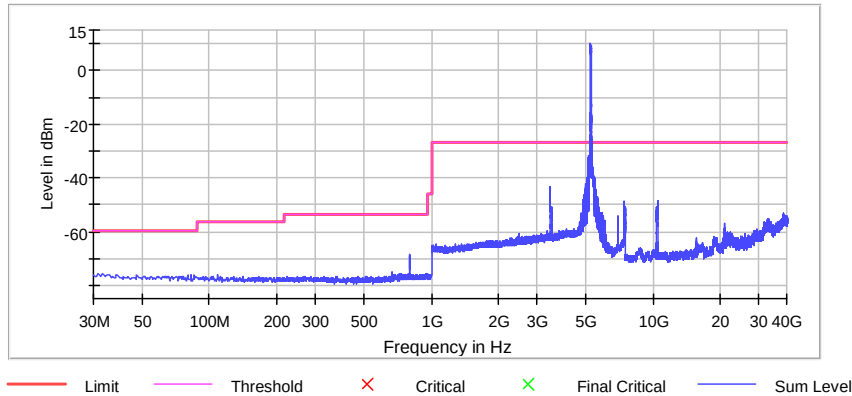
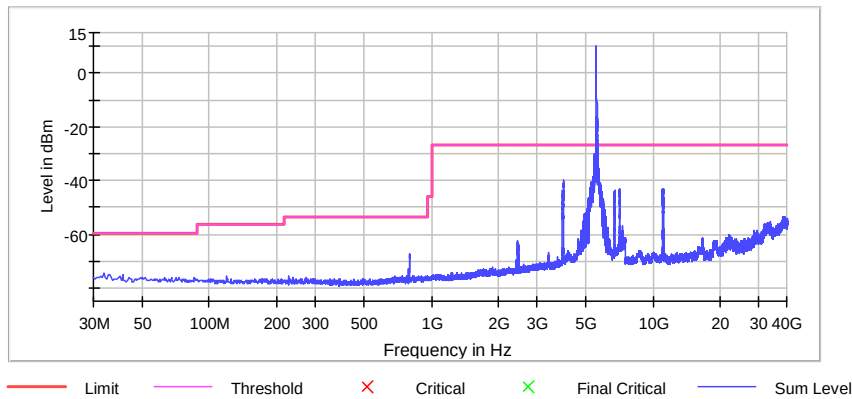


Spurious



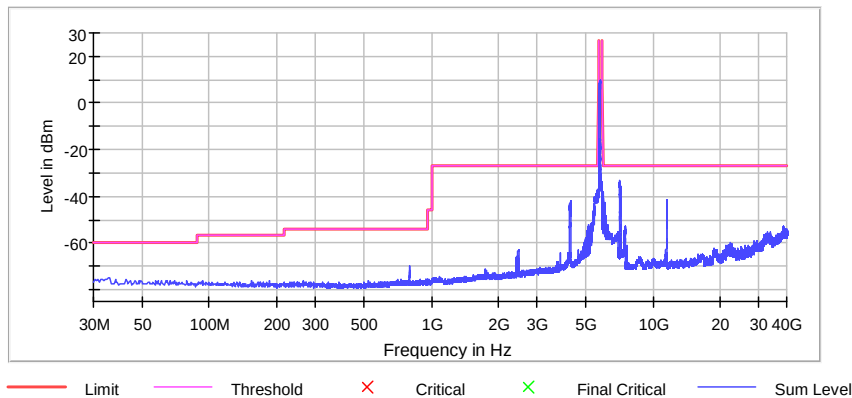
Unwanted Emissions 30M-40GHz, ch046, 802.11ac HT40, MIMO, Conducted

Spurious

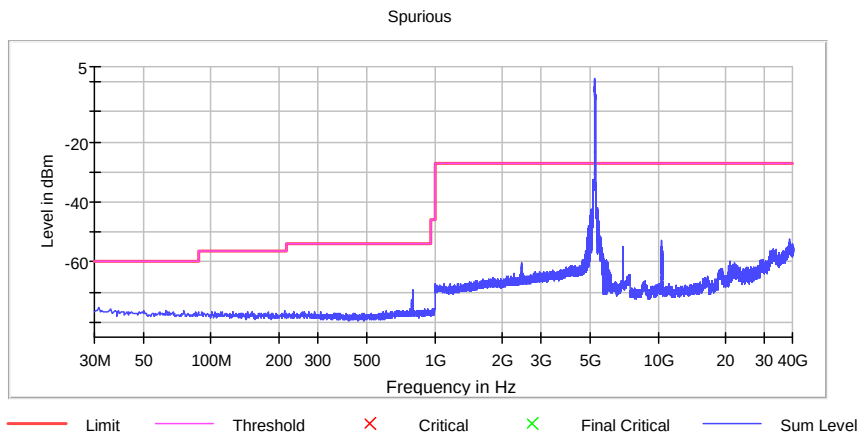


Unwanted Emissions 30M-40GHz, ch110, 802.11ac HT40, MIMO, Conducted

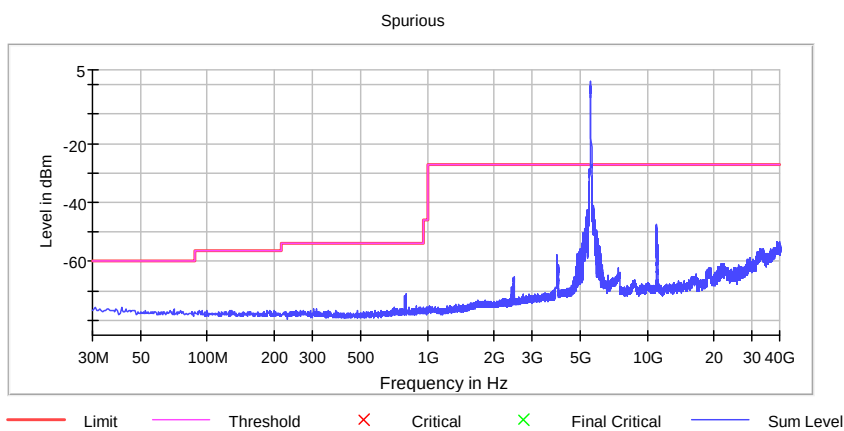
Spurious



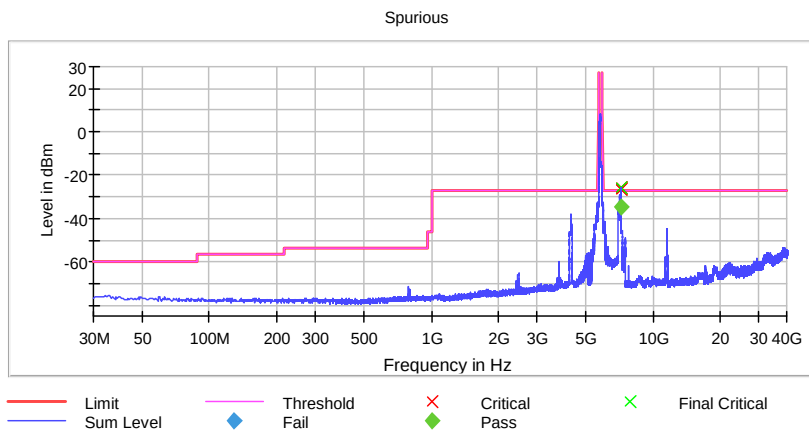
Unwanted Emissions 30M-40GHz, ch151, 802.11ac HT40, MIMO, Conducted



Unwanted Emissions 30M-40GHz, ch042, 802.11ac HT80, Ant1, Conducted



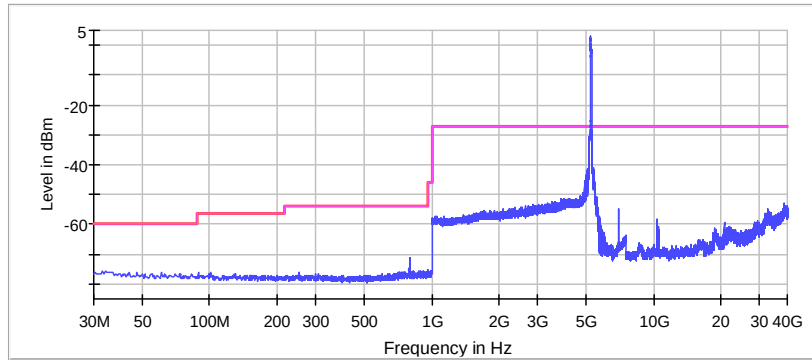
Unwanted Emissions 30M-40GHz, ch106, 802.11ac HT80, Ant1, Conducted



Unwanted Emissions 30M-40GHz, ch155, 802.11ac HT80, Ant1, Conducted

Measured: 7152.5 MHz, Level: -34.8 dBm, Limit: -27.0 dBm, Margin: 7.8 dB

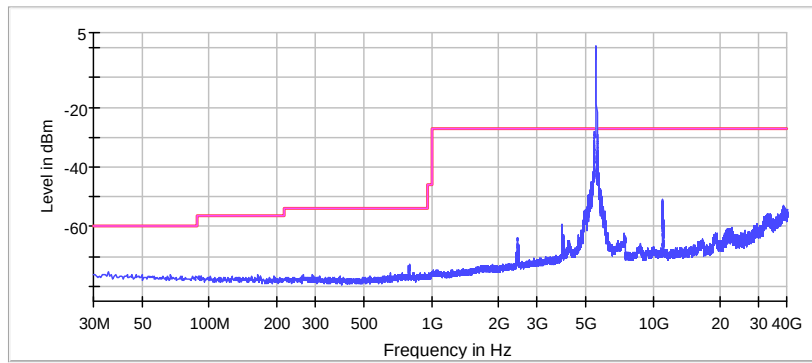
Spurious



— Limit — Threshold × Critical × Final Critical — Sum Level

Unwanted Emissions 30M-40GHz, ch042, 802.11ac HT80, MIMO, Conducted

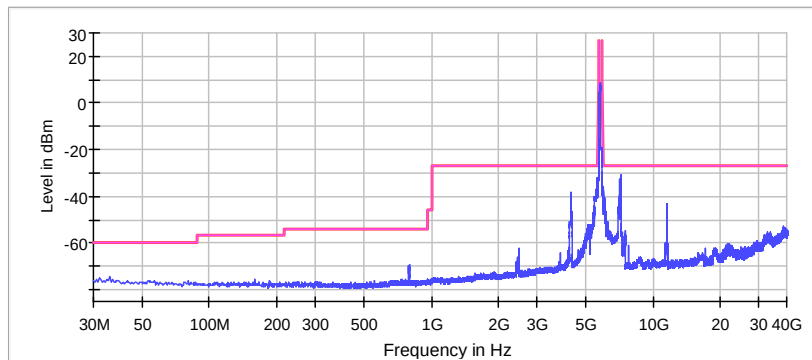
Spurious



— Limit — Threshold × Critical × Final Critical — Sum Level

Unwanted Emissions 30M-40GHz, ch106, 802.11ac HT80, MIMO, Conducted

Spurious



— Limit — Threshold × Critical × Final Critical — Sum Level

Unwanted Emissions 30M-40GHz, ch155, 802.11ac HT80, MIMO, Conducted

4.6 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)	ISED (MHz)	FCC (GHz)	ISED (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.

4.7 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 ch 048/116/157.

Measured Frequency (MHz)	Carrier Frequency (MHz)	Modulation	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30 – 88	2440	GFSK	< 30	40.0	> 10
88 – 216	2440	GFSK	40.0	43.5	3.5
216 – 960	2440	GFSK	< 36	46.0	> 10
960 – 1000	2440	GFSK	< 35	54.0	> 19
120.010	2440	GFSK	40.0	43.5	3.5

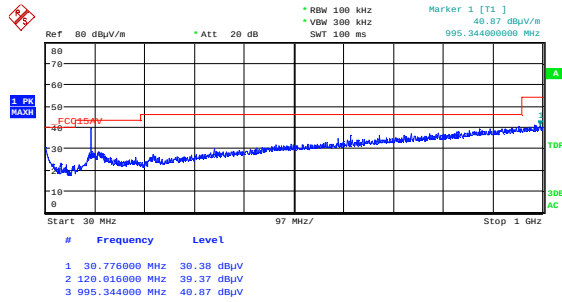
The spurious at 120.010 MHz is independent of RF signal or antenna type.

See attached plots.

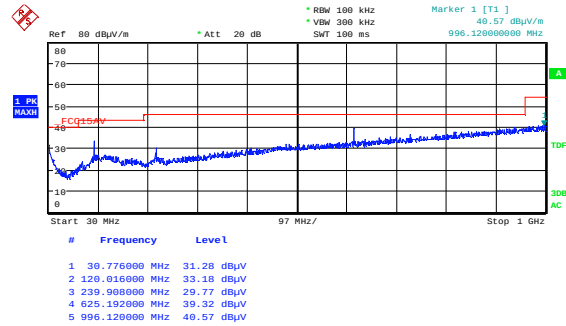
Requirements/Limit

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	

Combi Antenna

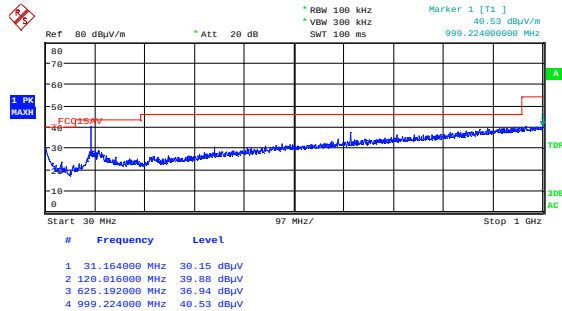


Date: 10.MAR.2023 14:42:28

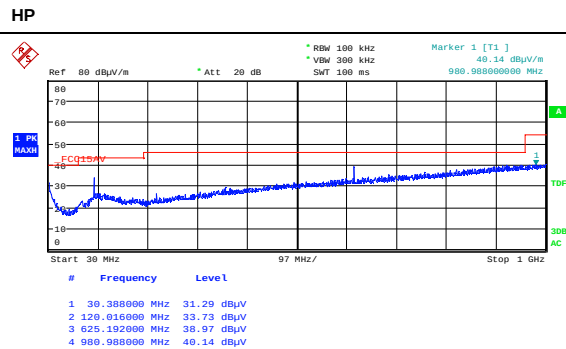


Date: 10.MAR.2023 14:44:24

Radiated Emissions 30-1000 MHz, Ch048, 802.11n HT20, MIMO, VP

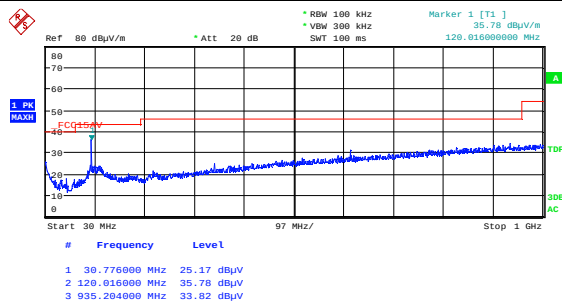


Date: 10.MAR.2023 14:54:44

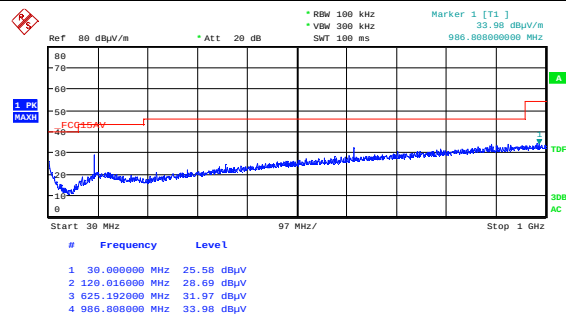


Date: 10.MAR.2023 15:04:53

Radiated Emissions 30-1000 MHz, Ch116, 802.11n HT20, MIMO, VP



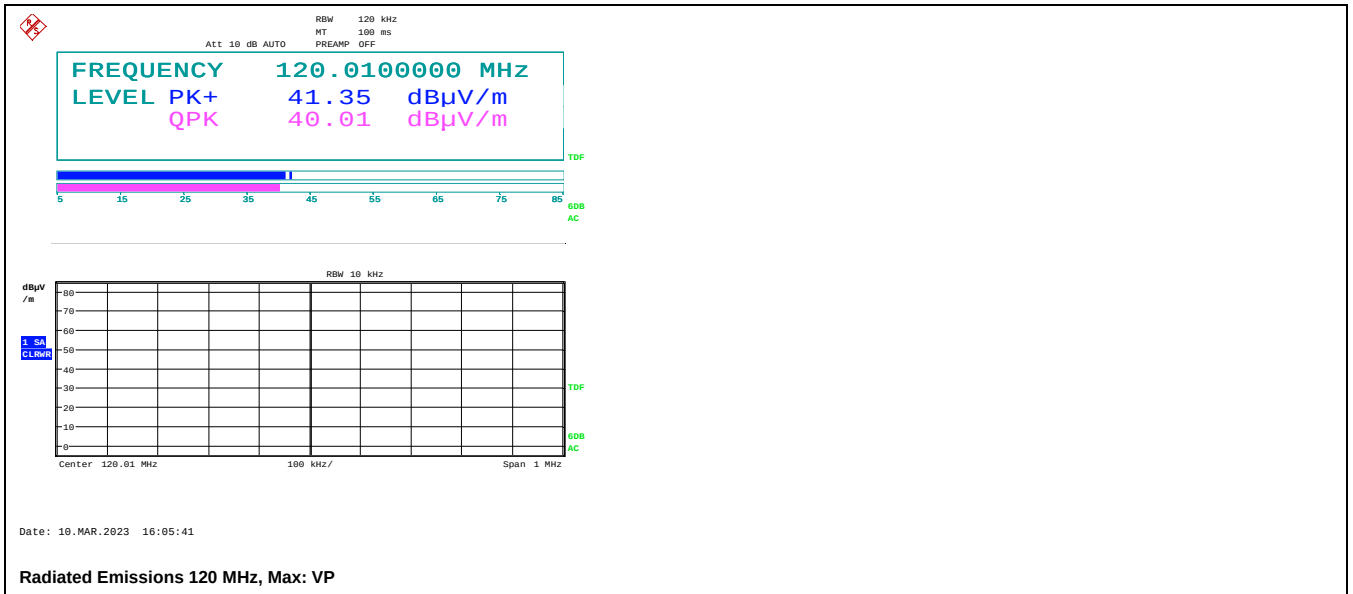
Date: 10.MAR.2023 15:19:30



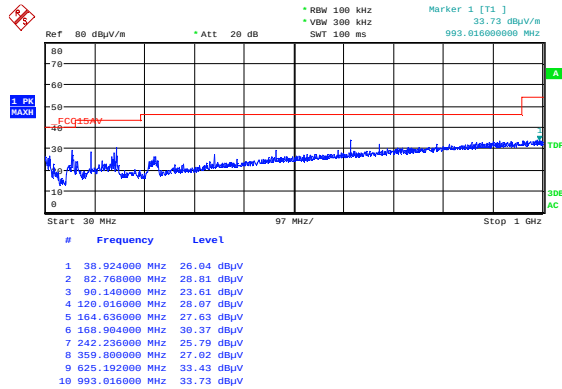
Date: 10.MAR.2023 15:25:57

Radiated Emissions 30-1000 MHz, Ch157, 802.11n HT20, MIMO, VP

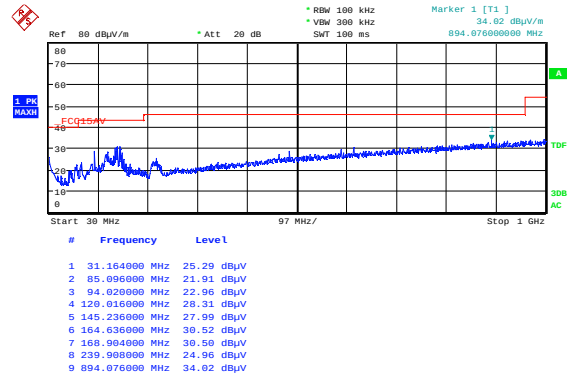
HP



Whip+Patch Antenna

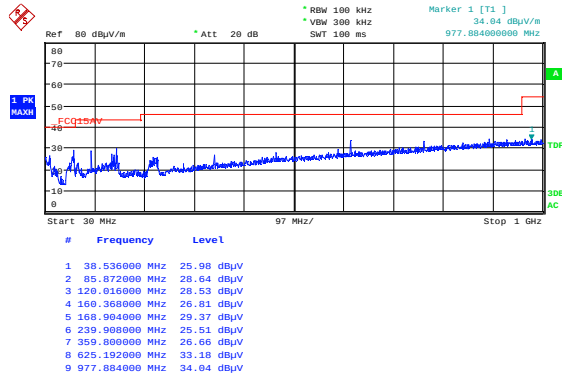


Date: 13.MAR.2023 11:04:17

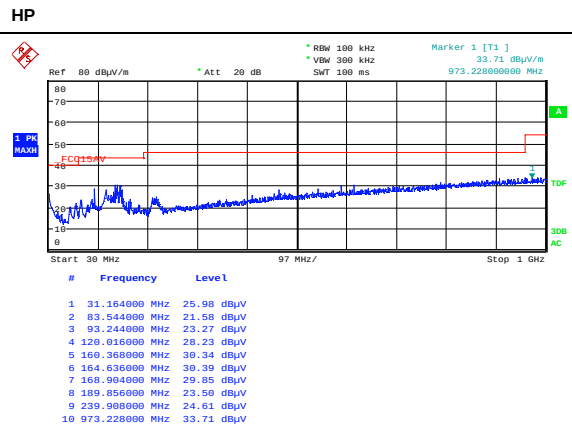


Date: 13.MAR.2023 11:06:14

Radiated Emissions 30-1000 MHz, Ch048, 802.11n HT20, MIMO, VP

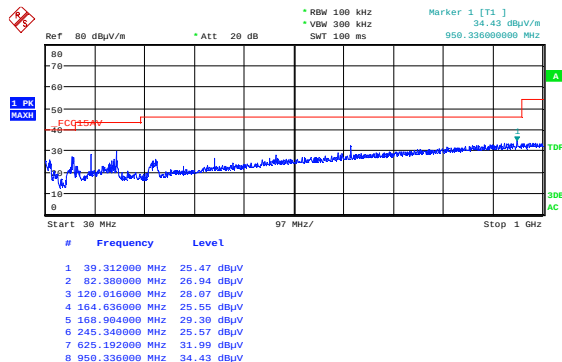


Date: 13.MAR.2023 11:11:41

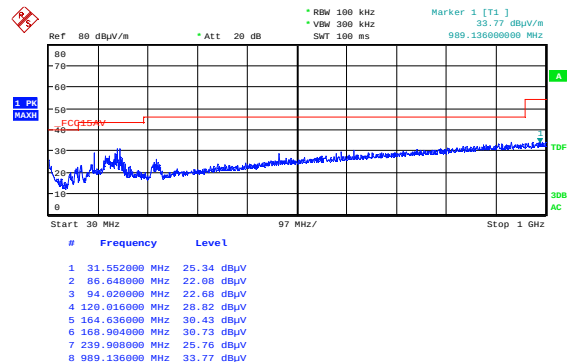


Date: 13.MAR.2023 11:13:38

Radiated Emissions 30-1000 MHz, Ch116, 802.11n HT20, MIMO, VP



Date: 13.MAR.2023 11:55:42



Date: 13.MAR.2023 11:57:38

Radiated Emissions 30-1000 MHz, Ch157, 802.11n HT20, MIMO, VP

HP

4.8 Radiated Emissions, 1 – 40 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.

A prescan at approx. 1m was performed from 18 – 40 GHz.

Peak Detector, RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (GHz)	Modulation	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5180	5150	Any	68.1	74	5.9
5320	5350	Any	67.4	74	6.6
5500	5460	Any	68.2	74	5.8
5220	10440	802.11a	57.5	74	16.5
5580	11160	802.11a	54.5	74	19.5

Band Edge values with Peak Detector are reported in clause 2.8

Average Detector, RBW=1 MHz

Carrier freq. (MHz)	Measured Frequency (GHz)	Modulation	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5180	5150	Any	53.5	54	0.5
5320	5350	Any	50.6	54	3.4
5500	5460	Any	53.1	54	0.9
5220	10440*	802.11a	45.3	54	8.7
5580	11160	802.11a	44.9	54	10.1

*Not in a Restricted Band

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.

BandStop Filters were used for measurements from 1 to 18 GHz.

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

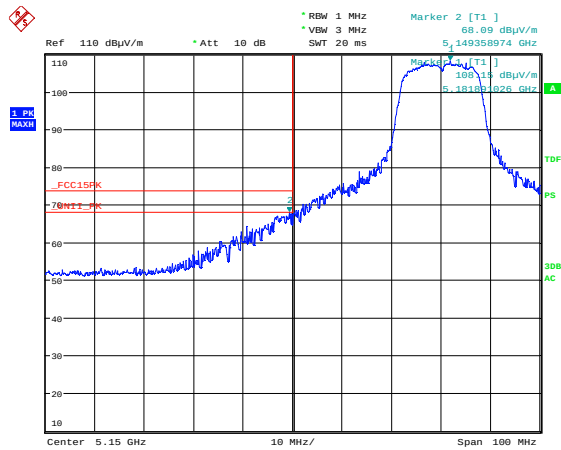
Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer "Transducer factor".

See attached plots.

