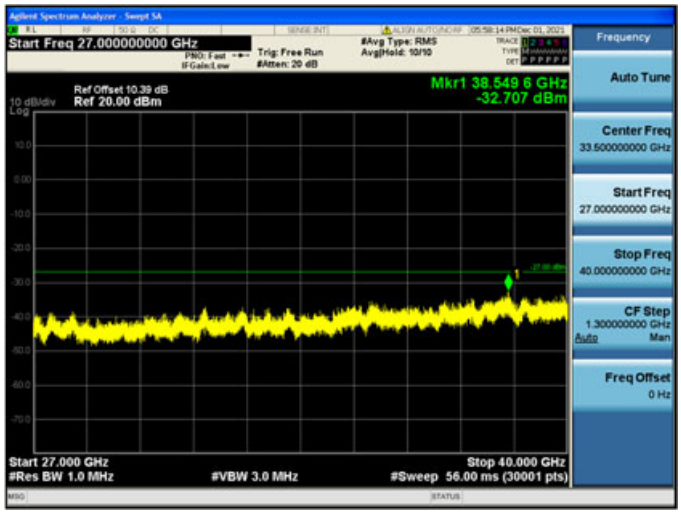
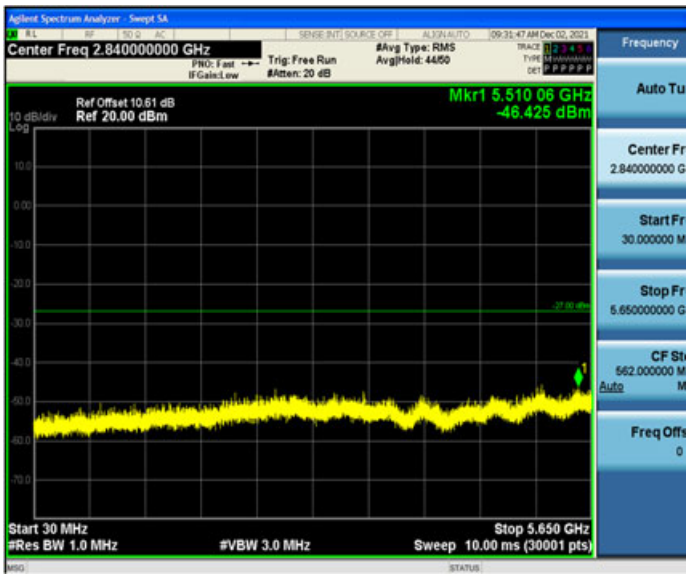
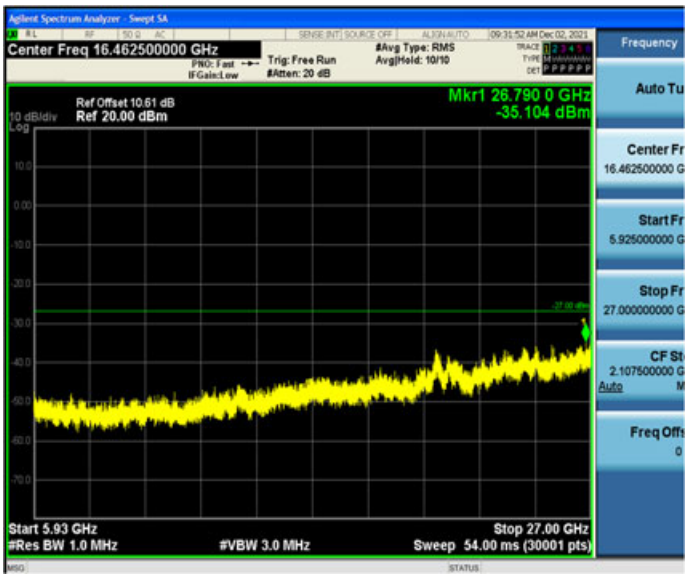
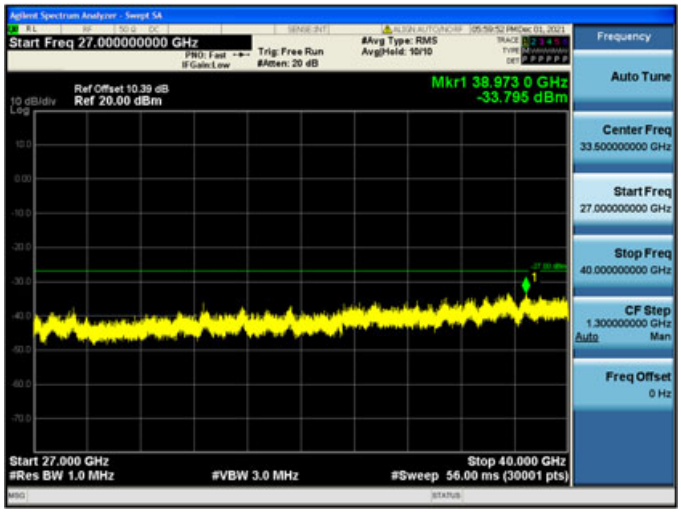

Agilent Spectrum Analyzer - Swept SA
Start Freq 27.000000000 GHz
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
Ref Offset 10.39 dB
10 dB/div Ref 20.00 dBm
Log
Mkr1 38.549 6 GHz
-32.707 dBm
Start 27.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.000 GHz
#Sweep 56.00 ms (30001 pts)
Frequency
Auto Tune
Center Freq
33.500000000 GHz
Start Freq
27.000000000 GHz
Stop Freq
40.000000000 GHz
CF Step
1.300000000 GHz
Auto Man
Freq Offset
0 Hz

Conducted spurious emissions – U-NII-3 band

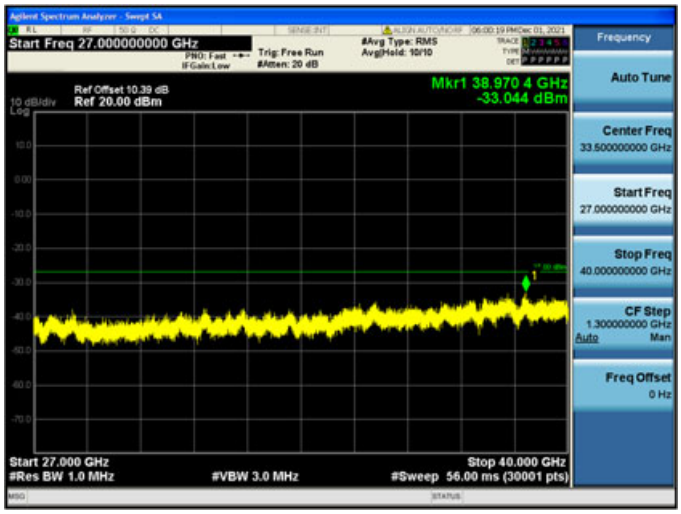
802.11a - CH149 (5745 MHz)



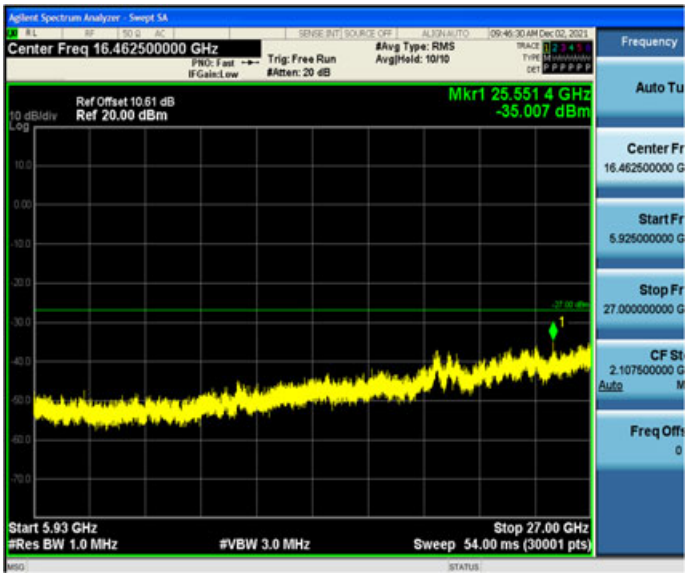


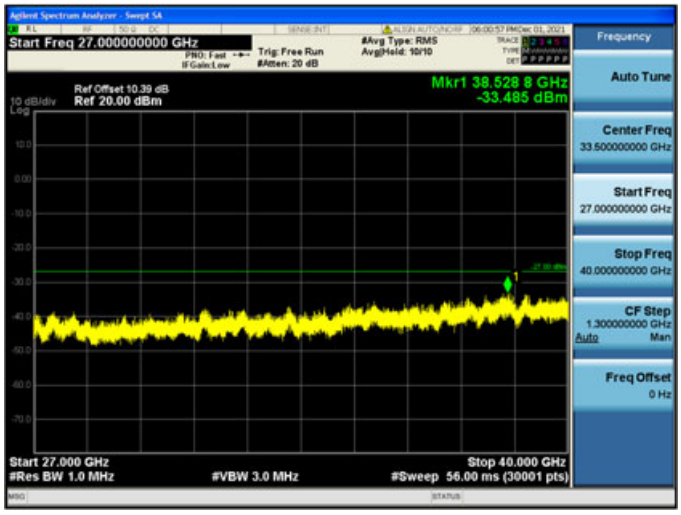


802.11a – CH157 (5785 MHz)

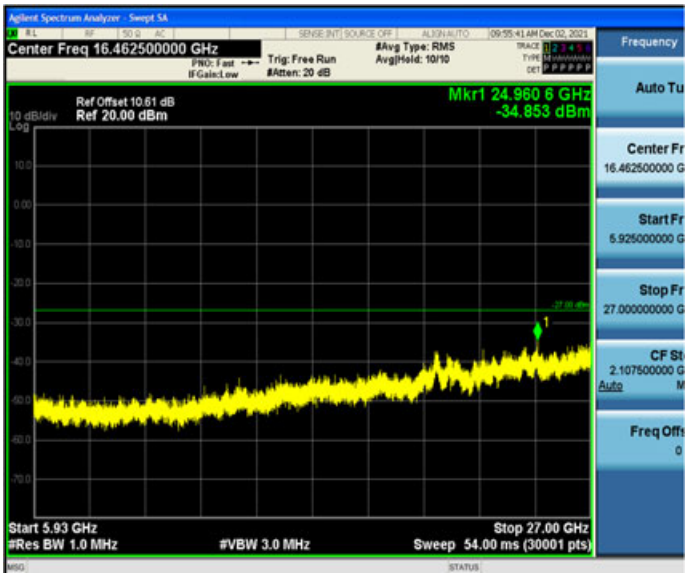


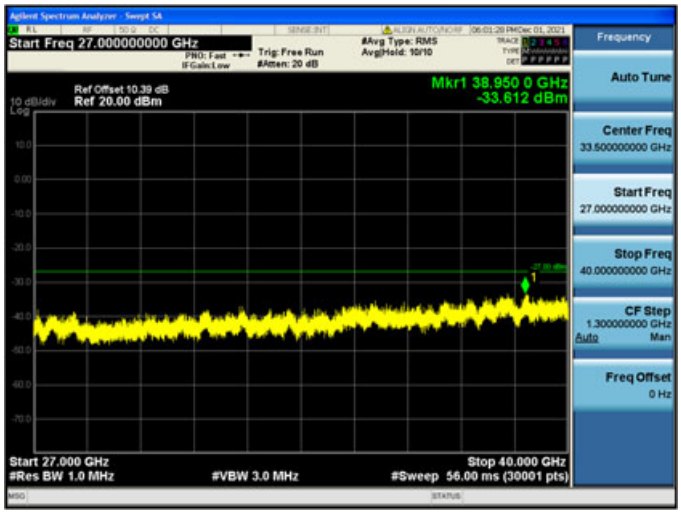
802. 11a – CH165 (5825 MHz)



