

3.4 Power Spectral Density

FCC 15.407(a)

ISED RSS-247, Issue 2, Clause 6.2

Measurement procedure: ANSI C63.10-2013 Clause 12.5

Test Results: Complies

Measurement Data:

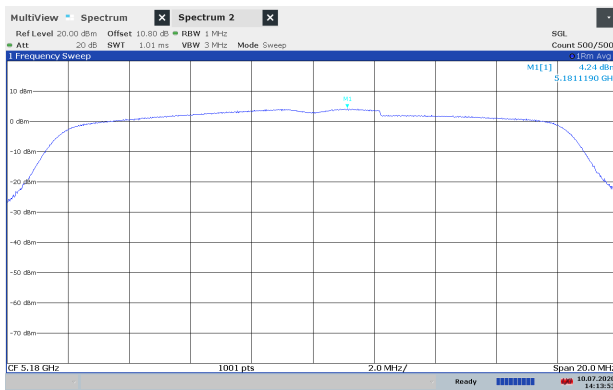
Ch. No.	Nominal Frequency (MHz)	Measured Value (dBm)			
		802.11a 6Mb	802.11n HT20	802.11n HT40	802.11ac HT80
36	5180	4.2	3.6		
48	5240	4.3	3.9		
52	5260	4.5	4.1		
64	5320	4.4	4.0		
100	5500	2.2	1.7		
112	5560	2.2	1.8		
140	5700	1.8	1.4		
149	5745	-0.8	-1.2		
157	5785	-0.7	-1.0		
165	5825	-0.8	-1.1		
38	5190			0.0	
46	5230			0.5	
54	5270			0.9	
62	5310			0.9	
102	5510			-1.4	
110	5550			-1.3	
134	5670			-1.5	
151	5755			-3.8	
159	5795			-4.1	
42	5210				-2.4
58	5290				-2.1
106	5530				-4.0
138	5690				-4.4
155	5775				-7.3

Values in U-NII Band 3 that were measured with RBW=1MHz have been corrected by -3dB.

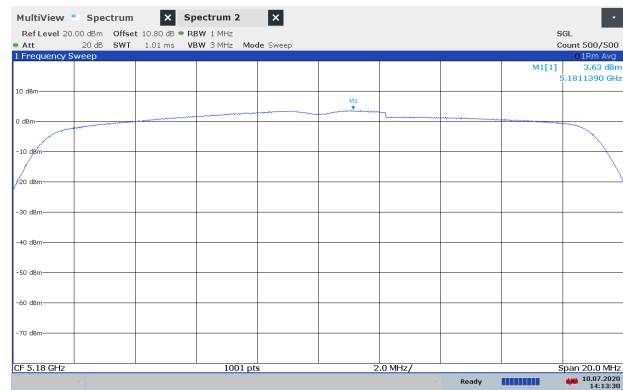
Antenna Gain is less than 6 dBi for all frequencies above.

Limits:

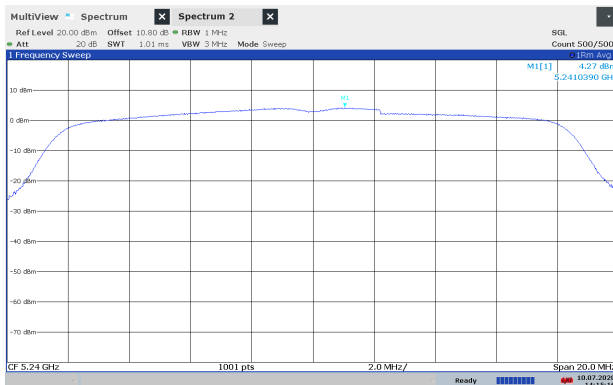
Frequency Band	FCC 15.407(a)	RSS-247, Issue 2
5150 – 5250 MHz	Less than 17 dBm/MHz for master device Less than 11 dBm/MHz for client device	Less than 10 dBm/MHz e.i.r.p. (only indoor allowed)
5250 – 5350 MHz	Less than 11 dBm/MHz	Less than 11 dBm/MHz
5470 – 5725 MHz	Less than 11 dBm/MHz	Less than 11 dBm/MHz
5725 – 5825 MHz	Less than 30 dBm/500kHz	Less than 30 dBm/500kHz
	If Antenna Gain is more than 6 dBi the limit above is reduced by the amount exceeding 6 dBi	



