



FCC RADIO TEST REPORT

| FCC ID | : | UZ7ET65AW |
|--------------|---|---|
| Equipment | : | Rugged 2 in 1 Android Tablet |
| Brand Name | : | Zebra |
| Model Name | : | ET65AW |
| Applicant | : | Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742 |
| Manufacturer | : | Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742 |
| Standard | : | FCC Part 15 Subpart E §15.407 |

The product was received on Jul. 12, 2023 and testing was performed from Jul. 17, 2023 to Oct. 06, 2023. We, Sporton International Inc. EMC & Wireless Communications Laboratory, 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 from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu Sporton International Inc. EMC & Wireless Communications Laboratory No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

| Report No. | Version | Description | Issue Date |
|------------|---------|--|---------------|
| FR371211G | 01 | Initial issue of report | Sep. 19, 2023 |
| FR371211G | 02 | Revise section 1.2 remark, section 2.2 description, CBP frequency domain plots and add partial RU mask data This report is an updated version, replacing the report issued on Sep. 19, 2023. | Sep. 27, 2023 |
| FR371211G | 03 | Revise CBP verify with frequency domain plots This report is an updated version, replacing the report issued on Sep. 27, 2023. | Sep. 28, 2023 |
| FR371211G | 04 | Revise Contention Based Protocol This report is an updated version, replacing the report issued on Sep. 28, 2023. | Oct. 03, 2023 |
| FR371211G | 05 | Revise Contention Based Protocol This report is an updated version, replacing the report issued on Oct. 03, 2023. | Oct. 11, 2023 |
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| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|------------------|---------------------|------------------------------------|-----------------------|--|
| 3.1 | 15.407(a)(10) | 26dB Emission Bandwidth | Pass | - |
| 3.1 | 2.1049 | 99% Occupied Bandwidth | 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 | 1.20 dB under the limit at 7125.02 MHz |
| 3.7 | 15.207 | AC Conducted Emission | Pass | 3.69 dB under the limit at 13.56 MHz |
| 3.8 | 15.203 15.407(a) | Antenna Requirement | Pass | - |

Summary of Test Result

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/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.

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.

Reviewed by: Keven Cheng

Report Producer: Lucy Wu

^{2.} The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

1 General Description

1.1 Product Feature of Equipment Under Test

| Product Feature | | | | | |
|--|--|--|--|--|--|
| Equipment Rugged 2 in 1 Android Tablet | | | | | |
| Brand Name | Zebra | | | | |
| Model Name | ET65AW | | | | |
| FCC ID | UZ7ET65AW | | | | |
| EUT supports Radios application | WCDMA/HSPA/LTE/5G NR/NFC/GNSS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE | | | | |
| HW Version | DV2 | | | | |
| SW Version | A13 | | | | |
| FW Version | 1.1.2.0.645.4 | | | | |
| MFD | 21JUN23 | | | | |
| EUT Stage | Identical Prototype | | | | |

Remark: The EUT's information above is declared by manufacturer.

| Specification of Accessories | | | | | |
|---|------------|-------|-------------|----------------|--|
| Adapter Brand Name Zebra Part Number PWR-BGA15V45W-UC2-WW | | | | | |
| Battery 1 | Brand Name | Zebra | Part Number | BT-000471-0020 | |
| Battery 2 | Brand Name | Zebra | Part Number | BT-000471-0820 | |

| Supported Unit Used in Test Configuration and System | | | | | | |
|--|------------|-------|-------------|--------------------|--|--|
| USB TYPE C to 3.5mm audio connector | Brand Name | Zebra | Part Number | ADP-USBC-35MM1-01 | | |
| 3.5mm Earphone | Brand Name | Zebra | Part Number | HDST-35MM-PTVP-01 | | |
| USB TYPE C Earphone | Brand Name | Zebra | Part Number | HPST-USBC-PTT1-01 | | |
| Headset Jumper | Brand Name | Zebra | Part Number | CBL-TC51-HDST35-01 | | |



1.2 Product Specification of Equipment Under Test

| Product Specification is subject to this standard | | | | | |
|---|---|--|--|--|--|
| Tx/Rx Channel Frequency Range | 5925 MHz ~ 6425 MHz 6425 MHz ~ 6525 MHz | | | | |
| | 6525 MHz ~ 6875 MHz 6875 MHz ~ 7125 MHz | | | | |
| | MIMO <ant. 6+7="">: <5925 MHz ~ 6425 MHz> 802.11a: 4.55 dBm / 0.0029 W</ant.> | | | | |
| Maximum Output Power to Antenna <cdd modes=""></cdd> | <6425 MHz ~ 6525 MHz> 802.11a: 6.00 dBm / 0.0040 W <6525 MHz ~ 6875 MHz> | | | | |
| | 802.11a: 5.40 dBm / 0.0035 W <6875 MHz ~ 7125 MHz> | | | | |
| | 802.11a: 5.67 dBm / 0.0037 W | | | | |
| Maximum Output Power to Antenna <sdm modes=""></sdm> | MIMO <ant. 6+7="">: <5925 MHz ~ 6425 MHz> 802.11ax: HE20: 8.10 dBm / 0.0065 W 802.11ax: HE40: 11.46 dBm / 0.0140 W 802.11ax: HE80: 13.97 dBm / 0.0249 W 802.11ax: HE160: 16.86 dBm / 0.0485 W <6425 MHz ~ 6525 MHz> 802.11ax: HE20: 9.85 dBm / 0.0097 W 802.11ax: HE40: 12.64 dBm / 0.0184 W 802.11ax: HE80: 15.21 dBm / 0.0332 W 802.11ax: HE160: 17.51 dBm / 0.0564 W <6525 MHz ~ 6875 MHz> 802.11ax: HE20: 9.24 dBm / 0.0084 W 802.11ax: HE40: 11.91 dBm / 0.0155 W 802.11ax: HE80: 14.71 dBm / 0.0296 W 802.11ax: HE160: 16.67 dBm / 0.0465 W <6875 MHz ~ 7125 MHz> 802.11ax: HE40: 12.97 dBm / 0.0198 W 802.11ax: HE40: 14.73 dBm / 0.0297 W 802.11ax: HE80: 14.73 dBm / 0.0297 W 802.11ax: HE160: 16.71 dBm / 0.0469 W</ant.> | | | | |
| 99% Occupied Bandwidth <cdd modes=""></cdd> | MIMO <ant. 6=""> 802.11a: 17.68 MHz MIMO <ant. 7=""> 802.11a: 16.98 MHz</ant.></ant.> | | | | |
| 99% Occupied Bandwidth <sdm modes=""></sdm> | MIMO <ant. 6=""> 802.11ax: HE20: 19.03 MHz 802.11ax: HE40: 38.16 MHz 802.11ax: HE80: 77.44 MHz 802.11ax: HE160: 156.80 MHz MIMO <ant. 7=""> 802.11ax: HE20: 19.13 MHz 802.11ax: HE40: 38.26 MHz 802.11ax: HE80: 77.32 MHz 802.11ax: HE160: 156.80 MHz</ant.></ant.> | | | | |



| Product Specification is subject to this standard | | | | | | |
|--|---|--------|--------|--|--|--|
| <5925 MHz ~ 6425 MHz> <ant. 7="">: Monopole Antenna with gain 3.38 dBi <ant. 8="">: Monopole Antenna with gain 2.54 dBi <6425 MHz ~ 6525 MHz> <ant. 7="">: Monopole Antenna with gain 1.17 dBi <ant. 8="">: Monopole Antenna with gain 2.15 dBi <6525 MHz ~ 6875 MHz> <ant. 7="">: Monopole Antenna with gain 1.52 dBi <ant. 8="">: Monopole Antenna with gain 1.52 dBi <ant. 8="">: Monopole Antenna with gain 2.49 dBi <6875 MHz ~ 7125 MHz></ant.></ant.></ant.></ant.></ant.></ant.></ant.> | | | | | | |
| | <ant. 7="">: Monopole Antenna with gain 1.62 dBi <ant. 8="">: Monopole Antenna with gain 2.45 dBi</ant.></ant.> | | | | | |
| Type of Modulation | 802.11a : OFDM (BP 802.11ax : OFDMA (BPSK/QPSK/16QAM | | , | | | |
| | | Ant. 7 | Ant. 8 | | | |
| Antenna Function Description | 802.11a/ax MIMO | V | V | | | |
| | 802.11ax TXBF | V | V | | | |

Remark:

- 1. MIMO Ant. 7+8 Directional Gain is a calculated result from MIMO Ant. 7 and MIMO Ant. 8. The formula used in calculation is documented in section 1.2.1.
- 2. Power of MIMO Ant. 7 + Ant. 8 is a calculated result from sum of the power MIMO Ant. 7 and MIMO Ant. 8.
- The device WIFI MIMO support 1S2T (CDD & Tx Beamforming) (Nss=1) mode& SDM (2S2T :Nss=2) mode, 1S2T: Nss=1, MIMO 2Tx; 2S2T: Nss=2, MIMO 2Tx.by manufacturer declared.
- 4. For 802.11a, it does not support SDM & Tx Beamforming so the correlated gain for CDD is applied.
- 5. 802.11ax support Tx Beamforming mode, and the manufacturer declares that Tx Beamforming power/EIRP/PSD is not greater than CDD&SDM mode, so CDD&SDM mode covers Tx Beamforming mode. In SDM mode, the conducted power is set to 3dB higher than TXBF/CDD. Since the maximum array gain for the two antenna system is 3dB, the TXBF/CDD compliance is met by testing SDM mode as worst mode for LPI power mode.
- 6. 802.11ax supports both full RU tones and partial RU tones, which are both conducted power/PSD tested in Appendix A, for channel masking in Section 3.4.5, all the other test case were performed with full RU with its maximum power/PSD.
- 7. The EUT does not support channel puncturing mode.
- 8. The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

1.2.1 Antenna Directional Gain

<For CDD Mode>

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)ii)

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows:

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \le 4$.

 $G_{\mbox{\scriptsize ANT}}$ is set equal to the gain of the antenna having the highest gain.

For PSD measurements, the directional gain calculation.

