# FCC Test Report

Report No.: AGC15705240915FR01

| | | |
|---|---|---|
| **FCC ID** | : | QV7-GC88752-104 |
| **APPLICATION PURPOSE** | : | Original Equipment |
| **PRODUCT DESIGNATION** | : | DRONE |
| **BRAND NAME** | : | SYMA |
| **MODEL NAME** | : | W5 |
| **APPLICANT** | : | GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO.,LTD |
| **DATE OF ISSUE** | : | Nov. 08, 2024 |
| **STANDARD(S)** | : | FCC Part 15 Subpart E §15.407 |
| **REPORT VERSION** | : | V1.0 |

Attestation of Global Compliance (Shenzhen) Co., Ltd

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## Report Revise Record

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|---|---|---|---|---|
| V1.0 | / | Nov. 08, 2024 | Valid | Initial Release |

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## 1. General Information

| | |
|---|---|
| Applicant | GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO.,LTD |
| Address | NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENG HAI, Shantou, China |
| Manufacturer | GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO.,LTD |
| Address | NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENG HAI, Shantou, China |
| Factory | GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO.,LTD |
| Address | NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENG HAI, Shantou, China |
| Product Designation | DRONE |
| Brand Name | SYMA |
| Test Model | W5 |
| Date of receipt of test item | Sep. 12, 2024 |
| Date of Test | Sep. 12, 2024~Nov. 08, 2024 |
| Deviation from Standard | No any deviation from the test method |
| Condition of Test Sample | Normal |
| Test Result | Pass |
| Test Report Form No | AGCER-FCC-5G WLAN-V1 |

Note: The test results of this report relate only to the tested sample identified in this report.

| | | |
|---|---|---|
| Prepared By | **Cici Li**<br>(Project Engineer) | Nov. 08, 2024 |
| Reviewed By | Calvin Liu<br>(Reviewer) | Nov. 08, 2024 |
| Approved By | Max Zhang<br>(Authorized Officer) | Nov. 08, 2024 |

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# 2. Product Information

## 2.1 Product Technical Description

| | |
|---|---|
| Equipment Type | ☐ Outdoor access points ☐ Indoor access points<br>☐ Fixed P2P access points ☒ Client devices |
| Operation Frequency | ☒ U-NII 1:5150MHz~5250MHz ☐ U-NII 2A: 5250MHz~5350MHz<br>☐ U-NII 2C:5470MHz~5725MHz ☐ U-NII 3: 5725MHz~5850MHz |
| DFS Design Type | ☐ Master ☐ Slave with radar detection ☐ Slave without radar detection |
| TPC Function | ☐ Yes ☒ No |
| Hardware Version | SM-227-BKT -V1 |
| Software Version | V1 |
| Test Frequency Range | For 802.11ac-VHT20:5180MHz |
| RF Output Power | 802.11ac (VHT20):7.94dBm |
| RF Output Power(MIMO) | 802.11ac (VHT20):10.63dBm |
| Modulation | 802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM |
| Data Rate | 802.11ac: up to 866.6Mbps; |
| Number of channels | 1 channels of U-NII-1 Band |
| Antenna Designation | Refer to Chapter 2.9 of the report. |
| Antenna Gain | Refer to Chapter 2.9 of the report. |
| Power Supply | DC 7.6V by battery |

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## 2.2 Table of Carrier Frequency

**For 5180~5240MHz:**

**802.11ac (VHT20):**

| Channel | Frequency |
|---|---|
| 36 | 5180 MHz |

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**2.3 IEEE 802.11ac Modulation Scheme**

| MCS Index | Nss | Modulation | R | $N_{BPSC}$ | $N_{CBPS}$ | | $N_{DBPS}$ | | Data rate (Mbps) 800nsGI | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz | 40MHz |
| 0 | 1 | BPSK | 1/2 | 1 | 52 | 108 | 26 | 54 | 6.5 | 13.5 |
| 1 | 1 | QPSK | 1/2 | 2 | 104 | 216 | 52 | 108 | 13.0 | 27.0 |
| 2 | 1 | QPSK | 3/4 | 2 | 104 | 216 | 78 | 162 | 19.5 | 40.5 |
| 3 | 1 | 16-QAM | 1/2 | 4 | 208 | 432 | 104 | 216 | 26.0 | 54.0 |
| 4 | 1 | 16-QAM | 3/4 | 4 | 208 | 432 | 156 | 324 | 39.0 | 81.0 |
| 5 | 1 | 64-QAM | 2/3 | 6 | 312 | 648 | 208 | 432 | 52.0 | 108.0 |
| 6 | 1 | 64-QAM | 3/4 | 6 | 312 | 648 | 234 | 489 | 58.5 | 121.5 |
| 7 | 1 | 64-QAM | 5/6 | 6 | 312 | 648 | 260 | 540 | 65.0 | 135.0 |

| Symbol | Explanation |
|---|---|
| NSS | Number of spatial streams |
| R | Code rate |
| NBPSC | Number of coded bits per single carrier |
| NCBPS | Number of coded bits per symbol |
| NDBPS | Number of data bits per symbol |
| GI | Guard interval |

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### 2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for **FCC ID: QV7-GC88752-104** filing to comply with the FCC Part 15 requirements.

