

**FCC RF TEST REPORT**  
**No. 170603051SHA-001**

Applicant : Alcatel-Lucent Shanghai Bell Co.,Ltd.  
388-389#, Ningqiao Road, Pudong Jinqiao, Shanghai, China

Manufacturer : Alcatel-Lucent Shanghai Bell Co.,Ltd.  
388-389#, Ningqiao Road, Pudong Jinqiao, Shanghai, China

Product Name : Digital Home CPE

Type/Model : A-240Z-A

EMA Code : 3FE 46615 AAAA

**TEST RESULT : PASS**

**SUMMARY**

The equipment complies with the requirements according to the following standard(s) or specification:

**47CFR Part 15 (2016):** Radio Frequency Devices (Subpart E)

**ANSI C63.10 (2013):** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices


Date of issue: July 5, 2017

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## 1 GENERAL INFORMATION

### 1.1 Description of Client

Applicant : Alcatel-Lucent Shanghai Bell Co., Ltd.  
388-389#, Ningqiao Road, Pudong Jinqiao, Shanghai, China  
Manufacturer : Alcatel-Lucent Shanghai Bell Co., Ltd.  
388-389#, Ningqiao Road, Pudong Jinqiao, Shanghai, China

### 1.2 Identification of the EUT

Product Name : Digital Home CPE  
Type/model : A-240Z-A  
FCC ID : 2ADZRA240ZA

### 1.3 Technical Specification

Operation Frequency : 5250 ~ 5350MHz,  
Band : 5470 ~ 5725MHz  
Type of Modulation : OFDM(BPSK, QPSK, 16QAM, 64QAM, 256QAM)  
EUT Modes of Modulation : 802.11a, 802.11n/ac(HT20),  
802.11n/ac(HT40), 802.11ac(VHT80)  
Channel Number : For 5250 ~ 5350MHz Band: Channel 52 - 64;  
For 5470 ~ 5725MHz Band: Channel 100 - 144  
Description of EUT : The EUT is a digital home CPE, it support WIFI, ZigBee and Z-Wave, and there have only one model, we test it and listed the WIFI 5G band results in this report.  
Antenna : PCB antenna, 3dBi max Peak gain, FAF connector  
Rating : 100-240V, 50/60Hz  
Category of EUT : Class B  
EUT type :  Table top  
 Floor standing  
Sample received date : March 6, 2017  
Date of test : March 6, 2017 to April 18, 2017

## 2 TEST SPECIFICATIONS

### 2.1 Standards or specification

47CFR Part 15 (2016)  
ANSI C63.10 (2013)  
KDB 789033 D02 v01r04

### 2.2 Mode of operation during the test

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)	Mode	Lowest (MHz)	Middle (MHz)	Highest (MHz)
5250~5350MHz	802.11a	5260	5300	5320
	802.11n20	5260	5300	5320
	802.11n40	5270	/	5310
	802.11ac80	/	5290	/
5470~5725MHz	802.11a	5500	5600	5720
	802.11n20	5500	5600	5720
	802.11n40	5510	5590	5710
	802.11ac80	5530	5610	5690

#### MIMO Function Description:

Mode	Tx/Rx Function	Beamforming Function
802.11a	1Tx/1Rx	No
802.11n20	4Tx/4Rx	No
802.11n40	4Tx/4Rx	No
802.11ac80	4Tx/4Rx	No

**Data rate VS Power:**

The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases.

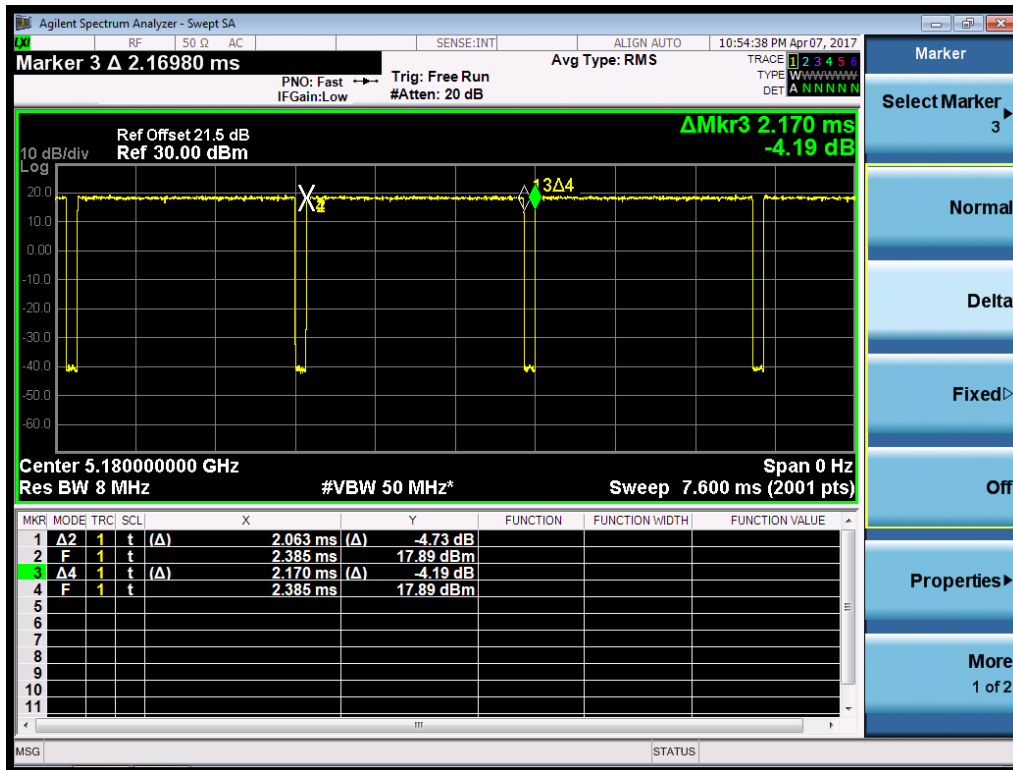
After this pre-scan, we choose the following table of the data rate as the worst case.

Frequency Band (MHz)	Mode	Worst case data rate
5250~5350	802.11a	6Mbps
	802.11n20	MCS24
	802.11n40	MCS24
	802.11ac80	MCS0NSS4
5500~5725	802.11a	6Mbps
	802.11n20	MCS24
	802.11n40	MCS24
	802.11ac80	MCS0NSS4

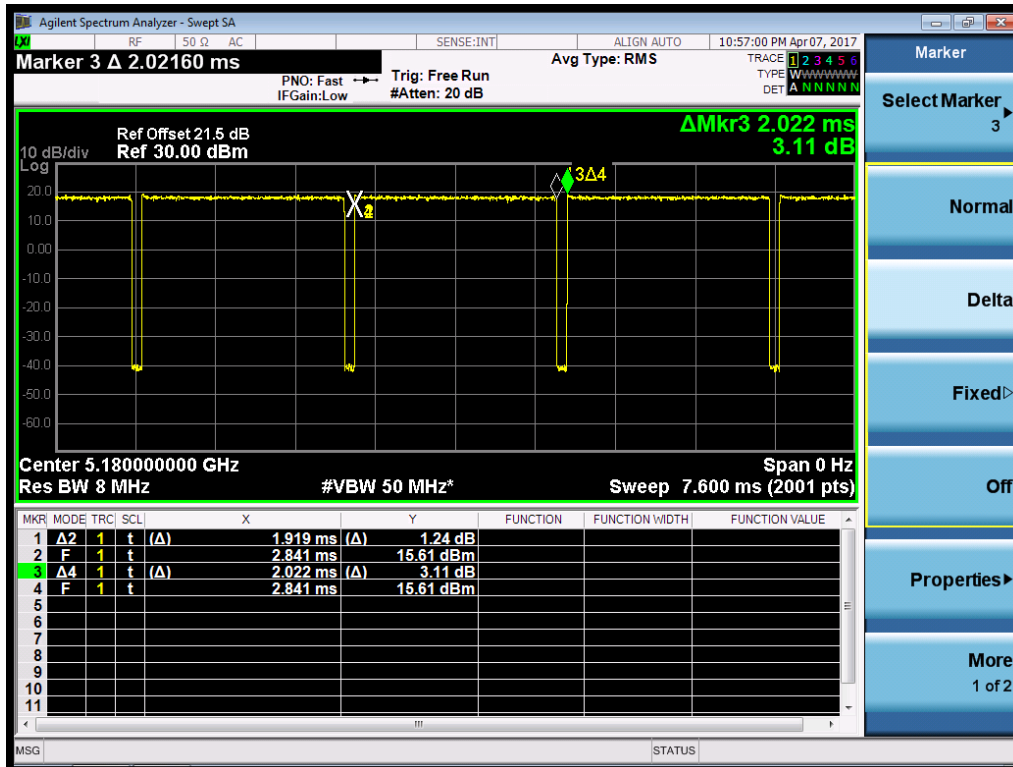
**Duty cycle:**

Mode	Duty cycle (%)	Duty cycle factor (dB)
802.11a	95.07	0.22
802.11n20	94.91	0.23
802.11n40	90.33	0.44
802.11ac80	84.37	0.74

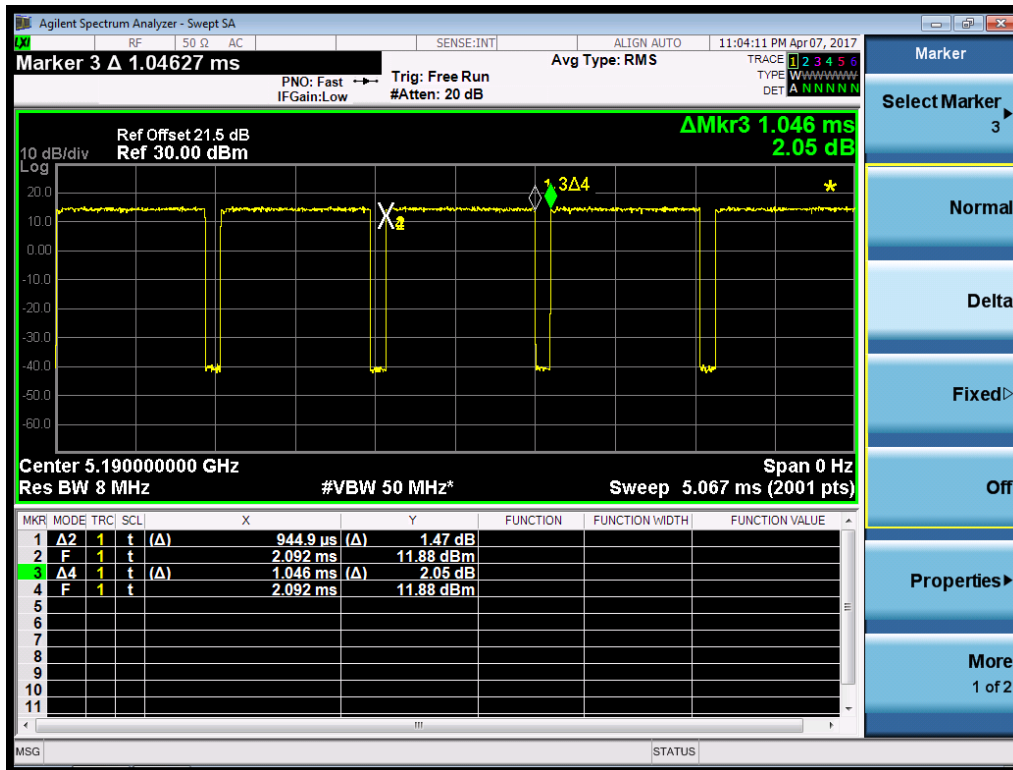
802.11a



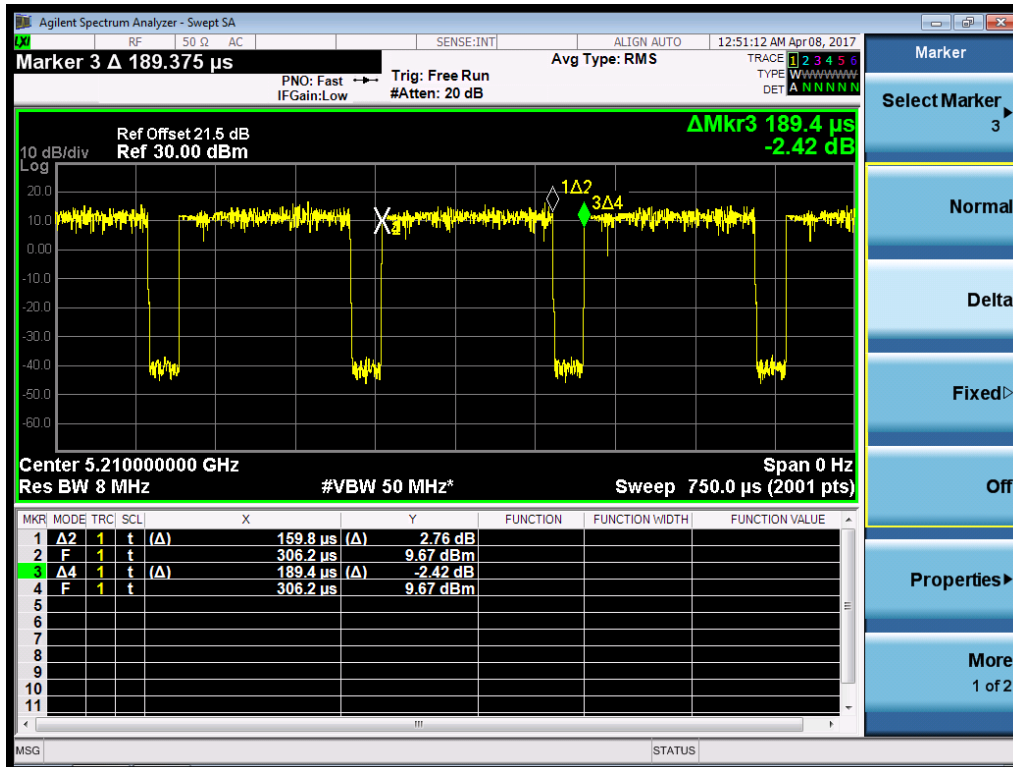
802.11n20



802.11n40



802.11ac80





### 2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

### 2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Laptop computer	HP ProBook 6470b	100-240V AC, 50/60Hz

### 2.5 Instrument list

Selected	Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
<input checked="" type="checkbox"/>	PXA Analyzer	N9030A	Agilent	EC5338	2017/3/3	2018/3/2
<input checked="" type="checkbox"/>	Vector SG	N5182B	Agilent	EC5175	2017/3/3	2018/3/2
<input checked="" type="checkbox"/>	Power sensor	U2021XA	Agilent	EC5338-1	2017/3/3	2018/3/2
<input checked="" type="checkbox"/>	MXG Analog SG	N5181A	Agilent	EC5338-2	2017/3/3	2018/3/2
<input checked="" type="checkbox"/>	Power meter	N1911A/N1921A	Agilent	EC4318	2016/5/18	2017/5/17
<input checked="" type="checkbox"/>	EMI Receiver	ESCS 30	R&S	EC 2107	2016/10/19	2017/10/18
<input checked="" type="checkbox"/>	A.M.N.	ESH2-Z5	R&S	EC 3119	2015/12/16	2017/12/15
<input checked="" type="checkbox"/>	I.S.N.	FCC-TLISN-T8-02	FCC	EC3756	2017/2/15	2018/2/14
<input checked="" type="checkbox"/>	EMI chamber	3m	Albatross	EC 3048	2016/9/10	2017/9/9
<input checked="" type="checkbox"/>	Test Receiver	ESIB 26	R&S	EC 3045	2016/10/19	2017/10/18
<input checked="" type="checkbox"/>	Test Receiver	ESCI 7	R&S	EC4501	2017/2/23	2018/2/22
<input checked="" type="checkbox"/>	Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2016/6/2	2017/6/1
<input checked="" type="checkbox"/>	Horn antenna	HF 906	R&S	EC 3049	2016/9/24	2017/9/23
<input checked="" type="checkbox"/>	Horn antenna	HAP18-26W	TOYO	EC 4792-3	2016/6/12	2017/6/11
<input checked="" type="checkbox"/>	Pre-amplifier	Pre-amp 18	R&S	EC 5262	2016/6/30	2017/6/29
<input checked="" type="checkbox"/>	Pre-amplifier	Tpa0118-40	R&S	EC 4792-2	2017/4/10	2018/4/9
<input checked="" type="checkbox"/>	Temp. chamber	SETH-Z-102U	ESPEC	EC 4315	2017/4/10	2018/4/9
<input checked="" type="checkbox"/>	Shielded room	-	Zhongyu	EC 2838	2017/1/8	2018/1/7

## 2.6 Test Summary

**This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.**

TEST ITEM	FCC REFERANCE	RESULT
Maximum Conducted Output Power	15.407(a)	Pass
Power spectral density	15.407(a)	Pass
Radiated emission	15.407 (b) 15.205, 15.209	Pass
Power line conducted emission	15.207	Pass
26 dB Bandwidth & Emission Bandwidth (99%)	15.403(i)	Tested

Notes: 1: NA =Not Applicable

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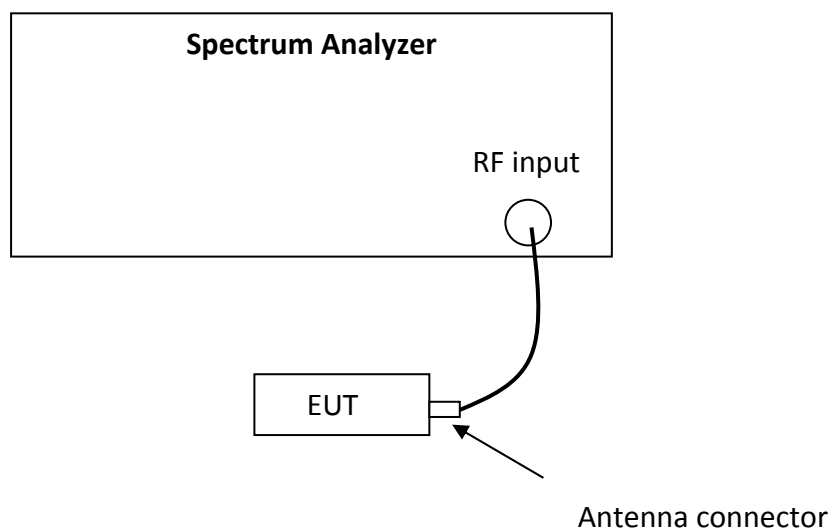
### 3 26 dB Bandwidth & Emission Bandwidth (99%)

Test Status: Tested

#### 3.1 Test limit

None

#### 3.2 Test Configuration



#### 3.3 Test procedure and test setup

The bandwidth was measured from the antenna port of the EUT according to the measurement method refer to KDB 789033D02: section C.

##### Emission Bandwidth (EBW)

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

## 99 Percent Occupied Bandwidth

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot$  RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

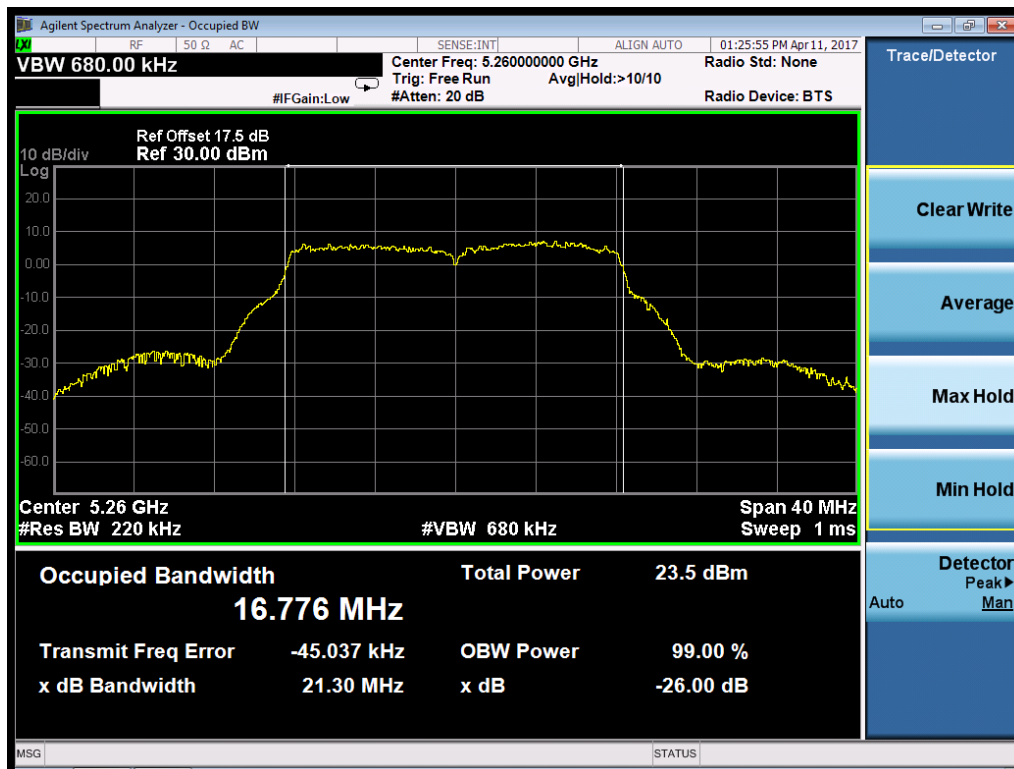
### 3.4 Test protocol

Temperature : 25 °C  
Relative Humidity : 55 %

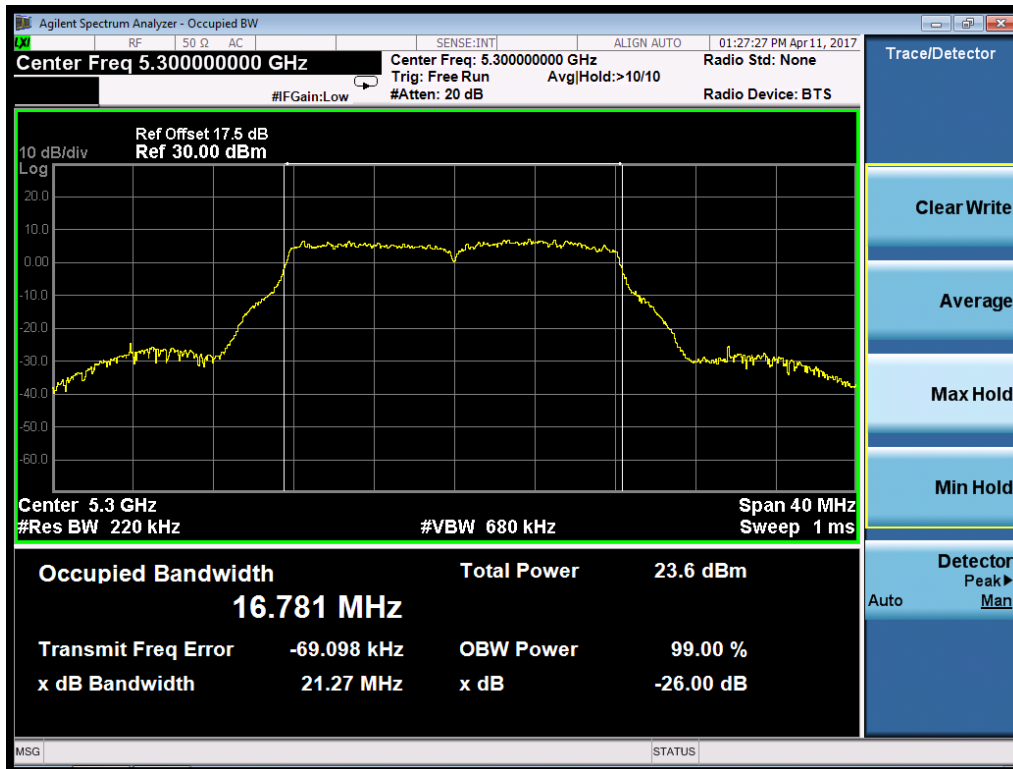
Frequency Band	Mode	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
U-NII 2A	802.11a	5260	21.30	16.776
		5300	21.27	16.781
		5320	21.38	16.756
	802.11n20	5260	21.62	17.859
		5300	21.41	17.909
		5320	21.50	17.899
	802.11n40	5270	41.26	36.358
		5310	39.90	36.314
	802.11ac80	5290	81.31	75.816

Test Plots:

