FCC RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART E

Test Standard	**FCC Part 15.407 and RSS-247 Issue 2**
FCC ID	**M82-AIM8Q**
ISED No.	**9404A- AIM8Q**
Brand name	**ADVANTECH**
Product name	**Computer**
FCC Model No.	**AIM8Q, AIM8Qxxxxxxxxxxxxxxx, AIM-x5BTxxxxxxxxxxx(where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions)**
IC Model No.	**AIM8Q, AIM-25BT, AIM-35BT, AIM-55BT, AIM-65BT, AIM-75BT**
Test Result	**Pass**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of CCS. Inc.

Testing Laboratory
1309

Approved by:

Sam Chuang
Manager

Reviewed by:

Ed Chiang
Engineer

Revision History

Rev.	Issue Date	Revisions	Revised By
00	June 8, 2017	Initial Issue	Angel Cheng
01	July 10, 2017	1. Added DFS equipment list in P.7. 2. Modify band edge test data in P.90-P.133 3. Modify setup photos in P.210	Angel Cheng

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Advantech Co.Ltd. No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan, R.O.C.
Equipment	Computer
FCC Model Name	AIM8Q, AIM8Qxxxxxxxxxxxxxxx, AIM-x5BTxxxxxxxxxxx(where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions)
IC Model Name	AIM8Q, AIM-25BT, AIM-35BT, AIM-55BT, AIM-65BT, AIM-75BT
Model Discrepancy	All models are electrically identical, different model names are for marketing purpose
Received Date	April 6, 2017
Date of Test	April 28 ~ June 8, 2017
Power Supply	1. VDC from Power Adapter Chicony / A16-018N1A I/P: 100-240Vac, 1A, 50-60Hz O/P: 5.15Vdc, 3A, 9.1Vdc, 2A, 18W 2. Battery ADVANTECH / AIM-BAT-8 Rating: 3.8V, 4900mAh, 18.62Wh

Output Power(W)

Band	Mode	Frequency Range (MHz)	Output Power (W)	EIRP Output Power (w)
U-NII-1	IEEE 802.11a	5180 ~ 5240	0.0381	0.0337
	IEEE 802.11n HT 20 MHz	5180 ~ 5240	0.0381	0.0337
	IEEE 802.11n HT 40 MHz	5190 ~ 5230	0.0216	0.0191
	IEEE 802.11ac VHT 80 MHz	5210	0.0148	0.0131
U-NII-2a	IEEE 802.11a	5260 ~ 5320	0.0344	0.0304
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	0.0239	0.0212
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	0.0199	0.0176
	IEEE 802.11ac VHT 80 MHz	5290	0.0149	0.0132
U-NII-2c	IEEE 802.11a	5500 ~ 5725	0.0451	0.0399
	IEEE 802.11n HT 20 MHz	5500 ~ 5725	0.0290	0.0257
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	0.0230	0.0203
	IEEE 802.11ac VHT 80 MHz	5690	0.0100	0.0089
U-NII-3	IEEE 802.11a	5745 ~ 5825	0.0385	-
	IEEE 802.11n HT 20 MHz	5745 ~ 5825	0.0397	-
	IEEE 802.11n HT 40 MHz	5755 ~ 5795	0.0344	-
	IEEE 802.11ac VHT 80 MHz	5775	0.0165	-

Remark:

1. For Canada the EUT Frequency Range 5600~5650MHz will be disabled.

1.2 EUT CHANNEL INFORMATION

Frequency Range	**UNII-1**	
	IEEE 802.11a	5180 ~ 5240 MHz
	IEEE 802.11n HT 20 MHz	5180 ~ 5240 MHz
	IEEE 802.11n HT 40 MHz	5190 ~ 5230 MHz
	IEEE 802.11ac VHT 20 MHz	5180 ~ 5240 MHz
	IEEE 802.11ac VHT 40 MHz	5190 ~ 5230 MHz
	IEEE 802.11ac VHT 80 MHz	5210 MHz
	UNII-2a	
	IEEE 802.11a	5260 ~ 5320 MHz
	IEEE 802.11n HT 20 MHz	5260 ~ 5320 MHz
	IEEE 802.11n HT 40 MHz	5270 ~ 5310 MHz
	IEEE 802.11ac VHT 20 MHz	5260 ~ 5320 MHz
	IEEE 802.11ac VHT 40 MHz	5270 ~ 5310 MHz
	IEEE 802.11ac VHT 80 MHz	5200 MHz
	UNII-2c	
	IEEE 802.11a	5500 ~ 5700 MHz
	IEEE 802.11a	5720 MHz
	IEEE 802.11n HT 20 MHz	5500 ~ 5700 MHz
	IEEE 802.11n HT 20 MHz	5720 MHz
	IEEE 802.11n HT 40 MHz	5510 ~ 5670 MHz
	IEEE 802.11n HT 40 MHz	5710 MHz
	IEEE 802.11ac VHT 20 MHz	5500 ~ 5700 MHz
	IEEE 802.11ac VHT 20 MHz	5720 MHz
	IEEE 802.11ac VHT 40 MHz	5510 ~ 5670 MHz
	IEEE 802.11ac VHT 40 MHz	5710 MHz
	IEEE 802.11ac VHT 80 MHz	5530-5610 MHz
	IEEE 802.11ac VHT 80 MHz	5690 MHz
	UNII-3	
	IEEE 802.11a	5745 ~ 5825 MHz
	IEEE 802.11n HT 20 MHz	5745 ~ 5825 MHz
	IEEE 802.11n HT 40 MHz	5755 ~ 5795 MHz
	IEEE 802.11ac VHT 20 MHz	5745 ~ 5825 MHz
	IEEE 802.11ac VHT 40 MHz	5755 ~ 5795 MHz
	IEEE 802.11ac VHT 80 MHz	5775 MHz
Modulation Type	1. IEEE 802.11a mode: OFDM 2. IEEE 802.11n HT 20 MHz mode: OFDM 3. IEEE 802.11n HT 40 MHz mode: OFDM 4. IEEE 802.11ac VHT 20 MHz mode: OFDM 5. IEEE 802.11ac VHT 40 MHz mode: OFDM 5. IEEE 802.11ac VHT 80 MHz mode: OFDM	

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	☒ PIFA ☐ PCB ☐ Dipole ☐ Coils
Antenna Gain	Gain: -0.53dBi

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

Remark:
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

NO. 989-1 Wen Shan Rd., Shang Shan Village, Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Eric Lee	
Radiation	Ed Chiang	
RF Conducted	Eric Lee	

Remark: *The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.*

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Power Meter	Anritsu	ML2495A	1012009	07/04/2016	07/03/2017
Power Sensor	Anritsu	MA2411B	917072	07/04/2016	07/03/2017
Base Station	R&S	CMU 200	101245	07/29/2016	07/28/2017
Base Station	Anritsu	MT-8820C	6200938900	07/26/2016	07/25/2017
Spectrum Analyzer	R&S	FSV 40	101073	10/05/2016	10/04/2017
Base Station	Anritsu	MT-8820C	6200938900	07/26/2016	07/25/2017

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Pre-Amplifier	EMCI	EMC 012635	980151	06/23/2016	06/22/2017
Pre-Amplifier	EMEC	EM330	060609	06/08/2016	06/07/2017
Spectrum Analyzer	Agilent	E4446A	US42510252	12/05/2016	12/04/2017
Loop Ant	COM-POWER	AL-130	121051	03/02/2017	03/01/2018
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R

AC Conducted Emissions Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
LISN	R&S	ENV216	101054	05/18/2017	05/17/2018
LISN	SCHWARZBECK	NSLK 8127	8127-541	02/14/2017	02/13/2018
Receiver	R&S	ESCI	101073	08/20/2016	08/19/2017

Adaptivity/DFS Room					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Vector Signal Generator	R&S	SMU 200A	102239	3/10/2016	3/9/2017
RF Power Splitter	ATM	PNR P414H	J275304Z-01	7/19/2016	7/18/2017
RF Power Splitter	Marvelous Microwave	MVE 8586	6011206	7/19/2016	7/18/2017
Spectrum Analyzer	R&S	FSU 8GHz	200114	7/28/2016	7/27/2017
Attenuator	E-INSTPVMENT	EPA-600H	EC1400050	N.C.R	N.C.R
Vector Signal Generator	R&S	SMU 200A	102239	3/13/2017	3/12/2018
RF Power Splitter	ATM	PNR P414H	J275304Z-01	7/19/2016	7/18/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.407, KDB 662911 D01 v02r01, KDB 789033 D02 v01r03, KDB 644545 D03 v01.

1.9 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW1039
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	Canada IC 2324G-1 IC 2324G-2

2. TEST SUMMERY

FCC Standard Sec.	IC Standard Sec.	Chapter	Test Item	Result
15.203	-	1.2	Antenna Requirement	Pass
15.207	RSS-Gen(8.8)	4.1	AC Conducted Emission	Pass
15.403(i)	-	4.2	26dB Bandwidth	Pass
15.403(i)	RSS-247(6.2.4)	4.2	6dB Bandwidth	Pass
15.403(i)	RSS-Gen(6.6)	4.2	Occupied Bandwidth (99%)	Pass
15.407(a)	RSS-247(6.2.1)(1) RSS-247(6.2.2)(1) RSS-247(6.2.3)(1) RSS-247(6.2.4)(1)	4.3	Output Power Measurement	Pass
15.407(a)	RSS-247(6.2.1)(1) RSS-247(6.2.2)(1) RSS-247(6.2.3)(1) RSS-247(6.2.4)(1)	4.4	Power Spectral Density	Pass
15.407(b)	RSS-247(6.2.1)(2) RSS-247(6.2.2)(2) RSS-247(6.2.3)(2) RSS-247(6.2.4)(2)	4.5	Radiation Band Edge	Pass
15.407(b)	RSS-247(6.2.1)(2) RSS-247(6.2.2)(2) RSS-247(6.2.3)(2) RSS-247(6.2.4)(2)	4.5	Radiation Spurious Emission	Pass
15.407(g)	RSS-Gen(6.11)	4.6	Frequency Stability	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	1. IEEE 802.11a mode: 6Mbps 2. IEEE 802.11n HT 20 MHz mode: MCS8 3. IEEE 802.11n HT 40 MHz mode: MCS8 4. IEEE 802.11ac VHT 20 MHz mode: MCS8 5. IEEE 802.11ac VHT 40 MHz mode: MCS8 5. IEEE 802.11ac VHT 80 MHz mode: MCS8

Operating Frequency Range & Number of Channels

	Mode	Frequency Range (MHz)	Number of Channels
U-NII-1	IEEE 802.11a	5180 ~ 5240	4 Channels
	IEEE 802.11n HT 20 MHz	5180 ~ 5240	4 Channels
	IEEE 802.11n HT 40 MHz	5190 ~ 5230	2 Channels
	IEEE 802.11ac VHT 20 MHz	5180 ~ 5240	4 Channels
	IEEE 802.11ac VHT 40 MHz	5190 ~ 5230	2 Channels
	IEEE 802.11ac VHT 80 MHz	5210	1 Channels
U-NII-2a	IEEE 802.11a	5260 ~ 5320	5 Channels
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	5 Channels
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	2 Channels
	IEEE 802.11ac VHT 20 MHz	5260 ~ 5320	5 Channels
	IEEE 802.11ac VHT 40 MHz	5270 ~ 5310	2 Channels
	IEEE 802.11ac VHT 80 MHz	5290	1 Channels
U-NII-2c	IEEE 802.11a	5500 ~ 5700	4 Channels
	IEEE 802.11n HT 20 MHz	5500 ~ 5700	4 Channels
	IEEE 802.11n HT 20 MHz	5720	1 Channels
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	2 Channels
	IEEE 802.11n HT 40 MHz	5710	1 Channels
	IEEE 802.11ac VHT 20 MHz	5500 ~ 5700	4 Channels
	IEEE 802.11ac VHT 20 MHz	5720	1 Channels
	IEEE 802.11ac VHT 40 MHz	5510 ~ 5670	2 Channels
	IEEE 802.11ac VHT 40 MHz	5710	1 Channels
	IEEE 802.11ac VHT 80 MHz	5530	1 Channels
	IEEE 802.11ac VHT 80 MHz	5690	1 Channels
U-NII-3	IEEE 802.11a	5745 ~ 5825	5 Channels
	IEEE 802.11n HT 20 MHz	5745 ~ 5825	5 Channels
	IEEE 802.11n HT 40 MHz	5755 ~ 5795	2 Channels
	IEEE 802.11ac VHT 20 MHz	5745 ~ 5825	5 Channels
	IEEE 802.11ac VHT 40 MHz	5755 ~ 5795	2 Channels
	IEEE 802.11ac VHT 80 MHz	5775	1 Channels

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. Covered modes are test reduction modes. The output powers on the covered modes are equal to or less than the mode referenced and use the same module
3.The mode IEEE 802.11ac VHT20 and VHT40 are only different in control messages with IEEE 802.11n HT20 and HT40, and have same power setting. Therefore, the highest power(IEEE 802.11n HT20 and HT40) were test conducted and radiated measurement and recorded in this report.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

Radiated Emission Measurement Above 1G	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**
Worst Position	**☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)**
Worst Polarity	**☐ Horizontal ☒ Vertical**

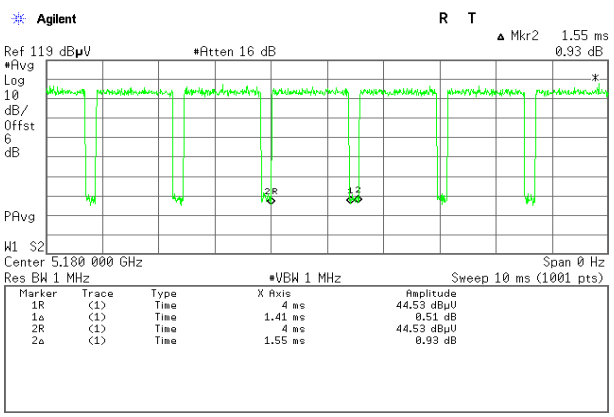
Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1:EUT power by AC adapter via power cable. Mode 2:EUT power by Battery.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(Z-Plane and Vertical) were recorded in this report
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

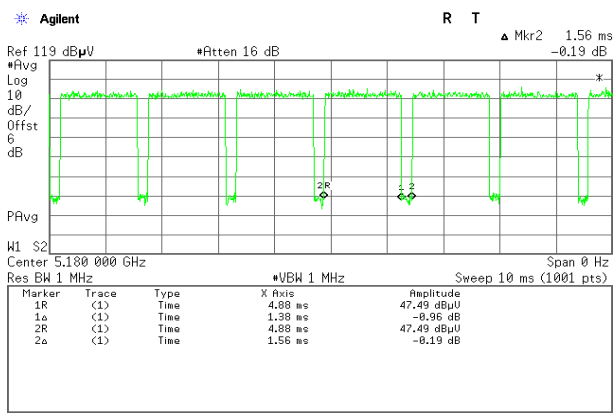
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11a	1.4100	1.5500	90.97%	0.41
802.11n HT20	1.3800	1.5600	88.46%	0.53
802.11n HT40	0.5300	0.7000	75.71%	1.21
802.11ac VHT80	0.2700	0.4400	61.36%	2.12

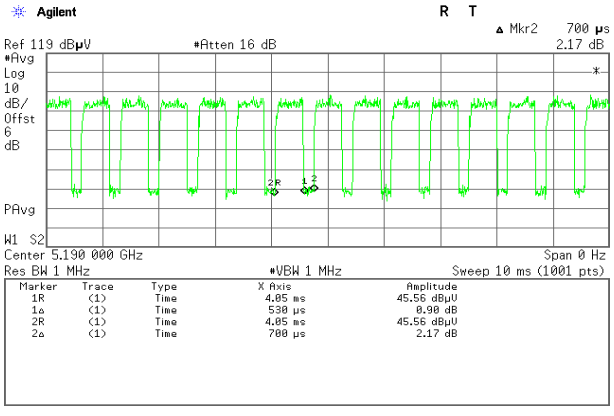
802.11a



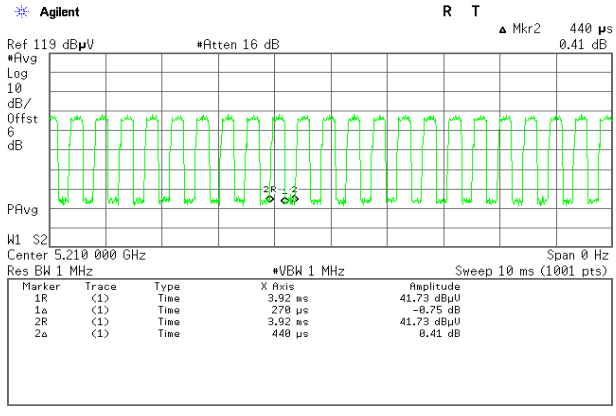
802.11n HT20



802.11n HT40



802.11ac VHT80



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a) and RSS-GEN section 8.8,

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

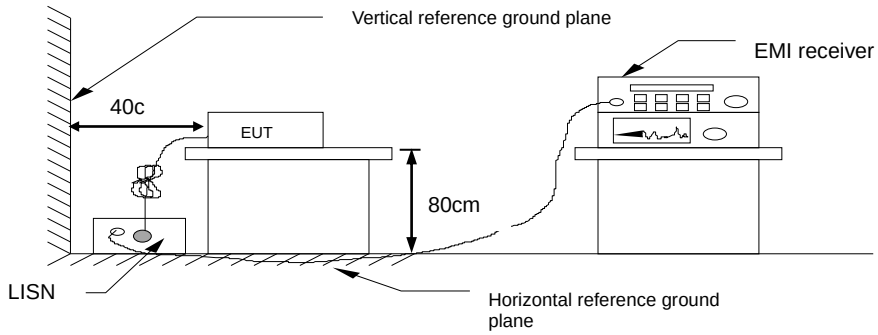
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

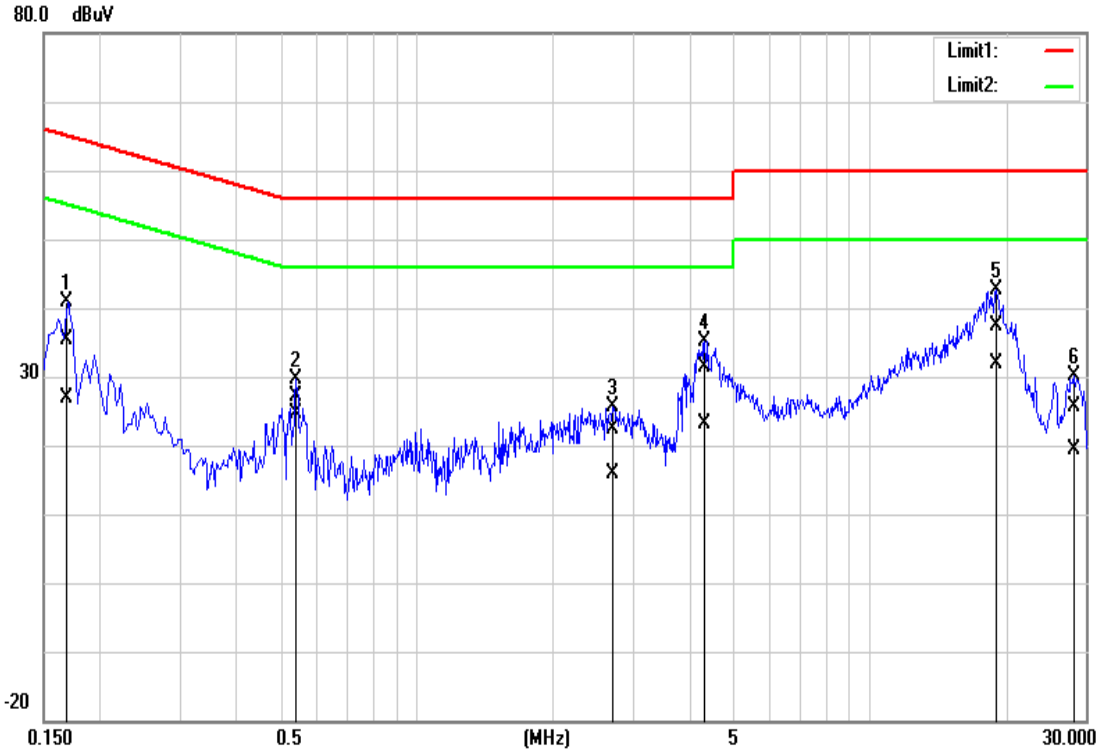


4.1.4 Test Result

Pass.

