

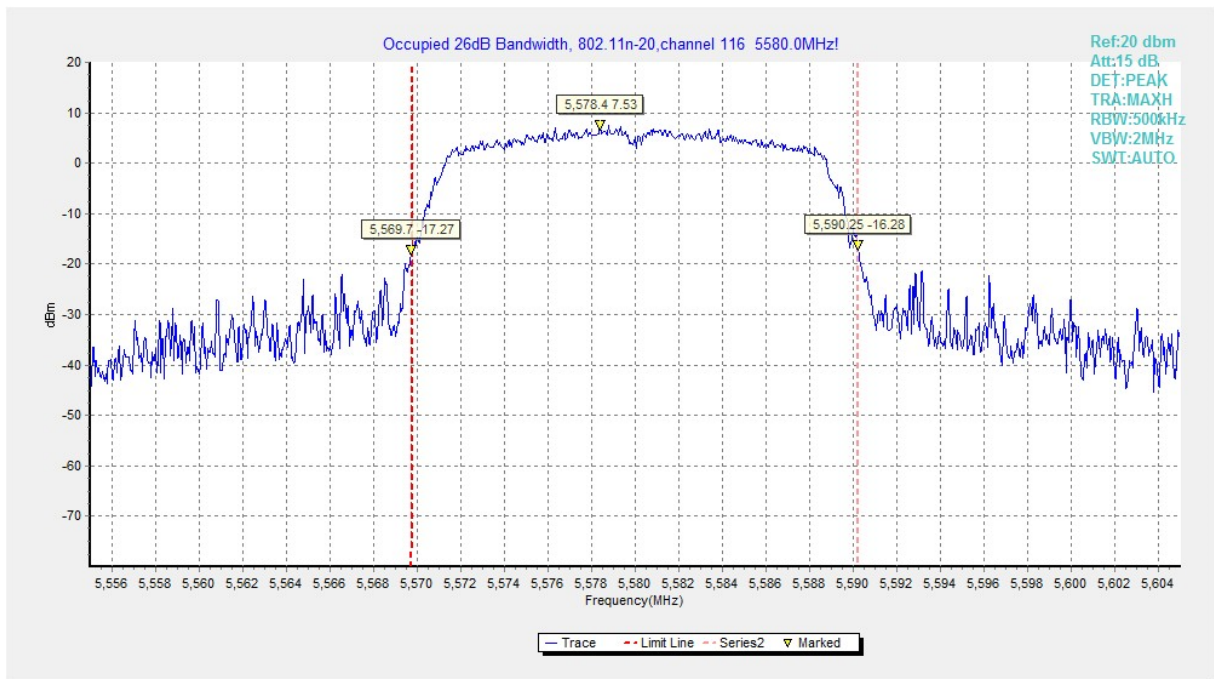


Fig.18 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

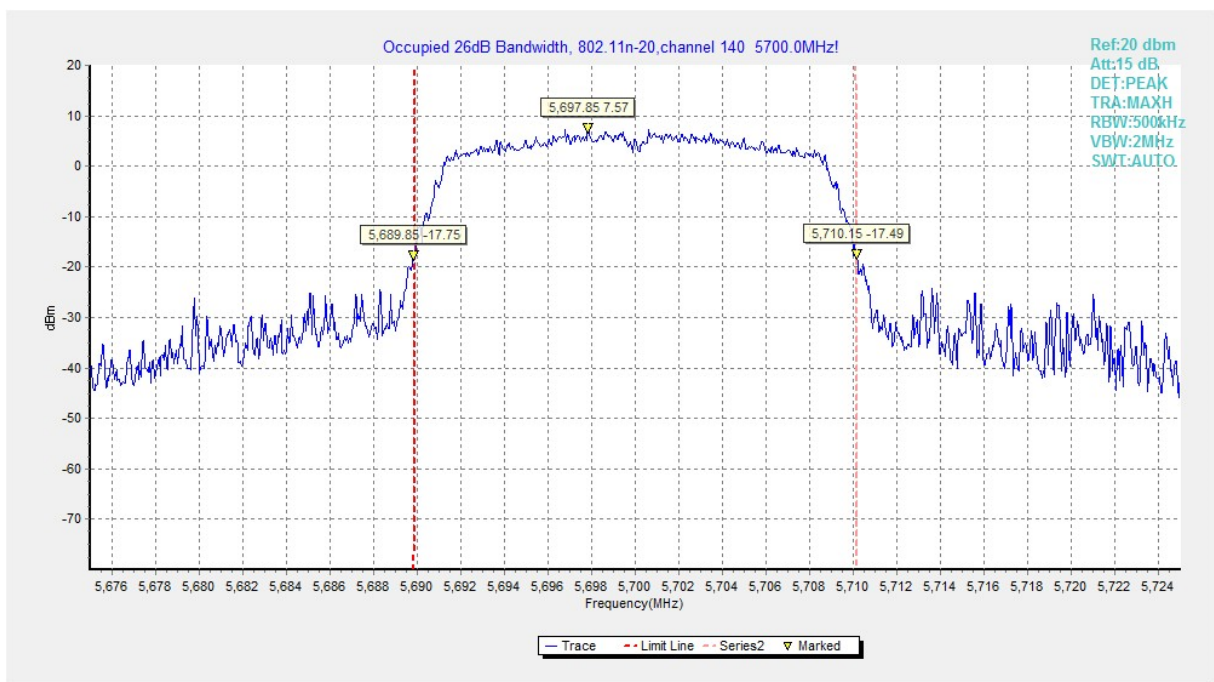


Fig.19 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

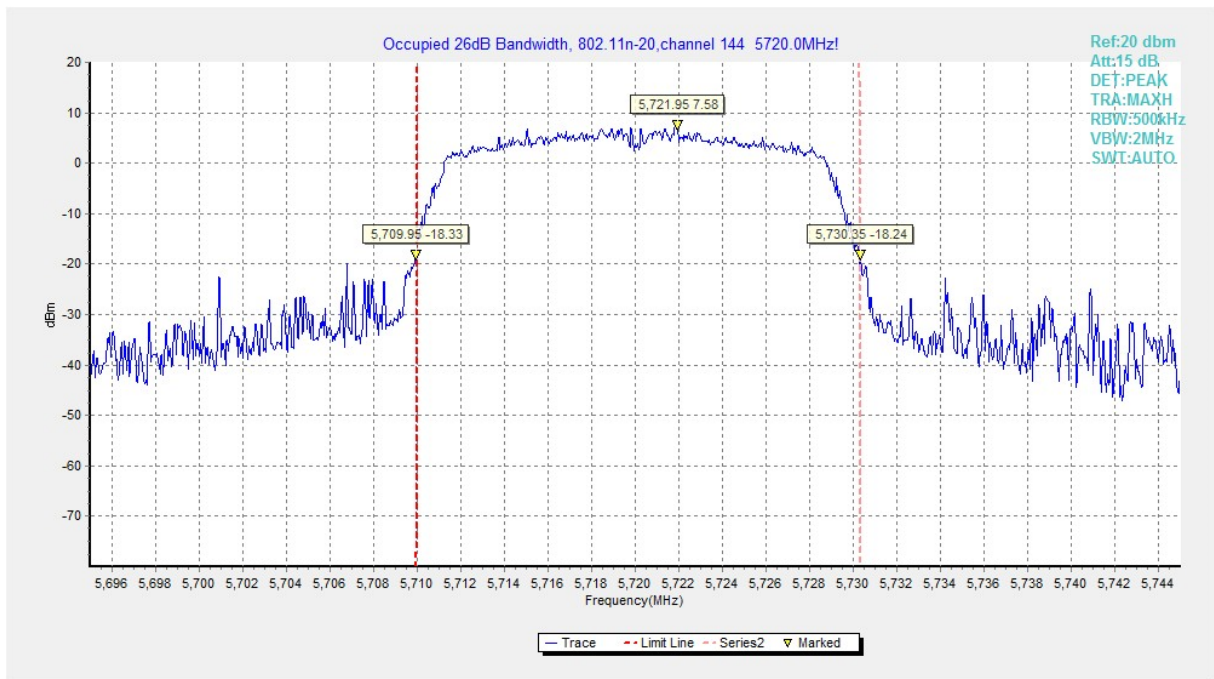


Fig.20 Occupied 26dB Bandwidth (802. 11n-HT20, 5720MHz)