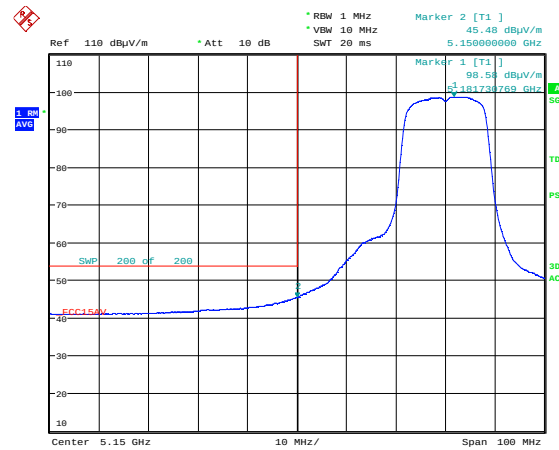
Requirements/Limit

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 (dBµV/m)	Peak Detector (dBµV/m)
1 – 40 GHz	54.0	74.0

Combi Antenna



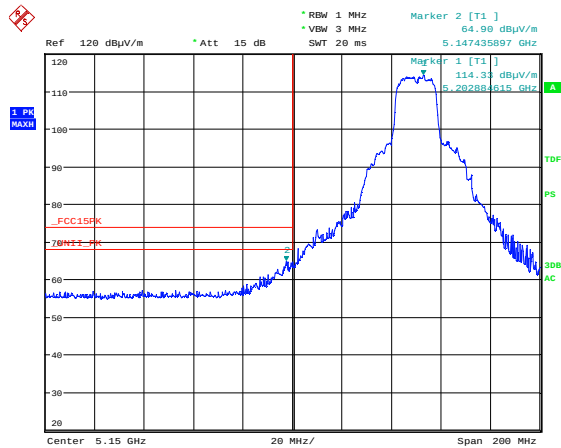
Date: 12.JUL.2023 12:43:14



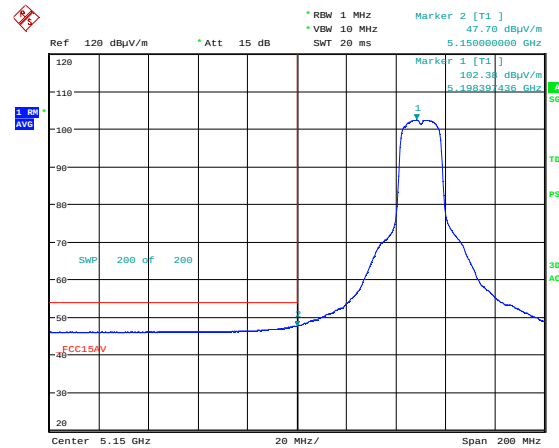
Date: 12.JUL.2023 12:44:38

Band Edge 5150 MHz, ch036, 802.11a 6Mb, Radiated, Max, Pk, PL8

Av



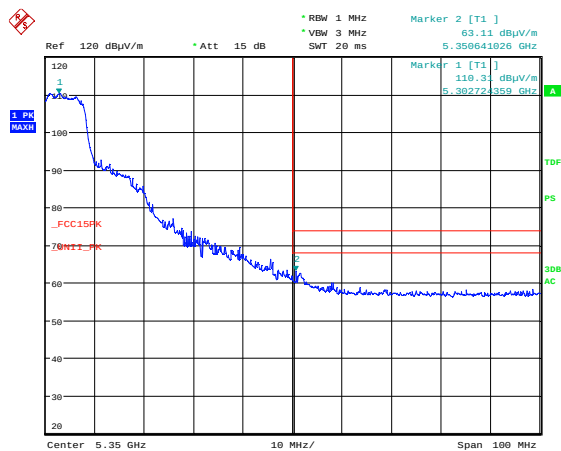
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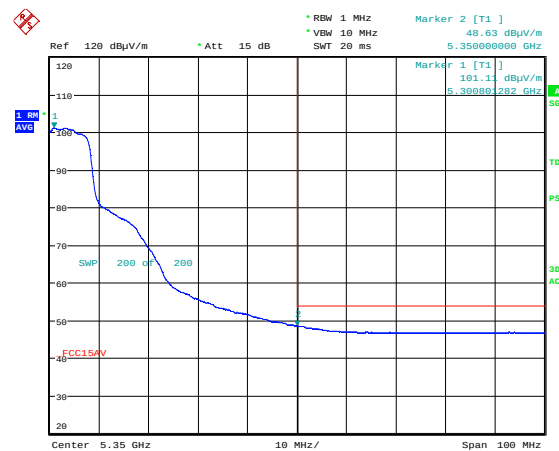
Date: 12.JUL.2023 11:17:12

Band Edge 5150 MHz, ch040, 802.11a 6Mb, Radiated, Max, Pk

Av



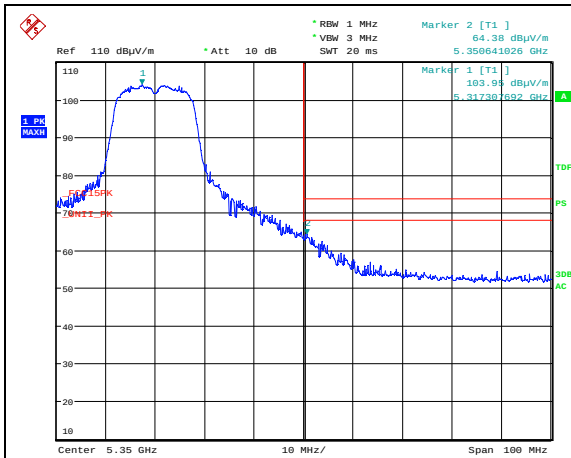
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Date: 12.JUL.2023 12:59:52

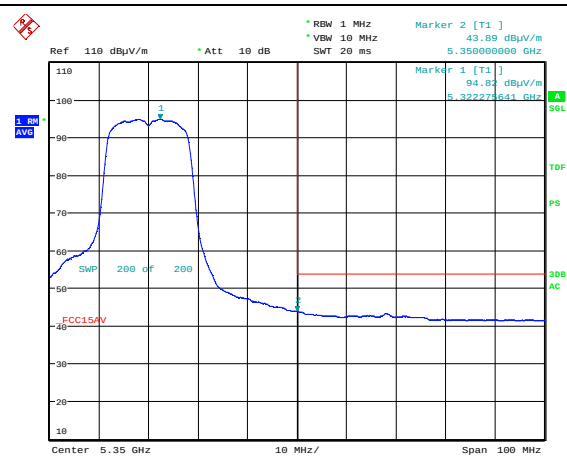
Band Edge 5350 MHz, ch060, 802.11a 6Mb, Radiated, Max, Pk

Av



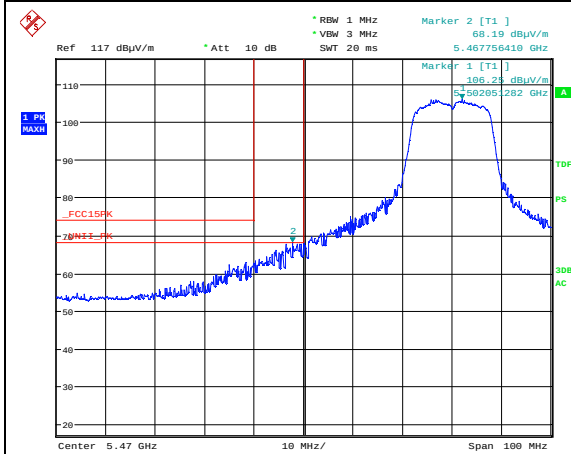
Date: 12.JUL.2023 13:01:36

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



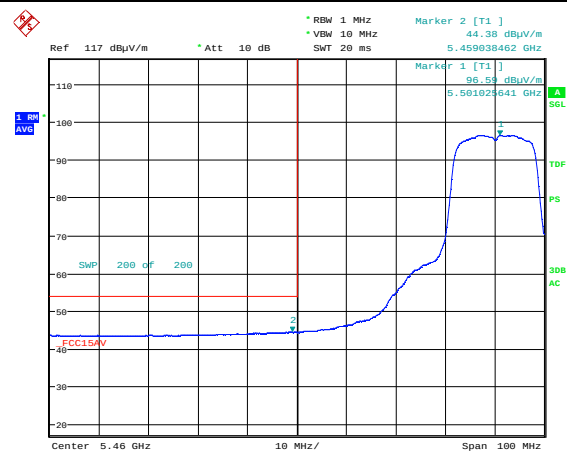
Date: 12.JUL.2023 13:04:37

Av



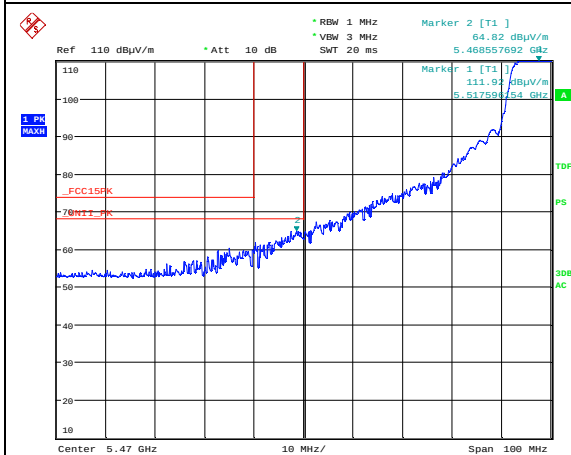
Date: 12.JUL.2023 13:15:18

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



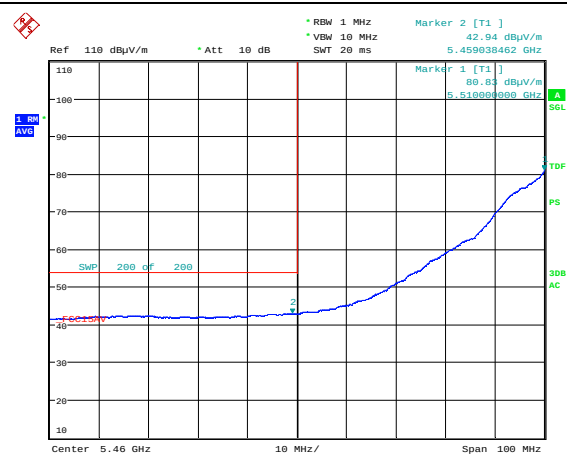
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Av



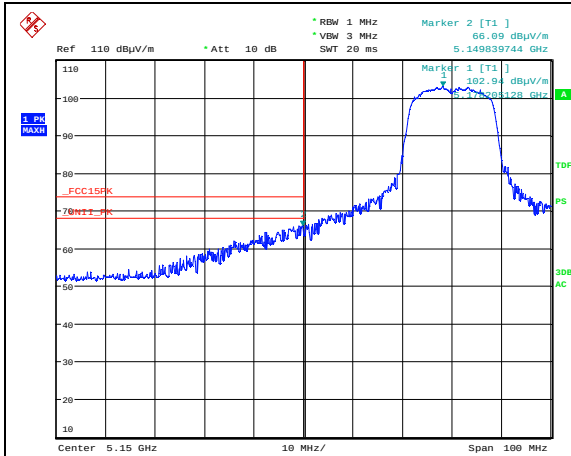
Date: 12.JUL.2023 13:09:20

Band Edge 5470 MHz, ch104, 802.11a 6Mb, Radiated, Max, Pk



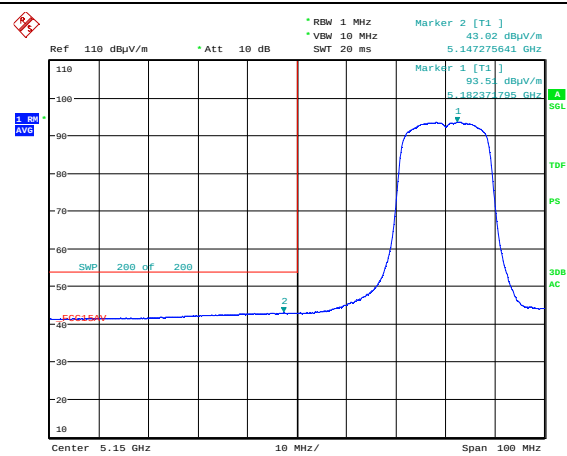
Date: 12.JUL.2023 13:10:03

Av



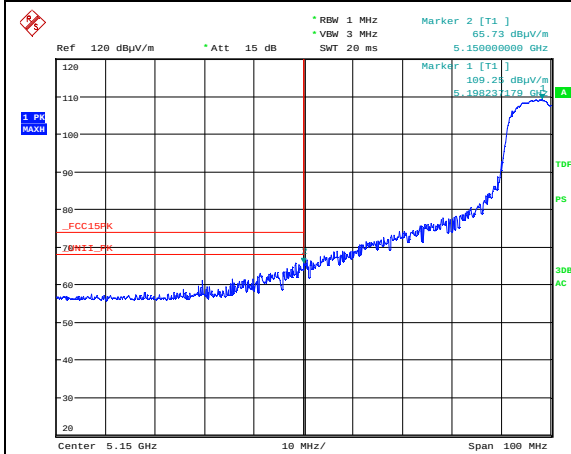
Date: 12.JUL.2023 10:54:18

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



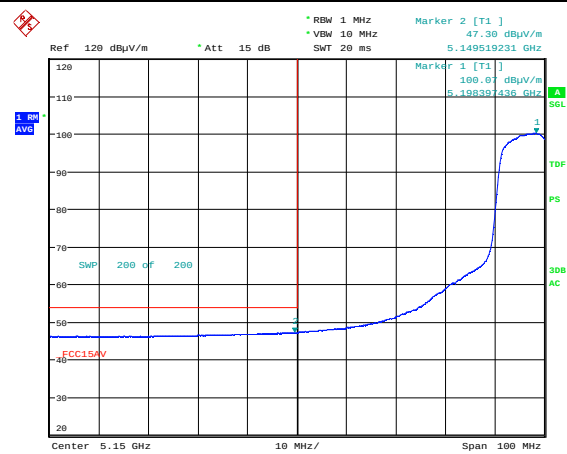
Date: 12.JUL.2023 10:55:14

Av



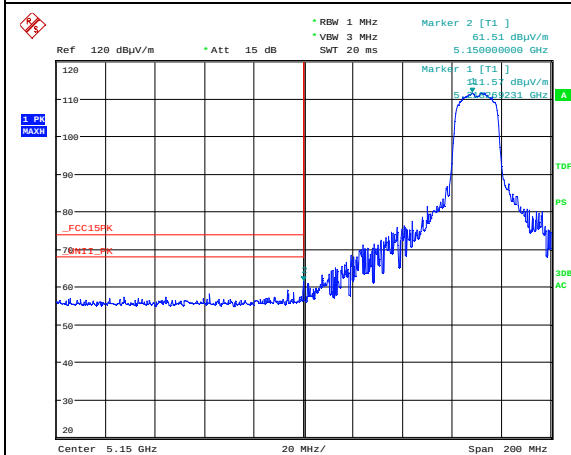
Date: 12.JUL.2023 10:59:59

Band Edge 5150MHz, ch040, 802.11n HT20 SISO, Radiated, Max, Pk PL14



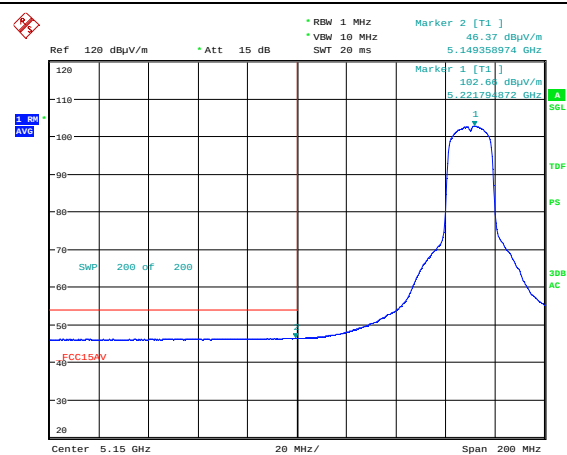
Date: 12.JUL.2023 11:02:02

Av



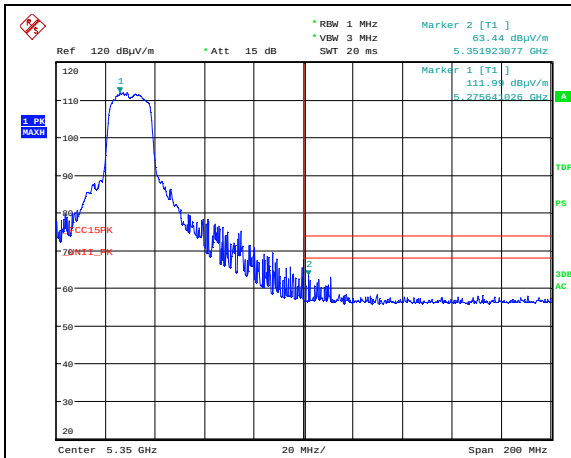
Date: 12.JUL.2023 11:04:08

Band Edge 5150MHz, ch044, 802.11n HT20 SISO, Radiated, Max, Pk



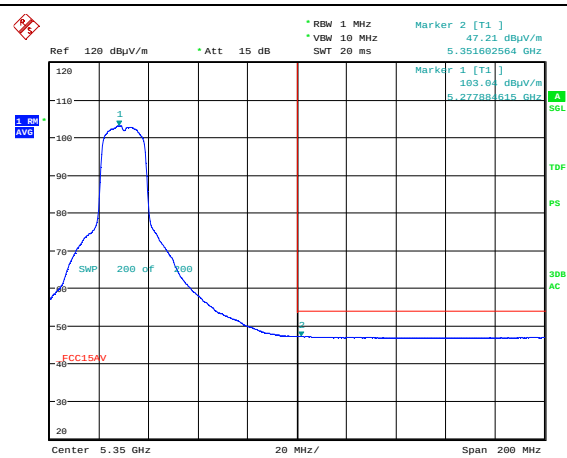
Date: 12.JUL.2023 11:04:58

Av



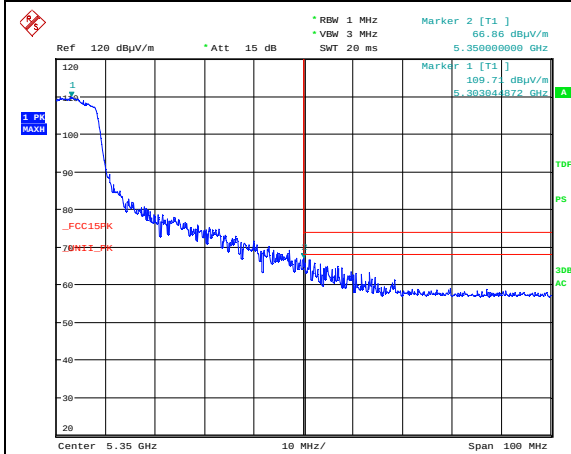
Date: 12.JUL.2023 10:41:42

Band Edge 5350 MHz, ch056, 802.11n HT20 SISO, Radiated, Max, Pk



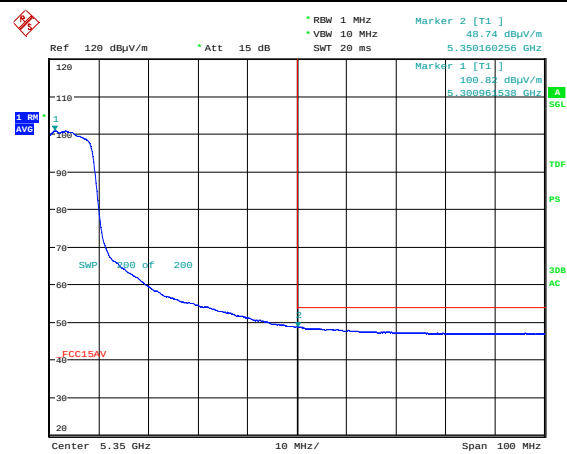
Date: 12.JUL.2023 10:42:23

Av



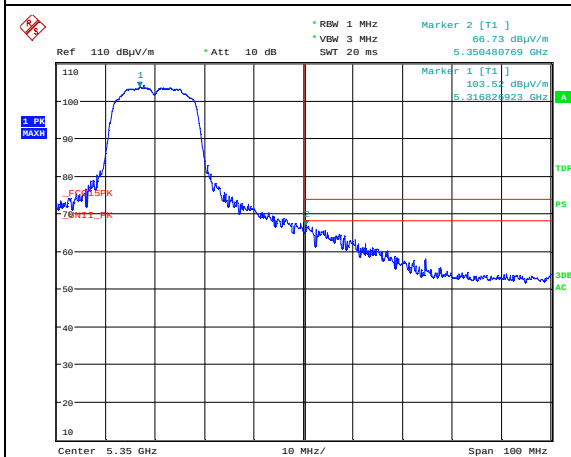
Date: 12.JUL.2023 10:39:08

Band Edge 5350 MHz, ch060, 802.11n HT20 SISO, Radiated, Max, Pk PL14



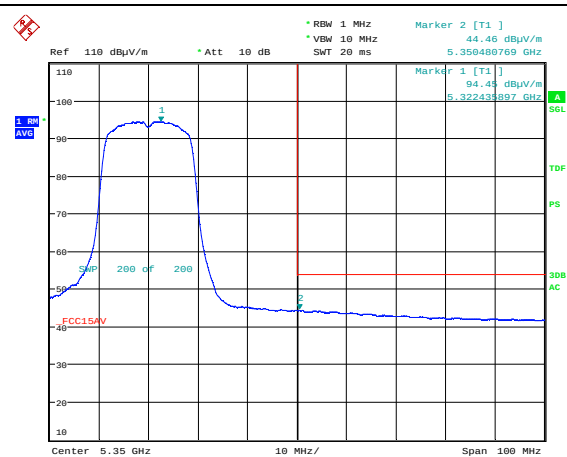
Date: 12.JUL.2023 10:39:33

Av



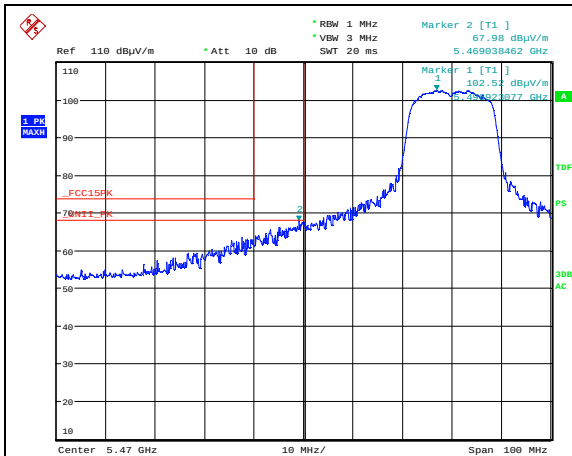
Date: 12.JUL.2023 10:31:55

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



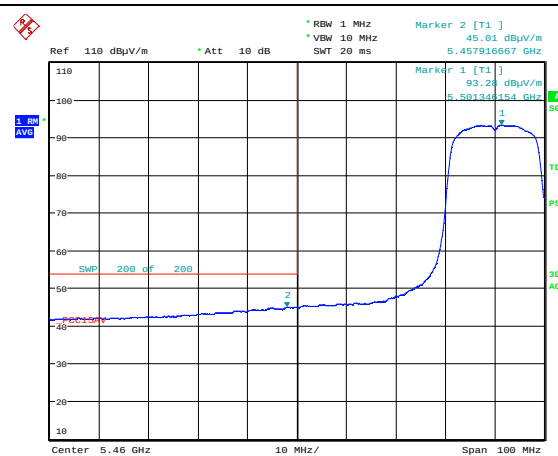
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Av



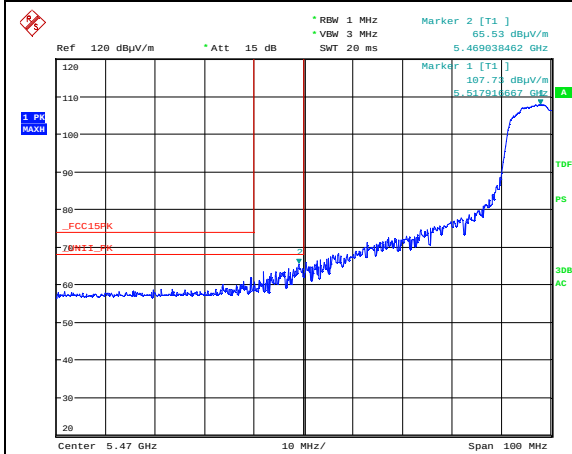
Date: 12.JUL.2023 10:28:02

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



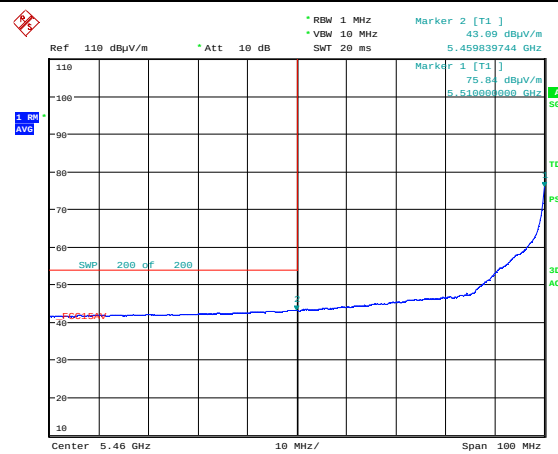
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Av



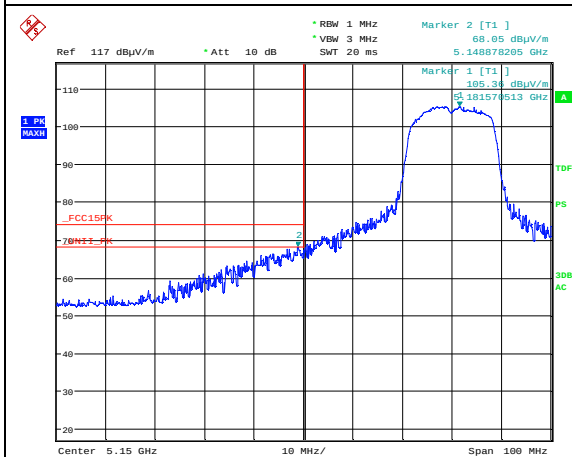
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Band Edge 5470 MHz, ch104, 802.11n HT20 SISO, Radiated, Max, Pk PL11



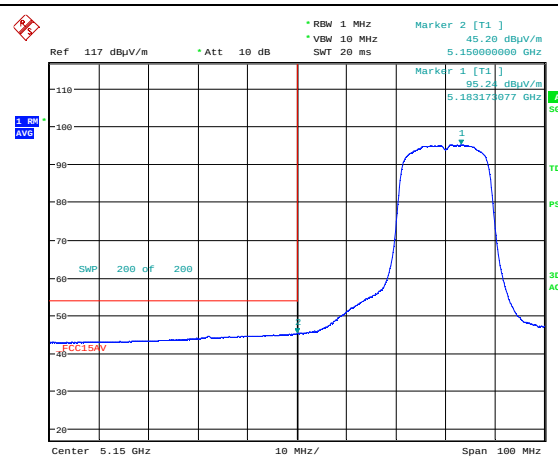
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Av



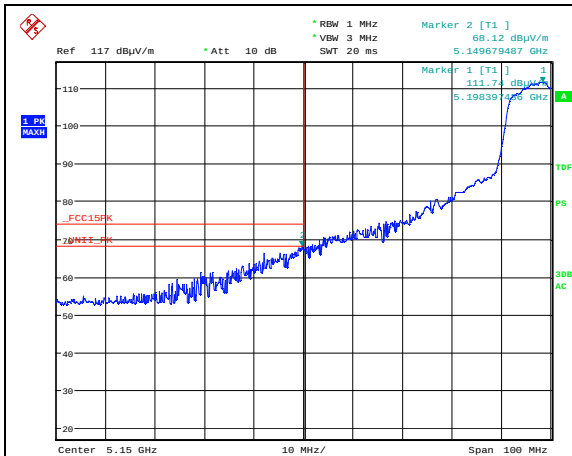
Date: 12.JUL.2023 15:26:33

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



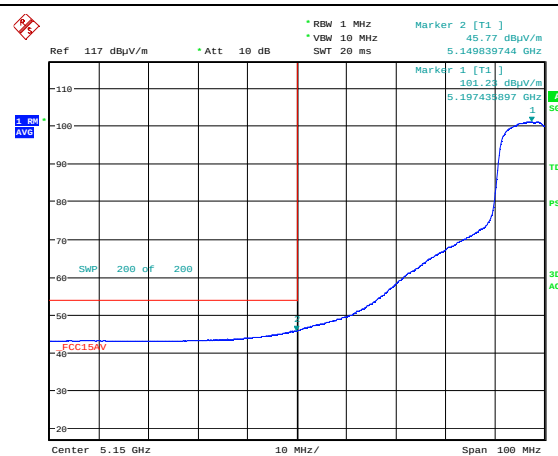
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Av



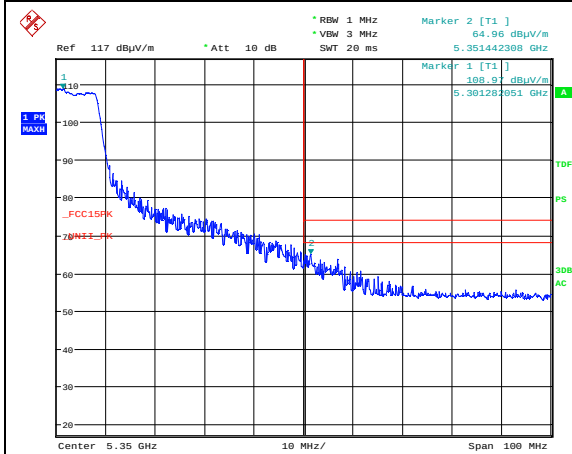
Date: 12.JUL.2023 15:21:35

Band Edge 5150 MHz, ch040, 802.11n HT20 MIMO, Radiated, Max, Pk



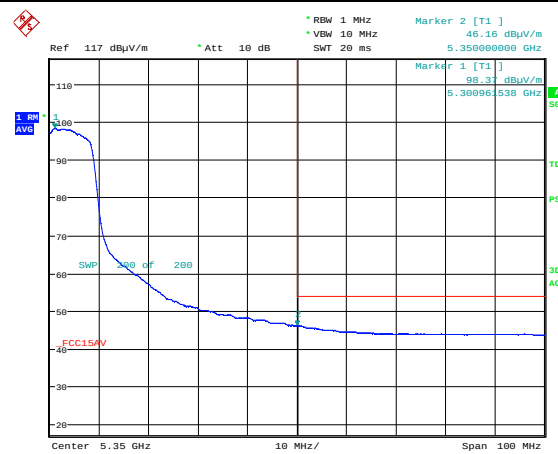
Date: 12.JUL.2023 15:21:57

Av



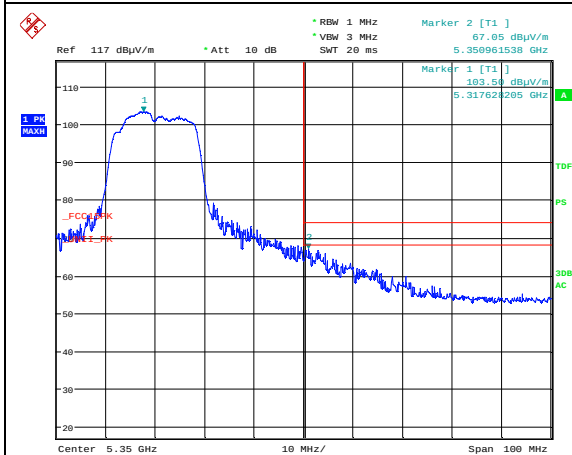
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Band Edge 5350 MHz, ch060, 802.11n HT20 MIMO, Radiated, Max, Pk



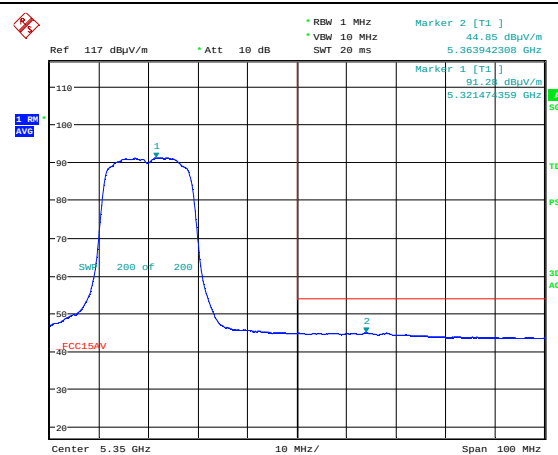
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Av



