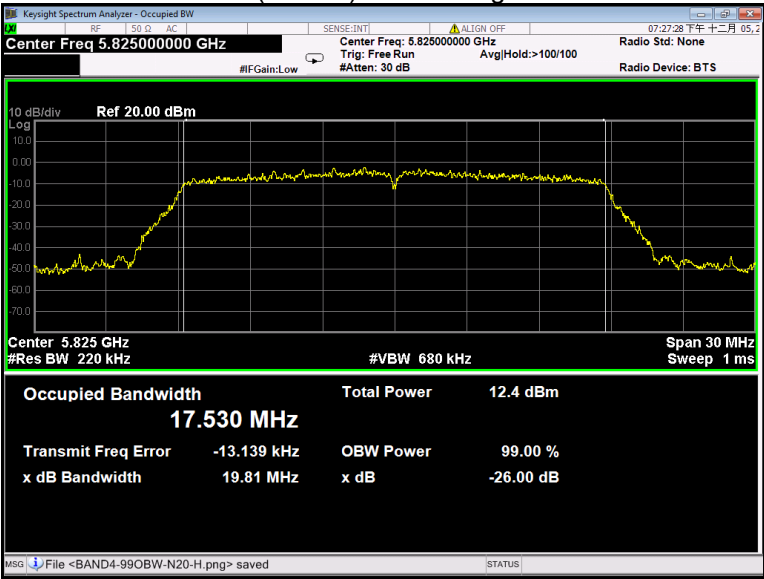
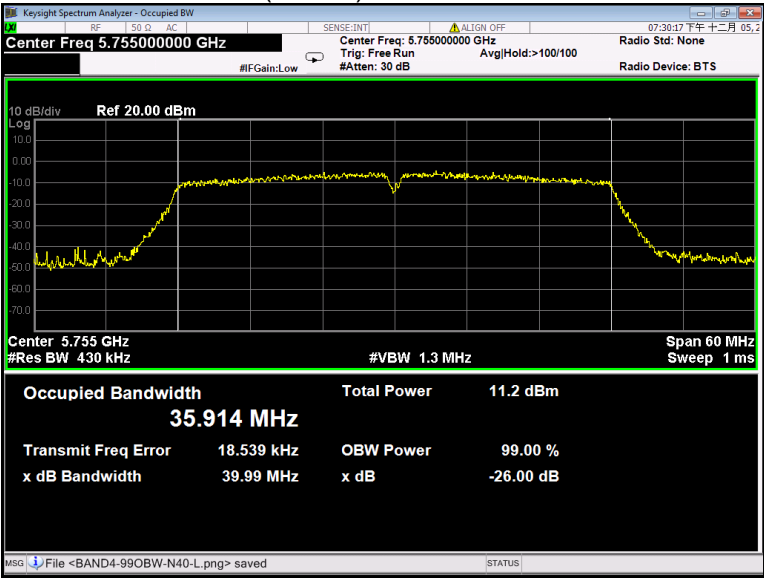


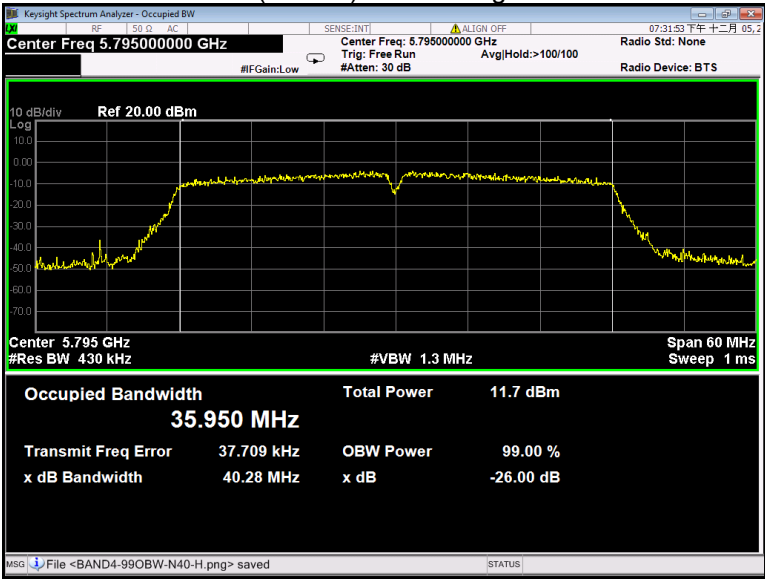
802.11ac(VHT20) U-NII-3 High channel



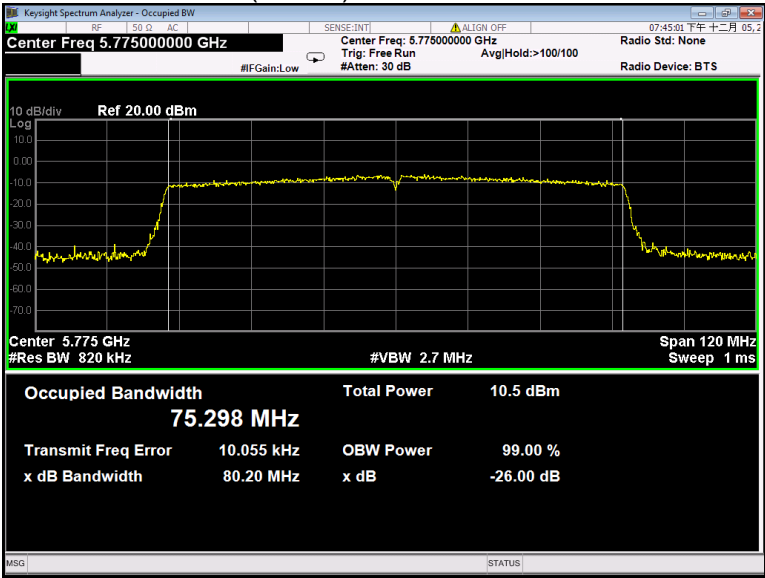
802.11ac(VHT40) U-NII-3 Low channel



802.11ac(VHT40) U-NII-3 High channel



802.11ac(VHT80) U-NII-3 Middle channel



13 Conducted Output Power

Test Requirement:	FCC 47CFR Part 15 Section 15.407(a)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01 Section E
Test Limit:	For the band 5.15-5.25 GHz 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. 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 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 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 5.725-5.850 GHz For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.
Test Result:	PASS Conducted output power= measurement power+10log(1/x)
Remark:	X is duty cycle=1, so $10\log(1/1)=0$ Conducted output power= measurement power

13.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

13.2 Test Result

Band	Operation mode	Channel	Conducted Output Power (dBm)
U-NII-1	802.11a	Low	10.96
		Middle	10.49
		High	10.16
	802.11n(HT20)	Low	10.92
		Middle	10.34
		High	10.15
	802.11n(HT40)	Low	10.67
		Middle	/
		High	10.60
	802.11ac(VHT20)	Low	10.68
		Middle	10.40
		High	10.21
	802.11ac(VHT40)	Low	10.83
		Middle	/
		High	10.58
	802.11ac(VHT80)	Low	/
		Middle	11.16
		High	/

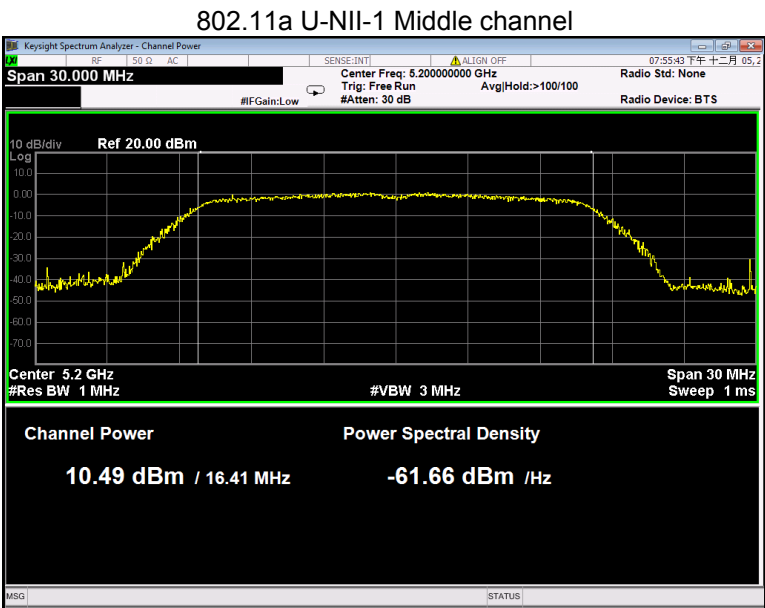
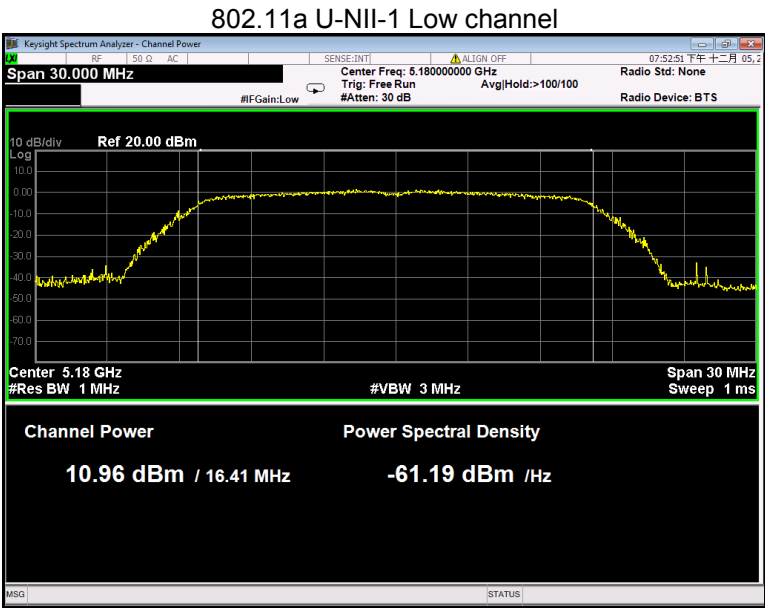
Band	Operation mode	Channel	Conducted Output Power (dBm)
U-NII-2A	802.11a	Low	9.10
		Middle	8.96
		High	9.00
	802.11n(HT20)	Low	9.04
		Middle	9.12
		High	8.93
	802.11n(HT40)	Low	9.96
		Middle	/
		High	9.62
	802.11ac(VHT20)	Low	8.92
		Middle	9.08
		High	8.89
	802.11ac(VHT40)	Low	9.77
		Middle	/
		High	9.65
	802.11ac(VHT80)	Low	/
		Middle	9.94
		High	/

Band	Operation mode	Channel	Conducted Output Power (dBm)
U-NII-2C	802.11a	Low	12.29
		Middle	12.63
		High	10.77
	802.11n(HT20)	Low	12.23
		Middle	12.55
		High	10.87
	802.11n(HT40)	Low	12.44
		Middle	13.21
		High	11.73
	802.11ac(VHT20)	Low	12.17
		Middle	12.74
		High	10.55
	802.11ac(VHT40)	Low	12.32
		Middle	13.25
		High	11.93
	802.11ac(VHT80)	Low	12.87
		Middle	/
		High	12.99

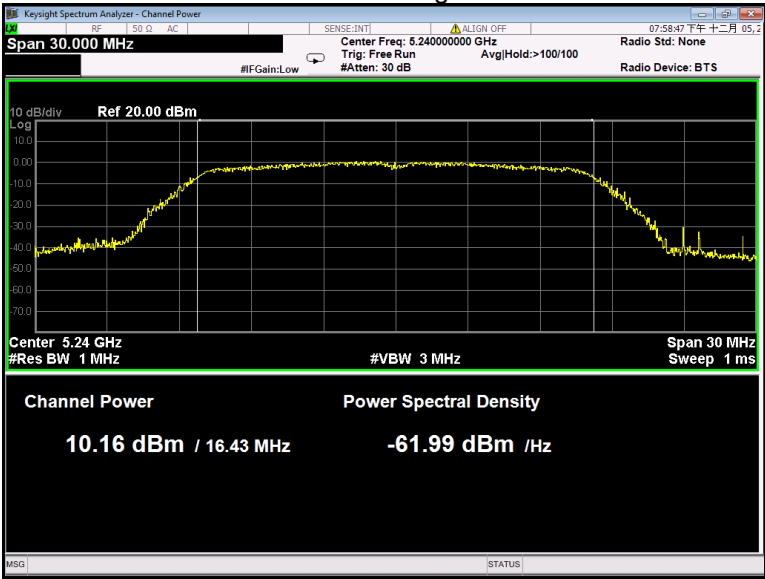
Band	Operation mode	Channel	Conducted Output Power (dBm)
U-NII-3	802.11a	Low	10.31
		Middle	10.99
		High	11.46
	802.11n(HT20)	Low	10.12
		Middle	10.98
		High	11.40
	802.11n(HT40)	Low	10.79
		Middle	/
		High	11.91
	802.11ac(VHT20)	Low	10.11
		Middle	11.08
		High	11.07
	802.11ac(VHT40)	Low	10.99
		Middle	/
		High	11.53
	802.11ac(VHT80)	Low	/
		Middle	11.05
		High	/

* All transmit signals are completely uncorrelated with each other, Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

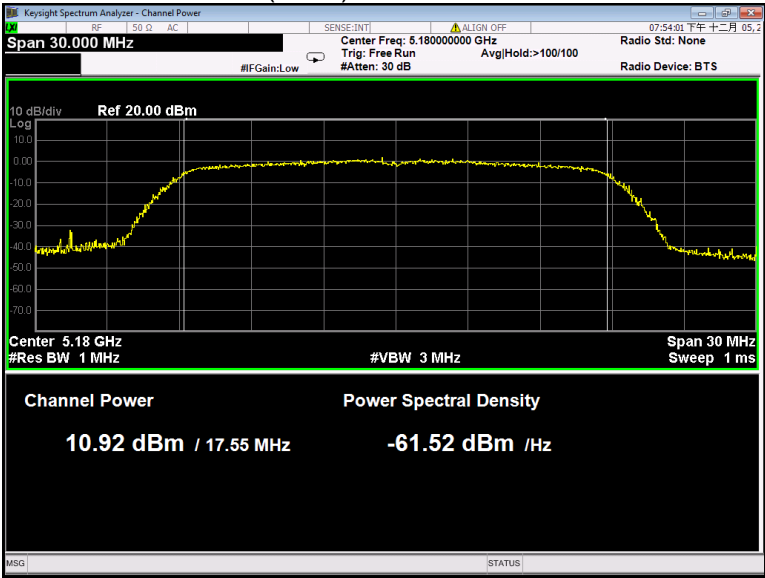
Test result plots shown as follows:



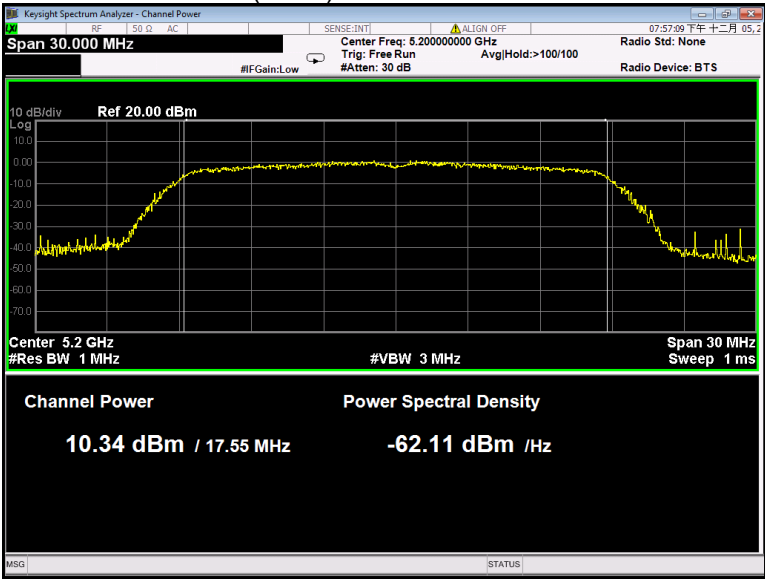
802.11a U-NII-1 High channel



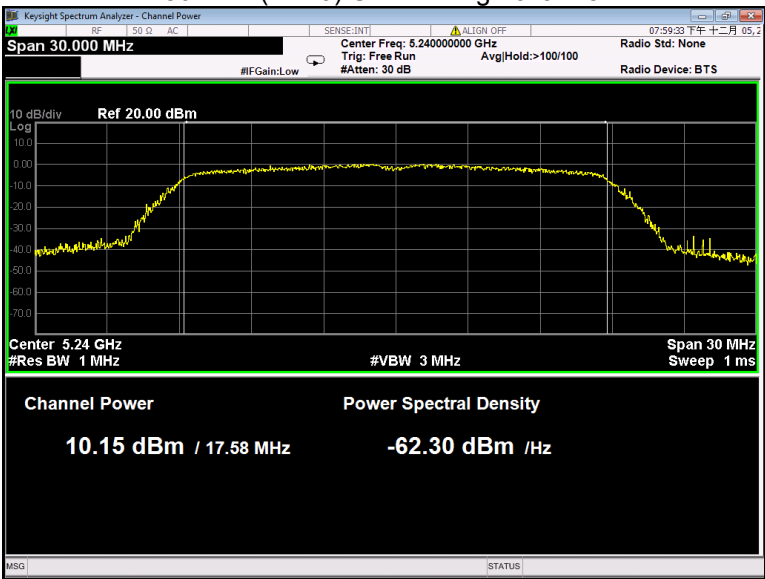
802.11n(HT20) U-NII-1 Low channel



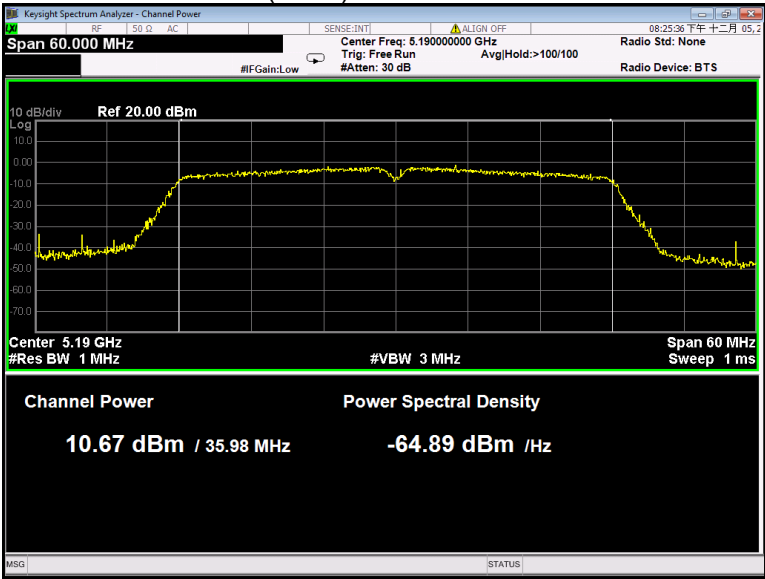
802.11n(HT20) U-NII-1 Middle channel



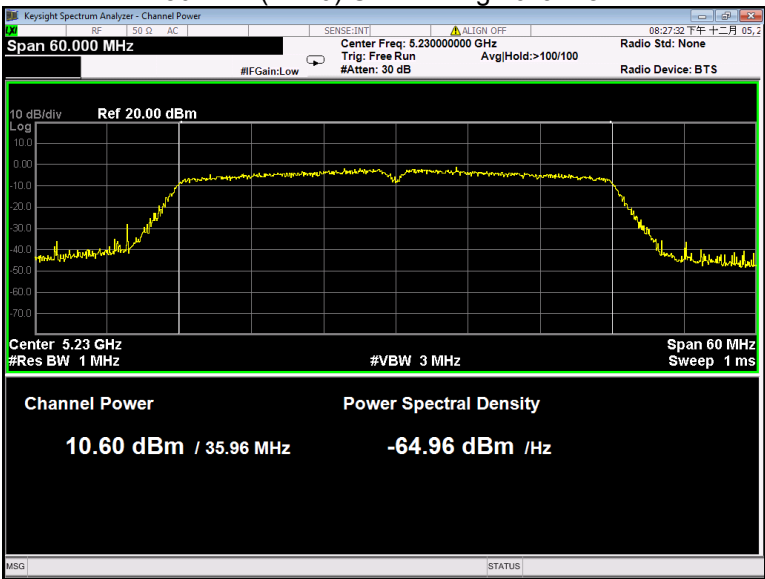
802.11n(HT20) U-NII-1 High channel

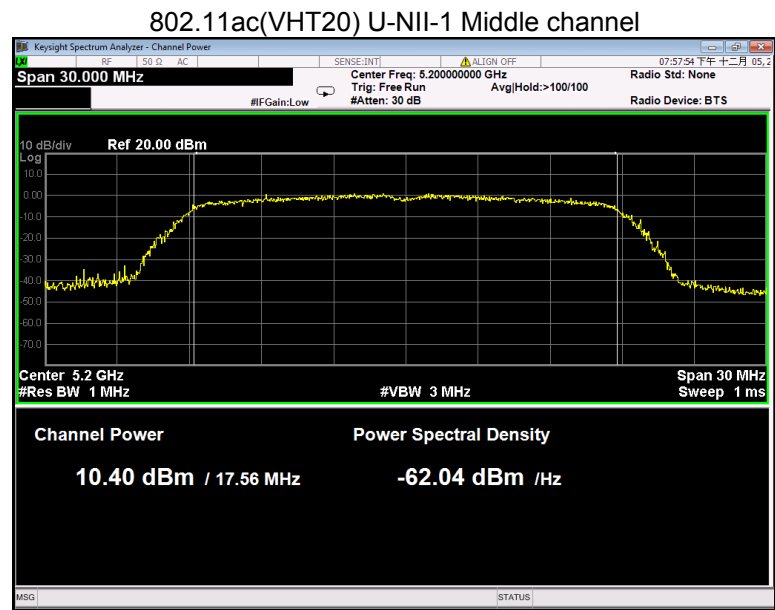
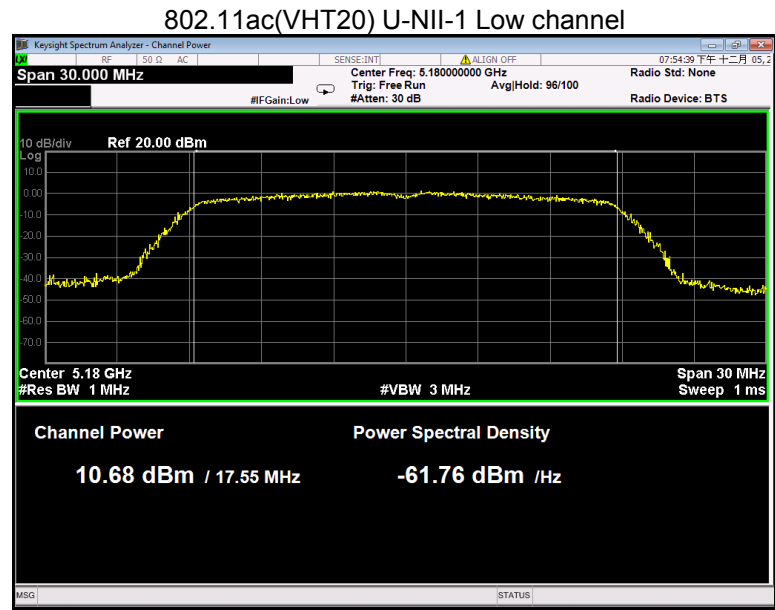