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

 N_{SS} = the number of independent spatial streams of data;

 N_{ANT} = the total number of antennas

 $g_{j,k} = 10^{G_k/20}$ if the *k*th antenna is being fed by spatial stream *j*, or zero if it is not; G_k is the gain in dBi of the kth antenna.

As minimum N_{SS} =1 is supported by EUT, the formula can be simplified as:

Directional gain = $10^{10} \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}] dBi$

Where G1, G2....GN denote single antenna gain.

The directional gain "DG" is calculated as following table.

| | | | DG | DG |
|---------------------|-------|-------|-------|-------|
| | | | for | for |
| | Ant 7 | Ant 8 | Power | PSD |
| | (dBi) | (dBi) | (dBi) | (dBi) |
| 5925 MHz ~ 6425 MHz | 3.38 | 2.54 | 3.38 | 5.98 |
| 6425 MHz ~ 6525 MHz | 1.17 | 2.15 | 2.15 | 4.68 |
| 6525 MHz ~ 6875 MHz | 1.52 | 2.49 | 2.49 | 5.03 |
| 6875 MHz ~ 7125 MHz | 1.62 | 2.45 | 2.45 | 5.06 |

Calculation example:

If a device has two antenna, G_{ANT1} = 3.38dBi; G_{ANT2} = 2.54dBi Directional gain of power measurement = max(3.38, 2.54) + 0 = 3.38 dBi Directional gain of PSD derived from formula which is 10 x log { { [10^ (3.38 dBi / 20) + 10^ (2.54 dBi / 20)] ^ 2 } / 2 }

= 5.98 dBi

<For SDM Modes>

SDM Modes all transmit signals are completely uncorrelated, then Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)d)ii) The Directional gain = $10*\log[(10^{G1/10} + 10^{G2/10} + ... + 10^{GN/10})/N_{ANT}] dBi$ Where G1, G2....GN denote single antenna gain.

The directional gain "DG" is calculated as following table.

| | | | DG | DG |
|---------------------|-------|-------|-------|-------|
| | | | for | for |
| | Ant 7 | Ant 8 | Power | PSD |
| | (dBi) | (dBi) | (dBi) | (dBi) |
| 5925 MHz ~ 6425 MHz | 3.38 | 2.54 | 2.98 | 2.98 |
| 6425 MHz ~ 6525 MHz | 1.17 | 2.15 | 1.69 | 1.69 |
| 6525 MHz ~ 6875 MHz | 1.52 | 2.49 | 2.03 | 2.03 |
| 6875 MHz ~ 7125 MHz | 1.62 | 2.45 | 2.05 | 2.05 |

Calculation example:

If a device has two antenna, G_{ANT1} = 3.38dBi; G_{ANT2} =2.54dBi

Directional gain is derived from formula which is

10 x log { { [10^ (3.38 dBi / 10) + 10^ (2.54 dBi / 10)] } / 2 }

= 2.98 dBi



<For TXBF Modes>

The EUT supports beamforming modes then

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)e)ii)

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

 N_{SS} = the number of independent spatial streams of data;

 N_{ANT} = the total number of antennas

 $g_{j,k} = 10^{G_k/20}$ if the *k*th antenna is being fed by spatial stream *j*, or zero if it is not; G_k is the gain in dBi of the kth antenna.

The directional gain "DG" is calculated as following table.

| | | | DG | DG |
|---------------------|-------|-------|-------|-------|
| | | | for | for |
| | Ant 7 | Ant 8 | Power | PSD |
| | (dBi) | (dBi) | (dBi) | (dBi) |
| 5925 MHz ~ 6425 MHz | 3.38 | 2.54 | 5.98 | 5.98 |
| 6425 MHz ~ 6525 MHz | 1.17 | 2.15 | 4.68 | 4.68 |
| 6525 MHz ~ 6875 MHz | 1.52 | 2.49 | 5.03 | 5.03 |
| 6875 MHz ~ 7125 MHz | 1.62 | 2.45 | 5.06 | 5.06 |

Calculation example:

Directional gain is derived from formula which is

10 x log { { [10^ (3.38 dBi / 20) + 10^ (2.54 dBi / 20)] ^ 2 } / 2 } = 5.98 dBi



1.3 Modification of EUT

No modifications made to the EUT during the testing.

1.4 Testing Location

| Test Site | Sporton International Inc. EMC & Wireless Communications Laboratory |
|--------------------|---|
| | No.52, Huaya 1st Rd., Guishan Dist., |
| Test Site Leastion | Taoyuan City 333, Taiwan (R.O.C.) |
| Test Site Location | TEL: +886-3-327-3456 |
| | FAX: +886-3-328-4978 |
| Test Site No. | Sporton Site No. |
| Test Site No. | CO05-HY, 03CH07-HY, DF02-HY |

Note: The test site complies with ANSI C63.4 2014 requirement.

| Test Site | Sporton International Inc. Wensan Laboratory |
|--------------------|--|
| Test Site Location | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855 |
| Test Site No. | Sporton Site No. |
| Test one No. | TH05-HY, 03CH20-HY (TAF Code: 3786) |
| Remark | The Conducted and Radiated Spurious Emission for Band 6 and Band 8 test items subcontracted to Sporton International Inc. Wensan Laboratory. |

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW3786

1.5 Applicable Standards

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

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

Remark:

- 1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.
- 3. 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, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

| DW OOM | Channel | 1 | 5 | 9 | 13 | 17 | 21 | 25 | 29 |
|------------|-------------|------|------|------|------|------|------|------|------|
| BW 20M | Freq. (MHz) | 5955 | 5975 | 5995 | 6015 | 6035 | 6055 | 6075 | 6095 |
| BW 40M | Channel | 3 | 3 | 11 | | 19 | | 27 | |
| | Freq. (MHz) | 59 | 65 | 60 | 05 | 60 | 45 | 6085 | |
| BW 80M | Channel | | 7 | 7 | | | 2 | 3 | |
| DVV OUIVI | Freq. (MHz) | | 59 | 85 | | | 60 | 65 | |
| BW 160M | Channel | | | | 1 | 5 | | | |
| BW TOOW | Freq. (MHz) | | | | 60 | 25 | | | |
| | Channel | 33 | 37 | 41 | 45 | 49 | 53 | 57 | 61 |
| BW 20M | Freq. (MHz) | 6115 | 6135 | 6155 | 6175 | 6195 | 6215 | 6235 | 6255 |
| BW 40M | Channel | 3 | 5 | 43 | | 5 | 51 | 59 | |
| | Freq. (MHz) | 61 | 25 | 6165 | | 6205 | | 6245 | |
| BW 80M | Channel | | 3 | 9 | | 55 | | | |
| D VV OUIVI | Freq. (MHz) | | 61 | 45 | | 6225 | | | |
| BW 160M | Channel | | | | 4 | 7 | | | |
| | Freq. (MHz) | | | | 61 | 185 | | | |



| | Channel | 65 | 69 | 73 | 77 | 81 | 85 | 89 | 93 | | |
|---------------------------------------|---|-------------------|---|---|-------------------------------|-------------------------|--------------------------------------|-------------------------------------|-------------|--|--|
| BW 20M | Freq. (MHz) | 6275 | 6295 | 6315 | 6335 | 6355 | 6375 | 6395 | 6415 | | |
| | Channel | 67 | | 75 | | 83 | | 91 | | | |
| BW 40M | Freq. (MHz) | 62 | 85 | 63 | 25 | 6365 | | 6405 | | | |
| | Channel | 71 | | | | | 8. | 7 | | | |
| BW 80M | Freq. (MHz) | | 63 | 05 | 5 6385 | | | 85 | | | |
| | Channel | | | | 7 | 9 | | | | | |
| BW 160M | Freq. (MHz) | | | | 63 | 45 | | | | | |
| | Channel | 97 | 101 | 105 | 109 | 113 | 117 | 121 | 125 | | |
| BW 20M | Freq. (MHz) | 6435 | 6455 | 6475 | 6495 | 6515 | 6535 | 6555 | 6575 | | |
| | Channel | | 9 | |)7 | | 15 | 12 | | | |
| BW 40M | Freq. (MHz) | | 45 | 64 | | | 25 | 65 | | | |
| | Channel | | 1(| 03 | | | 11 | 9 | | | |
| BW 80M | Freq. (MHz) | | 64 | 65 | | | 65 | 45 | | | |
| | Channel | | 111 | | | | | | | | |
| BW 160M | Freq. (MHz) | | | | 65 | 05 | | | | | |
| BW 20M | Channel | 129 | 133 | 137 | 141 | 145 | 149 | 153 | 157 | | |
| | Freq. (MHz) | 6595 | 6615 | 6635 | 6655 | 6675 | 6695 | 6715 | 6735 | | |
| | Channel | 13 | 31 | 13 | 39 | 14 | 7 | 15 | 55 | | |
| BW 40M | | | | 6645 | | 6685 | | 6725 | | | |
| | Freq. (MHz) | 66 | 05 | 00 | | | | | | | |
| | Freq. (MHz) Channel | 66 | | | | | 15 | 51 | | | |
| BW 80M | , | 66 | | 35 | | | 15 67 | | | | |
| BW 80M | Channel | 66 | 13 | 35 | 14 | 13 | | | | | |
| | Channel Freq. (MHz) | 66 | 13 | 35 | 14 66 | | | | | | |
| BW 80M BW 160M | Channel Freq. (MHz) Channel | 161 | 13 | 35 | | | | | 189 | | |
| BW 80M | Channel Freq. (MHz) Channel Freq. (MHz) | | 13 66 | 35 25 | 66 | 65 | 67 | 05 | 189 6895 | | |
| BW 80M BW 160M BW 20M | Channel Freq. (MHz) Channel Freq. (MHz) Channel | 161 6755 | 13 66 165 | 35 25 169 | 66 173 6815 | 65 177 6835 | 679 181 | 05 185 | 6895 | | |
| BW 80M BW 160M | Channel Freq. (MHz) Channel Freq. (MHz) Channel Freq. (MHz) | 161 6755 10 | 13 66 165 6775 | 35 25 169 6795 | 66 173 6815 | 65 177 6835 17 | 670 181 6855 | 05 185 6875 | 6895 37 | | |
| BW 80M BW 160M BW 20M BW 40M | Channel Freq. (MHz) Channel Freq. (MHz) Channel Freq. (MHz) Channel | 161 6755 10 | 13 66 165 6775 53 65 | 35 25 169 6795 | 66 173 6815 71 | 65 177 6835 17 | 670 181 6855 79 | 05 185 6875 18 68 | 6895 37 | | |
| BW 80M BW 160M BW 20M | Channel Freq. (MHz) Channel Freq. (MHz) Channel Freq. (MHz) Channel Freq. (MHz) | 161 6755 10 | 13 66 165 6775 63 65 10 | 35 25 169 6795 17 68 | 66 173 6815 71 | 65 177 6835 17 | 670 181 6855 79 45 | 05 185 6875 18 68 33 | 6895 37 | | |
| BW 80M BW 160M BW 20M BW 40M | Channel Freq. (MHz) Channel Freq. (MHz) Channel Freq. (MHz) Channel Freq. (MHz) Channel | 161 6755 10 | 13 66 165 6775 63 65 10 | 35 25 169 6795 17 68 67 | 66 173 6815 71 05 | 65 177 6835 17 | 670 181 6855 79 45 18 | 05 185 6875 18 68 33 | 6895 37 | | |