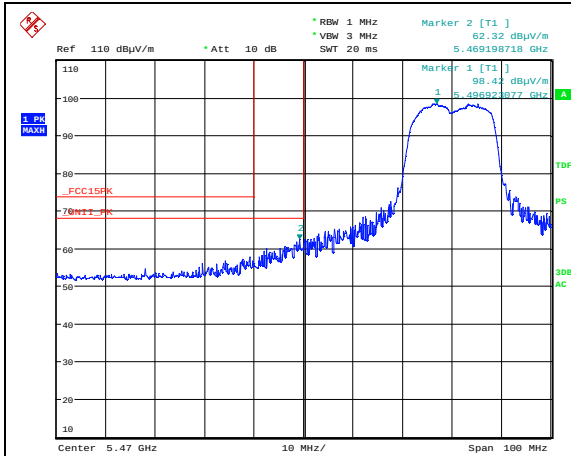
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Band Edge 5350 MHz, ch064, 802.11n HT20 MIMO, Radiated, Max, Pk



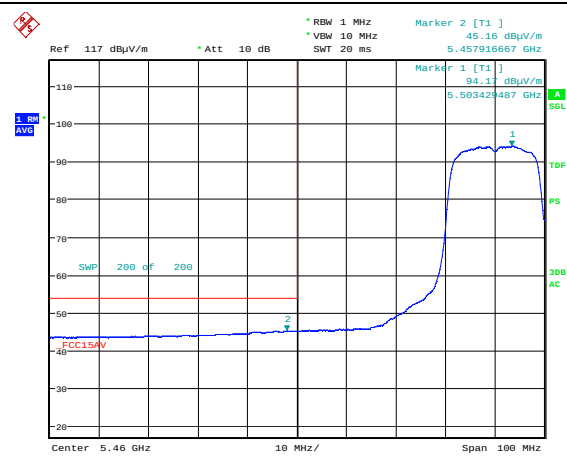
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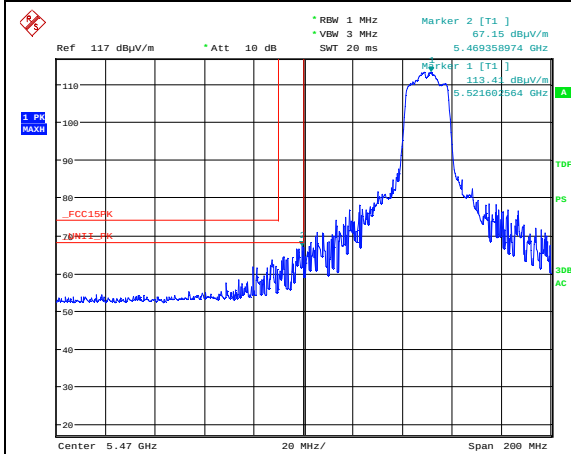
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Band Edge 5470 MHz, ch100, 802.11n HT20 MIMO, Radiated, Max, Pk



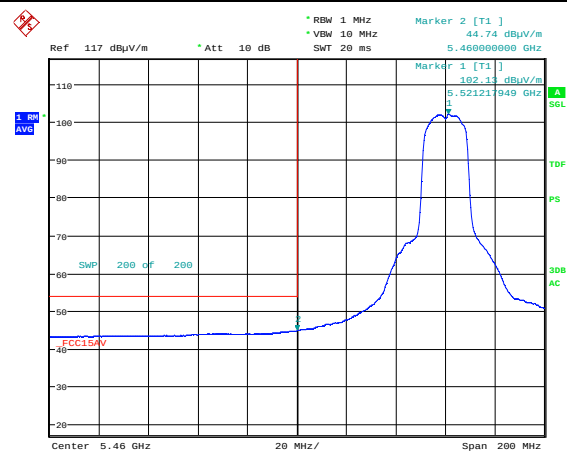
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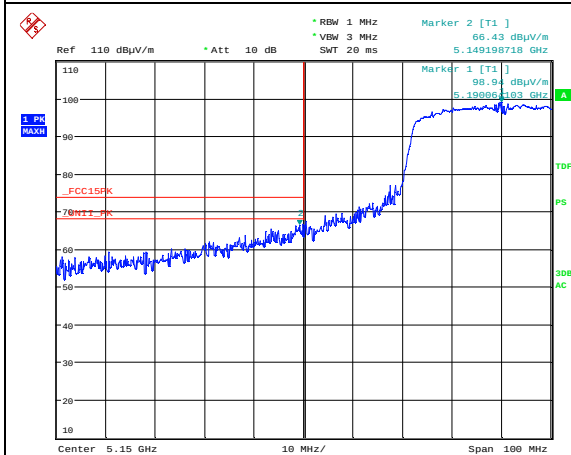
Date: 12.JUL.2023 14:31:24

Band Edge 5470 MHz, ch104, 802.11n HT20 MIMO, Radiated, Max, Pk



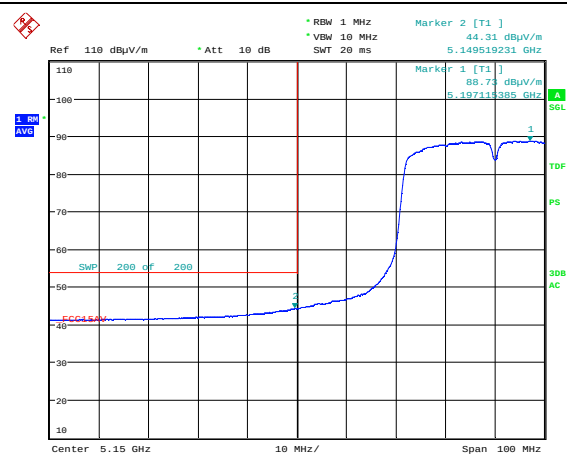
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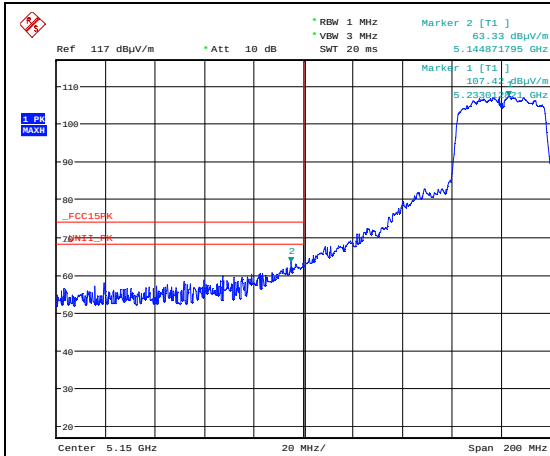
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Band Edge 5150 MHz, ch038, 802.11n HT40 SISO, Radiated, Max, Pk



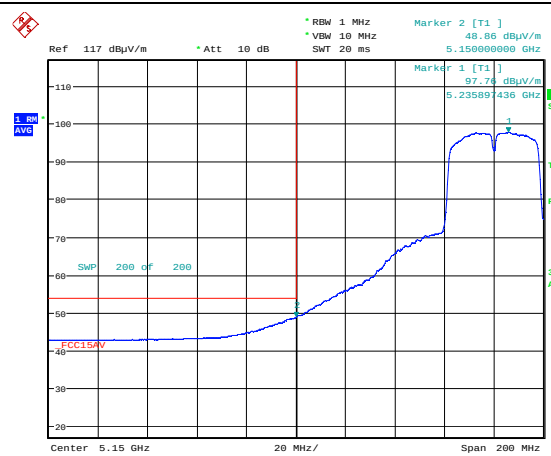
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Av



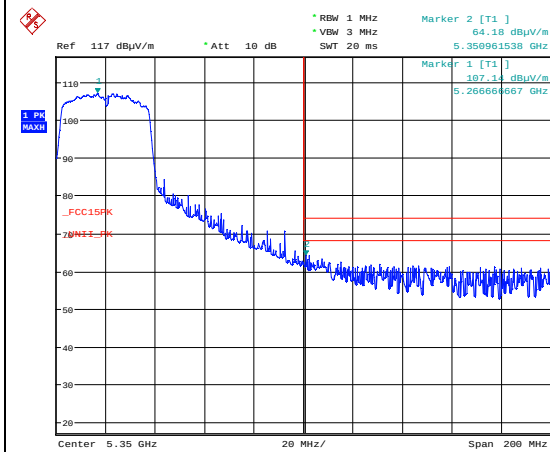
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Band Edge 5150 MHz, ch046, 802.11n HT40 SISO, Radiated, Max, Pk



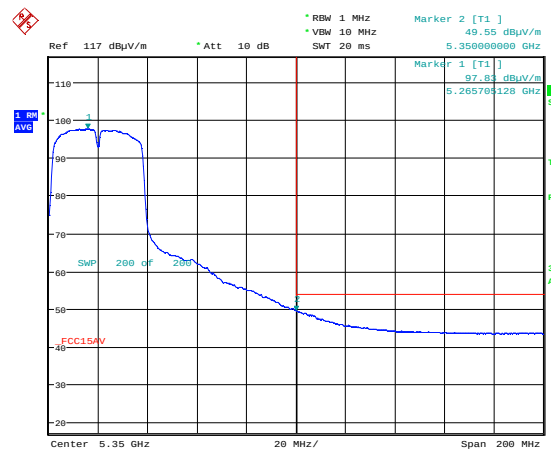
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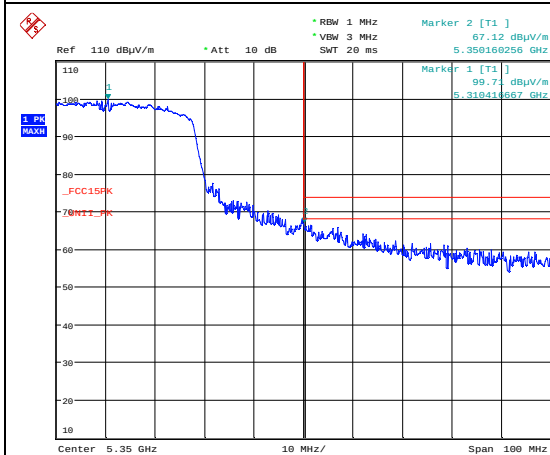
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Band Edge 5350 MHz, ch054, 802.11n HT40 SISO, Radiated, Max, Pk PL15



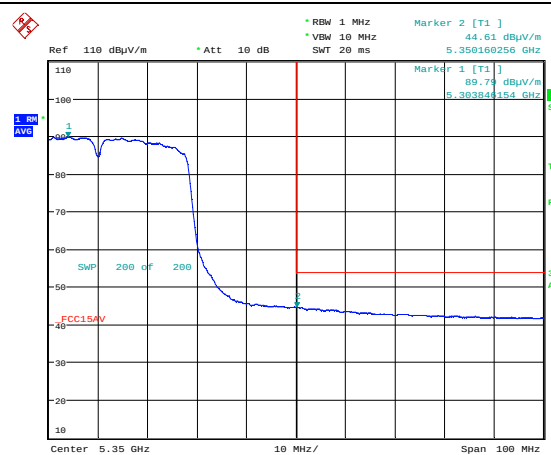
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Av



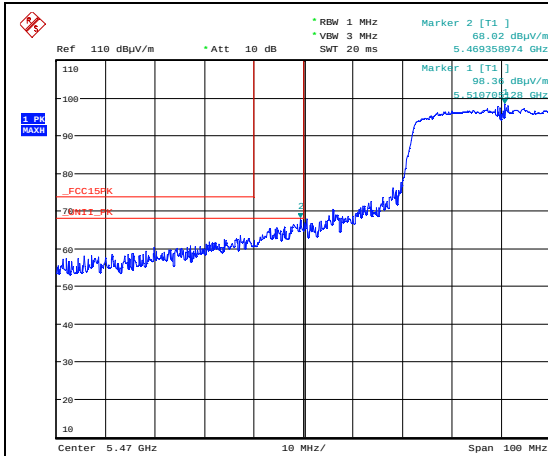
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Band Edge 5350 MHz, ch062, 802.11n HT40 SISO, Radiated, Max, Pk PL9



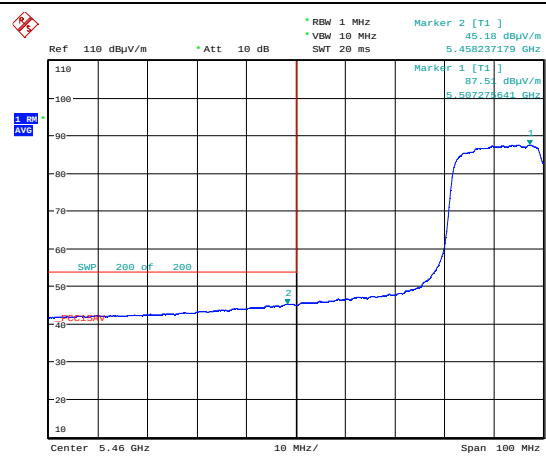
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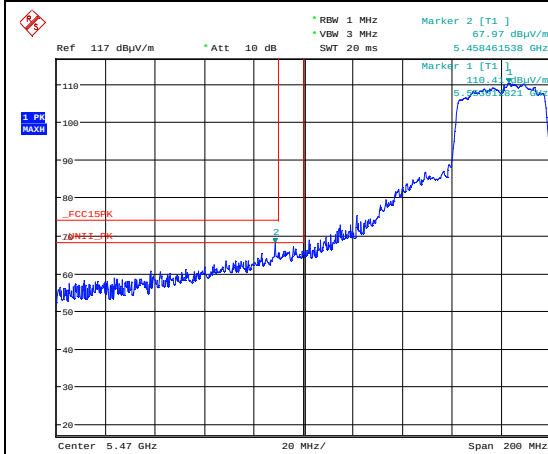
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Band Edge 5470 MHz, ch102, 802.11n HT40 SISO, Radiated, Max, Pk PL4



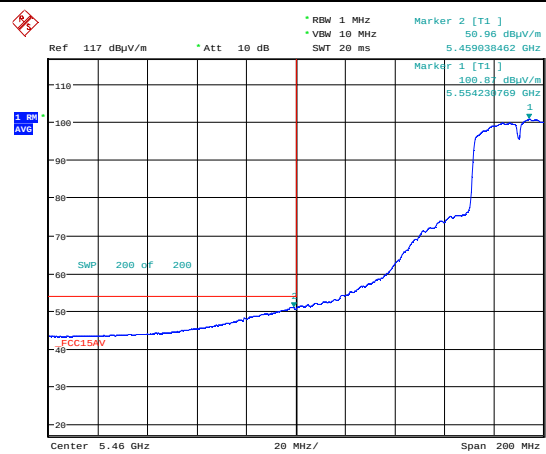
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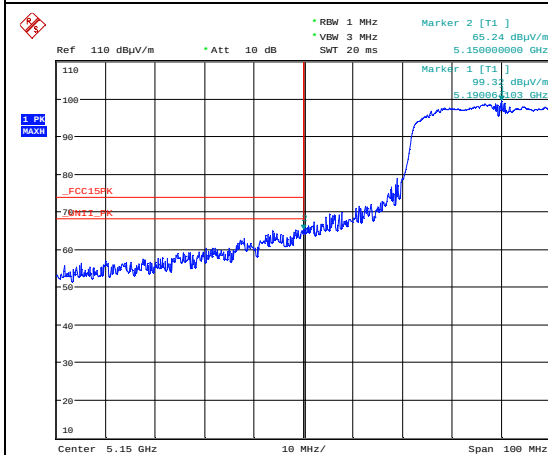
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Band Edge 5470 MHz, ch110, 802.11n HT40 SISO, Radiated, Max, Pk



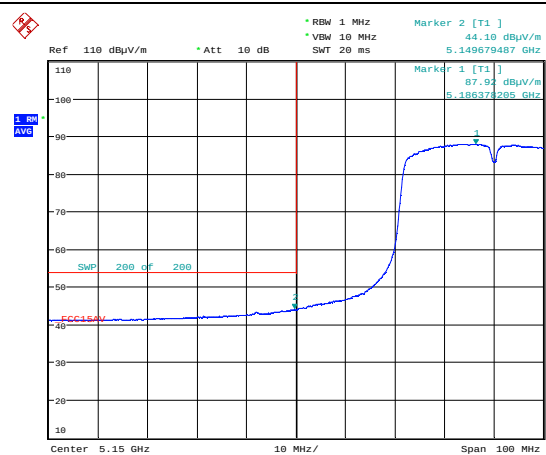
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Av



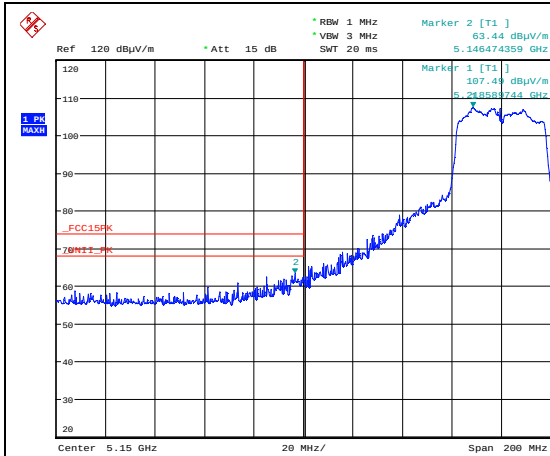
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Band Edge 5150 MHz, ch038, 802.11n HT40 MIMO, Radiated, Max, Pk PL2



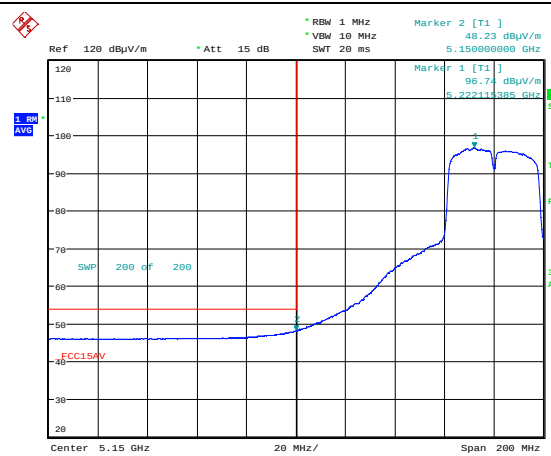
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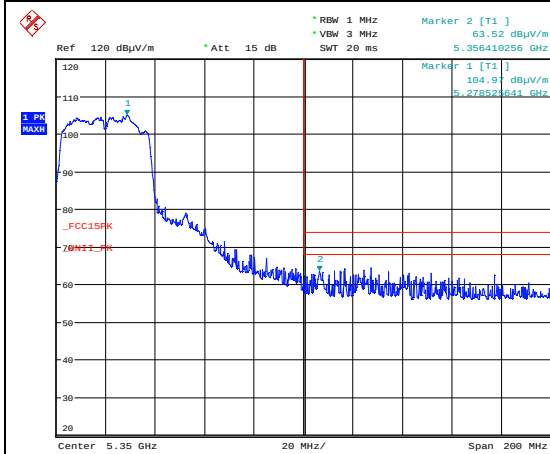
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Band Edge 5150 MHz, ch046, 802.11n HT40 MIMO, Radiated, Max, Pk



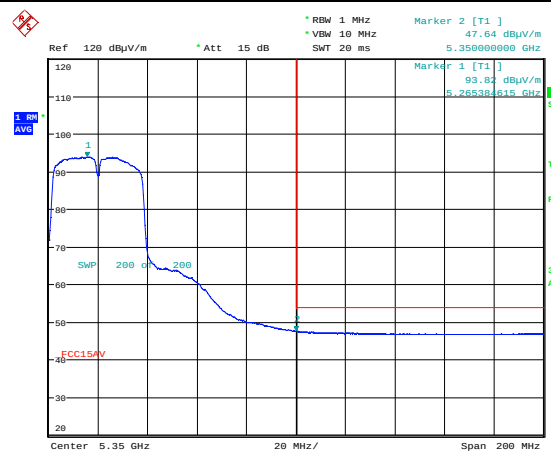
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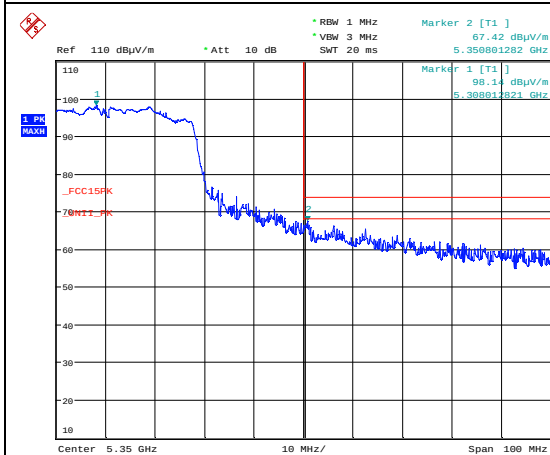
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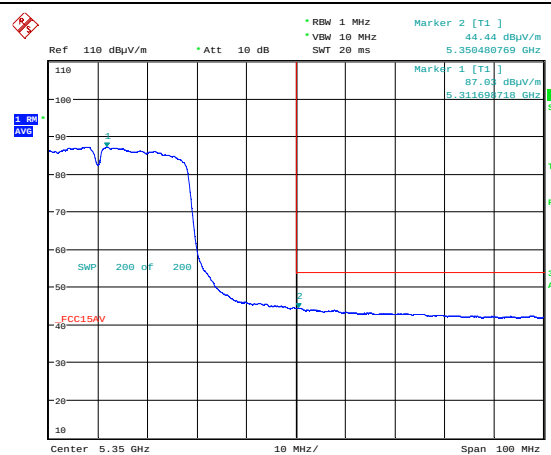
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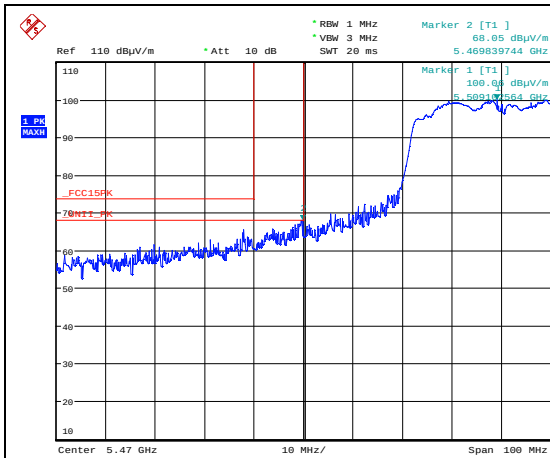
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Band Edge 5350 MHz, ch062, 802.11n HT40 MIMO, Radiated, Max, Pk



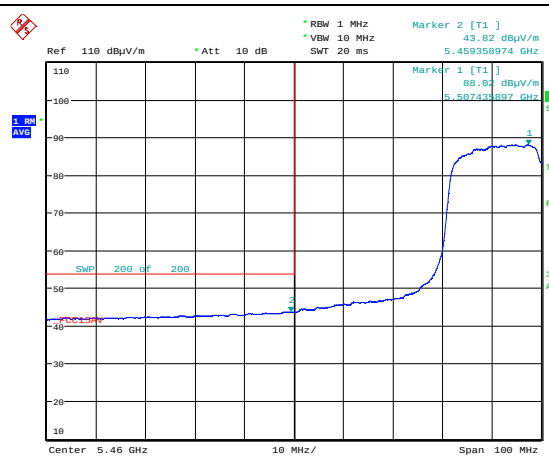
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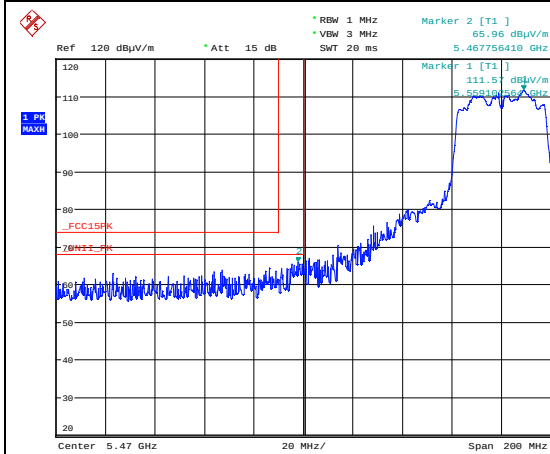
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Band Edge 5470 MHz, ch102, 802.11n HT40 MIMO, Radiated, Max, Pk PL3



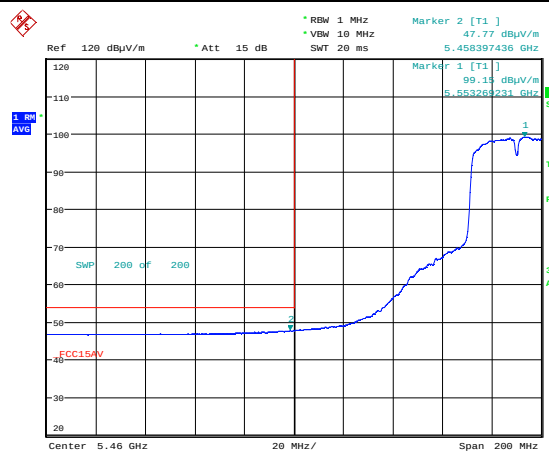
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Av



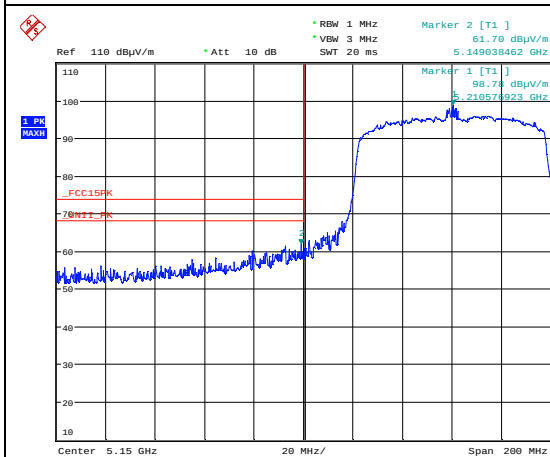
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Band Edge 5470 MHz, ch110, 802.11n HT40 MIMO, Radiated, Max, Pk



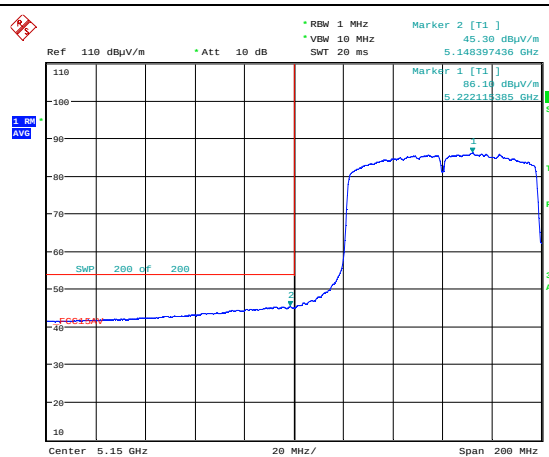
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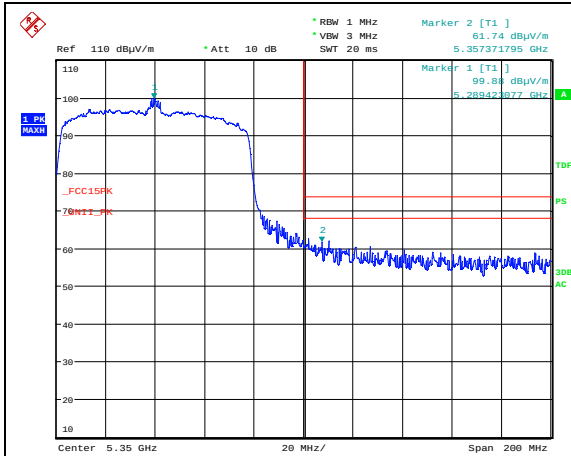
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Band Edge 5150 MHz, ch042, 802.11ac HT80 SISO, Radiated, Max, Pk PL9



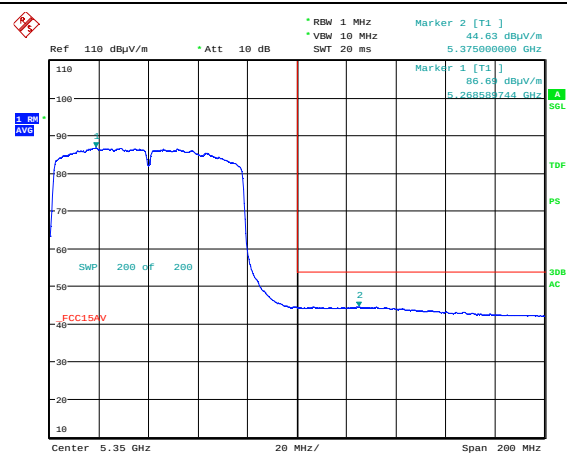
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Av



