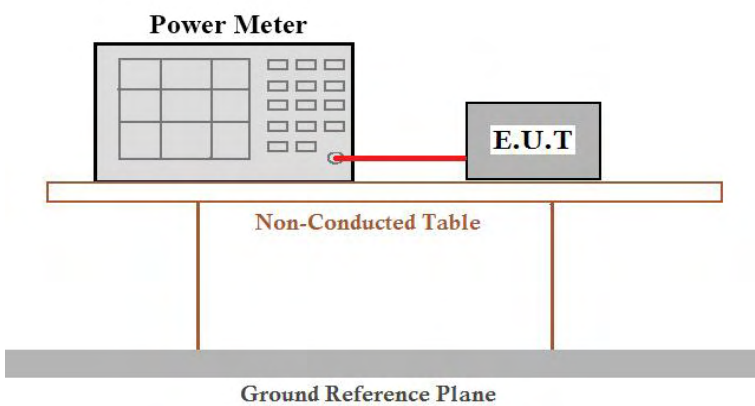


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1680	25.36	9.74	35.10	65.06	-29.96	QP
2	0.1680	4.83	9.74	14.57	55.06	-40.49	AVG
3	0.2085	21.87	9.73	31.60	63.26	-31.66	QP
4	0.2085	11.39	9.73	21.12	53.26	-32.14	AVG
5	2.4405	18.22	9.98	28.20	56.00	-27.80	QP
6	2.4405	12.82	9.98	22.80	46.00	-23.20	AVG
7	8.1015	26.30	10.20	36.50	60.00	-23.50	QP
8	8.1015	18.45	10.20	28.65	50.00	-21.35	AVG
9	14.5500	33.90	10.20	44.10	60.00	-15.90	QP
10	14.5500	24.72	10.20	34.92	50.00	-15.08	AVG
11	23.1405	28.81	10.19	39.00	60.00	-21.00	QP
12	23.1405	18.81	10.19	29.00	50.00	-21.00	AVG

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:	 The diagram illustrates the test setup. A Power Meter is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Power Meter and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Module1

ANT1:

Test CH	Peak Output Power (dBm)						Limit (dBm)	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	9.96	9.64	8.92	9.75	8.69	---	30.00	Pass
Middle	10.27	9.77	---	9.72	---	---		
Highest	11.34	9.91	8.55	9.91	9.37	---		

Module2

ANT1:

Test CH	Peak Output Power (dBm)						Limit (dBm)	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	12.31	12.59	10.35	4.64	4.60	---	30.00	Pass
Middle	12.06	11.95	---	4.12	---	---		
Highest	11.90	11.76	10.84	4.75	4.09	---		

ANT2:

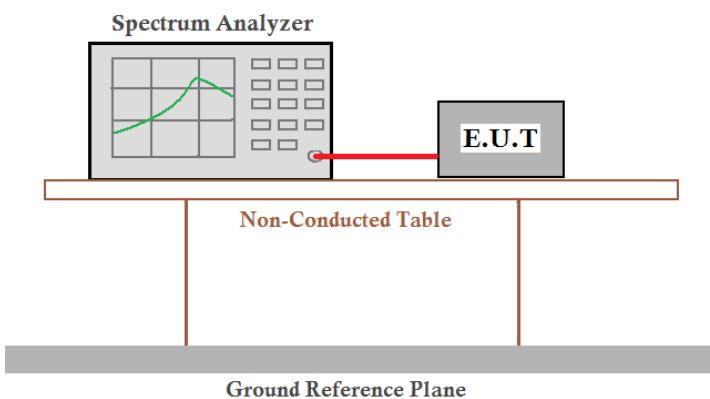
Test CH	Peak Output Power (dBm)						Limit (dBm)	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11ac (HT20)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	10.37	12.37	11.00	4.36	4.38	---	30.00	Pass
Middle	10.58	10.19	---	4.25	---	---		
Highest	11.80	10.76	12.03	4.64	4.98	---		

Remark: “---”is not applicable

ANT1+ANT2:

Test mode	Frequency (MHz)	ANT 1 power (dBm)	ANT 2 power (dBm)	ANT1+ANT2 power (dBm)	Limit (dBm)	Result
802.11a	5745	12.31	10.37	14.46	28.00	Pass
	5785	12.06	10.58	14.39		
	5825	11.90	11.80	14.86		
802.11n(HT20)	5745	12.59	12.37	15.49		Pass
	5785	11.95	10.19	14.17		
	5825	11.76	10.76	14.30		
802.11n(HT40)	5755	10.35	11.00	13.70		Pass
	5795	10.84	12.03	14.49		
802.11ac(HT20)	5745	4.64	4.36	7.51		Pass
	5785	4.12	4.25	7.19		
	5825	4.75	4.64	7.71		
802.11ac(HT40)	5755	4.60	4.38	7.50		Pass
	5795	4.09	4.98	7.56		
Note: GANT =5dBi, Array Gain=10log(NANT/NSS)=3.0dBi, Directional Gain=GANT + Array Gain=8.0dBi, limit=30-(8-6)=28dBm						

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

Measurement Data

Module1

Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11a	802.11n(HT20)	802.11n(HT40)		
Lowest	16.35	15.53	35.30	>500	Pass
Middle	16.31	15.95	---		
Highest	15.72	16.34	35.17		

Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11ac(HT20)	802.11ac(HT40)	802.11ac(HT80)		
Lowest	15.62	35.26	---	>500	Pass
Middle	16.39	---	---		
Highest	15.92	35.25	---		

Remark: “---“is not applicable

Module 2

ANT 1:

Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11a	802.11n(HT20)	802.11n(HT40)		
Lowest	15.89	15.98	35.68	>500	Pass
Middle	16.17	16.09	---		
Highest	15.52	15.70	35.29		

Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11ac(HT20)	802.11ac(HT40)	802.11ac(HT80)		
Lowest	15.71	35.20	---	>500	Pass
Middle	15.97	---	---		
Highest	15.83	35.26	---		

ANT 2

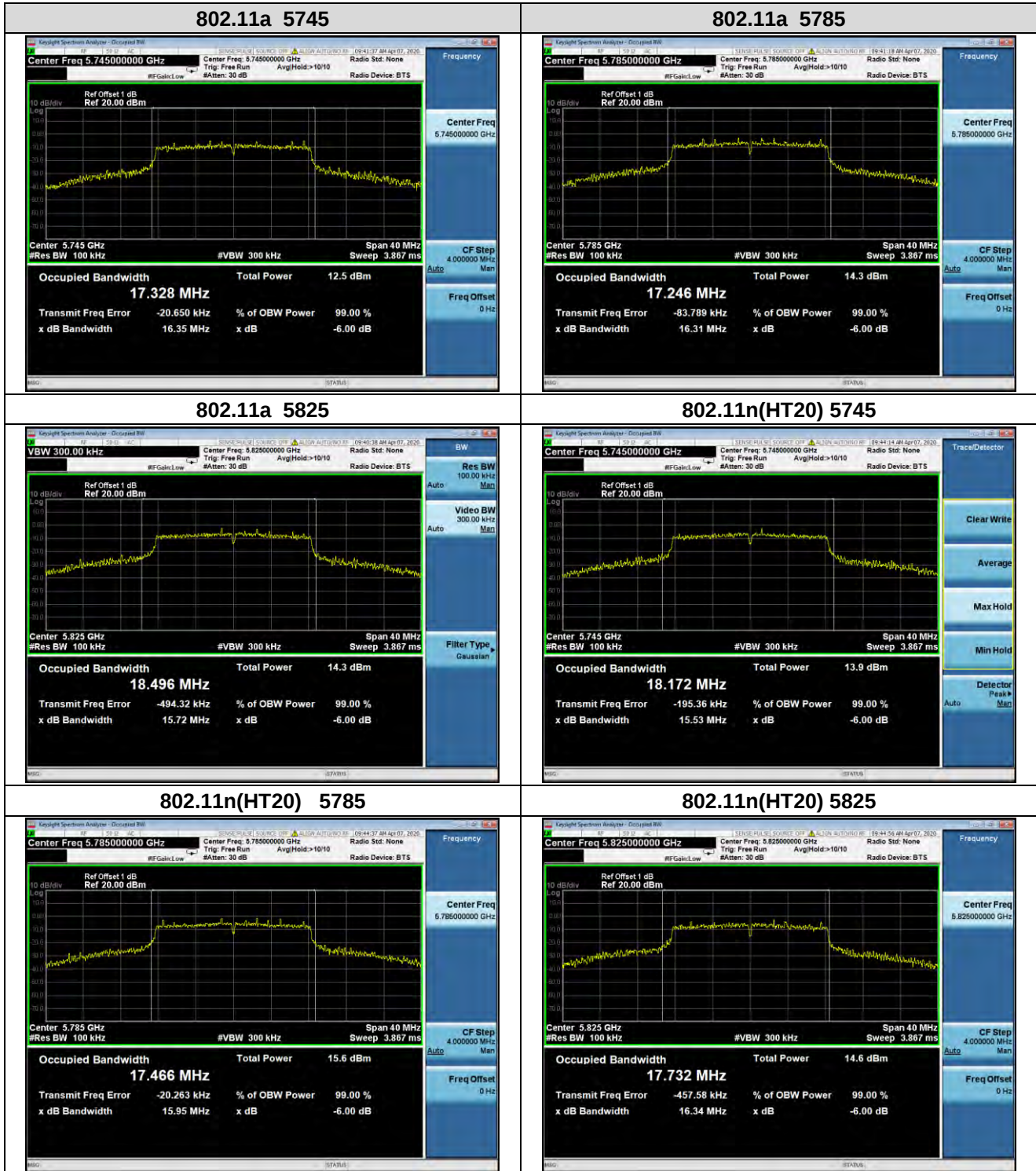
Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11a	802.11n(HT20)	802.11n(HT40)		
Lowest	15.82	16.77	35.12	>500	Pass
Middle	15.74	17.07	---		
Highest	15.25	16.87	35.36		