| BW 20M | Channel | 193 | 197 | 201 | 205 | 209 | 213 | 217 | 221 | | |
|------------|-------------|------|------|------|------|------|------|------|------|--|--|
| | Freq. (MHz) | 6915 | 6935 | 6955 | 6975 | 6995 | 7015 | 7035 | 7055 | | |
| BW 40M | Channel | 19 | 95 | 20 | 203 | | 1 | 219 | | | |
| | Freq. (MHz) | 69 | 25 | 69 | 65 | 70 | 05 | 70 | 45 | | |
| BW 80M | Channel | | 19 | 99 | | | 2′ | 15 | | | |
| D VV OUIVI | Freq. (MHz) | | 69 | 45 | | | 70 | 25 | | | |
| BW 160M | Channel | | 207 | | | | | | | | |
| DAA LOOIAL | Freq. (MHz) | 6985 | | | | | | | | | |
| DW/ 20M | Channel | | 22 | 25 | | | 22 | 29 | | | |
| BW 20M | Freq. (MHz) | | 70 | 75 | | 7095 | | | | | |
| BW 40M | Channel | 227 | | | | | | | | | |
| | Freq. (MHz) | 7085 | | | | | | | | | |
| | Channel | | | | 23 | 33 | | | | | |
| BW 20M | Freq. (MHz) | | | | 71 | 115 | | | | | |



2.2 Test Mode

This device support 26/52/106/242/484/996-tone RU but does not support 2x996-tone RU on 160MHz channel.

The PSD of partial RU is reduced to be smaller than full RU according to TCB workshop interim guidance Oct. 2018.

The 802.11ax mode is investigated among different tones, full resource units (RU), partial resource units. The partial RU has no higher power than full RU's, thus the full RU is chosen as main test configuration.

The 242-tone RU is covered by 20MHz channel, 484-tone RU is covered by 40MHz channel and 996-tone RU is covered by 80MHz channel.

The SISO mode conducted power is covered by MIMO mode per chain, so only the MIMO mode is tested.

The final test modes include the worst data rates for each modulation shown in the table below.

MIMO Mode

| Modulation | Data Rate |
|----------------|-----------|
| 802.11a | 6 Mbps |
| 802.11ax HE20 | MCS0 |
| 802.11ax HE40 | MCS0 |
| 802.11ax HE80 | MCS0 |
| 802.11ax HE160 | MCS0 |

Remark: The conducted power level of each chain in MIMO mode is equal or higher than SISO mode.

| Test Cases | | | | | | |
|--------------|---|--|--|--|--|--|
| | Mode 1: 5G NR n13 Idle + WLAN (5GHz) Link + Bluetooth Idle + NFC on + | | | | | |
| AC Conducted | USB TYPE-A Cable (Data Link with USB HD) (Copy data from USB | | | | | |
| Emission | HD to eMMC) + USB TYPE-A with Mouse + USB TYPE-C (Charging | | | | | |
| | from AC Adapter) + Battery 1 | | | | | |
| Remark: | | | | | | |

1. For Radiated Test Cases, the tests were performed with Battery 1.

2. Data Link with USB HD means data application transferred mode between EUT and USB HD.



| | Ch. # | UNII-5 (5925-6425 MHz) | UNII-6 (6425-6525 MHz) | UNII-7 (6525-6875 MHz) | UNII-8 (6875-7125 MHz) | |
|--------|---|--|--|---|--|--|
| | | 802.11a | 802.11a | 802.11a | 802.11a | |
| L | Low | 001 | 097 | 117 | 189 | |
| М | Middle | 049 | 105 | 149 | 209 | |
| н | High | 093 | 113 | - | 233 | |
| 5 | Straddle | - | - | 185 | - | |
| | Ch. # | UNII-5 (5925-6425 MHz) | UNII-6 (6425-6525 MHz) | UNII-7 (6525-6875 MHz) | UNII-8 (6875-7125 MHz) | |
| | | 802.11ax HE20 | 802.11ax HE20 | 802.11ax HE20 | 802.11ax HE20 | |
| L | Low | 001 | 097 | 117 | 189 | |
| М | Middle | 049 | 105 | 149 | 209 | |
| н | High | 093 | 113 | - | 233 | |
| Ş | Straddle | - | - | 185 | - | |
| | | | | | | |
| | Ch. # | UNII-5 (5925-6425 MHz) | UNII-6 (6425-6525 MHz) | UNII-7 (6525-6875 MHz) | UNII-8 (6875-7125 MHz) | |
| | Ch. # | | | | | |
| L | Ch. # Low | (5925-6425 MHz) | (6425-6525 MHz) | (6525-6875 MHz) | (6875-7125 MHz) | |
| L | | (5925-6425 MHz) 802.11ax HE40 | (6425-6525 MHz) 802.11ax HE40 | (6525-6875 MHz) 802.11ax HE40 | (6875-7125 MHz) 802.11ax HE40 | |
| | Low | (5925-6425 MHz) 802.11ax HE40 003 | (6425-6525 MHz) 802.11ax HE40 099 | (6525-6875 MHz) 802.11ax HE40 123 | (6875-7125 MHz) 802.11ax HE40 195 | |
| M H | Low Middle | (5925-6425 MHz) 802.11ax HE40 003 051 | (6425-6525 MHz) 802.11ax HE40 099 - | (6525-6875 MHz) 802.11ax HE40 123 | (6875-7125 MHz) 802.11ax HE40 195 211 | |
| M H | Low Middle High | (5925-6425 MHz) 802.11ax HE40 003 051 | (6425-6525 MHz) 802.11ax HE40 099 - 107 | (6525-6875 MHz) 802.11ax HE40 123 147 - | (6875-7125 MHz) 802.11ax HE40 195 211 | |
| M H | Low Middle High Straddle | (5925-6425 MHz) 802.11ax HE40 003 051 091 - UNII-5 | (6425-6525 MHz) 802.11ax HE40 099 - 107 115 UNII-6 | (6525-6875 MHz) 802.11ax HE40 123 147 - 187 UNII-7 | (6875-7125 MHz) 802.11ax HE40 195 211 227 - UNII-8 | |
| M H | Low Middle High Straddle | (5925-6425 MHz) 802.11ax HE40 003 051 091 - UNII-5 (5925-6425 MHz) | (6425-6525 MHz) 802.11ax HE40 099 - 107 115 UNII-6 (6425-6525 MHz) | (6525-6875 MHz) 802.11ax HE40 123 147 - 187 UNII-7 (6525-6875 MHz) | (6875-7125 MHz) 802.11ax HE40 195 211 227 - - UNII-8 (6875-7125 MHz) | |
| H S | Low Middle High Straddle Ch. # | (5925-6425 MHz) 802.11ax HE40 003 051 091 - - UNII-5 (5925-6425 MHz) 802.11ax HE80 | (6425-6525 MHz) 802.11ax HE40 099 - 107 115 UNII-6 (6425-6525 MHz) | (6525-6875 MHz) 802.11ax HE40 123 147 - 147 187 UNII-7 (6525-6875 MHz) 802.11ax HE80 | (6875-7125 MHz) 802.11ax HE40 195 211 227 227 - - UNII-8 (6875-7125 MHz) 802.11ax HE80 | |
| H K | Low Middle High Straddle Ch. # Low | (5925-6425 MHz) 802.11ax HE40 003 051 091 - - UNII-5 (5925-6425 MHz) 802.11ax HE80 007 | (6425-6525 MHz) 802.11ax HE40 099 - 107 115 UNII-6 (6425-6525 MHz) 802.11ax HE80 | (6525-6875 MHz) 802.11ax HE40 123 147 - 147 187 (6525-6875 MHz) 802.11ax HE80 135 | (6875-7125 MHz) 802.11ax HE40 195 211 227 - UNII-8 (6875-7125 MHz) 802.11ax HE80 199 | |

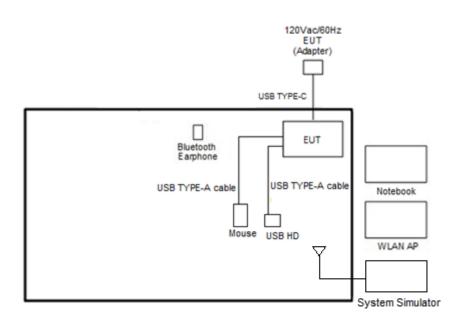


| Ch. # | | UNII-5 UNII-6 (5925-6425 MHz) (6425-6525 MHz) | | UNII-7 (6525-6875 MHz) | UNII-8 (6875-7125 MHz) | |
|-------|----------|--|----------------|---------------------------|---------------------------|--|
| | | 802.11ax HE160 | 802.11ax HE160 | 802.11ax HE160 | 802.11ax HE160 | |
| L | Low | 015 | | | | |
| М | Middle | 047 | - | 143 | 207 | |
| н | High | 079 | | | | |
| 5 | Straddle | - | 111 | 175 | - | |

Remark: Based on ANSI C63.10 clause 5.6.2.2, b) Spurious emissions, measure the mode with the highest output power and the mode with highest output power spectral density for each modulation family.