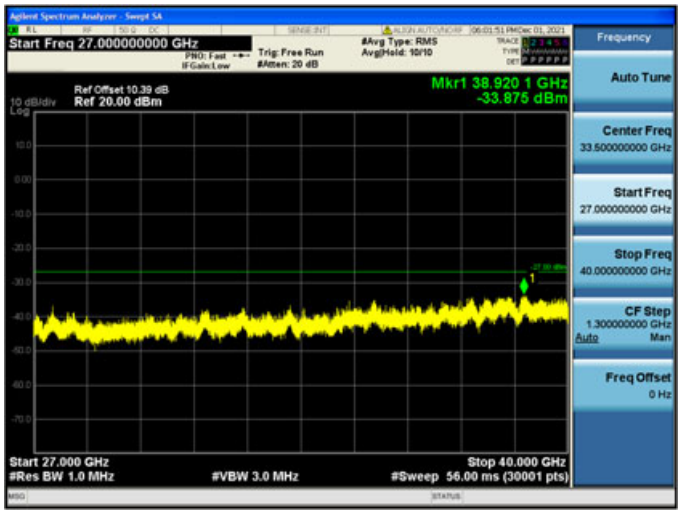


802.11n HT20 - CH149 (5745 MHz)

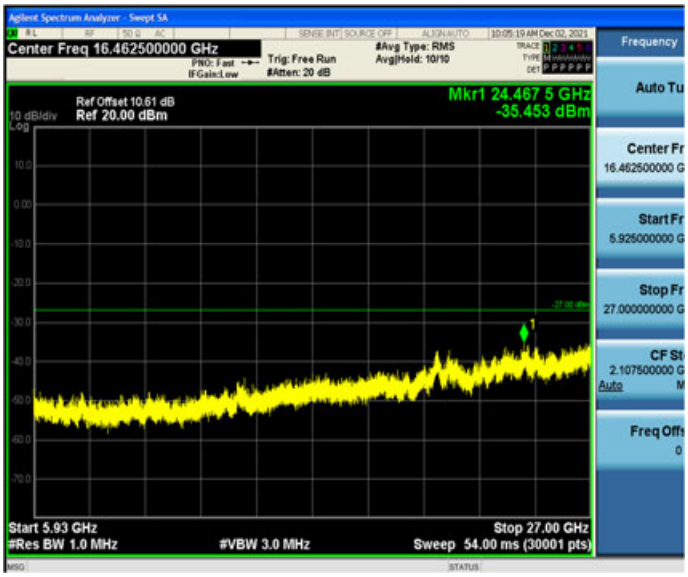


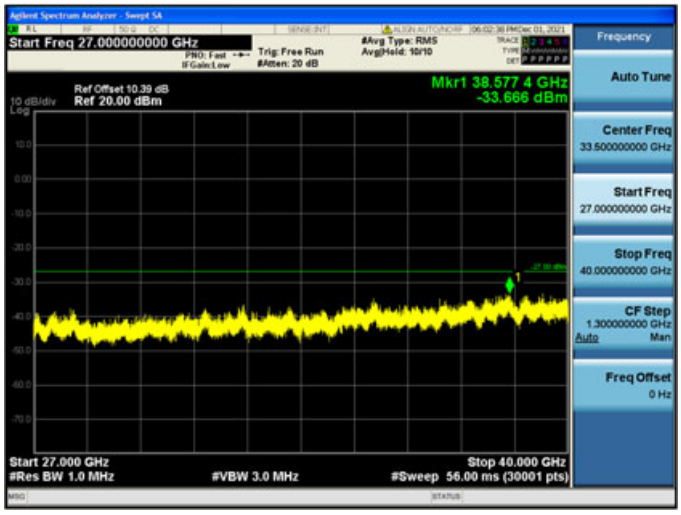


802. 11n HT20 – CH157 (5785 MHz)

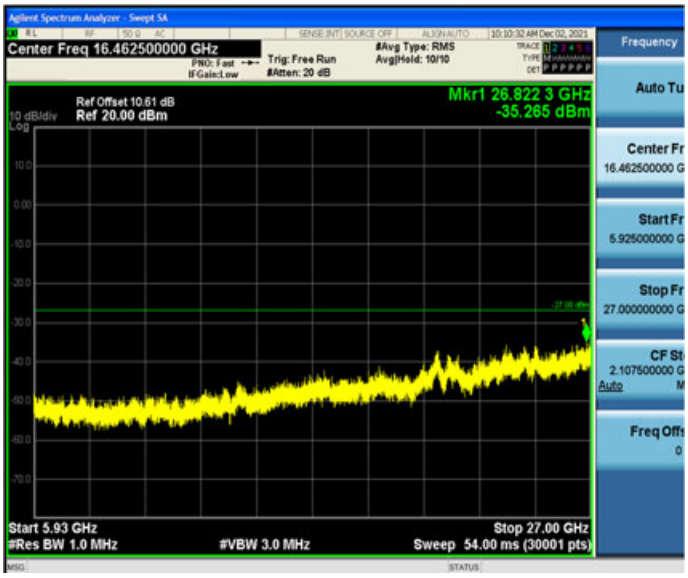


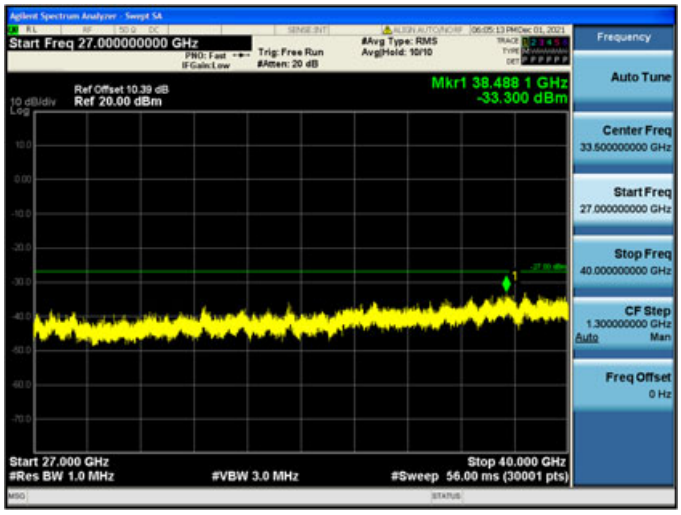
802. 11n HT20 – CH165 (5825 MHz)



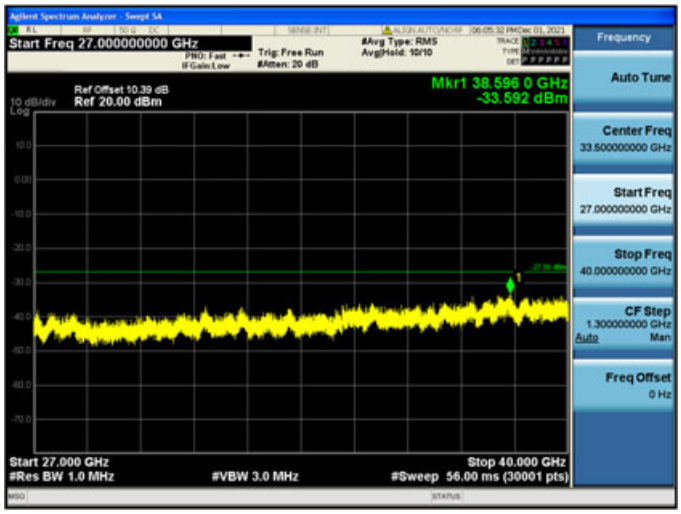


802.11n HT40 - CH151 (5755 MHz)

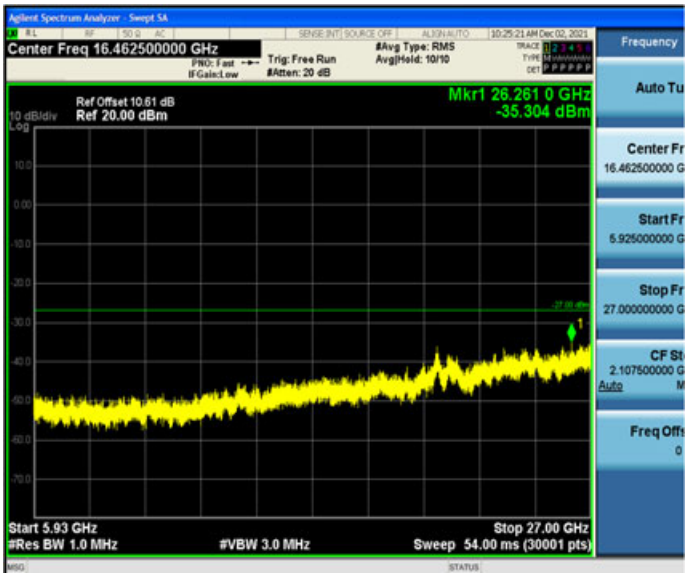


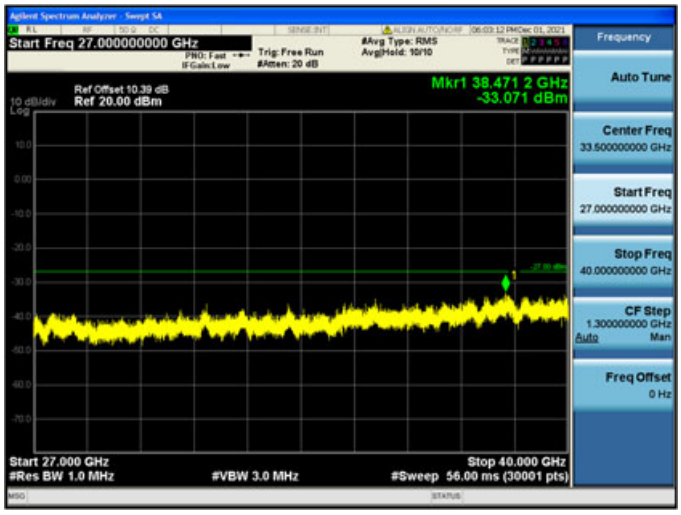


802.11n HT40 – CH159 (5795 MHz)

