

FCC TEST REPORT

for

YICHEN (SHENZHEN) TECHNOLOGY CO., LTD

Wireless Router

Model Number: JIR-AC682

Serial Number: PX-3765, AC680, REW1200-J1

FCC ID: 2AJSTJIR-AC682

Prepared for : YICHEN (SHENZHEN) TECHNOLOGY CO., LTD
Address : 23/F, Block C1, Nanshan I Park, No. 1001, Xueyuan Road,
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Report No. : 17KWE035288F
Date of Test : Jan. 15~Mar. 15, 2017
Date of Report : Mar. 22, 2017

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Keyway Testing Technology Co., Ltd.

Applicant:	YICHEN (SHENZHEN) TECHNOLOGY CO., LTD		
Address:	23/F, Block C1, Nanshan I Park, No. 1001, Xueyuan Road, Taoyuan Street, Nanshan District, Shenzhen, China		
Manufacturer:	YICHEN (SHENZHEN) TECHNOLOGY CO., LTD		
Address:	23/F, Block C1, Nanshan I Park, No. 1001, Xueyuan Road, Taoyuan Street, Nanshan District, Shenzhen, China		
E.U.T:	Wireless Router		
Model Number:	JIR-AC682		
Serial Model:	PX-3765, AC680, REW1200-J1		
Trade Name:		Serial No.:	-----
Date of Receipt:	Jan. 13, 2017	Date of Test:	Jan. 15~Mar. 15, 2017
Test Specification:	FCC Part 15, Subpart 15.407: 2016 ANSI C63.10:2013 KDB789033 D02 v01r03		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		
Issue Date: Mar. 22, 2017			
Tested by:	Reviewed by:	Approved by:	
			
_____ Keven Wu/ Engineer	_____ Mark Li / Supervisor	_____ Andy Gao/ Supervisor	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.</i>			

1. TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.407(b)	PASS
26dB bandwidth and 99%dB Bandwidth	15.407 (a)	PASS
Power density	15.407 (a)	PASS
Maximum Peak Output Power	15.407 (a)	PASS
Emissions from out of band	15.407 (b)	PASS
Frequency Stability	15.407 (g)	PASS
Antenna Requirement	15.203	PASS

2. GENERAL PRODUCT INFORMATION

2.1.Product Function

Refer to Technical Construction Form and User Manual.

2.2.Description of Device (EUT)

Product Name:	Wireless Router
Model No.:	JIR-AC682
Serial Model:	PX-3765, AC680, REW1200-J1
Model Difference	All the models are the same circuit and RF module, except the model names and colour.
Operation Frequency:	5.15GHz ~ 5.24GHz
Channel numbers:	4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)
Modulation technology:	OFDM
Bit Rate of Transmitter	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: 300/270/240/180/150/120/108/90/54Mbps
Antenna Type:	External Antenna*2; cable type
Antenna gain:	5.3dBi
Power supply:	DC 9V from adapter
Adapter:	Manufacturer:YICHEN (SHENZHEN) TECHNOLOGY CO., LTD Model:SA/12PA/12FEU090080 INPUT:AC 100-240V, 50/60Hz, 0.5A OUTPUT:DC 9V/0.8A DC Line:Unshielded, Undetachable 1.2m

2.3. Test Supporting System

Notebook

Manufacturer: Lenovo

M/N: Lenovo G475

S/N: GB14477457

2.4. Independent Operation Modes

The basic operation modes are:

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

For 5150~5250 MHz band:

802.11a, 802.11n(HT20) mode Channel 5180MHz, 5200MHz, 5240MHz were tested.

802.11n(HT40) mode Channel 5190MHz, 5230MHz were tested.

802.11a data speed:54/48/36/24/18/12/9/6Mbps; 802.11n(HT20)/N(40) data speed: 300/270/240/

180/150/120/108/90/54Mbps. According to ANSI C63.10 standards, the test results was the “worst case” 6Mbps for 802.11a, 54Mbps for 802.11n(HT20)/n(HT40) and its data have been recorded in this report.

2.5. Test Sites

Test Facilities

Lab Qualifications : Certificated by Industry Canada
Registration No.: 9868A
Date of registration: December 8, 2011

Certificated by FCC, USA
Registration No.: 370994
Date of registration: February21, 2012

Certificated by CNASChina
Registration No.: CNAS L5783
Date of registration: August 8, 2012

2.6.List of Test and Measurement Instruments

For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 09,16	Apr. 09,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr. 09,16	Apr. 09,17
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr. 09,16	Apr. 09,17
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr. 09,16	Apr. 09,17

For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 09,16	Apr. 09,17
System Simulator	Agilent	E5515C	GB43130245	Apr. 09,16	Apr. 09,17
Power Splitter	Weinschel	1506A	NW425	Apr. 09,16	Apr. 09,17
Bilog Antenna	ETS-LINDGREN	3142D	135452	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 26MHz-6GHz					
Spectrum Analyzer	Agilent	E4407B	MY4511304	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 100Hz-26.5GHz					
Spectrum Analyzer	R&S	FSV40	132.1.3008K39-100967	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 10Hz-40GHz					
3m Semi-anechoic Chamber	ETS-LINDGREN	966	KW01	Apr. 09,16	Apr. 09,17
Signal Amplifier	SONOMA	310	187016	Apr. 09,16	Apr. 09,17
Signal Amplifier	Agilent	8449B	3008A00251	Apr. 09,16	Apr. 09,17
RF Cable	IMRO	IMRO-400	966 Cable 1#	N/A	N/A
MULTI-DEVICE Controller	ETS-LINDGREN	2090	126913	N/A	N/A
Horn Antenna	DAZE	ZN30701	11003	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 1GHz-18GHz					
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 18GHz-40GHz					
Spectrum Analyzer	Agilent	8593E	3911A04271	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 9kHz-22GHz					
Spectrum Analyzer	Agilent	E4408B	MY44211125	Apr. 09,16	Apr. 09,17
Remark: Testable Frequency Range: 9kHz-26.5GHz					
Signal Amplifier	DAZE	ZN3380C	11001	Apr. 09,16	Apr. 09,17
HighPass filter	Micro	HPM50111	324216	Apr. 09,16	Apr. 09,17
Filter	COM-MW	ZBSF-C836.5-25-X	KW032	Apr. 09,16	Apr. 09,17
Filter	COM-MW	ZBSF-C1747.5-75-X2	KW035	Apr. 09,16	Apr. 09,17
Filter	COM-MW	ZBSF-C1880-60-X2	KW037	Apr. 09,16	Apr. 09,17
Constant temperature and humidity box	GF	GTH-800-40-1P	MAA9906-005	Apr. 09,16	Apr. 09,17
Splitter	Agilent	11636B	0025164	Apr. 09,16	Apr. 09,17
Power Meter	Anritsu	ML2495A	1204003	Apr. 24,16	Apr. 24,17
Power Sensor	Anritsu	MA2411B	1126150	Apr. 24,16	Apr. 24,17
Spectrum Analyzer	Agilent	N9020A	MY56070279	Jul.26,16	Jul.25,17
Remark: Testable Frequency Range: 10Hz-26.5GHz					

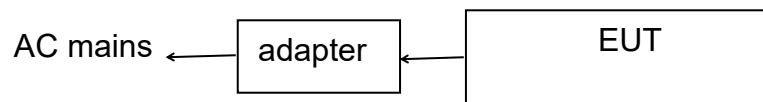
3. TEST SET-UP AND OPERATION MODES

3.1.Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2.Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: Wireless Router)

3.3.Test Software

Final Test Mode	Description
Test Software	MP tool

3.4.Special Accessories and Auxiliary Equipment

Notebook	
Manufacturer:	Lenovo
M/N:	Lenovo G475
S/N:	GB14477457

3.5.Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

4.1.1 Limit 15.207 limits

Frequency MHz	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.

4.1.2 Test Setup

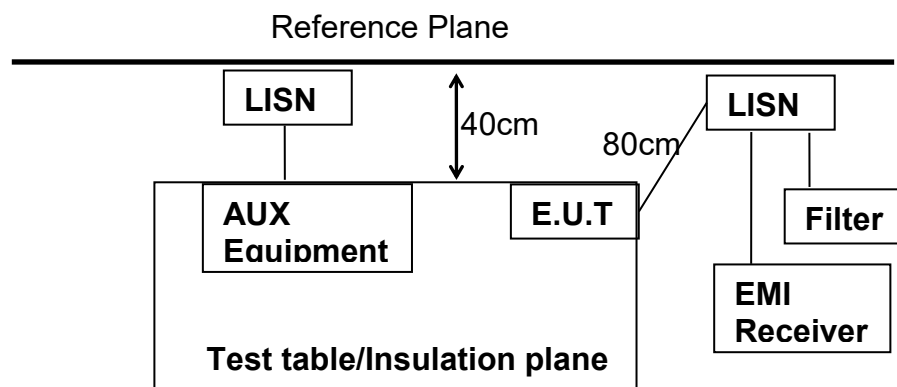
1. The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the center so as to form a bundle no longer than 0.4 m.

2. The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.

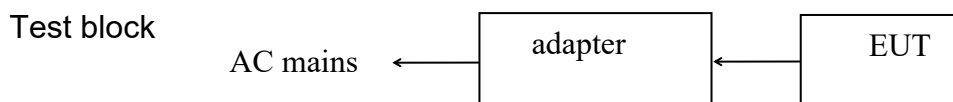
3. The frequency range from 150 kHz to 30 MHz was investigated.

4. The bandwidth of the test receiver was set at 9 kHz.

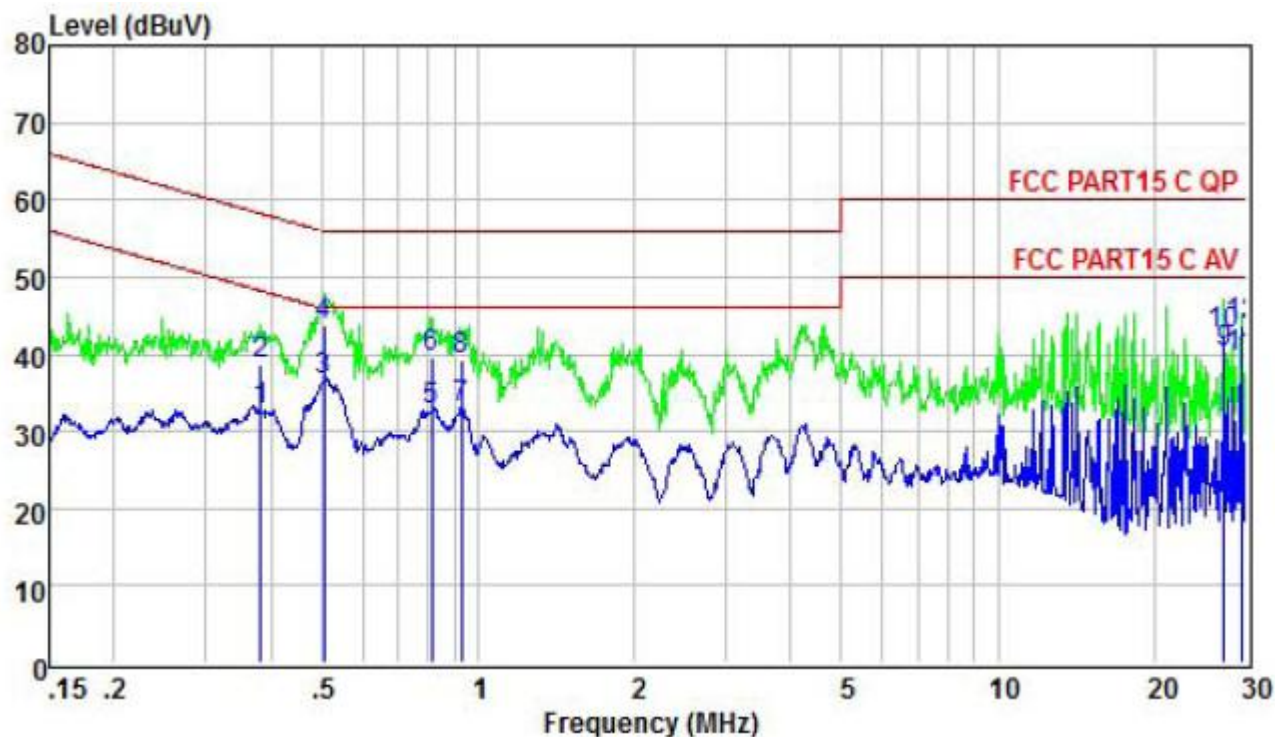
5. Pretest for all mode, and the test data of the worst case condition(s) was reported on the following page.



Remark: E.U.T. :Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height: 0.8m.

