

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 value E.I.R.P. (dBm/MHz)			
			802.11a, 6Mbps	802.11n, MCS0	802.11n, MCS0 HT40	802.11ac, MCS0 HT80
36	5180	5150	-31.9	-28.6		
64	5320	5350	-30.5	-27.9		
100	5500	5470	-32.9	-31.9		
140	5700	5725	-28.4	-31.9		
149	5745	5650	< -40	< -40		
149	5745	5700	< -35	< -35		
165	5825	5875	< -35	< -35		
165	5825	5925	< -40	< -40		
38	5190	5150			-28.9	
62	5310	5350			-29.8	
102	5510	5470			-32.9	
134	5670	5725			-36.6	
151	5755	5650			< -40	
151	5755	5700			< -35	
159	5795	5875			< -35	
159	5795	5925			< -40	
42	5210	5150				-29.4
58	5290	5350				-30.5
106	5530	5470				-33.6
155	5775	5650				< -40
155	5775	5700				< -35
155	5775	5875				< -35
155	5775	5925				< -40

The measurement was performed radiated.

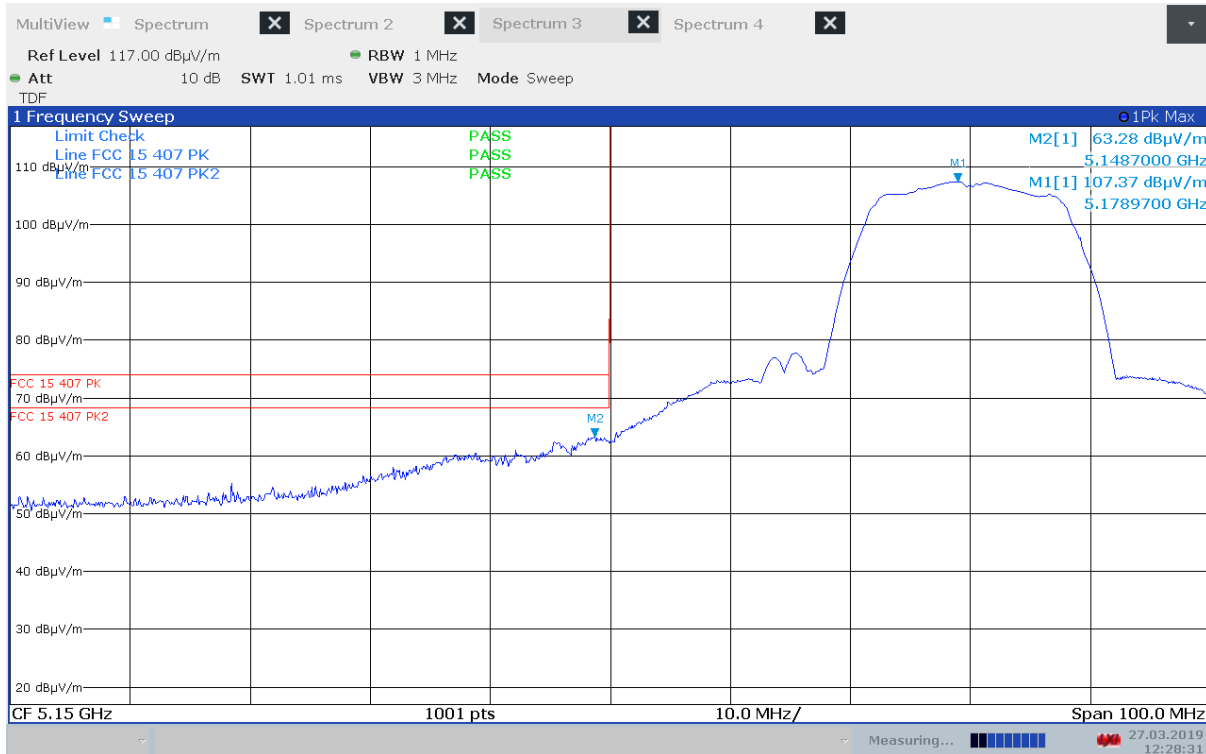
EIRP values were calculated from field strength using the method described in KDB 412172 D01.

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

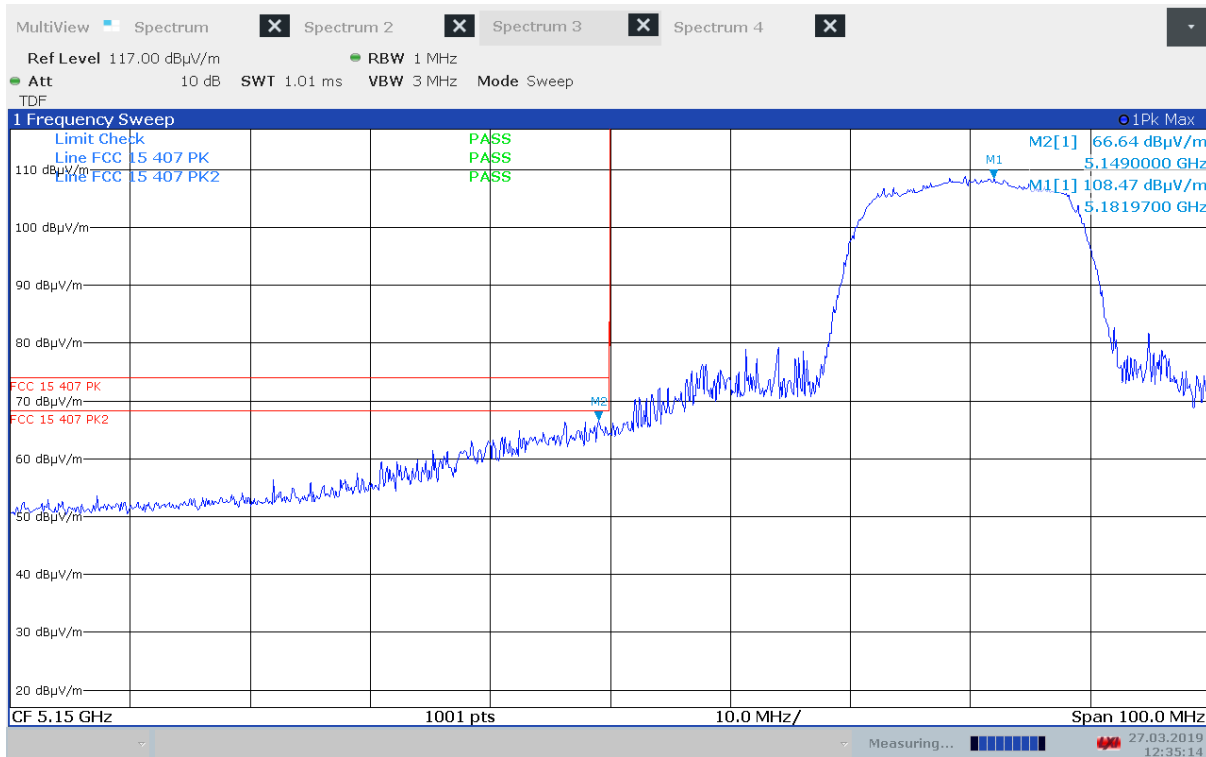
Limits:

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)

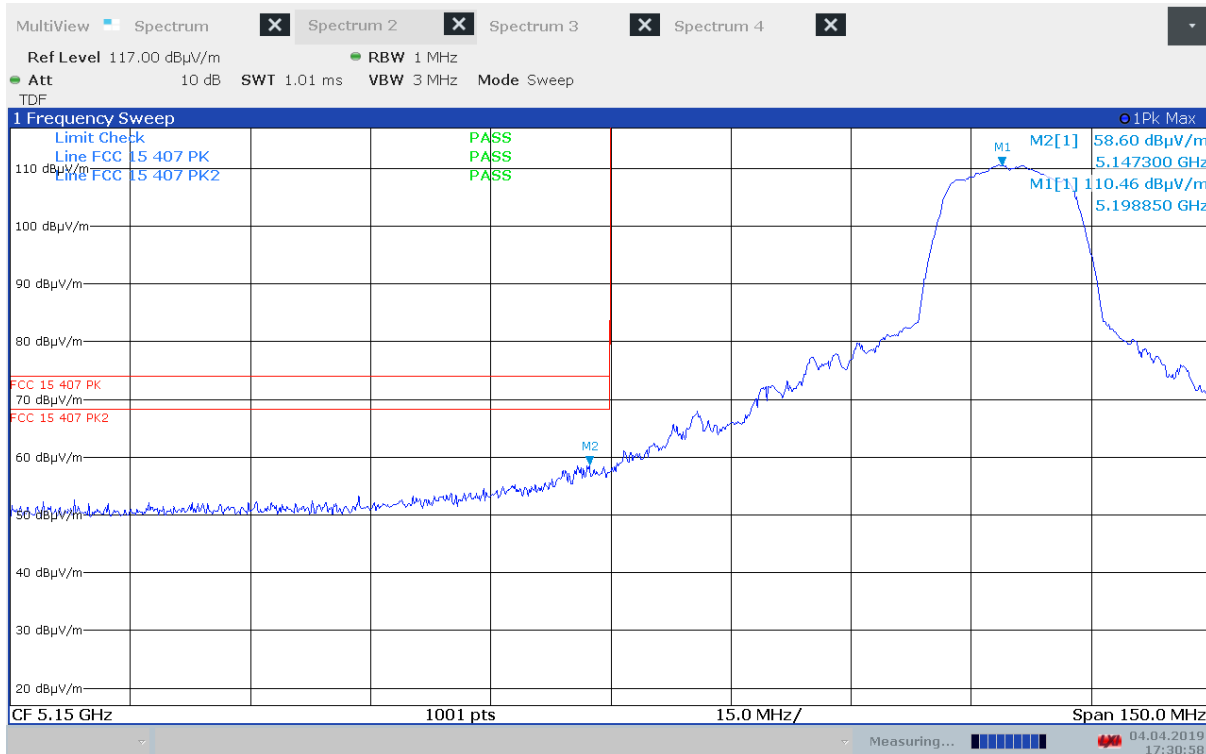
Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.



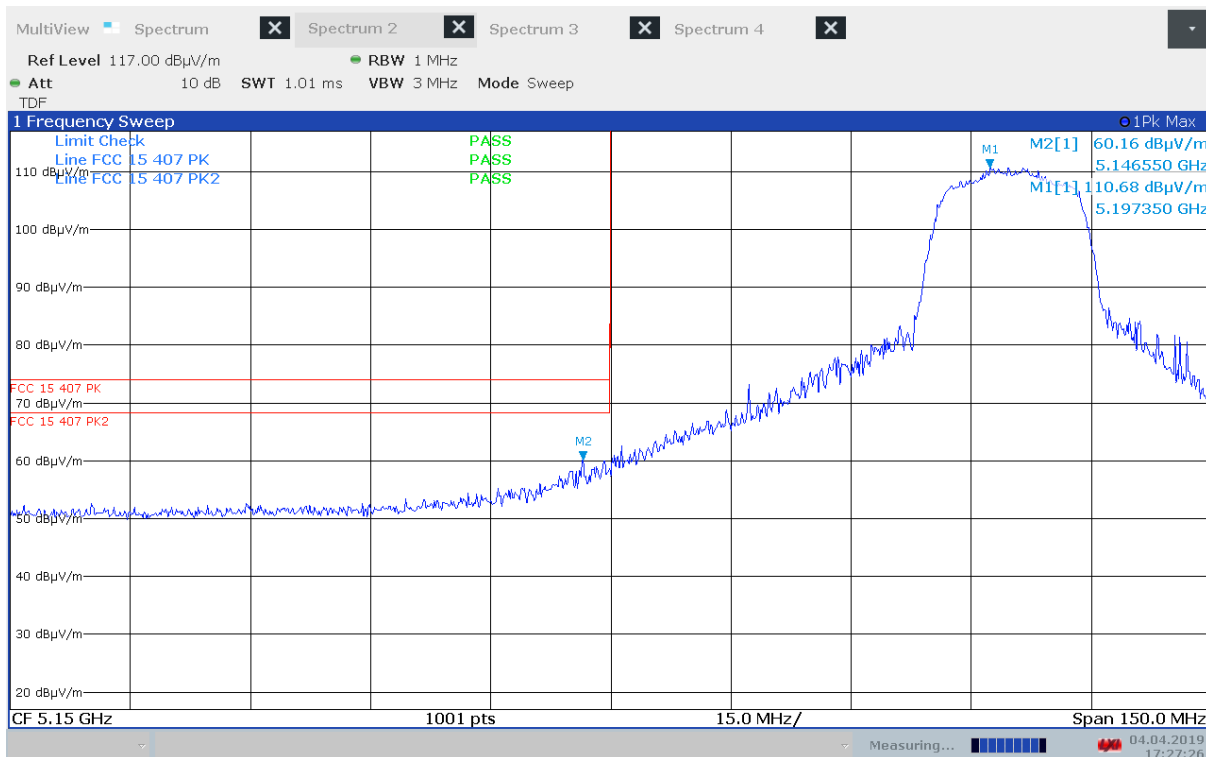
Unwanted Emissions, Band Edge, 5150 MHz, Ch36, 802.11a 6Mbps



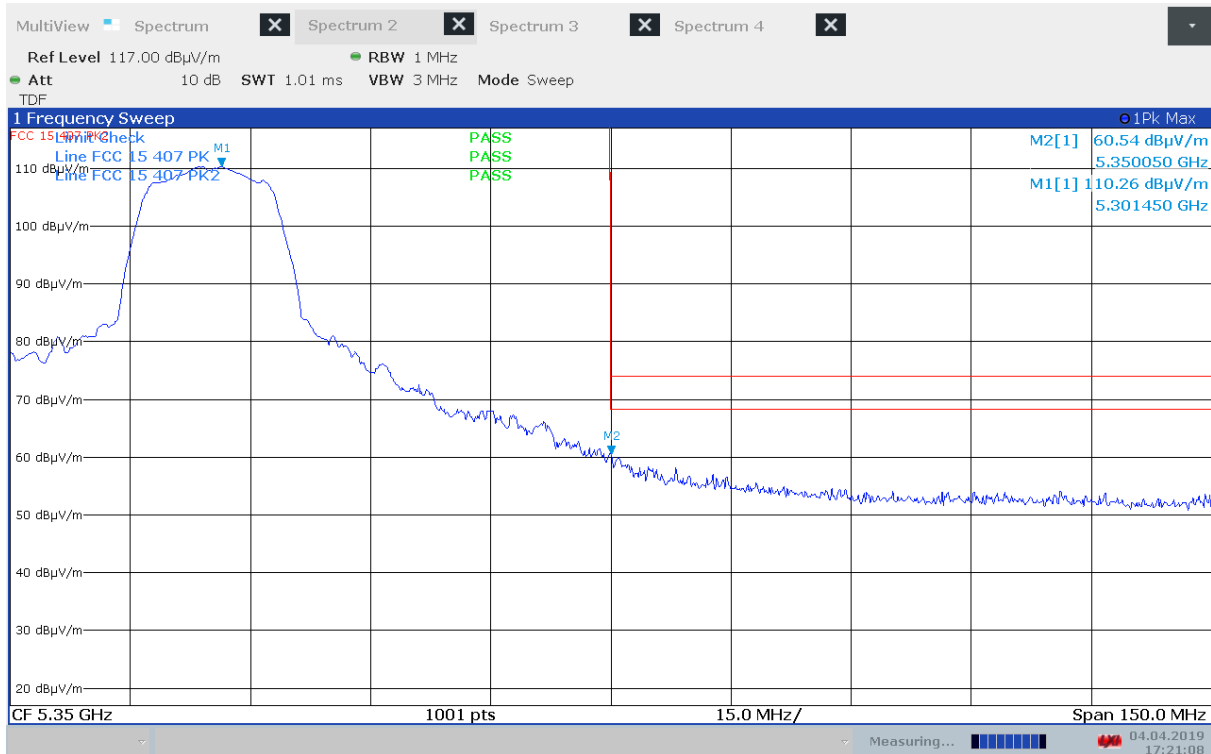
Unwanted Emissions, Band Edge, 5150 MHz, Ch36, 802.11n MCS0



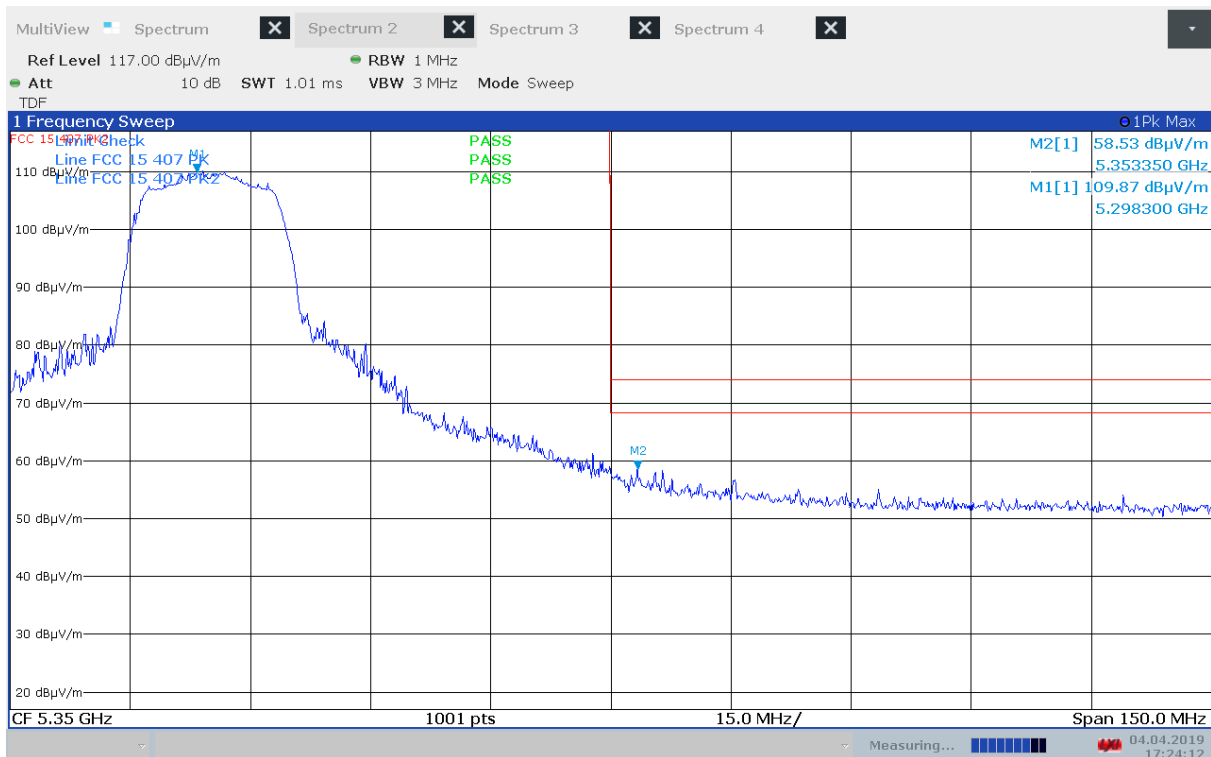
Unwanted Emissions, Band Edge, 5150 MHz, Ch40, 802.11a 6Mbps



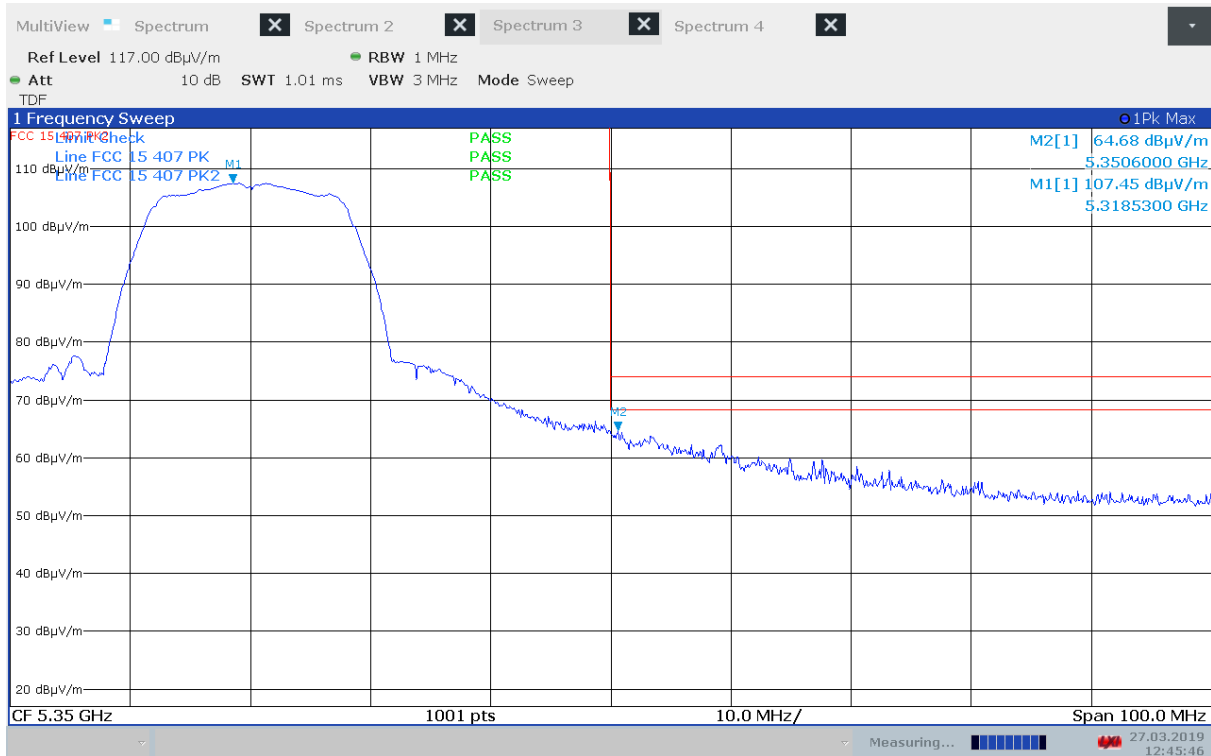
Unwanted Emissions, Band Edge, 5150 MHz, Ch40, 802.11n MCS0



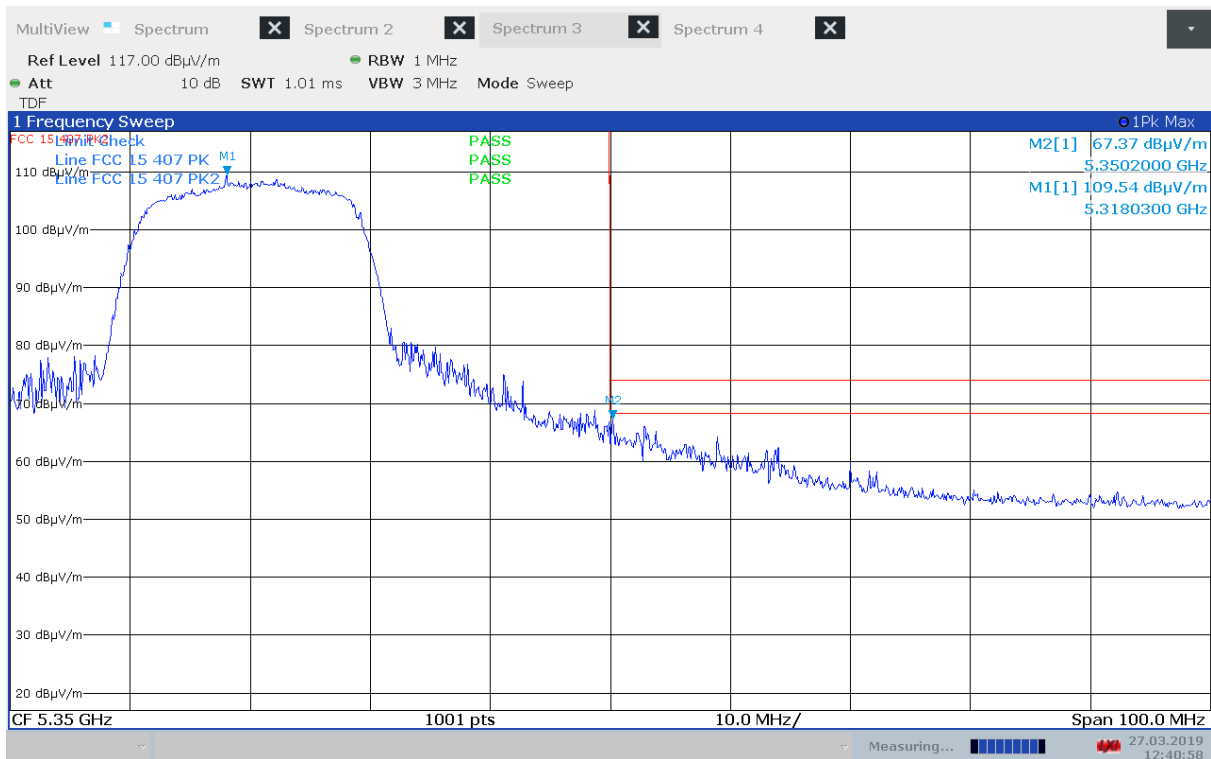
Unwanted Emissions, Band Edge, 5350 MHz, Ch60, 802.11a 6Mbps



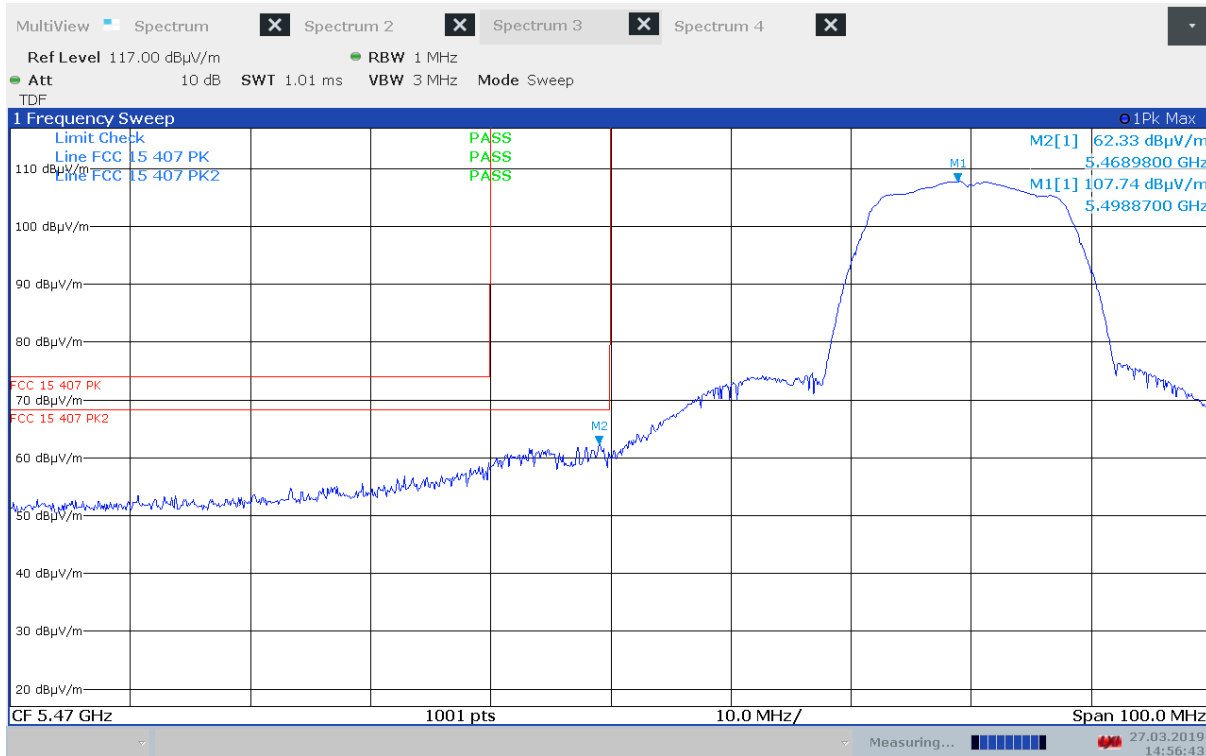
Unwanted Emissions, Band Edge, 5350 MHz, Ch60, 802.11n MCS0



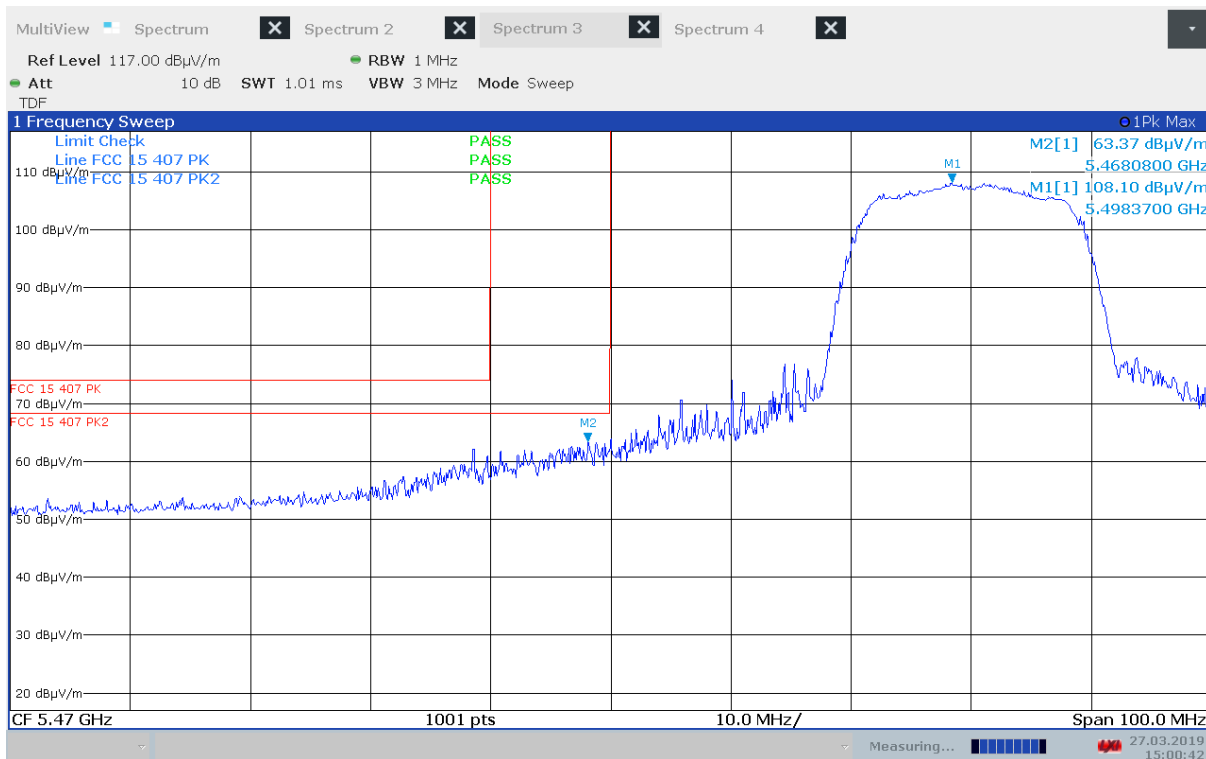
Unwanted Emissions, Band Edge, 5350 MHz, Ch64, 802.11a 6Mbps



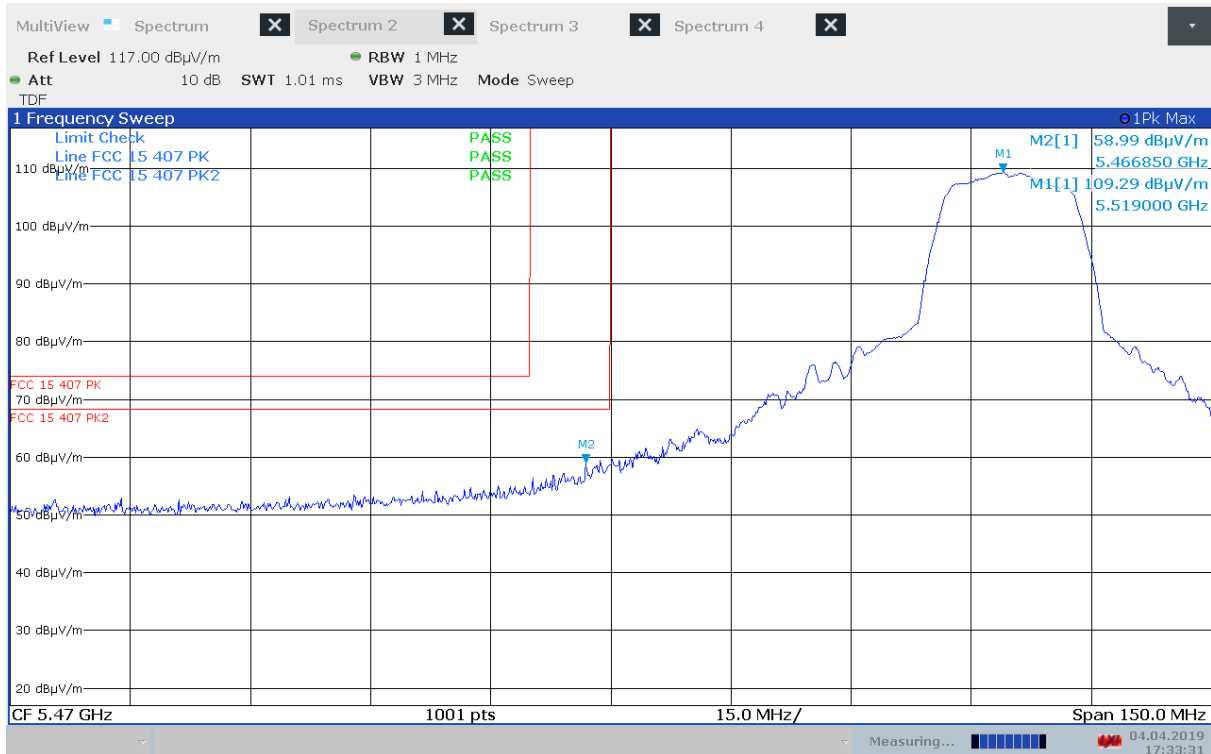
Unwanted Emissions, Band Edge, 5350 MHz, Ch64, 802.11n MCS0



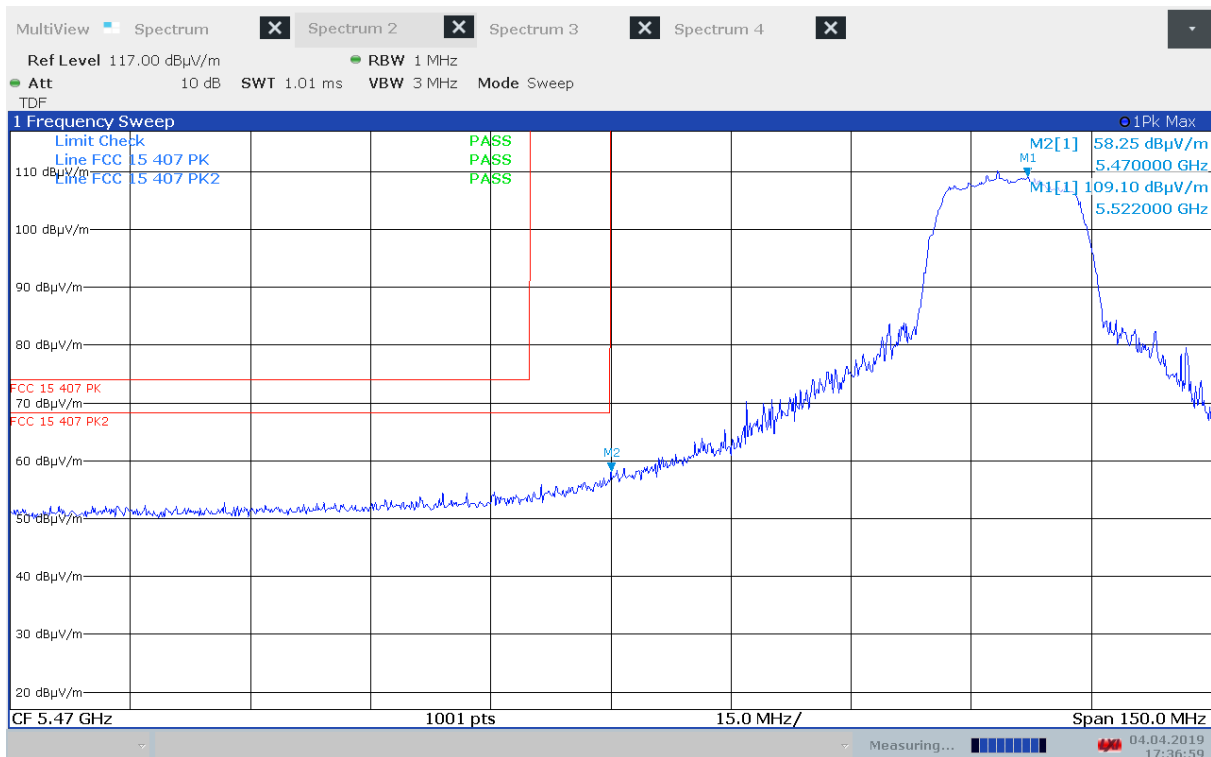
Unwanted Emissions, Band Edge, 5470 MHz, Ch100, 802.11a 6Mbps



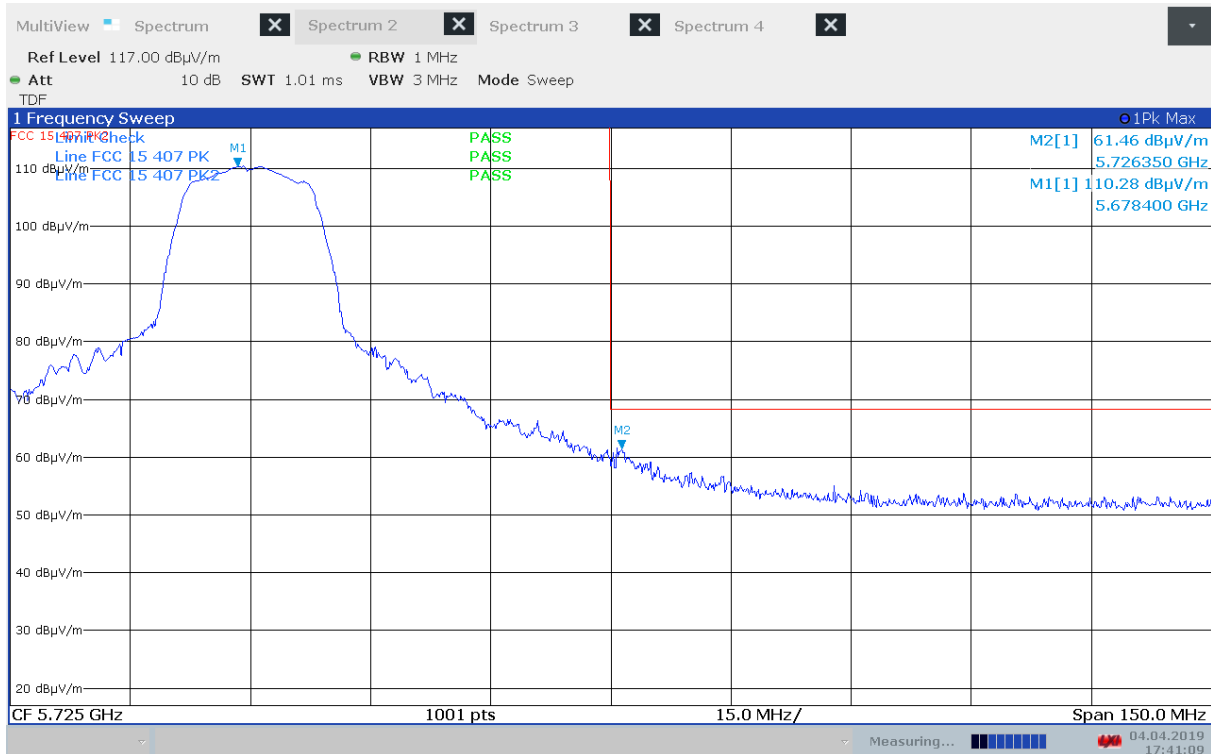
Unwanted Emissions, Band Edge, 5470 MHz, Ch100, 802.11n MCS0



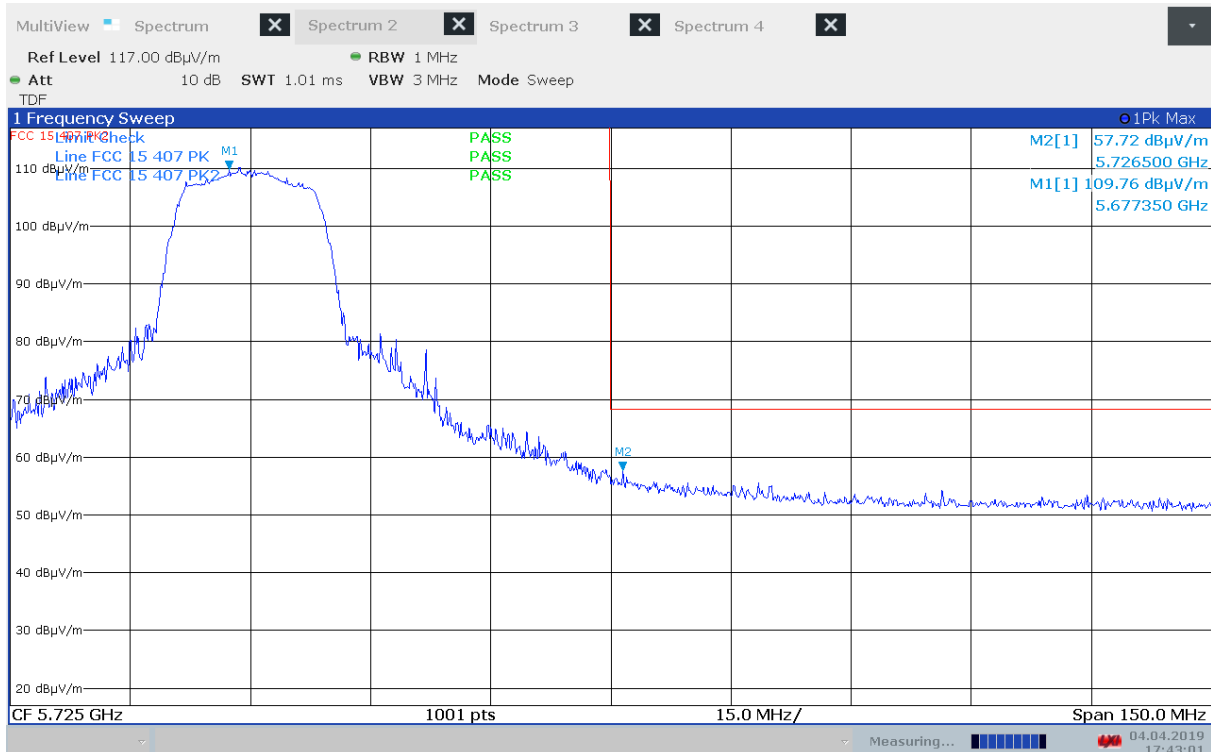
Unwanted Emissions, Band Edge, 5470 MHz, Ch104, 802.11a 6Mbps



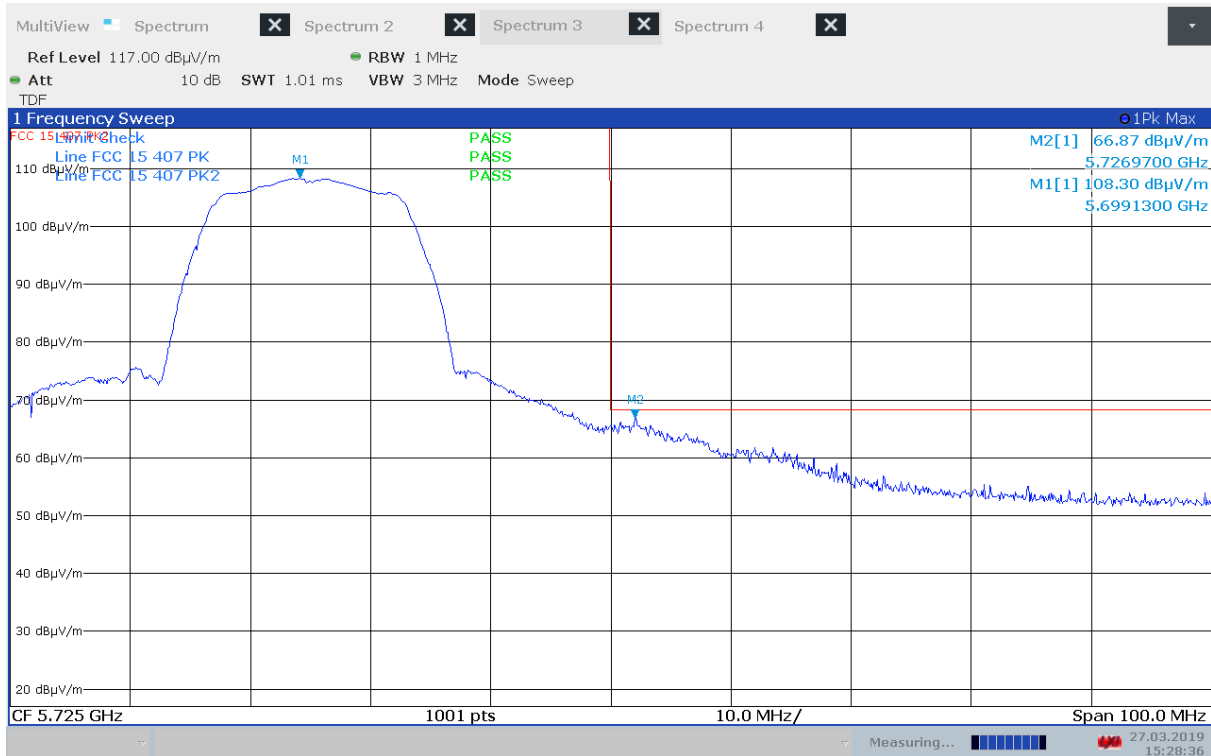
Unwanted Emissions, Band Edge, 5470 MHz, Ch104, 802.11n MCS0



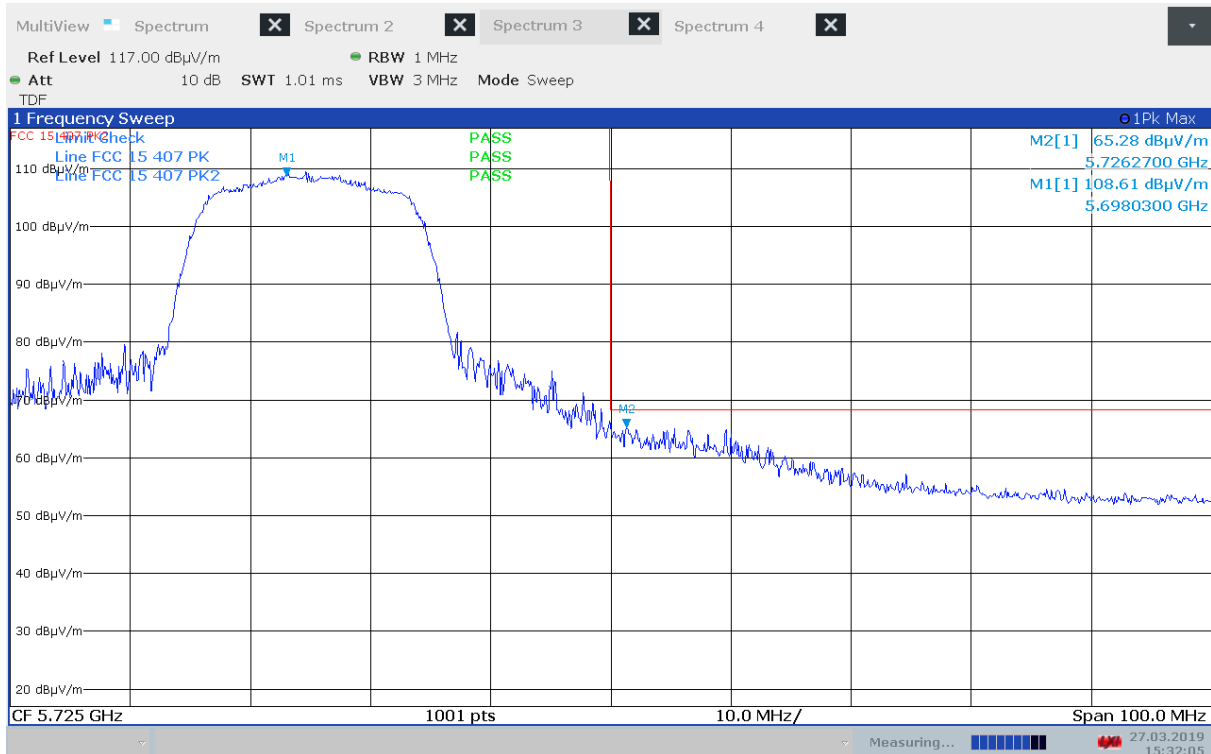
Unwanted Emissions, Band Edge, 5725 MHz, Ch136, 802.11a 6Mbps



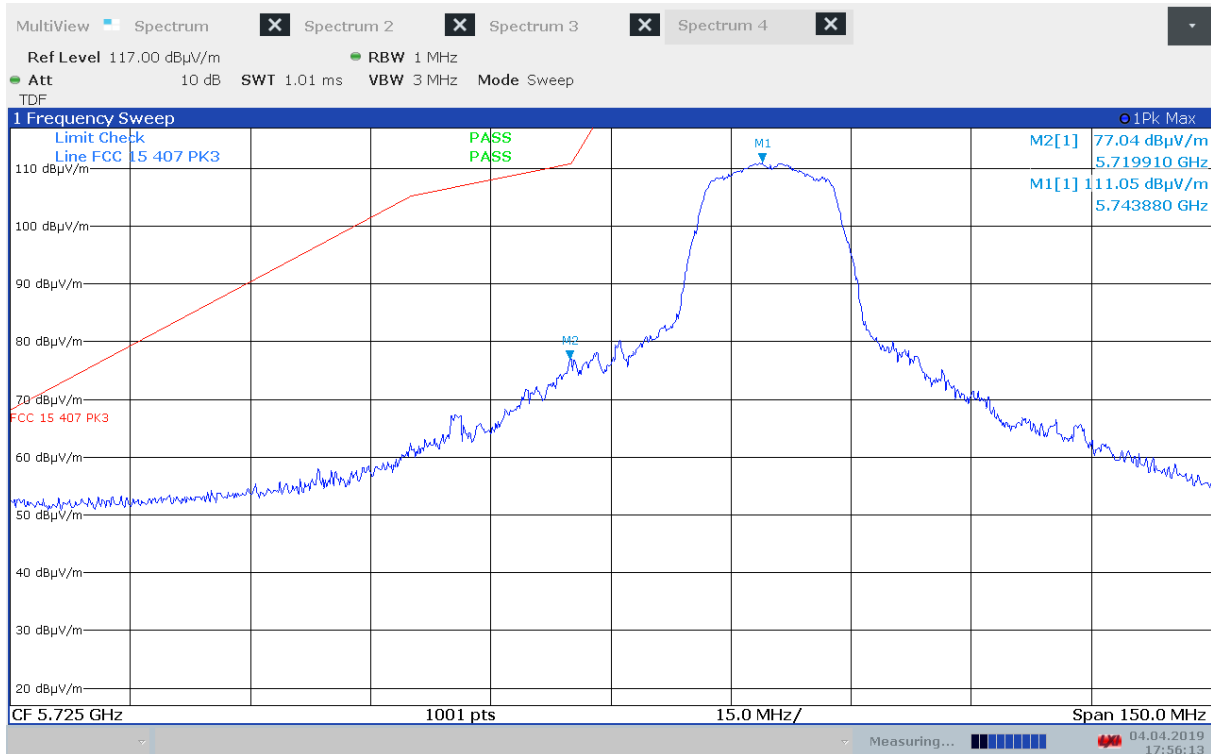
Unwanted Emissions, Band Edge, 5725 MHz, Ch136, 802.11n MCS0



