TEST REPORT

Test report
On Behalf of
VIZIONS NETWORK INC
For
Smart TV Box
Model No.: V1
FCC ID: 2ATE4-V1

Prepared for :	**VIZIONS NETWORK INC** **91-1035 LEHULEHU ST KAPOLEI, HI 96707**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China**
Date of Test:	**Jun. 17, 2019 ~ Jun. 24, 2019**
Date of Report:	**Jun. 24, 2019**
Report Number:	**HK1906201406E-3**

TEST RESULT CERTIFICATION

Applicant's name.....:	VIZIONS NETWORK INC
Address .....:	91-1035 LEHULEHU ST KAPOLEI, HI 96707
Manufacture's Name.....:	Wiatec International Ltd.
Address .....:	Unit 601-605, TaoJinDi Electronic Commercial Plaza B, Teng Long Rd., Long Hua, Shenzhen, China

Product description

Trade Mark:	VIZIONS
Product name.....:	Smart TV Box
Model and/or type reference .:	V1
Standards .....:	FCC Rules and Regulations Part 15 Subpart C Section 15.407 ANSI C63.10: 2013

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Date of Test.....:	
Date (s) of performance of tests .....:	Jun. 17, 2019 ~ Jun. 24, 2019
Date of Issue.....:	Jun. 24, 2019
Test Result.....:	Pass

Prepared by: Gary Qian

Project Engineer

Reviewed by: Leo Zhang

Project Supervisor

Approved by: James Zhou

Technical Director

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1. Test Result Summary

1.1. TEST PROCEDURES AND RESULTS

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a) §2.1046	PASS
6dB Emission Bandwidth	§15.407(e)	PASS
26dB Emission Bandwidth& 99% Occupied Bandwidth	§15.407(a) §2.1049	PASS
Power Spectral Density	§15.407(a)	PASS
Band edge	§15.407(a)	PASS
Radiated Emission	§15.407(a) §2.1053	PASS
Frequency Stability	§15.407(g) §2.1055	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

1.2. TEST FACILITY

Test Firm : Shenzhen HUAK Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

1.3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

2. EUT Description

2.1. GENERAL DESCRIPTION OF EUT

Equipment	Smart TV Box
Model Name	V1
Serial No.	N/A
Trade Mark	N/A
Model Difference	N/A
FCC ID	**2ATE4-V1**
Operation Frequency:	IEEE 802.11a/n/ac(HT20) 5.180GHz-5.240GHz IEEE 802.11n/ac(HT40) 5.190GHz-5.230GHz IEEE 802.11ac(HT80) 5.210GHz
	IEEE 802.11a/n/ac(HT20)5.745GHz-5.825GHz IEEE 802.11n/ac(HT40)5.755GHz-5.795GHz IEEE 802.11ac(HT80) 5.775GHz
Modulation Technology:	IEEE 802.11a/n/ac
Modulation Type	CCK/OFDM/DBPSK/DAPSK
Antenna Type	Internal Antenna
Antenna Gain	3dBi
Power Source	DC5V 2A From Adapter With AC 100-240V~50/60Hz 0.35A
Power Supply:	DC5V 2A From Adapter With AC100-240V~50/60Hz 0.35A

2.2. Operation Frequency each of channel

802.11a/802.11n(HT20) 802.11ac(HT20)		802.11n(HT40)/ 802.11ac(HT40)		802.11ac(HT80)	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180	38	5190	42	5210
40	5200	46	5230	155	5775
44	5220	151	5755		
48	5240	159	5795		
149	5745				
153	5765				
157	5785				
161	5805				
165	5825				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

2.3. Operation of EUT during testing

For 802.11a/n (HT20)/ac(HT20)

Band I (5150 - 5250 MHz)			Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
36	Low	5180	149	Low	5745
40	Mid	5200	157	Mid	5785
48	High	5240	165	High	5825

For 802.11n (HT40)/ ac(HT40)

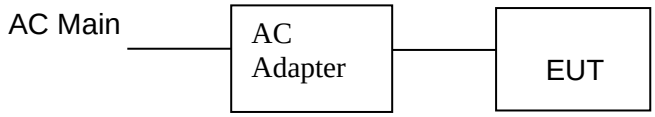
Band I (5150 - 5250 MHz)			Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
38	Low	5190	151	Low	5755
46	High	5230	159	High	5795

For 802.11ac(HT80)

Band I (5150 - 5250 MHz)		Band IV (5725 - 5850 MHz)	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
42	5210	155	5775

2.4. DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing and Radiation and Above1GHz Radiation testing:



- Adapter information
  Model: SR-C60502000U2
  Input: 100-240V~, 50/60Hz, 0.35A Max.
  Output: 5VDC, 2000mA

3. Genera Information

3.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)
The sample was placed 0.8m/1.5m for blow/above 1GHz 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	6 Mbps
802.11n(HT20)	MCS0
802.11n(HT40)	MCS0
802.11ac(HT20)/ac(HT40)/ac(HT80)	/
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Monitor	SE2417HGC	CE2417HG	/	DELL

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

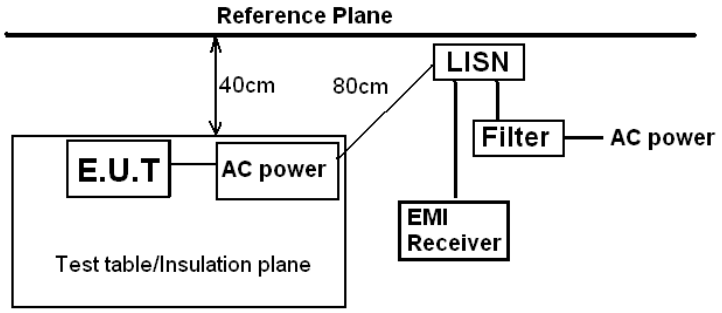
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

4. Test Results and Measurement Data

4.1. Conducted Emission

4.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Tx Mode</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

4.1.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Receiver	R&S	ESCI 7	HKE-010	Dec. 27, 2019
LISN	R&S	ENV216	HKE-002	Dec. 27, 2019
Coax cable (9KHz-30MHz)	Times	381806-002	N/A	Dec. 27, 2019
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A

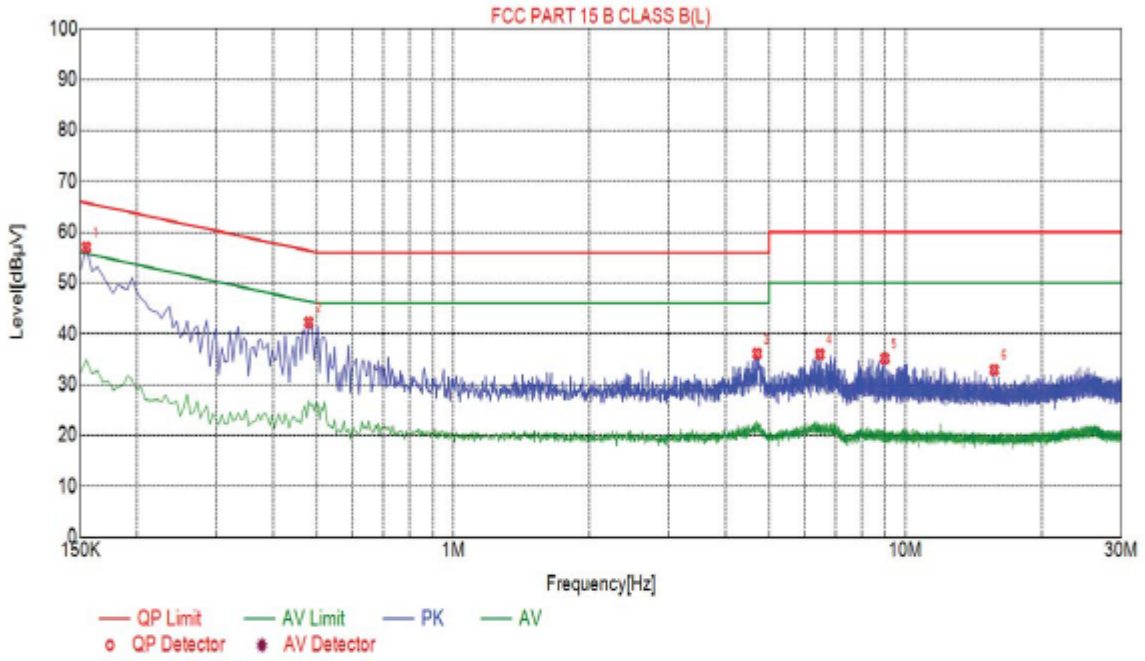
Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

4.1.3. Test data

Remark: We tested three Channels in AC 120V/60Hz and AC 240V/60Hz, the worst case was recorded.

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Suspected List

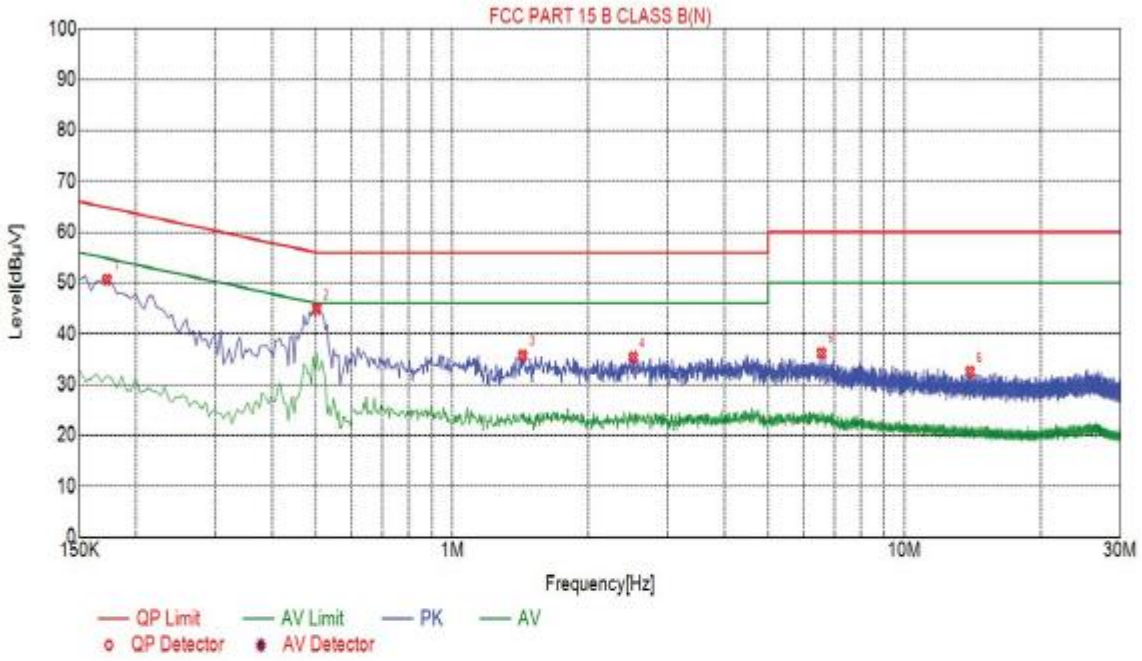
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector
1	0.1545	57.05	10.03	65.75	8.70	PK
2	0.4785	42.28	10.04	56.37	14.09	PK
3	4.7040	36.08	10.26	56.00	19.92	PK
4	6.4725	35.96	10.22	60.00	24.04	PK
5	9.0015	35.17	10.11	60.00	24.83	PK
6	15.7065	32.90	9.97	60.00	27.10	PK

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss*
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Suspected List						
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector
1	0.1725	50.60	10.04	64.84	14.24	PK
2	0.5010	44.86	10.04	56.00	11.14	PK
3	1.4280	35.68	10.11	56.00	20.32	PK
4	2.5170	35.39	10.19	56.00	20.61	PK
5	6.5580	36.17	10.21	60.00	23.83	PK
6	13.9605	32.50	9.96	60.00	27.50	PK

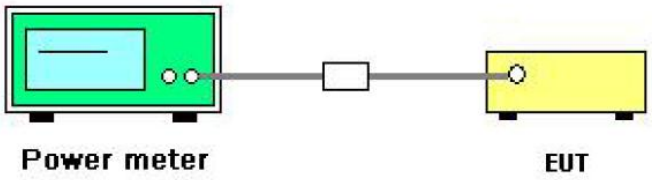
Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

4.2. Maximum Conducted Output Power

4.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046</td></tr>
<tr><td>Test Method:</td><td>KDB789033 D02 General UNII Test Procedures New Rules v02.r01 Section E</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency Band (MHz)</td><td>Limit</td></tr>
<tr><td>5150-5250</td><td>250mW for client devices</td></tr>
<tr><td>5725-5850</td><td>1 W</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 
</td></tr>
<tr><td>Test Mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Test Procedure:</td><td>1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
<tr><td>Remark:</td><td>Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0
Conducted output power= measurement power</td></tr>
</table>

4.2.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2019
Power meter	Agilent	E4419B	HKE-085	Dec. 27, 2019
Power Sensor	Agilent	E9300A	HKE-086	Dec. 27, 2019
RF cable	Times	1-40G	HKE-034	Dec. 27, 2019
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2019

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

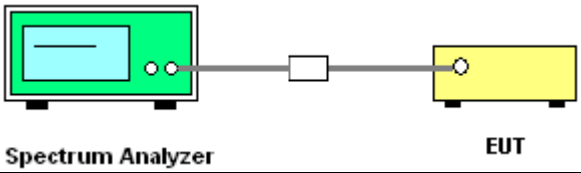
4.2.3. Test Data

Configuration Band I (5150 - 5250 MHz)				
Mode	Test channel	Maximum Conducted Output Power (dBm)	FCC Limit (dBm)	Result
11a	CH36	15.04	24	PASS
11a	CH40	14.34	24	PASS
11a	CH48	13.99	24	PASS
11n(HT20)	CH36	13.78	24	PASS
11n(HT20)	CH40	13.67	24	PASS
11n(HT20)	CH48	13.76	24	PASS
11n(HT40)	CH38	12.89	24	PASS
11n(HT40)	CH46	12.70	24	PASS
11ac(HT20)	CH36	12.25	24	PASS
11ac(HT20)	CH40	11.97	24	PASS
11ac(HT20)	CH48	11.84	24	PASS
11ac(HT40)	CH38	11.36	24	PASS
11ac(HT40)	CH46	11.22	24	PASS
11ac(HT80)	CH42	9.67	24	PASS

Configuration Band IV (5725 - 5850 MHz)				
Mode	Test channel	Maximum Conducted Output Power (dBm)	FCC Limit (dBm)	Result
11a	CH149	15.71	30	PASS
11a	CH157	15.52	30	PASS
11a	CH165	15.92	30	PASS
11n (HT20)	CH149	13.95	30	PASS
11n (HT20)	CH157	14.67	30	PASS
11n (HT20)	CH165	14.71	30	PASS
11n (HT40)	CH151	11.21	30	PASS
11n (HT40)	CH159	12.19	30	PASS
11ac(HT20)	CH149	12.53	30	PASS
11ac(HT20)	CH157	13.18	30	PASS
11ac(HT20)	CH165	13.25	30	PASS
11ac(HT40)	CH151	10.65	30	PASS
11ac(HT40)	CH159	10.79	30	PASS
11ac(HT80)	CH155	10.07	30	PASS

4.3. 6dB Emission Bandwidth

4.3.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	>500kHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

4.3.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2019
RF cable	Times	1-40G	HKE-034	Dec. 27, 2019
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2019

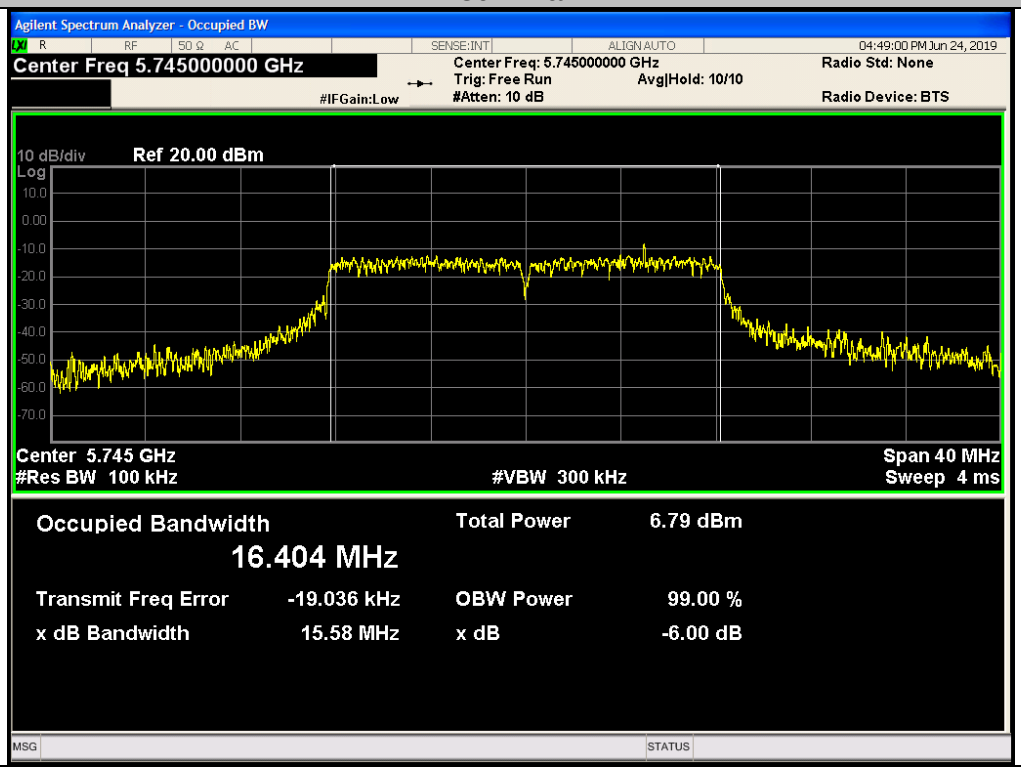
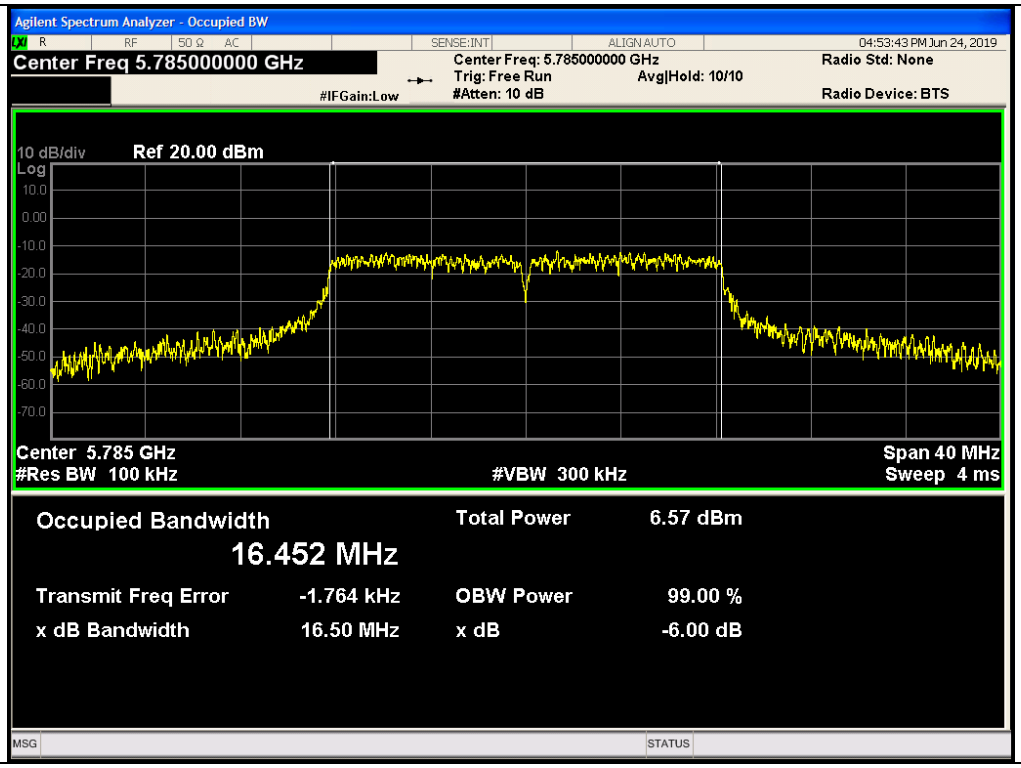
Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

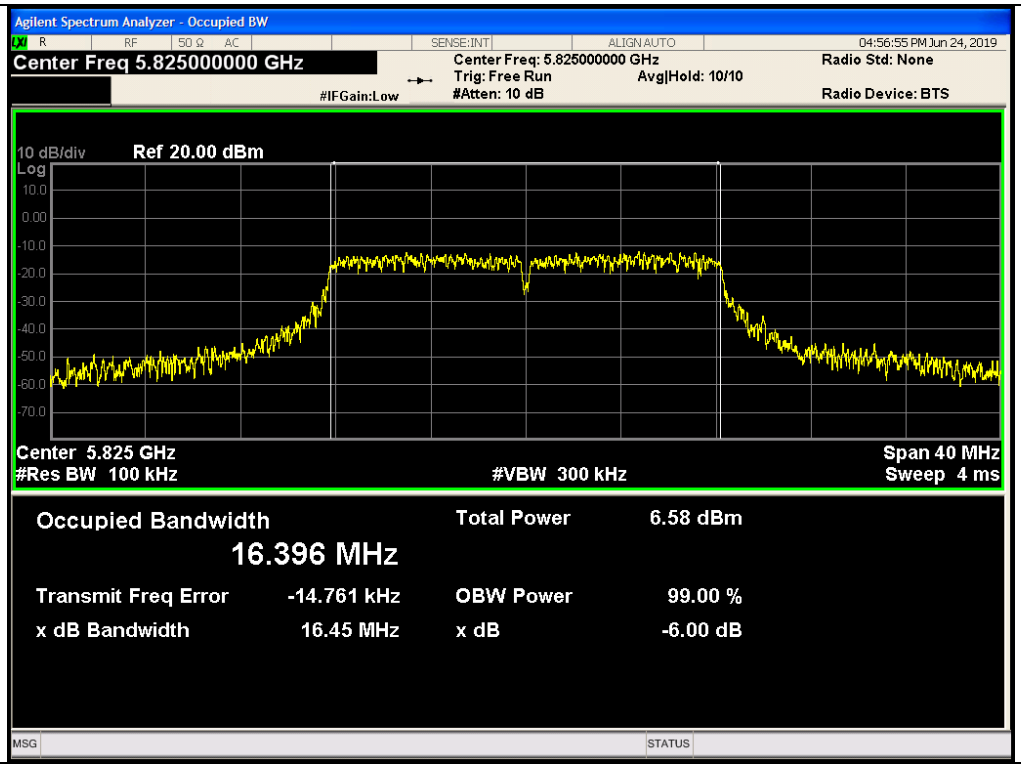
4.3.3. Test data

	Band IV (5725 - 5850 MHz)					
Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	16.4044	15.58	0.5	PASS
11a	CH157	5785	16.4524	16.45	0.5	PASS
11a	CH165	5825	16.3962	16.45	0.5	PASS
11n(HT20)	CH149	5745	17.5683	17.59	0.5	PASS
11n(HT20)	CH157	5785	17.5492	16.81	0.5	PASS
11n(HT20)	CH165	5825	17.5615	16.29	0.5	PASS
11n(HT40)	CH151	5755	36.0511	35.92	0.5	PASS
11n(HT40)	CH159	5795	36.0171	34.50	0.5	PASS
11ac(HT20)	CH149	5745	17.5161	16.93	0.5	PASS
11ac(HT20)	CH157	5785	17.5739	15.49	0.5	PASS
11ac(HT20)	CH165	5825	17.5522	17.27	0.5	PASS
11ac(HT40)	CH151	5755	36.0445	33.85	0.5	PASS
11ac(HT40)	CH159	5795	35.9422	33.86	0.5	PASS
11ac(HT80)	CH155	5775	75.0969	72.65	0.5	PASS

Test plots as follows:

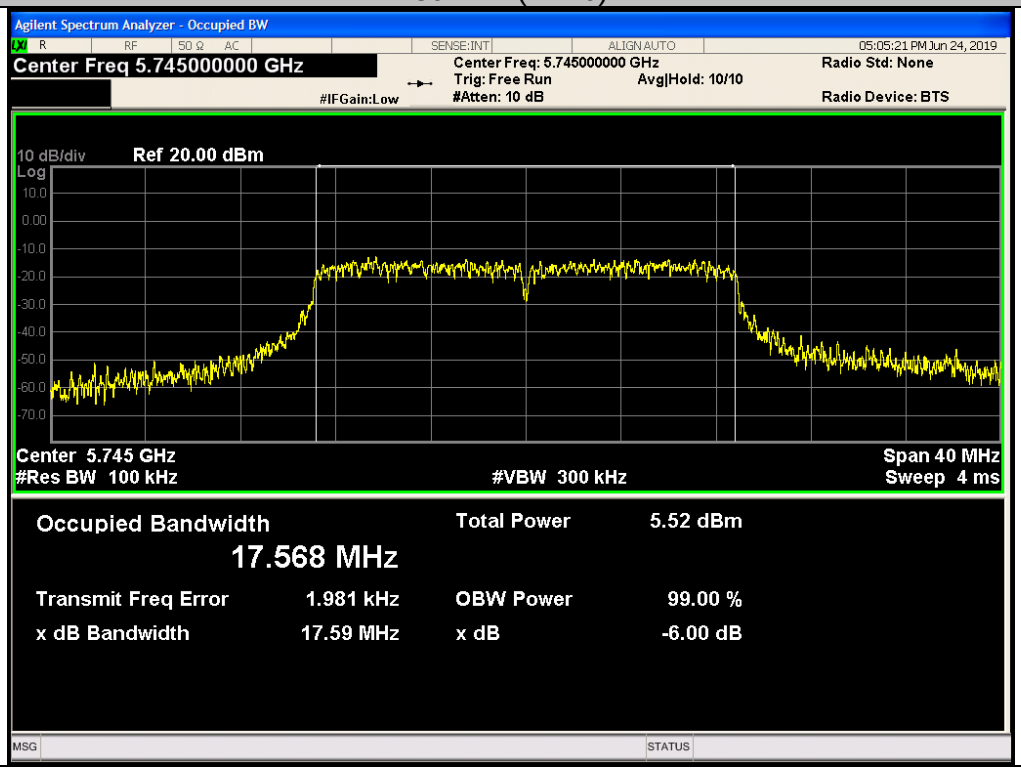
Band IV (5725 – 5850 MHz)

802.11a

Low

Mid

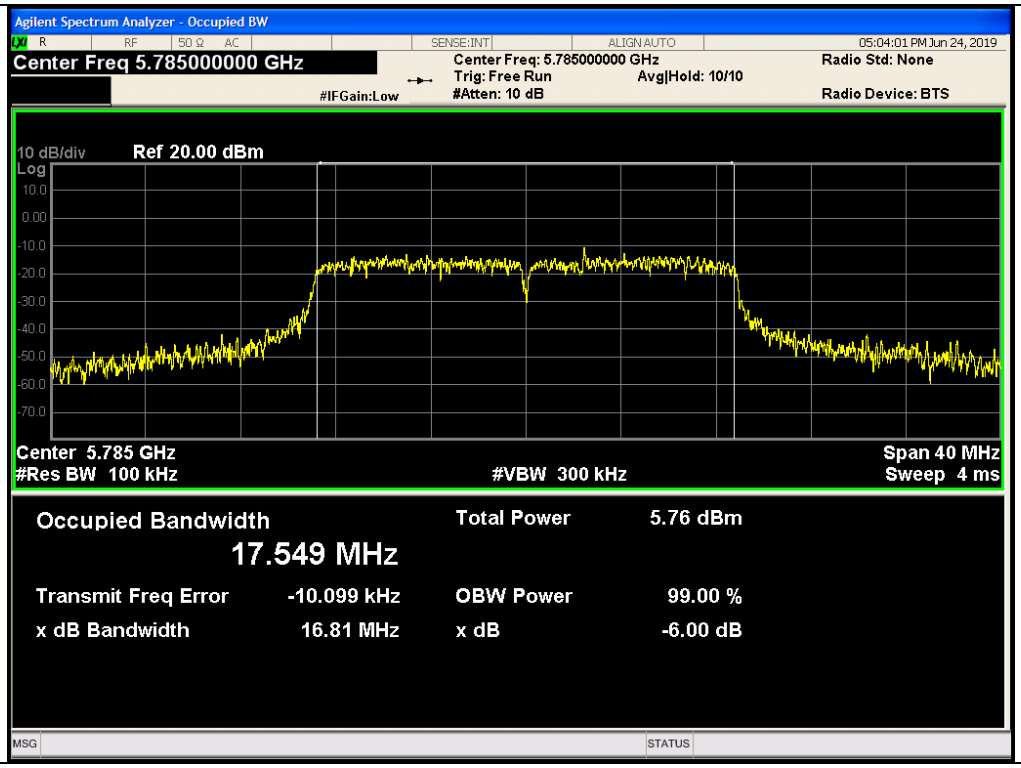


High

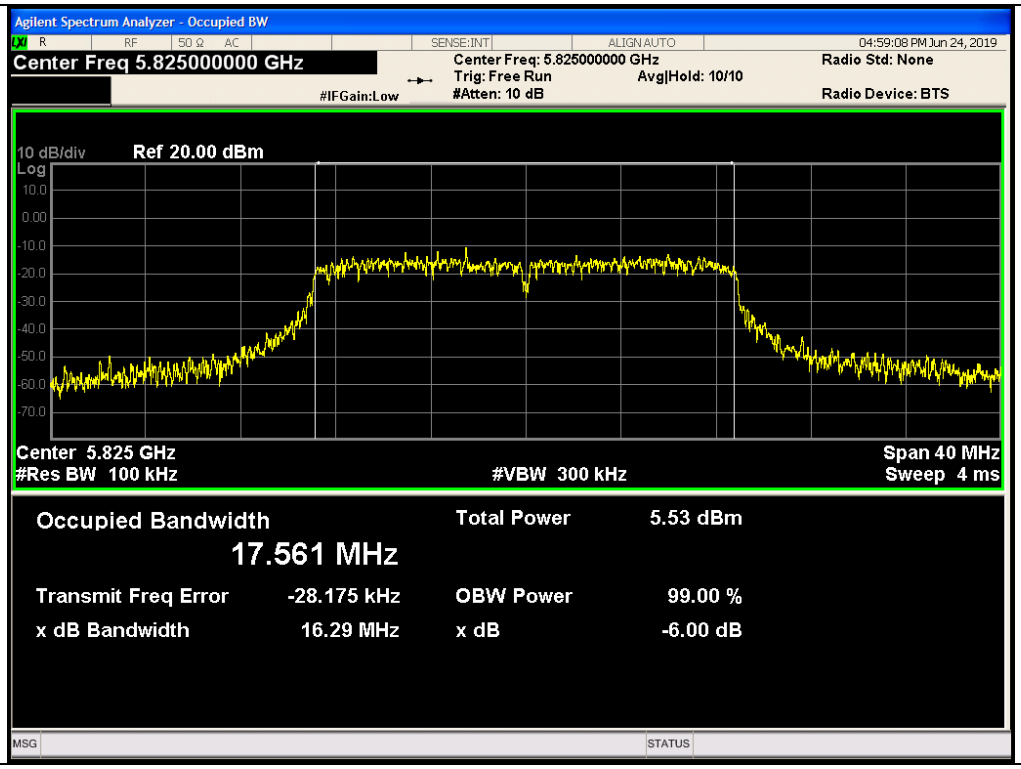
802.11n(HT20)



