



TEST Report

Applicant: Grand New Material (Shenzhen) Co.,Ltd

Address of Applicant: Room 725,Block B, Chengshishanhai Center, 11st Zhongxing Road,Bantian Street, Longgang District, Shenzhen.

Manufacturer : Grand New Material (Shenzhen) Co.,Ltd

Address of Manufacturer : Room 725,Block B, Chengshishanhai Center, 11st Zhongxing Road,Bantian Street, Longgang District, Shenzhen.

Equipment Under Test (EUT)

Product Name: wireless carplay adapter

Model No.: CP-101

Series model: CP-102, CP-200, CP-201, CP-202, CP-300, CP-301, CP-302, CPAA300, CPAA301, CPAA302, CPAA303, AI10, AI20, AI30, AI40, AI60, PAD1, PAD2, PAD3, PAD4

Trade Mark: N/A

FCC ID: 2A7AU-CP-101

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: May.12,2022

Date of Test: May.12,2022~June.04,2022

Date of report issued: June.04,2022

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.



1. Version

| Version No. | Date | Description |
|-------------|--------------|-------------|
| 00 | June.04,2022 | Original |
| | | |
| | | |
| | | |
| | | |

Tested/ Prepared By Ervin Xu **Date:** June.04,2022
Project Engineer

Check By: Bruce Zhu **Date:** June.04,2022
Reviewer

Approved By : Kevin Yang **Date:** June.04,2022
Authorized Signature



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3. Test Summary

| Test Item | Section in CFR 47 | Result |
|----------------------------------|----------------------------------|--------|
| Antenna requirement | 15.203 | PASS |
| AC Power Line Conducted Emission | 15.207 | PASS |
| 26dB Bandwidth | FCC §15.407(a) | PASS |
| Maximum Conducted Output Power | 15.407(a) | PASS |
| Power Spectral Density | 15.407(a) | PASS |
| Undesirable Emission | FCC Part 15.407(b) | PASS |
| Radiated Emission | FCC Part 15.407(b)/15.205/15.209 | PASS |
| Frequency Stability | 15.407(g) | PASS |

Remark: Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

| Test Item | Frequency Range | Measurement Uncertainty | Notes |
|-----------------------|-----------------|-------------------------|-------|
| Radiated Emission | 30~1000MHz | 3.45 dB | (1) |
| Radiated Emission | 1~6GHz | 3.54 dB | (1) |
| Radiated Emission | 6~40GHz | 5.38 dB | (1) |
| Conducted Disturbance | 0.15~30MHz | 2.66 dB | (1) |

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.



4. General Information

4.1. General Description of EUT

| | | | | |
|--|--|--------------|----------------------|--------------------|
| Product Name: | wireless carplay adapter | | | |
| Model No.: | CP-101 | | | |
| Series model: | CP-102, CP-200, CP-201, CP-202, CP-300, CP-301, CP-302, CPAA300, CPAA301, CPAA302, CPAA303, AI10, AI20, AI30, AI40, AI60, PAD1, PAD2, PAD3, PAD4 | | | |
| Test sample(s) ID: | HTT202205254-1(Engineer sample) HTT202205254-2(Normal sample) | | | |
| Operation Frequency: | Band | Mode | Frequency Range(MHz) | Number of channels |
| | U-NII Band I | IEEE 802.11a | 5180-5240 | 4 |
| Modulation technology: | OFDM | | | |
| Antenna Type: | PCB Antenna | | | |
| Antenna gain: | 0 dBi | | | |
| Power Supply: | DC 5V From External Circuit | | | |
| Adapter Information (Auxiliary test provided by the lab): | Mode: CD122 Input: AC100-240V, 50/60Hz, 500mA Output: DC 5V, 2A | | | |



| Channel list for 802.11a | | | | | | | |
|--------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 36 | 5180MHz | 40 | 5200MHz | 44 | 5220MHz | 48 | 5240MHz |

4.2. Test mode

| | |
|--|--|
| Transmitting mode | Keep the EUT in continuously transmitting mode |
| <p><i>Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i></p> | |

| | |
|---|------------|
| <p>We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:</p> | |
| <p>Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.</p> | |
| Mode | Data rate |
| 802.11a/n(HT20) | 6/6.5 Mbps |
| 802.11n(HT40) | 13.5 Mbps |

4.3. Description of Support Units

| |
|-------|
| None. |
|-------|

4.4. Deviation from Standards

| |
|-------|
| None. |
|-------|

4.5. Abnormalities from Standard Conditions

| |
|-------|
| None. |
|-------|

4.6. Test Facility

| |
|---|
| <p>The test facility is recognized, certified, or accredited by the following organizations:</p> <p>FCC-Registration No.: 779513 Designation Number: CN1319 Shenzhen HTT Technology Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.</p> <p>A2LA-Lab Cert. No.: 6435.01 Shenzhen HTT Technology Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.</p> <p>The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.</p> |
|---|

4.7. Test Location

| |
|---|
| All tests were performed at: |
| <p>Shenzhen HTT Technology Co.,Ltd. 1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23595200</p> |



Fax: 0755-23595201

4.8. Additional Instructions

| | |
|-------------------|---|
| Test Software | Special AT test command provided by manufacturer to Keep the EUT in continuously transmitting mode and hopping mode |
| Power level setup | Default |

5. Test Instruments list

| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
|------|---------------------------------|-------------------------------------|--------------------|---------------|---------------------|-------------------------|
| 1 | 3m Semi- Anechoic Chamber | Shenzhen C.R.T technology co., LTD | 9*6*6 | HTT-E028 | Aug. 10 2020 | Aug. 09 2024 |
| 2 | Control Room | Shenzhen C.R.T technology co., LTD | 4.8*3.5*3.0 | HTT-E030 | Aug. 10 2020 | Aug. 09 2024 |
| 3 | EMI Test Receiver | Rohde&Schwar | ESCI7 | HTT-E022 | May 23 2022 | May 22 2023 |
| 4 | Spectrum Analyzer | Rohde&Schwar | FSP | HTT-E037 | May 23 2022 | May 22 2023 |
| 5 | Coaxial Cable | ZDecl | ZT26-NJ-NJ-0.6M | HTT-E018 | May 23 2022 | May 22 2023 |
| 6 | Coaxial Cable | ZDecl | ZT26-NJ-SMAJ-2M | HTT-E019 | May 23 2022 | May 22 2023 |
| 7 | Coaxial Cable | ZDecl | ZT26-NJ-SMAJ-0.6M | HTT-E020 | May 23 2022 | May 22 2023 |
| 8 | Coaxial Cable | ZDecl | ZT26-NJ-SMAJ-8.5M | HTT-E021 | May 23 2022 | May 22 2023 |
| 9 | Composite logarithmic antenna | Schwarzbeck | VULB 9168 | HTT-E017 | Aug. 22 2021 | Aug. 21 2022 |
| 10 | Horn Antenna | Schwarzbeck | BBHA9120D | HTT-E016 | Aug. 22 2021 | Aug. 21 2022 |
| 11 | Loop Antenna | Zhinan | ZN30900C | HTT-E039 | Aug. 22 2021 | Aug. 21 2022 |
| 12 | Horn Antenna | Beijing Hangwei Dayang | OBH100400 | HTT-E040 | Aug. 22 2021 | Aug. 21 2022 |
| 13 | low frequency Amplifier | Sonoma Instrument | 310 | HTT-E015 | May 23 2022 | May 22 2023 |
| 14 | high-frequency Amplifier | HP | 8449B | HTT-E014 | May 23 2022 | May 22 2023 |
| 15 | Variable frequency power supply | Shenzhen Anbiao Instrument Co., Ltd | ANB-10VA | HTT-082 | May 23 2022 | May 22 2023 |
| 16 | EMI Test Receiver | Rohde & Schwarz | ESCS30 | HTT-E004 | May 23 2022 | May 22 2023 |
| 17 | Artificial Mains | Rohde & Schwarz | ESH3-Z5 | HTT-E006 | May 23 2022 | May 22 2023 |
| 18 | Artificial Mains | Rohde & Schwarz | ENV-216 | HTT-E038 | May 23 2022 | May 22 2023 |
| 19 | Cable Line | Robinson | Z302S-NJ-BNCJ-1.5M | HTT-E001 | May 23 2022 | May 22 2023 |
| 20 | Attenuator | Robinson | 6810.17A | HTT-E007 | May 23 2022 | May 22 2023 |
| 21 | Variable frequency power supply | Shenzhen Yanghong Electric Co., Ltd | YF-650 (5KVA) | HTT-E032 | May 23 2022 | May 22 2023 |
| 22 | Control Room | Shenzhen C.R.T technology co., LTD | 8*4*3.5 | HTT-E029 | May 23 2022 | May 22 2023 |
| 23 | DC power supply | Agilent | E3632A | HTT-E023 | May 23 2022 | May 22 2023 |
| 24 | EMI Test Receiver | Agilent | N9020A | HTT-E024 | May 23 2022 | May 22 2023 |
| 25 | Analog signal generator | Agilent | N5181A | HTT-E025 | May 23 2022 | May 22 2023 |
| 26 | Vector signal generator | Agilent | N5182A | HTT-E026 | May 23 2022 | May 22 2023 |