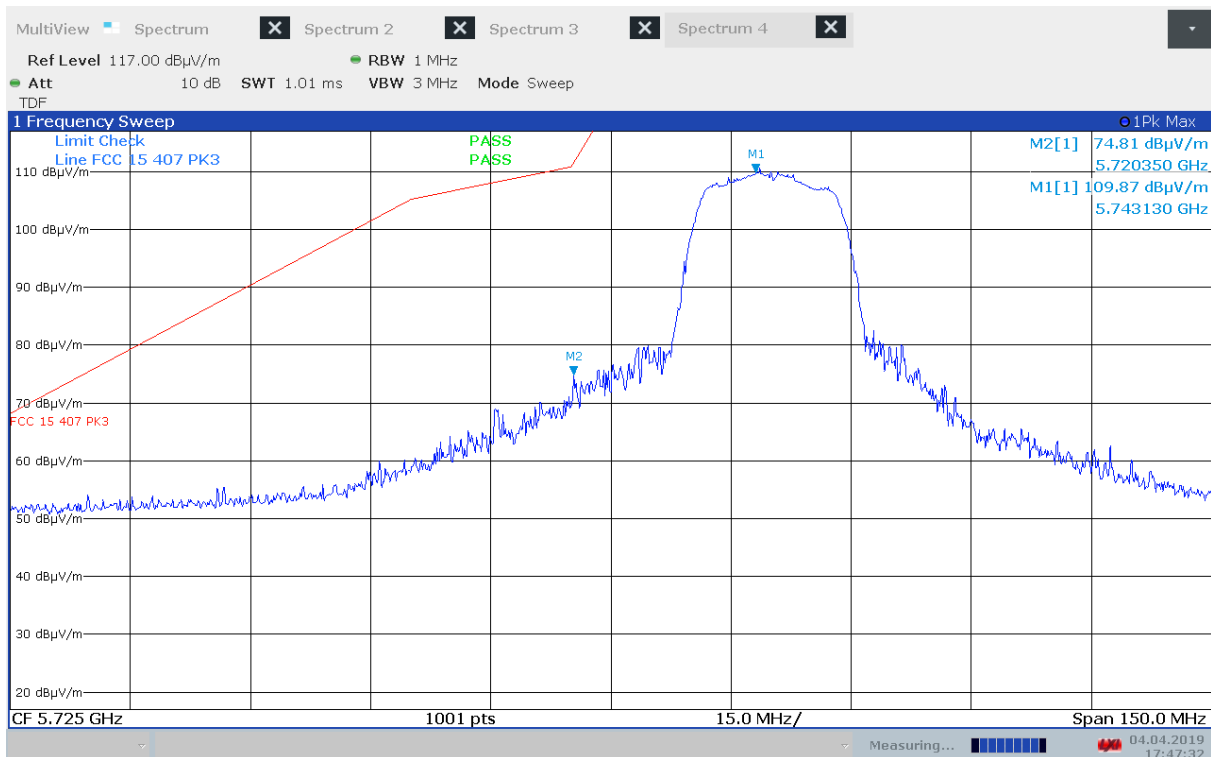
Unwanted Emissions, Band Edge, 5725 MHz, Ch140, 802.11a 6Mbps



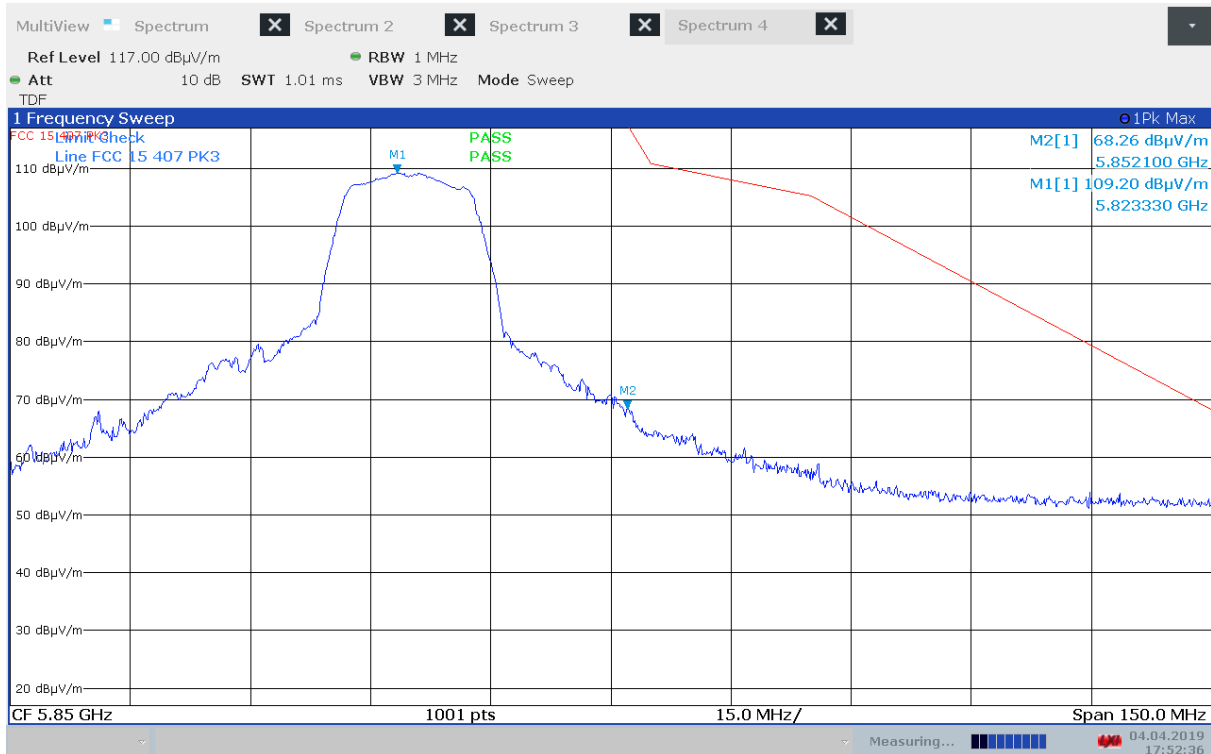
Unwanted Emissions, Band Edge, 5725 MHz, Ch140, 802.11n MCS0



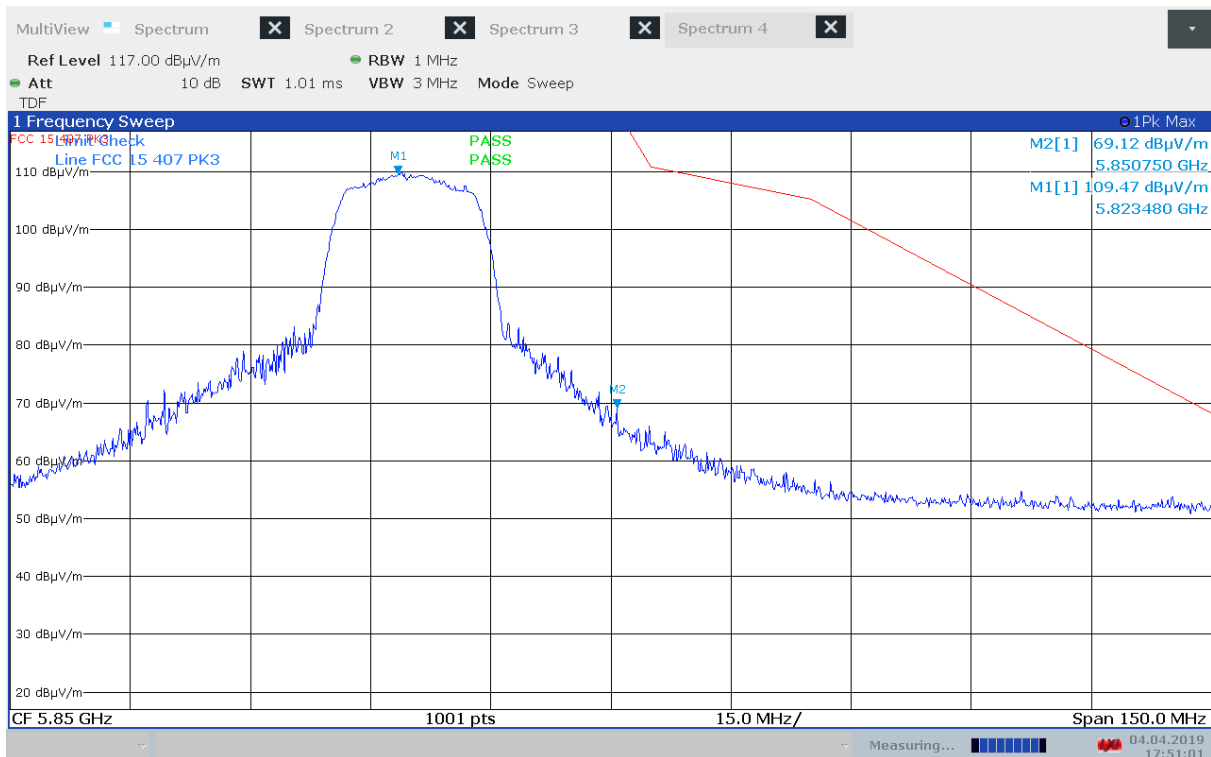
Unwanted Emissions, Band Edge, 5725 MHz, Ch149, 802.11a 6Mbps



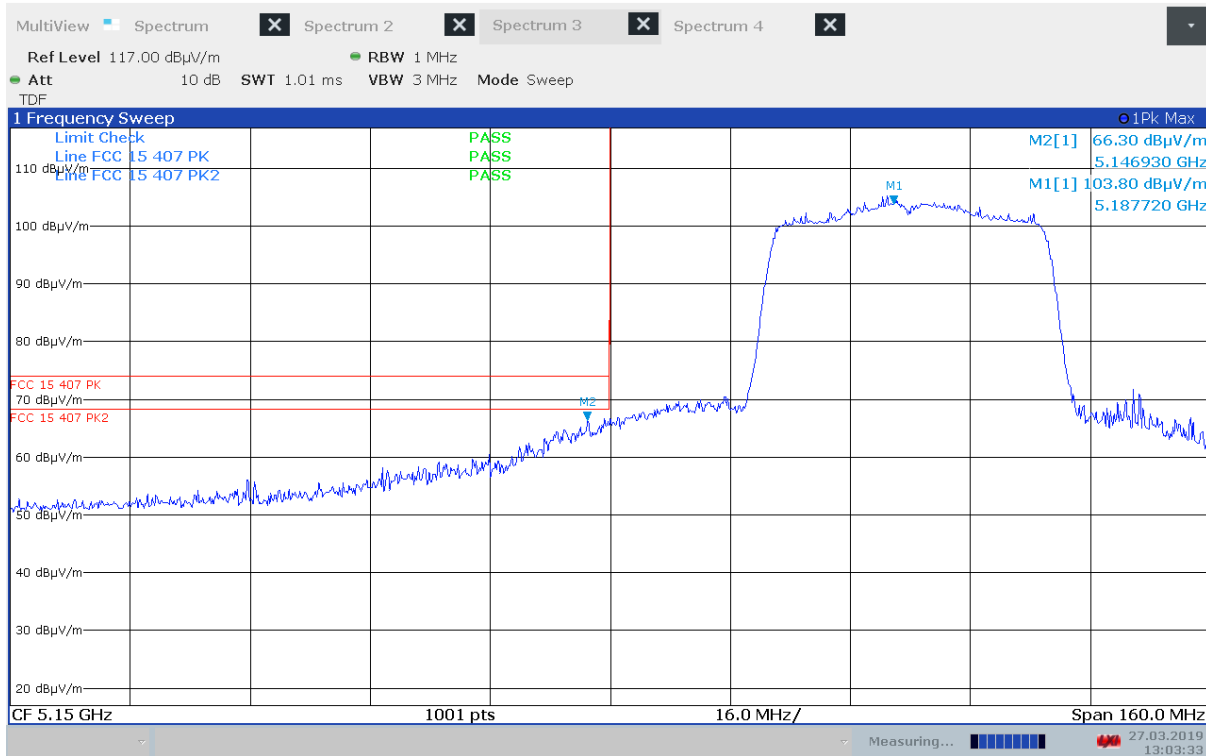
Unwanted Emissions, Band Edge, 5725 MHz, Ch149, 802.11n MCS0



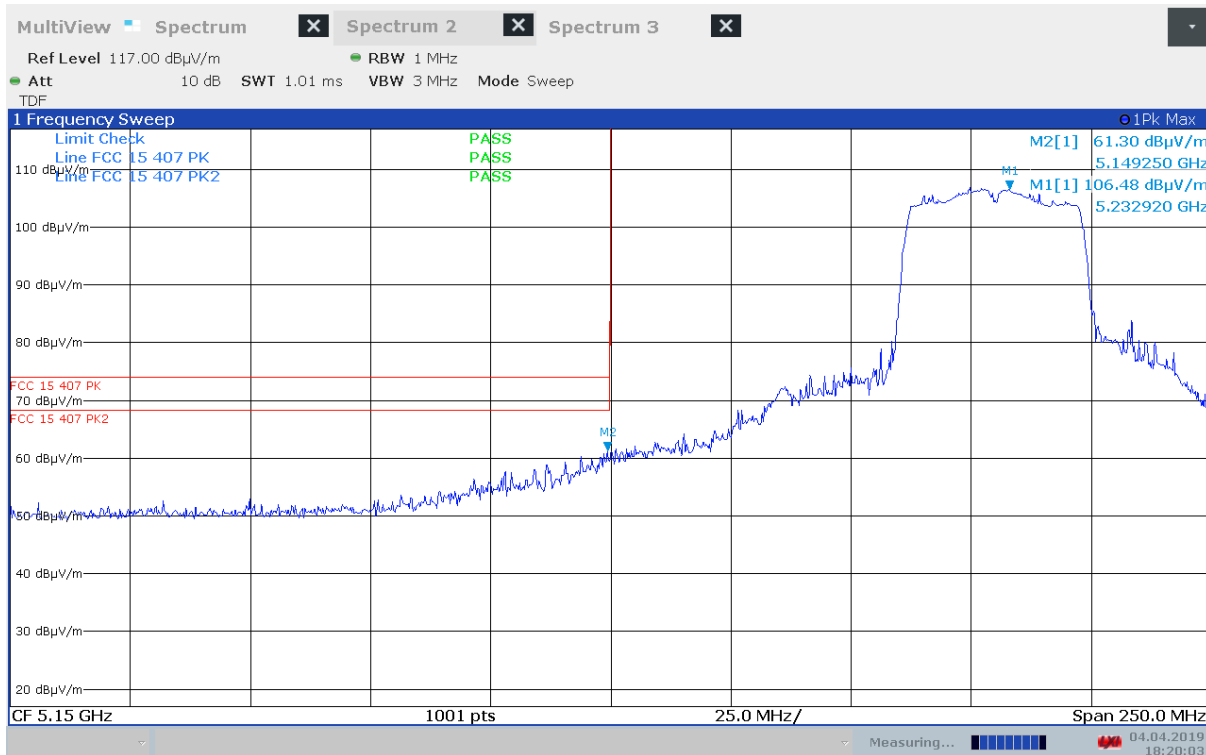
Unwanted Emissions, Band Edge, 5825 MHz, Ch165, 802.11a 6Mbps



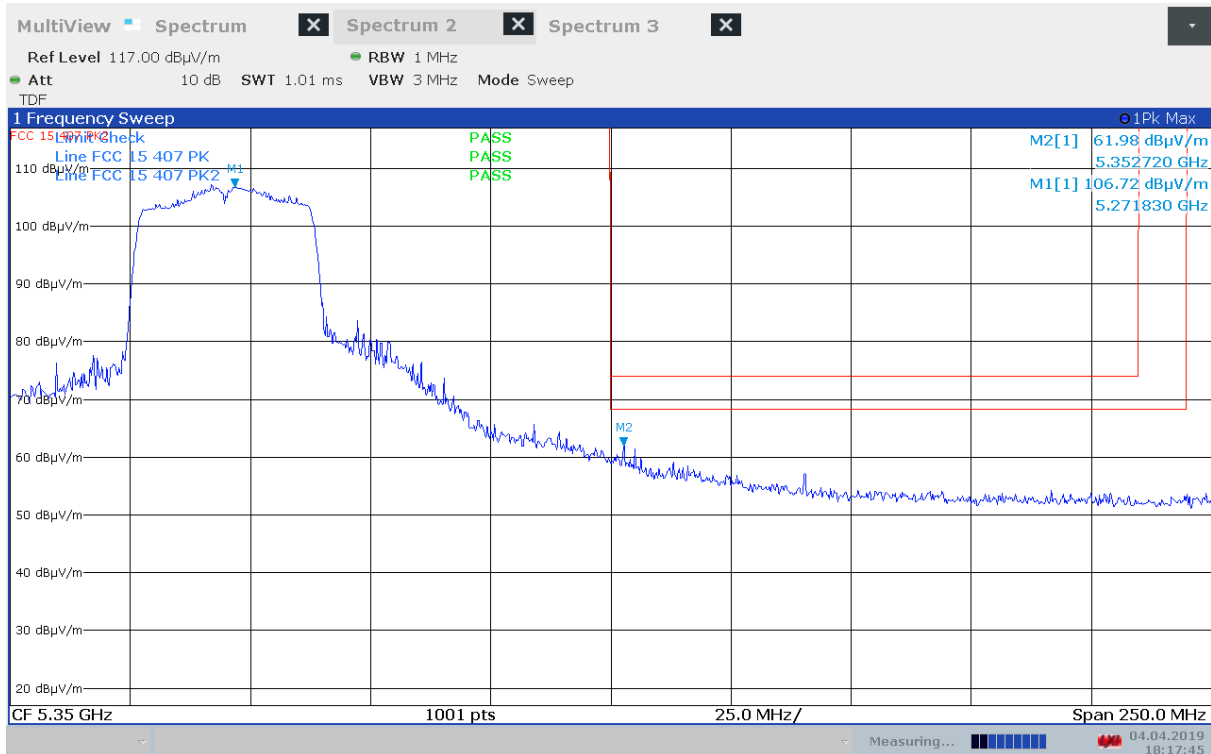
Unwanted Emissions, Band Edge, 5825 MHz, Ch165, 802.11n MCS0



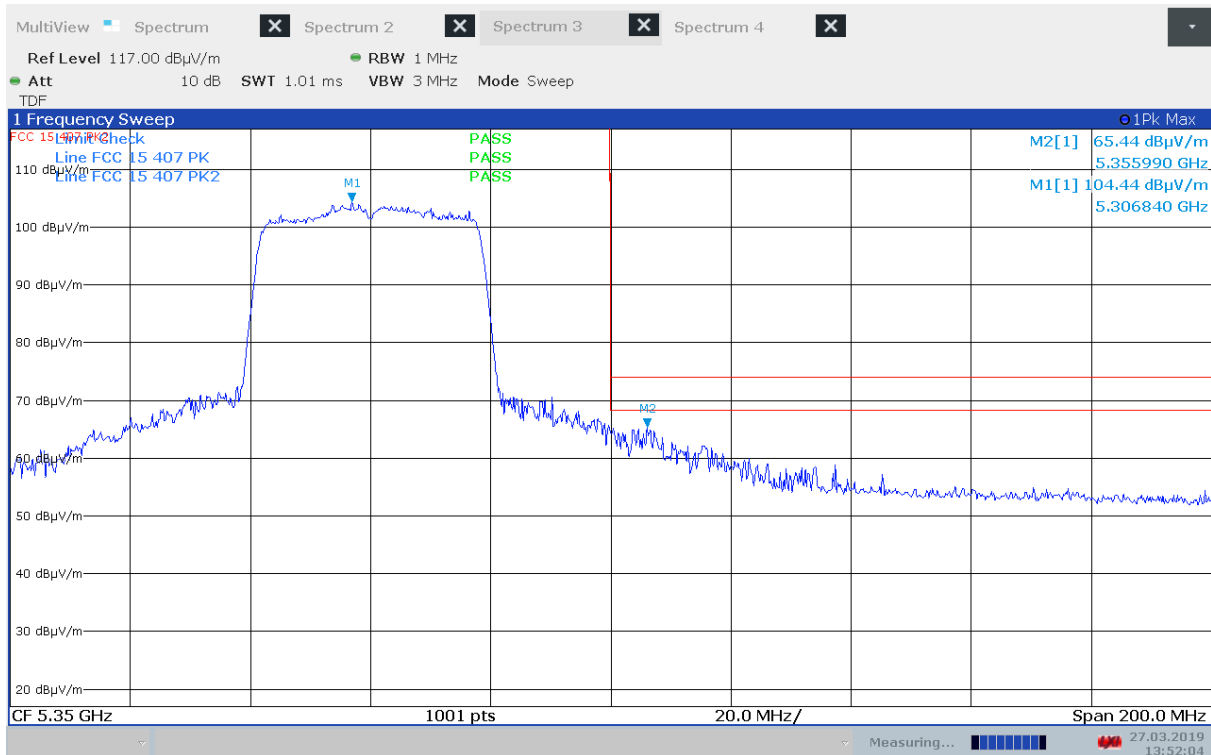
Unwanted Emissions, Band Edge, 5150 MHz, ch38, 802.11n HT40



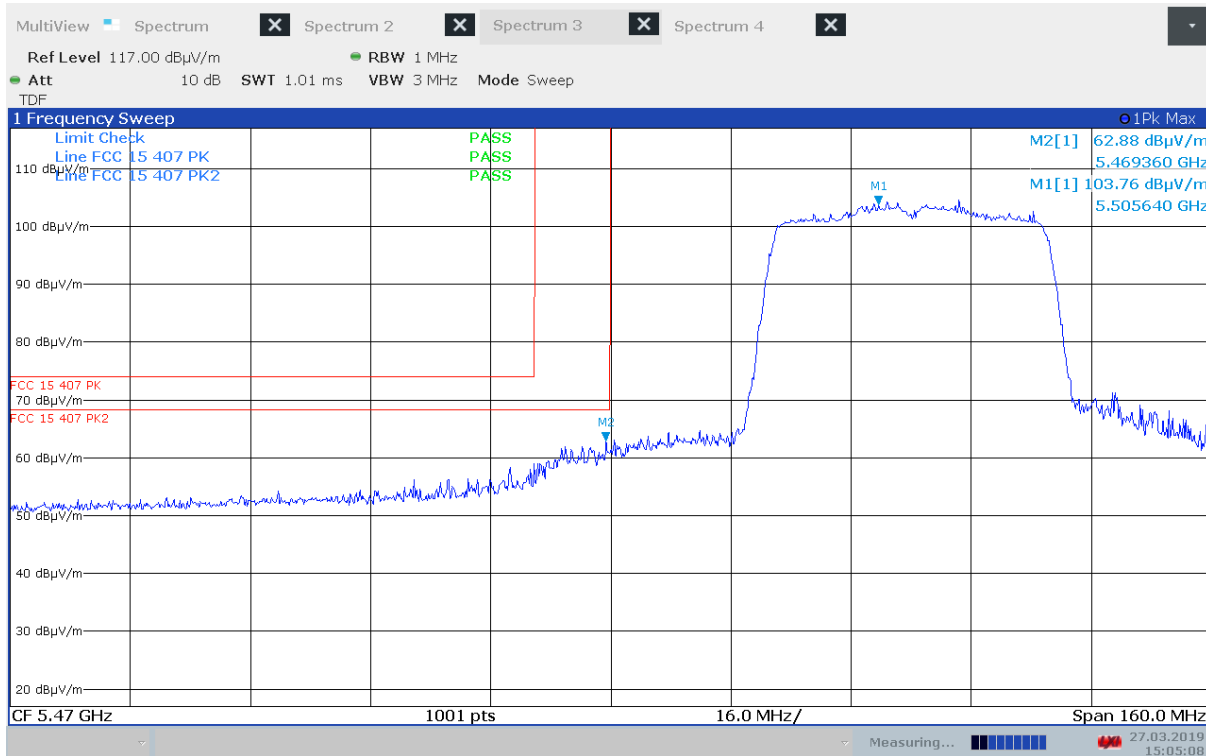
Unwanted Emissions, Band Edge, 5150 MHz, ch46, 802.11n HT40



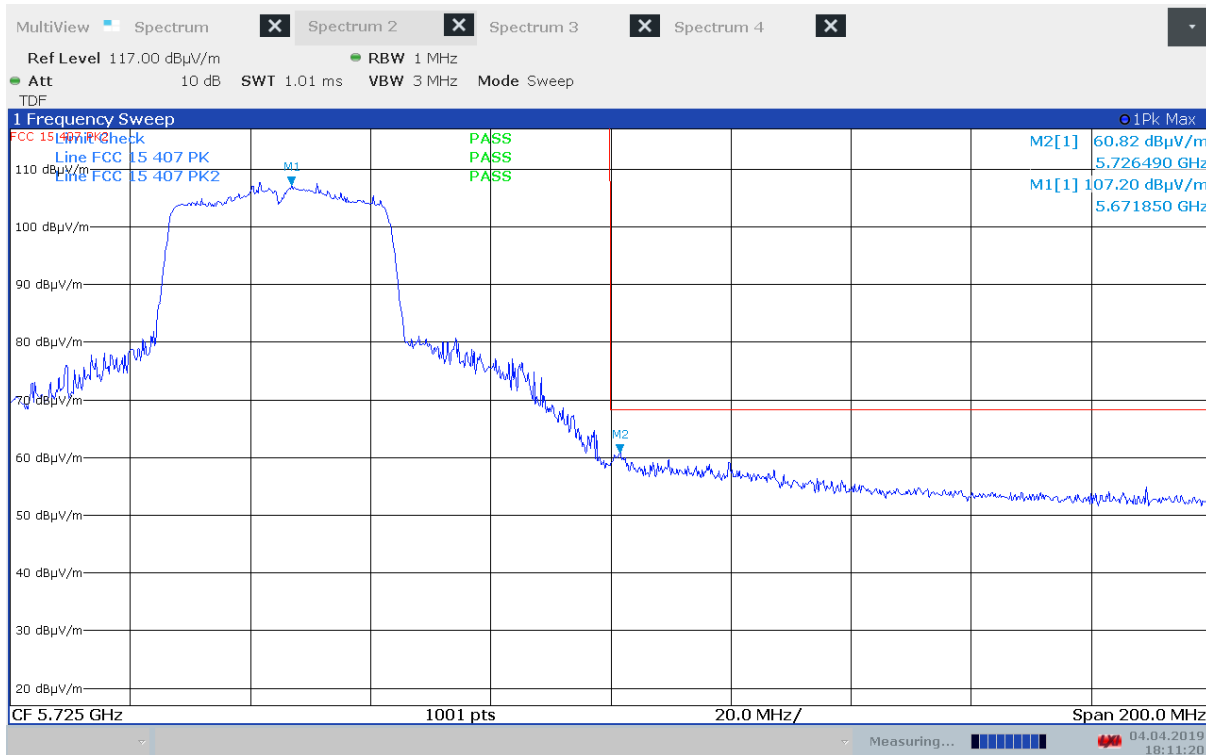
Unwanted Emissions, Band Edge, 5350 MHz, ch54, 802.11n HT40



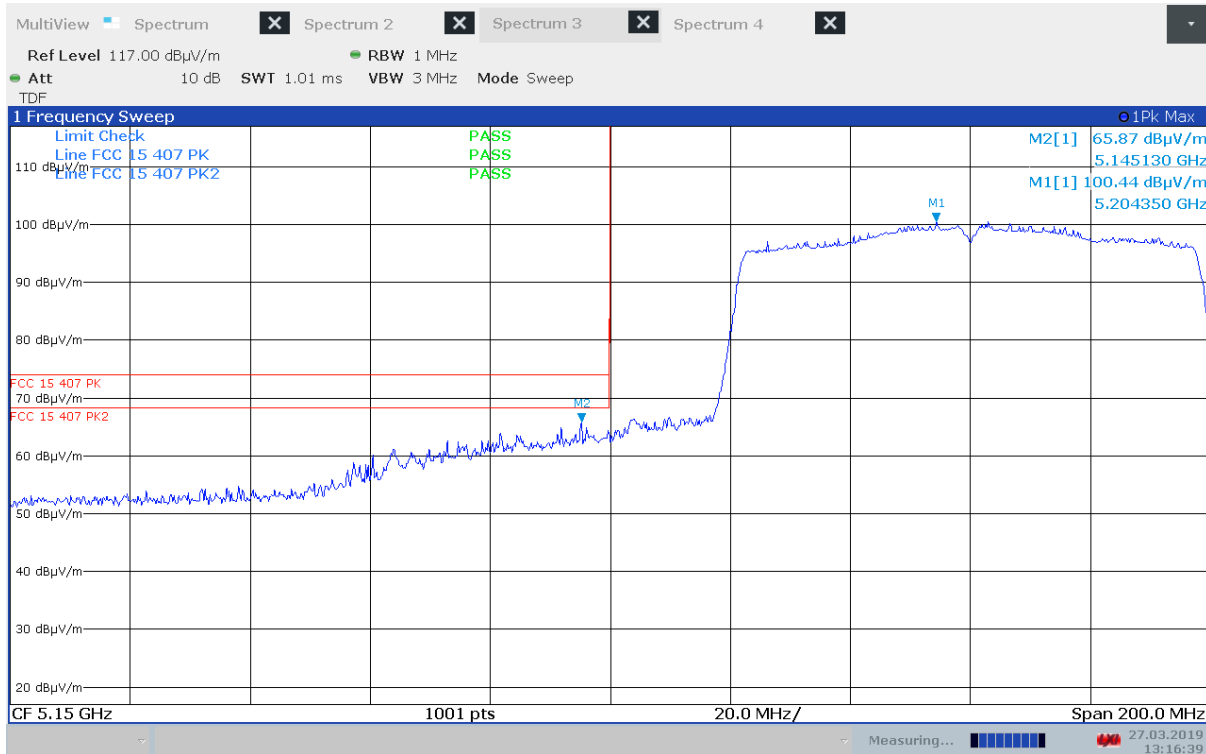
Unwanted Emissions, Band Edge, 5350 MHz, ch62, 802.11n HT40



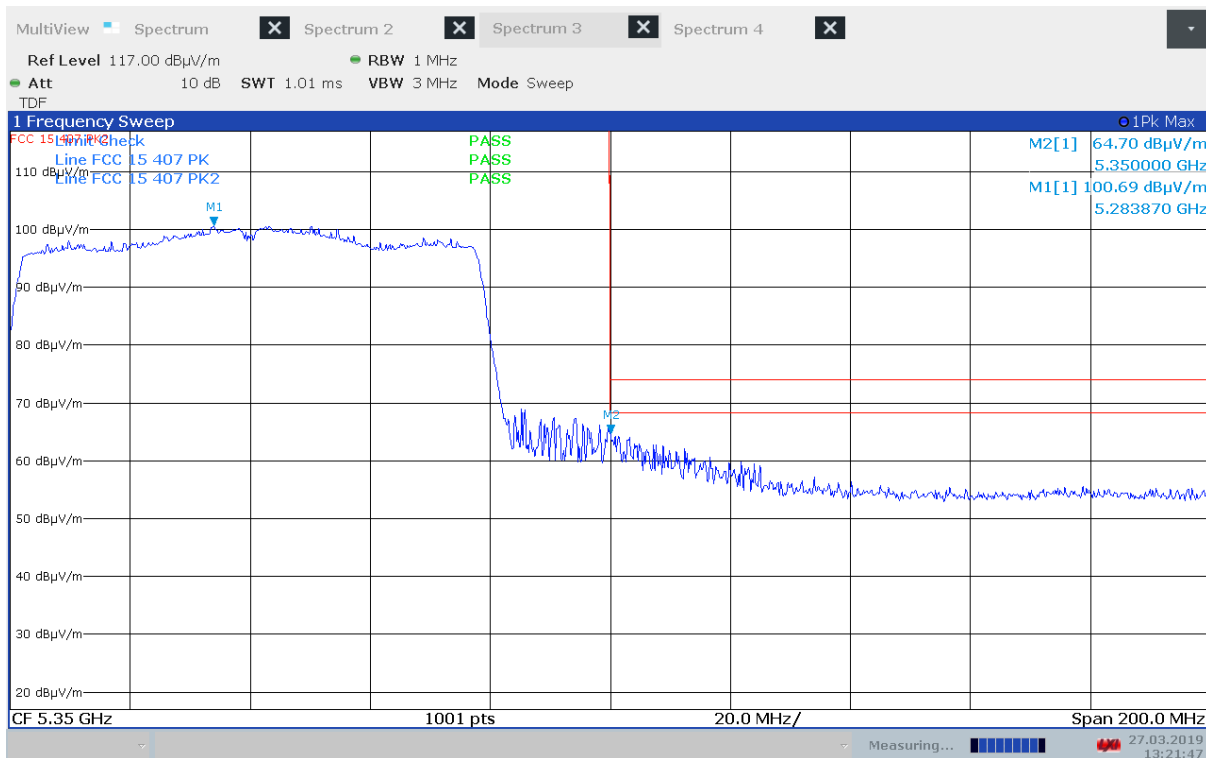
Unwanted Emissions, Band Edge, 5470 MHz, ch102, 802.11n HT40



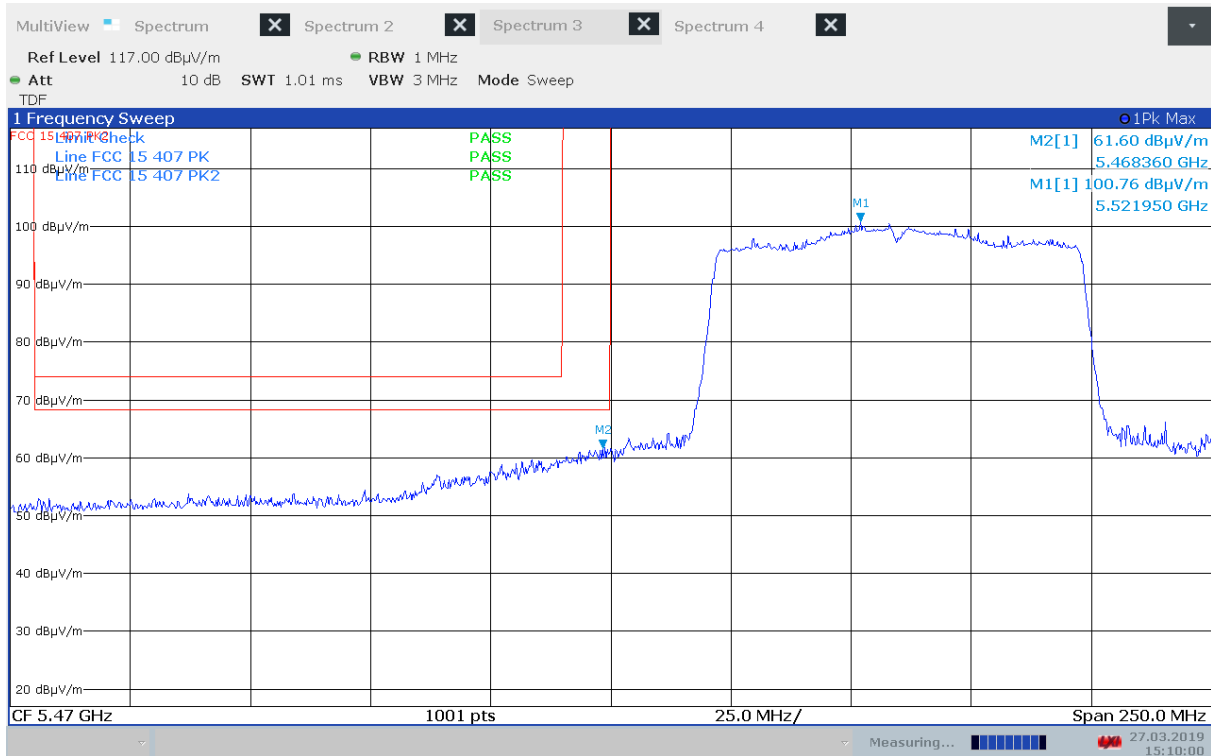
Unwanted Emissions, Band Edge, 5725 MHz, ch134, 802.11n HT40



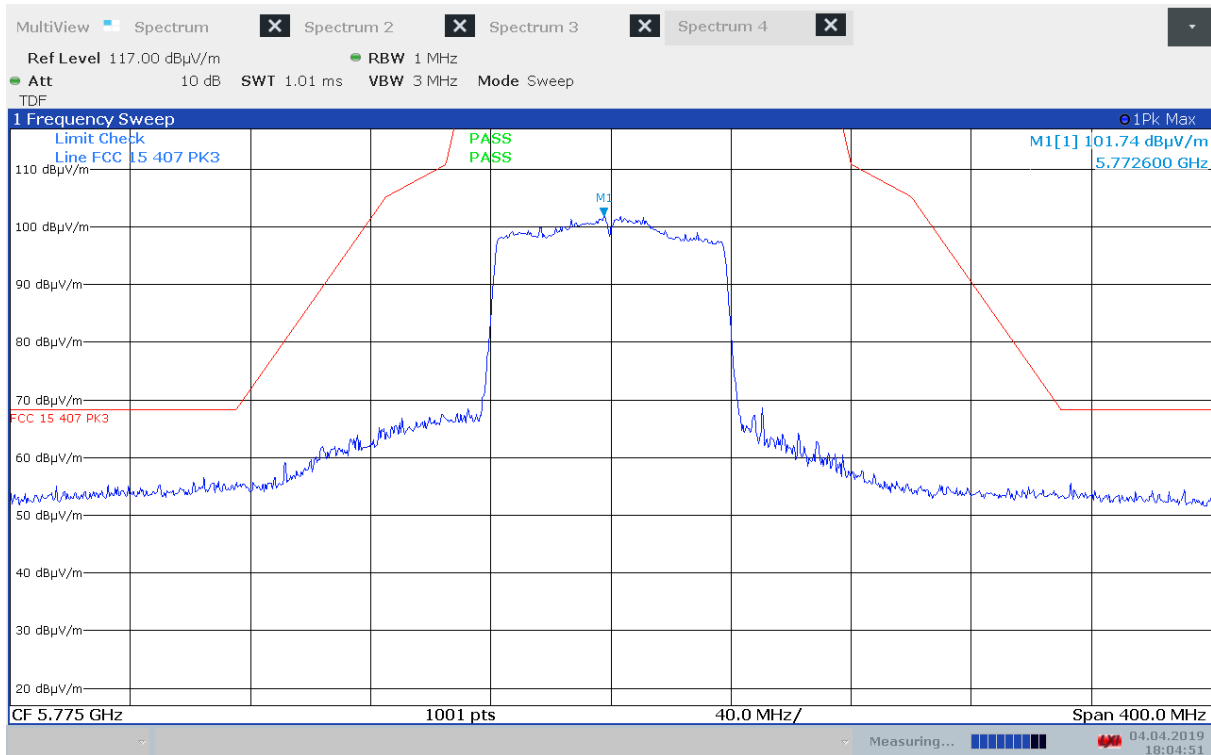
Unwanted Emissions, Band Edge, 5150 MHz, ch42, 802.11ac HT80



Unwanted Emissions, Band Edge, 5350 MHz, ch58, 802.11ac HT80



Unwanted Emissions, Band Edge, 5470 MHz, ch106, 802.11ac HT80



Unwanted Emissions, Band Edge, ch155, 802.11ac HT80

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 4 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

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

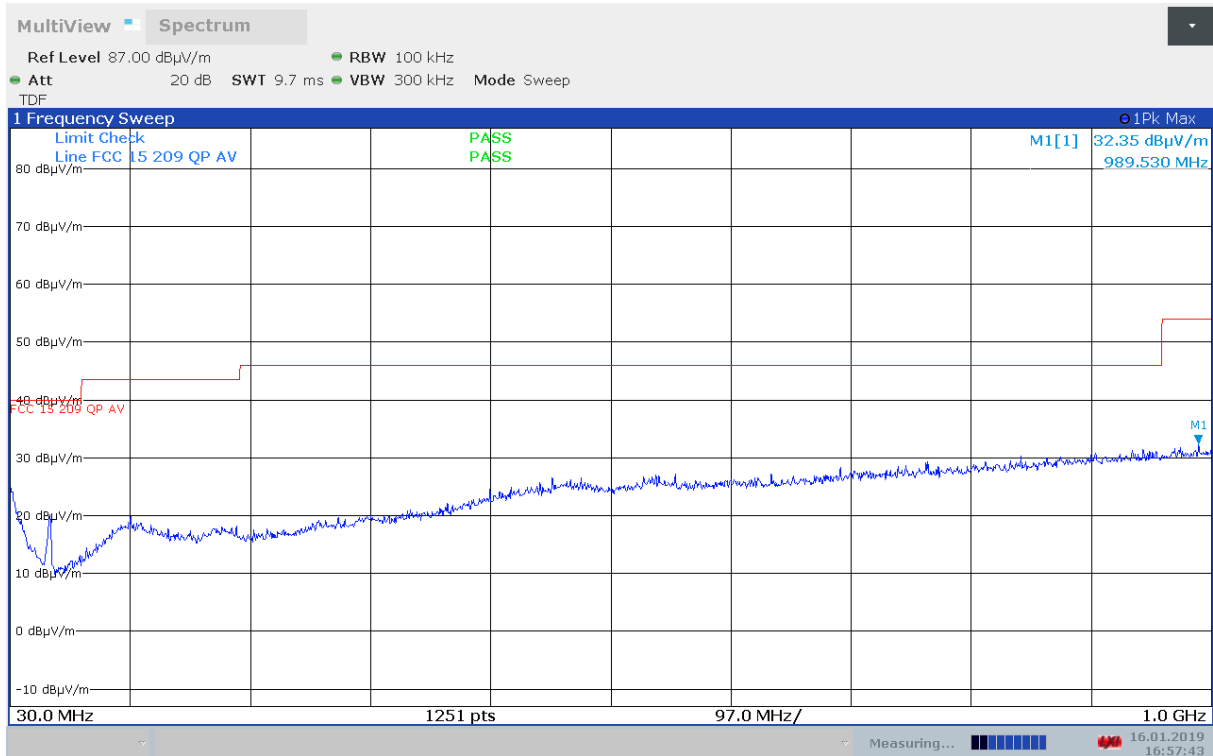
Tested in test mode with EUT transmitting

Measured Frequency (MHz)	Carrier Frequency (MHz)	Modulation	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30 – 88	5180	802.11a 6Mbps	< 35	40.0	> 5
88 – 216	5180	802.11a 6Mbps	< 30	43.5	> 13.5
216 – 960	5180	802.11a 6Mbps	< 30	46.0	> 16
960 – 1000	5180	802.11a 6Mbps	< 34	54.0	> 20

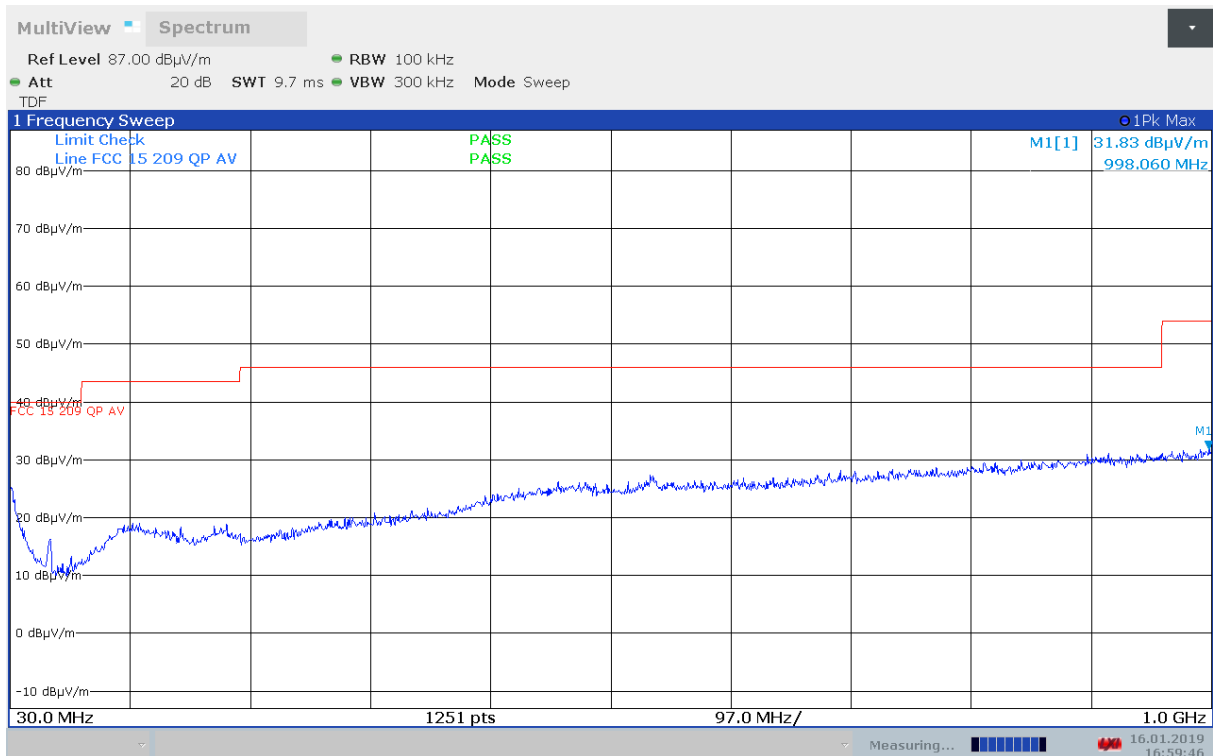
See attached plots.

Requirements/Limit

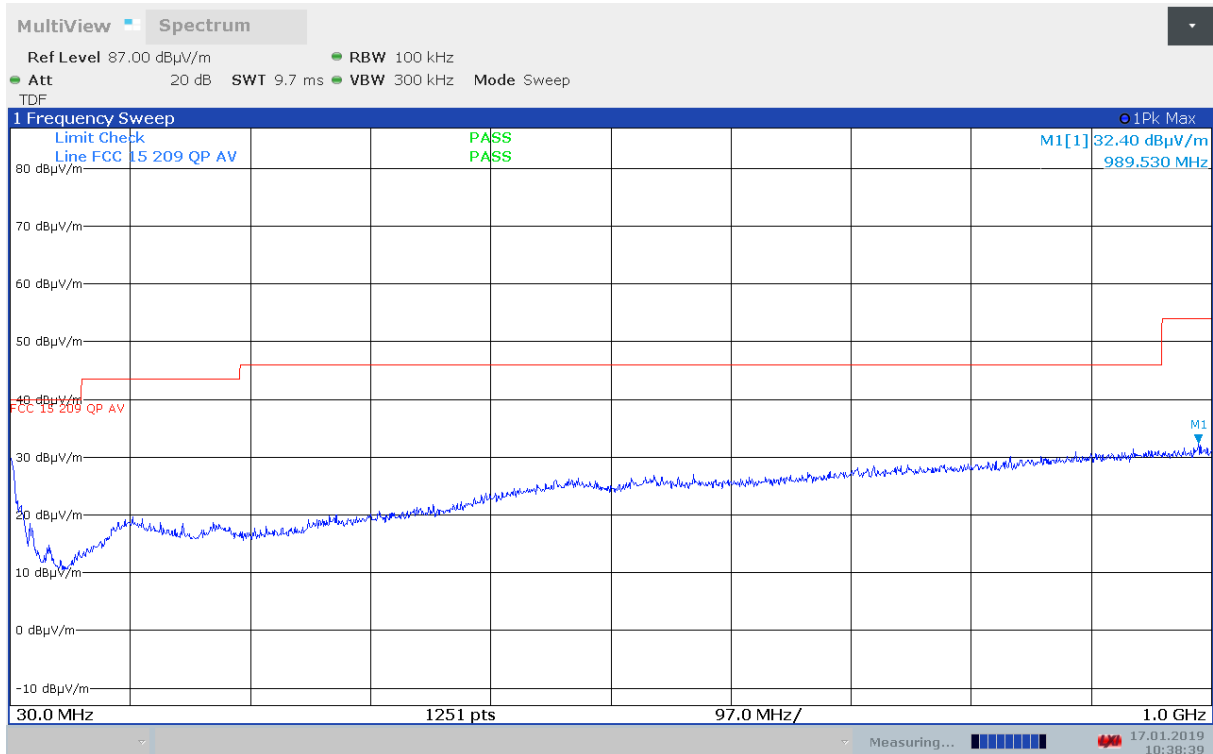
FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
Frequency	Radiated emission limit @3 meters	
30 – 88 MHz	100 μV/m	40.0 dBμV/m
88 – 216 MHz	150 μV/m	43.5 dBμV/m
216 – 960 MHz	200 μV/m	46.0 dBμV/m
960 – 1000 MHz	500 μV/m	54.0 dBμV/m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



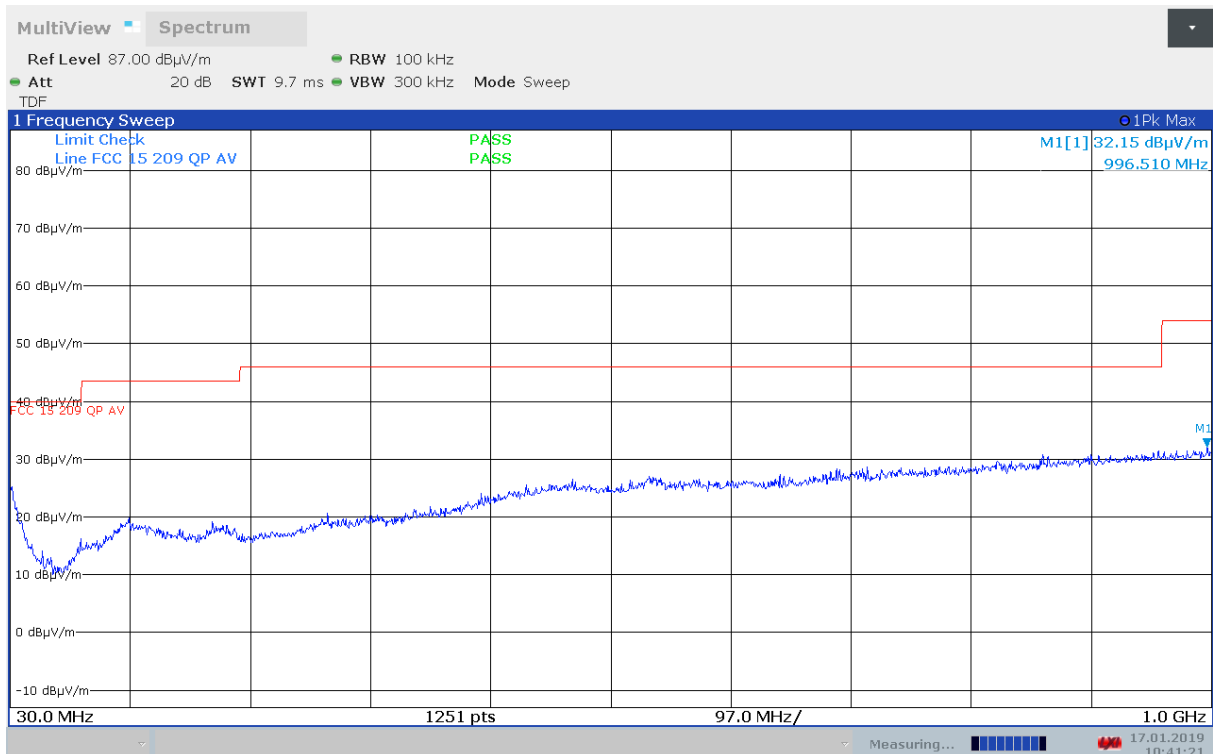
Radiated Emissions, 30– 1000 MHz, Ch36, 802.11a 6Mbps, EUT V, VP



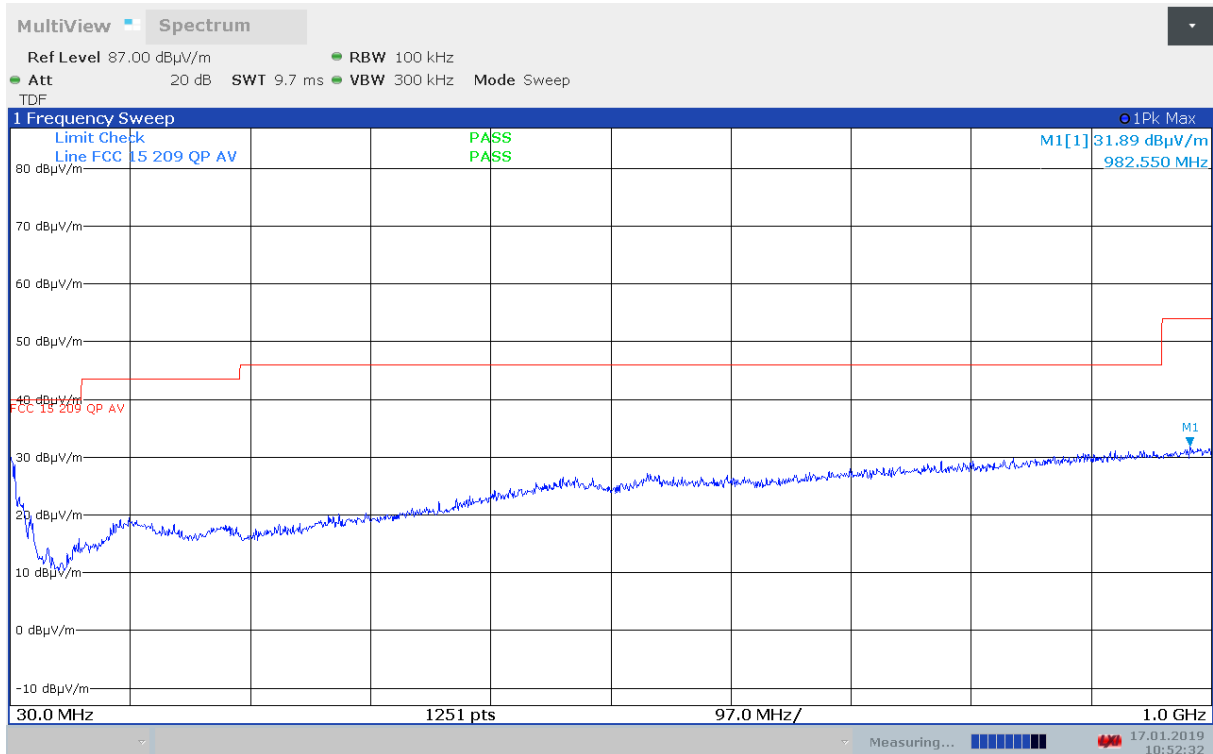
Radiated Emissions, 30– 1000 MHz, Ch36, 802.11a 6Mbps, EUT V, HP