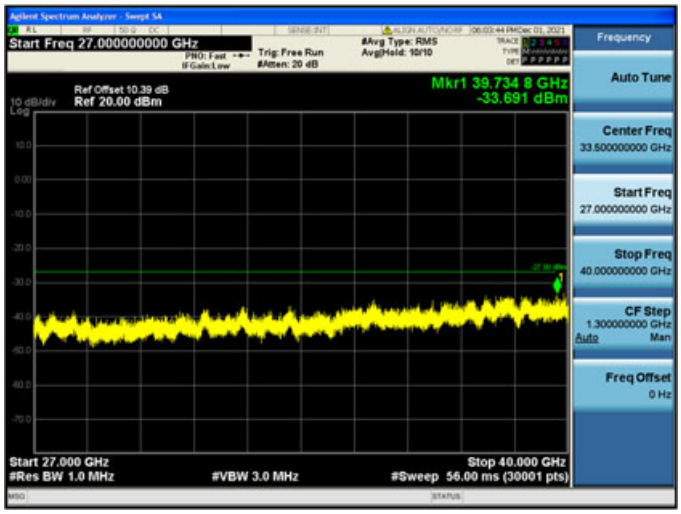

Agilent Spectrum Analyzer - Swept SA
Start Freq 27.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
Ref Offset 10.39 dB
10 dB/div Ref 20.00 dBm
Log
Mkr1 38.596 0 GHz
-33.592 dBm
Start 27.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.000 GHz
#Sweep 56.00 ms (30001 pts)
Frequency
Auto Tune
Center Freq
33.500000000 GHz
Start Freq
27.000000000 GHz
Stop Freq
40.000000000 GHz
CF Step
1.300000000 GHz
Auto
Man
Freq Offset
0 Hz

802.11ac VHT20 – CH149 (5745 MHz)

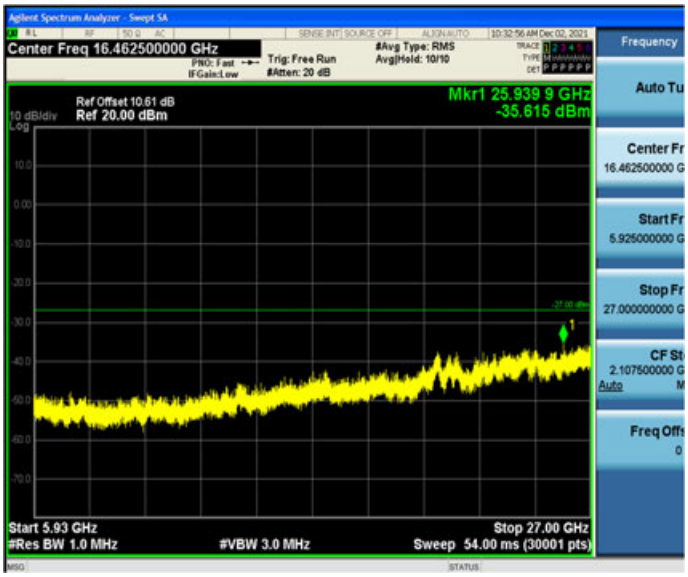


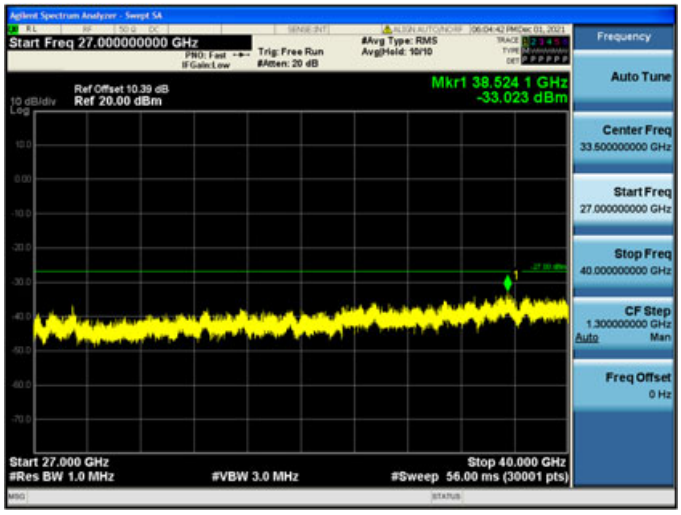


802. 11ac VHT20 – CH157 (5785 MHz)

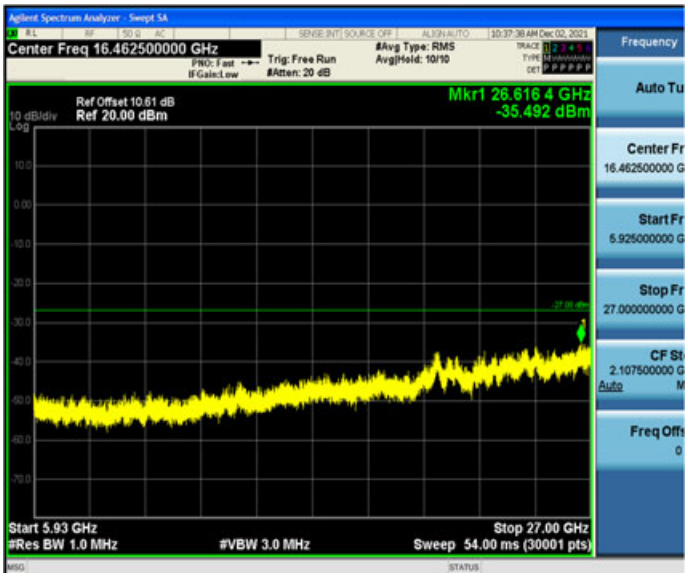


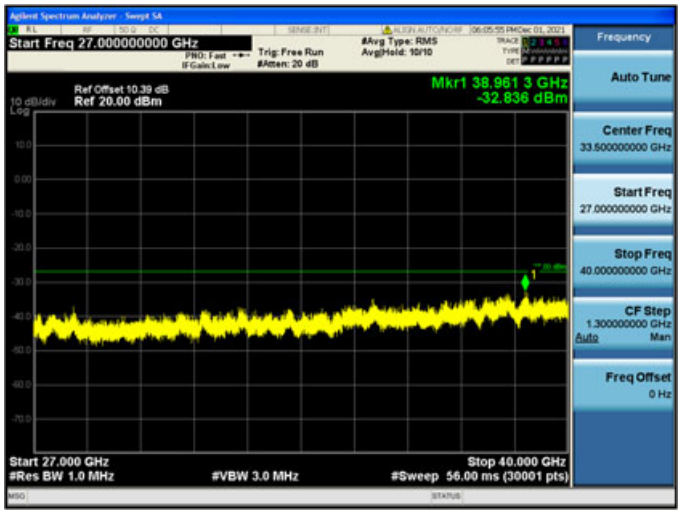
802. 11ac VHT20 – CH165 (5825 MHz)



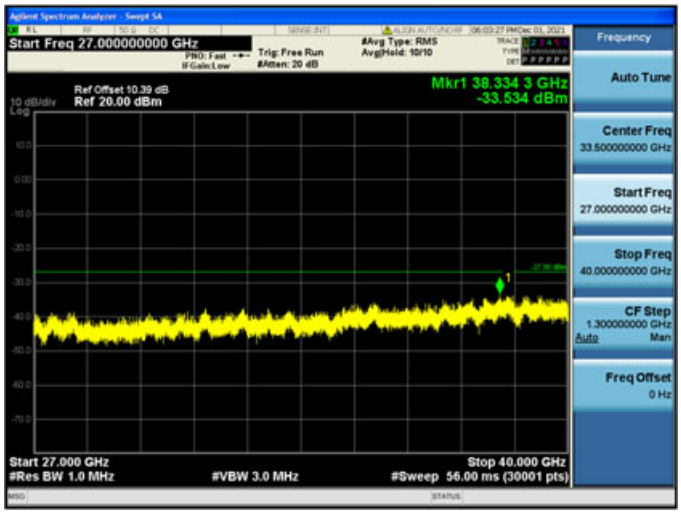


802. 11ac VHT40 – CH151 (5755 MHz)

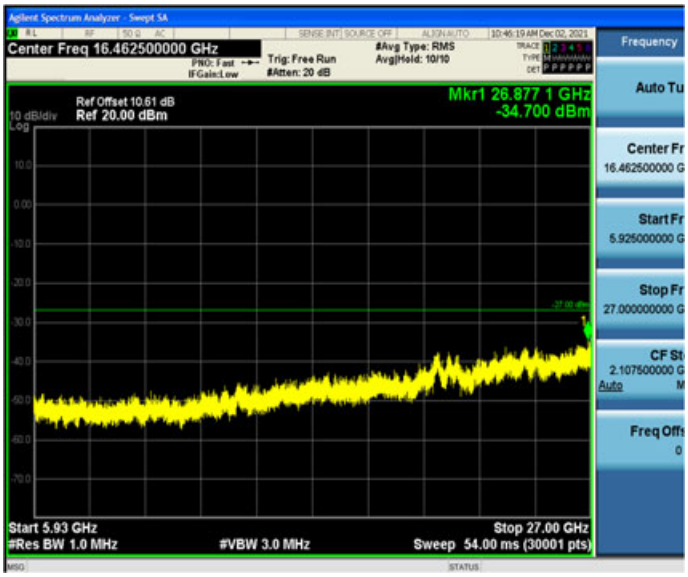


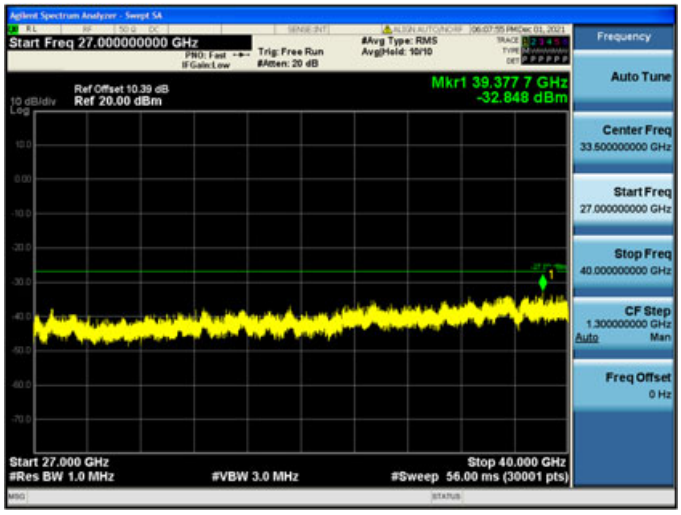


802. 11ac VHT40 – CH159 (5795 MHz)



802. 11ac VHT80 – CH155 (5775 MHz)





5.8 Conducted band edge

5.8.1 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:

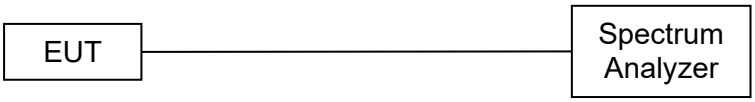
For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

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 solely in the 5.725-5.850 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.