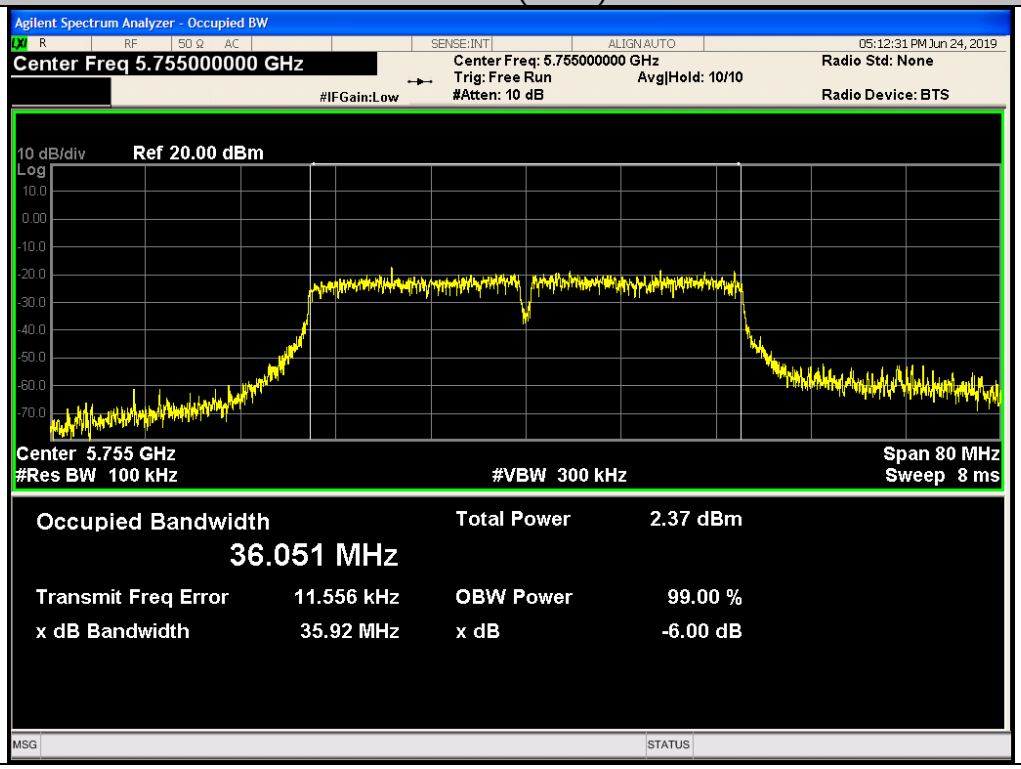
Low

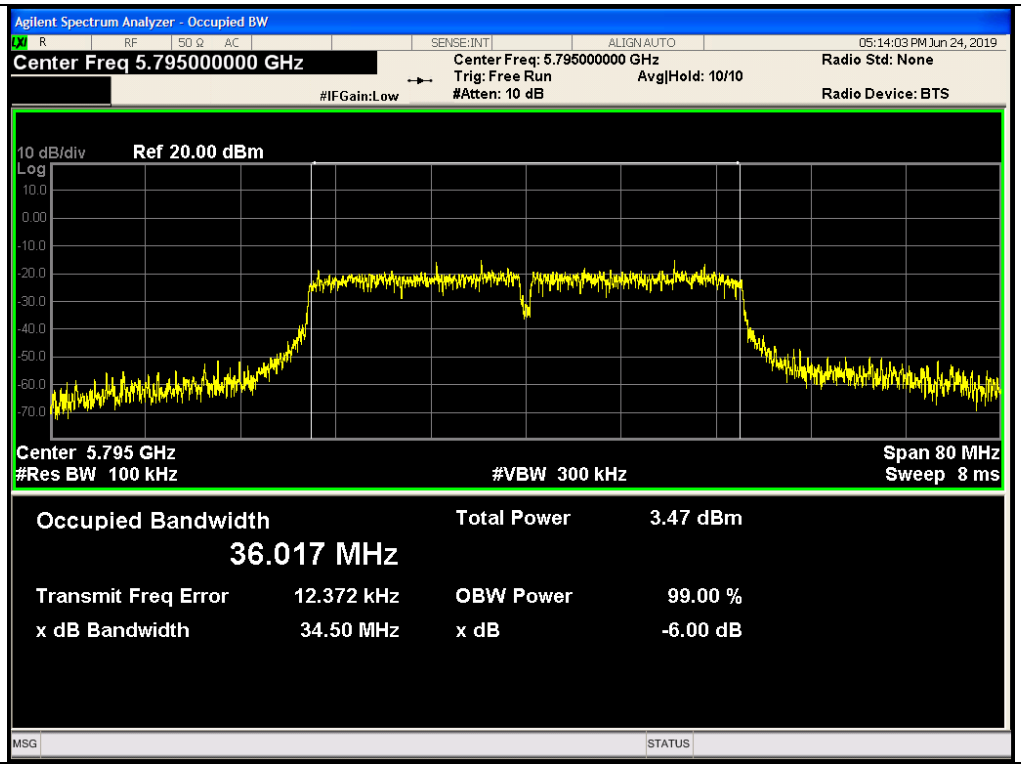

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 10 dB
05:04:01 PM Jun 24, 2019
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 20.00 dBm
Center 5.785 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 4 ms
Occupied Bandwidth
17.549 MHz
Total Power 5.76 dBm
Transmit Freq Error -10.099 kHz
OBW Power 99.00 %
x dB Bandwidth 16.81 MHz
x dB -6.00 dB
MSG
STATUS

Mid

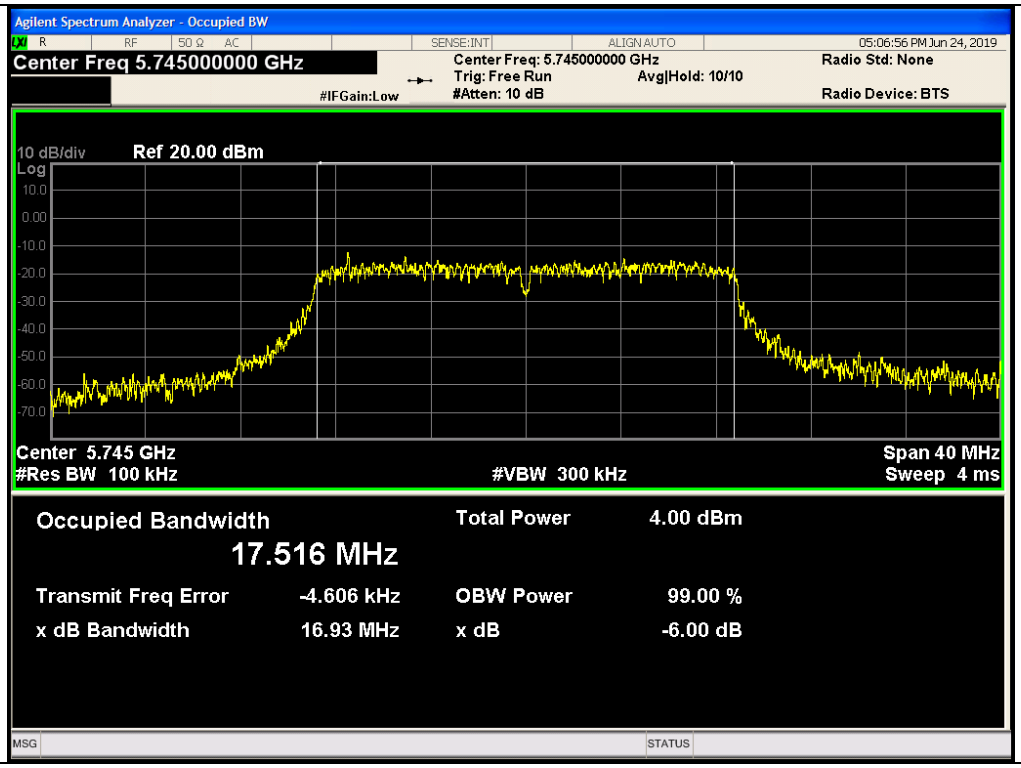

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 10 dB
04:59:08 PM Jun 24, 2019
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 20.00 dBm
Center 5.825 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 4 ms
Occupied Bandwidth
17.561 MHz
Total Power 5.53 dBm
Transmit Freq Error -28.175 kHz
OBW Power 99.00 %
x dB Bandwidth 16.29 MHz
x dB -6.00 dB
MSG
STATUS

High

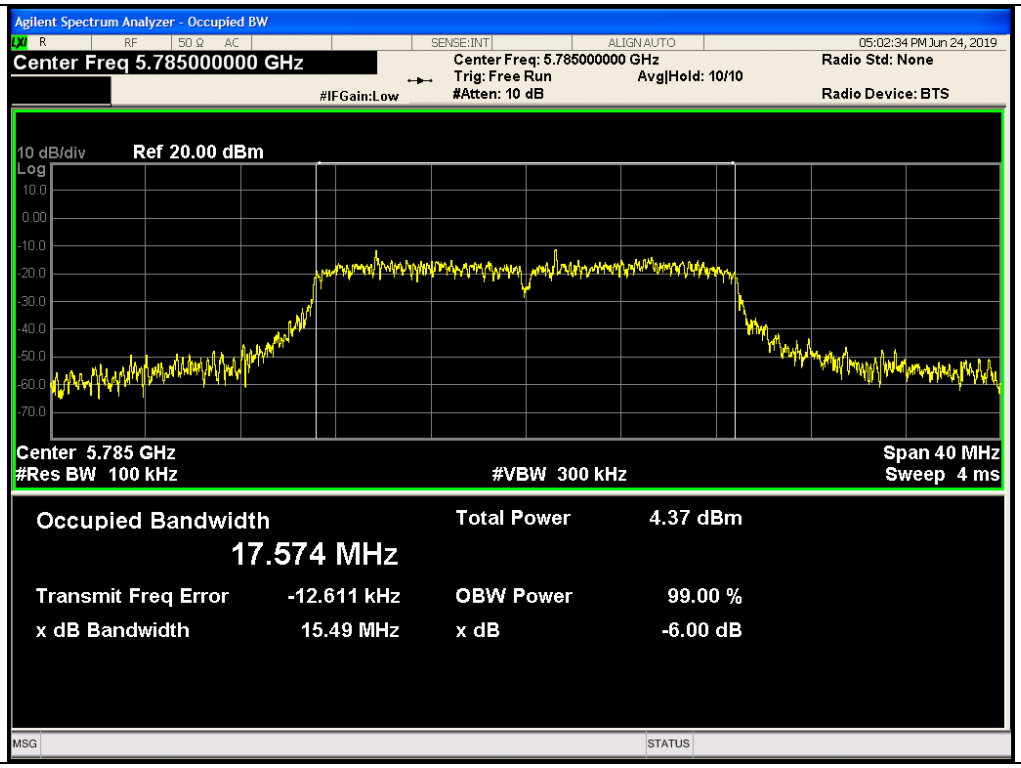
802.11n(HT40)

Low


High

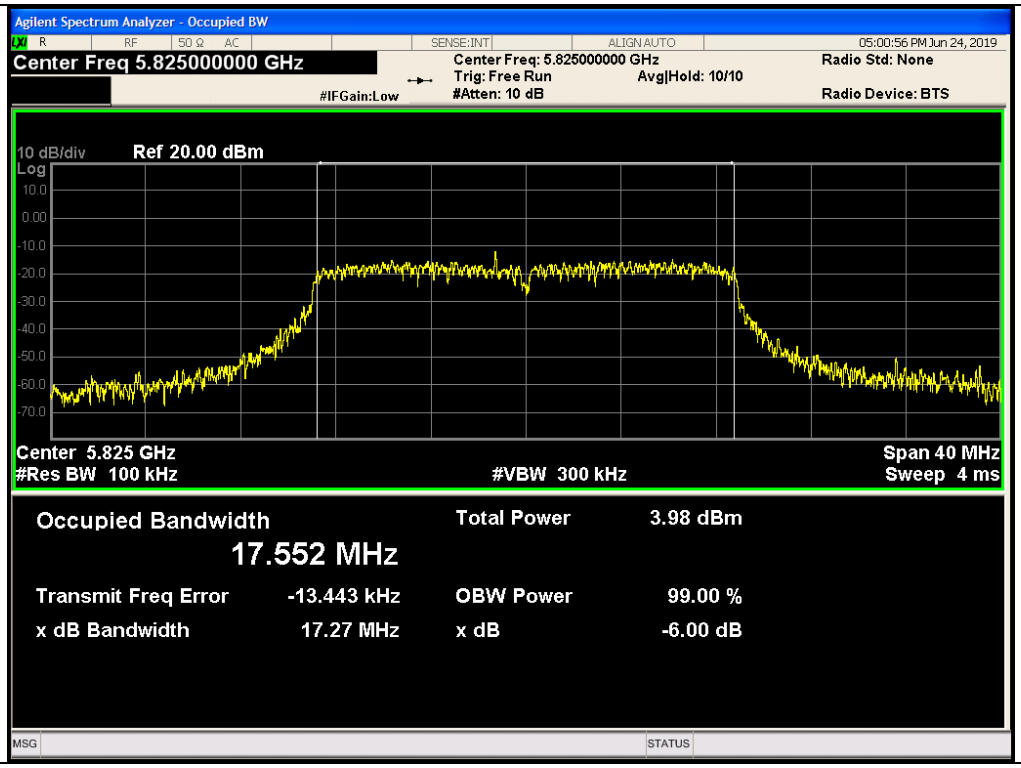
802.11ac(HT20)


Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
05:06:56 PM Jun 24, 2019
Center Freq 5.745000000 GHz
Center Freq: 5.745000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.745 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 4 ms
Occupied Bandwidth
17.516 MHz
Total Power 4.00 dBm
Transmit Freq Error -4.606 kHz
OBW Power 99.00 %
x dB Bandwidth 16.93 MHz
x dB -6.00 dB
MSG
STATUS

Low

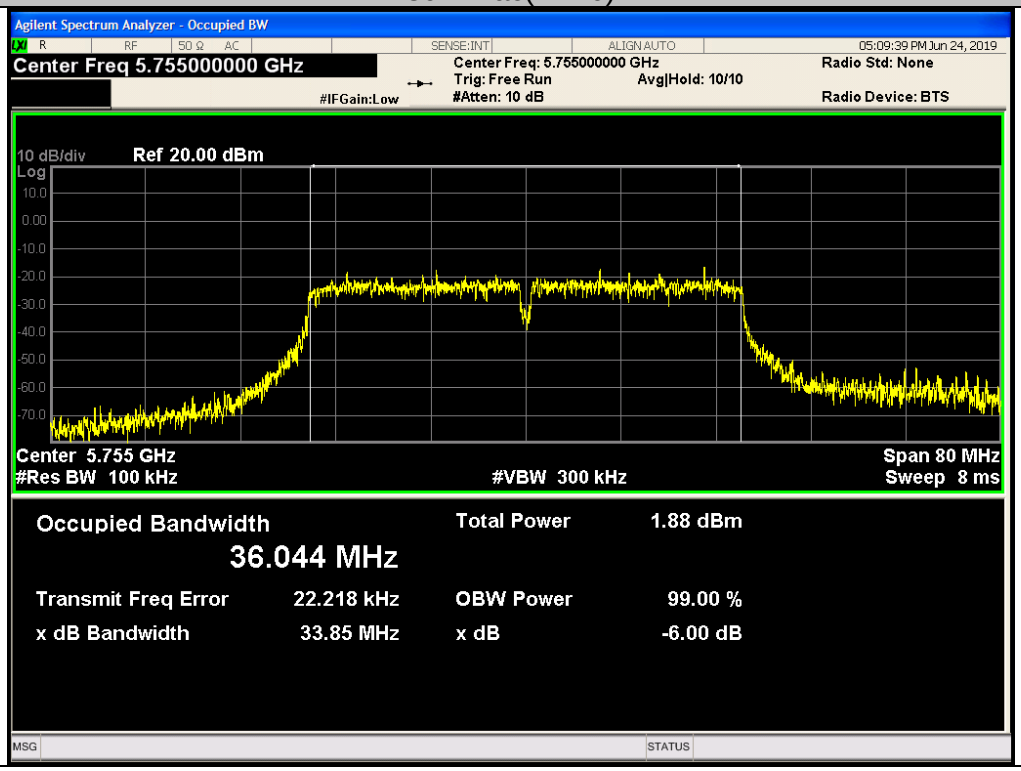

Agilent Spectrum Analyzer - Occupied BW
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
05:02:34 PM Jun 24, 2019
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
10 dB/div
Ref 20.00 dBm
Log
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.785 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 4 ms
Occupied Bandwidth
17.574 MHz
Total Power 4.37 dBm
Transmit Freq Error -12.611 kHz
OBW Power 99.00 %
x dB Bandwidth 15.49 MHz
x dB -6.00 dB
MSG
STATUS

Mid

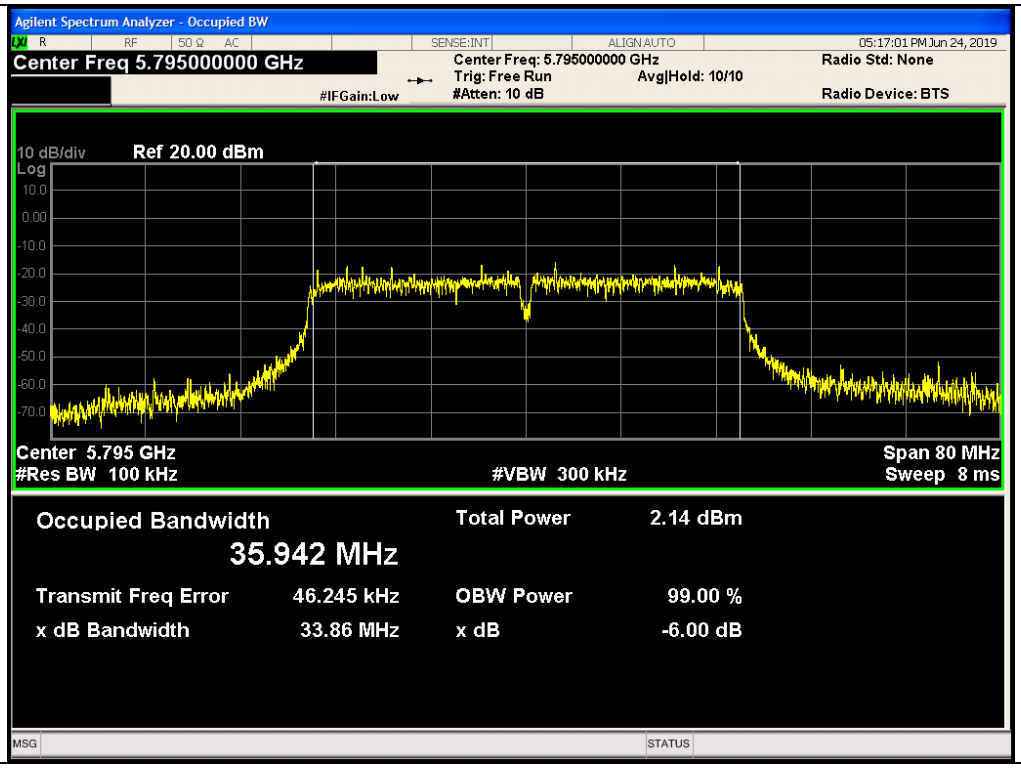


High

802.11ac(HT40)

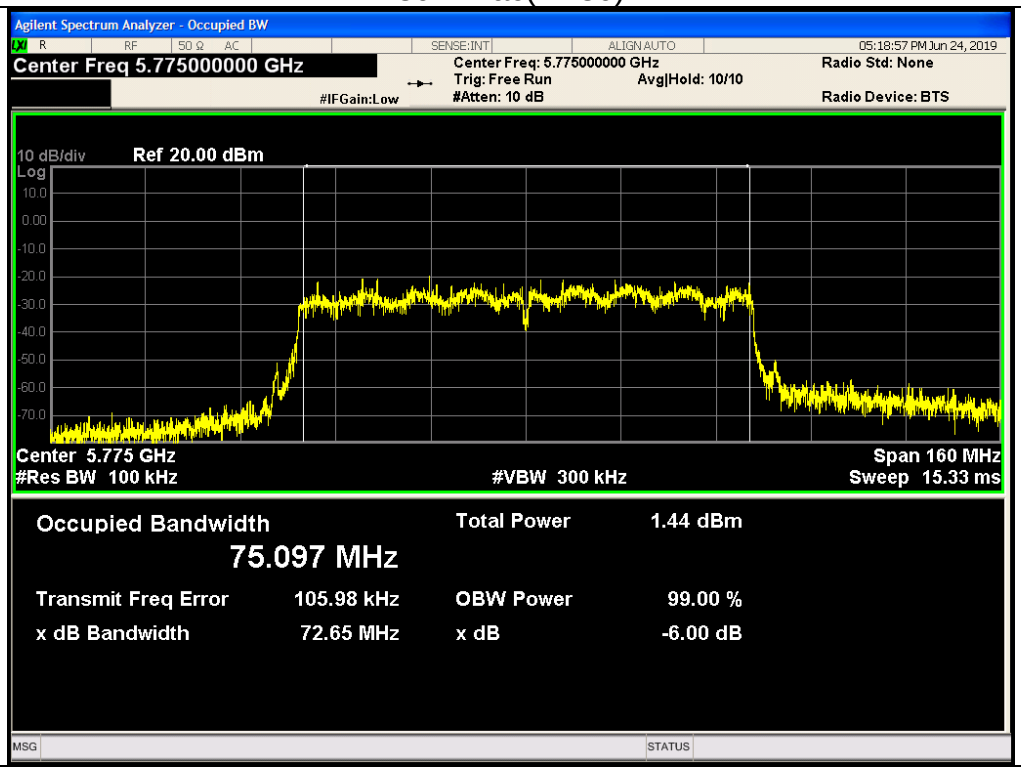


Low



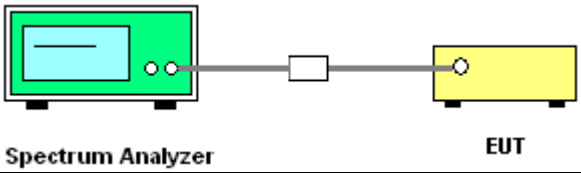
High

802.11ac(HT80)



4.4. 26dB Bandwidth and 99% Occupied Bandwidth

4.4.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	No restriction limits
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth RBW = 1% EBW, VBW≥3RBW, In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	PASS

4.4.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2019
RF cable	Times	1-40G	HKE-034	Dec. 27, 2019
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2019

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

4.4.3. Test data

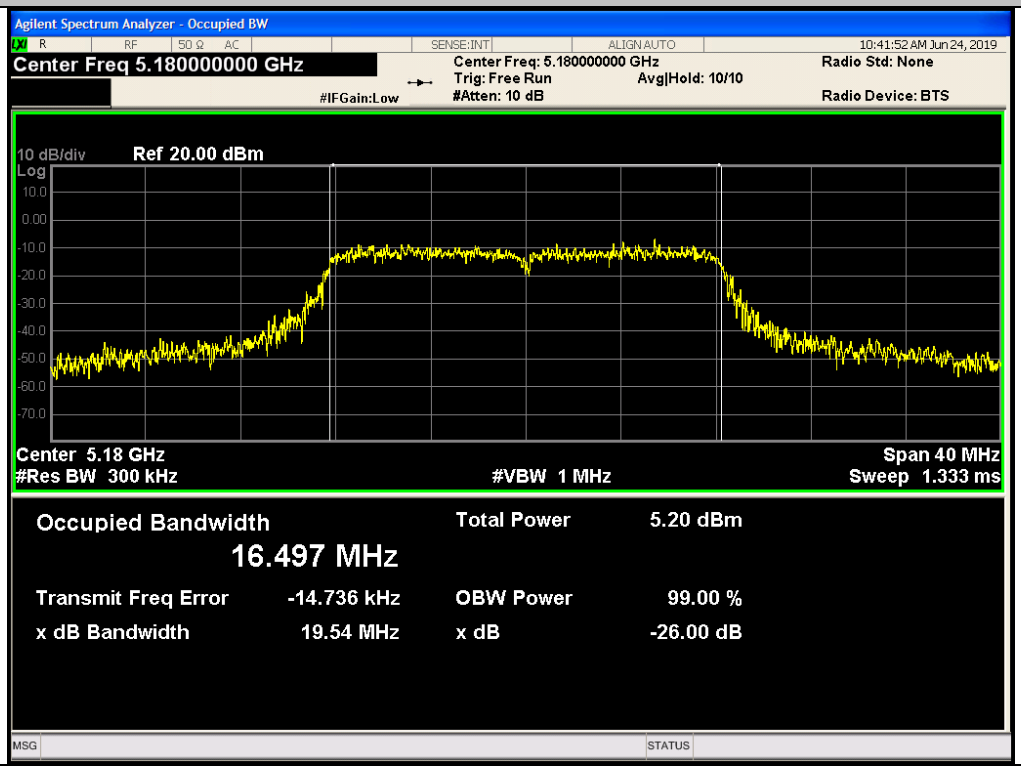
Band I

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	Verdict
11a	CH36	5180	16.4973	19.54	PASS
11a	CH40	5200	16.5256	19.71	PASS
11a	CH48	5240	16.5092	19.90	PASS
11n(HT20)	CH36	5180	17.5988	20.42	PASS
11n(HT20)	CH40	5200	17.5871	20.67	PASS
11n(HT20)	CH48	5240	17.5225	20.69	PASS
11n(HT40)	CH38	5190	35.9404	39.25	PASS
11n(HT40)	CH46	5230	35.944	39.68	PASS
11ac(HT20)	CH36	5180	17.5521	20.95	PASS
11ac(HT20)	CH40	5200	17.566	20.13	PASS
11ac(HT20)	CH48	5240	17.5455	20.33	PASS
11ac(HT40)	CH38	5190	35.9761	39.62	PASS
11ac(HT40)	CH46	5230	36.0736	40.31	PASS
11ac(HT80)	CH42	5210	75.0823	79.73	PASS

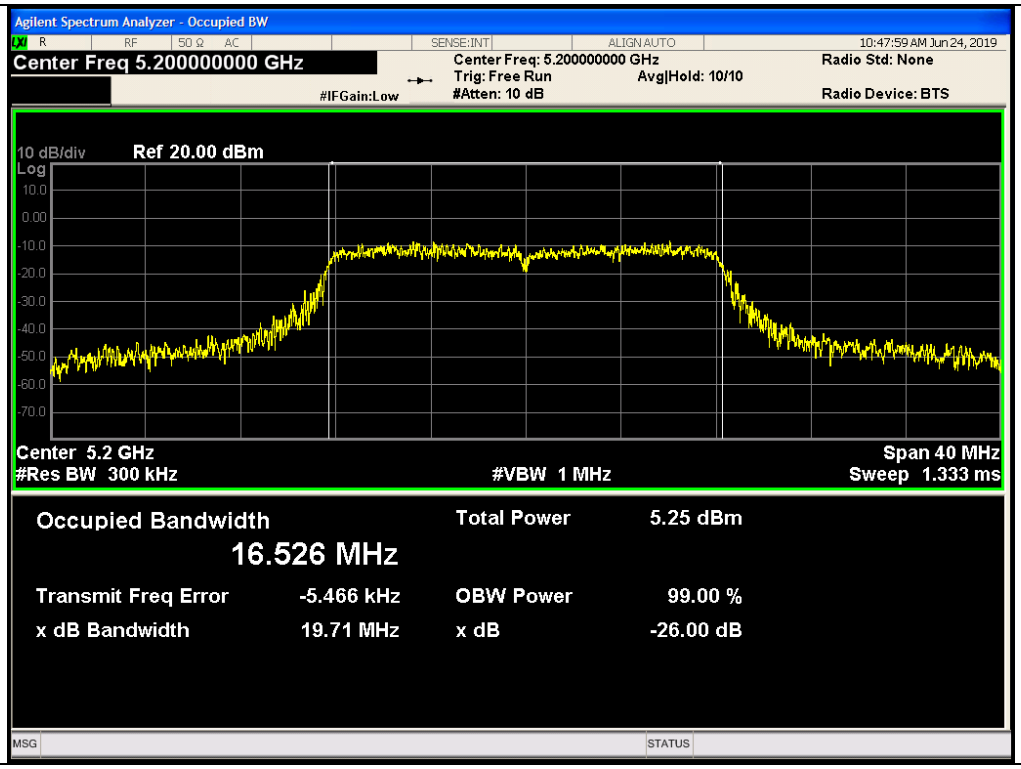
Test plots as follows:

Band I （5150 – 5250 MHz）

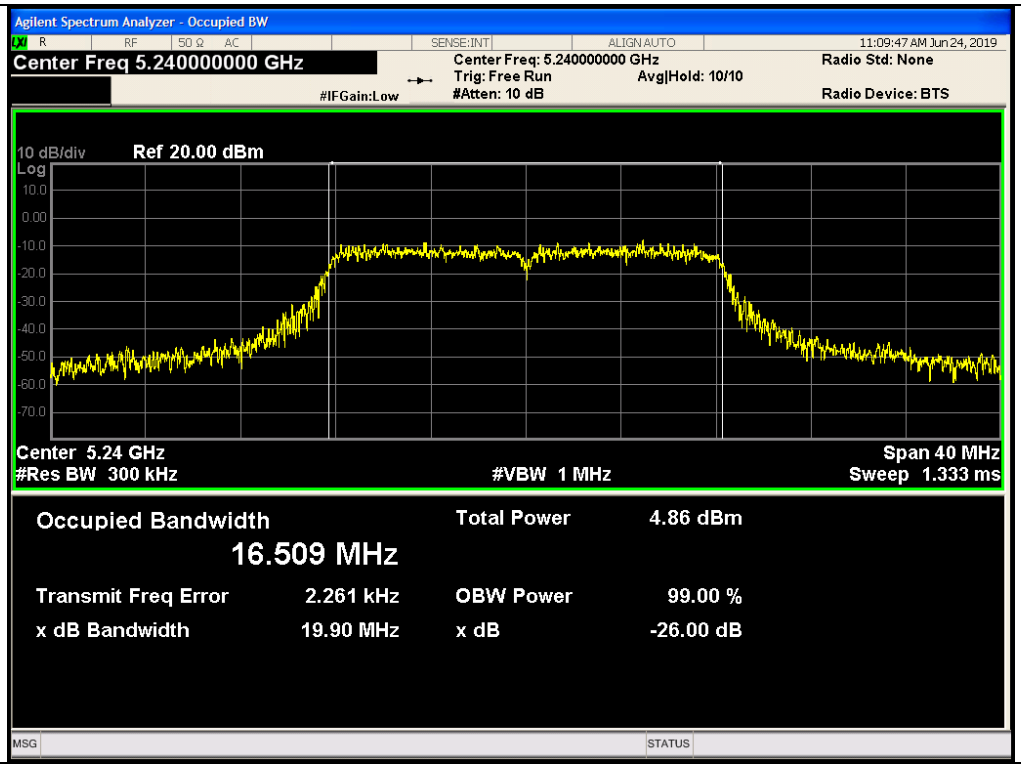
802.11a



Low

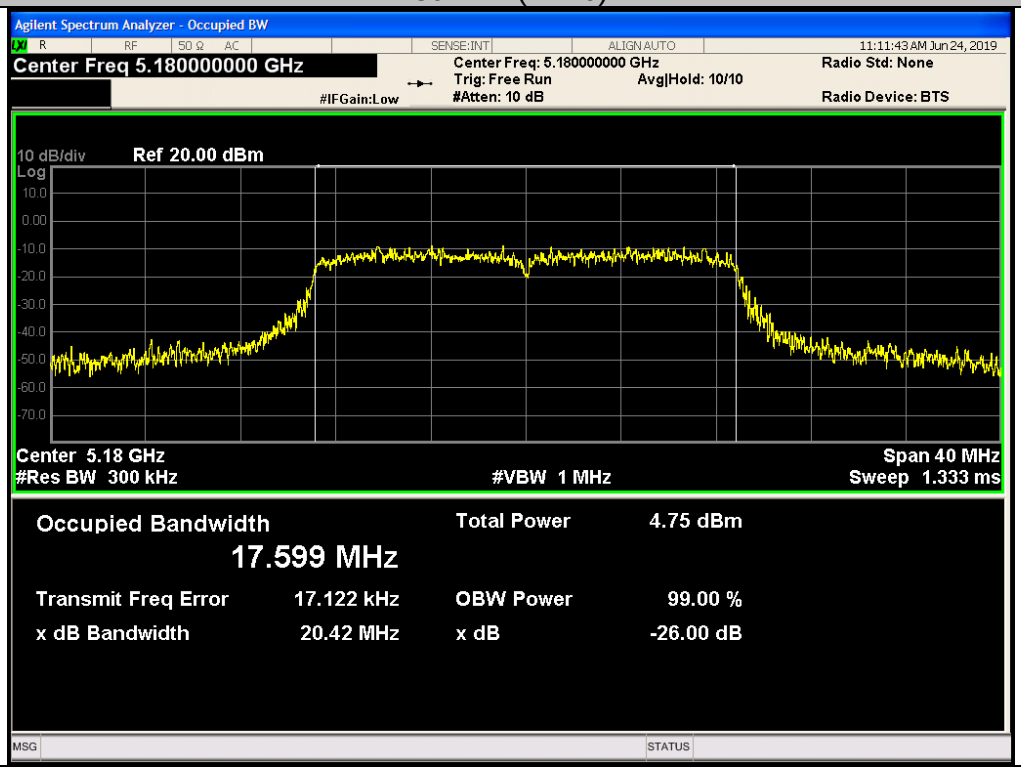


Mid

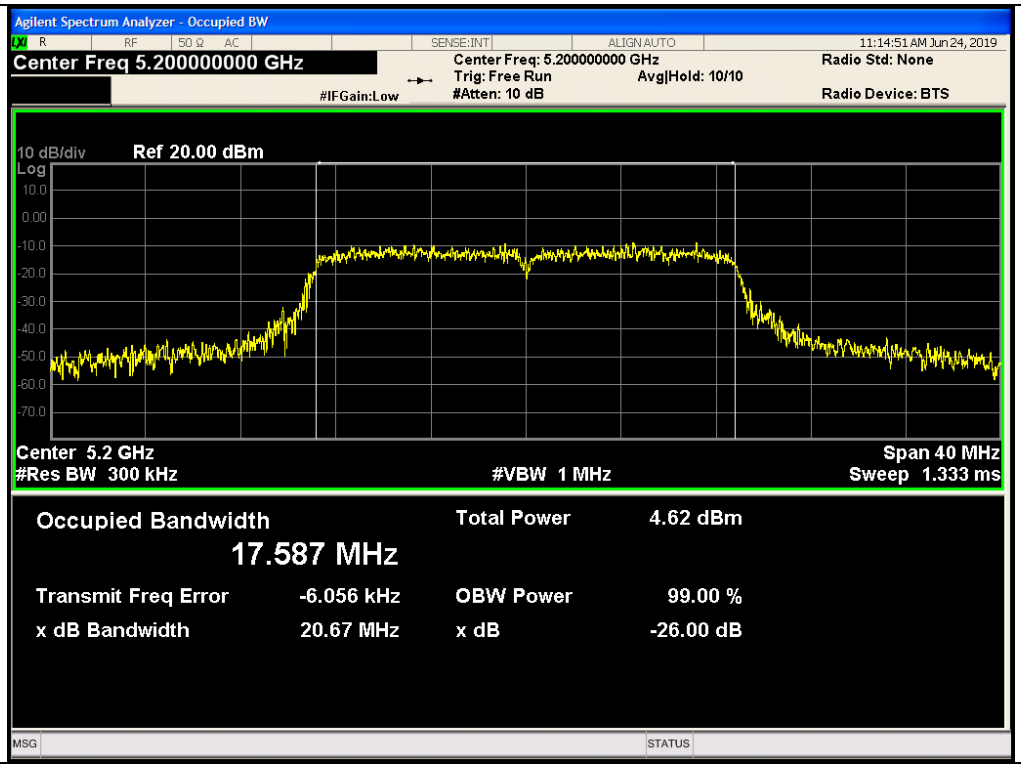


High

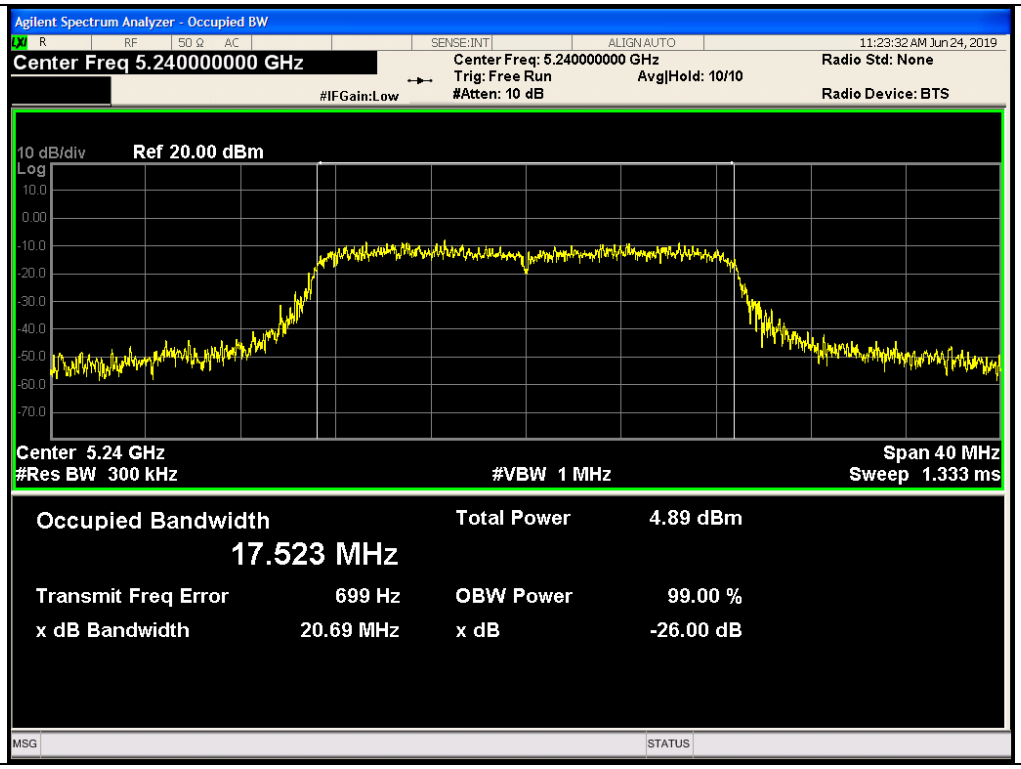
802.11n(HT20)



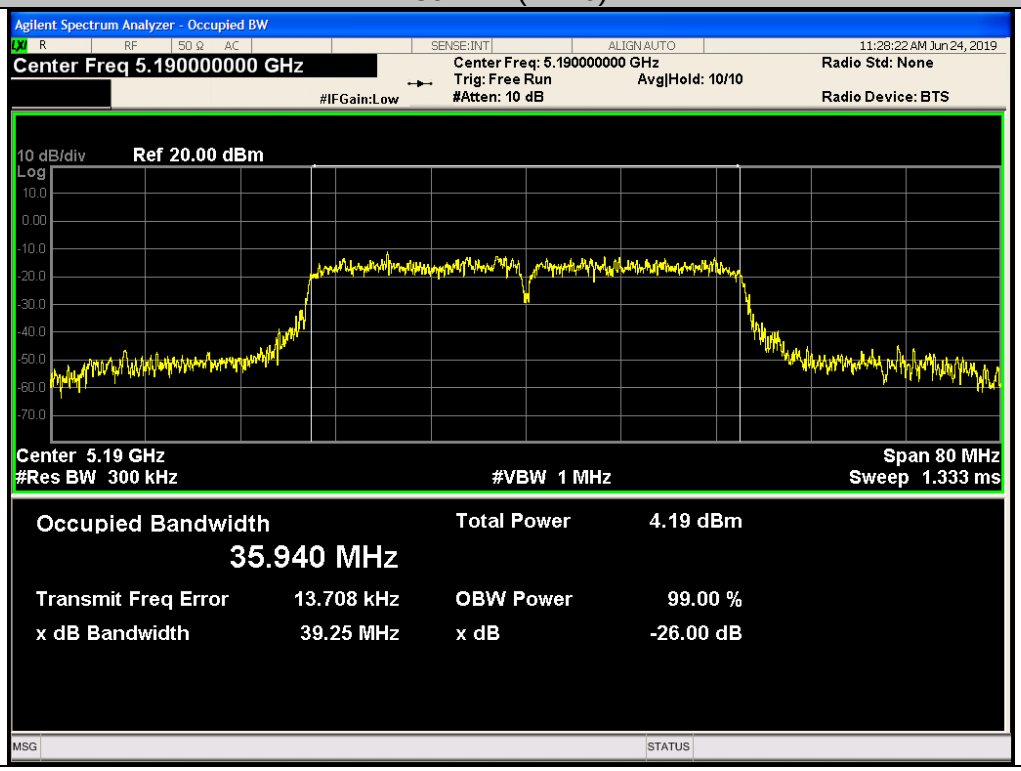
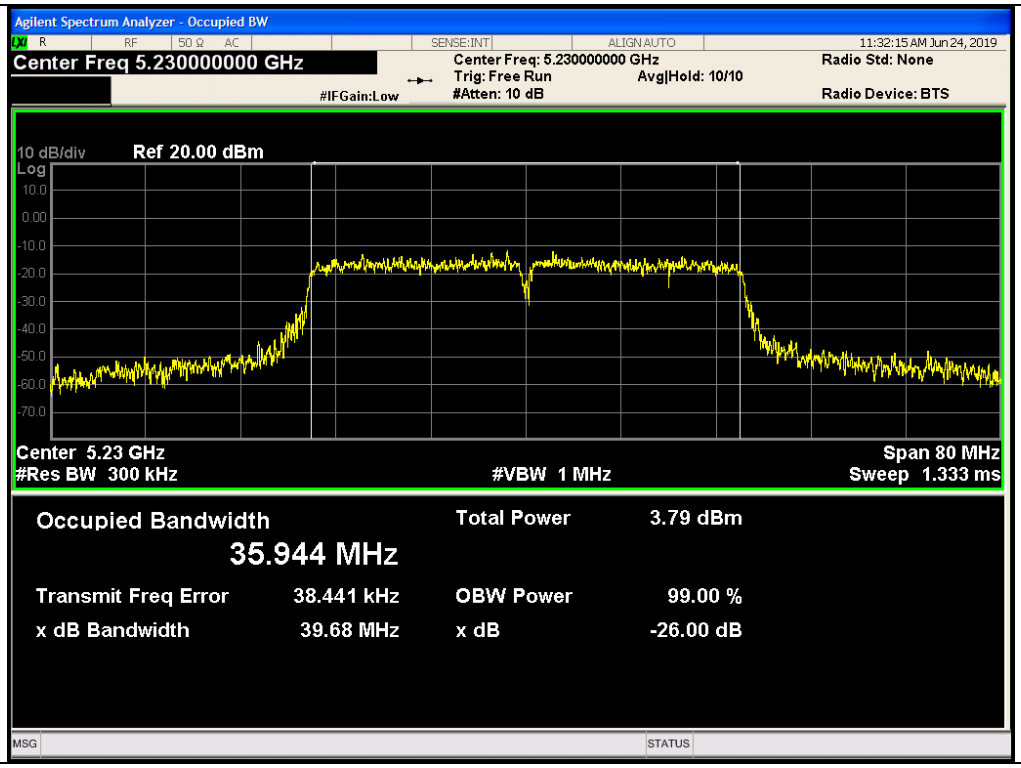
Low

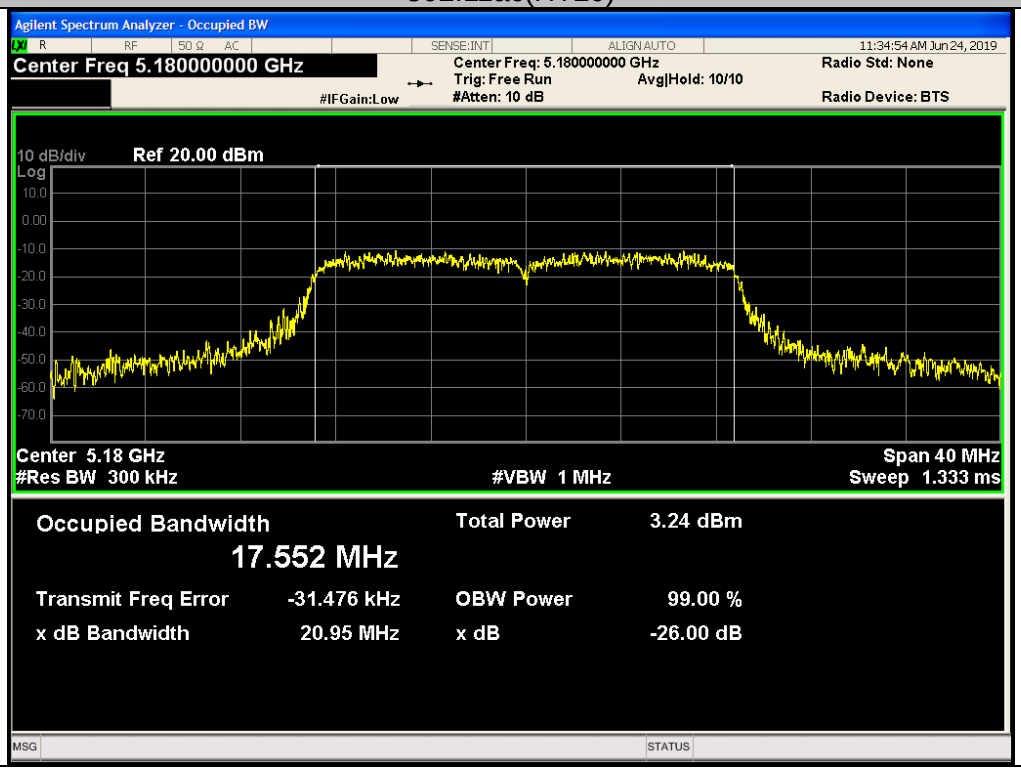
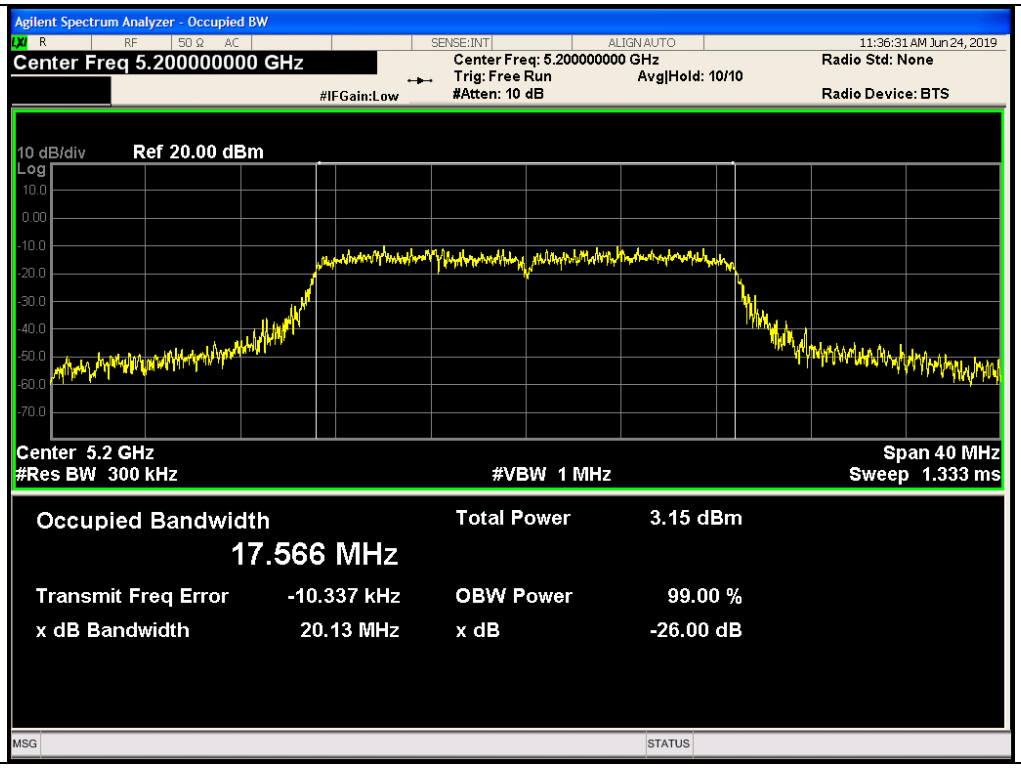

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.200000000 GHz
Center Freq: 5.200000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 10 dB
11:14:51 AM Jun 24, 2019
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 20.00 dBm
Center 5.2 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1.333 ms
Occupied Bandwidth
17.587 MHz
Total Power 4.62 dBm
Transmit Freq Error -6.056 kHz
OBW Power 99.00 %
x dB Bandwidth 20.67 MHz
x dB -26.00 dB
MSG
STATUS

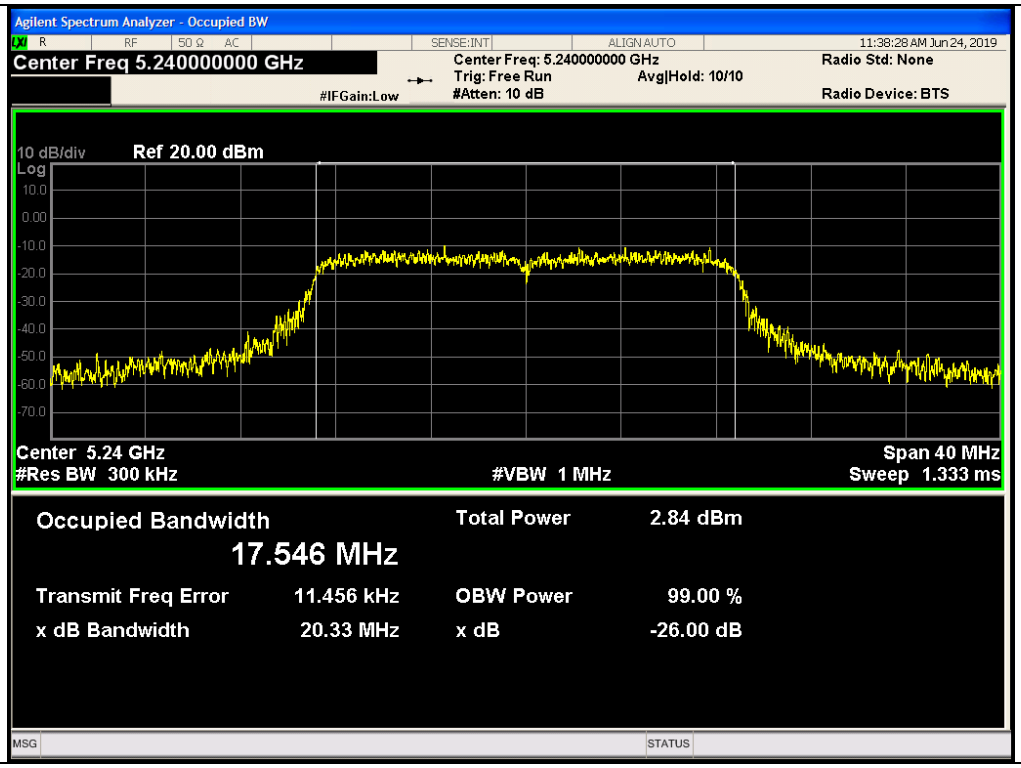
Mid


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: 10 dB
11:23:32 AM Jun 24, 2019
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 20.00 dBm
Center 5.24 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1.333 ms
Occupied Bandwidth
17.523 MHz
Total Power 4.89 dBm
Transmit Freq Error 699 Hz
OBW Power 99.00 %
x dB Bandwidth 20.69 MHz
x dB -26.00 dB
MSG
STATUS

High

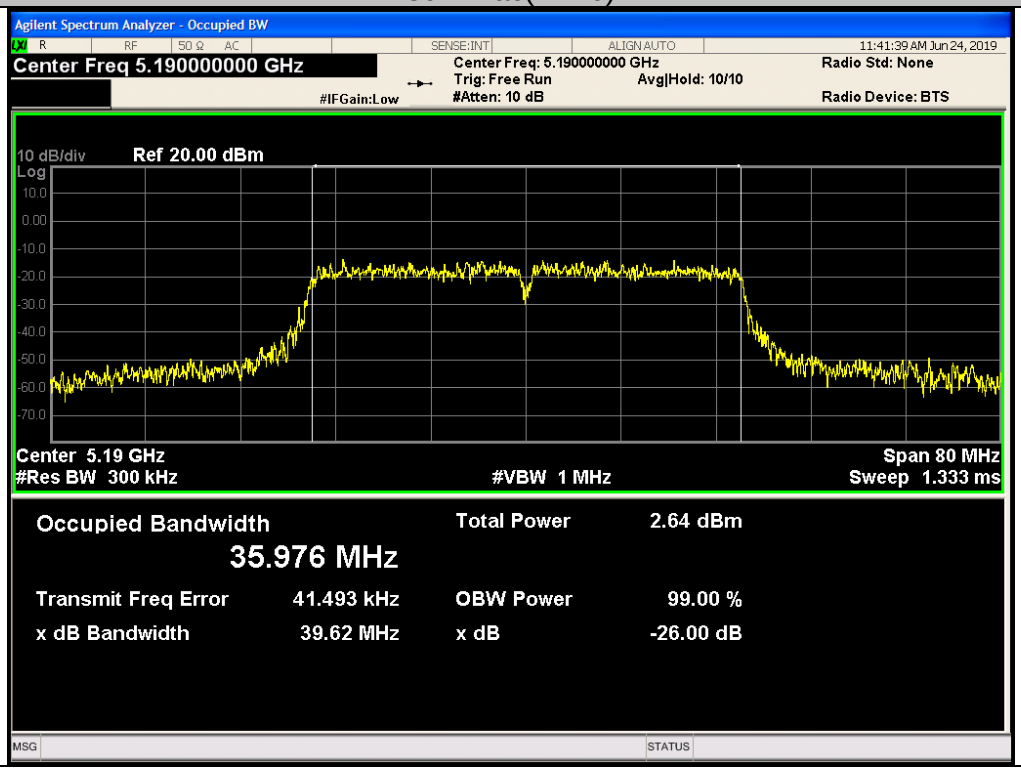
802.11n(HT40)

Low

High

802.11ac(HT20)

Low

Mid

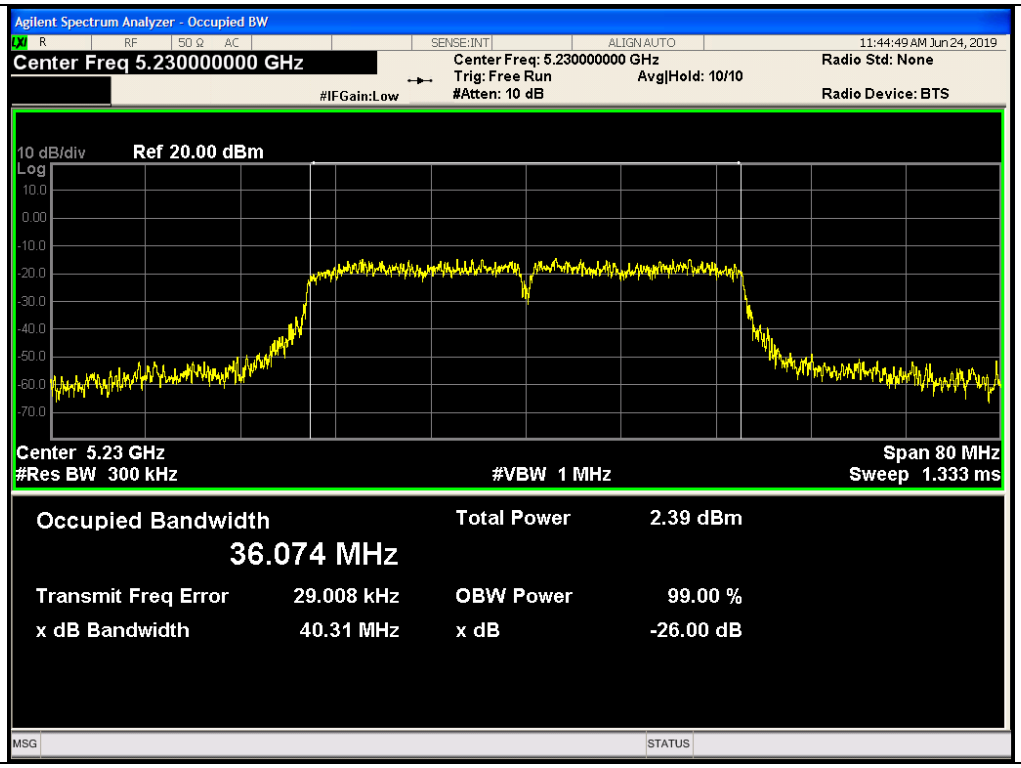


High

802.11ac(HT40)

