# TEST REPORT

## CERTIFICATE OF CONFORMITY

| | |
|---|---|
| **Standard:** | **47 CFR FCC Part 15, Subpart E (Section 15.407)** |
| **Report No.:** | RFBAOZ-WTW-P21060679D-3 |
| **FCC ID:** | 2AHKM-ARIA34118 |
| **Product:** | Tri-band WiFi Extender |
| **Brand:** | hitron |
| **Model No.:** | ARIA3411 |
| **Series Model:** | OS3411 |
| **Received Date:** | 2022/9/21 |
| **Test Date:** | 2022/9/24 ~ 2022/11/20 |
| **Issued Date:** | 2022/12/6 |
| **Applicant:** | Hitron Technologies Inc. |
| **Address:** | No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 30078, Taiwan |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory |
| **Lab Address:** | E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan |
| **Test Location:** | E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan |
| **FCC Registration / Designation Number:** | 723255 / TW2022 |

**Approved by:** _____ , **Date:** 2022/12/6

May Chen / Manager

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Prepared by : Vivian Huang / Specialist

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# Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RFBAOZ-WTW-P21060679D-3 | Original release. | 2022/12/6 |

# 1 Certificate

| | |
|---|---|
| **Product:** | Tri-band WiFi Extender |
| **Brand:** | hitron |
| **Test Model:** | ARIA3411 |
| **Series Model:** | OS3411 |
| **Sample Status:** | Engineering sample |
| **Applicant:** | Hitron Technologies Inc. |
| **Test Date:** | 2022/9/24 ~ 2022/11/20 |
| **Standard:** | 47 CFR FCC Part 15, Subpart E (Section 15.407) |
| **Measurement procedure:** | ANSI C63.10-2013<br>KDB 987594 D02 U-NII 6 GHz EMC Measurement v01v01<br>KDB 789033 D02 General UNII Test Procedure New Rules v02r01 |

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart E (Section 15.407) | | | |
|---|---|---|---|
| Clause | Test Item | Result | Remark |
| 15.407(a)(5)(6) | RF Output Power | Pass | Meet the requirement of limit. |
| 15.407(a)(5)(6) | Power Spectral Density | Pass | Meet the requirement of limit. |
| 15.407(a)(10) | Occupied Bandwidth | Pass | Meet the requirement of limit. |
| 15.407(b)(9) | AC Power Conducted Emissions | Pass | Minimum passing margin is -13.38 dB at 19.26172 MHz |
| 15.407(b)(9) | Unwanted Emissions below 1 GHz | Pass | Minimum passing margin is -4.4 dB at 53.95 MHz |
| 15.407(b)(6)<br>15.407(b)(10) | Unwanted Emissions above 1 GHz | Pass | Minimum passing margin is -2.0 dB at 7131.13 MHz |
| 15.407(b)(7) | In-Band Emission Mask | Pass | Meet the requirement of limit. |
| 15.407(d)(6) | Contention-based Protocol | Pass | Meet the requirement of limit. |
| 15.407(g) | Frequency Stability | Pass | Meet the requirement of limit. |
| 15.407(d) | Operational restrictions for 6 GHz U-NII devices | Pass | Declaration by applicant. |
| 15.203 | Antenna Requirement | Pass | Antenna connector is ipex(MHF) not a standard connector. |
| --- | Emission Bandwidth | - | Reference only. |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Specification | Expanded Uncertainty (k=2) (±) |
|---|---|---|
| AC Power Conducted Emissions | 150 kHz ~ 30 MHz | 1.9 dB |
| Unwanted Emissions below 1 GHz | 9 kHz ~ 30 MHz | 3.1 dB |
| | 30 MHz ~ 1 GHz | 5.4 dB |
| Unwanted Emissions above 1 GHz | 1 GHz ~ 18 GHz | 5.0 dB |
| | 18 GHz ~ 40 GHz | 5.3 dB |

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

### 2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

# 3 General Information

## 3.1 General Description of EUT

| | |
|---|---|
| Product | Tri-band WiFi Extender |
| Brand | hitron |
| Test Model | ARIA3411 |
| Series Model | OS3411 |
| Status of EUT | Engineering sample |
| Power Supply Rating | 12 Vdc from power adapter |
| Modulation Type | 1024QAM for OFDMA in 11ax HE mode |
| Modulation Technology | OFDMA |
| Transfer Rate | 802.11ax: up to 4083.9 Mbps |
| Operating Frequency | 6.115 GHz ~ 6.415 GHz<br>6.435 GHz ~ 6.525 GHz<br>6.525 GHz ~ 6.875 GHz<br>6.875 GHz ~ 7.095 GHz |
| Number of Channel | 802.11ax (HE20): 50<br>802.11ax (HE40): 25<br>802.11ax (HE80): 12<br>802.11ax (HE160): 6 |
| Output Power | **CDD Mode:**<br>**MCS0NSS1**<br>6.115 GHz ~ 6.415 GHz : EIRP: 133.968 mW (21.27 dBm)<br>6.435 GHz ~ 6.525 GHz : EIRP: 127.938 mW (21.07 dBm)<br>6.525 GHz ~ 6.875 GHz : EIRP: 130.918 mW (21.17 dBm)<br>6.875 GHz ~ 7.095 GHz : EIRP: 137.088 mW (21.37 dBm)<br>**MCS0NSS4**<br>6.115 GHz ~ 6.415 GHz : EIRP: 377.572 mW (25.77 dBm)<br>6.435 GHz ~ 6.525 GHz : EIRP: 377.572 mW (25.77 dBm)<br>6.525 GHz ~ 6.875 GHz : EIRP: 414 mW (26.17 dBm)<br>6.875 GHz ~ 7.095 GHz : EIRP: 386.367 mW (25.87 dBm)<br>**Beamforming Mode:**<br>**MCS0NSS1**<br>6.115 GHz ~ 6.415 GHz : EIRP: 306.902 mW (24.87 dBm)<br>6.435 GHz ~ 6.525 GHz : EIRP: 198.153 mW (22.97 dBm)<br>6.525 GHz ~ 6.875 GHz : EIRP: 238.232 mW (23.77 dBm)<br>6.875 GHz ~ 7.095 GHz : EIRP: 249.459 mW (23.97 dBm)<br>**MCS0NSS2**<br>6.115 GHz ~ 6.415 GHz : EIRP: 352.371 mW (25.47 dBm)<br>6.435 GHz ~ 6.525 GHz : EIRP: 293.089 mW (24.67 dBm)<br>6.525 GHz ~ 6.875 GHz : EIRP: 344.35 mW (24.97 dBm)<br>6.875 GHz ~ 7.095 GHz : EIRP: 249.459 mW (23.97 dBm) |
| EUT Category | Indoor Access Point + Subordinate Device |

Note:

1. The EUT has two model names which are identical to each other in all aspects except for the followings:

| Model Name | Difference |
|---|---|
| ARIA3411 | with black housing |
| OS3411 | with white housing |
| Node: From the above models, the radiated emission worst case was found in **model: ARIA3411**. Therefore only the test data of the mode was recorded in this report. | |

2. Simultaneously transmission condition.

| Condition | Technology | | | |
|---|---|---|---|---|
| 1 | WLAN 2.4GHz | WLAN 5GHz | WLAN 6GHz | Bluetooth |
| Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found. | | | | |

3. The EUT has below radios as following table:

| Radio 1 | Radio 2 | Radio 3 | Radio 4 |
|---|---|---|---|
| Bluetooth | WLAN 2.4GHz | WLAN 5GHz | WLAN 6GHz |

4. The EUT uses following accessories.

| **AC Adapter 1** | | | |
|---|---|---|---|
| Brand | Model | Specification | Description |
| APD | WA-30P12FU | AC Input : 100-240V~,50-60 Hz； 0.9 A Max<br>DC Output : 12V--2.5A<br>Signal Line : 1.5 meter | Black (for model: ARIA3411),<br>White (for model: OS3411) |
| **RJ45 Cable (Yellow for Model: ARIA3411)** | | | |
| Brand | Model | Specification | |
| EKSON | ZQ01-C069 | Signal Line : 1.5 meter, unshielded | |
| **RJ45 Cable (White for Model: OS3411)** | | | |
| Brand | Model | Specification | |
| EKSON | MT01-C044 | Signal Line : 1.5 meter, unshielded | |

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

### 3.2 Antenna Description of EUT

1. The antenna information is listed as below.

| Antenna NO. | RF Chain NO. | Model | Antenna Net Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type | Cable Length |
|---|---|---|---|---|---|---|---|
| 1 | 0 | RFPCA252525IMLB901 | 2.63 | 2.4~2.4835 | printed PCB | ipex(MHF) | 24cm |
| | | | 4.02 | 5.15~5.85 | | | |
| 2 | 1 | RFPCA282525IMLB901 | 2.6 | 2.4~2.4835 | printed PCB | ipex(MHF) | 24cm |
| | | | 3.81 | 5.15~5.85 | | | |
| 3 | 0 | RFPCA212009IMMB901 | 3.59 | 5.85~7.125 | printed PCB | ipex(MHF) | 10cm |
| 4 | 1 | RFPCA221508IMMB901 | 4.71 | 5.85~7.125 | printed PCB | ipex(MHF) | 7.5cm |
| 5 | 2 | RFPCA221514IMMB901 | 4.7 | 5.85~7.125 | printed PCB | ipex(MHF) | 13.5cm |
| 6 | 3 | RFPCA212009IMMB902 | 4.59 | 5.85~7.125 | printed PCB | ipex(MHF) | 8.5cm |
| 7 (for BT) | - | RFPCA381007IMAB301 | 4.77 | 2.4~2.4835 | printed PCB | ipex(MHF) | 6.5cm |

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. The EUT incorporates a MIMO function:

| 6GHz Band | | |
|---|---|---|
| **MODULATION MODE** | **TX & RX CONFIGURATION** | |
| **802.11ax (HE20)** | 4TX | 4RX |
| **802.11ax (HE40)** | 4TX | 4RX |
| **802.11ax (HE80)** | 4TX | 4RX |
| **802.11ax (HE160)** | 4TX | 4RX |

Note:
1. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.

### 3.3 Channel List

**U-NII-5:**

16 channels are provided for 802.11ax (HE20):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 33 | 6115 MHz | 37 | 6135 MHz | 41 | 6155 MHz | 45 | 6175 MHz |
| 49 | 6195 MHz | 53 | 6215 MHz | 57 | 6235 MHz | 61 | 6255 MHz |
| 65 | 6275 MHz | 69 | 6295 MHz | 73 | 6315 MHz | 77 | 6335 MHz |
| 81 | 6355 MHz | 85 | 6375 MHz | 89 | 6395 MHz | 93 | 6415MHz |

8 channels are provided for 802.11ax (HE40):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 35 | 6125 MHz | 43 | 6165 MHz | 51 | 6205 MHz | 59 | 6245 MHz |
| 67 | 6285MHz | 75 | 6325 MHz | 83 | 6365 MHz | 91 | 6405 MHz |

4 channel is provided for 802.11ax (HE80):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 39 | 6145 MHz | 55 | 6225 MHz | 71 | 6305 MHz | 87 | 6385 MHz |

2 channel is provided for 802.11ax (HE160):

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 47 | 6185 MHz | 79 | 6345 MHz |

**U-NII-6:**

5 channels are provided for 802.11ax (HE20):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 97 | 6435 MHz | 101 | 6455 MHz | 105 | 6475 MHz | 109 | 6495 MHz |
| 113 | 6515 MHz | | | | | | |

3 channels are provided for 802.11ax (HE40):

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 99 | 6445 MHz | 107 | 6485 MHz | *115 | 6525 MHz |

1 channels is provided for 802.11ax (HE80):

| Channel | Frequency |
|---|---|
| 103 | 6465 MHz |

1 channel is provided for 802.11ax (HE160):

| Channel | Frequency |
|---|---|
| *111 | 6505 MHz |

**U-NII-7:**

18 channels are provided for 802.11ax (HE20):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 117 | 6535 MHz | 121 | 6555 MHz | 125 | 6575 MHz | 129 | 6595 MHz |
| 133 | 6615 MHz | 137 | 6635 MHz | 141 | 6655 MHz | 145 | 6675 MHz |
| 149 | 6695 MHz | 153 | 6715 MHz | 157 | 6735 MHz | 161 | 6755 MHz |
| 165 | 6775 MHz | 169 | 6795 MHz | 173 | 6815 MHz | 177 | 6835 MHz |
| 181 | 6855 MHz | *185 | 6875 MHz | | | | |

8 channels are provided for 802.11ax (HE40):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 123 | 6565 MHz | 131 | 6605 MHz | 139 | 6645 MHz | 147 | 6685 MHz |
| 155 | 6725 MHz | 163 | 6765 MHz | 171 | 6805 MHz | 179 | 6845 MHz |

5 channels are provided for 802.11ax (HE80):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| *119 | 6545 MHz | 135 | 6625 MHz | 151 | 6705 MHz | 167 | 6785 MHz |
| *183 | 6865 MHz | | | | | | |

2 channels are provided for 802.11ax (HE160):

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 143 | 6665 MHz | 175 | *6825 MHz |

**U-NII-8:**

11 channels are provided for 802.11ax (HE20):

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 189 | 6895 MHz | 193 | 6915 MHz | 197 | 6935 MHz | 201 | 6955 MHz |
| 205 | 6975 MHz | 209 | 6995 MHz | 213 | 7015 MHz | 217 | 7035 MHz |
| 221 | 7055 MHz | 225 | 7075 MHz | 229 | 7095 MHz | | |

6 channels are provided for 802.11ax (HE40):

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| *187 | 6885 MHz | 195 | 6925 MHz | 203 | 6965 MHz |
| 211 | 7005 MHz | 219 | 7045 MHz | 227 | 7085 MHz |

2 channels is provided for 802.11ax (HE80):

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 199 | 6945 MHz | 215 | 7025 MHz |

1 channels are provided for 802.11ax (HE160):

| Channel | Frequency |
|---|---|
| 207 | 6985 MHz |

Note: * mean these are straddle channels and operating under control by Low-power indoor AP only.

### 3.4 Test Mode Applicability and Tested Channel Detail

| | |
|---|---|
| Pre-Scan: | 1. The RJ45 Cable has the following appearance: yellow/white. Pre-scan these of RJ45 Cable and find the worst case as a representative test condition.<br>2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). |
| Worst Case: | 1. RJ45 Cable Worst condition : yellow RJ45 cable |

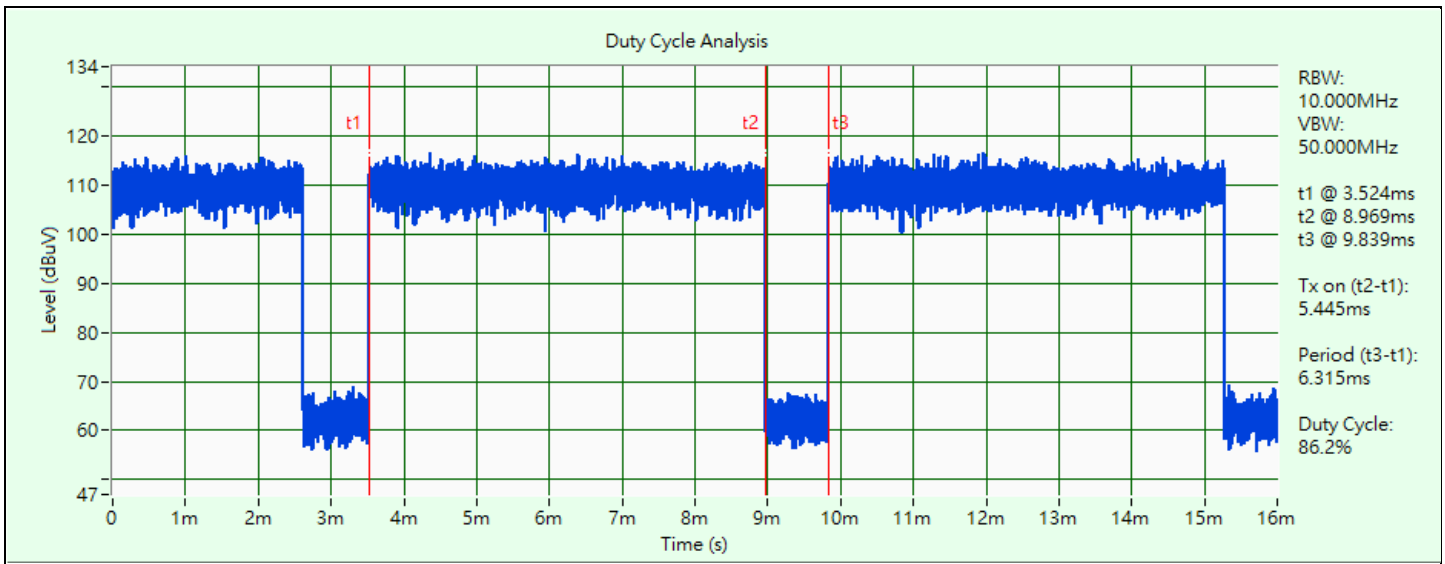
Following channel(s) was (were) selected for the final test as listed below:

| Test Item | Mode | Signal Mode | Tested Channel | Modulation | Data Rate Parameter |
|---|---|---|---|---|---|
| RF Output Power / Power Spectral Density | 802.11ax (HE20) | CDD | 33, 61, 93, 97, 105, 113, 117, 153, 181, 185, 213, 229 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE40) | CDD | 35, 59, 91, 99, 107, 115, 123, 155, 179, 187, 211, 227 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE80) | CDD | 39, 55, 87, 103, 119, 135, 151, 167, 183, 199, 215 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE160) | CDD | 47, 79, 111, 143, 175, 207 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE20) | Beamforming | 33, 61, 93, 97, 105, 113, 117, 153, 181, 185, 213, 229 | BPSK | MCS0NSS1, MCS0NSS2 |
| | 802.11ax (HE40) | Beamforming | 35, 59, 91, 99, 107, 115, 123, 155, 179, 187, 211, 227 | BPSK | MCS0NSS1, MCS0NSS2 |
| | 802.11ax (HE80) | Beamforming | 39, 55, 87, 103, 119, 135, 151, 167, 183, 199, 215 | BPSK | MCS0NSS1, MCS0NSS2 |
| | 802.11ax (HE160) | Beamforming | 47, 79, 111, 143, 175, 207 | BPSK | MCS0NSS1, MCS0NSS2 |
| Emission Bandwidth | 802.11ax (HE20) | CDD | 33, 61, 93, 97, 105, 113, 117, 153, 181, 185, 213, 229 | BPSK | MCS0NSS4 |
| | 802.11ax (HE40) | CDD | 35, 59, 91, 99, 107, 115, 123, 155, 179, 187, 211, 227 | BPSK | MCS0NSS4 |
| | 802.11ax (HE80) | CDD | 39, 55, 87, 103, 119, 135, 151, 167, 183, 199, 215 | BPSK | MCS0NSS4 |
| | 802.11ax (HE160) | CDD | 47, 79, 111, 143, 175, 207 | BPSK | MCS0NSS4 |

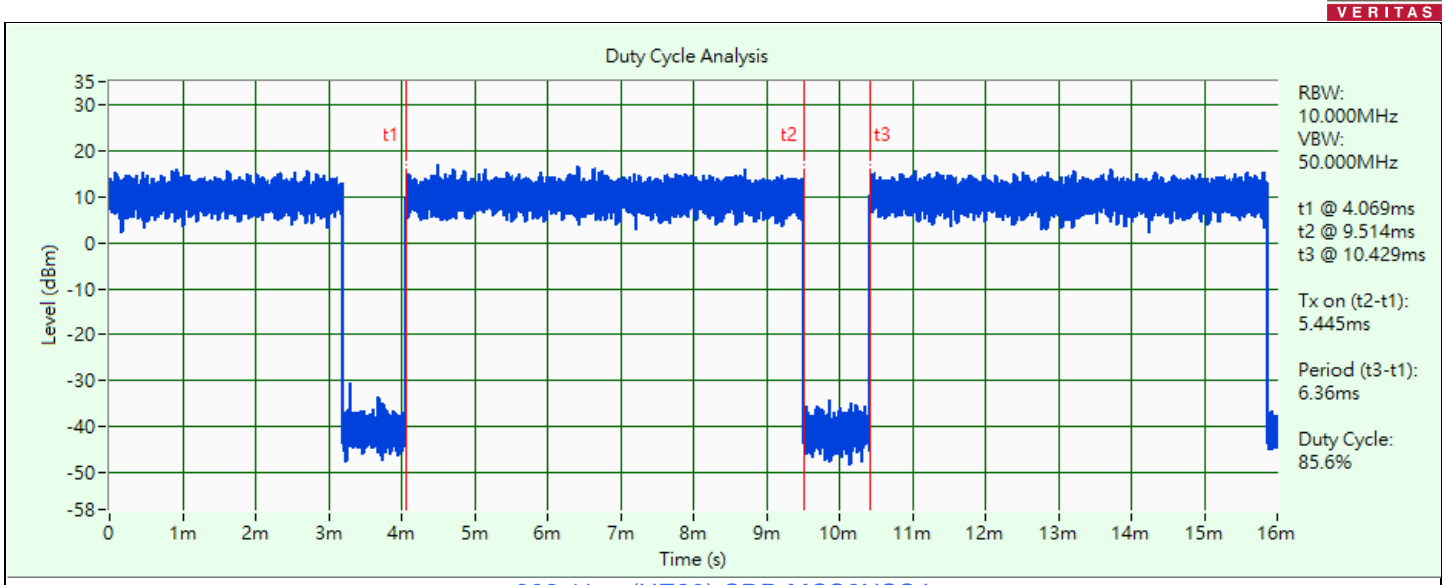
| Test Item | Mode | Signal Mode | Tested Channel | Modulation | Data Rate Parameter |
|---|---|---|---|---|---|
| In-Band Emission Mask | 802.11ax (HE20) | CDD | 33, 61, 93, 97, 105, 113, 117, 153, 181, 185, 213, 229 | BPSK | MCS0NSS4 |
| | 802.11ax (HE40) | CDD | 35, 59, 91, 99, 107, 115, 123, 155, 179, 187, 211, 227 | BPSK | MCS0NSS4 |
| | 802.11ax (HE80) | CDD | 39, 55, 87, 103, 119, 135, 151, 167, 183, 199, 215 | BPSK | MCS0NSS4 |
| | 802.11ax (HE160) | CDD | 47, 79, 111, 143, 175, 207 | BPSK | MCS0NSS4 |
| Occupied Bandwidth | 802.11ax (HE20) | CDD | 33, 61, 93, 97, 105, 113, 117, 153, 181, 185, 213, 229 | BPSK | MCS0NSS4 |
| | 802.11ax (HE40) | CDD | 35, 59, 91, 99, 107, 115, 123, 155, 179, 187, 211, 227 | BPSK | MCS0NSS4 |
| | 802.11ax (HE80) | CDD | 39, 55, 87, 103, 119, 135, 151, 167, 183, 199, 215 | BPSK | MCS0NSS4 |
| | 802.11ax (HE160) | CDD | 47, 79, 111, 143, 175, 207 | BPSK | MCS0NSS4 |
| Frequency Stability | 802.11ax (HE20) | - | 33 | un-modulation | - |
| Contention-based Protocol | 802.11ax (HE20) | CDD | 45, 97, 149, 209 | - | - |
| | 802.11ax (HE160) | CDD | 47, 111, 143, 207 | - | - |
| AC Power Conducted Emissions | 802.11ax (HE160) | CDD | 175 | BPSK | MCS0NSS4 |
| Unwanted Emissions below 1 GHz | 802.11ax (HE160) | CDD | 175 | BPSK | MCS0NSS4 |
| Unwanted Emissions above 1 GHz | 802.11ax (HE20) | CDD | 33, 61, 93, 97, 105, 113, 117, 153, 181, 185, 213, 229 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE40) | CDD | 35, 59, 91, 99, 107, 115, 123, 155, 179, 187, 211, 227 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE80) | CDD | 39, 55, 87, 103, 119, 135, 151, 167, 183, 199, 215 | BPSK | MCS0NSS1, MCS0NSS4 |
| | 802.11ax (HE160) | CDD | 47, 79, 111, 143, 175, 207 | BPSK | MCS0NSS1, MCS0NSS4 |
| Note: Partial RU (resource unit) and channel puncturing configurations are not supported. | | | | | |

### 3.5 Duty Cycle of Test Signal

**802.11ax (HE20) CDD MCS0NSS1:** Duty cycle = 5.445 ms / 6.315 ms x 100% = 86.2%, duty factor = 10 * log (1/Duty cycle) = 0.64 dB
**802.11ax (HE20) CDD MCS0NSS4:** Duty cycle = 5.445 ms / 6.36 ms x 100% = 85.6%, duty factor = 10 * log (1/Duty cycle) = 0.67 dB
**802.11ax (HE40) CDD MCS0NSS1:** Duty cycle = 5.446 ms / 6.333 ms x 100% = 86.0%, duty factor = 10 * log (1/Duty cycle) = 0.66 dB
**802.11ax (HE40) CDD MCS0NSS4:** Duty cycle = 5.444 ms / 6.314 ms x 100% = 86.2%, duty factor = 10 * log (1/Duty cycle) = 0.64 dB
**802.11ax (HE80) CDD MCS0NSS1:** Duty cycle = 5.444 ms / 6.385 ms x 100% = 85.3%, duty factor = 10 * log (1/Duty cycle) = 0.69 dB
**802.11ax (HE80) CDD MCS0NSS4:** Duty cycle = 5.445 ms / 5.9 ms x 100% = 92.3%, duty factor = 10 * log (1/Duty cycle) = 0.35 dB
**802.11ax (HE160) CDD MCS0NSS1:** Duty cycle = 5.445 ms / 6.314 ms x 100% = 86.2%, duty factor = 10 * log (1/Duty cycle) = 0.64 dB
**802.11ax (HE160) CDD MCS0NSS4:** Duty cycle = 5.445 ms / 5.972 ms x 100% = 91.2%, duty factor = 10 * log (1/Duty cycle) = 0.40 dB
**802.11ax (HE20) Beamforming MCS0NSS1:** Duty cycle = 82.265 ms / 100 ms x 100% = 82.3%, duty factor = 10 * log (1/Duty cycle) = 0.85 dB
**802.11ax (HE20) Beamforming MCS0NSS2:** Duty cycle = 80.023 ms / 100 ms x 100% = 80.0%, duty factor = 10 * log (1/Duty cycle) = 0.97 dB
**802.11ax (HE40) Beamforming MCS0NSS1:** Duty cycle = 94.592 ms / 100 ms x 100% = 94.6%, duty factor = 10 * log (1/Duty cycle) = 0.24 dB
**802.11ax (HE40) Beamforming MCS0NSS2:** Duty cycle = 94.592 ms / 100 ms x 100% = 94.6%, duty factor = 10 * log (1/Duty cycle) = 0.24 dB
**802.11ax (HE80) Beamforming MCS0NSS1:** Duty cycle = 90.569 ms / 100 ms x 100% = 90.6%, duty factor = 10 * log (1/Duty cycle) = 0.43 dB
**802.11ax (HE80) Beamforming MCS0NSS2:** Duty cycle = 80.251 ms / 100 ms x 100% = 80.3%, duty factor = 10 * log (1/Duty cycle) = 0.96 dB
**802.11ax (HE160) Beamforming MCS0NSS1:** Duty cycle = 73.1 ms / 100 ms x 100% = 73.1%, duty factor = 10 * log (1/Duty cycle) = 1.36 dB
**802.11ax (HE160) Beamforming MCS0NSS2:** Duty cycle = 79.197 ms / 100 ms x 100% = 79.2%, duty factor = 10 * log (1/Duty cycle) = 1.01 dB



802.11ax (HE20) CDD MCS0NSS1

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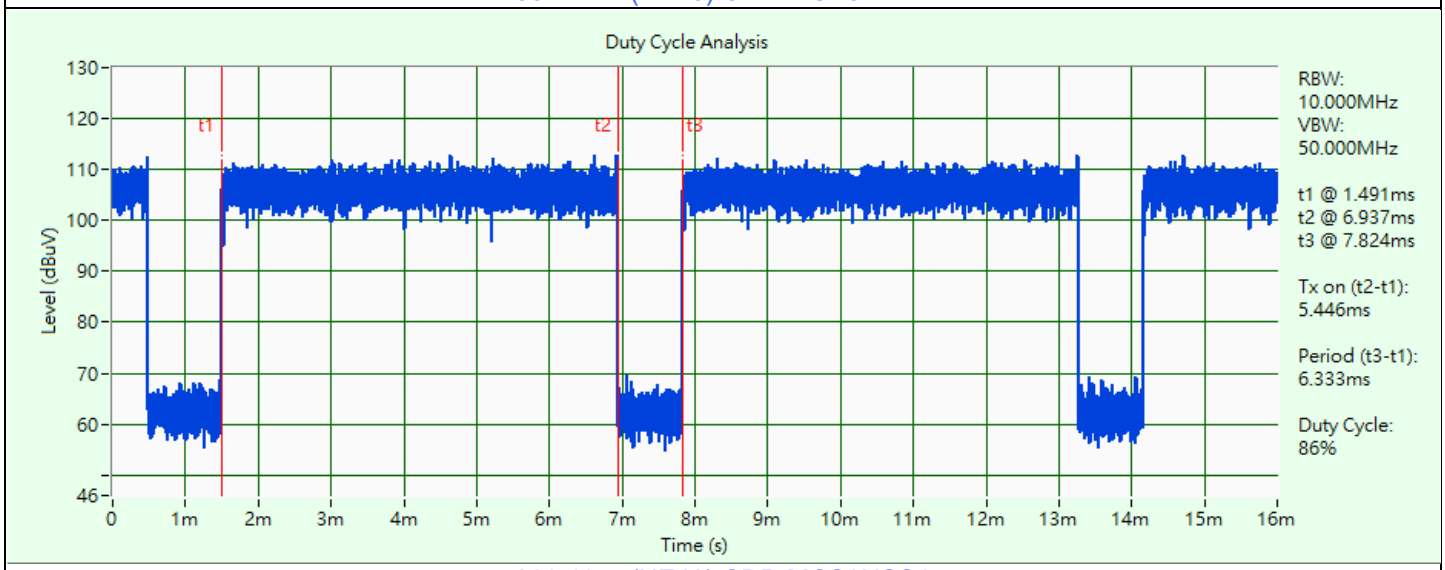
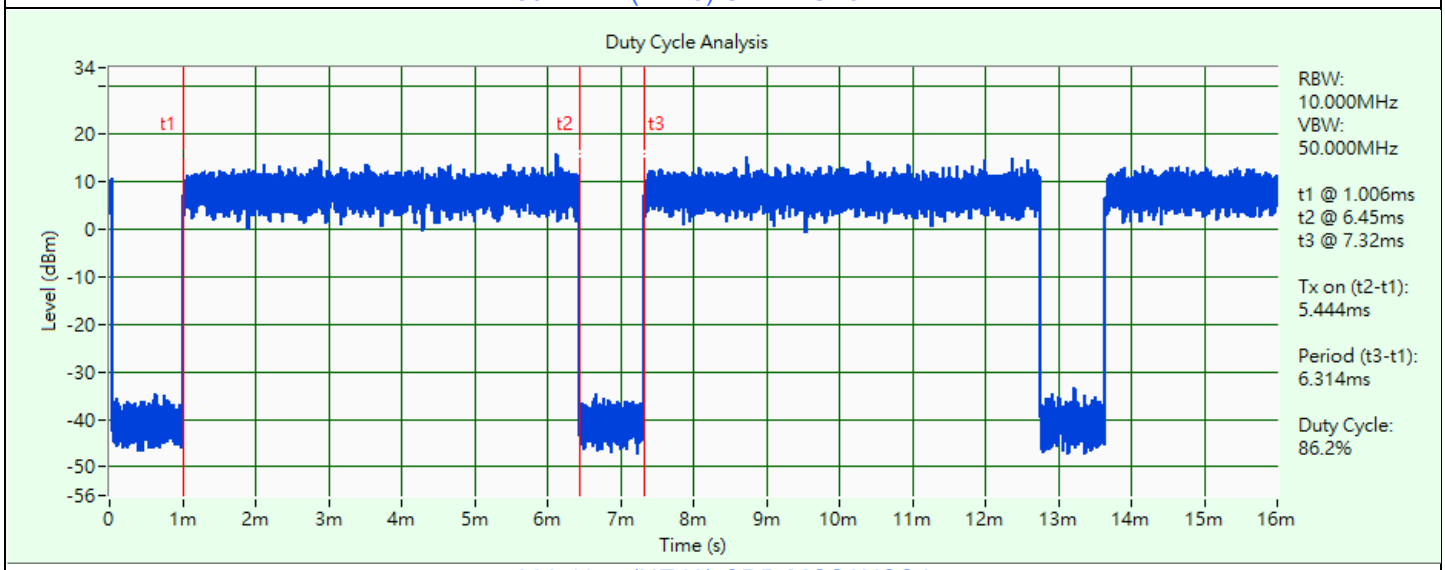
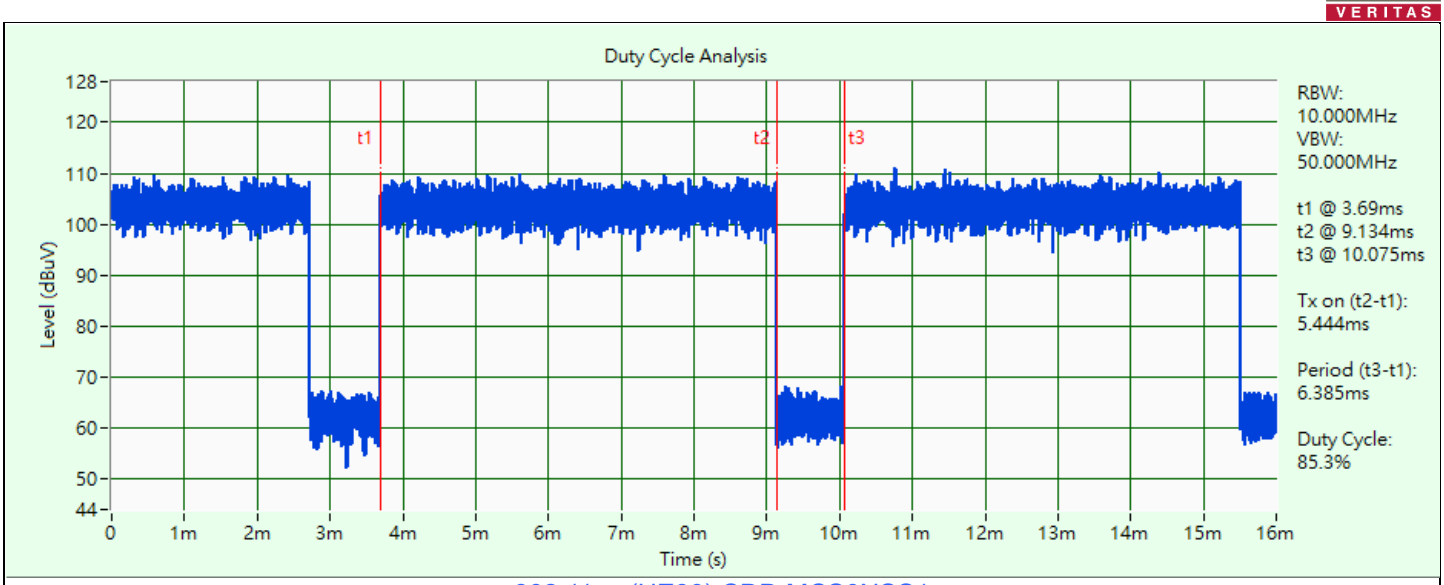