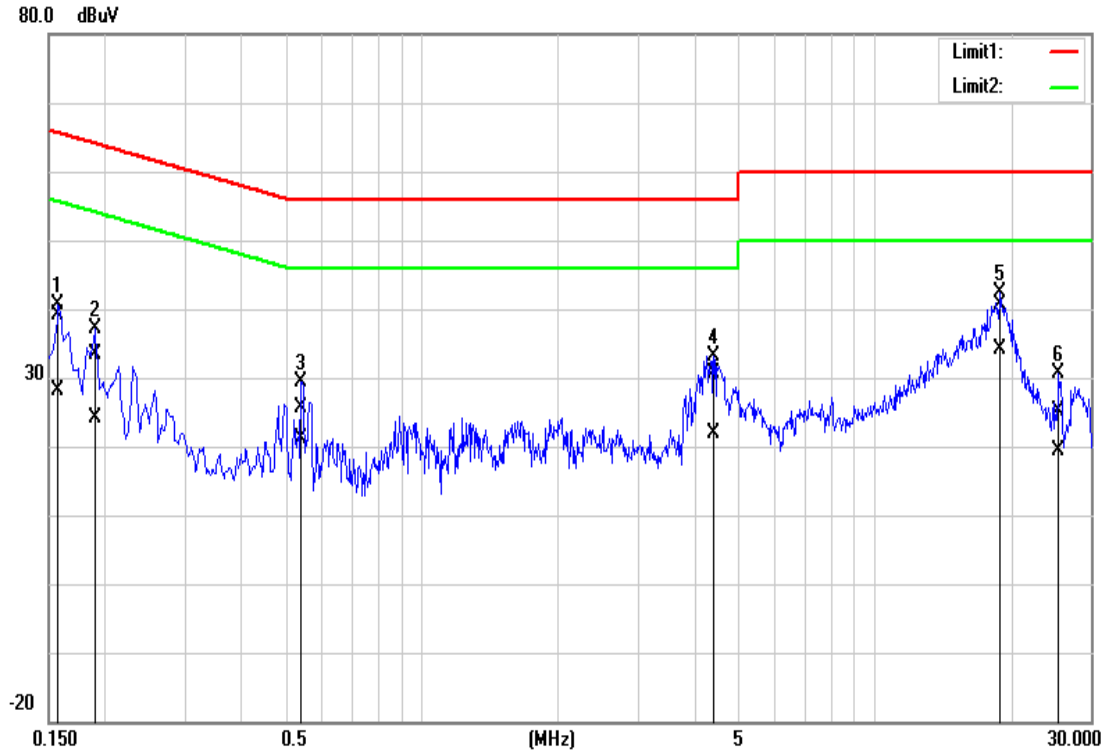
Test Data

Test Mode	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage	120Vac / 60Hz	Test Date	April 28, 2017
Phase	Line	Test Engineer	Eric Lee



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1700	25.58	17.11	9.70	35.28	26.81	64.96	54.96	-29.68	-28.15	Pass
0.5420	17.46	15.06	9.68	27.14	24.74	56.00	46.00	-28.86	-21.26	Pass
2.7100	12.66	6.18	9.70	22.36	15.88	56.00	46.00	-33.64	-30.12	Pass
4.3340	21.67	13.33	9.71	31.38	23.04	56.00	46.00	-24.62	-22.96	Pass
19.0420	27.50	22.00	9.85	37.35	31.85	60.00	50.00	-22.65	-18.15	Pass
28.2300	15.78	9.56	9.75	25.53	19.31	60.00	50.00	-34.47	-30.69	Pass

Test Mode	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage	120Vac / 60Hz	Test Date	April 28, 2017
Phase	Neutral	Test Engineer	Eric Lee



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1580	29.41	18.42	9.71	39.12	28.13	65.57	55.57	-26.45	-27.44	Pass
0.1900	23.78	14.39	9.70	33.48	24.09	64.04	54.04	-30.56	-29.95	Pass
0.5420	15.99	11.45	9.69	25.68	21.14	56.00	46.00	-30.32	-24.86	Pass
4.4140	20.88	12.07	9.71	30.59	21.78	56.00	46.00	-25.41	-24.22	Pass
19.0100	30.69	24.32	9.91	40.60	34.23	60.00	50.00	-19.40	-15.77	Pass
25.5900	15.29	9.54	9.85	25.14	19.39	60.00	50.00	-34.86	-30.61	Pass

4.2 26DB BANDWIDTH, 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

26 dB Bandwidth ：For reporting purposes only.

6 dB Bandwidth ：Least 500kHz.

Occupied Bandwidth(99%) ： For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r03 Section C, D, and ANSI 63.10:2013 clause 6.9.2,

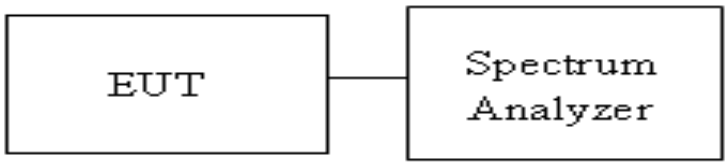
1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c,

   (1) BW=20MHz : SA set RBW = 300kHz, VBW = 1MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth

   (2) BW=40MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth

   (3) BW=80MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth
4. UNII-3, SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



4.2.4 Test Result

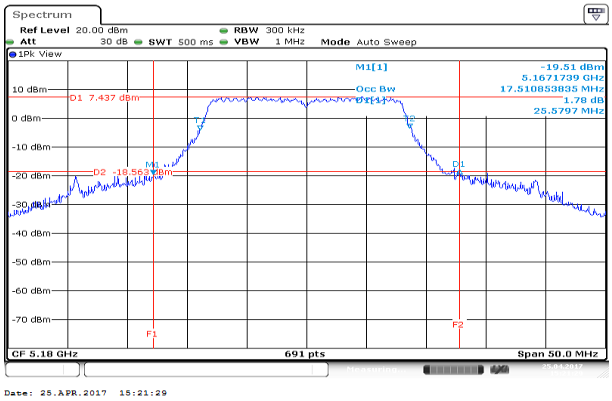
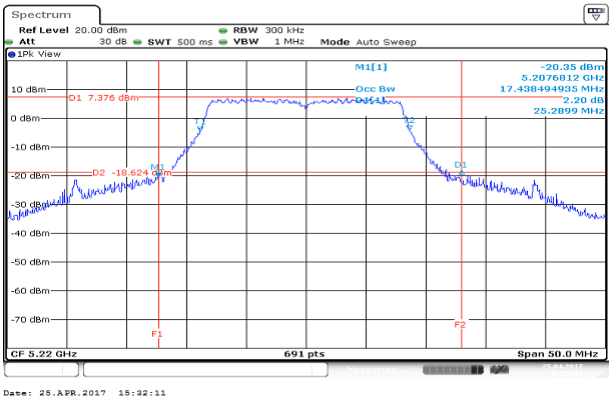
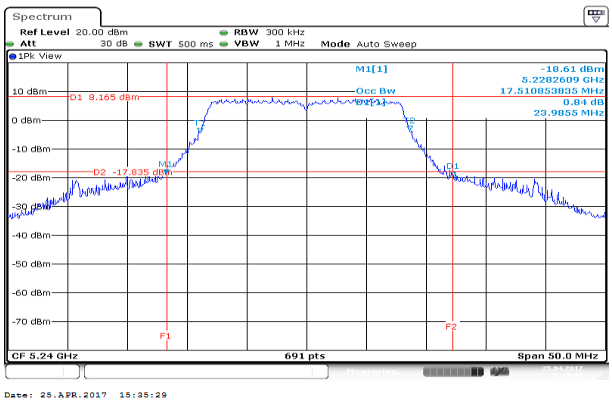
UNII-1 5150-5250 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5180	17.5108	-	25.5797	-
Mid	5220	17.4384	-	25.2899	-
High	5240	17.5108	-	23.9855	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5180	18.3068		22.8986	
Mid	5220	18.3068		23.1159	
High	5240	18.3068		23.3333	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5190	37.3950		45.913	
High	5230	37.3950		45.913	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5210	74.7901			88.116

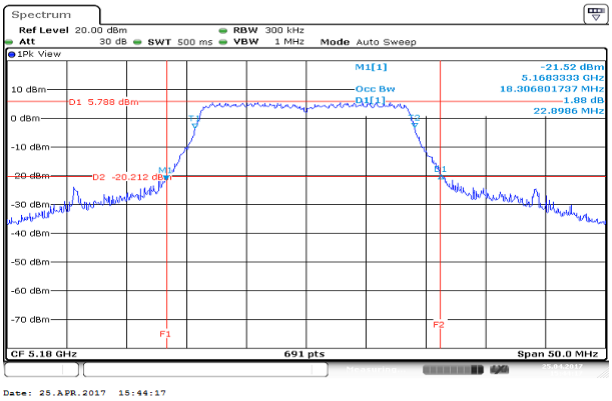
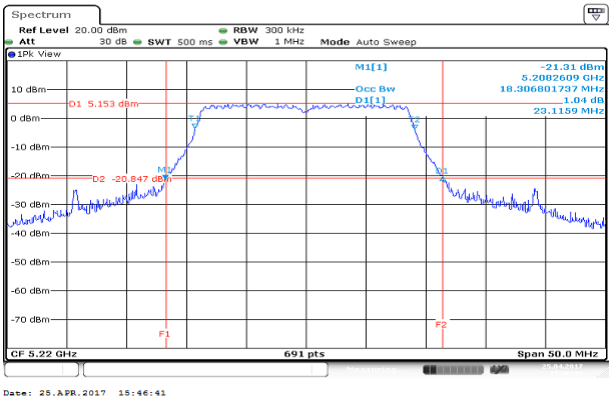
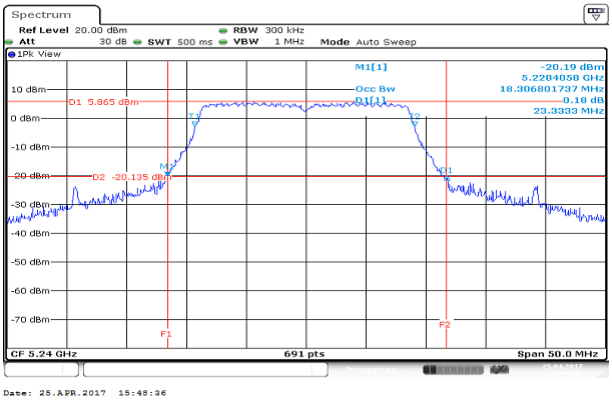
UNII-2a 5250-5350 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5260	17.4384	-	24.7101	-
Mid	5280	17.4384	-	24.4203	-
High	5320	17.4384	-	23.9855	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5260	18.1620		22.8986	
Mid	5280	18.2344		22.9710	
High	5320	18.2344		22.9710	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5270	37.5108		48.580	
High	5310	37.0477		44.986	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5290	74.7901		84.174	

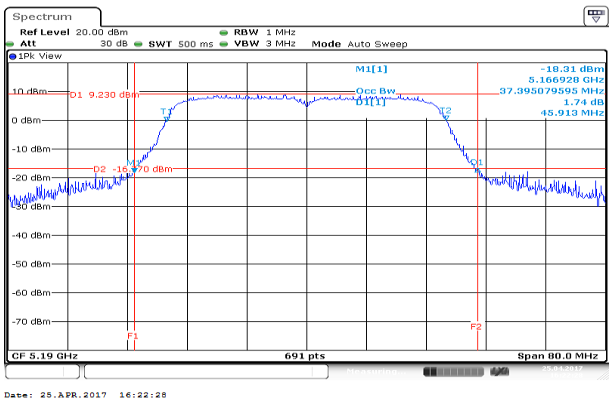
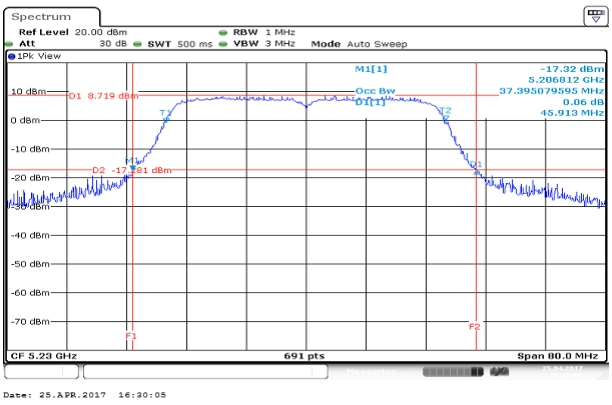
UNII-2c 5475-5725 MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5500	18.0897	-	22.7536	-
Mid	5580	18.0173	-	22.8261	-
High	5700	18.0897	-	22.5362	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5500	17.5832		26.3043	
Mid	5580	17.5832		26.1594	
High	5700	17.5832		26.5217	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5510	37.1635		44.754	
High	5670	37.5108		46.261	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5530	74.7901		84.638	

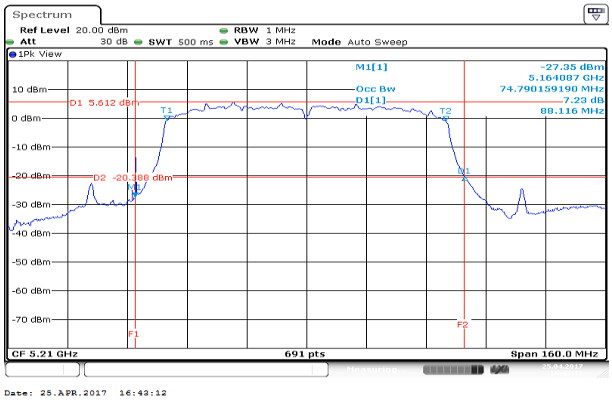
UNII-3 5725-5825MHz					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5745	16.6280		16.3913	
Mid	5785	16.6280		16.3913	
High	5825	16.6280		16.4348	
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5745	17.7568		17.6522	
Mid	5785	16.6280		16.3913	
High	5825	17.8002		17.6522	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5755	36.1215		35.362	
High	5795	36.0057		35.594	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Mid	5775	74.7901		75.362	

Test Data

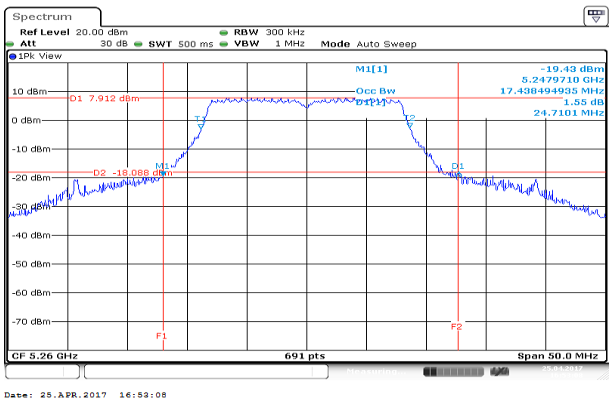
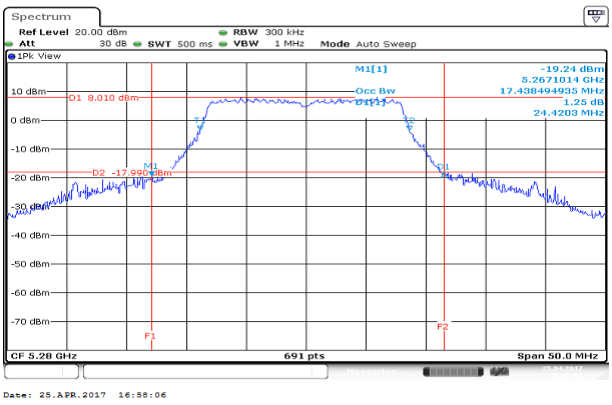
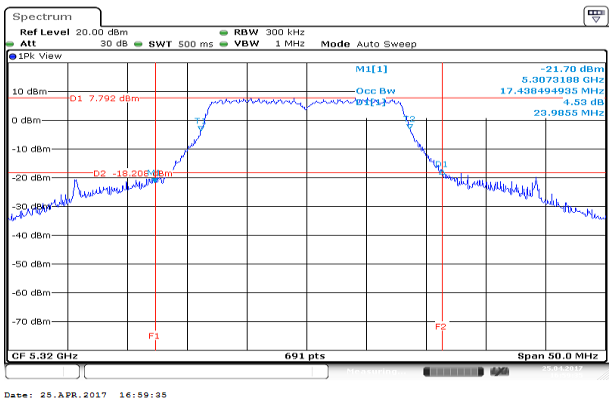
UNII-1 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

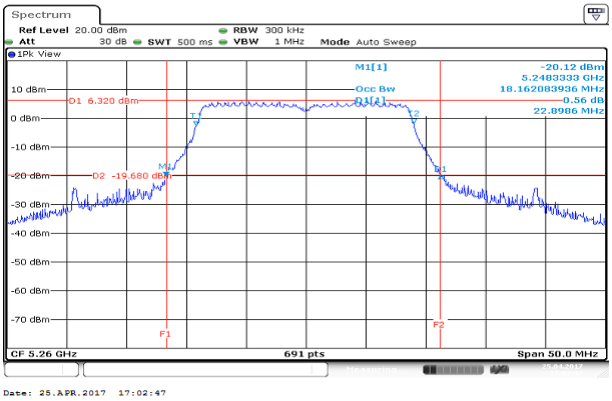
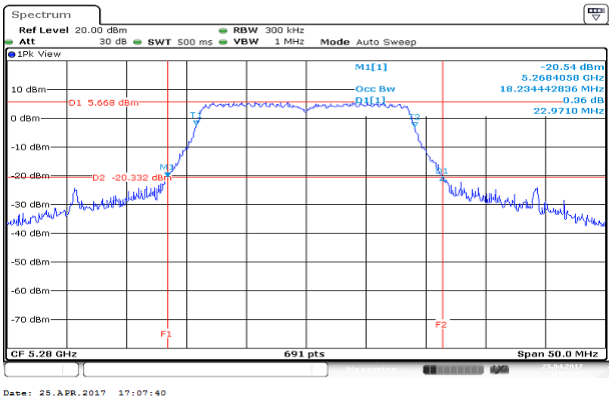
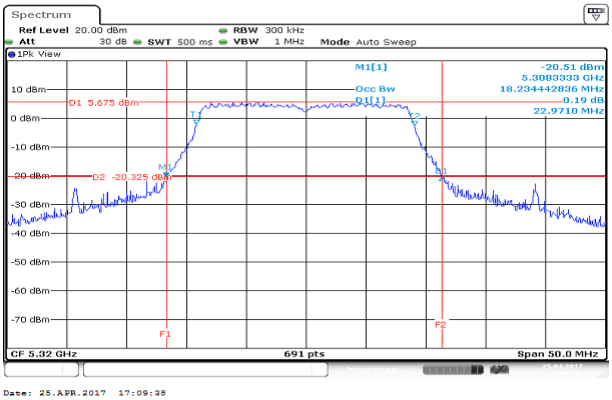
UNII-1 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

