RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART E

INDUSTRY CANADA RSS-247

Test Standard	**FCC Part 15.407** **IC RSS-247 issue 2 and IC RSS-GEN issue 5**
Brand name	**AVer Dual Band Wirelss Dongle**
Product name	**AVer**
Model No.	**PW00U**
Test Result	**Pass**
Statements of Conformity	**Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.**

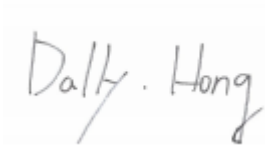
The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

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 Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Kevin Tsai
Deputy Manager

Reviewed by:



Dally Hong
Engineer

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	June 17, 2019	Initial Issue	ALL	May Lin
01	June 26, 2019	See the following Note Rev. (01)	P.13, P.75-77, P.109-110, P.113, P.186-187	May Lin

Rev (01):

1. Revised the chapter title、test limit、test data and test result.

Table of contents

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	AVer Information Inc. 8F., No.157, Da-An Rd., Tucheng Dist, New Taipei City, Taiwan
Manufacturer	AVer Information Inc. 8F., No.157, Da-An Rd., Tucheng Dist, New Taipei City, Taiwan
Equipment	AVer Dual Band Wirelss Dongle
Model No.	PW00U
Model Discrepancy	N/A
Trade Name	AVer
Received Date	March 15, 2019
Date of Test	March 26 ~ June 14, 2019
Power Operation	Power form host device.

Output Power(W)

Band	Mode	Frequency Range (MHz)	Output Power (W)
U-NII-1	IEEE 802.11a	5180 ~ 5240	0.0543
	IEEE 802.11n HT 20 MHz	5180 ~ 5240	0.0511
	IEEE 802.11n HT 40 MHz	5190 ~ 5230	0.0502
	IEEE 802.11ac VHT 80 MHz	5210	0.0377
U-NII-2a	IEEE 802.11a	5260 ~ 5320	0.0419
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	0.0684
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	0.0557
	IEEE 802.11ac VHT 80 MHz	5290	0.0422
U-NII-2c	IEEE 802.11a	5500 ~ 5700	0.0617
	IEEE 802.11n HT 20 MHz	5500 ~ 5700	0.0664
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	0.0736
	IEEE 802.11ac VHT 80 MHz	5530	0.0479
U-NII-3	IEEE 802.11a	5745 ~ 5825	0.0568
	IEEE 802.11n HT 20 MHz	5745 ~ 5825	0.0813
	IEEE 802.11n HT 40 MHz	5755 ~ 5795	0.0726
	IEEE 802.11ac VHT 80 MHz	5775	0.0551

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 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 80 MHz: 5290 MHz
	UNII-2c
	IEEE 802.11a: 5500 ~ 5700 MHz
	IEEE 802.11n HT 20 MHz: 5500 ~ 5700 MHz
	IEEE 802.11n HT 40 MHz: 5510 ~ 5670 MHz
	IEEE 802.11ac VHT 80 MHz: 5530 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 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 80 MHz mode: OFDM

Remark:
Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 and RSS-GEN Table 1 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: 1.78 dBi
Antenna Connector	N/A

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

***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.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Dally Hong	-
Radiation	Dally Hong	-
RF Conducted	Dally Hong	-

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

3M 966 Chamber Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/13/2018	07/12/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	02/26/2019	02/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
Double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	08/20/2018	08/19/2019
High Pass Filters	MICRO TRONICS	HPM13195	003	02/26/2019	02/25/2020
Horn Antenna	ETS LINDGREN	3116	00026370	12/26/2018	12/25/2019
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/31/2018	05/30/2019
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
Software	e3 6.11-20180413				

RF Conducted Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Coaxial Cable	Woken	WC12	CC001	06/29/2018	06/28/2019
Power Meter	Anritsu	ML2495A	1149001	02/12/2019	02/11/2020
Power Seneor	Anritsu	MA2491A	030982	02/12/2019	02/11/2020
Signal Analyzer	R&S	FSV 40	101073	09/27/2018	09/26/2019
Software	EZ-EMC(CCS-3A1-CE-五股)				

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

AC line Conduction Test Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
CABLE	EMCI	CFD300-NL	CERF	06/29/2018	06/28/2019
EMI Test Receiver	R&S	ESCI	100064	07/24/2018	07/23/2019
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020
Software	N/A				

Adaptivity Room / Dynamic Frequency Selection					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Attenuator	E-INSTRUMENT	EPA-600H	EC1400050	07/25/2018	07/24/2019
Coaxial Cable	Woken	SS402	DC001	06/29/2018	06/28/2019
Coaxial Cable	Woken	SS402	DC002	06/29/2018	06/28/2019
Coaxial Cable	Woken	SS402	DC003	06/29/2018	06/28/2019
Coaxial Cable	Woken	WC12	DC004	06/29/2018	06/28/2019
Coaxial Cable	Woken	WC12	DC005	06/29/2018	06/28/2019
Directional Couplers	Agilent	87301D	MY44350252	07/24/2018	07/23/2019
Power Divider	Marvelous Microwave	MVE8586	16011206	07/27/2018	07/26/2019
Power Divider	Solvang Technology	STI08-0015	008	07/27/2018	07/26/2019
Spectrum Analyzer	R&S	FSU 26	100258	06/25/2018	06/24/2019
Vector Signal Generator	R&S	SMU 200A	101480	03/27/2019	03/26/2020
Vector Signal Genertor	R&S	SMU 200A	103439	05/04/2018	05/03/2019
Wideband Radio Communication Tester	R&S	CMW 500	116875	04/20/2018	04/19/2019
Bluetooth Test Set	Anritsu	MT8852B	750013	05/24/2018	05/23/2019
WLAN Test Set	Anritsu	MT-8860C	1211004	03/03/2019	03/02/2020
Software	GPIBShot, DFS-Aggregate-Time FSU, LANLook, R&S Pulse Sequencer DFS				

Remark:

1. Each piece of equipment is scheduled for calibration once a year.

2. N.C.R. = No Calibration Required.

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**
1	NB(L)	Toshiba	PORTEGE R30-A	N/A	PD97260H

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 789033 D02, KDB 905462 D02.

2. TEST SUMMERY

FCC Standard Sec.	IC Standard Sec.	Chapter	Test Item	Result
15.203	-	1.3	Antenna Requirement	Pass
15.207	RSS-Gen (8.8)	4.1	AC Conducted Emission	Pass
15.403(i)	-	4.2	26dB Bandwidth	Pass
15.407(e)	RSS-247(6.2.4)	4.2	6dB Bandwidth	Pass
2.1049	RSS Gen (6.7)	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
15.407(h)	-	4.7	Dynamic Frequency Selection	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE EUT CHANNEL NUMBER OF OPERATING CONDITION

Operation mode	1. IEEE 802.11a mode: 6Mbps 2. IEEE 802.11n HT 20 MHz mode: MCS0 3. IEEE 802.11n HT 40 MHz mode: MCS0 4. IEEE 802.11ac VHT 20 MHz mode: MCS0 5. IEEE 802.11ac VHT 40 MHz mode: MCS0 5. IEEE 802.11ac VHT 80 MHz mode: MCS0

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	4 Channels
	IEEE 802.11n HT 20 MHz	5260 ~ 5320	4 Channels
	IEEE 802.11n HT 40 MHz	5270 ~ 5310	2 Channels
	IEEE 802.11ac VHT 20 MHz	5260 ~ 5320	4 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	11 Channels
	IEEE 802.11n HT 20 MHz	5500 ~ 5700	11 Channels
	IEEE 802.11n HT 40 MHz	5510 ~ 5670	5 Channels
	IEEE 802.11ac VHT 20 MHz	5500 ~ 5700	11 Channels
	IEEE 802.11ac VHT 40 MHz	5510 ~ 5670	5 Channels
	IEEE 802.11ac VHT 80 MHz	5530~5610	2 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.The mode IEEE 802.11ac VHT20 and VHT40 are only different in control messages with IEEE 802.11n 20 MHz and HT40, and have same power setting. Therefore, the highest power (IEEE 802.11n 20 MHz and HT40) were test conducted and radiated measurement and recorded in this report.
3. For Canada the EUT Frequency Range 5600~5650MHz will be disabled.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Power supply Mode	**Mode 1: EUT power by host system.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

Radiated Emission Measurement Above 1G	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Power supply Mode	**Mode 1: EUT power by host system.**
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**

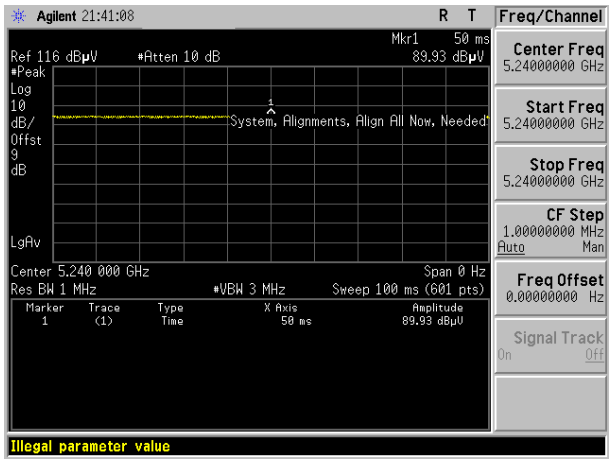
Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Power supply Mode	**Mode 1: EUT power by host system.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

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 (Y-Plane and Vertical) were recorded in this report
3. For below 1G, AC power line conducted emission and radiation emission were performed the EUT transmit at the highest output power channel as worse case.

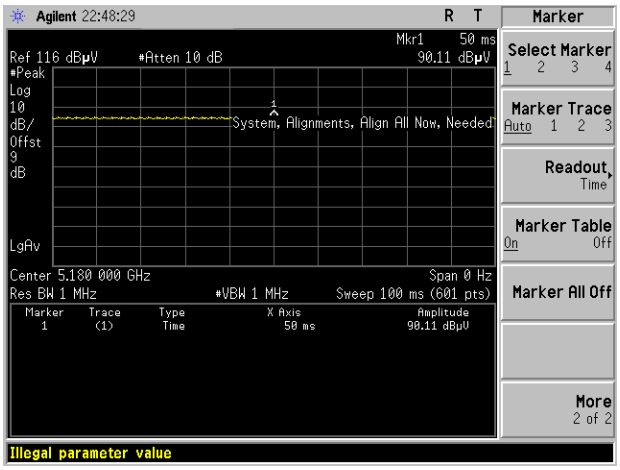
3.3 EUT DUTY CYCLE

Duty Cycle			
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)
802.11a	1.0000	1.0000	100.00%
802.11n 20	1.0000	1.0000	100.00%
802.11n 40	1.0000	1.0000	100.00%
802.11ac VHT80	1.0000	1.0000	100.00%

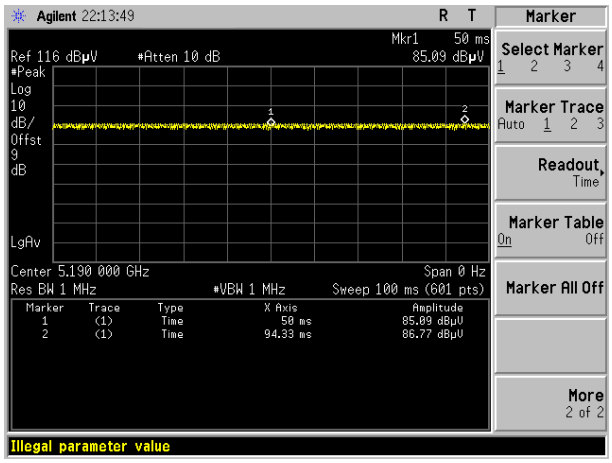
802.11a



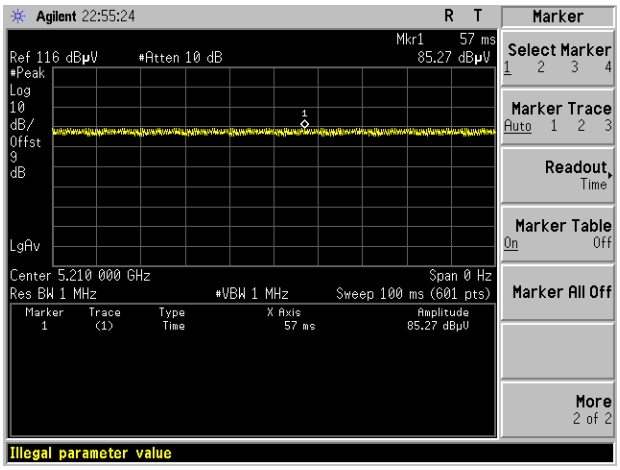
802.11n 20 MHz



802.11n 40 MHz



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

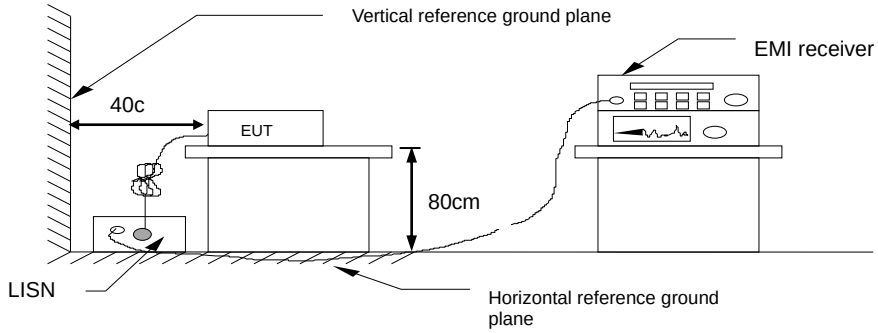
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 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

