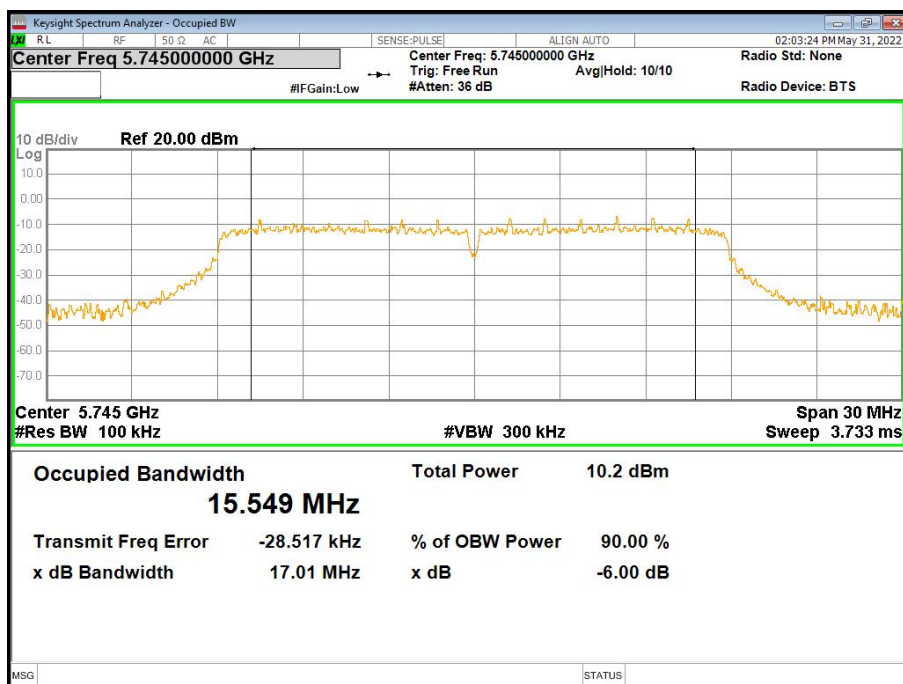
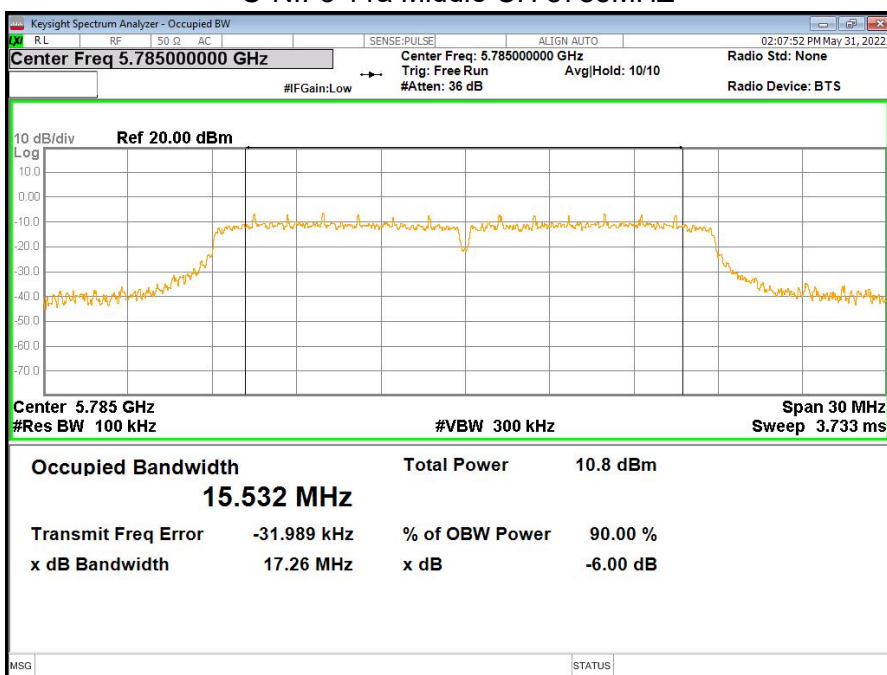