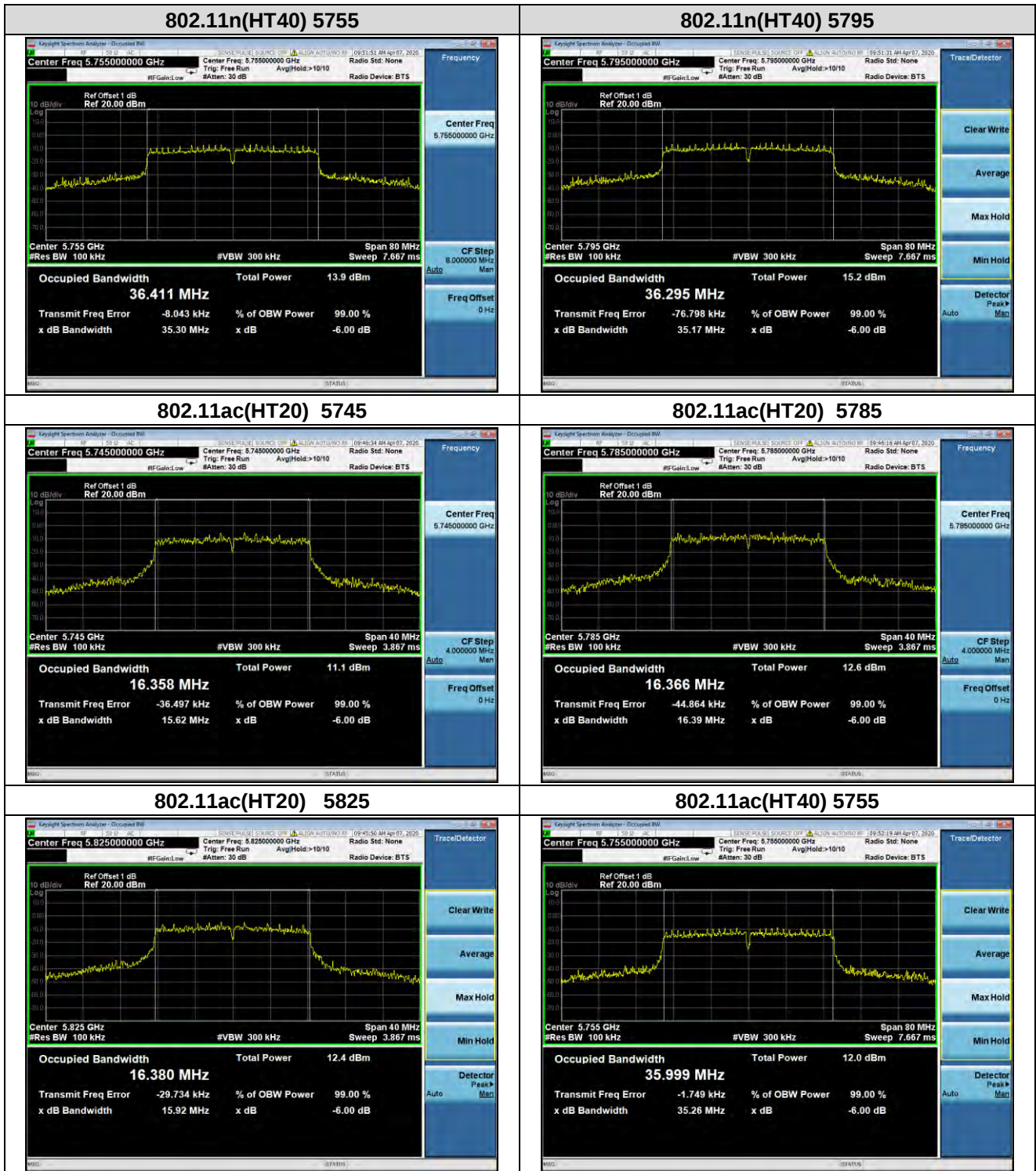
Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11ac(HT20)	802.11ac(HT40)	802.11ac(HT80)		
Lowest	15.74	35.72	---	>500	Pass
Middle	15.92	---	---		
Highest	16.65	35.25	---		

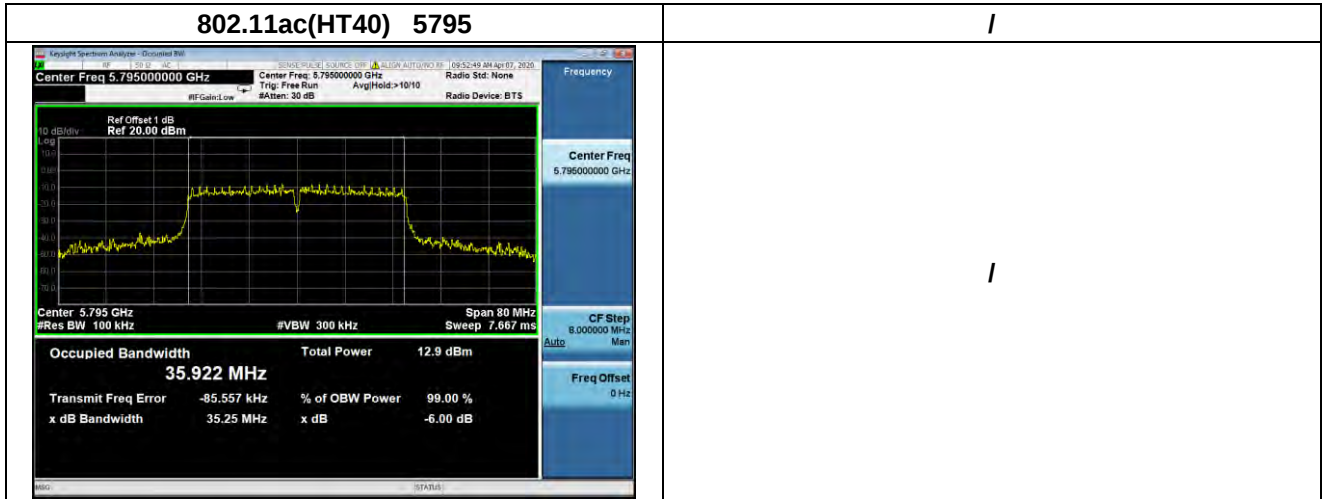
Remark: "---" is not applicable

Test plot as follows:

