



FCC RF Test Report

APPLICANT : ASUSTeK COMPUTER INC.
EQUIPMENT : ASUS Phone(Mobile Phone)
BRAND NAME : ASUS
MODEL NAME : ASUS_AI2401_E
FCC ID : MSQAI2401
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : 15E 6 GHz Low Power Indoor Client (6XD)
TEST DATE(S) : Oct. 23, 2023 ~ Dec. 28, 2023

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (ShenZhen), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



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People's Republic of China



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Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|---------------------|------------------------------------|--------------------|--|
| 3.1 | 15.403(i) | 26dB Emission Bandwidth | Pass | - |
| 3.1 | 15.407(a)(10) | 99% Occupied Bandwidth | Pass | - |
| 3.2 | 15.407(a)(8) | Maximum Conducted Output Power | Reporting only | - |
| 3.2 | 15.407(a)(8) | Fundamental Maximum EIRP | Pass | - |
| 3.3 | 15.407(a)(8) | Fundamental Power Spectral Density | Pass | - |
| 3.4 | 15.407(b)(6) | In-Band Emissions (Channel Mask) | Pass | - |
| 3.5 | 15.407(d)(6) | Contention Based Protocol | Pass | - |
| 3.6 | 15.407(b) | Unwanted Emissions | Pass | Under limit 2.01 dB at 7125.28 MHz |
| 3.7 | 15.207 | AC Conducted Emission | Pass | Under limit 9.28 dB at 0.150 MHz |
| 3.8 | 15.203 15.407(a) | Antenna Requirement | Pass | - |

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

1.2 Manufacturer

ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

1.3 Product Feature of Equipment Under Test

| Product Feature | |
|-----------------|---|
| Equipment | ASUS Phone(Mobile Phone) |
| Brand Name | ASUS |
| Model Name | ASUS_AI2401_E |
| FCC ID | MSQAI2401 |
| IMEI Code | Conducted: 356313810100997/356313810101003 Conduction: 356313810100831/356313810100849 Radiation: 356313810100617/356313810100625 for SKU1 350619900100671/350619900100689 for SKU2 CBP: 356313810100872/356313810100880 |
| HW Version | R2.0 |
| SW Version | Android 14 |
| EUT Stage | Identical Prototype |

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are four SKUs of EUT for this project. The differences between them are summary below, According to the difference, we evaluate SKU1 to perform full test and SKU2 is verified worse case for RSE testing.

| Sample list | | | | |
|------------------------------|--|--|--|--|
| | SKU1 | SKU2 | SKU3 | SKU4 |
| Model | ASUS_AI2401_E | ASUS_AI2401_E | ASUS_AI2401_E | ASUS_AI2401_E |
| Config. | US(Pro) | US(Enrty) | US(Pro) | US(Enrty) |
| RF module board | US(Pro) | US(Enrty) | US(Pro) | US(Enrty) |
| LCD+Touch front frame module | AI2401 FRONT CASE ASSY | AI2401 FRONT CASE ASSY | AI2401 FRONT CASE ASSY | AI2401 FRONT CASE ASSY |
| DDR | 16G(HYNIX) HYNIX / H58G76BK8HX095 | 16G(Micron) Micron / MT62F2G64D8ZA-023 WT:C | 16G(HYNIX) HYNIX / H58G76BK8HX095 | 16G(Micron) Micron / MT62F2G64D8ZA-023 WT:C |
| UFS | 1TB(Samsung) Samsung / KLUGGARHHD-B0G1 | 512G(HYNIX) (UFS4.0) HYNIX / HN8T274EJKX130 | 1TB(Samsung) Samsung / KLUGGARHHD-B0G1 | 512G(HYNIX) (UFS4.0) HYNIX / HN8T274EJKX130 |
| MB | AI2401_MB | AI2401_MB | AI2401_MB | AI2401_MB |
| Back cover SKU | WW Pro(Mini LED) | WW Entry(LGF) | WW Pro(Mini LED) | WW Entry(LGF) |



| | | | | |
|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Battery | SCUD / C21P2301 | SCUD / C21P2301 | SCUD / C21P2301 | SCUD / C21P2301 |
| Main 50+13M | SHINETECH / DDN03B | RAYPRUS / CASDJ-000A | RAYPRUS / CASDJ-000A | SHINETECH / DDN03B |
| Tele 32M | Kunshan Q-TECH / C3HS01 | SHINETECH / DHG01B | SHINETECH / DHG01B | Kunshan Q-TECH / C3HS01 |
| Front 32M | TSPRECISSION / TVHF3046 | RAYPRUS / CASG-000A | RAYPRUS / CASG-000A | TSPRECISSION / TVHF3046 |
| PCB | COMPEQ | COMPEQ | COMPEQ | COMPEQ |
| CPU | QUALCOMM SM-8650 MPSP1629 | QUALCOMM SM-8650 MPSP1629 | QUALCOMM SM-8650 MPSP1629 | QUALCOMM SM-8650 MPSP1629 |
| WPC antenna | ASAP | INPAQ | INPAQ | ASAP |
| NFC antenna | ASAP | INPAQ | INPAQ | ASAP |
| WWAN/WLAN /BT/GPS antenna | INPAQ | ASAP | ASAP | INPAQ |

1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification | |
|---|--|
| Tx/Rx Frequency Range | U-NII-5: 5925 MHz ~ 6425 MHz U-NII-6: 6425 MHz ~ 6525 MHz U-NII-7: 6525 MHz ~ 6875 MHz U-NII-8: 6875 MHz ~ 7125 MHz |
| Maximum EIRP | <5925 MHz ~ 7125 MHz > <MIMO Ant.5+4> 802.11a : 7.31 dBm / 0.0054 W 802.11be EHT20 : 7.86 dBm / 0.0061 W 802.11be EHT40 : 7.51 dBm / 0.0056 W 802.11be EHT80 : 6.93 dBm / 0.0049 W 802.11be EHT160 : 5.65 dBm / 0.0037 W 802.11be EHT320 : 8.03 dBm / 0.0064 W <MIMO Ant.5+6> 802.11a : 9.16 dBm / 0.0082 W 802.11be EHT20 : 9.86 dBm / 0.0097 W 802.11be EHT40 : 11.60 dBm / 0.0145 W 802.11be EHT80 : 11.73 dBm / 0.0149 W 802.11be EHT160 : 8.21 dBm / 0.0066 W 802.11be EHT320 : 10.57 dBm / 0.0114 W |
| 99% Occupied Bandwidth | 802.11a : 17.58 MHz 802.11 be EHT20 : 19.28 MHz 802.11 be EHT40 : 38.26 MHz 802.11 be EHT80 : 78.28 MHz 802.11 be EHT160 : 158.00 MHz 802.11 be EHT320 : 315.52 MHz |
| Antenna Type / Gain | <5925 MHz ~ 6425 MHz > <Ant. 4> : PIFA Antenna with gain -4.18 dBi <Ant. 5> : PIFA Antenna with gain -3.68 dBi <Ant. 6> : PIFA Antenna with gain -0.94 dBi <6425 MHz ~ 6525 MHz > <Ant. 4> : PIFA Antenna with gain -4.03 dBi <Ant. 5> : PIFA Antenna with gain -2.97 dBi <Ant. 6> : PIFA Antenna with gain -1.48 dBi <6525 MHz ~ 6875 MHz > <Ant. 4> : PIFA Antenna with gain -4.46 dBi <Ant. 5> : PIFA Antenna with gain -4.72 dBi |



| | |
|---------------------------|---|
| | <Ant. 6> : PIFA Antenna with gain -1.25 dBi <6875 MHz ~ 7125 MHz > <Ant. 4> : PIFA Antenna with gain -3.98 dBi <Ant. 5> : PIFA Antenna with gain -6.24 dBi <Ant. 6> : PIFA Antenna with gain -1.38 dBi |
| Type of Modulation | 802.11a : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM) 802.11be: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM / 4096QAM) |

Remark:

1. For 802.11ax/be mode, the 11ax power will set less than 11be power, thus the testing has assessed only 802.11be EHT20/EHT40/EHT80/EHT160MHz by referring to the higher output power.
2. The device support WIFI MIMO CDD mode.
3. For WLAN SISO & MIMO mode, the whole testing assess MIMO mode to cover SISO mode.
4. The device supports WLAN MIMO Ant.5+4 for normal mode and switch to MIMO Ant.5+6 for camera mode.
5. 802.11ax/be support full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) are tested for Power/PSD/Mask/Spurious, all the other test case were performed with full RU with its maximum power/PSD.
6. 802.11be support small size RU, Large size RU and Puncturing modes as below, which is less than full RU conducted power, therefore have assessed only PSD/Mask/RSE.
7. The CBP mode does not support channel puncturing function. (Channel puncturing is only used for optimizing network performance)

<Small size RU 52+26 Tone>:

| Bandwidth | Tones | | Index | | For test modes configure |
|-----------|-------|----|-------|----|--------------------------|
| 20MHz | 26 | 52 | 1 | 38 | 1 |
| 20MHz | 52 | 26 | 38 | 4 | 2 |
| 20MHz | 52 | 26 | 39 | 7 | 3 |

<Small size RU 106+26 Tone>:

| Bandwidth | Tones | | Index | | For test modes configure |
|-----------|-------|-----|-------|----|--------------------------|
| 20MHz | 106 | 26 | 53 | 4 | 1 |
| 20MHz | 26 | 106 | 4 | 54 | 2 |

<Large size RU 484+242 tone> & <80M BW Puncturing 20MHz>:

| Bandwidth | Tones | | Index | | For test modes configure |
|-----------|-------|-----|-------|----|--------------------------|
| 80MHz | 242 | 484 | 62 | 66 | 1 |
| 80MHz | 242 | 484 | 61 | 66 | 2 |
| 80MHz | 484 | 242 | 65 | 64 | 3 |
| 80MHz | 484 | 242 | 65 | 63 | 4 |



<Large size RU 996+484 tone> & <160M BW Puncturing 40MHz>:

| Bandwidth | Tones | | Index | | For test modes configure |
|-----------|----------|-----------|---------|----------|--------------------------|
| 160MHz | 484-Left | 996-Right | 66-Left | 67-Right | 1 |
| 160MHz | 484-Left | 996-Right | 65-Left | 67-Right | 2 |
| 160MHz | 996-Left | 484-Right | 67-Left | 66-Right | 3 |
| 160MHz | 996-Left | 484-Right | 67-Left | 65-Right | 4 |

<Large size RU 996+484+242 tone> & <160M BW Puncturing 20MHz>:

| Bandwidth | Tones | | | Index | | | For test modes configure |
|-----------|----------|-----------|-----------|---------|----------|----------|--------------------------|
| 160MHz | 242-Left | 484-Left | 996-Right | 62-Left | 66-Left | 67-Right | 1 |
| 160MHz | 242-Left | 484-Left | 996-Right | 61-Left | 66-Left | 67-Right | 2 |
| 160MHz | 484-Left | 242-Left | 996-Right | 65-Left | 64-Left | 67-Right | 3 |
| 160MHz | 484-Left | 242-Left | 996-Right | 65-Left | 63-Left | 67-Right | 4 |
| 160MHz | 996-Left | 242-Right | 484-Right | 67-Left | 62-Right | 66-Right | 5 |
| 160MHz | 996-Left | 242-Right | 484-Right | 67-Left | 61-Right | 66-Right | 6 |
| 160MHz | 996-Left | 484-Right | 242-Right | 67-Left | 65-Right | 64-Right | 7 |
| 160MHz | 996-Left | 484-Right | 242-Right | 67-Left | 65-Right | 63-Right | 8 |

<Large size RU 3*996 tone> & <320M BW Puncturing 80MHz>:

| Bandwidth | Tones | Index | For test modes configure |
|-----------|-------|-------|--------------------------|
| 320MHz | | | 1 |
| | | | 2 |
| | | | 3 |
| | | | 4 |

<Large size RU 3*996+484 tone> & <320M BW Puncturing 40MHz>:

| Bandwidth | Tones | Index | For test modes configure |
|-----------|-------|-------|--------------------------|
| 320MHz | | | 1 |
| | | | 2 |
| | | | 3 |
| | | | 4 |
| | | | 5 |
| | | | 6 |
| | | | 7 |
| | | | 8 |



<Large size RU 2*996+484 tone> & <320M BW Puncturing 80+40MHz>:

| Bandwidth | Tones | Index | For test modes configure |
|-----------|-------|-------|--------------------------|
| 320MHz | | | 1 |
| | | | 2 |
| | | | 3 |
| | | | 4 |
| | | | 5 |
| | | | 6 |
| | | | 7 |
| | | | 8 |
| | | | 9 |
| | | | 10 |
| | | | 11 |
| | | | 12 |

Only the worse cases are shown in this report.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

| | | | |
|---------------------------|---|----------------------------|---------------------------------------|
| Test Firm | Sporton International Inc. (ShenZhen) | | |
| Test Site Location | 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595 | | |
| Test Site No. | Sporton Site No. | FCC Designation No. | FCC Test Firm Registration No. |
| | CO01-SZ TH01-SZ DFS01-SZ | CN1256 | 421272 |

| | | | |
|---------------------------|---|----------------------------|---------------------------------------|
| Test Firm | Sporton International Inc. (ShenZhen) | | |
| Test Site Location | 101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985 | | |
| Test Site No. | Sporton Site No. | FCC Designation No. | FCC Test Firm Registration No. |
| | 03CH01-SZ | CN1256 | 421272 |



1.7 Test Software

| Item | Site | Manufacture | Name | Version |
|------|-----------|-------------|------------|-------------|
| 1. | 03CH01-SZ | AUDIX | E3 | 6.2009-8-24 |
| 2. | CO01-SZ | AUDIX | E3 | 6.120613b |
| 3. | DFS01-SZ | Sporton | Test Tools | 1.0 |

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement v02r01
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X/Z plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

<U-NII-5, 6, 7, 8>

| | | | | | | | | | | | |
|---------|-------------|------|------|------|------|------|------|------|------|------|--|
| BW 20M | Channel | 2 | 1 | 5 | 9 | 13 | 17 | 21 | 25 | 29 | |
| | Freq. (MHz) | 5935 | 5955 | 5975 | 5995 | 6015 | 6035 | 6055 | 6075 | 6095 | |
| BW 40M | Channel | 3 | | | 11 | | 19 | | 27 | | |
| | Freq. (MHz) | 5965 | | | 6005 | | 6045 | | 6085 | | |
| BW 80M | Channel | 7 | | | | | 23 | | | | |
| | Freq. (MHz) | 5985 | | | | | 6065 | | | | |
| BW 160M | Channel | 15 | | | | | | | | | |
| | Freq. (MHz) | 6025 | | | | | | | | | |
| BW 20M | Channel | 33 | 37 | 41 | 45 | 49 | 53 | 57 | 61 | | |
| | Freq. (MHz) | 6115 | 6135 | 6155 | 6175 | 6195 | 6215 | 6235 | 6255 | | |
| BW 40M | Channel | 35 | | | 43 | | 51 | | 59 | | |
| | Freq. (MHz) | 6125 | | | 6165 | | 6205 | | 6245 | | |
| BW 80M | Channel | 39 | | | | | 55 | | | | |
| | Freq. (MHz) | 6145 | | | | | 6225 | | | | |
| BW 160M | Channel | 47 | | | | | | | | | |
| | Freq. (MHz) | 6185 | | | | | | | | | |
| BW 320M | Channel | 31 | | | | | 63 | | | | |
| | Freq. (MHz) | 6105 | | | | | 6265 | | | | |



| | | | | | | | | | |
|---------|-------------|------|------|------|------|------|------|------|------|
| BW 20M | Channel | 65 | 69 | 73 | 77 | 81 | 85 | 89 | 93 |
| | Freq. (MHz) | 6275 | 6295 | 6315 | 6335 | 6355 | 6375 | 6395 | 6415 |
| BW 40M | Channel | 67 | | 75 | | 83 | | 91 | |
| | Freq. (MHz) | 6285 | | 6325 | | 6365 | | 6405 | |
| BW 80M | Channel | 71 | | | | 87 | | | |
| | Freq. (MHz) | 6305 | | | | 6385 | | | |
| BW 160M | Channel | 79 | | | | | | | |
| | Freq. (MHz) | 6345 | | | | | | | |
| BW 320M | Channel | 95 | | | | | | | |
| | Freq. (MHz) | 6425 | | | | | | | |

| | | | | | | | | | |
|---------|-------------|------|------|------|------|------|------|------|------|
| BW 20M | Channel | 97 | 101 | 105 | 109 | 113 | 117 | 121 | 125 |
| | Freq. (MHz) | 6435 | 6455 | 6475 | 6495 | 6515 | 6535 | 6555 | 6575 |
| BW 40M | Channel | 99 | | 107 | | 115 | | 123 | |
| | Freq. (MHz) | 6445 | | 6485 | | 6525 | | 6565 | |
| BW 80M | Channel | 103 | | | | 119 | | | |
| | Freq. (MHz) | 6465 | | | | 6545 | | | |
| BW 160M | Channel | 111 | | | | | | | |
| | Freq. (MHz) | 6505 | | | | | | | |

| | | | | | | | | | |
|---------|-------------|------|------|------|------|------|------|------|------|
| BW 20M | Channel | 129 | 133 | 137 | 141 | 145 | 149 | 153 | 157 |
| | Freq. (MHz) | 6595 | 6615 | 6635 | 6655 | 6675 | 6695 | 6715 | 6735 |
| BW 40M | Channel | 131 | | 139 | | 147 | | 155 | |
| | Freq. (MHz) | 6605 | | 6645 | | 6685 | | 6725 | |
| BW 80M | Channel | 135 | | | | 151 | | | |
| | Freq. (MHz) | 6625 | | | | 6705 | | | |
| BW 160M | Channel | 143 | | | | | | | |
| | Freq. (MHz) | 6665 | | | | | | | |
| BW 320M | Channel | 127 | | | | | | | |
| | Freq. (MHz) | 6585 | | | | | | | |



| | | | | | | | | | |
|---------|-------------|------|------|------|------|------|------|------|------|
| BW 20M | Channel | 161 | 165 | 169 | 173 | 177 | 181 | 185 | 189 |
| | Freq. (MHz) | 6755 | 6775 | 6795 | 6815 | 6835 | 6855 | 6875 | 6895 |
| BW 40M | Channel | 163 | | 171 | | 179 | | 187 | |
| | Freq. (MHz) | 6765 | | 6805 | | 6845 | | 6885 | |
| BW 80M | Channel | 167 | | | | 183 | | | |
| | Freq. (MHz) | 6785 | | | | 6865 | | | |
| BW 160M | Channel | 175 | | | | | | | |
| | Freq. (MHz) | 6825 | | | | | | | |
| BW 320M | Channel | 159 | | | | | | | |
| | Freq. (MHz) | 6745 | | | | | | | |

| | | | | | | | | | |
|---------|-------------|------|------|------|------|------|------|------|------|
| BW 20M | Channel | 193 | 197 | 201 | 205 | 209 | 213 | 217 | 221 |
| | Freq. (MHz) | 6915 | 6935 | 6955 | 6975 | 6995 | 7015 | 7035 | 7055 |
| BW 40M | Channel | 195 | | 203 | | 211 | | 219 | |
| | Freq. (MHz) | 6925 | | 6965 | | 7005 | | 7045 | |
| BW 80M | Channel | 199 | | | | 215 | | | |
| | Freq. (MHz) | 6945 | | | | 7025 | | | |
| BW 160M | Channel | 207 | | | | | | | |
| | Freq. (MHz) | 6985 | | | | | | | |
| BW 320M | Channel | 191 | | | | | | | |
| | Freq. (MHz) | 6905 | | | | | | | |

| | | | | | | | |
|--------|-------------|------|--|------|--|------|--|
| BW 20M | Channel | 225 | | 229 | | 233 | |
| | Freq. (MHz) | 7075 | | 7095 | | 7115 | |
| BW 40M | Channel | 227 | | | | | |
| | Freq. (MHz) | 7085 | | | | | |

2.2 Test Mode

Final RSE test modes are considering the modulation and worse data rates refer to Appendix C.