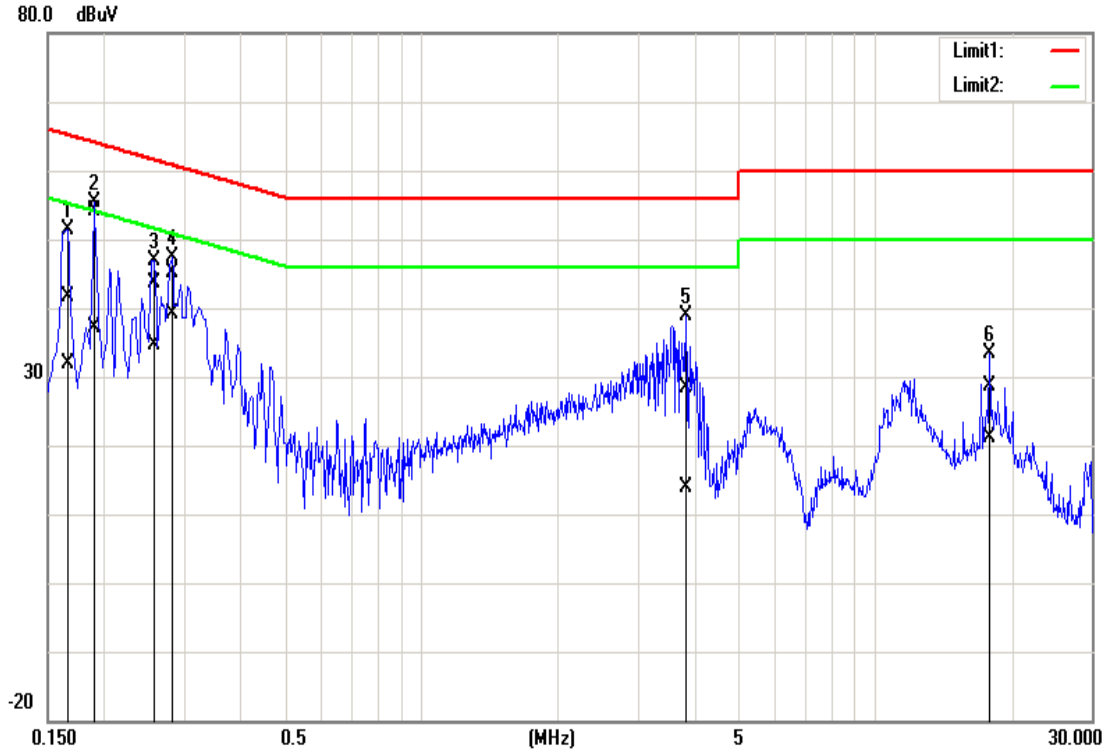


4.1.4 Test Result

Pass.

Test Data

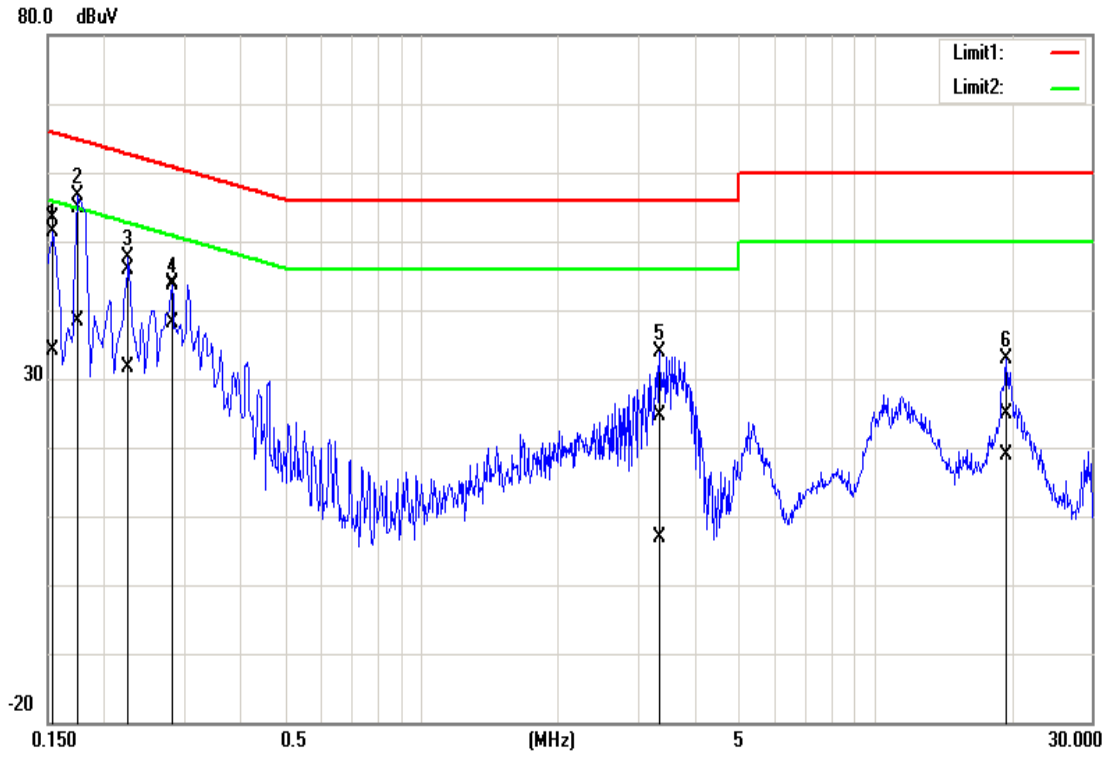
Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Phase:	Line	Test Date	March 26, 2019
		Test Engineer	Dally Hong



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
0.1660	41.55	31.65	0.16	41.71	31.81	65.16	55.16	-23.45	-23.35	Pass
0.1900	53.93	37.00	0.15	54.08	37.15	64.04	54.04	-9.96	-16.89	Pass
0.2580	43.47	34.48	0.15	43.62	34.63	61.50	51.50	-17.88	-16.87	Pass
0.2820	44.96	39.01	0.15	45.11	39.16	60.76	50.76	-15.65	-11.60	Pass
3.8300	28.05	13.49	0.27	28.32	13.76	56.00	46.00	-27.68	-32.24	Pass
17.9060	28.07	20.53	0.65	28.72	21.18	60.00	50.00	-31.28	-28.82	Pass

Report No.: T190322W01-RP4-1 Ref. No.: T190315W01-RP4

Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Phase:	Line	Test Date	March 26, 2019
		Test Engineer	Dally Hong



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
0.1540	53.23	33.94	0.10	53.33	34.04	65.78	55.78	-12.45	-21.74	Pass
0.1740	54.84	38.35	0.10	54.94	38.45	64.77	54.77	-9.83	-16.32	Pass
0.2260	45.79	31.53	0.10	45.89	31.63	62.60	52.60	-16.71	-20.97	Pass
0.2820	43.85	38.05	0.10	43.95	38.15	60.76	50.76	-16.81	-12.61	Pass
3.3580	24.35	6.80	0.19	24.54	6.99	56.00	46.00	-31.46	-39.01	Pass
19.4980	24.25	18.37	0.54	24.79	18.91	60.00	50.00	-35.21	-31.09	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 Section C, D, and ANSI C63.10: 2013 clause 6.9.2,

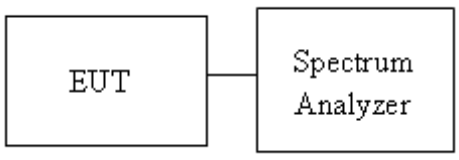
1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c,

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

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

   (3) BW=80MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth.
4. UNII-3, SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 26 dB Bandwidth.
5. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth.
6. Measure and record the result of 6 dB, 26 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)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5180	17.4384	33.7681
Mid	5220	17.5108	34.5652
High	5240	17.4384	34.9275
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5180	18.3791	38.1884
Mid	5220	18.4515	42.8986
High	5240	18.5238	38.5507
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5190	37.6266	78.029
High	5230	37.7424	78.609
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5210	77.5687	159.536

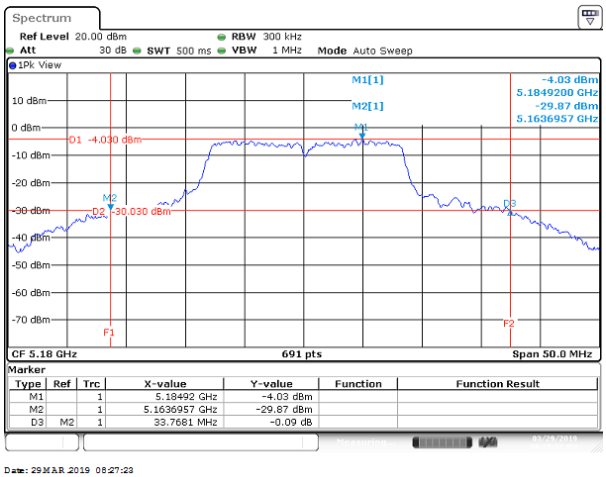
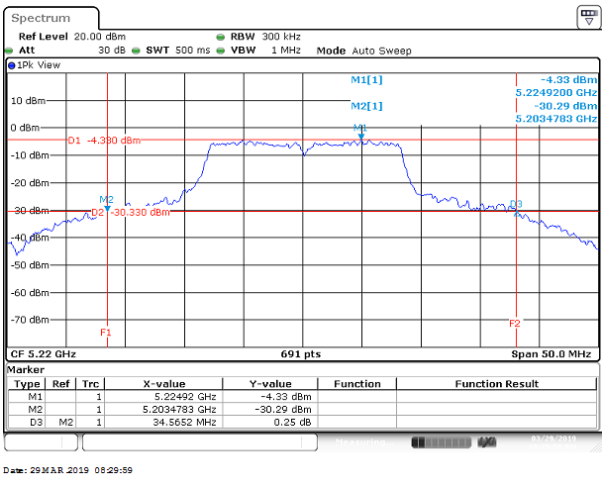
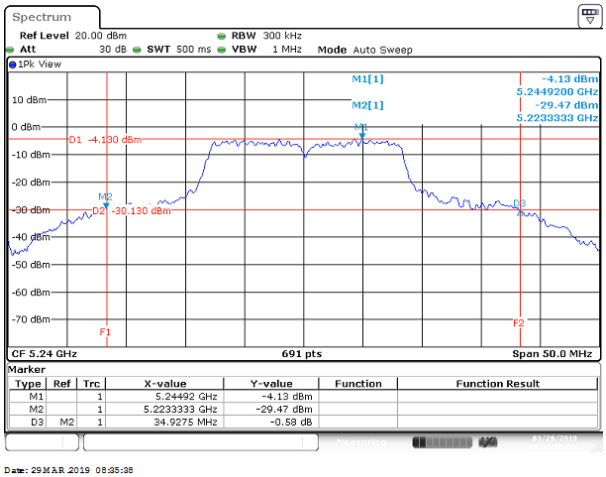
UNII-2a 5250-5350 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5260	17.4384	34.7101
Mid	5280	17.5832	35.8696
High	5320	17.1490	35.0725
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5260	18.5238	38.5507
Mid	5280	18.4515	38.2609
High	5320	18.3791	38.3333
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5270	37.5108	70.62
High	5310	37.6266	78.609
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5290	78.0318	160.0

UNII-2c 5475-5725 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5500	17.2214	32.971
Mid	5580	17.9450	34.6377
High	5700	20.4775	37.6812
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5500	18.3068	37.5362
Mid	5580	19.1027	39.2029
High	5700	21.7800	42.3188
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Low	5510	38.0897	75.19
Mid	5500	40.1736	75.54
High	5670	41.5629	79.13
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5530	82.6628	159.768

UNII-3 5725-5825MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Low	5745	18.4515	16.5217
Mid	5785	18.3791	16.4783
High	5825	18.1620	16.5217
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Low	5745	19.5369	17.6957
Mid	5785	19.6092	17.7391
High	5825	19.0303	17.7391
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**
Low	5755	40.7525	36.406
High	5795	39.8263	36.406
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**26dB BW (MHz)**
Mid	5775	79.4211	76.522