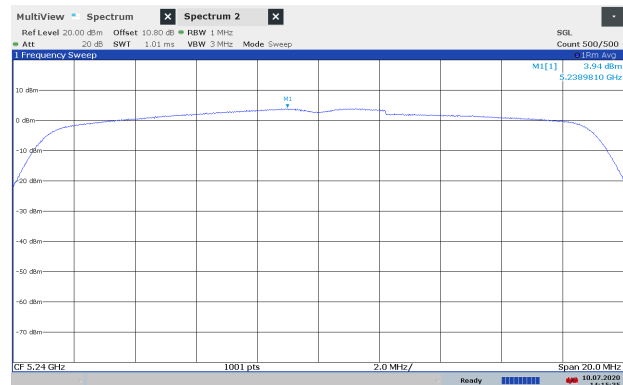
PSD, 5180 MHz, 802.11a, 6Mb



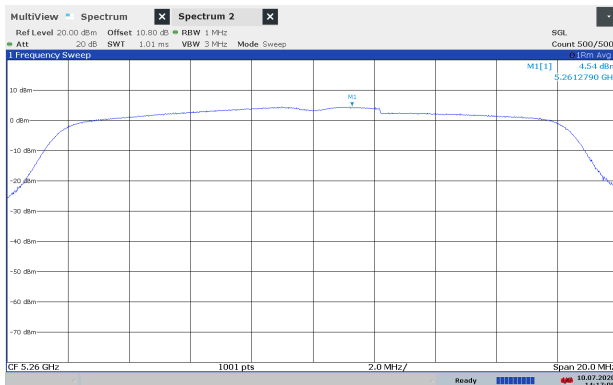
PSD, 5180 MHz, 802.11n, HT20



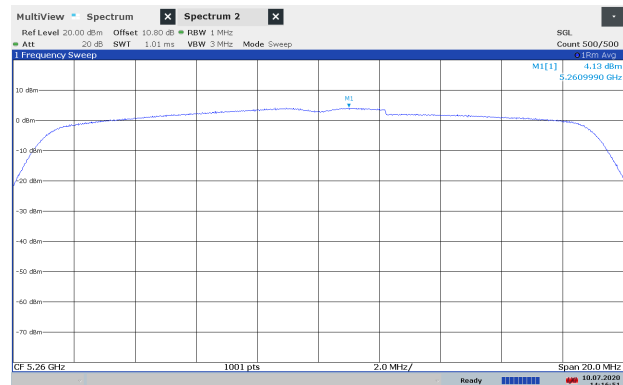
PSD, 5240 MHz, 802.11a, 6Mb



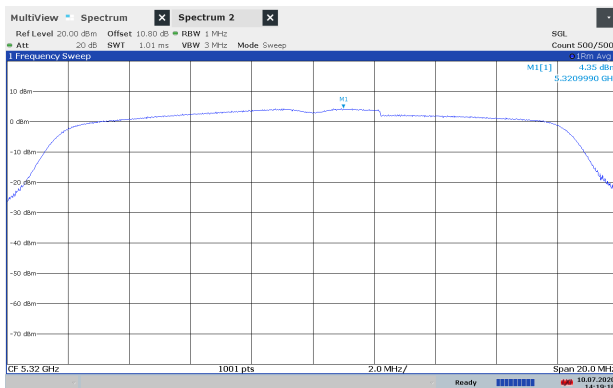
PSD, 5240 MHz, 802.11n, HT20



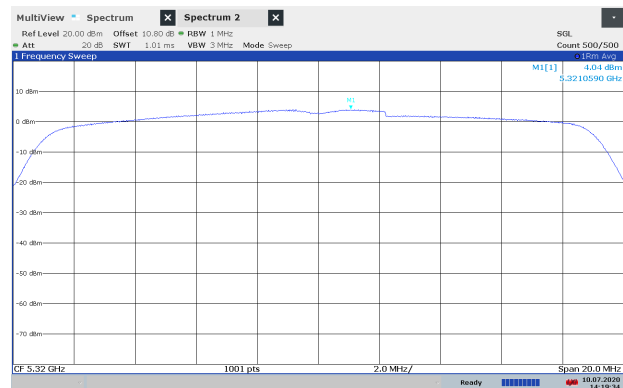
PSD, 5260 MHz, 802.11a, 6Mb



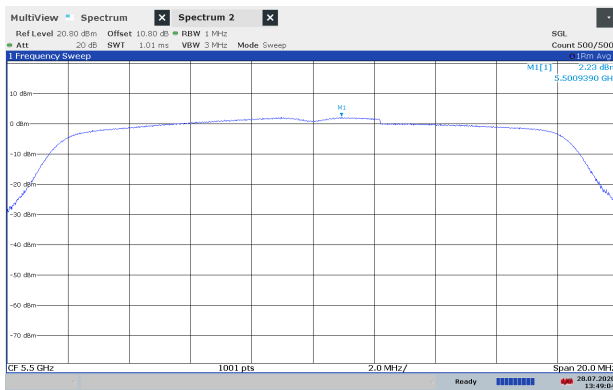
PSD, 5260 MHz, 802.11n, HT20



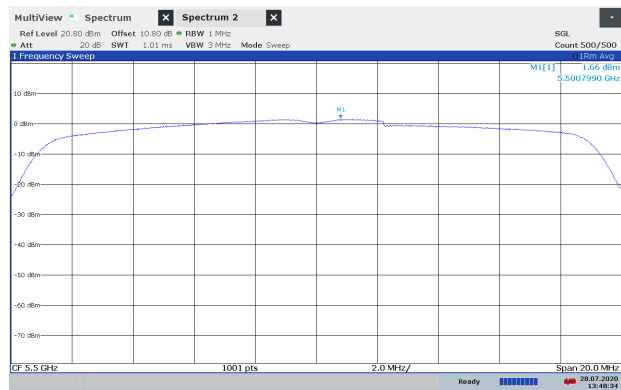
PSD, 5320 MHz, 802.11a, 6Mb



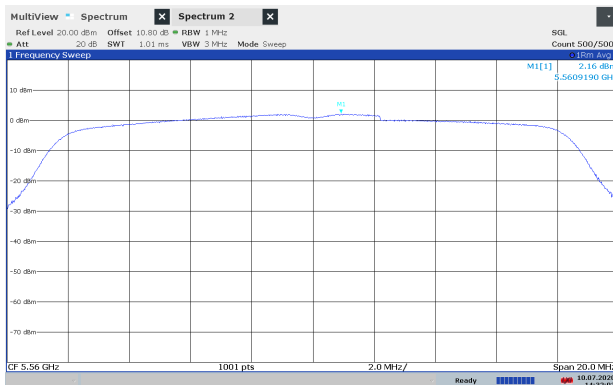
PSD, 5320 MHz, 802.11n, HT20



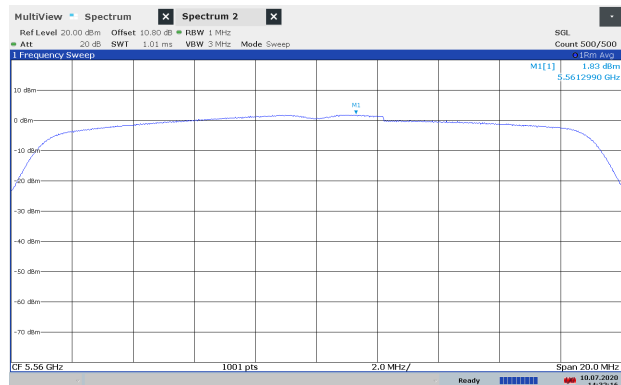
PSD, 5500 MHz, 802.11a, 6Mb



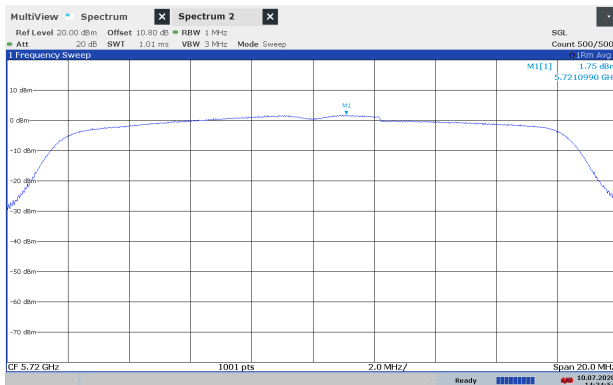
PSD, 5500 MHz, 802.11n, HT20



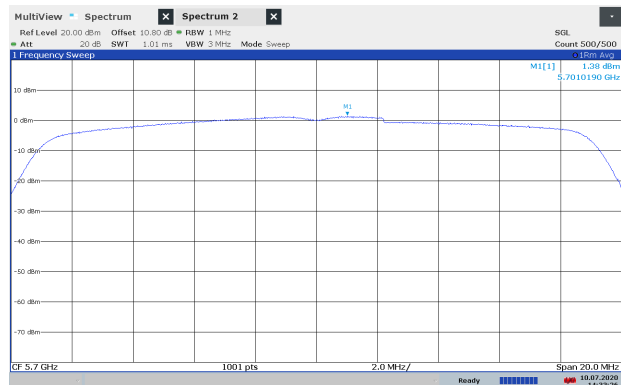
PSD, 5560 MHz, 802.11a, 6Mb



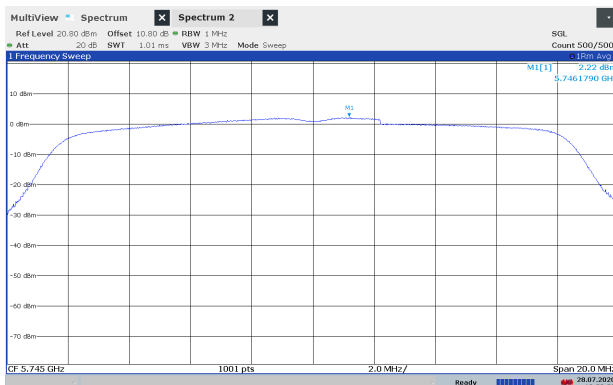
PSD, 5560 MHz, 802.11n, HT20



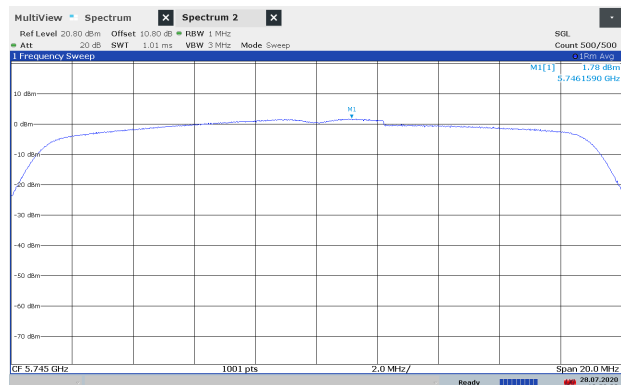
PSD, 5560 MHz, 802.11a, 6Mb



PSD, 5560 MHz, 802.11n, HT20



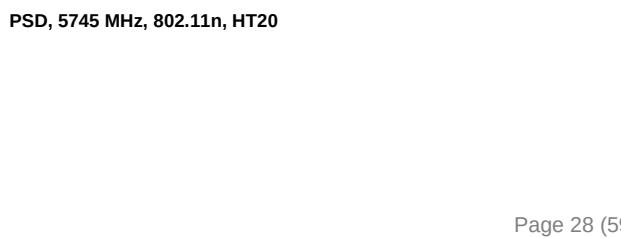
PSD, 5700 MHz, 802.11a, 6Mb



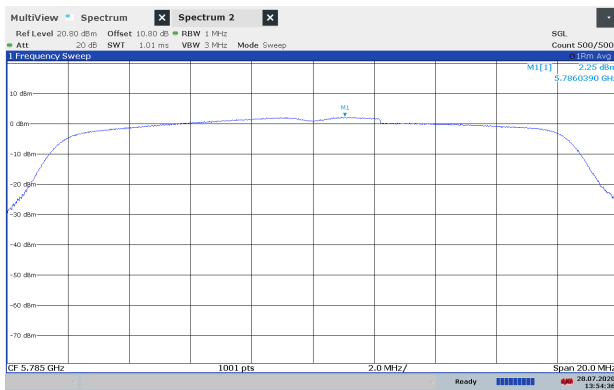
PSD, 5700 MHz, 802.11n, HT20



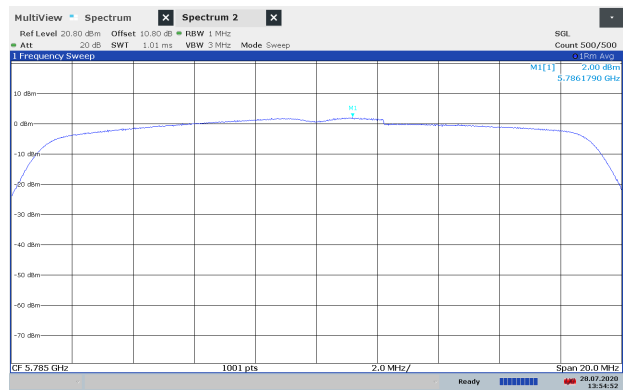
PSD, 5745 MHz, 802.11a, 6Mb



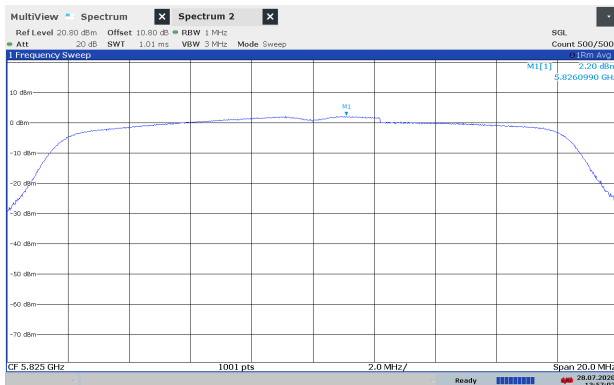
PSD, 5745 MHz, 802.11n, HT20



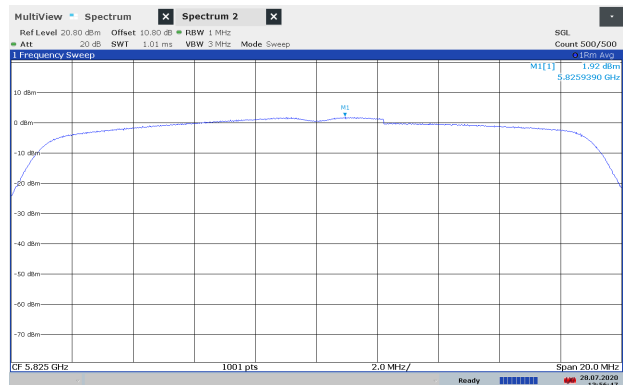
PSD, 5785 MHz, 802.11a, 6Mb



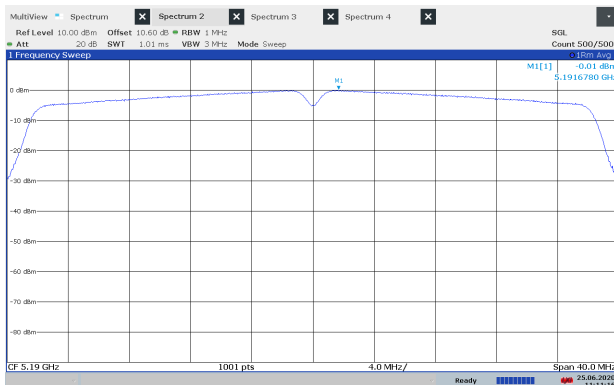
PSD, 5785 MHz, 802.11n, HT20



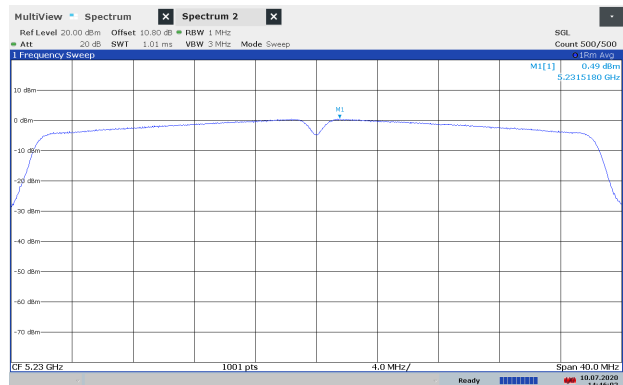
PSD, 5825 MHz, 802.11a, 6Mb



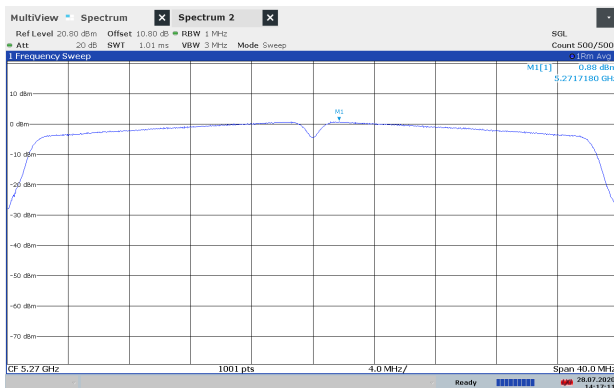
PSD, 5825 MHz, 802.11n, HT20



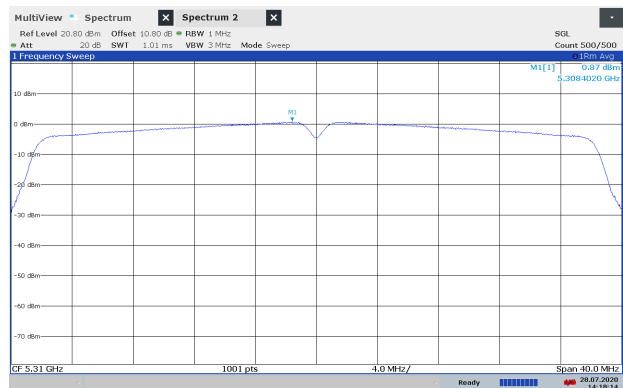
PSD, 5190 MHz, 802.11n, HT40



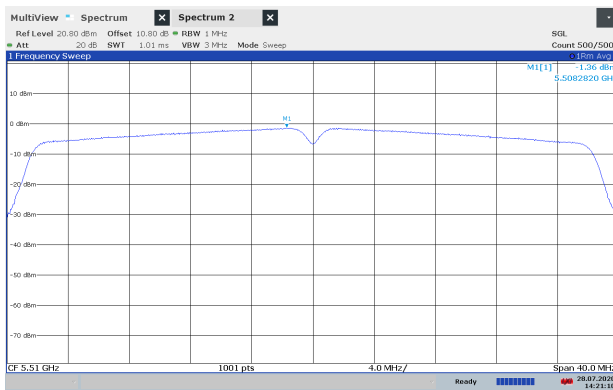
PSD, 5230 MHz, 802.11n, HT40



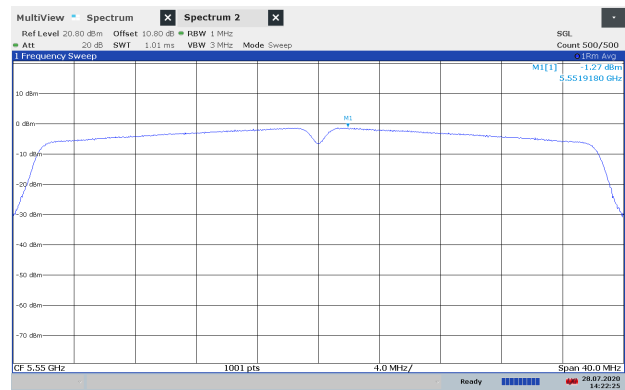
PSD, 5270 MHz, 802.11n, HT40



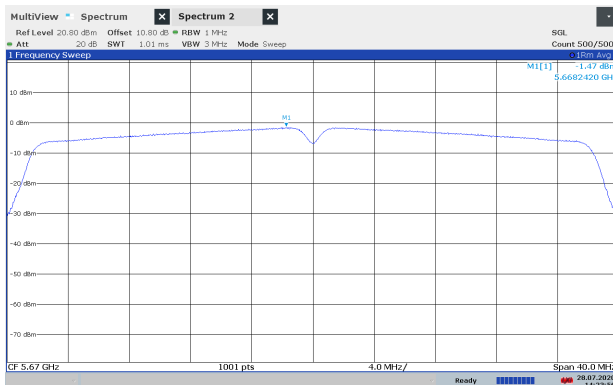
PSD, 5310 MHz, 802.11n, HT40



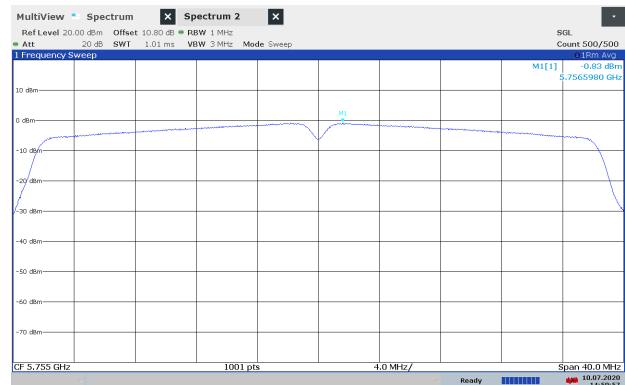
PSD, 5510 MHz, 802.11n, HT40



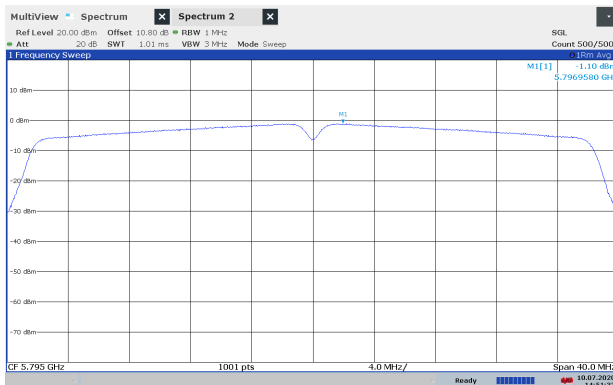
PSD, 5550 MHz, 802.11n, HT40



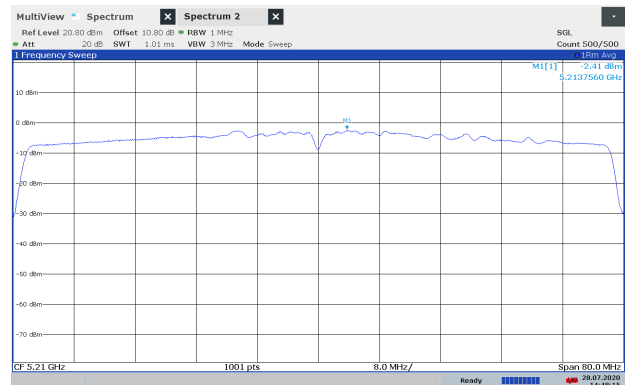
PSD, 5670 MHz, 802.11n, HT40



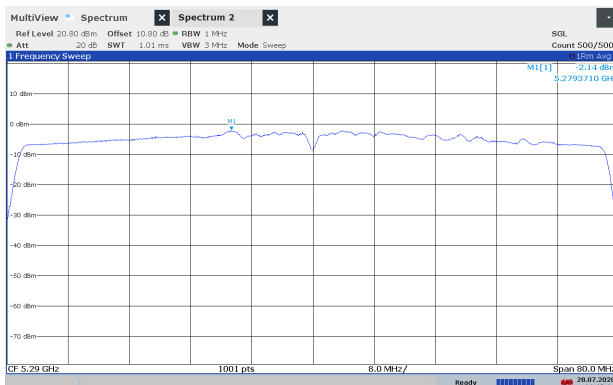
PSD, 5755 MHz, 802.11n, HT40



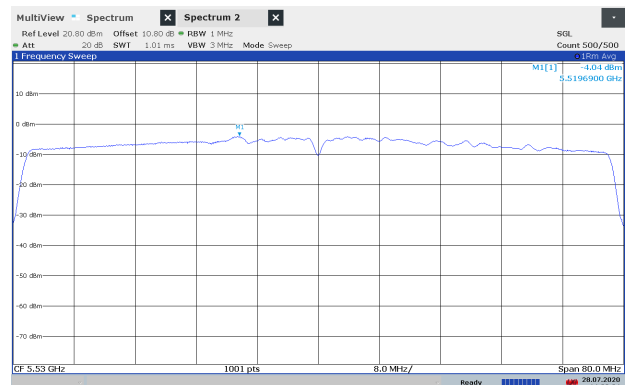
PSD, 5795 MHz, 802.11n, HT40



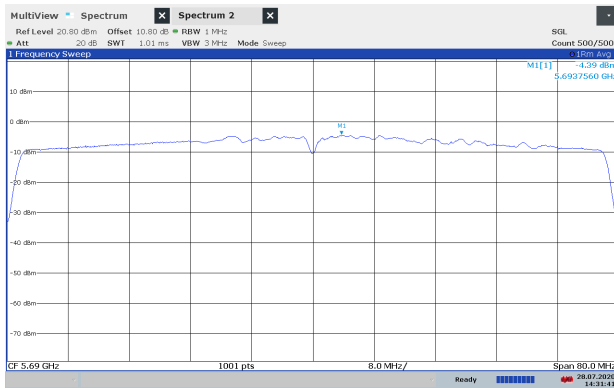
PSD, 5210 MHz, 802.11ac, HT80



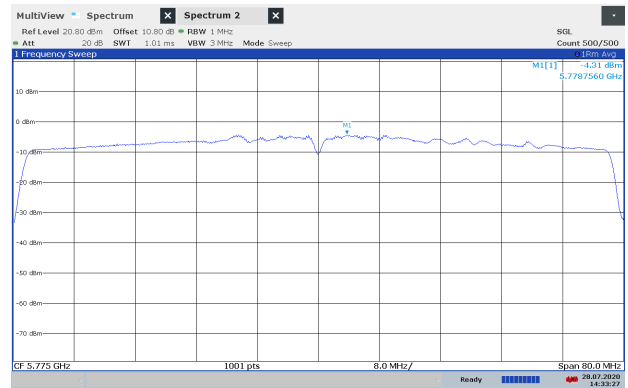
PSD, 5290 MHz, 802.11ac, HT80



PSD, 5530 MHz, 802.11ac, HT80



PSD, 5690 MHz, 802.11ac, HT80



PSD, 5775 MHz, 802.11ac, HT80

3.5 Unwanted Emissions

FCC 15.407 (b)

ISED RSS-247, Issue 2, clause 6.2

Measurement procedure: ANSI C63.10-2013 Clause 12.7

Test Results: Complies

Measurement Data:

Band Edge Emissions:

Ch. No.	Carrier Frequency (MHz)	Band Edge Frequency (MHz)	Measured Values (dBm/MHz e.i.r.p.)			
			802.11a 6Mb	802.11n HT20	802.11n HT40	802.11ac HT80
36	5180	5150	-32.7	-31.6		
64	5320	5350	-31.6	-29.1		
100	5500	5470	-30.5	-30.6		
140	5700	5725	-27.1	-27.6		
149	5745	5650	< -40	< -40		
149	5745	5700	< -45	< -45		
165	5825	5875	< -45	< -45		
165	5825	5925	< -40	< -40		
38	5190	5150			-27.9	
62	5310	5350			-27.7	
102	5510	5470			-29.1	
134	5670	5725			-31.0	
151	5755	5650			< -40	
151	5755	5700			< -45	
159	5795	5875			< -45	
159	5795	5925			< -40	
42	5210	5150				-32.2
58	5290	5350				-28.0
106	5530	5470				-27.1
155	5775	5650				< -40
155	5775	5700				< -45
155	5775	5875				< -45
155	5775	5925				< -40

The measurement was performed radiated.

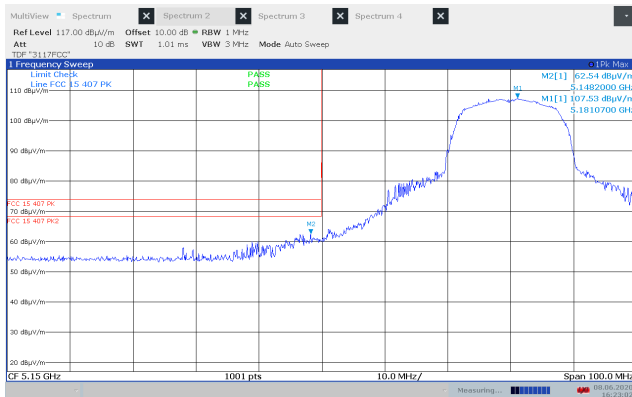
EIRP values were calculated from field strength using the method in KDB 412172 D01.

The tested equipment is for indoor use only, no band-edge requirements apply at 5250 MHz.

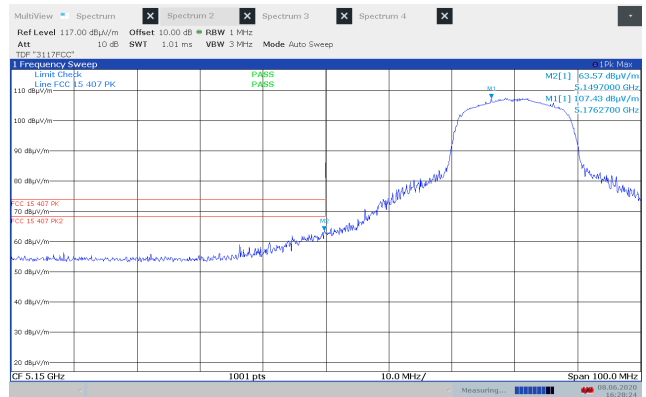
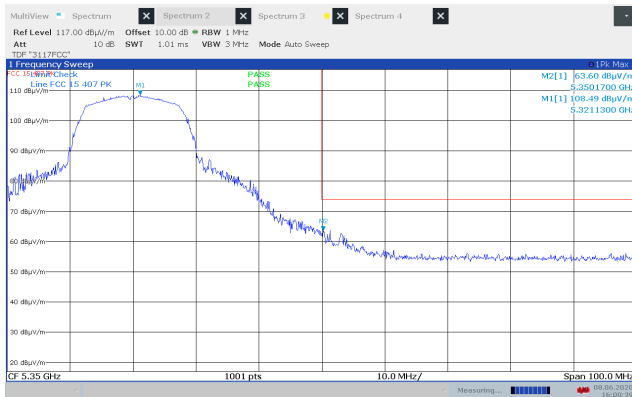
Limits:

Operating Frequency band	Limit for Emissions Outside Operating Frequency Band
5150 – 5250 MHz	-27 dBm/MHz e.i.r.p.
5250 – 5350 MHz	-27 dBm/MHz e.i.r.p.
5470 – 5725 MHz	-27 dBm/MHz e.i.r.p.
5725 – 5825 MHz	See FCC 15.407(b)(4)(i) or 15.407(b)(4)(ii)

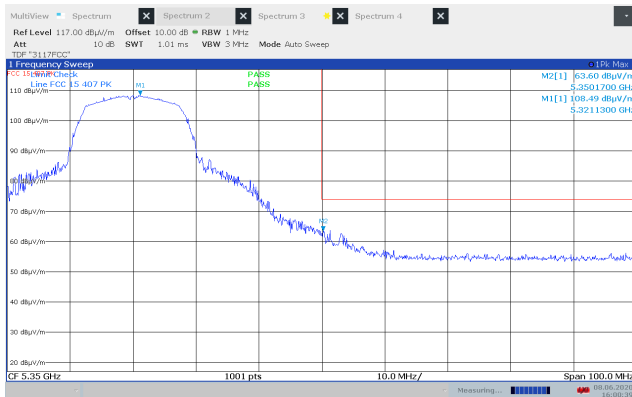
Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.



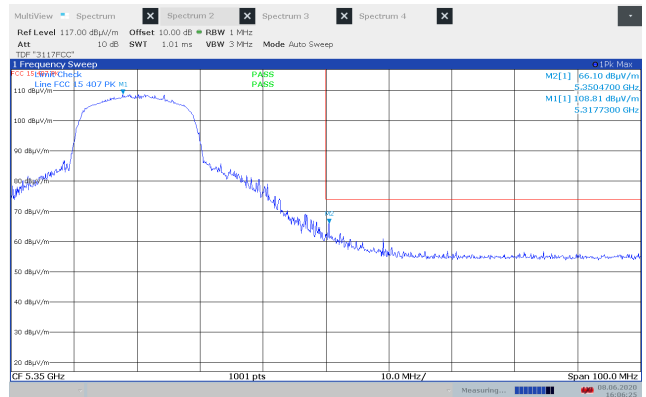
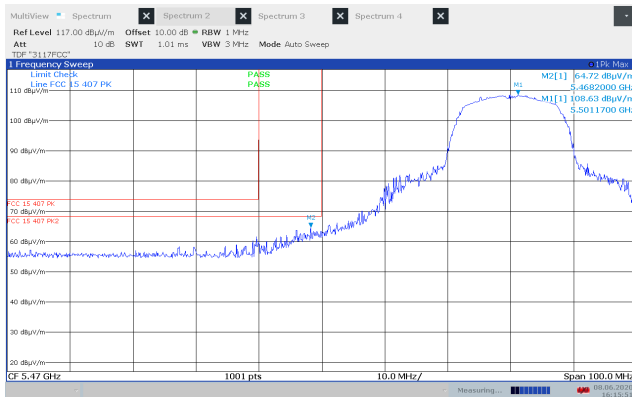
Band Edge 5150 MHz, ch036, 802.11a 6Mb, Radiated, Max



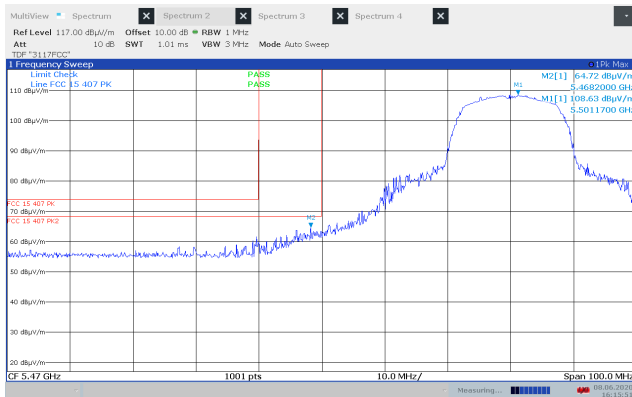
Band Edge 5150 MHz, ch036, 802.11n HT20, Radiated, Max



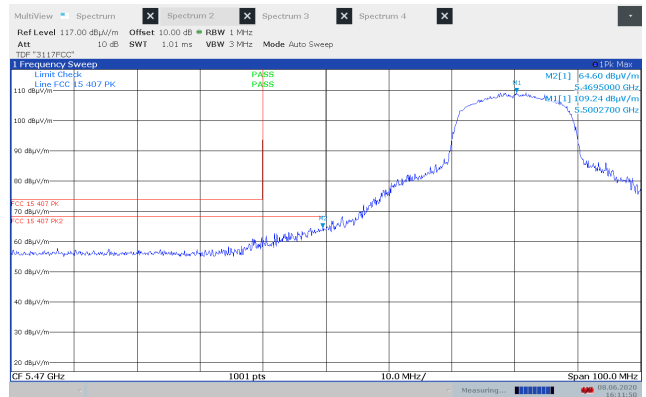
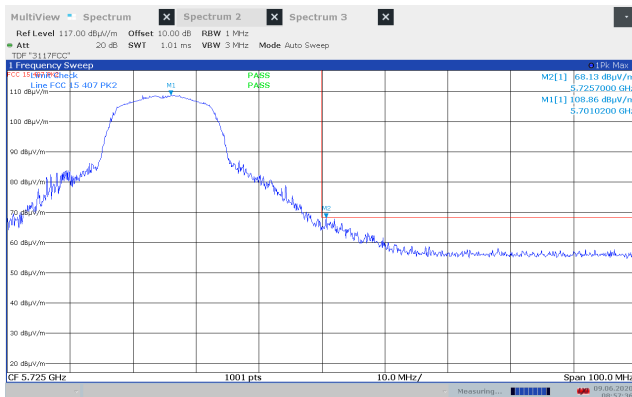
Band Edge 5350 MHz, ch064, 802.11a 6Mb, Radiated, Max