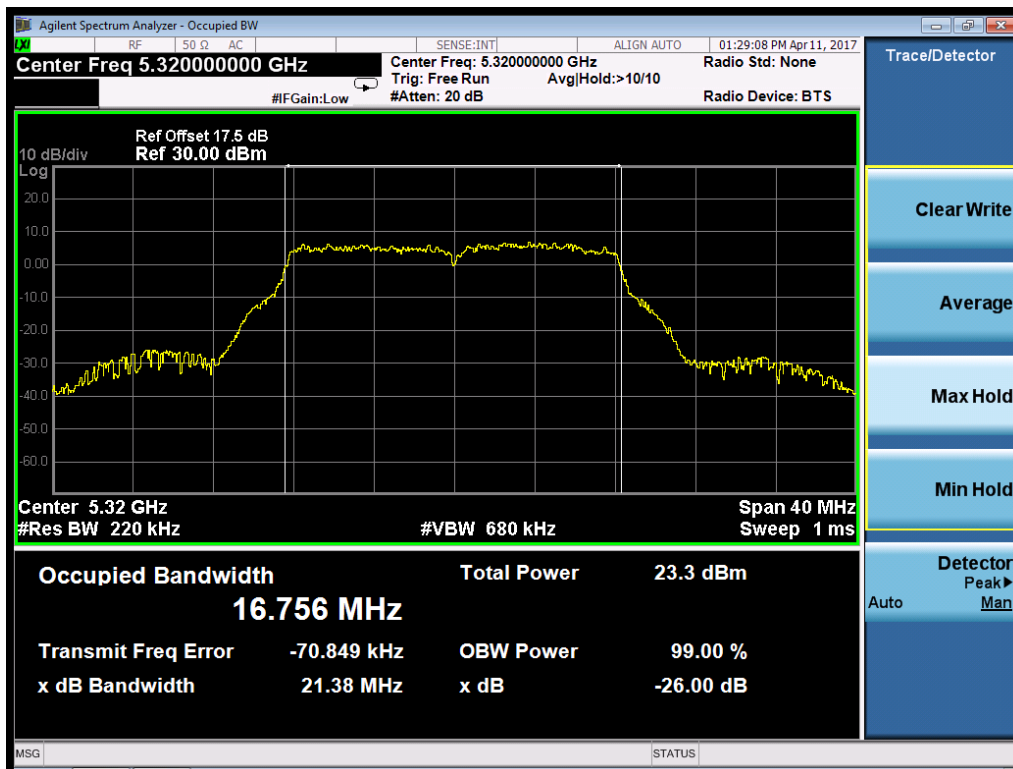
802.11a-5260MHz



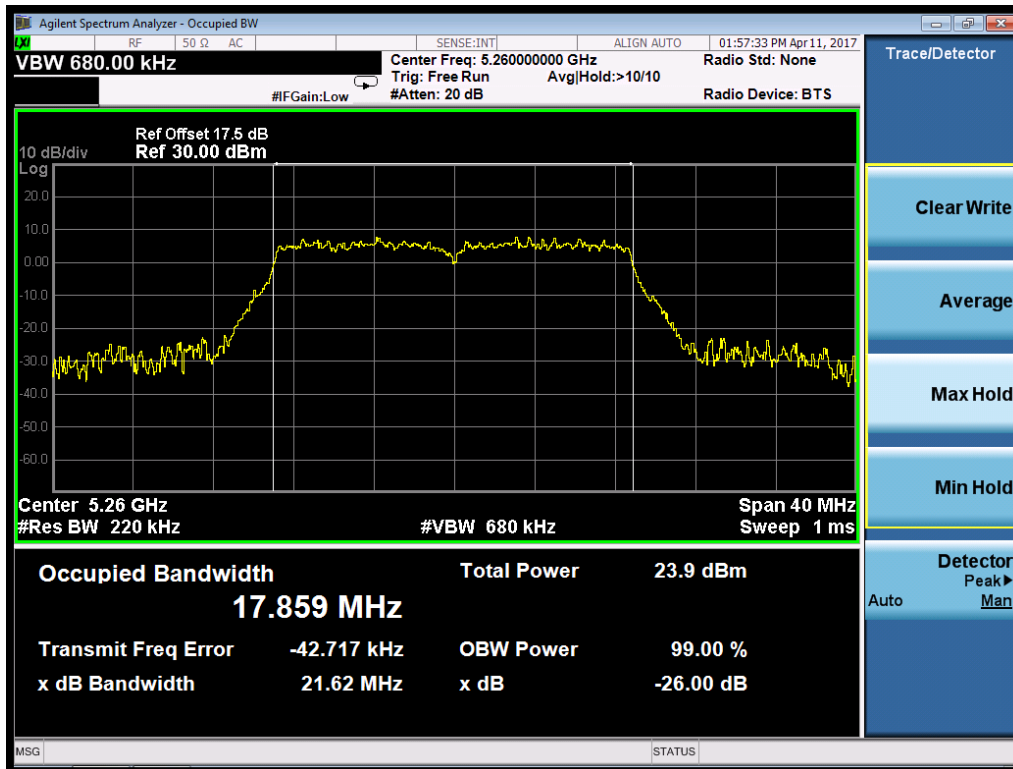
802.11a-5300MHz



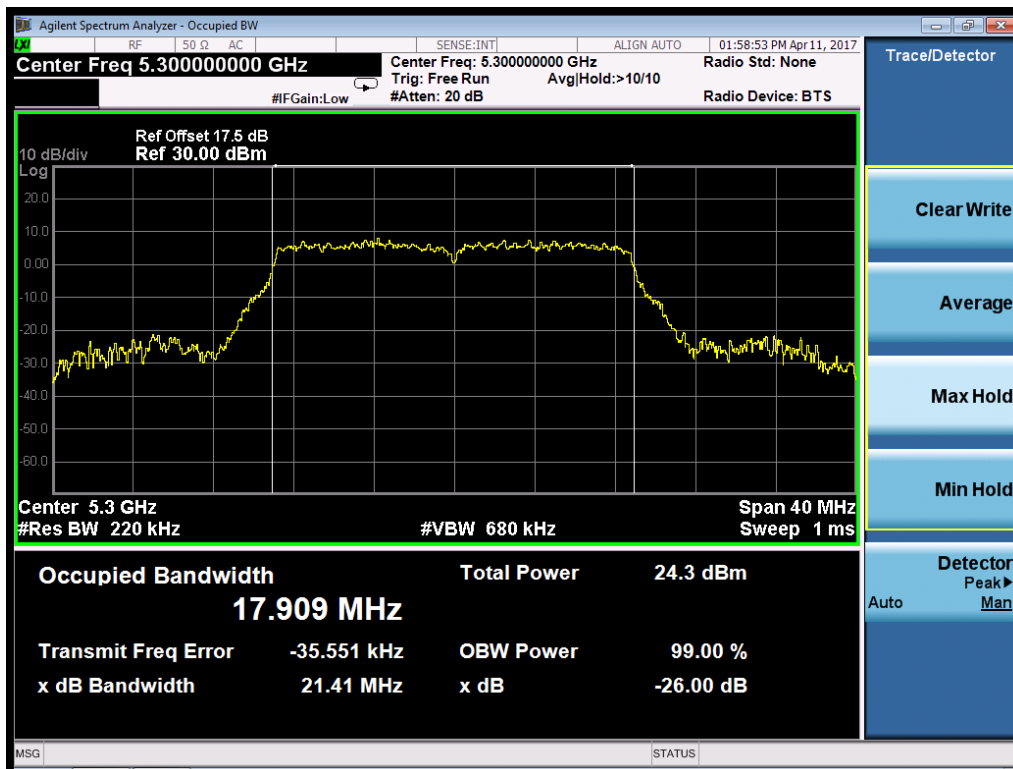
802.11a-5320MHz



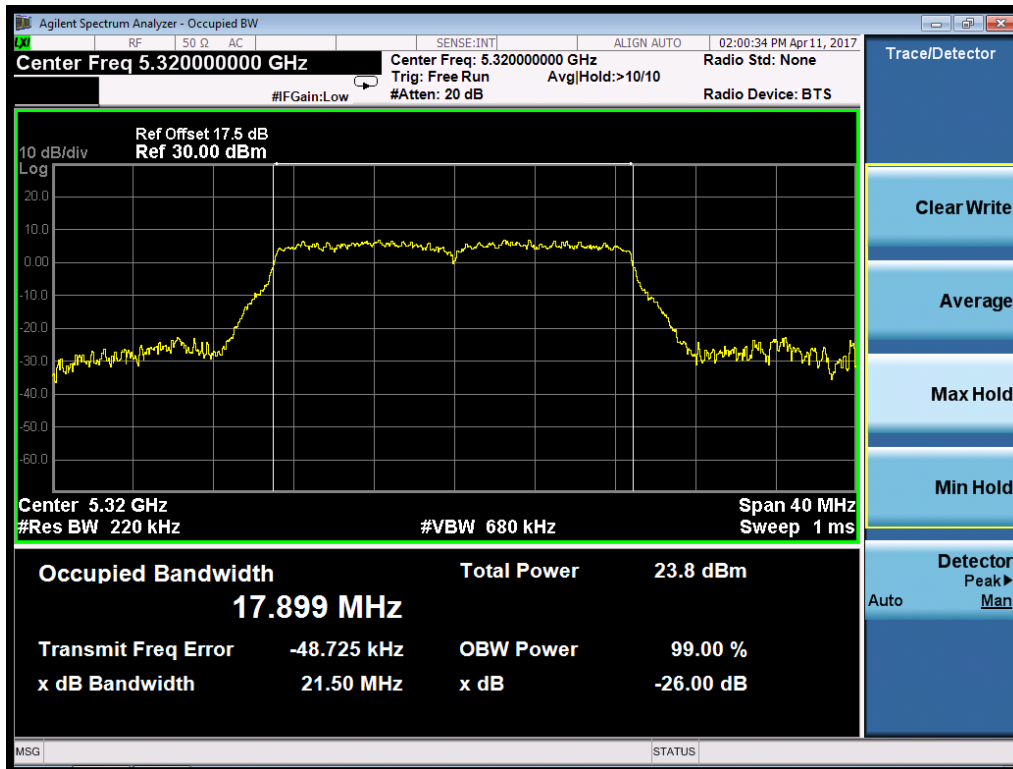
802.11n20-5260MHz



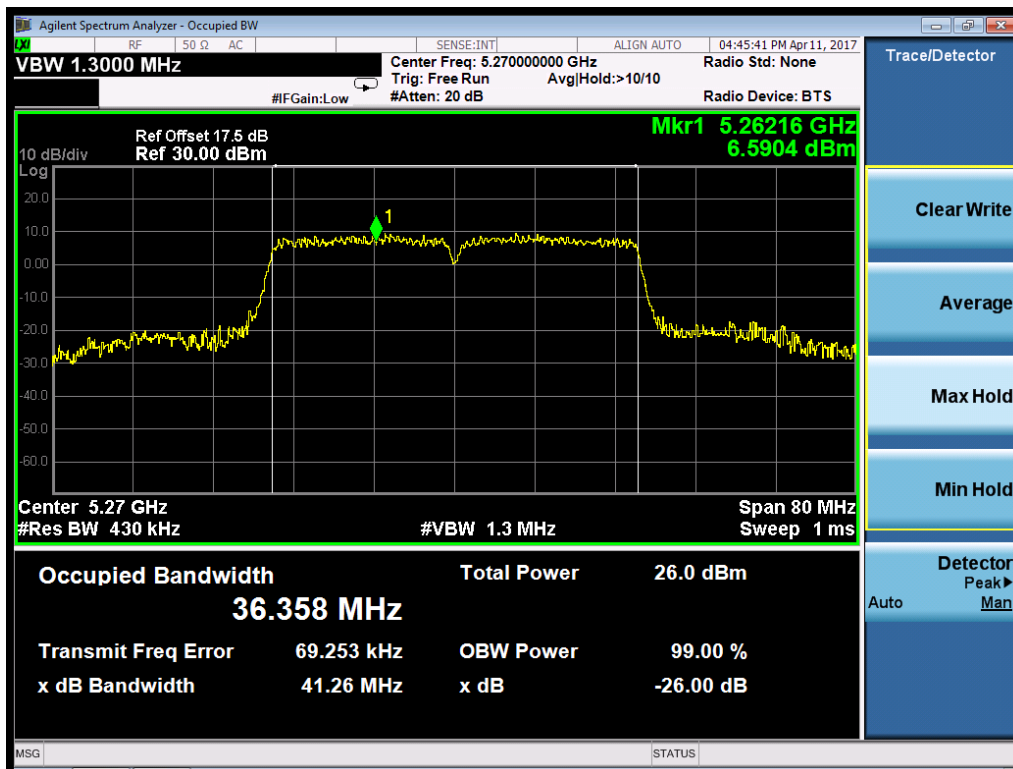
802.11n20-5300MHz



802.11n20-5320MHz

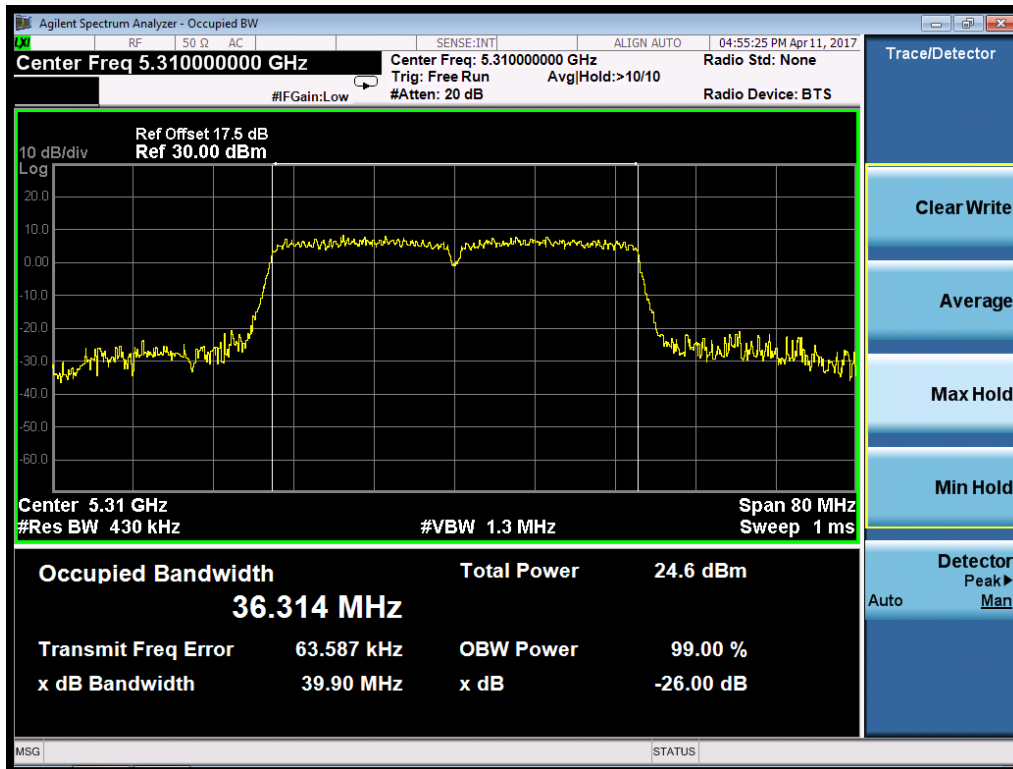


802.11n40-5270MHz

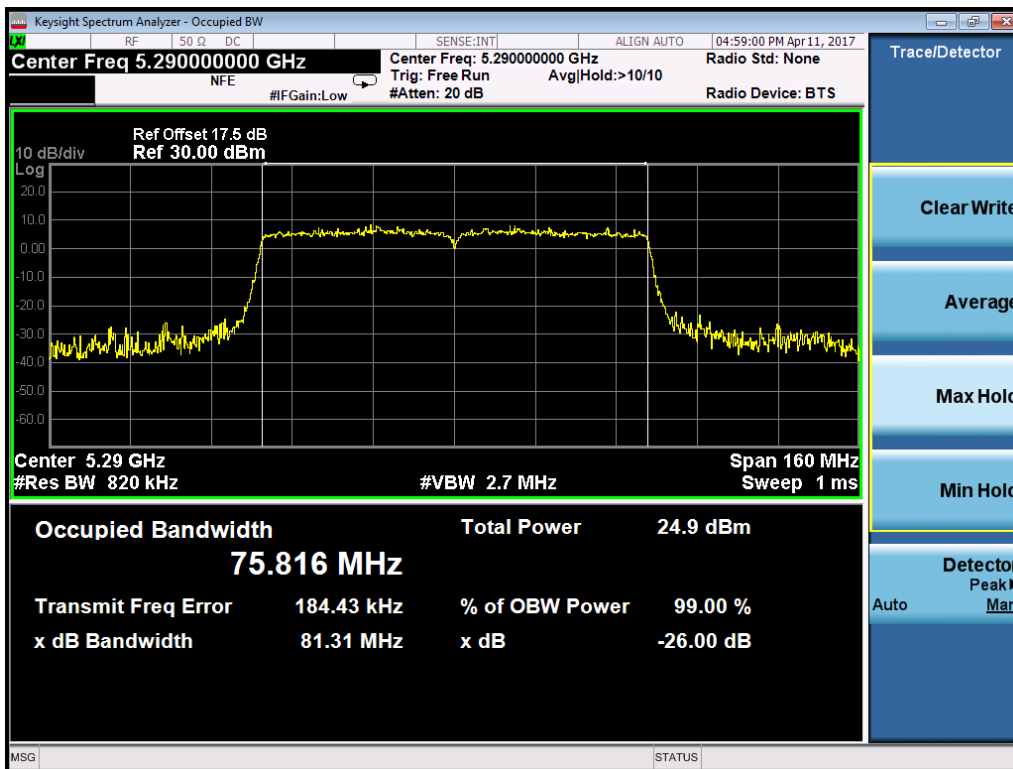




802.11n40-5310MHz



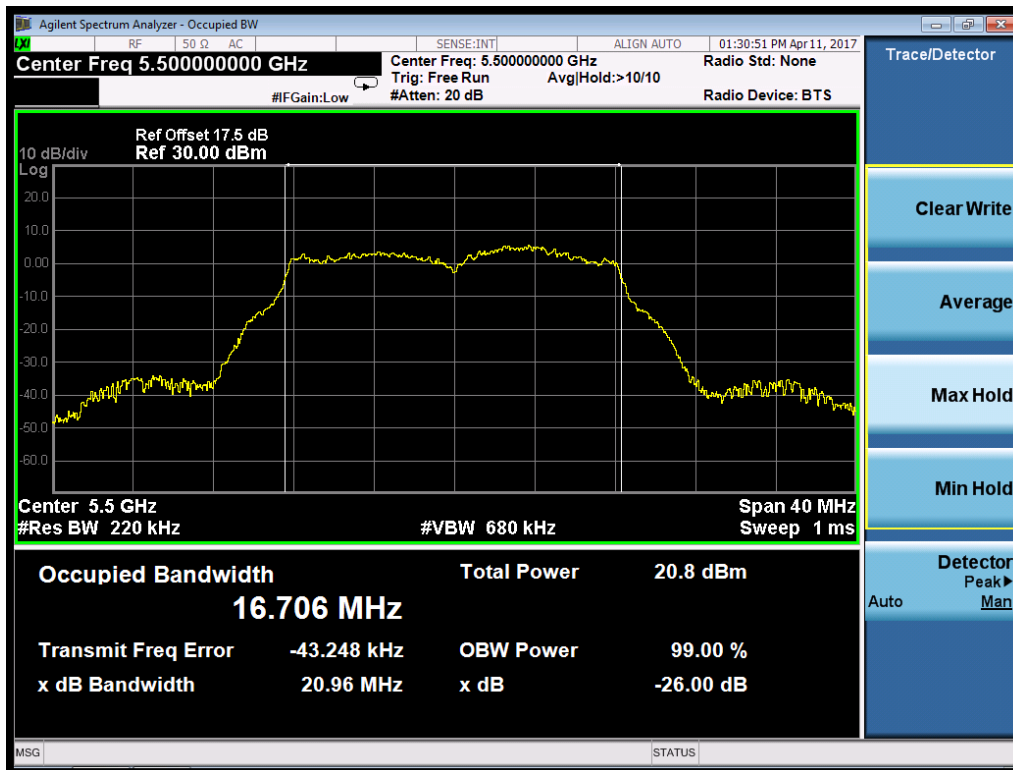
802.11ac80-5290MHz



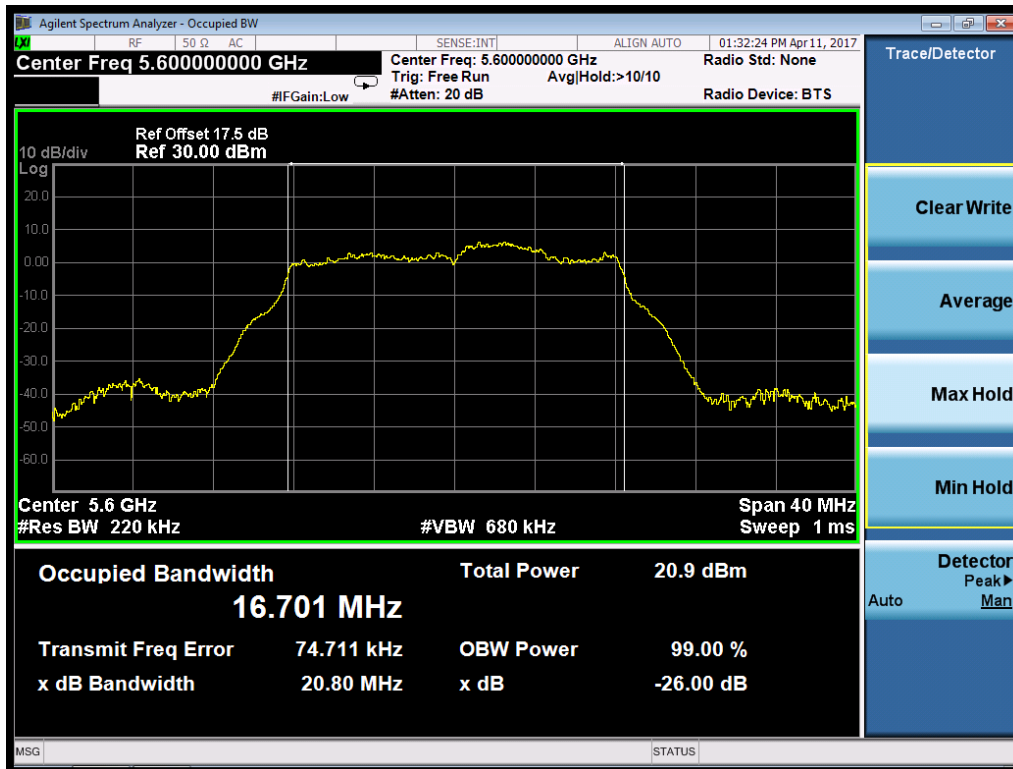
Frequency Band	Mode	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
U-NII 2C	802.11a	5500	20.96	16.706
		5600	20.80	16.701
		5720	21.76	16.988
	802.11n20	5500	21.52	17.845
		5600	21.24	17.773
		5720	20.89	15.871
	802.11n40	5510	39.80	36.314
		5590	38.99	36.149
		5710	39.23	31.658
	802.11ac80	5530	80.84	75.959
		5610	80.78	75.869
		5690	81.04	75.926

Test Plots:

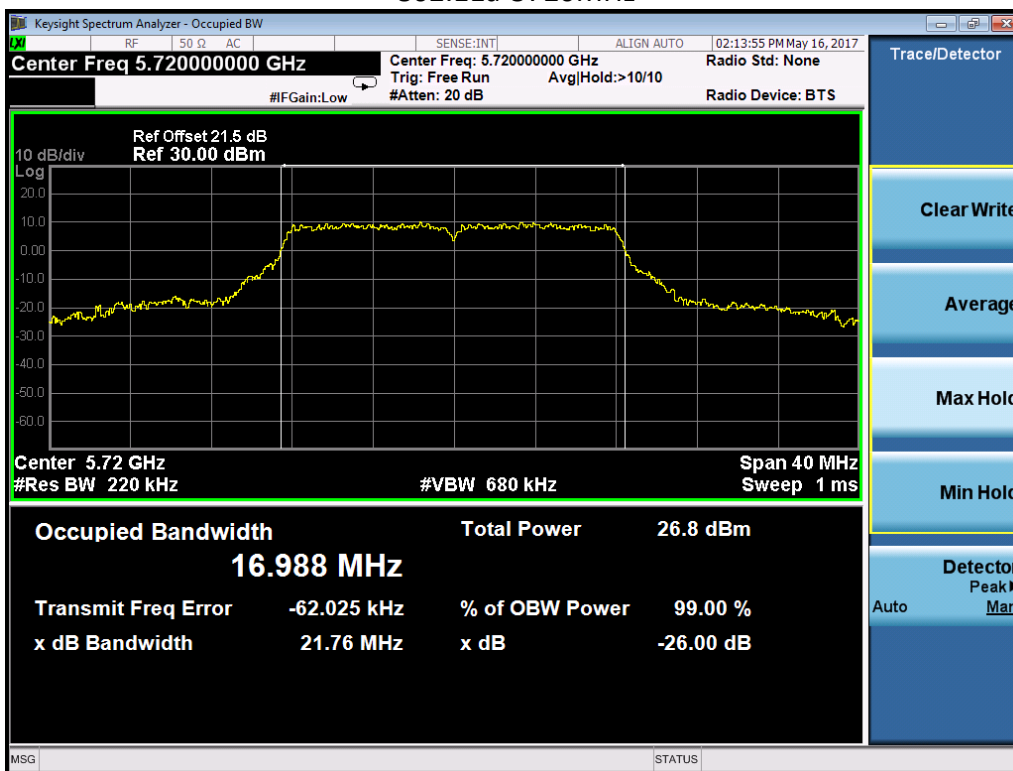
802.11a-5500MHz



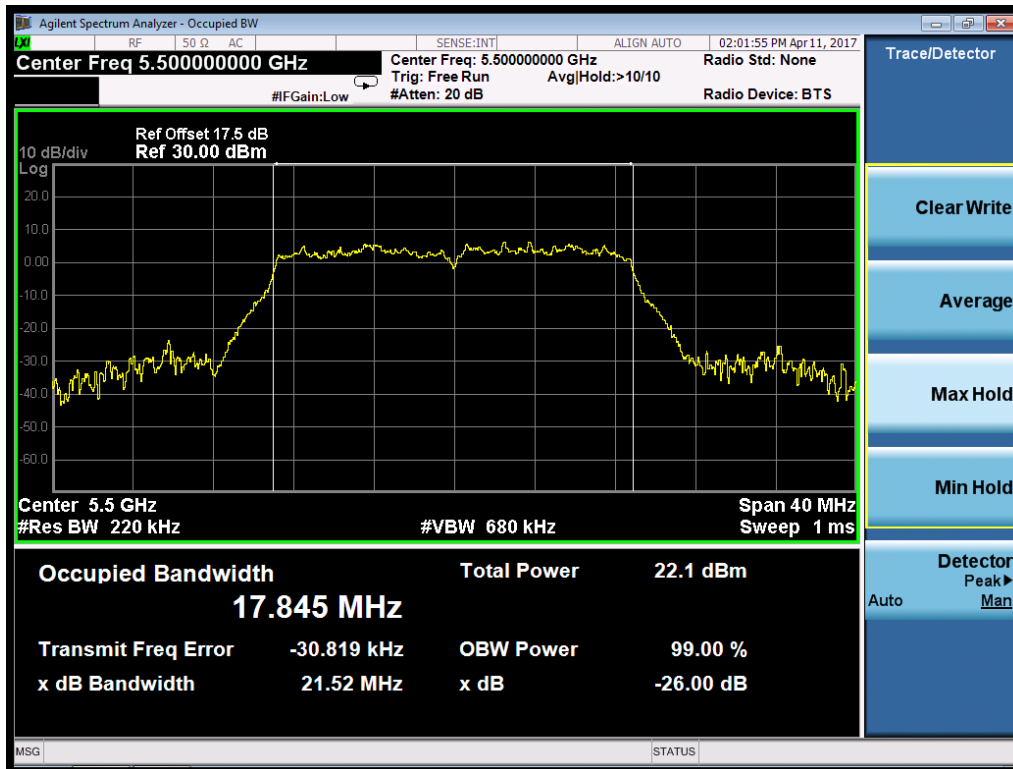
802.11a-5600MHz



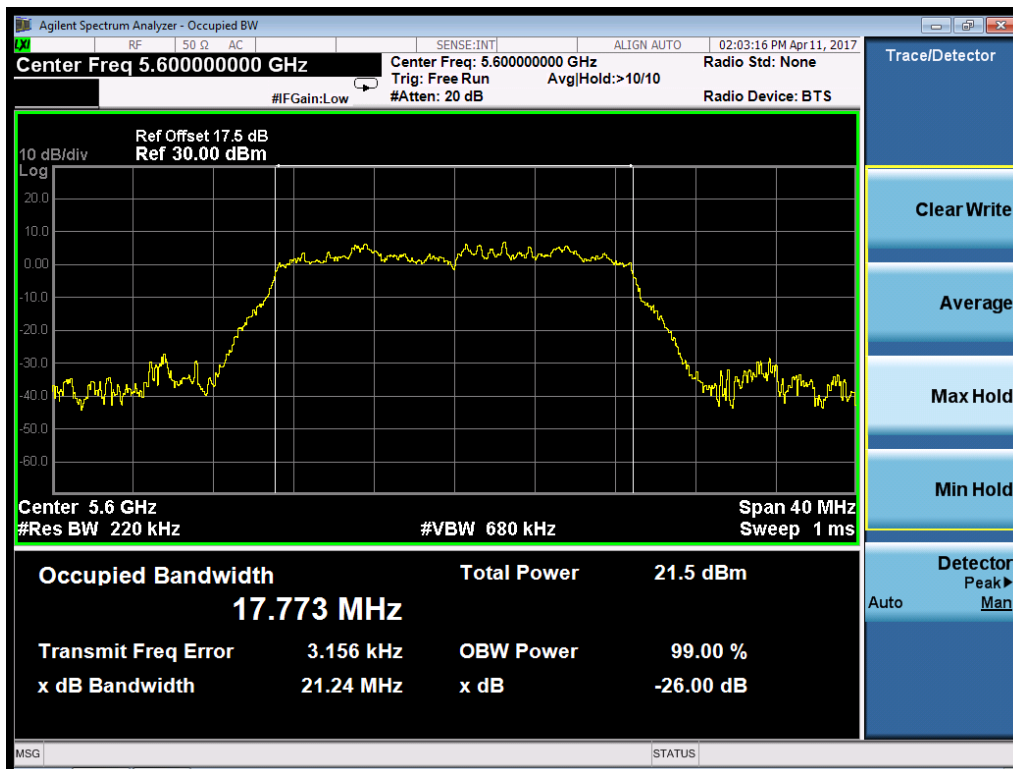
802.11a-5720MHz



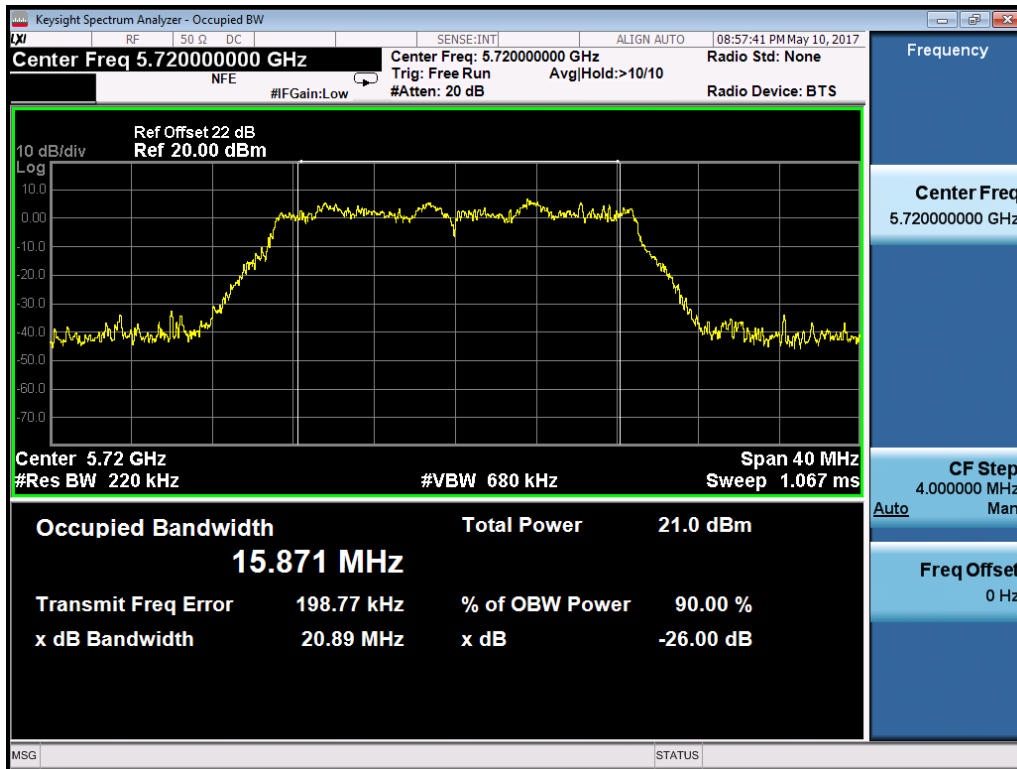
802.11n20-5500MHz



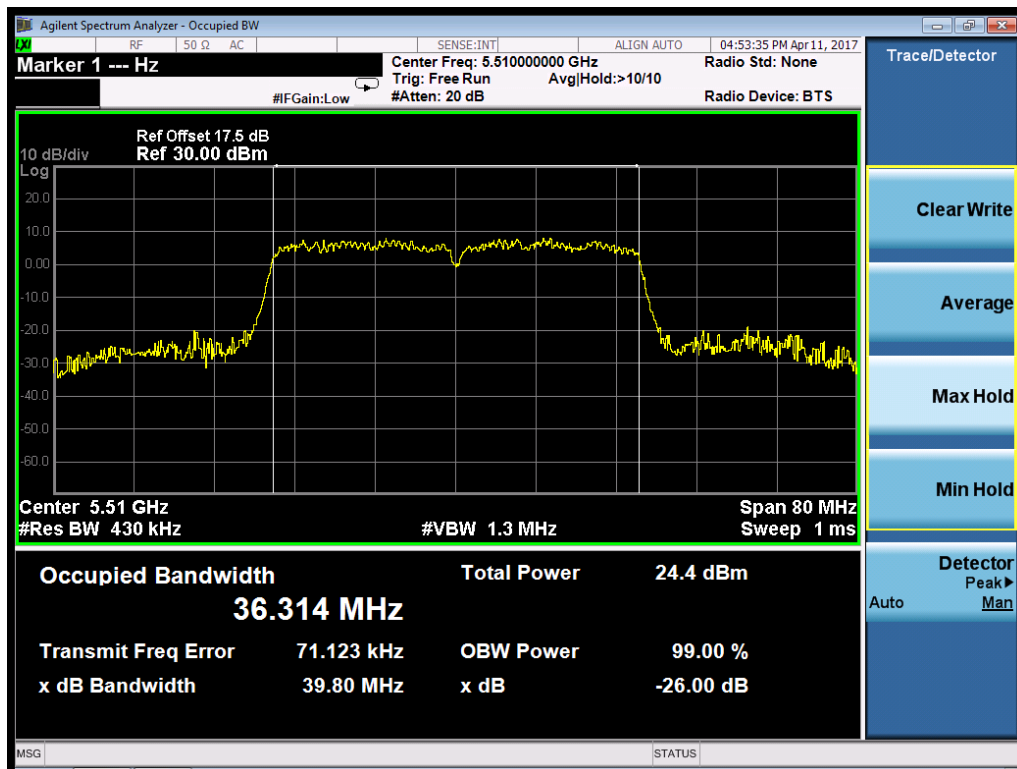
802.11n20-5600MHz



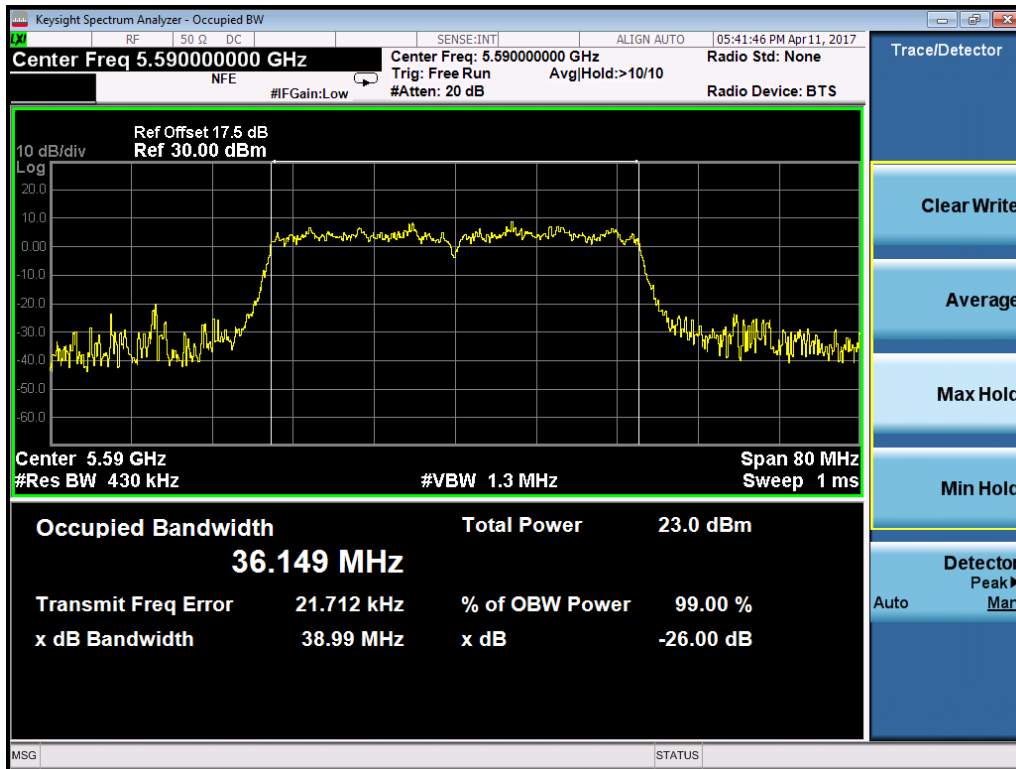
802.11n20-5720MHz



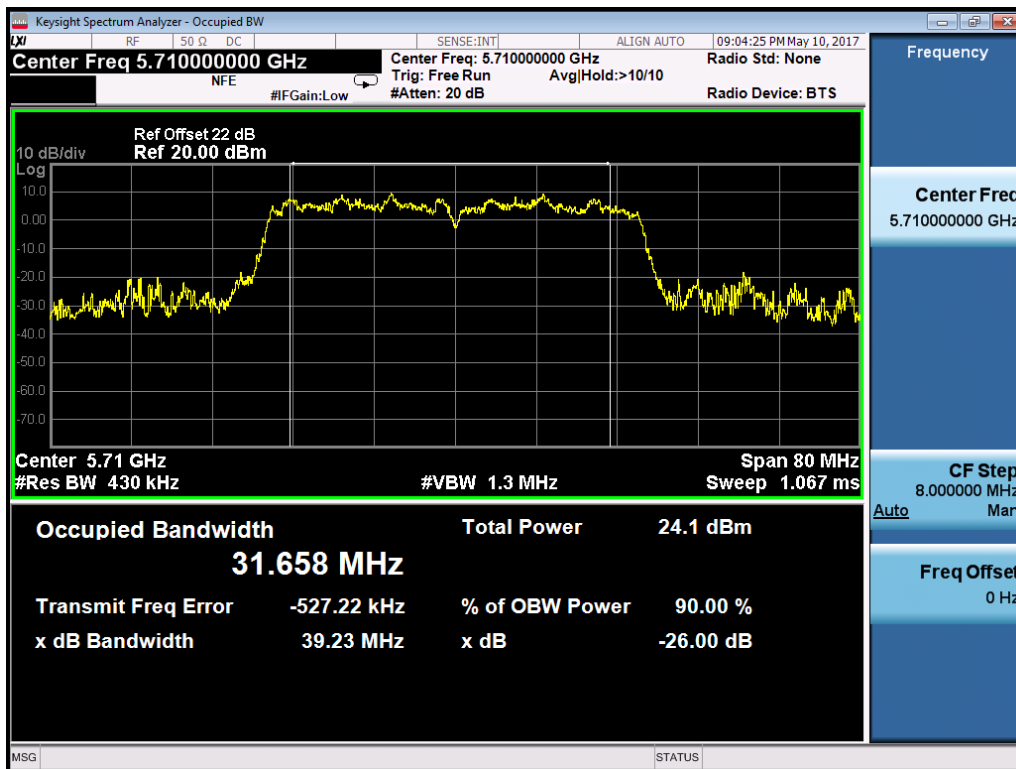
802.11n40-5510MHz



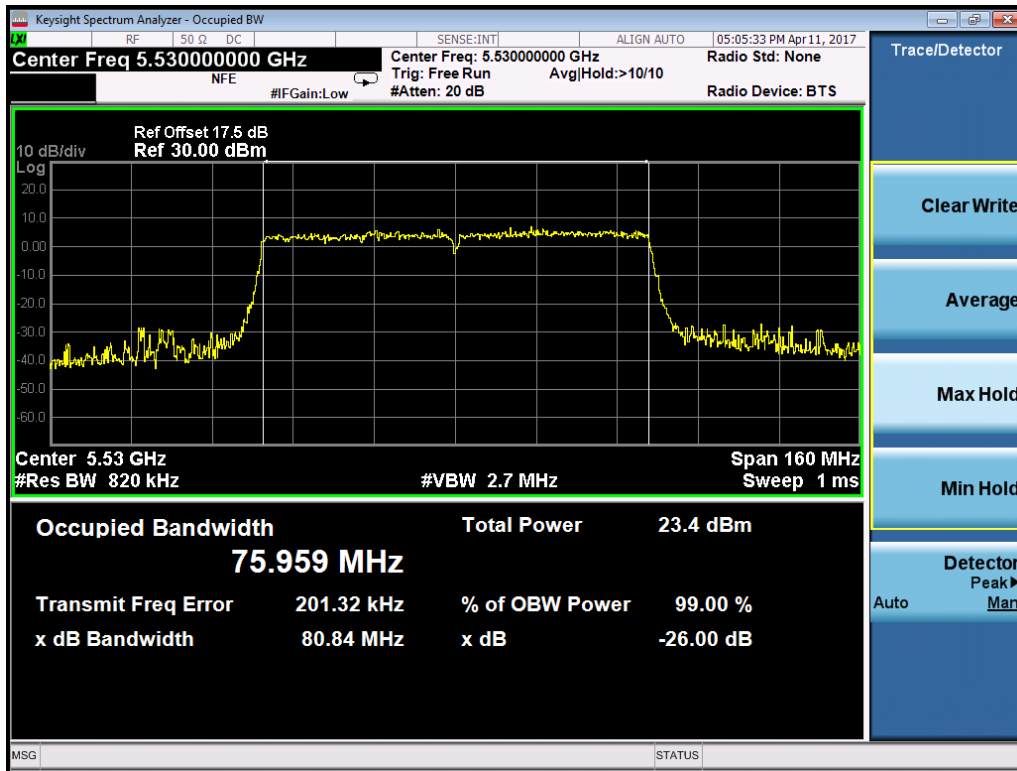
802.11n40-5590MHz



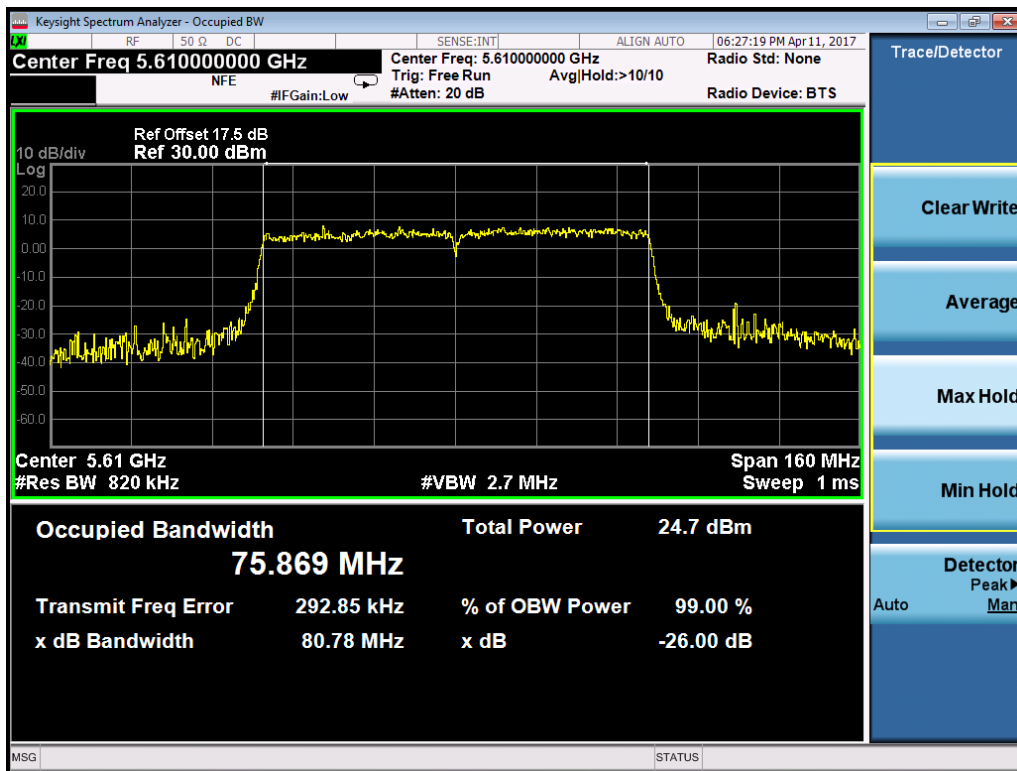
802.11n40-5710MHz



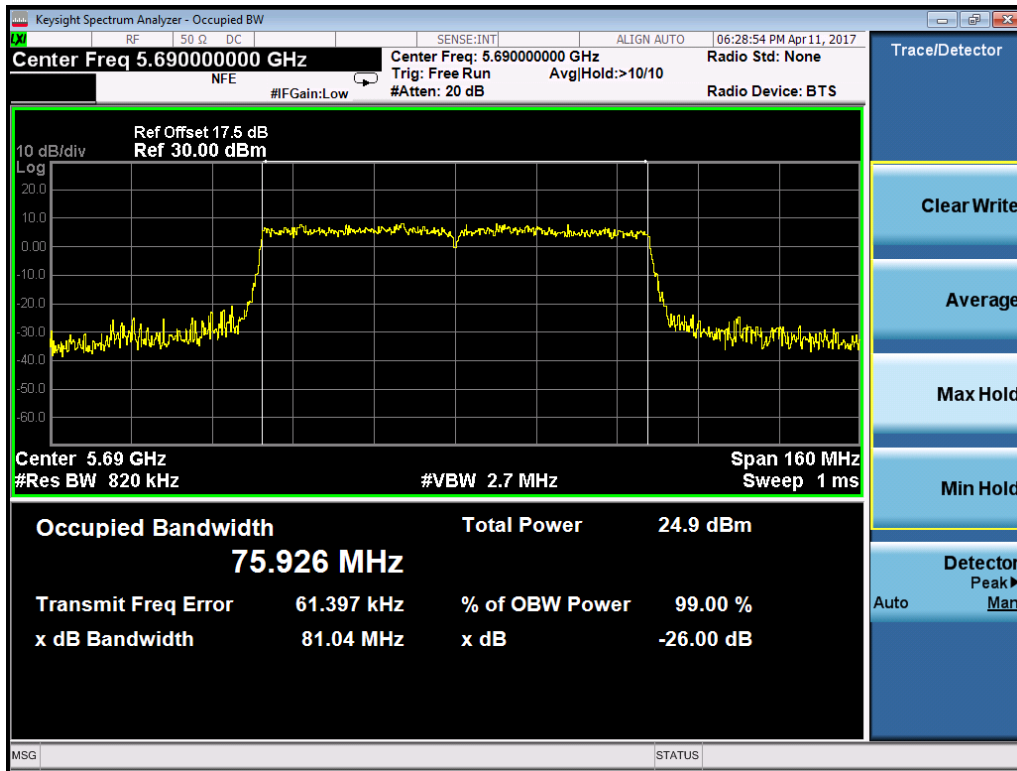
802.11ac80-5530MHz



802.11ac80-5610MHz



802.11ac80-5690MHz





## 4 Maximum Conducted Output Power

Test result: Pass

### 4.1 Test limit

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

The maximum e.i.r.p.at any elevation angle above 30 degrees from the horizon must not exceed 125 mW (21 dBm).

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

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

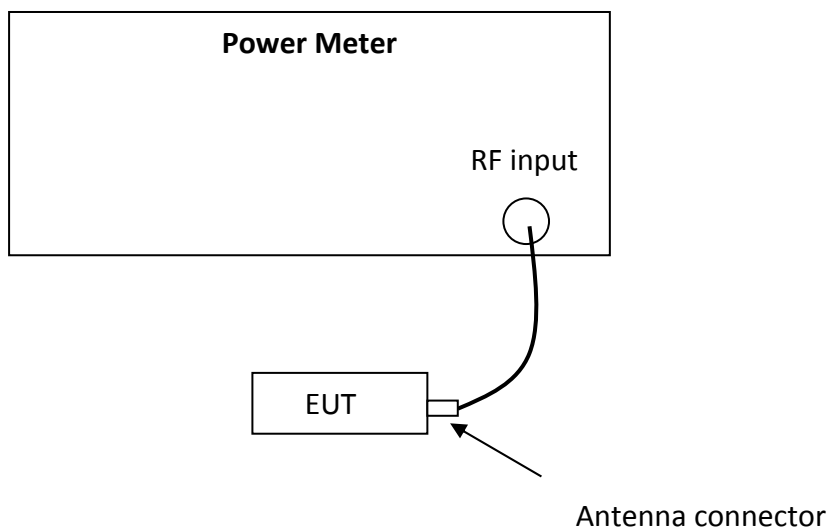
For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

## 4.2 Test Configuration



## 4.3 Test procedure and test setup

The power output per FCC §15.407(a) was measured from the antenna port of the EUT according to the measurement method refer to KDB 789033D02: Method PM.

#### 4.4 Test protocol

Temperature : 25 °C  
Relative Humidity : 55 %

#### U-NII-2A Band Conducted Power:

Power limit calculation:

Frequency range (MHz)	Mode	26dB bandwidth (MHz)	11+10log B (dBm)	Chosen limit (dBm)
5250 - 5350	802.11a	21.27	24.28	24.00
	802.11n20	21.41	24.31	24.00
	802.11n40	39.90	27.01	24.00
	802.11ac80	81.31	30.10	24.00

Note: Chosen limit is 24dBm or 11dBm + 10logB (26dB bandwidth) which is lesser.

Mode	Frequency (MHz)	Reading + Duty cycle factor (dBm)				Max Power (dBm)	Limit (dBm)
		Port 0	Port 1	Port 2	Port 3		
802.11 a	5260	16.62	17.45	18.57	17.84	18.57	24.00
	5300	16.43	17.27	17.37	17.64	17.64	24.00
	5320	20.16	21.05	21.06	21.51	21.51	24.00

Mode	Frequency (MHz)	Reading + Duty cycle factor (dBm)				Total Power (dBm)	Limit (dBm)
		Port 0	Port 1	Port 2	Port 3		
802.11n20	5260	17.12	17.73	17.83	18.51	23.85	24.00
	5300	17.13	17.52	17.62	18.38	23.71	24.00
	5320	16.18	16.94	17.24	17.82	23.11	24.00
802.11n40	5270	16.86	17.37	17.42	18.05	23.47	24.00
	5310	17.01	17.52	17.71	18.26	23.67	24.00
802.11ac80	5290	16.73	17.31	17.53	18.16	23.48	24.00

Note: Total power =  $10 * \lg(10^{\text{port 0} / 10} + 10^{\text{port 1} / 10} + 10^{\text{port 2} / 10} + 10^{\text{port 3} / 10})$ .

**U-NII-2C Band Conducted Power:**

Power limit calculation:

Frequency range (MHz)	Mode	26dB bandwidth (MHz)	11+10log B (dBm)	Chosen limit (dBm)
5470 - 5725	802.11a	20.80	24.18	24.00
	802.11n20	20.89	24.20	24.00
	802.11n40	38.99	26.91	24.00
	802.11ac80	80.78	30.07	24.00

Note: Chosen limit is 24dBm or 11dBm + 10logB (26dB bandwidth) which is lesser.

Mode	Frequency (MHz)	Reading + Duty cycle factor (dBm)				Max Power (dBm)	Limit (dBm)
		Port 0	Port 1	Port 2	Port 3		
802.11 a	5500	18.11	18.95	19.12	19.04	19.12	24.00
	5600	18.80	18.71	19.43	19.48	19.48	24.00
	5720	21.45	21.72	21.68	20.75	21.72	24.00

Mode	Frequency (MHz)	Reading + Duty cycle factor (dBm)				Total Power (dBm)	Limit (dBm)
		Port 0	Port 1	Port 2	Port 3		
802.11n20	5500	14.69	15.52	15.66	15.61	21.41	24.00
	5600	13.44	14.09	14.16	14.43	20.07	24.00
	5720	13.89	13.40	14.05	13.42	19.72	24.00
802.11n40	5510	16.38	16.42	17.06	16.89	22.72	24.00
	5590	17.16	17.02	17.34	18.04	23.43	24.00
	5710	14.31	14.55	15.24	15.01	20.81	24.00
802.11ac80	5530	14.98	15.63	15.79	16.15	21.68	24.00
	5610	17.39	16.98	17.54	18.14	23.55	24.00
	5690	17.38	17.31	17.63	18.09	23.63	24.00

Note: Total power =  $10 * \lg(10^{\text{port 0} / 10} + 10^{\text{port 1} / 10} + 10^{\text{port 2} / 10} + 10^{\text{port 3} / 10})$ .

## 5 Power spectrum density

**Test result:** Pass

### 5.1 Test limit

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

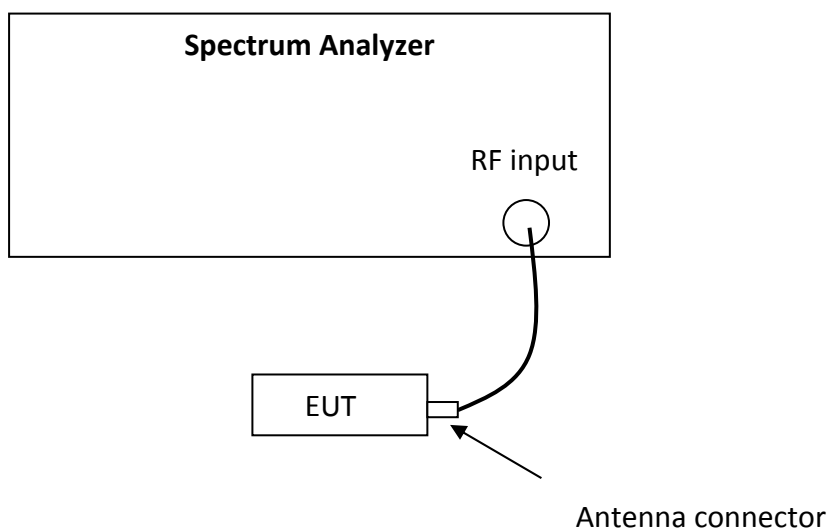
For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the less of original and original + (6 - antenna gain - beamforming gain).

### 5.2 Test Configuration



### 5.3 Test procedure and test setup

The power spectral density per FCC §15.407(a) was measured from the antenna port of the EUT according to the measurement method refer to KDB 789033D02: section F.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

3. Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add  $10 \log(1/x)$ , where  $x$  is the duty cycle, to the peak of the spectrum. b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

4. The result is the Maximum PSD over 1 MHz reference bandwidth.

5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (*i.e.*, 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set  $RBW \geq 1/T$ , where  $T$  is defined in section II.B.1.a).

b) Set  $VBW \geq 3 RBW$ .

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10 \log(500 \text{ kHz} / RBW)$  to the measured result, whereas  $RBW (< 500 \text{ kHz})$  is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add  $10 \log(1 \text{ MHz} / RBW)$  to the measured result, whereas  $RBW (< 1 \text{ MHz})$  is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since  $RBW=100 \text{ kHz}$  is available on nearly all spectrum analyzers.

### 5.4 Test Protocol

Temperature: 25 °C  
Relative Humidity: 55 %

#### U-NII-2A Band:

Mode	Frequency (MHz)	Duty cycle Factor (dB)	Reading + Duty cycle factor (dBm/MHz)				Max Power (dBm/MHz)	Limit (dBm/MHz)
			Port0	Port1	Port2	Port3		
802.11 a	5260	0.22	-	-	6.04	-	6.04	11.00
	5300	0.22	-	-	5.84	-	5.84	11.00
	5320	0.22	-	-	9.81	-	9.81	11.00

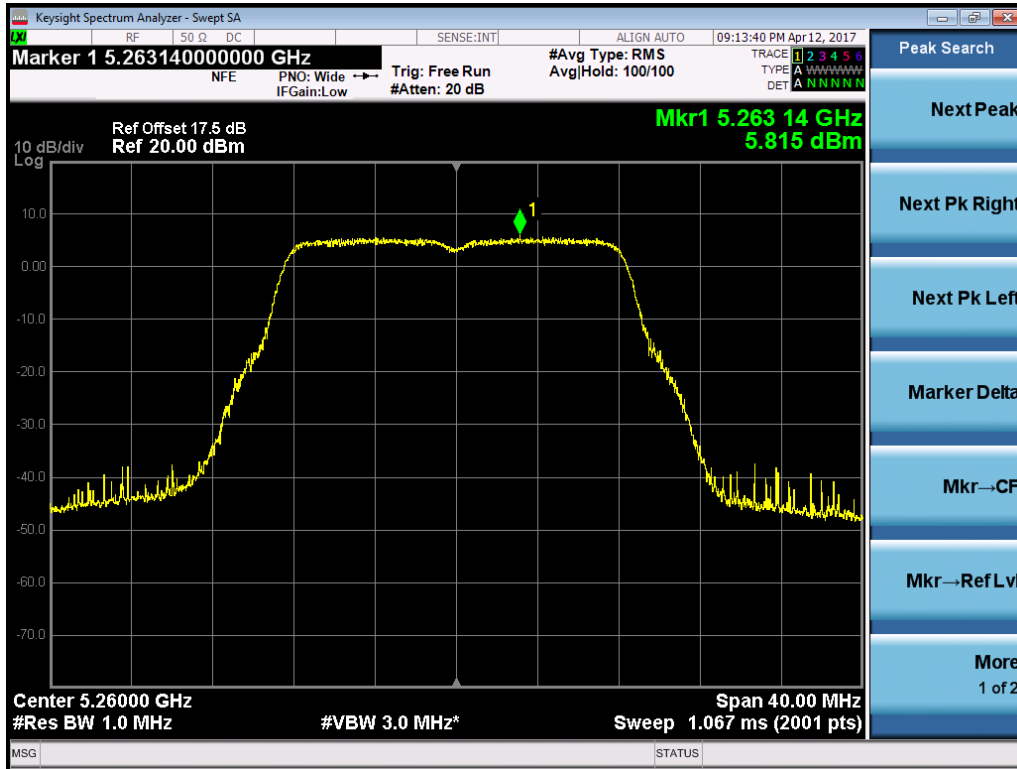
Note: The port 2 was chosen to test as representative.

Mode	Frequency (MHz)	Duty cycle Factor (dB)	Reading (dBm/MHz)				Total Power (dBm/MHz)	Limit (dBm/MHz)
			Port0	Port1	Port2	Port3		
802.11n20	5260	0.23	3.95	4.41	4.28	4.83	10.63	11.00
	5300	0.23	3.90	4.92	4.68	4.95	10.88	11.00
	5320	0.23	3.96	4.22	4.41	4.59	10.55	11.00
802.11n40	5270	0.44	3.25	3.72	3.96	4.67	10.39	11.00
	5310	0.44	2.06	1.84	2.36	2.91	8.77	11.00
802.11ac80	5290	0.74	-2.60	-1.64	-1.87	-0.93	5.04	11.00

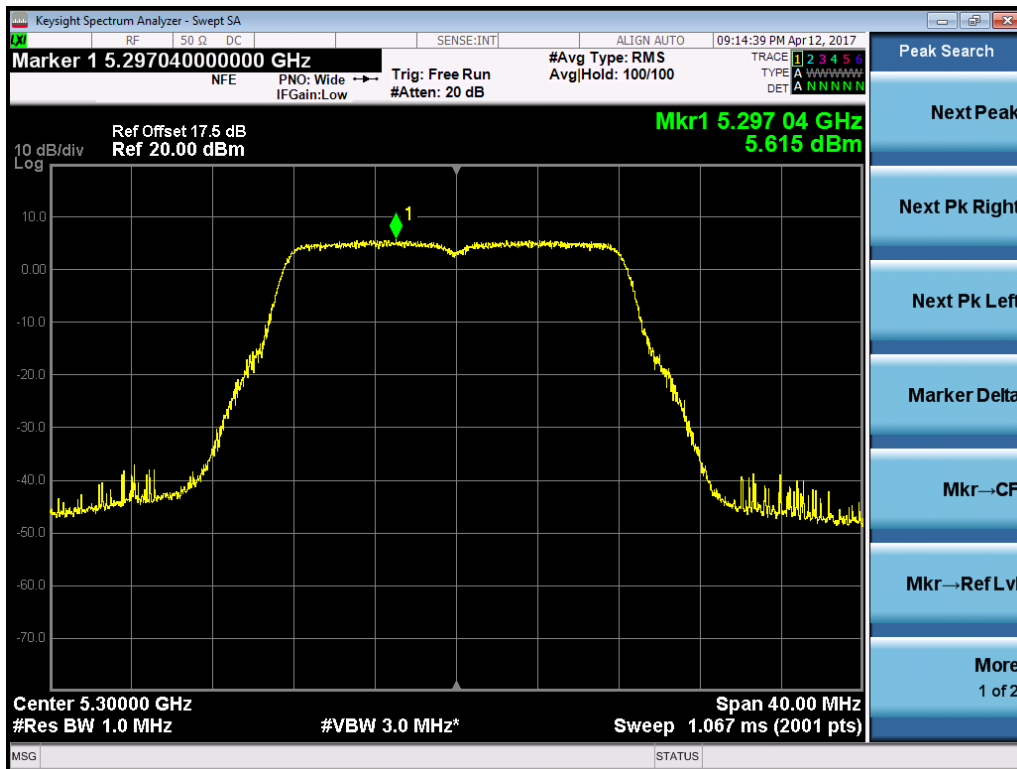
Note: Total power =  $10 * \lg(10^{\text{port } 0 / 10} + 10^{\text{port } 1 / 10} + 10^{\text{port } 2 / 10} + 10^{\text{port } 3 / 10}) + \text{Duty cycle factor}$ .