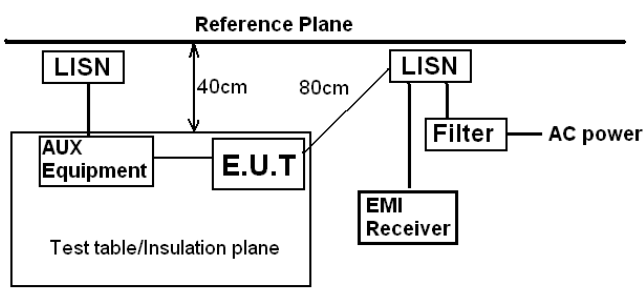


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| | | | | | | |
|----|----------------------------------|-------------------------------------|---------|----------|-------------|-------------|
| 27 | Power sensor | Keysight | U2021XA | HTT-E027 | May 23 2022 | May 22 2023 |
| 28 | Temperature and humidity meter | Shenzhen Anbiao Instrument Co., Ltd | TH10R | HTT-074 | May 23 2022 | May 22 2023 |
| 29 | Radiated Emission Test Software | Farad | EZ-EMC | N/A | N/A | N/A |
| 30 | Conducted Emission Test Software | Farad | EZ-EMC | N/A | N/A | N/A |
| 31 | RF Test Software | panshanf | TST | N/A | N/A | N/A |

6. Test results and Measurement Data

6.1. Conducted Emissions

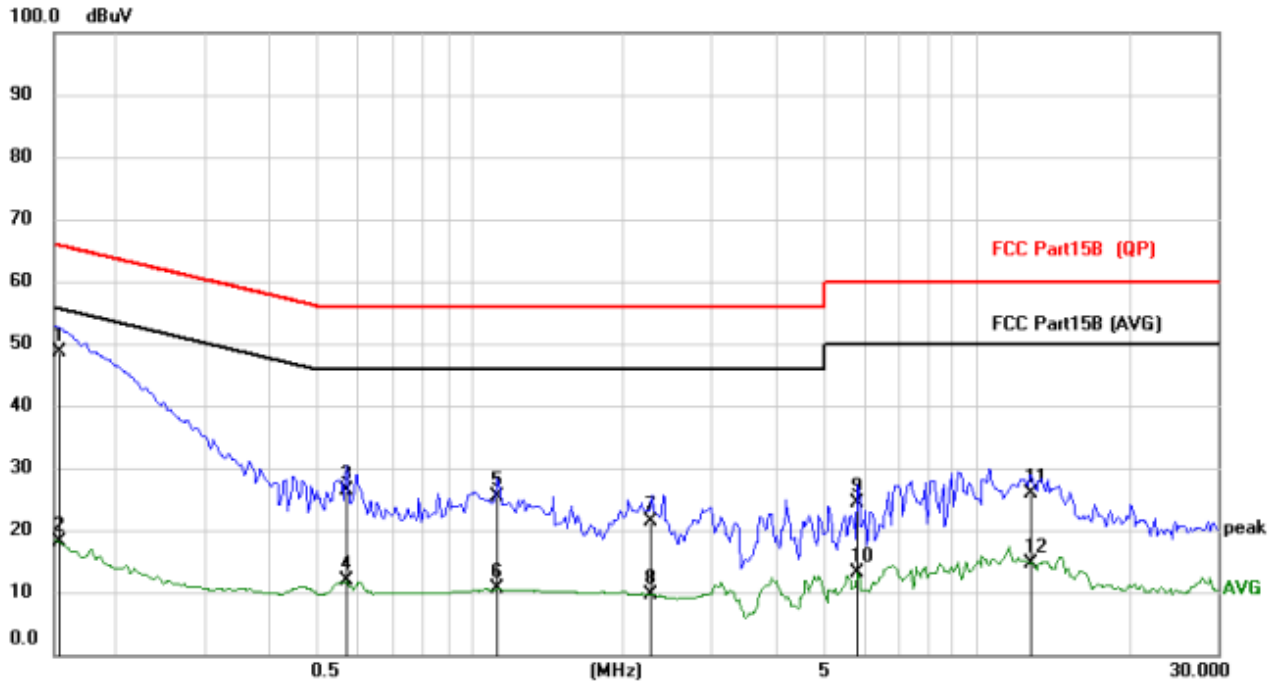
| | | | |
|--|--|--------------|---------------------------------|
| Test Requirement: | FCC Part15 C Section 15.207 | | |
| Test Method: | ANSI C63.10:2013 | | |
| Test Frequency Range: | 150KHz to 30MHz | | |
| Class / Severity: | Class B | | |
| Receiver setup: | RBW=9KHz, VBW=30KHz | | |
| Limit: | Frequency range (MHz) | Limit (dBuV) | |
| | | Quasi-peak | Average |
| | 0.15-0.5 | 66 to 56* | 56 to 46* |
| | 0.5-5 | 56 | 46 |
| | 5-30 | 60 | 50 |
| * Decreases with the logarithm of the frequency. | | | |
| Test setup: |  <p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p> | | |
| Test procedure: | <ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. | | |
| Test Instruments: | Refer to section 6.0 for details | | |
| Test mode: | Refer to section 5.2 for details | | |
| Test environment: | Temp.: | 25 °C | Humid.: 52% Press.: 1012mbar |
| Test voltage: | AC 120V, 60Hz | | |
| Test results: | Pass | | |

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.



