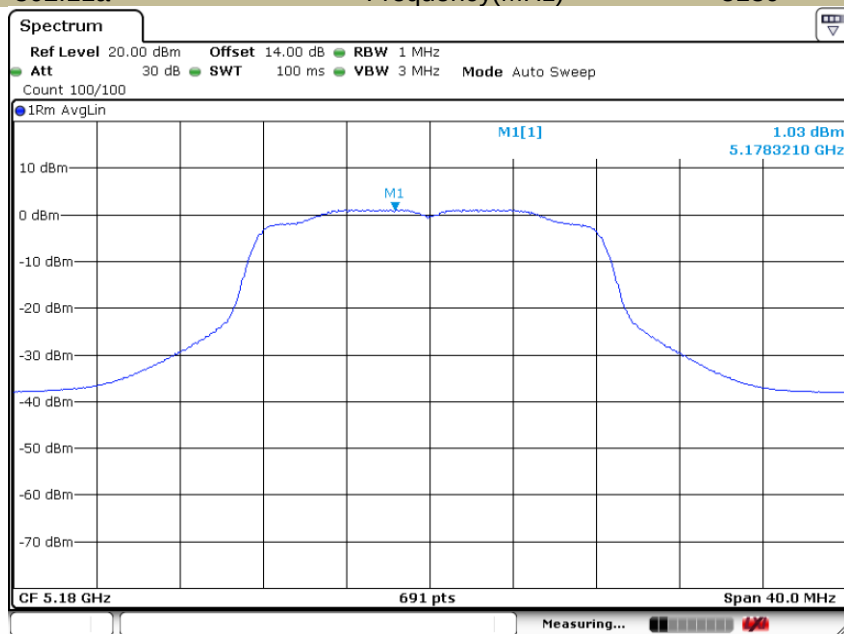


Power Spectral Density
Test Model 802.11a

U-NII - 1
Frequency(MHz)

5180



Date: 14.NOV.2020 10:52:29

Power Spectral Density
Test Model 802.11a

U-NII - 1
Frequency(MHz)

5200



Date: 14.NOV.2020 10:53:04

Power Spectral Density
Test Model 802.11a

U-NII - 1
Frequency(MHz)

5240



Power Spectral Density
Test Model 802.11n-HT20

U-NII - 1
Frequency(MHz)

5180



Power Spectral Density
Test Model 802.11n-HT20

U-NII - 1
Frequency(MHz)

5200



Date: 14.NOV.2020 10:43:16

Power Spectral Density
Test Model 802.11n-HT20

U-NII - 1
Frequency(MHz)

5240

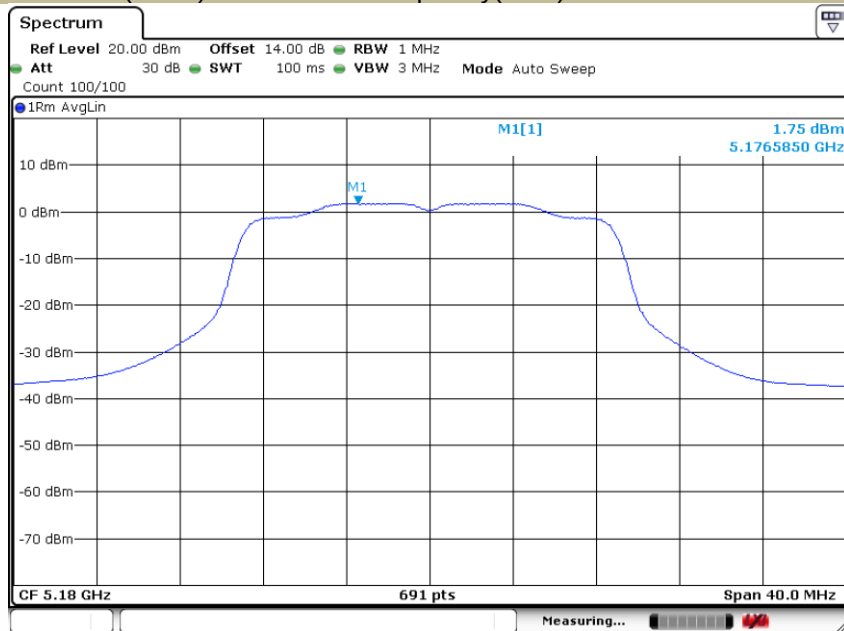


Date: 14.NOV.2020 10:43:53

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII - 1
Frequency(MHz)

5180



Date: 14.NOV.2020 10:32:17

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII - 1
Frequency(MHz)

5200



Date: 14.NOV.2020 10:32:56

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII - 1
Frequency(MHz) 5240



Date: 14.NOV.2020 10:33:35

Power Spectral Density
Test Model 802.11n-HT40

U-NII - 1
Frequency(MHz) 5190



Date: 14.NOV.2020 10:23:46

Power Spectral Density
Test Model 802.11n-HT40

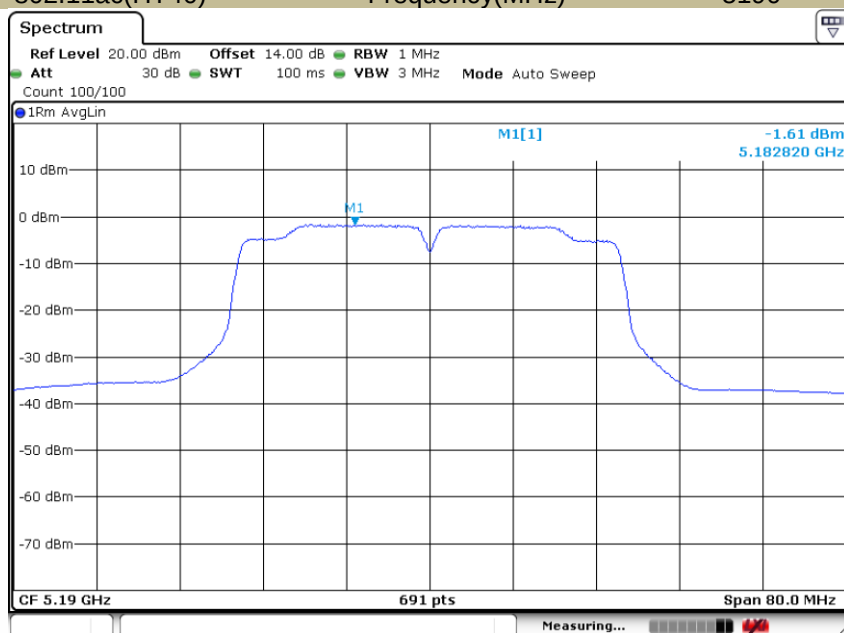
U-NII - 1
Frequency(MHz) 5230



Date: 14.NOV.2020 10:25:08

Power Spectral Density
Test Model 802.11ac(HT40)

U-NII - 1
Frequency(MHz) 5190



Date: 14.NOV.2020 10:17:08

Power Spectral Density
Test Model 802.11ac(HT40)

U-NII - 1
Frequency(MHz) 5230



Date: 14.NOV.2020 10:18:03

Power Spectral Density
Test Model 802.11ac 80

U-NII - 1
Frequency(MHz) 5210



Date: 14.NOV.2020 10:10:07

5250-5350MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5260	0.78	11
	5280	0.83	11
	5320	1.22	11
802.11n-HT20	5260	1.89	11
	5280	2.05	11
	5320	1.35	11
802.11ac(HT20)	5260	1.53	11
	5280	1.12	11
	5320	2.00	11
802.11n-HT40	5270	-1.43	11
	5310	-1.82	11
802.11ac(HT40)	5270	-2.33	11
	5310	-2.17	11
802.11ac(HT80)	5290	-6.26	11