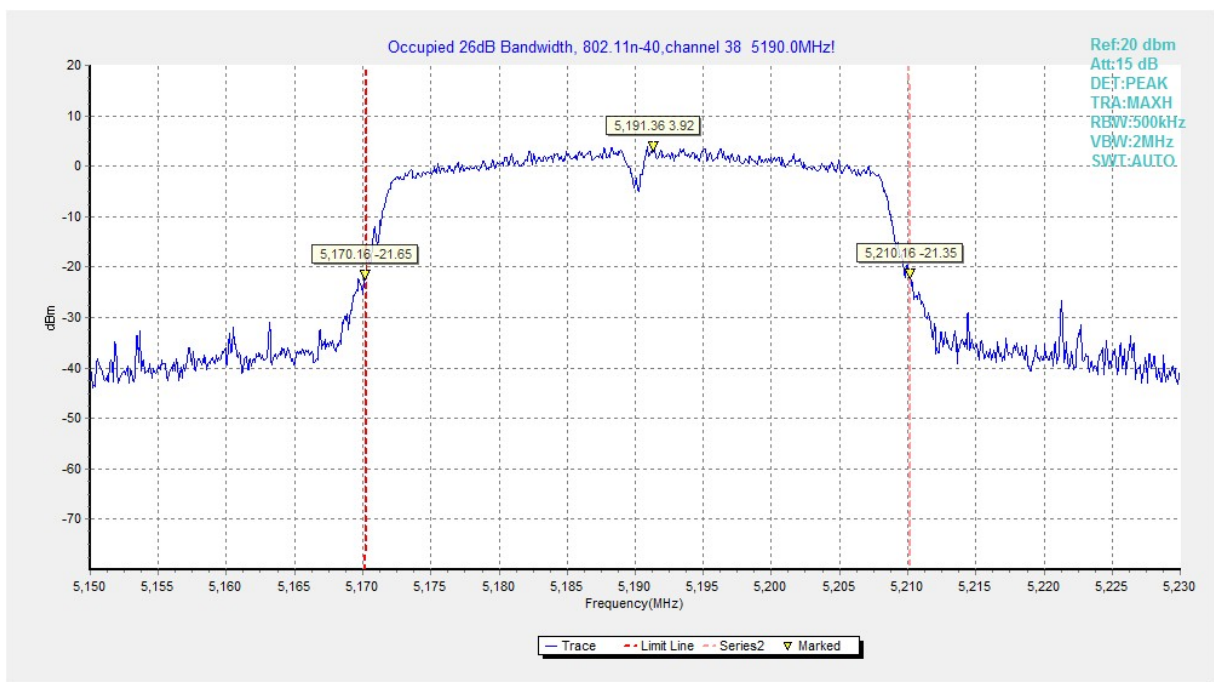


Fig.21 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

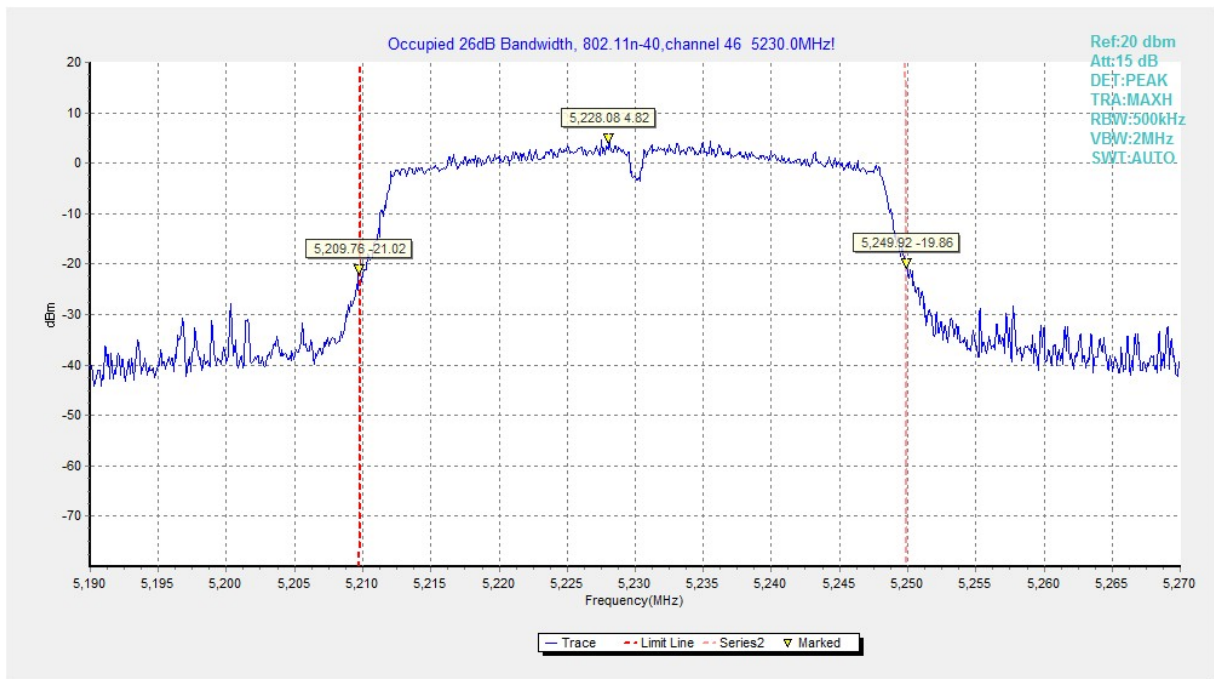


Fig.22 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

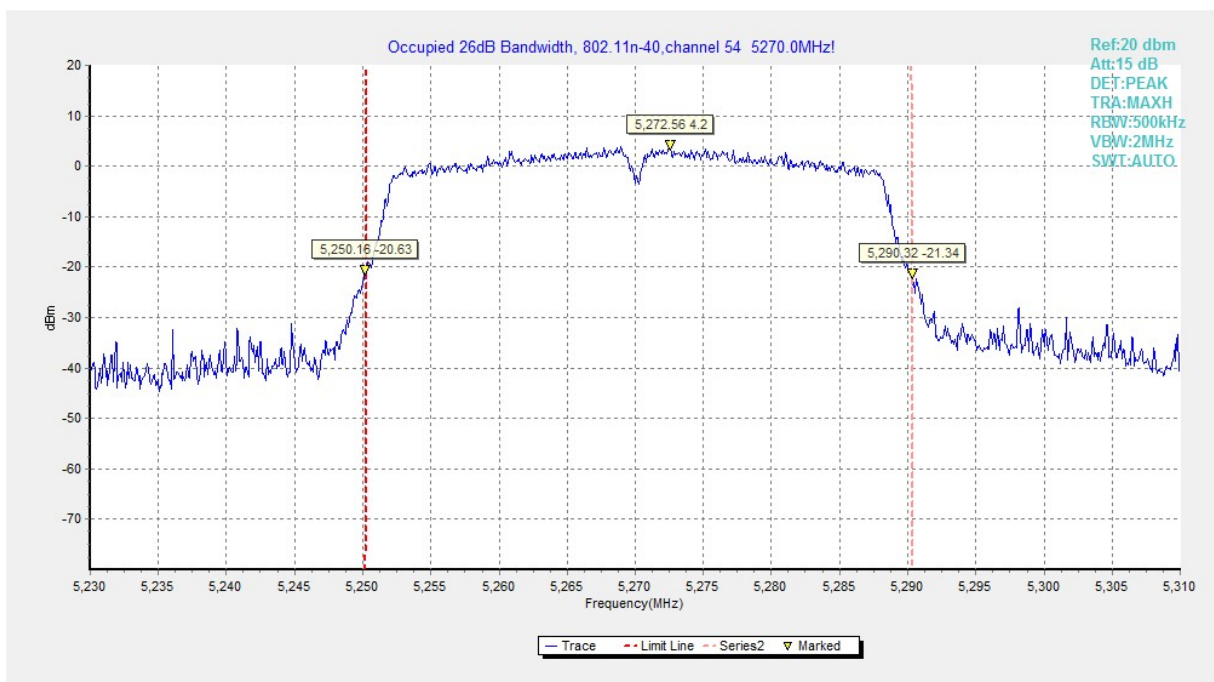


Fig.23 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

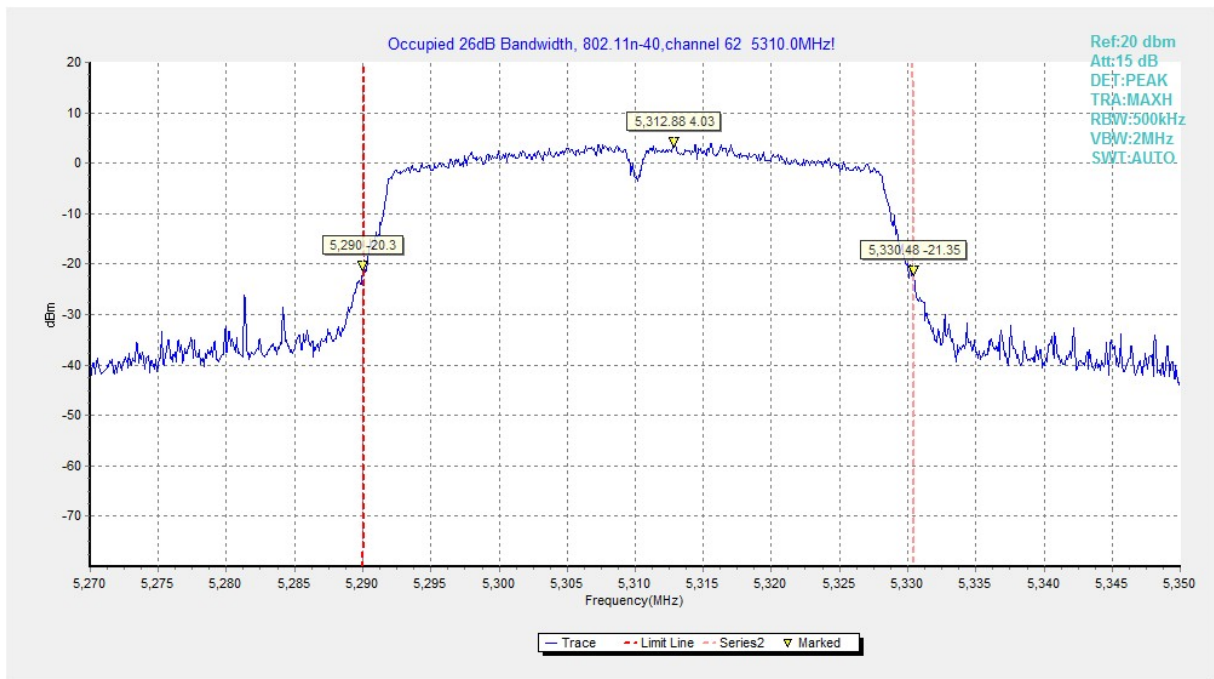


Fig.24 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

