

### 3.5 Unwanted Emissions

FCC 15.407 (b)

ISED RSS-247, Issue 2, clause 6.2

Measurement procedure: ANSI C63.10-2013 Clause 12.7

Test Results: Complies

Measurement Data:

Band Edge Emissions:

| Ch. No. | Carrier Frequency (MHz) | Band Edge Frequency (MHz) | Measured Values (dBm/MHz e.i.r.p.) |              |
|---------|-------------------------|---------------------------|------------------------------------|--------------|
|         |                         |                           | 802.11a 6Mb                        | 802.11n HT20 |
| 36      | 5180                    | 5150                      | -28.7                              | -28.4        |
| 64      | 5320                    | 5350                      | -28.3                              | -29.1        |
| 100     | 5500                    | 5470                      | -29.3                              | -29.0        |
| 140     | 5700                    | 5725                      | -27.5                              | -27.6        |
| 149     | 5745                    | 5650                      | < -40                              | < -40        |
| 149     | 5745                    | 5700                      | < -20                              | < -20        |
| 165     | 5825                    | 5875                      | < -20                              | < -20        |
| 165     | 5825                    | 5925                      | < -40                              | < -40        |

The measurement was performed radiated.

The results in the table above are from measurements performed on the polarization (HP or VP) and antenna (1 or 2) providing the highest e.i.r.p. on the respective frequency – see plots on the following pages.

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

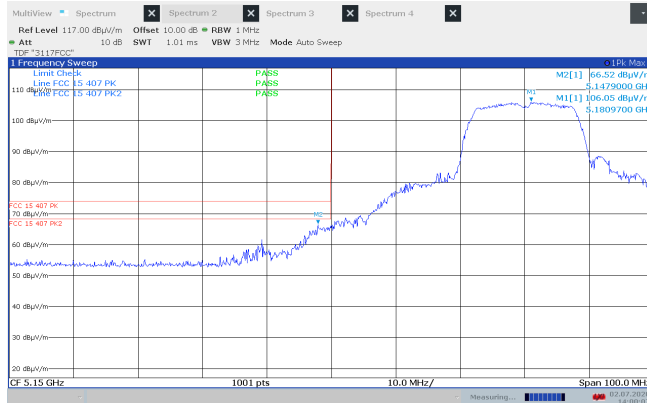
The tested equipment is for indoor use only, no band-edge requirements apply at 5250 MHz.

Limits:

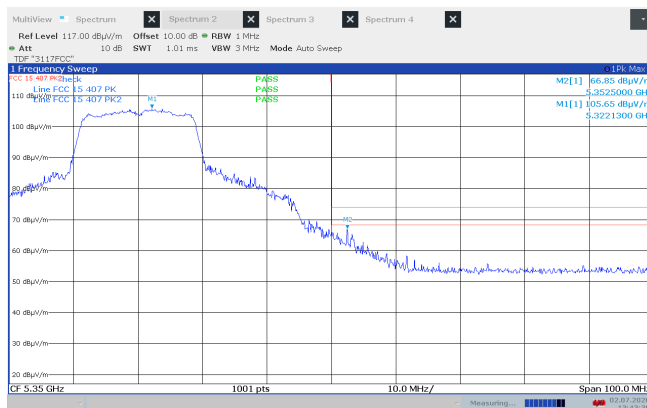
| Operating Frequency band | Limit for Emissions Outside Operating Frequency Band |
|--------------------------|------------------------------------------------------|
| 5150 – 5250 MHz          | -27 dBm/MHz e.i.r.p.                                 |
| 5250 – 5350 MHz          | -27 dBm/MHz e.i.r.p.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

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

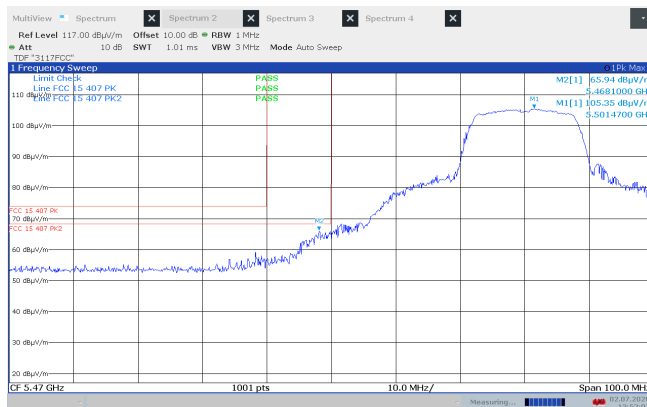
## Band Edge emissions – Peak Detector



**Band Edge 5150 MHz, ch036, 802.11a 6Mb, EUT V, VP, Ant 2, Max**



**Band Edge 5350 MHz, ch064, 802.11a 6Mb, EUT V, VP, Ant 1, Max**



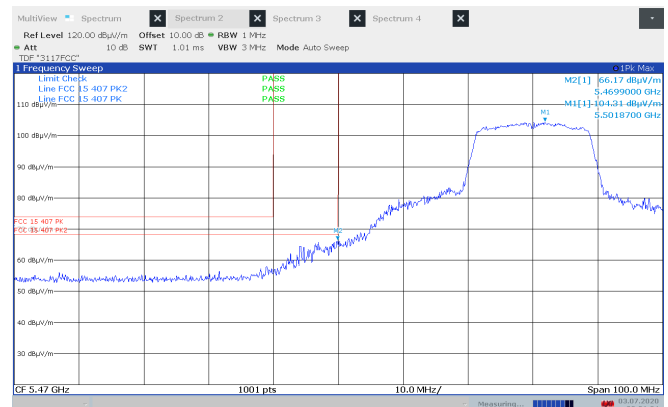
**Band Edge 5470 MHz, ch100, 802.11a 6Mb, EUT V, VP, Ant 1, Max**



**Band Edge 5150 MHz, ch036, 802.11n HT20, EUT V, VP, Ant 2, Max**



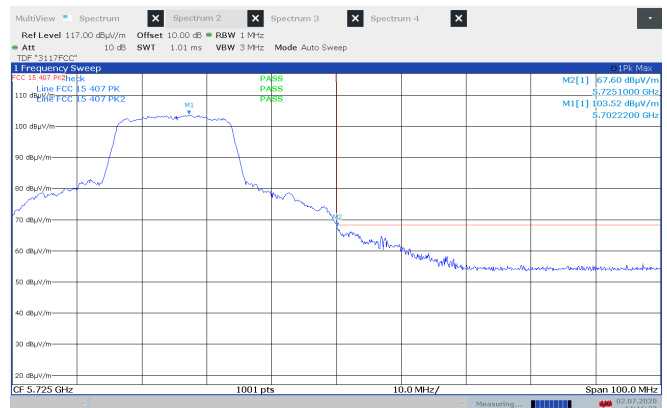
**Band Edge 5350 MHz, ch064, 802.11n HT20, EUT V, VP, Ant 1, Max**



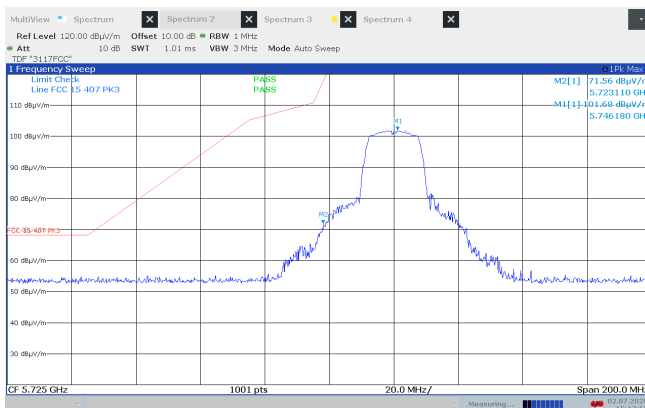
**Band Edge 5470 MHz, ch100, 802.11n HT20, EUT V, VP, Ant 1, Max**



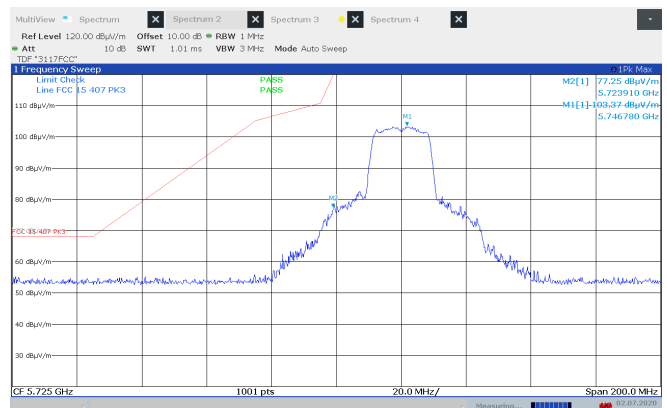
**Band Edge 5725 MHz, ch140, 802.11a 6Mb, EUT V, VP, Ant 2, Max**



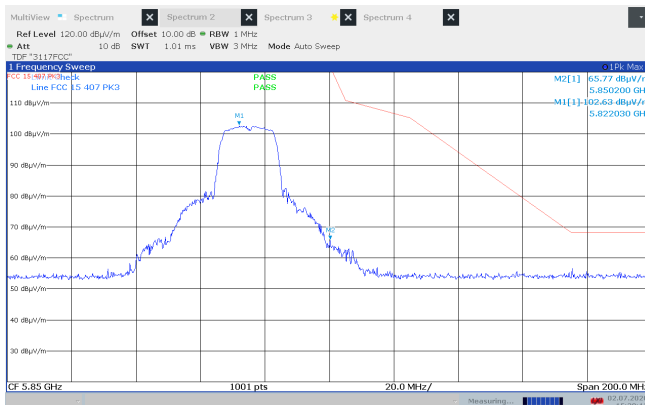
**Band Edge 5725 MHz, ch140, 802.11n HT20, EUT V, VP, Ant 2, Max**



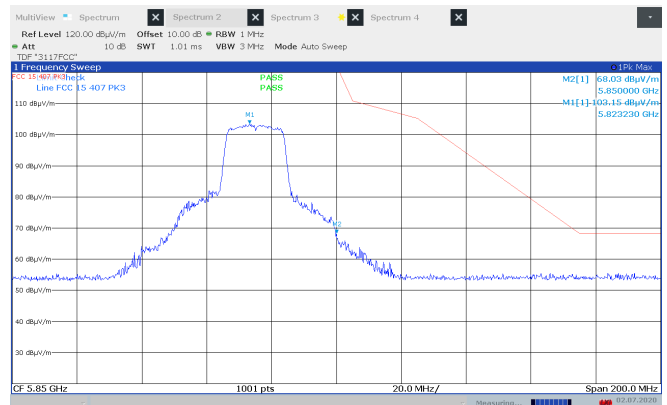
**Band Edge 5725 MHz, ch149, 802.11a 6Mb, EUT V, VP, Ant 1, Max**



**Band Edge 5725 MHz, ch149, 802.11n HT20, EUT V, VP, Ant 1, Max**



**Band Edge 5850 MHz, ch165, 802.11a 6Mb, EUT V, VP, Ant 2, Max**



**Band Edge 5850 MHz, ch165, 802.11n HT20, EUT V, VP, Ant 2, Max**

For unwanted emissions measurements in the range 1-40 GHz and plots with Peak Detector see clause 3.8

### 3.6 Restricted Bands of operation

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

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

| FCC (MHz)                           | ISED (MHz)         | FCC (GHz)                            | ISED (GHz)        |
|-------------------------------------|--------------------|--------------------------------------|-------------------|
| 0.090-0.110                         |                    | <b>0.96-1.24</b><br><b>1.3-1.427</b> | <b>0.96-1.427</b> |
| 0.495-0.505                         |                    | 1.435-1.6265                         |                   |
| 2.1735-2.1905                       |                    | 1.6455-1.6465                        |                   |
|                                     | <b>3.020-3.026</b> | 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                            |                   |
|                                     | <b>5.677-5.683</b> | 2.4835-2.5                           |                   |
| 6.215-6.218                         |                    | <b>2.69-2.9</b>                      | <b>2.655-2.9</b>  |
| 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                         |                    | <b>3.6-4.4</b>                       | <b>3.5-4.4</b>    |
| 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                            |                   |
| <b>108-121.94</b><br><b>123-138</b> | <b>108-138</b>     | 31.2-31.8                            |                   |
| 149.9-150.05                        |                    | 36.43-36.5                           |                   |
| 156.52475-156.52525                 |                    | Above 38.6                           |                   |
| 156.7-156.9                         |                    |                                      |                   |
| 162.0125-167.17                     |                    |                                      |                   |
| 167.72-173.2                        |                    |                                      |                   |
| 240-285                             |                    |                                      |                   |
| 322-335.4                           |                    |                                      |                   |
| 399.9-410                           |                    |                                      |                   |
| 608-614                             |                    |                                      |                   |

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

### 3.7 Radiated Emissions, 30 – 1000 MHz

FCC 15.205, 15.209, 15.407

ISED RSS-GEN, Issue 5, Clause 8.9

Measurement procedure: ANSI C63.10-2013 Clause 12.7

Test Results: Complies

#### Measurement Data:

Detector: Peak

Measuring distance 3 m

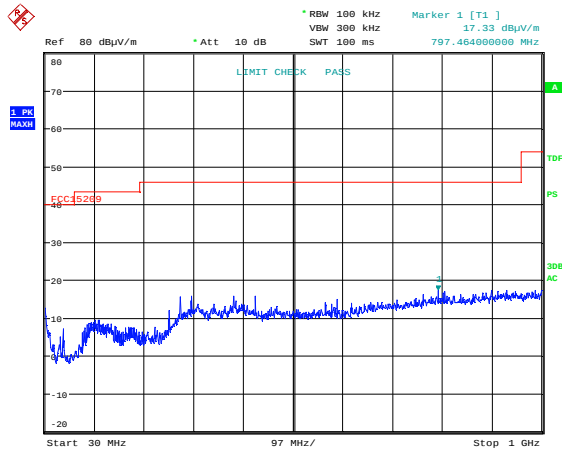
Tested in test mode with EUT transmitting on ch36, ch64, ch100, ch140, ch149, and ch165, on antenna1 and antenna2

| Frequency (MHz) | Peak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Bandwidth (kHz) | Pol |
|-----------------|---------------|----------------|-------------|-----------------|-----|
| 30-1000         | < 20          | See below      | > 20        | 120.000         | V/H |

See attached plots.

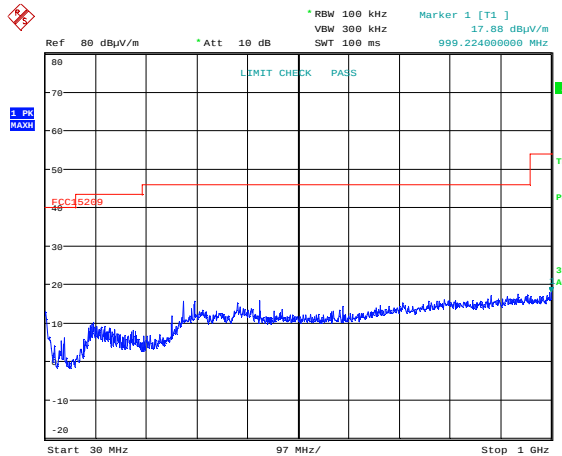
#### Requirements/Limit

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



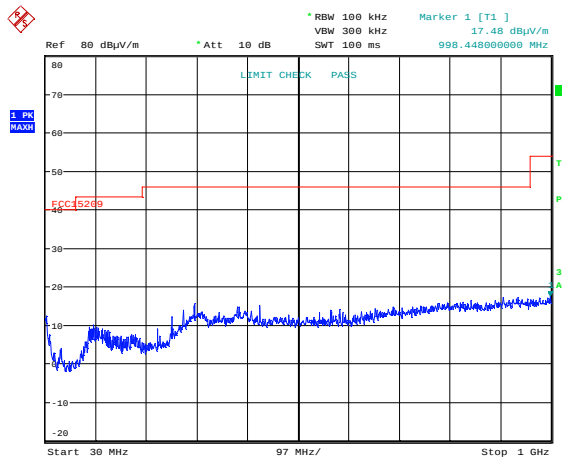
Date: 26.AUG.2020 08:31:03

### Radiated Emissions 30-1000 MHz, Ch036, 802.11a 6M, EUT V, VP



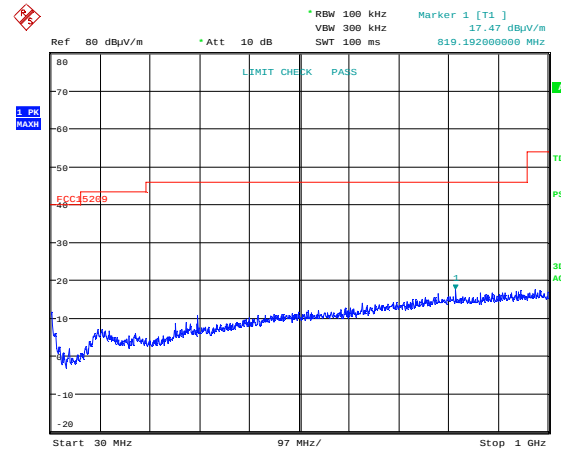
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### Radiated Emissions 30-1000 MHz, Ch036, 802.11n HT20, EUT V, VP