Power Spectral Density
Test Model 802.11a

U-NII – 2A
Frequency(MHz) 5260



Date: 14.NOV.2020 10:54:17

Power Spectral Density
Test Model 802.11a

U-NII – 2A
Frequency(MHz) 5280



Date: 14.NOV.2020 10:54:52

U-NII – 2A	
Frequency(MHz)	5320

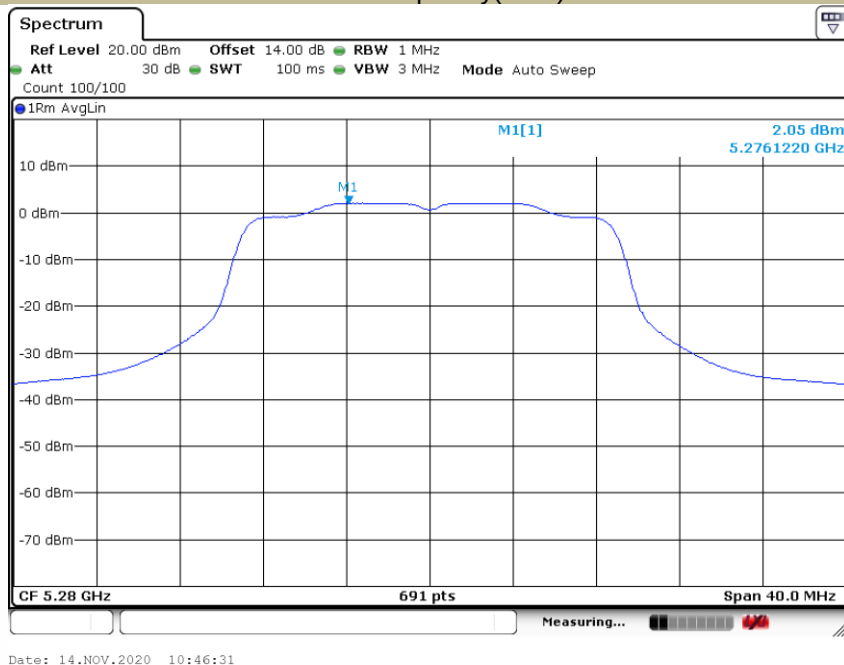


U-NII – 2A	
Frequency(MHz)	5260



Power Spectral Density
Test Model 802.11n-HT20

U-NII – 2A
Frequency(MHz) 5280



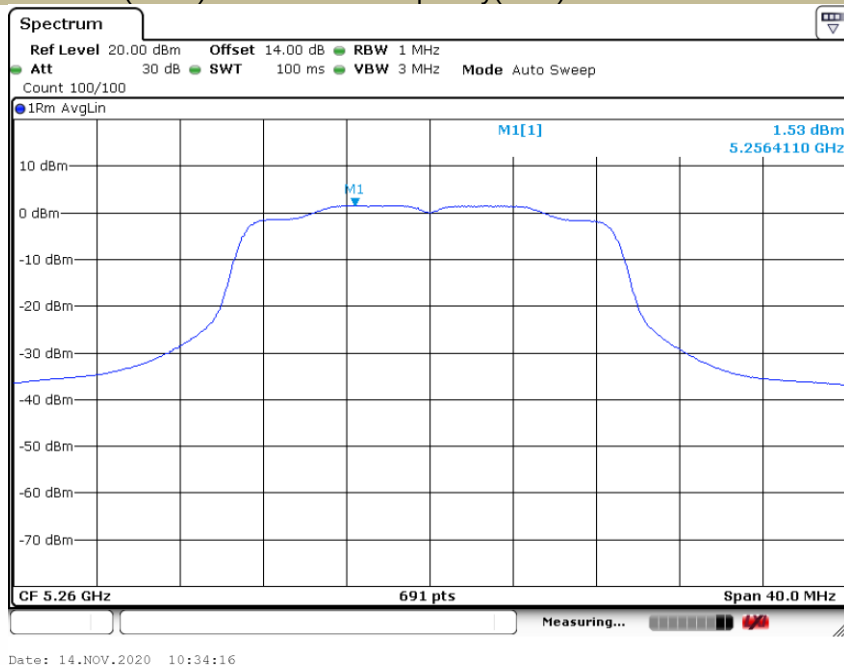
Power Spectral Density
Test Model 802.11n-HT20

U-NII – 2A
Frequency(MHz) 5320



Power Spectral Density
Test Model 802.11ac(HT20)

U-NII – 2A
Frequency(MHz) 5260



Power Spectral Density
Test Model 802.11ac(HT20)

U-NII – 2A
Frequency(MHz) 5280



Power Spectral Density
Test Model 802.11ac(HT20)

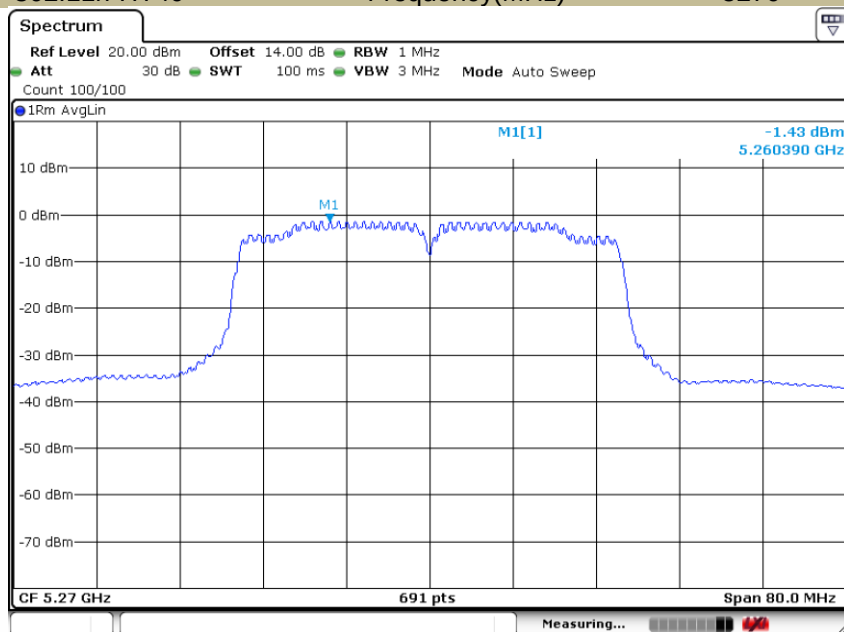
U-NII – 2A
Frequency(MHz) 5320



Date: 14.NOV.2020 10:35:22

Power Spectral Density
Test Model 802.11n-HT40

U-NII – 2A
Frequency(MHz) 5270



Date: 14.NOV.2020 10:25:40

Power Spectral Density
Test Model 802.11n-HT40

U-NII – 2A
Frequency(MHz) 5310



Date: 14.NOV.2020 10:26:11

Power Spectral Density
Test Model 802.11ac(HT40)

U-NII – 2A
Frequency(MHz) 5270



Date: 14.NOV.2020 10:18:46

Power Spectral Density
Test Model 802.11ac(HT40)