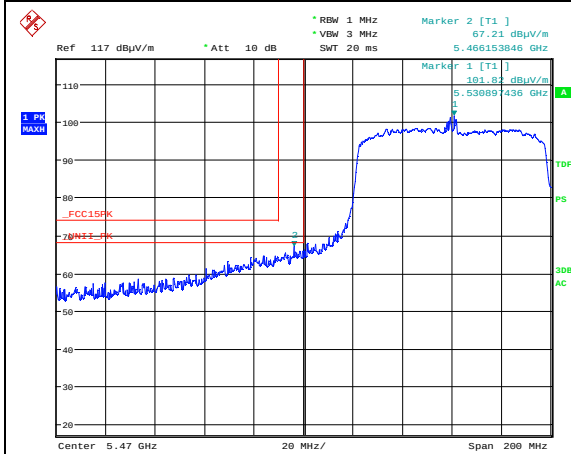
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Band Edge 5350 MHz, ch058, 802.11ac HT80 SISO, Radiated, Max, Pk PL9



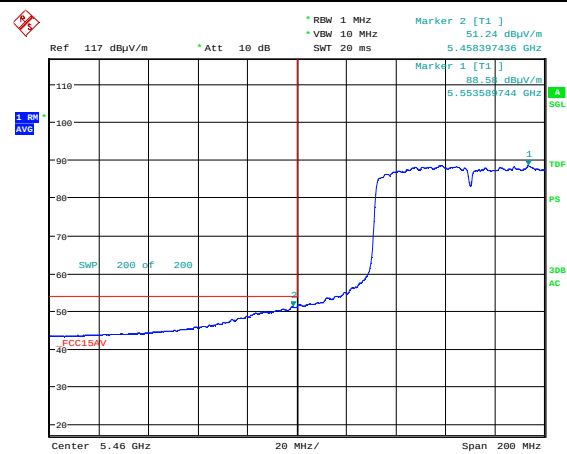
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Av



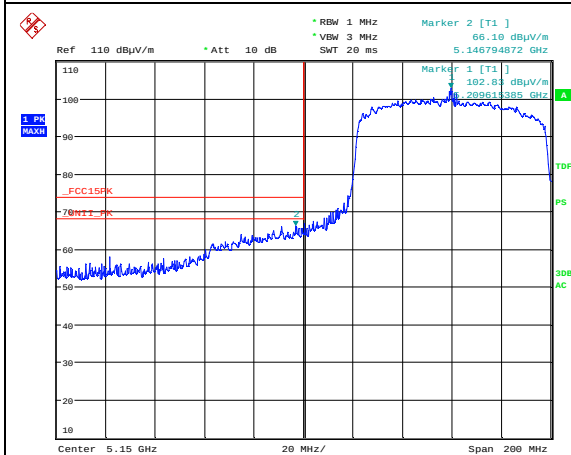
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Band Edge 5470 MHz, ch106, 802.11ac HT80 SISO, Radiated, Max, Pk PL9



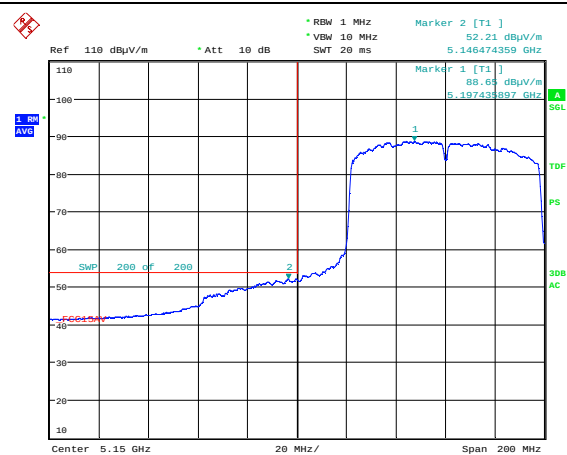
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Av



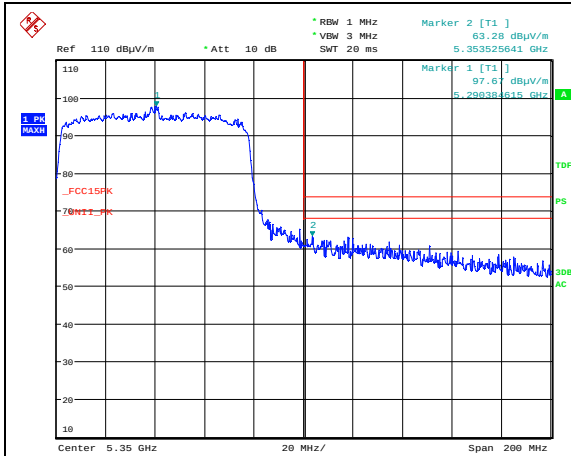
Date: 12.JUL.2023 16:36:53

Band Edge 5150 MHz, ch042, 802.11ac HT80 MIMO, Radiated, Max, Pk



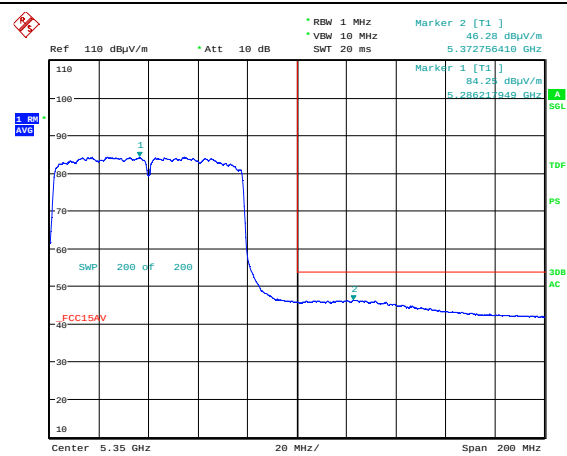
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Av



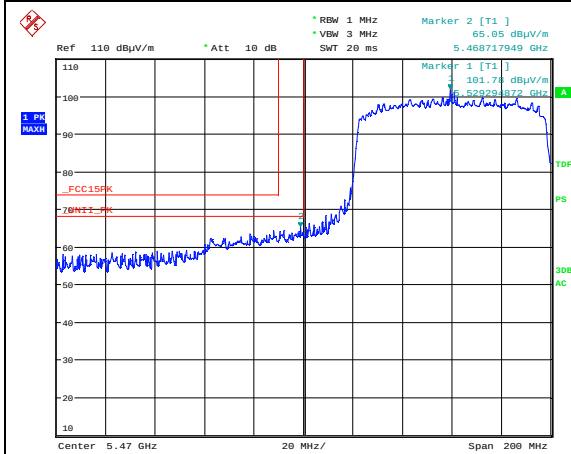
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Band Edge 5350 MHz, ch058, 802.11ac HT80 MIMO, Radiated, Max, Pk



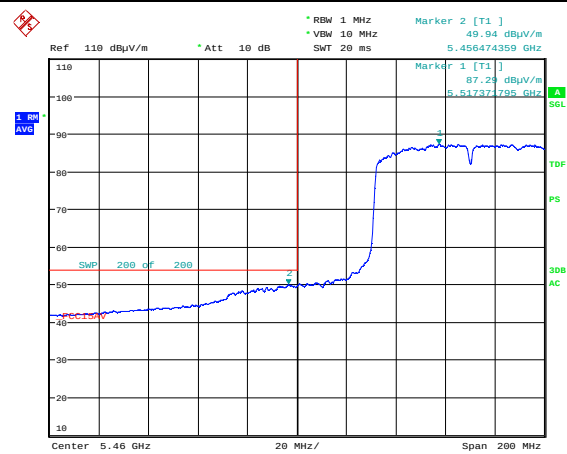
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Av



Date: 12.JUL.2023 16:30:33

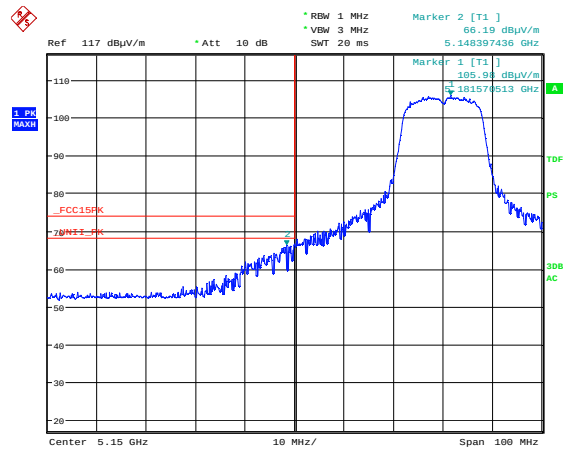
Band Edge 5470 MHz, ch106, 802.11ac HT80 MIMO, Radiated, Max, Pk



Date: 12.JUL.2023 16:31:15

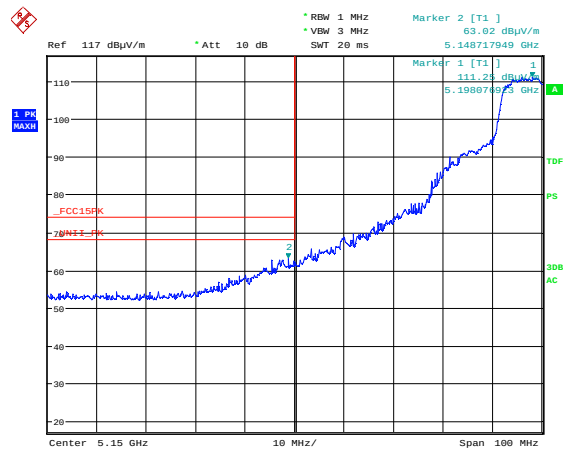
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Whip+Patch Antenna



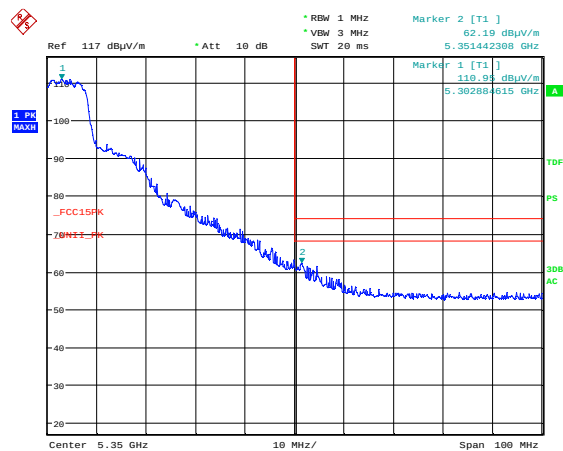
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Band Edge 5150 MHz, ch036, 802.11a 6Mb, Radiated, Max, Pk



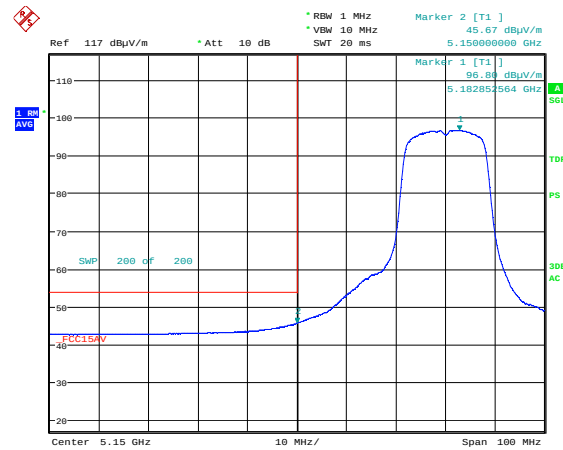
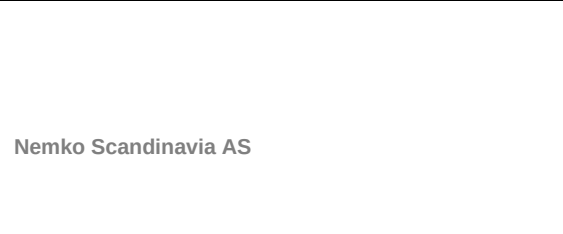
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Band Edge 5150 MHz, ch040, 802.11a 6Mb, Radiated, Max, Pk



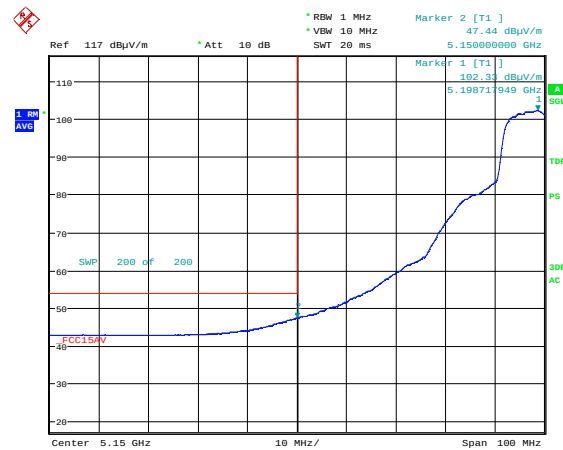
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Band Edge 5350 MHz, ch060, 802.11a 6Mb, Radiated, Max, Pk



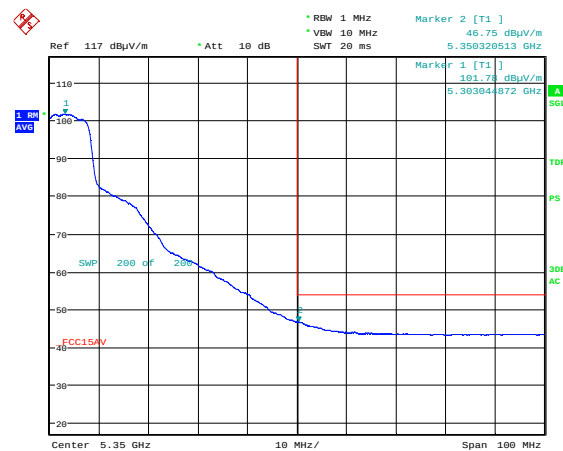
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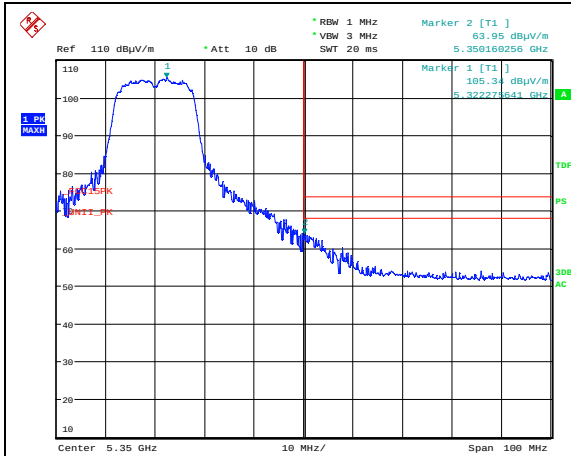
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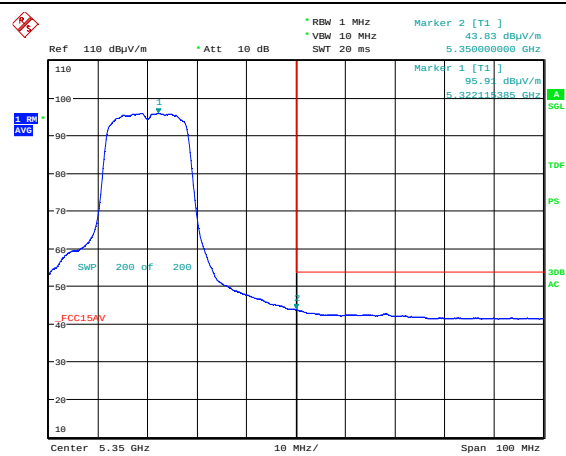
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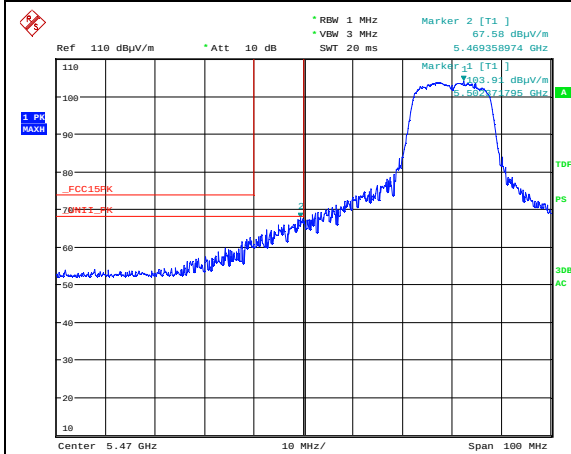
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Band Edge 5350 MHz, ch064, 802.11a 6Mb, Radiated, Max, Pk



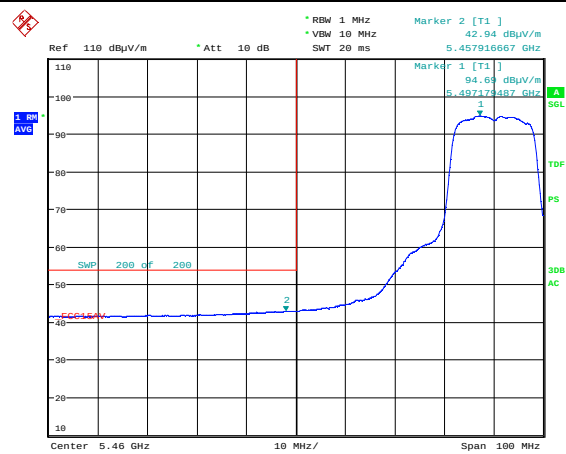
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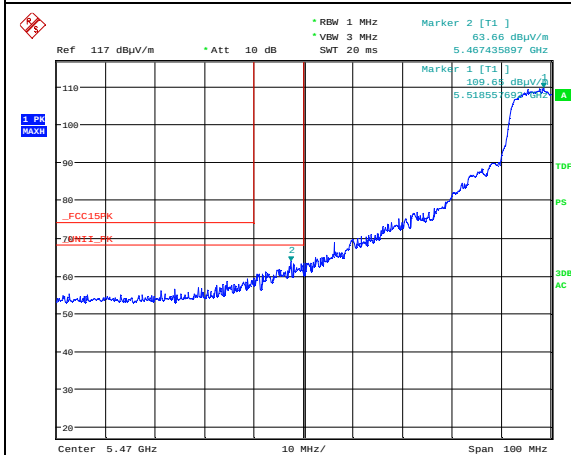
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Band Edge 5470 MHz, ch100, 802.11a 6Mb, Radiated, Max, Pk



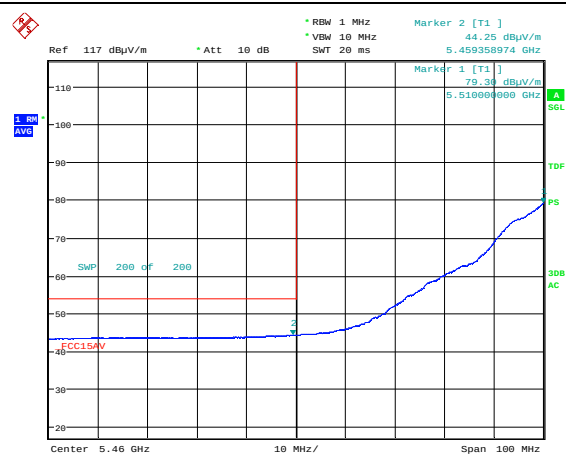
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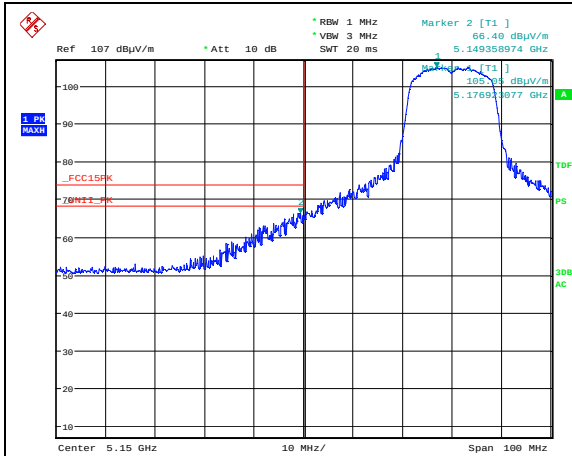
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Band Edge 5470 MHz, ch104, 802.11a 6Mb, Radiated, Max, Pk



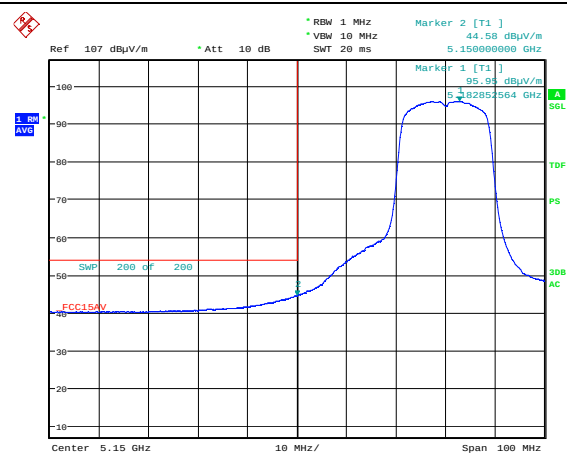
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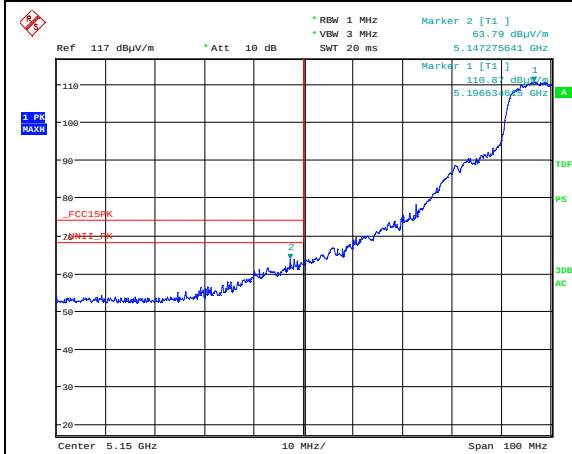
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Band Edge 5150 MHz, ch036, 802.11n HT20 SISO, Radiated, Max, Pk



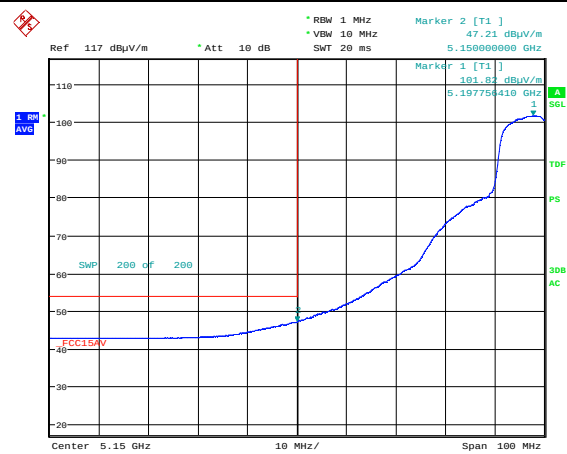
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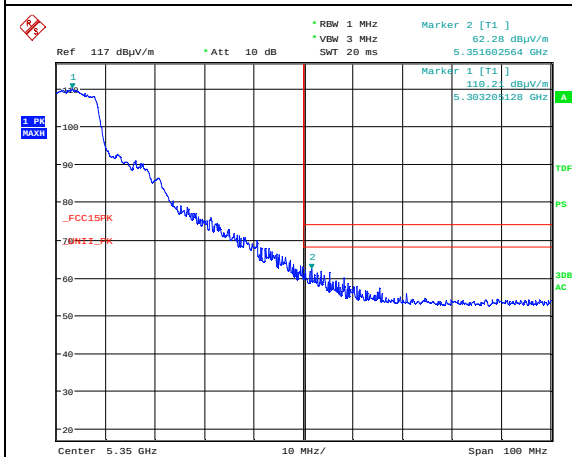
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Band Edge 5150MHz, ch040, 802.11n HT20 SISO, Radiated, Max, Pk



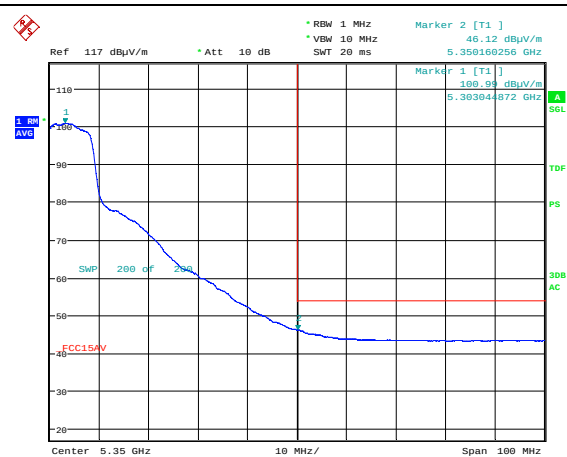
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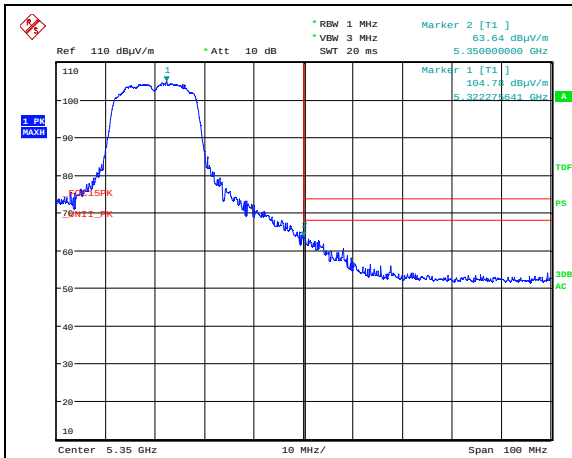
Date: 11.JUL.2023 12:49:00

Band Edge 5350 MHz, ch060, 802.11n HT20 SISO, Radiated, Max, Pk



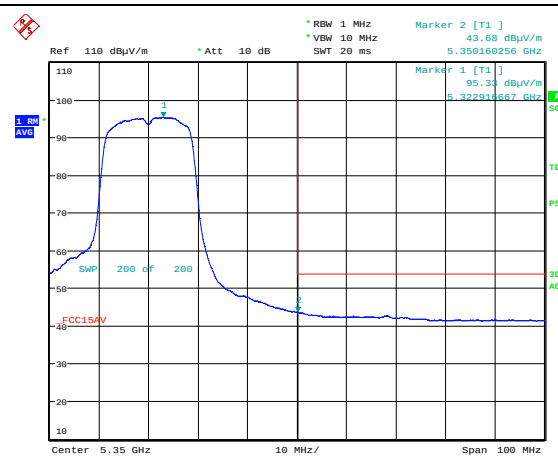
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Av



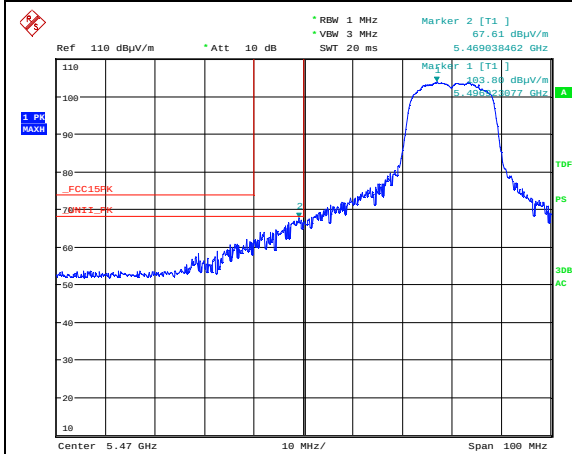
Date: 11.JUL.2023 12:57:02

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



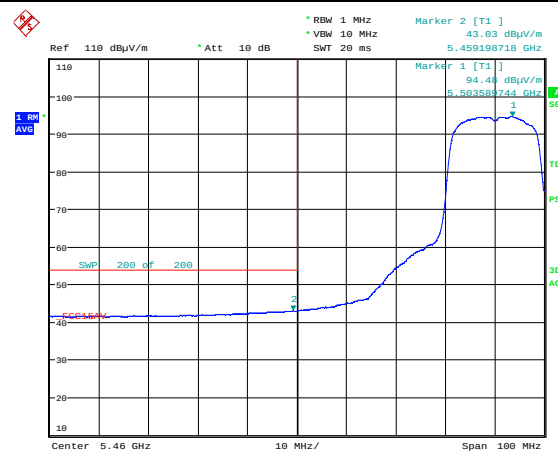
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Av