5.8.2 Test setup



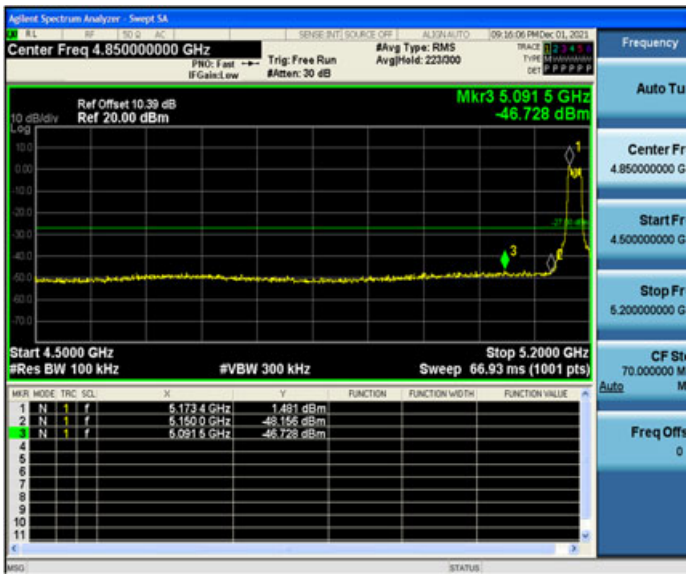
5.8.3 Test procedure

Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
Repeat above procedures until all measured frequencies were complete.