Remark:

1. For Radiated Test Cases, the tests were performance with Adapter 1, USB Cable 1 and Earphone.
2. For simultaneous transmission test modes, the combination testing was assessed from the worst RSE link mode of WWAN (GSM/WCDMA/LTE/5G/6G) and the worst RSE link mode of BT / WLAN (2.4G/6G).

| Test Cases | |
|-----------------------|---|
| AC Conducted Emission | Mode 1 : GSM850 Idle + BT Link + WLAN Link(6G) + USB Cable 1(Charging from Adapter 1) + Battery 1 |



| Ch. # | | 5925-6425 MHz UNII-5 | 6425-6525 MHz UNII-6 | 6525-6875 MHz UNII-7 | 6875-7125 MHz UNII-8 |
|----------|--------|----------------------|----------------------|----------------------|----------------------|
| | | 802.11a/be EHT20 | 802.11a/be EHT20 | 802.11a/be EHT20 | 802.11a/be EHT20 |
| L | Low | 001/002 | 097 | 117 | 189 |
| M | Middle | 045 | 105 | 149 | 209 |
| H | High | 093 | 113 | 181 | 229/233 |
| Straddle | | - | - | - | 185 |

| Ch. # | | 5925-6425 MHz UNII-5 | 6425-6525 MHz UNII-6 | 6525-6875 MHz UNII-7 | 6875-7125 MHz UNII-8 |
|----------|--------|----------------------|----------------------|----------------------|----------------------|
| | | 802.11be EHT40 | 802.11be EHT40 | 802.11be EHT40 | 802.11be EHT40 |
| L | Low | 003 | 099 | 123 | 195 |
| M | Middle | 043 | - | 147 | 203 |
| H | High | 091 | 107 | 179 | 227 |
| Straddle | | - | 115 | - | 187 |

| Ch. # | | 5925-6425 MHz UNII-5 | 6425-6525 MHz UNII-6 | 6525-6875 MHz UNII-7 | 6875-7125 MHz UNII-8 |
|----------|--------|----------------------|----------------------|----------------------|----------------------|
| | | 802.11be EHT80 | 802.11be EHT80 | 802.11be EHT80 | 802.11be EHT80 |
| L | Low | 007 | 103 | 135 | 199 |
| M | Middle | 039 | | 151 | - |
| H | High | 087 | | 167 | 215 |
| Straddle | | - | 119 | 183 | - |

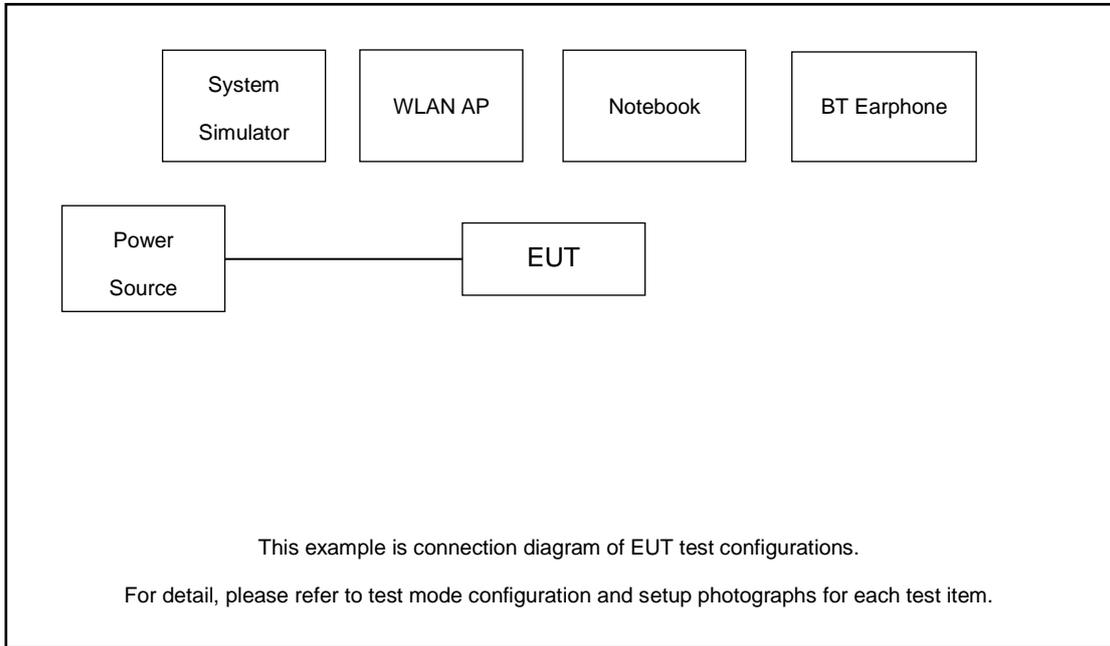
| Ch. # | | 5925-6425 MHz UNII-5 | 6425-6525 MHz UNII-6 | 6525-6875 MHz UNII-7 | 6875-7125 MHz UNII-8 |
|----------|--------|----------------------|----------------------|----------------------|----------------------|
| | | 802.11be EHT160 | 802.11be EHT160 | 802.11be EHT160 | 802.11be EHT160 |
| L | Low | 015 | - | 143 | 207 |
| M | Middle | 047 | | | |
| H | High | 079 | | | |
| Straddle | | - | 111 | 175 | - |

| Ch. # | | UNII-5 | UNII-6 | UNII-7 | UNII-8 |
|----------|--------|-----------------|-----------------|-----------------|-----------------|
| | | 802.11be EHT320 | 802.11be EHT320 | 802.11be EHT320 | 802.11be EHT320 |
| L | Low | - | - | - | - |
| M | Middle | 031 | | | |
| H | High | 063 | | | |
| Straddle | | 095 | 127 | 159 | 191 |

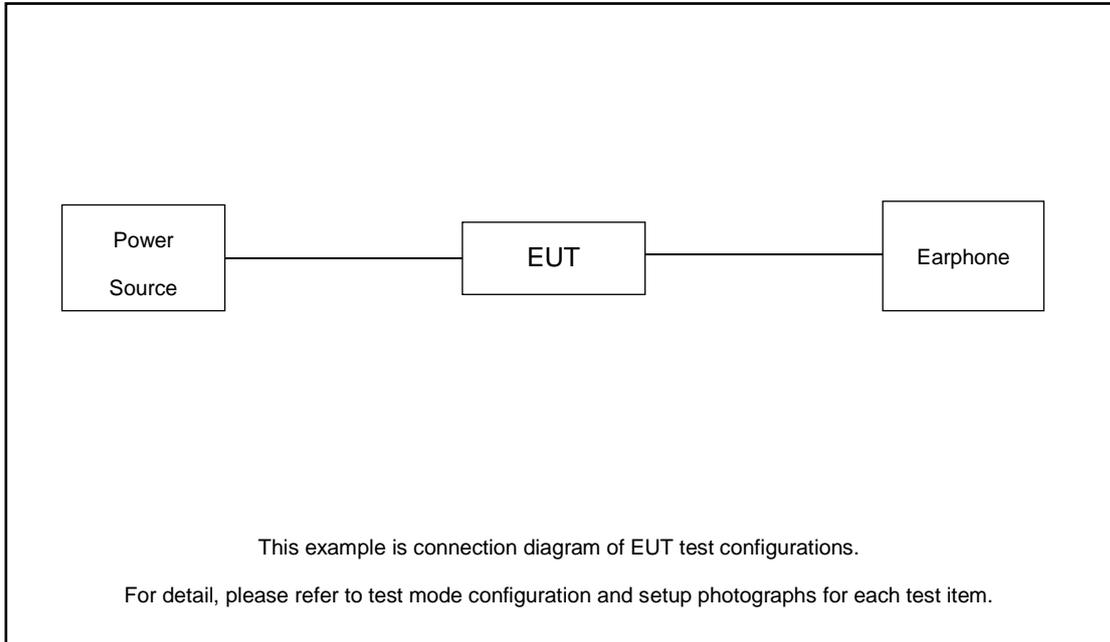
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

For AC Conducted Emission:



For Radiated Emission:





2.4 Support Unit used in test configuration and system

| Item | Equipment | Brand Name | Model Name | FCC ID | Data Cable | Power Cord |
|------|--------------------|------------|------------|---------------|------------|--|
| 1. | System Simulator | Anritsu | MT8820C | N/A | N/A | Unshielded,1.8m |
| 2. | Bluetooth Earphone | Samsung | EO-MG900 | PYAHS-107W | N/A | N/A |
| 3. | WLAN AP | Dlink | DIR-820L | KA2IR820LA1 | N/A | Unshielded,1.8m |
| 4. | Notebook | Lenovo | G480 | QDS-BRCM1050I | N/A | AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m |
| 5. | Earphone | ASUS | EA010B | N/A | N/A | N/A |

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program (QRCT TX Tool) was provided and enabled to make EUT continuously transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

$$\text{Offset} = \text{RF cable loss} + \text{attenuator factor}.$$

Following shows an offset computation example with cable loss 2.3 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset}(dB) &= \text{RF cable loss}(dB) + \text{attenuator factor}(dB). \\ &= 2.3 + 10 = 12.3 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 CFR 15.407 (a)(10)

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

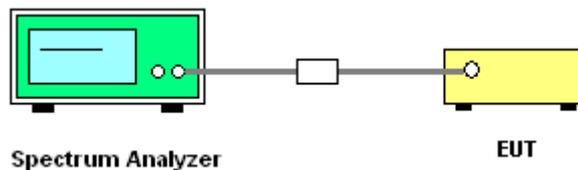
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. 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%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
8. Measure and record the results in the test report.

3.1.4 Test Setup



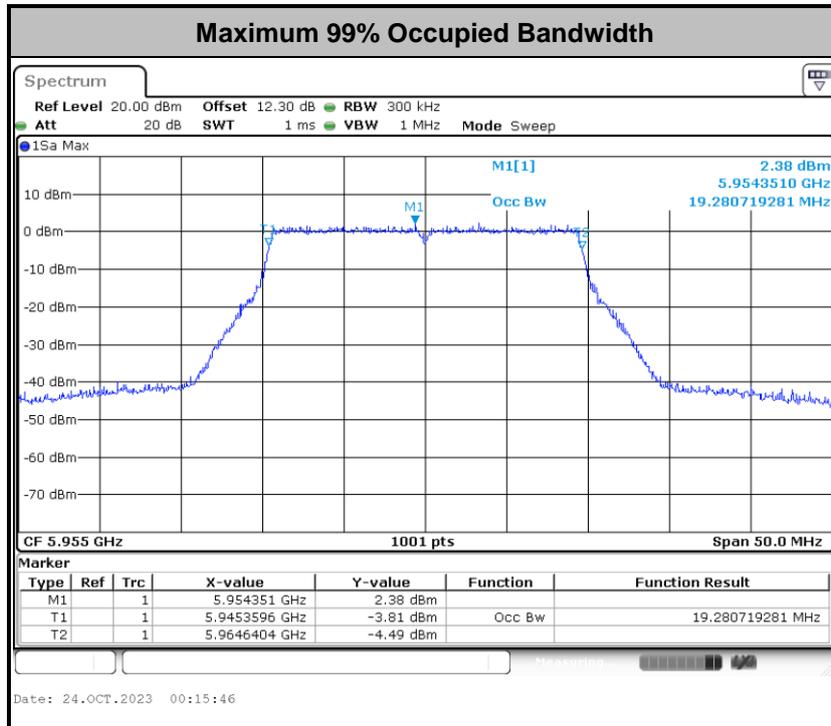
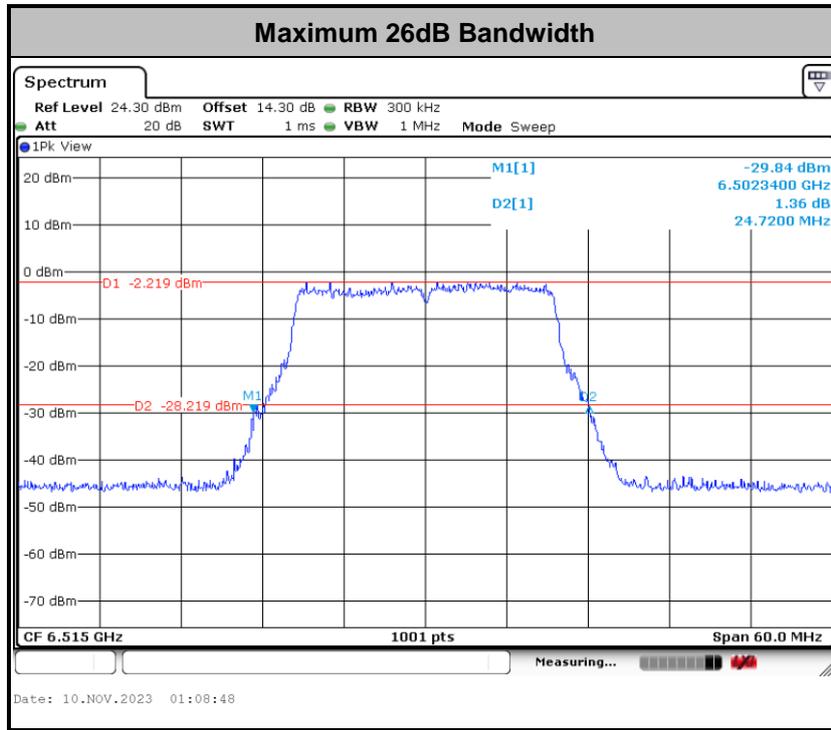
3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.

Only the maximum 26dB & 99% OB plots of each bandwidth shown in the report.

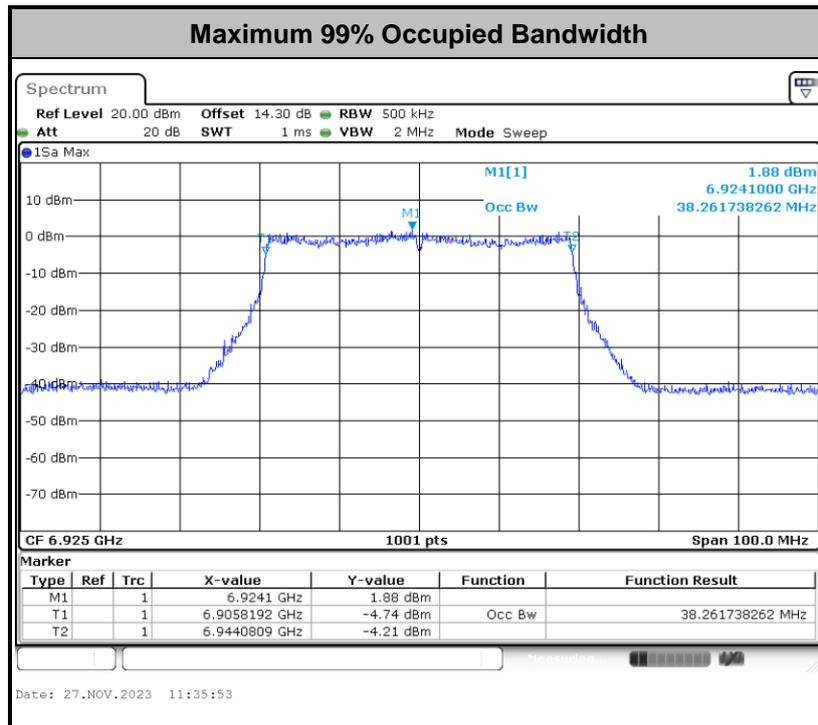
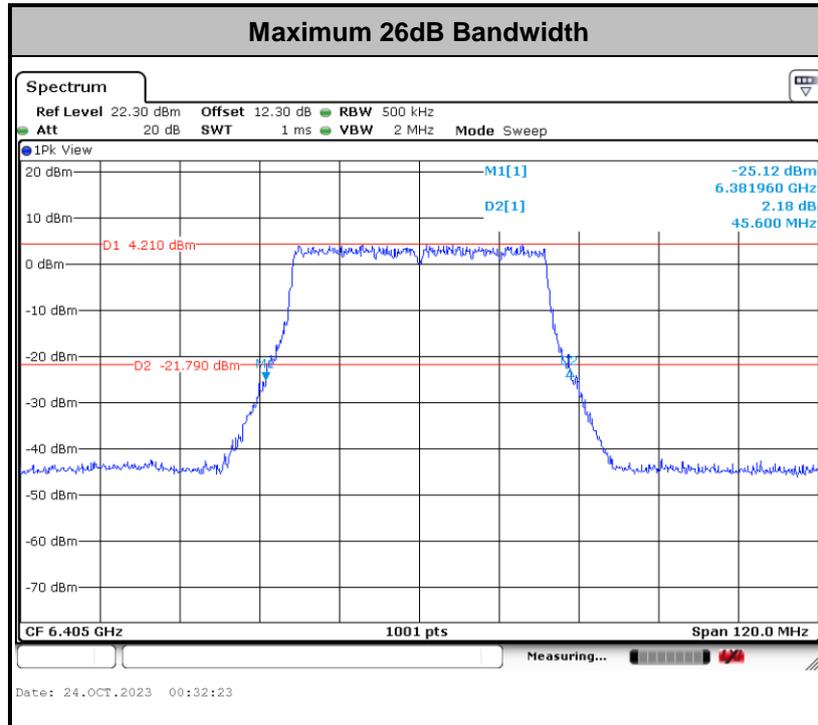


For 20MHz:



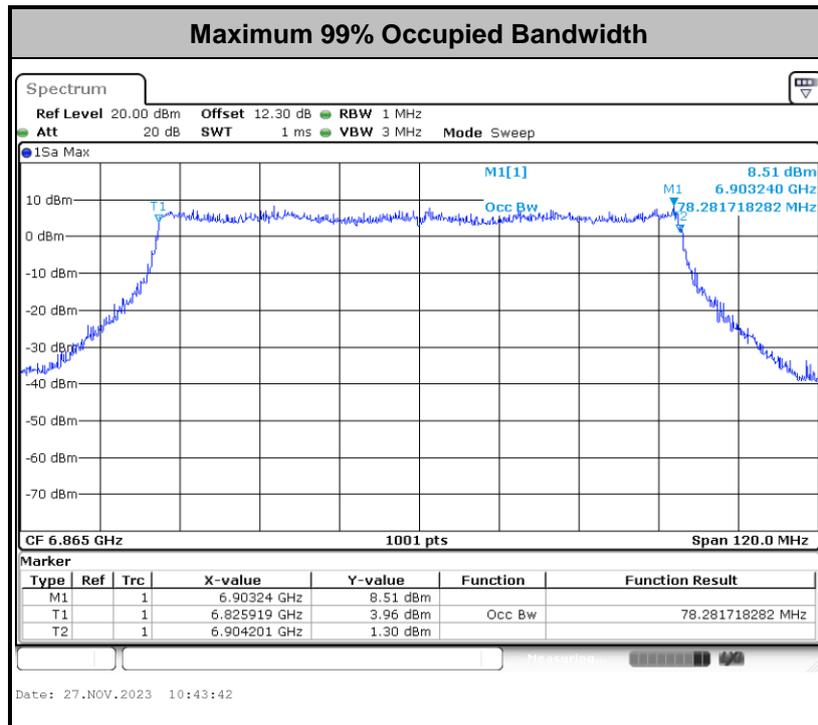
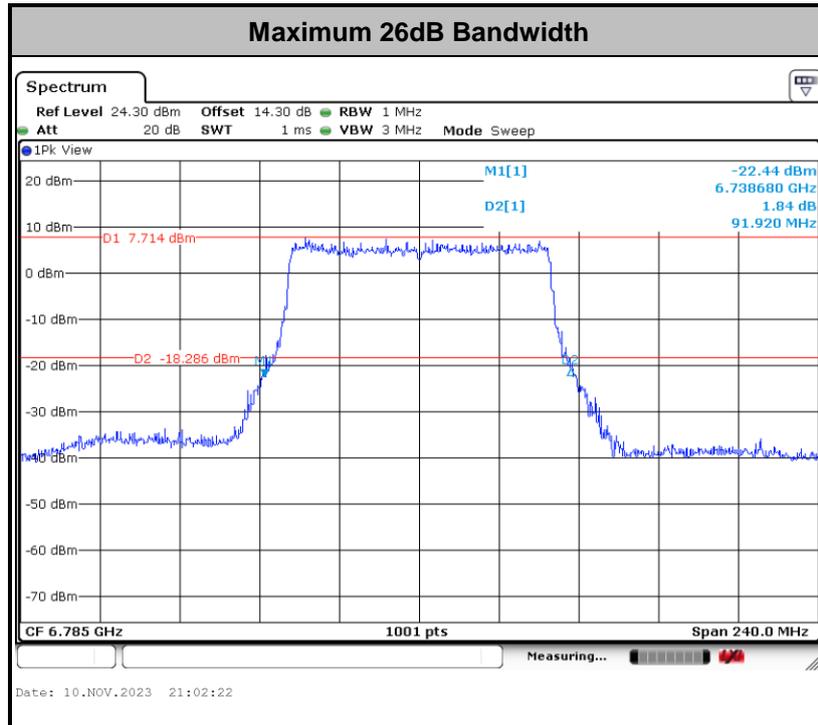


For 40MHz:



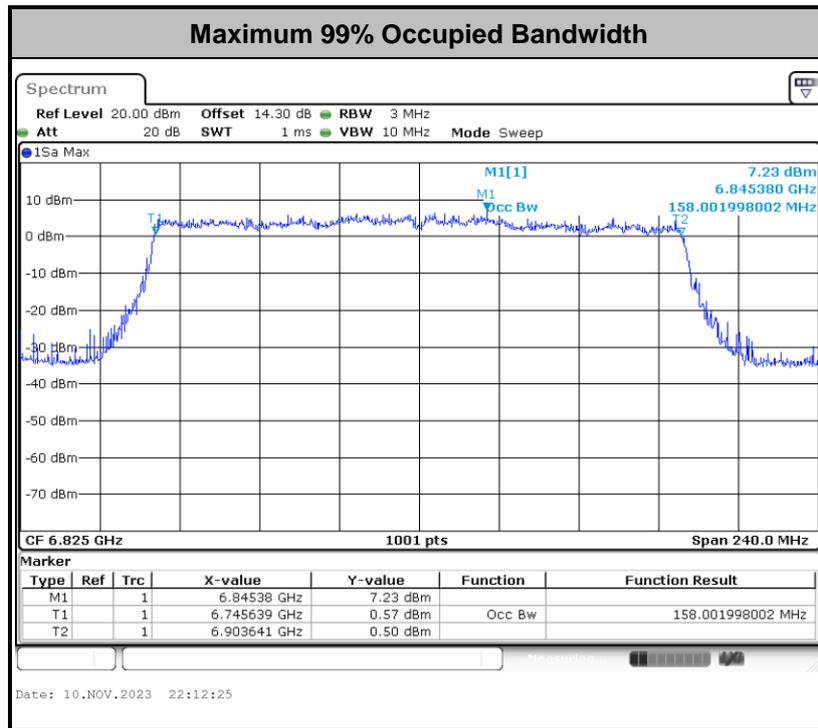
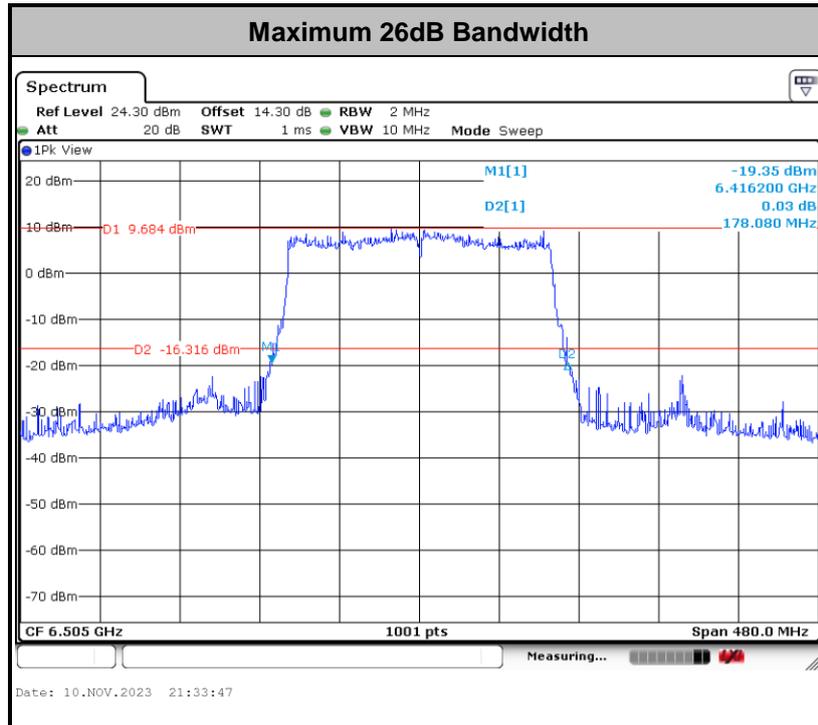


For 80MHz:



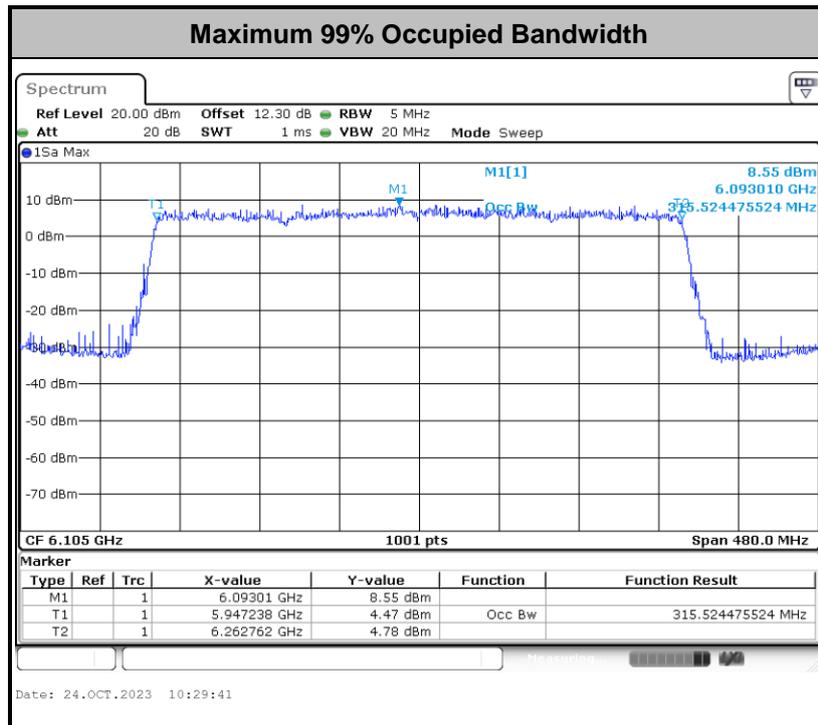
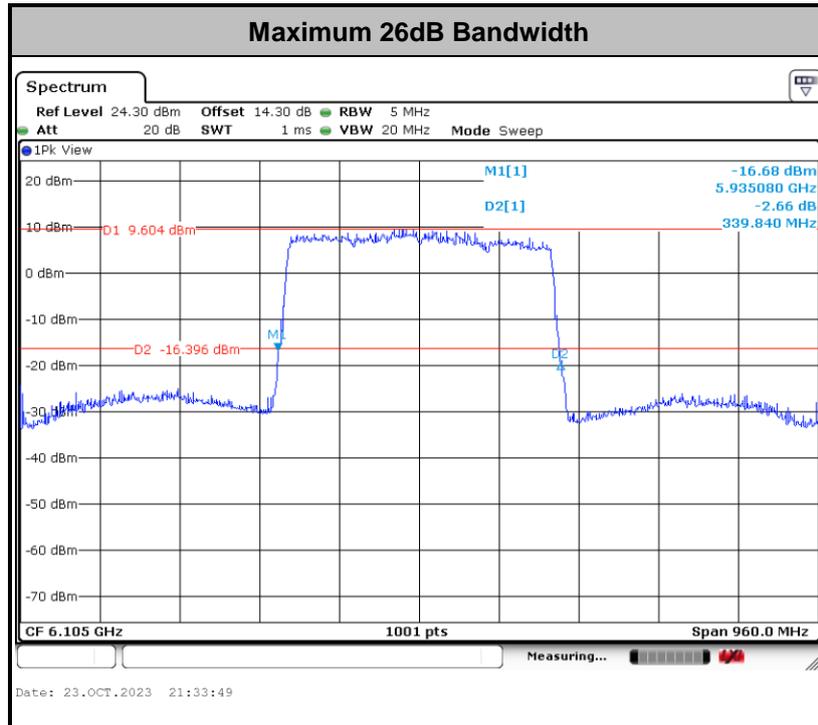


For 160MHz:





For 320MHz:



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Maximum conducted Output Power and Fundamental Maximum EIRP Measurement

3.2.1 Limit of Fundamental Maximum EIRP

<FCC 14-30 CFR 15.407>

(a)(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum e.i.r.p. over the frequency band of operation must not exceed 24 dBm.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

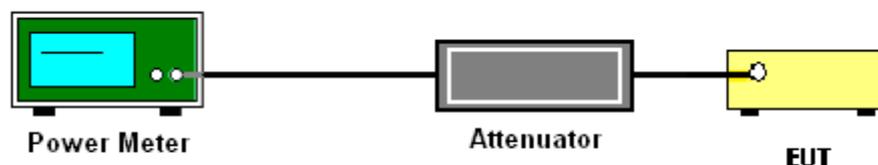
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

3.2.4 Test Setup



3.2.5 Test Result of Fundamental Maximum EIRP

Please refer to Appendix A.



3.3 Fundamental Power Spectral Density Measurement

3.3.1 Limit of Fundamental Power Spectral Density

<FCC 14-30 CFR 15.407>

(a)(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum power spectral density must not exceed -1 dBm e.i.r.p. in any 1-megahertz band.

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Section F) Maximum power spectral density.

Method SA-2

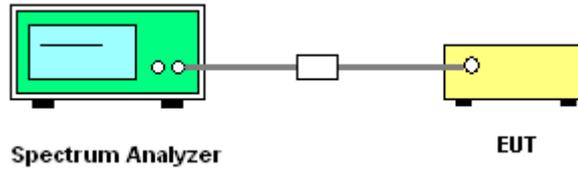
(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
 2. Each plot has already offset with cable loss, attenuator loss and duty factor. Measure the PPSD and record it.
 3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup



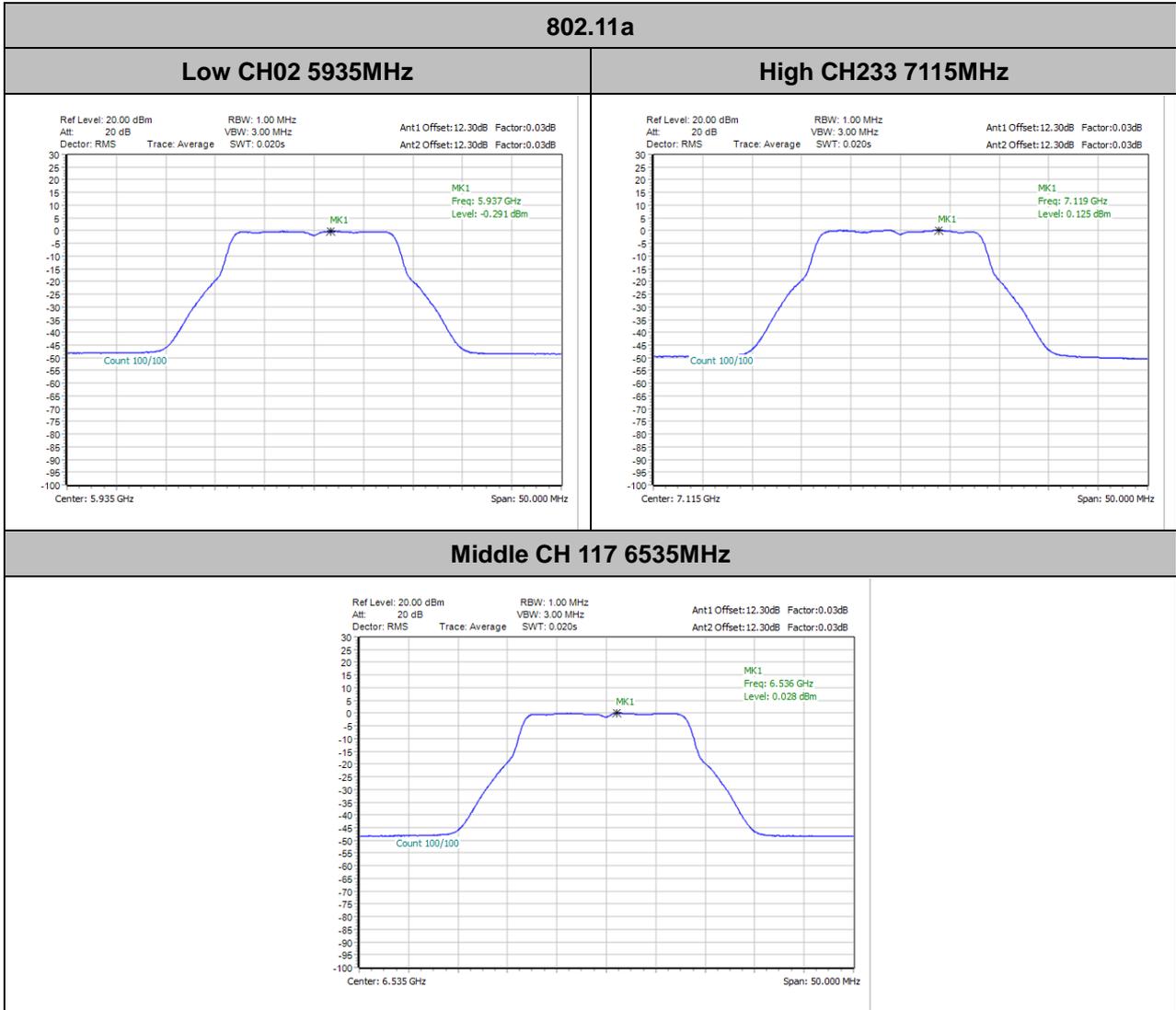
3.3.5 Test Result of Power Spectral Density

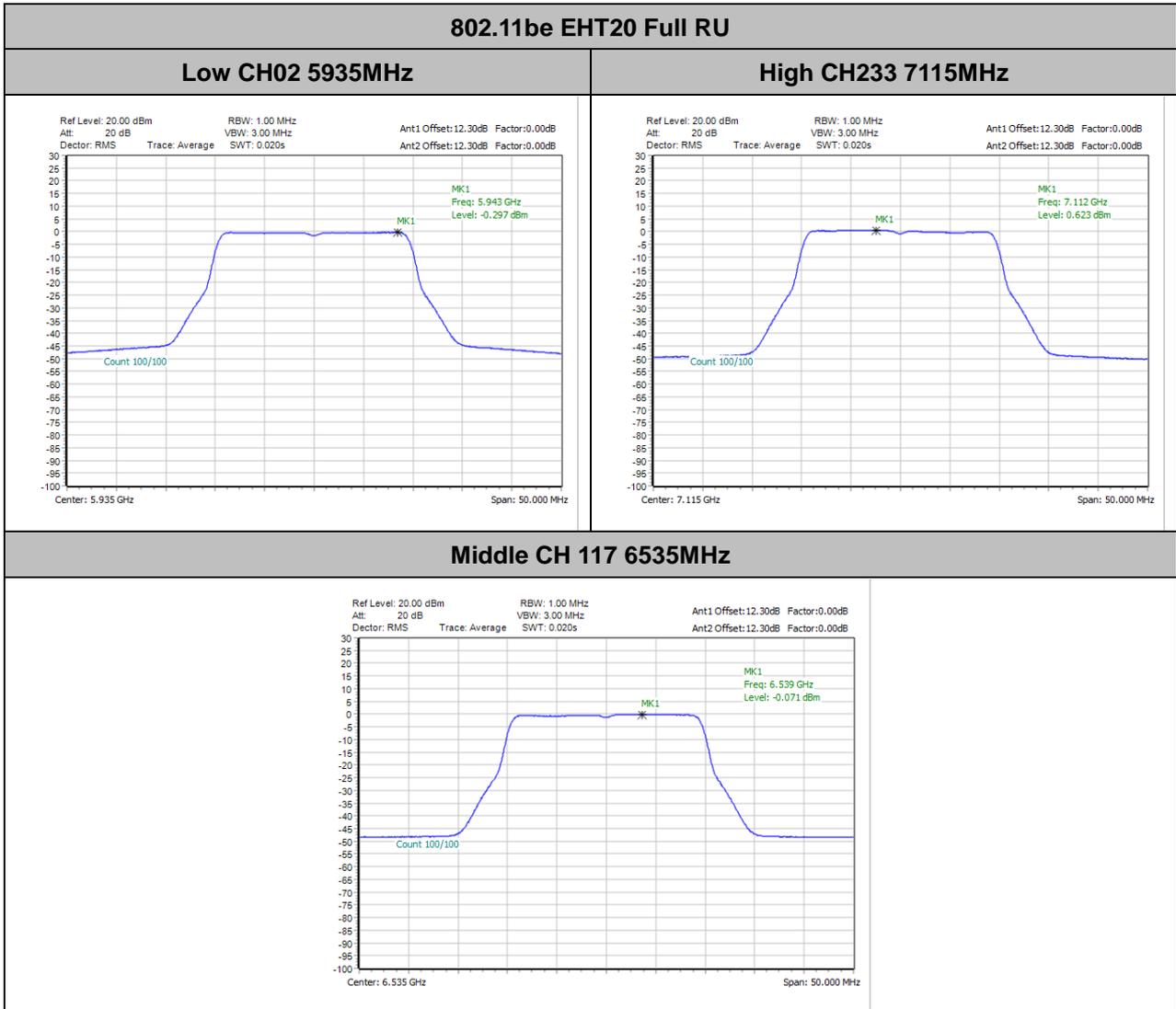
Please refer to Appendix A for Small RU & Large RU & Puncturing mode.

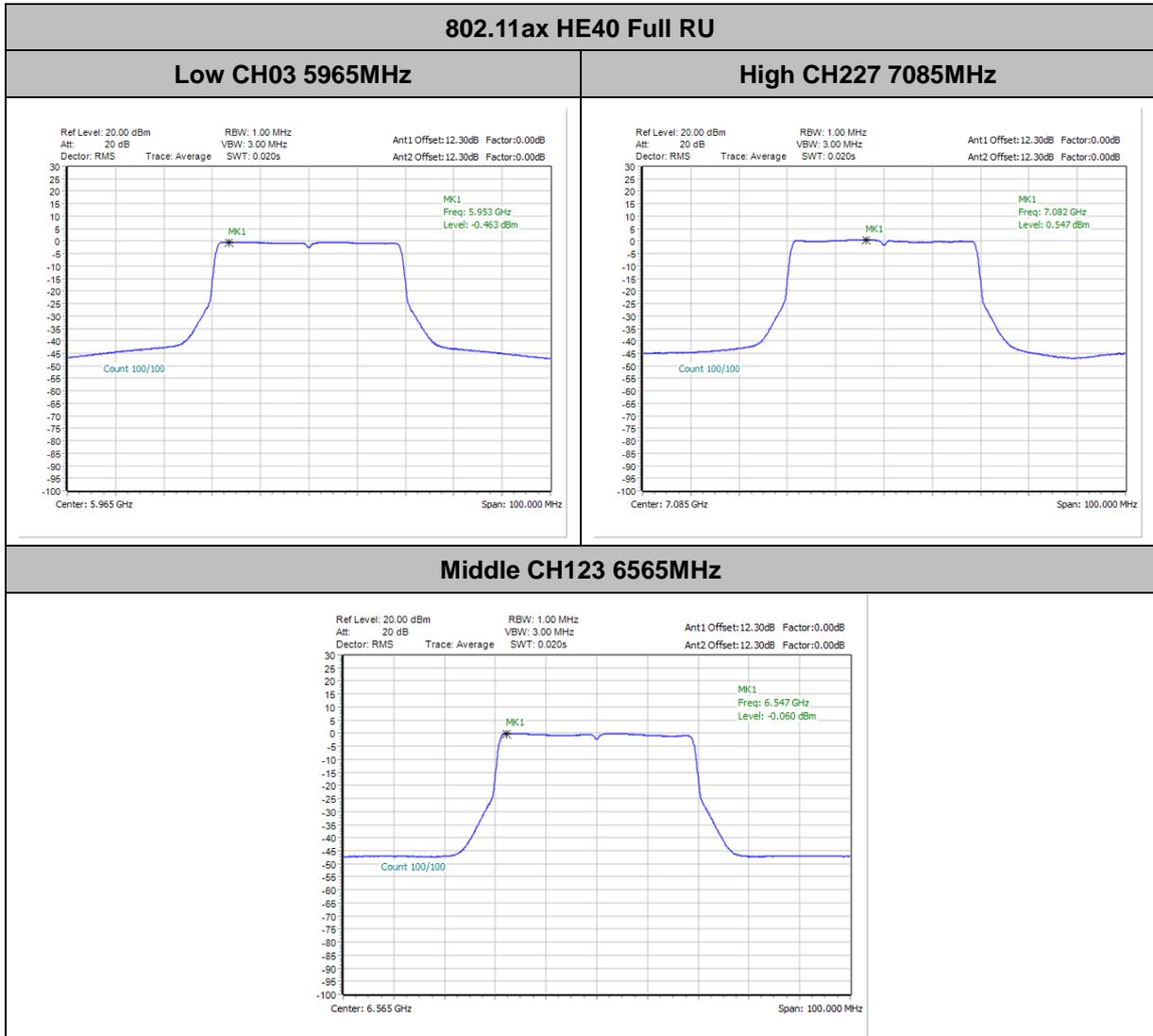
Only the L/M/H channel PSD plots of Full RU & Partial Single RU for each bandwidth are shown as follows:

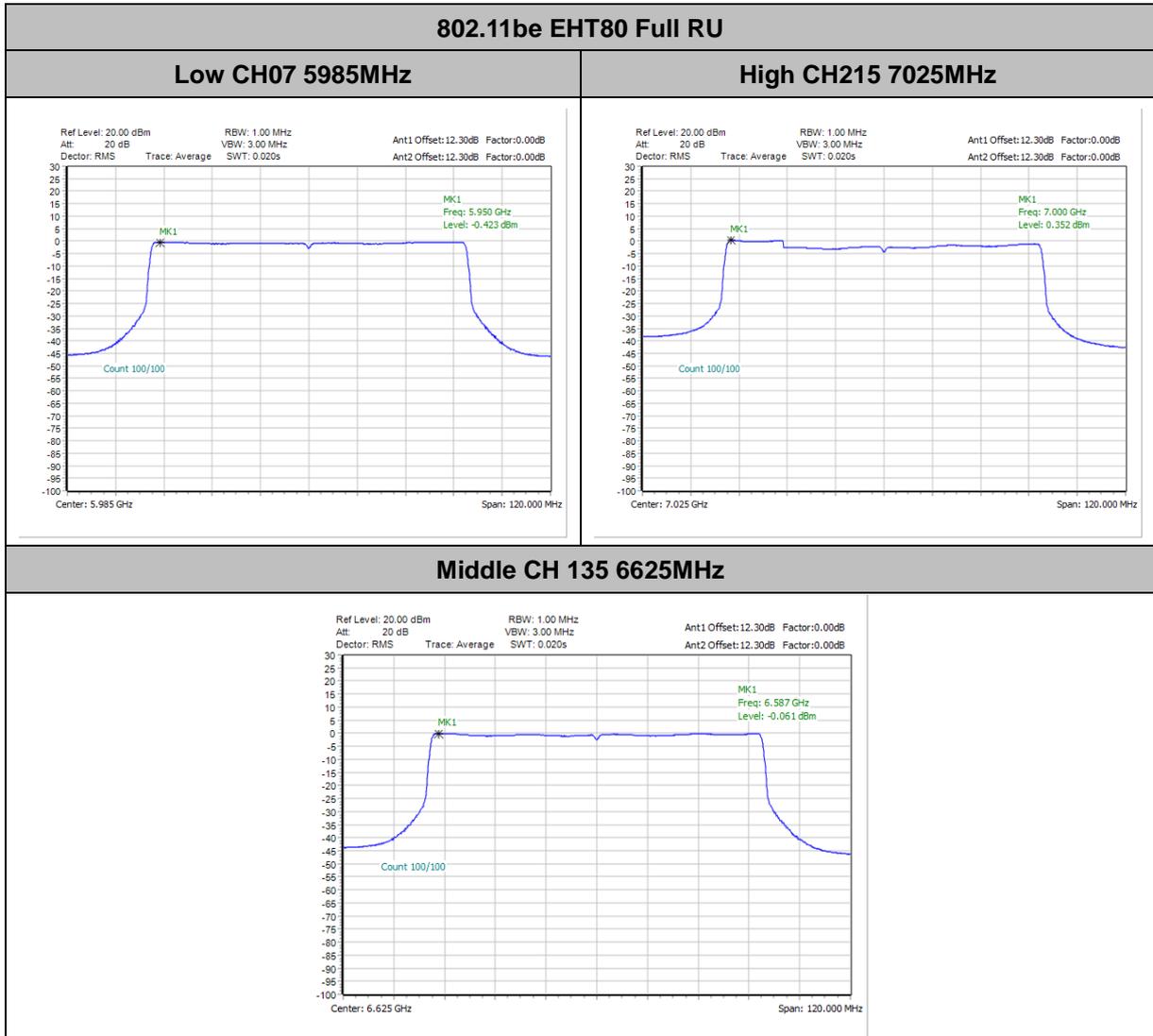


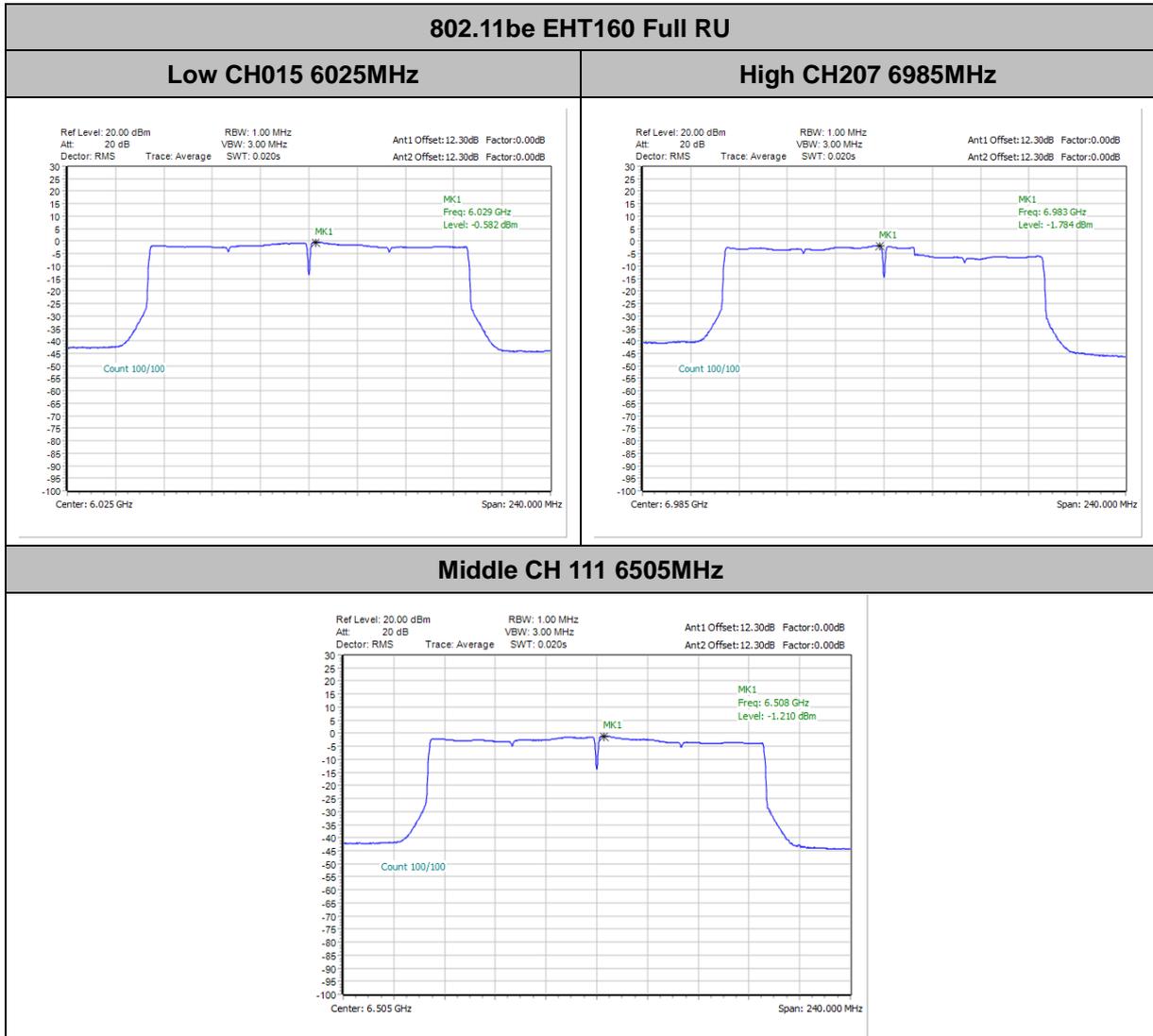
<MIMO Ant.5+4>:







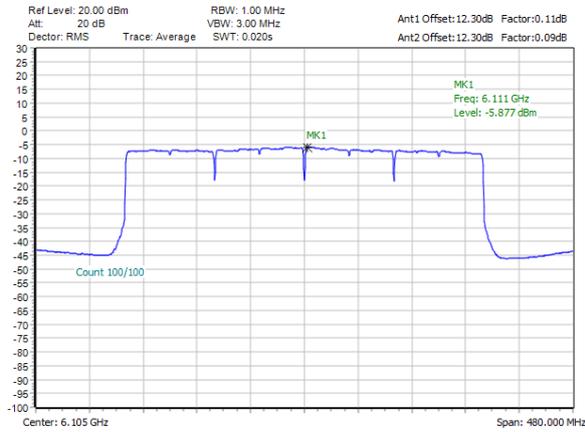




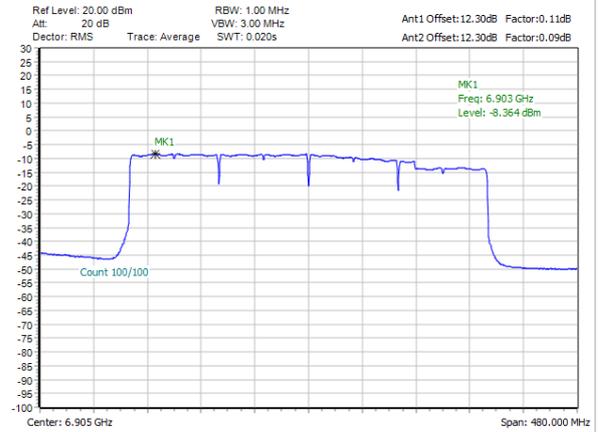


802.11be EHT320 Full RU

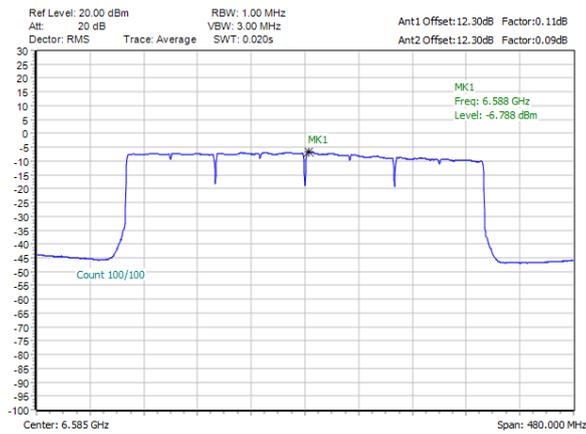
Low CH31 6105MHz



High CH191 6905MHz



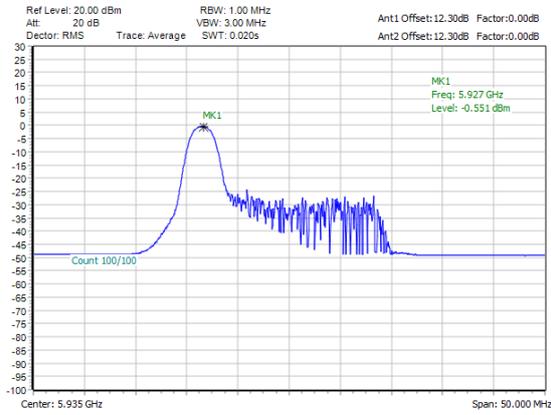
Middle CH 127 6585MHz



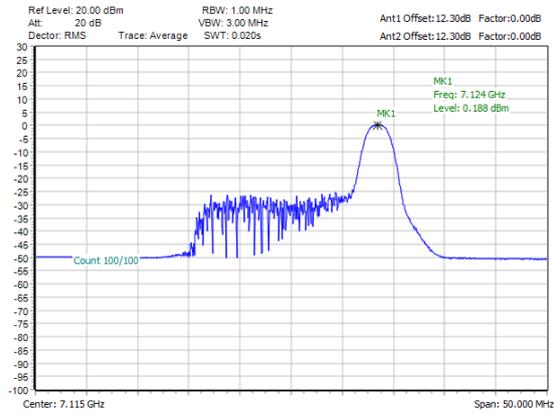


802.11be EHT20 Partial RU

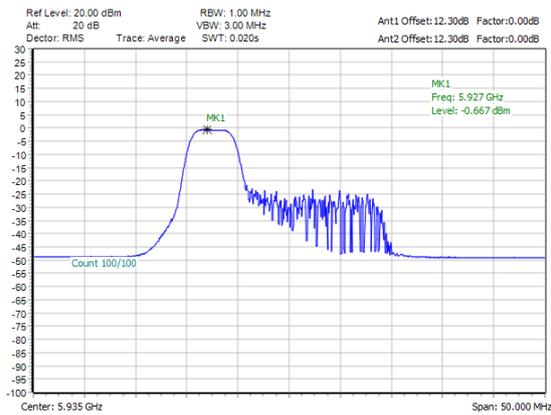
Low CH02 5935MHz 26RU0



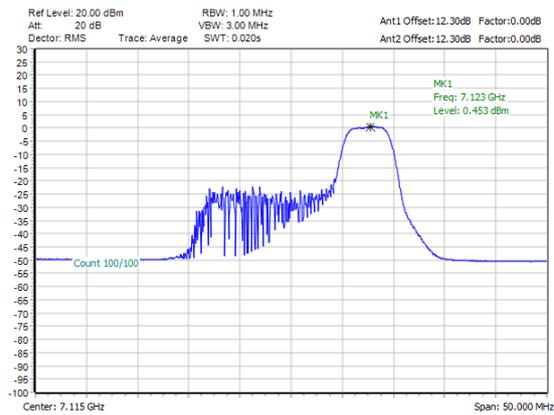
High CH233 7115MHz 26RU8



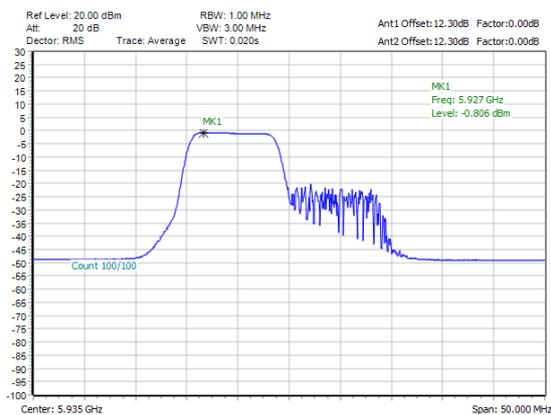
Low CH02 5935MHz 52RU37



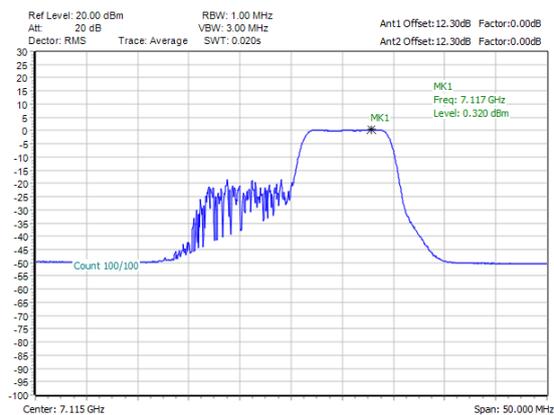
High CH233 7115MHz 52RU40

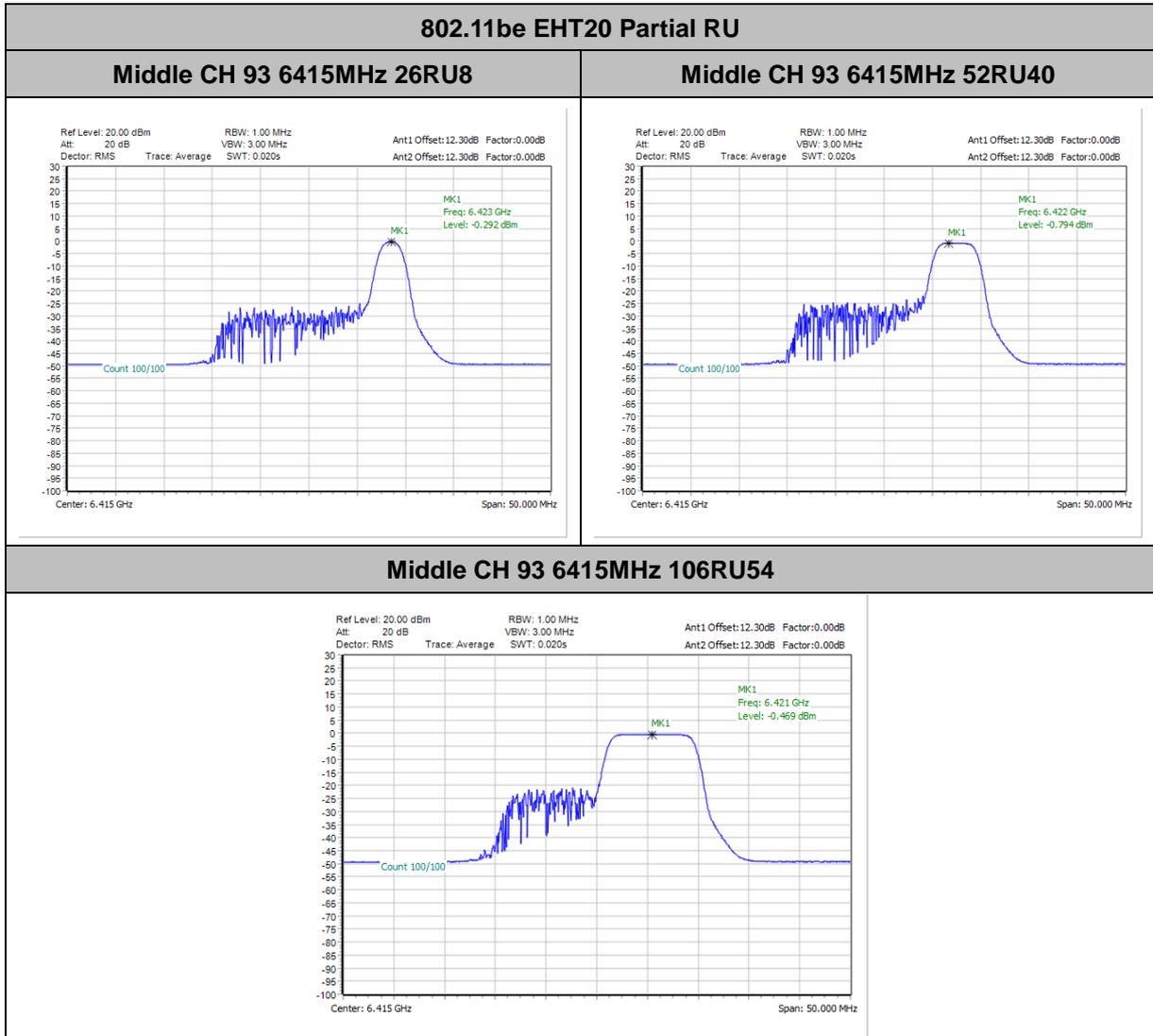


Low CH02 5935MHz 106RU53



High CH233 7115MHz 106RU54

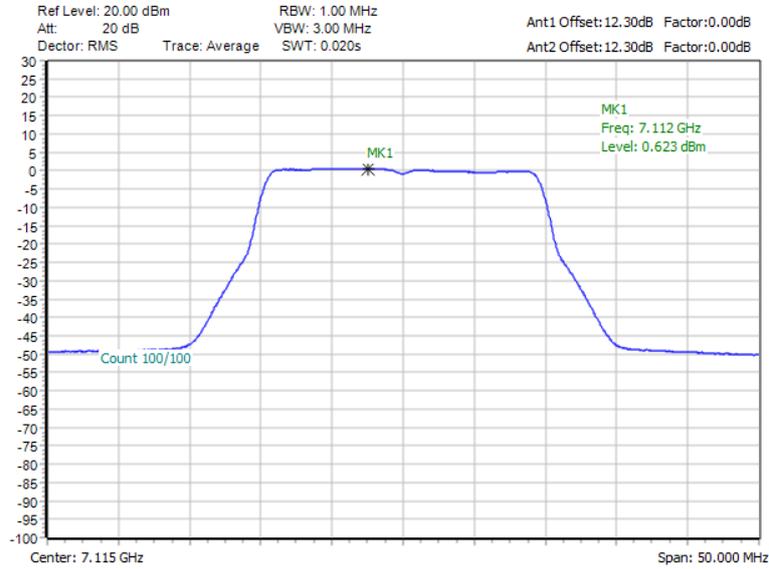






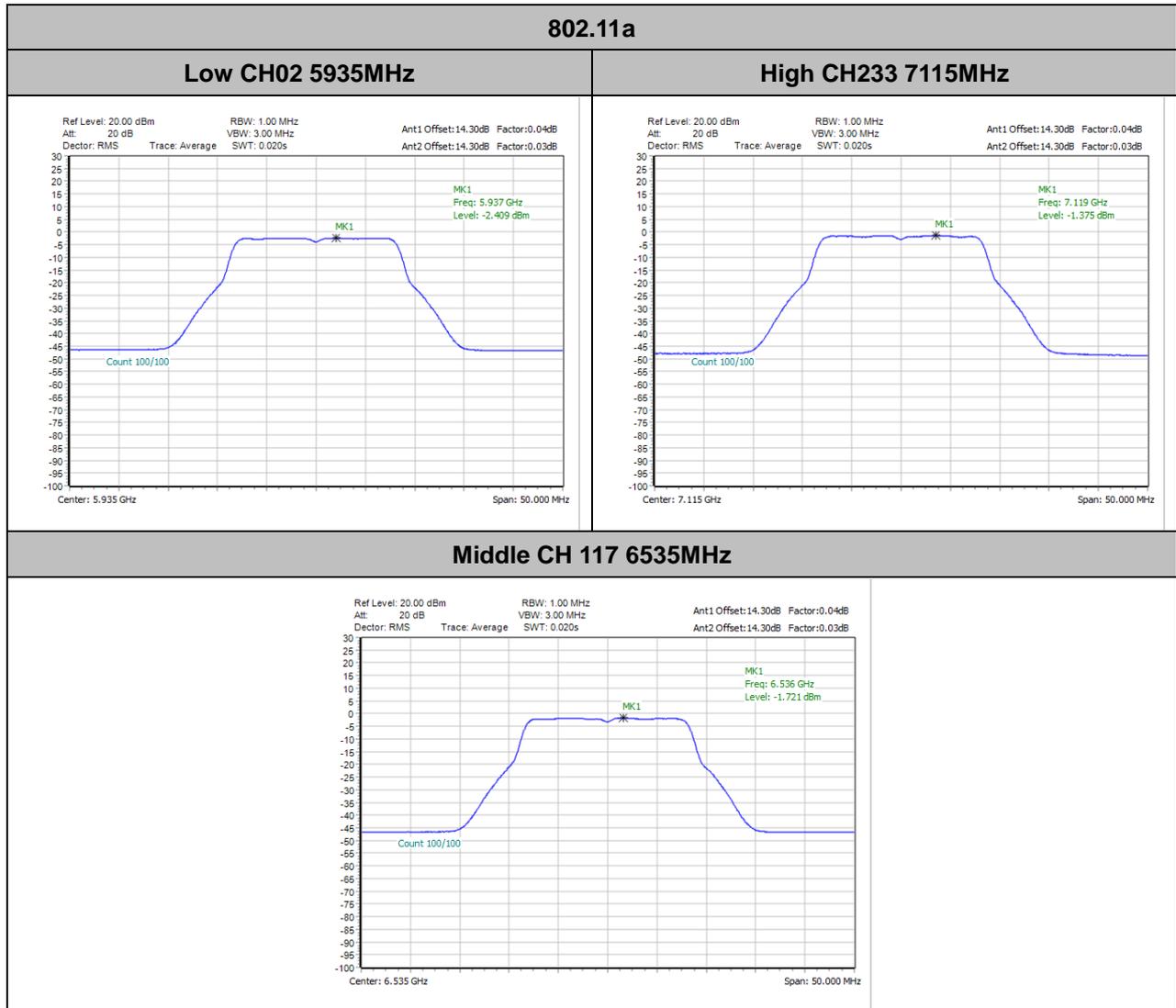
Worst Case Power Density (dBm/MHz) for MIMO Ant.5+4