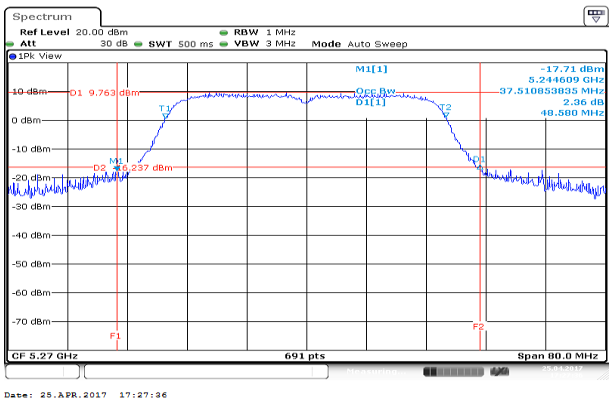
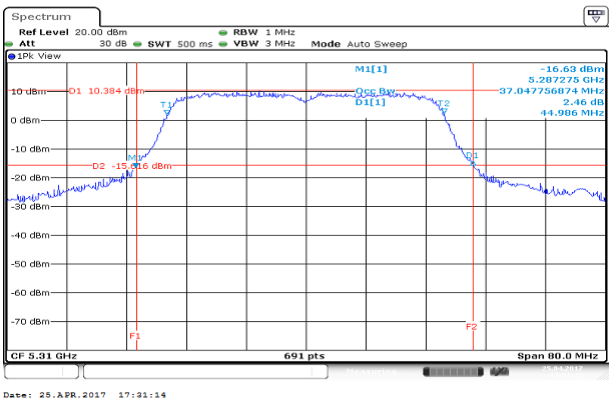
UNII-1 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

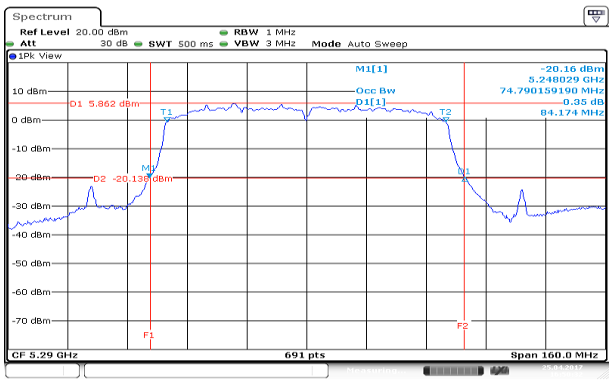
UNII-1 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

Test Data

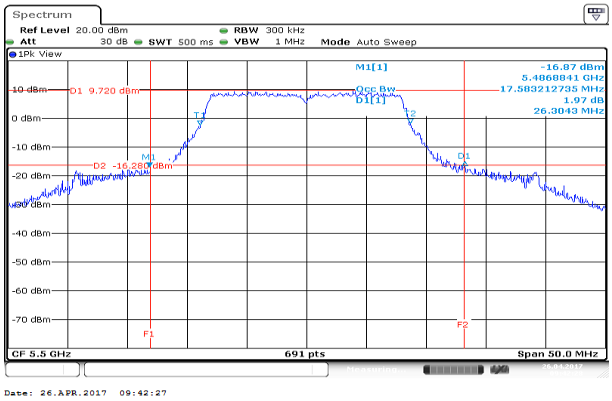
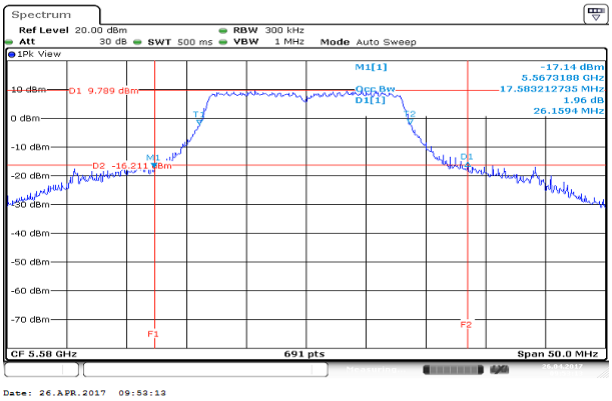
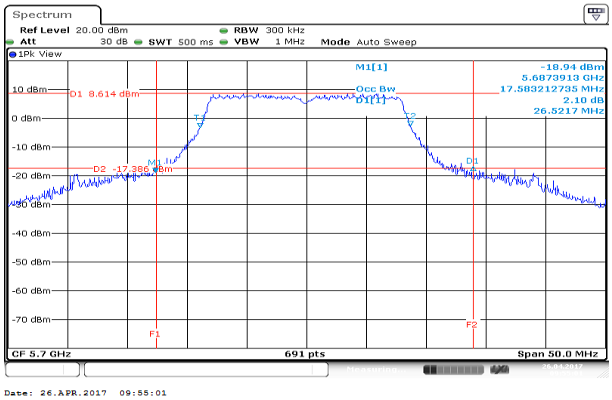
UNII-2a IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

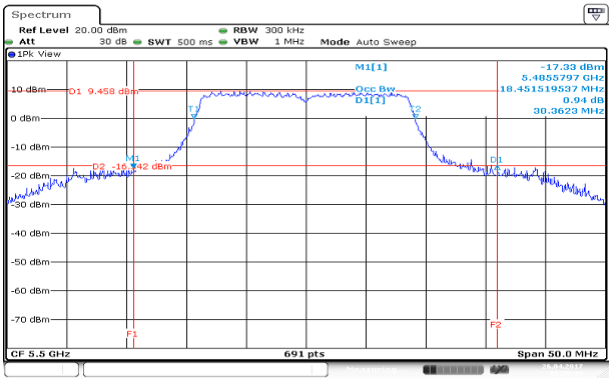
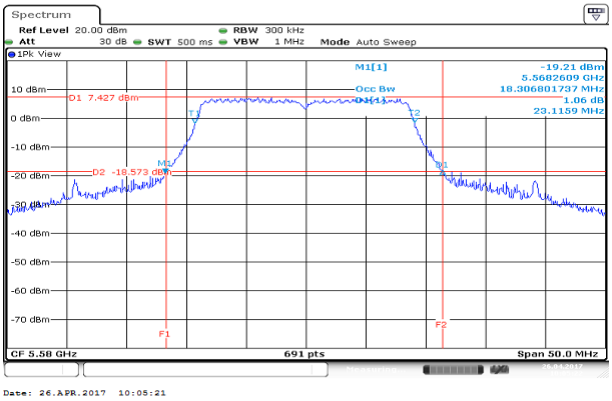
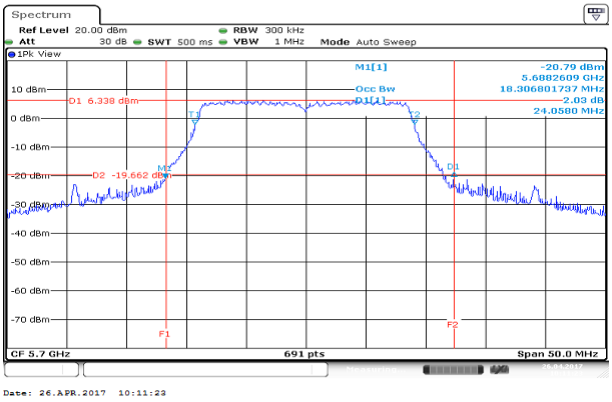
UNII-2a IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

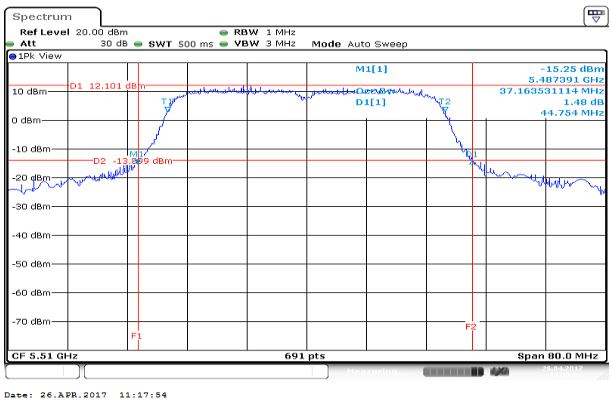
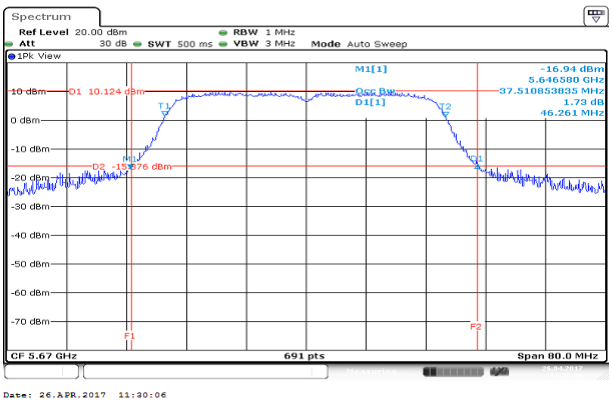
UNII-2a IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

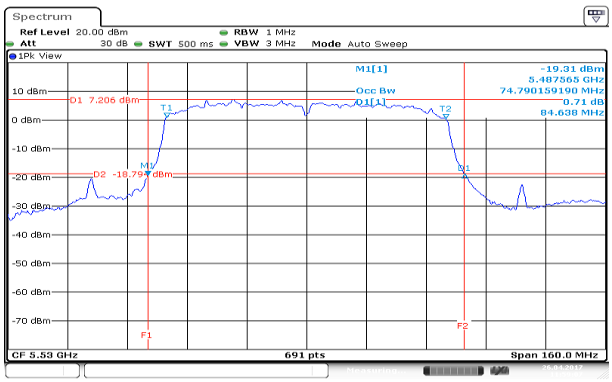
UNII-2a IEEE 802.11ac VHT80 mode- chain 0
Mid CH


Test Data

UNII-2c IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

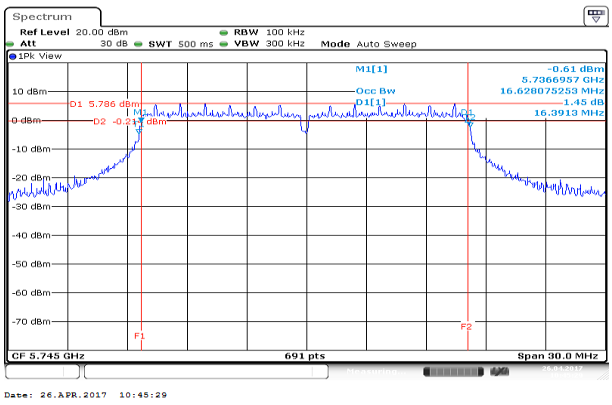
UNII-2c IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-2c IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

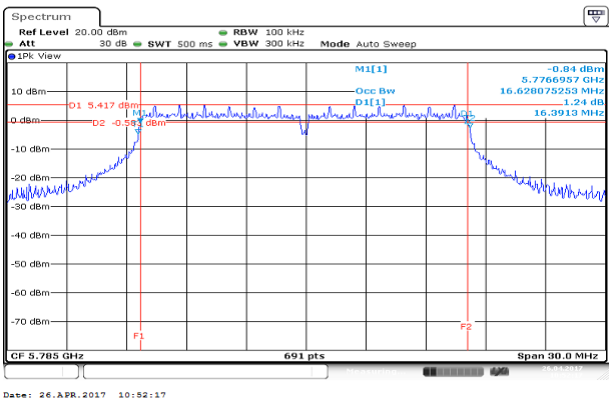
UNII-2c IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

UNII-3 IEEE 802.11a mode- chain 0

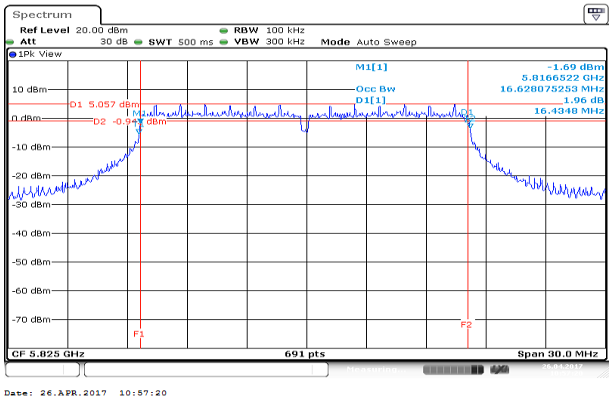
Low CH

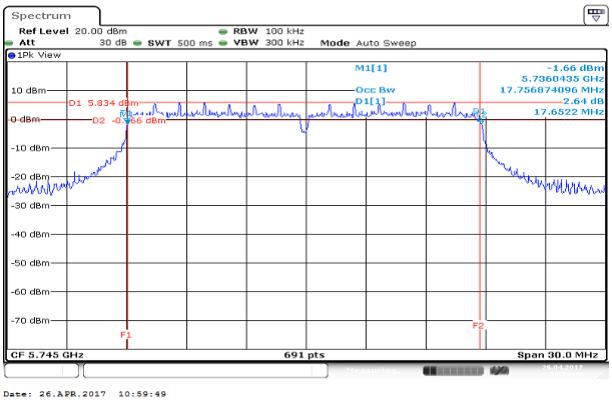
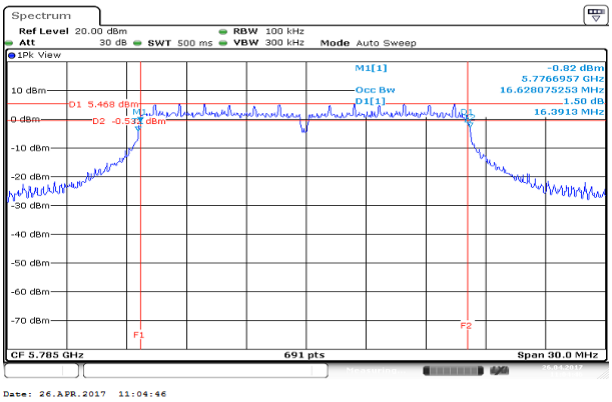
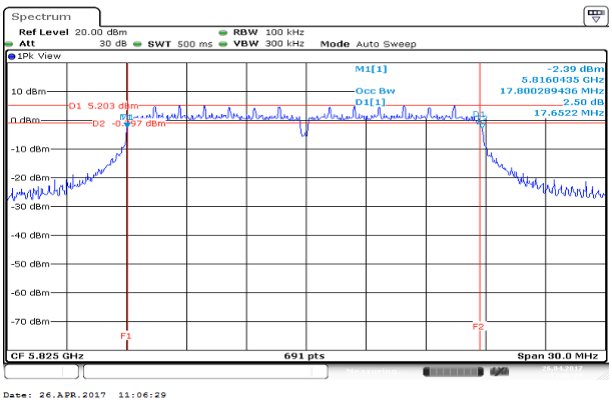


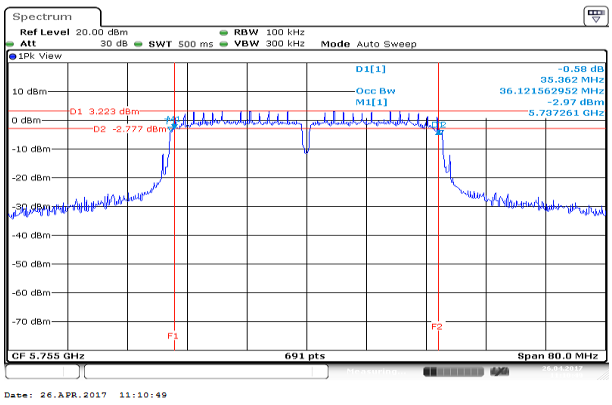
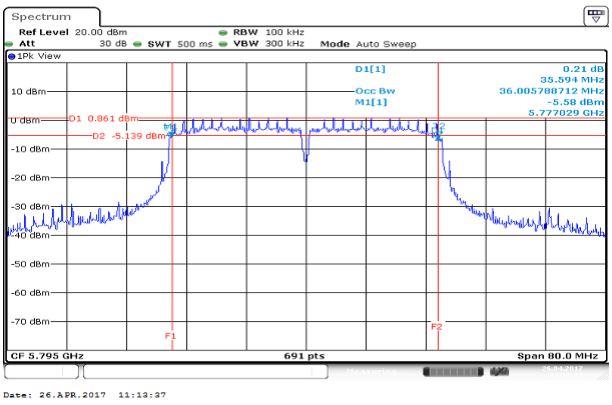
Mid CH

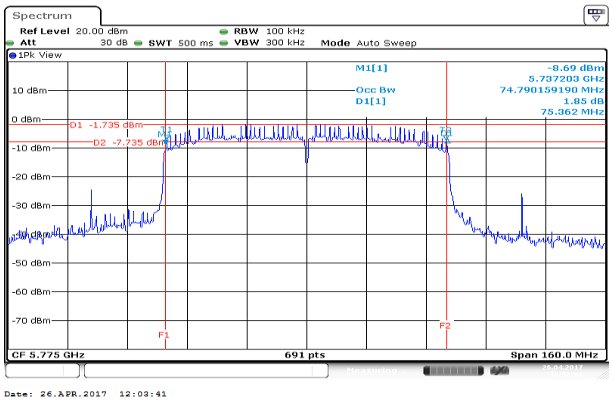


High CH



UNII-3 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3) and RSS-247 section 6.2.1(1), section 6.2.2(1), section 6.2.3(1) and section 6.2.4(1)

UNII-1 :

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW(24 dBm) and The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz ,provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-2a and 2c:

the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. and The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 Log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

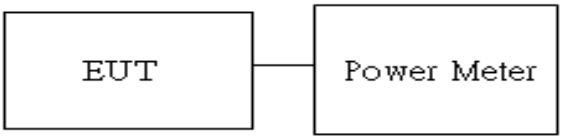
UNII-1 Limit	☒ Antenna not exceed 6 dBi：24dBm (EIRP : 23dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi：24dBm (EIRP : 30dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r03, Section E.3.b.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Average output power. in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Conducted output power：

UNII-1													
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	EIRP AV Total Power (dBm)	AV Total Power (W)	EIRP AV Total Power (W)	DG (dBi)	Limit (dBm)	EIRP Limit (dBm)
			chain0	chain1	chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	36	5180	14.00	-	15.49	-	15.49	14.96	0.0354	0.0313	-0.53	24	23
	44	5220	14.00	-	15.44	-	15.44	14.91	0.0350	0.0310			
	48	5240	14.00	-	15.81	-	15.81	15.28	0.0381	0.0337			
IEEE 802.11n HT20 Data rate: MCS8	36	5180	13.00	-	13.92	-	13.92	13.39	0.0247	0.0218			
	44	5220	14.00	-	15.44	-	15.44	14.91	0.0350	0.0310			
	48	5240	14.00	-	15.81	-	15.81	15.28	0.0381	0.0337			
IEEE 802.11n HT40 Data rate: MCS8	38	5190	13.00	-	13.34	-	13.34	12.81	0.0216	0.0191			
	46	5230	13.00	-	13.12	-	13.12	12.59	0.0205	0.0182			
IEEE 802.11ac VHT80 Data rate: MCS8	42	5210	13.00	-	11.70	-	11.70	11.17	0.0148	0.0131			