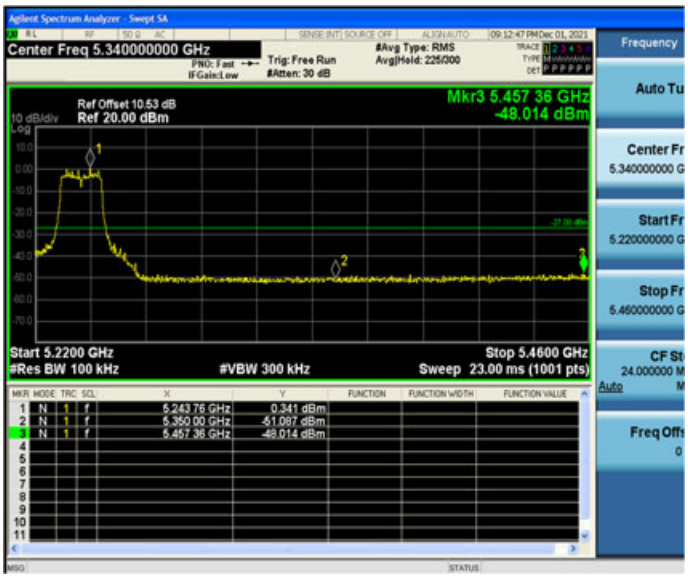
5.8.4 Test results

Conducted band edge– U-NII-1 band

802.11a - Low band-edge

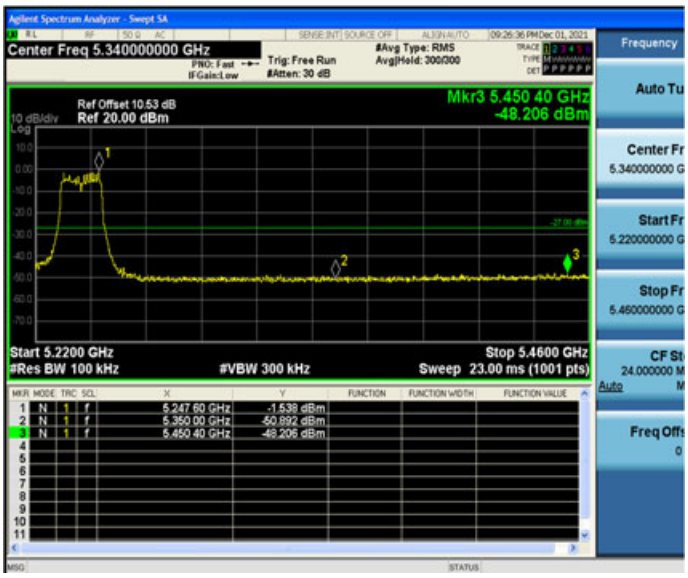


802.11a - High band-edge

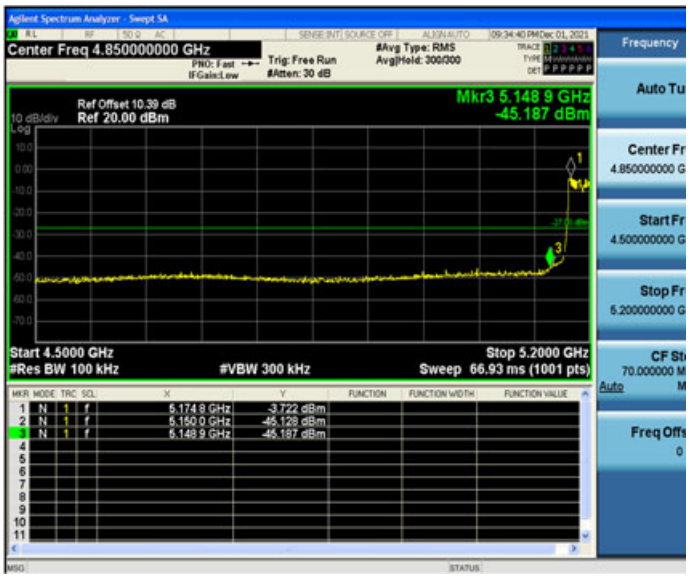


802.11n HT20 - Low band-edge

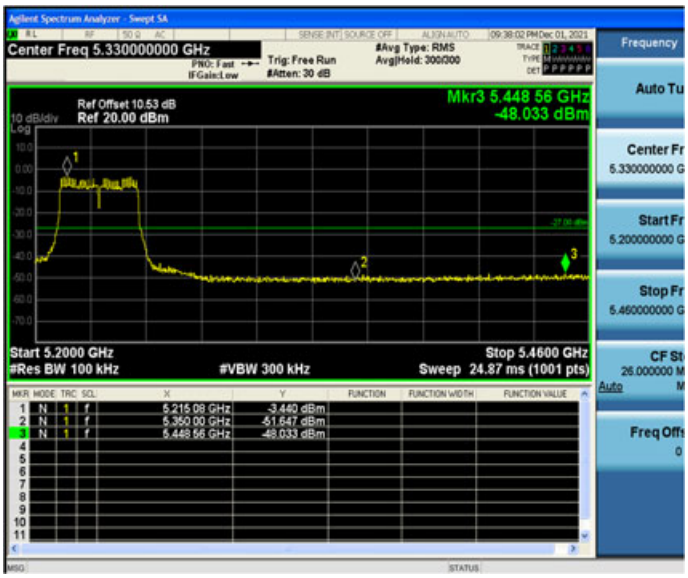
802.11n HT20 - High band-edge



802.11n HT40 - Low band-edge

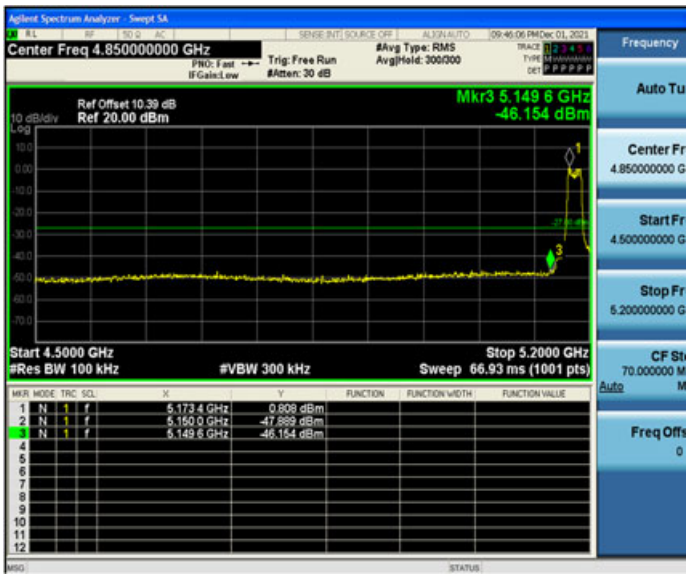


802.11n HT40 - High band-edge

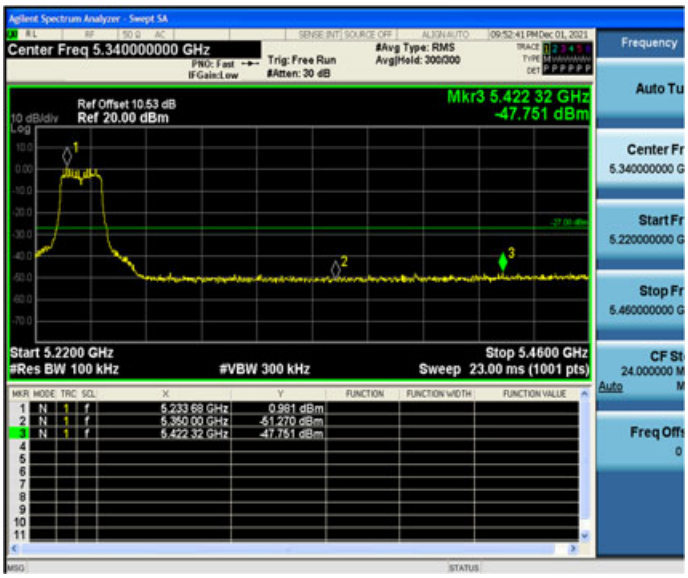


Conducted band edge– U-NII-1 band

802.11ac VHT20 - Low band-edge



802.11ac VHT20 - High band-edge

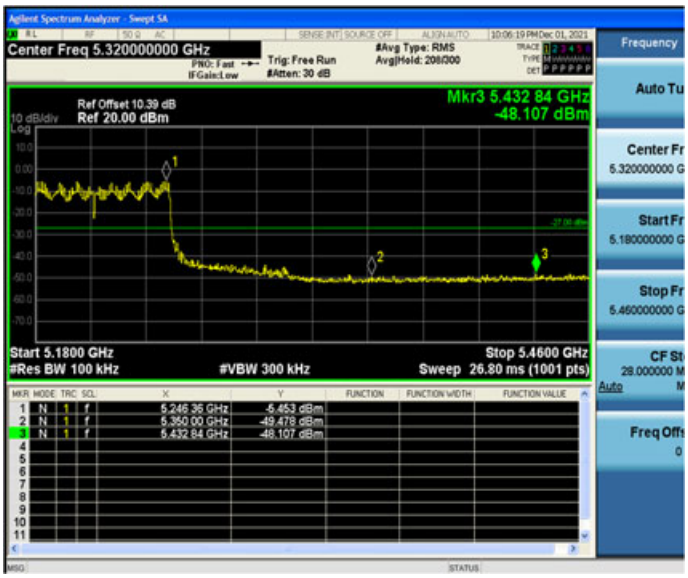


802.11ac VHT40 - Low band-edge

802.11ac VHT40 - High band-edge

802.11ac VHT80 - Low band-edge

802.11ac VHT80 - High band-edge



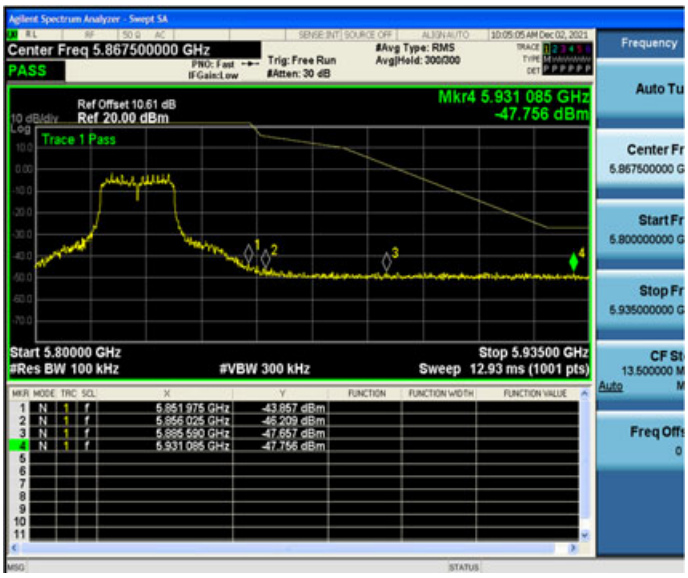
Conducted band edge– U-NII-3 band

802.11a - Low band-edge

802.11a - High band-edge

802.11n HT20 - Low band-edge

802.11n HT20 - High band-edge



802.11n HT40 - Low band-edge

802.11n HT40 - High band-edge

Conducted band edge– U-NII-3 band

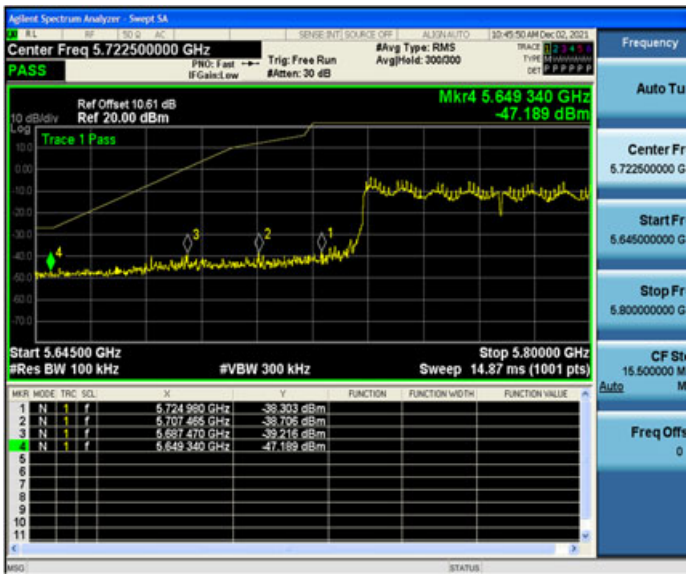
802.11ac VHT20 - Low band-edge

802.11ac VHT20 - High band-edge

802.11ac VHT40 - Low band-edge

802.11ac VHT40 - High band-edge

802.11ac VHT80 - Low band-edge



802.11ac VHT80 - High band-edge

5.9 Radiated spurious emission

5.9.1 Limits

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 solely in the 5.725-5.850 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.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

§ 15.209 Radiated emission limits at restricted bands:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note 1: the tighter limit applies at the band edges.
Note 2: the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

§ 15.35 (b) requirements:
When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

According to ANSI C63.10-2013, the tests shall be performed in the frequency range shown in the following table:

Frequency range of measurements for unlicensed wireless device

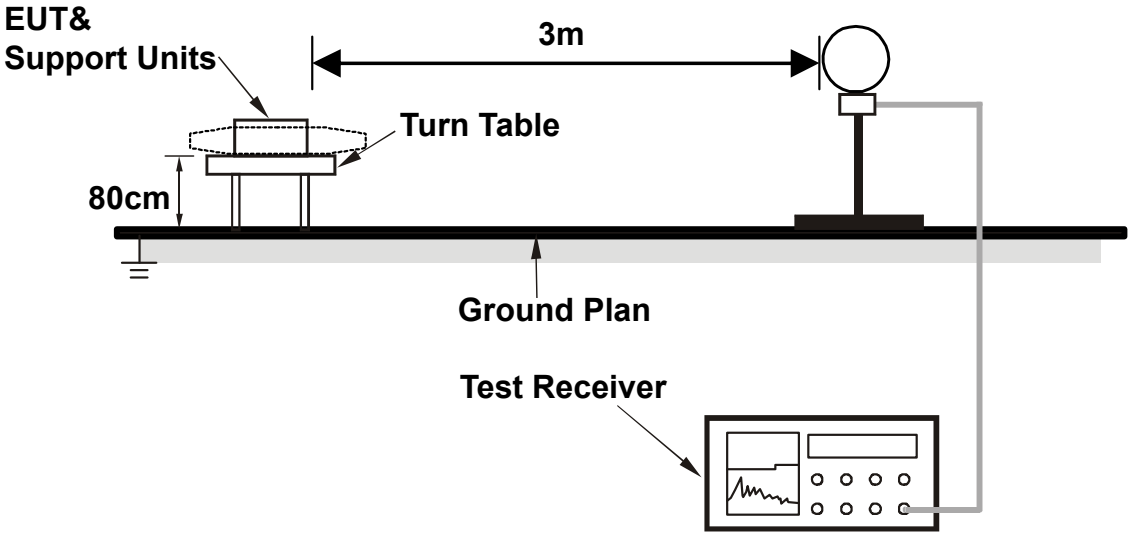
Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Frequency range of measurements for unlicensed wireless device with digital device

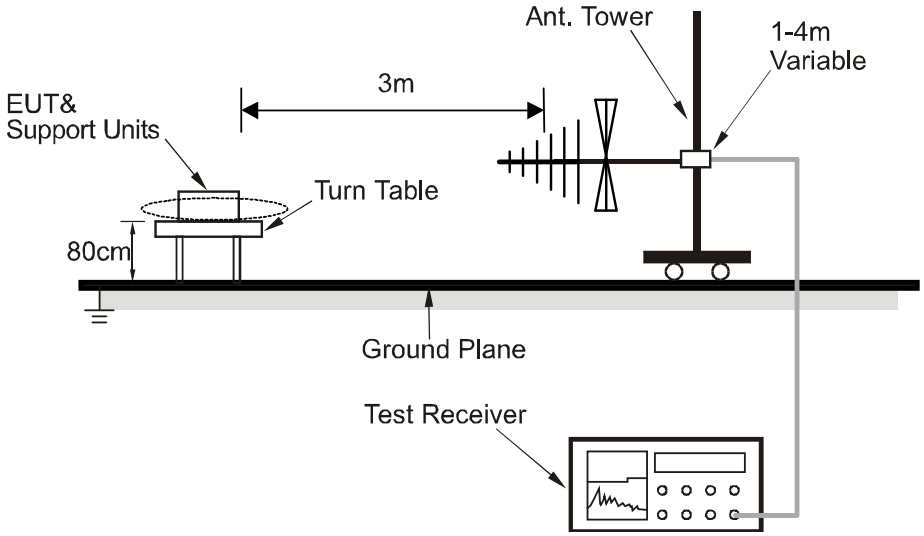
Highest frequency generated or used in the device or on which the device operates or tunes	Upper frequency range of measurement
Below 1.705 MHz	30 MHz
1.705 MHz to 108 MHz	1000 MHz
108 MHz to 500 MHz	2000 MHz
500 MHz to 1000 MHz	5000 MHz
Above 1000 MHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower

5.9.2 Test setup

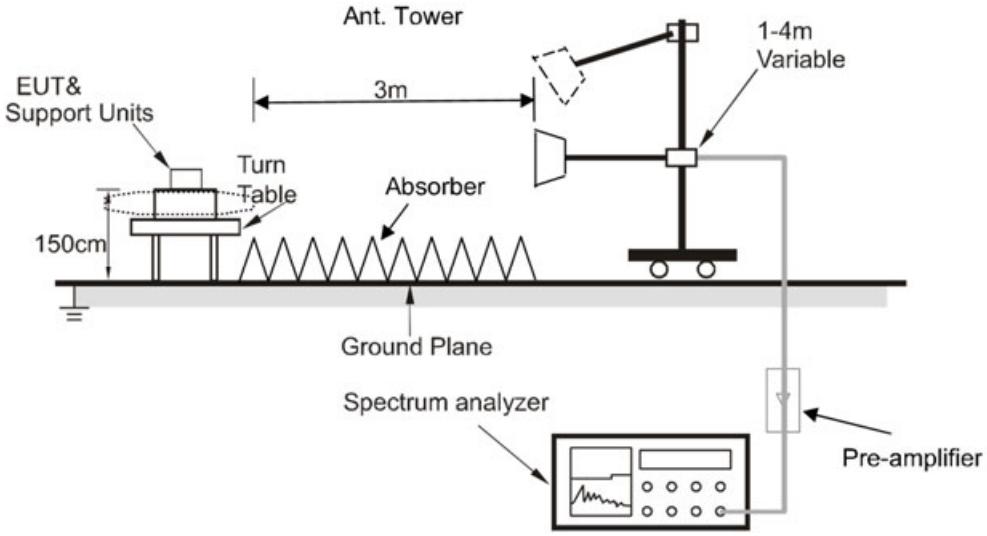
Below 30MHz:



30MHz~1GHz:



Above 1GHz:



For the actual test configuration, please refer to the related item – Photographs of the test setup.

5.9.3 Test procedure

a) Test method: ANSI C63.10-2013 Sections 6.3, 6.4, 6.5 and 6.6; KDB 789033 D02 v02r01 Sections G3, G4, G5, and G6.
b) The EUT is placed on an on-conducting table 0.8 meters above the ground plane for measurement below 1GHz, 1.5 meters above the ground plane for measurement above 1GHz.
c) Emission blew 18 GHz were measured at a 3 meters test distance, above 18 GHz were measured at 1-meter test distance with the application of a distance correction factor
d) The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Test instrument setup

Frequency	Test receiver / Spectrum analyzer setting
9 kHz ~ 150 kHz	Quasi Peak / RBW: 200 Hz
150 kHz ~ 30 MHz	Quasi Peak / RBW: 9 kHz
30 MHz ~ 1 GHz	Quasi Peak / RBW: 120 kHz
Above 1 GHz	Peak / RBW: 1 MHz, VBW: 3MHz, Peak detector AVG / RBW: 1 MHz, VBW: 3MHz, Average detector

1.1.1 Test results

Notes:

All emissions that are in the restricted bands specified in §15.205 are subject to the limit of §15.209.