802.11be EHT20 CH233 7115MHz





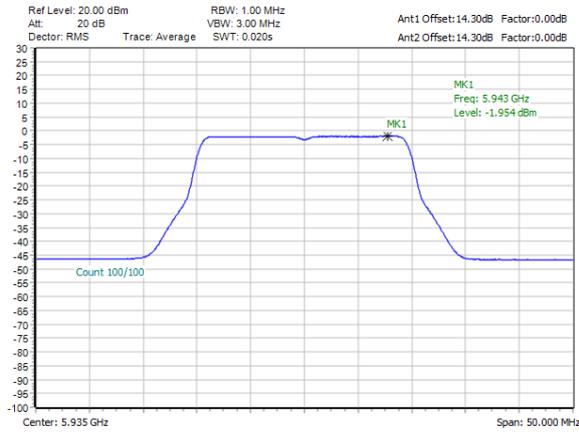
<MIMO Ant.5+6>:



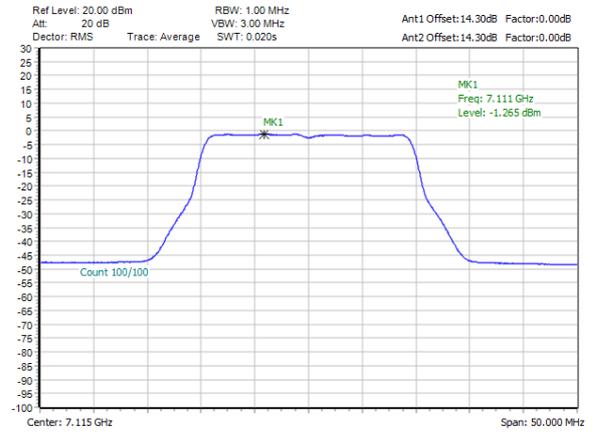


802.11be EHT20 Full RU

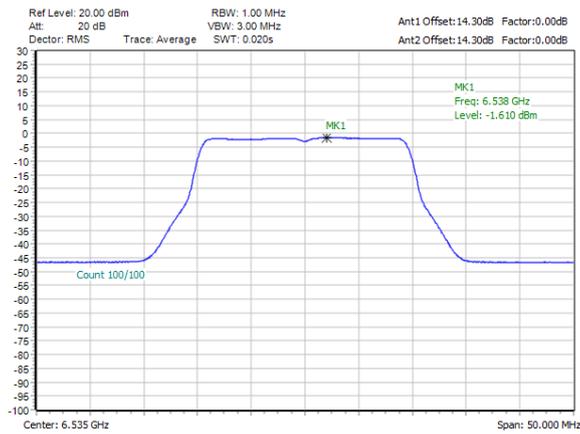
Low CH02 5935MHz

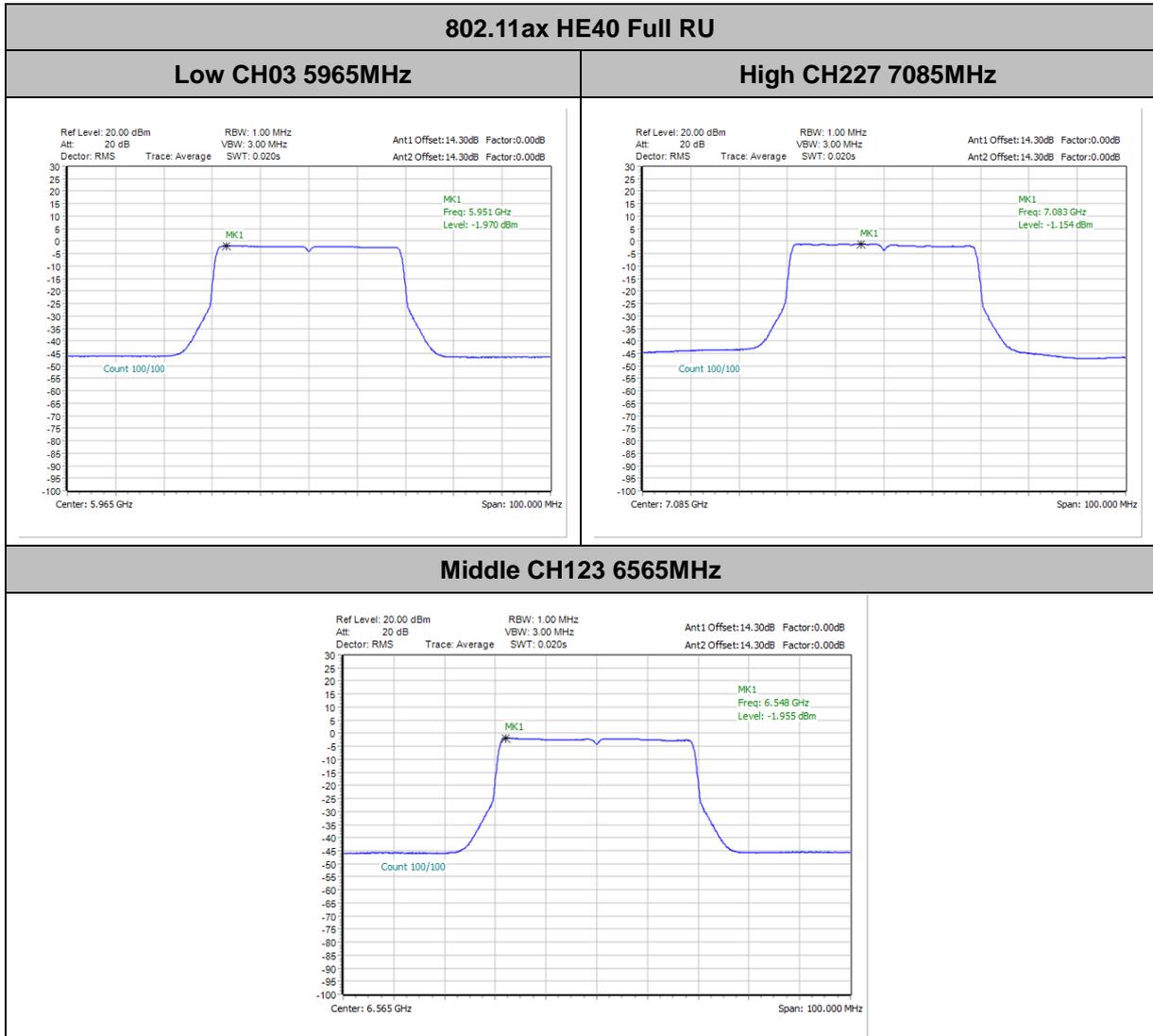


High CH233 7115MHz



Middle CH 117 6535MHz

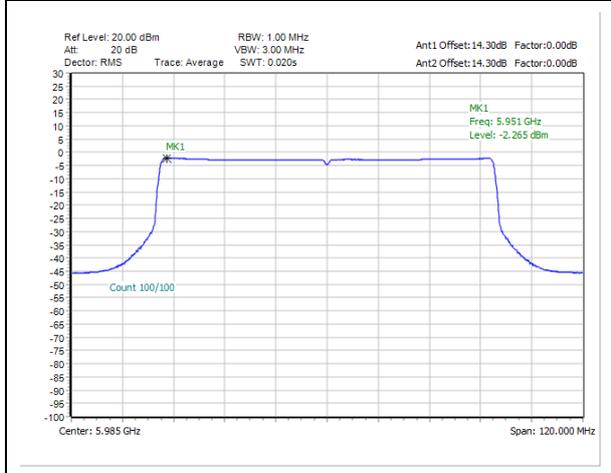




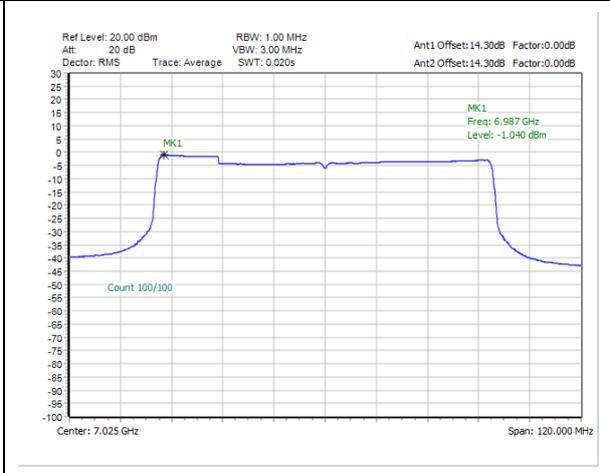


802.11be EHT80 Full RU

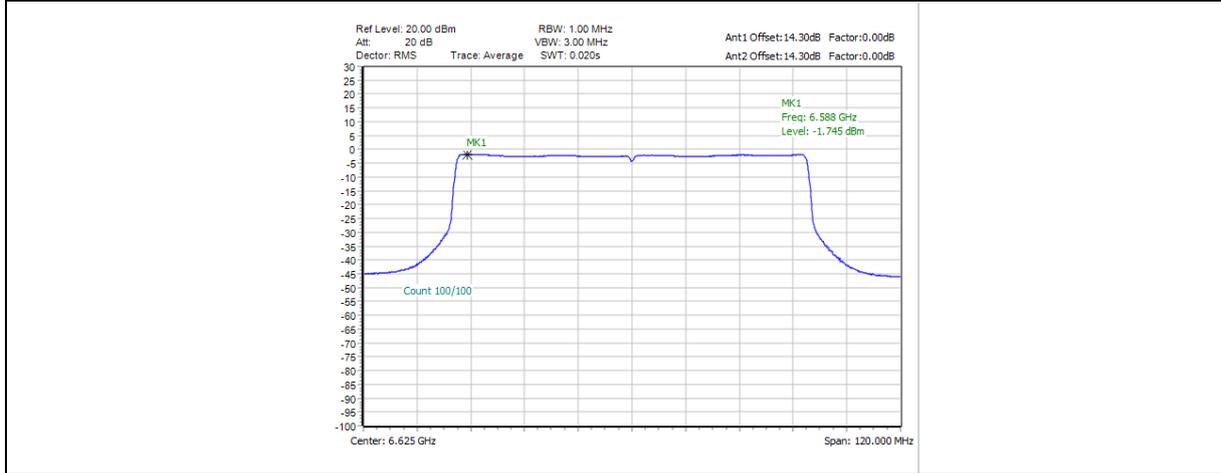
Low CH07 5985MHz

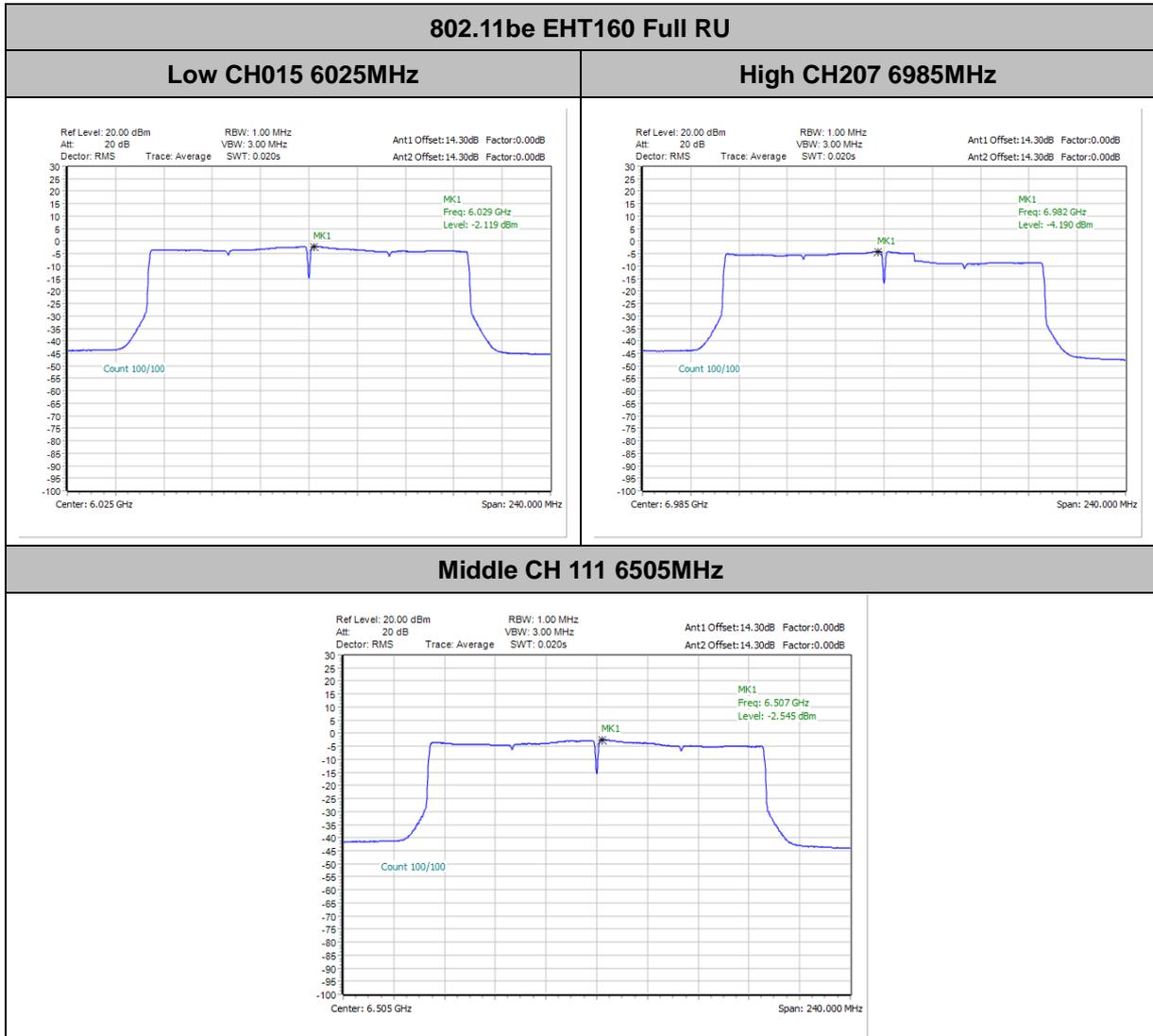


High CH215 7025MHz



Middle CH 135 6625MHz

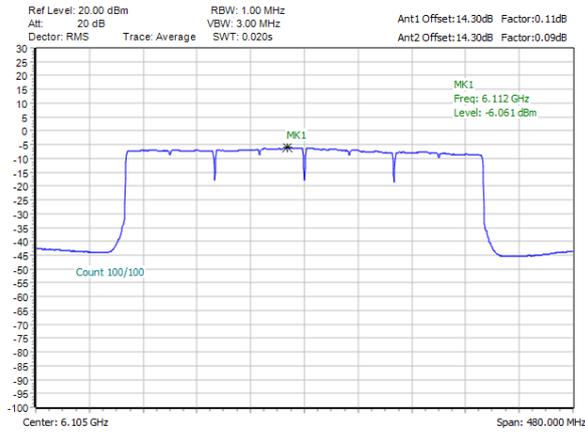




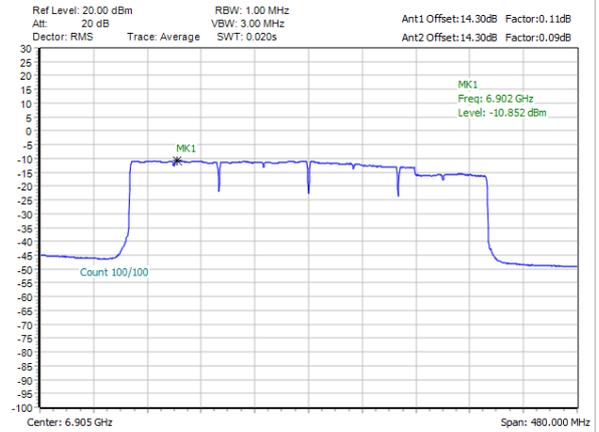


802.11be EHT320 Full RU

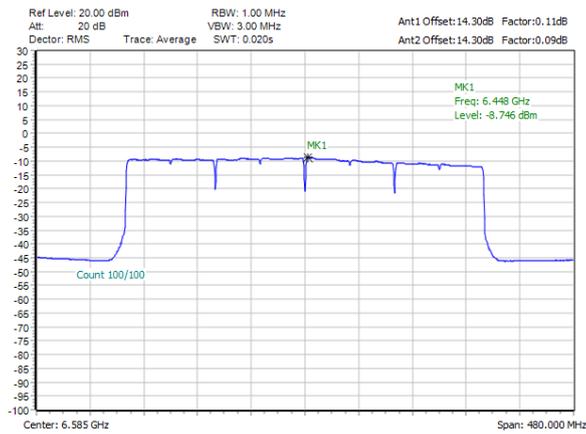
Low CH31 6105MHz



High CH191 6905MHz



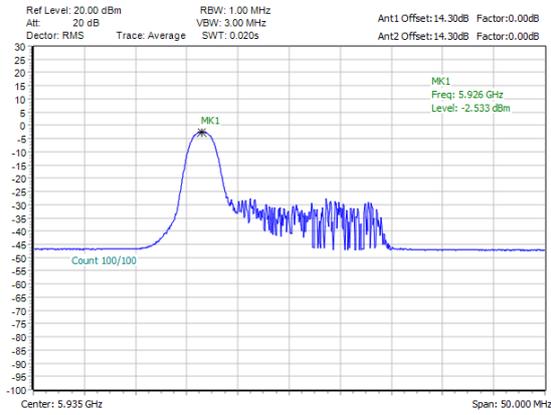
Middle CH 127 6585MHz



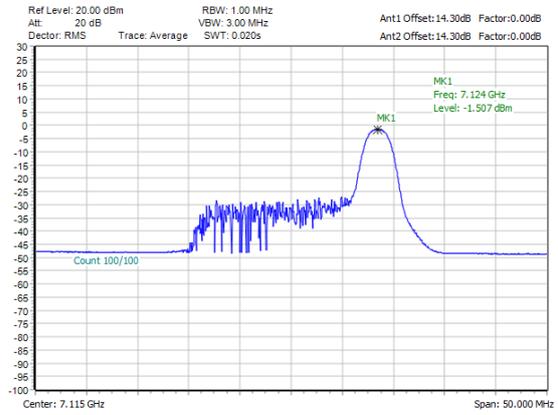


802.11be EHT20 Partial RU

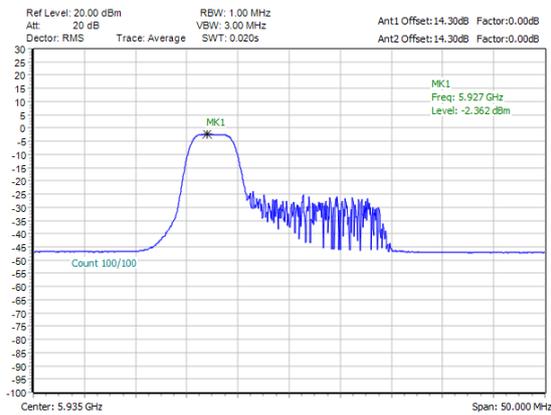
Low CH02 5935MHz 26RU0



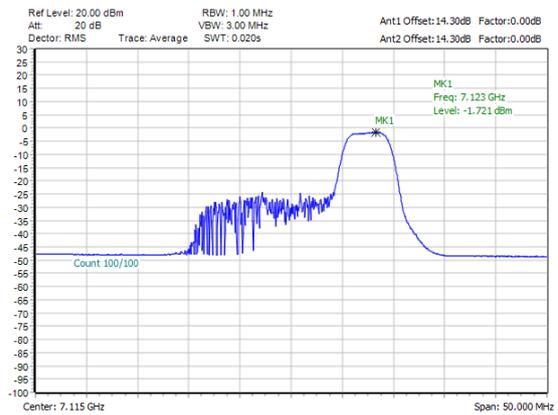
High CH233 7115MHz 26RU8



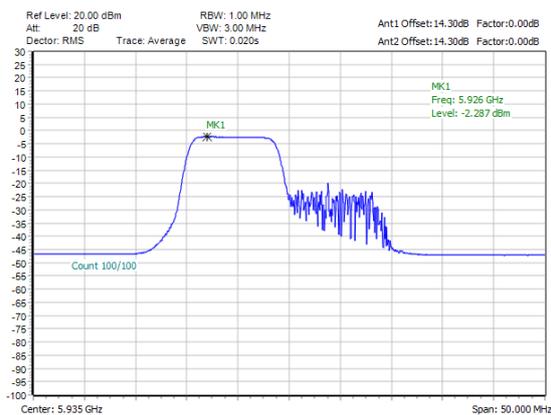
Low CH02 5935MHz 52RU37



High CH233 7115MHz 52RU40



Low CH02 5935MHz 106RU53

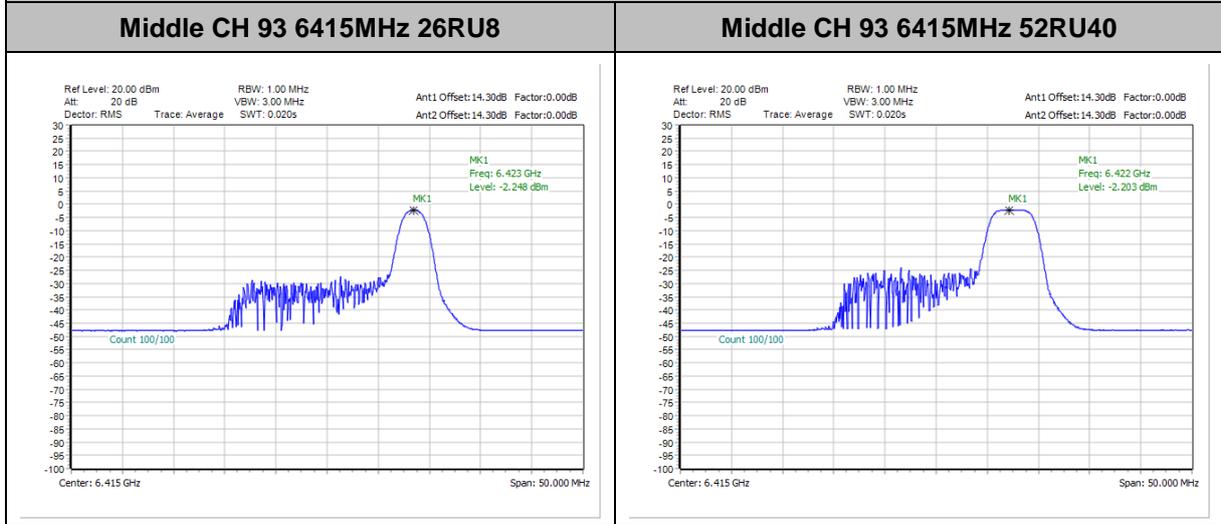


High CH233 7115MHz 106RU54

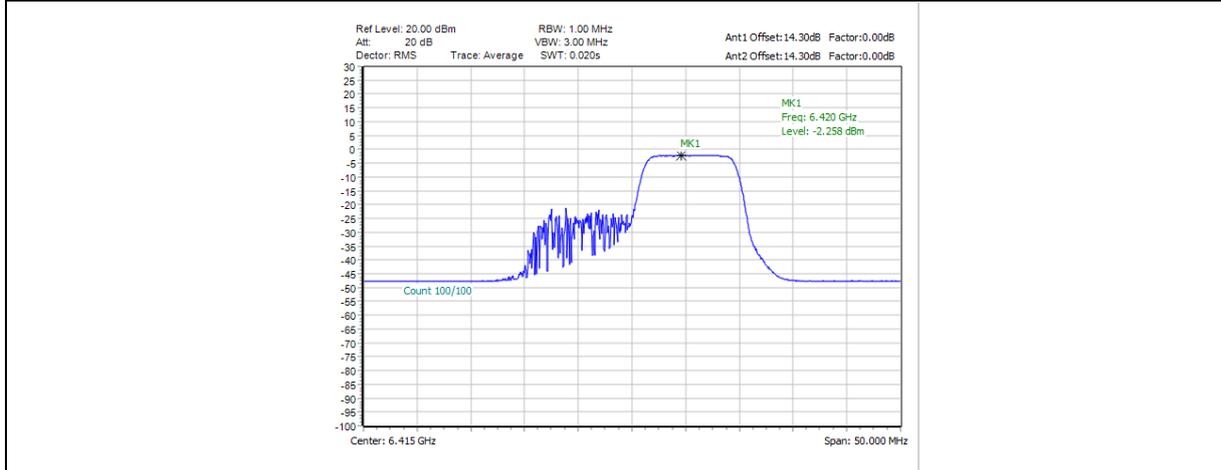




802.11be EHT20 Partial RU



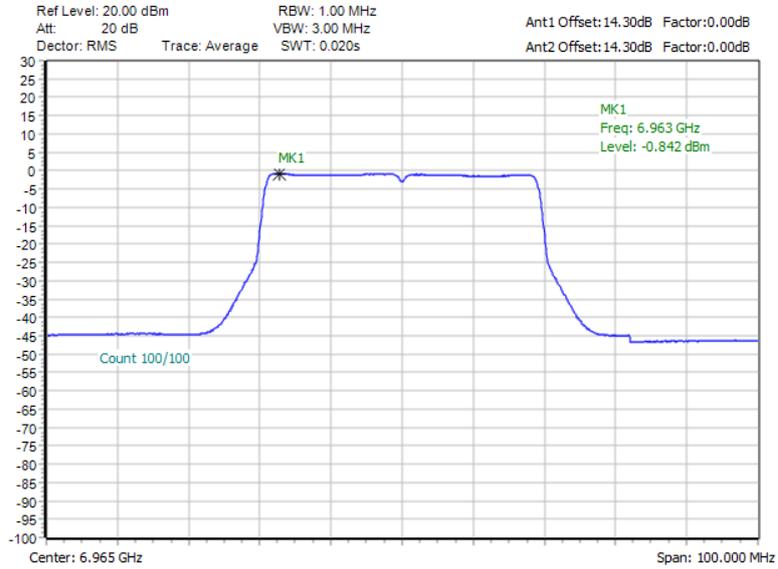
Middle CH 93 6415MHz 106RU54





Worst Case Power Density (dBm/MHz) for MIMO Ant.5+6

802.11be EHT40 CH203 6965MHz





3.4 In-Band Emissions (Channel Mask)

3.4.1 Limit of Unwanted Emissions

<FCC 14-30 CFR 15.407>

(b)(6) For transmitters operating within the 5.925-7.125 GHz bands: Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. 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, and 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. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

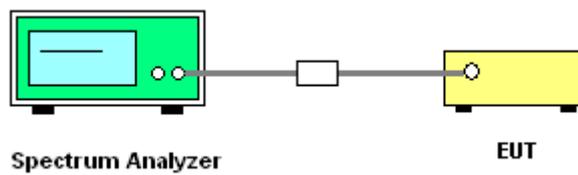
The testing follows FCC KDB 987594 D02 U-NII 6GHz EMC Measurement.

Section J) In-Band Emissions.

1. Take nominal bandwidth as reference channel bandwidth provided that 26 dB emission bandwidth is always larger than nominal bandwidth
2. Measure the power spectral density (which will be used 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 $\geq 3 \times$ RBW
 - d) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$.
 - 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.
3. 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.
 - 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.
4. Adjust the span to encompass the entire mask as necessary.
5. Clear trace.
6. Trace average at least 100 traces in power averaging (rms) mode.
7. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask.

3.4.4 Test Setup



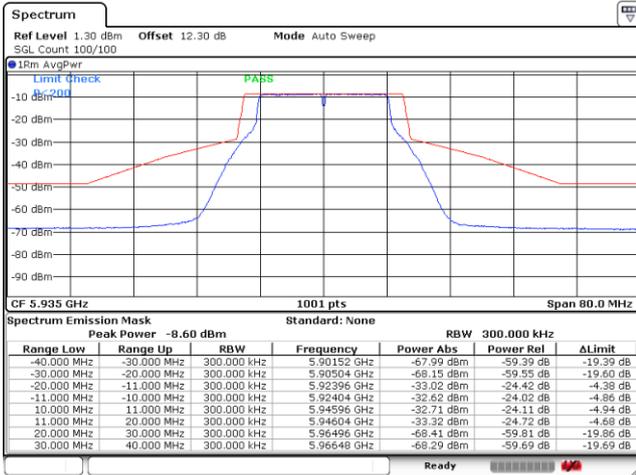


3.4.5 Test Result

<MIMO Ant.5+4(5)>:

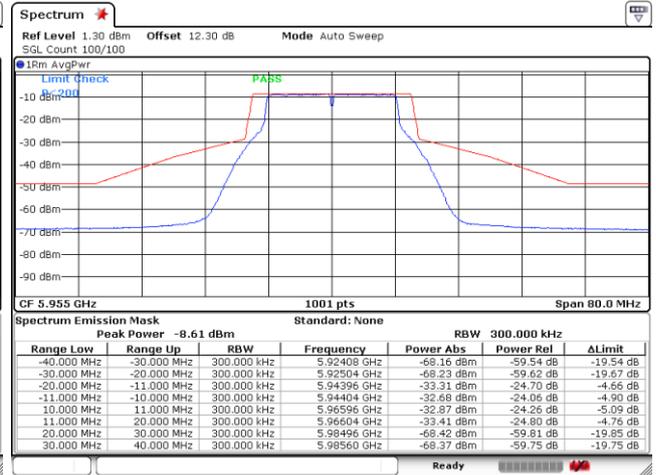
EUT Mode : 802.11a

Plot on Channel 5935MHz



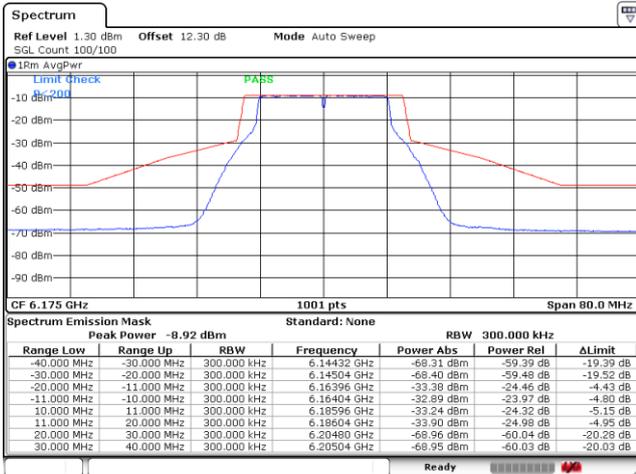
Date: 23.OCT.2023 23:41:08

Plot on Channel 5955MHz



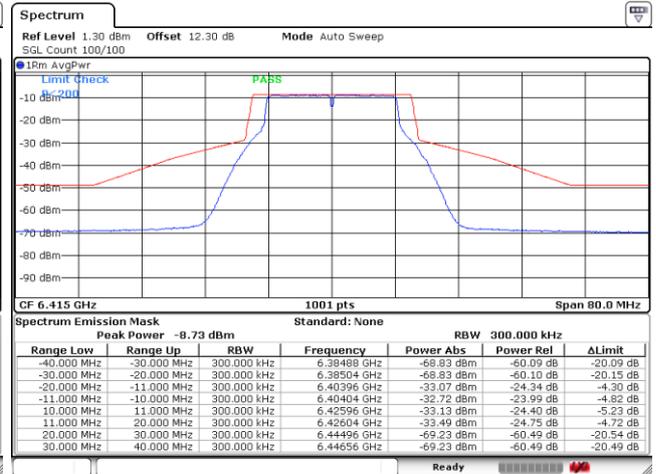
Date: 23.OCT.2023 23:39:39

Plot on Channel 6175MHz



Date: 23.OCT.2023 23:47:28

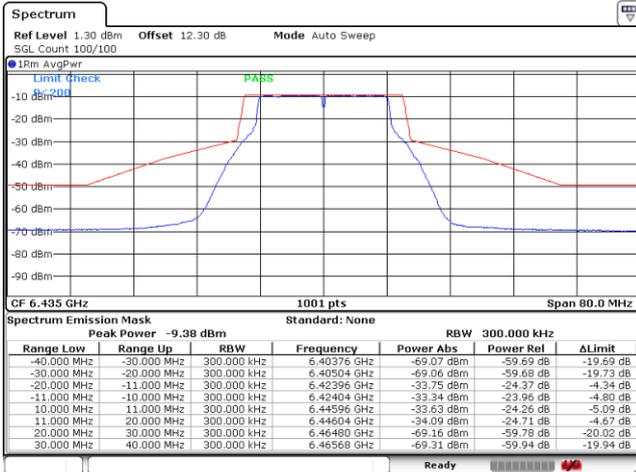
Plot on Channel 6415MHz



Date: 23.OCT.2023 23:52:58

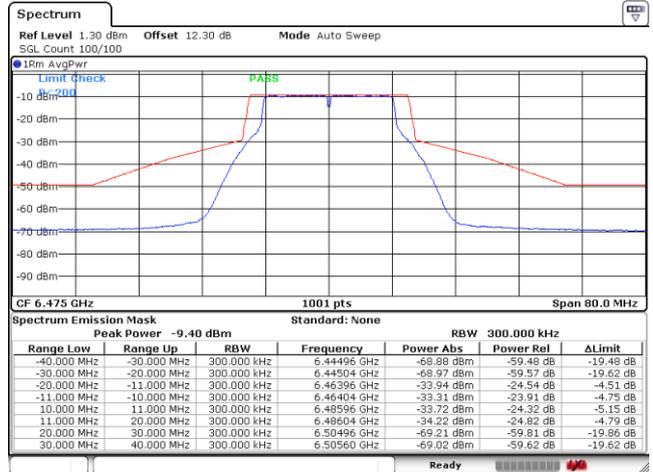


Plot on Channel 6435MHz



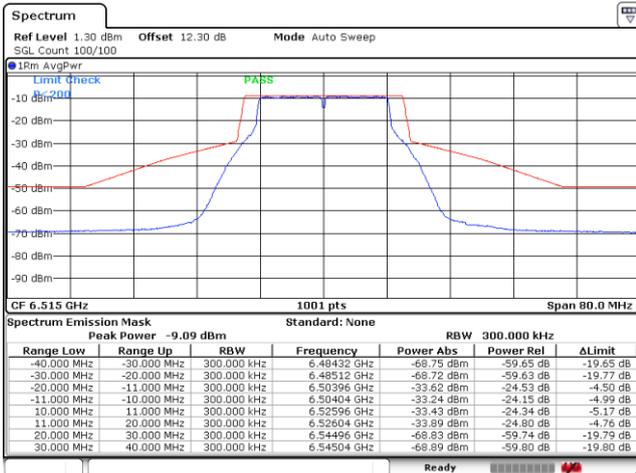
Date: 8.NOV.2023 23:02:25

Plot on Channel 6475MHz



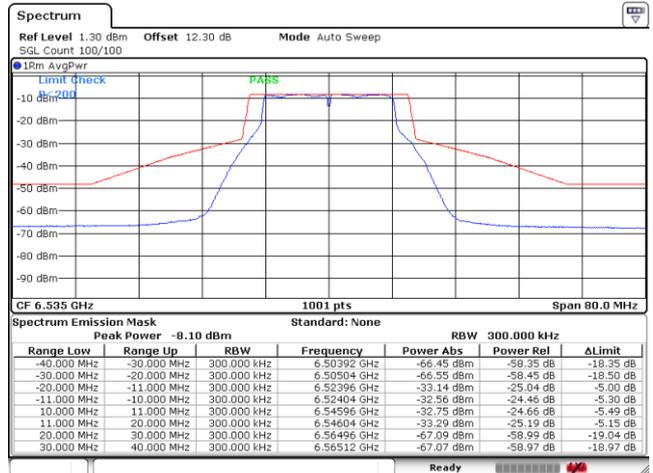
Date: 8.NOV.2023 23:13:09

Plot on Channel 6515MHz



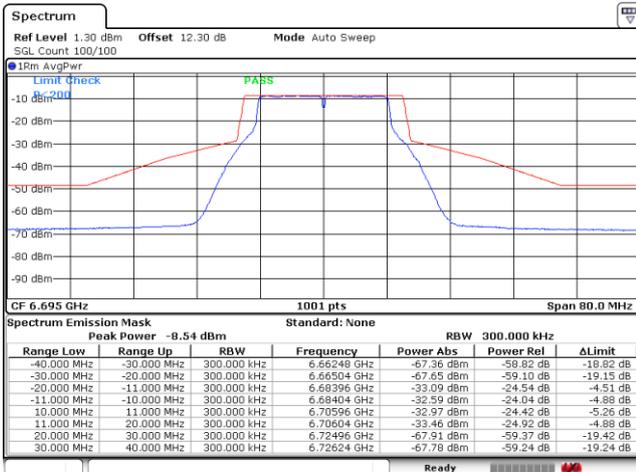
Date: 8.NOV.2023 23:18:33

Plot on Channel 6535MHz



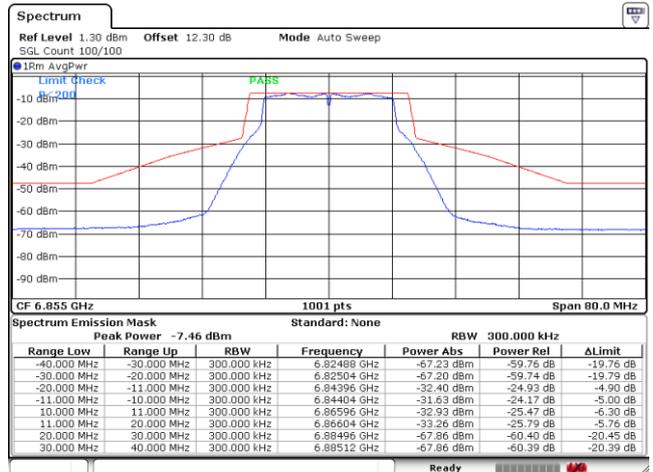
Date: 8.NOV.2023 23:26:04

Plot on Channel 6695MHz



Date: 8.NOV.2023 23:29:57

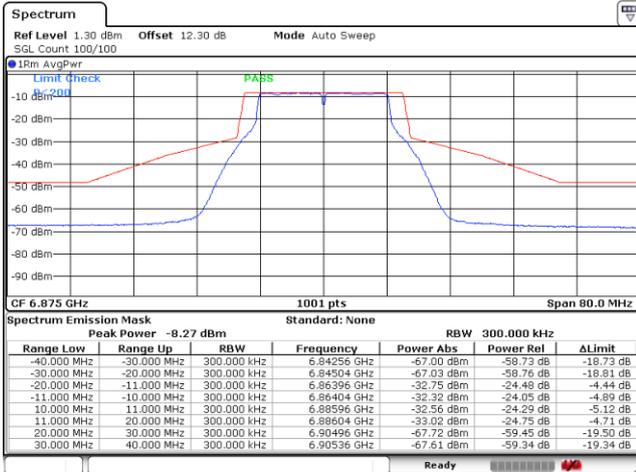
Plot on Channel 6855MHz



Date: 8.NOV.2023 23:46:41

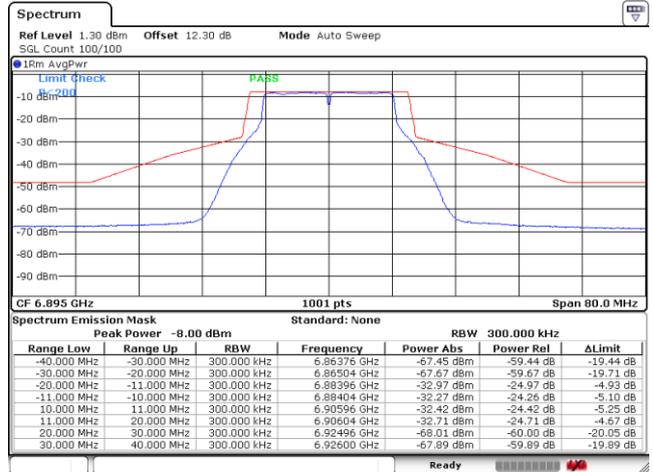


Plot on Channel 6875MHz



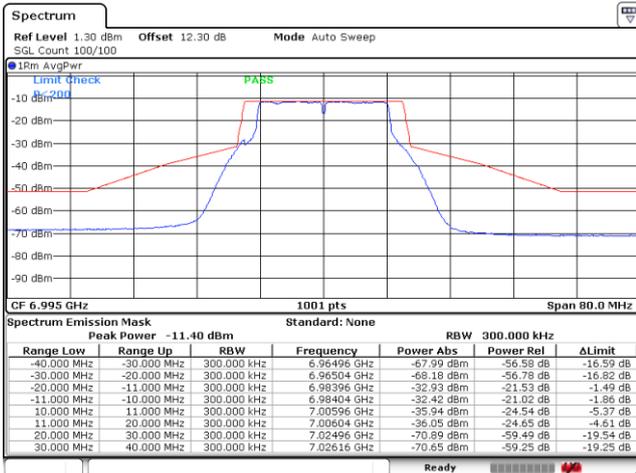
Date: 9.NOV.2023 00:18:20

Plot on Channel 6895MHz



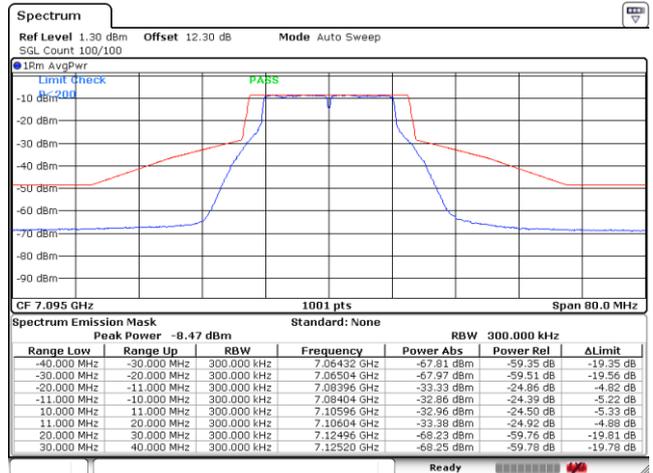
Date: 9.NOV.2023 00:23:23

Plot on Channel 6995MHz



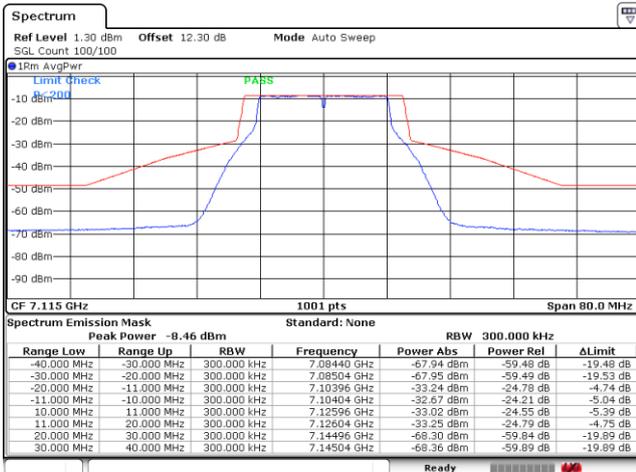
Date: 9.NOV.2023 00:31:06

Plot on Channel 7095MHz



Date: 9.NOV.2023 00:46:39

Plot on Channel 7115MHz

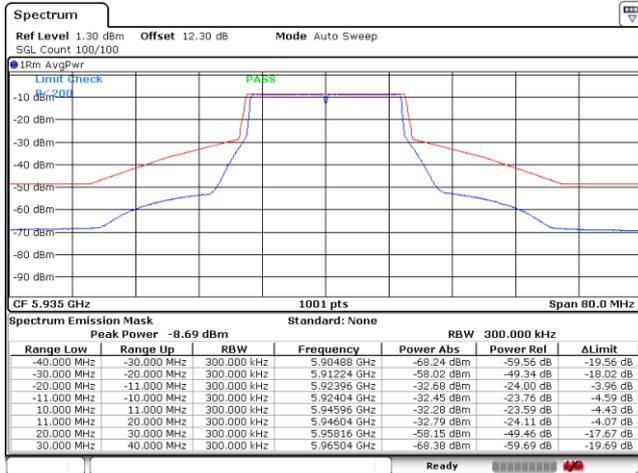


Date: 9.NOV.2023 00:53:03



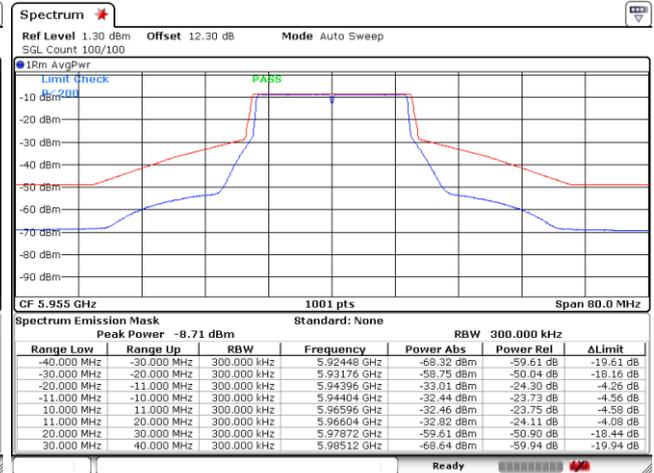
EUT Mode : 802.11be EHT20

Plot on Channel 5935MHz



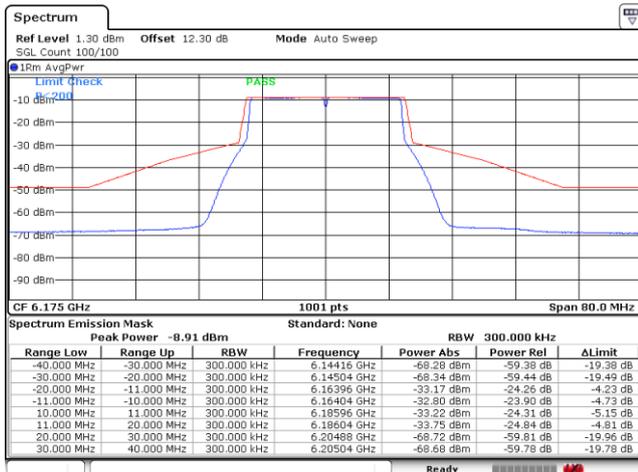
Date: 24.OCT.2023 00:12:38

Plot on Channel 5955MHz