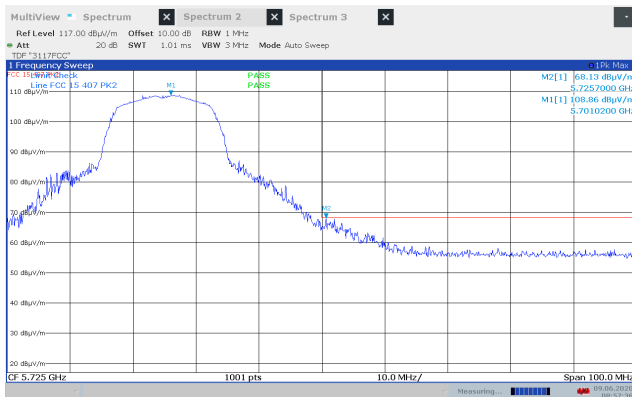
Band Edge 5350 MHz, ch064, 802.11n HT20, Radiated, Max



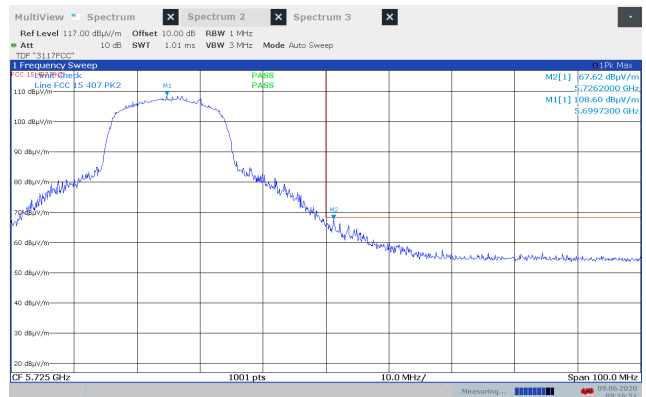
Band Edge 5470 MHz, ch100, 802.11a 6Mb, Radiated, Max



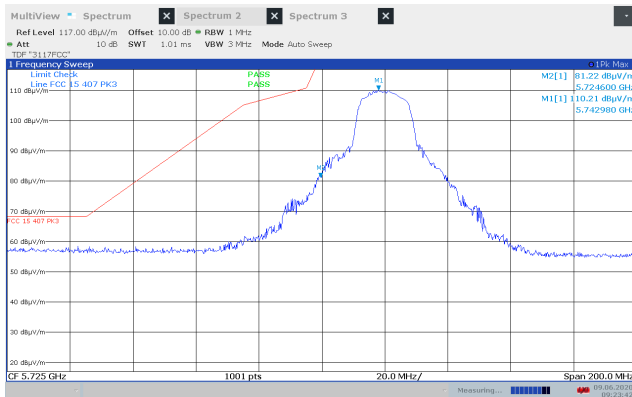
Band Edge 5470 MHz, ch100, 802.11n HT20, Radiated, Max



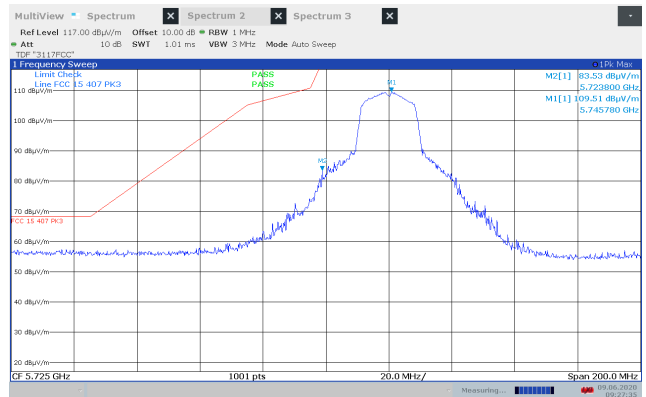
Band Edge 5725 MHz, ch140, 802.11a 6Mb, Radiated, Max



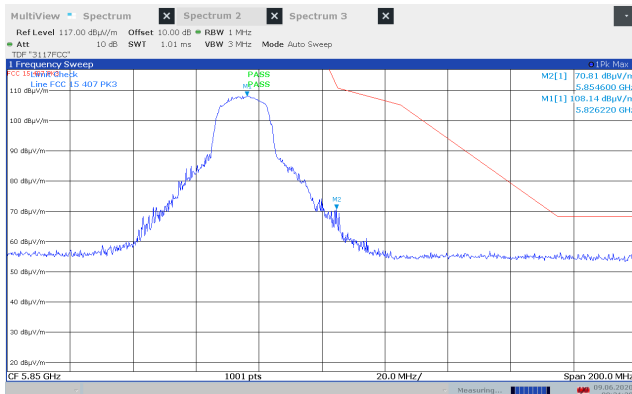
Band Edge 5725 MHz, ch140, 802.11n HT20, Radiated, Max



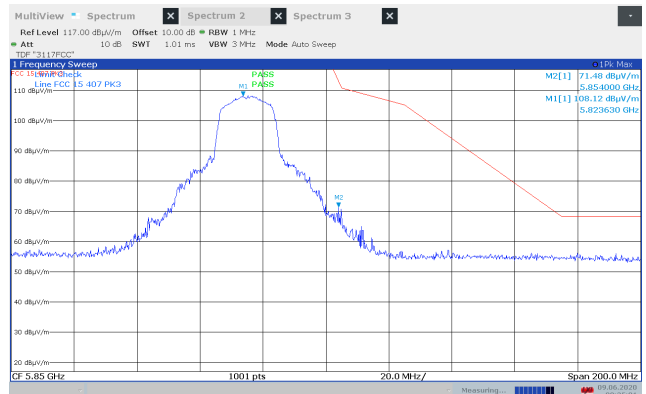
Band Edge 5725 MHz, ch149, 802.11a 6Mb, Radiated, Max



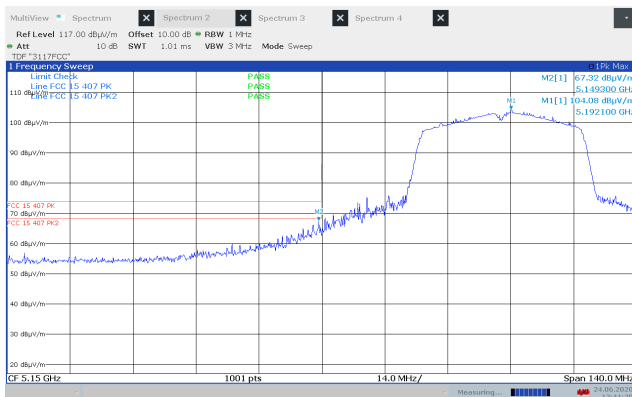
Band Edge 5725 MHz, ch149, 802.11n HT20, Radiated, Max



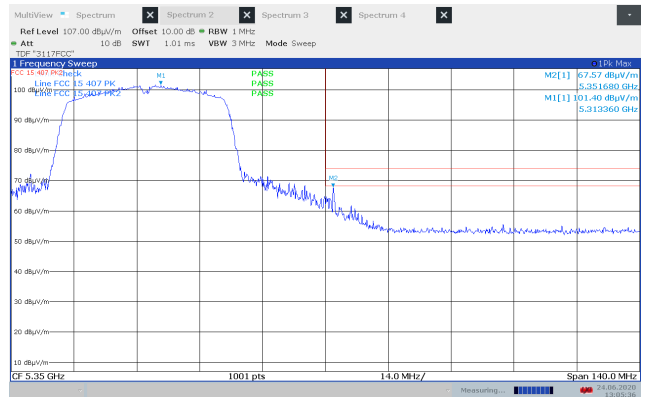
Band Edge 5850 MHz, ch165, 802.11a 6Mb, Radiated, Max



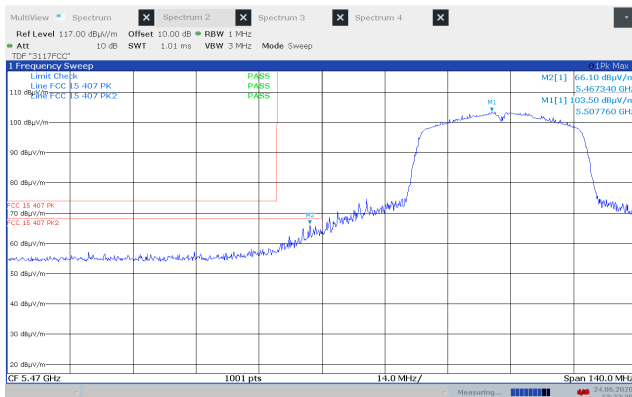
Band Edge 5850 MHz, ch165, 802.11n HT20, Radiated, Max



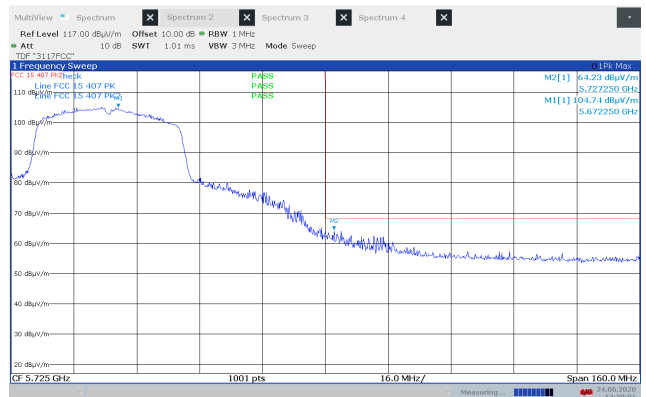
Band Edge 5150 MHz, ch038, 802.11n HT40, Radiated, Max



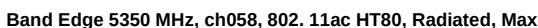
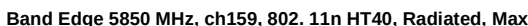
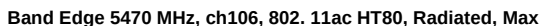
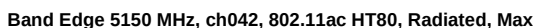
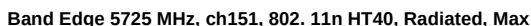
Band Edge 5350 MHz, ch062, 802.11n HT40, Radiated, Max

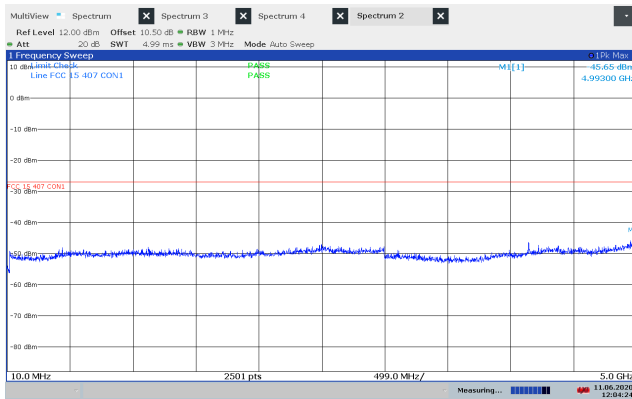


Band Edge 5470 MHz, ch102, 802.11n HT40, Radiated, Max

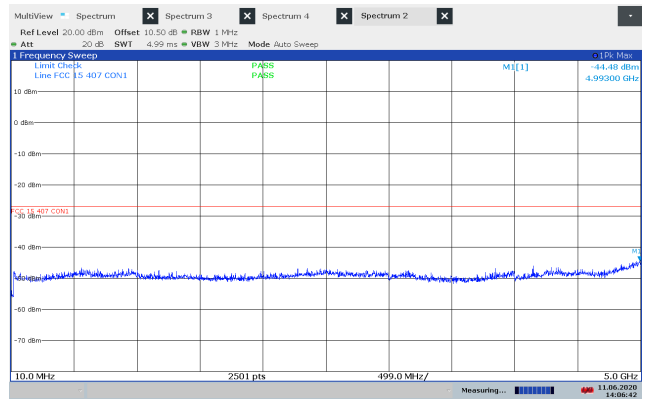


Band Edge 5725 MHz, ch134, 802.11n HT40, Radiated, Max

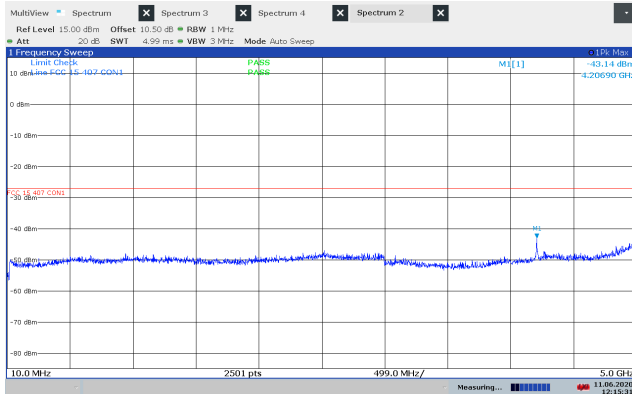




Unwanted Emissions 10-5000 MHz, ch036, 802.11a 6Mb, Conducted



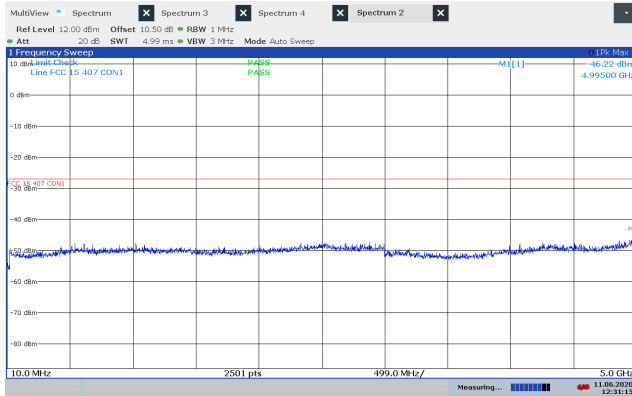
Unwanted Emissions 10-5000 MHz, ch036, 802.11n HT20, Conducted



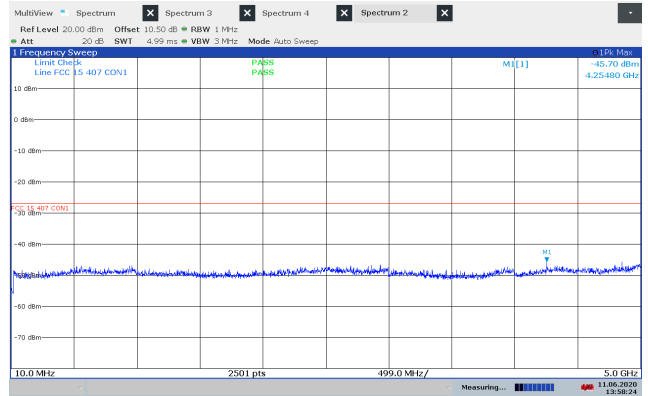
Unwanted Emissions 10-5000 MHz, ch052, 802.11a 6Mb, Conducted



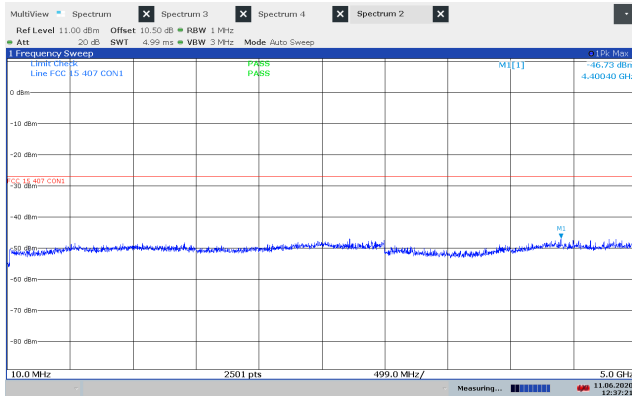
Unwanted Emissions 10-5000 MHz, ch052, 802.11n HT20, Conducted



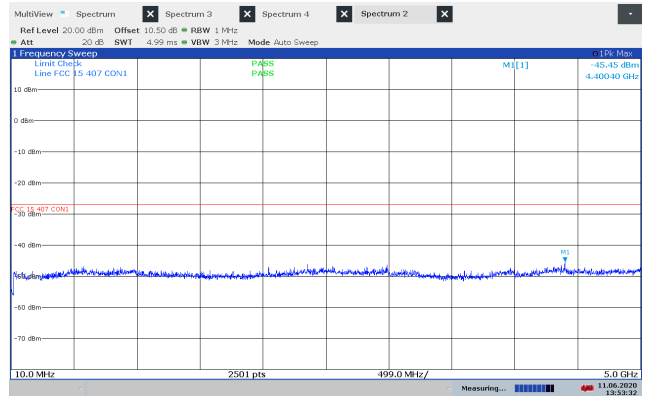
Unwanted Emissions 10-5000 MHz, ch064, 802.11a 6Mb, Conducted



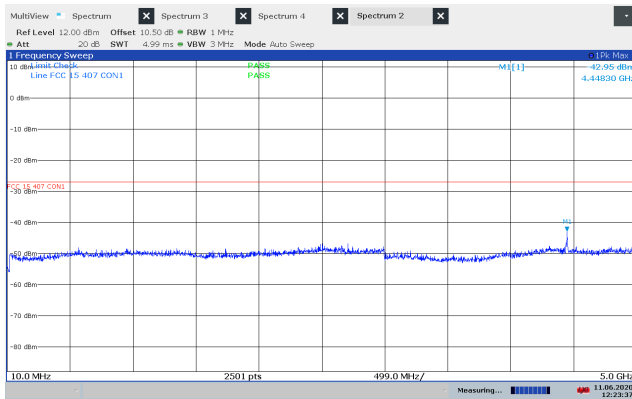
Unwanted Emissions 10-5000 MHz, ch064, 802.11n HT20, Conducted



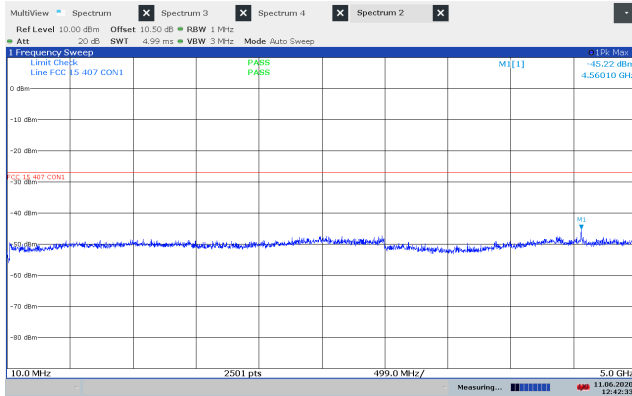
Unwanted Emissions 10-5000 MHz, ch100, 802.11a 6Mb, Conducted



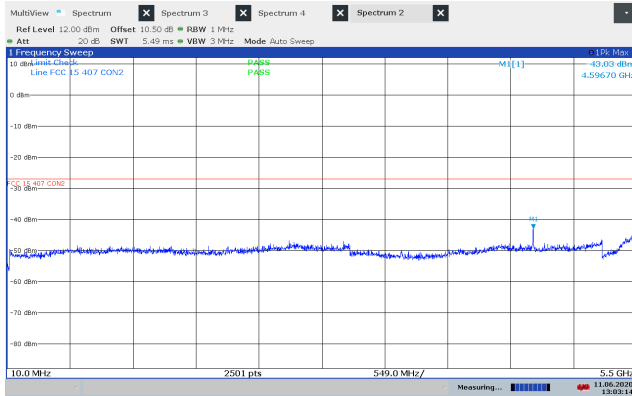
Unwanted Emissions 10-5000 MHz, ch100, 802.11n HT20, Conducted



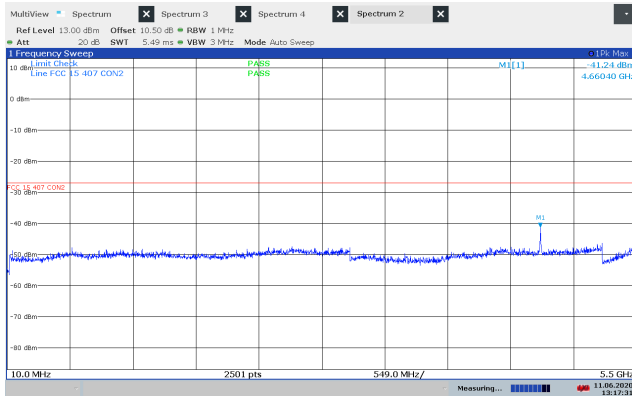
Unwanted Emissions 10-5000 MHz, ch112, 802.11a 6Mb, Conducted