All spurious emissions that are outside of the restricted bands are subject to a peak emission limit of § 15.407(b). And for above 1000 MHz, the field strength shall be computed as follows:

E[dBμV/m] = EIRP[dBm] + 95.2, for test distance = 3 m

Worst case configuration:

All channels, modes and modulations/data rates were investigated among all U-NII bands. Only the worst-case results shown in the report.

For blew 30MHz tests, there were no emissions found within 20dB of the limit.

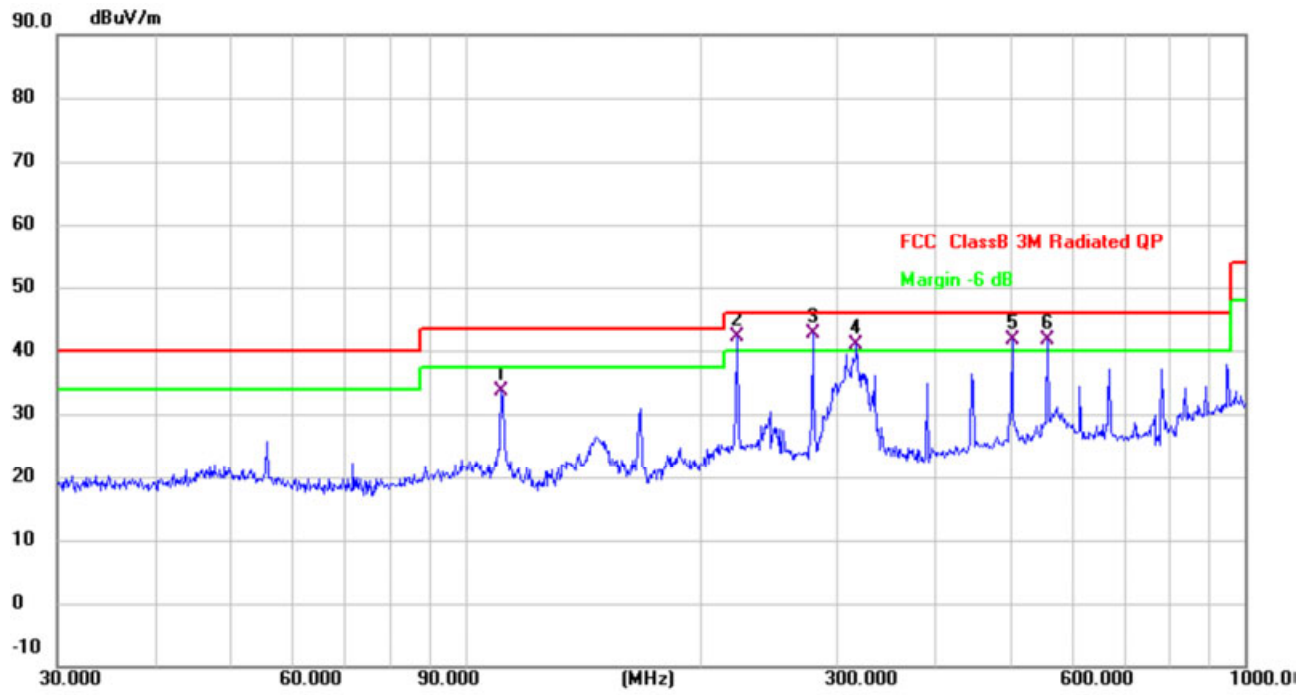
Calculation formula:

Measurement (dBμV/m) = Reading Level (dBμV) + Correct Factor (dB/m)

Over (dB) = Measurement (dBμV/m) – Limit (dBμV/m)

Radiated emissions between 30MHz – 1GHz

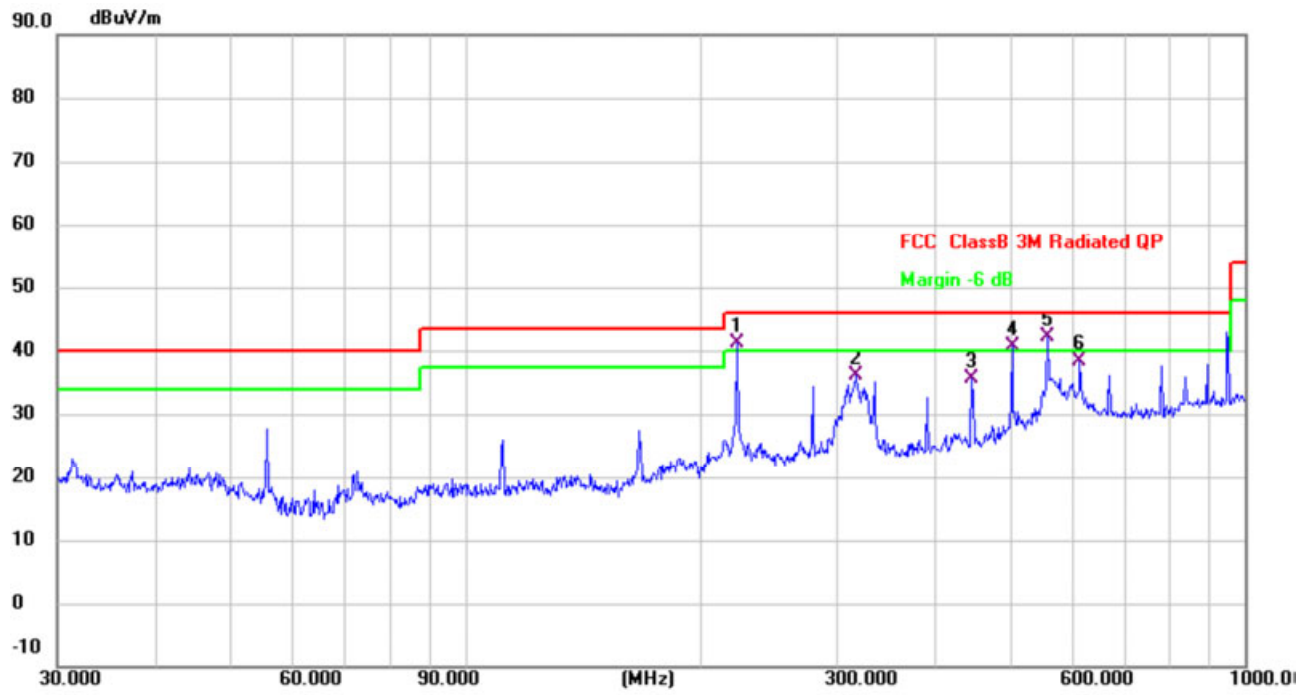
Test mode:	802.11a-CH40 TX mode	Polarization:	Horizontal
Power supply:	DC 12V	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		111.3468	42.65	-8.96	33.69	43.50	-9.81	QP
2	!	223.7333	49.25	-7.03	42.22	46.00	-3.78	QP
3	*	279.0436	48.40	-5.66	42.74	46.00	-3.26	QP
4	!	317.7010	45.67	-4.91	40.76	46.00	-5.24	QP
5	!	502.9395	43.82	-2.20	41.62	46.00	-4.38	QP
6	!	558.7300	42.60	-0.95	41.65	46.00	-4.35	QP

Radiated emissions between 30MHz – 1GHz

Test mode:	802.11a-CH40 TX mode	Polarization:	Vertical
Power supply:	DC 12V	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	!	222.9500	48.08	-7.05	41.03	46.00	-4.97	QP
2		316.5889	41.02	-4.97	36.05	46.00	-9.95	QP
3		446.4139	39.03	-3.47	35.56	46.00	-10.44	QP
4	!	502.9395	42.79	-2.20	40.59	46.00	-5.41	QP
5	*	558.7300	43.01	-0.95	42.06	46.00	-3.94	QP
6		614.2142	38.48	0.00	38.48	46.00	-7.52	QP

Radiated emissions 1 GHz ~ 18 GHz (U-NII-1 band)

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11a – CH36 (5180 MHz) TX mode							
10360	54.96	7.09	62.05	68.2	-6.15	Peak	V
15540	44.95	13.41	58.36	74	-15.64	Peak	V
15540	32.06	13.41	45.47	54	-8.53	AVG	V
10360	43.15	7.09	50.24	68.2	-17.96	Peak	H
15540	45.36	13.41	58.77	74	-15.23	Peak	H
15540	32.25	13.41	45.66	54	-8.34	AVG	H
802.11a – CH40 (5200 MHz) TX mode							
10400	54.25	7.16	61.41	68.2	-6.79	Peak	V
15600	46.31	13.44	59.75	74	-14.25	Peak	V
15600	31.81	13.44	45.25	54	-8.75	AVG	V
10400	43.29	7.16	50.45	68.2	-23.55	Peak	H
15600	45.36	13.44	58.80	74	-15.20	Peak	H
15600	32.18	13.44	45.62	54	-8.38	AVG	H
802.11a – CH48 (5240 MHz) TX mode							
10480	53.64	7.31	60.95	68.2	-7.25	Peak	V
15720	45.49	13.50	58.99	74	-15.01	Peak	V
15720	32.31	13.50	45.81	54	-8.19	AVG	V
10480	42.96	7.31	50.27	68.2	-23.73	Peak	H
15720	46.13	13.50	59.63	74	-14.37	Peak	H
15720	32.13	13.50	45.63	54	-8.37	AVG	H

Radiated emissions 18 GHz ~ 40 GHz (U-NII-1 band)

Frequency	Reading Level	Correct Factor	Dist. Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	dB	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11a – CH36 (5180 MHz) TX mode								
20720	62.63	-7.9	-9.5	45.23	74	-28.77	Peak	V
20720	50.66	-7.9	-9.5	33.26	54	-20.74	AVG	V
36430	59.07	4.44	-9.5	54.01	74	-19.99	Peak	V
36430	49.64	4.44	-9.5	44.58	54	-9.42	AVG	V
20720	61.77	-7.9	-9.5	44.37	74	-29.63	Peak	H
20720	49.91	-7.9	-9.5	32.51	54	-21.49	AVG	H
36430	58.7	4.44	-9.5	53.64	74	-20.36	Peak	H
36430	50.14	4.44	-9.5	45.08	54	-8.92	AVG	H
802.11a – CH40 (5200 MHz) TX mode								
20800	59.45	-7.89	-9.5	42.06	74	-31.94	Peak	V
20800	51.09	-7.89	-9.5	33.7	54	-20.3	AVG	V
36430	58.69	4.44	-9.5	53.63	74	-20.37	Peak	V
36430	49.28	4.44	-9.5	44.22	54	-9.78	AVG	V
20800	59.75	-7.89	-9.5	42.36	74	-31.64	Peak	H
20800	51.18	-7.89	-9.5	33.79	54	-20.21	AVG	H
36430	58.18	4.44	-9.5	53.12	74	-20.88	Peak	H
36430	48.79	4.44	-9.5	43.73	54	-10.27	AVG	H
802.11a – CH48 (5240 MHz) TX mode								
20960	60.42	-7.87	-9.5	43.05	74	-30.95	Peak	V
20960	50.38	-7.87	-9.5	33.01	54	-20.99	AVG	V
36430	59.85	4.44	-9.5	54.79	74	-19.21	Peak	V
36430	48.79	4.44	-9.5	43.73	54	-10.27	AVG	V
20960	60.14	-7.87	-9.5	42.77	74	-31.23	Peak	H
20960	49.69	-7.87	-9.5	32.32	54	-21.68	AVG	H
36430	58.64	4.44	-9.5	53.58	74	-20.42	Peak	H
36430	50.05	4.44	-9.5	44.99	54	-9.01	AVG	H

Notes:

For above 18GHz tests, the test distance is 1m.