802.11n(HT40) U-NII-1 Low channel

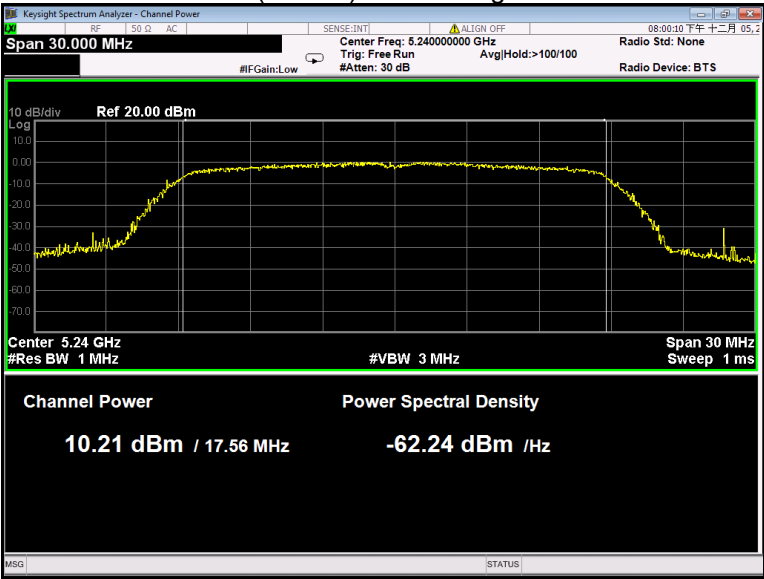


802.11n(HT40) U-NII-1 High channel

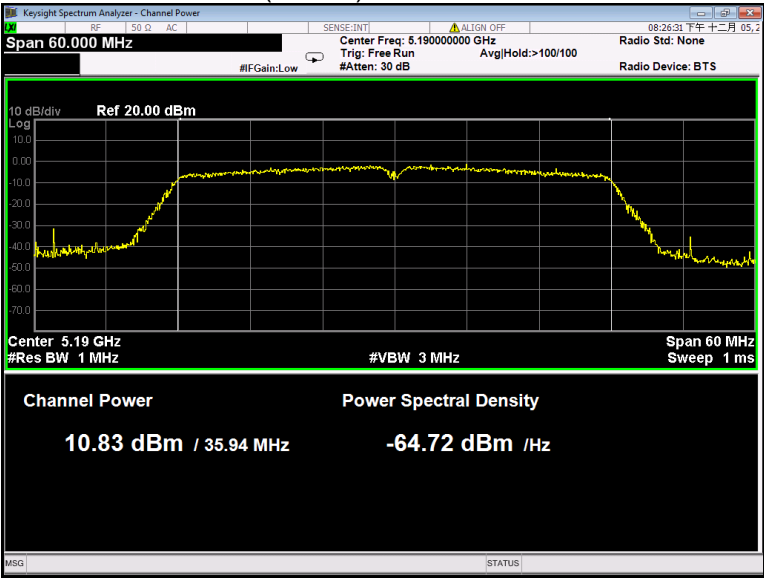




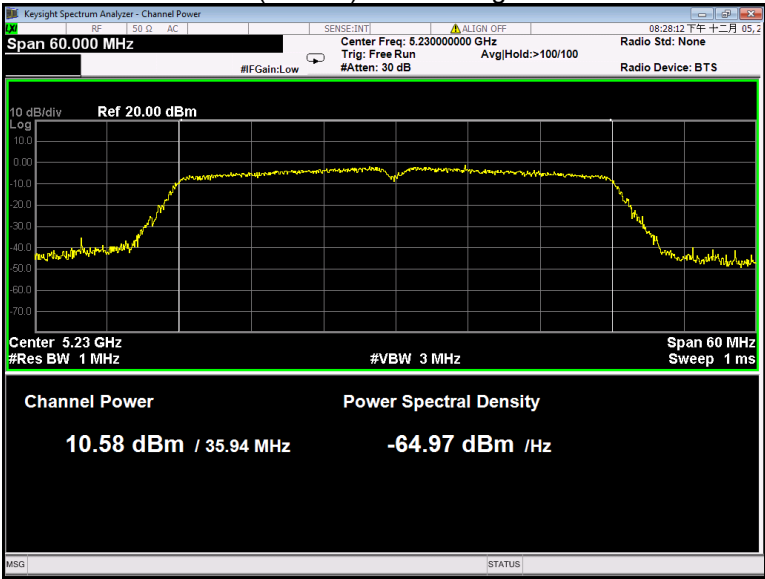
802.11ac(VHT20) U-NII-1 High channel



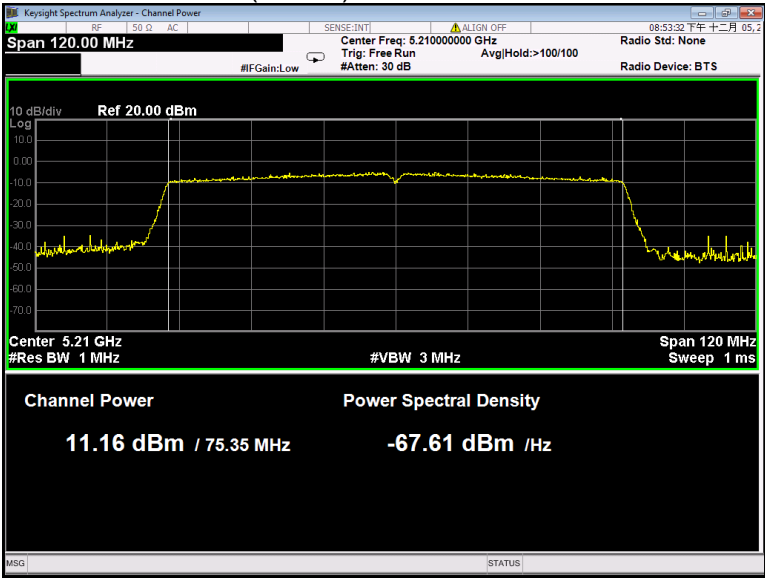
802.11ac(VHT40) U-NII-1 Low channel



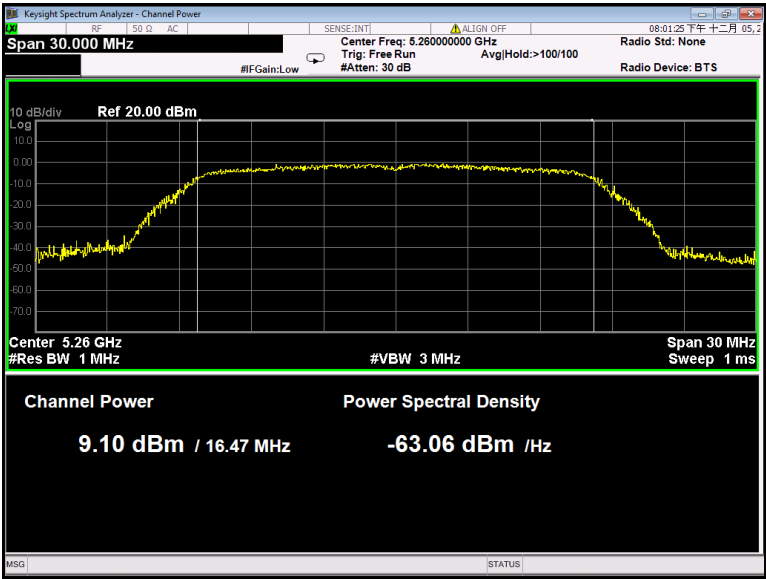
802.11ac(VHT40) U-NII-1 High channel



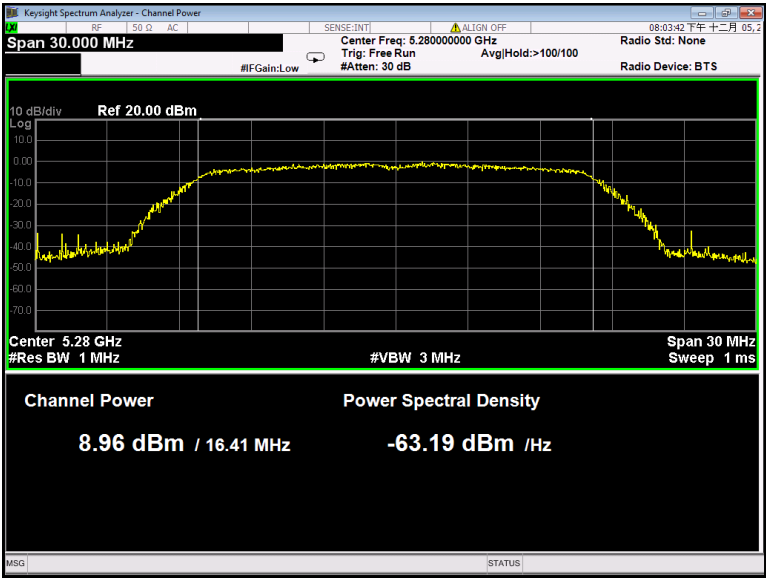
802.11ac(VHT80) U-NII-1 Middle channel



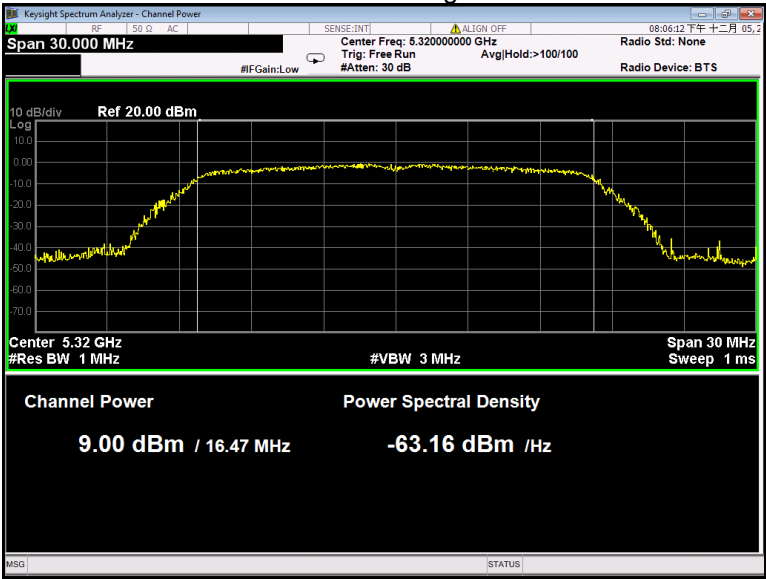
802.11a U-NII-2A Low channel



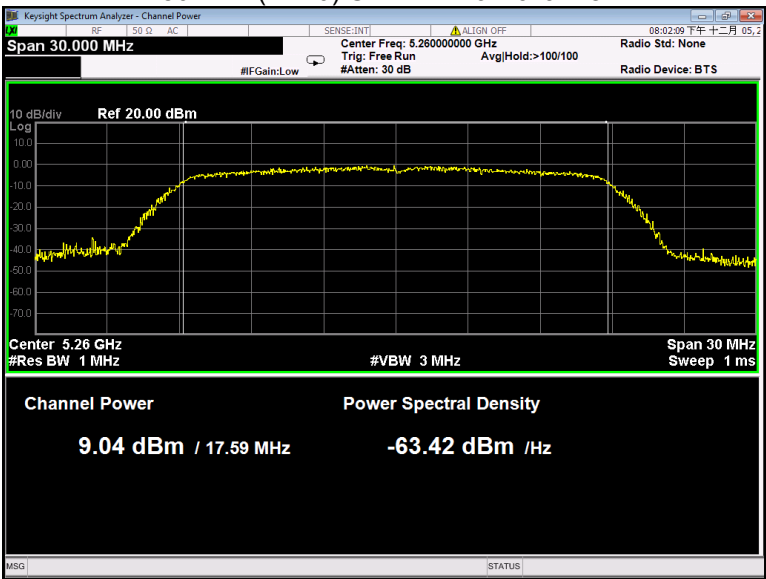
802.11a U-NII-2A Middle channel



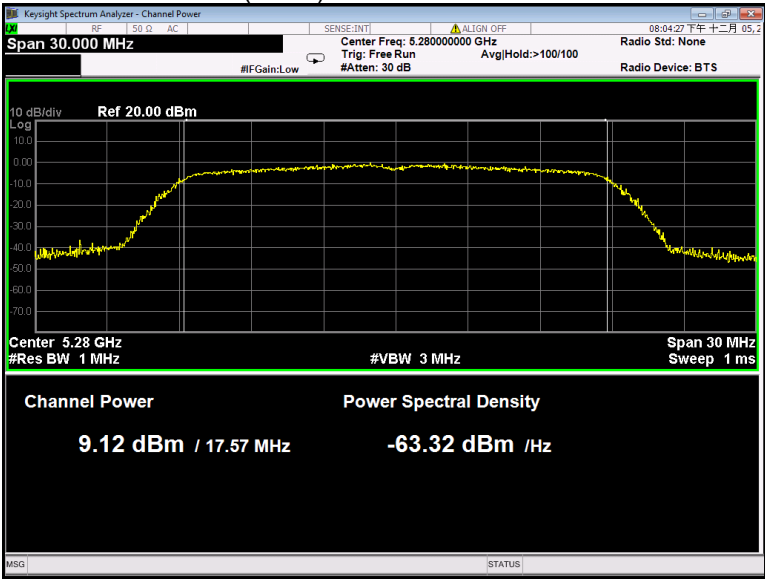
802.11a U-NII-2A High channel



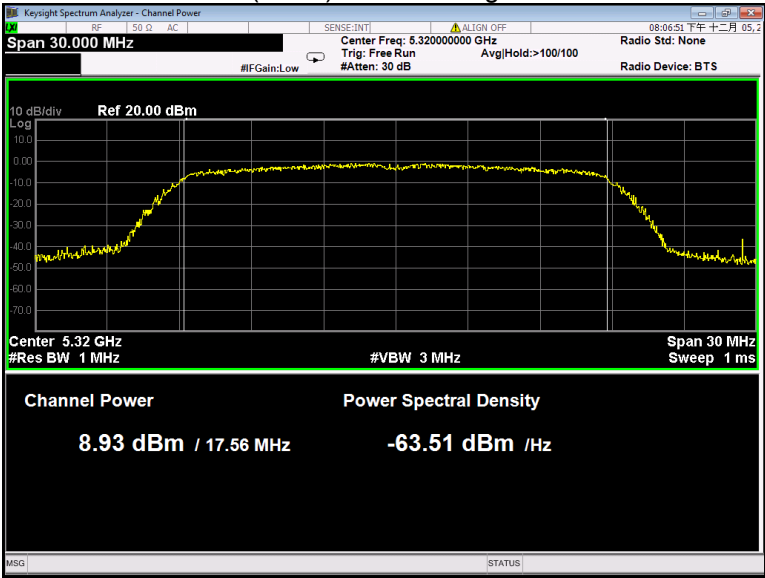
802.11n(HT20) U-NII-2A Low channel



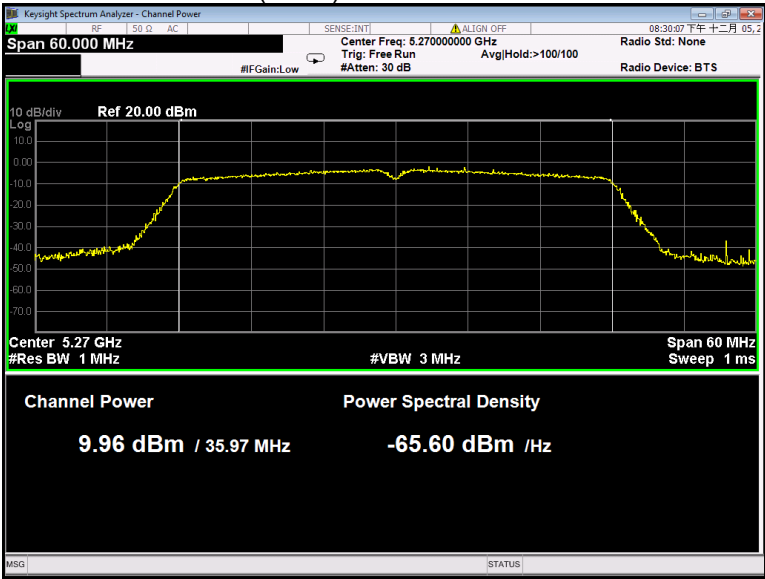
802.11n(HT20) U-NII-2A Middle channel



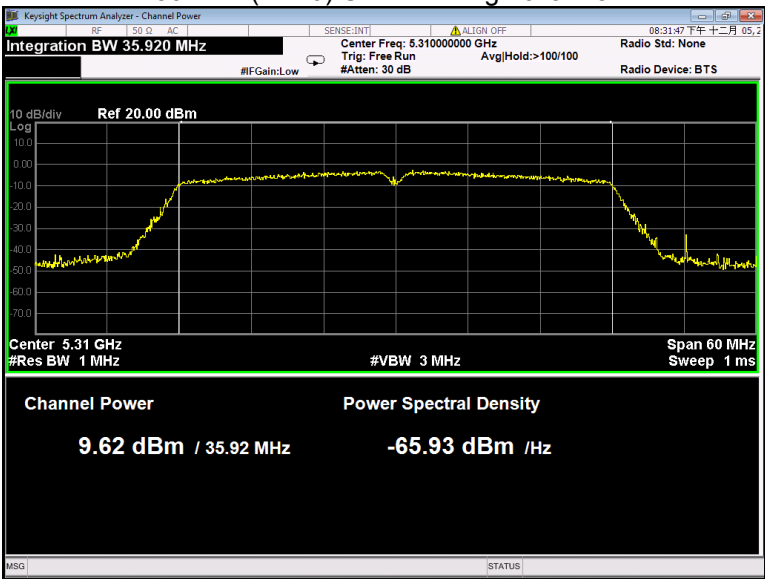
802.11n(HT20) U-NII-2A High channel



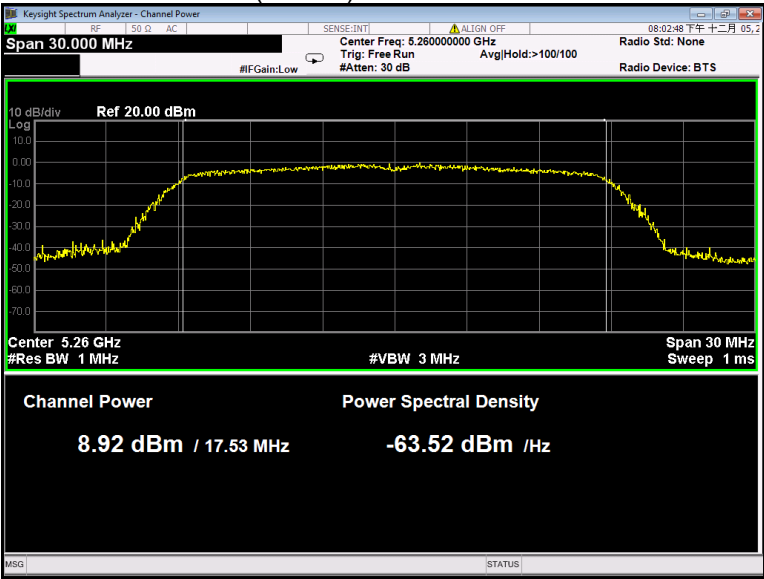
802.11n(HT40) U-NII-2A Low channel



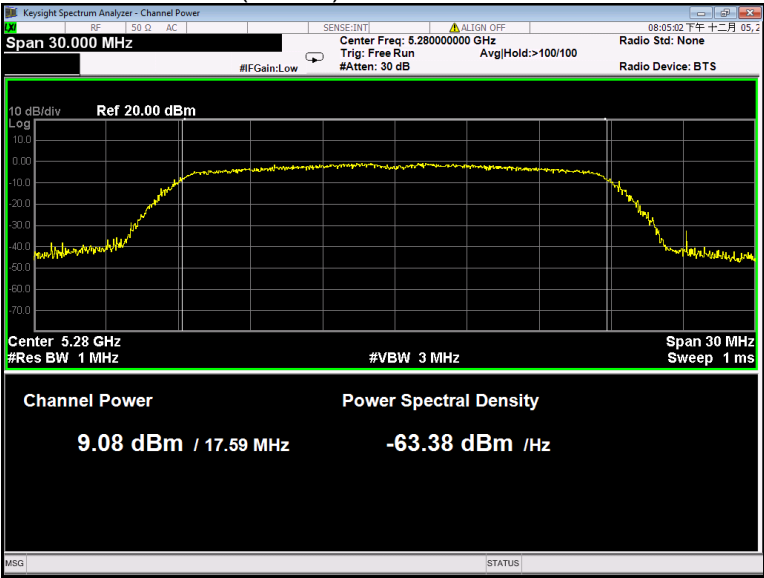