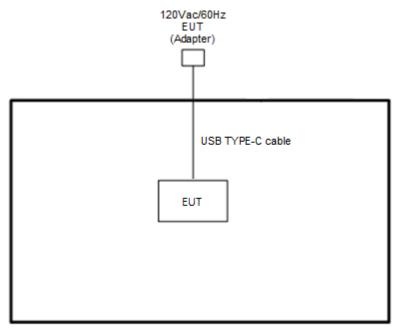
2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>





<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

| Item | Equipment | Brand Name | Model Name | FCC ID | Data Cable | Power Cord |
|------|------------------------------|---------------|---------------|-------------|----------------|--|
| 1. | Bluetooth Earphone | Sony Ericsson | MW600 | PY700A2029 | N/A | N/A |
| 2. | 5G Wireless Test Platform | Anritsu | MT8000A | N/A | N/A | Unshielded,1.8m |
| 3. | System Simulator | Anritsu | MT8820C | N/A | N/A | Unshielded,1.8m |
| 4. | WLAN AP | ASUS | RT-AC66U | MSQ-RTAC66U | N/A | Unshielded,1.8m |
| 5. | Notebook | Dell | Latitude 3400 | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 6. | Notebook | Dell | Latitude 5310 | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 7. | USB HD | ADATA | HV620S-1T | FCC DoC | Shielded, 1m | N/A |
| 8. | Mouse | KRONE | SM-K800U | FCC DoC | Shielded, 1.8m | N/A |
| 9. | SD Card | SanDisk | MicroSD HC | FCC DoC | N/A | N/A |

2.5 EUT Operation Test Setup

The RF test items, utility "QRCT Version 4.0.211.0" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.



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.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)



3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Limit of 26dB & 99% Occupied Bandwidth

<FCC 14-30 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.

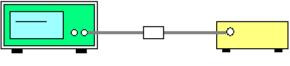
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.1.3 Test Procedures

- 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%.
- 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) ≥ 3 * RBW.
- 8. Measure and record the results in the test report.

3.1.4 Test Setup



Spectrum Analyzer

EUT

3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

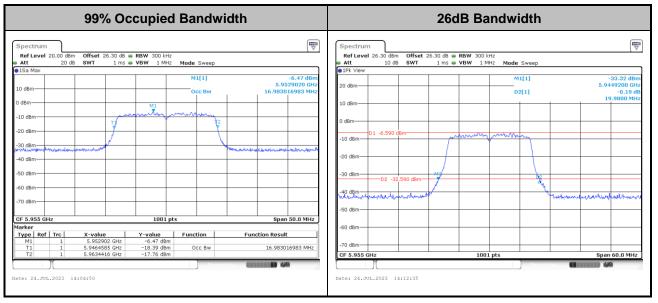
Please refer to Appendix A.



MIMO <Ant. 7+8>

<CDD Modes>

<802.11a>

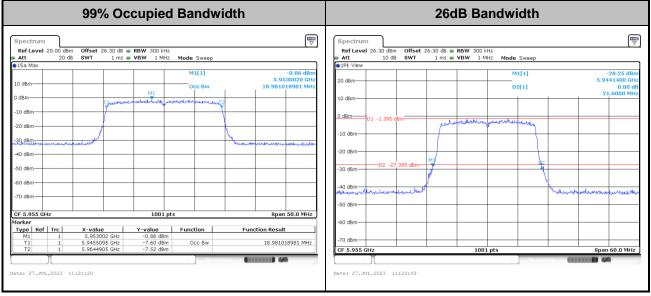


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



<SDM Modes>

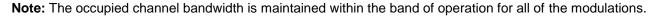
<802.11ax HE20>



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

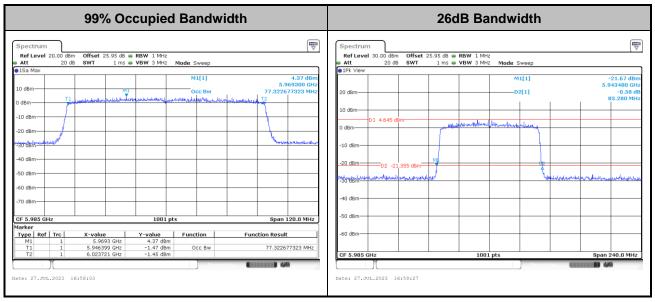
99% Occupied Bandwidth 26dB Bandwidth Spectrum Spectrum Offset 26.12 dB Ref Level 20.0 Ref Level 30.0 Offset 26.12 dB 12 dB 👄 RBW 1 MHz 1 ms 👄 VBW 3 MHz 12 dB RBW 1 MHz 1 ms VBW 3 MHz Att SWT Mode Sweet Att SWT Mode Sweep 20 dB 20 dB 4.19 dB 5.9597100 GF M1[1] M1[1] -22.24 dBn 5.944240 GH .0 dBr 37.962 **2[1]** 20 dBr dBr 10 dBm 1.0 dE 01 4.783 Autobalia بالحلق dBr 20 dB 30 dBm 10 dB 40 dB 20 dBm 50 dB 30 dBm 40 di 70 dBn 50 dBm CF 5.965 GH 1001 pts Span 100.0 MHz Type Ref Trc X-value Y-value 4.19 di Function Function Result 60 dBr GH2 GH2 37.962037962 MHz Occ Bw -2.78 dBm -2.42 dBm n.n MHz CF 5.963 100 e: 27.JUL.2023 15:19:40 Date: 27.JUL.2023 15:20:01

<802.11ax HE40>





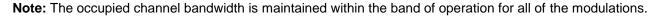
<802.11ax HE80>



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

99% Occupied Bandwidth 26dB Bandwidth Spectrum Spectrum Ref Level 20.0 Offset 26.23 dB Ref Level 30.0 Offset 26.23 dB 23 dB 👄 RBW 2 MHz 1 ms 👄 VBW 10 MHz Att 20 dB SWT Mode Sweet Att SWT Mode Sweet 20 dB M1[1] 8.16 dB M1[1] 20.91 dE 8150 G 5.9414 n GF .0 dBn **2[1]** a Brau 20 dBr -0.07 167.520 M 3. dBr 10 dBrr ant war to marked . John Autom dBr 20 dB 30 dBm-10 dBr 40 dB 20 dBm Martin ليحت النب -30 dBi 40 dB 70 dBn 50 dBm CF 6.025 GH 1001 pts Span 240.0 MHz Y-value Type Ref Trc X-value 5.99815 Function Function Result 60 dBr Occ Bw 156.803196803 MHz 1.93 dBm 3.06 dBm .0 MHz CF 6.025 100 e: 31.JUL.2023 10:15:57 Date: 31.JUL.2023 10:16:32

<802.11ax HE160>



3.2 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

Please refer to the measuring equipment list in this test report.

3.2.3 Test Procedures

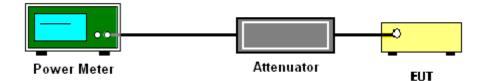
<CDD and SDM Modes>

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

Method PM-G (Measurement using a gated RF average power meter):

- 1. Measurement is performed using a wideband RF power meter.
- 2. The EUT is configured to transmit at its maximum power control level.
- 3. Measure the average power of the transmitter.
- 4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
- 5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

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

Please refer to the measuring equipment list in 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.

<CDD and SDM Modes>

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 ≥ 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.

The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

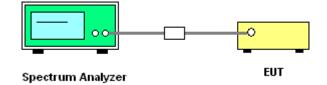
- 1. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
- 2. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

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



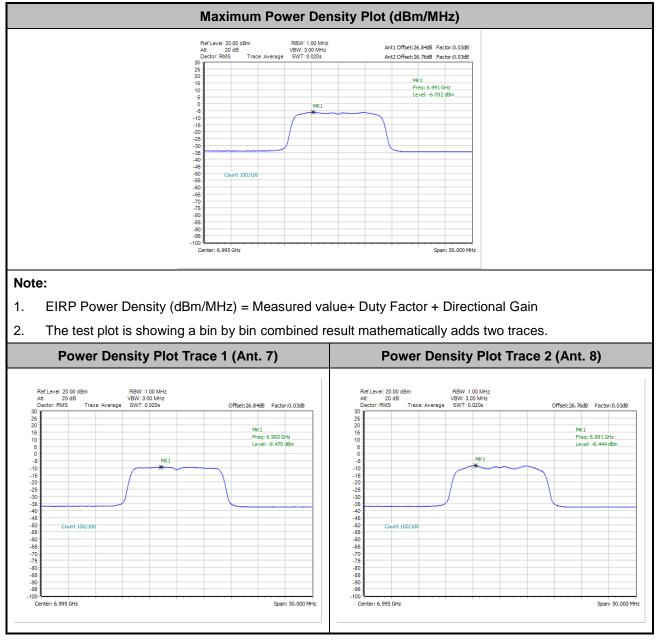
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



<CDD Modes>

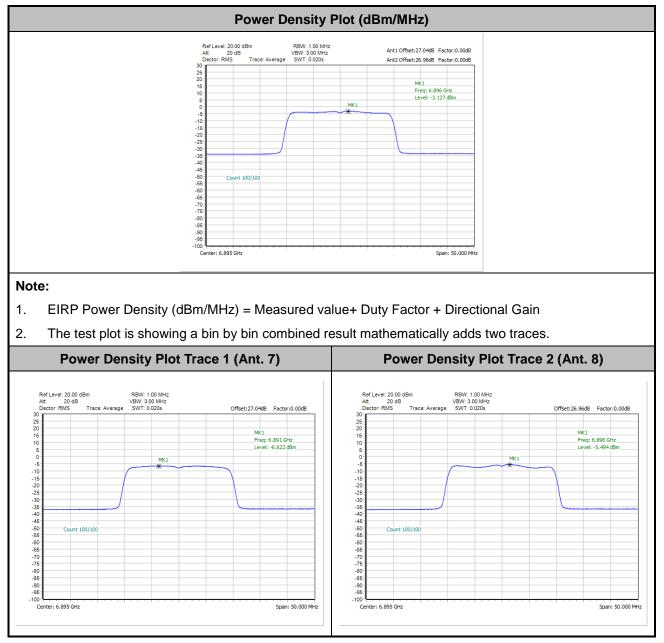
<802.11a>





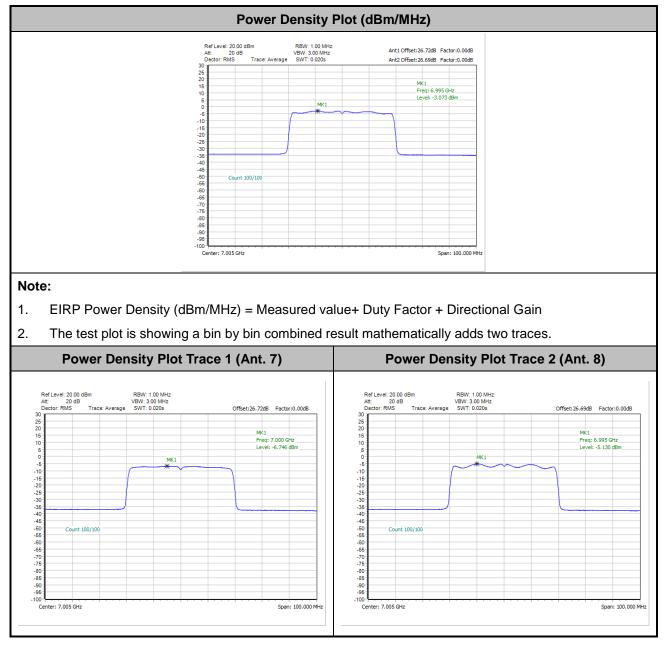
<SDM Modes>

<802.11ax HE20 Full RU>



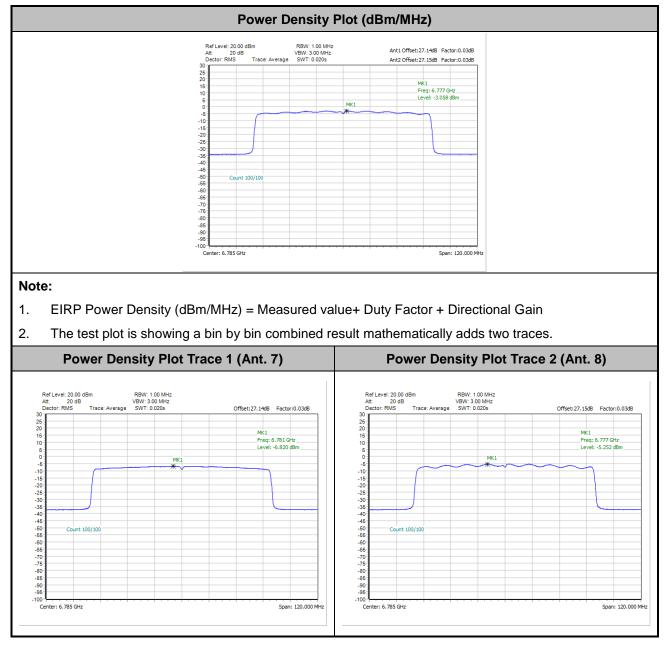


<802.11ax HE40 Full RU>



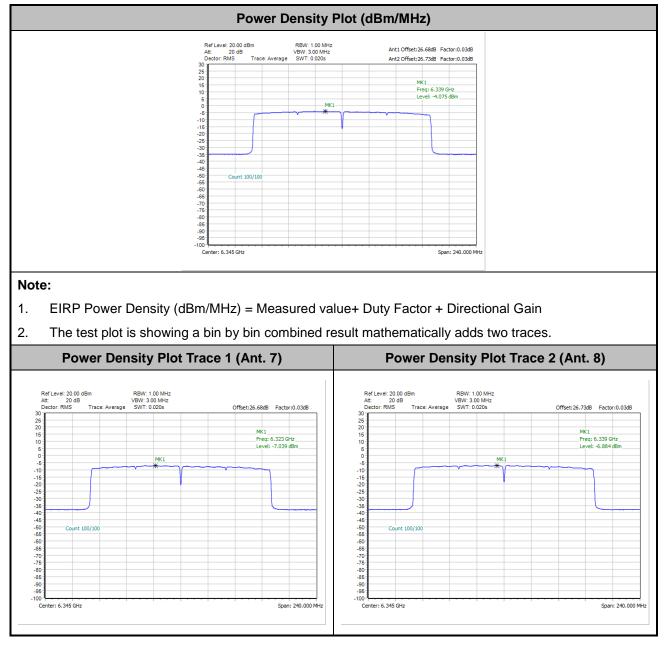


<802.11ax HE80 Full RU>





<802.11ax HE160 Full RU>





3.4 In-Band Emissions (Channel Mask)

3.4.1 Limit of Unwanted Emissions

<FCC 14-30 CFR 15.407>

(a)(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

Please refer to the measuring equipment list in this test report.



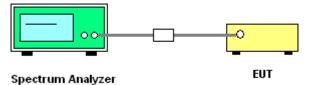
3.4.3 Test Procedures

The testing follows FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01.

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 ≥ 3 X RBW
 - d) Number of points in sweep \geq [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.
- 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





-11.08 dB -11.32 dB -16.01 dB -16.44 dB -16.65 dB -16.30 dB -11.23 dB -11.07 dB

3.4.5 Test Result

<CDD Modes>

MIMO <Ant. 7+8(7)>

EUT Mode

802.11a

Plot on Channel 5955 MHz

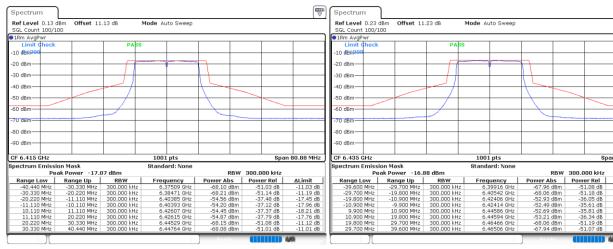
Plot on Channel 6195 MHz Spectrum Spectrum Ref Level 0.13 dBm SGL Count 100/100 Offset 11.13 dB Mode Auto Sweep Ref Level 0.13 Offset 11.13 dB Mode Auto Sweep .13 dBm .00/100 SGL Count 10 1Rm AvgPwr 1Rm AvgP DARS DARS -10 dBm2 10 dBm -20 dBm-20 dBm -30 dBm-30 dBm -40 dBm 40 dBm -50 dBm-50 dBm -60 dBm 60 dBm -70 dBm— 70 dBm-80 dBm 80 dBm 90 dBm-90 dBm CF 5.955 GHz 1001 pts 79.92 MHz CF 6.195 GHz 1001 pts 1 78.72 MHz Span Span ectrum Emission Mask Description Encode Power 1.5. Poole Nover -1.5. Poole Nover -1.5. -0.9 360 MHz -0.9 500 MHz -0.9 500 MHz -0.9 500 MHz -0.9 360 MHz -1.9 360 MHz -1.9 360 MHz -1.9 360 MHz -1.9 340 MHz -1.9 460 MHz -1.9 40 MHz -9.9 40 MHz -9.840 MHz -9.840 MHz -9.840 MHz -9.840 MHz -9.940 MHz -9.940 MHz -9.940 MHz -9.940 MHz -9.9520 MHz < ectrum Em sion Mask rd: No rd: No -16.14 dBm -15.64 dB RBW 300.000 kHz 300.000 kHz RBW PBOK Purver - 30. Range Low Range Up -39.960 MHz -29.970 MHz -29.970 MHz -19.980 MHz -19.980 MHz -10.990 MHz -19.990 MHz -9.990 MHz 9.990 MHz 10.990 MHz 9.990 MHz 10.990 MHz 9.990 MHz 19.990 MHz 19.980 MHz 29.970 MHz 19.980 MHz 29.970 MHz 29.970 MHz 39.960 MHz Frequency Frequency Power Abs RB\ Power Abs Power Rel RB Power Rel RBW 300.000 300.000 300.000 300.000 300.000 300.000 300.000 RBW 300.000 300.000 300.000 300.000 300.000 300.000 300.000 -11.07 dB -11.46 dB -16.99 dB -17.33 dB -17.40 dB -17.02 dB -11.45 dB -11.21 dB 51.07 dB 51.41 dB 37.02 dB 36.50 dB 36.56 dB 37.06 dB 51.40 dB 51.21 dB 5.16150 GHz 5.16552 GHz 5.18412 GHz 5.18420 GHz 5.20580 GHz 5.20588 GHz 5.20588 GHz 5.20588 GHz -67.21 dBm -67.55 dBm -53.16 dBm -52.64 dBm -52.70 dBm -53.20 dBm -67.54 dBm -67.34 dBm -67.85 dBm -67.98 dBm -51.69 dBm -51.12 dBm -51.33 dBm -51.84 dBm -68.09 dBm -67.94 dBm 52.21 dB 52.34 dB 36.05 dB 35.48 dB 35.69 dB 36.20 dB 52.46 dB 52.30 dB -12.21 dB -12.39 dB -16.01 dB -16.32 dB -16.52 dB -16.16 dB -12.60 dB -12.30 dB 5.92507 5.94397 5.94405 GHZ GHZ GHZ GHZ GHZ 96595

Date: 24.JUL.2023 16:28:44

Plot on Channel 6415 MHz

Date: 24.JUL.2023 16:29:33

Plot on Channel 6435 MHz

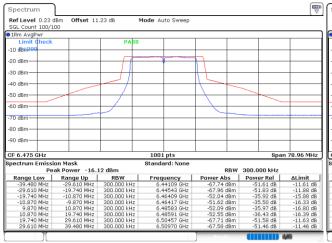


Date: 24.JUL.2023 16:30:52

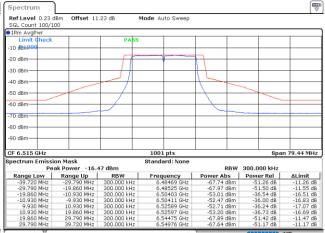
Date: 24.JUL.2023 16:31:47



Plot on Channel 6475 MHz

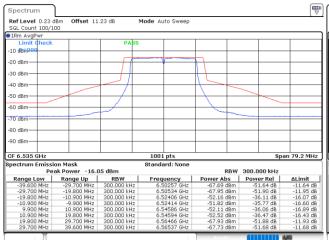


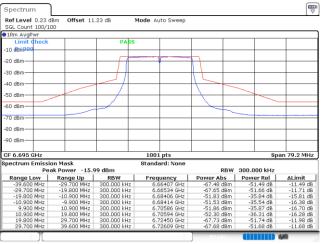
Plot on Channel 6515 MHz



Date: 24.JUL.2023 16:33:06

Plot on Channel 6535 MHz





Date: 24.JUL.2023 16:35:05

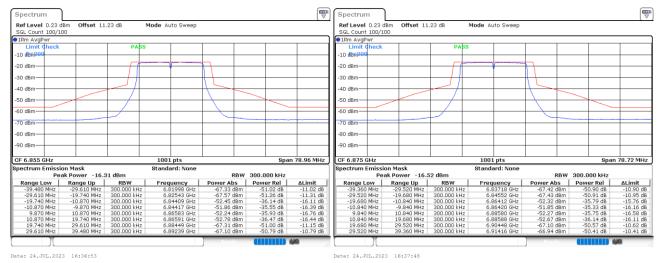
Plot on Channel 6855 MHz

Date: 24.JUL.2023 16:35:56

Date: 24.JUL.2023 16:34:06

Plot on Channel 6695 MHz

Plot on Channel 6875 MHz

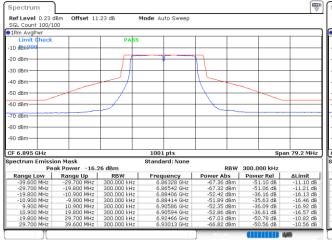


TEL : 886-3-327-3456 FAX : 886-3-328-4978 Report Template No.: BU5-FR15EWLAC MA Version 1.0.0 Page Number : Issue Date : Report Version :

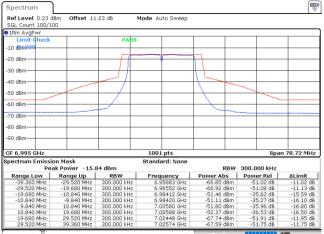
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Plot on Channel 6895 MHz



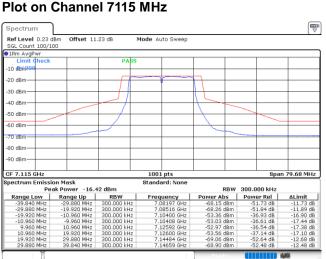
Plot on Channel 6995 MHz



Date: 24.JUL.2023 16:38:41

Plot on Channel 7095 MHz

Spectrum Ref Level 0.23 dBm SGL Count 100/100 IRm AvgPwr Limit Check Offset 11.23 dB Mode Auto Swee PARS -10 (1966) -20 dBm--30 dBm -40 dBm -50 dBm--60 dBm -70 dBm-80 dBm 90 dBm-CF 7.095 GHz 1001 pts ectrum Emission Mask Peak Powe dard: N 300.000 kHz -15.80 dB RBW RBW 300.000 kHz ALimit -12.32 dB -16.58 dB -16.96 dB -17.32 dB -17.32 dB -16.74 dB -12.96 dB -12.86 dB -39,720 MH Range Up -29,790 MHz Frequency -67.90 dBm -52.10 dB -39.720 MHz -29.790 MHz -19.860 MHz -10.930 MHz 9.930 MHz 10.930 MHz 19.860 MHz 29.790 MHz -29.790 MHz -19.860 MHz -9.930 MHz -9.930 MHz 10.930 MHz 19.860 MHz 29.790 MHz 39.720 MHz -67.90 dBm -68.07 dBm -52.41 dBm -51.92 dBm -52.28 dBm -52.57 dBm -68.70 dBm -68.65 dBm -52.10 dB -52.28 dB -36.61 dB -36.13 dB -36.48 dB -36.78 dB -52.91 dB -52.86 dB 7.06525 GHz 7.08403 GHz 7.08411 GHz 7.10589 GHz 7.10597 GHz 7.12475 GHz 7.12626 GHz



Date: 24.JUL.2023 16:40:27

Date: 24.JUL.2023 16:41:15

Date: 24.JUL.2023 16:39:40

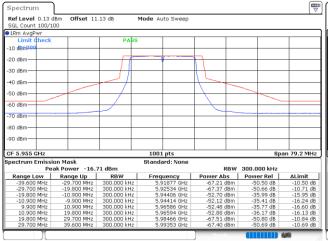


MIMO <Ant. 7+8(8)>

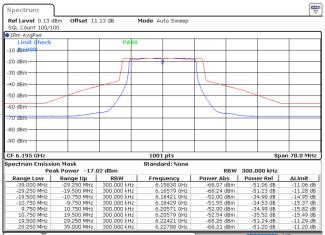
EUT Mode

802.11a

Plot on Channel 5955 MHz

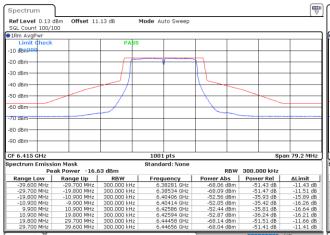


Plot on Channel 6195 MHz



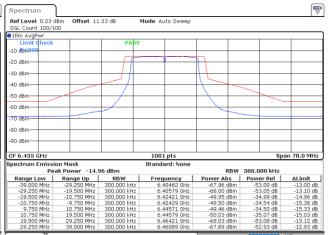
Date: 24.JUL.2023 15:59:55

Plot on Channel 6415 MHz



Plot on Channel 6435 MHz

Date: 24.JUL.2023 16:00:58

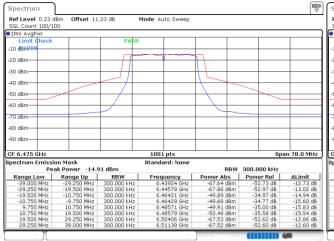


Date: 24.JUL.2023 16:01:56

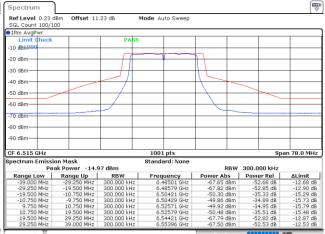
Date: 24.JUL.2023 16:02:53



Plot on Channel 6475 MHz

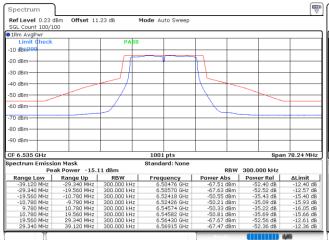


Plot on Channel 6515 MHz



Date: 24.JUL.2023 16:03:56

Plot on Channel 6535 MHz



Spectrum Ref Level 0.23 dBm SGL Count 100/100 Offset 11.23 dB Mode Auto Swee SGL Count 100/: 91Rm AvgPwr Limit Check -10 **dBm** -20 dBm-30 dBm 40 dBm -50 dBm 60 dBm 70 dBm-80 dBm 90 dBm CF 6.695 GHz 1001 pts pectrum Emission Mask Peak Powe rd: N -15.21 dB RBW 300.000 kHz Ronge Up RBW 2 -29.520 MHz 300.000 kHz 2 -19.680 MHz 300.000 kHz 2 -19.640 MHz 300.000 kHz 2 -10.640 MHz 300.000 kHz 2 -10.640 MHz 300.000 kHz 2 10.640 MHz 300.000 kHz 2 10.640 MHz 300.000 kHz 2 19.680 MHz 300.000 kHz 2 19.680 MHz 300.000 kHz 2 29.520 MHz 300.000 kHz 3 39.360 MHz 300.000 kHz Frequency -39,360 MH; -67.46 dBm -52.25 dB -52.25 dB -52.45 dB -35.72 dB -35.43 dB -35.68 dB -36.19 dB -52.47 dB -52.34 dB -39.360 MHz -29.520 MHz -19.680 MHz -10.840 MHz 9.840 MHz 10.840 MHz 19.680 MHz 29.520 MHz 5.65906 GHz 5.66552 GHz 5.68412 GHz 5.68420 GHz 5.70580 GHz 5.70588 GHz 5.72448 GHz 5.73385 GHz -67.46 dBm -67.66 dBm -50.93 dBm -50.64 dBm -50.88 dBm -51.40 dBm -67.68 dBm -67.55 dBm -12.25 dB -12.50 dB -15.68 dB -16.27 dB -16.51 dB -16.16 dB -12.52 dB -12.35 dB .68 dBm

Date: 24.JUL.2023 16:05:56

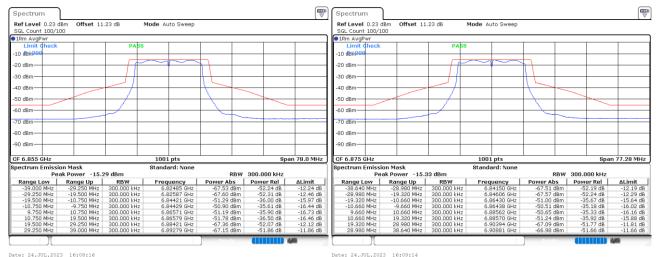
Plot on Channel 6855 MHz

Date: 24.JUL.2023 16:07:13

Date: 24.JUL.2023 16:04:47

Plot on Channel 6695 MHz

Plot on Channel 6875 MHz

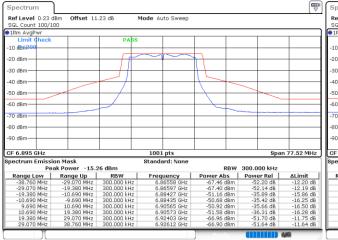


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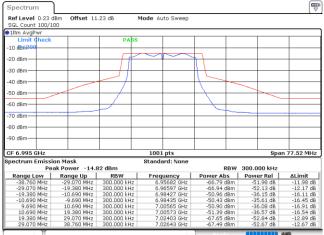
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Plot on Channel 6895 MHz



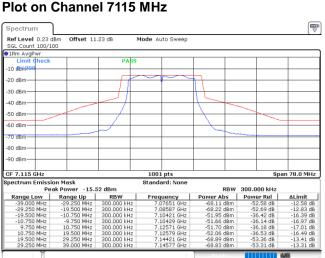
Plot on Channel 6995 MHz



Date: 24.JUL.2023 16:17:52

Plot on Channel 7095 MHz

Spectrum Spectrum Ref Level 0.23 dBm SGL Count 100/100 IRm AvgPwr Limit Check Offset 11.23 dB Mode Auto Swee Ref Level 0.23 dBm SGL Count 100/100 SGL Count 100/: 91Rm AvgPwr Limit Check PARS -10 (1966) -10 **dBm** -20 dBm--20 dBm--30 dBm 30 dBm -40 dBm 40 dBm -50 dBm -50 dBm -60 dBm -60 dBm -70 dBm-70 dBm-80 dBm 80 dBm 90 dBm-90 dBm CF 7.095 GHz CF 7.115 GHz 1001 pts Pectrum Emission Mask Peak Powe ectrum Emission Mask Peak Powe dard: N RBW 300.000 kHz -14.92 dB Range Up -29.160 MHz -19.440 MHz -10.720 MHz -9.720 MHz 10.720 MHz 19.440 MHz 29.160 MHz 38.880 MHz RBW 300.000 kHz Frequency -38,880 MH; -67.93 dBm -53.01 dB -39.000 MH Limit -13.01 dB -13.31 dB -16.06 dB -16.25 dB -16.98 dB -16.98 dB -16.81 dB -13.90 dB -13.74 dB 7.05748 GHz 7.06588 GHz 7.08424 GHz 7.08432 GHz 7.0868 GHz 7.10568 GHz 7.10576 GHz 7.12404 GHz 7.12467 GHz -53.01 dB -53.26 dB -36.10 dB -35.42 dB -36.15 dB -36.85 dB -53.75 dB -53.74 dB -39,000 MHz -29,250 MHz -19,500 MHz -10,750 MHz 9,750 MHz 10,750 MHz 19,500 MHz 29,250 MHz -29.160 MHz -19.440 MHz -10.720 MHz 9.720 MHz 10.720 MHz 3.18 dBm 3.18 dBm 1.02 dBm 0.34 dBm 1.07 dBm 1.77 dBm -68 -51 MH2 MH2 MHz MHz 68 dBm



Date: 24.JUL.2023 16:24:22

Date: 24.JUL.2023 16:25:37

Date: 24.JUL.2023 16:18:53

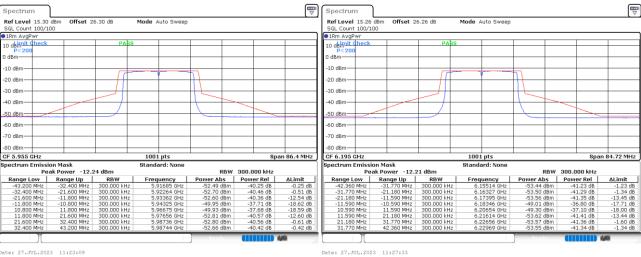


<SDM Modes>

MIMO <Ant. 7+8(7)>

EUT Mode 802.11ax HE20 Full RU

Plot on Channel 5955 MHz



Date: 27.JUL.2023 11:23:09

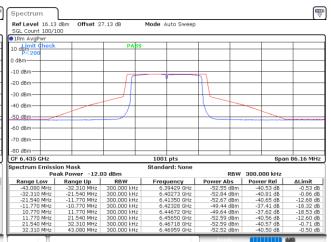
Plot on Channel 6415 MHz

♥ Spectrum Ref Level 15.80 dBm Offset 26.80 dB Mode Auto Sweep SGL Count 100/100 PRm AvgPwr 10 dbimit Check P<200 0 dBm--10 dBm -20 dBm -30 dBm--40 dBm -50 dBm--60 dBm -70 dBm-80 dBm CF 6.415 GHz 1001 pts Span 85.92 MHz ectrum Emission Mask Peak Power -12.51 dBm RBW 300.000 kHz Peak Power -12. Range Up z -32.220 MHz z -21.480 MHz z -11.740 MHz z 11.740 MHz z 11.740 MHz z 21.480 MHz z 32.220 MHz z 42.960 MHz 1 dBm RBW 300.000 kHz Range Low Po Power Rel -0.45 dB -0.55 dB -12.54 dB -18.10 dB -18.50 dB -12.47 dB -0.41 dB -0.27 dB -42.960 MHz -32.220 MHz -21.480 MHz -11.740 MHz 10.740 MHz 11.740 MHz 21.480 MHz 32.220 MHz -52.96 dBm -53.02 dBm -52.95 dBm -49.71 dBm -50.10 dBm -52.95 dBm -52.88 dBm -52.78 dBm 6.37982 GHZ 6.38282 GHZ 6.39365 GHZ 6.40331 GHZ 6.42669 GHZ 6.43644 GHZ 6.44718 GHZ 6.45551 GHZ -40.45 dB -40.51 dB -40.43 dB -37.19 dB -37.59 dB -40.44 dB -40.36 dB -40.27 dB

Date: 27.JUL.2023 11:31:39

Plot on Channel 6435 MHz

Plot on Channel 6195 MHz

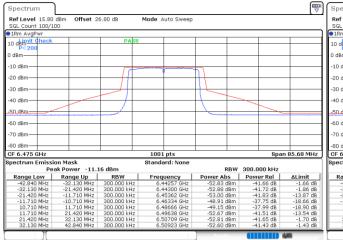


Date: 27.JUL.2023 11:37:36

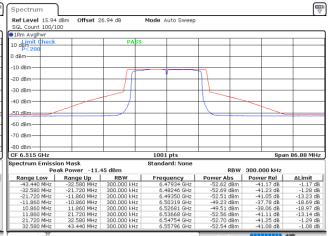
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Plot on Channel 6475 MHz

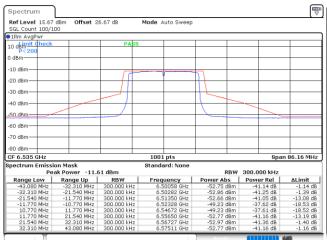


Plot on Channel 6515 MHz



Date: 27.JUL.2023 11:44:56

Plot on Channel 6535 MHz



Ref Level 15.85 dBm Offset 26.85 dB Mode Auto Swee SGL Count PAS 10 dem 0 dBm--10 dBm -20 dBm--30 dBm--40 dBm--50 dBm--60 dBm--70 dBm-80 dBm CF 6.695 GHz 1001 pts Span 86.64 MH pectrum Emission Mask Peak Powe -12.10 dB RBW 300.000 kHz
 Point
 <th AP 320 MH Frequency -52.32 dBm Power Rel -0.22 dB -0.31 dB -12.39 dB -18.27 dB -18.47 dB -12.43 dB -0.68 dB -0.39 dB -40.22 dB -40.26 dB -37.36 dB -37.56 dB -40.39 dB -40.63 dB -40.39 dB -43.320 MHz -32.490 MHz -21.660 MHz -11.830 MHz 10.830 MHz 11.830 MHz 21.660 MHz 32.490 MHz 5.65259 GHz 5.66255 GHz 5.67338 GHz 5.68322 GHz 5.70678 GHz 5.71662 GHz 5.72745 GHz 5.73464 GHz -52.32 dBm -52.36 dBm -52.45 dBm -49.47 dBm -49.67 dBm -52.49 dBm -52.73 dBm -52.49 dBm

Date: 27.JUL.2023 11:52:08

Plot on Channel 6855 MHz

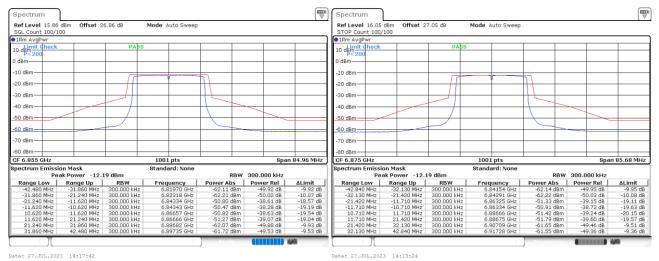
Date: 27.JUL.2023 11:56:13

Date: 27.JUL.2023 11:48:59

Spectrum

Plot on Channel 6695 MHz

Plot on Channel 6875 MHz



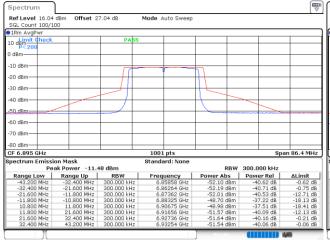
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Span 84.96 MHz

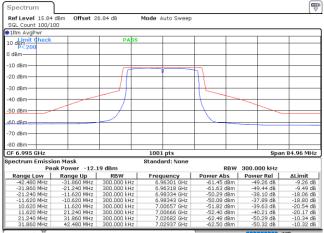
-9.43 dB -9.75 dB -19.48 dB -20.09 dB -20.33 dB -19.71 dB -10.27 dB -10.05 dB



Plot on Channel 6895 MHz



Plot on Channel 6995 MHz



Date: 27.JUL.2023 14:31:04

Plot on Channel 7095 MHz

Plot on Channel 7115 MHz Spectrum Spectrum Ref Level 15.80 dBm SGL Count 100/100 IRm AvgPwr 10 dbmit Check P<200 Offset 26.80 dB Mode Auto Swee Ref Level 15.99 dBm SGL Count 100/100 Offset 26.99 dB Mode Auto Swee SGL Count 10 1Rm AvgPwr 10 dBm P< 200 PAS PAR 0 dBm— 0 dBm--10 dBm -10 dBm -20 dBm--20 dBm--30 dBm--30 dBm--40 dBm--40 dBm--50 dBm-50 dBm--60 dBm--60 dBm--70 dBm--70 dBm-80 dBm an dam CF 7.095 GHz Span 84.96 MHz CF 7.115 GHz 1001 pts 1001 pts Pectrum Emission Mask Peak Powe ectrum Emission Mask Peak Powe 300.000 kHz -11.38 dB RBW -13.21 dB RBW 300.000 kHz RBW 300.000 kHz Rower -13. Range Up -31.860 MHz -21.240 MHz -11.620 MHz -10.620 MHz 11.620 MHz 21.240 MHz 31.860 MHz 42.480 MHz RBW 300.000 kHz -1.47 dB -1.79 dB -1.79 dB -13.83 dB -18.83 dB -18.83 dB -14.03 dB -2.44 dB -2.22 dB Frequency -42,480 MH; Range Up -31,860 MHz Frequency -52.85 dBm -41.47 dB -42.480 MH -62.63 dBm -49.43 dB -31.860 MHz -21.240 MHz -11.620 MHz -10.620 MHz 11.620 MHz 21.240 MHz 31.860 MHz 42.480 MHz 7.05545 GHz 7.06318 GHz 7.07389 GHz 7.08343 GHz 7.10657 GHz 7.11620 GHz 7.12682 GHz 7.13149 GHz -52.85 dBm -53.13 dBm -53.10 dBm -48.78 dBm -49.30 dBm -53.38 dBm -53.78 dBm -53.60 dBm -41.47 dB -41.75 dB -41.72 dB -37.40 dB -37.92 dB -42.00 dB -42.39 dB -42.22 dB 7.07324 GHz 7.08318 GHz 7.10334 GHz 7.10343 GHz 7.12657 GHz 7.12666 GHz 7.12666 GHz 7.14673 GHz 7.14699 GHz -62.63 dBm -62.91 dBm -52.72 dBm -52.39 dBm -52.63 dBm -52.95 dBm -63.34 dBm -63.25 dBm -49.43 dB -49.71 dB -39.51 dB -39.18 dB -39.42 dB -39.75 dB -50.13 dB -50.05 dB -31.860 MHz -21.240 MHz -11.620 MHz 10.620 MHz 11.620 MHz -31.860 MHz -21.240 MHz -11.620 MHz 10.620 MHz 11.620 MHz 240 MHz 860 MHz MHz MHz

Date: 27.JUL.2023 14:45:06

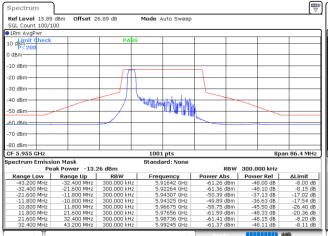
Date: 27.JUL.2023 14:52:43

Date: 27.JUL.2023 14:38:40

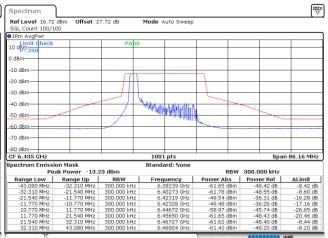


802.11ax HE20 26RU0

Plot on Channel 5955 MHz

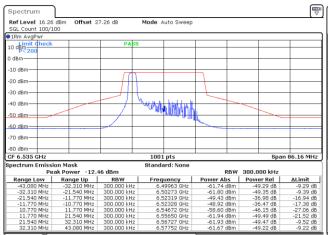


Plot on Channel 6435 MHz



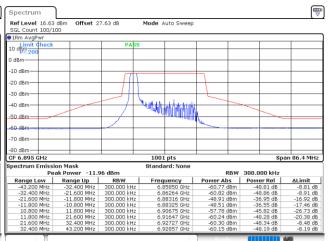
Date: 15.AUG.2023 09:06:32

Plot on Channel 6535 MHz



Plot on Channel 6895 MHz

Date: 15.AUG.2023 09:34:59



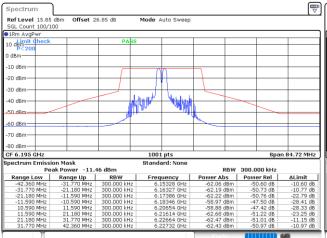
Date: 15.AUG.2023 09:47:22

Date: 15.AUG.2023 09:59:05

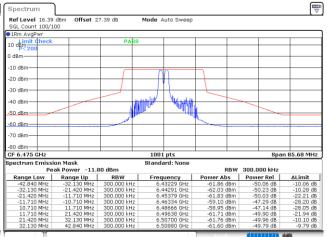


802.11ax HE20 26RU4

Plot on Channel 6195 MHz

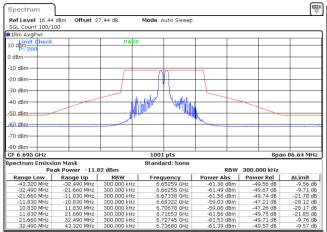


Plot on Channel 6475 MHz



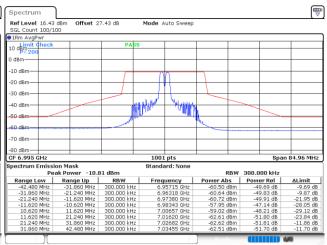
Date: 15.AUG.2023 09:13:41

Plot on Channel 6695 MHz



Plot on Channel 6995 MHz

Date: 15.AUG.2023 09:41:08



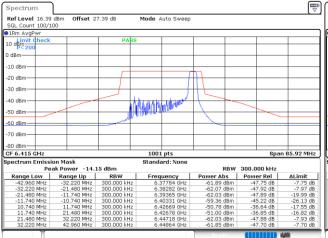
Date: 15.AUG.2023 09:49:28

Date: 15.AUG.2023 10:03:28

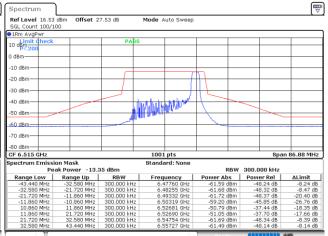


802.11ax HE20 26RU8

Plot on Channel 6415 MHz

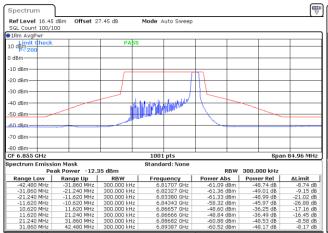


Plot on Channel 6515 MHz



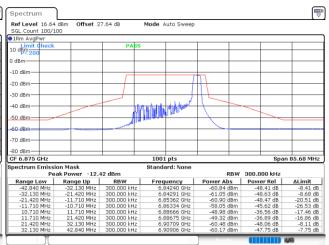
Date: 15.AUG.2023 09:24:19

Plot on Channel 6855 MHz



Plot on Channel 6875 MHz

Date: 15.AUG.2023 09:45:05

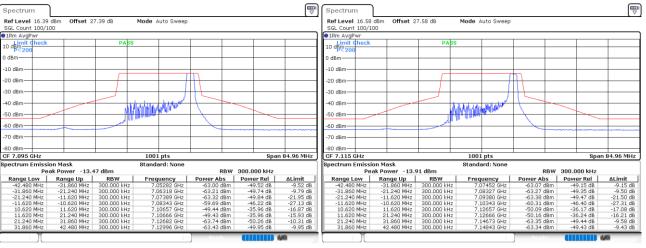


Date: 15.AUG.2023 09:52:09

Date: 15.AUG.2023 09:56:30



Plot on Channel 7095 MHz



Date: 15.AUG.2023 10:06:08

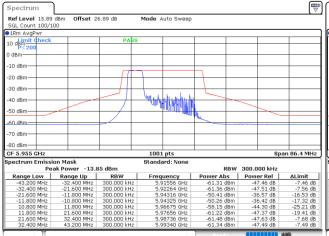
Date: 15.AUG.2023 10:08:10

Plot on Channel 7115 MHz

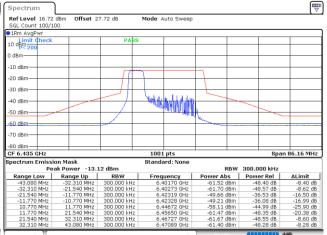


802.11ax HE20 52RU37

Plot on Channel 5955 MHz

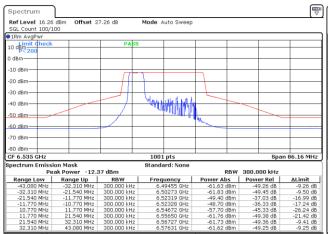


Plot on Channel 6435 MHz



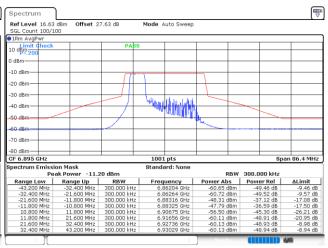
Date: 15.AUG.2023 10:13:38

Plot on Channel 6535 MHz



Plot on Channel 6895 MHz

Date: 15.AUG.2023 10:22:06



Date: 15.AUG.2023 14:05:04

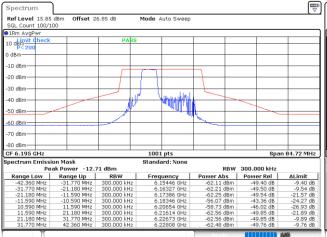
Date: 15.AUG.2023 14:41:14

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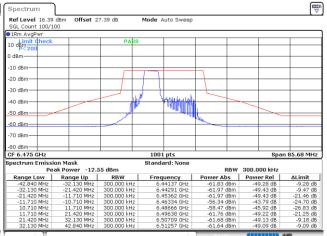


802.11ax HE20 52RU38

Plot on Channel 6195 MHz



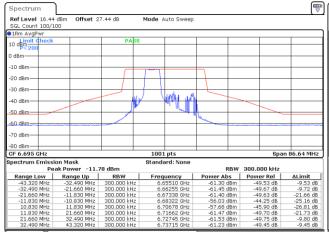
Plot on Channel 6475 MHz



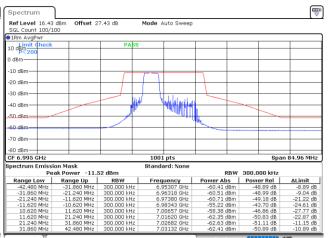
Date: 15.AUG.2023 10:15:33

Date: 15.AUG.2023 10:24:35





Plot on Channel 6995 MHz



Date: 15.AUG.2023 14:14:40

Date: 15.AUG.2023 14:48:31