6dB Bandwidth test result

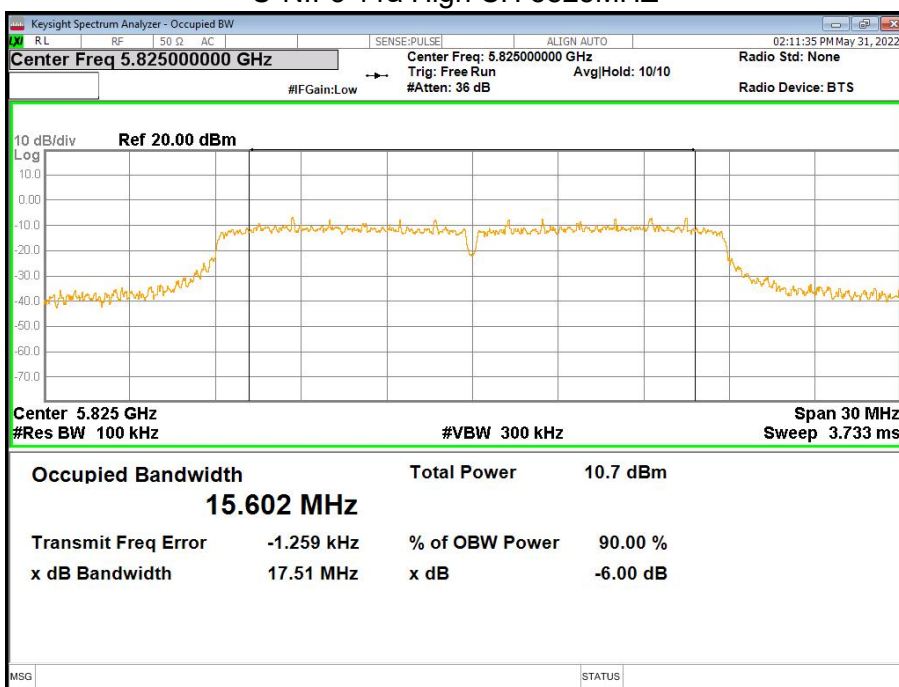
U-NII-3 11a Low CH 5745MHZ



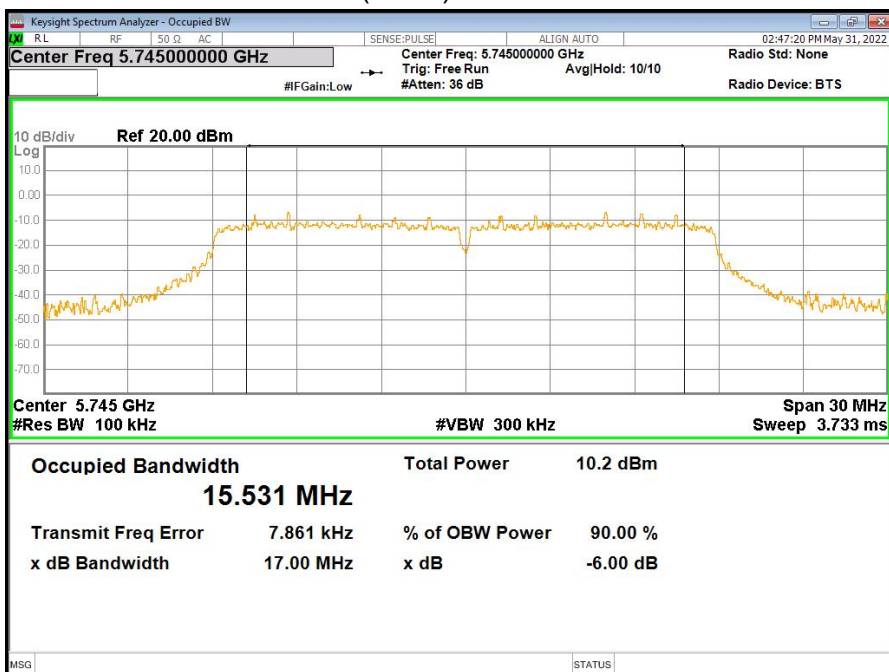
U-NII-3 11a Middle CH 5785MHZ



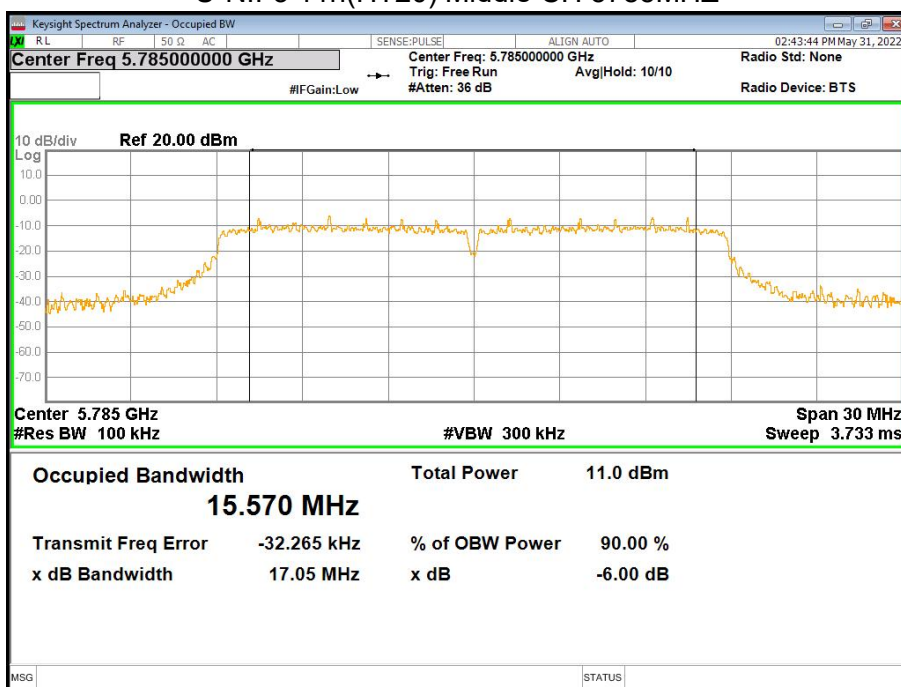
U-NII-3 11a High CH 5825MHZ



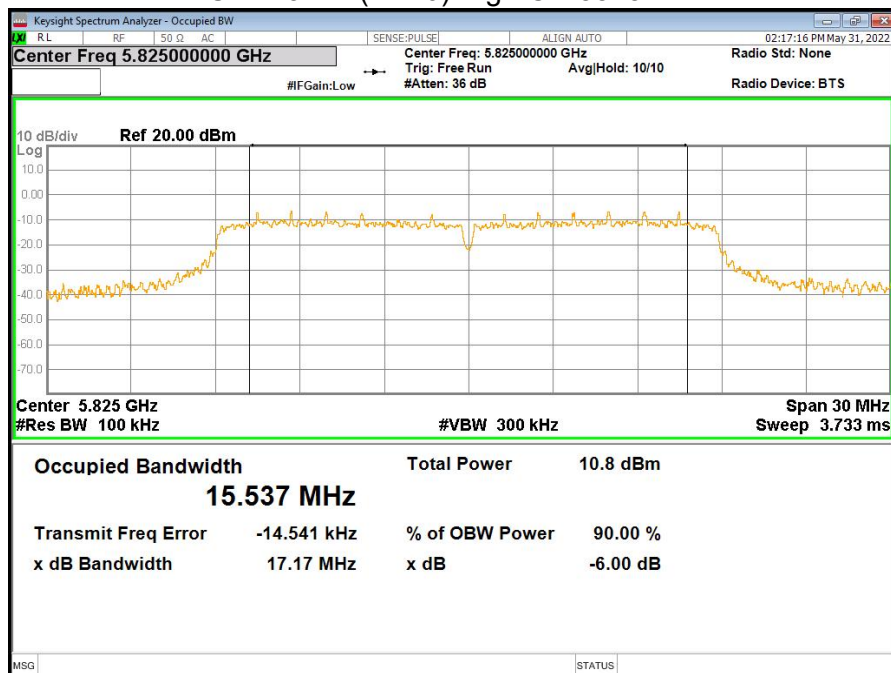
U-NII-3 11n(HT20) Low CH 5745MHZ



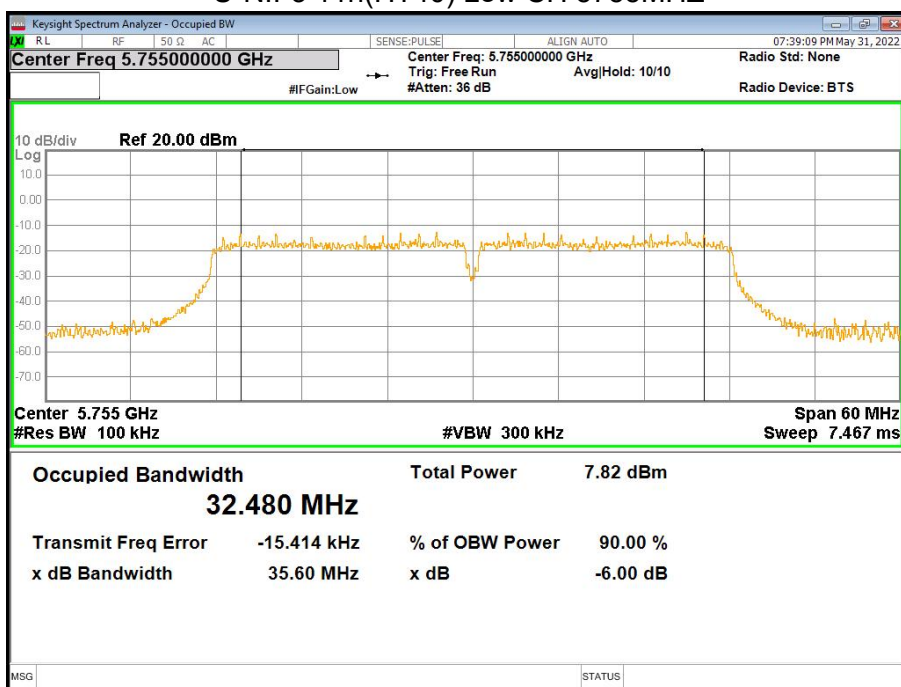
U-NII-3 11n(HT20) Middle CH 5785MHZ



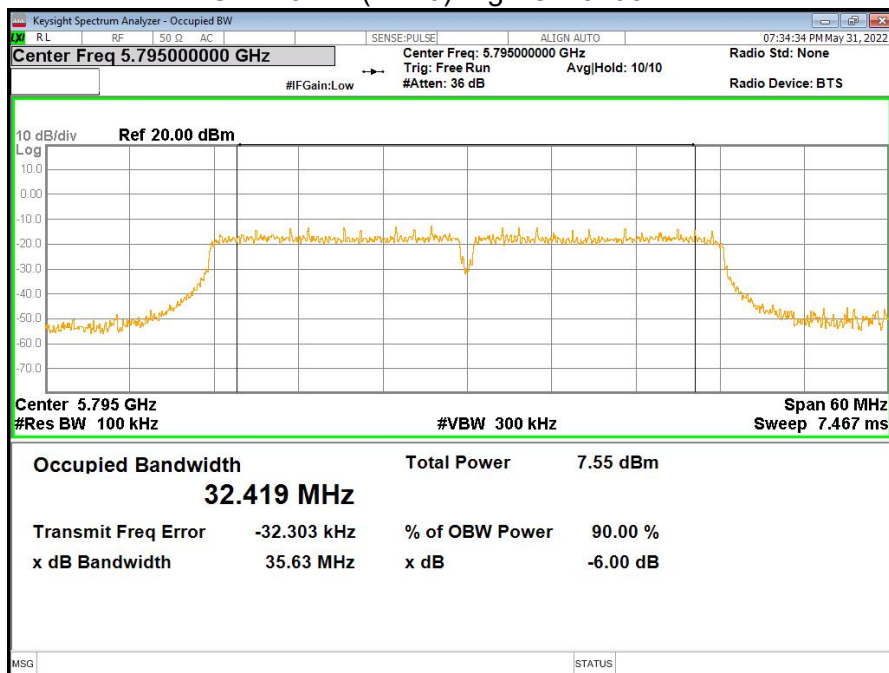
U-NII-3 11n(HT20) High CH 5825MHZ



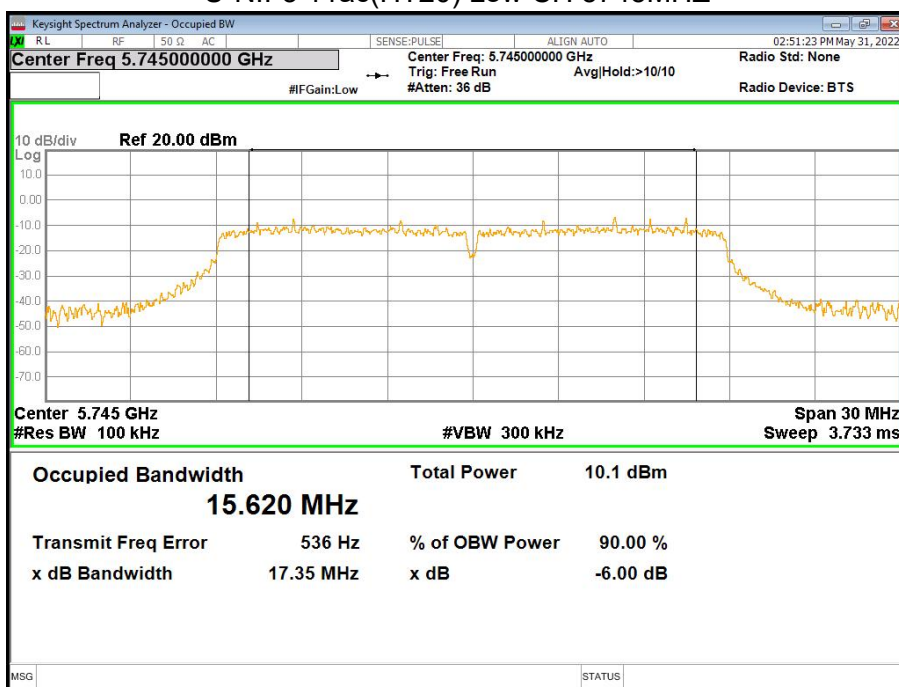
U-NII-3 11n(HT40) Low CH 5755MHZ



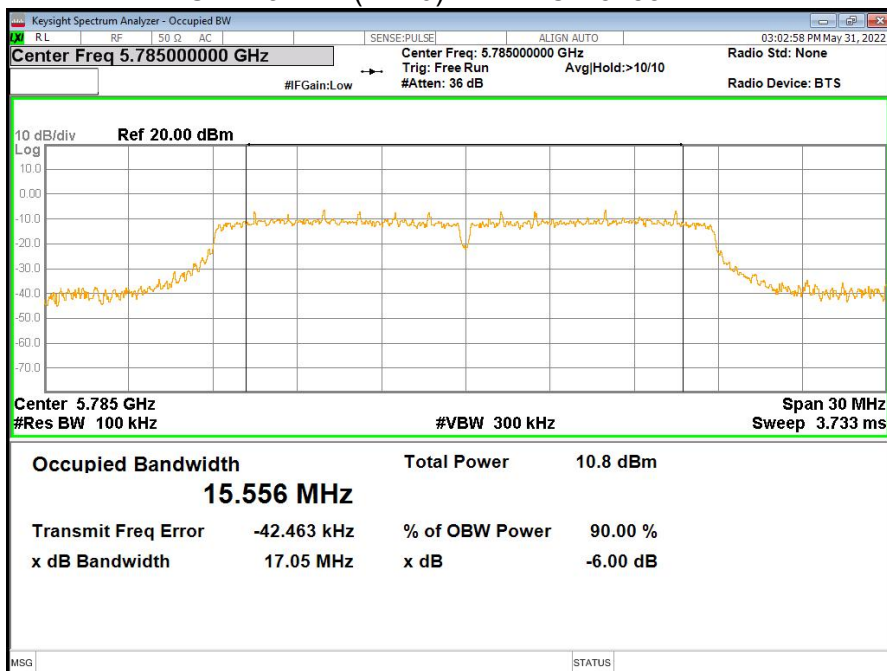
U-NII-3 11n(HT40) High CH 5795MHZ



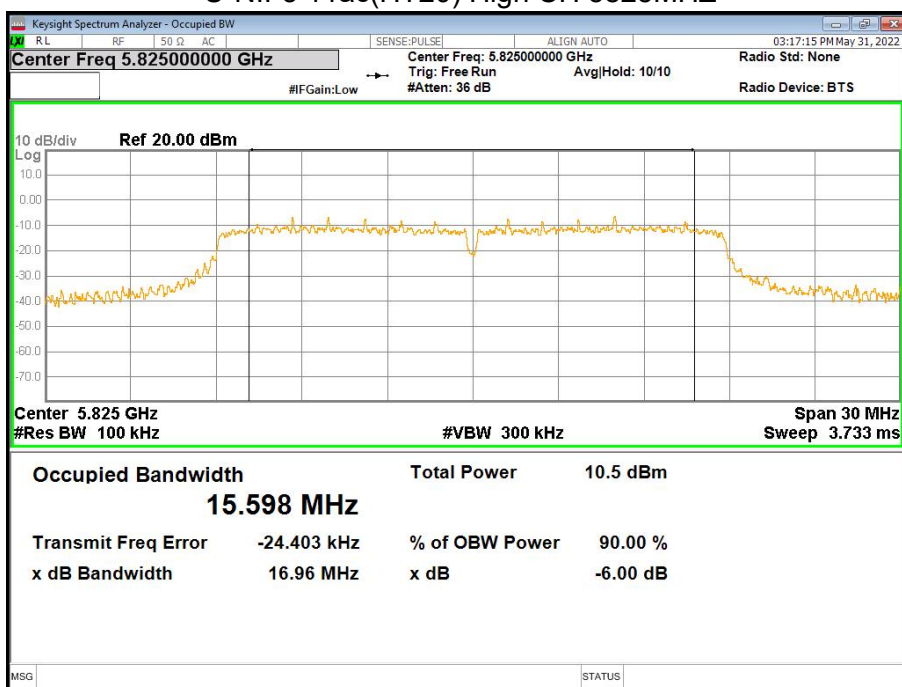
U-NII-3 11ac(HT20) Low CH 5745MHZ



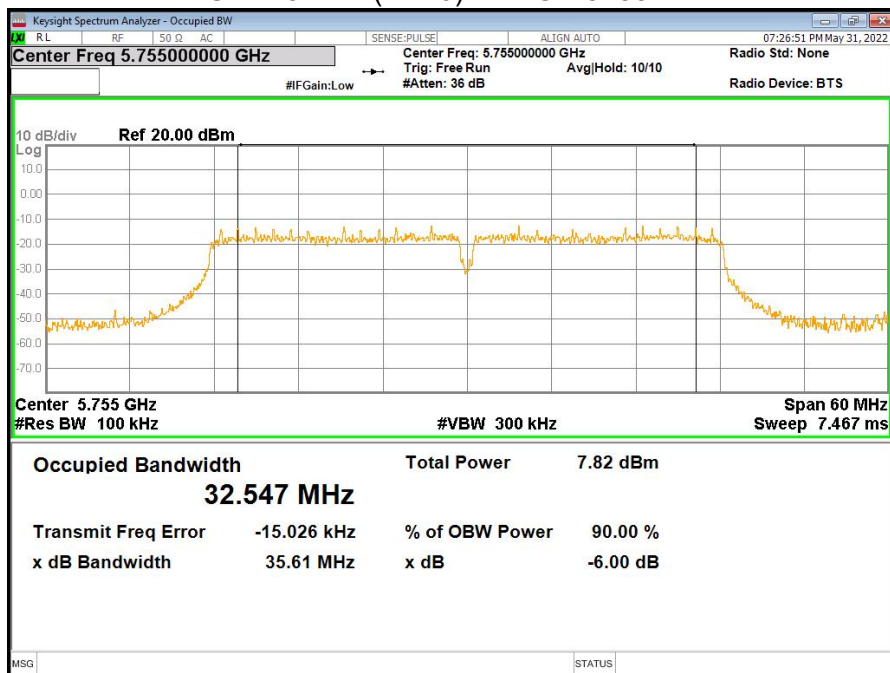
U-NII-3 11ac(HT20) Middle CH 5785MHZ



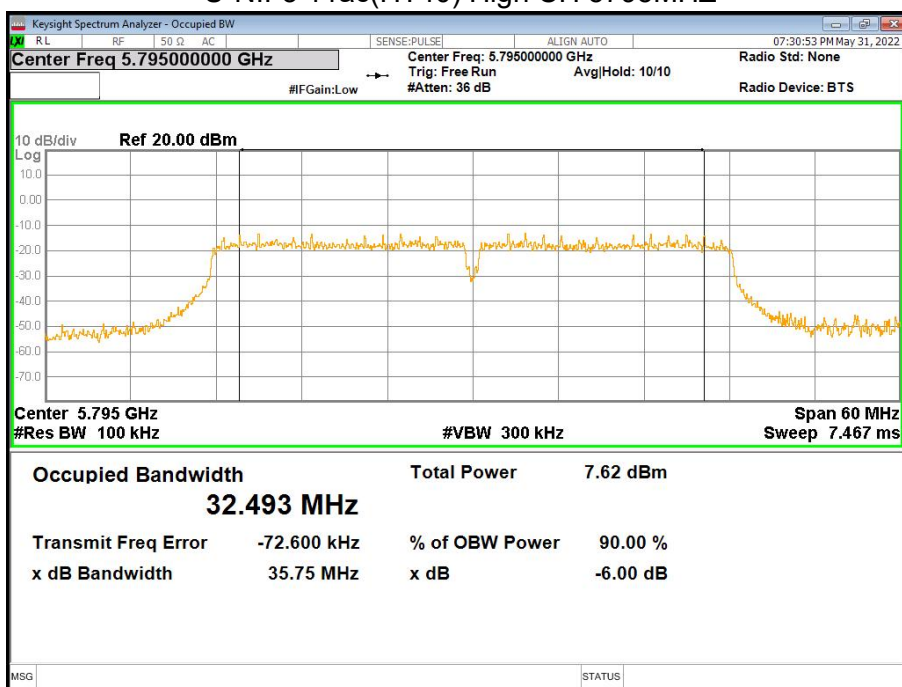
U-NII-3 11ac(HT20) High CH 5825MHZ



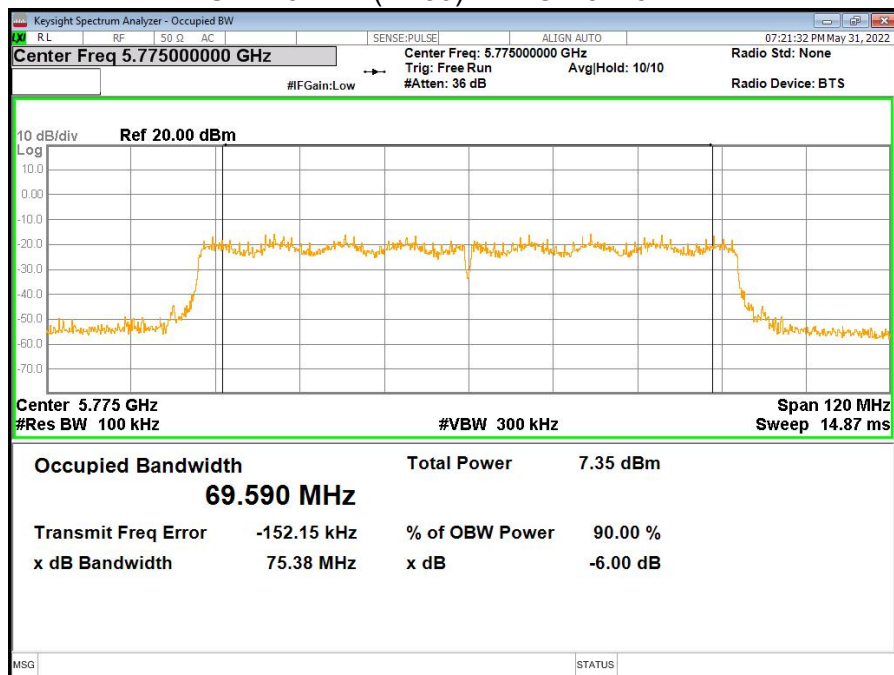
U-NII-3 11ac(HT40) Low CH 5755MHZ



U-NII-3 11ac(HT40) High CH 5795MHZ



U-NII-3 11ac(HT80) Low CH 5775MHZ



4 CONDUCTED OUTPUT POWER

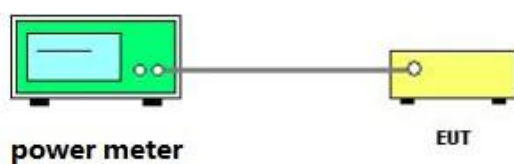
4.1 limit

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	For FCC client devices: 250mW (24dBm)	5150-5250
	For RSS: e.i.r.p. power: not exceed 200 mW(23dBm) or $10 + 10 \log_{10} B$	