U-NII – 2A
Frequency(MHz) 5310



Date: 14.NOV.2020 10:19:18

Power Spectral Density
Test Model 802.11ac 80

U-NII – 2A
Frequency(MHz) 5290



Date: 14.NOV.2020 10:13:35

5470-5725MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz	Limit (dBm/MHz)
802.11a	5500	2.43	11
	5580	7.45	11
	5700	4.42	11
802.11n-HT20	5500	2.88	11
	5580	4.80	11
	5700	1.52	11
802.11ac(HT20)	5500	3.08	11
	5580	4.80	11
	5700	1.59	11
802.11n-HT40	5510	-3.38	11
	5670	-2.71	11
802.11ac(HT40)	5510	-4.61	11
	5670	-4.03	11
802.11ac(HT80)	5530	-7.07	11

Power Spectral Density
Test Model 802.11a

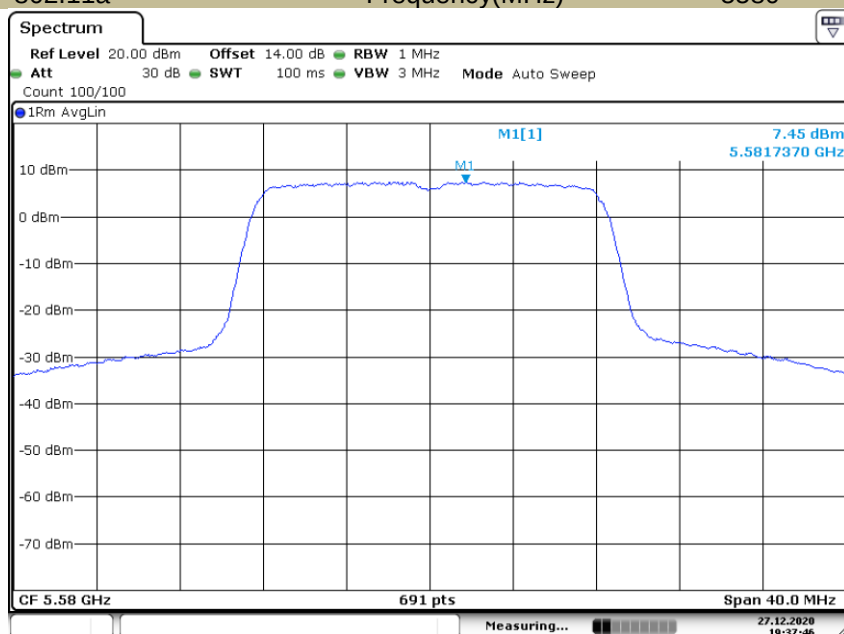
U-NII – 2C
Frequency(MHz) 5500



Date: 14.NOV.2020 10:56:28

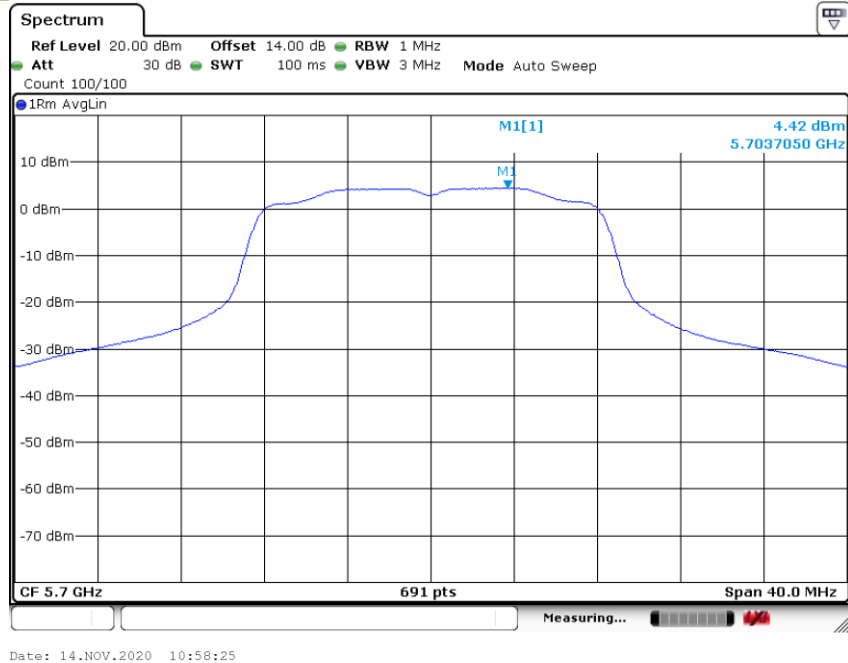
Power Spectral Density
Test Model 802.11a

U-NII – 2C
Frequency(MHz) 5580



Date: 27.DEC.2020 19:37:46

U-NII – 2C	
Frequency(MHz)	5700



U-NII – 2C	
Frequency(MHz)	5500



Power Spectral Density
Test Model 802.11n-HT20

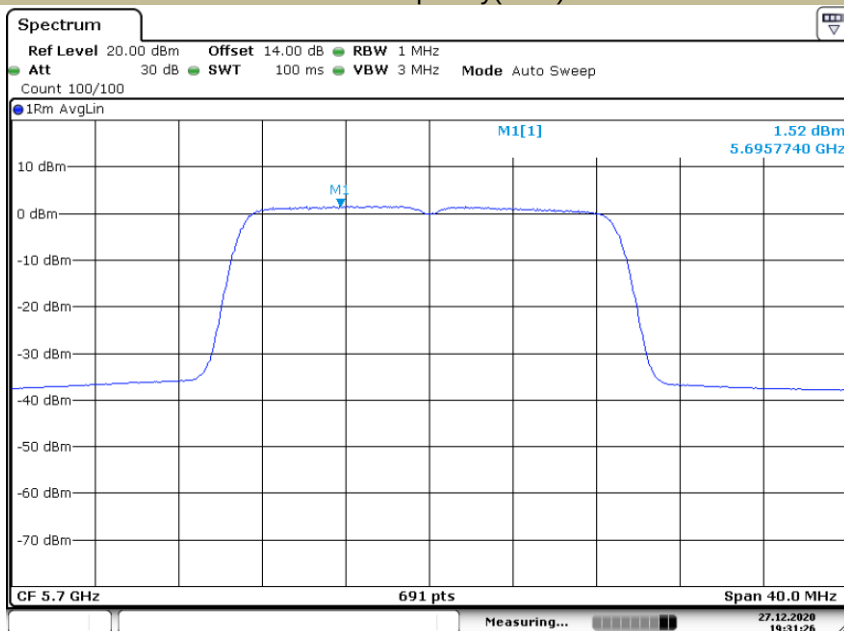
U-NII – 2C
Frequency(MHz) 5580



Date: 27. DEC. 2020 19:30:52

Power Spectral Density
Test Model 802.11n-HT20

U-NII – 2C
Frequency(MHz) 5700



Date: 27. DEC. 2020 19:31:26

Power Spectral Density
Test Model 802.11ac(HT20)