802.11n(HT40) U-NII-2A High channel



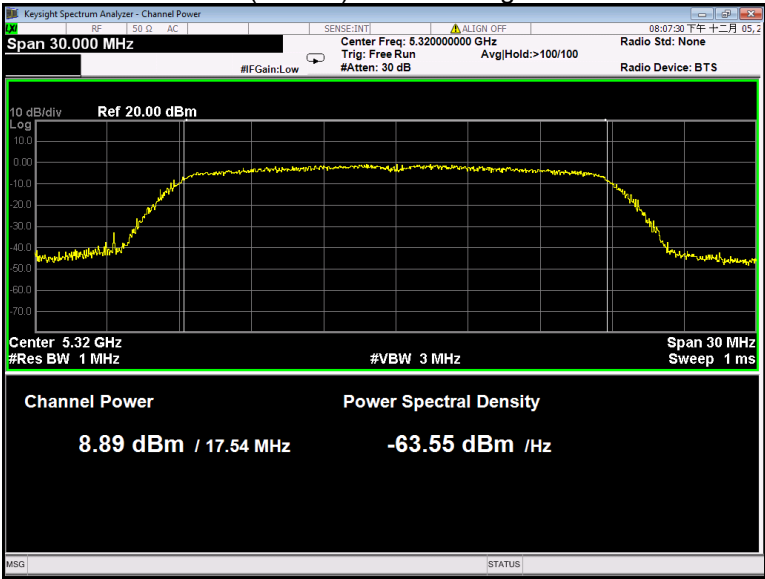
802.11ac(VHT20) U-NII-2A Low channel



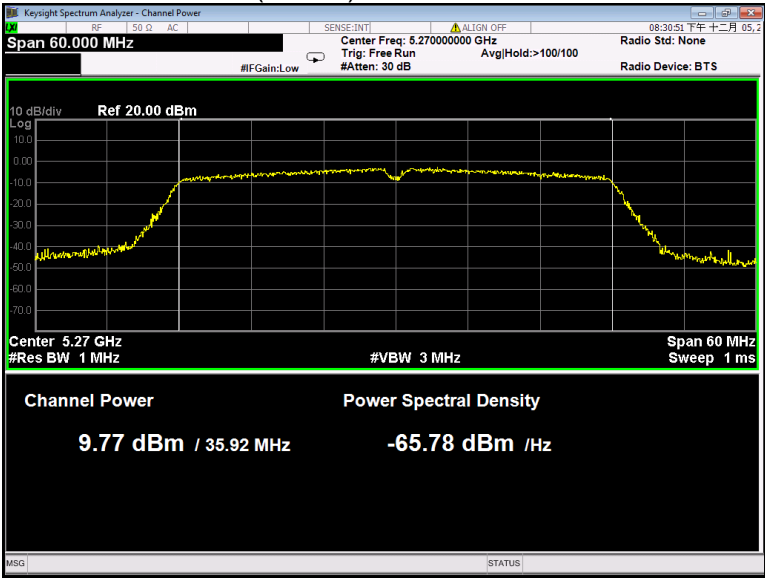
802.11ac(VHT20) U-NII-2A Middle channel



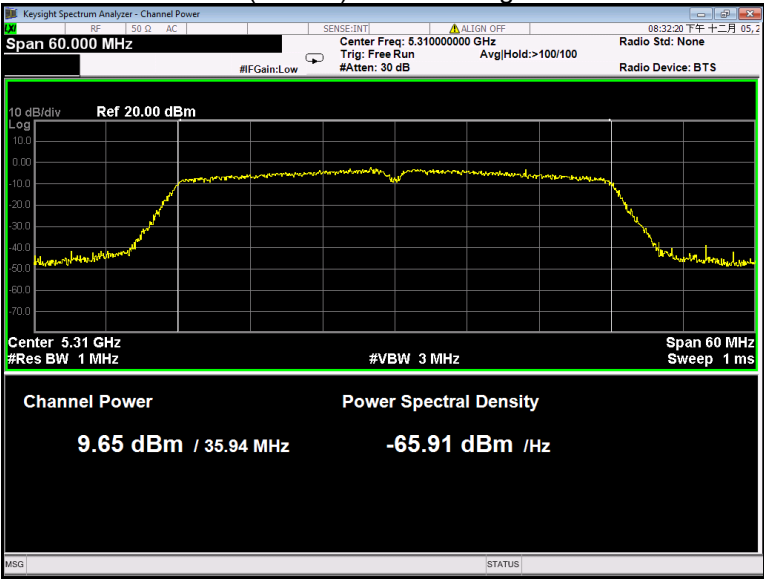
802.11ac(VHT20) U-NII-2A High channel



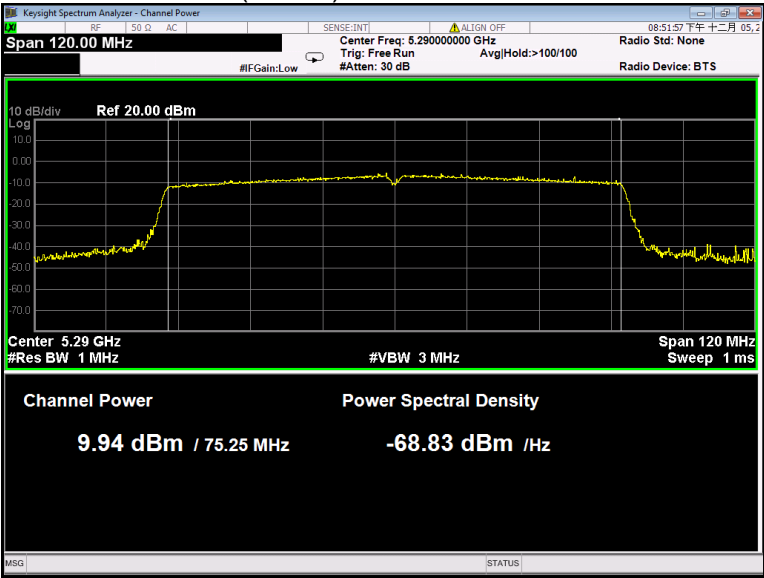
802.11ac(VHT40) U-NII-2A Low channel



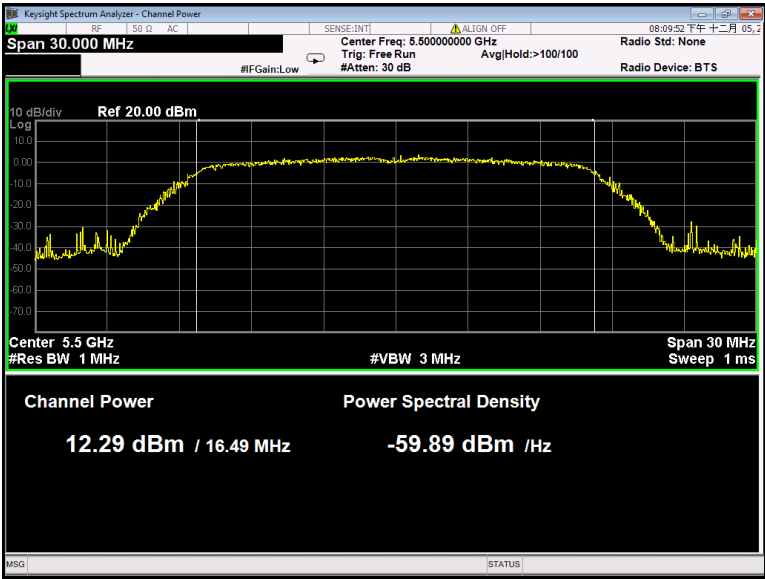
802.11ac(VHT40) U-NII-2A High channel



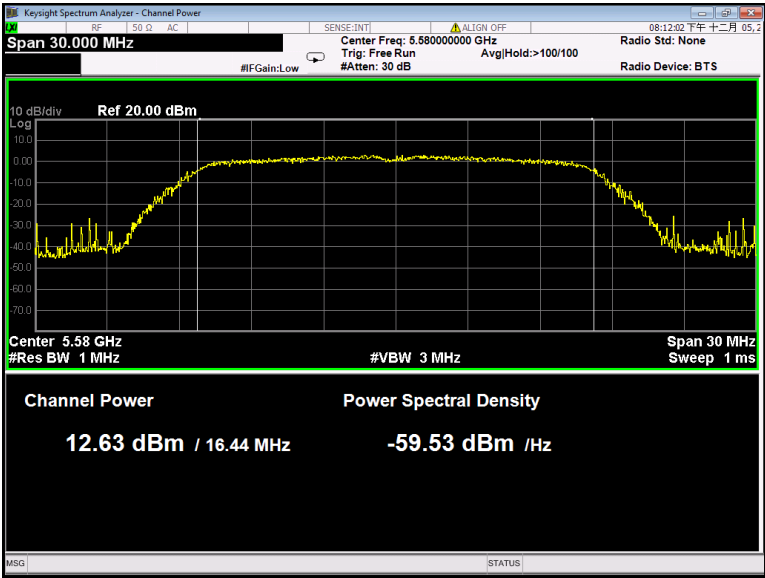
802.11ac(VHT80) U-NII-2A middle channel



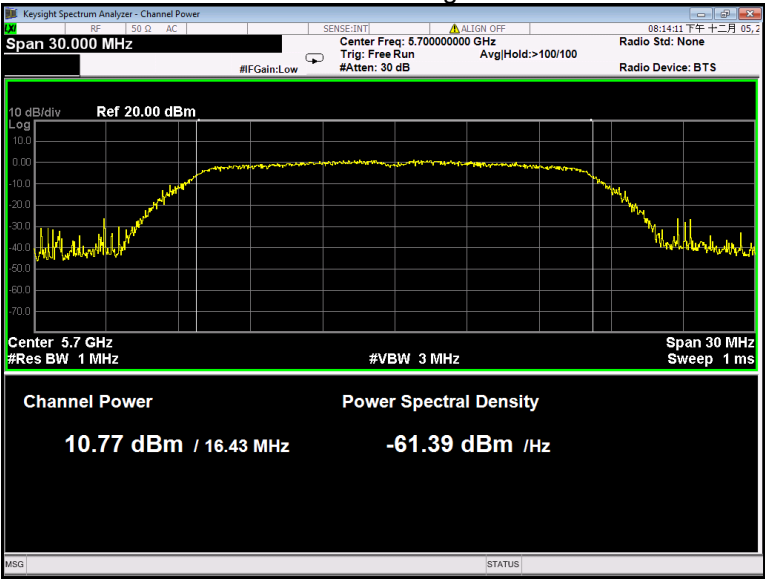
802.11a U-NII-2C Low channel



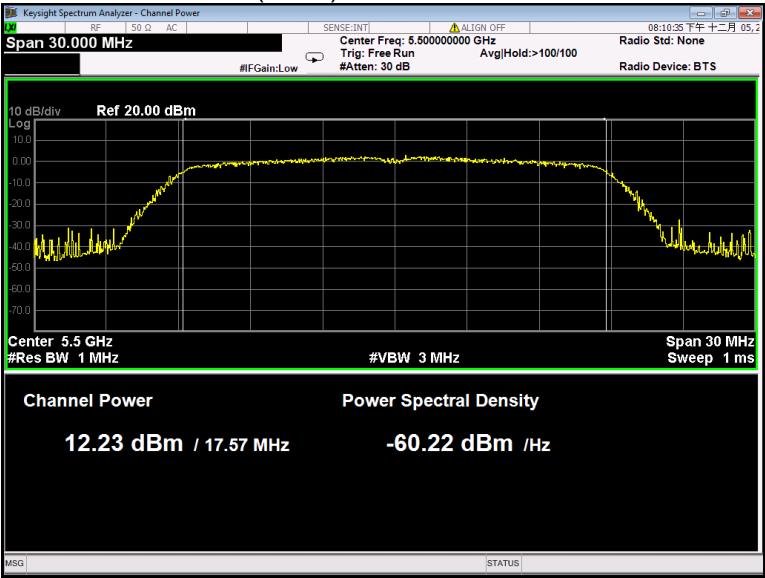
802.11a U-NII-2C Middle channel



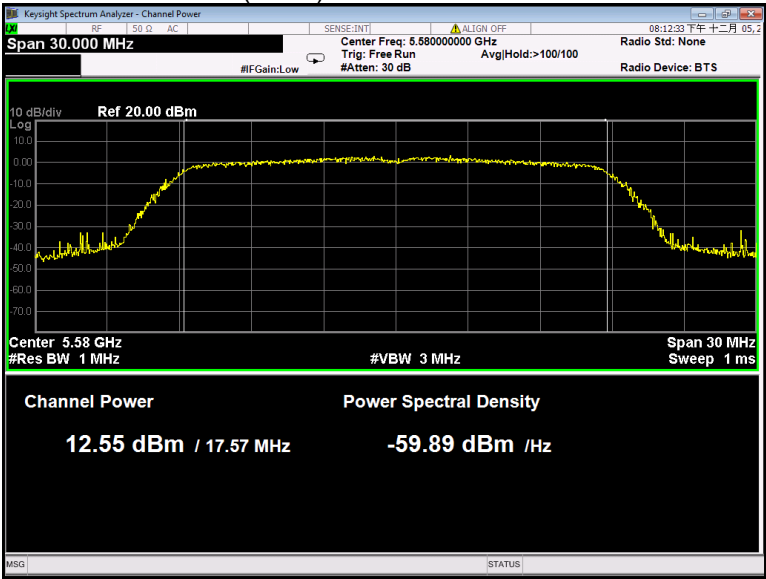
802.11a U-NII-2C High channel



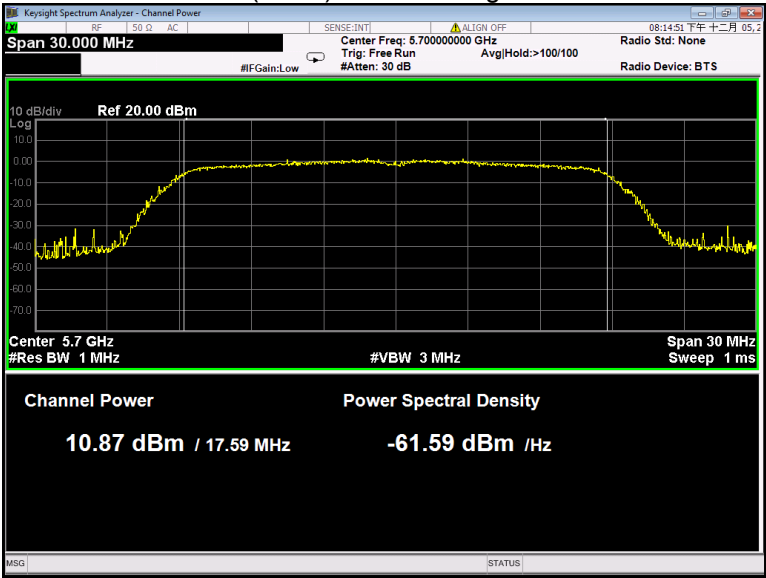
802.11n(HT20) U-NII-2C Low channel



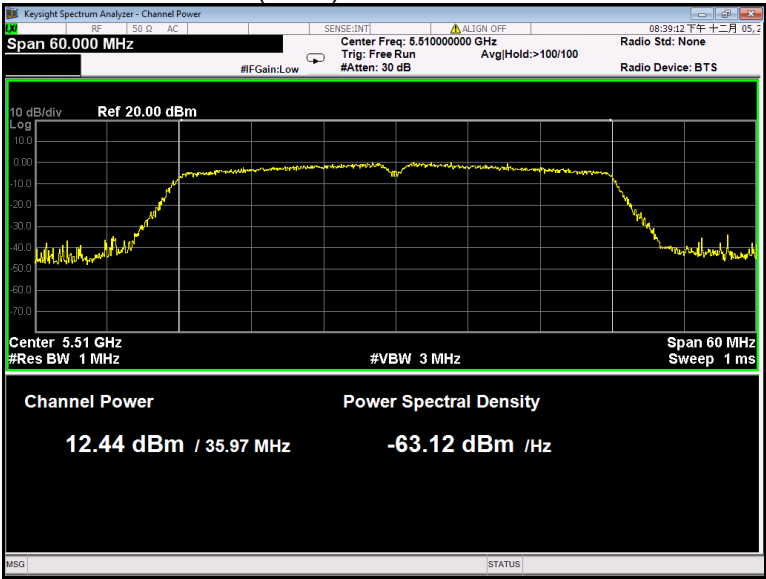
802.11n(HT20) U-NII-2C Middle channel



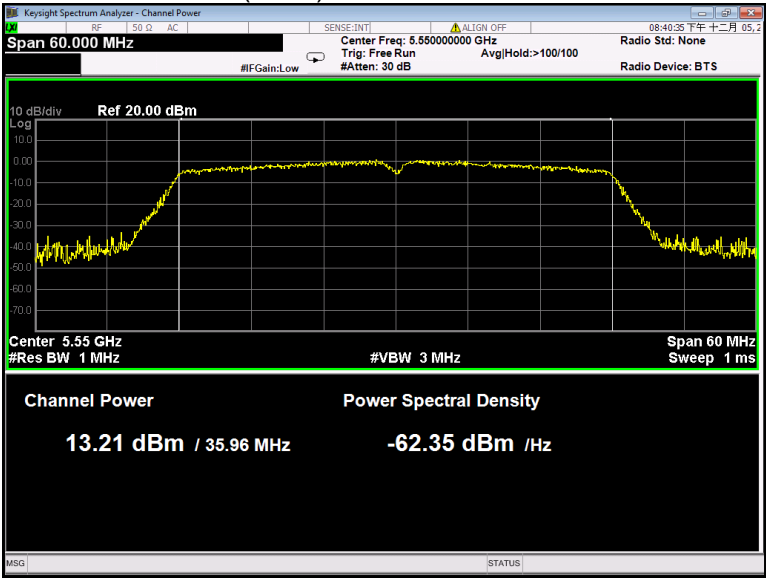
802.11n(HT20) U-NII-2C High channel

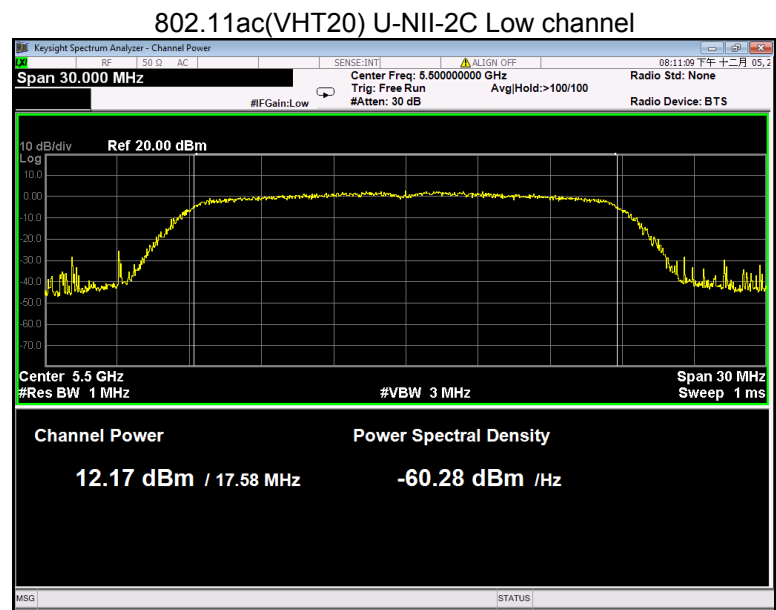
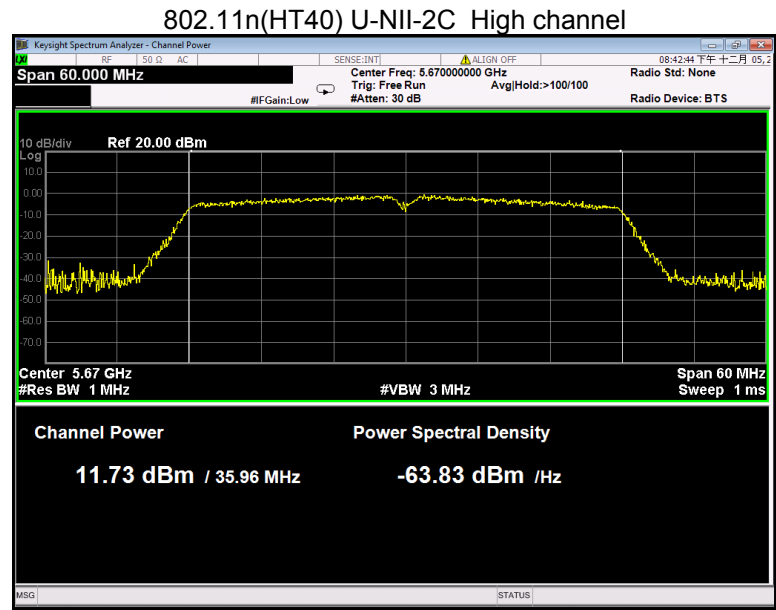