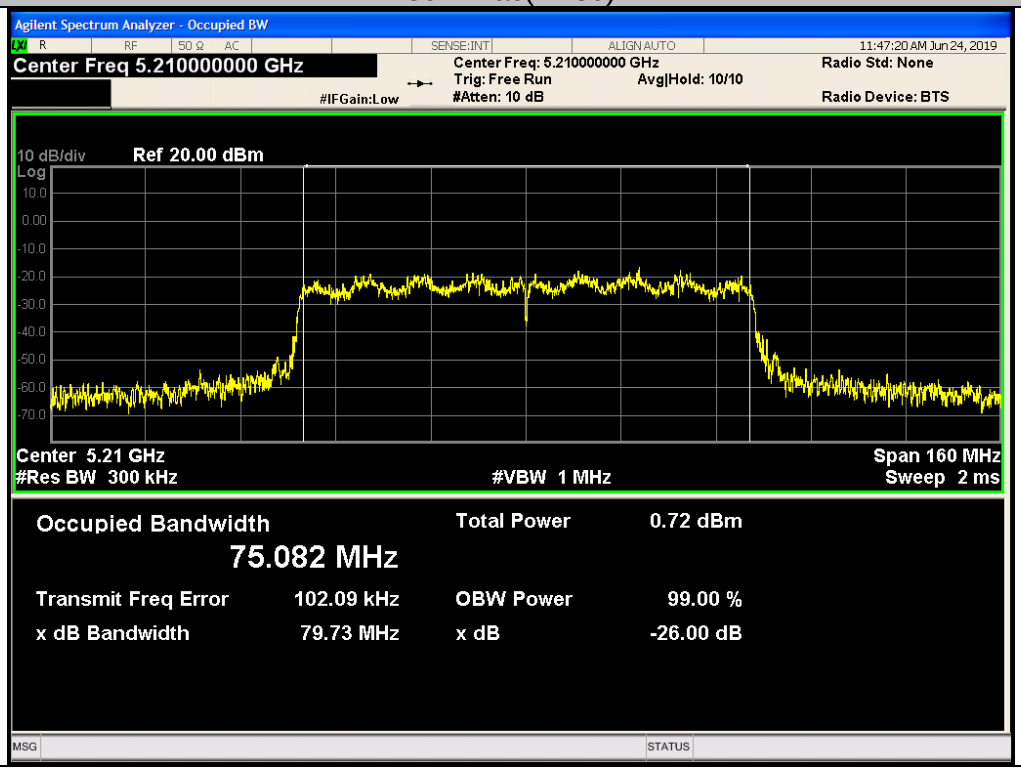


Low



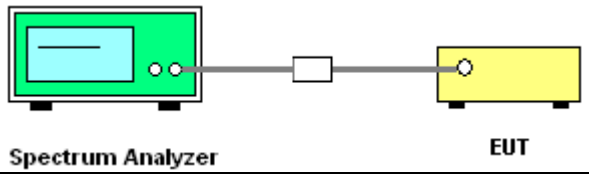
High

802.11ac(HT80)



4.5. Power Spectral Density

4.5.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F
Limit:	≤11.00dBm/MHz for Band I 5150MHz-5250MHz ≤30.00dBm/500KHz for Band IV 5725MHz-5850MHz The e.i,r,p spectral density for Band I 5150MHz – 5250 MHz should not exceed 10dBm/MHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS. 2. Allow the sweeps to continue until the trace stabilizes. 3. Use the peak marker function to determine the maximum amplitude level. 4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.
Test Result:	PASS

4.5.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2019
RF cable	Times	1-40G	HKE-034	Dec. 27, 2019
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2019

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

4.5.3. Test data

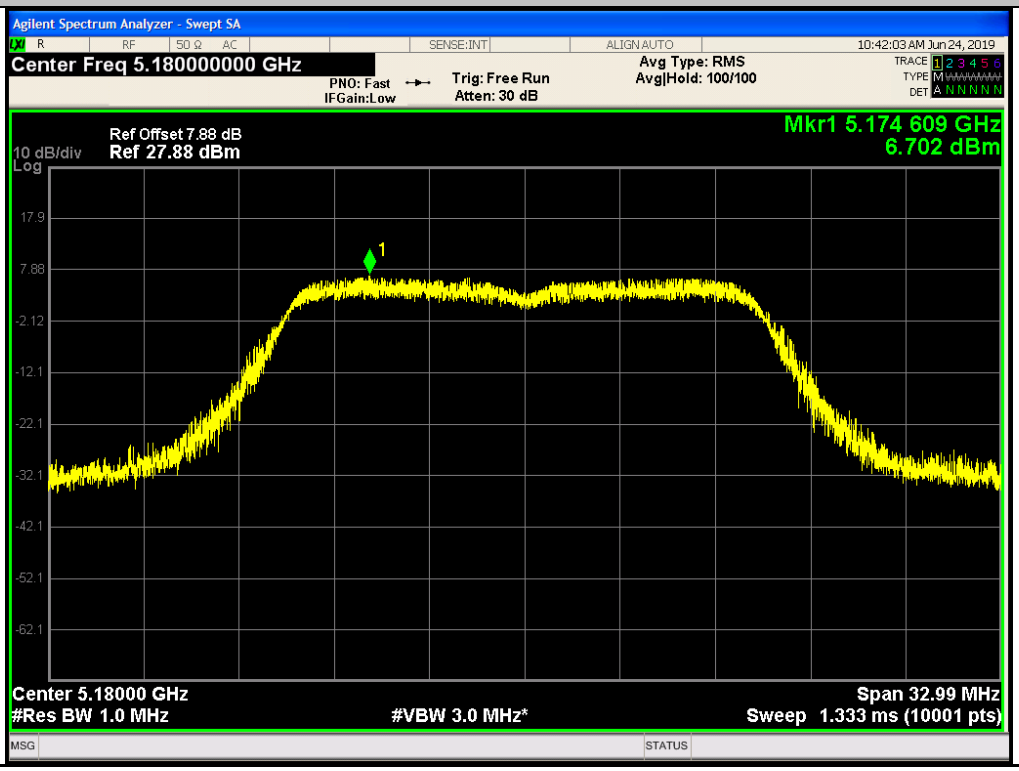
Configuration Band I (5150 - 5250 MHz)						
Mode	Test channel	Level [dBm/MHz]	10log(1/x) Factor [dB]	Power Spectral Density	Limit (dBm/MHz)	Result
11a	CH36	6.702	0	6.702	11	PASS
11a	CH40	6.541	0	6.541	11	PASS
11a	CH48	6.428	0	6.428	11	PASS
11n(HT20)	CH36	5.552	0	5.552	11	PASS
11n(HT20)	CH40	5.944	0	5.944	11	PASS
11n(HT20)	CH48	6.111	0	6.111	11	PASS
11n(HT40)	CH38	1.946	0	1.946	11	PASS
11n(HT40)	CH46	1.637	0	1.637	11	PASS
11ac(HT20)	CH36	3.968	0	3.968	11	PASS
11ac(HT20)	CH40	4.477	0	4.477	11	PASS
11ac(HT20)	CH48	4.151	0	4.151	11	PASS
11ac(HT40)	CH38	0.429	0	0.429	11	PASS
11ac(HT40)	CH46	0.155	0	0.155	11	PASS
11ac(HT80)	CH42	-3.881	0	-3.881	11	PASS

Configuration Band IV (5725 - 5850 MHz)						
Mode	Test channel	Level [dBm/500kHz]	10log(1/x) Factor[dB]	Power Spectral Density	Limit (dBm/500kHz)	Result
11a	CH149	3.861	0	3.861	30	PASS
11a	CH157	4.137	0	4.137	30	PASS
11a	CH161	4.352	0	4.352	30	PASS
11n(HT20)	CH149	2.477	0	2.477	30	PASS
11n(HT20)	CH157	3.384	0	3.384	30	PASS
11n(HT20)	CH161	3.31	0	3.31	30	PASS
11n(HT40)	CH151	-3.389	0	-3.389	30	PASS
11n(HT40)	CH159	-2.423	0	-2.423	30	PASS
11ac(HT20)	CH149	1.431	0	1.431	30	PASS
11ac(HT20)	CH157	1.785	0	1.785	30	PASS
11ac(HT20)	CH161	1.859	0	1.859	30	PASS
11ac(HT40)	CH151	-3.599	0	-3.599	30	PASS
11ac(HT40)	CH159	-4.056	0	-4.056	30	PASS
11ac(HT80)	CH155	-6.317	0	-6.317	30	PASS

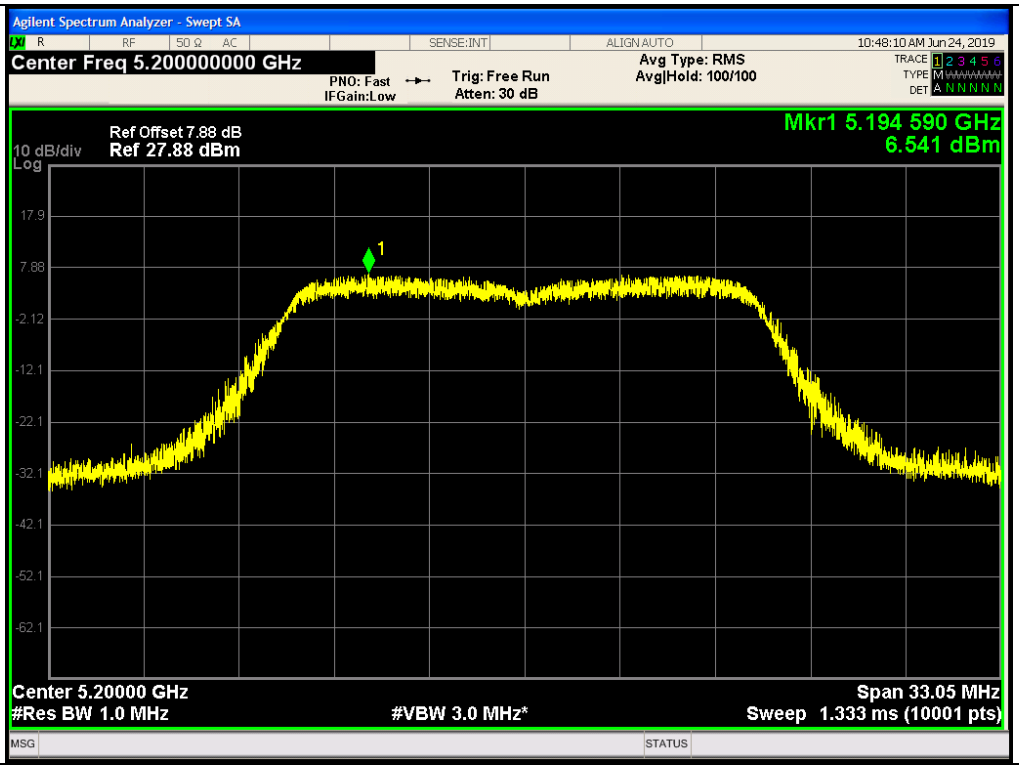
Test plots as follows:

Band I （5150 – 5250 MHz）

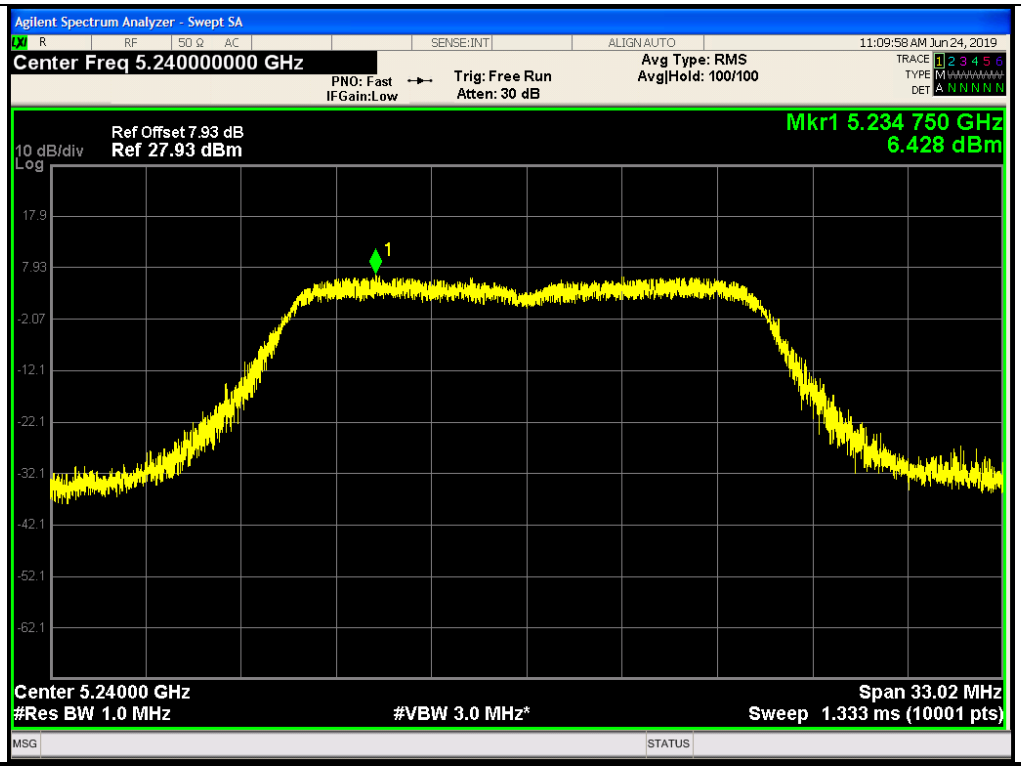
802.11a



Low

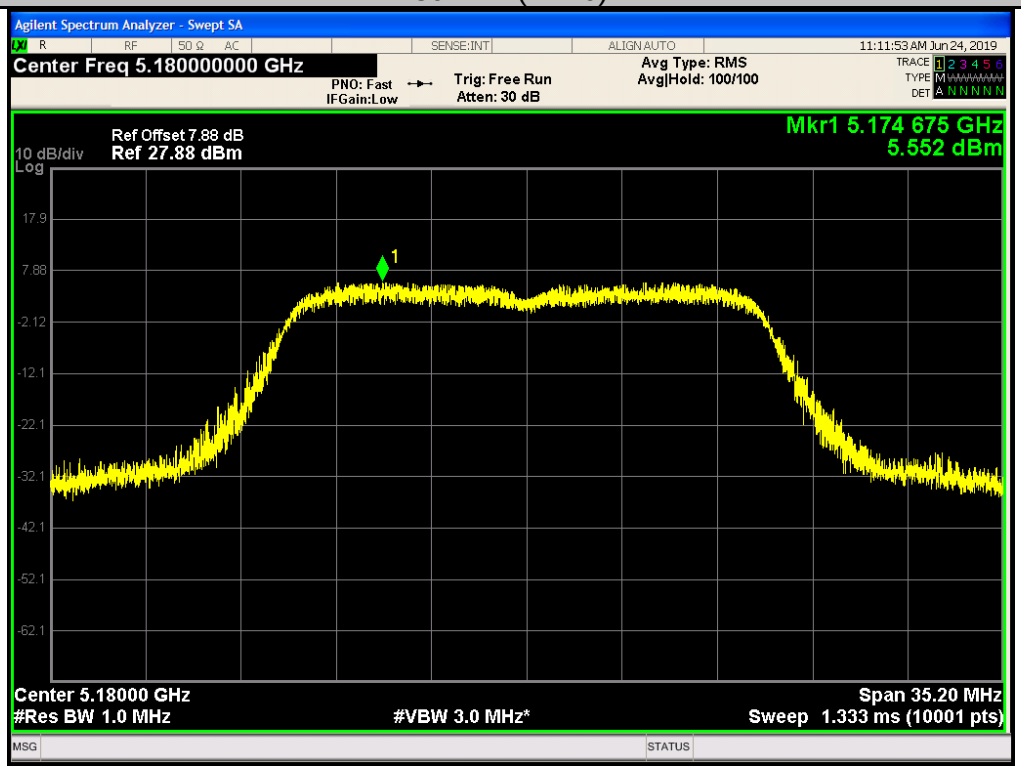


Mid

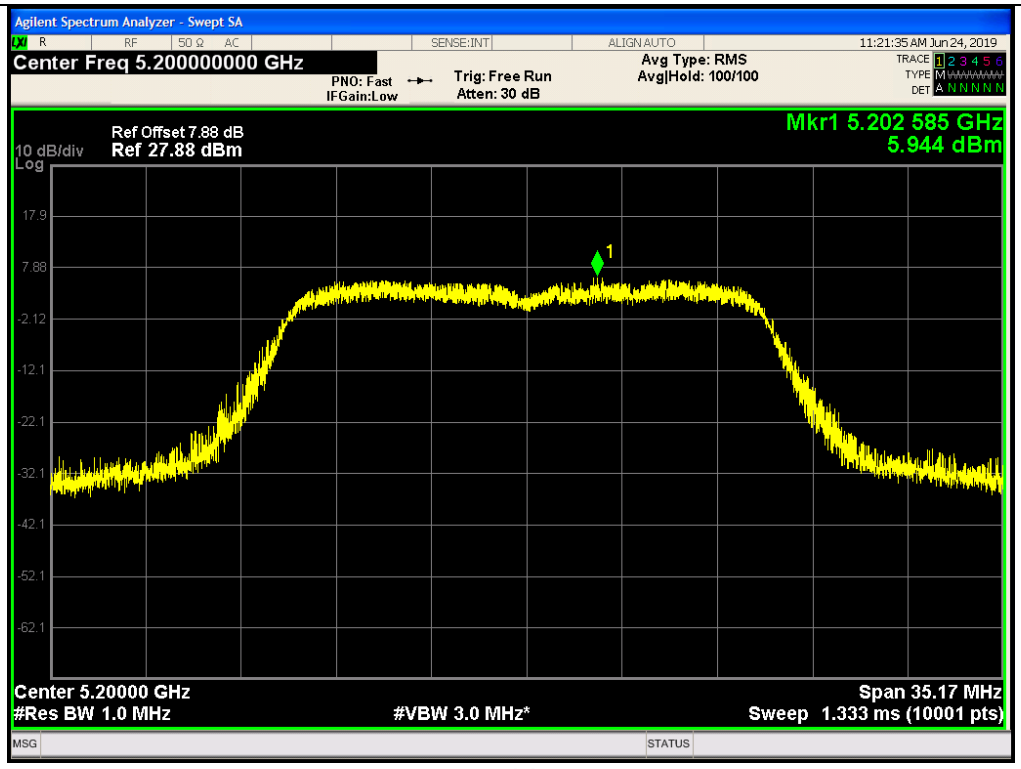


High

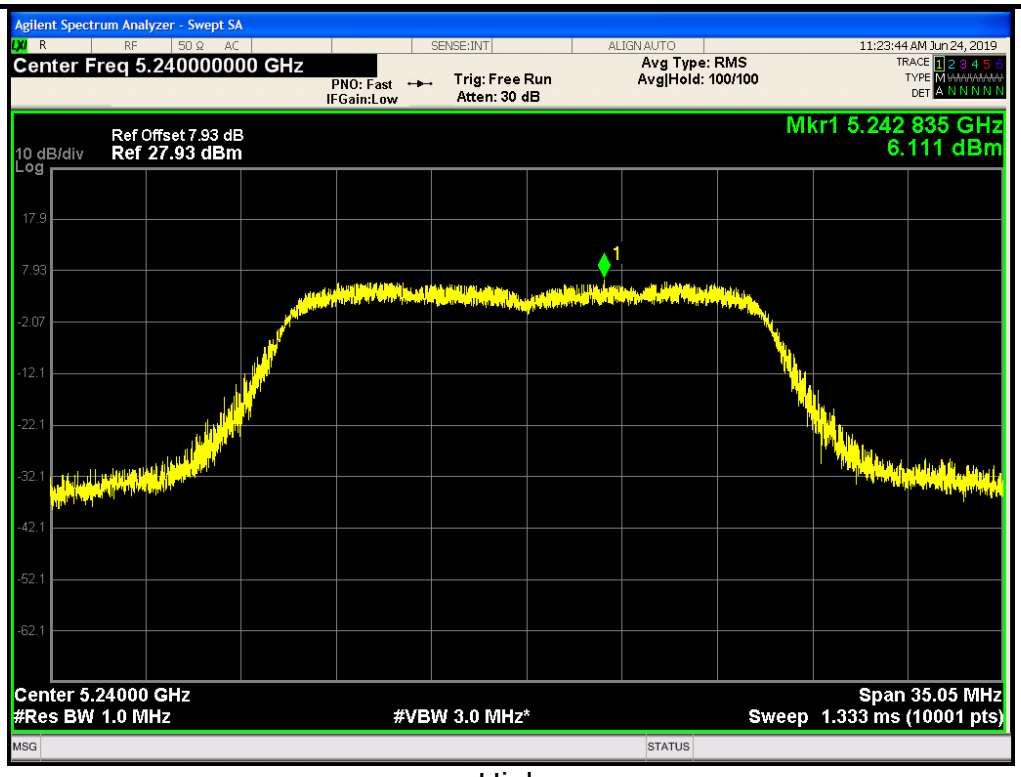
802.11n(HT20)



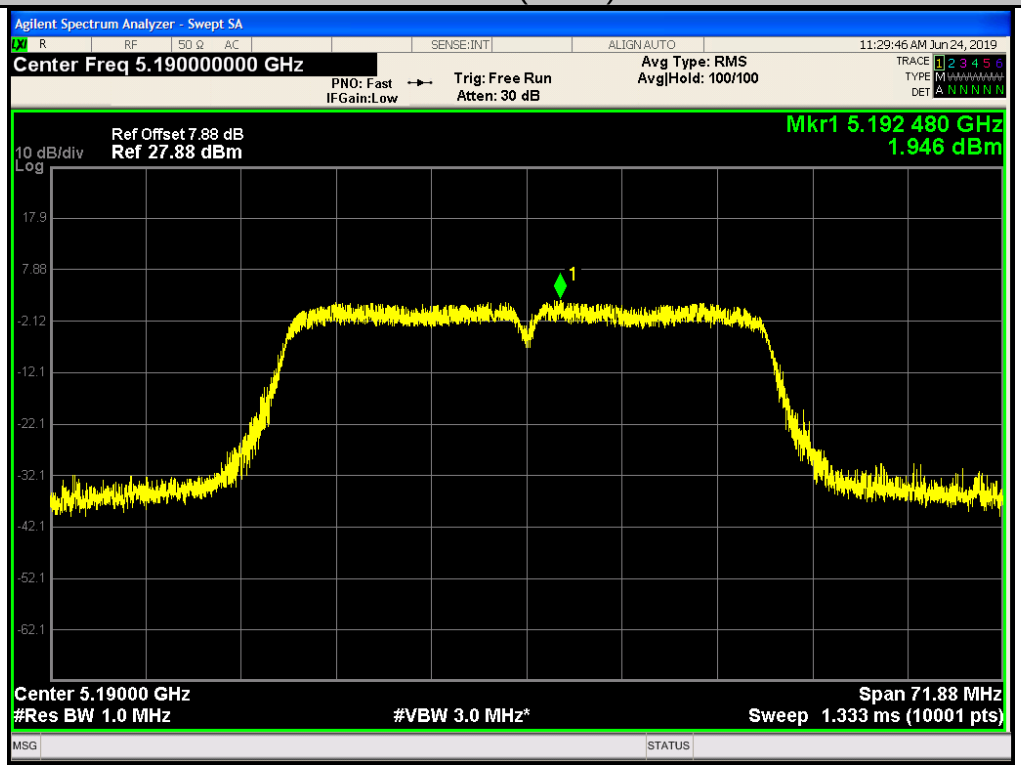
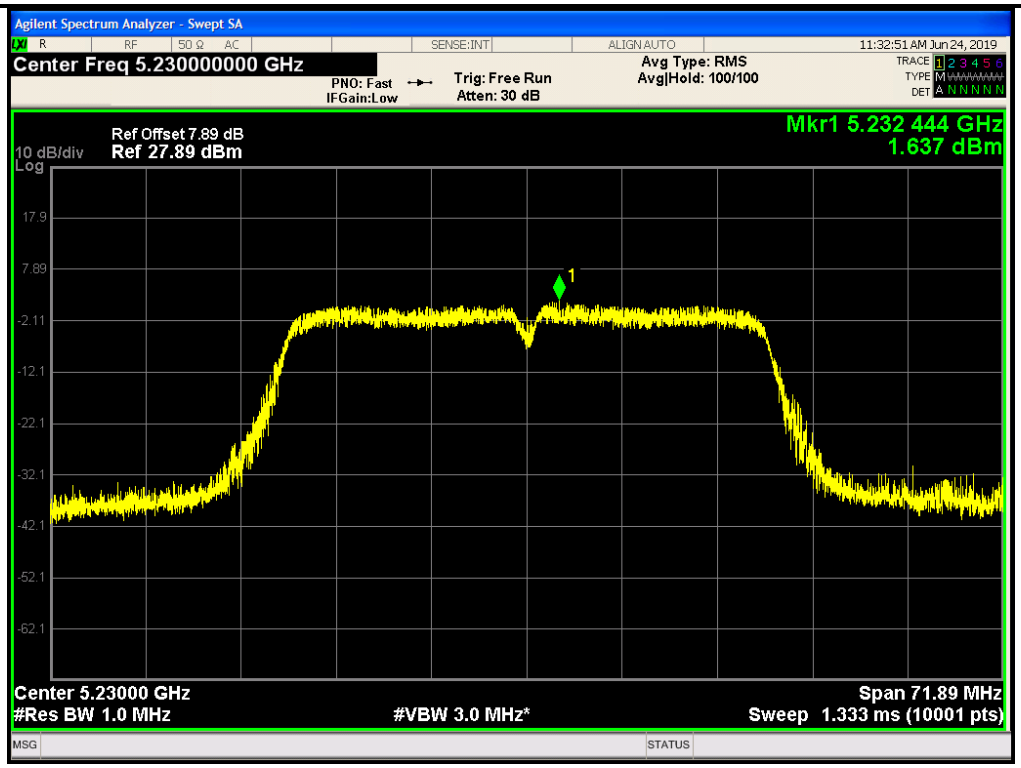
Low

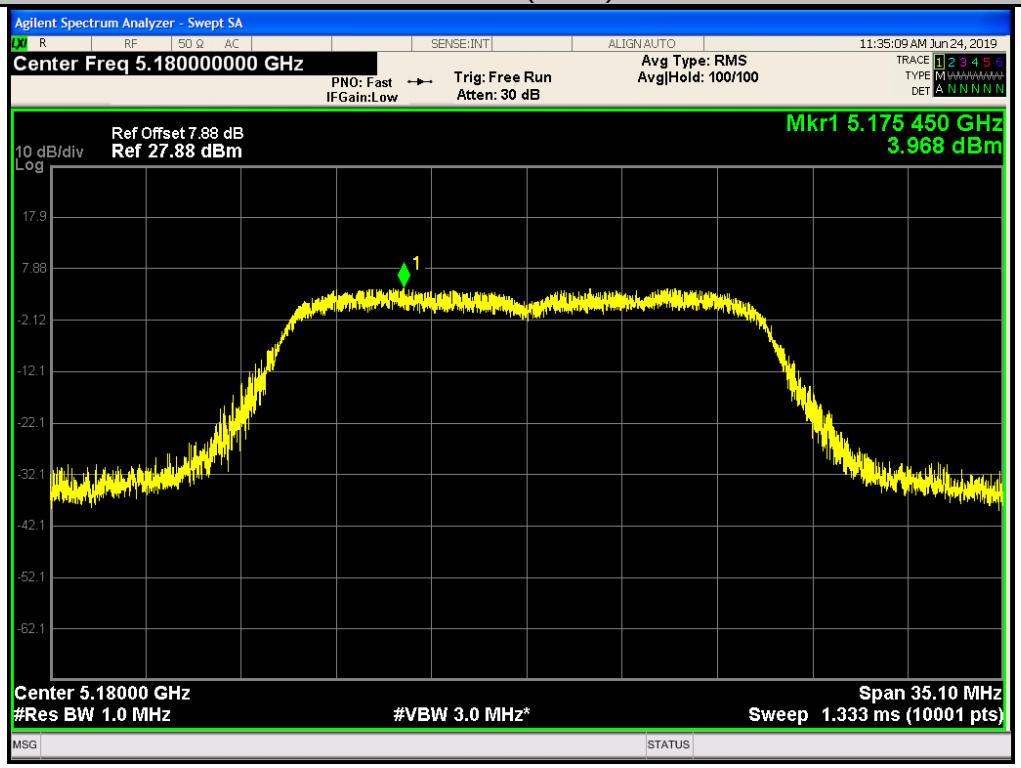
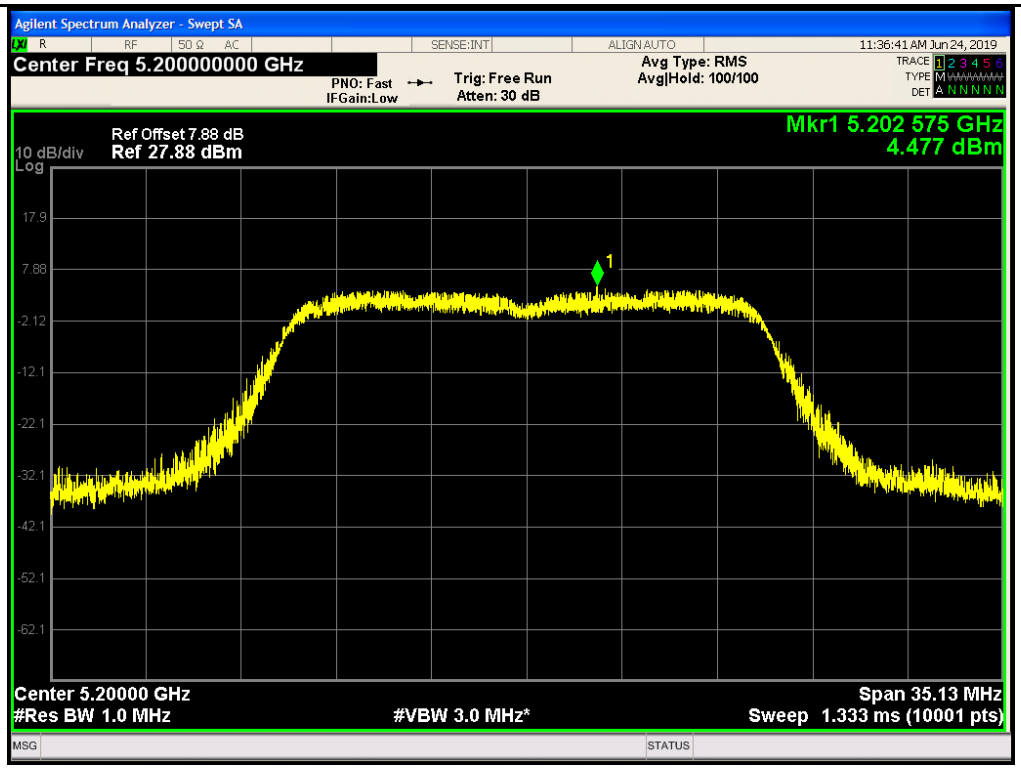