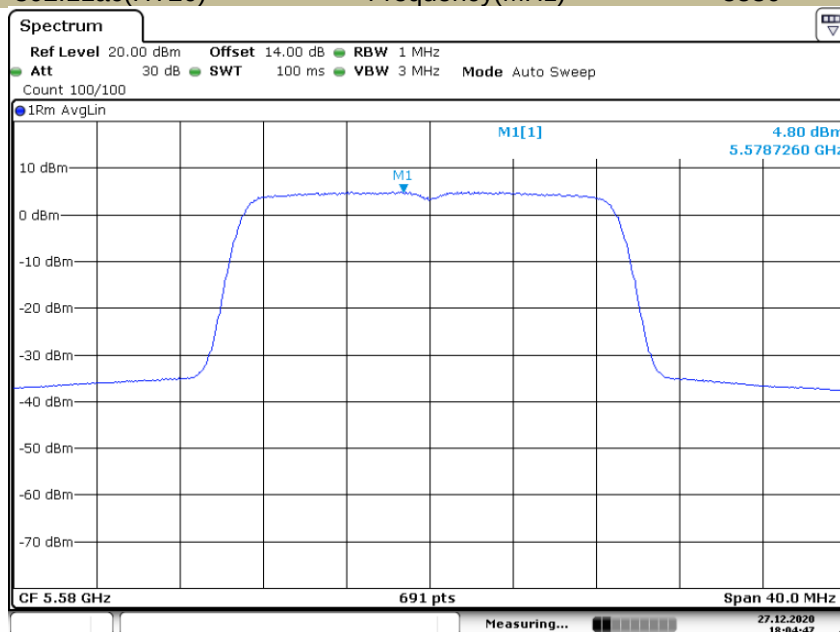
U-NII – 2C
Frequency(MHz) 5500



Date: 14.NOV.2020 10:36:04

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII – 2C
Frequency(MHz) 5580



Date: 27.DEC.2020 18:04:47

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII – 2C
Frequency(MHz) 5700



Date: 27.DEC.2020 18:05:18

Power Spectral Density
Test Model 802.11n-HT40

U-NII – 2C
Frequency(MHz) 5510



Date: 14.NOV.2020 10:26:54

Power Spectral Density
Test Model 802.11n-HT40

U-NII – 2C
Frequency(MHz) 5670



Date: 14.NOV.2020 10:29:30

Power Spectral Density
Test Model 802.11ac(HT40)

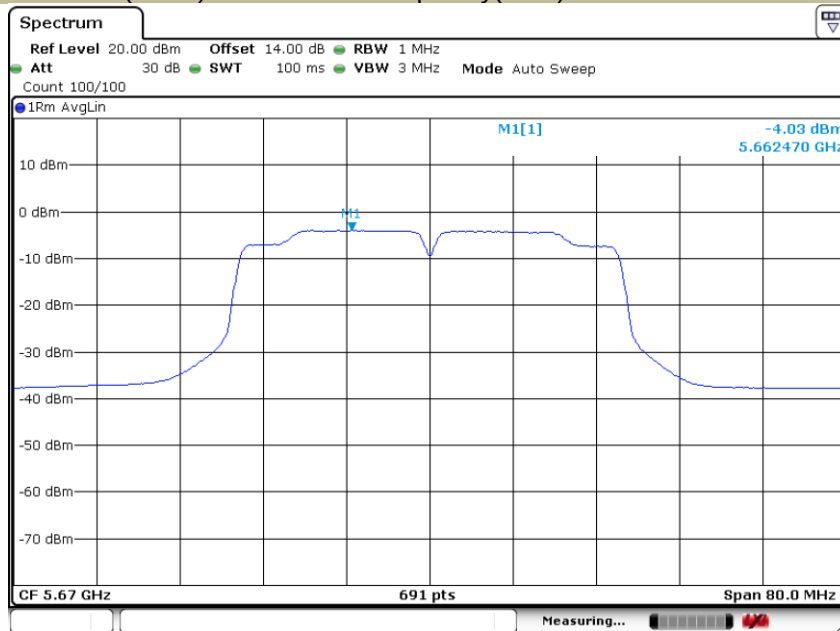
U-NII – 2C
Frequency(MHz) 5510



Date: 14.NOV.2020 10:20:09

Power Spectral Density
Test Model 802.11ac(HT40)

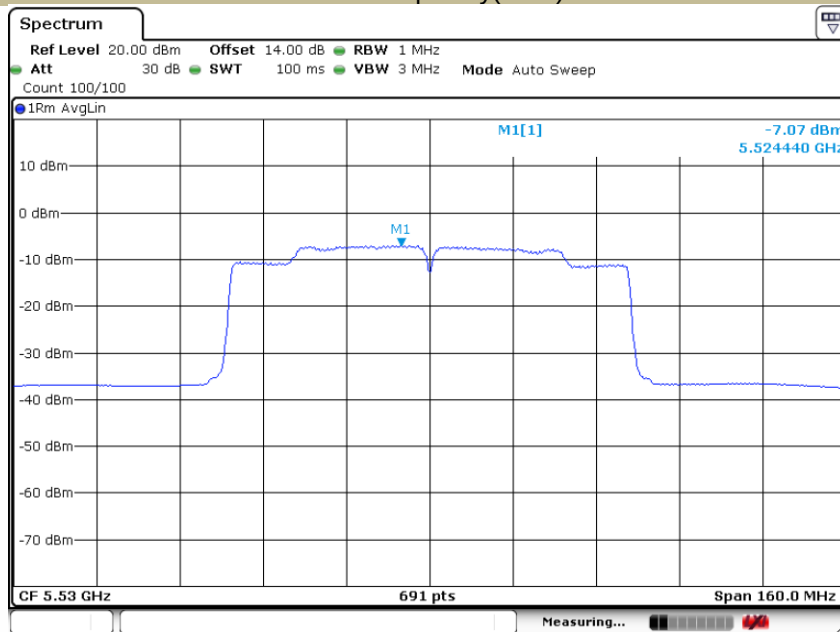
U-NII – 2C
Frequency(MHz) 5670



Date: 14.NOV.2020 10:21:27

Power Spectral Density
Test Model 802.11ac 80

U-NII – 2C
Frequency(MHz) 5530



Date: 14.NOV.2020 10:14:27

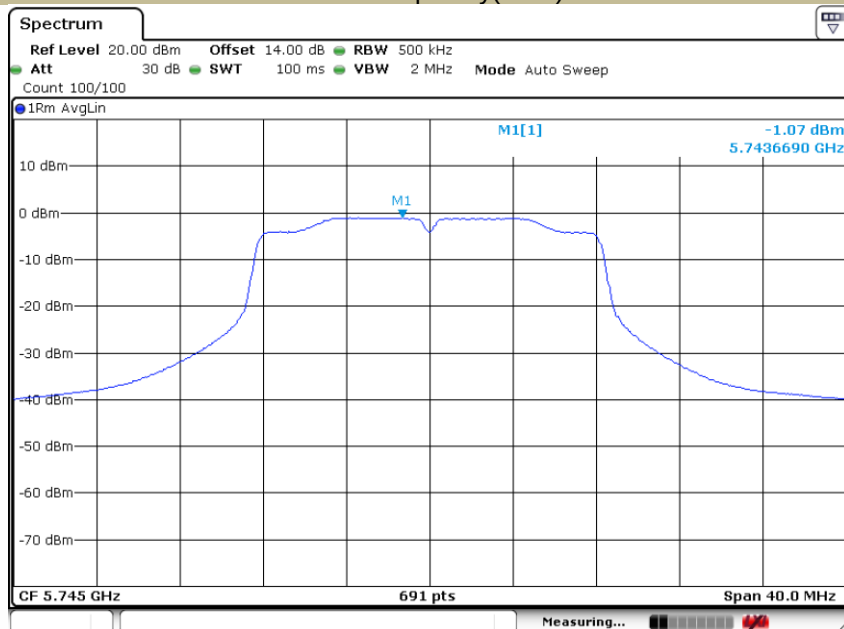
5725-5850MHz

Operating mode	Test Channel	Power Spectral Density dBm/500kHz	Limit (dBm/500kHz)
802.11a	5745	-1.07	30
	5785	-0.56	30
	5825	-1.09	30
802.11n-HT20	5745	-1.95	30
	5785	-1.23	30
	5825	-1.43	30
802.11ac(HT20)	5745	-0.71	30
	5785	-0.81	30
	5825	-0.66	30
802.11n-HT40	5755	-6.10	30
	5795	-5.78	30
802.11ac(HT40)	5755	-5.89	30
	5795	-5.46	30
802.11ac(HT80)	5775	-8.51	30