802.11n(HT40) U-NII-2C Low channel

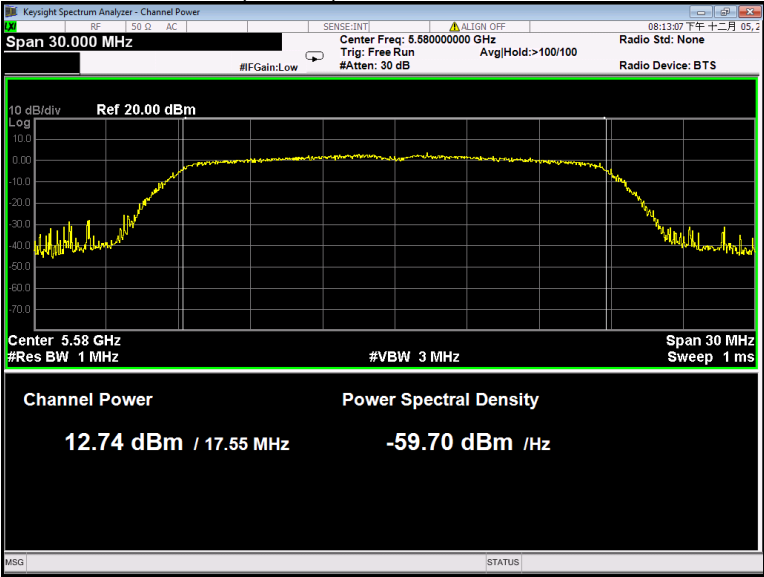


802.11n(HT40) U-NII-2C Middle channel

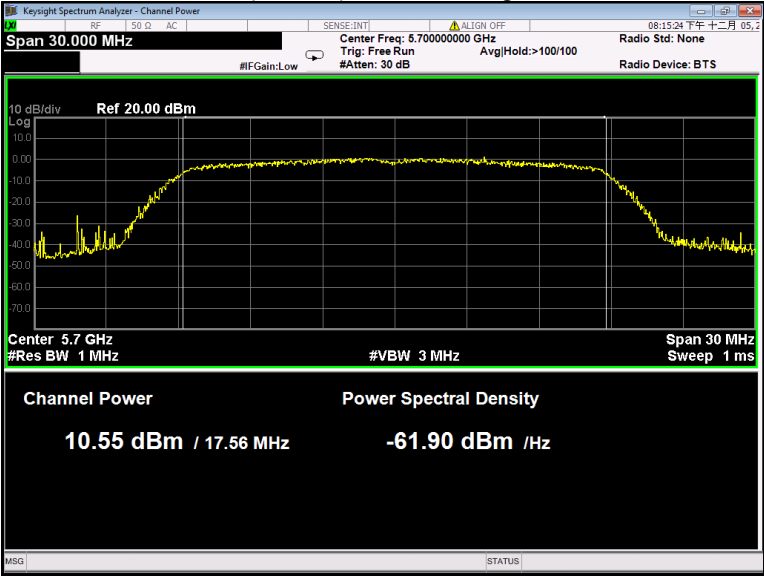




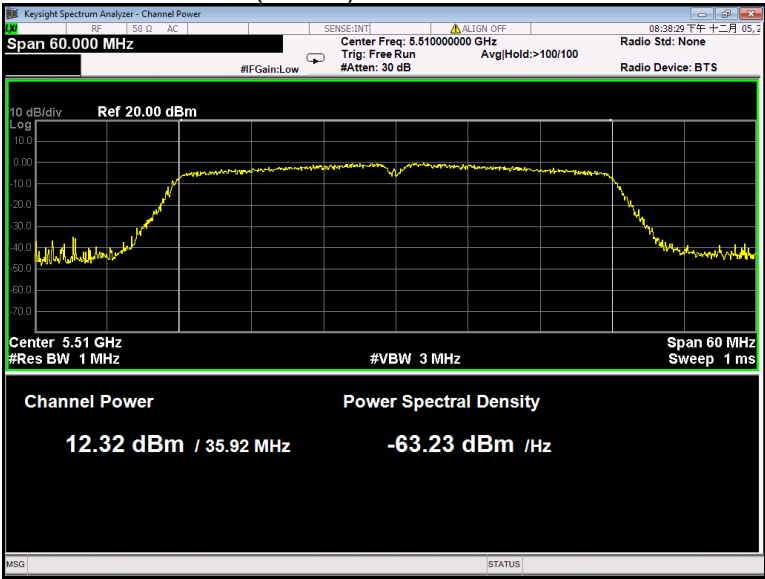
802.11ac(VHT20) U-NII-2C Middle channel



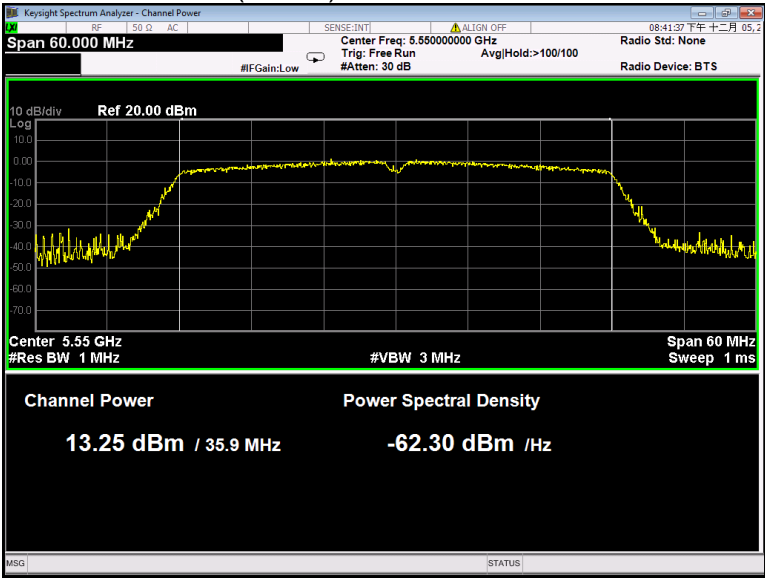
802.11ac(VHT20) U-NII-2C High channel



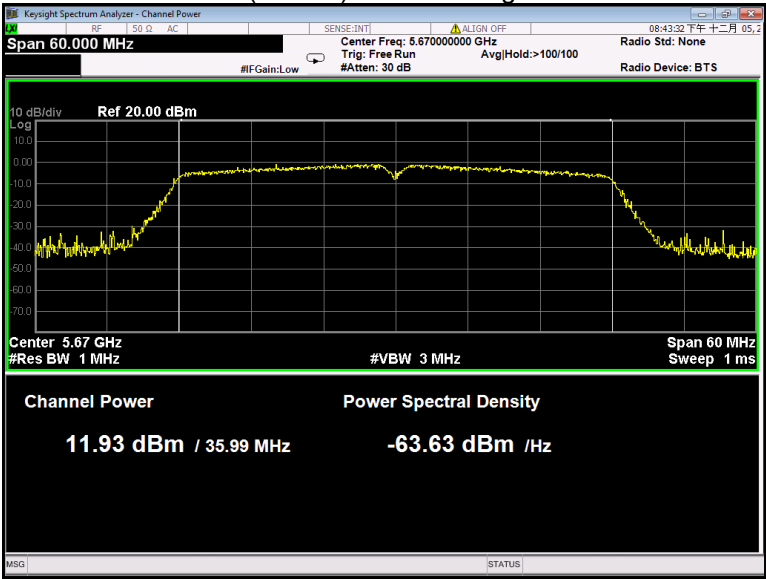
802.11ac(VHT40) U-NII-2C Low channel



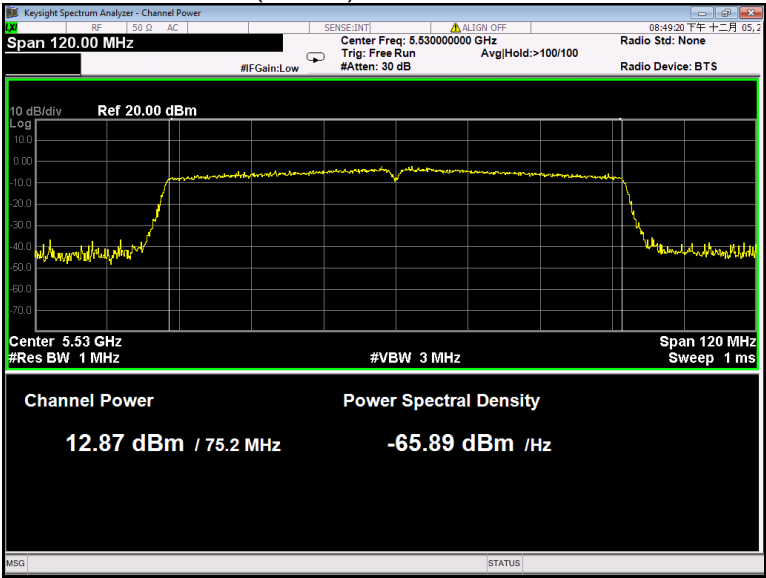
802.11ac(VHT40) U-NII-2C Middle channel



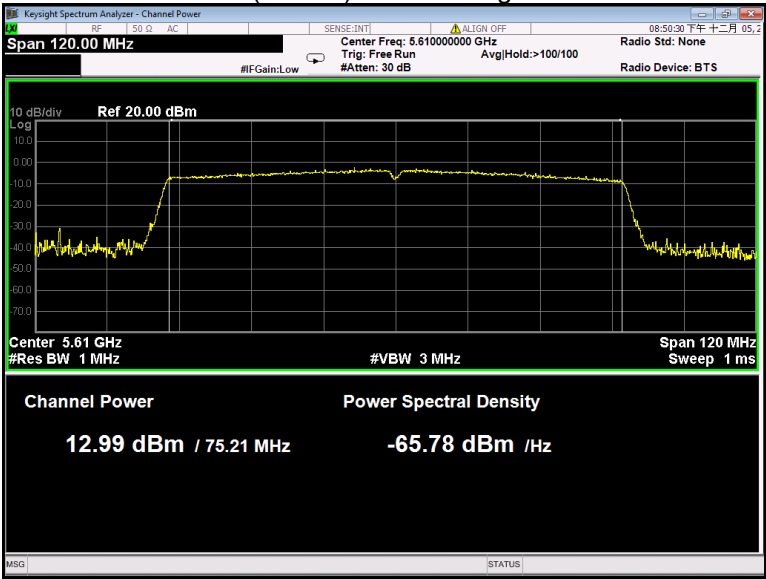
802.11ac(VHT40) U-NII-2C High channel



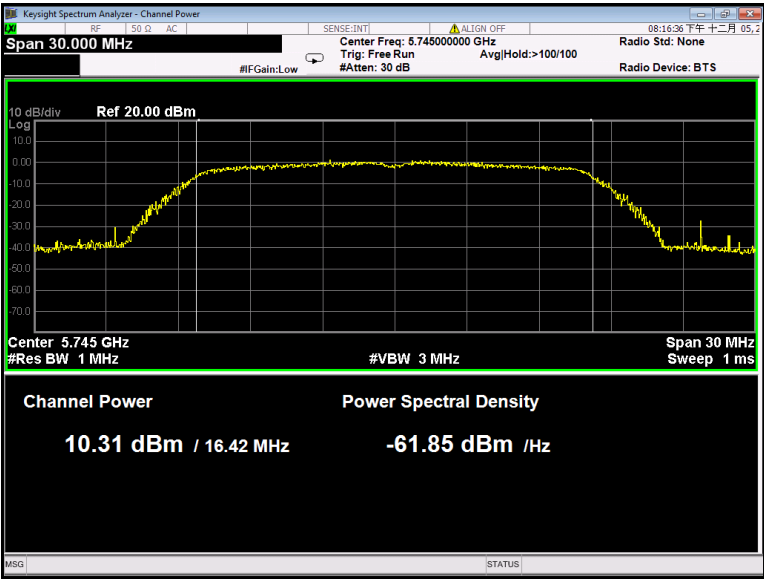
802.11ac(VHT80) U-NII-2C Low channel



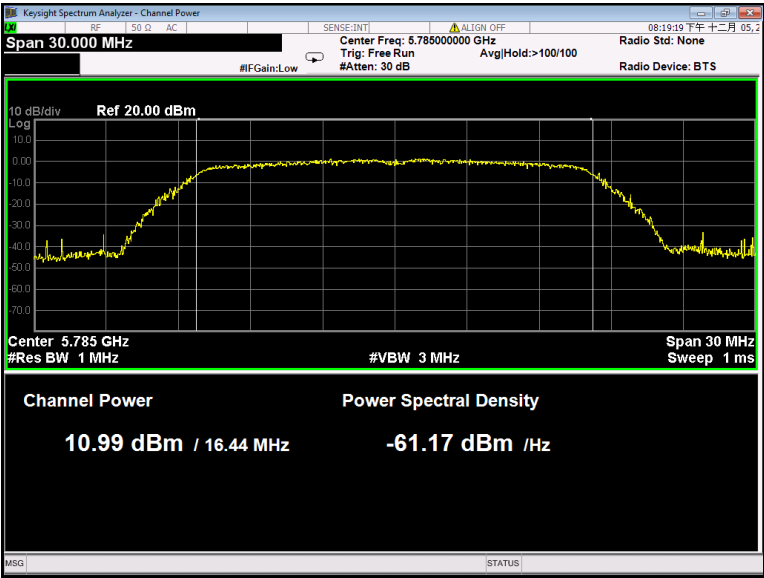
802.11ac(VHT80) U-NII-2C High channel



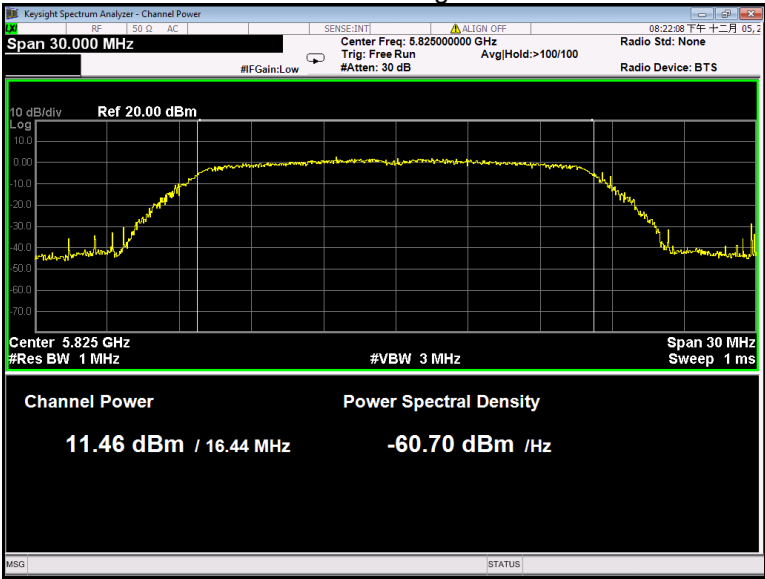
802.11a U-NII-3 Low channel



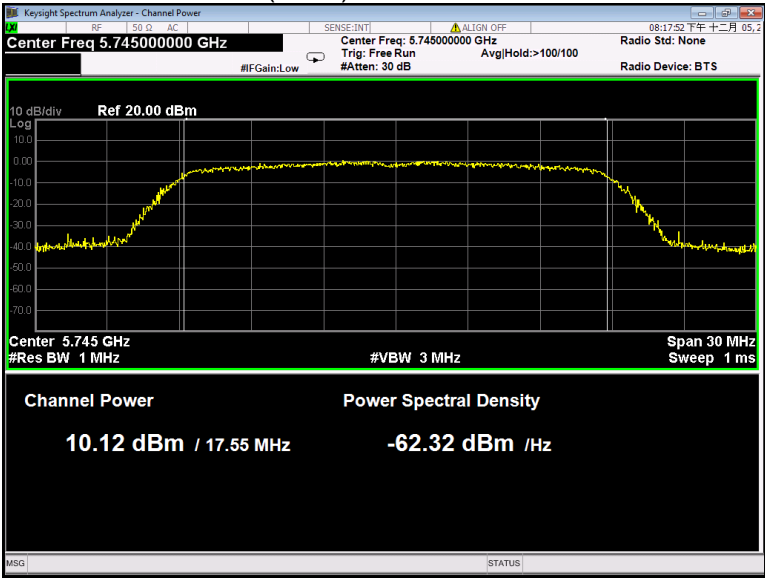
802.11a U-NII-3 Middle channel



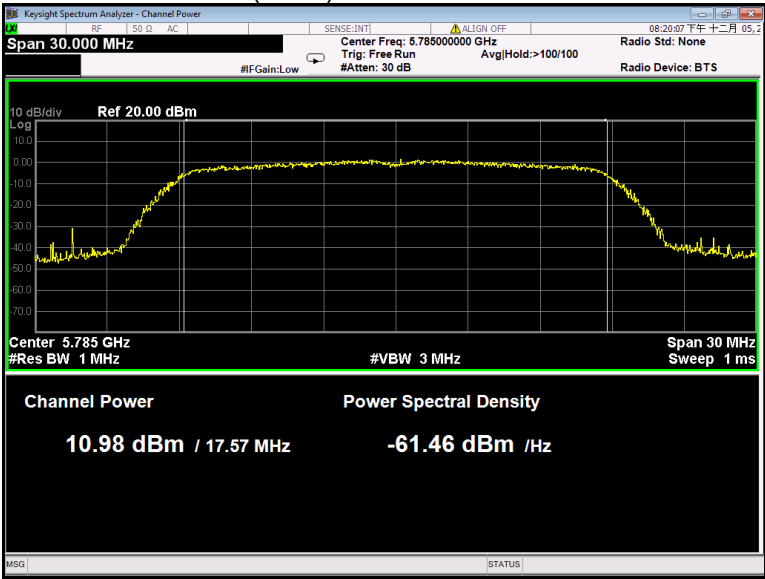
802.11a U-NII-3 High channel



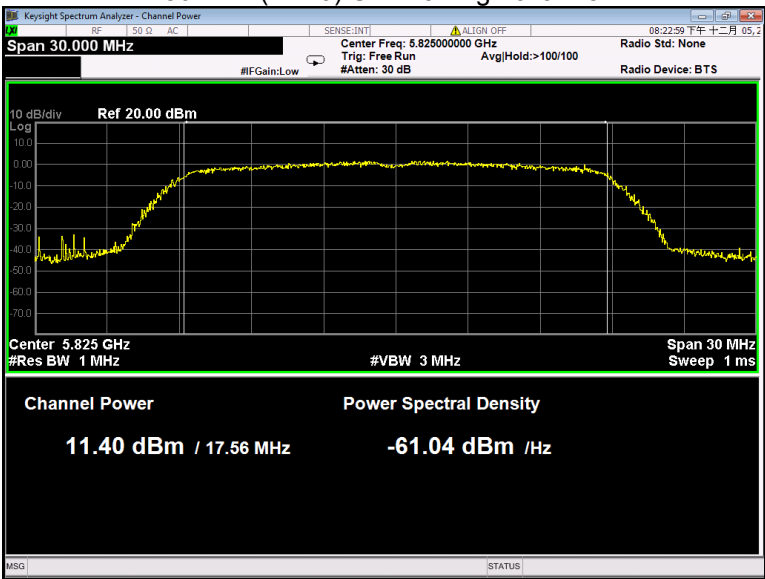
802.11n(HT20) U-NII-3 Low channel



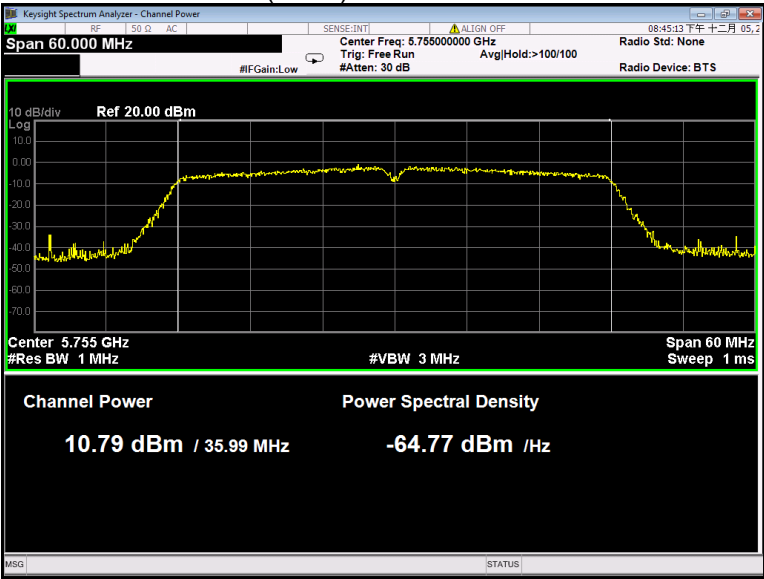
802.11n(HT20) U-NII-3 Middle channel



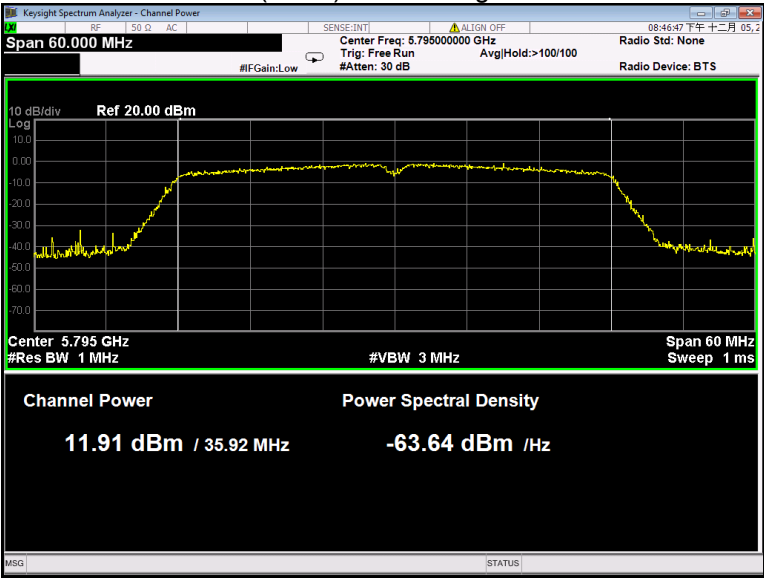
802.11n(HT20) U-NII-3 High channel

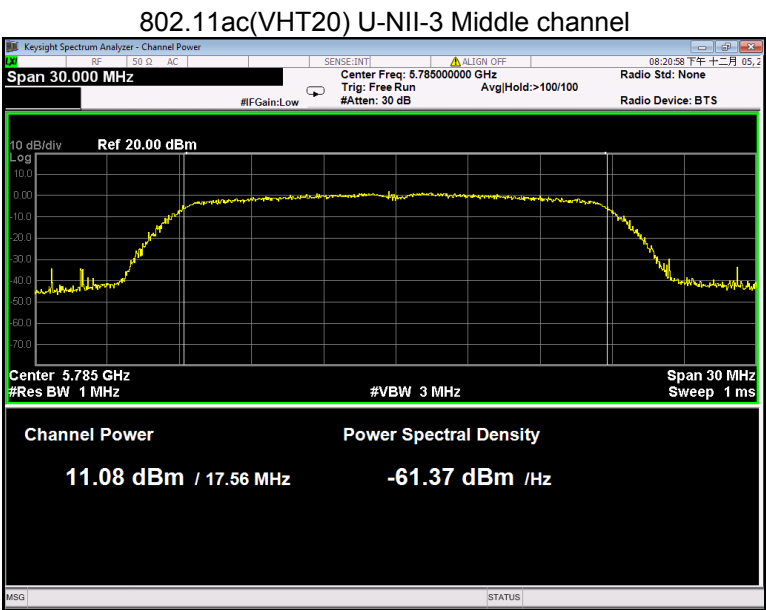
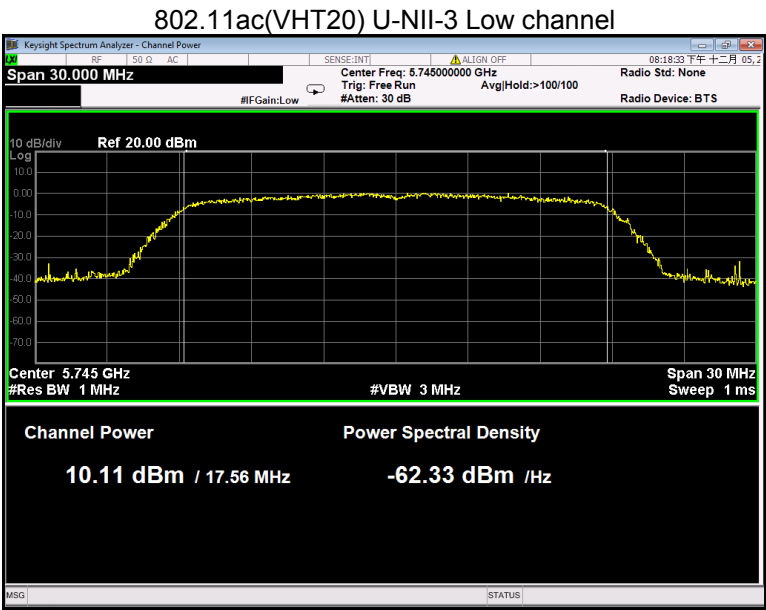


802.11n(HT40) U-NII-3 Low channel

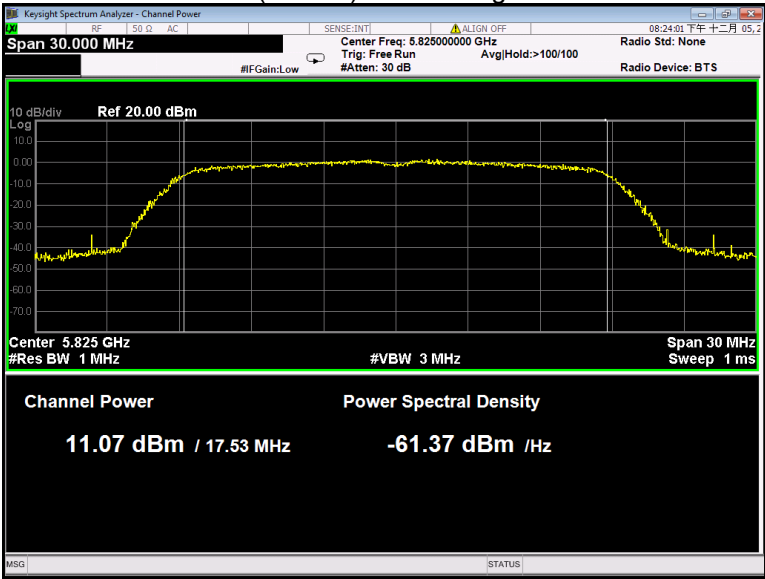


802.11n(HT40) U-NII-3 High channel

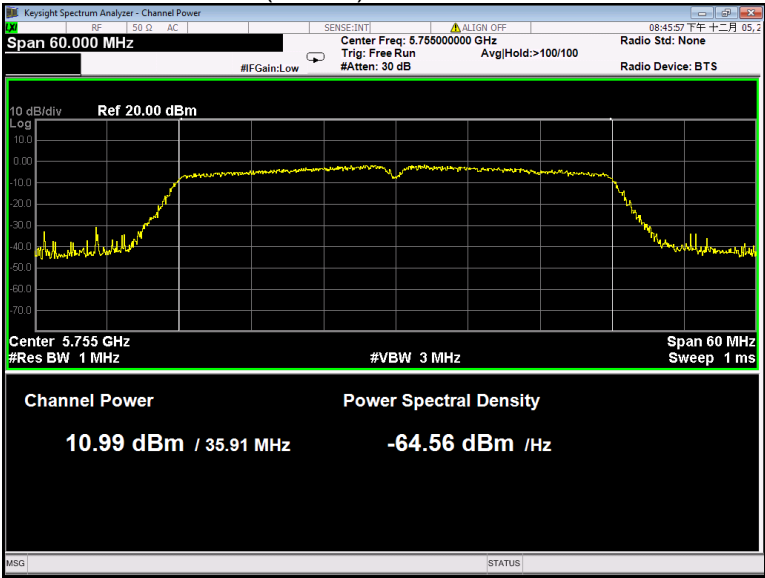




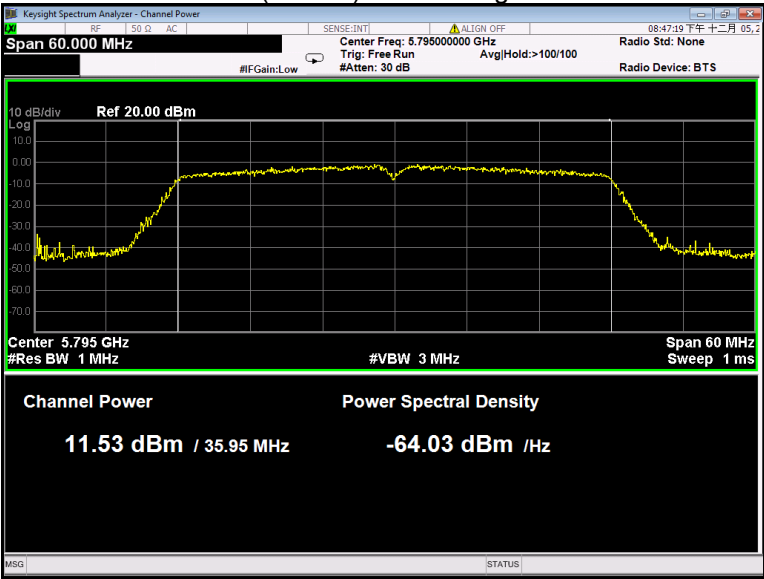
802.11ac(VHT20) U-NII-3 High channel



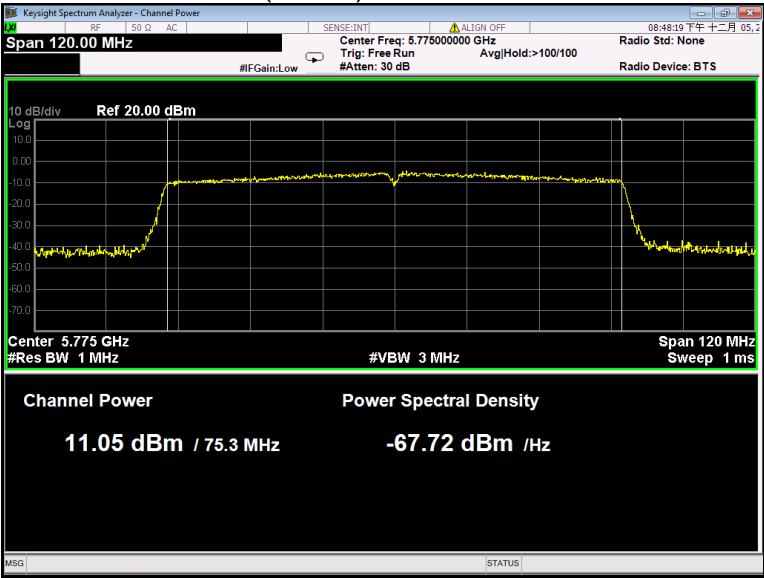
802.11ac(VHT40) U-NII-3 Low channel



802.11ac(VHT40) U-NII-3 High channel



802.11ac(VHT80) U-NII-3 Low channel



14 Power Spectral Density

Test Requirement:	FCC 47CFR Part 15 Section 15.407(a)
Test Method:	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Test Limit:	For the band 5.15-5.25 GHz 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 fixed point-to-point access points 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 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 5.725-5.850 GHz The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.
Test Result:	PASS

14.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer:
U-NII-1
RBW = 1MHz, VBW $\geq 3 \times$ RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.
U-NII-3
RBW = 510KHz, VBW $\geq 3 \times$ RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section
Submit this plot.

