TEST REPORT

Report Number: C21T00027-SRD04-V03

Applicant	Cipia Vision Ltd
Product Name	Cipia-FS10
Model Name	FS10-LOC / FS10-LOC-ADS
Brand Name	Cipia
FCC ID	2AZIQFS10L
IC	27633-FS10L

Industrial Internet Innovation Center (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in FCC Part15, ANSI C63.10-2013, KDB 558074, RSS-Gen Issue 5, RSS-247 Issue 2.

Prepared by	范宇航	Reviewed by	陈晨飞
Approved by		Issue Date	2021-10-20

Industrial Internet Innovation Center (Shanghai) Co., Ltd.

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10. The measurement uncertainty is not taken into account when deciding conformity, and the results of measurement (or the average of measurement results) are directly used as the criterion for the stating conformity.

Test Laboratory:
Industrial Internet Innovation Center (Shanghai) Co., Ltd.
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Revision Version

Report Number	Revision	Date	Memo
C21T00027-SRD04-V00	00	2021-08-30	Initial creation of test report
C21T00027-SRD04-V01	01	2021-09-30	1.Update the calibration information. 2.Add block diagram to all items. 3.ADD requirement at clause4.2. 4.Modify the IC ID.
C21T00027-SRD04-V02	02	2021-10-19	The antenna statement has been corrected in Section 4
C21T00027-SRD04-V03	03	2021-10-20	The data has been corrected in Chapter 6.1.3.

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1. Test Laboratory

1.1. Testing Location

Primary Lab:

Company Name	Industrial Internet Innovation Center (Shanghai) Co., Ltd.
Address	Building 4, No. 766 Jingang Rd, Pudong, Shanghai, China
FCC Registration No.	958356
FCC Designation No.	CN1177
IC designation No.	CN0067

Subcontracting Lab #1:

Company Name	N/A
Address	N/A

1.2. Testing Environment

Normal Temperature	15℃~35℃
Relative Humidity	30%RH~60%RH
Supply Voltage	120V/60Hz

1.3. Project Information

Project Leader	Chen Minfei
Testing Start Date	2021-03-23
Testing End Date	2021-08-05

2. Client Information

2.1. Applicant Information

Company Name	Cipia Vision Ltd
Address	Maskit 8th st. Hertzelia, Israel
Telephone	+972-77-5047760

2.2. Manufacturer Information

Company Name	Cipia Vision Ltd
Address	Maskit 8th st. Hertzelia, Israel
Telephone	+972-77-5047760

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Product Name	Cipia-FS10
Model name	FS10-LOC / FS10-LOC-ADS
Supported Radio Technology and Bands	BT5.0 WLAN 802.11b,g,n WLAN 802.11a,n,ac
Hardware Version	Revision D
Software Version	0.0.0.19B
WLAN Frequency	UNII 1: 5150MHz-5250MHz
FCC ID	2AZIQFS10L
IC	27633-FS10L

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of Receipt
N01	N/A	Revision D	0.0.0.19B	2021-03-15
N02	N/A	Revision D	0.0.0.19B	2021-04-14
N22	N/A	Revision D	0.0.0.19B	2021-07-20

*EUT ID: is internally used to identify the test sample in the lab.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN/Remark
AE1	RF Cable	N/A	N/A

*AE ID: is internally used to identify the test sample in the lab.

*The AE is provided by the client.

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2018-10-01
ANSI 63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
KDB 789033	Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2017
KDB 905462	COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION	2016
RSS-247 Issue 2	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices	2017
RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus	2019

4.2. Reference Information from client

Information of the test sample provided by the client.
Antenna gain of EUT -2.98 dBi
Note:The product FS10-LOC / FS10-LOC-ADS use an integral antenna which compliance with the requirement of 15.203.

5. Test Summary

5.1. Summary of Test Results

Measurement Items	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Output Power	15.407(a)	RSS-247 6.2	Pass
Power Spectral Density	15.407(a)	RSS-247 6.2	Pass
99% Occupied Bandwidth	N/A	RSS-Gen 6.7	Pass
-26dB	15. 407(a)	RSS-247 6.2	Pass
Band edge compliance	15.407(b)	RSS-247 6.2	Pass
Transmitter spurious emissions radiated	15.407(b)	RSS-247 6.2	Pass
Spurious emissions radiated < 30 MHz	15.209 & 15.407(b)	RSS-247 6.2 RSS-Gen 8.9,8.10	Pass
Spurious emissions conducted < 30 MHz	15.407(b)	RSS-247 6.2	Pass
Frequency Stability	15.407(g)	RSS-Gen 8.11	Pass
Transmit Power Control	15.407(h)	RSS-247 6.2	N/A

Test Conditions

Tnom	Normal Temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage
Hnom	Norm Humidity
Anom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	Tnom	24℃
Voltage	Vnom	24V
Humidity	Hnom	48%
Air Pressure	Anom	1010hPa

Note:

a. All the test data for each data were verified, but only the worst case was reported.

b.The DC and low frequency voltages' measurement uncertainty is ±2%.

5.2. Statements

The FS10-LOC / FS10-LOC-ADS manufactured by Cipia Vision Ltd, Incorporated are new products for testing.

This project have two sets of configured sample N01(N02)/N22, and we mainly tested sample N01(N02) , the main difference is as below：

Mainly Supply	FS10-LOC	(N01/N02)
Secondary Supply	FS10-LOC-ADS	Add ADAS(N22)

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 5.1.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Measurement Results

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5
Temperature	Min. = 15 ℃, Max. = 35 ℃

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 k
Ground system resistance	< 0.5

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 k
Ground system resistance	< 0.5
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

6.1. Maximum output Power

6.1.1. Measurement Limit and Method

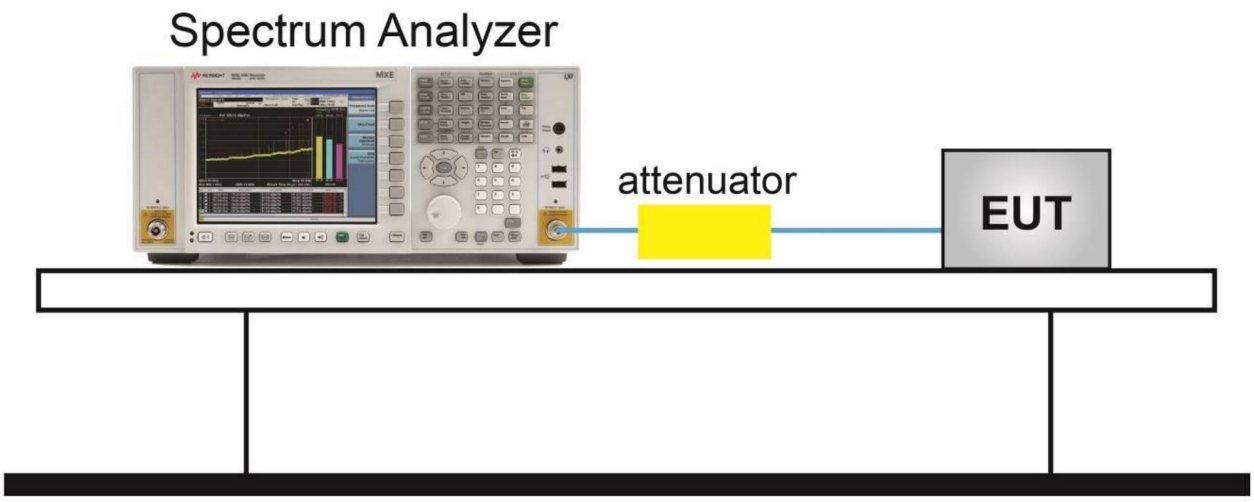
Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	23 or 10+10 log10B
RSS-247 6.2.1.1	23 or 10+10 log10B

Limit use the less value, and B is the 26dB bandwidth.

6.1.2. The measurement method SA-1 is made according to KDB 789033

Set the spectrum analyzer in the following:
Detector: RMS.
RBW=1MHz.
VBW=3MHz.
Sweep time = AUTO.
Span: 30MHz (for 20MHz); 60MHz (for 40MHz)；120MHz (for 80MHz).

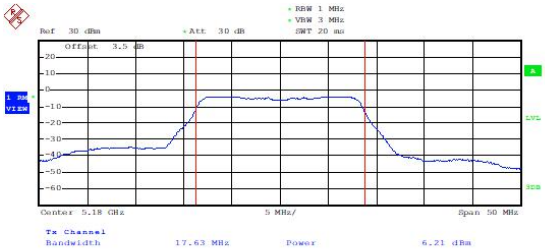
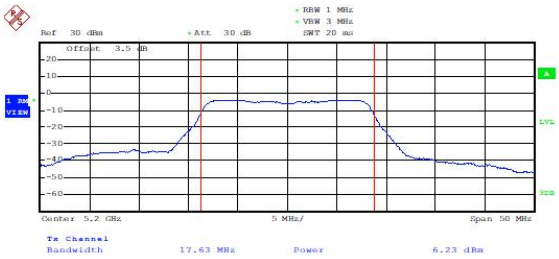
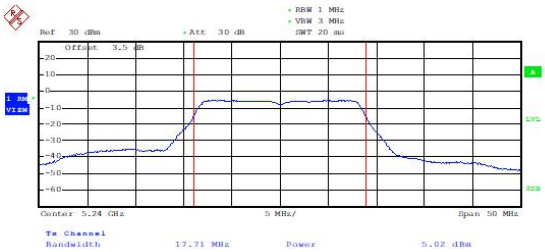
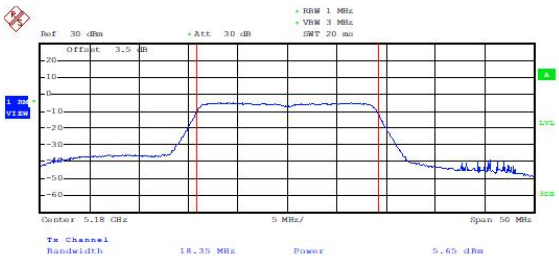
6.1.3. Test Setup

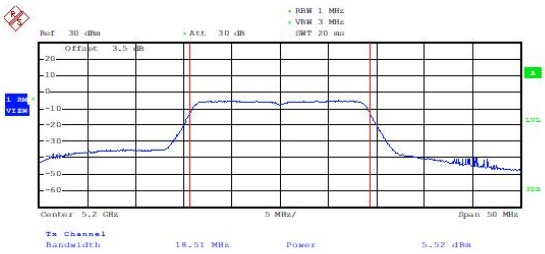
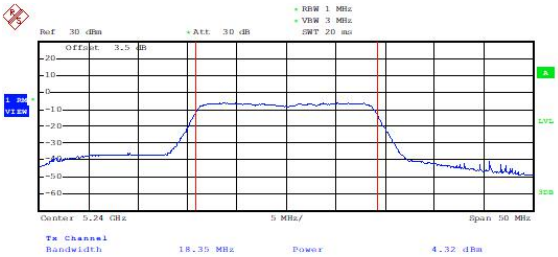
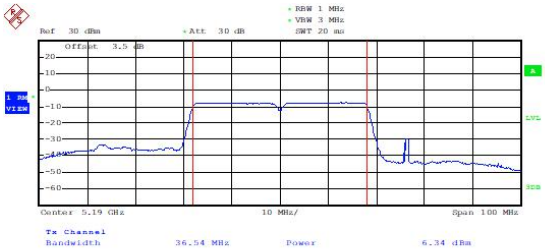
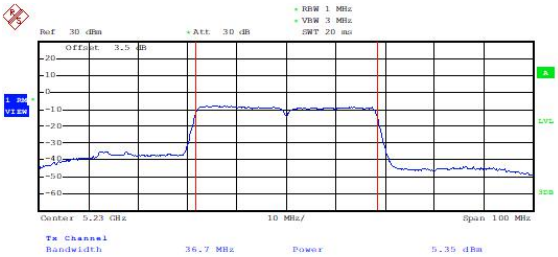