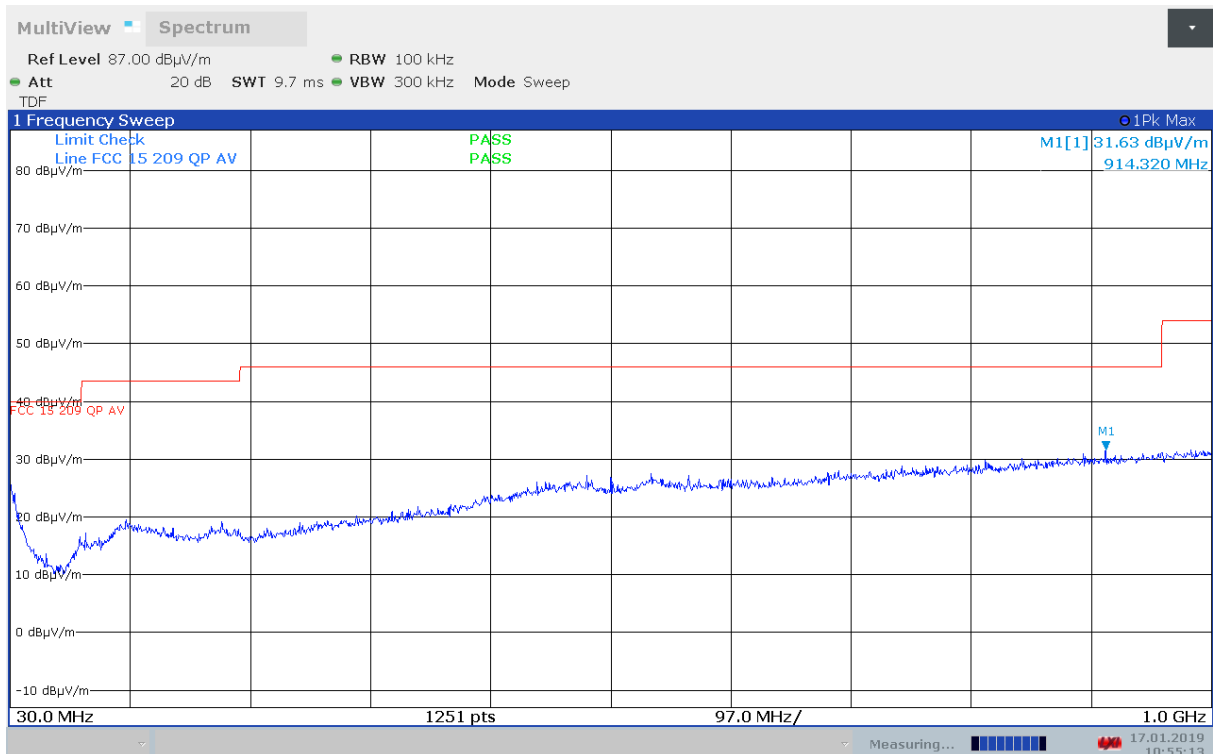
Radiated Emissions, 30– 1000 MHz, Ch36, 802.11n MCS0, EUT V, VP



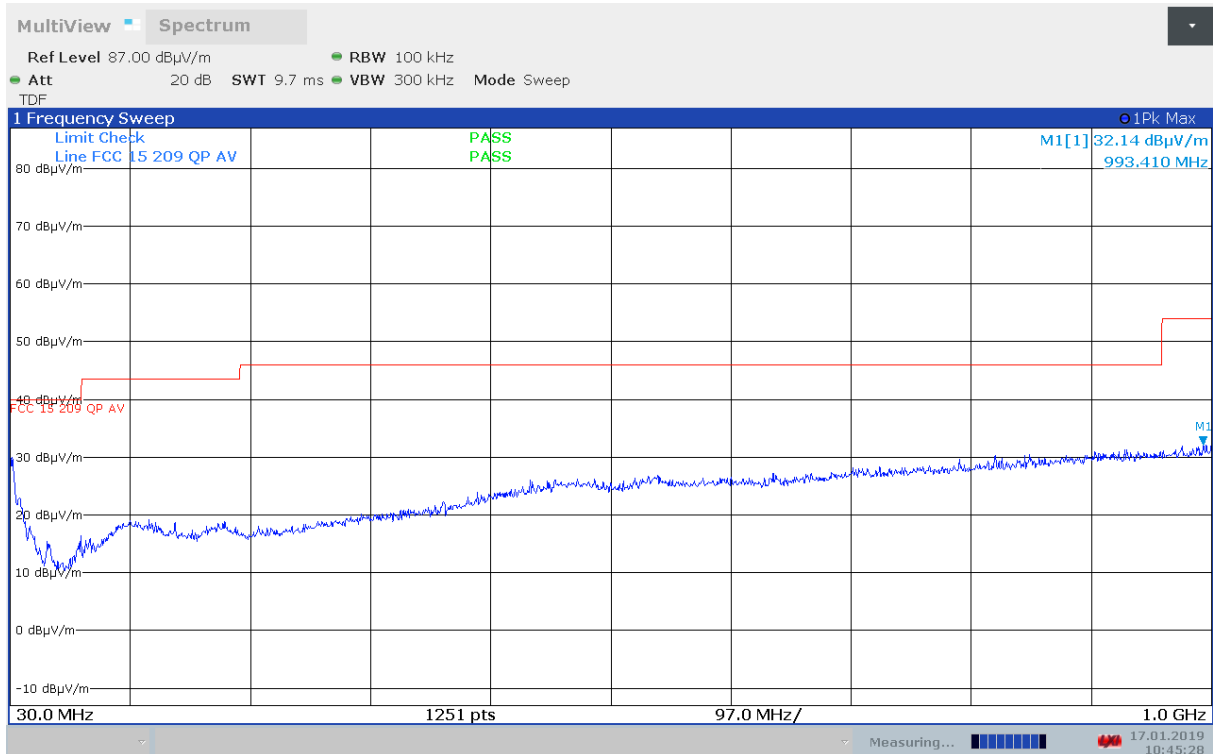
Radiated Emissions, 30– 1000 MHz, Ch36, 802.11n MCS0, EUT V, HP



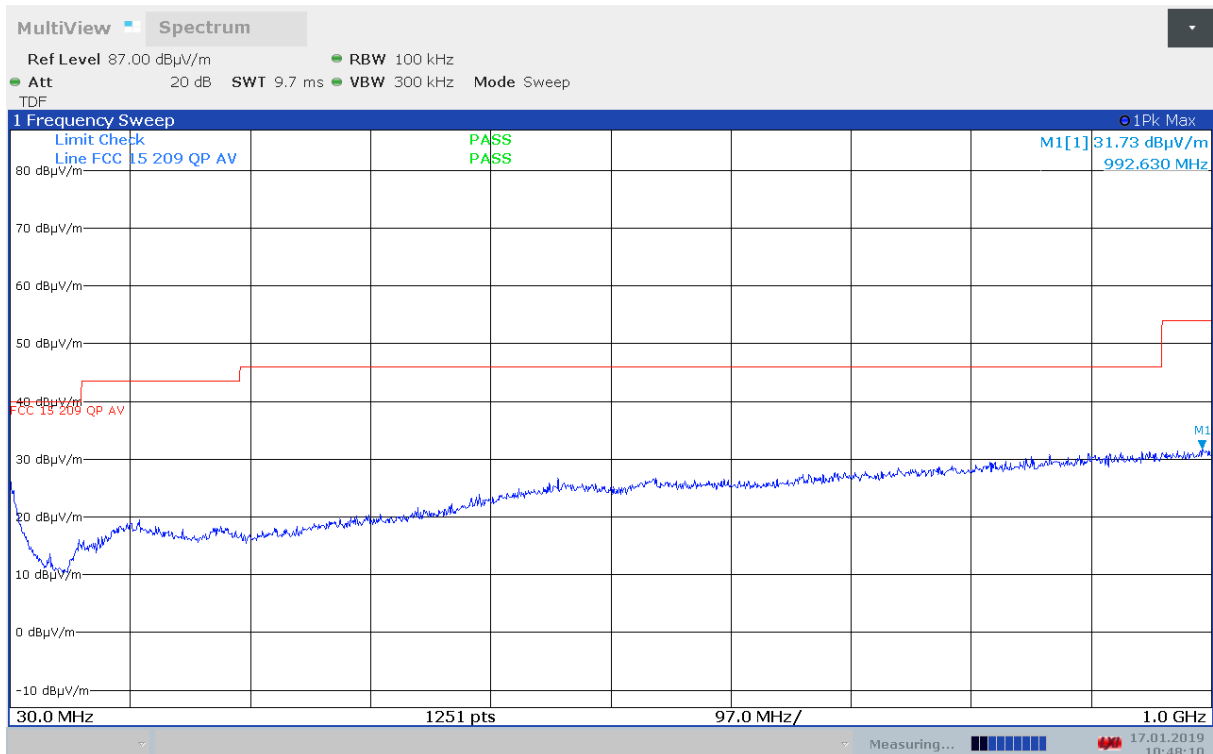
Radiated Emissions, 30– 1000 MHz, Ch100, 802.11a 6Mbps, EUT V, VP



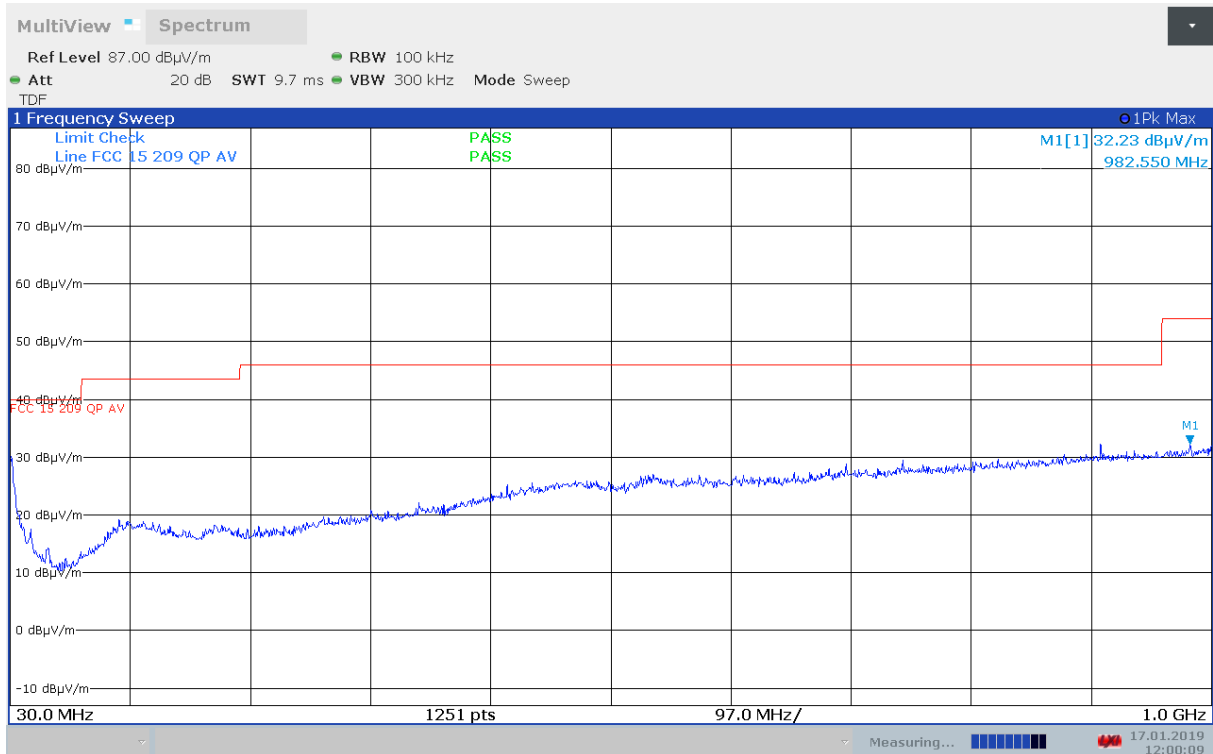
Radiated Emissions, 30– 1000 MHz, Ch100, 802.11a 6Mbps, EUT V, HP



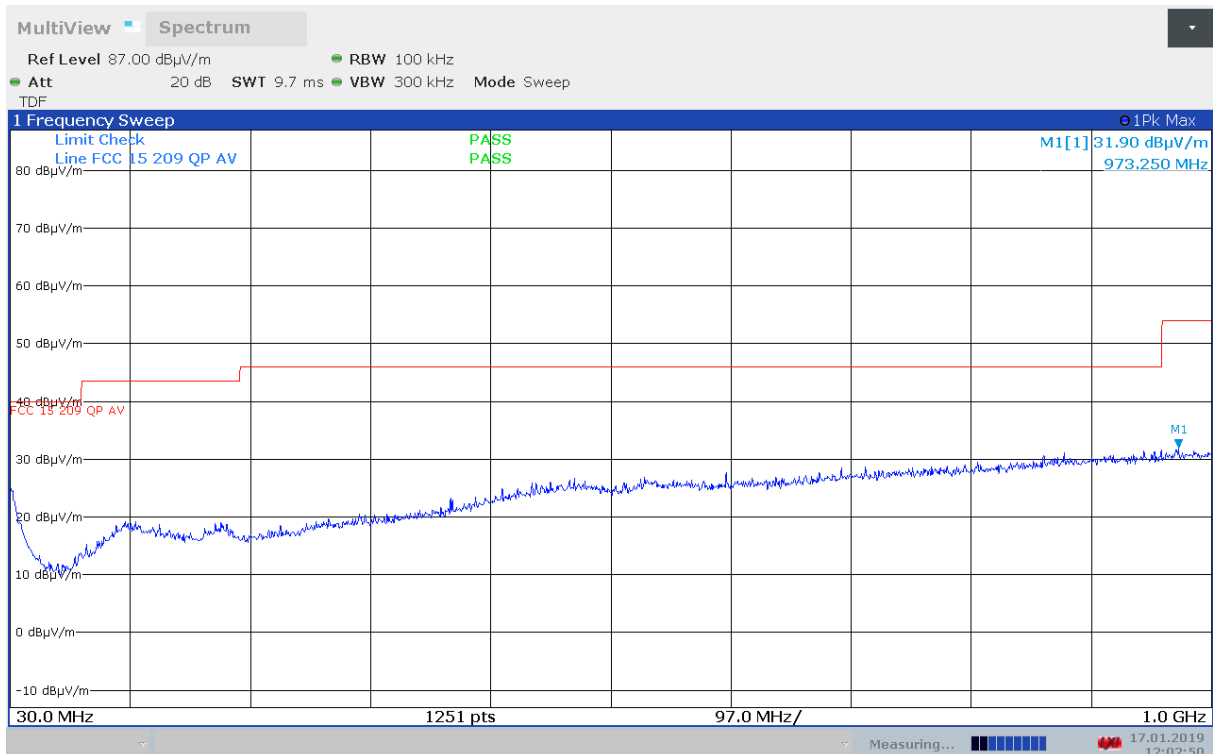
Radiated Emissions, 30– 1000 MHz, Ch100, 802.11n MCS0, EUT V, VP



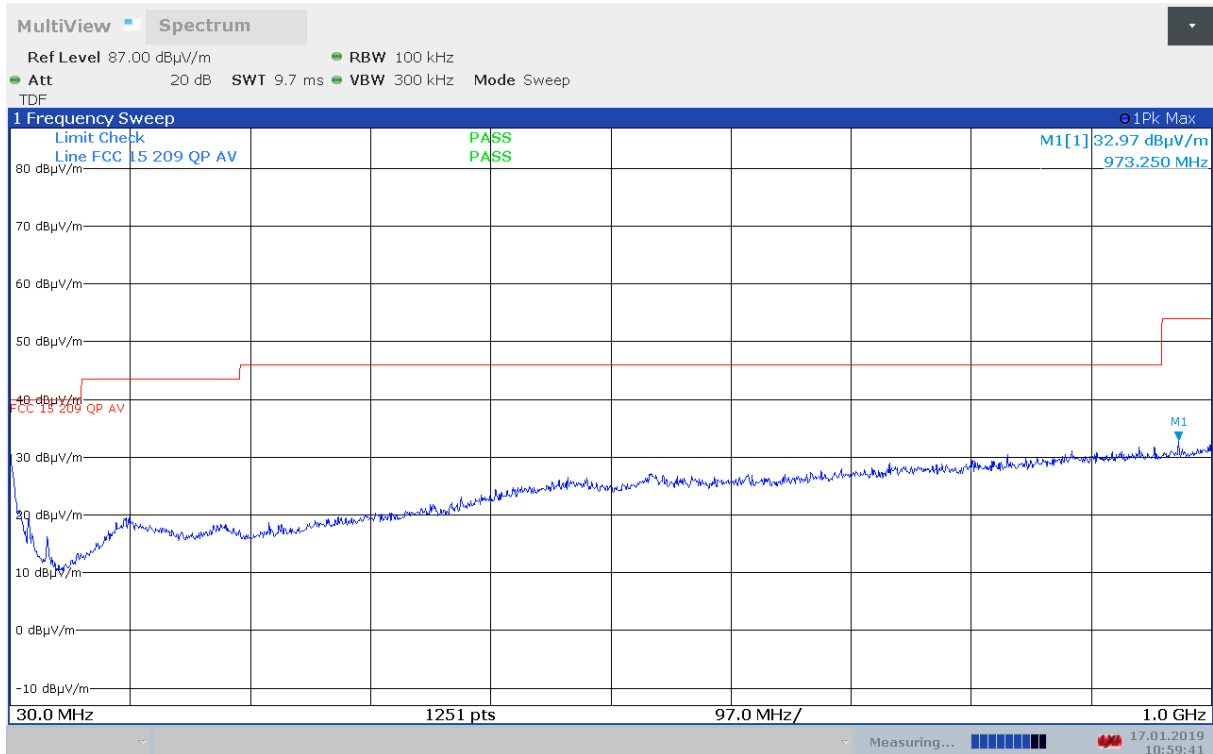
Radiated Emissions, 30– 1000 MHz, Ch100, 802.11n MCS0, EUT V, HP



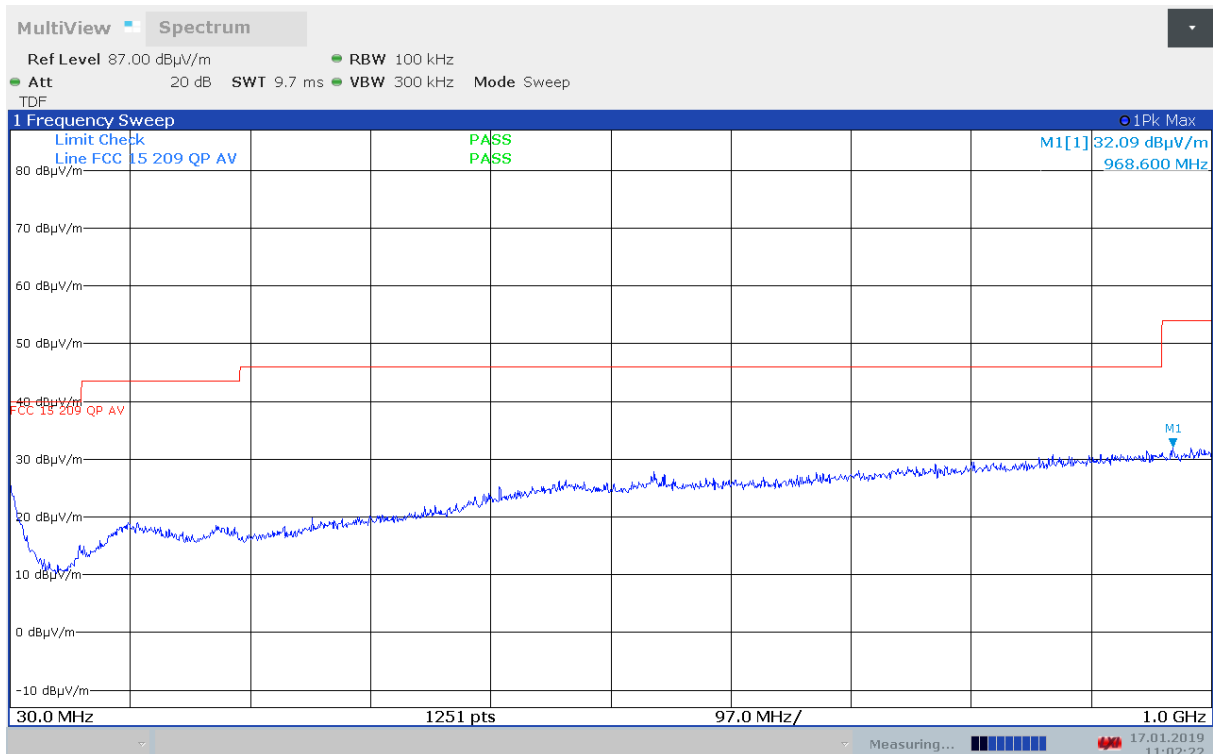
Radiated Emissions, 30– 1000 MHz, Ch157, 802.11a 6Mbps, EUT V, VP



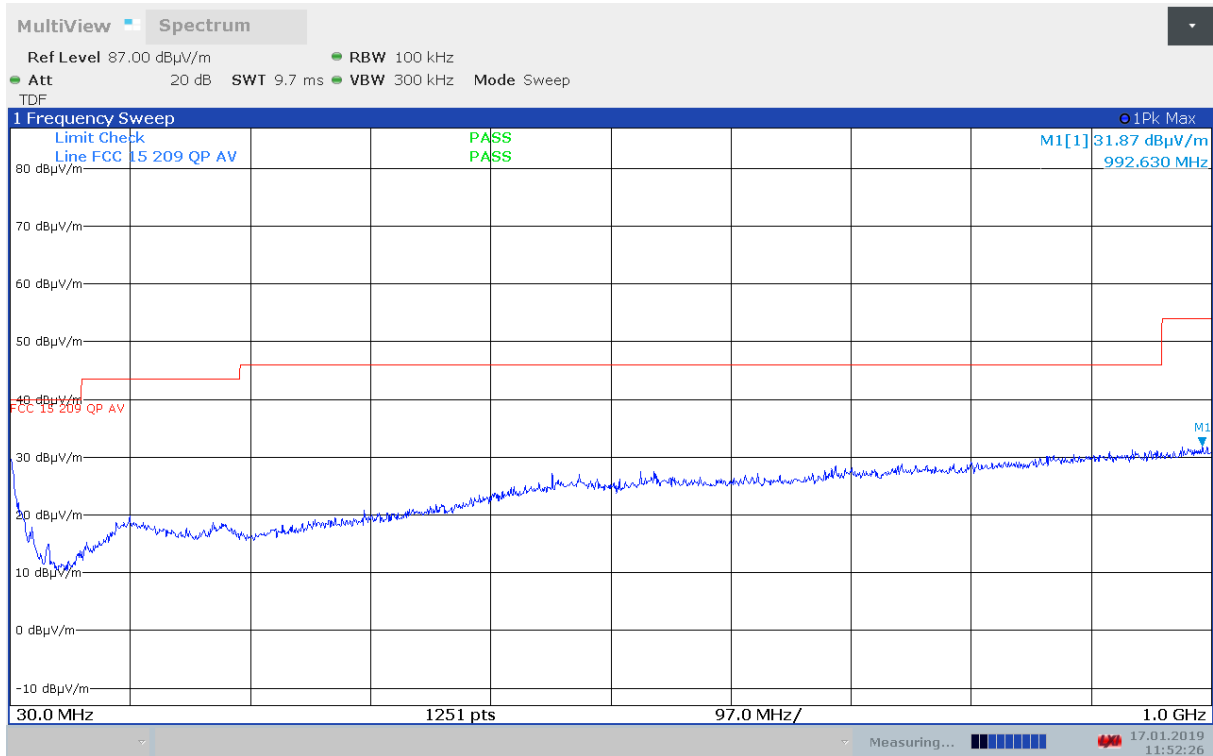
Radiated Emissions, 30– 1000 MHz, Ch157, 802.11a 6Mbps, EUT V, HP



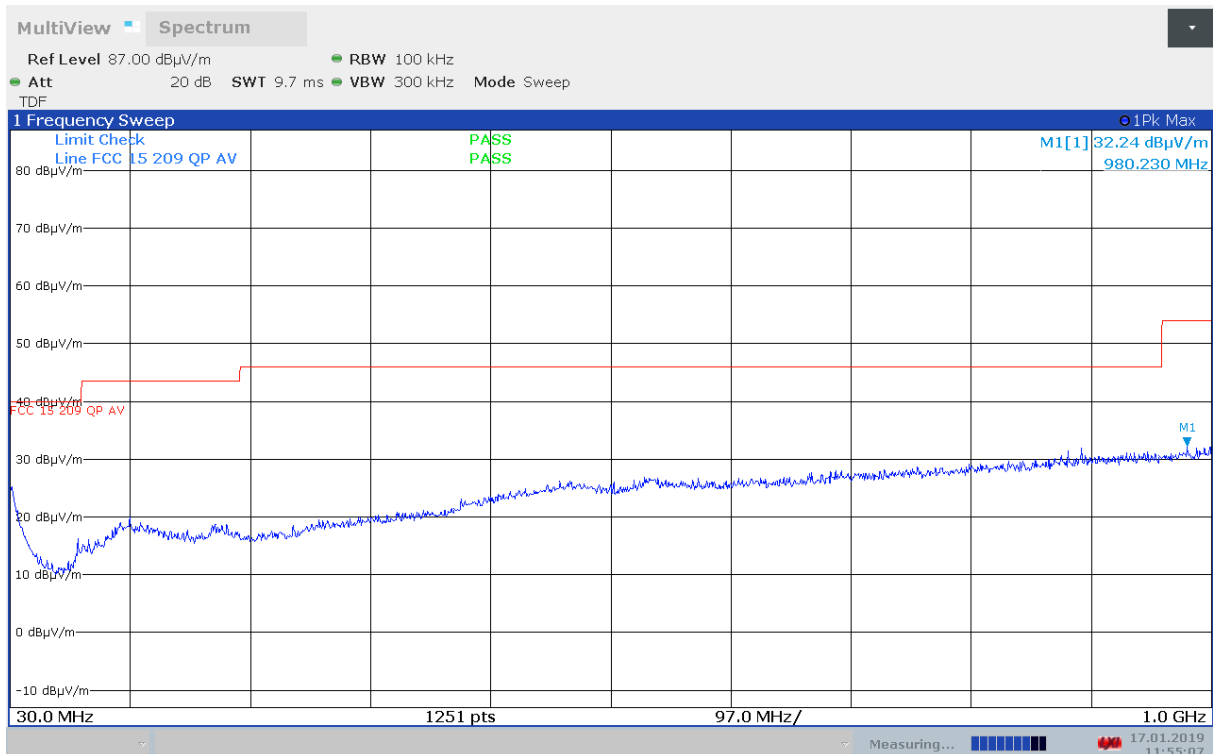
Radiated Emissions, 30– 1000 MHz, Ch38, 802.11n HT40, EUT V, VP



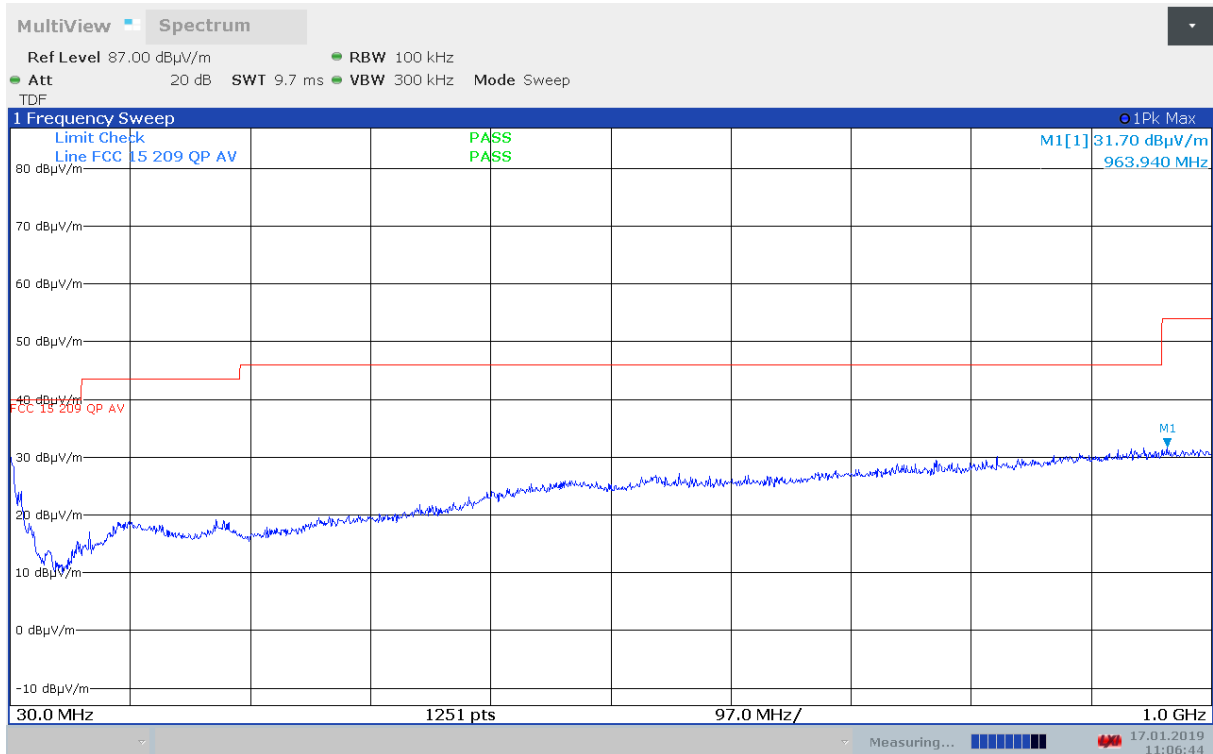
Radiated Emissions, 30– 1000 MHz, Ch38, 802.11n HT40, EUT V, HP



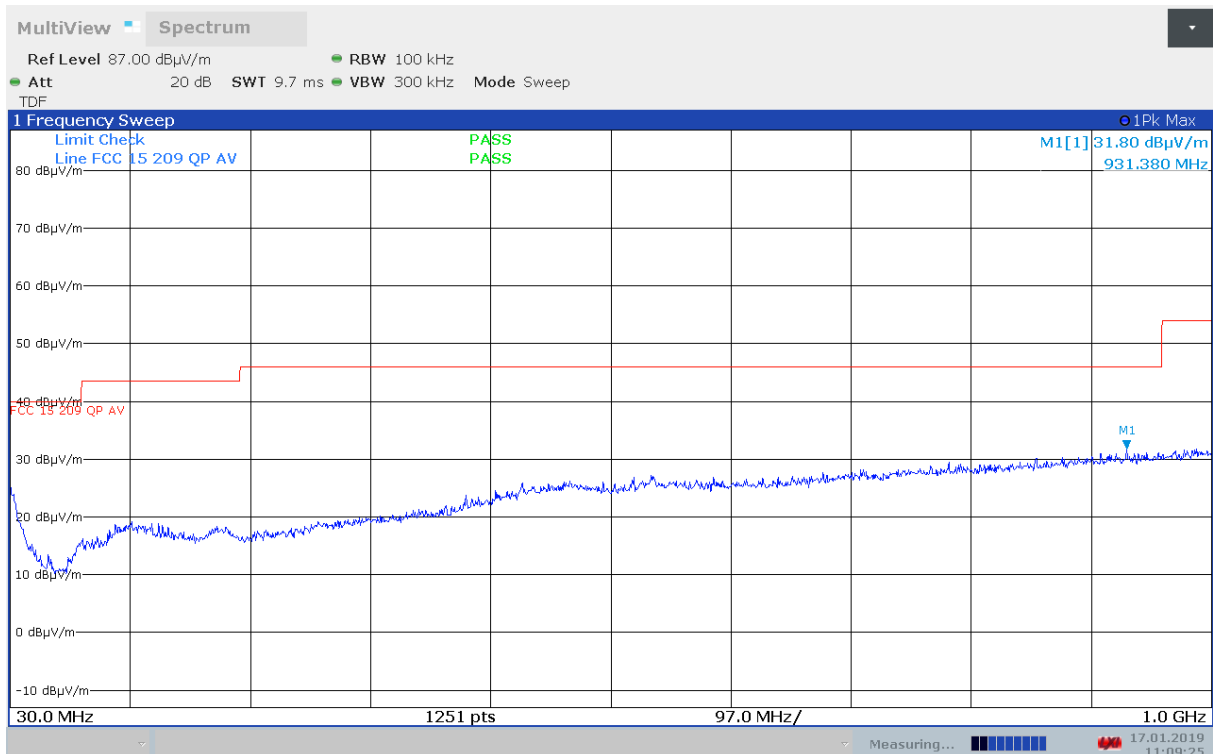
Radiated Emissions, 30– 1000 MHz, Ch102, 802.11n HT40, EUT V, VP



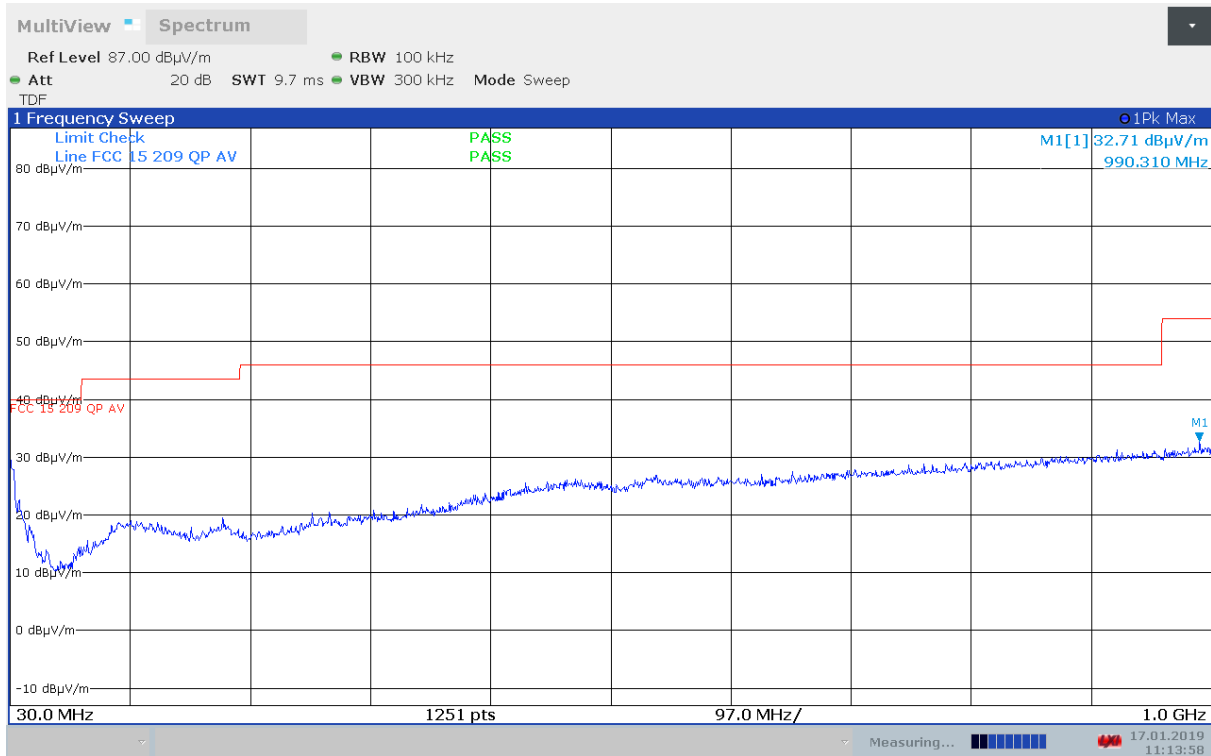
Radiated Emissions, 30– 1000 MHz, Ch102, 802.11n HT40, EUT V, HP



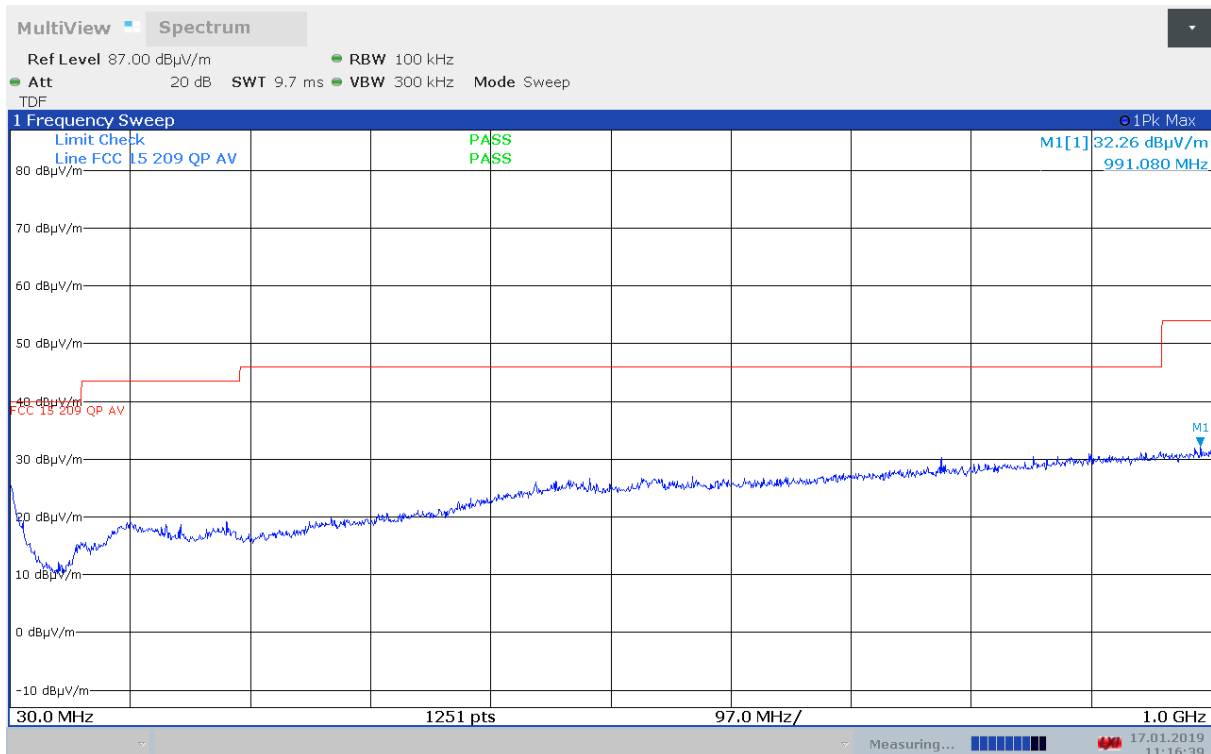
Radiated Emissions, 30– 1000 MHz, Ch42, 802.11n HT80, EUT V, VP



Radiated Emissions, 30– 1000 MHz, Ch42, 802.11n HT80, EUT V, HP



Radiated Emissions, 30– 1000 MHz, Ch106, 802.11n HT80, EUT V, VP



Radiated Emissions, 30– 1000 MHz, Ch106, 802.11n HT80, EUT V, HP

3.8 Radiated Emissions, 1 – 40 GHz

FCC 15.205, 15.209

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, Prescan at approx. 10 cm above 18 GHz.

Peak Detector, RBW=1 MHz

See clause 2.8 Unwanted Emissions.

Field Strength limit is calculated from EIRP limit using the method described in KDB 412172 D01.

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 6Mbps	45.5	54	8.5
5180	5150	802.11n MCS0	50.2	54	3.8
5190	5150	802.11n HT40	52.6	54	1.4
5210	5150	802.11ac HT80	52.1	54	1.9
5320	5350	802.11a 6Mbps	46.3	54	7.7
5320	5350	802.11n MCS0	47.2	54	8.2
5310	5350	802.11n HT40	47.4	54	6.4
5290	5350	802.11av HT80	46.4	54	7.6
5500	5460	802.11a 6Mbps	44.0	54	10.0
5500	5460	802.11n MCS0	44.1	54	9.9
5510	5460	802.11n HT40	43.8	54	10.2
5530	5460	802.11ac HT80	47.2	54	6.8
Any	Any	Any	< 44	54	>10

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

A High Pass Filter was used for measurements from 6 to 18 GHz.

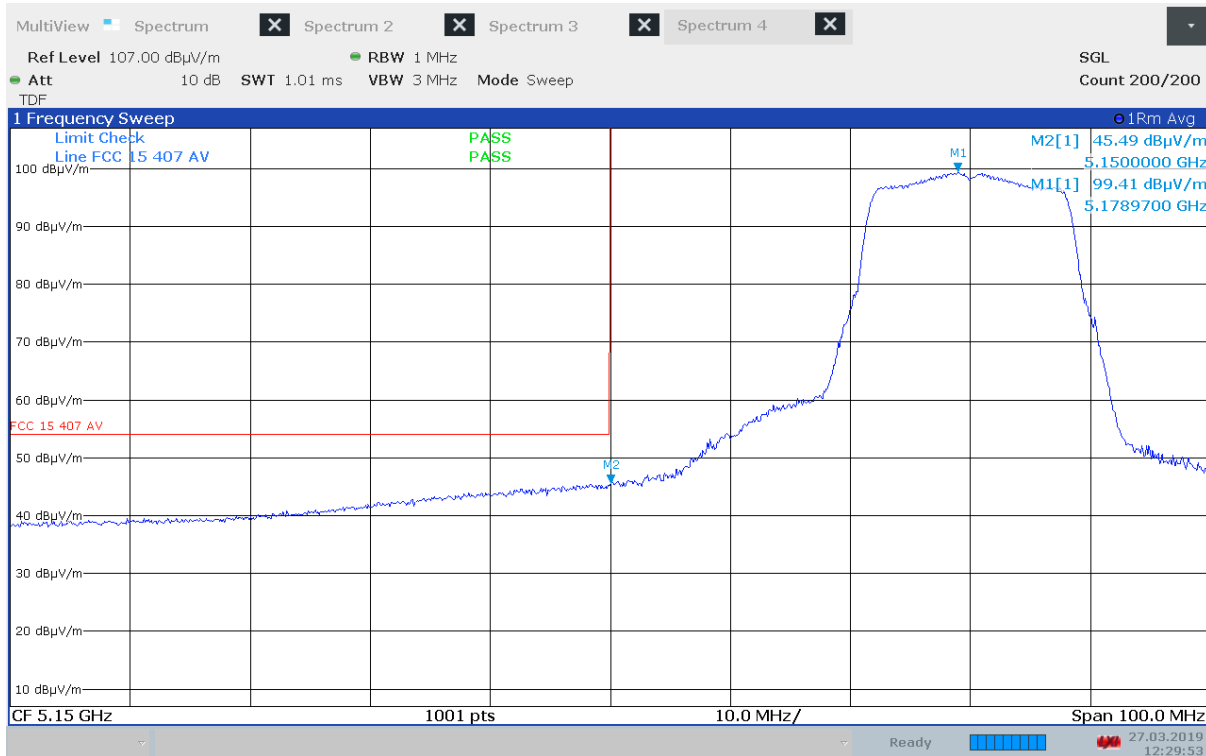
Only harmonics that fall in the restricted bands (ref. §15.205) have been measured.

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

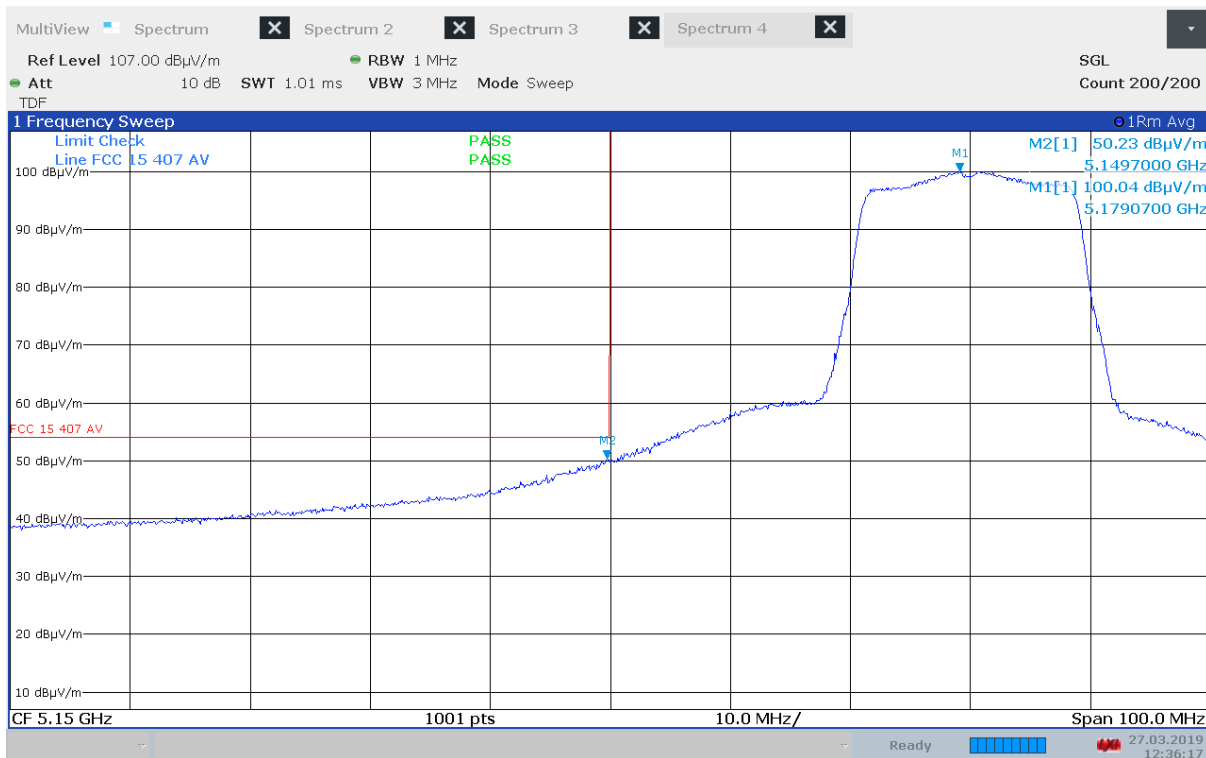
See attached plots.