14.2 Test Result

Band	Operation mode	Channel	Power Spectral Density (dBm/MHz)
U-NII-1	802.11a	Low	7.340
		Middle	6.362
		High	5.588
	802.11n(HT20)	Low	6.956
		Middle	6.230
		High	5.578
	802.11n(HT40)	Low	3.386
		Middle	/
		High	2.244
	802.11ac(VHT20)	Low	6.925
		Middle	6.726
		High	5.607
	802.11ac(VHT40)	Low	2.957
		Middle	/
		High	2.838
	802.11ac(VHT80)	Low	/
		Middle	-0.425
		High	/

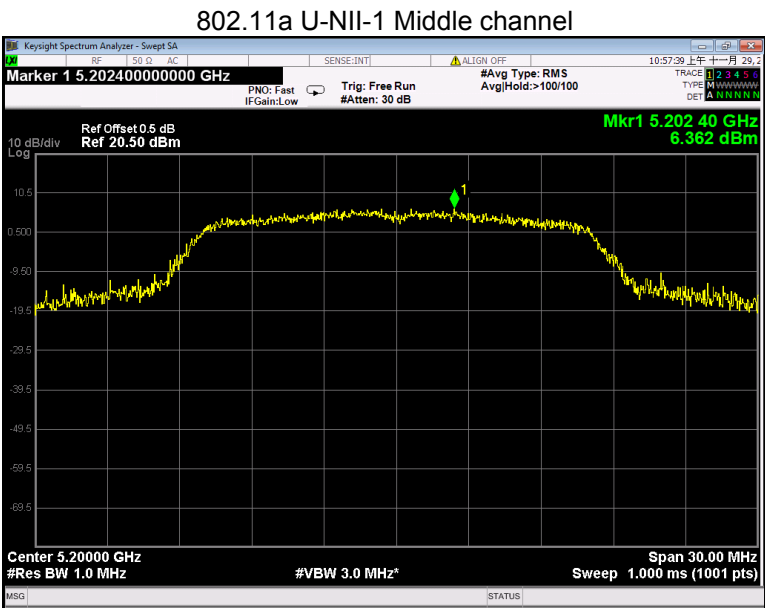
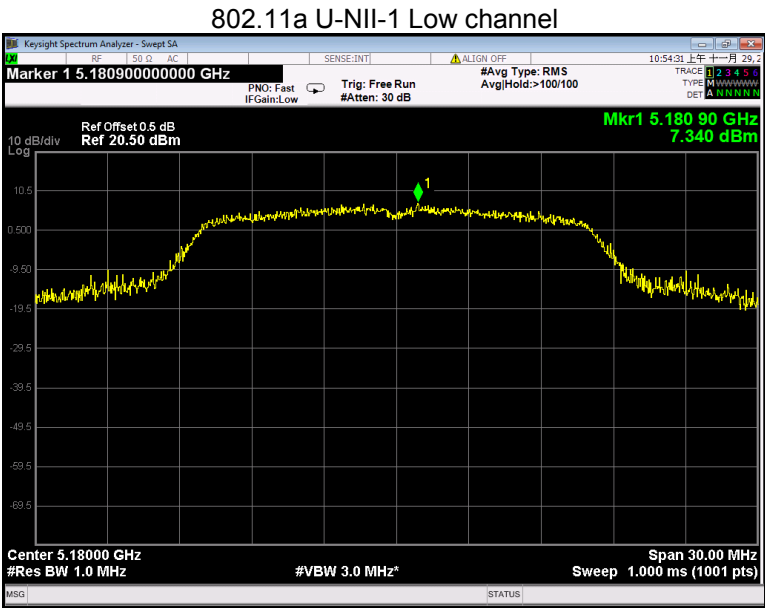
Band	Operation mode	Channel	Power Spectral Density (dBm/MHz)
U-NII-2A	802.11a	Low	5.693
		Middle	5.477
		High	5.647
	802.11n(HT20)	Low	5.192
		Middle	5.251
		High	5.506
	802.11n(HT40)	Low	1.929
		Middle	/
		High	1.473
	802.11ac(VHT20)	Low	5.534
		Middle	5.227
		High	5.812
	802.11ac(VHT40)	Low	2.155
		Middle	/
		High	1.682
	802.11ac(VHT80)	Low	/
		Middle	-0.933
		High	/

Band	Operation mode	Channel	Power Spectral Density (dBm/MHz)
U-NII-2C	802.11a	Low	7.892
		Middle	6.927
		High	5.538
	802.11n(HT20)	Low	7.005
		Middle	7.397
		High	5.240
	802.11n(HT40)	Low	3.472
		Middle	3.238
		High	1.141
	802.11ac(VHT20)	Low	7.258
		Middle	6.832
		High	4.963
	802.11ac(VHT40)	Low	3.279
		Middle	2.790
		High	1.139
	802.11ac(VHT80)	Low	0.087
		Middle	/
		High	-0.798

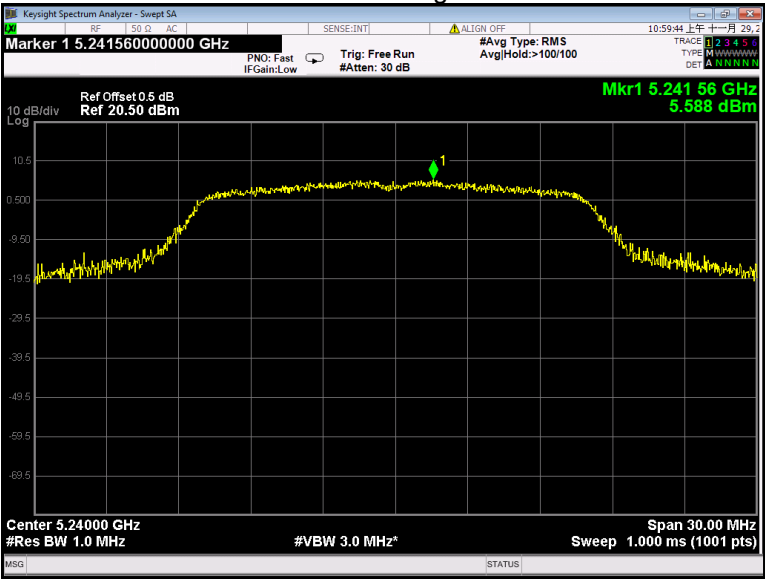
Band	Operation mode	Channel	Power Spectral Density (dBm/MHz)
U-NII-3	802.11a	Low	3.367
		Middle	4.979
		High	5.783
	802.11n(HT20)	Low	3.526
		Middle	4.300
		High	4.755
	802.11n(HT40)	Low	1.075
		Middle	/
		High	1.668
	802.11ac(VHT20)	Low	3.155
		Middle	4.854
		High	4.820
	802.11ac(VHT40)	Low	0.841
		Middle	/
		High	1.725
	802.11ac(VHT80)	Low	-1.490
		Middle	/
		High	/

* All transmit signals are completely uncorrelated with each other, Directional gain = G_{ANT} which is less than 6dBi. So the limit does not be reduced.

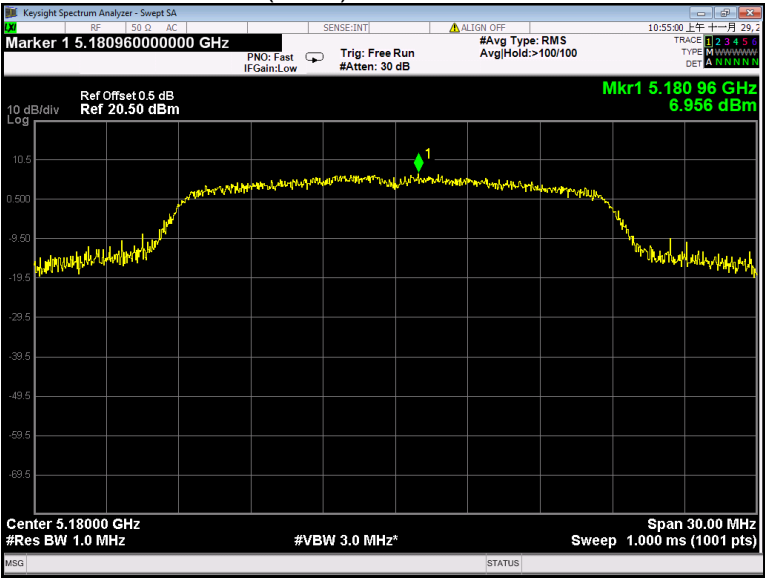
Test result plots shown as follows:



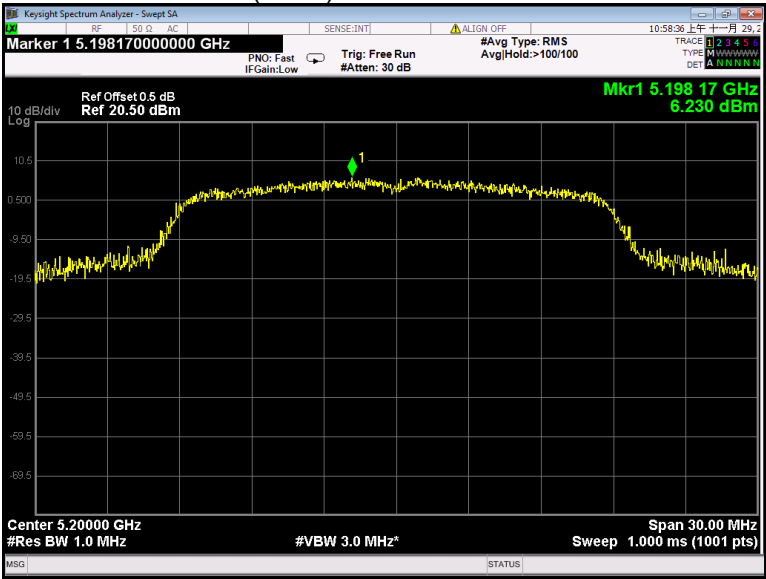
802.11a U-NII-1 High channel



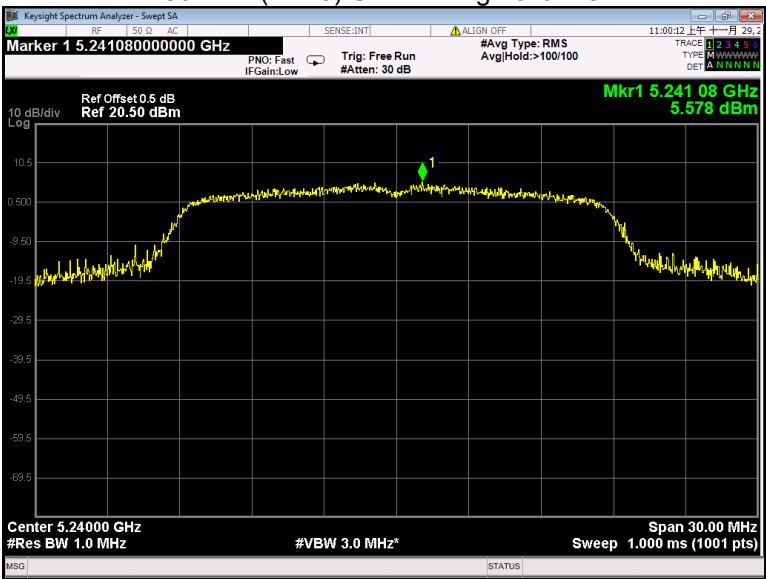
802.11n(HT20) U-NII-1 Low channel



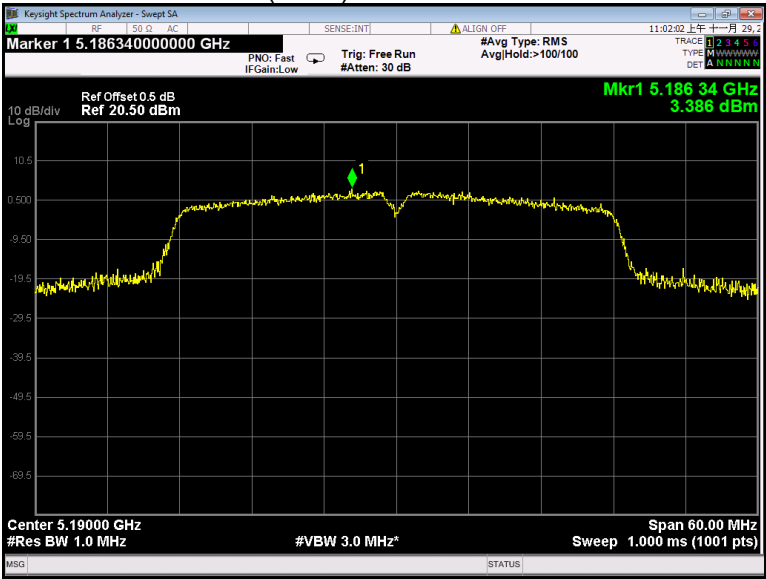
802.11n(HT20) U-NII-1 Middle channel



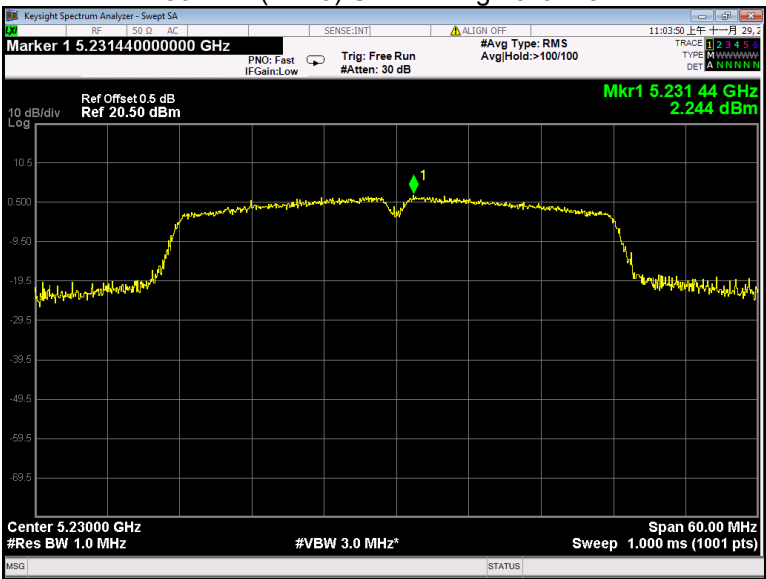
802.11n(HT20) U-NII-1 High channel

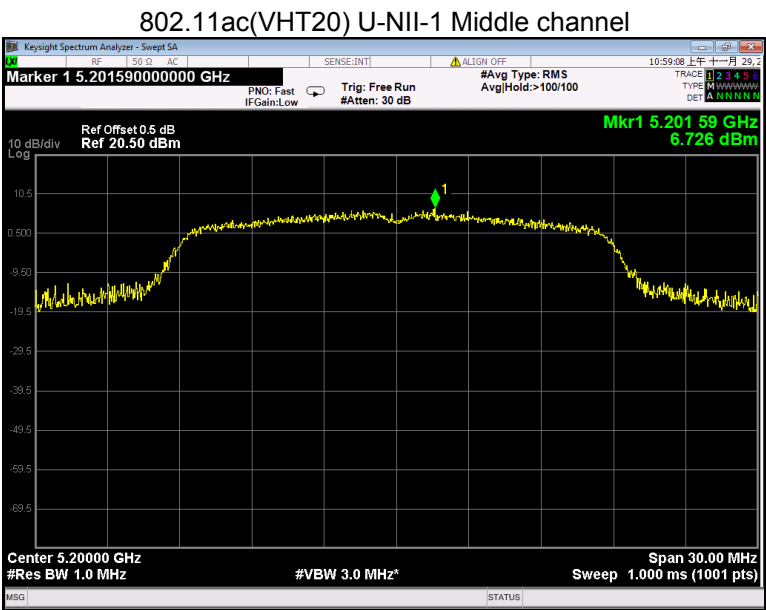
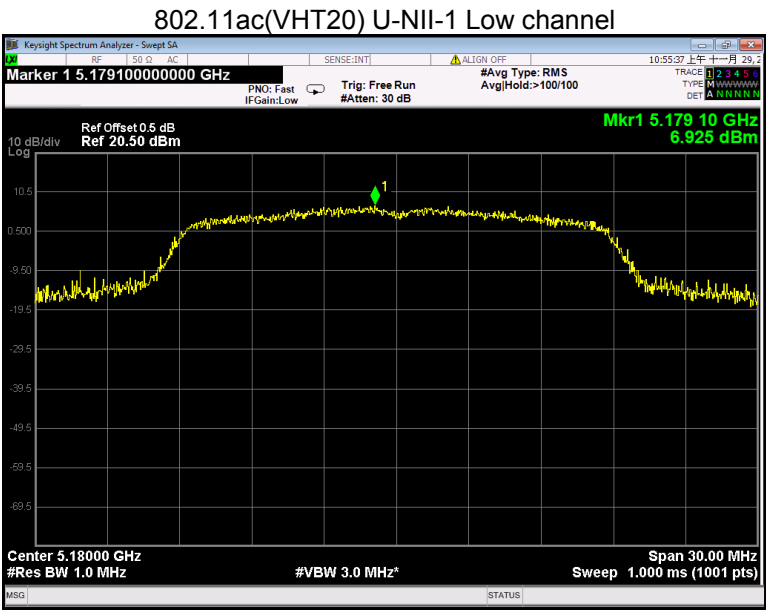