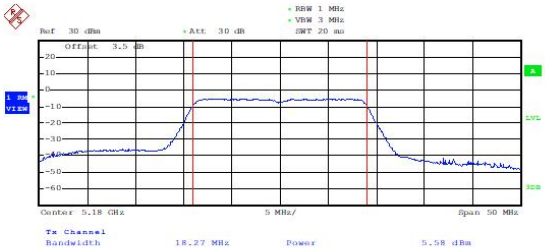
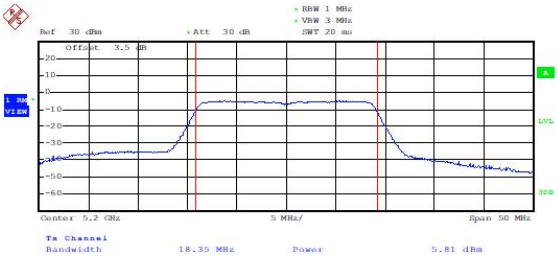
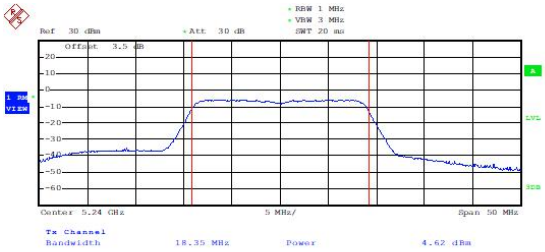
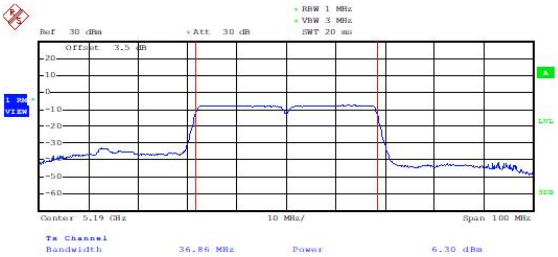
Measurement Results
U-NII-1

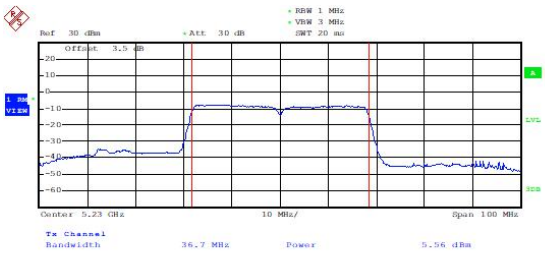
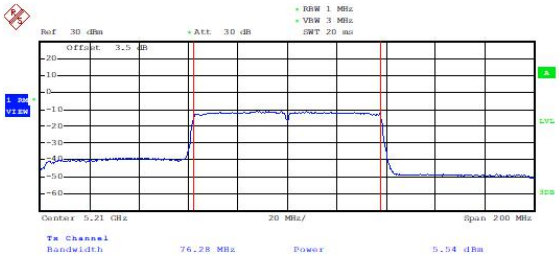
Mode	Channel	Conducted (dBm)	E. I.R.P(dBm)	Duty cycle factor (dB)
802.11a	5180	6.51	3.53	0.3
	5200	6.53	3.55	0.3
	5240	5.32	2.34	0.3
802.11n(20MHz)	5180	6.22	3.24	0.57
	5200	6.09	3.11	0.57
	5240	4.89	1.91	0.57
802.11n(40MHz)	5190	7.51	4.53	1.17
	5230	6.52	3.64	1.17
802.11ac	5180	6.17	3.19	0.59
	5200	6.4	3.42	0.59
	5240	5.21	2.23	0.59
802.11ac(40)	5190	7.45	4.47	1.15
	5230	8.12	5.14	1.15
802.11ac(80)	5210	8.12	5.14	2.58

TEST PLOTS:

Output Power-Conducted (802.11a, Ch36)	Output Power-Conducted (802.11a, Ch40)
 Date: 26.APR.2021 13:56:12	 Date: 26.APR.2021 13:57:57
Output Power-Conducted (802.11a, Ch48)	**Output Power-Conducted (802.11n-HT20, Ch36)**
 Date: 26.APR.2021 13:59:05	 Date: 26.APR.2021 14:00:25

Output Power-Conducted (802.11n-HT20, Ch40)	Output Power-Conducted (802.11n-HT20, Ch48)
 Date: 26.APR.2021 14:01:58	 Date: 26.APR.2021 14:03:37
Output Power-Conducted (802.11n-HT40, Ch38)	**Output Power-Conducted (802.11n-HT40, Ch46)**
 Date: 26.APR.2021 14:05:25	 Date: 26.APR.2021 14:06:51

Output Power-Conducted (802.11ac-VHT20, Ch36)	Output Power-Conducted (802.11ac-VHT20, Ch40)
 Date: 26.APR.2021 14:09:01	 Date: 26.APR.2021 14:32:36
Output Power-Conducted (802.11ac-VHT20, Ch48)	**Output Power-Conducted (802.11ac-VHT40, Ch38)**
 Date: 26.APR.2021 14:34:09	 Date: 26.APR.2021 14:35:39

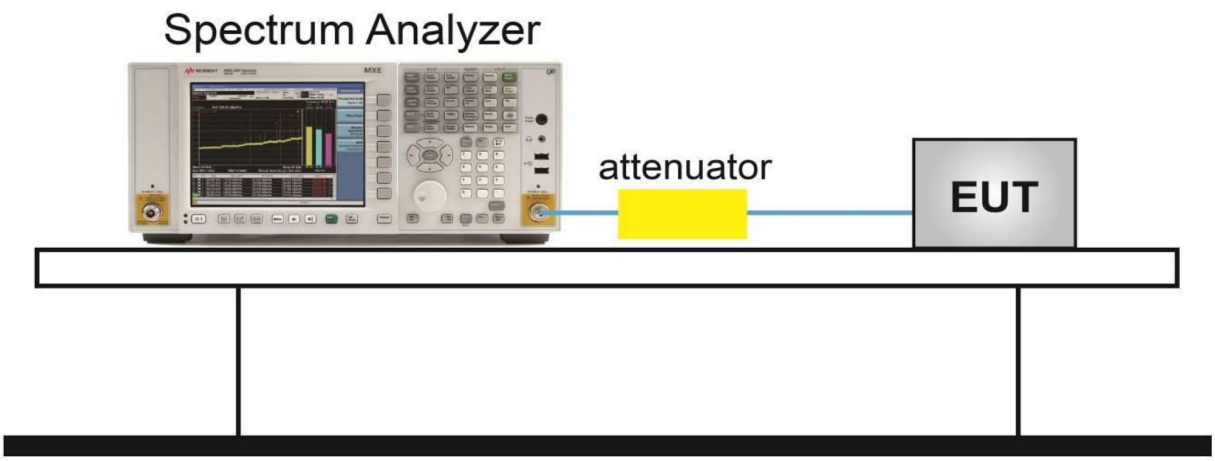
Output Power-Conducted (802.11ac-VHT40, Ch46)	Output Power-Conducted (802.11ac-VHT80, Ch44)
 Date: 26.APR.2021 14:37:20	 Date: 26.APR.2021 14:39:18

6.2. Peak Power Spectral Density

6.2.1. Measurement Limit

Standard	Limit (dBm)
FCC 47 CFR Part 15.407(a)(1)(iv)	≤11
RSS-247 6.2.1.1	≤11

6.2.2. Test Setup



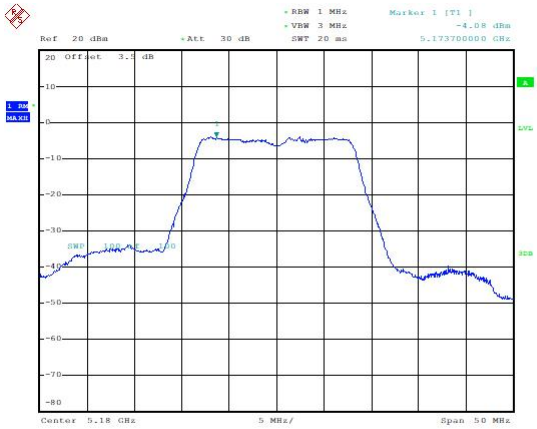
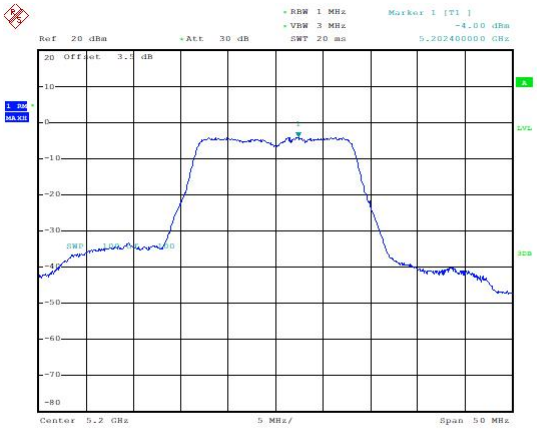
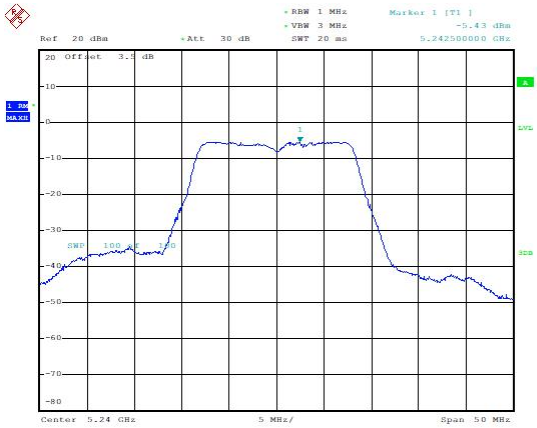
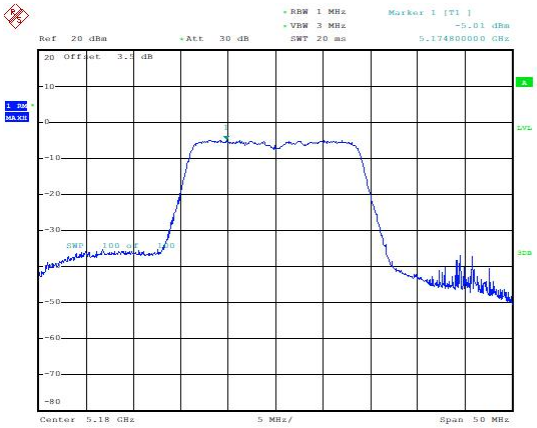
6.2.3. The output power measurement method SA-1 is made according to KDB 789033

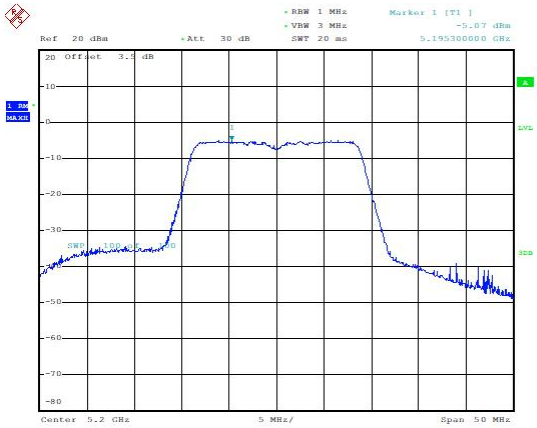
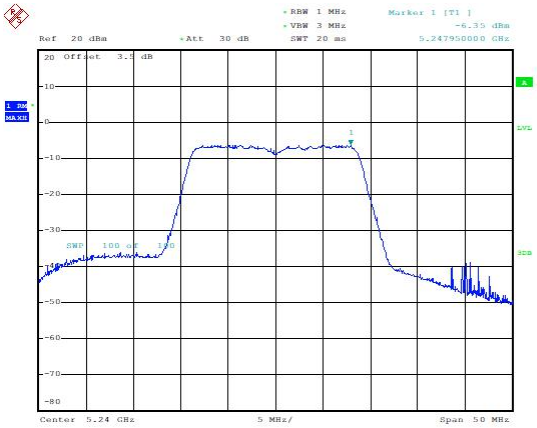
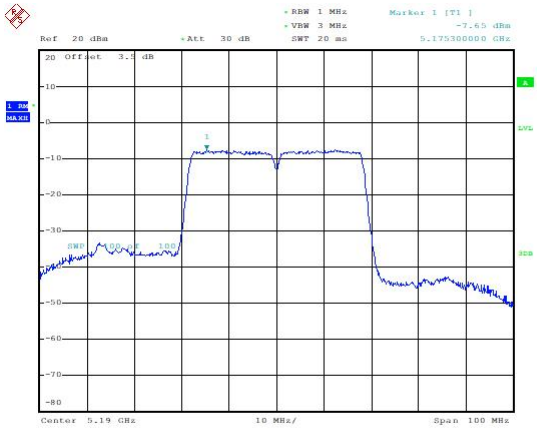
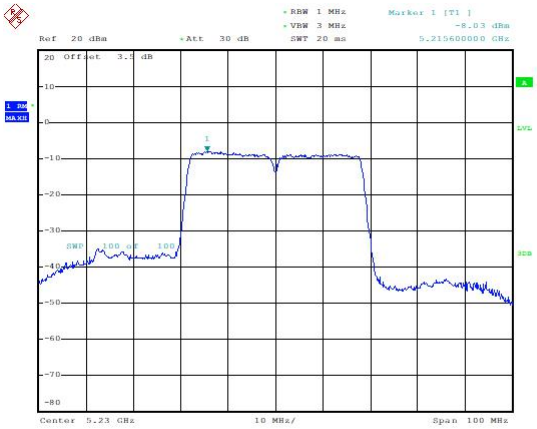
Measurement Results