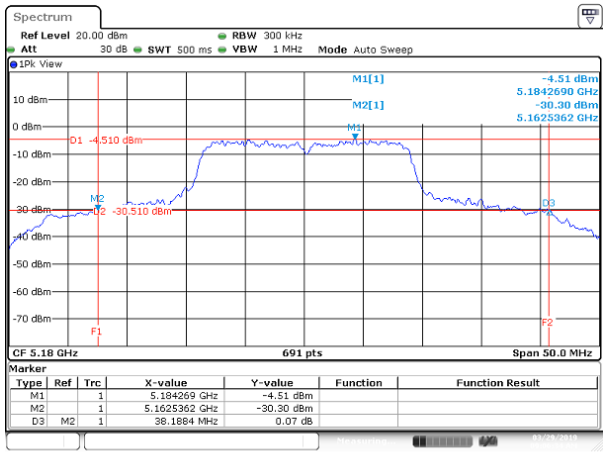
Test Data

26dB BANDWIDTH

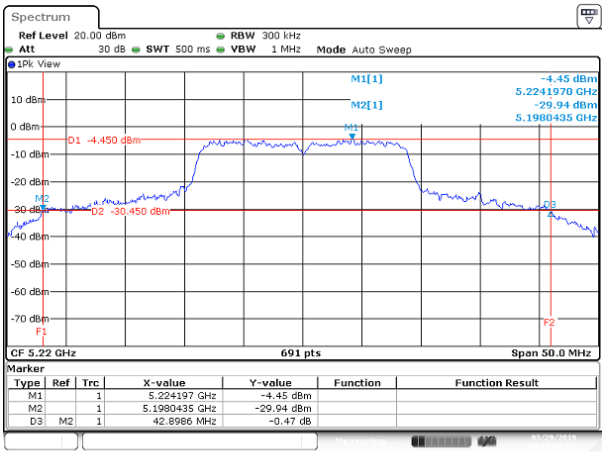
UNII-1 IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-1 IEEE 802.11n 20 MHz mode

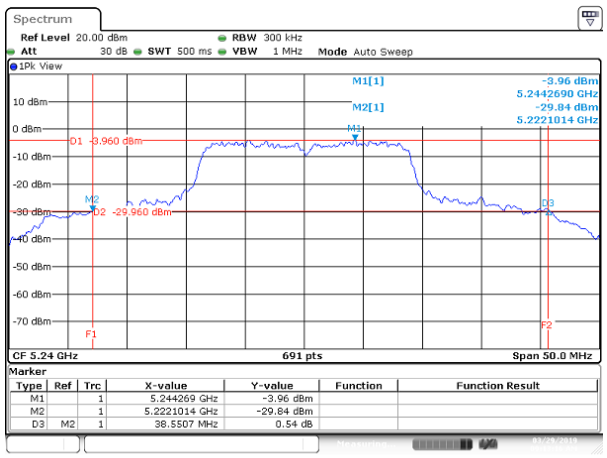
Low CH

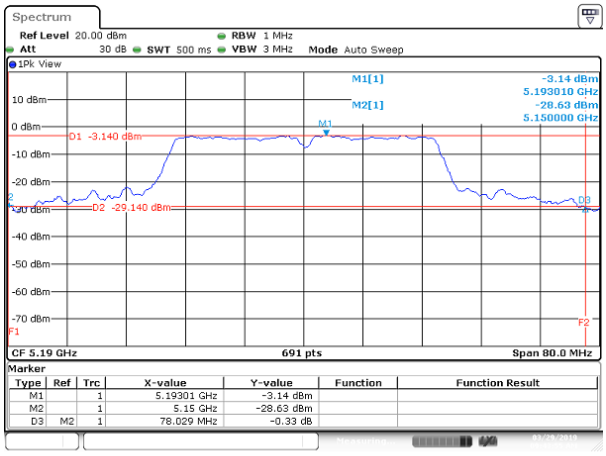
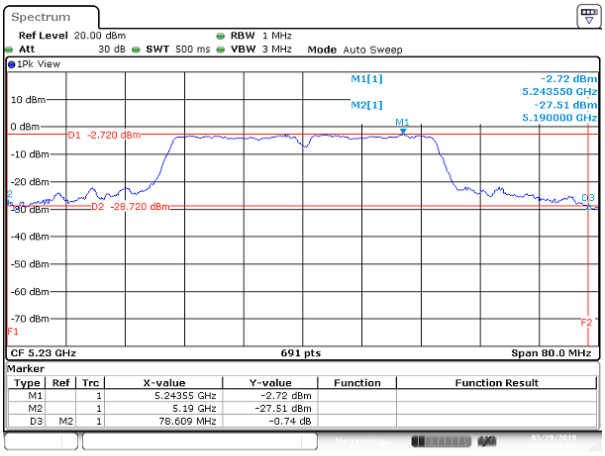


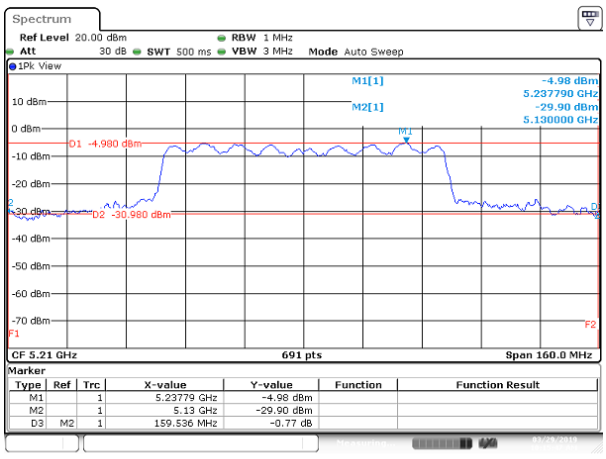
Mid CH



High CH

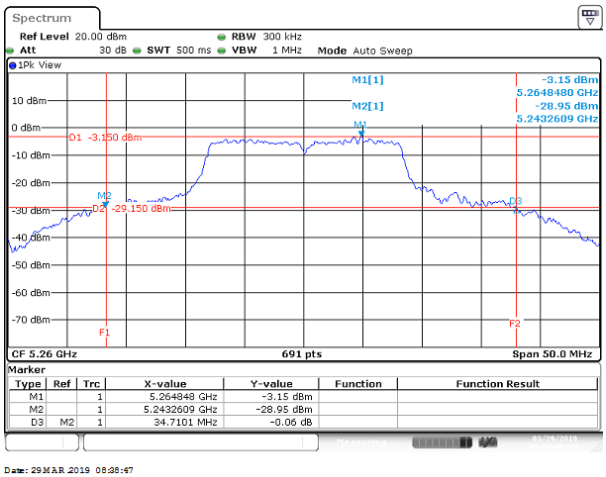
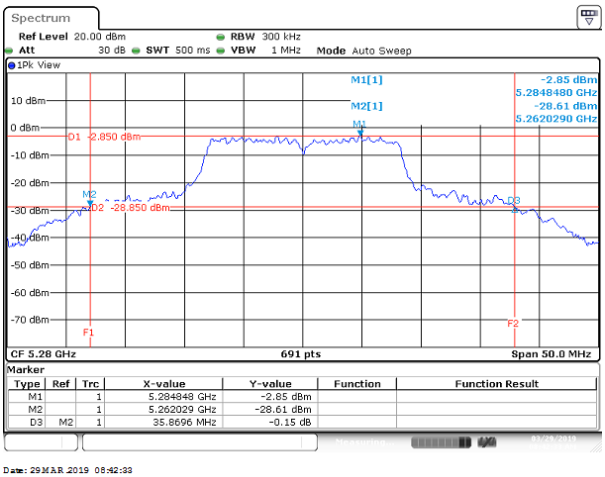
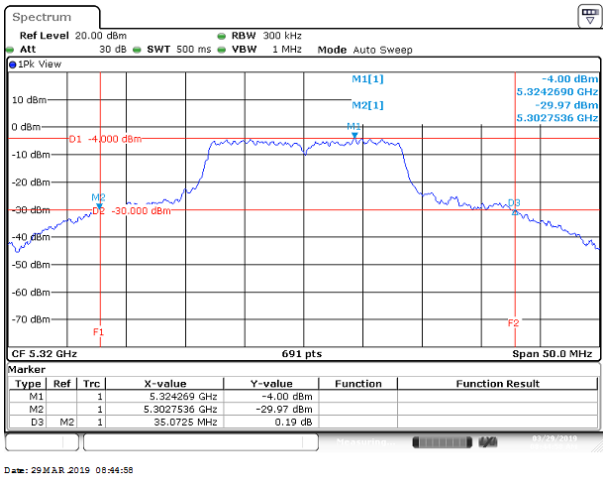


UNII-1 IEEE 802.11n 40 MHz mode	
Low CH	**High CH**
	

UNII-1 IEEE 802.11ac VHT80 mode
Mid CH


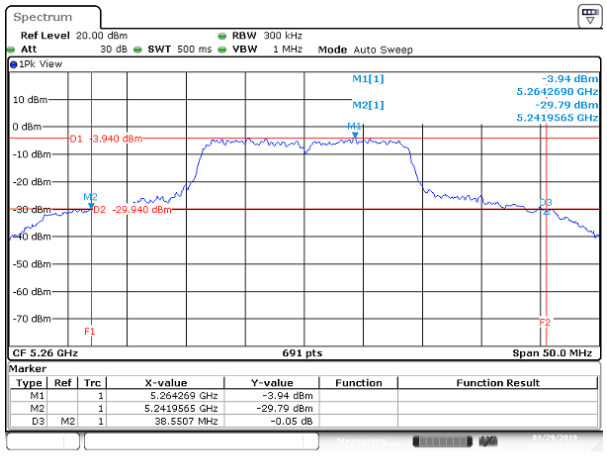
Test Data

26dB BANDWIDTH

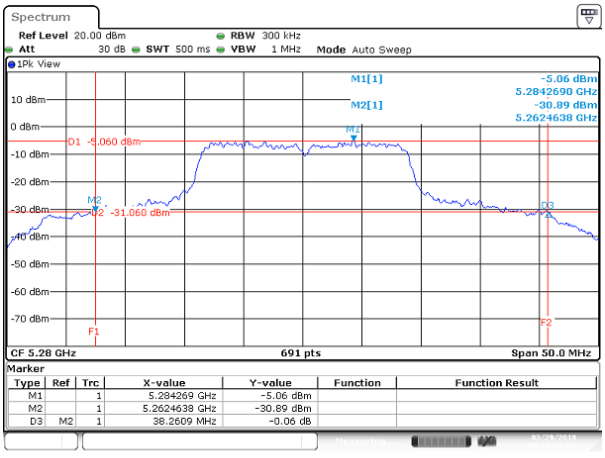
UNII-2a IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-2a IEEE 802.11n 20 MHz mode

