FCC Test Report (WIFI)

FCC ID	:	**2AI6DX92**
Applicant	:	**SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD** 3F, Tower A, Building A, Minsheng Industrial Park, Longhua Road, Longhua New Area, Shenzhen, China.
Sample Description		
Product Name	:	**Smart TV BOX**
Model No.	:	X92
Serial No.	:	X92 PRO
Trademark	:	N/A
Receipt Date	:	2016-10-25
Test Date	:	2016-10-26 to 2016-10-30
Issue Date	:	2016-10-31
Test Standard(s)	:	**FCC CFR Title 47 Part 15 Subpart C Section 15.407**
Conclusions	:	**PASSED***

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

Test/Witness Engineer : Tom Chen

Approved & Authorized : Frank Zhang

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information

1.1 Client Information

Applicant	:	SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD
Address	:	3F, Tower A, Building A, Minsheng Industrial Park, Longhua Road, Longhua New Area, Shenzhen, China.
Manufacturer	:	SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD
Address	:	3F, Tower A, Building A, Minsheng Industrial Park, Longhua Road, Longhua New Area, Shenzhen, China.

1.2 General Description of EUT (Equipment Under Test)

Product Name	:	Smart TV BOX	
Models No.	:	X92, X92 PRO	
Difference	:	Only differ on apperarance and name	
Trademark	:	AngelLira	
Product Description	:	Operation Frequency:	5180MHz~5240MHz，5745MHz-5825MHz (802.11a/802.11n(H20)/ 802.11n(H40)/802.11ac(80MHz))
		Transfer Rate:	802.11a: 6Mbps 802.11n(20): 6.5Mbps 802.11n(40): 13.5Mbps 802.11ac(80MHz):433.3 Mbps
		Number of Channel:	4 for 802.11a/802.11n(H20), 2 for 802.11n(H40) 1 for802.11ac(80MHz)
		Channel separation	5MHz
		Modulation Technology:	OFDM
		Antenna Type:	Integral Antenna
		Antenna Gain:	2.0 dBi
Power Supply	:	DC 5V powered by power adapter	

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) Channel List:

For IEEE 802.11 a with 5.2G			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH36	5180	CH44	5220
CH40	5200	CH48	5240

For IEEE 802.11 n/HT20 with 5.2G			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH36	5180	CH44	5220
CH40	5200	CH48	5240

For IEEE 802.11 n/HT40 with 5.2G			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH38	5190	CH46	5230

For IEEE 802.11 ac with 5.2G			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH42	5210		

For IEEE 802.11 a with 5.8G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH149	5745	CH157	5785	CH165	5825
CH153	5765	CH161	5805		

For IEEE 802.11n/HT20 with 5.8G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH149	5745	CH157	5785	CH165	5825
CH153	5765	CH161	5805		

For IEEE 802.11n/HT40 with 5.8G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH151	5755	CH159	5795		

For IEEE 802.11 ac with 5.8G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH155	5775				

1.3 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

Test Mode	Description
Transmitting mode	Keep the EUT in continuous transmitting with modulation

Remark: The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables,

rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
802.11a	6Mbps
802.11n(H20)	6.5Mbps
802.11n(H40)	13.5 Mbps
802.11(80MHz)	433.3 Mbps
Final Test Mode:	
According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 6Mbps for 802.11a, 6.5Mbps for 802.11n(H20) and 13.5 Mbps for 802.11n(H40). Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.	

1.4 Test Instruments List

	Test Equipment	Manufacturer	Model No.	Cal. Date	Cal. Due date
1	Bilog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	May 22, 2016	May 21, 2017
2	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	May 27, 2016	May 26, 2017
3	Coaxial Cable	N/A	N/A	Mar. 28, 2016	Mar. 27, 2017
4	Coaxial Cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
5	Coaxial cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
6	Coaxial Cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
7	Coaxial Cable	N/A	N/A	Mar. 29, 2016	Mar. 29, 2017
8	Amplifier (10kHz-1.3GHz)	HP	8447D	Mar. 29, 2016	Mar. 29, 2017
9	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	Jun. 06, 2016	Mar. 29, 2017
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	Mar. 29, 2016	Mar. 29, 2017
11	Horn Antenna	ETS-LINDGREN	3160	Mar. 27, 2016	Mar. 27, 2017
12	Positioning Controller	UC	UC3000	N/A	N/A

13	Spectrum analyzer 9kHz-30GHz	Rohde & Schwarz	FSP	May 26, 2016	May 27, 2017
14	EMI Test Receiver	Rohde & Schwarz	ESPI	Mar. 29, 2016	Mar. 30, 2017
15	Loop antenna	Laplace instrument	RF300	May 22,, 2016	May 23, 2017
16	Universal radio communication tester	Rhode & Schwarz	CMU200	May 26, 2016	May 27, 2017
17	Signal Analyzer	Rohde & Schwarz	FSIQ3	May 26, 2016	May 27, 2017
18	L.I.S.N.#1	Rohde & Schwarz	NSLK8126	May 26, 2016	May 27, 2017
19	L.I.S.N.#2	Rohde & Schwarz	ENV216	May 26, 2016	May 27, 2017
20	Power Meter	Anritsu	ML2495A	May 26, 2016	May 27, 2017
21	Power sensor	Anritsu	ML2491A	May 26, 2016	May 27, 2017

2. Test Summary

Standard Section	Test Item	Judgment
15.203/15.407	Antenna Requirement	PASSED
15.207	Conducted Emission	PASSED
15.407(a)	Conducted Peak Output Power	PASSED
15.407(a)	Emission Bandwidth	PASSED
15.407(a)	Power Spectral Density	PASSED
15.407(b)&15.209	Spurious Emission	PASSED
15.407(b)	Undesirable emission	PASSED
15.407	Frequency stability	PASSED

3. Antenna Requirement

3.1. Standard Requirement

3.1.1 Test standard

FCC Part15 Section 15.203 /407

3.1.2 Requirement

1) 15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

3.2. Antenna Connected Construction

The antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 2.0dBi. It complies with the standard requirement.

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1 Test Standard

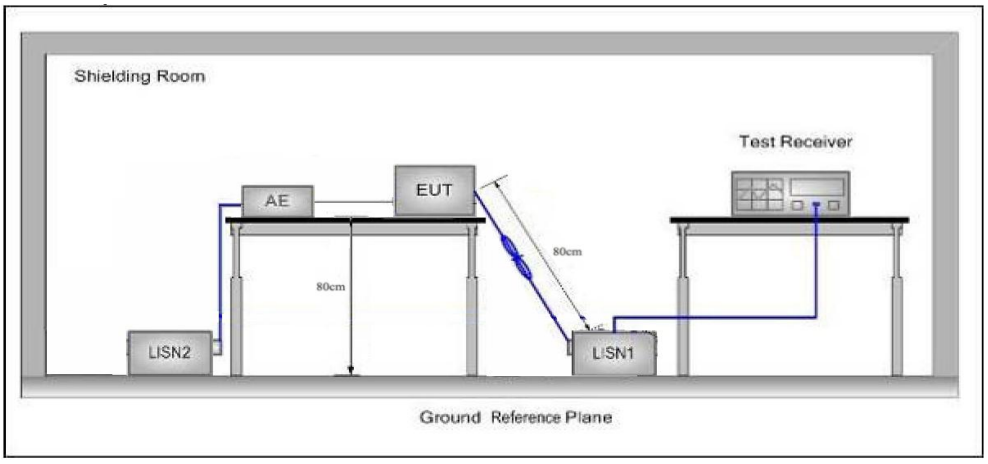
FCC Part15 Section 15.207

4.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequencies.		