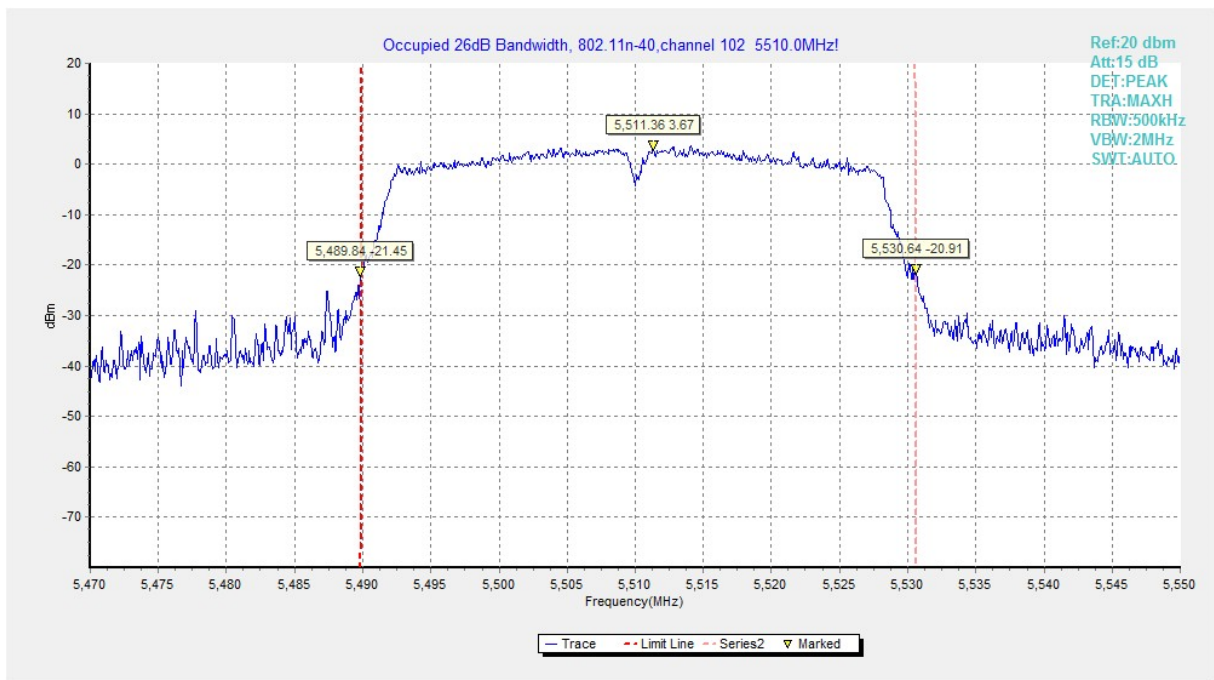


Fig.25 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

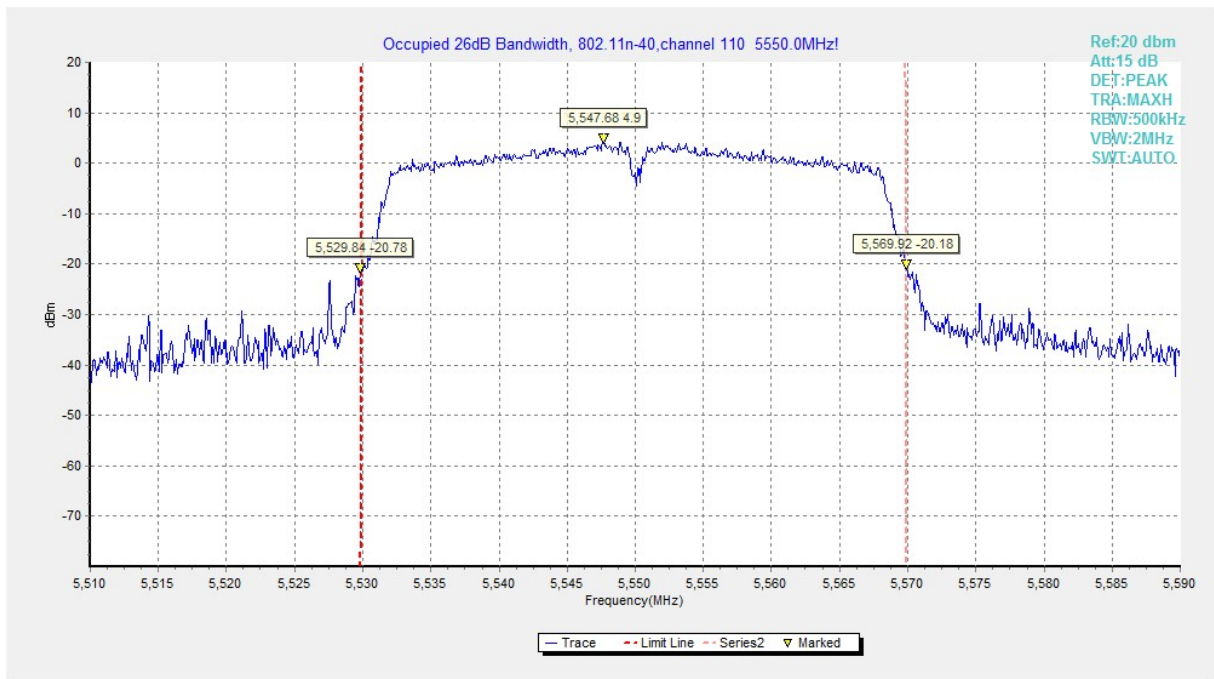


Fig.26 Occupied 26dB Bandwidth (802. 11n-HT40, 5590MHz)

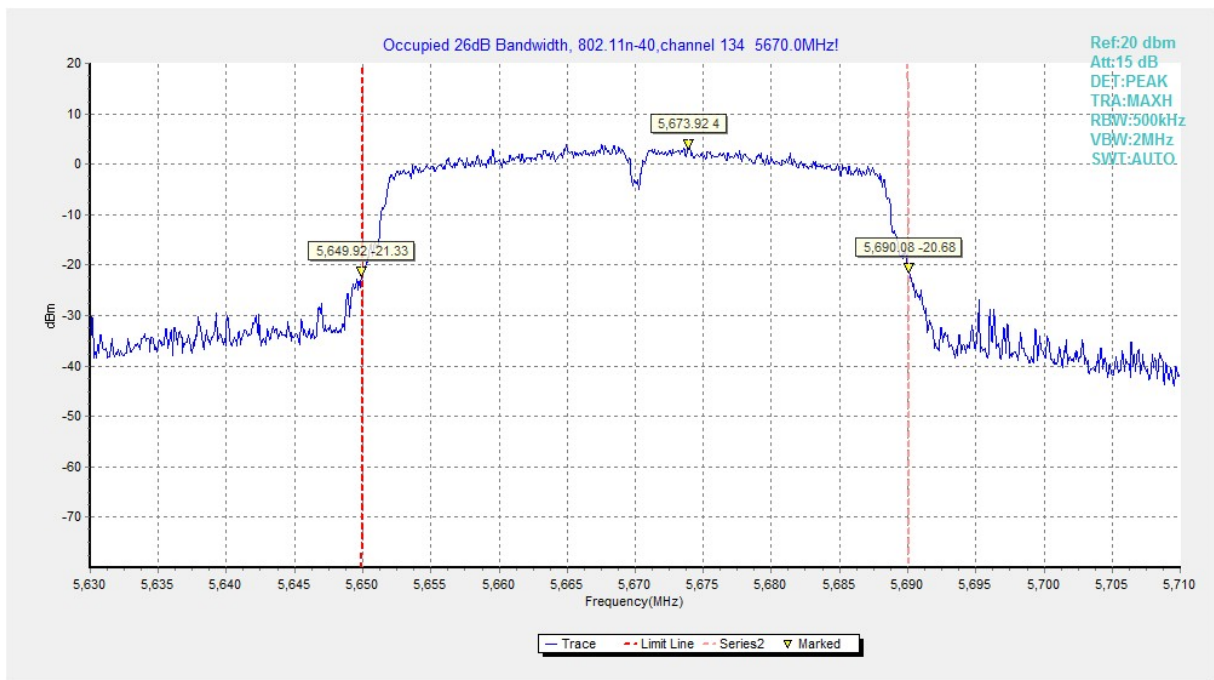


Fig.27 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

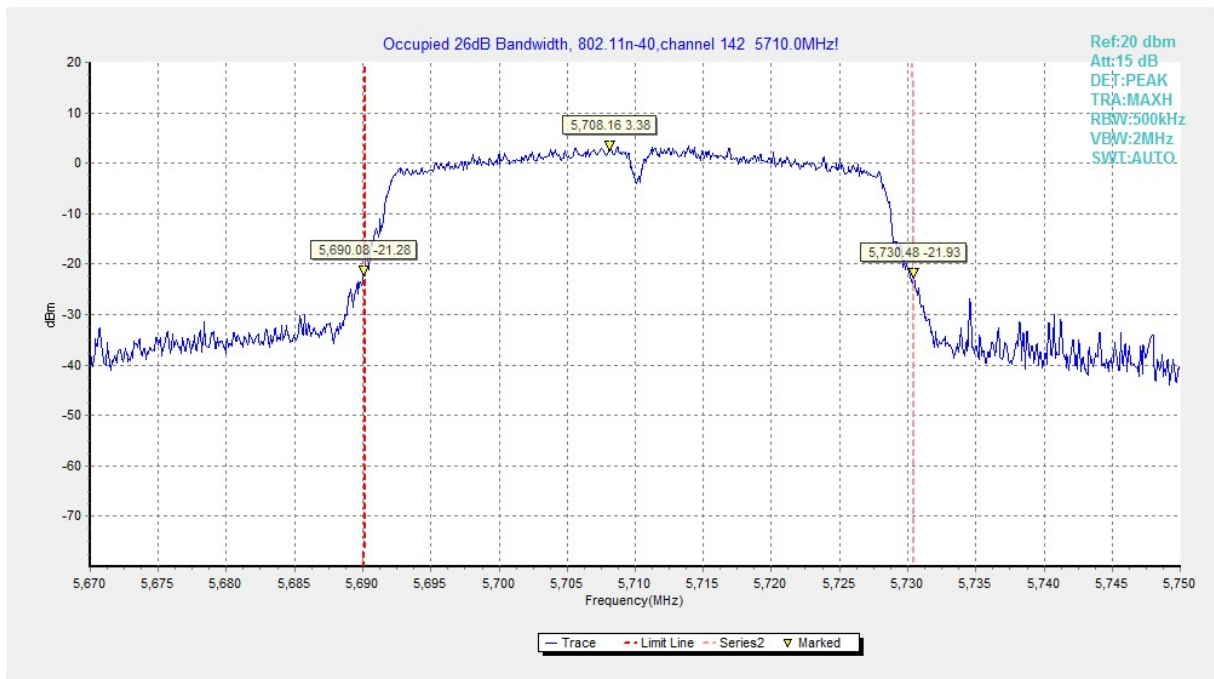


Fig.28 Occupied 26dB Bandwidth (802. 11n-HT40, 5710MHz)