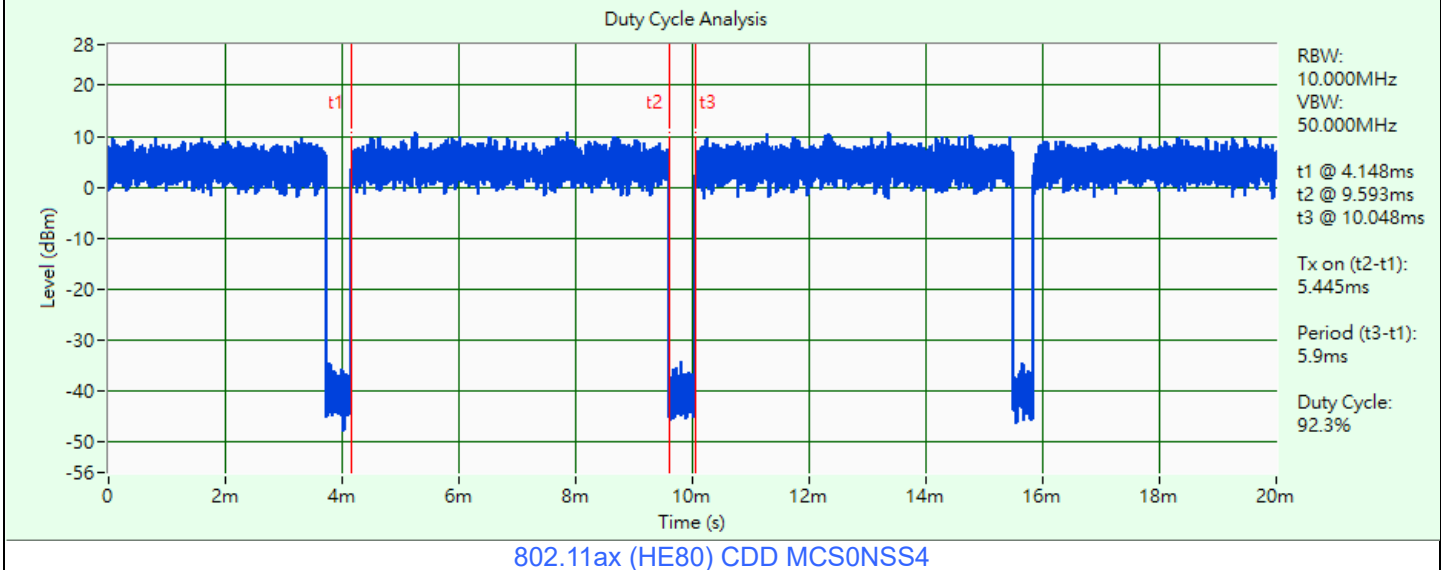

802.11ax (HE40) CDD MCS0NSS1



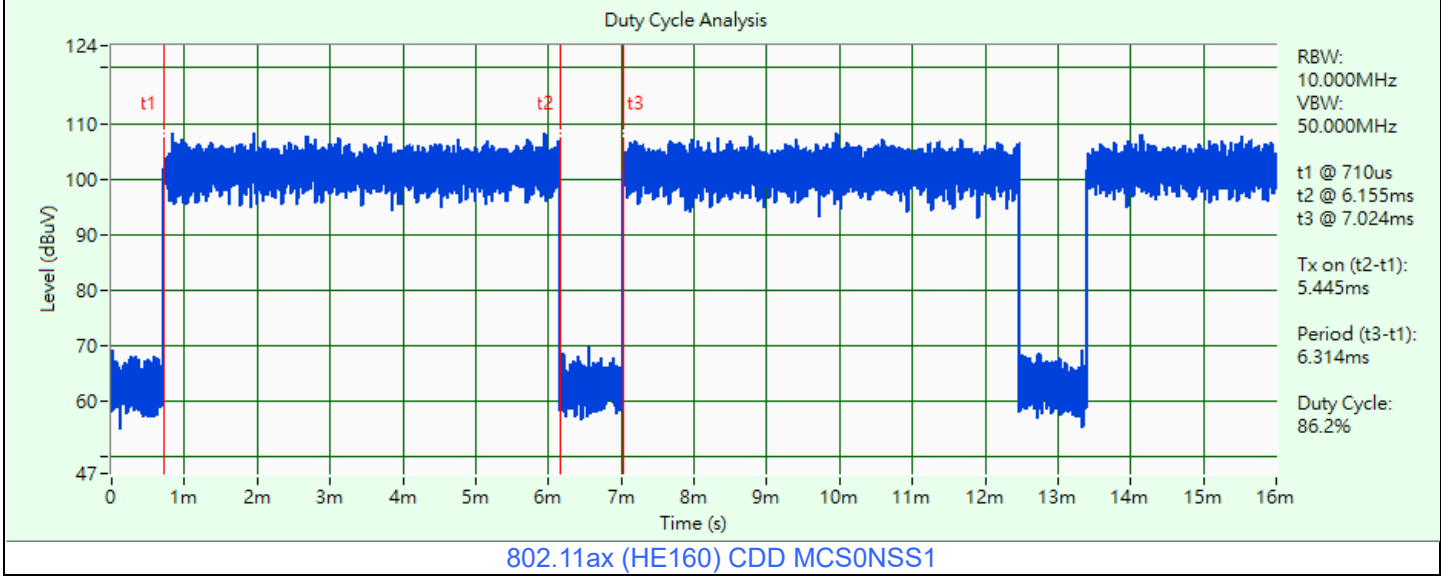

802.11ax (HE40) CDD MCS0NSS4



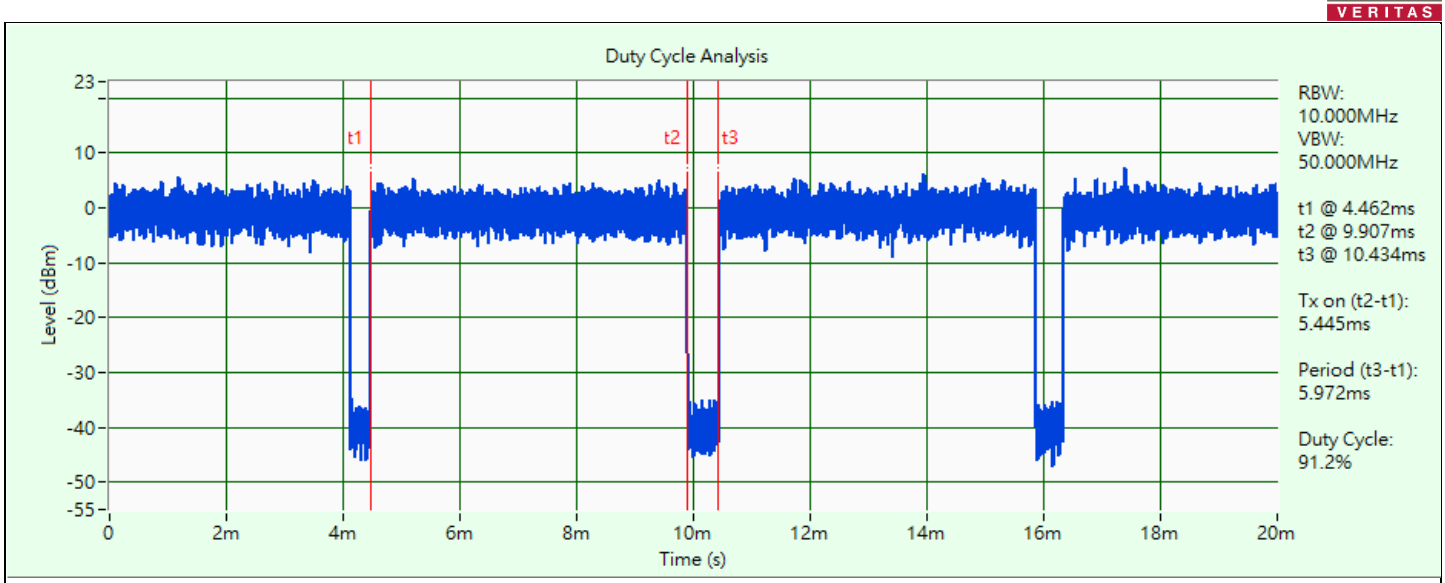

802.11ax (HE80) CDD MCS0NSS1



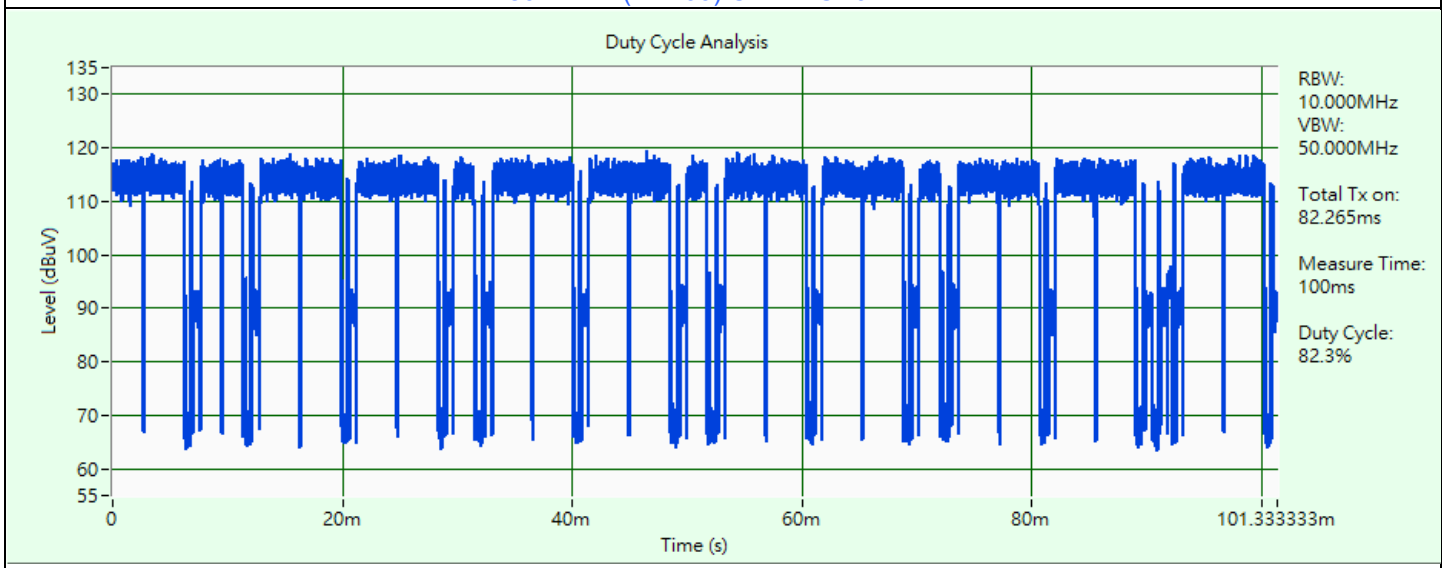

802.11ax (HE80) CDD MCS0NSS4



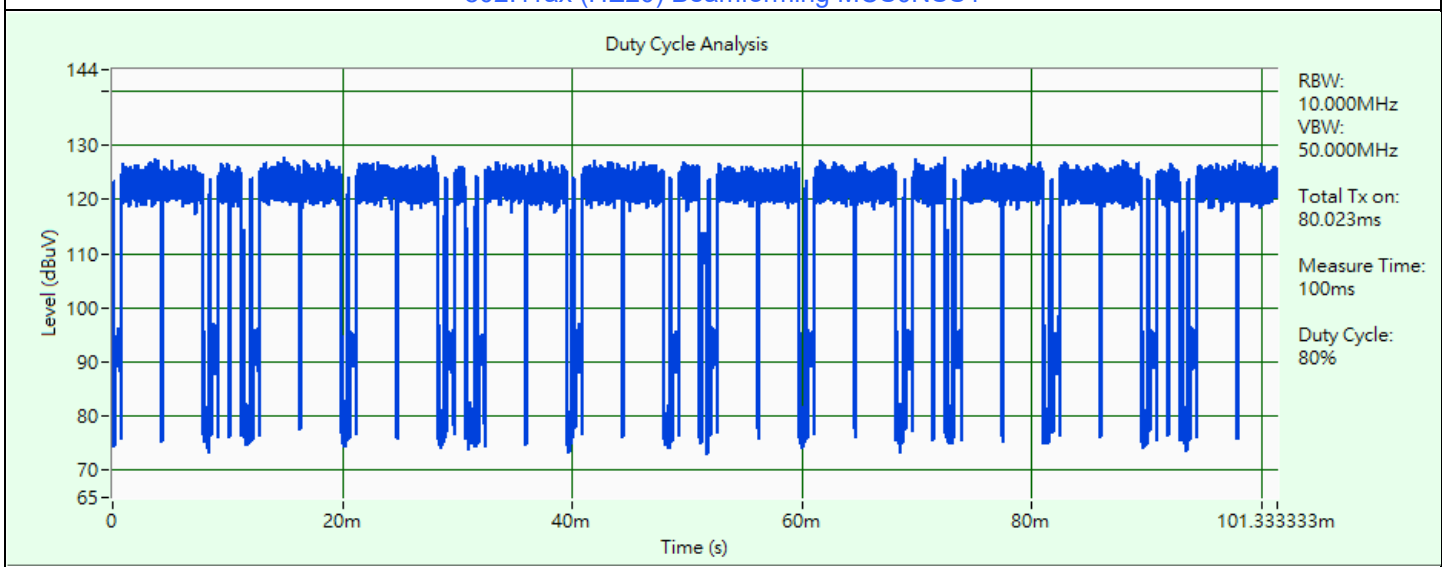

802.11ax (HE160) CDD MCS0NSS1



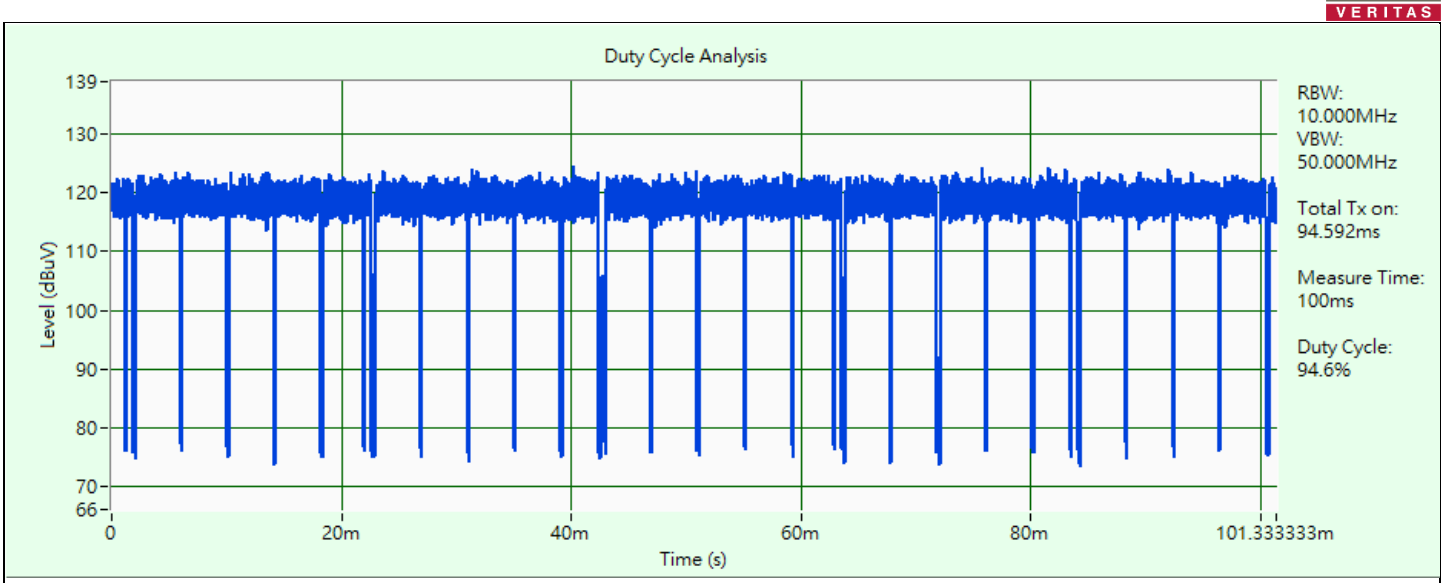

802.11ax (HE160) CDD MCS0NSS4



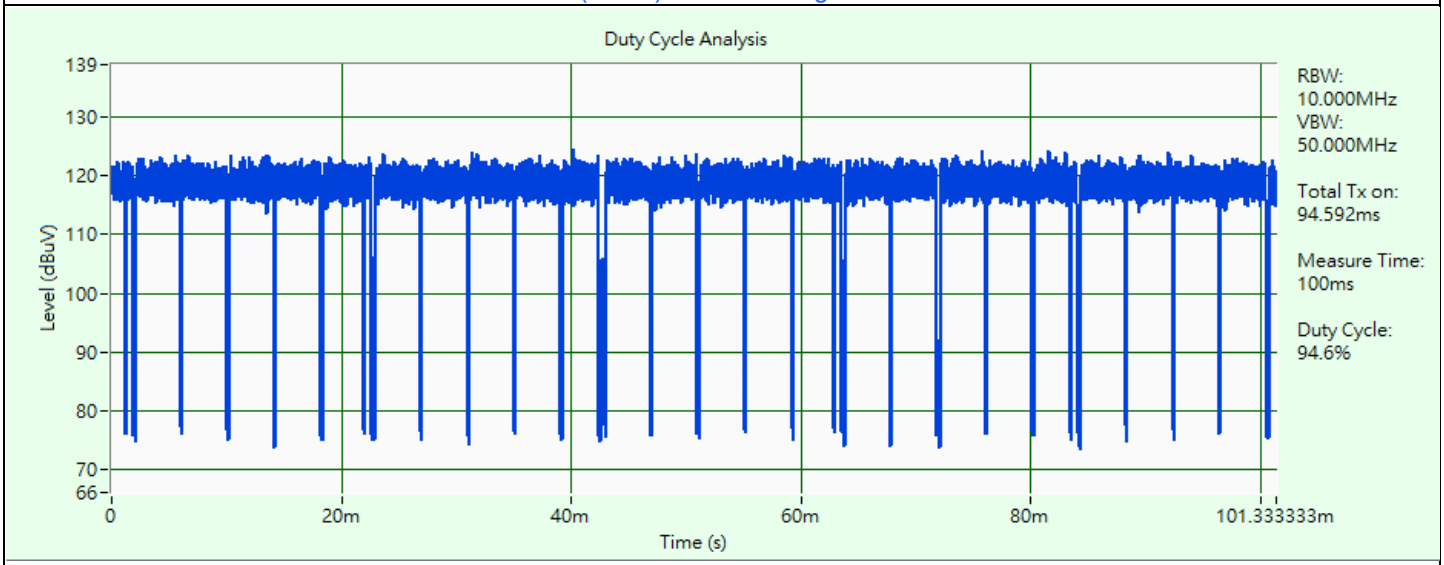

802.11ax (HE20) Beamforming MCS0NSS1



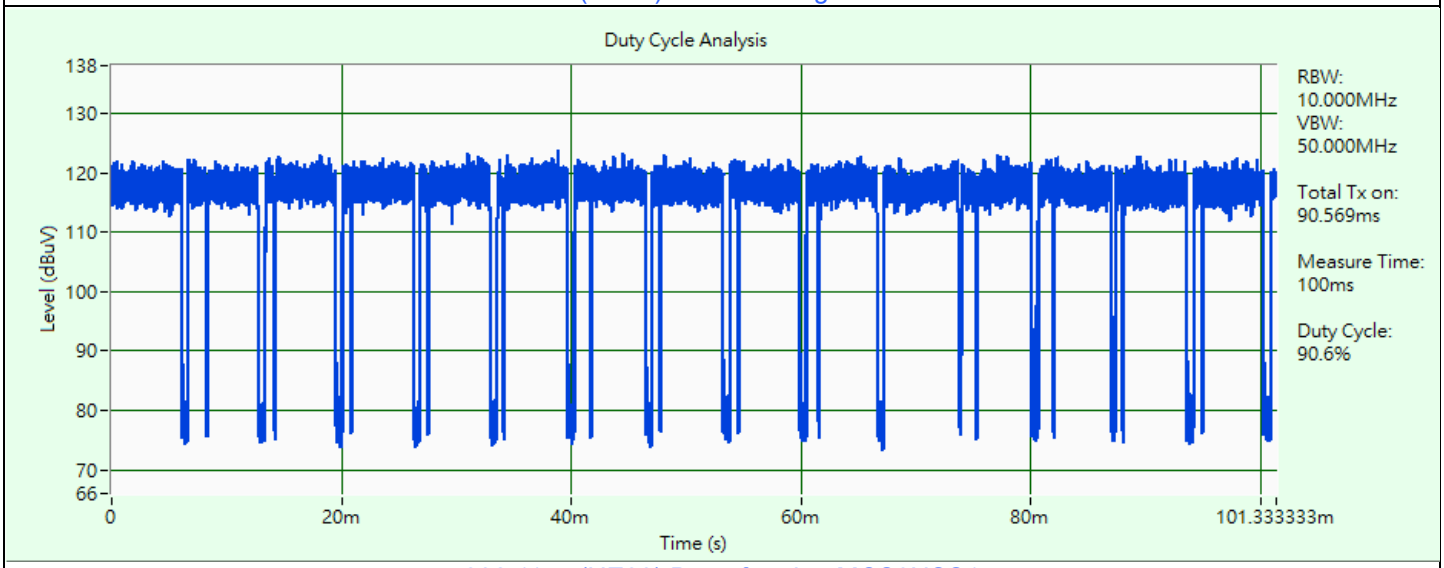

802.11ax (HE20) Beamforming MCS0NSS2



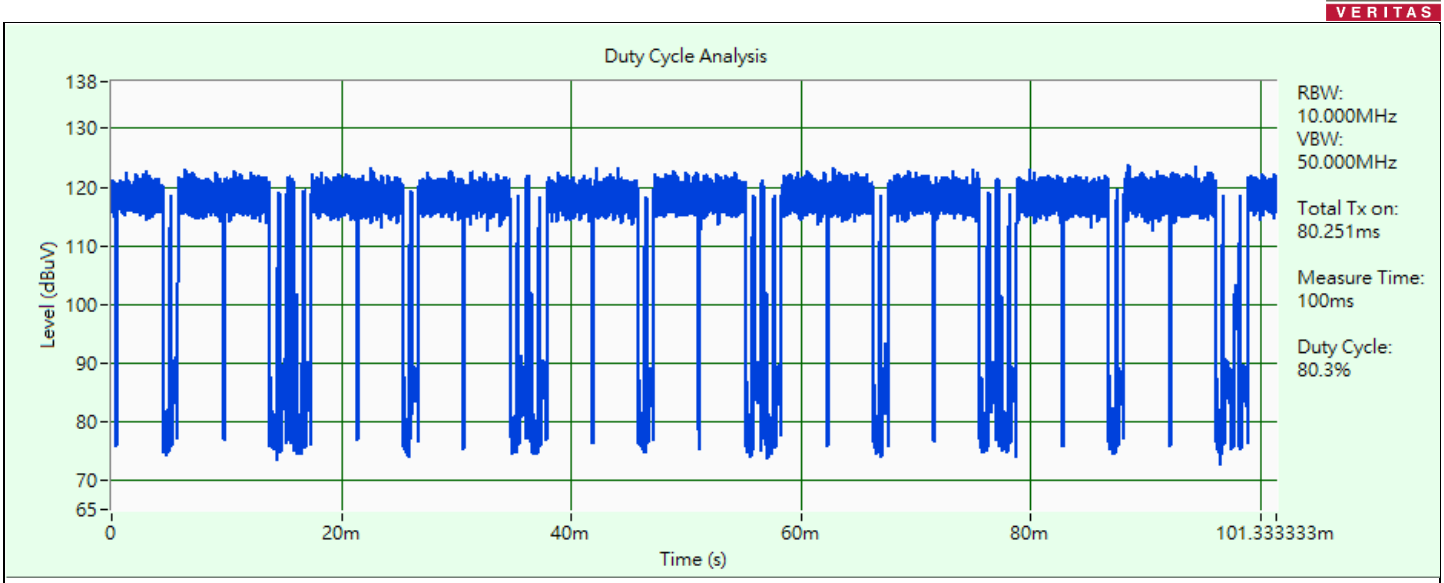

802.11ax (HE40) Beamforming MCS0NSS1



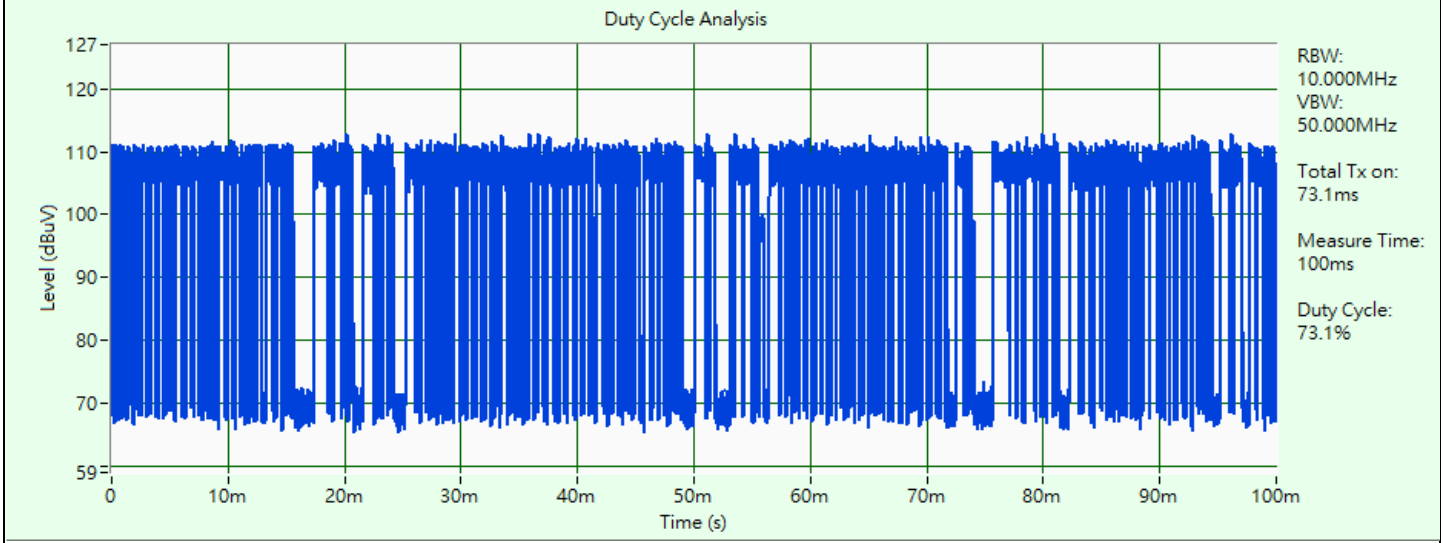

802.11ax (HE40) Beamforming MCS0NSS2



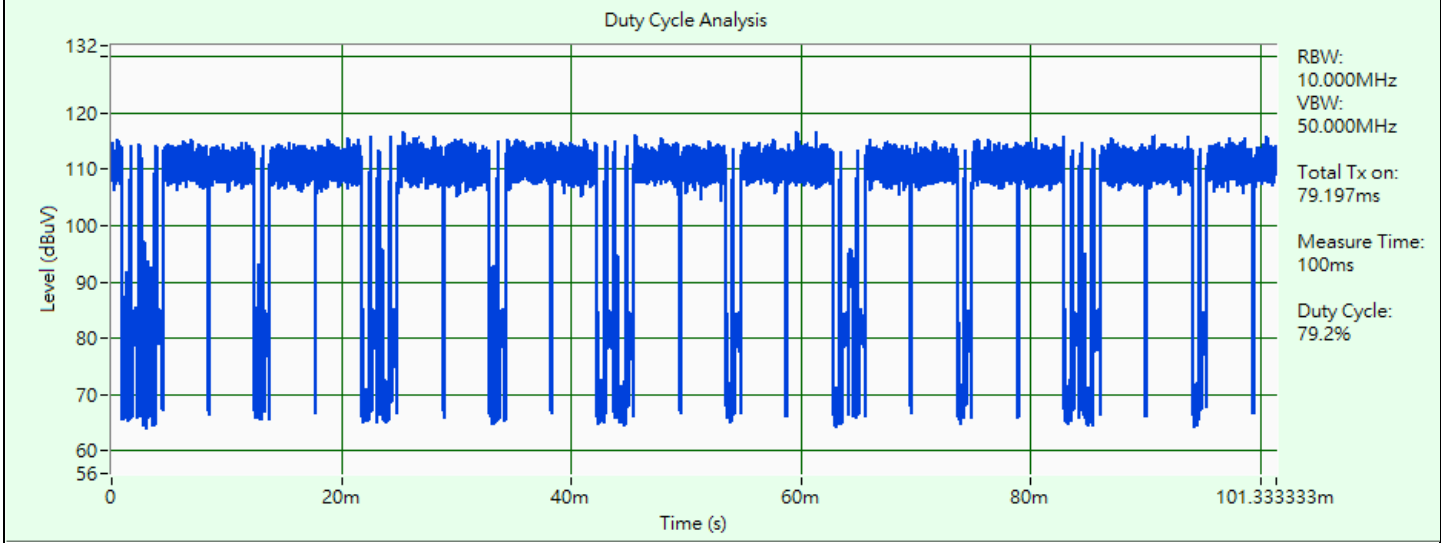

802.11ax (HE80) Beamforming MCS0NSS1




802.11ax (HE80) Beamforming MCS0NSS2




802.11ax (HE160) Beamforming MCS0NSS1

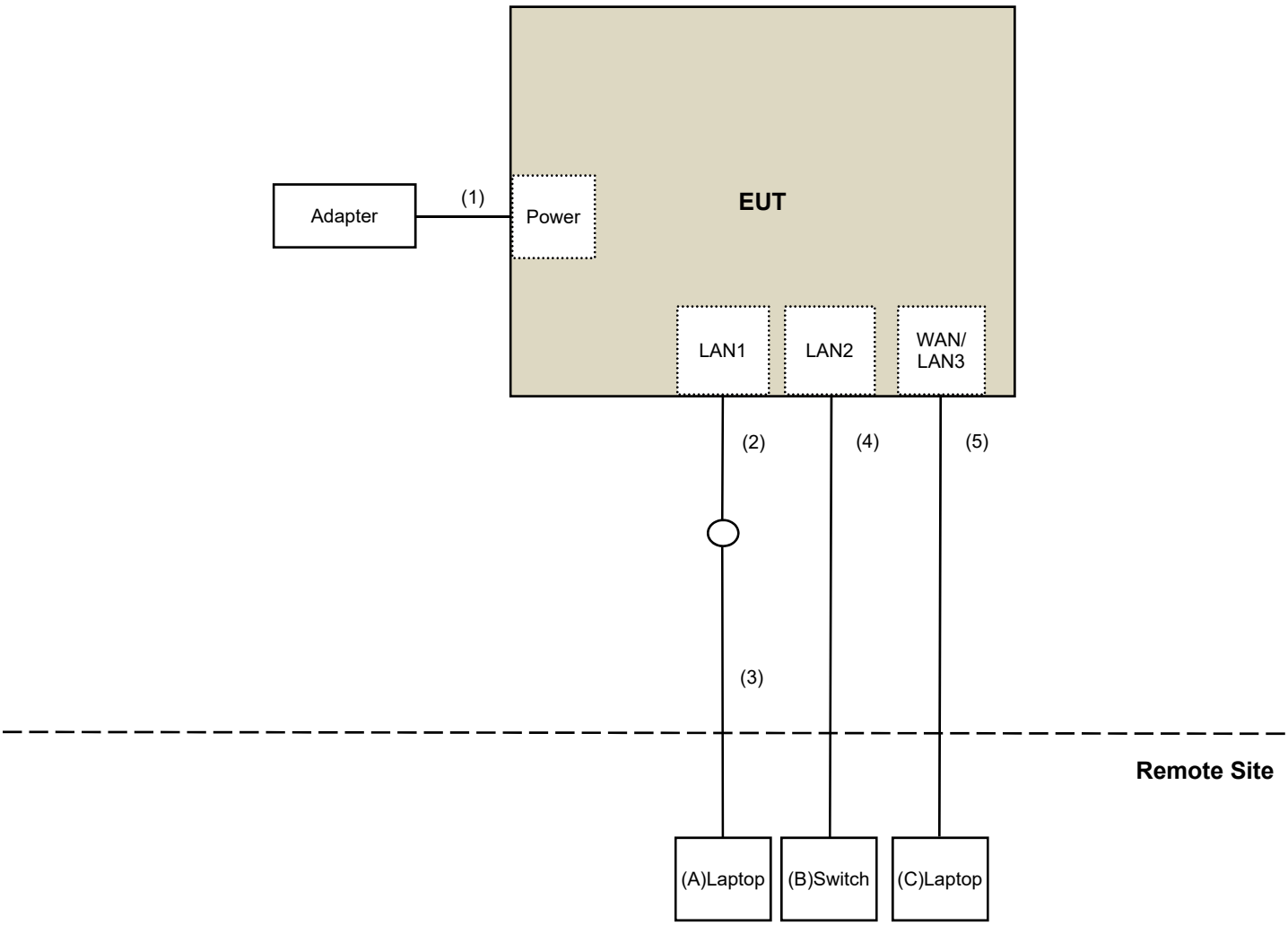



802.11ax (HE160) Beamforming MCS0NSS2

### 3.6 Test Program Used and Operation Descriptions

Controlling software (qdart_conn.win.1.0_installer_00076.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

### 3.7 Connection Diagram of EUT and Peripheral Devices



### 3.8 Configuration of Peripheral Devices and Cable Connections

| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|---|---|---|---|---|---|---|
| A | Laptop | Lenovo | 20U5S01X00 L14 | PF-1ANPYA | N/A | Provided by Lab |
| B | Switch | D-Link | DGS-1005D | DR8WC92000523 | N/A | Provided by Lab |
| C | Laptop | Lenovo | 20U5S01X00 L14 | PF-28LKK7 | N/A | Provided by Lab |

| ID | Cable Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|---|---|---|---|---|---|---|
| 1 | DC Cable | 1 | 1.5 | No | 0 | Supplied by applicant |
| 2 | RJ-45 Cable | 1 | 1.5 | No | 0 | Supplied by applicant |
| 3 | RJ-45 Cable | 1 | 10 | No | 0 | Provided by Lab |
| 4 | RJ-45 Cable | 1 | 10 | No | 0 | Provided by Lab |
| 5 | RJ-45 Cable | 1 | 10 | No | 0 | Provided by Lab |

# 4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

## 4.1 RF Output Power

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| Antenna Tower & Turn Table<br>Max-Full | MF-7802 | MF780208406 | N/A | N/A |
| Fix tool for Boresight antenna tower<br>BV | FBA-01 | FBA_SIP01 | N/A | N/A |
| Horn Antenna<br>Schwarzbeck | BBHA9120-D | 9120D-406 | 2021/11/14<br>2022/11/13 | 2022/11/13<br>2023/11/12 |
| Pre_Amplifier<br>EMCI | EMC12630SE | 980384 | 2022/1/10 | 2023/1/9 |
| RF Cable<br>EMCI | EMC104-SM-SM-6000 | 210201 | 2022/5/10 | 2023/5/9 |
| RF Coaxial Cable<br>EMCI | EMC104-SM-SM-1500 | 180504 | 2022/4/25 | 2023/4/24 |
| | EMC104-SM-SM-2000 | 180601 | 2022/6/6 | 2023/6/5 |
| Software | ADT_Radiated_V8.7.08 | N/A | N/A | N/A |
| Spectrum Analyzer<br>KEYSIGHT | N9030B | MY57142938 | 2022/4/26 | 2023/4/25 |
| Test Receiver<br>KEYSIGHT | N9038A | MY59050100 | 2022/6/20 | 2023/6/19 |

Notes:

1. The test was performed in 966 Chamber No. 3.
2. Tested Date: 2022/11/11 ~ 2022/11/15

## 4.2 Power Spectral Density

Refer to section 4.1 to get information of the instruments.

### 4.3 Emission Bandwidth

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| Attenuator<br>WOKEN | MDCS18N-10 | MDCS18N-10-01 | 2022/4/5 | 2023/4/4 |
| Software | ADT_RF Test Software V6.6.5.4 | N/A | N/A | N/A |
| Spectrum Analyzer<br>Keysight | N9020B | MY60112409 | 2022/3/11 | 2023/3/10 |

Notes:
1. The test was performed in Oven room 2.
2. Tested Date: 2022/11/11 ~ 2022/11/15

### 4.4 In-Band Emission Mask

Refer to section 4.3 to get information of the instruments.

### 4.5 Occupied Bandwidth

Refer to section 4.3 to get information of the instruments.

### 4.6 Frequency Stability

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| Attenuator<br>WOKEN | MDCS18N-10 | MDCS18N-10-01 | 2022/4/5 | 2023/4/4 |
| AC Power Source<br>GOOD WILL | 6905S | 1991551 | NA | NA |
| Software | ADT_RF Test Software V6.6.5.4 | N/A | N/A | N/A |
| Spectrum Analyzer<br>R&S | FSV40 | 101516 | 2022/3/7 | 2023/3/6 |
| Temperature & Humidity Chamber<br>Giant Force | GTH-150-40-SP-AR | MAA0812-008 | 2022/1/14 | 2023/1/13 |
| True RMS Clamp Meter<br>Fluke | 325 | 31130711WS | 2022/6/9 | 2023/6/8 |

Notes:
1. The test was performed in Oven room 2.
2. Tested Date: 2022/11/11

### 4.7 Contention-based Protocol

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| Direct Coupler<br>EMCI | CS20-18-436/16 | 1139 | 2022/1/10 | 2023/1/9 |
| ESG Vector signal generator<br>Agilent | E4438C | MY45094468 | 2021/11/21 | 2022/11/20 |
| MXG X-Series RF Vector Signal Generator<br>Keysight | N5182B | MY53052647 | 2022/11/8 | 2023/11/7 |
| Power Splitter/combiner<br>Mini-Circuits | ZN4PD-642W-S+ | 408501327_01 | 2022/4/5 | 2023/4/4 |
| | | 408501327_02 | 2022/9/14 | 2023/9/13 |
| Spectrum Analyzer<br>Keysight | N9030A | MY55410176 | 2022/6/21 | 2023/6/20 |
| Upgrade the software license on current E4438C ESG<br>Agilent | E4438CK-403 | ESG E4_010001 | N/A | N/A |

Notes:

1. The test was performed in Adaptivity room.
2. Tested Date: 2022/11/20

### 4.8 AC Power Conducted Emissions

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| 50 ohm terminal resistance | N/A | EMC-01 | 2022/9/27 | 2023/9/26 |
| Fixed attenuator<br>STI | STI02-2200-10 | 005 | 2022/8/24 | 2023/8/23 |
| LISN<br>R&S | ESH3-Z5 | 848773/004 | 2022/10/18 | 2023/10/17 |
| RF Coaxial Cable<br>JYEBO | 5D-FB | COCCAB-001 | 2022/8/24 | 2023/8/23 |
| Software<br>BVADT | BVADT_Cond_V7.3.7.4 | N/A | N/A | N/A |
| TEST RECEIVER<br>R&S | ESCS 30 | 847124/029 | 2022/10/14 | 2023/10/13 |

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2022/11/7

## 4.9 Unwanted Emissions below 1 GHz

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| Antenna Tower & Turn Table<br>Max-Full | MF-7802 | MF780208406 | N/A | N/A |
| Fix tool for Boresight antenna tower<br>BV | FBA-01 | FBA_SIP01 | N/A | N/A |
| Fixed attenuator<br>Mini-Circuits | UNAT-5+ | PAD-3m-3-01 | 2022/9/14 | 2023/9/13 |
| LOOP ANTENNA<br>Electro-Metrics | EM-6879 | 264 | 2022/3/18 | 2023/3/17 |
| Pre_Amplifier<br>Agilent | 8447D | 2944A10636 | 2022/3/19 | 2023/3/18 |
| Pre_Amplifier<br>Mini-Circuits | ZFL-1000VH2 | QA0838008 | 2022/10/4 | 2023/10/3 |
| RF Coaxial Cable<br>COMMATE/PEWC | 8D | 966-3-2 | 2022/2/26 | 2023/2/25 |
| | | 966-3-3 | 2022/2/26 | 2023/2/25 |
| | | 966-4-1 | 2022/3/8 | 2023/3/7 |
| RF Coaxial Cable<br>JYEBO | 5D-FB | LOOPCAB-001 | 2022/1/6 | 2023/1/5 |
| | | LOOPCAB-002 | 2022/1/6 | 2023/1/5 |
| Software | ADT_Radiated_V8.7.08 | N/A | N/A | N/A |
| Spectrum Analyzer<br>KEYSIGHT | N9030B | MY57142938 | 2022/4/26 | 2023/4/25 |
| Test Receiver<br>KEYSIGHT | N9038A | MY59050100 | 2022/6/20 | 2023/6/19 |
| Trilog Broadband Antenna<br>Schwarzbeck | VULB 9168 | 9168-361 | 2022/10/21 | 2023/10/20 |

Notes:

1. The test was performed in 966 Chamber No. 3.
2. Tested Date: 2022/11/7

### 4.10 Unwanted Emissions above 1 GHz

| Description<br>Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---|---|---|---|---|
| Antenna Tower & Turn Table<br>Max-Full | MF-7802 | MF780208406 | N/A | N/A |
| Fix tool for Boresight antenna tower<br>BV | FBA-01 | FBA_SIP01 | N/A | N/A |
| Horn Antenna<br>Schwarzbeck | BBHA 9170 | 9170-739 | 2021/11/14<br>2022/11/13 | 2022/11/13<br>2023/11/12 |
| | BBHA9120-D | 9120D-406 | 2021/11/14<br>2022/11/13 | 2022/11/13<br>2023/11/12 |
| Pre_Amplifier<br>EMCI | EMC12630SE | 980384 | 2022/1/10 | 2023/1/9 |
| | EMC184045SE | 980387 | 2022/1/10 | 2023/1/9 |
| RF Cable<br>EMCI | EMC104-SM-SM-6000 | 210201 | 2022/5/10 | 2023/5/9 |
| RF Cable-Frequency range: 1-40GHz<br>EMCI | EMC102-KM-KM-1200 | 160924 | 2022/1/10 | 2023/1/9 |
| RF Coaxial Cable<br>EMCI | EMC-KM-KM-4000 | 200214 | 2022/3/8 | 2023/3/7 |
| | EMC104-SM-SM-1500 | 180504 | 2022/4/25 | 2023/4/24 |
| | EMC104-SM-SM-2000 | 180601 | 2022/6/6 | 2023/6/5 |
| Software | ADT_Radiated_V8.7.08 | N/A | N/A | N/A |
| Spectrum Analyzer<br>KEYSIGHT | N9030B | MY57142938 | 2022/4/26 | 2023/4/25 |
| Test Receiver<br>KEYSIGHT | N9038A | MY59050100 | 2022/6/20 | 2023/6/19 |

Notes:

1. The test was performed in 966 Chamber No. 3.
2. Tested Date: 2022/9/24 ~ 2022/11/14

# 5 Limits of Test Items

## 5.1 RF Output Power

| Operation Band | EUT Category | Limit |
|---|---|---|
| | | Max Average Power |
| U-NII-5<br>U-NII-6<br>U-NII-7<br>U-NII-8 | Indoor AP / Subordinate Device | EIRP 30 dBm |

## 5.2 Power Spectral Density

| Operation Band | EUT Category | Limit |
|---|---|---|
| | | Peak Power Density |
| U-NII-5<br>U-NII-6<br>U-NII-7<br>U-NII-8 | Indoor AP / Subordinate Device | EIRP 5 dBm/MHz |

## 5.3 Emission Bandwidth

The results are for reference only.

## 5.4 In-Band Emission Mask

| Test Item | Frequencies (MHz) | (X) dBc*1 |
|---|---|---|
| Emission Mask | At 1 MHz outside of channel edge | 20 |
| | At one channel bandwidth from the channel center*2 | 28 |
| | At one- and one-half times the channel bandwidth away from channel center*3 | 40 |
| | More than one- and one-half times the channel bandwidth | 40 |

*1 : The power spectral density must be suppressed by “x” dB

*2 : At frequencies between one megahertz outside an unlicensed device’s channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression,

*3 : At frequencies between one and one- and one-half times an unlicensed device’s channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression.

## 5.5 Occupied Bandwidth

The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 MHz.

### 5.6 Frequency Stability

The frequency of the carrier signal shall be maintained within band of operation.

### 5.7 Contention-based Protocol

Unlicensed indoor low-power devices must detect co-channel radio frequency power that is at least -62 dBm (The threshold is referenced to a 0 dBi antenna gain.) or lower. Additionally, indoor low-power devices must detect co-channel energy with 90% or greater certainty.

### 5.8 AC Power Conducted Emissions

| Frequency (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 - 0.5 | 66 - 56 | 56 - 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 5.9 Unwanted Emissions below 1 GHz

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

## 5.10 Unwanted Emissions above 1 GHz

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| Above 960 | 500 | 3 |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

| Frequencies (MHz) | EIRP Limit | Equivalent Field Strength at 3 m |
|---|---|---|
| 5925 MHz > F > 7125 MHz | Peak: -7 (dBm/MHz) | 88.2 (dBuV/m) |
| | Average: -27 (dBm/MHz) | 68.2 (dBuV/m) |

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

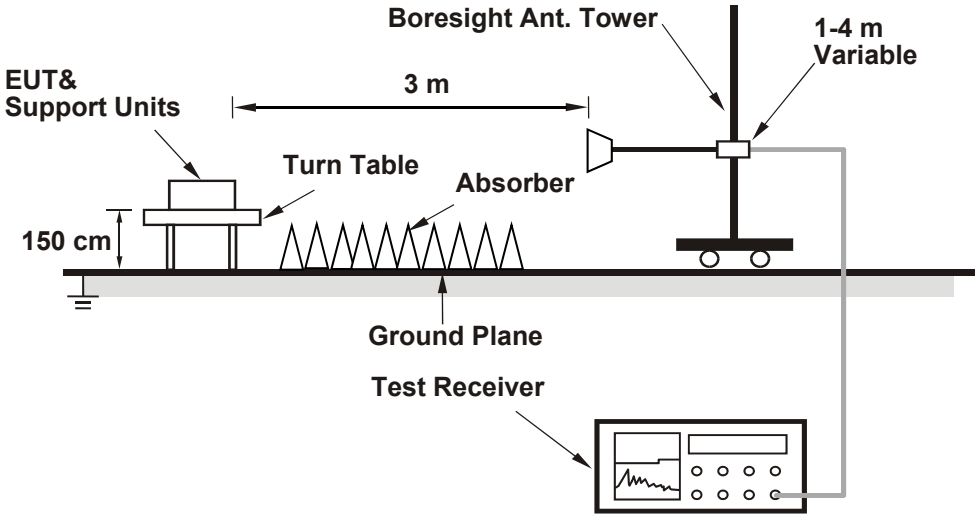
$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

# 6 Test Arrangements

## 6.1 RF Output Power

### 6.1.1 Test Setup

Radiated Measurement Method




### 6.1.2 Test Procedure

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP level.

e. Follow ANSI C63.10 section 12.7.3, EIRP Value (dBm) = Field Strength Value (dBuV / m) + Correction Factor @ 3 m.

f. Correction Factor (dB) @ 3 m = 20log(D) – 104.77; where D is the measurement distance @3 m = -95.23 dB

Spectrum analyzer setting as below:

Method SA-2

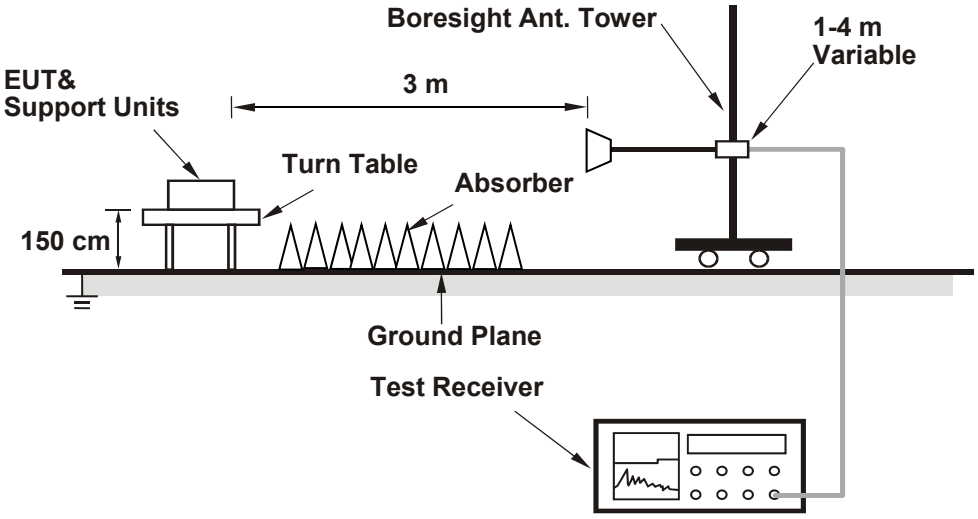
a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
c. Sweep points ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
d. Sweep time = auto, trigger set to “free run”.
e. Trace average at least 100 traces in power averaging mode.
f. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
g. Record the max value and add 10 log (1/duty cycle).

Note: When measuring power, use compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

## 6.2 Power Spectral Density

### 6.2.1 Test Setup

Radiated Measurement Method




### 6.2.2 Test Procedure

Radiated Measurement Method

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP level.

e. Follow ANSI C63.10 section 12.7.3, EIRP Value (dBm) = Field Strength Value (dBuV/m) + Correction Factor @ 3 m.

f. Correction Factor (dB) @ 3 m = 20log(D) – 104.77; where D is the measurement distance @3 m = -95.23 dB

Spectrum analyzer setting as below:

Method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Sweep points ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)

d. Sweep time = auto, trigger set to “free run”.