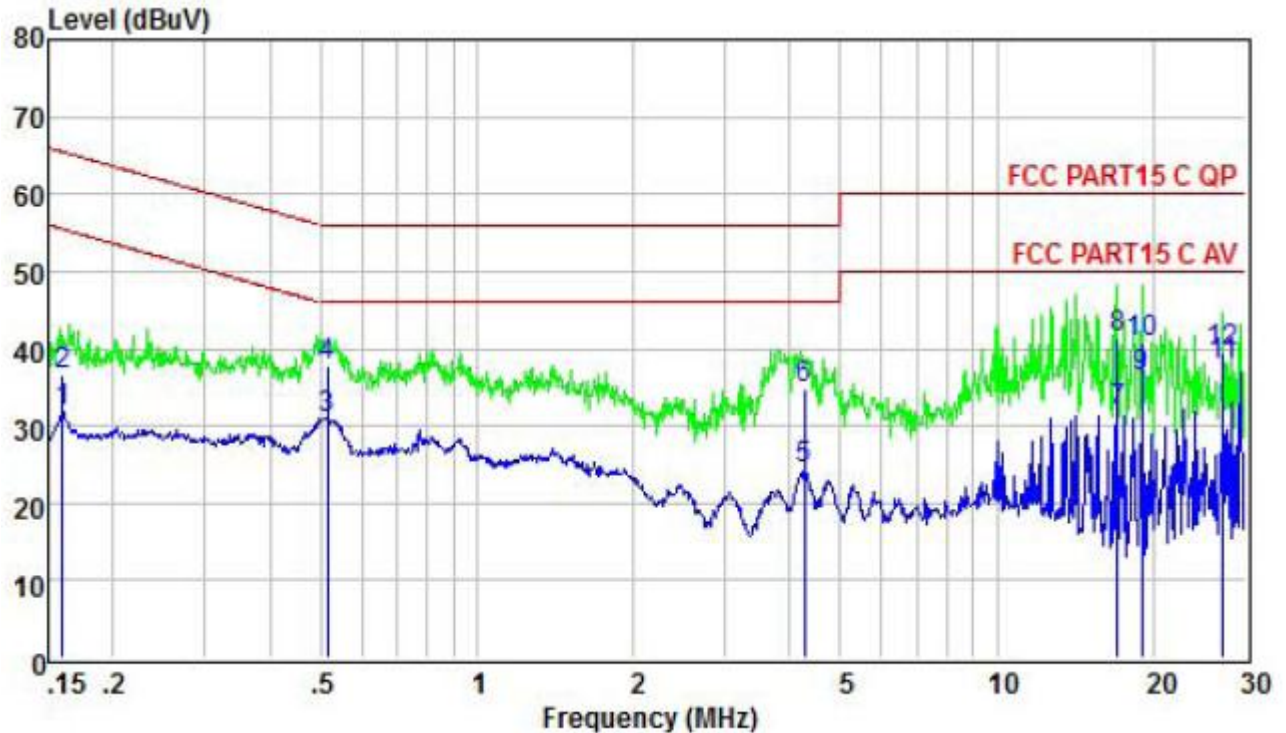


EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase:	L
Test Voltage :	AC 120V/60Hz	Test Mode :	Link Mode



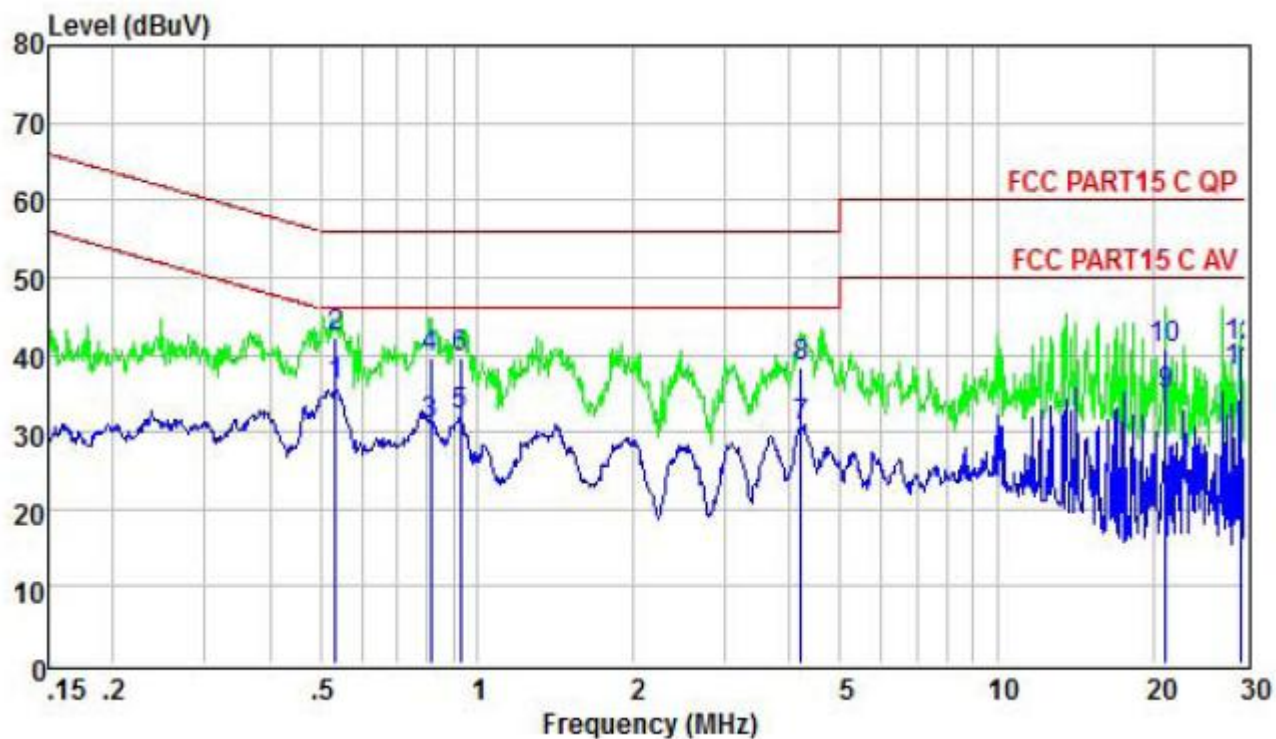
	Freq	Level	Limit	Over	Remark
	MHz	dBuV	Line	Limit	
			dBuV	dB	
1	0.383	32.66	48.21	-15.55	Average
2	0.383	38.60	58.21	-19.61	QP
3	0.505	36.57	46.00	-9.43	Average
4	0.505	43.80	56.00	-12.20	QP
5	0.813	32.81	46.00	-13.19	Average
6	0.813	39.70	56.00	-16.30	QP
7	0.928	32.97	46.00	-13.03	Average
8	0.928	39.20	56.00	-16.80	QP
9	27.127	40.14	50.00	-9.86	Average
10	27.127	42.60	60.00	-17.40	QP
11	29.371	39.63	50.00	-10.37	Average
12	29.371	43.70	60.00	-16.30	QP

EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase:	N
Test Voltage :	AC 120V/60Hz	Test Mode :	Link Mode



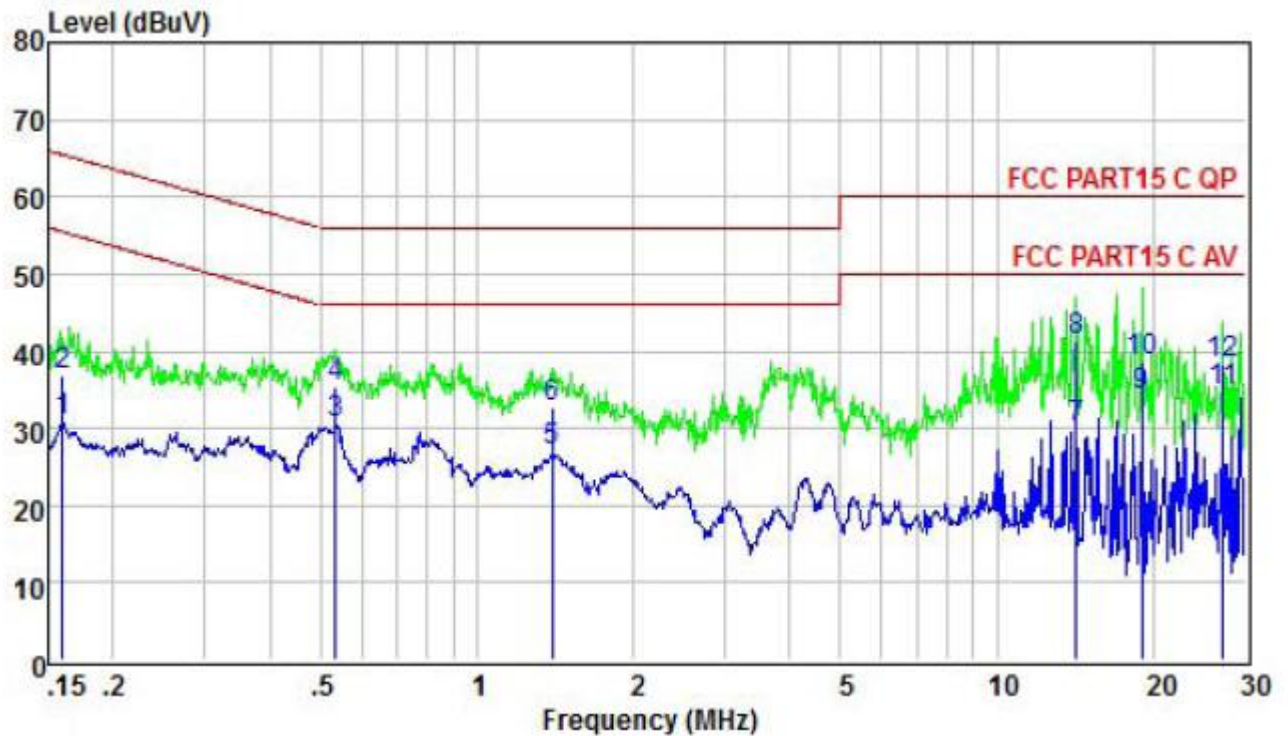
	Freq	Level	Limit	Over	Remark
	MHz	dBuV	Line	Limit	
			dBuV	dB	
1	0.160	31.78	55.47	-23.69	Average
2	0.160	36.60	65.47	-28.87	QP
3	0.516	30.79	46.00	-15.21	Average
4	0.516	37.70	56.00	-18.30	QP
5	4.269	24.36	46.00	-21.64	Average
6	4.269	34.90	56.00	-21.10	QP
7	17.018	31.88	50.00	-18.12	Average
8	17.018	41.40	60.00	-18.60	QP
9	18.920	36.14	50.00	-13.86	Average
10	18.920	40.80	60.00	-19.20	QP
11	27.127	37.71	50.00	-12.29	Average
12	27.127	39.60	60.00	-20.40	QP

EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase:	L
Test Voltage :	AC 240V/60Hz	Test Mode :	Link Mode



	Freq	Level	Limit	Over	Remark
	MHz	dBuV	dBuV	dB	
1	0.535	36.05	46.00	-9.95	Average
2	0.535	42.30	56.00	-13.70	QP
3	0.813	30.81	46.00	-15.19	Average
4	0.813	39.70	56.00	-16.30	QP
5	0.928	31.97	46.00	-14.03	Average
6	0.928	39.60	56.00	-16.40	QP
7	4.202	30.73	46.00	-15.27	Average
8	4.202	38.50	56.00	-17.50	QP
9	21.035	34.81	50.00	-15.19	Average
10	21.035	40.60	60.00	-19.40	QP
11	29.371	37.63	50.00	-12.37	Average
12	29.371	41.10	60.00	-18.90	QP

EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase:	N
Test Voltage :	AC 240V/60Hz	Test Mode :	Link Mode



	Freq	Level	Limit	Over	
	MHz	dBuV	Line	Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.160	30.78	55.47	-24.69	Average
2	0.160	36.90	65.47	-28.57	QP
3	0.535	30.62	46.00	-15.38	Average
4	0.535	35.40	56.00	-20.60	QP
5	1.396	27.11	46.00	-18.89	Average
6	1.396	32.60	56.00	-23.40	QP
7	14.213	30.14	50.00	-19.86	Average
8	14.213	41.20	60.00	-18.80	QP
9	18.920	34.14	50.00	-15.86	Average
10	18.920	38.70	60.00	-21.30	QP
11	27.127	34.71	50.00	-15.29	Average
12	27.127	38.40	60.00	-21.60	QP

4.2.Radiated Emission Test

4.2.1 Limit 15.209 limits

Frequency MHZ	Distance Meters	Filed Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0dB(μV)/m(Peak) 54.0dB(μV)/m(Average)	

4.2.2 Restricted bands of operation

MHz	MHz	MHz	GHz
0.009-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209,all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.			

4.2.3 Test setup

The EUT was placed on a turn table which was 0.8 m (above 1GHz, the high was 1.5m) above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, Both PK and AV measure, PK detector is used.

The frequency range from 30MHz to 10th harmonic are checked. and no any emissions were found from 18GHz to 40 GHz, So the radiated emissions from 18GHz to 40GHz were not record.

Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

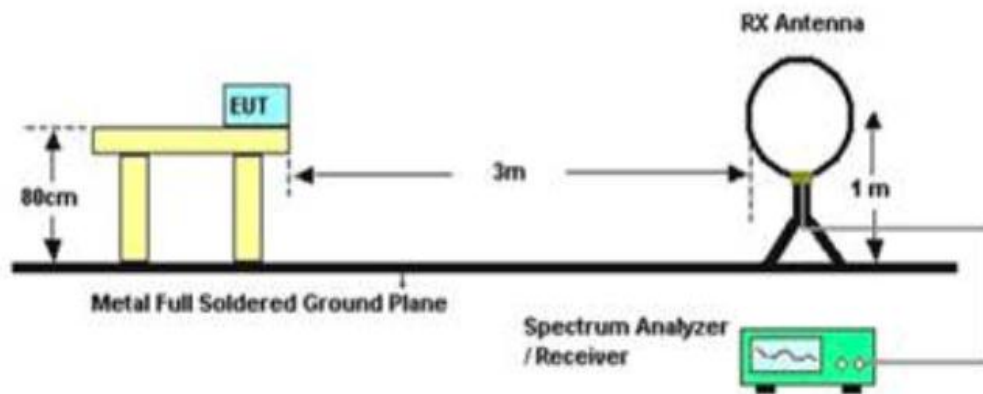
2. Measurement Uncertainty: ± 3.2 dB at a level of confidence of 95%.

3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

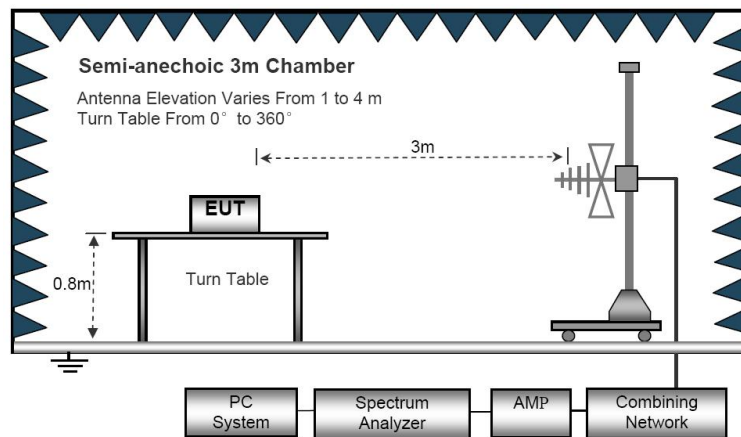
4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.

5. For Both PK and AV value above 1GHz, PK detector is used.

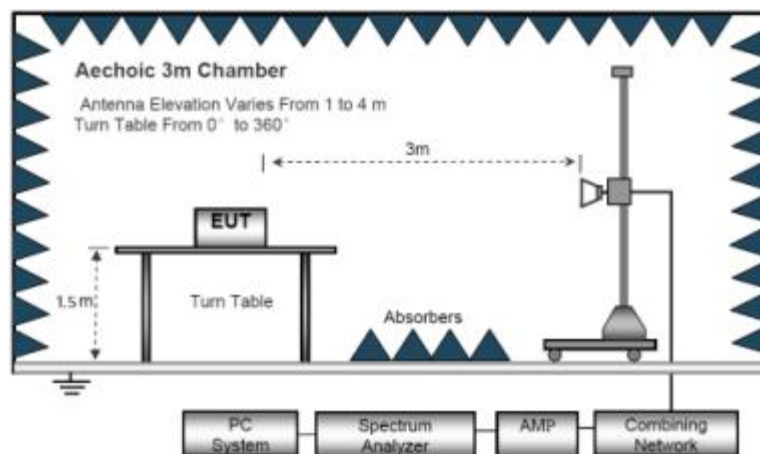
Radiated Emission Test-Up Frequency Below 30MHz



Radiated Emission Test-Up Frequency 30MHz- 1GHz



Above 1GHz



EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	20℃	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	Link Mode
Test Voltage :	AC 120V/60Hz		

Below 30MHz

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	P
--	--	--	--	P

Note:

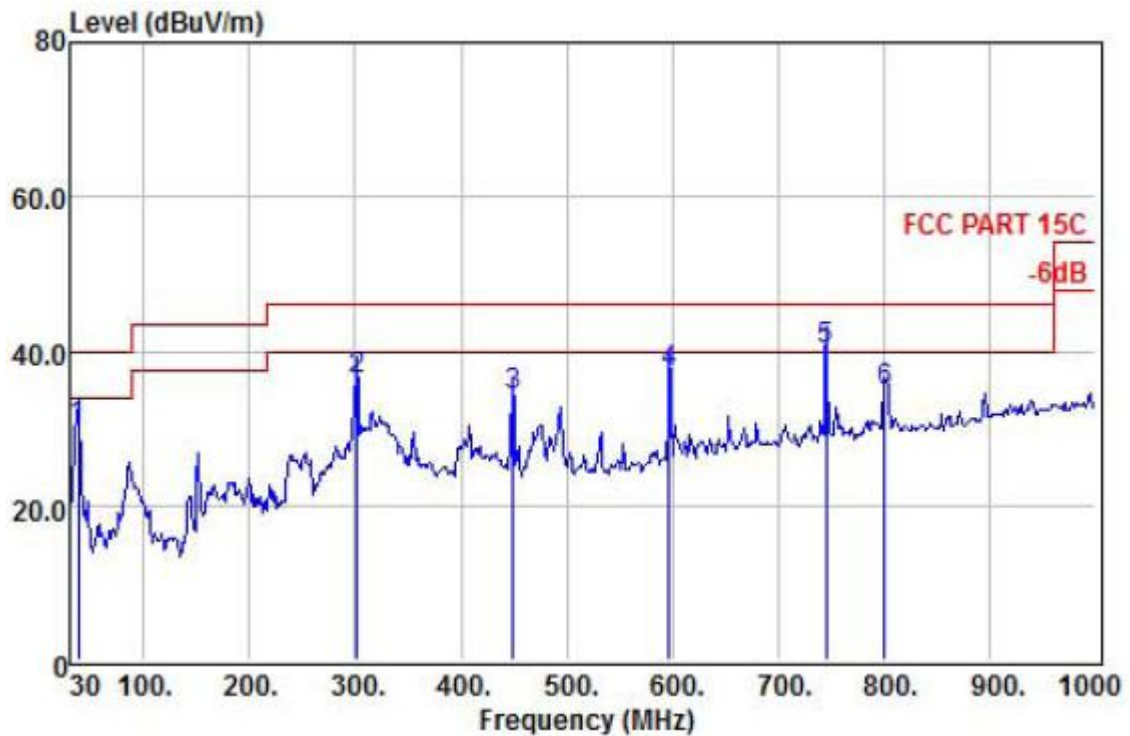
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})(\text{dB})$;

Limit line = specific limits(dBuv) + distance extrapolation factor.

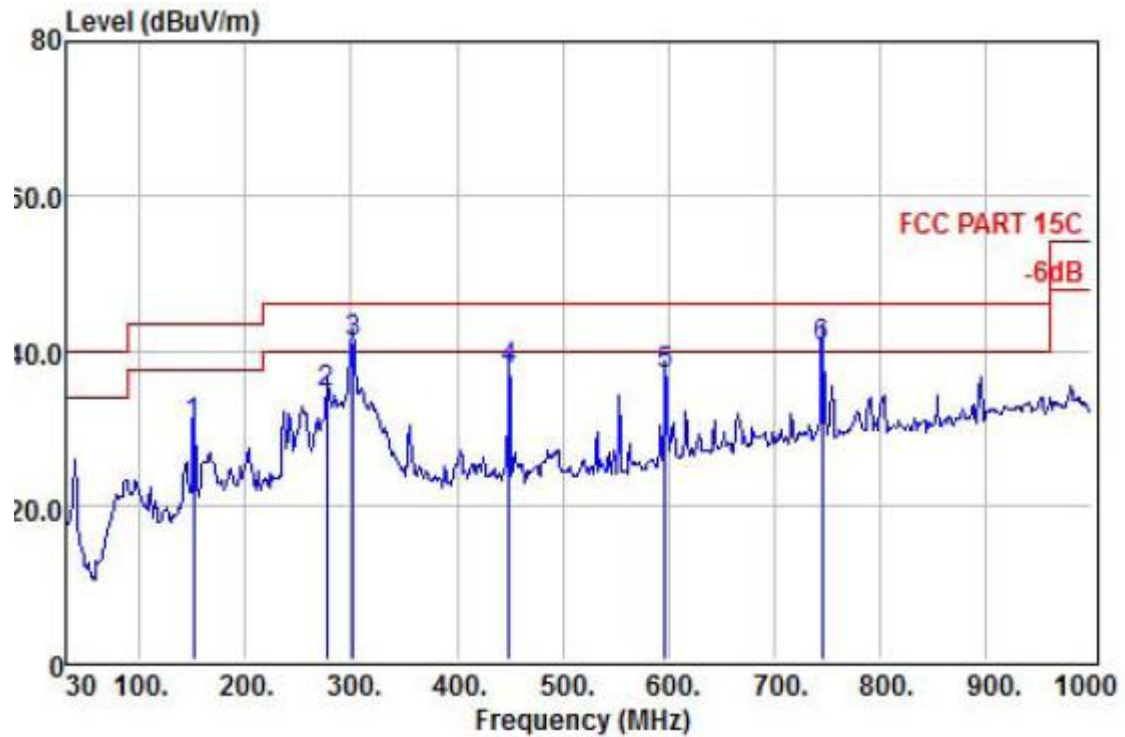
Below 1GHz			
EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	20℃	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-5180(802.11a)
Test Voltage :	AC 120V/60Hz		

Vertical



	Preamp Freq	Preamp Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	37.76	31.36	46.71	0.56	14.22	30.13	40.00	-9.87	QP
2	301.60	30.92	51.33	1.94	13.84	36.19	46.00	-9.81	QP
3	449.04	30.61	44.75	2.62	17.58	34.34	46.00	-11.66	QP
4	597.45	30.64	44.02	3.29	20.52	37.19	46.00	-8.81	QP
5 !	745.86	30.67	44.09	4.04	22.77	40.23	46.00	-5.77	QP
6	801.15	30.56	37.94	4.29	23.00	34.67	46.00	-11.33	QP

Horizontal



		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	151.25	31.25	51.36	1.22	9.02	30.35	43.50	-13.15	QP
2	277.35	30.94	50.61	1.78	13.08	34.53	46.00	-11.47	QP
3 !	301.60	30.92	56.11	1.94	13.84	40.97	46.00	-5.03	QP
4	449.04	30.61	47.93	2.62	17.58	37.52	46.00	-8.48	QP
5	597.45	30.64	43.62	3.29	20.52	36.79	46.00	-9.21	QP
6 !	745.86	30.67	44.31	4.04	22.77	40.45	46.00	-5.55	QP

Note:1. Absolute Level= Reading Level+ antenna Factor + cable loss - Preamp factor,

2. Over Limit= Absolute Level – Limit;

3.Only the worst case is presented in the report .

Above 1GHz			
EUT :	Wireless Router	Model Name :	JIR-AC682
Temperature :	20°C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-802.11a
Test Voltage :	AC 120V/60Hz		

Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
802.11a-5180									
V	10360	31.76	23.99	17.04	28.84	43.95	54.00	-10.05	Average
V	10360	44.41	23.99	17.04	28.84	56.60	74.00	-17.40	Peak
V	15540	30.08	23.53	20.34	29.63	44.32	54.00	-9.68	Average
V	15540	40.18	23.53	20.34	29.63	54.42	74.00	-19.58	Peak
H	10360	32.26	23.99	17.04	28.84	44.45	54.00	-9.55	Average
H	10360	41.15	23.99	17.04	28.84	53.34	74.00	-20.66	Peak
H	15540	27.74	23.53	20.34	29.63	41.98	54.00	-12.02	Average
H	15540	37.26	23.53	20.34	29.63	51.50	74.00	-22.50	Peak
802.11a-5200									
V	10400	31.42	24.04	17.04	28.84	43.66	54.00	-10.34	Average
V	10400	42.37	24.04	17.04	28.84	54.61	74.00	-19.39	Peak
V	15600	31.19	23.79	20.39	29.64	45.73	54.00	-8.27	Average
V	15600	38.74	23.79	20.39	29.64	53.28	74.00	-20.72	Peak
H	10400	33.96	24.04	17.04	28.84	46.20	54.00	-7.80	Average
H	10400	42.58	24.04	17.04	28.84	54.82	74.00	-19.18	Peak
H	15600	29.92	23.79	20.39	29.64	44.46	54.00	-9.54	Average
H	15600	39.54	23.79	20.39	29.64	54.08	74.00	-19.92	Peak
802.11a-5240									
V	10480	32.27	25.17	17.06	28.85	45.65	54.00	-8.35	Average
V	10480	42.65	25.17	17.06	28.85	56.03	74.00	-17.97	Peak
V	15720	30.27	24.25	20.45	29.67	45.30	54.00	-8.70	Average
V	15720	35.73	24.25	20.45	29.67	50.76	74.00	-23.24	Peak
H	10480	31.19	25.17	17.06	28.85	44.57	54.00	-9.43	Average
H	10480	43.26	25.17	17.06	28.85	56.64	74.00	-17.36	Peak
H	15720	28.44	24.25	20.45	29.67	43.47	54.00	-10.53	Average
H	15720	38.37	24.25	20.45	29.67	53.40	74.00	-20.60	Peak

Note:

Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

Over Limit= Absolute Level – Limit

“802.11a” mode is the worst mode and show in the report. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has not to be reported.