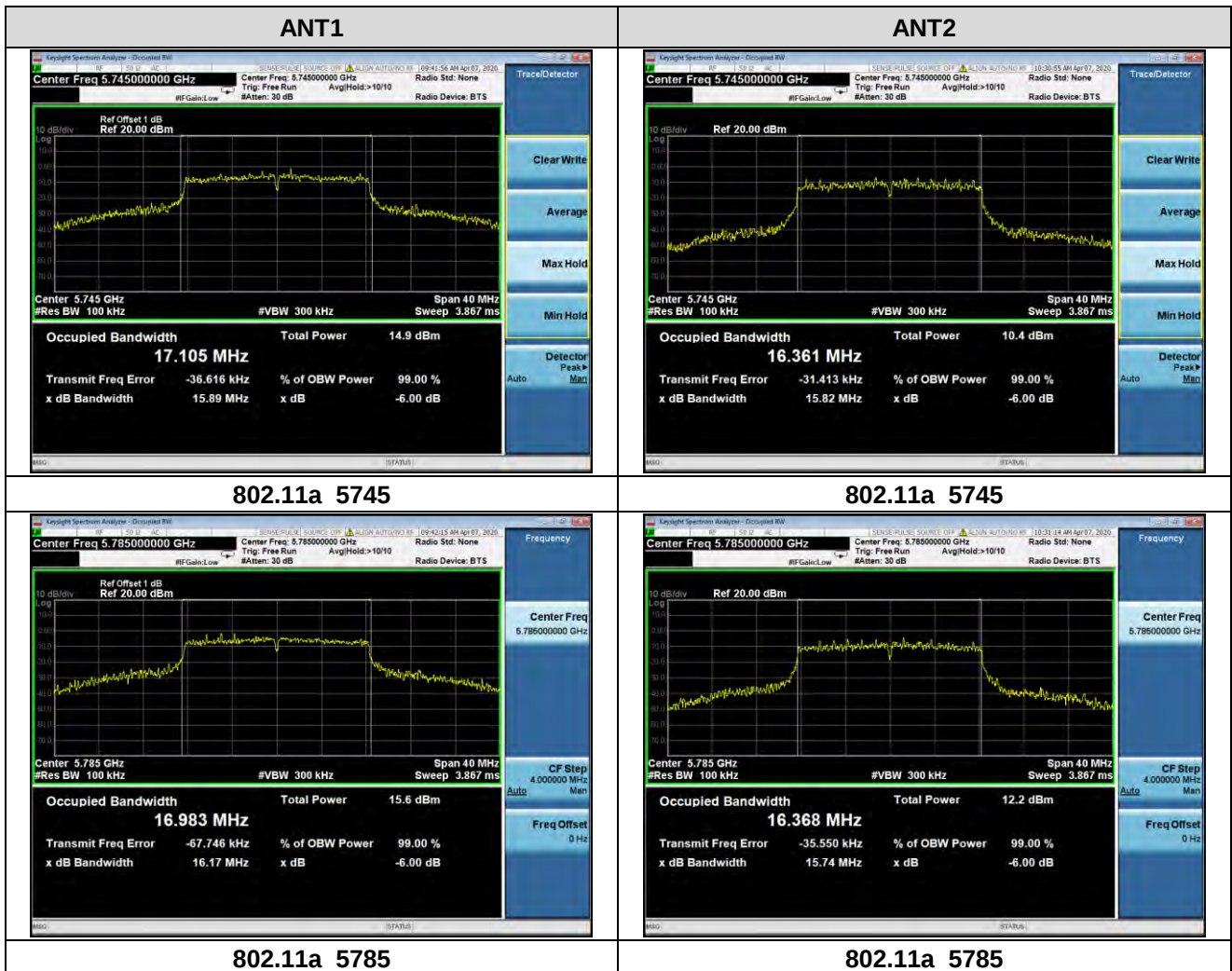
Module 1





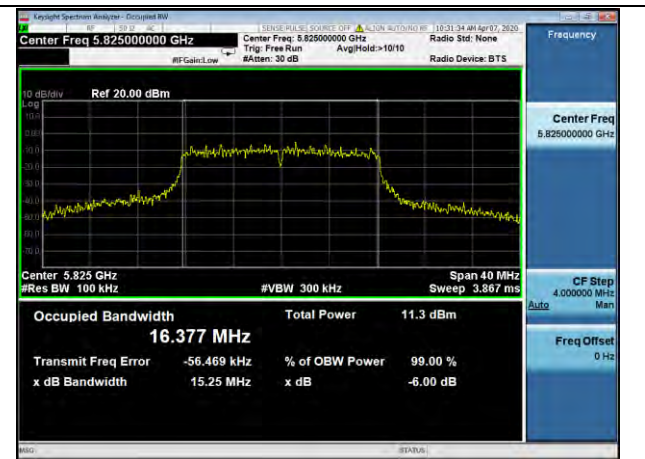


Module 2





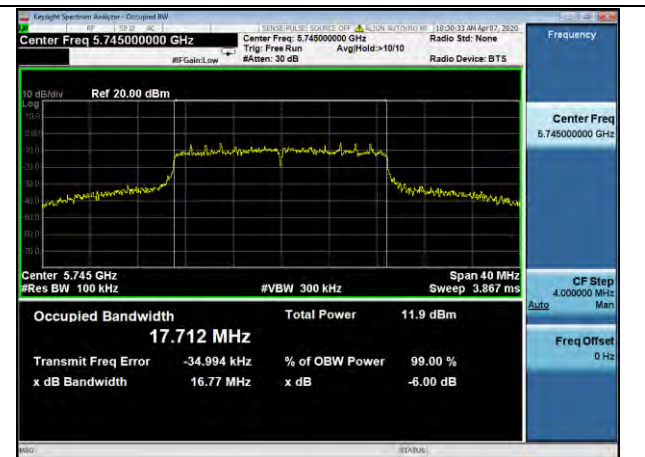
802.11a 5825



802.11a 5825



802.11n(HT20) 5745



802.11n(HT20) 5745



802.11n(HT20) 5785



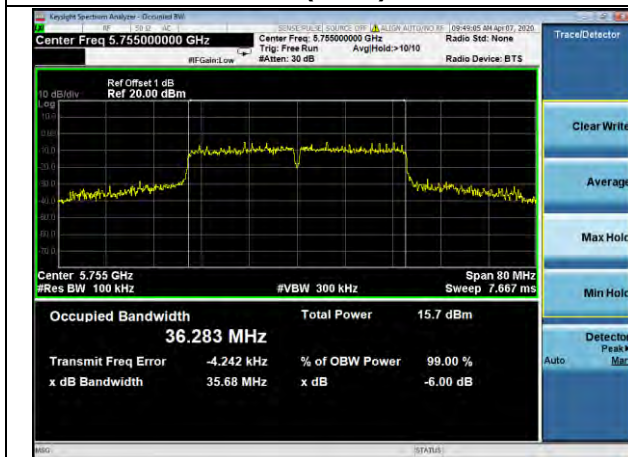
802.11n(HT20) 5785



802.11n(HT20) 5825



802.11n(HT20) 5825



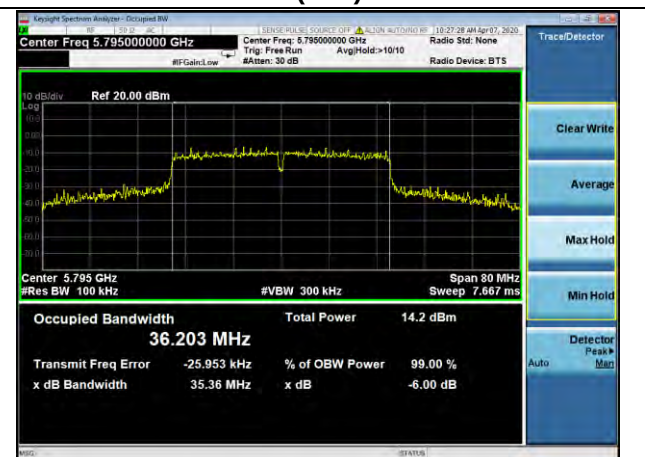
802.11n(H40) 5755



802.11n(H40) 5755



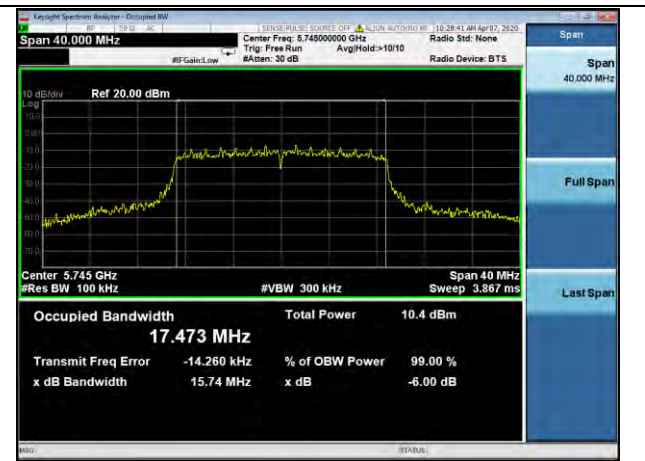
802.11n(H40) 5795



802.11n(H40) 5795



802.11ac(HT20) 5745



802.11ac(HT20) 5745



802.11ac(HT20) 5785



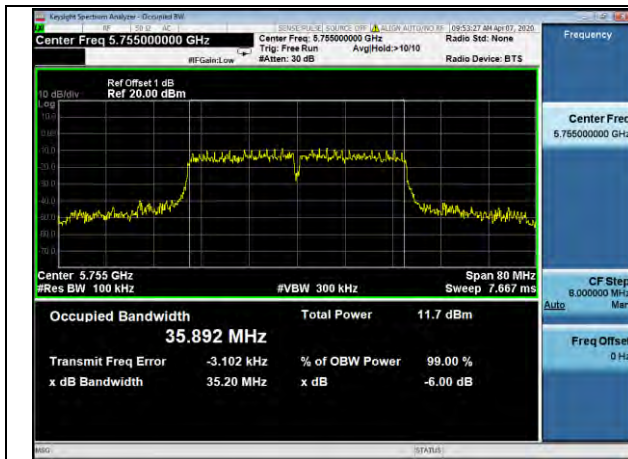
802.11ac(HT20) 5785



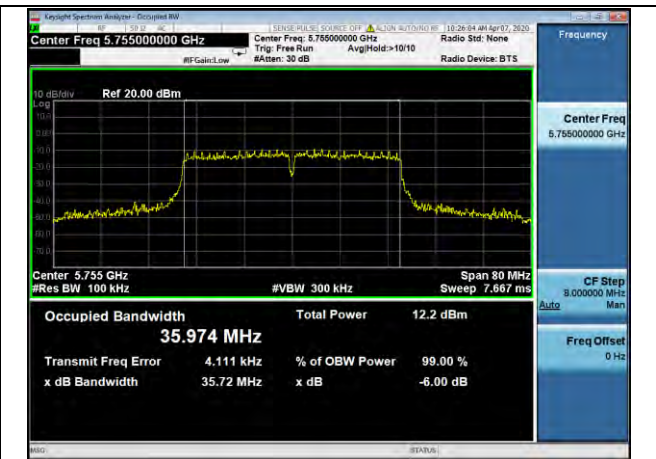
802.11ac(HT20) 5825



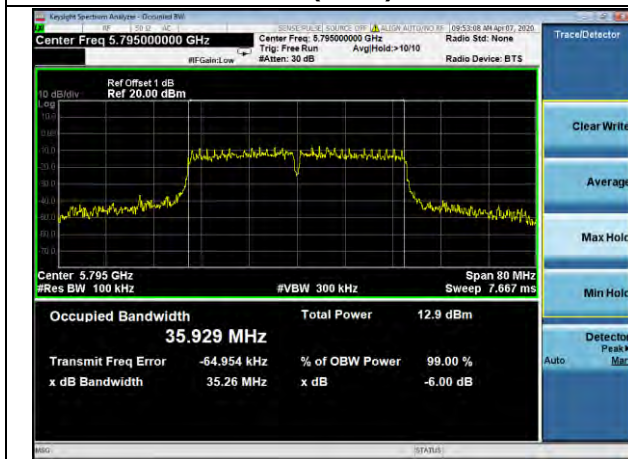
802.11ac(HT20) 5825



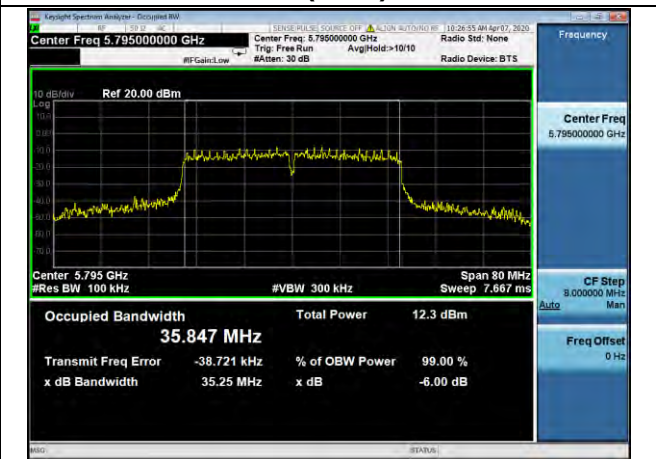
802.11ac(HT40) 5755



802.11ac(HT40) 5755

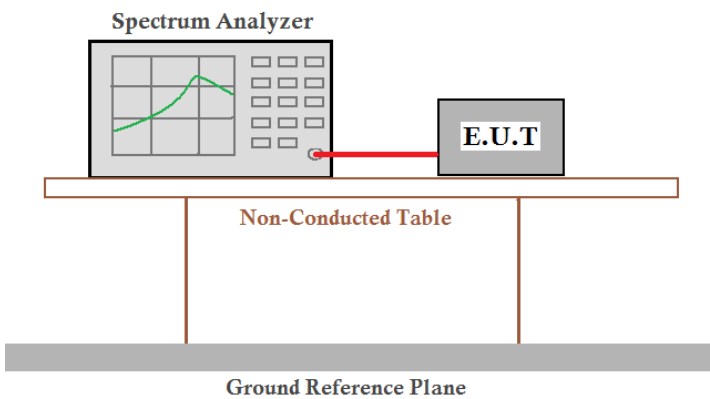


802.11ac(HT40) 5795



802.11ac(HT40) 5795

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/500kHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Note: If the measurement is X dBm/510kHz, thus $X \text{ dBm/510kHz} = (10^{X/10}) * (500 / 510) \text{ dBm/500kHz}$

Module1

Test CH	Power Spectral Density (dBm/510kHz)			Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11a	802.11n (HT20)	802.11n (HT40)		
Lowest	2.344	2.965	0.289	2.258	2.879	0.203	30.00	Pass
Middle	3.001	3.544	---	2.915	3.458	---		
Highest	3.305	3.350	0.877	3.219	3.264	0.791		

Test CH	Power Spectral Density (dBm/510kHz)			Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11ac (HT20)	802.11ac (HT40)	802.11n (HT80)	802.11ac (HT20)	802.11ac (HT40)	802.11n (HT80)		
Lowest	1.615	-0.037	---	1.529	-0.123	---	30.00	Pass
Middle	2.384	---	---	2.298	---	---		
Highest	2.490	-0.060	---	2.404	-0.146	---		

Module2

ANT1:

Test CH	Power Spectral Density (dBm/510kHz)			Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11a	802.11n (HT20)	802.11n (HT40)		
Lowest	2.778	1.609	-0.558	2.692	1.523	-0.644	30.00	Pass
Middle	2.201	1.794	---	2.115	1.708	---		
Highest	1.573	1.877	-1.415	1.487	1.791	-1.501		

Test CH	Power Spectral Density (dBm/510kHz)			Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11ac (HT20)	802.11ac (HT40)	802.11n (HT80)	802.11ac (HT20)	802.11ac (HT40)	802.11n (HT80)		
Lowest	1.298	-0.423	---	1.212	-0.509	---	30.00	Pass
Middle	1.758	---	---	1.672	---	---		
Highest	2.385	-0.943	---	2.299	-1.029	---		