	250mW (24dBm) or $11 + 10 \log_{10} B$	5250-5350
	250mW (24dBm) or $11 + 10 \log_{10} B$	For FCC:5470-5725 For IC:5470-5600 5650-5725
	1 Watt (30dBm)	5725-5850
Note: For ISSED: B=99% bandwidth.		

4.2 test procedure

- Connect each EUT's antenna output to power meter by RF cable and attenuator
- Get each antenna port's output power of EUT.

4.3 TEST SETUP



4.4 test results

ANT 1

Band	Operation mode	Coneucted Output Power(dBm)		
		Low	Middle	High
U-NII-1	802.11a	5.43	6.03	6.35
	802.11 n(HT20)	5.19	5.98	6.30
	802.11 n(HT40)	3.2	/	7.25
	802.11ac(HT20)	5.07	5.93	6.31
	802.11ac(HT40)	3.16	/	7.28
	802.11ac(HT80)	2.27	/	/
U-NII-3	802.11a	12.43	13.07	12.93
	802.11 n(HT20)	12.41	13.24	12.95
	802.11 n(HT40)	7.65	/	7.35
	802.11ac(HT20)	12.37	13.09	12.81
	802.11ac(HT40)	7.58	/	7.33
	802.11ac(HT80)	10.79	/	/

5. POWER SPECTRAL DENSITY

5.1 LIMIT

FCC Part15, Subpart E/ RSS-247		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	For FCC: Other than Mobile and portable:17dBm/MHz Mobile and portable:11dBm/MHz	5150-5250
	For RSS eirp:10dBm/MHz	
	11dBm/MHz	5250-5350
	11dBm/MHz	For FCC:5470-5725 For IC:5470-5600 5650-5725
	30dBm/500kHz	5725-5850

5.2 TEST PROCEDURE

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW.