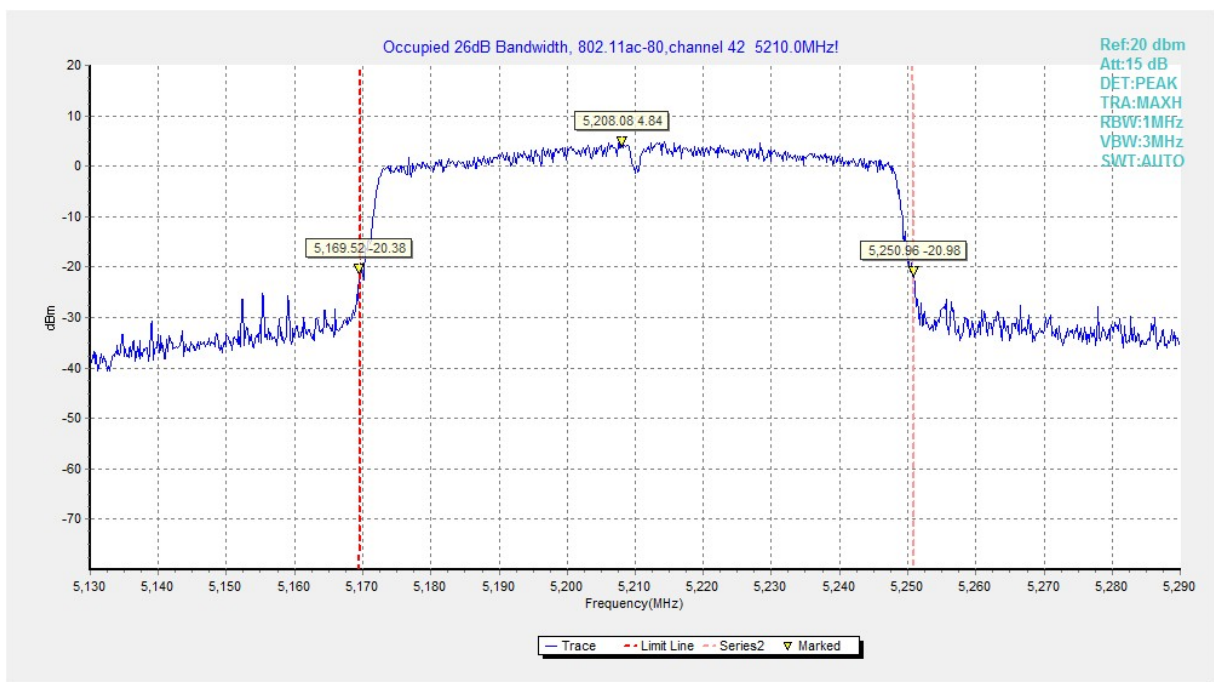


Fig.29 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

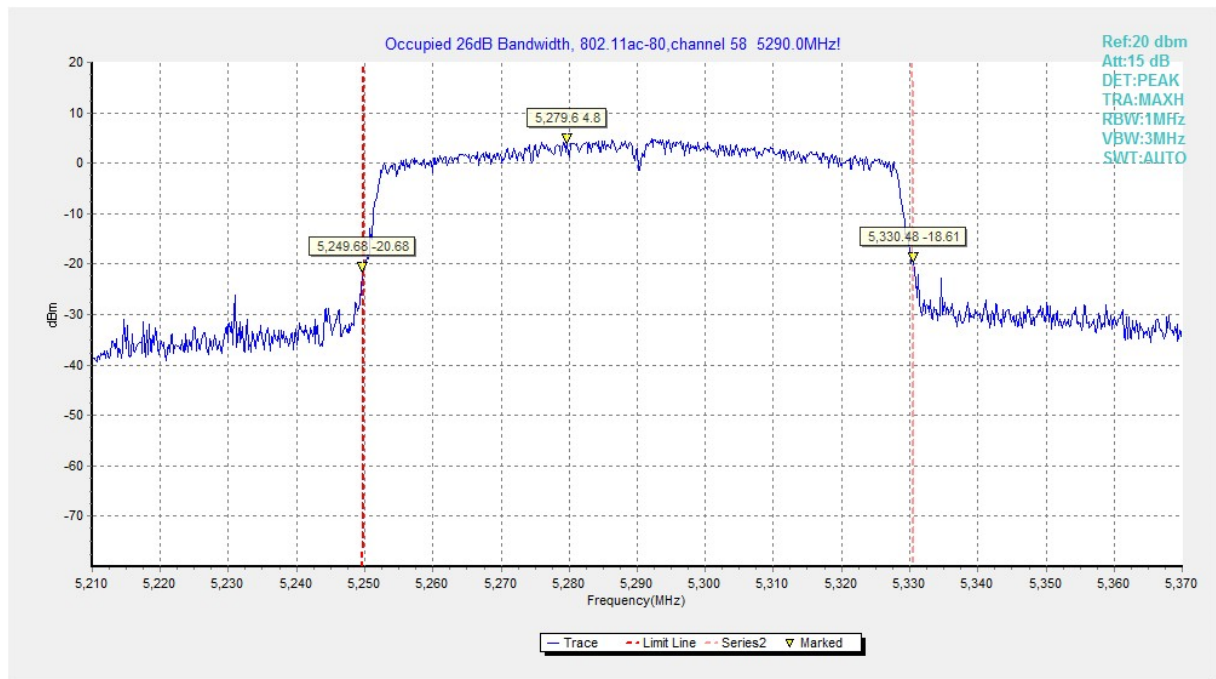


Fig.30 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

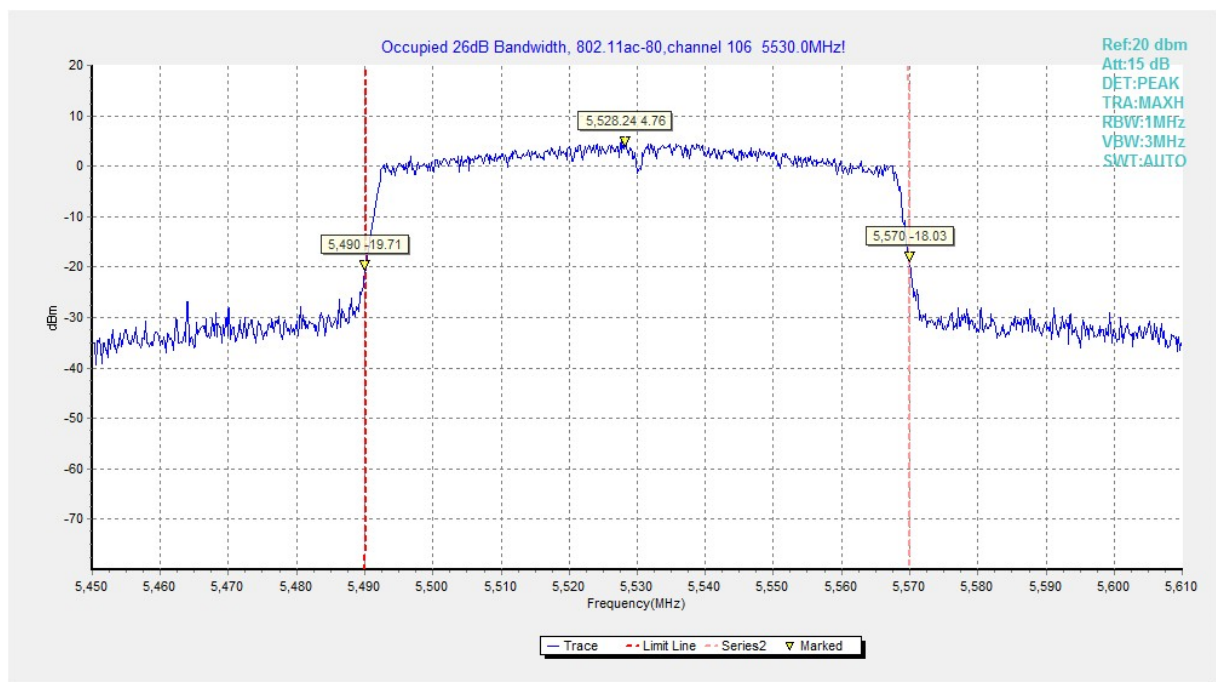


Fig.31 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

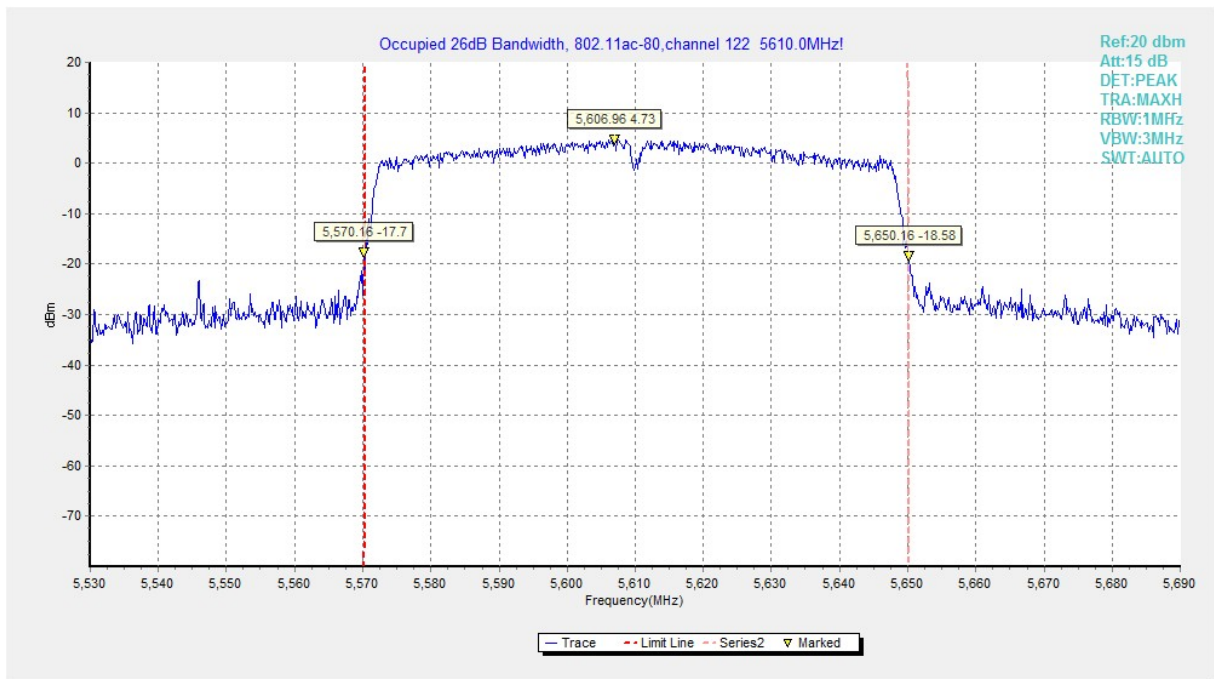


Fig.32 Occupied 26dB Bandwidth (802. 11ac-HT80, 5610MHz)

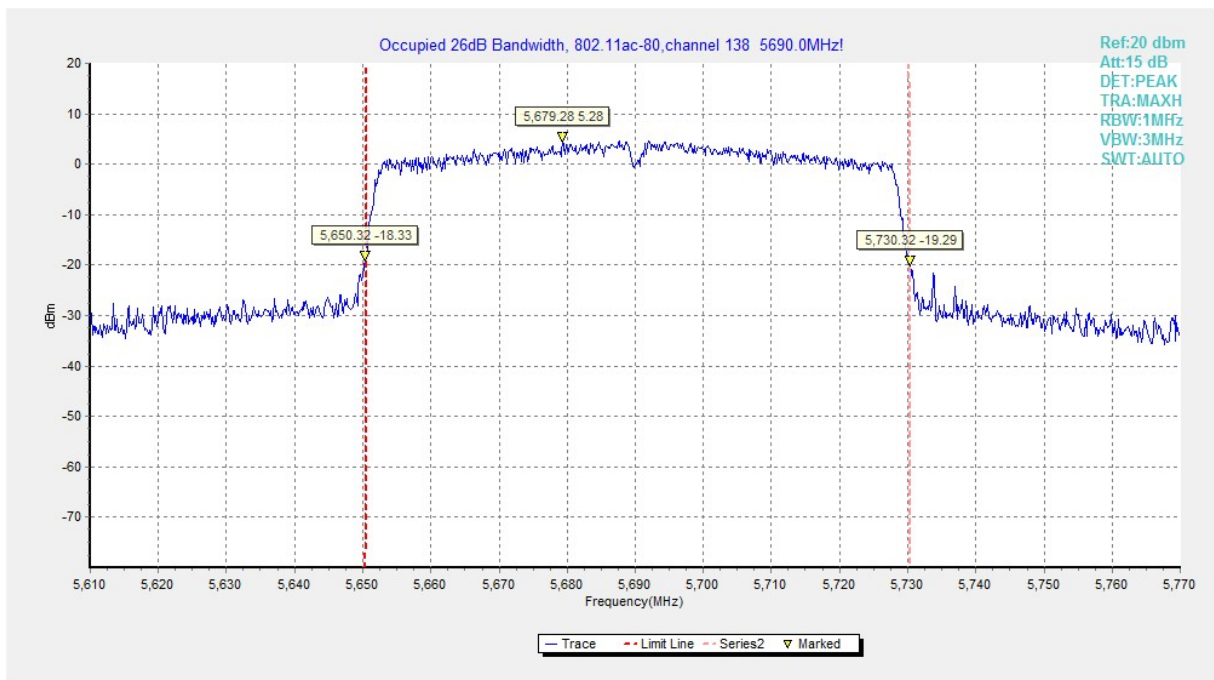


Fig.33 Occupied 26dB Bandwidth (802. 11ac-HT80, 5690MHz)

A.5. Band Edges Compliance

A5.1 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dBm/MHz)	
FCC 47 CFR Part 15.407	at the band edge	27
	at 5 MHz above or below the band edge	15.6
	at 25 MHz above or below the band edge	10
	at 75 MHz or more above or below the band edge	-27
	Note: Increasing linearly from point to point.	