UNII-2a													
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	EIRP AV Total Power (dBm)	AV Total Power (dBm)	EIRP AV Total Power (W)	DG (dBi)	Limit (dBm)	EIRP Limit (dBm)
			chain0	chain1	chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	52	5260	14	-	14.91	-	14.91	14.38	0.0310	0.0274	-0.53	24	30
	56	5280	14	-	15.36	-	15.36	14.83	0.0344	0.0304			
	64	5320	14	-	15.08	-	15.08	14.55	0.0322	0.0285			
IEEE 802.11n HT20 Data rate: MCS8	52	5260	13	-	13.79	-	13.79	13.26	0.0239	0.0212			
	56	5280	13	-	13.64	-	13.64	13.11	0.0231	0.0205			
	64	5320	13	-	13.27	-	13.27	12.74	0.0212	0.0188			
IEEE 802.11n HT40 Data rate: MCS8	54	5270	13	-	12.98	-	12.98	12.45	0.0199	0.0176			
	62	5310	12	-	12.83	-	12.83	12.30	0.0192	0.0170			
IEEE 802.11ac VHT80 Data rate: MCS8	58	5290	13	-	11.72	-	11.72	11.19	0.0149	0.0132			

UNII-2c													
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	EIRP AV Total Power (dBm)	AV Total Power (W)	EIRP AV Total Power (W)	DG (dBi)	Limit (dBm)	EIRP Limit (dBm)
			chain0	chain1	chain0	chain1							
IEEE 802.11a Data rate: 6Mbps	100	5500	13	-	13.98	-	13.98	13.45	0.0250	0.0221	-0.53	24	24
	116	5580	15	-	16.54	-	16.54	16.01	0.0451	0.0399			
	140	5700	13	-	13.34	-	13.34	12.81	0.0216	0.0191			
IEEE 802.11n HT20 Data rate: MCS8	100	5500	13	-	13.96	-	13.96	13.43	0.0249	0.0220			
	116	5580	14	-	14.63	-	14.63	14.10	0.0290	0.0257			
	140	5700	13	-	13.28	-	13.28	12.75	0.0213	0.0188			
IEEE 802.11n HT40 Data rate: MCS8	102	5510	12	-	11.63	-	11.63	11.10	0.0146	0.0129			
	110	5550	14	-	13.61	-	13.61	13.08	0.0230	0.0203			
	134	5670	14	-	12.93	-	12.93	12.40	0.0196	0.0174			
IEEE 802.11ac VHT80 Data rate: MCS8	106	5530	12	-	10.02	-	10.02	9.49	0.0100	0.0089			

UNII-3										
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			chain0	chain1	chain0	chain1				
IEEE 802.11a Data rate: 6Mbps	149	5745	15	-	15.85	-	15.85	0.0385	-0.53	30
	157	5785	15	-	15.70	-	15.70	0.0372		
	165	5825	15	-	15.65	-	15.65	0.0367		
IEEE 802.11n HT20 Data rate: MCS0	149	5745	15	-	15.96	-	15.96	0.0394		
	157	5785	15	-	15.99	-	15.99	0.0397		
	165	5825	15	-	15.76	-	15.76	0.0377		
IEEE 802.11n HT40 Data rate: MCS0	151	5755	15	-	15.36	-	15.36	0.0344		
	159	5795	14	-	13.47	-	13.47	0.0222		
IEEE 802.11ac VHT80 Data rate: MCS0	155	5775	14	-	12.18	-	12.18	0.0165		

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3) and RSS-247 section 6.2.1(1), section 6.2.2(1), section 6.2.3(1) and section 6.2.4(1)

UNII-1 :

FCC: The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

IC: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-2a and 2c:

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.i.

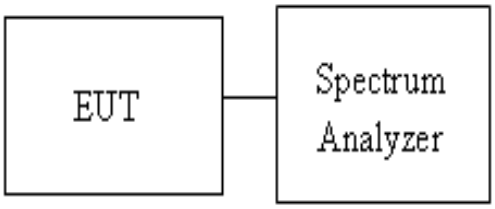
UNII-1 Limit	☒ Antenna not exceed 6 dBi：11 dBm (EIRP : 10 dBm) ☐ Antenna with DG greater than 6 dBi： [Limit = 17 – (DG – 6)]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 17 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

4.4.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r03, Section F

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c, SA set RBW = 1MHz, VBW = 3MHz and Detector = RMS, to measurement Power Density.
4. UNII-3, SA set RBW = 500kHz, VBW = 2MHz and Detector = RMS, to measurement Power Density
5. The path loss and Duty Factor were compensated to the results for each measurement by SA.
6. Mark the maximum level.
7. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



4.4.4 Test Result

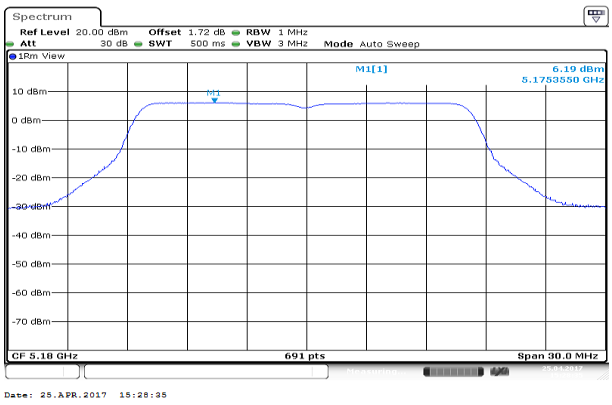
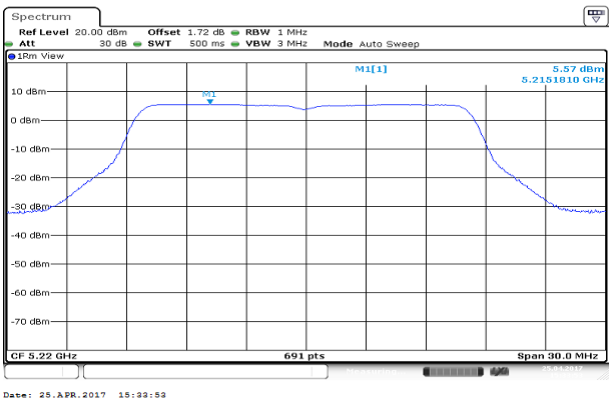
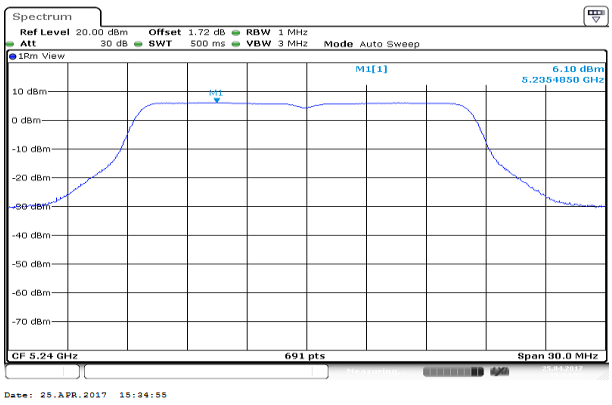
UNII-1 5150-5250 MHz				
Test mode: IEEE 802.11a mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**	**EIRP Limit (dBm)**
Low	5180	6.19	11	10
Mid	5220	5.57		
High	5240	6.10		
Test mode: IEEE 802.11n HT20 mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**	**EIRP Limit (dBm)**
Low	5180	3.96	11	10
Mid	5220	3.73		
High	5240	4.24		
Test mode: IEEE 802.11n HT40 mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**	**EIRP Limit (dBm)**
Low	5190	1.71	11	10
High	5230	0.42		
Test mode: IEEE 802.11ac VHT80 mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**	**EIRP Limit (dBm)**
Mid	5210	-2.12	11	10

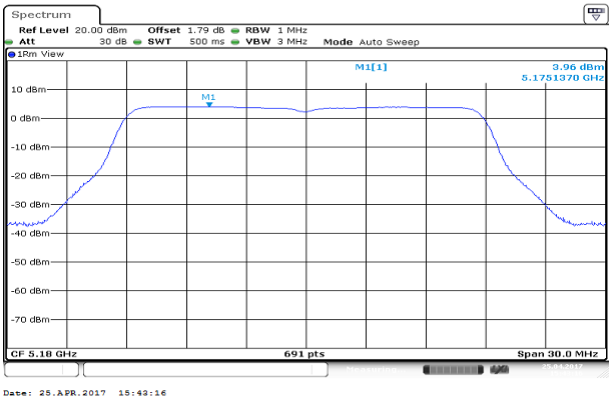
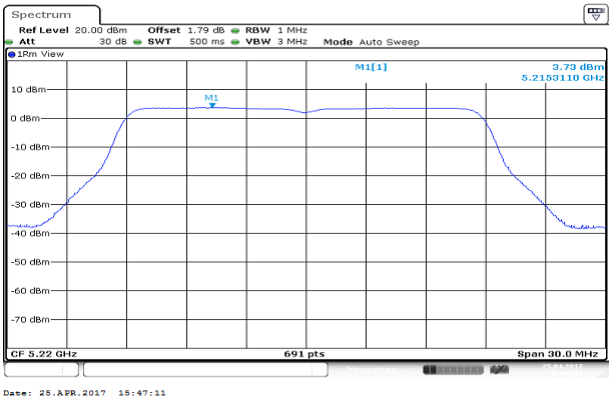
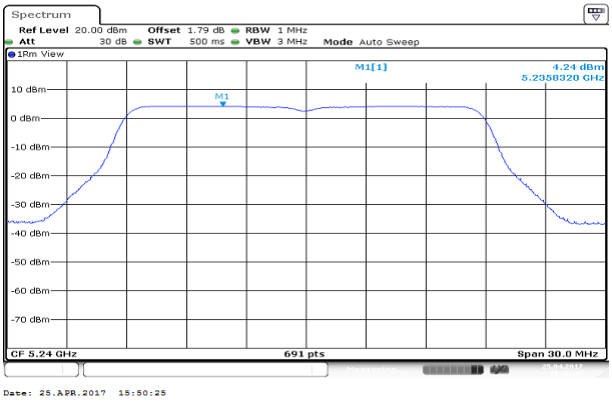
UNII-2a 5250-5350 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5260	6.42	11
Mid	5280	6.35	
High	5320	6.11	
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5260	4.29	11
Mid	5280	4.28	
High	5320	4.04	
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5270	0.99	11
High	5310	-0.33	
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Mid	5290	-1.91	11

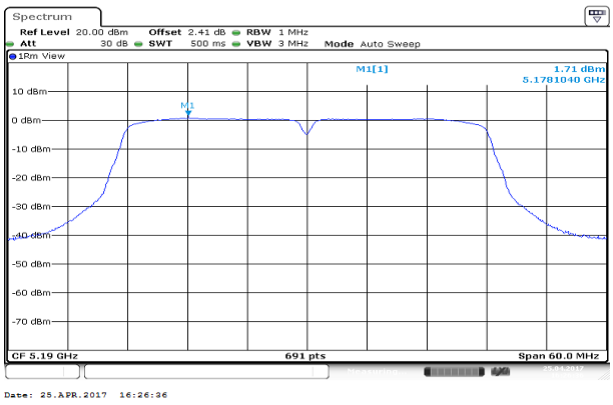
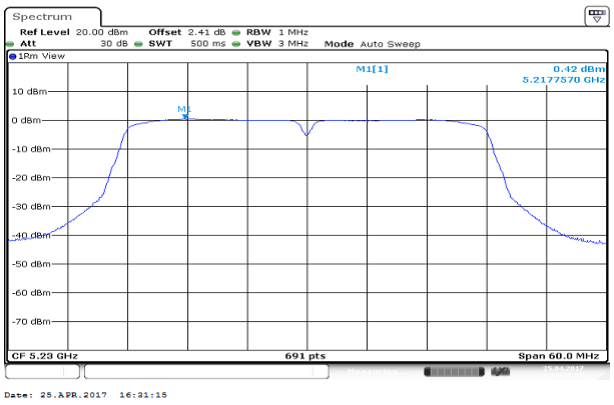
UNII-2c 5470-5725 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5500	4.16	11
Mid	5580	7.97	
High	5725	2.94	
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5500	3.88	11
Mid	5580	5.66	
High	5725	2.74	
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5510	-1.12	11
High	5670	1.59	
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Mid	5530	-4.59	11

UNII-3 5725-5825 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5745	13.29	30
Mid	5785	12.73	
High	5825	12.88	
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5745	13.46	30
Mid	5785	13.21	
High	5825	12.55	
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5755	10.95	30
High	5795	8.69	
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Mid	5775	6.09	30

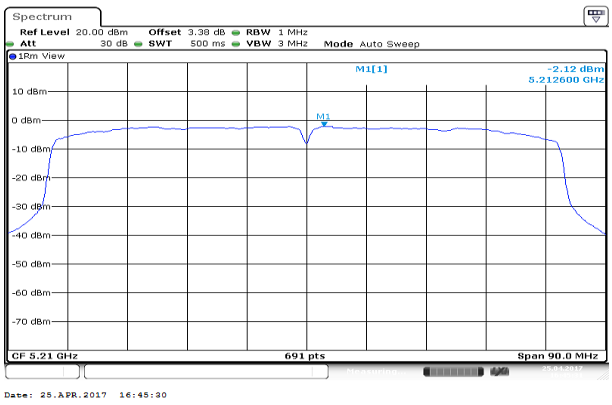
Test Data

UNII-1 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

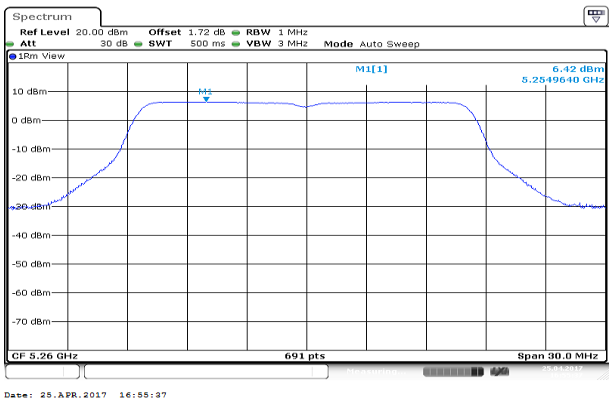
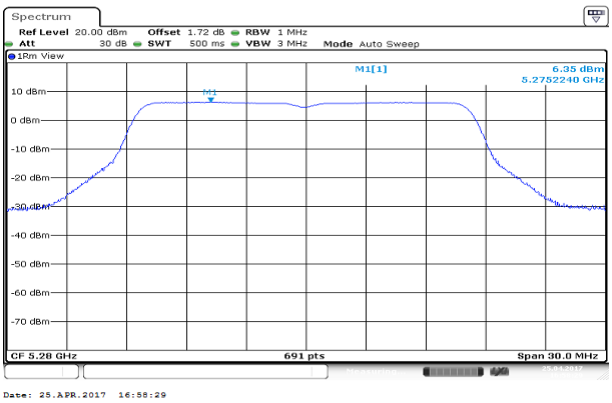
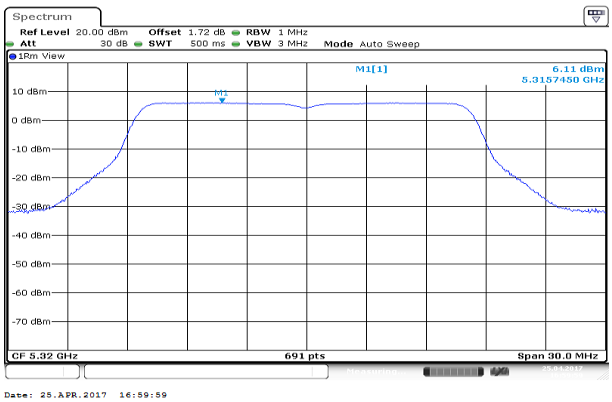
UNII-1 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

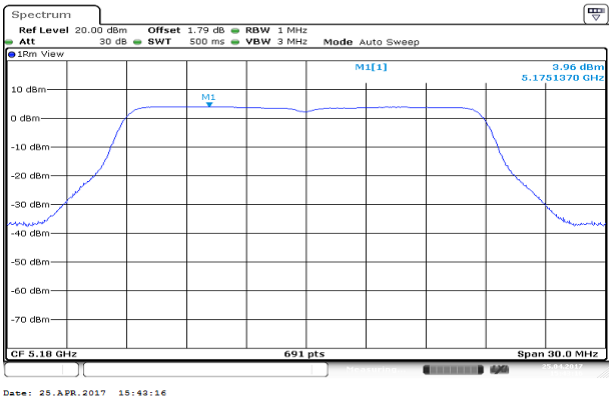
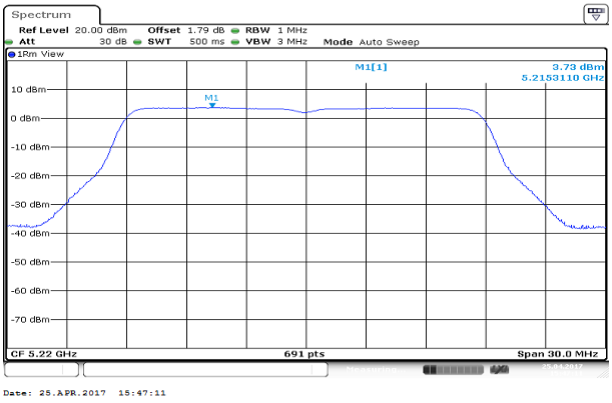
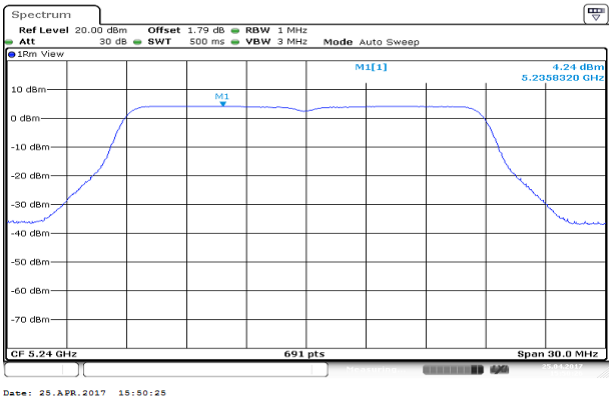
UNII-1 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