Measurement data:

Line:

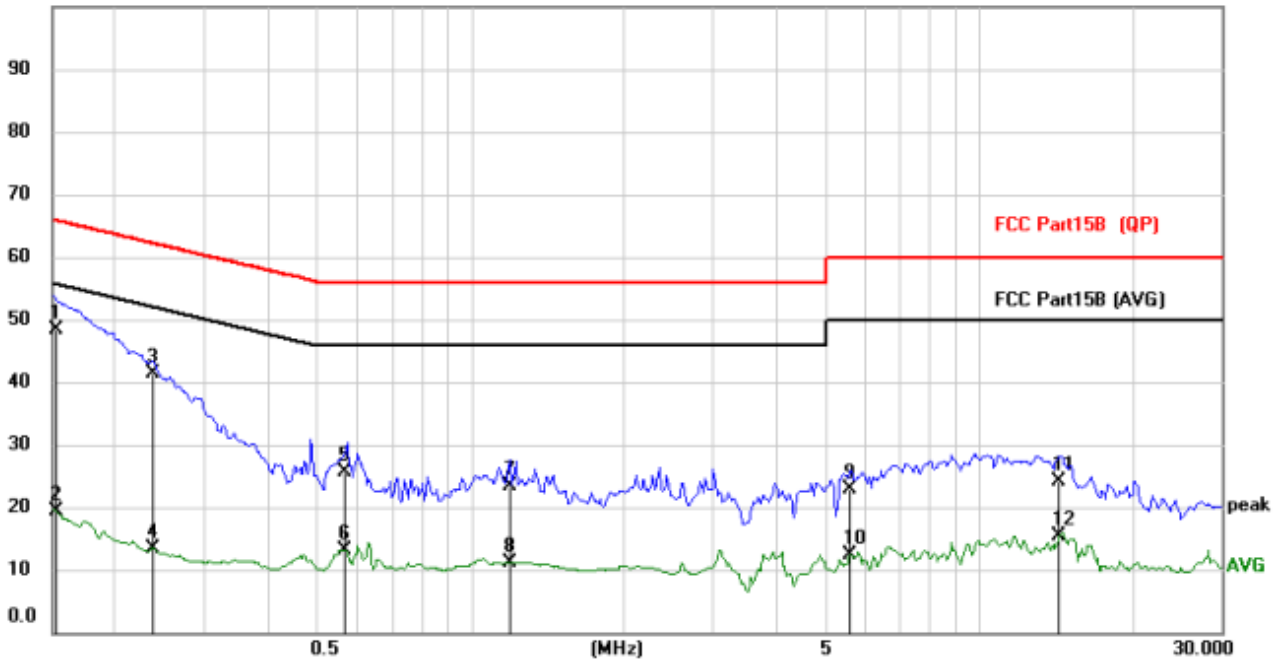


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|
| 1 | * | 0.1539 | 38.16 | 10.37 | 48.53 | 65.79 | -17.26 | QP |
| 2 | | 0.1539 | 7.74 | 10.37 | 18.11 | 55.79 | -37.68 | AVG |
| 3 | | 0.5673 | 15.75 | 10.55 | 26.30 | 56.00 | -29.70 | QP |
| 4 | | 0.5673 | 1.27 | 10.55 | 11.82 | 46.00 | -34.18 | AVG |
| 5 | | 1.1328 | 14.61 | 10.89 | 25.50 | 56.00 | -30.50 | QP |
| 6 | | 1.1328 | -0.31 | 10.89 | 10.58 | 46.00 | -35.42 | AVG |
| 7 | | 2.2726 | 10.65 | 10.83 | 21.48 | 56.00 | -34.52 | QP |
| 8 | | 2.2726 | -1.16 | 10.83 | 9.67 | 46.00 | -36.33 | AVG |
| 9 | | 5.8236 | 13.20 | 11.21 | 24.41 | 60.00 | -35.59 | QP |
| 10 | | 5.8236 | 1.94 | 11.21 | 13.15 | 50.00 | -36.85 | AVG |
| 11 | | 12.7837 | 13.95 | 11.83 | 25.78 | 60.00 | -34.22 | QP |
| 12 | | 12.7837 | 2.82 | 11.83 | 14.65 | 50.00 | -35.35 | AVG |



Neutral:

100.0 dBuV

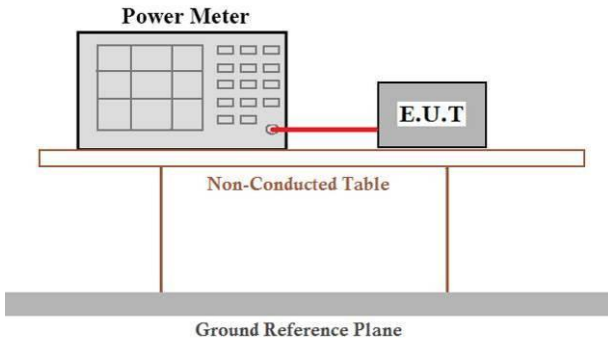


| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Detector |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | |
| 1 | * | 0.1524 | 38.02 | 10.37 | 48.39 | 65.87 | -17.48 | QP |
| 2 | | 0.1524 | 9.06 | 10.37 | 19.43 | 55.87 | -36.44 | AVG |
| 3 | | 0.2366 | 30.87 | 10.40 | 41.27 | 62.21 | -20.94 | QP |
| 4 | | 0.2366 | 3.08 | 10.40 | 13.48 | 52.21 | -38.73 | AVG |
| 5 | | 0.5641 | 15.04 | 10.54 | 25.58 | 56.00 | -30.42 | QP |
| 6 | | 0.5641 | 2.56 | 10.54 | 13.10 | 46.00 | -32.90 | AVG |
| 7 | | 1.1844 | 12.49 | 10.88 | 23.37 | 56.00 | -32.63 | QP |
| 8 | | 1.1844 | 0.25 | 10.88 | 11.13 | 46.00 | -34.87 | AVG |
| 9 | | 5.5857 | 11.77 | 11.16 | 22.93 | 60.00 | -37.07 | QP |
| 10 | | 5.5857 | 1.17 | 11.16 | 12.33 | 50.00 | -37.67 | AVG |
| 11 | | 14.3919 | 12.10 | 12.03 | 24.13 | 60.00 | -35.87 | QP |
| 12 | | 14.3919 | 3.37 | 12.03 | 15.40 | 50.00 | -34.60 | AVG |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Los

6.2. Maximum Conducted Output Power

| Test Requirement: | FCC Part15 E Section 15.407 | | | | | | | | | |
|---|---|---|-------|-----------|------------------------------|------------------------------------|-----------|---|-----------|---|
| Test Method: | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 | | | | | | | | | |
| Limit: | <table border="1"> <thead> <tr> <th>Frequency band (MHz)</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td rowspan="2">5150-5250</td> <td>≤1W(30dBm) for master device</td> </tr> <tr> <td>≤250mW(23.98dBm) for client device</td> </tr> <tr> <td>5250-5350</td> <td>≤250mW(23.98dBm) for client device or 11dBm+10logB*</td> </tr> <tr> <td>5470-5725</td> <td>≤250mW(23.98dBm) for client device or 11dBm+10logB*</td> </tr> </tbody> </table> | Frequency band (MHz) | Limit | 5150-5250 | ≤1W(30dBm) for master device | ≤250mW(23.98dBm) for client device | 5250-5350 | ≤250mW(23.98dBm) for client device or 11dBm+10logB* | 5470-5725 | ≤250mW(23.98dBm) for client device or 11dBm+10logB* |
| | Frequency band (MHz) | Limit | | | | | | | | |
| | 5150-5250 | ≤1W(30dBm) for master device | | | | | | | | |
| | | ≤250mW(23.98dBm) for client device | | | | | | | | |
| | 5250-5350 | ≤250mW(23.98dBm) for client device or 11dBm+10logB* | | | | | | | | |
| 5470-5725 | ≤250mW(23.98dBm) for client device or 11dBm+10logB* | | | | | | | | | |
| Remark: *Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. | | | | | | | | | | |
| Test setup: |  <p>The diagram illustrates the test setup. A Power Meter is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p> | | | | | | | | | |
| Test procedure: | <p>Measurement using an RF average power meter</p> <ul style="list-style-type: none"> (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied <ul style="list-style-type: none"> a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle. b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level. c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five. (ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B). (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter. (iv) Adjust the measurement in dBm by adding $10 \log(1/x)$ where x is the duty cycle (e.g., $10 \log(1/0.25)$ if the duty cycle is 25 percent). | | | | | | | | | |
| Test Instruments: | Refer to section 6 for details | | | | | | | | | |
| Test mode: | Refer to section 5.2 for details | | | | | | | | | |
| Test results: | Pass | | | | | | | | | |