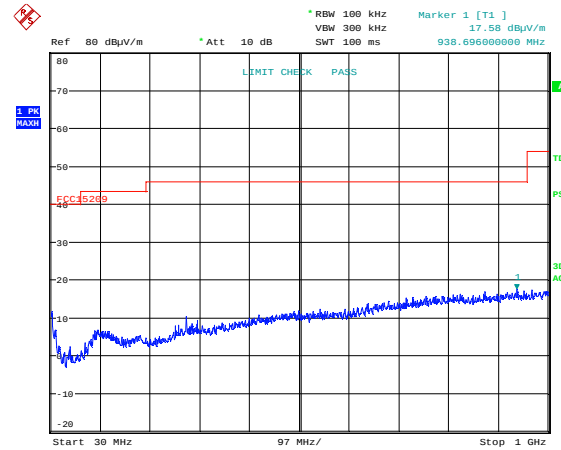
Date: 26.AUG.2020 09:27:30

### Radiated Emissions 30-1000 MHz, Ch064, 802.11a 6M, EUT V, VP



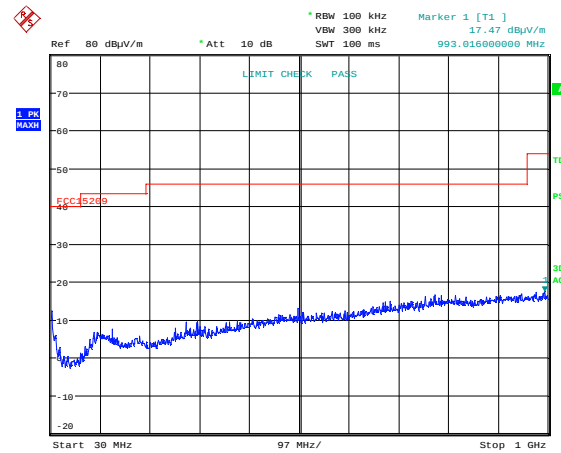
Date: 26.AUG.2020 08:32:58

### Radiated Emissions 30-1000 MHz, Ch036, 802.11a 6M, EUT V, HP



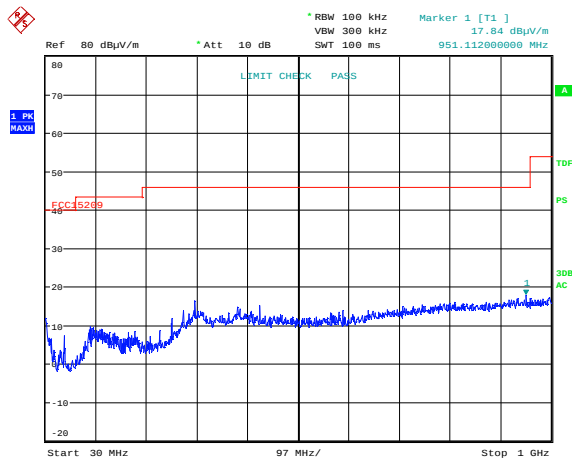
Date: 26.AUG.2020 08:46:21

### Radiated Emissions 30-1000 MHz, 802.11n HT20, EUT V, HP



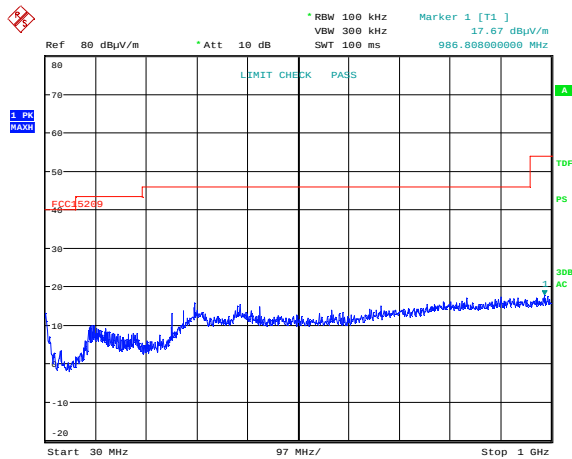
Date: 26.AUG.2020 09:29:24

### Radiated Emissions 30-1000 MHz, Ch064, 802.11a 6M, EUT V, HP



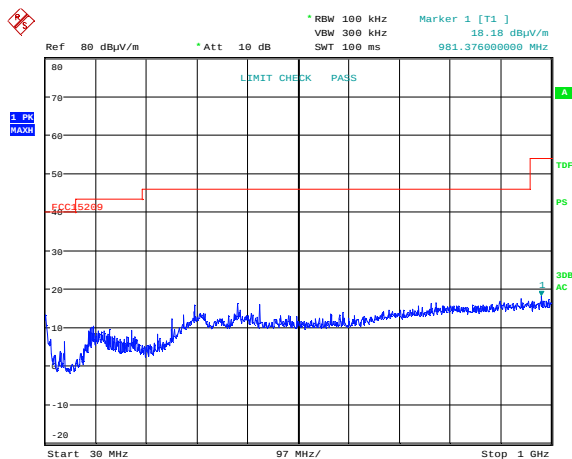
Date: 26.AUG.2020 09:17:01

#### Radiated Emissions 30-1000 MHz, Ch064, 802.11n HT20, EUT V, VP



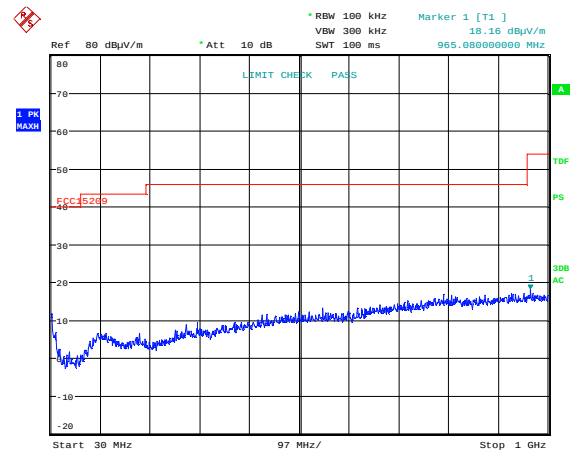
Date: 26.AUG.2020 09:51:13

#### Radiated Emissions 30-1000 MHz, Ch100, 802.11a 6M, EUT V, VP



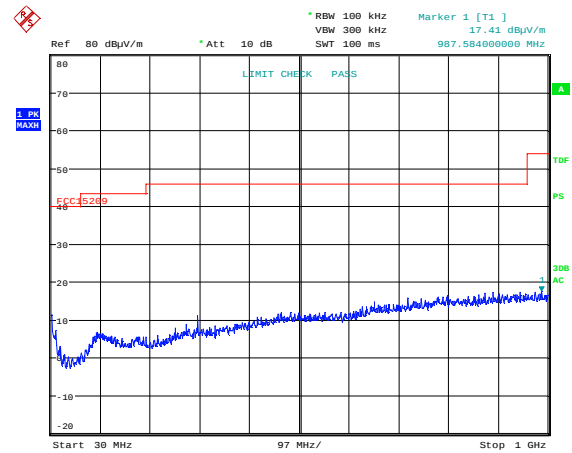
Date: 26.AUG.2020 09:38:33

#### Radiated Emissions 30-1000 MHz, Ch100, 802.11n HT20, EUT V, VP



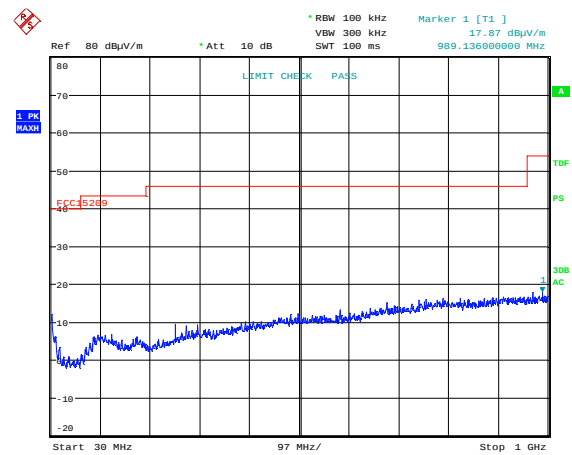
Date: 26.AUG.2020 09:18:55

#### Radiated Emissions 30-1000 MHz, , Ch064, 802.11n HT20, EUT V, HP



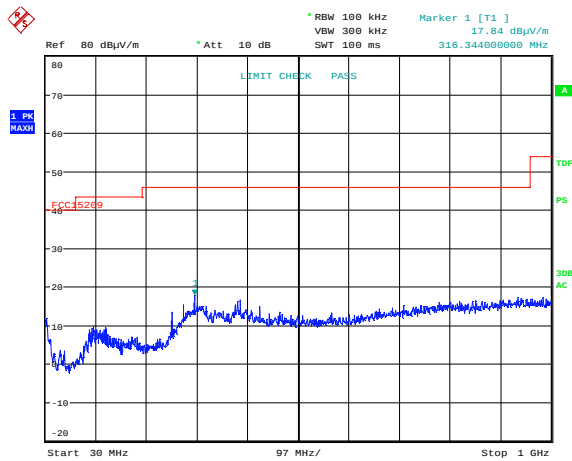
Date: 26.AUG.2020 09:53:07

#### Radiated Emissions 30-1000 MHz, Ch100, 802.11a 6M, EUT V, HP



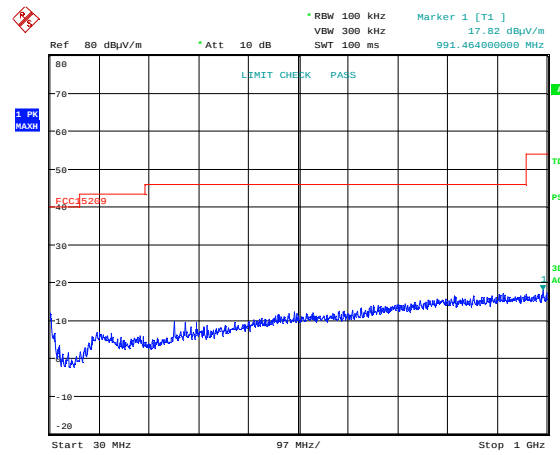
Date: 26.AUG.2020 09:40:28

#### Radiated Emissions 30-1000 MHz, , Ch100, 802.11n HT20, EUT V, HP



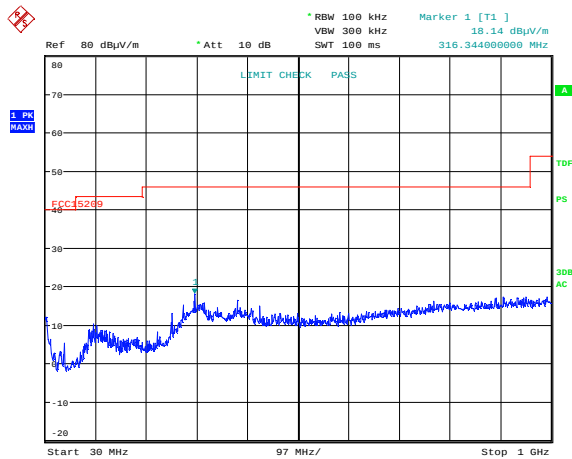
Date: 26.AUG.2020 10:15:33

#### Radiated Emissions 30-1000 MHz, Ch140, 802.11a 6M, EUT V, VP



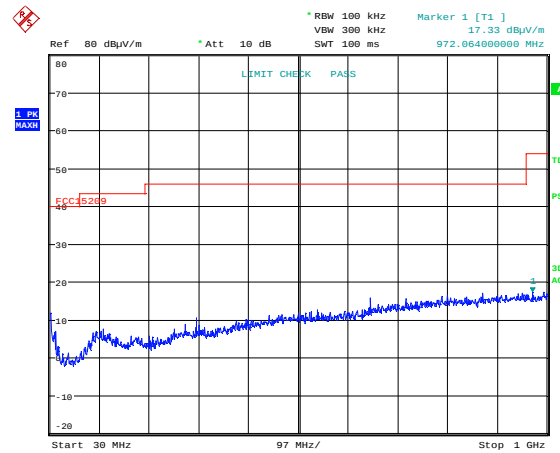
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#### Radiated Emissions 30-1000 MHz, Ch140, 802.11a 6M, EUT V, HP



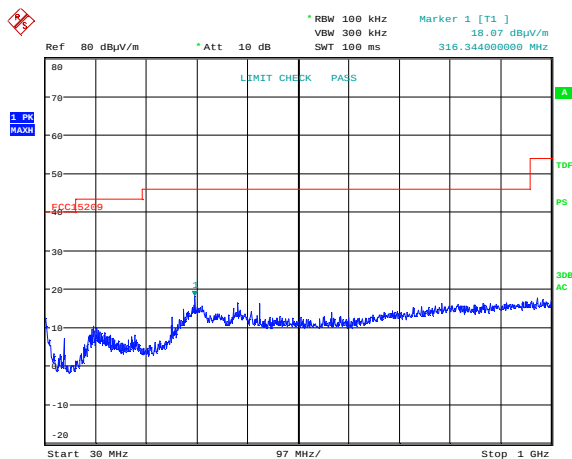
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#### Radiated Emissions 30-1000 MHz, Ch140, 802.11n HT20, EUT V, VP



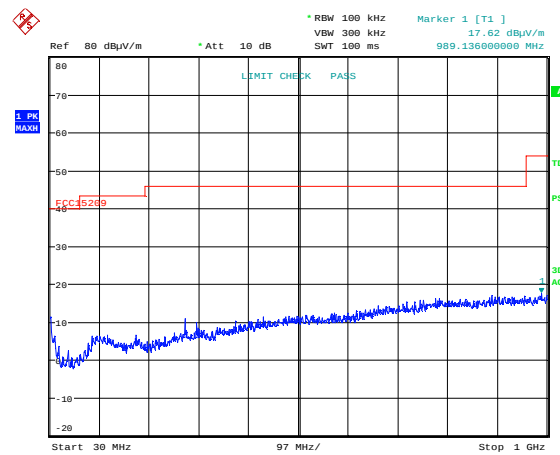
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#### Radiated Emissions 30-1000 MHz, , Ch140, 802.11n HT20, EUT V, HP



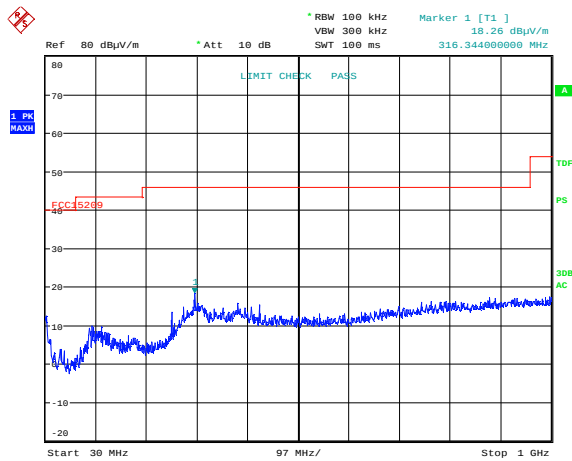
Date: 26.AUG.2020 11:06:25

#### Radiated Emissions 30-1000 MHz, Ch165, 802.11a 6M, EUT V, VP



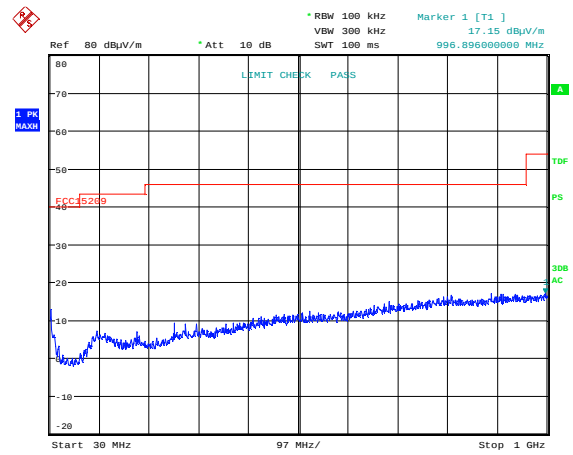
Date: 26.AUG.2020 11:08:19

#### Radiated Emissions 30-1000 MHz, Ch165, 802.11a 6M, EUT V, HP



Date: 26.AUG.2020 10:53:35

**Radiated Emissions 30-1000 MHz, Ch165, 802.11n HT20, EUT V, VP**



Date: 26.AUG.2020 10:55:29

**Radiated Emissions 30-1000 MHz, , Ch165, 802.11n HT20, EUT V, HP**

### 3.8 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, prescan (20 cm) above 18 GHz.

Peak Detector, RBW=1 MHz

Band Edge values with Peak Detector are reported in clause 3.5

Band Edge values - Average Detector, RBW=1 MHz

| Carrier freq. (MHz) | Measured Frequency (MHz) | Modulation   | Measured Emission (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---------------------|--------------------------|--------------|----------------------------|----------------|-------------|
| 5180                | 5150                     | 802.11a 6M   | 41.6                       | 54             | 12.4        |
| 5180                | 5150                     | 802.11n HT20 | 42.7                       | 54             | 11.3        |
| 5320                | 5350                     | 802.11a 6M   | 41.6                       | 54             | 12.4        |
| 5320                | 5350                     | 802.11n HT20 | 41.6                       | 54             | 12.6        |
| 5500                | 5460                     | 802.11a 6M   | 40.8                       | 54             | 13.2        |
| 5500                | 5460                     | 802.11n HT20 | 40.9                       | 54             | 13.1        |

Spurious values - Average Detector and Peak Detector, RBW=1 MHz

| Carrier freq. (MHz)                | Measured Frequency (MHz) | Modulation                 | Measured Emission (dBμV/m) |        | Limit (dBμV/m) |    | Margin (dB) |        |
|------------------------------------|--------------------------|----------------------------|----------------------------|--------|----------------|----|-------------|--------|
| 5180, 5320, 5500, 5700, 5745, 5825 | 1000-5150<br>5350-5460   | 802.11a 6M<br>802.11n HT20 | < 50                       | < 60   | 54             | 74 | > 4         | > 14   |
|                                    | 6500-15000               |                            | < 40                       | < 50   | 54             | 74 | > 4         | > 14   |
|                                    | 15000-18000              |                            | < 45                       | < 55   | 54             | 74 | > 9         | > 19   |
|                                    | 18000-26000              |                            | < 52 *                     | < 63 * | 54             | 74 | > 2 *       | > 11 * |
|                                    | 26000-40000              |                            | < 52 *                     | < 63 * | 54             | 74 | > 2 *       | > 11 * |

Note: In the range 18-40 GHz measurements have been performed as prescan at approx. 10-20 cms distance – and not spurious components were observed.