5. BAND EDGE COMPLIANCE TEST

5.1.Limits

All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

5.2.Test setup

Test method: FCC KDB 789033 G)& Parts 15.407(b)(4) & 15.209(a)

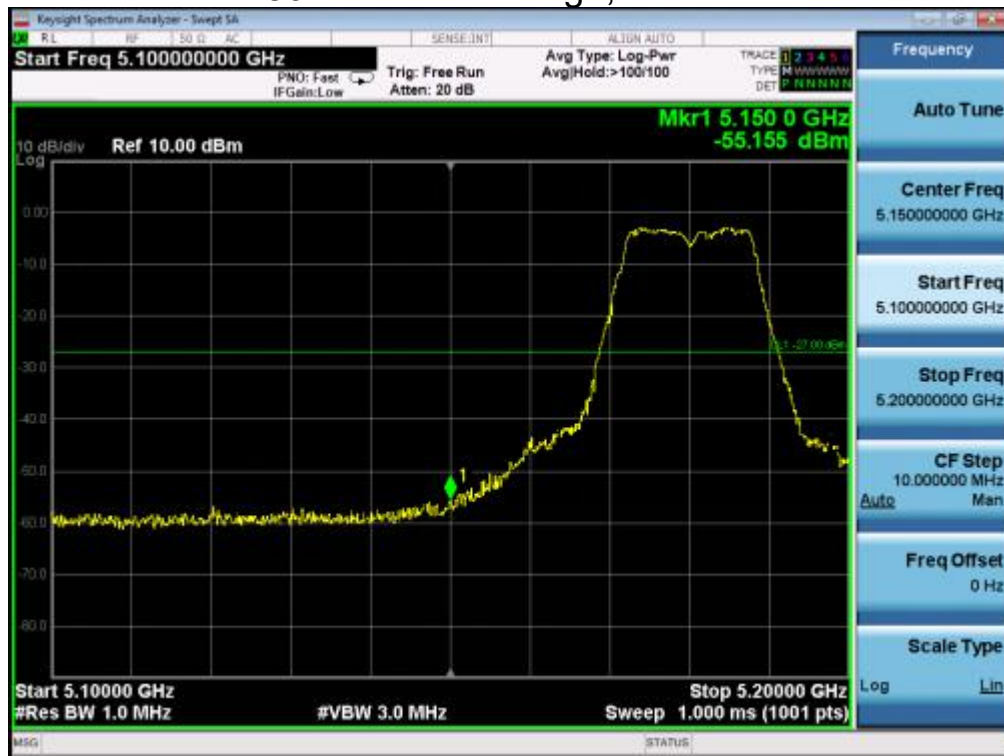
Same as Clause 4.2.

5.3. Test Data

For conducted test:

A Antenna

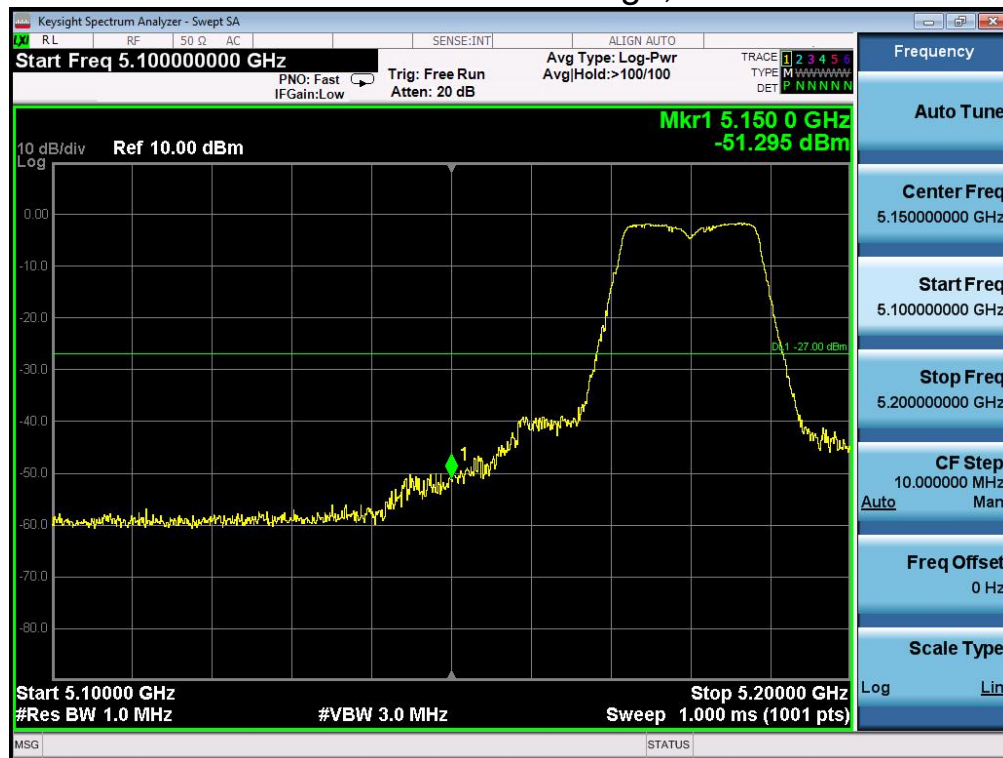
802.11a: Band Edge, Left Side



802.11a: Band Edge, Right Side



802.11n (20) : Band Edge, Left Side



802.11n (20) : Band Edge, Right Side



802.11n (40) : Band Edge, Left Side

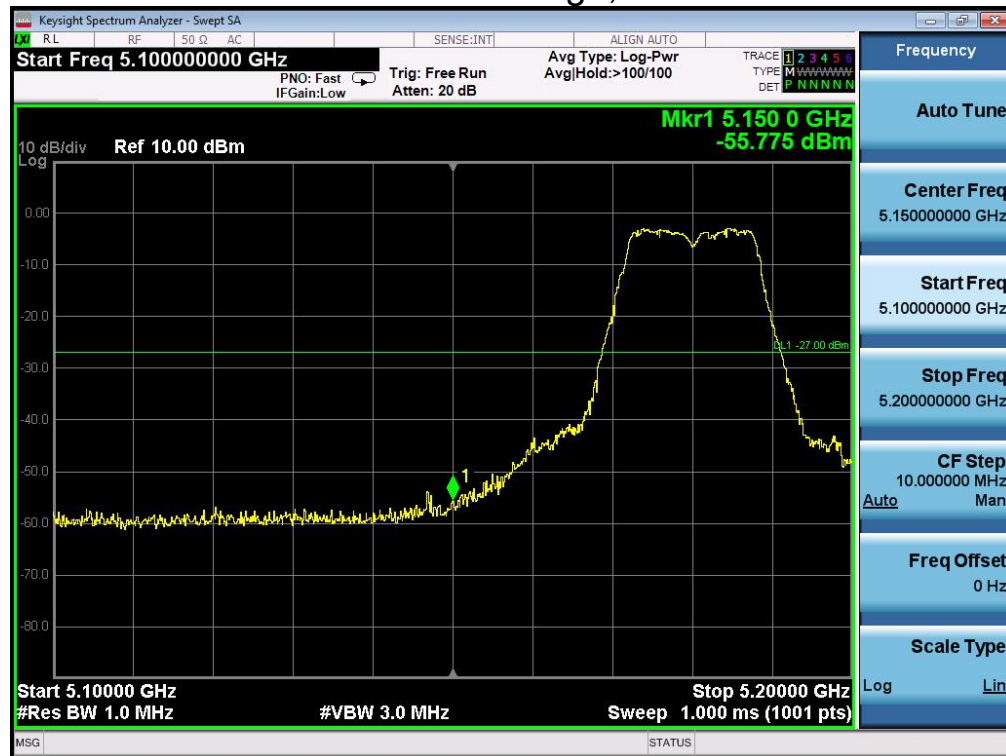


802.11n (40) : Band Edge, Right Side

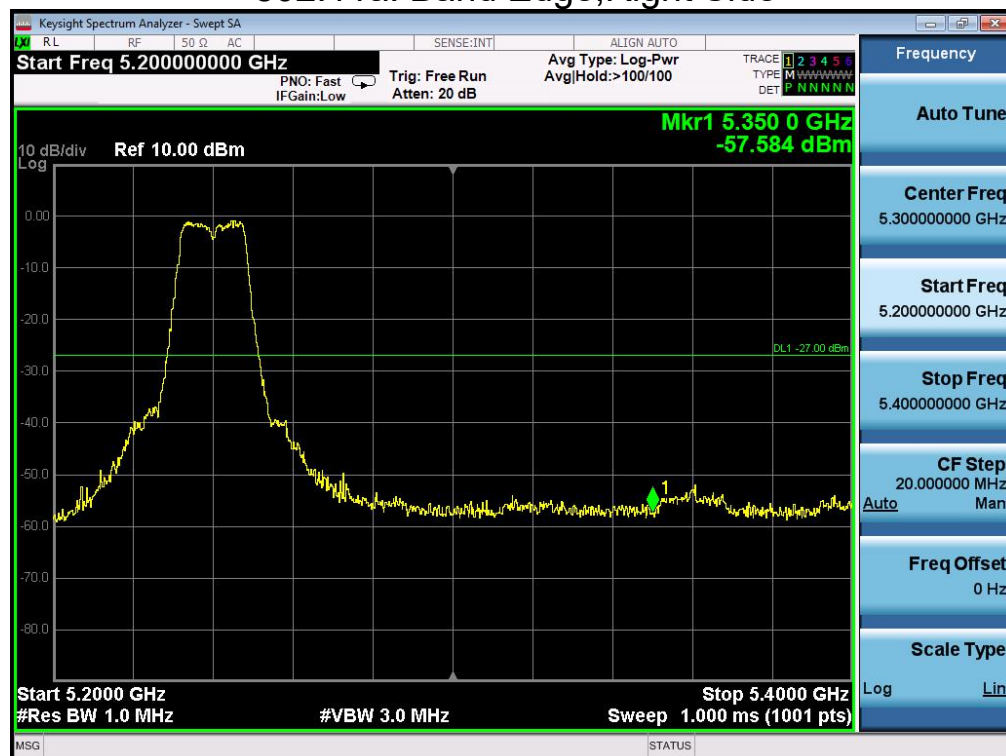


B Antenna

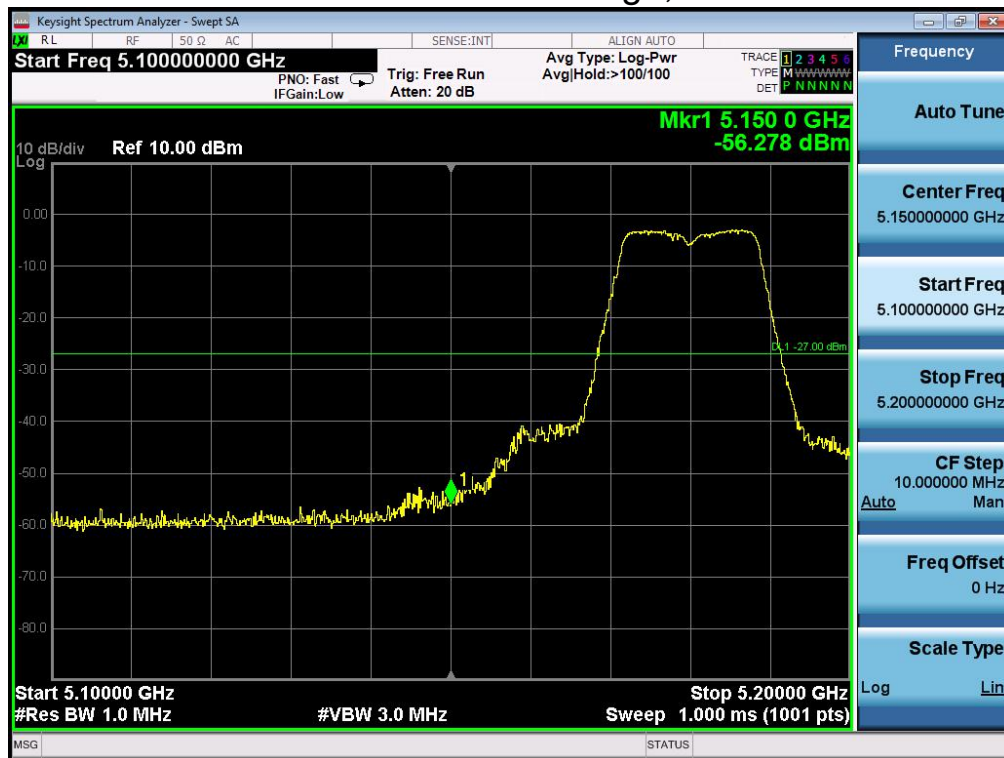
802.11a: Band Edge, Left Side



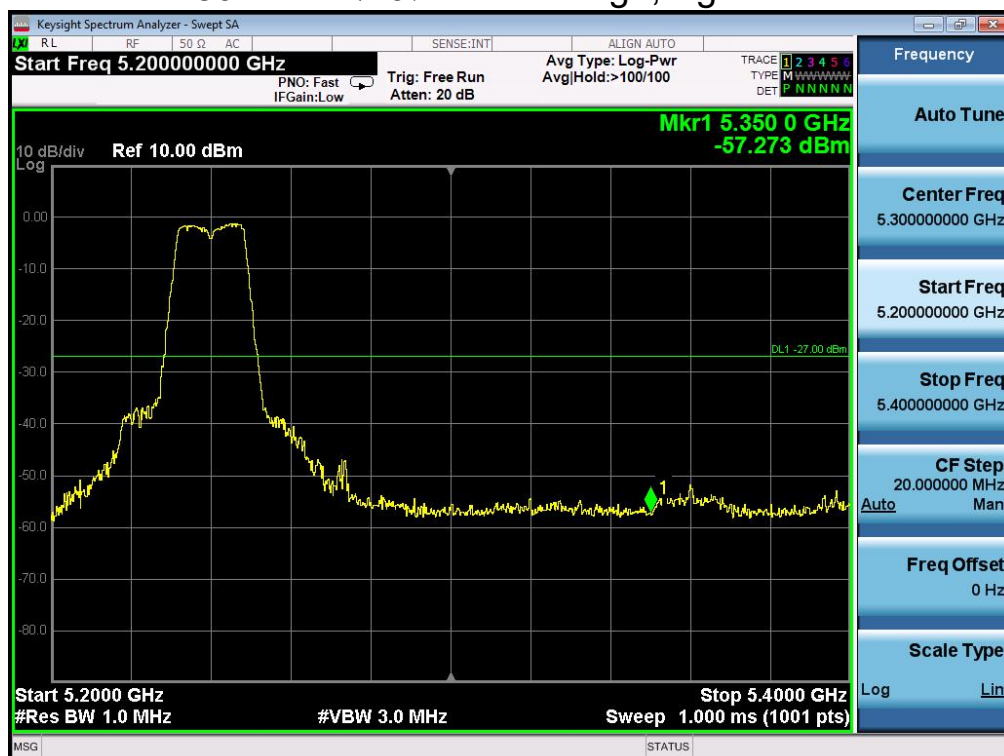
802.11a: Band Edge, Right Side



802.11n (20) : Band Edge, Left Side



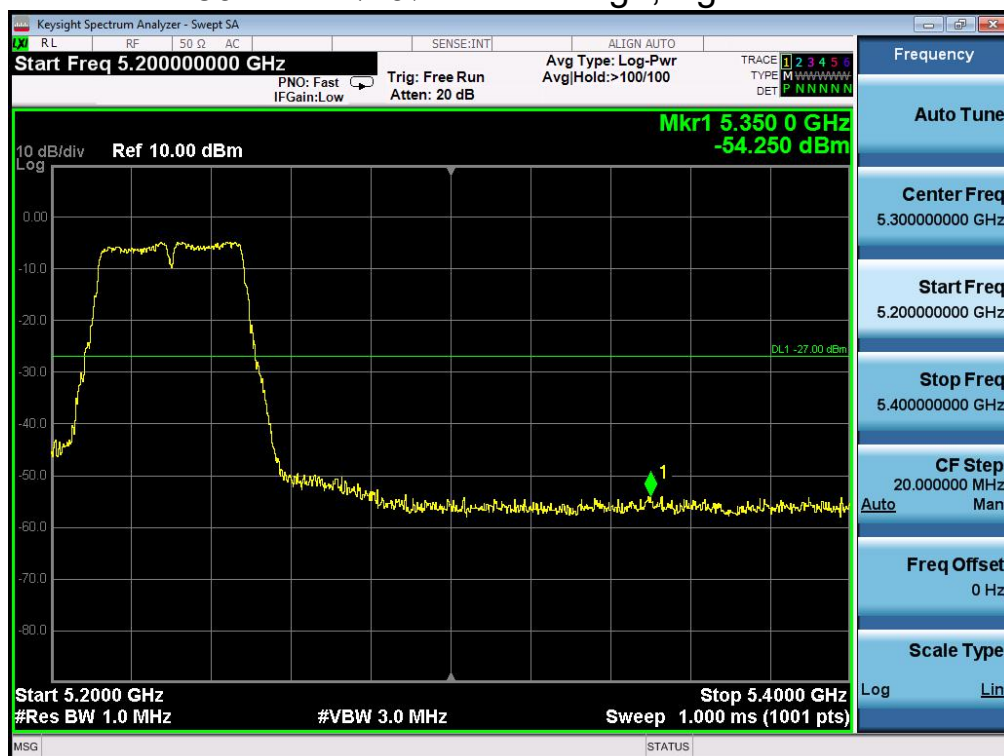
802.11n (20) : Band Edge, Right Side



802.11n (40) : Band Edge, Left Side

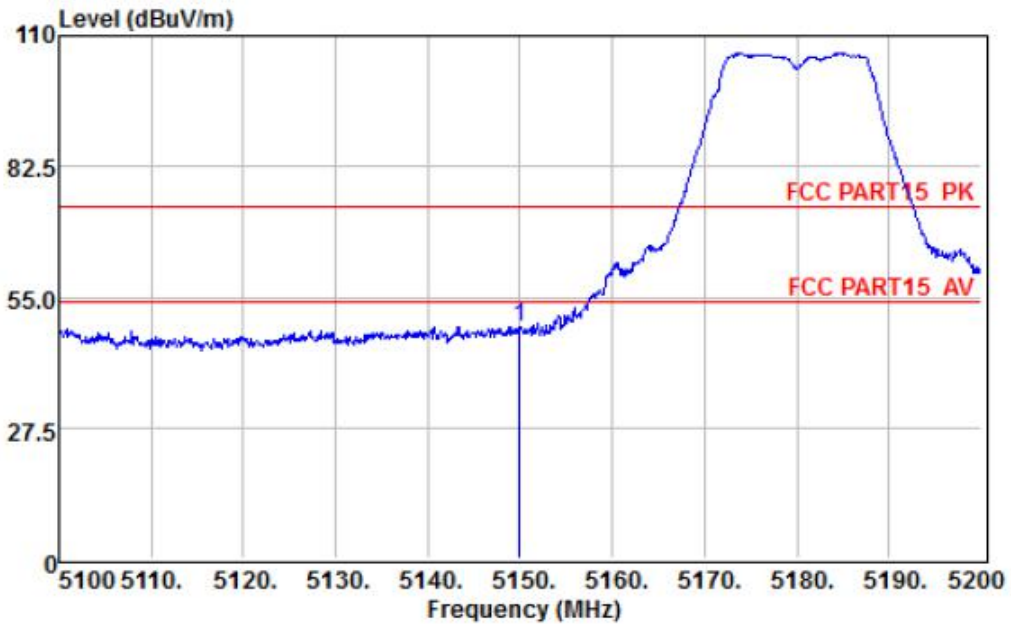


802.11n (40) : Band Edge, Right Side

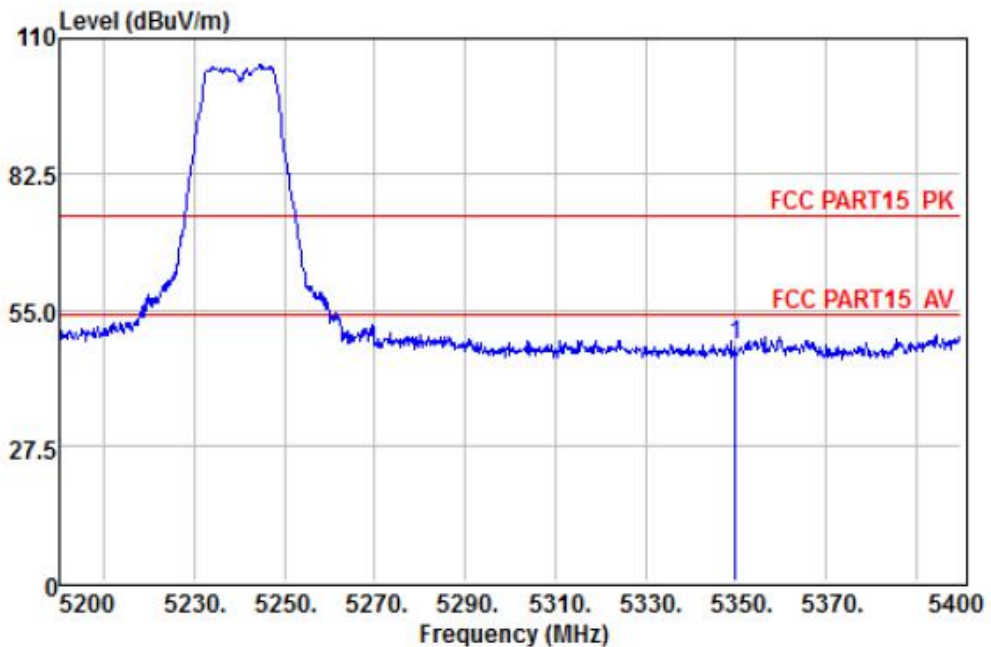


Spurious Emission in Band Edge:

802.11a - Horizontal

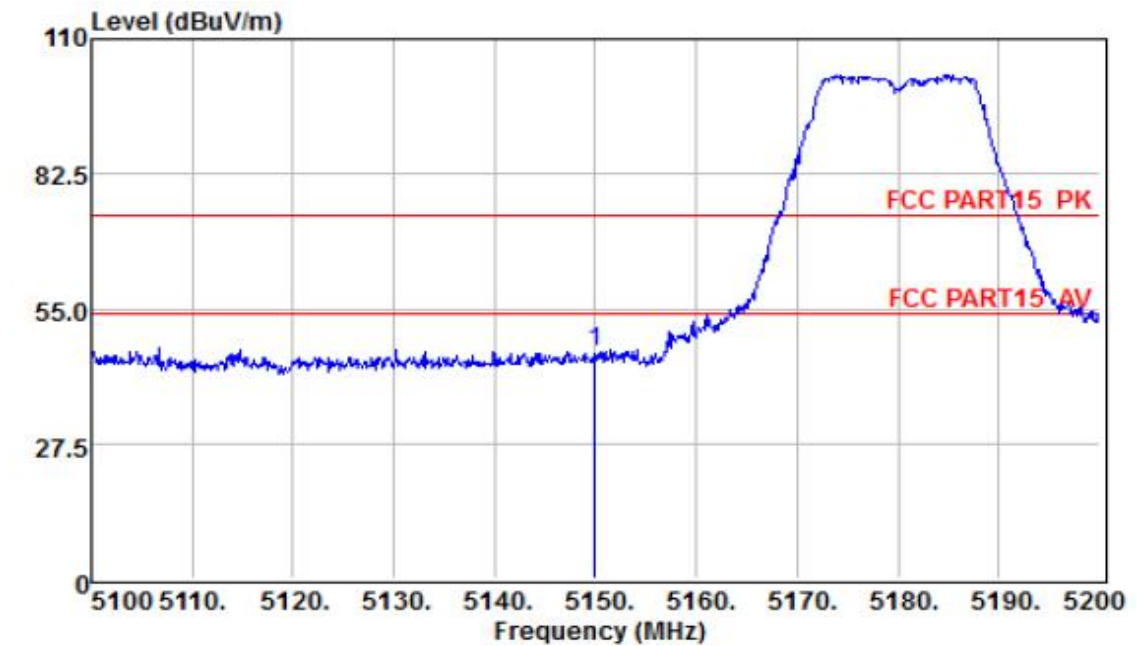


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5150.00	27.62	29.69	12.82	33.61	48.50	74.00	-25.50	Peak