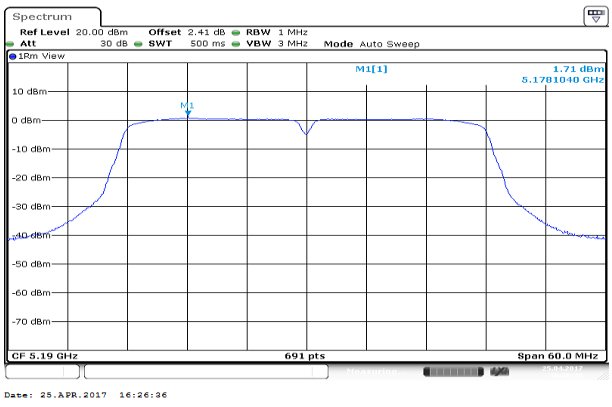
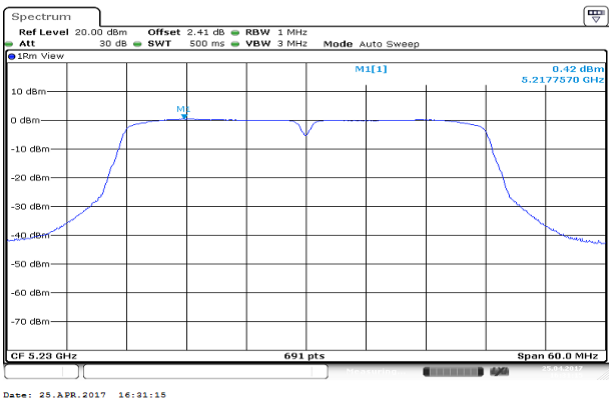
UNII-1 IEEE 802.11ac VHT80 mode- chain 0
Mid CH

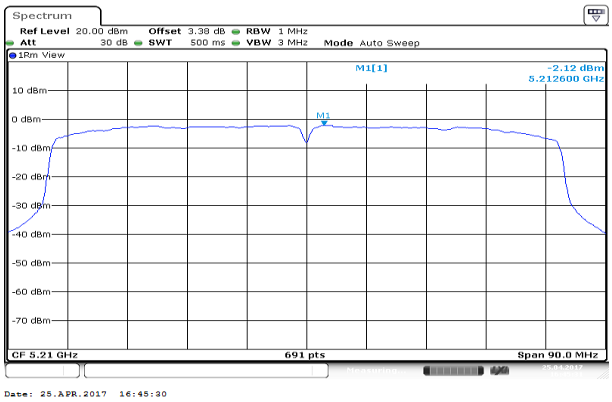


Test Data

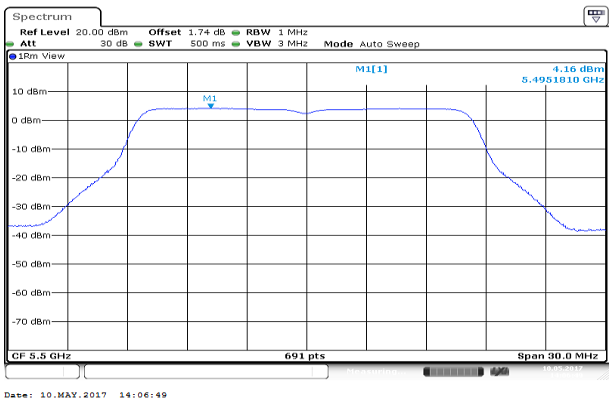
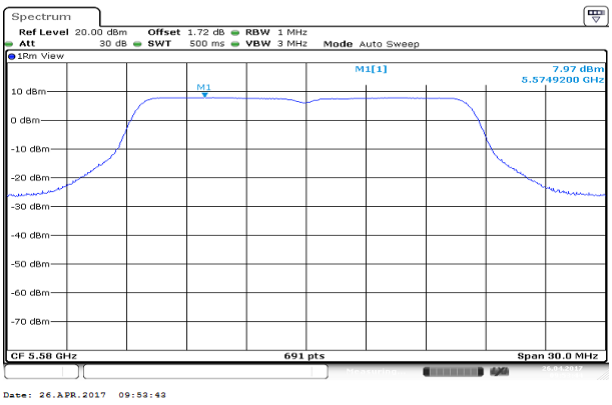
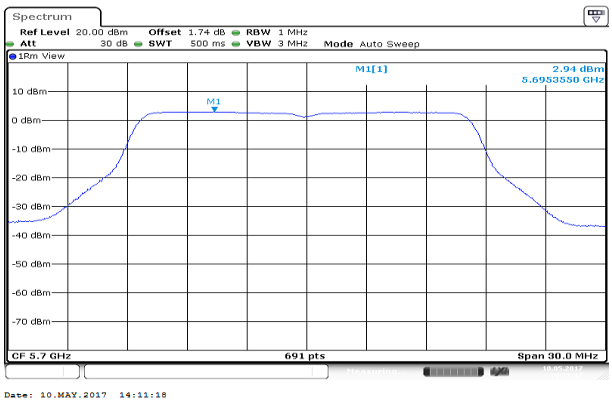
UNII-2a IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

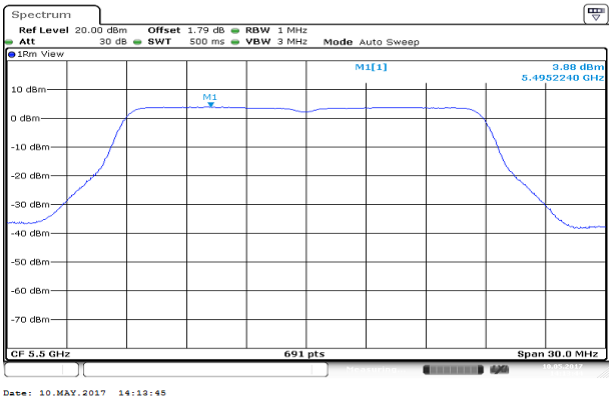
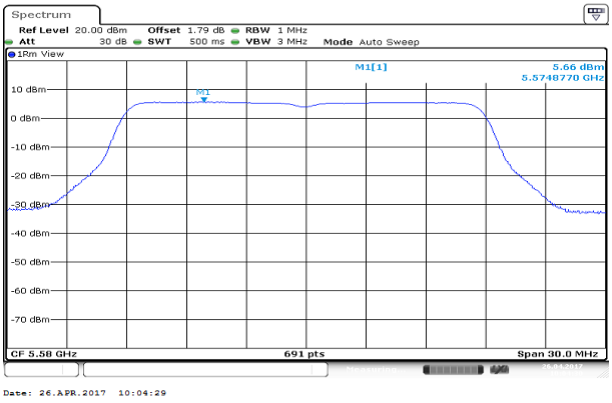
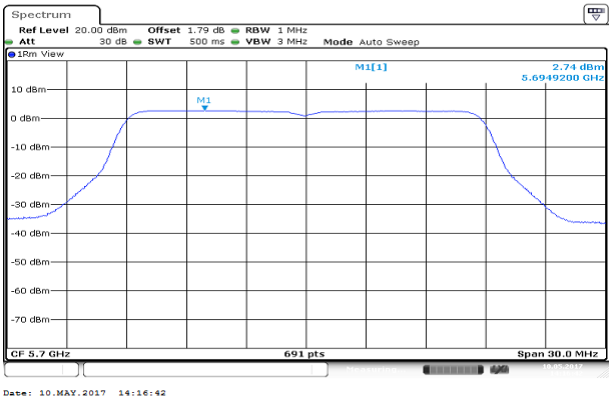
UNII-2a IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

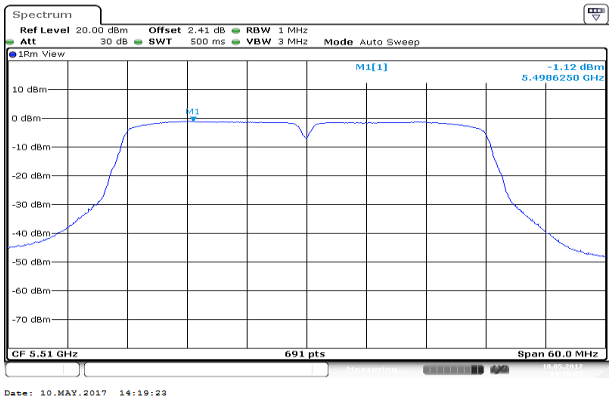
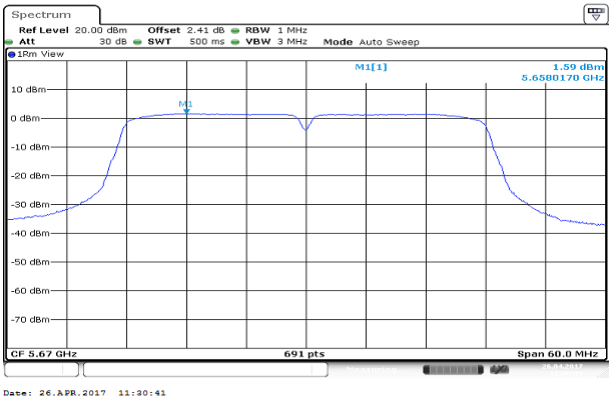
UNII-2a IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

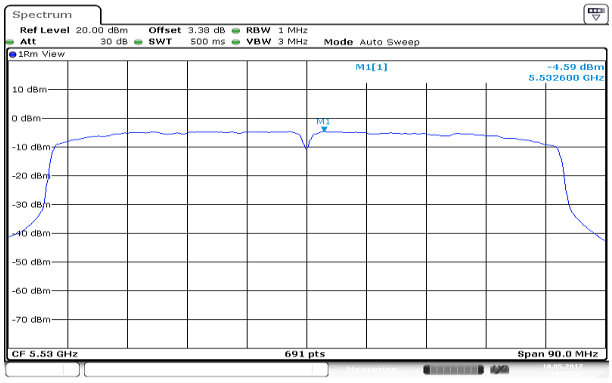
UNII-2a IEEE 802.11ac VHT80 mode- chain 0
Mid CH


Test Data

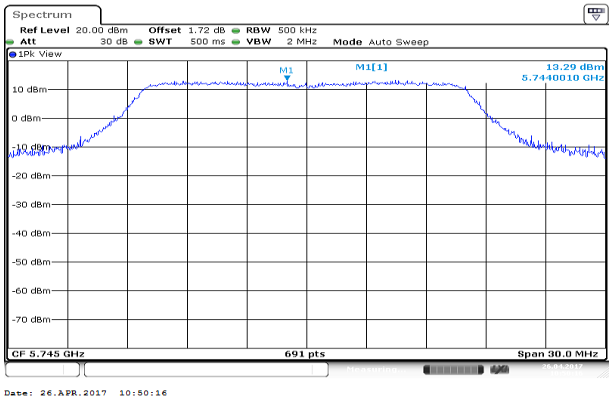
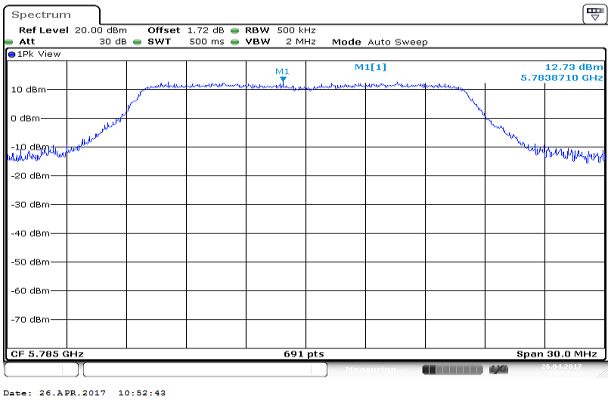
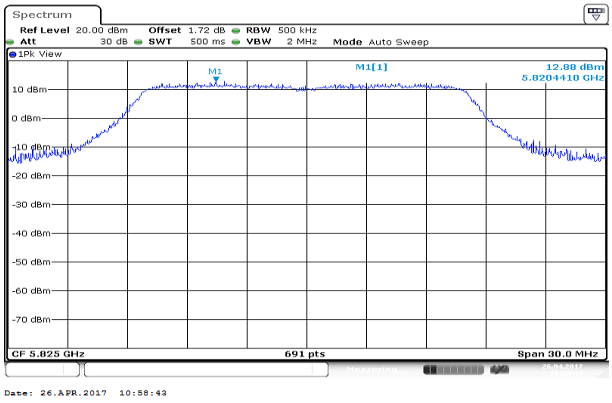
UNII-2c IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

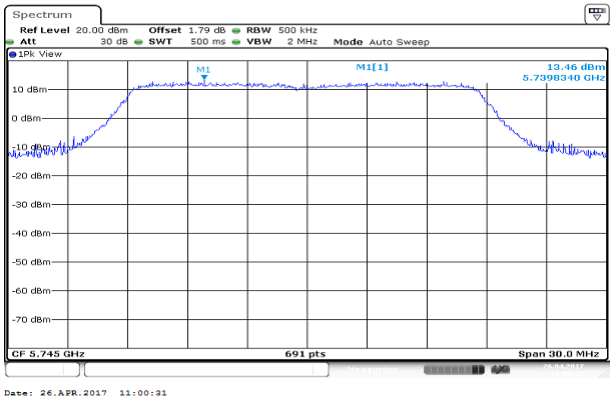
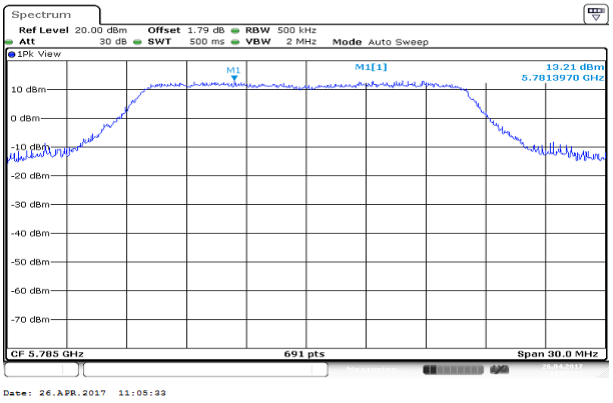
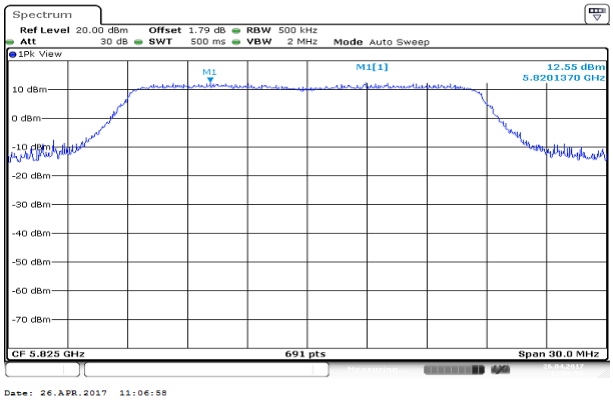
UNII-2c IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

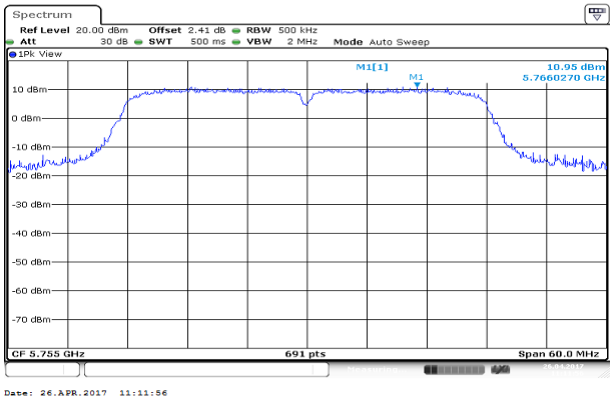
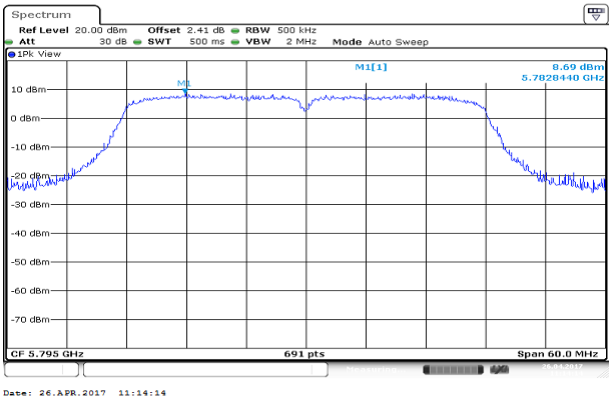
UNII-2c IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

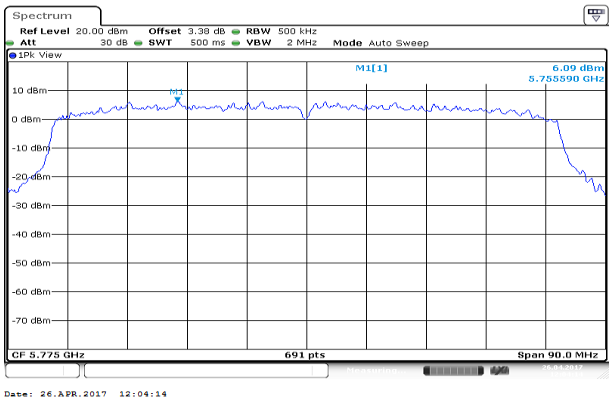
UNII-2c IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

Test Data

UNII-3 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

4.5 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

FCC according to §15.407, §15.209 and §15.205,

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

IC according to RSS-247 section 6.2.1(2), section 6.2.2(2), section 6.2.3(2) and section 6.2.4(2)

UNII-1 :

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz

UNII-2a and 2c :

For devices with operating frequencies in the band 5250-5350 MHz but having a channel bandwidth that overlaps the band 5150-5250 MHz, the devices' unwanted emission shall not exceed -27 dBm/MHz e.i.r.p. outside the band 5150-5350 MHz and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device shall be labelled "for indoor use only." Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

UNII-3:

For the band 5725-5850 MHz, emissions at frequencies from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p.
For emissions at frequencies more than 10 MHz above or below the band edges, the emissions power shall not exceed -27 dBm/MHz

4.5.2 Test Procedure

Test method Refer as KDB 789033 D02 v01r03, Section G.3, G.4, G.5, and G.6,.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

5. The SA setting following：

(1) Below 1G：RBW = 100kHz, VBW ≥ 3*RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G：

(2.1) For Peak measurement：RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

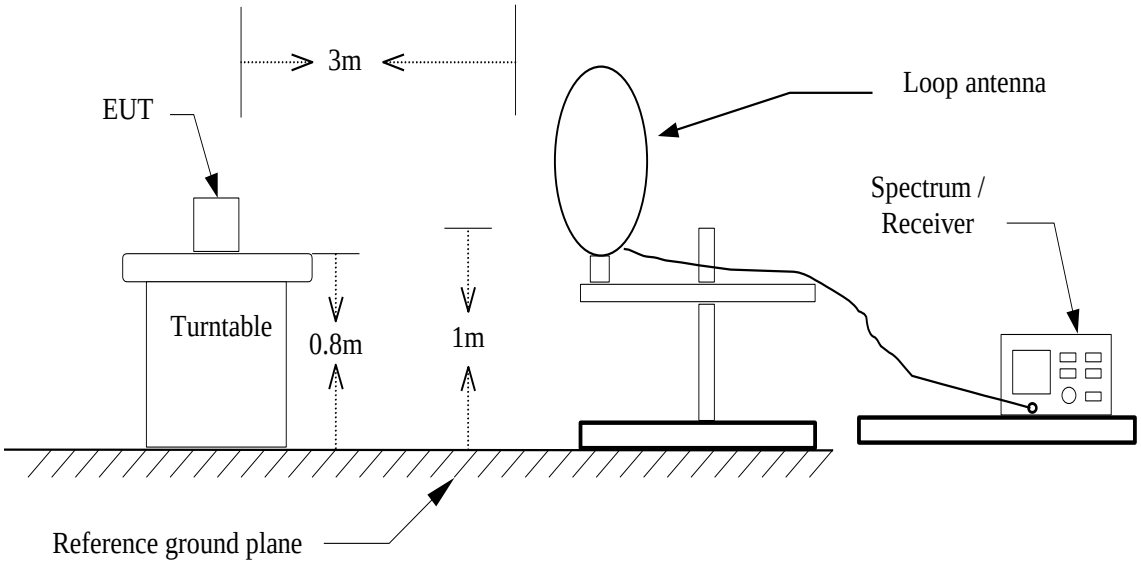
(2.2) For Average measurement：RBW = 1MHz, VBW

- If Duty Cycle ≥ 98%, VBW=10Hz.
- If Duty Cycle < 98%, VBW=1/T.