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

All values except Band Edge values are measured with Maximum Output Power (Setting Level 127)

A High Pass Filter was used for all measurements from 6.5 to 18 GHz

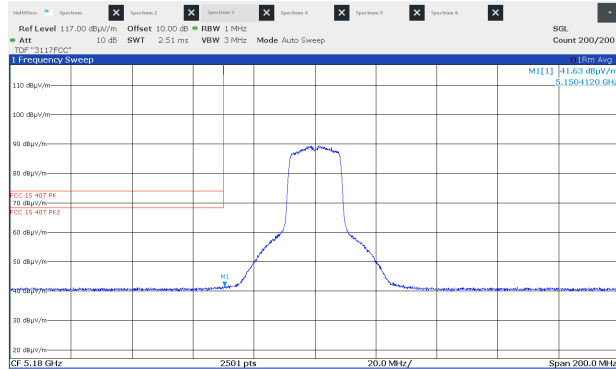
Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer "Transducer factor"

See attached plots

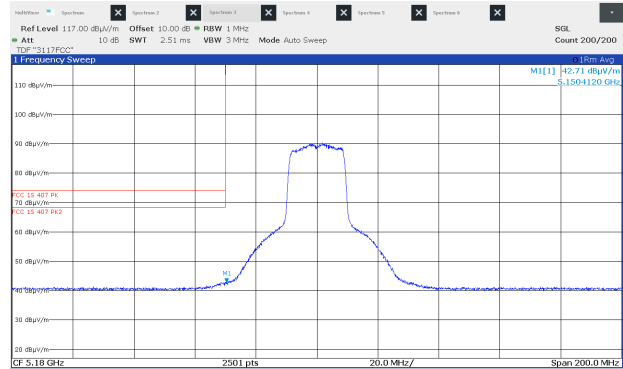
#### Requirements/Limit

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

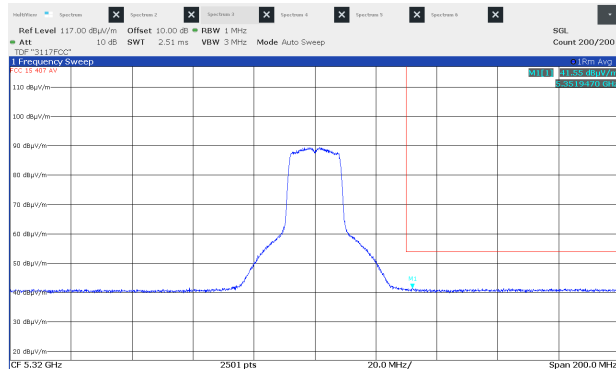
## Band Edge – Average Detector



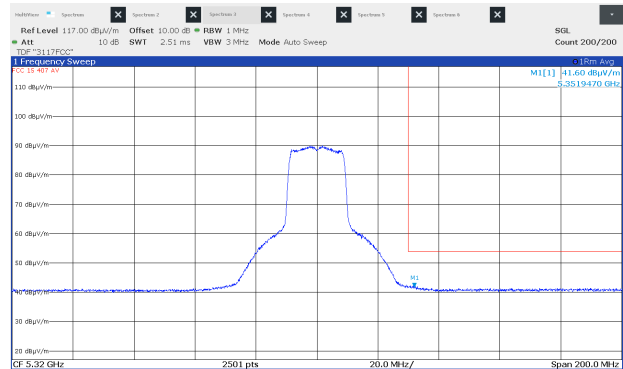
**Band Edge, 5150 MHz, Ch036, 802.11a 6M, EUT V, VP, Av, Max**



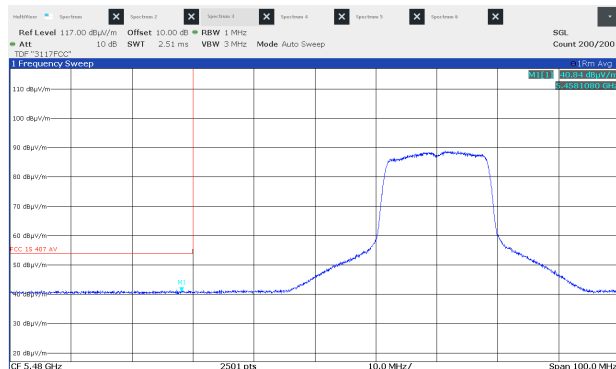
**Band Edge, 5150 MHz, Ch036, 802.11n HT20, EUT V, VP, Av, Max**



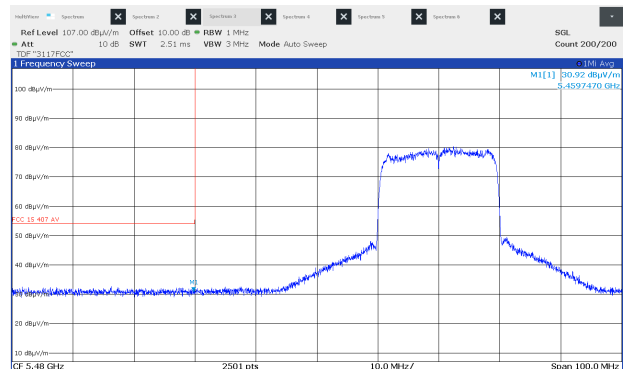
**Band Edge, 5350 MHz, Ch064, 802.11a 6M, EUT V, VP, Av, Max**



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

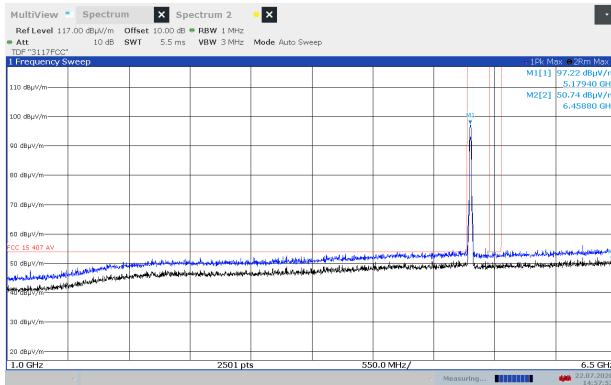


**Band Edge, 5460 MHz, Ch100, 802.11a 6M, EUT V, VP, Av, Max**

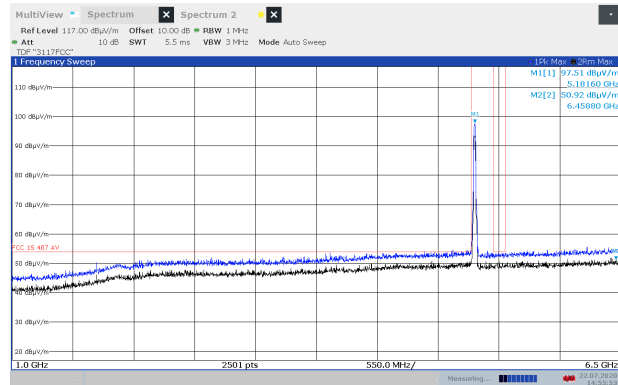


**Band Edge, 5460 MHz, Ch100, 802.11n HT20, EUT V, VP, Av, Max**

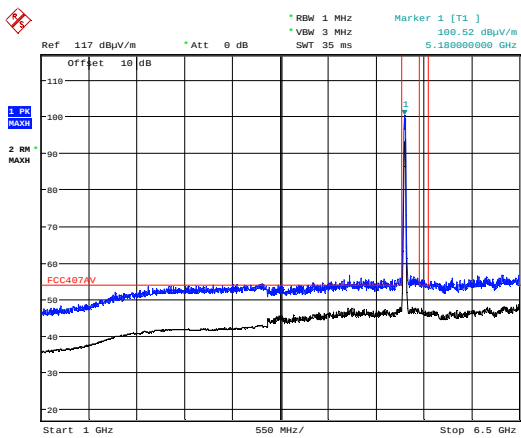
## Radiated spurious emissions 1-40 GHz – Average and Peak Detector



Radiated Emissions 1-6.5 GHz, Ch036, 802.11a 6M, EUT V, Ant 1, HP

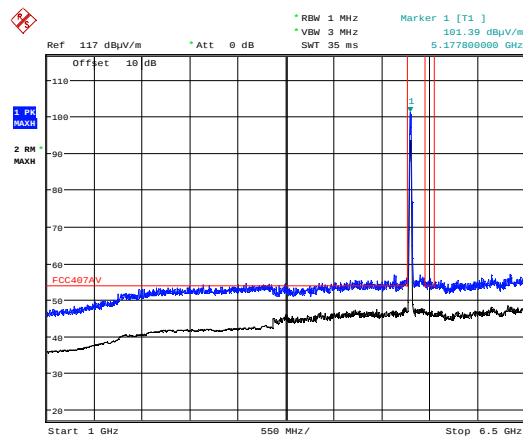


Radiated Emissions 1-6.5 GHz, Ch036, 802.11a 6M, EUT V, Ant 1, VP



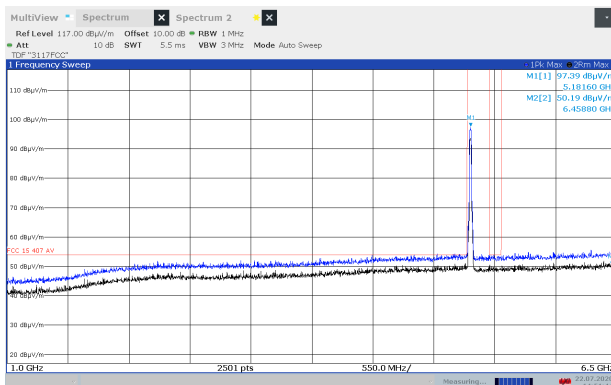
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Radiated Emissions 1-6.5 GHz, Ch036, 802.11n HT20, EUT V, Ant 1, HP

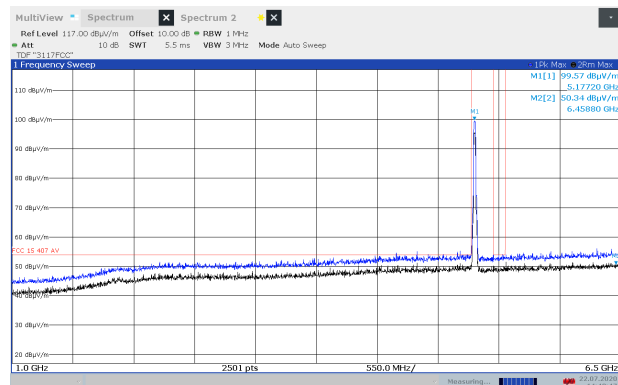


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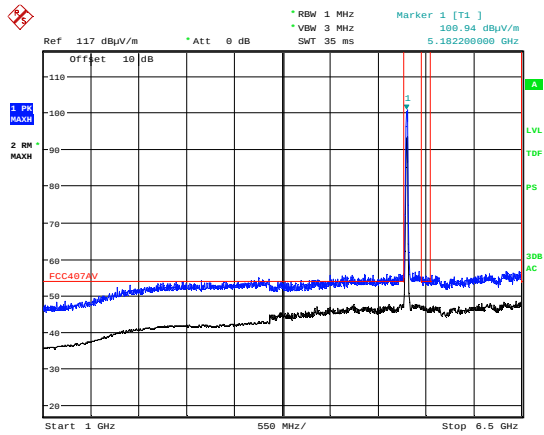
Radiated Emissions 1-6.5 GHz, Ch036, 802.11n HT20, EUT V, Ant 1, VP



Radiated Emissions 1-6.5 GHz, Ch036, 802.11a 6M, EUT V, Ant 2, HP

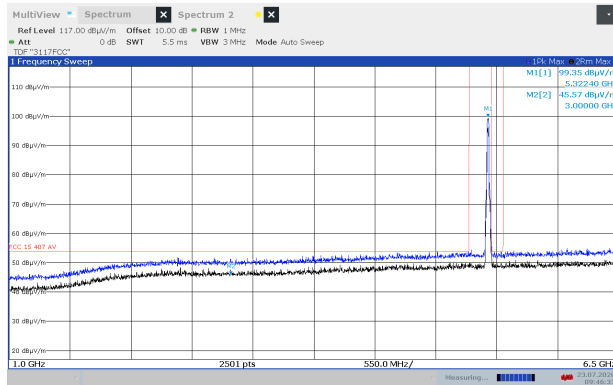


Radiated Emissions 1-6.5 GHz, Ch036, 802.11a 6M, EUT V, Ant 2, VP

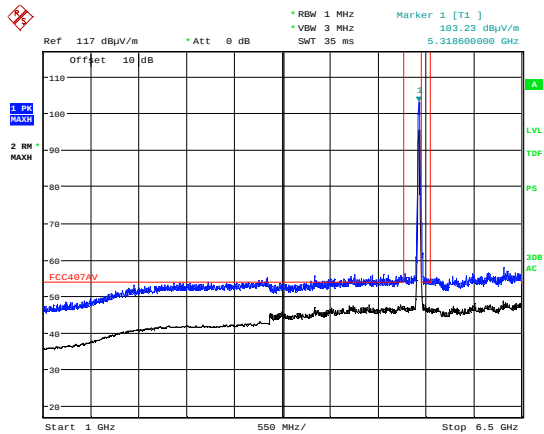


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### Radiated Emissions 1-6.5 GHz, Ch036, 802.11n HT20, EUT V, Ant 2, HP

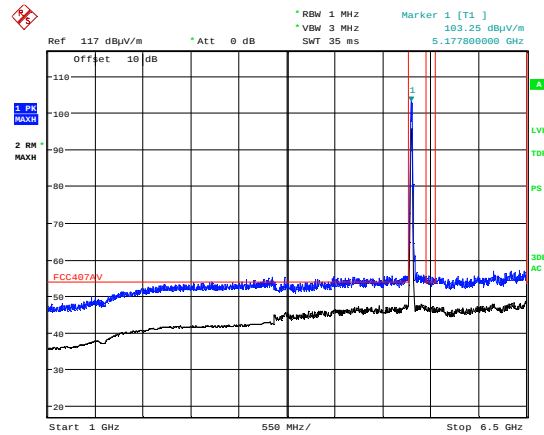


### Radiated Emissions 1-6.5 GHz, Ch064, 802.11a 6M, EUT V, Ant 1, HP



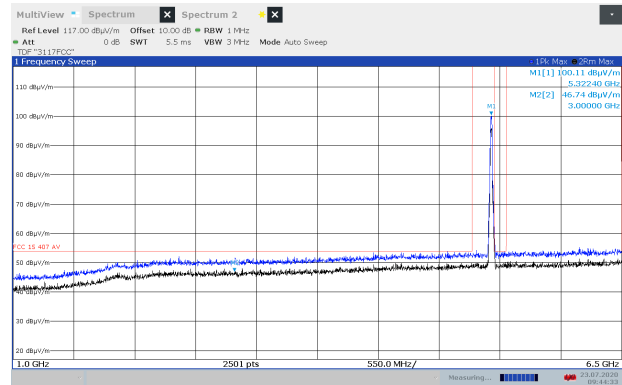
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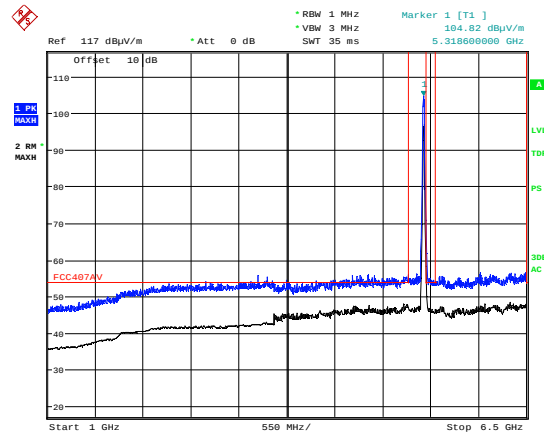


Date: 16.SEP.2020 15:59:33

### Radiated Emissions 1-6.5 GHz, Ch036, 802.11n HT20, EUT V, Ant 2, VP

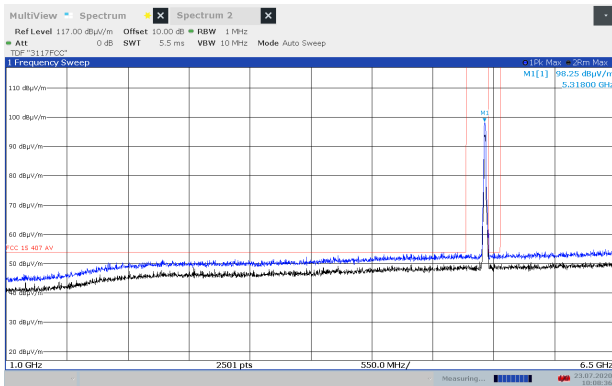


### Radiated Emissions 1-6.5 GHz, Ch064, 802.11a 6M, EUT V, Ant 1, VP

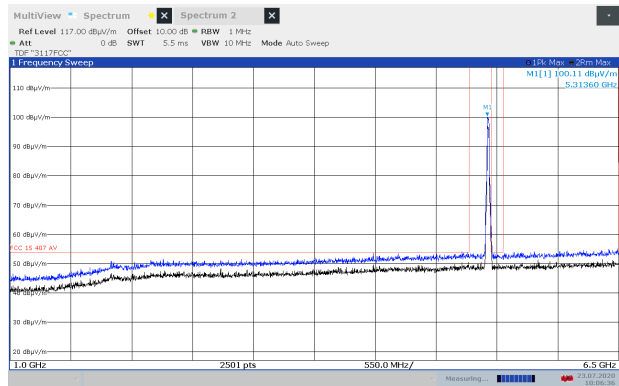


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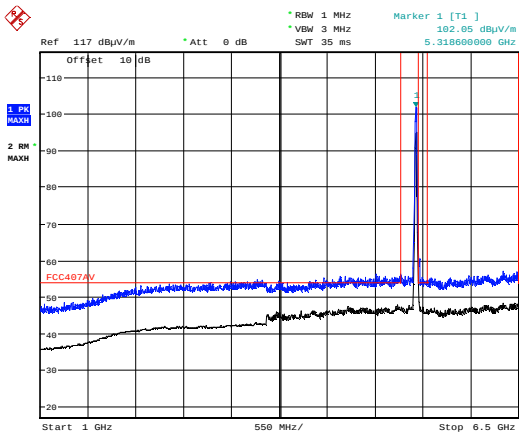
### Radiated Emissions 1-6.5 GHz, Ch064, 802.11n HT20, EUT V, Ant 1, VP



Radiated Emissions 1-6.5 GHz, Ch064, 802.11a 6M, EUT V, Ant 2, HP

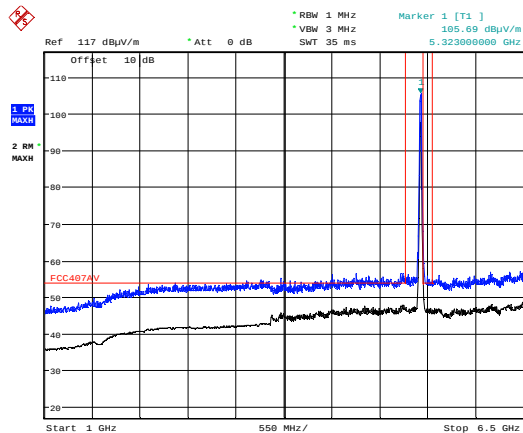


Radiated Emissions 1-6.5 GHz, Ch064, 802.11a 6M, EUT V, Ant 2, VP



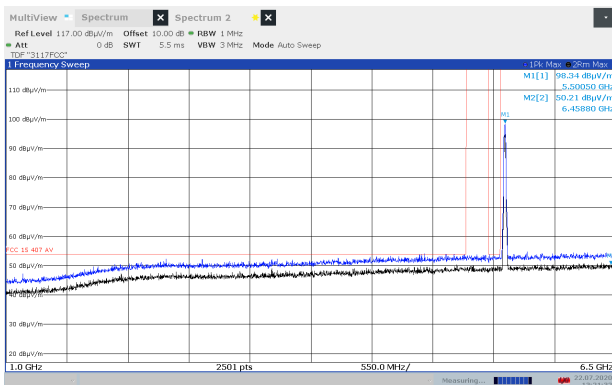
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Radiated Emissions 1-6.5 GHz, Ch064, 802.11n HT20, EUT V, Ant 2, HP

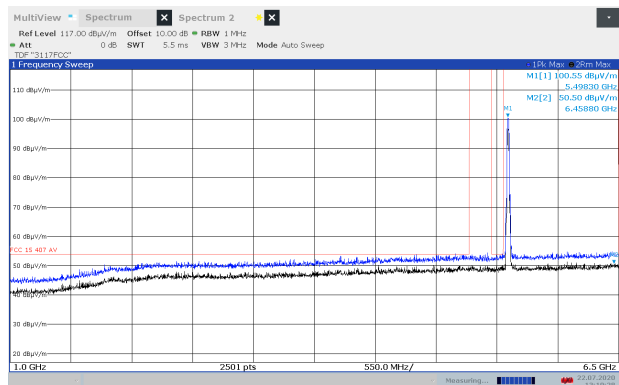


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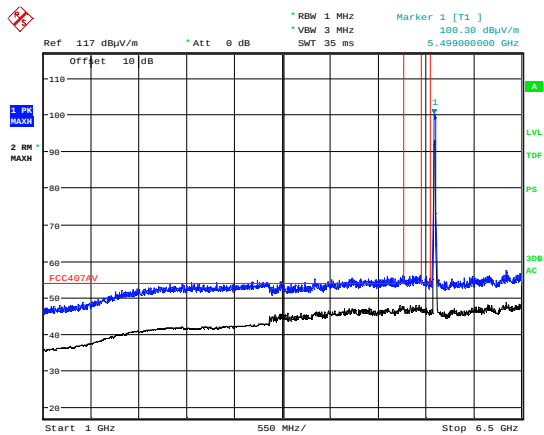
Radiated Emissions 1-6.5 GHz, Ch064, 802.11n HT20, EUT V, Ant 2, VP