### 2.5 Test Methodology

| No. | Identity | Document Title |
|---|---|---|
| 1 | FCC 47 CFR Part 2 | Frequency allocations and radio treaty matters; general rules and regulations |
| 2 | FCC 47 CFR Part 15 | Radio Frequency Devices |
| 3 | ANSI C63.10-2013 | American National Standard for Testing Unlicensed Wireless Devices |
| 4 | KDB 662911 | 662911 D01 Multiple Transmitter Output v02r01 |
| 5 | KDB 789033 | 789033 D02 General U-NII Test Procedures New Rules v02r01 |

### 2.6 Special Accessories

Refer to section 4.4.

### 2.7 Equipment Modifications

Not available for this EUT intended for grant.

### 2.8 Antenna Requirement

| Standard Requirement |
|---|
| **15.203 requirement:**<br>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. The use of a permanently attached antenna or of an antennathat uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a brokenantenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. |
| **EUT Antenna:** |
| The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna refer to Section 2.9 of the report |

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**2.9 Description of Available Antennas**

| Antenna Type | Frequency Band (MHz) | TX Paths | Bandwidth (MHz) | Max Peak Gain (dBi) | | Max Directional Gain (dBi) |
|---|---|---|---|---|---|---|
| | | | | Chain A | Chain B | |
| 5G WIFI Monopole Antenna List (5GHz 2*2 MIMO) | | | | | | |
| Monopole Antenna | 5150 ~ 5250 | 2 | 20 | 2.9 | 2.9 | 5.91 |

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11ac mode.

Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain, $G_{ANT}$, Directional gain = $G_{ANT}$ + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on devices:

  Array Gain = 10 log ($N_{ANT}$/ $N_{SS}$) dB = 3.01;

- For power measurements on IEEE 802.1devices:

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

  Array Gain = 0 dB (i.e., no array gain) for channel widths ≥40 MHz for any $N_{ANT}$;

  Array Gain = 5 log($N_{ANT}$/$N_{SS}$) dB or 3 dB, whichever is less, for 20 MHz channel widths with $N_{ANT} \geq 5$.

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with $G_{ANT}$ set equal to the gain of the antenna having the highest gain.

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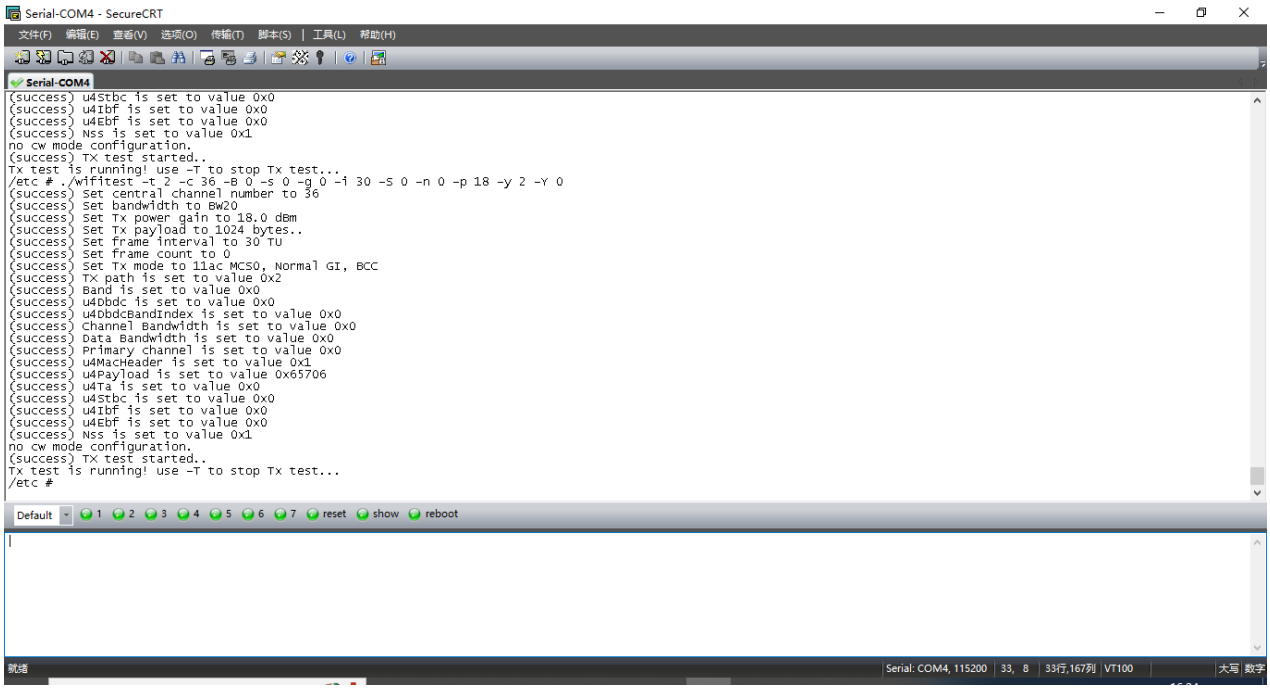
## 2.10 Description of Test Software