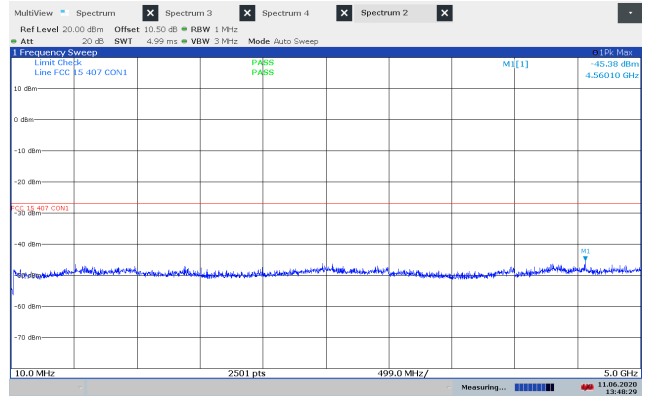
Unwanted Emissions 10-5000 MHz, ch140, 802.11a 6Mb, Conducted



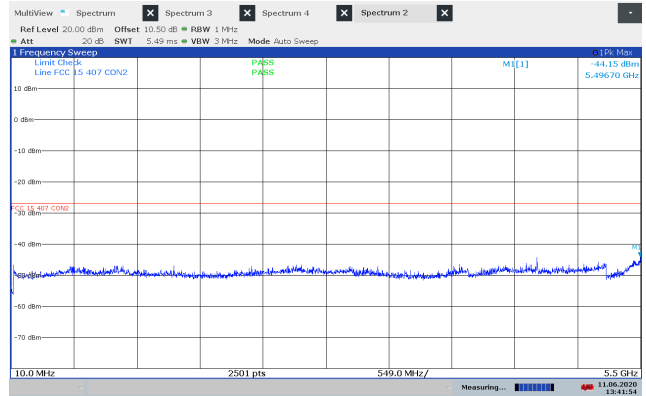
Unwanted Emissions 10-5500 MHz, ch149, 802.11a 6Mb, Conducted



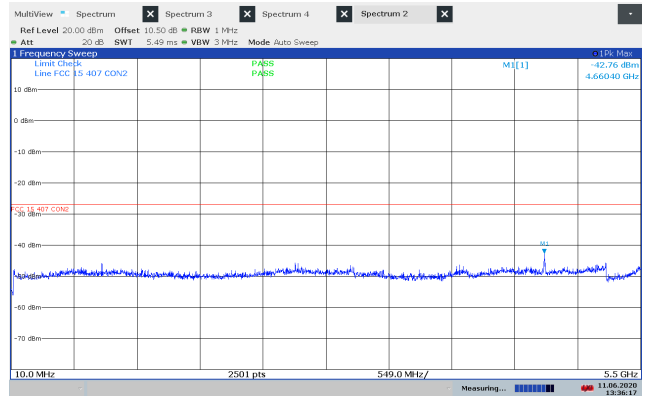
Unwanted Emissions 10-5500 MHz, ch165, 802.11a 6Mb, Conducted



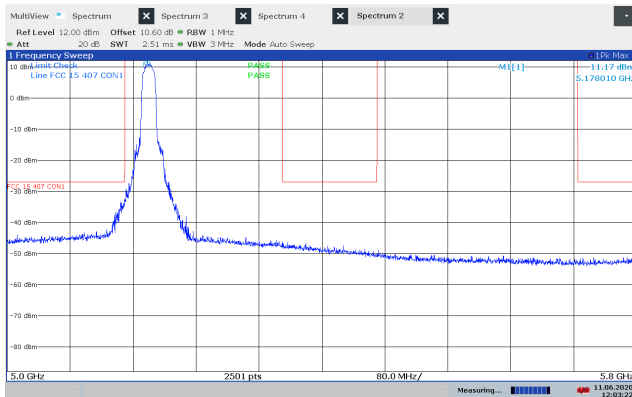
Unwanted Emissions 10-5000 MHz, ch140, 802.11n HT20, Conducted



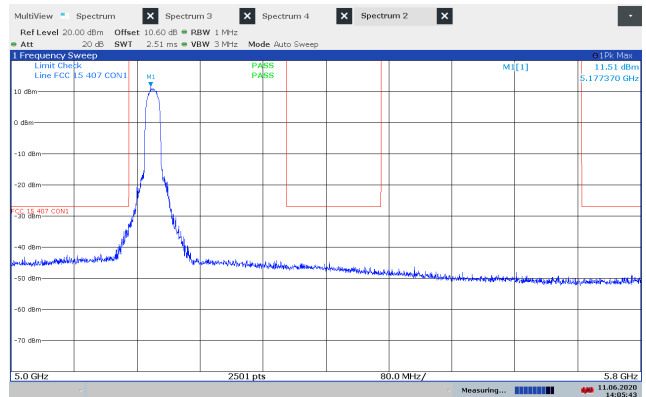
Unwanted Emissions 10-5500 MHz, ch149, 802.11n HT20, Conducted



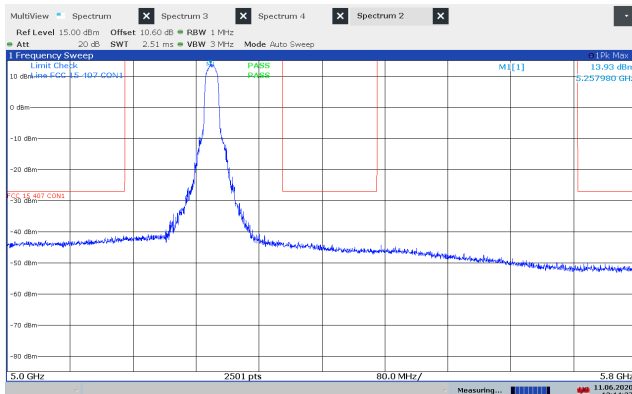
Unwanted Emissions 10-5500 MHz, ch165, 802.11n HT20, Conducted



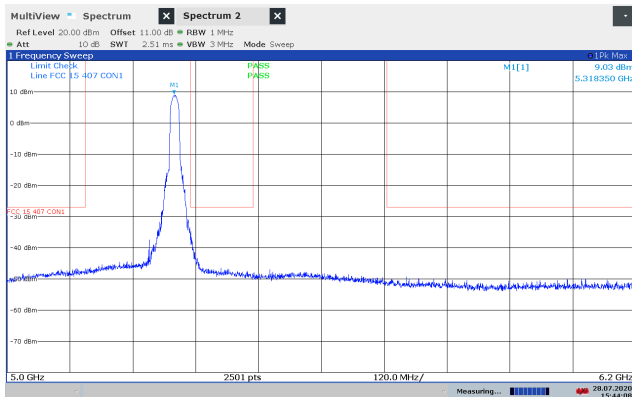
Unwanted Emissions 5000-5800 MHz, ch036, 802.11a 6Mb, Conducted



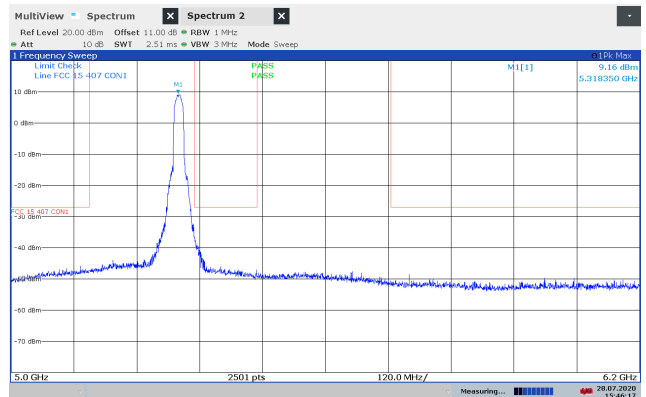
Unwanted Emissions 5000-5800 MHz, ch036, 802.11n HT20, Conducted



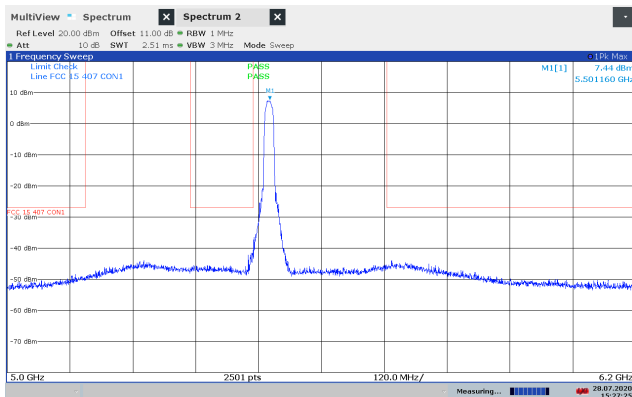
Unwanted Emissions 5000-5800 MHz, ch052, 802.11a 6Mb, Conducted



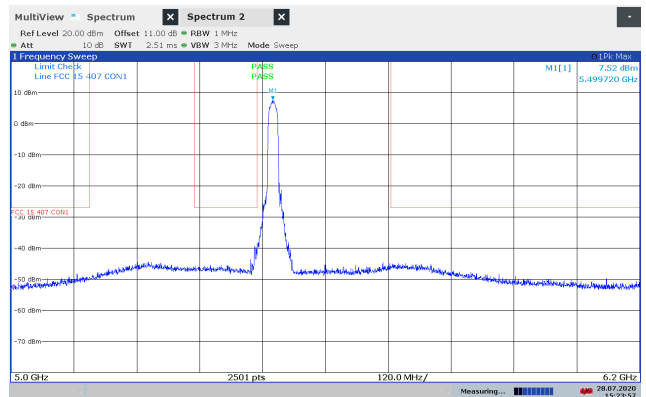
Unwanted Emissions 5000-6200 MHz, ch064, 802.11a 6Mb, Conducted



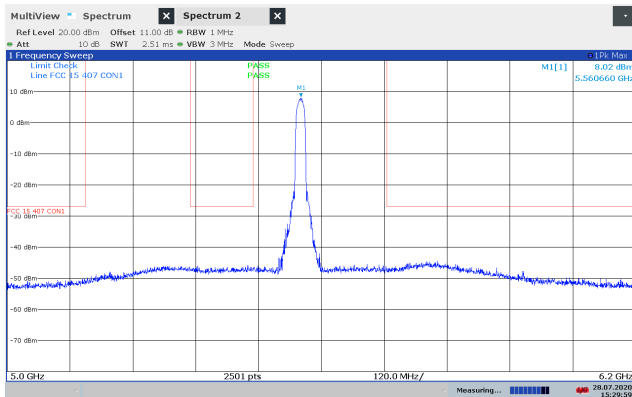
Unwanted Emissions 5000-6200 MHz, ch064, 802.11n HT20, Conducted



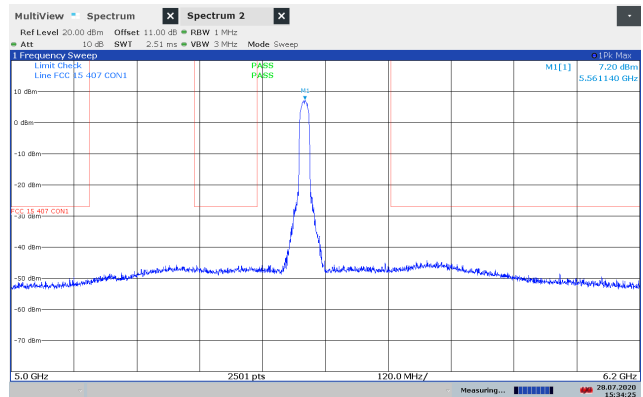
Unwanted Emissions 5000-6200 MHz, ch100, 802.11a 6Mb, Conducted



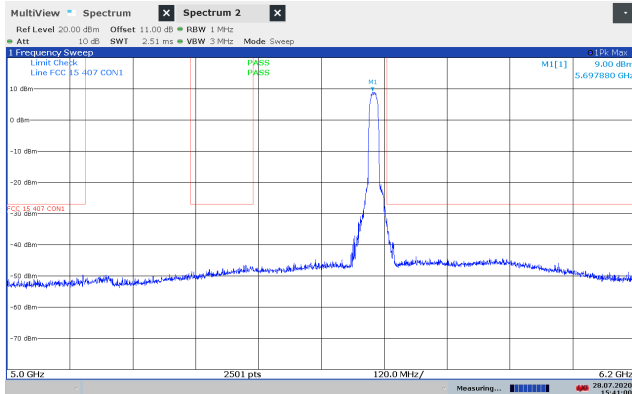
Unwanted Emissions 5000-6200 MHz, ch100, 802.11n HT20, Conducted



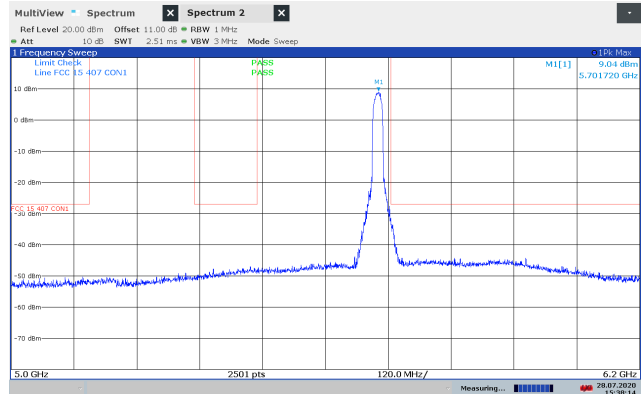
Unwanted Emissions 5000-6200 MHz, ch112, 802.11a 6Mb, Conducted



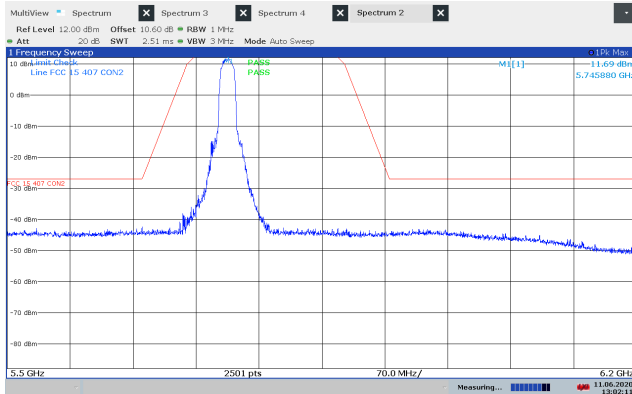
Unwanted Emissions 5000-6200 MHz, ch112, 802.11n HT20, Conducted



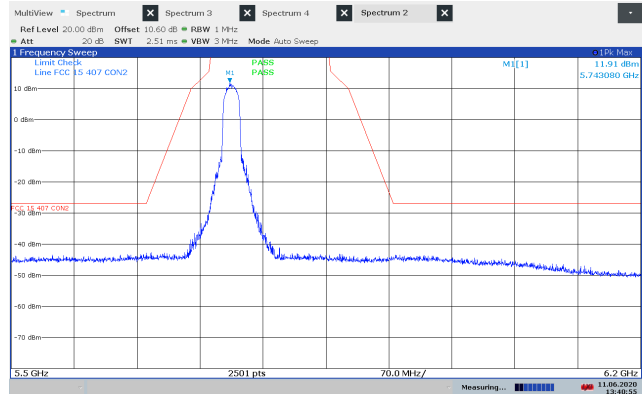
Unwanted Emissions 5000-6200 MHz, ch140, 802.11a 6Mb, Conducted



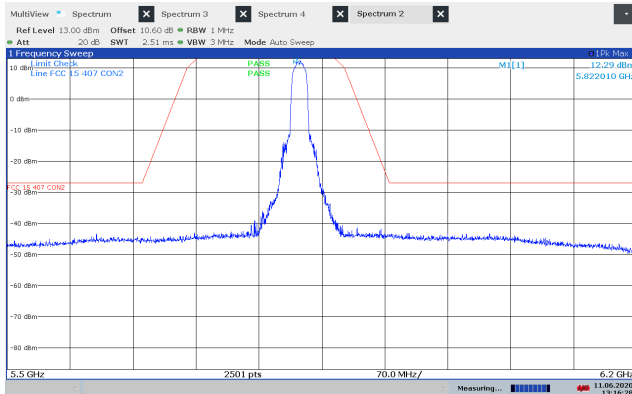
Unwanted Emissions 5000-6200 MHz, ch140, 802.11n HT20, Conducted



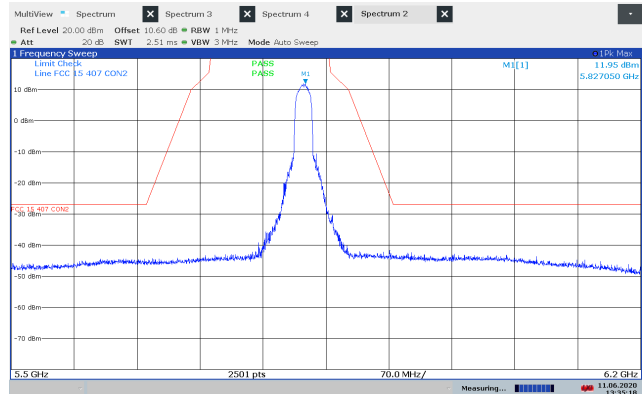
Unwanted Emissions 5500-6200 MHz, ch149, 802.11a 6Mb, Conducted



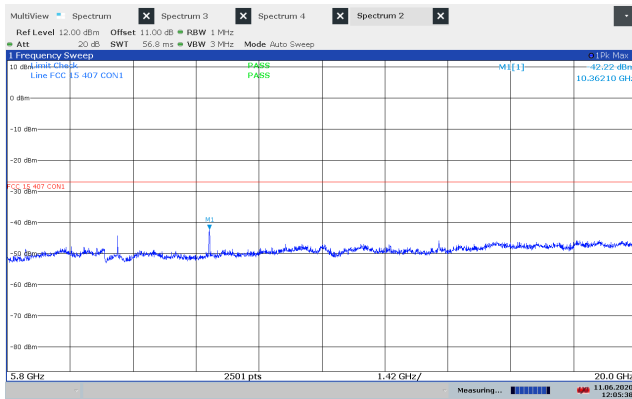
Unwanted Emissions 5500-6200 MHz, ch149, 802.11n HT20, Conducted



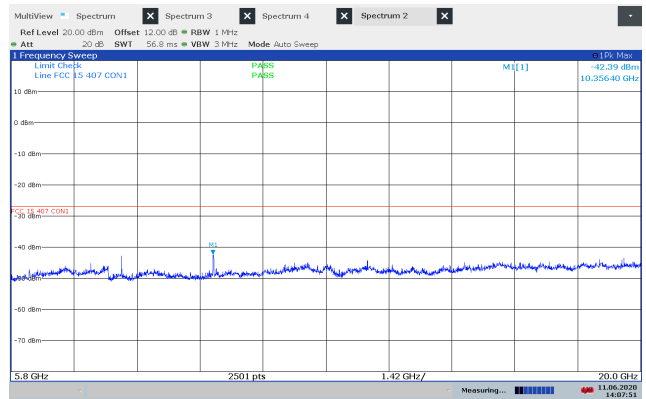
Unwanted Emissions 5500-6200 MHz, ch165, 802.11a 6Mb, Conducted



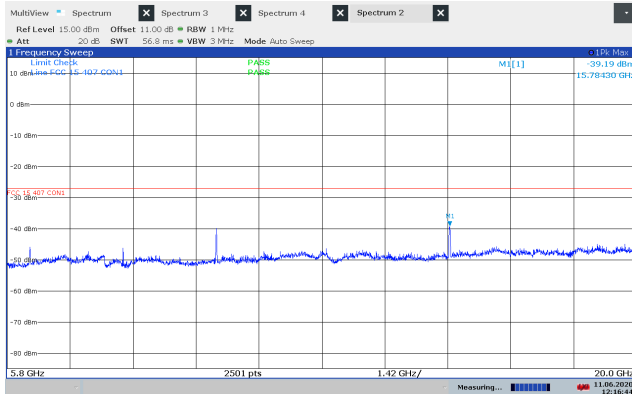
Unwanted Emissions 5500-6200 MHz, ch165, 802.11n HT20, Conducted