ANT2:

Test CH	Power Spectral Density (dBm/510kHz)			Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11a	802.11n (HT20)	802.11n (HT40)	802.11a	802.11n (HT20)	802.11n (HT40)		
Lowest	-3.336	-2.496	-5.452	-3.420	-2.581	-5.544	30.00	Pass
Middle	-2.331	-2.398	---	-2.418	-2.484	---		
Highest	-2.477	-1.396	-5.152	-2.563	-1.482	-5.238		

Test CH	Power Spectral Density (dBm/510kHz)			Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11ac (HT20)	802.11ac (HT40)	802.11n (HT80)	802.11ac (HT20)	802.11ac (HT40)	802.11n (HT80)		
Lowest	-1.254	-1.722	---	-1.340	-1.808	---	30.00	Pass
Middle	-1.304	---	---	-1.390	---	---		
Highest	-0.029	-2.400	---	-0.114	-2.486	---		

Remark: “---”is not applicable

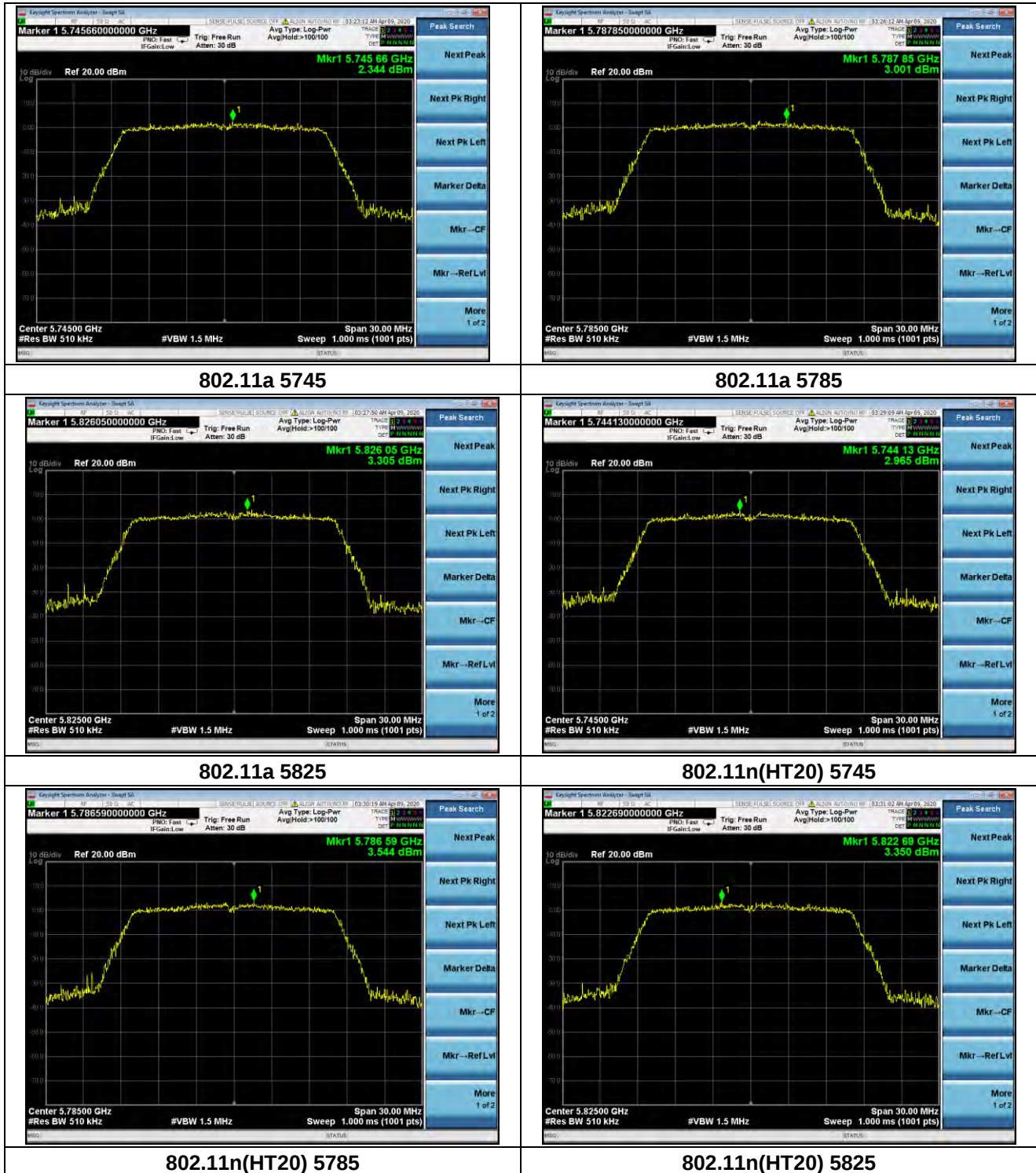
ANT1+ANT2

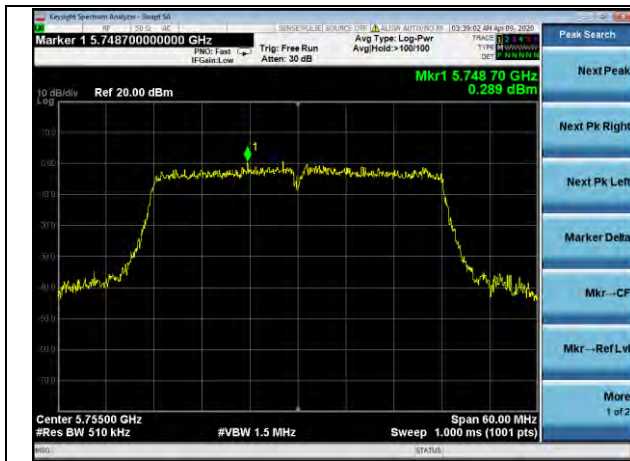
Test mode	Frequency (MHz)	ANT 1 PSD (dBm/500KHz)	ANT 2 PSD (dBm/500KHz)	ANT1+ANT2 (dBm/500KHz)	Limit (dBm/500kHz)	Result
802.11a	5745	2.692	-3.420	3.644	28.00	Pass
	5785	2.115	-2.418	3.424		
	5825	1.487	-2.563	2.927		
802.11n(HT20)	5745	1.523	-2.581	2.949		Pass
	5785	1.708	-2.484	3.109		
	5825	1.791	-1.482	3.465		
802.11n(HT40)	5755	-0.644	-5.544	0.573		Pass
	5795	-1.501	-5.238	0.303		
802.11ac(HT20)	5745	1.212	-1.340	3.132		Pass
	5785	1.672	-1.390	3.416		
	5825	2.299	-0.114	4.103		
802.11ac(HT40)	5755	-0.509	-1.808	1.898		Pass
	5795	-1.029	-2.486	1.313		

Note: GANT =5dBi, Array Gain=10log(NANT/NSS)=3.0dBi, Directional Gain=GANT + Array Gain=8.0dBi, limit=30-(8-6)=28dBm

Test plot as follows:

Module 1

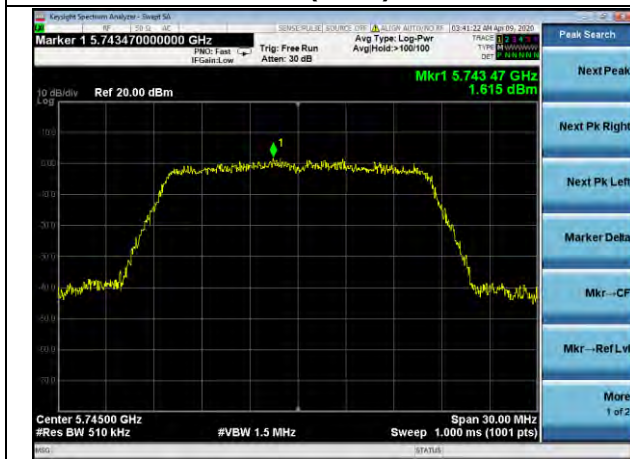




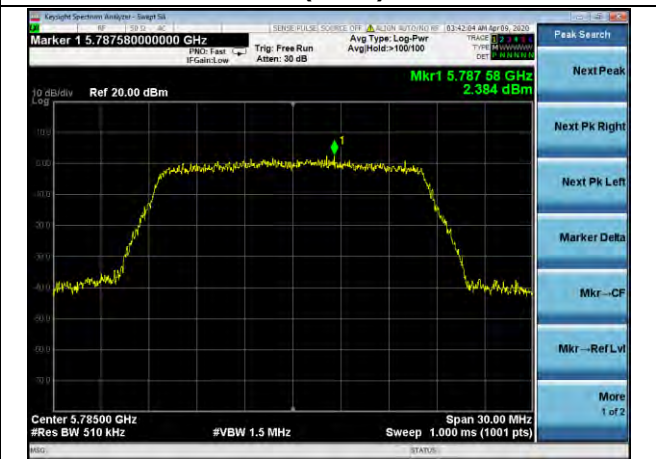
802.11n(HT40) 5755



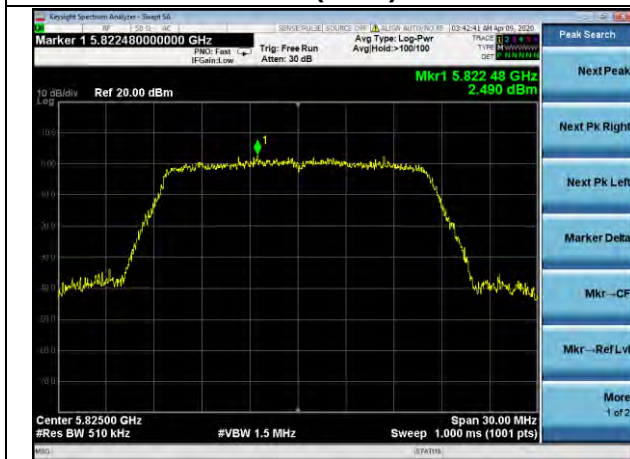
802.11n(HT40) 5795



802.11ac(HT20) 5745



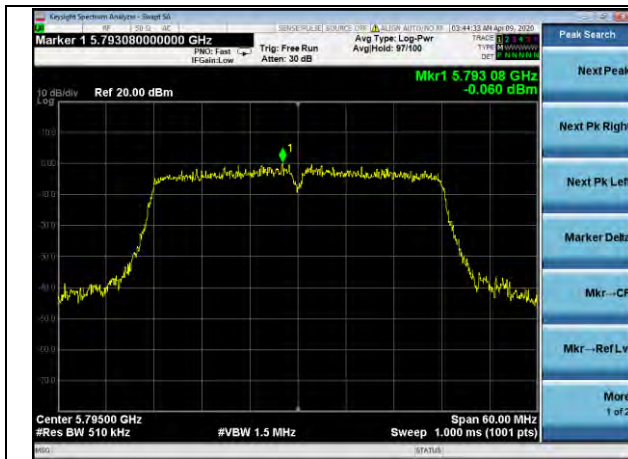
802.11ac(HT20) 5785



802.11ac(HT20) 5825



802.11ac(HT40) 5755



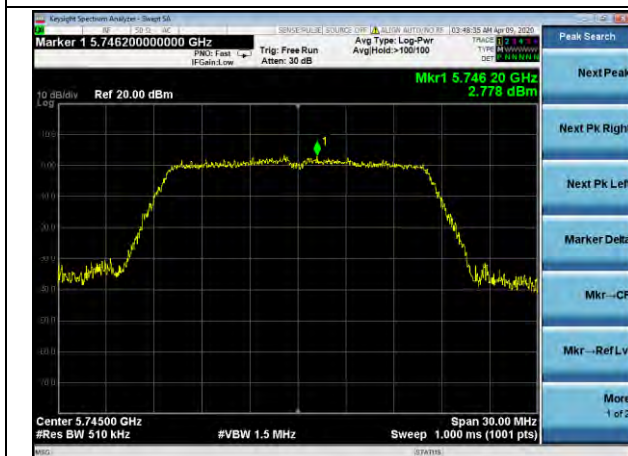
802.11ac(HT40) 5795



/

Module2

ANT1

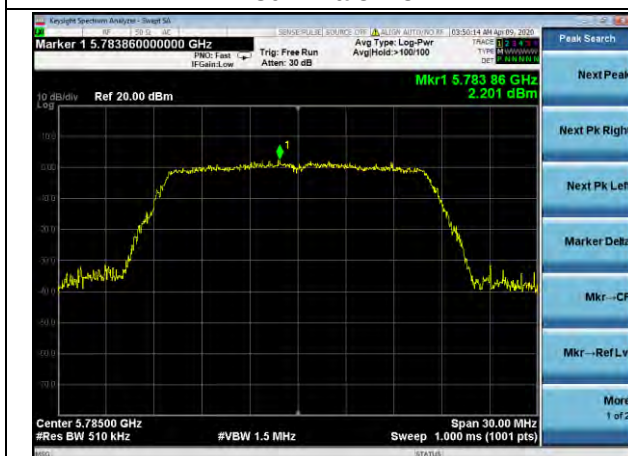


802.11a 5745

ANT2



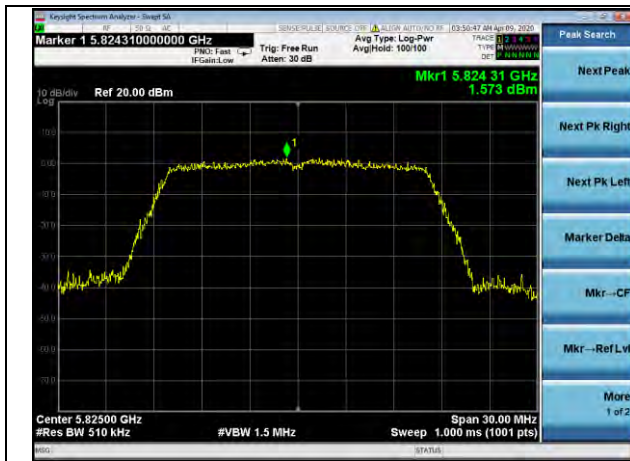
802.11a 5745



802.11a 5785



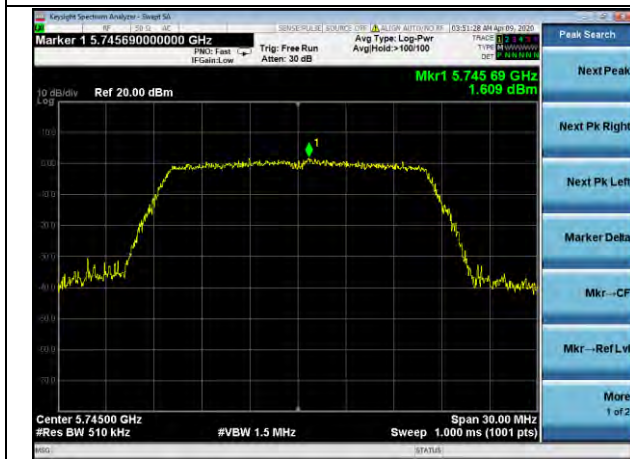
802.11a 5785



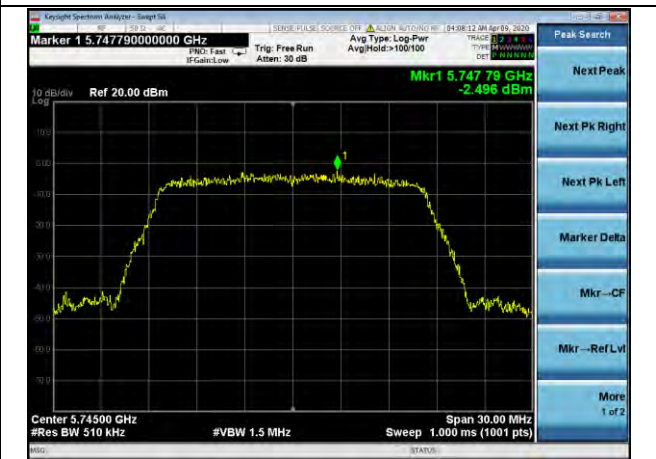
802.11a 5825



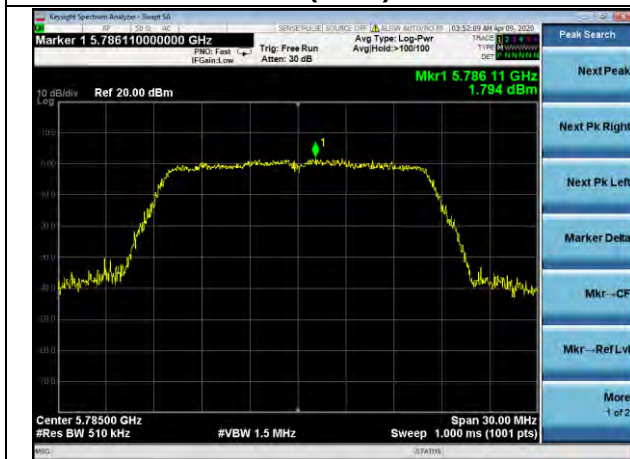
802.11a 5825



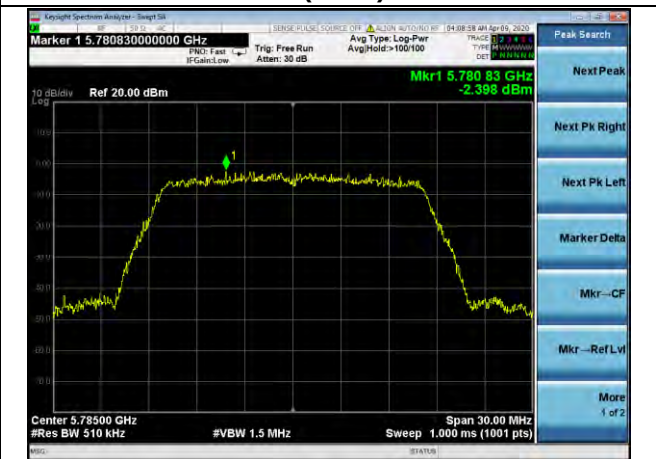
802.11n(HT20) 5745



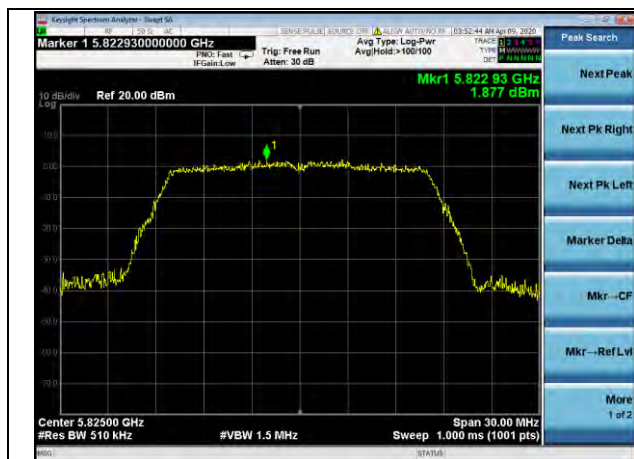
802.11n(HT20) 5745



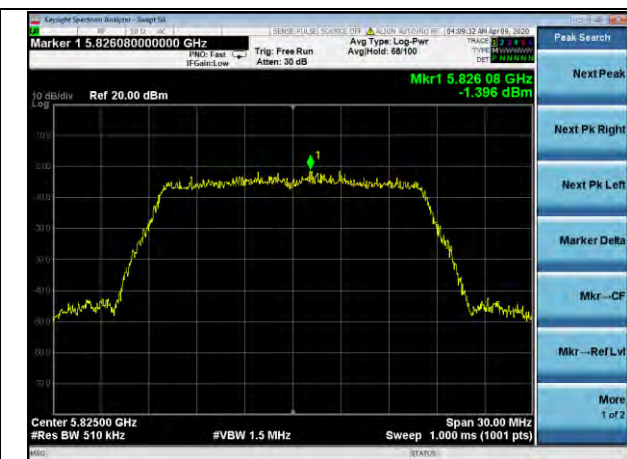
802.11n(HT20) 5785



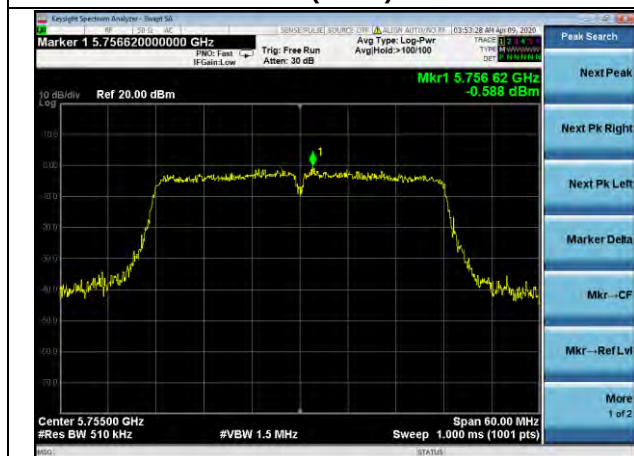
802.11n(HT20) 5785



802.11n(HT20) 5825



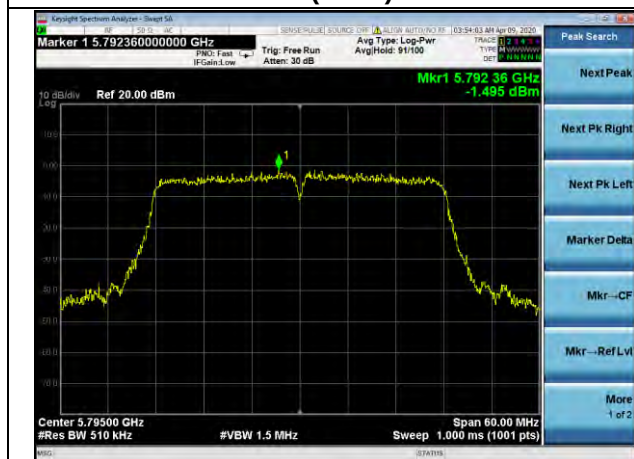
802.11n(HT20) 5825



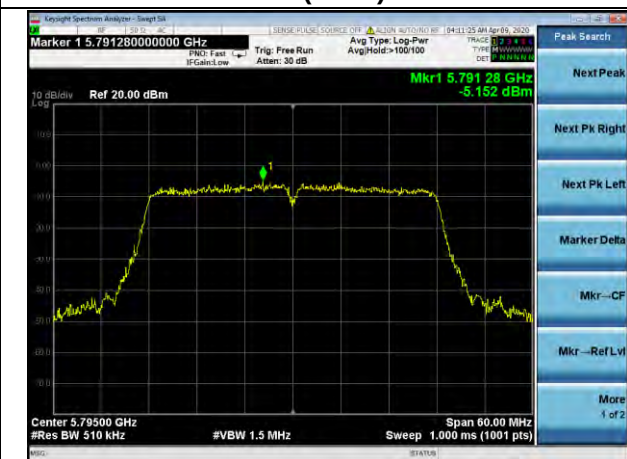
802.11n(HT40) 5755



802.11n(HT40) 5755



802.11n(HT40) 5795



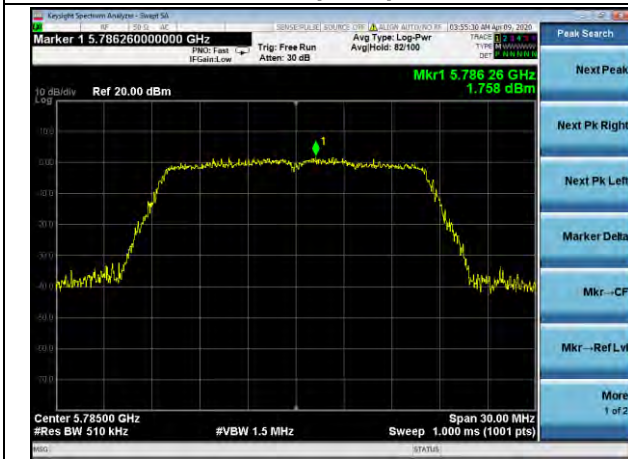
802.11n(HT40) 5795



802.11ac(HT20) 5745



802.11ac(HT20) 5745



802.11ac(HT20) 5785



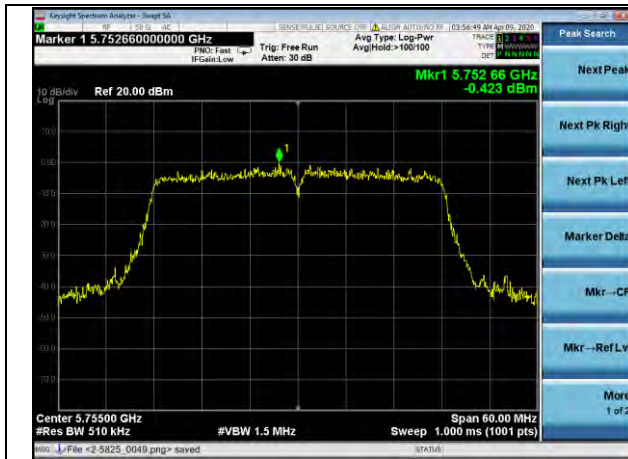
802.11ac(HT20) 5785



802.11ac(HT20) 5825



802.11ac(HT20) 5825



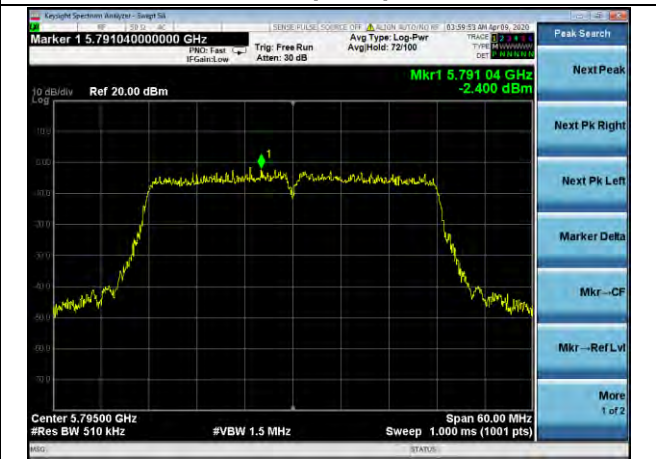
802.11ac(HT40) 5755



802.11ac(HT40) 5755



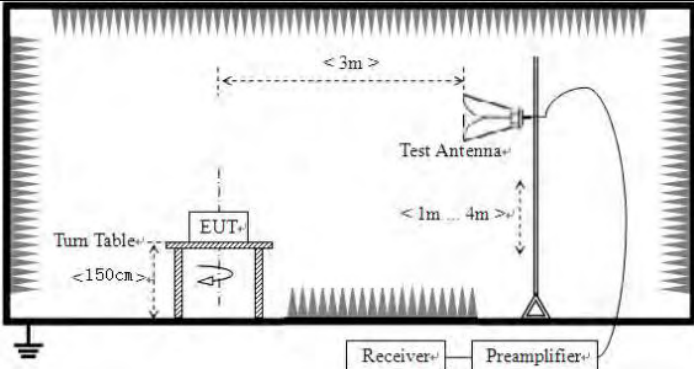
802.11ac(HT40) 5795



802.11ac(HT40) 5795

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:	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. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 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. All antennas was tested, only show the worst case ant 1 (module2)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:*
$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2;$$
$$E[\text{dBuV/m}] = -27 + 95.2 = 68.2\text{dBuV/m}.$$
$$E[\text{dBuV/m}] = 10 + 95.2 = 105.2\text{dBuV/m}.$$
$$E[\text{dBuV/m}] = 15.6 + 95.2 = 110.8\text{dBuV/m}.$$