4.2 Test Setup



4.3 Test Procedure

1) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50 Ω /50μH + 5 Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal

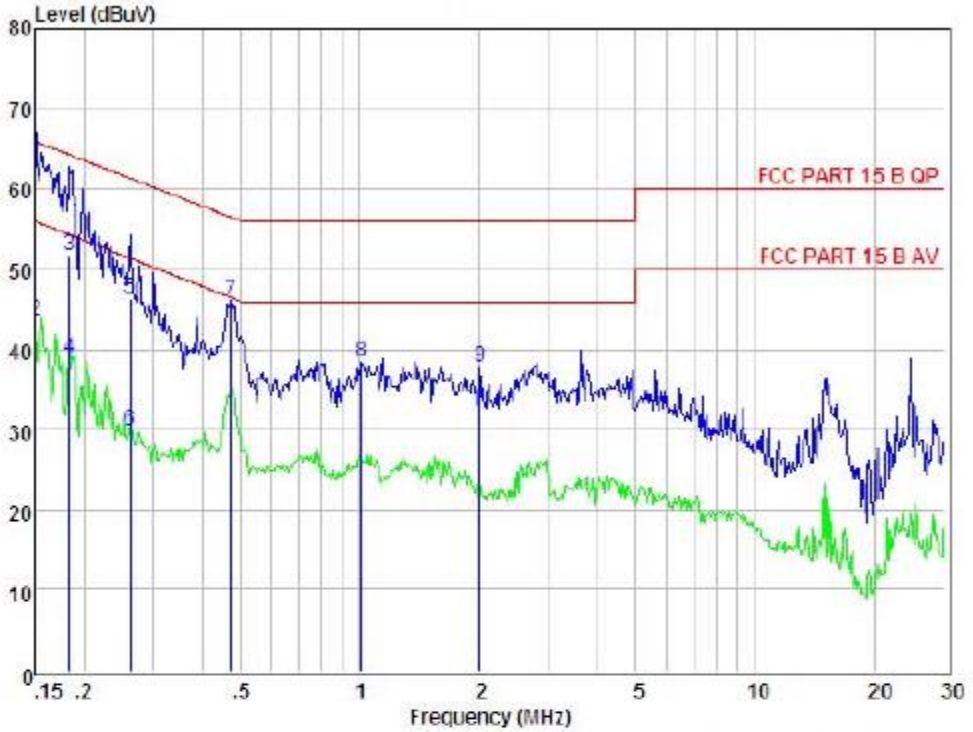
ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

4.4 Test Data

Please refer to the following pages

Conducted Emission Test Data

EUT:	Smart TV BOX	M/N: X92
Operating Condition:	WIFI mode	
Test Site:	Shielded room	
Operator:	Tom	
Test Specification:	AC 120V/60Hz	
Polarization:	Line	
Note	Tem:25℃	Hum:50%



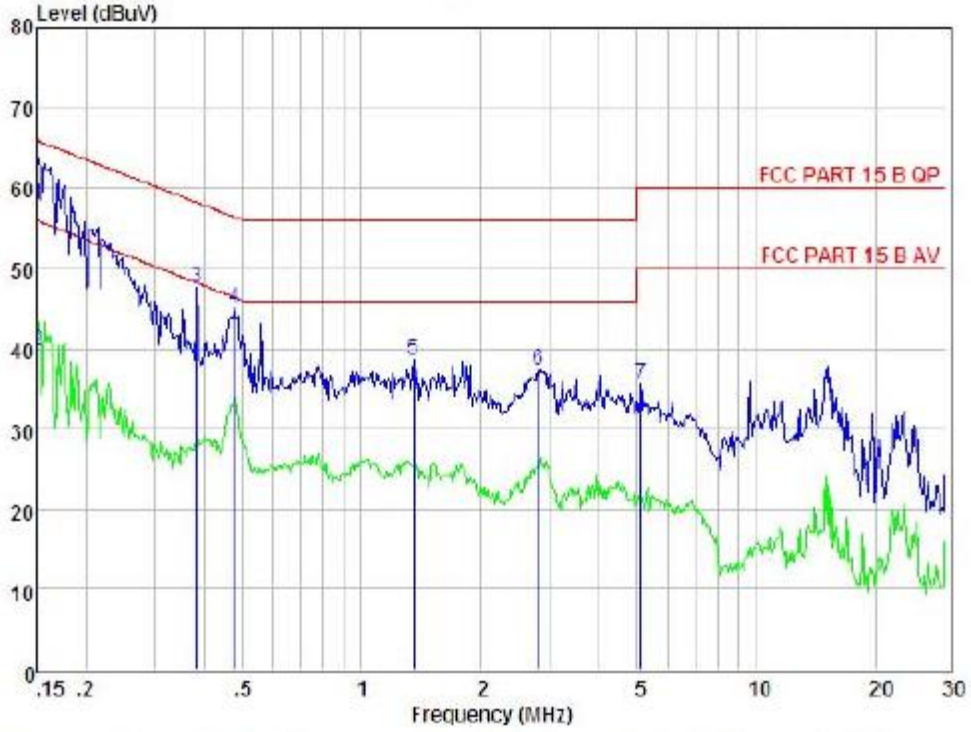
Condition : FCC PART 15 B QP POL: LINE Temp: 25℃ Hum: 51 %

Item	Freq	Read Level	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.150	52.30	0.03	-9.49	0.10	61.92	66.00	-4.08	QP
2	0.150	33.90	0.03	-9.49	0.10	43.52	56.00	-12.48	Average
3	0.183	42.00	0.03	-9.52	0.10	51.65	64.33	-12.68	QP
4	0.183	29.11	0.03	-9.52	0.10	38.76	54.33	-15.57	Average
5	0.262	36.68	0.03	-9.56	0.10	46.37	61.38	-15.01	QP
6	0.262	20.22	0.03	-9.56	0.10	29.91	51.38	-21.47	Average
7	0.471	36.50	0.03	-9.58	0.10	46.21	56.49	-10.28	Peak
8	1.010	28.70	0.04	-9.63	0.10	38.47	56.00	-17.53	Peak
9	2.012	27.83	0.06	-9.72	0.10	37.71	56.00	-18.29	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

Conducted Emission Test Data

EUT:	Smart TV BOX	M/N: X92
Operating Condition:	WIFI mode	
Test Site:	Shielded room	
Operator:	Tom	
Test Specification:	AC 120V/60Hz	
Polarization:	Neutral	
Note	Tem:25℃ Hum:50%	



Condition : FCC PART 15 B QP POL: NEUTRAL Temp: 25℃ Hum: 51 %

Item	Freq	Read Level	LISN Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.150	48.33	0.03	-9.49	0.10	57.95	66.00	-8.05	QP
2	0.150	30.00	0.03	-9.49	0.10	39.62	56.00	-16.38	Average
3	0.381	37.83	0.03	-9.57	0.10	47.53	58.25	-10.72	Peak
4	0.476	35.37	0.03	-9.58	0.10	45.08	56.41	-11.33	Peak
5	1.352	28.77	0.05	-9.66	0.10	38.58	56.00	-17.42	Peak
6	2.794	27.42	0.07	-9.78	0.12	37.39	56.00	-18.61	Peak
7	5.112	25.51	0.10	-9.93	0.12	35.66	60.00	-24.34	Peak

Remark: Level = Read Level + LISN Factor - Preamp Factor + Cable Loss

5. Peak Output Power Test

5.1. Test Standard and Limit

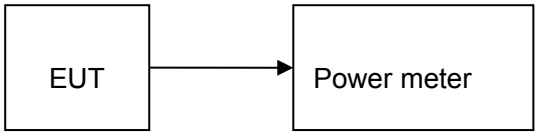
5.1.1 Test Standard

FCC Part15 C Section 15.407

5.1.2 Test Limit

For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

5.2. Test Setup



5.3. Test Procedure

(1) The EUT was directly connected to peak power meter and antenna output port as show in the block diagram above.
(2) Measure out each mode and each bands peak output power of EUT.
(3) The EUT was set to continuously transmitting in the max power during the test.