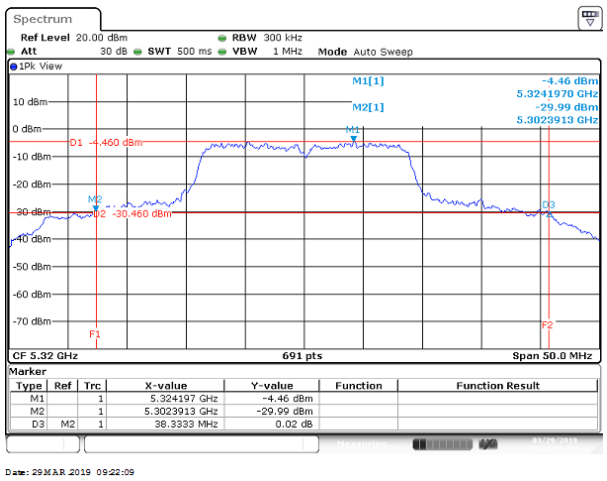
Low CH



Mid CH

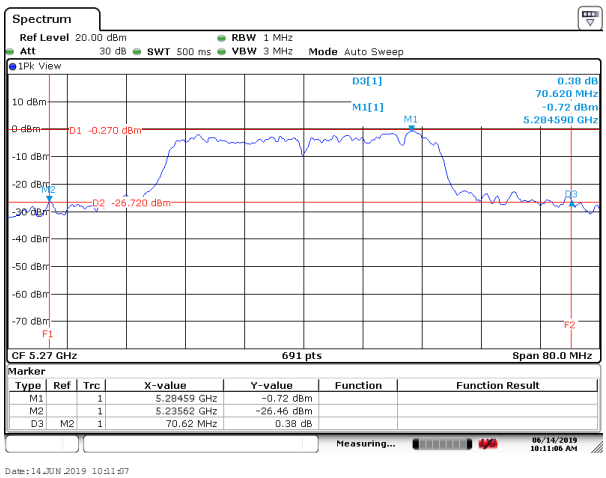


High CH

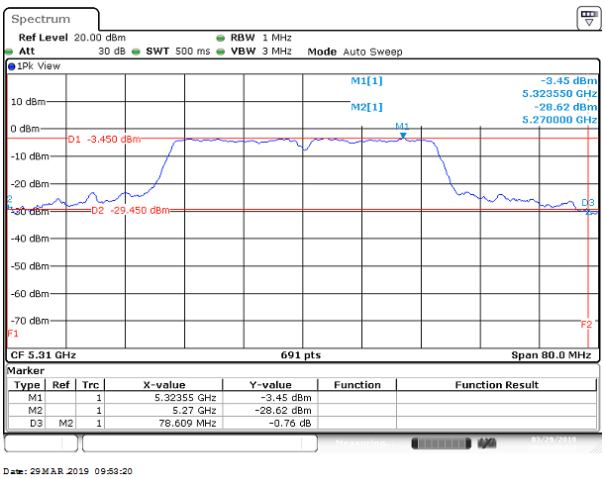


UNII-2a IEEE 802.11n 40 MHz mode

Low CH

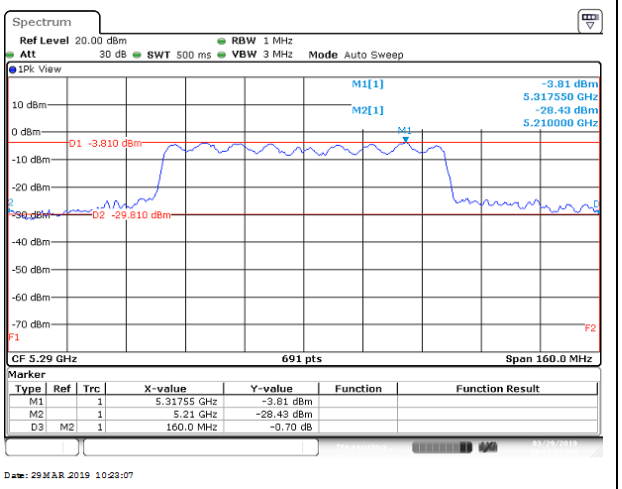


High CH



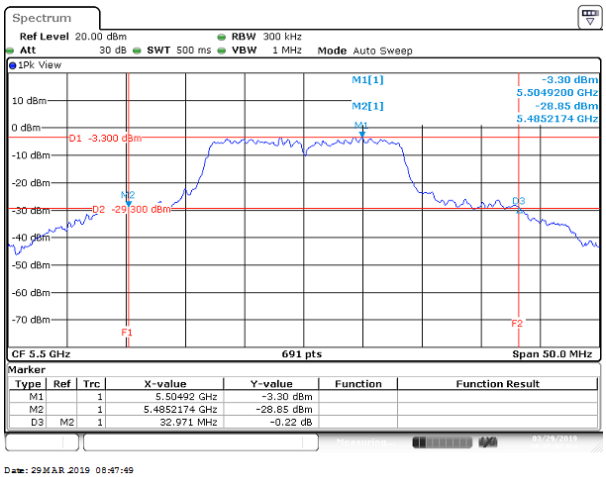
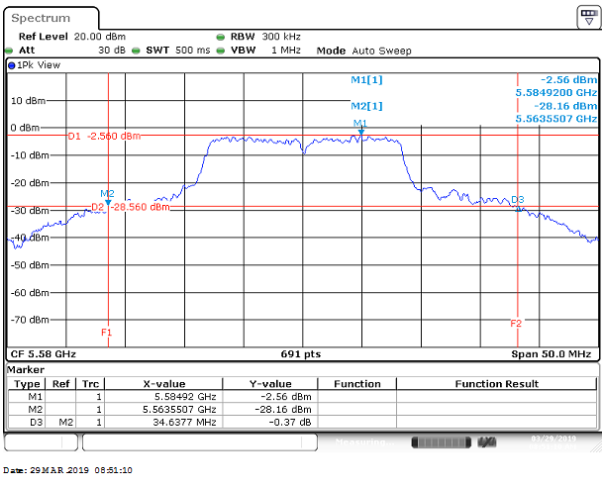
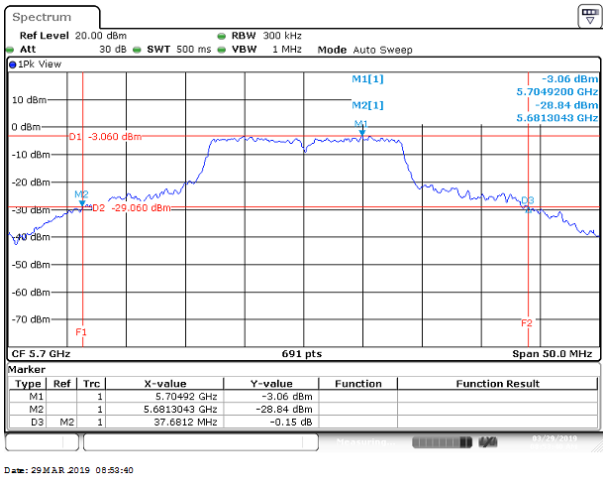
UNII-2a IEEE 802.11ac VHT80 mode

Mid CH



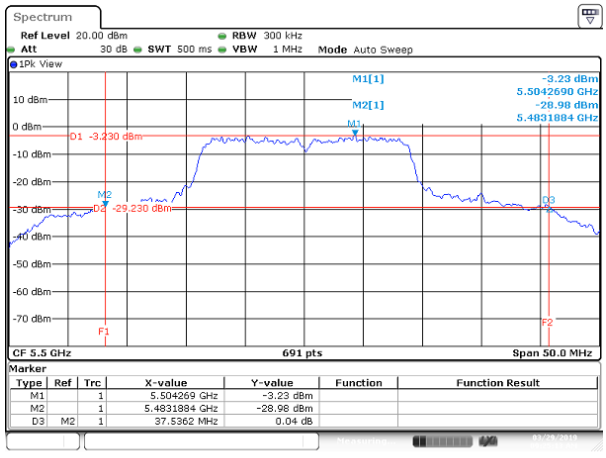
Test Data

26dB BANDWIDTH

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

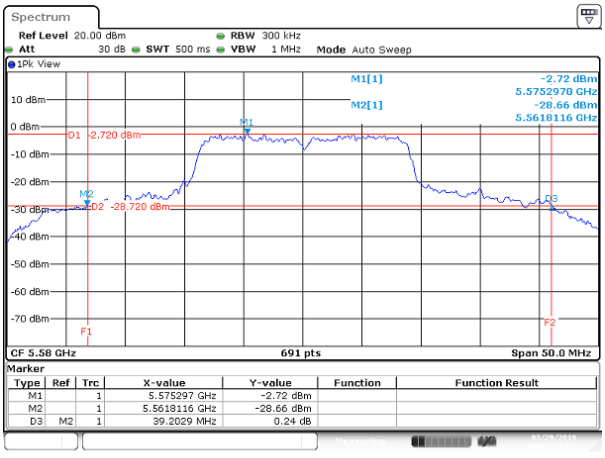
UNII-2c IEEE 802.11n 20 MHz mode

Low CH



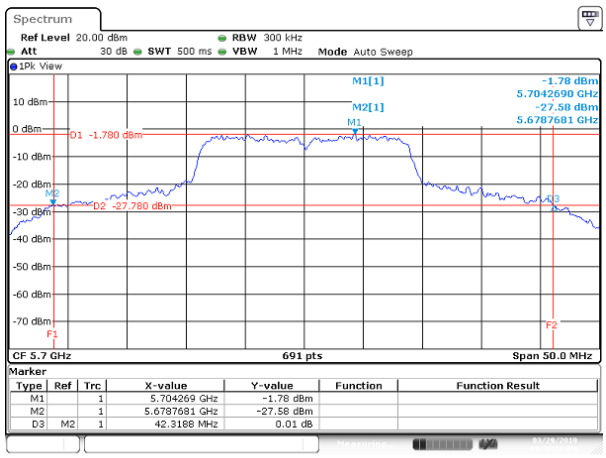
Date: 29.MAR.2019 09:25:13

Mid CH



Date: 29.MAR.2019 09:27:56

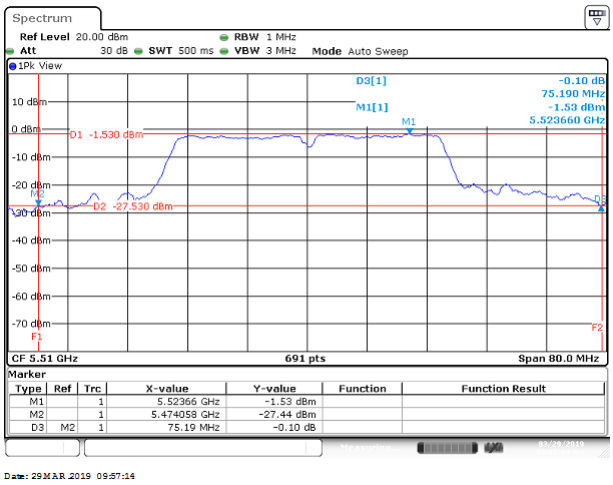
High CH



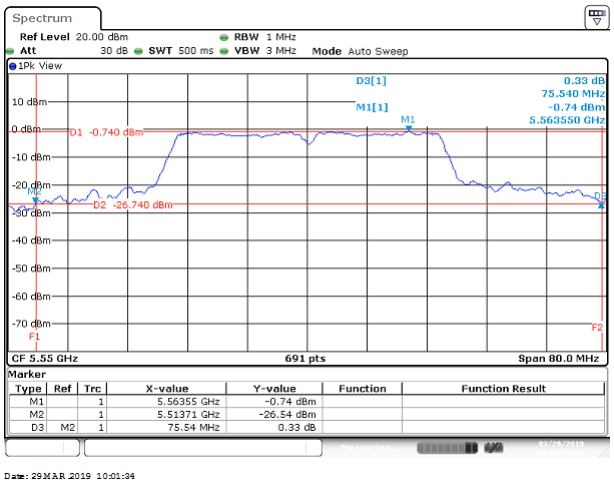
Date: 29.MAR.2019 09:30:22

UNII-2c IEEE 802.11n 40 MHz mode

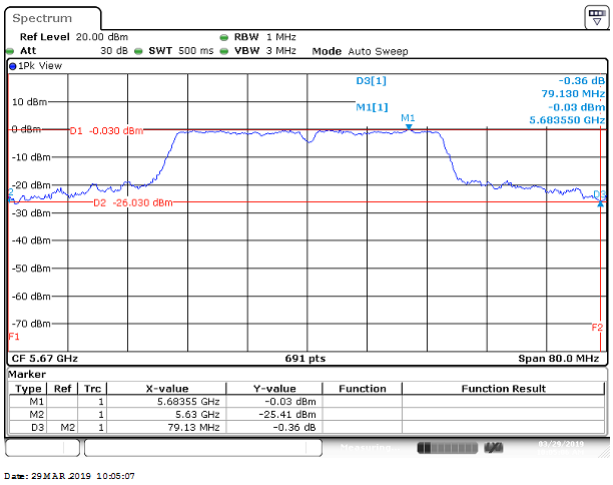
Low CH

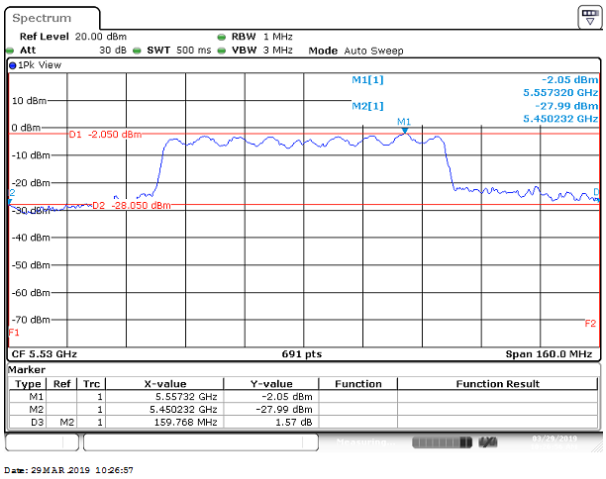


Mid CH



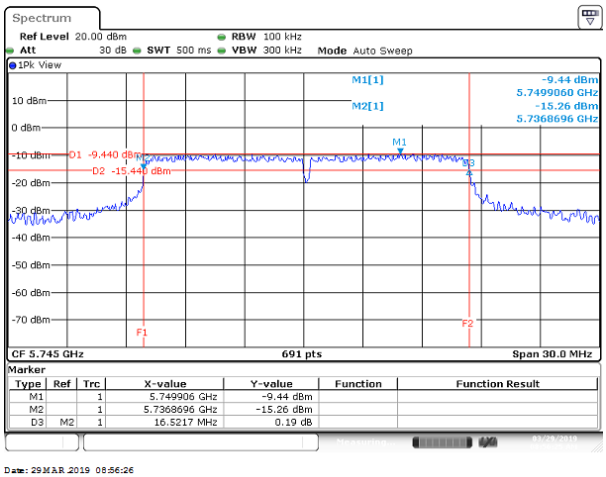
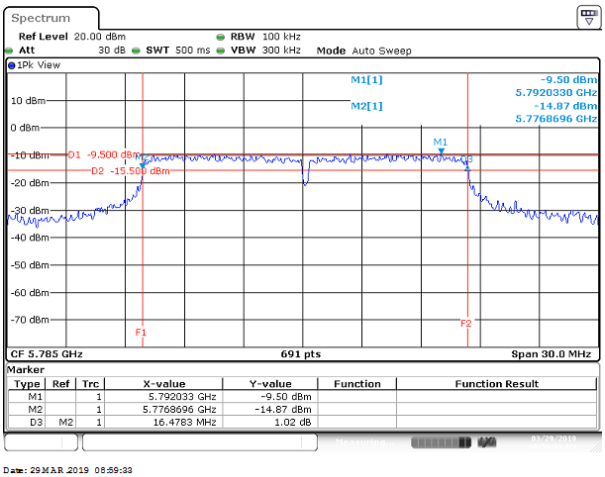
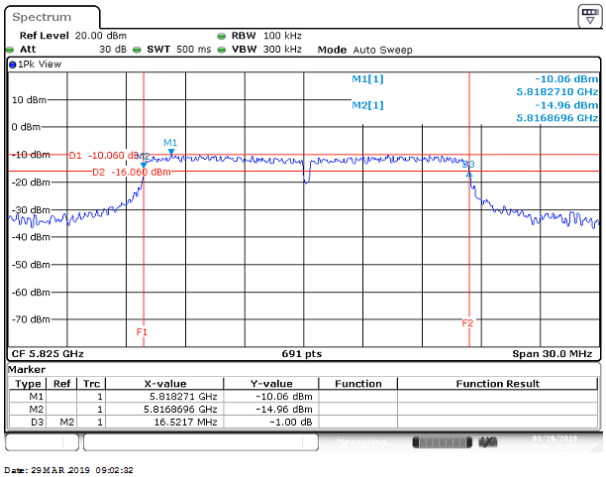
High CH