Connect the UUT to the spectrum analyser and use the following settings:

5725MHz-5850MHz

Note:

1. For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v01, section II.F.5., it is acceptable to set RBW at 1MHz and VBW at 3MHz if the spectrum analyzer does not have 500kHz RBW.
2. The value measured with RBW=1MHz is to be added with $10\log(500\text{kHz}/1\text{MHz})$ which is - 3dB. For example, if the measured value is +10dBm using RBW=1MHz (that is +10dBm/MHz), then the converted value will be +7dBm/500kHz.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

5.3 TEST SETUP



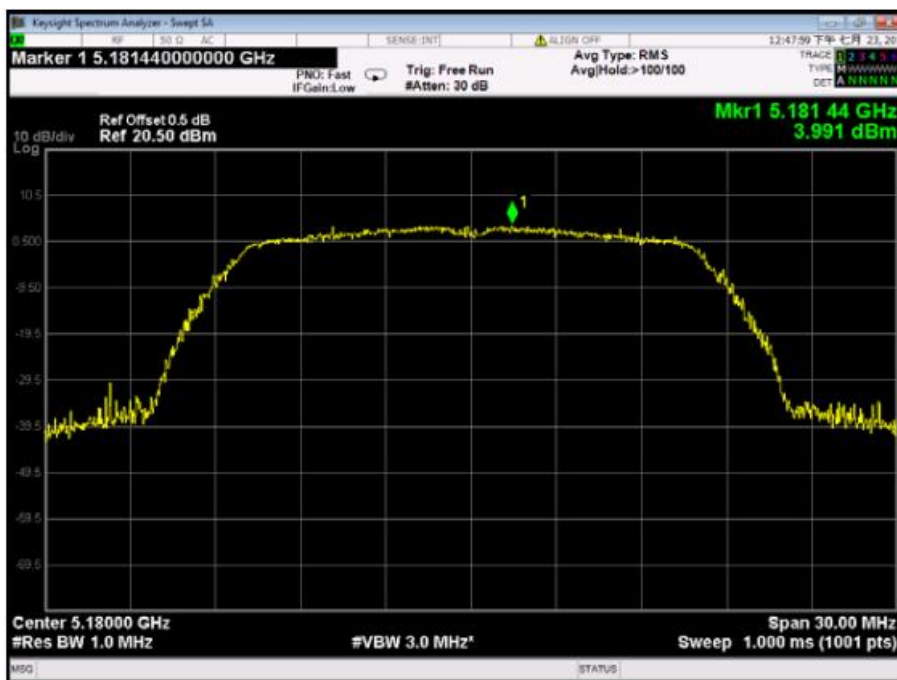
5.4 TEST RESULTS

Band	Operation mode	Power Spectral Density(dBm/MHz)		
		Low	Middle	High
U-NIM	802.11a	3.991	3.634	3.825
	802.11 n(HT20)	3.641	3.440	3.899
	802.11 n(HT40)	0.255	/	0.396
	802.11ac(HT20)	2.491	2.845	2.860
	802.11ac(HT40)	-0.456	/	-0.412
	802.11ac(HT80)	-2.698	/	/

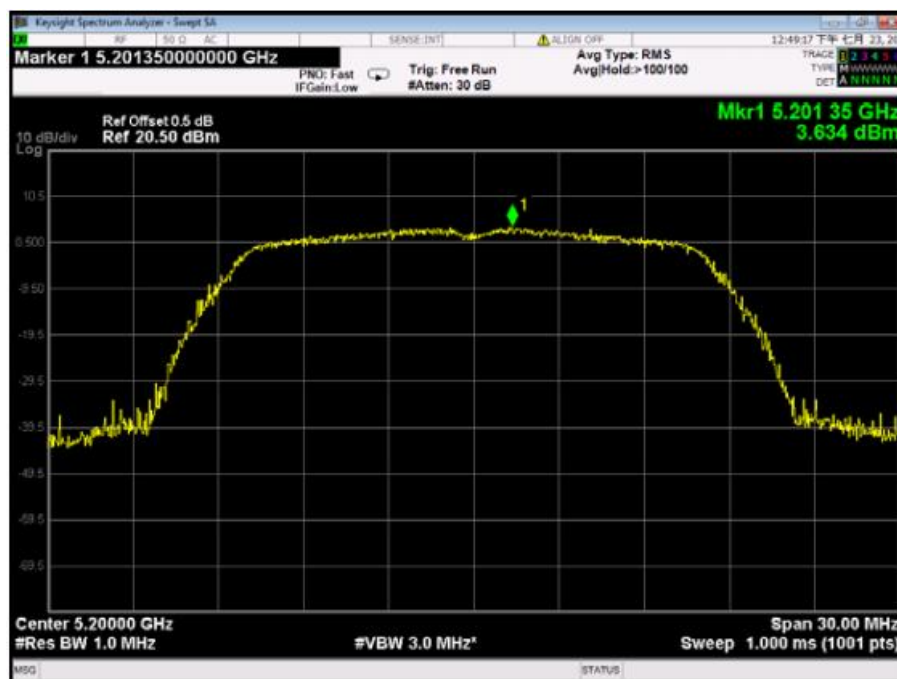
Band	Operation mode	Power Spectral Density(dBm/500KHz)		
		Low	Middle	High
U-NII-3	802.11a	1.536	1.334	1.595
	802.11 n(HT20)	0.359	0.879	0.524
	802.11 n(HT40)	-2.629	/	-2.813
	802.11ac(HT20)	-0.015	-0.781	-0.671
	802.11ac(HT40)	-2.520	/	-2.877
	802.11ac(HT80)	-5.998	/	/