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|-------------------|--------|-------|---------|-----|---------|----------|
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
|-------------------|--------|-------|---------|-----|---------|----------|

Measurement Data

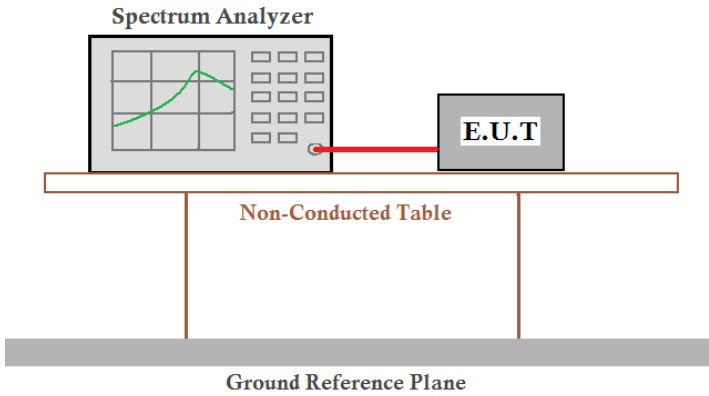
ANT 1:

| Test Mode | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Result |
|-----------|-----------------|--------------------|-------------|--------|
| 802.11a | 5180 | 7.87 | 30.0 | PASS |
| | 5200 | 7.96 | 30.0 | PASS |
| | 5240 | 7.55 | 30.0 | PASS |

ANT 2:

| Test Mode | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Result |
|-----------|-----------------|--------------------|-------------|--------|
| 802.11a | 5180 | 7.70 | 30.0 | PASS |
| | 5200 | 7.30 | 30.0 | PASS |
| | 5240 | 7.51 | 30.0 | PASS |

6.3. Emission Bandwidth

| | |
|-------------------|--|
| Test Requirement: | FCC Part15 E Section 15.407 |
| Test Method: | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 |
| Limit: | N/A |
| Test setup: |  |
| Test procedure: | According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01. |
| Test Instruments: | Refer to section 6 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

| | | | | | | |
|-------------------|--------|-------|---------|-----|---------|----------|
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
|-------------------|--------|-------|---------|-----|---------|----------|

Measurement Data

ANT 1:

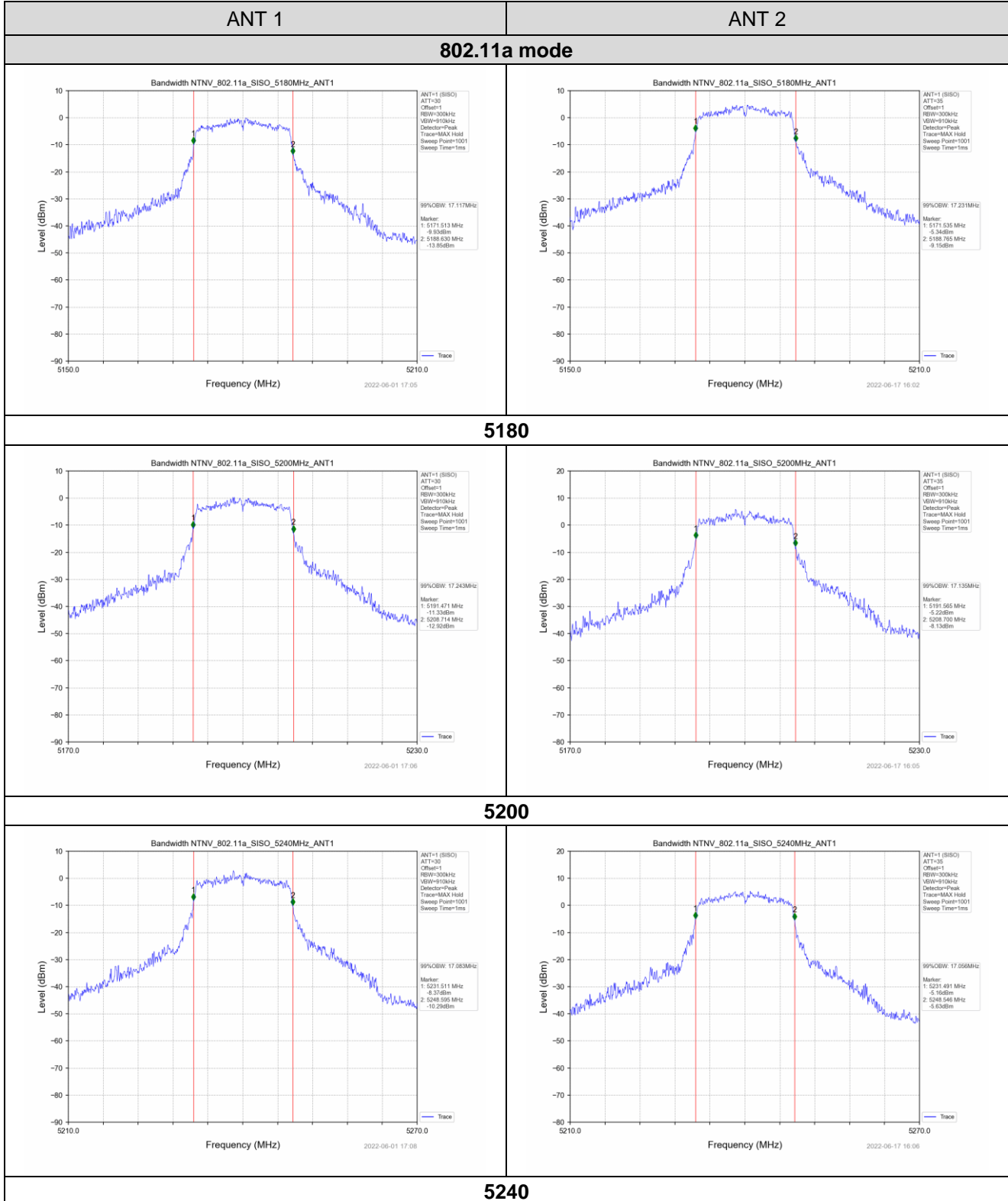
| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26dB Occupied Bandwidth (MHz) |
|---------|-----------------|------------------------------|-------------------------------|
| | | 802.11a | 802.11a |
| 36 | 5180 | 17.117 | 23.437 |
| 40 | 5200 | 17.243 | 23.432 |
| 48 | 5240 | 17.083 | 23.399 |

ANT 2:

| CH. No. | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | 26dB Occupied Bandwidth (MHz) |
|---------|-----------------|------------------------------|-------------------------------|
| | | 802.11a | 802.11a |
| 36 | 5180 | 17.231 | 23.193 |
| 40 | 5200 | 17.135 | 24.038 |
| 48 | 5240 | 17.056 | 22.003 |