UNII-2c IEEE 802.11ac VHT80 mode	
Mid CH	
	

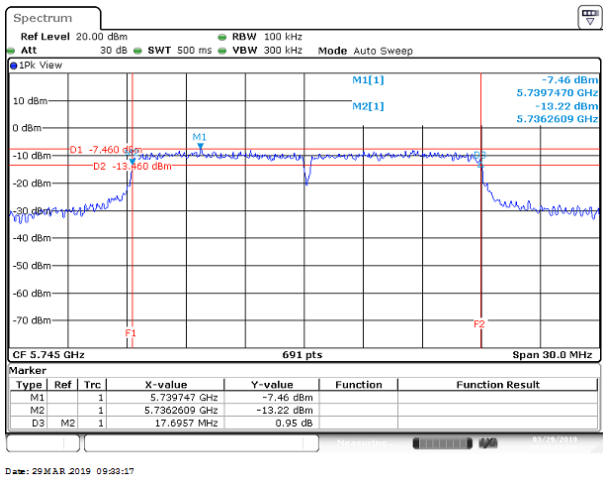
Test Data

6dB BANDWIDTH

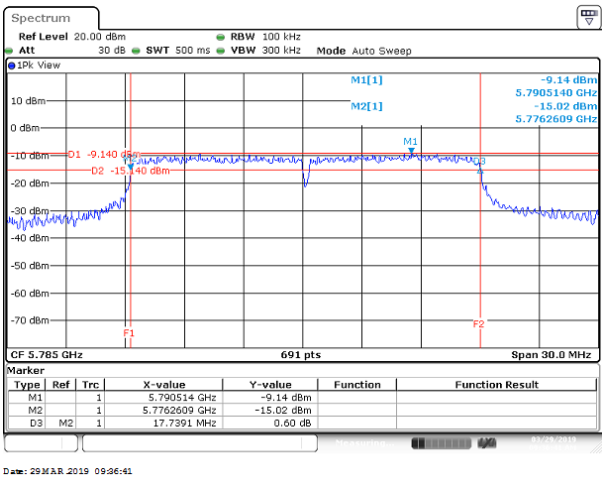
UNII-3 IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n 20 MHz mode

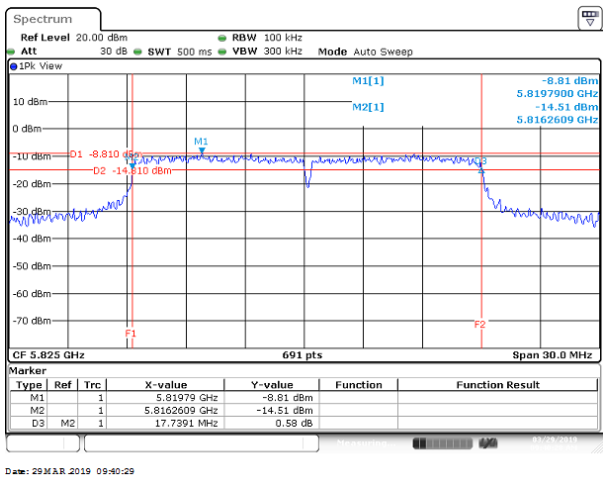
Low CH



Mid CH

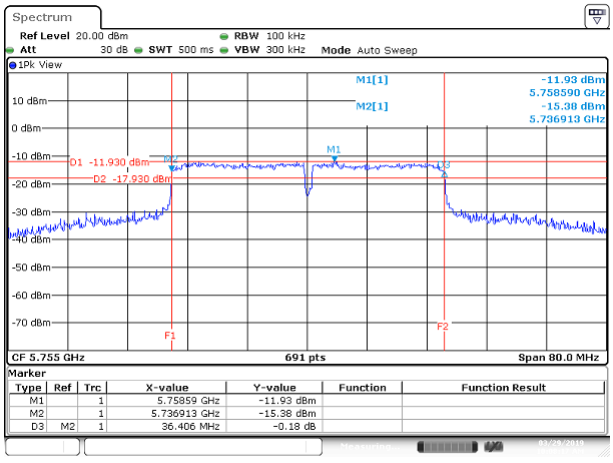


High CH

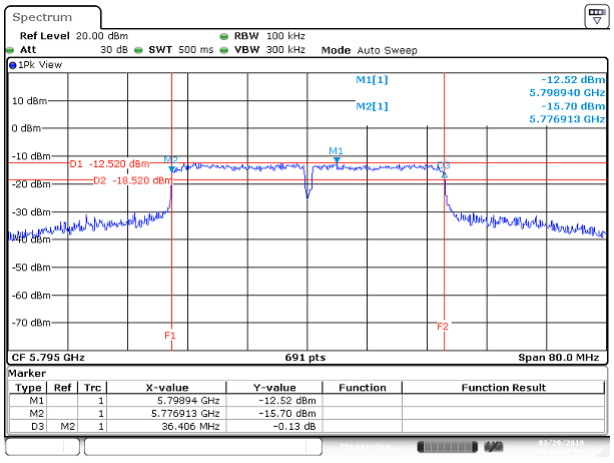


UNII-3 IEEE 802.11n 40 MHz mode

Low CH

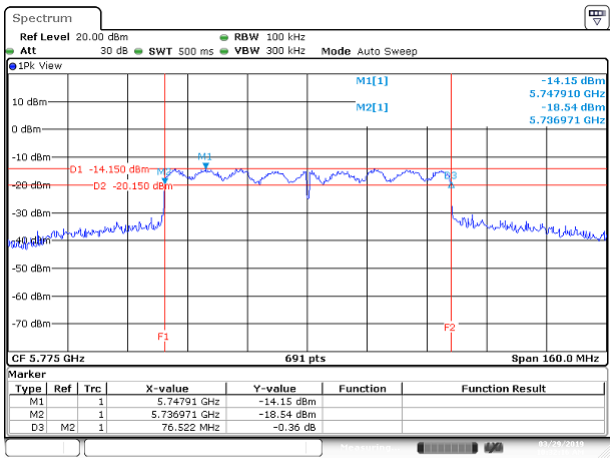


High CH



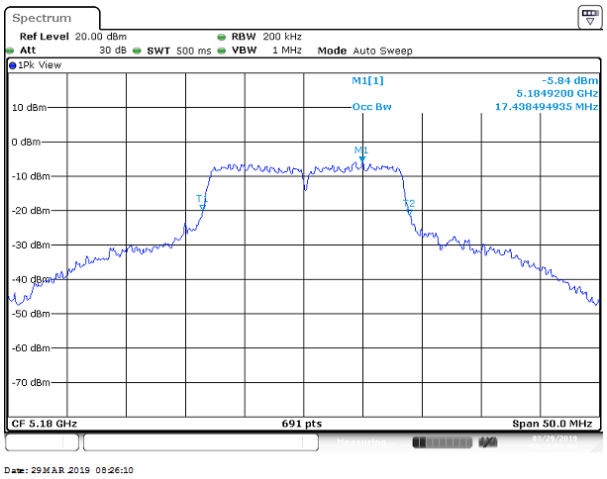
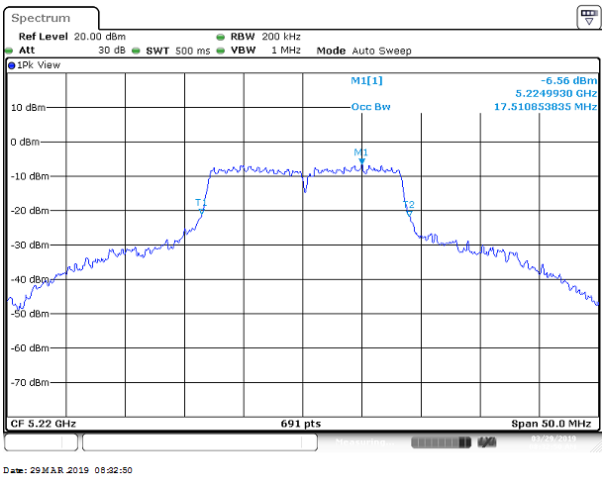
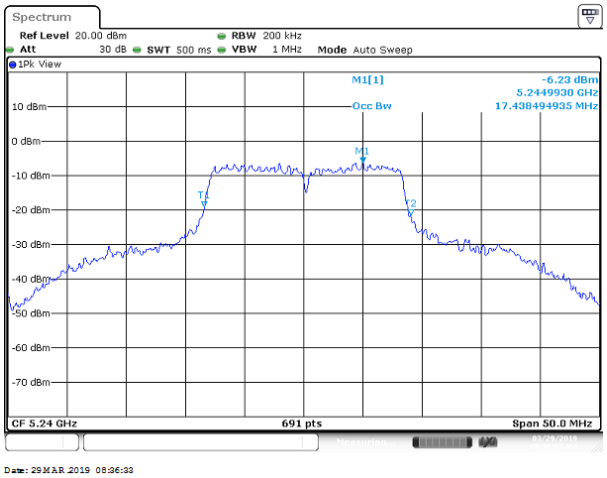
UNII-3 IEEE 802.11ac VHT80 mode

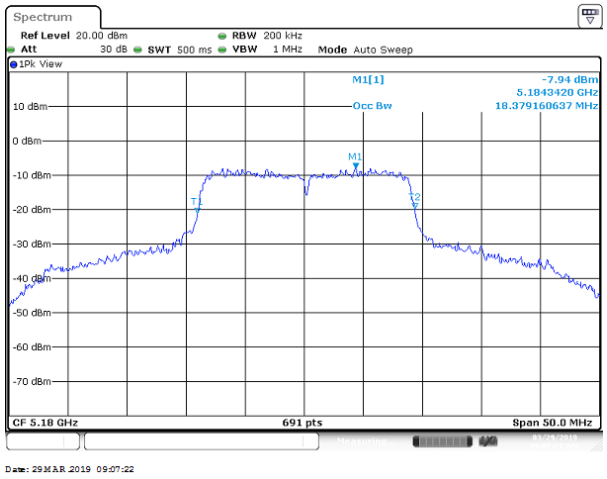
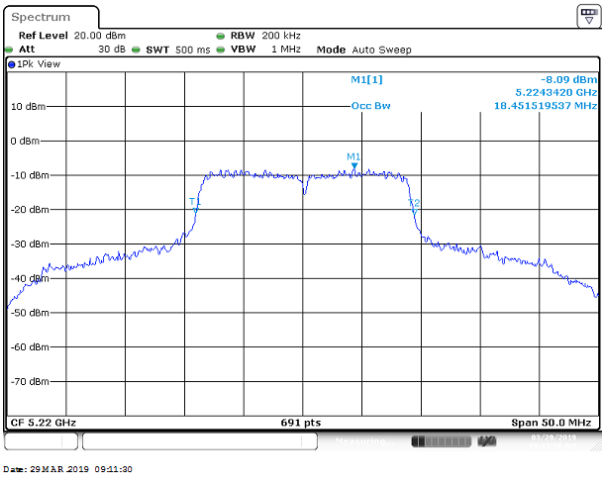
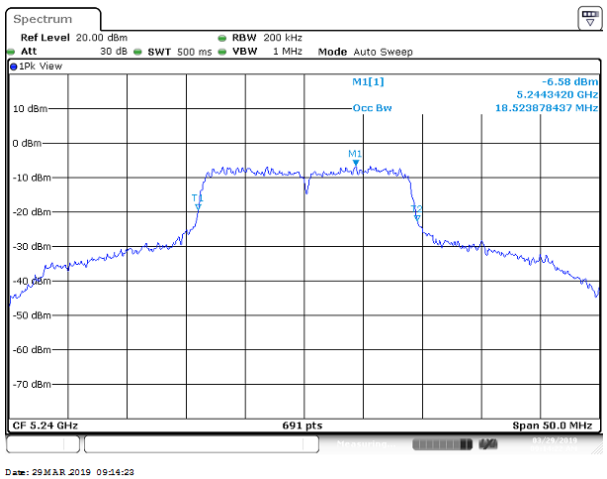
Mid CH