Power Spectral Density
Test Model 802.11a

U-NII - 3
Frequency(MHz)

5745



Date: 14.NOV.2020 11:01:41

Power Spectral Density
Test Model 802.11a

U-NII - 3
Frequency(MHz)

5785

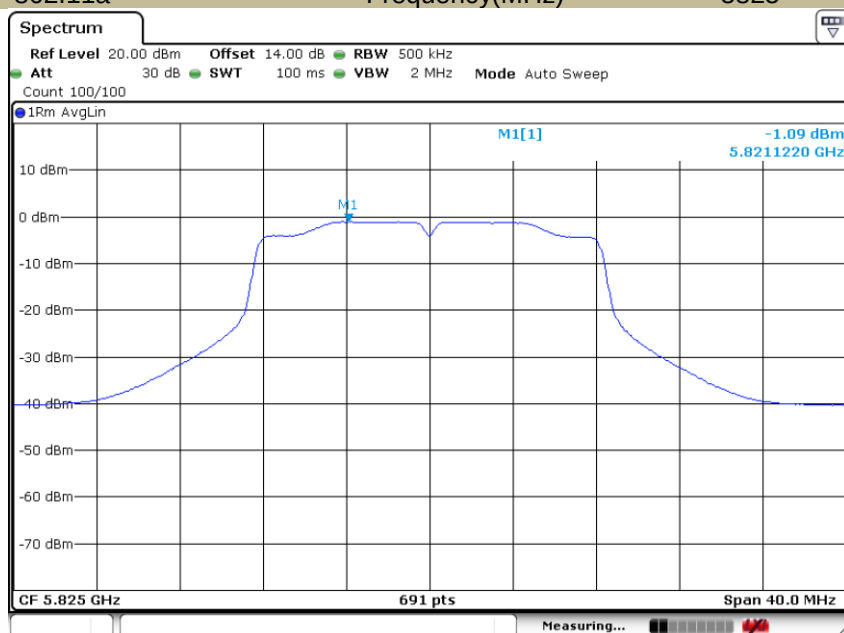


Date: 14.NOV.2020 11:02:23

Power Spectral Density
Test Model 802.11a

U-NII - 3
Frequency(MHz)

5825



Date: 14.NOV.2020 11:03:06

Power Spectral Density
Test Model 802.11n-HT20

U-NII - 3
Frequency(MHz)

5745



Date: 14.NOV.2020 10:49:55

Power Spectral Density
Test Model 802.11n-HT20

U-NII - 3
Frequency(MHz)

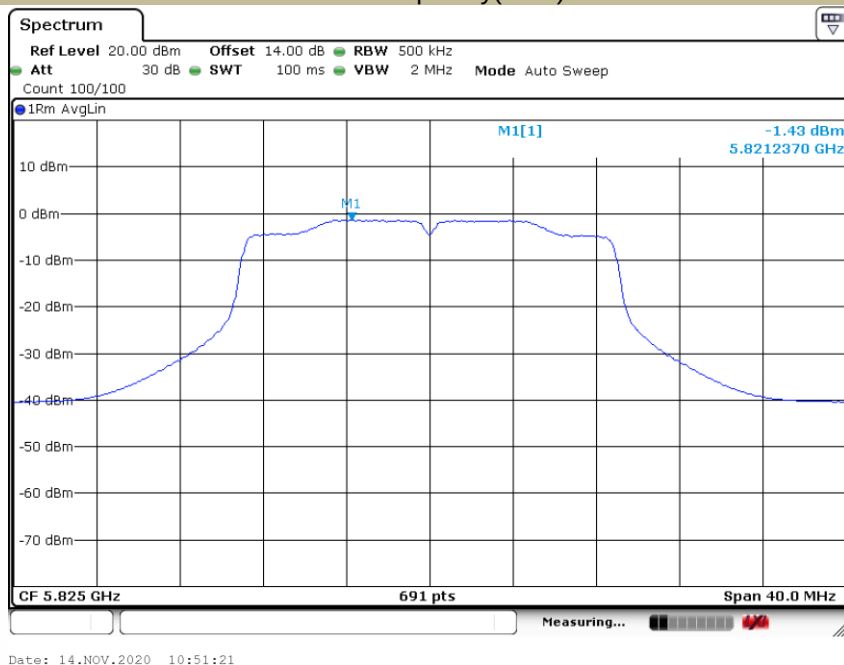
5785



Power Spectral Density
Test Model 802.11n-HT20

U-NII - 3
Frequency(MHz)

5825



Power Spectral Density
Test Model 802.11ac(HT20)

U-NII - 3
Frequency(MHz) 5745



Date: 14.NOV.2020 11:06:16

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII - 3
Frequency(MHz) 5785



Date: 14.NOV.2020 11:07:01

Power Spectral Density
Test Model 802.11ac(HT20)

U-NII - 3
Frequency(MHz) 5825



Date: 14.NOV.2020 11:07:45

Power Spectral Density
Test Model 802.11n-HT40

U-NII - 3
Frequency(MHz) 5755



Date: 14.NOV.2020 11:11:24

Power Spectral Density
Test Model 802.11n-HT40

U-NII - 3
Frequency(MHz) 5795



Date: 14.NOV.2020 11:10:22

Power Spectral Density
Test Model 802.11ac(HT40)

U-NII - 3
Frequency(MHz) 5755



Date: 14.NOV.2020 11:08:48

Power Spectral Density
Test Model 802.11ac(HT40)

U-NII - 3
Frequency(MHz)

5795

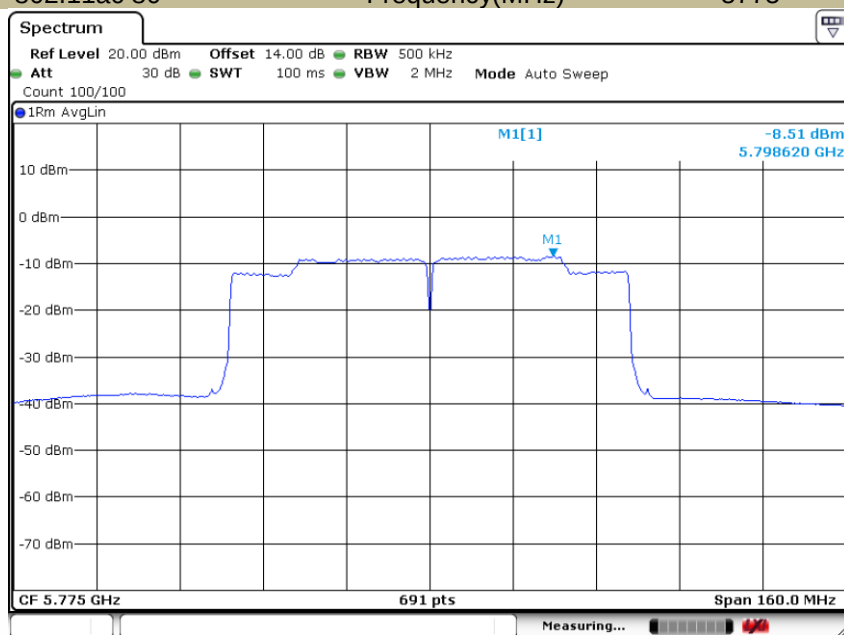


Date: 14.NOV.2020 11:09:34

Power Spectral Density
Test Model 802.11ac 80

U-NII - 3
Frequency(MHz)