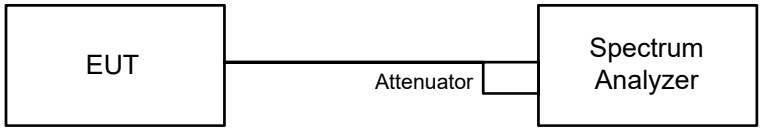
e. Trace average at least 100 traces in power averaging mode.

f. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

g. Record the max value and add 10 log (1/duty cycle).

## 6.3 Emission Bandwidth

### 6.3.1 Test Setup

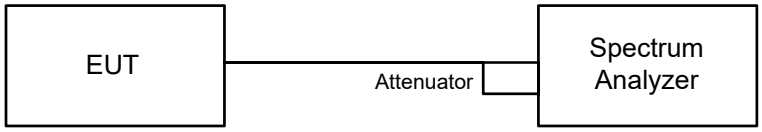



### 6.3.2 Test Procedure

a. Set RBW = approximately 1% of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

## 6.4 In-Band Emission Mask

6.4.1 Test Setup




6.4.2 Test Procedure

a. Connect output of the antenna port to a spectrum analyzer and adjust appropriate attenuation.

b. Measure the 26 dB EBW using the test procedure 12.4.1 of ANSI C63.10-2013. (Determine the channel edge.)

c. Measure the power spectral density (for emissions mask reference) using the following procedure:
   a) Set the span to encompass the entire 26 dB EBW of the signal.
   b) Set RBW = same RBW used for 26 dB EBW measurement.
   c) Set VBW ≥ [3 X RBW].
   d) Number of points in sweep ≥ [2 X span / RBW].
   e) Sweep time = auto.
   f) Detector = RMS (i.e., power averaging).
   g) Trace average at least 100 traces in power averaging (rms) mode.
   h) Use the peak search function on the instrument to find the peak of the spectrum.

d. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
   a) Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the 26-dB point on either side of the carrier center frequency.)
   b) Suppressed by 28 dB at one channel bandwidth from the channel center.
   c) Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.

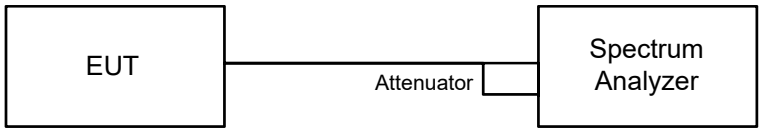
e. Adjust the span to encompass the entire mask as necessary and clear trace.

f. Trace average at least 100 traces in power averaging (rms) mode.

g. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask

## 6.5 Occupied Bandwidth

6.5.1 Test Setup

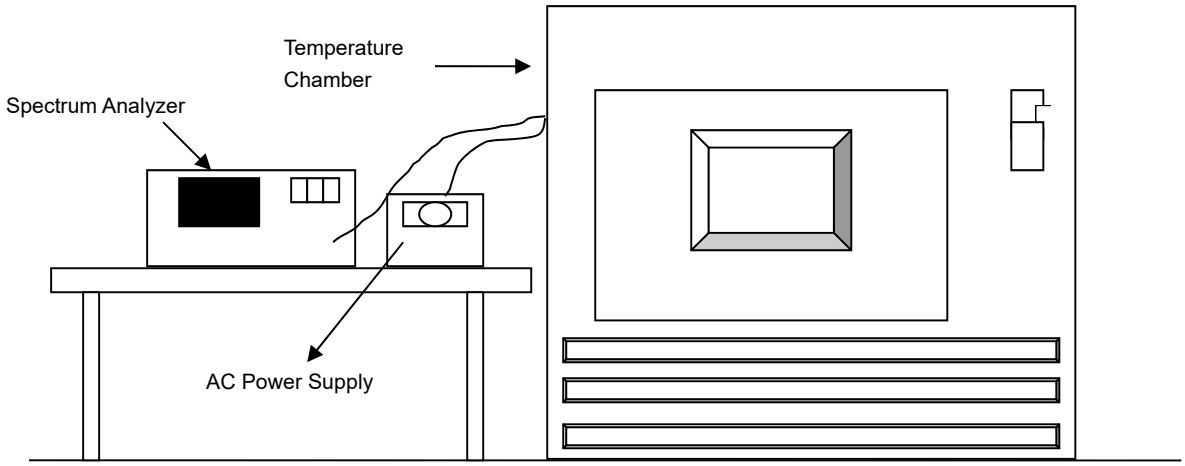



6.5.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to Sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

## 6.6 Frequency Stability

### 6.6.1 Test Setup

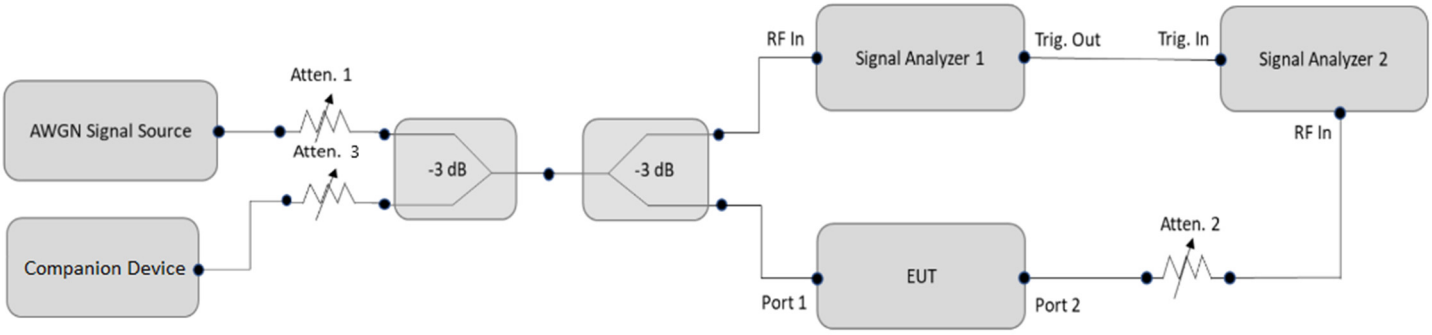



### 6.6.2 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

## 6.7 Contention-based Protocol

### 6.7.1 Test Setup




### 6.7.2 Test Procedure

a. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.

b. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters (set as following section 4.7.5 EUT operating condition).

c. Determine number of times detection threshold test as following table,

| If | Number of Tests | Placement of Incumbent Transmission |
|---|---|---|
| $BW_{EUT} \leqq BW_{Inc}$ | Once | Same as EUT transmission |
| $BW_{Inc} < BW_{EUT} \leqq 2xBW_{Inc}$ | Once | Contained within $BW_{EUT}$ |
| $2xBW_{Inc} < BW_{EUT} \leqq 4xBW_{Inc}$ | Twice.<br>(Incumbent transmission is contained within $BW_{EUT}$) | Closely to the lower edge and upper edge of the EUT Channel |
| $BW_{EUT} > 4xBW_{Inc}$ | Three times | Closely to the lower edge ,in the middle and upper edge of the EUT Channel |

d. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use step c table to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.

e. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT.

f. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.

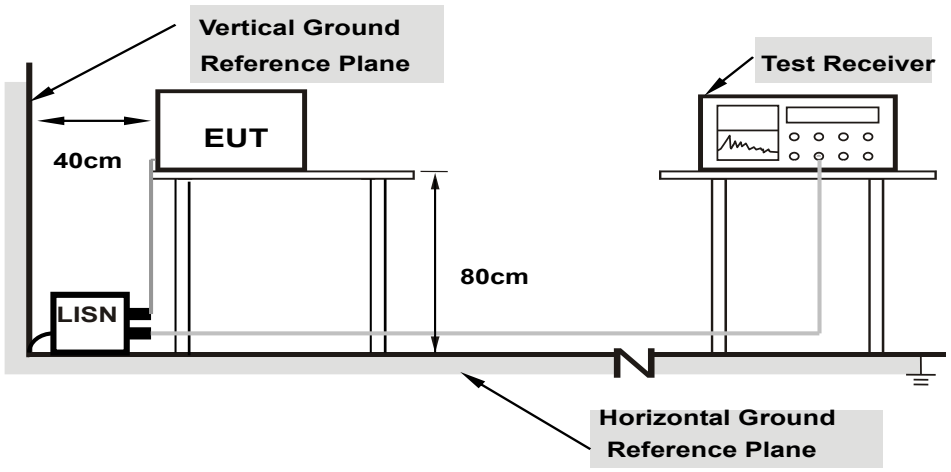
g. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.

h. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.

i. Refer to step c table to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step d, choose a different center frequency for the AWGN signal and repeat the process.

## 6.8 AC Power Conducted Emissions

### 6.8.1 Test Setup




**Note: 1.Support units were connected to second LISN.**

For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 6.8.2 Test Procedure

a. The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

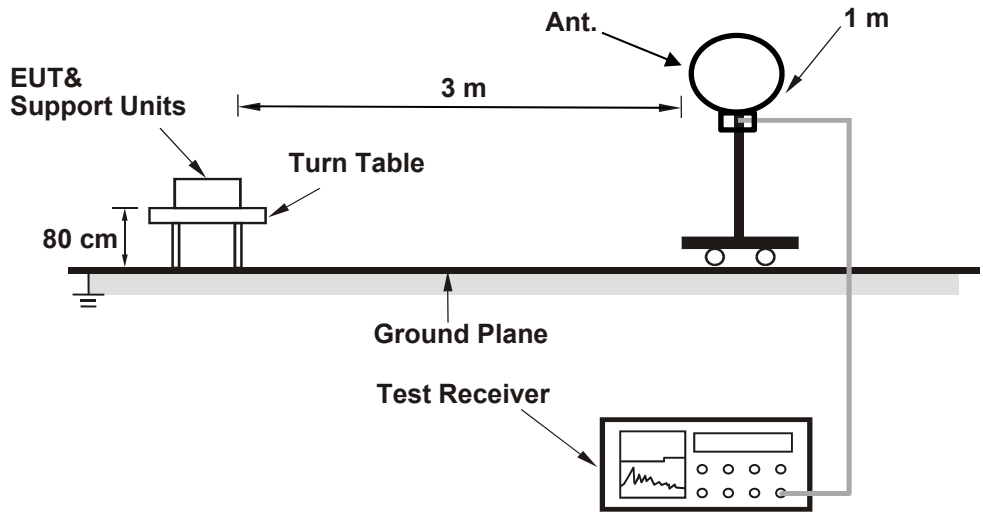
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

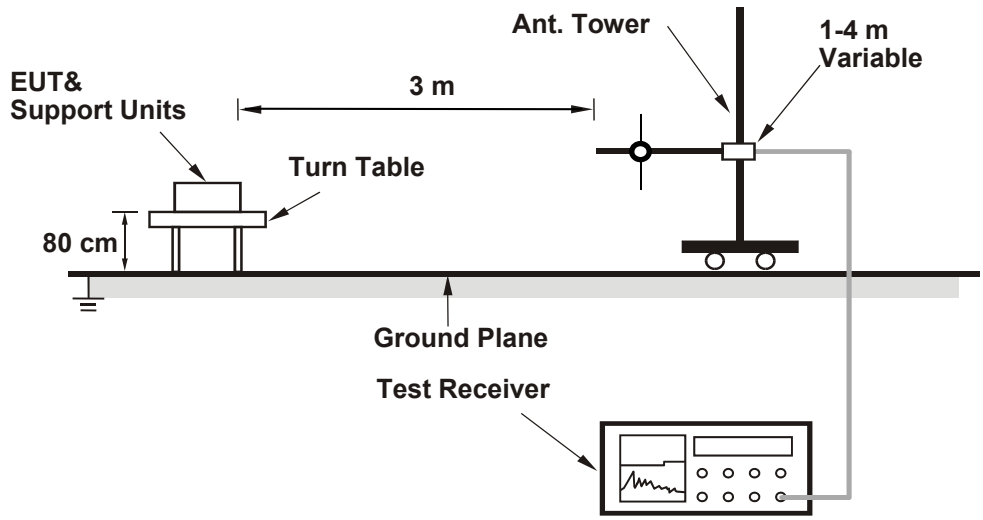
## 6.9 Unwanted Emissions below 1 GHz

6.9.1 Test Setup

**For Radiated emission below 30 MHz**




**For Radiated emission above 30 MHz**




For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.9.2 Test Procedure

**For Radiated emission below 30 MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

**For Radiated emission above 30 MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

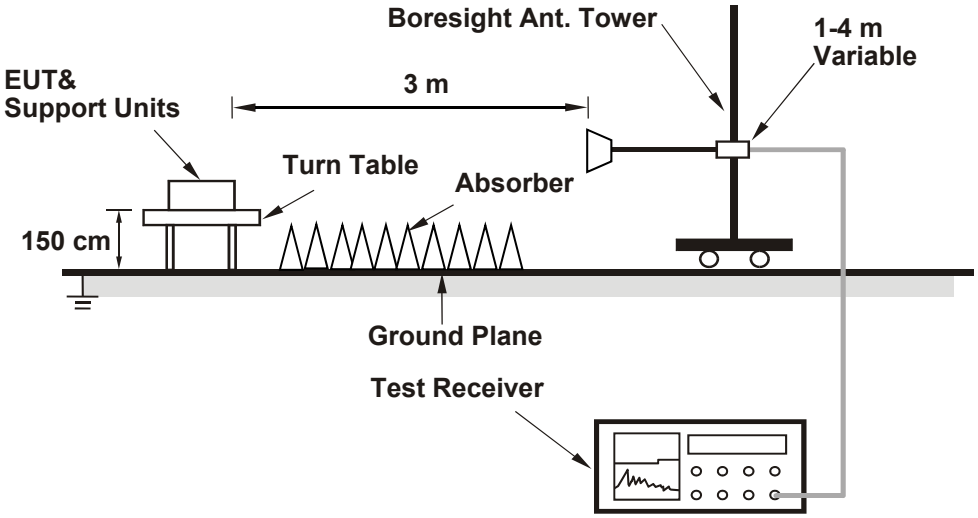
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

## 6.10 Unwanted Emissions above 1 GHz

6.10.1Test Setup




For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.10.2Test Procedure

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Notes:

1. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
2. For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10 Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

# 7 Test Results of Test Item

## 7.1 RF Output Power

| Input Power: | 120 Vac, 60 Hz | Environmental Conditions: | 25°C, 65% RH | Tested By: | Katina Lu |
|---|---|---|---|---|---|

### 802.11ax (HE20) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 33 | 6115 | 107.8 | -95.23 | 18.072 | 12.57 | 30 | Pass |
| 61 | 6255 | 107.6 | -95.23 | 17.258 | 12.37 | 30 | Pass |
| 93 | 6415 | 107.7 | -95.23 | 17.66 | 12.47 | 30 | Pass |
| 97 | 6435 | 107.5 | -95.23 | 16.866 | 12.27 | 30 | Pass |
| 105 | 6475 | 107.7 | -95.23 | 17.66 | 12.47 | 30 | Pass |
| 113 | 6515 | 107.4 | -95.23 | 16.482 | 12.17 | 30 | Pass |
| 117 | 6535 | 107.6 | -95.23 | 17.258 | 12.37 | 30 | Pass |
| 153 | 6715 | 107.7 | -95.23 | 17.66 | 12.47 | 30 | Pass |
| 181 | 6855 | 107.5 | -95.23 | 16.866 | 12.27 | 30 | Pass |
| 185 | 6875 | 107.8 | -95.23 | 18.072 | 12.57 | 30 | Pass |
| 213 | 7015 | 107.9 | -95.23 | 18.493 | 12.67 | 30 | Pass |
| 229 | 7095 | 107.7 | -95.23 | 17.66 | 12.47 | 30 | Pass |

### 802.11ax (HE20) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 33 | 6115 | 111.2 | -95.23 | 39.537 | 15.97 | 30 | Pass |
| 61 | 6255 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 93 | 6415 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 97 | 6435 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 105 | 6475 | 111.3 | -95.23 | 40.458 | 16.07 | 30 | Pass |
| 113 | 6515 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 117 | 6535 | 111.7 | -95.23 | 44.361 | 16.47 | 30 | Pass |
| 153 | 6715 | 111.3 | -95.23 | 40.458 | 16.07 | 30 | Pass |
| 181 | 6855 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 185 | 6875 | 111.6 | -95.23 | 43.351 | 16.37 | 30 | Pass |
| 213 | 7015 | 111.8 | -95.23 | 45.394 | 16.57 | 30 | Pass |
| 229 | 7095 | 111.9 | -95.23 | 46.452 | 16.67 | 30 | Pass |

## 802.11ax (HE40) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 35 | 6125 | 111.2 | -95.23 | 39.537 | 15.97 | 30 | Pass |
| 59 | 6245 | 110.7 | -95.23 | 35.237 | 15.47 | 30 | Pass |
| 91 | 6405 | 110.8 | -95.23 | 36.058 | 15.57 | 30 | Pass |
| 99 | 6445 | 110.4 | -95.23 | 32.885 | 15.17 | 30 | Pass |
| 107 | 6485 | 110.6 | -95.23 | 34.435 | 15.37 | 30 | Pass |
| 115 | 6525 | 110.3 | -95.23 | 32.137 | 15.07 | 30 | Pass |
| 123 | 6565 | 110.6 | -95.23 | 34.435 | 15.37 | 30 | Pass |
| 155 | 6725 | 110.5 | -95.23 | 33.651 | 15.27 | 30 | Pass |
| 179 | 6845 | 110.7 | -95.23 | 35.237 | 15.47 | 30 | Pass |
| 187 | 6885 | 110.4 | -95.23 | 32.885 | 15.17 | 30 | Pass |
| 211 | 7005 | 110.8 | -95.23 | 36.058 | 15.57 | 30 | Pass |
| 227 | 7085 | 110.6 | -95.23 | 34.435 | 15.37 | 30 | Pass |

## 802.11ax (HE40) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 35 | 6125 | 113.8 | -95.23 | 71.945 | 18.57 | 30 | Pass |
| 59 | 6245 | 113.9 | -95.23 | 73.621 | 18.67 | 30 | Pass |
| 91 | 6405 | 114 | -95.23 | 75.336 | 18.77 | 30 | Pass |
| 99 | 6445 | 114.1 | -95.23 | 77.09 | 18.87 | 30 | Pass |
| 107 | 6485 | 113.7 | -95.23 | 70.307 | 18.47 | 30 | Pass |
| 115 | 6525 | 113.9 | -95.23 | 73.621 | 18.67 | 30 | Pass |
| 123 | 6565 | 114 | -95.23 | 75.336 | 18.77 | 30 | Pass |
| 155 | 6725 | 113.8 | -95.23 | 71.945 | 18.57 | 30 | Pass |
| 179 | 6845 | 114.1 | -95.23 | 77.09 | 18.87 | 30 | Pass |
| 187 | 6885 | 114.3 | -95.23 | 80.724 | 19.07 | 30 | Pass |
| 211 | 7005 | 113.9 | -95.23 | 73.621 | 18.67 | 30 | Pass |
| 227 | 7085 | 114.1 | -95.23 | 77.09 | 18.87 | 30 | Pass |

## 802.11ax (HE80) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 39 | 6145 | 113.5 | -95.23 | 67.143 | 18.27 | 30 | Pass |
| 55 | 6225 | 113.3 | -95.23 | 64.121 | 18.07 | 30 | Pass |
| 87 | 6385 | 113.6 | -95.23 | 68.707 | 18.37 | 30 | Pass |
| 103 | 6465 | 113.4 | -95.23 | 65.615 | 18.17 | 30 | Pass |
| 119 | 6545 | 113.2 | -95.23 | 62.661 | 17.97 | 30 | Pass |
| 135 | 6625 | 113.1 | -95.23 | 61.235 | 17.87 | 30 | Pass |
| 151 | 6705 | 113.3 | -95.23 | 64.121 | 18.07 | 30 | Pass |
| 167 | 6785 | 113.4 | -95.23 | 65.615 | 18.17 | 30 | Pass |
| 183 | 6865 | 113.5 | -95.23 | 67.143 | 18.27 | 30 | Pass |
| 199 | 6945 | 113.3 | -95.23 | 64.121 | 18.07 | 30 | Pass |
| 215 | 7025 | 113.7 | -95.23 | 70.307 | 18.47 | 30 | Pass |

## 802.11ax (HE80) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 39 | 6145 | 118 | -95.23 | 189.234 | 22.77 | 30 | Pass |
| 55 | 6225 | 117.8 | -95.23 | 180.717 | 22.57 | 30 | Pass |
| 87 | 6385 | 117.6 | -95.23 | 172.584 | 22.37 | 30 | Pass |
| 103 | 6465 | 117.9 | -95.23 | 184.927 | 22.67 | 30 | Pass |
| 119 | 6545 | 118 | -95.23 | 189.234 | 22.77 | 30 | Pass |
| 135 | 6625 | 117.5 | -95.23 | 168.655 | 22.27 | 30 | Pass |
| 151 | 6705 | 117.8 | -95.23 | 180.717 | 22.57 | 30 | Pass |
| 167 | 6785 | 117.7 | -95.23 | 176.604 | 22.47 | 30 | Pass |
| 183 | 6865 | 117.9 | -95.23 | 184.927 | 22.67 | 30 | Pass |
| 199 | 6945 | 118 | -95.23 | 189.234 | 22.77 | 30 | Pass |
| 215 | 7025 | 117.7 | -95.23 | 176.604 | 22.47 | 30 | Pass |

### 802.11ax (HE160) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 47 | 6185 | 116.5 | -95.23 | 133.968 | 21.27 | 30 | Pass |
| 79 | 6345 | 116.2 | -95.23 | 125.026 | 20.97 | 30 | Pass |
| 111 | 6505 | 116.3 | -95.23 | 127.938 | 21.07 | 30 | Pass |
| 143 | 6665 | 115.8 | -95.23 | 114.025 | 20.57 | 30 | Pass |
| 175 | 6825 | 116.4 | -95.23 | 130.918 | 21.17 | 30 | Pass |
| 207 | 6985 | 116.6 | -95.23 | 137.088 | 21.37 | 30 | Pass |

### 802.11ax (HE160) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 47 | 6185 | 120.4 | -95.23 | 328.852 | 25.17 | 30 | Pass |
| 79 | 6345 | 121 | -95.23 | 377.572 | 25.77 | 30 | Pass |
| 111 | 6505 | 121 | -95.23 | 377.572 | 25.77 | 30 | Pass |
| 143 | 6665 | 120.9 | -95.23 | 368.978 | 25.67 | 30 | Pass |
| 175 | 6825 | 121.4 | -95.23 | 414 | 26.17 | 30 | Pass |
| 207 | 6985 | 121.1 | -95.23 | 386.367 | 25.87 | 30 | Pass |

### 802.11ax (HE20) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 33 | 6115 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 61 | 6255 | 110.3 | -95.23 | 32.137 | 15.07 | 30 | Pass |
| 93 | 6415 | 110.3 | -95.23 | 32.137 | 15.07 | 30 | Pass |
| 97 | 6435 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 105 | 6475 | 110.5 | -95.23 | 33.651 | 15.27 | 30 | Pass |
| 113 | 6515 | 111.7 | -95.23 | 44.361 | 16.47 | 30 | Pass |
| 117 | 6535 | 112.8 | -95.23 | 57.148 | 17.57 | 30 | Pass |
| 153 | 6715 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 181 | 6855 | 112 | -95.23 | 47.534 | 16.77 | 30 | Pass |
| 185 | 6875 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 213 | 7015 | 111 | -95.23 | 37.757 | 15.77 | 30 | Pass |
| 229 | 7095 | 110.8 | -95.23 | 36.058 | 15.57 | 30 | Pass |

## 802.11ax (HE20) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 33 | 6115 | 111.6 | -95.23 | 43.351 | 16.37 | 30 | Pass |
| 61 | 6255 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 93 | 6415 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 97 | 6435 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 105 | 6475 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 113 | 6515 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 117 | 6535 | 110 | -95.23 | 29.992 | 14.77 | 30 | Pass |
| 153 | 6715 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 181 | 6855 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 185 | 6875 | 111.5 | -95.23 | 42.364 | 16.27 | 30 | Pass |
| 213 | 7015 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |
| 229 | 7095 | 111.4 | -95.23 | 41.4 | 16.17 | 30 | Pass |

## 802.11ax (HE40) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 35 | 6125 | 113.8 | -95.23 | 71.945 | 18.57 | 30 | Pass |
| 59 | 6245 | 114 | -95.23 | 75.336 | 18.77 | 30 | Pass |
| 91 | 6405 | 113.8 | -95.23 | 71.945 | 18.57 | 30 | Pass |
| 99 | 6445 | 114 | -95.23 | 75.336 | 18.77 | 30 | Pass |
| 107 | 6485 | 113.9 | -95.23 | 73.621 | 18.67 | 30 | Pass |
| 115 | 6525 | 114 | -95.23 | 75.336 | 18.77 | 30 | Pass |
| 123 | 6565 | 113.8 | -95.23 | 71.945 | 18.57 | 30 | Pass |
| 155 | 6725 | 114.2 | -95.23 | 78.886 | 18.97 | 30 | Pass |
| 179 | 6845 | 113.7 | -95.23 | 70.307 | 18.47 | 30 | Pass |
| 187 | 6885 | 114.2 | -95.23 | 78.886 | 18.97 | 30 | Pass |
| 211 | 7005 | 114.3 | -95.23 | 80.724 | 19.07 | 30 | Pass |
| 227 | 7085 | 115.3 | -95.23 | 101.625 | 20.07 | 30 | Pass |

## 802.11ax (HE40) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 35 | 6125 | 112.9 | -95.23 | 58.479 | 17.67 | 30 | Pass |
| 59 | 6245 | 113.2 | -95.23 | 62.661 | 17.97 | 30 | Pass |
| 91 | 6405 | 113.1 | -95.23 | 61.235 | 17.87 | 30 | Pass |
| 99 | 6445 | 112.7 | -95.23 | 55.847 | 17.47 | 30 | Pass |
| 107 | 6485 | 112.8 | -95.23 | 57.148 | 17.57 | 30 | Pass |
| 115 | 6525 | 114.5 | -95.23 | 84.528 | 19.27 | 30 | Pass |
| 123 | 6565 | 112.8 | -95.23 | 57.148 | 17.57 | 30 | Pass |
| 155 | 6725 | 113 | -95.23 | 59.841 | 17.77 | 30 | Pass |
| 179 | 6845 | 113.1 | -95.23 | 61.235 | 17.87 | 30 | Pass |
| 187 | 6885 | 113.2 | -95.23 | 62.661 | 17.97 | 30 | Pass |
| 211 | 7005 | 112.9 | -95.23 | 58.479 | 17.67 | 30 | Pass |
| 227 | 7085 | 114.2 | -95.23 | 78.886 | 18.97 | 30 | Pass |

## 802.11ax (HE80) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 39 | 6145 | 116.8 | -95.23 | 143.549 | 21.57 | 30 | Pass |
| 55 | 6225 | 117.1 | -95.23 | 153.815 | 21.87 | 30 | Pass |
| 87 | 6385 | 117.1 | -95.23 | 153.815 | 21.87 | 30 | Pass |
| 103 | 6465 | 116.7 | -95.23 | 140.281 | 21.47 | 30 | Pass |
| 119 | 6545 | 116.9 | -95.23 | 146.893 | 21.67 | 30 | Pass |
| 135 | 6625 | 117.2 | -95.23 | 157.398 | 21.97 | 30 | Pass |
| 151 | 6705 | 116.7 | -95.23 | 140.281 | 21.47 | 30 | Pass |
| 167 | 6785 | 117.3 | -95.23 | 161.065 | 22.07 | 30 | Pass |
| 183 | 6865 | 117.2 | -95.23 | 157.398 | 21.97 | 30 | Pass |
| 199 | 6945 | 116.8 | -95.23 | 143.549 | 21.57 | 30 | Pass |
| 215 | 7025 | 117.3 | -95.23 | 161.065 | 22.07 | 30 | Pass |

## 802.11ax (HE80) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 39 | 6145 | 116.6 | -95.23 | 137.088 | 21.37 | 30 | Pass |
| 55 | 6225 | 116.9 | -95.23 | 146.893 | 21.67 | 30 | Pass |
| 87 | 6385 | 116.5 | -95.23 | 133.968 | 21.27 | 30 | Pass |
| 103 | 6465 | 116.7 | -95.23 | 140.281 | 21.47 | 30 | Pass |
| 119 | 6545 | 116.9 | -95.23 | 146.893 | 21.67 | 30 | Pass |
| 135 | 6625 | 116.6 | -95.23 | 137.088 | 21.37 | 30 | Pass |
| 151 | 6705 | 116.8 | -95.23 | 143.549 | 21.57 | 30 | Pass |
| 167 | 6785 | 116.8 | -95.23 | 143.549 | 21.57 | 30 | Pass |
| 183 | 6865 | 116.8 | -95.23 | 143.549 | 21.57 | 30 | Pass |
| 199 | 6945 | 116.7 | -95.23 | 140.281 | 21.47 | 30 | Pass |
| 215 | 7025 | 116.6 | -95.23 | 137.088 | 21.37 | 30 | Pass |

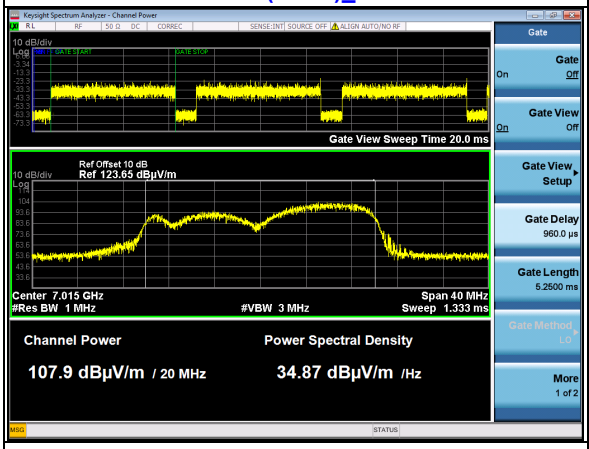
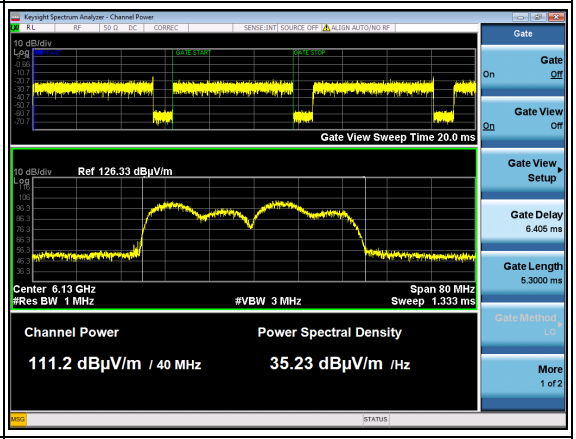
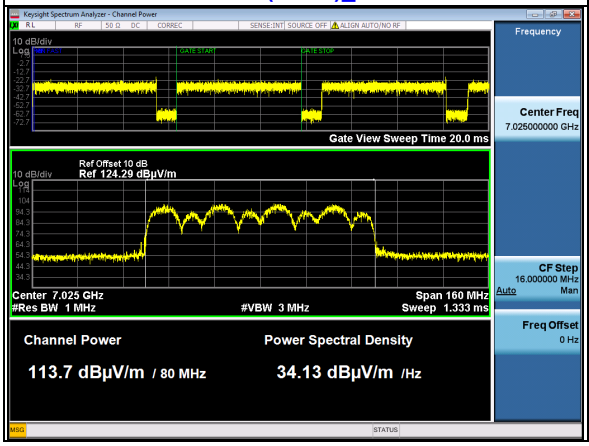
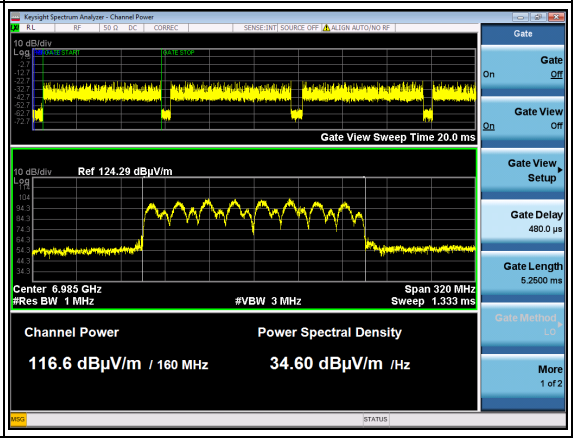
## 802.11ax (HE160) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 47 | 6185 | 120.1 | -95.23 | 306.902 | 24.87 | 30 | Pass |
| 79 | 6345 | 120 | -95.23 | 299.916 | 24.77 | 30 | Pass |
| 111 | 6505 | 118.2 | -95.23 | 198.153 | 22.97 | 30 | Pass |
| 143 | 6665 | 117.7 | -95.23 | 176.604 | 22.47 | 30 | Pass |
| 175 | 6825 | 119 | -95.23 | 238.232 | 23.77 | 30 | Pass |
| 207 | 6985 | 119.2 | -95.23 | 249.459 | 23.97 | 30 | Pass |

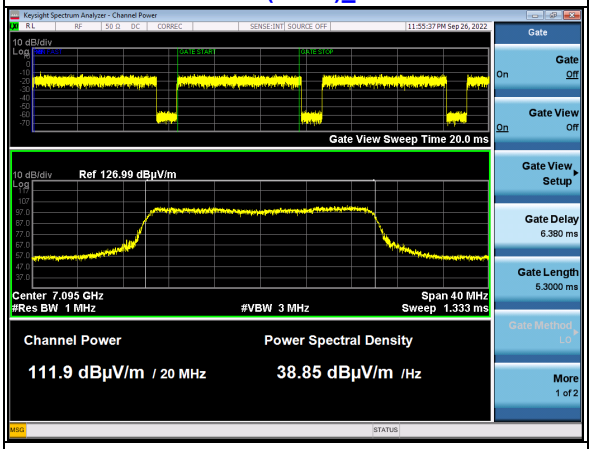
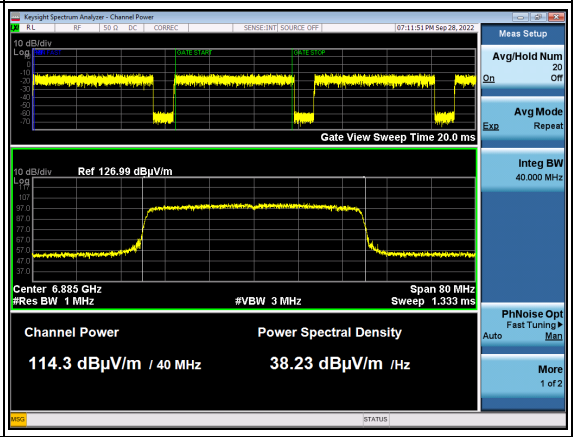
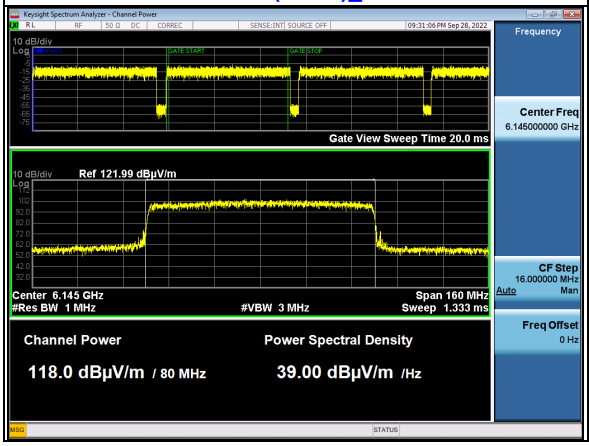
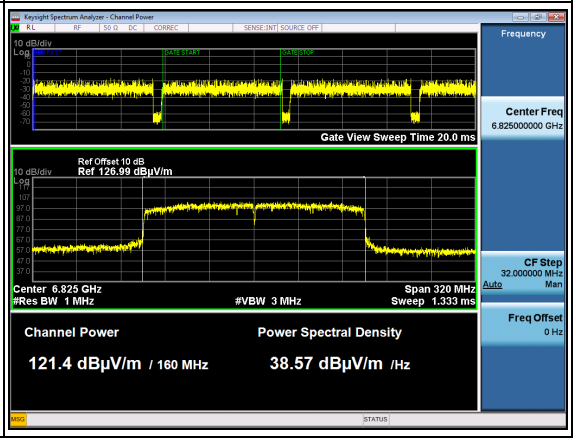
## 802.11ax (HE160) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP (mW) | EIRP (dBm) | EIRP Limit (dBm) | Test Result |
|---|---|---|---|---|---|---|---|
| 47 | 6185 | 120.7 | -95.23 | 352.371 | 25.47 | 30 | Pass |
| 79 | 6345 | 120.7 | -95.23 | 352.371 | 25.47 | 30 | Pass |
| 111 | 6505 | 119.9 | -95.23 | 293.089 | 24.67 | 30 | Pass |
| 143 | 6665 | 120.6 | -95.23 | 344.35 | 25.37 | 30 | Pass |
| 175 | 6825 | 120.2 | -95.23 | 314.051 | 24.97 | 30 | Pass |
| 207 | 6985 | 119.2 | -95.23 | 249.459 | 23.97 | 30 | Pass |

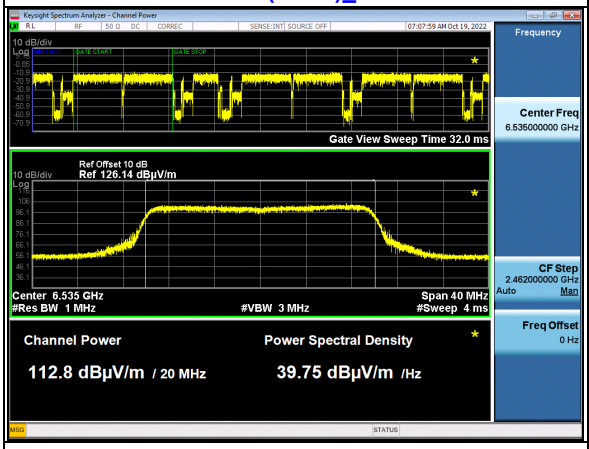
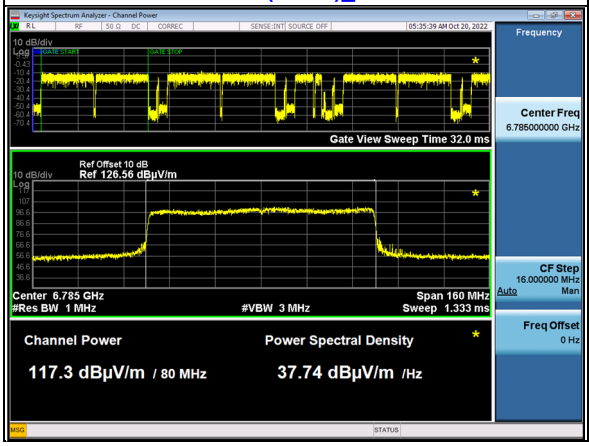
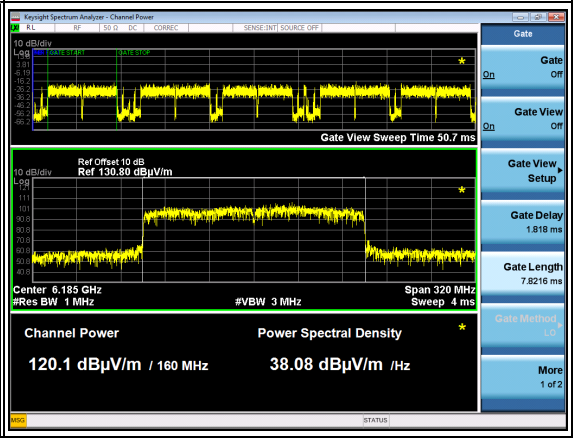
## CDD MCS0NSS1

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH213 | 802.11ax (HE40)_CH35 |
|  |  |
| 802.11ax (HE80)_CH215 | 802.11ax (HE160)_CH207 |
|  |  |

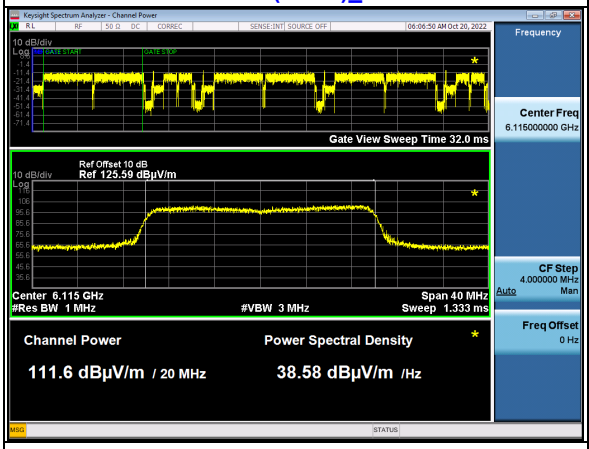
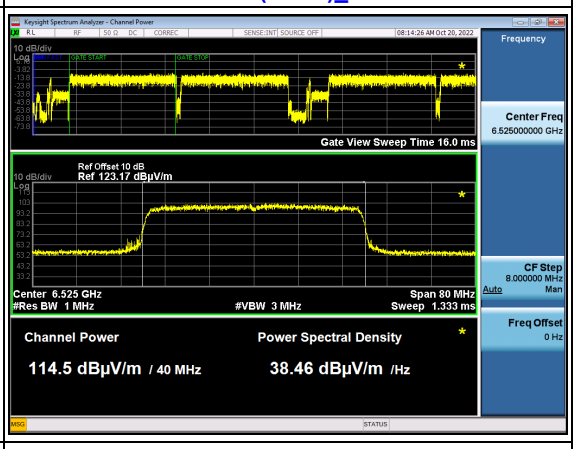
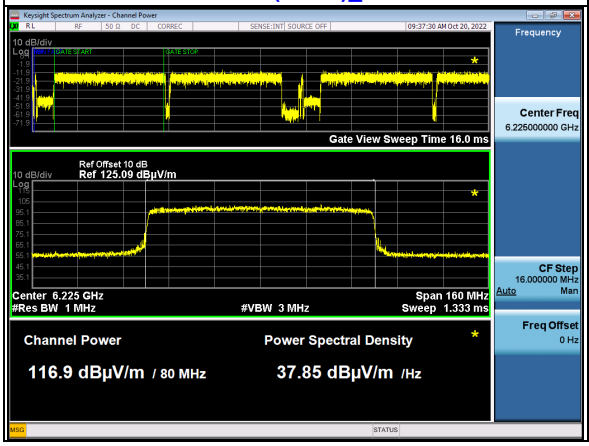
## CDD MCS0NSS4