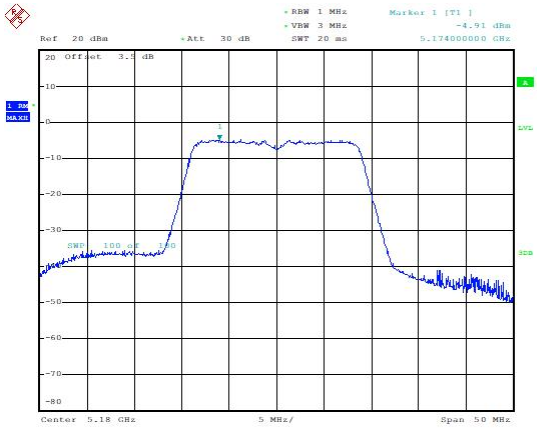
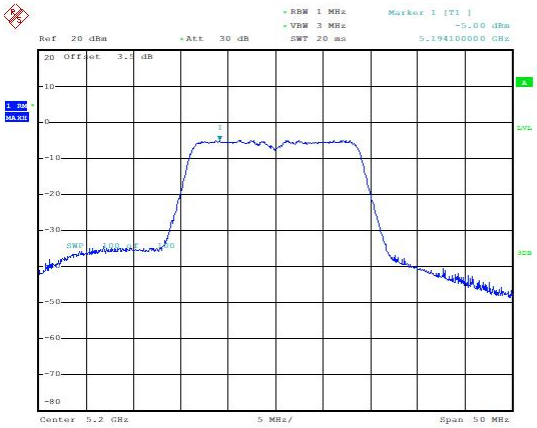
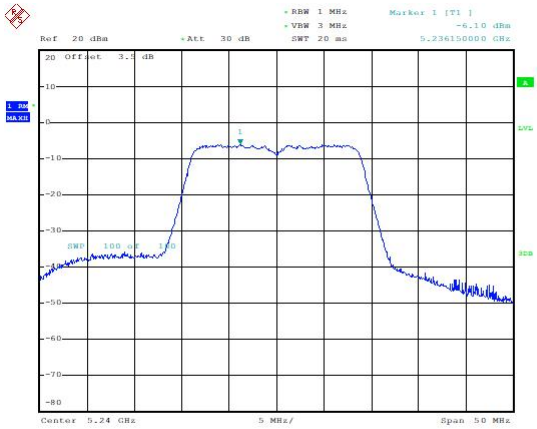
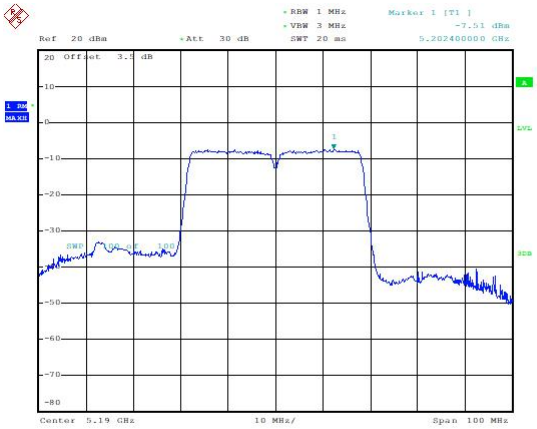
Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	-3.776	P
	5200 MHz	-3.699	P
	5240 MHz	-5.127	P
802.11n HT20	5180 MHz	-4.442	P
	5200 MHz	-4.499	P
	5240 MHz	-5.780	P
802.11n HT40	5190 MHz	-6.485	P
	5230 MHz	-6.857	P
802.11ac HT20	5180 MHz	-4.319	P
	5200 MHz	-4.412	P
	5240MHZ	-5.510	P
802.11ac HT40	5190 MHz	-6.362	P
	5230 MHz	-6.909	P

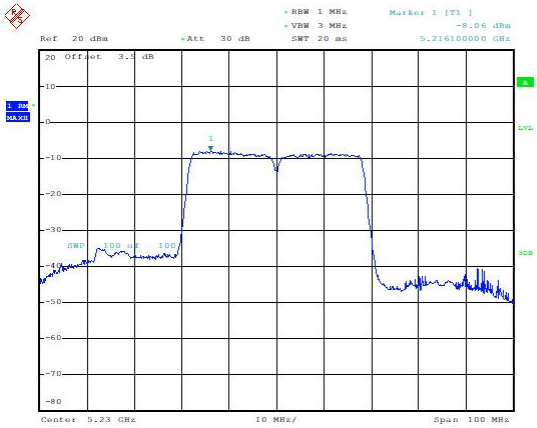
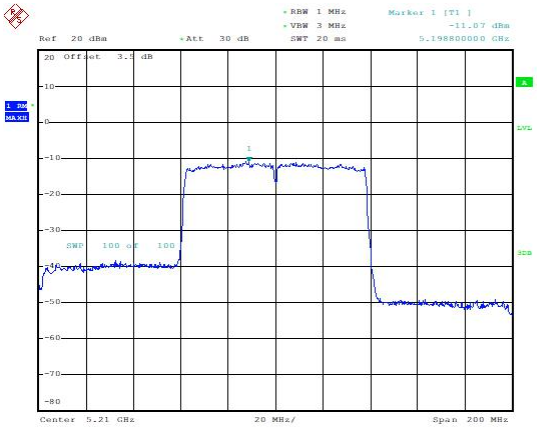
Note: Bold font is the maximum Value

U-NII-1:

Power Spectral Density(dBm/MHz) (802.11a, 5180MHz)	-3.776	Power Spectral Density(dBm/MHz) (802.11a, 5200MHz)	-3.699
			
Date: 26.APR.2021 14:51:11		Date: 26.APR.2021 14:53:12	
Power Spectral Density(dBm/MHz) (802.11a, 5240MHz)	**-5.127**	**Power Spectral Density(dBm/MHz) (802.11n-HT20), 5180MHz)**	**-5.780**
			
Date: 26.APR.2021 14:54:54		Date: 26.APR.2021 14:55:49	

Power Spectral Density(dBm/MHz) (802.11n-HT20), 5200MHz)	-4.499	Power Spectral Density(dBm/MHz) (802.11n-HT20), 5240MHz)	-5.780
 Date: 26.APR.2021 14:58:02		 Date: 26.APR.2021 14:59:07	
Power Spectral Density(dBm/MHz) (802.11n-HT40), 5190MHz)	-6.485	Power Spectral Density(dBm/MHz) (802.11n-HT40), 5230MHz)	-6.857
 Date: 26.APR.2021 15:02:19		 Date: 26.APR.2021 15:05:00	

Power Spectral Density(dBm/MHz) (802.11ac-HT20), 5180MHz)	-4.319	Power Spectral Density(dBm/MHz) (802.11ac-HT20), 5200MHz)	-4.412
			
Power Spectral Density(dBm/MHz) (802.11ac-HT20), 5240MHz)	-5.510	Power Spectral Density(dBm/MHz) (802.11ac-HT40), 5190MHz)	-6.362
			

Power Spectral Density(dBm/MHz) (802.11ac-HT40), 5230MHz)	-6.909	Power Spectral Density(dBm/MHz) (802.11ac-HT80), 5210MHz)	-8.487
 Date: 26.APR.2021 15:11:30		 Date: 26.APR.2021 15:13:24	

6.3. Occupied 26dB Bandwidth(conducted)

6.3.1. Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.407(a)	N/A
RSS-247 6.2	N/A

6.3.2. The measurement is made according to KDB 789033

Measurement Result

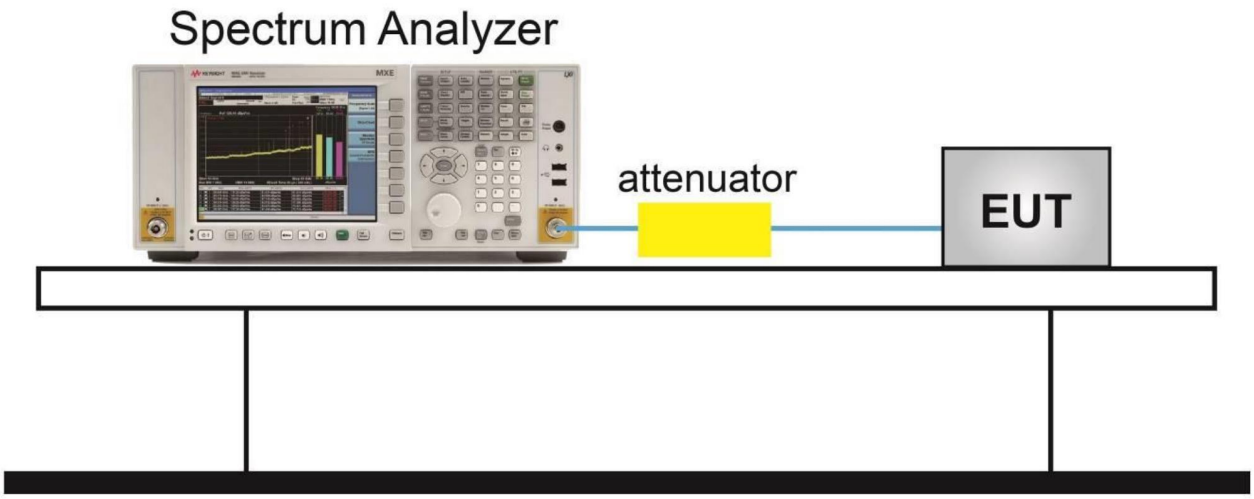
U-NII-1:

Mode	Channel	Occupied 26dB Bandwidth (MHz)	Conclusion
802.11a	5180 MHz	22.20	P
	5200 MHz	22.12	P
	5240 MHz	22.12	P
802.11n HT20	5180 MHz	22.36	P
	5200 MHz	22.44	P
	5240 MHz	22.28	P
802.11n HT40	5190 MHz	40.54	P
	5230 MHz	40.54	P
802.11ac HT20	5180 MHz	22.68	P
	5200 MHz	22.60	P
	5240MHZ	22.44	P
802.11ac HT40	5190 MHz	40.54	P
	5230 MHz	40.86	P
802.11ac HT80	5210MHZ	81.09	P

Note: Bold font is the maximum Value

Occupied 26dB Bandwidth (MHz) (802.11a, 5180MHz)	22.20	Occupied 26dB Bandwidth (MHz) (802.11a, 5200MHz)	22.12

6.3.1. Test Setup



6.4. 99% Occupied Bandwidth(conducted)