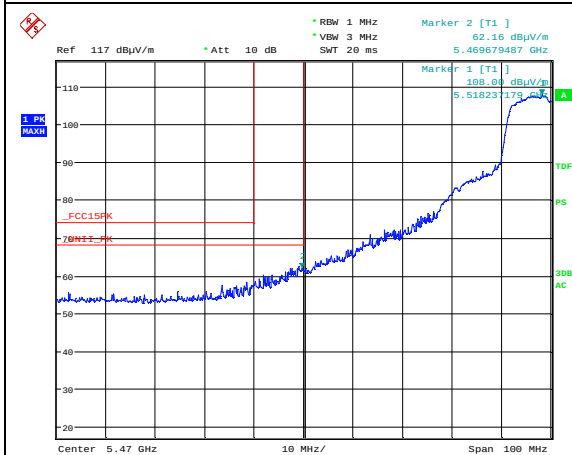
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Band Edge 5470 MHz, ch100, 802.11n HT20 SISO, Radiated, Max, Pk



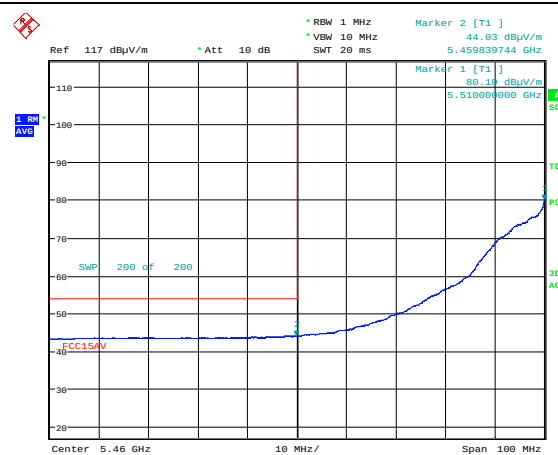
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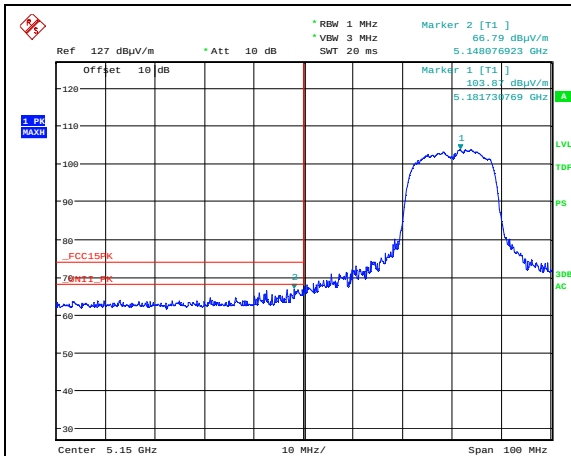
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Band Edge 5470 MHz, ch104, 802.11n HT20 SISO, Radiated, Max, Pk



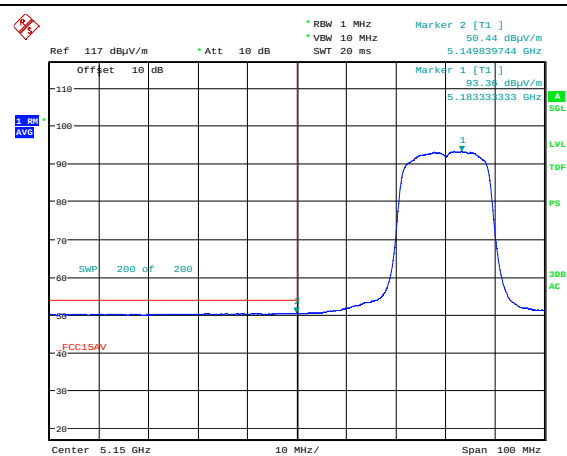
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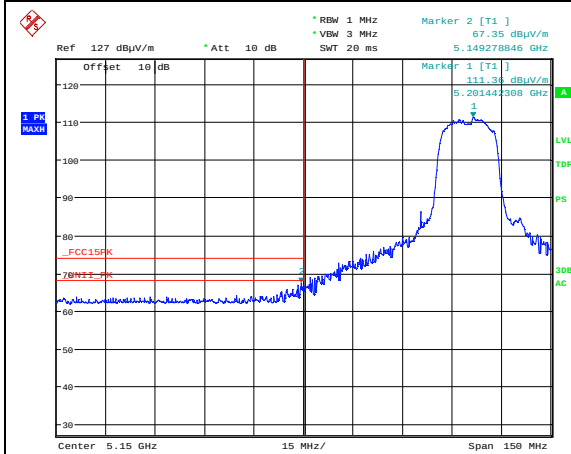
Date: 6.MAR.2023 15:01:21

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



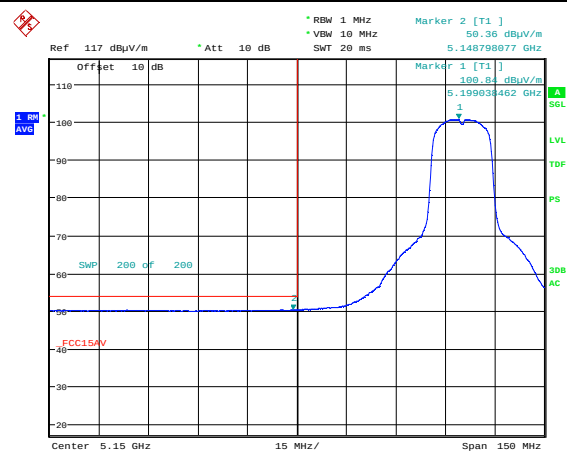
Date: 6.MAR.2023 15:01:44

Av



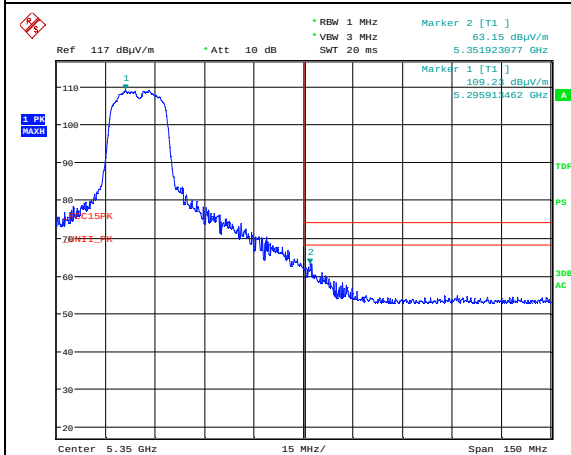
Date: 6.MAR.2023 14:37:37

Band Edge 5150 MHz, ch040, 802.11n HT20 MIMO, Radiated, Max, Pk



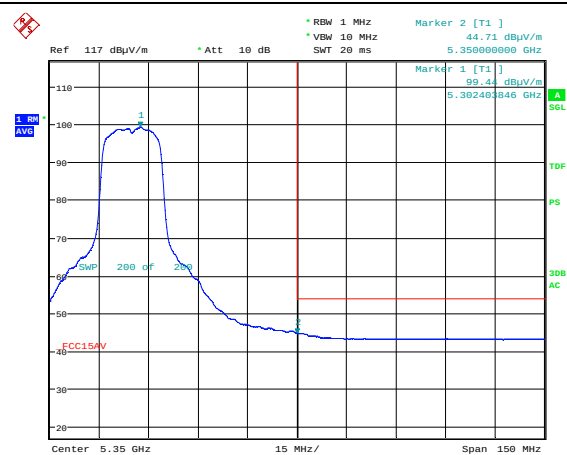
Date: 6.MAR.2023 14:38:00

Av



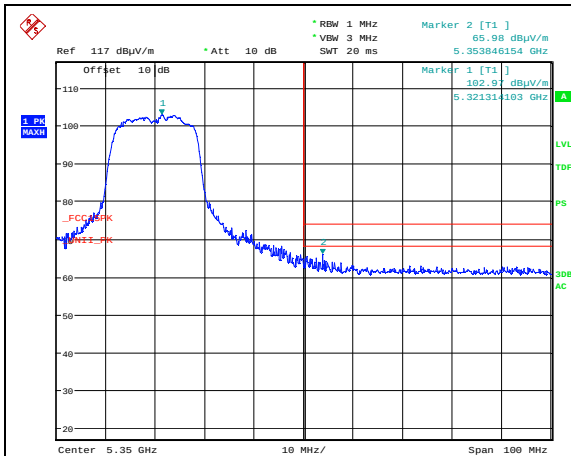
Date: 7.MAR.2023 13:07:13

Band Edge 5350 MHz, ch060, 802.11n HT20 MIMO, Radiated, Max, Pk



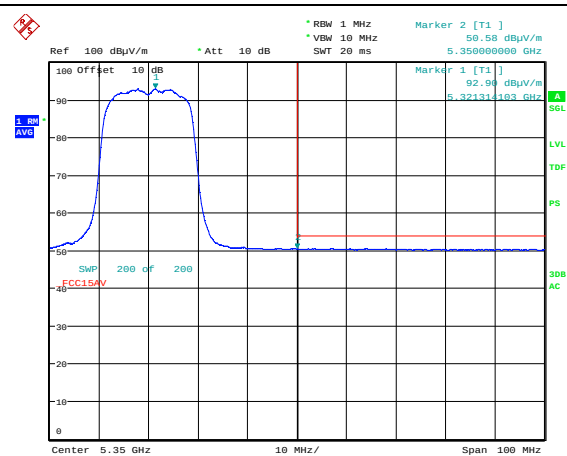
Date: 7.MAR.2023 13:08:23

Av



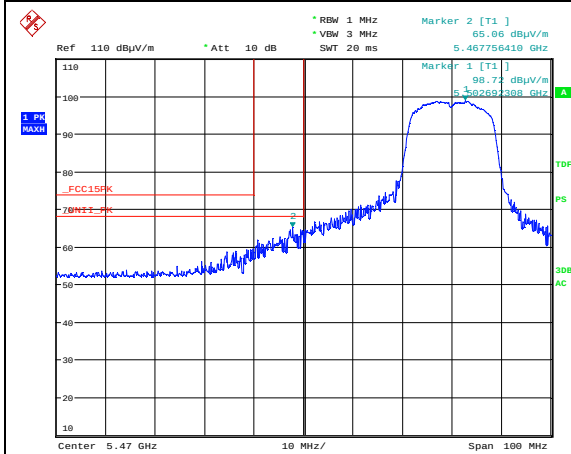
Date: 6.MAR.2023 15:12:35

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



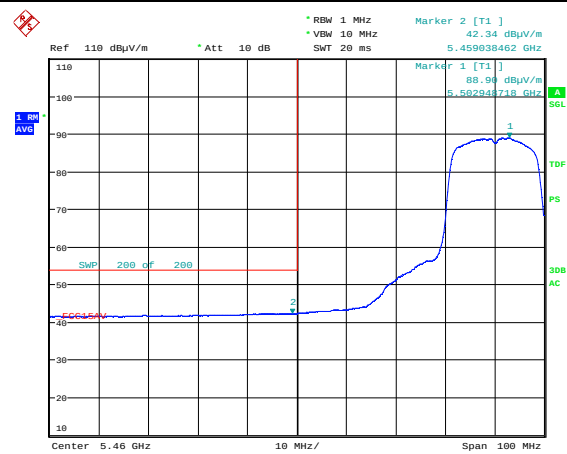
Date: 6.MAR.2023 15:14:37

Av



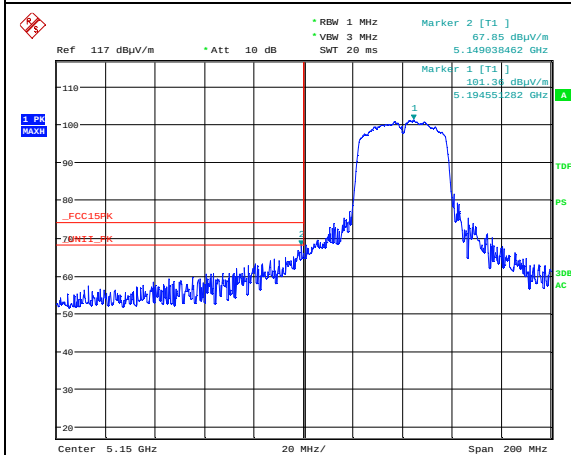
Date: 7.MAR.2023 13:18:26

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



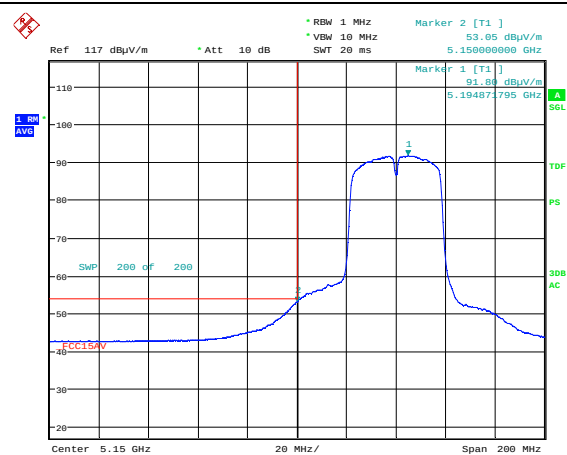
Date: 7.MAR.2023 13:18:48

Av



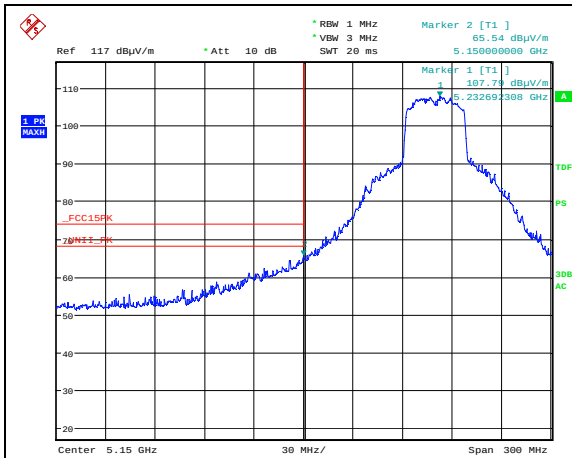
Date: 11.JUL.2023 11:05:10

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



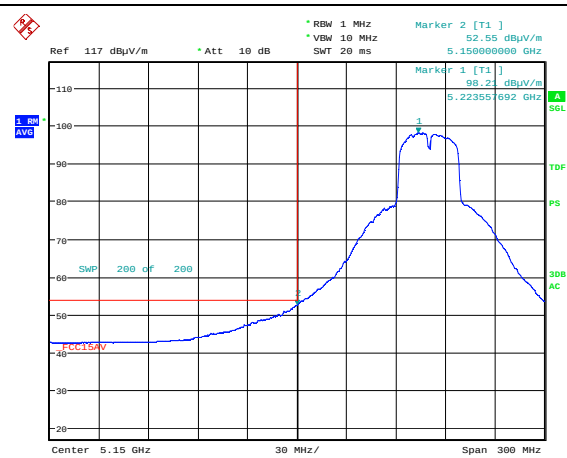
Date: 11.JUL.2023 11:07:02

Av



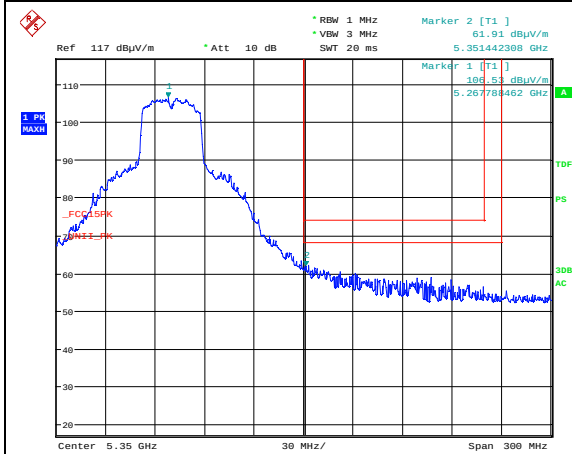
Date: 11.JUL.2023 11:00:25

Band Edge 5150 MHz, ch046, 802.11n HT40 SISO, Radiated, Max, Pk



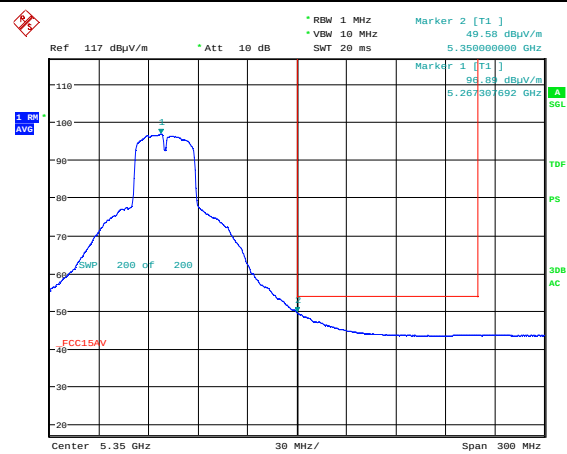
Date: 11.JUL.2023 11:01:18

Av



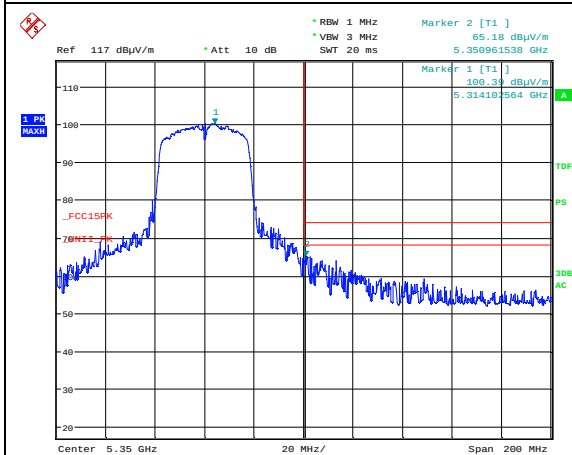
Date: 11.JUL.2023 10:53:34

Band Edge 5350 MHz, ch054, 802.11n HT40 SISO, Radiated, Max, Pk



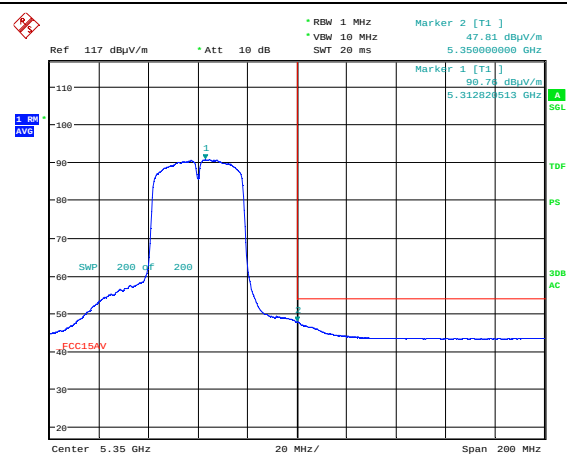
Date: 11.JUL.2023 10:56:45

Av



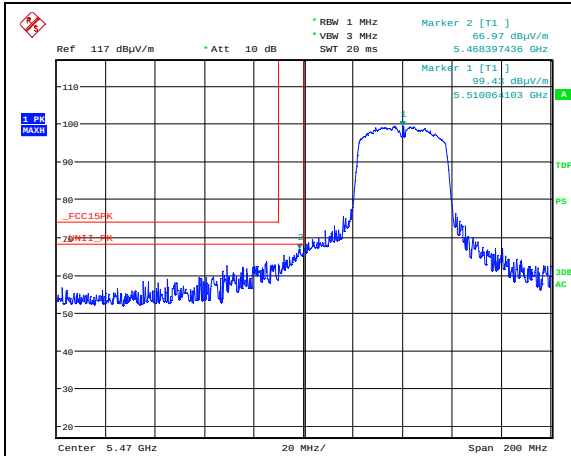
Date: 11.JUL.2023 10:49:35

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



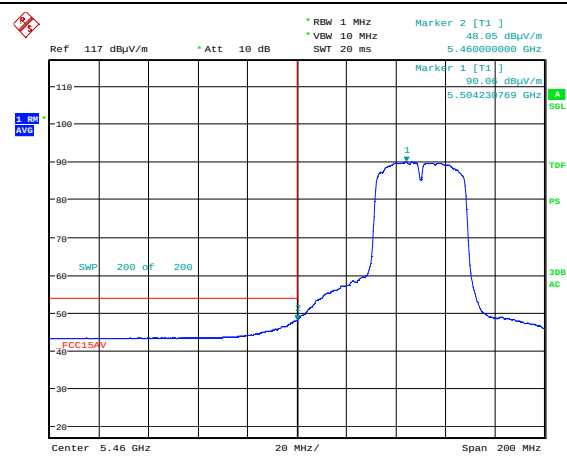
Date: 11.JUL.2023 10:50:20

Av



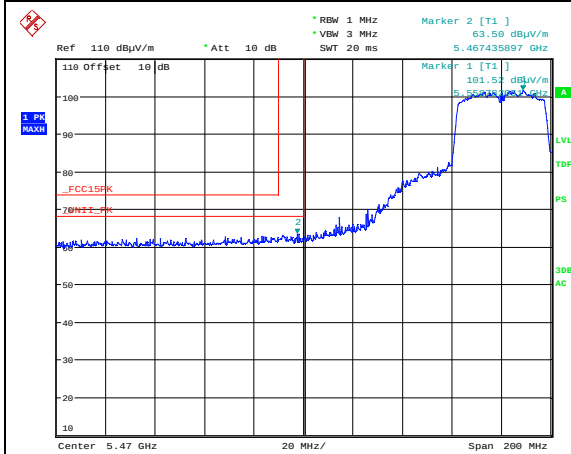
Date: 11.JUL.2023 10:44:11

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



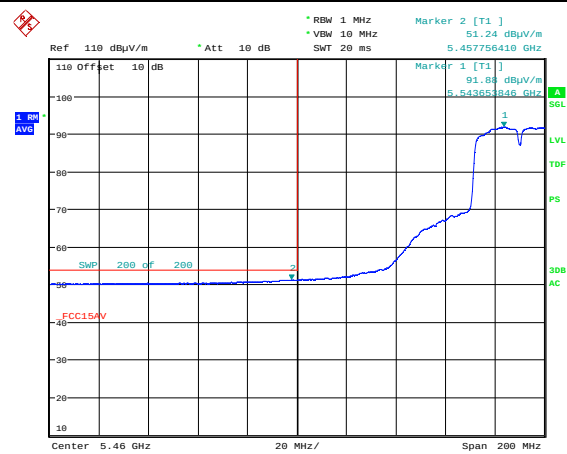
Date: 11.JUL.2023 10:46:05

Av



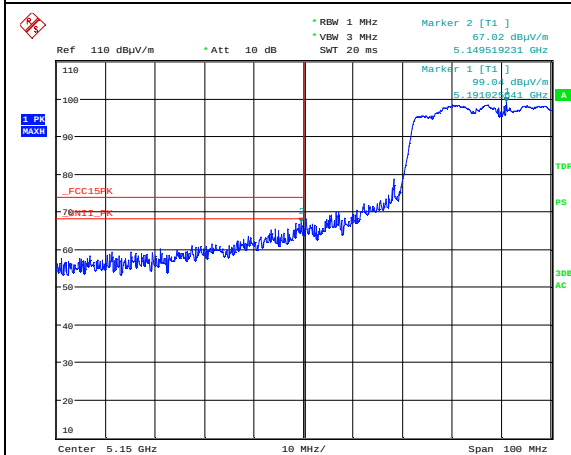
Date: 10.JUL.2023 13:41:18

Band Edge 5470 MHz, ch110, 802.11n HT40 SISO, Radiated, Max, Pk



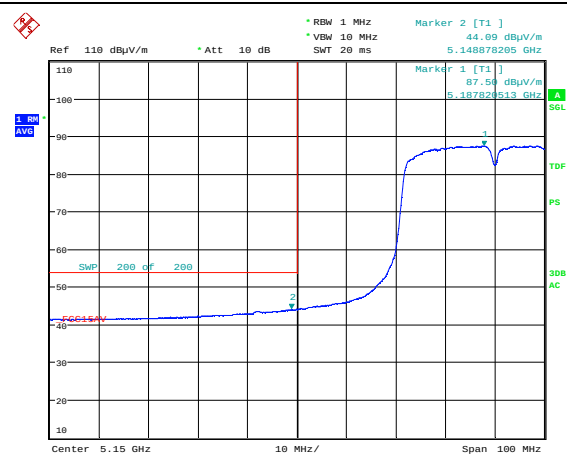
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Av



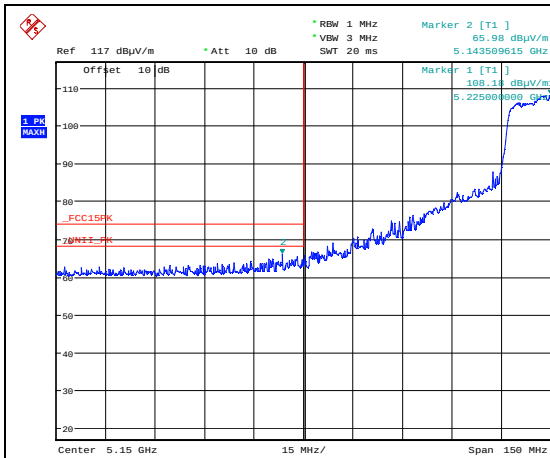
Date: 10.JUL.2023 15:15:55

Band Edge 5150 MHz, ch038, 802.11n HT40 MIMO, Radiated, Max, Pk PL2



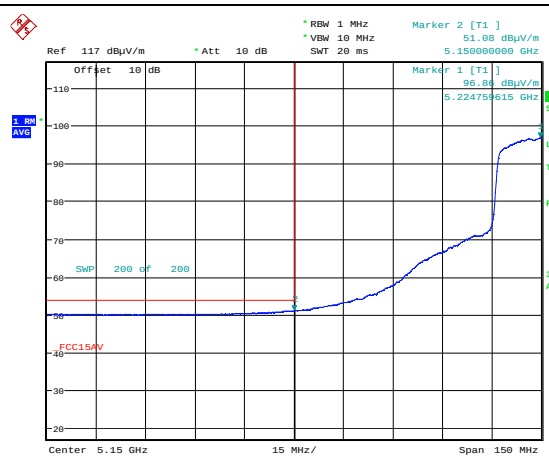
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Av



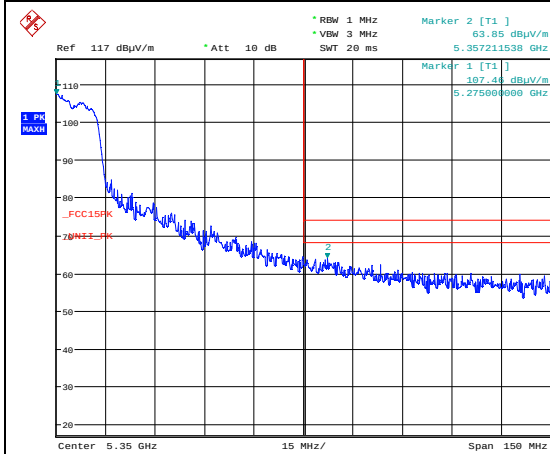
Date: 10.JUL.2023 14:59:44

Band Edge 5150 MHz, ch046, 802.11n HT40 MIMO, Radiated, Max, Pk



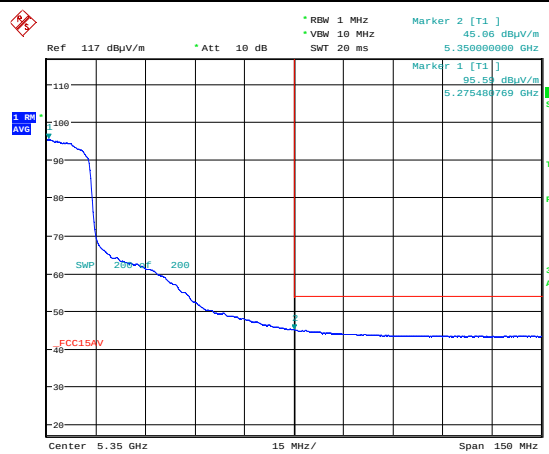
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Av



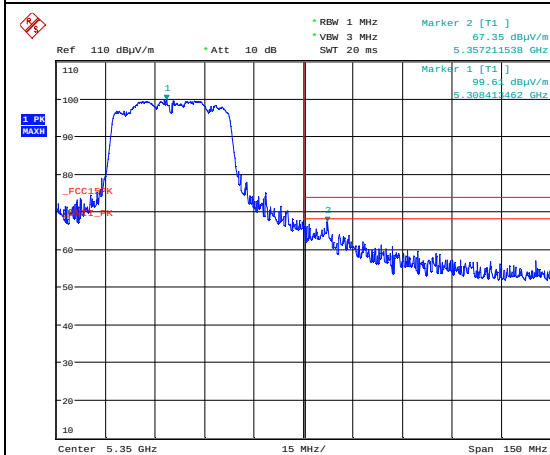
Date: 10.JUL.2023 15:26:45

Band Edge 5350 MHz, ch054, 802.11n HT40 MIMO, Radiated, Max, Pk



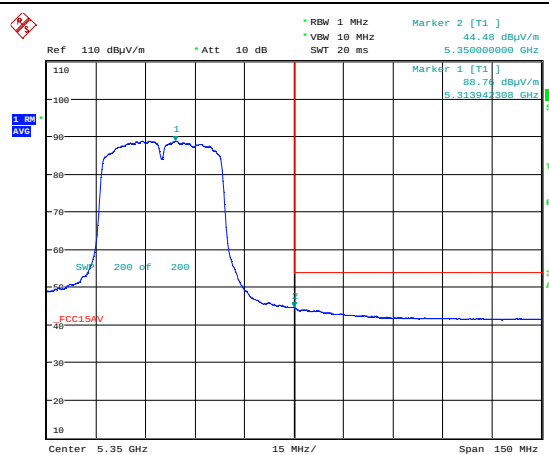
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Av