5.4. Test Data

5.2G Band

Mode	Frequency (MHz)	PK Output power(dBm)	Limit (dBm)	Result
IEEE 802.11 a with 5.2G	CH36:5180	19.46	30	Pass
	CH40:5200	19.45	30	Pass
	CH48:5240	19.65	30	Pass
IEEE 802.11 n/HT20 with 5.2G	CH36:5180	19.53	30	Pass
	CH40:5200	19.72	30	Pass
	CH48:5240	19.57	30	Pass
IEEE 802.11 n/HT40 with 5.2G	CH38:5190	19.73	30	Pass
	CH46:5230	19.67	30	Pass
IEEE 802.11 ac with 5.2G	CH42:5210	19.68	30	Pass
Conclusion: PASS				

5.8G Band

Mode	Frequency (MHz)	PK Output powe(dBm)	Limit (dBm)	Result
IEEE 802.11 a with 5.8G	CH149:5745	24.31	30	Pass
	CH157:5785	29.31	30	Pass
	CH165:5825	24.33	30	Pass
IEEE 802.11 n/HT20 with 5.8G	CH149:5745	24.22	30	Pass
	CH157:5785	29.21	30	Pass
	CH165:5825	24.23	30	Pass
IEEE 802.11 n/HT40 with 5.8G	CH151:5755	24.64	30	Pass
	CH159:5795	24.66	30	Pass
IEEE 802.11 ac with 5.8G	CH155:5775	24.62	30	Pass
Conclusion: PASS				

6. Occupy Bandwidth Test

6.1. Test Standard and Limit

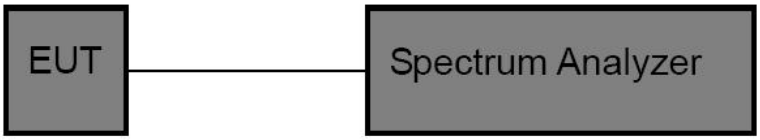
6.1.1 Test Standard

FCC Part15 C Section 15.407

6.1.2 Test Limit

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

6.2. Test Setup



6.3. Test Procedure

a) The bandwidth is measured at an amplitude level reduced 26dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

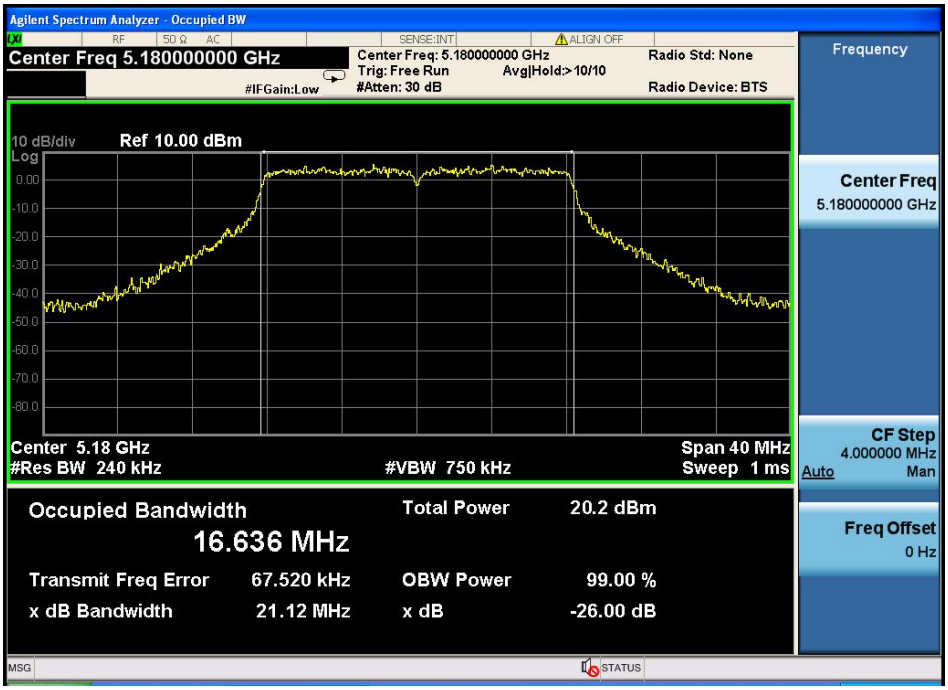
b) The test receiver set RBW = 1-5 % EBW, VBW≥3RBW, Sweep time set auto, detail see the test plot.

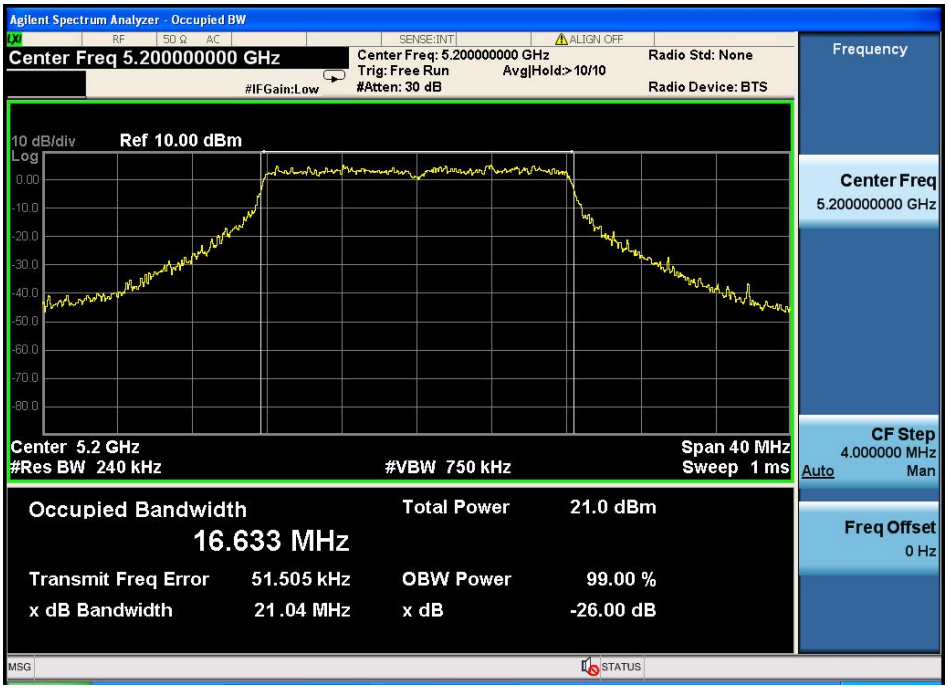
6.4. Test Data

5.2G

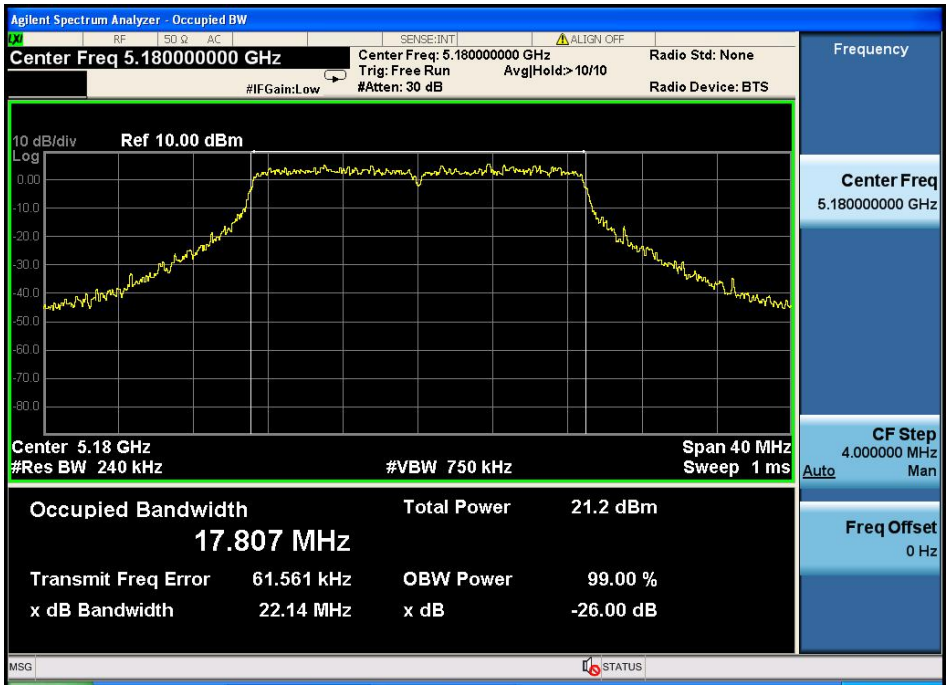
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a:					
Low	5180	21.12	16.636	/	PASS
Mid	5200	21.04	16.633	/	PASS
High	5240	22.87	16.687	/	PASS
IEEE 802.11n/HT20:					
Low	5180	22.14	17.807	/	PASS
Mid	5200	22.42	17.797	/	PASS
High	5240	22.72	17.801	/	PASS
IEEE 802.11n/HT40:					
Low	5190	42.26	36.144	/	PASS
High	5230	42.61	36.193	/	PASS
IEEE 802.11ac:					
	5210	78.01	75.565	/	PASS