Requirements/Limit

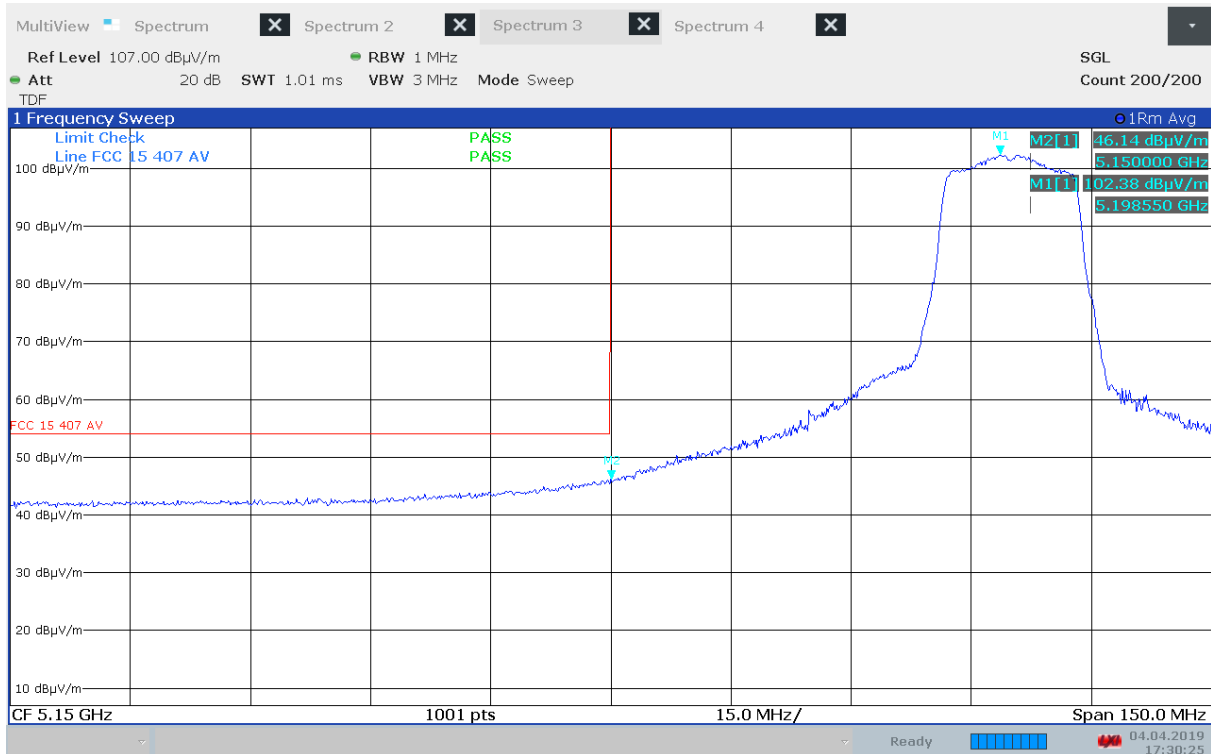
FCC	Part 15.209 @ frequencies defined in §15.205	
ISED	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	Radiated emission limit @3 meters	
Frequency	Average Detector	Peak Detector
1 - 40 GHz	54.0 dBμV/m	74.0 dBμV/m



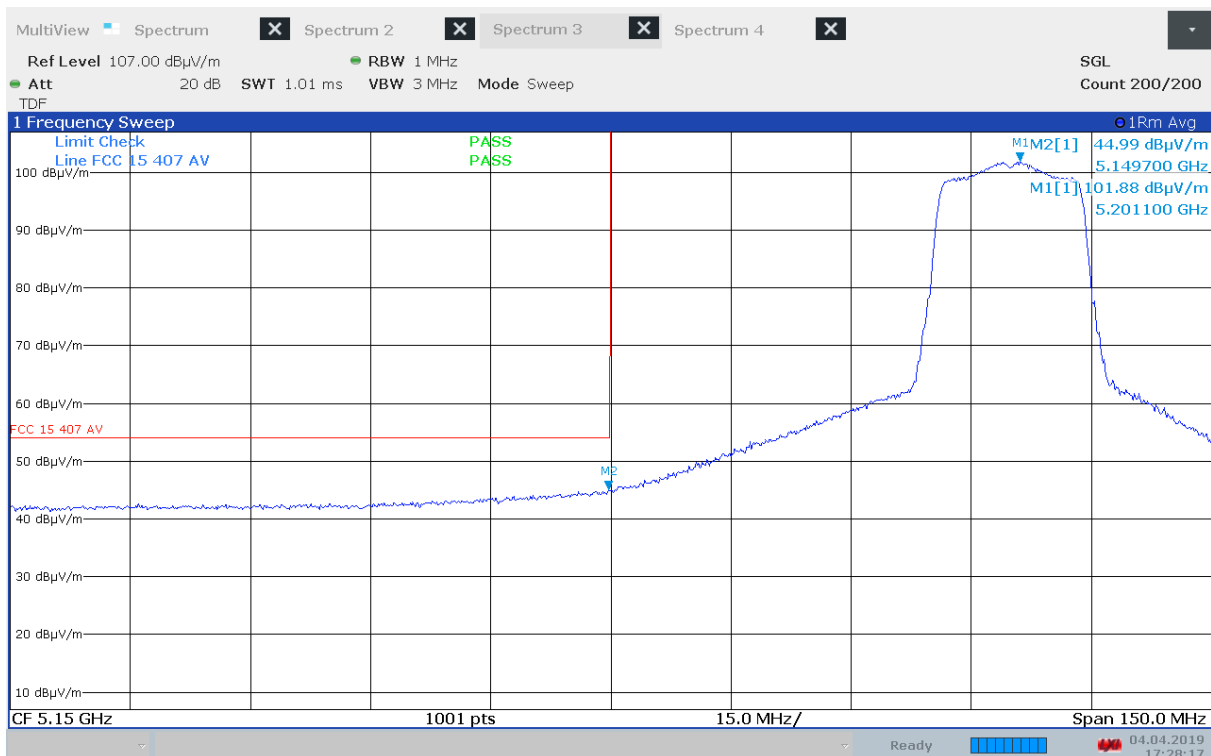
Band Edge, 5150 MHz, Ch36, 802.11a 6Mbps, Average



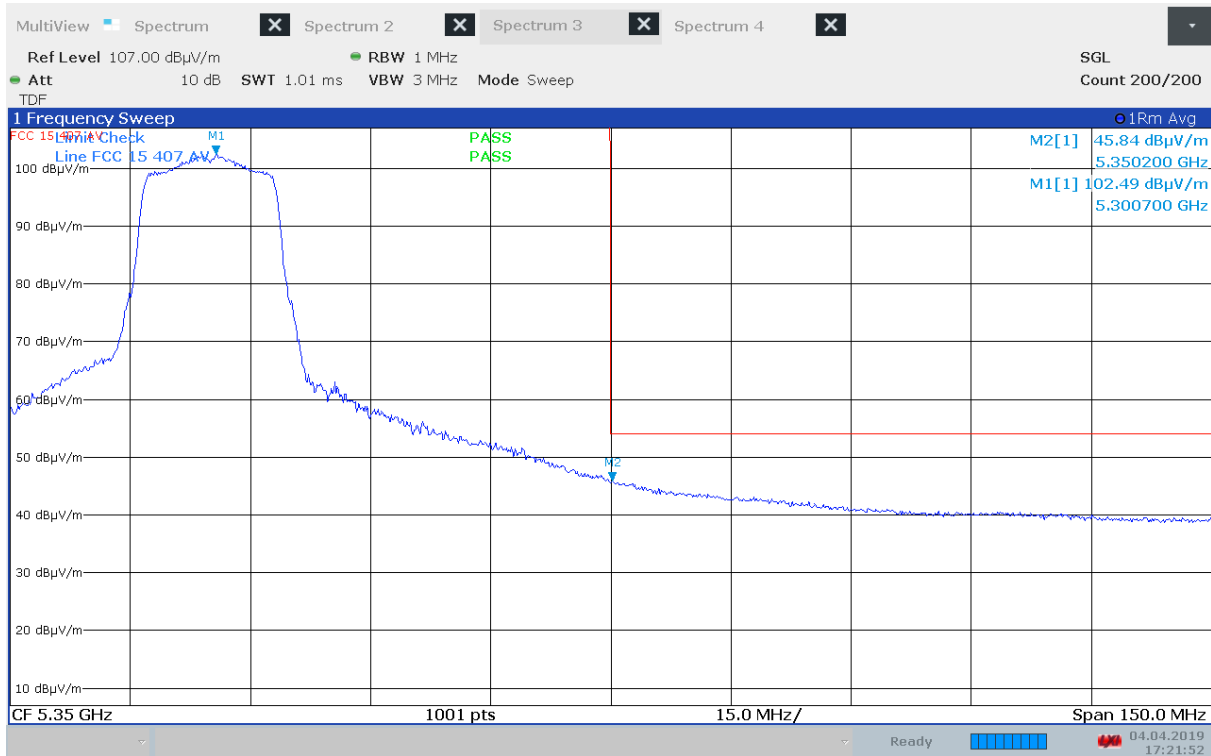
Band Edge, 5150 MHz, Ch36, 802.11n MCS0, Average



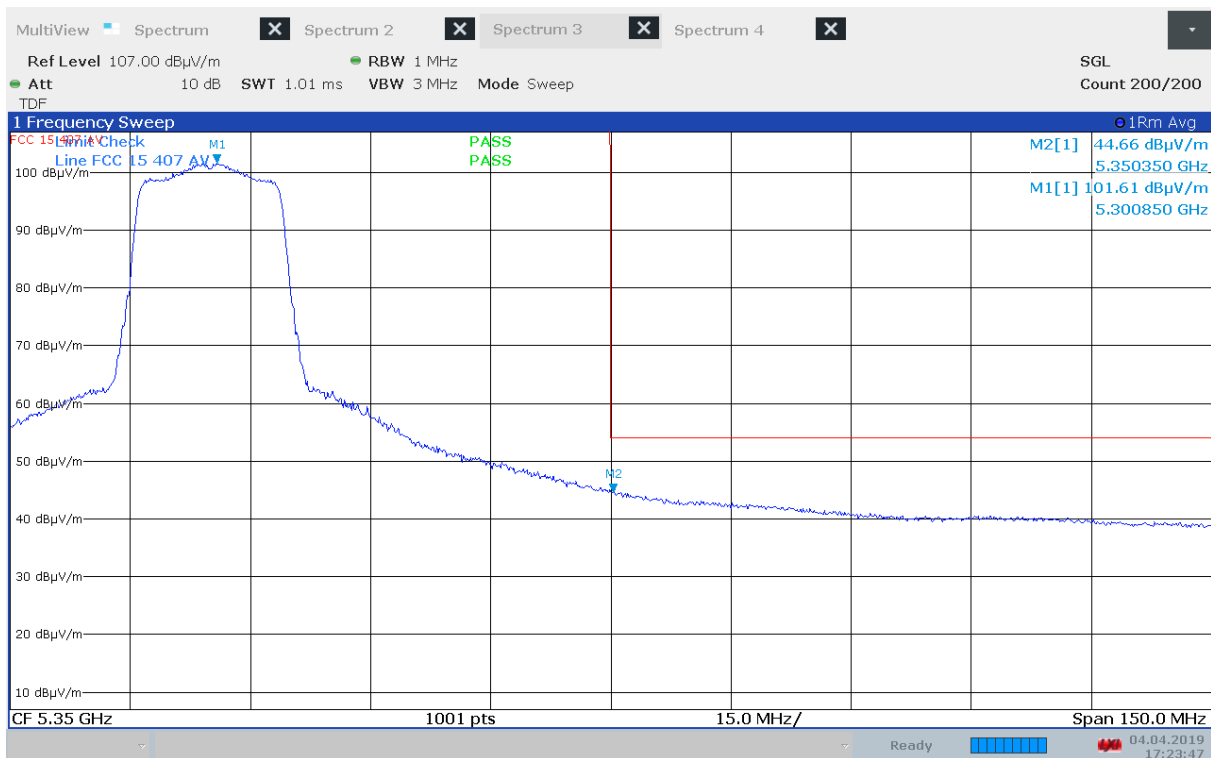
Band Edge, 5150 MHz, Ch40, 802.11a 6Mbps, Average



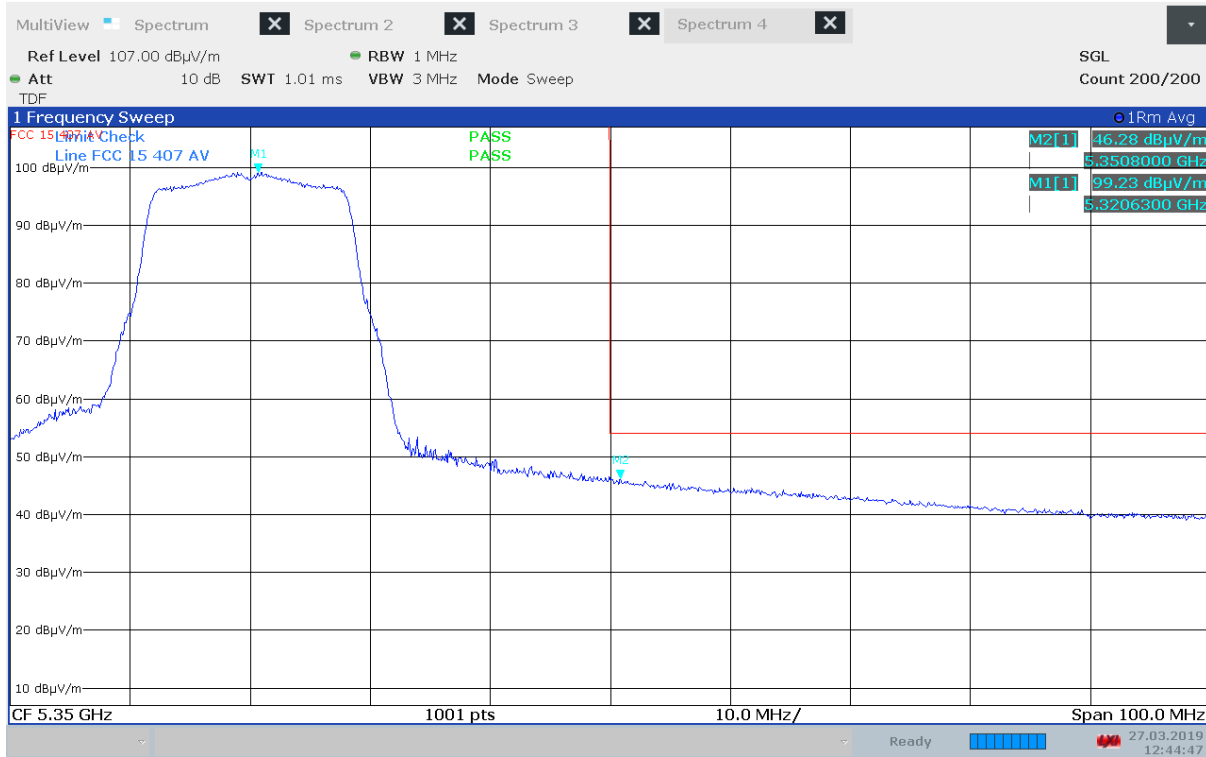
Band Edge, 5150 MHz, Ch40, 802.11n MCS0, Average



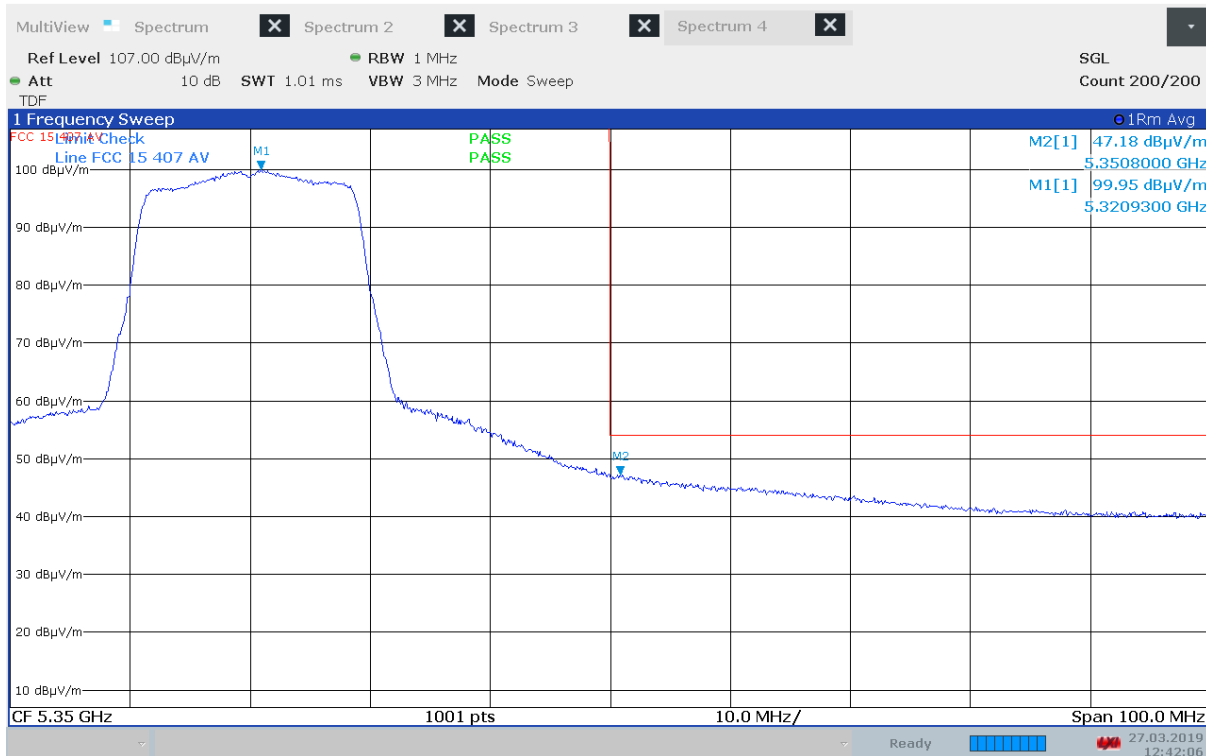
Band Edge, 5350 MHz, Ch60, 802.11a 6Mbps, Average



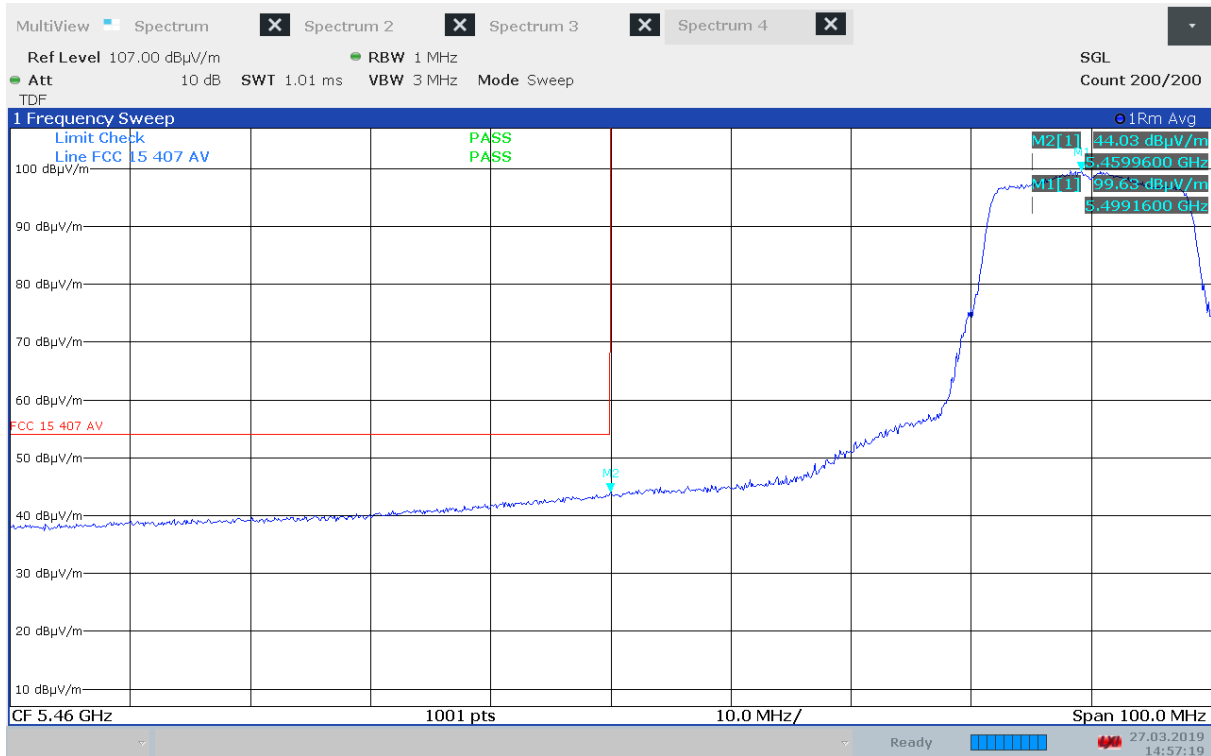
Band Edge, 5350 MHz, Ch60, 802.11n MCS0, Average



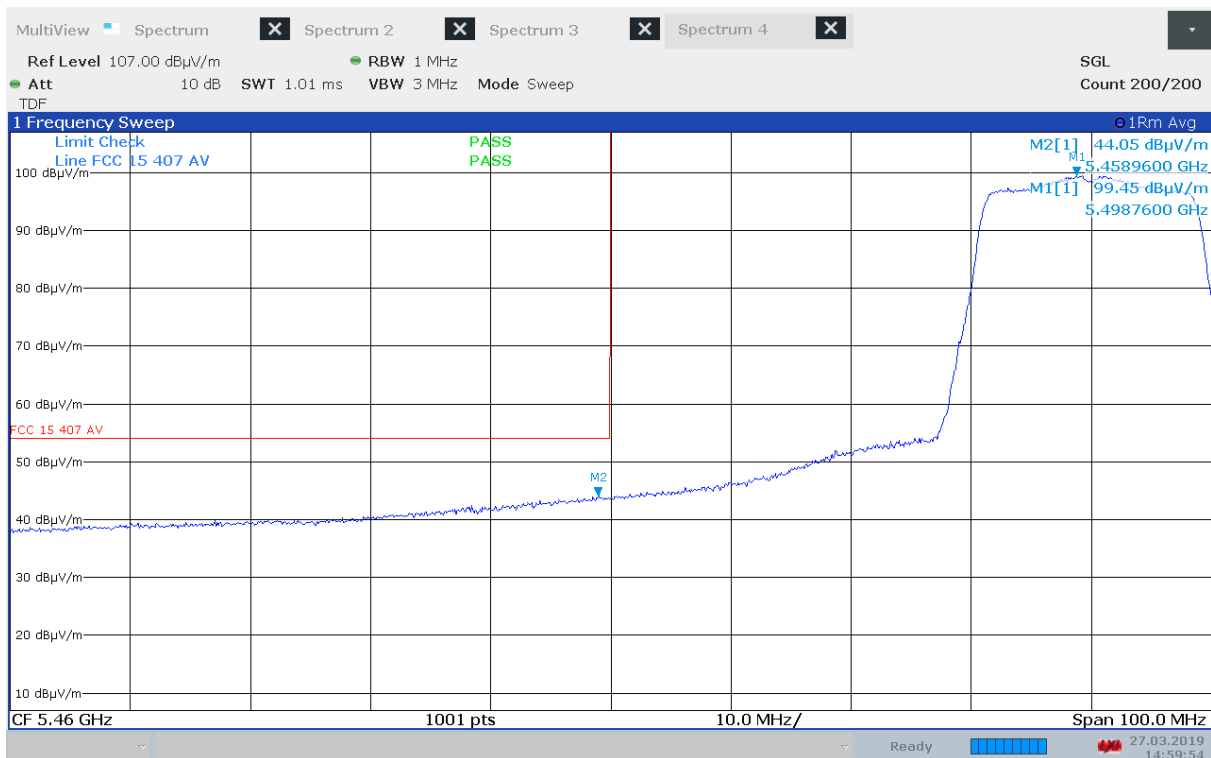
Band Edge, 5350 MHz, Ch64, 802.11a 6Mbps, Average



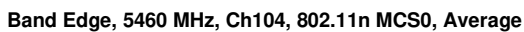
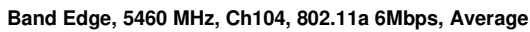
Band Edge, 5350 MHz, Ch64, 802.11n MCS0, Average

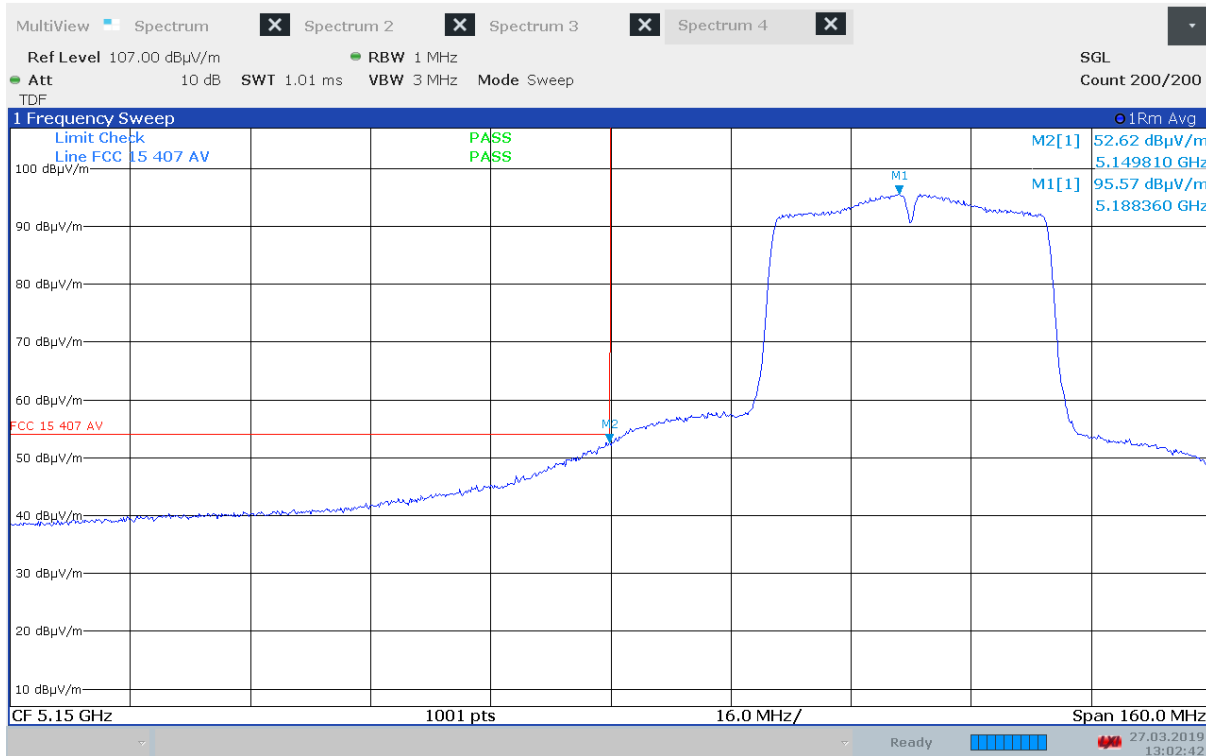


Band Edge, 5460 MHz, Ch100, 802.11a 6Mbps, Average

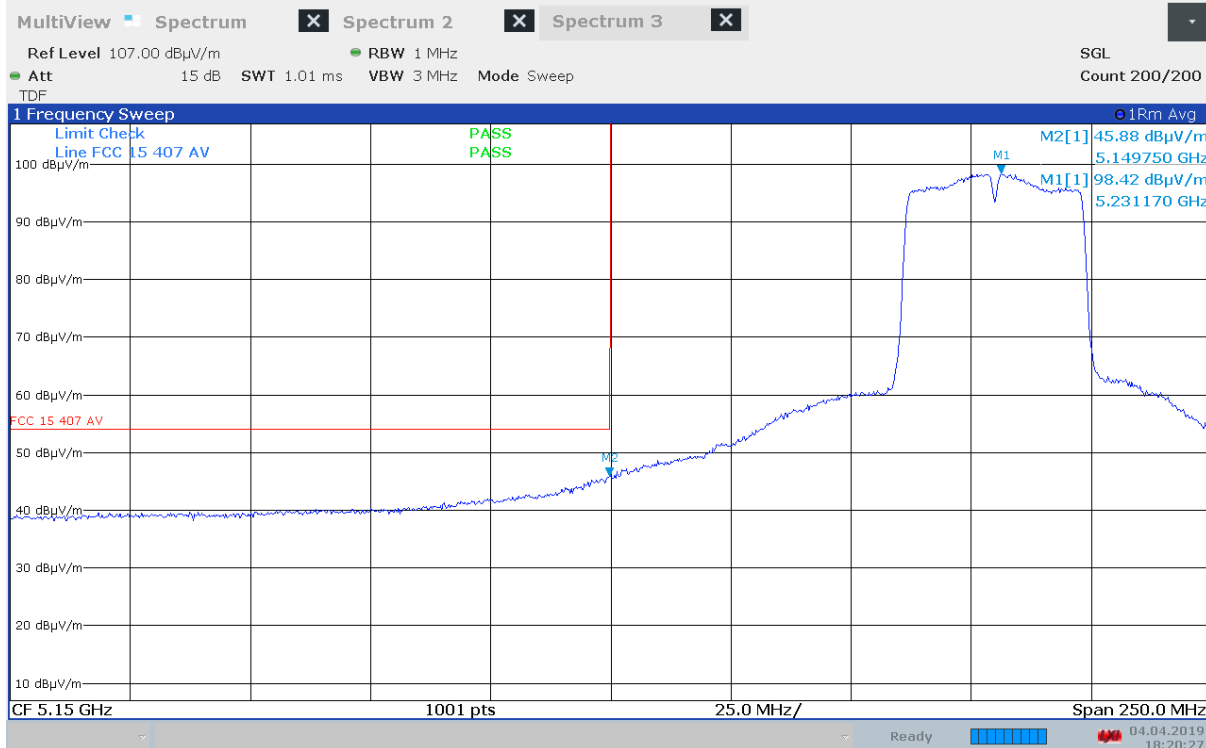


Band Edge, 5460 MHz, Ch100, 802.11n MCS0, Average

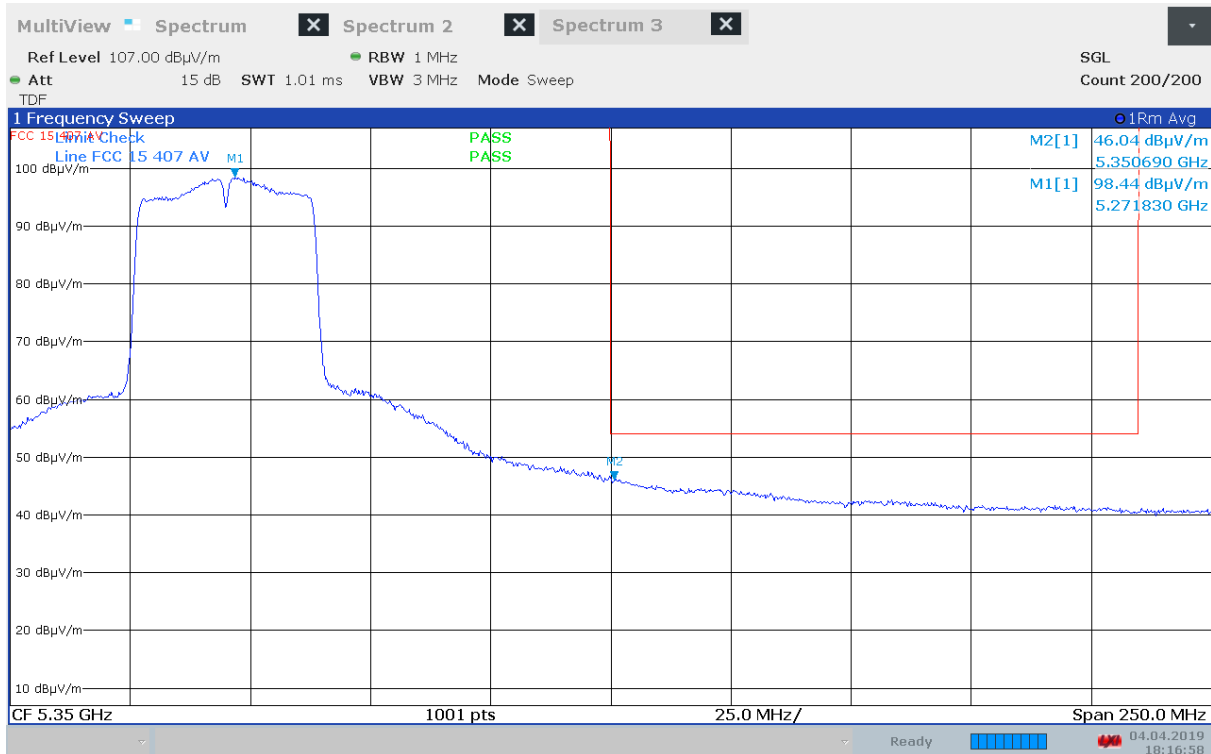




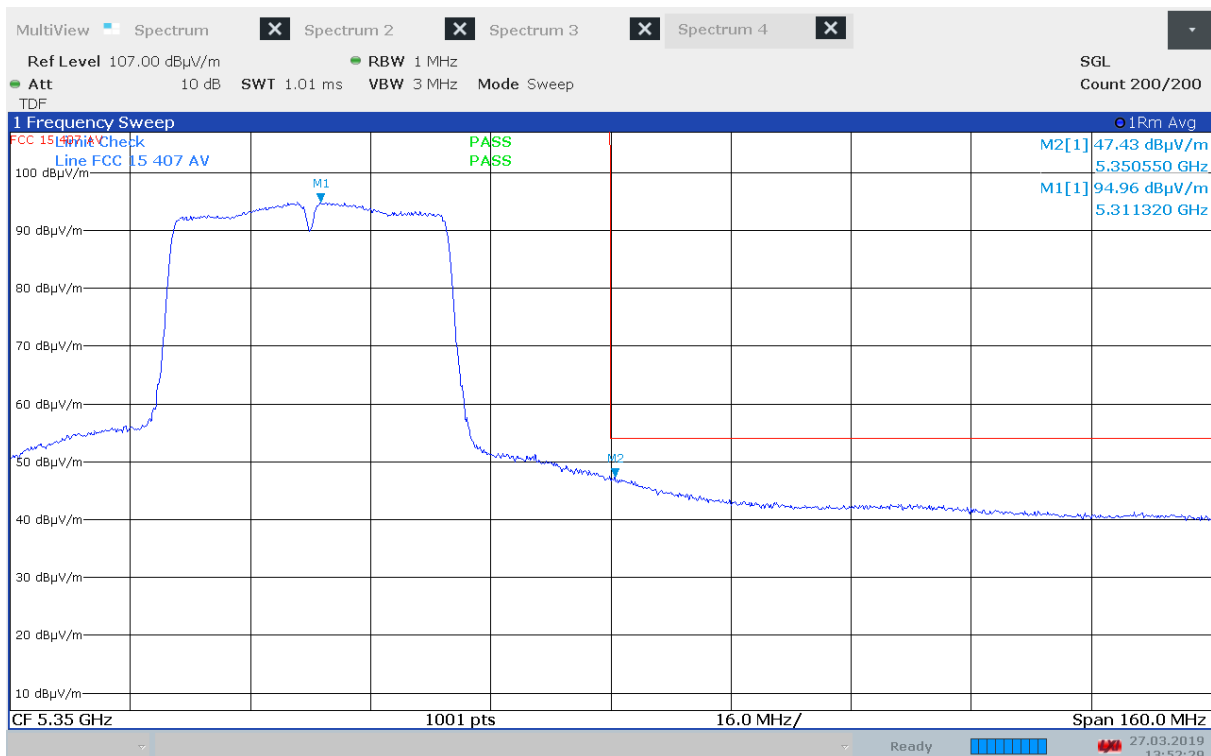
Band Edge, 5150 MHz, ch38, 802.11n HT40, Average



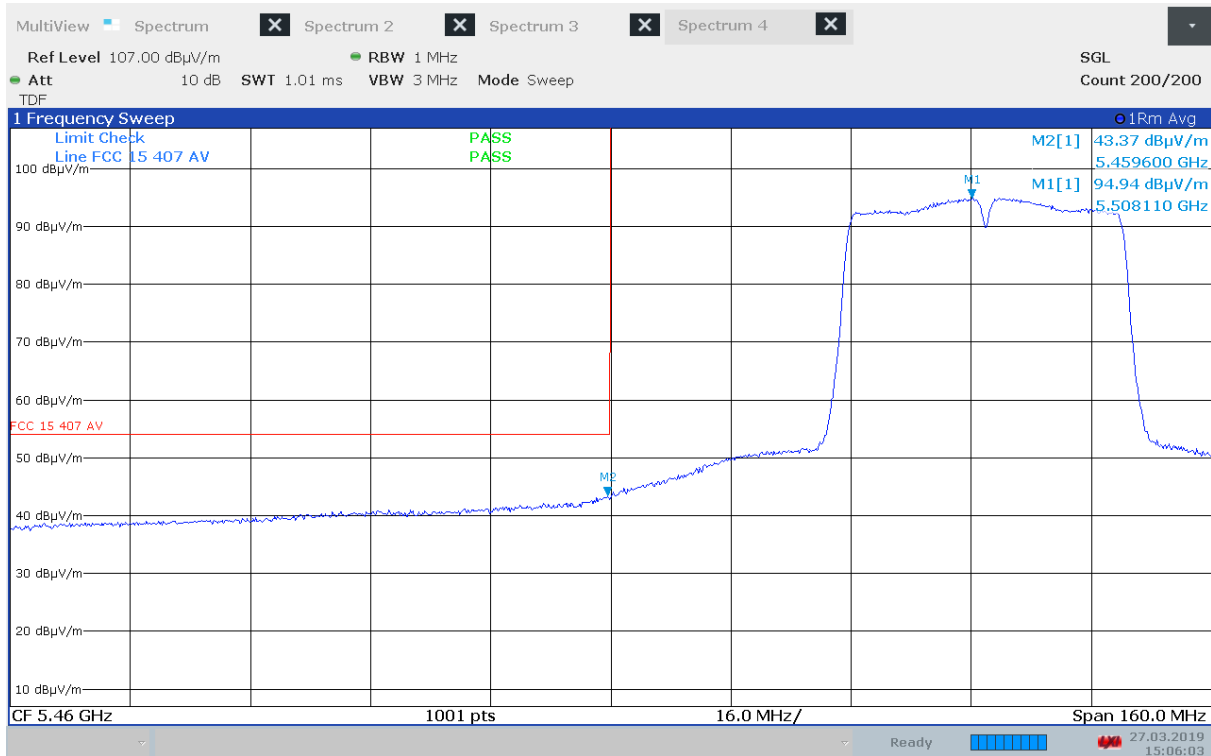
Band Edge, 5150 MHz, ch46, 802.11n HT40, Average



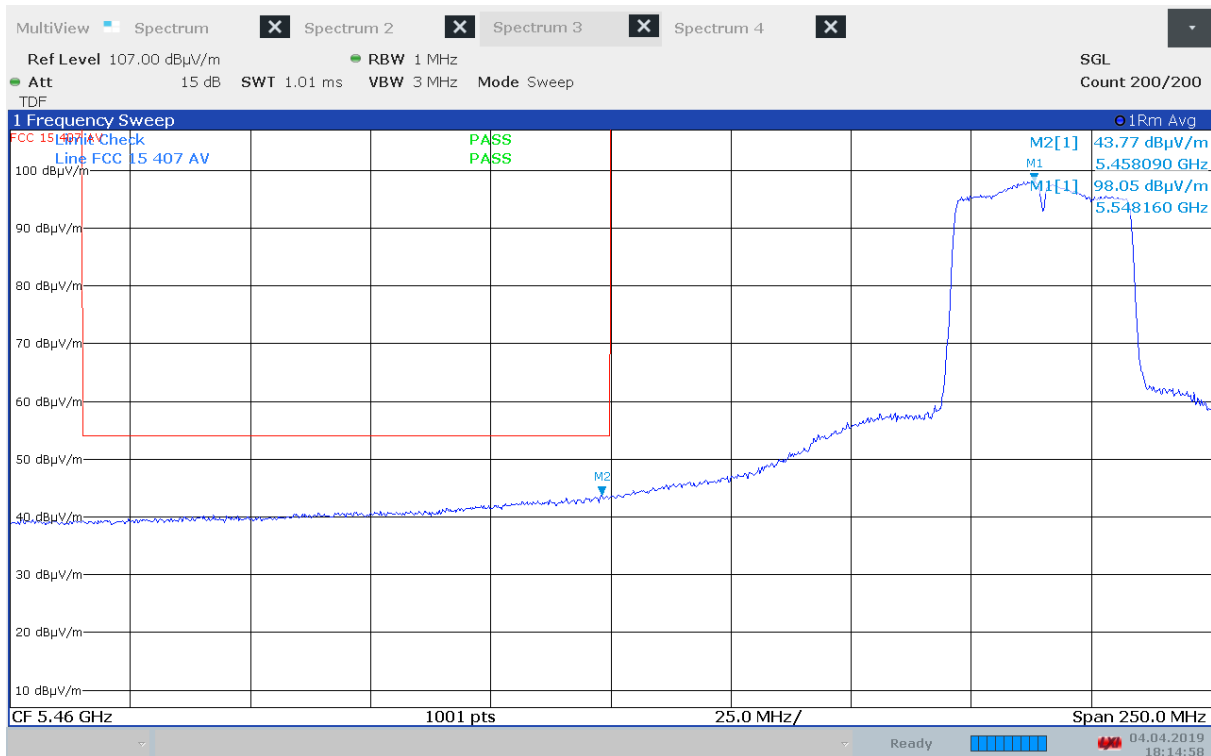
Band Edge, 5350 MHz, ch54, 802.11n HT40, Average



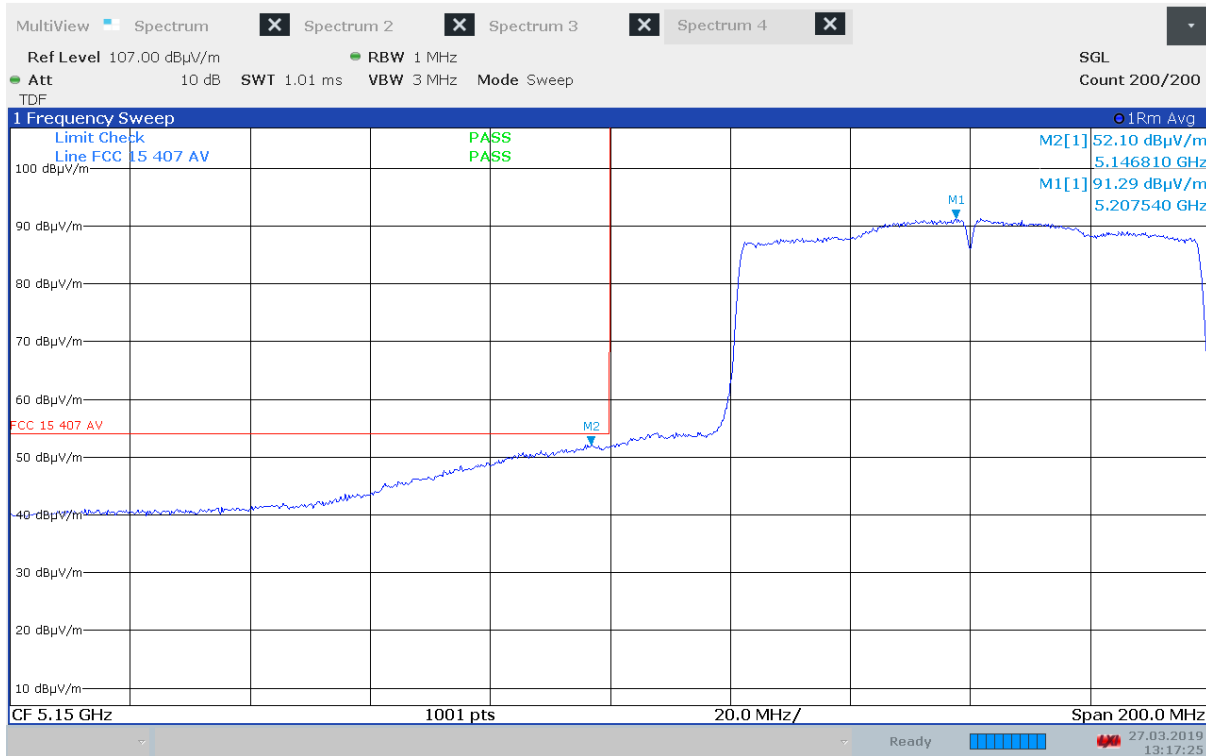
Band Edge, 5350 MHz, ch62, 802.11n HT40, Average



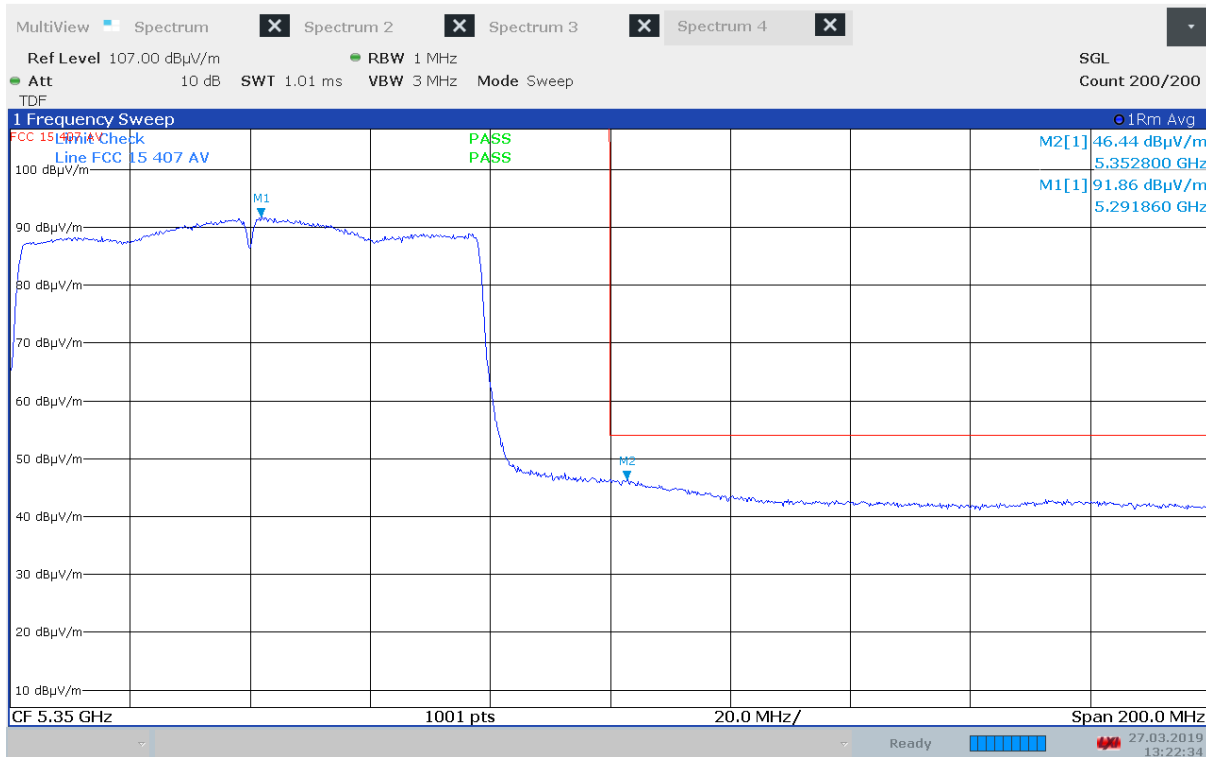
Band Edge, 5470 MHz, ch102, 802.11n HT40, Average



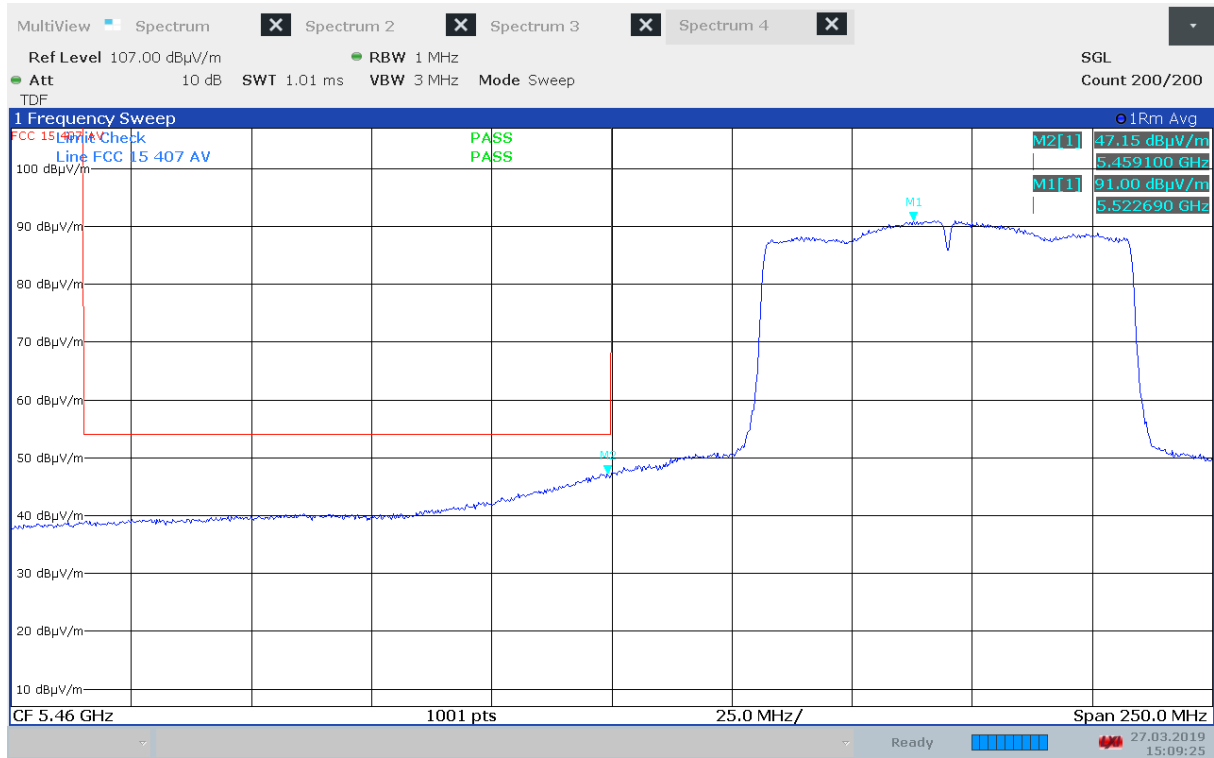
Band Edge, 5470 MHz, ch110, 802.11n HT40, Average



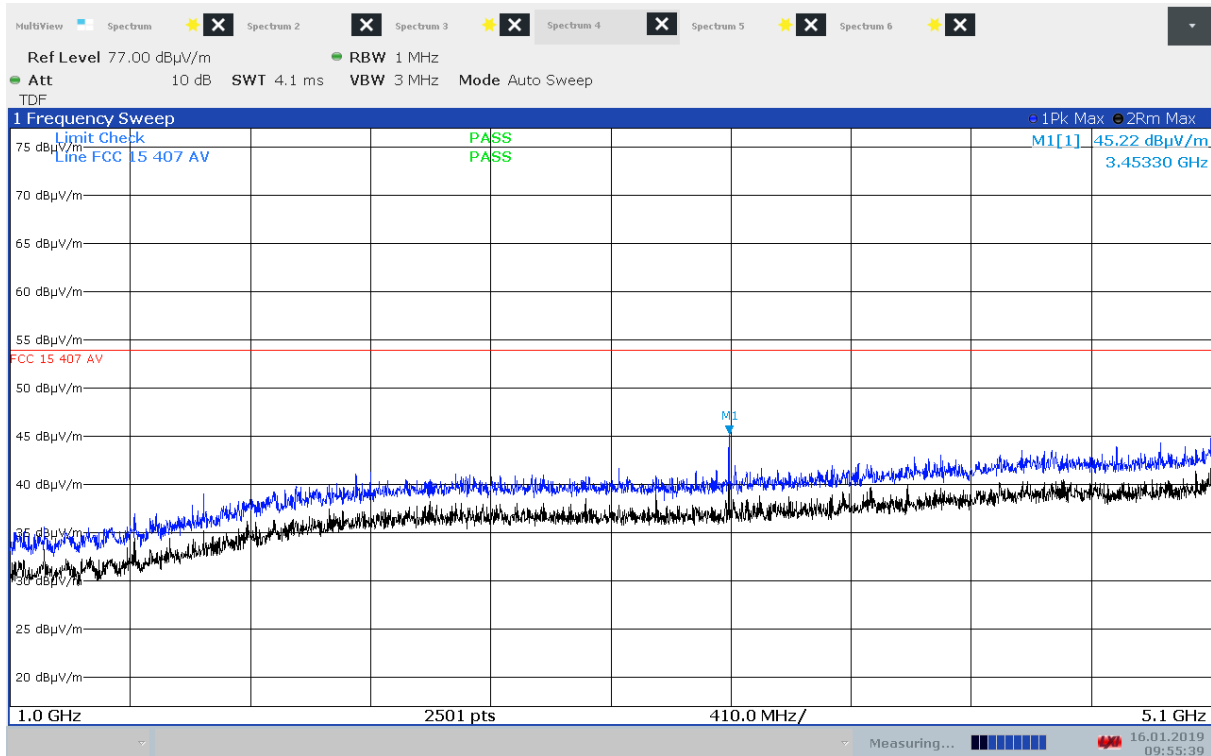
Band Edge, 5150 MHz, ch42, 802.11ac HT80, Average



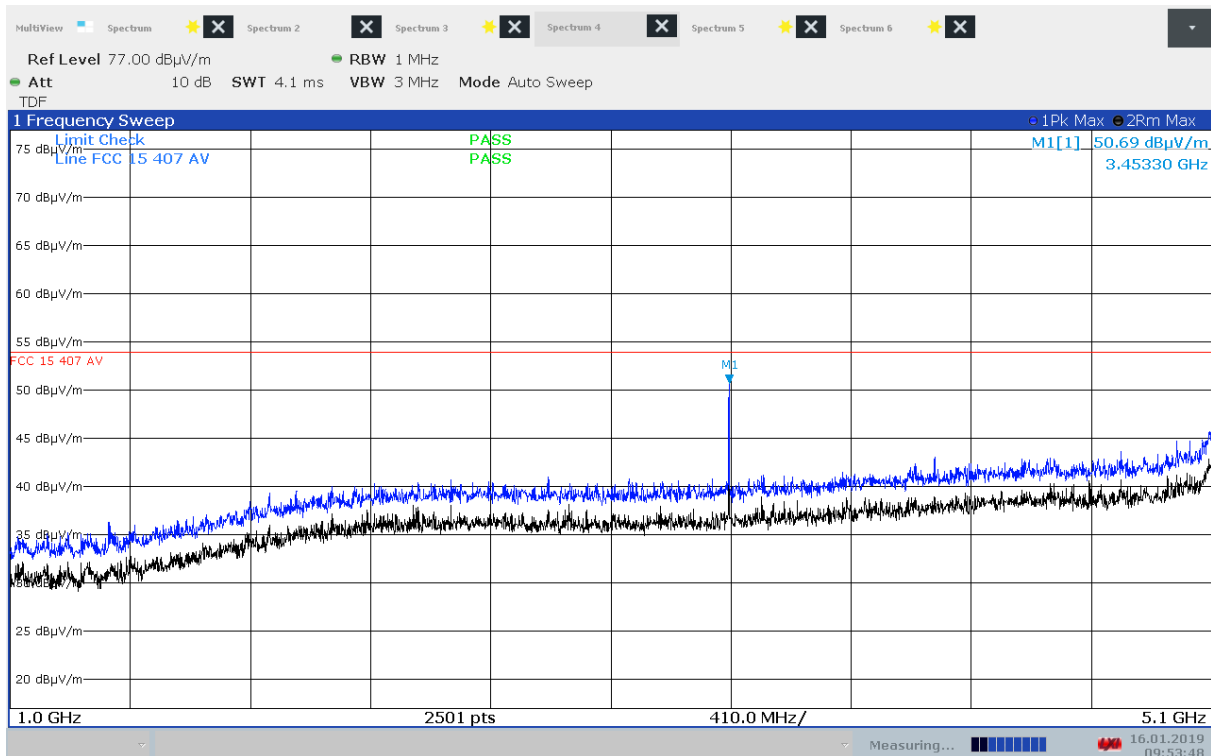
Band Edge, 5350 MHz, ch58, 802.11ac HT80, Average



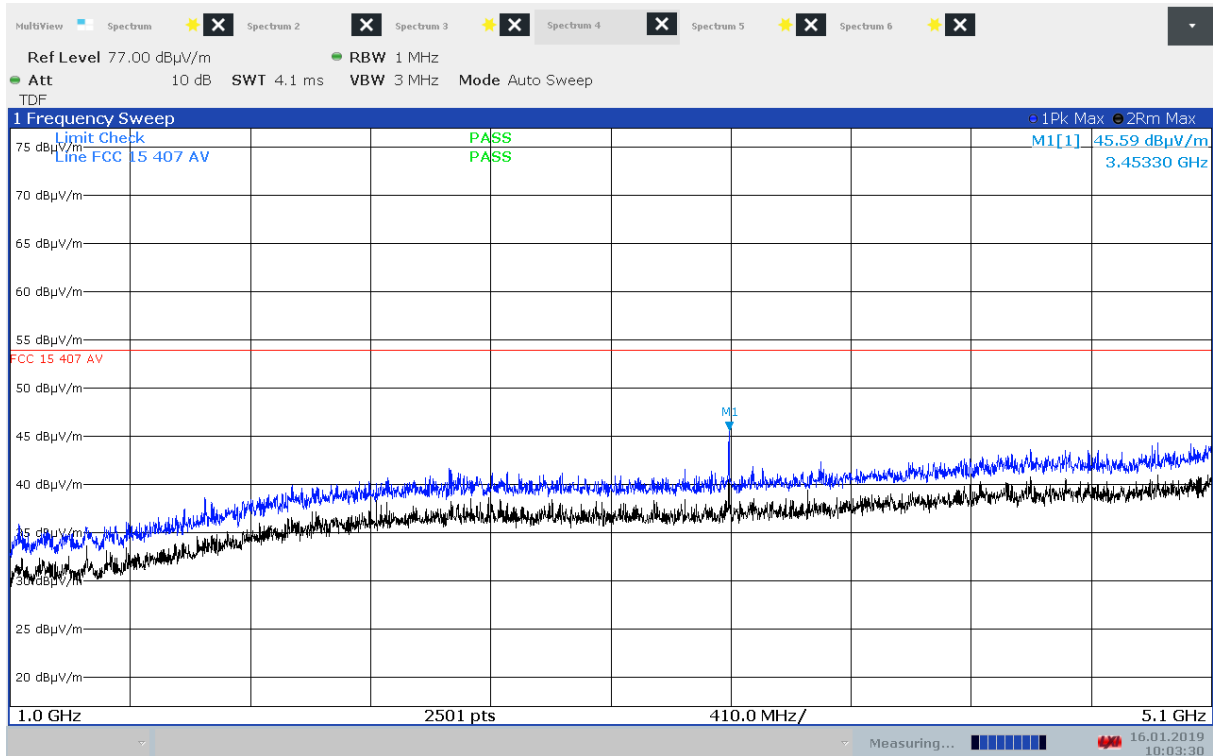
Band Edge, 5470 MHz, ch106, 802.11ac HT80, Average