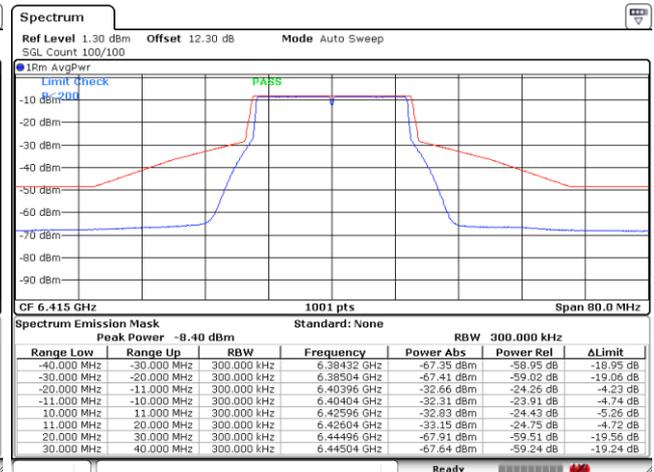
Date: 24.OCT.2023 00:16:20

Plot on Channel 6175MHz



Date: 24.OCT.2023 00:08:20

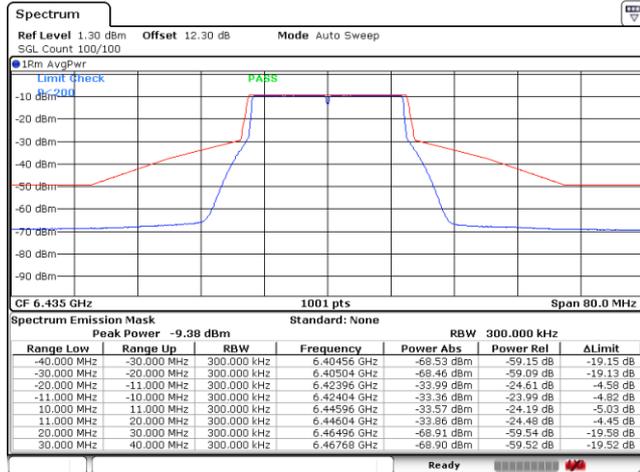
Plot on Channel 6415MHz



Date: 23.OCT.2023 23:59:10

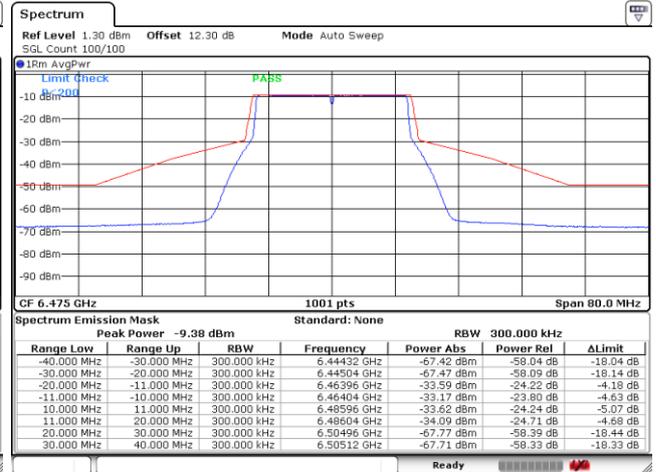


Plot on Channel 6435MHz



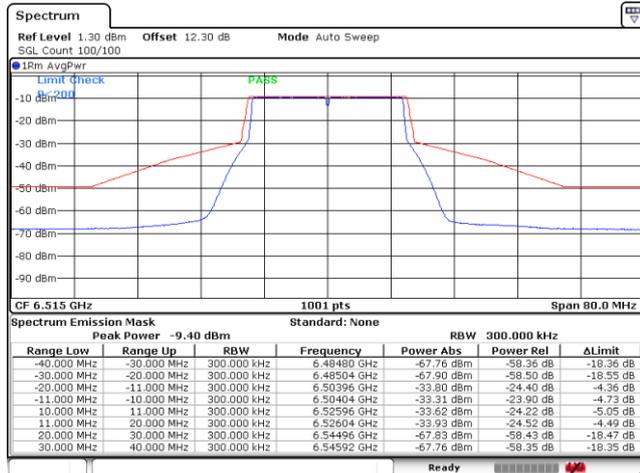
Date: 9.NOV.2023 01:23:29

Plot on Channel 6475MHz



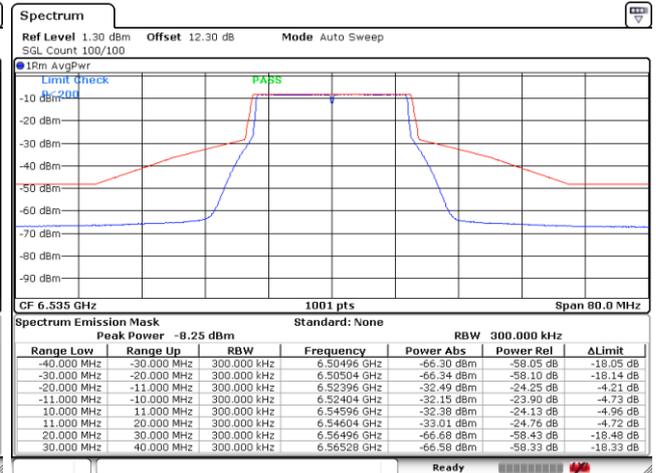
Date: 9.NOV.2023 01:32:31

Plot on Channel 6515MHz



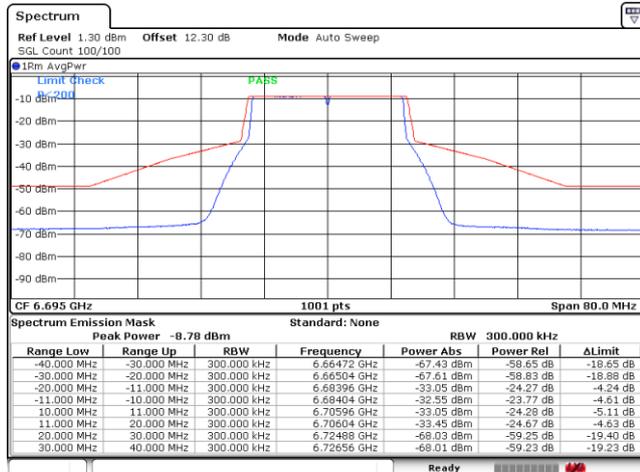
Date: 9.NOV.2023 08:53:20

Plot on Channel 6535MHz



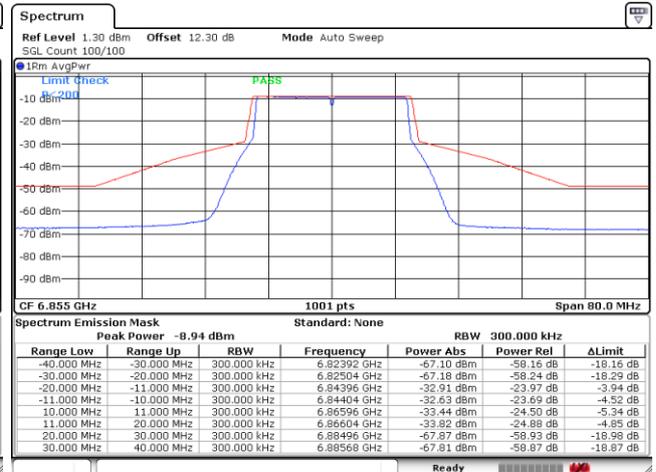
Date: 9.NOV.2023 09:03:39

Plot on Channel 6695MHz



Date: 9.NOV.2023 09:08:33

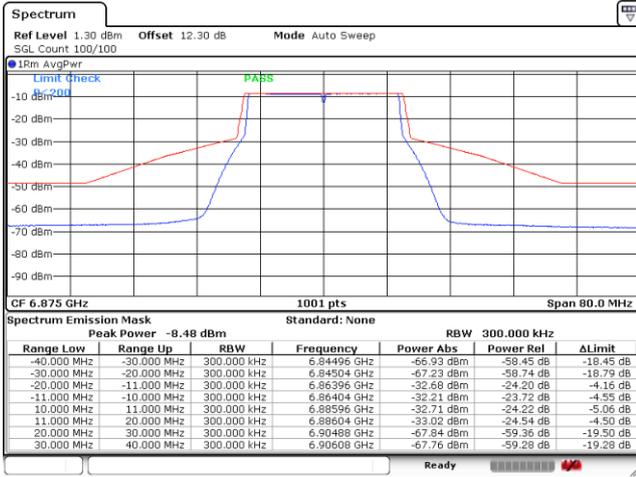
Plot on Channel 6855MHz



Date: 9.NOV.2023 09:12:51

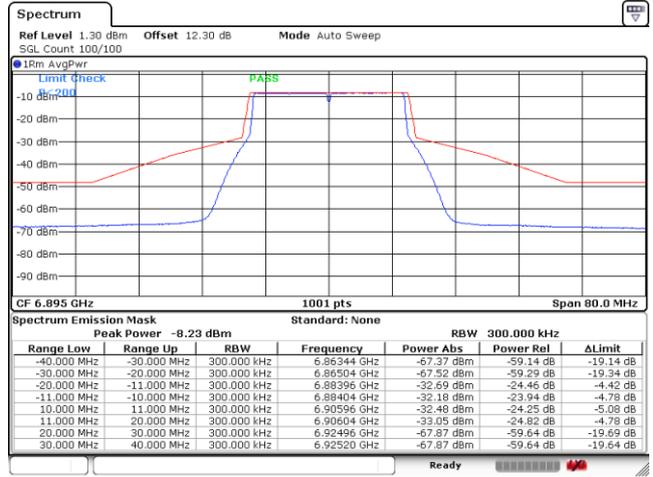


Plot on Channel 6875MHz



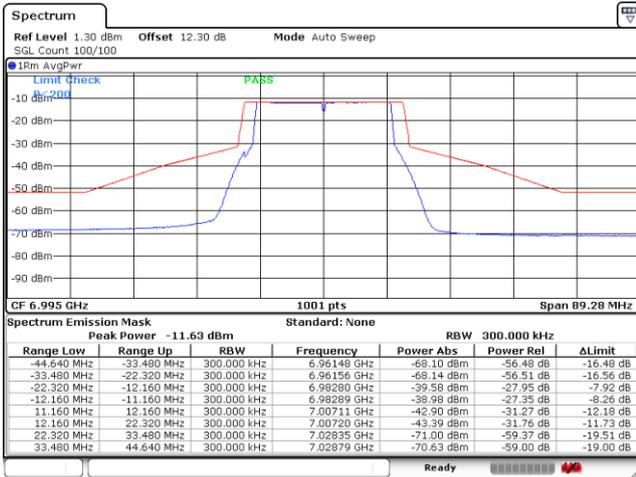
Date: 9.NOV.2023 09:21:32

Plot on Channel 6895MHz



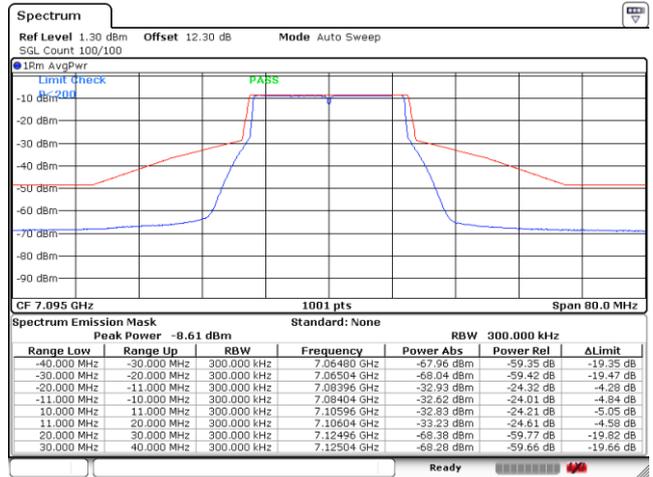
Date: 9.NOV.2023 09:35:19

Plot on Channel 6995MHz



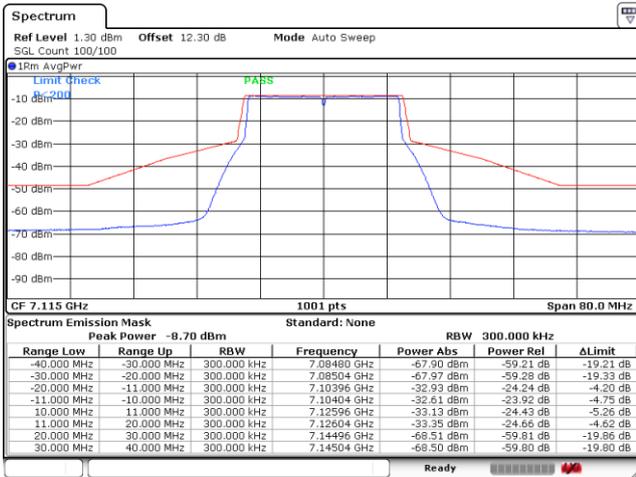
Date: 9.NOV.2023 09:43:15

Plot on Channel 7095MHz



Date: 9.NOV.2023 09:58:20

Plot on Channel 7115MHz

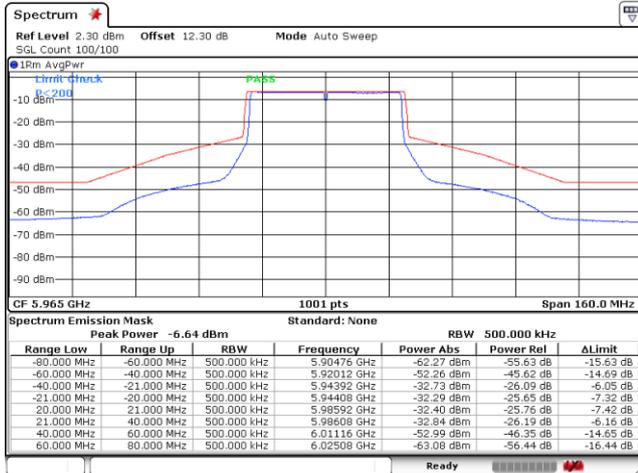


Date: 9.NOV.2023 10:07:04



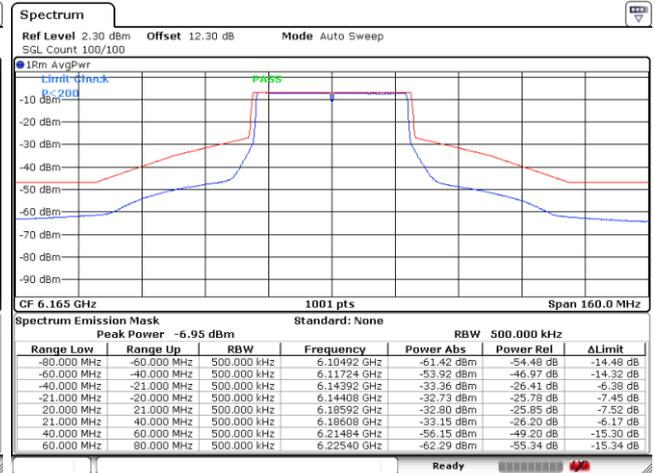
EUT Mode : 802.11be EHT40

Plot on Channel 5965MHz



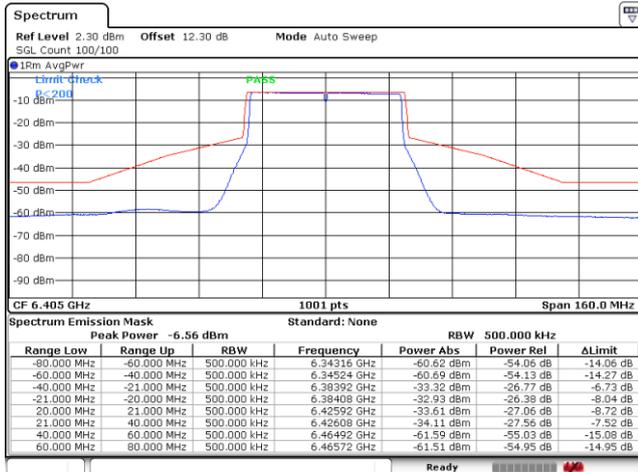
Date: 24.OCT.2023 00:22:14

Plot on Channel 6165MHz



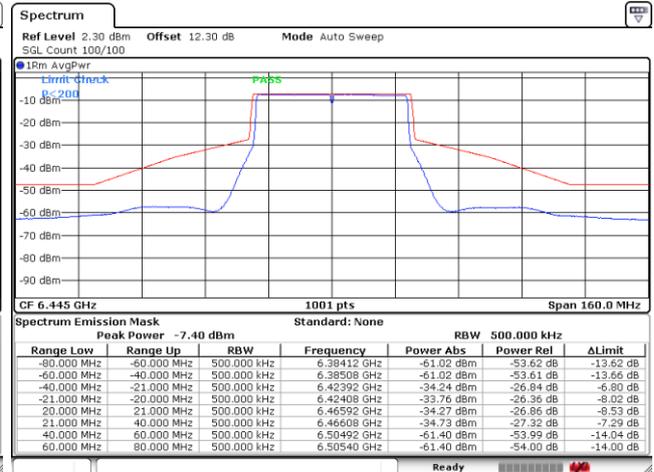
Date: 24.OCT.2023 00:28:36

Plot on Channel 6405MHz



Date: 24.OCT.2023 00:33:26

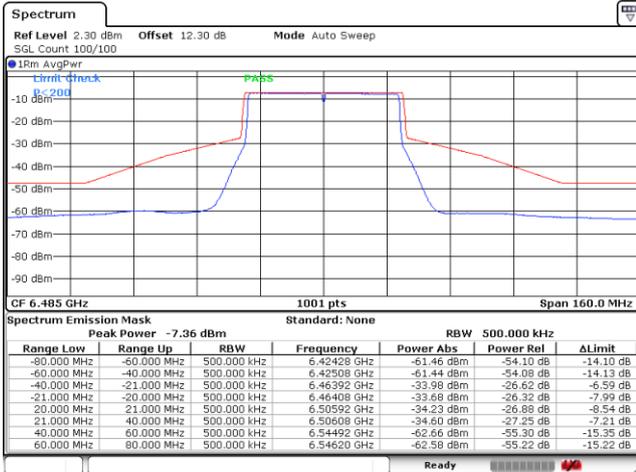
Plot on Channel 6445MHz