$$E[\text{dBuV/m}] = 27 + 95.2 = 122.2\text{dBuV/m}$$

Measurement data:

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	27.34	32.36	9.72	23.83	45.59	68.20	-22.61	Horizontal
5700.00	26.21	32.50	9.79	23.84	44.66	105.20	-60.54	Horizontal
5720.00	28.66	32.53	9.81	23.85	47.15	110.80	-63.65	Horizontal
5725.00	29.31	32.53	9.83	23.86	47.81	122.20	-74.39	Horizontal
5850.00	27.67	32.70	9.99	23.87	46.49	122.20	-75.71	Horizontal
5855.00	26.38	32.72	9.99	23.88	45.21	110.80	-65.59	Horizontal
5875.00	29.94	32.74	10.04	23.89	48.83	105.20	-56.37	Horizontal
5925.00	34.44	32.80	10.11	23.90	53.45	68.20	-14.75	Horizontal
5650.00	30.52	32.36	9.72	23.83	48.77	68.20	-19.43	Vertical
5700.00	33.85	32.50	9.79	23.84	52.3	105.20	-52.90	Vertical
5720.00	30.65	32.53	9.81	23.85	49.14	110.80	-61.66	Vertical
5725.00	29.27	32.53	9.83	23.86	47.77	122.20	-74.43	Vertical
5850.00	34.34	32.70	9.99	23.87	53.16	122.20	-69.04	Vertical
5855.00	32.58	32.72	9.99	23.88	51.41	110.80	-59.39	Vertical
5875.00	29.49	32.74	10.04	23.89	48.38	105.20	-56.82	Vertical
5925.00	28.34	32.80	10.11	23.90	47.35	68.20	-20.85	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	30.21	32.36	9.72	23.83	48.46	68.20	-19.74	Horizontal
5700.00	29.39	32.50	9.79	23.84	47.84	105.20	-57.36	Horizontal
5720.00	32.94	32.53	9.81	23.85	51.43	110.80	-59.37	Horizontal
5725.00	33.56	32.53	9.83	23.86	52.06	122.20	-70.14	Horizontal
5850.00	32.33	32.70	9.99	23.87	51.15	122.20	-71.05	Horizontal
5855.00	31.74	32.72	9.99	23.88	50.57	110.80	-60.23	Horizontal
5875.00	34.21	32.74	10.04	23.89	53.1	105.20	-52.10	Horizontal
5925.00	33.49	32.80	10.11	23.90	52.5	68.20	-15.70	Horizontal
5650.00	31.02	32.36	9.72	23.83	49.27	68.20	-18.93	Vertical
5700.00	34.64	32.50	9.79	23.84	53.09	105.20	-52.11	Vertical
5720.00	30.29	32.53	9.81	23.85	48.78	110.80	-62.02	Vertical
5725.00	30.18	32.53	9.83	23.86	48.68	122.20	-73.52	Vertical
5850.00	33.54	32.70	9.99	23.87	52.36	122.20	-69.84	Vertical
5855.00	32.79	32.72	9.99	23.88	51.62	110.80	-59.18	Vertical
5875.00	34.43	32.74	10.04	23.89	53.32	105.20	-51.88	Vertical
5925.00	30.55	32.80	10.11	23.90	49.56	68.20	-18.64	Vertical