5.5 original test data

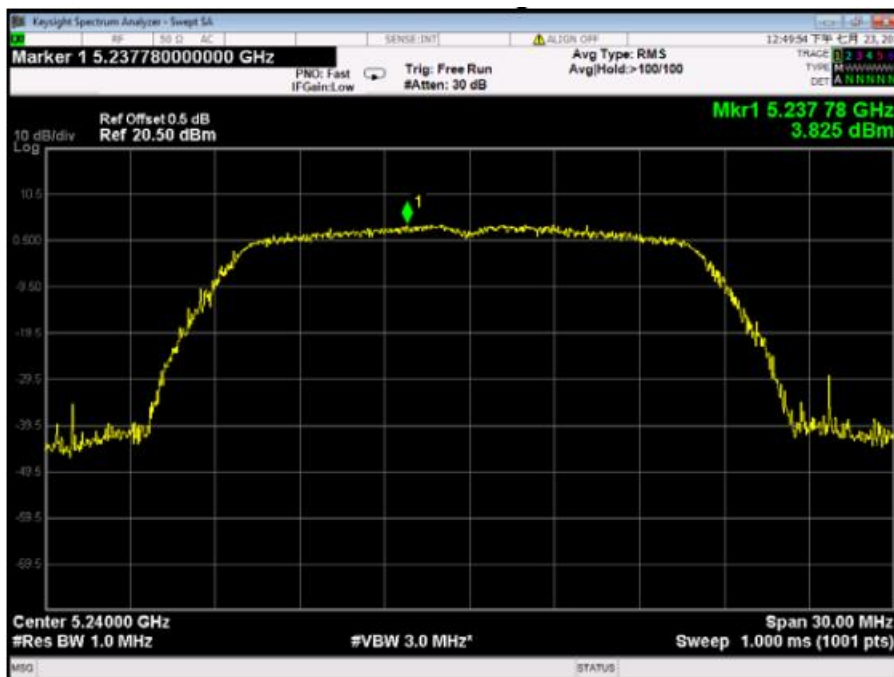
U-NII-1 802.11a Low CH



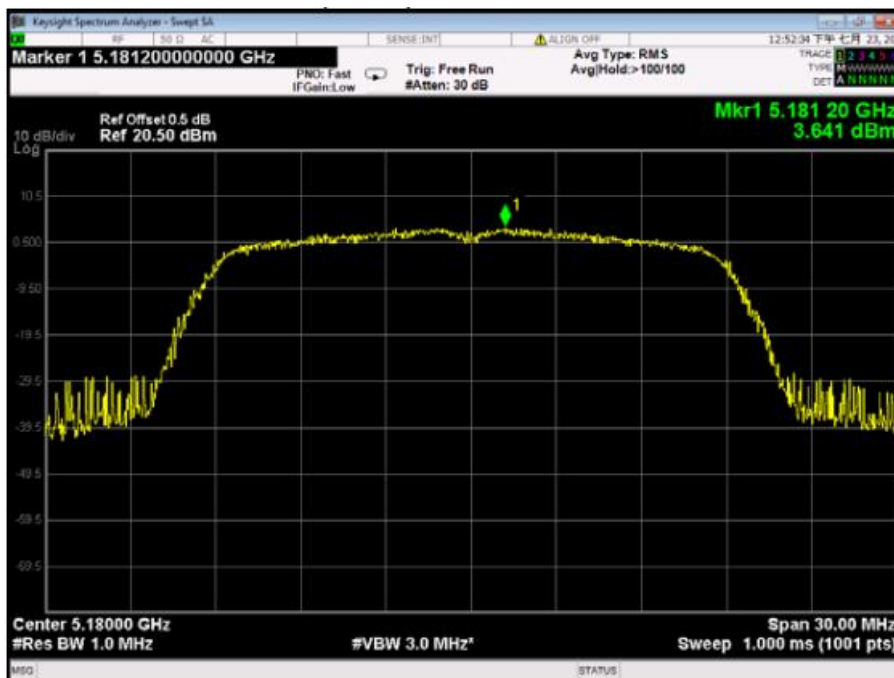
U-NII-1 802.11a Middle CH



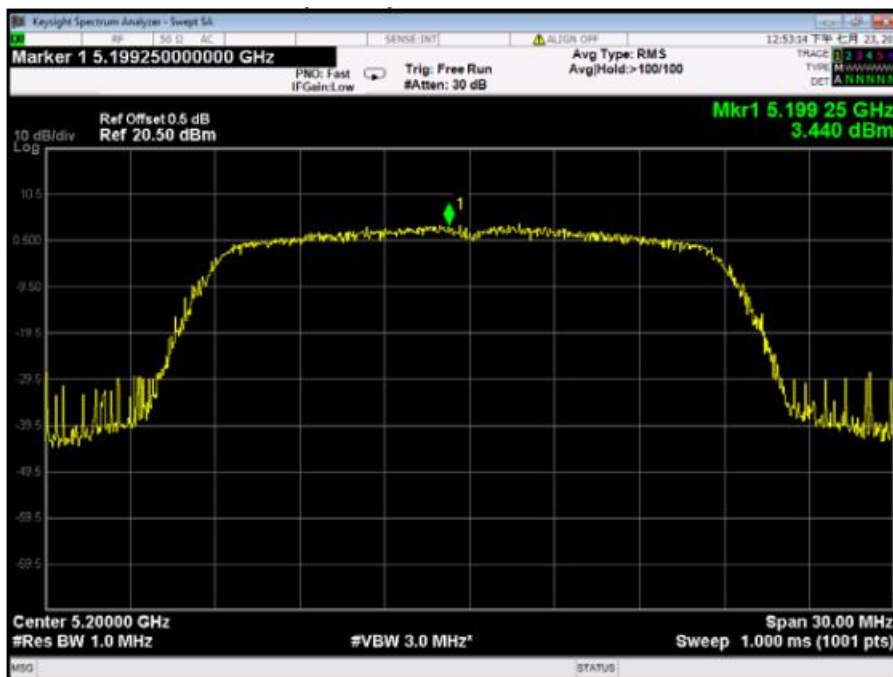
U-NII-1 802.11a High CH



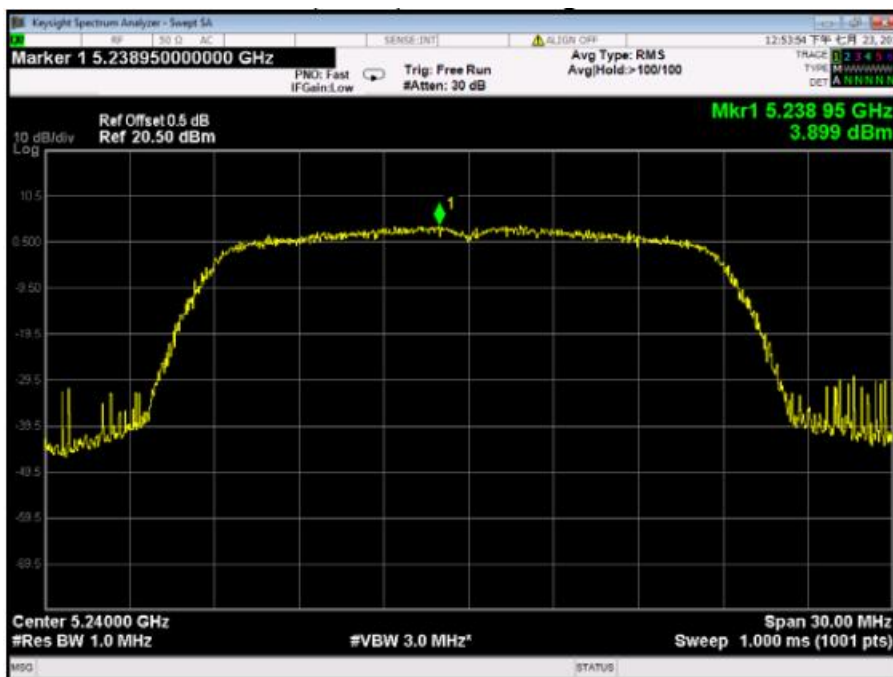
U-NII-1 802.11n(HT20) Low CH



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



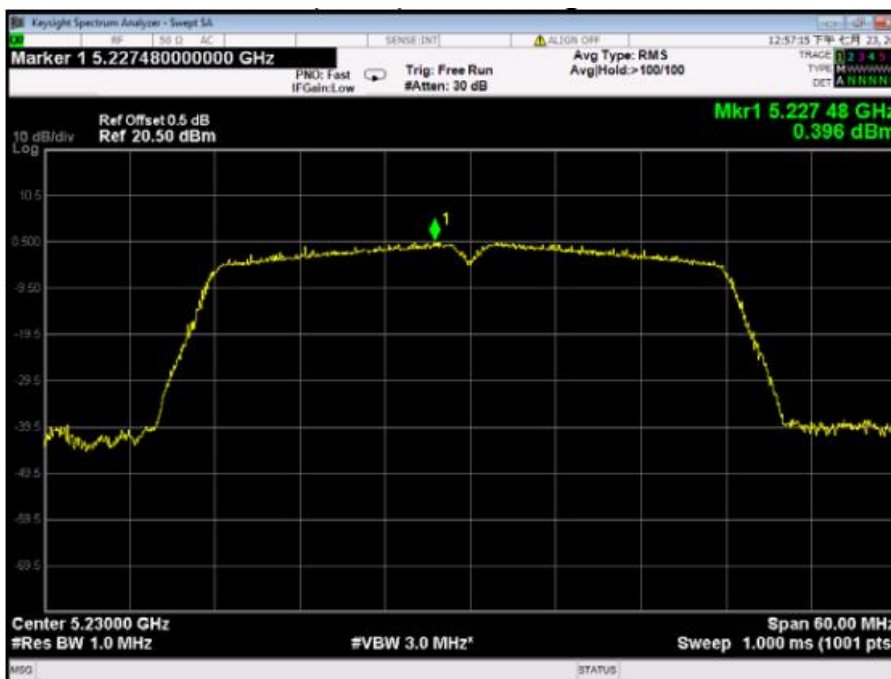
U-NII-1 802.11n(HT20) High CH



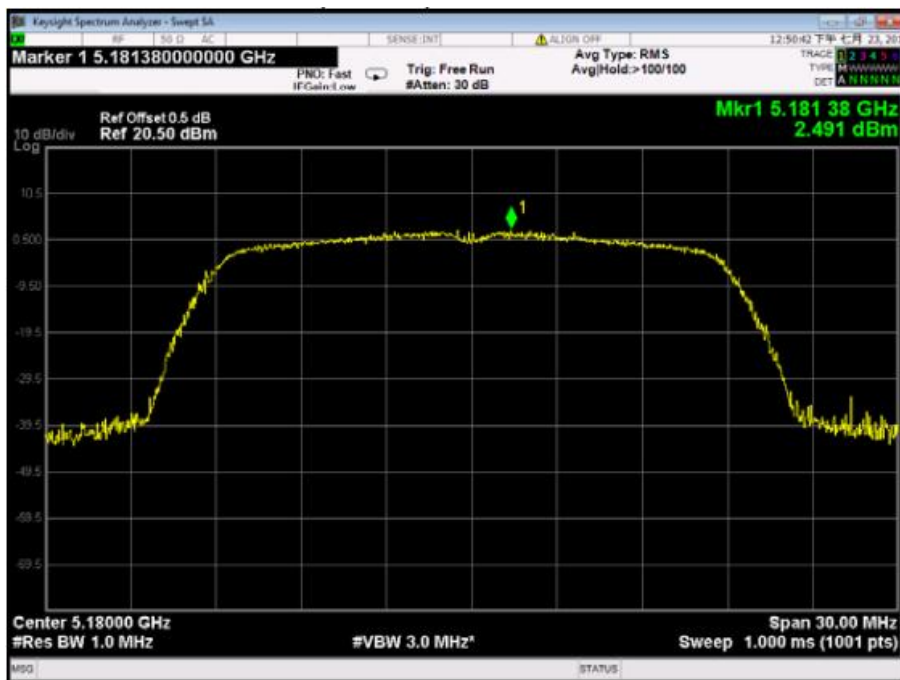
U-NII-1 802.11n(HT40) Low CH



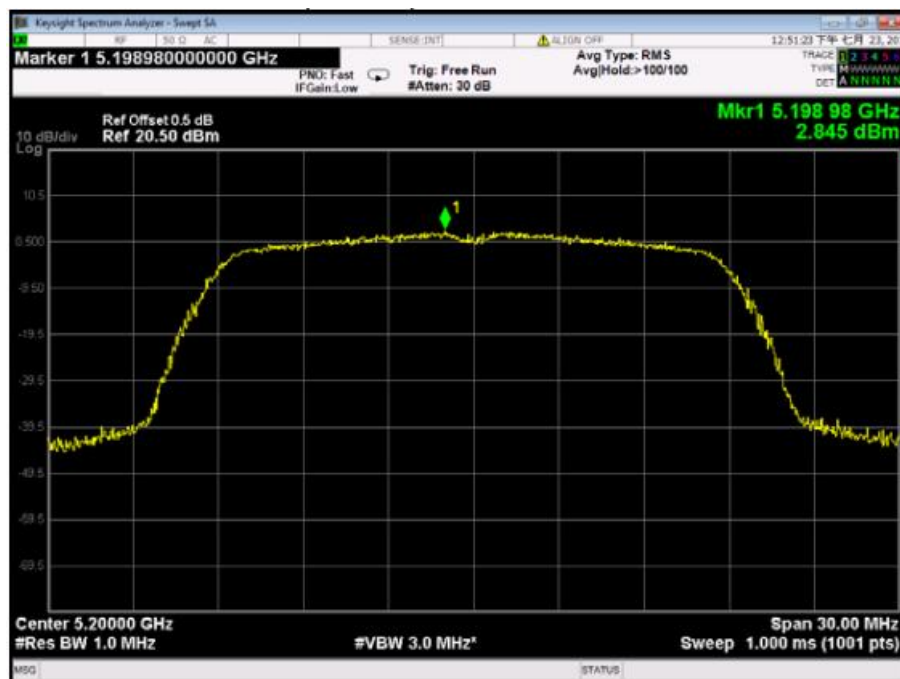
U-NII-1 802.11n(HT40) High CH



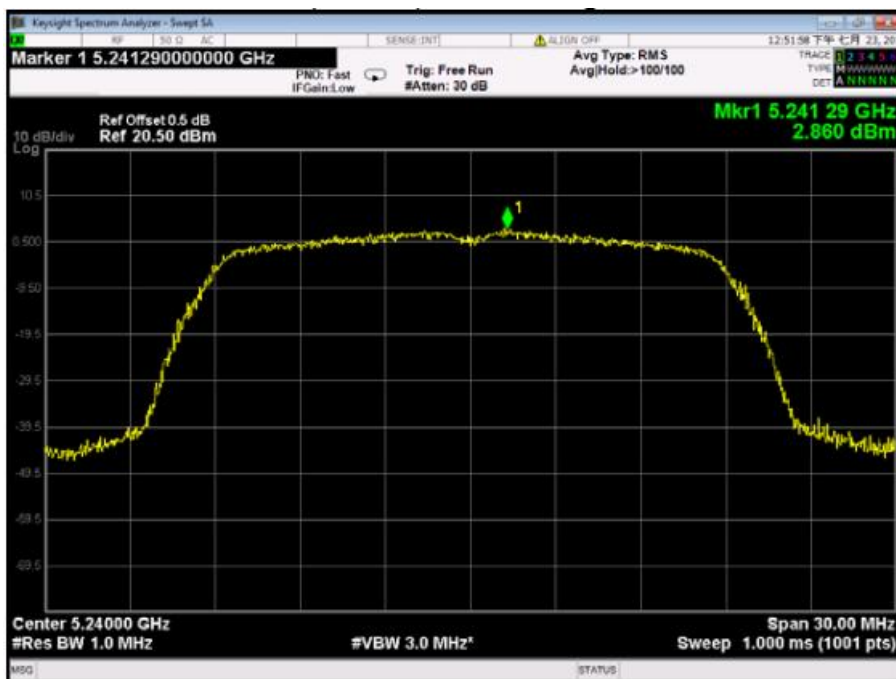
U-NII-1 802.11ac(HT20) Low CH



U-NII-1 802.11ac(HT20) Middle CH



U-NII-1 802.11ac(HT20) High CH



U-NII-1 802.11ac(HT40) Low CH



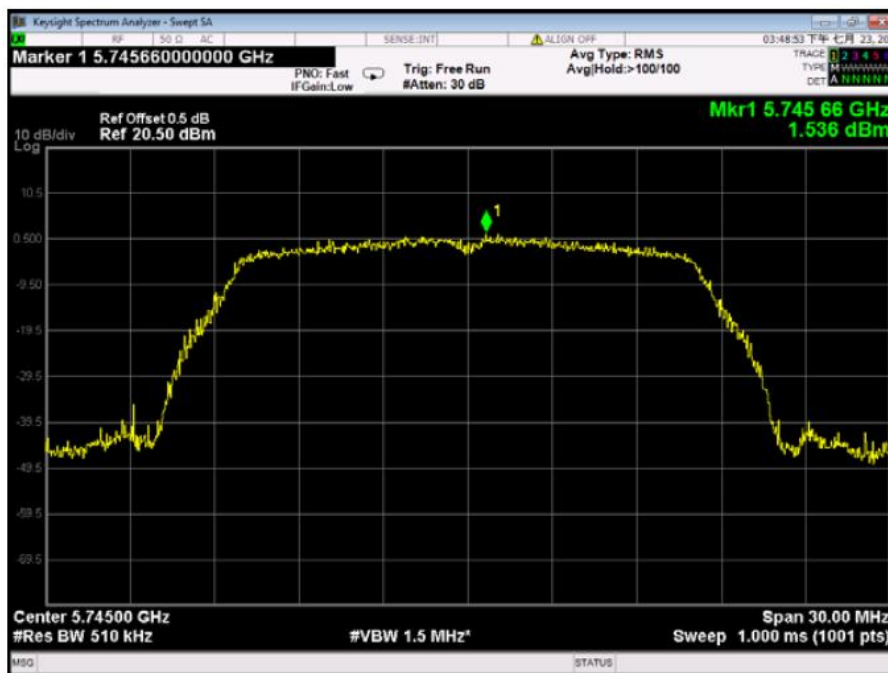
U-NII-1 802.11ac(HT40) High CH



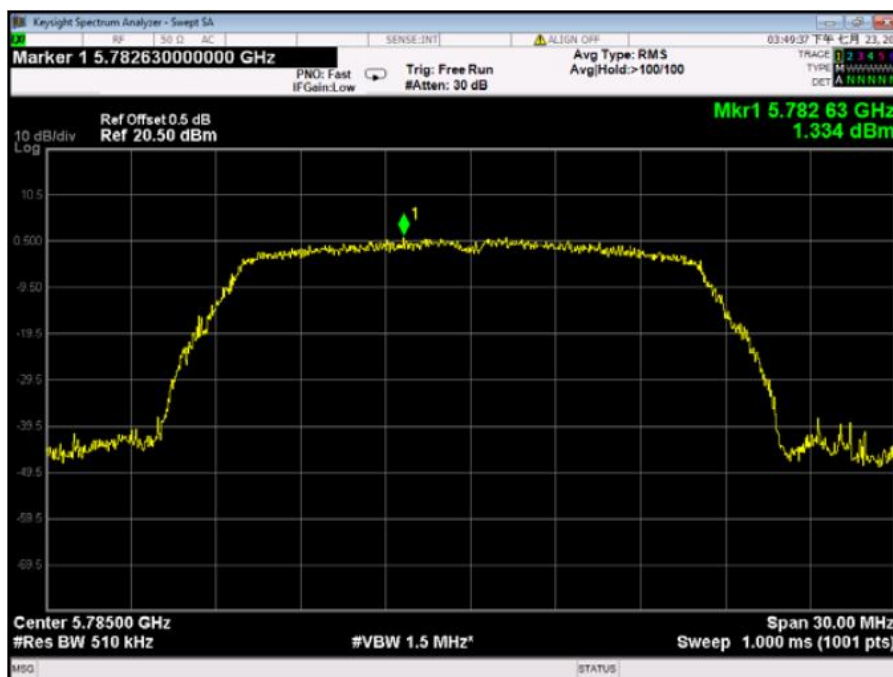