Test Plots:

802.11a-5260MHz

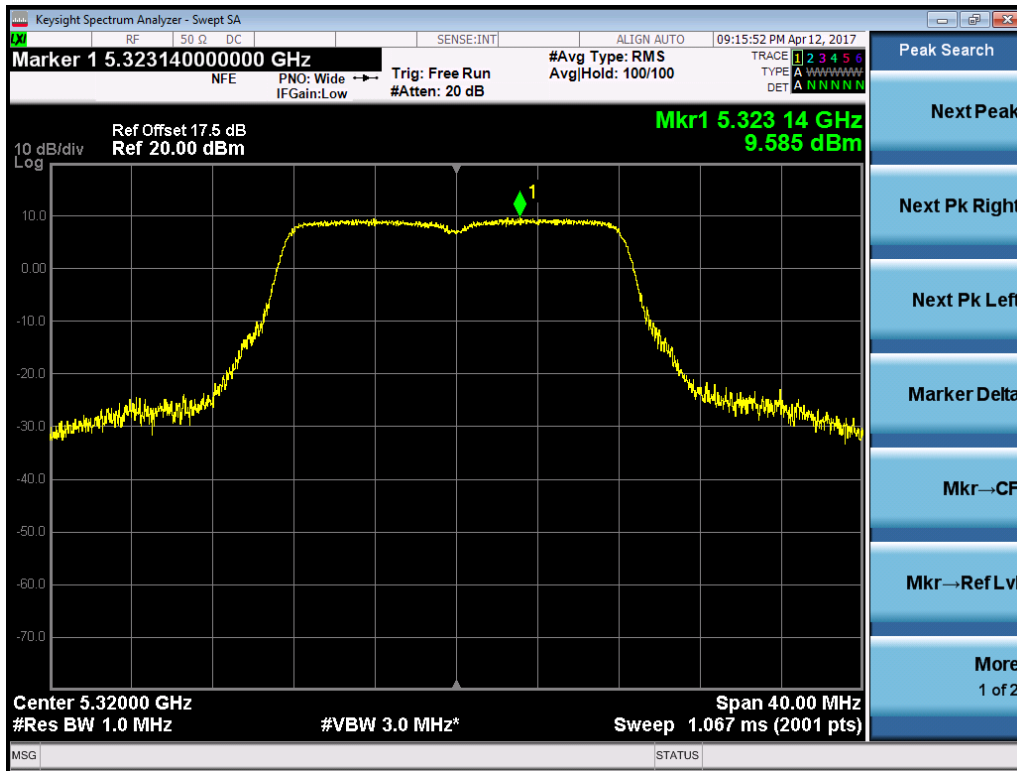


802.11a-5300MHz



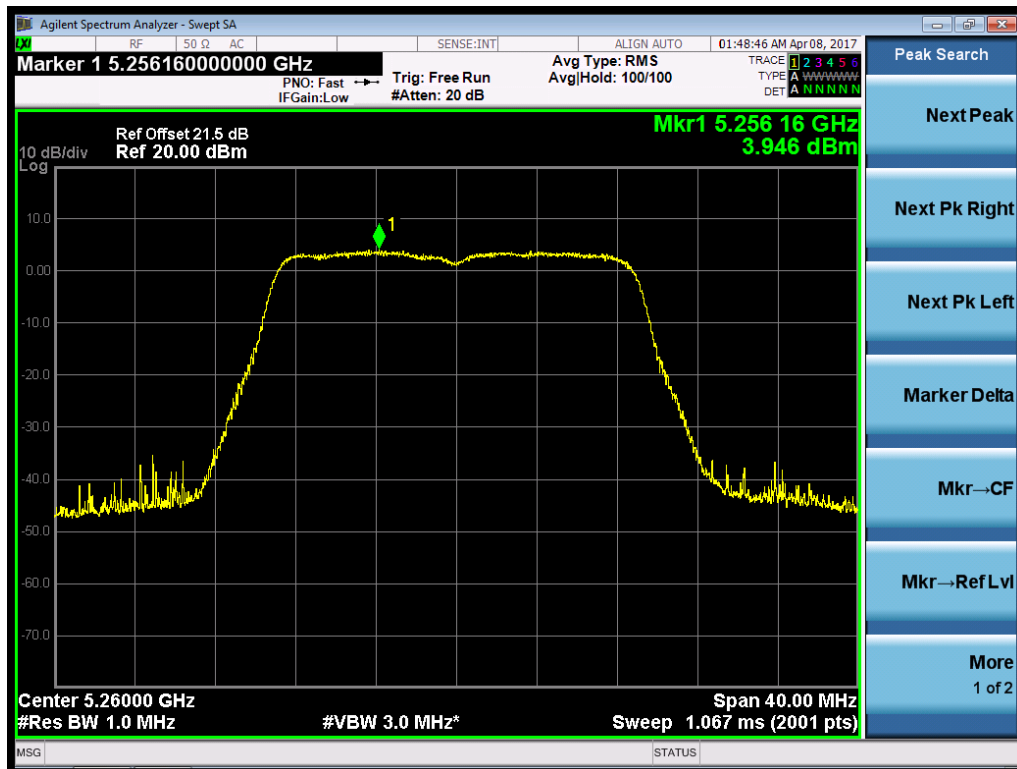


802.11a-5320MHz

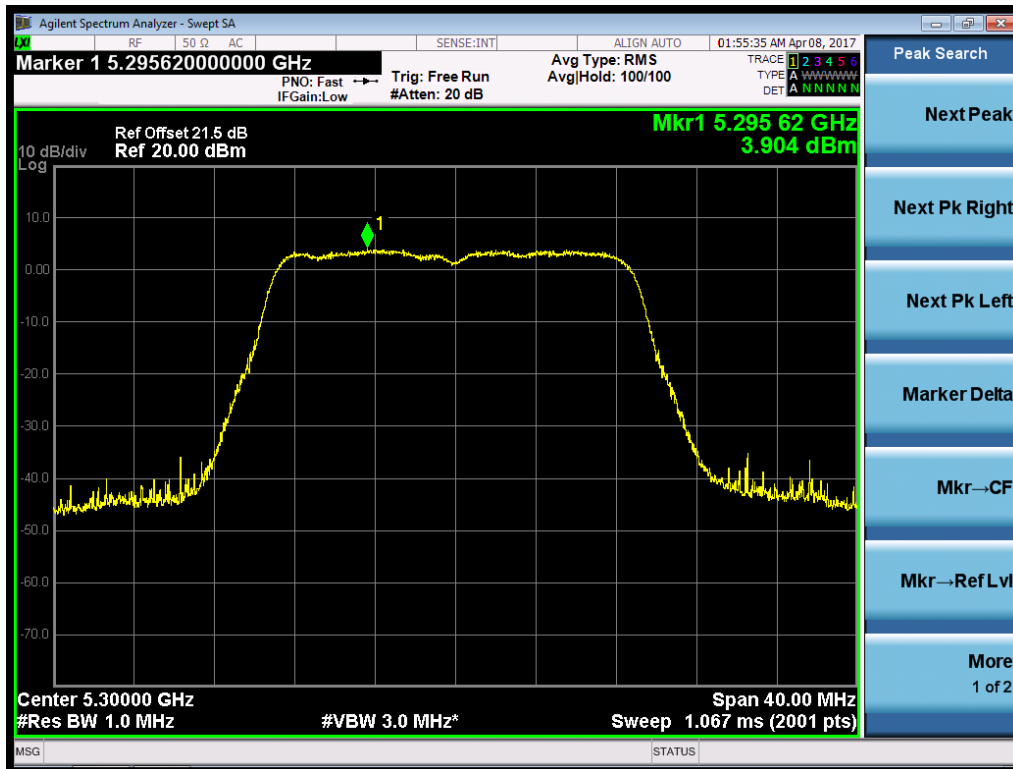


Antenna port 0

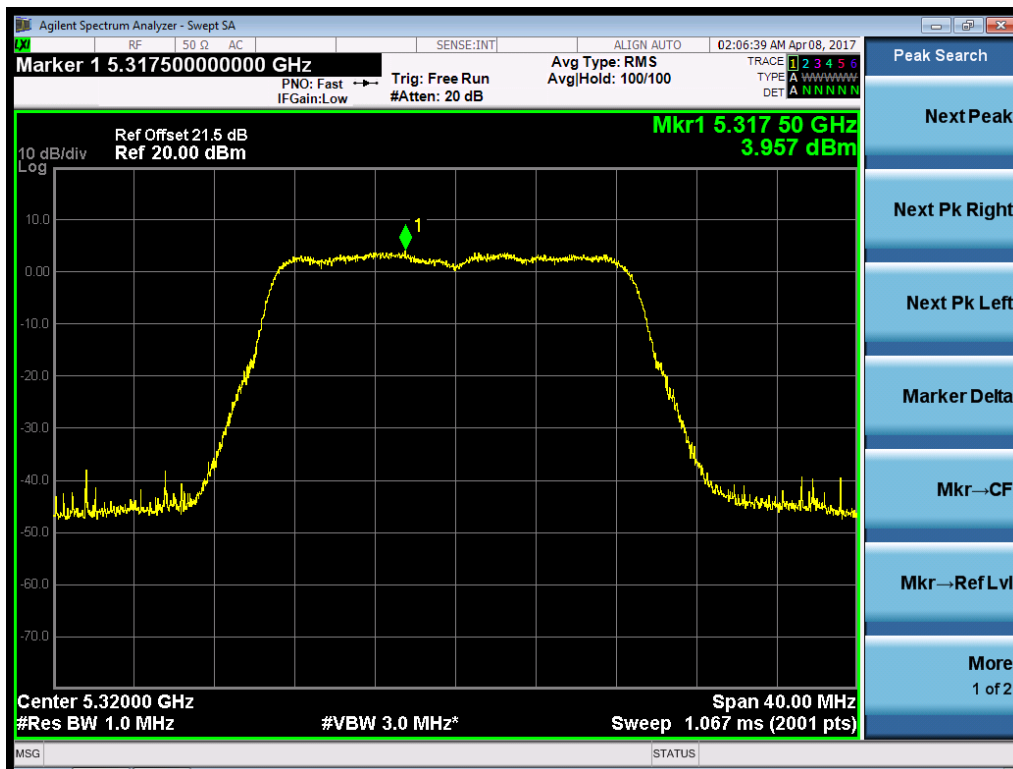
802.11n20-5260MHz



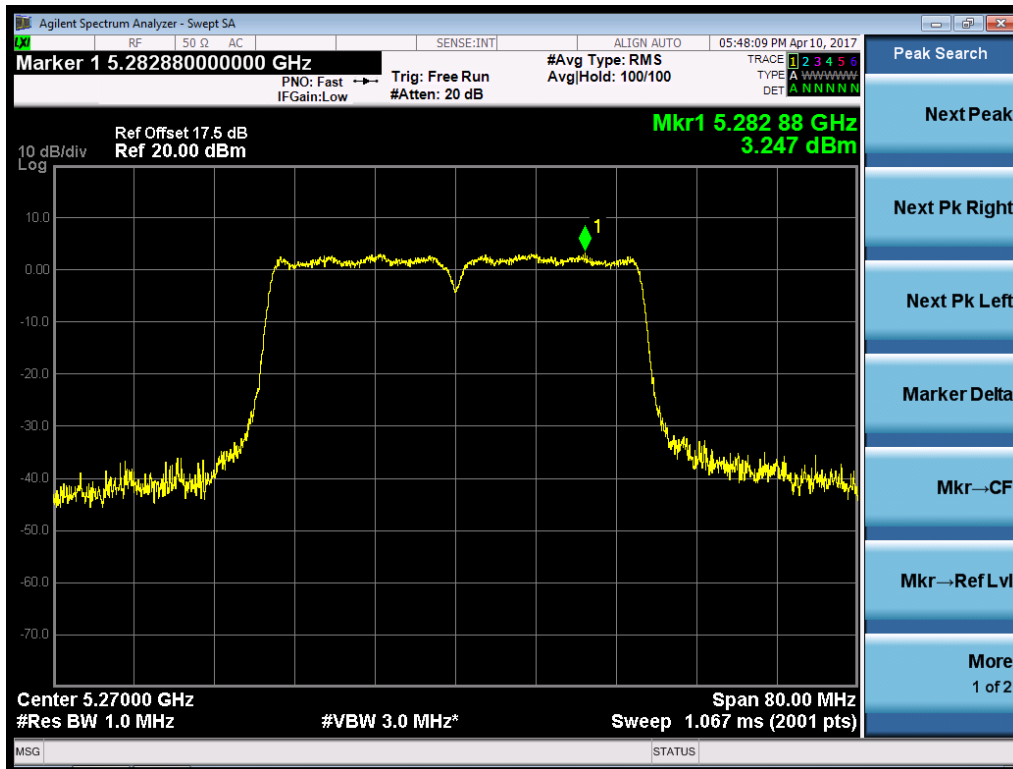
802.11n20-5300MHz



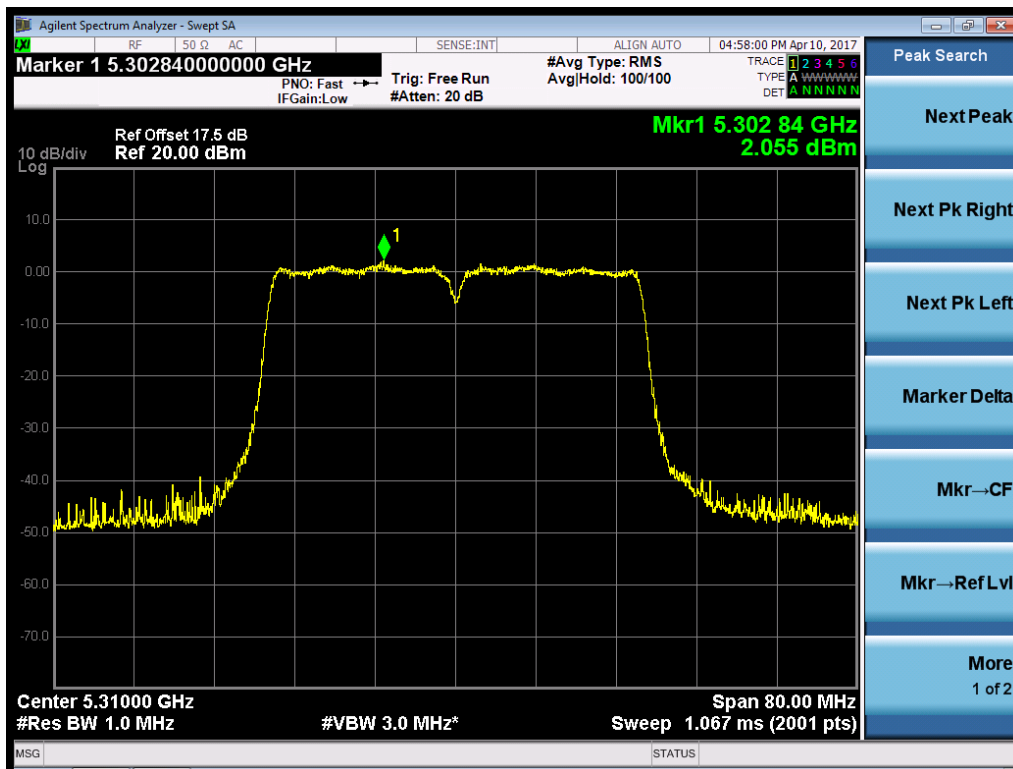
802.11n20-5320MHz



802.11n40-5270MHz



802.11n40-5310MHz

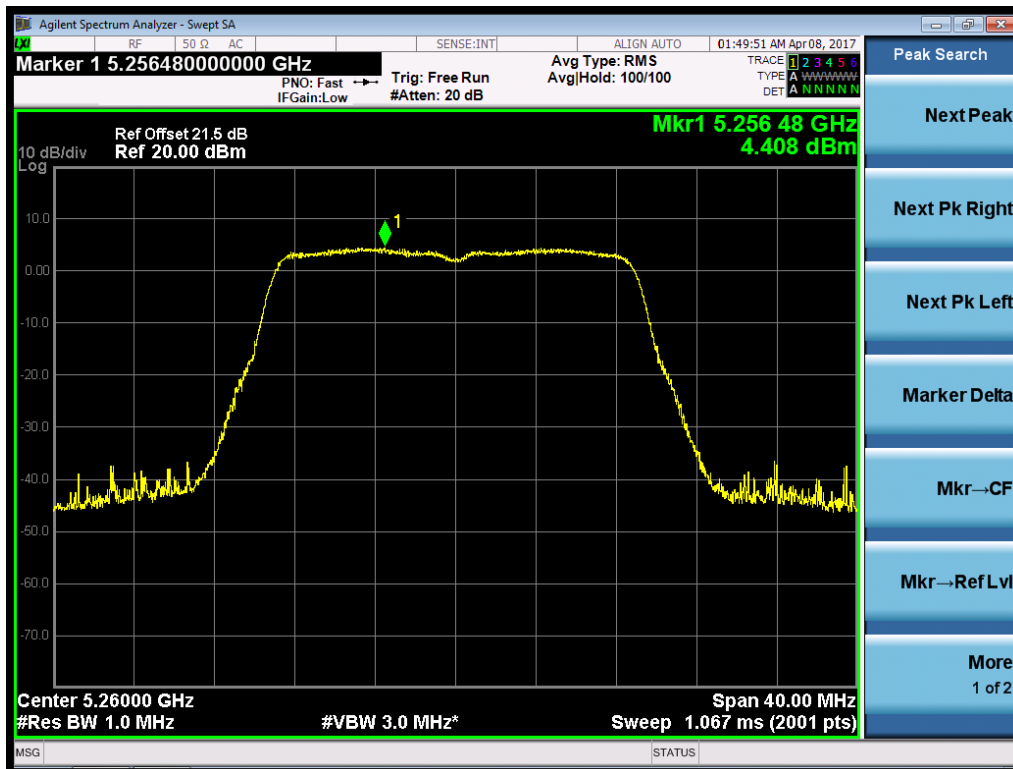


802.11ac80-5290MHz

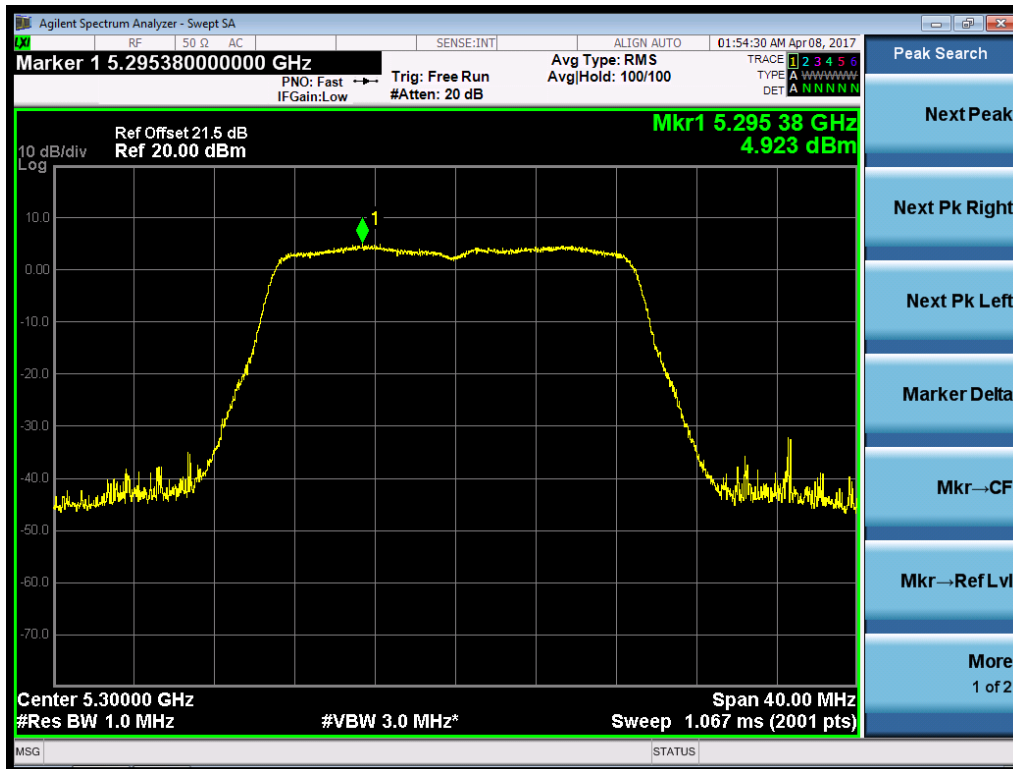


Antenna port 1

802.11n20-5260MHz



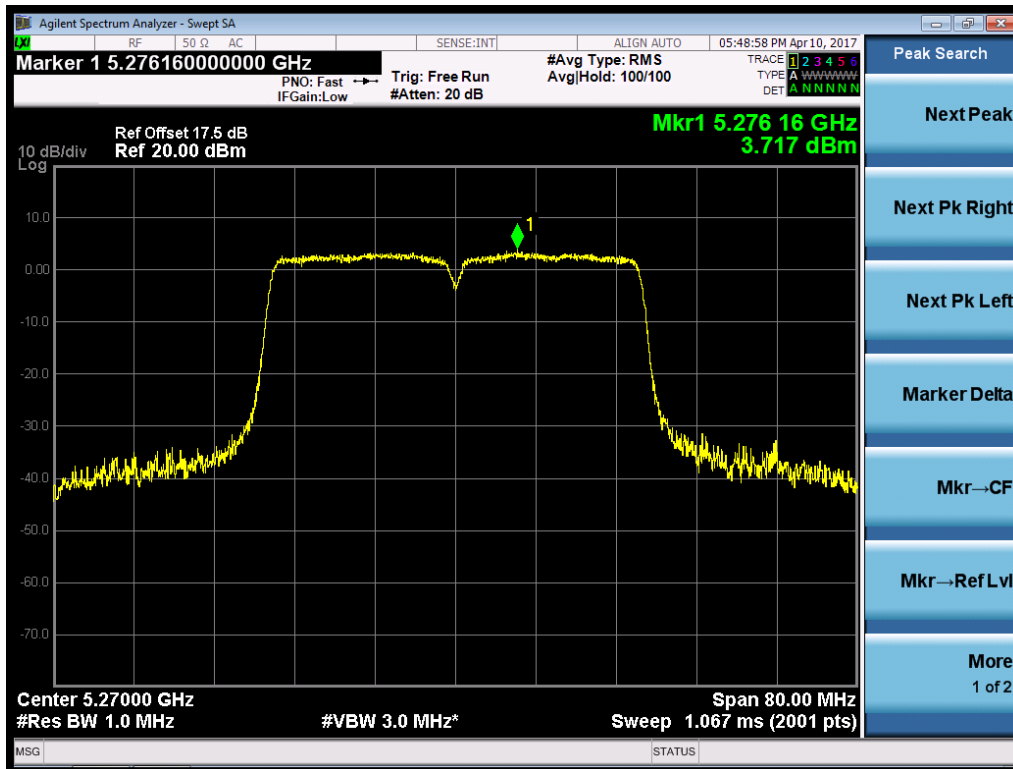
802.11n20-5300MHz



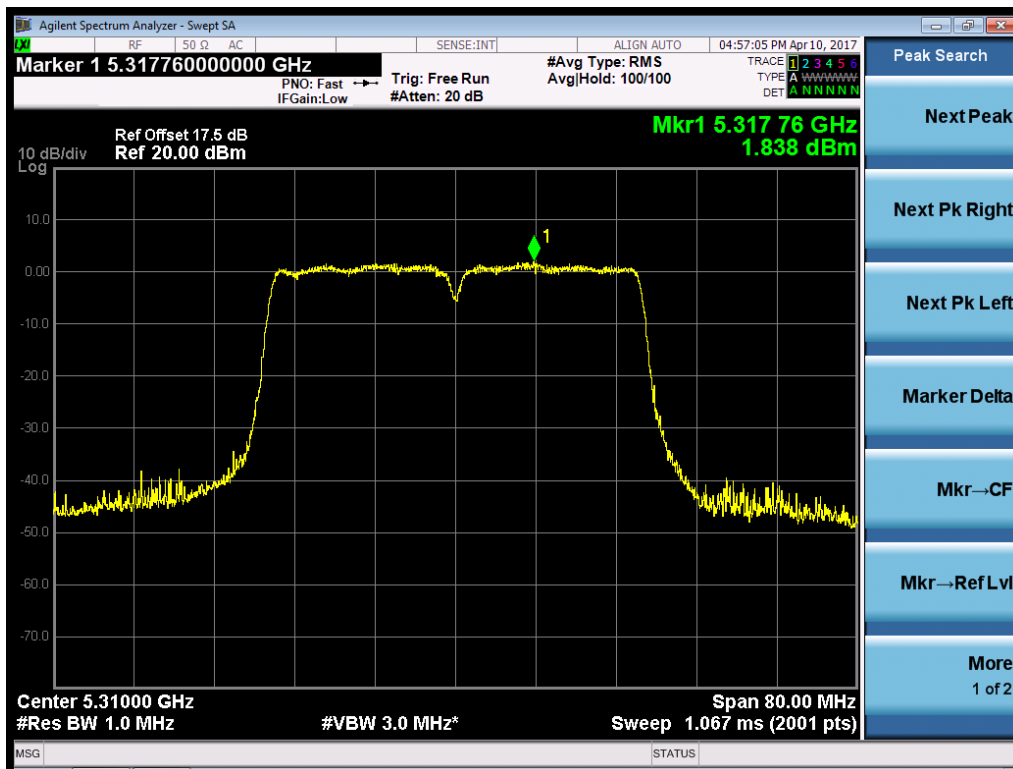
802.11n20-5320MHz



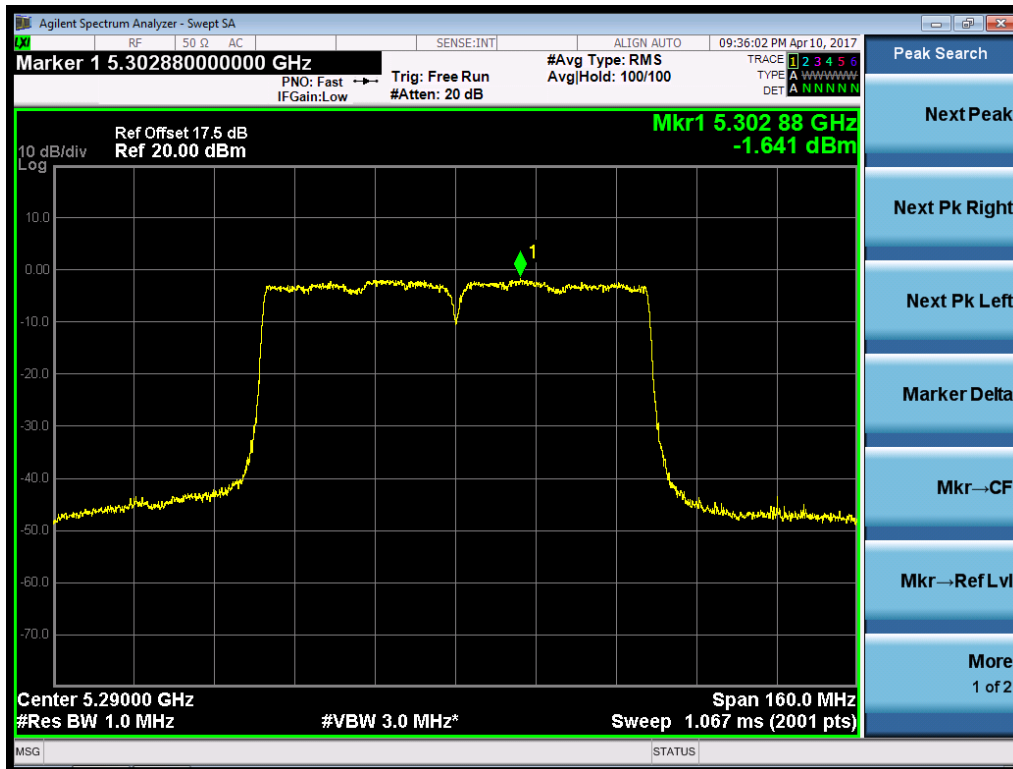
802.11n40-5270MHz



802.11n40-5310MHz

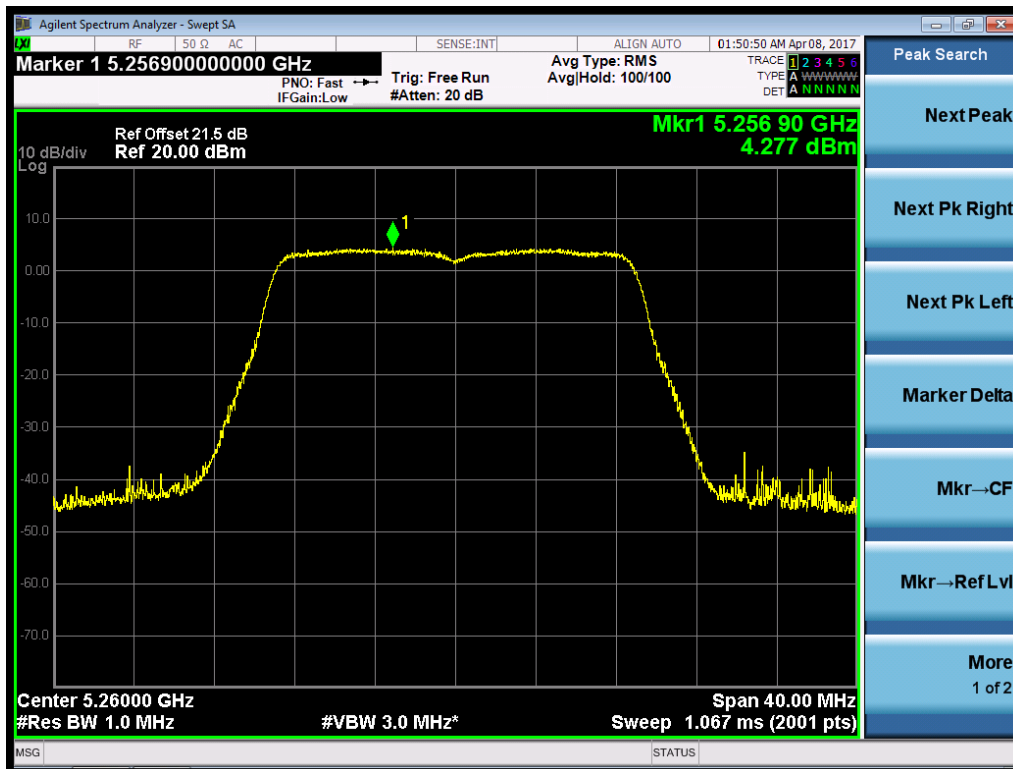


802.11ac80-5290MHz

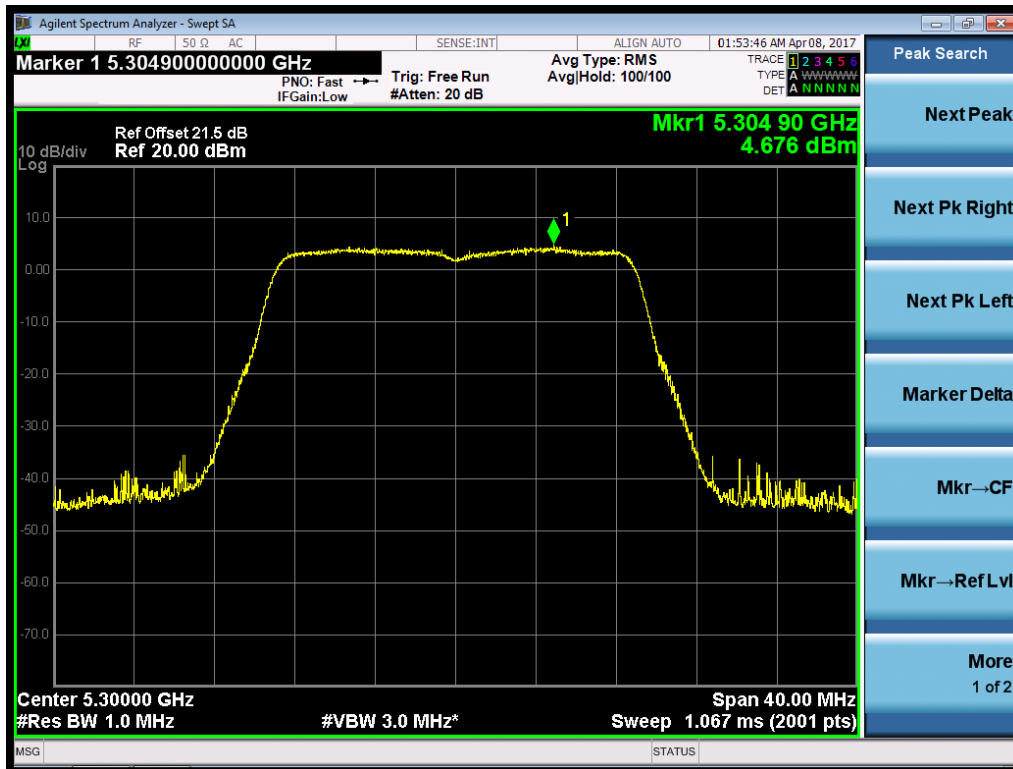


Antenna port 2

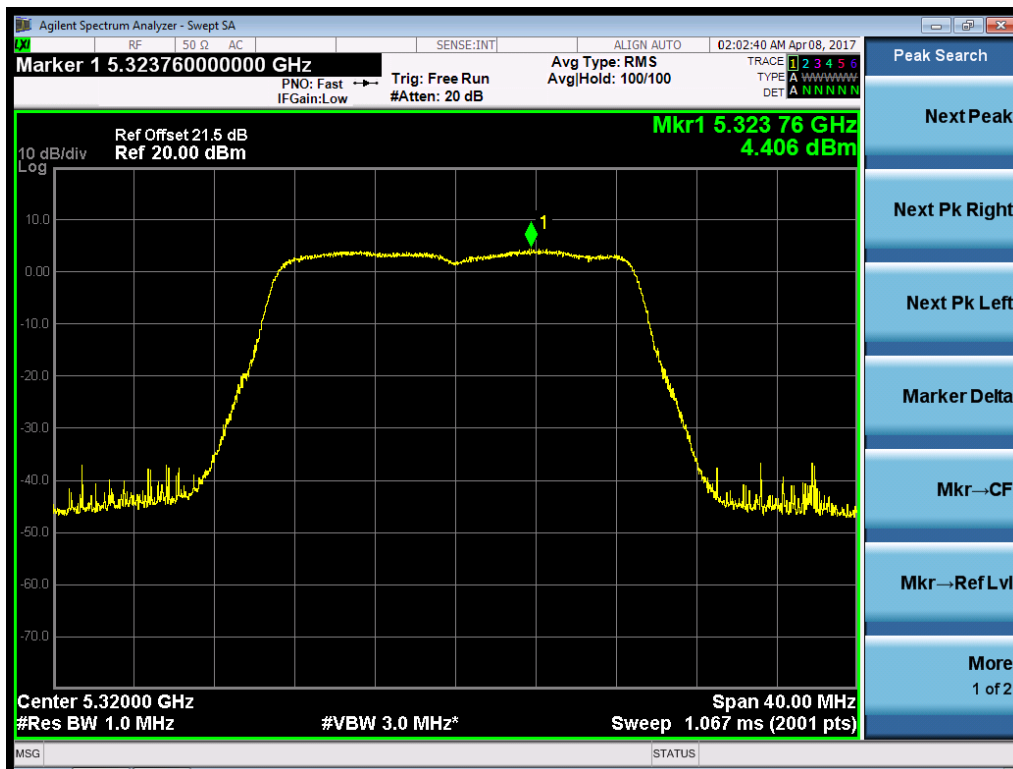
802.11n20-5260MHz



802.11n20-5300MHz



802.11n20-5320MHz

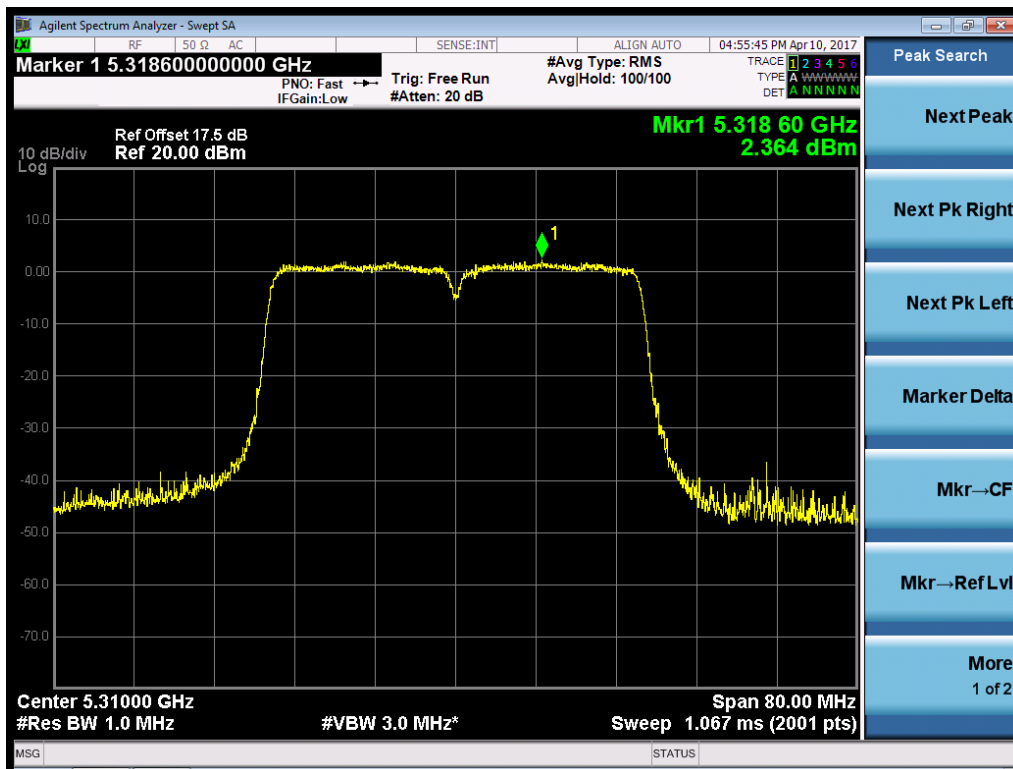




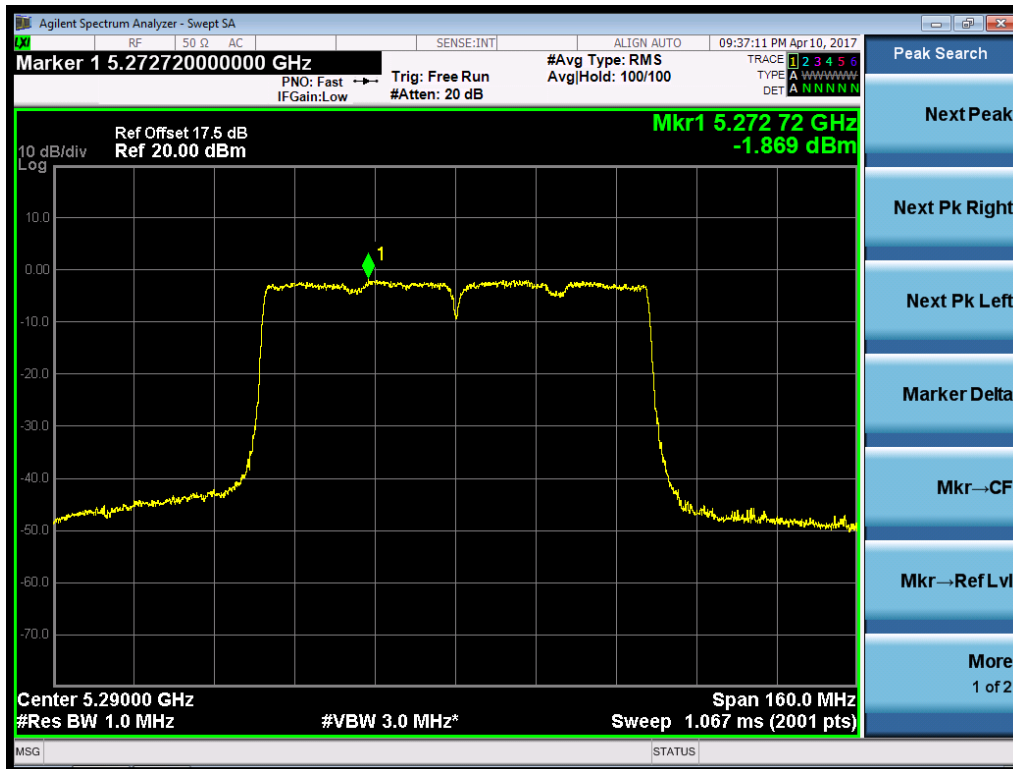
802.11n40-5270MHz



802.11n40-5310MHz

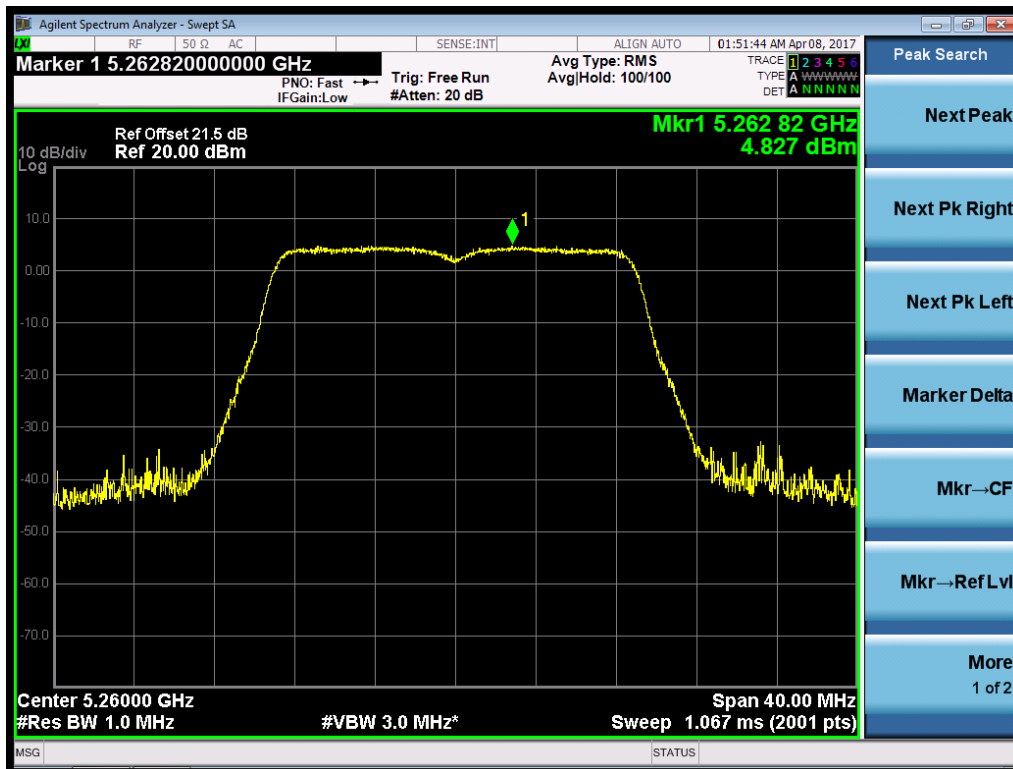


802.11ac80-5290MHz

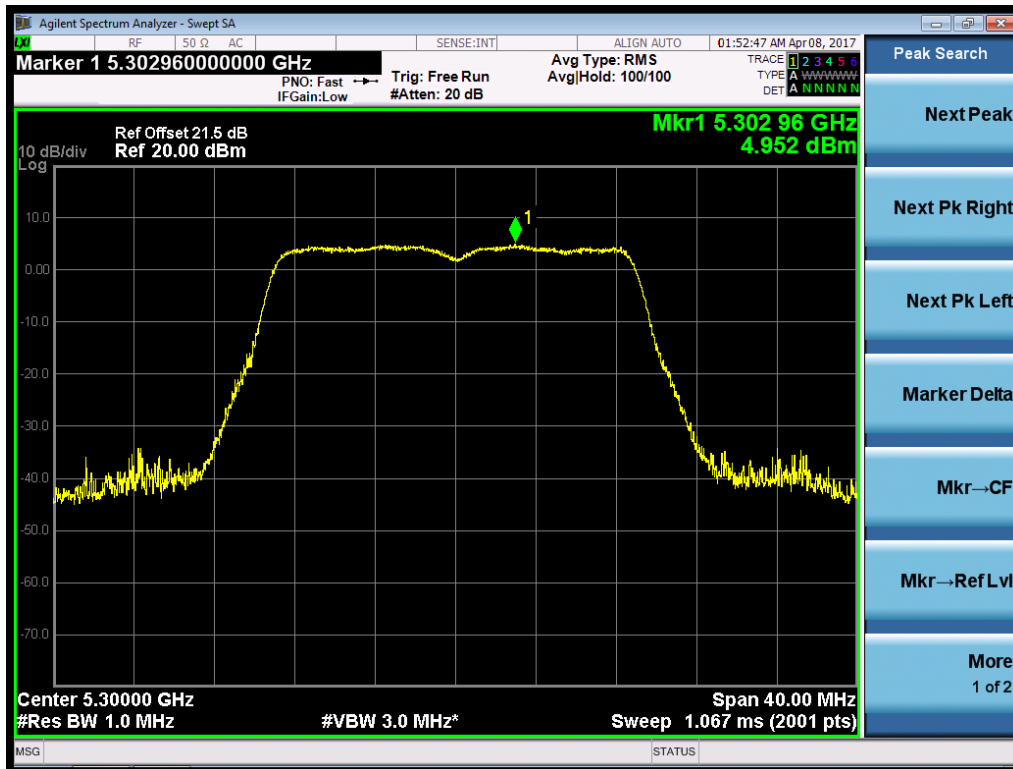


Antenna port 3

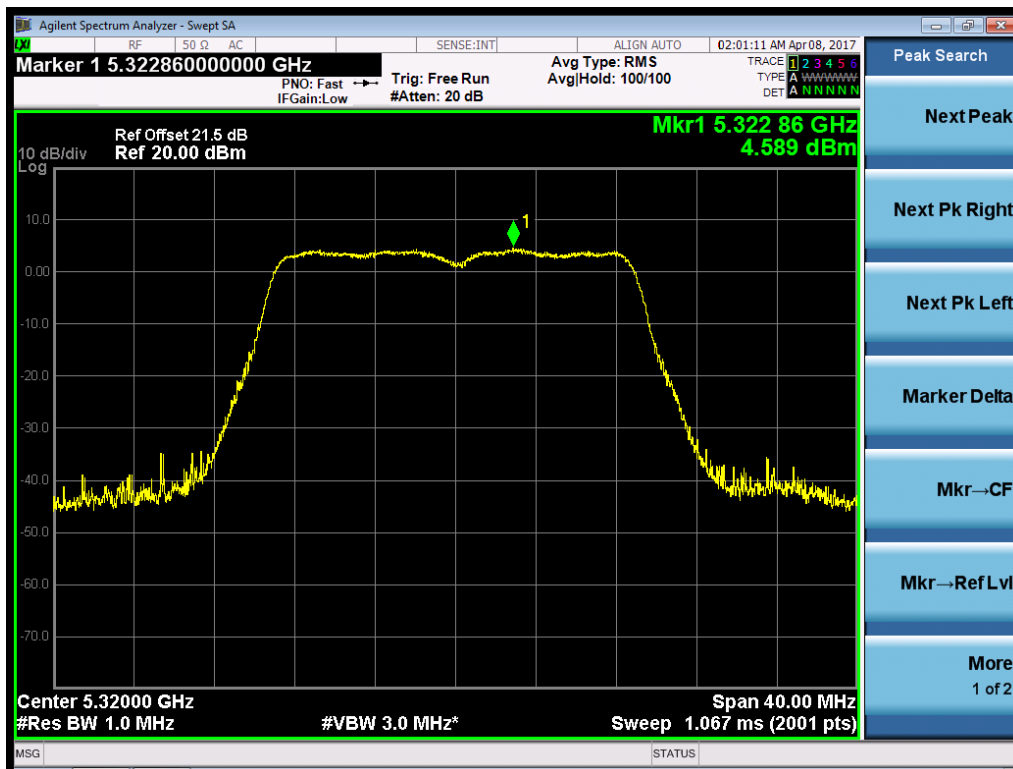
802.11n20-5260MHz