IEEE 802.11n 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	32.39	32.36	9.72	23.83	50.64	68.20	-17.56	Horizontal
5700.00	27.65	32.50	9.79	23.84	46.10	105.20	-59.10	Horizontal
5720.00	34.69	32.53	9.81	23.85	53.18	110.80	-57.62	Horizontal
5725.00	33.51	32.53	9.83	23.86	52.01	122.20	-70.19	Horizontal
5850.00	34.05	32.70	9.99	23.87	52.87	122.20	-69.33	Horizontal
5855.00	34.18	32.72	9.99	23.88	53.01	110.80	-57.79	Horizontal
5875.00	30.06	32.74	10.04	23.89	48.95	105.20	-56.25	Horizontal
5925.00	33.34	32.80	10.11	23.90	52.35	68.20	-15.85	Horizontal
5650.00	30.67	32.36	9.72	23.83	48.92	68.20	-19.28	Vertical
5700.00	29.19	32.50	9.79	23.84	47.64	105.20	-57.56	Vertical
5720.00	30.99	32.53	9.81	23.85	49.48	110.80	-61.32	Vertical
5725.00	31.34	32.53	9.83	23.86	49.84	122.20	-72.36	Vertical
5850.00	32.68	32.70	9.99	23.87	51.50	122.20	-70.70	Vertical
5855.00	30.42	32.72	9.99	23.88	49.25	110.80	-61.55	Vertical
5875.00	30.79	32.74	10.04	23.89	49.68	105.20	-55.52	Vertical
5925.00	31.81	32.80	10.11	23.90	50.82	68.20	-17.38	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	33.38	32.36	9.72	23.83	51.63	68.20	-16.57	Horizontal
5700.00	31.63	32.50	9.79	23.84	50.08	105.20	-55.12	Horizontal
5720.00	33.04	32.53	9.81	23.85	51.53	110.80	-59.27	Horizontal
5725.00	34.58	32.53	9.83	23.86	53.08	122.20	-69.12	Horizontal
5850.00	34.05	32.70	9.99	23.87	52.87	122.20	-69.33	Horizontal
5855.00	32.82	32.72	9.99	23.88	51.65	110.80	-59.15	Horizontal
5875.00	33.56	32.74	10.04	23.89	52.45	105.20	-52.75	Horizontal
5925.00	34.59	32.80	10.11	23.90	53.6	68.20	-14.6	Horizontal
5650.00	30.67	32.36	9.72	23.83	48.92	68.20	-19.28	Vertical
5700.00	34.18	32.50	9.79	23.84	52.63	105.20	-52.57	Vertical
5720.00	33.89	32.53	9.81	23.85	52.38	110.80	-58.42	Vertical
5725.00	28.93	32.53	9.83	23.86	47.43	122.20	-74.77	Vertical
5850.00	33.64	32.70	9.99	23.87	52.46	122.20	-69.74	Vertical
5855.00	30.69	32.72	9.99	23.88	49.52	110.80	-61.28	Vertical
5875.00	31.38	32.74	10.04	23.89	50.27	105.20	-54.93	Vertical
5925.00	33.81	32.80	10.11	23.90	52.82	68.20	-15.38	Vertical

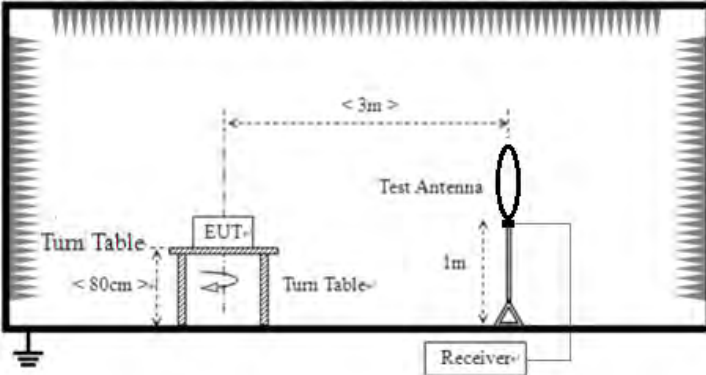
IEEE 802.11ac HT40								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	33.48	32.36	9.72	23.83	51.73	68.20	-16.47	Horizontal
5700.00	31.87	32.50	9.79	23.84	50.32	105.20	-54.88	Horizontal
5720.00	34.06	32.53	9.81	23.85	52.55	110.80	-58.25	Horizontal
5725.00	34.31	32.53	9.83	23.86	3449.5	122.20	3327.3	Horizontal
5850.00	35.69	32.70	9.99	23.87	54.51	122.20	-67.69	Horizontal
5855.00	36.38	32.72	9.99	23.88	55.21	110.80	-55.59	Horizontal
5875.00	34.71	32.74	10.04	23.89	53.6	105.20	-51.6	Horizontal
5925.00	30.58	32.80	10.11	23.90	49.59	68.20	-18.61	Horizontal
5650.00	29.77	32.36	9.72	23.83	48.02	68.20	-20.18	Vertical
5700.00	34.18	32.50	9.79	23.84	52.63	105.20	-52.57	Vertical
5720.00	33.08	32.53	9.81	23.85	51.57	110.80	-59.23	Vertical
5725.00	31.31	32.53	9.83	23.86	49.81	122.20	-72.39	Vertical
5850.00	31.62	32.70	9.99	23.87	50.44	122.20	-71.76	Vertical
5855.00	29.44	32.72	9.99	23.88	48.27	110.80	-62.53	Vertical
5875.00	30.66	32.74	10.04	23.89	49.55	105.20	-55.65	Vertical
5925.00	31.82	32.80	10.11	23.90	50.83	68.20	-17.37	Vertical

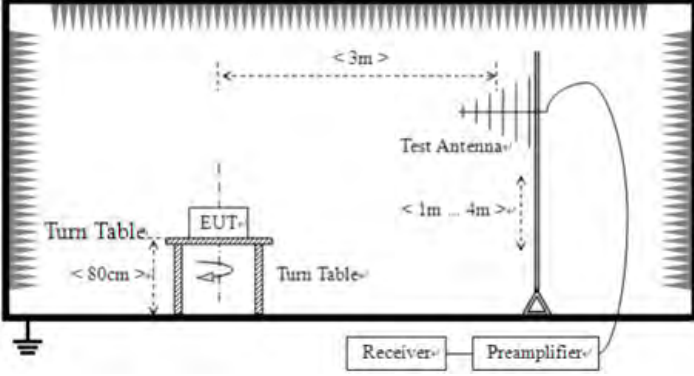
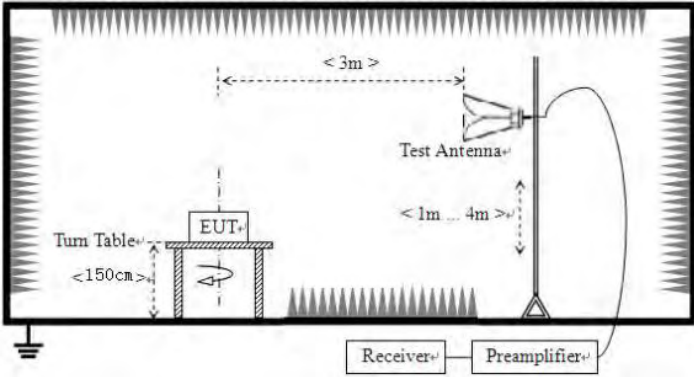
Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

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	120KHz	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				
					
	For radiated emissions from 30MHz to 1GHz				

	 For radiated emissions above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 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 environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. All antennas was tested, only show the worst case ant 1 (module2)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.

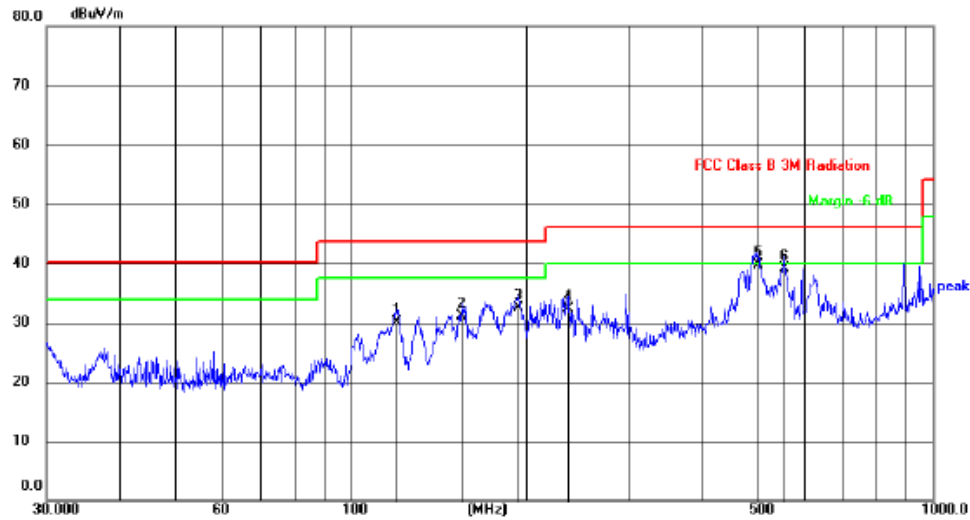
Measurement Data:

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.

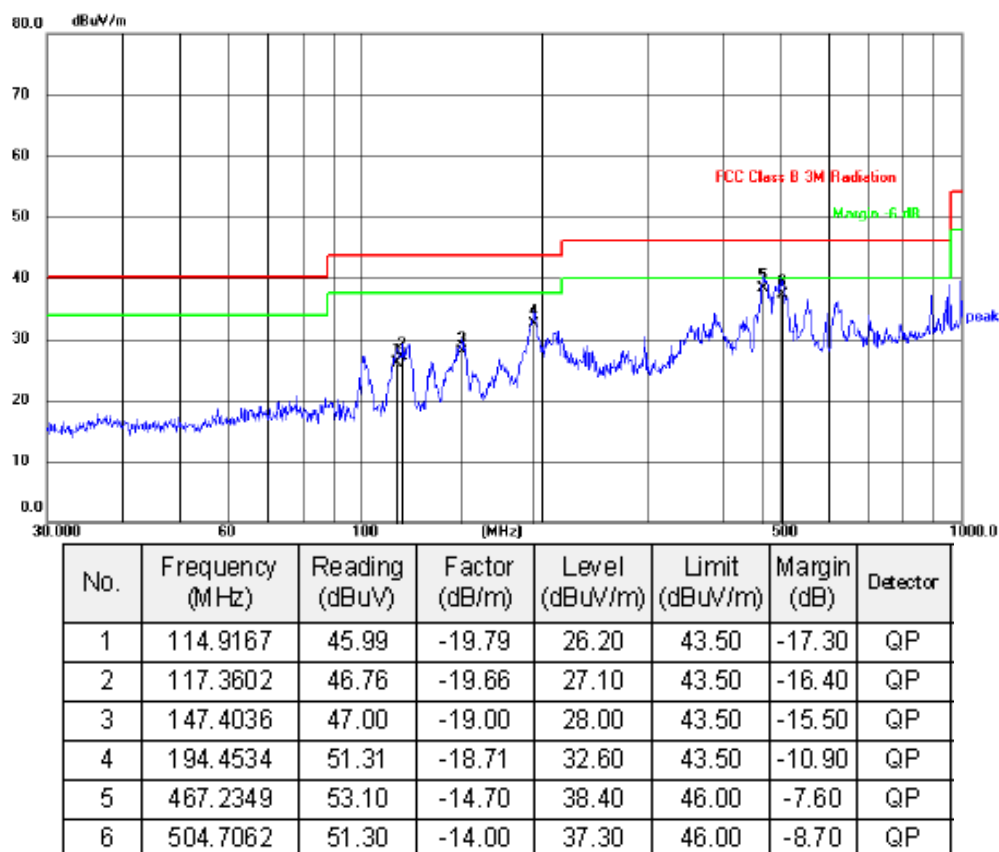
Below 1GHz

Horizontal:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	119.4361	49.42	-19.32	30.10	43.50	-13.40	QP
2	155.3642	50.42	-19.22	31.20	43.50	-12.30	QP
3	194.4534	51.75	-19.15	32.60	43.50	-10.90	QP
4	235.8163	51.15	-18.75	32.40	46.00	-13.60	QP
5	501.1790	53.78	-14.08	39.70	46.00	-6.30	QP
6	554.8252	51.89	-12.69	39.20	46.00	-6.80	QP

Vertical:



Above 1GHz:

All antennas was tested, only show the worst case ant 1 (module2) test data.