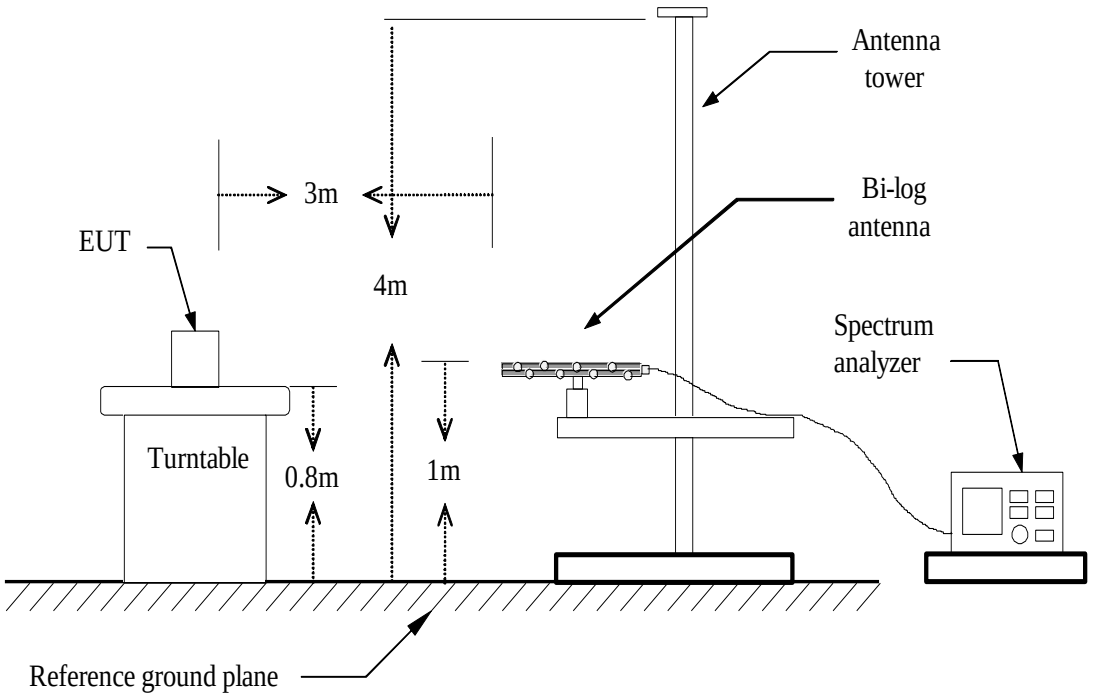
Configuration	Duty Cycle (%)	VBW
802.11a	91%	750Hz
802.11n HT20	88%	750Hz
802.11n HT40	76%	2KHz
802.11ac VHT80	61%	3.9KHz

4.5.3 Test Setup

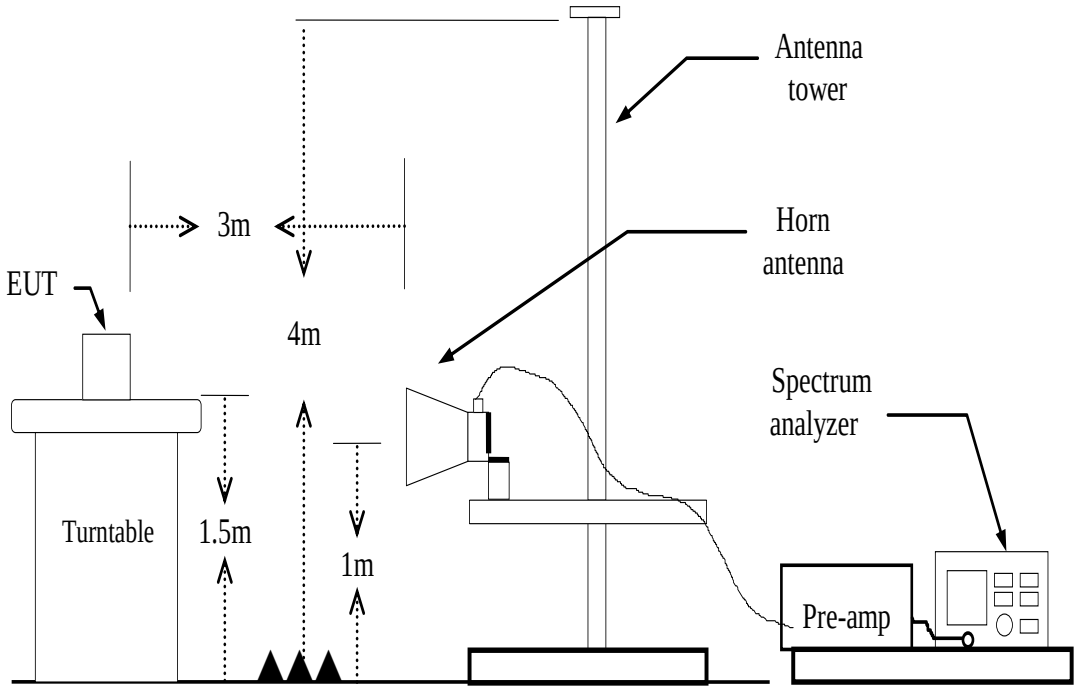
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz

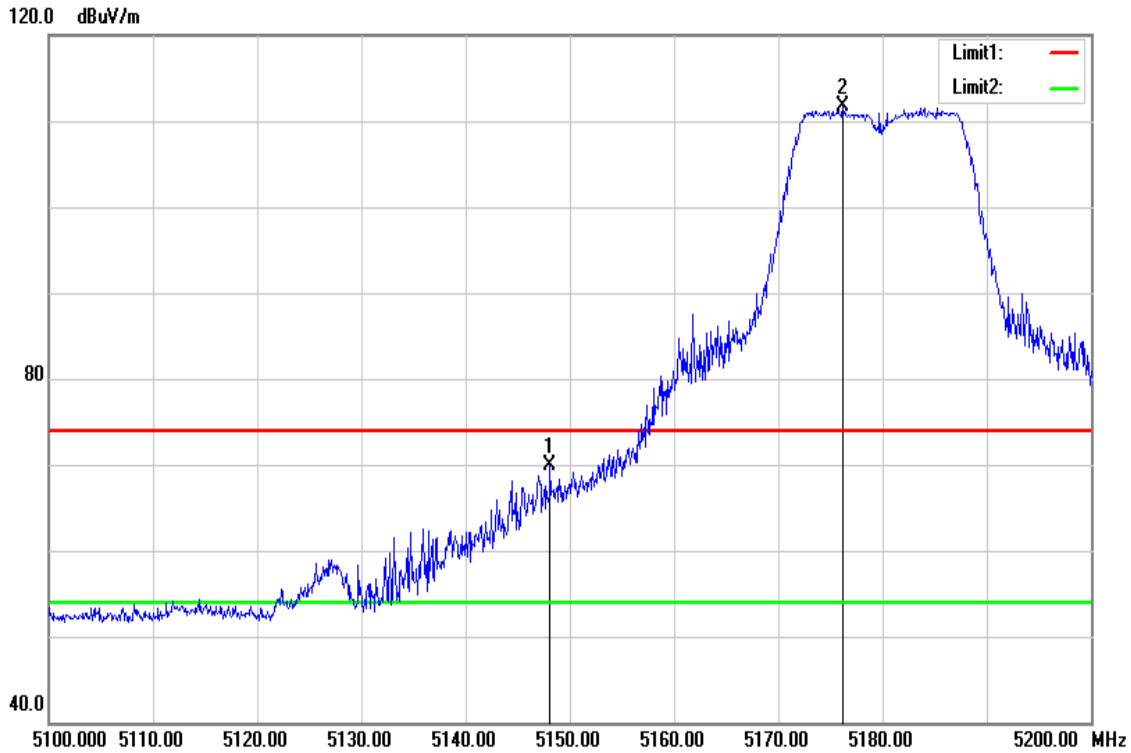


4.5.4 Test Result

Test Data

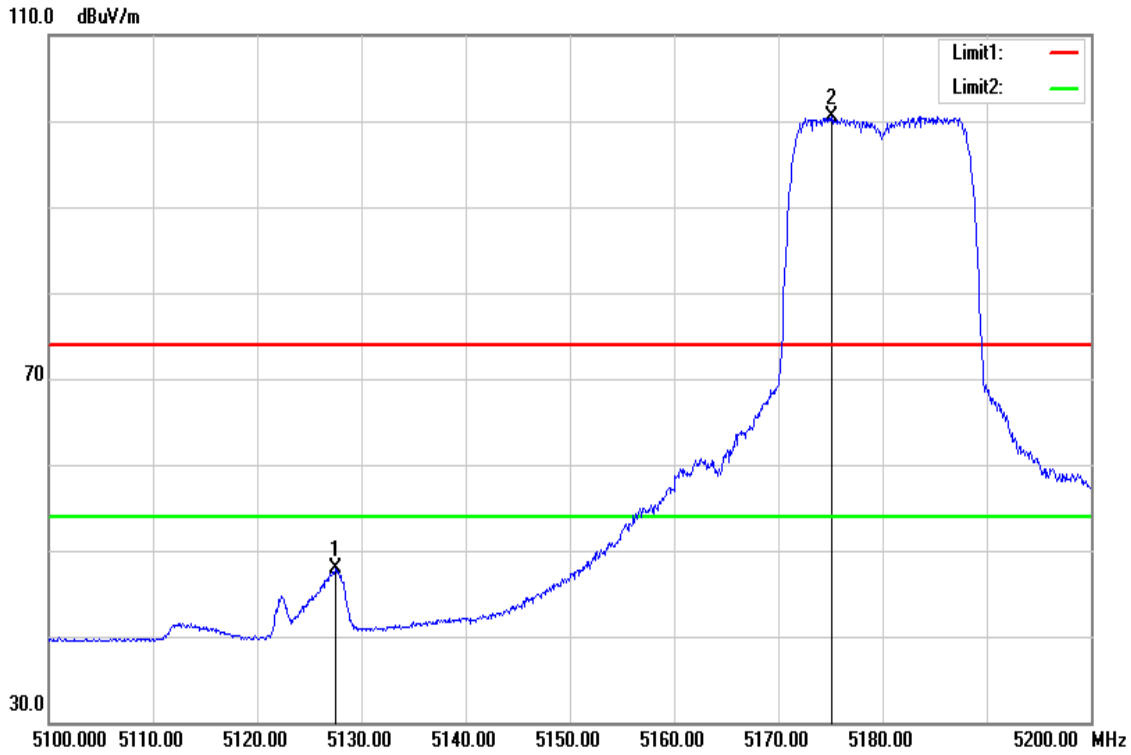
Band Edge Test Data for UNII-1

Test Mode	IEEE 802.11a Low CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



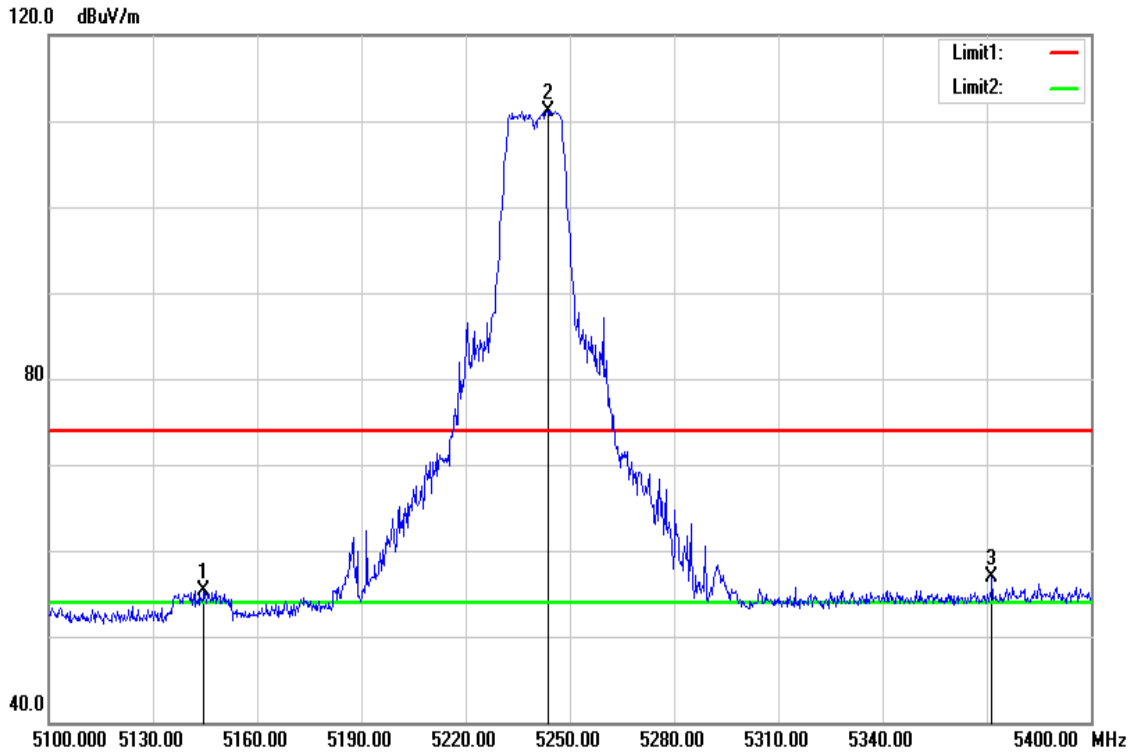
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5148.100	66.93	3.03	69.96	74.00	-4.04	peak
5176.200	107.99	3.80	111.79	-	-	peak

Test Mode	IEEE 802.11a Low CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



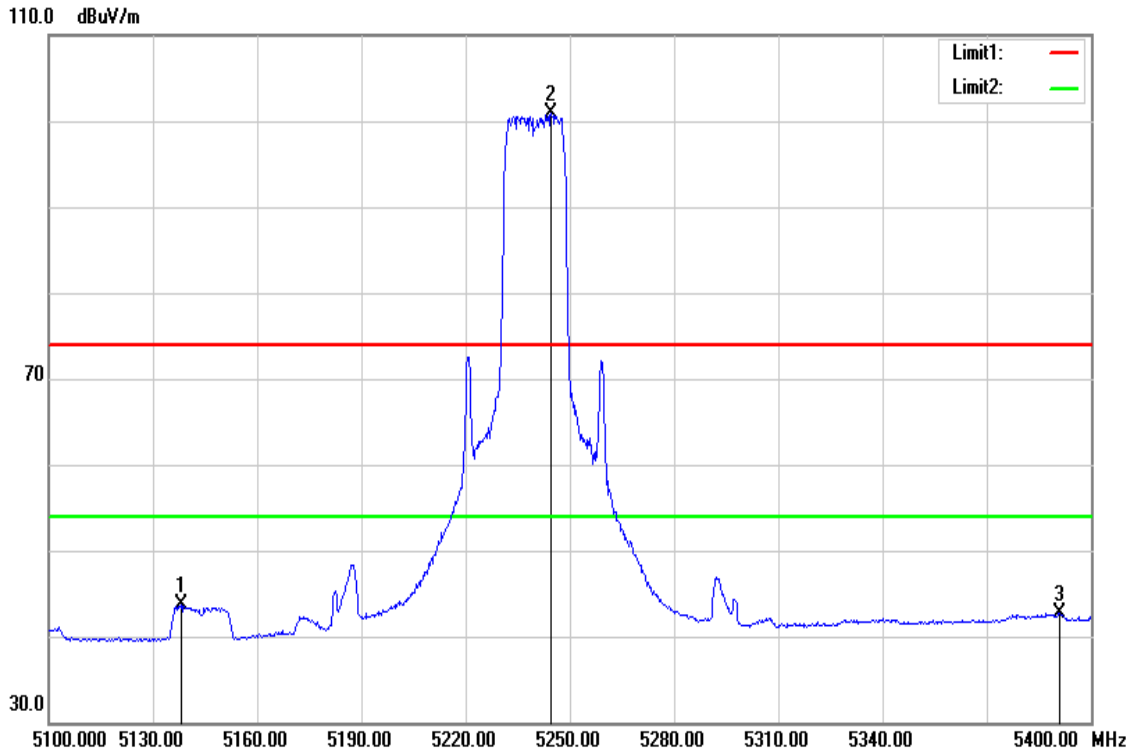
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5127.500	44.99	2.89	47.88	54.00	-6.12	AVG
5175.100	96.67	3.77	100.44	-	-	AVG

Test Mode	IEEE 802.11a High CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



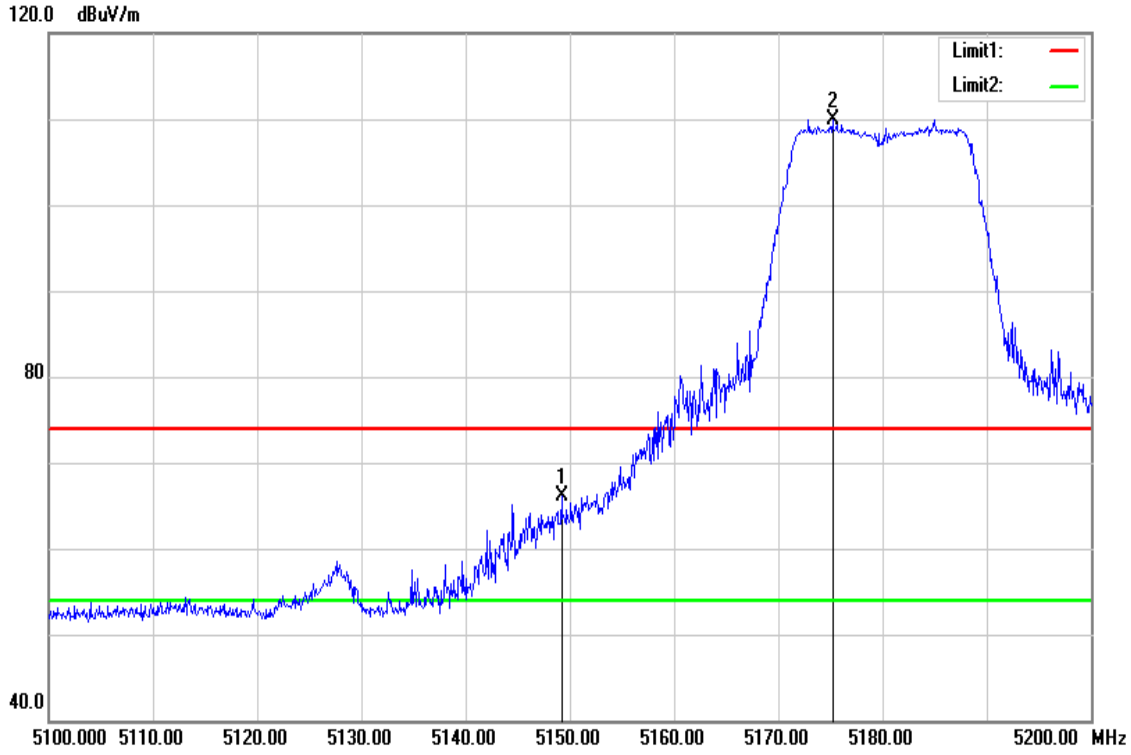
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5144.700	52.38	3.00	55.38	74.00	-18.62	peak
5243.700	106.55	4.64	111.19	-	-	peak
5371.500	51.45	5.49	56.94	74.00	-17.06	peak