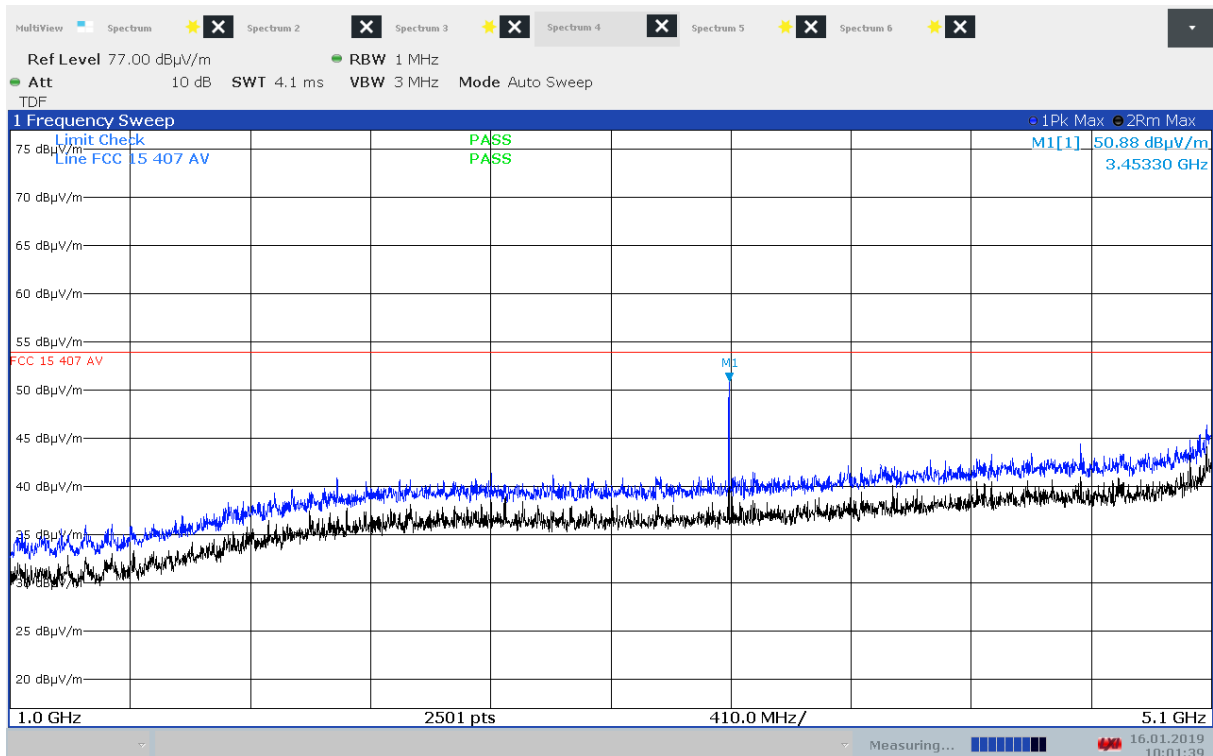
Radiated Emissions, 1000 - 5100 MHz, ch36, 802.11a 6Mbps, EUT V, HP



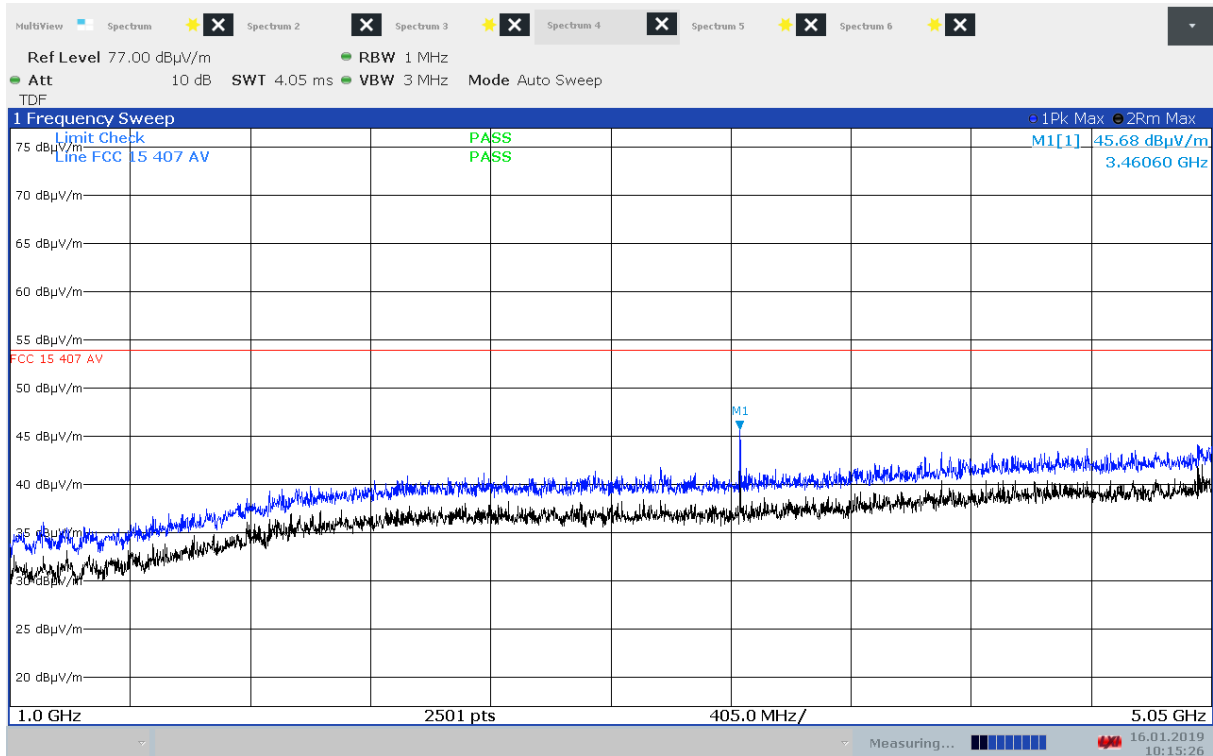
Radiated Emissions, 1000 - 5100 MHz, ch36, 802.11a 6Mbps, EUT V, VP



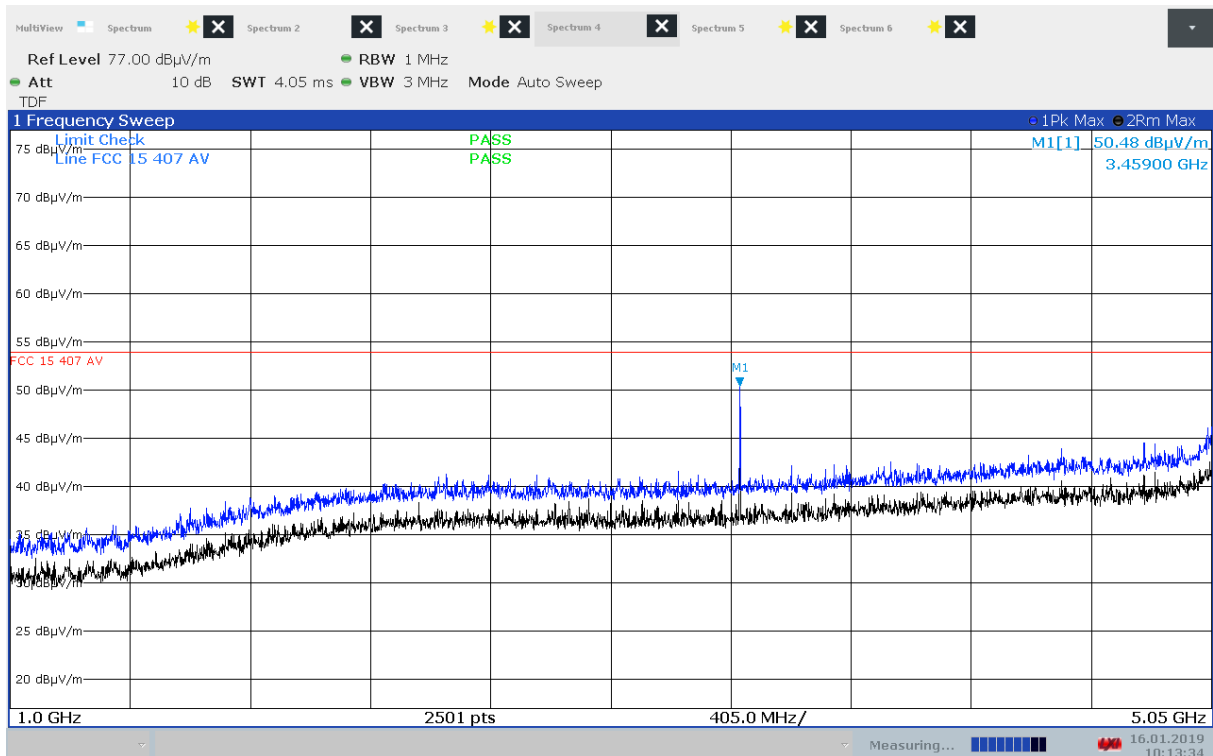
Radiated Emissions, 1000 - 5100 MHz, ch36, 802.11n MCS0, EUT V, HP



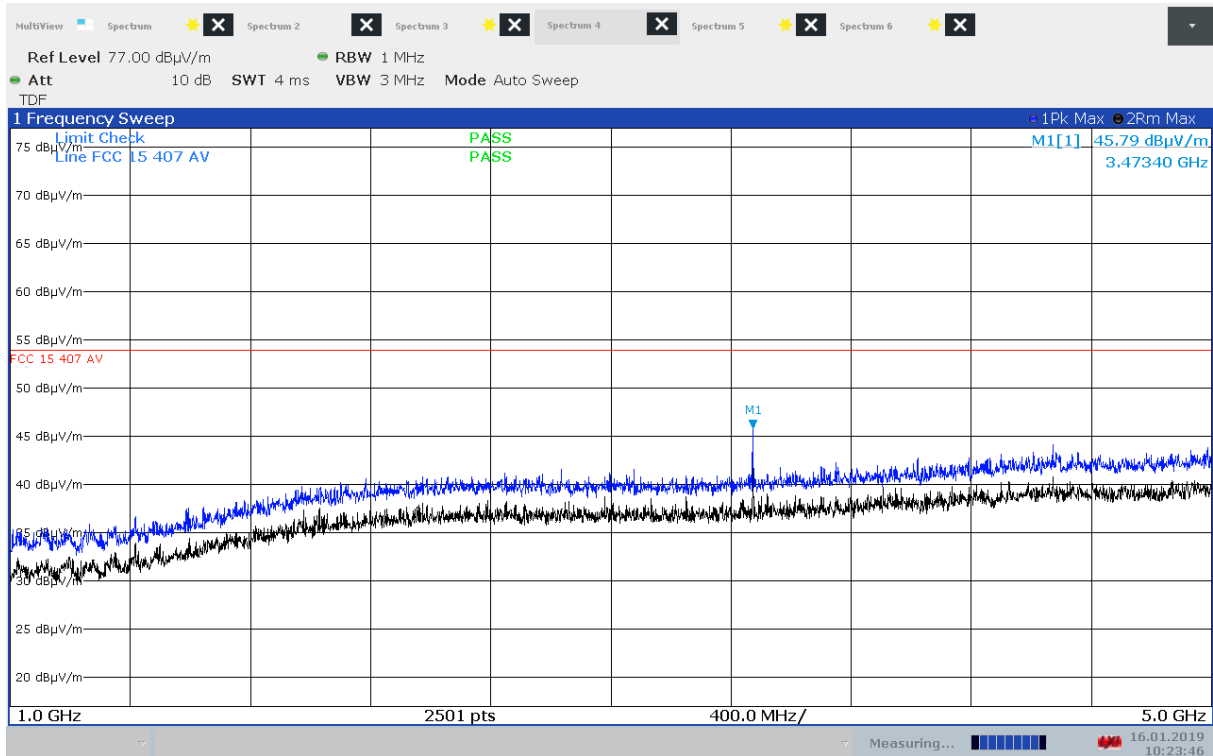
Radiated Emissions, 1000 - 5100 MHz, ch36, 802.11n MCS0, EUT V, VP



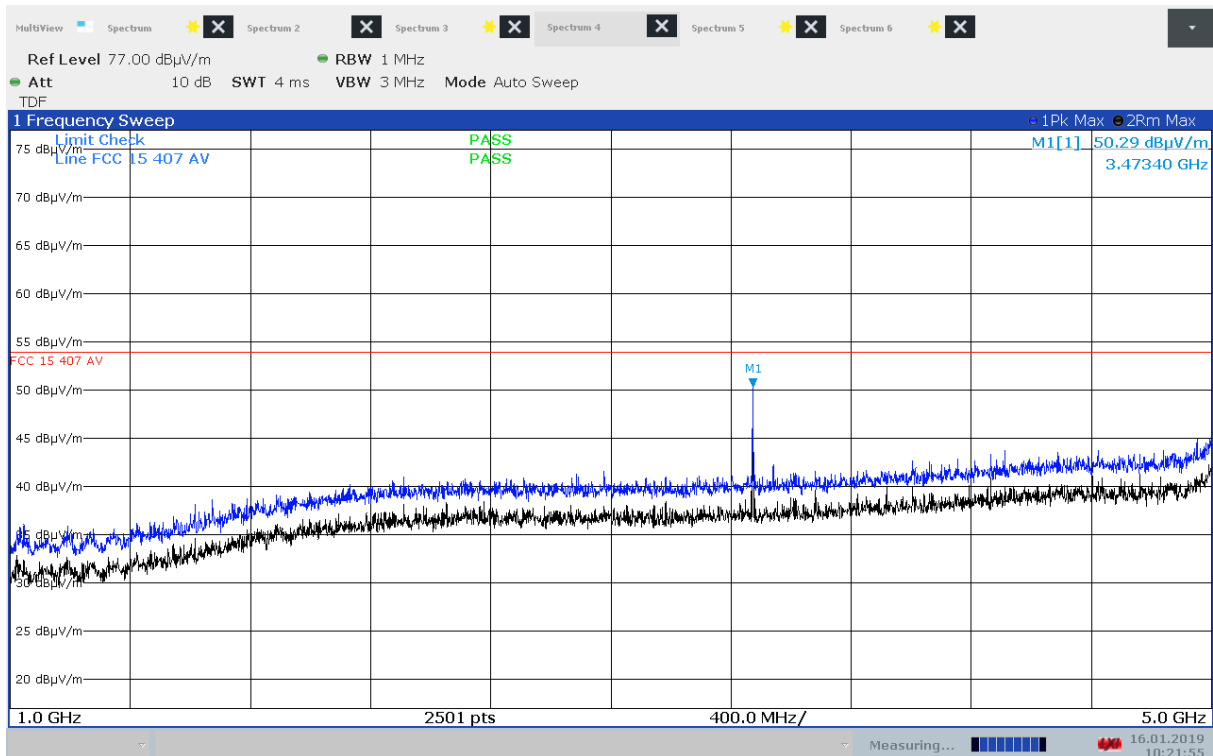
Radiated Emissions, 1000 - 5050 MHz, ch38, 802.11n MCS0 HT40, EUT V, HP



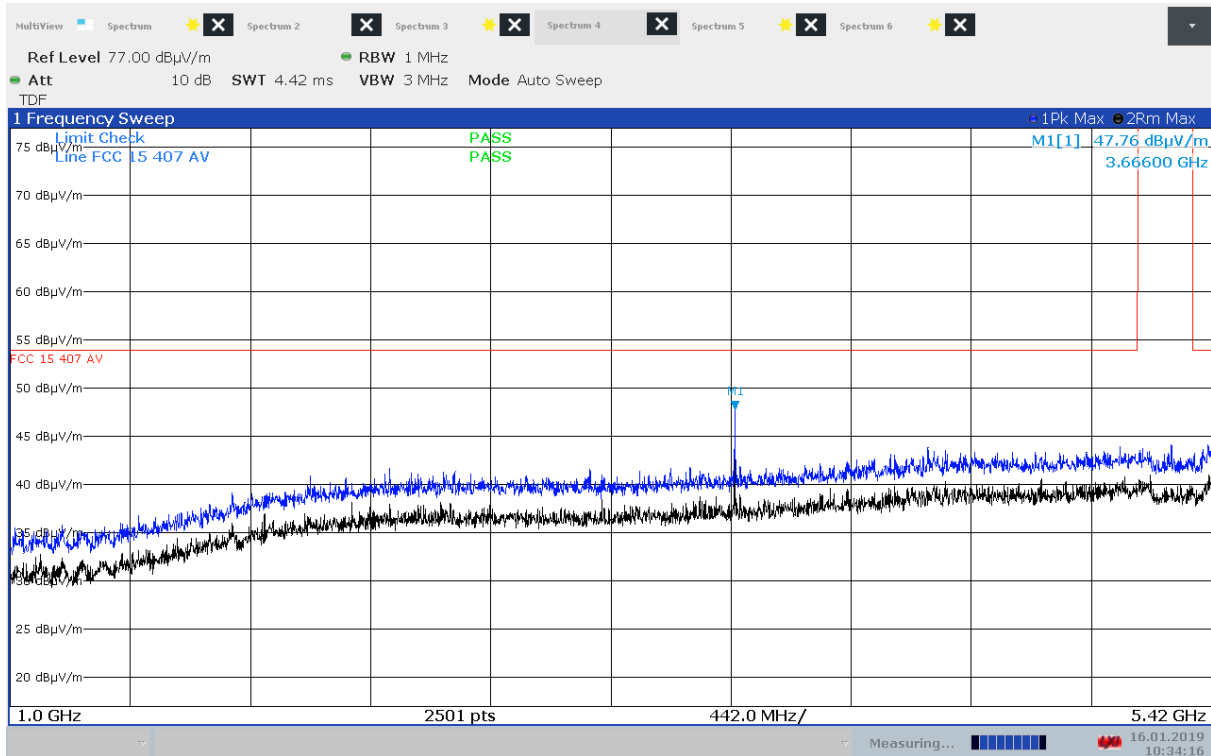
Radiated Emissions, 1000 - 5050 MHz, ch38, 802.11n MCS0 HT40, EUT V, VP



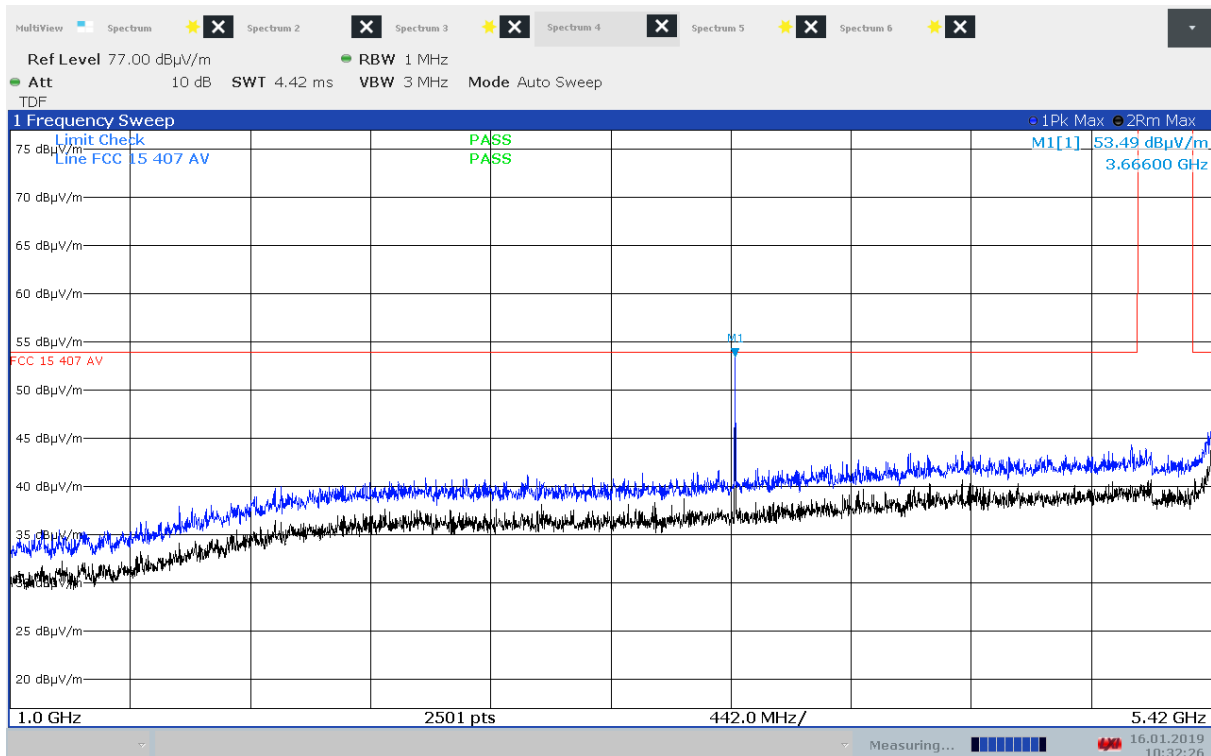
Radiated Emissions, 1000 - 5000 MHz, ch42, 802.11n MCS0 HT80, EUT V, HP



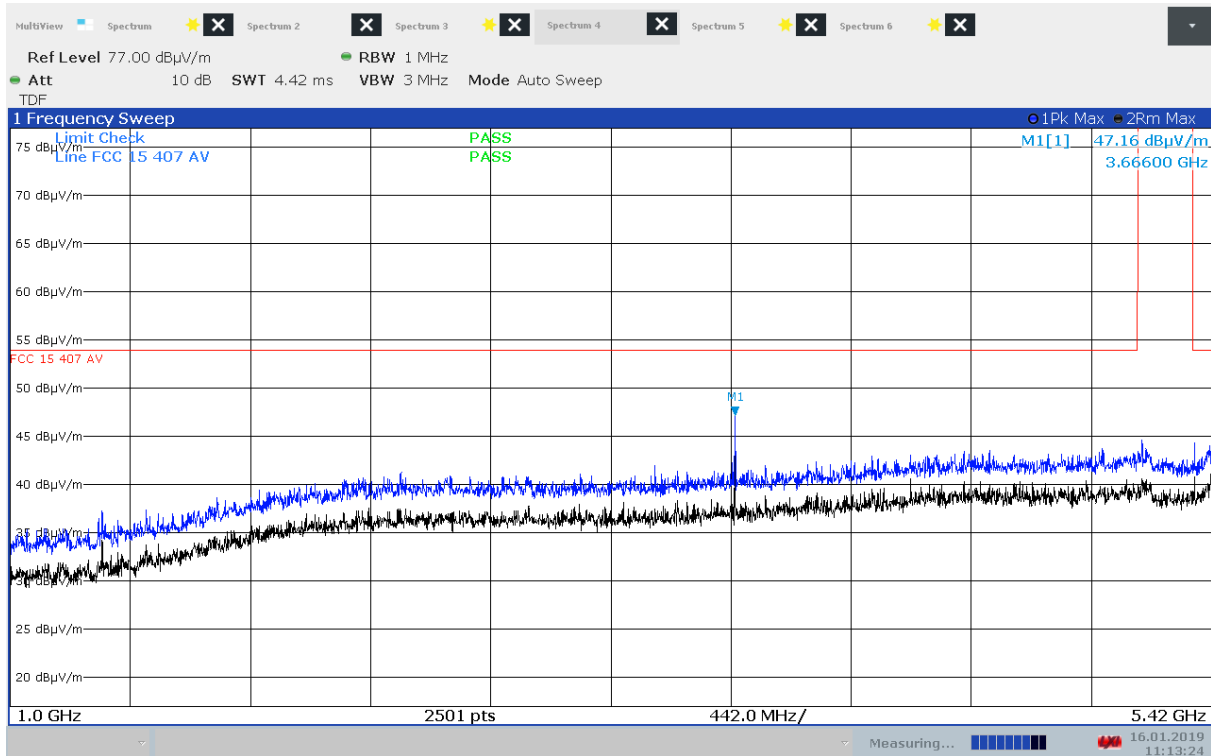
Radiated Emissions, 1000 - 5000 MHz, ch42, 802.11n MCS0 HT80, EUT V, VP



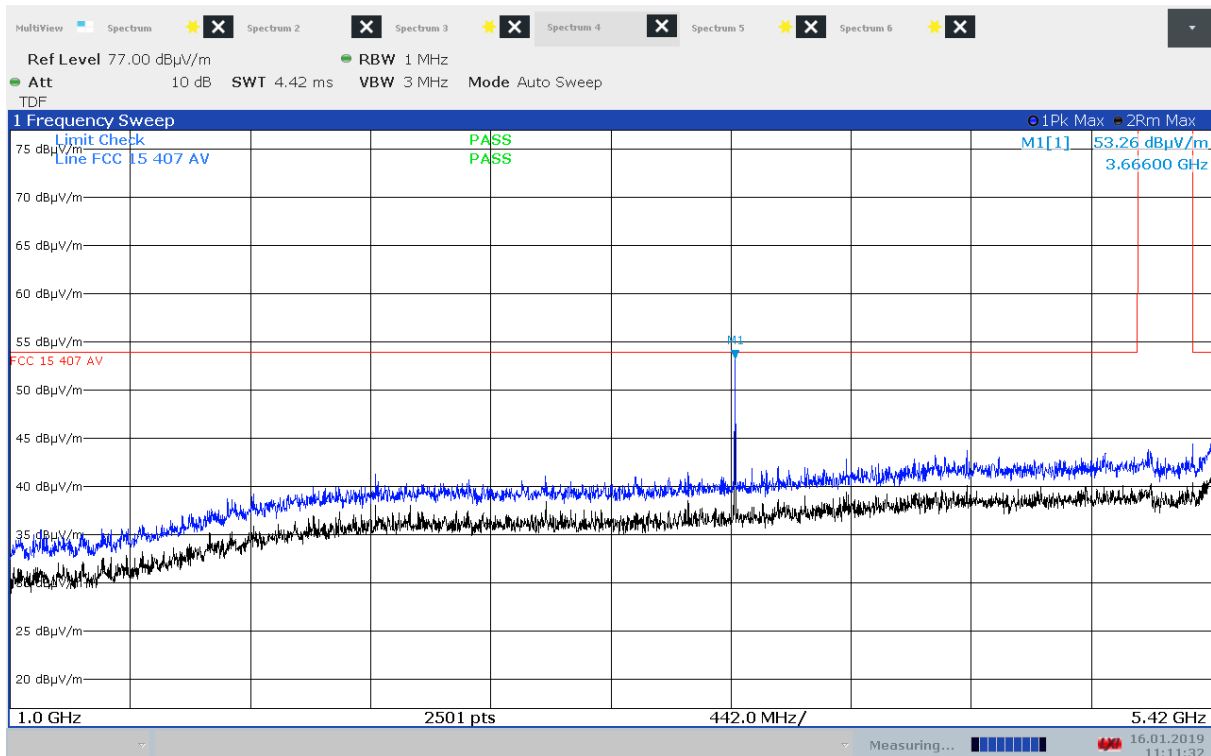
Radiated Emissions, 1000 - 5420 MHz, ch100, 802.11a 6Mbps, EUT V, HP



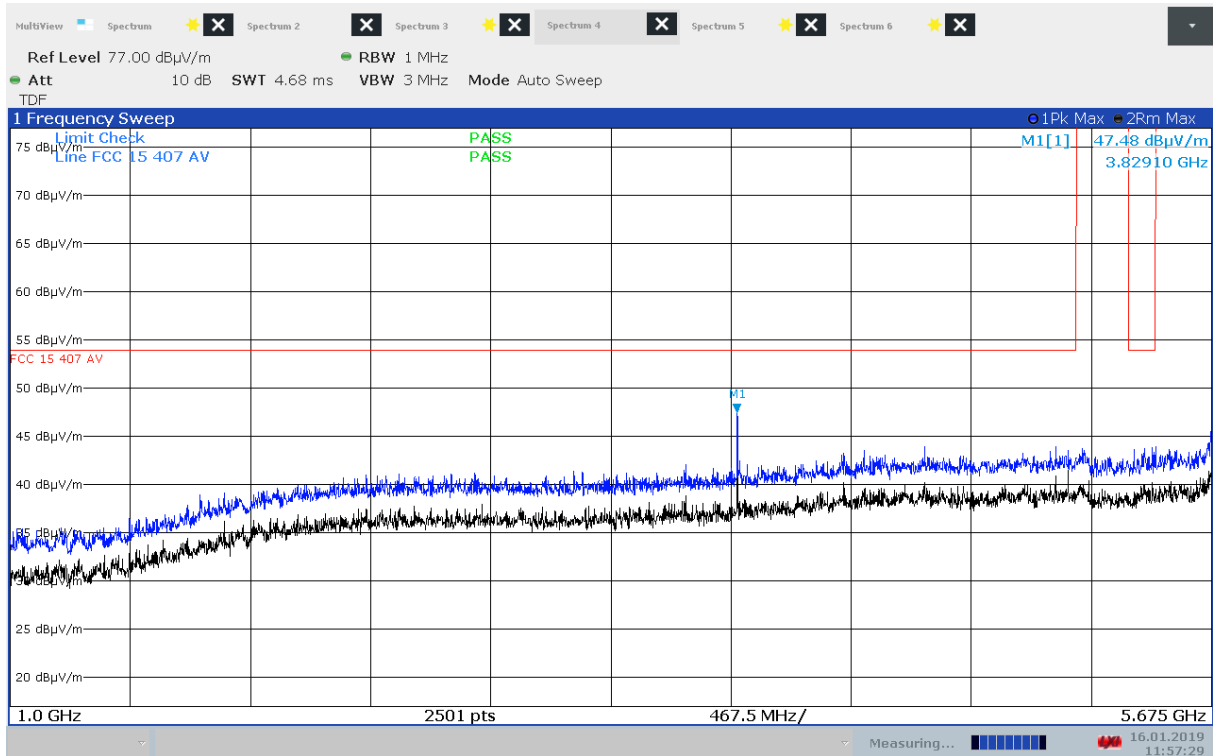
Radiated Emissions, 1000 - 5420 MHz, ch100, 802.11a 6Mbps, EUT V, VP



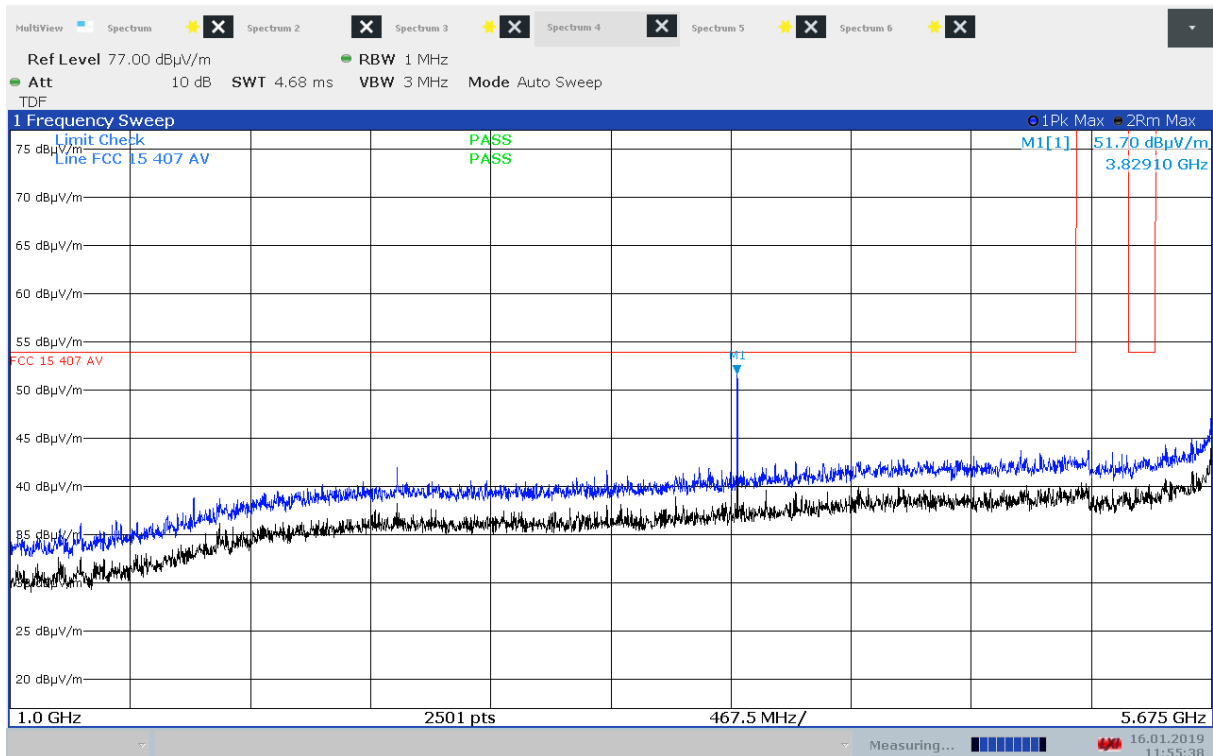
Radiated Emissions, 1000 - 5420 MHz, ch100, 802.11n MCS0, EUT V, HP



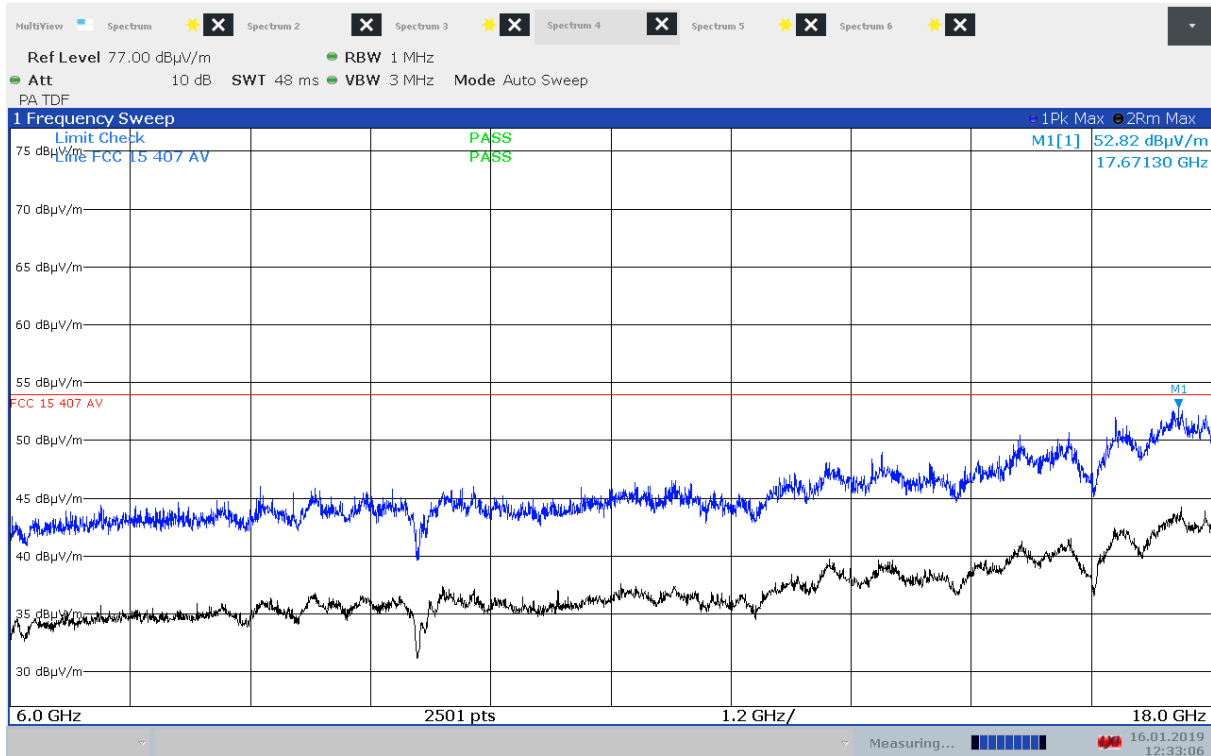
Radiated Emissions, 1000 - 5420 MHz, ch100, 802.11n MCS0, EUT V, VP



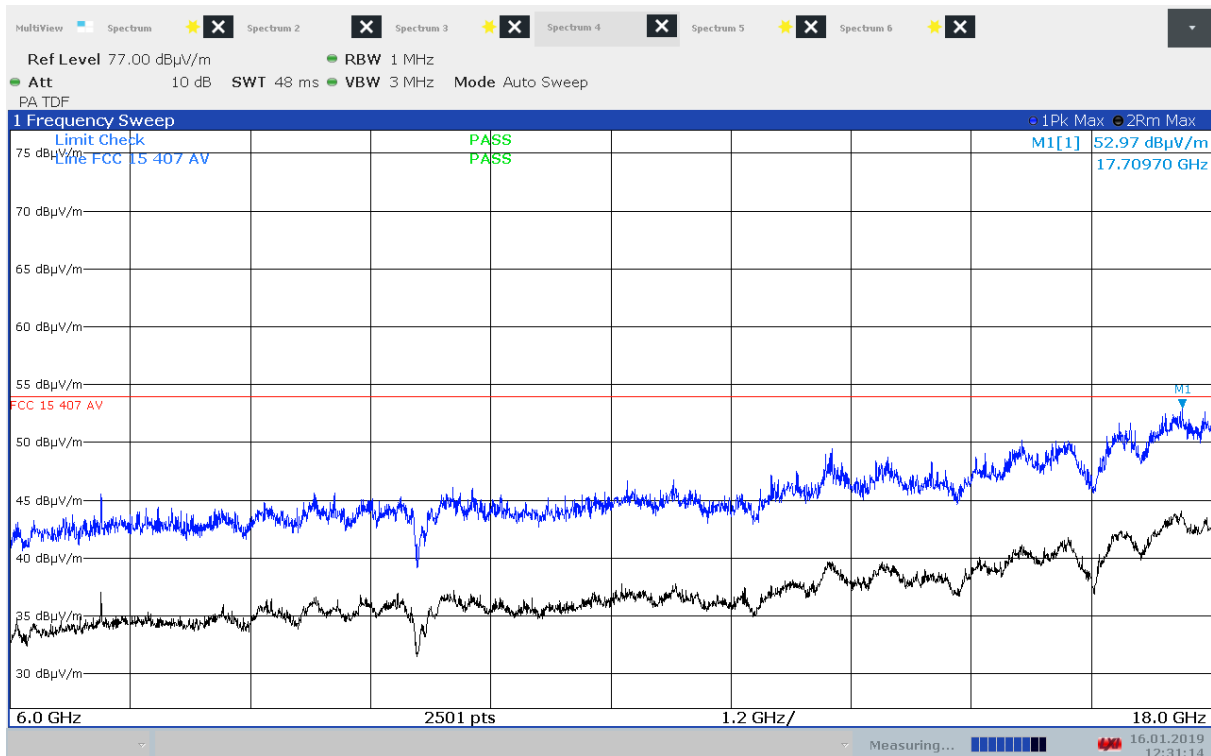
Radiated Emissions, 1000 - 5675 MHz, ch149, 802.11a 6Mbps, EUT V, HP



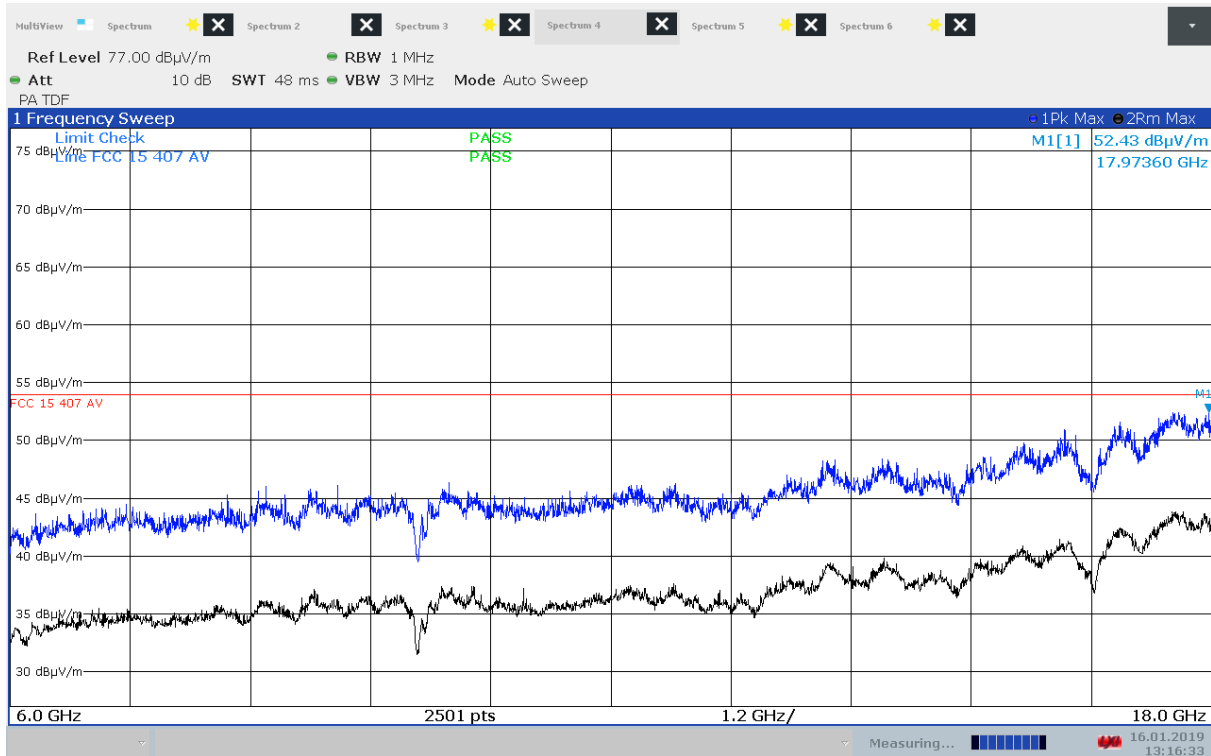
Radiated Emissions, 1000 - 5675 MHz, ch149, 802.11a 6Mbps, EUT V, VP



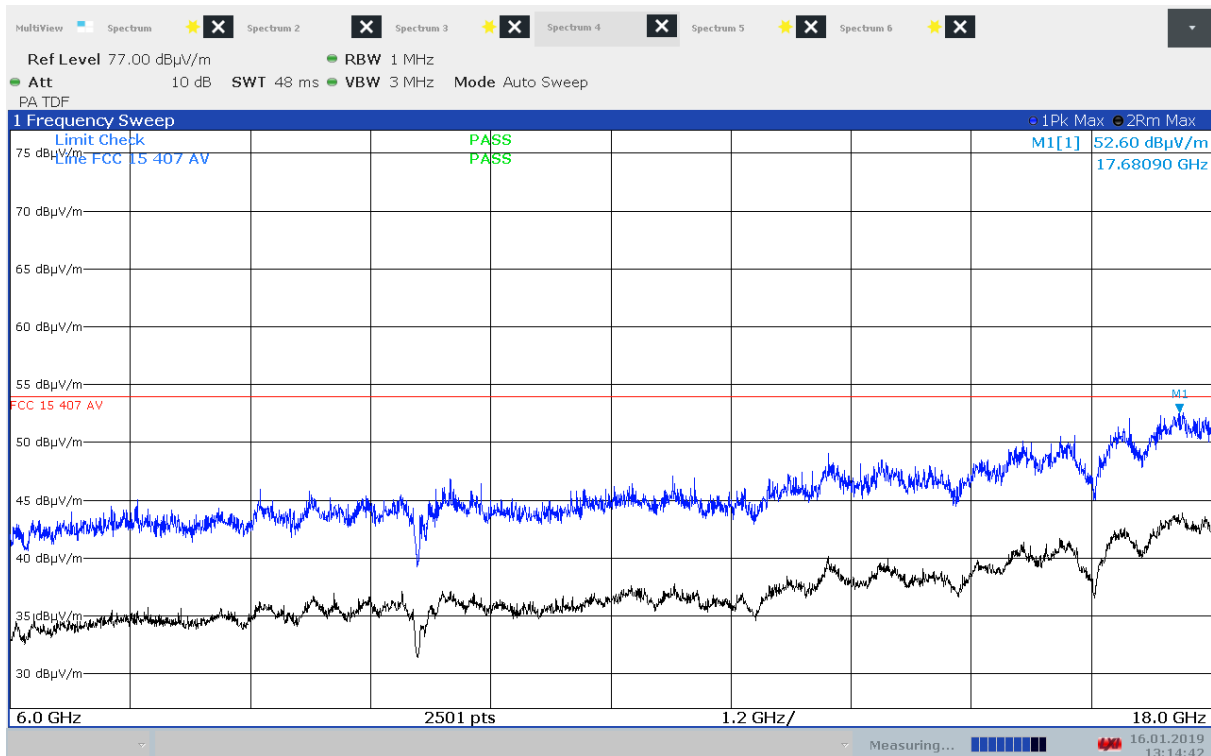
Radiated Emissions, 6000 - 18000 MHz, ch36, 802.11a 6Mbps, EUT V, HP



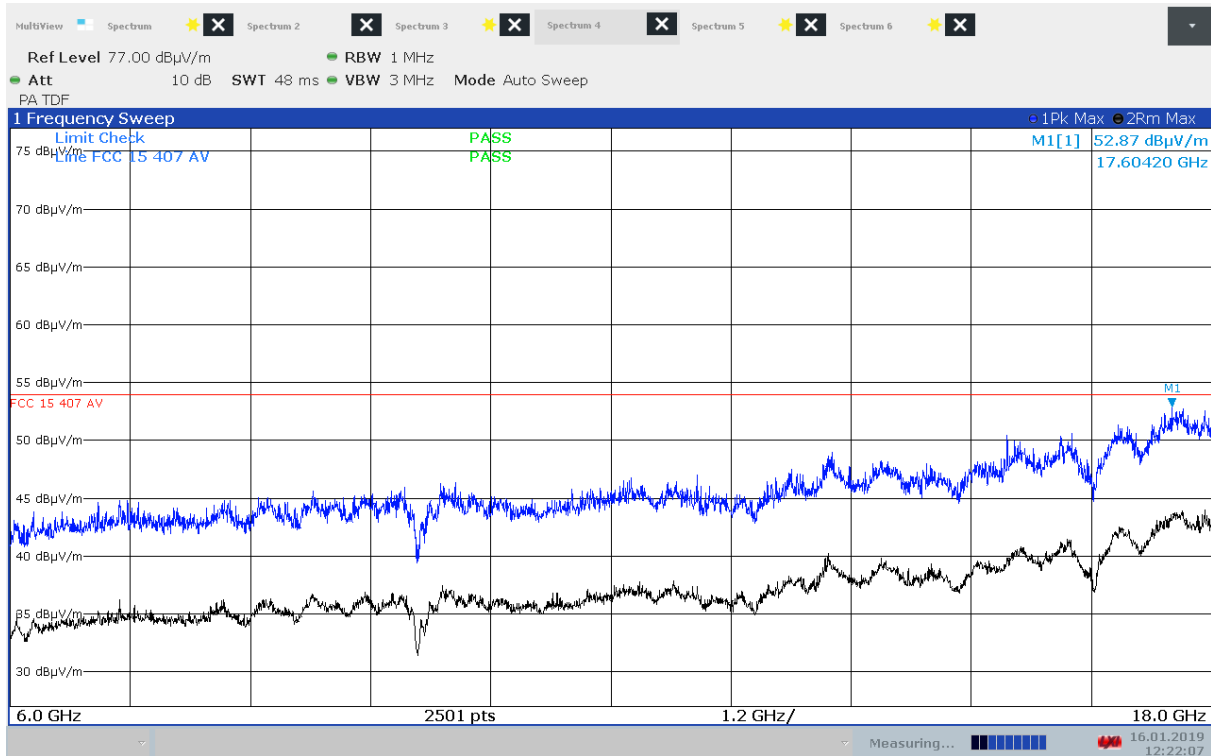
Radiated Emissions, 6000 - 18000 MHz, ch36, 802.11a 6Mbps, EUT V, VP



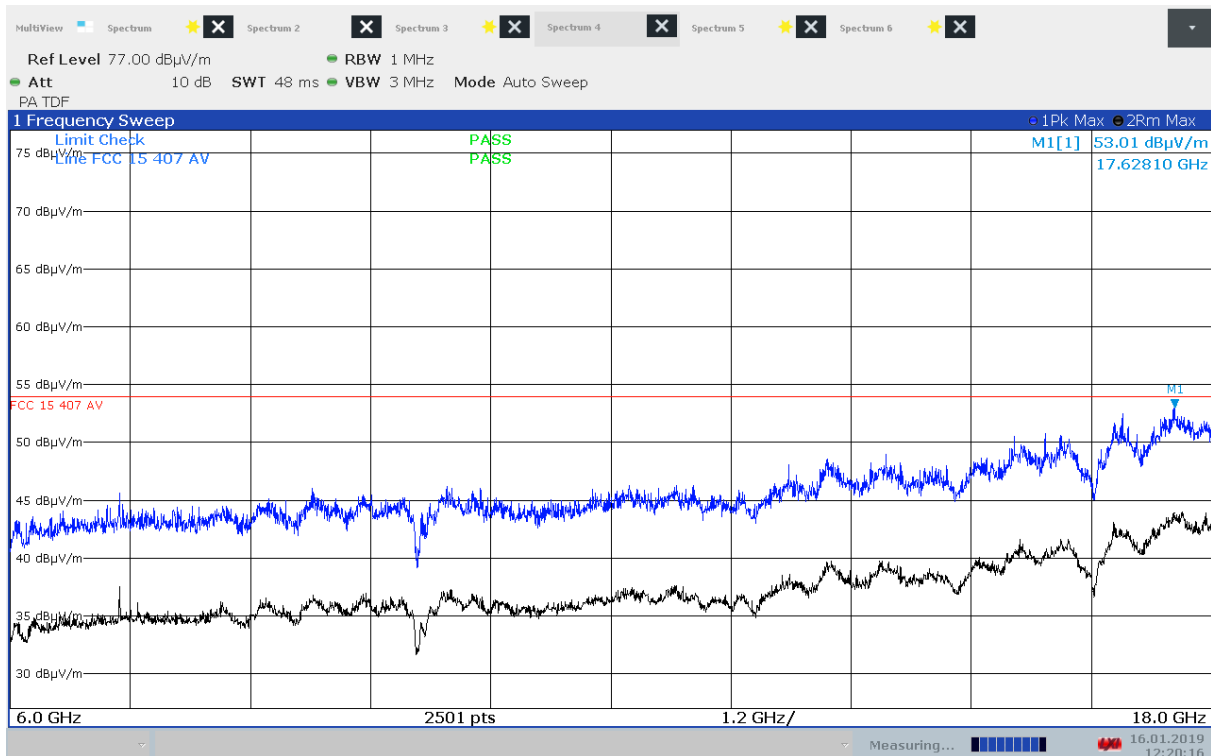
Radiated Emissions, 6000 - 18000 MHz, ch52, 802.11n MCS0, EUT V, HP



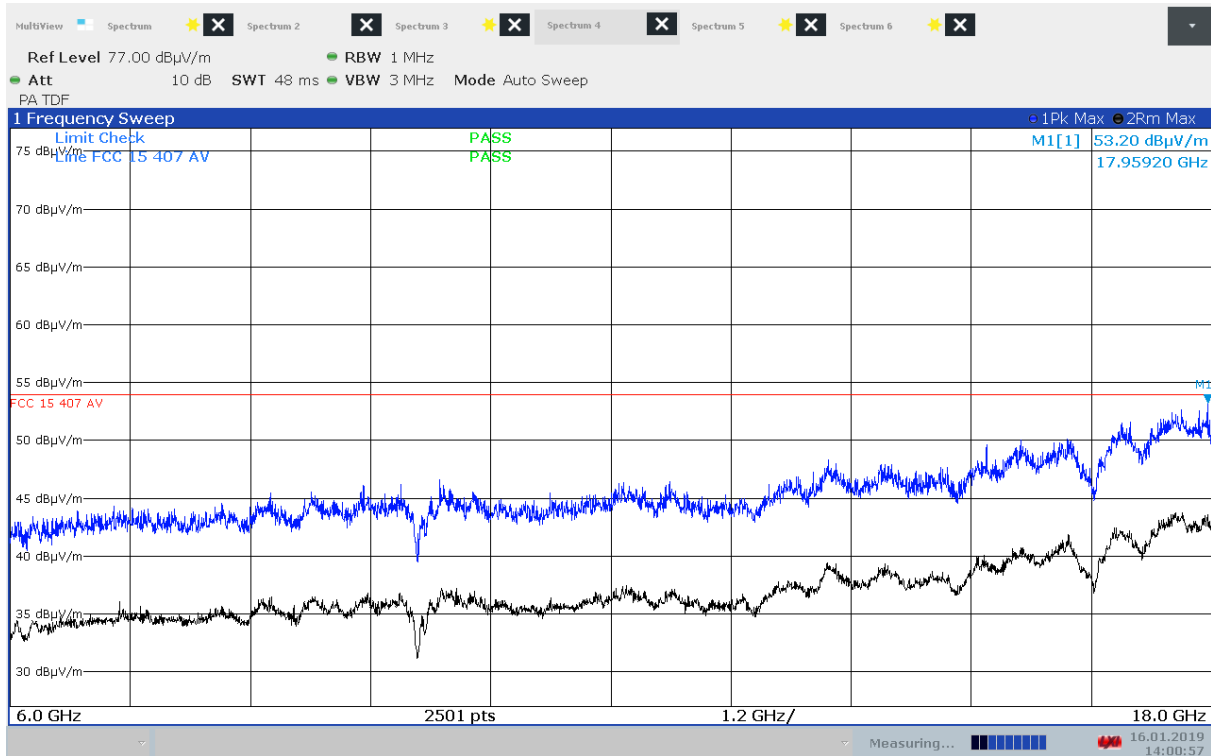
Radiated Emissions, 6000 - 18000 MHz, ch52, 802.11n MCS0, EUT V, VP