802.11n(HT40) U-NII-1 Low channel

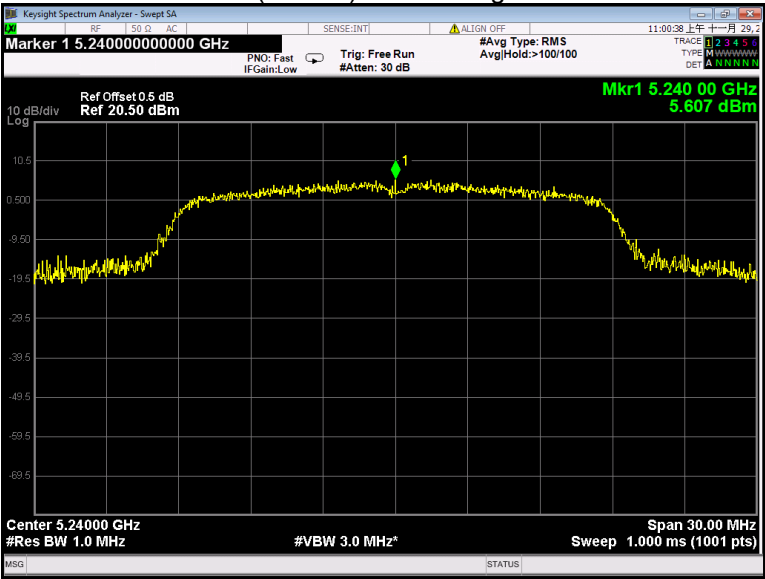


802.11n(HT40) U-NII-1 High channel

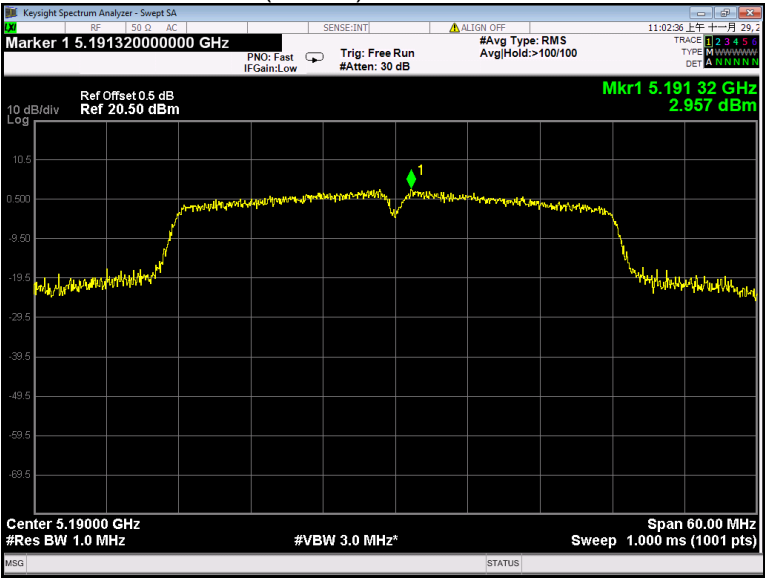




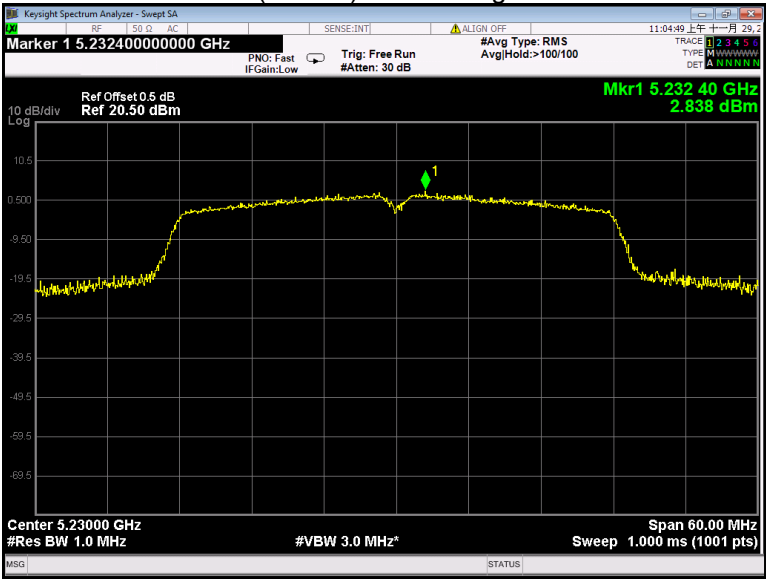
802.11ac(VHT20) U-NII-1 High channel



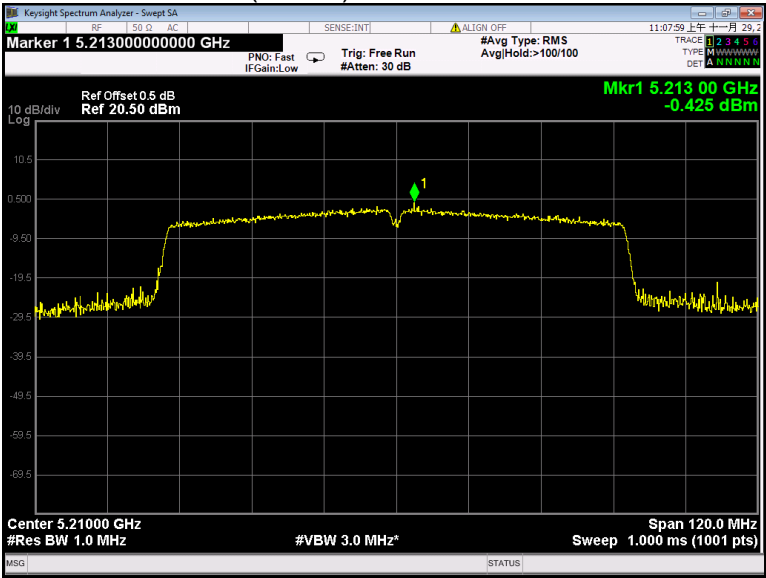
802.11ac(VHT40) U-NII-1 Low channel



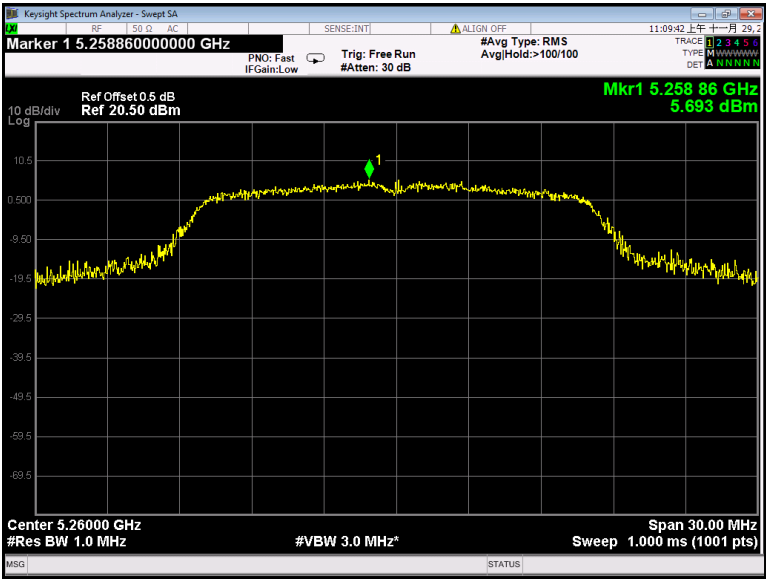
802.11ac(VHT40) U-NII-1 High channel



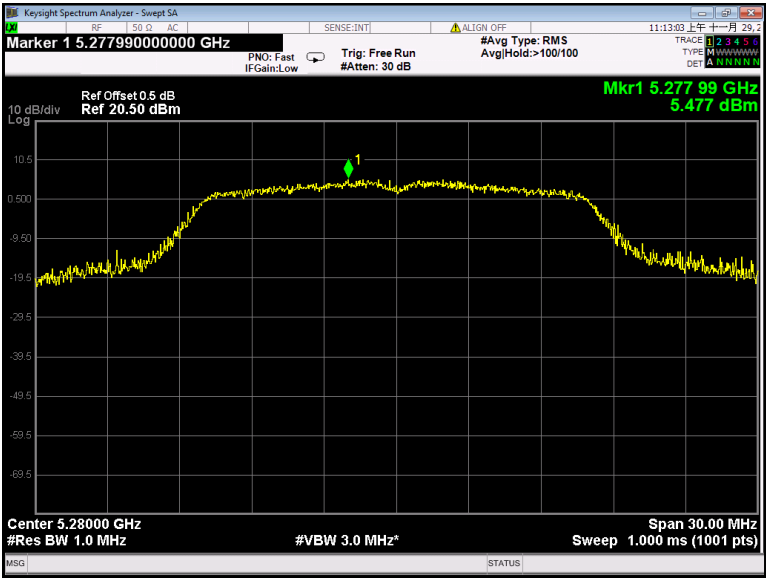
802.11ac(VHT80) U-NII-1 Middle channel



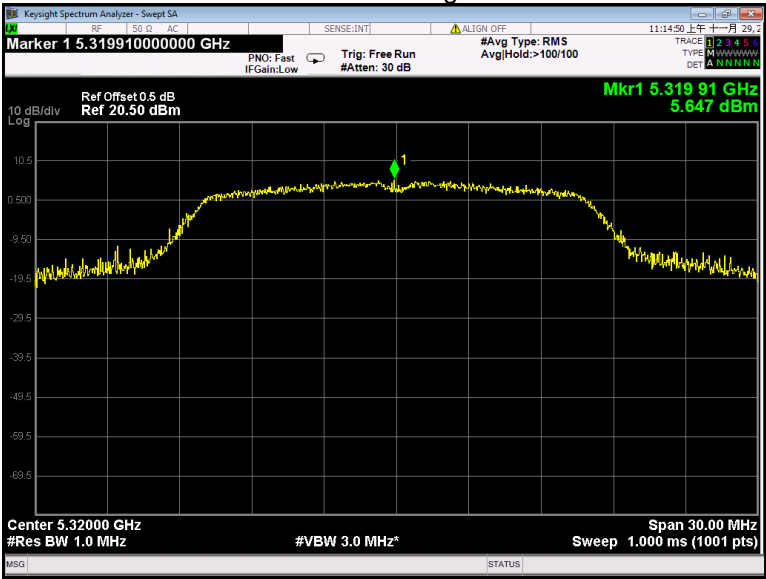
802.11a U-NII-2A Low channel



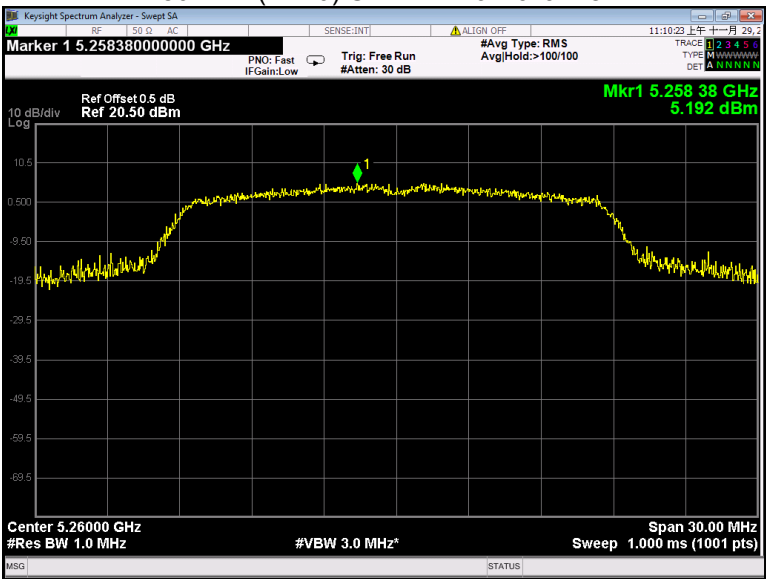
802.11a U-NII-2A Middle channel



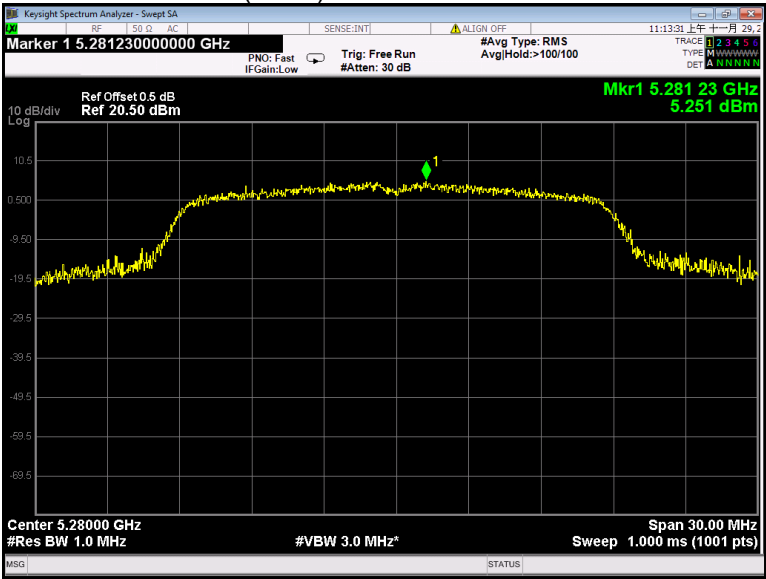
802.11a U-NII-2A High channel



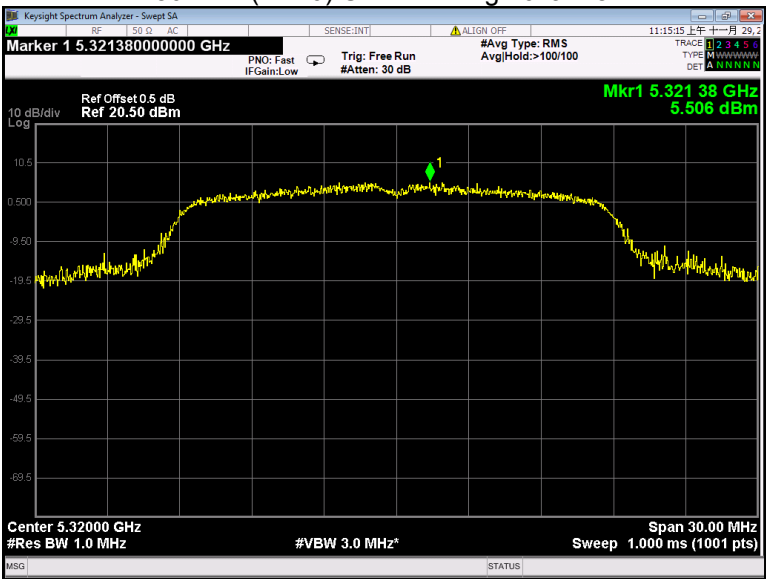
802.11n(HT20) U-NII-2A Low channel



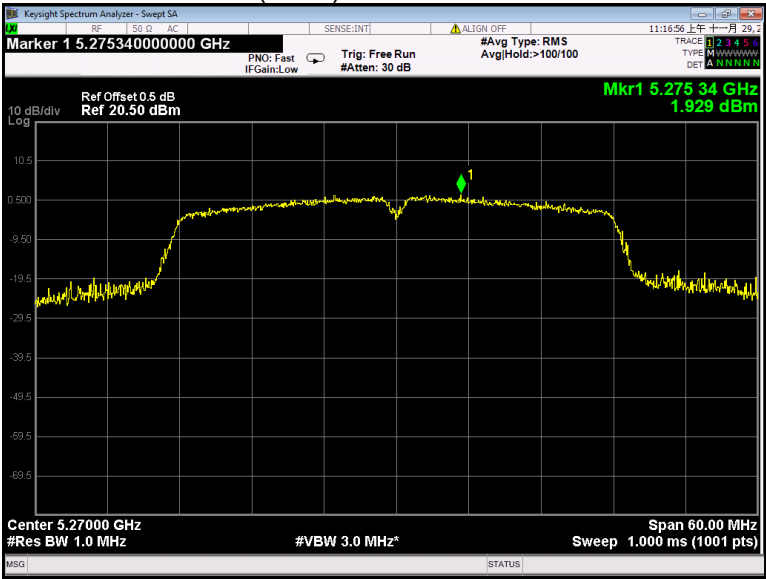
802.11n(HT20) U-NII-2A Middle channel



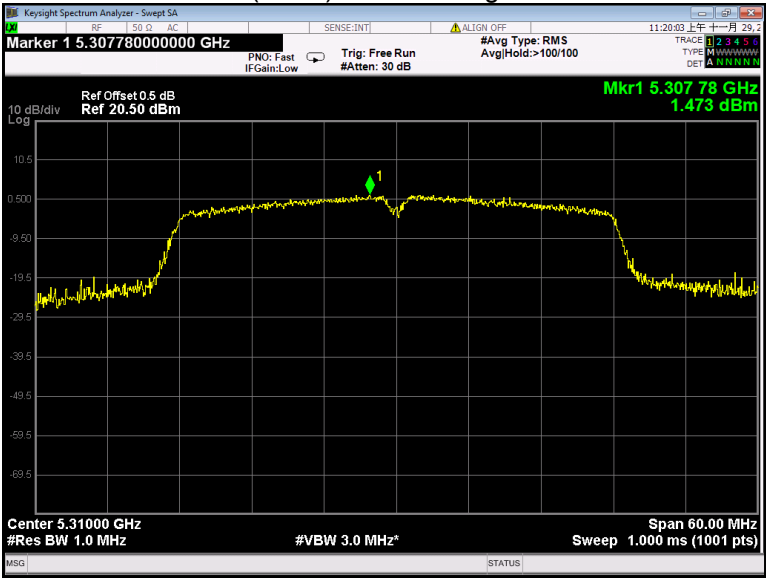
802.11n(HT20) U-NII-2A High channel



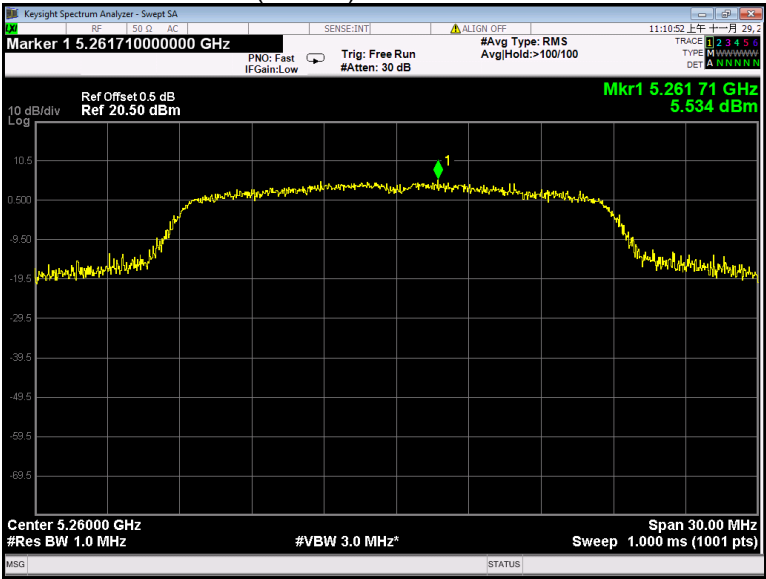
802.11n(HT40) U-NII-2A Low channel



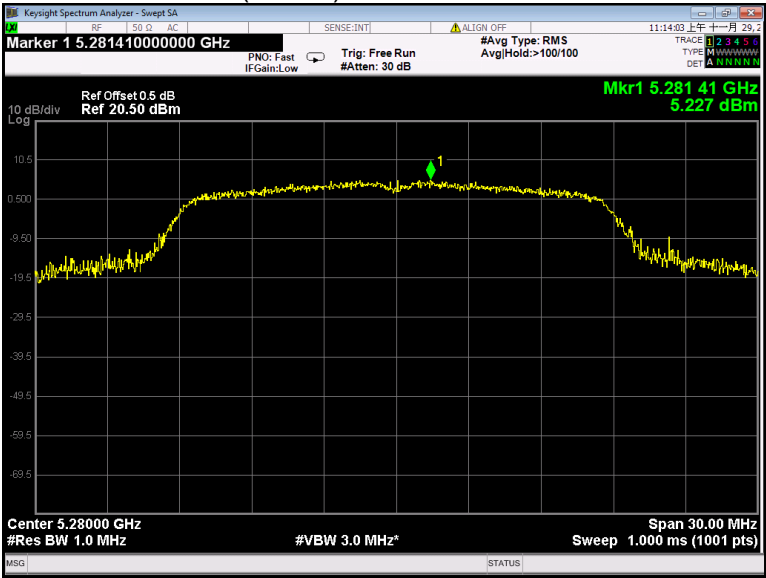