U-NII-1 802.11ac(HT80) Low CH



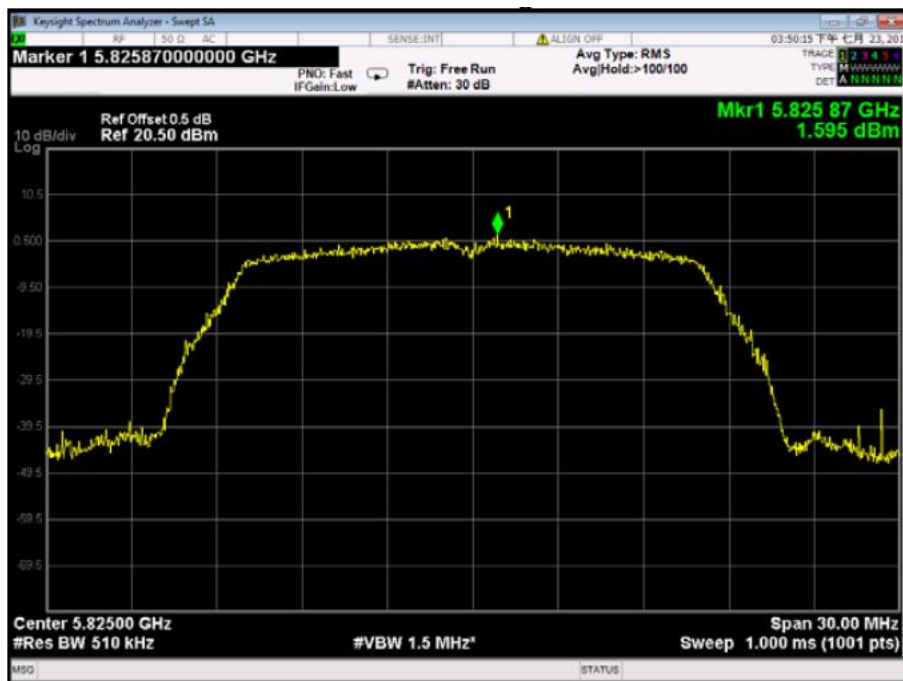
U-NII-3 802.11a Low CH



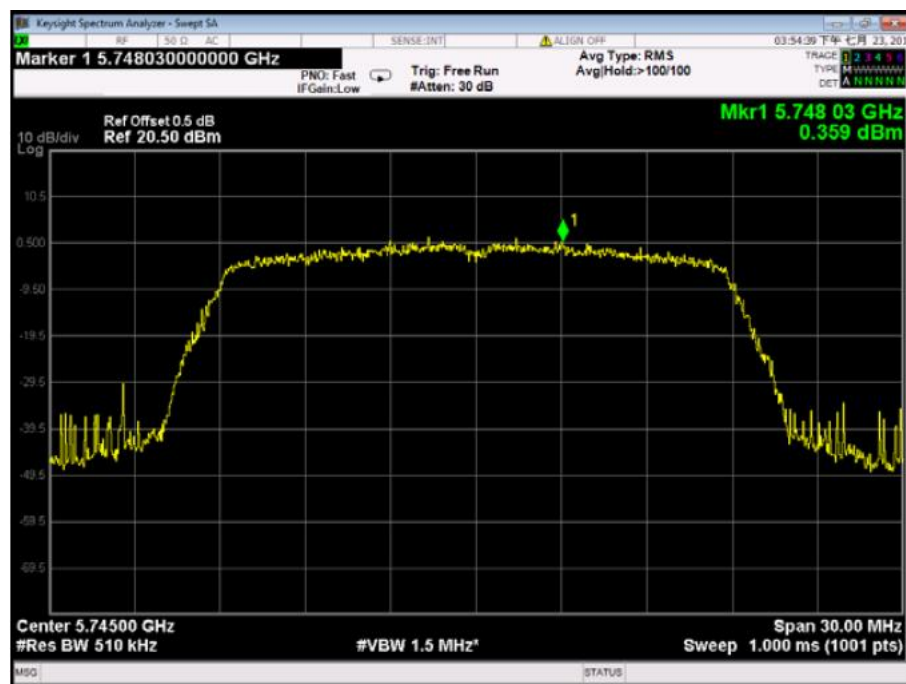
U-NII-3 802.11a Middle CH



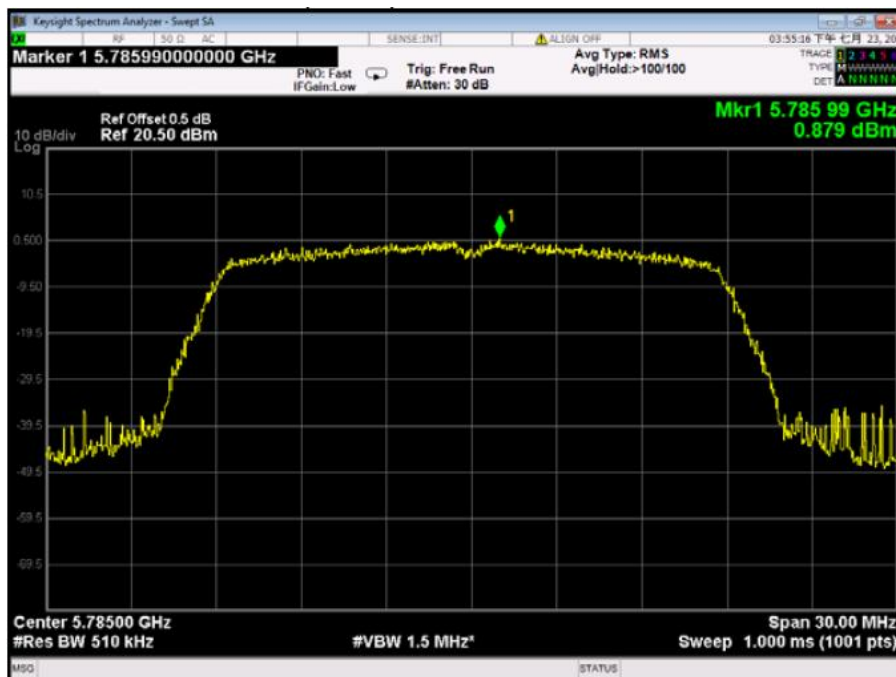
U-NII-3 802.11a High CH



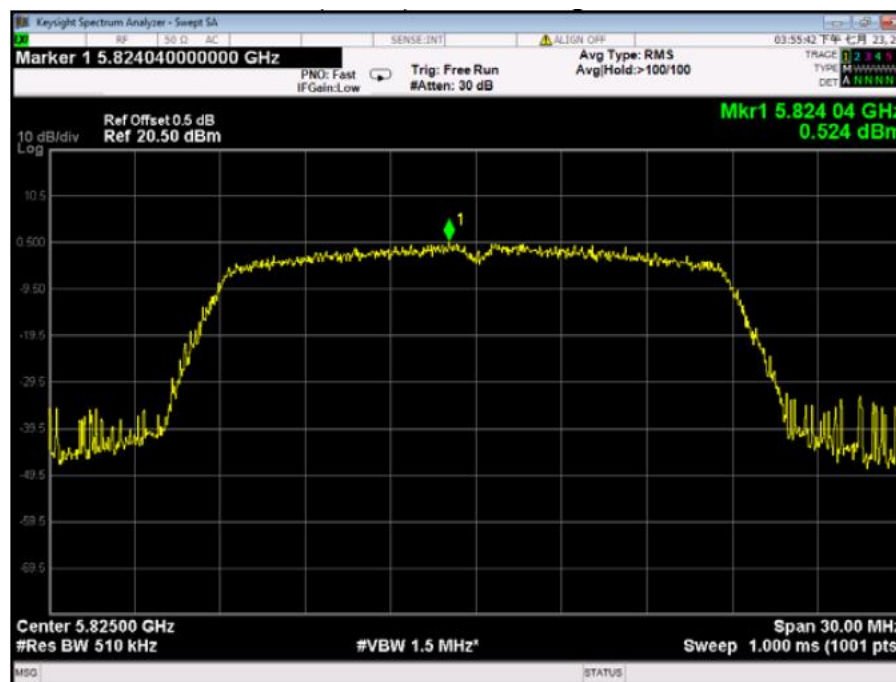
U-NII-3 802.11n(HT20) Low CH



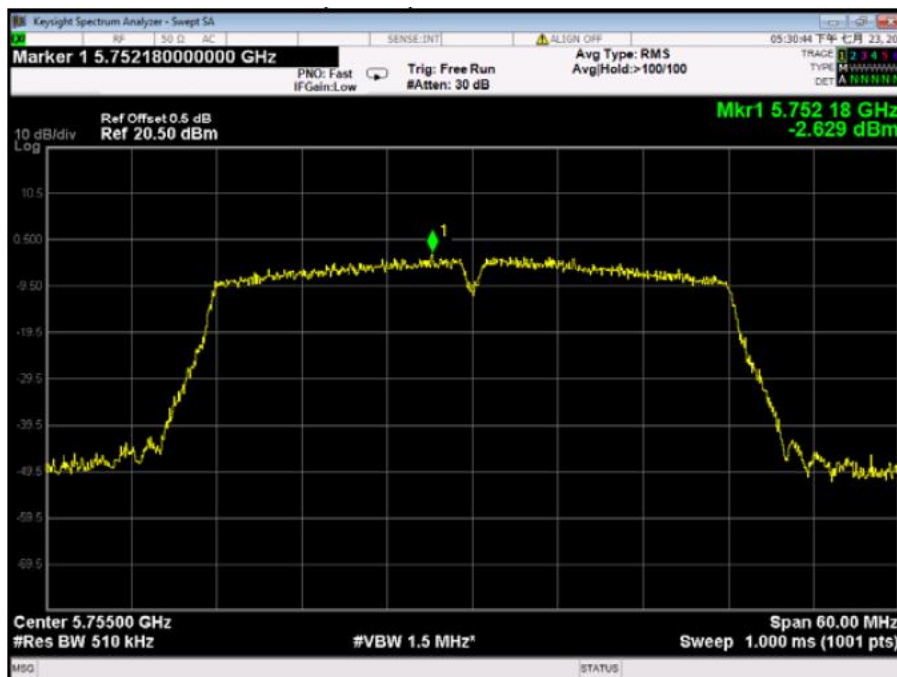
U-NII-3 802.11n(HT20) Middle CH



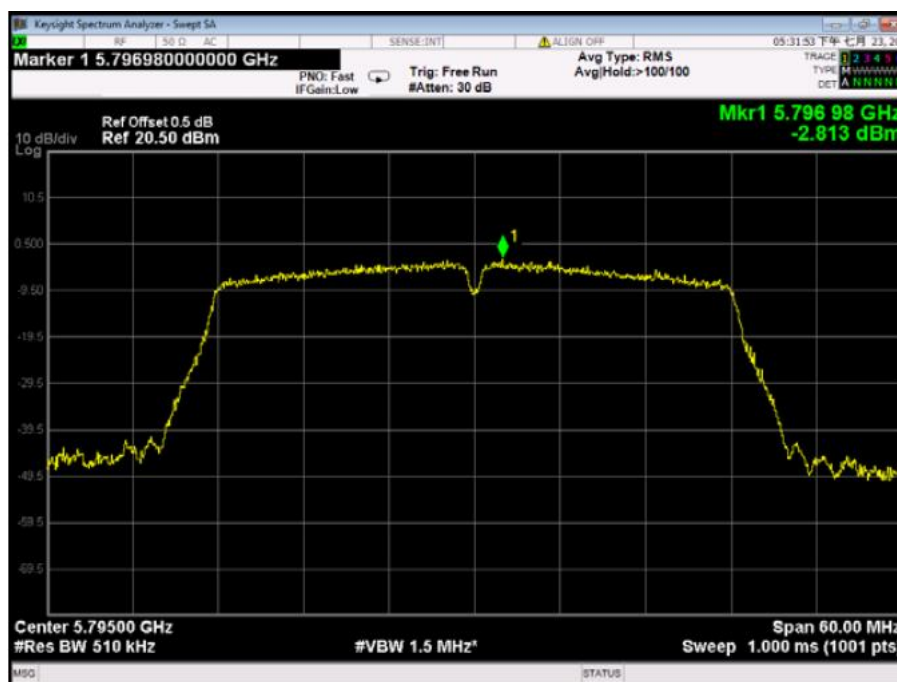
U-NII-3 802.11n(HT20) High CH



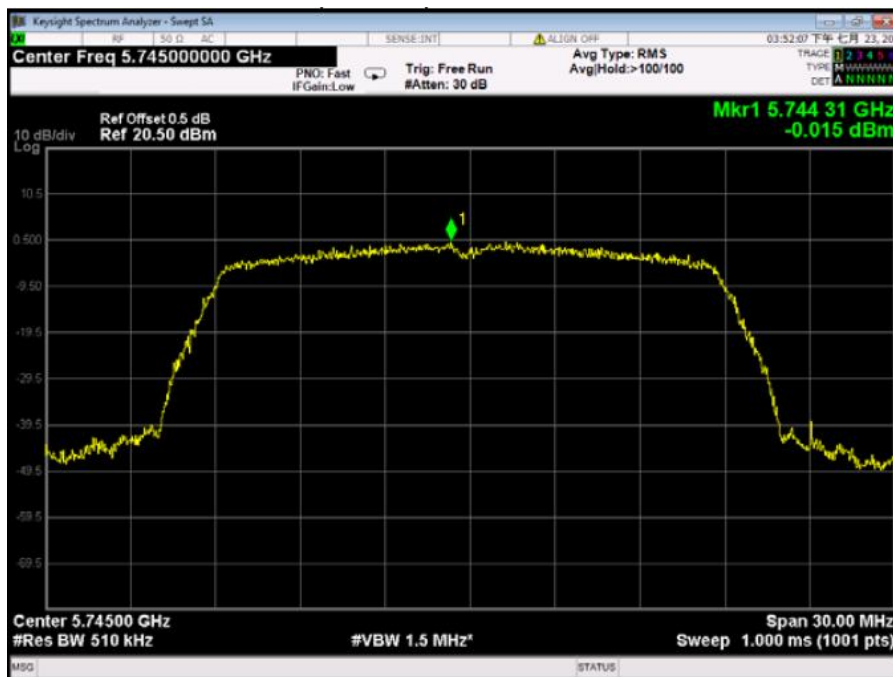
U-NII-3 802.11n(HT40) Low CH



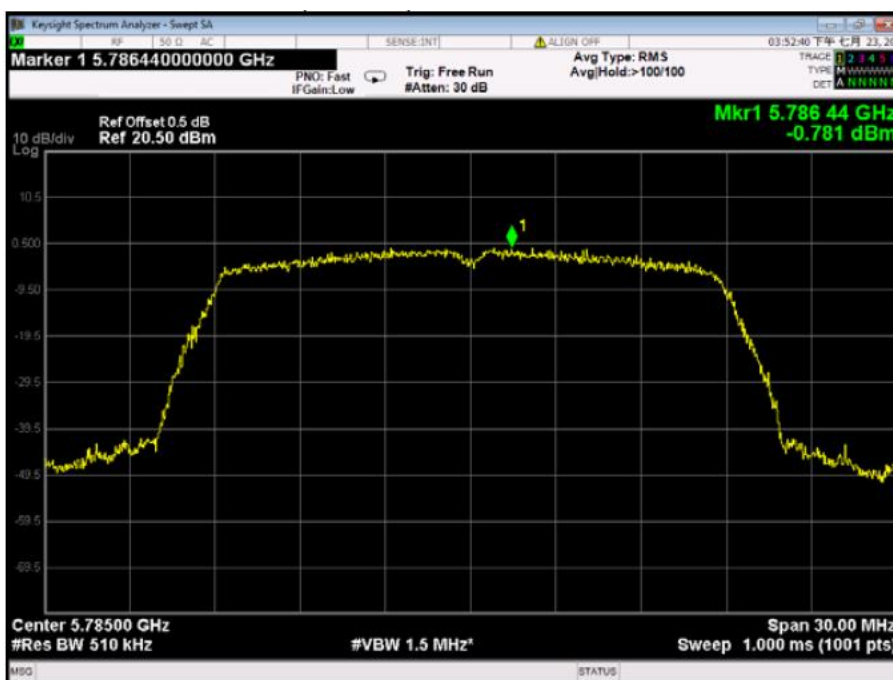
U-NII-3 802.11n(HT40) High CH



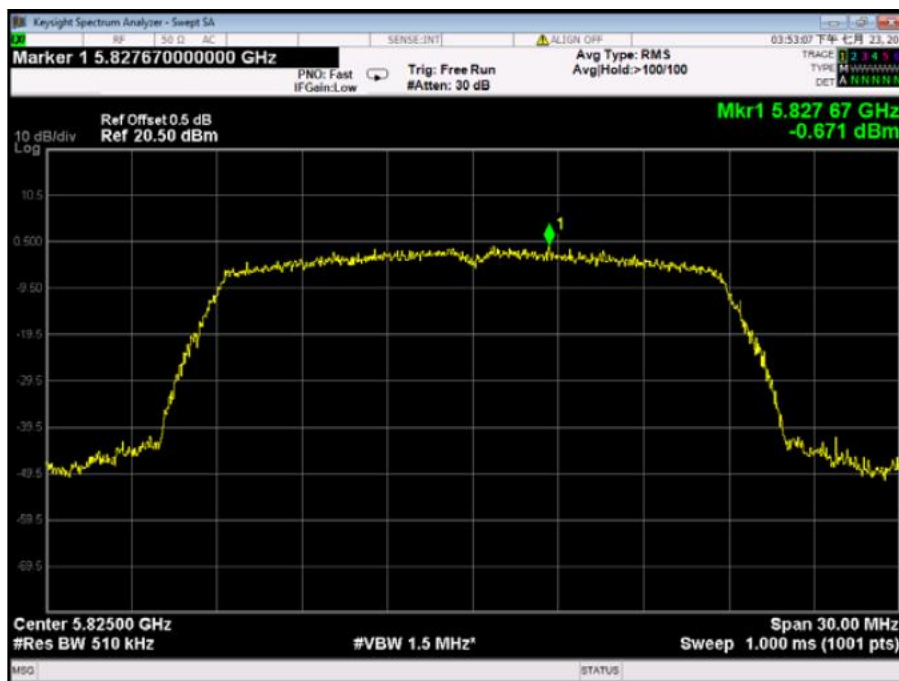
U-NII-3 802.11ac(HT20) Low CH



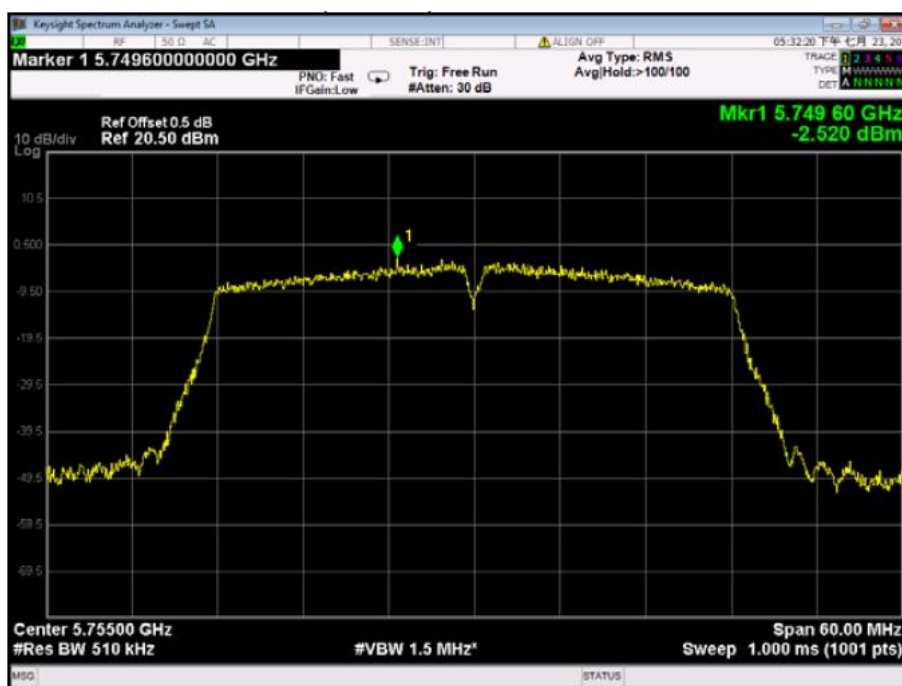
U-NII-3 802.11ac(HT20) Middle CH



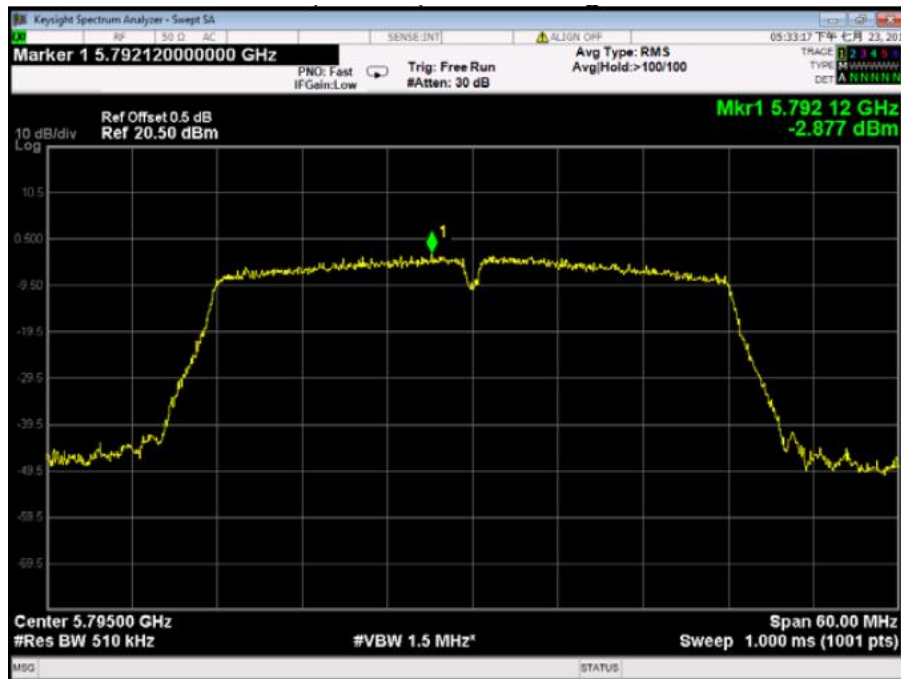
U-NII-3 802.11ac(HT20) High CH



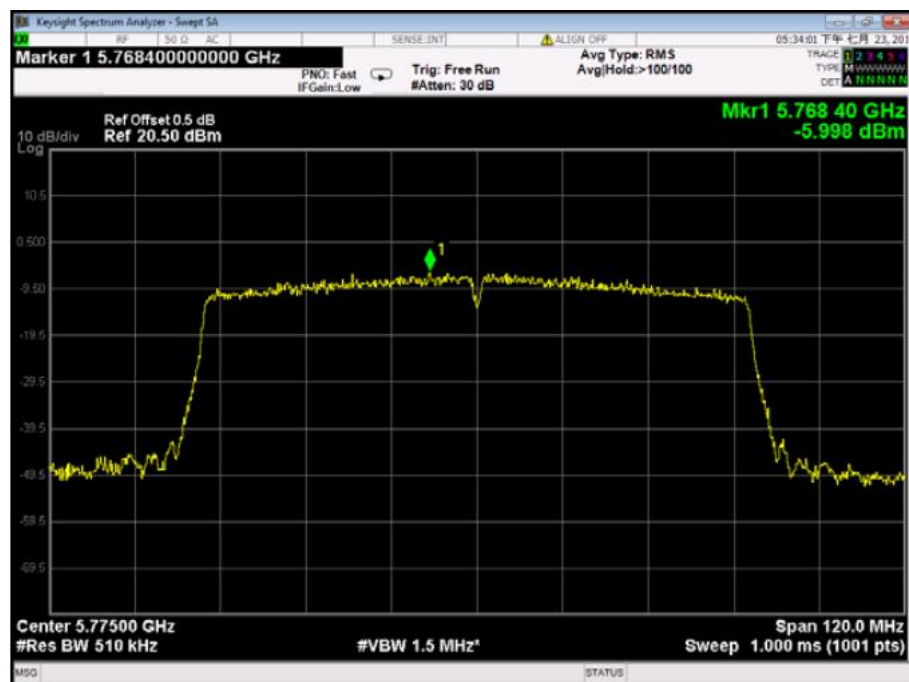
U-NII-3 802.11ac(HT40) Low CH