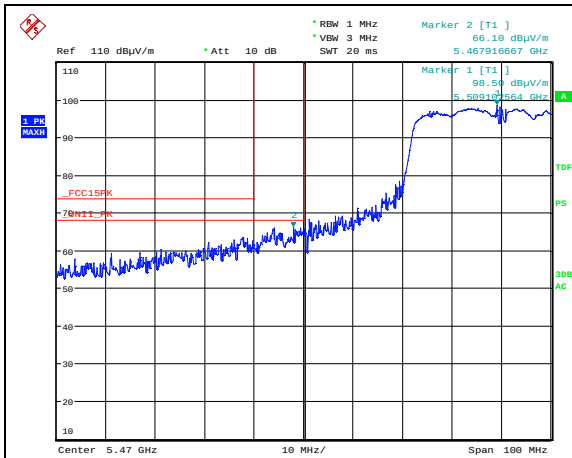
Date: 10.JUL.2023 15:37:09

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



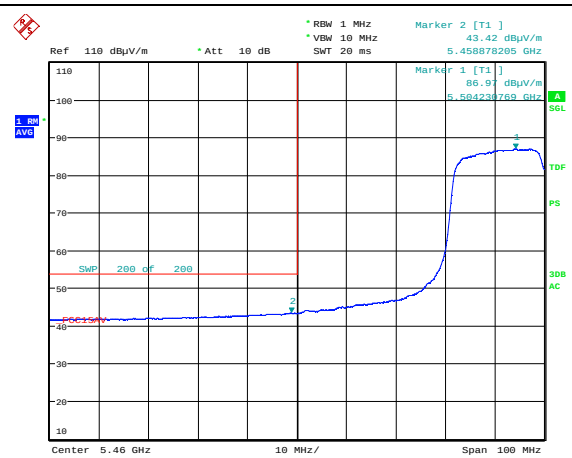
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Av



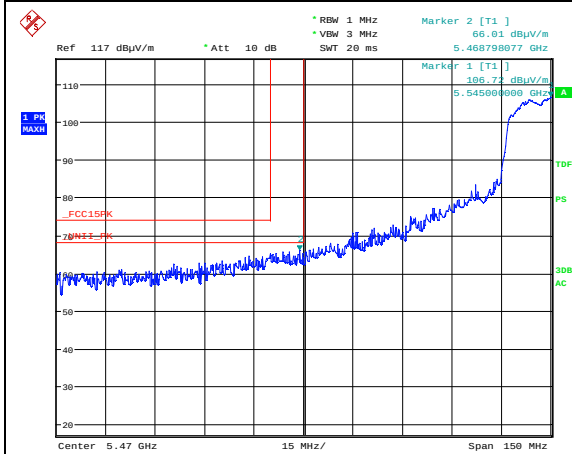
Date: 10.JUL.2023 15:46:28

Band Edge 5470 MHz, ch102, 802. 11n HT40 MIMO, Radiated, Max, Pk PL3



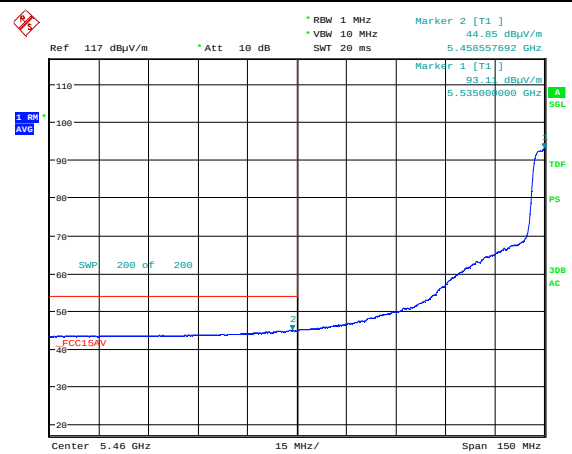
Date: 10.JUL.2023 15:47:52

Av



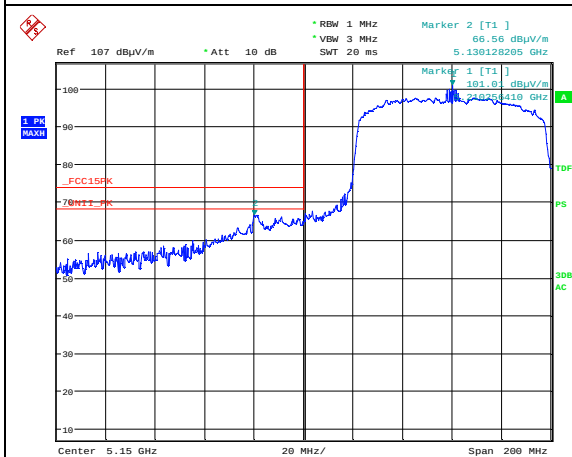
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Band Edge 5470 MHz, ch110, 802. 11n HT40 MIMO, Radiated, Max, Pk



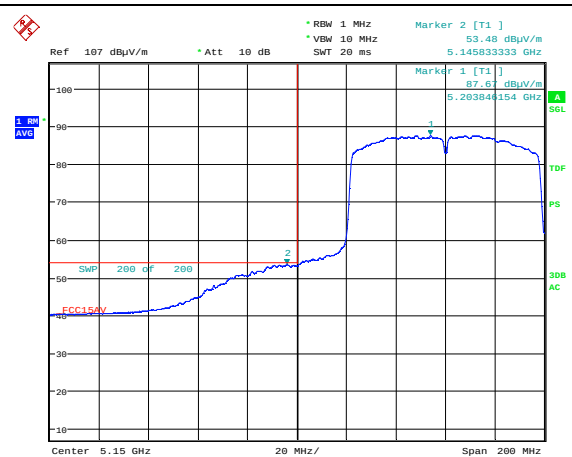
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Av



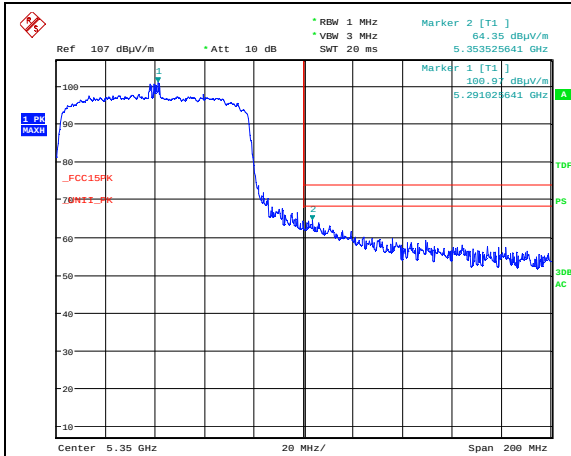
Date: 11.JUL.2023 09:53:41

Band Edge 5150 MHz, ch042, 802.11ac HT80 SISO, Radiated, Max, Pk PL6



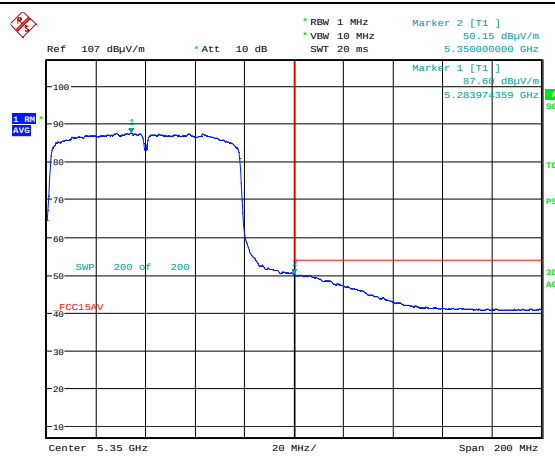
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Av



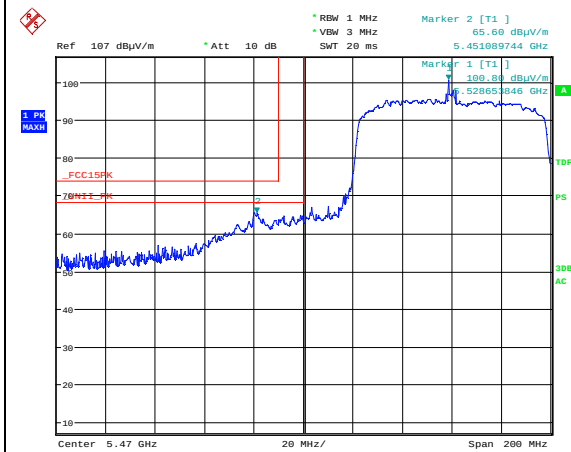
Date: 11.JUL.2023 09:44:48

Band Edge 5350 MHz, ch058, 802.11ac HT80 SISO, Radiated, Max, Pk



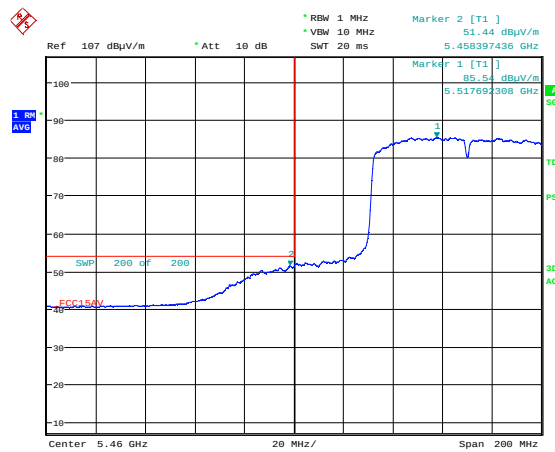
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Av



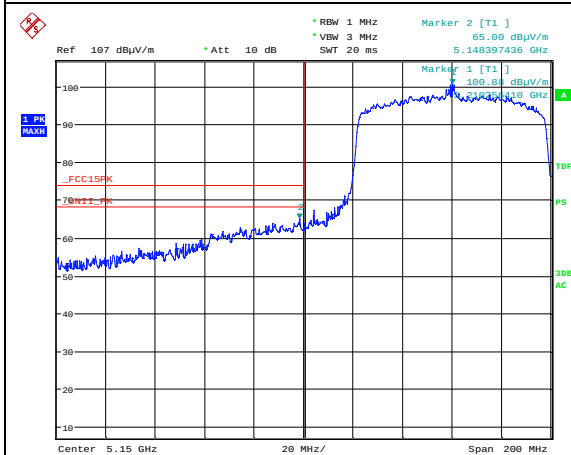
Date: 11.JUL.2023 09:40:55

Band Edge 5470 MHz, ch106, 802.11ac HT80 SISO, Radiated, Max, Pk PL6



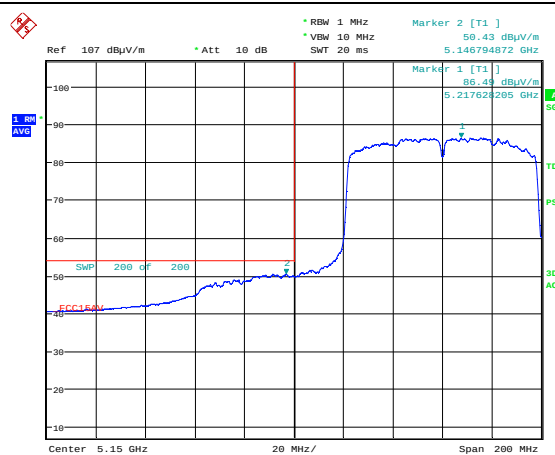
Date: 11.JUL.2023 09:41:47

Av



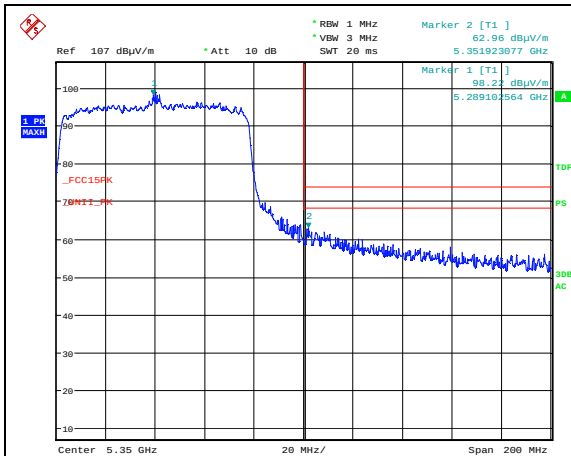
Date: 11.JUL.2023 08:59:36

Band Edge 5150 MHz, ch042, 802.11ac HT80 MIMO, Radiated, Max, Pk



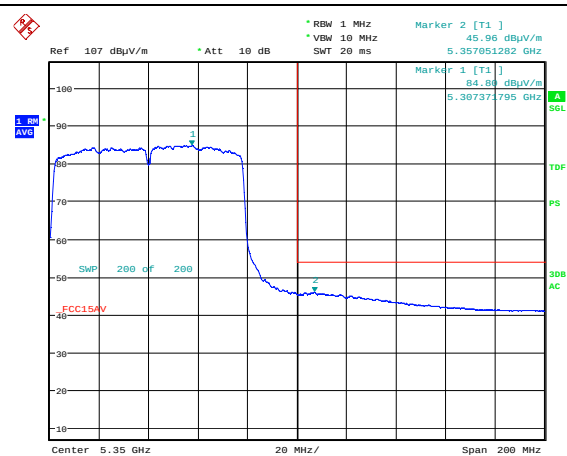
Date: 11.JUL.2023 09:00:19

Av



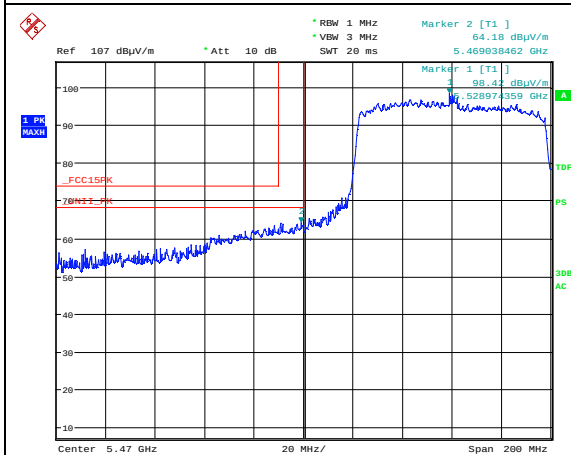
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Band Edge 5350 MHz, ch058, 802.11ac HT80 MIMO, Radiated, Max, Pk



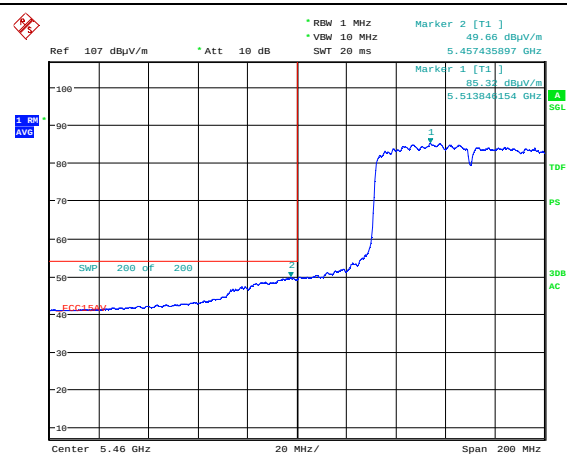
Date: 11.JUL.2023 08:58:07

Av



Date: 11.JUL.2023 08:54:20

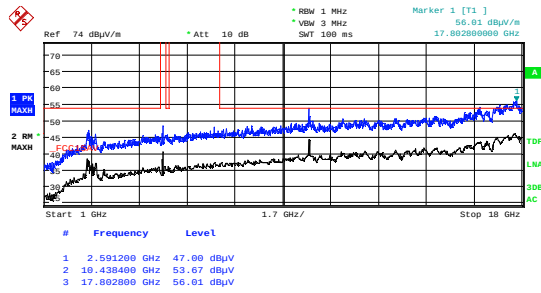
Band Edge 5470 MHz, ch106, 802.11ac HT80 MIMO, Radiated, Max, Pk



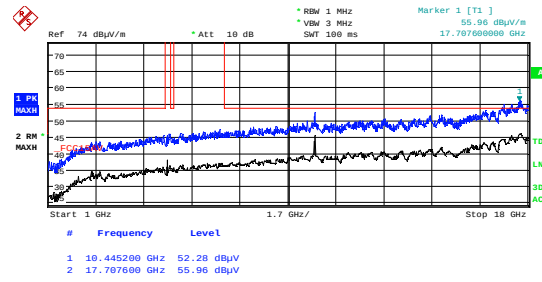
Date: 11.JUL.2023 08:55:19

Av

Combi Antenna



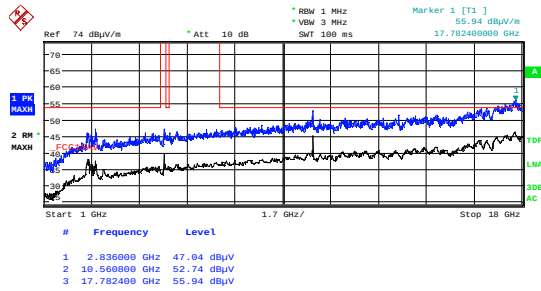
Date: 28.FEB.2023 13:11:47



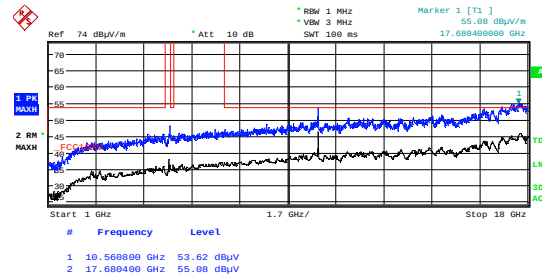
Date: 28.FEB.2023 13:13:44

Radiated Emissions 1-18 GHz, Ch044, 802.11a 6M, VP

HP



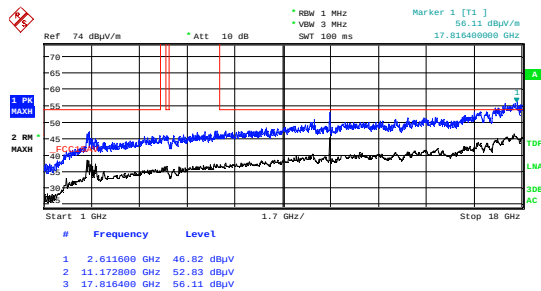
Date: 28.FEB.2023 13:56:46



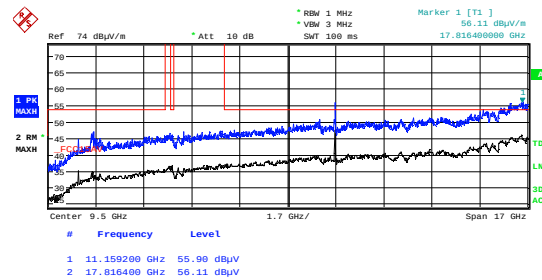
Date: 28.FEB.2023 13:58:44

Radiated Emissions 1-18 GHz, Ch056, 802.11a 6M, VP

HP



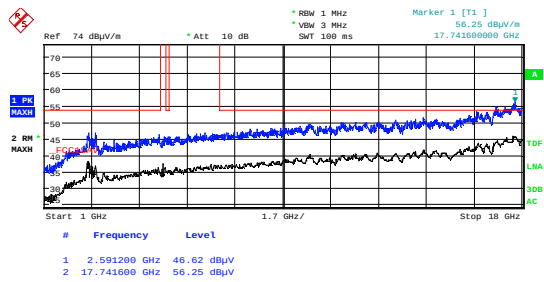
Date: 28.FEB.2023 14:06:04



Date: 28.FEB.2023 14:08:02

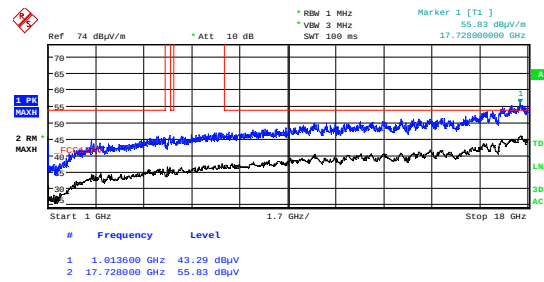
Radiated Emissions 1-18 GHz, Ch116, 802.11a 6M, VP

HP



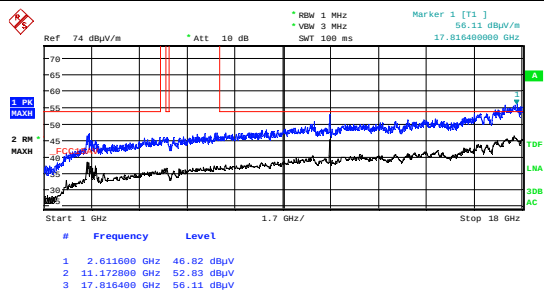
Date: 28.FEB.2023 13:28:04

Radiated Emissions 1-18 GHz, Ch044, 802.11n HT20, VP



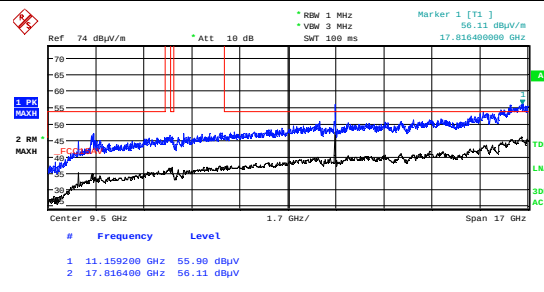
Date: 28.FEB.2023 13:30:02

HP



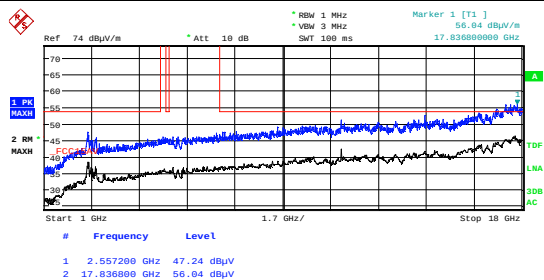
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Radiated Emissions 1-18 GHz, Ch116, 802.11n HT20, VP



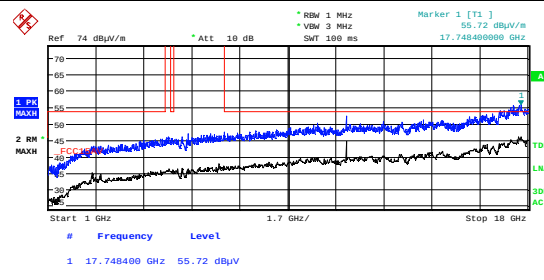
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HP



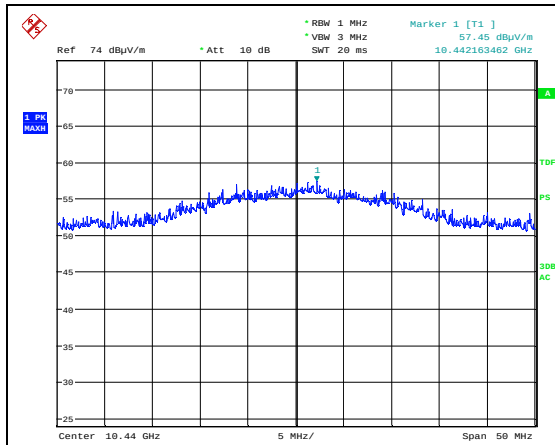
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Radiated Emissions 1-18 GHz, Ch157, 802.11n HT20, VP

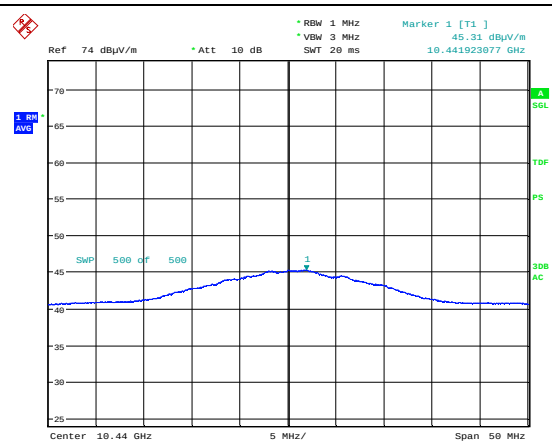


Date: 28.FEB.2023 14:26:02

HP



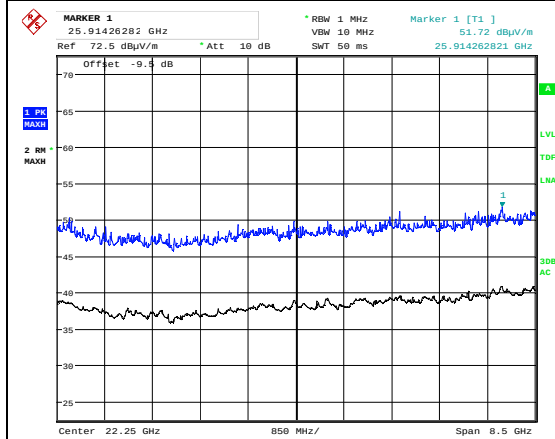
Date: 28.FEB.2023 13:45:44



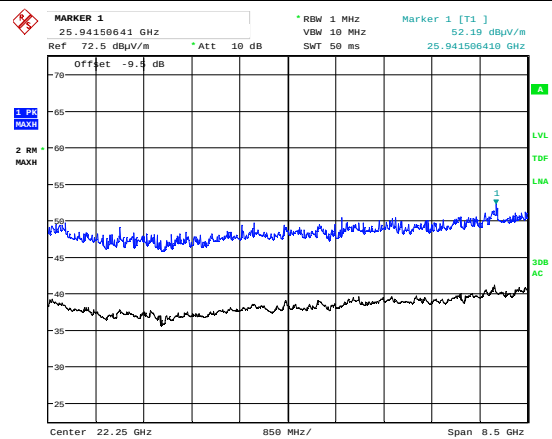
Date: 28.FEB.2023 13:46:56

Radiated Emissions 10440 MHz, Ch044, 802.11a 6M, Max: HP, Pk

Av



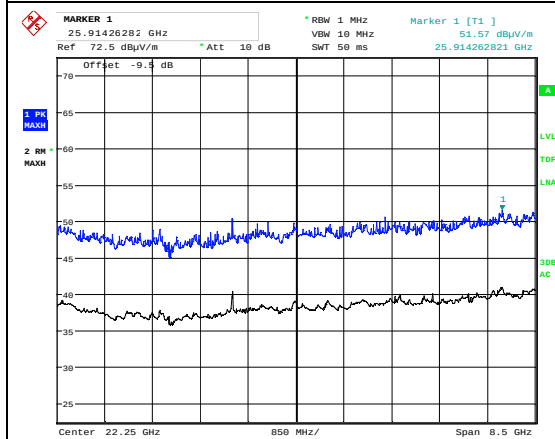
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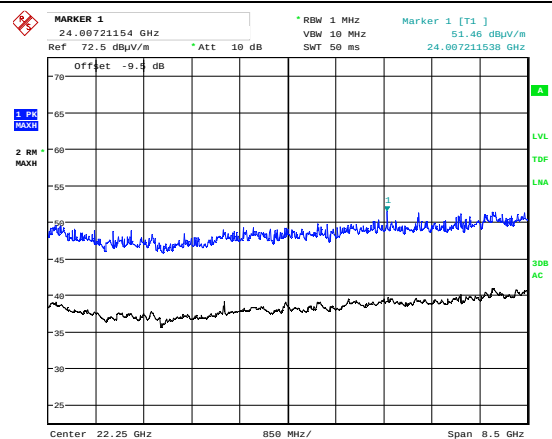
Date: 14.MAR.2023 12:55:29