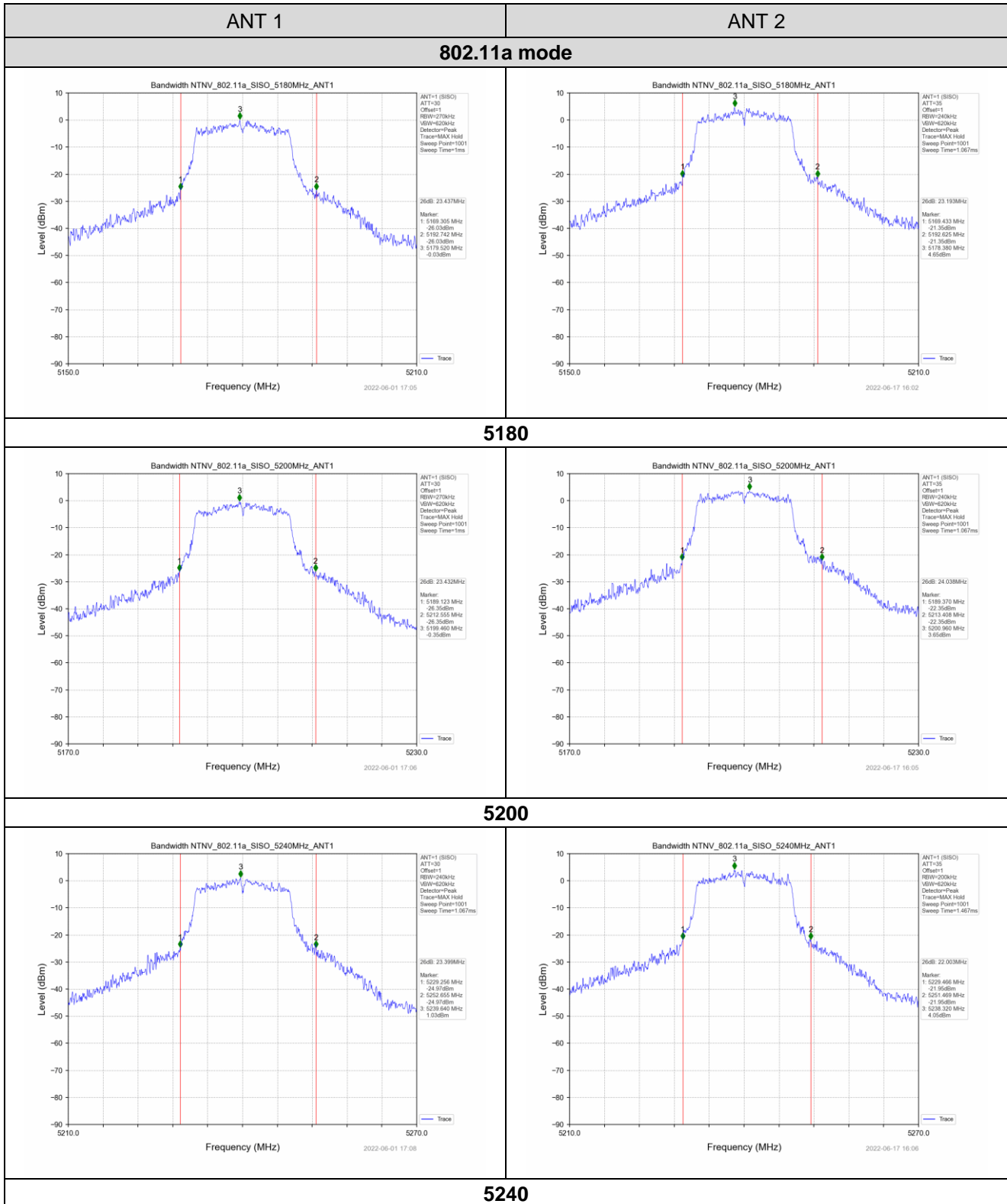


99% Occupied Bandwidth:

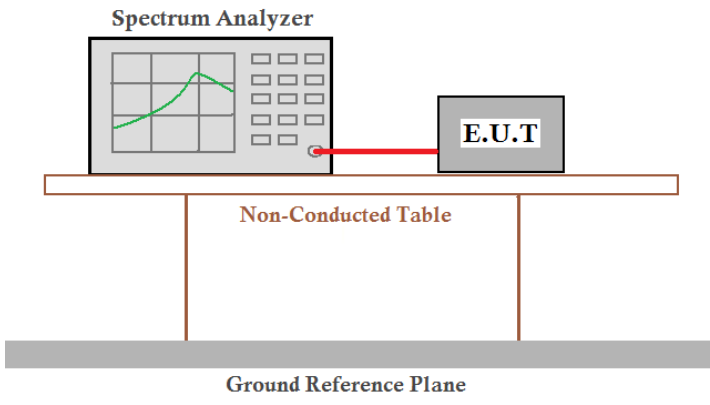




26dB Occupied Bandwidth:



6.4. Power Spectral Density

| | | |
|--|--|----------------------------------|
| Test Requirement: | FCC Part15 E Section 15.407 | |
| Test Method: | KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 | |
| Limit: | Frequency band (MHz) | Limit |
| | 5150-5250 | ≤17dBm in 1MHz for master device |
| | | ≤11dBm in 1MHz for client device |
| | 5250-5350 | ≤11dBm in 1MHz for client device |
| | 5470-5725 | ≤11dBm in 1MHz for client device |
| Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. | | |
| Test setup: |  | |
| Test procedure: | <ol style="list-style-type: none"> 1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". 2) Use the peak search function on the instrument to find the peak of the spectrum. 3) Make the following adjustments to the peak value of the spectrum, if applicable: <ol style="list-style-type: none"> a) If Method SA-2 or SA-2 Alternative was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum. b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. 4) The result is the PSD. | |
| Test Instruments: | Refer to section 6 for details | |
| Test mode: | Refer to section 5.2 for details | |
| Test results: | Pass | |

| | | | | | | |
|-------------------|--------|-------|---------|-----|---------|----------|
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
|-------------------|--------|-------|---------|-----|---------|----------|



Measurement Data

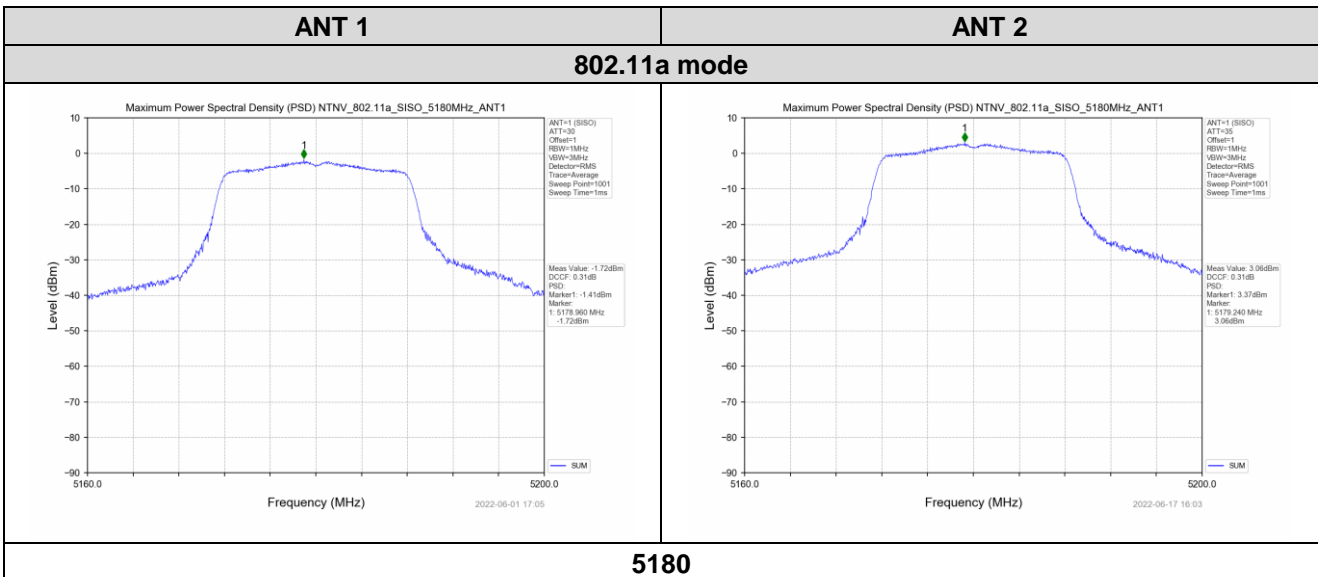
ANT 1:

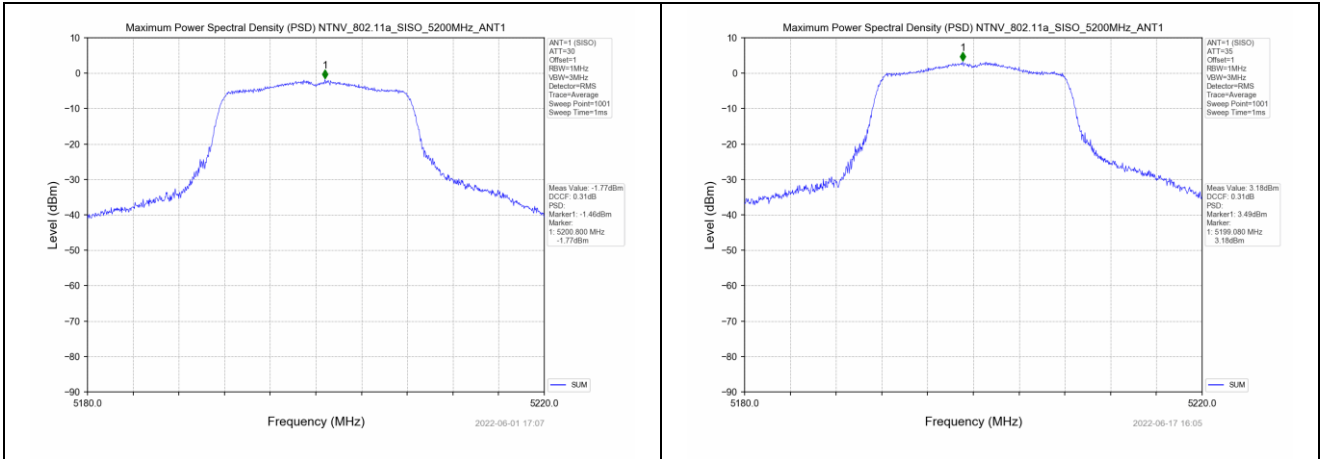
| Test Mode | Frequency (MHz) | Total PSD Power(dBm/MHz) | Limits (dBm/MHz) | Result |
|-----------|-----------------|--------------------------|------------------|--------|
| 802.11a | 5180 | -1.41 | 17.0 | PASS |
| | 5200 | -1.46 | 17.0 | PASS |
| | 5240 | -0.08 | 17.0 | PASS |

ANT 2:

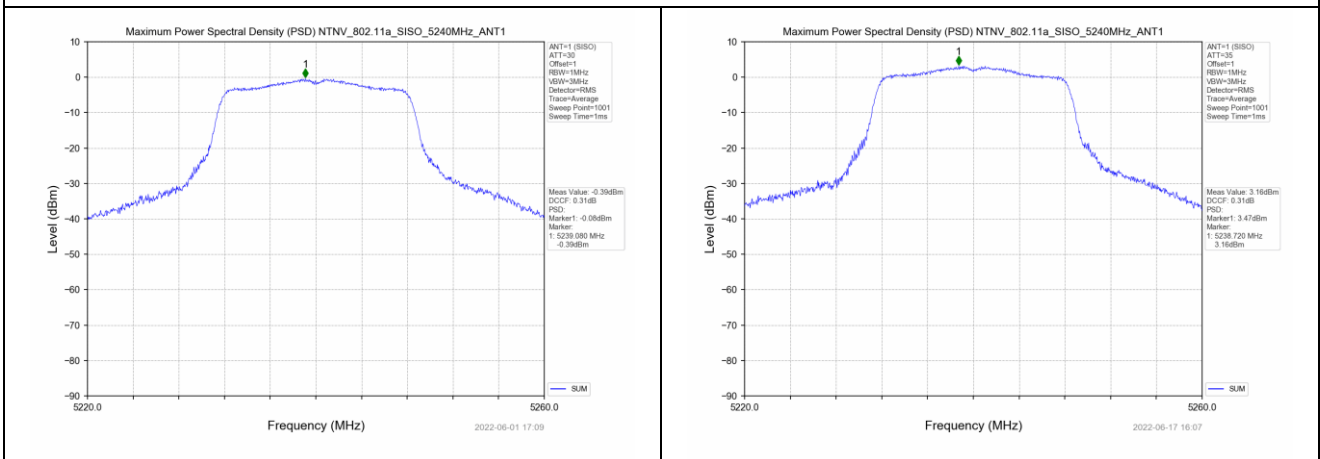
| Test Mode | Frequency (MHz) | Total PSD Power(dBm/MHz) | Limits (dBm/MHz) | Result |
|-----------|-----------------|--------------------------|------------------|--------|
| 802.11a | 5180 | 3.37 | 17.0 | PASS |
| | 5200 | 3.49 | 17.0 | PASS |
| | 5240 | 3.47 | 17.0 | PASS |

Test plots as followed:



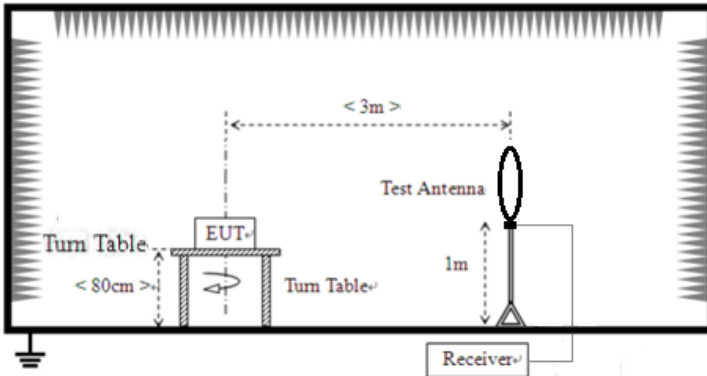


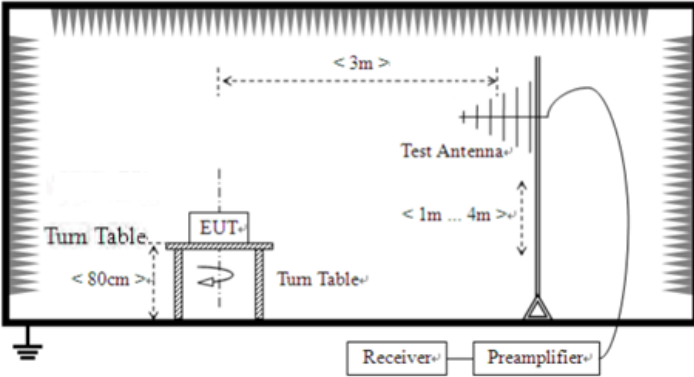
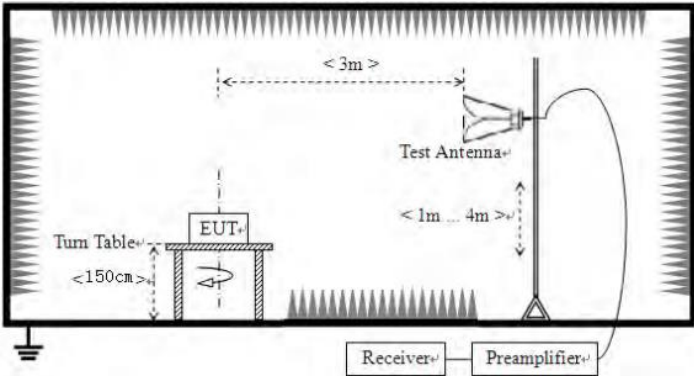
5200