802.11n(HT40) U-NII-2A High channel



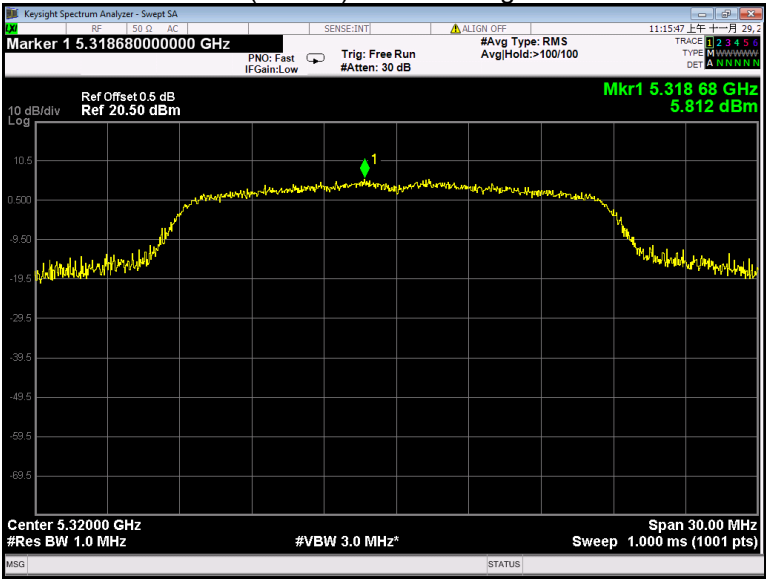
802.11ac(VHT20) U-NII-2A Low channel



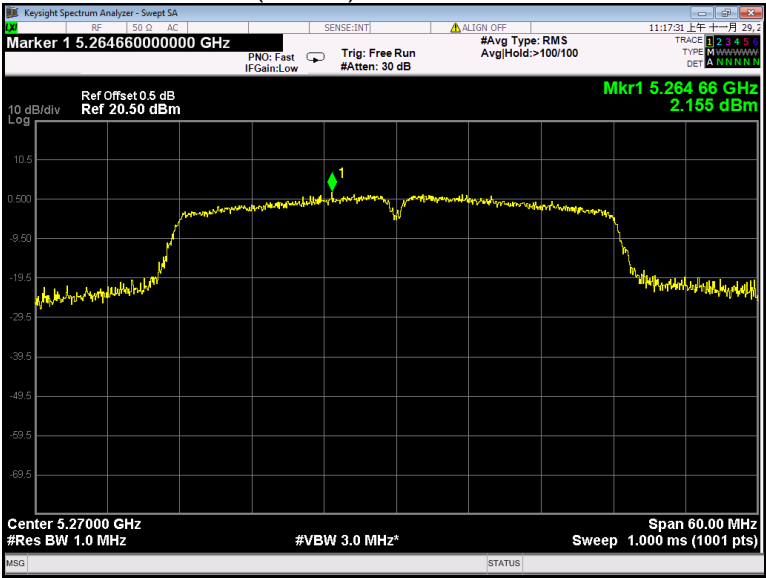
802.11ac(VHT20) U-NII-2A Middle channel



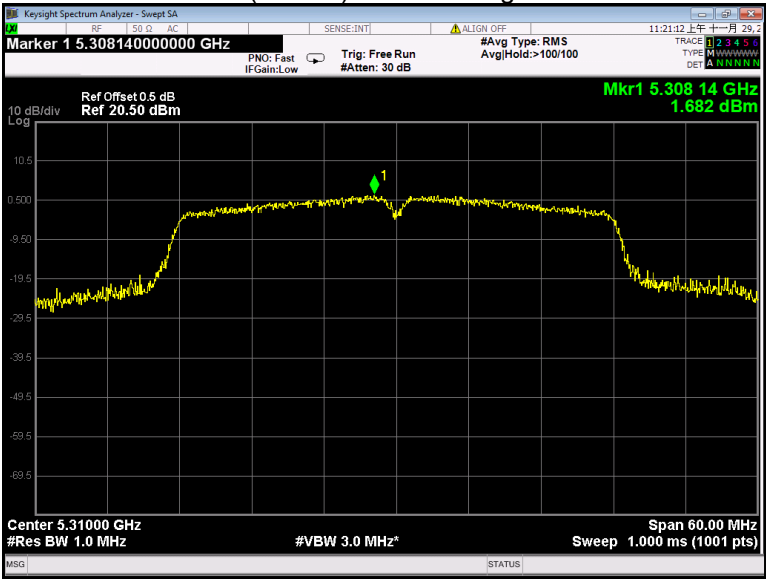
802.11ac(VHT20) U-NII-2A High channel



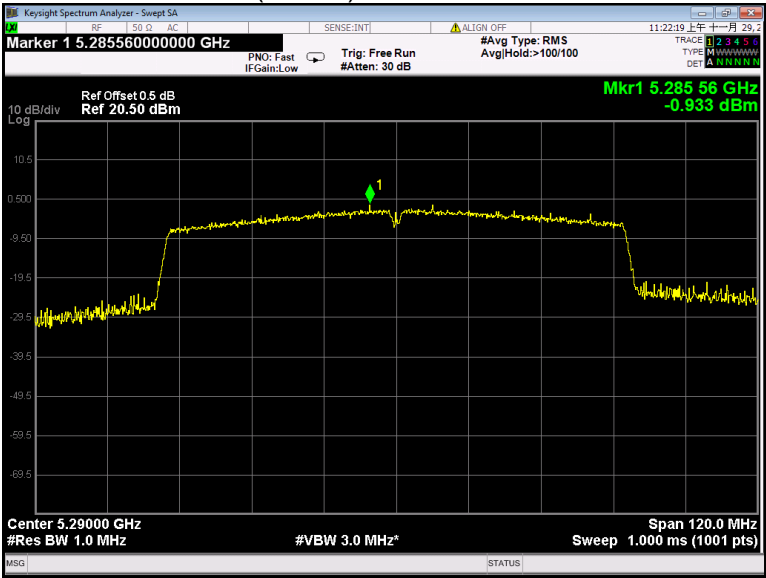
802.11ac(VHT40) U-NII-2A Low channel



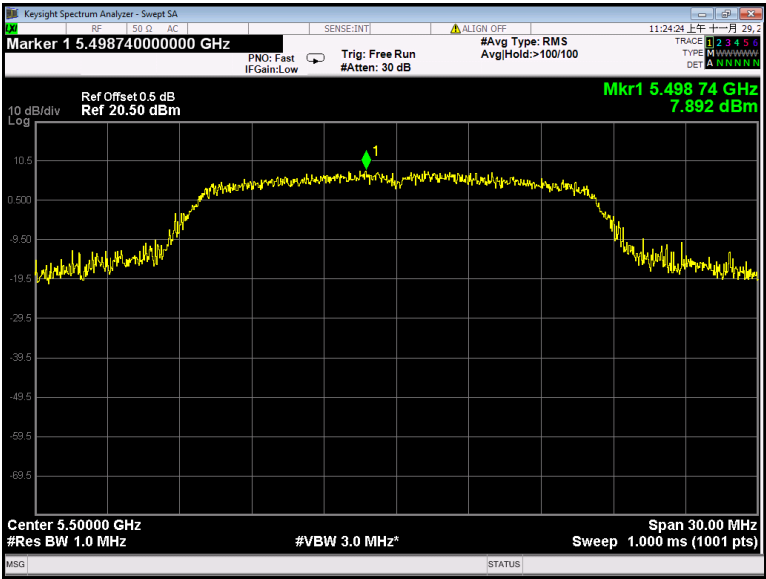
802.11ac(VHT40) U-NII-2A High channel



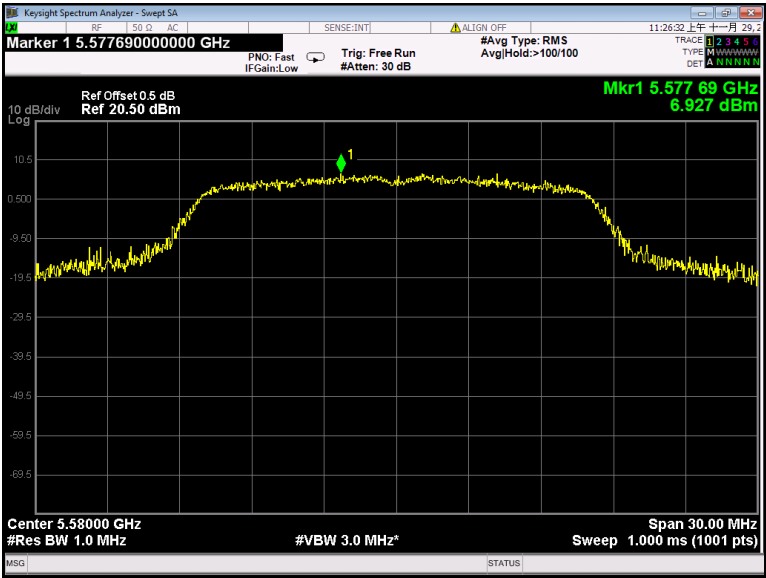
802.11ac(VHT80) U-NII-2A Low channel



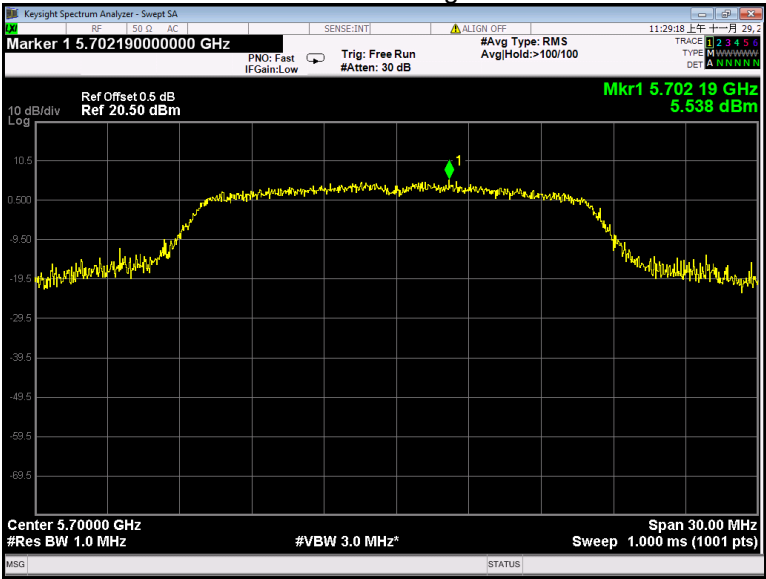
802.11a U-NII-2C Low channel



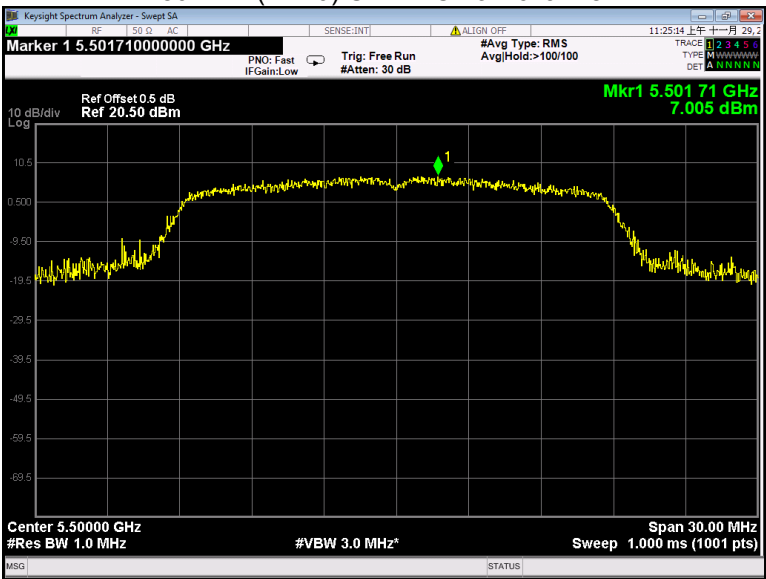
802.11a U-NII-2C Middle channel



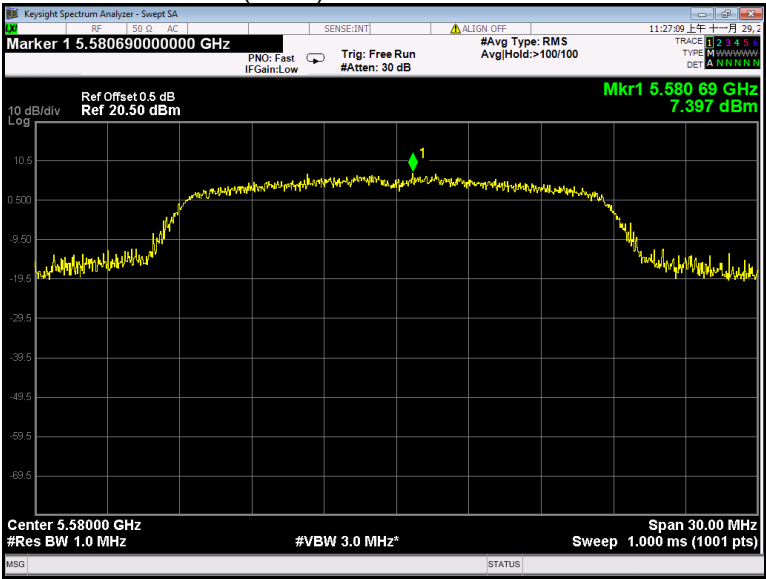
802.11a U-NII-2C High channel



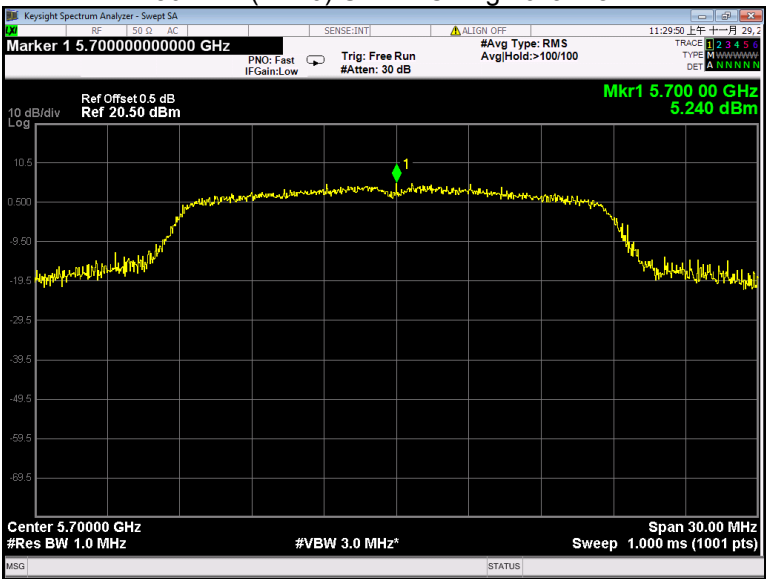
802.11n(HT20) U-NII-2C Low channel



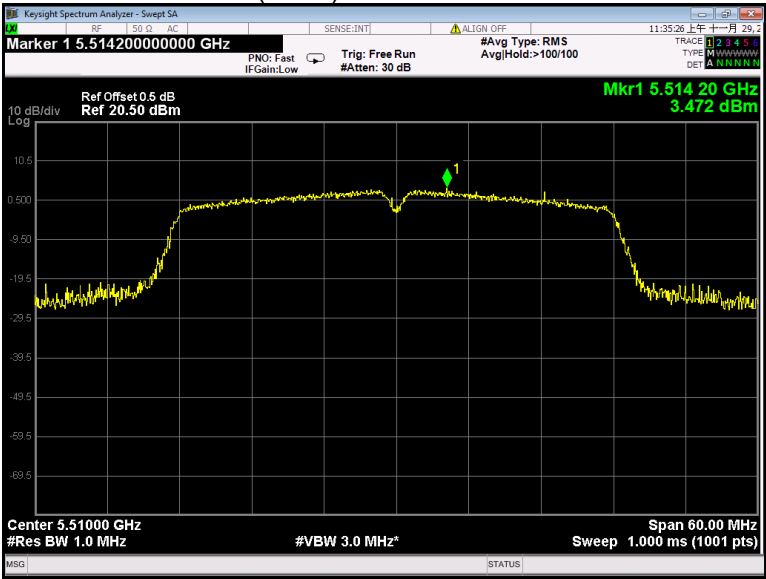
802.11n(HT20) U-NII-2C Middle channel



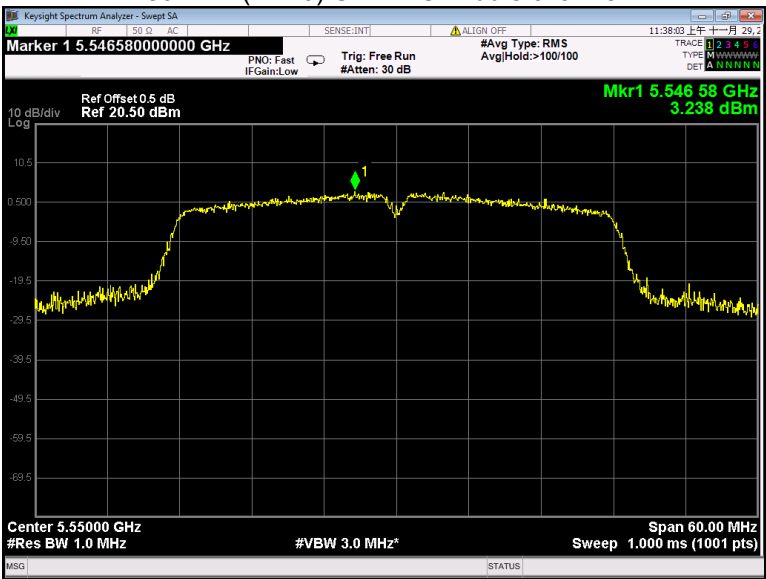
802.11n(HT20) U-NII-2C High channel

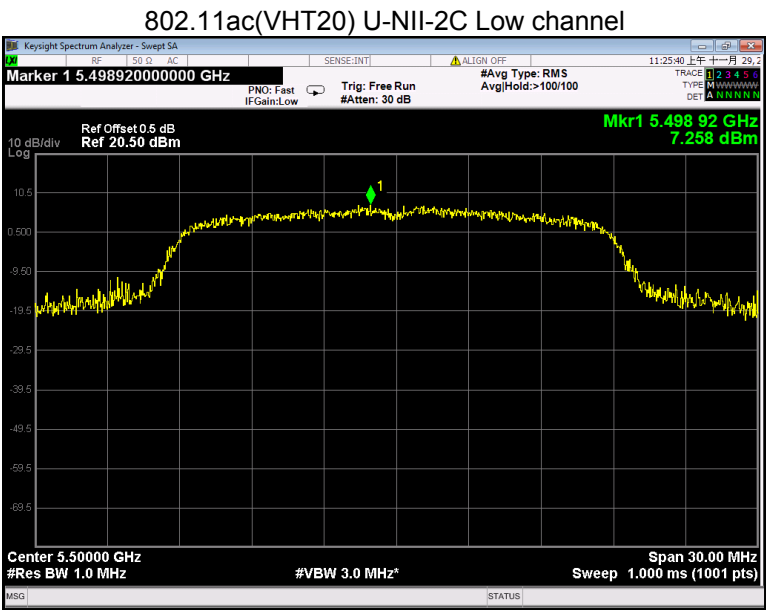
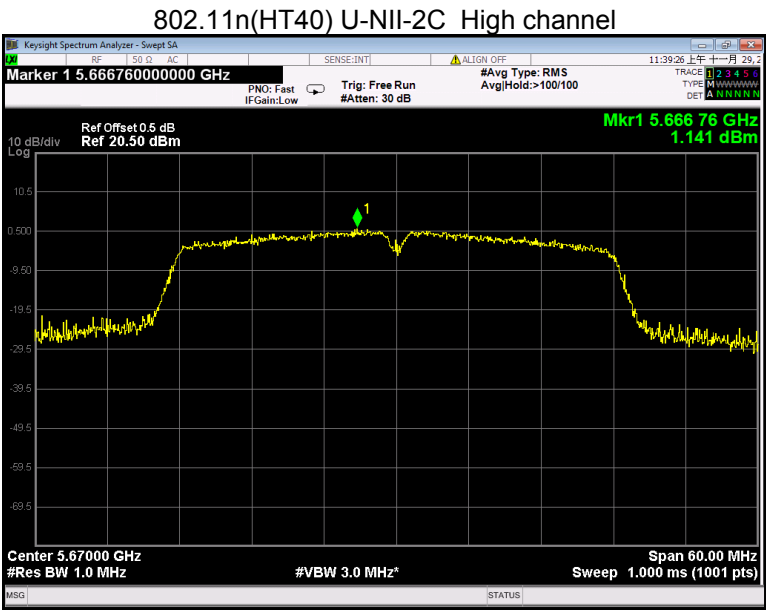