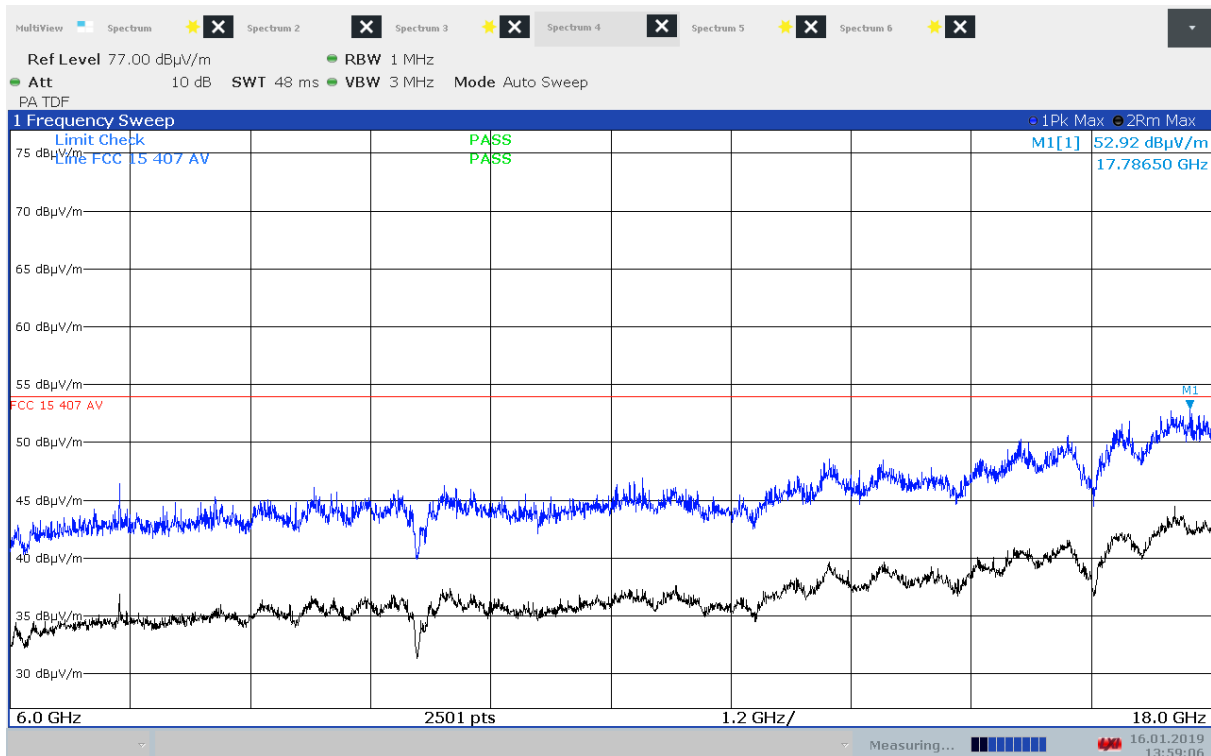
Radiated Emissions, 6000 - 18000 MHz, ch64, 802.11a 6Mbps, EUT V, HP



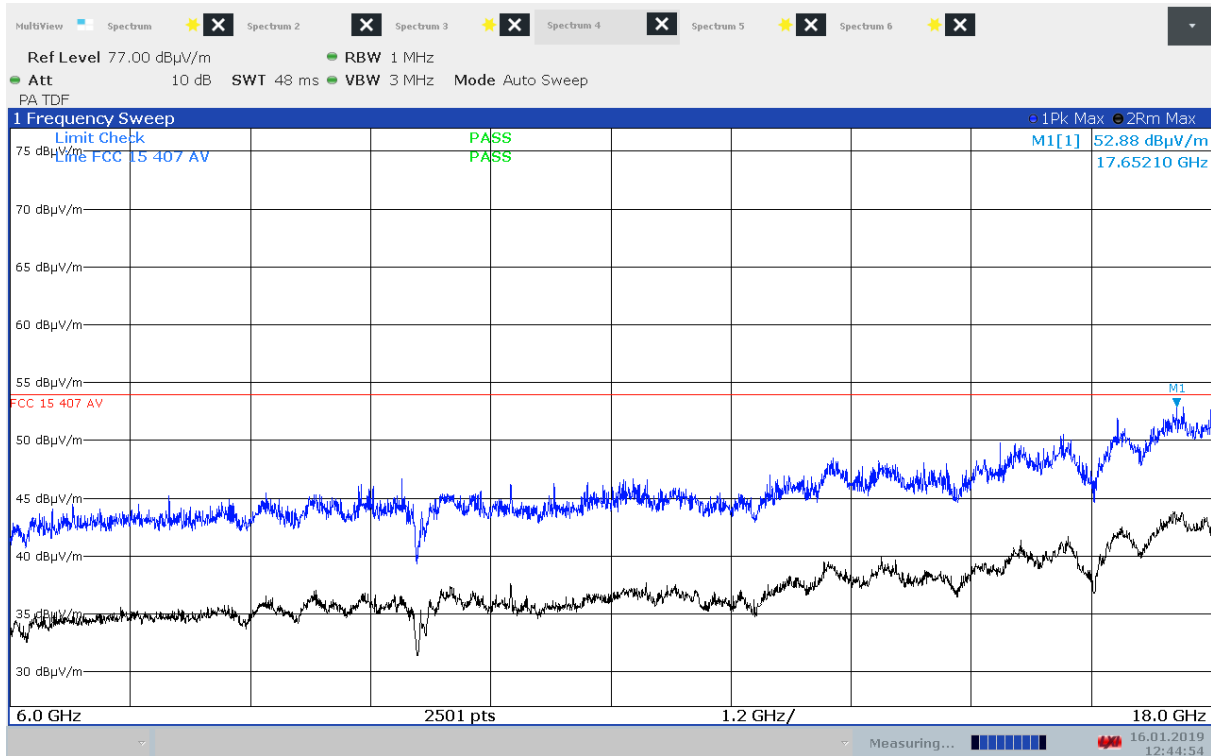
Radiated Emissions, 6000 - 18000 MHz, ch64, 802.11a 6Mbps, EUT V, VP



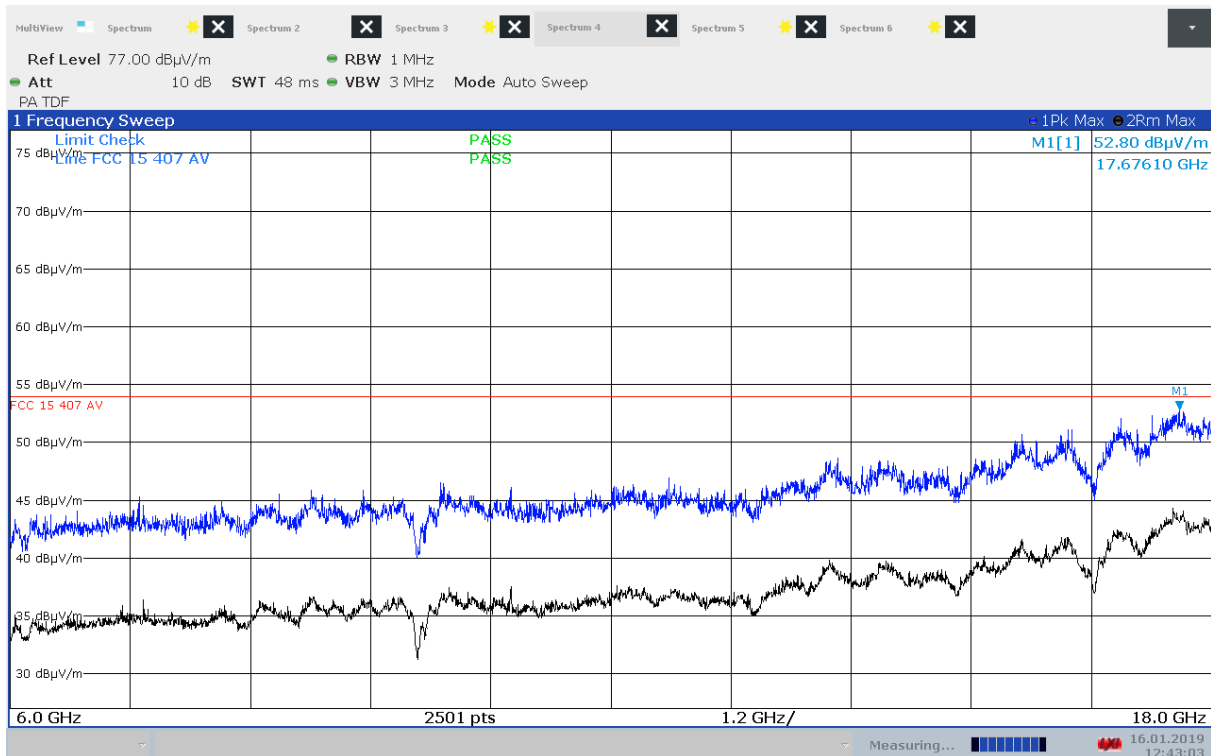
Radiated Emissions, 6000 - 18000 MHz, ch64, 802.11n MCS0, EUT V, HP



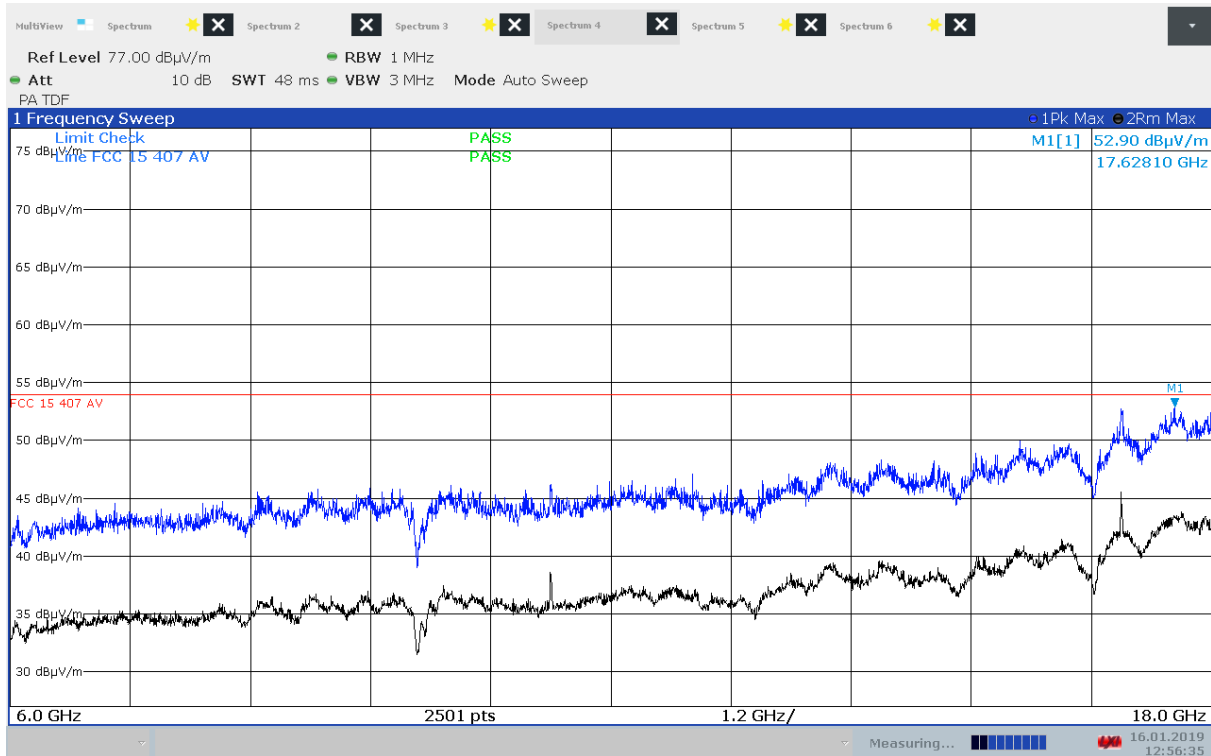
Radiated Emissions, 6000 - 18000 MHz, ch64, 802.11n MCS0, EUT V, VP



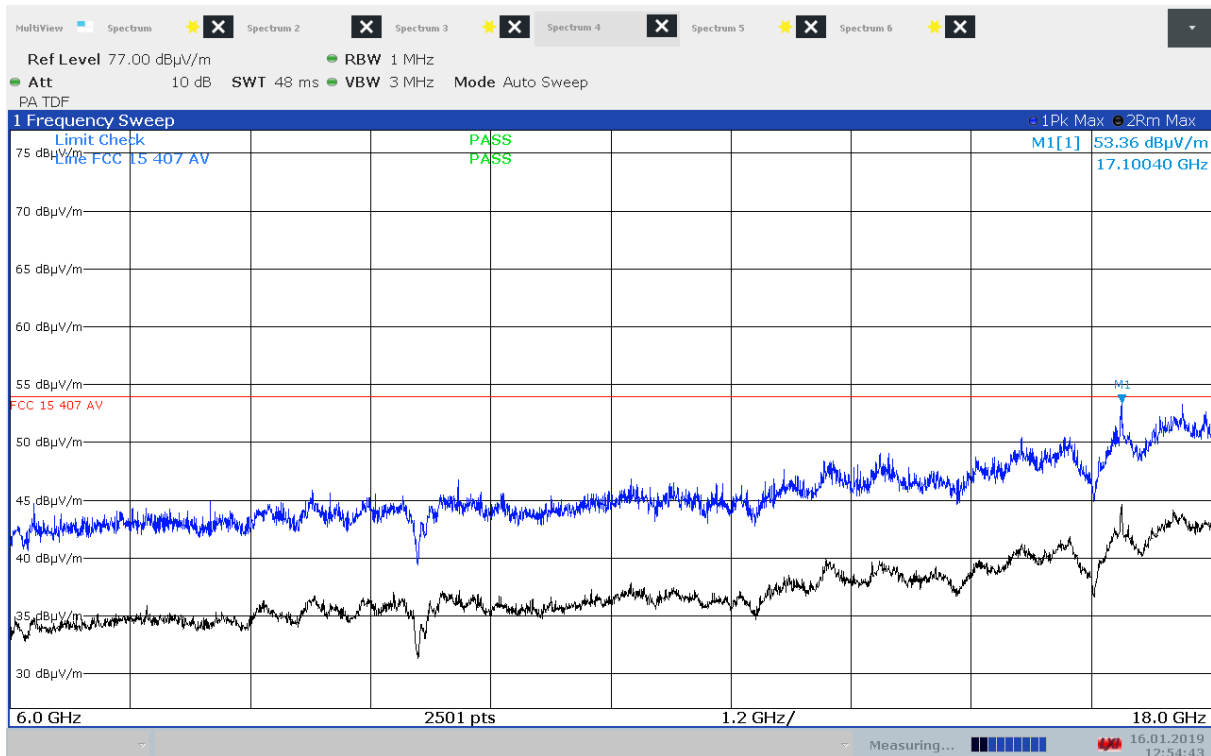
Radiated Emissions, 6000 - 18000 MHz, ch100, 802.11a 6Mbps, EUT V, HP



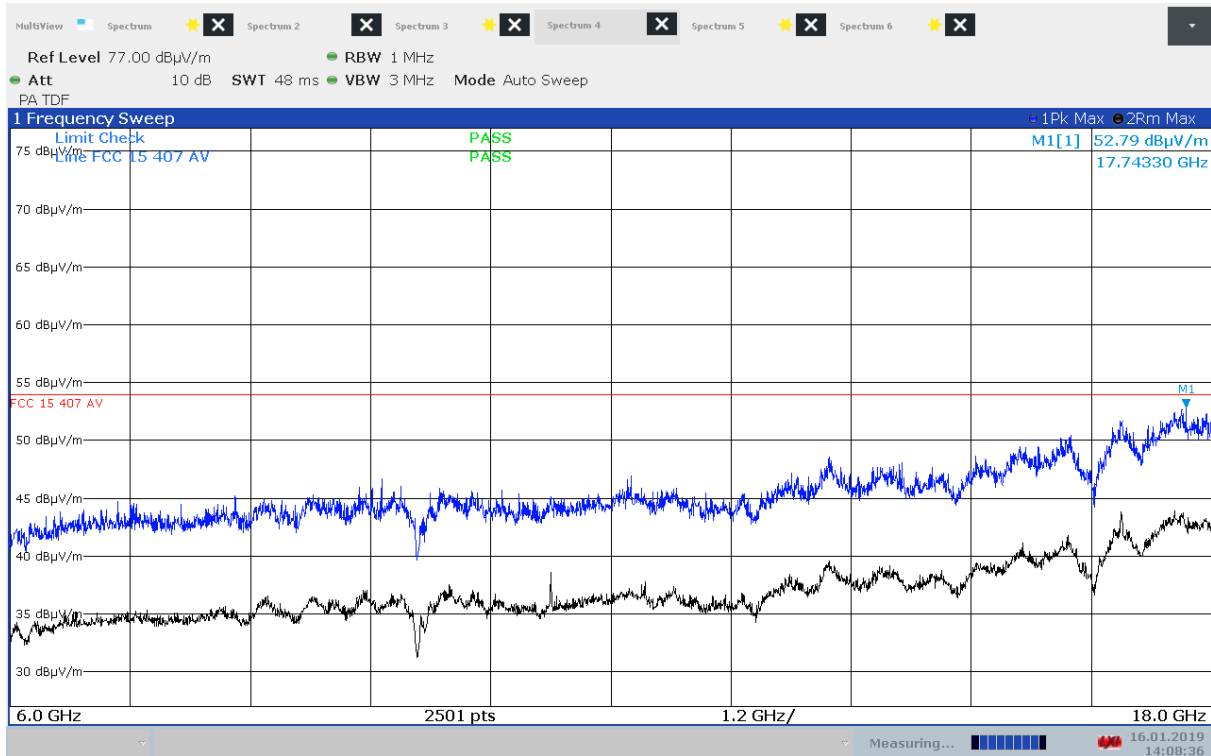
Radiated Emissions, 6000 - 18000 MHz, ch100, 802.11a 6Mbps, EUT V, VP



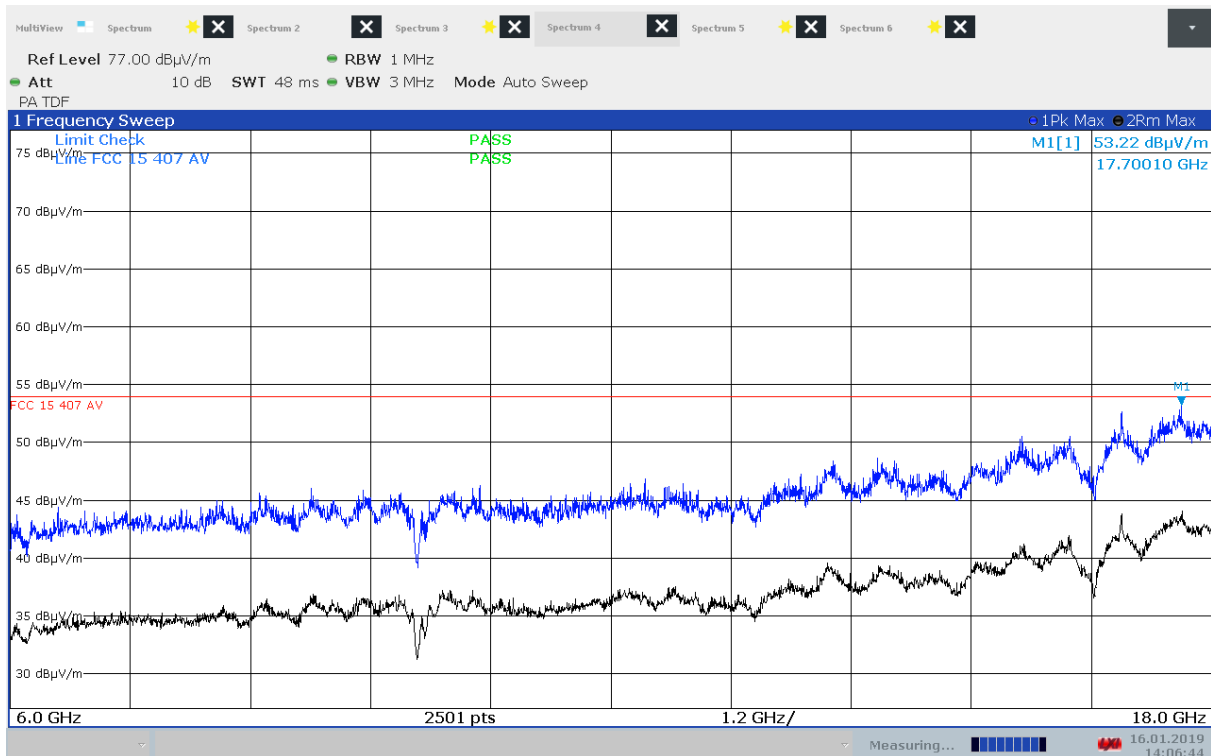
Radiated Emissions, 6000 - 18000 MHz, ch140, 802.11n MCS0, EUT V, HP



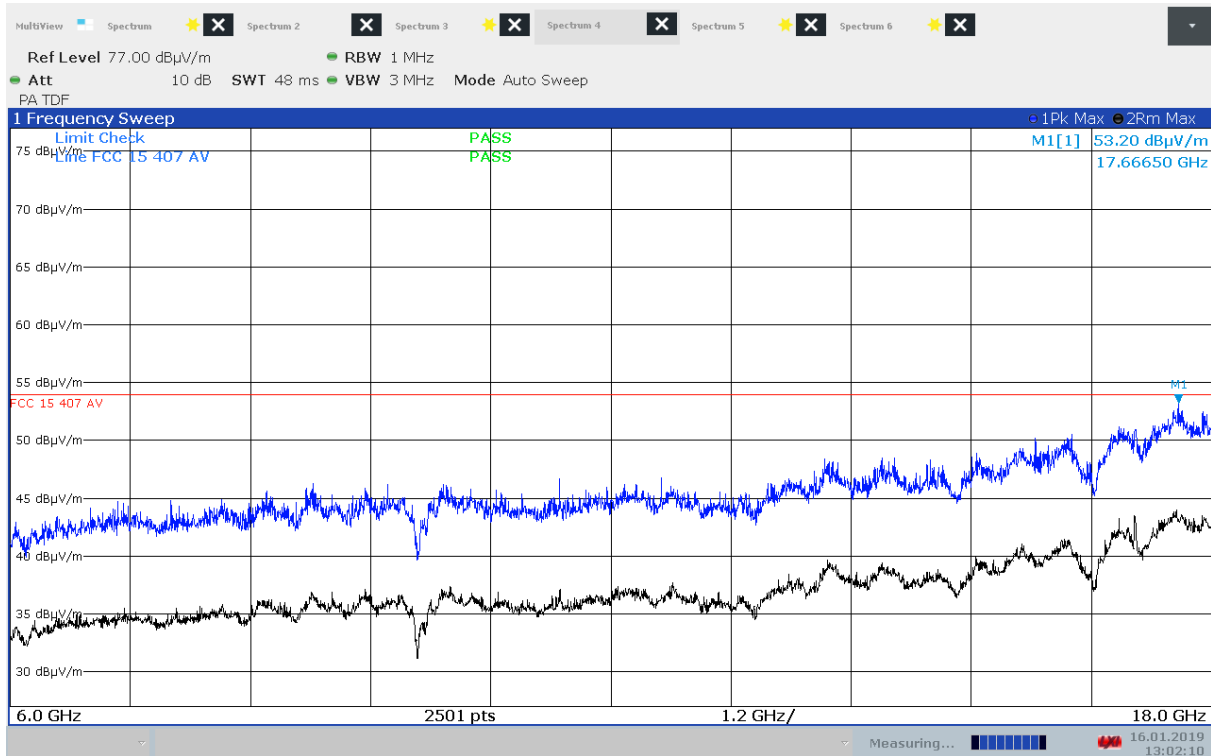
Radiated Emissions, 6000 - 18000 MHz, ch140, 802.11n MCS0, EUT V, VP



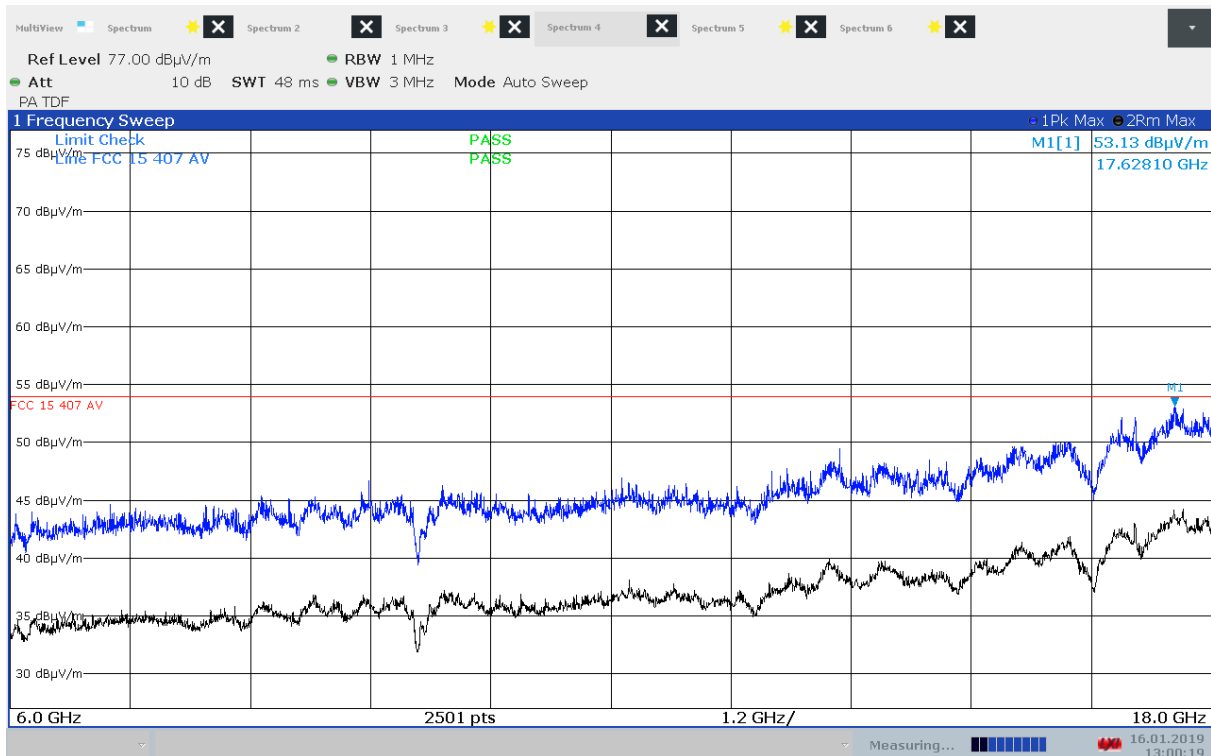
Radiated Emissions, 6000 - 18000 MHz, ch140, 802.11n MCS0, EUT V, HP



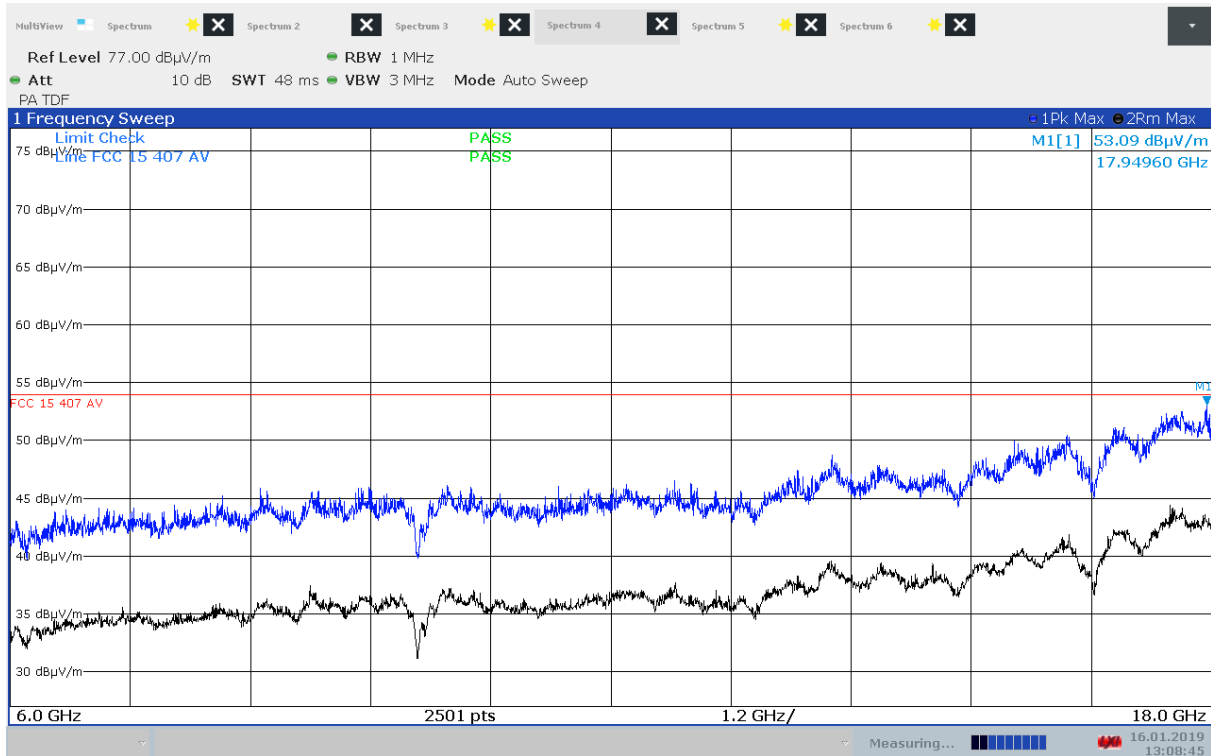
Radiated Emissions, 6000 - 18000 MHz, ch140, 802.11n MCS0, EUT V, VP



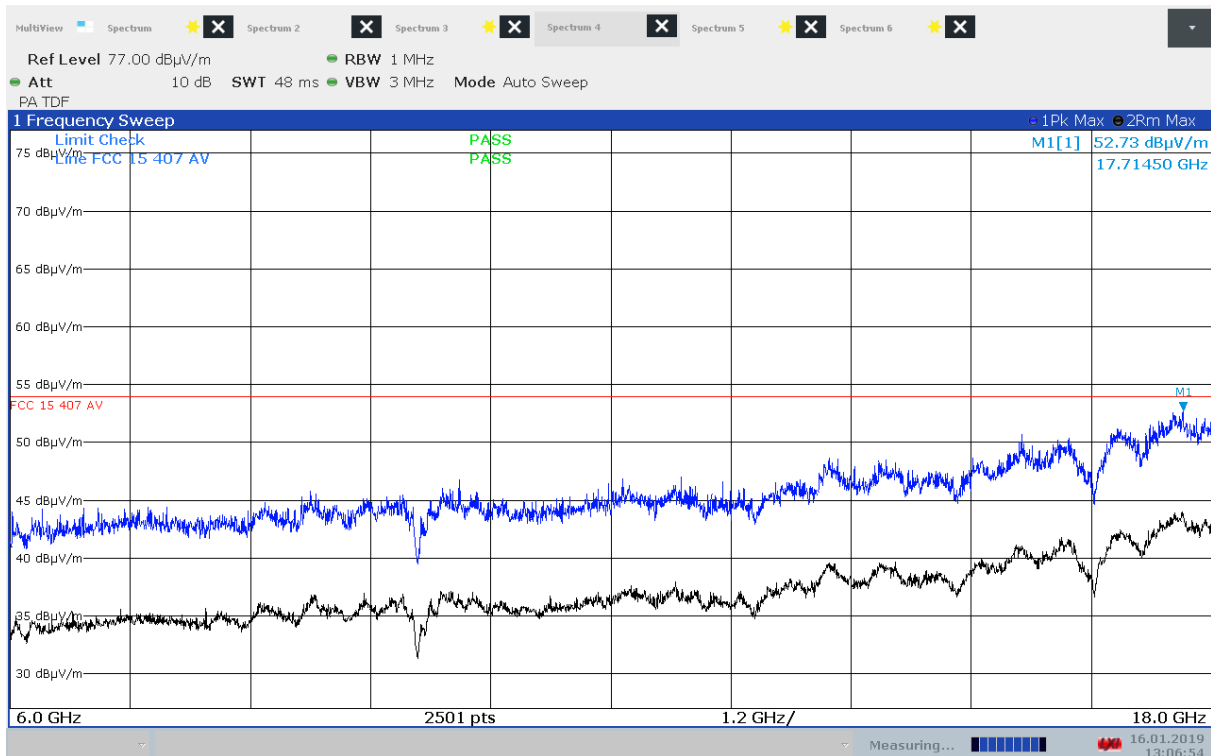
Radiated Emissions, 6000 - 18000 MHz, ch149, 802.11a 6Mbps, EUT V, HP



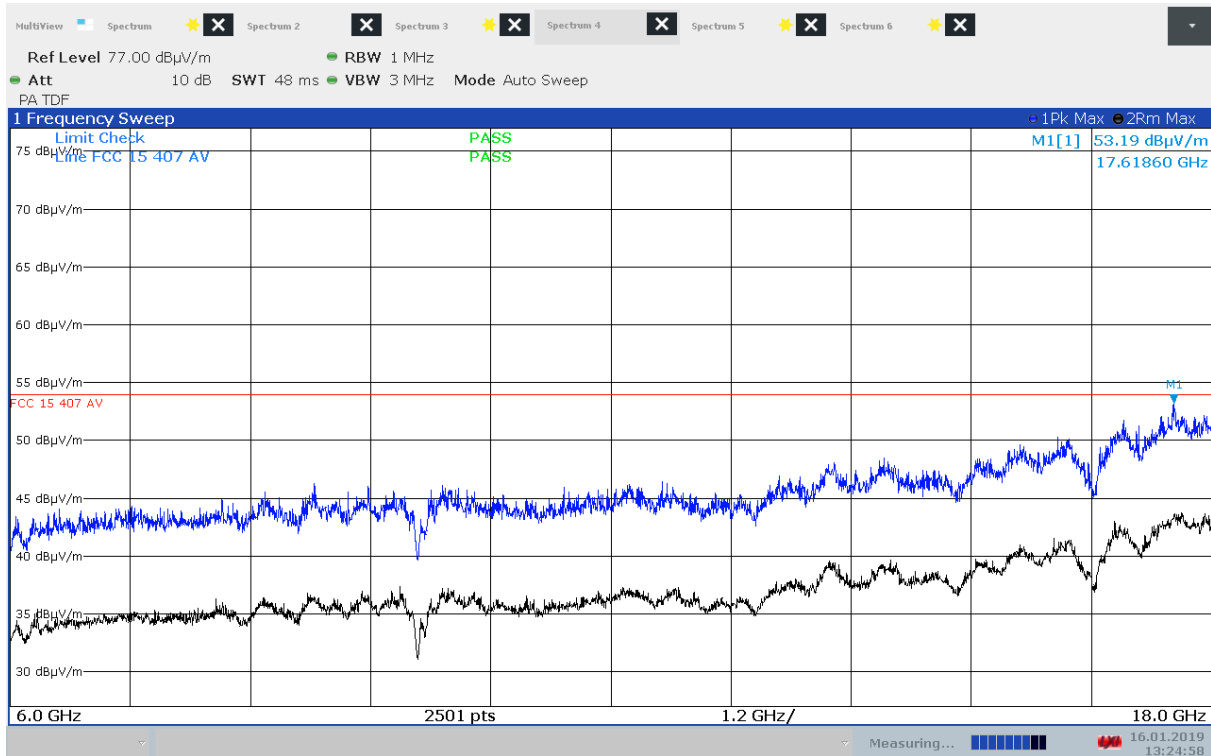
Radiated Emissions, 6000 - 18000 MHz, ch149, 802.11a 6Mbps, EUT V, VP



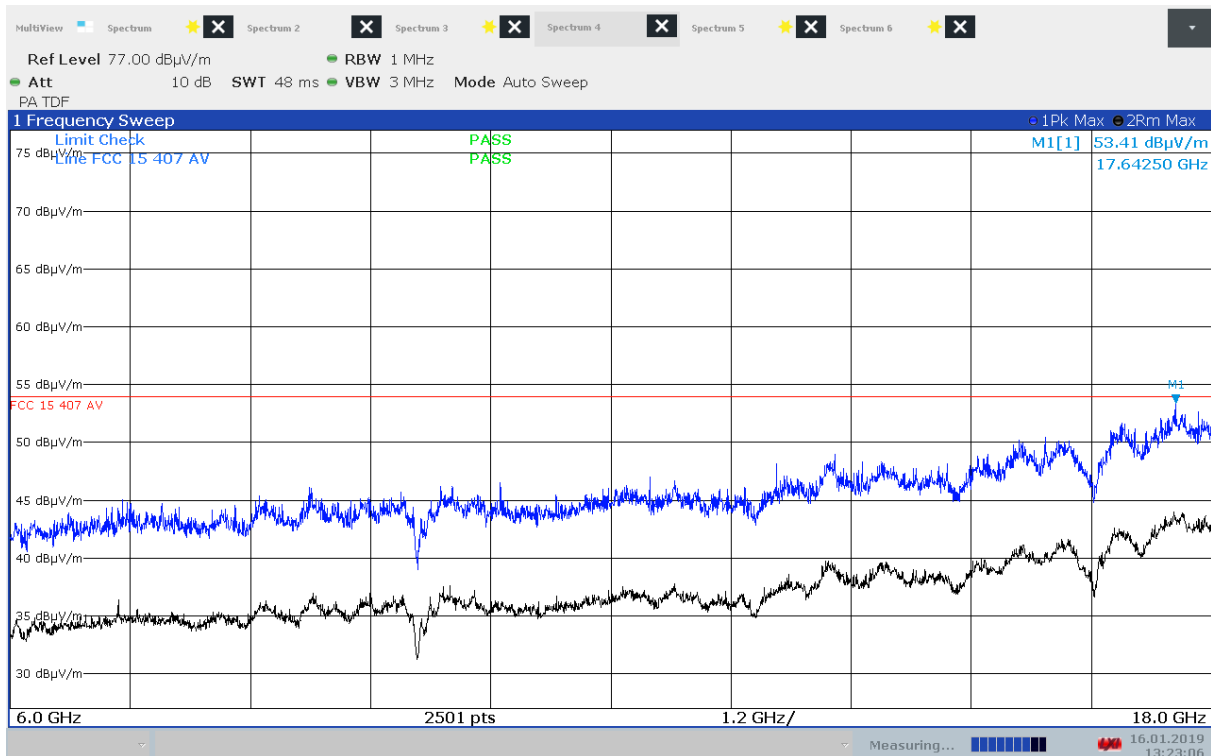
Radiated Emissions, 6000 - 18000 MHz, ch165, 802.11n MCS0, EUT V, HP



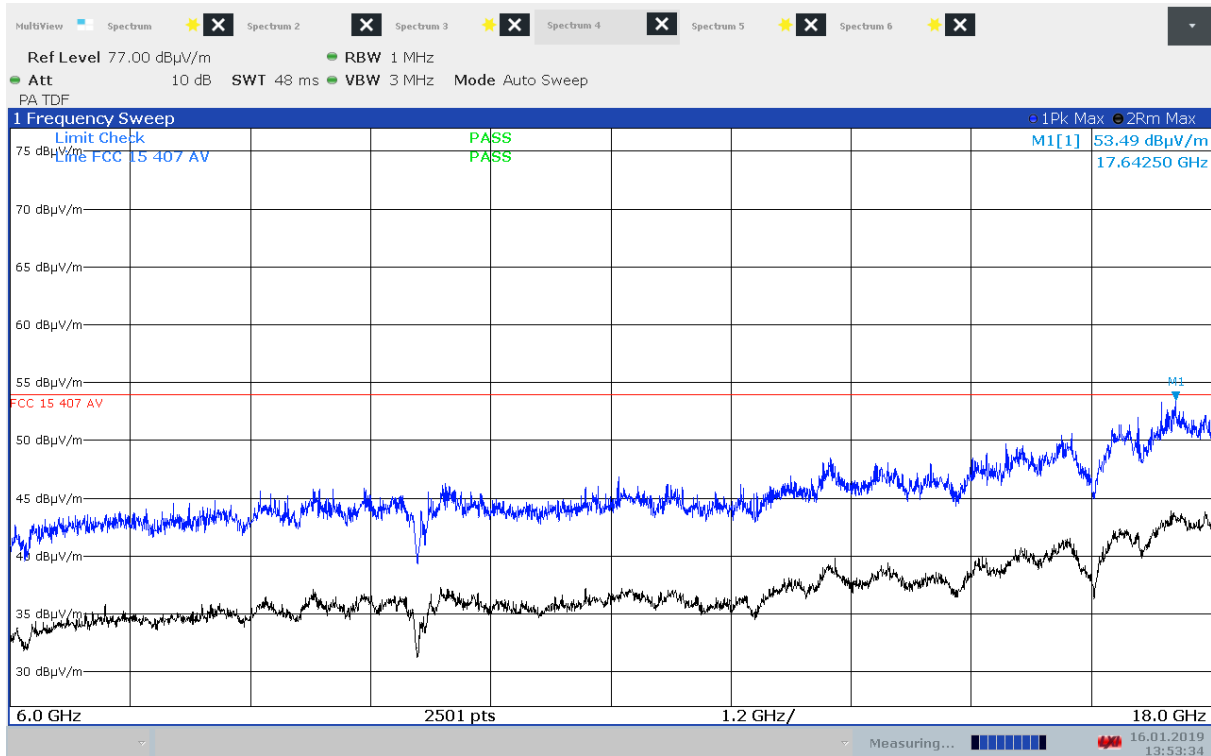
Radiated Emissions, 6000 - 18000 MHz, ch165, 802.11n MCS0, EUT V, VP



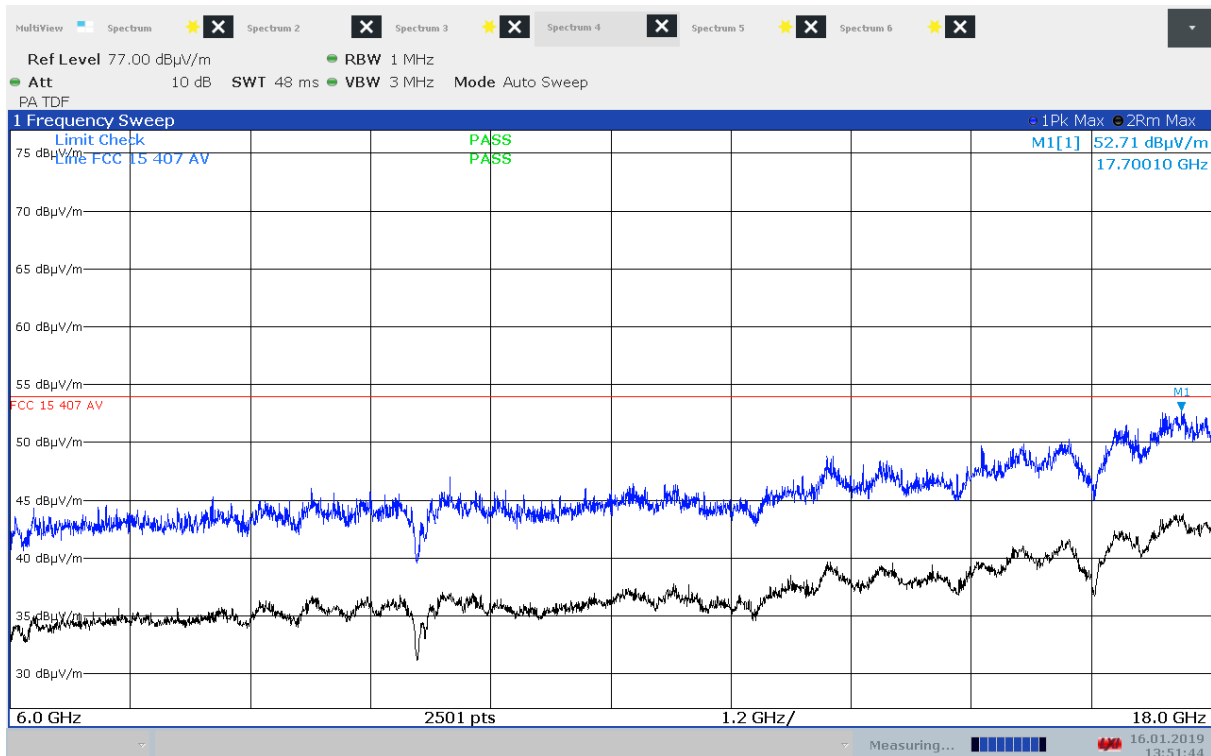
Radiated Emissions, 6000 - 18000 MHz, ch62, 802.11n MCS0 HT40, EUT V, HP



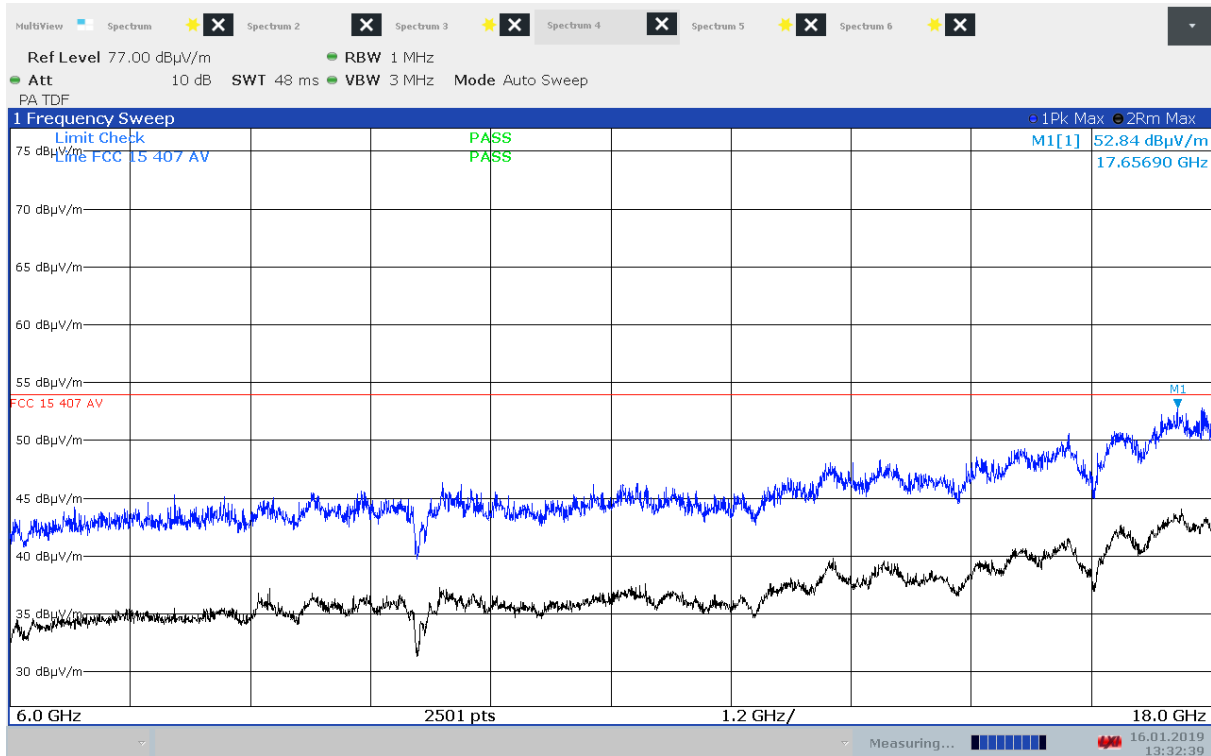
Radiated Emissions, 6000 - 18000 MHz, ch62, 802.11n MCS0 HT40, EUT V, VP



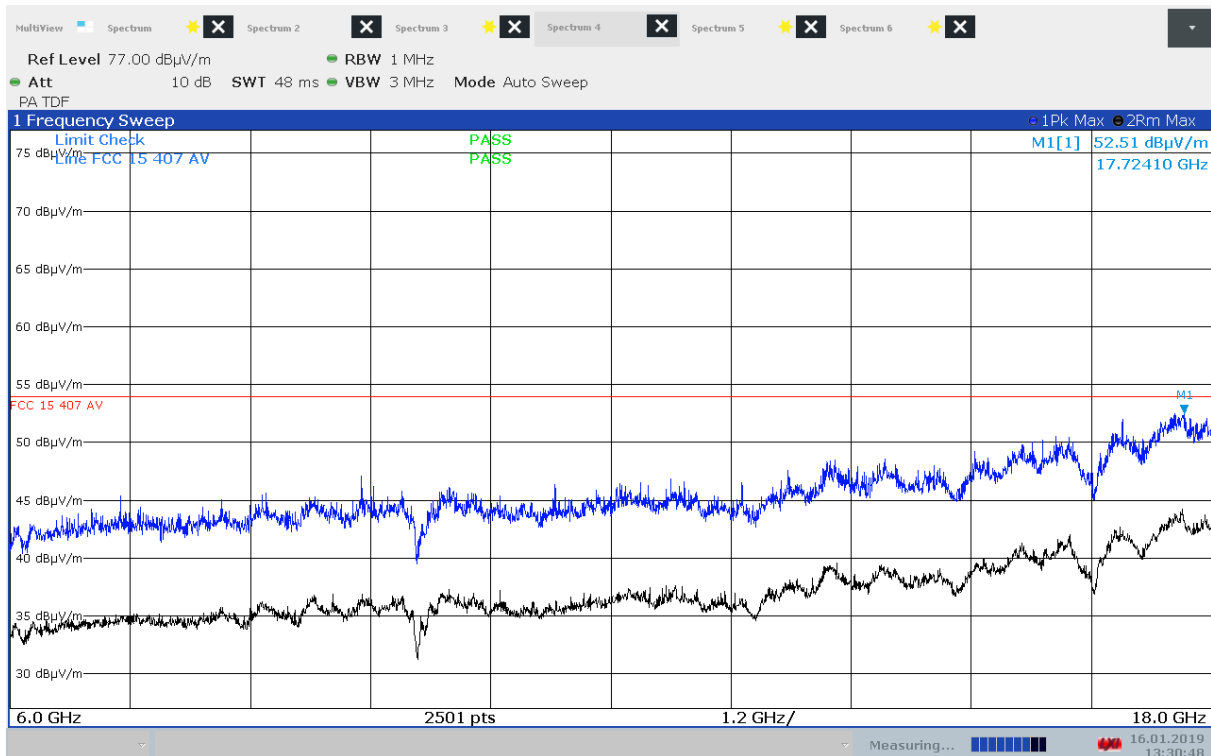
Radiated Emissions, 6000 - 18000 MHz, ch151, 802.11n MCS0 HT40, EUT V, HP