5240

6.5. Radiated Emission

| | | | | | |
|-----------------------|---|--------------|---------|----------------------|------------|
| Test Requirement: | FCC Part15 C Section 15.209 | | | | |
| Test Method: | ANSI C63.10:2013 | | | | |
| Test Frequency Range: | 9kHz to 25GHz | | | | |
| Test site: | Measurement Distance: 3m | | | | |
| Receiver setup: | Frequency | Detector | RBW | VBW | Value |
| | 9KHz-150KHz | Quasi-peak | 200Hz | 600Hz | Quasi-peak |
| | 150KHz-30MHz | Quasi-peak | 9KHz | 30KHz | Quasi-peak |
| | 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz | Quasi-peak |
| | Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| Peak | | 1MHz | 10Hz | Average | |
| Limit: | Frequency | Limit (uV/m) | Value | Measurement Distance | |
| | 0.009MHz-0.490MHz | 2400/F(KHz) | QP | 300m | |
| | 0.490MHz-1.705MHz | 24000/F(KHz) | QP | 30m | |
| | 1.705MHz-30MHz | 30 | QP | 30m | |
| | 30MHz-88MHz | 100 | QP | 3m | |
| | 88MHz-216MHz | 150 | QP | | |
| | 216MHz-960MHz | 200 | QP | | |
| | 960MHz-1GHz | 500 | QP | | |
| | Above 1GHz | 500 | Average | | |
| | | 5000 | Peak | | |
| Test setup: | <p>For radiated emissions from 9kHz to 30MHz</p>  | | | | |

| | |
|--------------------------|--|
| | <p>For radiated emissions from 30MHz to 1GHz</p>  <p>For radiated emissions above 1GHz</p>  |
| <p>Test Procedure:</p> | <ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. |
| <p>Test Instruments:</p> | <p>Refer to section 6.0 for details</p> |
| <p>Test mode:</p> | <p>Refer to section 5.2 for details</p> |



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| | | | | | | |
|-------------------|---------------|-------|---------|-----|---------|----------|
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
| Test voltage: | AC 120V, 60Hz | | | | | |
| Test results: | Pass | | | | | |

Remarks:

- 1.Only the worst case Main Antenna test data.*
- 2.Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement data:

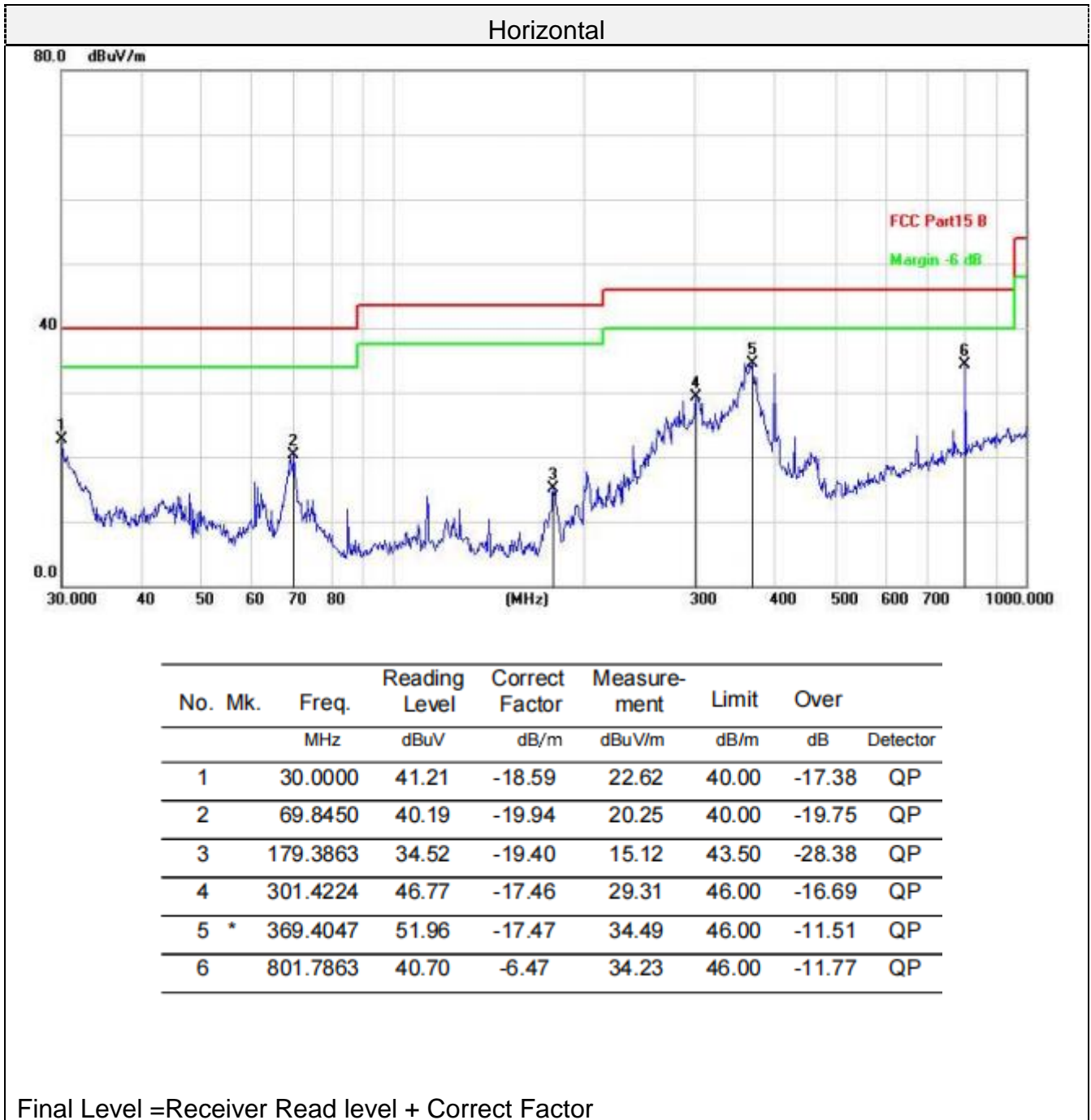
■ **9kHz~30MHz**

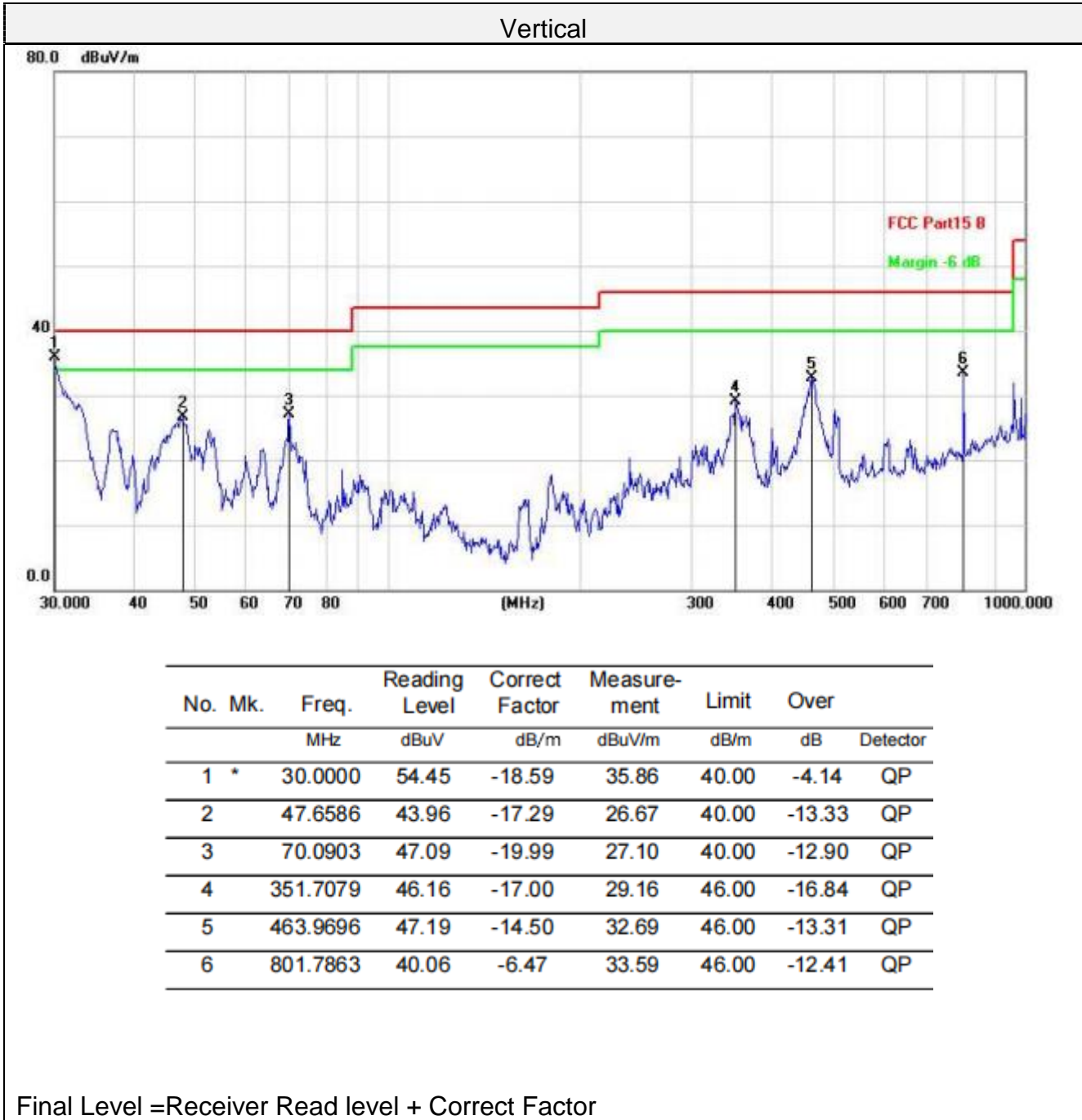
The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.