The measurement is made according to KDB 789033

Radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency (MHz)	Field strength(μ V/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (μ V/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Set up:

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

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The receiver references:

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Sample Calculations

1. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20 \log(D) + 104.77$$

Where:

E is the field strength in dB μ V/m

D is the measurement distance in meters

EIRP is the equivalent isotropically radiated power in dbm

2. The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + \text{Cable Loss} + \text{Antenna Factor}$$

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

Measurement Results:
802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	157	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	165	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	157	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	165	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	151	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	159	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11ac-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT20)	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	157	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	165	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11ac-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT40)	151	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	159	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11ac-HT80 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT80)	155	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P

Conclusion: PASS

Average Results:

802.11a

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5393.250	40.14	-25.73	34.50	31.38	54.00	13.86	V
5436.600	40.13	-25.47	34.54	31.06	54.00	13.87	V
11490.200	32.38	-32.54	38.19	26.72	54.00	21.62	V
16165.200	36.42	-28.00	40.87	23.56	54.00	17.58	V
17749.200	37.93	-26.52	41.10	23.35	54.00	16.07	V
17928.500	38.27	-26.16	41.24	23.19	54.00	15.73	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5387.550	40.23	-25.74	34.49	31.48	54.00	13.77	V
5441.100	39.97	-25.44	34.54	30.87	54.00	14.03	V
11570.500	31.84	-32.29	38.29	25.85	54.00	22.16	V
16155.300	36.43	-28.05	40.86	23.62	54.00	17.57	V
17762.400	37.75	-26.50	41.11	23.14	54.00	16.25	H
17910.900	38.34	-26.20	41.23	23.31	54.00	15.66	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5397.900	40.15	-25.72	34.50	31.37	54.00	13.85	V
5449.500	39.90	-25.39	34.55	30.73	54.00	14.10	V
11649.700	31.98	-32.11	38.38	25.70	54.00	22.02	H
16037.600	36.28	-27.89	40.74	23.44	54.00	17.72	V
17758.000	37.76	-26.51	41.11	23.16	54.00	16.24	H
17917.500	38.43	-26.19	41.23	23.38	54.00	15.57	V

802.11n-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5398.050	40.28	-25.72	34.50	31.50	54.00	13.72	V
5429.850	40.08	-25.51	34.53	31.06	54.00	13.92	V
11490.200	32.48	-32.54	38.19	26.83	54.00	21.52	H
16146.500	36.47	-28.08	40.85	23.70	54.00	17.53	V
17749.200	37.95	-26.52	41.10	23.37	54.00	16.05	V
17919.700	38.26	-26.18	41.24	23.21	54.00	15.74	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5383.950	40.33	-25.74	34.49	31.58	54.00	13.67	V
5400.450	40.17	-25.70	34.50	31.37	54.00	13.83	V
11570.500	31.91	-32.29	38.29	25.92	54.00	22.09	H
16146.500	36.51	-28.08	40.85	23.74	54.00	17.49	V
17751.400	37.92	-26.52	41.10	23.33	54.00	16.08	H
17915.300	38.46	-26.19	41.23	23.42	54.00	15.54	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5386.950	39.15	-25.74	34.49	30.40	54.00	14.85	V
5434.350	39.05	-25.48	34.54	30.00	54.00	14.95	V
11649.700	32.01	-32.11	38.38	25.73	54.00	21.99	H
16060.700	36.32	-27.97	40.76	23.53	54.00	17.68	H
17749.200	37.95	-26.52	41.10	23.37	54.00	16.05	V
17902.100	38.29	-26.23	41.22	23.29	54.00	15.71	H

802.11n-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5387.400	39.19	-25.74	34.49	30.44	54.00	14.81	V
5404.500	39.06	-25.68	34.51	30.24	54.00	14.94	V
11510.000	31.87	-32.50	38.21	26.16	54.00	22.13	V
16145.400	36.45	-28.09	40.85	23.69	54.00	17.55	V
17740.400	38.01	-26.53	41.09	23.44	54.00	15.99	V
17906.500	38.43	-26.22	41.23	23.42	54.00	15.57	H

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5397.600	39.24	-25.72	34.50	30.46	54.00	14.76	V
5410.350	39.10	-25.64	34.51	30.23	54.00	14.90	V
11590.300	32.17	-32.23	38.31	26.09	54.00	21.83	H
16029.900	36.32	-27.87	40.73	23.46	54.00	17.68	H
17731.600	37.98	-26.54	41.09	23.44	54.00	16.02	H
17906.500	38.46	-26.22	41.23	23.45	54.00	15.54	V

802.11ac-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5384.850	40.3	-25.7	34.5	31.52	54.0	13.7	V
5434.650	40.1	-25.5	34.5	31.07	54.0	13.9	V
11490.200	32.5	-32.5	38.2	26.80	54.0	21.5	H
16164.100	36.5	-28.0	40.9	23.62	54.0	17.5	V
17765.700	37.8	-26.5	41.1	23.21	54.0	16.2	H
17908.700	38.4	-26.2	41.2	23.40	54.0	15.6	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5388.450	40.4	-25.7	34.5	31.60	54.0	13.6	V
5405.550	40.2	-25.7	34.5	31.32	54.0	13.8	V
11570.500	32.0	-32.3	38.3	25.97	54.0	22.0	V
16165.200	36.5	-28.0	40.9	23.61	54.0	17.5	V
17740.400	37.9	-26.5	41.1	23.37	54.0	16.1	H
17912.000	38.4	-26.2	41.2	23.41	54.0	15.6	V

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5398.350	40.3	-25.7	34.5	31.55	54.0	13.7	V
5410.950	40.2	-25.6	34.5	31.31	54.0	13.8	V
11649.700	32.0	-32.1	38.4	25.73	54.0	22.0	H
16157.500	36.4	-28.0	40.9	23.60	54.0	17.6	V
17740.400	38.0	-26.5	41.1	23.47	54.0	16.0	V
17930.700	38.4	-26.2	41.2	23.36	54.0	15.6	H

802.11ac-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5390.700	39.3	-25.7	34.5	30.52	54.0	14.7	V
5405.100	39.1	-25.7	34.5	30.28	54.0	14.9	V
11510.000	32.0	-32.5	38.2	26.24	54.0	22.1	H
16145.400	36.5	-28.1	40.8	23.71	54.0	17.5	V
17765.700	37.8	-26.5	41.1	23.17	54.0	16.2	H
17919.700	38.5	-26.2	41.2	23.40	54.0	15.5	V

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5398.650	39.2	-25.7	34.5	30.38	54.0	14.8	V
5440.350	39.2	-25.4	34.5	30.07	54.0	14.8	V
11590.300	32.1	-32.2	38.3	26.03	54.0	21.9	H
16033.200	36.3	-27.9	40.7	23.42	54.0	17.7	V
17740.400	37.9	-26.5	41.1	23.36	54.0	16.1	H
17910.900	38.4	-26.2	41.2	23.41	54.0	15.6	V

802.11ac-HT80

Channel 155

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5457.200	39.9	-25.3	34.6	30.64	54.0	14.1	V
5459.650	40.0	-25.3	34.6	30.73	54.0	14.0	V
11549.600	33.2	-32.4	38.3	27.34	54.0	20.8	V
17748.100	37.7	-26.5	41.1	23.16	54.0	16.3	H
17859.200	38.1	-26.3	41.2	23.28	54.0	15.9	V
17962.600	38.2	-26.1	41.3	23.05	54.0	15.8	V

Peak Results:
802.11a
Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5650.655	55.48	-24.77	34.76	45.49	68.69	13.21	H
5655.532	54.41	-24.76	34.76	44.41	72.29	17.88	V
11490.200	45.90	-32.54	38.19	40.25	74.00	28.10	H
16811.450	57.52	-27.29	41.51	43.29	68.30	10.78	H
17234.950	55.32	-26.91	41.32	40.90	68.30	12.98	H
17324.600	56.80	-26.86	41.18	42.48	68.30	11.50	H

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5758.000	53.81	-24.76	34.86	43.71	68.30	14.49	V
5817.600	55.42	-24.90	34.92	45.40	68.30	12.88	V
11569.950	45.99	-32.30	38.29	40.00	74.00	28.01	H
17031.450	57.21	-27.04	41.65	42.60	68.30	11.09	V
17117.250	56.55	-26.95	41.51	41.99	68.30	11.75	H
17354.850	55.13	-26.84	41.13	40.83	68.30	13.17	V

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5919.515	54.90	-25.21	35.02	45.09	72.26	17.36	V
5923.114	54.86	-25.21	35.03	45.05	69.60	14.73	V
11650.250	46.77	-32.11	38.38	40.50	74.00	27.23	H
17161.250	56.92	-26.93	41.44	42.42	68.30	11.38	V
17298.200	56.57	-26.88	41.22	42.23	68.30	11.73	V
17474.750	54.22	-26.75	40.94	40.02	68.30	14.08	V

802.11n-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5650.897	53.79	-24.77	34.76	43.81	68.86	15.07	V
5664.973	55.48	-24.74	34.77	45.45	79.28	23.80	H
11490.200	46.08	-32.54	38.19	40.43	74.00	27.92	V
16566.150	56.21	-27.60	41.27	42.54	68.30	12.09	V
17234.950	56.21	-26.91	41.32	41.80	68.30	12.09	V
17450.550	57.01	-26.76	40.98	42.79	68.30	11.29	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5753.400	54.16	-24.77	34.86	44.07	68.30	14.14	H
5840.200	55.88	-25.02	34.94	45.96	68.30	12.42	H
11569.950	45.80	-32.30	38.29	39.81	74.00	28.20	H
16827.400	56.72	-27.27	41.53	42.46	68.30	11.58	H
17354.850	54.79	-26.84	41.13	40.49	68.30	13.51	H
17564.400	56.92	-26.70	40.95	42.67	68.30	11.38	V

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5920.814	54.69	-25.21	35.02	44.87	71.30	16.61	V
5921.596	55.23	-25.21	35.02	45.41	70.72	15.49	H
11650.250	46.10	-32.11	38.38	39.82	74.00	27.90	V
17027.600	56.67	-27.04	41.66	42.06	68.30	11.63	V
17474.750	54.60	-26.75	40.94	40.41	68.30	13.70	H
17661.750	57.21	-26.63	41.03	42.81	68.30	11.09	H

802.11n-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5651.115	54.12	-24.77	34.76	44.14	69.03	14.91	H
5653.565	54.25	-24.77	34.76	44.26	70.84	16.59	V
11510.000	46.36	-32.50	38.21	40.64	74.00	27.64	H
16880.200	56.41	-27.21	41.58	42.03	68.30	11.89	H
17265.200	54.63	-26.90	41.27	40.25	68.30	13.67	H
17646.350	57.12	-26.65	41.02	42.75	68.30	11.18	H

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5917.894	54.59	-25.21	35.02	44.78	73.46	18.87	H
5922.712	55.06	-25.21	35.03	45.24	69.89	14.84	V
11589.750	45.42	-32.23	38.31	39.34	74.00	28.58	H
17084.250	56.98	-26.98	41.56	42.40	68.30	11.32	H
17385.100	55.12	-26.81	41.08	40.85	68.30	13.18	H
17402.150	57.20	-26.80	41.05	42.95	68.30	11.10	V

802.11ac-HT20
Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5651.817	53.7	-24.8	34.8	43.69	69.5	15.9	H
5654.462	55.1	-24.8	34.8	45.15	71.5	16.4	V
11490.200	47.1	-32.5	38.2	41.49	74.0	26.9	V
17006.150	56.9	-27.1	41.7	42.29	68.3	11.4	H
17234.950	54.7	-26.9	41.3	40.31	68.3	13.6	V
17652.400	57.0	-26.6	41.0	42.65	68.3	11.3	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5760.400	55.5	-24.8	34.9	45.37	68.3	12.8	H
5811.000	57.9	-24.9	34.9	47.90	68.3	10.4	V
11569.950	46.0	-32.3	38.3	40.05	74.0	28.0	H
16845.000	56.7	-27.2	41.5	42.43	68.3	11.6	H
17354.850	54.1	-26.8	41.1	39.85	68.3	14.2	H
17465.950	56.9	-26.8	41.0	42.67	68.3	11.4	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5920.711	55.2	-25.2	35.0	45.38	71.4	16.2	H
5922.367	55.2	-25.2	35.0	45.34	70.1	15.0	V
11650.250	46.3	-32.1	38.4	40.00	74.0	27.7	V
16989.650	56.8	-27.1	41.7	42.23	68.3	11.5	H
17140.350	57.0	-26.9	41.5	42.46	68.3	11.3	V
17474.750	54.2	-26.7	40.9	39.96	68.3	14.1	V