802.11n20-5300MHz



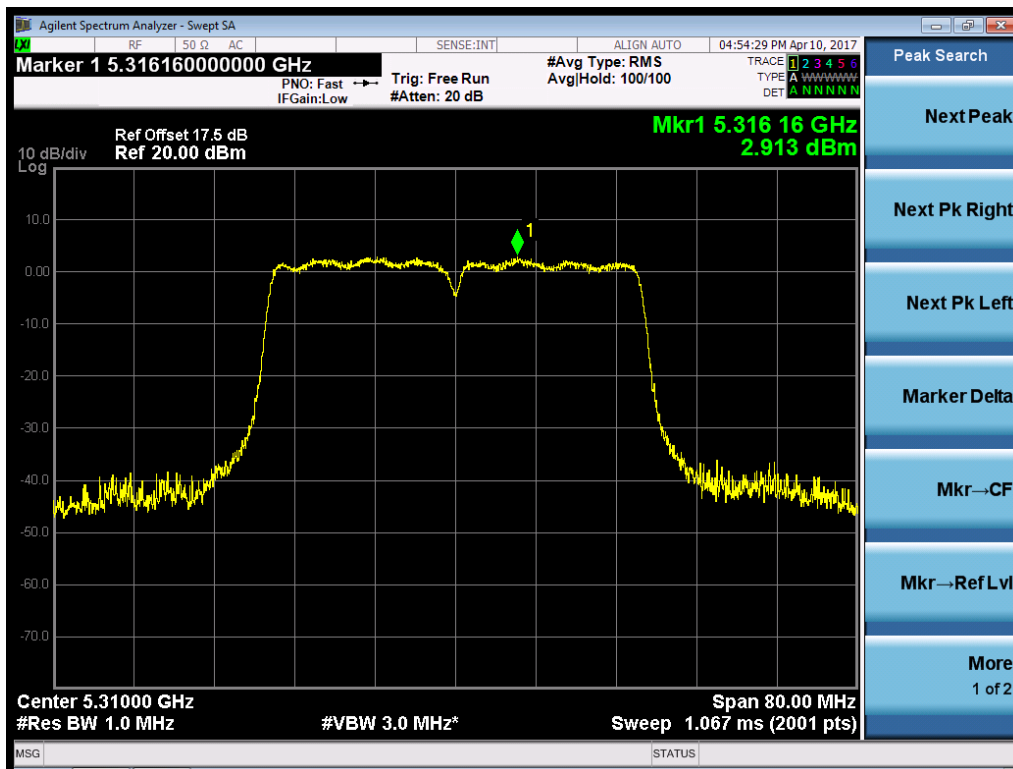
802.11n20-5320MHz



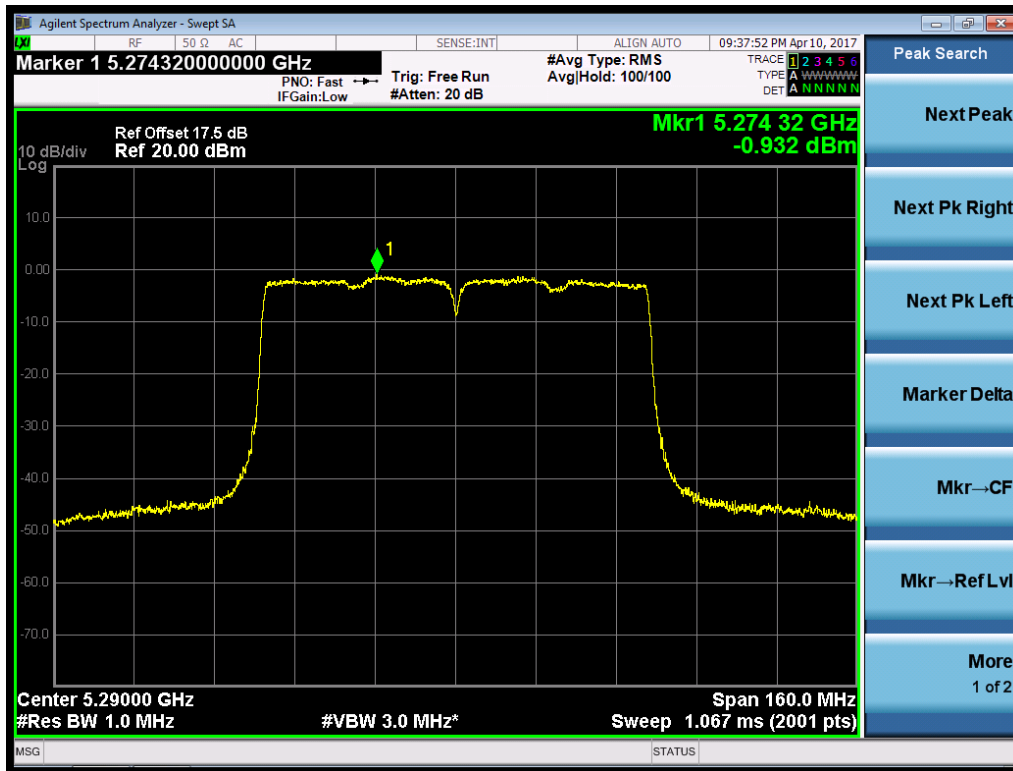
802.11n40-5270MHz



802.11n40-5310MHz



802.11ac80-5290MHz



**U-NII-2C Band:**

Mode	Frequency (MHz)	Duty cycle Factor (dB)	Reading + Duty cycle factor (dBm/MHz)				Max Power (dBm/MHz)	Limit (dBm/MHz)
			Port0	Port1	Port2	Port3		
802.11 a	5500	0.22	-	-	8.17	-	8.17	11.00
	5600	0.22	-	-	7.49	-	7.49	11.00
	5720	0.22	-	-	10.82	-	10.82	11.00

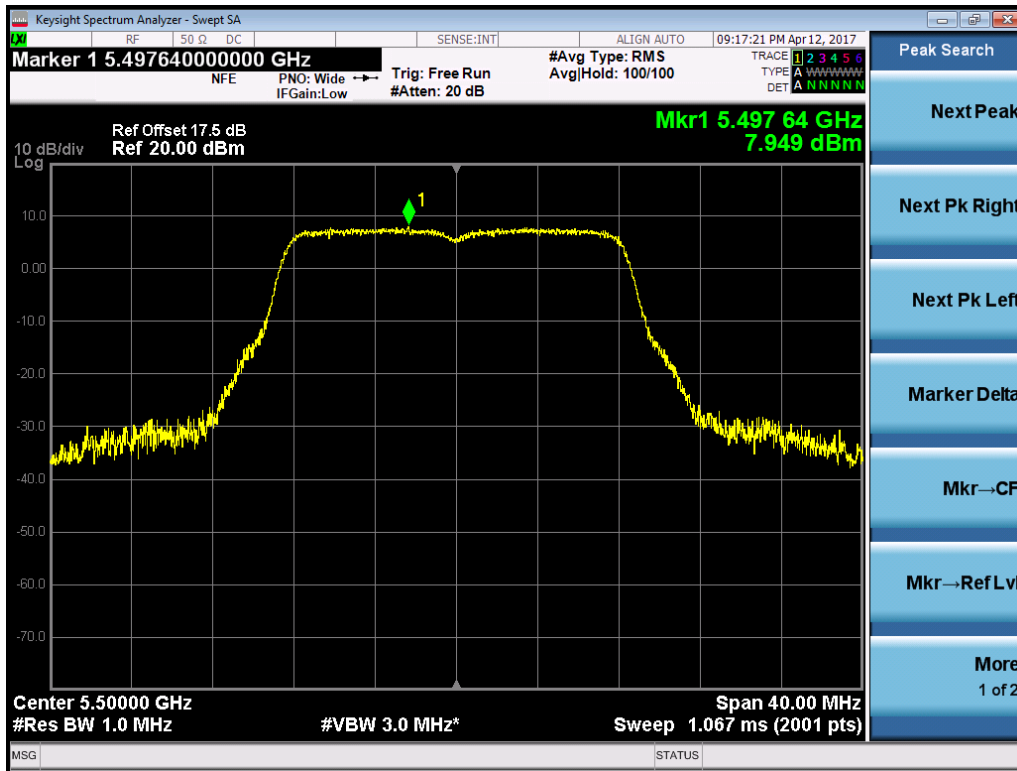
Note: The port 2 was chosen to test as representative.

Mode	Frequency (MHz)	Duty cycle Factor (dB)	Reading (dBm/MHz)				Total Power (dBm/MHz)	Limit (dBm/MHz)
			Port0	Port1	Port2	Port3		
802.11n20	5500	0.23	4.31	4.42	4.31	5.40	10.88	11.00
	5600	0.23	4.19	3.52	4.03	5.20	10.53	11.00
	5720	0.23	4.45	3.09	4.30	4.36	10.33	11.00
802.11n40	5510	0.44	1.93	1.54	1.73	2.77	8.48	11.00
	5590	0.44	4.53	4.21	3.57	5.10	10.85	11.00
	5710	0.44	3.97	2.98	4.17	4.89	10.52	11.00
802.11ac80	5530	0.74	-2.77	-2.65	-2.71	-2.01	4.23	11.00
	5610	0.74	3.69	3.01	3.36	3.94	10.27	11.00
	5690	0.74	3.55	3.32	4.16	4.07	10.55	11.00

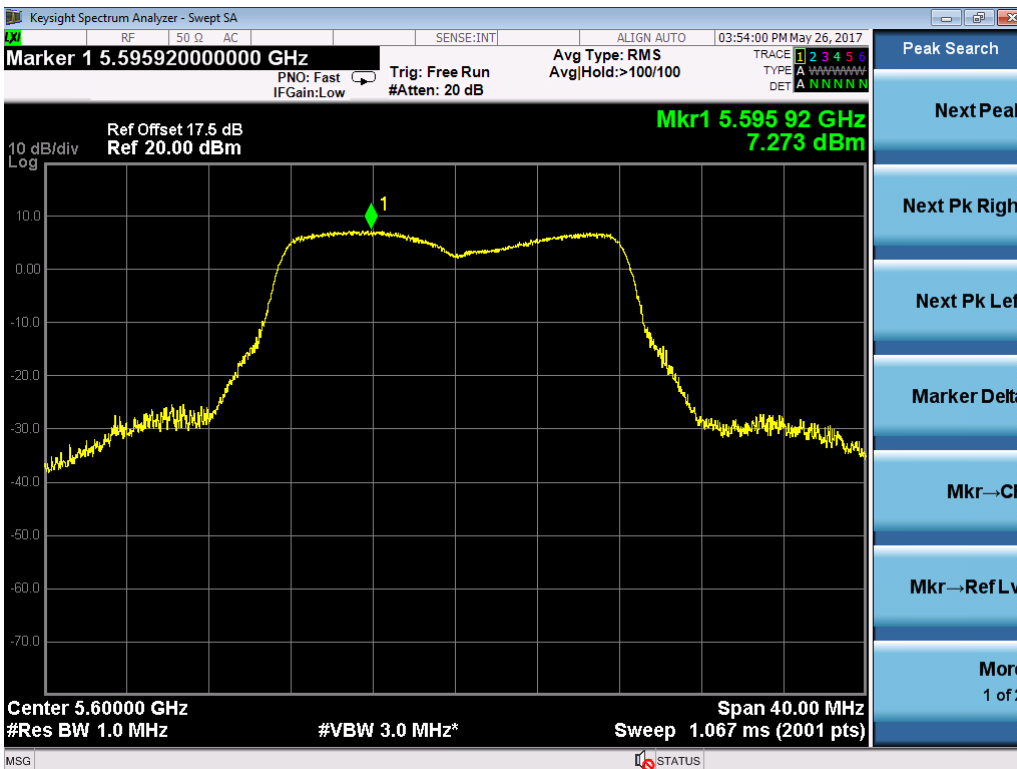
Note: Total power =  $10 * \lg(10^{\text{port } 0 / 10} + 10^{\text{port } 1 / 10} + 10^{\text{port } 2 / 10} + 10^{\text{port } 3 / 10}) + \text{Duty cycle factor}$ .