Date: 9.NOV.2023 10:29:22

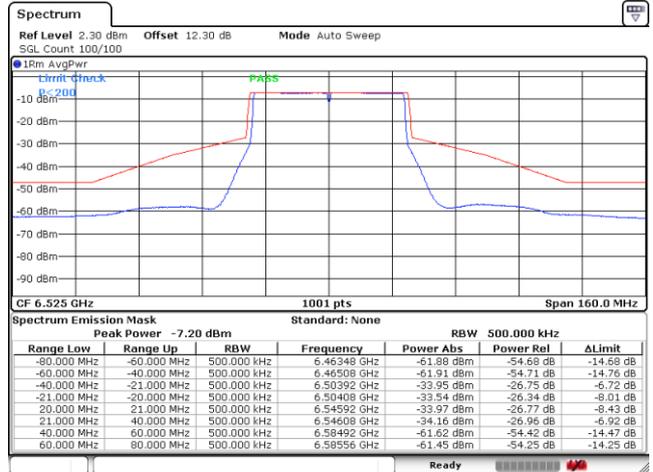


Plot on Channel 6485MHz



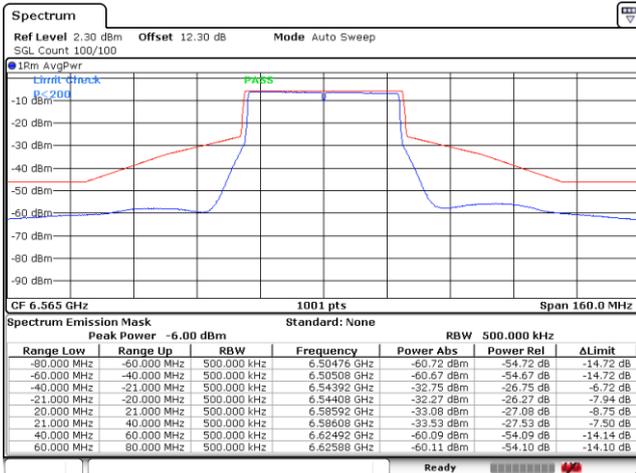
Date: 9.NOV.2023 10:32:13

Plot on Channel 6525MHz



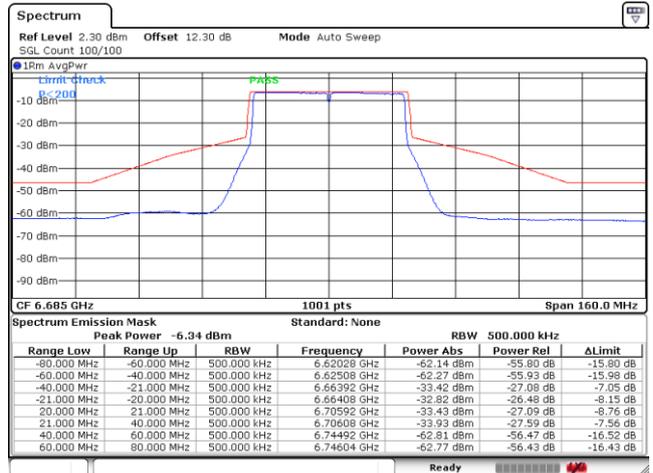
Date: 9.NOV.2023 10:39:05

Plot on Channel 6565MHz



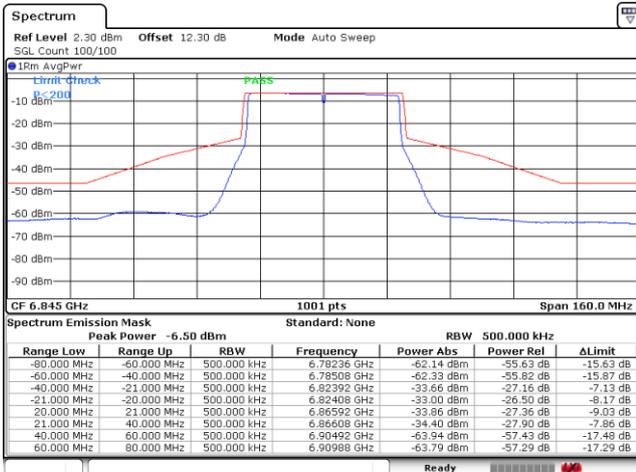
Date: 9.NOV.2023 10:56:35

Plot on Channel 6685MHz



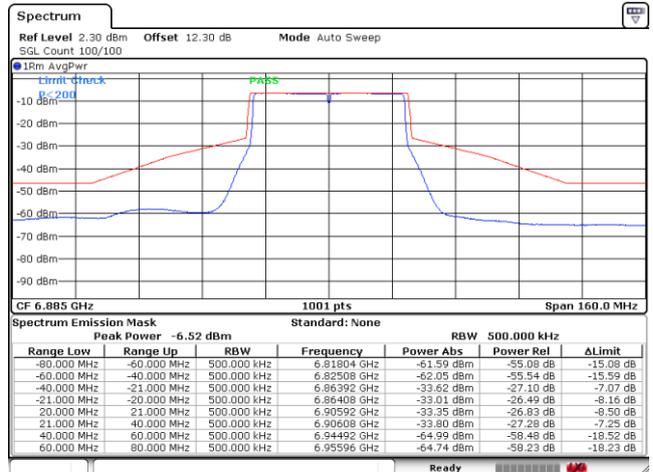
Date: 9.NOV.2023 10:59:14

Plot on Channel 6845MHz



Date: 9.NOV.2023 11:02:50

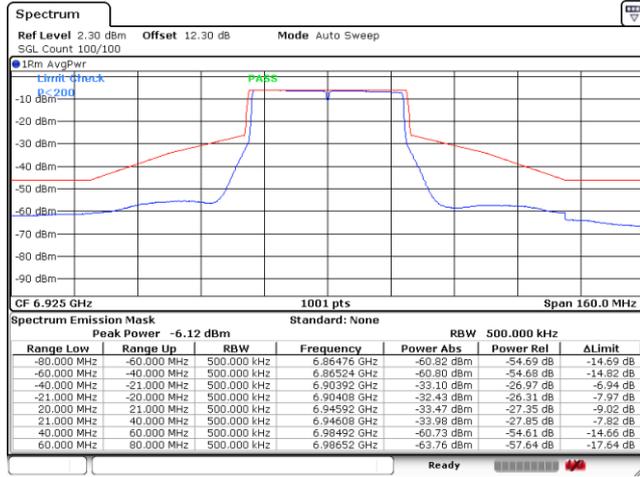
Plot on Channel 6885MHz



Date: 9.NOV.2023 11:08:15

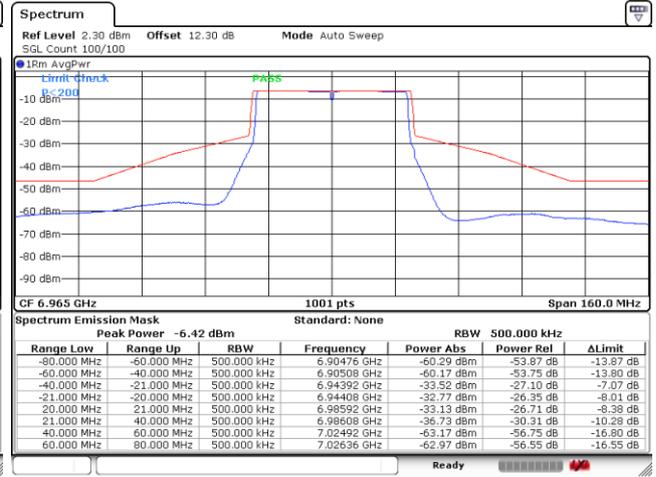


Plot on Channel 6925MHz



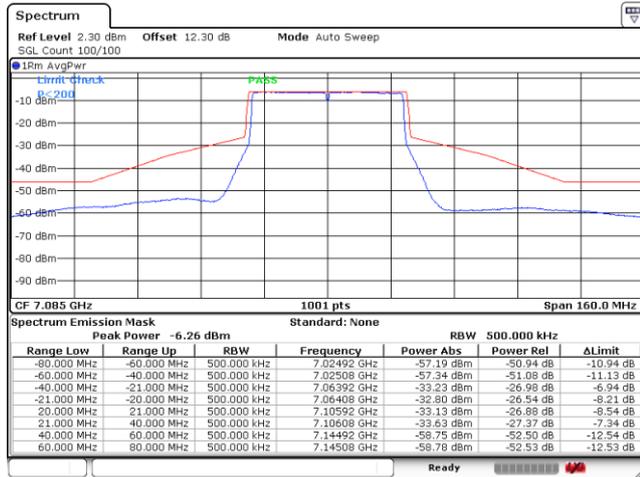
Date: 9.NOV.2023 11:13:44

Plot on Channel 6965MHz



Date: 9.NOV.2023 11:18:40

Plot on Channel 7085MHz

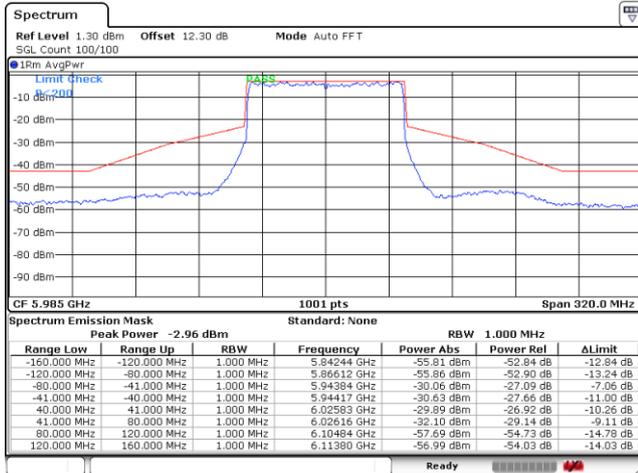


Date: 9.NOV.2023 11:31:12



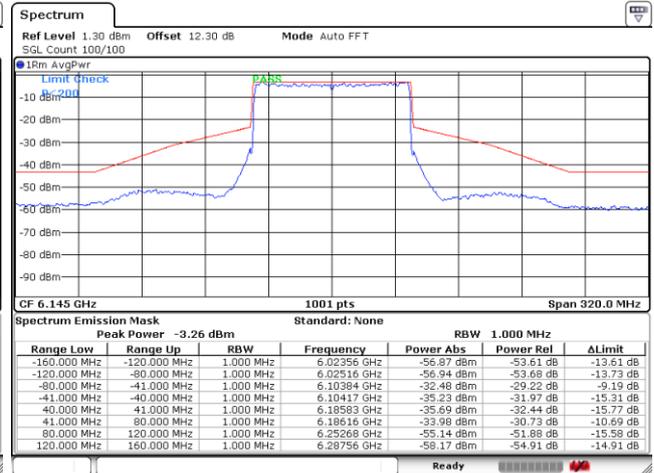
EUT Mode : 802.11be EHT80

Plot on Channel 5985MHz



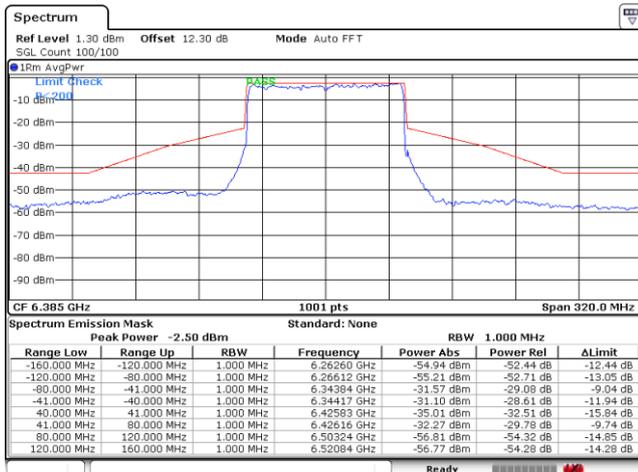
Date: 24.OCT.2023 00:42:16

Plot on Channel 6145MHz



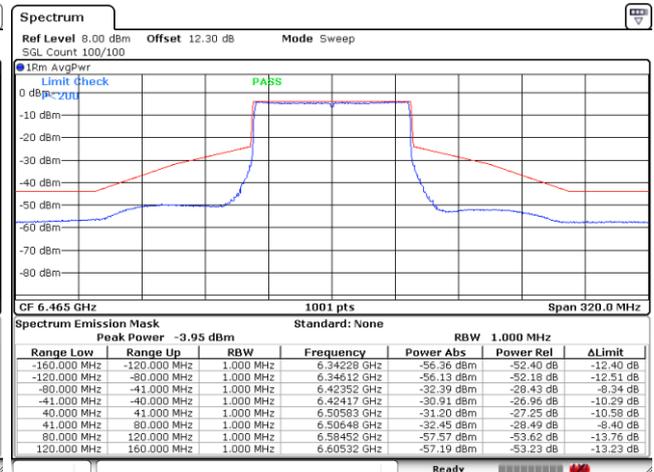
Date: 24.OCT.2023 00:52:16

Plot on Channel 6385MHz



Date: 24.OCT.2023 01:01:00

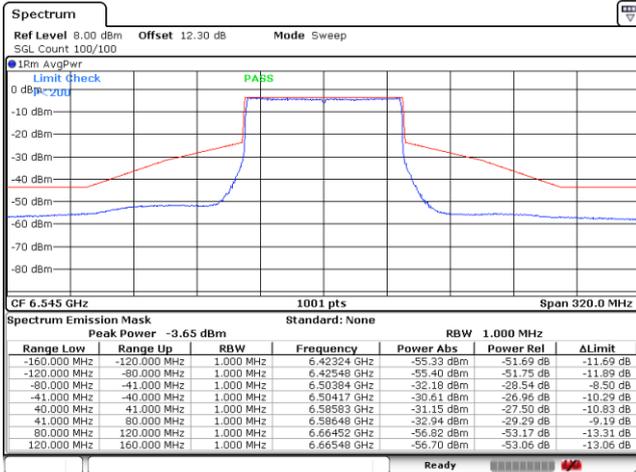
Plot on Channel 6465MHz



Date: 9.NOV.2023 11:38:48

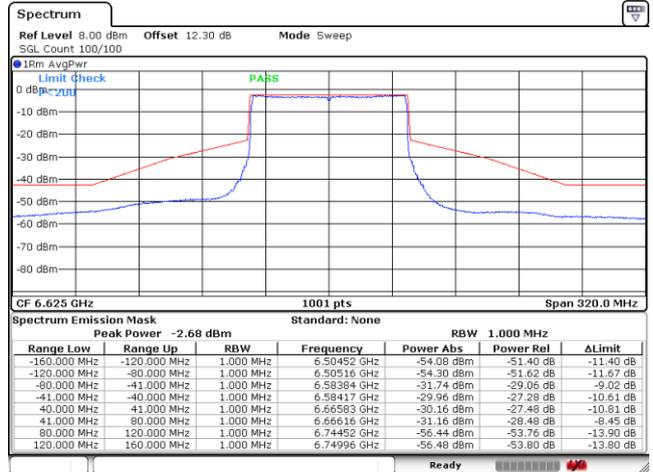


Plot on Channel 6545MHz



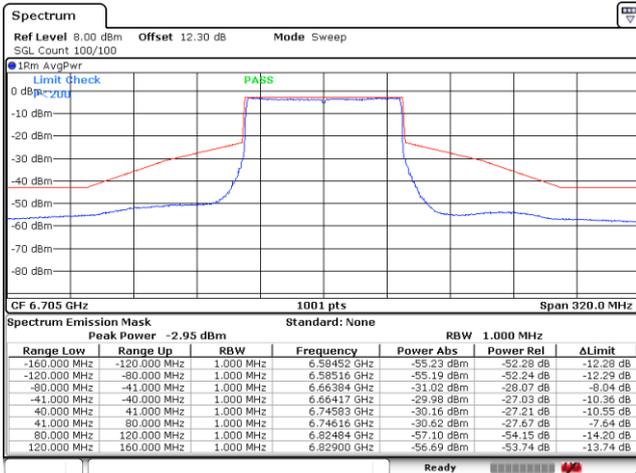
Date: 9.NOV.2023 11:51:42

Plot on Channel 6625MHz



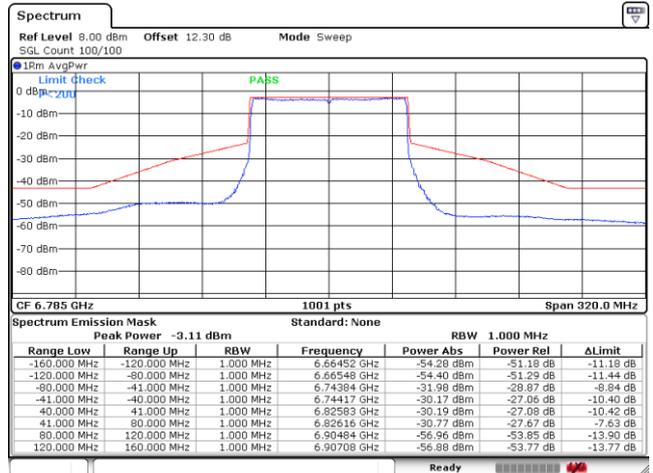
Date: 9.NOV.2023 14:15:06

Plot on Channel 6705MHz



Date: 9.NOV.2023 14:17:09

Plot on Channel 6785MHz



Date: 9.NOV.2023 14:21:00