Radiated Emissions 1-6.5 GHz, Ch100, 802.11a 6M, EUT V, Ant 1, HP

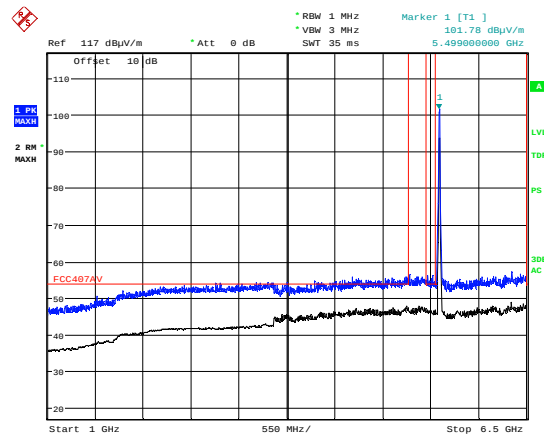


Radiated Emissions 1-6.5 GHz, Ch100, 802.11a 6M, EUT V, Ant 1, VP



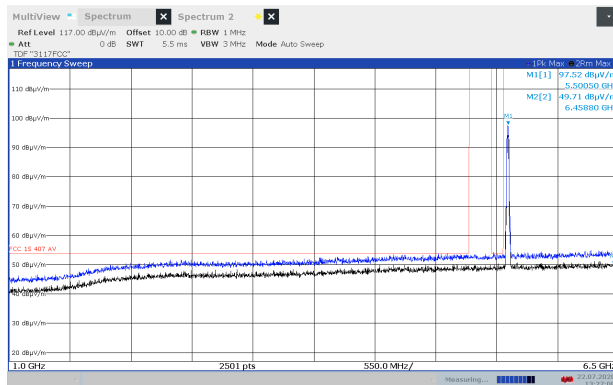
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### Radiated Emissions 1-6.5 GHz, Ch100, 802.11n HT20, EUT V, Ant 1, HP

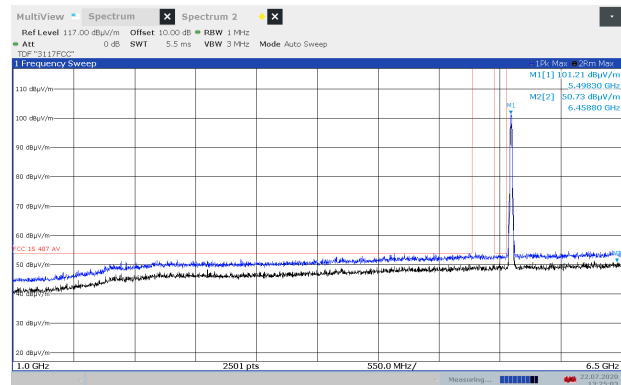


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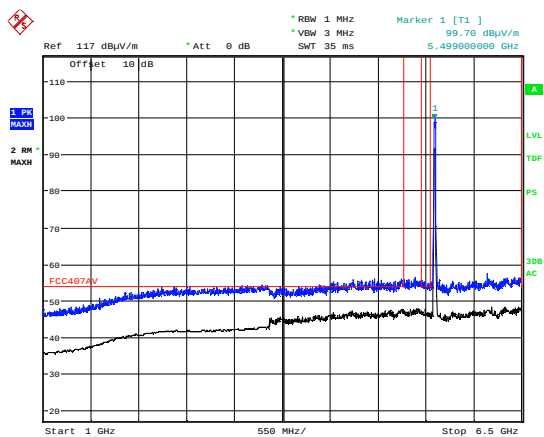
### Radiated Emissions 1-6.5 GHz, Ch100, 802.11n HT20, EUT V, Ant 1, VP



### Radiated Emissions 1-6.5 GHz, Ch100, 802.11a 6M, EUT V, Ant 2, HP

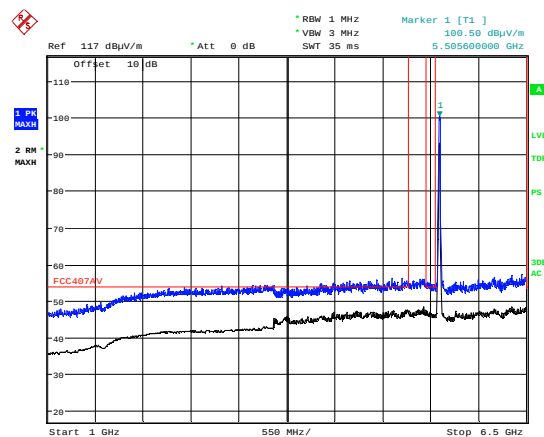


### Radiated Emissions 1-6.5 GHz, Ch100, 802.11a 6M, EUT V, Ant 2, VP



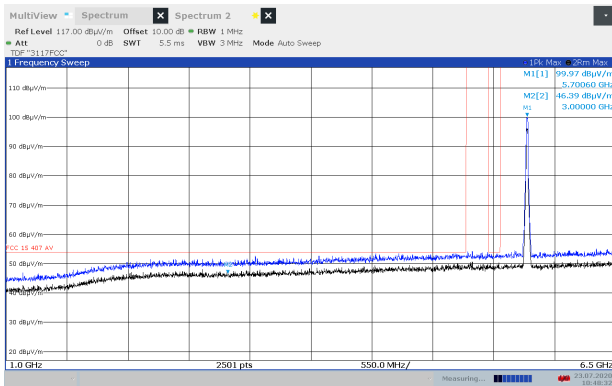
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### Radiated Emissions 1-6.5 GHz, Ch100, 802.11n HT20, EUT V, Ant 2, HP

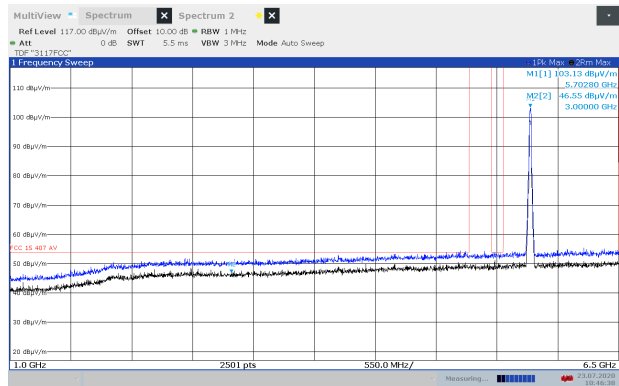


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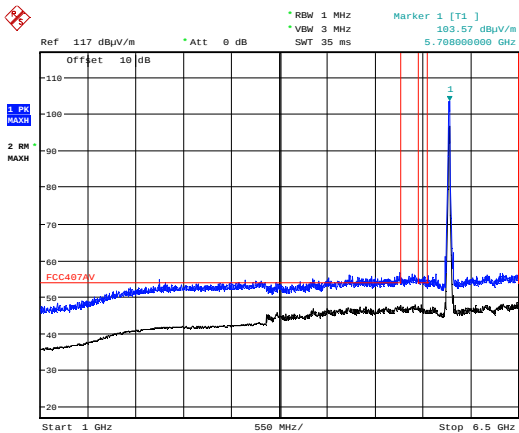
### Radiated Emissions 1-6.5 GHz, Ch100, 802.11n HT20, EUT V, Ant 2, VP



Radiated Emissions 1-6.5 GHz, Ch140, 802.11a 6M, EUT V, Ant 1, HP

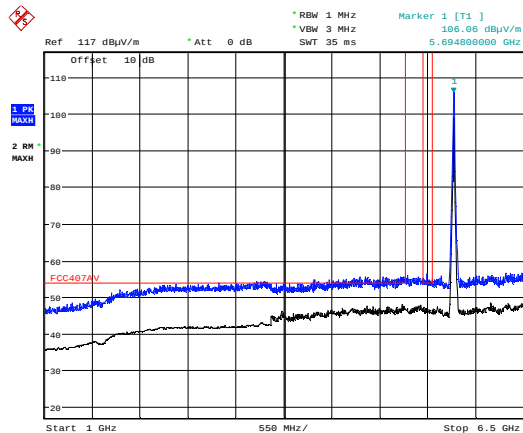


Radiated Emissions 1-6.5 GHz, Ch140, 802.11a 6M, EUT V, Ant 1, VP



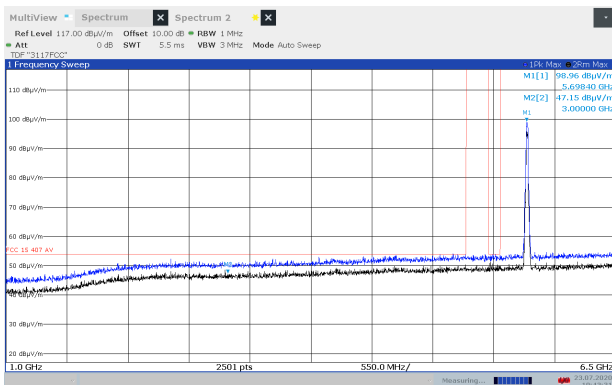
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Radiated Emissions 1-6.5 GHz, Ch140, 802.11n HT20, EUT V, Ant 1, HP

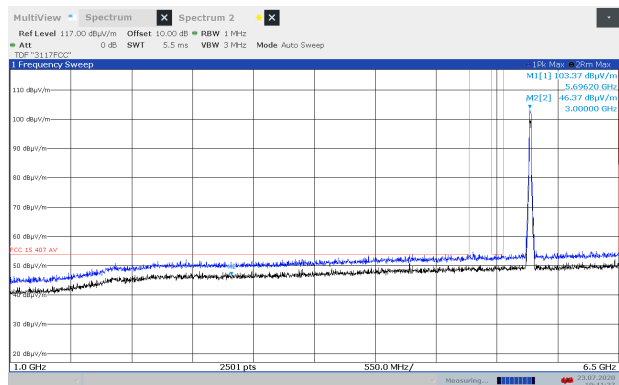


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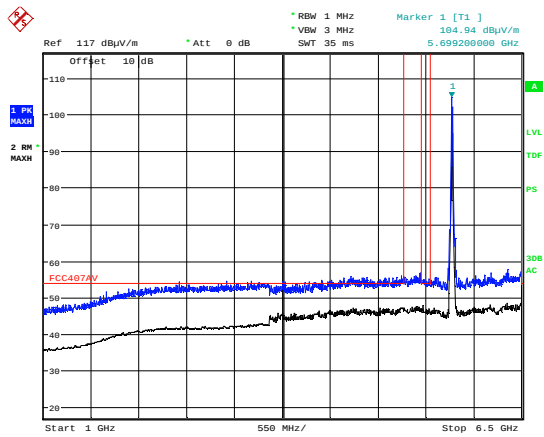
Radiated Emissions 1-6.5 GHz, Ch140, 802.11n HT20, EUT V, Ant 1, VP



Radiated Emissions 1-6.5 GHz, Ch140, 802.11a 6M, EUT V, Ant 2, HP

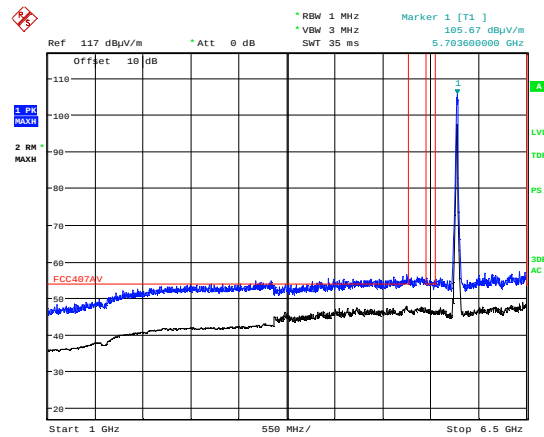


Radiated Emissions 1-6.5 GHz, Ch140, 802.11a 6M, EUT V, Ant 2, VP



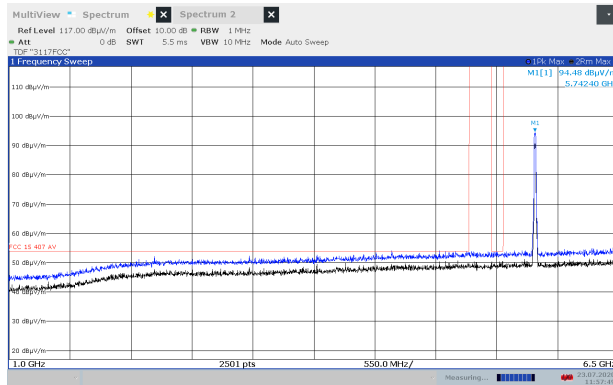
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**Radiated Emissions 1-6.5 GHz, Ch140, 802.11n HT20, EUT V, Ant 2, HP**

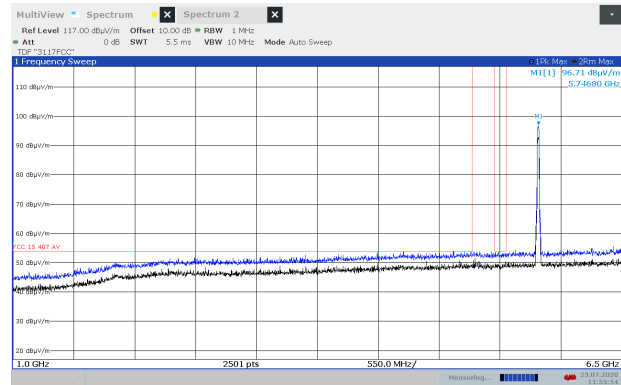


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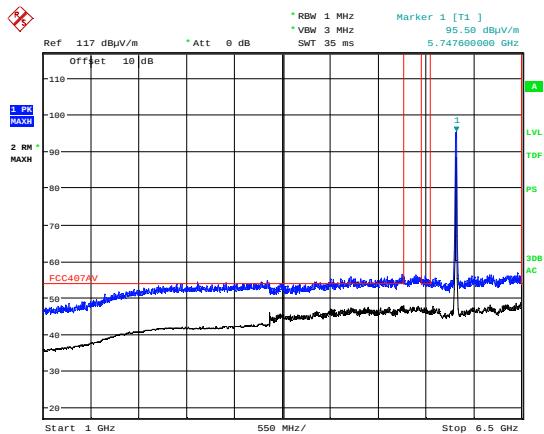
**Radiated Emissions 1-6.5 GHz, Ch140, 802.11n HT20, EUT V, Ant 2, VP**



**Radiated Emissions 1-6.5 GHz, Ch149, 802.11a 6M, EUT V, Ant 1, HP**

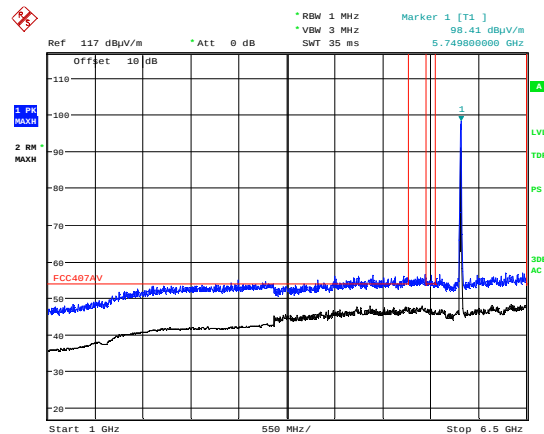


**Radiated Emissions 1-6.5 GHz, Ch149, 802.11a 6M, EUT V, Ant 1, VP**



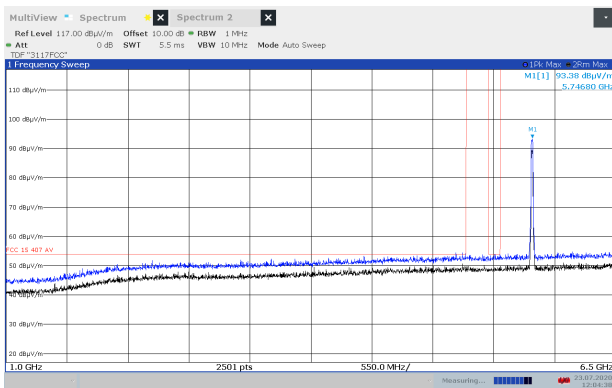
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**Radiated Emissions 1-6.5 GHz, Ch149, 802.11n HT20, EUT V, Ant 1, HP**

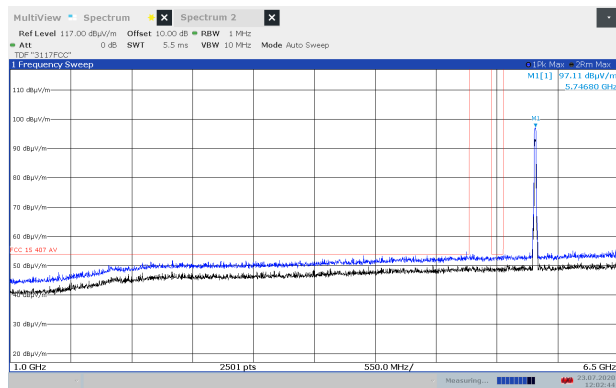


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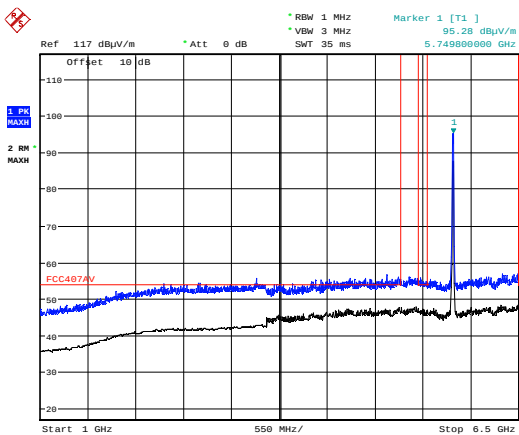
**Radiated Emissions 1-6.5 GHz, Ch149, 802.11n HT20, EUT V, Ant 1, VP**