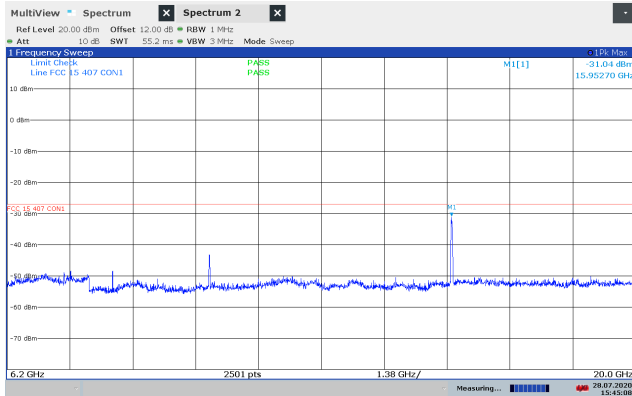
Unwanted Emissions 5.8-20 GHz, ch036, 802.11a 6Mb, Conducted



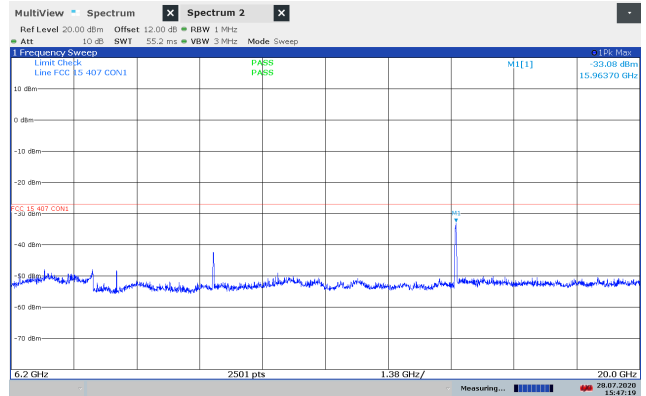
Unwanted Emissions 5.8-20 GHz, ch036, 802.11n HT20, Conducted



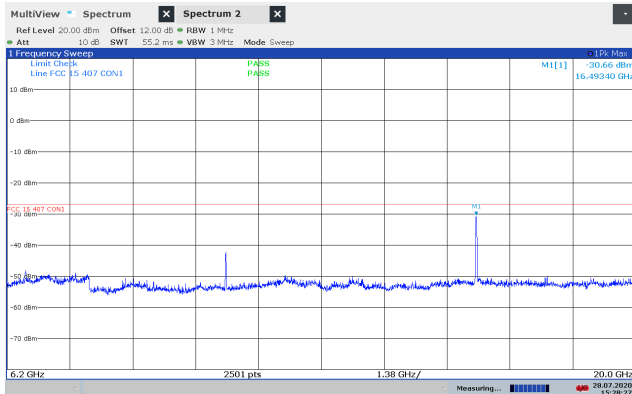
Unwanted Emissions 5.8-20 GHz, ch052, 802.11a 6Mb, Conducted



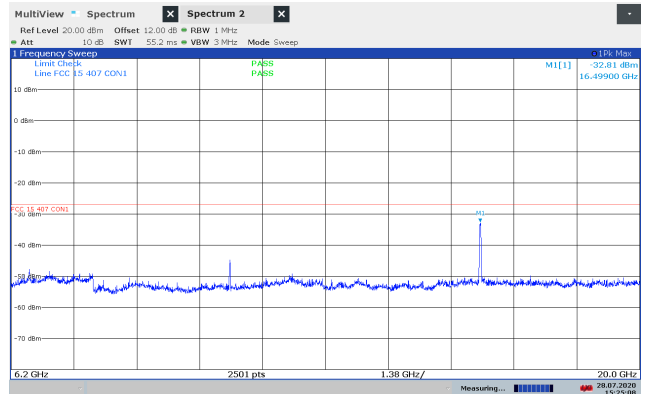
Unwanted Emissions 6.2-20 GHz, ch064, 802.11a 6Mb, Conducted



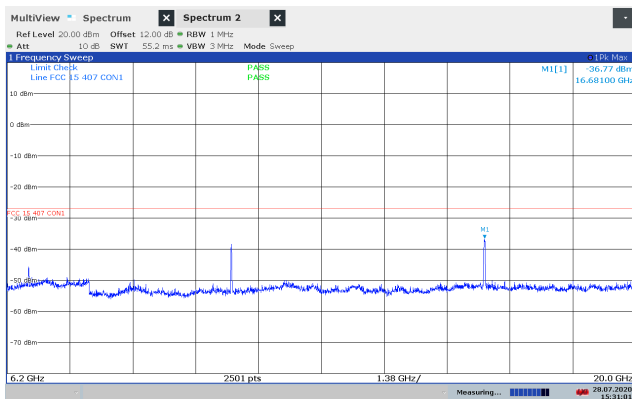
Unwanted Emissions 6.2-20 GHz, ch064, 802.11n HT20, Conducted



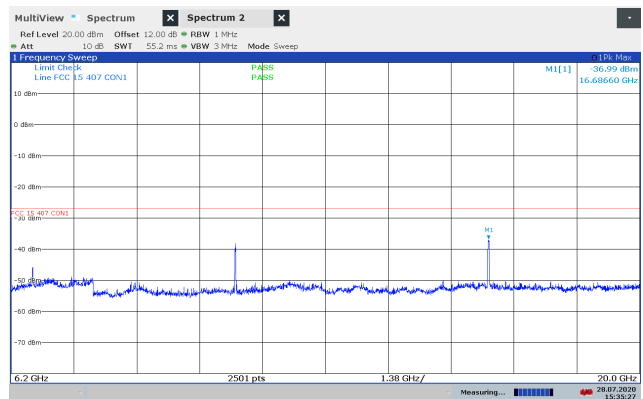
Unwanted Emissions 6.2-20 GHz, ch100, 802.11a 6Mb, Conducted



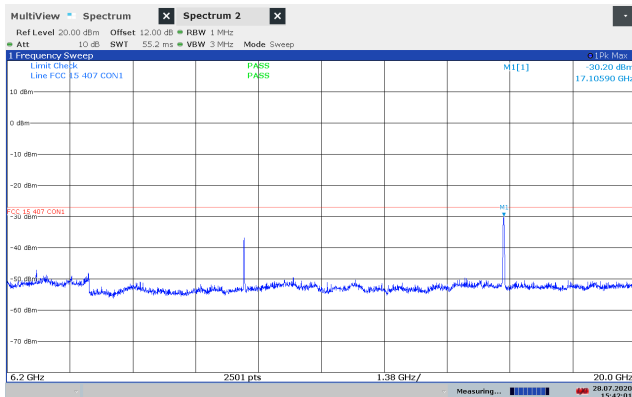
Unwanted Emissions 6.2-20 GHz, ch100, 802.11n HT20, Conducted



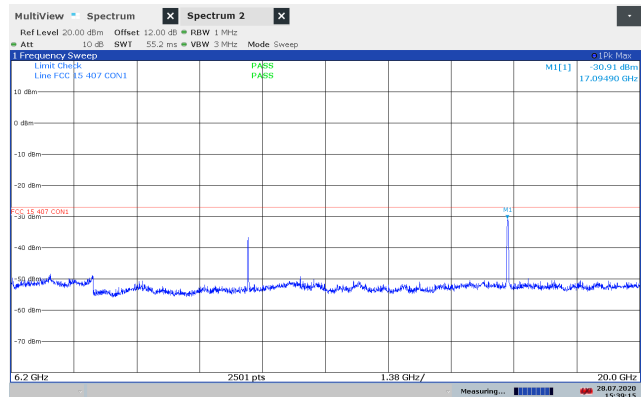
Unwanted Emissions 6.2-20 GHz, ch112, 802.11a 6Mb, Conducted



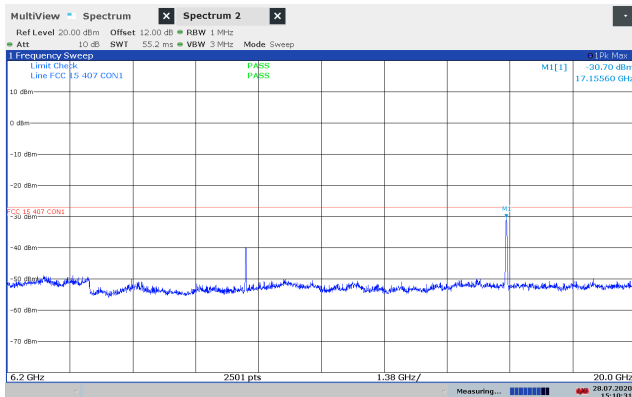
Unwanted Emissions 6.2-20 GHz, ch112, 802.11n HT20, Conducted



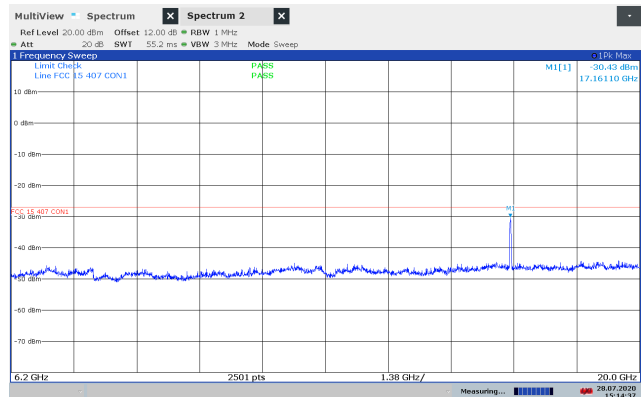
Unwanted Emissions 6.2-20 GHz, ch140, 802.11a 6Mb, Conducted



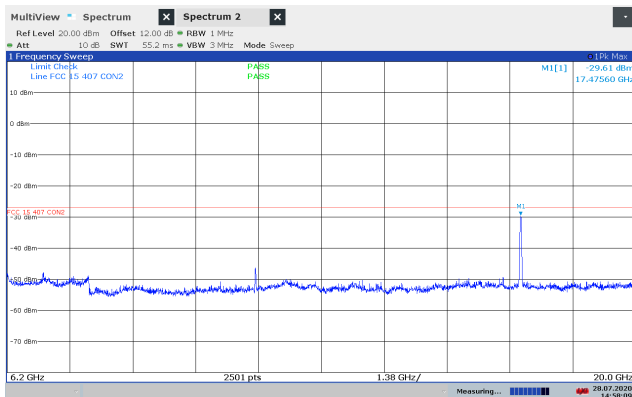
Unwanted Emissions 6.2-20 GHz, ch140, 802.11n HT20, Conducted



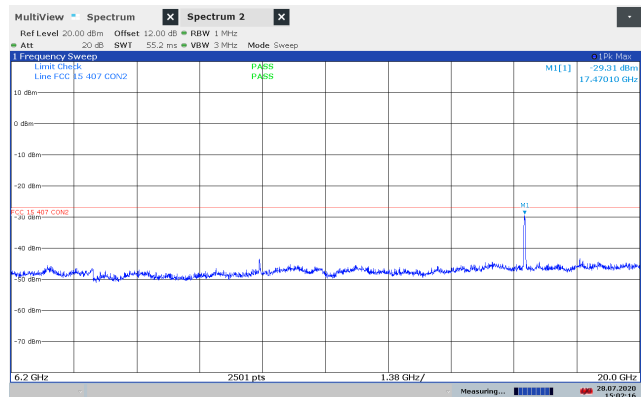
Unwanted Emissions 6.2-20 GHz, ch144, 802.11a 6Mb, Conducted



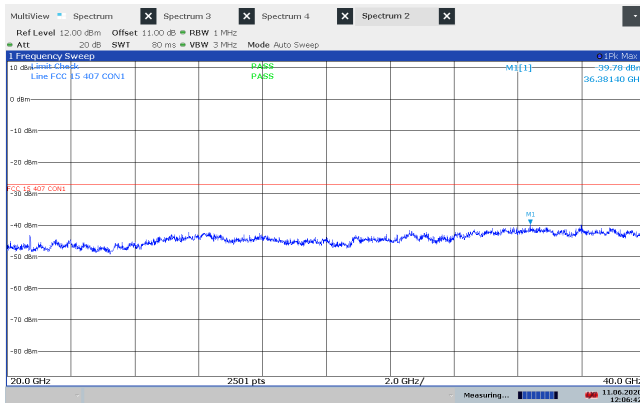
Unwanted Emissions 6.2-20 GHz, ch144, 802.11n HT20, Conducted



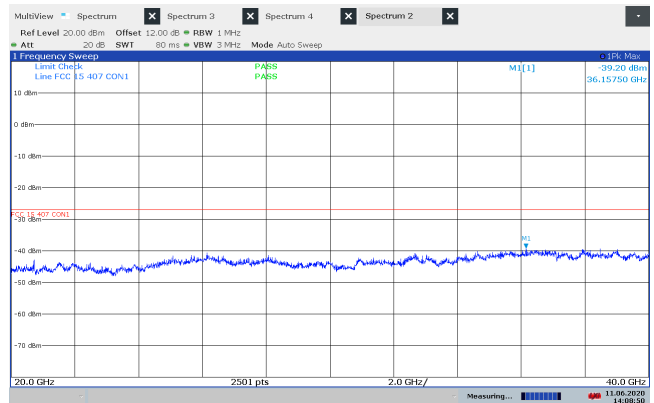
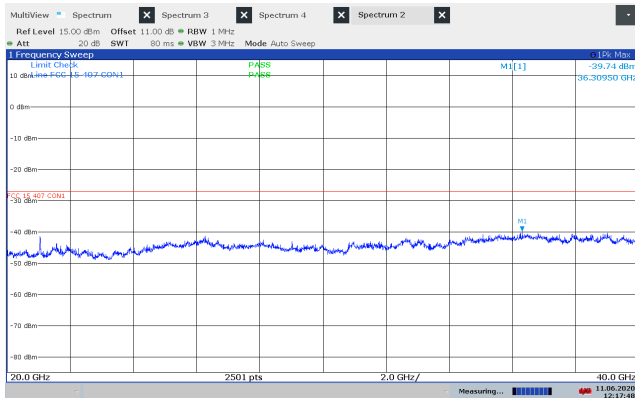
Unwanted Emissions 6.2-20 GHz, ch165, 802.11a 6Mb, Conducted



Unwanted Emissions 6.2-20 GHz, ch165, 802.11n HT20, Conducted

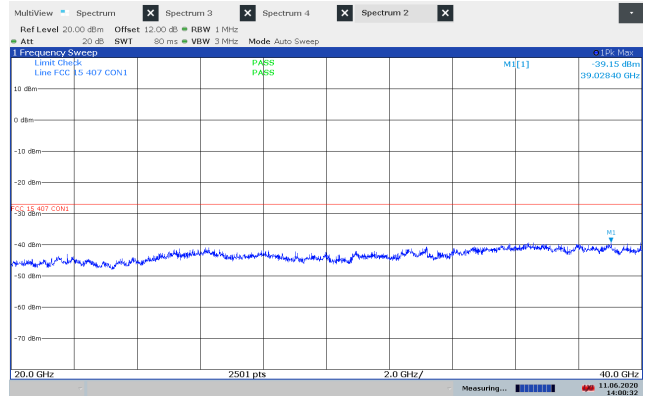
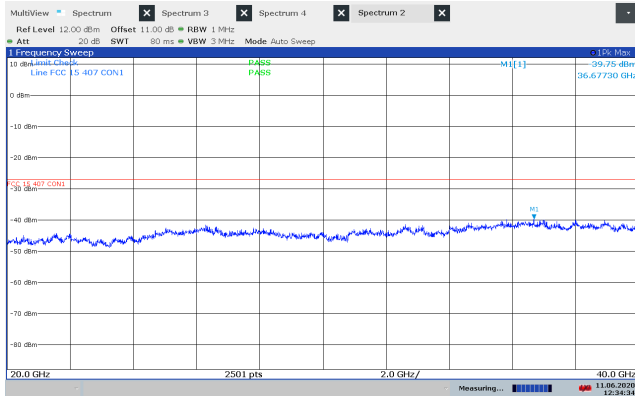


Unwanted Emissions 20-40 GHz, ch036, 802.11a 6Mb, Conducted



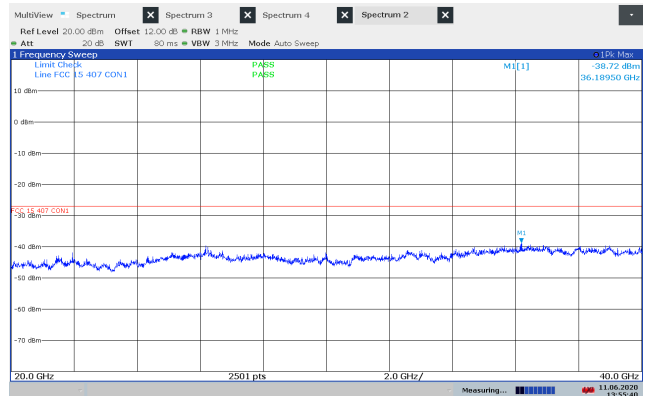
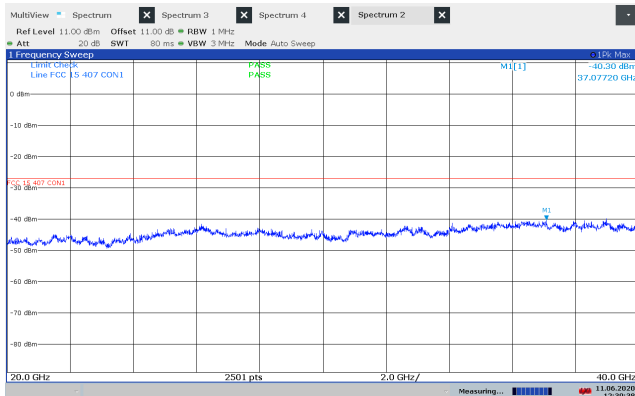
Unwanted Emissions 20-40 GHz, ch036, 802.11n HT20, Conducted

Unwanted Emissions 20-40 GHz, ch052, 802.11a 6Mb, Conducted



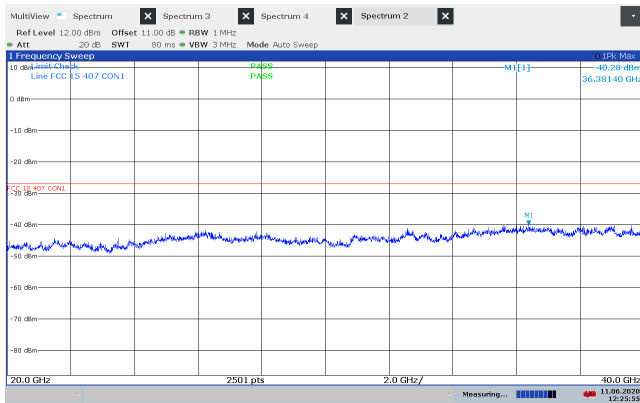
Unwanted Emissions 20-40 GHz, ch064, 802.11n HT20, Conducted

Unwanted Emissions 20-40 GHz, ch064, 802.11a 6Mb, Conducted

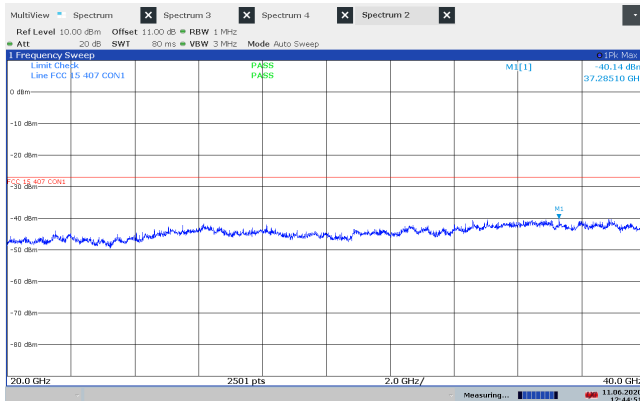


Unwanted Emissions 20-40 GHz, ch100, 802.11n HT20, Conducted

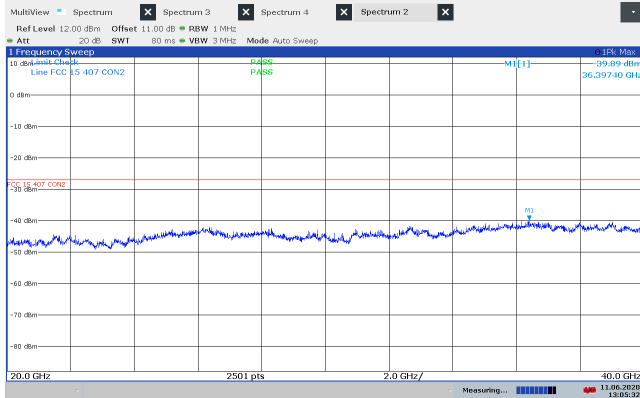
Unwanted Emissions 20-40 GHz, ch100, 802.11a 6Mb, Conducted