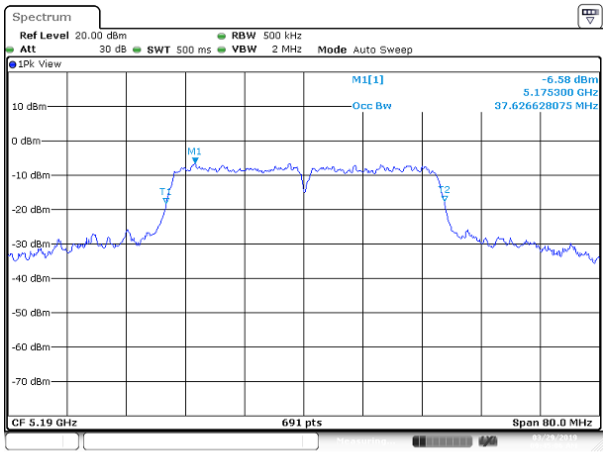
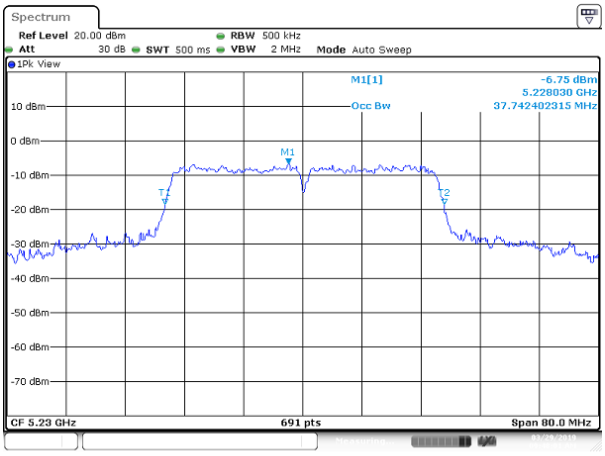


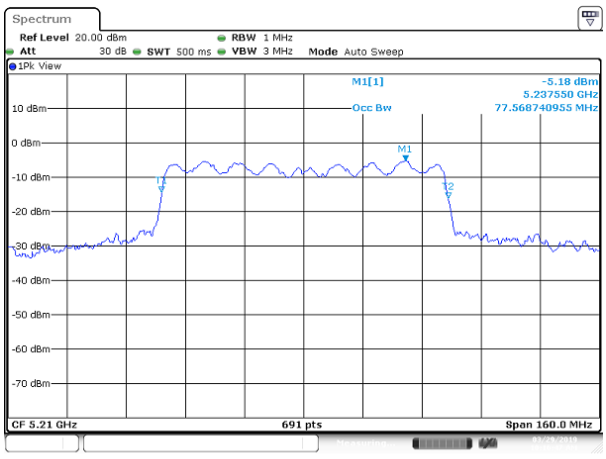
Test Data

BANDWIDTH (99%)

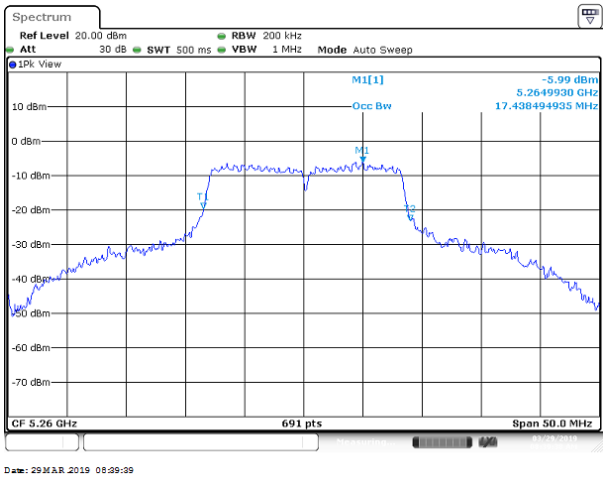
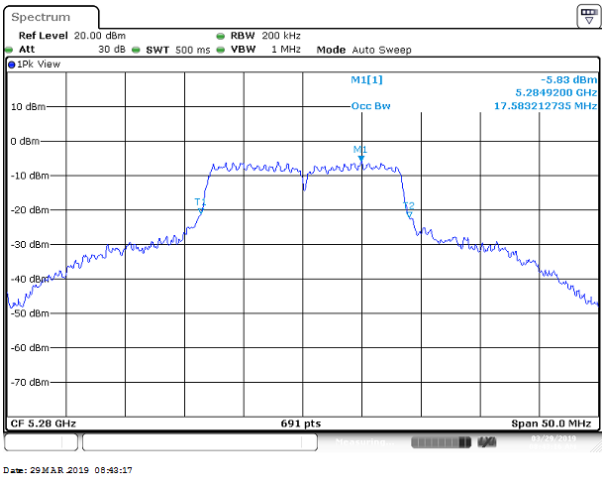
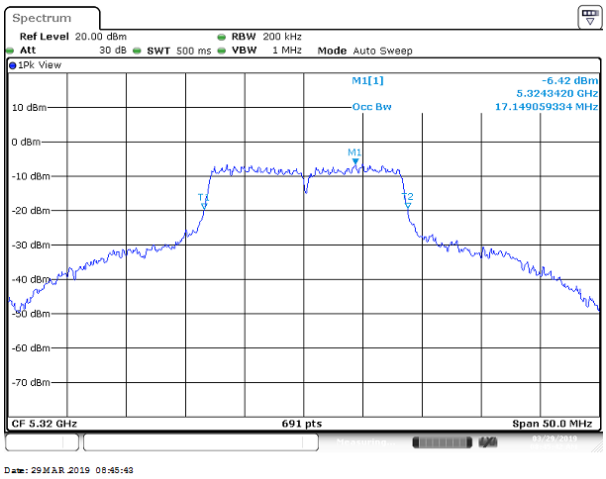
UNII-1 IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

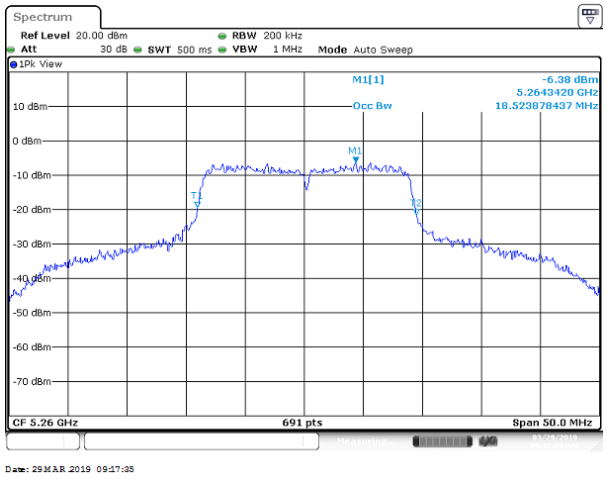
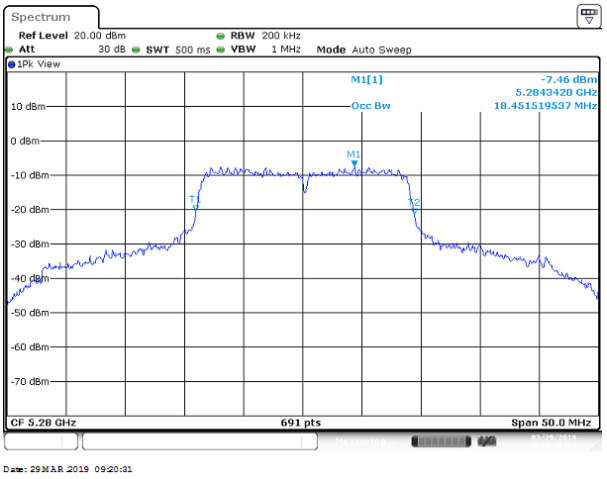
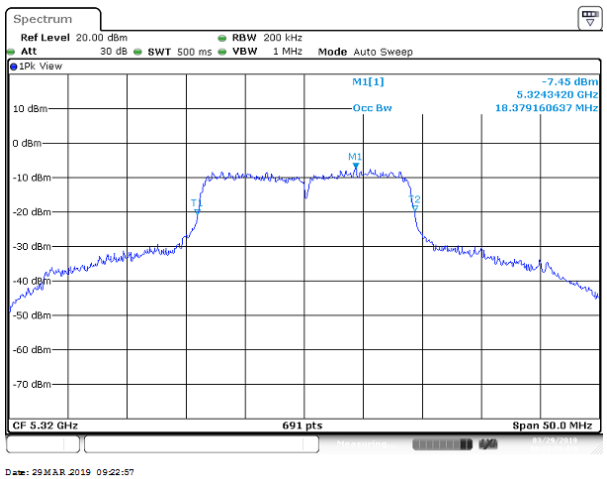
UNII-1 IEEE 802.11n 20 MHz mode	
Low CH	**Mid CH**
	
High CH	
	

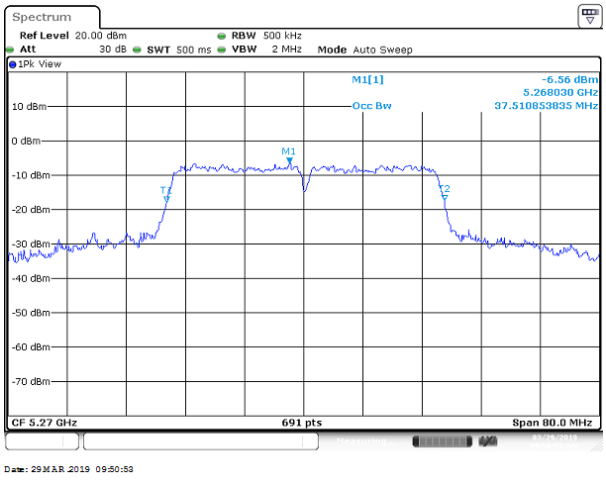
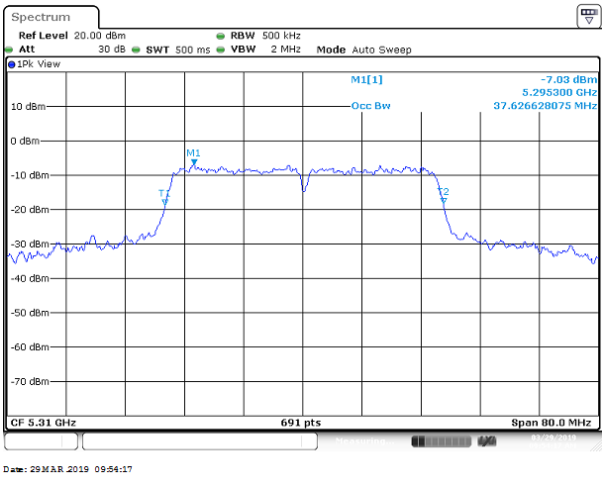
UNII-1 IEEE 802.11n 40 MHz mode	
Low CH	**High CH**
	