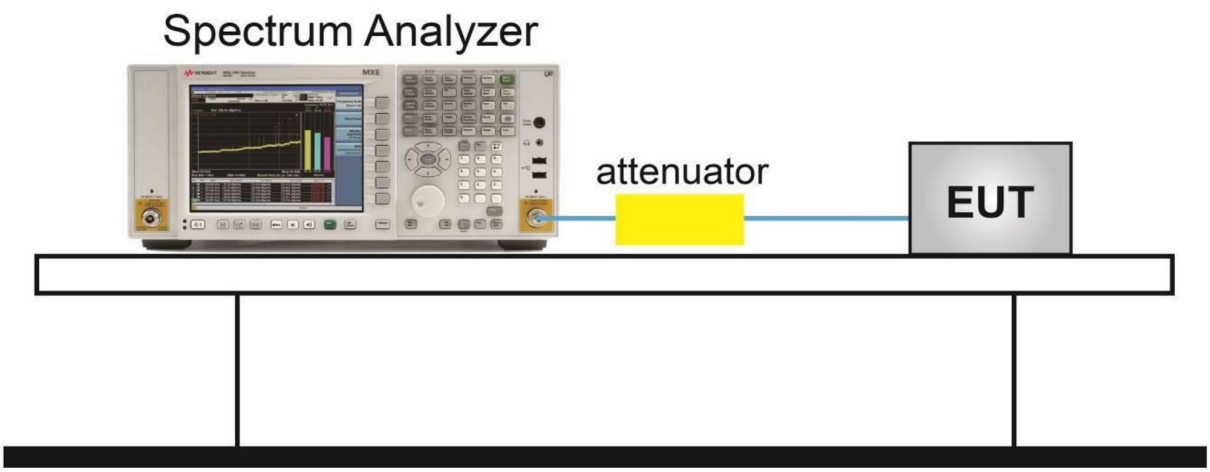
6.4.1. Measurement Limit:

Standard	Limit (MHz)
RSS-Gen 6.7	N/A

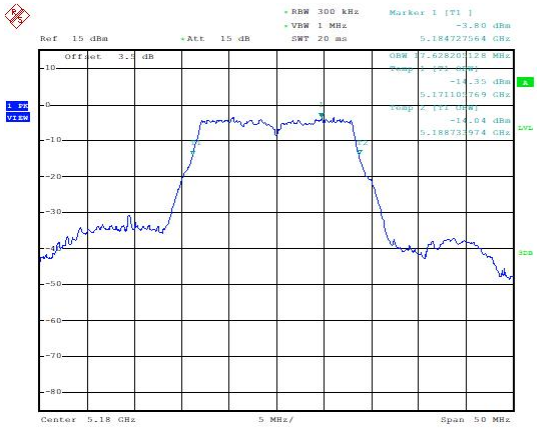
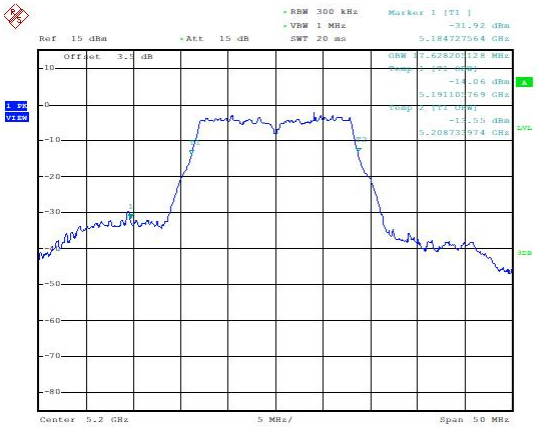
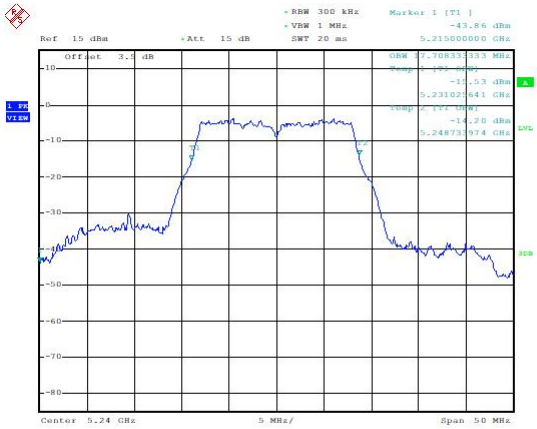
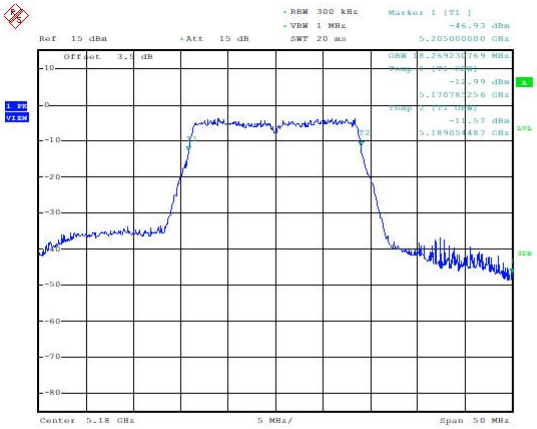
6.4.2. The measurement is made according to KDB 789033

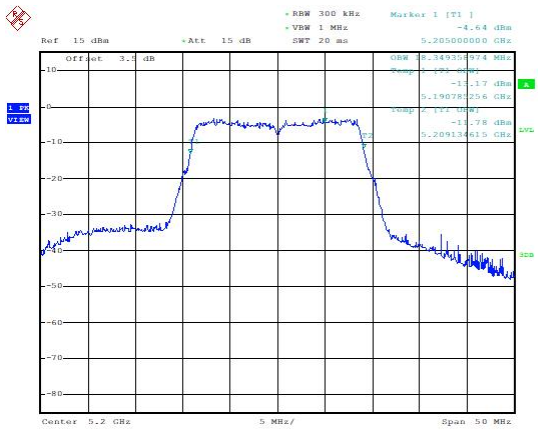
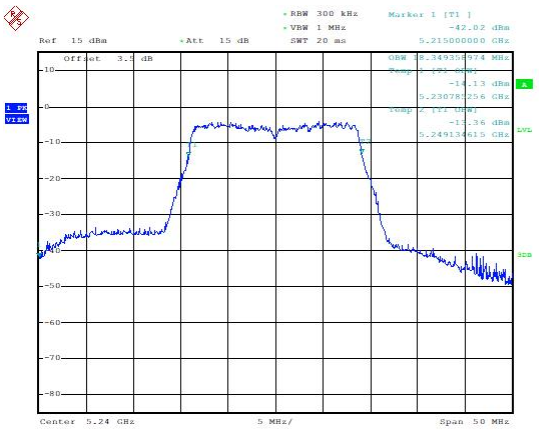
Mode	Channel	99% Occupied Bandwidth (MHz)	Conclusion
802.11a	5180 MHz	17.628	P
	5200 MHz	17.628	P
	5240 MHz	17.708	P
802.11n HT20	5180 MHz	18.269	P
	5200 MHz	18.510	P
	5240 MHz	18.349	P
802.11n HT40	5190 MHz	36.538	P
	5230 MHz	36.699	P
802.11ac HT20	5180 MHz	18.269	P
	5200 MHz	18.349	P
	5240MHZ	18.349	P
802.11ac HT40	5190 MHz	36.859	P
	5230 MHz	36.699	P
802.11ac HT80	5210MHZ	76.282	P

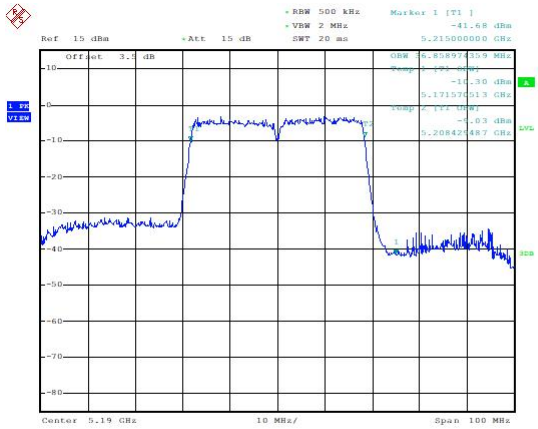
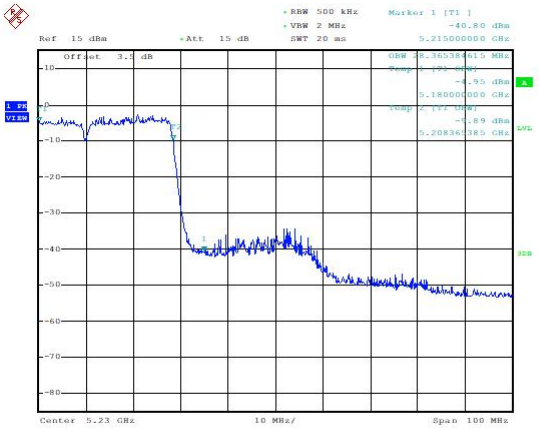
6.4.3. Test Setup

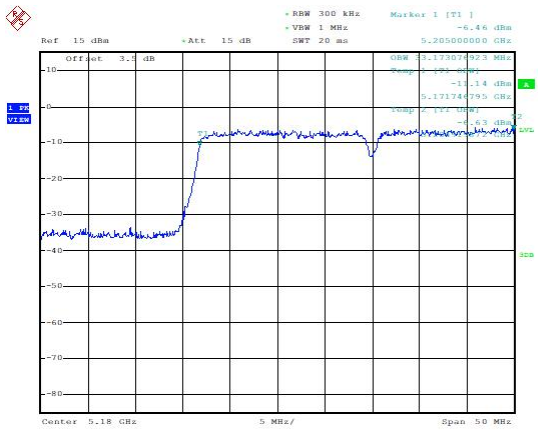
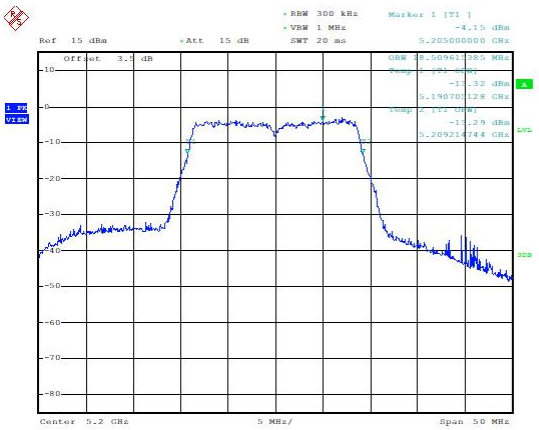
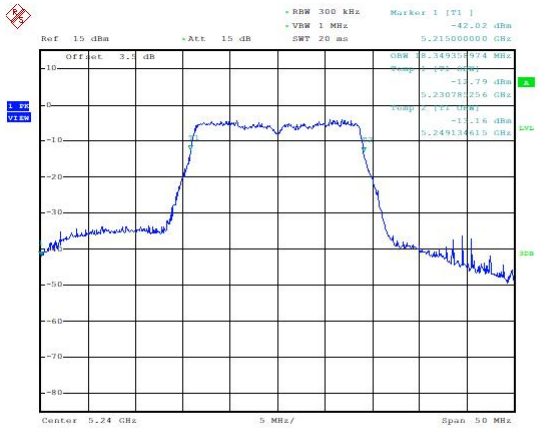
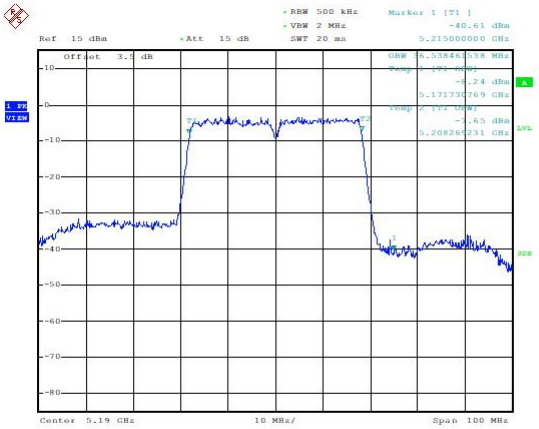