Radiated emissions 1 GHz ~ 18 GHz (U-NII-3 band)

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11a – CH149 (5745 MHz) TX mode							
11490	51.46	9.26	60.72	74	-13.28	Peak	V
11490	37.37	9.26	46.63	54	-7.37	AVG	V
17235	45.60	14.63	60.23	74	-13.77	Peak	V
17235	33.01	14.63	47.64	54	-6.36	AVG	V
11490	43.94	9.26	53.20	74	-20.80	Peak	H
11490	32.72	9.26	41.98	54	-12.02	AVG	H
17235	45.14	14.63	59.77	74	-14.23	Peak	H
17235	32.16	14.63	46.79	54	-7.21	AVG	H
802.11a – CH157 (5785 MHz) TX mode							
11650	44.63	9.58	54.21	74	-19.79	Peak	V
11650	33.22	9.58	42.80	54	-11.20	AVG	V
17475	45.61	14.97	60.58	74	-13.42	Peak	V
17475	32.87	14.97	47.84	54	-6.16	AVG	V
11650	44.60	9.58	54.18	74	-19.82	Peak	H
11650	32.60	9.58	42.18	54	-11.82	AVG	H
17475	45.96	14.97	60.93	74	-13.07	Peak	H
17475	32.69	14.97	47.66	54	-6.34	AVG	H
802.11a – CH165 (5825 MHz) TX mode							
11570	49.03	9.43	58.46	74	-15.54	Peak	V
11570	37.40	9.43	46.83	54	-7.17	AVG	V
17355	44.69	14.80	59.49	74	-14.51	Peak	V
17355	32.88	14.80	47.68	54	-6.32	AVG	V
11570	44.17	9.43	53.60	74	-20.40	Peak	H
11570	34.77	9.43	44.20	54	-9.80	AVG	H
17355	44.70	14.80	59.50	74	-14.50	Peak	H
17355	33.14	14.80	47.94	54	-6.06	AVG	H

Radiated emissions 18 GHz ~ 40 GHz (U-NII-3 band)

Frequency	Reading Level	Correct Factor	Dist. Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	dB	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11a – CH149 (5745 MHz) TX mode								
22980	59.99	-5.22	-9.5	45.27	74	-28.73	Peak	V
22980	50.27	-5.22	-9.5	35.55	54	-18.45	AVG	V
36430	59.07	4.44	-9.5	54.01	74	-19.99	Peak	V
36430	49.64	4.44	-9.5	44.58	54	-9.42	AVG	V
20720	59.41	-7.9	-9.5	42.01	74	-31.99	Peak	H
20720	49.69	-7.9	-9.5	32.29	54	-21.71	AVG	H
36430	59.62	4.44	-9.5	54.56	74	-19.44	Peak	H
36430	50.36	4.44	-9.5	45.3	54	-8.7	AVG	H
802.11a – CH157 (5785 MHz) TX mode								
23140	60.64	-5.22	-9.5	45.92	68.2	-22.28	Peak	V
36430	59.73	4.44	-9.5	54.67	74	-19.33	Peak	V
36430	50.4	4.44	-9.5	45.34	54	-8.66	AVG	V
23140	60.27	-7.89	-9.5	42.88	68.2	-25.32	Peak	H
36430	58.66	4.44	-9.5	53.6	74	-20.4	Peak	H
36430	50.33	4.44	-9.5	45.27	54	-8.73	AVG	H
802.11a – CH165 (5825 MHz) TX mode								
23300	60.21	-5.25	-9.5	45.46	68.2	-22.74	Peak	V
36430	59.24	4.44	-9.5	54.18	74	-19.82	Peak	V
36430	50.26	4.44	-9.5	45.2	54	-8.8	AVG	V
23300	61.18	-7.87	-9.5	43.81	68.2	-24.39	Peak	H
36430	59.73	4.44	-9.5	54.67	74	-19.33	Peak	H
36430	50.47	4.44	-9.5	45.41	54	-8.59	AVG	H

Notes:

For above 18GHz tests, the test distance is 1m.

Radiated emissions at band edge – U-NII-1 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11a – CH36 (5180 MHz) TX mode							
4500	46.37	0.91	47.28	74	-26.72	Peak	V
4500	35.8	0.91	36.71	54	-17.29	AVG	V
5150	61.62	2.41	64.03	74	-9.97	Peak	V
5150	45.3	2.41	47.71	54	-6.29	AVG	V
4500	45.98	0.91	46.89	74	-27.11	Peak	H
4500	36.51	0.91	37.42	54	-16.58	AVG	H
5150	64.21	2.41	66.62	74	-7.38	Peak	H
5150	47.4	2.41	49.81	54	-4.19	AVG	H
802.11a – CH48 (5240 MHz) TX mode							
5350	43.48	3.05	45.91	74	-28.09	Peak	V
5350	33.51	3.05	36.74	54	-17.26	AVG	V
5460	42.48	3.41	46.5	74	-27.5	Peak	V
5460	33.09	3.41	36.81	54	-17.19	AVG	V
5350	42.76	3.05	45.81	74	-28.19	Peak	H
5350	33.76	3.05	36.81	54	-17.19	AVG	H
5460	41.99	3.41	45.4	74	-28.6	Peak	H
5460	33.1	3.41	36.51	54	-17.49	AVG	H

Radiated emissions at band edge – U-NII-1 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11n20 – CH36 (5180 MHz) TX mode							
4500	45.66	0.91	46.57	74	-27.43	Peak	V
4500	35.7	0.91	36.61	54	-17.39	AVG	V
5150	55.62	2.41	58.03	74	-15.97	Peak	V
5150	44.75	2.41	47.16	54	-6.84	AVG	V
4500	45.45	0.91	46.36	74	-27.64	Peak	H
4500	36.29	0.91	37.2	54	-16.8	AVG	H
5150	59.53	2.41	61.94	74	-12.06	Peak	H
5150	47.66	2.41	50.07	54	-3.93	AVG	H
802.11n20 – CH48 (5240 MHz) TX mode							
5350	43.73	3.05	45.91	74	-28.09	Peak	V
5350	33.77	3.05	36.74	54	-17.26	AVG	V
5460	42.82	3.41	46.5	74	-27.5	Peak	V
5460	33.54	3.41	36.81	54	-17.19	AVG	V
5350	42.94	3.05	45.99	74	-28.01	Peak	H
5350	31.92	3.05	34.97	54	-19.03	AVG	H
5460	43.67	3.41	47.08	74	-26.92	Peak	H
5460	32	3.41	35.41	54	-18.59	AVG	H

Radiated emissions at band edge – U-NII-1 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11n40 – CH38 (5190 MHz) TX mode							
4500	47.31	0.91	48.22	74	-25.78	Peak	V
4500	36.15	0.91	37.06	54	-16.94	AVG	V
5150	52.49	2.41	54.9	74	-19.1	Peak	V
5150	41.35	2.41	43.76	54	-10.24	AVG	V
4500	46.71	0.91	47.62	74	-26.38	Peak	H
4500	36.65	0.91	37.56	54	-16.44	AVG	H
5150	56.16	2.41	58.57	74	-15.43	Peak	H
5150	44.04	2.41	46.45	54	-7.55	AVG	H
802.11n40 – CH46 (5230 MHz) TX mode							
5350	42.24	3.05	45.91	74	-28.09	Peak	V
5350	33.17	3.05	36.74	54	-17.26	AVG	V
5460	41.97	3.41	46.5	74	-27.5	Peak	V
5460	33.23	3.41	36.81	54	-17.19	AVG	V
5350	42.17	3.05	45.22	74	-28.78	Peak	H
5350	32.52	3.05	35.57	54	-18.43	AVG	H
5460	42.49	3.41	45.9	74	-28.1	Peak	H
5460	33.81	3.41	37.22	54	-16.78	AVG	H

Radiated emissions at band edge – U-NII-1 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11ac20 – CH36 (5180 MHz) TX mode							
4500	46.84	0.91	47.75	74	-26.25	Peak	V
4500	36.62	0.91	37.53	54	-16.47	AVG	V
5150	60.11	2.41	62.52	74	-11.48	Peak	V
5150	44.98	2.41	47.39	54	-6.61	AVG	V
4500	45.85	0.91	46.76	74	-27.24	Peak	H
4500	36.74	0.91	37.65	54	-16.35	AVG	H
5150	63.6	2.41	66.01	74	-7.99	Peak	H
5150	47.99	2.41	50.4	54	-3.6	AVG	H
802.11ac20 – CH48 (5240 MHz) TX mode							
5350	42.23	3.05	45.91	74	-28.09	Peak	V
5350	32.59	3.05	36.74	54	-17.26	AVG	V
5460	42.57	3.41	46.5	74	-27.5	Peak	V
5460	32.4	3.41	36.81	54	-17.19	AVG	V
5350	43.83	3.05	46.88	74	-27.12	Peak	H
5350	31.93	3.05	34.98	54	-19.02	AVG	H
5460	41.9	3.41	45.31	74	-28.69	Peak	H
5460	32.23	3.41	35.64	54	-18.36	AVG	H

Radiated emissions at band edge – U-NII-1 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11ac40 – CH38 (5190 MHz) TX mode							
4500	48.34	0.91	49.25	74	-24.75	Peak	V
4500	35.78	0.91	36.69	54	-17.31	AVG	V
5150	53.52	2.41	55.93	74	-18.07	Peak	V
5150	41.15	2.41	43.56	54	-10.44	AVG	V
4500	47.38	0.91	48.29	74	-25.71	Peak	H
4500	36.57	0.91	37.48	54	-16.52	AVG	H
5150	56.3	2.41	58.71	74	-15.29	Peak	H
5150	44.43	2.41	46.84	54	-7.16	AVG	H
802.11ac40 – CH46 (5230 MHz) TX mode							
5350	41.91	3.05	45.91	74	-28.09	Peak	V
5350	33.14	3.05	36.74	54	-17.26	AVG	V
5460	43.38	3.41	46.5	74	-27.5	Peak	V
5460	33.37	3.41	36.81	54	-17.19	AVG	V
5350	42.62	3.05	45.67	74	-28.33	Peak	H
5350	32.75	3.05	35.8	54	-18.2	AVG	H
5460	43.32	3.41	46.73	74	-27.27	Peak	H
5460	32.32	3.41	35.73	54	-18.27	AVG	H