802.11n(HT40) U-NII-2C Low channel

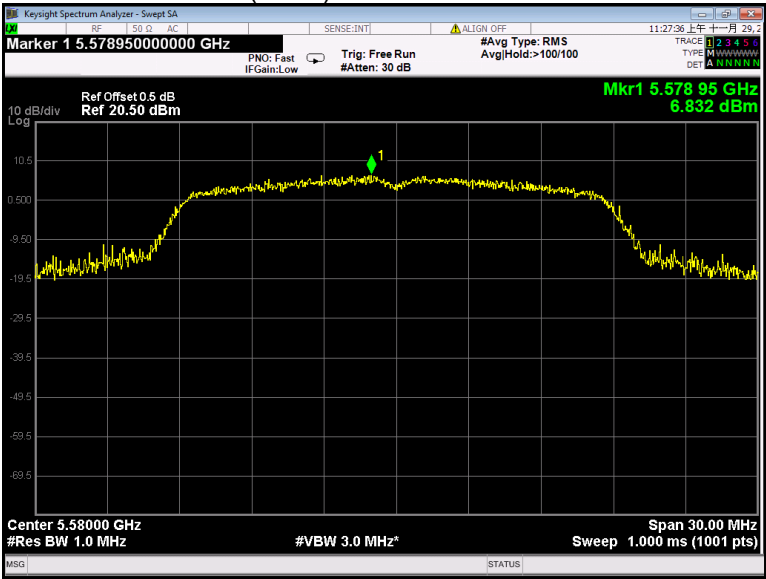


802.11n(HT40) U-NII-2C Middle channel

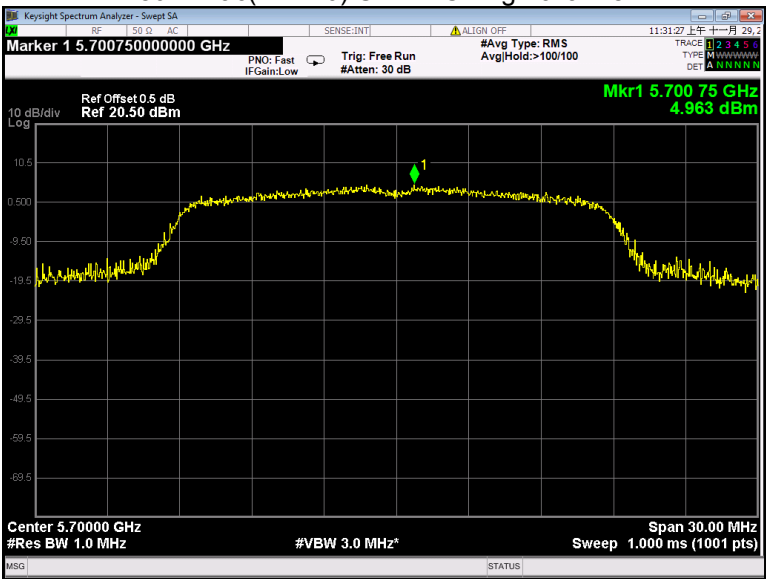




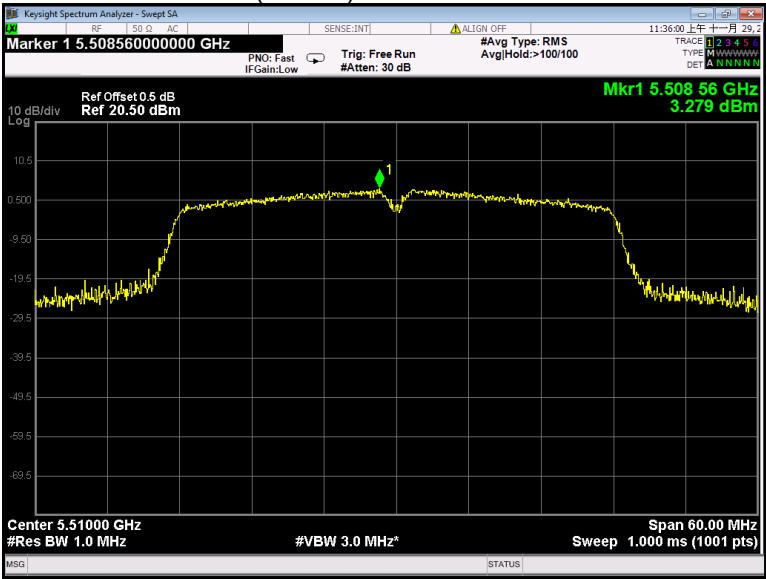
802.11ac(HT20) U-NII-2C Middle channel



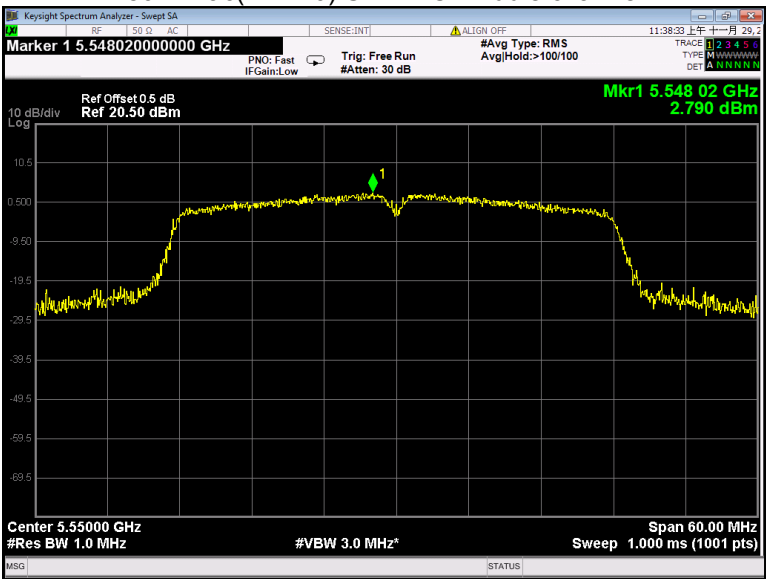
802.11ac(VHT20) U-NII-2C High channel



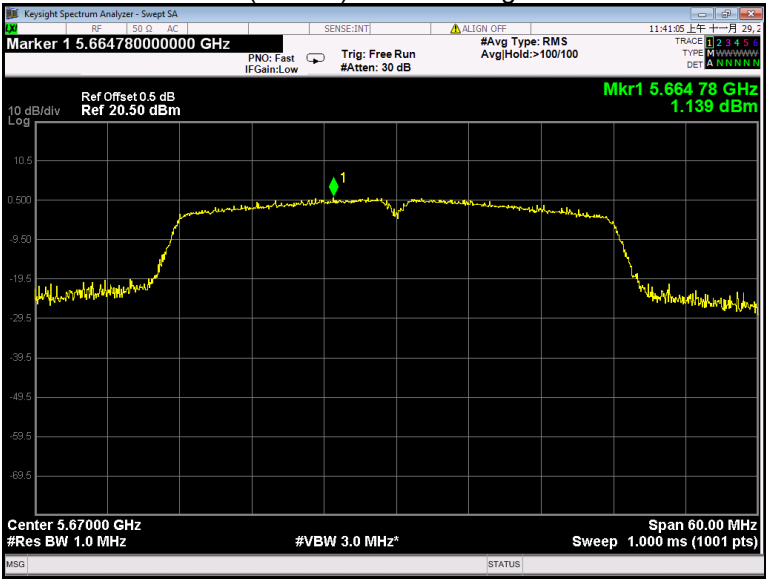
802.11ac(VHT40) U-NII-2C Low channel



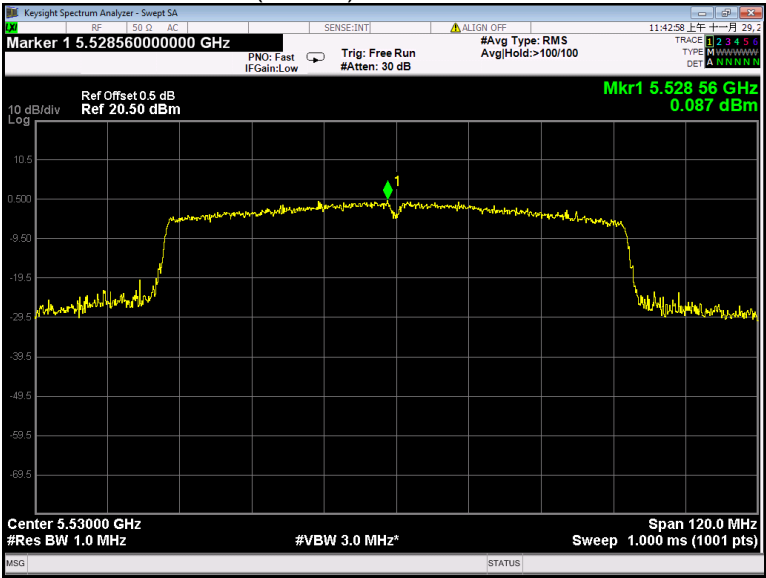
802.11ac(VHT40) U-NII-2C Middle channel



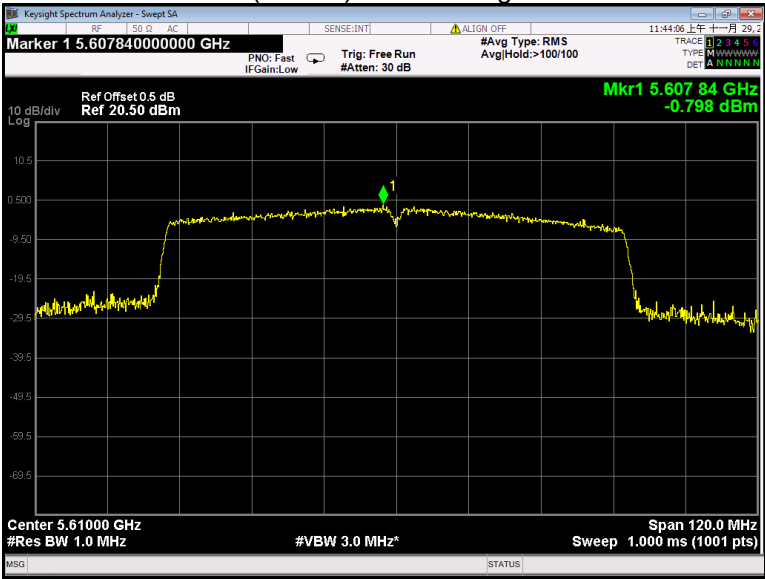
802.11ac(VHT40) U-NII-2C High channel



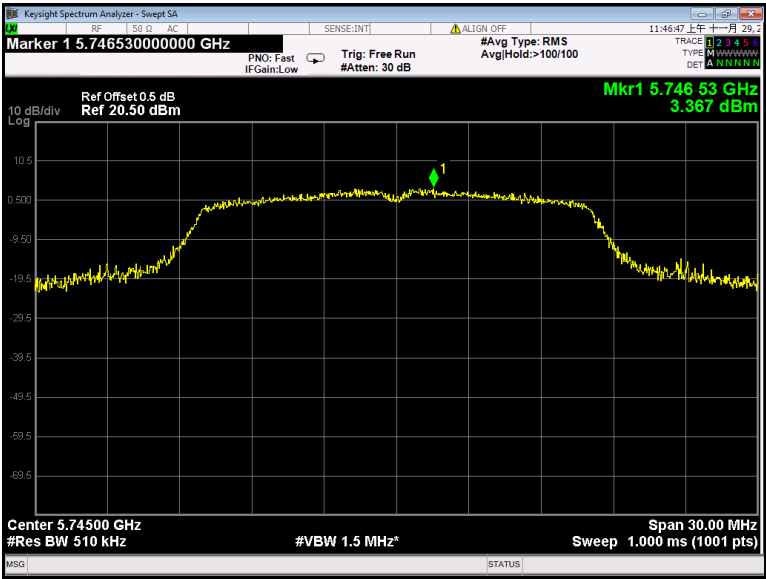
802.11ac(VHT80) U-NII-2C Low channel



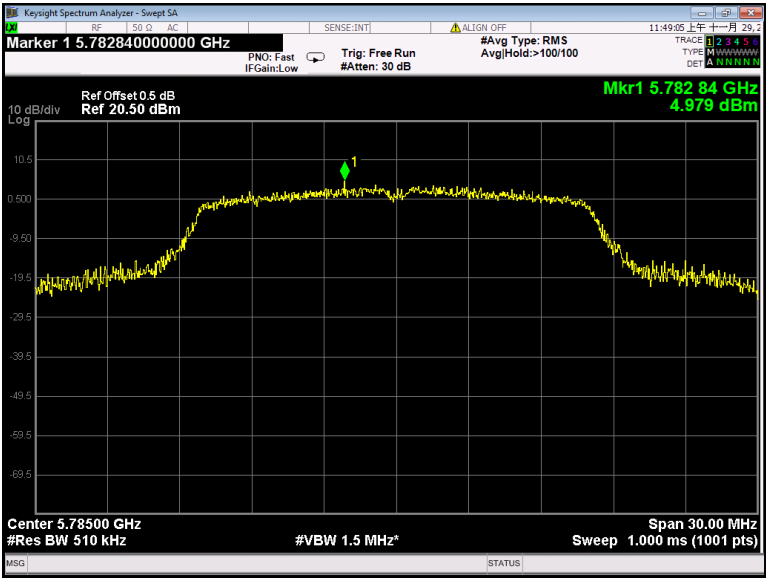
802.11ac(VHT80) U-NII-2C High channel



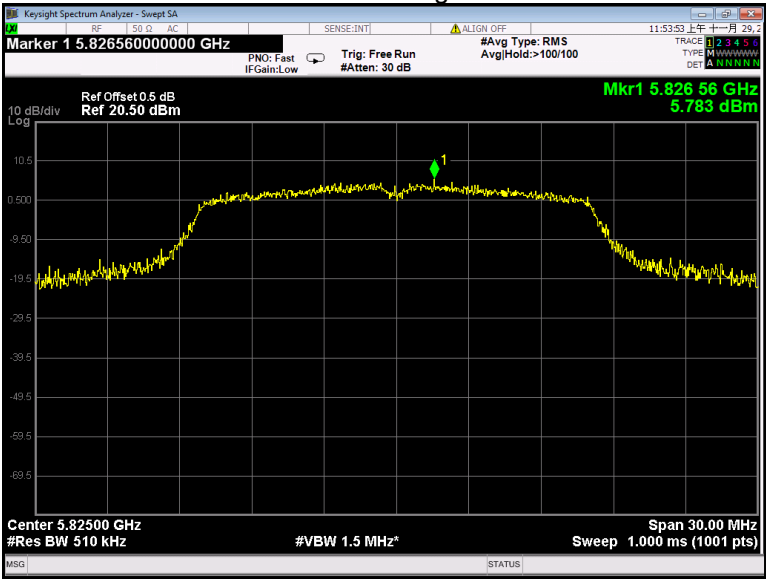
802.11a U-NII-3 Low channel



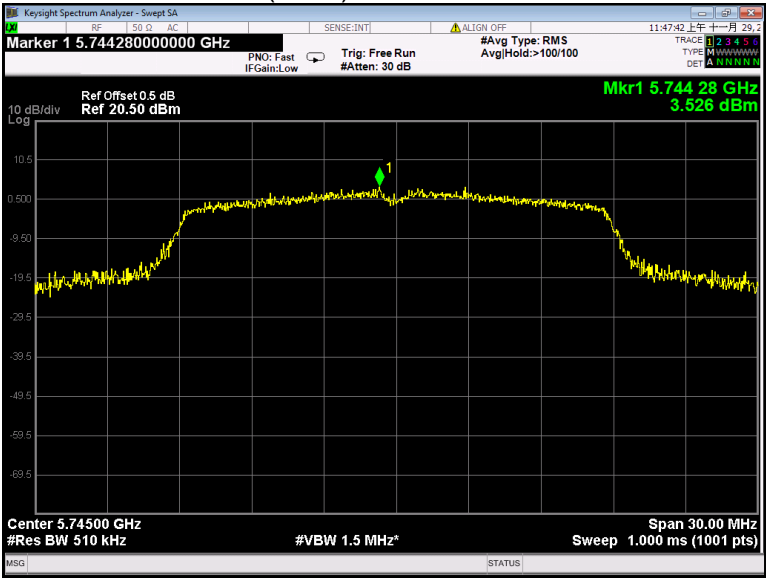
802.11a U-NII-3 Middle channel



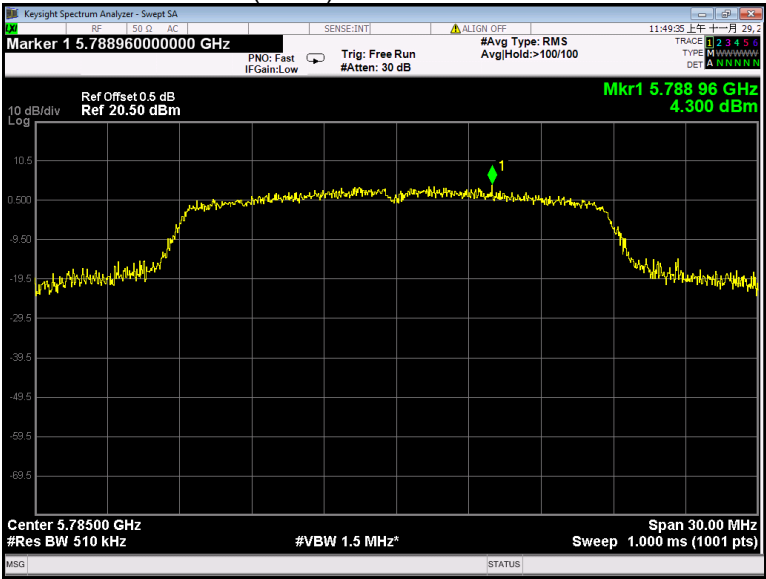
802.11a U-NII-3 High channel



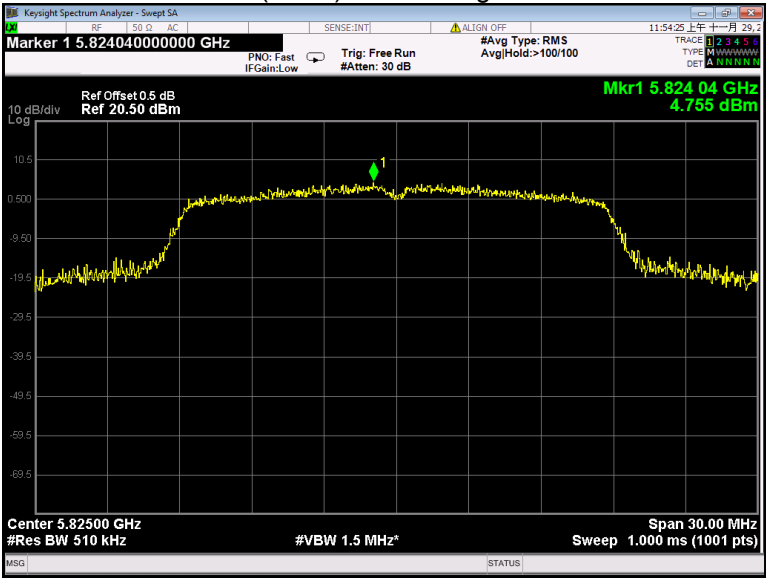
802.11n(HT20) U-NII-3 Low channel



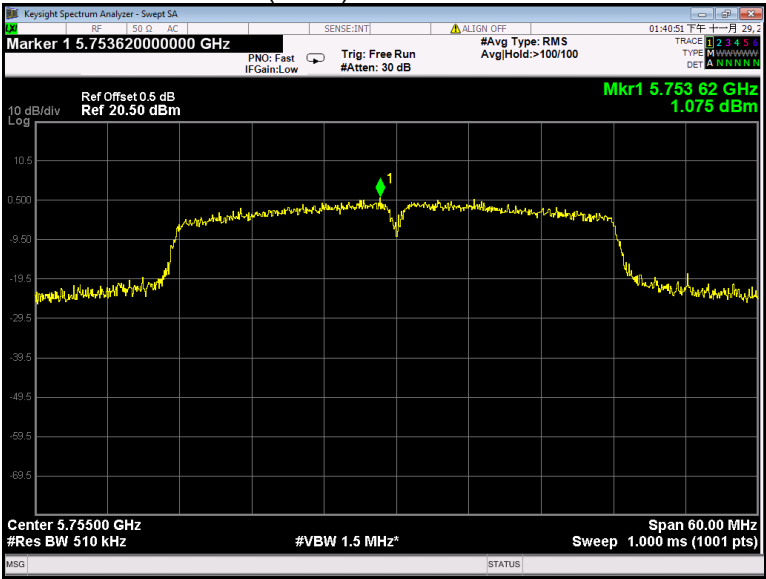
802.11n(HT20) U-NII-3 Middle channel



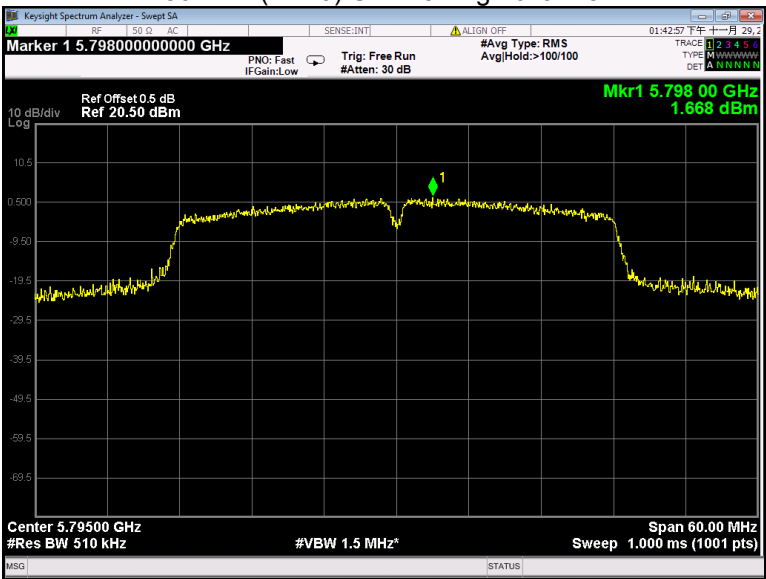
802.11n(HT20) U-NII-3 High channel

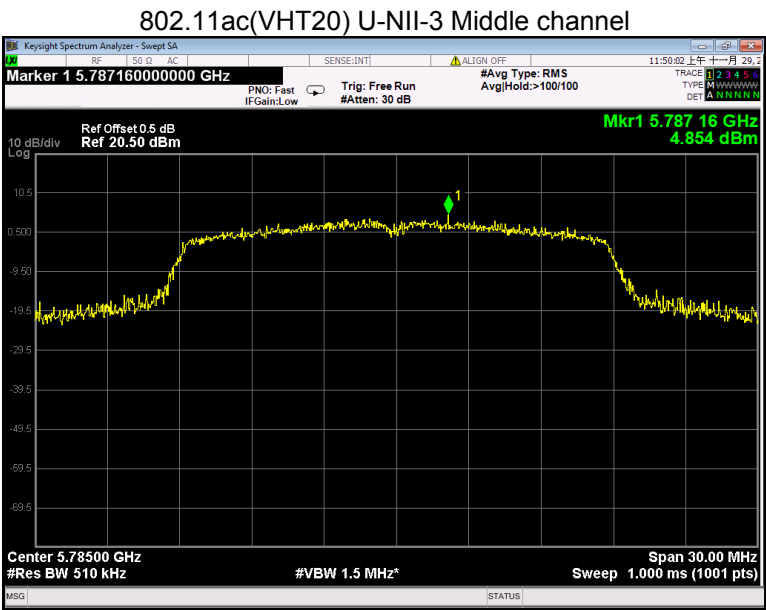
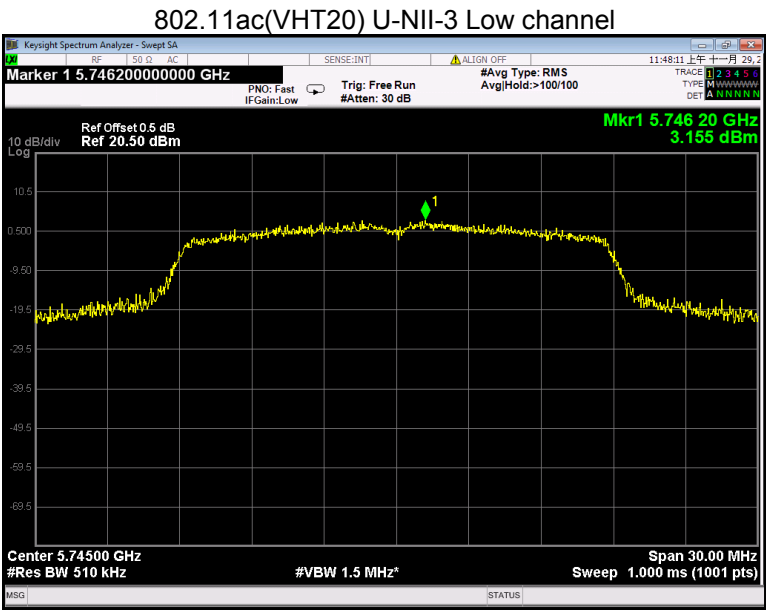


802.11n(HT40) U-NII-3 Low channel

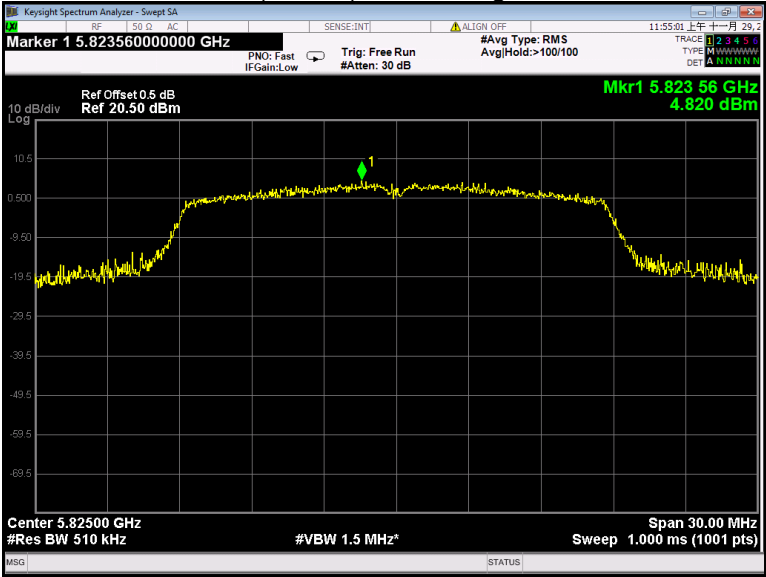


802.11n(HT40) U-NII-3 High channel

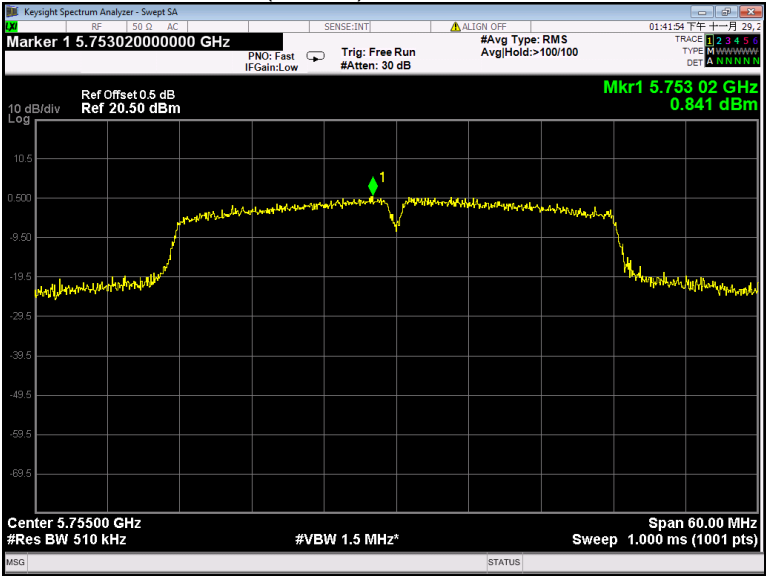




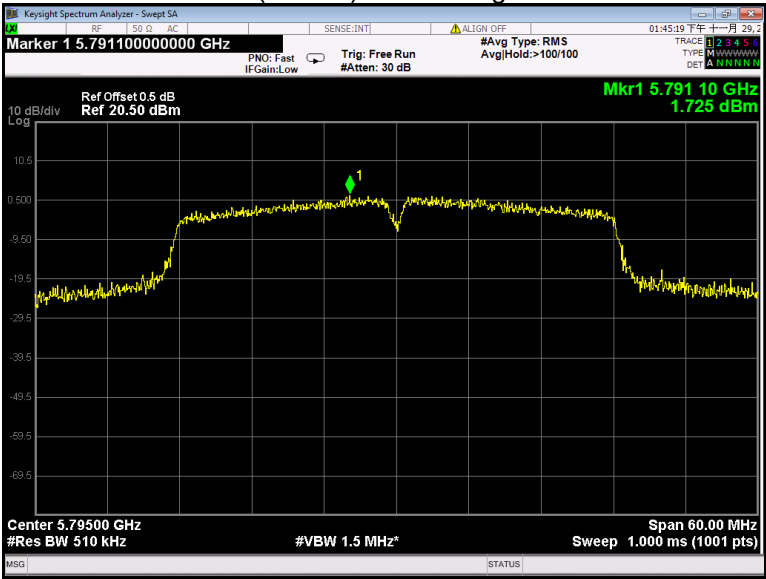
802.11ac(VHT20) U-NII-3 High channel



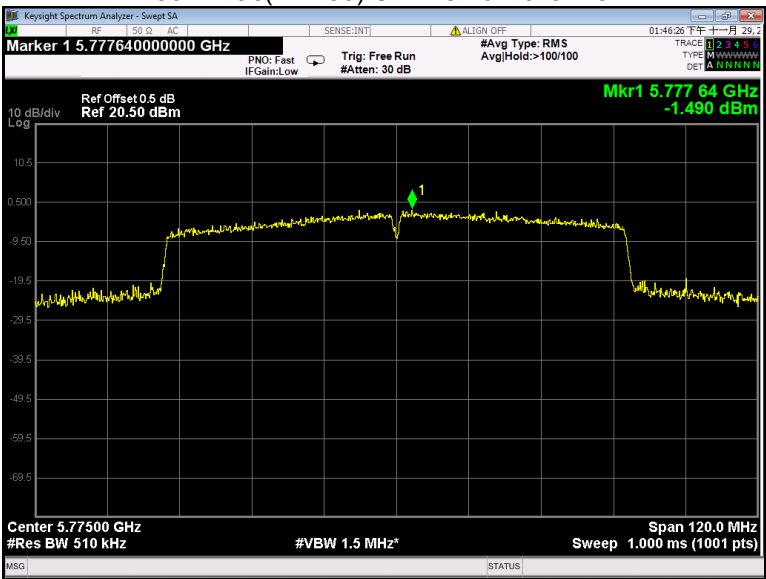
802.11ac(VHT40) U-NII-3 Low channel



802.11ac(VHT40) U-NII-3 High channel



802.11ac(VHT80) U-NII-3 Low channel



15 Frequency Stability

Test Requirement:	FCC 47CFR Part 15 Section 15.407(g)
Test Method:	ANSI C63.10-2020
Test 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 users manual or 20ppm.
Test Result:	PASS

15.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
EUT have transmitted absence of unmodulation signal and fixed channelise. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
2. Extreme temperature rule is $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

15.2 Test Result

U-NII-1 Test Frequency:5180MHz				
Temperature (°C)	Power Supply (VAC)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)
50	3.88	-0.0085	-13.87	20
45		-0.0050	-8.22	20
30		-0.0049	-8.01	20
20		-0.0050	-8.19	20
10		-0.0030	-4.88	20
0		-0.0014	-2.35	20
-10		-0.0100	-16.42	20
-15		-0.0109	-17.88	20
-30		-0.0042	-6.92	20
20	3.30	-0.0082	-13.44	20
20	4.46	-0.0049	-8.03	20

U-NII-2A Test Frequency:5260MHz				
Temperature (°C)	Power Supply (VAC)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)
50	3.88	0.0034	5.56	20
45		0.0032	5.28	20
30		0.0045	7.44	20
20		0.0010	1.64	20
10		0.0024	3.85	20
0		-0.0030	-4.94	20
-10		-0.0064	-10.46	20
-15		0.0065	10.70	20
-30		0.0033	5.36	20
20	3.30	-0.0040	-6.53	20
20	4.46	0.0003	0.51	20

U-NII-2C Test Frequency:5500MHz				
Temperature (°C)	Power Supply (VAC)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)
50	3.88	0.0001	0.18	20
45		0.0050	8.15	20
30		-0.0050	-8.17	20
20		-0.0010	-1.64	20
10		-0.0019	-3.05	20
0		-0.0012	-1.98	20
-10		-0.0037	-6.13	20
-15		0.0054	8.81	20
-30		0.0007	1.11	20
20	3.30	0.0015	2.38	20
20	4.46	0.0005	0.84	20

U-NII-3 Test Frequency:5785MHz				
Temperature (°C)	Power Supply (VAC)	Frequency Error (MHz)	Frequency Error (ppm)	Limit (ppm)
50	3.88	-0.0073	-11.93	20
45		-0.0006	-0.94	20
30		0.0034	5.61	20
20		-0.0005	-0.82	20
10		0.0018	3.02	20
0		-0.0006	-1.01	20
-10		0.0070	11.46	20
-15		0.0024	3.90	20
-30		0.0028	4.56	20
20	3.30	-0.0062	-10.19	20
20	4.46	-0.0002	-0.38	20

16 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

This device uses of an Internal antenna that uses a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.

17 RF Exposure

Remark: Please refer to SAR test report: WTD25D11310672W011.

18 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-Black 6-Photos.

=====End of Report=====