802.11ac-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5654.106	53.9	-24.8	34.8	43.94	71.2	17.3	V
5658.000	54.1	-24.8	34.8	44.11	74.1	20.0	H
11510.000	46.0	-32.5	38.2	40.34	74.0	28.0	V
17052.900	57.0	-27.0	41.6	42.41	68.3	11.3	H
17265.200	54.2	-26.9	41.3	39.82	68.3	14.1	V
17585.300	56.9	-26.7	41.0	42.60	68.3	11.4	V

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5922.332	55.4	-25.2	35.0	45.62	70.2	14.7	H
5924.218	54.9	-25.2	35.0	45.06	68.8	13.9	V
11589.750	45.2	-32.2	38.3	39.17	74.0	28.8	V
17048.500	56.6	-27.0	41.6	41.97	68.3	11.7	H
17385.100	54.6	-26.8	41.1	40.32	68.3	13.7	V
17637.000	57.1	-26.7	41.0	42.75	68.3	11.2	V

802.11ac-HT80

Channel 155

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5651.846	58.0	-24.8	34.8	48.00	69.6	11.6	H
5924.856	58.9	-25.2	35.0	49.08	68.3	9.4	V
11550.150	44.9	-32.4	38.3	38.99	68.3	23.4	V
16496.300	51.3	-27.6	41.2	37.72	68.3	17.0	V
17096.350	52.1	-27.0	41.5	37.55	68.3	16.2	V
17325.150	49.2	-26.9	41.2	34.90	68.3	19.1	V

Note:

1. The spurious emission above 18G is noise only.
2. All emissions below 30MHz are more than 20 dB below the limit

A.6. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit (dBm/MHz)	
FCC 47 CFR Part 15.407	at the band edge	27
	at 5 MHz above or below the band edge	15.6
	at 25 MHz above or below the band edge	10
	at 75 MHz or more above or below the band edge	-27
	Note: increasing linearly from point to point.	

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m and the table height shall be 1.5 m.

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The receiver references:

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Sample Calculations

Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$E = \text{EIRP} - 20 \log(D) + 104.77$ Where:

E is the field strength in dBμV/m

D is the measurement distance in meters

EIRP is the equivalent isotropically radiated power in dbm

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.34	P
	5825 MHz	Fig.35	P
802.11n HT20	5745 MHz	Fig.36	P
	5825 MHz	Fig.37	P
802.11n HT40	5755 MHz	Fig.38	P
	5795 MHz	Fig.39	P
802.11ac HT20	5745 MHz	Fig.40	P
	5825 MHz	Fig.41	P
802.11ac HT40	5755 MHz	Fig.42	P
	5795 MHz	Fig.43	P
802.11ac HT80	5775 MHz	Fig.44 Fig.45	P

Conclusion: PASS
Test graphs as below:

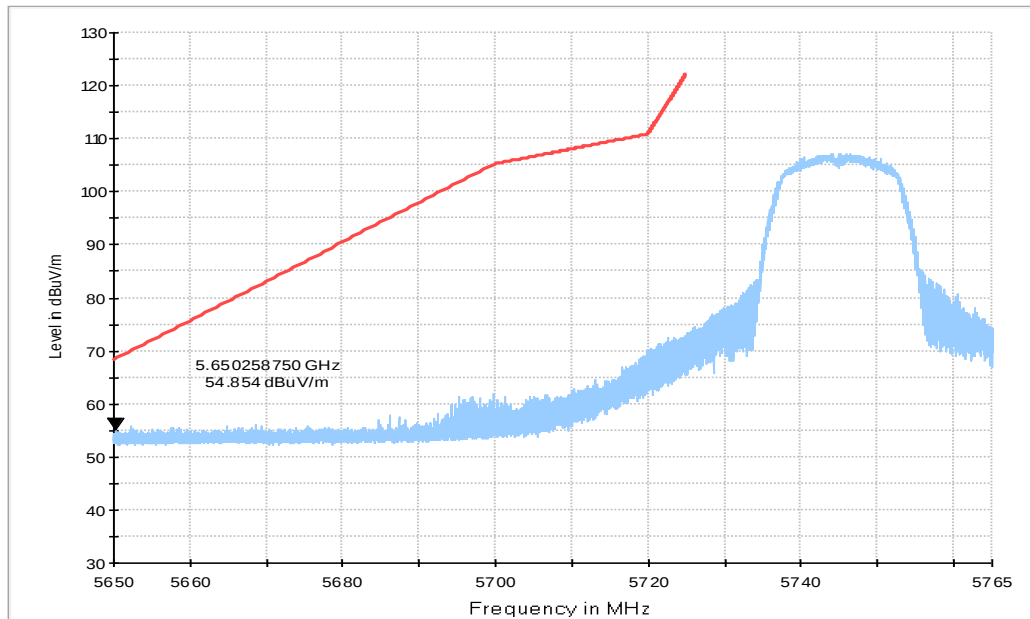


Fig. 34 Band Edges (802.11a Ch149,5745MHz)

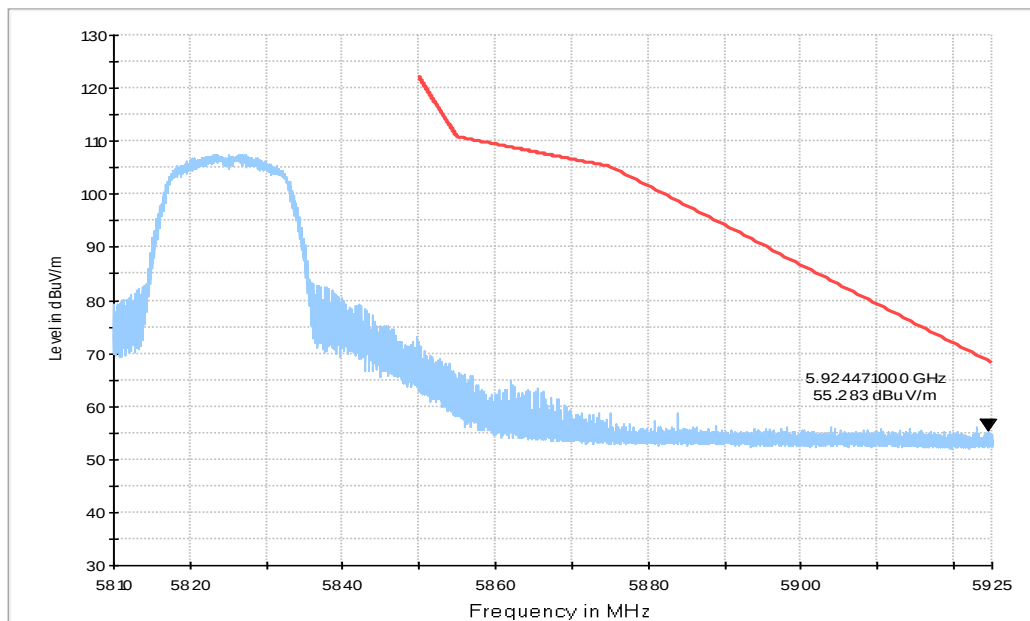


Fig. 35 Band Edges (802.11a Ch165, 5825MHz)

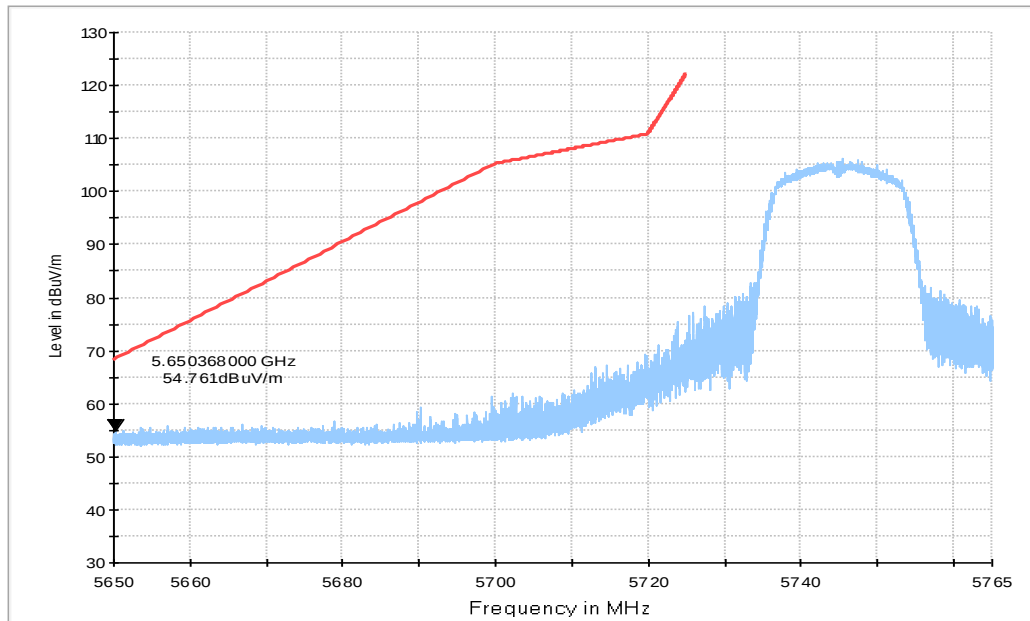


Fig. 36 Band Edges (802.11n-HT20 Ch149, 5745MHz)

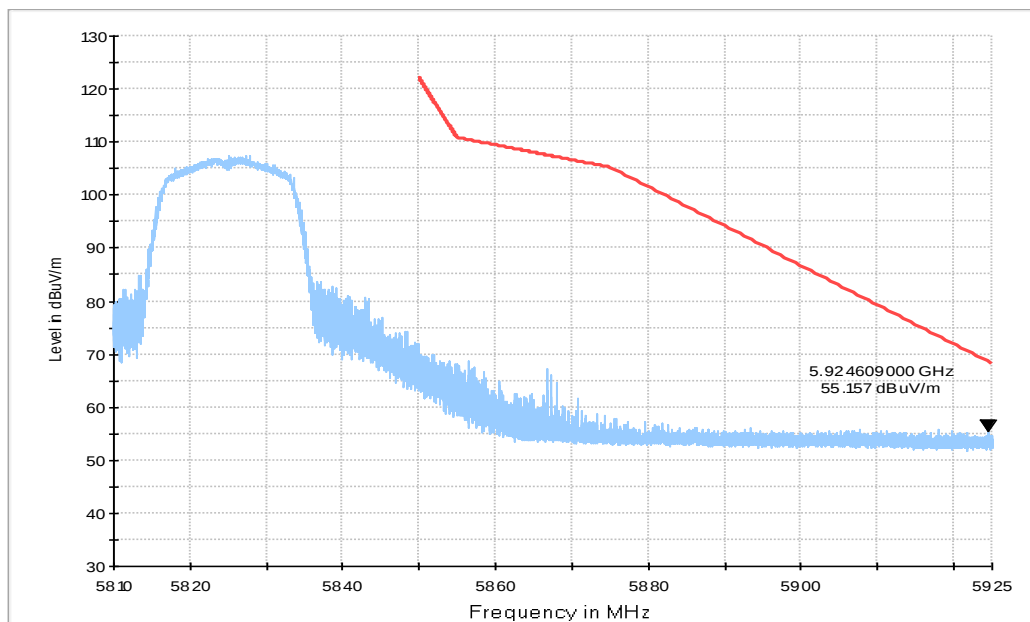


Fig. 37 Band Edges (802.11n-HT20 Ch165, 5825MHz)