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	11490.00	23.24	21.64	44.88	54(Note3)	-9.12	PK
V	17235.00	21.12	21.80	42.92	54(Note3)	-11.08	PK
H	11490.00	21.47	21.83	43.3	54(Note3)	-10.7	PK
H	17235.00	18.92	21.67	40.59	54(Note3)	-13.41	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	11570.00	23.71	21.64	45.35	54(Note3)	-8.65	PK
V	17355.00	21.34	21.80	43.14	54(Note3)	-10.86	PK
H	11570.00	24.21	21.83	46.04	54(Note3)	-7.96	PK
H	17355.00	23.42	21.67	45.09	54(Note3)	-8.91	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	11650.00	22.42	21.64	44.06	54(Note3)	-9.94	PK
V	17475.00	20.35	21.80	42.15	54(Note3)	-11.85	PK
H	11650.00	19.83	21.83	41.66	54(Note3)	-12.34	PK
H	17475.00	18.33	21.67	40.00	54(Note3)	-14.00	PK

Test mode:		802.11n(HT20)		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	11490.00	22.65	21.64	44.29	54(Note3)	-9.71	PK
V	17235.00	20.16	21.80	41.96	54(Note3)	-12.04	PK
H	11490.00	19.91	21.83	41.74	54(Note3)	-12.26	PK
H	17235.00	18.71	21.67	40.38	54(Note3)	-13.62	PK

Test mode:		802.11n(HT20)		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	11570.00	23.32	21.64	44.96	54(Note3)	-9.04	PK
V	17355.00	22.47	21.80	44.27	54(Note3)	-9.73	PK
H	11570.00	21.82	21.83	43.65	54(Note3)	-10.35	PK
H	17355.00	20.09	21.67	41.76	54(Note3)	-12.24	PK

Test mode:		802.11n(HT20)		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	11650.00	24.62	21.64	46.26	54(Note3)	-7.74	PK
V	17475.00	20.54	21.80	42.34	54(Note3)	-11.66	PK
H	11650.00	19.32	21.83	41.15	54(Note3)	-12.85	PK
H	17475.00	18.19	21.67	39.86	54(Note3)	-14.14	PK

Test mode:		802.11n(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	11510.00	20.58	21.67	42.25	54(Note3)	-11.75	PK
V	17265.00	20.93	21.83	42.76	54(Note3)	-11.24	PK
H	11510.00	19.32	21.67	40.99	54(Note3)	-13.01	PK
H	17265.00	20.44	21.83	42.27	54(Note3)	-11.73	PK

Test mode:		802.11n(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	11590.00	23.29	21.67	44.96	54(Note3)	-9.04	PK
V	17385.00	24.21	21.83	46.04	54(Note3)	-7.96	PK
H	11590.00	26.65	21.67	48.32	54(Note3)	-5.68	PK
H	17385.00	20.33	21.83	42.16	54(Note3)	-11.84	PK

Test mode:		802.11ac(HT20)		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	11490.00	23.15	21.64	44.79	54(Note3)	-9.21	PK
V	17235.00	22.43	21.80	44.23	54(Note3)	-9.77	PK
H	11490.00	20.67	21.83	42.50	54(Note3)	-11.50	PK
H	17235.00	19.09	21.67	40.76	54(Note3)	-13.24	PK

Test mode:		802.11ac(HT20)		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	11570.00	24.37	21.64	46.01	54(Note3)	-7.99	PK
V	17355.00	22.51	21.80	44.31	54(Note3)	-9.69	PK
H	11570.00	23.98	21.83	45.81	54(Note3)	-8.19	PK
H	17355.00	22.17	21.67	43.84	54(Note3)	-10.16	PK

Test mode:		802.11ac(HT20)		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	11650.00	23.64	21.64	45.28	54(Note3)	-8.72	PK
V	17475.00	23.05	21.80	44.85	54(Note3)	-9.15	PK
H	11650.00	21.48	21.83	43.31	54(Note3)	-10.69	PK
H	17475.00	18.29	21.67	39.96	54(Note3)	-14.04	PK

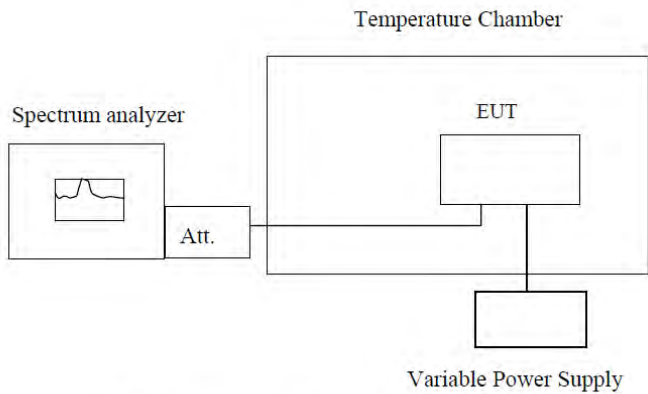
Test mode:		802.11ac(HT40)		Test channel:		Lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11510.00	23.15	21.67	44.82	54(Note3)	-9.18	PK
V	17265.00	20.33	21.83	42.16	54(Note3)	-11.84	PK
H	11510.00	23.29	21.67	44.96	54(Note3)	-9.04	PK
H	17265.00	19.89	21.83	41.72	54(Note3)	-12.28	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	11590.00	24.29	21.67	45.96	54(Note3)	-8.04	PK
V	17385.00	21.33	21.83	43.16	54(Note3)	-10.84	PK
H	11590.00	24.71	21.67	46.38	54(Note3)	-7.62	PK
H	17385.00	20.39	21.83	42.22	54(Note3)	-11.78	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 peak measurement needn't be performed.

7.8 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

HT 20MHz					
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	5746.3121	5744.9583	5744.5428	5746.6802
	5785	5786.0344	5784.0079	5784.8043	5786.3537
	5825	5825.3673	5824.8952	5824.5142	5826.9029
-20	5745	5745.2411	5744.5411	5744.7077	5746.0342
	5785	5785.2157	5784.0914	5784.0709	5785.9138
	5825	5825.4012	5824.4686	5824.3138	5825.4517
-10	5745	5745.2734	5744.1522	5744.1171	5745.0333
	5785	5785.9445	5784.2094	5784.9532	5785.9409
	5825	5825.3831	5824.8212	5824.3057	5825.5531
0	5745	5745.7776	5744.9292	5744.9409	5745.2707
	5785	5785.5182	5784.5267	5784.8237	5785.1043
	5825	5825.6238	5824.1544	5824.3444	5825.1281
10	5745	5745.4714	5744.0083	5744.2589	5745.5237
	5785	5785.6391	5784.3007	5784.4017	5785.1737
	5825	5825.7803	5824.9901	5824.2734	5825.8302
20	5745	5745.4122	5744.3562	5744.7909	5745.4238
	5785	5785.8051	5784.5823	5784.6248	5785.4904
	5825	5825.5790	5824.9948	5824.3232	5825.5848
30	5745	5745.5263	5744.6325	5744.4121	5745.71411
	5785	5785.3959	5784.6274	5784.9313	5785.9638
	5825	5825.9562	5824.4425	5824.8326	5825.6374
40	5745	5745.2071	5744.4116	5744.0952	5745.1238
	5785	5785.5032	5784.0548	5784.0931	5785.4476
	5825	5825.5371	5824.3331	5824.1104	5825.1443
50	5745	5745.4303	5744.8549	5744.3146	5745.8715
	5785	5785.6981	5784.4422	5784.8538	5785.9023
	5825	5825.9752	5824.5045	5824.3183	5825.8735

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	5745.6723	5746.5817	5743.4983	5743.1202
	5785	5785.1756	5785.4048	5784.3305	5783.4745
	5825	5825.8044	5825.6212	5824.1592	5824.1216
120	5745	5745.9729	5745.0176	5744.4950	5744.6688
	5785	5785.2605	5785.7401	5784.2277	5784.6049
	5825	5825.5738	5825.2317	5824.0814	5824.8603
132	5745	5745.2547	5745.3466	5744.0609	5744.4632
	5785	5785.2344	5785.7451	5784.3188	5784.7604
	5825	5825.4859	5825.6278	5824.0013	5824.0855

HT40 MHz					
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	5755	5755.2457	5753.6872	5754.7743	5755.3343
	5795	5795.6290	5793.6626	5794.8654	5795.1104
-20	5755	5755.1382	5753.0324	5754.6876	5755.0686
	5795	5795.1580	5793.6758	5794.4036	5795.9841
-10	5755	5755.5919	5753.1011	5754.1282	5755.4904
	5795	5795.7245	5793.4625	5794.5493	5795.4995
0	5755	5755.9792	5754.0878	5754.8314	5755.6687
	5795	5795.1571	5794.1202	5794.0626	5795.9412
10	5755	5755.0256	5754.8624	5754.4538	5755.7074
	5795	5795.5665	5794.3726	5794.8463	5795.5855
20	5755	5755.6784	5754.4058	5754.7154	5755.0946
	5795	5795.2635	5794.5534	5794.6379	5795.7392
30	5755	5755.3194	5754.0781	5754.2991	5755.2133
	5795	5795.1128	5794.0065	5794.8244	5795.5367
40	5755	5755.6928	5754.1381	5754.3979	5755.3719
	5795	5795.7656	5794.1417	5794.6332	5795.4213
50	5755	5755.0274	5754.7009	5754.8168	5755.6747
	5795	5795.8459	5794.8243	5794.6519	5795.2667

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	5755	5755.8645	5754.7855	5755.9815	5754.6366
	5795	5795.4888	5794.1363	5795.6517	5794.9972
120	5755	5755.7674	5754.0057	5755.4842	5754.9857
	5795	5795.0432	5794.6178	5795.3877	5794.3448
132	5755	5755.0765	5754.3258	5755.0090	5754.1053
	5795	5795.8267	5794.6782	5795.4723	5794.8042

8 Test Setup Photo

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

9 EUT Constructional Details

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

-----END-----