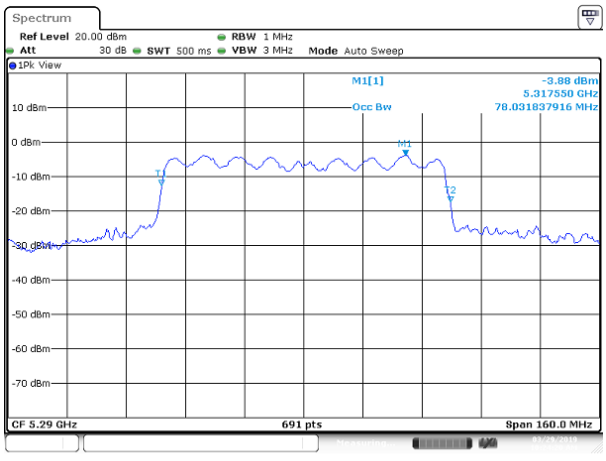
UNII-1 IEEE 802.11ac VHT80 mode	
Mid CH	
	

Test Data

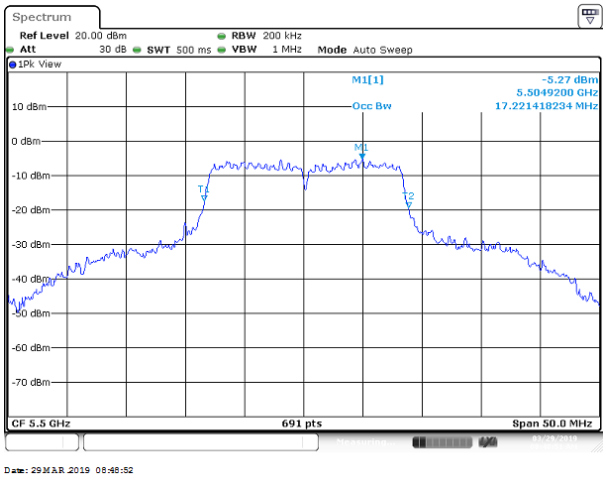
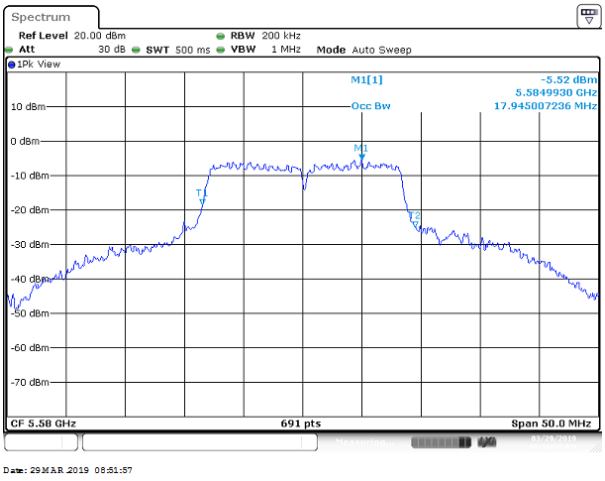
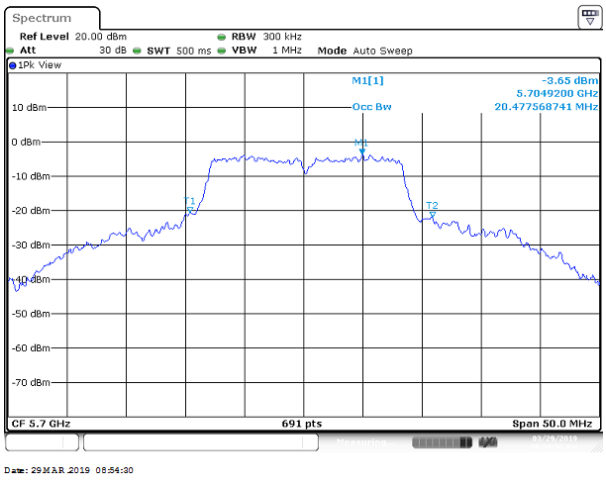
UNII-2a IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

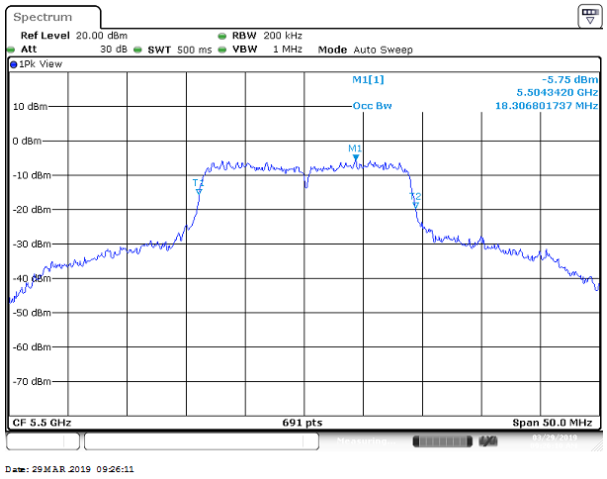
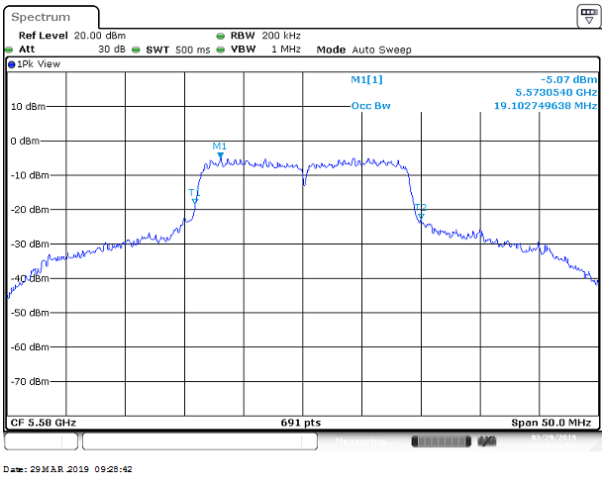
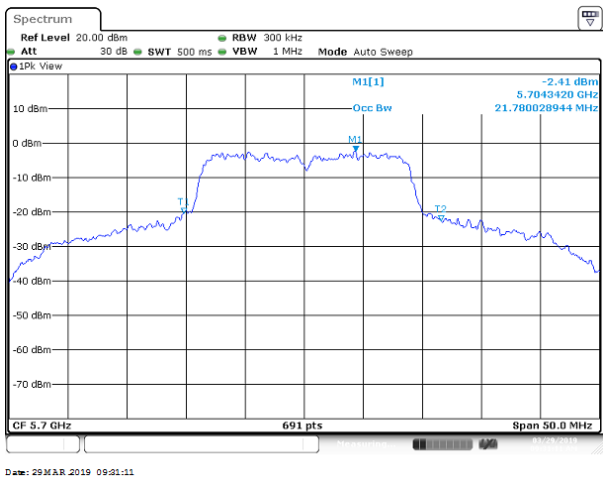
UNII-2a IEEE 802.11n 20 MHz mode	
Low CH	**Mid CH**
	
High CH	
	

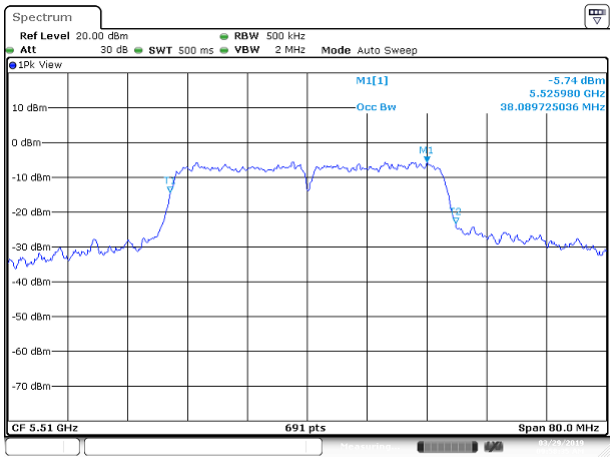
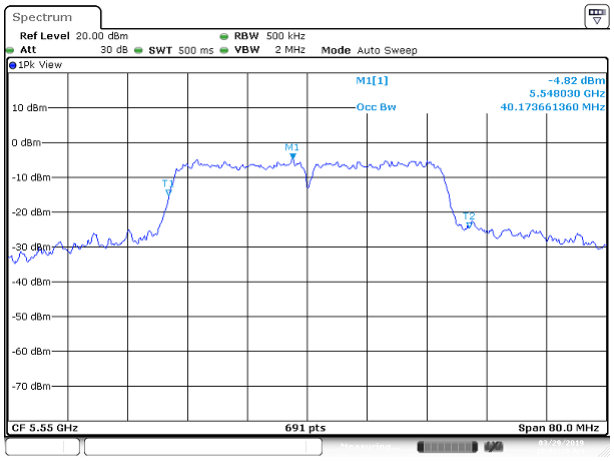
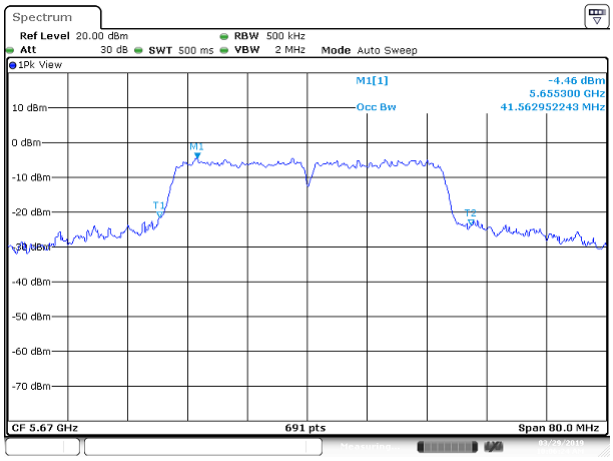
UNII-2a IEEE 802.11n 40 MHz mode	
Low CH	**High CH**
	

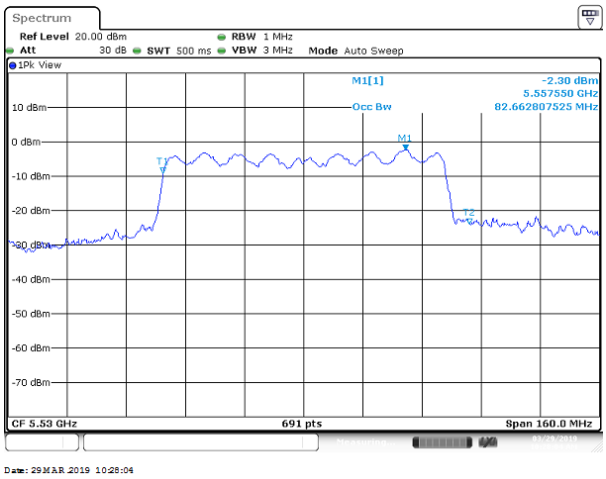
UNII-2a IEEE 802.11ac VHT80 mode	
Mid CH	
	

Test Data

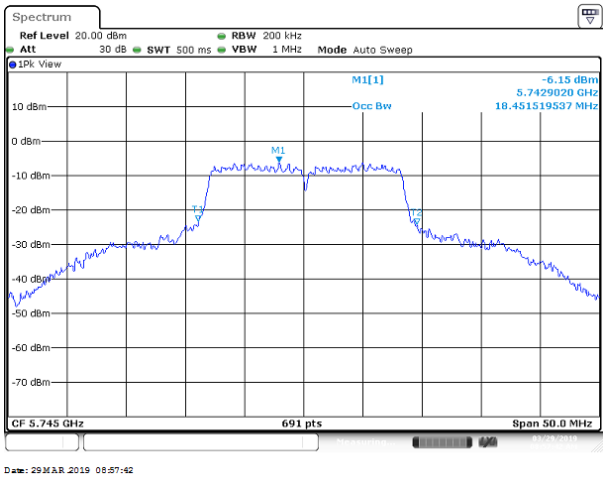
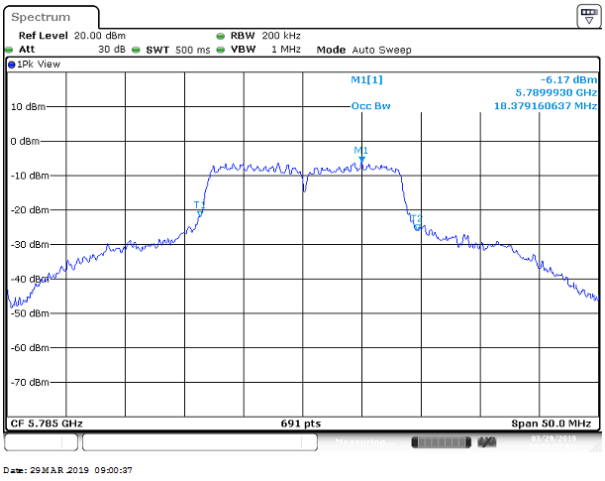
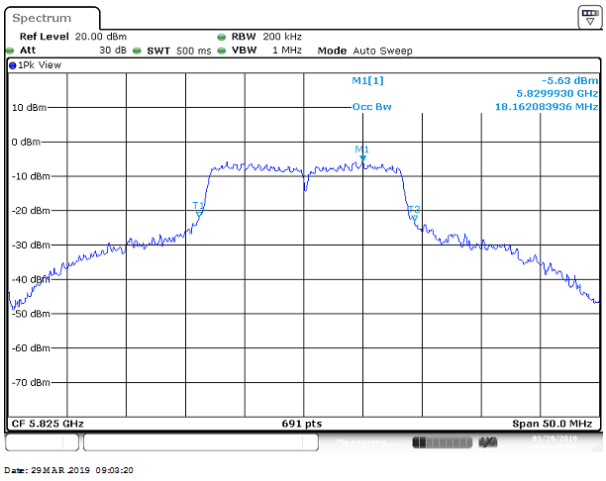
UNII-2c IEEE 802.11a mode	
Low CH	**Mid CH**
	