Radiated Emissions 1-6.5 GHz, Ch149, 802.11a 6M, EUT V, Ant 2, HP

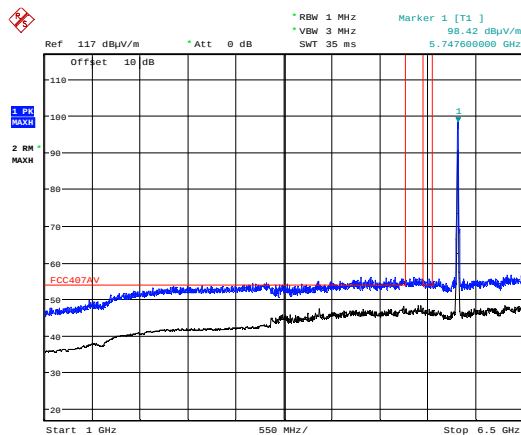


Radiated Emissions 1-6.5 GHz, Ch149, 802.11a 6M, EUT V, Ant 2, VP



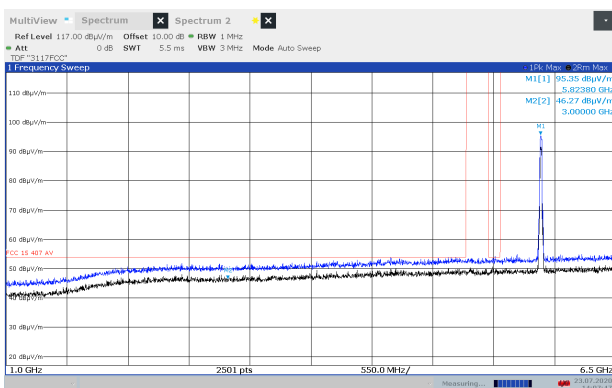
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Radiated Emissions 1-6.5 GHz, Ch149, 802.11n HT20, EUT V, Ant 2, HP

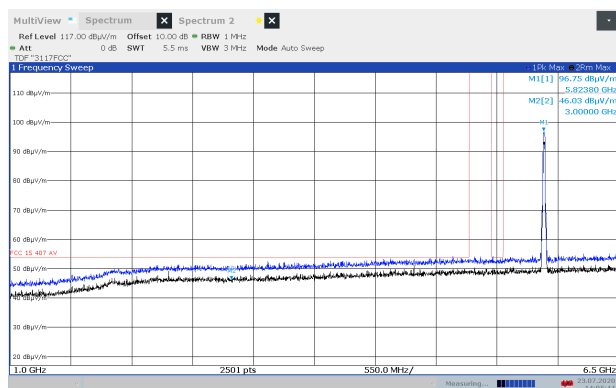


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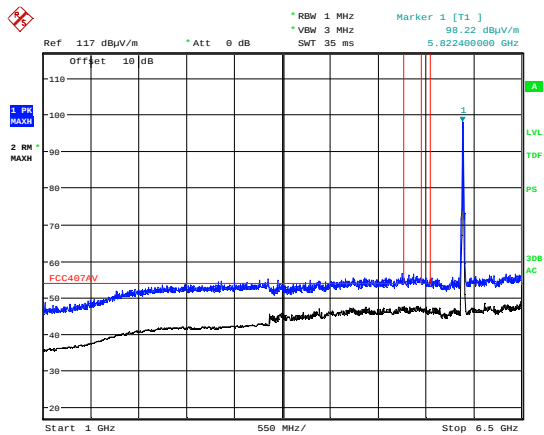
Radiated Emissions 1-6.5 GHz, Ch149, 802.11n HT20, EUT V, Ant 2, VP



Radiated Emissions 1-6.5 GHz, Ch165, 802.11a 6M, EUT V, Ant 1, HP

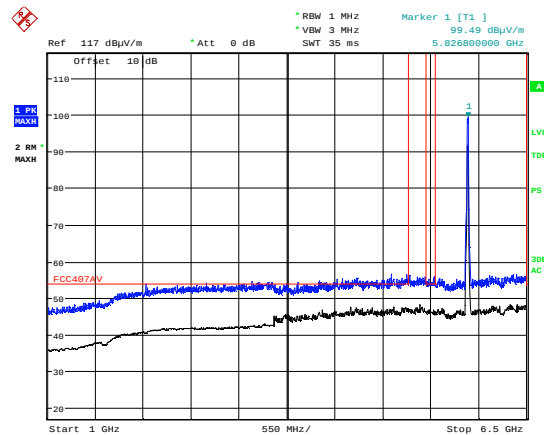


Radiated Emissions 1-6.5 GHz, Ch165, 802.11a 6M, EUT V, Ant 1, VP



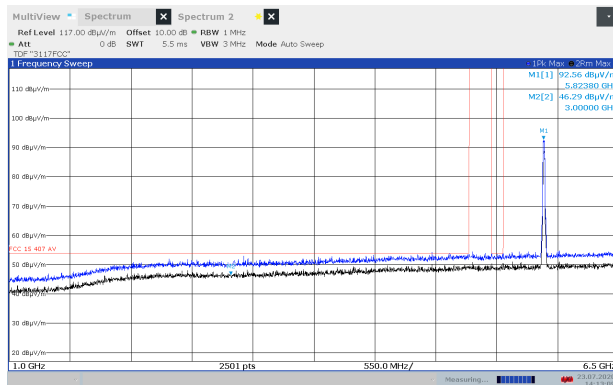
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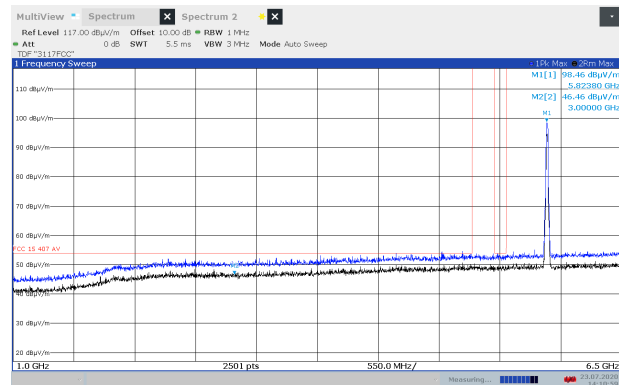


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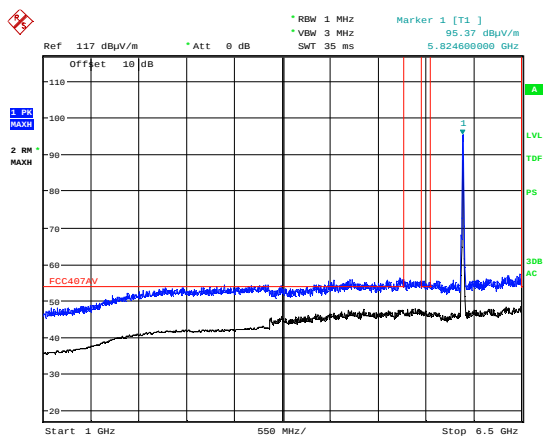
Radiated Emissions 1-6.5 GHz, Ch165, 802.11n HT20, EUT V, Ant 1, VP



Radiated Emissions 1-6.5 GHz, Ch165, 802.11a 6M, EUT V, Ant 2, HP

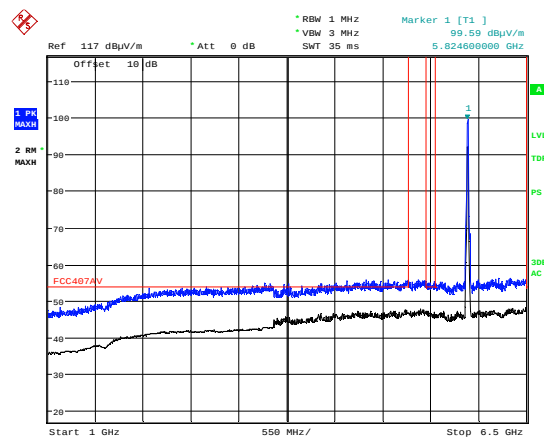


Radiated Emissions 1-6.5 GHz, Ch165, 802.11a 6M, EUT V, Ant 2, VP



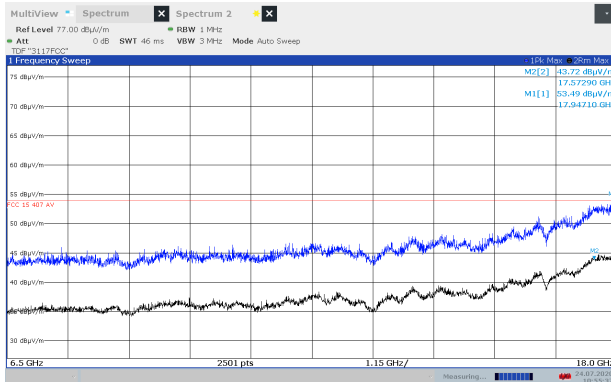
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Radiated Emissions 1-6.5 GHz, Ch165, 802.11n HT20, EUT V, Ant 2, HP

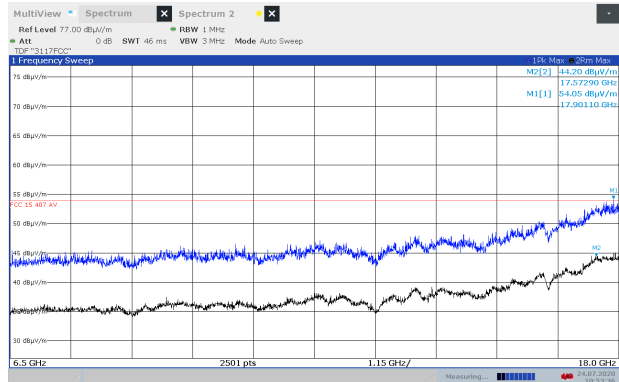


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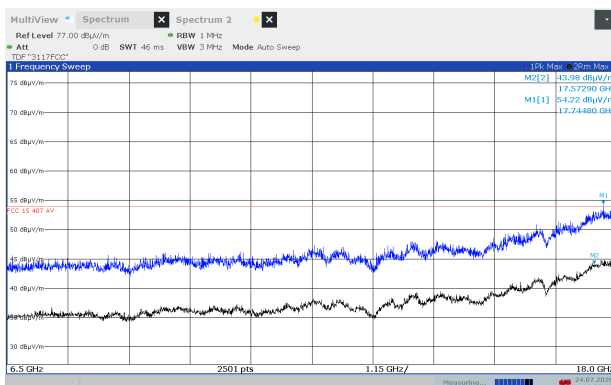
Radiated Emissions 1-6.5 GHz, Ch165, 802.11n HT20, EUT V, Ant 2, VP



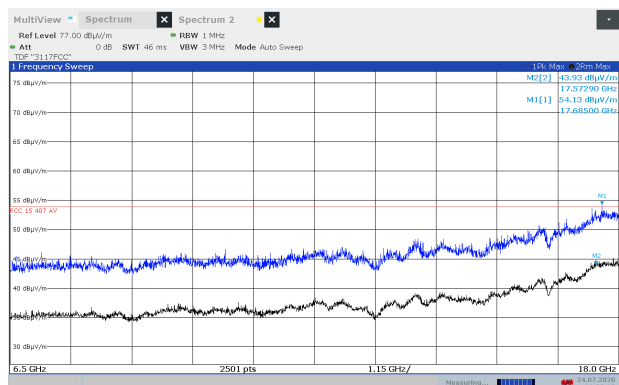
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11a 6M, EUT V, Ant 1, HP**



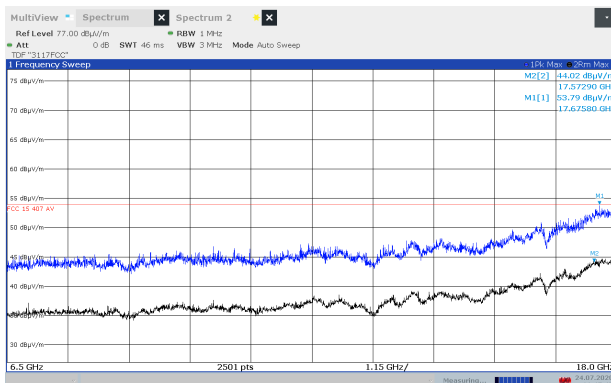
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11a 6M, EUT V, Ant 1, VP**



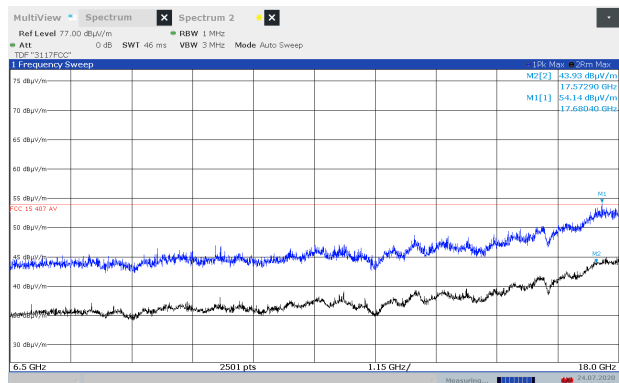
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11n HT20, EUT V, Ant 1, HP**



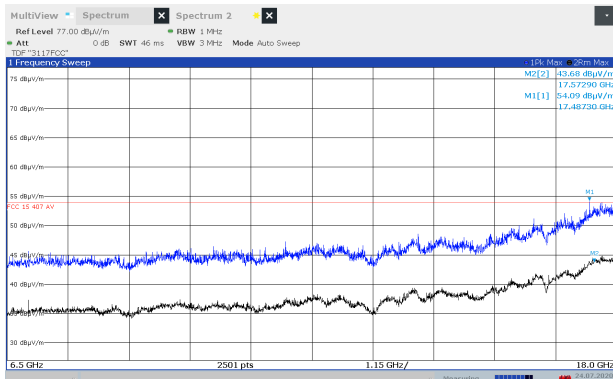
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11n HT20, EUT V, Ant 1, VP**



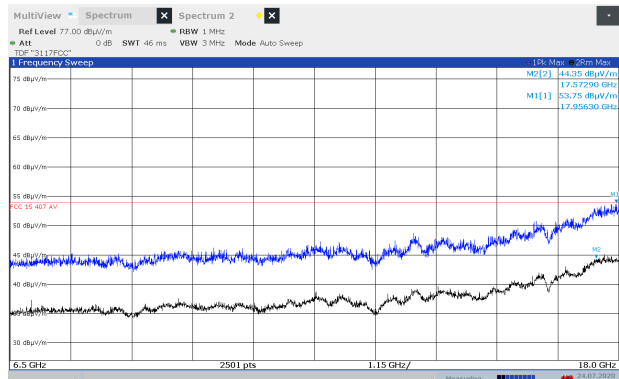
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11a 6M, EUT V, Ant 2, HP**



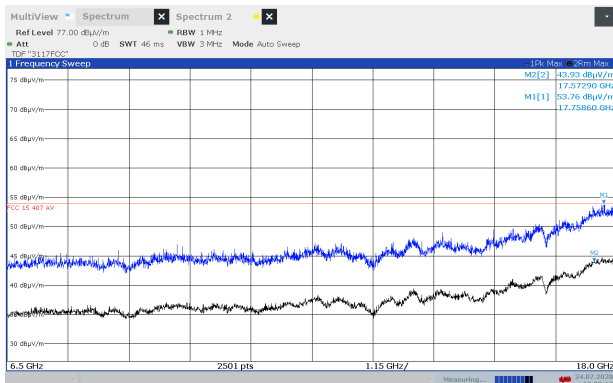
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11a 6M, EUT V, Ant 2, VP**



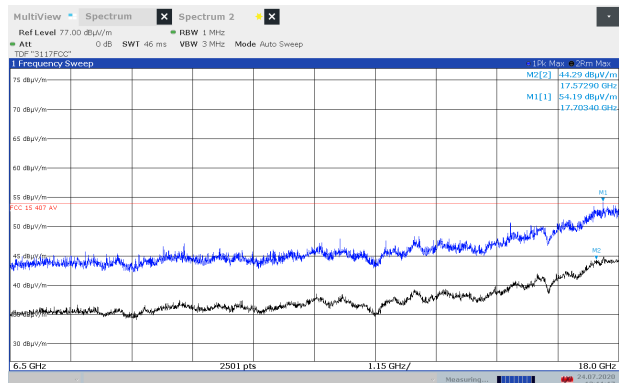
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11n HT20, EUT V, Ant 2, HP**



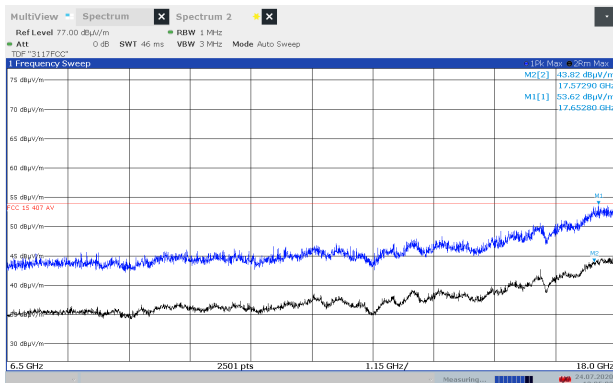
**Radiated Emissions 6.5-18 GHz, Ch036, 802.11n HT20, EUT V, Ant 2, VP**



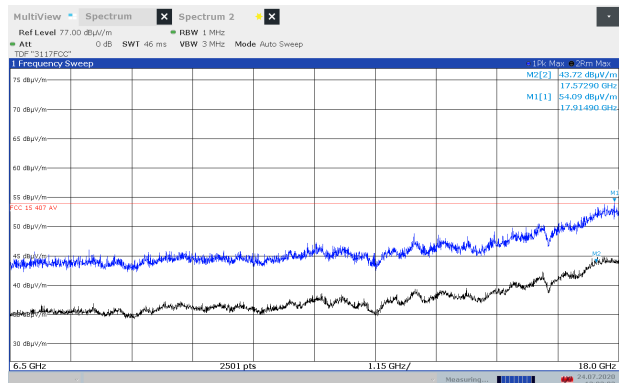
**Radiated Emissions 6.5-18 GHz, Ch064, 802.11a 6M, EUT V, Ant 1, HP**



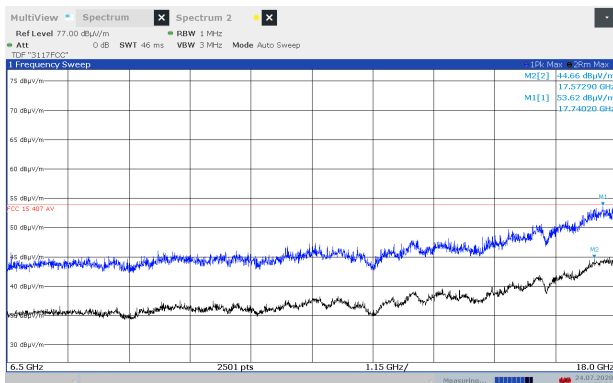
**Radiated Emissions 6.5-18 GHz, Ch064, 802.11a 6M, EUT V, Ant 1, VP**