Test Mode	IEEE 802.11a High CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



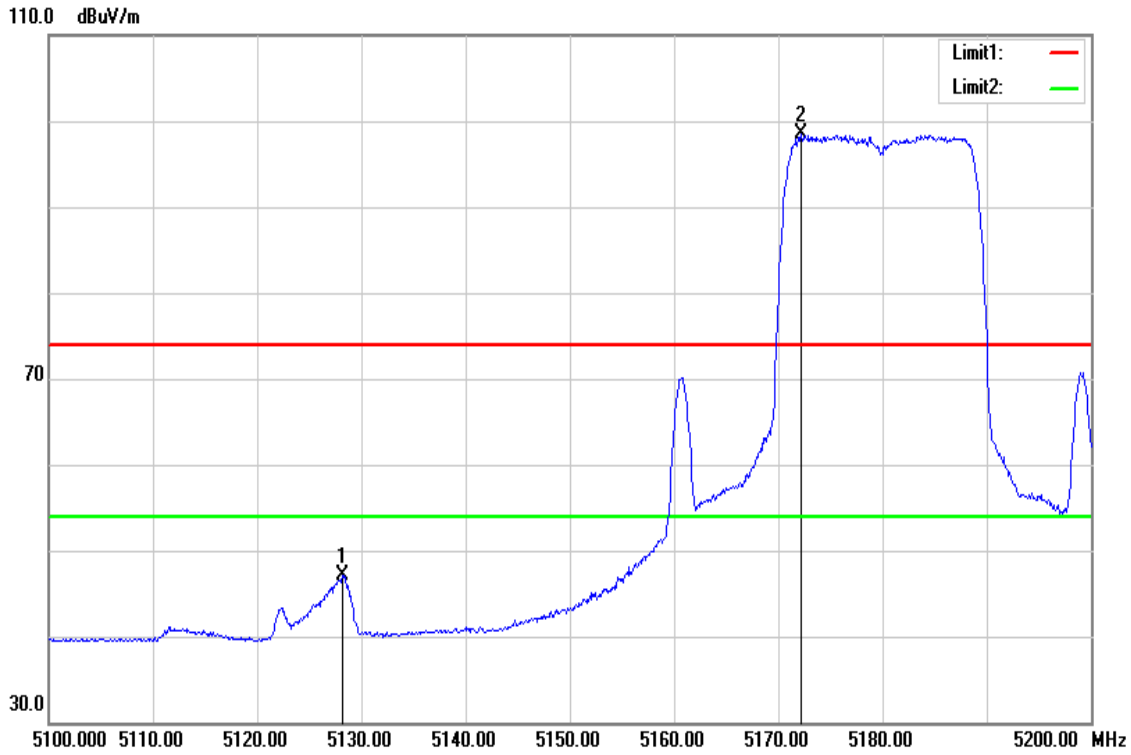
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5138.100	40.79	2.96	43.75	54.00	-10.25	AVG
5244.600	96.17	4.64	100.81	-	-	AVG
5391.000	36.99	5.65	42.64	54.00	-11.36	AVG

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



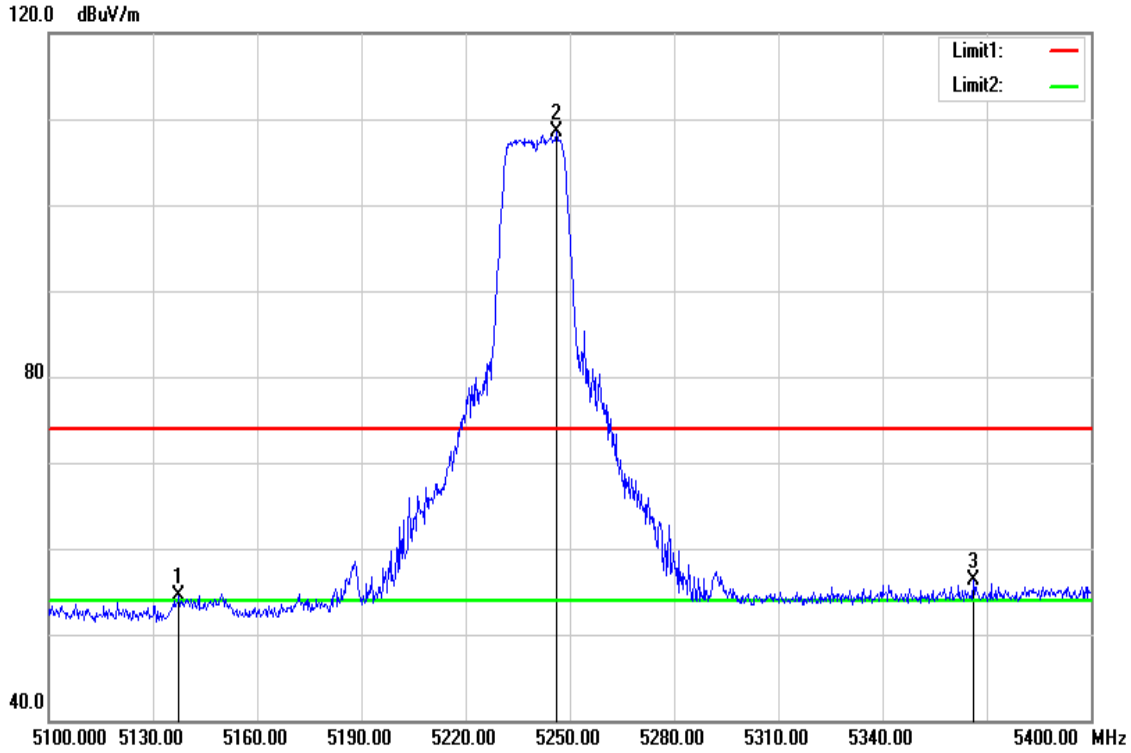
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.200	63.04	3.03	66.07	74.00	-7.93	peak
5175.200	106.21	3.77	109.98	-	-	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



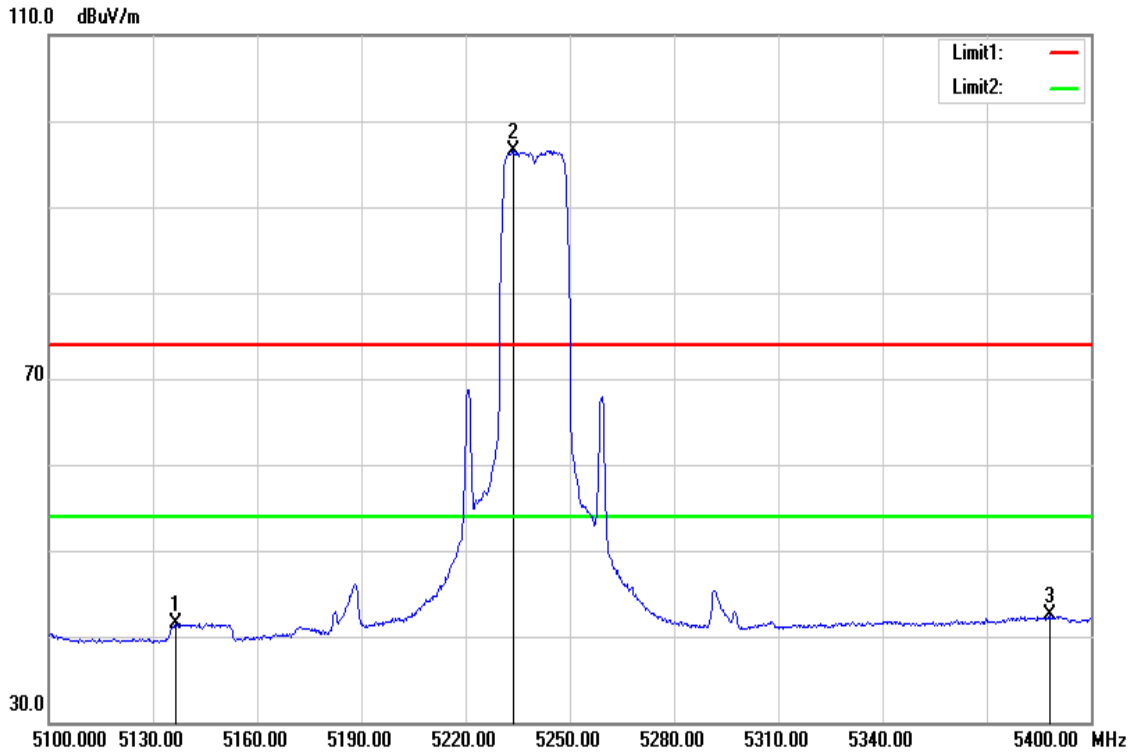
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5128.200	44.28	2.89	47.17	54.00	-6.83	AVG
5172.200	94.75	3.68	98.43	-	-	AVG

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



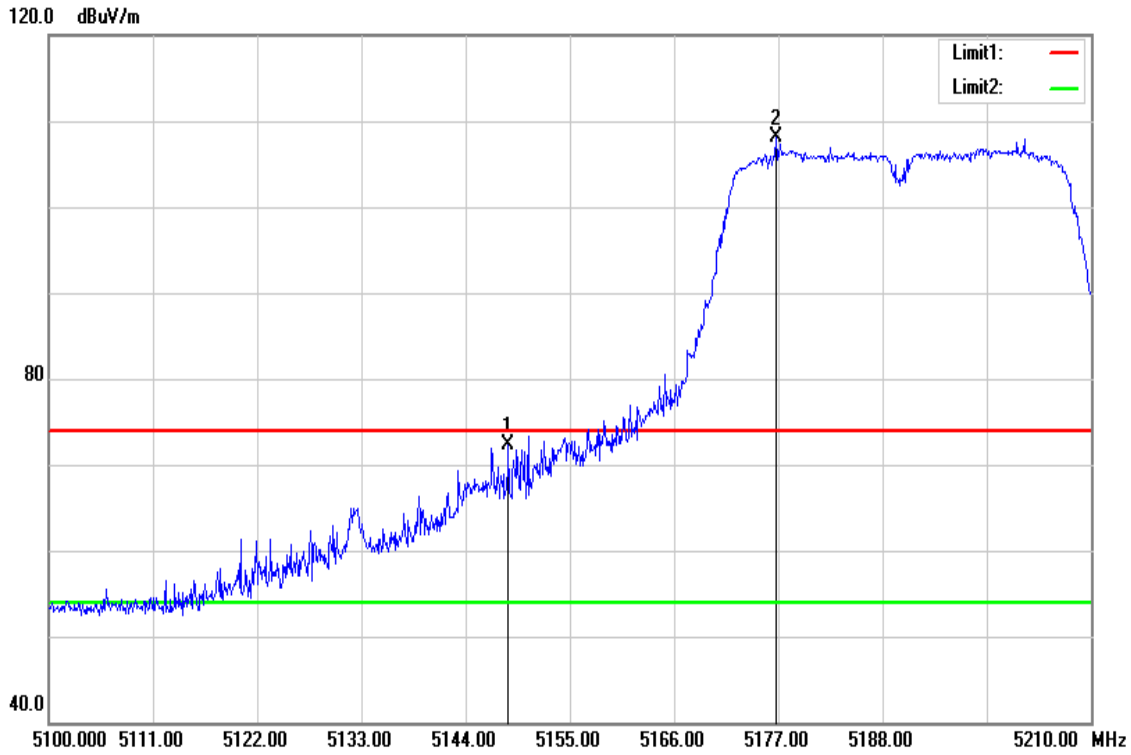
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5137.500	51.51	2.96	54.47	74.00	-19.53	peak
5246.100	103.85	4.65	108.50	-	-	peak
5366.100	50.90	5.44	56.34	74.00	-17.66	peak

Test Mode	IEEE 802.11n HT20 High CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



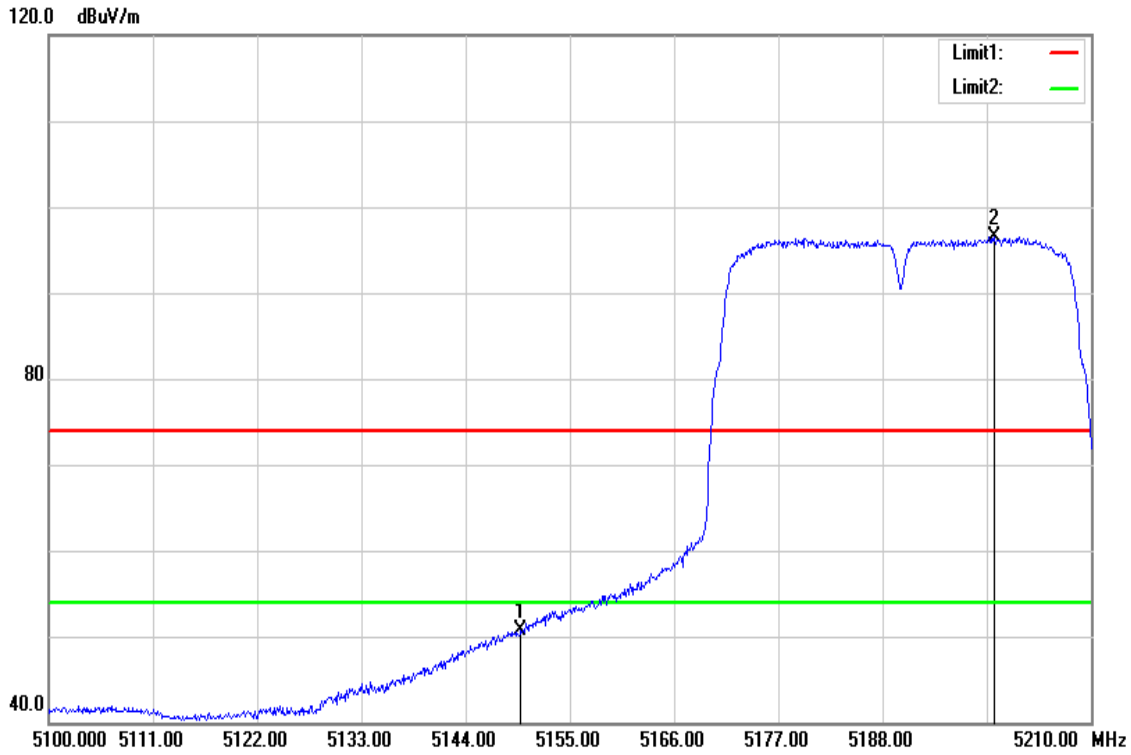
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5136.600	38.56	2.95	41.51	54.00	-12.49	AVG
5233.800	91.88	4.60	96.48	-	-	AVG
5388.000	36.82	5.62	42.44	54.00	-11.56	AVG

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



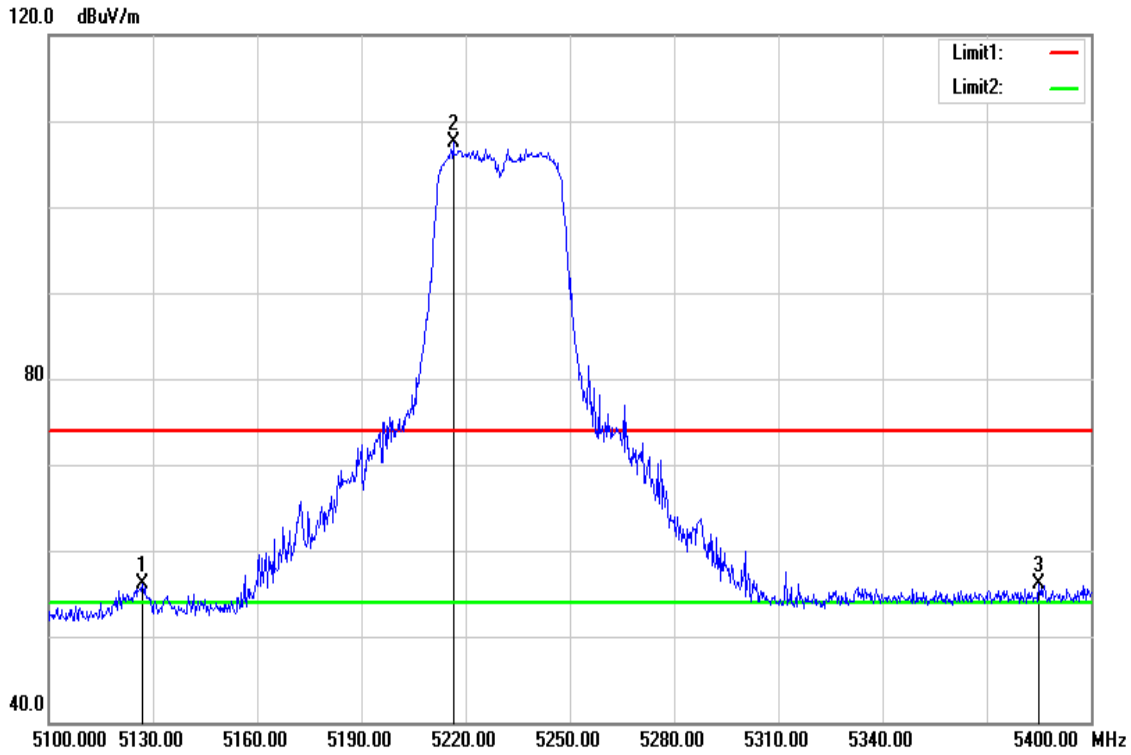
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5148.510	69.29	3.03	72.32	74.00	-1.68	peak
5176.780	104.26	3.82	108.08	-	-	peak

Test Mode	IEEE 802.11n HT40 Low CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



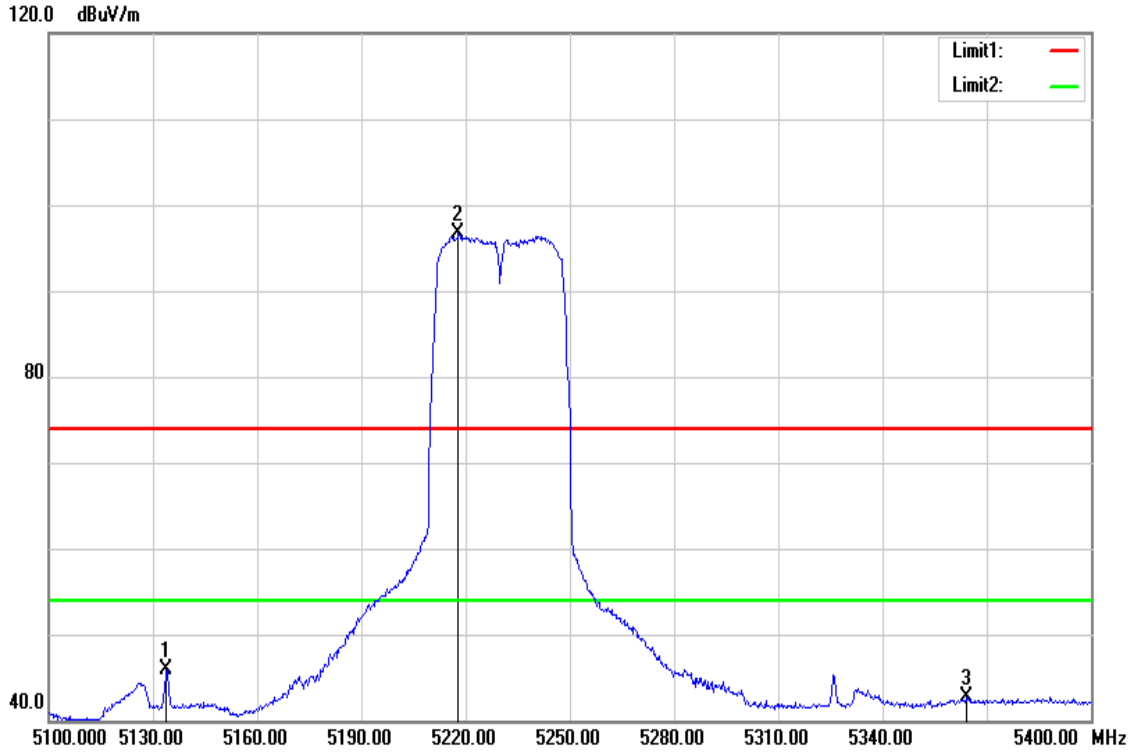
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.830	47.59	3.04	50.63	54.00	-3.37	AVG
5199.770	92.10	4.48	96.58	-	-	AVG