Radiated Emissions 18-26 GHz, Ch056, 802.11a 6M, Ant1, VP

HP



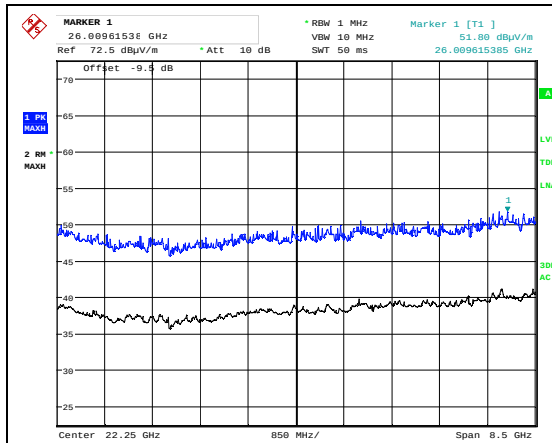
Date: 14.MAR.2023 13:00:36



Date: 14.MAR.2023 12:58:27

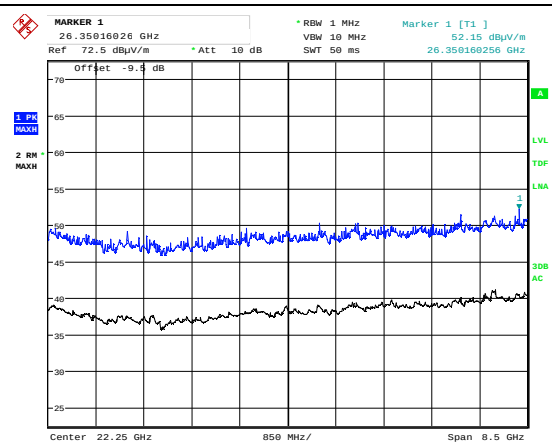
Radiated Emissions 18-26 GHz, Ch056, 802.11a 6M, Ant2, VP

HP



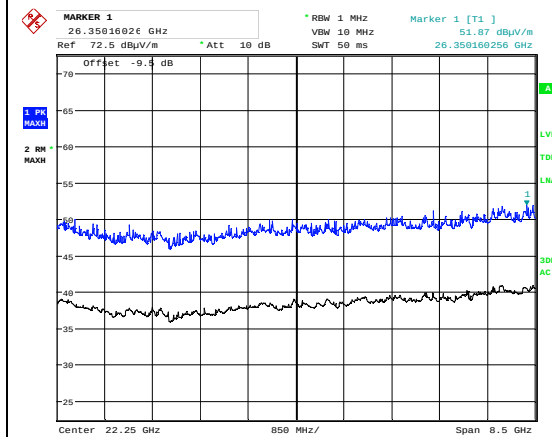
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Radiated Emissions 18-26 GHz, Ch056, 802.11n MCS0, MIMO, VP



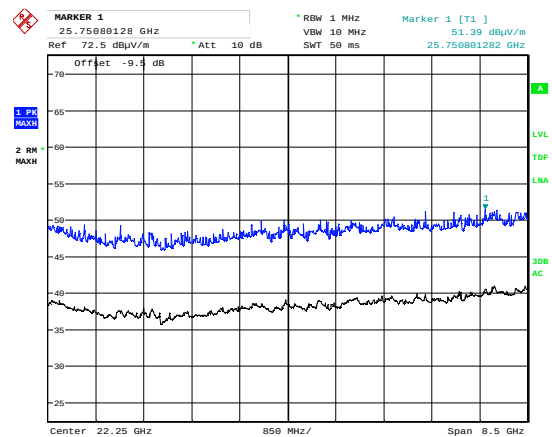
Date: 14.MAR.2023 12:12:26

HP



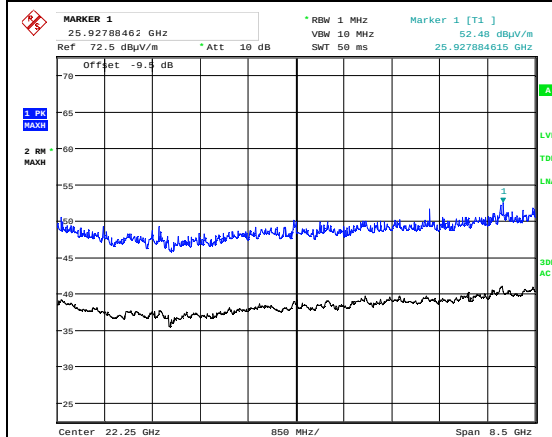
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Radiated Emissions 18-26 GHz, Ch106, 802.11ac HT80 MCS0, MIMO, VP



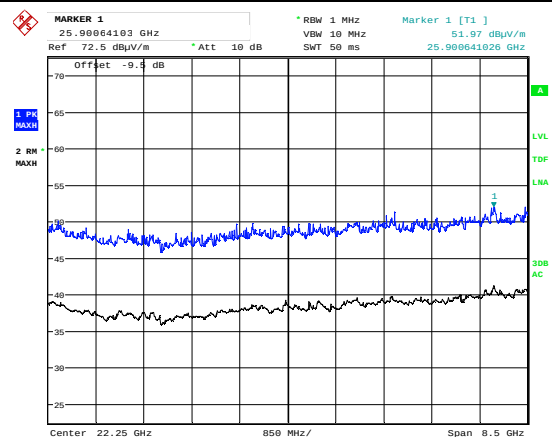
Date: 14.MAR.2023 13:13:28

HP



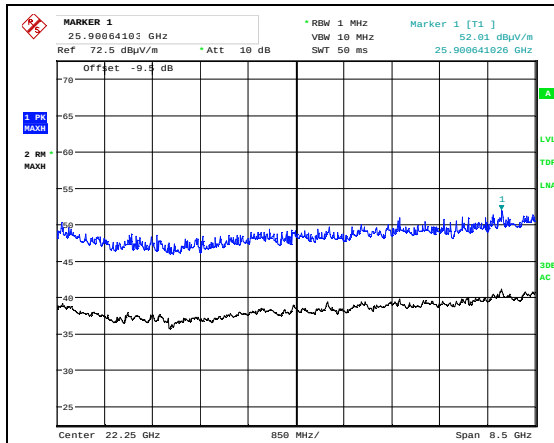
Date: 14.MAR.2023 13:06:08

Radiated Emissions 18-26 GHz, Ch110, 802.11ac HT40 MCS0, MIMO, VP



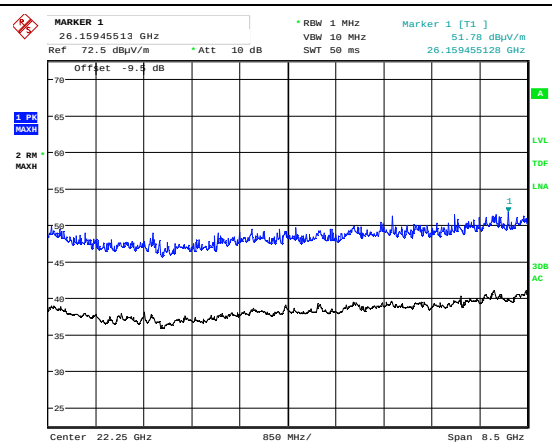
Date: 14.MAR.2023 13:10:15

HP



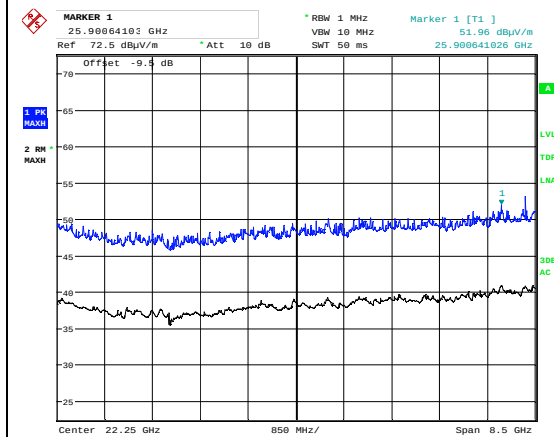
Date: 14.MAR.2023 12:50:48

Radiated Emissions 18-26 GHz, Ch116, 802.11a 6M, Ant1, VP



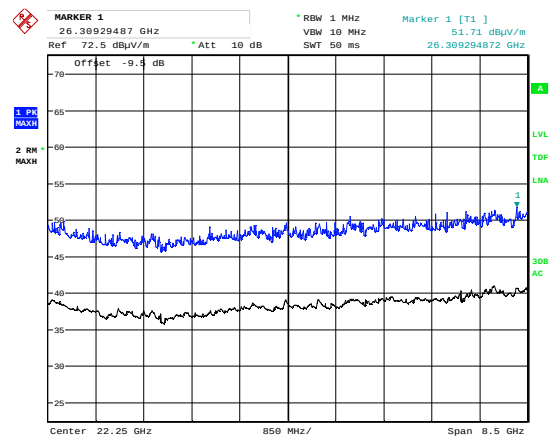
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HP



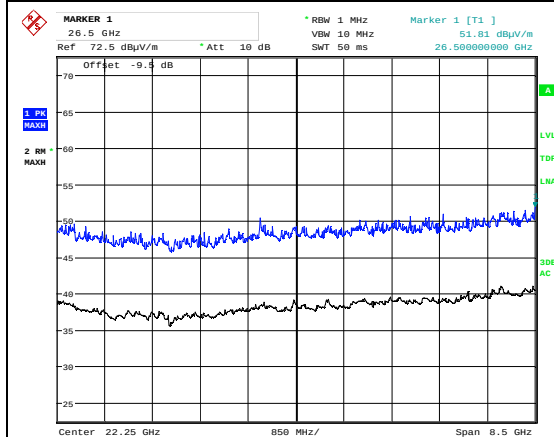
Date: 14.MAR.2023 12:43:50

Radiated Emissions 18-26 GHz, Ch116, 802.11a 6M, Ant2, VP



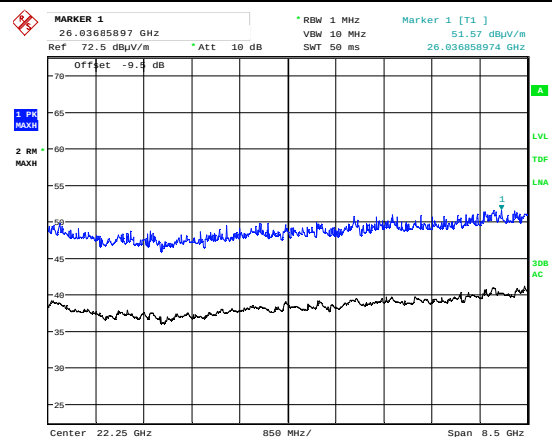
Date: 14.MAR.2023 12:46:05

HP



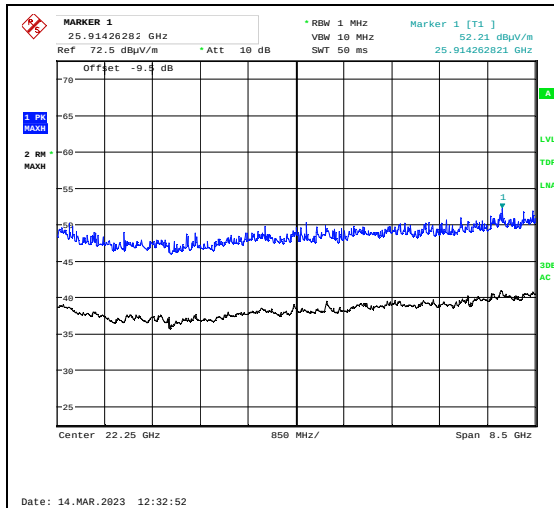
Date: 14.MAR.2023 12:17:39

Radiated Emissions 18-26 GHz, Ch116, 802.11n MCS0, MIMO, VP

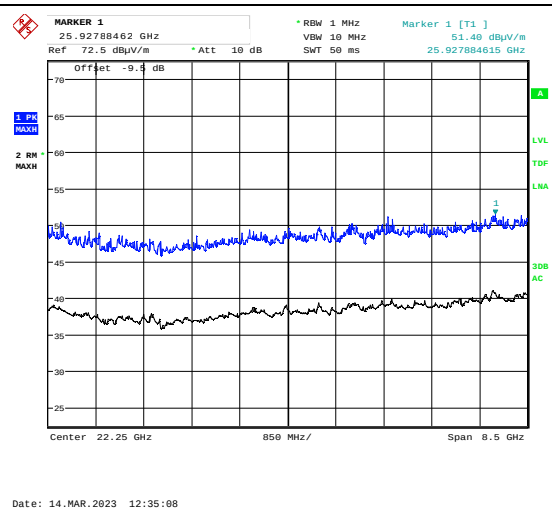


Date: 14.MAR.2023 12:21:31

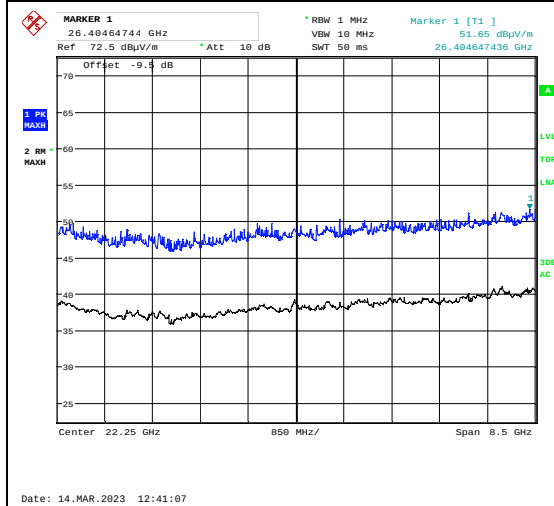
HP



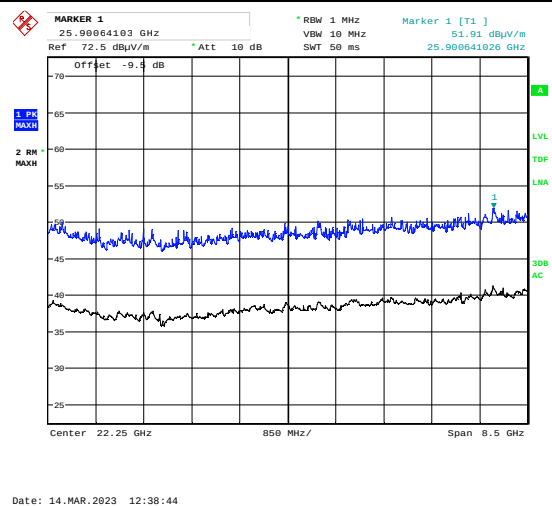
Radiated Emissions 18-26 GHz, Ch157, 802.11a 6M, Ant1, VP



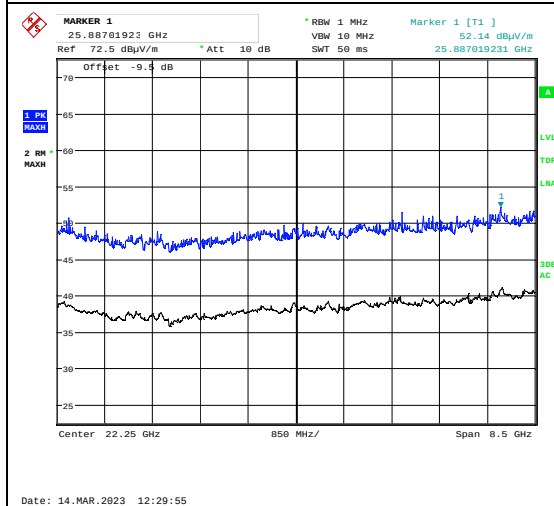
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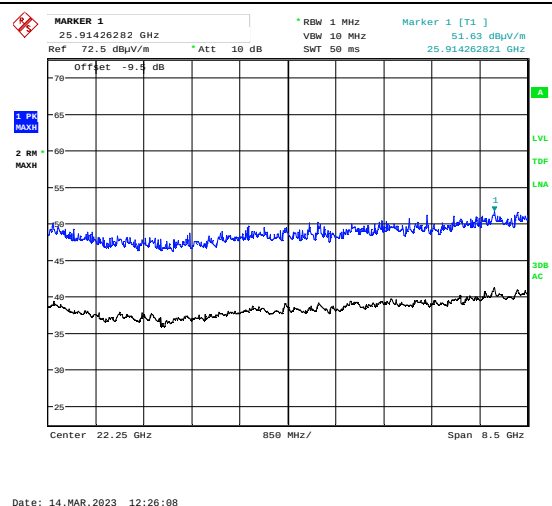
Radiated Emissions 18-26 GHz, Ch157, 802.11a 6M, Ant2, VP



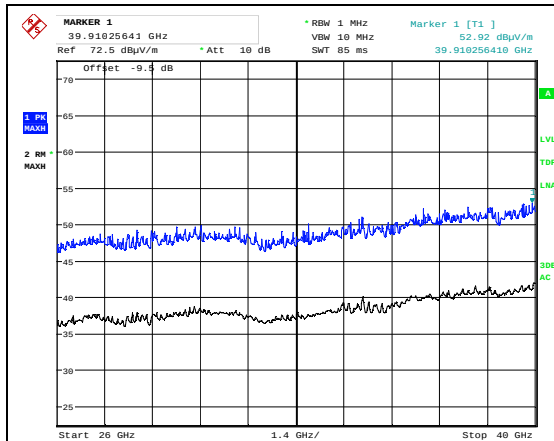
HP



Radiated Emissions 18-26 GHz, Ch157, 802.11n MCS0, MIMO, VP

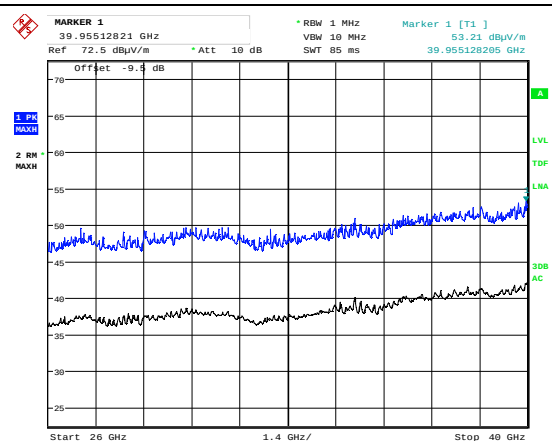


HP



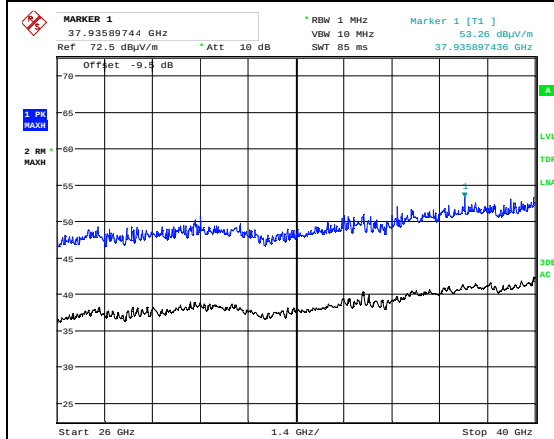
Date: 14.MAR.2023 13:43:37

Radiated Emissions 18-26 GHz, Ch056, 802.11n MCS0, MIMO, VP



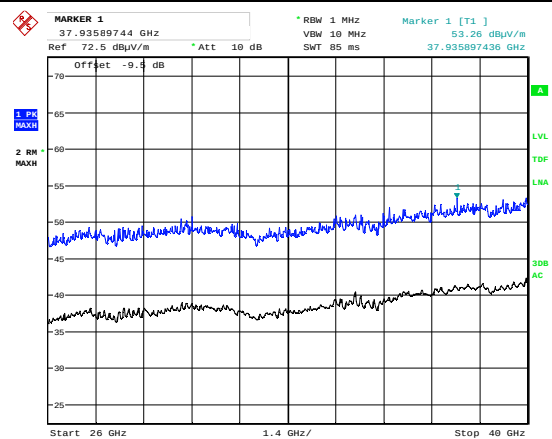
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HP



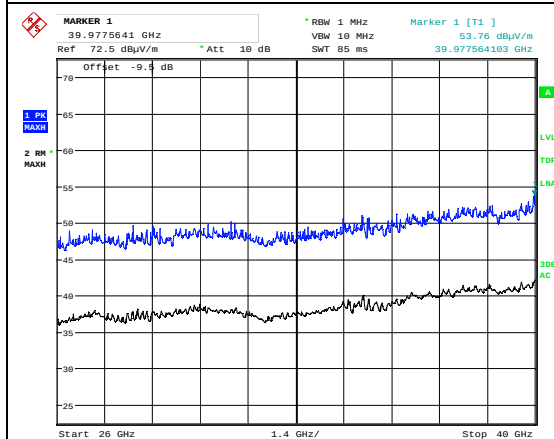
Date: 14.MAR.2023 13:22:10

Radiated Emissions 18-26 GHz, Ch106, 802.11n HT80 MCS0, MIMO, VP



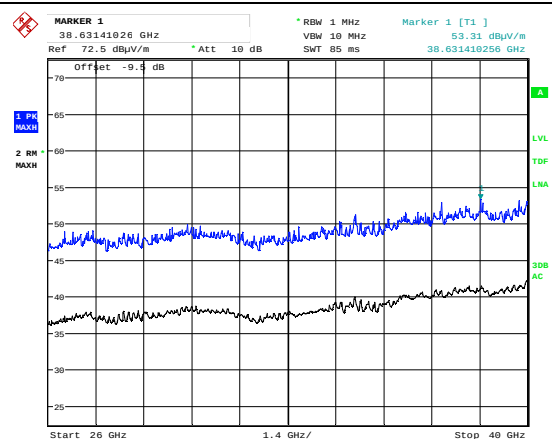
Date: 14.MAR.2023 13:24:18

HP



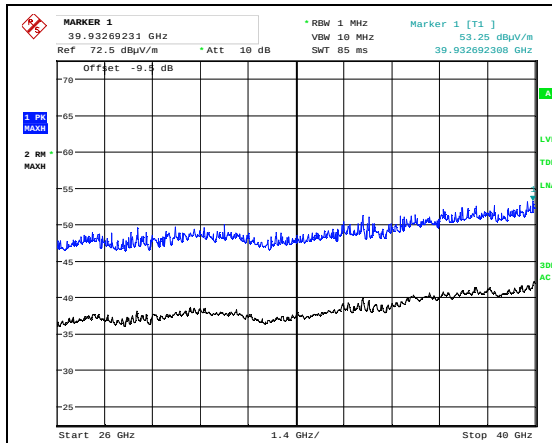
Date: 14.MAR.2023 13:29:11

Radiated Emissions 18-26 GHz, Ch110, 802.11n HT40 MCS0, MIMO, VP



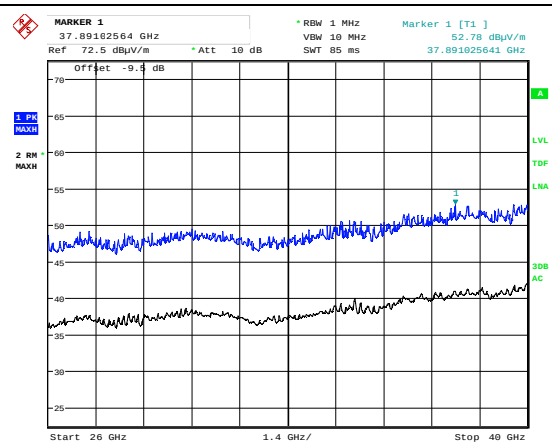
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HP



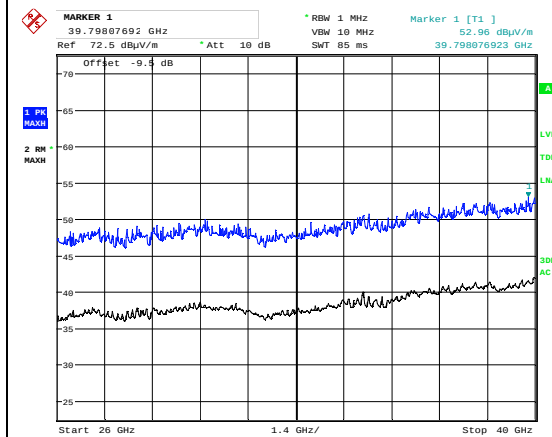
Date: 14.MAR.2023 13:55:51

Radiated Emissions 18-26 GHz, Ch116, 802.11a 6M, Ant1, VP



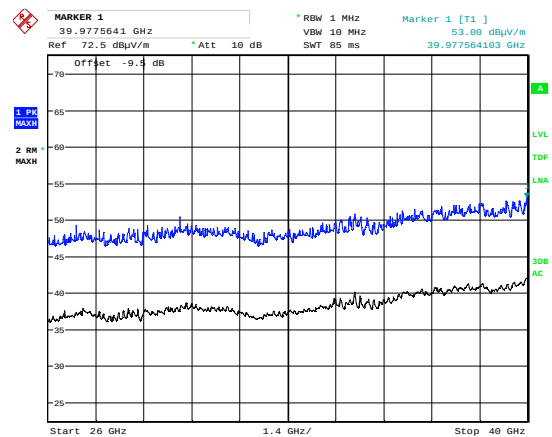
Date: 14.MAR.2023 13:53:21

HP



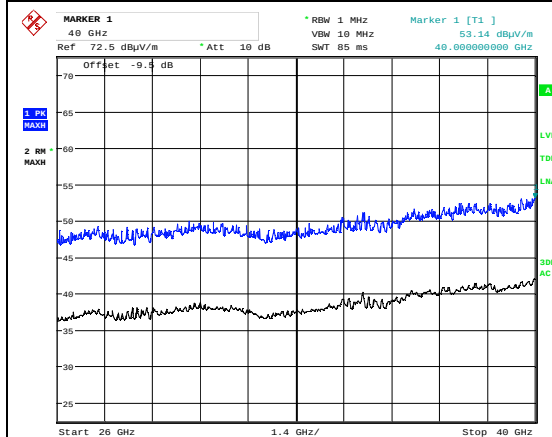
Date: 14.MAR.2023 13:58:39

Radiated Emissions 18-26 GHz, Ch116, 802.11a 6M, Ant2, VP



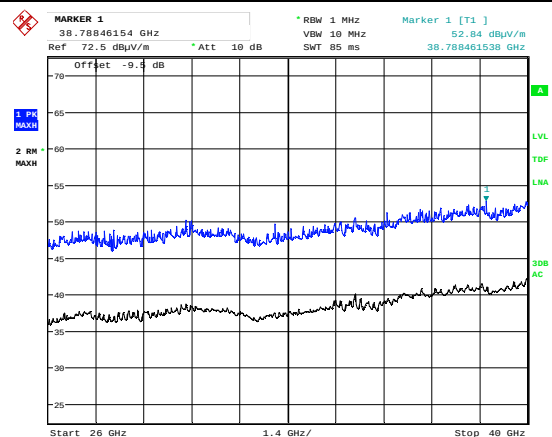
Date: 14.MAR.2023 14:00:59

HP



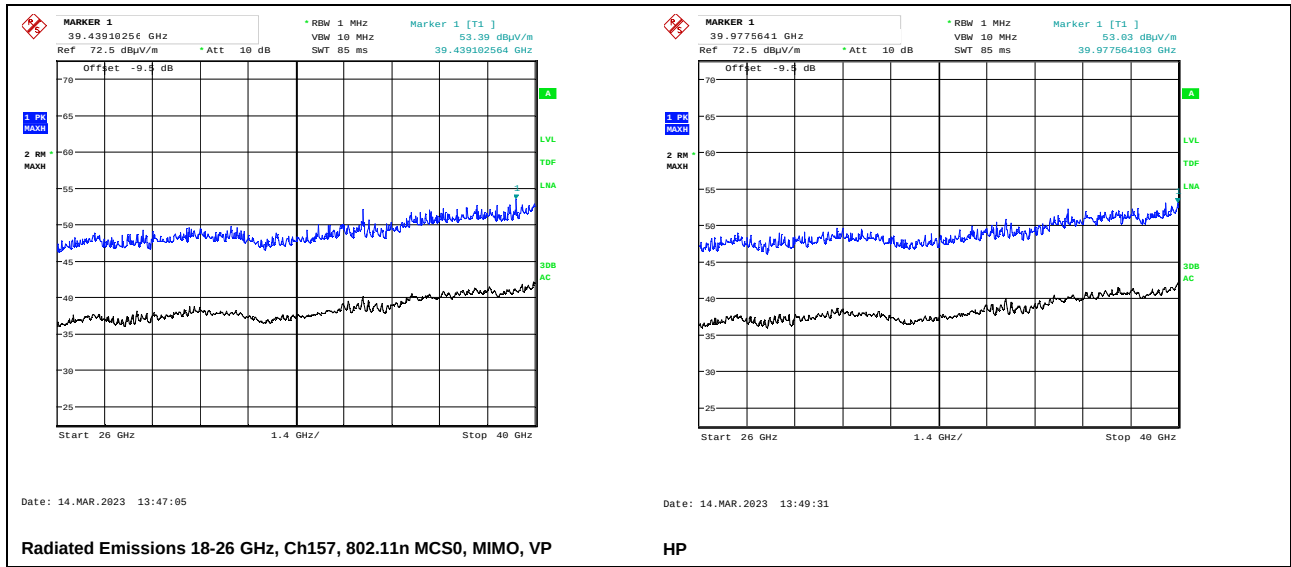
Date: 14.MAR.2023 13:34:57

Radiated Emissions 18-26 GHz, Ch116, 802.11n MCS0, MIMO, VP

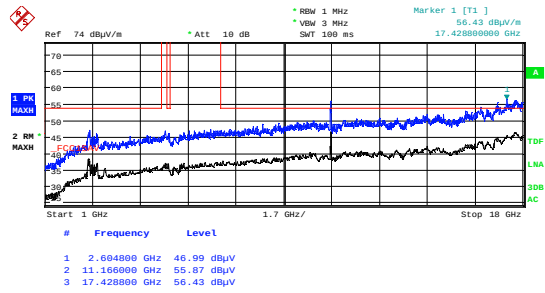


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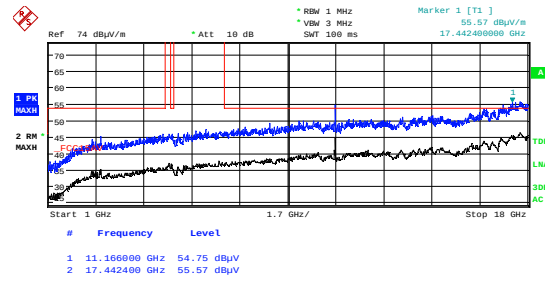
HP