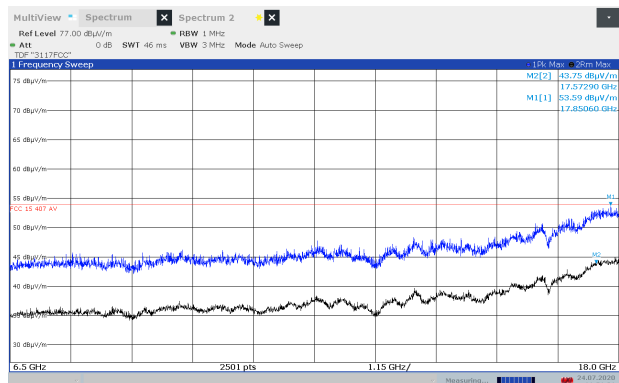
**Radiated Emissions 6.5-18 GHz, Ch064, 802.11n HT20, EUT V, Ant 1, HP**



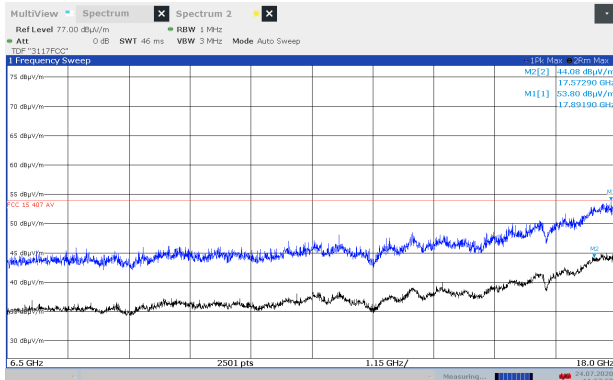
**Radiated Emissions 6.5-18 GHz, Ch064, 802.11n HT20, EUT V, Ant 1, VP**



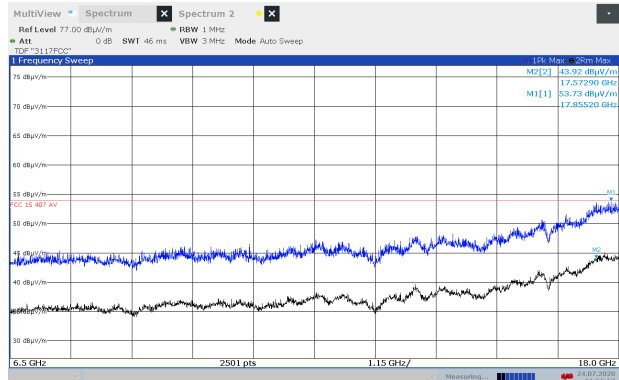
**Radiated Emissions 6.5-18 GHz, Ch064, 802.11a 6M, EUT V, Ant 2, HP**



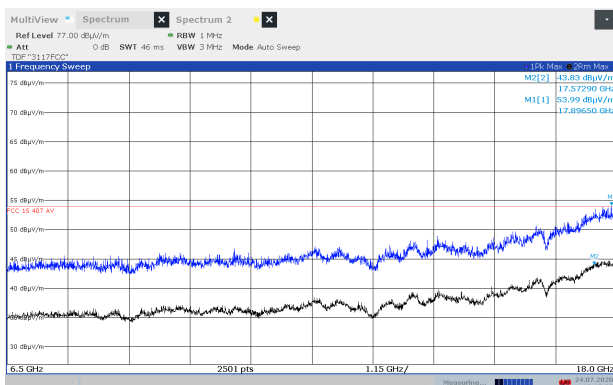
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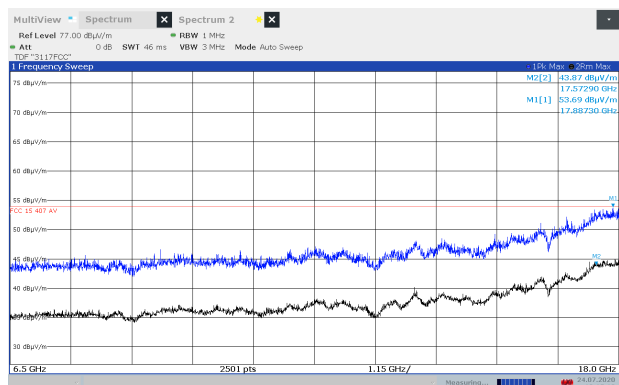
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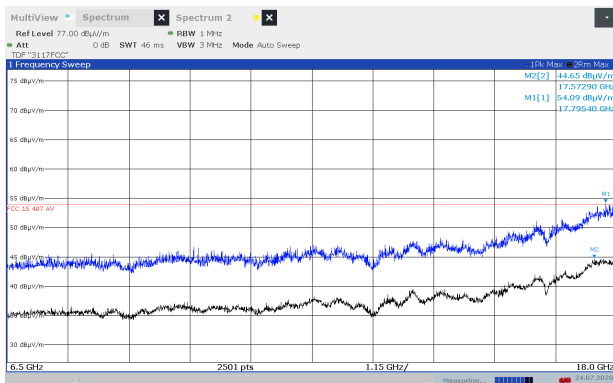
**Radiated Emissions 6.5-18 GHz, Ch064, 802.11n HT20, EUT V, Ant 2, VP**



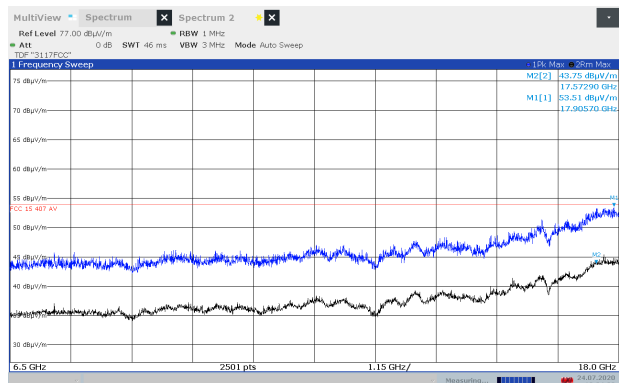
**Radiated Emissions 6.5-18 GHz, Ch100, 802.11a 6M, EUT V, Ant 1, HP**



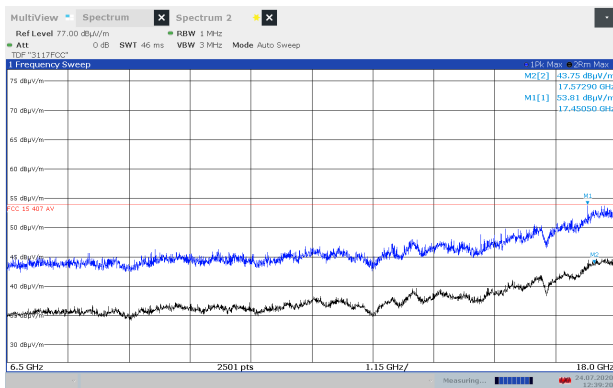
**Radiated Emissions 6.5-18 GHz, Ch100, 802.11a 6M, EUT V, Ant 1, VP**



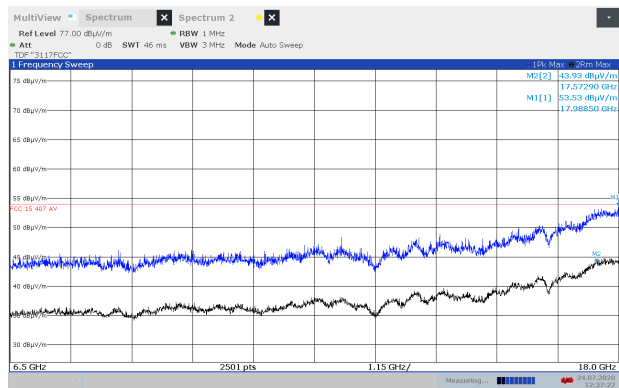
**Radiated Emissions 6.5-18 GHz, Ch100, 802.11n HT20, EUT V, Ant 1, HP**



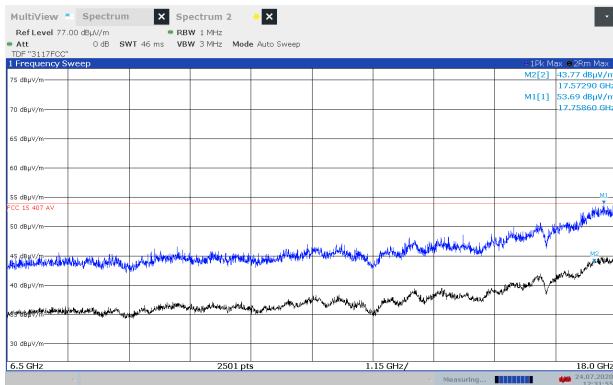
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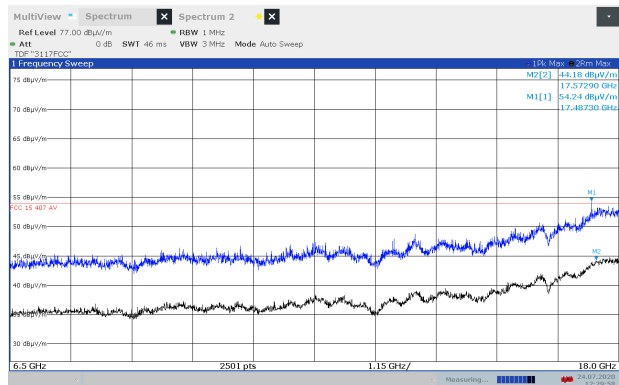
**Radiated Emissions 6.5-18 GHz, Ch100, 802.11a 6M, EUT V, Ant 2, HP**



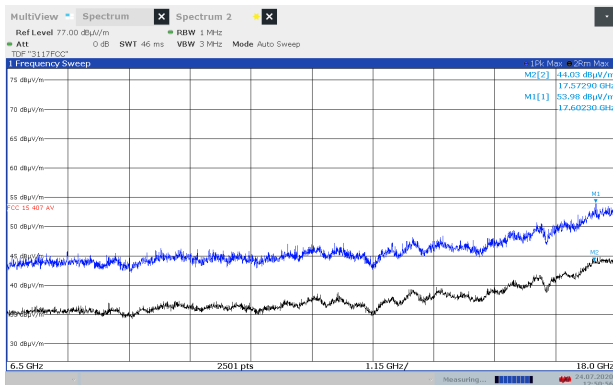
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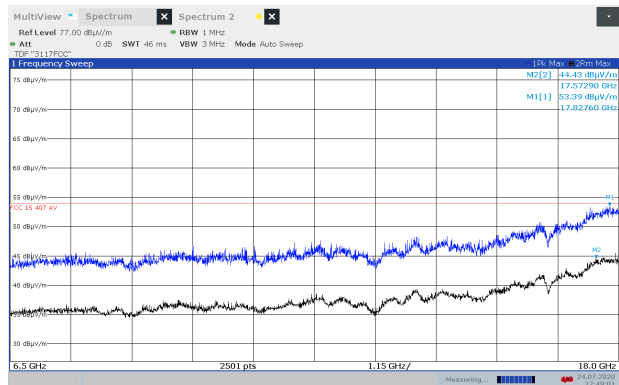
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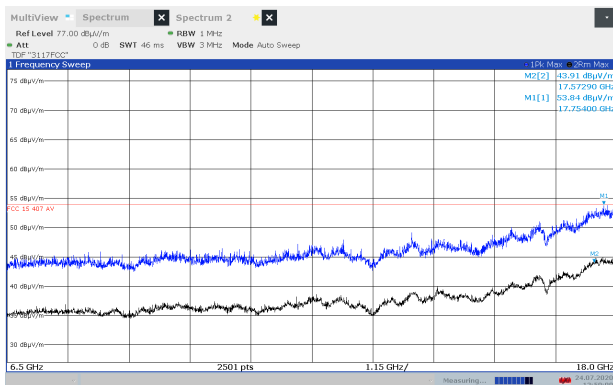
**Radiated Emissions 6.5-18 GHz, Ch100, 802.11n HT20, EUT V, Ant 2, VP**



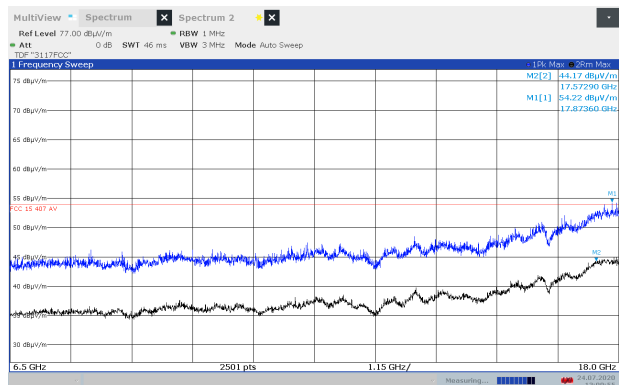
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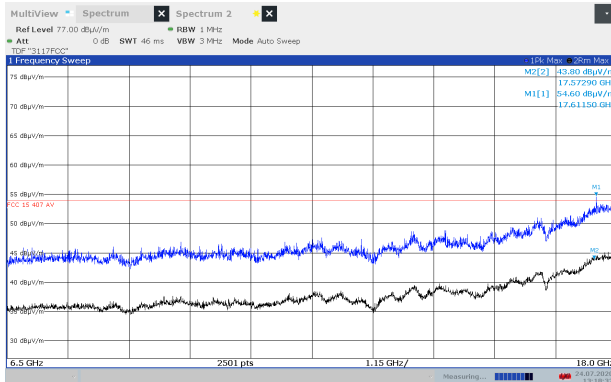
**Radiated Emissions 6.5-18 GHz, Ch140, 802.11a 6M, EUT V, Ant 1, VP**



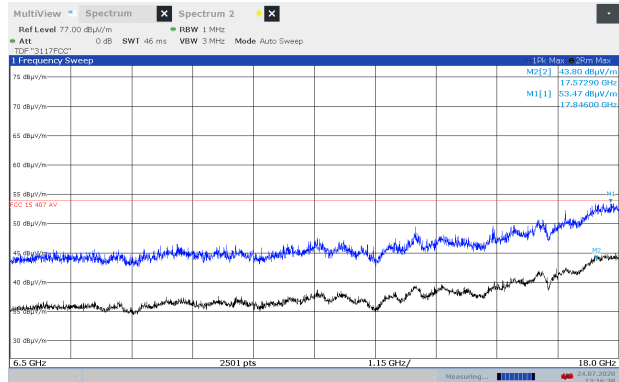
**Radiated Emissions 6.5-18 GHz, Ch140, 802.11n HT20, EUT V, Ant 1, HP**



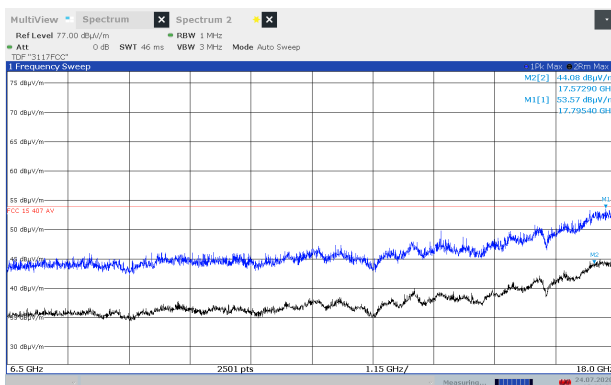
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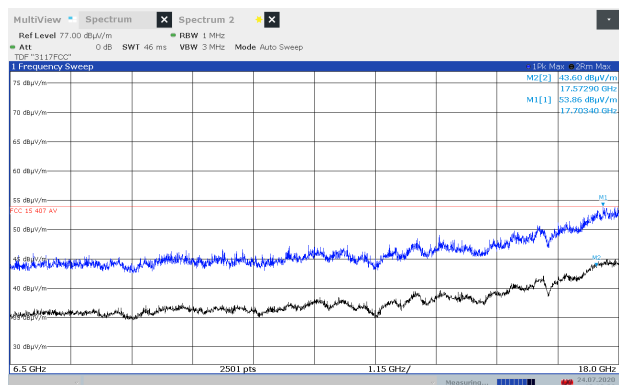
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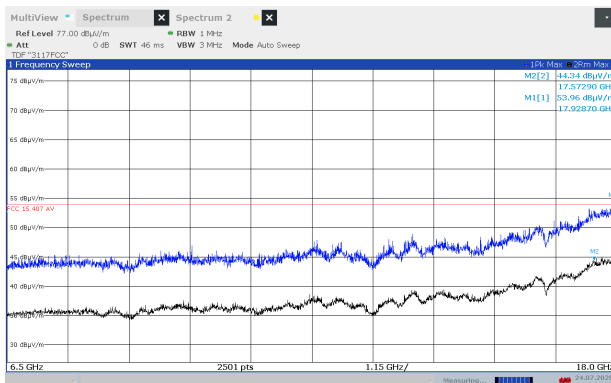
**Radiated Emissions 6.5-18 GHz, Ch140, 802.11a 6M, EUT V, Ant 2, VP**



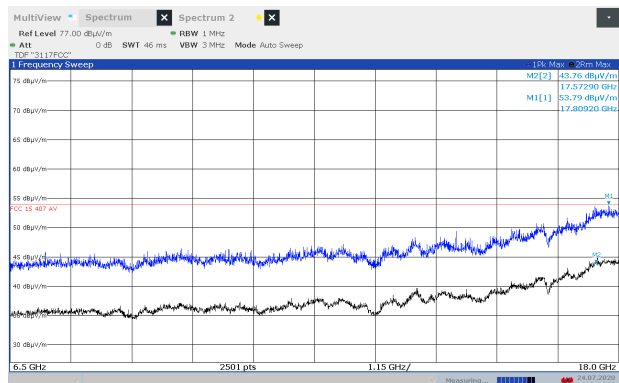
**Radiated Emissions 6.5-18 GHz, Ch140, 802.11n HT20, EUT V, Ant 2, HP**



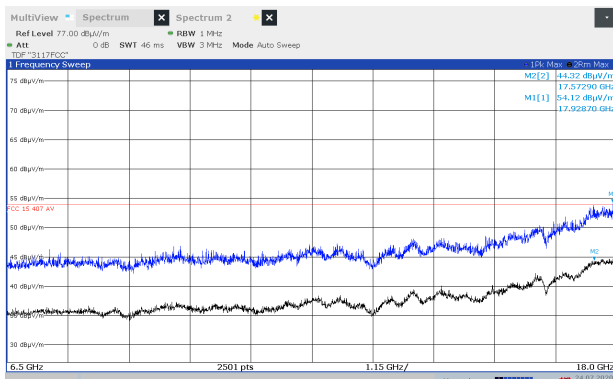
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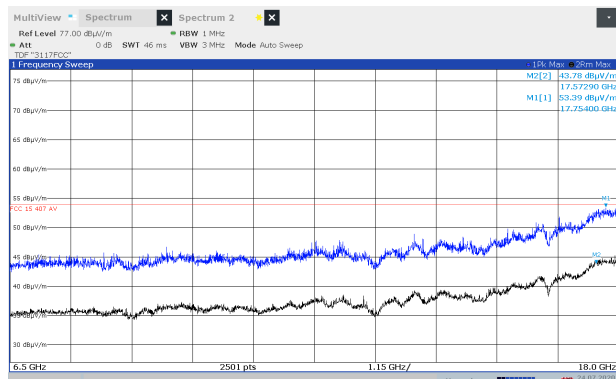
**Radiated Emissions 6.5-18 GHz, Ch149, 802.11a 6M, EUT V, Ant 1, HP**