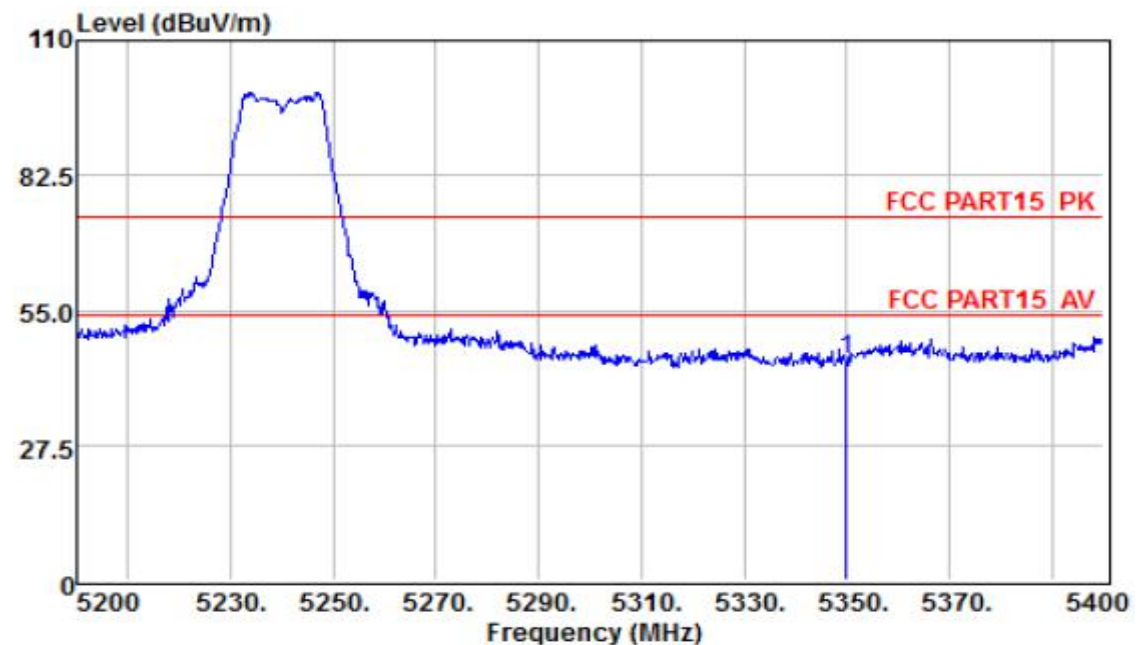


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5350.00	27.64	28.08	13.43	33.89	47.76	74.00	-26.24	Peak

802.11a - Vertical

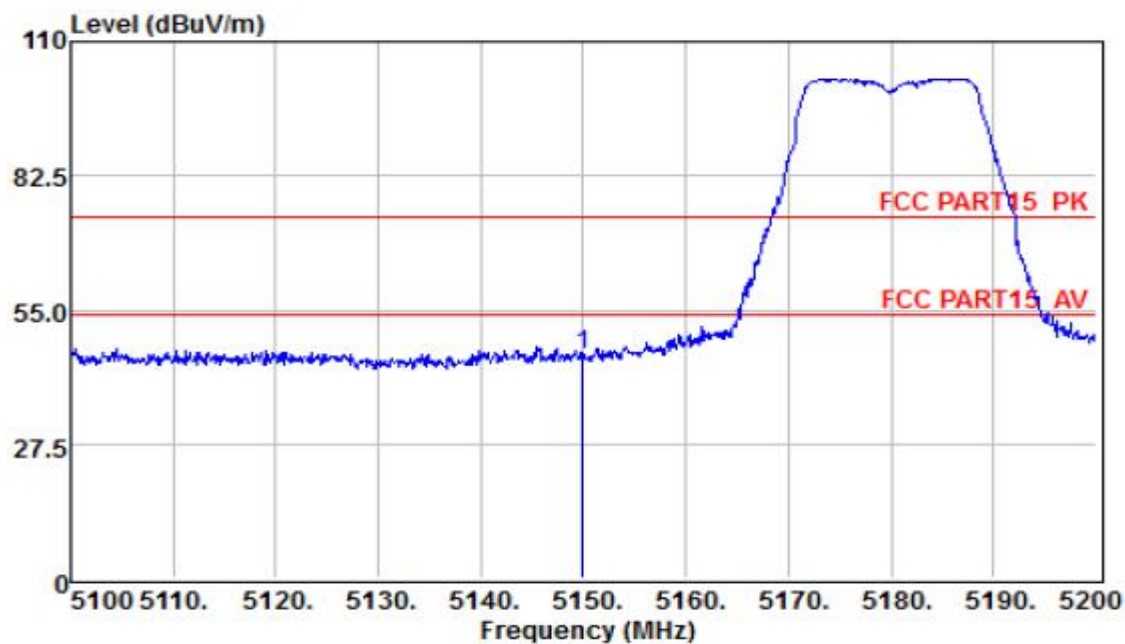


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5150.00	27.62	27.35	12.82	33.61	46.16	74.00	-27.84	Peak

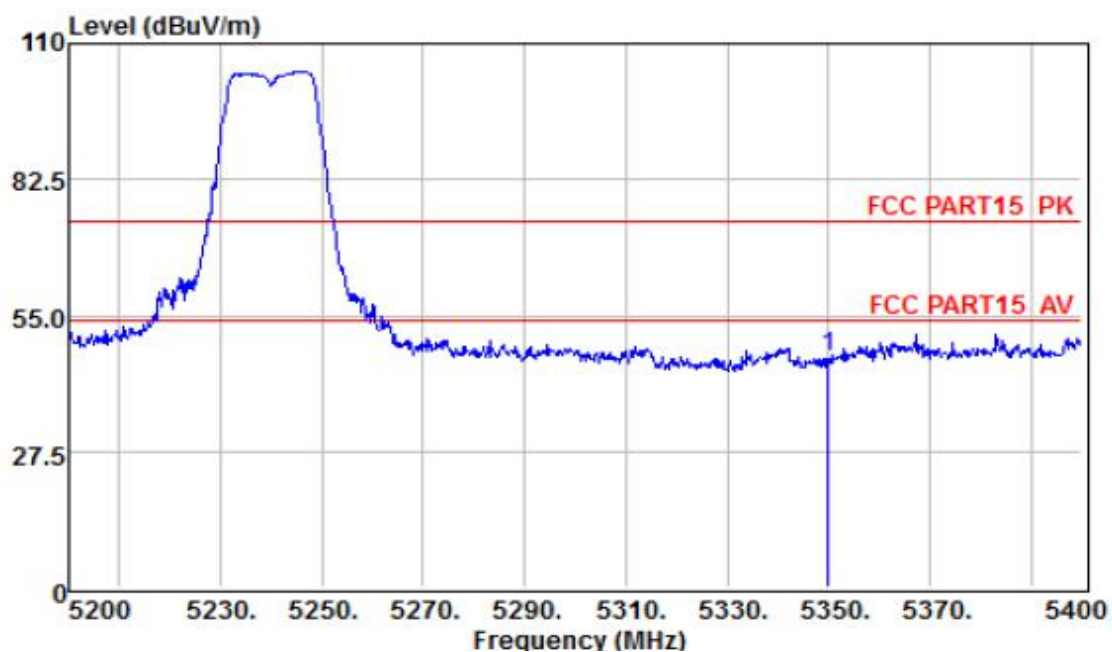


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5350.00	27.64	25.42	13.43	33.89	45.10	74.00	-28.90	Peak

802.11n(20) - Horizontal

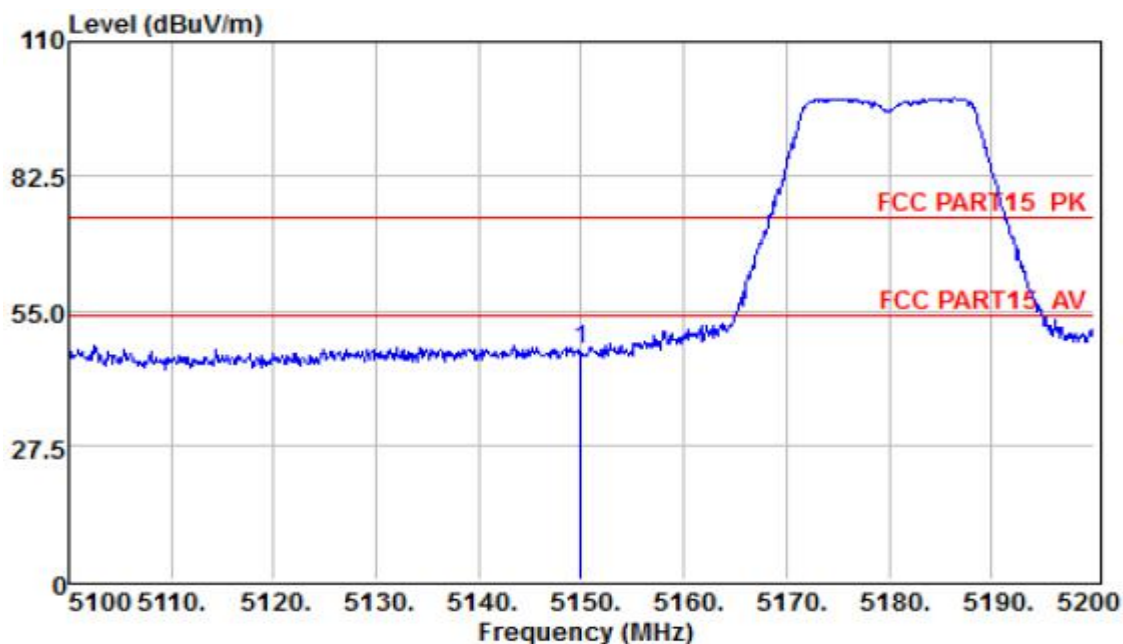


	Preamp Freq	Factor dB	Read Level dBuV	CableAntenna Loss dB	Factor dB/m	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Remark
	MHz								
1	5150.00	27.62	26.83	12.82	33.61	45.64	74.00	-28.36	Peak

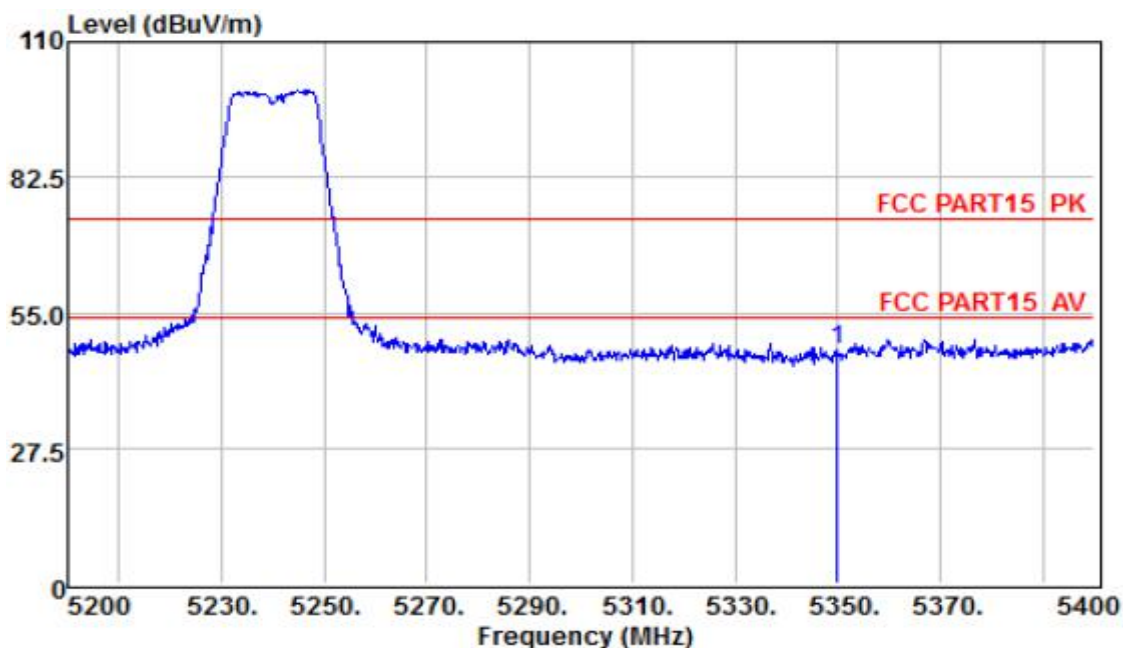


	Preamp Freq	Factor dB	Read Level dBuV	CableAntenna Loss dB	Factor dB/m	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Remark
	MHz								
1	5350.00	27.64	26.78	13.43	33.89	46.46	74.00	-27.54	Peak