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.200000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
11:21:35 AM Jun 24, 2019
Ref Offset 7.88 dB
10 dB/div
Log
Ref 27.88 dBm
Mkr1 5.202 585 GHz
5.944 dBm
17.9
7.88
-2.12
-12.1
-22.1
-32.1
-42.1
-52.1
-62.1
Center 5.20000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 35.17 MHz
Sweep 1.333 ms (10001 pts)
MSG
STATUS

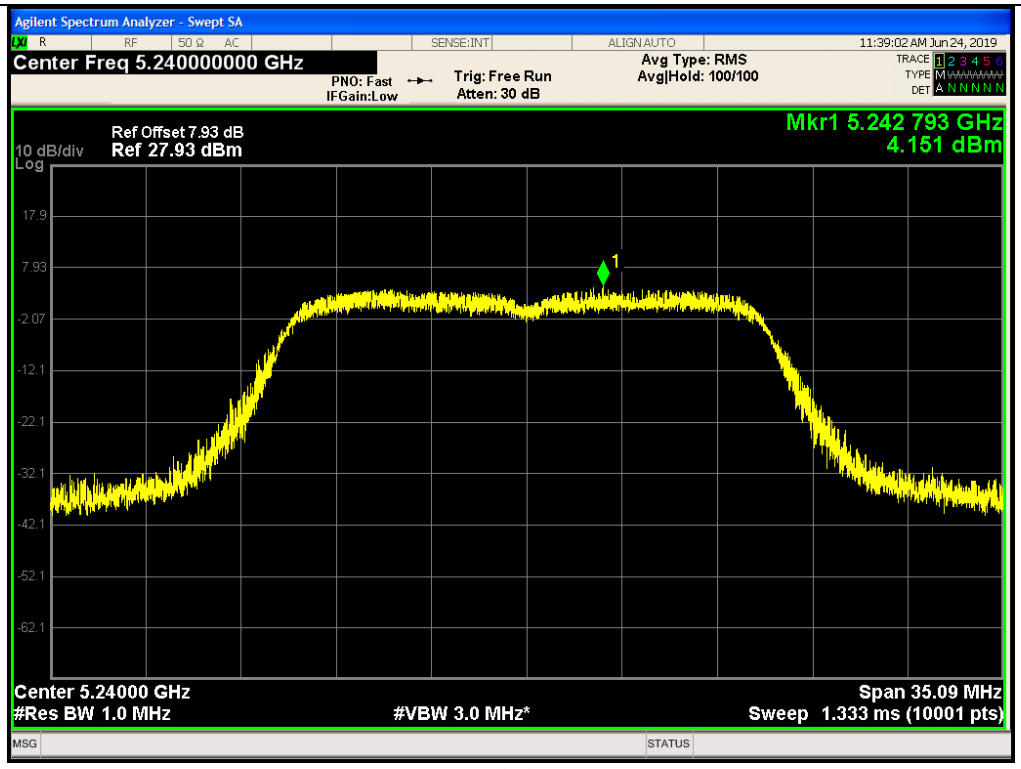
Mid


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
11:23:44 AM Jun 24, 2019
Ref Offset 7.93 dB
10 dB/div
Log
Ref 27.93 dBm
Mkr1 5.242 835 GHz
6.111 dBm
17.9
7.93
-2.07
-12.1
-22.1
-32.1
-42.1
-52.1
-62.1
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 35.05 MHz
Sweep 1.333 ms (10001 pts)
MSG
STATUS

High

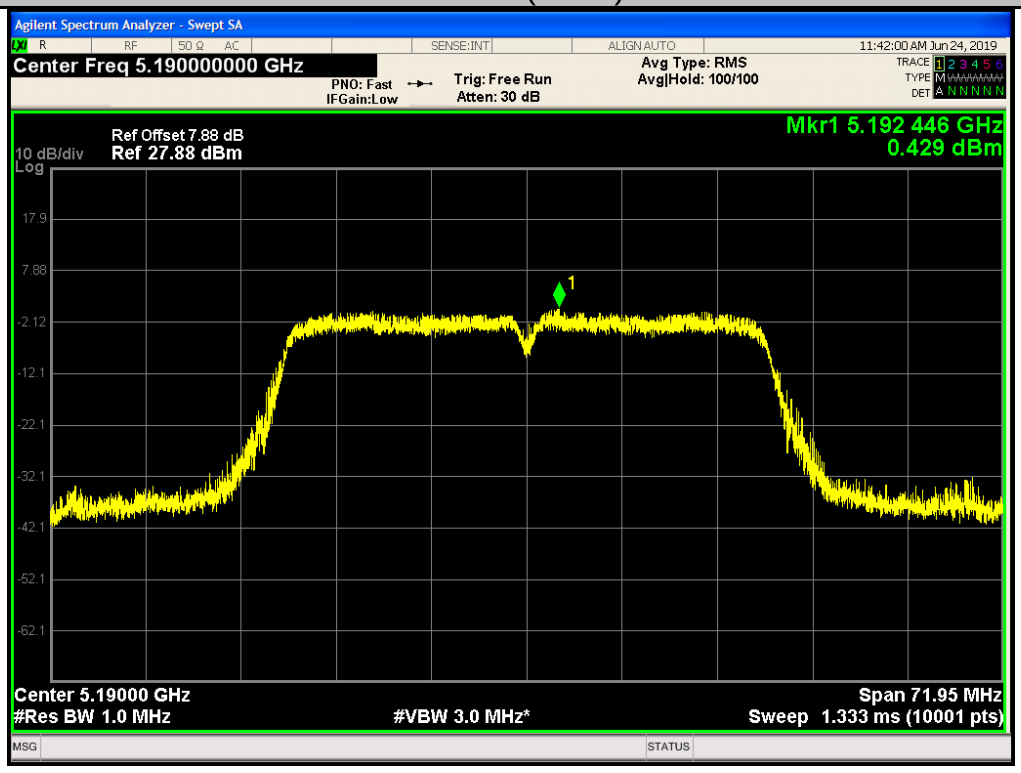
802.11n(HT40)
 Low
 High

802.11ac(HT20)

Low

Mid

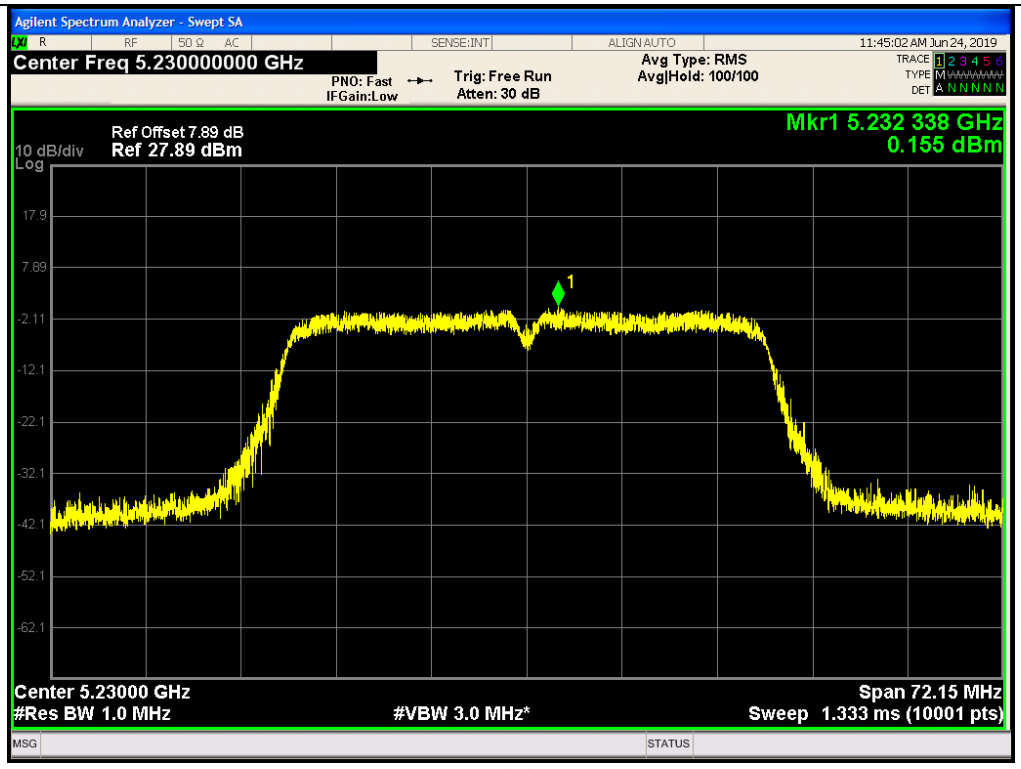


High

802.11ac(HT40)

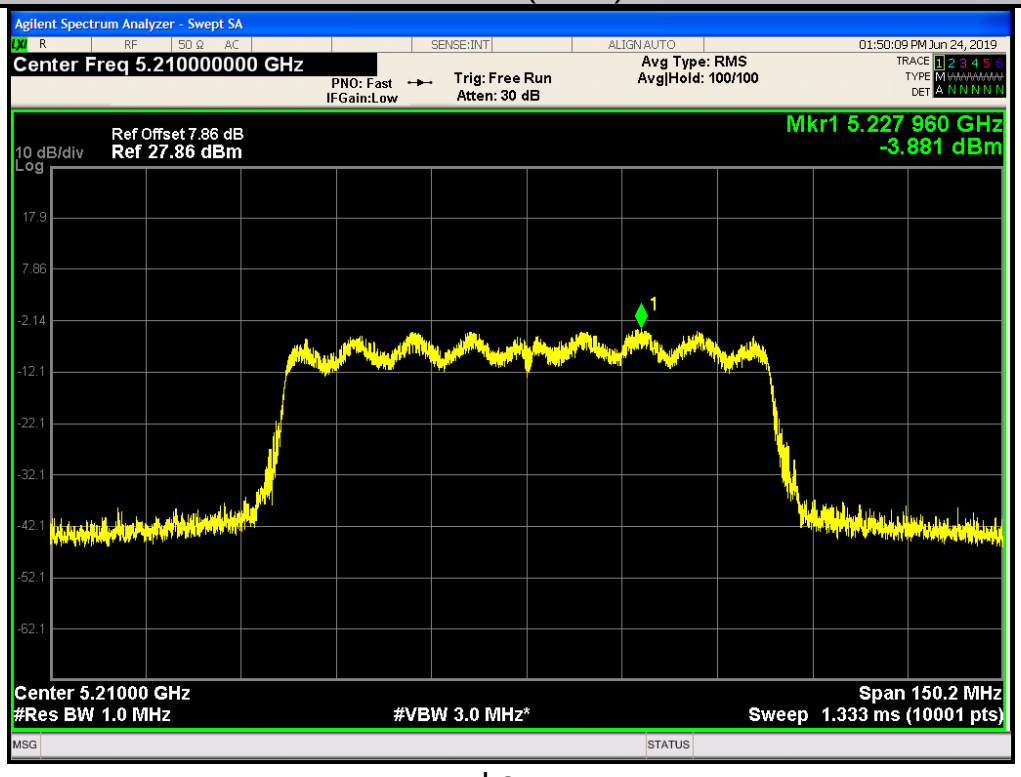


Low



High

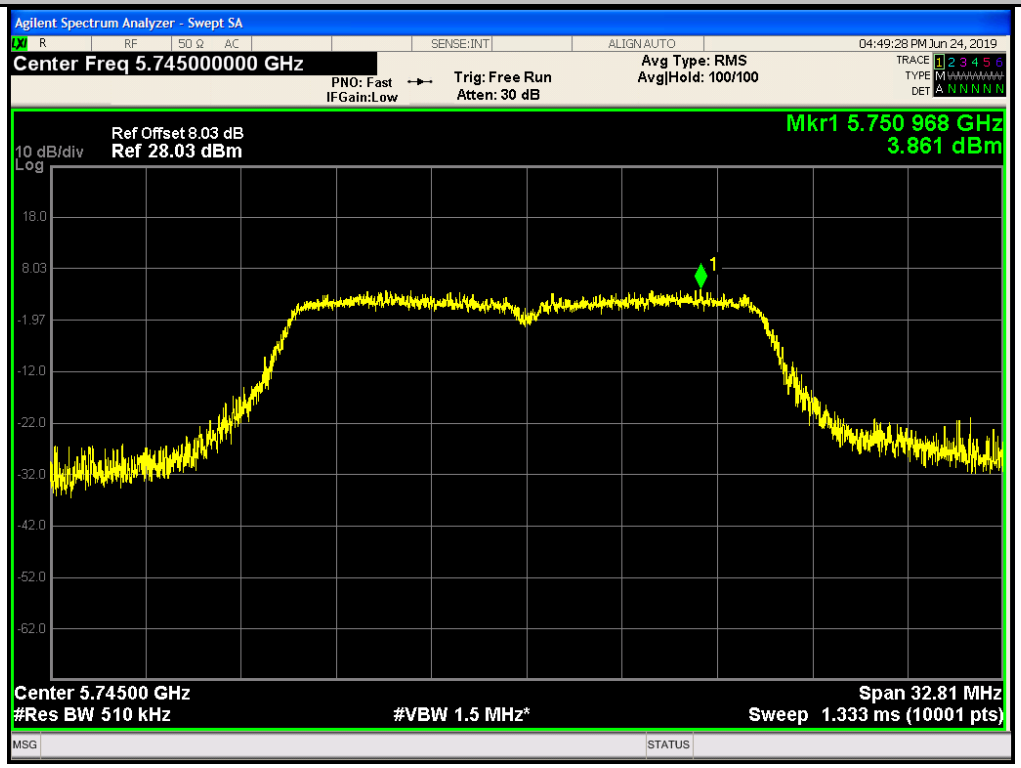
802.11ac(HT80)



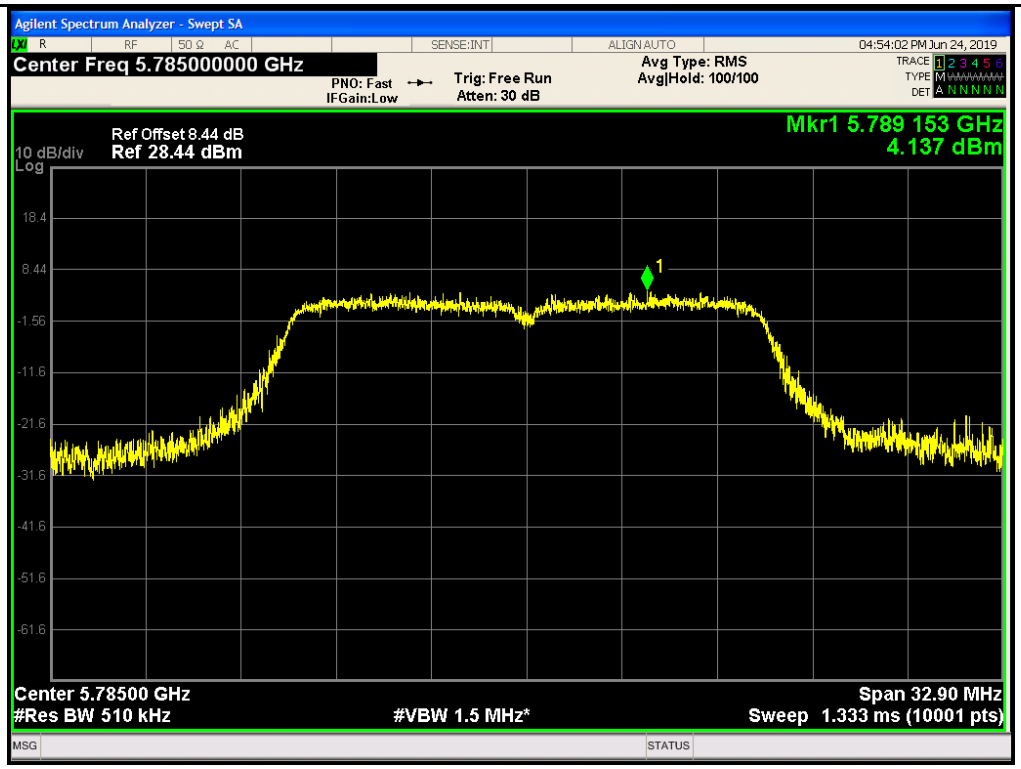
Low

Band IV (5725 – 5850 MHz)

802.11a



Low



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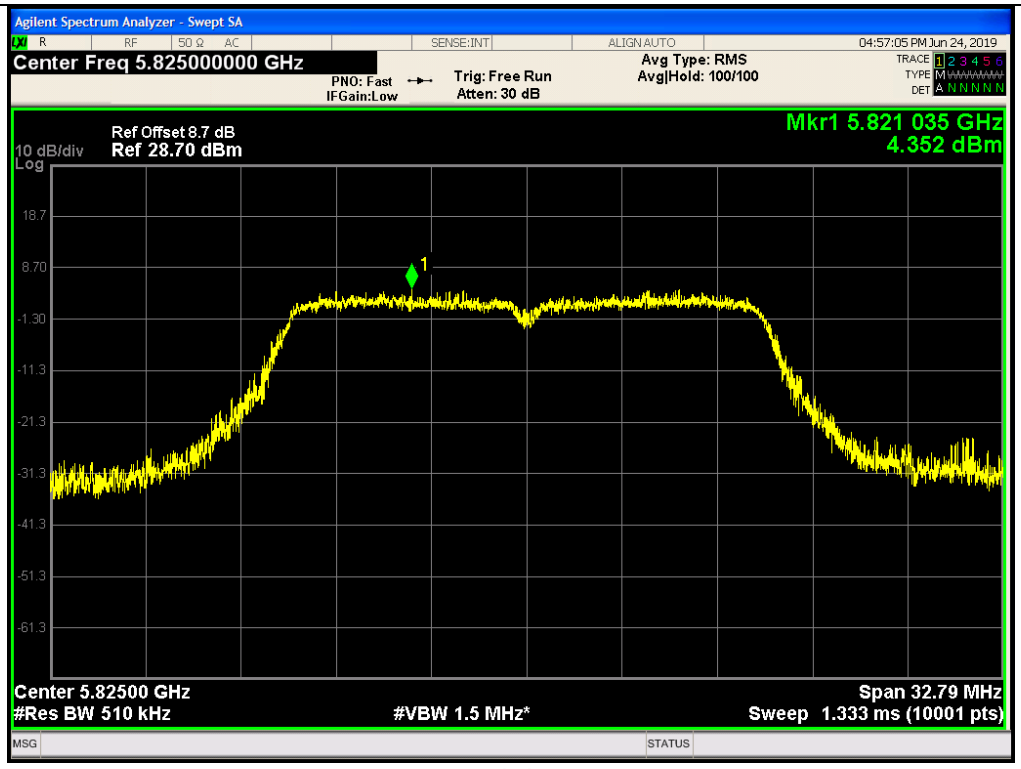
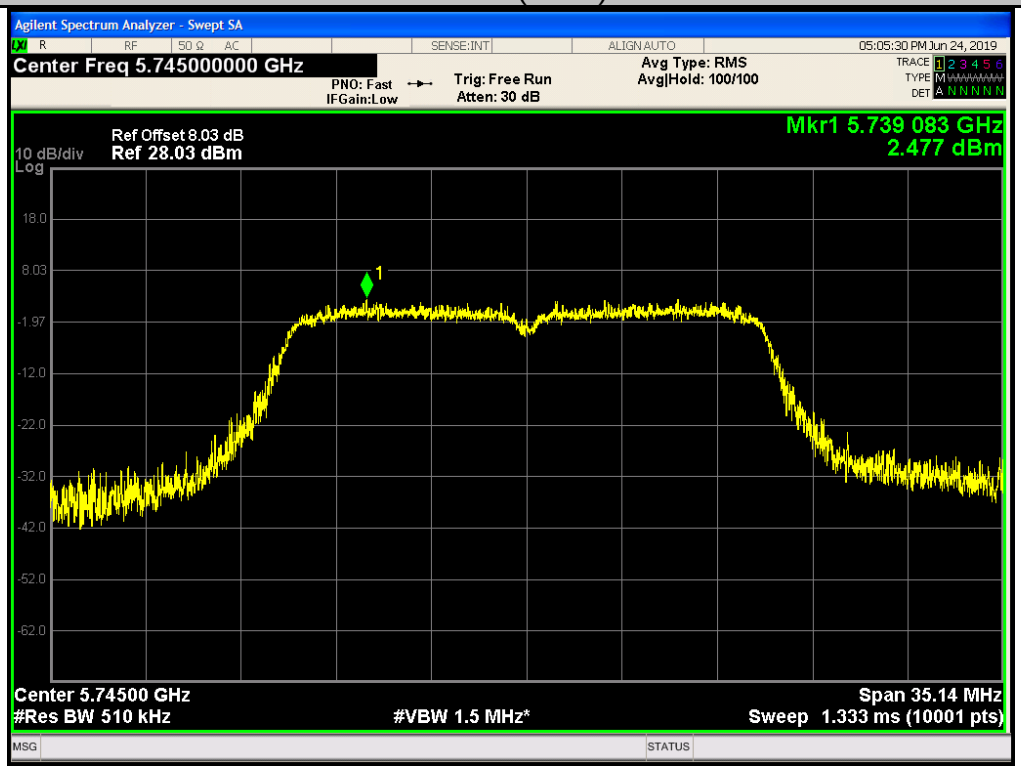
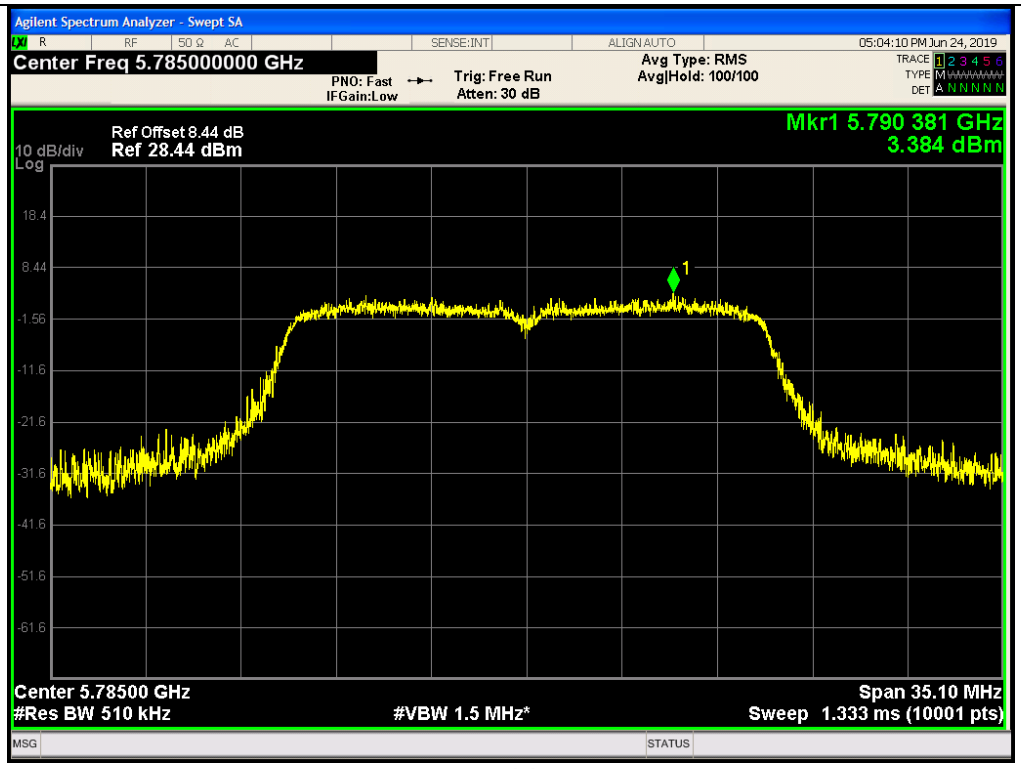


High

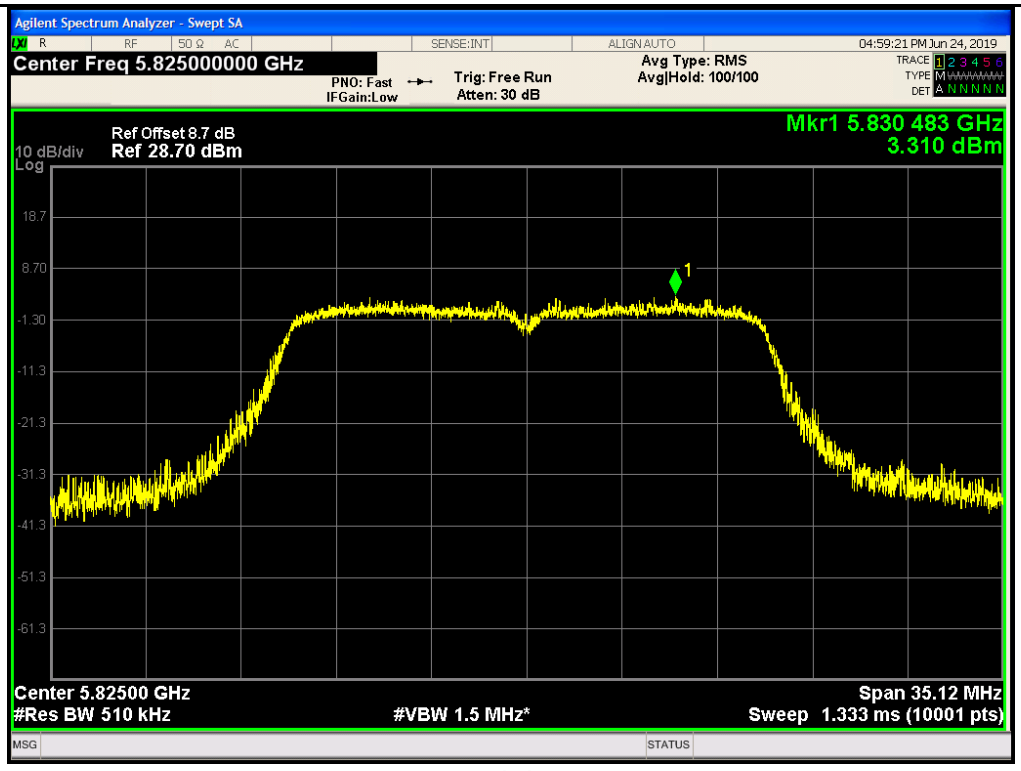
802.11n(HT20)