**For IEEE 802.11 mode:**

The test utility software used during testing was “Securecrt”, and the version was “V1.0”.

Software Setting Diagram




| Test Mode | Channel | Power Index | |
|---|---|---|---|
| | | Chain A | Chain B |
| 802.11ac(VHT20) | L/M/H | 17 | 17 |

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# 3. Test Environment

## 3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

## 3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**CNAS-Lab Code: L5488**

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

**A2LA-Lab Cert. No.: 5054.02**

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**FCC-Registration No.: 975832**

Attestation of Global Compliance (Shenzhen) 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 with Registration 975832.

**IC-Registration No.: 24842 (CAB identifier: CN0063)**

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

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### 3.3 Environmental Conditions

| | Normal Conditions |
|---|---|
| Temperature range (℃) | 15 - 35 |
| Relative humidity range | 20% - 75% |
| Pressure range (kPa) | 86 - 106 |
| Power supply | DC 7.6V by battery |

### 3.4 Measurement Uncertainty

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

| Item | Measurement Uncertainty |
|---|---|
| Uncertainty of Conducted Emission for AC Port | $U_c$ = ±2.9 dB |
| Uncertainty of Radiated Emission below 1GHz | $U_c$ = ±3.9 dB |
| Uncertainty of Radiated Emission above 1GHz | $U_c$ = ±4.9 dB |
| Uncertainty of total RF power, conducted | $U_c$ = ±0.8 dB |
| Uncertainty of RF power density, conducted | $U_c$ = ±2.6 dB |
| Uncertainty of spurious emissions, conducted | $U_c$ = ±2 % |
| Uncertainty of Occupied Channel Bandwidth | $U_c$ = ±2.7 % |

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### 3.5 List of Equipment Used

| ● RF Conducted Test System | | | | | | | |
|---|---|---|---|---|---|---|---|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ☒ | AGC-ER-E036 | Spectrum Analyzer | Agilent | N9020A | MY49100060 | 2024-05-24 | 2025-05-23 |
| ☒ | AGC-ER-E062 | Power Sensor | Agilent | U2021XA | MY54110007 | 2024-02-01 | 2025-01-31 |
| ☒ | AGC-ER-E063 | Power Sensor | Agilent | U2021XA | MY54110009 | 2024-02-01 | 2025-01-31 |
| ☒ | AGC-EM-A152 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | N/A | 2023-09-21 | 2025-09-20 |
| ☒ | AGC-ER-E083 | Signal Generator | Agilent | E4421B | US39340815 | 2024-05-23 | 2025-05-22 |
| ☒ | N/A | RF Connection Cable | N/A | 1# | N/A | Each time | N/A |
| ☒ | N/A | RF Connection Cable | N/A | 2# | N/A | Each time | N/A |

| ● Radiated Spurious Emission | | | | | | | |
|---|---|---|---|---|---|---|---|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ☐ | AGC-EM-E046 | EMI Test Receiver | R&S | ESCI | 10096 | 2024-02-01 | 2025-01-31 |
| ☒ | AGC-EM-E116 | EMI Test Receiver | R&S | ESCI | 100034 | 2024-05-24 | 2025-05-23 |
| ☒ | AGC-EM-E061 | Spectrum Analyzer | Agilent | N9010A | MY53470504 | 2024-05-28 | 2025-05-27 |
| ☒ | AGC-EM-E086 | Loop Antenna | ZHINAN | ZN30900C | 18051 | 2024-03-05 | 2026-03-04 |
| ☒ | AGC-EM-E001 | Wideband Antenna | SCHWARZBECK | VULB9168 | D69250 | 2023-05-11 | 2025-05-10 |
| ☒ | AGC-EM-E029 | Broadband Ridged Horn Antenna | ETS | 3117 | 00034609 | 2024-03-31 | 2025-03-30 |
| ☒ | AGC-EM-E082 | Horn Antenna | SCHWARZBECK | BBHA 9170 | #768 | 2023-09-24 | 2025-09-23 |
| ☒ | AGC-EM-E146 | Pre-amplifier | ETS | 3117-PA | 00246148 | 2024-07-24 | 2026-07-23 |
| ☒ | AGC-EM-A119 | 2.4G Filter | SongYi | N/A | N/A | 2024-05-23 | 2025-05-22 |
| ☒ | AGC-EM-A138 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | N/A | 2023-06-09 | 2025-06-08 |
| ☐ | AGC-EM-A139 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | N/A | 2023-06-09 | 2025-06-08 |