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH229 | 802.11ax (HE40)_CH187 |
|  |  |
| 802.11ax (HE80)_CH39 | 802.11ax (HE160)_CH175 |
|  |  |

## Beamforming MCS0NSS1

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH117 | 802.11ax (HE40)_CH227 |
|  |  |
| 802.11ax (HE80)_CH167 | 802.11ax (HE160)_CH47 |
|  |  |

## Beamforming MCS0NSS2

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH33 | 802.11ax (HE40)_CH115 |
|  |  |
| 802.11ax (HE80)_CH55 | 802.11ax (HE160)_CH47 |
|  |  |

## 7.2 Power Spectral Density

| Input Power: | 120 Vac, 60 Hz | Environmental Conditions: | 25°C, 65% RH | Tested By: | Katina Lu |
|---|---|---|---|---|---|

### 802.11ax (HE20) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 33 | 6115 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 61 | 6255 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 93 | 6415 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 97 | 6435 | 99.95 | -95.23 | 4.72 | 5 | Pass |
| 105 | 6475 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 113 | 6515 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 117 | 6535 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 153 | 6715 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 181 | 6855 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 185 | 6875 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 213 | 7015 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 229 | 7095 | 100.03 | -95.23 | 4.80 | 5 | Pass |

### 802.11ax (HE20) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 33 | 6115 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 61 | 6255 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 93 | 6415 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 97 | 6435 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 105 | 6475 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 113 | 6515 | 99.96 | -95.23 | 4.73 | 5 | Pass |
| 117 | 6535 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 153 | 6715 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 181 | 6855 | 99.94 | -95.23 | 4.71 | 5 | Pass |
| 185 | 6875 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 213 | 7015 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 229 | 7095 | 100.20 | -95.23 | 4.97 | 5 | Pass |

## 802.11ax (HE40) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 35 | 6125 | 100.00 | -95.23 | 4.77 | 5 | Pass |
| 59 | 6245 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 91 | 6405 | 99.96 | -95.23 | 4.73 | 5 | Pass |
| 99 | 6445 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 107 | 6485 | 100.13 | -95.23 | 4.90 | 5 | Pass |
| 115 | 6525 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 123 | 6565 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 155 | 6725 | 99.95 | -95.23 | 4.72 | 5 | Pass |
| 179 | 6845 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 187 | 6885 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 211 | 7005 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 227 | 7085 | 100.13 | -95.23 | 4.90 | 5 | Pass |

## 802.11ax (HE40) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 35 | 6125 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 59 | 6245 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 91 | 6405 | 100.12 | -95.23 | 4.89 | 5 | Pass |
| 99 | 6445 | 100.09 | -95.23 | 4.86 | 5 | Pass |
| 107 | 6485 | 100.17 | -95.23 | 4.94 | 5 | Pass |
| 115 | 6525 | 100.07 | -95.23 | 4.84 | 5 | Pass |
| 123 | 6565 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 155 | 6725 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 179 | 6845 | 99.94 | -95.23 | 4.71 | 5 | Pass |
| 187 | 6885 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 211 | 7005 | 99.96 | -95.23 | 4.73 | 5 | Pass |
| 227 | 7085 | 100.02 | -95.23 | 4.79 | 5 | Pass |

## 802.11ax (HE80) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 39 | 6145 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 55 | 6225 | 99.95 | -95.23 | 4.72 | 5 | Pass |
| 87 | 6385 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 103 | 6465 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 119 | 6545 | 99.95 | -95.23 | 4.72 | 5 | Pass |
| 135 | 6625 | 99.94 | -95.23 | 4.71 | 5 | Pass |
| 151 | 6705 | 99.97 | -95.23 | 4.74 | 5 | Pass |
| 167 | 6785 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 183 | 6865 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 199 | 6945 | 99.94 | -95.23 | 4.71 | 5 | Pass |
| 215 | 7025 | 99.99 | -95.23 | 4.76 | 5 | Pass |

## 802.11ax (HE80) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 39 | 6145 | 100.21 | -95.23 | 4.98 | 5 | Pass |
| 55 | 6225 | 100.12 | -95.23 | 4.89 | 5 | Pass |
| 87 | 6385 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 103 | 6465 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 119 | 6545 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 135 | 6625 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 151 | 6705 | 99.96 | -95.23 | 4.73 | 5 | Pass |
| 167 | 6785 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 183 | 6865 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 199 | 6945 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 215 | 7025 | 99.99 | -95.23 | 4.76 | 5 | Pass |

## 802.11ax (HE160) CDD MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 47 | 6185 | 100.17 | -95.23 | 4.94 | 5 | Pass |
| 79 | 6345 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 111 | 6505 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 143 | 6665 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 175 | 6825 | 99.96 | -95.23 | 4.73 | 5 | Pass |
| 207 | 6985 | 100.03 | -95.23 | 4.80 | 5 | Pass |

## 802.11ax (HE160) CDD MCS0NSS4

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 47 | 6185 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 79 | 6345 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 111 | 6505 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 143 | 6665 | 100.12 | -95.23 | 4.89 | 5 | Pass |
| 175 | 6825 | 100.19 | -95.23 | 4.96 | 5 | Pass |
| 207 | 6985 | 100.19 | -95.23 | 4.96 | 5 | Pass |

## 802.11ax (HE20) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 33 | 6115 | 100.12 | -95.23 | 4.89 | 5 | Pass |
| 61 | 6255 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 93 | 6415 | 100.12 | -95.23 | 4.89 | 5 | Pass |
| 97 | 6435 | 100.15 | -95.23 | 4.92 | 5 | Pass |
| 105 | 6475 | 100.13 | -95.23 | 4.90 | 5 | Pass |
| 113 | 6515 | 100.14 | -95.23 | 4.91 | 5 | Pass |
| 117 | 6535 | 100.15 | -95.23 | 4.92 | 5 | Pass |
| 153 | 6715 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 181 | 6855 | 100.14 | -95.23 | 4.91 | 5 | Pass |
| 185 | 6875 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 213 | 7015 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 229 | 7095 | 100.14 | -95.23 | 4.91 | 5 | Pass |

## 802.11ax (HE20) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 33 | 6115 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 61 | 6255 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 93 | 6415 | 99.96 | -95.23 | 4.73 | 5 | Pass |
| 97 | 6435 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 105 | 6475 | 100.00 | -95.23 | 4.77 | 5 | Pass |
| 113 | 6515 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 117 | 6535 | 100.13 | -95.23 | 4.90 | 5 | Pass |
| 153 | 6715 | 100.07 | -95.23 | 4.84 | 5 | Pass |
| 181 | 6855 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 185 | 6875 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 213 | 7015 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 229 | 7095 | 100.13 | -95.23 | 4.90 | 5 | Pass |

## 802.11ax (HE40) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 35 | 6125 | 99.93 | -95.23 | 4.70 | 5 | Pass |
| 59 | 6245 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 91 | 6405 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 99 | 6445 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 107 | 6485 | 100.07 | -95.23 | 4.84 | 5 | Pass |
| 115 | 6525 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 123 | 6565 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 155 | 6725 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 179 | 6845 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 187 | 6885 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 211 | 7005 | 100.09 | -95.23 | 4.86 | 5 | Pass |
| 227 | 7085 | 100.07 | -95.23 | 4.84 | 5 | Pass |

## 802.11ax (HE40) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 35 | 6125 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 59 | 6245 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 91 | 6405 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 99 | 6445 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 107 | 6485 | 100.01 | -95.23 | 4.78 | 5 | Pass |
| 115 | 6525 | 100.15 | -95.23 | 4.92 | 5 | Pass |
| 123 | 6565 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 155 | 6725 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 179 | 6845 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 187 | 6885 | 100.00 | -95.23 | 4.77 | 5 | Pass |
| 211 | 7005 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 227 | 7085 | 100.10 | -95.23 | 4.87 | 5 | Pass |

## 802.11ax (HE80) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 39 | 6145 | 100.13 | -95.23 | 4.90 | 5 | Pass |
| 55 | 6225 | 100.03 | -95.23 | 4.80 | 5 | Pass |
| 87 | 6385 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 103 | 6465 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 119 | 6545 | 100.15 | -95.23 | 4.92 | 5 | Pass |
| 135 | 6625 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 151 | 6705 | 100.12 | -95.23 | 4.89 | 5 | Pass |
| 167 | 6785 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 183 | 6865 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 199 | 6945 | 99.98 | -95.23 | 4.75 | 5 | Pass |
| 215 | 7025 | 100.12 | -95.23 | 4.89 | 5 | Pass |

### 802.11ax (HE80) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 39 | 6145 | 100.14 | -95.23 | 4.91 | 5 | Pass |
| 55 | 6225 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 87 | 6385 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 103 | 6465 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 119 | 6545 | 100.10 | -95.23 | 4.87 | 5 | Pass |
| 135 | 6625 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 151 | 6705 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 167 | 6785 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 183 | 6865 | 100.02 | -95.23 | 4.79 | 5 | Pass |
| 199 | 6945 | 100.04 | -95.23 | 4.81 | 5 | Pass |
| 215 | 7025 | 100.15 | -95.23 | 4.92 | 5 | Pass |

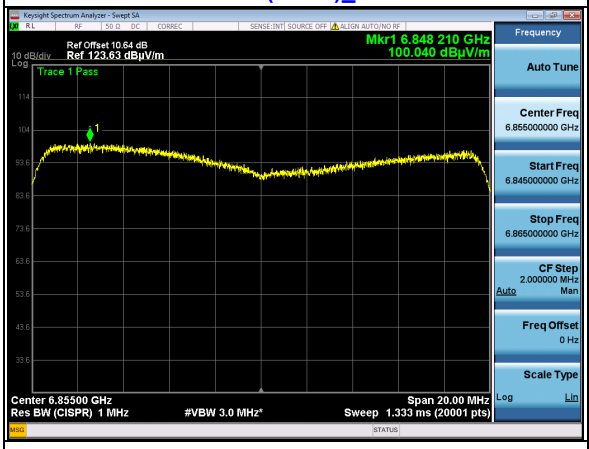
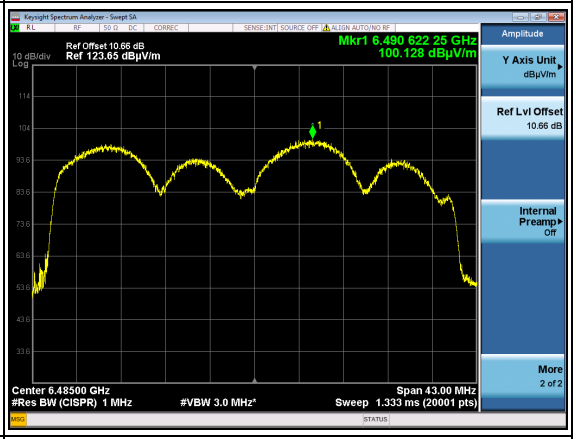
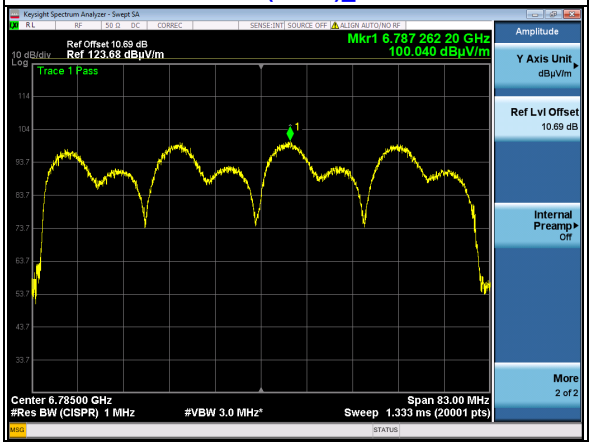
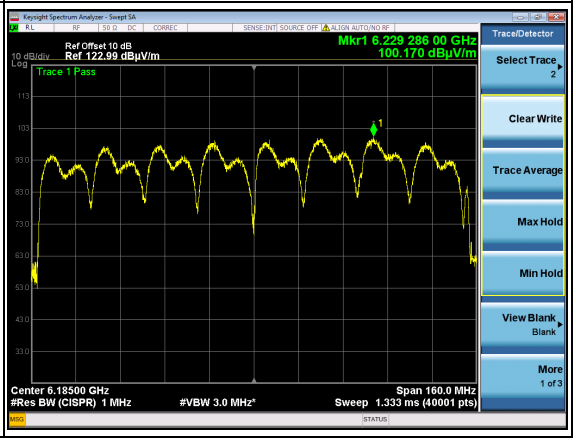
### 802.11ax (HE160) Beamforming MCS0NSS1

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 47 | 6185 | 100.14 | -95.23 | 4.91 | 5 | Pass |
| 79 | 6345 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 111 | 6505 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 143 | 6665 | 100.11 | -95.23 | 4.88 | 5 | Pass |
| 175 | 6825 | 100.09 | -95.23 | 4.86 | 5 | Pass |
| 207 | 6985 | 100.16 | -95.23 | 4.93 | 5 | Pass |

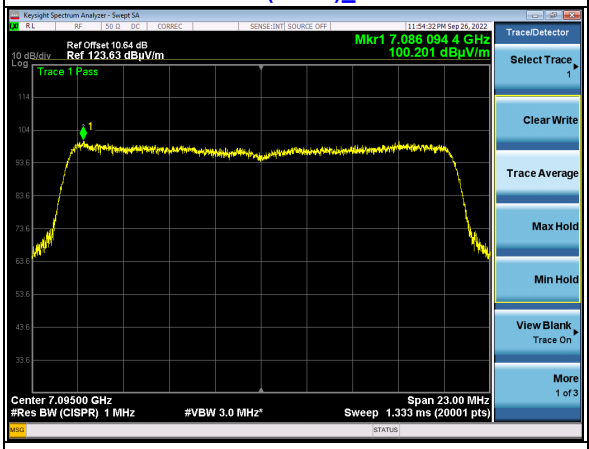
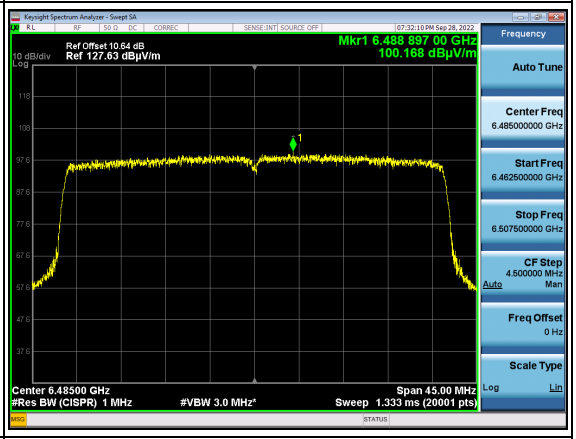
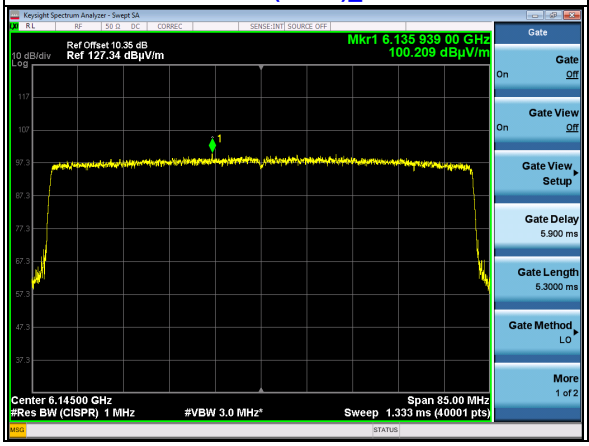
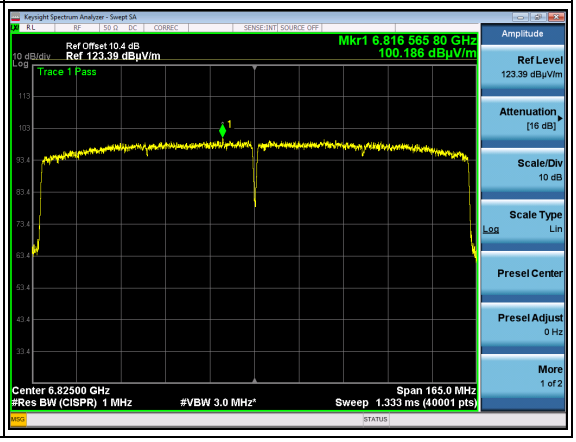
### 802.11ax (HE160) Beamforming MCS0NSS2

| Chan. | Chan. Freq. (MHz) | Field Strength (dBuV/m) | Correction Factor (dB) | EIRP PSD (dBm/MHz) | EIRP PSD Limit (dBm/MHz) | Test Result |
|---|---|---|---|---|---|---|
| 47 | 6185 | 100.06 | -95.23 | 4.83 | 5 | Pass |
| 79 | 6345 | 99.99 | -95.23 | 4.76 | 5 | Pass |
| 111 | 6505 | 100.05 | -95.23 | 4.82 | 5 | Pass |
| 143 | 6665 | 100.08 | -95.23 | 4.85 | 5 | Pass |
| 175 | 6825 | 100.13 | -95.23 | 4.90 | 5 | Pass |
| 207 | 6985 | 100.09 | -95.23 | 4.86 | 5 | Pass |

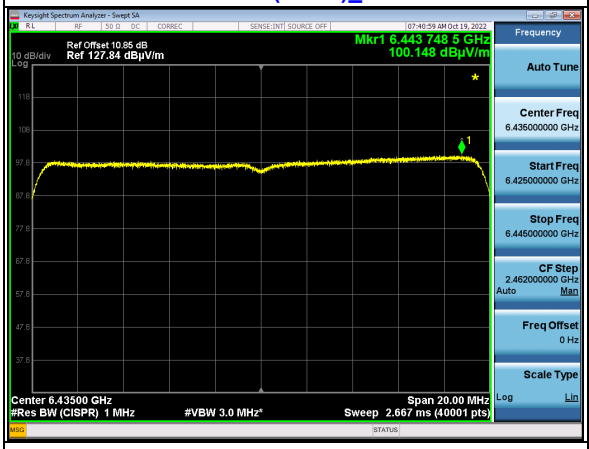
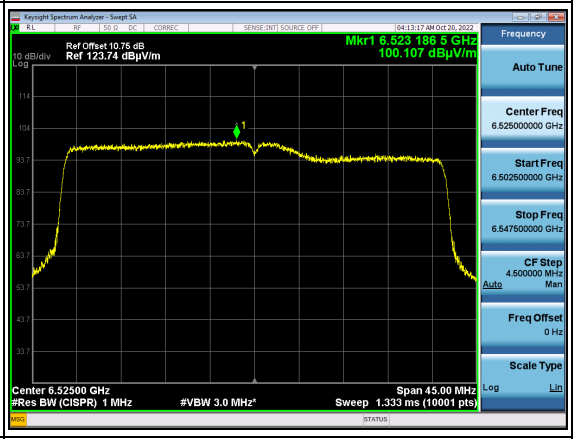
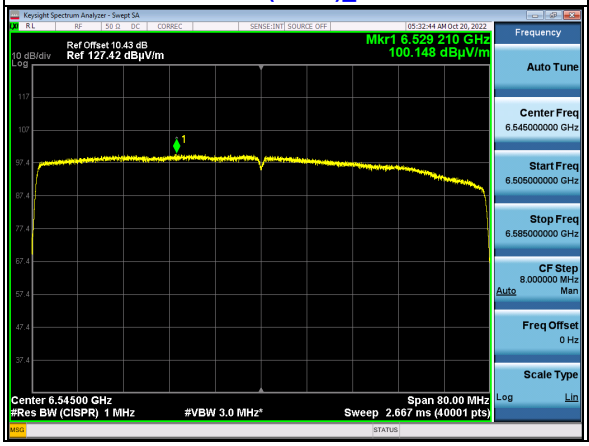
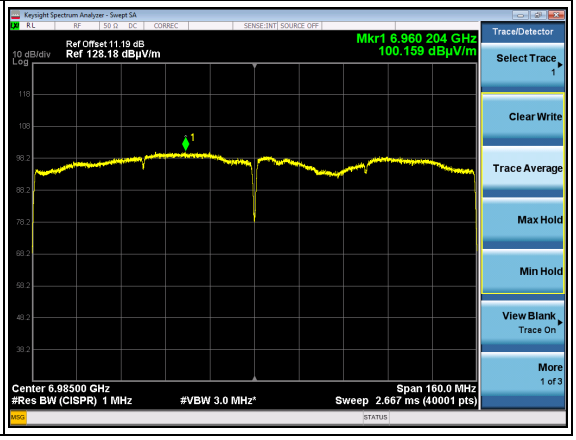
## CDD MCS0NSS1

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH181 | 802.11ax (HE40)_CH107 |
|  |  |
| 802.11ax (HE80)_CH167 | 802.11ax (HE160)_CH47 |
|  |  |

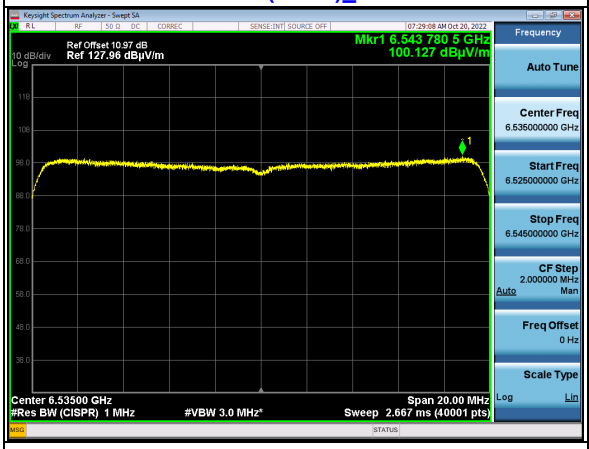
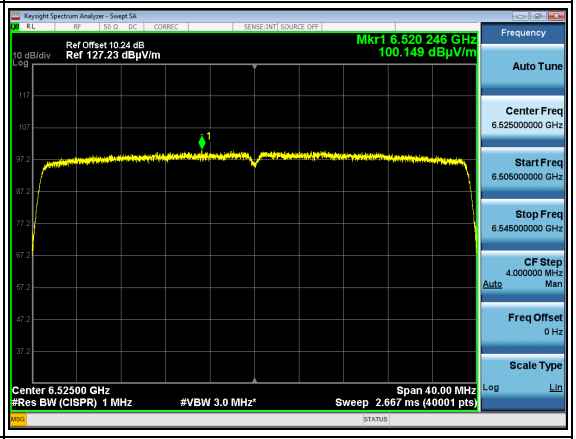
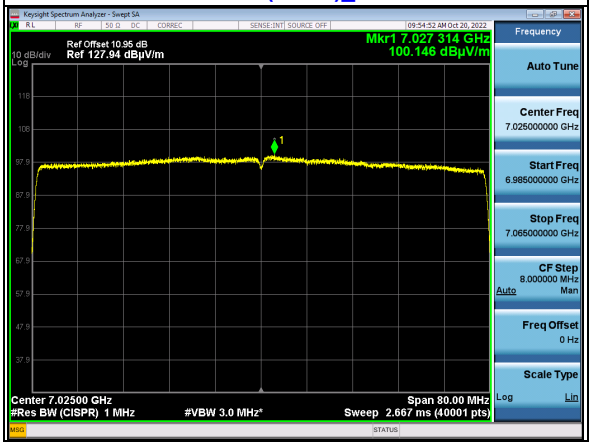
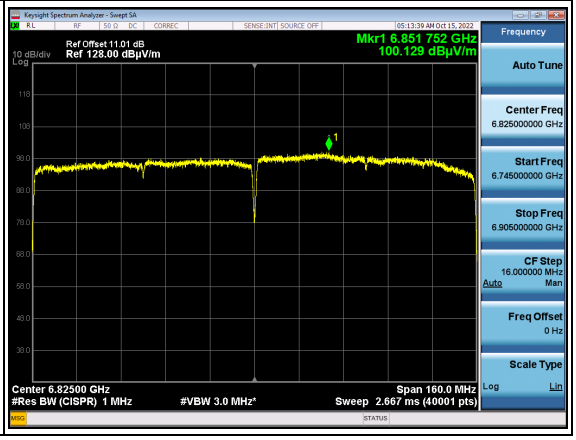
## CDD MCS0NSS4

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH229 | 802.11ax (HE40)_CH107 |
|  |  |
| 802.11ax (HE80)_CH39 | 802.11ax (HE160)_CH175 |
|  |  |

## Beamforming MCS0NSS1

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH97 | 802.11ax (HE40)_CH115 |
|  |  |
| 802.11ax (HE80)_CH119 | 802.11ax (HE160)_CH207 |
|  |  |

## Beamforming MCS0NSS2

| Spectrum Plot of Worst Value | |
|---|---|
| 802.11ax (HE20)_CH117 | 802.11ax (HE40)_CH115 |
|  |  |
| 802.11ax (HE80)_CH215 | 802.11ax (HE160)_CH175 |
|  |  |

## 7.3 Emission Bandwidth

| Input Power: | 120 Vac, 60 Hz | Environmental Conditions: | 25°C, 65% RH | Tested By: | Katina Lu |
|---|---|---|---|---|---|

### 802.11ax (HE20)

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | | | |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 |
| 33 | 6115 | 22.29 | 23.22 | 22.42 | 22.43 |
| 61 | 6255 | 22.43 | 22.66 | 22.43 | 22.45 |
| 93 | 6415 | 22.54 | 22.76 | 22.59 | 22.63 |
| 97 | 6435 | 22.30 | 22.88 | 22.43 | 22.38 |
| 105 | 6475 | 22.57 | 22.78 | 22.30 | 22.67 |
| 113 | 6515 | 22.34 | 22.57 | 22.51 | 22.27 |
| 117 | 6535 | 22.54 | 22.62 | 22.42 | 22.67 |
| 153 | 6715 | 22.47 | 22.76 | 22.68 | 22.61 |
| 181 | 6855 | 22.18 | 22.75 | 22.76 | 22.64 |
| 185 | 6875 | 22.33 | 22.41 | 22.49 | 22.57 |
| 213 | 7015 | 22.28 | 22.45 | 22.41 | 22.15 |
| 229 | 7095 | 22.43 | 22.49 | 22.50 | 22.69 |

### 802.11ax (HE40)

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | | | |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 |
| 35 | 6125 | 41.85 | 41.75 | 41.85 | 41.62 |
| 59 | 6245 | 41.78 | 41.52 | 41.68 | 41.65 |
| 91 | 6405 | 41.78 | 41.82 | 41.78 | 41.81 |
| 99 | 6445 | 41.79 | 41.84 | 41.59 | 41.61 |
| 107 | 6485 | 41.60 | 41.69 | 41.79 | 42.07 |
| 115 | 6525 | 41.99 | 41.80 | 41.76 | 41.66 |
| 123 | 6565 | 41.71 | 41.50 | 41.70 | 41.92 |
| 155 | 6725 | 41.66 | 41.59 | 41.87 | 41.75 |
| 179 | 6845 | 41.67 | 41.51 | 41.64 | 41.67 |
| 187 | 6885 | 41.80 | 41.88 | 41.68 | 41.68 |
| 211 | 7005 | 41.67 | 41.65 | 41.54 | 41.52 |
| 227 | 7085 | 41.64 | 41.59 | 41.56 | 41.79 |

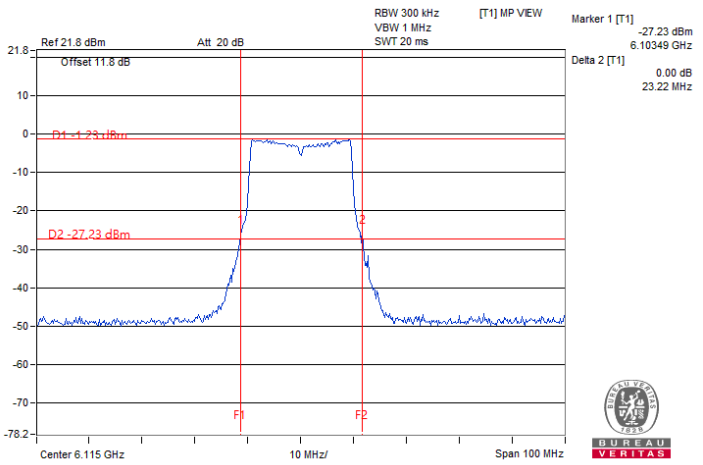
## 802.11ax (HE80)

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | | | |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 |
| 39 | 6145 | 83.47 | 83.48 | 83.05 | 83.53 |
| 55 | 6225 | 82.97 | 83.35 | 83.18 | 83.47 |
| 87 | 6385 | 83.36 | 83.07 | 83.28 | 83.00 |
| 103 | 6465 | 83.44 | 83.25 | 83.42 | 82.78 |
| 119 | 6545 | 83.22 | 82.97 | 83.21 | 83.39 |
| 135 | 6625 | 83.31 | 83.07 | 82.84 | 83.13 |
| 151 | 6705 | 83.28 | 82.79 | 83.35 | 83.01 |
| 167 | 6785 | 82.81 | 83.16 | 83.37 | 82.88 |
| 183 | 6865 | 83.71 | 83.18 | 83.59 | 83.19 |
| 199 | 6945 | 83.69 | 83.25 | 83.11 | 83.08 |
| 215 | 7025 | 83.35 | 82.49 | 83.59 | 83.05 |

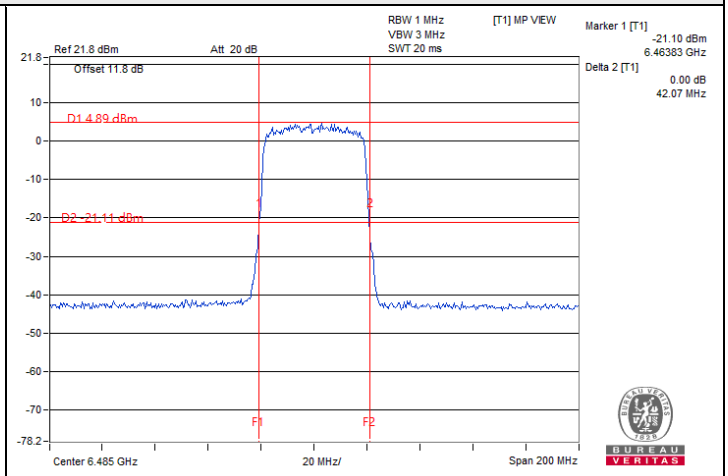
## 802.11ax (HE160)

| Channel | Frequency (MHz) | 26dB Bandwidth (MHz) | | | |
|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 |
| 47 | 6185 | 168.16 | 168.26 | 168.95 | 167.90 |
| 79 | 6345 | 168.06 | 168.25 | 168.95 | 168.40 |
| 111 | 6505 | 168.76 | 169.10 | 167.96 | 168.22 |
| 143 | 6665 | 168.24 | 167.49 | 169.35 | 168.84 |
| 175 | 6825 | 168.35 | 168.00 | 168.01 | 168.70 |
| 207 | 6985 | 168.92 | 168.40 | 168.57 | 167.65 |

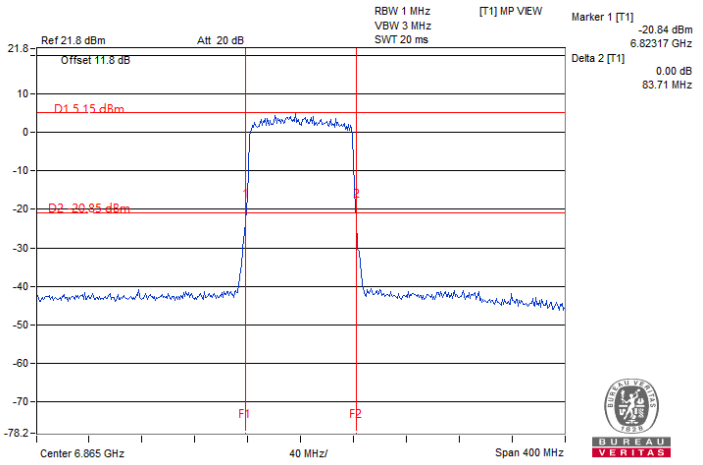
## Spectrum Plot of Maximum Value



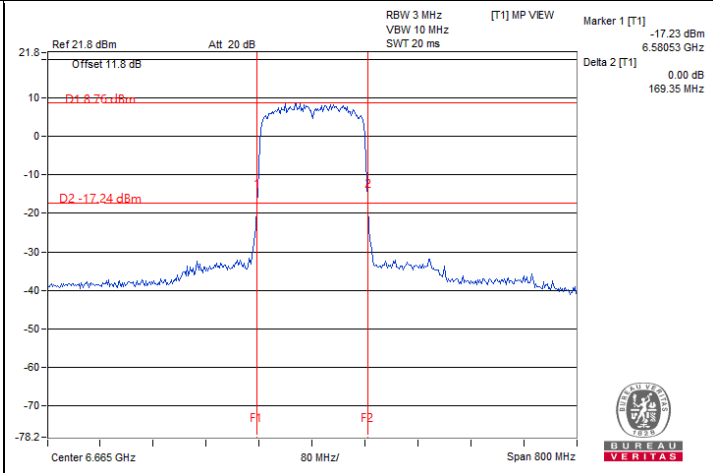

802.11ax (HE20) / Chain 1 : CH 33




802.11ax (HE40) / Chain 3 : CH 107




802.11ax (HE80) / Chain 0 : CH 183

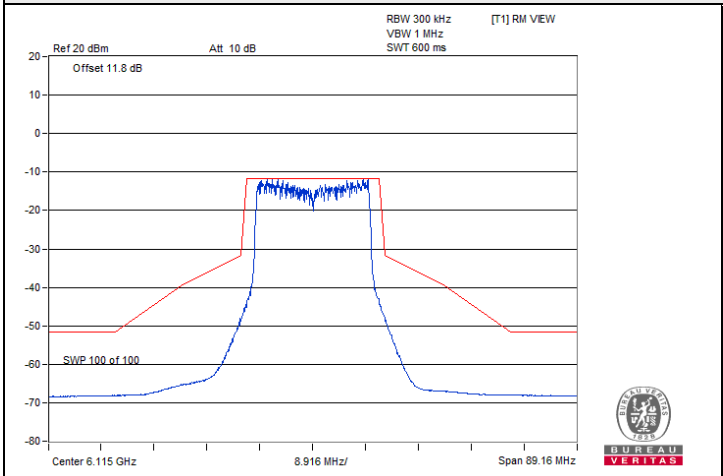
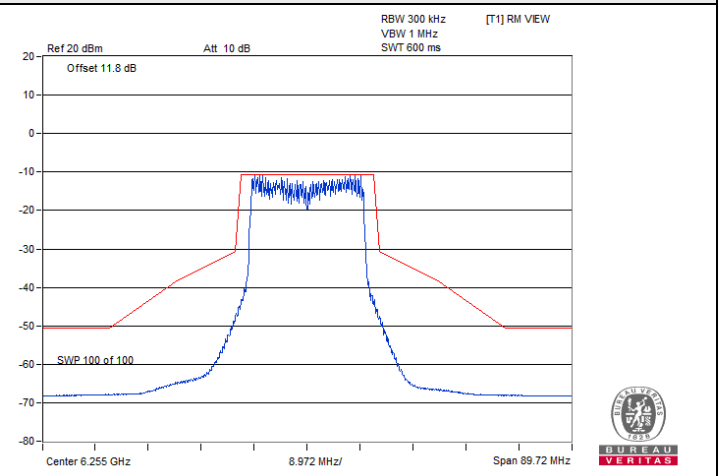
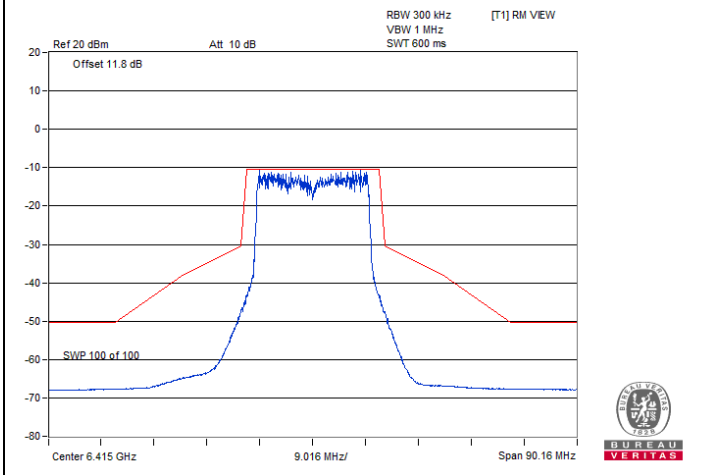
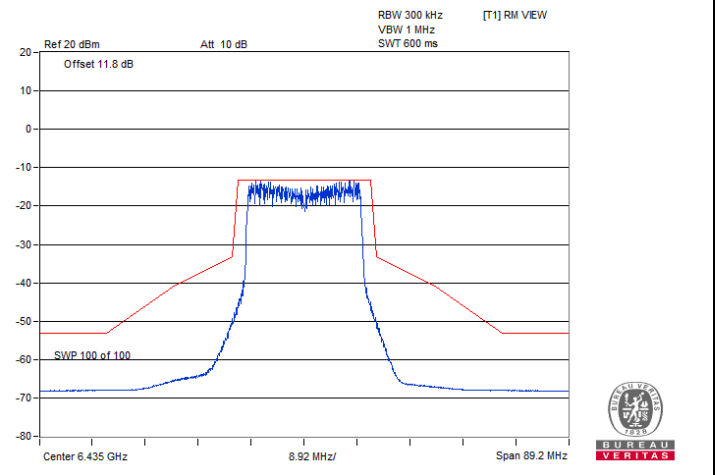
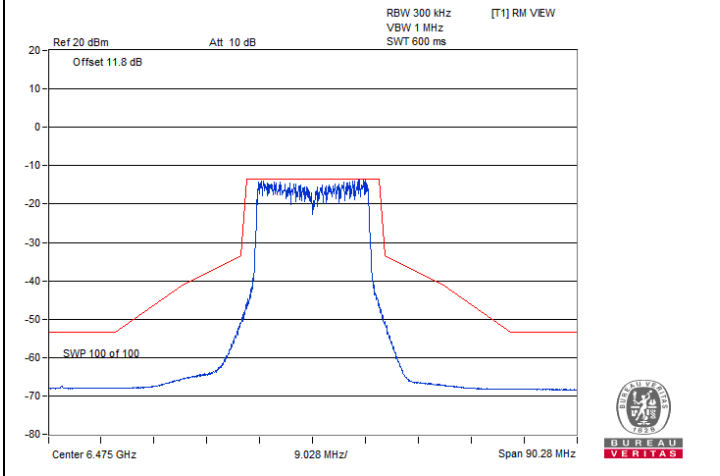
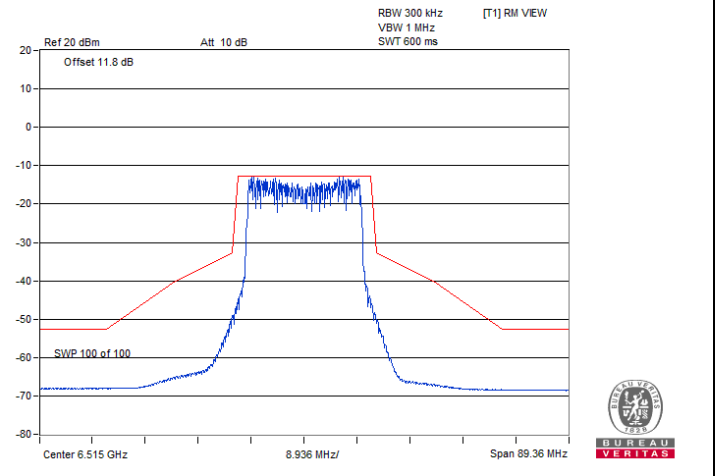



802.11ax (HE160) / Chain 2 : CH 143

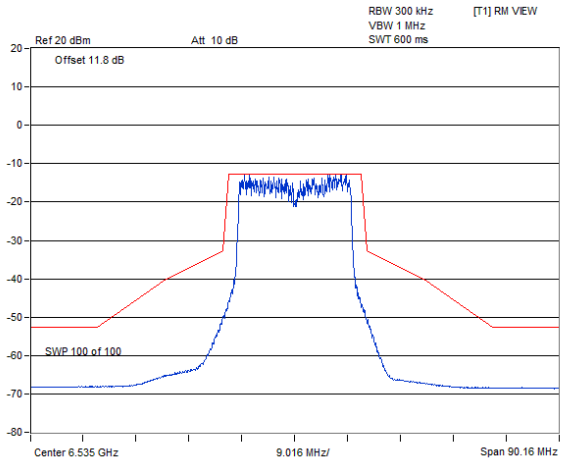
## 7.4 In-Band Emission Mask

| Input Power: | 120 Vac, 60 Hz | Environmental Conditions: | 25°C, 65% RH | Tested By: | Katina Lu |
|---|---|---|---|---|---|

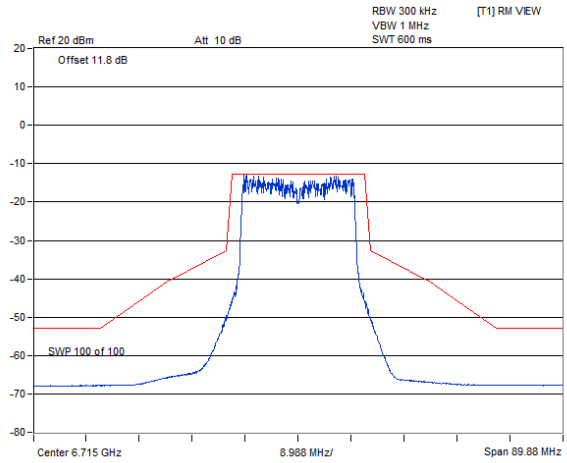
### 802.11ax (HE20)

| Spectrum Plot | |
|---|---|
|  |  |
| 802.11ax (HE20) / Chain 0 : CH 33 | 802.11ax (HE20) / Chain 0 : CH 61 |
|  |  |
| 802.11ax (HE20) / Chain 0 : CH 93 | 802.11ax (HE20) / Chain 0 : CH 97 |
|  |  |
| 802.11ax (HE20) / Chain 0 : CH 105 | 802.11ax (HE20) / Chain 0 : CH 113 |