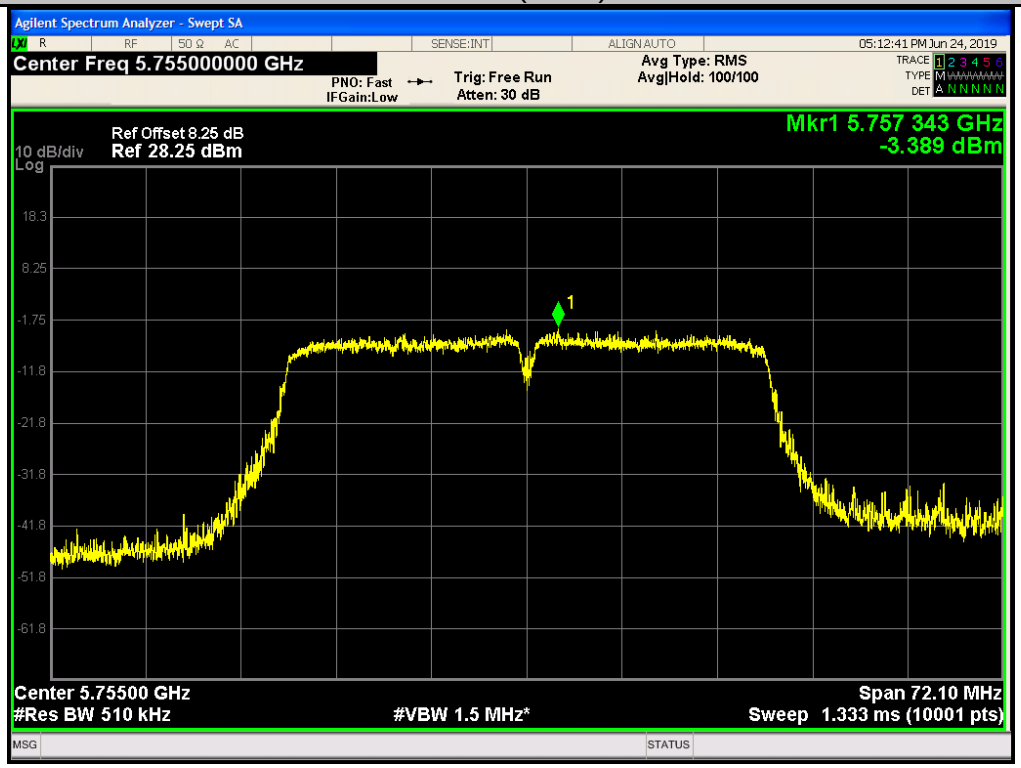
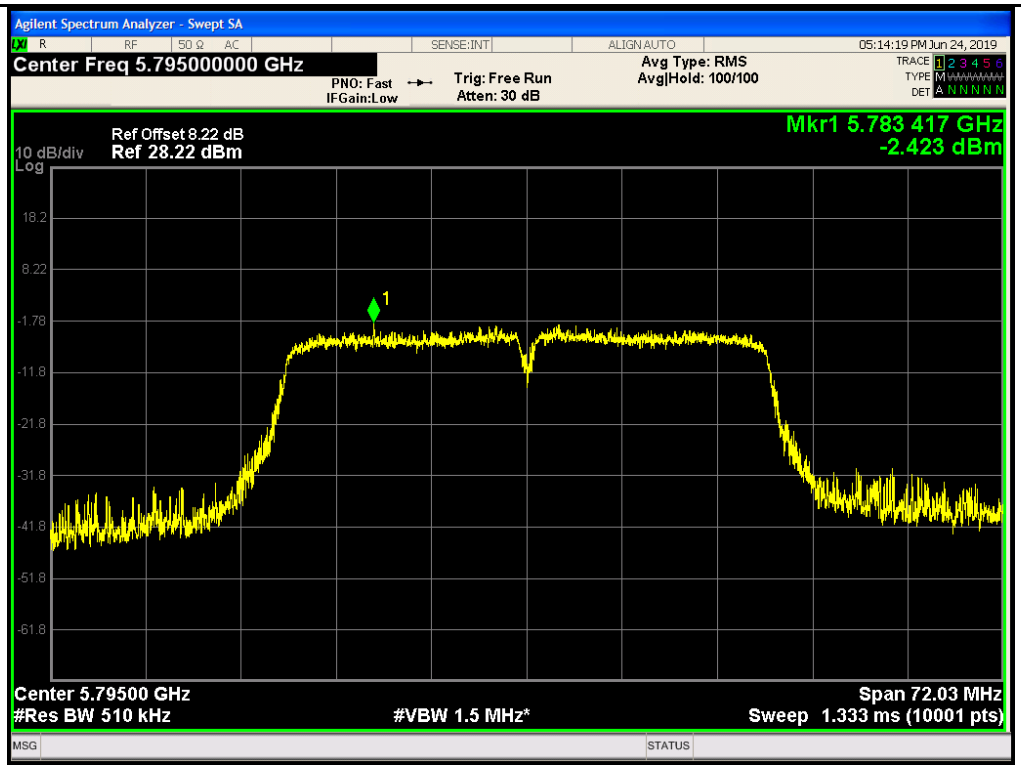
Low

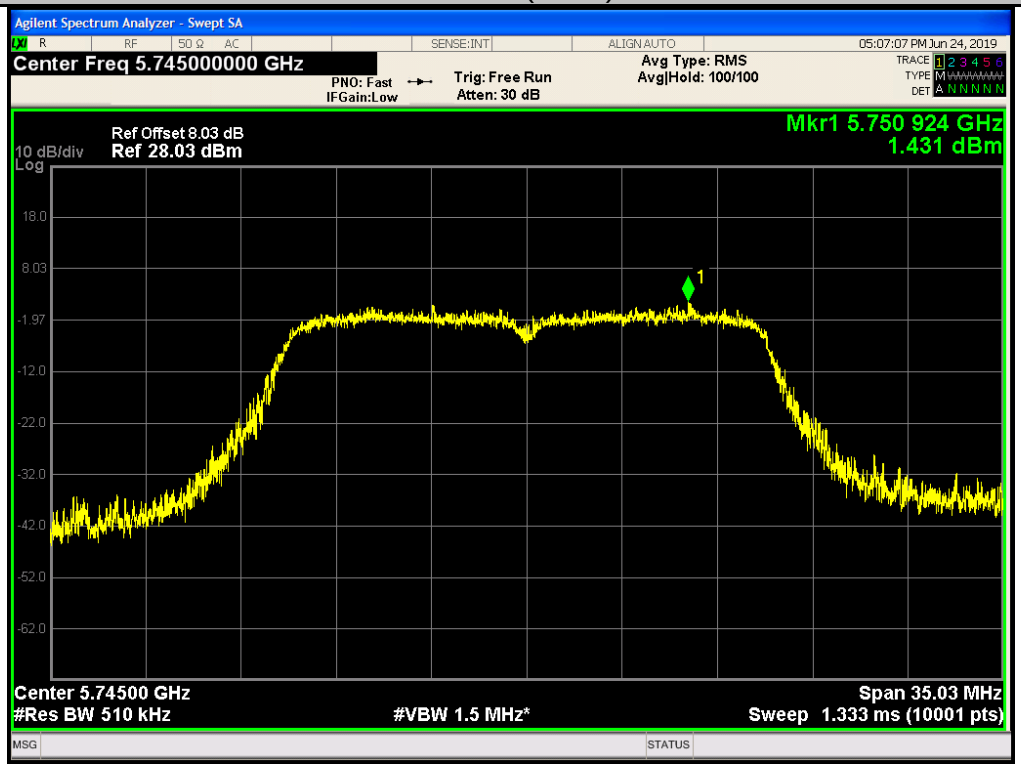
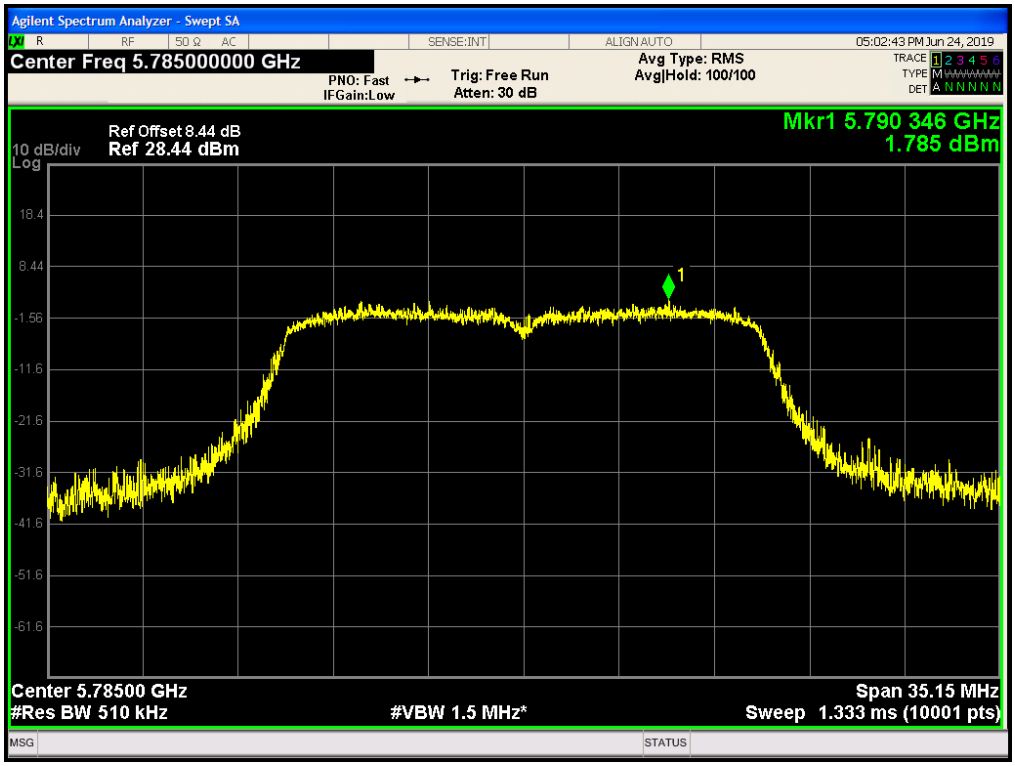

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.785000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
05:04:10 PM Jun 24, 2019
Ref Offset 8.44 dB
10 dB/div
Log
Ref 28.44 dBm
Mkr1 5.790 381 GHz
3.384 dBm
18.4
8.44
-1.56
-11.6
-21.6
-31.6
-41.6
-51.6
-61.6
Center 5.78500 GHz
#Res BW 510 kHz
#VBW 1.5 MHz*
Span 35.10 MHz
Sweep 1.333 ms (10001 pts)
MSG
STATUS

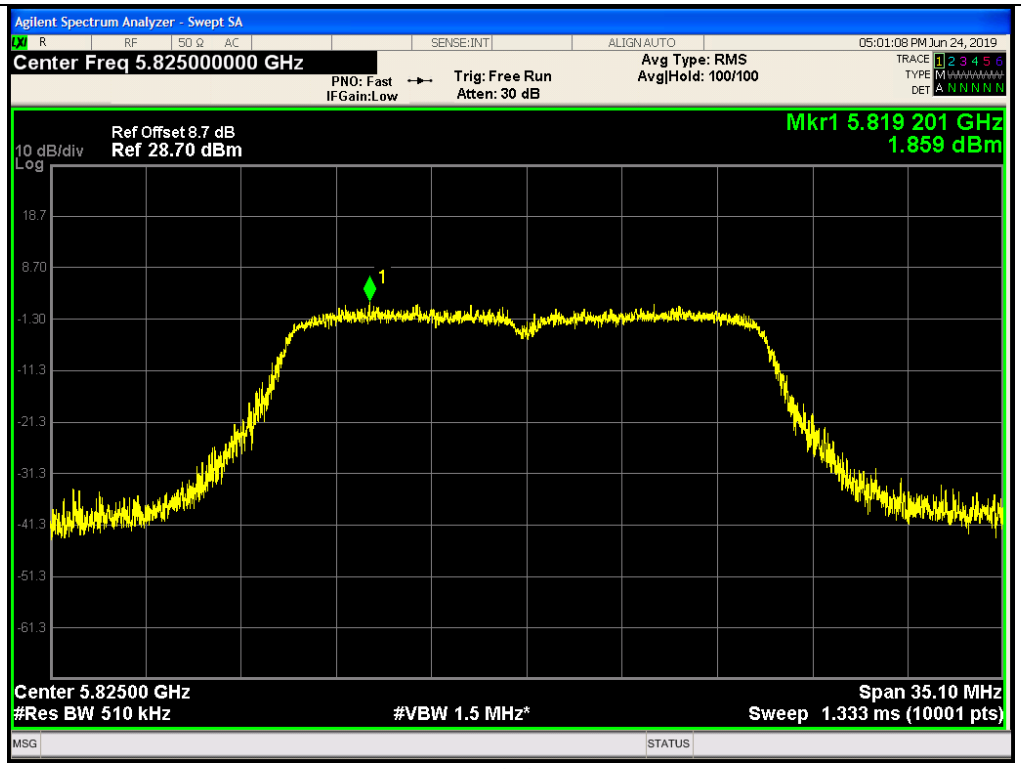
Mid


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: RMS
Avg|Hold: 100/100
04:59:21 PM Jun 24, 2019
Ref Offset 8.7 dB
10 dB/div
Log
Ref 28.70 dBm
Mkr1 5.830 483 GHz
3.310 dBm
18.7
8.70
-1.30
-11.3
-21.3
-31.3
-41.3
-51.3
-61.3
Center 5.82500 GHz
#Res BW 510 kHz
#VBW 1.5 MHz*
Span 35.12 MHz
Sweep 1.333 ms (10001 pts)
MSG
STATUS

High

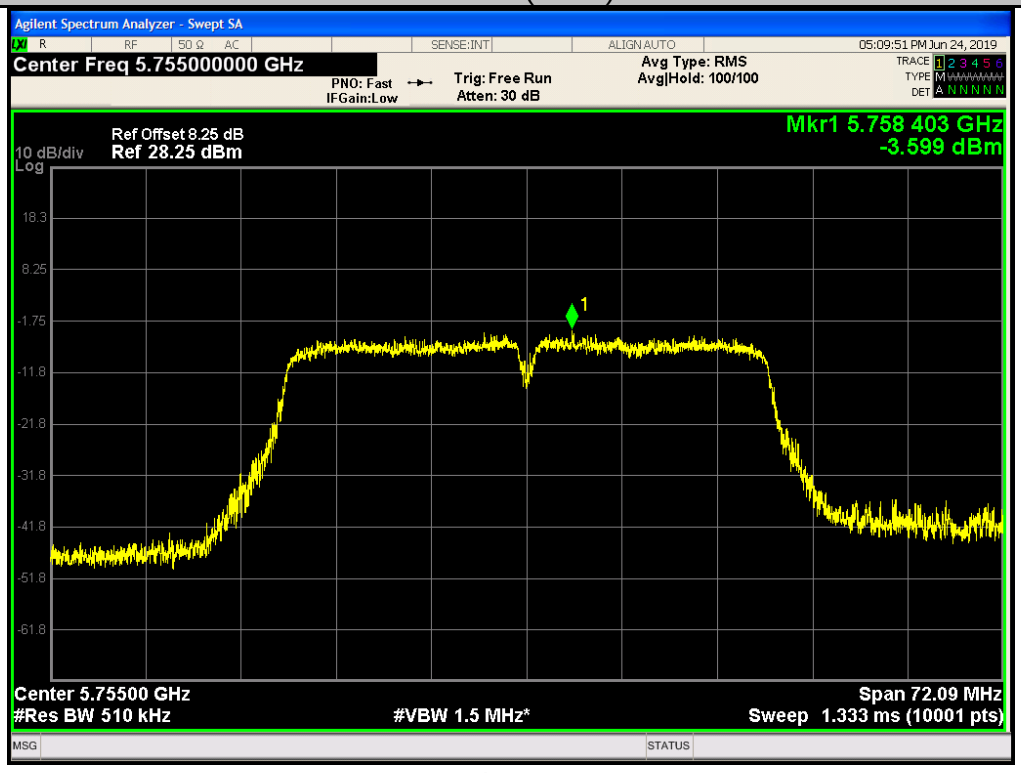
802.11n(HT40)
 Low
 High

802.11ac(HT20)
 Low
 Mid

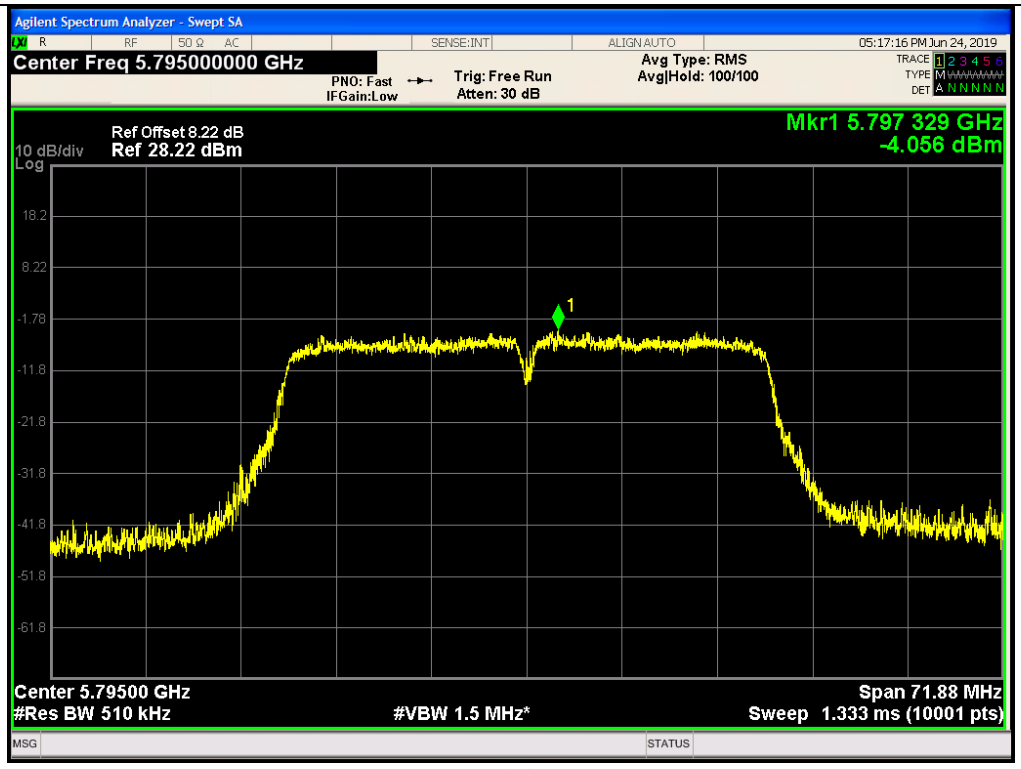


High

802.11ac(HT40)

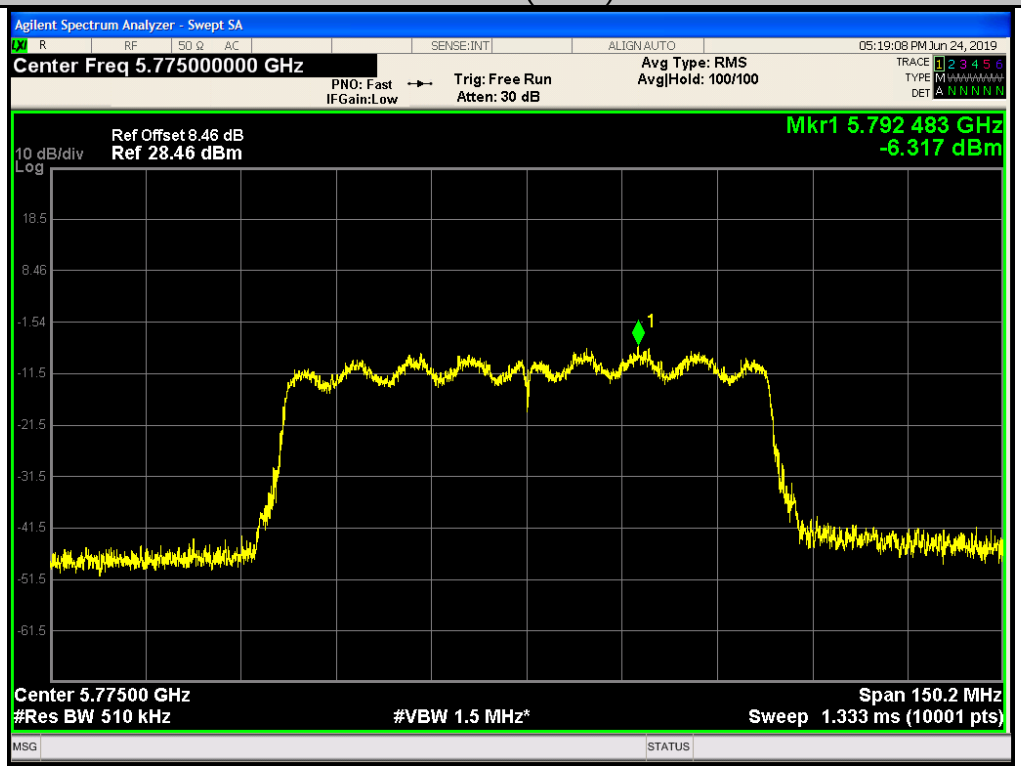


Low



High

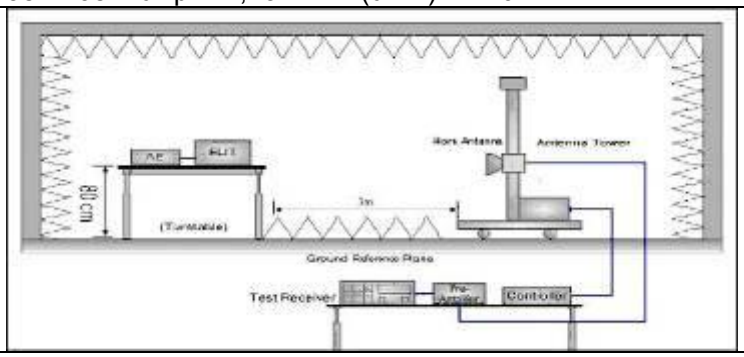
802.11ac(HT40)



Low

4.6. Band edge

4.6.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407
Test Method:	ANSI C63.10 2013
Limit:	For band I&II&III: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIRP(dBm)= **-27dBm** For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. For band IV(5715-5725MHz&5850-5860MHz): E[dBμV/m] = EIRP[dBm] + 95.2=78.2 dBμV/m, for EIRP(dBm)= **-27dBm**; For band IV(other un-restricted band):E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIRP(dBm)= **-27dBm**
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the

	maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data sheet.
Test Result:	PASS

4.6.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Receiver	R&S	ESRP3	HKE-005	Dec. 27, 2019
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2019
Preamplifier	EMCI	EMC051845SE	HKE-015	Dec. 27, 2019
Preamplifier	Agilent	83051A	HKE-016	Dec. 27, 2019
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Sep. 26, 2019
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	Sep. 26, 2019
Horn antenna	Schwarzbeck	9120D	HKE-013	Sep. 26, 2019
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
Position controller	Taiwan MF	MF7802	HKE-011	Dec. 27, 2019
Radiated test software	Tonscend	TS+ Rev 2.5.0.0	HKE-082	N/A
RF cable (9KHz-1GHz)	Times	381806-001	N/A	N/A
Hf antenna	Schwarzbeck	LB-180400-KF	HKE-031	Sep. 27, 2019
RF cable	Tonscend	1-18G	HKE-099	Dec. 27, 2019
RF cable	Times	1-40G	HKE-034	Dec. 27, 2019

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

4.6.3. Test Data

Radiated Band Edge Test:
Operation Mode: 802.11a Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.89	-2.49	50.4	74	-23.6	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.56	-2.49	50.07	74	-23.93	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.2G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	51.65	-2.28	49.37	74	-24.63	peak
5250	/	-2.28	/	54	/	AVG
5350	51.48	-2.11	49.37	74	-24.63	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	52.22	-2.28	49.94	74	-24.06	peak
5250	/	-2.28	/	54	/	AVG
5350	51.63	-2.11	49.52	74	-24.48	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	53.49	-2.49	51	74	-23	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.26	-2.49	48.77	74	-25.23	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.2G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	51.49	-2.28	49.21	74	-24.79	peak
5250	/	-2.28	/	54	/	AVG
5350	50.26	-2.11	48.15	74	-25.85	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	54.62	-2.28	52.34	74	-21.66	peak
5250	/	-2.28	/	54	/	AVG
5350	50.42	-2.11	48.31	74	-25.69	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.32	-2.49	49.83	74	-24.17	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.23	-2.49	48.74	74	-25.26	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.2G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	53.49	-2.28	51.21	74	-22.79	peak
5250	/	-2.28	/	54	/	AVG
5350	50.28	-2.11	48.17	74	-25.83	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	52.36	-2.28	50.08	74	-23.92	peak
5250	/	-2.28	/	54	/	AVG
5350	49.31	-2.11	47.2	74	-26.8	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 ac20 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	54.26	-2.49	51.77	74	-22.23	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.98	-2.49	50.49	74	-23.51	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.2G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	54.96	-2.28	52.68	74	-21.32	peak
5250	/	-2.28	/	54	/	AVG
5350	52.13	-2.11	50.02	74	-23.98	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	53.36	-2.28	51.08	74	-22.92	peak
5250	/	-2.28	/	54	/	AVG
5350	50.82	-2.11	48.71	74	-25.29	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 ac40 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	53.38	-2.49	50.89	74	-23.11	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.49	-2.49	49	74	-25	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.2G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	54.23	-2.28	51.95	74	-22.05	peak
5250	/	-2.28	/	54	/	AVG
5350	51.32	-2.11	49.21	74	-24.79	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	53.63	-2.28	51.35	74	-22.65	peak
5250	/	-2.28	/	54	/	AVG
5350	50.29	-2.11	48.18	74	-25.82	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 ac80 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	53.48	-2.49	50.99	74	-23.01	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	53.69	-2.49	51.2	74	-22.8	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.2G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	54.49	-2.28	52.21	74	-21.79	peak
5250	/	-2.28	/	54	/	AVG
5350	50.23	-2.11	48.12	74	-25.88	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5250	54.63	-2.28	52.35	74	-21.65	peak
5250	/	-2.28	/	54	/	AVG
5350	50.94	-2.11	48.83	74	-25.17	peak
5350	/	-2.11	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11a Mode with 5.8G TX CH Low
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	57.26	-2.06	55.2	68.2	-13	peak
5650	/	-2.06	/	48.2	/	AVG
5700	91.66	-1.96	89.7	105.2	-15.5	peak
5700	/	-1.96	/	85.2	/	AVG
5720	93.36	-2.87	90.49	110.8	-20.31	peak
5720	/	-2.87	/	90.8	/	AVG
5725	111.85	-2.14	109.71	122.2	-12.49	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	56.63	-2.06	54.57	68.2	-13.63	peak
5650	/	-2.06	/	48.2	/	AVG
5700	91.81	-1.96	89.85	105.2	-15.35	peak
5700	/	-1.96	/	85.2	/	AVG
5720	95.36	-2.87	92.49	110.8	-18.31	peak
5720	/	-2.87	/	90.8	/	AVG
5725	111.96	-2.14	109.82	122.2	-12.38	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.8G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	113.21	-1.97	111.24	122.2	-10.96	peak
5850	/	-1.97	/	102.2	/	AVG
5855	95.36	-2.13	93.23	110.8	-17.57	peak
5855	/	-2.13	/	90.8	/	AVG
5875	87.82	-2.65	85.17	105.2	-20.03	peak
5875	/	-2.65	/	85.2	/	AVG
5925	54.36	-2.28	52.08	68.2	-16.12	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	112.32	-1.97	110.35	122.2	-11.85	peak
5850	/	-1.97	/	102.2	/	AVG
5855	93.26	-2.13	91.13	110.8	-19.67	peak
5855	/	-2.13	/	90.8	/	AVG
5875	86.15	-2.65	83.5	105.2	-21.7	peak
5875	/	-2.65	/	85.2	/	AVG
5925	54.96	-2.28	52.68	68.2	-15.52	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	57.52	-2.06	55.46	68.2	-12.74	peak
5650	/	-2.06	/	48.2	/	AVG
5700	92.96	-1.96	91	105.2	-14.2	peak
5700	/	-1.96	/	85.2	/	AVG
5720	94.12	-2.87	91.25	110.8	-19.55	peak
5720	/	-2.87	/	90.8	/	AVG
5725	113.63	-2.14	111.49	122.2	-10.71	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	60.36	-2.06	58.3	68.2	-9.9	peak
5650	/	-2.06	/	48.2	/	AVG
5700	98.43	-1.96	96.47	105.2	-8.73	peak
5700	/	-1.96	/	85.2	/	AVG
5720	94.49	-2.87	91.62	110.8	-19.18	peak
5720	/	-2.87	/	90.8	/	AVG
5725	112.43	-2.14	110.29	122.2	-11.91	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	111.23	-1.97	109.26	122.2	-12.94	peak
5850	/	-1.97	/	102.2	/	AVG
5855	95.36	-2.13	93.23	110.8	-17.57	peak
5855	/	-2.13	/	90.8	/	AVG
5875	87.31	-2.65	84.66	105.2	-20.54	peak
5875	/	-2.65	/	85.2	/	AVG
5925	52.52	-2.28	50.24	68.2	-17.96	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	111.36	-1.97	109.39	122.2	-12.81	peak
5850	/	-1.97	/	102.2	/	AVG
5855	93.83	-2.13	91.7	110.8	-19.1	peak
5855	/	-2.13	/	90.8	/	AVG
5875	87.99	-2.65	85.34	105.2	-19.86	peak
5875	/	-2.65	/	85.2	/	AVG
5925	56.92	-2.28	54.64	68.2	-13.56	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n40 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	56.63	-2.06	54.57	68.2	-13.63	peak
5650	/	-2.06	/	48.2	/	AVG
5700	92.48	-1.96	90.52	105.2	-14.68	peak
5700	/	-1.96	/	85.2	/	AVG
5720	94.76	-2.87	91.89	110.8	-18.91	peak
5720	/	-2.87	/	90.8	/	AVG
5725	112.63	-2.14	110.49	122.2	-11.71	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	61.32	-2.06	59.26	68.2	-8.94	peak
5650	/	-2.06	/	48.2	/	AVG
5700	96.48	-1.96	94.52	105.2	-10.68	peak
5700	/	-1.96	/	85.2	/	AVG
5720	92.32	-2.87	89.45	110.8	-21.35	peak
5720	/	-2.87	/	90.8	/	AVG
5725	112.25	-2.14	110.11	122.2	-12.09	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.8G
Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	111.02	-1.97	109.05	122.2	-13.15	peak
5850	/	-1.97	/	102.2	/	AVG
5855	95.89	-2.13	93.76	110.8	-17.04	peak
5855	/	-2.13	/	90.8	/	AVG
5875	88.25	-2.65	85.6	105.2	-19.6	peak
5875	/	-2.65	/	85.2	/	AVG
5925	53.93	-2.28	51.65	68.2	-16.55	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	110.66	-1.97	108.69	122.2	-13.51	peak
5850	/	-1.97	/	102.2	/	AVG
5855	93.81	-2.13	91.68	110.8	-19.12	peak
5855	/	-2.13	/	90.8	/	AVG
5875	89.36	-2.65	86.71	105.2	-18.49	peak
5875	/	-2.65	/	85.2	/	AVG
5925	52.65	-2.28	50.37	68.2	-17.83	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11ac20 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	58.89	-2.06	56.83	68.2	-11.37	peak
5650	/	-2.06	/	48.2	/	AVG
5700	90.61	-1.96	88.65	105.2	-16.55	peak
5700	/	-1.96	/	85.2	/	AVG
5720	93.56	-2.87	90.69	110.8	-20.11	peak
5720	/	-2.87	/	90.8	/	AVG
5725	111.27	-2.14	109.13	122.2	-13.07	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	59.62	-2.06	57.56	68.2	-10.64	peak
5650	/	-2.06	/	48.2	/	AVG
5700	90.86	-1.96	88.9	105.2	-16.3	peak
5700	/	-1.96	/	85.2	/	AVG
5720	95.12	-2.87	92.25	110.8	-18.55	peak
5720	/	-2.87	/	90.8	/	AVG
5725	112.56	-2.14	110.42	122.2	-11.78	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.8G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	112.83	-1.97	110.86	122.2	-11.34	peak
5850	/	-1.97	/	102.2	/	AVG
5855	95.61	-2.13	93.48	110.8	-17.32	peak
5855	/	-2.13	/	90.8	/	AVG
5875	87.48	-2.65	84.83	105.2	-20.37	peak
5875	/	-2.65	/	85.2	/	AVG
5925	53.25	-2.28	50.97	68.2	-17.23	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	112.92	-1.97	110.95	122.2	-11.25	peak
5850	/	-1.97	/	102.2	/	AVG
5855	92.59	-2.13	90.46	110.8	-20.34	peak
5855	/	-2.13	/	90.8	/	AVG
5875	85.54	-2.65	82.89	105.2	-22.31	peak
5875	/	-2.65	/	85.2	/	AVG
5925	55.76	-2.28	53.48	68.2	-14.72	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11ac40 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	57.46	-2.06	55.4	68.2	-12.8	peak
5650	/	-2.06	/	48.2	/	AVG
5700	91.36	-1.96	89.4	105.2	-15.8	peak
5700	/	-1.96	/	85.2	/	AVG
5720	92.63	-2.87	89.76	110.8	-21.04	peak
5720	/	-2.87	/	90.8	/	AVG
5725	111.98	-2.14	109.84	122.2	-12.36	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	59.39	-2.06	57.33	68.2	-10.87	peak
5650	/	-2.06	/	48.2	/	AVG
5700	91.33	-1.96	89.37	105.2	-15.83	peak
5700	/	-1.96	/	85.2	/	AVG
5720	95.86	-2.87	92.99	110.8	-17.81	peak
5720	/	-2.87	/	90.8	/	AVG
5725	111.95	-2.14	109.81	122.2	-12.39	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.8G