Test Plots:

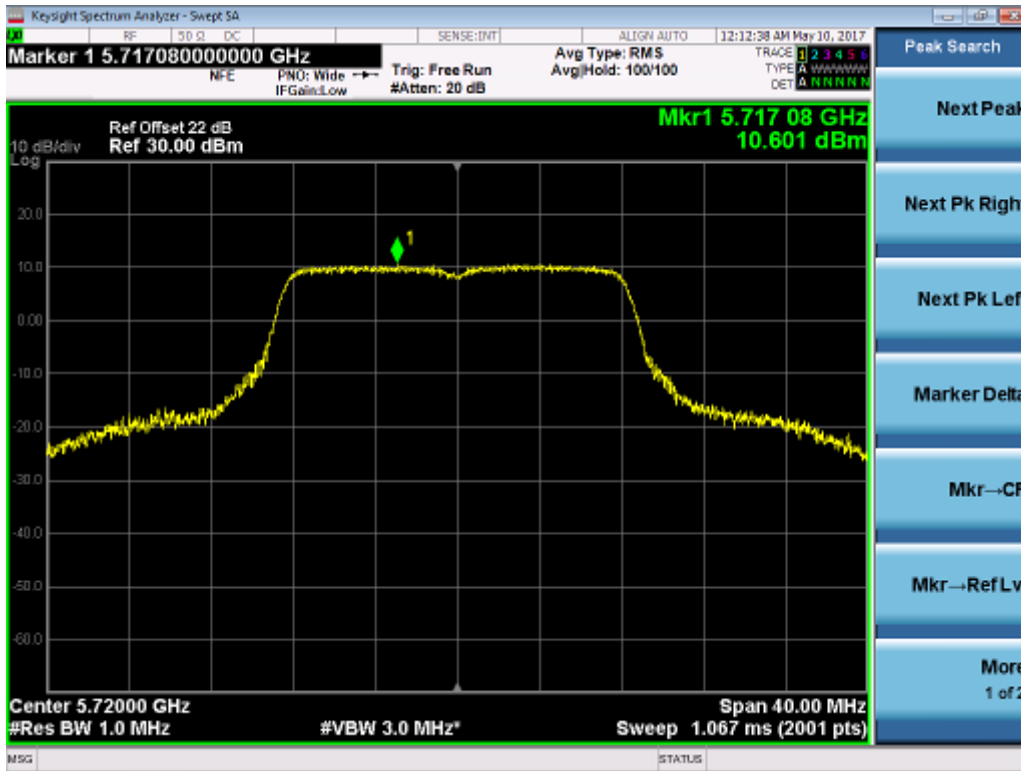
802.11a-5500MHz



802.11a-5600MHz



802.11a-5720MHz



Antenna port 0

802.11n20-5500MHz

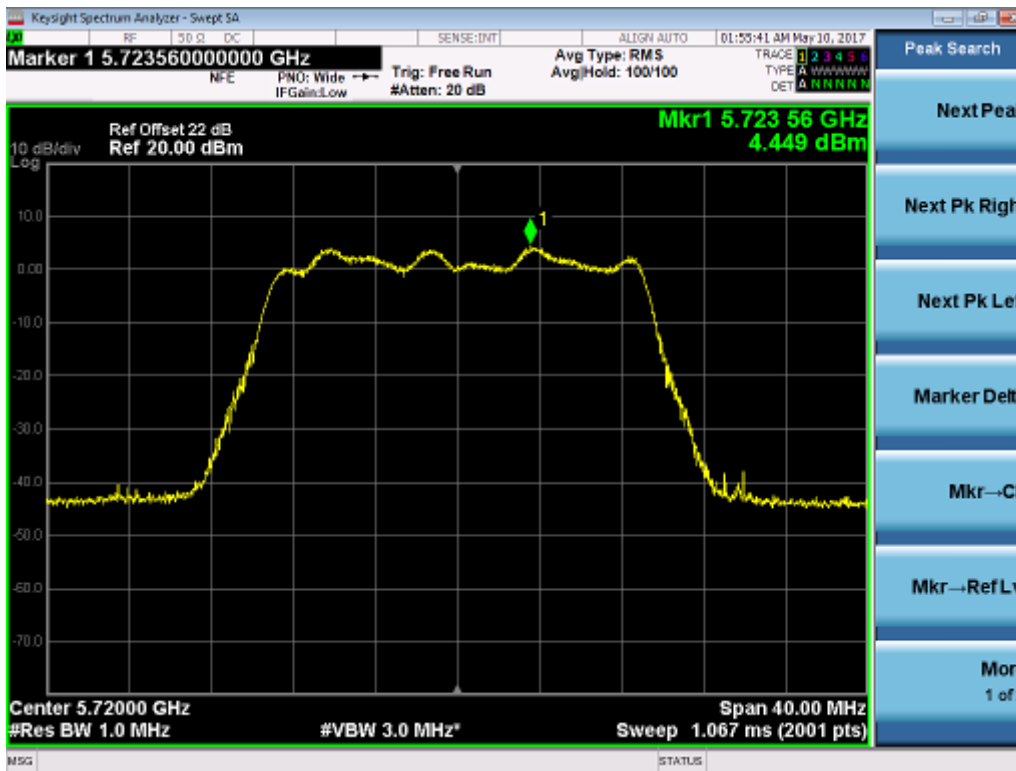




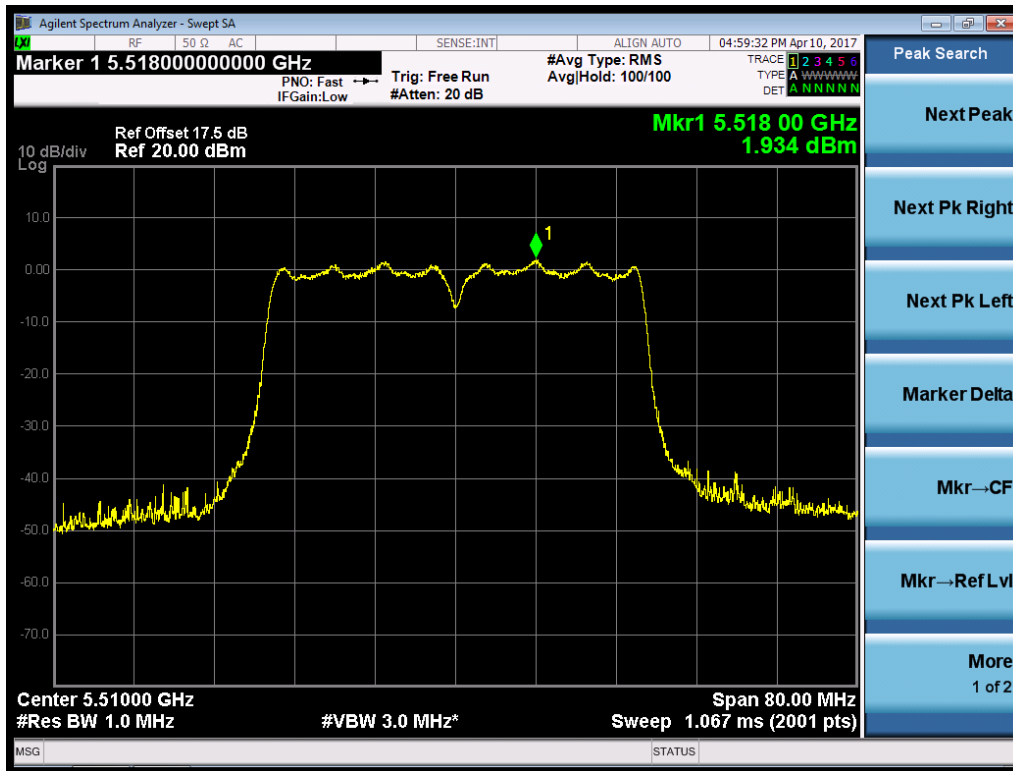
802.11n20-5600MHz



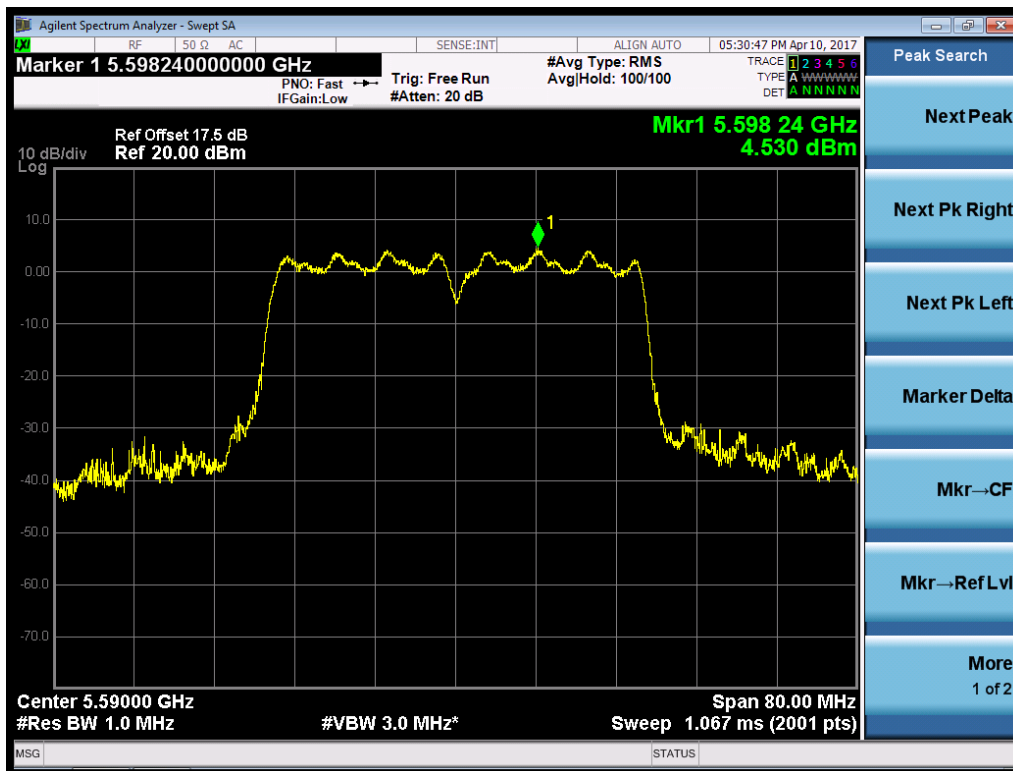
802.11n20-5720MHz



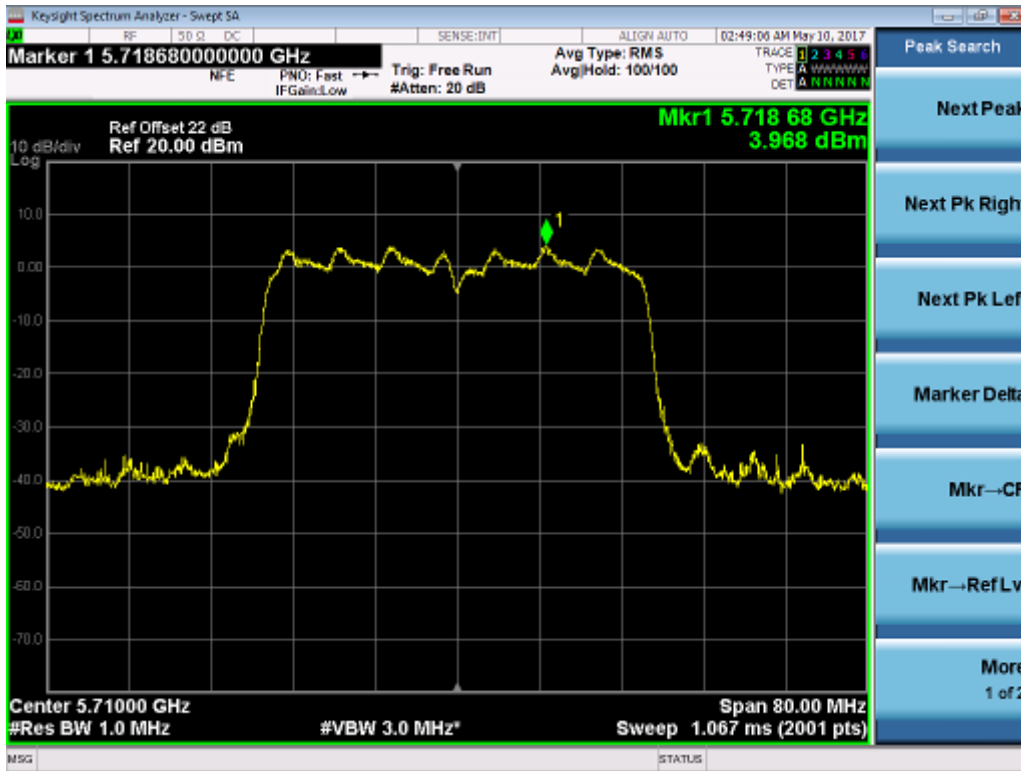
802.11n40-5510MHz



802.11n40-5590MHz



802.11n40-5710MHz



802.11ac80-5530MHz



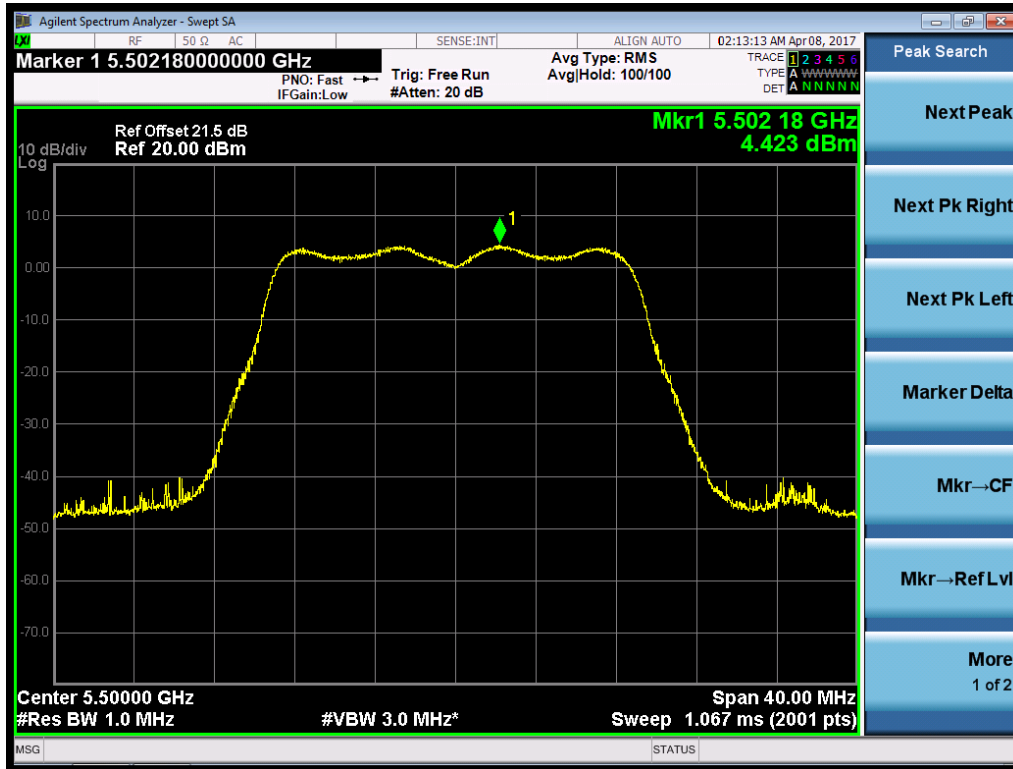
802.11ac80-5610MHz



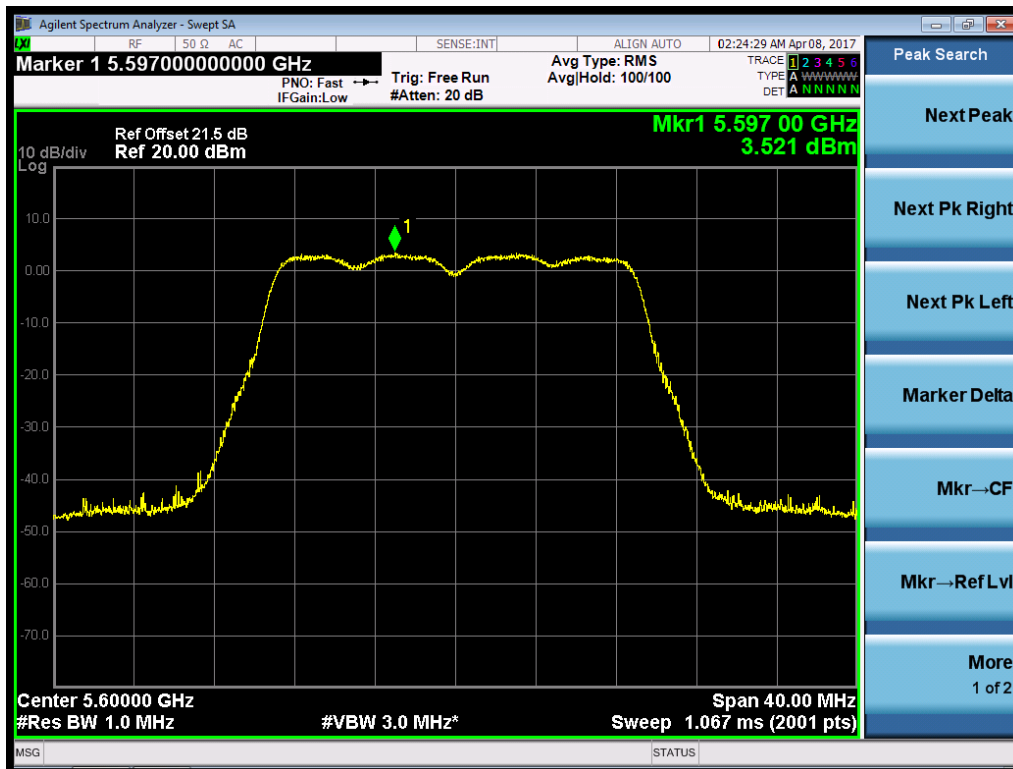
802.11ac80-5690MHz



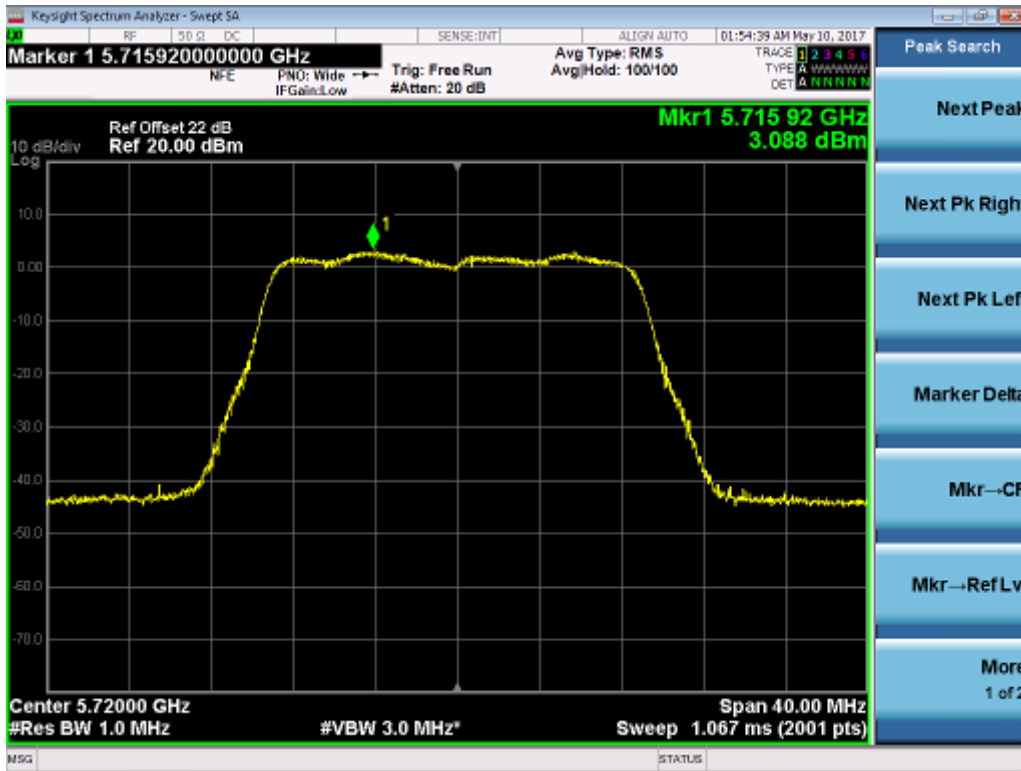
**Antenna port 1**  
**802.11n20-5500MHz**