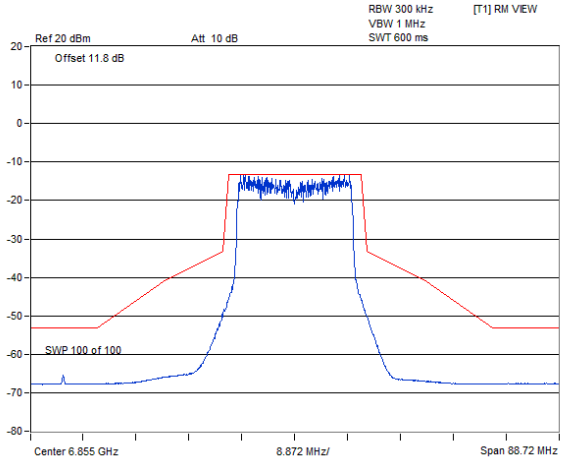
## Spectrum Plot



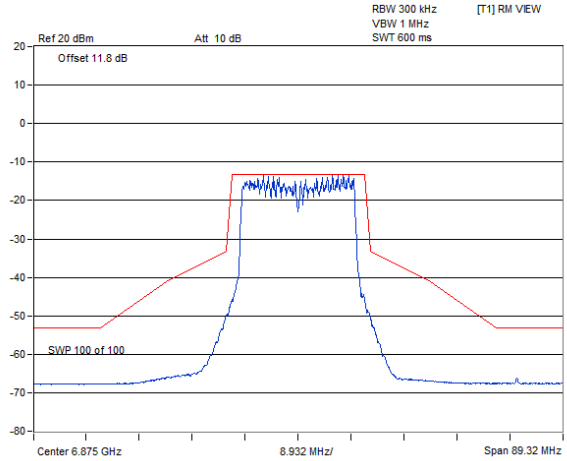

802.11ax (HE20) / Chain 0 : CH 117



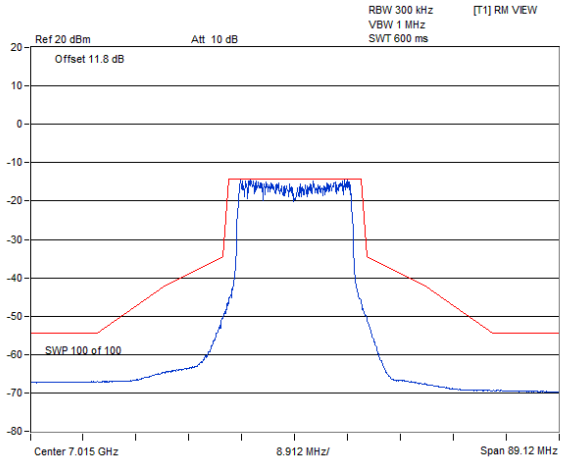

802.11ax (HE20) / Chain 0 : CH 153



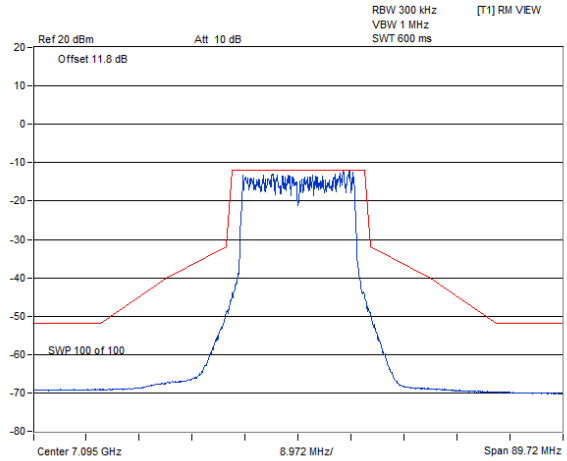

802.11ax (HE20) / Chain 0 : CH 181




802.11ax (HE20) / Chain 0 : CH 185

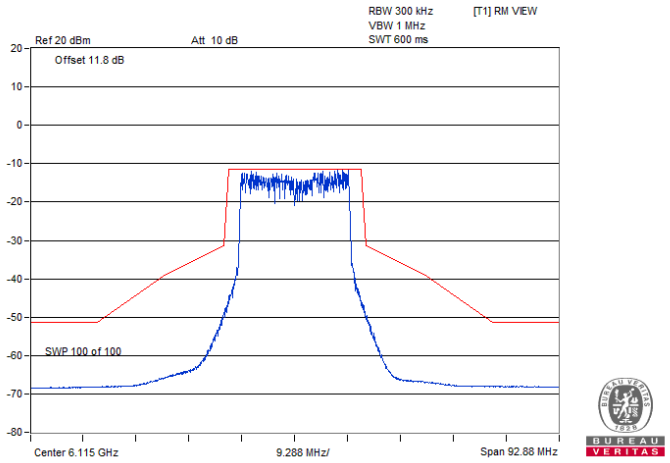



802.11ax (HE20) / Chain 0 : CH 213

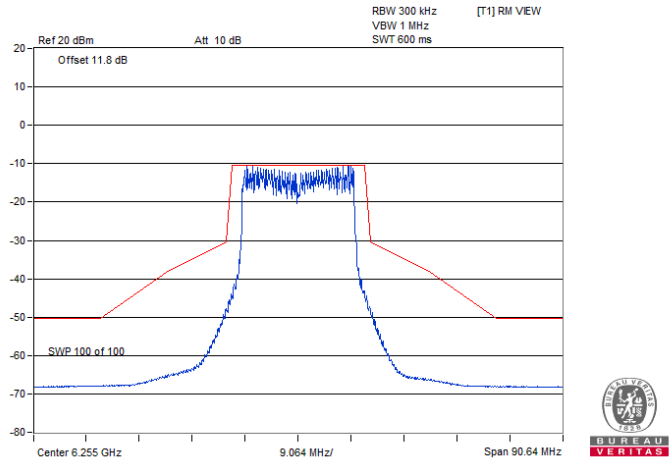



802.11ax (HE20) / Chain 0 : CH 229

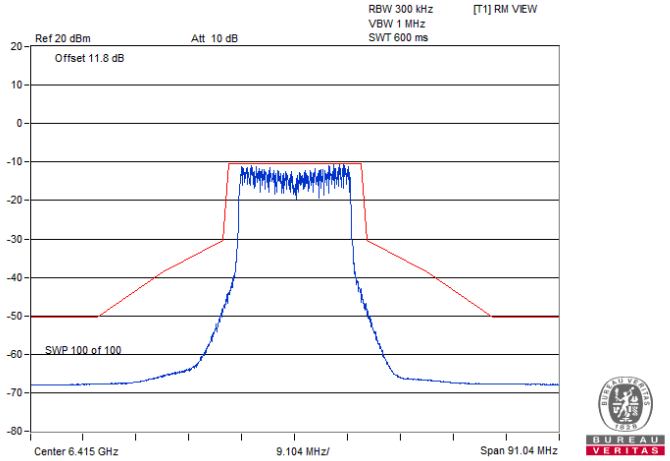
## Spectrum Plot



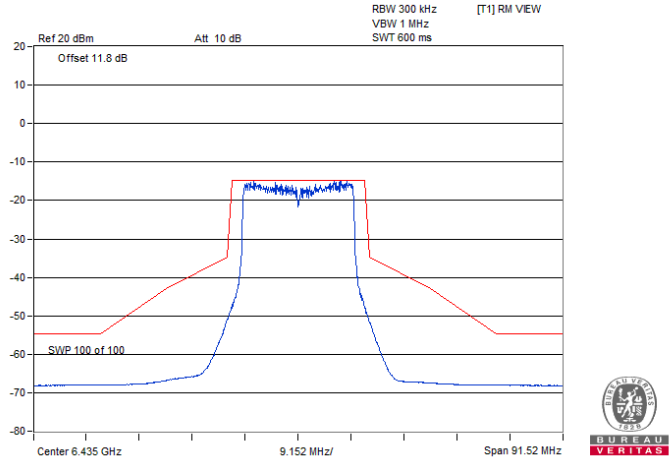

802.11ax (HE20) / Chain 1 : CH 33



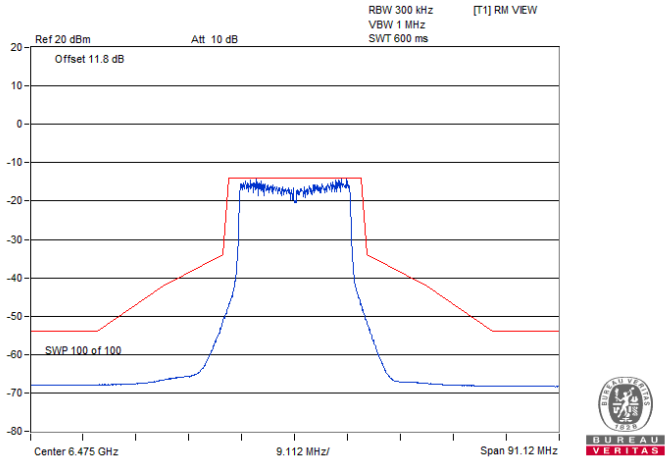

802.11ax (HE20) / Chain 1 : CH 61



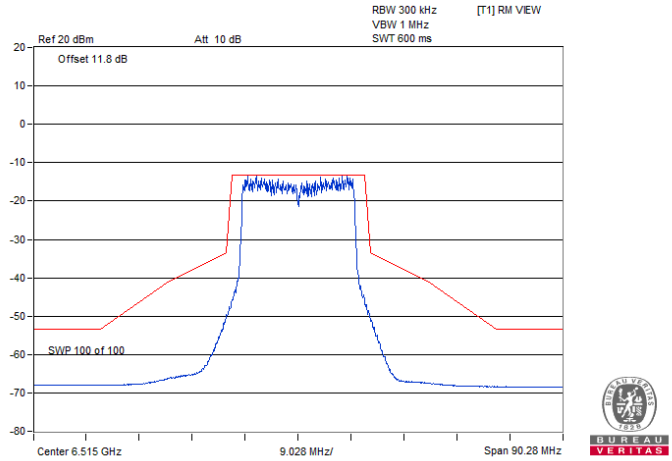

802.11ax (HE20) / Chain 1 : CH 93




802.11ax (HE20) / Chain 1 : CH 97

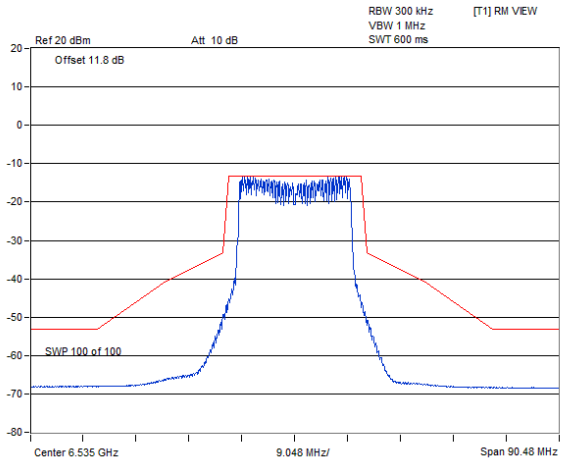



802.11ax (HE20) / Chain 1 : CH 105

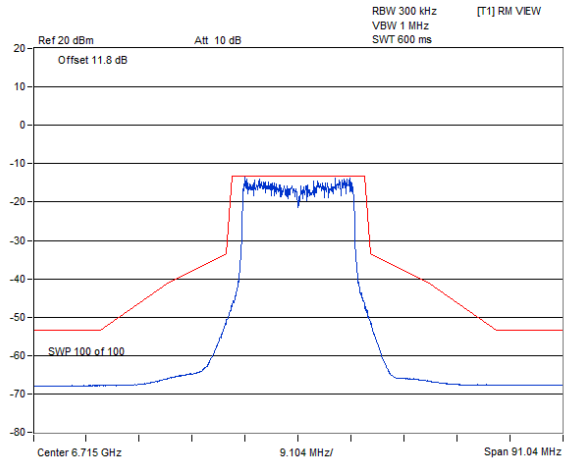



802.11ax (HE20) / Chain 1 : CH 113

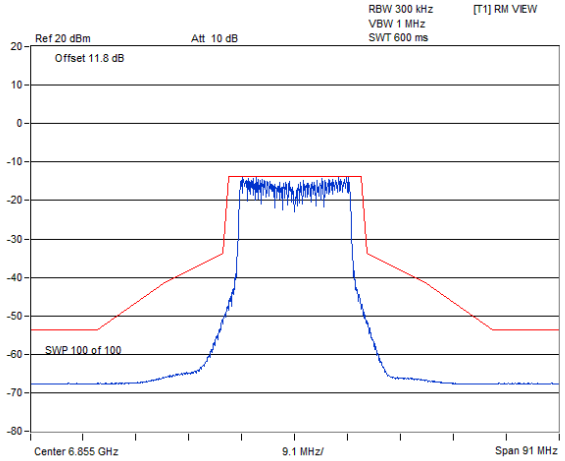
## Spectrum Plot



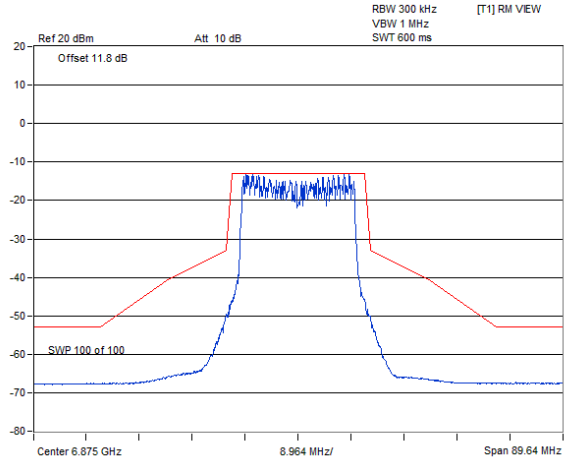

802.11ax (HE20) / Chain 1 : CH 117



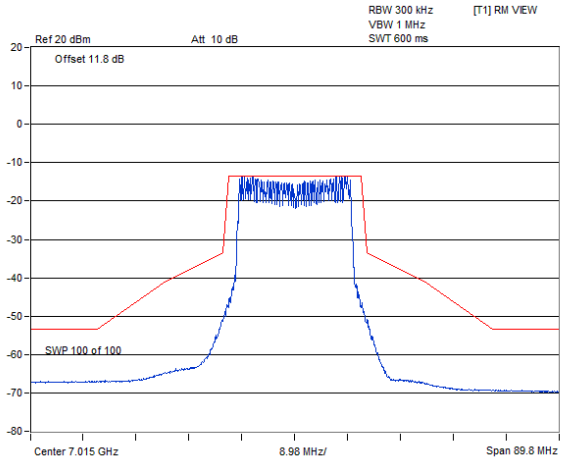

802.11ax (HE20) / Chain 1 : CH 153



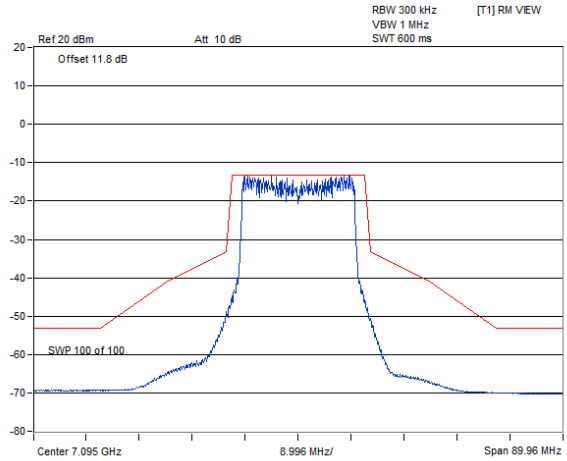

802.11ax (HE20) / Chain 1 : CH 181




802.11ax (HE20) / Chain 1 : CH 185

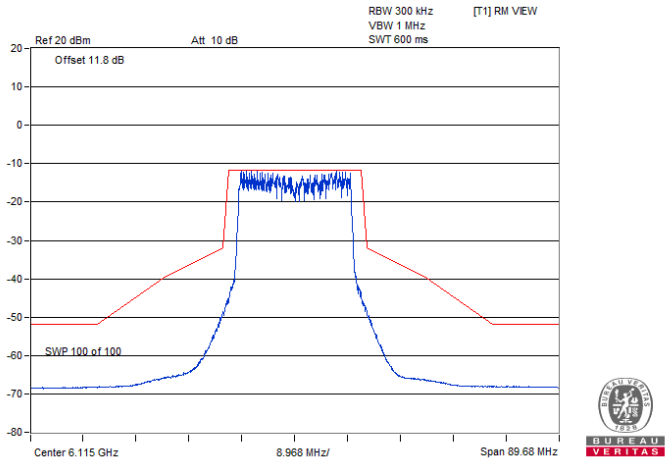



802.11ax (HE20) / Chain 1 : CH 213

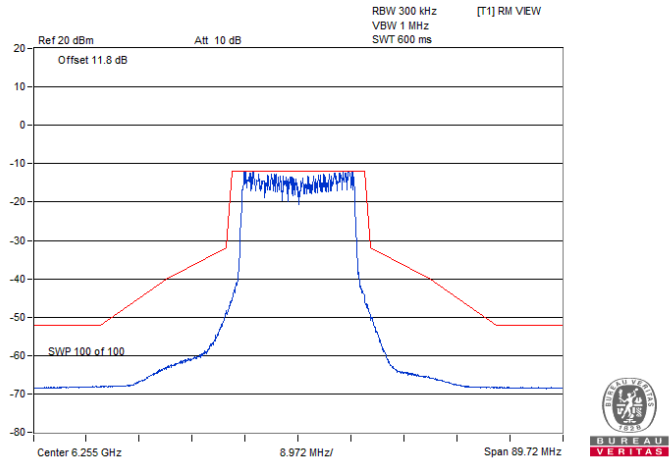



802.11ax (HE20) / Chain 1 : CH 229

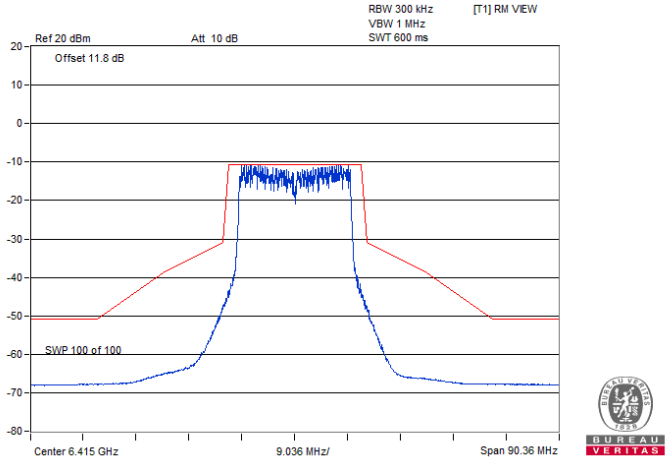
## Spectrum Plot



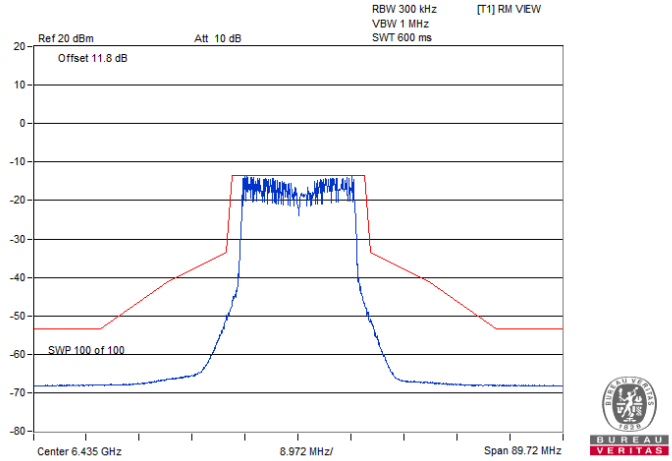

802.11ax (HE20) / Chain 2 : CH 33



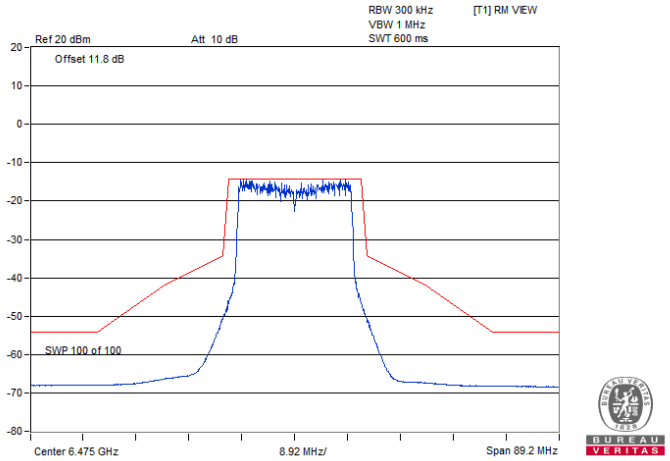

802.11ax (HE20) / Chain 2 : CH 61



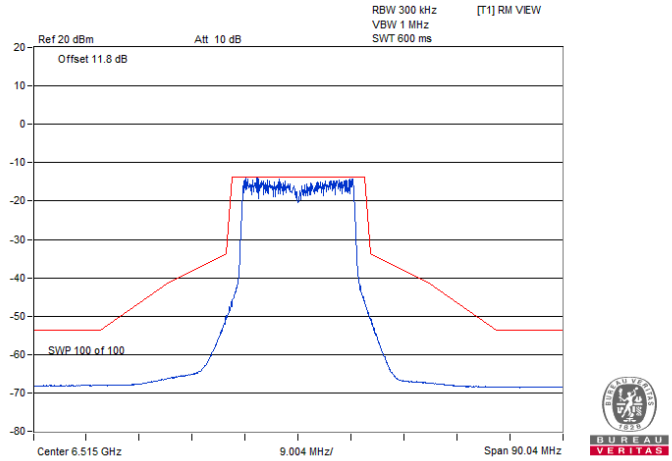

802.11ax (HE20) / Chain 2 : CH 93




802.11ax (HE20) / Chain 2 : CH 97

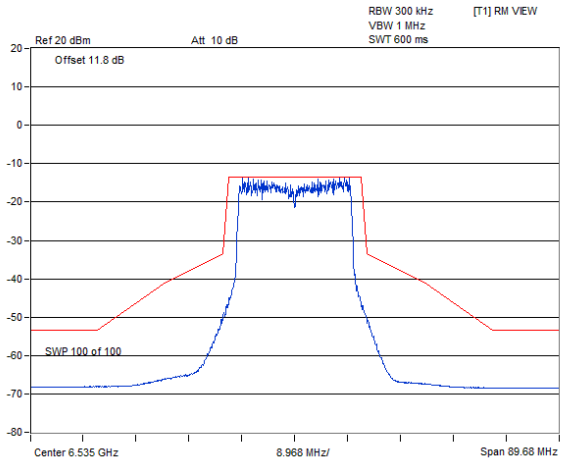



802.11ax (HE20) / Chain 2 : CH 105

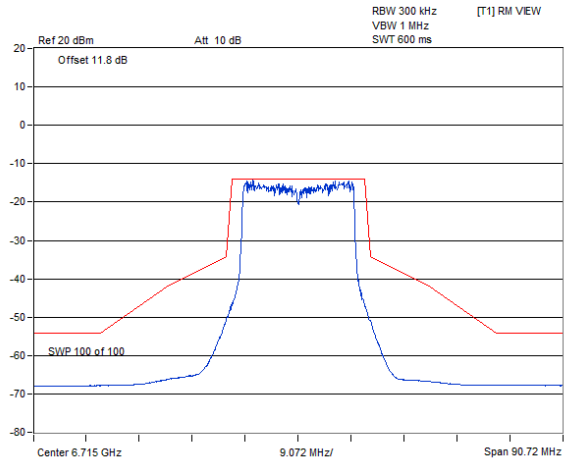



802.11ax (HE20) / Chain 2 : CH 113

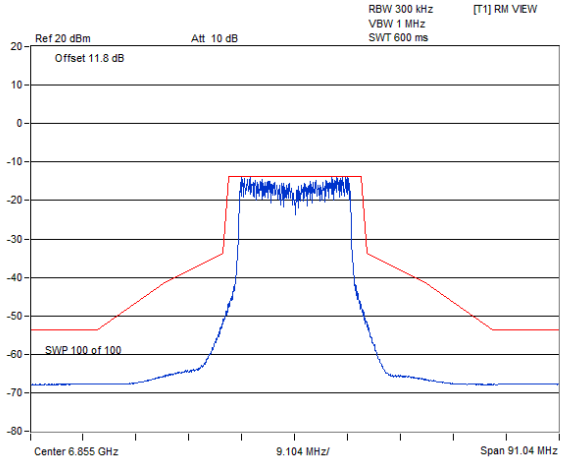
## Spectrum Plot



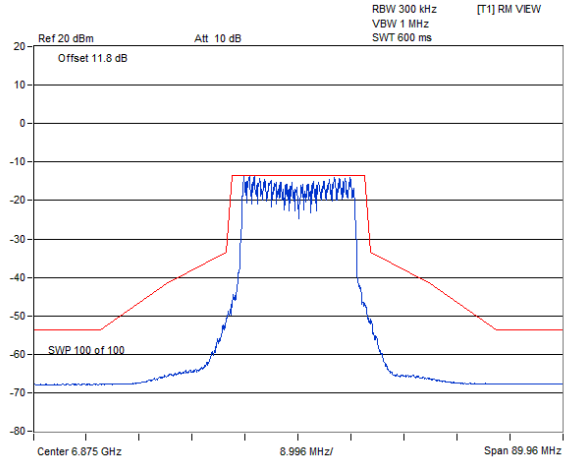

802.11ax (HE20) / Chain 2 : CH 117



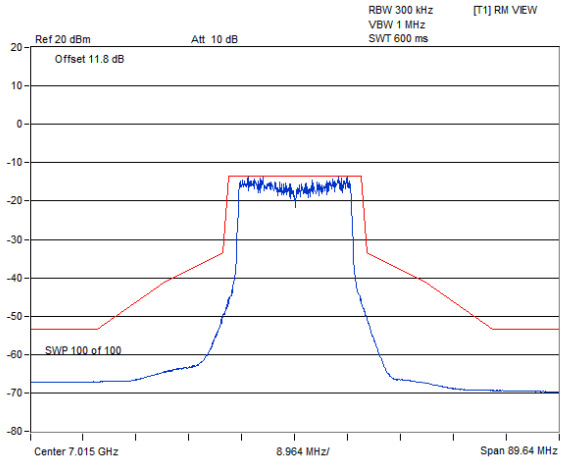

802.11ax (HE20) / Chain 2 : CH 153



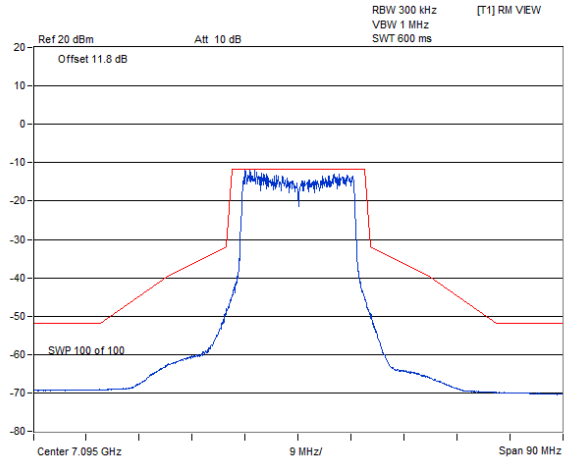

802.11ax (HE20) / Chain 2 : CH 181




802.11ax (HE20) / Chain 2 : CH 185

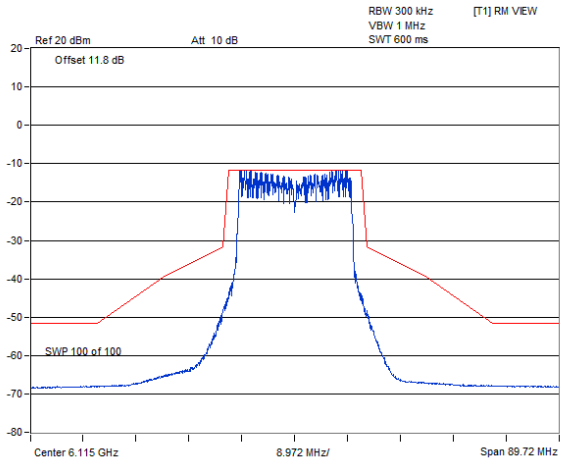



802.11ax (HE20) / Chain 2 : CH 213

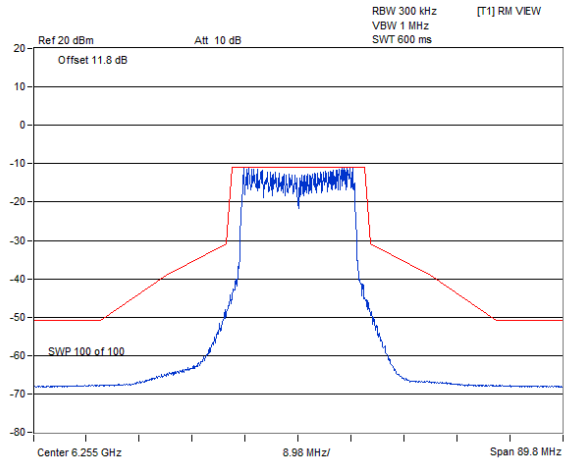



802.11ax (HE20) / Chain 2 : CH 229

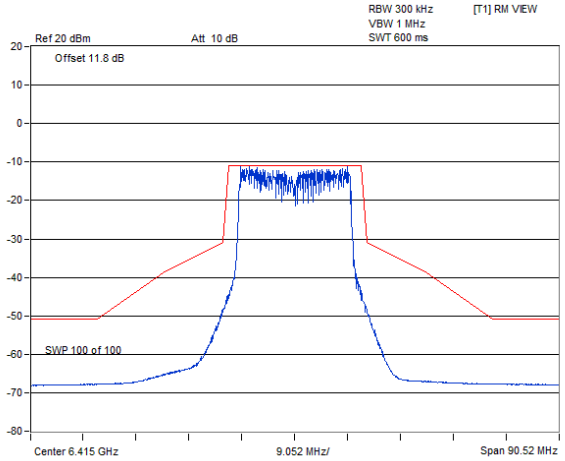
## Spectrum Plot



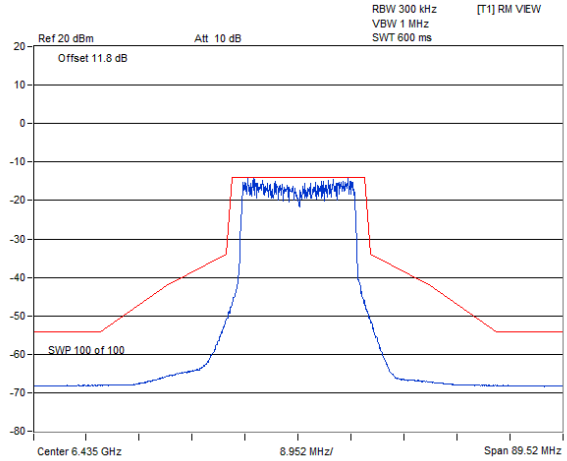

802.11ax (HE20) / Chain 3 : CH 33



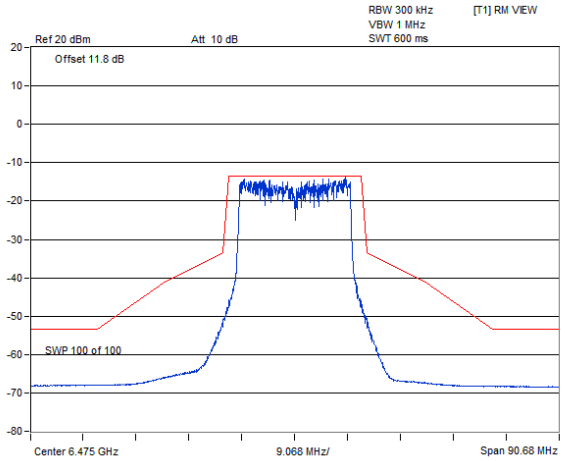

802.11ax (HE20) / Chain 3 : CH 61



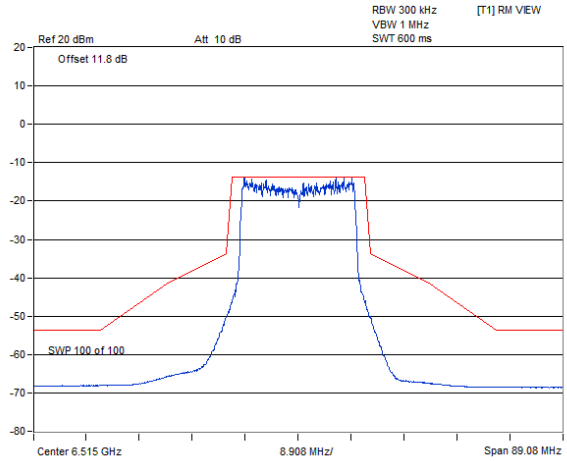

802.11ax (HE20) / Chain 3 : CH 93




802.11ax (HE20) / Chain 3 : CH 97

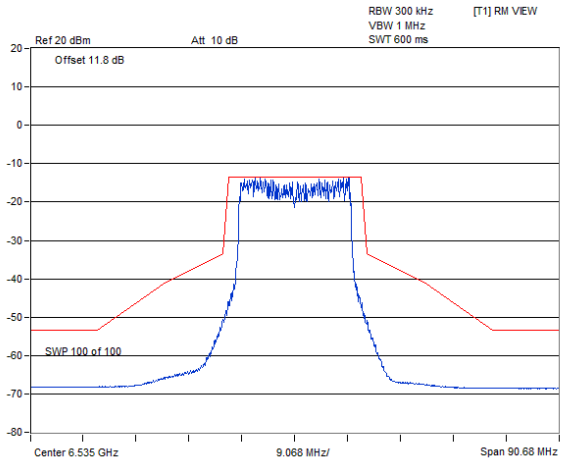



802.11ax (HE20) / Chain 3 : CH 105

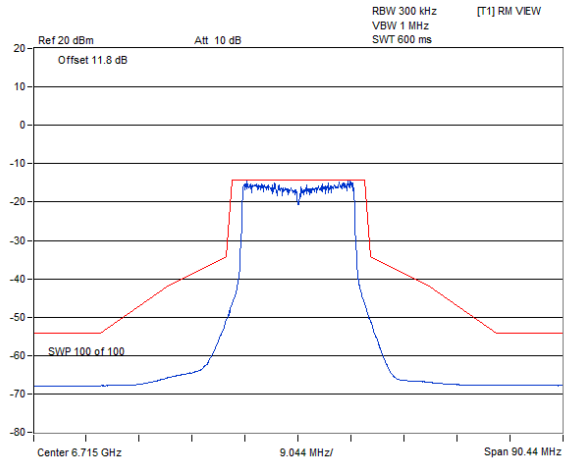



802.11ax (HE20) / Chain 3 : CH 113

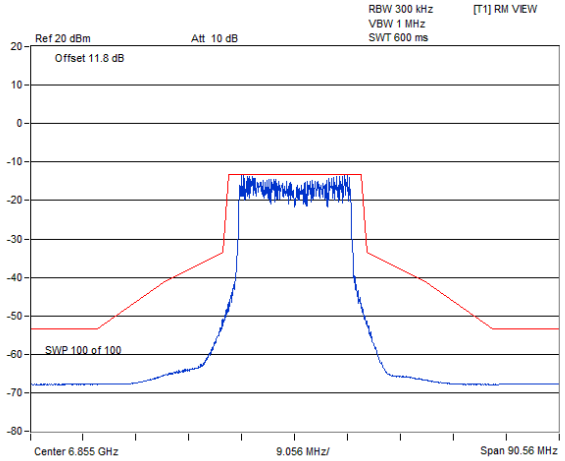
## Spectrum Plot



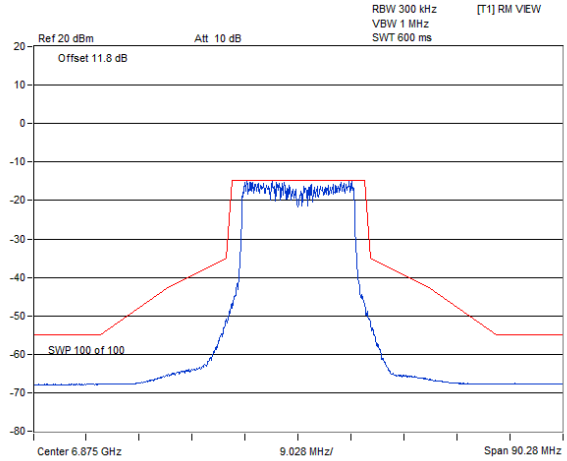

802.11ax (HE20) / Chain 3 : CH 117



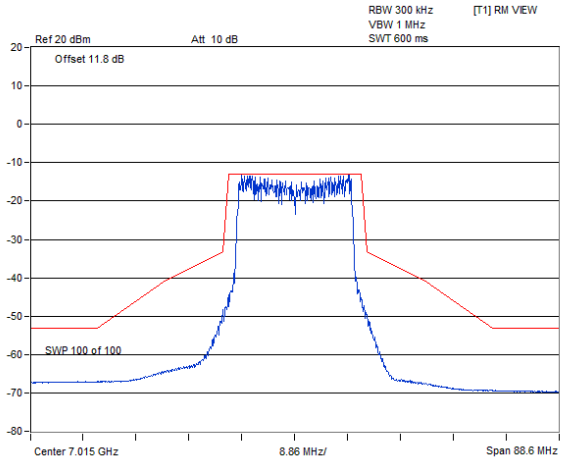

802.11ax (HE20) / Chain 3 : CH 153



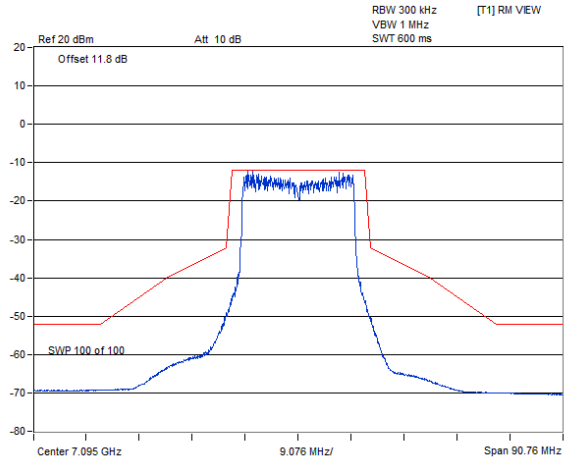

802.11ax (HE20) / Chain 3 : CH 181




802.11ax (HE20) / Chain 3 : CH 185

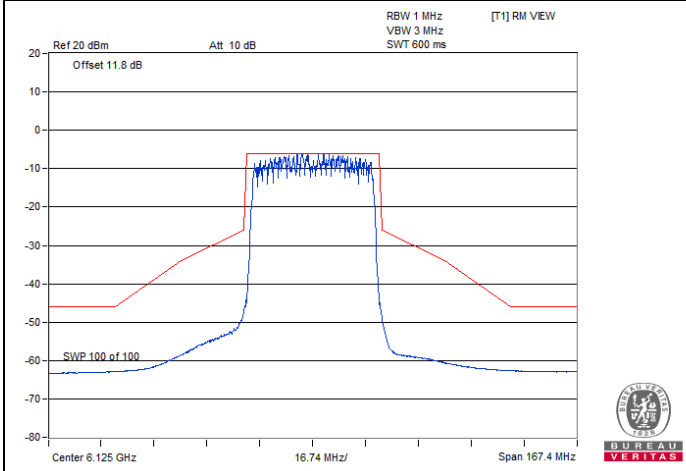
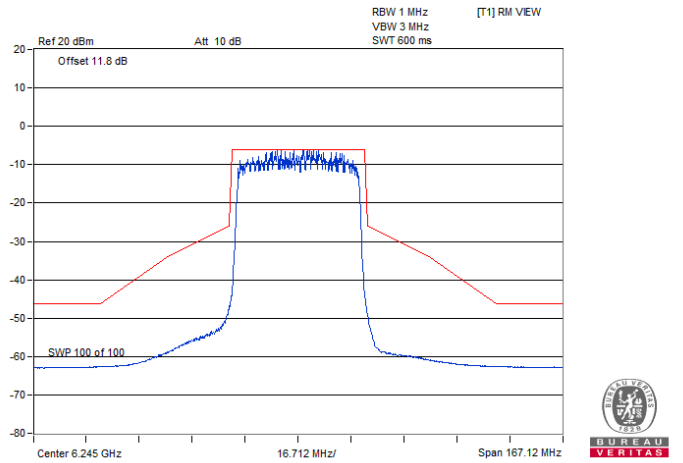
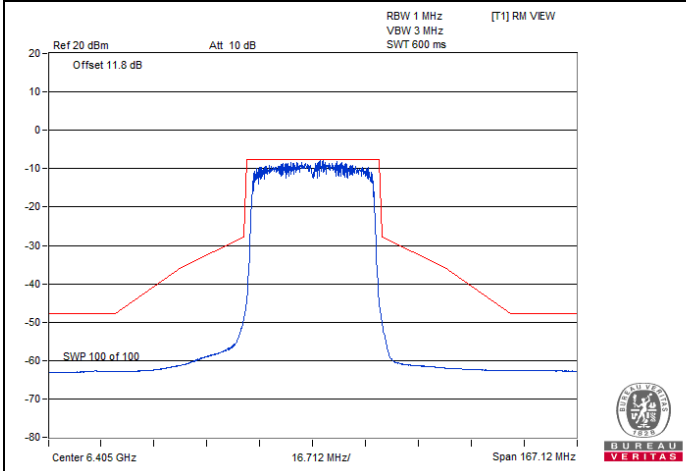
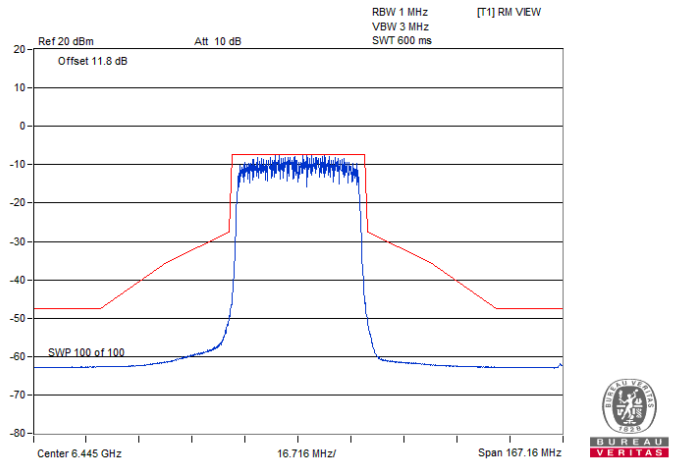
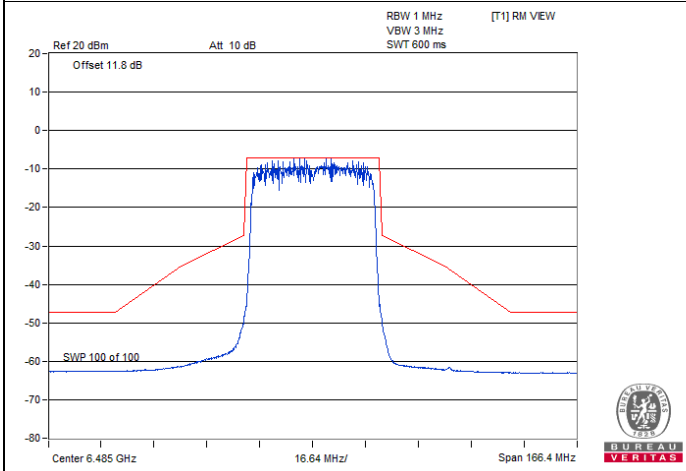
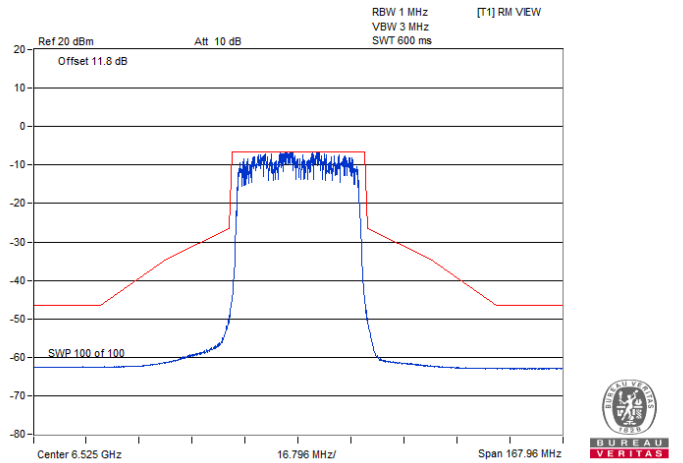