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	113.03	-1.97	111.06	122.2	-11.14	peak
5850	/	-1.97	/	102.2	/	AVG
5855	94.58	-2.13	92.45	110.8	-18.35	peak
5855	/	-2.13	/	90.8	/	AVG
5875	87.89	-2.65	85.24	105.2	-19.96	peak
5875	/	-2.65	/	85.2	/	AVG
5925	53.96	-2.28	51.68	68.2	-16.52	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	113.61	-1.97	111.64	122.2	-10.56	peak
5850	/	-1.97	/	102.2	/	AVG
5855	92.59	-2.13	90.46	110.8	-20.34	peak
5855	/	-2.13	/	90.8	/	AVG
5875	86.38	-2.65	83.73	105.2	-21.47	peak
5875	/	-2.65	/	85.2	/	AVG
5925	55.36	-2.28	53.08	68.2	-15.12	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11ac80 Mode with 5.8G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	58.33	-2.06	56.27	68.2	-11.93	peak
5650	/	-2.06	/	48.2	/	AVG
5700	90.56	-1.96	88.6	105.2	-16.6	peak
5700	/	-1.96	/	85.2	/	AVG
5720	92.77	-2.87	89.9	110.8	-20.9	peak
5720	/	-2.87	/	90.8	/	AVG
5725	111.32	-2.14	109.18	122.2	-13.02	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5650	59.96	-2.06	57.9	68.2	-10.3	peak
5650	/	-2.06	/	48.2	/	AVG
5700	90.38	-1.96	88.42	105.2	-16.78	peak
5700	/	-1.96	/	85.2	/	AVG
5720	95.41	-2.87	92.54	110.8	-18.26	peak
5720	/	-2.87	/	90.8	/	AVG
5725	113.39	-2.14	111.25	122.2	-10.95	peak
5725	/	-2.14	/	102.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High with 5.8G

Horizontal

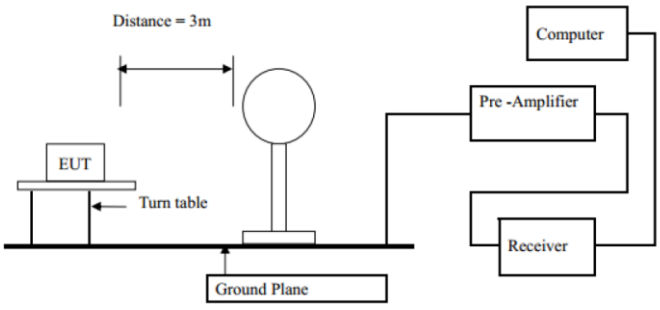
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	113.92	-1.97	111.95	122.2	-10.25	peak
5850	/	-1.97	/	102.2	/	AVG
5855	94.96	-2.13	92.83	110.8	-17.97	peak
5855	/	-2.13	/	90.8	/	AVG
5875	86.47	-2.65	83.82	105.2	-21.38	peak
5875	/	-2.65	/	85.2	/	AVG
5925	52.93	-2.28	50.65	68.2	-17.55	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

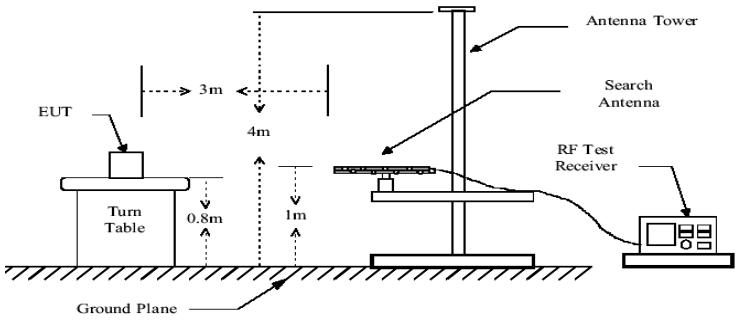
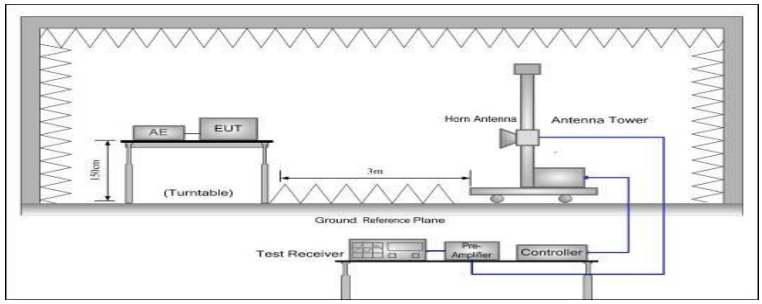
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5850	111.33	-1.97	109.36	122.2	-12.84	peak
5850	/	-1.97	/	102.2	/	AVG
5855	93.98	-2.13	91.85	110.8	-18.95	peak
5855	/	-2.13	/	90.8	/	AVG
5875	86.94	-2.65	84.29	105.2	-20.91	peak
5875	/	-2.65	/	85.2	/	AVG
5925	55.49	-2.28	53.21	68.2	-14.99	peak
5925	/	-2.28	/	48.2	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

4.7. Spurious Emission

4.7.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 v02r01</td></tr>
<tr><td>Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Detector</td></tr>
<tr><td rowspan="2">Above 1G</td><td>74.0</td><td>Peak</td></tr>
<tr><td>54.0</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 

30MHz to 1GHz</td></tr>
</table>

	 Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.
Test results:	PASS

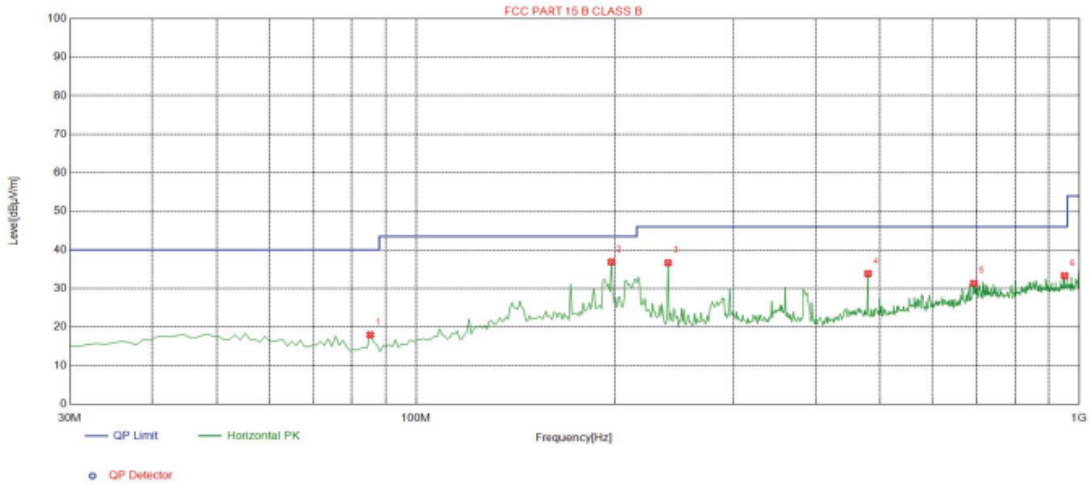
4.7.2. Test Data

Remark: We tested all Channels, the worst case was recorded.

Please refer to following diagram for individual

Below 1GHz

Horizontal

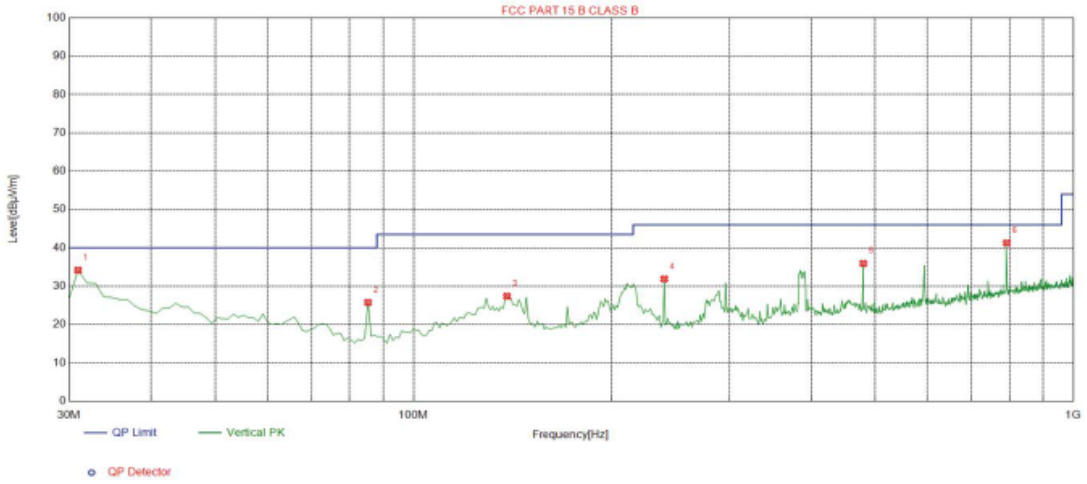


Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	85.2900	17.95	-18.20	40.00	22.05	100	94	Horizontal
2	197.810	36.89	-15.27	43.50	6.61	100	77	Horizontal
3	239.520	36.65	-13.88	46.00	9.35	100	320	Horizontal
4	480.080	33.84	-8.45	46.00	12.16	100	349	Horizontal
5	693.480	31.32	-5.16	46.00	14.68	100	86	Horizontal
6	950.530	33.29	-1.24	46.00	12.71	100	12	Horizontal

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9700	34.18	-16.30	40.00	5.82	100	272	Vertical
2	85.2900	25.75	-18.20	40.00	14.25	100	156	Vertical
3	138.640	27.38	-19.10	43.50	16.12	100	315	Vertical
4	239.520	31.89	-13.88	46.00	14.11	100	354	Vertical
5	480.080	35.93	-8.45	46.00	10.07	100	333	Vertical
6	792.420	41.28	-3.23	46.00	4.72	100	93	Vertical

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Above 1GHz

LOW CH 36 (802.11 a Mode with 5.2G)/5180

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	62.58	-4.59	57.99	74.00	-16.01	peak
3647	47.44	-4.59	42.85	54.00	-11.15	AVG
10360	52.49	3.74	56.23	74.00	-17.77	peak
10360	41.28	3.74	45.02	54.00	-8.98	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	62.35	-4.59	57.76	74.00	-16.24	peak
3647	47.24	-4.59	42.65	54.00	-11.35	AVG
10360	52.45	3.74	56.19	74.00	-17.81	peak
10360	41.11	3.74	44.85	54.00	-9.15	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

MID CH40 (802.11 a Mode with 5.2G)/5200
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	62.88	-4.59	58.29	74.00	-15.71	peak
3647	46.70	-4.59	42.11	54.00	-11.89	AVG
10400	54.36	3.74	58.10	74.00	-15.90	peak
10400	41.50	3.74	45.24	54.00	-8.76	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	62.66	-4.59	58.07	74.00	-15.93	peak
3647	46.39	-4.59	41.80	54.00	-12.20	AVG
10400	53.75	3.74	57.49	74.00	-16.51	peak
10400	41.04	3.74	44.78	54.00	-9.22	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

HIGH CH 48 (802.11a Mode with 5.2G)/5240
Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	61.83	-4.59	57.24	74.00	-16.76	peak
3647	46.64	-4.59	42.05	54.00	-11.95	AVG
10480	53.29	3.75	57.04	74.00	-16.96	peak
10480	40.67	3.75	44.42	54.00	-9.58	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	61.30	-4.59	56.71	74.00	-17.29	peak
3647	46.06	-4.59	41.47	54.00	-12.53	AVG
10480	52.55	3.75	56.30	74.00	-17.70	peak
10480	39.94	3.75	43.69	54.00	-10.31	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Remark：
(1) Measuring frequencies from 1 GHz to the 40 GHz。
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

LOW CH 149 (802.11 a Mode with 5.8G)/5745

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	62.63	-4.59	58.04	74.00	-15.96	peak
3647	46.82	-4.59	42.23	54.00	-11.77	AVG
11570	54.41	4.21	58.62	74.00	-15.38	peak
11570	40.61	4.21	44.82	54.00	-9.18	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	61.42	-4.59	56.83	74.00	-17.17	peak
3647	47.25	-4.59	42.66	54.00	-11.34	AVG
11570	54.34	4.21	58.55	74.00	-15.45	peak
11570	40.33	4.21	44.54	54.00	-9.46	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

MID CH157 (802.11 a Mode with 5.8G)/5785

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	61.61	-4.59	57.02	74.00	-16.98	peak
3647	46.77	-4.59	42.18	54.00	-11.82	AVG
11570	54.51	4.21	58.72	74.00	-15.28	peak
11570	39.86	4.21	44.07	54.00	-9.93	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	60.48	-4.59	55.89	74.00	-18.11	peak
3647	46.46	-4.59	41.87	54.00	-12.13	AVG
11570	53.41	4.21	57.62	74.00	-16.38	peak
11570	39.66	4.21	43.87	54.00	-10.13	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

HIGH CH 165 (802.11a Mode with 5.8G)/5825

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	62.64	-4.59	58.05	74.00	-15.95	peak
3647	47.11	-4.59	42.52	54.00	-11.48	AVG
11650	54.93	4.84	59.77	74.00	-14.23	peak
11650	42.25	4.84	47.09	54.00	-6.91	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

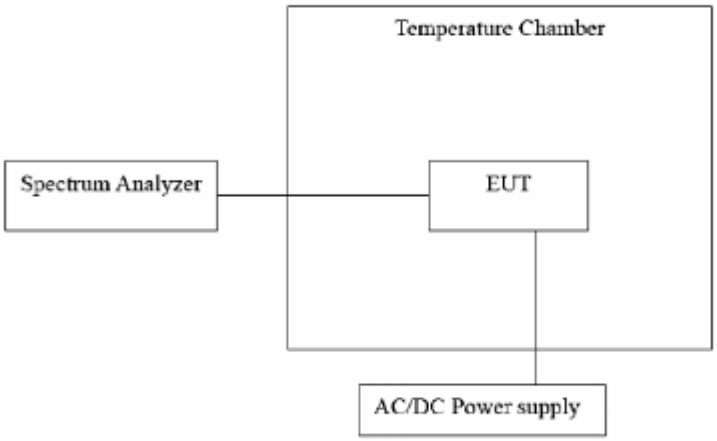
Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
3647	61.90	-4.59	57.31	74.00	-16.69	peak
3647	46.36	-4.59	41.77	54.00	-12.23	AVG
11650	54.63	4.84	59.47	74.00	-14.53	peak
11650	41.36	4.84	46.20	54.00	-7.80	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Remark：
(1) Measuring frequencies from 1 GHz to the 40 GHz。
(2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
(4) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.
(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

4.8. Frequency Stability Measurement

4.8.1. Test Specification

Test Requirement:	FCC Part15 Section 15.407(g) &Part2 J Section 2.1055
Test Method:	ANSI C63.10: 2013
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Setup:	
Test Procedure:	The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Test Result:	PASS
Remark:	N/A

Test Result as follows:

Mode	Voltage (V)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	132 V	5179.989	11	5239.982	18
	120 V	5179.985	15	5239.989	11
	108 V	5179.990	10	5239.987	13

Mode	Temperature (℃)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
5.2G Band	-30	5179.960	40	5239.964	36
	-20	5179.978	22	5239.974	26
	-10	5179.976	24	5239.962	38
	0	5179.962	38	5239.966	34
	10	5179.967	33	5239.965	35
	20	5179.974	26	5239.965	35
	30	5179.966	34	5239.977	23
	40	5179.973	27	5239.963	37
	50	5179.968	32	5239.980	20

Mode	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	5744.982	18	5824.989	11	5744.982
	5744.982	18	5824.982	18	5744.982
	5744.981	19	5824.988	12	5744.981

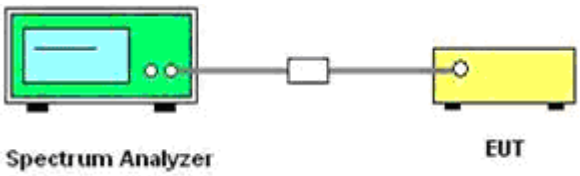
Mode	Temperature (℃)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
5.8G Band	-30	5744.968	32	5824.974	26
	-20	5744.978	22	5824.972	28
	-10	5744.973	27	5824.972	28
	0	5744.976	24	5824.979	21
	10	5744.962	38	5824.963	37
	20	5744.978	22	5824.973	27
	30	5744.970	30	5824.975	25
	40	5744.978	22	5824.967	33
	50	5744.971	29	5824.969	31

4.9. Unwanted Emissions Measurement

4.9.1. Test Requirements

According to FCC Part15 Section 15.407(b) unwanted emission limits.
For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz.
Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:
a. 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;
b. 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
c. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
d. -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

4.9.2. Test Configuration



4.9.3. Test Procedure

According to KDB789033 D02 General UNII Test Procedures New Rules v02.r01 Section G: Unwanted Emission Measurement

1. Unwanted Emissions in the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”
b) At frequencies below 1000 MHz, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements below 1000 MHz.”
c) At frequencies above 1000 MHz, measurements performed using the peak and average measurement procedures described in sections II.G.5. and II.G.6, respectively, must satisfy the respective peak and average limits. If all peak measurements satisfy the average limit, then average measurements are not required.
d) For conducted measurements above 1000 MHz, EIRP shall be computed as specified in section II.G.3.b) and then field strength shall be computed as follows (see KDB Publication 412172):
i) E[dBμV/m] = EIRP[dBm] - 20 log (d[meters]) + 104.77, where E = field strength and d = distance at which field strength limit is specified in the rules;
ii) E[dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters
e) For conducted measurements below 1000 MHz, the field strength shall be computed as

specified in d), above, and then an additional 4.7 dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30 MHz and 1000 MHz, or an additional 6 dB shall be added for frequencies below 30 MHz.

2. Unwanted Emissions that fall Outside of the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b) At frequencies below 1000 MHz, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements below 1000 MHz.”

c) At frequencies above 1000 MHz, use the procedure for maximum emissions described in section II.G.5., “Procedure for Unwanted Maximum Unwanted Emissions Measurements Above 1000 MHz.”

d) Section 15.407(b) (1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz dBm/MHz peak emission limit.

i) Section 15.407(b) (4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b) (4) (i). An alternative to the band emissions mask is specified in Section 15.407(b) (4) (ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the alternative limit.

e) If radiated measurements are performed, field strength is then converted to EIRP as follows:

i) EIRP = ((E×d) ^2) / 30

Where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotopically radiated power in watts;

ii) Working in dB units, the above equation is equivalent to:

EIRP [dBm] = E [dBµV/m] + 20 log (d [meters]) - 104.77

iii) Or, if d is 3 meters:

EIRP [dBm] = E [dBµV/m] - 95.23

3) Radiated versus Conducted Measurements.

The unwanted emission limits in both the restricted and non-restricted bands are based on radiated measurements; however, as an alternative, antenna-port conducted measurements in conjunction with cabinet emissions tests will be permitted to demonstrate compliance provided that the following steps are performed:

(i) Cabinet emissions measurements. A radiated test shall be performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna may be replaced by a termination matching the nominal impedance of the antenna.

(ii) Impedance matching. Conducted tests shall be performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.

(iii) EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.[3] However, for devices that operate in multiple bands using the same transmit antenna, the highest gain of the antenna within the operating band nearest to the out-of-band frequency being measured may be used in lieu of the overall highest gain when measuring emissions at frequencies within 20% of the absolute frequency at the nearest edge of that band, but in no case shall a value less than 2 dBi be selected.

(iv) EIRP adjustments for multiple outputs. For devices with multiple outputs occupying the same or overlapping frequency ranges in the same band (e.g., MIMO or beamforming devices), compute the total EIRP as follows:

- Compute EIRP for each output, as described in (iii), above.
- Follow the procedures specified in KDB Publication 662911 for summing

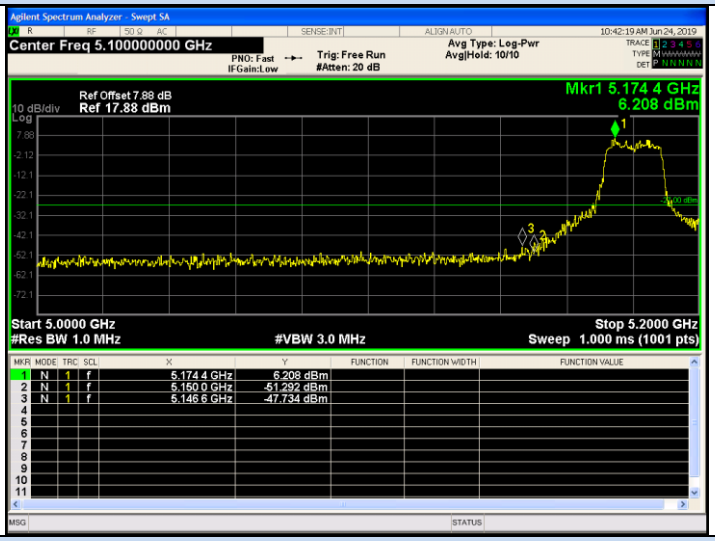
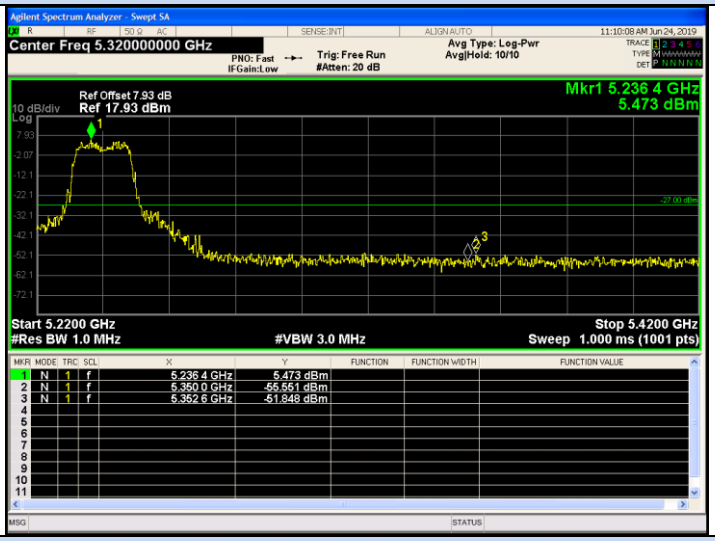
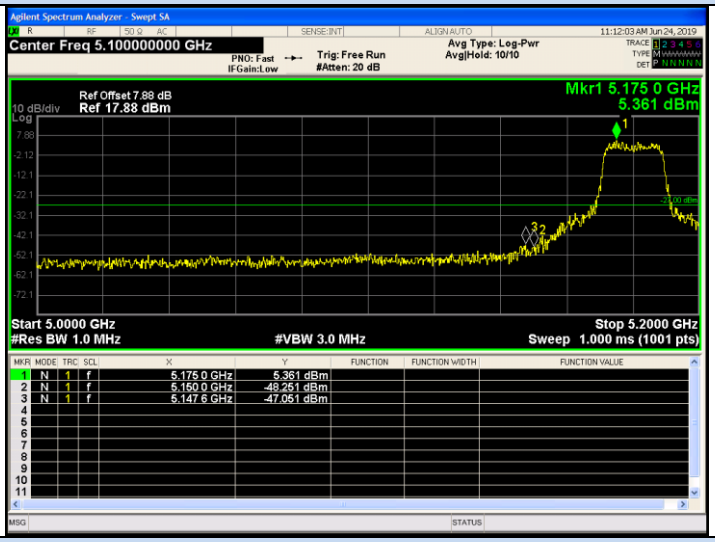
emissions across the outputs or adjusting emission levels measured on individual outputs by 10 log (N_{ANT}), where N_{ANT} is the number of outputs.

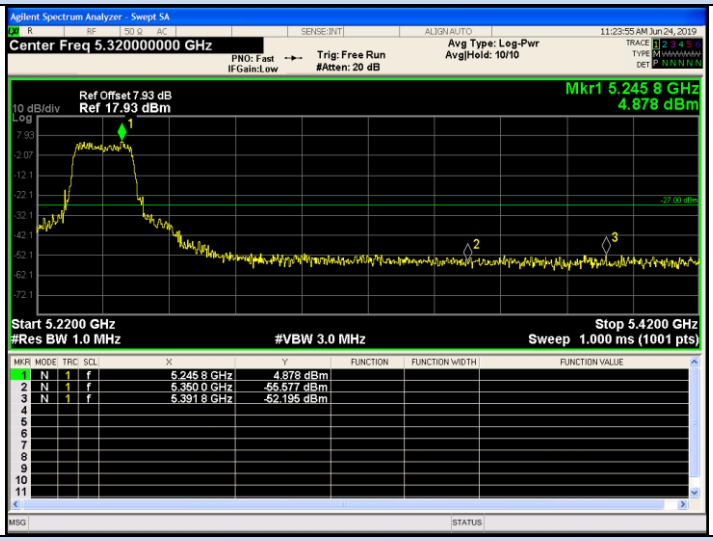
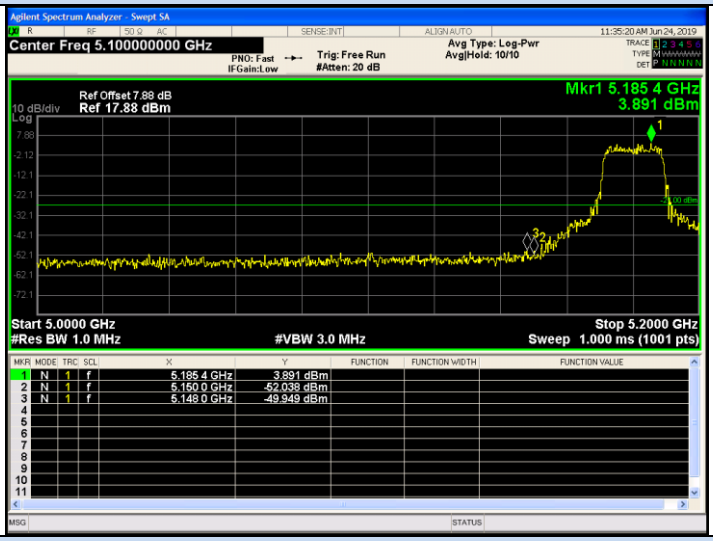
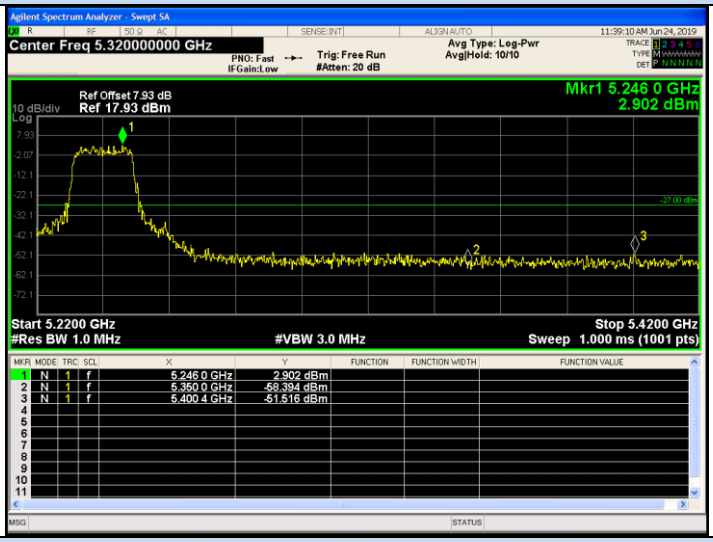
- Add the array gain term specified in KDB Publication 662911 for out-of-band and spurious signals.