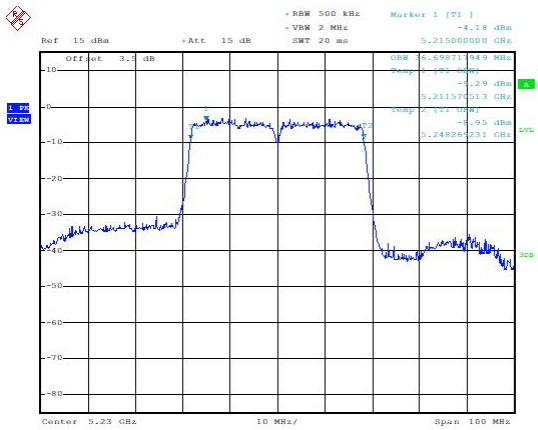
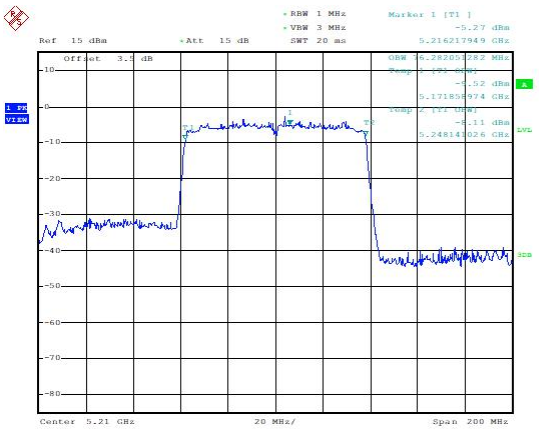
Note: Bold font is the maximum Value

99% Occupied Bandwidth (MHz) (802.11a, 5180MHz)	17.628	99% Occupied Bandwidth (MHz) (802.11a, 5200MHz)	17.628
			
Date: 26.APR.2021 11:17:00		Date: 26.APR.2021 11:18:12	
99% Occupied Bandwidth (MHz) (802.11a, 5240MHz)	17.708	99% Occupied Bandwidth (MHz) (802.11n-HT20), 5180MHz)	18.269
			
Date: 26.APR.2021 11:19:28		Date: 26.APR.2021 11:28:46	

99% Occupied Bandwidth (MHz) (802.11n-HT20), 5200MHz)	18.510	99% Occupied Bandwidth (MHz) (802.11n-HT20), 5240MHz)	18.349
			

99% Occupied Bandwidth (MHz) (802.11n-HT40), 5190MHz)	36.538	99% Occupied Bandwidth (MHz) (802.11n-HT40), 5230MHz)	36.699
			

99% Occupied Bandwidth (MHz) (802.11ac-HT20), 5180MHz)	18.269	99% Occupied Bandwidth (MHz) (802.11ac-HT20), 5200MHz)	18.349
			
Date: 26.APR.2021 11:21:09		Date: 26.APR.2021 11:23:09	
99% Occupied Bandwidth (MHz) (802.11ac-HT20), 5240MHz)	18.349	99% Occupied Bandwidth (MHz) (802.11ac-HT40), 5190MHz)	36.859
			
Date: 26.APR.2021 11:24:37		Date: 26.APR.2021 11:26:11	

99% Occupied Bandwidth (MHz) (802.11ac-HT40), 5230MHz)	36.699	99% Occupied Bandwidth (MHz) (802.11ac-HT80), 5210MHz)	76.282
 Date: 26.APR.2021 11:27:20		 Date: 26.APR.2021 11:42:11	

6.5. Band Edges Compliance

6.5.1. Band Edges - conducted

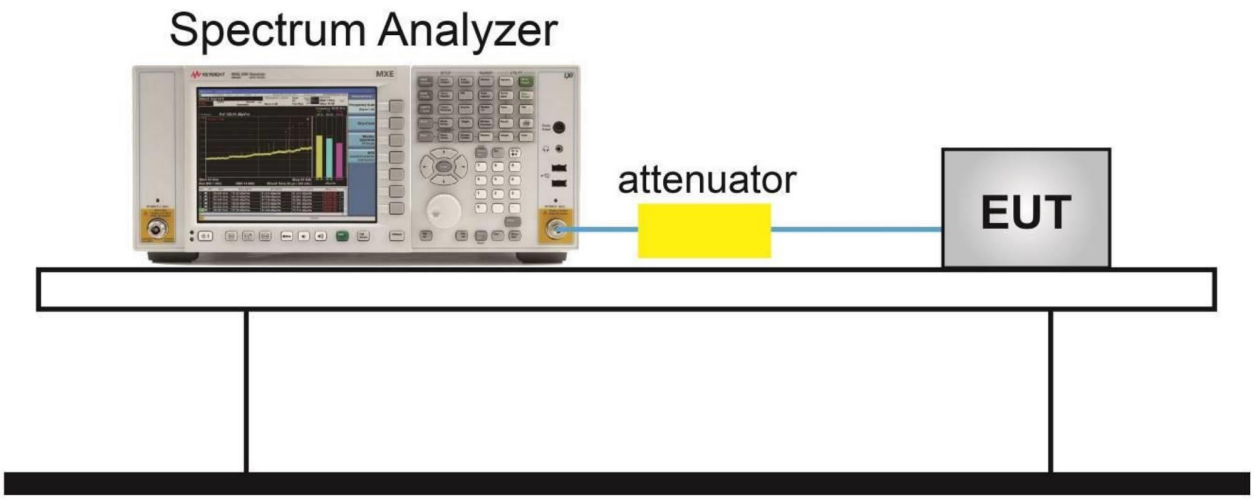
Measurement Limit:

Standard	Limit (dBm/MHz)
FCC 47 CFR Part 15.407(b)(1)	< -27
RSS-247 6.2.1.2	< -27

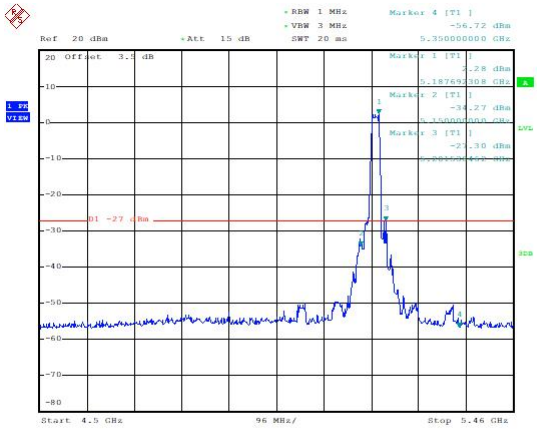
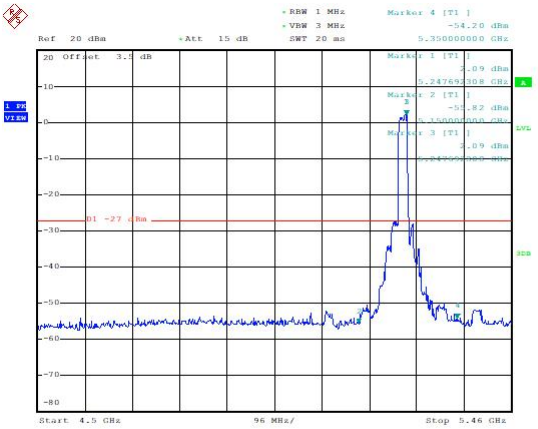
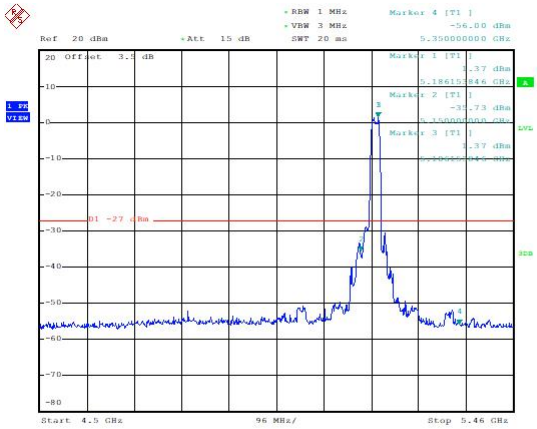
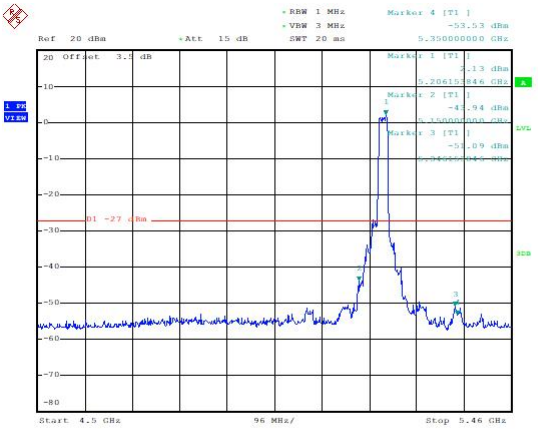
Note:The test doesn't add the antenna gain to the test plots.

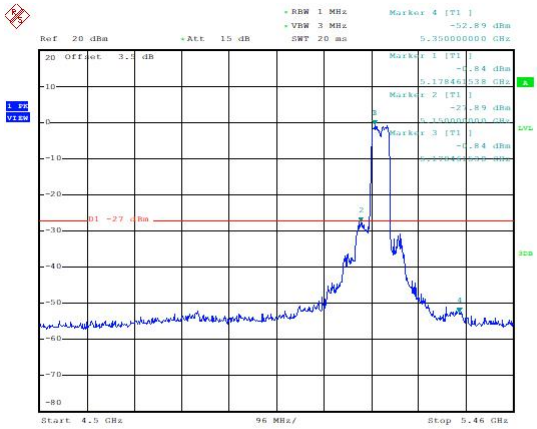
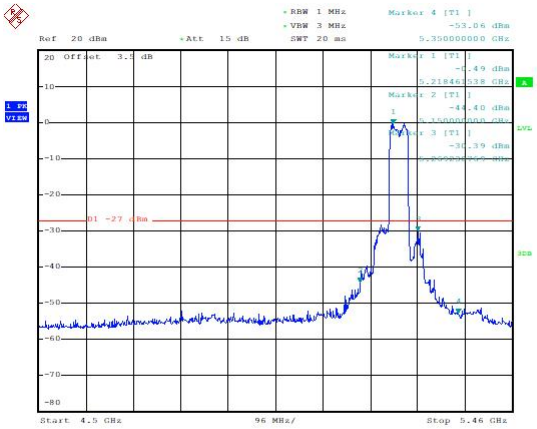
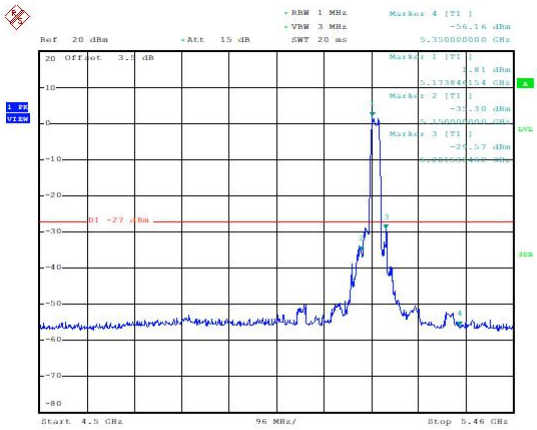
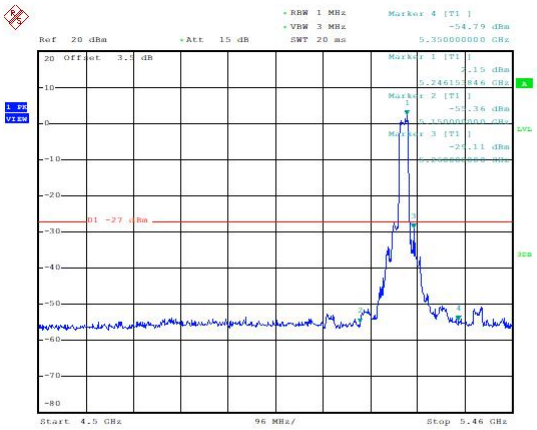
6.5.1.1 The measurement is made according to KDB 789033