Radiated emissions at band edge – U-NII-1 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11ac80 – CH42 (5210 MHz) TX mode							
4500	44.54	0.91	45.45	74	-28.55	Peak	V
4500	36.61	0.91	37.52	54	-16.48	AVG	V
5150	56.37	2.41	58.78	74	-15.22	Peak	V
5150	44.55	2.41	46.96	54	-7.04	AVG	V
4500	45.09	0.91	46	74	-28	Peak	H
4500	36.64	0.91	37.55	54	-16.45	AVG	H
5150	60.22	2.41	62.63	74	-11.37	Peak	H
5150	47.64	2.41	50.05	54	-3.95	AVG	H
5350	43.29	3.05	45.91	74	-28.09	Peak	V
5350	32.84	3.05	36.74	54	-17.26	AVG	V
5460	42.95	3.41	46.5	74	-27.5	Peak	V
5460	33.4	3.41	36.81	54	-17.19	AVG	V
5350	42.31	3.05	45.36	74	-28.64	Peak	H
5350	33.13	3.05	36.18	54	-17.82	AVG	H
5460	42.6	3.41	46.01	74	-27.99	Peak	H
5460	32.56	3.41	35.97	54	-18.03	AVG	H

Radiated emissions at band edge – U-NII-3 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11a – CH149 (5745 MHz) TX mode							
5650	48.14	2.2	50.34	68.2	-17.86	Peak	V
5700	56.12	2.36	58.48	105.2	-46.72	Peak	V
5720	62.66	2.42	65.08	110.8	-45.72	Peak	V
5725	73.01	2.43	75.44	122.2	-46.76	Peak	V
5650	48.47	2.2	50.67	68.2	-17.53	Peak	H
5700	57.29	2.36	59.65	105.2	-45.55	Peak	H
5720	63.99	2.42	66.41	110.8	-44.39	Peak	H
5725	75.19	2.43	77.62	122.2	-44.58	Peak	H
802.11a – CH165 (5825 MHz) TX mode							
5850	63.42	4.49	67.91	122.2	-54.29	Peak	V
5855	62.29	4.49	66.78	110.8	-44.02	Peak	V
5875	48.51	4.5	53.01	105.2	-52.19	Peak	V
5925	46.6	4.55	51.15	68.2	-17.05	Peak	V
5850	63.99	4.49	68.48	122.2	-53.72	Peak	H
5855	64.21	4.49	68.7	110.8	-42.1	Peak	H
5875	50.31	4.5	54.81	105.2	-50.39	Peak	H
5925	47.91	4.55	52.46	68.2	-15.74	Peak	H

Radiated emissions at band edge – U-NII-3 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11n20 – CH149 (5745 MHz) TX mode							
5650	47	2.2	49.2	68.2	-19	Peak	V
5700	52.12	2.36	54.48	105.2	-50.72	Peak	V
5720	68.18	2.42	70.6	110.8	-40.2	Peak	V
5725	72.86	2.43	75.29	122.2	-46.91	Peak	V
5650	47.9	2.2	50.1	68.2	-18.1	Peak	H
5700	53.8	2.36	56.16	105.2	-49.04	Peak	H
5720	69.79	2.42	72.21	110.8	-38.59	Peak	H
5725	75.51	2.43	77.94	122.2	-44.26	Peak	H
802.11 n20 – CH165 (5825 MHz) TX mode							
5850	69.15	4.49	73.64	122.2	-48.56	Peak	V
5855	57.89	4.49	62.38	110.8	-48.42	Peak	V
5875	53.06	4.5	57.56	105.2	-47.64	Peak	V
5925	45.11	4.55	49.66	68.2	-18.54	Peak	V
5850	69.79	4.49	74.28	122.2	-47.92	Peak	H
5855	60.53	4.49	65.02	110.8	-45.78	Peak	H
5875	54.52	4.5	59.02	105.2	-46.18	Peak	H
5925	47.69	4.55	52.24	68.2	-15.96	Peak	H

Radiated emissions at band edge – U-NII-3 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11n40 – CH151 (5755 MHz) TX mode							
5650	46.69	2.2	48.89	68.2	-19.31	Peak	V
5700	48.5	2.36	50.86	105.2	-54.34	Peak	V
5720	57.17	2.42	59.59	110.8	-51.21	Peak	V
5725	58.58	2.43	61.01	122.2	-61.19	Peak	V
5650	47.46	2.2	49.66	68.2	-18.54	Peak	H
5700	50.11	2.36	52.47	105.2	-52.73	Peak	H
5720	59.61	2.42	62.03	110.8	-48.77	Peak	H
5725	61.14	2.43	63.57	122.2	-58.63	Peak	H
802.11 n40 – CH159 (5795 MHz) TX mode							
5850	59.62	4.49	64.11	122.2	-58.09	Peak	V
5855	55	4.49	59.49	110.8	-51.31	Peak	V
5875	45.85	4.5	50.35	105.2	-54.85	Peak	V
5925	46.18	4.55	50.73	68.2	-17.47	Peak	V
5850	59.61	4.49	64.1	122.2	-58.1	Peak	H
5855	56.16	4.49	60.65	110.8	-50.15	Peak	H
5875	48.45	4.5	52.95	105.2	-52.25	Peak	H
5925	48.15	4.55	52.7	68.2	-15.5	Peak	H

Radiated emissions at band edge – U-NII-3 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11ac20 – CH149 (5745 MHz) TX mode							
5650	48.59	2.2	50.79	68.2	-17.41	Peak	V
5700	54.35	2.36	56.71	105.2	-48.49	Peak	V
5720	65.26	2.42	67.68	110.8	-43.12	Peak	V
5725	73.68	2.43	76.11	122.2	-46.09	Peak	V
5650	48.76	2.2	50.96	68.2	-17.24	Peak	H
5700	55.86	2.36	58.22	105.2	-46.98	Peak	H
5720	66.83	2.42	69.25	110.8	-41.55	Peak	H
5725	76.46	2.43	78.89	122.2	-43.31	Peak	H
802.11ac20 – CH165 (5825 MHz) TX mode							
5850	66.54	4.49	71.03	122.2	-51.17	Peak	V
5855	63.15	4.49	67.64	110.8	-43.16	Peak	V
5875	53.19	4.5	57.69	105.2	-47.51	Peak	V
5925	45.59	4.55	50.14	68.2	-18.06	Peak	V
5850	66.83	4.49	71.32	122.2	-50.88	Peak	H
5855	64.6	4.49	69.09	110.8	-41.71	Peak	H
5875	54.77	4.5	59.27	105.2	-45.93	Peak	H
5925	46.7	4.55	51.25	68.2	-16.95	Peak	H

Radiated emissions at band edge – U-NII-3 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11ac40 – CH151 (5755 MHz) TX mode							
5650	48.04	2.2	50.24	68.2	-17.96	Peak	V
5700	48.02	2.36	50.38	105.2	-54.82	Peak	V
5720	57.97	2.42	60.39	110.8	-50.41	Peak	V
5725	59.44	2.43	61.87	122.2	-60.33	Peak	V
5650	47.53	2.2	49.73	68.2	-18.47	Peak	H
5700	49.72	2.36	52.08	105.2	-53.12	Peak	H
5720	60.91	2.42	63.33	110.8	-47.47	Peak	H
5725	61.01	2.43	63.44	122.2	-58.76	Peak	H
802.11ac40 – CH159 (5795 MHz) TX mode							
5850	61.57	4.49	66.06	122.2	-56.14	Peak	V
5855	54.16	4.49	58.65	110.8	-52.15	Peak	V
5875	46.42	4.5	50.92	105.2	-54.28	Peak	V
5925	46.54	4.55	51.09	68.2	-17.11	Peak	V
5850	60.91	4.49	65.4	122.2	-56.8	Peak	H
5855	56.3	4.49	60.79	110.8	-50.01	Peak	H
5875	48.16	4.5	52.66	105.2	-52.54	Peak	H
5925	47.66	4.55	52.21	68.2	-15.99	Peak	H

Radiated emissions at band edge – U-NII-3 band

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
802.11ac80 – CH155 (5775 MHz) TX mode							
5650	47.87	2.2	50.07	68.2	-18.13	Peak	V
5700	57.62	2.36	59.98	105.2	-45.22	Peak	V
5720	63.13	2.42	65.55	110.8	-45.25	Peak	V
5725	65.28	2.43	67.71	122.2	-54.49	Peak	V
5650	47.81	2.2	50.01	68.2	-18.19	Peak	H
5700	58.96	2.36	61.32	105.2	-43.88	Peak	H
5720	64.35	2.42	66.77	110.8	-44.03	Peak	H
5725	67.08	2.43	69.51	122.2	-52.69	Peak	H
5850	63.13	4.49	67.62	122.2	-54.58	Peak	V
5855	60.22	4.49	64.71	110.8	-46.09	Peak	V
5875	55.55	4.5	60.05	105.2	-45.15	Peak	V
5925	48.42	4.55	52.97	68.2	-15.23	Peak	V
5850	63.74	4.49	68.23	122.2	-53.97	Peak	H
5855	60.26	4.49	64.75	110.8	-46.05	Peak	H
5875	56.77	4.5	61.27	105.2	-43.93	Peak	H
5925	49.28	4.55	53.83	68.2	-14.37	Peak	H

5.10 Frequency Stability Measurement

5.10.1 Limits

Manufactures 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.

5.10.2 Test Procedures

ANSI C63.10-2013 Clause 6.8.

5.10.3 Test results

Note: the extreme temperature is -20℃ ~ 70℃, which is declared by manufacture

Operating frequency: 5200 MHz			
Power Supply (VDC)	Temperature (℃)	Measured Frequency (MHz)	Frequency Deviation (ppm)
12V	-20	5180.016	3.11
	-10	5180.016	3.03
	0	5180.014	2.78
	10	5180.014	2.7
	20	5180.015	2.95
	30	5180.014	2.76
	40	5180.016	2.99
	50	5180.014	2.66
	60	5180.013	2.55
	70	5180.014	2.74
13.8V	20	5180.017	3.19
10.2V	20	5180.016	3.03

Operating frequency: 5785 MHz			
Power Supply (VDC)	Temperature (℃)	Measured Frequency (MHz)	Frequency Deviation
12V	-20	5785.0153	2.64
	-10	5785.0173	2.99
	0	5785.0164	2.83
	10	5785.0148	2.56
	20	5785.0166	2.87
	30	5785.0174	3.01
	40	5785.0166	2.87
	50	5785.0151	2.61
	60	5785.0161	2.78
	70	5785.0166	2.87
13.8V	20	5785.0162	2.8
10.2V	20	5785.0163	2.82

Photographs of the Test Setup

See the appendix – Test Setup Photos.

Photographs of the EUT

See the appendix - EUT Photos.

----End of Report----