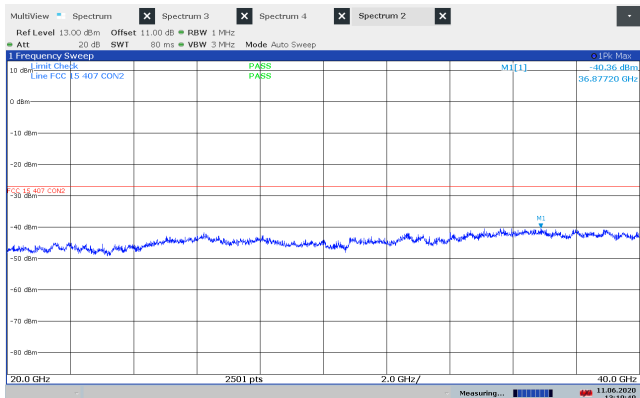
Unwanted Emissions 20-40 GHz, ch112, 802.11a 6Mb, Conducted



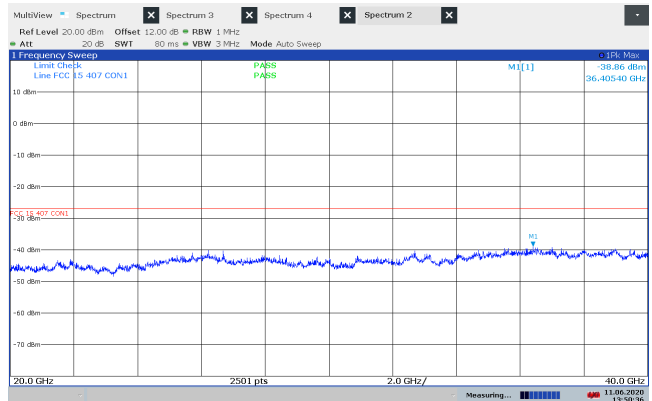
Unwanted Emissions 20-40 GHz, ch140, 802.11a 6Mb, Conducted



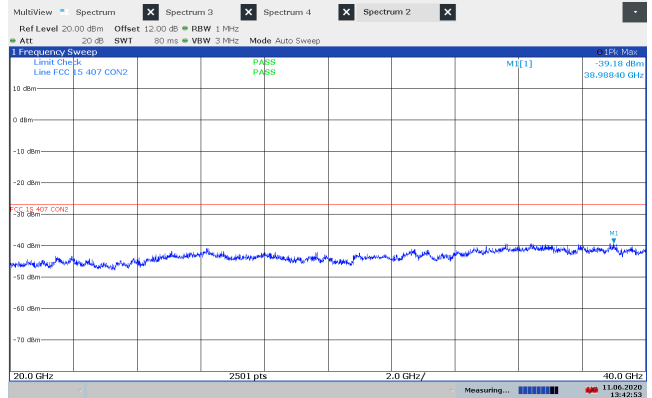
Unwanted Emissions 20-40 GHz, ch149, 802.11a 6Mb, Conducted



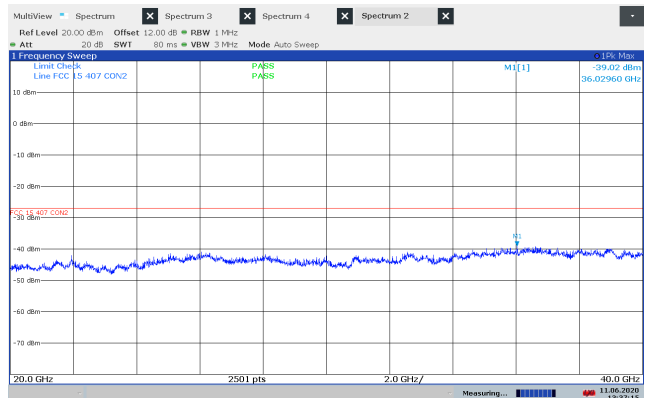
Unwanted Emissions 20-40 GHz, ch165, 802.11a 6Mb, Conducted



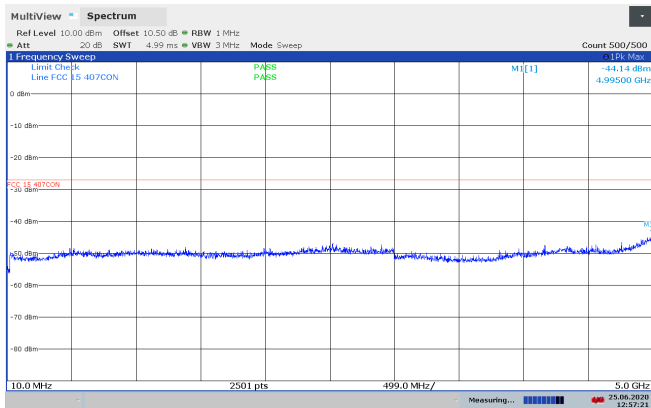
Unwanted Emissions 20-40 GHz, ch140, 802.11n HT20, Conducted



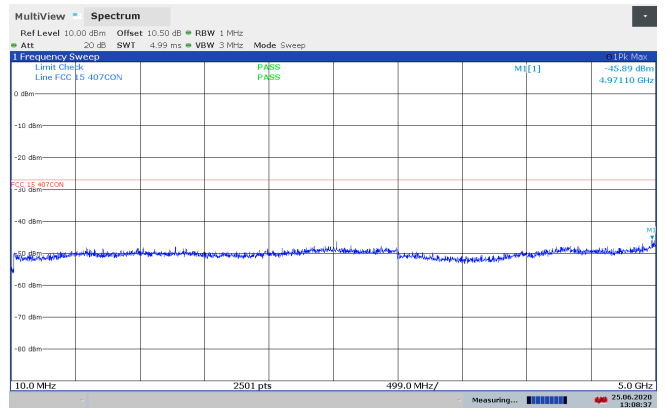
Unwanted Emissions 20-40 GHz, ch149, 802.11n HT20, Conducted



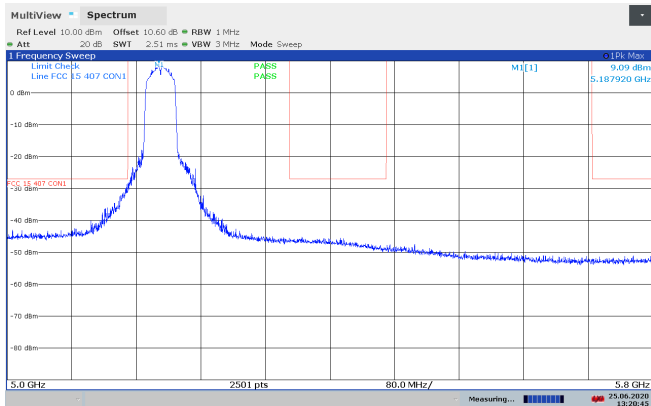
Unwanted Emissions 20-40 GHz, ch165, 802.11n HT20, Conducted



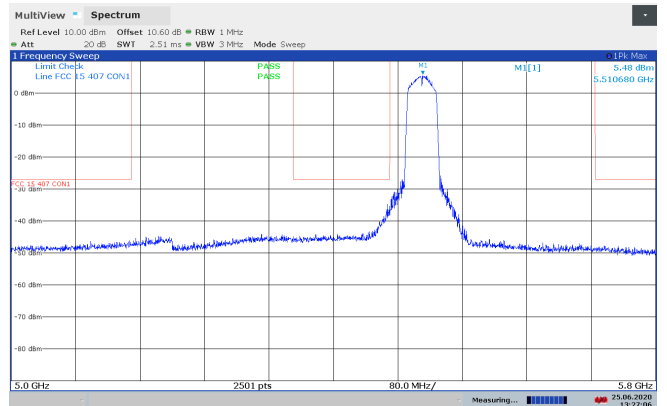
Unwanted Emissions 10-5000 MHz, ch042, 802.11ac HT80, Conducted



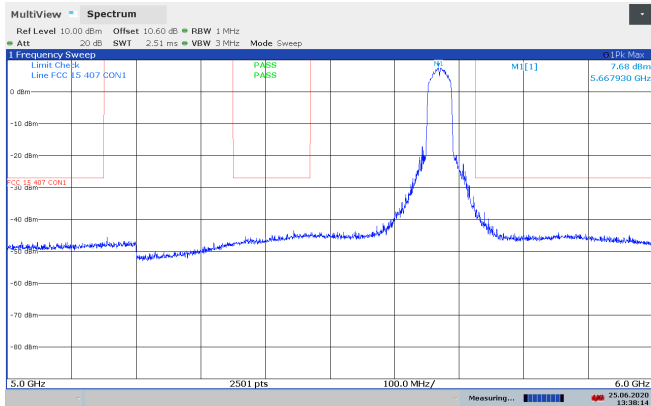
Unwanted Emissions 10-5000 MHz, ch058, 802.11ac HT80, Conducted



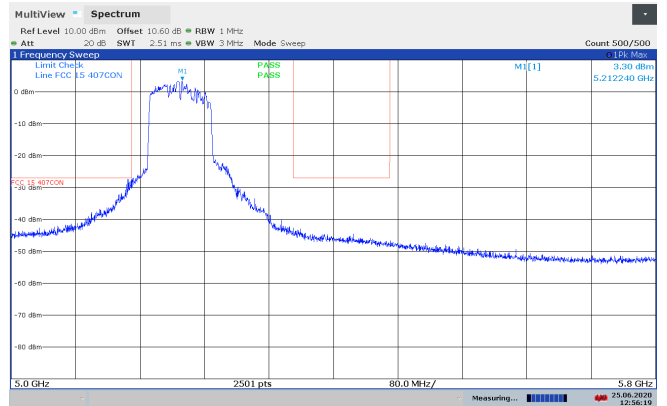
Unwanted Emissions 5000-5800 MHz, ch038, 802.11n HT40, Conducted



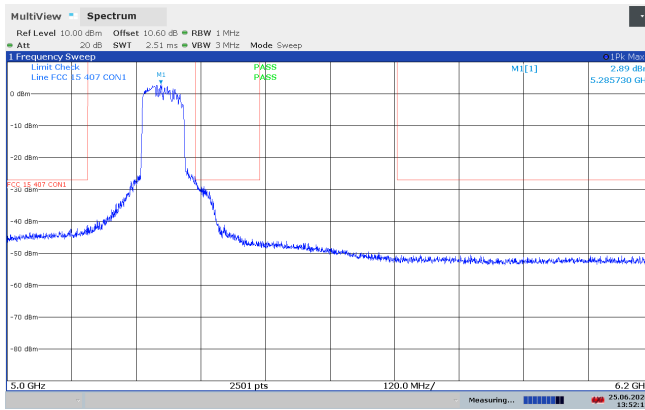
Unwanted Emissions 5000-5800 MHz, ch102, 802.11n HT40, Conducted



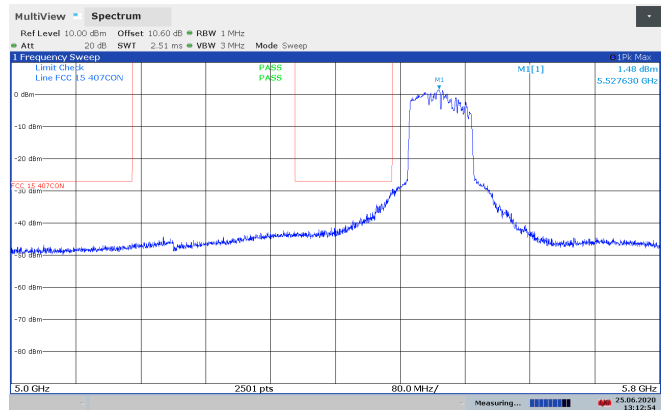
Unwanted Emissions 5000-6000 MHz, ch134, 802.11n HT40, Conducted



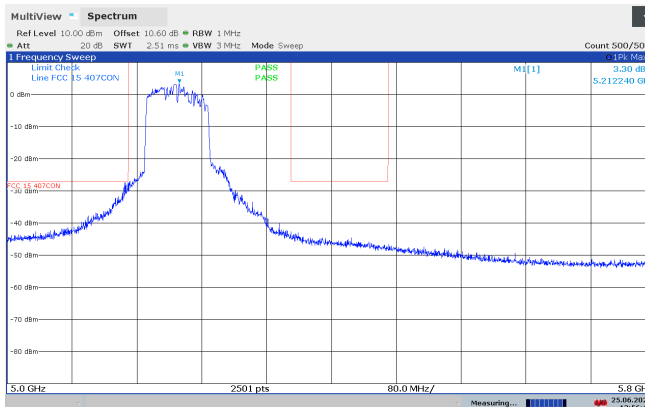
Unwanted Emissions 5000-5800 MHz, ch042, 802.11ac HT80, Conducted



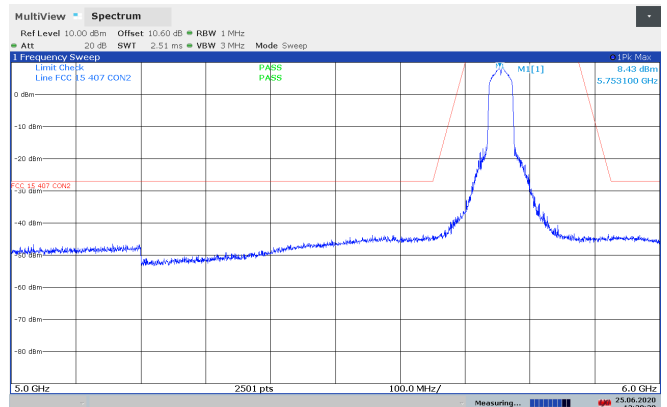
Unwanted Emissions 5000-6200 MHz, ch058, 802.11ac HT80, Conducted



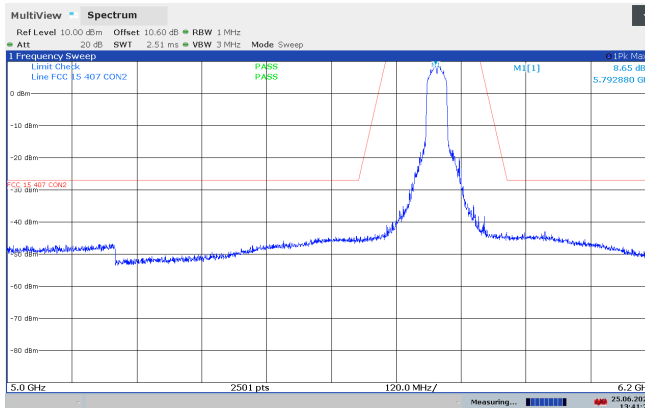
Unwanted Emissions 5000-5800 MHz, ch106, 802.11ac HT80, Conducted



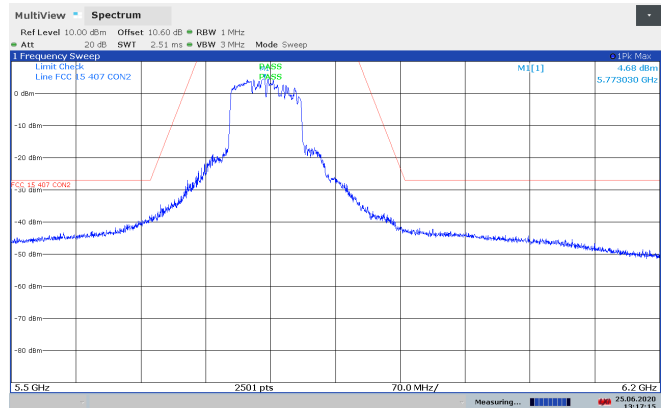
Unwanted Emissions 5000-5800 MHz, ch042, 802.11ac HT80, Conducted



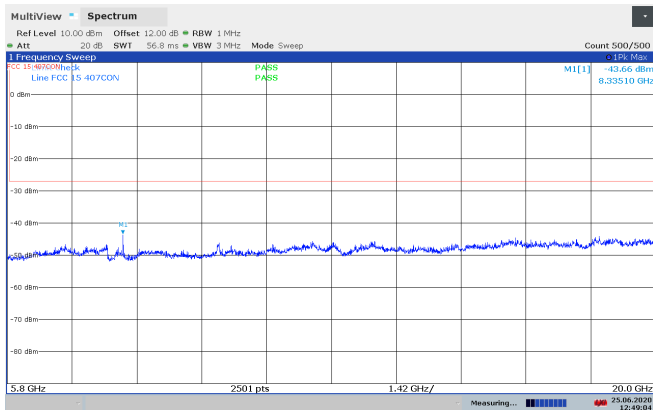
Unwanted Emissions 5000-6000 MHz, ch151, 802.11n HT40, Conducted



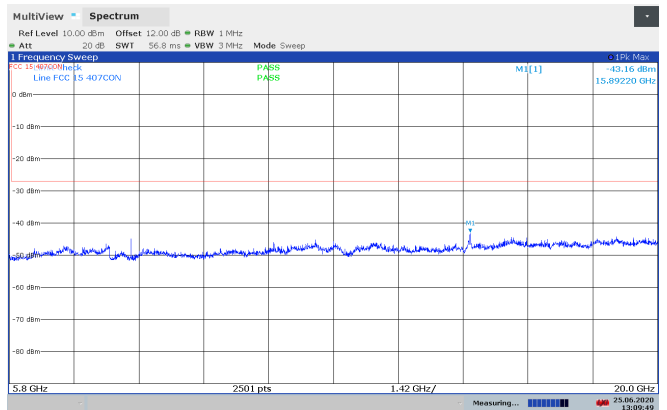
Unwanted Emissions 5000-6200 MHz, ch159, 802.11n HT40, Conducted



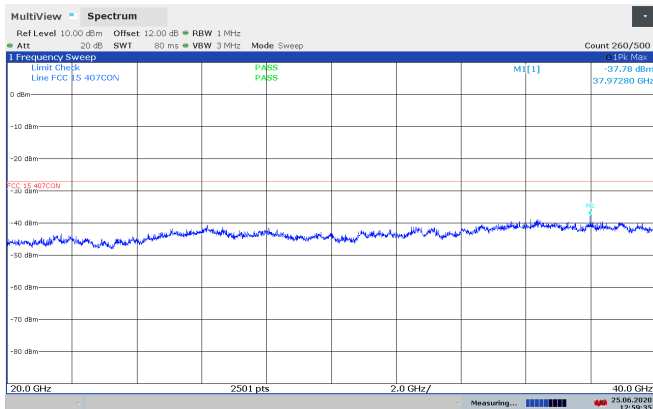
Unwanted Emissions 5500-6200 MHz, ch155, 802.11ac HT80, Conducted



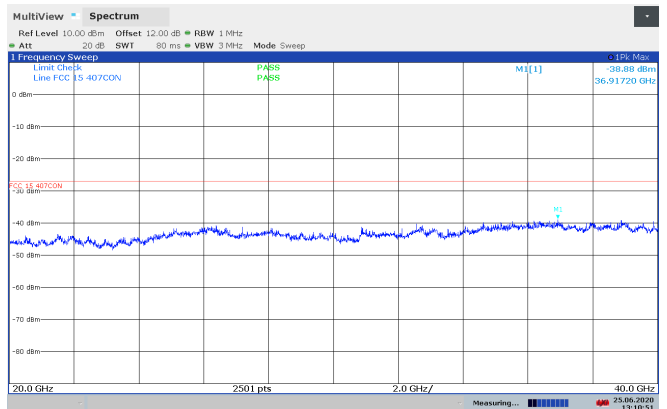
Unwanted Emissions 5.8-20 GHz, ch042, 802.11ac HT80, Conducted



Unwanted Emissions 5.8-20 GHz, ch058, 802.11ac HT80, Conducted



Unwanted Emissions 20-40 GHz, ch042, 802.11ac HT80, Conducted



Unwanted Emissions 20-40 GHz, ch058, 802.11ac HT80, Conducted

3.6 Restricted Bands of operation

Restricted Bands of operation for FCC and ISSED are defined in FCC Part 15.205 and ISSED RSS-GEN, Issue 5 clause 8.10.