802.11n(20) - Vertical

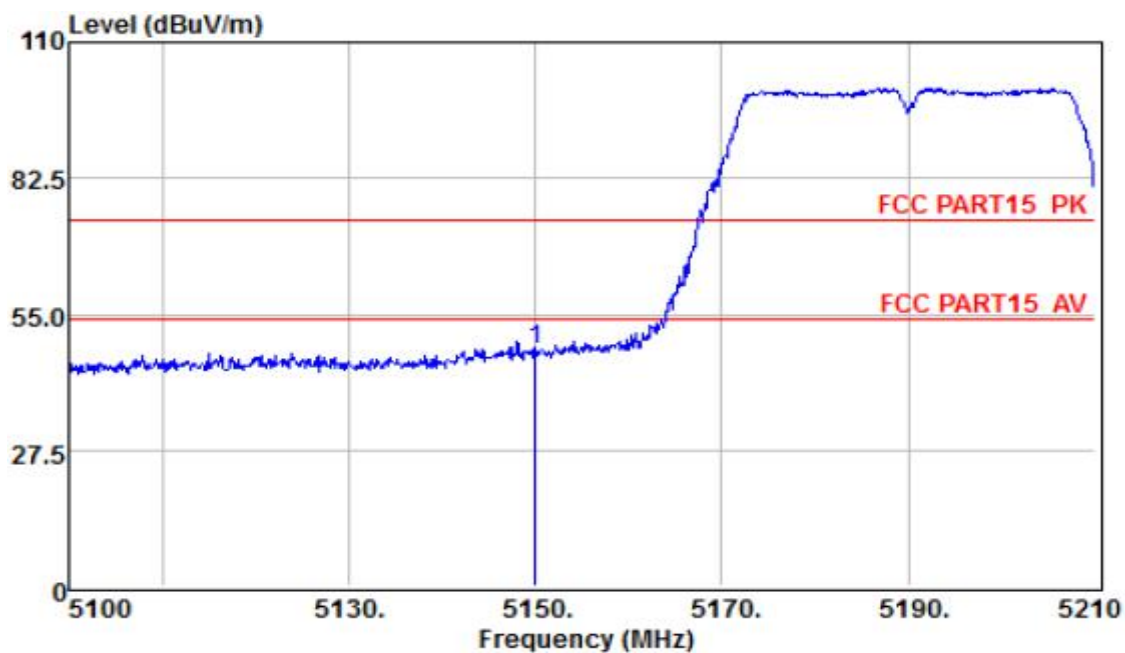


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5150.00	27.62	28.23	12.82	33.61	47.04	74.00	-26.96	Peak

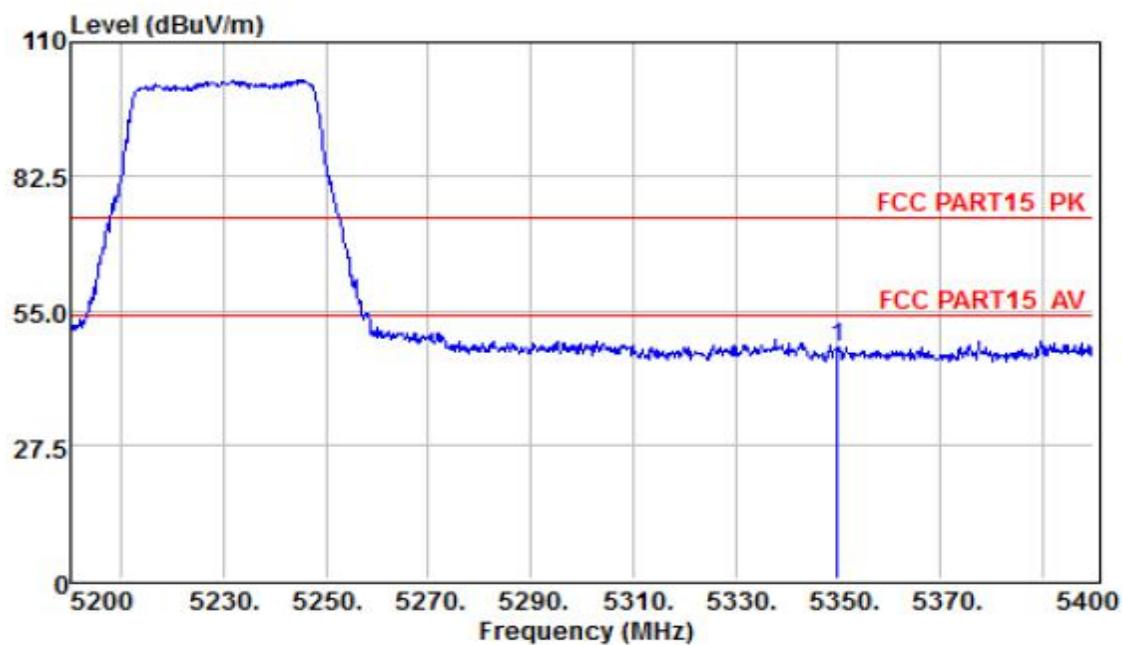


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5350.00	27.64	27.55	13.43	33.89	47.23	74.00	-26.77	Peak

802.11n(40) - Horizontal

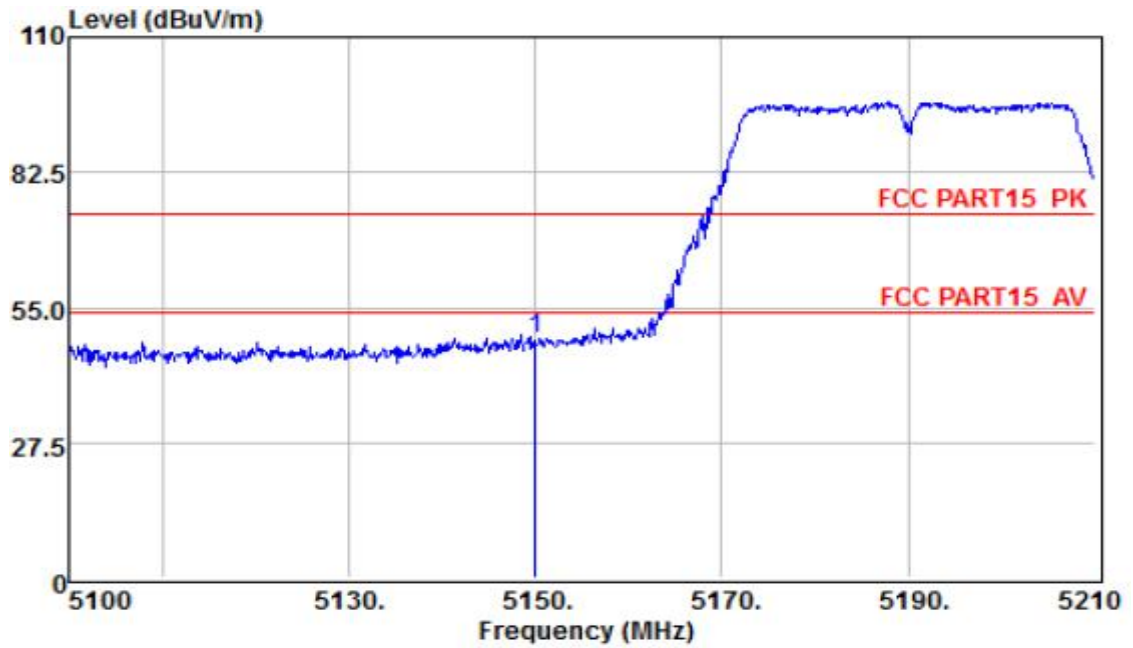


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5150.00	27.62	28.90	12.82	33.61	47.71	74.00	-26.29	Peak

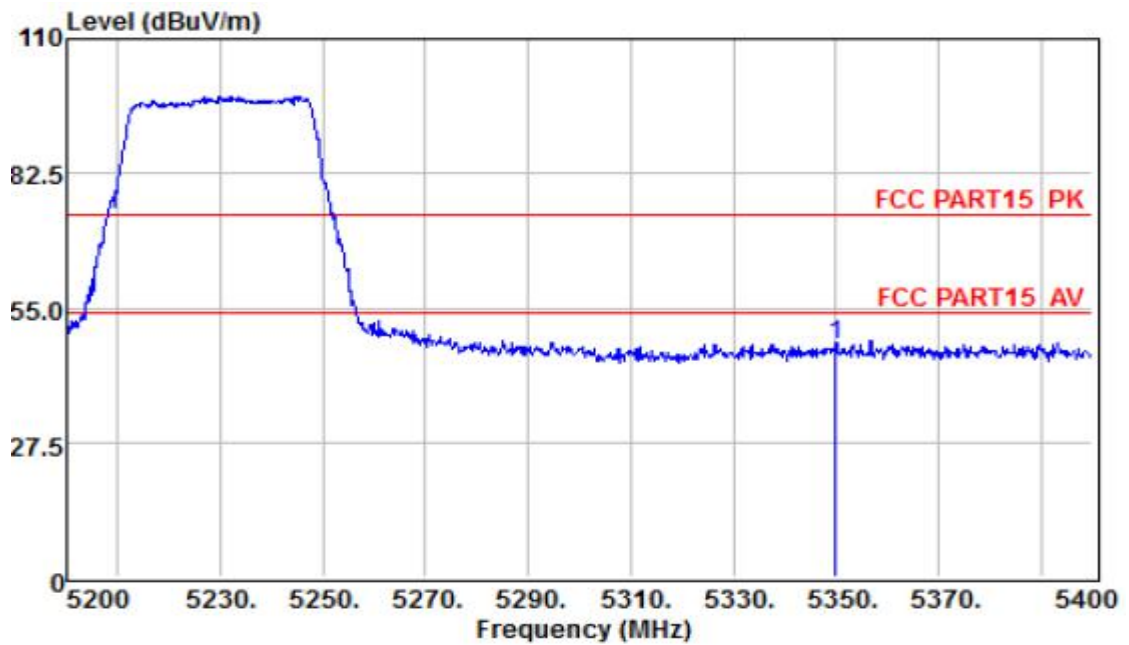


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5350.00	27.64	27.83	13.43	33.89	47.51	74.00	-26.49	Peak

802.11n(40) - Vertical



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5150.00	27.62	29.67	12.82	33.61	48.48	74.00	-25.52	Peak



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	5350.00	27.64	27.82	13.43	33.89	47.50	74.00	-26.50	Peak

6. 26DB AND 6DB BANDWIDTH TEST

6.1.Applicable Standard

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

6.2. Test Procedure

1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.3. Test setup



A Antenna

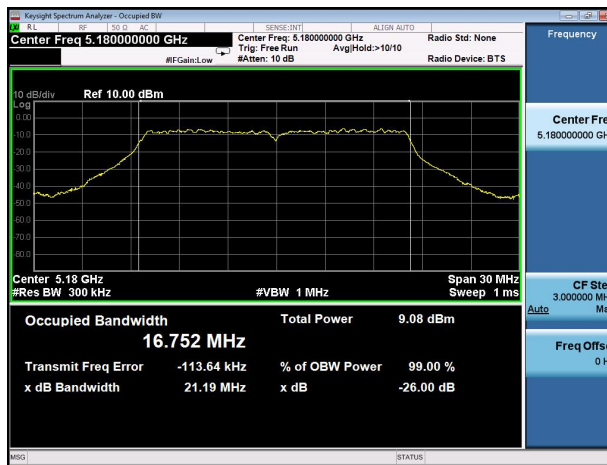
Mode	Channel number	Frequency (MHz)	26dB Bandwidth (MHz)
802.11a	36	5180	21.19
	40	5200	21.22
	48	5240	21.28
802.11n (HT20)	36	5180	21.79
	40	5200	21.73
	48	5240	21.40
802.11n (HT40)	38	5190	42.17
	46	5230	41.76

B Antenna

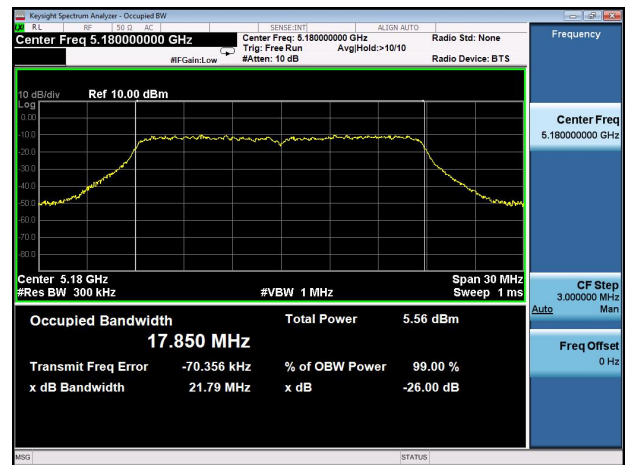
Mode	Channel number	Frequency (MHz)	26dB Bandwidth (MHz)
802.11a	36	5180	21.03
	40	5200	21.32
	48	5240	21.32
802.11n (HT20)	36	5180	21.70
	40	5200	21.65
	48	5240	21.71
802.11n (HT40)	38	5190	41.91
	46	5230	41.88

