# TEST REPORT

| | | |
|---|---|---|
| **Reference No.** | : | WTD23D05116716W001 |
| **FCC ID** | : | 2AVCN-NWPXXX |
| **Applicant** | : | PVS N.V. |
| **Address** | : | Kolmenstraat 149, 3512 Stevoort, Belgium |
| **Manufacturer** | : | Max International (HK) Ltd. |
| **Address** | : | Unit 9, 12/F Wing Tuck Commercial Centre 177 Wing Lok Street, Sheungwan Hong-Kong |
| **Product** | : | NWPxxx wall panels |
| **Model(s)** | : | 2AVCN-NWPXXX |
| **Standards** | : | FCC 47CFR Part 15.247 |
| **Date of Receipt sample** | : | 2023-08-04 |
| **Date of Test** | : | 2023-08-04 to 2023-08-14 |
| **Date of Issue** | : | 2023-09-11 |
| **Test Result** | : | **Pass** |

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.


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# 3 Revision History

| Test Report No. | Date of Receipt Sample | Date of Test | Date of Issue | Purpose | Comment | Approved |
|---|---|---|---|---|---|---|
| WTD23D05116716W001 | 2023-08-04 | 2023-08-04 to 2023-08-14 | 2023-09-11 | Original | - | Valid |

# 4 General Information

## 4.1 General Description of E.U.T.

| | |
|---|---|
| Product: | NWPxxx wall panels |
| Model(s): | 2AVCN-NWPXXX |
| Model Description: | N/A |
| Wi-Fi Specification: | 2.4G-802.11b/g/n HT20/n HT40 |
| Hardware Version: | V1.1 |
| Software Version: | ESP-IDF V4.3.1 library |

## 4.2 Details of E.U.T.

| | |
|---|---|
| Operation Frequency: | 802.11b/g/n HT20: 2412~2462MHz<br>802.11n HT40: 2422~2452MHz |
| Max. RF output power: | 15.28dBm |
| Type of Modulation: | DSSS, OFDM |
| Antenna installation: | Dipole antenna with IPEX connector |
| Antenna Gain: | 4.4dBi |

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTEK lab has not verified the authenticity of its information.

| | |
|---|---|
| Ratings: | DC 3.0V-3.6V, 500mA |

## 4.3 Channel List

**Wi-Fi**

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|---|---|---|---|---|---|---|---|
| 1 | 2412 | 2 | 2417 | 3 | 2422 | 4 | 2427 |
| 5 | 2432 | 6 | 2437 | 7 | 2442 | 8 | 2447 |
| 9 | 2452 | 10 | 2457 | 11 | 2462 | - | - |

## 4.4 Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

## 4.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

## 4.6 Abnormalities from Standard Conditions

None.

## 4.7 Test Mode

Tests Carried Out Under FCC part 15.247

| Test Items | Mode | Data Rate | Channel | TX/RX |
|---|---|---|---|---|
| Maximum Peak Output Power | 802.11b | 1 Mbps | 1/6/11 | TX |
| | 802.11g | 6 Mbps | 1/6/11 | TX |
| | 802.11n HT20 | MCS0 | 1/6/11 | TX |
| | 802.11n HT40 | MCS0 | 3/6/9 | TX |
| Power Spectral Density | 802.11b | 1 Mbps | 1/6/11 | TX |
| | 802.11g | 6 Mbps | 1/6/11 | TX |
| | 802.11n HT20 | MCS0 | 1/6/11 | TX |
| | 802.11n HT40 | MCS0 | 3/6/9 | TX |
| 6dB Bandwidth | 802.11b | 1 Mbps | 1/6/11 | TX |
| | 802.11g | 6 Mbps | 1/6/11 | TX |
| | 802.11n HT20 | MCS0 | 1/6/11 | TX |
| | 802.11n HT40 | MCS0 | 3/6/9 | TX |
| Band Edge | 802.11b | 1 Mbps | 1/6/11 | TX |
| | 802.11g | 6 Mbps | 1/6/11 | TX |
| | 802.11n HT20 | MCS0 | 1/6/11 | TX |
| | 802.11n HT40 | MCS0 | 3/6/9 | TX |
| Transmitter Spurious Emissions | 802.11b | 1 Mbps | 1/6/11 | TX |
| | 802.11g | 6 Mbps | 1/6/11 | TX |
| | 802.11n HT20 | MCS0 | 1/6/11 | TX |
| | 802.11n HT40 | MCS0 | 3/6/9 | TX |

**Note**: Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product.

# 5 Test Summary

| Test Items | Test Requirement | Result |
|---|---|---|
| Radiated Spurious Emissions | 15.247(d)<br>15.205(a)<br>15.209(a) | PASS |
| Conducted Spurious Emissions | 15.247(d) | PASS |
| Conducted Emissions | 15.207(a) | N/A |
| 6dB Bandwidth | 15.247(a)(2) | PASS |
| Maximum Peak Output Power | 15.247(b)(3), (4) | PASS |
| Power Spectral Density | 15.247(e) | PASS |
| Band Edge | 15.247(d) | PASS |
| Antenna Requirement | 15.203 | PASS |
| Maximum Permissible Exposure<br>(Exposure of Humans to RF Fields) | 1.1307(b)(1) | PASS |

# 6 Equipment Used during Test

## 6.1 Equipments List

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| **3m Semi-anechoic Chamber for Radiation Emissions 1#** | | | | | | |
| 1 | Spectrum Analyzer | R&S | FSP30 | 100091 | 2023-04-24 | 2024-04-23 |
| 2 | Amplifier | Agilent | 8447D | 2944A10178 | 2023-07-27 | 2024-07-26 |
| 3 | Tri-log Broadband Antenna | SCHWARZBECK | VULB9163 | 336 | 2023-08-07 | 2024-08-06 |
| 4 | Coaxial Cable | Top | TYPE16(13M) | - | 2023-04-24 | 2024-04-23 |
| 5 | Broad-band Horn Antenna | SCHWARZBECK | BBHA 9120D | 667 | 2023-02-02 | 2024-02-01 |
| 6 | Broad-band Horn Antenna | SCHWARZBECK | BBHA 9170 | 335 | 2023-07-27 | 2024-07-26 |
| 7 | Broadband Preamplifier | COMPLIANCE | PAP-1G18 | 2004 | 2023-08-08 | 2024-08-07 |
| 8 | Coaxial Cable | Top | ZT26-NJ-NJ-8M/FA | - | 2023-02-02 | 2024-02-01 |
| 9 | Microwave Amplifier | SCHWARZBECK | BBV 9721 | 100472 | 2023-07-27 | 2024-07-26 |
| 10 | Coaxial Cable | Top | ZT40-2.92J-2.92J-2.0M | 17100919 | 2023-04-24 | 2024-04-23 |
| **3m Semi-anechoic Chamber for Radiation Emissions 2#** | | | | | | |
| 1 | Test Receiver | R&S | ESCI | 101296 | 2023-04-24 | 2024-04-23 |
| 2 | Trilog Broadband Antenna | SCHWARZBECK | VULB9160 | 9160-3325 | 2022-10-31 | 2023-10-30 |
| 3 | Active Loop Antenna | Com-Power | AL-130R | 10160007 | 2023-05-07 | 2024-05-06 |
| 4 | Amplifier | ANRITSU | MH648A | M43381 | 2023-04-24 | 2024-04-23 |
| 5 | Cable | HUBER+SUHNER | CBL2 | 525178 | 2023-04-24 | 2024-04-23 |
| **RF Conducted Testing** | | | | | | |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100501 | 2023-07-27 | 2024-07-26 |
| 2 | Spectrum Analyzer | Agilent | N9020A | MY49100060 | 2023-07-27 | 2024-07-26 |

**Test Software:**

| Test Item | Software name | Software version |
|---|---|---|
| Radiated Emission(3m) | EZ-EMC | EZ-EMC(RA-03A1-1) |

## 6.2 Description of Support Units

| Equipment | Manufacturer | Model No. | Series No. |
|---|---|---|---|
| / | / | / | / |

## 6.3 Measurement Uncertainty

| Parameter | Uncertainty |
|---|---|
| Conducted Emission | ± 3.64dB (AC mains 150KHz~30MHz) |
| Radiated Spurious Emissions | ± 5.08dB (Bilog antenna 30M~1000MHz) |
| | ± 5.47 dB (Horn antenna 1000M~25000MHz) |
| Radio Frequency | ± 1 x $10^{-7}$Hz |
| RF Power | ± 0.42 dB |
| RF Power Density | ± 0.7dB |
| Conducted Spurious Emissions | ± 2.76 dB (9kHz~26500MHz) |
| Confidence interval：95%. Confidence factor: k=2 | |

## 6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R. China.

# 7 Duty Cycle

| Type of Modulation | On time ms | Period ms | Duty Cycle linear | Duty Cycle % | Duty Cycle Factor(dB) | Average Factor(dB) |
|---|---|---|---|---|---|---|
| 802.11b | 100 | 100 | 1.00 | 100.00 | 0.00 | 0.00 |
| 802.11g | 100 | 100 | 1.00 | 100.00 | 0.00 | 0.00 |
| 802.11n-HT20 | 100 | 100 | 1.00 | 100.00 | 0.00 | 0.00 |
| 802.11n-HT40 | 100 | 100 | 1.00 | 100.00 | 0.00 | 0.00 |

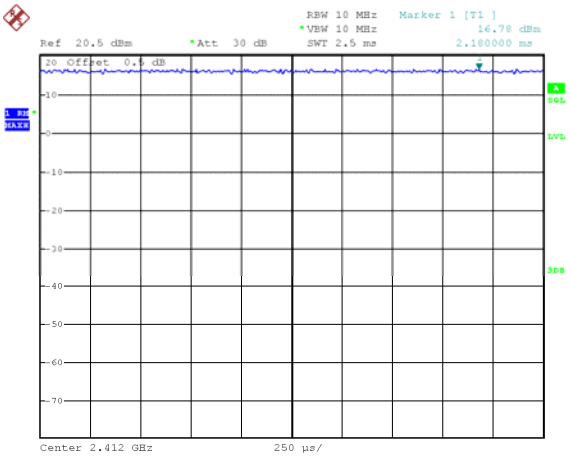
**Remark:**

Duty cycle=On Time/period;

Duty cycle factor=10*log (1/Duty cycle);

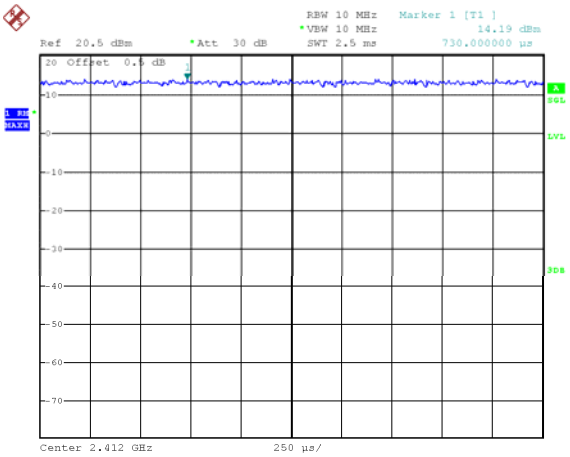
Average factor=$20\log_{10}$Duty cycle

**Wi-Fi 802.11b**



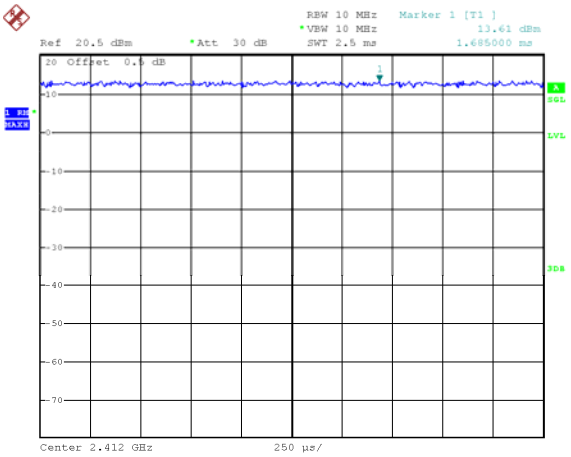

Date: 15.AUG.2023 15:04:30

**Wi-Fi 802.11g**



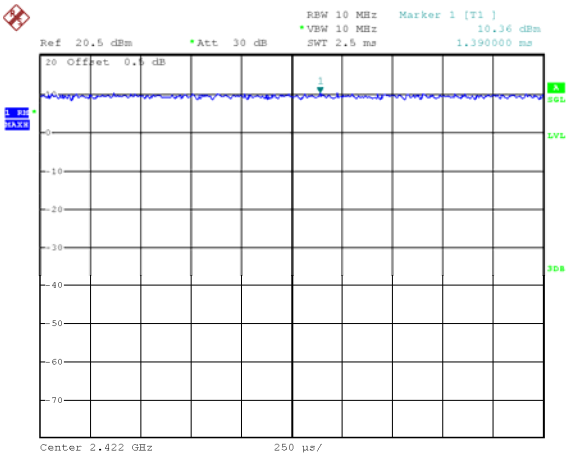

Date: 15.AUG.2023 15:04:52

**Wi-Fi 802.11n-HT20**




Date: 15.AUG.2023 15:05:12

**Wi-Fi 802.11n-HT40**




Date: 15.AUG.2023 15:05:53

# 8 Radiated Emissions

Test Requirement: 47CFR FCC Part15 Subpart C §15.209&15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019; ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

| Frequency (MHz) | Field Strength | | Field Strength Limit at 3m Measurement Dist | |
|---|---|---|---|---|
| | uV/m | Distance (m) | uV/m | dBuV/m |
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 | 10000 * 2400/F(kHz) | $20\log^{(2400/F(kHz))} + 80$ |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 | 100 * 24000/F(kHz) | $20\log^{(24000/F(kHz))} + 40$ |
| 1.705 ~ 30 | 30 | 30 | 100 * 30 | $20\log^{(30)} + 40$ |
| 30 ~ 88 | 100 | 3 | 100 | $20\log^{(100)}$ |
| 88 ~ 216 | 150 | 3 | 150 | $20\log^{(150)}$ |
| 216 ~ 960 | 200 | 3 | 200 | $20\log^{(200)}$ |
| Above 960 | 500 | 3 | 500 | $20\log^{(500)}$ |

## 8.1 EUT Operation

Operating Environment:

Temperature: 27.7 °C

Humidity: 47.4 % RH

Atmospheric Pressure: 101.2kPa

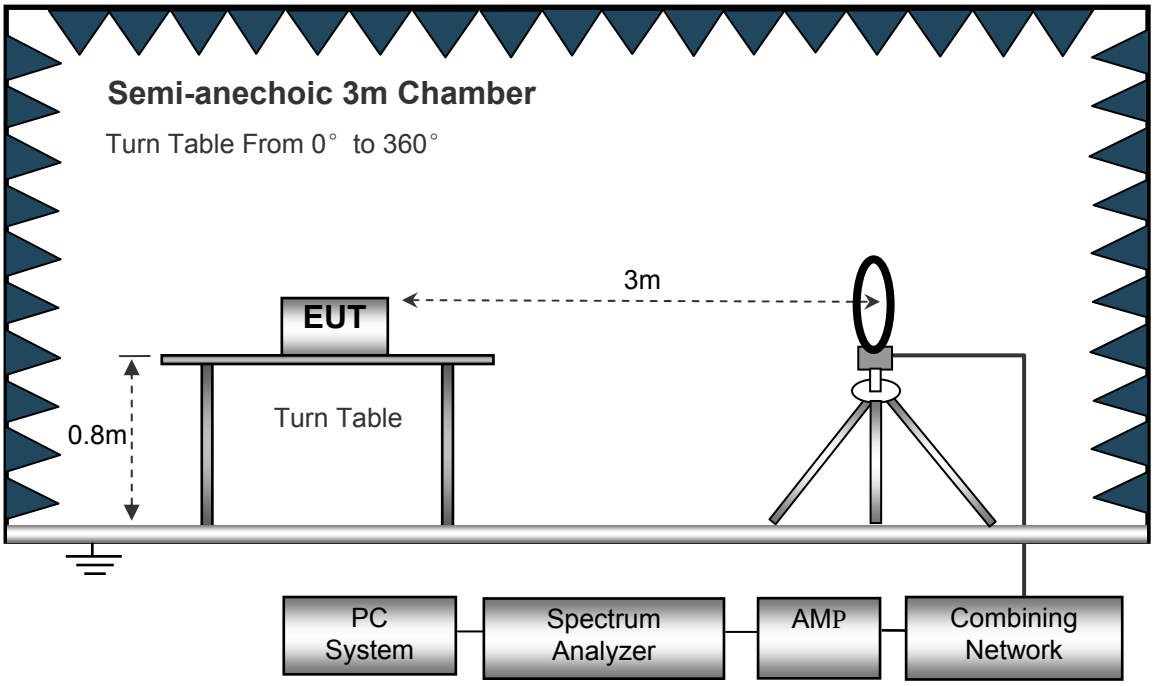
EUT Operation:

The test was performed in Transmitting mode, the worst test data were shown in the report.

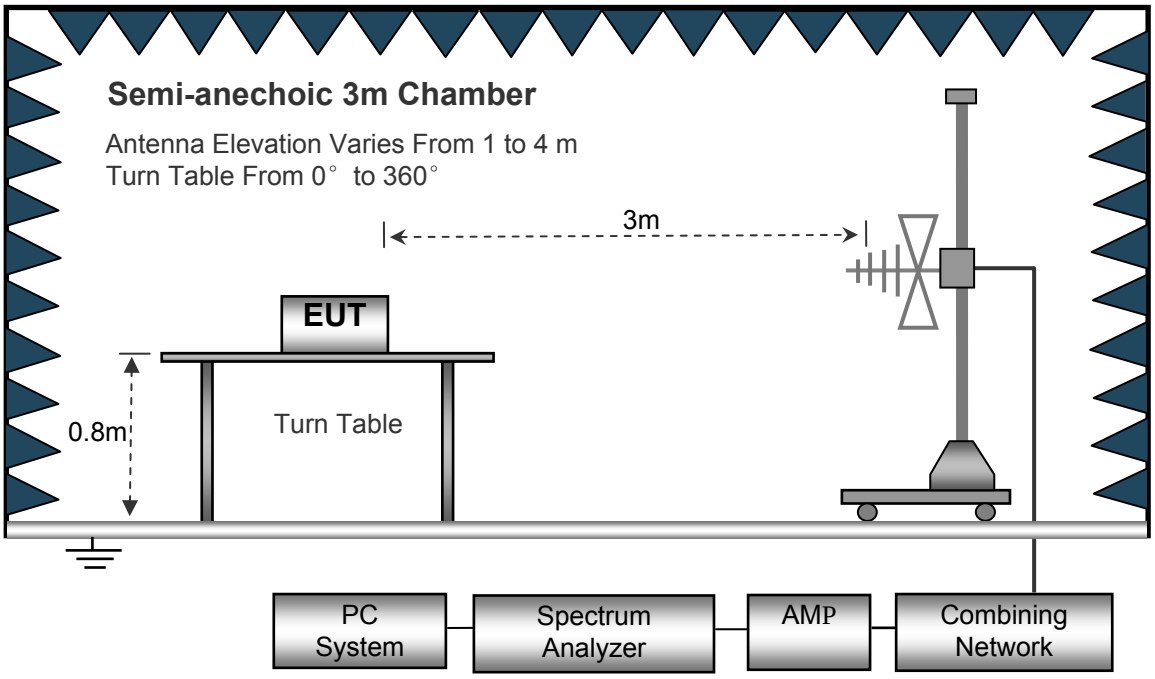
## 8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

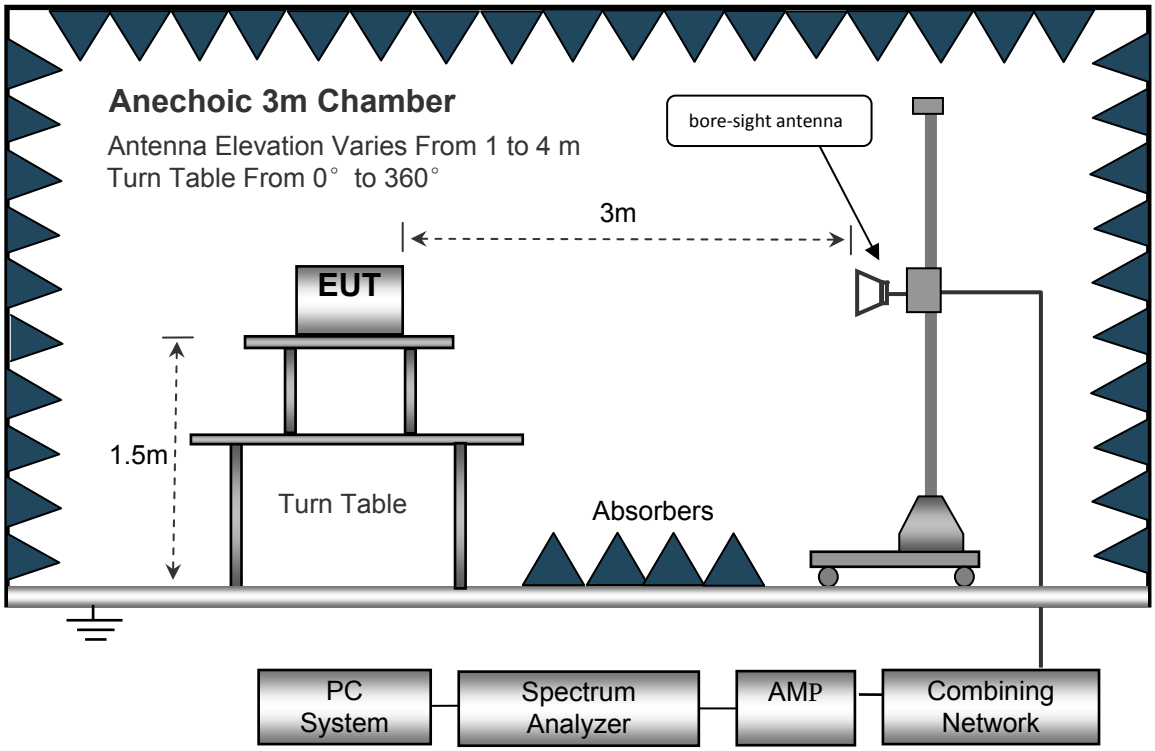
The test setup for emission measurement below 30MHz.




The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.




## 8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

## 8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used druing radiated emissions above 1GHz measurement.

## 8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

## 8.6 Summary of Test Results

**Test Frequency: 9kHz ~ 30MHz**

The measurements were more than 20 dB below the limit and not reported.

**Test Frequency: 30MHz ~ 8GHz**

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11b: Low Channel 2412MHz | | | | | | | | | |
| 322.94 | 41.08 | QP | 28 | 1.6 | H | -13.21 | 27.87 | 46.00 | -18.13 |
| 322.94 | 46.94 | QP | 202 | 1.1 | V | -13.21 | 33.73 | 46.00 | -12.27 |
| 4824.00 | 51.00 | PK | 164 | 1.5 | V | -1.06 | 49.94 | 74.00 | -24.06 |
| 4824.00 | 40.39 | Ave | 164 | 1.5 | V | -1.06 | 39.33 | 54.00 | -14.67 |
| 7236.00 | 49.87 | PK | 141 | 1.3 | H | 1.33 | 51.20 | 74.00 | -22.80 |
| 7236.00 | 39.09 | Ave | 141 | 1.3 | H | 1.33 | 40.42 | 54.00 | -13.58 |
| 2327.43 | 48.27 | PK | 349 | 1.9 | V | -13.19 | 35.08 | 74.00 | -38.92 |
| 2327.43 | 38.81 | Ave | 349 | 1.9 | V | -13.19 | 25.62 | 54.00 | -28.38 |
| 2388.12 | 44.19 | PK | 306 | 1.7 | H | -13.14 | 31.05 | 74.00 | -42.95 |
| 2388.12 | 37.72 | Ave | 306 | 1.7 | H | -13.14 | 24.58 | 54.00 | -29.42 |
| 2484.96 | 43.14 | PK | 304 | 1.9 | V | -13.08 | 30.06 | 74.00 | -43.94 |
| 2484.96 | 36.71 | Ave | 304 | 1.9 | V | -13.08 | 23.63 | 54.00 | -30.37 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11b: Middle Channel 2437MHz | | | | | | | | | |
| 322.94 | 40.31 | QP | 87 | 1.1 | H | -13.21 | 27.10 | 46.00 | -18.90 |
| 322.94 | 47.32 | QP | 157 | 1.4 | V | -13.21 | 34.11 | 46.00 | -11.89 |
| 4874.00 | 51.75 | PK | 329 | 1.9 | V | -0.62 | 51.13 | 74.00 | -22.87 |
| 4874.00 | 39.23 | Ave | 329 | 1.9 | V | -0.62 | 38.61 | 54.00 | -15.39 |
| 7311.00 | 51.12 | PK | 108 | 2.0 | H | 2.21 | 53.33 | 74.00 | -20.67 |
| 7311.00 | 39.84 | Ave | 108 | 2.0 | H | 2.21 | 42.05 | 54.00 | -11.95 |
| 2344.09 | 46.75 | PK | 130 | 1.4 | V | -13.19 | 33.56 | 74.00 | -40.44 |
| 2344.09 | 37.58 | Ave | 130 | 1.4 | V | -13.19 | 24.39 | 54.00 | -29.61 |
| 2381.84 | 43.10 | PK | 88 | 1.4 | H | -13.14 | 29.96 | 74.00 | -44.04 |
| 2381.84 | 37.42 | Ave | 88 | 1.4 | H | -13.14 | 24.28 | 54.00 | -29.72 |
| 2498.40 | 44.38 | PK | 261 | 1.2 | V | -13.08 | 31.30 | 74.00 | -42.70 |
| 2498.40 | 37.32 | Ave | 261 | 1.2 | V | -13.08 | 24.24 | 54.00 | -29.76 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11b: High Channel 2462MHz | | | | | | | | | |
| 322.94 | 40.26 | QP | 282 | 1.7 | H | -13.21 | 27.05 | 46.00 | -18.95 |
| 322.94 | 47.61 | QP | 22 | 1.2 | V | -13.21 | 34.40 | 46.00 | -11.60 |
| 4924.00 | 50.40 | PK | 173 | 1.9 | V | -0.24 | 50.16 | 74.00 | -23.84 |
| 4924.00 | 40.44 | Ave | 173 | 1.9 | V | -0.24 | 40.20 | 54.00 | -13.80 |
| 7386.00 | 52.18 | PK | 180 | 1.9 | H | 2.84 | 55.02 | 74.00 | -18.98 |
| 7386.00 | 40.46 | Ave | 180 | 1.9 | H | 2.84 | 43.30 | 54.00 | -10.70 |
| 2326.72 | 46.39 | PK | 195 | 1.4 | V | -13.19 | 33.20 | 74.00 | -40.80 |
| 2326.72 | 39.13 | Ave | 195 | 1.4 | V | -13.19 | 25.94 | 54.00 | -28.06 |
| 2373.14 | 42.04 | PK | 246 | 1.4 | H | -13.14 | 28.90 | 74.00 | -45.10 |
| 2373.14 | 38.24 | Ave | 246 | 1.4 | H | -13.14 | 25.10 | 54.00 | -28.90 |
| 2483.84 | 43.58 | PK | 336 | 1.0 | V | -13.08 | 30.50 | 74.00 | -43.50 |
| 2483.84 | 38.46 | Ave | 336 | 1.0 | V | -13.08 | 25.38 | 54.00 | -28.62 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11g: Low Channel 2412MHz | | | | | | | | | |
| 322.94 | 42.46 | QP | 81 | 1.7 | H | -13.21 | 29.25 | 46.00 | -16.75 |
| 322.94 | 48.03 | QP | 260 | 1.8 | V | -13.21 | 34.82 | 46.00 | -11.18 |
| 4824.00 | 52.01 | PK | 189 | 1.1 | V | -1.06 | 50.95 | 74.00 | -23.05 |
| 4824.00 | 40.75 | Ave | 189 | 1.1 | V | -1.06 | 39.69 | 54.00 | -14.31 |
| 7236.00 | 49.56 | PK | 103 | 1.9 | H | 1.33 | 50.89 | 74.00 | -23.11 |
| 7236.00 | 37.65 | Ave | 103 | 1.9 | H | 1.33 | 38.98 | 54.00 | -15.02 |
| 2318.75 | 46.71 | PK | 340 | 1.9 | V | -13.19 | 33.52 | 74.00 | -40.48 |
| 2318.75 | 37.51 | Ave | 340 | 1.9 | V | -13.19 | 24.32 | 54.00 | -29.68 |
| 2376.19 | 42.82 | PK | 1 | 1.0 | H | -13.14 | 29.68 | 74.00 | -44.32 |
| 2376.19 | 37.57 | Ave | 1 | 1.0 | H | -13.14 | 24.43 | 54.00 | -29.57 |
| 2490.14 | 43.18 | PK | 323 | 1.8 | V | -13.08 | 30.10 | 74.00 | -43.90 |
| 2490.14 | 37.73 | Ave | 323 | 1.8 | V | -13.08 | 24.65 | 54.00 | -29.35 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11g: Middle Channel 2437MHz | | | | | | | | | |
| 322.94 | 42.72 | QP | 47 | 1.2 | H | -13.21 | 29.51 | 46.00 | -16.49 |
| 322.94 | 47.35 | QP | 1 | 1.7 | V | -13.21 | 34.14 | 46.00 | -11.86 |
| 4874.00 | 53.21 | PK | 223 | 1.4 | V | -0.62 | 52.59 | 74.00 | -21.41 |
| 4874.00 | 39.99 | Ave | 223 | 1.4 | V | -0.62 | 39.37 | 54.00 | -14.63 |
| 7311.00 | 48.72 | PK | 68 | 1.2 | H | 2.21 | 50.93 | 74.00 | -23.07 |
| 7311.00 | 37.15 | Ave | 68 | 1.2 | H | 2.21 | 39.36 | 54.00 | -14.64 |
| 2328.12 | 45.89 | PK | 300 | 1.3 | V | -13.19 | 32.70 | 74.00 | -41.30 |
| 2328.12 | 37.11 | Ave | 300 | 1.3 | V | -13.19 | 23.92 | 54.00 | -30.08 |
| 2353.40 | 42.37 | PK | 155 | 1.4 | H | -13.14 | 29.23 | 74.00 | -44.77 |
| 2353.40 | 38.50 | Ave | 155 | 1.4 | H | -13.14 | 25.36 | 54.00 | -28.64 |
| 2496.22 | 44.75 | PK | 155 | 1.4 | V | -13.08 | 31.67 | 74.00 | -42.33 |
| 2496.22 | 38.01 | Ave | 155 | 1.4 | V | -13.08 | 24.93 | 54.00 | -29.07 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11g: High Channel 2462MHz | | | | | | | | | |
| 322.94 | 42.76 | QP | 27 | 1.1 | H | -13.21 | 29.55 | 46.00 | -16.45 |
| 322.94 | 48.52 | QP | 65 | 1.5 | V | -13.21 | 35.31 | 46.00 | -10.69 |
| 4924.00 | 53.62 | PK | 355 | 1.7 | V | -0.24 | 53.38 | 74.00 | -20.62 |
| 4924.00 | 39.39 | Ave | 355 | 1.7 | V | -0.24 | 39.15 | 54.00 | -14.85 |
| 7386.00 | 48.62 | PK | 322 | 1.1 | H | 2.84 | 51.46 | 74.00 | -22.54 |
| 7386.00 | 36.10 | Ave | 322 | 1.1 | H | 2.84 | 38.94 | 54.00 | -15.06 |
| 2317.34 | 46.94 | PK | 335 | 1.6 | V | -13.19 | 33.75 | 74.00 | -40.25 |
| 2317.34 | 39.22 | Ave | 335 | 1.6 | V | -13.19 | 26.03 | 54.00 | -27.97 |
| 2351.53 | 42.02 | PK | 42 | 1.8 | H | -13.14 | 28.88 | 74.00 | -45.12 |
| 2351.53 | 37.43 | Ave | 42 | 1.8 | H | -13.14 | 24.29 | 54.00 | -29.71 |
| 2489.74 | 44.51 | PK | 85 | 1.6 | V | -13.08 | 31.43 | 74.00 | -42.57 |
| 2489.74 | 37.49 | Ave | 85 | 1.6 | V | -13.08 | 24.41 | 54.00 | -29.59 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11n HT20 : Low Channel 2412MHz | | | | | | | | | |
| 322.94 | 42.01 | QP | 65 | 1.2 | H | -13.21 | 28.80 | 46.00 | -17.20 |
| 322.94 | 47.41 | QP | 110 | 1.8 | V | -13.21 | 34.20 | 46.00 | -11.80 |
| 4824.00 | 54.89 | PK | 281 | 1.4 | V | -1.06 | 53.83 | 74.00 | -20.17 |
| 4824.00 | 39.55 | Ave | 281 | 1.4 | V | -1.06 | 38.49 | 54.00 | -15.51 |
| 7236.00 | 47.48 | PK | 21 | 1.2 | H | 1.33 | 48.81 | 74.00 | -25.19 |
| 7236.00 | 34.67 | Ave | 21 | 1.2 | H | 1.33 | 36.00 | 54.00 | -18.00 |
| 2310.95 | 46.09 | PK | 14 | 1.8 | V | -13.19 | 32.90 | 74.00 | -41.10 |
| 2310.95 | 39.10 | Ave | 14 | 1.8 | V | -13.19 | 25.91 | 54.00 | -28.09 |
| 2381.57 | 44.51 | PK | 258 | 1.9 | H | -13.14 | 31.37 | 74.00 | -42.63 |
| 2381.57 | 36.70 | Ave | 258 | 1.9 | H | -13.14 | 23.56 | 54.00 | -30.44 |
| 2494.19 | 42.03 | PK | 302 | 1.9 | V | -13.08 | 28.95 | 74.00 | -45.05 |
| 2494.19 | 37.70 | Ave | 302 | 1.9 | V | -13.08 | 24.62 | 54.00 | -29.38 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11n HT20: Middle Channel 2437MHz | | | | | | | | | |
| 322.94 | 42.42 | QP | 212 | 1.2 | H | -13.21 | 29.21 | 46.00 | -16.79 |
| 322.94 | 47.57 | QP | 238 | 1.9 | V | -13.21 | 34.36 | 46.00 | -11.64 |
| 4874.00 | 53.39 | PK | 21 | 1.1 | V | -0.62 | 52.77 | 74.00 | -21.23 |
| 4874.00 | 39.59 | Ave | 21 | 1.1 | V | -0.62 | 38.97 | 54.00 | -15.03 |
| 7311.00 | 47.48 | PK | 8 | 2.0 | H | 2.21 | 49.69 | 74.00 | -24.31 |
| 7311.00 | 34.22 | Ave | 8 | 2.0 | H | 2.21 | 36.43 | 54.00 | -17.57 |
| 2328.86 | 45.83 | PK | 253 | 2.0 | V | -13.19 | 32.64 | 74.00 | -41.36 |
| 2328.86 | 38.05 | Ave | 253 | 2.0 | V | -13.19 | 24.86 | 54.00 | -29.14 |
| 2381.02 | 42.91 | PK | 186 | 1.4 | H | -13.14 | 29.77 | 74.00 | -44.23 |
| 2381.02 | 36.12 | Ave | 186 | 1.4 | H | -13.14 | 22.98 | 54.00 | -31.02 |
| 2495.07 | 43.84 | PK | 198 | 1.9 | V | -13.08 | 30.76 | 74.00 | -43.24 |
| 2495.07 | 37.88 | Ave | 198 | 1.9 | V | -13.08 | 24.80 | 54.00 | -29.20 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11n HT20 : High Channel 2462MHz | | | | | | | | | |
| 322.94 | 41.29 | QP | 185 | 1.5 | H | -13.21 | 28.08 | 46.00 | -17.92 |
| 322.94 | 49.00 | QP | 127 | 1.8 | V | -13.21 | 35.79 | 46.00 | -10.21 |
| 4924.00 | 54.88 | PK | 121 | 1.7 | V | -0.24 | 54.64 | 74.00 | -19.36 |
| 4924.00 | 40.90 | Ave | 121 | 1.7 | V | -0.24 | 40.66 | 54.00 | -13.34 |
| 7386.00 | 47.23 | PK | 184 | 1.2 | H | 2.84 | 50.07 | 74.00 | -23.93 |
| 7386.00 | 33.44 | Ave | 184 | 1.2 | H | 2.84 | 36.28 | 54.00 | -17.72 |
| 2339.70 | 46.05 | PK | 118 | 1.9 | V | -13.19 | 32.86 | 74.00 | -41.14 |
| 2339.70 | 39.28 | Ave | 118 | 1.9 | V | -13.19 | 26.09 | 54.00 | -27.91 |
| 2363.57 | 43.97 | PK | 45 | 1.2 | H | -13.14 | 30.83 | 74.00 | -43.17 |
| 2363.57 | 37.05 | Ave | 45 | 1.2 | H | -13.14 | 23.91 | 54.00 | -30.09 |
| 2486.19 | 43.94 | PK | 113 | 1.5 | V | -13.08 | 30.86 | 74.00 | -43.14 |
| 2486.19 | 37.57 | Ave | 113 | 1.5 | V | -13.08 | 24.49 | 54.00 | -29.51 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11n HT40: Low Channel 2422MHz | | | | | | | | | |
| 322.94 | 39.88 | QP | 260 | 1.8 | H | -13.21 | 26.67 | 46.00 | -19.33 |
| 322.94 | 48.59 | QP | 259 | 1.6 | V | -13.21 | 35.38 | 46.00 | -10.62 |
| 4844.00 | 53.43 | PK | 204 | 1.6 | V | -1.06 | 52.37 | 74.00 | -21.63 |
| 4844.00 | 39.72 | Ave | 204 | 1.6 | V | -1.06 | 38.66 | 54.00 | -15.34 |
| 7266.00 | 45.06 | PK | 145 | 1.9 | H | 1.33 | 46.39 | 74.00 | -27.61 |
| 7266.00 | 31.73 | Ave | 145 | 1.9 | H | 1.33 | 33.06 | 54.00 | -20.94 |
| 2341.89 | 45.30 | PK | 37 | 1.1 | V | -13.19 | 32.11 | 74.00 | -41.89 |
| 2341.89 | 39.86 | Ave | 37 | 1.1 | V | -13.19 | 26.67 | 54.00 | -27.33 |
| 2360.78 | 42.91 | PK | 5 | 1.0 | H | -13.14 | 29.77 | 74.00 | -44.23 |
| 2360.78 | 38.81 | Ave | 5 | 1.0 | H | -13.14 | 25.67 | 54.00 | -28.33 |
| 2485.22 | 44.85 | PK | 52 | 1.4 | V | -13.08 | 31.77 | 74.00 | -42.23 |
| 2485.22 | 38.14 | Ave | 52 | 1.4 | V | -13.08 | 25.06 | 54.00 | -28.94 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11n HT40: Middle Channel 2437MHz | | | | | | | | | |
| 322.94 | 40.33 | QP | 128 | 1.8 | H | -13.21 | 27.12 | 46.00 | -18.88 |
| 322.94 | 47.93 | QP | 234 | 1.3 | V | -13.21 | 34.72 | 46.00 | -11.28 |
| 4874.00 | 52.98 | PK | 18 | 1.3 | V | -0.62 | 52.36 | 74.00 | -21.64 |
| 4874.00 | 39.48 | Ave | 18 | 1.3 | V | -0.62 | 38.86 | 54.00 | -15.14 |
| 7311.00 | 45.83 | PK | 342 | 1.3 | H | 2.21 | 48.04 | 74.00 | -25.96 |
| 7311.00 | 31.60 | Ave | 342 | 1.3 | H | 2.21 | 33.81 | 54.00 | -20.19 |
| 2345.76 | 45.65 | PK | 214 | 1.2 | V | -13.19 | 32.46 | 74.00 | -41.54 |
| 2345.76 | 37.46 | Ave | 214 | 1.2 | V | -13.19 | 24.27 | 54.00 | -29.73 |
| 2354.92 | 42.49 | PK | 322 | 1.2 | H | -13.14 | 29.35 | 74.00 | -44.65 |
| 2354.92 | 37.95 | Ave | 322 | 1.2 | H | -13.14 | 24.81 | 54.00 | -29.19 |
| 2485.68 | 44.58 | PK | 34 | 1.3 | V | -13.08 | 31.50 | 74.00 | -42.50 |
| 2485.68 | 38.66 | Ave | 34 | 1.3 | V | -13.08 | 25.58 | 54.00 | -28.42 |

| Frequency | Receiver Reading | Detector | Turn table Angle | RX Antenna | | Corrected Factor | Corrected Amplitude | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Height | Polar | | | | |
| (MHz) | (dBμV) | (PK/QP/Ave) | Degree | (m) | (H/V) | (dB) | (dBμV/m) | (dBμV/m) | (dB) |
| 11n HT40: High Channel 2452MHz | | | | | | | | | |
| 322.94 | 40.95 | QP | 85 | 1.7 | H | -13.21 | 27.74 | 46.00 | -18.26 |
| 322.94 | 47.30 | QP | 240 | 1.3 | V | -13.21 | 34.09 | 46.00 | -11.91 |
| 4904.00 | 53.49 | PK | 98 | 1.5 | V | -0.24 | 53.25 | 74.00 | -20.75 |
| 4904.00 | 40.12 | Ave | 98 | 1.5 | V | -0.24 | 39.88 | 54.00 | -14.12 |
| 7356.00 | 46.48 | PK | 317 | 1.8 | H | 2.84 | 49.32 | 74.00 | -24.68 |
| 7356.00 | 31.60 | Ave | 317 | 1.8 | H | 2.84 | 34.44 | 54.00 | -19.56 |
| 2335.77 | 45.27 | PK | 197 | 1.8 | V | -13.19 | 32.08 | 74.00 | -41.92 |
| 2335.77 | 37.52 | Ave | 197 | 1.8 | V | -13.19 | 24.33 | 54.00 | -29.67 |
| 2371.16 | 43.95 | PK | 133 | 1.9 | H | -13.14 | 30.81 | 74.00 | -43.19 |
| 2371.16 | 38.07 | Ave | 133 | 1.9 | H | -13.14 | 24.93 | 54.00 | -29.07 |
| 2486.19 | 43.83 | PK | 297 | 1.5 | V | -13.08 | 30.75 | 74.00 | -43.25 |
| 2486.19 | 36.24 | Ave | 297 | 1.5 | V | -13.08 | 23.16 | 54.00 | -30.84 |

**Test Frequency: 8GHz~25GHz**

The measurements were more than 20 dB below the limit and not reported.

# 9 Conducted Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019;
ANSI C63.10:2013

Test Result: PASS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

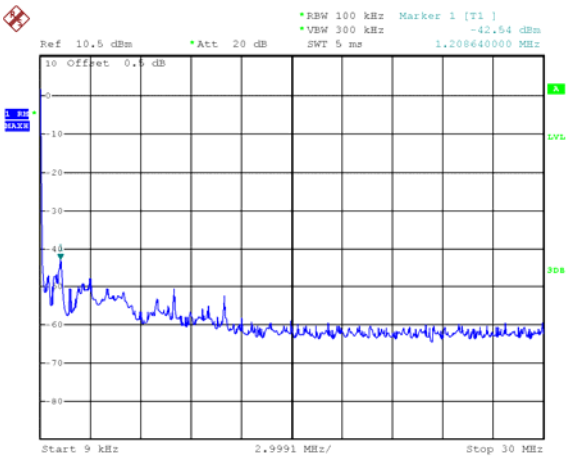
## 9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:
   a) Set instrument center frequency to DTS channel center frequency.
   b) Set the span to _ 1.5 times the DTS bandwidth.
   c) Set the RBW = 100 kHz.
   d) Set the VBW _ [3 × RBW].
   e) Detector = peak.
   f) Sweep time = auto couple.
   g) Trace mode = max hold.
   h) Allow trace to fully stabilize.
   i) Use the peak marker function to determine the maximum PSD level.
   Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

## 9.2 Test Result

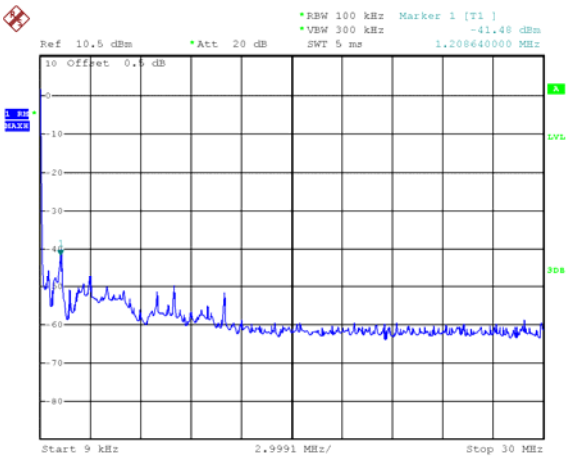
**9KHz – 30MHz**

Mode: TX 11b channel 1



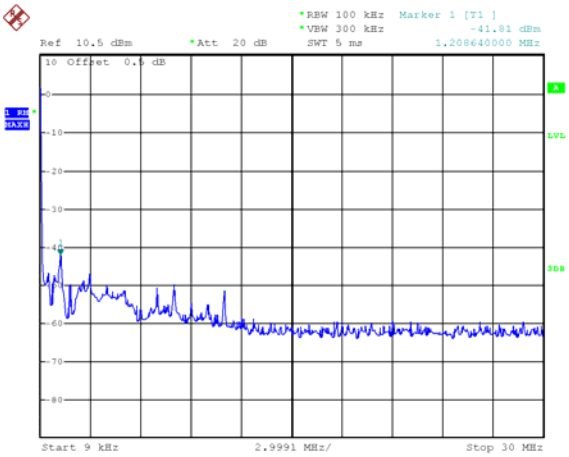

Date: 14.AUG.2023 10:16:57

Mode: TX 11b channel 6



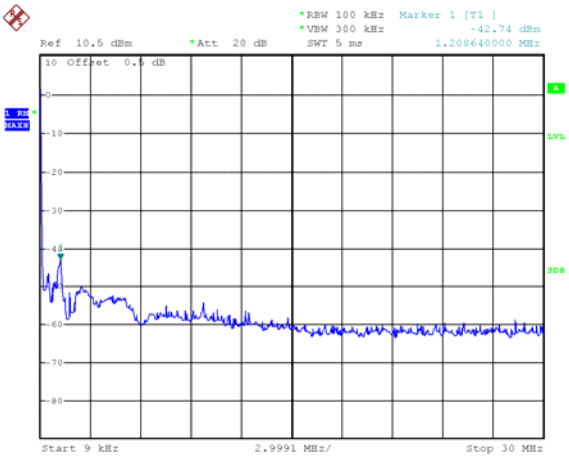

Date: 14.AUG.2023 10:13:05

Mode: TX 11b channel 11



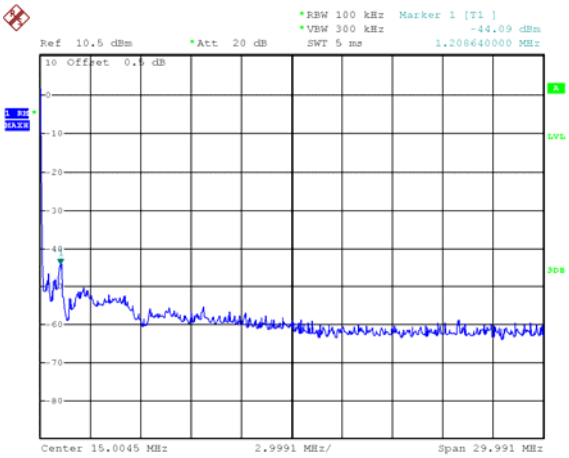

Date: 14.AUG.2023 10:14:47

Mode: TX 11g channel 1



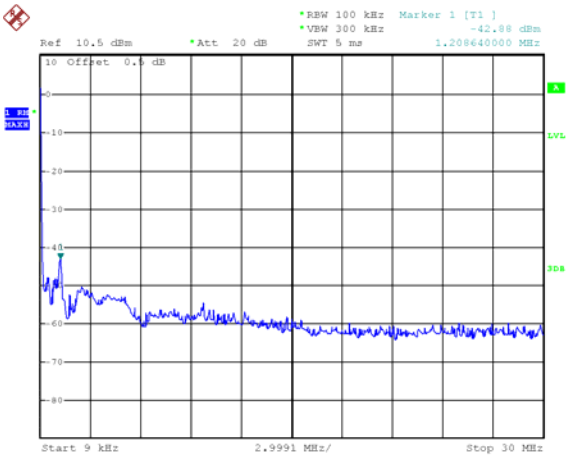

Date: 14.AUG.2023 10:03:39

Mode: TX 11g channel 6



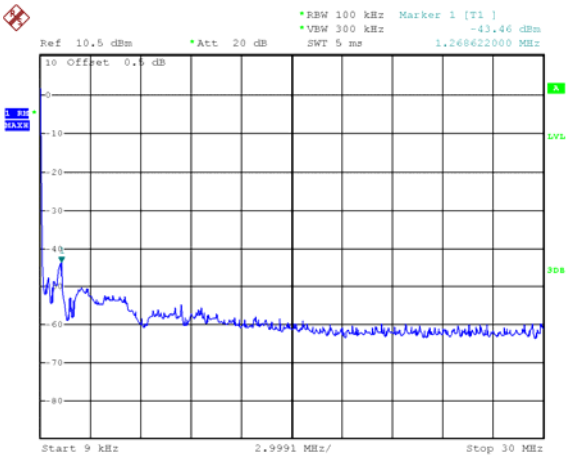

Date: 14.AUG.2023 10:09:58

Mode: TX 11g channel 11



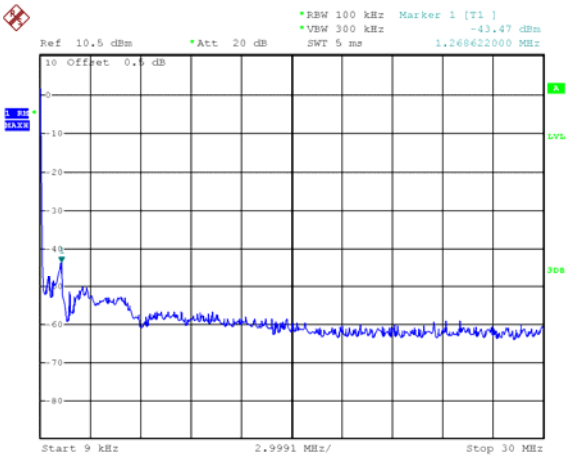

Date: 14.AUG.2023 10:11:27

Mode: TX 11n HT20 channel 1



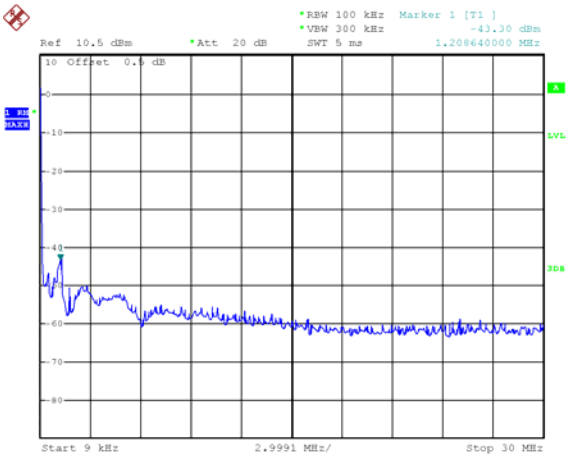

Date: 14.AUG.2023 09:59:33

Mode: TX 11 n HT20 channel 6



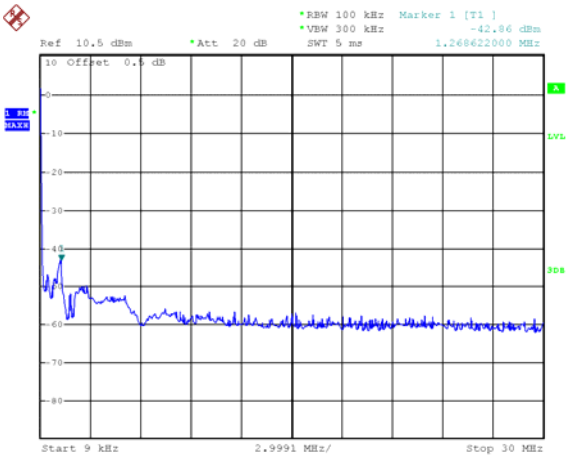

Date: 14.AUG.2023 10:00:39

Mode: TX 11 n HT20 channel 11



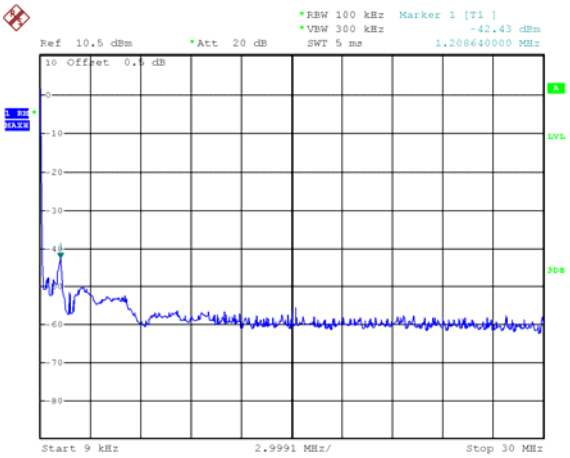

Date: 14.AUG.2023 10:02:21

Mode: TX 11n HT40 channel 3



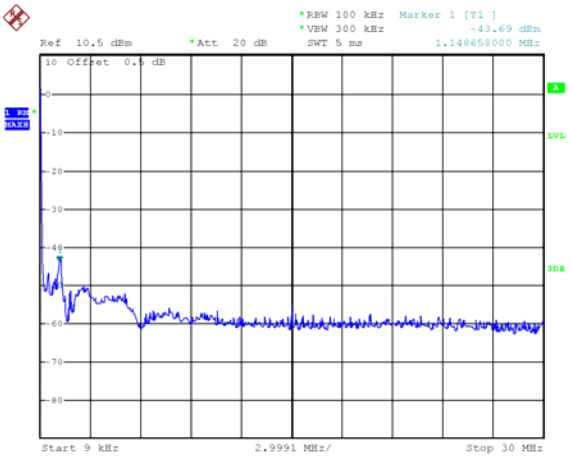

Date: 14.AUG.2023 09:52:13

Mode: TX 11 n HT40 channel 6




Date: 14.AUG.2023 09:52:56

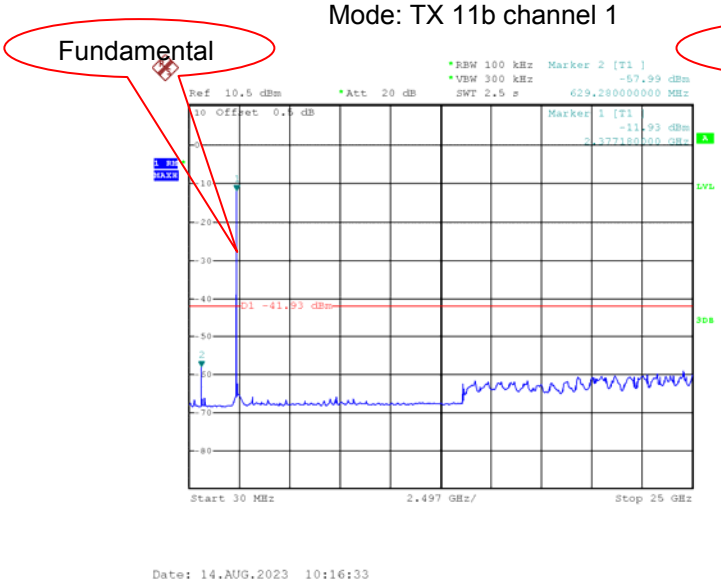
Mode: TX 11 n HT40 channel 9



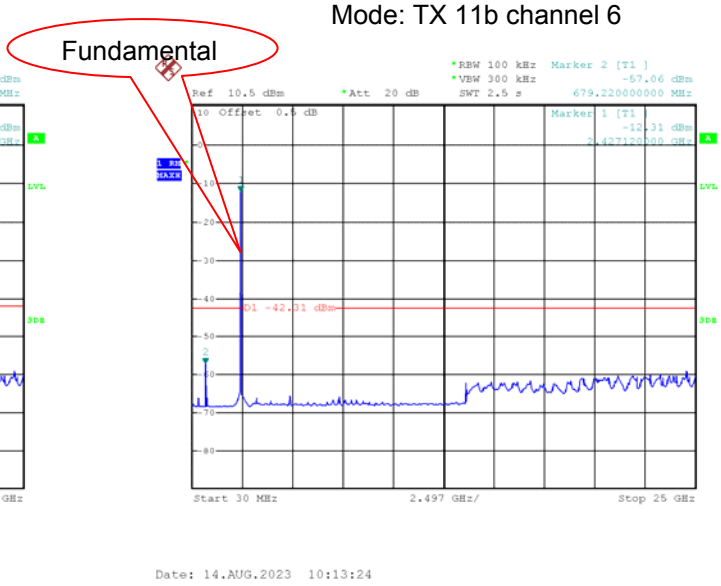

Date: 14.AUG.2023 09:54:50

**Above 30MHz**

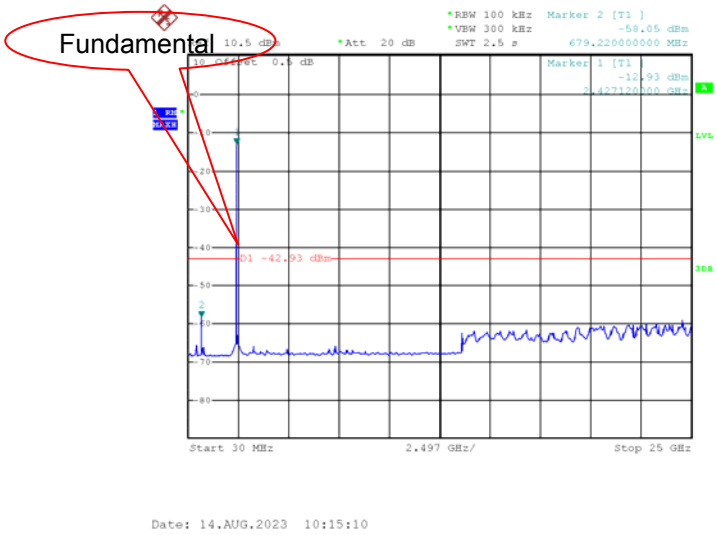
Mode: TX 11b channel 1



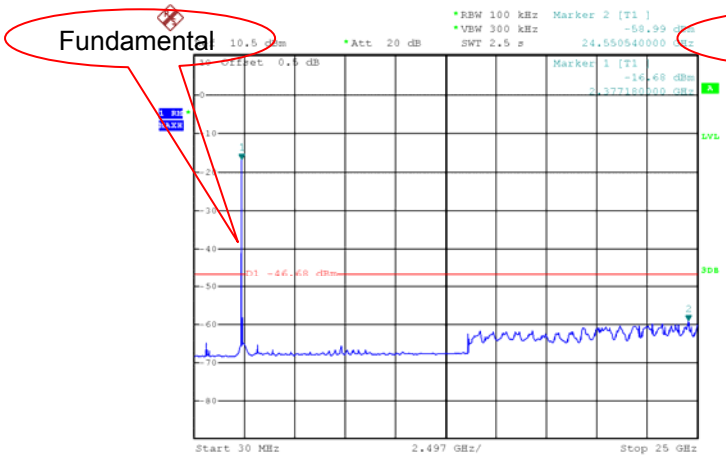

Mode: TX 11b channel 6




Mode: TX 11b channel 11

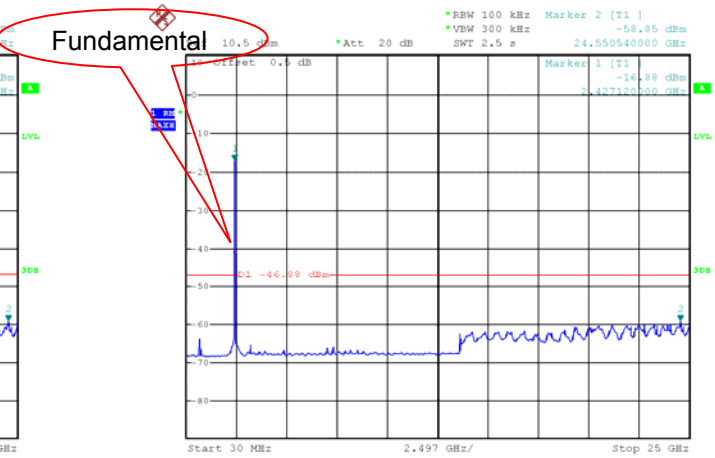


Mode: TX 11g channel 1



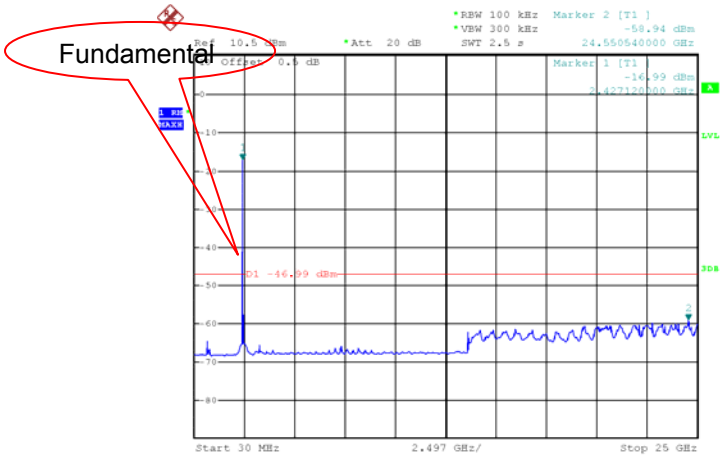

Date: 14.AUG.2023 10:04:22

Mode: TX 11g channel 6



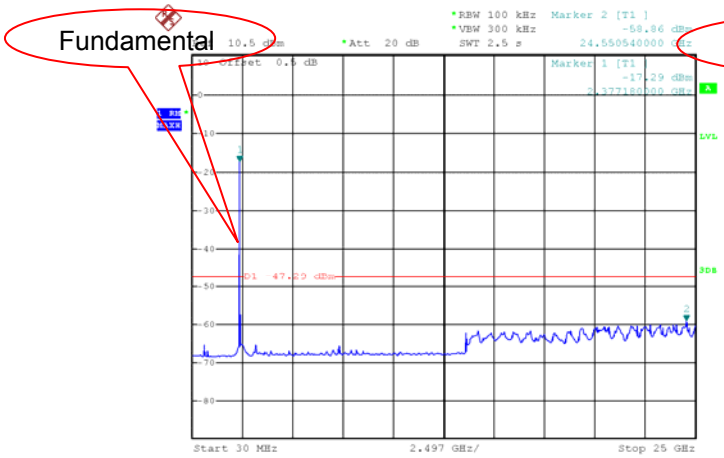

Date: 14.AUG.2023 10:10:58

Mode: TX 11g channel 11



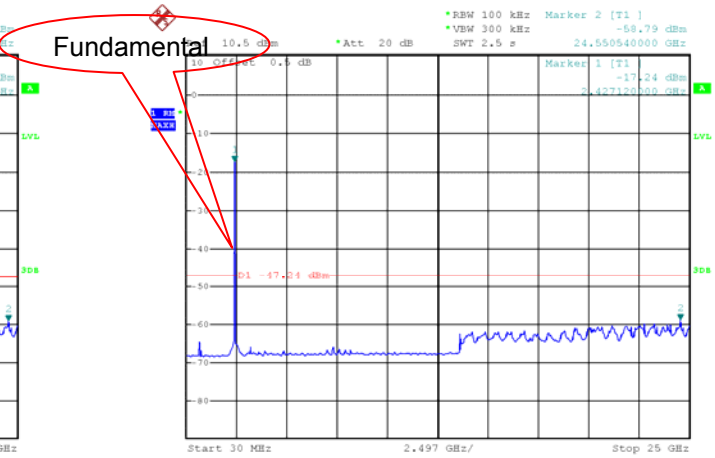

Date: 14.AUG.2023 10:12:21

Mode: TX 11n HT20 channel 1



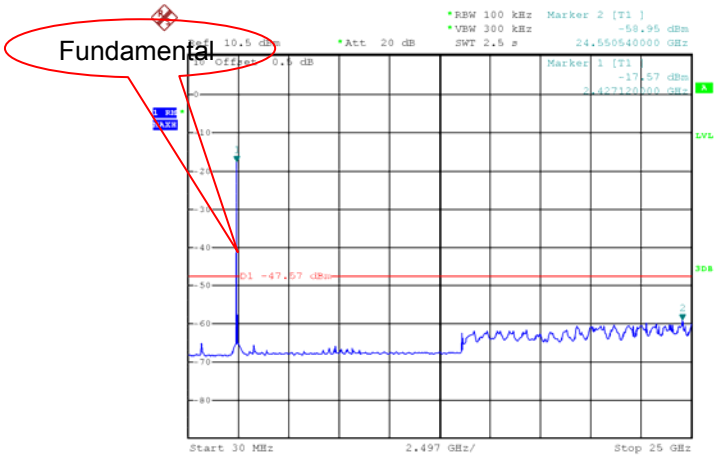

Date: 14.AUG.2023 10:00:16

Mode: TX 11 n HT20 channel 6



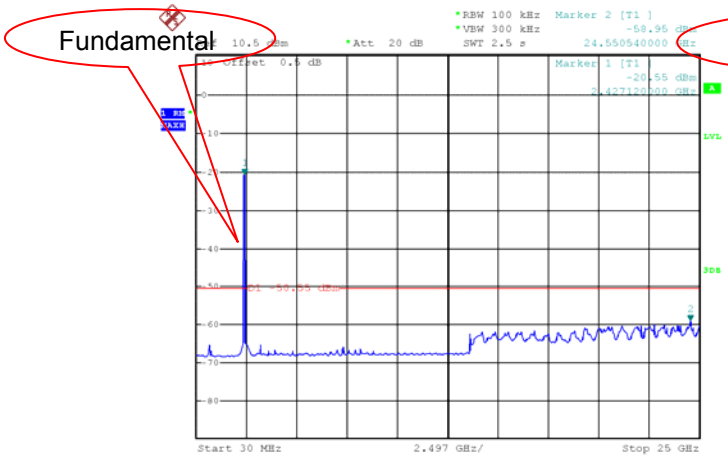

Date: 14.AUG.2023 10:01:23

Mode: TX 11 n HT20 channel 11




Date: 14.AUG.2023 10:03:00

Mode: TX 11n HT40 channel 3

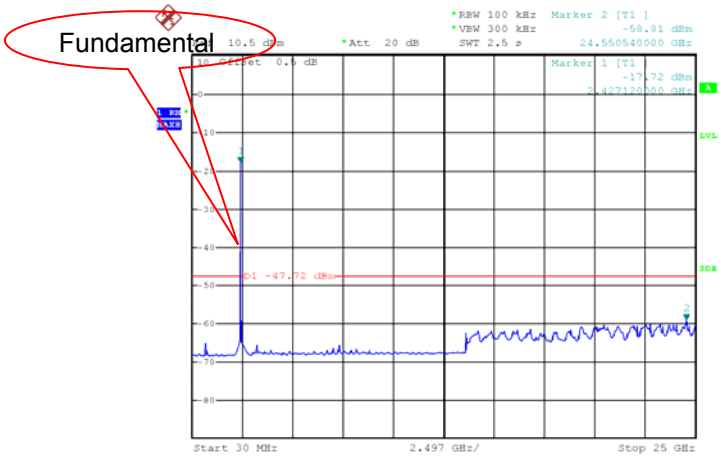



Date: 14.AUG.2023 09:51:20

Mode: TX 11 n HT40 channel 6

Date: 14.AUG.2023 09:54:11

Mode: TX 11 n HT40 channel 9




Date: 14.AUG.2023 09:55:26

# 10 Band Edge Measurement

| | |
|---|---|
| Test Requirement: | 47CFR FCC Part15 Subpart C §15.247 |
| Test Method: | KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019 |
| Test Limit: | Regulation 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). |
| Test Mode: | Transmitting |

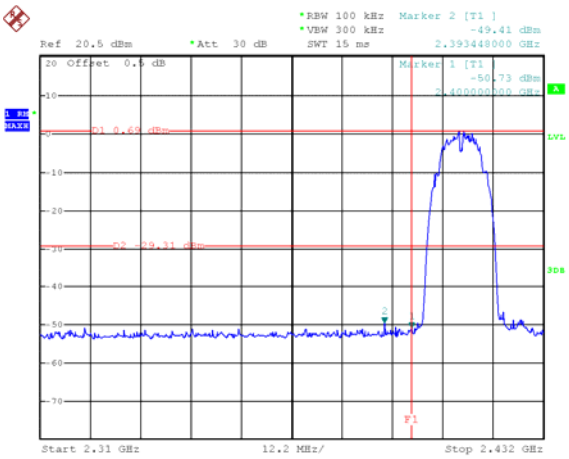
## 10.1 Test Produce

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 10.2 Test Result

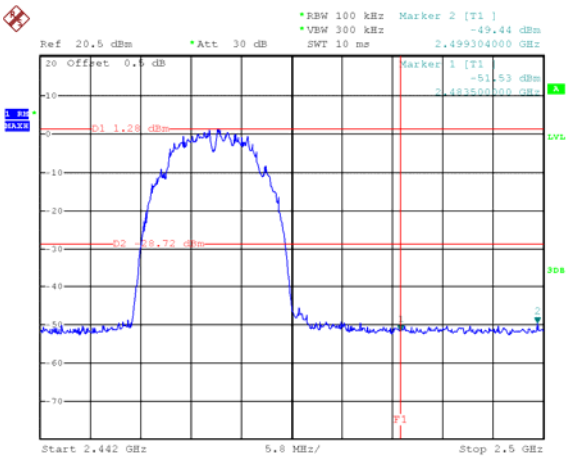
Test result plots shown as follows:

TX 11b: Band edge-left side



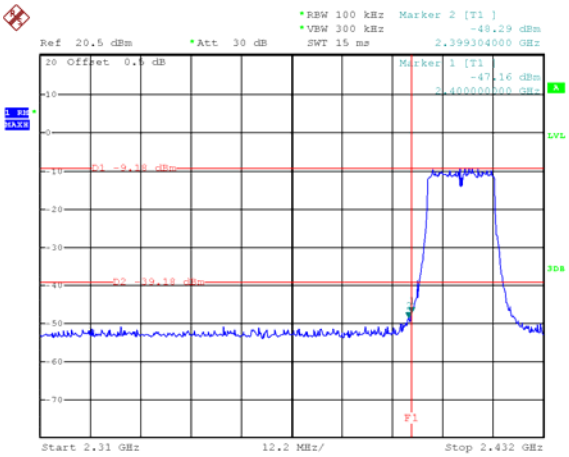

Date: 11.AUG.2023 18:13:56

TX 11b: Band edge-right side



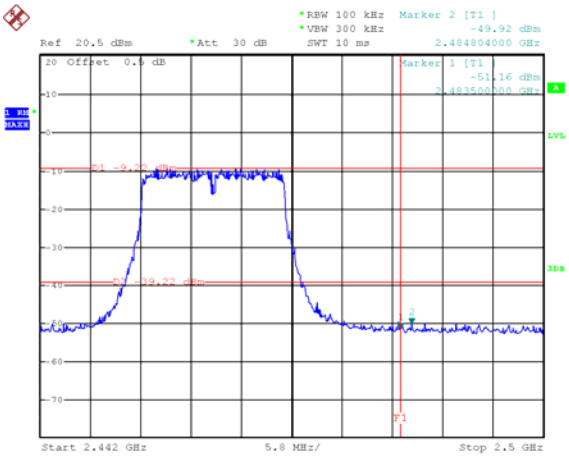

Date: 11.AUG.2023 18:15:31

TX 11g: Band edge-left side



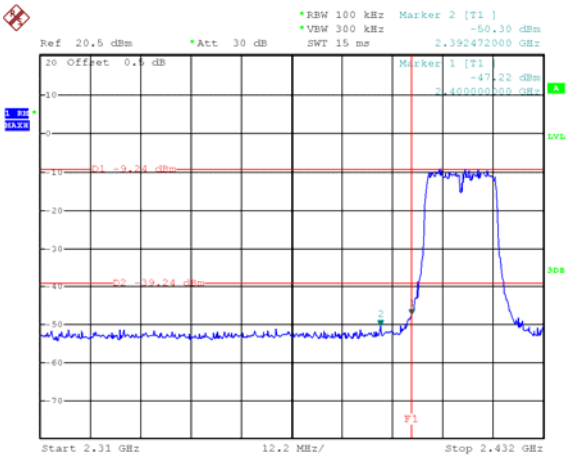

Date: 11.AUG.2023 18:18:00

TX 11g: Band edge-right side



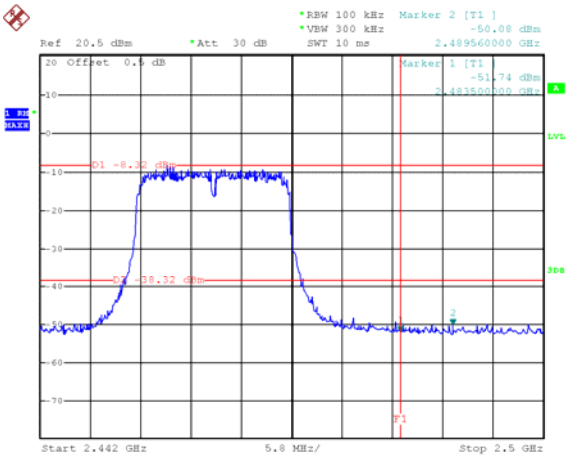

Date: 11.AUG.2023 18:16:48

TX 11n HT20: Band edge-left side



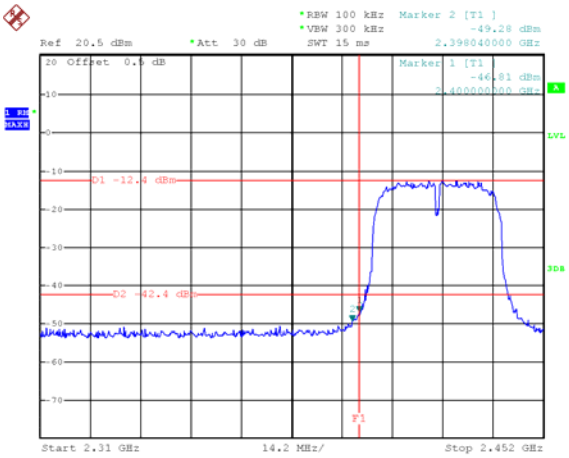

Date: 11.AUG.2023 18:18:58

TX 11n HT20: Band edge-right side



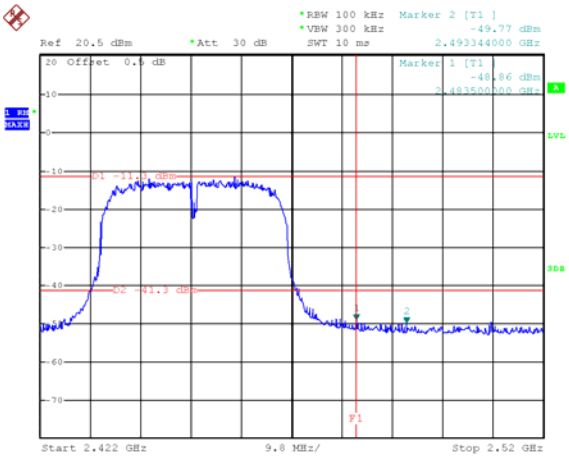

Date: 11.AUG.2023 18:20:27

TX 11n HT40: Band edge-left side




Date: 11.AUG.2023 18:21:53

TX 11n HT40: Band edge-right side




Date: 11.AUG.2023 18:22:53

# 11 6 dB Bandwidth and 99% Bandwidth Measurement

Test Requirement: 47CFR FCC Part15 Subpart C §15.247

Test Method: ANSI C63.10:2013
KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

Test Limit: §15.247(a)(2)
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Mode: Transmitting

## 11.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. 6dB Bandwidth Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

99% Bandwidth Set the spectrum analyzer: 1~5% of the OBW, VBW = 3 times the RBW

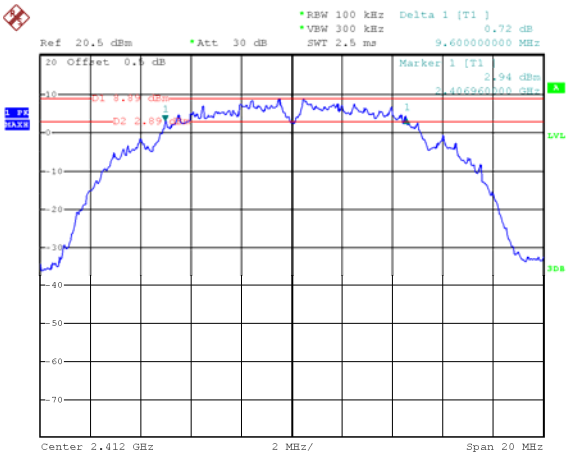
## 11.2 Test Result:

| Operation mode | Test Channel | 6dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|
| TX 11b | Channel 1 | 9.600 | 13.320 |
| | Channel 6 | 9.880 | 13.280 |
| | Channel 11 | 9.600 | 13.280 |
| TX 11g | Channel 1 | 16.500 | 16.550 |
| | Channel 6 | 16.500 | 16.550 |
| | Channel 11 | 16.500 | 16.550 |
| TX 11n HT20 | Channel 1 | 17.334 | 17.388 |
| | Channel 6 | 17.334 | 17.388 |
| | Channel 11 | 17.118 | 17.334 |
| TX 11n HT40 | Channel 3 | 33.440 | 34.980 |
| | Channel 6 | 33.440 | 34.980 |
| | Channel 9 | 33.440 | 34.980 |

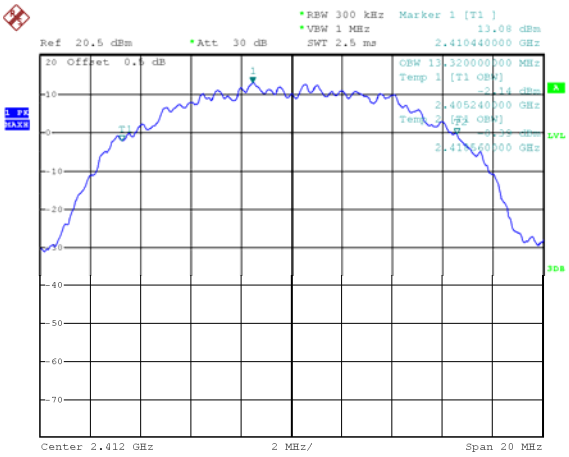
**Test result plot:**

6 dB Bandwidth 99% Bandwidth

Mode: TX 11b channel 1

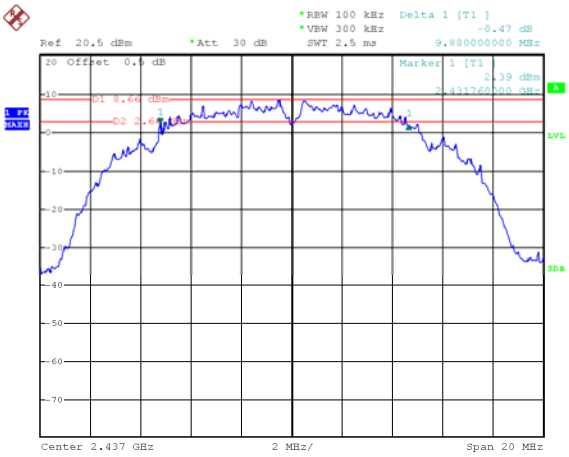



Date: 11.AUG.2023 17:06:07

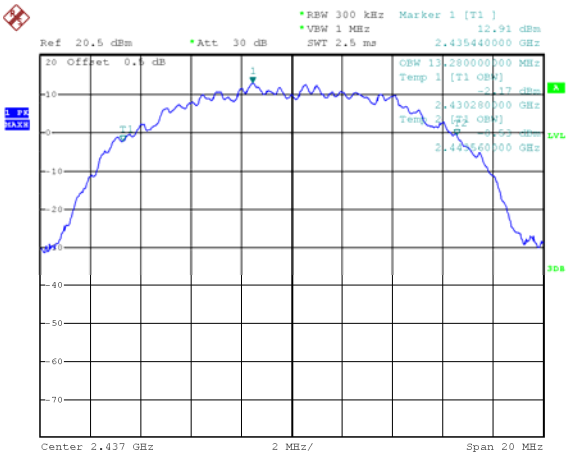



Date: 11.AUG.2023 16:54:03

Mode: TX 11b channel 6




Date: 11.AUG.2023 17:09:07

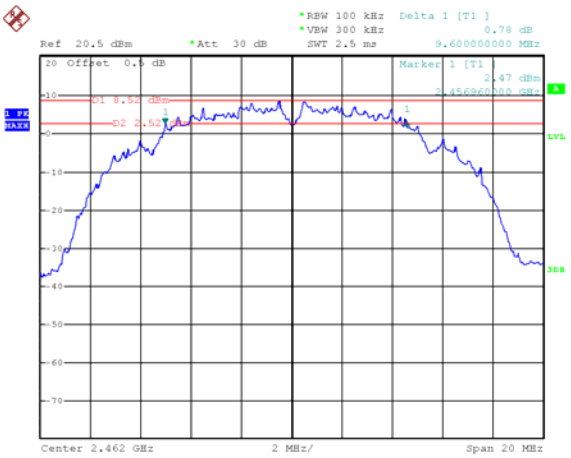



Date: 11.AUG.2023 16:54:43

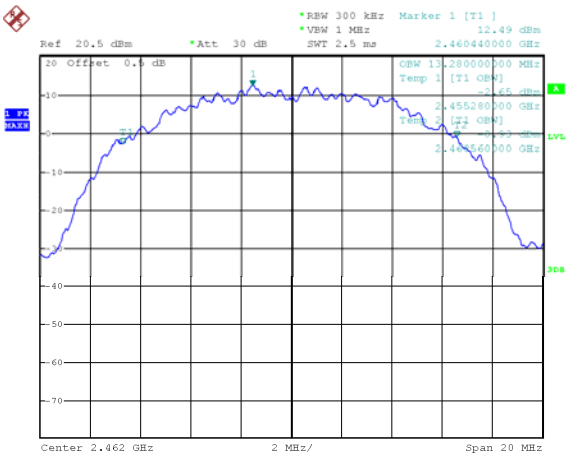
6 dB Bandwidth

99% Bandwidth

Mode: TX 11b channel 11

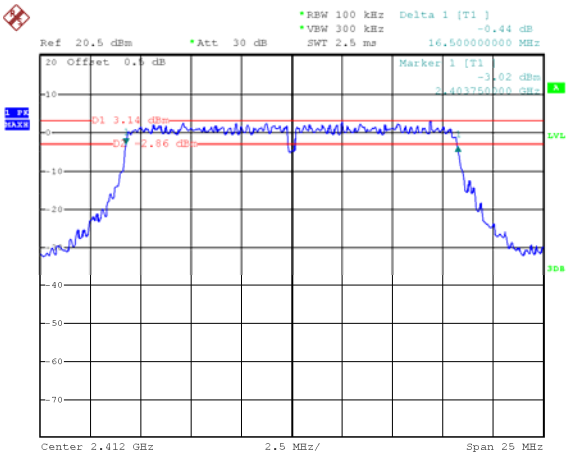



Date: 11.AUG.2023 17:11:13

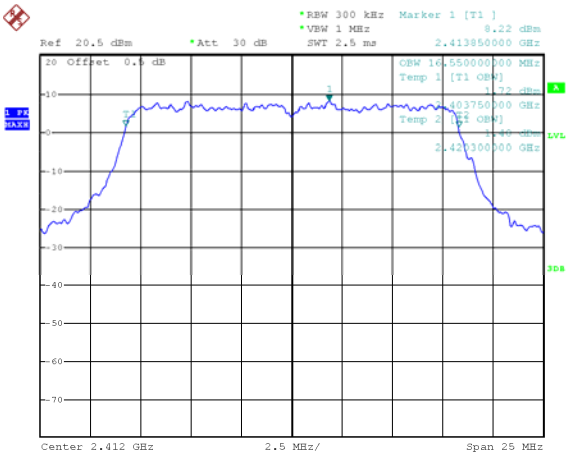



Date: 11.AUG.2023 16:55:14

Mode: TX 11g channel 1




Date: 11.AUG.2023 17:13:15

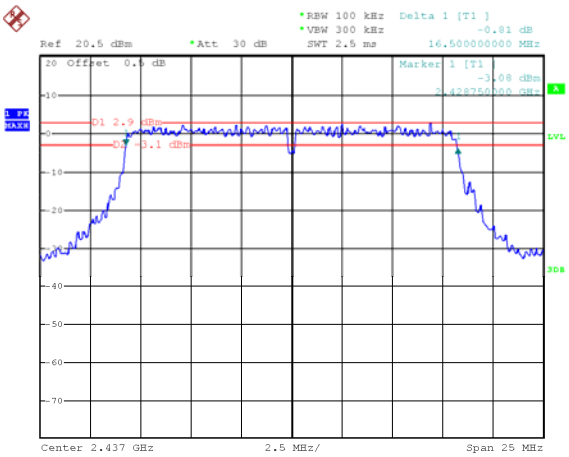



Date: 11.AUG.2023 16:57:12

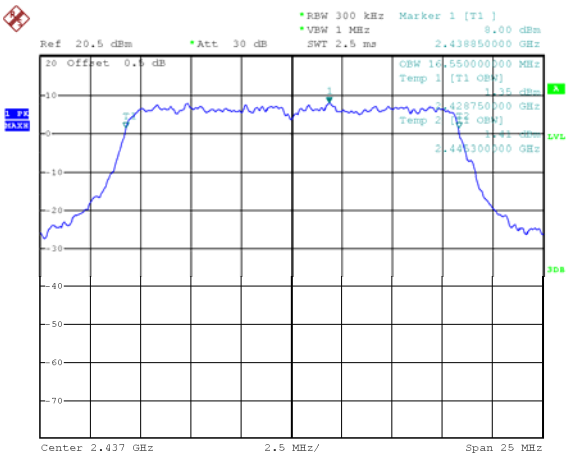
6 dB Bandwidth

99% Bandwidth

Mode: TX 11g channel 6

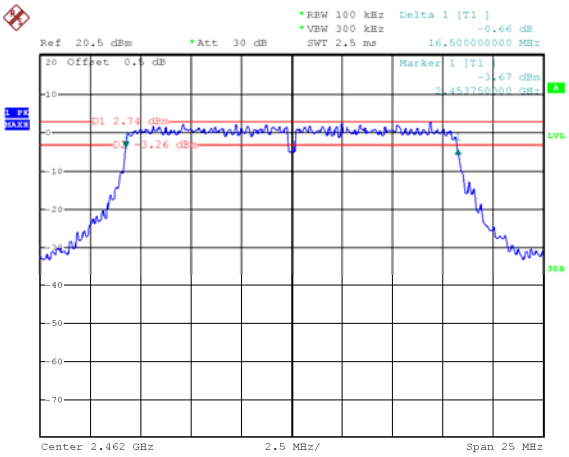



Date: 11.AUG.2023 17:15:25

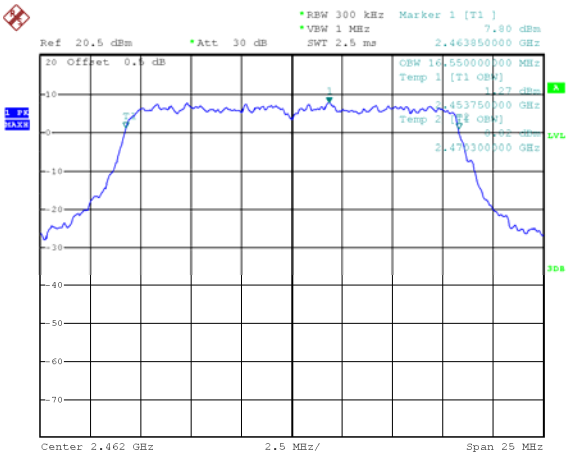



Date: 11.AUG.2023 16:57:55

Mode: TX 11g channel 11




Date: 11.AUG.2023 17:17:06

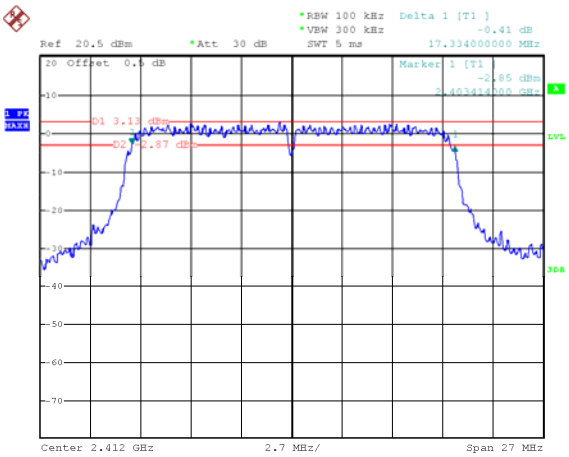



Date: 11.AUG.2023 16:58:50

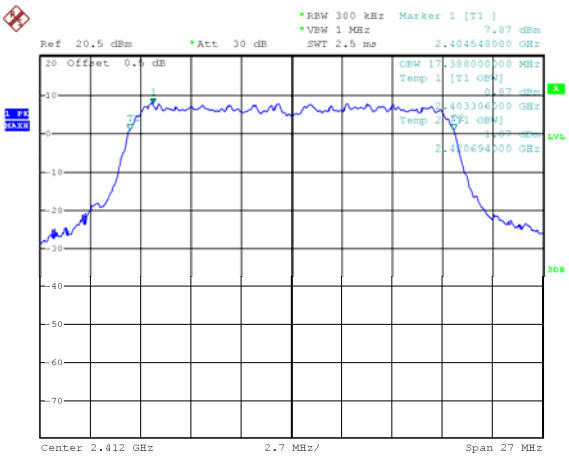
6 dB Bandwidth

99% Bandwidth

Mode: TX 11n HT20 channel 1

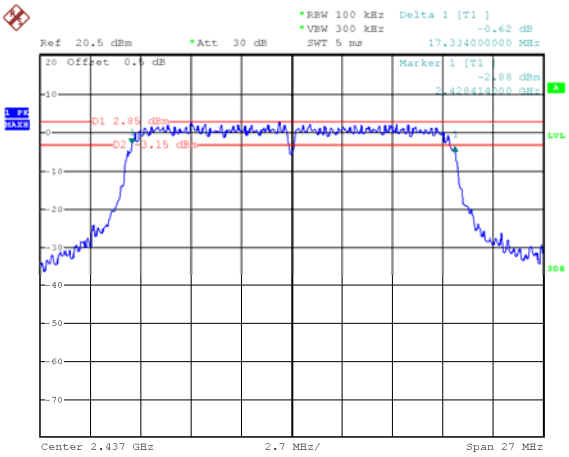



Date: 11.AUG.2023 17:20:04

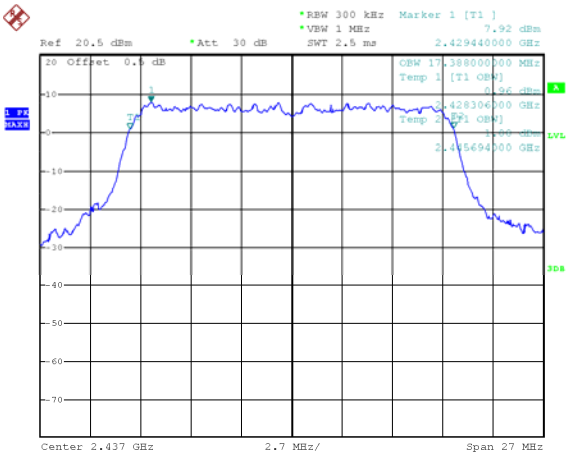



Date: 11.AUG.2023 16:59:53

Mode: TX 11n HT20 channel 6




Date: 11.AUG.2023 17:21:16

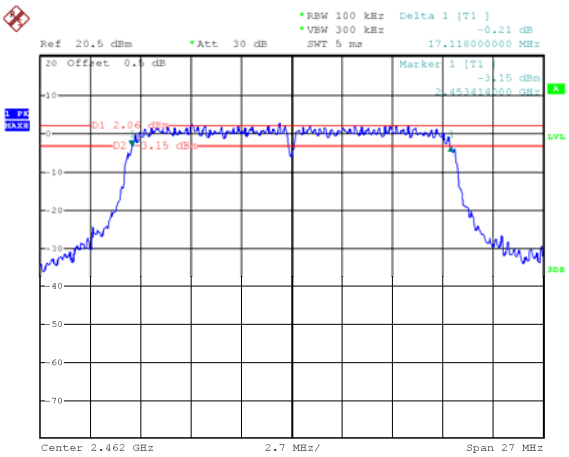



Date: 11.AUG.2023 17:00:42

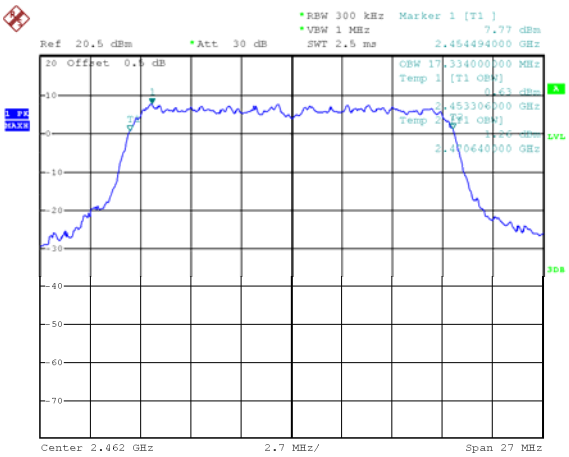
6 dB Bandwidth

99% Bandwidth

Mode: TX 11n HT20 channel 11

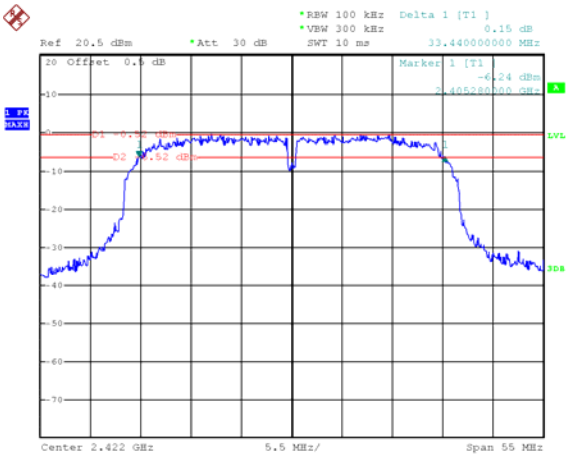



Date: 11.AUG.2023 17:23:21

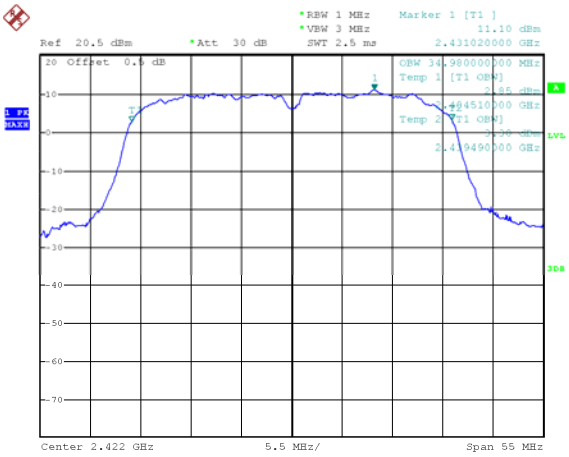



Date: 11.AUG.2023 17:01:14

Mode: TX 11n HT40 channel 3




Date: 11.AUG.2023 17:29:53

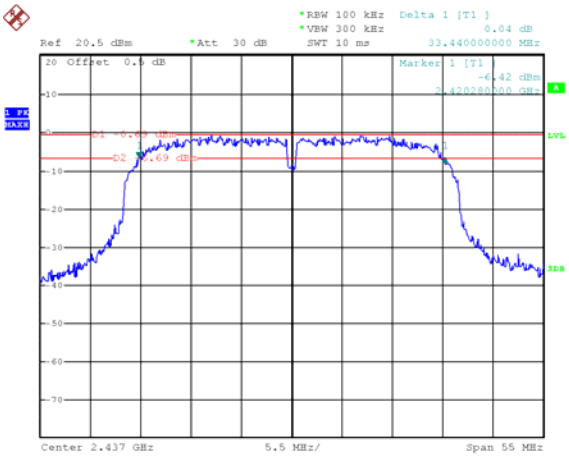



Date: 11.AUG.2023 17:02:18

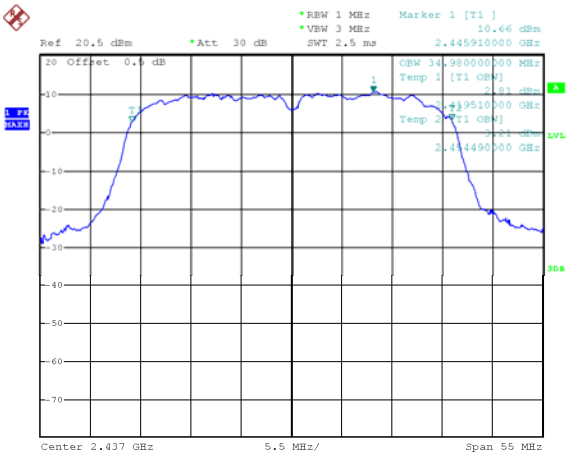
6 dB Bandwidth

99% Bandwidth

Mode: TX 11n HT40 channel 6

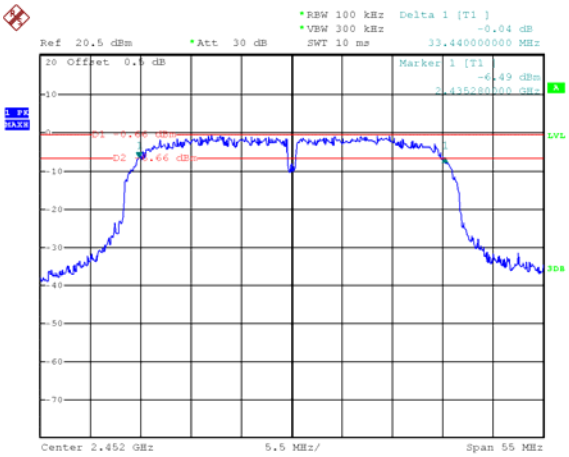



Date: 11.AUG.2023 17:31:33

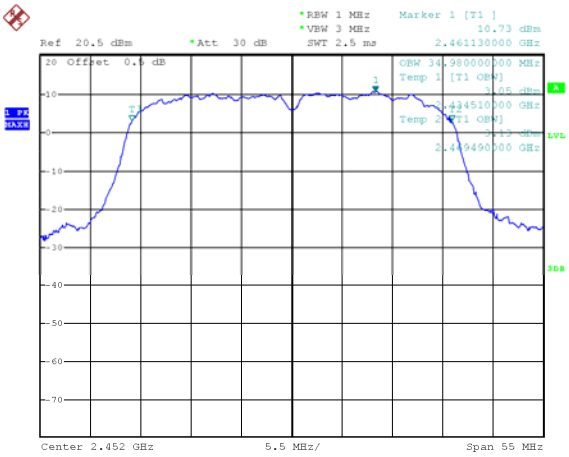



Date: 11.AUG.2023 17:02:52

Mode: TX 11n HT40 channel 9




Date: 11.AUG.2023 17:32:34




Date: 11.AUG.2023 17:03:31

# 12 Maximum Peak conducted Output Power

| | |
|---|---|
| Test Requirement: | 47CFR FCC Part15 Subpart C §15.247 |
| Test Method: | ANSI C63.10:2013<br>KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019 |
| Test Limit: | §15.247(b)<br>The maximum peak conducted output power of the intentional radiator shall not exceed 1W. |
| Test Mode: | Transmitting |

## 12.1 Test Procedure:

According to KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019

**Section 8.3.1.1 RBW ≥ DTS bandwidth**

Subclause 11.9.1.1 of ANSI C63.10 is applicable.

**Section 8.3.1.2 Integrated band power method**

For measuring the output power of a device transmitting a wide-band noise-like signal where the peak power amplitude is a statistical parameter, the preferred methodology is to use an integrated average power measurement, as described in 8.3.2. The peak integrated band power method of 11.9.1 in ANSI C63.10 is not applicable.

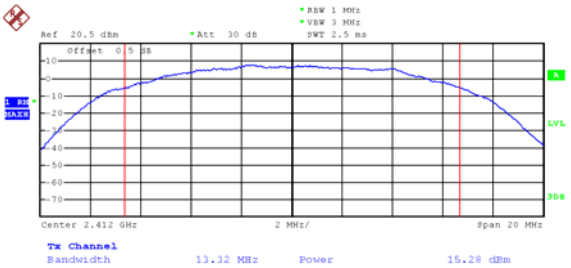
Subclause 11.9.2 of ANSI C63.10 is applicable.

## 12.2 Test Result:

| Operation mode | Channel Frequency (MHz) | Measurements (dBm) | Duty Cycle Factor (dB) | Conducted Output Power (dBm) | Limit |
|---|---|---|---|---|---|
| TX 11b | Low-2412 | 15.28 | 0 | 15.28 | 1W/30dBm |
| | Middle-2437 | 15.27 | | 15.27 | 1W/30dBm |
| | High-2462 | 15.13 | | 15.13 | 1W/30dBm |
| TX 11g | Low-2412 | 9.33 | 0 | 9.33 | 1W/30dBm |
| | Middle-2437 | 9.03 | | 9.03 | 1W/30dBm |
| | High-2462 | 8.91 | | 8.91 | 1W/30dBm |
| TX 11n HT20 | Low-2412 | 9.43 | 0 | 9.43 | 1W/30dBm |
| | Middle-2437 | 9.17 | | 9.17 | 1W/30dBm |
| | High-2462 | 9.02 | | 9.02 | 1W/30dBm |
| TX 11n HT40 | Low-2422 | 8.85 | 0 | 8.85 | 1W/30dBm |
| | Middle-2437 | 8.54 | | 8.54 | 1W/30dBm |
| | High-2452 | 8.45 | | 8.45 | 1W/30dBm |

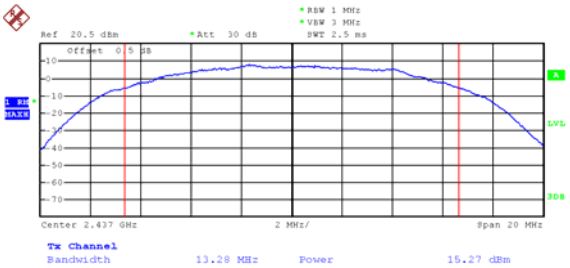
**Test Plot:**

Mode: TX 11b channel 1



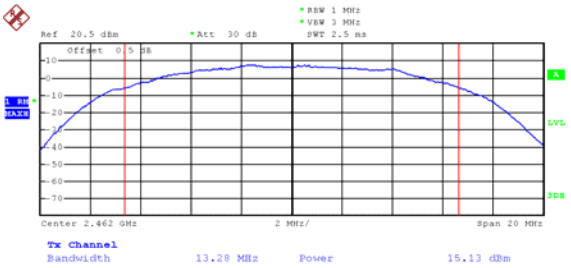

Date: 11.AUG.2023 17:42:29

Mode: TX 11b channel 6



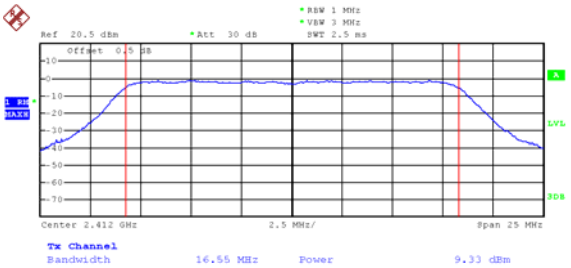

Date: 11.AUG.2023 17:43:36

Mode: TX 11b channel 11



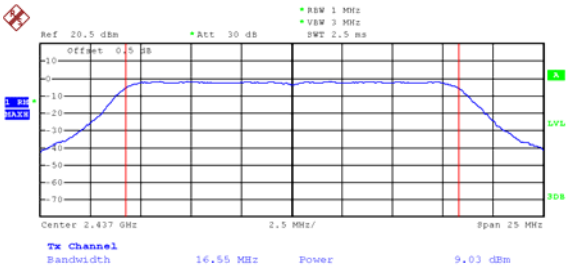

Date: 11.AUG.2023 17:44:32

Mode: TX 11g channel 1



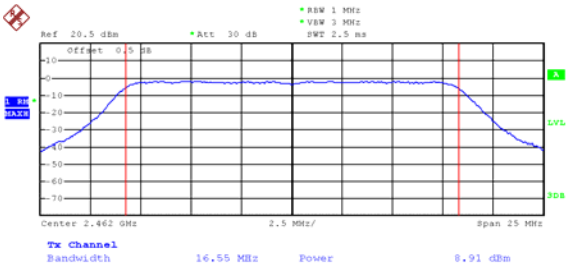

Date: 11.AUG.2023 17:48:36

Mode: TX 11g channel 6



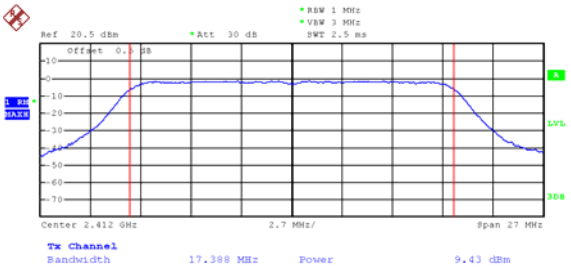

Date: 11.AUG.2023 17:50:33

Mode: TX 11g channel 11



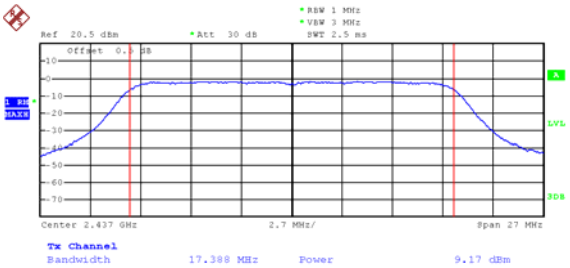

Date: 11.AUG.2023 17:51:22

Mode: TX 11n HT20 channel 1



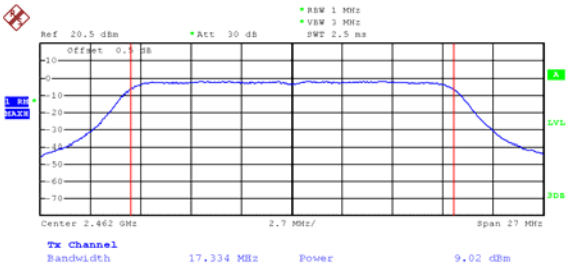

Date: 11.AUG.2023 17:52:35

Mode: TX 11n HT20 channel 6



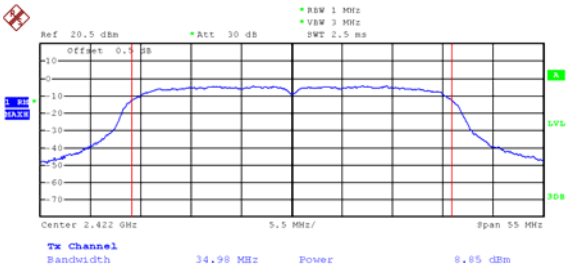

Date: 11.AUG.2023 17:53:51

Mode: TX 11n HT20 channel 11



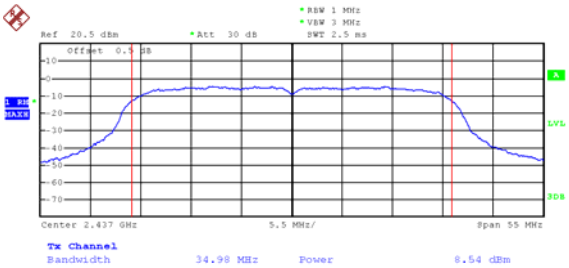

Date: 11.AUG.2023 17:54:42

Mode: TX 11n HT40 channel 3



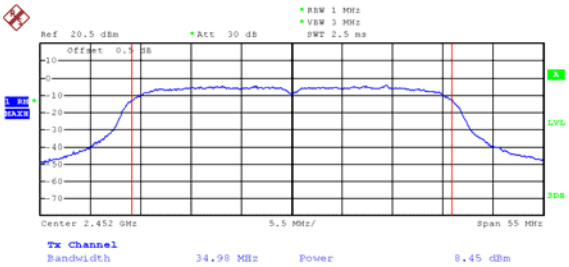

Date: 11.AUG.2023 17:55:37

Mode: TX 11n HT40 channel 6




Date: 11.AUG.2023 17:56:36

Mode: TX 11n HT40 channel 9




Date: 11.AUG.2023 17:57:11

# 13 Power Spectral density

| | |
|---|---|
| Test Requirement: | 47CFR FCC Part15 Subpart C §15.247 |
| Test Method: | ANSI C63.10:2013<br>KDB 558074 D01 15.247 Meas Guidance v05r02, April 2, 2019 |
| Test Limit: | §15.247(e)<br>For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. |
| Test Mode: | Transmitting |

## 13.1 Test Procedure:

According to KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019 section 8.4

**Subclause 11.10 of ANSI C63.10 is applicable.**

Choose the test procedure according to the product type

**Peak PSD**

Subclause 11.10.2 of ANSI C63.10 is applicable.

**AVG PSD**

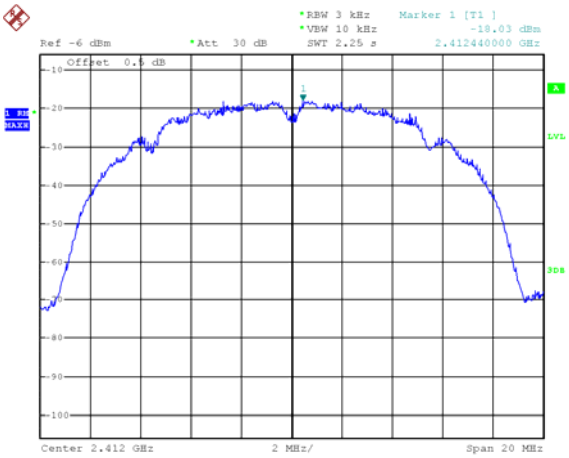
Subclause 11.10.3/4/5/6/7/8 of ANSI C63.10 is applicable.

## 13.2 Test Result:

| Operation mode | Channel Frequency (MHz) | Measurements (dBm per 3kHz) | Duty Cycle Factor (dB) | Power Spectral density (dBm per 3kHz) | Limit |
|---|---|---|---|---|---|
| TX 11b | Low-2412 | -18.03 | 0 | -18.03 | 8dBm per 3kHz |
| | Middle-2437 | -17.80 | | -17.80 | 8dBm per 3kHz |
| | High-2462 | -17.89 | | -17.89 | 8dBm per 3kHz |
| TX 11g | Low-2412 | -26.48 | 0 | -26.48 | 8dBm per 3kHz |
| | Middle-2437 | -26.91 | | -26.91 | 8dBm per 3kHz |
| | High-2462 | -26.95 | | -26.95 | 8dBm per 3kHz |
| TX 11n HT20 | Low-2412 | -26.20 | 0 | -26.20 | 8dBm per 3kHz |
| | Middle-2437 | -26.59 | | -26.59 | 8dBm per 3kHz |
| | High-2462 | -26.82 | | -26.82 | 8dBm per 3kHz |
| TX 11n HT40 | Low-2422 | -30.27 | 0 | -30.27 | 8dBm per 3kHz |
| | Middle-2437 | -30.90 | | -30.90 | 8dBm per 3kHz |
| | High-2452 | -30.78 | | -30.78 | 8dBm per 3kHz |

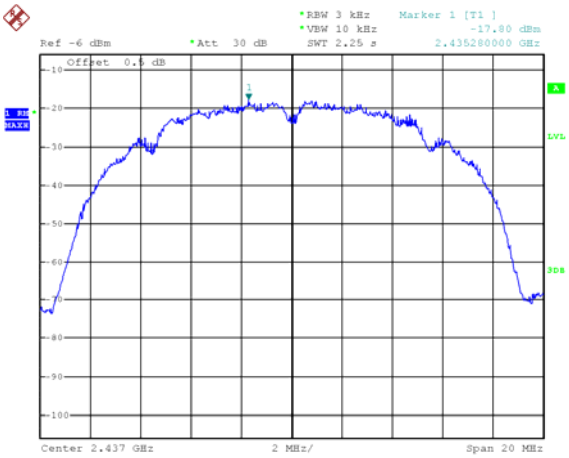
**Test Plot:**

Mode: TX 11b channel 1



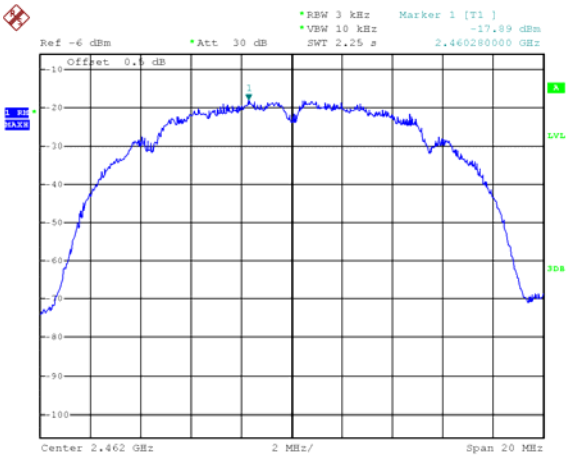

Date: 11.AUG.2023 17:58:48

Mode: TX 11b channel 6



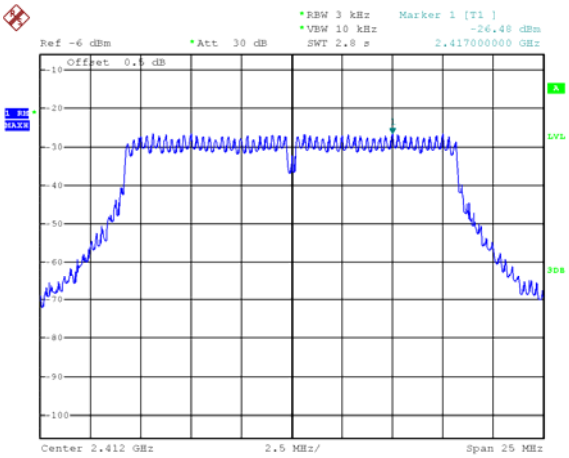

Date: 11.AUG.2023 17:59:17

Mode: TX 11b channel 11



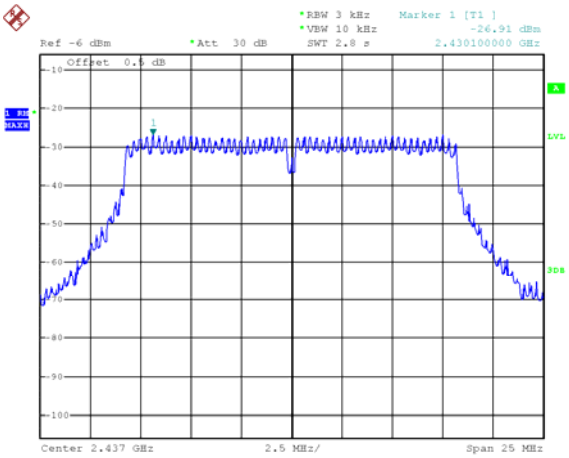

Date: 11.AUG.2023 18:04:21

Mode: TX 11g channel 1



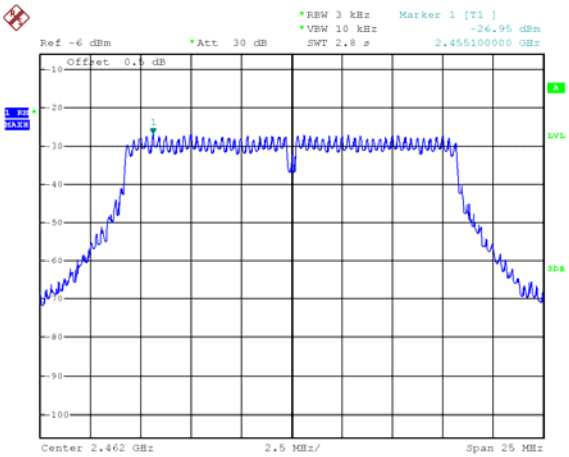

Date: 11.AUG.2023 18:05:18

Mode: TX 11g channel 6



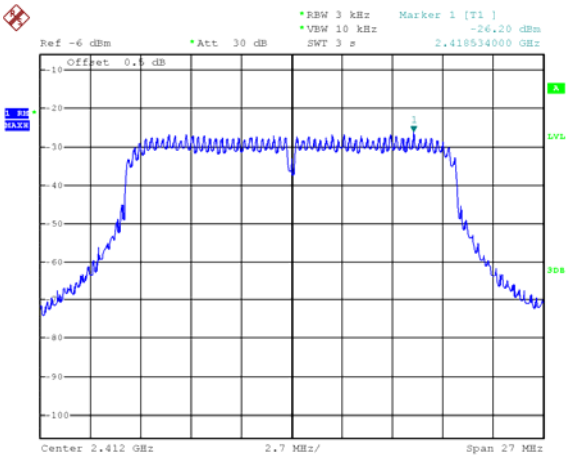

Date: 11.AUG.2023 18:05:46

Mode: TX 11g channel 11



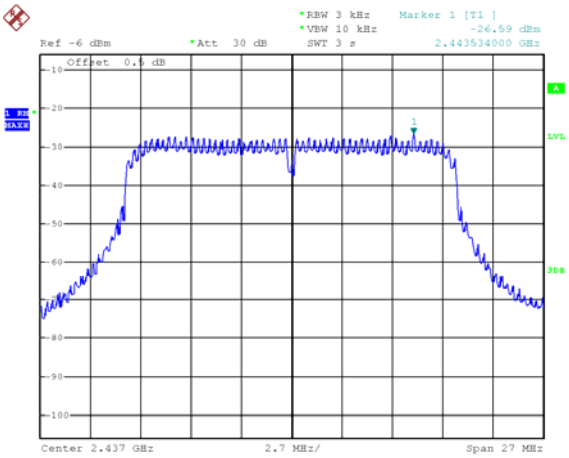

Date: 11.AUG.2023 18:06:24

Mode: TX 11n HT20 channel 1



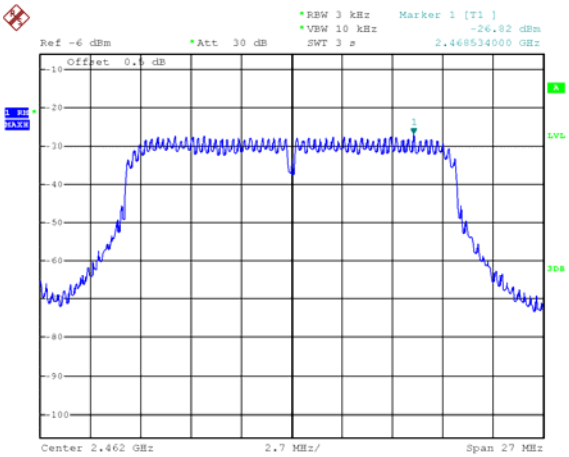

Date: 11.AUG.2023 18:07:08

Mode: TX 11n HT20 channel 6



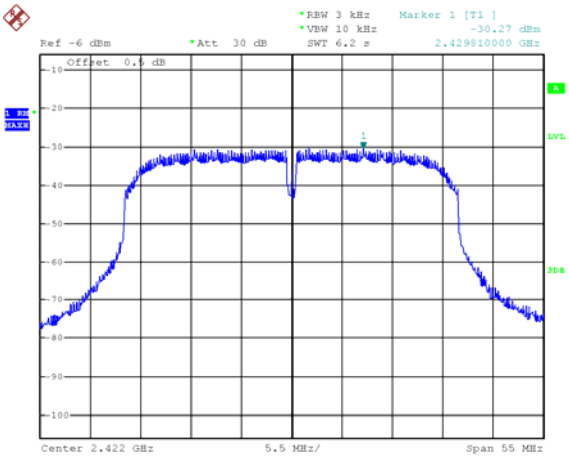

Date: 11.AUG.2023 18:07:45

Mode: TX 11n HT20 channel 11



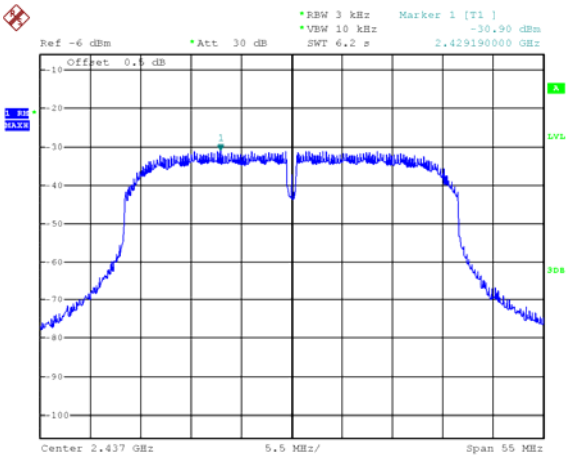

Date: 11.AUG.2023 18:08:23

Mode: TX 11n HT40 channel 3



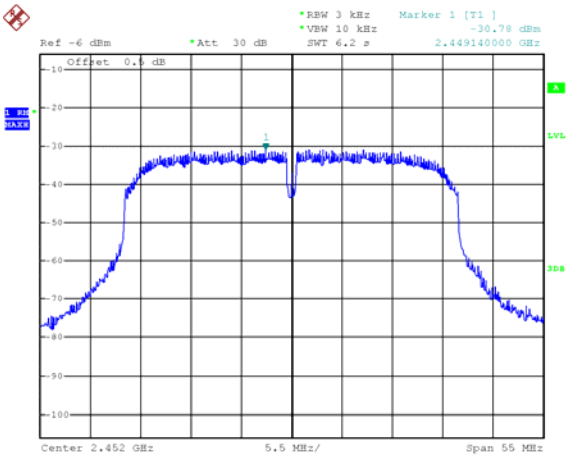

Date: 11.AUG.2023 18:09:49

Mode: TX 11n HT40 channel 6




Date: 11.AUG.2023 18:10:28

Mode: TX 11n HT40 channel 9




Date: 11.AUG.2023 18:10:54

# 14 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. This product has a Dipole antenna with IPEX connector fulfil the requirement of this section.

Note: Please refer to EUT photos for more details.

# 15 RF Exposure

Note: Please refer to RF Exposure Report: WTD23D05116716W003.

# 16 Photographs of test setup and EUT.

Note: Please refer to appendix: Appendix-2AVCN-NWPXXX -Photos.

======End of Report======