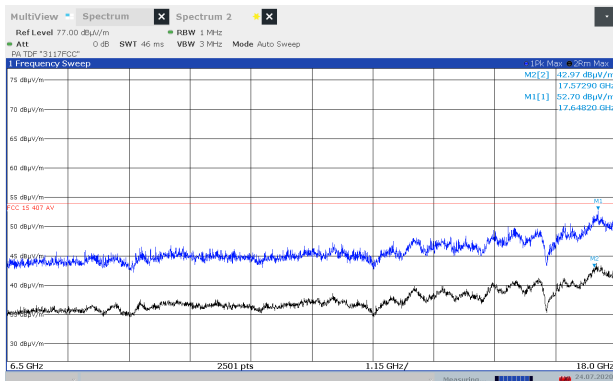
**Radiated Emissions 6.5-18 GHz, Ch149, 802.11a 6M, EUT V, Ant 1, VP**



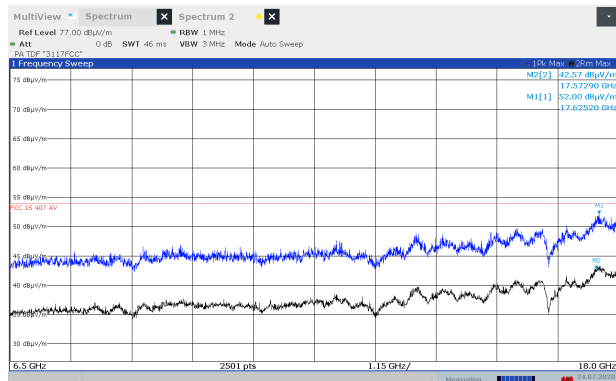
Radiated Emissions 6.5-18 GHz, Ch149, 802.11n HT20, EUT V, Ant 1, HP



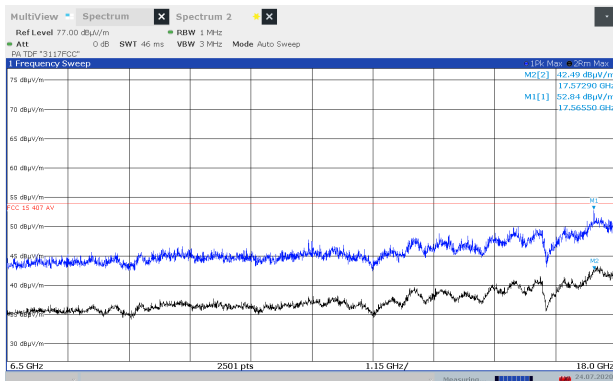
Radiated Emissions 6.5-18 GHz, Ch149, 802.11n HT20, EUT V, Ant 1, VP



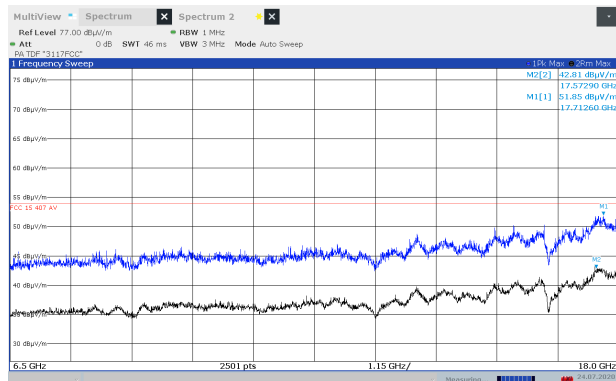
Radiated Emissions 6.5-18 GHz, Ch149, 802.11a 6M, EUT V, Ant 2, HP



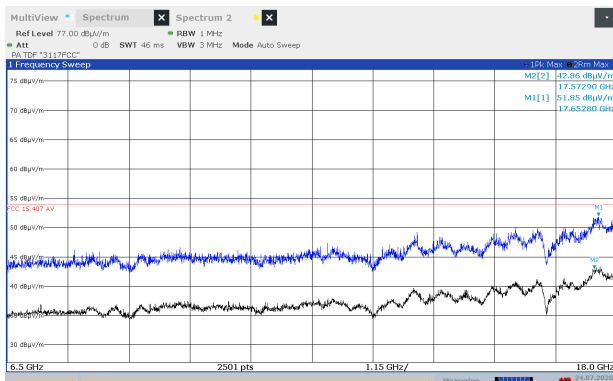
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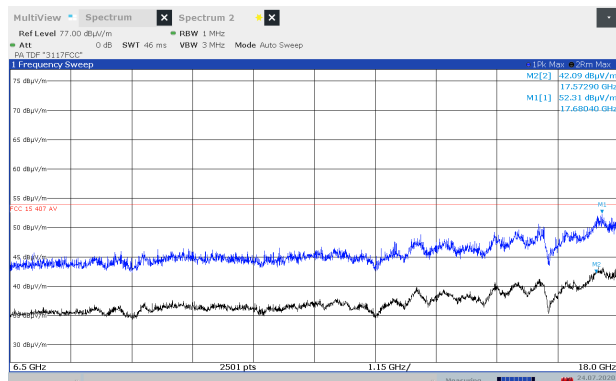
Radiated Emissions 6.5-18 GHz, Ch149, 802.11n HT20, EUT V, Ant 2, HP



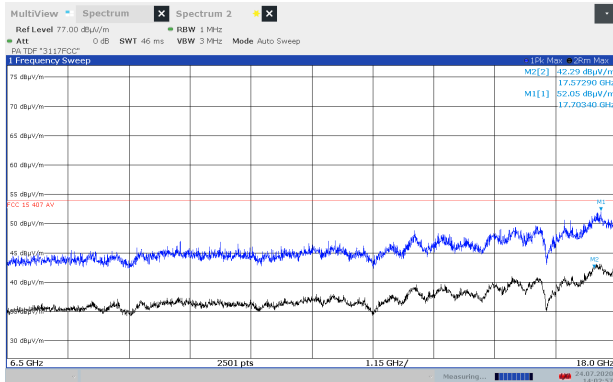
Radiated Emissions 6.5-18 GHz, Ch149, 802.11n HT20, EUT V, Ant 2, VP



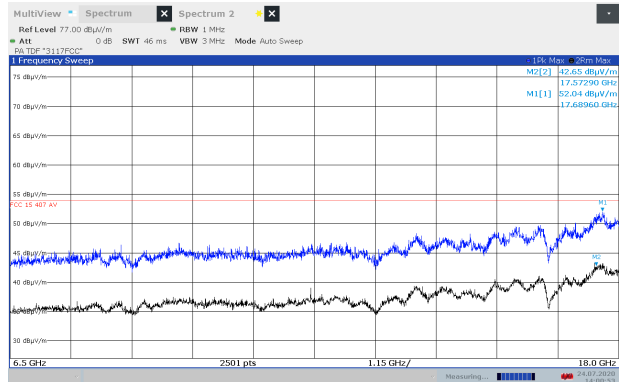
Radiated Emissions 6.5-18 GHz, Ch165, 802.11a 6M, EUT V, Ant 1, HP



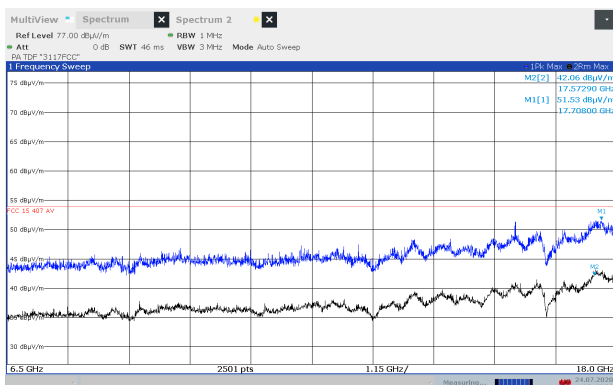
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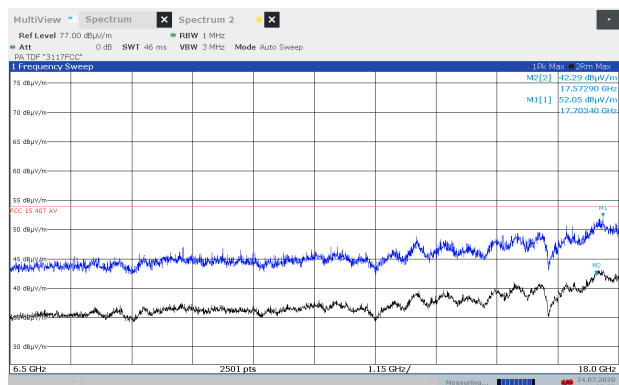
**Radiated Emissions 6.5-18 GHz, Ch165, 802.11n HT20, EUT V, Ant 1, HP**



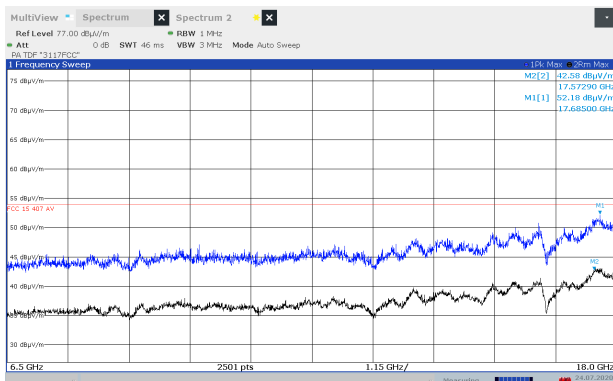
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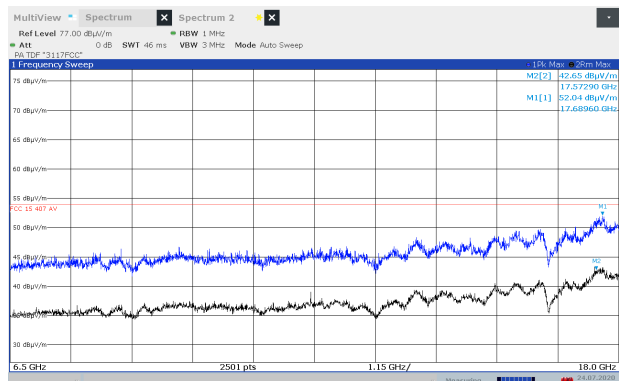
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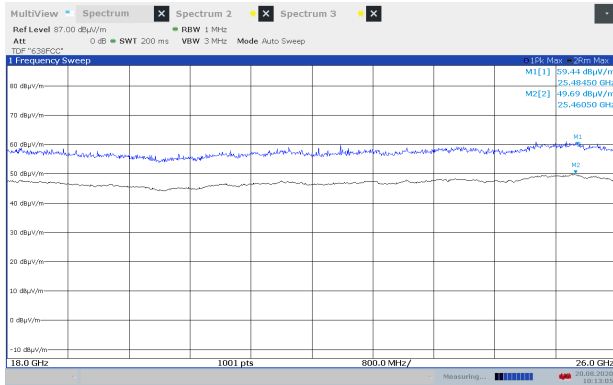
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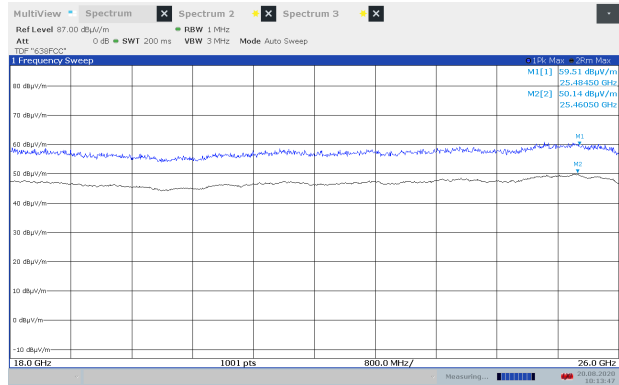
**Radiated Emissions 6.5-18 GHz, Ch165, 802.11n HT20, EUT V, Ant 2, HP**



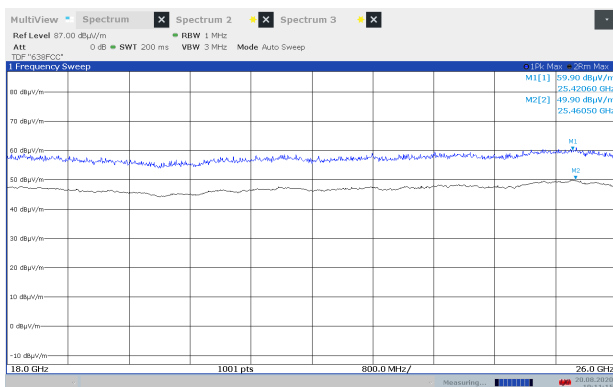
**Radiated Emissions 6.5-18 GHz, Ch165, 802.11n HT20, EUT V, Ant 2, VP**



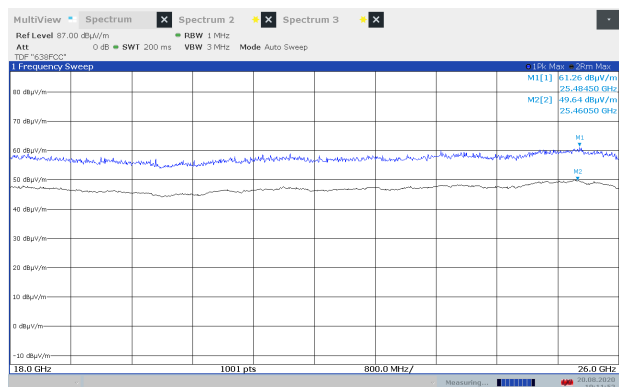
**Emissions 18-26 GHz, Ch036, 802.11a 6M, Ant1, Prescan @0.2m**



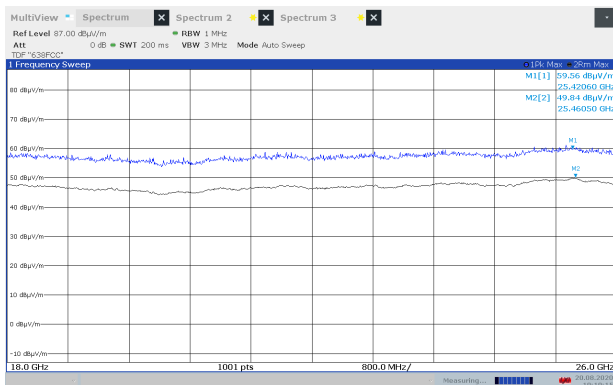
**Emissions 18-26 GHz, Ch036, 802.11n HT20, Ant1, Prescan @0.2m**



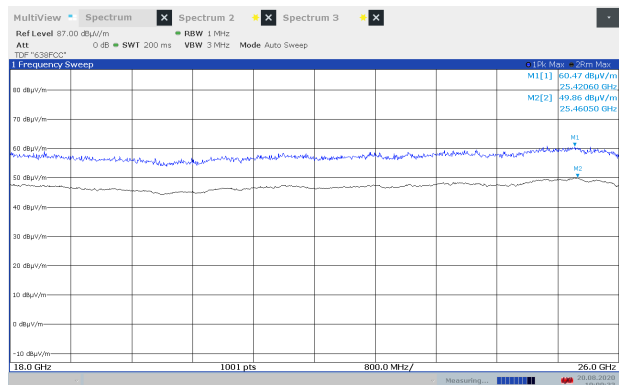
**Emissions 18-26 GHz, Ch064, 802.11a 6M, Ant2, Prescan @0.2m**



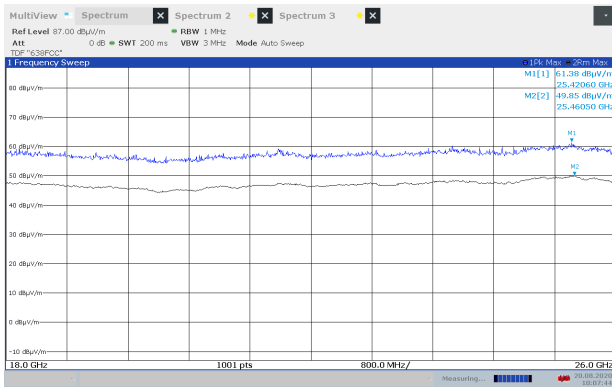
**Emissions 18-26 GHz, Ch064, 802.11n HT20, Ant2, Prescan @0.2m**



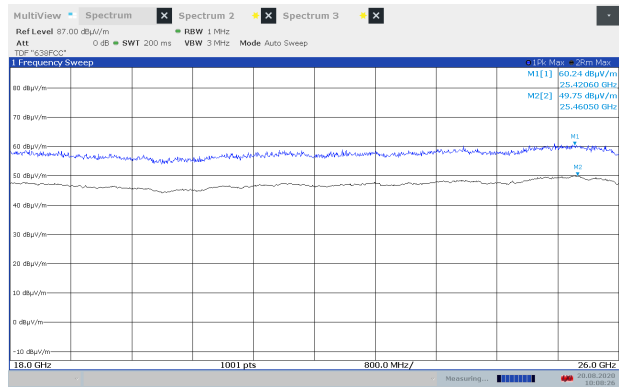
**Emissions 18-26 GHz, Ch100, 802.11a 6M, Ant2, Prescan @0.2m**



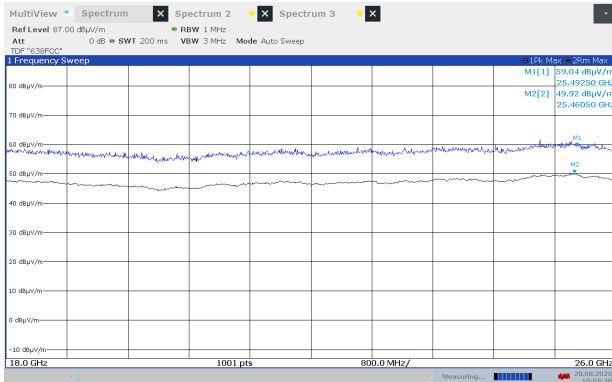
**Emissions 18-26 GHz, Ch100, 802.11n HT20, Ant2, Prescan @0.2m**



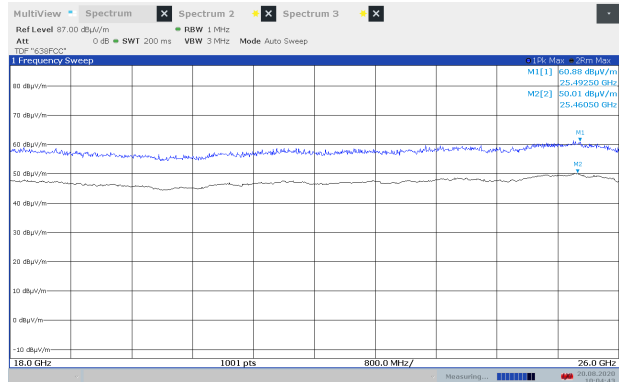
**Emissions 18-26 GHz, Ch140, 802.11a 6M, Ant1, Prescan @0.2m**