Whip+Patch Antenna



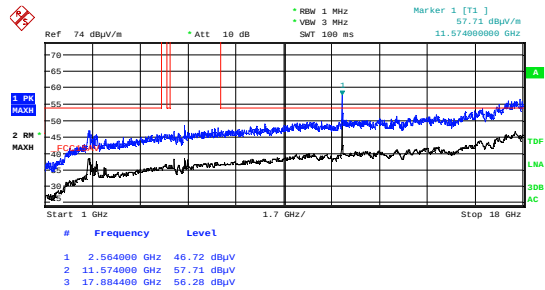
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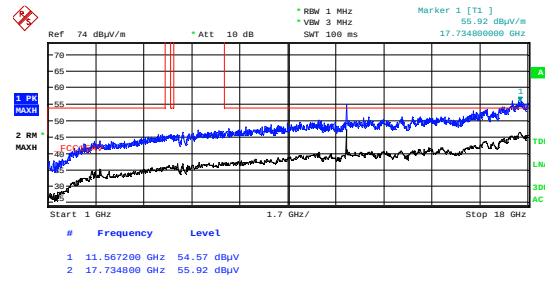
Date: 8.MAR.2023 09:49:54

Radiated Emissions 1-18 GHz, Ch116, 802.11n HT20, MIMO, VP

HP



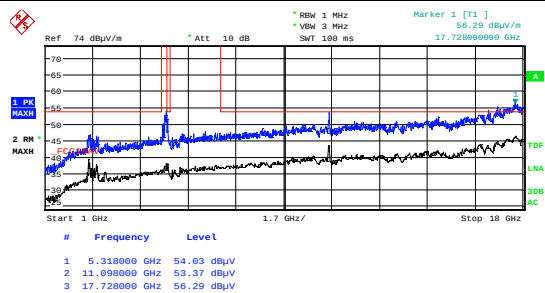
Date: 8.MAR.2023 10:55:31



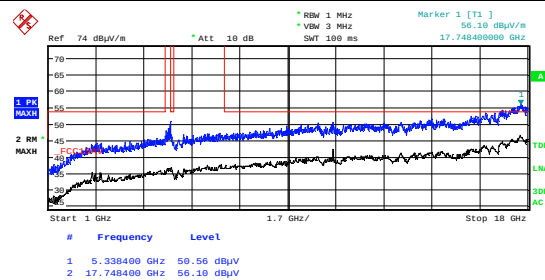
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Radiated Emissions 1-18 GHz, Ch157, 802.11n HT20, MIMO, VP

HP



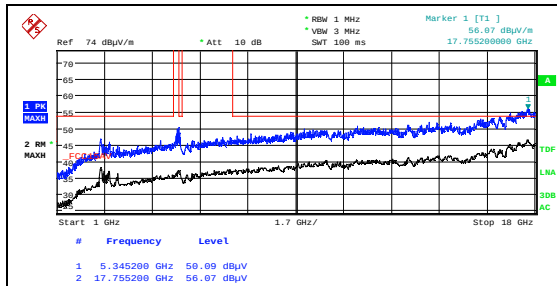
Date: 8.MAR.2023 09:22:02



Date: 8.MAR.2023 09:23:59

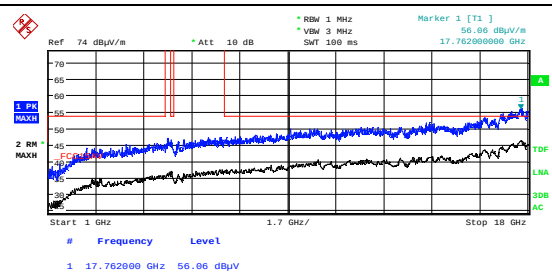
Radiated Emissions 1-18 GHz, Ch110, 802.11n HT40, MIMO, VP

HP



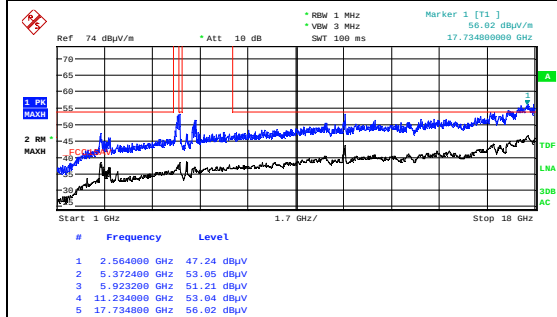
Date: 8.MAR.2023 09:35:21

Radiated Emissions 1-18 GHz, Ch106, 802.11n HT80, MIMO, VP



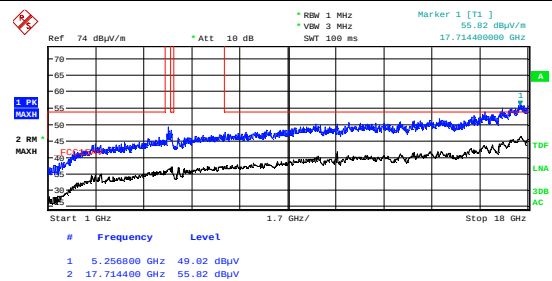
Date: 8.MAR.2023 09:37:19

HP



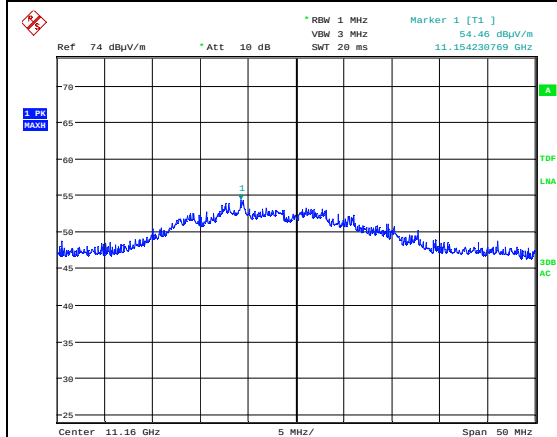
Date: 8.MAR.2023 09:41:20

Radiated Emissions 1-18 GHz, Ch122, 802.11n HT80, MIMO, VP



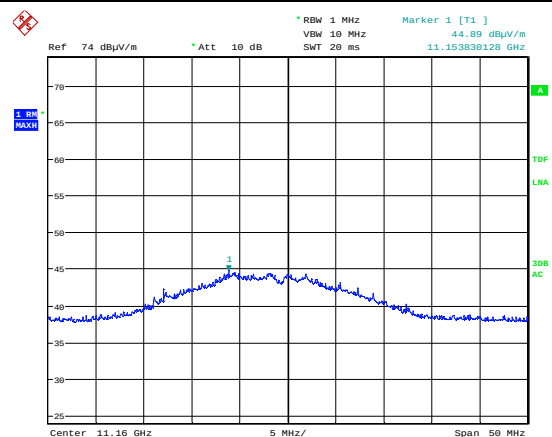
Date: 8.MAR.2023 09:43:18

HP



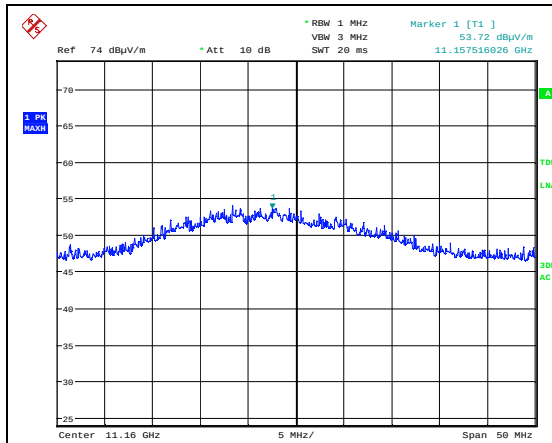
Date: 8.MAR.2023 10:33:25

Emissions 11160 MHz, Ch116, 802.11a 6M, Max: Ant1, VP, Peak

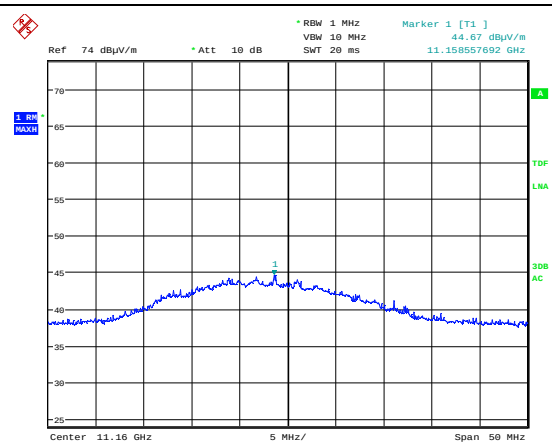


Date: 8.MAR.2023 10:36:16

Av



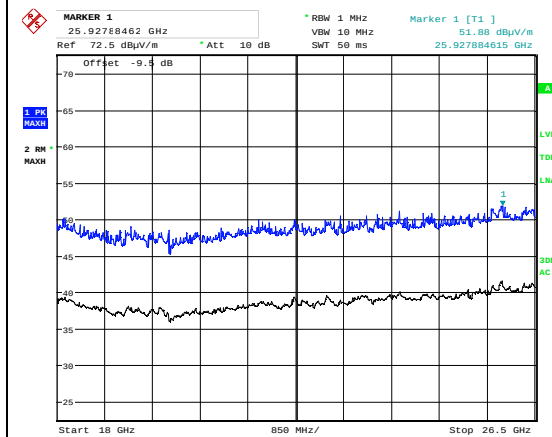
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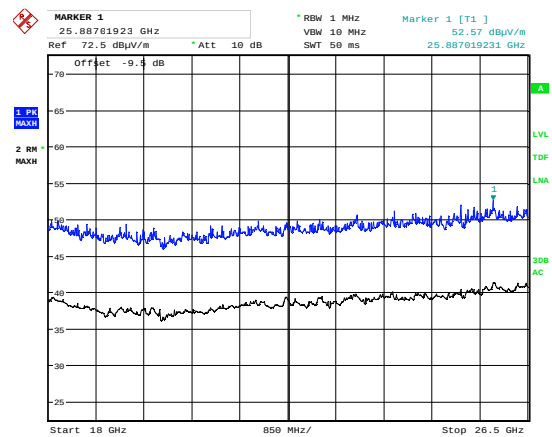
Date: 8.MAR.2023 10:31:14

Emissions 11160 MHz, Ch116, 802.11n HT20 MCS0, Max: Ant1, VP, Peak

Av



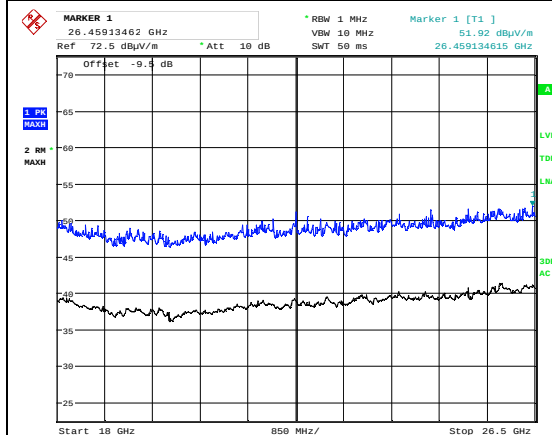
Date: 14.MAR.2023 15:29:14



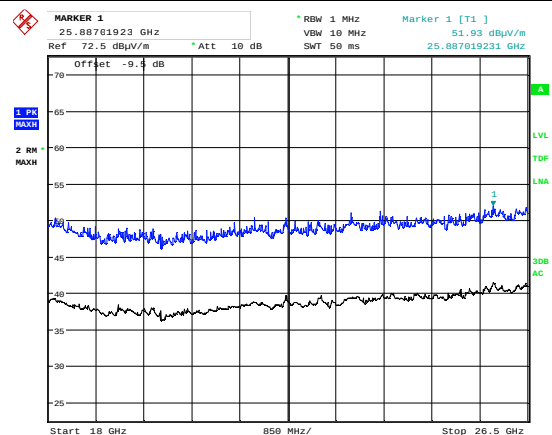
Date: 14.MAR.2023 15:27:03

Emissions 18-26 GHz, Ch056, 802.11n HT20, MIMO, @1m, VP

HP



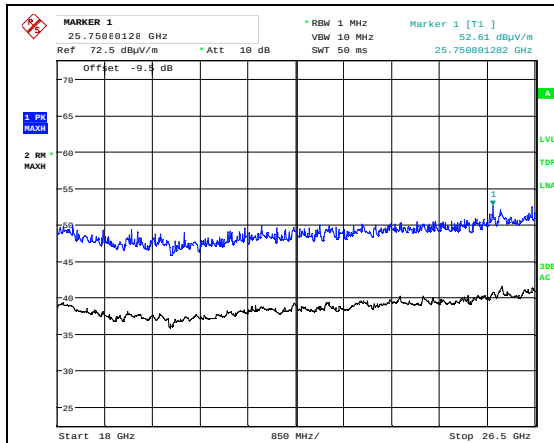
Date: 14.MAR.2023 15:21:42



Date: 14.MAR.2023 15:24:37

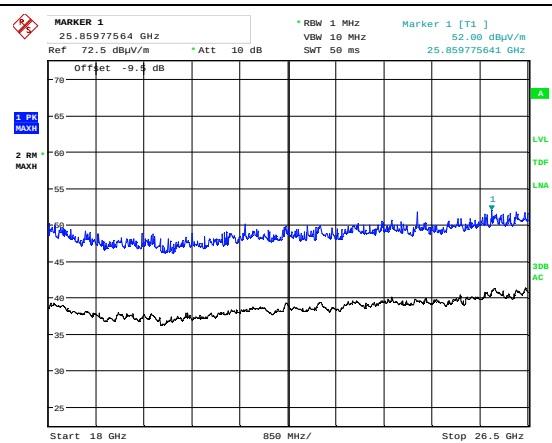
Emissions 18-26 GHz, Ch116, 802.11n HT20, MIMO, @1m, VP

HP



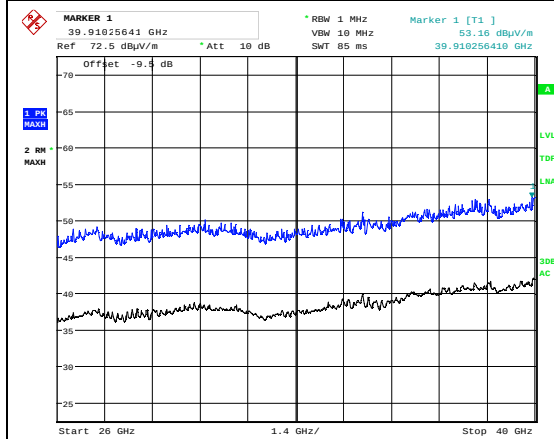
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Emissions 18-26 GHz, Ch157, 802.11n HT20, MIMO, @1m, VP



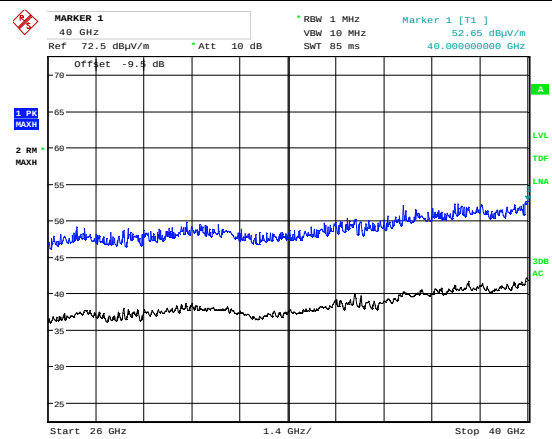
Date: 14.MAR.2023 15:34:48

HP



Date: 14.MAR.2023 14:52:15

Emissions 26-40 GHz, Ch116, 802.11n HT20, MIMO, @1m, VP



Date: 14.MAR.2023 14:54:20

HP

4.9 Dynamic Frequency Selection

FCC 15.407(h)(2)

ISED RSS-247, Issue 3, Clause 6.3

Test Results: Complies

Measurement Data:

	Measured values	
	Frequency Band 2	Frequency Band 3
Carrier Frequency	5280 MHz	5580 MHz
Channel Move Time	2.117 sec	2.136 sec
Non-occupancy Period	> 30 min	> 30 min

The tested EUT is a slave or client device without radar detection capabilities. The handset does not have ad-hoc or direct mode.

The test was performed by setting up a link between the EUT and the base station with DFS on the test channel, and then applying a radar signal at a RF level of -50dBm to the Master device while the channel was monitored on the Spectrum Analyzer.

The EUT moves channel with the Master Device. See plots that illustrate Channel Move Time and Non-Occupancy Time in the frequency bands 5250 - 5350 MHz and 5470 – 5725 MHz.

The test was performed conducted according to KDB 848637.

FCC Radar Type 3 with Pulse Width 10μs, PRI 200μs and 18 pulses per burst was used (FCC 06-96 A1). Only one burst was used for each test since the Access point with DFS detected the radar every time.

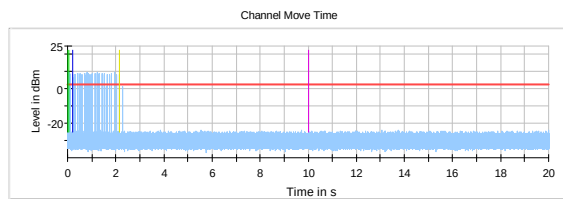
The Access Point with DFS used as companion device for this test was a Linksys WRT3200ACM.

Requirements

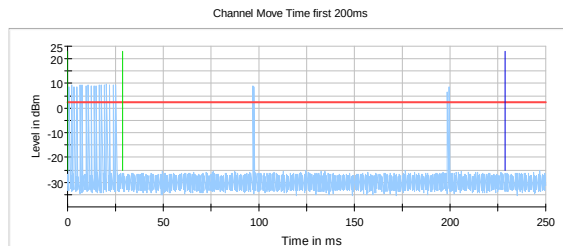
FCC 15.407(h)(2), IC RSS-247, Issue 3, Clause 6.3:

Channel Move Time: After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

Non-occupancy Period: A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

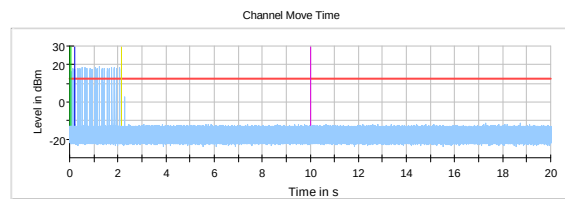


Channel Move Time
Threshold
Start of Radar
Trigger at end of Radar
First 200ms of Channel Closing Tx Time
10sec Channel Move Time Limit
Last measured edge of Channel Closing Tx Time

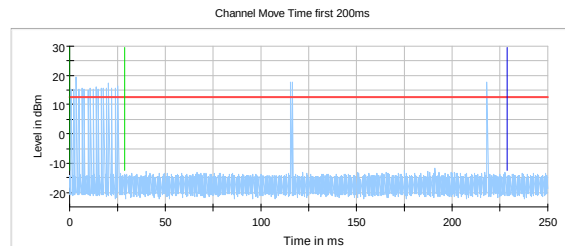


Channel Move Time first 200ms
Threshold
Start of Radar
Trigger at end of Radar
First 200ms of Channel Closing Tx Time

Channel Move Time, Band 2

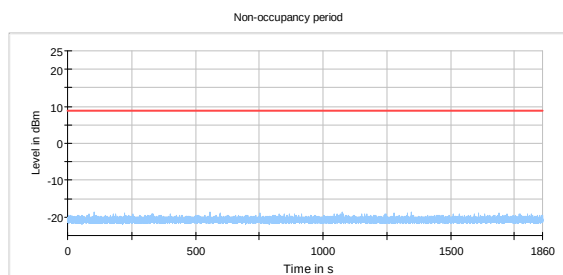


Channel Move Time
Threshold
Start of Radar
Trigger at end of Radar
First 200ms of Channel Closing Tx Time
10sec Channel Move Time Limit
Last measured edge of Channel Closing Tx Time



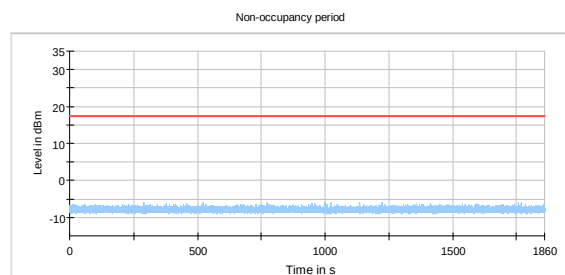
Channel Move Time first 200ms
Threshold
Start of Radar
Trigger at end of Radar
First 200ms of Channel Closing Tx Time

Channel Move Time, Band 3



Non-occupancy period
Threshold

Non-Occupancy Period, Band 2



Non-occupancy period
Threshold

Non-Occupancy Period, Band 3

5 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

6 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	FSVA3044	Spectrum Analyzer	Rohde & Schwarz	LR 1808	2022-08	2024-08
2	OSP-B157W8	Peak Power Meters	Rohde & Schwarz	LR 1793	2022-02	2024-01
3	OSP-220	Switch and Control Unit	Rohde & Schwarz	LR 1806	2022-08	2024-08
4	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2023-01	2024-01
5	6810-17B	Attenuator	Suhner	LR 1669	COU	
6	L01G18G1	LowPass Filter (1 GHz)	Microwave Circuits	LR 1768	COU	
7	JB3	BiLog Antenna	Sunol	N-4525	2020-03 2023-04	2023-03 2026-04
8	310	Preamplifier	Sonoma Inst.	LR 1686	2022-08 2023-08	2023-08 2024-08
9	8449A	Pre-amplifier	Hewlett Packard	LR 1322	2022-08 2023-08	2023-08 2024-08
10	3117-PA	Antenna Horn +PreAmp	EMCO	LR 1717	2022-08 2023-08	2023-08 2024-08
11	3115	Antenna Horn	EMCO	LR 1226	2022-12	2027-12
12	Model 638	Antenna Horn	Narda	LR 1480	N/A	
14	Model V637	Antenna Horn	Narda	LR 099	N/A	
15	JS4-20004000	Preamplifier	Miteq	LR 1591	2022-08 2023-08	2023-08 2024-08
16	N0452501	BandStop Filter (5.3 GHz)	Microwave Circuits	LR 1775	COU	
17	N0555983	BandStop Filter (5.5 GHz)	Microwave Circuits	LR 1774	COU	
18	N0257881	BandStop Filter (5.8 GHz)	Microwave Circuits	LR 1764	COU	
19	Model 87 V	Multimeter	Fluke	LR 1597	2023-04	2024-04
20	9205B	DC Power Supply	BK Precision	LR 1846	COU	
21	SF102/1000MM	RF Cable	Suhner	SN 50113/2	COU	
22	SF102/2000MM	RF Cable	Suhner	SN 500100/2	COU	

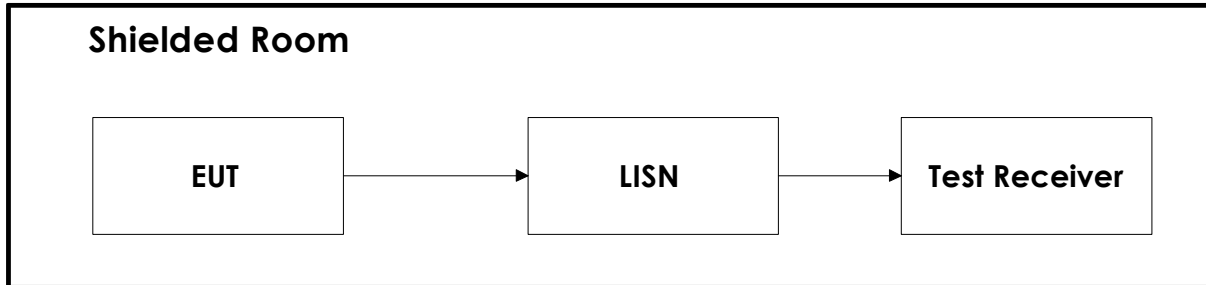
Note: COU – calibrate on use; N/A – Not Applicable

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

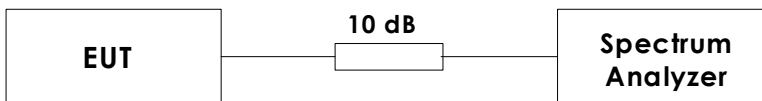
No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.50	EMC test software
2	Rohde & Schwarz	EMC32	11.40	Radio test software
3	Nemko	RSPlot	1.0.8.0	Screenshots from R&S Spectrum Analyzers

7 BLOCK DIAGRAM

7.1 Power Line Conducted Emission

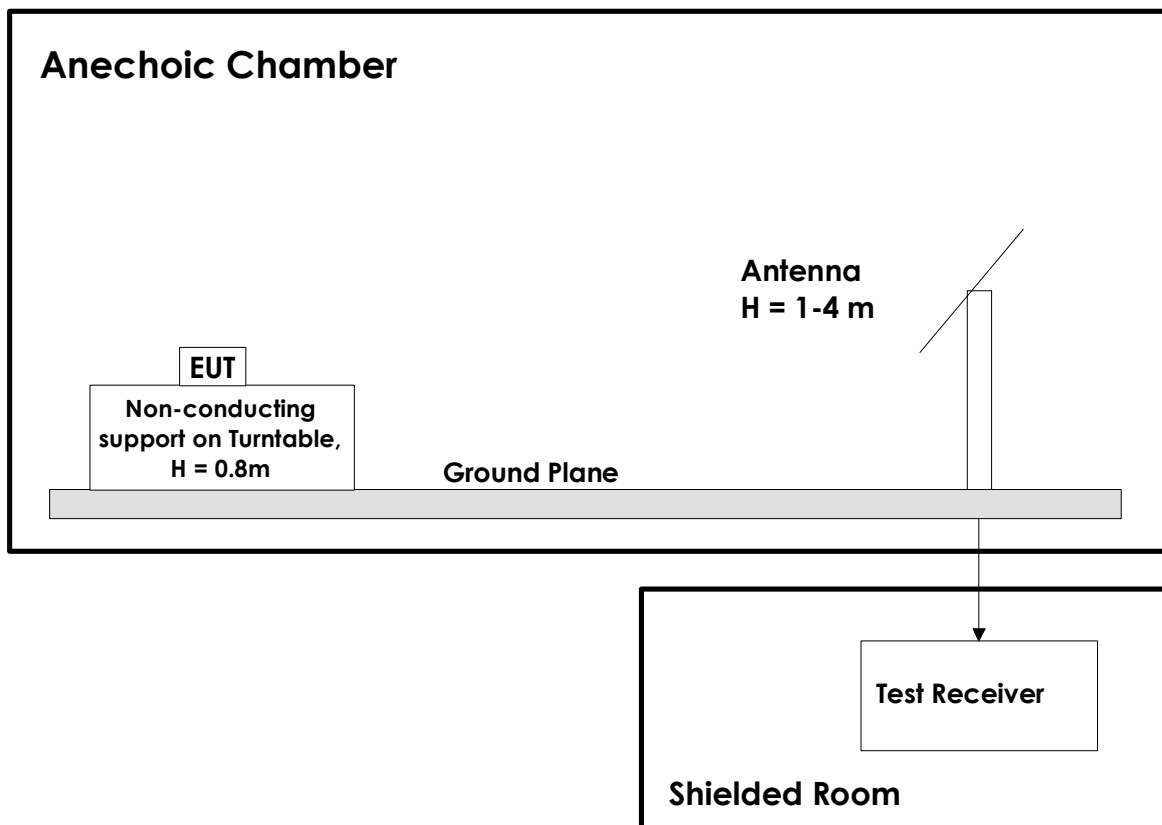


7.2 Conducted Tests



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

7.3 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.