■ Below 1GHz

Pre-scan all test modes, found worst case at 802.11a 5180MHz, and so only show the test result of 802.11a 5180MHz







■ Above 1-40GHz

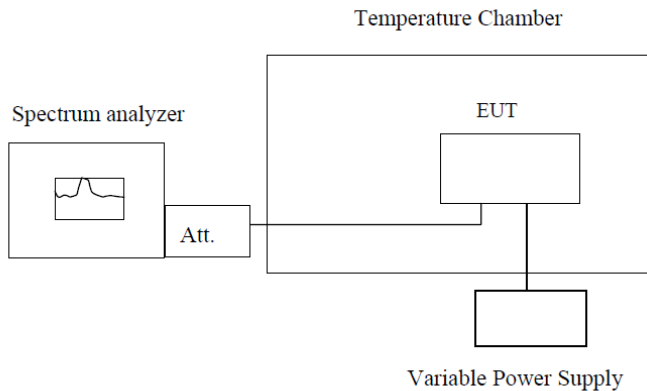
U-NII 1 & 802.11a (above 1GHz)

| Tested Channel | Frequency (MHz) | Emission Level (dBuV/m) | Detector Mode | ANT Pol | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre amplifier (dB) | Correction Factor (dB/m) |
|----------------|-----------------|-------------------------|---------------|---------|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| | 5150.00 | 54.66 | PK | H | 68.20 | 13.54 | 46.32 | 31.4 | 8.44 | 31.5 | 8.34 |
| 36.00 | 5150.00 | 43.25 | AV | H | 54.00 | 10.75 | 34.91 | 31.4 | 8.44 | 31.5 | 8.34 |
| (5180MHz) | 10360.00 | 54.06 | PK | H | 68.20 | 14.14 | 38.83 | 38.21 | 11.59 | 38.26 | 11.54 |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 40.00 | 10400.00 | 53.98 | PK | H | 68.20 | 14.22 | 42.44 | 38.21 | 11.59 | 38.26 | 11.54 |
| (5200MHz) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 48.00 | 5350.50 | 43.15 | PK | H | 68.20 | 25.05 | 34.81 | 31.4 | 8.44 | 31.5 | 8.34 |
| (5240MHz) | 10480.00 | 53.87 | PK | H | 68.20 | 14.33 | 42.73 | 38.21 | 11.19 | 38.26 | 11.14 |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| Tested Channel | Frequency (MHz) | Emission Level (dBuV/m) | Detector Mode | ANT Pol | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre amplifier (dB) | Correction Factor (dB/m) |
|----------------|-----------------|-------------------------|---------------|---------|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| | 5150.00 | 52.97 | PK | V | 68.20 | 15.23 | 44.63 | 31.4 | 8.44 | 31.5 | 8.34 |
| 36.00 | 5150.00 | 44.50 | AV | V | 54.00 | 9.50 | 36.16 | 31.4 | 8.44 | 31.5 | 8.34 |
| (5180MHz) | 10360.00 | 51.69 | PK | V | 68.20 | 16.51 | 40.15 | 38.21 | 11.59 | 38.26 | 11.54 |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 40.00 | 10400.00 | 51.67 | PK | V | 68.20 | 16.53 | 40.13 | 38.21 | 11.59 | 38.26 | 11.54 |
| (5200MHz) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 48.00 | 5350.50 | 53.41 | PK | V | 68.20 | 14.79 | 45.07 | 31.4 | 8.44 | 31.5 | 8.34 |
| (5240MHz) | 10480.00 | 51.26 | PK | V | 68.20 | 16.94 | 40.12 | 38.21 | 11.19 | 38.26 | 11.14 |
| | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Remark:
 (1) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
 (2) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed.

6.6. Frequency stability

| | |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.407(g) |
| Test Method: | ANSI C63.10:2013, FCC Part 2.1055 |
| Limit: | Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified |
| Test Procedure: | The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements. |
| Test setup: |  <p style="text-align: center;">Note : Measurement setup for testing on Antenna connector</p> |
| Test Instruments: | Refer to section 6 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

| | | | | | | |
|-------------------|--------|-------|---------|-----|---------|----------|
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
|-------------------|--------|-------|---------|-----|---------|----------|

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

**ANT 1:**

| Reference Frequency: 802.11a channel=36 frequency=5180MHz | | | | | |
|---|------------------|-----------------|---------|------------------------------------|--------|
| Voltage (V) | Temperature (°C) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| AC120 | -30 | 80.59 | 0.01556 | Within the band of operation | Pass |
| | -20 | 85.26 | 0.01646 | | |
| | -10 | 70.62 | 0.01363 | | |
| | 0 | 60.57 | 0.01169 | | |
| | 10 | 70.25 | 0.01356 | | |
| | 20 | 90.26 | 0.01742 | | |
| | 30 | 55.68 | 0.01075 | | |
| | 40 | 62.14 | 0.01200 | | |
| | 50 | 68.15 | 0.01316 | | |
| AC138 | 25 | 68.47 | 0.01321 | | |
| AC102 | 25 | 76.15 | 0.01470 | | |

ANT 2:

| Reference Frequency: 802.11a channel=36 frequency=5180MHz | | | | | |
|---|------------------|-----------------|---------|------------------------------------|--------|
| Voltage (V) | Temperature (°C) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| AC120 | -30 | 75.36 | 0.01455 | Within the band of operation | Pass |
| | -20 | 84.25 | 0.01626 | | |
| | -10 | 90.32 | 0.01744 | | |
| | 0 | 55.27 | 0.01167 | | |
| | 10 | 65.28 | 0.01260 | | |
| | 20 | 85.37 | 0.01648 | | |
| | 30 | 56.18 | 0.01085 | | |
| | 40 | 63.25 | 0.01221 | | |
| | 50 | 67.18 | 0.01297 | | |
| AC138 | 25 | 59.26 | 0.01144 | | |
| AC102 | 25 | 78.19 | 0.01509 | | |



7. Test Setup Photo

Reference to the **appendix I** for details.

8. EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----