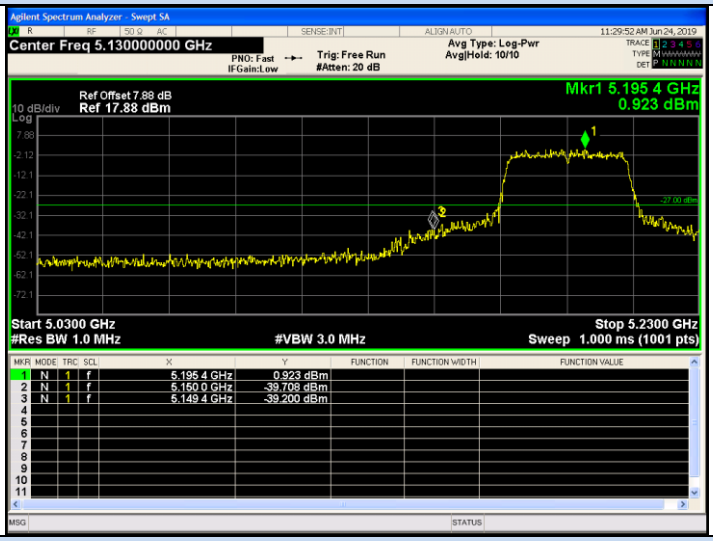
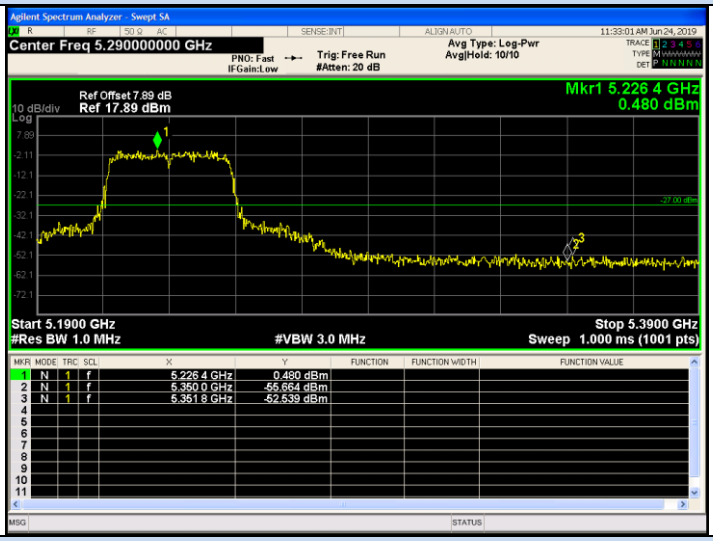
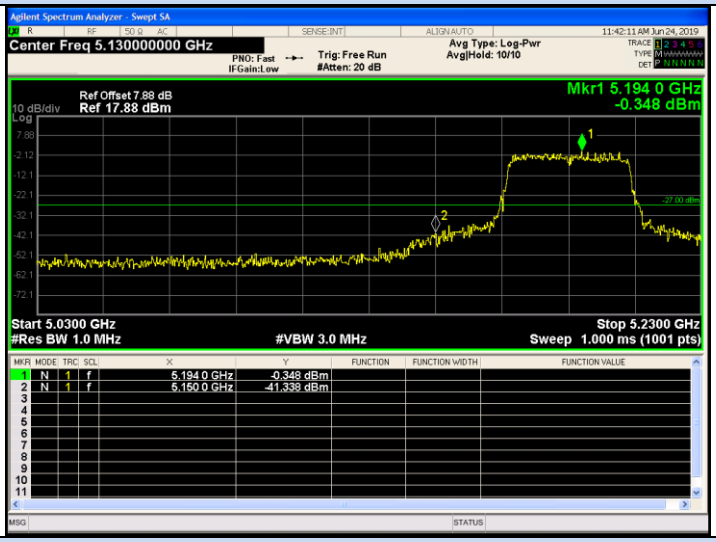
(v) Direction of maximum emission.

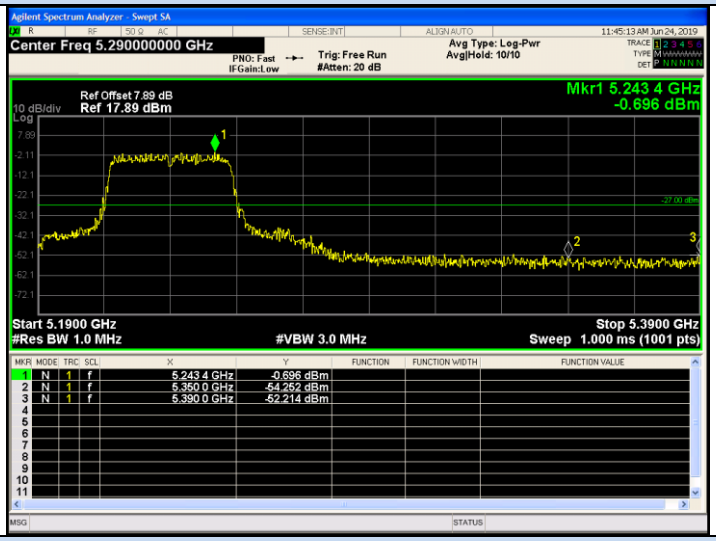
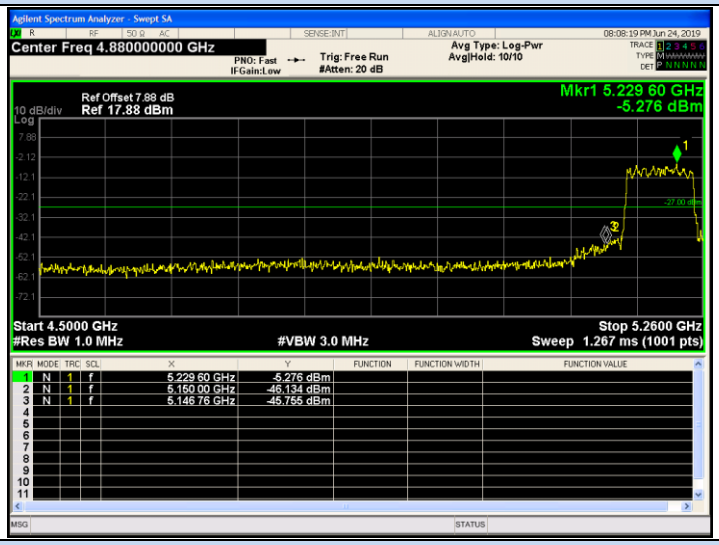
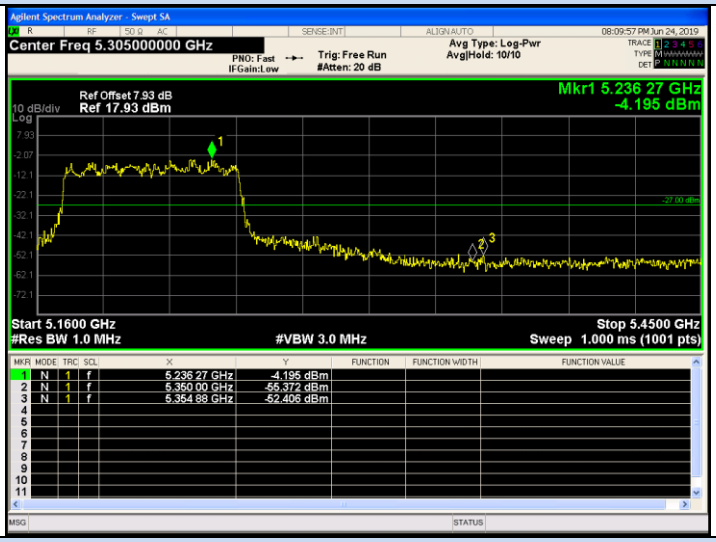
For all radiated emissions tests, measurements shall correspond to the direction of maximum emission level for each measured emission (see ANSI C63.10 for guidance).

Test Results of 5.2G

IEEE 802.11a

Channel 36 / 5180 MHz - Peak

Channel 48 / 5240 MHz - Peak
IEEE 802.11n HT20

Channel 36 / 5180 MHz - Peak

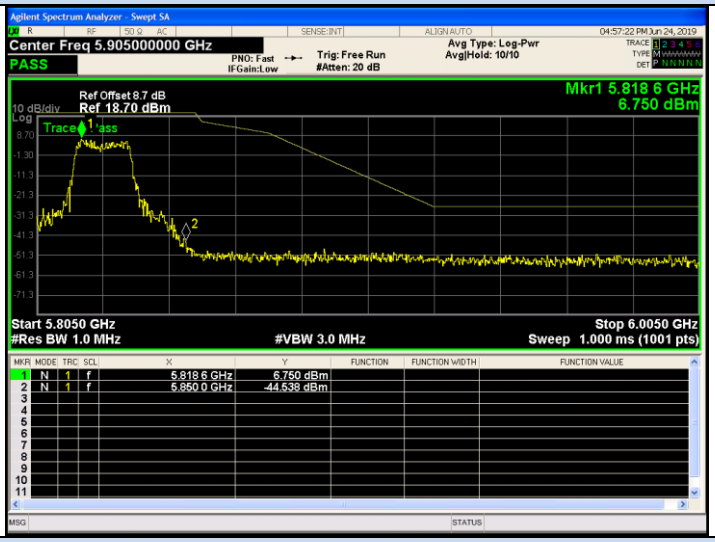
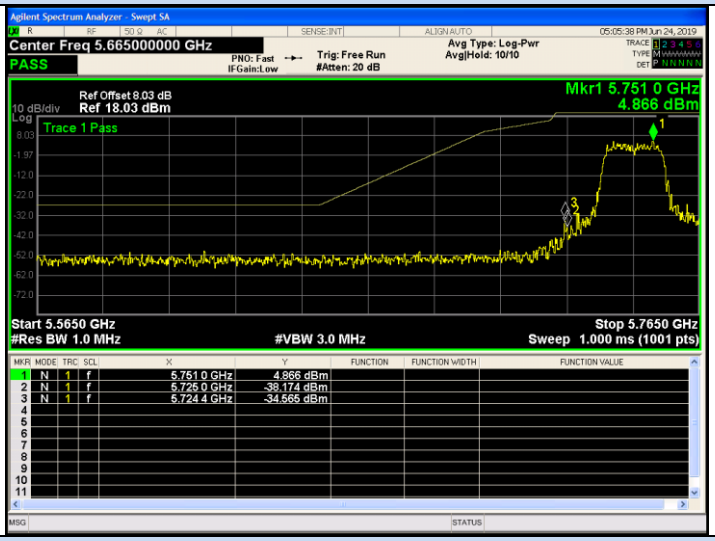
IEEE 802.11n HT20

Channel 48 / 5240 MHz - Peak
IEEE 802.11ac VHT20

Channel 36 / 5180 MHz - Peak

Channel 48 / 5240 MHz - Peak

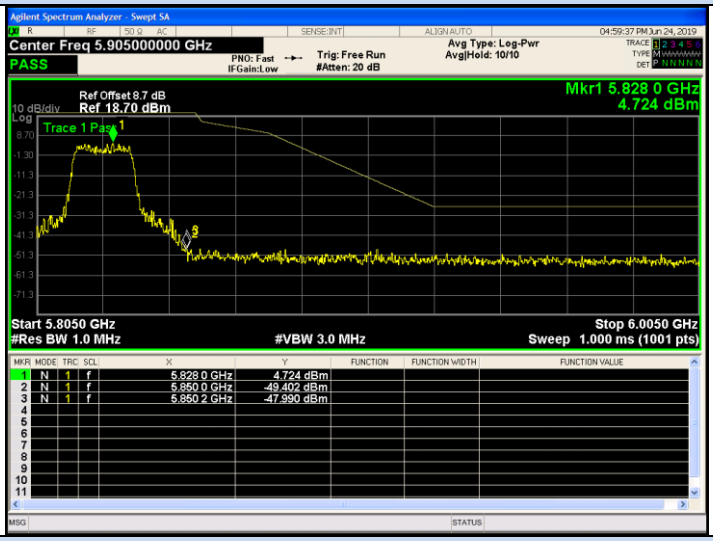
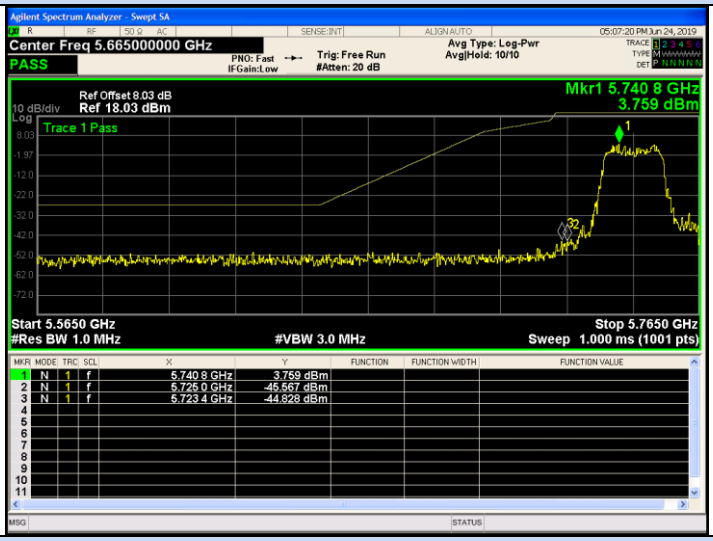
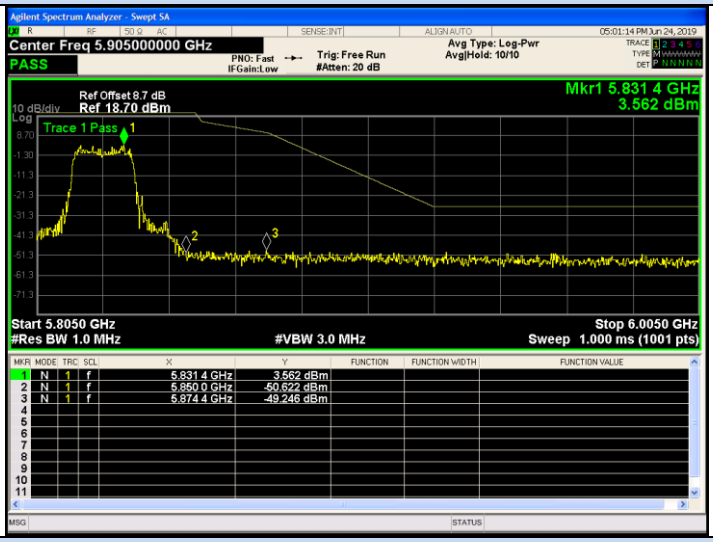
IEEE 802.11n HT40

Channel 38 / 5190 MHz - Peak

Channel 46 / 5230 MHz - Peak
IEEE 802.11ac VHT40

Channel 38 / 5190 MHz - Peak

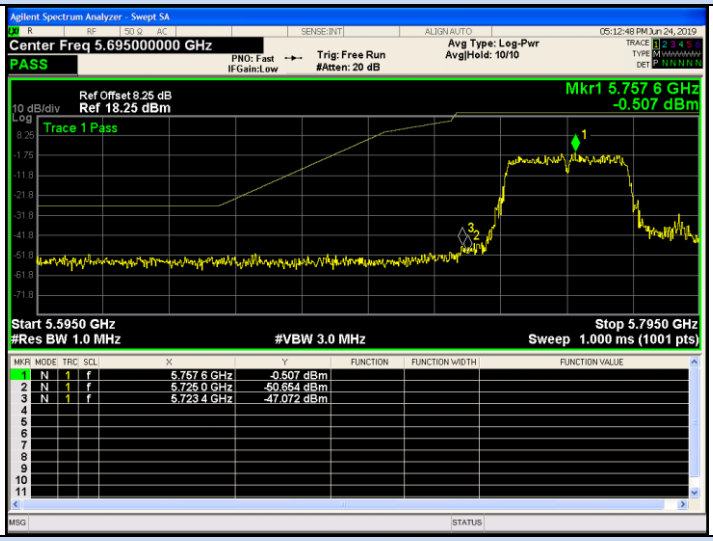
IEEE 802.11ac VHT40

Channel 46 / 5230 MHz - Peak
IEEE 802.11ac VHT80

Channel 42 / 5210 MHz - Peak

Channel 42/ 5210 MHz - Peak

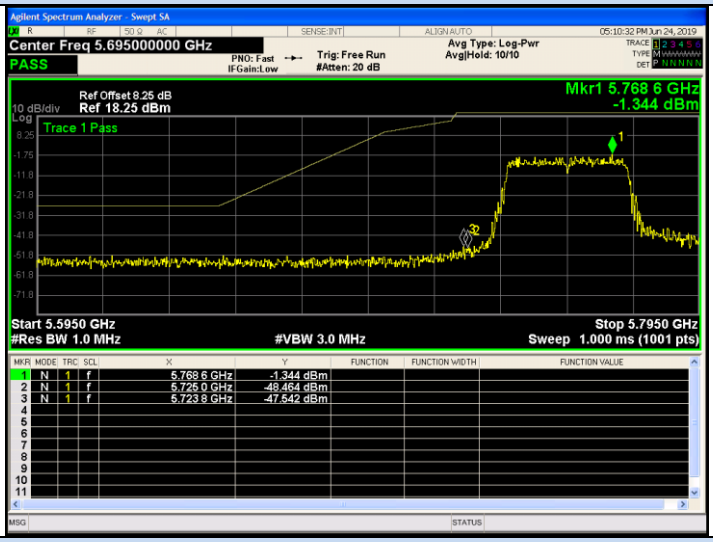
Test Results of 5.8G

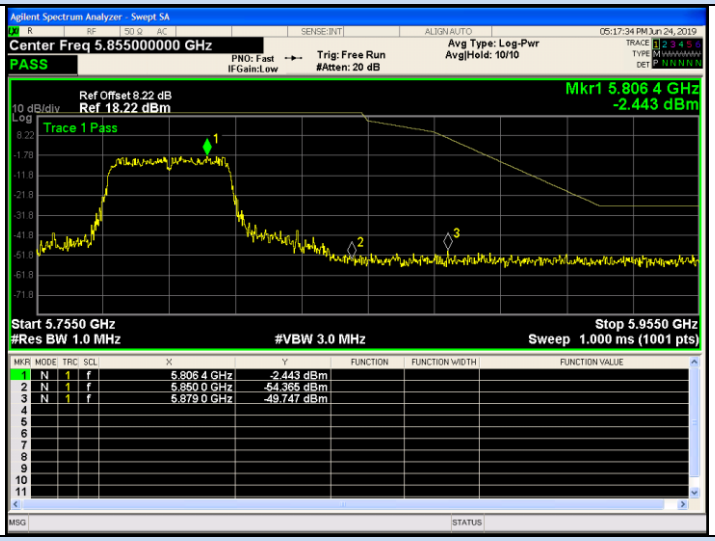
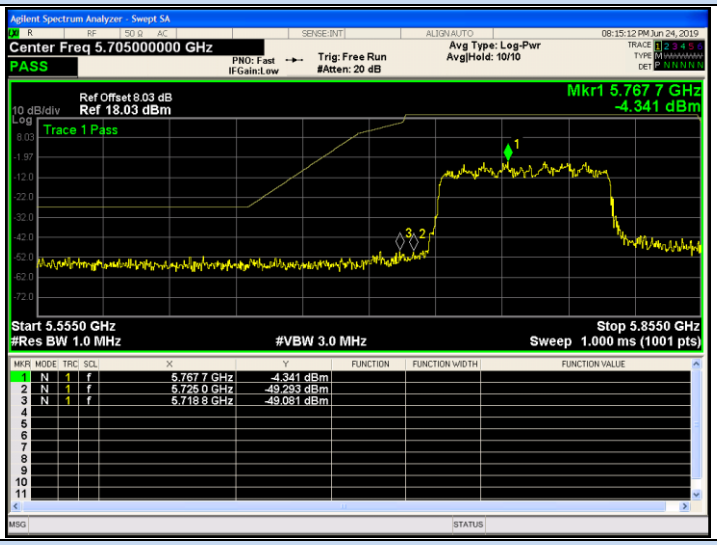
IEEE 802.11a

Channel 149 / 5745 MHz - Peak

Channel 165 / 5825 MHz - Peak
IEEE 802.11n HT20

Channel 149 / 5745 MHz - Peak

IEEE 802.11n HT20

Channel 165 / 5825 MHz - Peak
IEEE 802.11ac VHT20

Channel 149 / 5745 MHz - Peak

Channel 165 / 5825 MHz - Peak

IEEE 802.11n HT40

Channel 151 / 5755 MHz - Peak

Channel 159 / 5795 MHz - Peak
IEEE 802.11ac VHT40

Channel 151 / 5755 MHz - Peak

IEEE 802.11ac VHT40

Channel 159 / 5795 MHz - Peak
IEEE 802.11ac VHT80

Channel 155 / 5775 MHz - Peak

Channel 155 / 5775 MHz - Peak

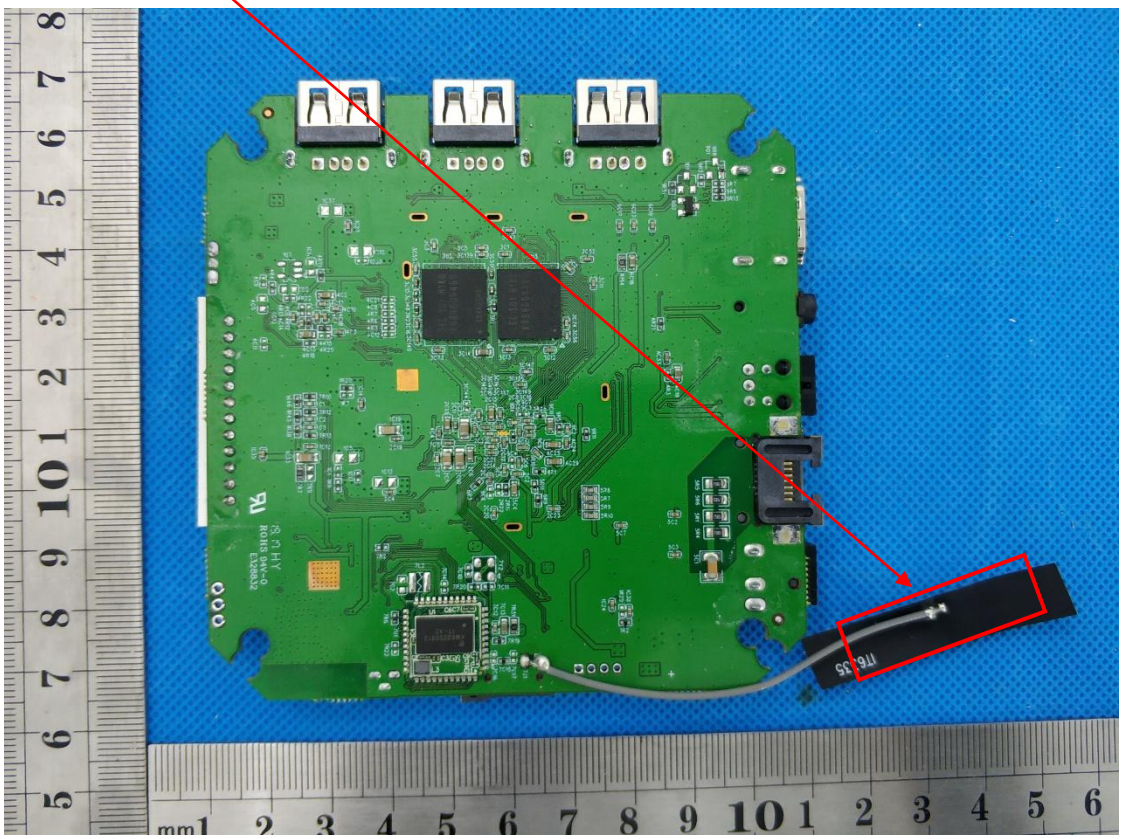
4.10. ANTENNA REQUIREMENT

Standard Applicable
For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

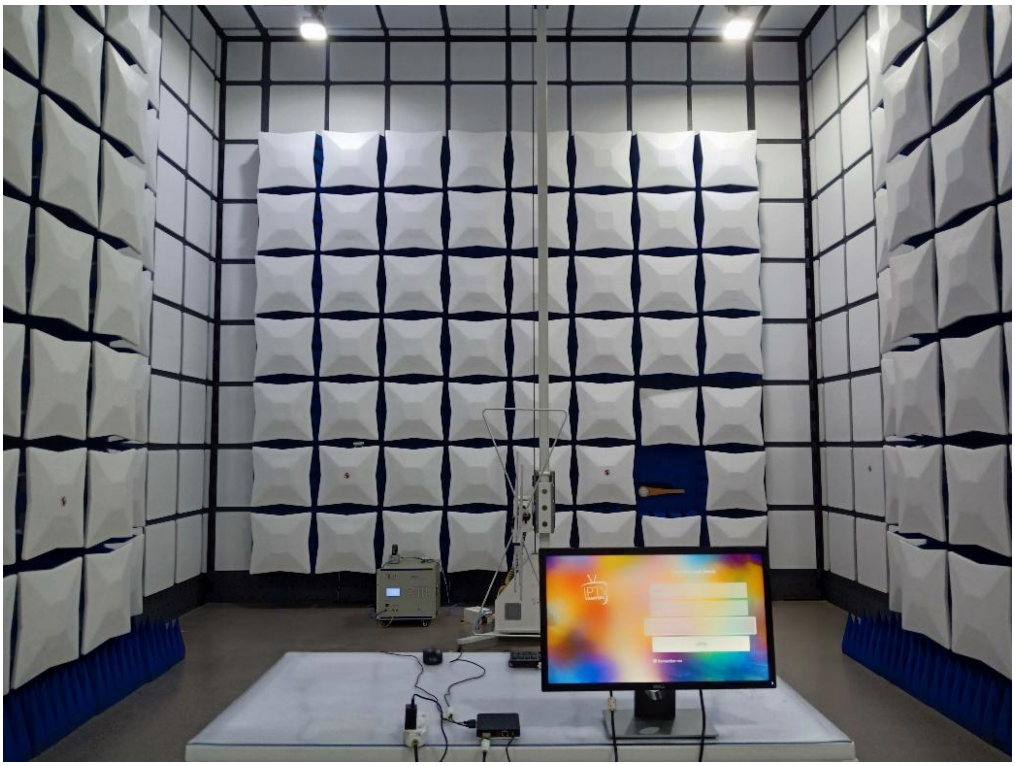
Antenna Connected Construction
The antenna used in this product is a Internal Antenna, The directional gains of antenna used for transmitting is 3dBi.

WIFI ANTENNA

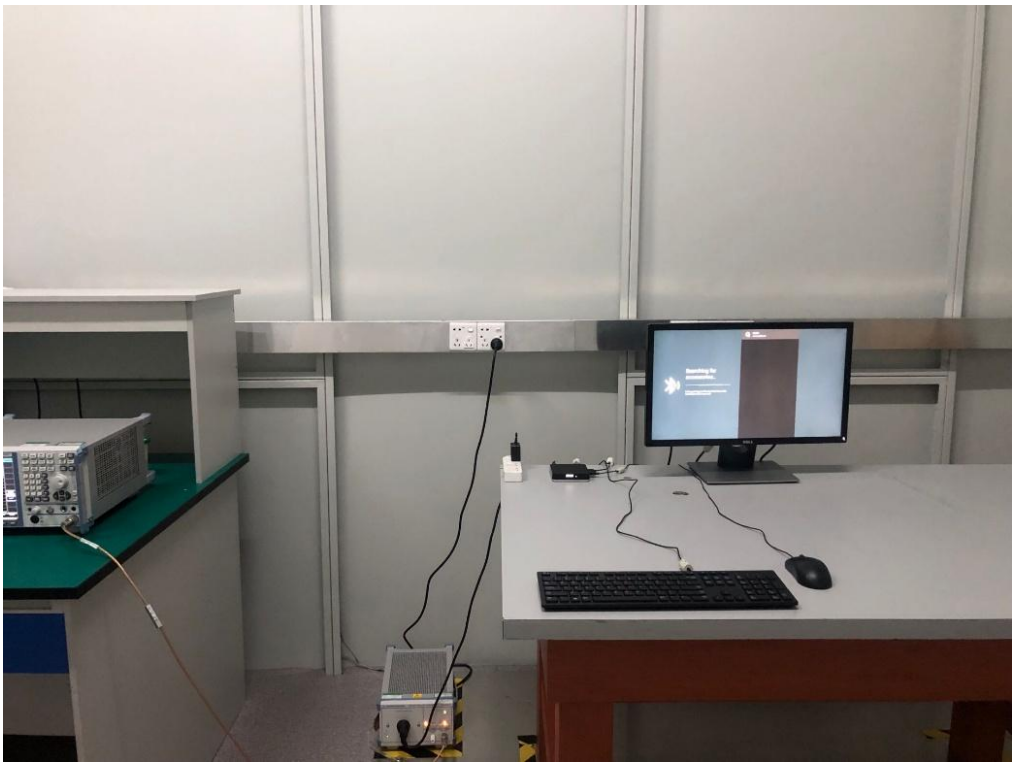


4.11. Photographs of Test Setup

Radiated Emission



Conducted Emission



The end