U-NII-3 802.11ac(HT40) High CH



U-NII-3 802.11ac(HT80) Low CH



6. FREQUENCY STABILITY MEASUREMENT

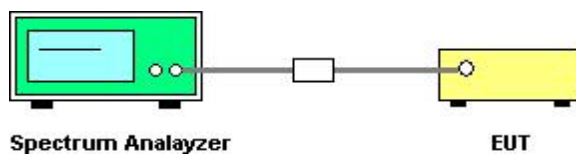
6.1 LIMIT

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

6.2 TEST PROCEDURE

- (1) 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.
- (2) 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.
- (3) 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.

6.3 TEST SETUP



6.4 TEST RESULTS

U-NII-1 Test Frequency:5180MHz				
Temperature (°C)	Power Supply (DC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	12.0 V	/	/	/
45		1807	2.1599	20
30		1800	2.1516	20
20		1806	2.1587	20
10		1800	2.1516	20
0		1803	2.1552	20
-10		1800	2.1516	20
-15		1809	2.1623	20
-30		/	/	/
20	12.0 V	1810	2.1635	20
20	12.0 V	1798	2.1492	20

U-NII-3 Test Frequency:5785MHz				
Temperature (°C)	Power Supply (DC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	12.0 V	/	/	/
45		1919	2.2938	20
30		1911	2.2842	20
20		1915	2.2890	20
10		1923	2.2986	20
0		1907	2.2795	20
-10		1908	2.2807	20
-15		1914	2.2878	20
-30		/	/	/
20	12.0 V	1918	2.2926	20
20	12.0 V	1906	2.2783	20

7. Conducted spurious emission and Band edge

7.1 LIMIT

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

Frequency Band (MHz)	Limit
5150 - 5250	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5250 - 5350	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5470 - 5725	Outside of the 5.47-5.725 GHz band: e.i.r.p. -27 dBm
5725 - 5850	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

7.2 TEST PROCEDURE

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 1 MHz for $f > 1$ GHz, 100 kHz

for $f < 1$ GHz VBW > RBW

Sweep = auto

Detector

function =

peak Trace =

max hold

Allow the trace to stabilize

7.3 TEST SETUP