A Antenna

802.11a mode-ch36



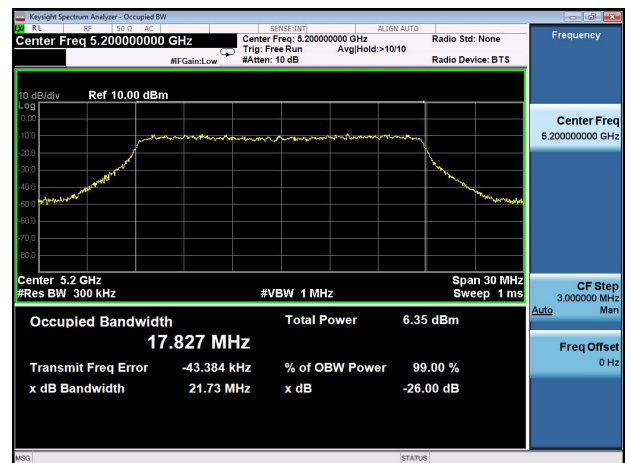
802.11n(HT20) mode-ch36



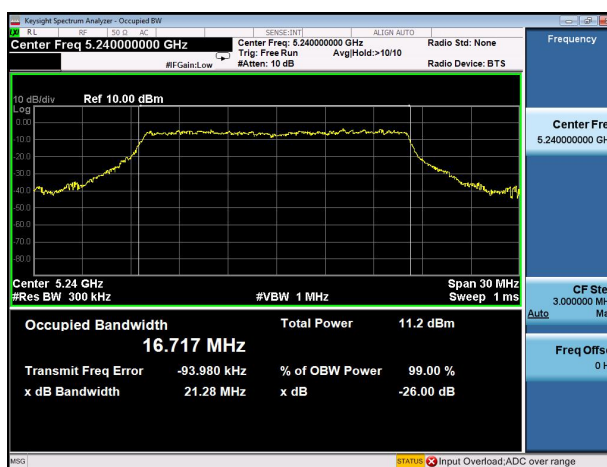
802.11a mode-ch40



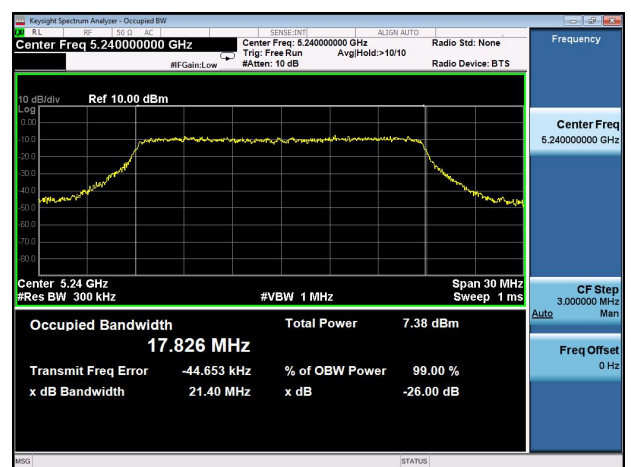
802.11 n(HT20) mode-ch40

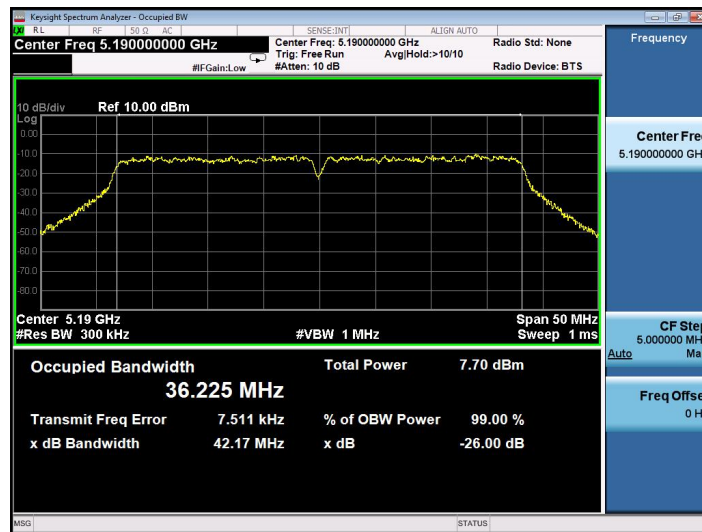


802.11a mode-ch48



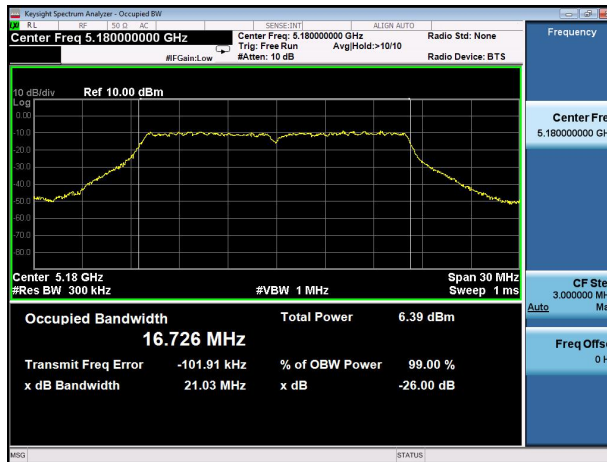
802.11 n(HT20) mode-ch48



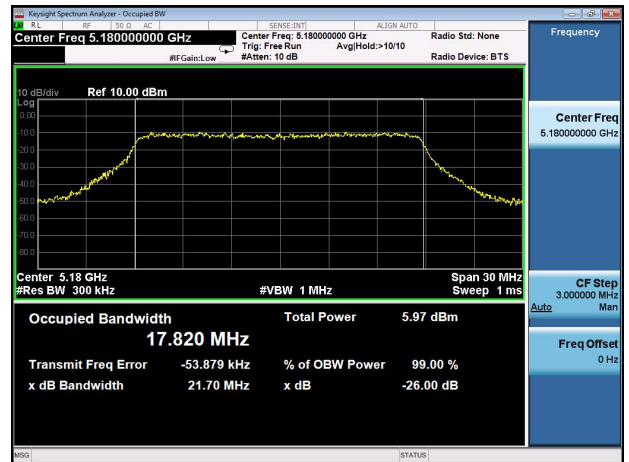
802.11n(HT40) mode-ch38**802.11 n(HT40) mode-ch46**

B Antenna

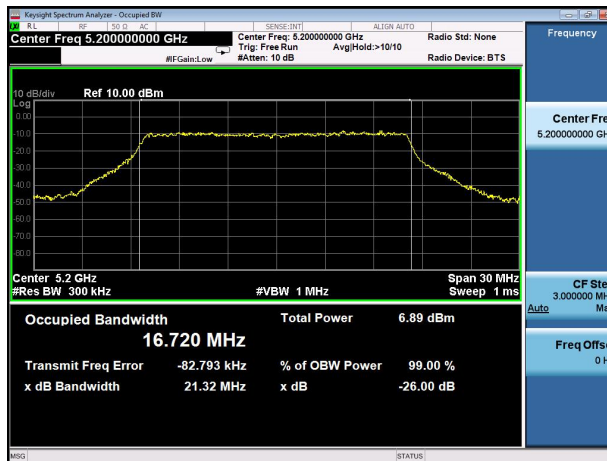
802.11a mode-ch36



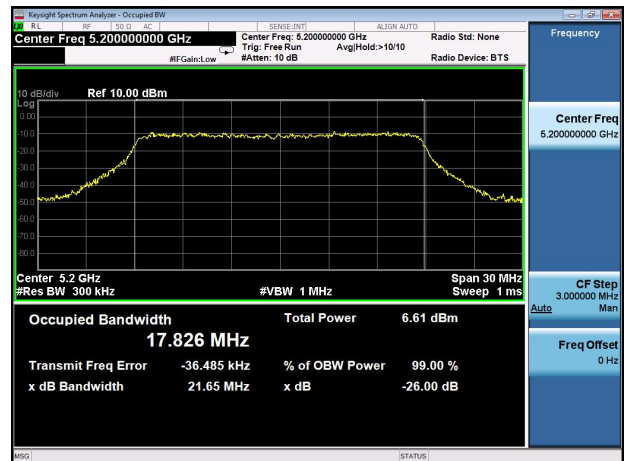
802.11n(HT20) mode-ch36



802.11a mode-ch40



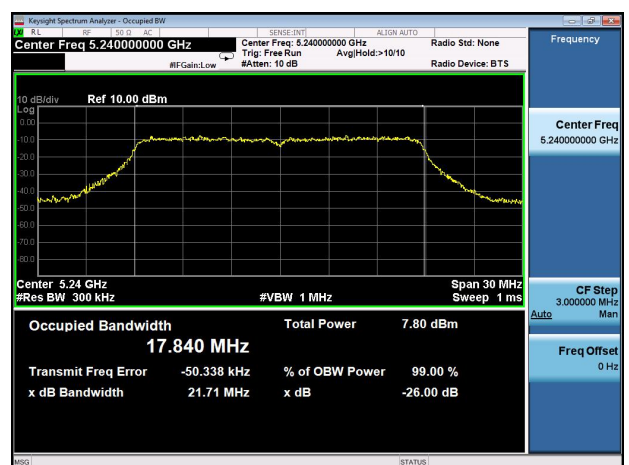
802.11 n(HT20) mode-ch40

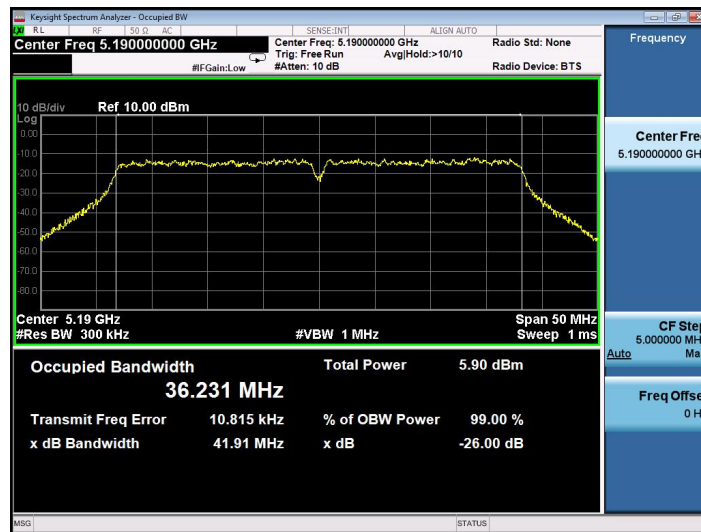
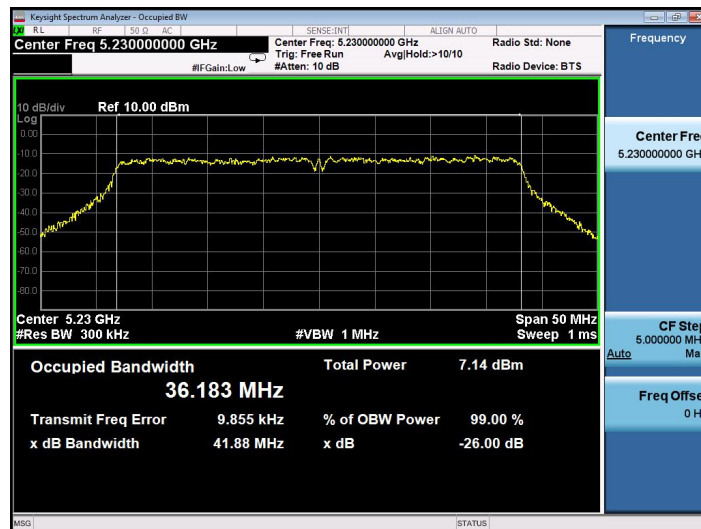


802.11a mode-ch48



802.11 n(HT20) mode-ch48



802.11n(HT40) mode-ch38**802.11 n(HT40) mode-ch46**

7. OUTPUT POWER TEST

7.1.Limits

Band 5.15-5.25GHz:

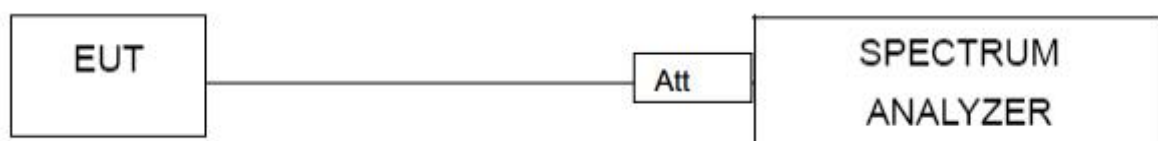
FCC: For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

7.2.Test setup

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
 - a. The Transmitter output (antenna port) was connected to the power meter.
 - b. Turn on the EUT and power meter and then record the power value.
 - c. Repeat above procedures on all channels needed to be tested.



Duty cycle



7.3. Test result

	Frequency (MHz)	Maximum Conducted Output Power		Total power (dBm)	Limit (dBm)
		(dBm)			
		Ant A	Ant B		
TX 802.11a Mode					
CH36	5180	12.57	11.92	-	24.0
CH40	5200	11.68	11.74	-	24.0
CH48	5240	11.83	11.78	-	24.0
TX 802.11n(20) Mode					
CH36	5180	11.29	11.31	14.31	21.7
CH40	5200	11.17	11.24	14.22	21.7
CH48	5240	11.08	10.97	14.04	21.7
TX 802.11n(40) Mode					
CH38	5190	10.89	10.73	13.82	21.7
CH46	5230	10.75	10.62	13.70	21.7

- Note: 1. 802.11a mode the ANT A and ANT B can not TX and RX at the same time;
 2. 802.11n(20), 802.11n(40) mode the ANT A and ANT B can TX and RX at the same time;
 3. Directional gain = $G_{ANT} + 10\log(N)_{dbi} = 5.3 + 10\log 2 = 8.3_{dbi}$;
 4. For power test the duty cycle is 100% in continuous transmitting mode.