802.11ax (HE20) / Chain 3 : CH 213

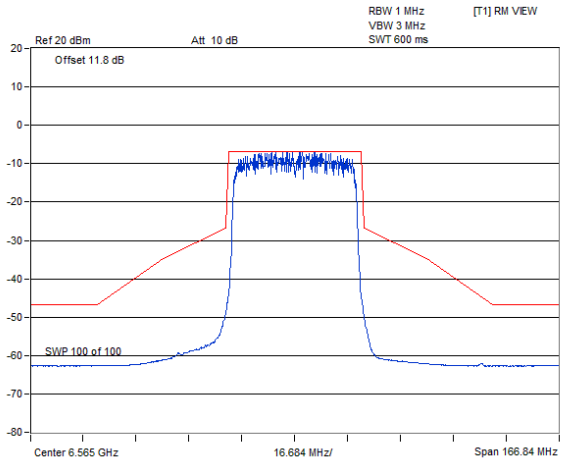



802.11ax (HE20) / Chain 3 : CH 229

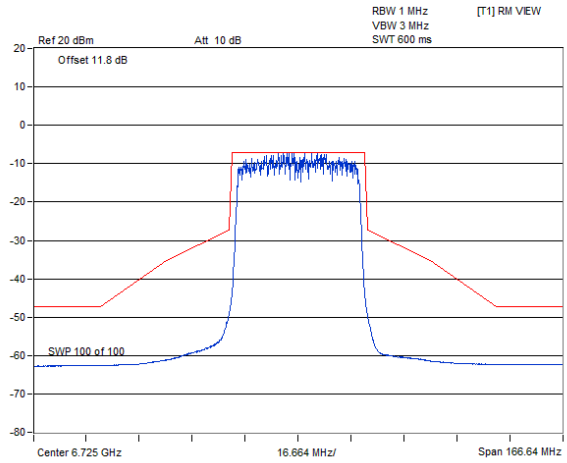
## 802.11ax (HE40)

| Spectrum Plot | |
|---|---|
|  |  |
| 802.11ax (HE40) / Chain 0 : CH 35 | 802.11ax (HE40) / Chain 0 : CH 59 |
|  |  |
| 802.11ax (HE40) / Chain 0 : CH 91 | 802.11ax (HE40) / Chain 0 : CH 99 |
|  |  |
| 802.11ax (HE40) / Chain 0 : CH 107 | 802.11ax (HE40) / Chain 0 : CH 115 |

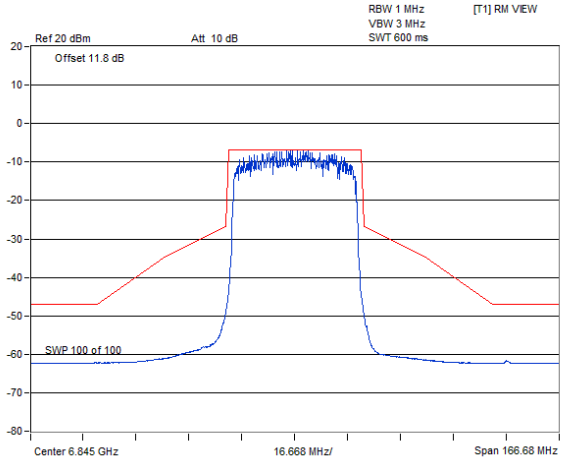
## Spectrum Plot



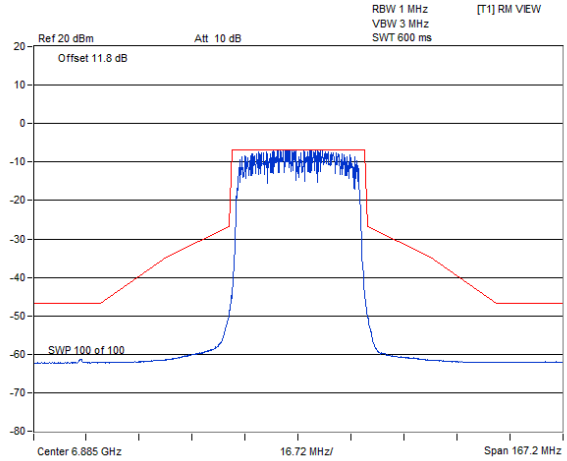

802.11ax (HE40) / Chain 0 : CH 123



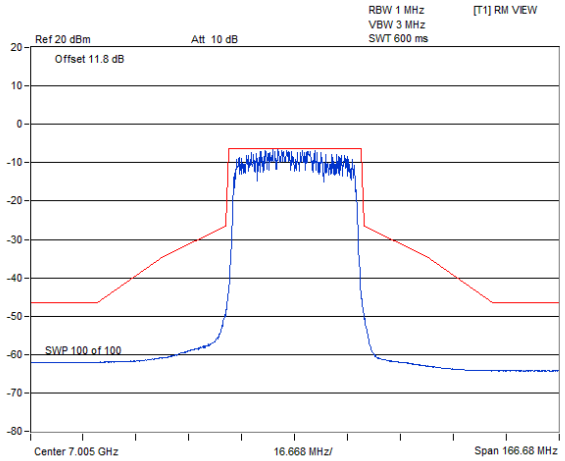

802.11ax (HE40) / Chain 0 : CH 155



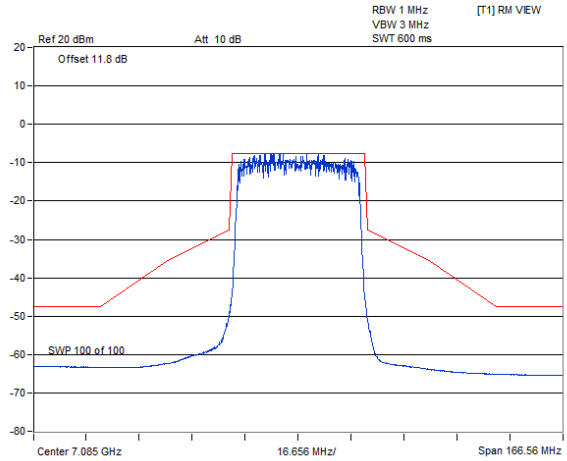

802.11ax (HE40) / Chain 0 : CH 179




802.11ax (HE40) / Chain 0 : CH 187

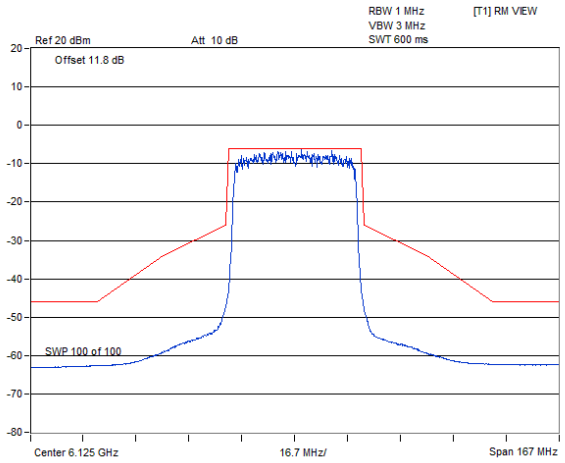



802.11ax (HE40) / Chain 0 : CH 211

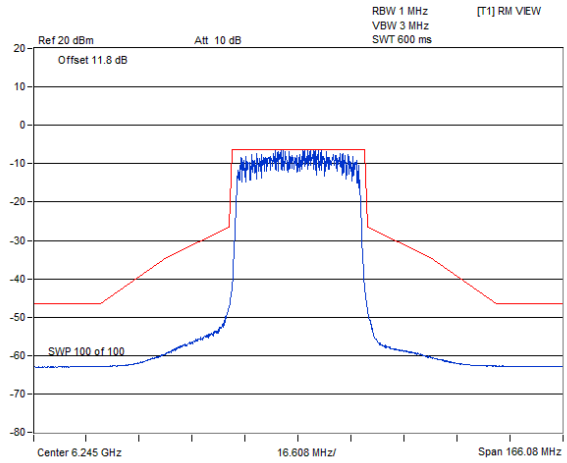



802.11ax (HE40) / Chain 0 : CH 227

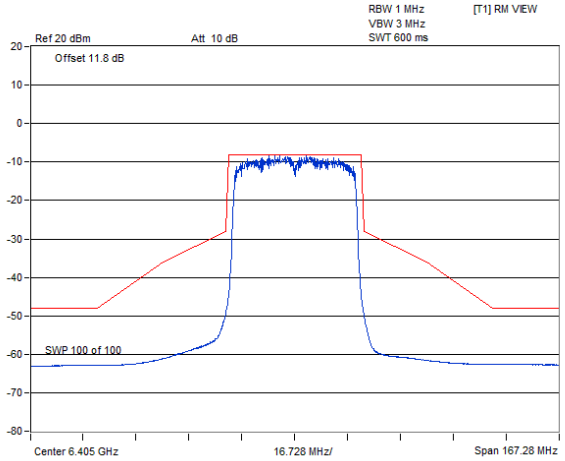
## Spectrum Plot



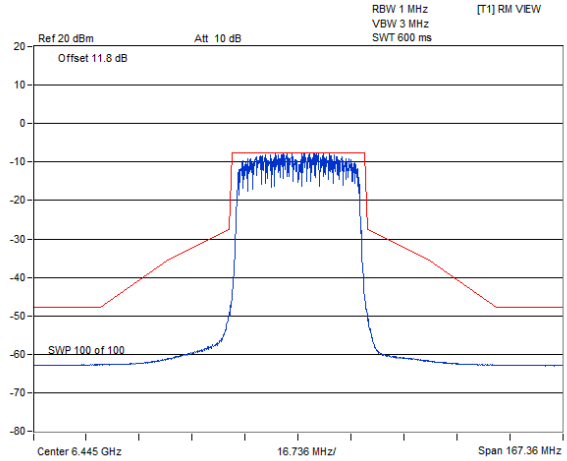

802.11ax (HE40) / Chain 1 : CH 35



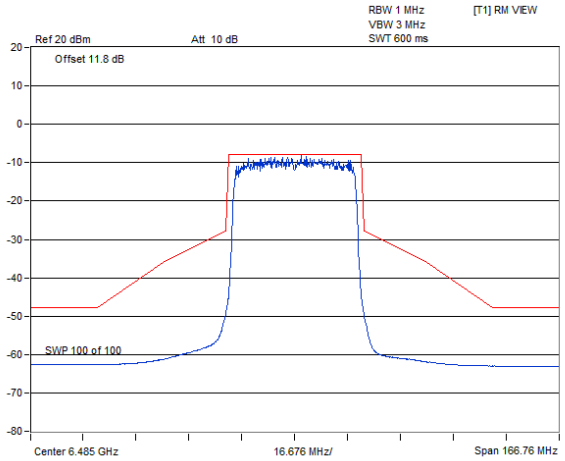

802.11ax (HE40) / Chain 1 : CH 59



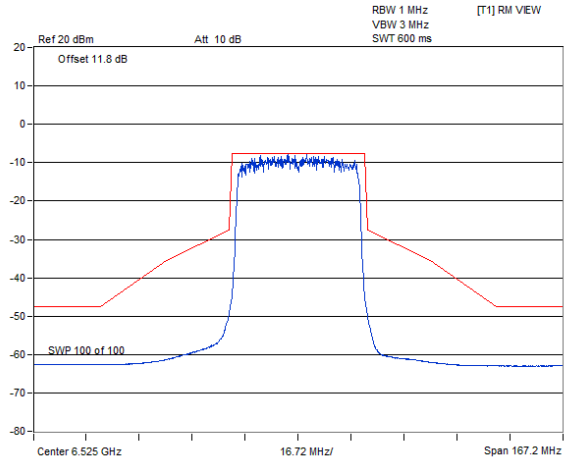

802.11ax (HE40) / Chain 1 : CH 91




802.11ax (HE40) / Chain 1 : CH 99

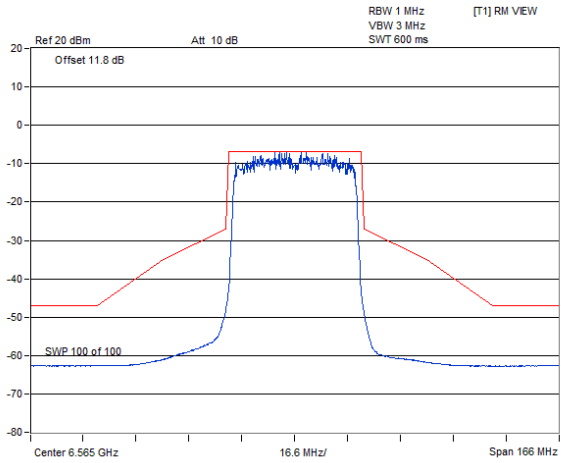



802.11ax (HE40) / Chain 1 : CH 107

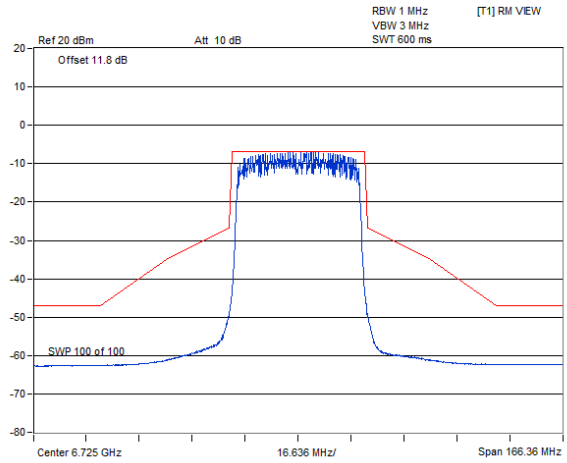



802.11ax (HE40) / Chain 1 : CH 115

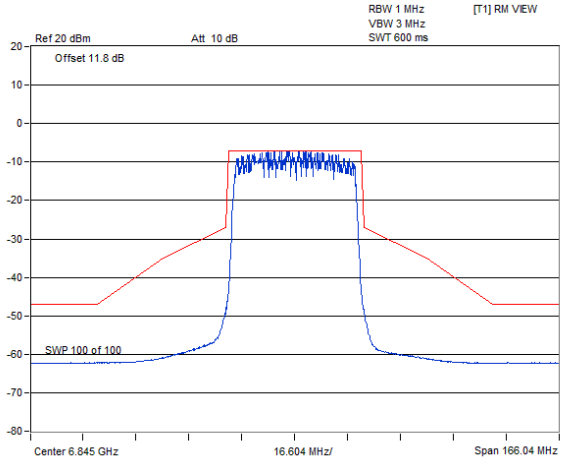
## Spectrum Plot



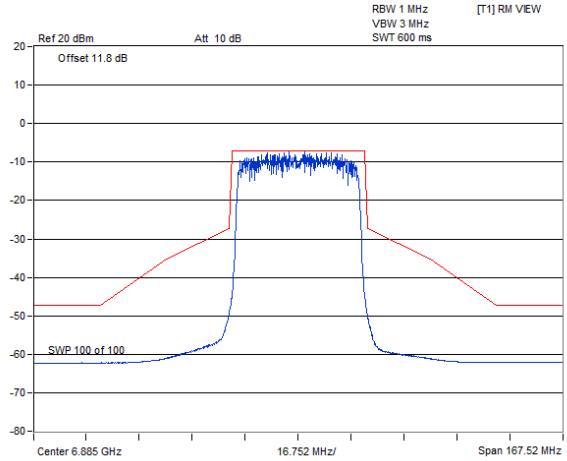

802.11ax (HE40) / Chain 1 : CH 123



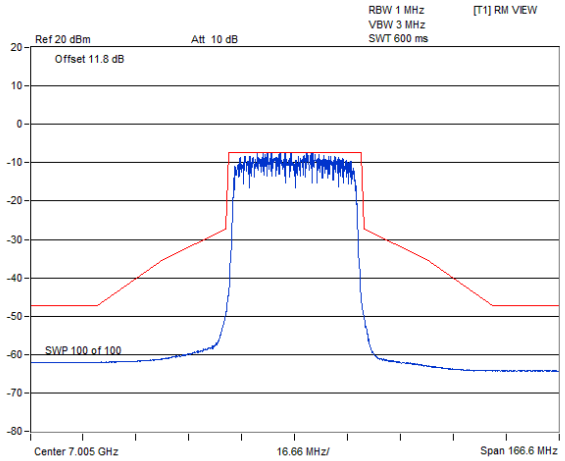

802.11ax (HE40) / Chain 1 : CH 155



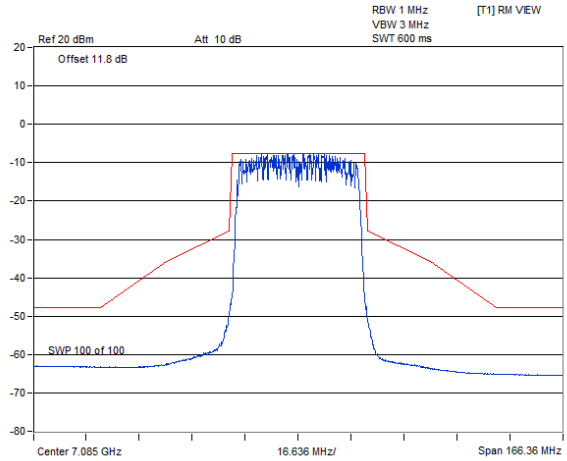

802.11ax (HE40) / Chain 1 : CH 179




802.11ax (HE40) / Chain 1 : CH 187

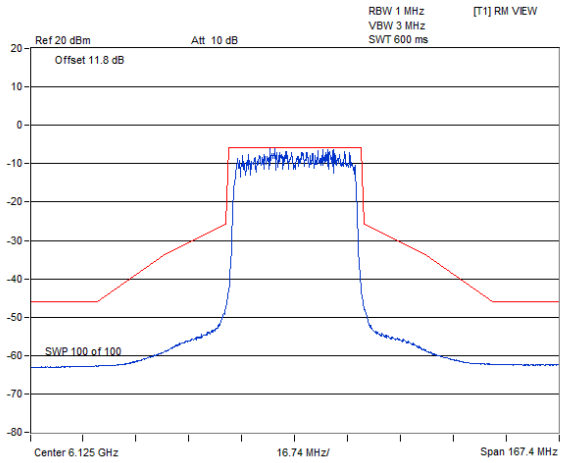



802.11ax (HE40) / Chain 1 : CH 211

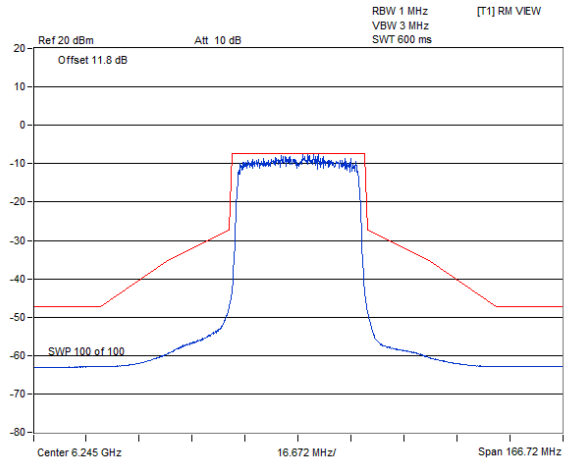



802.11ax (HE40) / Chain 1 : CH 227

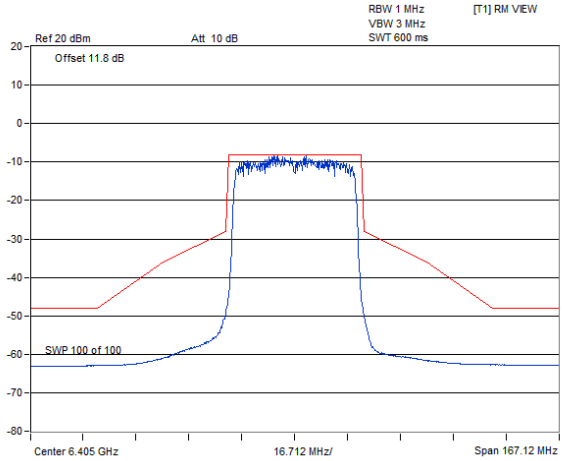
## Spectrum Plot



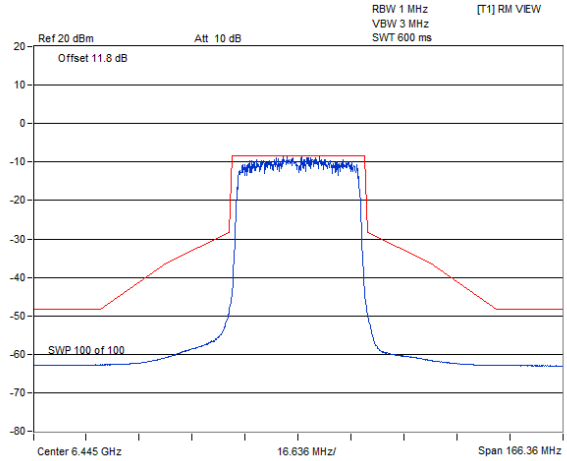

802.11ax (HE40) / Chain 2 : CH 35



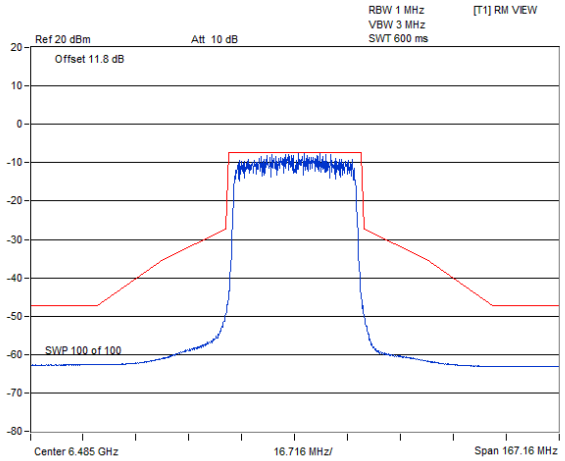

802.11ax (HE40) / Chain 2 : CH 59



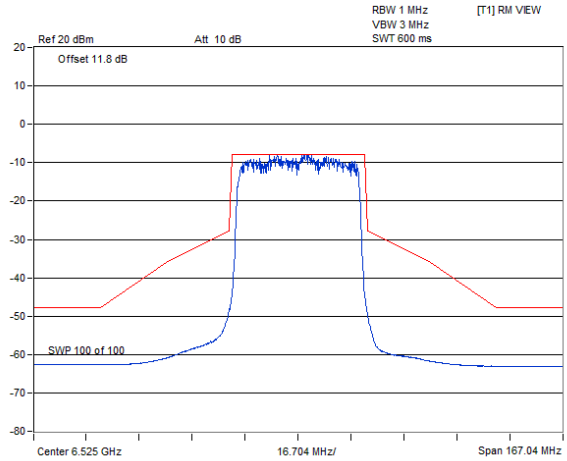

802.11ax (HE40) / Chain 2 : CH 91




802.11ax (HE40) / Chain 2 : CH 99

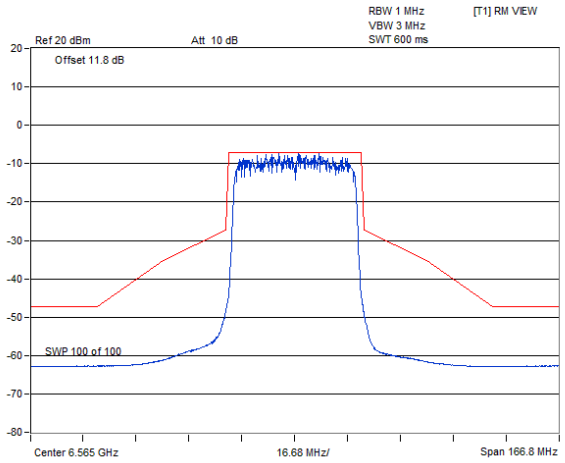



802.11ax (HE40) / Chain 2 : CH 107

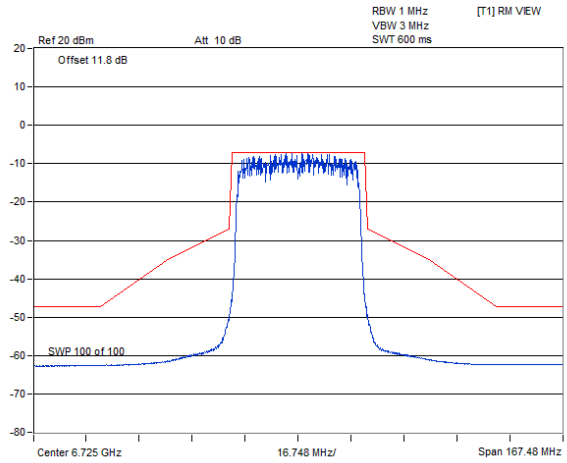



802.11ax (HE40) / Chain 2 : CH 115

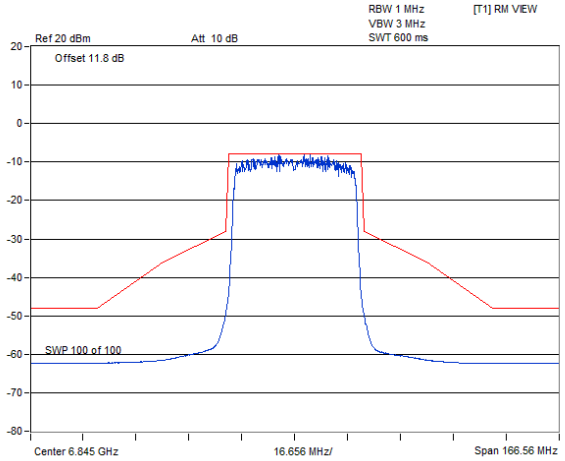
## Spectrum Plot



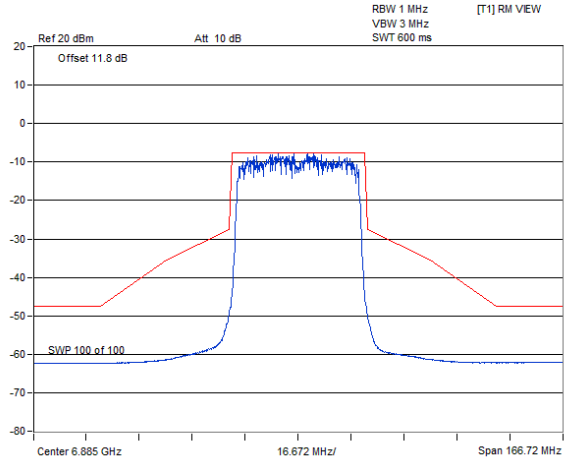

802.11ax (HE40) / Chain 2 : CH 123



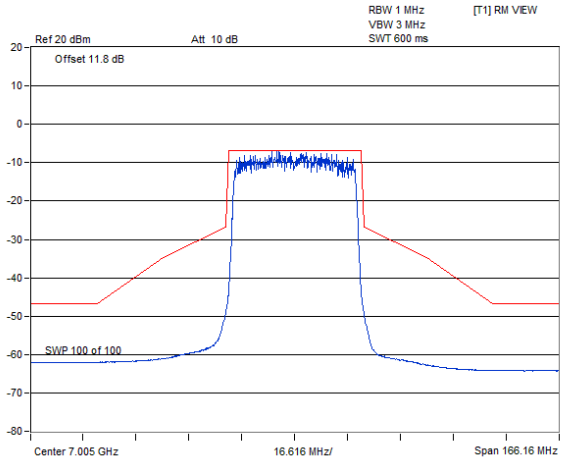

802.11ax (HE40) / Chain 2 : CH 155



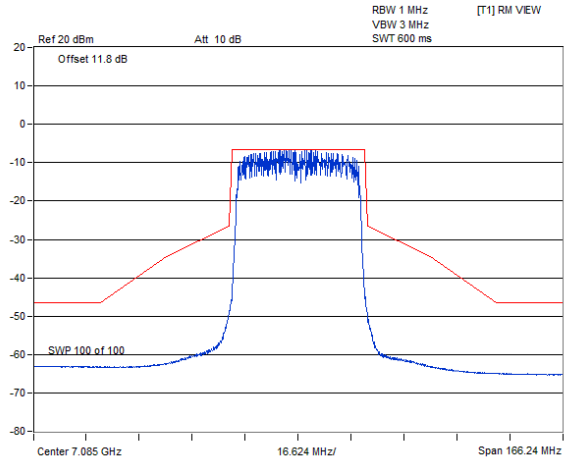

802.11ax (HE40) / Chain 2 : CH 179




802.11ax (HE40) / Chain 2 : CH 187

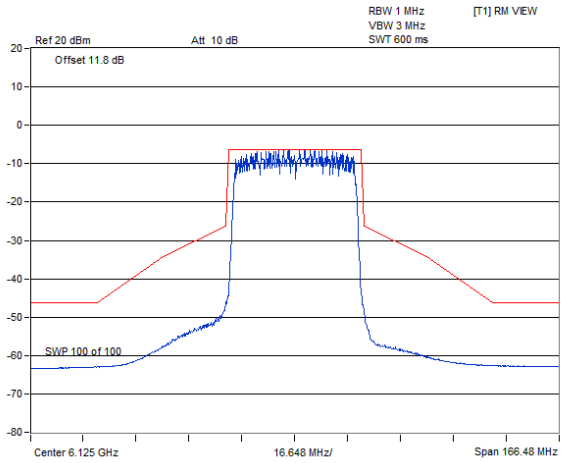



802.11ax (HE40) / Chain 2 : CH 211

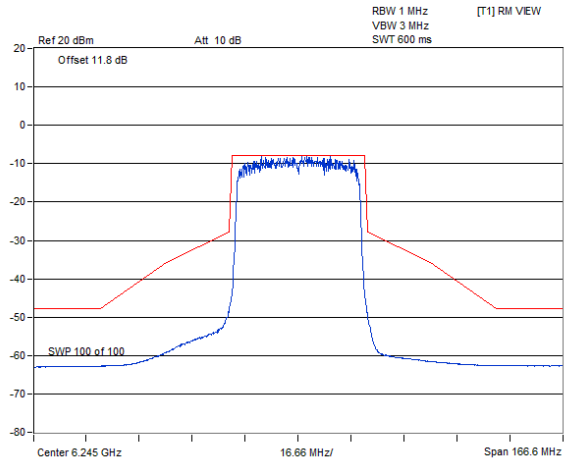



802.11ax (HE40) / Chain 2 : CH 227

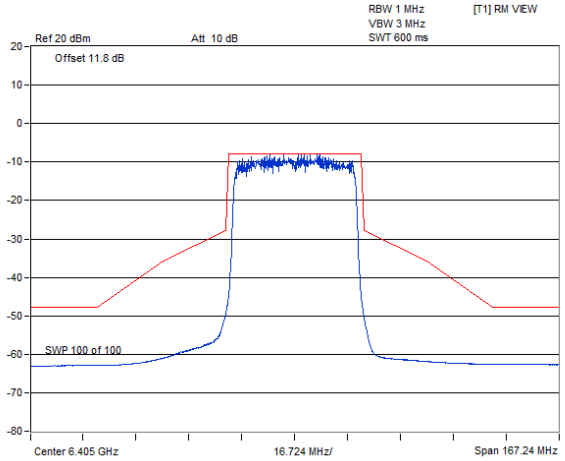
## Spectrum Plot



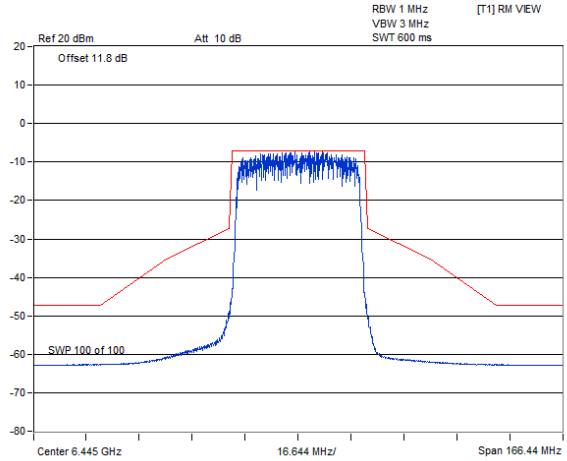

802.11ax (HE40) / Chain 3 : CH 35



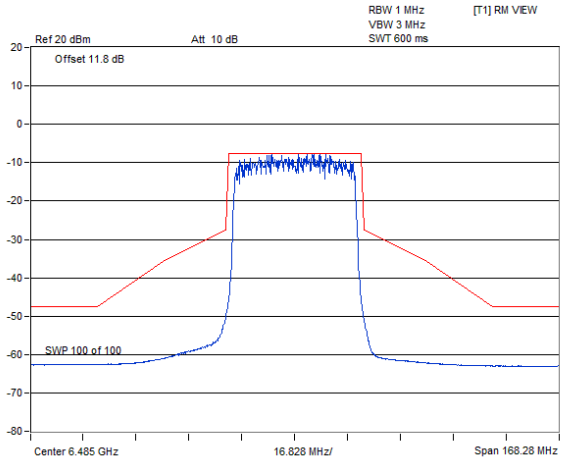

802.11ax (HE40) / Chain 3 : CH 59



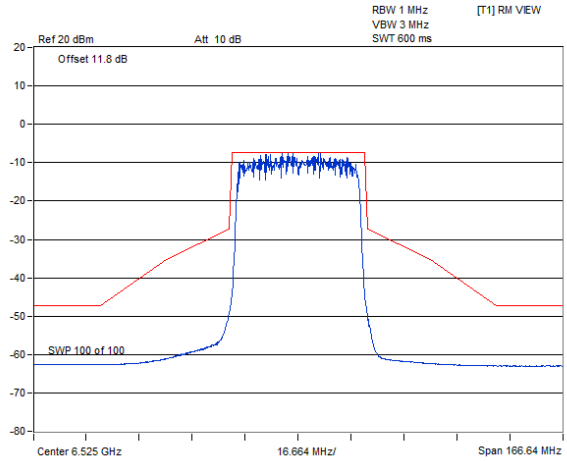

802.11ax (HE40) / Chain 3 : CH 91




802.11ax (HE40) / Chain 3 : CH 99

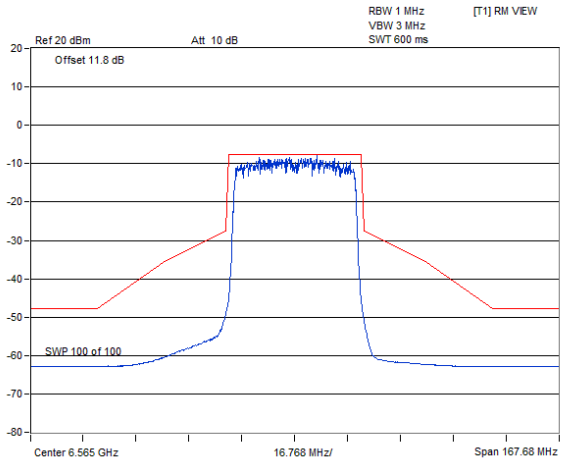



802.11ax (HE40) / Chain 3 : CH 107

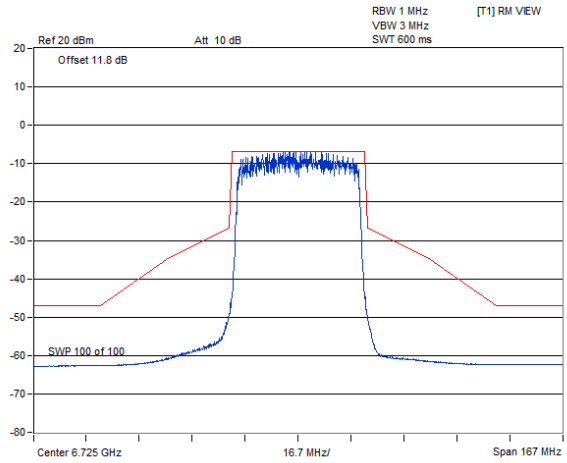



802.11ax (HE40) / Chain 3 : CH 115

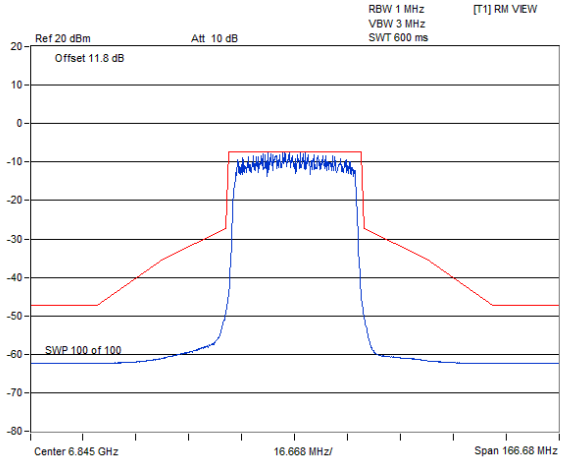
## Spectrum Plot



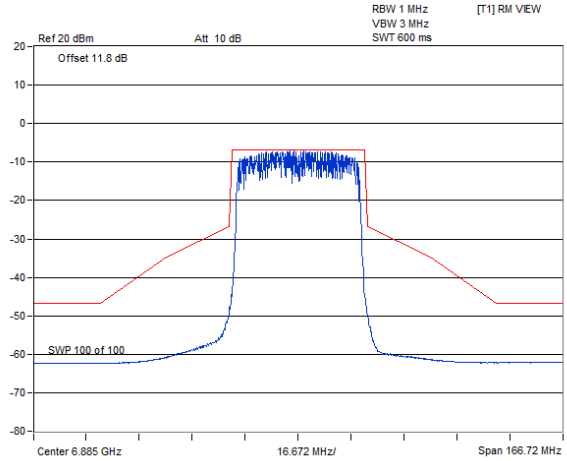

802.11ax (HE40) / Chain 3 : CH 123



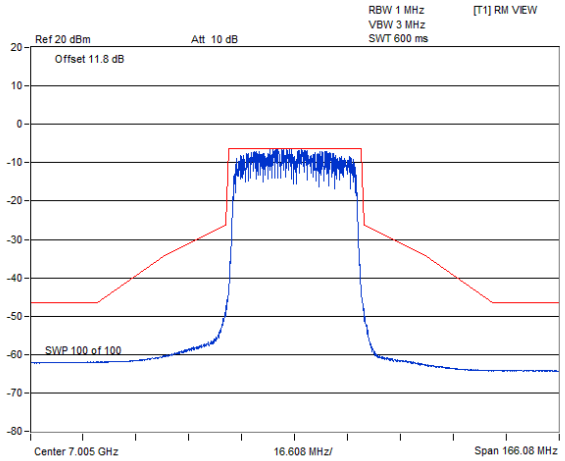

802.11ax (HE40) / Chain 3 : CH 155



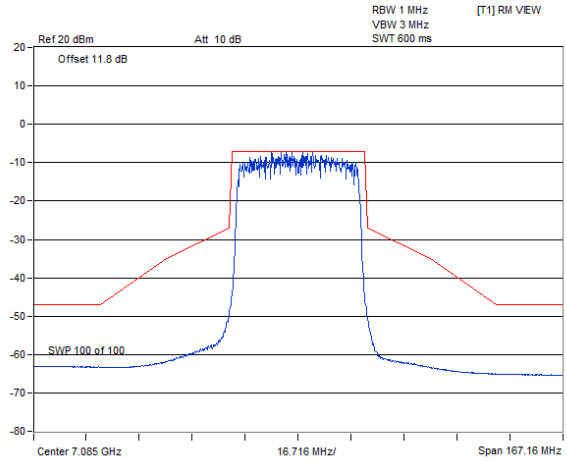

802.11ax (HE40) / Chain 3 : CH 179




802.11ax (HE40) / Chain 3 : CH 187

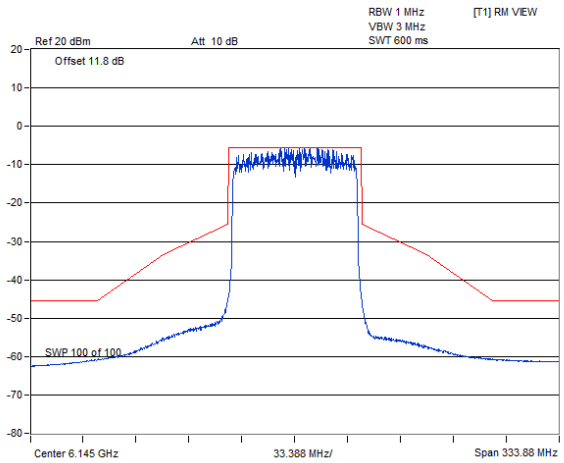
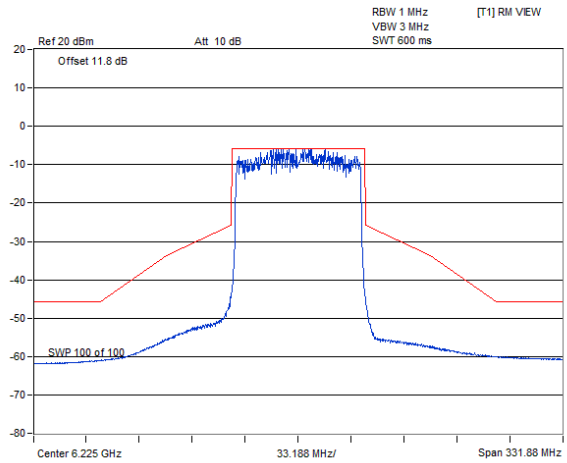
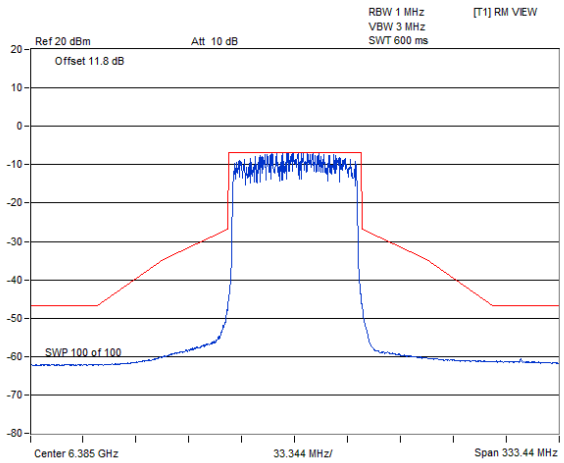
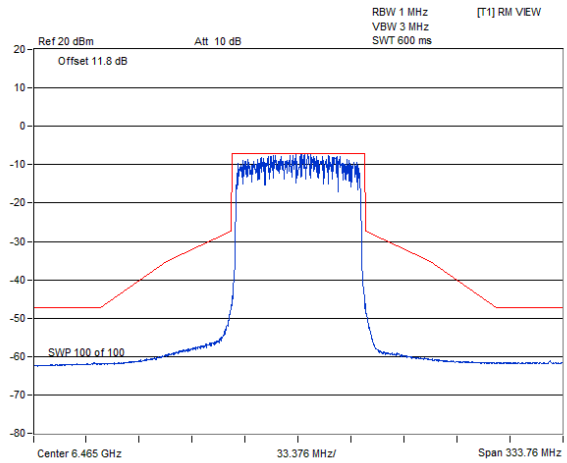
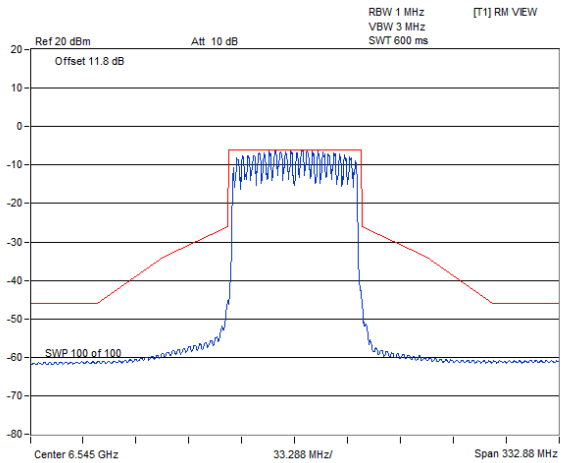
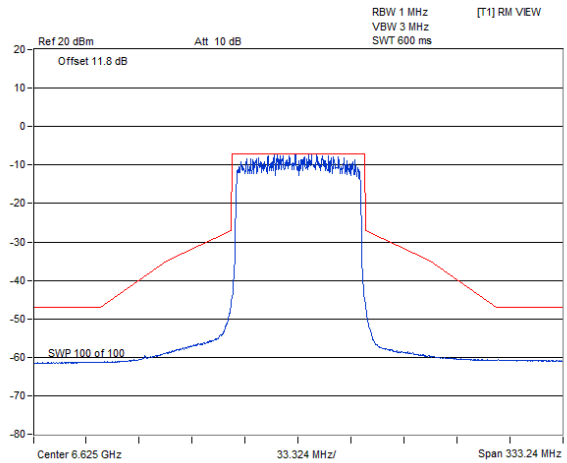