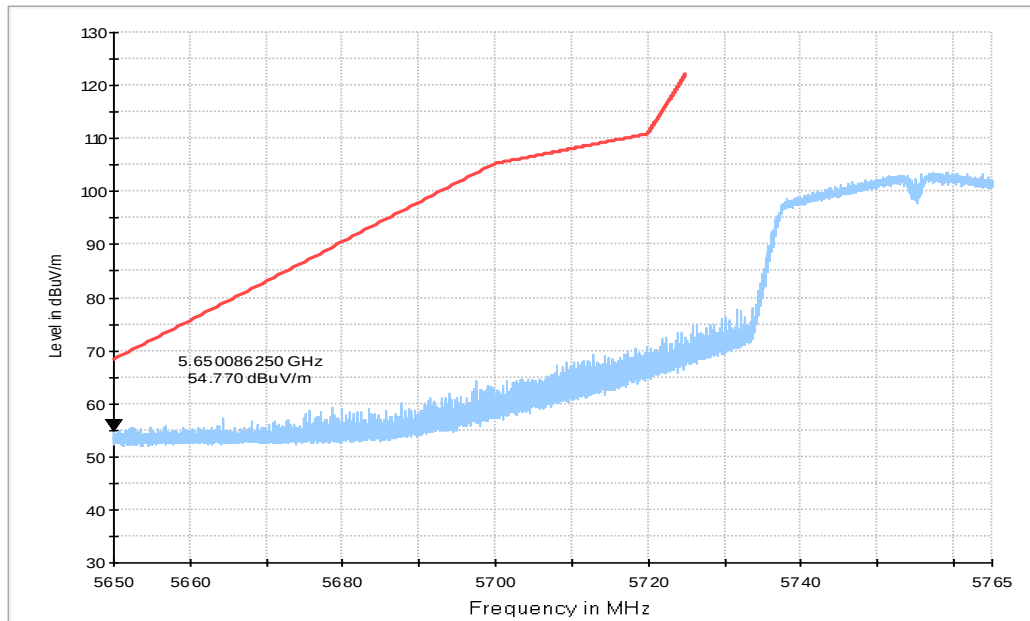


Fig. 38 Band Edges (802.11n-HT40 Ch151, 5755MHz)

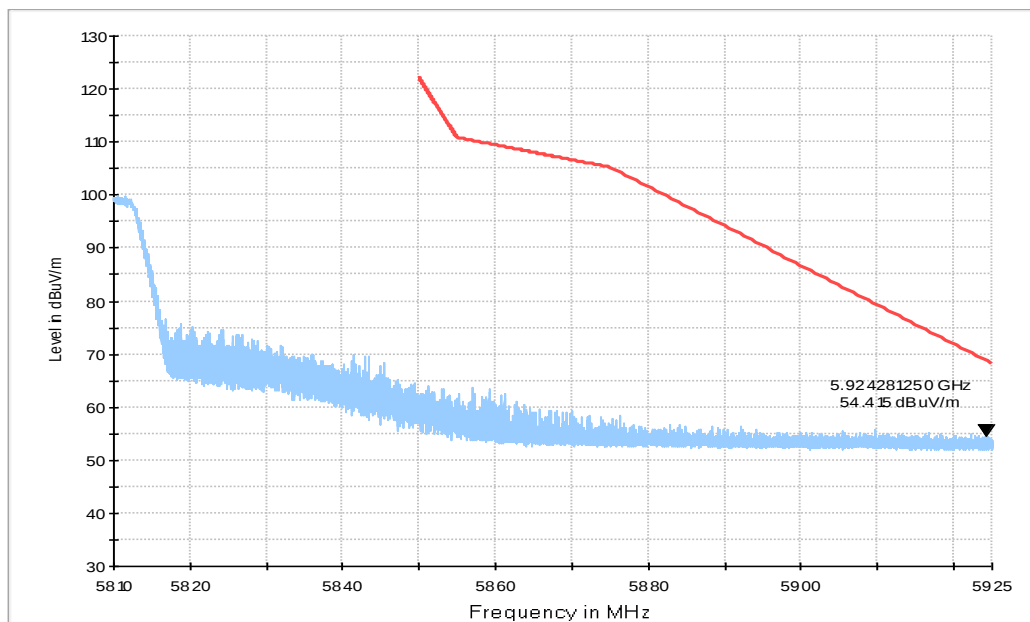


Fig. 39 Band Edges (802.11n-HT40 Ch159, 5795MHz)

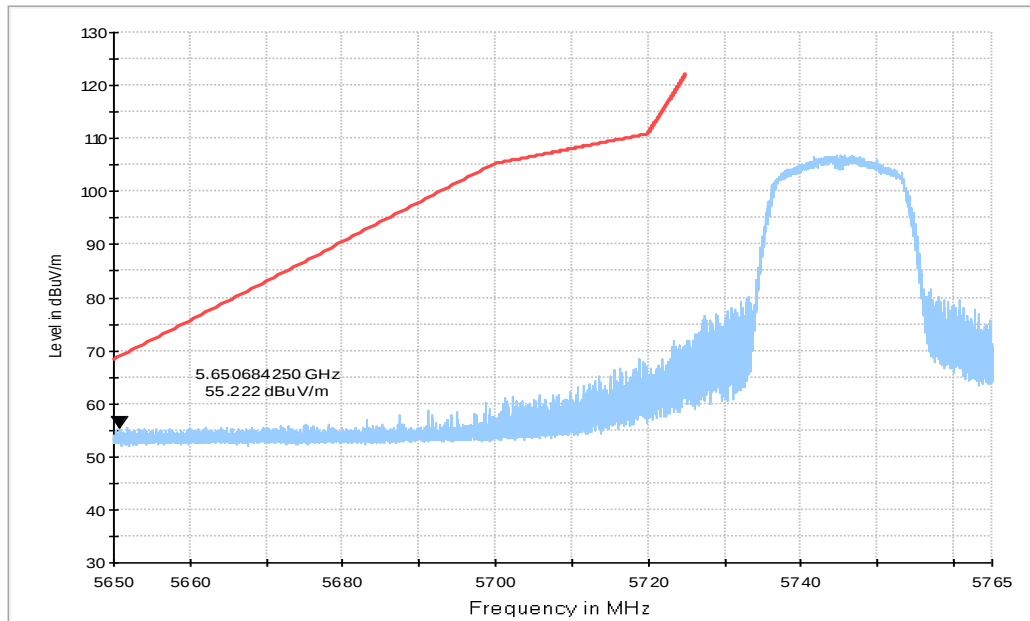


Fig. 40 Band Edges (802.11ac-HT20 Ch149, 5745MHz)

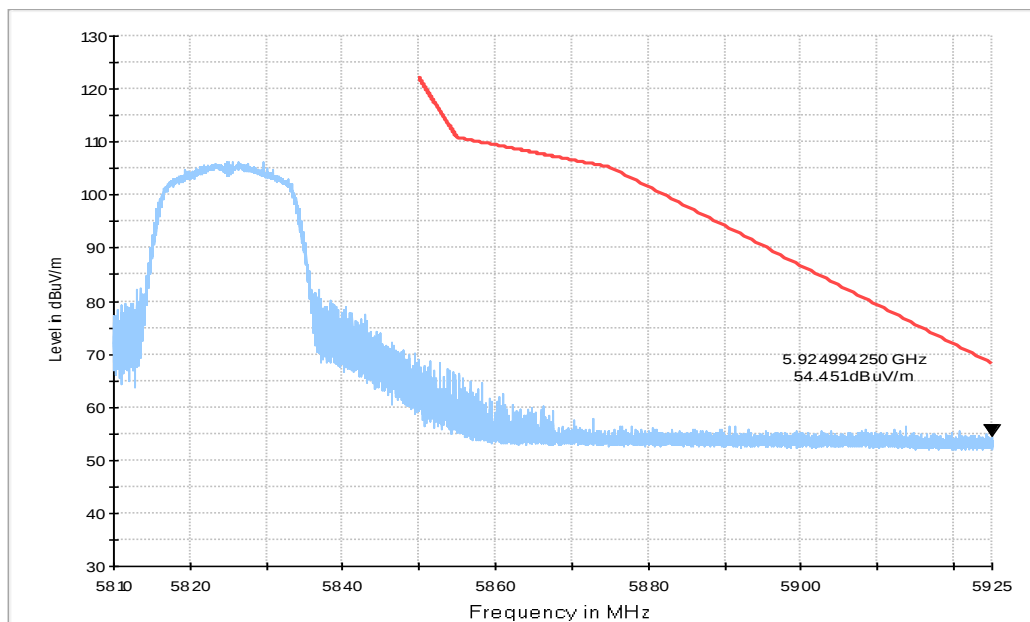


Fig. 41 Band Edges (802.11ac-HT20 Ch165, 5825MHz)

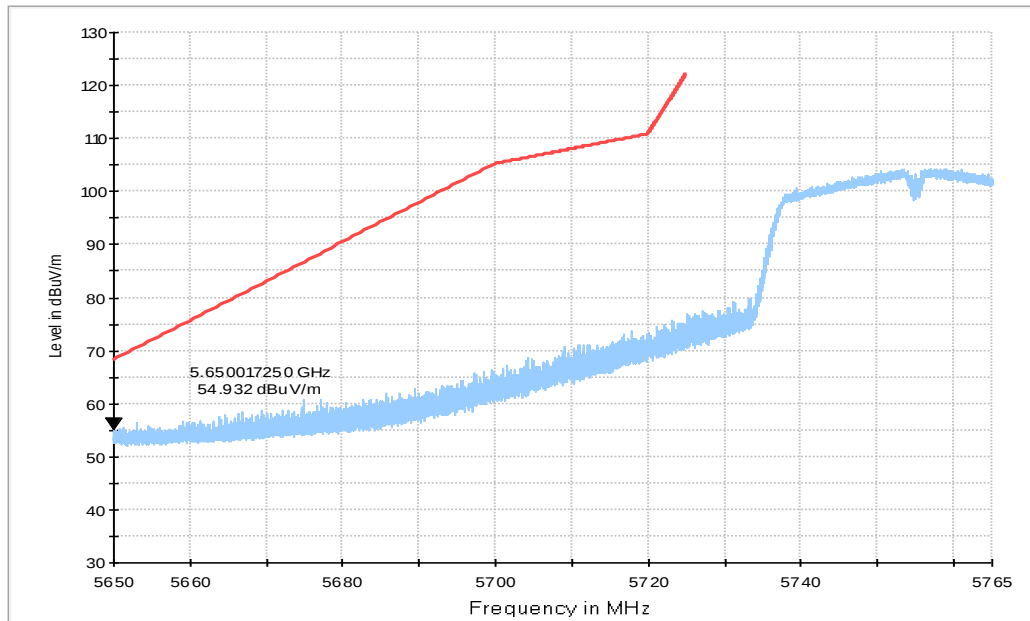


Fig. 42 Band Edges (802.11ac-HT40 Ch151, 5755MHz)