5775



Date: 14.NOV.2020 11:12:17

For 2T2R- Total

5150-5250MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz			Limit (dBm/MHz)
		Antenna 1	Antenna 2	Total	
802.11n-HT20	5180	1.17	1.71	4.46	11
	5200	0.97	1.44	4.22	11
	5240	1.04	1.84	4.47	11
802.11ac(HT20)	5180	1.54	1.75	4.66	11
	5200	1.38	1.48	4.44	11
	5240	1.12	1.51	4.33	11
802.11n-HT40	5190	-2.54	-1.75	0.88	11
	5230	-2.53	-1.33	1.12	11
802.11ac(HT40)	5190	-2.54	-1.61	0.96	11
	5230	-2.83	-1.47	0.91	11
802.11ac(HT80)	5210	-6.73	-5.94	-3.31	11

5250-5350MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz			Limit (dBm/MHz)
		Antenna 1	Antenna 2	Total	
802.11n-HT20	5260	2.26	1.89	5.09	11
	5280	1.79	2.05	4.93	11
	5320	1.79	1.35	4.59	11
802.11ac(HT20)	5260	1.09	1.53	4.33	11
	5280	0.95	1.12	4.05	11
	5320	0.83	2	4.46	11
802.11n-HT40	5270	-3.05	-1.43	0.85	11
	5310	-2.9	-1.82	0.68	11
802.11ac(HT40)	5270	-2.83	-2.33	0.44	11
	5310	-3.15	-2.17	0.38	11
802.11ac(HT80)	5290	-6.78	-6.26	-3.50	11

5470-5725MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz			Limit (dBm/MHz)
		Antenna 1	Antenna 2	Total	
802.11n-HT20	5500	3.44	2.88	6.18	11
	5580	3.08	4.8	7.03	11
	5700	2.82	1.52	5.23	11
802.11ac(HT20)	5500	2.62	3.08	5.87	11
	5580	3.21	4.8	7.09	11
	5700	2.76	1.59	5.22	11
802.11n-HT40	5510	-1.12	-3.38	0.91	11
	5670	-0.91	-2.71	1.29	11
802.11ac(HT40)	5510	-1	-4.61	0.57	11
	5670	0.21	-4.03	1.60	11
802.11ac(HT80)	5530	-5.53	-7.07	-3.22	11

5725-5850MHz

Operating mode	Test Channel	Power Spectral Density dBm/MHz			Limit (dBm/MHz)
		Antenna 1	Antenna 2	Total	
802.11n-HT20	5745	-1.43	-1.95	1.33	30
	5785	-0.72	-1.23	2.04	30
	5825	-0.93	-1.43	1.84	30
802.11ac(HT20)	5745	-1	-0.71	2.16	30
	5785	0.01	-0.81	2.63	30
	5825	-1.64	-0.66	1.89	30
802.11n-HT40	5755	-4.9	-6.1	-2.45	30
	5795	-4.65	-5.78	-2.17	30
802.11ac(HT40)	5755	-5.08	-5.89	-2.46	30
	5795	-4.3	-5.46	-1.83	30
802.11ac(HT80)	5775	-7.28	-8.51	-4.84	30

8.4 FREQUENCY STABILITY

8.4.1 Applicable Standard

According to FCC Part 15.407(g)
ANSI C63.10 Section 6.8

8.4.2 Conformance 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.

8.4.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.4.4 Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 10 kHz.

Set Span= Entire absence of modulation emissions band

Set the video bandwidth (VBW) =30 kHz. width

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

Beginning at each temperature level specified in user manual , the frequency shall be measured within one minute after application of primary power to the transmitter and at intervals of no more than one minute thereafter until ten minutes have elapsed or until sufficient measurements are obtained to indicate clearly that the frequency has stabilized within the applicable tolerance, whichever time period is greater. During each test, the ambient temperature shall not be allowed to rise more than 10° centigrade above the respective beginning ambient temperature level

Measure and record the results in the test report.

8.4.5 Test Results

802.11a 5180

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5179.9740	-26.0	Pass
	-10	5179.9744	-25.6	Pass
	0	5179.9746	-25.4	Pass
	10	5179.9715	-28.5	Pass
	20	5179.9728	-27.2	Pass
	30	5179.9704	-29.6	Pass
	40	5179.9716	-28.4	Pass
	55	5179.9718	-28.2	Pass
85% Vnom	25	5179.9723	-27.7	Pass
115% Vnom	25	5179.9719	-28.1	Pass

5200

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5199.9740	-26.0	Pass
	-10	5199.9729	-27.1	Pass
	0	5199.9722	-27.8	Pass
	10	5199.9743	-25.7	Pass
	20	5199.9741	-25.9	Pass
	30	5199.9723	-27.7	Pass
	40	5199.9743	-25.7	Pass
	55	5199.9741	-25.9	Pass
85% Vnom	25	5199.9719	-28.1	Pass
115% Vnom	25	5199.9727	-27.3	Pass

5240

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5239.9740	-26.0	Pass
	-10	5239.9711	-28.9	Pass
	0	5239.9743	-25.7	Pass
	10	5239.9708	-29.2	Pass
	20	5239.9724	-27.6	Pass
	30	5239.9735	-26.5	Pass
	40	5239.9701	-29.9	Pass
	55	5239.9745	-25.5	Pass
85% Vnom	25	5239.9729	-27.1	Pass
115% Vnom	25	5239.9733	-26.7	Pass

5190

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5189.9740	-26.0	Pass
	-10	5189.9737	-26.3	Pass
	0	5189.9738	-26.2	Pass
	10	5189.9726	-27.4	Pass
	20	5189.9742	-25.8	Pass
	30	5189.9721	-27.9	Pass
	40	5189.9702	-29.8	Pass
	55	5189.9708	-29.2	Pass
85% Vnom	25	5189.9746	-25.4	Pass
115% Vnom	25	5189.9718	-28.2	Pass

5230

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5229.9740	-26.0	Pass
	-10	5229.9709	-29.1	Pass
	0	5229.9719	-28.1	Pass
	10	5229.9703	-29.7	Pass
	20	5229.9737	-26.3	Pass
	30	5229.9733	-26.7	Pass
	40	5229.9734	-26.6	Pass
	55	5229.9741	-25.9	Pass
85% Vnom	25	5229.9733	-26.7	Pass
115% Vnom	25	5229.9735	-26.5	Pass