802.11ax (HE40) / Chain 3 : CH 211

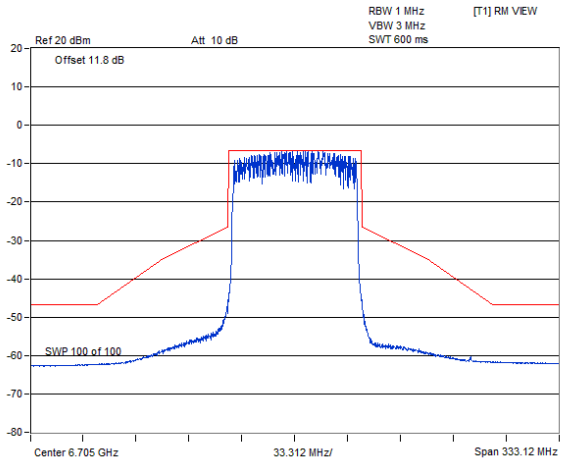



802.11ax (HE40) / Chain 3 : CH 227

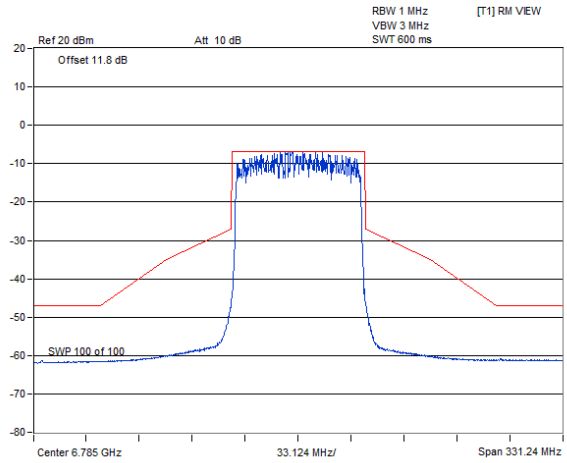
## 802.11ax (HE80)

| Spectrum Plot | |
|---|---|
|  |  |
| 802.11ax (HE80) / Chain 0 : CH 39 | 802.11ax (HE80) / Chain 0 : CH 55 |
|  |  |
| 802.11ax (HE80) / Chain 0 : CH 87 | 802.11ax (HE80) / Chain 0 : CH 103 |
|  |  |
| 802.11ax (HE80) / Chain 0 : CH 119 | 802.11ax (HE80) / Chain 0 : CH 135 |

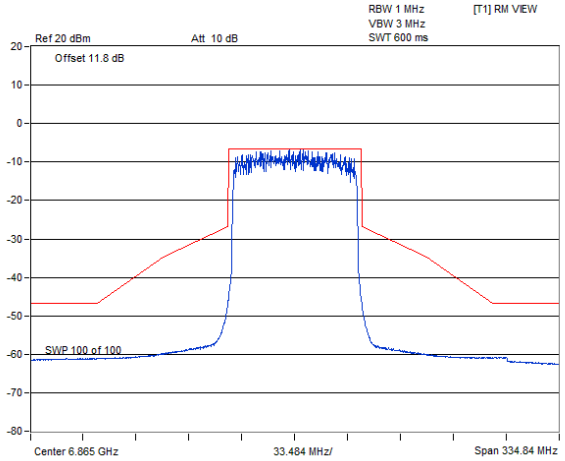
## Spectrum Plot



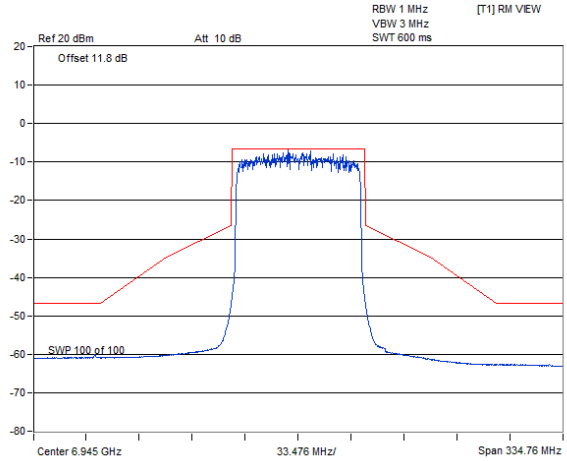

802.11ax (HE80) / Chain 0 : CH 151



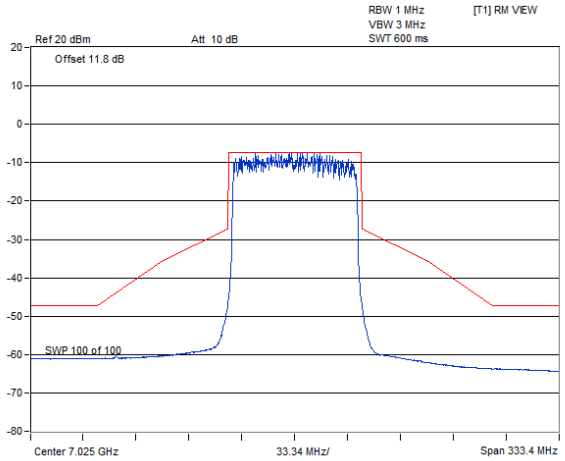

802.11ax (HE80) / Chain 0 : CH 167



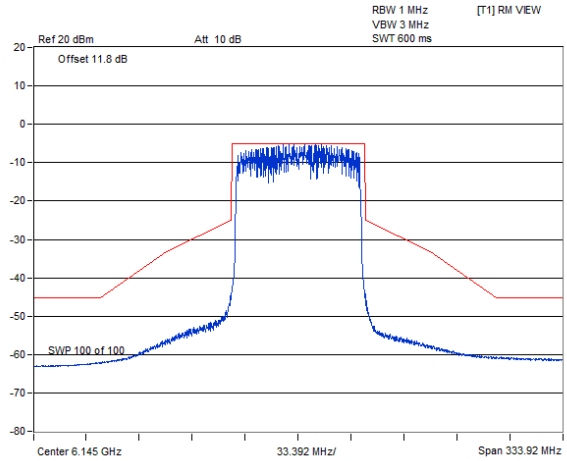

802.11ax (HE80) / Chain 0 : CH 183




802.11ax (HE80) / Chain 0 : CH 199

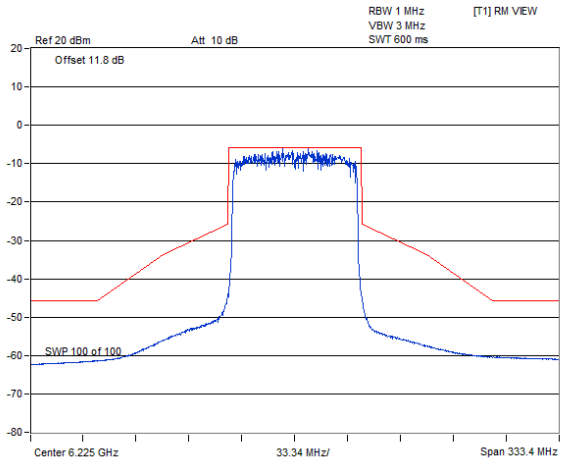



802.11ax (HE80) / Chain 0 : CH 215

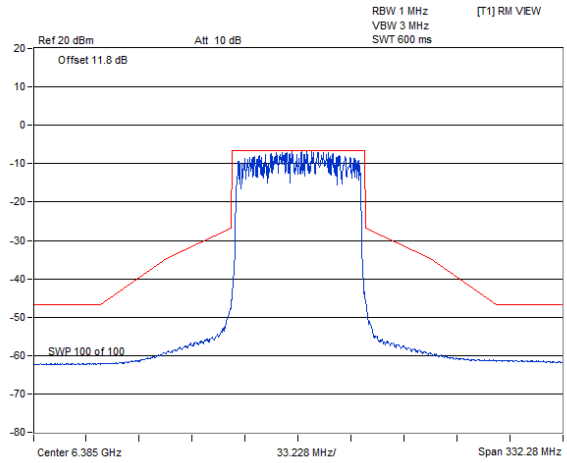



802.11ax (HE80) / Chain 1 : CH 39

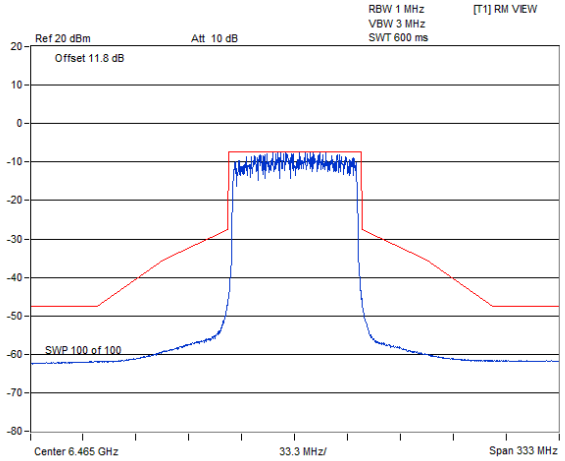
## Spectrum Plot



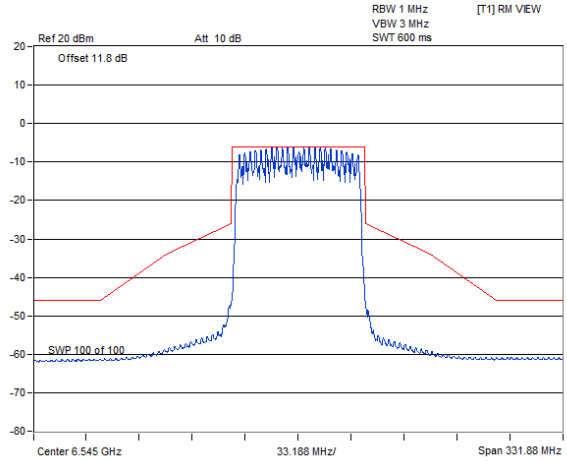

802.11ax (HE80) / Chain 1 : CH 55



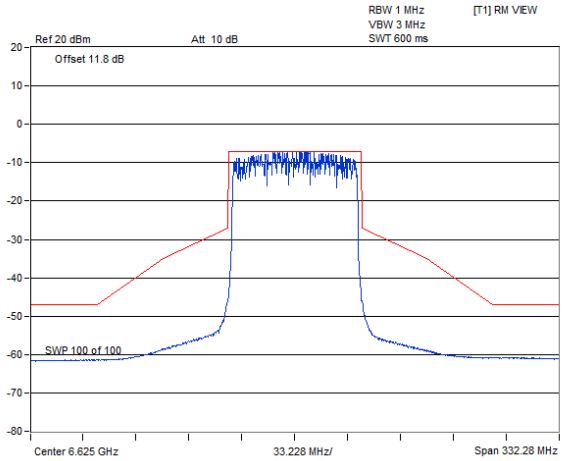

802.11ax (HE80) / Chain 1 : CH 87



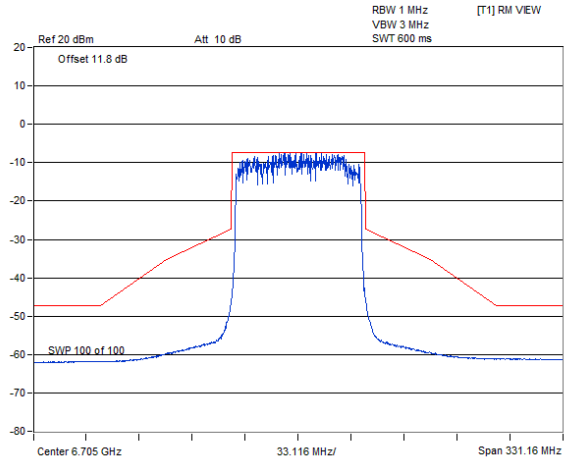

802.11ax (HE80) / Chain 1 : CH 103




802.11ax (HE80) / Chain 1 : CH 119

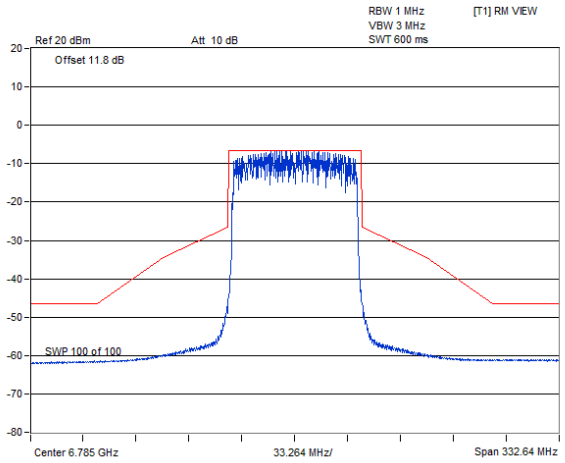



802.11ax (HE80) / Chain 1 : CH 135

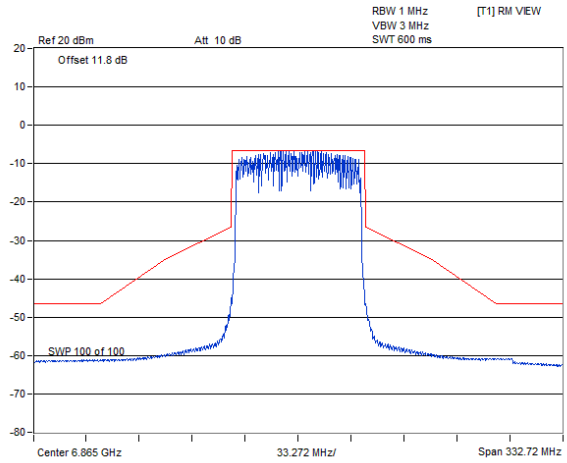



802.11ax (HE80) / Chain 1 : CH 151

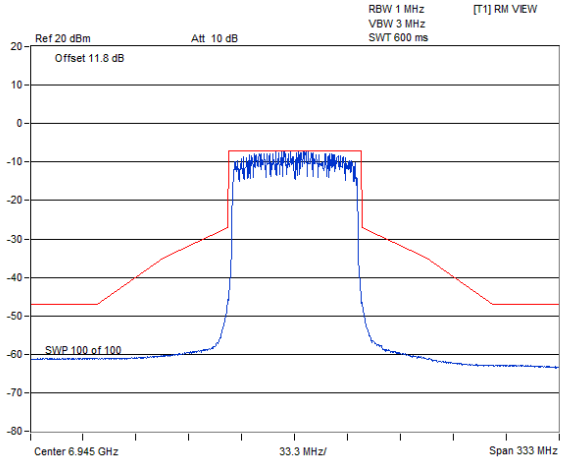
## Spectrum Plot



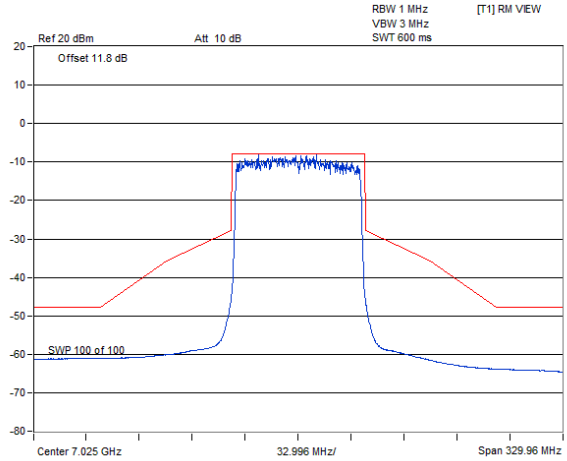

802.11ax (HE80) / Chain 1 : CH 167



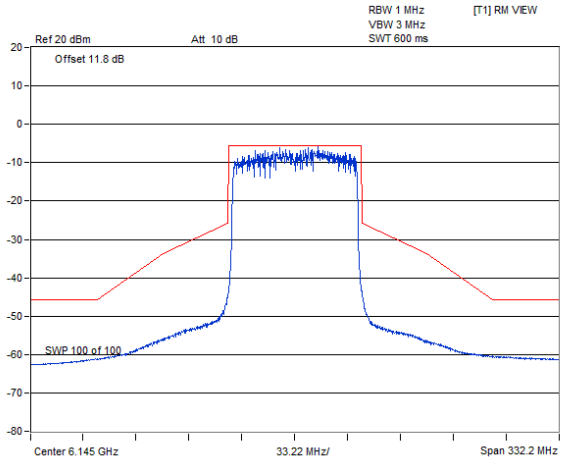

802.11ax (HE80) / Chain 1 : CH 183



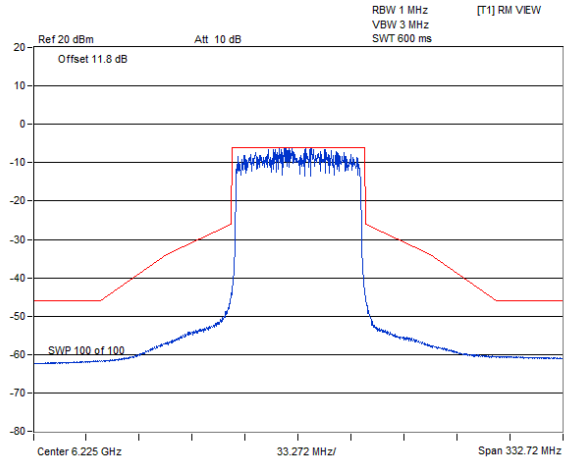

802.11ax (HE80) / Chain 1 : CH 199




802.11ax (HE80) / Chain 1 : CH 215

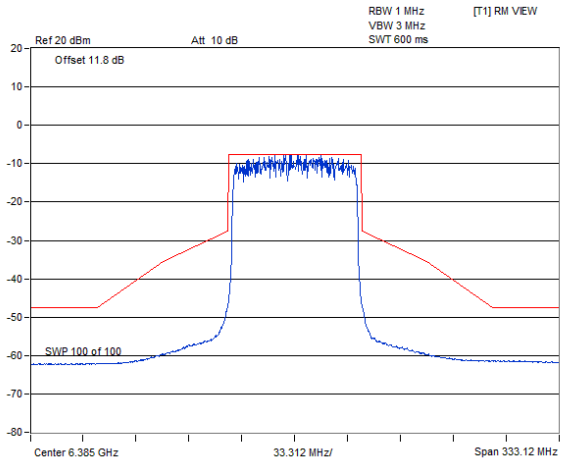



802.11ax (HE80) / Chain 2 : CH 39

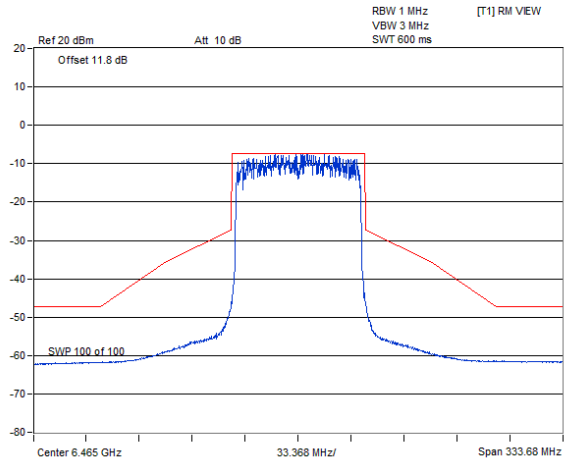



802.11ax (HE80) / Chain 2 : CH 55

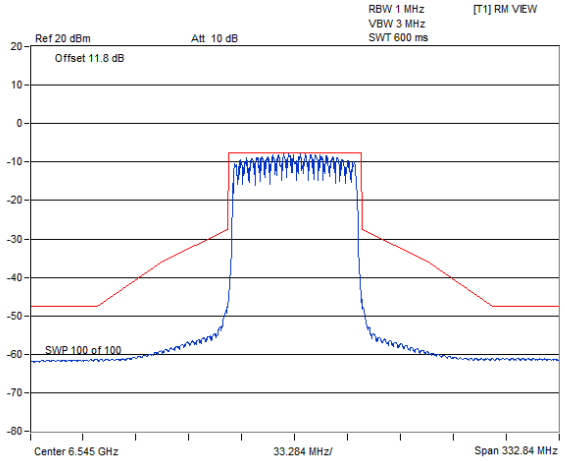
## Spectrum Plot



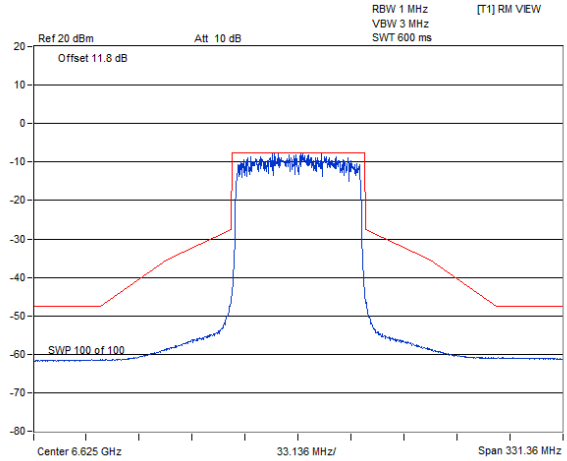

802.11ax (HE80) / Chain 2 : CH 87



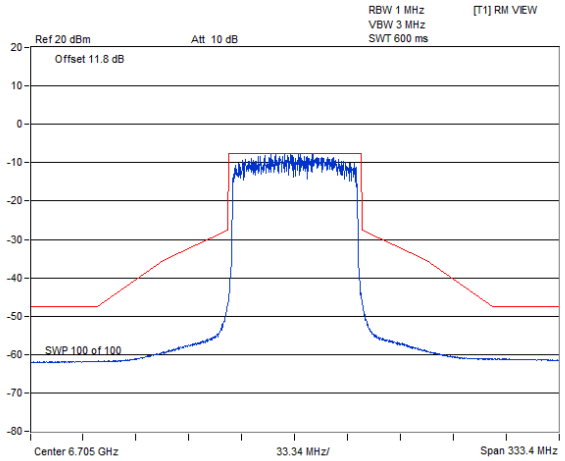

802.11ax (HE80) / Chain 2 : CH 103



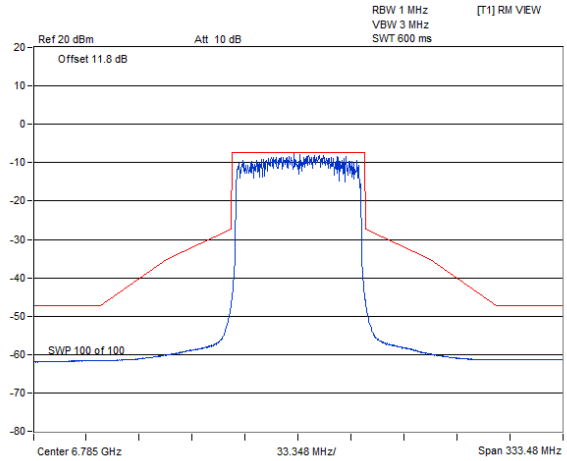

802.11ax (HE80) / Chain 2 : CH 119




802.11ax (HE80) / Chain 2 : CH 135

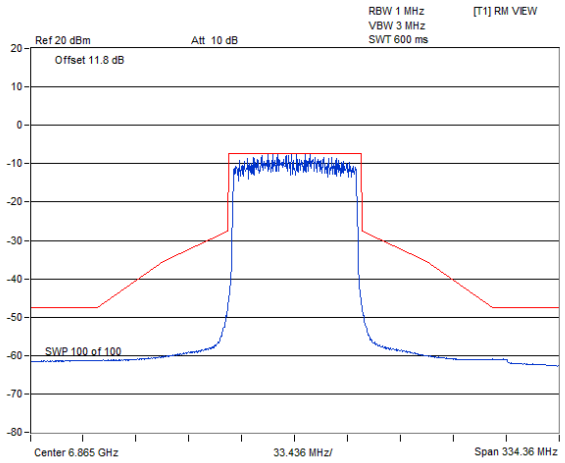



802.11ax (HE80) / Chain 2 : CH 151

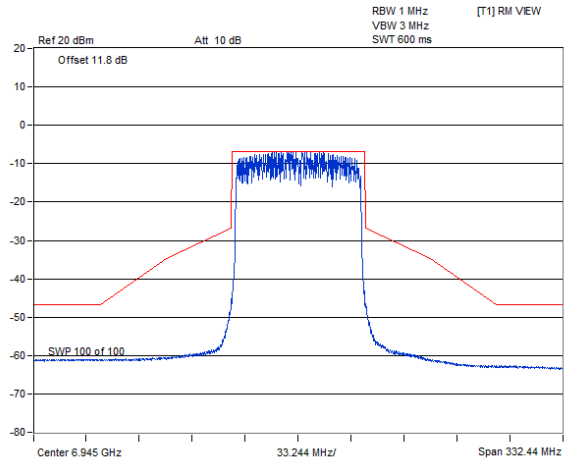



802.11ax (HE80) / Chain 2 : CH 167

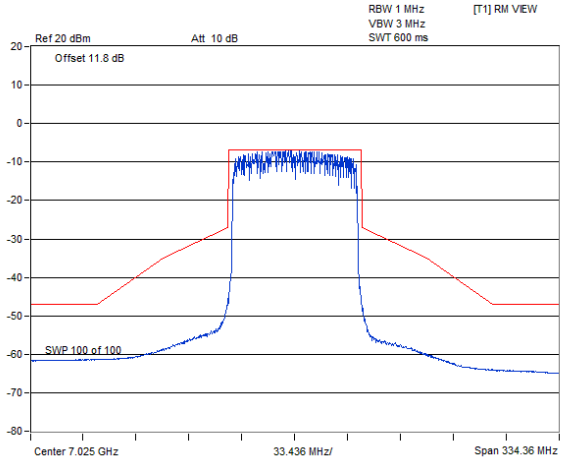
## Spectrum Plot



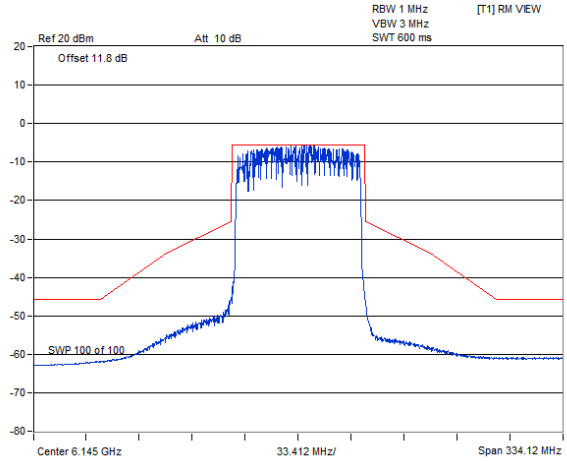

802.11ax (HE80) / Chain 2 : CH 183



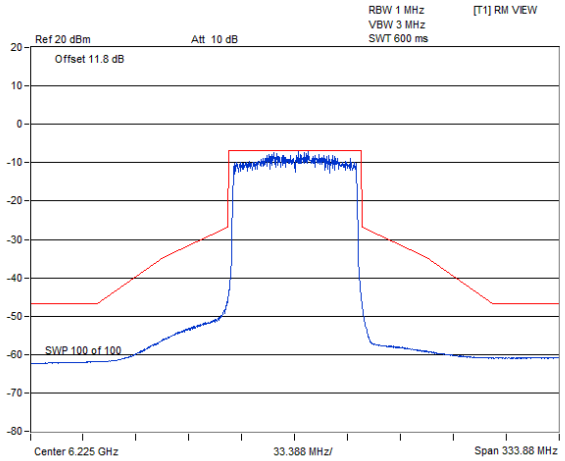

802.11ax (HE80) / Chain 2 : CH 199



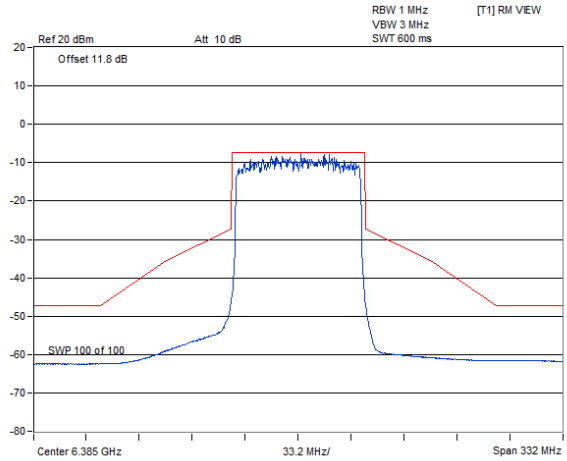

802.11ax (HE80) / Chain 2 : CH 215




802.11ax (HE80) / Chain 3 : CH 39

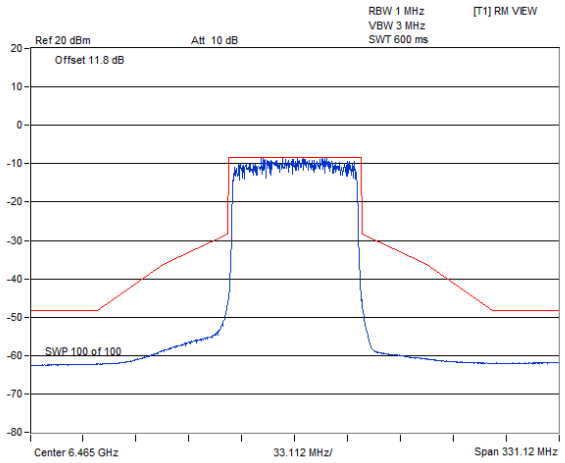



802.11ax (HE80) / Chain 3 : CH 55

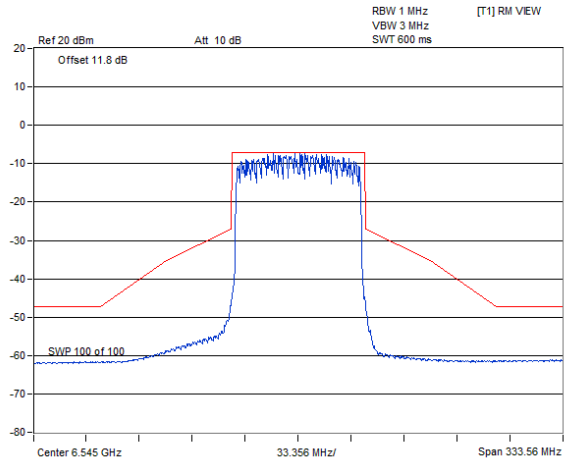



802.11ax (HE80) / Chain 3 : CH 87

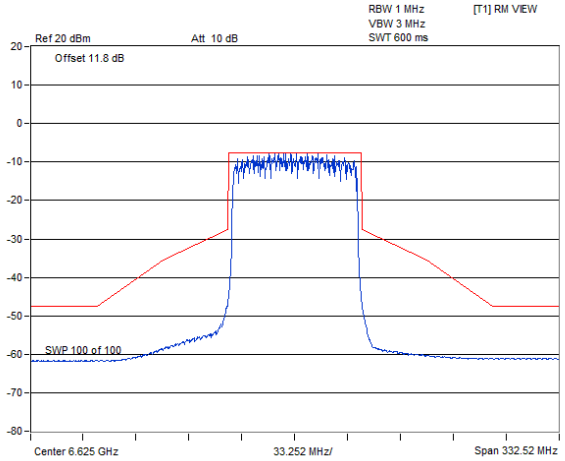
## Spectrum Plot



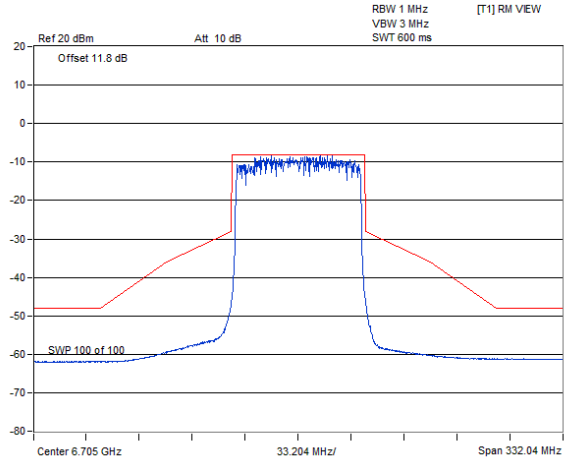

802.11ax (HE80) / Chain 3 : CH 103



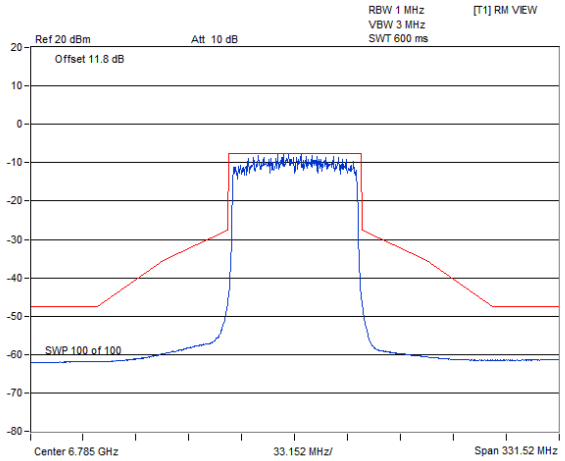

802.11ax (HE80) / Chain 3 : CH 119



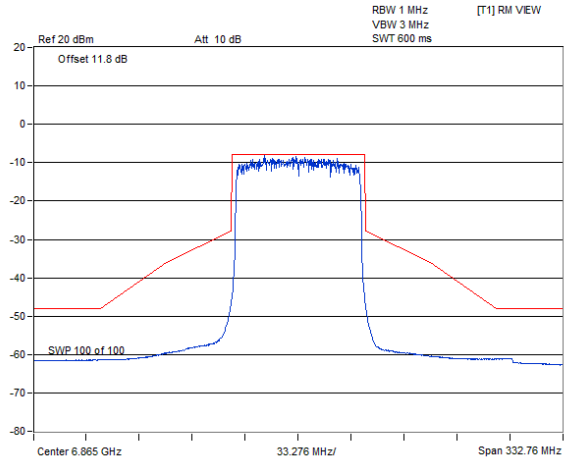

802.11ax (HE80) / Chain 3 : CH 135




802.11ax (HE80) / Chain 3 : CH 151

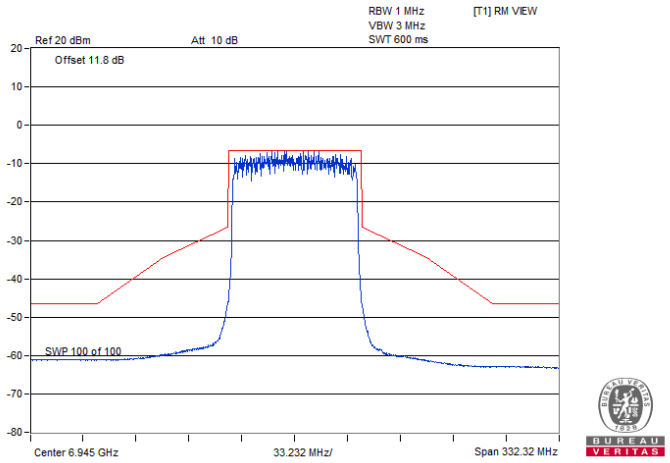



802.11ax (HE80) / Chain 3 : CH 167

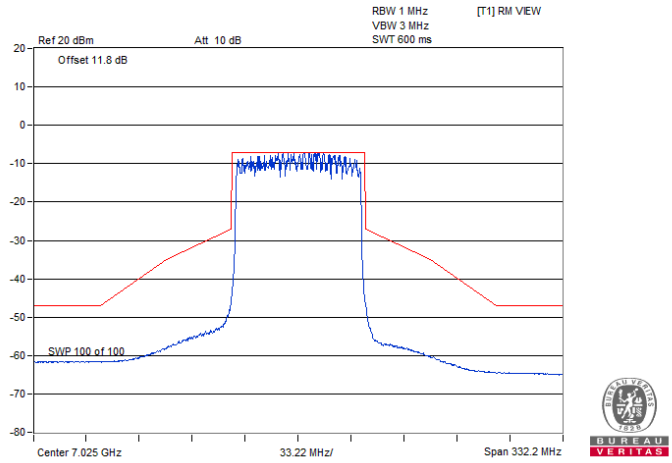



802.11ax (HE80) / Chain 3 : CH 183

## Spectrum Plot

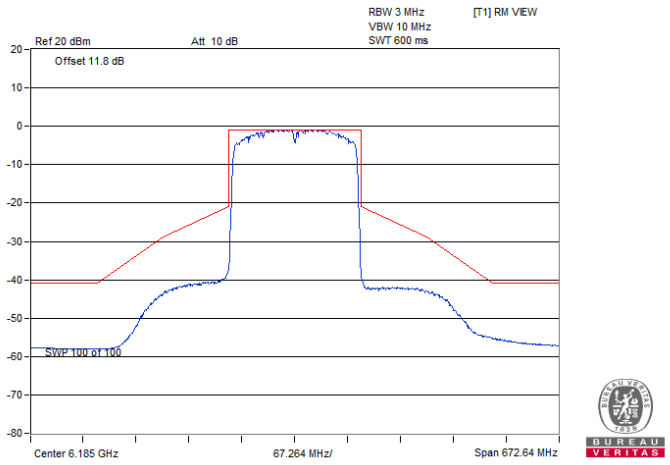
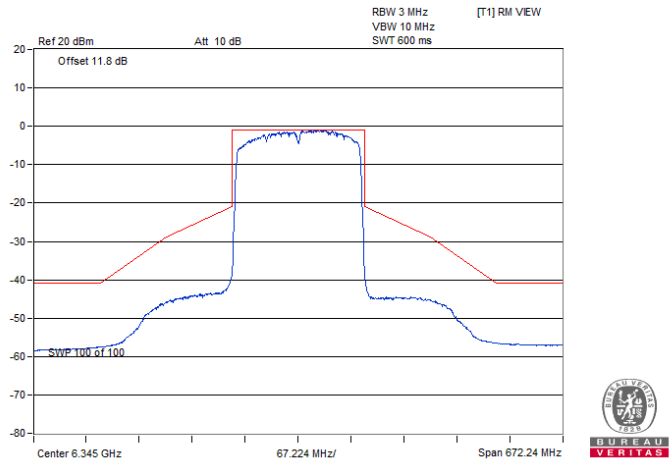
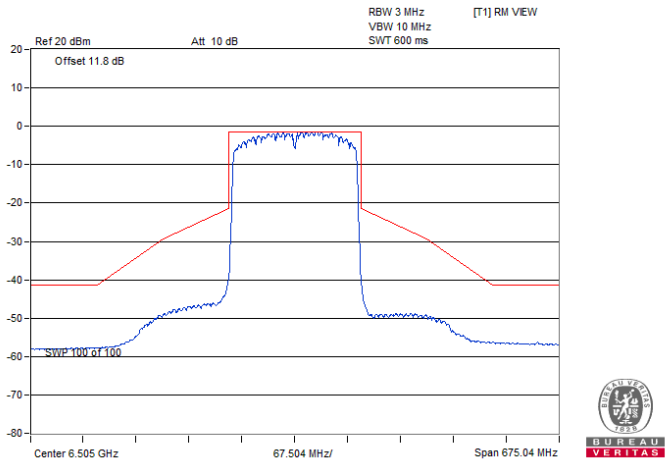
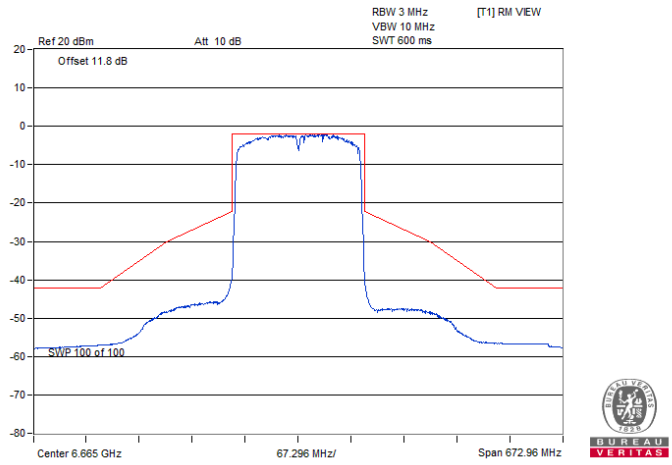
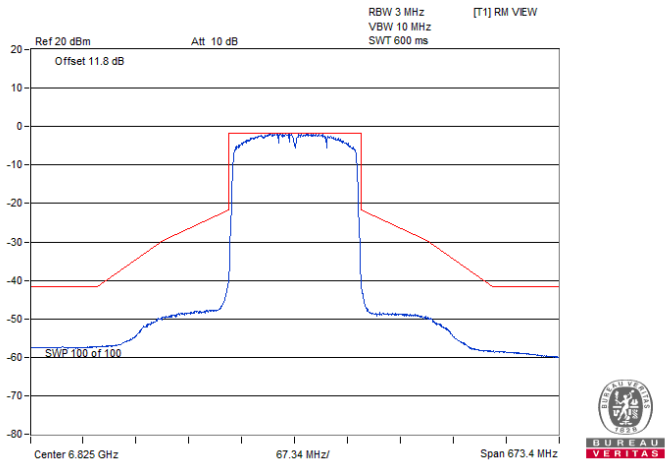
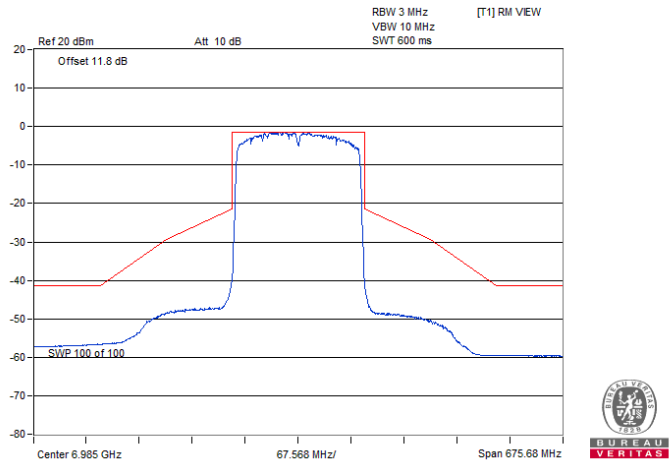