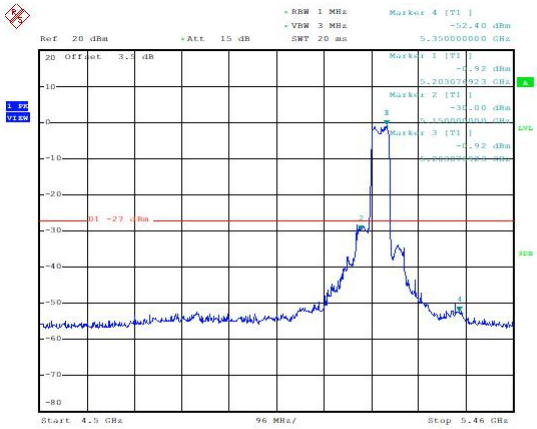
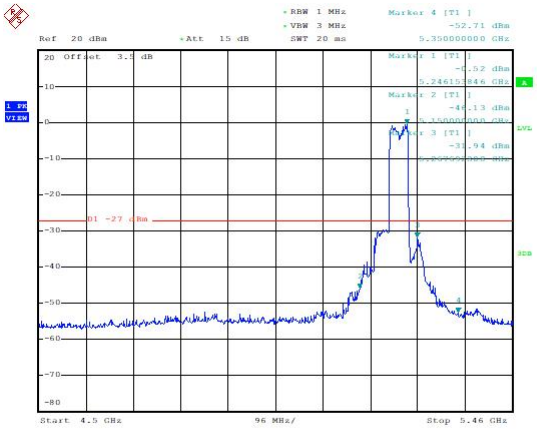
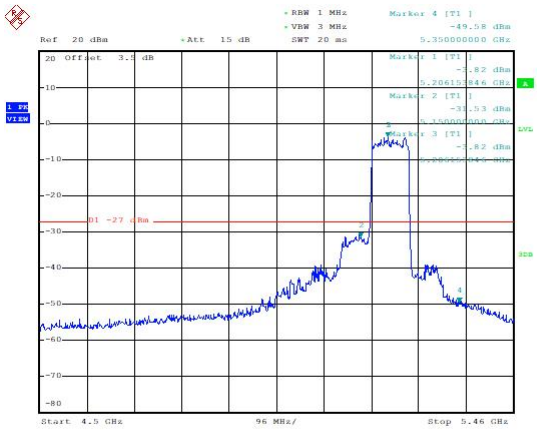
6.5.1.2 Test Setup



U-NII-1:

Band Edges (802.11a, 5180MHz)	Band Edges (802.11a, 5240MHz)
	
Band Edges(802.11n-HT20), 5180MHz)	Band Edges (802.11n-HT20), 5240MHz)
	

Band Edges(802.11n-HT40), 5190MHz	Band Edges (802.11n-HT40), 5230MHz
 Date: 26.APR.2021 15:54:35	 Date: 26.APR.2021 15:57:30
Band Edges (802.11ac-HT20), 5180MHz	**Band Edges (802.11ac-HT20), 5240MHz**
 Date: 26.APR.2021 16:01:36	 Date: 26.APR.2021 16:07:35

Band Edges (802.11ac-HT40), 5190MHz	Band Edges (802.11ac-HT40), 5230MHz
 Date: 26.APR.2021 16:11:31	 Date: 26.APR.2021 16:14:57
Band Edges (802.11ac-HT80), 5210MHz	**/**
 Date: 26.APR.2021 16:18:42	/

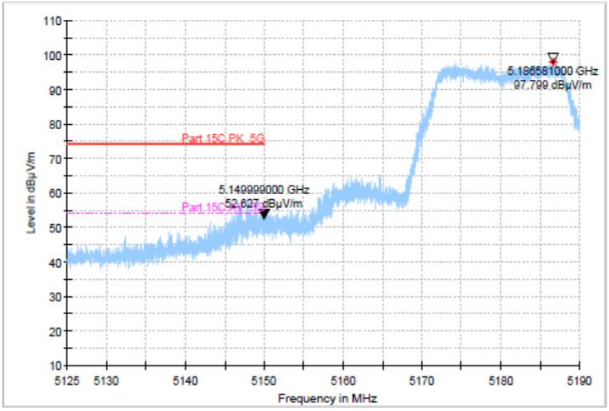
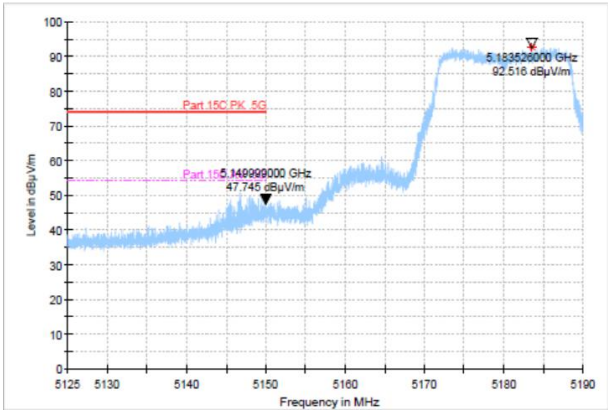
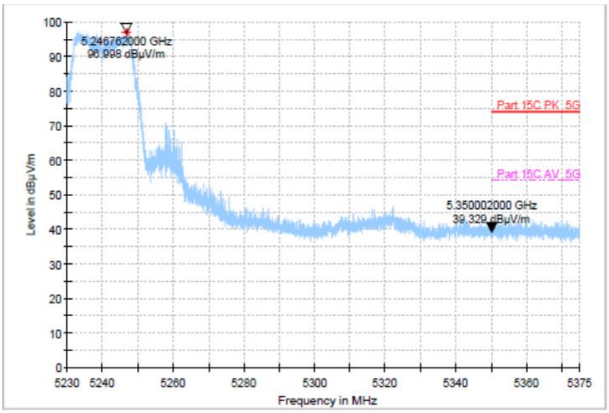
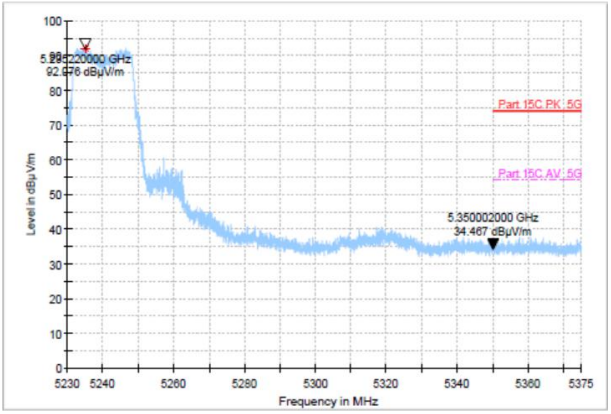
6.5.2. Band Edges - Radiated

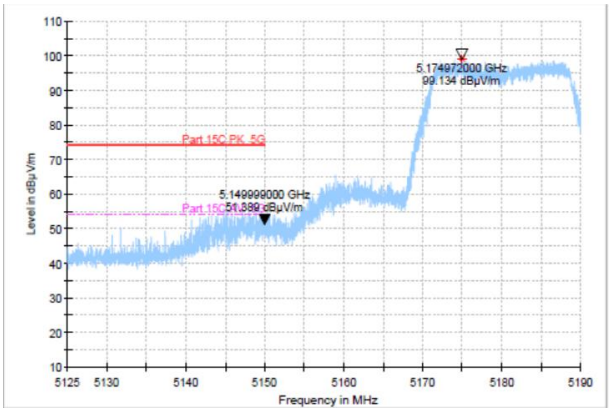
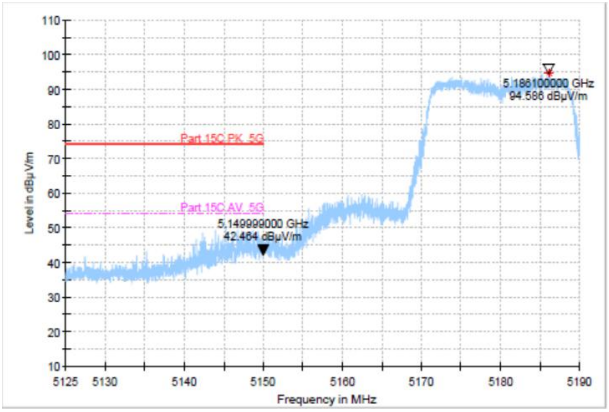
6.5.2.1 Measurement Limit:

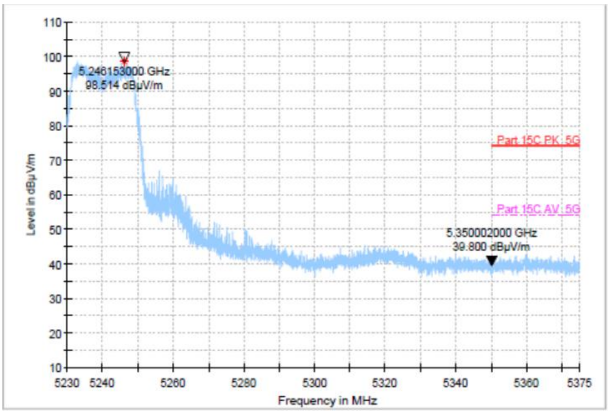
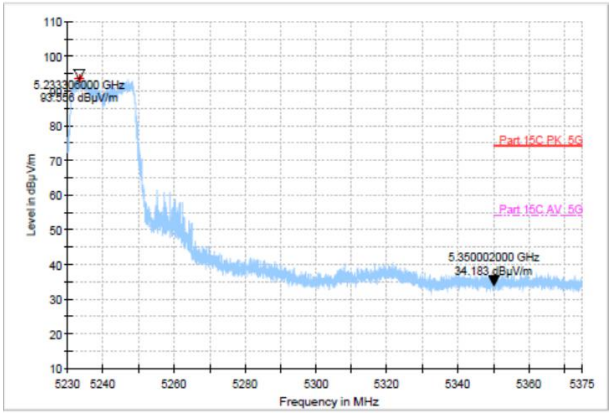
Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209 & 15.407(b)(9),(10)	Peak	74
	Average	54
RSS-Gen 8.9,8.10 RSS-247 6.2.1.2	Peak	74
	Average	54

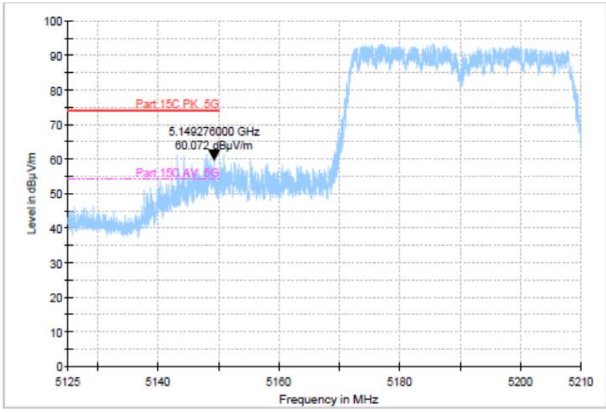
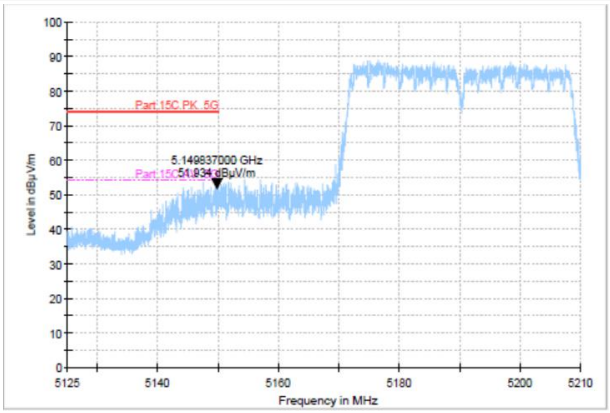
6.5.2.2 The measurement is made according to KDB 789033.