High CH	
	

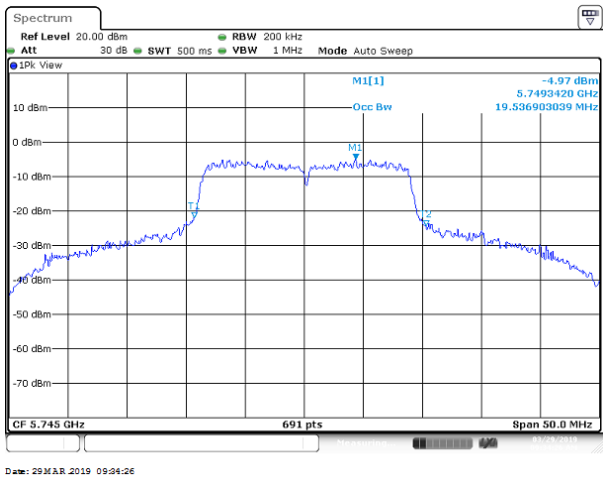
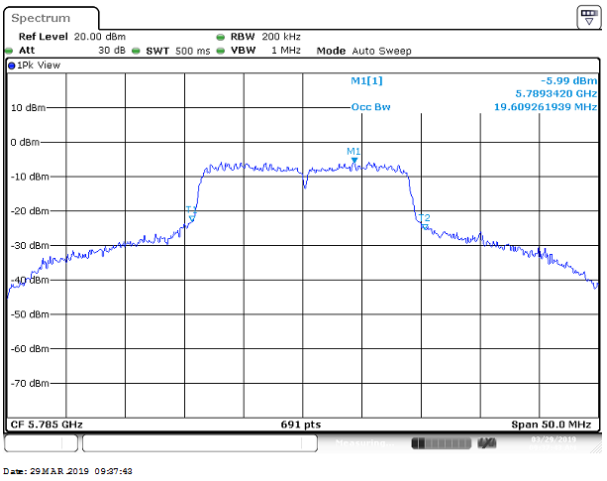
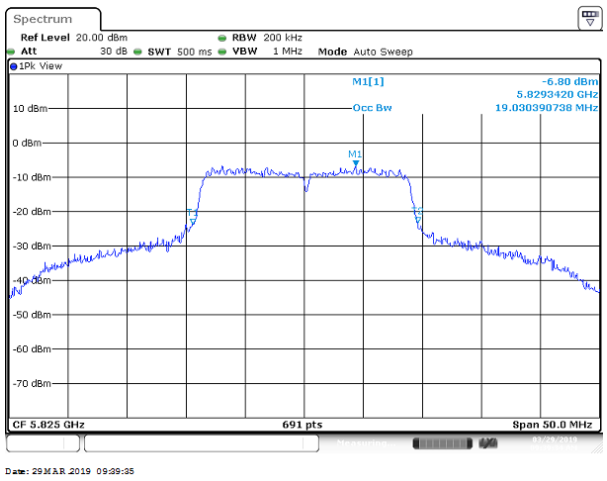
UNII-2c IEEE 802.11n 20 MHz mode	
Low CH	**Mid CH**
	
High CH	
	

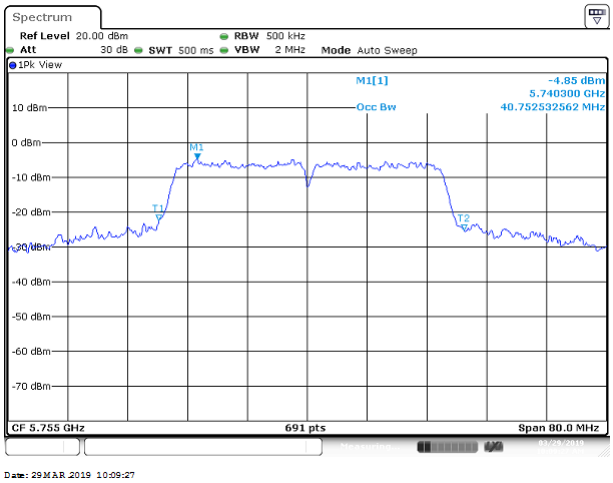
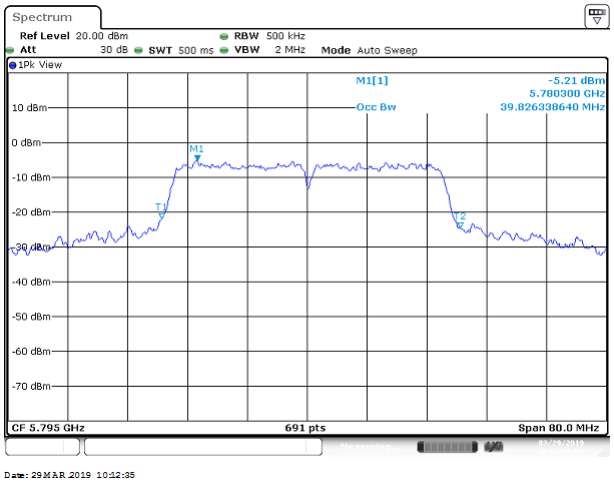
UNII-2c IEEE 802.11n 40 MHz mode	
Low CH	**Mid CH**
	
High CH	
	

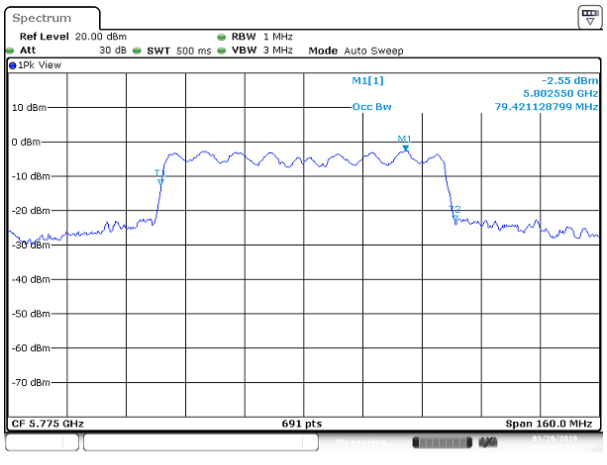
UNII-2c IEEE 802.11ac VHT80 mode	
Mid CH	
	

Test Data

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

UNII-3 IEEE 802.11n 20 MHz mode	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n 40 MHz mode	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode	
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),

UNII-1 :

FCC

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), 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.

IC

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, 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. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

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.

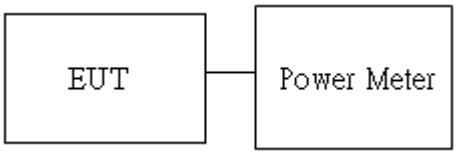
UNII-1 Limit	☒ Antenna not exceed 6 dBi：24dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 24 – (DG – 6)]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi：24dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 24 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi：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

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02, 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)**	**EIRP AV Power (dBm)**	**AV Power (W)**	**EIRP AV Power (W)**	**DG (dBi)**	**Limit (dBm)**	**EIRP Limit (dBm)**
IEEE 802.11a Data rate: 6Mbps	36	5180	63	16.32	18.10	0.0429	0.0646	1.78	24	23
	44	5220	63	16.60	18.38	0.0457	0.0689			
	48	5240	63	17.35	19.13	0.0543	0.0818			
IEEE 802.11n HT20 Data rate: MCS0	36	5180	63	17.08	18.86	0.0511	0.0769			
	44	5220	63	16.24	18.02	0.0421	0.0634			
	48	5240	63	15.23	17.01	0.0333	0.0502			
IEEE 802.11n HT40 Data rate: MCS0	38	5190	63	16.89	18.67	0.0489	0.0736			
	46	5230	63	17.01	18.79	0.0502	0.0757			
IEEE 802.11ac VHT80 Data rate: MCS0	42	5210	63	15.76	17.54	0.0377	0.0568			

UNII-2a										
Config	**CH**	**Freq. (MHz)**	**Power Set**	**AV Power (dBm)**	**EIRP AV Power (dBm)**	**AV Power (W)**	**EIRP AV Power (W)**	**DG (dBi)**	**Limit (dBm)**	**EIRP Limit (dBm)**
IEEE 802.11a Data rate: 6Mbps	52	5260	63	15.41	17.19	0.0348	0.0524	1.78	24	30
	56	5280	63	16.22	18.00	0.0419	0.0631			
	64	5320	63	16.22	18.00	0.0419	0.0631			
IEEE 802.11n HT20 Data rate: MCS0	52	5260	63	16.63	18.41	0.0460	0.0693			
	56	5280	63	18.35	20.13	0.0684	0.1030			
	64	5320	63	16.12	17.90	0.0409	0.0617			
IEEE 802.11n HT40 Data rate: MCS0	54	5270	63	17.36	19.14	0.0545	0.0820			
	62	5310	63	17.46	19.24	0.0557	0.0839			
IEEE 802.11ac VHT80 Data rate: MCS0	58	5290	63	16.25	18.03	0.0422	0.0635			

UNII-2c										
Config	**CH**	**Freq. (MHz)**	**Power Set**	**AV Power (dBm)**	**EIRP AV Power (dBm)**	**AV Power (W)**	**EIRP AV Power (W)**	**DG (dBi)**	**Limit (dBm)**	**EIRP Limit (dBm)**
IEEE 802.11a Data rate: 6Mbps	100	5500	63	17.29	19.07	0.0536	0.0807	1.78	24	30
	116	5580	63	17.90	19.68	0.0617	0.0929			
	140	5700	63	17.52	19.30	0.0565	0.0851			
IEEE 802.11n HT20 Data rate: MCS0	100	5500	63	16.99	18.77	0.0500	0.0753			
	116	5580	63	18.08	19.86	0.0643	0.0968			
	140	5700	63	18.22	20.00	0.0664	0.1000			
IEEE 802.11n HT40 Data rate: MCS0	102	5510	63	17.15	18.93	0.0519	0.0782			
	110	5550	63	18.03	19.81	0.0635	0.0957			
	134	5670	63	18.67	20.45	0.0736	0.1109			
IEEE 802.11ac VHT80 Data rate: MCS0	106	5530	63	16.80	18.58	0.0479	0.0721			

UNII-3										
Config	**CH**	**Freq. (MHz)**	**Power Set**	**AV Power (dBm)**	**EIRP AV Power (dBm)**	**EIRP AV Power (dBm)**	**AV Power (W)**	**EIRP AV Total Power (W)**	**DG (dBi)**	**Limit (dBm)**
IEEE 802.11a Data rate: 6Mbps	149	5745	63	17.25	17.25	19.03	0.0531	0.0800	1.78	30
	157	5785	63	17.33	17.33	19.11	0.0541	0.0815		
	165	5825	63	17.54	17.54	19.32	0.0568	0.0855		
IEEE 802.11n HT20 Data rate: MCS0	149	5745	63	17.52	17.52	19.30	0.0565	0.0851		
	157	5785	63	19.10	19.10	20.88	0.0813	0.1225		
	165	5825	63	18.80	18.80	20.58	0.0759	0.1143		
IEEE 802.11n HT40 Data rate:	151	5755	63	18.48	18.48	20.26	0.0705	0.1062		
	159	5795	63	18.61	18.61	20.39	0.0726	0.1094		
IEEE 802.11ac VHT80	155	5775	63	17.41	17.41	19.19	0.0551	0.0830		

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 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.

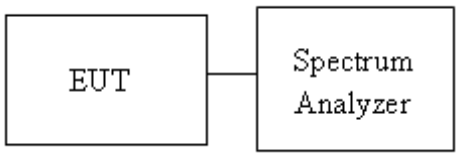
UNII-1 Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 11 – (DG – 6)]
UNII-2a Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 11 – (DG – 6)]
UNII-2c Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi：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

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)**	**FCC Limit (dBm)**	**IC Limit (dBm)**
Low	5180	4.38	11	10
Mid	5220	4.2		
High	5240	4.22		
Test mode: IEEE 802.11n HT20 mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**FCC Limit (dBm)**	**IC Limit (dBm)**
Low	5180	3.2	11	10
Mid	5220	3.64		
High	5240	3.86		
Test mode: IEEE 802.11n HT40 mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**FCC Limit (dBm)**	**IC Limit (dBm)**
Low	5190	-0.16	11	10
High	5230	-0.29		
Test mode: IEEE 802.11ac VHT80 mode				
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**FCC Limit (dBm)**	**IC Limit (dBm)**
Mid	5210	-2.43	11	10

UNII-2a 5250-5350 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5260	4.25	11
Mid	5280	4.39	
High	5320	4.05	
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5260	4.36	11
Mid	5280	3.59	
High	5320	3.56	
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5270	0.34	11
High	5310	-0.68	
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Mid	5290	-0.99	11

UNII-2c 5470-5725 MHz			
Test mode: IEEE 802.11a mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5500	4.51	11
Mid	5580	5.14	
High	5700	5.11	
Test mode: IEEE 802.11n HT20 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5500	5.12	11
Mid	5580	5.73	
High	5700	6.05	
Test mode: IEEE 802.11n HT40 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Low	5510	1.89	11
Mid	5550	1.39	
High	5670	1.85	
Test mode: IEEE 802.11ac VHT80 mode			
Channel	**Frequency (MHz)**	**PPSD (dBm)**	**Limit (dBm)**
Mid	5530	0.39	11