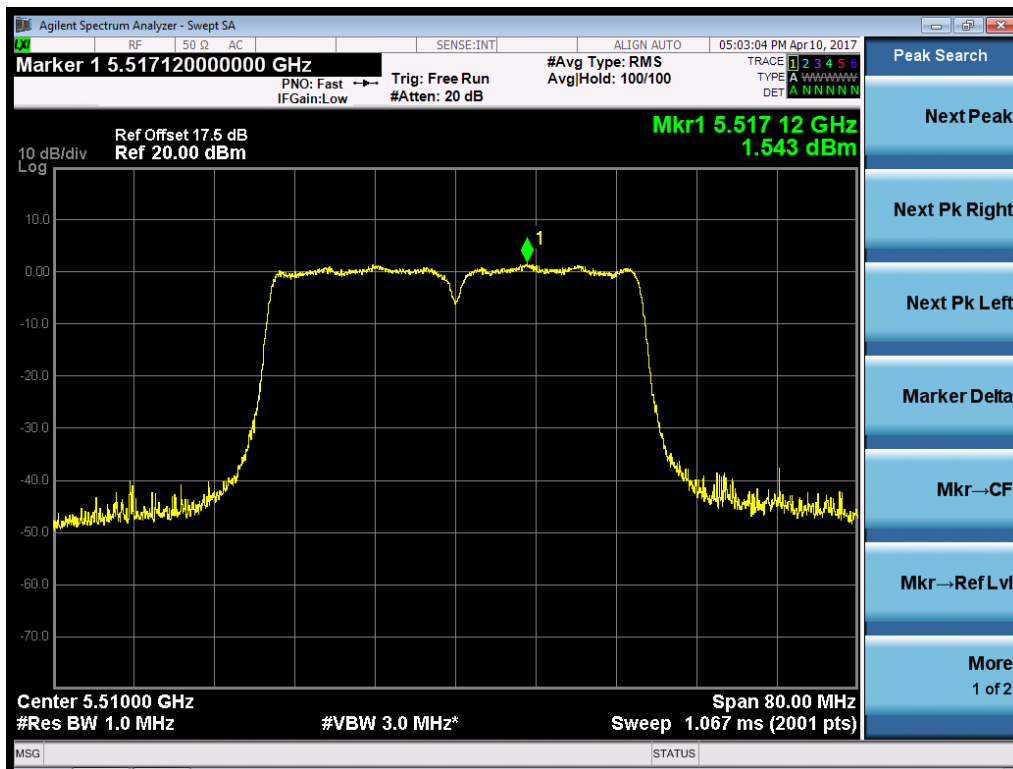
**802.11n20-5600MHz**



802.11n20-5720MHz



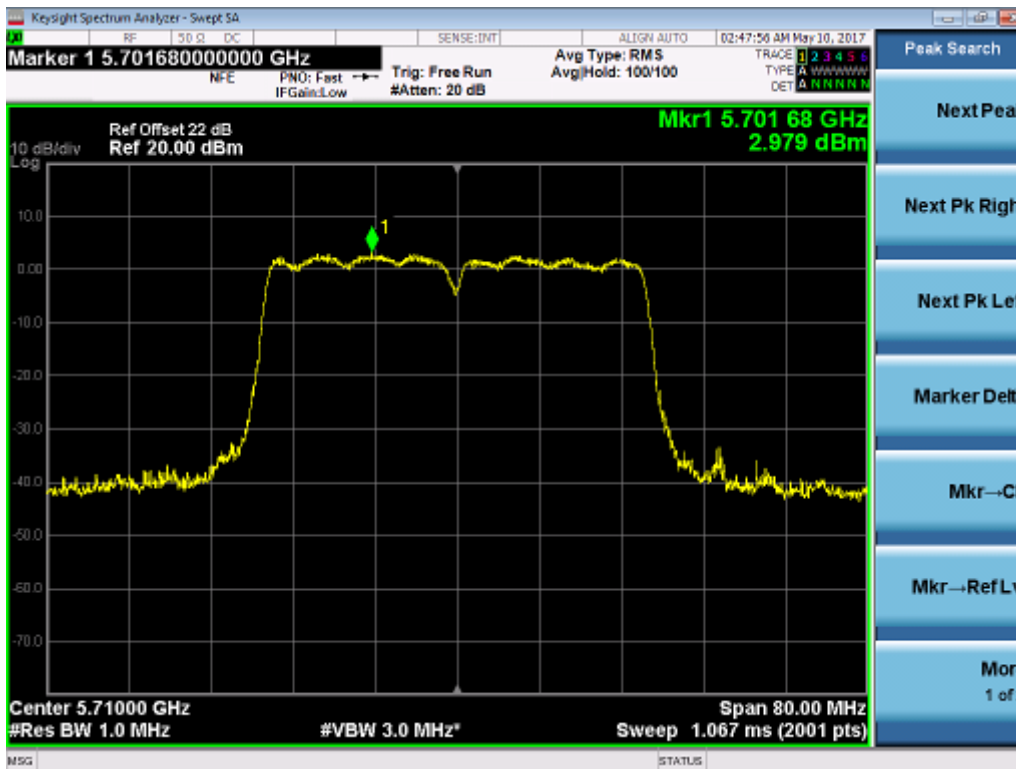
802.11n40-5510MHz



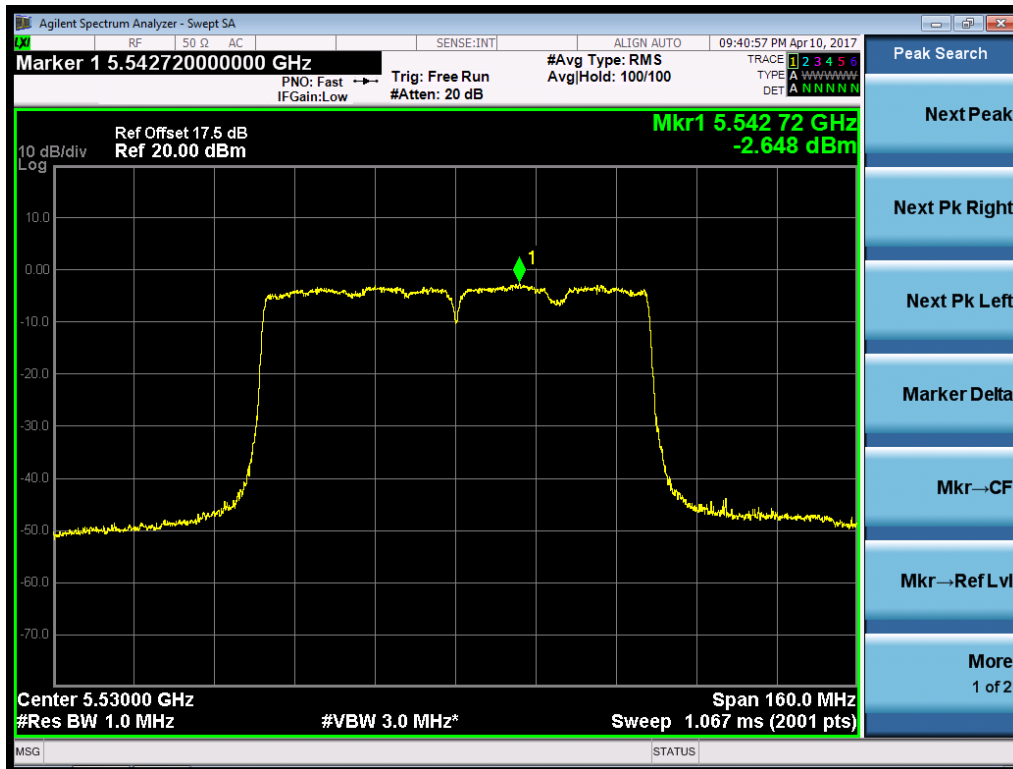
802.11n40-5590MHz



802.11n40-5710MHz



802.11ac80-5530MHz



802.11ac80-5610MHz



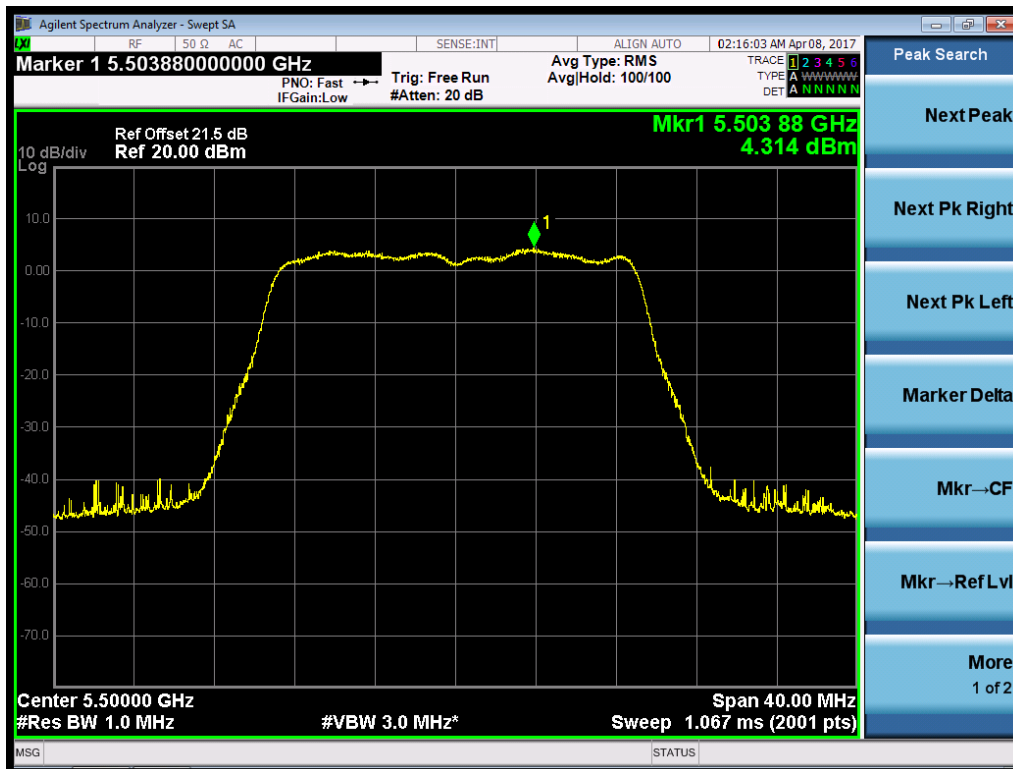


802.11ac80-5690MHz

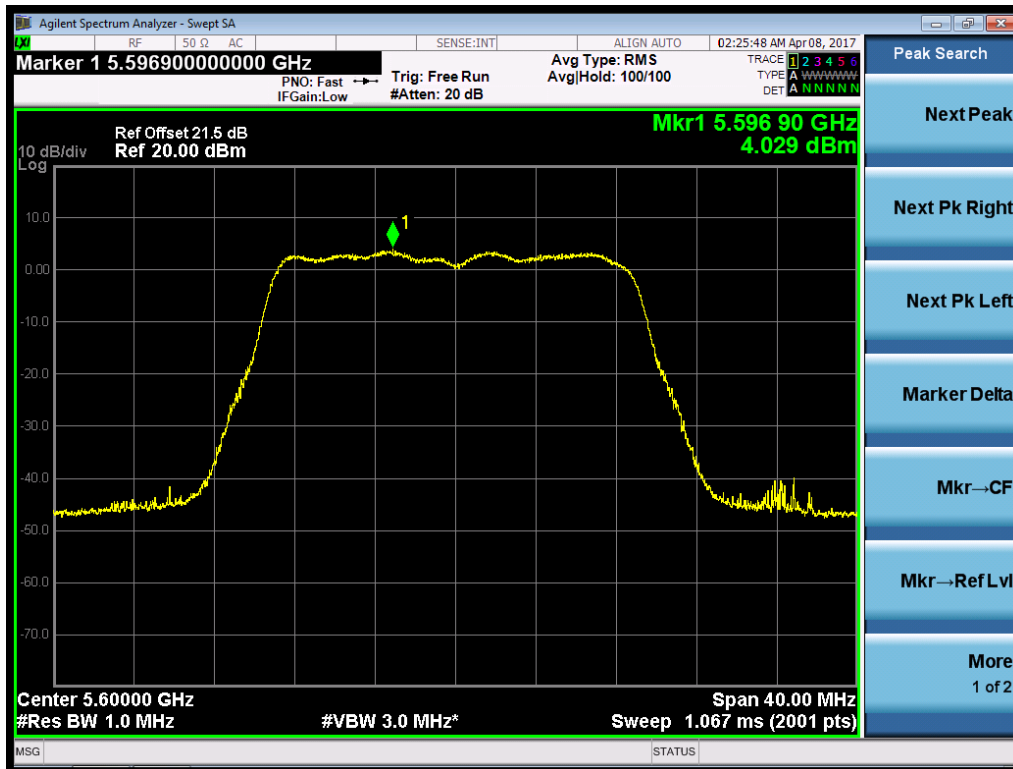


Antenna port 2

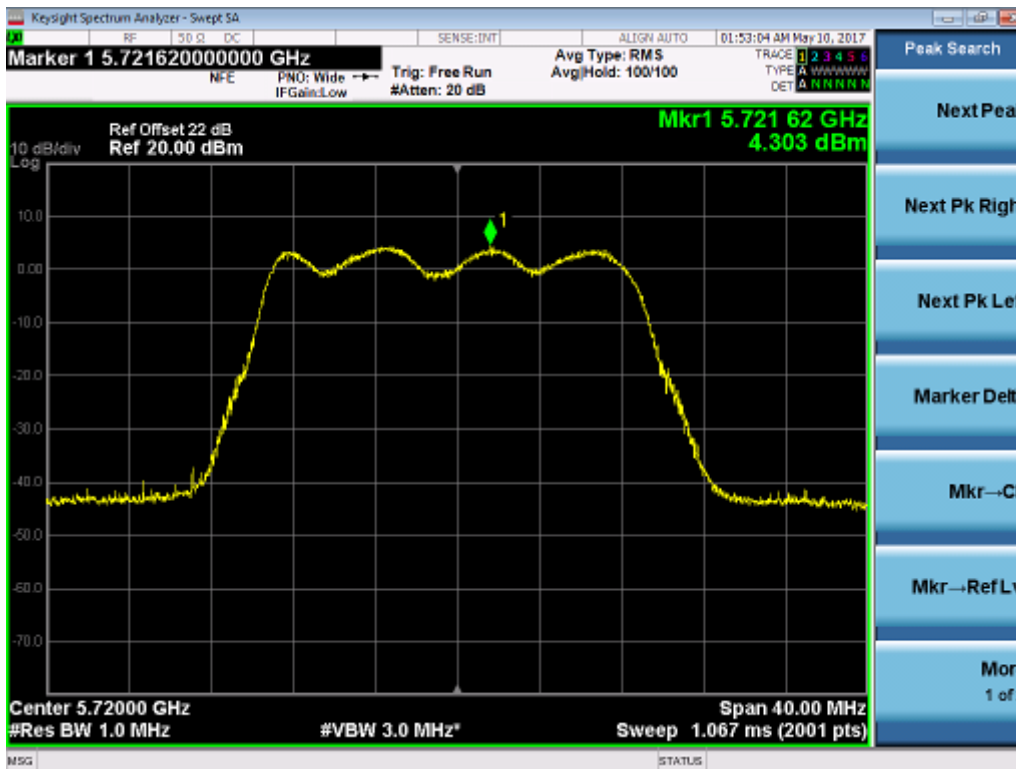
802.11n20-5500MHz



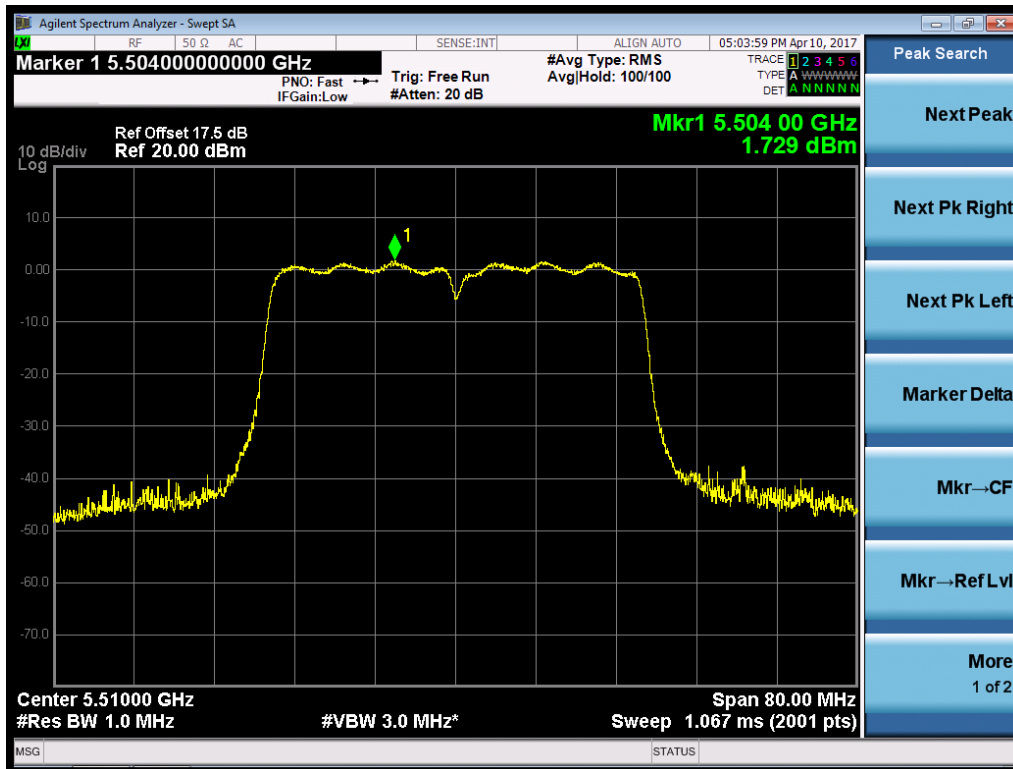
802.11n20-5600MHz



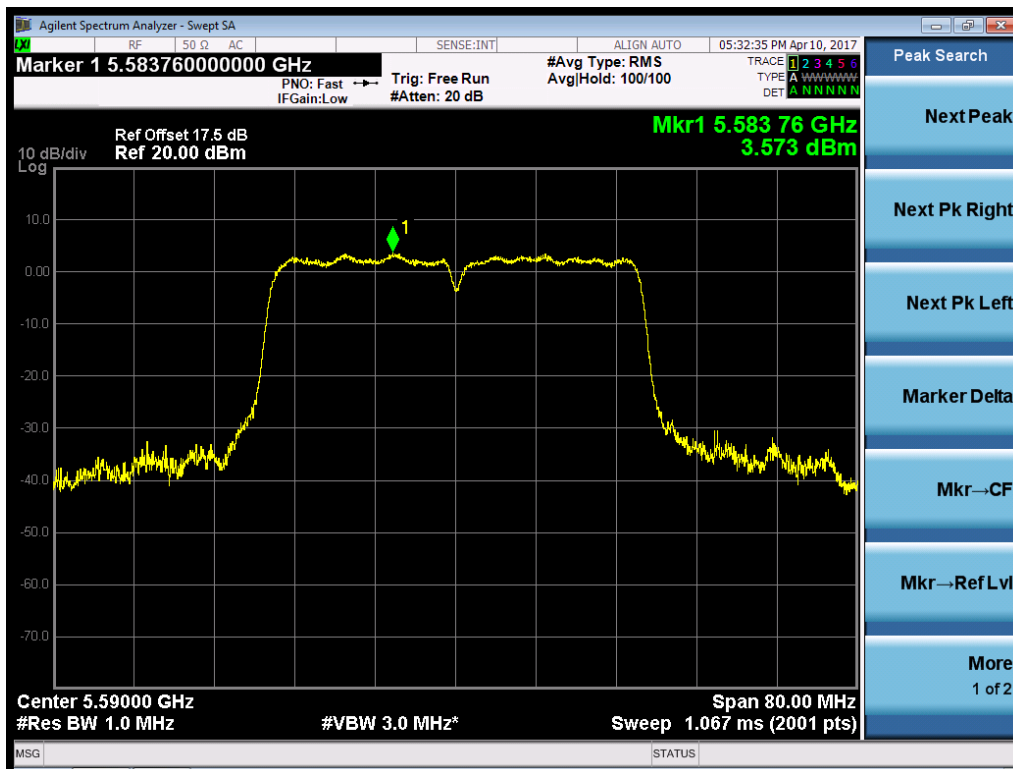
802.11n20-5720MHz



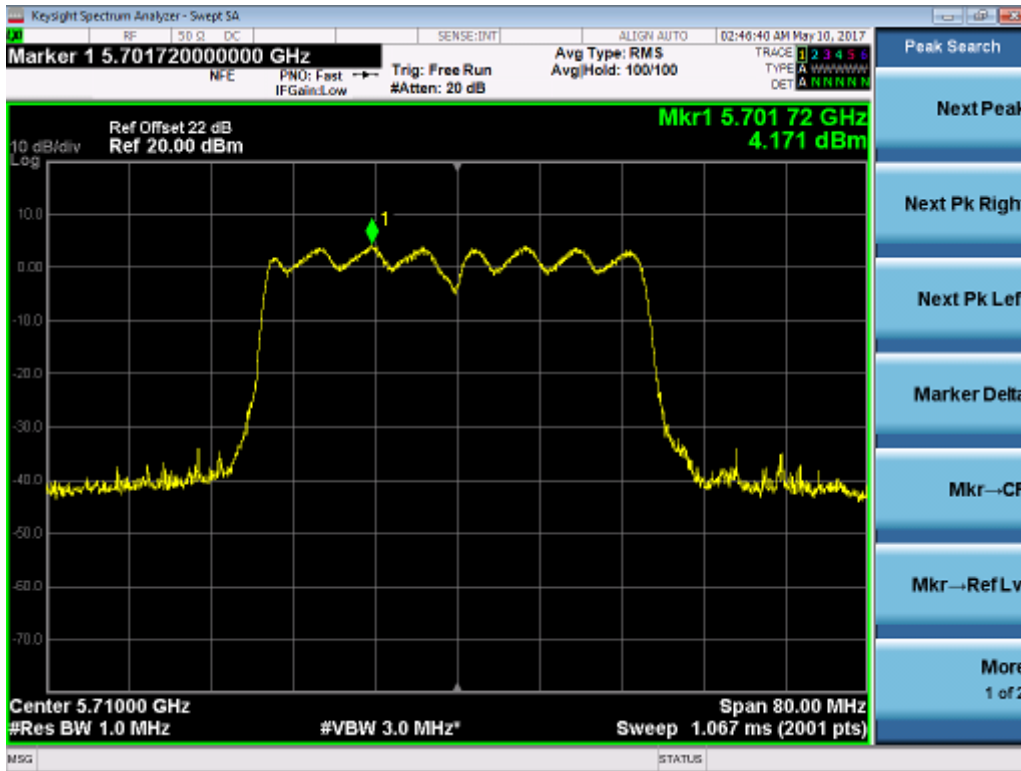
802.11n40-5510MHz



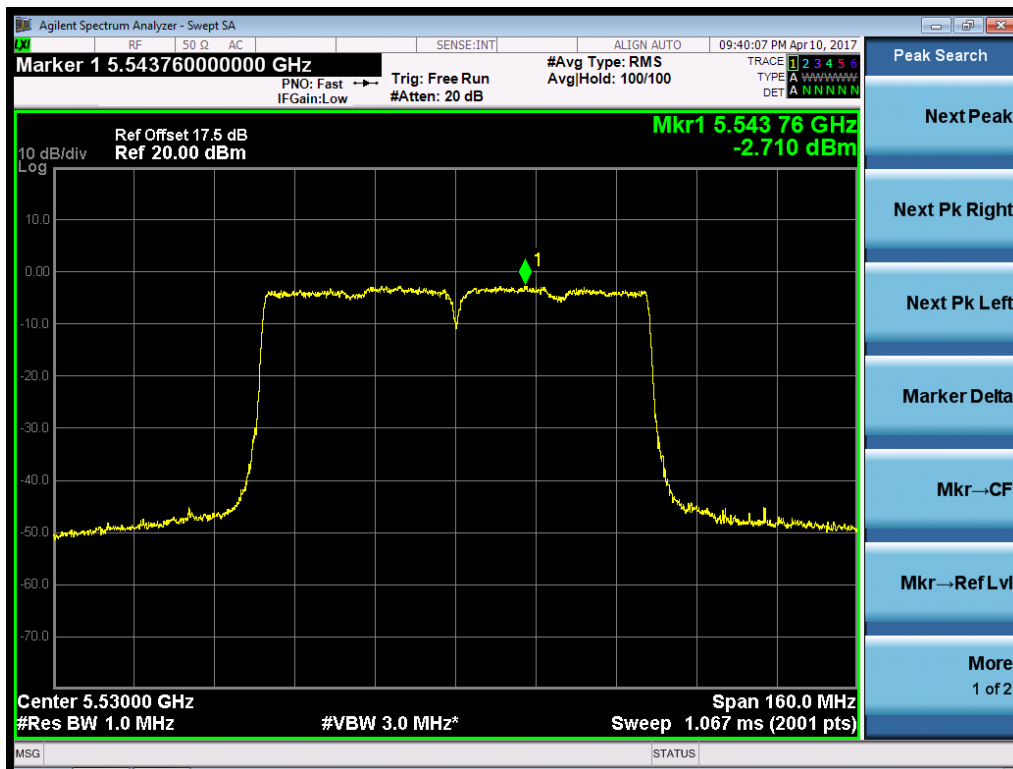
802.11n40-5590MHz



802.11n40-5710MHz



802.11ac80-5530MHz



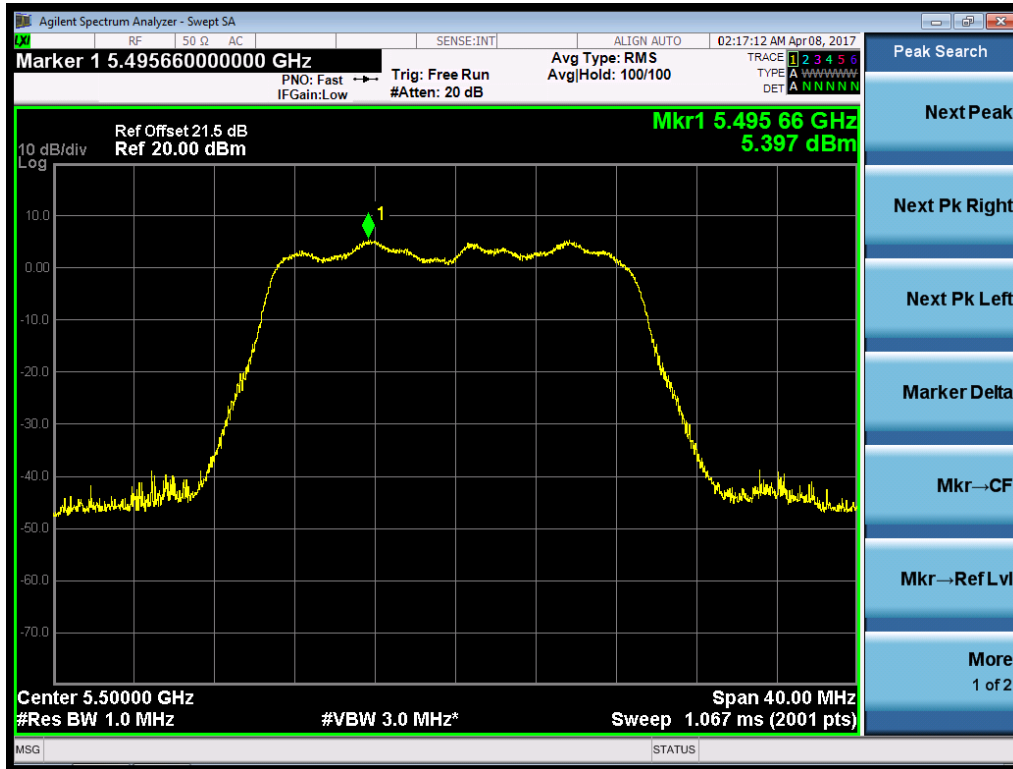
802.11ac80-5610MHz



802.11ac80-5690MHz



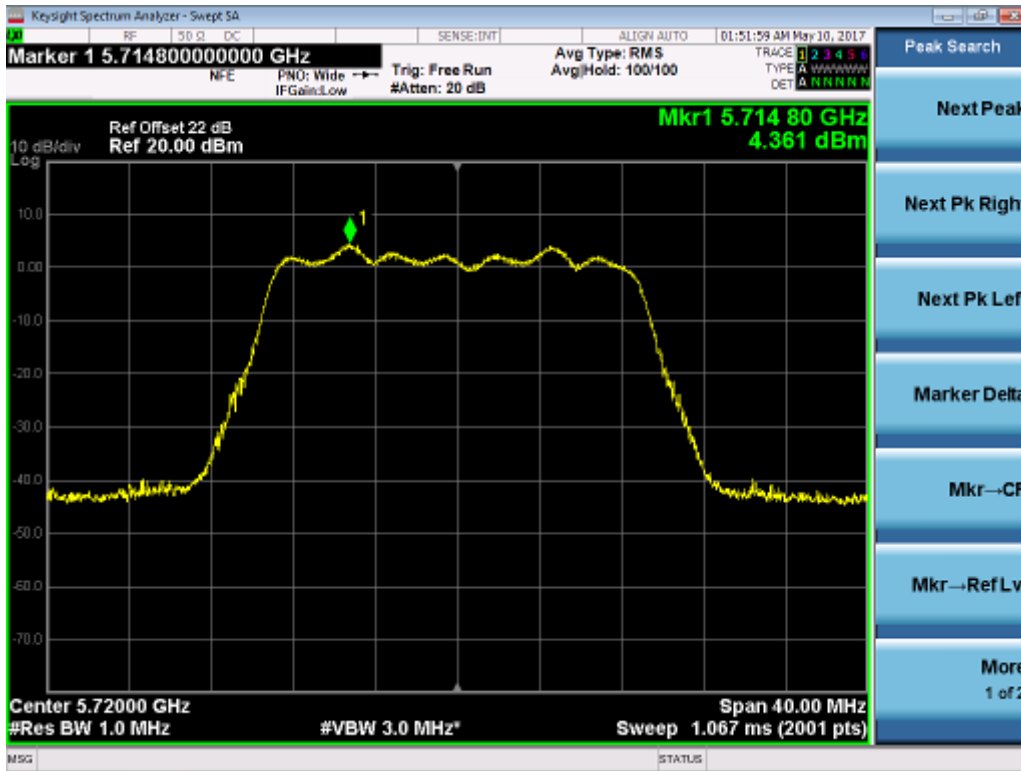
**Antenna port 3**  
**802.11n20-5500MHz**



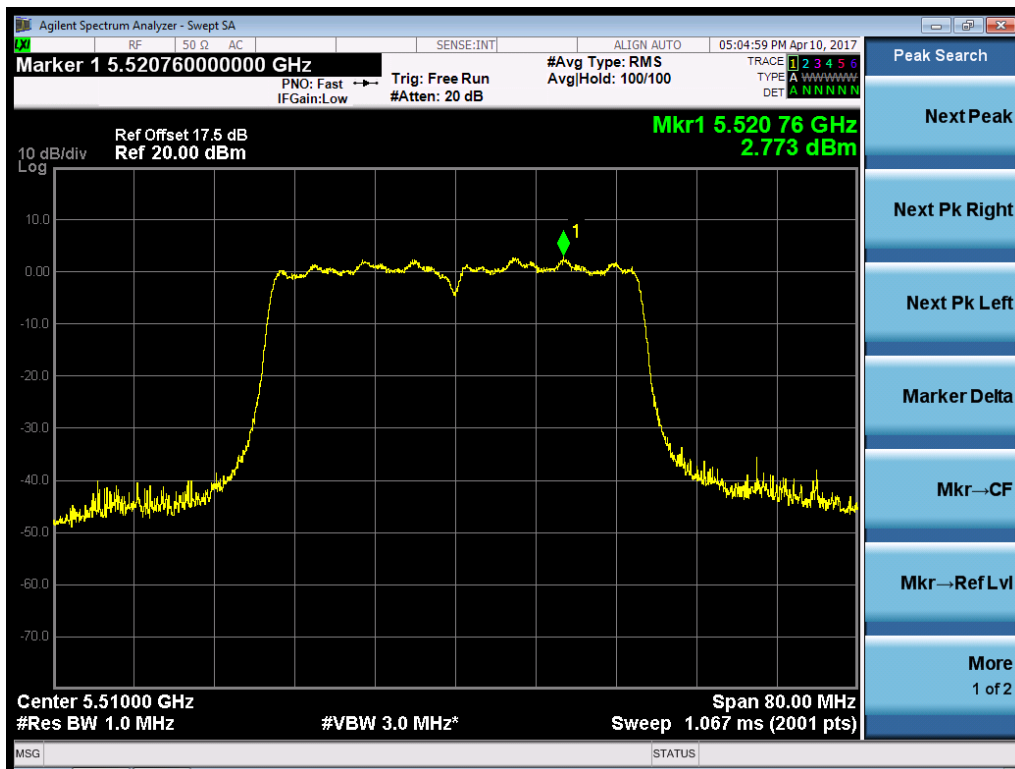
**802.11n20-5600MHz**



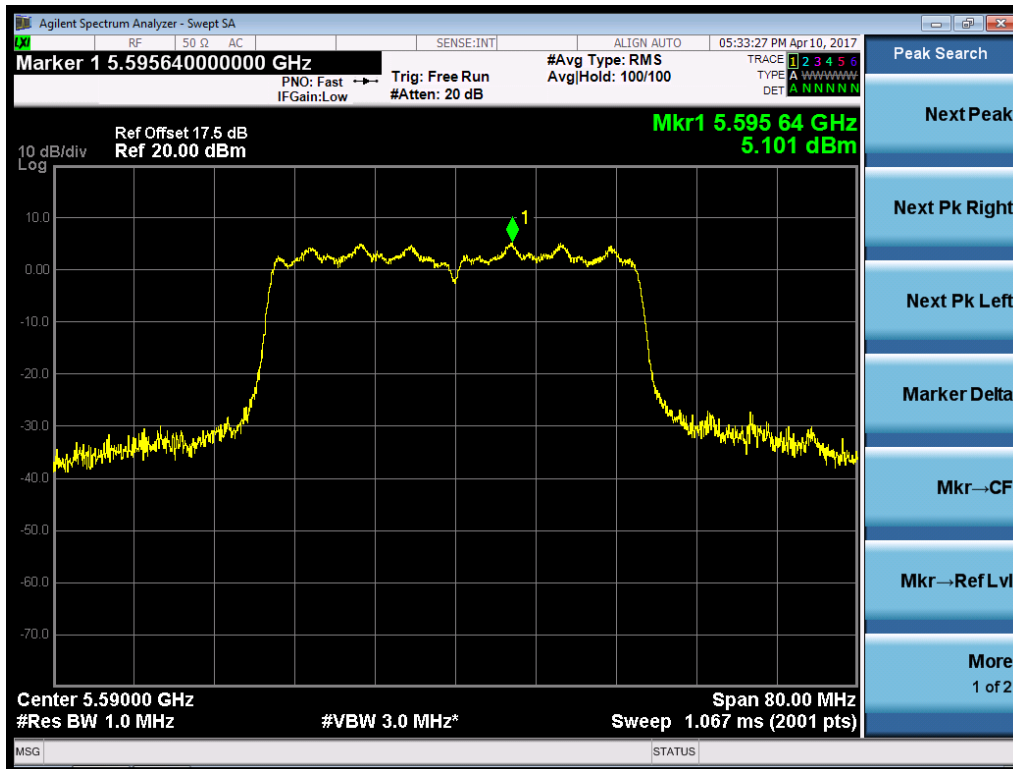
802.11n20-5720MHz



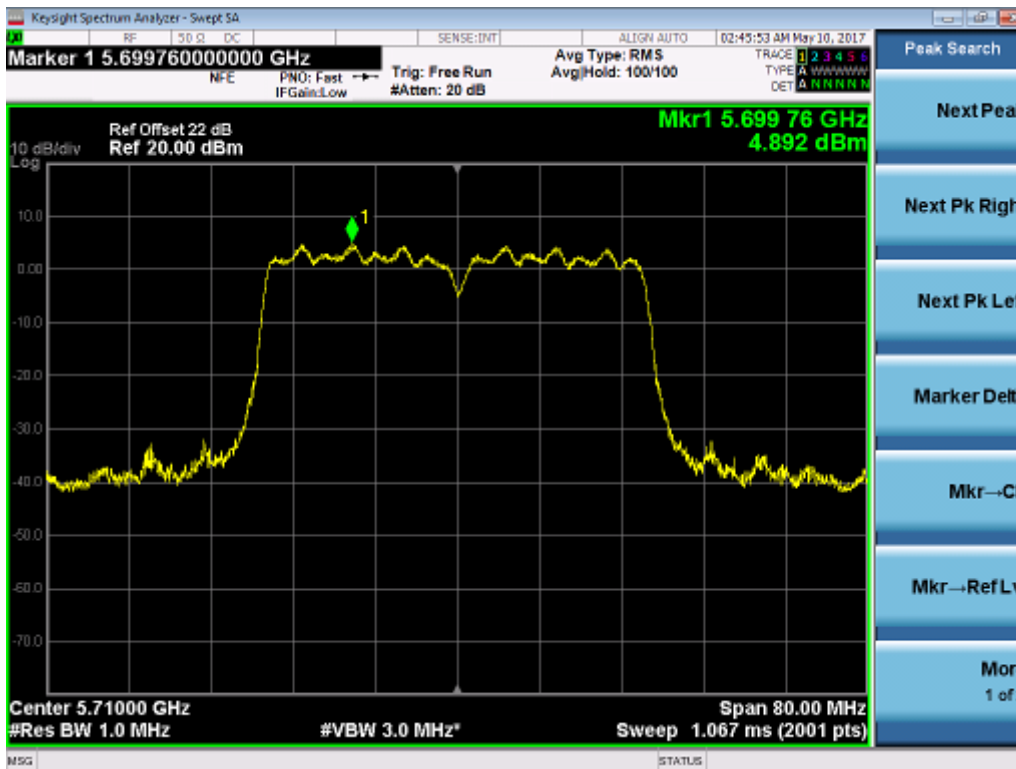
802.11n40-5510MHz



802.11n40-5590MHz

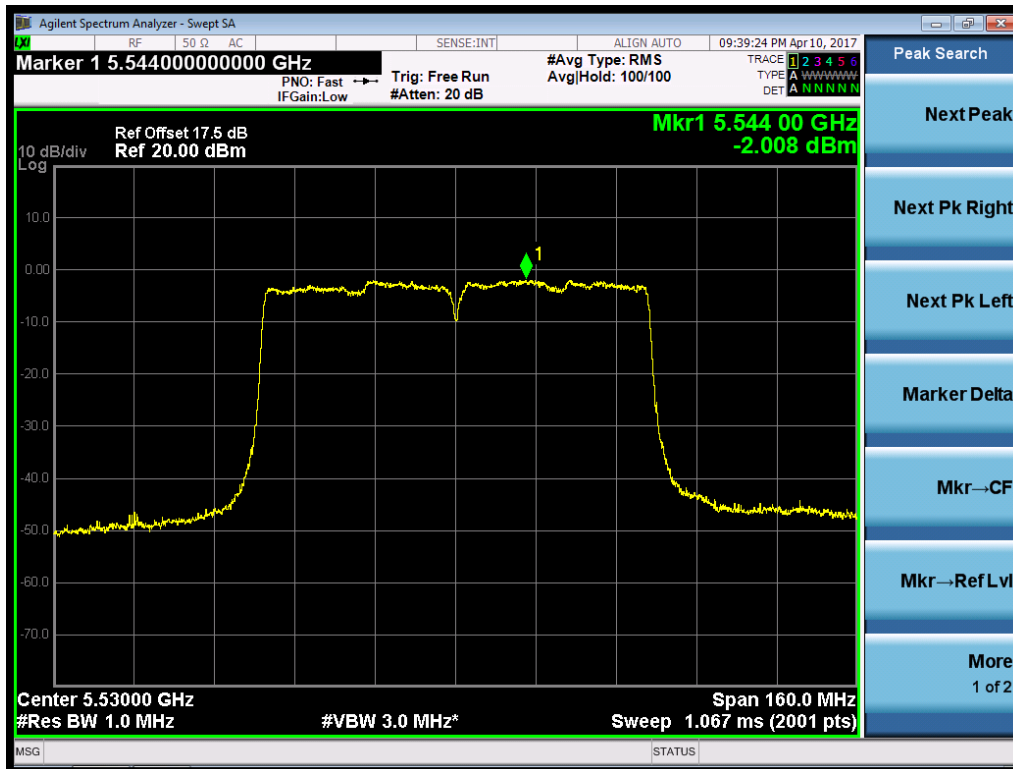


802.11n40-5710MHz





802.11ac80-5530MHz



802.11ac80-5610MHz



802.11ac80-5690MHz



## 6 Radiated Emissions

**Test result: Pass**

### 6.1 Test limit

6.1.1 The radiated emissions which are lower than 1GHz or fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

6.1.2 The emission which is outside the restrict bands, should comply with the EIRP limit as below:

For transmitters operating in the 5.15–5.25 / 5.25 – 5.35 / 5.47 – 5.725 GHz band:

Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
<5150	-27	68.20
>5350		
<5470		
>5725		

For transmitters operating in the 5.15–5.25 / 5.25 – 5.35 / 5.47 – 5.725 GHz band Assessed with 15.209(a):

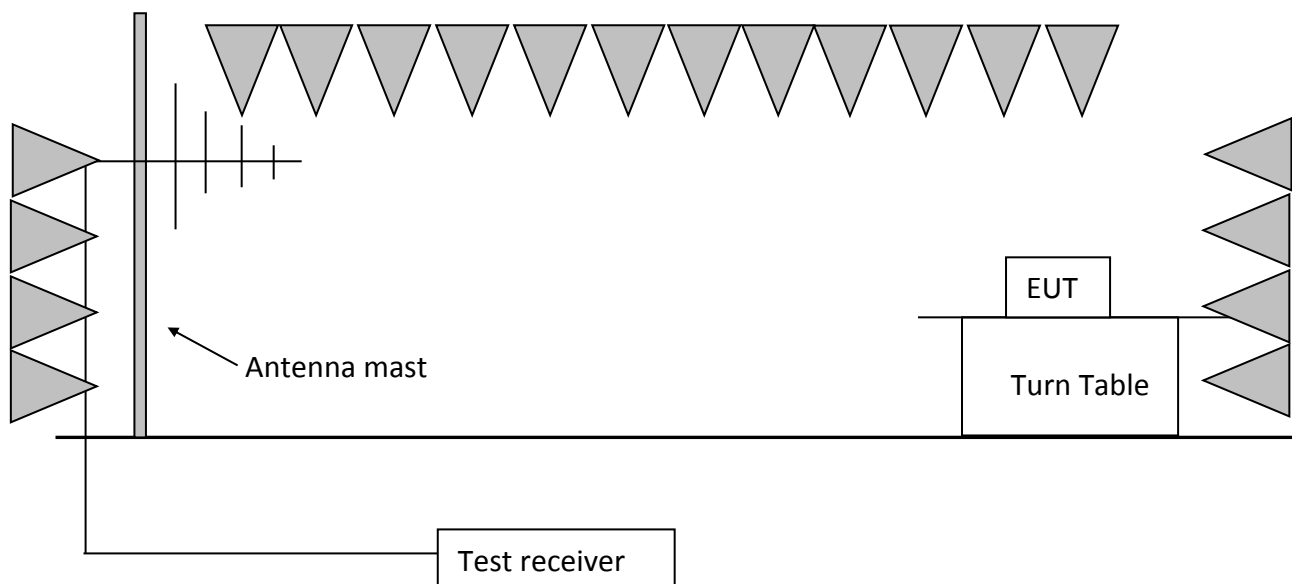
Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

For transmitters operating in the 5.725 – 5.85GHz band:

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (3m) (dBμV/m)
<5650	-27	68.20
5650 ~ 5700	-27 ~ 10	68.20 ~ 105.20
5700 ~ 5720	10 ~ 15.6	105.20 ~ 110.80
5720 ~ 5725	15.6 ~ 27	110.8 ~ 122.2
5850 ~ 5855	27 ~ 15.6	122.2 ~ 110.8
5855 ~ 5875	15.6 ~ 10	110.8 ~ 105.20
5875 ~ 5925	10 ~ -27	105.20 ~ 68.20
>5925	-27	68.20

6.1.3 As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

## 6.2 Test Configuration



### 6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to KDB 789033 D02: Section G.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);  
RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);  
RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)  
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

Remark:

1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Measured level= Original Receiver Reading + Factor
3. Margin = Limit – Measured level
4. If the PK measured level is lower than AV limit, the AV test can be elided.