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



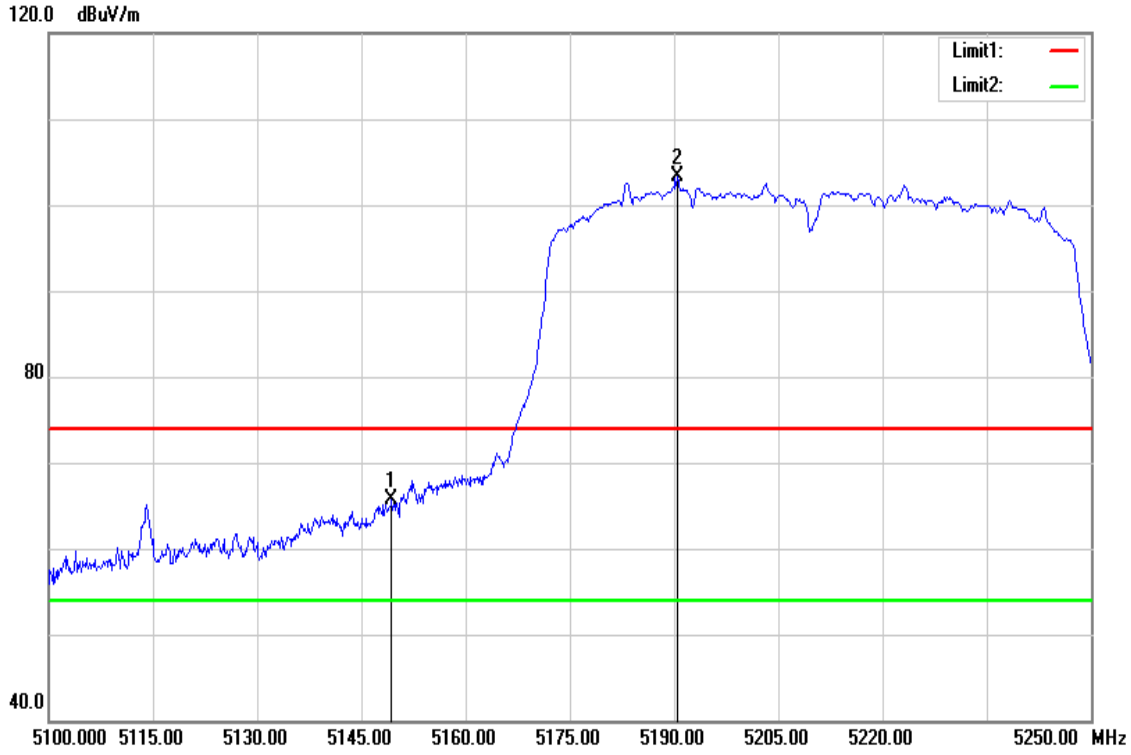
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5127.000	53.17	2.88	56.05	74.00	-17.95	peak
5216.400	102.95	4.55	107.50	-	-	peak
5385.000	50.58	5.60	56.18	74.00	-17.82	peak

Test Mode	IEEE 802.11n HT40 High CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



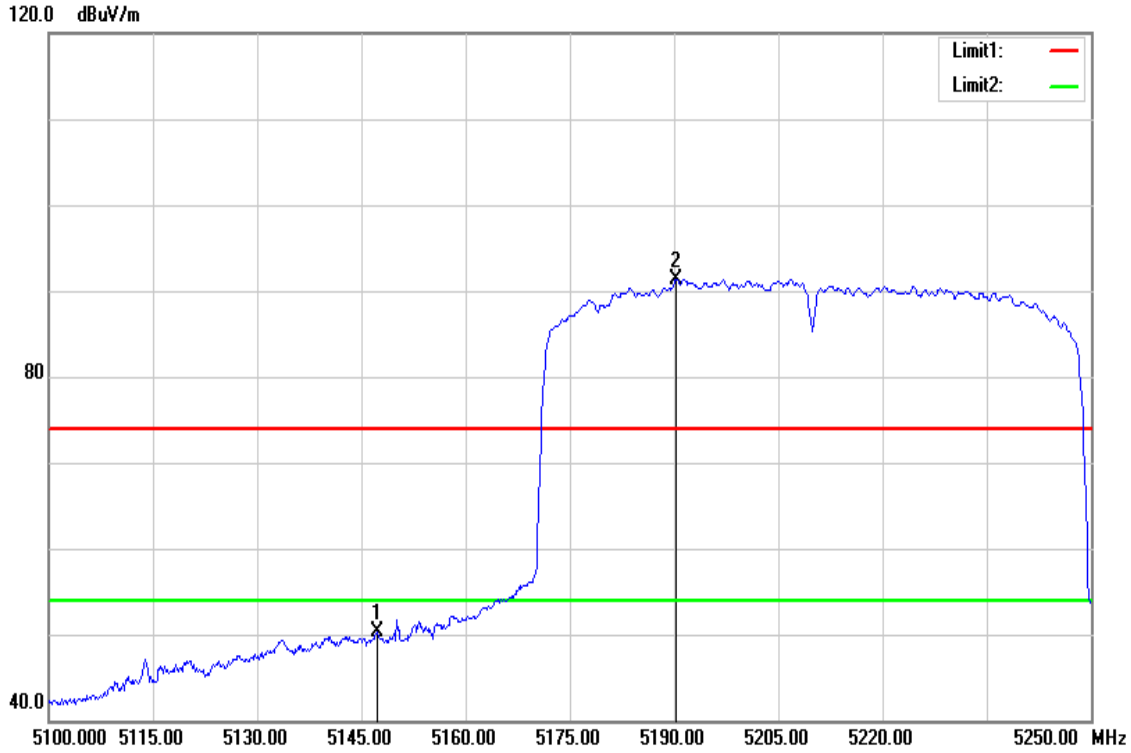
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5133.900	42.94	2.93	45.87	54.00	-8.13	AVG
5217.900	92.12	4.55	96.67	-	-	AVG
5364.000	37.27	5.42	42.69	54.00	-11.31	AVG

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.350	62.58	3.04	65.62	74.00	-8.38	peak
5190.450	99.06	4.21	103.27	-	-	peak

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz

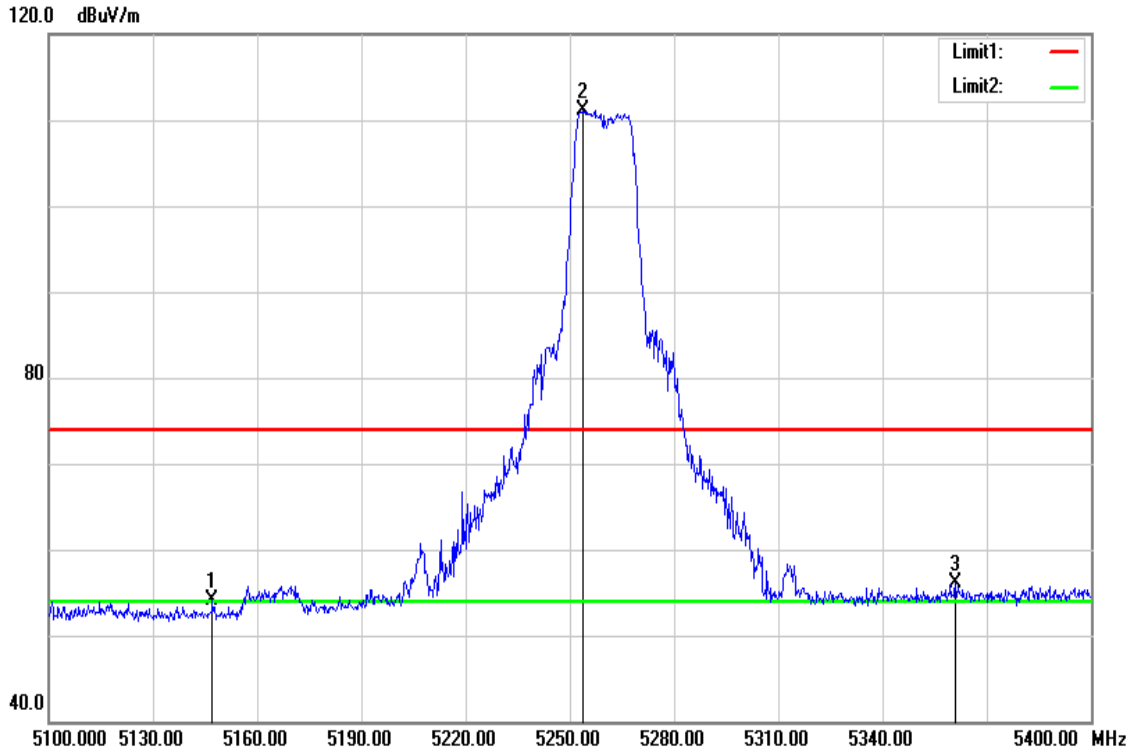


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5147.250	47.31	3.02	50.33	54.00	-3.67	AVG
5190.300	87.14	4.21	91.35	-	-	AVG

Test Data

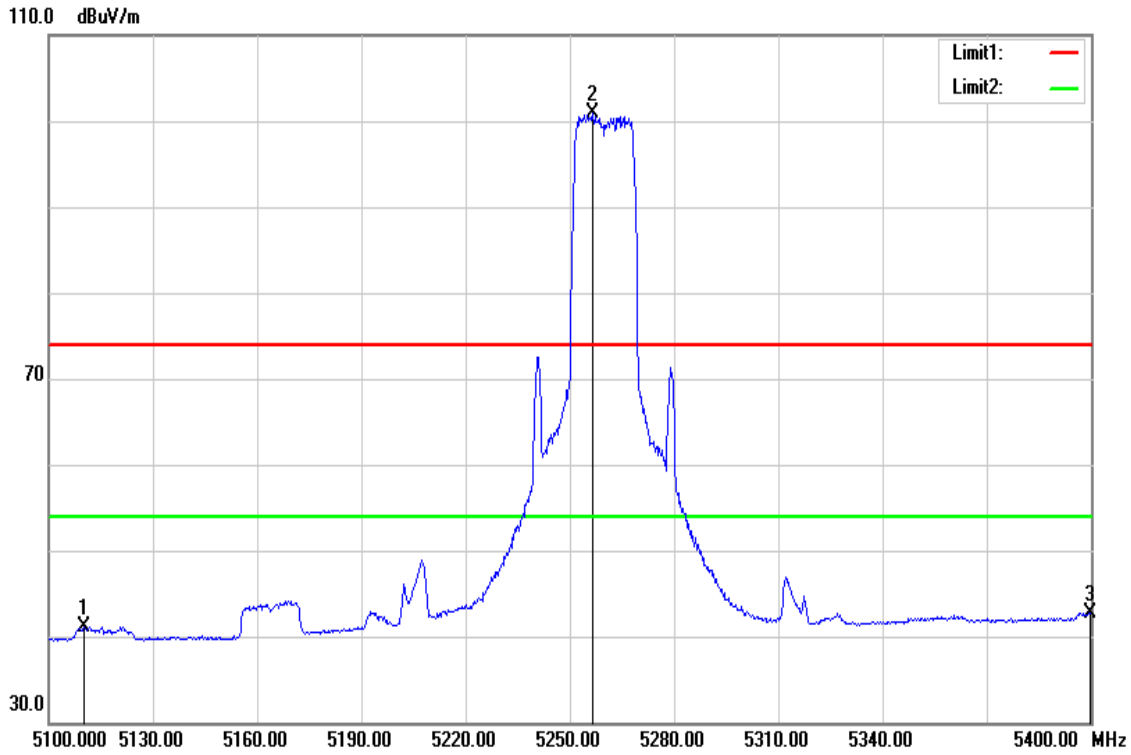
Band Edge Test Data for UNII-2a

Test Mode	IEEE 802.11a Low CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



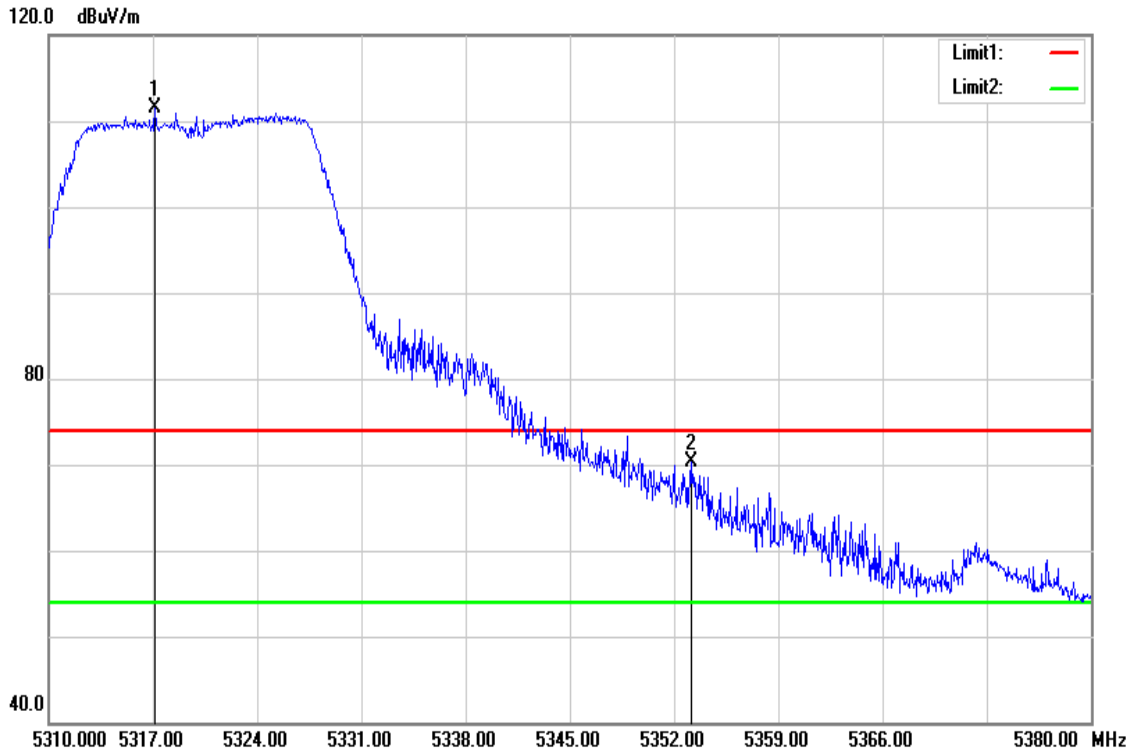
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5147.100	51.13	3.02	54.15	74.00	-19.85	peak
5253.600	106.45	4.67	111.12	-	-	peak
5361.000	50.67	5.40	56.07	74.00	-17.93	peak

Test Mode	IEEE 802.11a Low CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



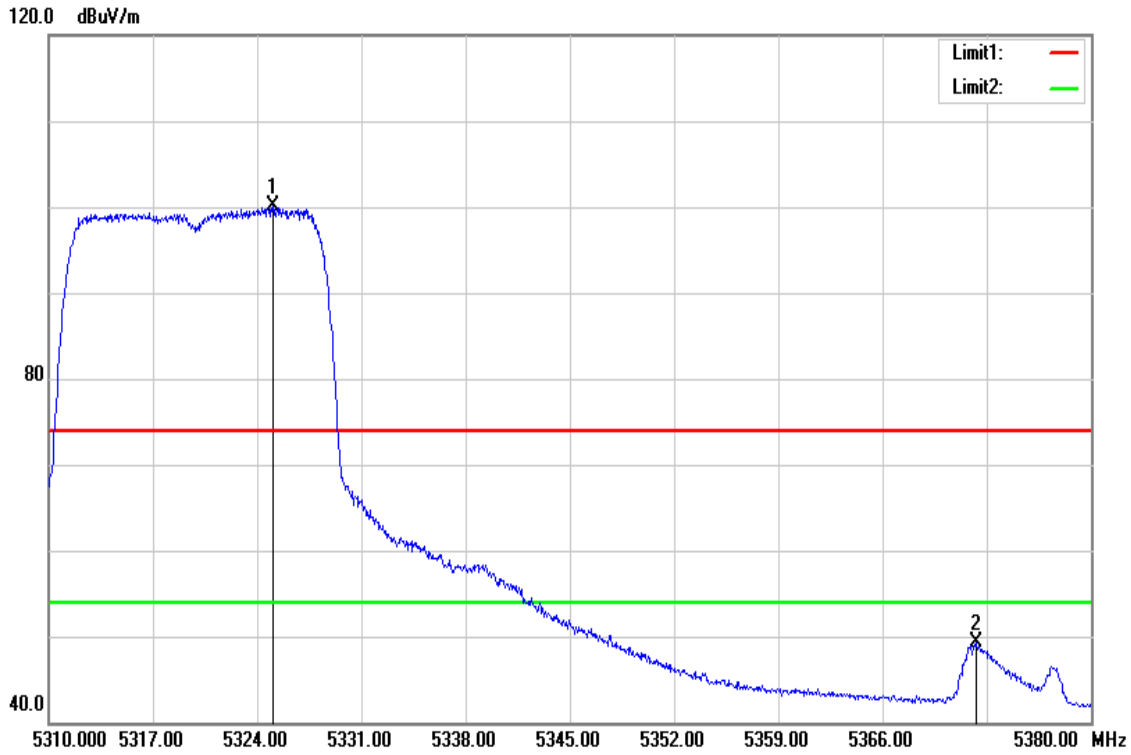
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5110.200	38.41	2.77	41.18	54.00	-12.82	AVG
5256.600	96.16	4.68	100.84	-	-	AVG
5399.700	37.07	5.72	42.79	54.00	-11.21	AVG

Test Mode	IEEE 802.11a High CH	Temp/Hum	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5317.140	106.52	4.99	111.51	-	-	peak
5353.190	65.00	5.34	70.34	74.00	-3.66	peak

Test Mode	IEEE 802.11a High CH	Temperature	22(℃)/ 47%RH
Test Item	Band Edge	Test Date	May 8, 2017
Polarize	Vertical	Test Engineer	Kevin Kuo
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5325.050	95.03	5.07	100.10	-	-	AVG
5372.300	43.74	5.49	49.23	54.00	-4.77	AVG