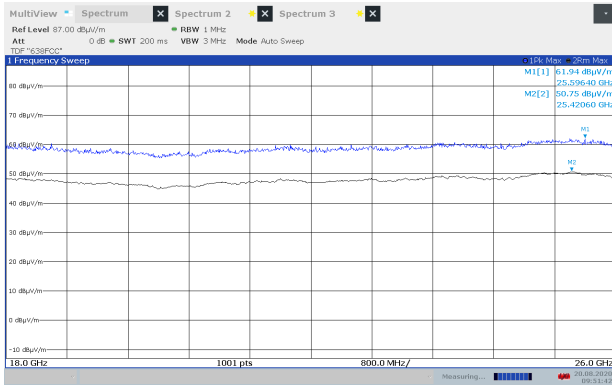
**Emissions 18-26 GHz, Ch140, 802.11n HT20, Ant1, Prescan @0.2m**



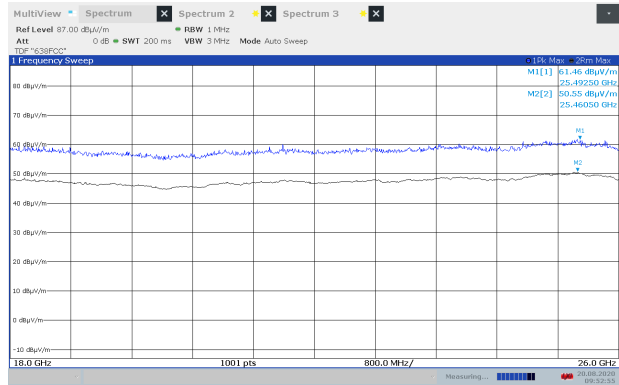
**Emissions 18-26 GHz, Ch149, 802.11a 6M, Ant1, Prescan @0.2m**



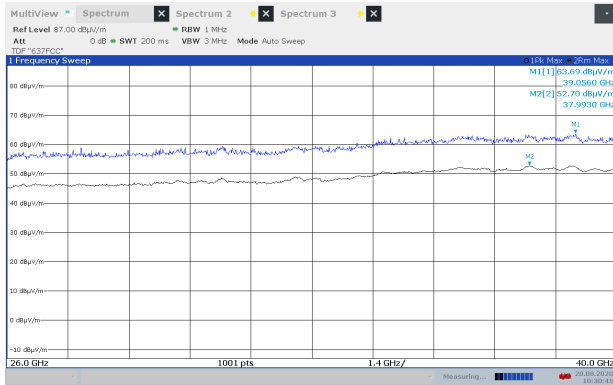
**Emissions 18-26 GHz, Ch149, 802.11n HT20, Ant1, Prescan @0.2m**



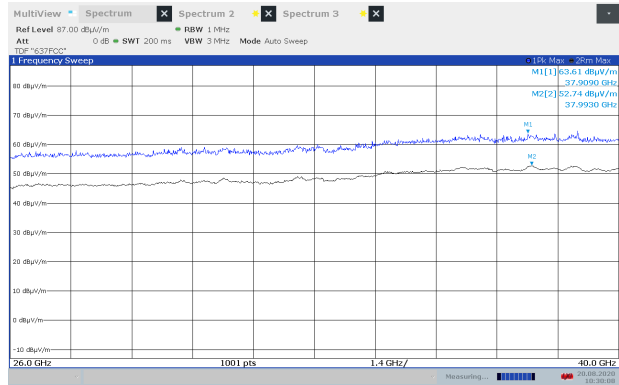
**Emissions 18-26 GHz, Ch165, 802.11a 6M, Ant2, Prescan @0.2m**



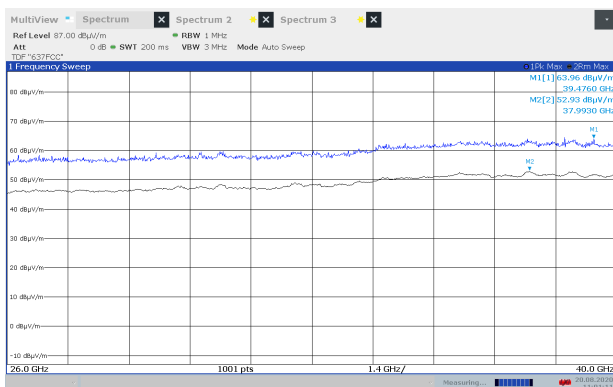
**Emissions 18-26 GHz, Ch165, 802.11n HT20, Ant2, Prescan @0.2m**



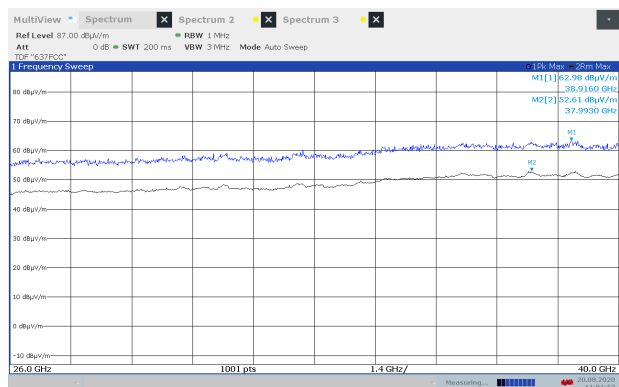
**Emissions 26-40 GHz, Ch036, 802.11a 6M, Ant1, Prescan @0.2m**



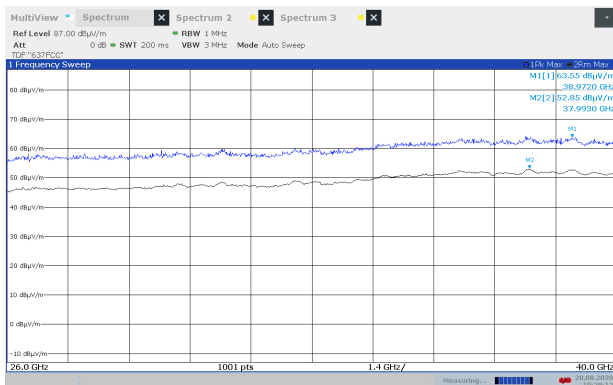
**Emissions 26-40 GHz, Ch036, 802.11n HT20, Ant1, Prescan @0.2m**



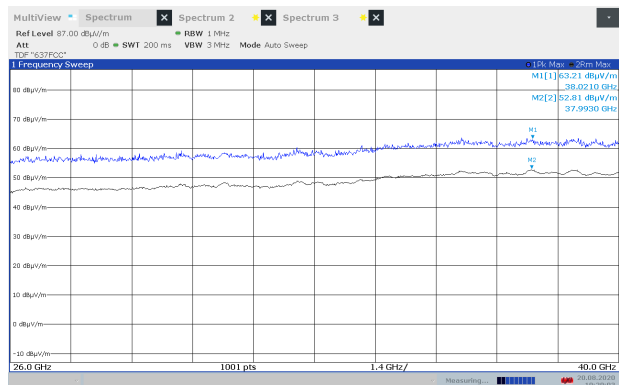
**Emissions 26-40 GHz, Ch64, 802.11a 6M, Ant1, Prescan @0.2m**



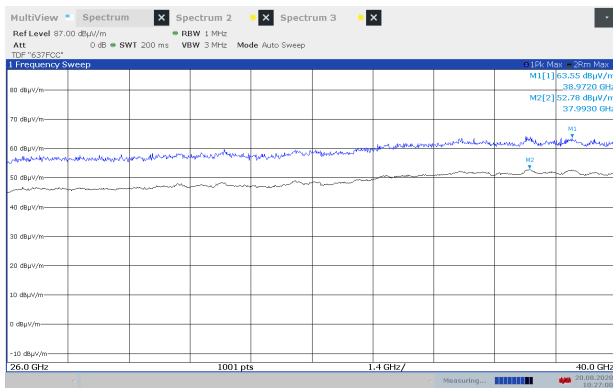
**Emissions 26-40 GHz, Ch64, 802.11n HT20, Ant1, Prescan @0.2m**



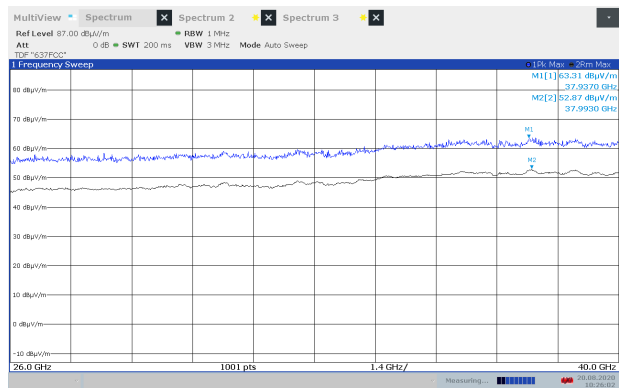
**Emissions 26-40 GHz, Ch100, 802.11a 6M, Ant1, Prescan @0.2m**



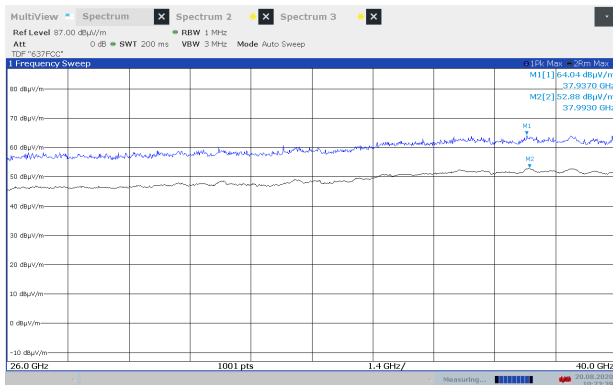
**Emissions 26-40 GHz, Ch100, 802.11n HT20, Ant1, Prescan @0.2m**



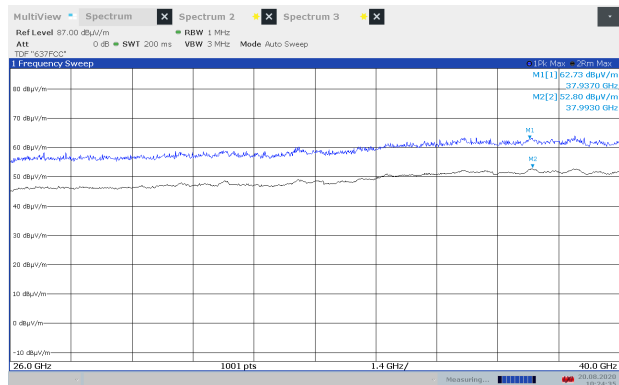
**Emissions 26-40 GHz, Ch140, 802.11a 6M, Ant2, Prescan @0.2m**



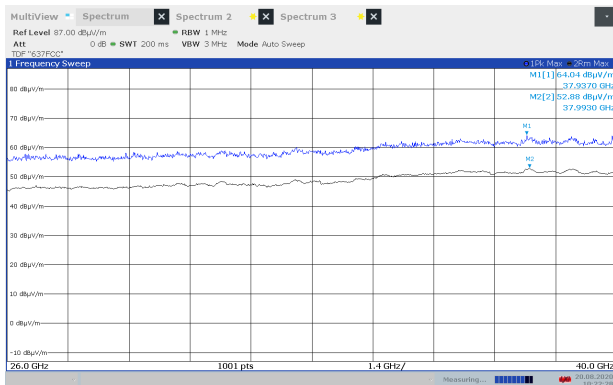
**Emissions 26-40 GHz, Ch140, 802.11n HT20, Ant2, Prescan @0.2m**



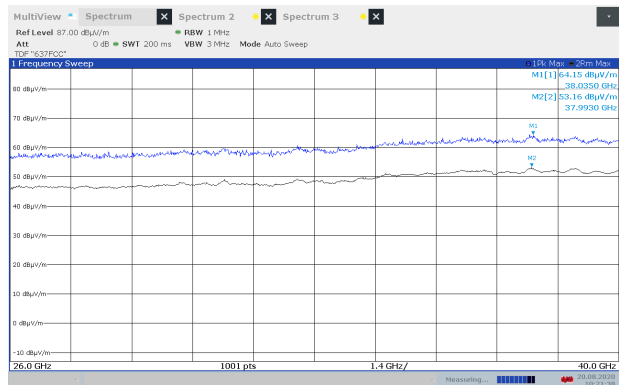
**Emissions 26-40 GHz, Ch149, 802.11a 6M, Ant1, Prescan @0.2m**



**Emissions 26-40 GHz, Ch149, 802.11n HT20, Ant1, Prescan @0.2m**



**Emissions 26-40 GHz, Ch165, 802.11a 6M, Ant2, HP, @1m**



**Emissions 26-40 GHz, Ch165, 802.11n 20HT, Ant2, VP, @1m**

## 4 Measurement Uncertainty

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

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

## 5 LIST OF TEST EQUIPMENT

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

| No. | Model number             | Description          | Manufacturer       | Ref. no.    | Cal. date          | Cal. Due           |
|-----|--------------------------|----------------------|--------------------|-------------|--------------------|--------------------|
| 1   | FSW43                    | Spectrum Analyzer    | Rohde & Schwarz    | LR 1690     | 2020-01            | 2021-01            |
| 2   | ESU40                    | Measuring Receiver   | Rohde & Schwarz    | LR 1639     | 2020-01            | 2021-01            |
| 3   | 6810.17B                 | Attenuator           | Suhner             | LR 1669     | COU                |                    |
| 4   | NO324415                 | Band Reject Filter   | Microwave Circuits | LR 1760     | COU                |                    |
| 5   | VULB 9163                | BiLog Antenna        | Schwarzbech        | LR 1616     | 2020-01            | 2023-01            |
| 6   | 317                      | Preamplifier         | Sonoma Inst.       | LR 1687     | 2019-07<br>2020-08 | 2020-07<br>2021-08 |
| 7   | 3117-PA                  | Horn Antenna +PreAmp | EMCO               | LR 1717     | 2017-12            | 2020-12            |
| 8   | WLK5-1100-1485-7000-40SS | Low Pass Filter      | Wainwright Inst.   | LR 1761     | COU                |                    |
| 9   | 8449B                    | PreAmplifier         | Hewlett Packard    | LR 1322     | 2019-07<br>2020-08 | 2020-07<br>2021-08 |
| 10  | JS4-26004000-27-8A       | PreAmplifier         | Miteq              | LR 1591     | 2019-07<br>2020-08 | 2020-07<br>2021-08 |
| 11  | V637                     | Horn Antenna         | Narda              | LR 099      | N/A                |                    |
| 12  | 638                      | Horn Antenna         | Narda              | LR 1480     | N/A                |                    |
| 13  | 4768-10                  | Microwave Attenuator | Narda              | LR 1671     | COU                |                    |
| 14  | ST18/SMA/N/36            | RF Cable             | Suhner             | LR 1627     | COU                |                    |
| 15  | Sucoflex 102             | Microwave Cable (1m) | Suhner             | S/N: 500111 | COU                |                    |
| 16  | Sucoflex 102             | Microwave Cable (2m) | Suhner             | S/N: 500100 | COU                |                    |

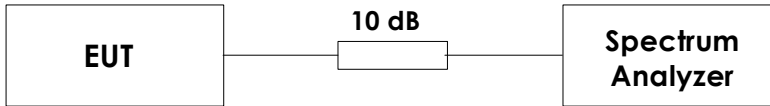
Note: COU – calibrate on use; N/A – Not Applicable

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

| No. | Manufacturer    | Name    | Version  | Comment                                 |
|-----|-----------------|---------|----------|-----------------------------------------|
| 1   | Rohde & Schwarz | EMC32   | 10.50.10 | Radiated Emission test software         |
| 2   | Rohde & Schwarz | GPBShot | 2.7      | Screenshots from R&S Spectrum Analyzers |
| 3   |                 |         |          |                                         |

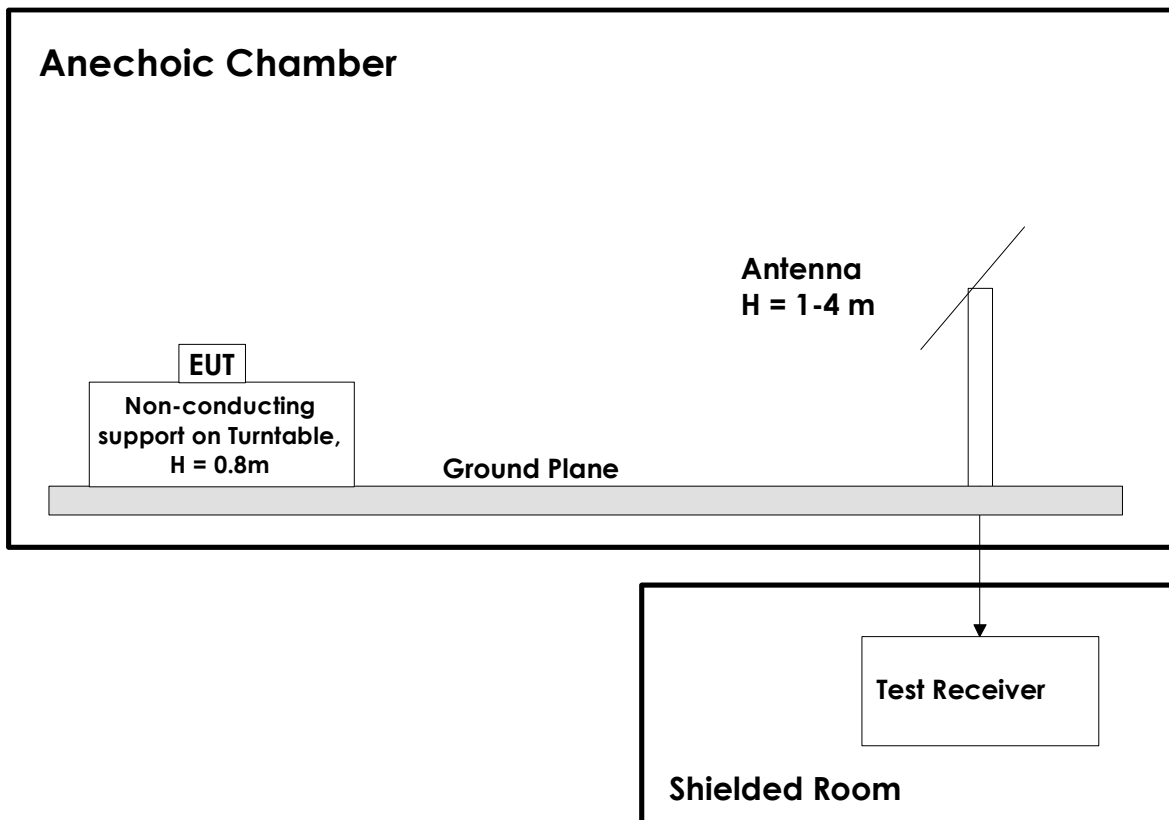
## 6 BLOCK DIAGRAM

### 6.1 Conducted Tests



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

### 6.2 Test Site Radiated Emission



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

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

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

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