Generally, no fundamentals are allowed in the restricted bands and all emissions must comply with the limits in FCC 15.209 or RSS-GEN, Issue 5, clause 8.9.

FCC (MHz)	ISSED (MHz)	FCC (GHz)	ISSED (GHz)
0.090-0.110		0.96-1.24 1.3-1.427	0.96-1.427
0.495-0.505		1.435-1.6265	
2.1735-2.1905		1.6455-1.6465	
	3.020-3.026	1.660-1.710	
4.125-4.128		1.7188-1.7222	
4.17725-4.17775		2.2-2.3	
4.20725-4.20775		2.31-2.39	
	5.677-5.683	2.4835-2.5	
6.215-6.218		2.69-2.9	2.655-2.9
6.26775-6.26825		3.26-3.267	
6.31175-6.31225		3.332-3.339	
8.291-8.294		3.3458-3.358	
8.362-8.366		3.6-4.4	3.5-4.4
8.37625-8.38675		4.5-5.15	
8.41425-8.41475		5.35-5.46	
12.29-12.293		7.25-7.75	
12.51975-12.52025		8.025-8.5	
12.57675-12.57725		9.0-9.2	
13.36-13.41		9.3-9.5	
16.42-16.423		10.6-12.7	
16.69475-16.69525		13.25-13.4	
16.80425-16.80475		14.47-14.5	
25.5-25.67		15.35-16.2	
37.5-38.25		17.7-21.4	
73-74.6		22.01-23.12	
74.8-75.2		23.6-24.0	
108-121.94 123-138	108-138	31.2-31.8	
149.9-150.05		36.43-36.5	
156.52475-156.52525		Above 38.6	
156.7-156.9			
162.0125-167.17			
167.72-173.2			
240-285			
322-335.4			
399.9-410			
608-614			

Frequencies in **Bold** text are specific for FCC or ISSED, all other frequencies are common.

3.7 Radiated Emissions, 30 – 1000 MHz

FCC 15.205, 15.209, 15.407

ISED RSS-GEN, Issue 5, Clause 8.9

Measurement procedure: ANSI C63.10-2013 Clause 12.7

Test Results: Complies

Measurement Data:

Detector: Peak

Measuring distance 3 m

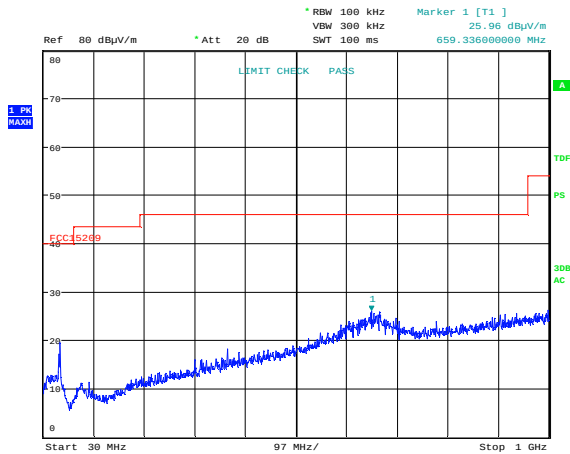
Tested in test mode with EUT transmitting on ch36

Measured Frequency (MHz)	Carrier Frequency (MHz)	Modulation	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30 – 88	5260	802.11a 6Mbps	< 20	40.0	> 20
88 – 216	5260	802.11a 6Mbps	< 18.5	43.5	> 25
216 – 960	5260	802.11a 6Mbps	< 26	46.0	> 20
960 – 1000	5260	802.11a 6Mbps	< 30	54.0	> 24

See attached plots.

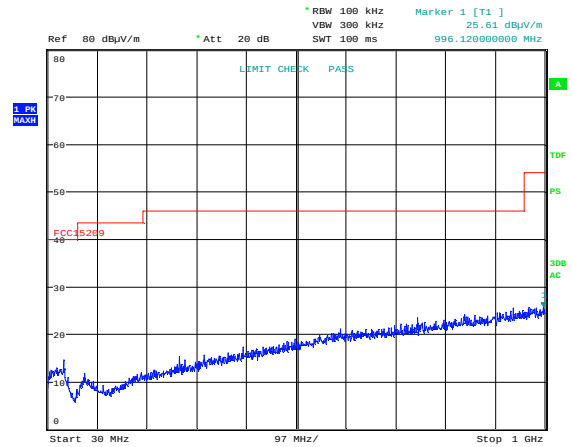
Requirements/Limit

FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
Frequency	Radiated emission limit @3 meters	
30 – 88 MHz	100 µV/m	40.0 dBµV/m
88 – 216 MHz	150 µV/m	43.5 dBµV/m
216 – 960 MHz	200 µV/m	46.0 dBµV/m
960 – 1000 MHz	500 µV/m	54.0 dBµV/m
Limits above are with Quasi Peak Detector		



Date: 9.JUN.2020 15:00:03

Radiated Emissions 30-1000 MHz, 802.11a 6Mb, EUT V, VP



Date: 9.JUN.2020 15:02:16

Radiated Emissions 30-1000 MHz, 802.11a 6Mb, EUT V, HP

3.8 Radiated Emissions, 1 – 18 GHz

FCC 15.205, 15.209, 15.407

ISED RSS-GEN, Issue 5, Clause 8.9

Measurement procedure: ANSI C63.10-2013 Clause 12.7

Test Results: Complies

Measurement Data:

Measuring distance 3m up to 18 GHz, 1m above 18 GHz.

Peak Detector, RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (GHz)	Modulation	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5180	5150	802.11a 6M	62.5	74	11.5
5180	5150	802.11n HT20	63.6	74	11.4
5190	5150	802.11n HT40	67.3	74	6.7
5210	5150	802.11ac HT80	63.0	74	11.0
5320	5350	802.11a 6M	63.6	74	11.4
5320	5350	802.11n HT20	66.1	74	7.9
5310	5350	802.11n HT40	67.6	74	6.4
5290	5350	802.11ac HT80	67.2	74	6.8
5500	5460	802.11a 6M	64.7	74	9.3
5500	5460	802.11n HT20	64.6	74	9.4
5510	5460	802.11n HT40	66.1	74	7.9
5530	5460	802.11ac HT80	68.2	74	5.8
5785	4628	802.11a 6M	54.2	74	19.8
5240	15720	802.11a 6M	56.4	74	17.6
5785	17355	802.11a 6M	63.6	74	10.4

Band Edge values with Peak Detector are reported in clause 3.5

Average Detector, RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (GHz)	Modulation	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5180	5150	802.11a 6M	46.6	54	7.4
5180	5150	802.11n HT20	48.0	54	6.0
5190	5150	802.11n HT40	50.9	54	3.1
5210	5150	802.11ac HT80	48.0	54	6.0
5320	5350	802.11a 6M	46.6	54	7.4
5320	5350	802.11n HT20	46.7	54	7.3
5310	5350	802.11n HT40	47.0	54	7.0
5290	5350	802.11ac HT80	52.9	54	1.1
5500	5460	802.11a 6M	45.1	54	8.9
5500	5460	802.11n HT20	45.1	54	8.9
5510	5460	802.11n HT40	45.4	54	8.6
5530	5460	802.11ac HT80	49.5	54	4.5
5785	4628	802.11a 6M	48.0	54	6.0
5240	15720	802.11a 6M	44.0	54	10.0
5785	17355	802.11a 6M	50.6	54	3.4

Measured results are for 802.11a 6Mbps and 802.11n MCS0, it was checked that other modulations and/or bitrates did not produce higher emissions

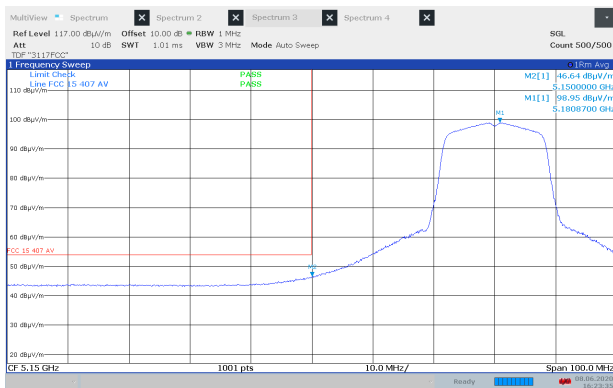
A Band Reject Filter was used for all measurements from 1 to 18 GHz

Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer "Transducer factor"

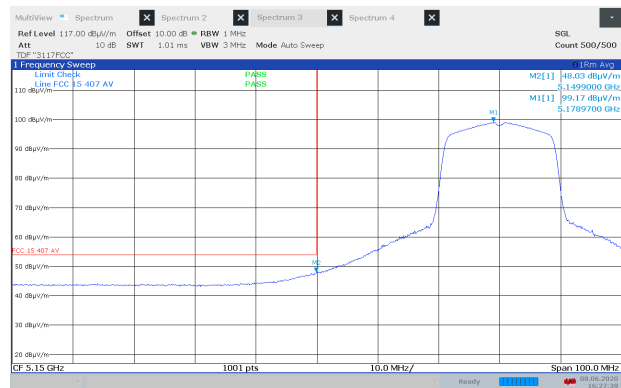
See attached plots

Requirements/Limit

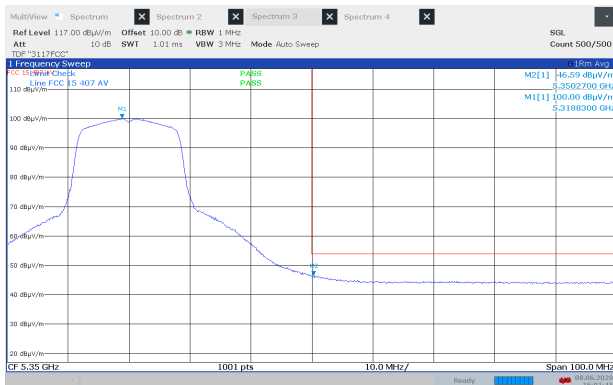
FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency	Average Detector (dBμV/m)	Peak Detector (dBμV/m)
1 – 40 GHz	54.0	74.0



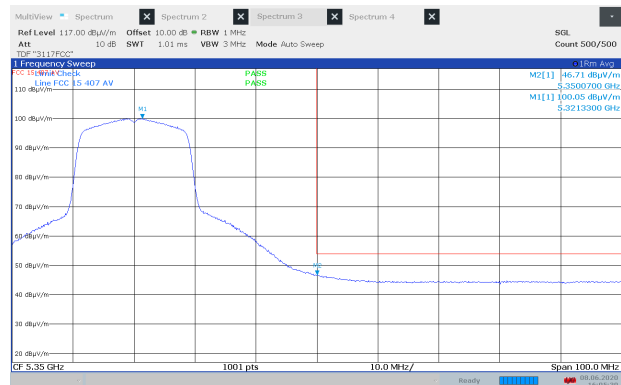
Band Edge, 5150 MHz, Ch036, 802.11a 6M, EUT H1, VP, Av, Max



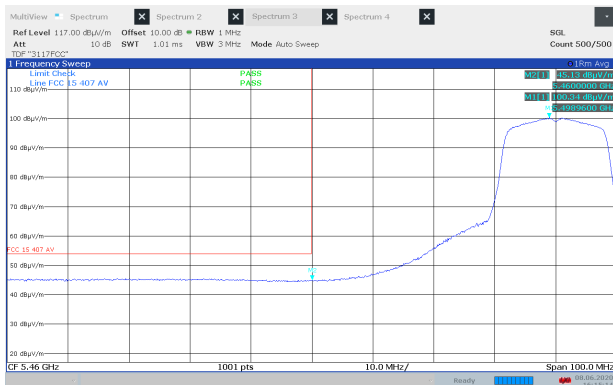
Band Edge, 5150 MHz, Ch036, 802.11n HT20, EUT H1, VP, Av, Max



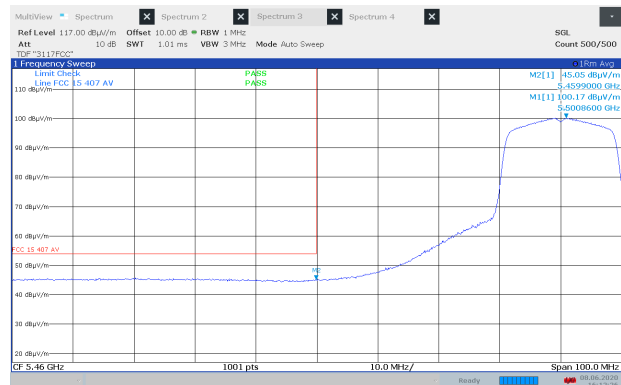
Band Edge, 5350 MHz, Ch064, 802.11a 6M, EUT H1, VP, Av, Max



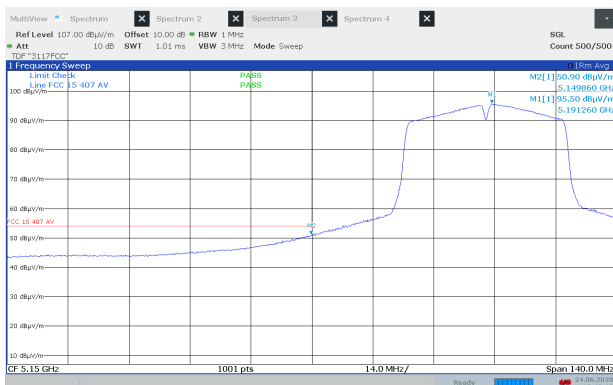
Band Edge, 5350 MHz, Ch064, 802.11n HT20, EUT H1, VP, Av, Max



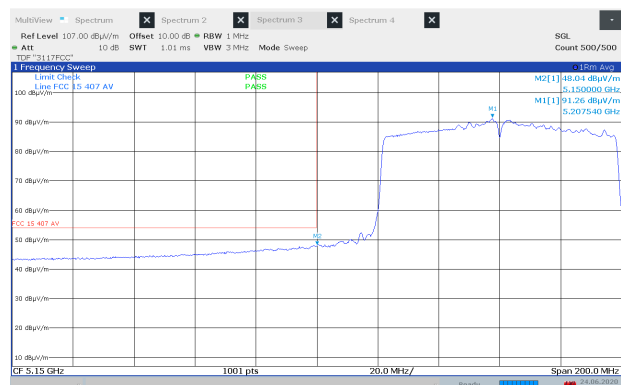
Band Edge, 5460 MHz, Ch100, 802.11a 6M, EUT H1, VP, Av, Max



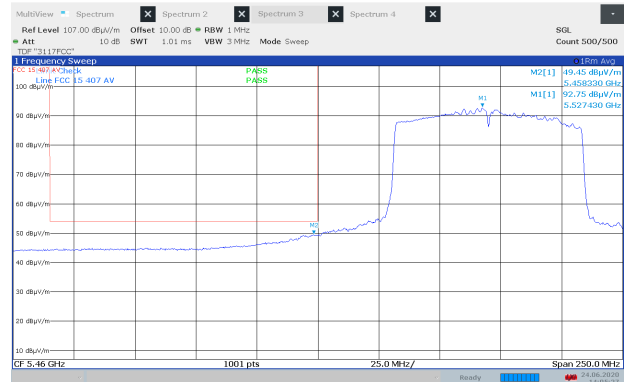
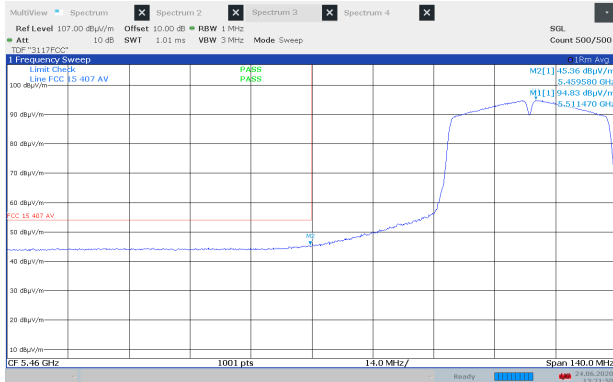
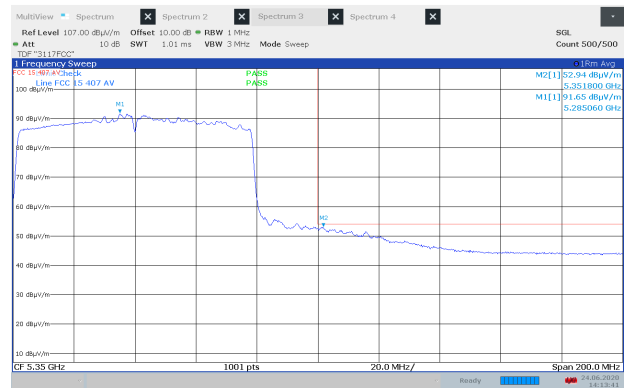
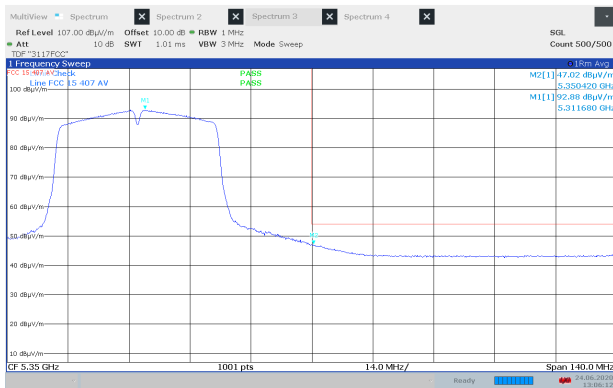
Band Edge, 5460 MHz, Ch100, 802.11n HT20, EUT H1, VP, Av, Max

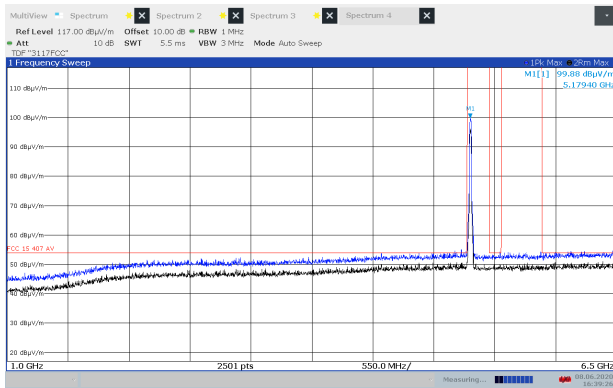


Band Edge, 5150 MHz, Ch038, 802.11n HT40, EUT H1, VP, Av, Max

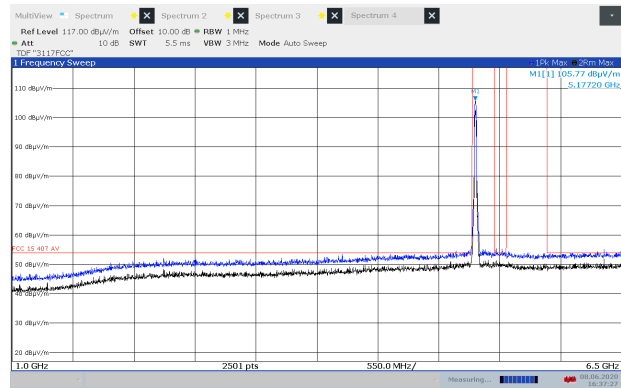


Band Edge, 5150 MHz, Ch042, 802.11ac HT80, EUT H1, VP, Av, Max

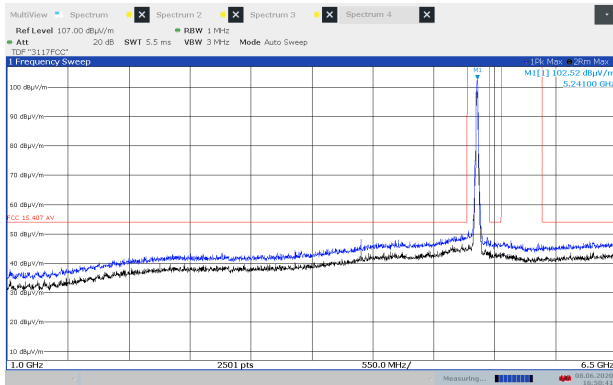




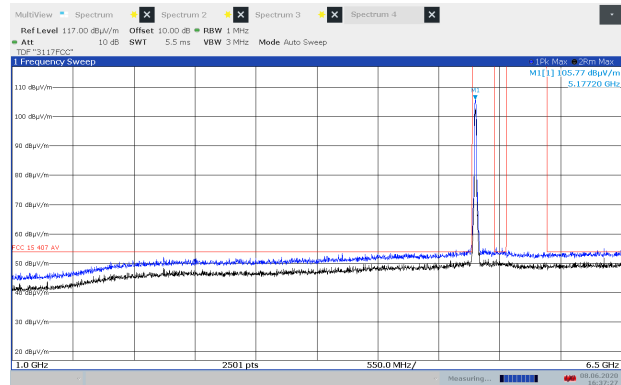
Radiated Emissions 1-6.5 GHz, Ch036, 802.11n HT20, EUT H1, HP