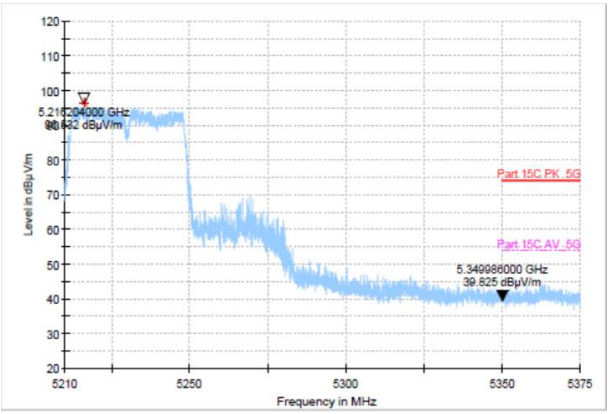
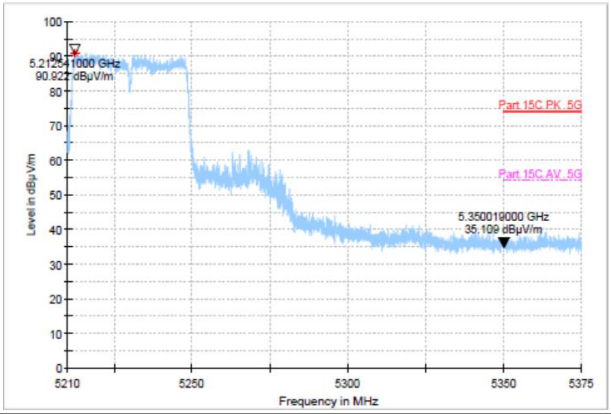
Measurement Result
U-NII-1:
Main supply-12V

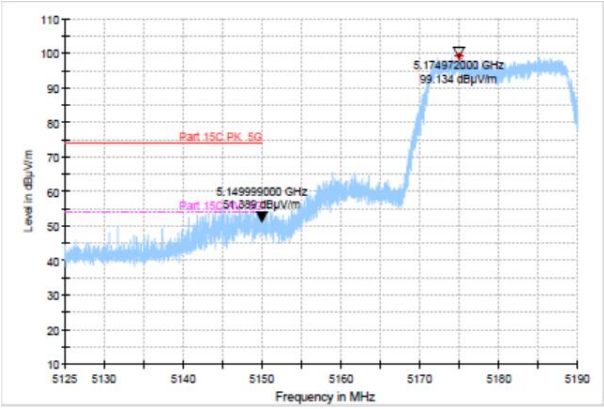
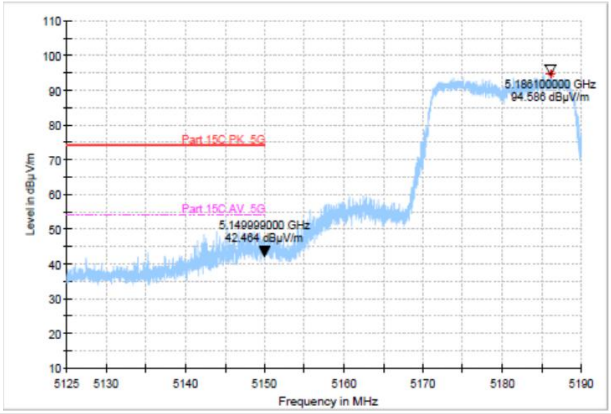
Band Edges (802.11a, 5180MHz)	
Peak detector	AV detector
	
Band Edges (802.11a, 5240MHz)	
Peak detector	AV detector
	

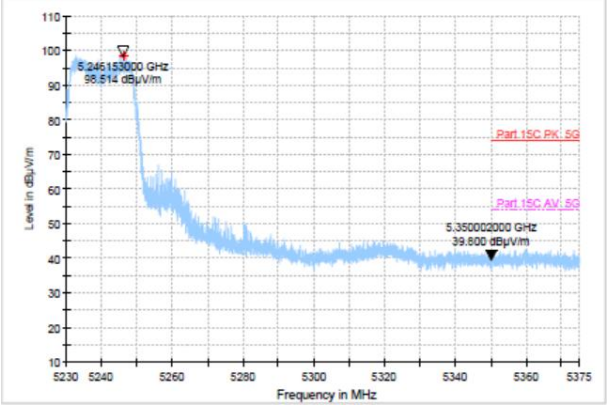
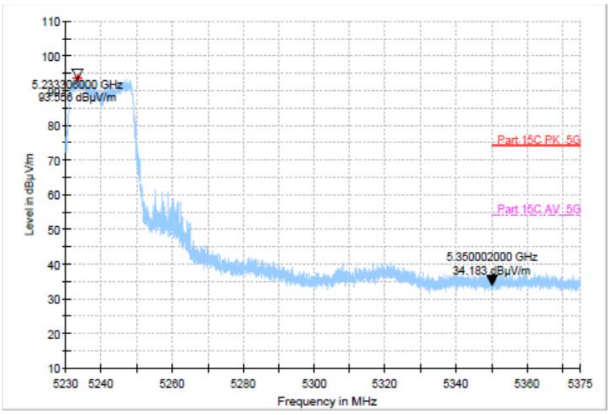
Band Edges (802.11n-HT20, 5180MHz)	
Peak detector	AV detector
	

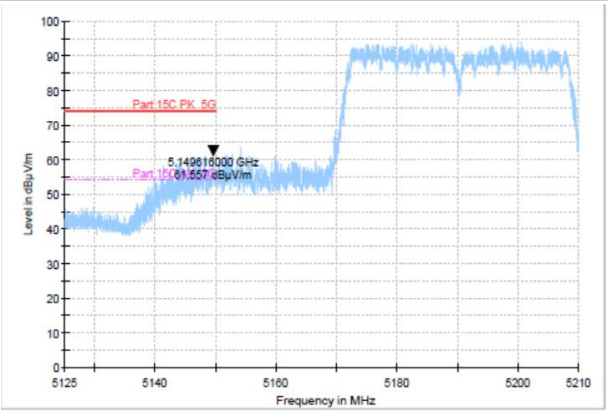
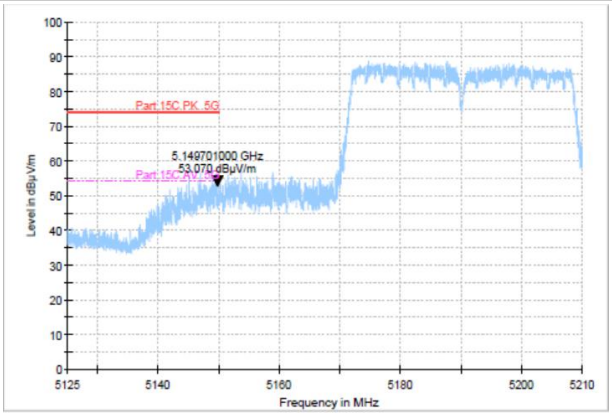
Band Edges (802.11n-HT20, 5240MHz)	
Peak detector	AV detector
	

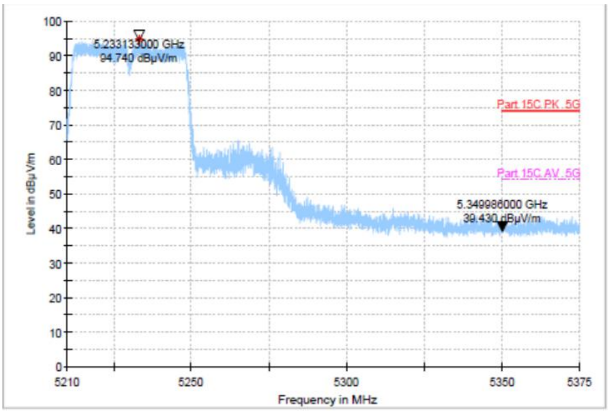
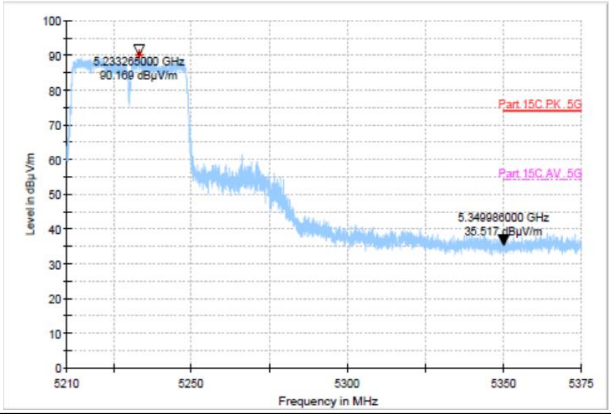
Band Edges (802.11n-HT40, 5190MHz)	
Peak detector	AV detector
	

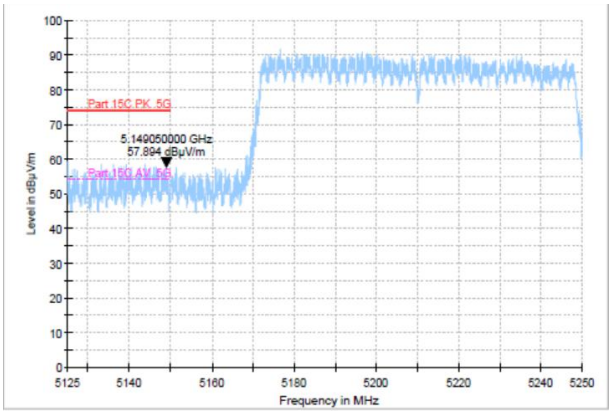
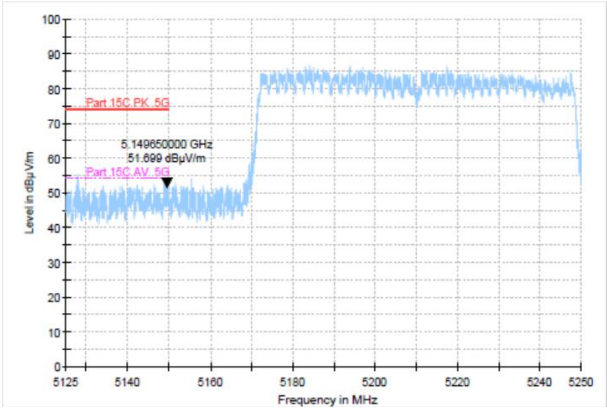
Band Edges (802.11n-HT40, 5230MHz)	
Peak detector	AV detector
	

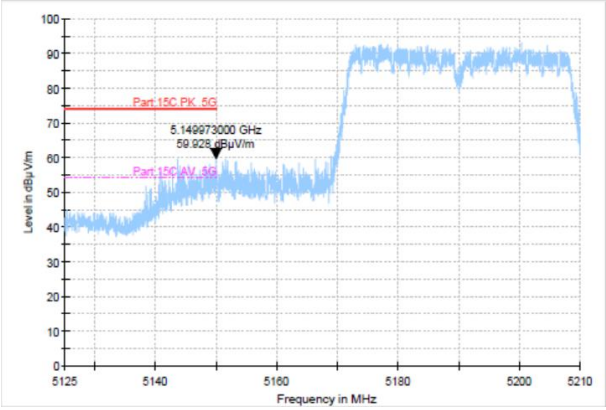
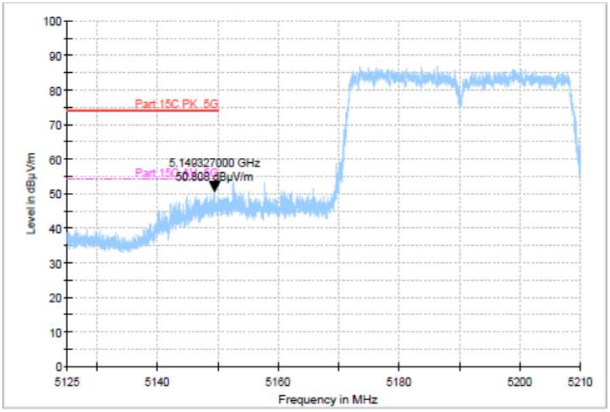
Band Edges (802.11ac-HT20, 5180MHz)	
Peak detector	AV detector
	

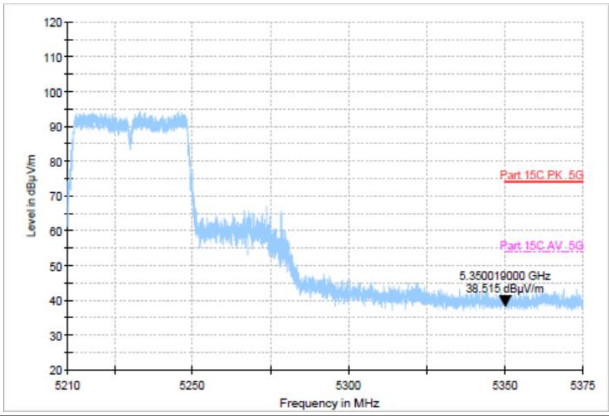
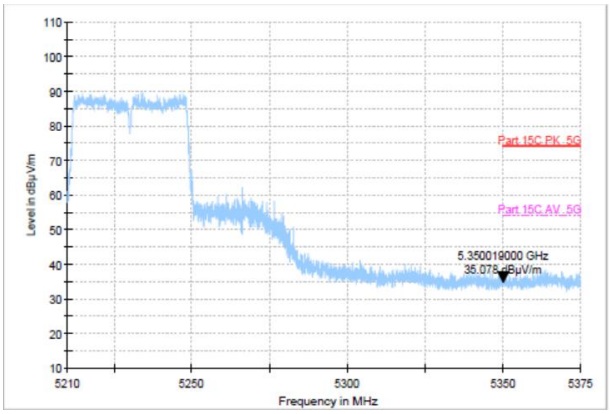
Band Edges (802.11ac-HT20, 5240MHz)	
Peak detector	AV detector
	