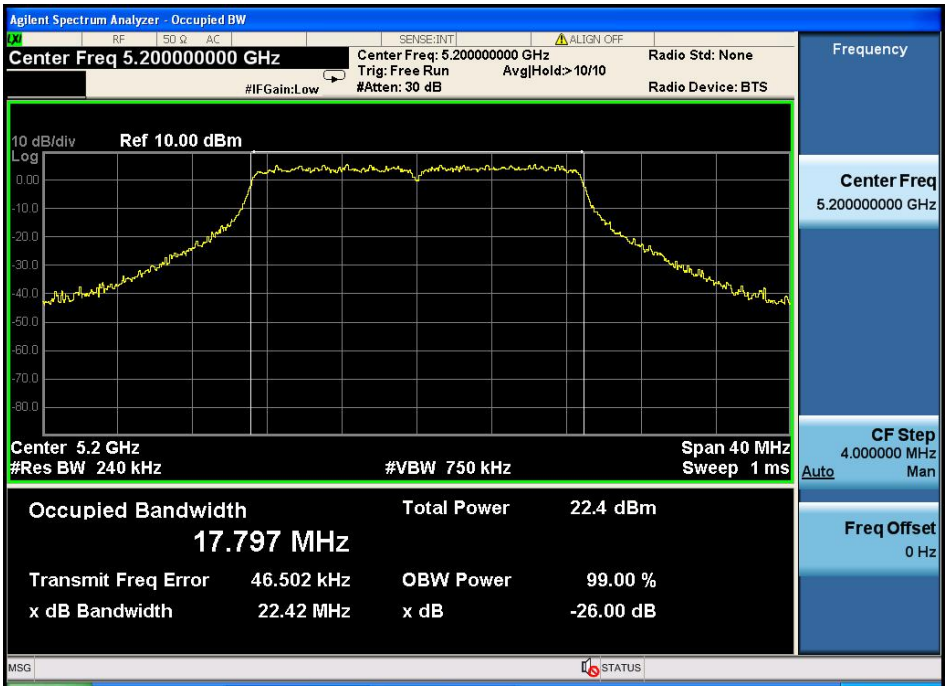
IEEE 802.11a

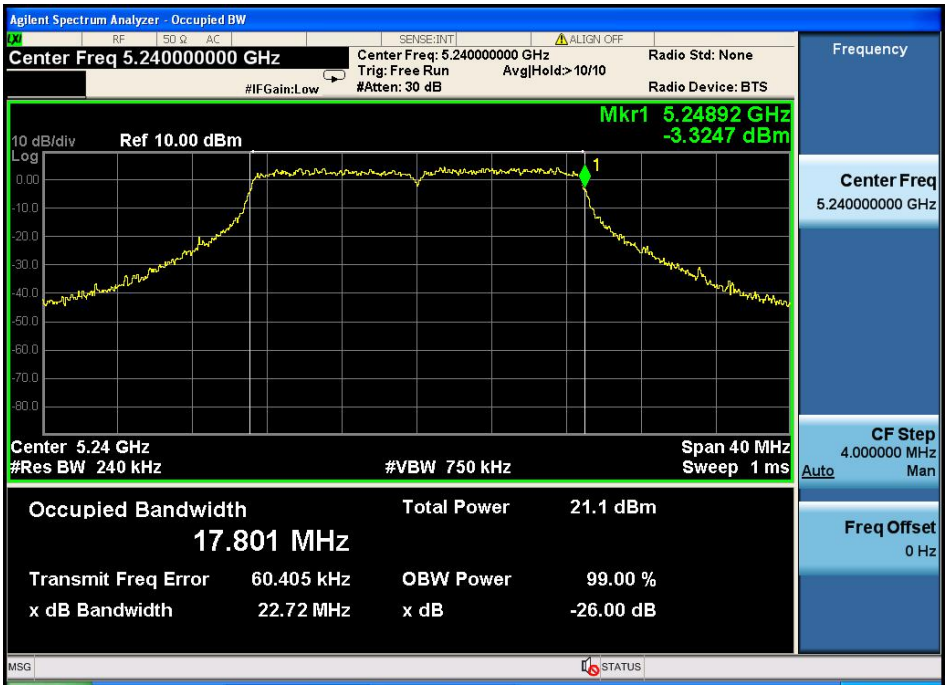

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.180000000 GHz
Center Freq: 5.180000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 5.18 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.636 MHz
Total Power 20.2 dBm
Transmit Freq Error 67.520 kHz
OBW Power 99.00 %
x dB Bandwidth 21.12 MHz
x dB -26.00 dB
Center Freq
5.180000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.200000000 GHz
Center Freq: 5.200000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 10.00 dBm
Log
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 5.2 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.633 MHz
Total Power 21.0 dBm
Transmit Freq Error 51.505 kHz
OBW Power 99.00 %
x dB Bandwidth 21.04 MHz
x dB -26.00 dB
Center Freq
5.200000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

IEEE 802.11n HT20:

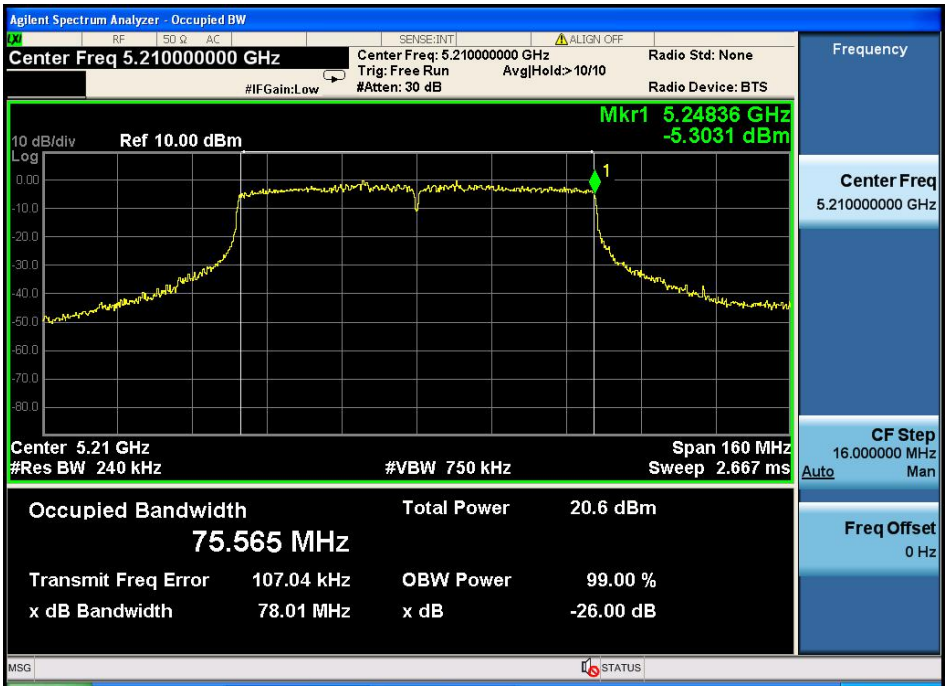



Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.200000000 GHz
Center Freq: 5.200000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div
Ref 10.00 dBm
Log
Center Freq
5.200000000 GHz
Center 5.2 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
17.797 MHz
Total Power
22.4 dBm
Transmit Freq Error
46.502 kHz
OBW Power
99.00 %
x dB Bandwidth
22.42 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.240000000 GHz
Center Freq: 5.240000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Mkr1 5.24892 GHz
-3.3247 dBm
10 dB/div
Ref 10.00 dBm
Log
Center Freq
5.240000000 GHz
Center 5.24 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
CF Step
4.000000 MHz
Auto
Man
Occupied Bandwidth
17.801 MHz
Total Power
21.1 dBm
Transmit Freq Error
60.405 kHz
OBW Power
99.00 %
x dB Bandwidth
22.72 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

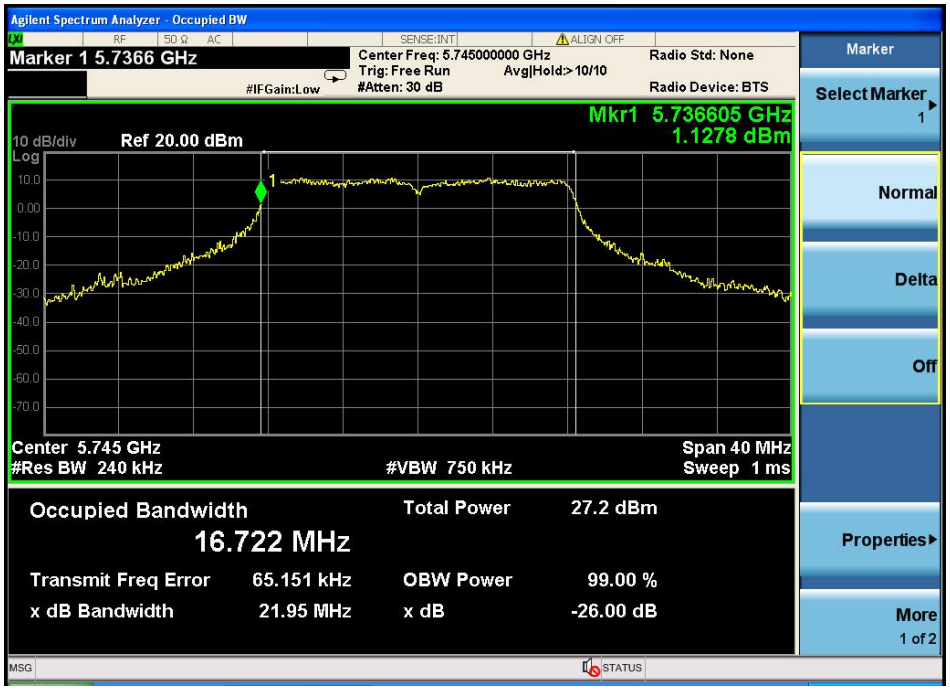
IEEE 802.11n HT40:

IEEE 802.11ac



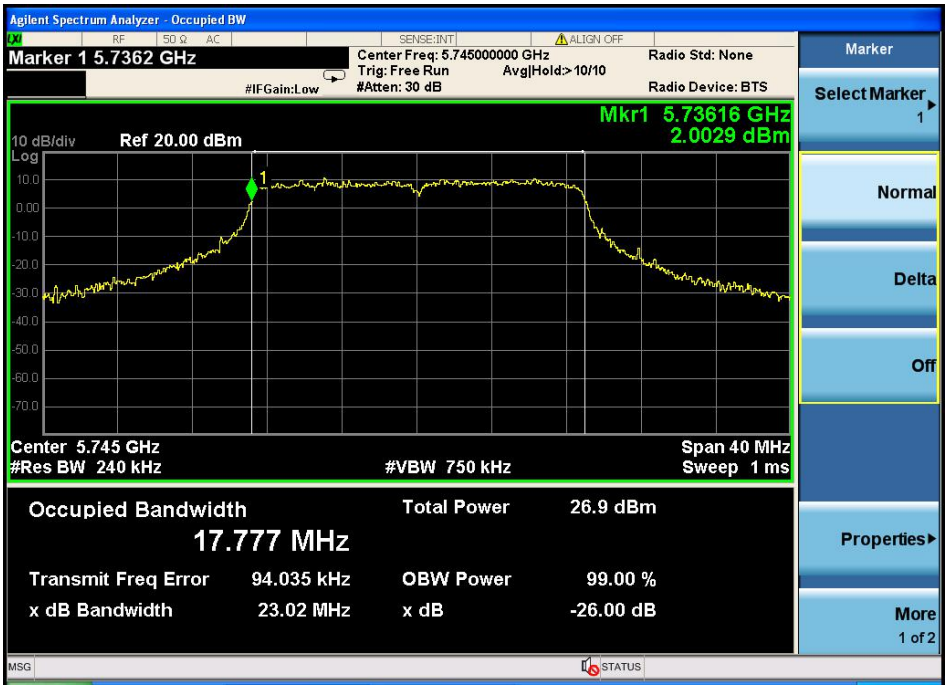
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a:					
Low	5745	21.95	16.722	/	PASS
Mid	5785	22.93	16.686	/	PASS
High	5825	21.12	16.690	/	PASS
IEEE 802.11n/HT20:					
Low	5745	23.02	17.777	/	PASS
Mid	5785	21.70	17.784	/	PASS
High	5825	22.31	17.824	/	PASS
IEEE 802.11n/HT40:					
Low	5755	43.01	36.183	/	PASS
High	5795	42.02	36.200	/	PASS
IEEE 802.11ac:					
	5775	81.12	75.391	/	PASS

IEEE 802.11a


Agilent Spectrum Analyzer - Occupied BW
Marker 1 5.7366 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Mkr1 5.736605 GHz
1.1278 dBm
10 dB/div Ref 20.00 dBm
Log
Center 5.745 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.722 MHz
Total Power 27.2 dBm
Transmit Freq Error 65.151 kHz
OBW Power 99.00 %
x dB Bandwidth 21.95 MHz
x dB -26.00 dB
Marker
Select Marker
Normal
Delta
Off
Properties
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Marker 1 --- Hz
Center Freq: 5.785000000 GHz
Trig: Free Run Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
10 dB/div Ref 20.00 dBm
Log
Center 5.785 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
16.686 MHz
Total Power 26.2 dBm
Transmit Freq Error 25.823 kHz
OBW Power 99.00 %
x dB Bandwidth 22.33 MHz
x dB -26.00 dB
Marker
Select Marker
Normal
Delta
Off
Properties
More
1 of 2
MSG
STATUS

IEEE 802.11n HT20:

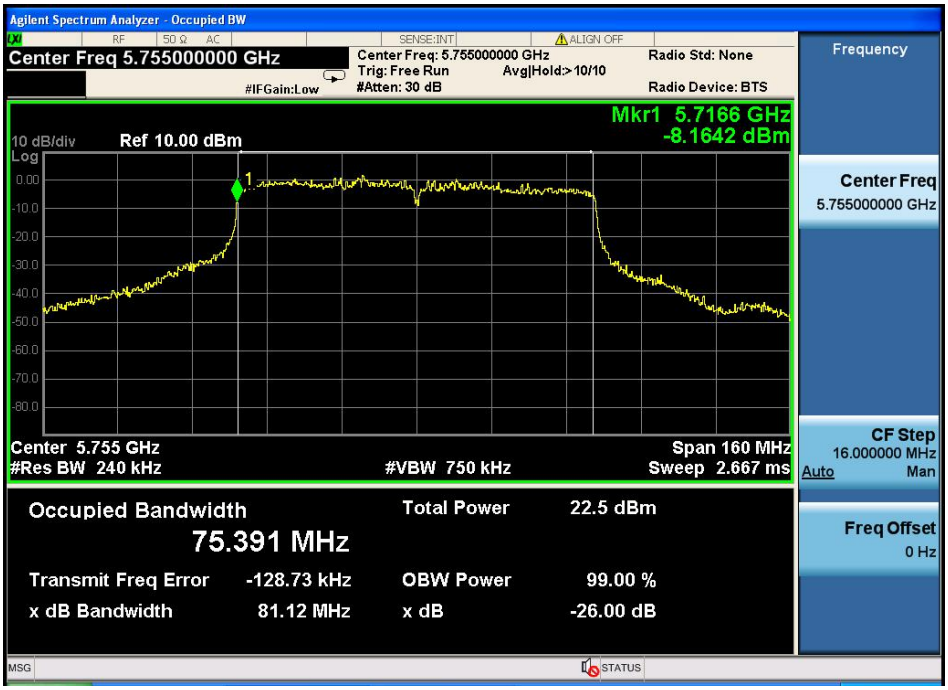



Agilent Spectrum Analyzer - Occupied BW
x dB -26.00 dB
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Center 5.785 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.784 MHz
Total Power 25.8 dBm
Transmit Freq Error 74.344 kHz
OBW Power 99.00 %
x dB Bandwidth 21.70 MHz
x dB -26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Center 5.825 GHz
#Res BW 240 kHz
#VBW 750 kHz
Span 40 MHz
Sweep 1 ms
Occupied Bandwidth
17.824 MHz
Total Power 25.3 dBm
Transmit Freq Error 35.198 kHz
OBW Power 99.00 %
x dB Bandwidth 22.31 MHz
x dB -26.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Peak
Auto
Man
MSG
STATUS

IEEE 802.11n HT40:

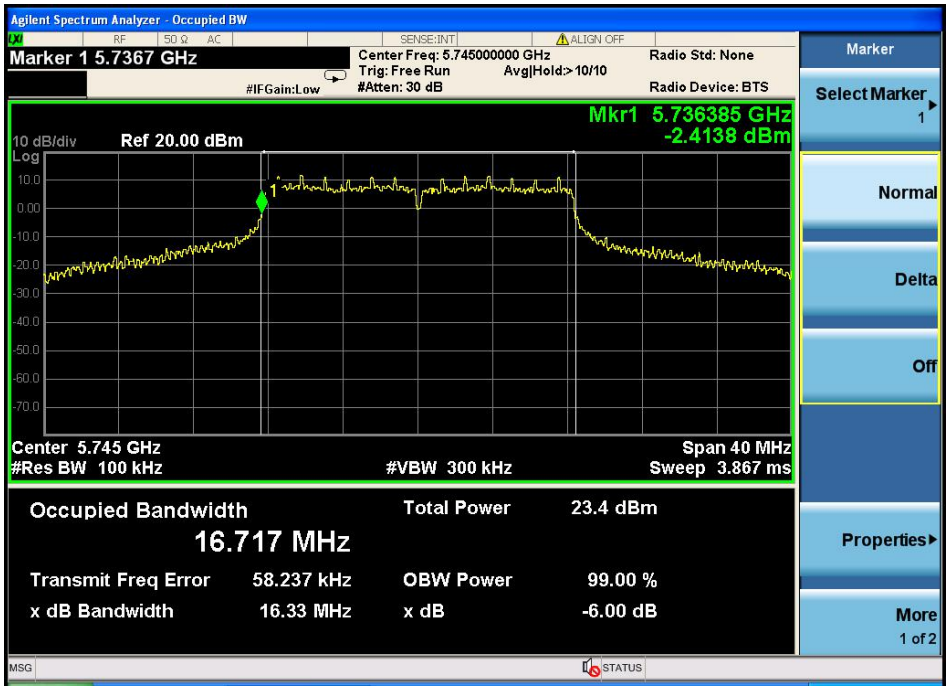
IEEE 802.11ac



Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a:					
Low	5745	16.63	16.717	0.5	PASS
Mid	5785	16.13	16.470	0.5	PASS
High	5825	16.33	16.463	0.5	PASS
IEEE 802.11n/HT20:					
Low	5745	17.22	17.633	0.5	PASS
Mid	5785	17.13	17.670	0.5	PASS
High	5825	16.33	17.671	0.5	PASS
IEEE 802.11n/HT40:					
Low	5755	35.43	36.143	0.5	PASS
High	5795	35.73	36.183	0.5	PASS
IEEE 802.11ac:					
	5775	71.35	75.302	0.5	PASS

IEEE 802.11a with 5.8G:

CH Low :

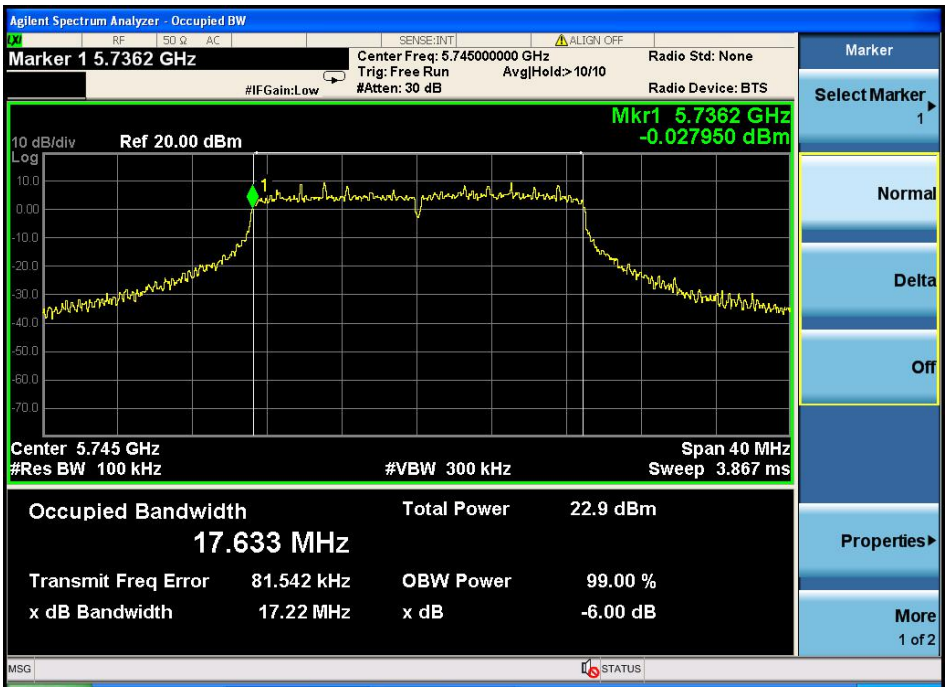


CH Mid :

CH High :

IEEE 802.11n HT20:

CH Low :