Example:

Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,  
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.  
Then Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;  
Measured level = 10dBuV + 0.20dB/m = 10.20dBuV/m  
Assuming limit = 54dBuV/m,  
Measured level = 10.20dBuV/m, then Margin = 54 - 10.20 = 43.80dBuV/m.

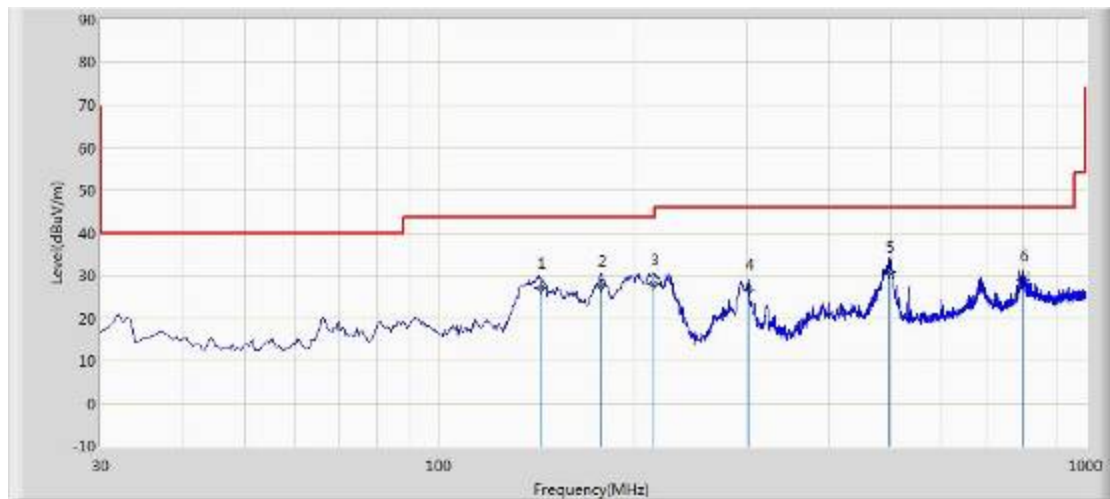
## 6.4 Test Protocol

Temperature: 25 °C  
Relative Humidity: 55 %

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

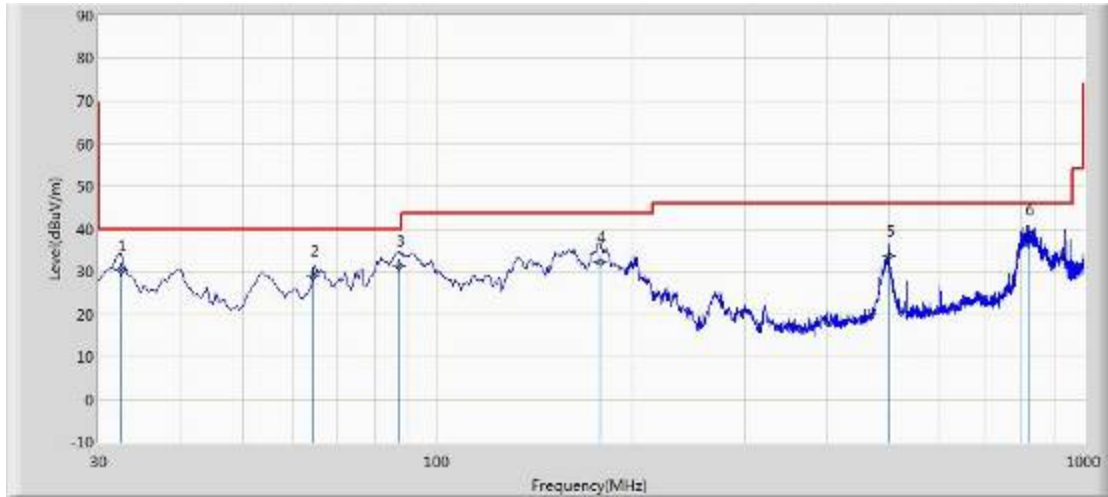
The worst waveform from 30MHz to 1000MHz is listed as below:

Horizontal



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			143.526	27.181	12.450	-16.319	43.500	14.731	QP
2			177.925	27.632	14.526	-15.868	43.500	13.105	QP
3			214.526	28.084	16.520	-15.416	43.500	11.564	QP
4			301.115	26.856	12.520	-19.144	46.000	14.336	QP
5		*	496.520	30.848	12.425	-15.152	46.000	18.423	QP
6			800.150	28.826	5.630	-17.174	46.000	23.195	QP

Vertical



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			32.425	30.231	16.523	-9.769	40.000	13.708	QP
2			64.256	29.104	16.523	-10.896	40.000	12.581	QP
3			87.250	31.579	21.420	-8.421	40.000	10.159	QP
4			178.410	32.393	19.360	-11.107	43.500	13.033	QP
5			499.630	33.675	15.200	-12.325	46.000	18.475	QP
6		*	819.526	38.809	15.410	-7.191	46.000	23.398	QP

**Test result above 1GHz:**

The emission was conducted from 1GHz to 40GHz.

**U-NII-2A Band:**  
802.11a

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	V	10520.000	51.382	38.934	-22.618	74.000	12.448	PK
	V	12330.500	46.695	35.124	-27.305	74.000	11.571	PK
	H	15776.350	40.166	28.461	-13.834	54.000	11.705	AV
	H	15781.500	55.016	43.340	-18.984	74.000	11.675	PK
M	H	10605.000	48.959	36.560	-25.041	74.000	12.399	PK
	H	15892.000	52.376	40.700	-21.624	74.000	11.676	PK
	V	11786.500	46.367	34.516	-27.633	74.000	11.851	PK
	V	15892.000	53.323	41.647	-20.677	74.000	11.676	PK
H	V	5350.000	69.834	32.548	-4.166	74.000	37.286	PK
	V	5354.960	71.576	34.275	-2.424	74.000	37.301	PK
	V	5350.000	53.254	15.968	-0.746	54.000	37.286	AV
	H	5350.000	62.795	25.509	-11.205	74.000	37.286	PK
	H	5351.480	65.330	28.039	-8.670	74.000	37.291	PK
	H	5350.000	50.588	13.302	-3.412	54.000	37.286	AV
	H	7094.500	51.029	43.622	-22.971	74.000	7.406	PK
	V	7094.500	49.818	42.411	-24.182	74.000	7.406	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	H	15781.500	53.594	41.918	-20.406	74.000	11.675	PK
	V	10520.000	49.943	37.495	-24.057	74.000	12.448	PK
M	H	15900.500	52.450	40.735	-21.550	74.000	11.715	PK
	V	15892.000	50.521	38.845	-23.479	74.000	11.676	PK



H	H	5350.000	63.171	25.885	-10.829	74.000	37.286	PK
	H	5353.000	71.084	33.789	-2.916	74.000	37.295	PK
	H	5350.000	49.913	12.627	-4.087	54.000	37.286	AV
	V	5350.000	63.324	26.038	-10.676	74.000	37.286	PK
	V	5352.600	66.208	28.914	-7.792	74.000	37.295	PK
	V	5350.000	49.873	12.587	-4.127	54.000	37.286	AV
	H	7094.500	48.542	41.135	-25.458	74.000	7.406	PK
	V	7094.500	50.532	43.125	-23.468	74.000	7.406	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	H	15807.000	50.439	38.748	-23.561	74.000	11.691	PK
	V	7026.500	49.313	42.381	-24.687	74.000	6.931	PK
H	H	5350.000	68.664	31.378	-5.336	74.000	37.286	PK
	H	5351.500	71.116	33.825	-2.884	74.000	37.291	PK
	H	5350.000	50.368	13.082	-3.632	54.000	37.286	AV
	V	5350.000	68.023	30.737	-5.977	74.000	37.286	PK
	V	5350.750	73.463	36.174	-0.537	74.000	37.288	PK
	V	5350.000	50.580	13.294	-3.420	54.000	37.286	AV
	H	7077.500	49.604	42.322	-24.396	74.000	7.282	PK
	V	7077.500	50.834	43.552	-23.166	74.000	7.282	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
-	V	5350.000	69.284	31.998	-4.716	74.000	37.286	PK
	V	5350.110	72.653	35.366	-1.347	74.000	37.287	PK
	V	5350.000	51.659	14.373	-2.341	54.000	37.286	AV
	V	5353.080	51.960	14.664	-2.040	54.000	37.296	AV

	H	5350.000	72.111	34.825	-1.889	74.000	37.286	PK
	H	5357.810	73.295	35.987	-0.705	74.000	37.308	PK
	H	5350.000	51.675	14.389	-2.325	54.000	37.286	AV
	H	5353.300	52.296	15.000	-1.704	54.000	37.296	AV
	H	7052.000	51.806	44.697	-22.194	74.000	7.109	PK
	V	7052.000	49.856	42.747	-24.144	74.000	7.109	PK

**U-NII-2C Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	V	5460.000	62.735	25.172	-11.265	74.000	37.563	PK
	V	5466.990	71.436	33.855	-2.564	74.000	37.581	PK
	V	5470.000	69.246	31.657	-4.754	74.000	37.588	PK
	V	5460.000	51.179	13.616	-2.821	54.000	37.563	AV
	V	5470.000	52.335	14.746	-1.665	54.000	37.588	AV
	V	5470.000	52.335	14.746	-1.665	54.000	37.588	AV
	H	5460.000	63.125	25.562	-10.875	74.000	37.563	PK
	H	5470.000	63.287	25.698	-10.713	74.000	37.588	PK
	H	5460.000	50.461	12.898	-3.539	54.000	37.563	AV
	V	7094.500	49.818	42.411	-24.182	74.000	7.406	PK
	H	7332.500	47.478	39.434	-26.522	74.000	8.044	PK
M	V	9381.000	45.829	35.325	-28.171	74.000	10.504	PK
	V	10783.500	47.407	34.827	-26.593	74.000	12.580	PK
	H	10613.500	45.760	33.345	-28.240	74.000	12.415	PK
	H	11480.500	46.133	33.402	-27.867	74.000	12.731	PK
H	V	11395.500	49.768	37.165	-24.232	74.000	12.603	PK
	V	15203.500	50.253	36.637	-23.747	74.000	13.617	PK
	H	7502.500	46.406	38.151	-27.594	74.000	8.254	PK
	H	9457.500	45.775	35.262	-28.225	74.000	10.513	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	V	5460.000	62.975	25.412	-11.025	74.000	37.563	PK
	V	5470.000	62.859	25.270	-11.141	74.000	37.588	PK
	V	5460.000	50.189	12.626	-3.811	54.000	37.563	AV
	H	5460.000	63.058	25.495	-10.942	74.000	37.563	PK
	H	5470.000	63.334	25.745	-10.666	74.000	37.588	PK
	H	5460.000	50.222	12.659	-3.778	54.000	37.563	AV
	H	7332.500	46.449	38.405	-27.551	74.000	8.044	PK
	H	10333.000	46.806	34.647	-27.194	74.000	12.159	PK
	V	9882.500	46.653	35.061	-27.347	74.000	11.592	PK
	V	12959.500	45.183	33.034	-28.817	74.000	12.149	PK
M	H	7443.000	43.883	35.891	-30.117	74.000	7.992	PK
	H	10843.000	46.774	34.030	-27.226	74.000	12.744	PK
	V	10681.500	47.047	34.673	-26.953	74.000	12.374	PK
	V	11642.000	46.732	34.365	-27.268	74.000	12.367	PK
H	V	7630.000	48.043	40.004	-25.957	74.000	8.039	PK
	V	11038.500	46.611	33.684	-27.389	74.000	12.927	PK
	H	7502.500	45.207	36.952	-28.793	74.000	8.254	PK
	H	11149.000	47.541	34.911	-26.459	74.000	12.630	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	H	5460.000	65.434	27.871	-8.566	74.000	37.563	PK
	H	5469.900	71.362	33.774	-2.638	74.000	37.588	PK
	H	5470.000	70.250	32.661	-3.750	74.000	37.588	PK
	H	5460.000	50.482	12.919	-3.518	54.000	37.563	AV
	H	5470.000	50.905	13.316	-3.095	54.000	37.588	AV

	V	5460.000	64.451	26.888	-9.549	74.000	37.563	PK
	V	5469.700	70.506	32.918	-3.494	74.000	37.588	PK
	V	5470.000	68.009	30.420	-5.991	74.000	37.588	PK
	V	5460.000	50.402	12.839	-3.598	54.000	37.563	AV
	V	5470.000	50.871	13.282	-3.129	54.000	37.588	AV
	H	14566.000	50.678	35.065	-23.322	74.000	15.613	PK
	V	7349.500	47.416	39.420	-26.584	74.000	7.997	PK
M	H	10902.500	46.506	33.548	-27.494	74.000	12.958	PK
	H	12245.500	45.574	33.848	-28.426	74.000	11.727	PK
	V	7902.000	43.976	35.628	-30.024	74.000	8.348	PK
	V	11072.500	46.529	33.683	-27.471	74.000	12.846	PK
	V	12101.000	45.814	33.818	-28.186	74.000	11.996	PK
H	H	11013.000	46.175	33.186	-27.825	74.000	12.989	PK
	H	12237.000	46.411	34.661	-27.589	74.000	11.750	PK
	V	11047.000	46.140	33.254	-27.860	74.000	12.886	PK
	V	11888.500	45.469	33.645	-28.531	74.000	11.824	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
L	H	5460.000	66.061	28.498	-7.939	74.000	37.563	PK
	H	5468.220	73.340	35.756	-0.660	74.000	37.584	PK
	H	5470.000	70.437	32.848	-3.563	74.000	37.588	PK
	H	5460.000	50.671	13.108	-3.329	54.000	37.563	AV
	H	5469.370	51.042	13.455	-2.958	54.000	37.587	AV
	H	5470.000	50.907	13.318	-3.093	54.000	37.588	AV
	V	5460.000	69.156	31.593	-4.844	74.000	37.563	PK
	V	5467.760	70.393	32.810	-3.607	74.000	37.583	PK
	V	5470.000	68.443	30.854	-5.557	74.000	37.588	PK
	V	5460.000	50.646	13.083	-3.354	54.000	37.563	AV
	V	5470.000	50.867	13.278	-3.133	54.000	37.588	AV
	V	7375.000	46.827	38.933	-27.173	74.000	7.894	PK
	H	10273.500	48.186	36.199	-25.814	74.000	11.986	PK
H	H	7587.500	46.697	38.538	-27.303	74.000	8.159	PK
	H	11378.500	48.797	36.205	-25.203	74.000	12.593	PK
	H	12840.500	45.909	34.023	-28.091	74.000	11.886	PK
	H	14557.500	50.123	34.499	-23.877	74.000	15.625	PK
	V	7587.500	46.109	37.950	-27.891	74.000	8.159	PK
	V	11395.500	48.639	36.036	-25.361	74.000	12.603	PK
	V	13716.000	46.958	32.871	-27.042	74.000	14.087	PK
	V	14812.500	50.573	35.349	-23.427	74.000	15.225	PK

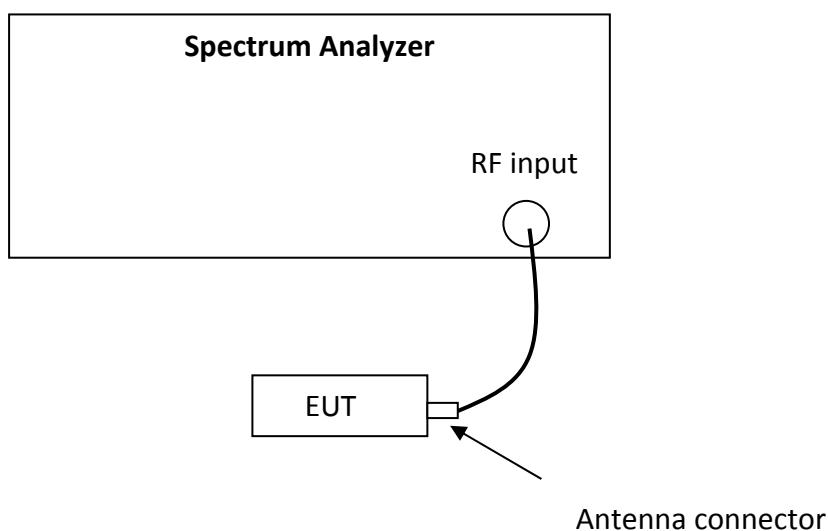
## 7 Frequency Stability

**Test result:** Pass

### 7.1 Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

### 7.2 Block Diagram of Test Setup



### 7.3 Test Procedure and Test Setup

- a) To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- b) The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
- c) The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

#### 7.4 Test Protocol

Temperature: 25 °C  
Relative Humidity: 55 %

Temperature (°C)	Voltage (V)	Mod.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)
20	90	11a	5320	5319.975	-0.025	-4.70
20	135	11a	5320	5319.975	-0.025	-4.70
20	120	11a	5320	5320.000	0.000	0.00
-30	120	11a	5320	5320.025	0.025	4.70
50	120	11a	5320	5319.975	-0.025	-4.70

Temperature (°C)	Voltage (V)	Mod.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)
20	90	11a	5500	5500.000	0.000	0.00
20	135	11a	5500	5499.975	-0.025	-4.55
20	120	11a	5500	5500.000	0.000	0.00
-30	120	11a	5500	5500.025	0.025	4.55
50	120	11a	5500	5499.975	-0.025	-4.55

#### 7.5 Measurement uncertainty

Measurement uncertainty:  $\pm 0.84 \times 10^{-7}$

## 8 Power line conducted emission

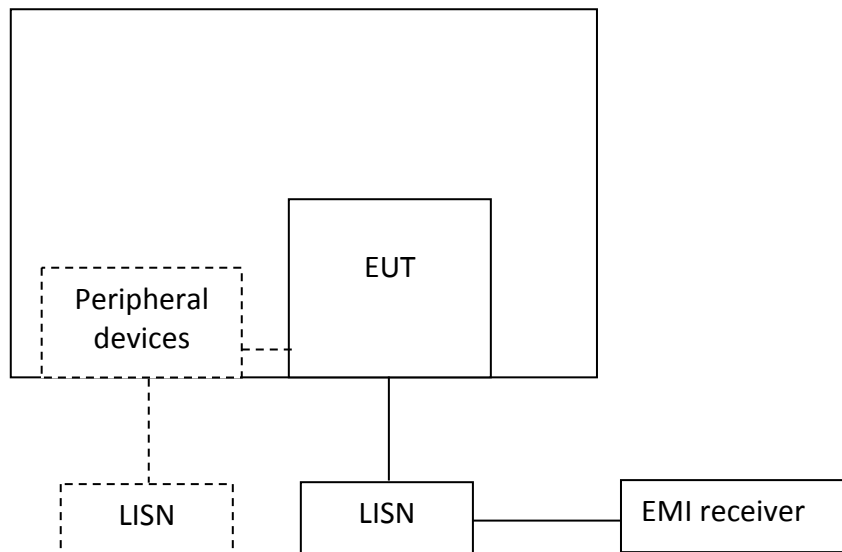
**Test result:** Pass

### 8.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### 8.2 Test configuration



For table top equipment, wooden support is 0.8m height table

For floor standing equipment, wooden support is 0.1m height rack.



### 8.3 Test procedure and test set up

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50  $\Omega$  LISN port (to which the EUT is connected), where permitted, terminated into a 50  $\Omega$  measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50  $\Omega$  measuring port is terminated by a measuring instrument having 50  $\Omega$  input impedance. All other ports are terminated in 50  $\Omega$  loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

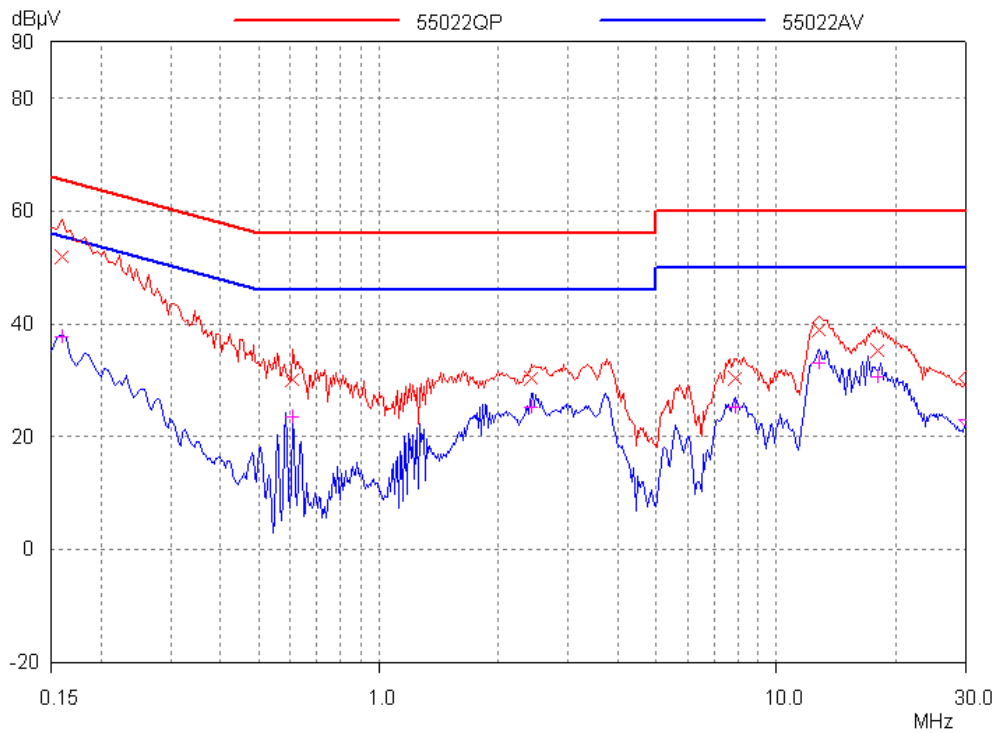
The bandwidth of the test receiver is set at 9 kHz.

### 8.4 Test protocol

Temperature: 25 °C  
Relative Humidity: 55 %

**L line:**

**Test Curve:**

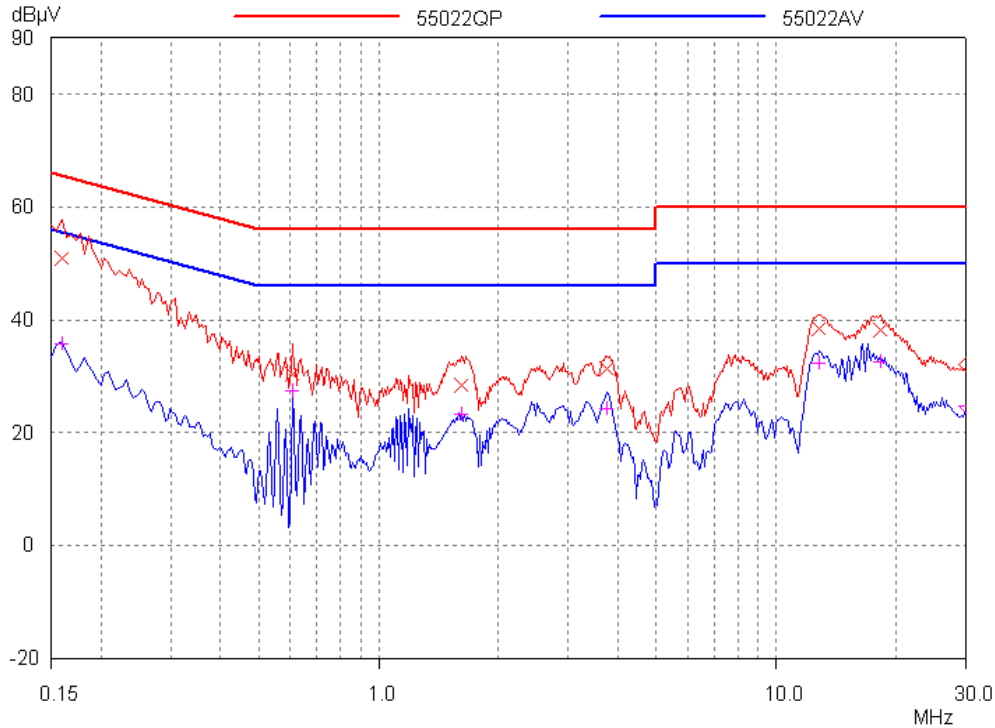


**Test Data:**

Frequency (MHz)	Quasi-peak			Frequency (MHz)	Average		
	Level dB(µV)	Limit dB(µV)	Margin dB		Level dB(µV)	Limit dB(µV)	Margin dB
0.159	52.00	65.52	13.52	0.159	37.66	55.52	17.86
0.6045	30.03	56.00	25.97	0.6045	23.60	46.00	22.40
2.4045	30.43	56.00	25.57	2.4045	25.16	46.00	20.84
7.8225	30.41	60.00	29.59	7.8225	25.28	50.00	24.72
12.714	38.89	60.00	21.11	12.714	32.96	50.00	17.04
17.889	35.15	60.00	24.85	17.889	30.52	50.00	19.48

**N line:**

**Test Curve:**



**Test Data:**

Frequency (MHz)	Quasi-peak			Frequency (MHz)	Average		
	Level dB(µV)	Limit dB(µV)	Margin dB		Level dB(µV)	Limit dB(µV)	Margin dB
0.159	51.01	65.52	14.51	0.159	35.72	0.159	35.72
0.609	30.45	56.00	25.55	0.609	27.35	0.609	27.35
1.6125	28.50	56.00	27.50	1.6125	23.23	1.6125	23.23
3.723	31.45	56.00	24.55	3.723	24.31	3.723	24.31
12.777	38.36	60.00	21.64	12.777	32.27	12.777	32.27
18.276	38.14	60.00	21.86	18.276	32.44	18.276	32.44