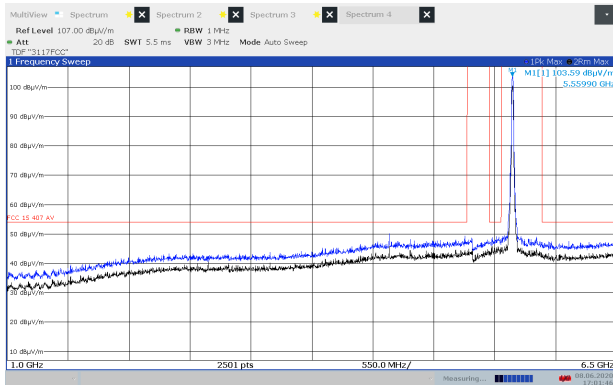
Radiated Emissions 1-6.5 GHz, Ch036, 802.11n HT20, EUT H1, VP



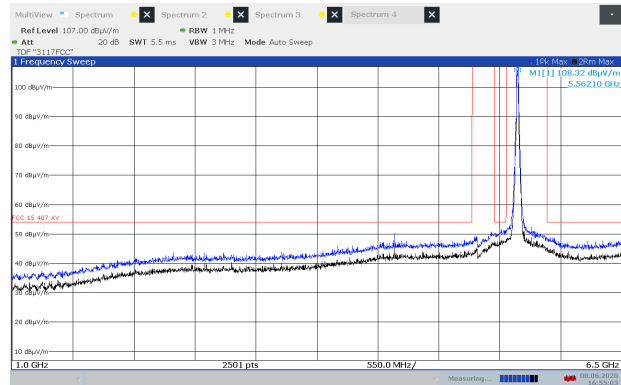
Radiated Emissions 1-6.5 GHz, Ch048, 802.11a 6M, EUT H1, HP



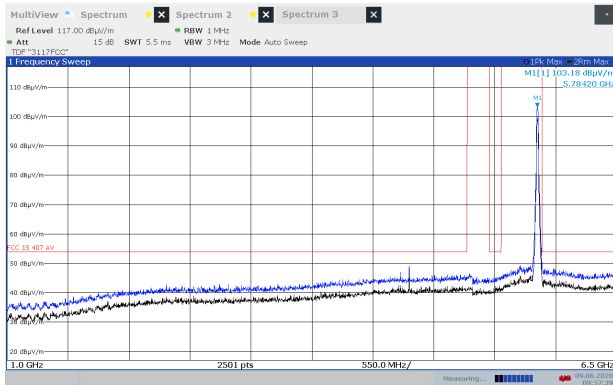
Radiated Emissions 1-6.5 GHz, Ch048, 802.11a 6M, EUT H1, VP



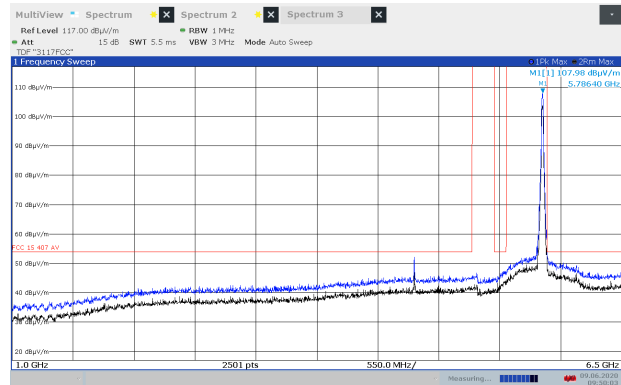
Radiated Emissions 1-6.5 GHz, Ch112, 802.11a 6M, EUT H1, HP



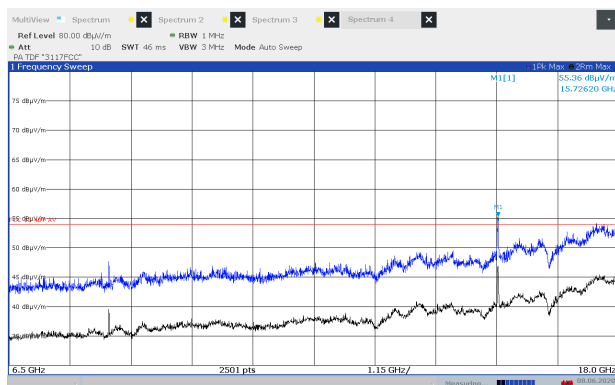
Radiated Emissions 1-6.5 GHz, Ch112, 802.11a 6M, EUT H1, VP



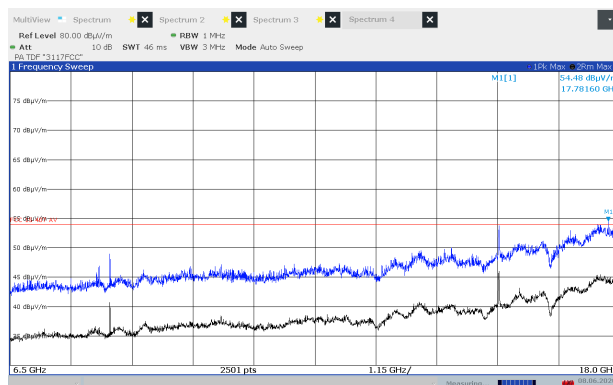
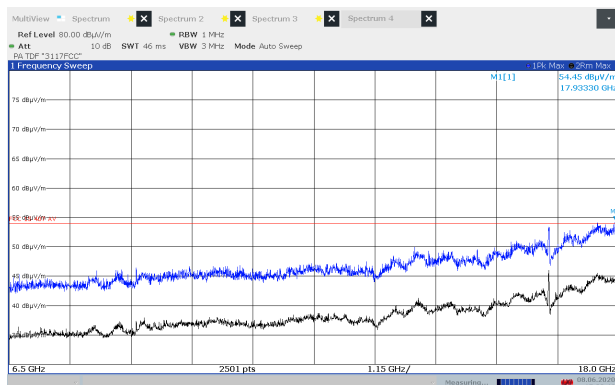
Radiated Emissions 1-6.5 GHz, Ch157, 802.11a 6M, EUT H1, HP



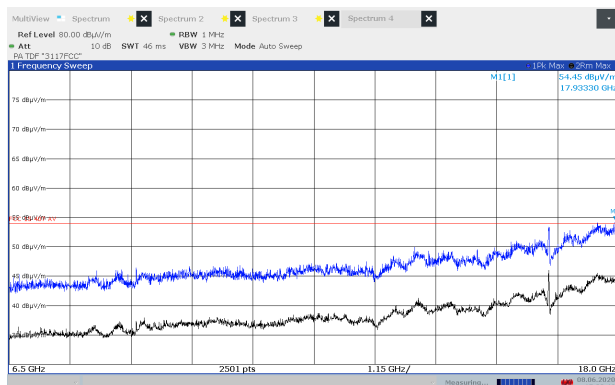
Radiated Emissions 1-6.5 GHz, Ch157, 802.11a 6M, EUT H1, VP



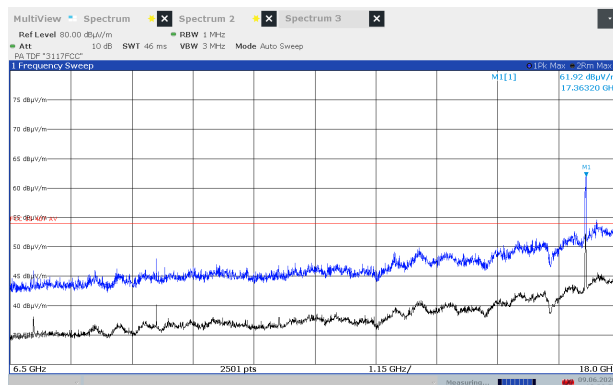
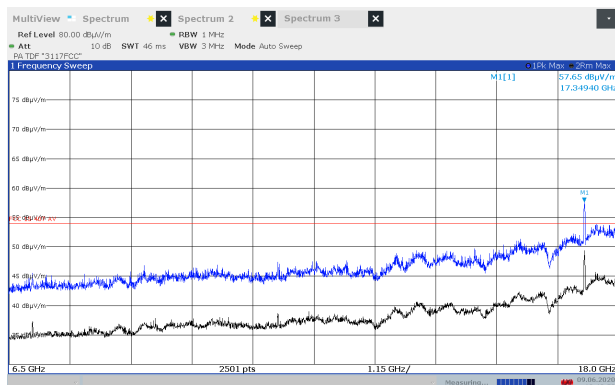
Radiated Emissions 6.5-18 GHz, Ch048, 802.11a 6M, EUT H1, HP



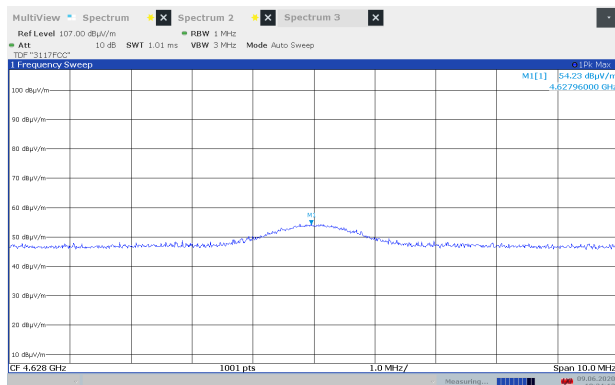
Radiated Emissions 6.5-18 GHz, Ch048, 802.11a 6M, EUT H1, VP



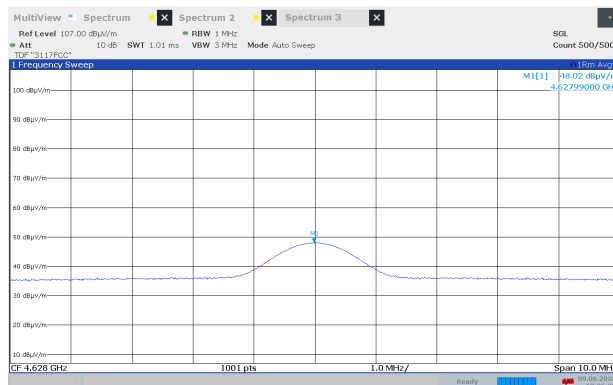
Radiated Emissions 6.5-18 GHz, Ch112, 802.11a 6M, EUT H1, HP



Radiated Emissions 6.5-18 GHz, Ch157, 802.11a 6M, EUT H1, HP

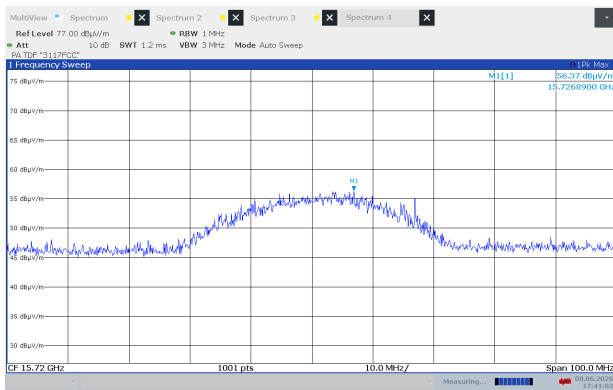


Radiated Emissions 6.5-18 GHz, Ch157, 802.11a 6M, EUT H1, VP

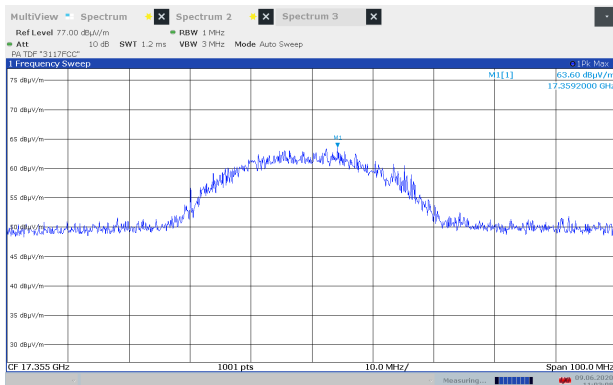


Radiated Emissions 4628 MHz, Ch157, 802.11a 6M, EUT H1, PK

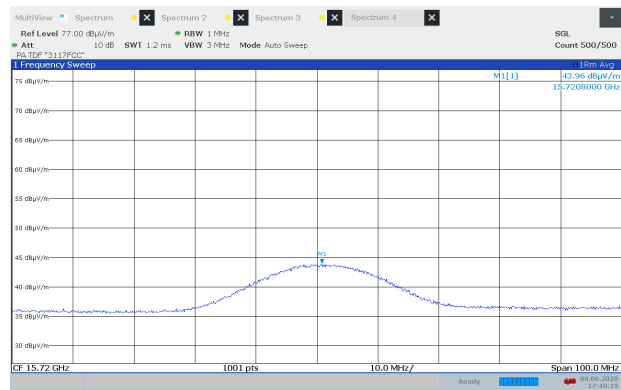
Radiated Emissions 4628 MHz, Ch157, 802.11a 6M, EUT H1, Av



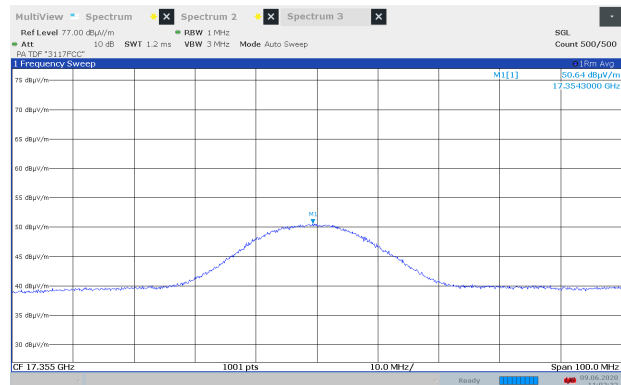
Radiated Emissions 15720 MHz, Ch048, 802.11a 6M, EUT H1, Pk



Radiated Emissions 17355 MHz, Ch157, 802.11a 6M, EUT H1, Pk



Radiated Emissions 15720 MHz, Ch048, 802.11a 6M, EUT H1, Av



Radiated Emissions 17355 MHz, Ch157, 802.11a 6M, EUT H1, Av

4 Measurement Uncertainty

Measurement Uncertainty Values		
Test Item		Uncertainty
Output Power		±0.5 dB
Power Spectral Density		±0.5 dB
Out of Band Emissions, Conducted	< 3.6 GHz	±0.6 dB
	> 3.6 GHz	±0.9 dB
Spurious Emissions, Radiated	< 1 GHz	±2.5 dB
	> 1 GHz	±2.2 dB
Emission Bandwidth		±4 %
Power Line Conducted Emissions		+2.9 / -4.1 dB
Spectrum Mask Measurements	Frequency	±5 %
	Amplitude	±1.0 dB
Frequency Error		±0.6 ppm
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	FSW43	Spectrum Analyzer	Rohde & Schwarz	LR 1690	2020-01	2021-01
2	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2020-01	2021-01
3	6810.17B	Attenuator	Suhner	LR 1669	2019-07	2020-07
4	NO324415	Band Reject Filter	Microwave Circuits	LR 1760	COU	
5	VULB 9163	BiLog Antenna	Schwarzbech	LR 1616	2020-01	2023-01
6	317	Preamplifier	Sonoma Inst.	LR 1687	2020-07	2021-07
7	3117-PA	Horn Antenna +PreAmp	EMCO	LR 1717	2017-12	2020-12
8	WLK5-1100-1485-7000-40SS	Low Pass Filter	Wainwright Inst.	LR 1761	COU	
9	ST18/SMA/N/36	RF Cable	Suhner	LR 1627	COU	

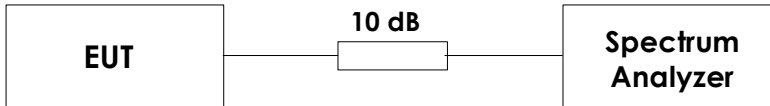
Note: COU – calibrate on use; N/A – Not Applicable

The software listed below has been used for one or more tests.

No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.40.10	Radiated Emission test software
2	Rohde & Schwarz	GPBShot	2.7	Screenshots from R&S Spectrum Analyzers
3				

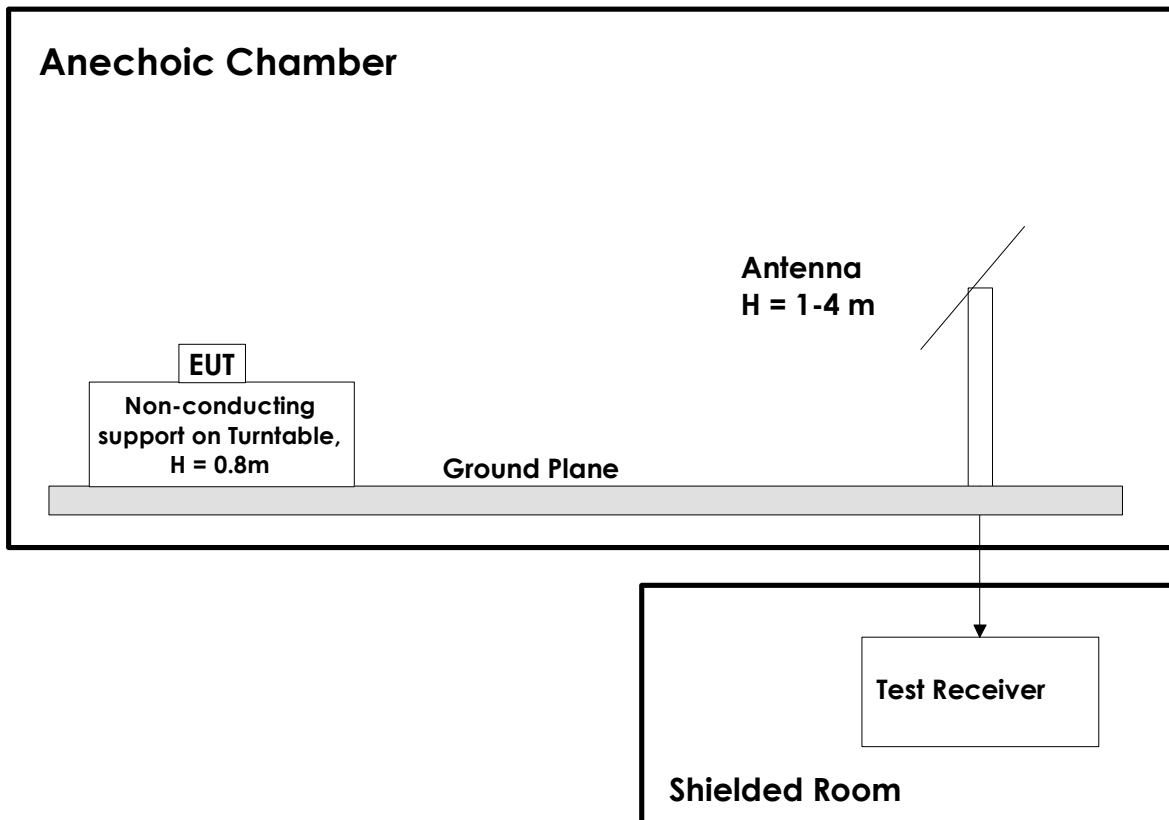
6 BLOCK DIAGRAM

6.1 Conducted Tests



This test set-up is used for all Conducted tests. For the Frequency Stability test the EUT was placed in a climatic chamber.

6.2 Test Site Radiated Emission



This test setup is used for all radiated emissions tests. Measuring distance is 3m for all frequencies.

Emissions above 1 GHz are measured with a Spectrum Analyzer and Horn Antenna.

All measurements at 1GHz and above were performed with turntable height 1.5m and with the ground plane covered by absorbers.

A pre-amplifier is used for all measurements, and High-Pass filter is used for all harmonics.