5210

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5209.9740	-26.0	Pass
	-10	5209.9721	-27.9	Pass
	0	5209.9743	-25.7	Pass
	10	5209.9707	-29.3	Pass
	20	5209.9732	-26.8	Pass
	30	5209.9715	-28.5	Pass
	40	5209.9701	-29.9	Pass
	55	5209.9708	-29.2	Pass
85% Vnom	25	5209.9721	-27.9	Pass
115% Vnom	25	5209.9726	-27.4	Pass

802.11a 5260

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5259.9740	-26.0	Pass
	-10	5259.9728	-27.2	Pass
	0	5259.9719	-28.1	Pass
	10	5259.9719	-28.1	Pass
	20	5259.9709	-29.1	Pass
	30	5259.9734	-26.6	Pass
	40	5259.9727	-27.3	Pass
	55	5259.9749	-25.1	Pass
85% Vnom	25	5259.9749	-25.1	Pass
115% Vnom	25	5259.9713	-28.7	Pass

5280

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5279.9740	-26.0	Pass
	-10	5279.9737	-26.3	Pass
	0	5279.9722	-27.8	Pass
	10	5279.9714	-28.6	Pass
	20	5279.9743	-25.7	Pass
	30	5279.9735	-26.5	Pass
	40	5279.9702	-29.8	Pass
	55	5279.9729	-27.1	Pass
85% Vnom	25	5279.9713	-28.7	Pass
115% Vnom	25	5279.9733	-26.7	Pass

5320

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5319.9725	-27.5	Pass
	-10	5319.9747	-25.3	Pass
	0	5319.9749	-25.1	Pass
	10	5319.9722	-27.8	Pass
	20	5319.9742	-25.8	Pass
	30	5319.9739	-26.1	Pass
	40	5319.9717	-28.3	Pass
	55	5319.9712	-28.8	Pass
85% Vnom	25	5319.9747	-25.3	Pass
115% Vnom	25	5319.9742	-25.8	Pass

5270

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5269.9754	-24.6	Pass
	-10	5269.9704	-29.6	Pass
	0	5269.9703	-29.7	Pass
	10	5269.9704	-29.6	Pass
	20	5269.9738	-26.2	Pass
	30	5269.9727	-27.3	Pass
	40	5269.9735	-26.5	Pass
	55	5269.9725	-27.5	Pass
85% Vnom	25	5269.9705	-29.5	Pass
115% Vnom	25	5269.9731	-26.9	Pass

5310

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5309.9740	-26	Pass
	-10	5309.9746	-25.4	Pass
	0	5309.9712	-28.8	Pass
	10	5309.9702	-29.8	Pass
	20	5309.9715	-28.5	Pass
	30	5309.9707	-29.3	Pass
	40	5309.9704	-29.6	Pass
	55	5309.9711	-28.9	Pass
85% Vnom	25	5309.9714	-28.6	Pass
115% Vnom	25	5309.9722	-27.8	Pass

5290

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5289.9740	-26	Pass
	-10	5289.9721	-27.9	Pass
	0	5289.9707	-29.3	Pass
	10	5289.9741	-25.9	Pass
	20	5289.9717	-28.3	Pass
	30	5289.9734	-26.6	Pass
	40	5289.9708	-29.2	Pass
	55	5289.9736	-26.4	Pass
85% Vnom	25	5289.9734	-26.6	Pass
115% Vnom	25	5289.9741	-25.9	Pass

802.11a 5500

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5499.9725	-27.5	Pass
	-10	5499.9738	-26.2	Pass
	0	5499.9727	-27.3	Pass
	10	5499.9705	-29.5	Pass
	20	5499.9745	-25.5	Pass
	30	5499.9705	-29.5	Pass
	40	5499.9742	-25.8	Pass
	55	5499.9707	-29.3	Pass
85% Vnom	25	5499.9708	-29.2	Pass
115% Vnom	25	5499.9726	-27.4	Pass

5580

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5579.9725	-27.5	Pass
	-10	5579.9724	-27.6	Pass
	0	5579.9737	-26.3	Pass
	10	5579.9732	-26.8	Pass
	20	5579.9735	-26.5	Pass
	30	5579.9727	-27.3	Pass
	40	5579.9727	-27.3	Pass
	55	5579.9748	-25.2	Pass
85% Vnom	25	5579.9749	-25.1	Pass
115% Vnom	25	5579.9722	-27.8	Pass

5700

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5699.9711	-28.9	Pass
	-10	5699.9705	-29.5	Pass
	0	5699.9741	-25.9	Pass
	10	5699.9713	-28.7	Pass
	20	5699.9732	-26.8	Pass
	30	5699.9734	-26.6	Pass
	40	5699.9721	-27.9	Pass
	55	5699.9706	-29.4	Pass
85% Vnom	25	5699.9734	-26.6	Pass
115% Vnom	25	5699.9715	-28.5	Pass

5510

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5509.9725	-27.5	Pass
	-10	5509.9746	-25.4	Pass
	0	5509.9749	-25.1	Pass
	10	5509.9748	-25.2	Pass
	20	5509.9702	-29.8	Pass
	30	5509.9714	-28.6	Pass
	40	5509.9714	-28.6	Pass
	55	5509.9702	-29.8	Pass
85% Vnom	25	5509.9733	-26.7	Pass
115% Vnom	25	5509.9746	-25.4	Pass

5670

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5669.9711	-28.9	Pass
	-10	5669.9744	-25.6	Pass
	0	5669.9719	-28.1	Pass
	10	5669.9703	-29.7	Pass
	20	5669.9713	-28.7	Pass
	30	5669.9717	-28.3	Pass
	40	5669.9724	-27.6	Pass
	55	5669.9719	-28.1	Pass
85% Vnom	25	5669.9704	-29.6	Pass
115% Vnom	25	5669.9748	-25.2	Pass

5530

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5529.9725	-27.5	Pass
	-10	5529.9736	-26.4	Pass
	0	5529.9708	-29.2	Pass
	10	5529.9734	-26.6	Pass
	20	5529.9735	-26.5	Pass
	30	5529.9702	-29.8	Pass
	40	5529.9737	-26.3	Pass
	55	5529.9735	-26.5	Pass
85% Vnom	25	5529.9717	-28.3	Pass
115% Vnom	25	5529.9704	-29.6	Pass

802.11a 5745

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5744.9711	-28.9	Pass
	-10	5744.9742	-25.8	Pass
	0	5744.9746	-25.4	Pass
	10	5744.9741	-25.9	Pass
	20	5744.9708	-29.2	Pass
	30	5744.9734	-26.6	Pass
	40	5744.9723	-27.7	Pass
	55	5744.9717	-28.3	Pass
85% Vnom	25	5744.9746	-25.4	Pass
115% Vnom	25	5744.9711	-28.9	Pass

5785

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5784.9711	-28.9	Pass
	-10	5784.9729	-27.1	Pass
	0	5784.9713	-28.7	Pass
	10	5784.9708	-29.2	Pass
	20	5784.9706	-29.4	Pass
	30	5784.9724	-27.6	Pass
	40	5784.9709	-29.1	Pass
	55	5784.9749	-25.1	Pass
85% Vnom	25	5784.9719	-28.1	Pass
115% Vnom	25	5784.9729	-27.1	Pass

5825

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5824.9711	-28.9	Pass
	-10	5824.9748	-25.2	Pass
	0	5824.9742	-25.8	Pass
	10	5824.9703	-29.7	Pass
	20	5824.9719	-28.1	Pass
	30	5824.9734	-26.6	Pass
	40	5824.9748	-25.2	Pass
	55	5824.9742	-25.8	Pass
85% Vnom	25	5824.9728	-27.2	Pass
115% Vnom	25	5824.9731	-26.9	Pass