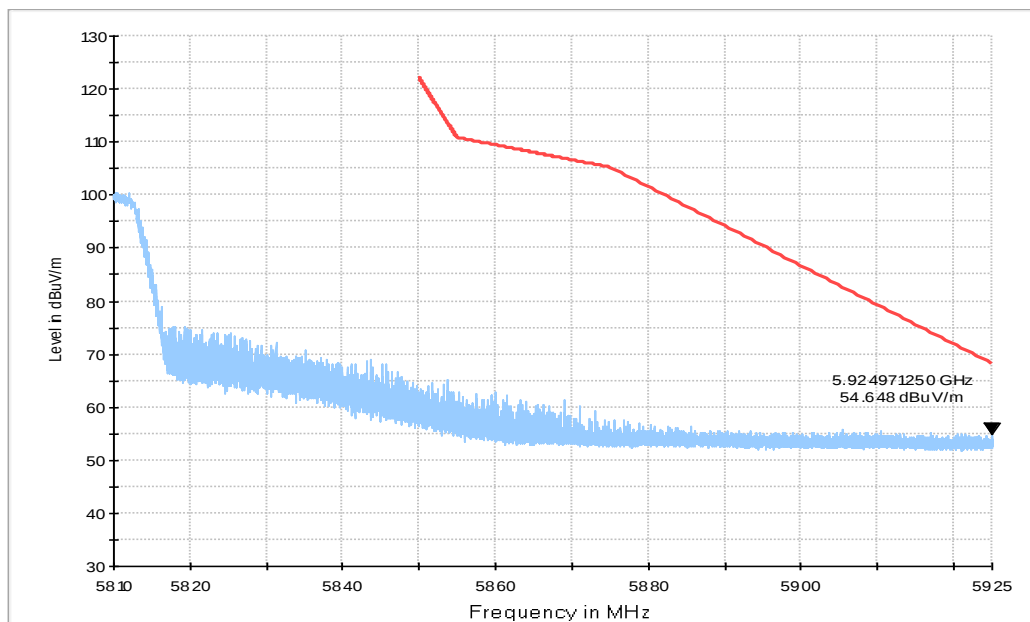


Fig. 43 Band Edges (802.11ac-HT40 Ch159, 5795MHz)

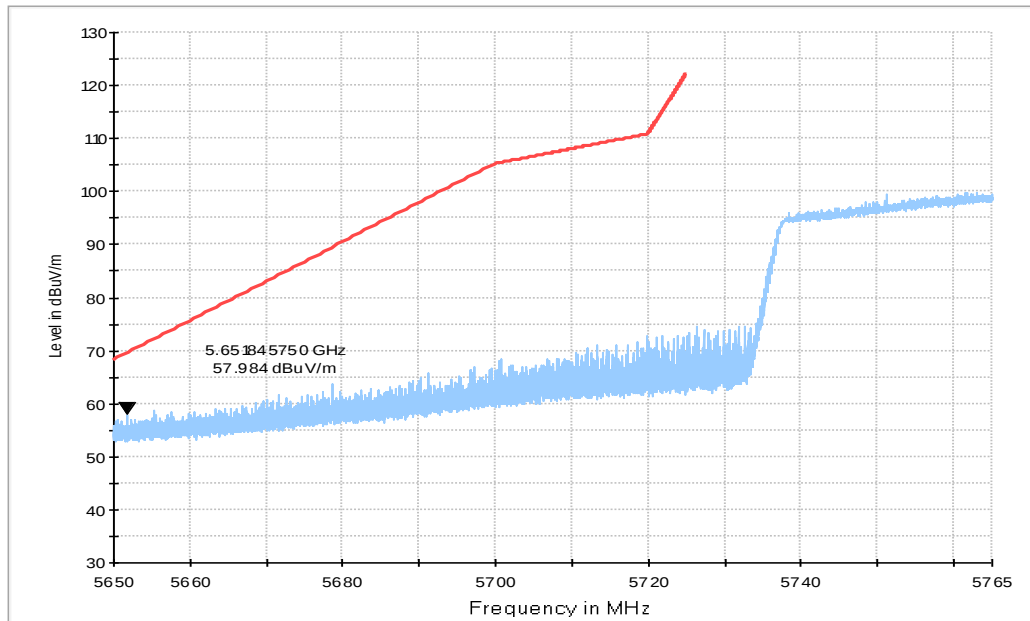


Fig. 44 Band Edges (802.11ac-HT80 Ch155, 5775MHz)

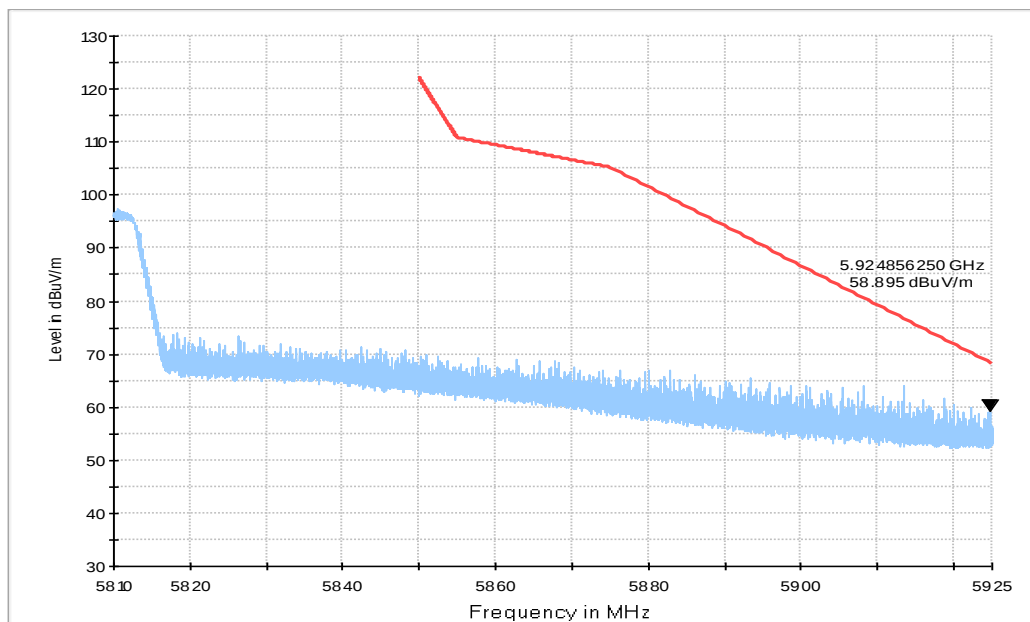


Fig. 45 Band Edges (802.11ac-HT80 Ch155, 5775MHz)

A.7. AC Powerline Conducted Emission (150kHz- 30MHz)

Method of Measurement:

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

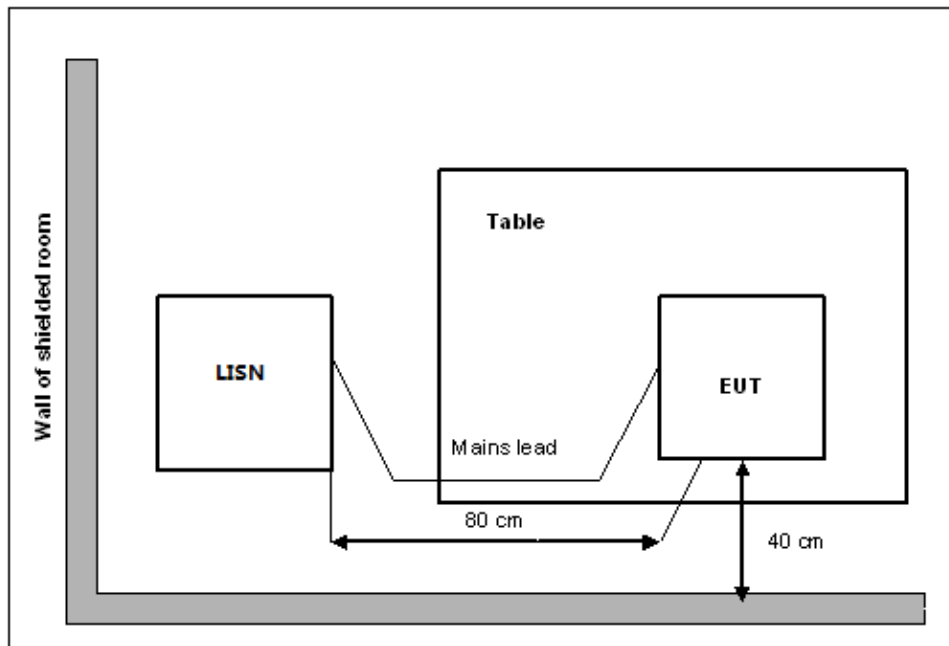
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Setup



Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	66 to 56	Fig.46	Fig.47	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.46	Fig.47	P
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to ANSI C63.10 .

Conclusion: PASS
Test graphs as below:

Traffic:

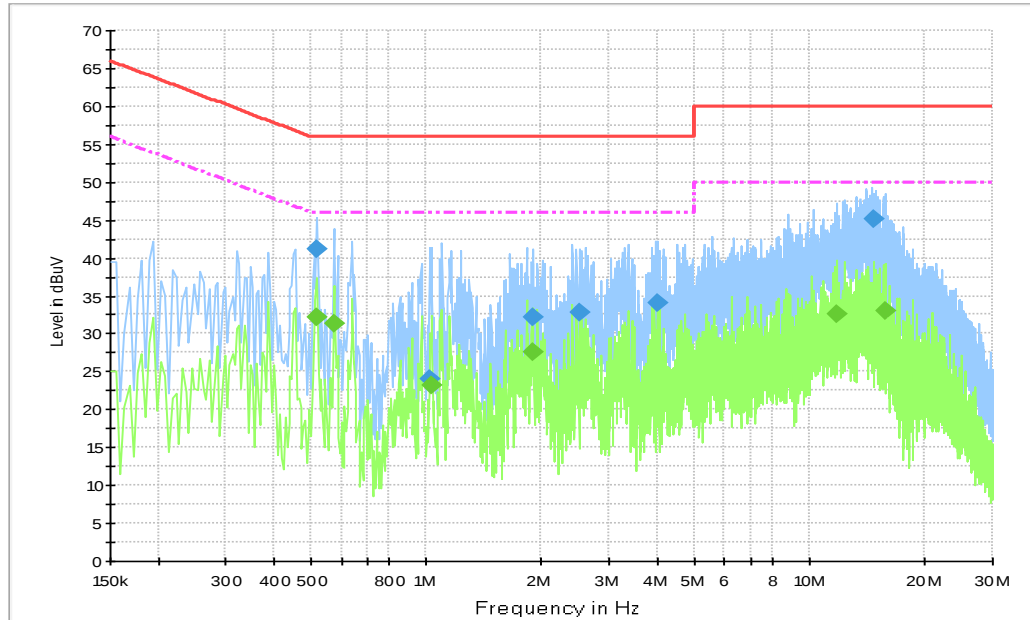


Fig. 46 AC Power line Conducted Emission-802.11a

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.519000	41.2	5000	9.000	On	L1	19.5	14.8	56.0
1.023000	24.0	5000	9.000	On	L1	19.5	32.0	56.0
1.900500	32.1	5000	9.000	On	N	19.6	23.9	56.0
2.526000	32.7	5000	9.000	On	N	19.6	23.3	56.0
4.011000	34.1	5000	9.000	On	N	19.6	21.9	56.0
14.73000	45.1	5000	9.000	On	L1	19.9	14.9	60.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.519000	32.2	5000	9.000	On	L1	19.5	13.8	46.0
0.573000	31.4	5000	9.000	On	L1	19.5	14.6	46.0
1.032000	23.2	5000	9.000	On	N	19.6	22.8	46.0
1.891500	27.5	5000	9.000	On	L1	19.6	18.5	46.0
11.74650	32.6	5000	9.000	On	L1	19.8	17.4	50.0
15.68850	33.1	5000	9.000	On	N	19.8	16.9	50.0