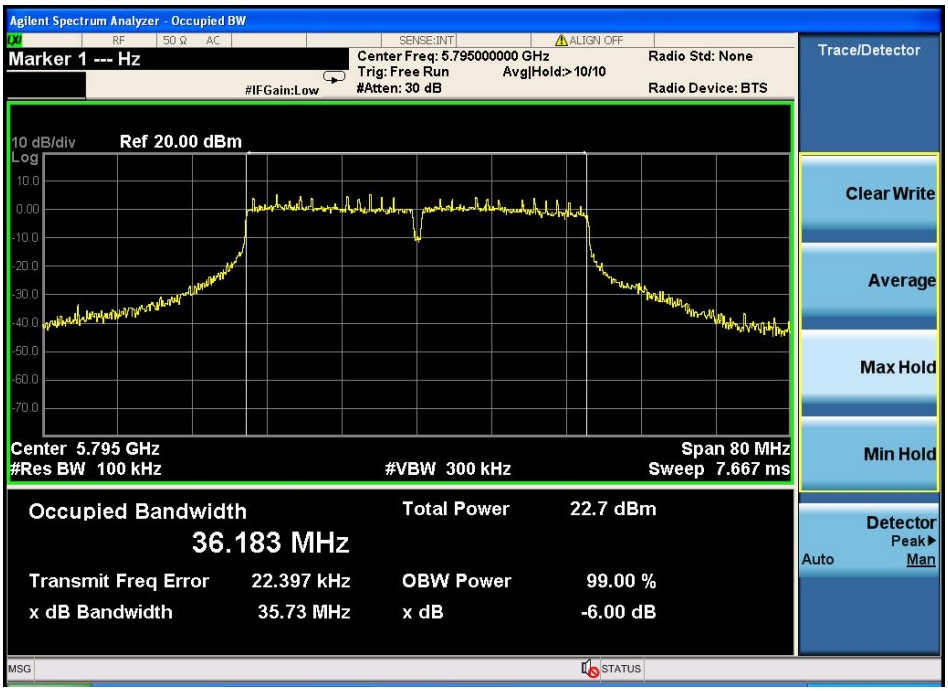
CH Mid :

CH High :

IEEE 802.11n/HT40:

CH Low :

CH High :



IEEE 802.11ac:

7. Power Spectral Density Test

7.1. Test Standard and Limit

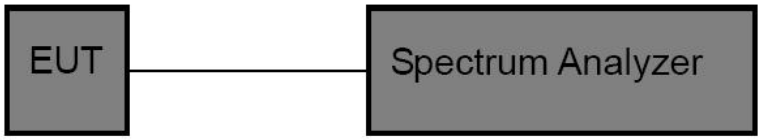
7.1.1 Test Standard

FCC Part15 C Section 15.407

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	17dBm(in any 1 megahertz)	5150-5250
Power Spectral Density	30dBm(in any 500KHz)	5725-5850

7.2. Test Setup



7.3. Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Measure the spectral power density the spectrum analyzer was set to Resolution Bandwidth=100 0kHz, and Video Bandwidth≥3000kHz, Detector: Peak, Span to 5%~30% greater than EBW, Sweep time auto.

7.4. Test Data

5.2G Band

Mode	Frequency (MHz)	PK Output power(dBm)	Limit (dBm)	Result
IEEE 802.11 a with 5.2G	CH36:5180	5.773	17	Pass
	CH40:5200	5.304	17	Pass
	CH48:5240	4.442	17	Pass
IEEE 802.11 n/HT20 with 5.2G	CH36:5180	5.518	17	Pass
	CH40:5200	5.319	17	Pass
	CH48:5240	4.135	17	Pass
IEEE 802.11 n/HT40 with 5.2G	CH38:5190	2.607	17	Pass
	CH46:5230	1.353	17	Pass
IEEE 802.11 ac with 5.2G	CH42:5210	6.023	17	Pass
Conclusion: PASS				

5.8G Band

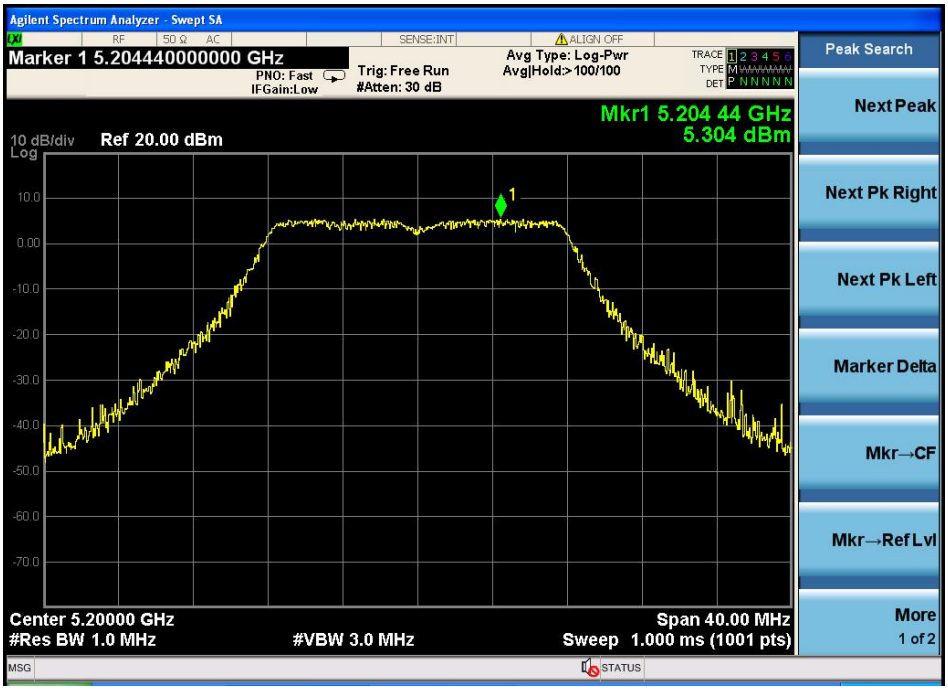
Mode	Frequency (MHz)	PK Output power(dBm)	Factor	Final Result	Limit (dBm)	Result
IEEE 802.11 a with 5.8G	CH149:5745	6.646	-0.086	6.56	30	Pass
	CH157:5785	12.602	-0.086	12.516	30	Pass
	CH165:5825	5.081	-0.086	4.995	30	Pass
IEEE 802.11 n/HT20 with 5.8G	CH149:5745	7.232	-0.086	7.146	30	Pass
	CH157:5785	11.643	-0.086	11.557	30	Pass
	CH165:5825	5.252	-0.086	5.166	30	Pass
IEEE 802.11 n/HT40 with 5.8G	CH151:5755	5.602	-0.086	5.516	30	Pass
	CH159:5795	5.452	-0.086	5.366	30	Pass
IEEE 802.11 ac with 5.8G	CH155:5755	5.273	-0.086	5.187	30	Pass
Conclusion: PASS						

Since the test was performed with a RBW of 510KHz, therefore, a factor of 10*log(500/510) =-0.086 should be used to correct the real value

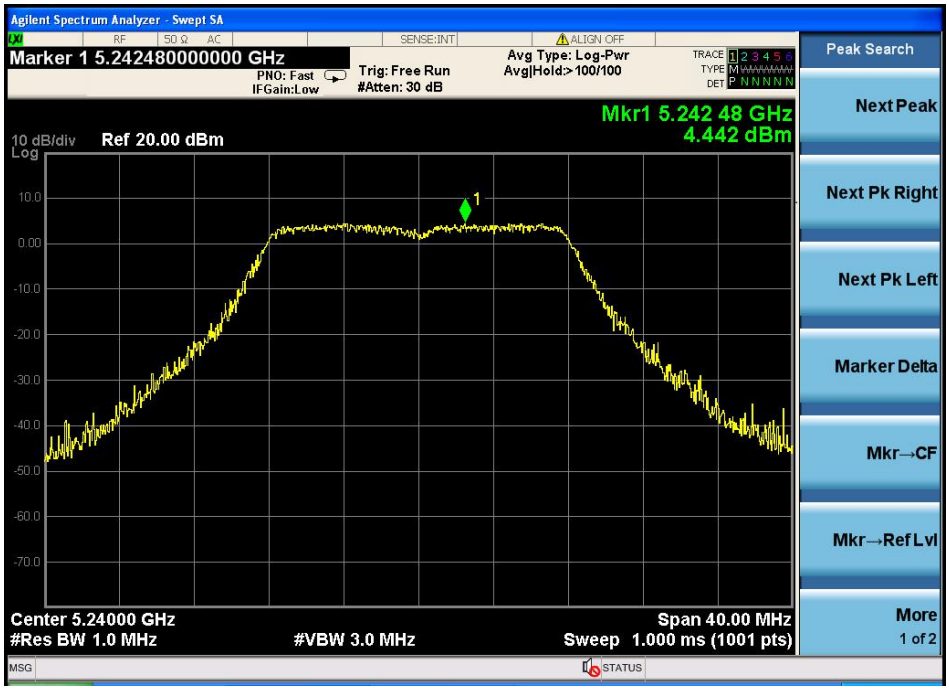
IEEE 802.11a with5.2G:

CH Low :

CH Mid:



CH Hig:



IEEE 802.11n HT20 :

CH Low :

CH Mid:


Agilent Spectrum Analyzer - Swept SA
Marker 1 5.195360000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Mkr1 5.195 36 GHz
5.319 dBm
10 dB/div
Log
Ref 20.00 dBm
Center 5.20000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 40.00 MHz
Sweep 1.000 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

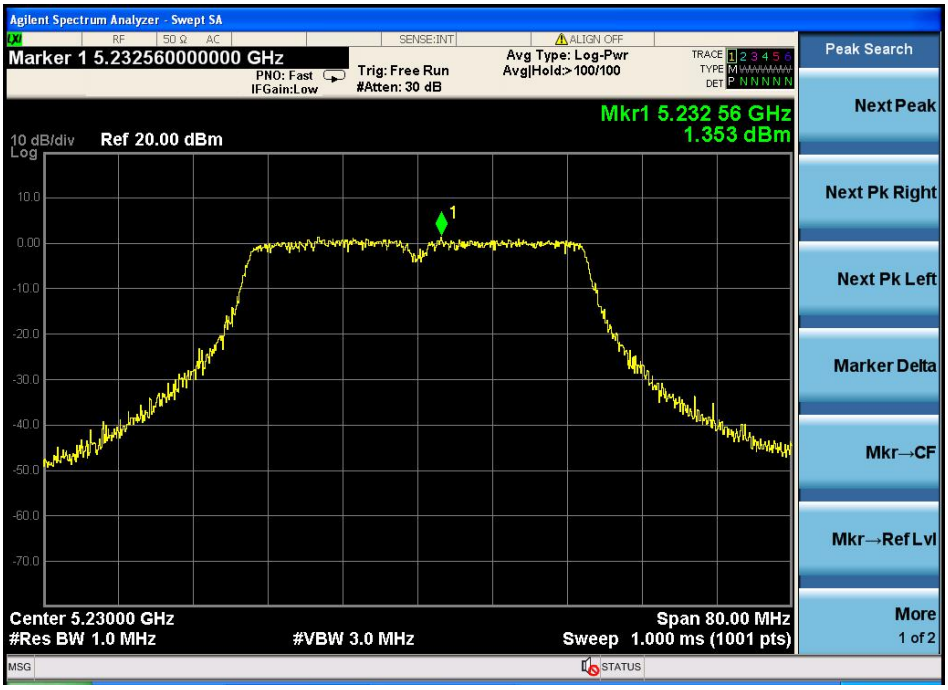
CH Hig:


Agilent Spectrum Analyzer - Swept SA
Marker 1 5.232960000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Mkr1 5.232 96 GHz
4.135 dBm
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 40.00 MHz
Sweep 1.000 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

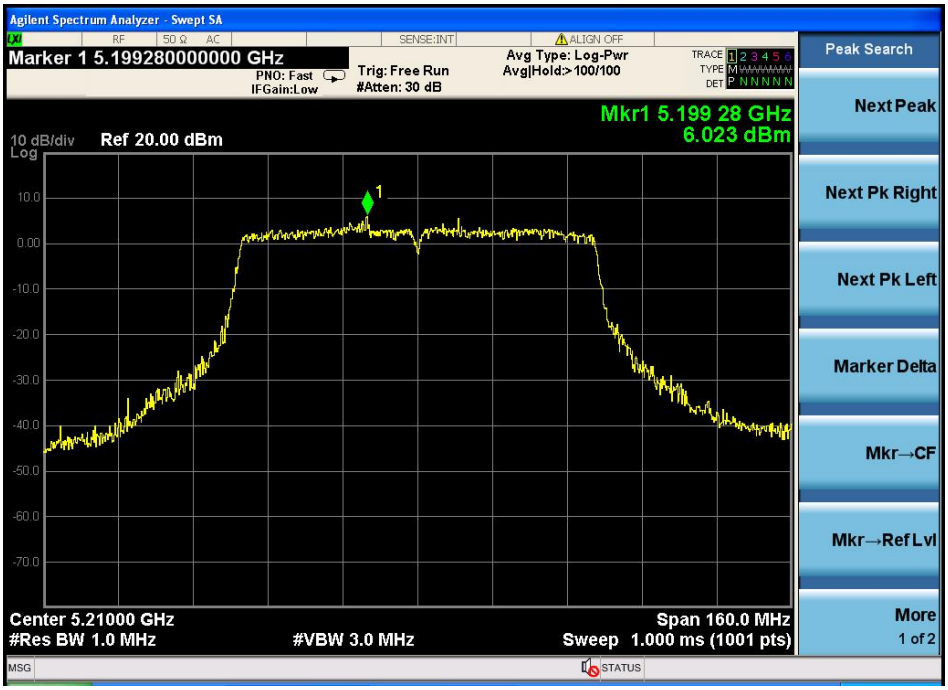
IEEE 802.11n HT40 :

CH Low :

CH Hig:

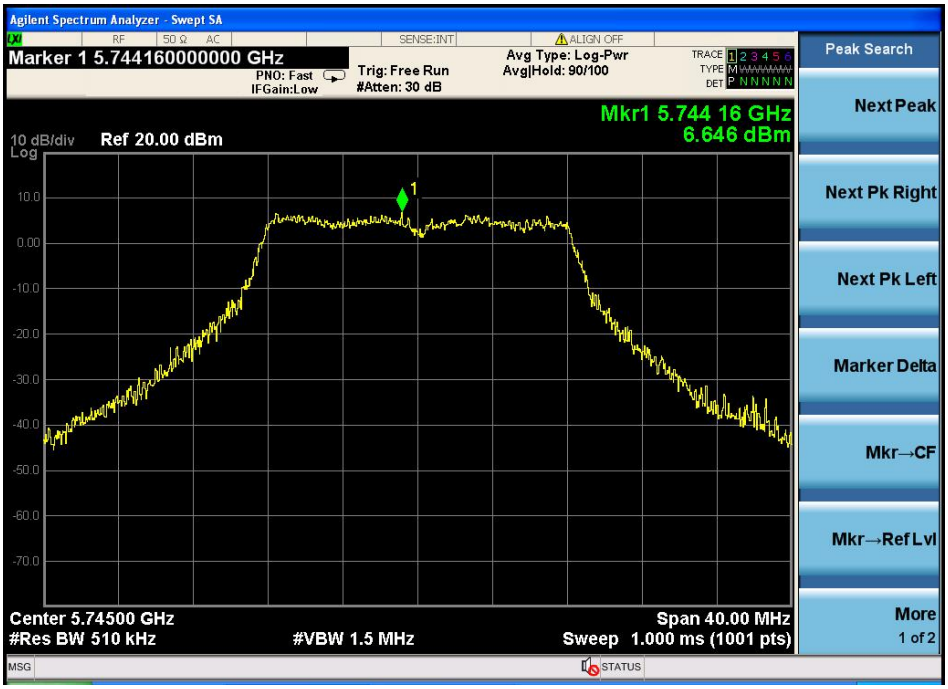


IEEE 802.11ac :



IEEE 802.11a with 5.8G :

CH Low :



CH Mid: