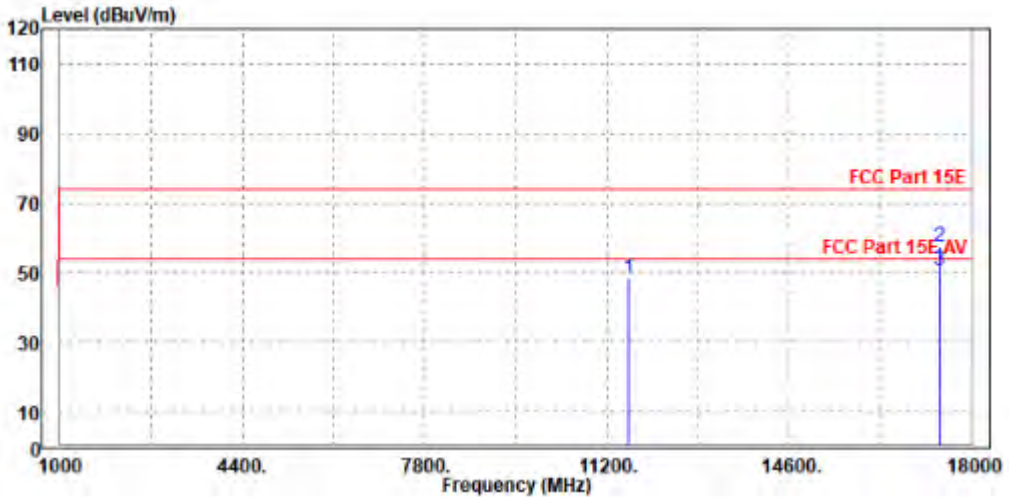
**802.11ax (40MHz) (RU484):**

**Worst case harmonic:**

| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 159 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

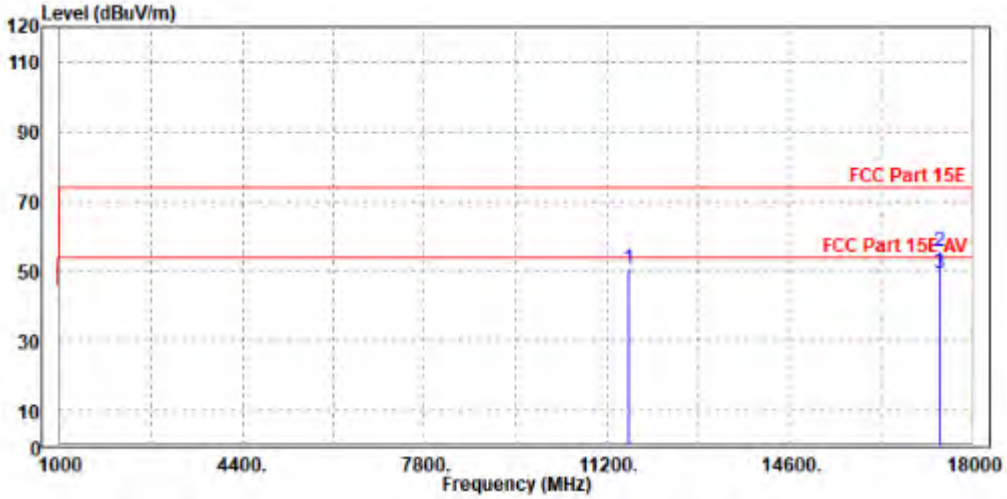
**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV | dBuV/m | dB | dB/m | | |
| 1 | 11591.000 | 48.45 | 39.11 | 74.00 | -25.55 | 9.34 | Peak | Horizontal |
| 2 | PK17385.000 | 57.68 | 39.35 | 74.00 | -16.32 | 18.33 | Peak | Horizontal |
| 3 | PP17385.000 | 50.81 | 32.48 | 54.00 | -3.19 | 18.33 | Average | Horizontal |



## ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV | dBuV/m | dB | dB/m | | |
| 1 | 11590.000 | 50.83 | 41.00 | 74.00 | -23.17 | 9.83 | Peak | Vertical |
| 2 | PK17388.000 | 55.56 | 38.41 | 74.00 | -18.44 | 17.15 | Peak | Vertical |
| 3 | PP17388.000 | 49.23 | 32.08 | 54.00 | -4.77 | 17.15 | Average | Vertical |




**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 5795MHz: Fundamental frequency.
3. For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.

## 3.2 CONDUCTED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 ~ 0.5 | 66 to 56 | 56 to 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

**NOTE**: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 3.2.2 TEST INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde&Schwarz | ESR3 | 101900 | Feb. 15,22 | Feb. 14,23 |
| EMC32 test software | Rohde&Schwarz | EMC32 | NA | NA | NA |
| LISN network | Rohde&Schwarz | ENV216 | 101922 | Mar. 04,22 | Mar. 03,23 |

**NOTE:**
1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

### 3.2.3 TEST PROCEDURES

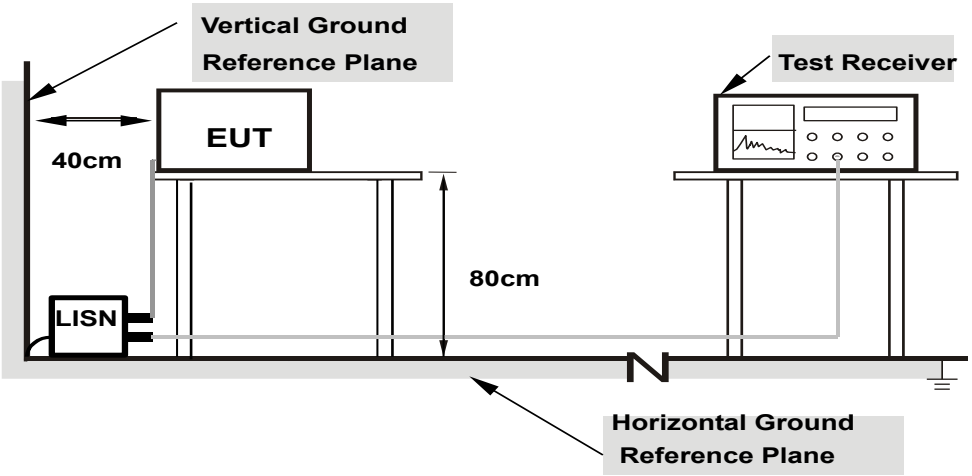
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

### 3.2.5 TEST SETUP




**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

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

### 3.2.6 EUT OPERATING CONDITIONS

Same as 3.1.7.

## 3.2.7 TEST RESULTS

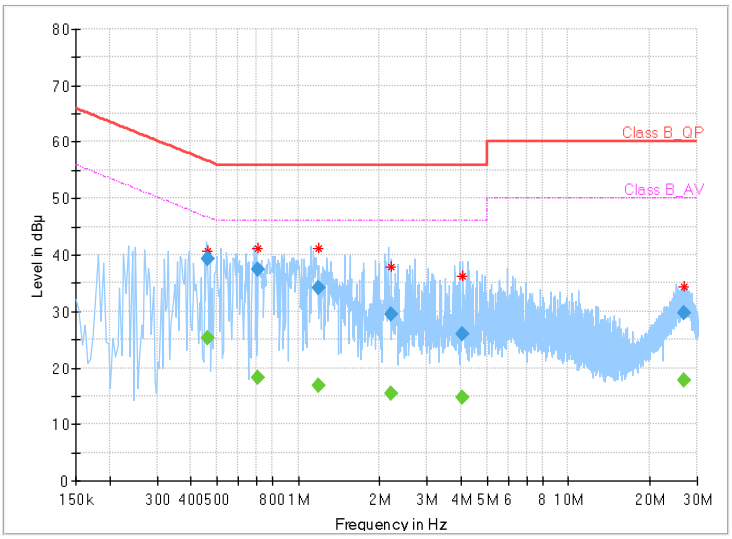
**CONDUCTED WORST-CASE DATA:**

| | | | |
|---|---|---|---|
| **Frequency Range** | 150KHz ~ 30MHz | **Detector Function & Resolution Bandwidth** | Quasi-Peak (QP) / Average (AV), 9 kHz |
| **Input Power** | 120Vac, 60Hz | **Environmental Conditions** | 26deg. C, 51%RH |
| **Tested By** | Carl Xie | | |

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|---|
| 0.460000 | --- | 25.21 | 46.69 | 21.48 | L1 | ON | 9.7 |
| 0.460000 | 39.34 | --- | 56.69 | 17.35 | L1 | ON | 9.7 |
| 0.712000 | --- | 18.32 | 46.00 | 27.68 | L1 | ON | 9.7 |
| 0.712000 | 37.52 | --- | 56.00 | 18.48 | L1 | ON | 9.7 |
| 1.188000 | --- | 16.78 | 46.00 | 29.22 | L1 | ON | 9.7 |
| 1.188000 | 34.11 | --- | 56.00 | 21.89 | L1 | ON | 9.7 |
| 2.208000 | --- | 15.50 | 46.00 | 30.50 | L1 | ON | 9.7 |
| 2.208000 | 29.41 | --- | 56.00 | 26.59 | L1 | ON | 9.7 |
| 4.044000 | --- | 14.67 | 46.00 | 31.33 | L1 | ON | 9.7 |
| 4.044000 | 25.99 | --- | 56.00 | 30.01 | L1 | ON | 9.7 |
| 26.868000 | --- | 17.89 | 50.00 | 32.11 | L1 | ON | 9.8 |
| 26.868000 | 29.68 | --- | 60.00 | 30.32 | L1 | ON | 9.8 |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

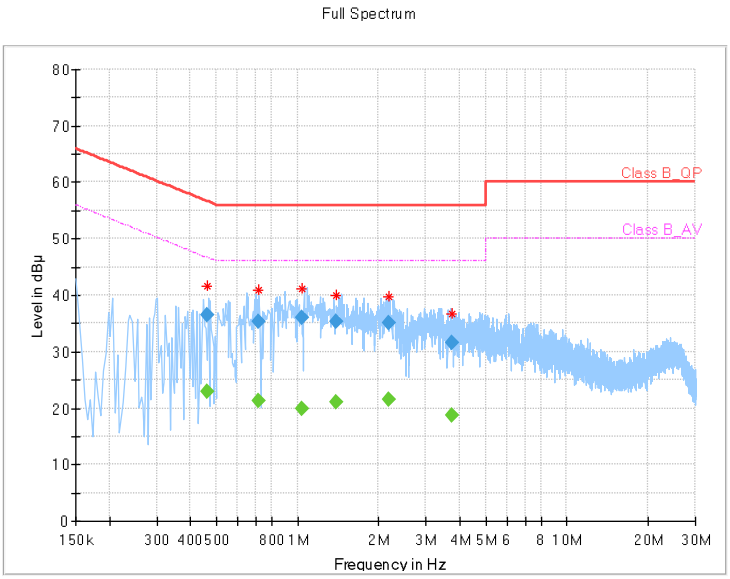
Full Spectrum



| | | | |
|---|---|---|---|
| **Frequency Range** | 150KHz ~ 30MHz | **Detector Function & Resolution Bandwidth** | Quasi-Peak (QP) / Average (AV), 9 kHz |
| **Input Power** | 120Vac, 60Hz | **Environmental Conditions** | 26deg. C, 51%RH |
| **Tested By** | Carl Xie | | |

| Frequency (MHz) | QuasiPeak (dBuV) | CAverage (dBuV) | Limit (dBuV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|---|
| 0.460000 | --- | 22.92 | 46.69 | 23.77 | N | ON | 9.7 |
| 0.460000 | 36.40 | --- | 56.69 | 20.29 | N | ON | 9.7 |
| 0.714000 | --- | 21.35 | 46.00 | 24.65 | N | ON | 9.7 |
| 0.714000 | 35.21 | --- | 56.00 | 20.79 | N | ON | 9.7 |
| 1.044000 | --- | 19.86 | 46.00 | 26.14 | N | ON | 9.8 |
| 1.044000 | 36.12 | --- | 56.00 | 19.88 | N | ON | 9.8 |
| 1.396000 | --- | 20.96 | 46.00 | 25.04 | N | ON | 9.8 |
| 1.396000 | 35.34 | --- | 56.00 | 20.66 | N | ON | 9.8 |
| 2.192000 | --- | 21.41 | 46.00 | 24.59 | N | ON | 9.8 |
| 2.192000 | 35.17 | --- | 56.00 | 20.83 | N | ON | 9.8 |
| 3.740000 | --- | 18.70 | 46.00 | 27.30 | N | ON | 9.8 |
| 3.740000 | 31.65 | --- | 56.00 | 24.35 | N | ON | 9.8 |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



## 3.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

### 3.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

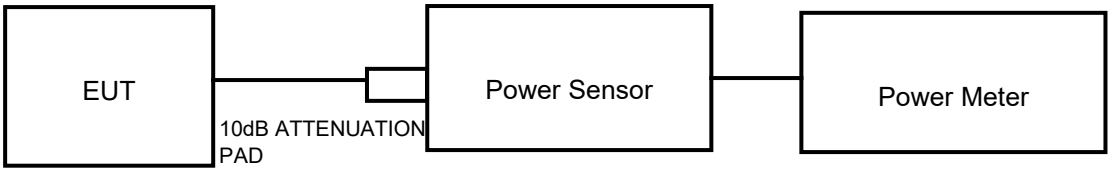
| Operation Band | EUT Category | | LIMIT |
|---|---|---|---|
| U-NII-1 | | Outdoor Access Point | 1 Watt (30 dBm)<br>(Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon) |
| | | Fixed point-to-point Access Point | 1 Watt (30 dBm) |
| | **B** | Indoor Access Point | 1 Watt (30 dBm) |
| | √ | Client devices | 250mW (24 dBm) |
| U-NII-2A | √ | | 250mW (24 dBm) or 11 dBm+10 log B* |
| U-NII-2C | √ | | 250mW (24 dBm) or 11 dBm+10 log B* |
| U-NII-3 | √ | | 1 Watt (30 dBm) |

**NOTE:** Where B is the 26dB emission bandwidth in MHz.

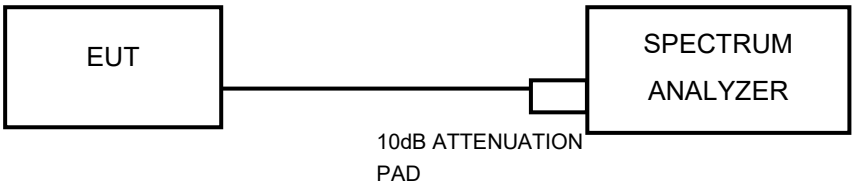
## 3.3.2 TEST SETUP

**FOR POWER OUTPUT MEASUREMENT**

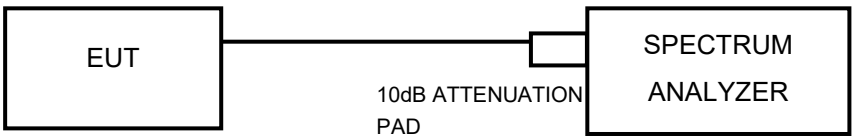
**802.11a, 802.11n/ac/ax (20MHz), 802.11 n/ac/ax (40MHz) TEST CONFIGURATION**




**802.11ac/ax (80MHz) TEST CONFIGURATION**




**FOR 26dB BANDWIDTH**




## 3.3.3 TEST INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| Power Meter | ANRITSU | ML2495A | 1506002 | Feb. 22,22 | Feb. 21,23 |
| EXA Signal Analyzer | KEYSIGHT | N9010A-526 | MY54510322 | Feb. 18,22 | Feb. 17,23 |
| EXA Signal Analyzer | KEYSIGHT | N9010A-544 | MY54510355 | May.15,22 | May.14,23 |
| Power Sensor | ANRITSU | MA2411B | 1339352 | May. 06,22 | May. 05,23 |

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

### 3.3.4 TEST PROCEDURE

**FOR POWER MEASUREMENT**

**For 802.11a, 802.11 n/ac/ax (20MHz), 802.11 n/ac/ax (40MHz)**

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

**For 802.11ac/ax (80MHz)**

1. Measure the duty cycle, x, of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz.
4. Set VBW ≥ 3 MHz.
5. Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
8. Do not use sweep triggering. Allow the sweep to “free run.”
9. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
10. Add 10 log (1/x), where x is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25%.

**FOR 99 PERCENT OCCUPIED BANDWIDTH**

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

**FOR 26dB BANDWIDTH**

1) Set RBW = approximately 1% of the emission bandwidth.
2) Set the VBW > RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) 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 6dB BANDWIDTH**

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

### 3.3.7 TEST RESULTS

Please Refer to Appendix A/B Of this test report.

## 3.4 MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

### 3.4.1 LIMITS OF MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

| Operation Band | EUT Category | | LIMIT |
|---|---|---|---|
| U-NII-1 | | Outdoor Access Point | 17dBm/ MHz |
| | | Fixed point-to-point Access Point | |
| | | Indoor Access Point | |
| | √ | Client devices | 11dBm/ MHz |
| U-NII-2A | √ | | 11dBm/ MHz |
| U-NII-2C | √ | | 11dBm/ MHz |
| U-NII-3 | √ | | 30dBm/ 500kHz |

### 3.4.2 TEST SETUP

### 3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

### 3.4.4 TEST PROCEDURES

Using method SA-2(Band1/2/3)

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) 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 (because the measurement represents an average over both the on and off times of the transmission).
7) Record the max value

Using method SA-2 (Band4)

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 300 KHz, Set VBW ≥ 1 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Add 10 log(500kHz/RBW) to the test result. 10 log(500kHz/300KHZ) = 2.22dBm
7) 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 (because the measurement represents an average over both the on and off times of the transmission).
8) Record the max value

### 3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.4.6 EUT OPERATING CONDITIONS

Same as 3.1.7.

### 3.4.7 TEST RESULTS

Please Refer to Appendix A/B Of this test report.

## 3.5 AUTOMATICALLY DISCONTINUE TRANSMISSION

### 3.5.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

### 3.5.2 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

### 3.5.3 TEST RESULT

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving。 The EUT can detect the controlling of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission

## 3.6 ANTENNA REQUIREMENTS

### 3.6.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 3.6.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

### 3.6.3 ANTENNA GAIN

Accoring to FCC KDB 662911 D01 Multiple Transmitter Output v02r01
For CDD transmissions,directional gain is calculated as
Directional gain=GANT +Array Gain, where Array Gain is as follows.
For power spectral density (PSD) measurements on all devices,
Array Gain= 10 log(NANT/ Nss) dB;
For power measurements on IEEE 802.11 devices,Array Gain = 0 dB for NANT≤ 4;
The EUT supports Cyclic Delay Diversity (CDD) mode,
For power measurements,the directional GANT is set equal to the antenna having the highest gain as following formulas.

Directional Gain = Max.Gain + Array Gain.

For PSD measurements,the directional GANT is calculation is following F)2)f)ii of KDB 662911 D01 v02r01.
The directional gain is calculated as following table.

| 5GHz Band1/2 3/4 | Ant 1 (dBi) | Ant 2 (dBi) | DG For Power (dBi) | DG For PSD (dBi) | Power Limit Reduction (dB) | PSD Limit Reduction (dB) |
|---|---|---|---|---|---|---|
| | -3.00 | -1.80 | -1.80 | 0.63 | 0.00 | 0.00 |

NOTE :DG= directional gain, Power Limit Reduction = DG For Power Gain -6dbi<0

PSD Limit Reduction = DG For PSD – 6dBi<0.Therefore, it is not necessary to reduce maximum peak output power and PSD limit.

# 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

# 5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

# 6 APPENDIX A: RLAN

## EMISSION BANDWIDTH

## TEST RESULT

| TestMode | Antenna | Frequency[MHz] | 26db EBW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| 11A-CDD | Ant1 | 5180 | 19.160 | 5170.400 | 5189.560 | --- | --- |
| | Ant2 | 5180 | 19.240 | 5170.320 | 5189.560 | --- | --- |
| | Ant1 | 5200 | 19.200 | 5190.360 | 5209.560 | --- | --- |
| | Ant2 | 5200 | 19.480 | 5190.320 | 5209.800 | --- | --- |
| | Ant1 | 5240 | 18.960 | 5230.600 | 5249.560 | --- | --- |
| | Ant2 | 5240 | 19.480 | 5230.480 | 5249.960 | --- | --- |
| | Ant1 | 5260 | 19.440 | 5250.160 | 5269.600 | --- | --- |
| | Ant2 | 5260 | 19.240 | 5250.400 | 5269.640 | --- | --- |
| | Ant1 | 5300 | 19.240 | 5290.240 | 5309.480 | --- | --- |
| | Ant2 | 5300 | 19.200 | 5290.400 | 5309.600 | --- | --- |
| | Ant1 | 5320 | 19.240 | 5310.160 | 5329.400 | --- | --- |
| | Ant2 | 5320 | 19.400 | 5310.240 | 5329.640 | --- | --- |
| | Ant1 | 5500 | 19.480 | 5490.040 | 5509.520 | --- | --- |
| | Ant2 | 5500 | 19.160 | 5490.440 | 5509.600 | --- | --- |
| | Ant1 | 5580 | 19.400 | 5570.000 | 5589.400 | --- | --- |
| | Ant2 | 5580 | 19.080 | 5570.520 | 5589.600 | --- | --- |
| | Ant1 | 5700 | 19.120 | 5690.480 | 5709.600 | --- | --- |
| | Ant2 | 5700 | 19.080 | 5690.520 | 5709.600 | --- | --- |
| | Ant1 | 5720 | 19.320 | 5710.240 | 5729.560 | --- | --- |
| | Ant2 | 5720 | 19.320 | 5710.280 | 5729.600 | --- | --- |
| | Ant1 | 5720_UNII-2C | 14.76 | 5710.240 | 5725 | --- | --- |
| | Ant2 | 5720_UNII-2C | 14.72 | 5710.280 | 5725 | --- | --- |
| | Ant1 | 5720_UNII-3 | 4.56 | 5725 | 5729.560 | --- | --- |
| | Ant2 | 5720_UNII-3 | 4.6 | 5725 | 5729.600 | --- | --- |
| | Ant1 | 5745 | 19.400 | 5735.160 | 5754.560 | --- | --- |
| | Ant2 | 5745 | 19.440 | 5735.160 | 5754.600 | --- | --- |
| | Ant1 | 5785 | 19.360 | 5775.280 | 5794.640 | --- | --- |
| | Ant2 | 5785 | 19.200 | 5775.280 | 5794.480 | --- | --- |
| | Ant1 | 5825 | 19.160 | 5815.360 | 5834.520 | --- | --- |
| | Ant2 | 5825 | 19.040 | 5815.440 | 5834.480 | --- | --- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 11N20MIMO | Ant1 | 5180 | 20.600 | 5169.840 | 5190.440 | --- | --- |
| | Ant2 | 5180 | 20.400 | 5169.800 | 5190.200 | --- | --- |
| | Ant1 | 5200 | 20.960 | 5189.400 | 5210.360 | --- | --- |
| | Ant2 | 5200 | 20.280 | 5189.920 | 5210.200 | --- | --- |
| | Ant1 | 5240 | 20.480 | 5229.760 | 5250.240 | --- | --- |
| | Ant2 | 5240 | 20.240 | 5229.880 | 5250.120 | --- | --- |
| | Ant1 | 5260 | 20.600 | 5249.800 | 5270.400 | --- | --- |
| | Ant2 | 5260 | 20.320 | 5249.680 | 5270.000 | --- | --- |
| | Ant1 | 5300 | 20.200 | 5289.880 | 5310.080 | --- | --- |
| | Ant2 | 5300 | 20.120 | 5290.000 | 5310.120 | --- | --- |
| | Ant1 | 5320 | 20.120 | 5309.960 | 5330.080 | --- | --- |
| | Ant2 | 5320 | 20.200 | 5309.800 | 5330.000 | --- | --- |
| | Ant1 | 5500 | 20.320 | 5489.880 | 5510.200 | --- | --- |
| | Ant2 | 5500 | 20.280 | 5489.840 | 5510.120 | --- | --- |
| | Ant1 | 5580 | 20.400 | 5569.880 | 5590.280 | --- | --- |
| | Ant2 | 5580 | 20.320 | 5569.720 | 5590.040 | --- | --- |
| | Ant1 | 5700 | 20.440 | 5689.840 | 5710.280 | --- | --- |
| | Ant2 | 5700 | 20.280 | 5689.760 | 5710.040 | --- | --- |
| | Ant1 | 5720 | 20.600 | 5709.640 | 5730.240 | --- | --- |
| | Ant2 | 5720 | 20.360 | 5709.960 | 5730.320 | --- | --- |
| | Ant1 | 5720_UNII-2C | 15.36 | 5709.640 | 5725 | --- | --- |
| | Ant2 | 5720_UNII-2C | 15.04 | 5709.960 | 5725 | --- | --- |
| | Ant1 | 5720_UNII-3 | 5.24 | 5725 | 5730.240 | --- | --- |
| | Ant2 | 5720_UNII-3 | 5.32 | 5725 | 5730.320 | --- | --- |
| | Ant1 | 5745 | 20.320 | 5734.880 | 5755.200 | --- | --- |
| | Ant2 | 5745 | 20.120 | 5734.840 | 5754.960 | --- | --- |
| | Ant1 | 5785 | 20.280 | 5774.880 | 5795.160 | --- | --- |
| | Ant2 | 5785 | 20.080 | 5775.000 | 5795.080 | --- | --- |
| | Ant1 | 5825 | 20.440 | 5814.720 | 5835.160 | --- | --- |
| | Ant2 | 5825 | 20.080 | 5815.000 | 5835.080 | --- | --- |
| 11N40MIMO | Ant1 | 5190 | 40.080 | 5169.760 | 5209.840 | --- | --- |
| | Ant2 | 5190 | 39.920 | 5170.240 | 5210.160 | --- | --- |
| | Ant1 | 5230 | 40.240 | 5209.840 | 5250.080 | --- | --- |
| | Ant2 | 5230 | 40.080 | 5210.000 | 5250.080 | --- | --- |
| | Ant1 | 5270 | 39.920 | 5250.000 | 5289.920 | --- | --- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant2 | 5270 | 40.240 | 5249.760 | 5290.000 | --- | --- |
| | Ant1 | 5310 | 40.160 | 5289.920 | 5330.080 | --- | --- |
| | Ant2 | 5310 | 40.000 | 5289.760 | 5329.760 | --- | --- |
| | Ant1 | 5510 | 40.080 | 5490.000 | 5530.080 | --- | --- |
| | Ant2 | 5510 | 40.160 | 5490.240 | 5530.400 | --- | --- |
| | Ant1 | 5550 | 39.440 | 5530.480 | 5569.920 | --- | --- |
| | Ant2 | 5550 | 40.400 | 5529.680 | 5570.080 | --- | --- |
| | Ant1 | 5670 | 40.000 | 5650.160 | 5690.160 | --- | --- |
| | Ant2 | 5670 | 39.840 | 5649.920 | 5689.760 | --- | --- |
| | Ant1 | 5710 | 40.080 | 5690.240 | 5730.320 | --- | --- |
| | Ant2 | 5710 | 39.680 | 5689.920 | 5729.600 | --- | --- |
| | Ant1 | 5710_UNII-2C | 34.76 | 5690.240 | 5725 | --- | --- |
| | Ant2 | 5710_UNII-2C | 35.08 | 5689.920 | 5725 | --- | --- |
| | Ant1 | 5710_UNII-3 | 5.32 | 5725 | 5730.320 | --- | --- |
| | Ant2 | 5710_UNII-3 | 4.6 | 5725 | 5729.600 | --- | --- |
| | Ant1 | 5755 | 40.240 | 5735.320 | 5775.560 | --- | --- |
| | Ant2 | 5755 | 39.760 | 5735.000 | 5774.760 | --- | --- |
| | Ant1 | 5795 | 39.920 | 5775.080 | 5815.000 | --- | --- |
| | Ant2 | 5795 | 39.600 | 5775.000 | 5814.600 | --- | --- |
| 11AC20MIMO | Ant1 | 5180 | 20.760 | 5169.480 | 5190.240 | --- | --- |
| | Ant2 | 5180 | 20.440 | 5169.760 | 5190.200 | --- | --- |
| | Ant1 | 5200 | 20.080 | 5190.080 | 5210.160 | --- | --- |
| | Ant2 | 5200 | 19.960 | 5190.000 | 5209.960 | --- | --- |
| | Ant1 | 5240 | 20.440 | 5229.800 | 5250.240 | --- | --- |
| | Ant2 | 5240 | 20.360 | 5229.880 | 5250.240 | --- | --- |
| | Ant1 | 5260 | 20.200 | 5249.840 | 5270.040 | --- | --- |
| | Ant2 | 5260 | 20.680 | 5249.600 | 5270.280 | --- | --- |
| | Ant1 | 5300 | 20.080 | 5290.000 | 5310.080 | --- | --- |
| | Ant2 | 5300 | 19.960 | 5290.040 | 5310.000 | --- | --- |
| | Ant1 | 5320 | 20.480 | 5309.880 | 5330.360 | --- | --- |
| | Ant2 | 5320 | 20.640 | 5309.720 | 5330.360 | --- | --- |
| | Ant1 | 5500 | 20.440 | 5489.760 | 5510.200 | --- | --- |
| | Ant2 | 5500 | 20.360 | 5489.840 | 5510.200 | --- | --- |
| | Ant1 | 5580 | 20.360 | 5569.760 | 5590.120 | --- | --- |
| | Ant2 | 5580 | 20.360 | 5569.800 | 5590.160 | --- | --- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant1 | 5700 | 20.240 | 5689.960 | 5710.200 | --- | --- |
| | Ant2 | 5700 | 20.600 | 5689.760 | 5710.360 | --- | --- |
| | Ant1 | 5720 | 20.040 | 5710.200 | 5730.240 | --- | --- |
| | Ant2 | 5720 | 20.000 | 5709.960 | 5729.960 | --- | --- |
| | Ant1 | 5720_UNII-2C | 14.8 | 5710.200 | 5725 | --- | --- |
| | Ant2 | 5720_UNII-2C | 15.04 | 5709.960 | 5725 | --- | --- |
| | Ant1 | 5720_UNII-3 | 5.24 | 5725 | 5730.240 | --- | --- |
| | Ant2 | 5720_UNII-3 | 4.96 | 5725 | 5729.960 | --- | --- |
| | Ant1 | 5745 | 19.960 | 5735.040 | 5755.000 | --- | --- |
| | Ant2 | 5745 | 20.240 | 5734.680 | 5754.920 | --- | --- |
| | Ant1 | 5785 | 20.920 | 5774.520 | 5795.440 | --- | --- |
| | Ant2 | 5785 | 20.400 | 5774.640 | 5795.040 | --- | --- |
| | Ant1 | 5825 | 20.280 | 5815.080 | 5835.360 | --- | --- |
| | Ant2 | 5825 | 19.960 | 5815.040 | 5835.000 | --- | --- |
| 11AC40MIMO | Ant1 | 5190 | 40.560 | 5169.760 | 5210.320 | --- | --- |
| | Ant2 | 5190 | 40.000 | 5170.080 | 5210.080 | --- | --- |
| | Ant1 | 5230 | 40.160 | 5210.000 | 5250.160 | --- | --- |
| | Ant2 | 5230 | 39.840 | 5210.160 | 5250.000 | --- | --- |
| | Ant1 | 5270 | 41.120 | 5249.520 | 5290.640 | --- | --- |
| | Ant2 | 5270 | 40.080 | 5249.840 | 5289.920 | --- | --- |
| | Ant1 | 5310 | 41.120 | 5288.880 | 5330.000 | --- | --- |
| | Ant2 | 5310 | 39.760 | 5290.240 | 5330.000 | --- | --- |
| | Ant1 | 5510 | 51.600 | 5489.600 | 5541.200 | --- | --- |
| | Ant2 | 5510 | 40.240 | 5489.840 | 5530.080 | --- | --- |
| | Ant1 | 5550 | 40.000 | 5529.920 | 5569.920 | --- | --- |
| | Ant2 | 5550 | 40.000 | 5530.080 | 5570.080 | --- | --- |
| | Ant1 | 5670 | 40.400 | 5650.160 | 5690.560 | --- | --- |
| | Ant2 | 5670 | 40.080 | 5649.840 | 5689.920 | --- | --- |
| | Ant1 | 5710 | 40.000 | 5690.000 | 5730.000 | --- | --- |
| | Ant2 | 5710 | 40.160 | 5690.240 | 5730.400 | --- | --- |
| | Ant1 | 5710_UNII-2C | 35 | 5690.000 | 5725 | --- | --- |
| | Ant2 | 5710_UNII-2C | 34.76 | 5690.240 | 5725 | --- | --- |
| | Ant1 | 5710_UNII-3 | 5 | 5725 | 5730.000 | --- | --- |
| | Ant2 | 5710_UNII-3 | 5.4 | 5725 | 5730.400 | --- | --- |
| | Ant1 | 5755 | 40.320 | 5734.760 | 5775.080 | --- | --- |

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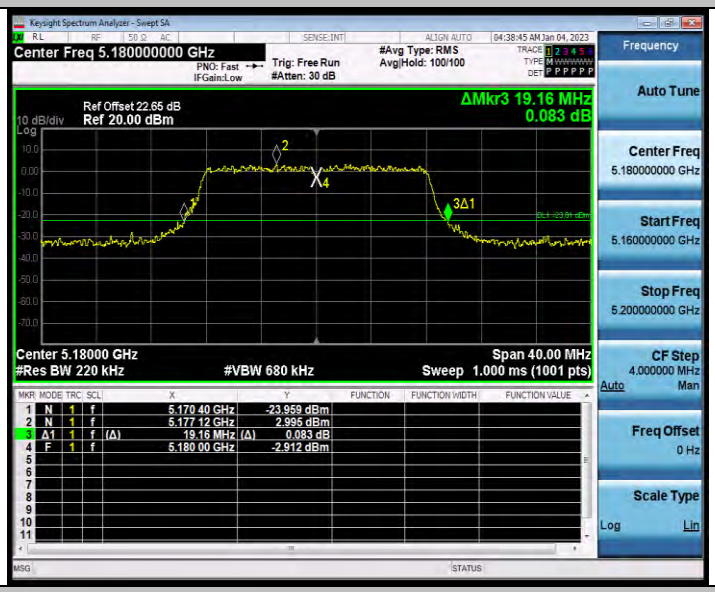
|---|---|---|---|---|---|---|---|
| | Ant2 | 5755 | 39.840 | 5735.080 | 5774.920 | --- | --- |
| | Ant1 | 5795 | 40.960 | 5774.760 | 5815.720 | --- | --- |
| | Ant2 | 5795 | 39.760 | 5775.080 | 5814.840 | --- | --- |
| 11AC80MIMO | Ant1 | 5210 | 160.000 | 5130.000 | 5290.000 | --- | --- |
| | Ant2 | 5210 | 159.840 | 5130.160 | 5290.000 | --- | --- |
| | Ant1 | 5290 | 158.560 | 5210.000 | 5368.560 | --- | --- |
| | Ant2 | 5290 | 160.000 | 5210.000 | 5370.000 | --- | --- |
| | Ant1 | 5530 | 159.520 | 5450.480 | 5610.000 | --- | --- |
| | Ant2 | 5530 | 160.000 | 5450.000 | 5610.000 | --- | --- |
| | Ant1 | 5610 | 159.520 | 5530.480 | 5690.000 | --- | --- |
| | Ant2 | 5610 | 160.000 | 5530.000 | 5690.000 | --- | --- |
| | Ant1 | 5690 | 160.000 | 5610.000 | 5770.000 | --- | --- |
| | Ant2 | 5690 | 156.640 | 5612.560 | 5769.200 | --- | --- |
| | Ant1 | 5690_UNII-2C | 115 | 5610.000 | 5725 | --- | --- |
| | Ant2 | 5690_UNII-2C | 112.44 | 5612.560 | 5725 | --- | --- |
| | Ant1 | 5690_UNII-3 | 45 | 5725 | 5770.000 | --- | --- |
| | Ant2 | 5690_UNII-3 | 44.2 | 5725 | 5769.200 | --- | --- |
| | Ant1 | 5775 | 159.840 | 5695.000 | 5854.840 | --- | --- |
| | Ant2 | 5775 | 154.080 | 5697.400 | 5851.480 | --- | --- |
| 11AX20MIMO | Ant1 | 5180 | 20.680 | 5169.760 | 5190.440 | --- | --- |
| | Ant2 | 5180 | 21.360 | 5169.240 | 5190.600 | --- | --- |
| | Ant1 | 5200 | 20.960 | 5189.640 | 5210.600 | --- | --- |
| | Ant2 | 5200 | 21.000 | 5189.280 | 5210.280 | --- | --- |
| | Ant1 | 5240 | 20.440 | 5229.800 | 5250.240 | --- | --- |
| | Ant2 | 5240 | 21.000 | 5229.360 | 5250.360 | --- | --- |
| | Ant1 | 5260 | 20.960 | 5249.480 | 5270.440 | --- | --- |
| | Ant2 | 5260 | 20.840 | 5249.560 | 5270.400 | --- | --- |
| | Ant1 | 5280 | 20.640 | 5269.600 | 5290.240 | --- | --- |
| | Ant2 | 5280 | 20.760 | 5269.640 | 5290.400 | --- | --- |
| | Ant1 | 5300 | 20.960 | 5289.640 | 5310.600 | --- | --- |
| | Ant2 | 5300 | 21.280 | 5289.360 | 5310.640 | --- | --- |
| | Ant1 | 5320 | 21.440 | 5309.440 | 5330.880 | --- | --- |
| | Ant2 | 5320 | 20.760 | 5309.520 | 5330.280 | --- | --- |
| | Ant1 | 5500 | 21.480 | 5489.040 | 5510.520 | --- | --- |
| | Ant2 | 5500 | 20.640 | 5489.640 | 5510.280 | --- | --- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant1 | 5580 | 21.040 | 5569.440 | 5590.480 | --- | --- |
| | Ant2 | 5580 | 20.680 | 5569.800 | 5590.480 | --- | --- |
| | Ant1 | 5700 | 21.160 | 5689.360 | 5710.520 | --- | --- |
| | Ant2 | 5700 | 20.720 | 5689.720 | 5710.440 | --- | --- |
| | Ant1 | 5720 | 20.880 | 5709.440 | 5730.320 | --- | --- |
| | Ant2 | 5720 | 20.800 | 5709.600 | 5730.400 | --- | --- |
| | Ant1 | 5720_UNII-2C | 15.56 | 5709.440 | 5725 | --- | --- |
| | Ant2 | 5720_UNII-2C | 15.4 | 5709.600 | 5725 | --- | --- |
| | Ant1 | 5720_UNII-3 | 5.32 | 5725 | 5730.320 | --- | --- |
| | Ant2 | 5720_UNII-3 | 5.4 | 5725 | 5730.400 | --- | --- |
| | Ant1 | 5745 | 20.600 | 5734.680 | 5755.280 | --- | --- |
| | Ant2 | 5745 | 20.480 | 5734.720 | 5755.200 | --- | --- |
| | Ant1 | 5785 | 21.200 | 5774.360 | 5795.560 | --- | --- |
| | Ant2 | 5785 | 20.800 | 5774.640 | 5795.440 | --- | --- |
| | Ant1 | 5825 | 21.160 | 5814.480 | 5835.640 | --- | --- |
| | Ant2 | 5825 | 20.440 | 5814.720 | 5835.160 | --- | --- |
| 11AX40MIMO | Ant1 | 5190 | 40.880 | 5169.600 | 5210.480 | --- | --- |
| | Ant2 | 5190 | 40.240 | 5169.760 | 5210.000 | --- | --- |
| | Ant1 | 5230 | 40.080 | 5210.000 | 5250.080 | --- | --- |
| | Ant2 | 5230 | 40.240 | 5209.920 | 5250.160 | --- | --- |
| | Ant1 | 5270 | 40.240 | 5250.000 | 5290.240 | --- | --- |
| | Ant2 | 5270 | 40.800 | 5249.440 | 5290.240 | --- | --- |
| | Ant1 | 5310 | 40.880 | 5289.680 | 5330.560 | --- | --- |
| | Ant2 | 5310 | 40.080 | 5289.760 | 5329.840 | --- | --- |
| | Ant1 | 5510 | 40.480 | 5489.920 | 5530.400 | --- | --- |
| | Ant2 | 5510 | 40.240 | 5489.920 | 5530.160 | --- | --- |
| | Ant1 | 5550 | 40.320 | 5530.000 | 5570.320 | --- | --- |
| | Ant2 | 5550 | 48.160 | 5530.080 | 5578.240 | --- | --- |
| | Ant1 | 5670 | 40.720 | 5650.000 | 5690.720 | --- | --- |
| | Ant2 | 5670 | 40.400 | 5649.680 | 5690.080 | --- | --- |
| | Ant1 | 5710 | 40.160 | 5690.080 | 5730.240 | --- | --- |
| | Ant2 | 5710 | 42.880 | 5687.440 | 5730.320 | --- | --- |
| | Ant1 | 5710_UNII-2C | 34.92 | 5690.080 | 5725 | --- | --- |
| | Ant2 | 5710_UNII-2C | 37.56 | 5687.440 | 5725 | --- | --- |
| | Ant1 | 5710_UNII-3 | 5.24 | 5725 | 5730.240 | --- | --- |

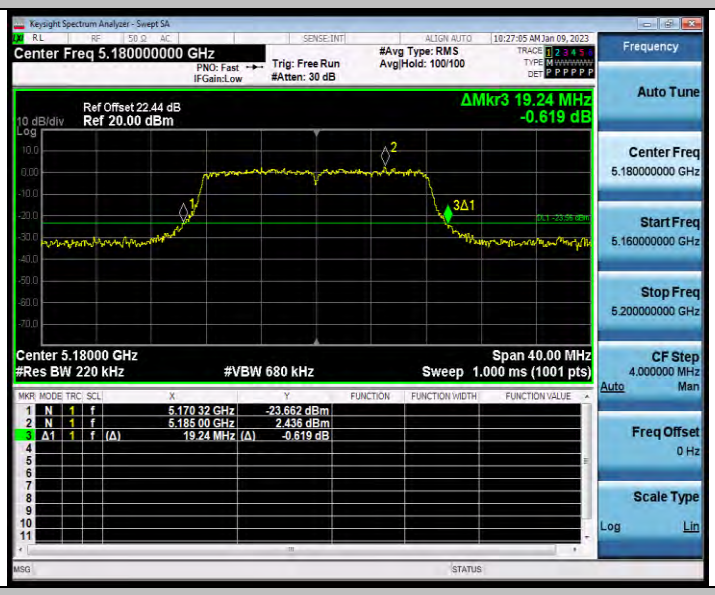
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ant2 | 5710_UNII-3 | 5.32 | 5725 | 5730.320 | --- | --- |
| | Ant1 | 5755 | 40.880 | 5734.680 | 5775.560 | --- | --- |
| | Ant2 | 5755 | 40.800 | 5734.600 | 5775.400 | --- | --- |
| | Ant1 | 5795 | 40.240 | 5775.000 | 5815.240 | --- | --- |
| | Ant2 | 5795 | 40.160 | 5774.840 | 5815.000 | --- | --- |
| 11AX80MIMO | Ant1 | 5210 | 118.400 | 5133.520 | 5251.920 | --- | --- |
| | Ant2 | 5210 | 154.720 | 5134.640 | 5289.360 | --- | --- |
| | Ant1 | 5290 | 159.520 | 5210.000 | 5369.520 | --- | --- |
| | Ant2 | 5290 | 138.240 | 5219.440 | 5357.680 | --- | --- |
| | Ant1 | 5530 | 159.840 | 5450.160 | 5610.000 | --- | --- |
| | Ant2 | 5530 | 160.000 | 5450.000 | 5610.000 | --- | --- |
| | Ant1 | 5610 | 156.000 | 5532.400 | 5688.400 | --- | --- |
| | Ant2 | 5610 | 146.080 | 5533.200 | 5679.280 | --- | --- |
| | Ant1 | 5690 | 157.760 | 5611.280 | 5769.040 | --- | --- |
| | Ant2 | 5690 | 157.920 | 5610.000 | 5767.920 | --- | --- |
| | Ant1 | 5690_UNII-2C | 113.72 | 5611.280 | 5725 | --- | --- |
| | Ant2 | 5690_UNII-2C | 115 | 5610.000 | 5725 | --- | --- |
| | Ant1 | 5690_UNII-3 | 44.04 | 5725 | 5769.040 | --- | --- |
| | Ant2 | 5690_UNII-3 | 42.92 | 5725 | 5767.920 | --- | --- |
| | Ant1 | 5775 | 159.200 | 5695.800 | 5855.000 | --- | --- |
| | Ant2 | 5775 | 130.880 | 5719.640 | 5850.520 | --- | --- |

## TEST GRAPHS

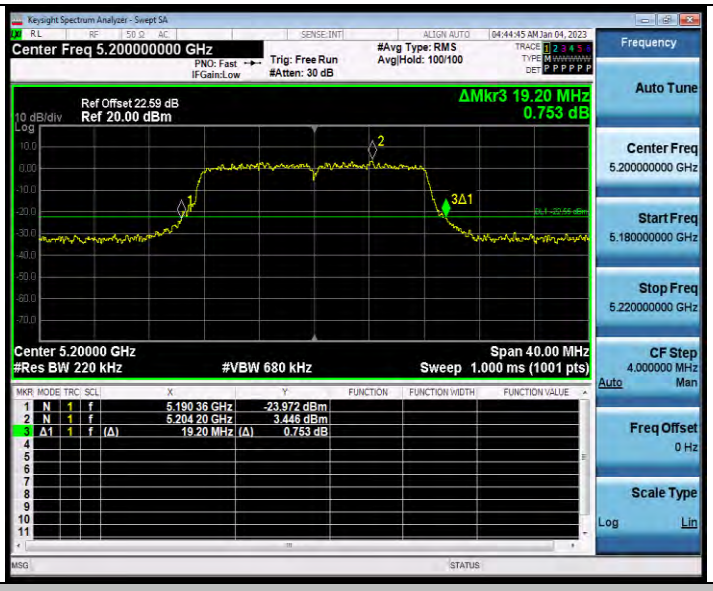
11A-CDD_Ant1_5180



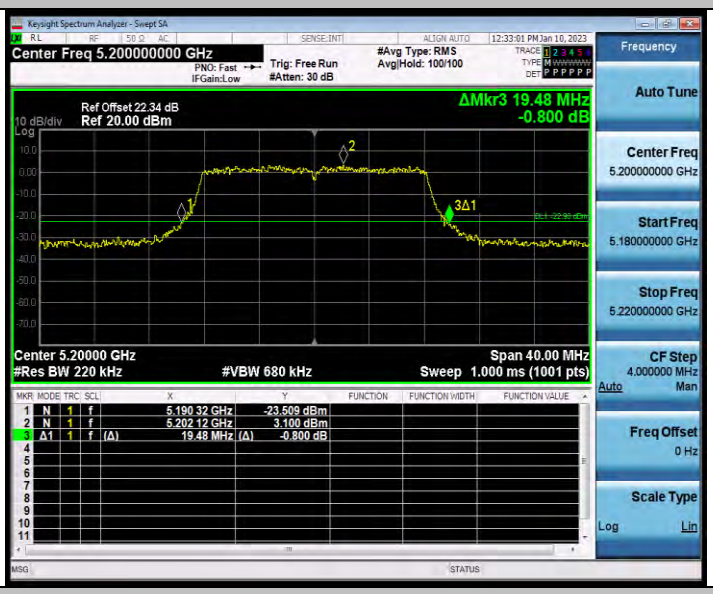

11A-CDD_Ant2_5180



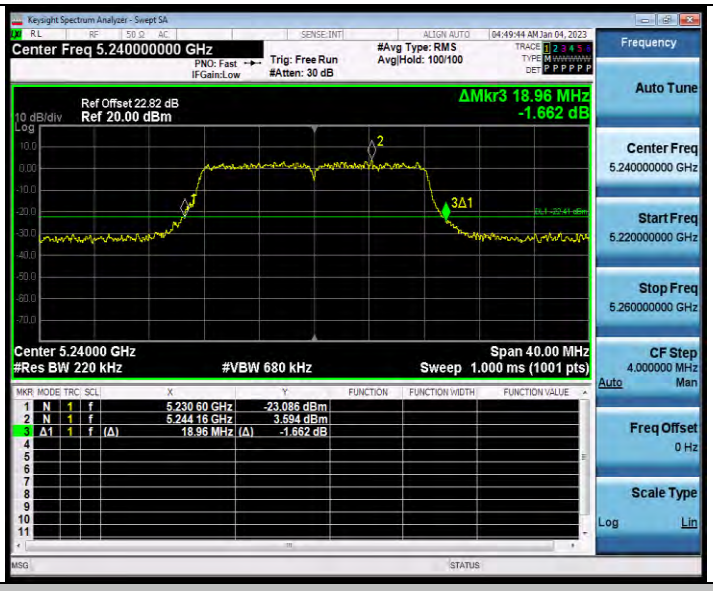

11A-CDD_Ant1_5200



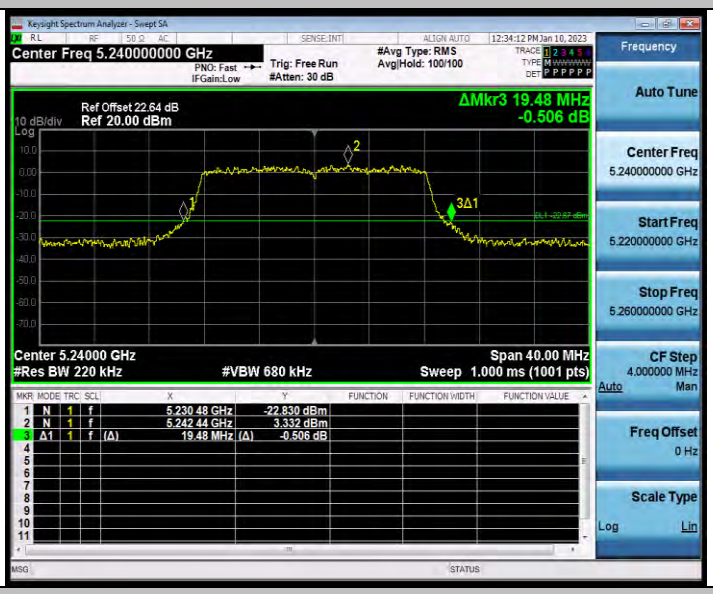

11A-CDD_Ant2_5200



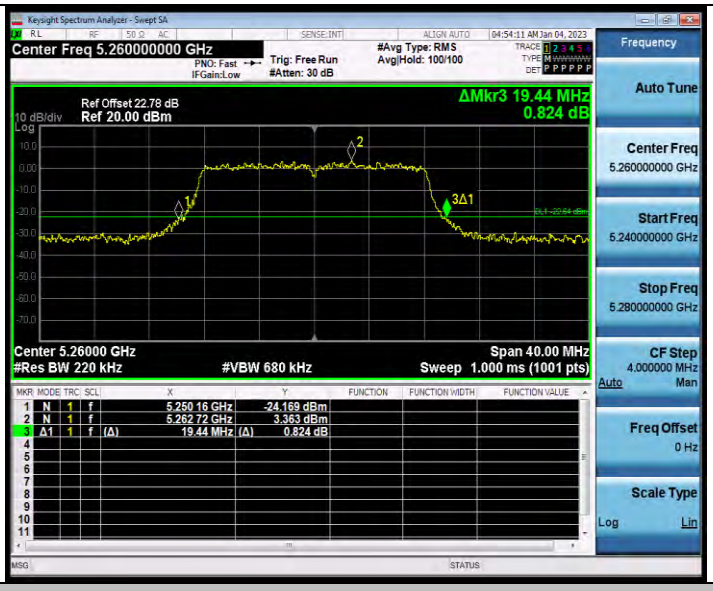

11A-CDD_Ant1_5240




11A-CDD_Ant2_5240




11A-CDD_Ant1_5260

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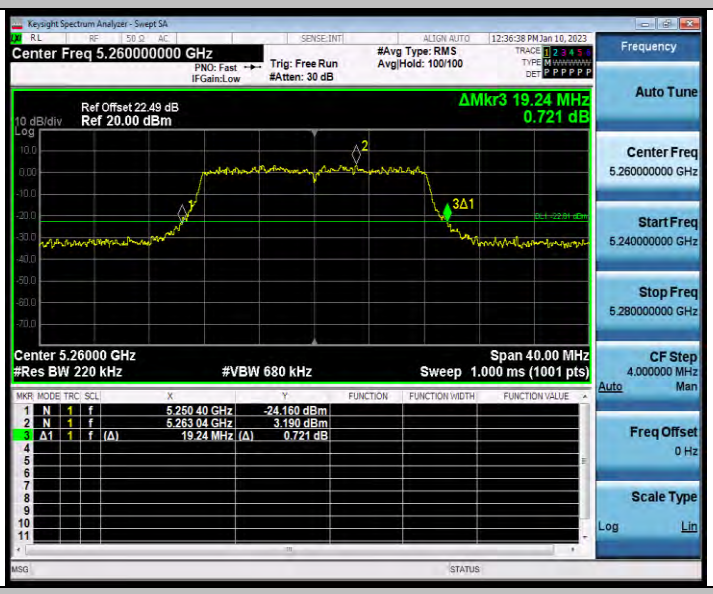
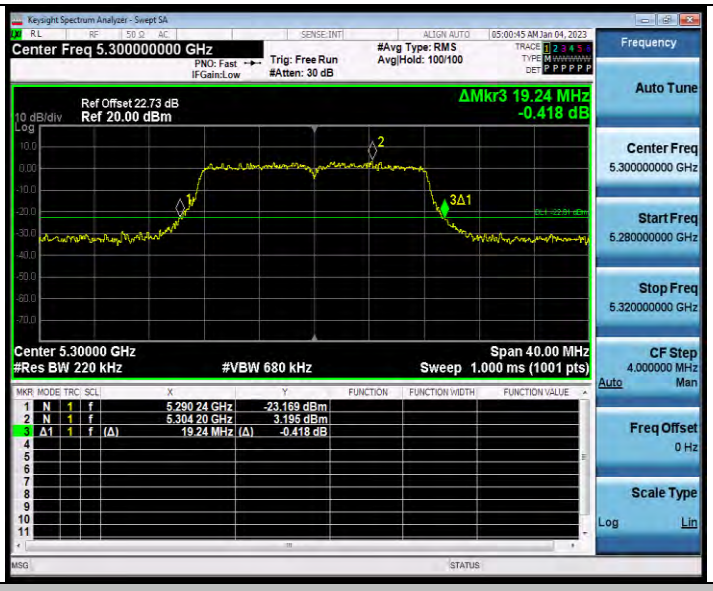
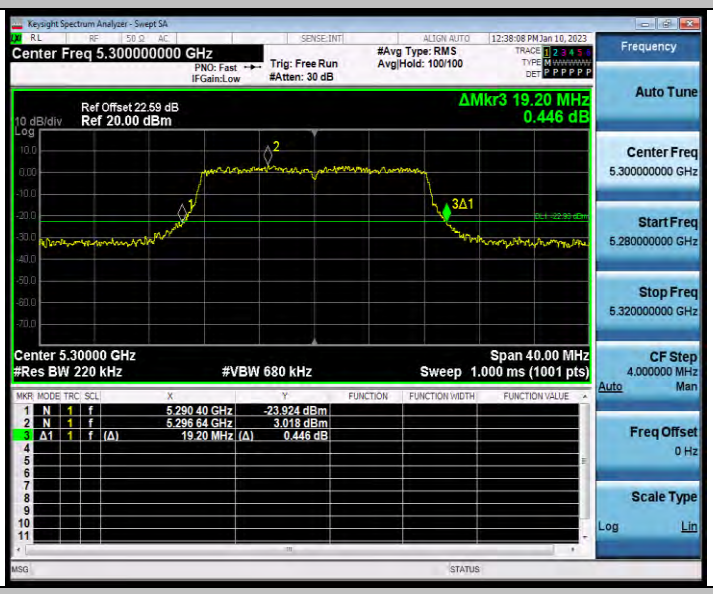


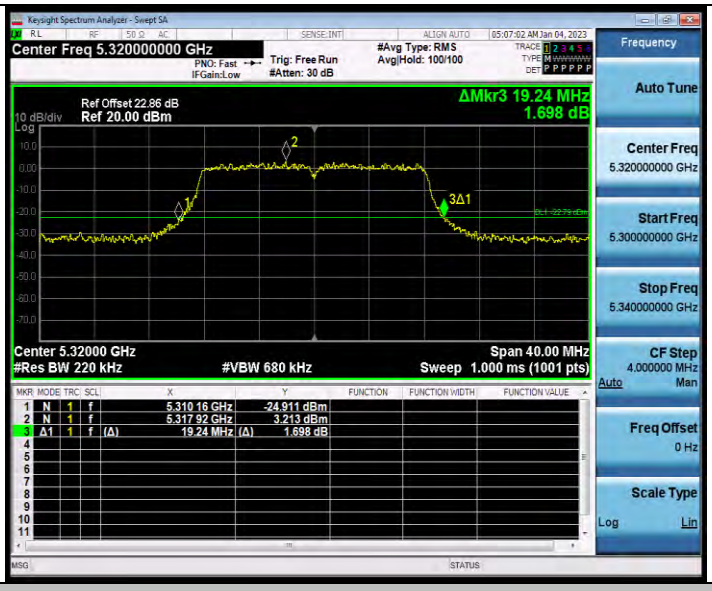

11A-CDD_Ant1_5300



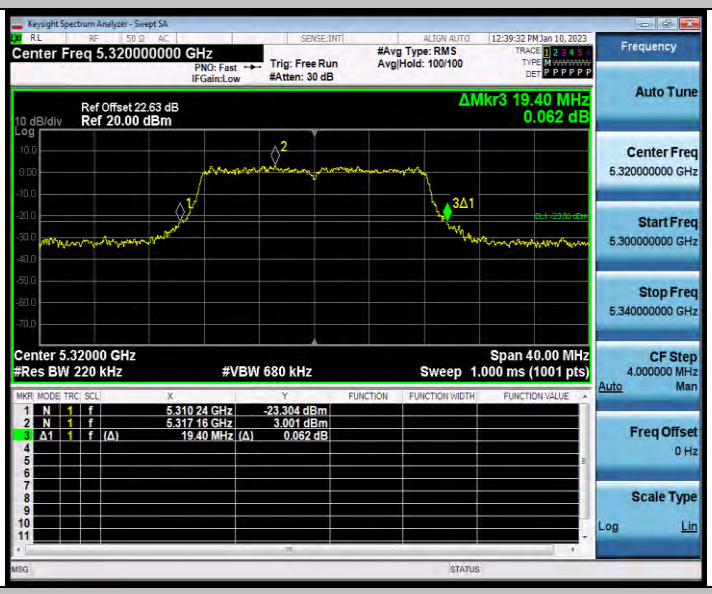

11A-CDD_Ant2_5300




11A-CDD_Ant1_5320




11A-CDD_Ant2_5320




11A-CDD_Ant1_5500