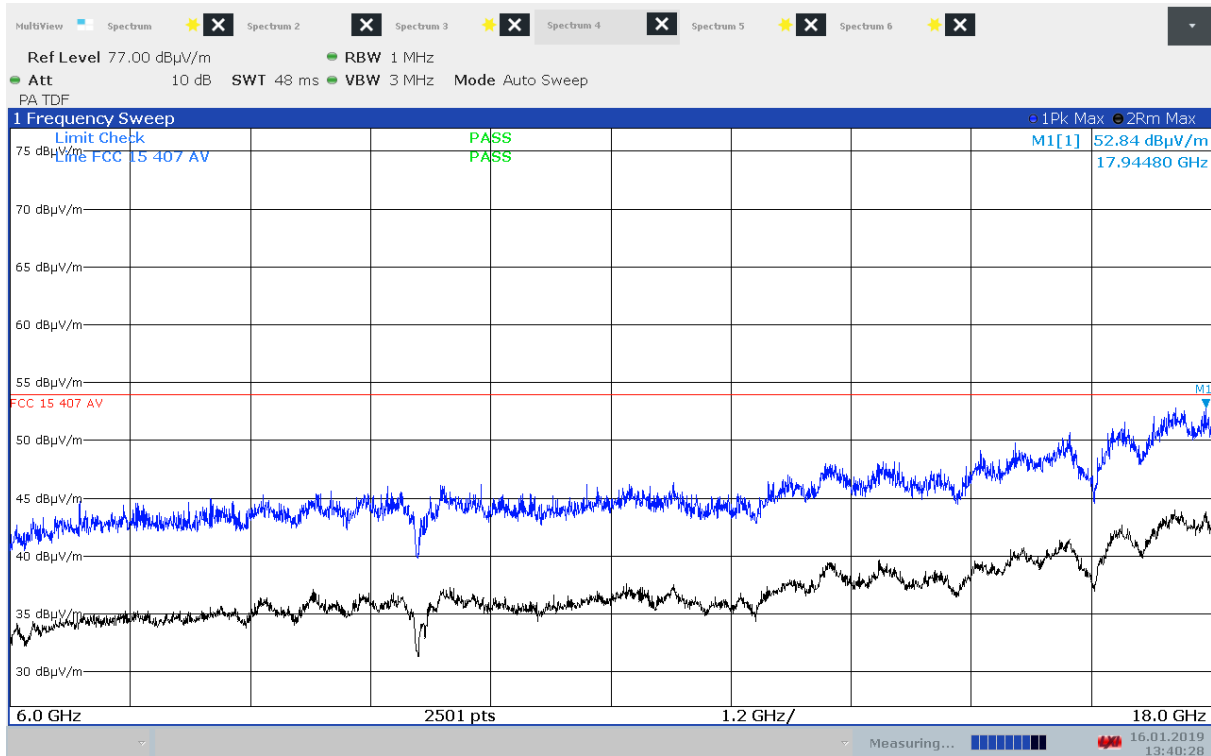
Radiated Emissions, 6000 - 18000 MHz, ch151, 802.11n MCS0 HT40, EUT V, VP



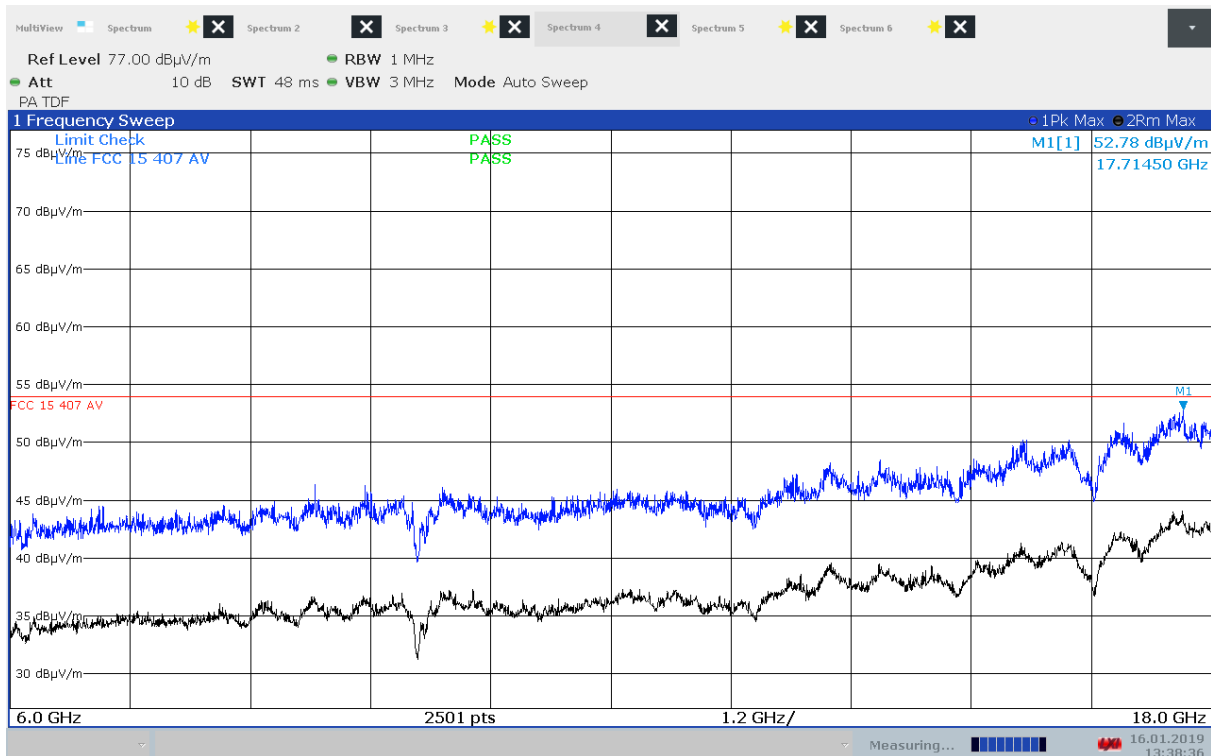
Radiated Emissions, 6000 - 18000 MHz, ch058, 802.11n MCS0 HT80, EUT V, HP



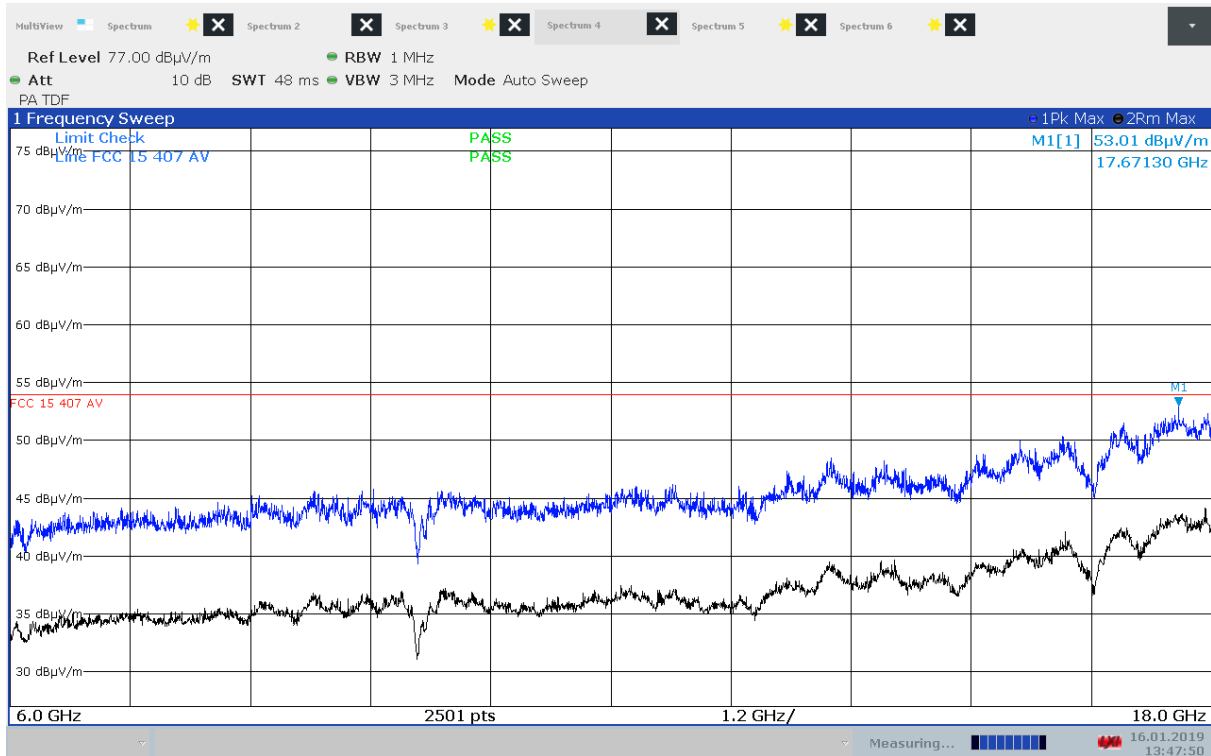
Radiated Emissions, 6000 - 18000 MHz, ch058, 802.11n MCS0 HT80, EUT V, VP



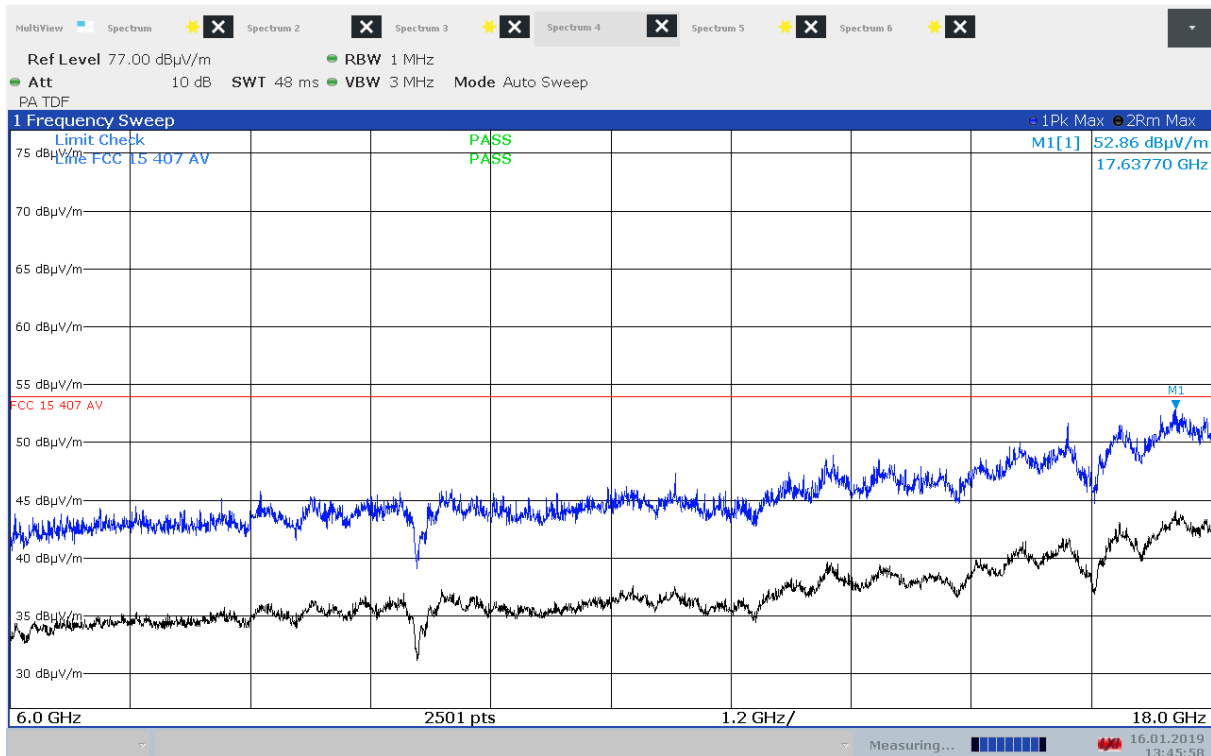
Radiated Emissions, 6000 - 18000 MHz, ch106, 802.11n MCS0 HT80, EUT V, HP



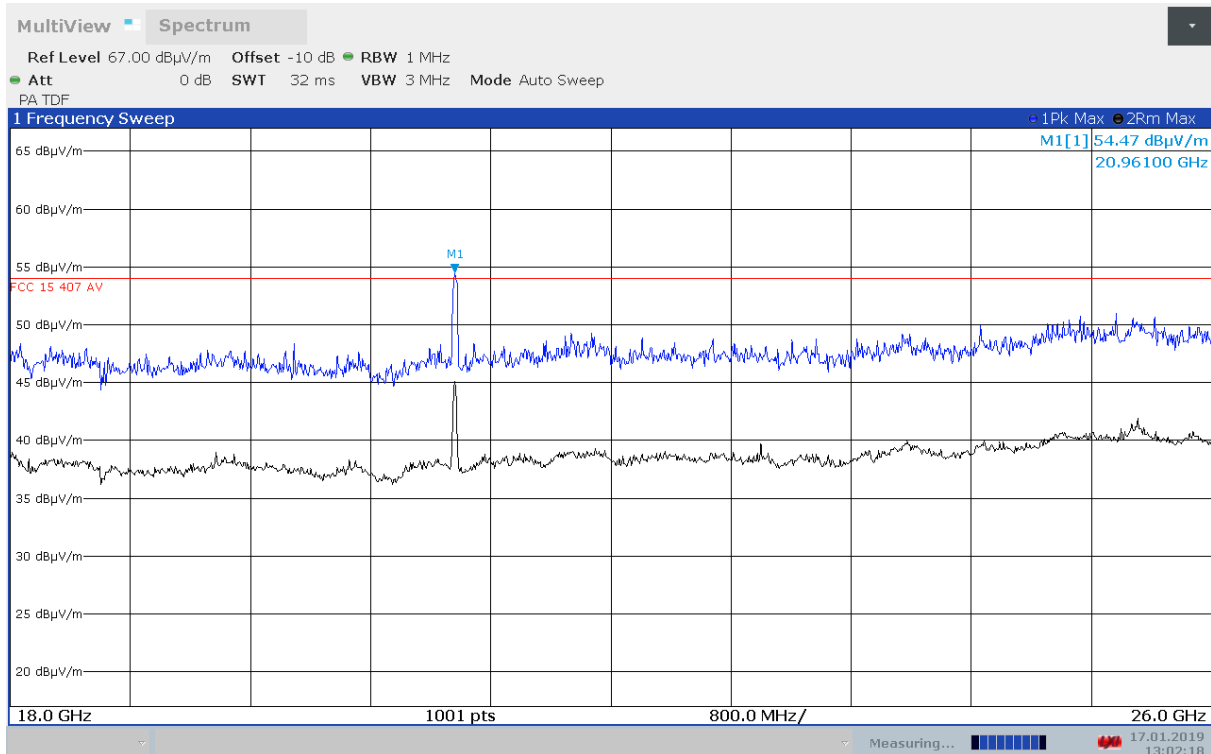
Radiated Emissions, 6000 - 18000 MHz, ch106, 802.11n MCS0 HT80, EUT V, VP



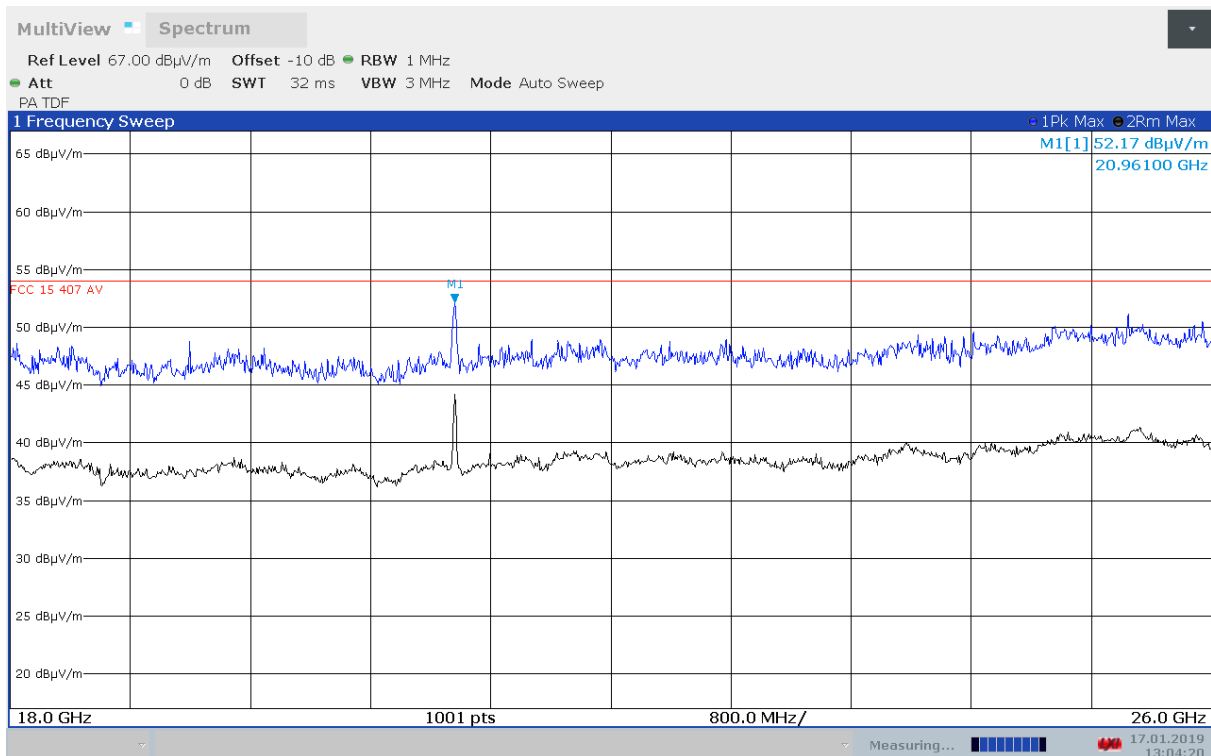
Radiated Emissions, 6000 - 18000 MHz, ch155, 802.11n MCS0 HT80, EUT V, HP



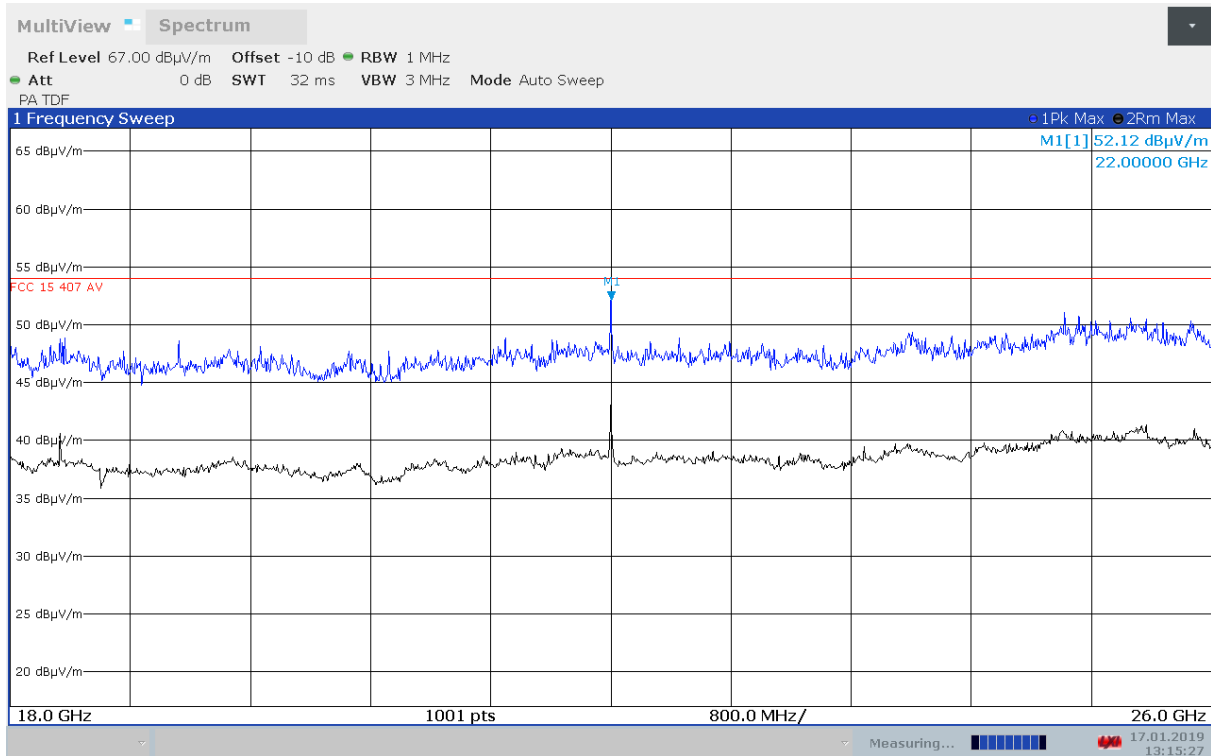
Radiated Emissions, 6000 - 18000 MHz, ch155, 802.11n MCS0 HT80, EUT V, VP



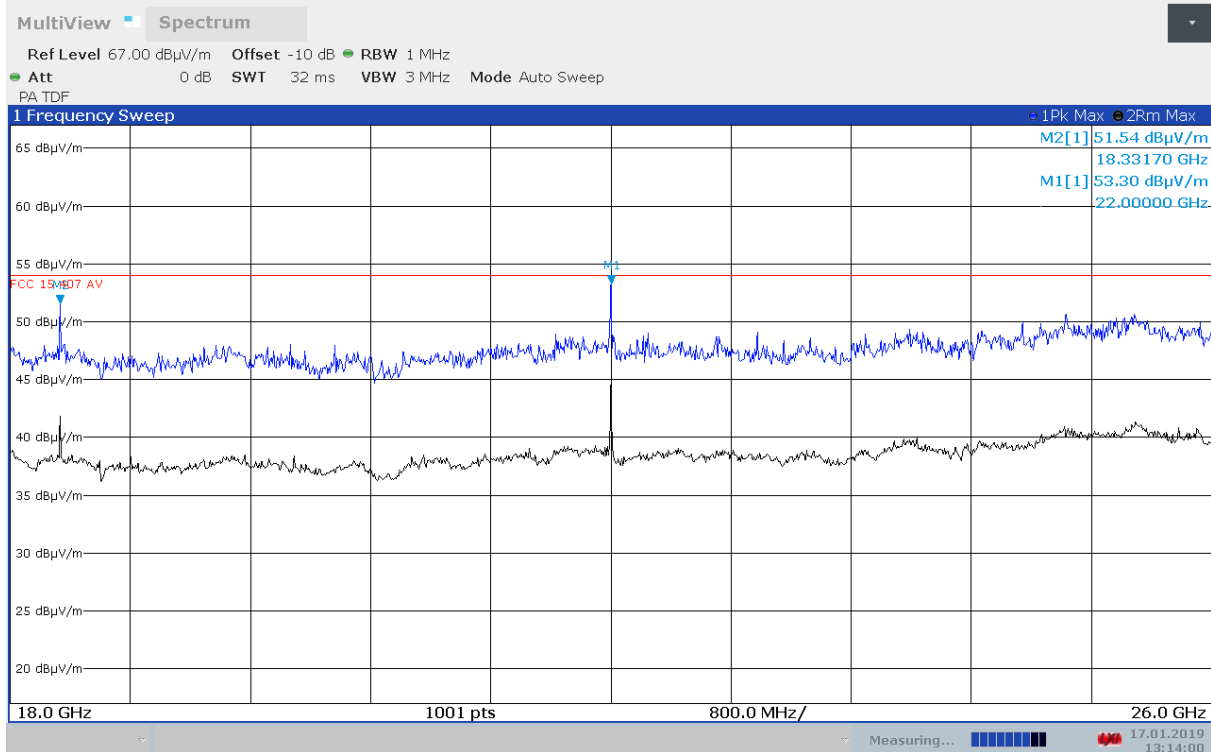
Prescan, 18 – 26 GHz, Ch048, 802.11a 6Mbps, approx. 10 cm



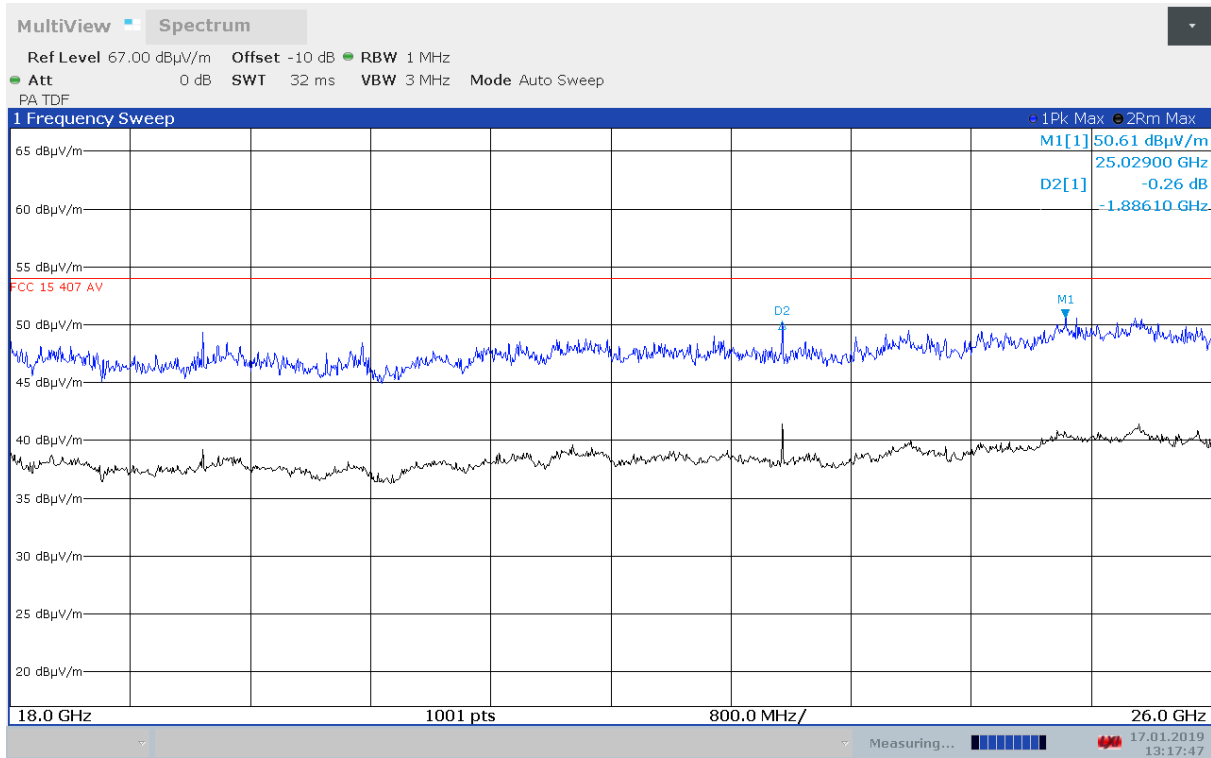
Prescan, 18 – 26 GHz, Ch048, 802.11n MCS0, approx. 10 cm



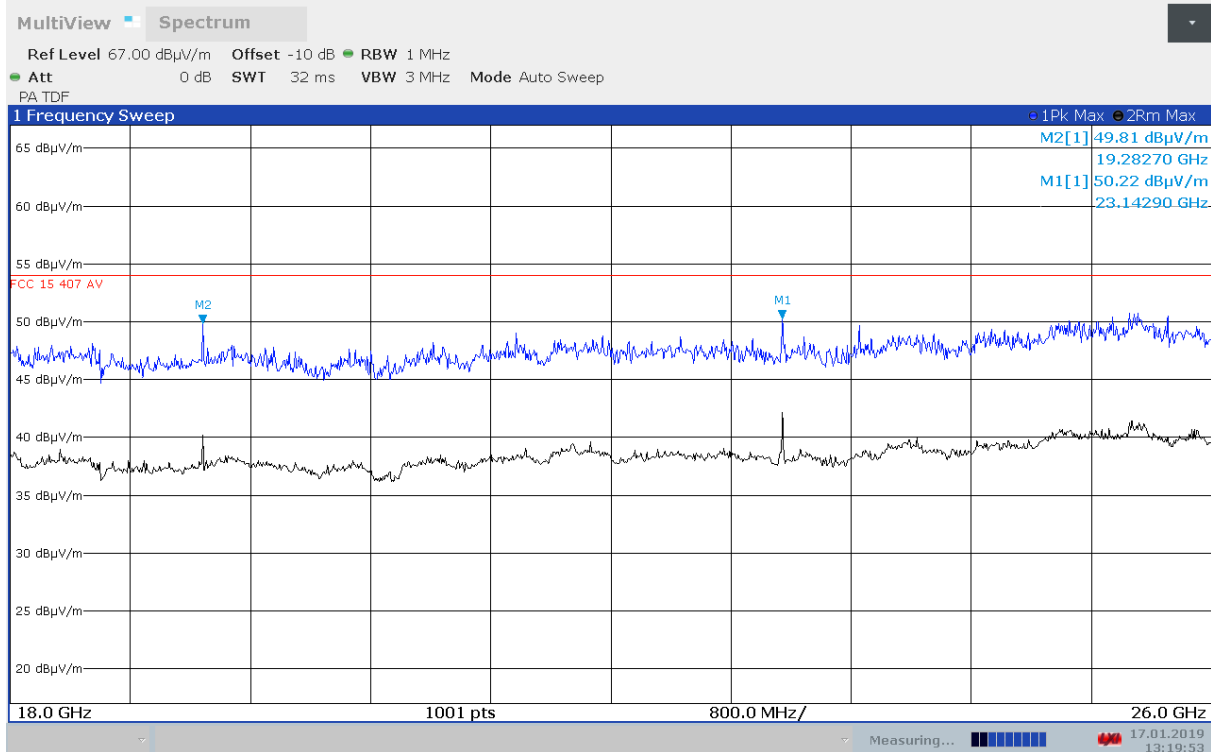
Prescan, 18 – 26 GHz, Ch100, 802.11a 6Mbps, approx. 10 cm



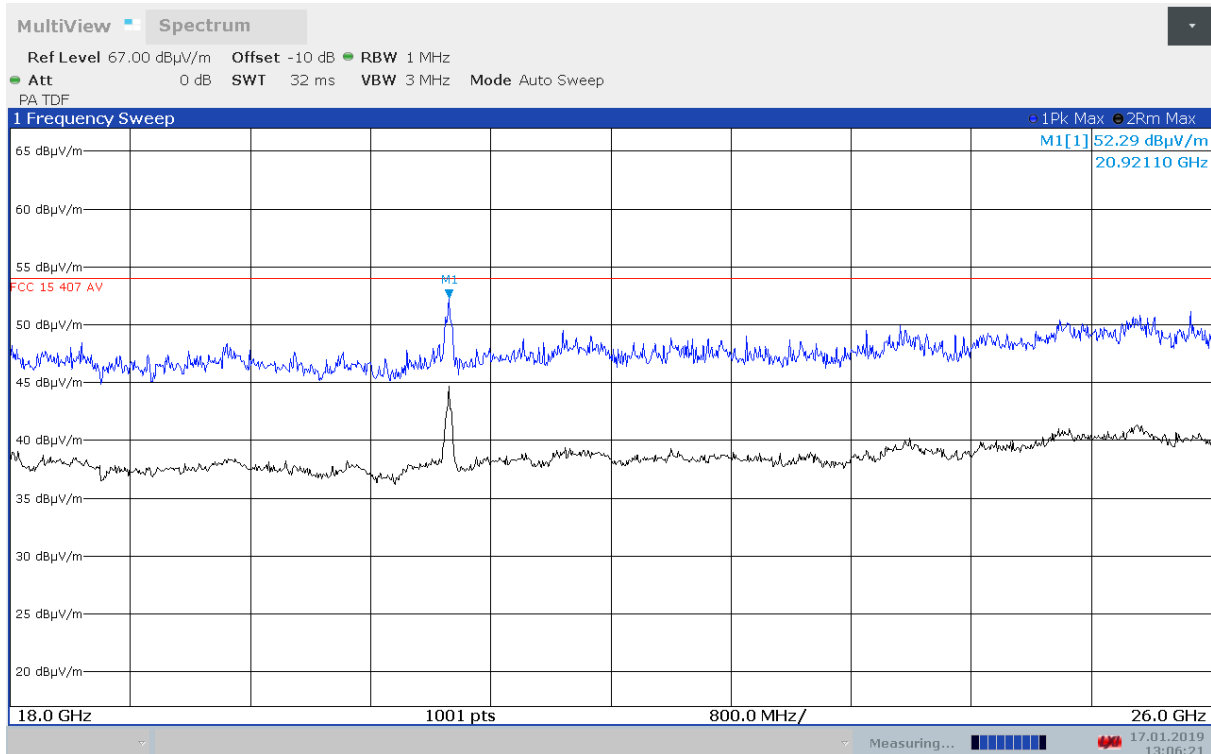
Prescan, 18 – 26 GHz, Ch100, 802.11n MCS0, approx. 10 cm



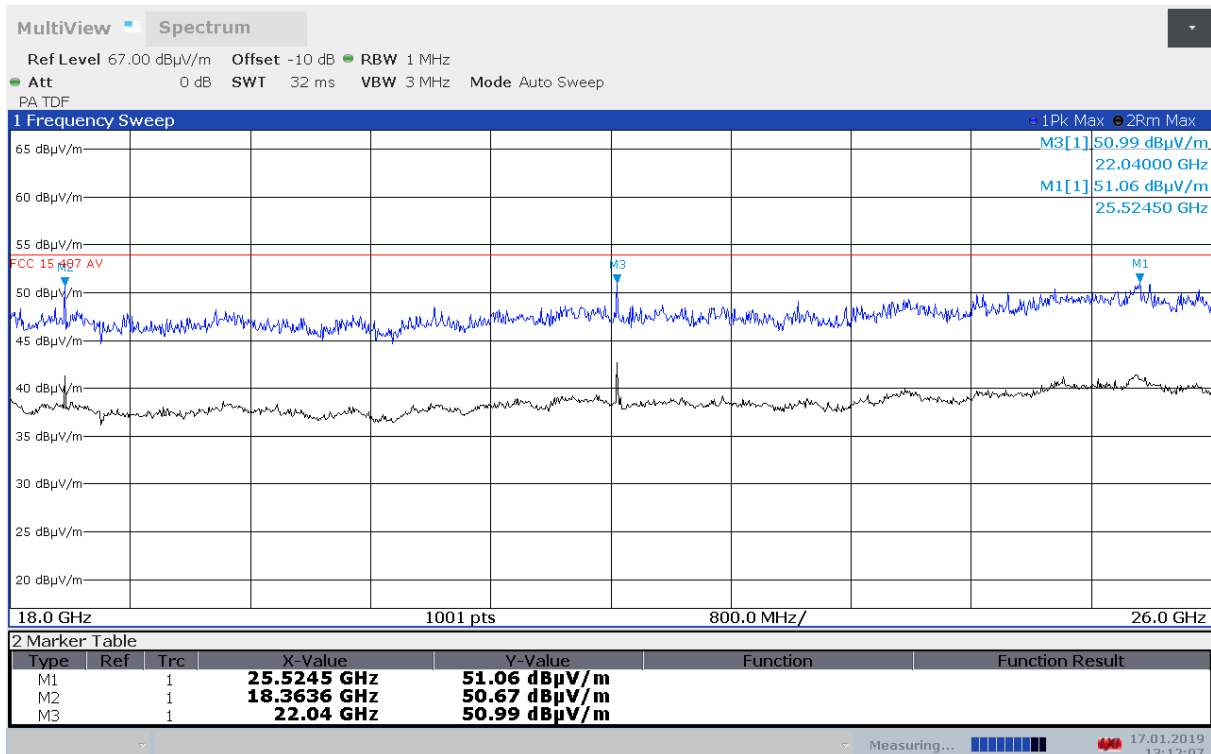
Prescan, 18 – 26 GHz, Ch157, 802.11a 6Mbps, approx. 10 cm



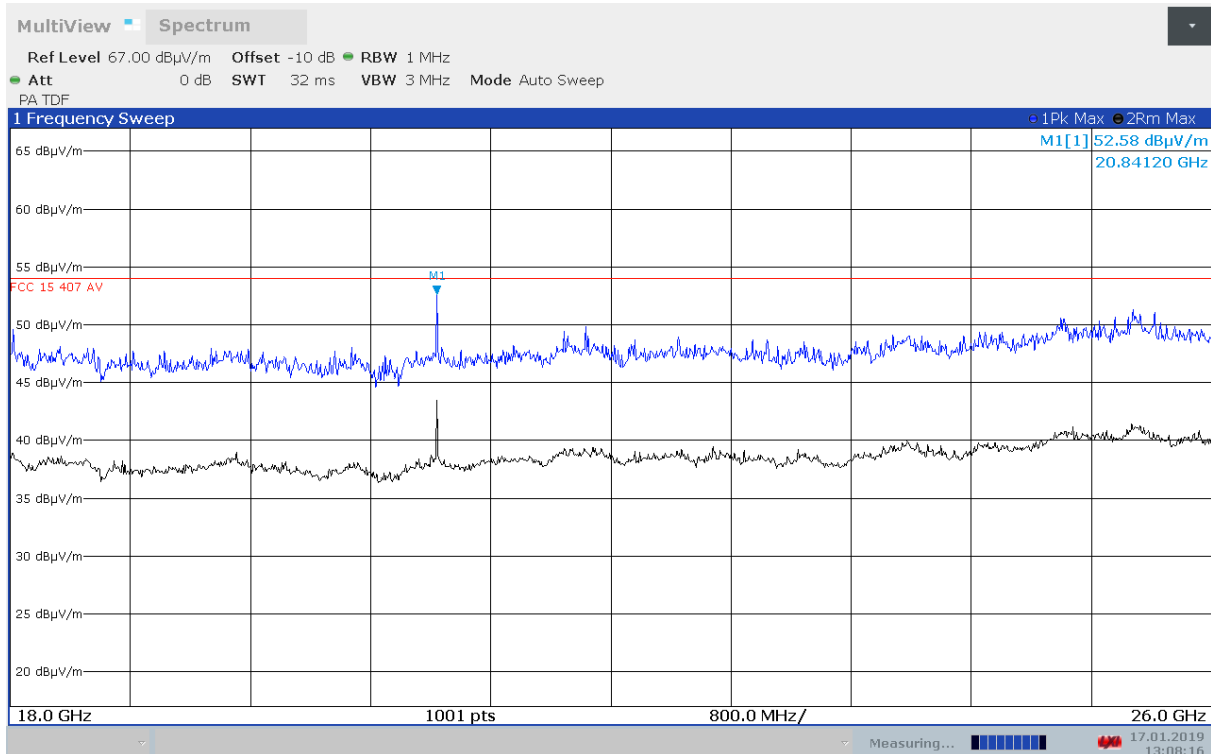
Prescan, 18 – 26 GHz, Ch157, 802.11n MCS0, approx. 10 cm



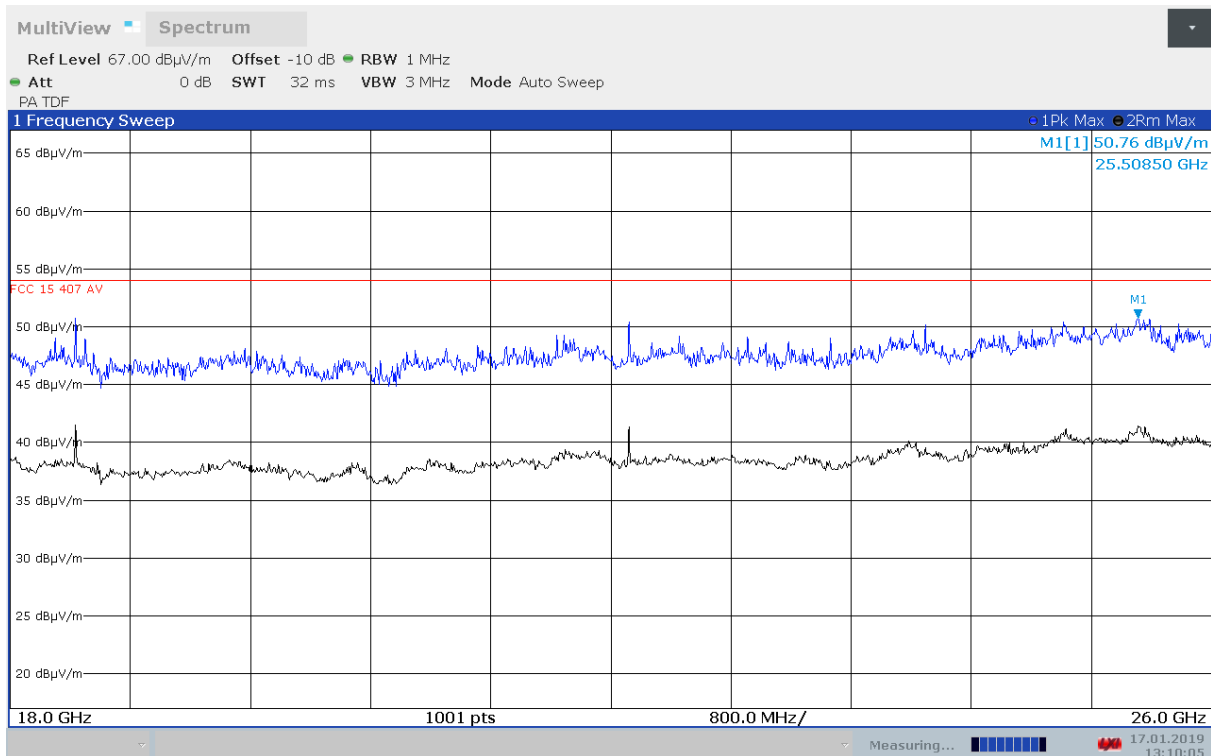
Prescan, 18 – 26 GHz, Ch046, 802.11n MCS0 HT40, approx. 10 cm



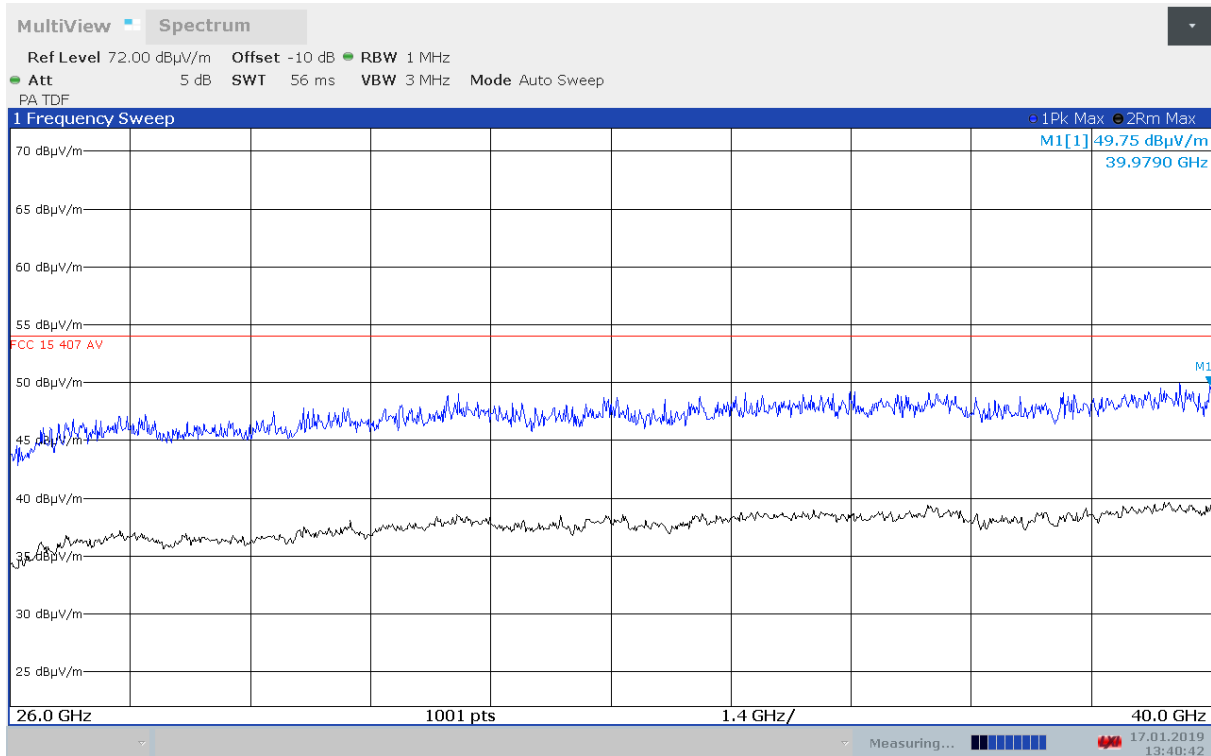
Prescan, 18 – 26 GHz, Ch102, 802.11n MCS0 HT40, approx. 10 cm



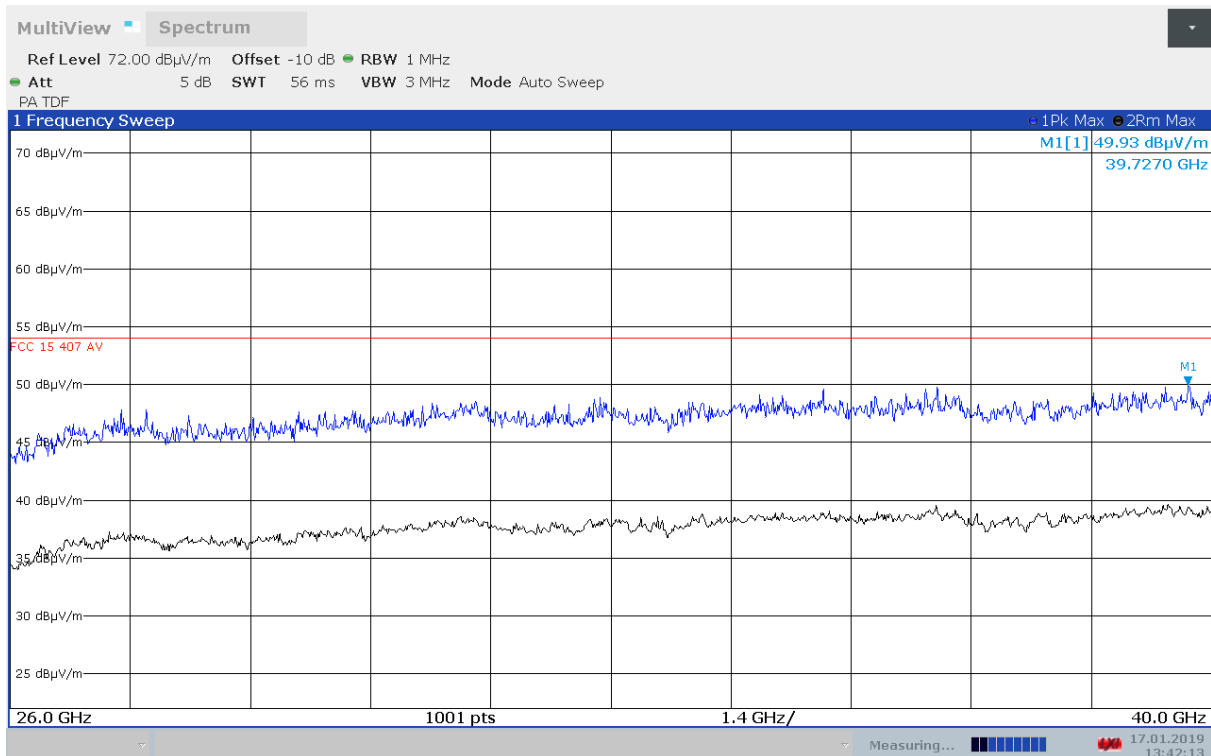
Prescan, 18 – 26 GHz, Ch042, 802.11n MCS0 HT80, approx. 10 cm



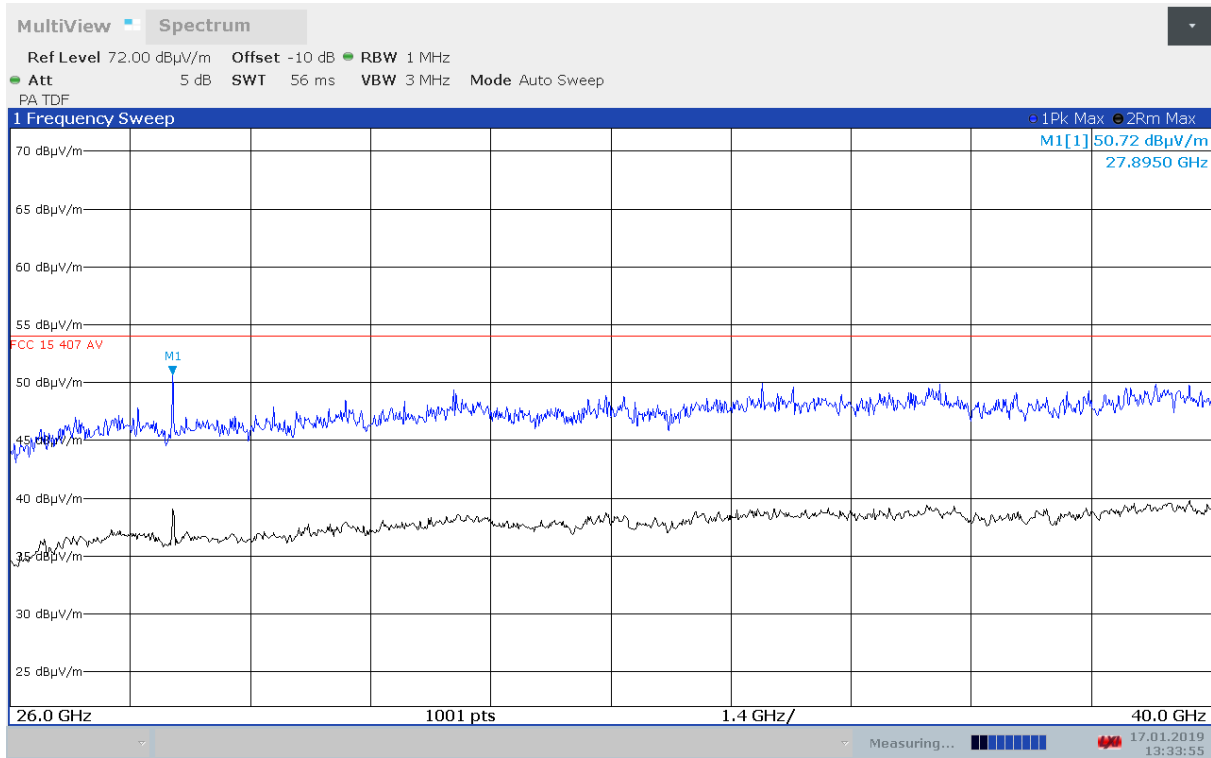
Prescan, 18 – 26 GHz, Ch106, 802.11n MCS0 HT80, approx. 10 cm



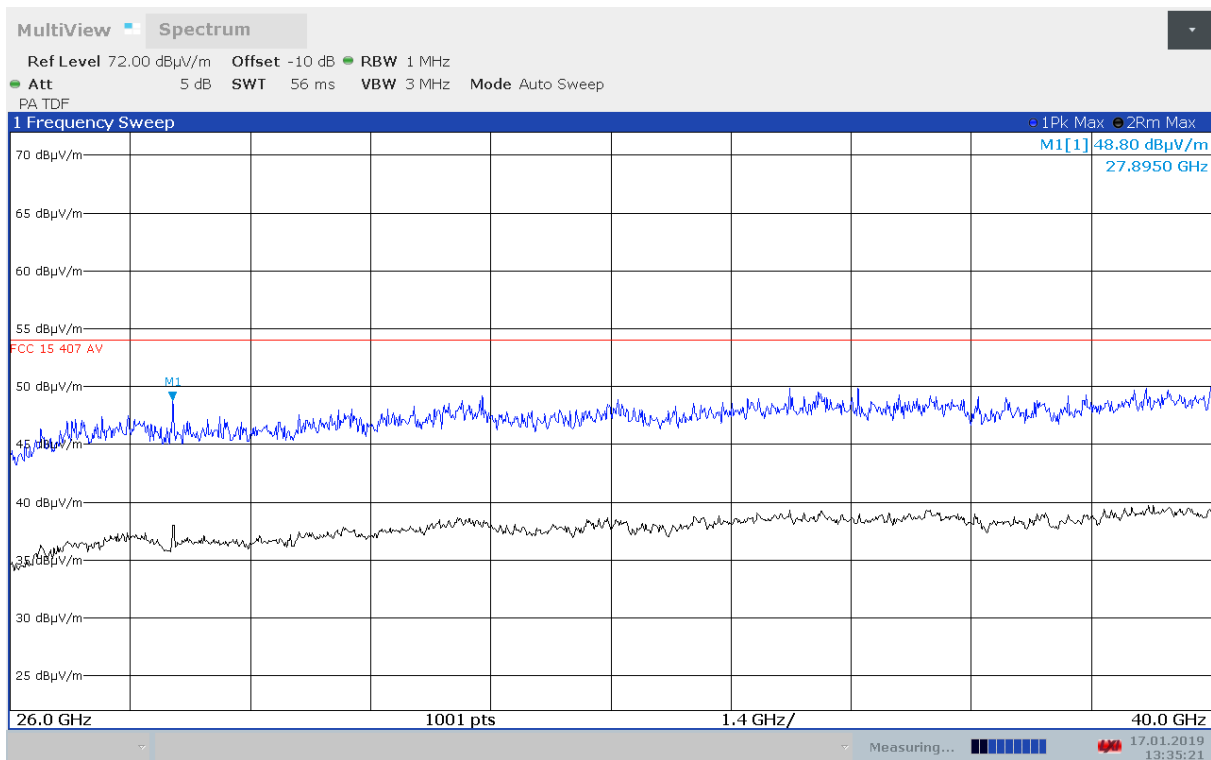
Prescan, 26 – 40 GHz, Ch048, 802.11a 6Mbps, approx. 10 cm