802.11ax (HE80) / Chain 3 : CH 199

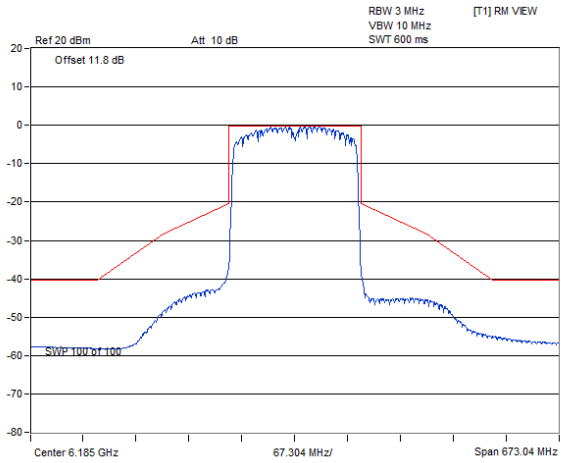



802.11ax (HE80) / Chain 3 : CH 215

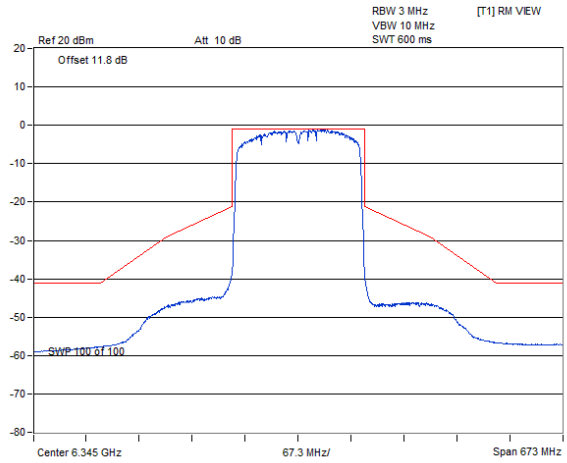
## 802.11ax (HE160)

| Spectrum Plot | |
|---|---|
|  |  |
| 802.11ax (HE160) / Chain 0 : CH 47 | 802.11ax (HE160) / Chain 0 : CH 79 |
|  |  |
| 802.11ax (HE160) / Chain 0 : CH 111 | 802.11ax (HE160) / Chain 0 : CH 143 |
|  |  |
| 802.11ax (HE160) / Chain 0 : CH 175 | 802.11ax (HE160) / Chain 0 : CH 207 |

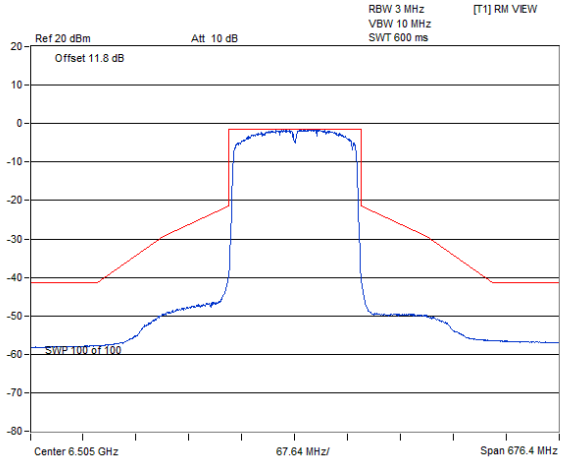
## Spectrum Plot



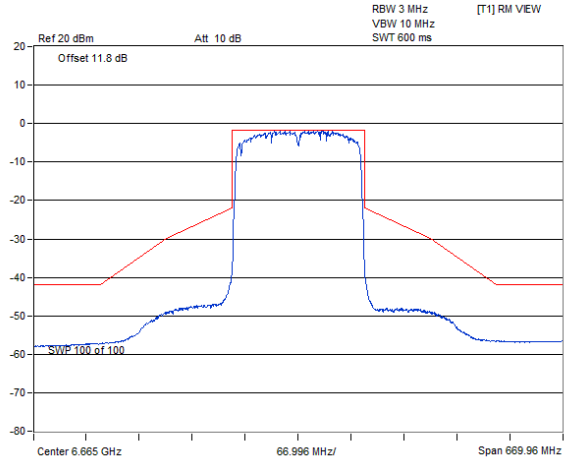

802.11ax (HE160) / Chain 1 : CH 47



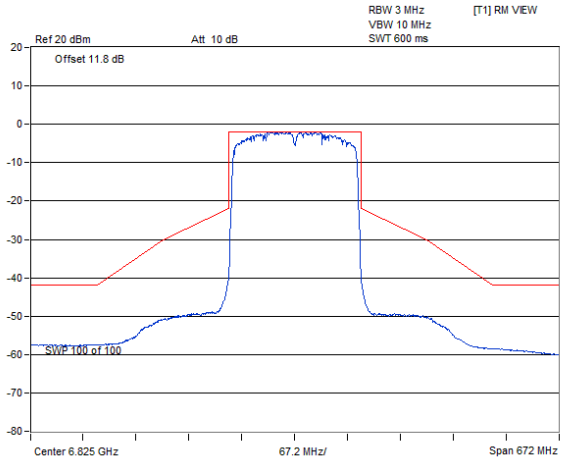

802.11ax (HE160) / Chain 1 : CH 79



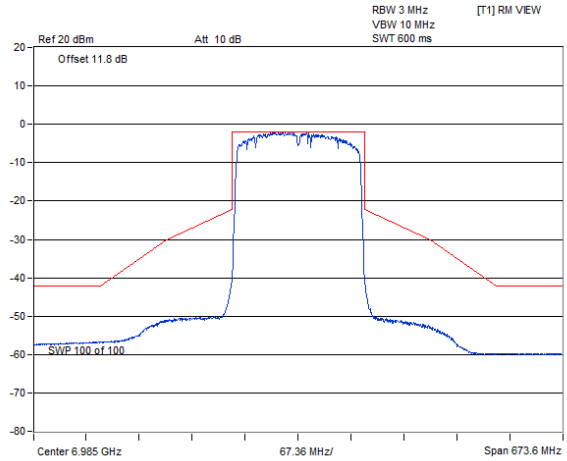

802.11ax (HE160) / Chain 1 : CH 111




802.11ax (HE160) / Chain 1 : CH 143

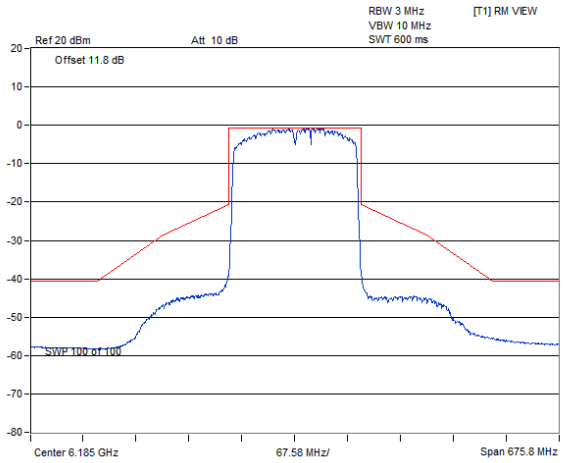



802.11ax (HE160) / Chain 1 : CH 175

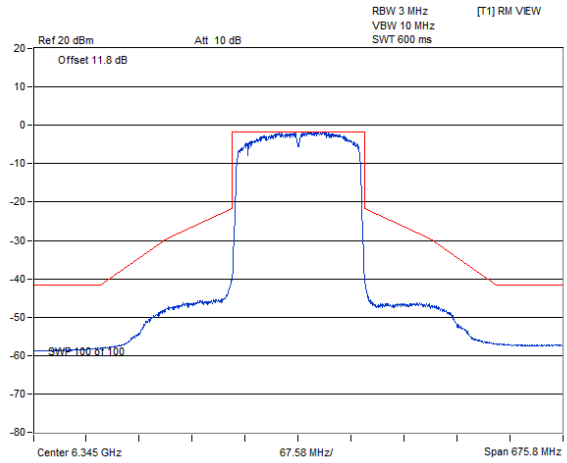



802.11ax (HE160) / Chain 1 : CH 207

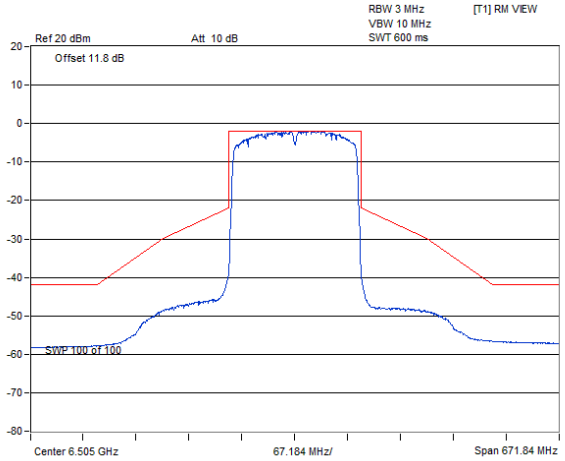
## Spectrum Plot



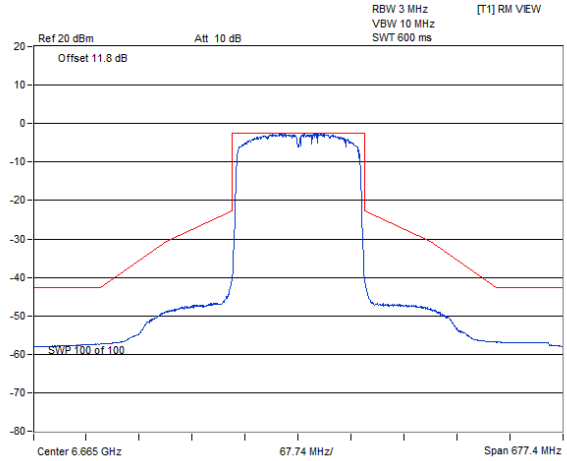

802.11ax (HE160) / Chain 2 : CH 47



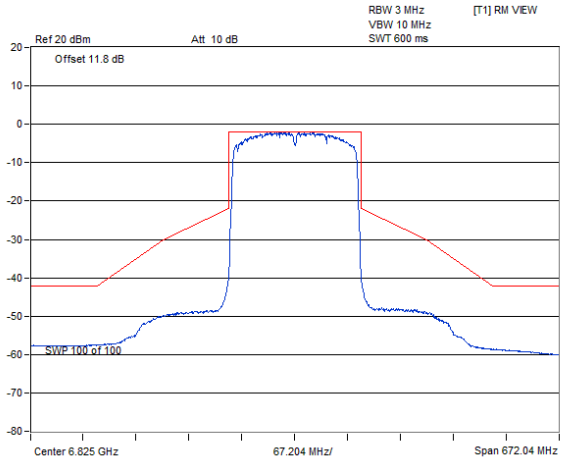

802.11ax (HE160) / Chain 2 : CH 79



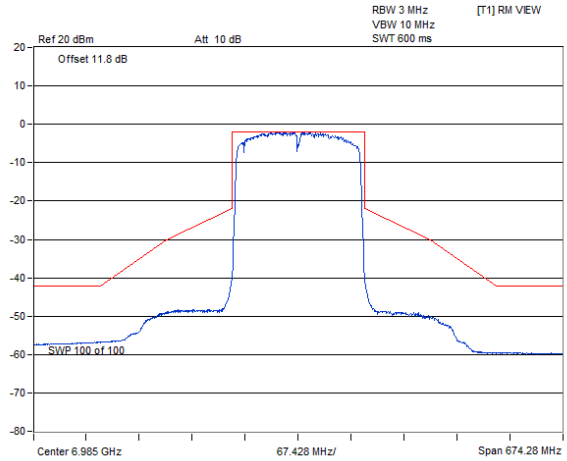

802.11ax (HE160) / Chain 2 : CH 111




802.11ax (HE160) / Chain 2 : CH 143

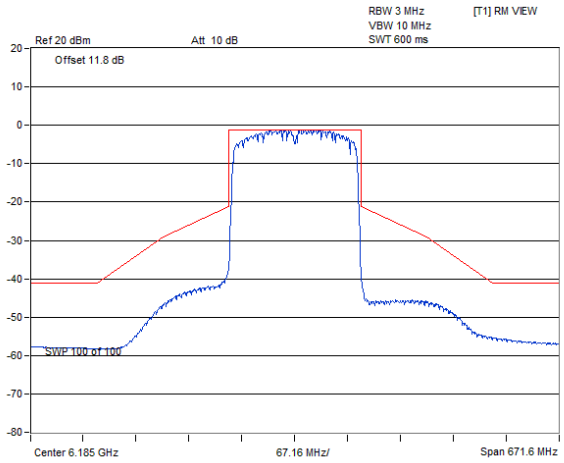



802.11ax (HE160) / Chain 2 : CH 175

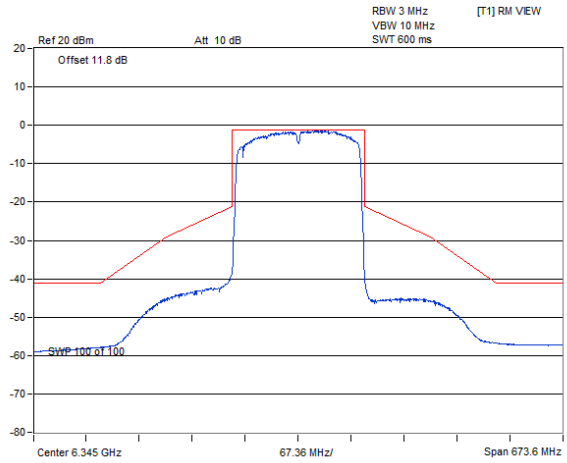



802.11ax (HE160) / Chain 2 : CH 207

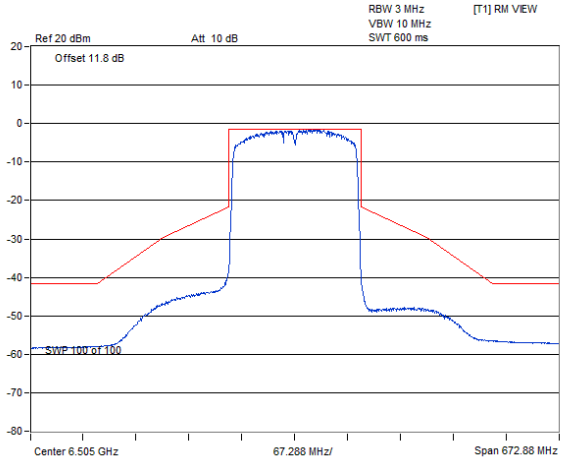
## Spectrum Plot



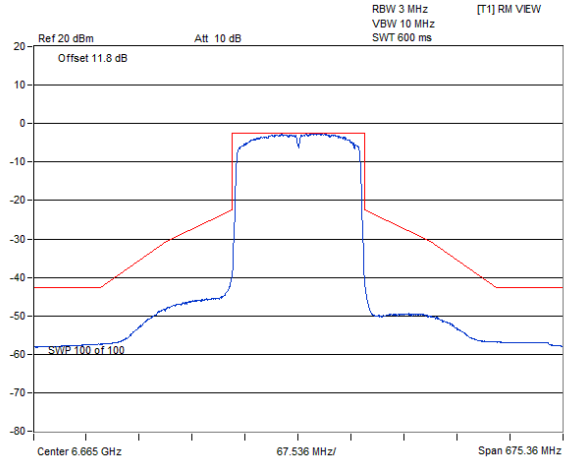

802.11ax (HE160) / Chain 3 : CH 47



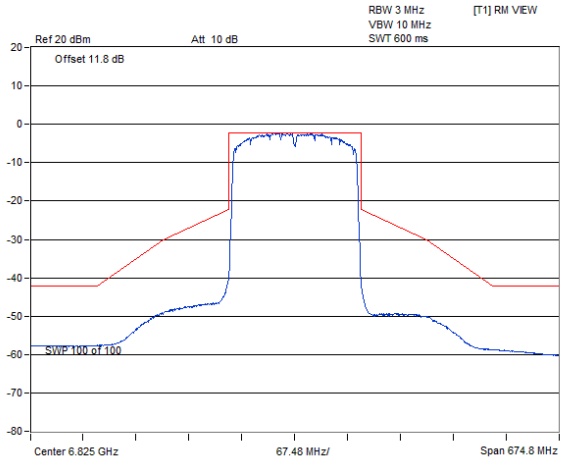

802.11ax (HE160) / Chain 3 : CH 79



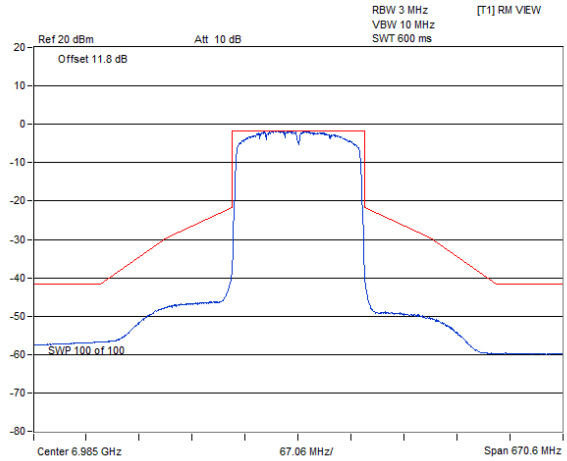

802.11ax (HE160) / Chain 3 : CH 111




802.11ax (HE160) / Chain 3 : CH 143




802.11ax (HE160) / Chain 3 : CH 175




802.11ax (HE160) / Chain 3 : CH 207

## 7.5 Occupied Bandwidth

| Input Power: | 120 Vac, 60 Hz | Environmental Conditions: | 25°C, 65% RH | Tested By: | Katina Lu |
|---|---|---|---|---|---|

### 802.11ax (HE20)

| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | | Maximum Limit (MHz) | Test Result |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 | | |
| 33 | 6115 | 19.20 | 19.20 | 19.20 | 19.20 | 320 | Pass |
| 61 | 6255 | 19.20 | 19.20 | 19.08 | 19.20 | 320 | Pass |
| 93 | 6415 | 19.08 | 19.20 | 19.20 | 19.20 | 320 | Pass |
| 97 | 6435 | 19.08 | 19.20 | 19.08 | 19.20 | 320 | Pass |
| 105 | 6475 | 19.08 | 19.08 | 19.20 | 19.08 | 320 | Pass |
| 113 | 6515 | 19.20 | 19.20 | 19.08 | 19.08 | 320 | Pass |
| 117 | 6535 | 19.08 | 19.08 | 19.08 | 19.20 | 320 | Pass |
| 153 | 6715 | 19.08 | 19.20 | 19.08 | 19.20 | 320 | Pass |
| 181 | 6855 | 19.08 | 19.08 | 19.08 | 19.20 | 320 | Pass |
| 185 | 6875 | 19.08 | 19.20 | 19.08 | 19.08 | 320 | Pass |
| 213 | 7015 | 19.08 | 19.08 | 19.08 | 19.08 | 320 | Pass |
| 229 | 7095 | 19.20 | 19.20 | 19.08 | 19.20 | 320 | Pass |

### 802.11ax (HE40)

| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | | Maximum Limit (MHz) | Test Result |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 | | |
| 35 | 6125 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 59 | 6245 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 91 | 6405 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 99 | 6445 | 38.16 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 107 | 6485 | 38.16 | 37.92 | 37.92 | 38.16 | 320 | Pass |
| 115 | 6525 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 123 | 6565 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 155 | 6725 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 179 | 6845 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 187 | 6885 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 211 | 7005 | 37.92 | 37.92 | 37.92 | 37.92 | 320 | Pass |
| 227 | 7085 | 37.92 | 37.92 | 37.68 | 37.92 | 320 | Pass |

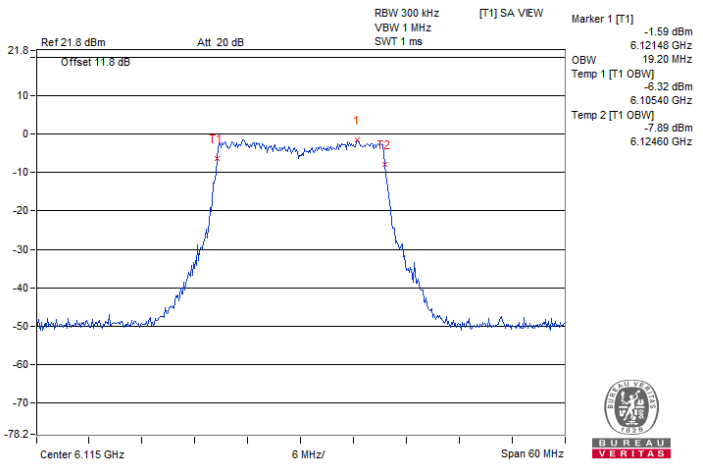
## 802.11ax (HE80)

| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | | Maximum Limit (MHz) | Test Result |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 | | |
| 39 | 6145 | 77.28 | 77.28 | 77.76 | 77.28 | 320 | Pass |
| 55 | 6225 | 77.28 | 77.28 | 77.28 | 77.28 | 320 | Pass |
| 87 | 6385 | 77.28 | 77.28 | 76.80 | 77.28 | 320 | Pass |
| 103 | 6465 | 77.28 | 77.28 | 77.28 | 77.28 | 320 | Pass |
| 119 | 6545 | 76.80 | 76.80 | 77.28 | 77.76 | 320 | Pass |
| 135 | 6625 | 77.28 | 77.28 | 77.28 | 77.28 | 320 | Pass |
| 151 | 6705 | 77.28 | 76.80 | 77.28 | 77.28 | 320 | Pass |
| 167 | 6785 | 77.28 | 77.28 | 77.28 | 76.80 | 320 | Pass |
| 183 | 6865 | 77.28 | 77.28 | 77.28 | 77.28 | 320 | Pass |
| 199 | 6945 | 77.28 | 77.28 | 77.28 | 77.28 | 320 | Pass |
| 215 | 7025 | 77.28 | 77.28 | 77.76 | 77.28 | 320 | Pass |

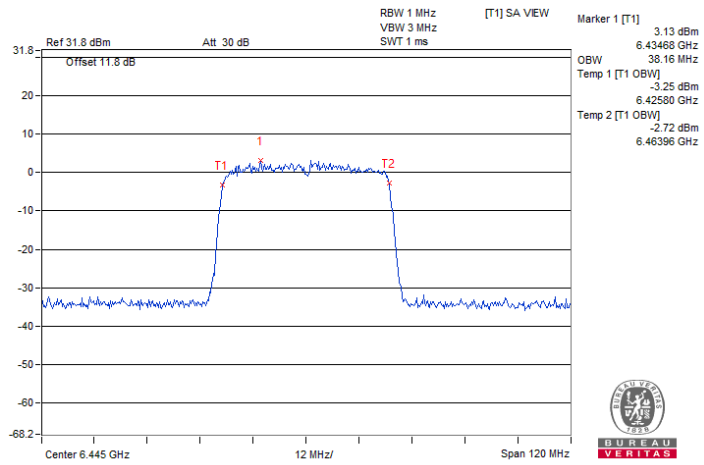
## 802.11ax (HE160)

| Channel | Frequency (MHz) | Occupied Bandwidth (MHz) | | | | Maximum Limit (MHz) | Test Result |
|---|---|---|---|---|---|---|---|
| | | Chain 0 | Chain 1 | Chain 2 | Chain 3 | | |
| 47 | 6185 | 155.52 | 155.52 | 155.52 | 155.52 | 320 | Pass |
| 79 | 6345 | 155.52 | 155.52 | 155.52 | 155.52 | 320 | Pass |
| 111 | 6505 | 155.52 | 155.52 | 155.52 | 155.52 | 320 | Pass |
| 143 | 6665 | 155.52 | 155.52 | 156.48 | 155.52 | 320 | Pass |
| 175 | 6825 | 154.56 | 155.52 | 156.48 | 156.48 | 320 | Pass |
| 207 | 6985 | 154.56 | 153.60 | 153.60 | 153.60 | 320 | Pass |

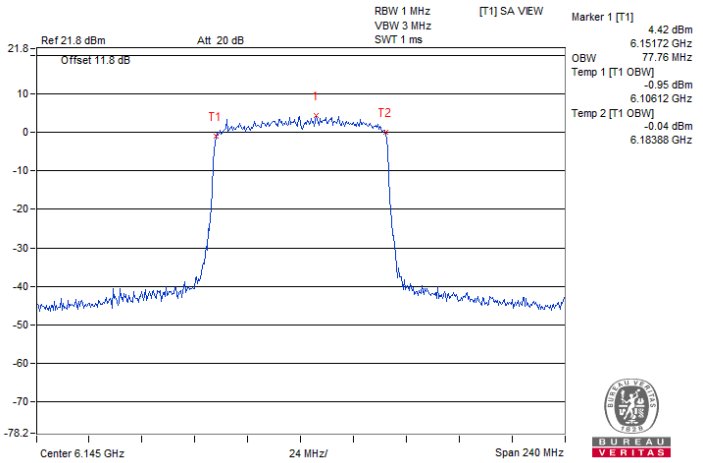
## Spectrum Plot of Maximum Value



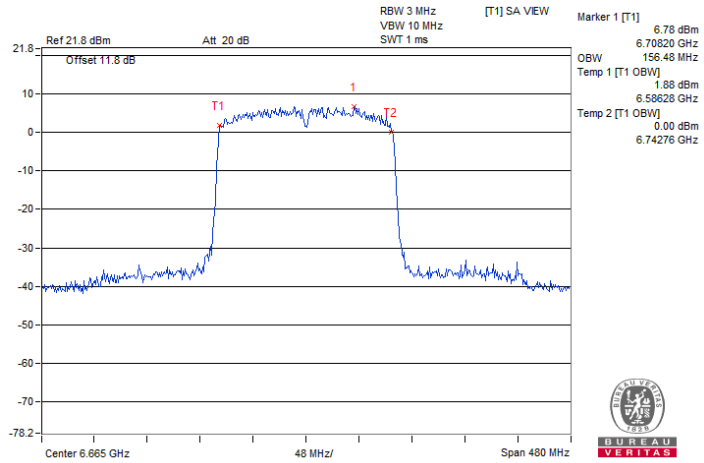

802.11ax (HE20) / Chain 0 : CH 33




802.11ax (HE40) / Chain 0 : CH 99




802.11ax (HE80) / Chain 2 : CH 39




802.11ax (HE160) / Chain 2 : CH 143

## 7.6 Frequency Stability

### 802.11ax (HE20)

| Frequency Stability Versus Temp. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Frequency: 6115MHz | | | | | | | | | |
| TEMP. (℃) | Power Supply (Vac) | 0 Minute | | 2 Minutes | | 5 Minutes | | 10 Minutes | |
| | | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail |
| 40 | 120 | 6115.0213 | Pass | 6115.0199 | Pass | 6115.0223 | Pass | 6115.0212 | Pass |
| 30 | 120 | 6115.0052 | Pass | 6115.0003 | Pass | 6115.0043 | Pass | 6115.0043 | Pass |
| 20 | 120 | 6114.994 | Pass | 6114.9972 | Pass | 6114.9982 | Pass | 6114.9936 | Pass |
| 10 | 120 | 6114.9895 | Pass | 6114.9915 | Pass | 6114.9899 | Pass | 6114.9903 | Pass |
| 0 | 120 | 6115.0094 | Pass | 6115.0091 | Pass | 6115.0084 | Pass | 6115.0105 | Pass |

| Frequency Stability Versus Voltage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Frequency: 6115MHz | | | | | | | | | |
| TEMP. (℃) | Power Supply (Vac) | 0 Minute | | 2 Minutes | | 5 Minutes | | 10 Minutes | |
| | | Measured Frequency(MHz) | Pass/Fail | Measured Frequency(MHz) | Pass/Fail | Measured Frequency(MHz) | Pass/Fail | Measured Frequency(MHz) | Pass/Fail |
| 20 | 138 | 6114.9985 | Pass | 6114.995 | Pass | 6114.9979 | Pass | 6114.9925 | Pass |
| | 120 | 6114.994 | Pass | 6114.9972 | Pass | 6114.9982 | Pass | 6114.9936 | Pass |
| | 102 | 6115.0024 | Pass | 6115.0028 | Pass | 6115.0045 | Pass | 6115.007 | Pass |

## 7.7 Contention-based Protocol

| Environmental Conditions: | 25°C, 60% RH | Tested By: | Tobey Chen |
|---|---|---|---|

**For U-NII-5**

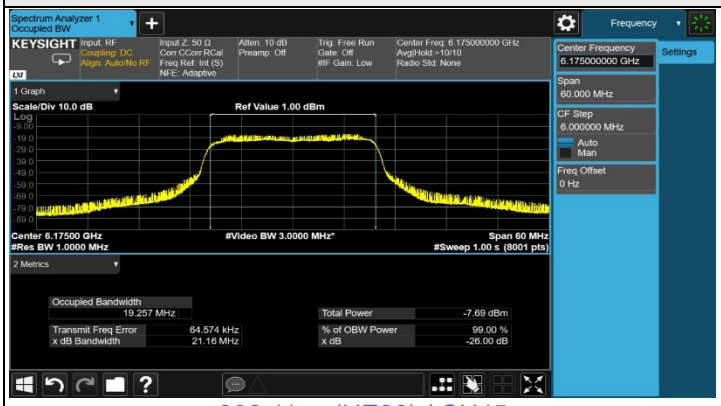
| Contention Based Protocol Measurement | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Operation Mode | Channel Bandwidth (MHz) | Channel Number | Channel Freq. (MHz) | Injected Signal (AWGN) | | Antenna Gain (dBi) | Path Loss (dB) (Note 2) | Adjusted Power (dBm) | Detection Limit | EUT TX Status |
| | | | | Freq. (MHz) | Power (dBm) | | | | | |
| 802.11ax | 20 | 45 | 6175 | 6175 | -64.06 | 3.59 | 0 | -67.65 | -62 | OFF |
| | | | | | -64.56 | 3.59 | 0 | -68.15 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |
| | 160 | 47 | 6185 | 6110 | -64.04 | 3.59 | 0 | -67.63 | -62 | OFF |
| | | | | | -64.54 | 3.59 | 0 | -68.13 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |
| | | | | 6185 | -62.06 | 3.59 | 0 | -65.65 | -62 | OFF |
| | | | | | -62.56 | 3.59 | 0 | -66.15 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |
| | | | | 6260 | -65.05 | 3.59 | 0 | -68.64 | -62 | OFF |
| | | | | | -65.55 | 3.59 | 0 | -69.14 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |

Notes:

1. Adjusted Power (dBm) = Injected Signal (AWGN) Power (dBm) - Antenna Gain (dBi) + Path Loss (dB)
2. Antenna gain values include all the applicable path losses.
3. After evaluation, only the Chain0 was chosen for test and presented in the test report.

| Contention Based Protocol Detection Probability | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operation Mode | Channel Bandwidth (MHz) | AWGN Signal Freq. (MHz) | #01 | #02 | #03 | #04 | #05 | #06 | #07 | #08 | #09 | #10 | Detection Probability | Detection Limit | Test Result |
| 802.11ax | 20 | 6175 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |
| | 160 | 6110 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |
| | | 6185 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |
| | | 6260 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |

## Plots of EUT Tx waveform

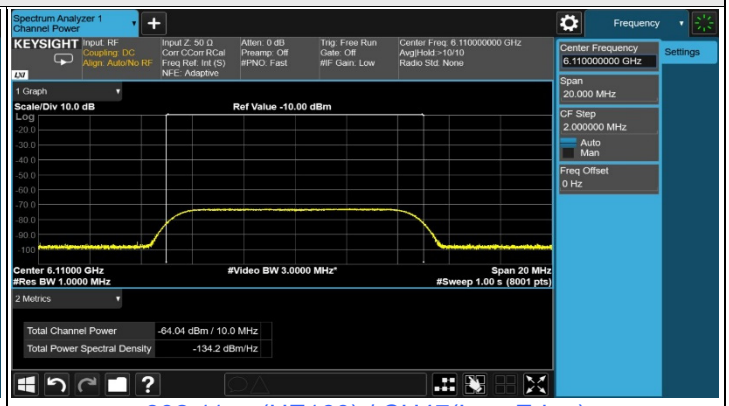



802.11ax (HE20) / CH45


802.11ax (HE160) / CH47

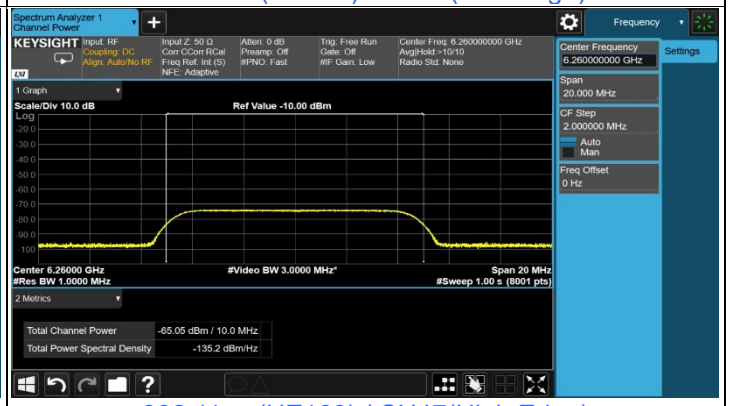
## Plots of Injected signal (AWGN) level


802.11ax (HE20) / CH45



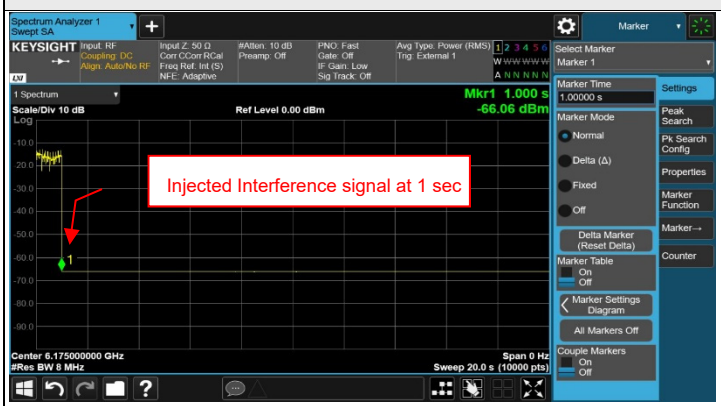

802.11ax (HE160) / CH47(Low Edge)


802.11ax (HE160) / CH47(Middle)

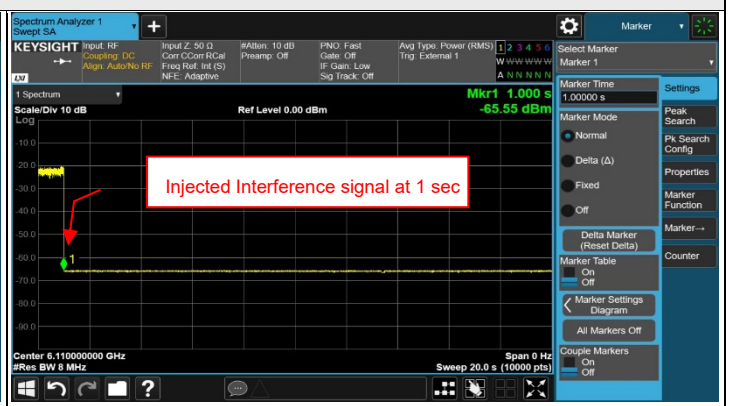



802.11ax (HE160) / CH47(High Edge)

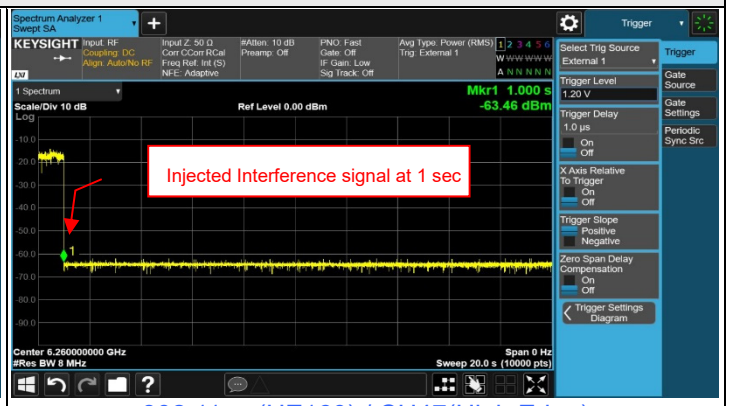
## Plots of EUT ceased transmission in the time domain




802.11ax (HE20) / CH45




802.11ax (HE160) / CH47(Low Edge)

| Plots of EUT ceased transmission in the time domain | |
|---|---|
|  |  |
| 802.11ax (HE160) / CH47(Middle) | 802.11ax (HE160) / CH47(High Edge) |

## For U-NII-6

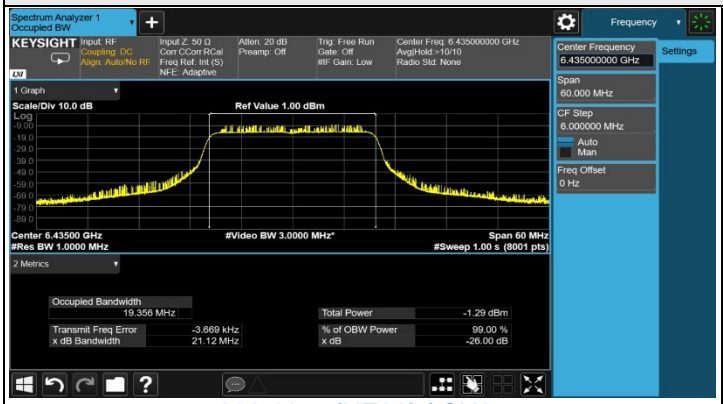
| Contention Based Protocol Measurement | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Operation Mode | Channel Bandwidth (MHz) | Channel Number | Channel Freq. (MHz) | Injected Signal (AWGN) | | Antenna Gain (dBi) | Path Loss (dB) (Note 2) | Adjusted Power (dBm) | Detection Limit | EUT TX Status |
| | | | | Freq. (MHz) | Power (dBm) | | | | | |
| 802.11ax | 20 | 97 | 6435 | 6435 | -64.04 | 3.59 | 0 | -67.63 | -62 | OFF |
| | | | | | -64.54 | 3.59 | 0 | -68.13 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |
| | 160 | 111 | 6505 | 6430 | -65.05 | 3.59 | 0 | -68.64 | -62 | OFF |
| | | | | | -65.55 | 3.59 | 0 | -69.14 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |
| | | | | 6505 | -64.03 | 3.59 | 0 | -67.62 | -62 | OFF |
| | | | | | -64.53 | 3.59 | 0 | -68.12 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |
| | | | | 6580 | -62.02 | 3.59 | 0 | -65.61 | -62 | OFF |
| | | | | | -62.52 | 3.59 | 0 | -66.11 | -62 | Minimal |
| | | | | | -78.41 | 3.59 | 0 | -82 | -62 | ON |

Notes:

1. Adjusted Power (dBm) = Injected Signal (AWGN) Power (dBm) - Antenna Gain (dBi) + Path Loss (dB)
2. Antenna gain values include all the applicable path losses.
3. After evaluation, only the Chain0 was chosen for test and presented in the test report.

| Contention Based Protocol Detection Probability | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Operation Mode | Channel Bandwidth (MHz) | AWGN Signal Freq. (MHz) | #01 | #02 | #03 | #04 | #05 | #06 | #07 | #08 | #09 | #10 | Detection Probability | Detection Limit | Test Result |
| 802.11ax | 20 | 6435 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |
| | 160 | 6430 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |
| | | 6505 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |
| | | 6580 | v | v | v | v | v | v | v | v | v | v | 100% | 90% | Pass |

Plots of EUT Tx waveform




802.11ax (HE20) / CH97


802.11ax (HE160) / CH111