5755

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5754.9711	-28.9	Pass
	-10	5754.9726	-27.4	Pass
	0	5754.9738	-26.2	Pass
	10	5754.9746	-25.4	Pass
	20	5754.9728	-27.2	Pass
	30	5754.9731	-26.9	Pass
	40	5754.9745	-25.5	Pass
	55	5754.9701	-29.9	Pass
85% Vnom	25	5754.9743	-25.7	Pass
115% Vnom	25	5754.9741	-25.9	Pass

5795

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5794.9711	-28.9	Pass
	-10	5794.9721	-27.9	Pass
	0	5794.9726	-27.4	Pass
	10	5794.9717	-28.3	Pass
	20	5794.9745	-25.5	Pass
	30	5794.9708	-29.2	Pass
	40	5794.9704	-29.6	Pass
	55	5794.9737	-26.3	Pass
85% Vnom	25	5794.9718	-28.2	Pass
115% Vnom	25	5794.9738	-26.2	Pass

5775

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5774.9711	-28.9	Pass
	-10	5774.9723	-27.7	Pass
	0	5774.9701	-29.9	Pass
	10	5774.9729	-27.1	Pass
	20	5774.9703	-29.7	Pass
	30	5774.9736	-26.4	Pass
	40	5774.9714	-28.6	Pass
	55	5774.9742	-25.8	Pass
85% Vnom	25	5774.9747	-25.3	Pass
115% Vnom	25	5774.9748	-25.2	Pass

8.5 UNDESIRABLE RADIATED SPURIOUS EMISSION

8.5.1 Applicable Standard

According to FCC Part 15.407 (b)
According to 789033 D02 Section II(G)

8.5.2 Conformance Limit

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209 The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The provisions of §15.205 apply to intentional radiators operating under this section,15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

Remark: 1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

8.5.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

8.5.4 Test Procedure

■ Unwanted Emissions Measurements below 1000 MHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

The EUT was placed on a turn table which is 0.8m above ground plane.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until all frequency measured was complete.

We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.

Use the following spectrum analyzer settings:

Set RBW=120kHz for $f < 1$ GHz(30MHz to 1GHz), 200Hz for $f < 150$ KHz(9KHz to 150KHz), 9KHz for < 30 MHz

(150KHz to 30KHz).

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Repeat above procedures until all frequency measured was complete.

■ Unwanted Maximum peak Emissions Measurements above 1000 MHz

Maximum emission levels are measured by setting the analyzer as follows:

RBW = 1 MHz.

VBW $\geq$ 3 MHz.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

■ Unwanted Average Emissions Measurements above 1000 MHz

Method VB (Averaging using reduced video bandwidth): Alternative method.

RBW = 1 MHz.

Video bandwidth. • If the EUT is configured to transmit with duty cycle $\geq$ 98 percent, set $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is < 98 percent, set $VBW \geq 1/T$, where T is defined in section II.B.1.a).

Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).

• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged.)

■ **Band edge measurements.**

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.

Marker-Delta Method.

The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

8.5.5 Test Results

The voltage AC10V & 30V and the modes 802.11a/n/ac has been tested and the worst result recorded as below

- ☒ For Undesirable radiated Spurious Emission in U-NII – 1
All the modes 802.11a/n/ac has been tested and the worst result antenna 1 802.11ac recorded as below:
- : ☒ Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Test mode: 802.11ac Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
3415.78	V	41.77	-53.46	-27	-26.46
5615.62	V	47.05	-48.18	-27	-21.18
7875.25	V	53.51	-41.72	-27	-14.72
3981.25	H	42.08	-53.15	-27	-26.15
7673.03	H	53.15	-42.08	-27	-15.08
12079.38	H	57.14	-38.09	-27	-11.09

Test mode: 802.11ac Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
3912.80	V	41.98	-53.25	-27	-26.25
5090.00	V	46.27	-48.96	-27	-21.96
7829.86	V	53.43	-41.80	-27	-14.8
5583.25	H	47.29	-47.94	-27	-20.94
7829.86	H	54.47	-40.76	-27	-13.76
12044.52	H	57.30	-37.93	-27	-10.93

Test mode: 802.11ac Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
5075.31	V	46.03	-49.2	-27	-22.2
7852.52	V	54.22	-41.01	-27	-14.01
12079.38	V	57.59	-37.64	-27	-10.64
3946.88	H	41.67	-53.56	-27	-26.56
5599.41	H	47.22	-48.01	-27	-21.01
7784.72	H	53.64	-41.59	-27	-14.59

Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

Test mode: 802.11ac				Frequency(MHz): 5180			
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin (dB)	
		PK	AV	PK	AV	PK	AV
3415.78	V	41.77	26.60	74	54	-32.23	-27.40
5615.62	V	47.05	33.40	74	54	-26.95	-20.60
7875.25	V	53.51	36.70	74	54	-20.49	-17.30
3981.25	H	42.08	27.30	74	54	-31.92	-26.70
7673.03	H	53.15	36.60	74	54	-20.85	-17.40
12079.38	H	57.14	38.50	74	54	-16.86	-15.50

Test mode: 802.11ac				Frequency(MHz): 5200			
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin (dB)	
		PK	AV	PK	AV	PK	AV
3912.80	V	41.98	26.80	74	54	-32.02	-27.20
5090.00	V	46.27	31.50	74	54	-27.73	-22.50
7829.86	V	53.43	36.40	74	54	-20.57	-17.60
5583.25	H	47.29	32.70	74	54	-26.71	-21.30
7829.86	H	54.47	37.00	74	54	-19.53	-17.00
12044.52	H	57.30	38.10	74	54	-16.7	-15.90

Test mode: 802.11ac				Frequency(MHz): 5240			
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin (dB)	
		PK	AV	PK	AV	PK	AV
5075.31	V	46.03	30.80	74	54	-27.97	-23.20
7852.52	V	54.22	36.00	74	54	-19.78	-18.00
12079.38	V	57.59	38.20	74	54	-16.41	-15.80
3946.88	H	41.67	26.30	74	54	-32.33	-27.70
5599.41	H	47.22	33.80	74	54	-26.78	-20.20
7784.72	H	53.64	36.50	74	54	-20.36	-17.50

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
 - (2) Emission Level= Reading Level+Correct Factor.
 - (3) Correct Factor= Ant_F + Cab_L - Preamp
 - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11ac Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5149.68	H	51.55	-43.68	-27	Pass
5144.72	V	49.54	-45.69	-27	Pass

Test mode: 802.11ac Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5355.02	H	50.57	-44.66	-27	Pass
5352.04	V	50.27	-44.96	-27	Pass

Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

Test mode: 802.11ac Frequency(MHz): 5180

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5149.68	H	51.55	74	34.80	54
5144.72	V	49.54	74	34.60	54

Test mode: 802.11ac Frequency(MHz): 5240

Frequency (MHz)	Polarity	PK(dBuV/m) (VBW=3MHz)	Limit 3m (dBuV/m)	AV(dBuV/m) (VBW=10Hz)	Limit 3m (dBuV/m)
5355.02	H	50.57	74	34.60	54
5352.04	V	50.27	74	34.40	54

Note: (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).

(2) Emission Level= Reading Level+Correct Factor.

(3) Correct Factor= Ant_F + Cab_L - Preamp

(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.