Band Edges (802.11ac-HT40, 5190MHz)	
Peak detector	AV detector
	

Band Edges (802.11ac-HT40, 5230MHz)	
Peak detector	AV detector
	

Band Edges (802.11ac-HT80, 5210MHz)	
Peak detector	AV detector
	

Band Edges (802.11ac-HT40, 5190MHz)	
Peak detector	AV detector
	

Band Edges (802.11ac-HT40, 5230MHz)	
Peak detector	AV detector
	

6.6. Transmitter Spurious Emission

6.6.1. Measurement Limit

Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209 & 15.407(b)(9),(10)	Peak	74
	Average	54
RSS-Gen 8.9,8.10 RSS-247 6.2.1.2	Peak	74
	Average	54

6.6.2. The measurement is made according to KDB 789033

Set the spectrum analyzer in the following:
Below 1GHz (detector: Peak and Quasi-Peak)
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz (detector: Peak):
(a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep= AUTO

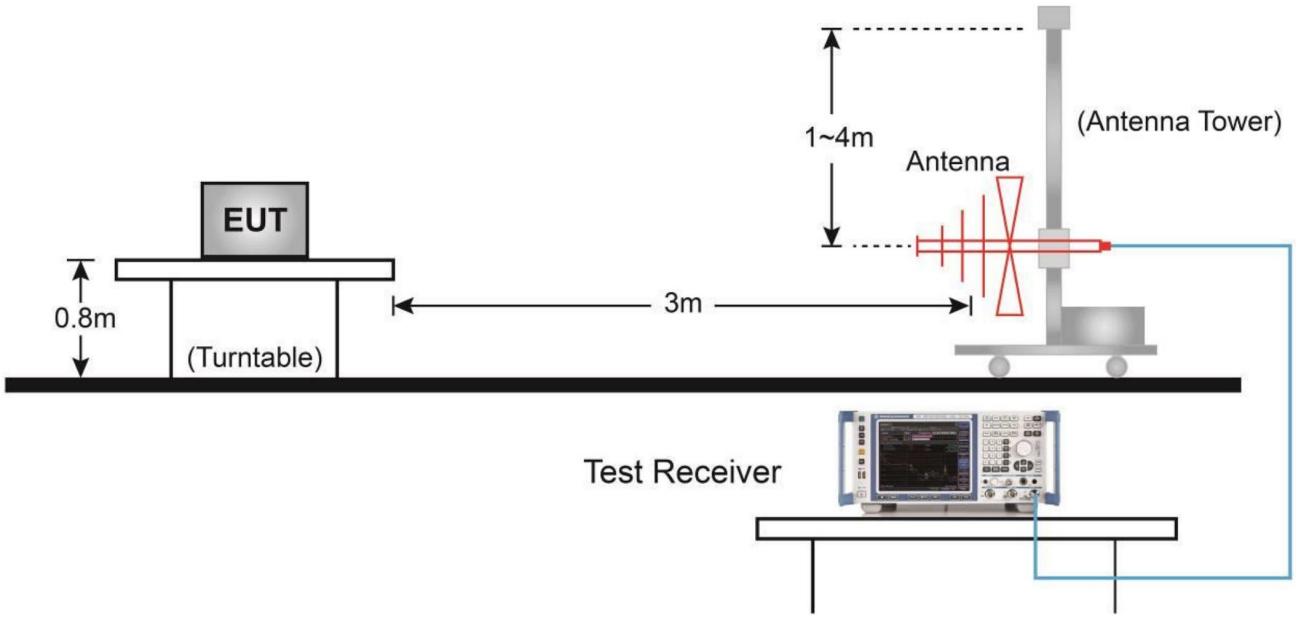
Limit in restricted band:

Frequency of emission (MHz)	Field strength(dBμV/m)	Measurement distance(m)
0.009-0.490	129-94	3
0.490-1.705	74-63	3
1.705-30	70	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

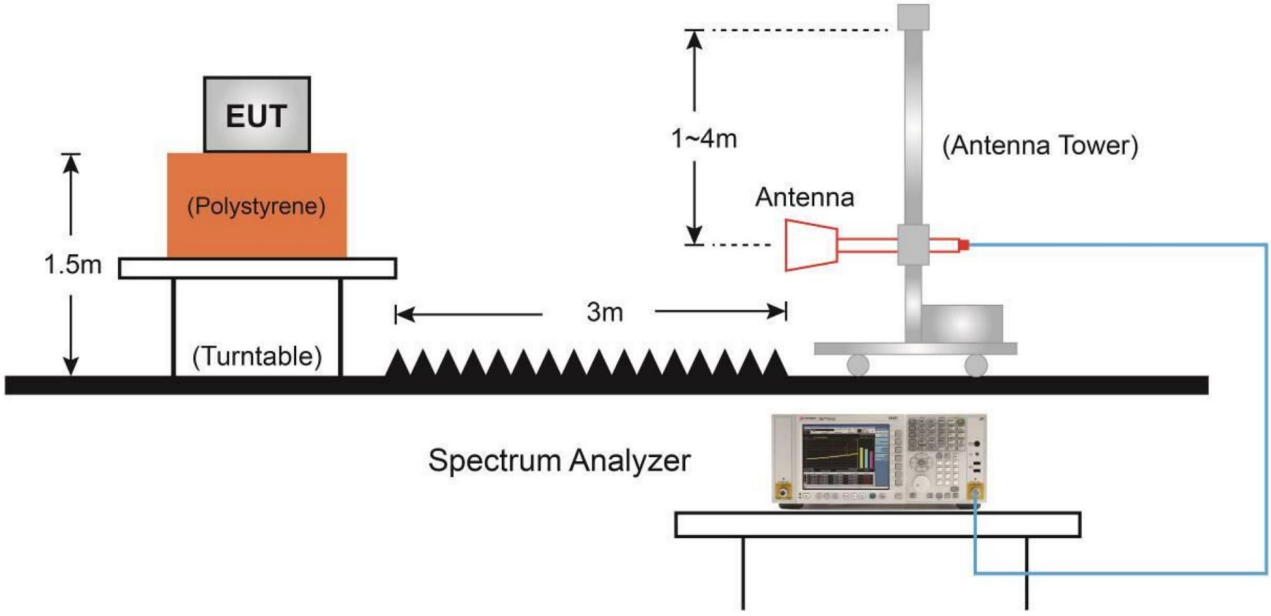
Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

6.6.3. Test Setup

Below 1GHz Test Setup



Above 1GHz Test Setup



Modulation type and data rate tested (Only worst case result is given below):

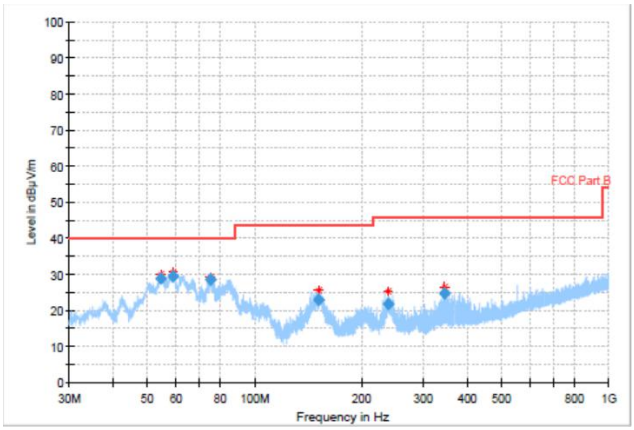
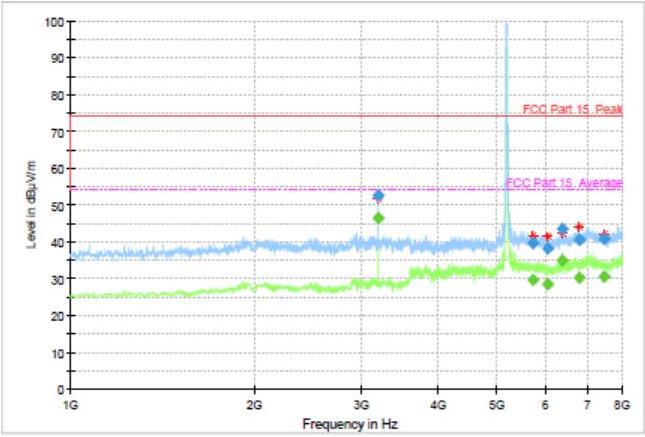
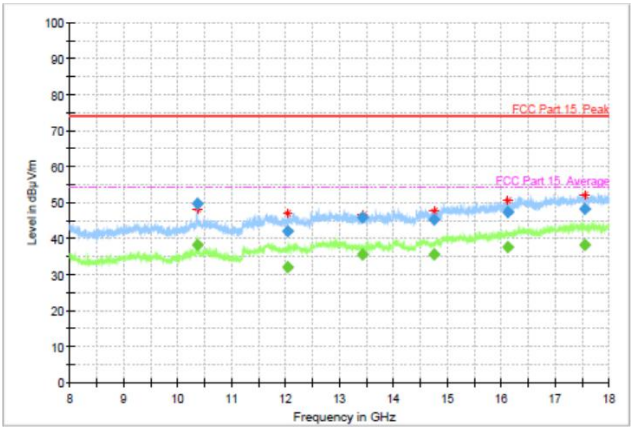
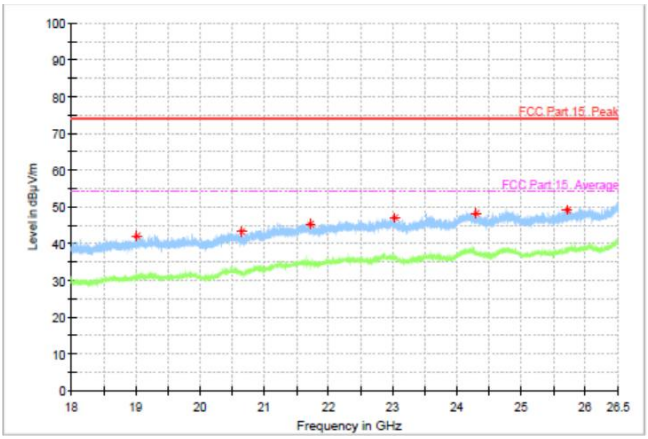
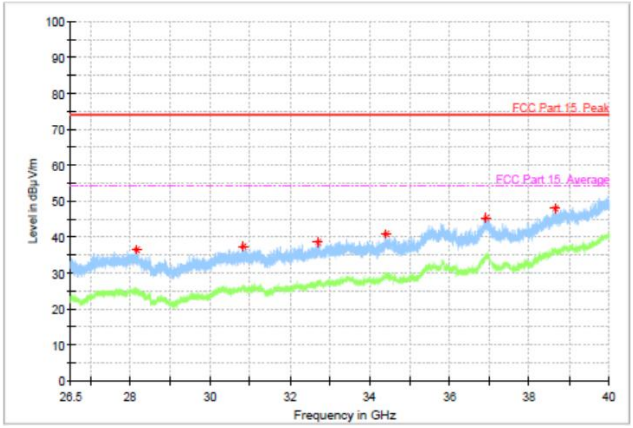
U-NII-1:

Mode	**Data rate**	**Channel**
802.11a	6Mbps	36(5180MHz)
802.11n-HT20	MCS0	36(5180MHz)
802.11n-HT40	MCS0	38(5190MHz)
802.11ac-HT20	MCS0	36(5180MHz)
802.11ac-HT40	MCS0	38(5190MHz)
802.11ac-HT80	MCS0	42(5210MHZ)

Measurement Results

U-NII-1

Main supply-12V

Radiated Spurious Emission (802.11a, ch36, 30MHz-1GHz)	Radiated Spurious Emission (802.11a, ch36, 1GHz-8GHz))
	
Radiated Spurious Emission (802.11a, ch36, 8GHz-18GHz)	**Radiated Spurious Emission (802.11a, ch36, 18GHz-26.5GHz)**
	
Radiated Spurious Emission (802.11a, ch36, 26.5 GHz-40 GHz)	**/**
	**/**