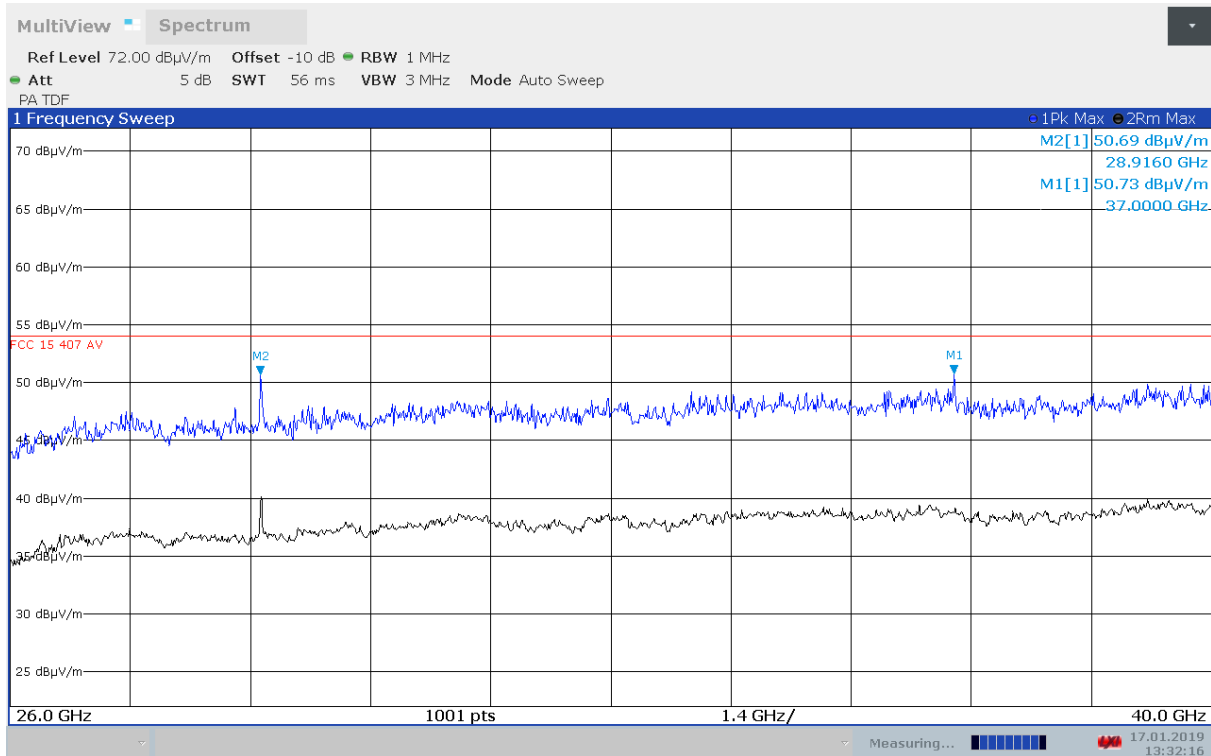
Prescan, 26 – 40 GHz, Ch048, 802.11n MCS0, approx. 10 cm



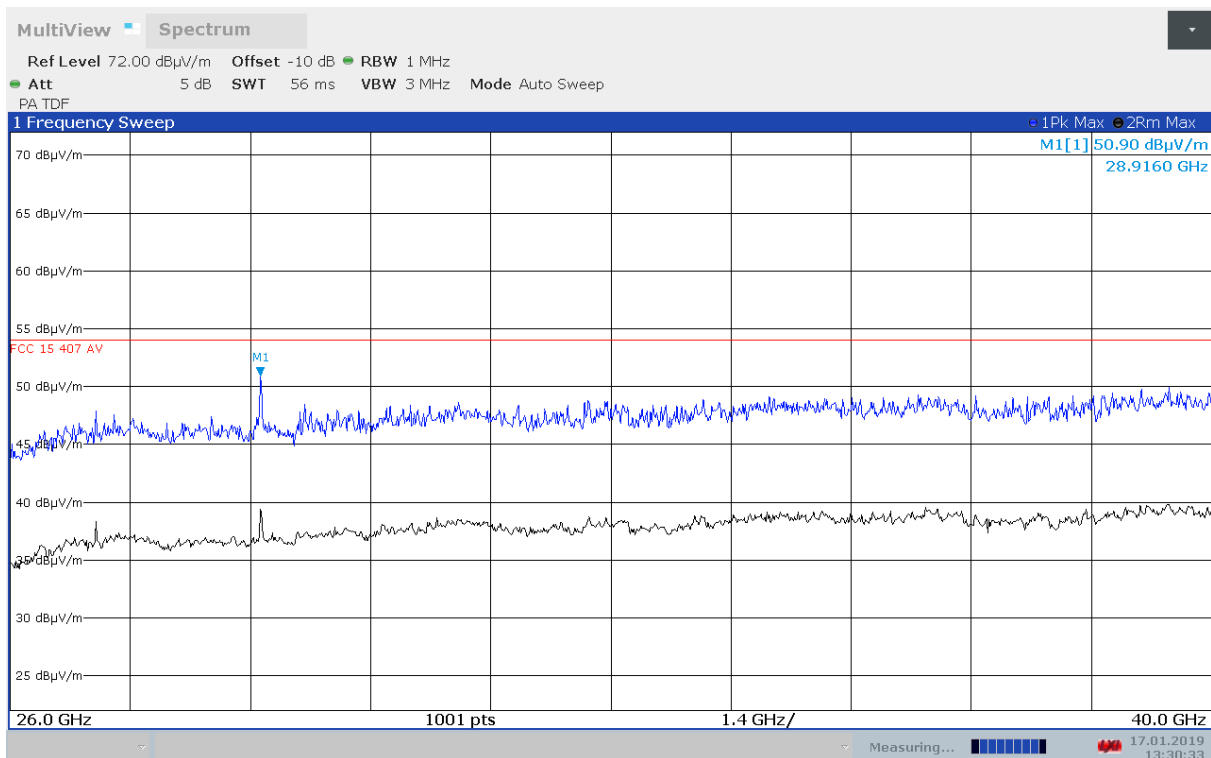
Prescan, 26 – 40 GHz, Ch116, 802.11a 6Mbps, approx. 10 cm



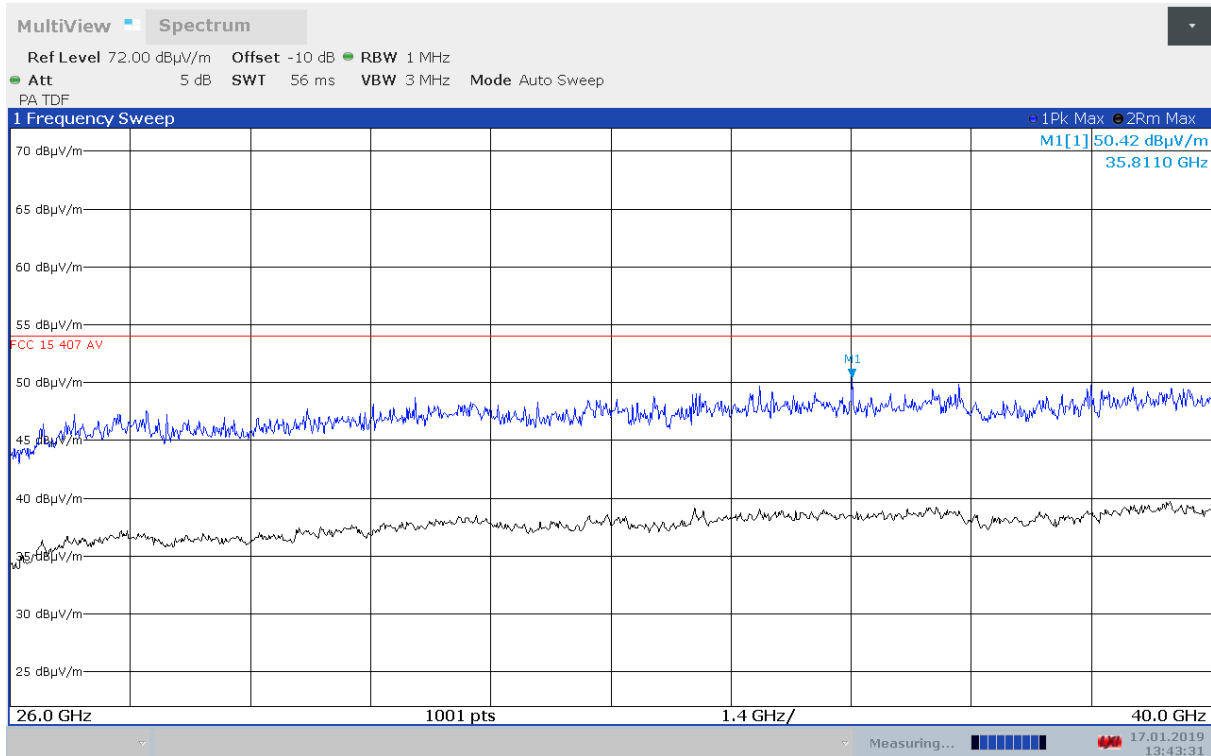
Prescan, 26 – 40 GHz, Ch116, 802.11n MCS0, approx. 10 cm



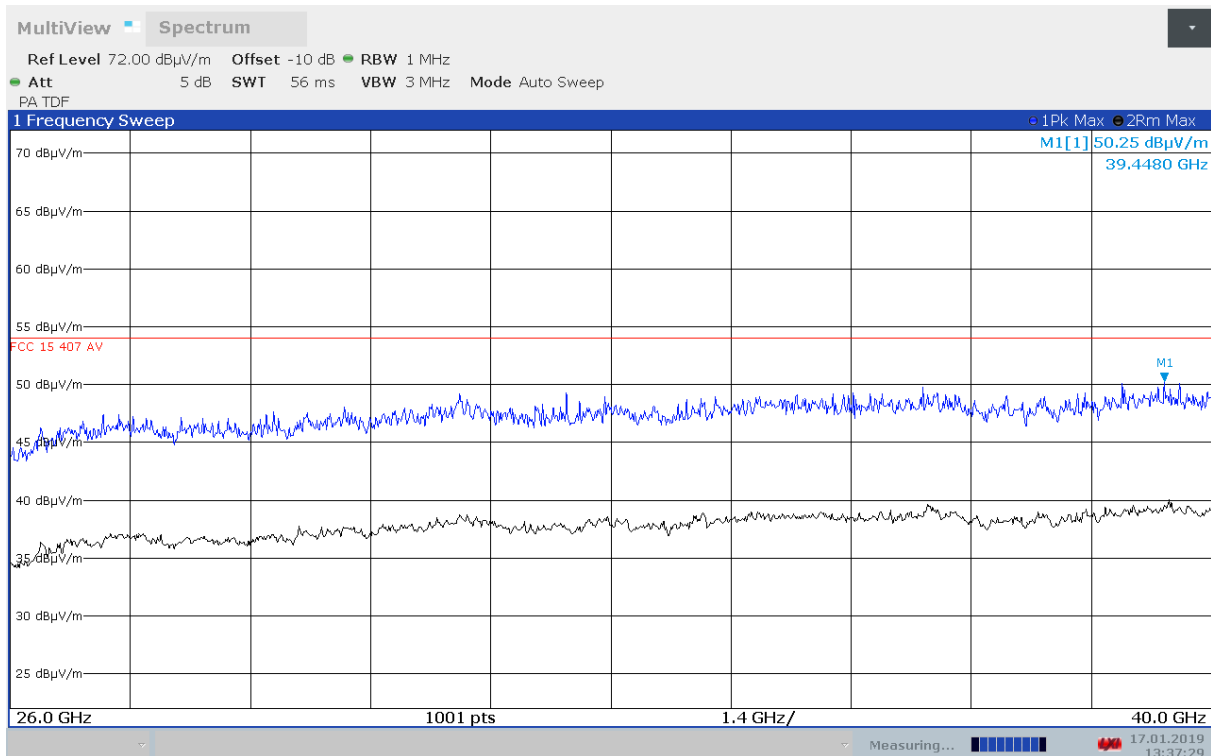
Prescan, 26 – 40 GHz, Ch157, 802.11a 6Mbps, approx. 10 cm



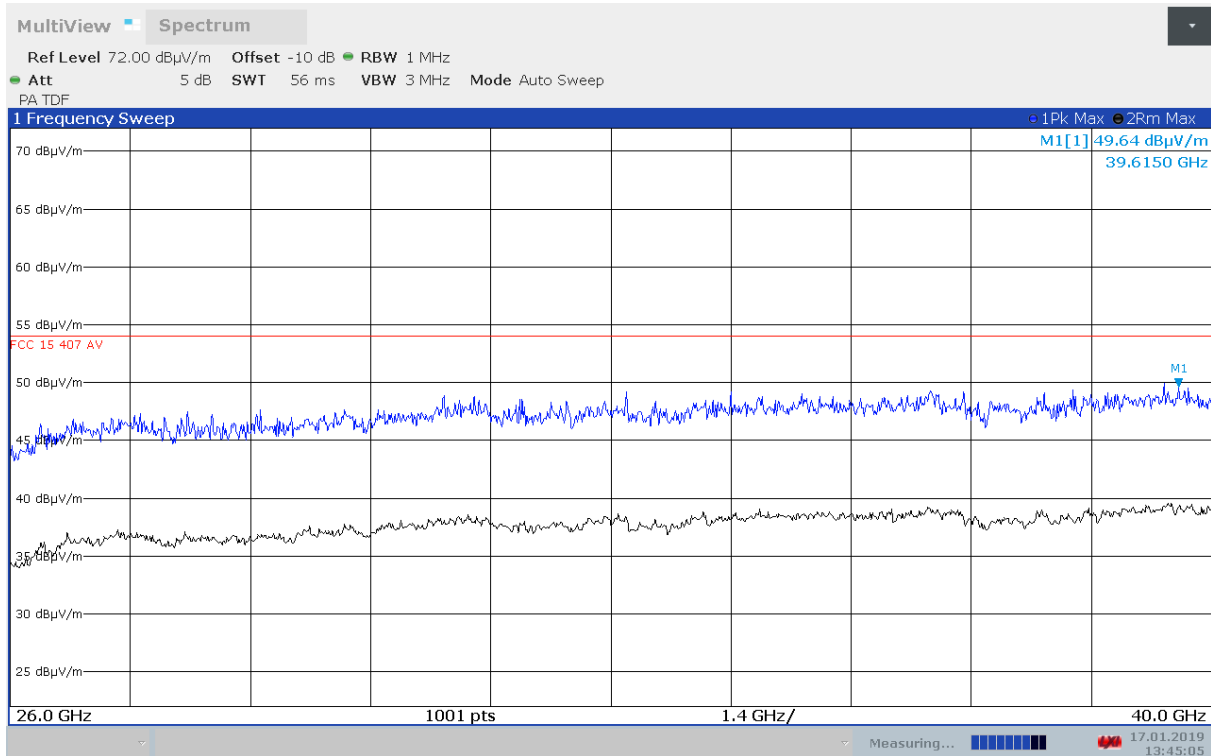
Prescan, 26 – 40 GHz, Ch157, 802.11n MCS0, approx. 10 cm



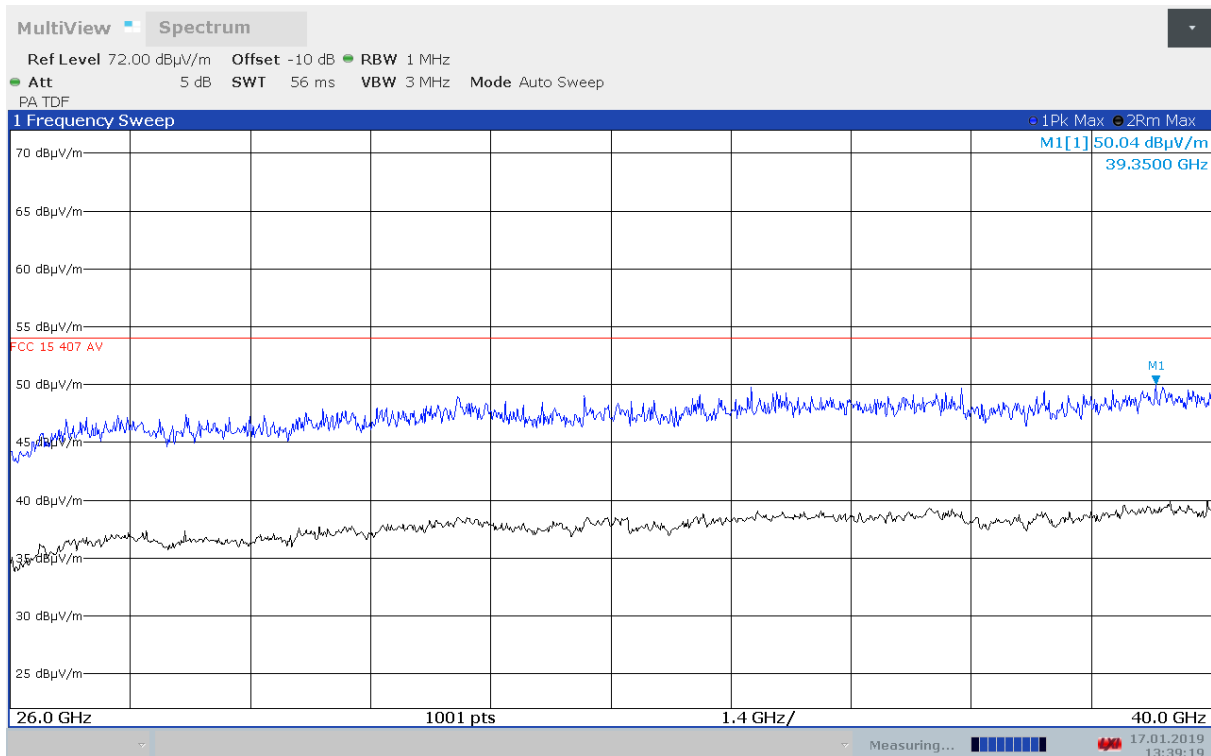
Prescan, 26 – 40 GHz, Ch046, 802.11n MCS0 HT40, approx. 10 cm



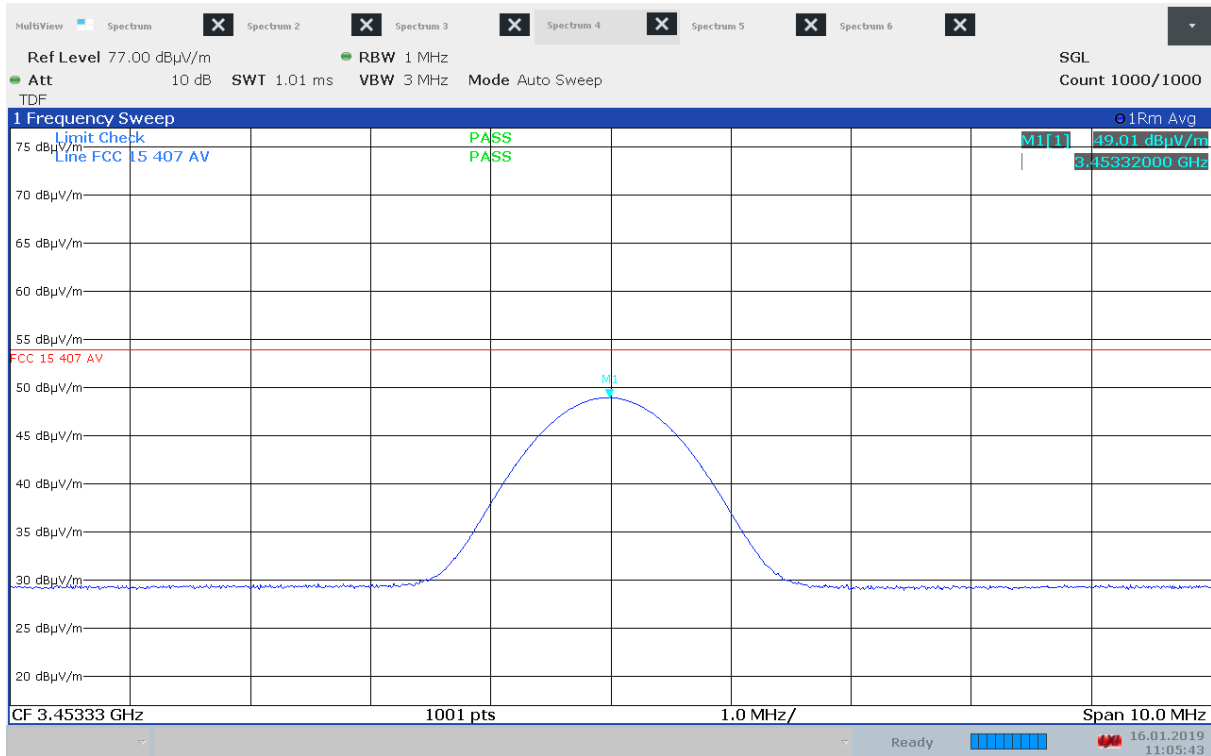
Prescan, 26 – 40 GHz, Ch110, 802.11n MCS0 HT40, approx. 10 cm



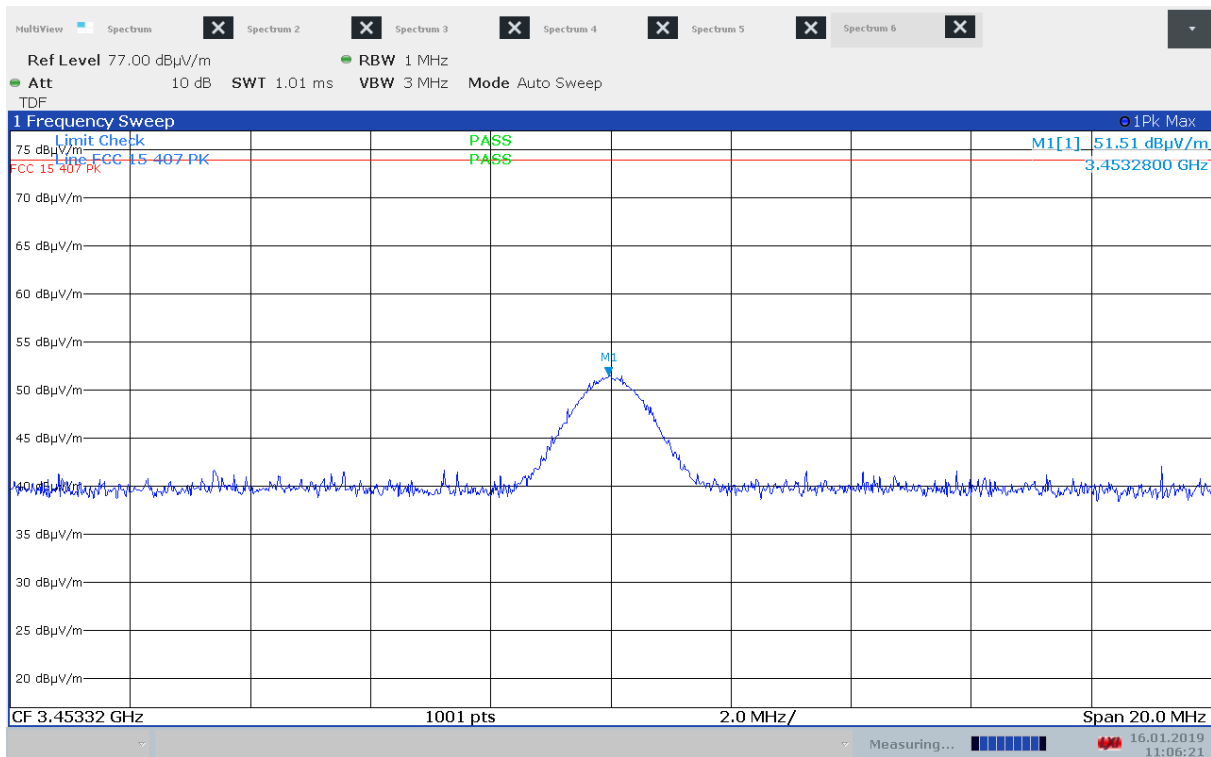
Prescan, 26 – 40 GHz, Ch042, 802.11n MCS0 HT80, approx. 10 cm



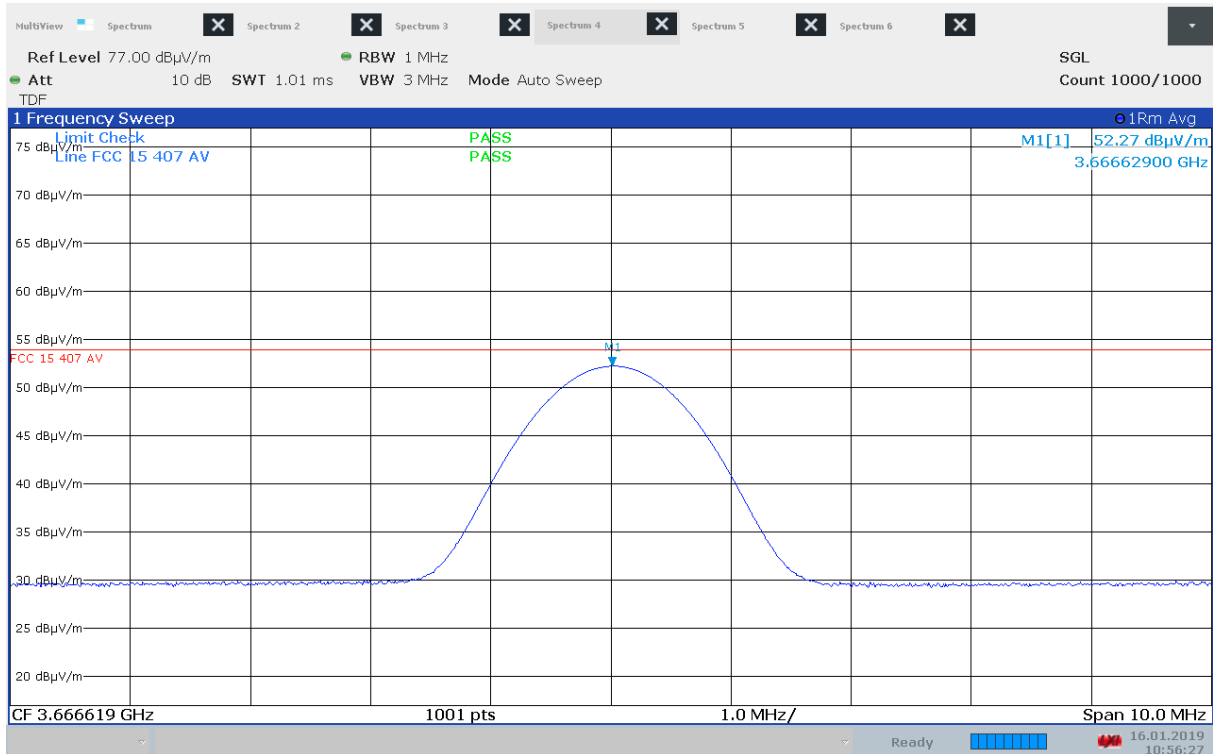
Prescan, 26 – 40 GHz, Ch106, 802.11n MCS0 HT80, approx. 10 cm



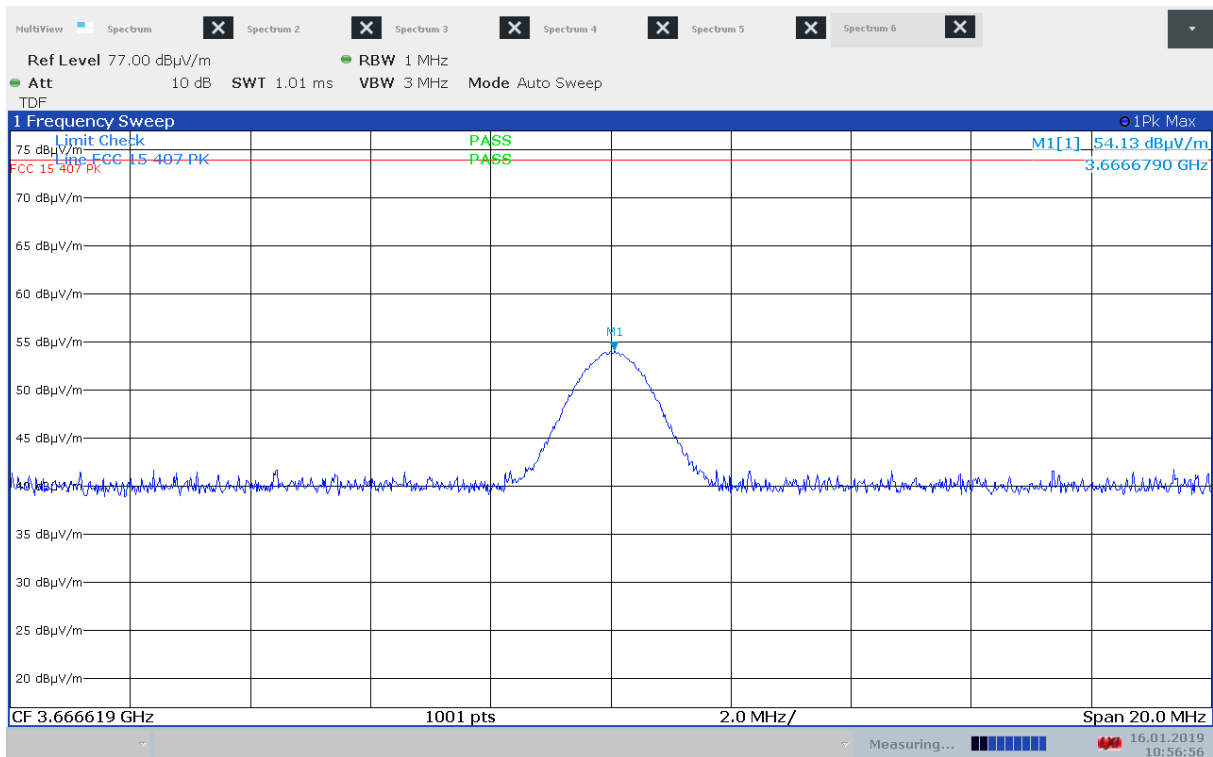
Radiated Emissions, 3453 MHz, ch36, 802.11a 6Mbps, EUT V, VP, Average



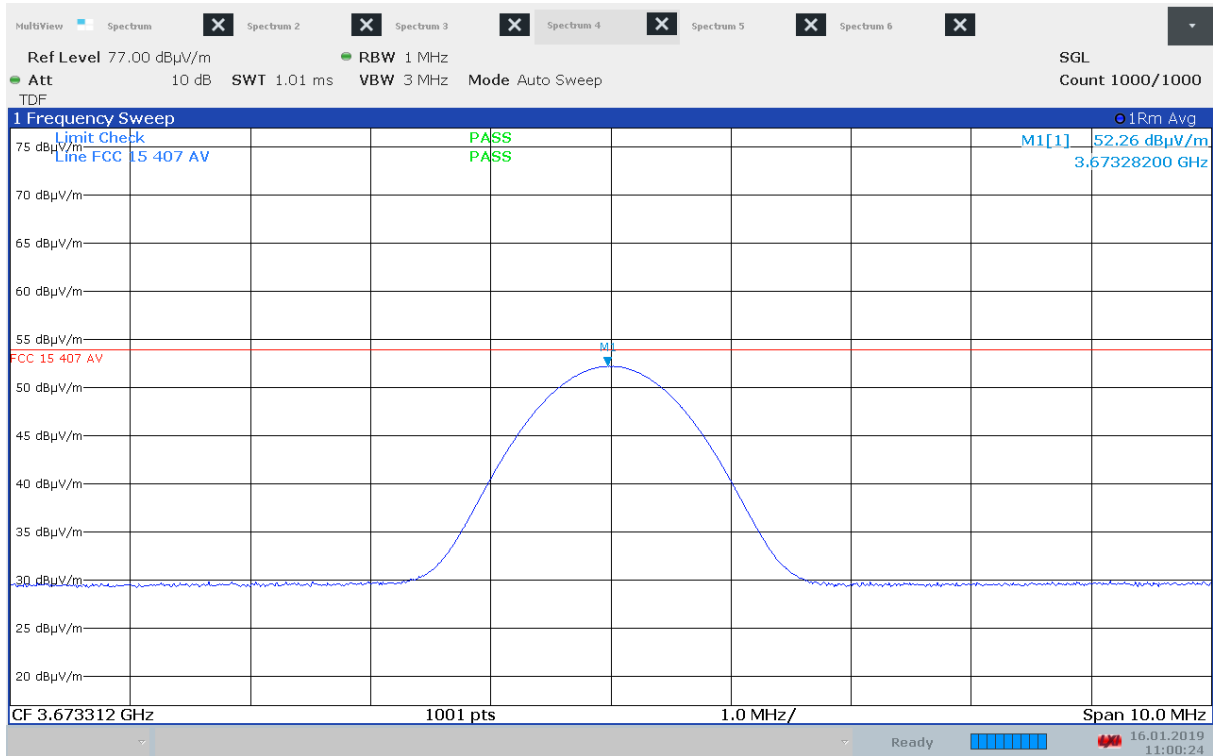
Radiated Emissions, 3453 MHz, ch36, 802.11a 6Mbps, EUT V, VP, Peak



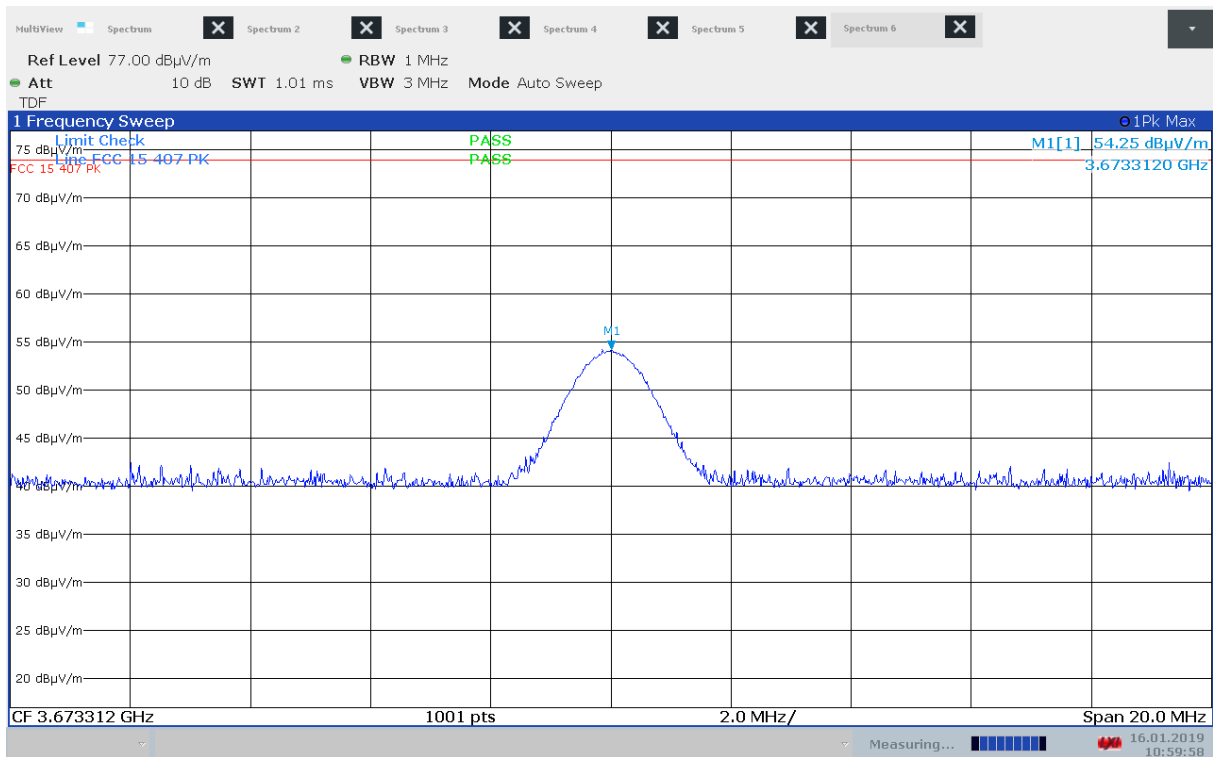
Radiated Emissions, 3667 MHz, ch36, 802.11a 6Mbps, EUT V, VP, Average



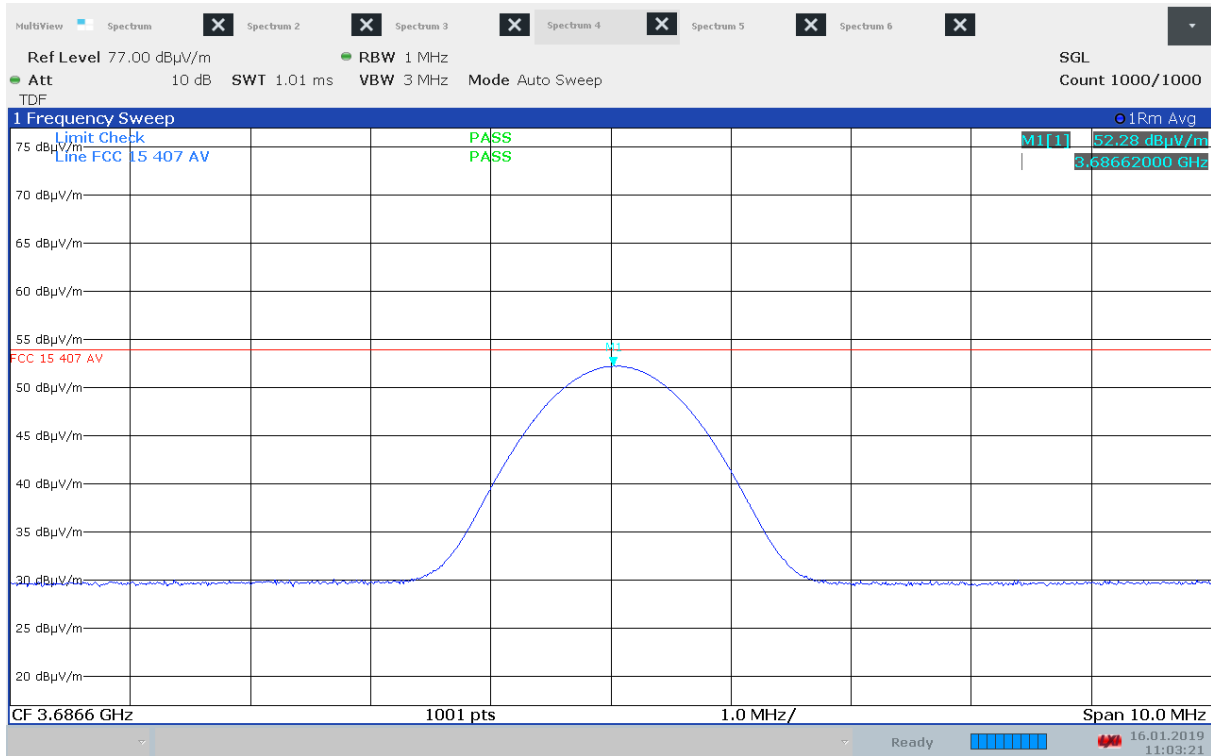
Radiated Emissions, 3667 MHz, ch36, 802.11a 6Mbps, EUT V, VP, Peak



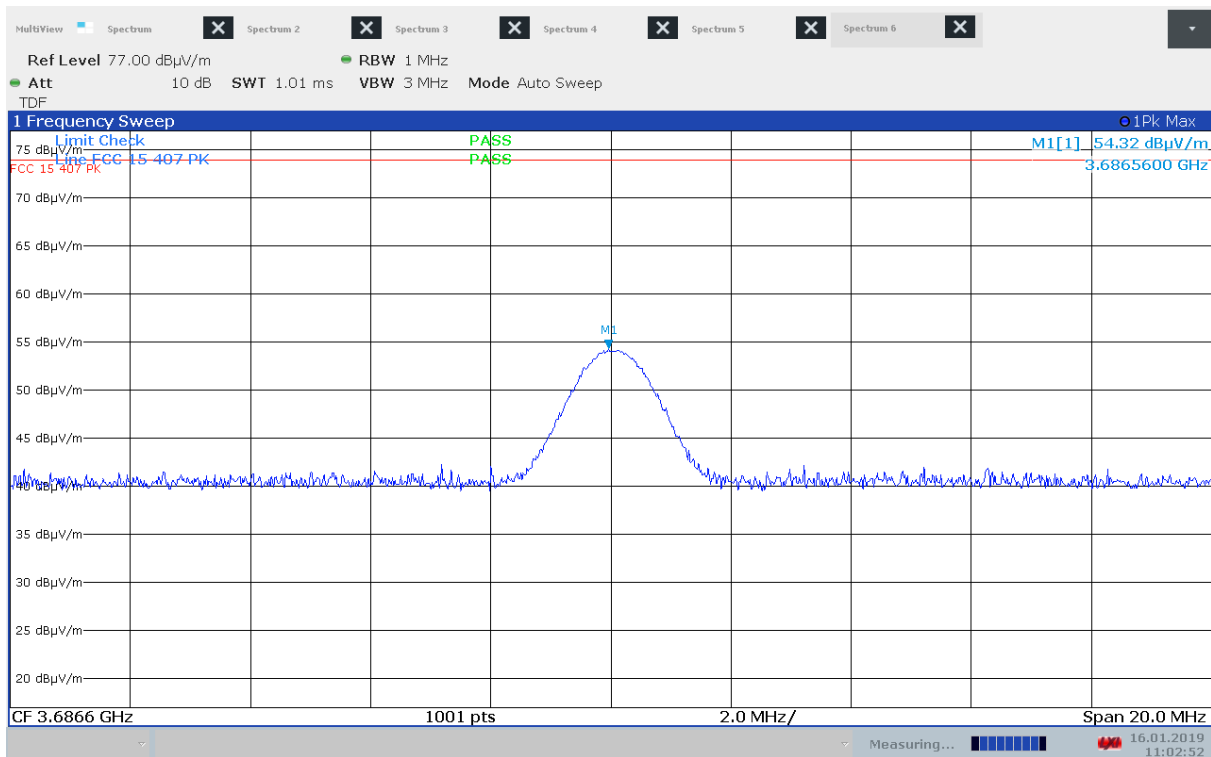
Radiated Emissions, 3673 MHz, ch102, 802.11a 6Mbps, EUT V, VP, Average



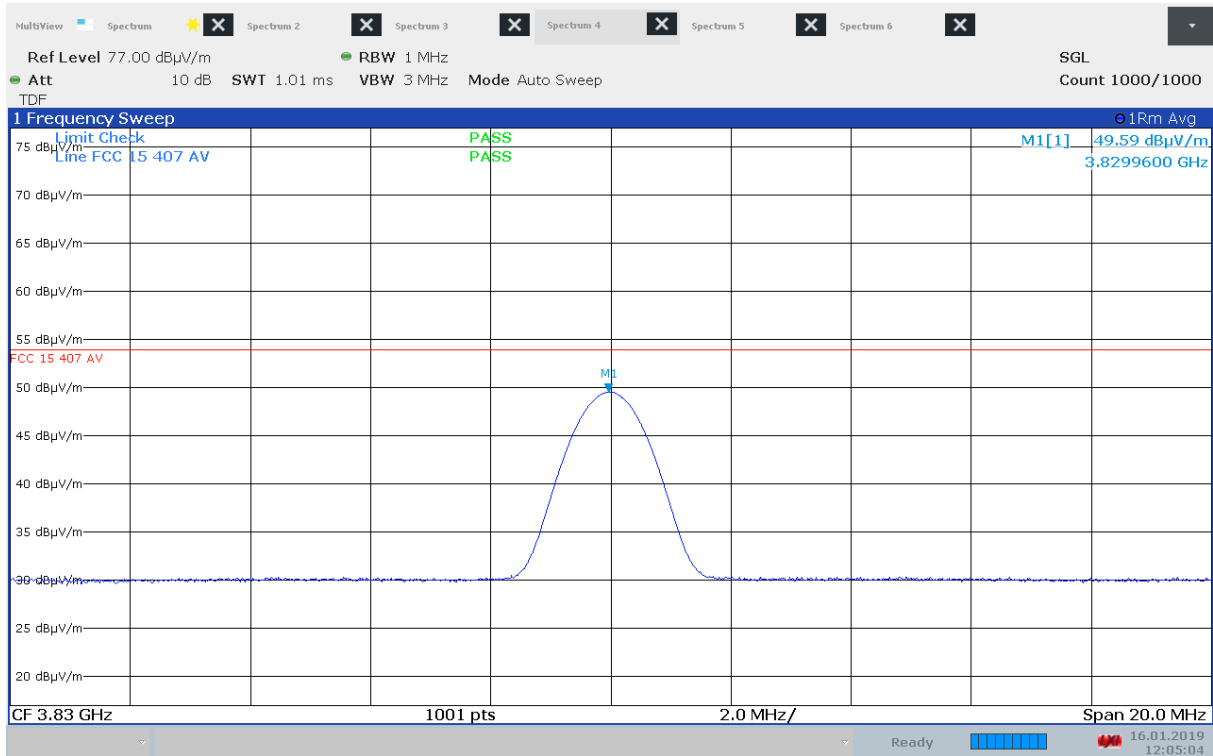
Radiated Emissions, 3673 MHz, ch102, 802.11a 6Mbps, EUT V, VP, Peak



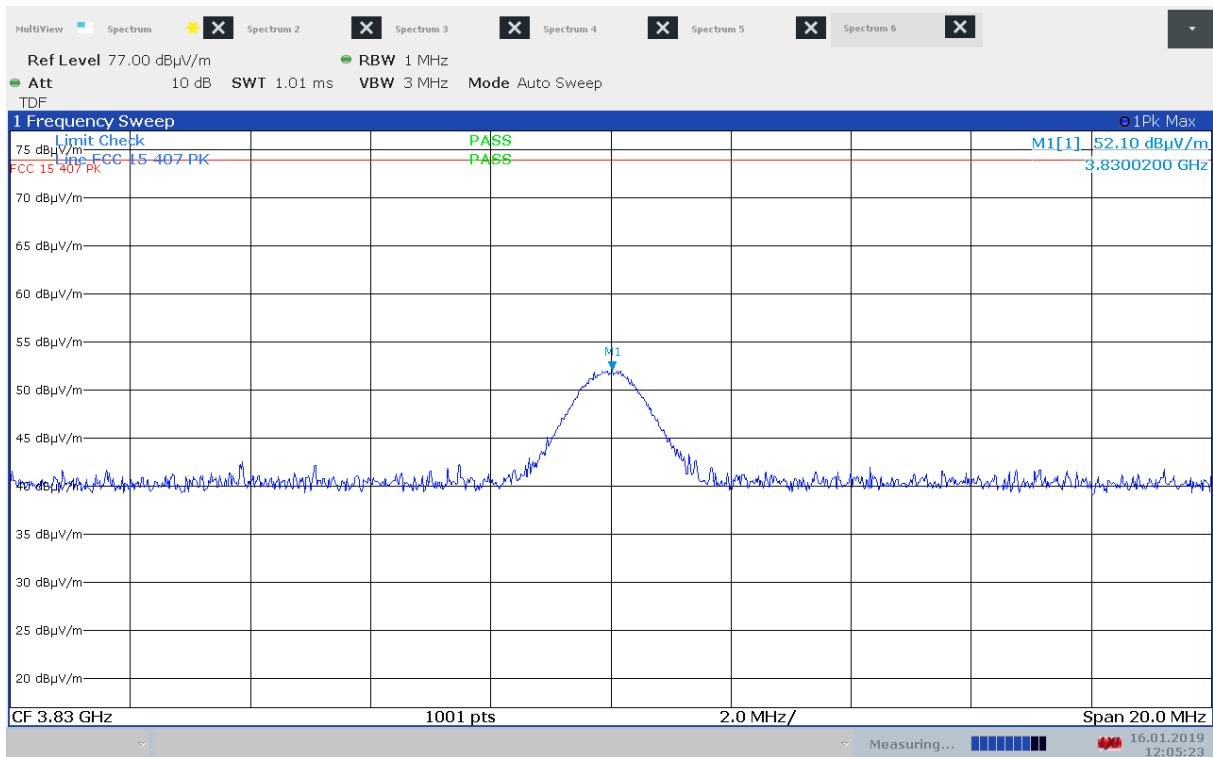
Radiated Emissions, 3686 MHz, ch106, 802.11ac HT80, EUT V, VP, Average



Radiated Emissions, 3686 MHz, ch106, 802.11ac HT80, EUT V, VP, Peak



Radiated Emissions, 3830 MHz, ch149, 802.11a 6Mbps, EUT V, VP, Average



Radiated Emissions, 3830 MHz, ch149, 802.11a 6Mbps, EUT V, VP, Peak

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	2018.01 2019.01	2019.01 2020.01
2	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2018.03 2019.01	2019.03 2020.01
3	6810-17B	Attenuator	Suhner	LR 1669	COU	
4	WHKX6.5/18G	Highpass Filter	Wainwright Inst.	LR 1619	COU	
5	JB3	BiLog Antenna	Sunol Sciences	N-4525	2016.05	2019.05*
6	317	Preamplifier	Sonoma Inst.	LR 1687	2018.07	2019.07
7	8449A	Pre-amplifier	Hewlett Packard	LR 1322	2018.07	2019.07
8	3115	Horn Antenna	EMCO	LR 1330	2016.10	2019.12
9	3117-PA	Horn Antenna +PreAmp	EMCO	LR 1717	2017-12	2019-12
10	Model 638	Antenna Horn	Narda	LR 1480	2010.06	2020.06
11	Model 87 V	Multimeter	Fluke	LR 1597	2018.02	2020.02
12	Model V637	Horn Antenna	Narda	LR 099	N/A	
13	JS4-20004000	Preamplifier	Miteq	LR 1591	2018.07	2019.07
14	ST18/SMA/N/36	RF Cable	Suhner	LR 1627	COU	
15	SF102/1000MM	RF Cable	Suhner	SN 50113/2	COU	
16	SF102/2000MM	RF Cable	Suhner	SN 500100/2	COU	

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

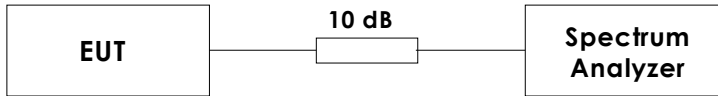
*All radiated measurements were performed 2019-04-10 or earlier.

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

No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.30.10	Radiated Emission test software
2	Rohde & Schwarz	GPBShot	2.7	Screenshots from R&S Spectrum Analyzers
3				

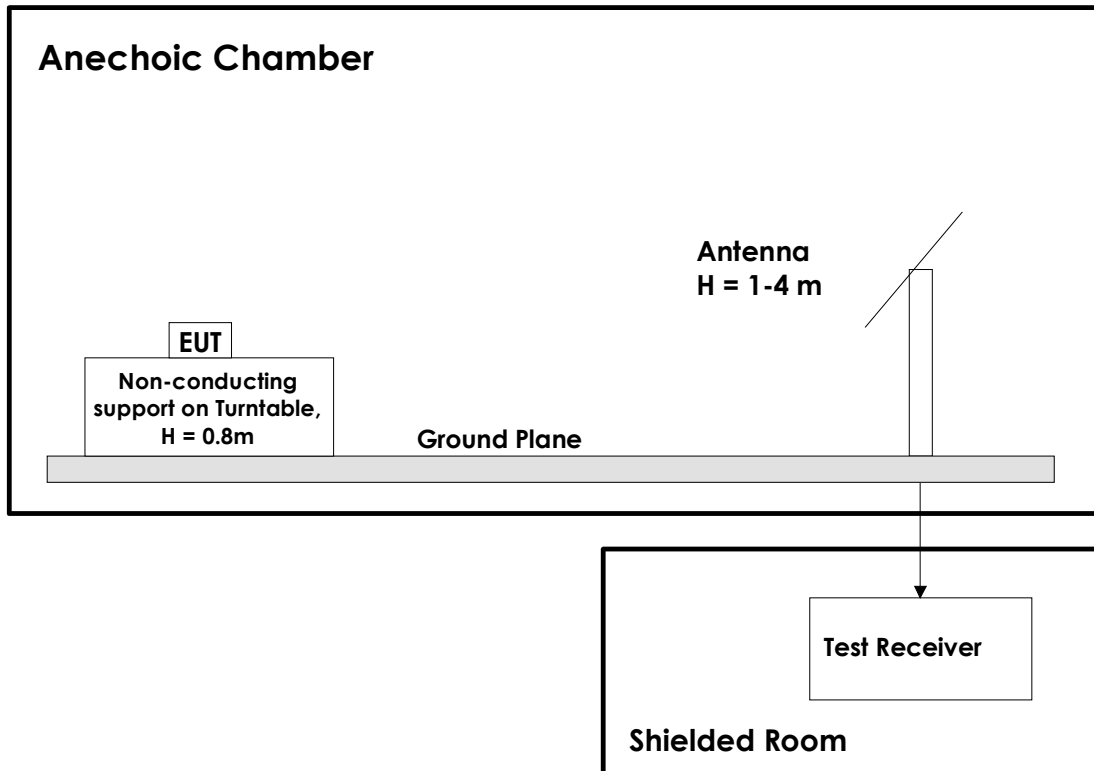
6 BLOCK DIAGRAM

6.1 Conducted Tests



This test set-up is used for all Conducted tests.

6.2 Test Site Radiated Emission



This test setup is used for all radiated emissions tests. Measuring distance is 3m for all frequencies up to 18 GHz. Above 18 GHz measuring distance is 1m.

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

All measurements at 1 GHz 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.

Above 18 GHz the test receiver is moved inside the anechoic chamber and located next to the antenna to minimize the cable loss.