| ● AC Power Line Conducted Emission | | | | | | | |
|---|---|---|---|---|---|---|---|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ☐ | AGC-EM-E045 | EMI Test Receiver | R&S | ESPI | 101206 | 2024-05-28 | 2025-05-27 |
| ☐ | AGC-EM-A130 | 6dB Attenuator | Eeatsheep | LM-XX-6-5W | DC-6GZ | 2023-06-09 | 2025-06-08 |
| ☐ | AGC-EM-E023 | AMN | R&S | 100086 | ESH2-Z5 | 2024-05-28 | 2025-05-27 |

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| ● Test Software | | | | | |
|---|---|---|---|---|---|
| Used | Equipment No. | Test Equipment | Manufacturer | Model No. | Version Information |
| ☐ | AGC-EM-S001 | CE Test System | R&S | ES-K1 | V1.71 |
| ☒ | AGC-EM-S003 | RE Test System | FARA | EZ-EMC | VRA-03A |
| ☒ | AGC-ER-S012 | BT/WIFI Test System | Tonscend | JS1120-2 | 2.6 |
| ☒ | AGC-EM-S011 | RSE Test System | Tonscend | TS+-Ver2.1(JS36-RSE) | 4.0.0.0 |

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# 4.System Test Configuration

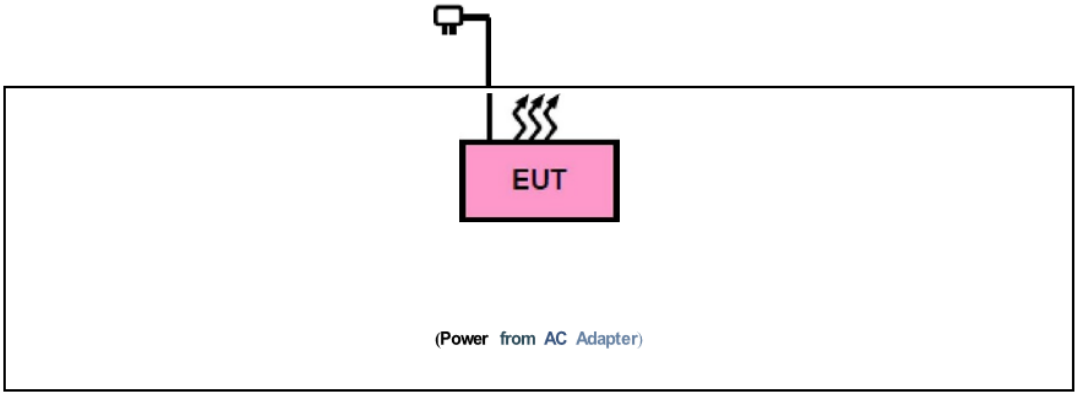
## 4.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

## 4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

## 4.3 Configuration of Tested System




## 4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

☐ Test Accessories Come From The Manufacturer

| No. | Equipment | Model No. | Manufacturer | Specification Information | Cable |
|---|---|---|---|---|---|
| 1 | Control Box | USB-TTL | -- | -- | -- |

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### 4.5 Summary of Test Results

| Item | FCC Rules | Description of Test | Result |
|---|---|---|---|
| 1 | §15.203 | Antenna Equipment | Pass |
| 2 | §15.407(a)(1) | RF Output Power | Pass |
| 3 | §15.407(e) | 6dB Bandwidth Measurement | Pass |
| 4 | §15.403(i) | 26dB bandwidth Measurement | Pass |
| 5 | §15.407(a)(1) | Power Spectral Density | Pass |
| 6 | §15.407(g) | Frequency Stability | Pass (See Note 1) |
| 7 | §15.407(c) | Transmission Discontinuation Requirement | Pass (See Note 2) |
| 8 | §15.407(b)(1) | Conducted Band Edge and Out-of-Band Emissions | Pass |
| 9 | §15.209,§15.407(b)(1) | Radiated Spurious Emission | Pass |
| 10 | §15.207 | AC Power Line Conducted Emission | Not applicable |

Note:

1. Refer to the manufacturer's declaration in the user manual.
2. The device operates without the transmission of information.
3. The WIFI function cannot transmit when charging.

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## 5. Description of Test Modes

| EUT Configure Mode | Applicable To | | | | Description |
|---|---|---|---|---|---|
| | RE > 1G | RE < 1G | PLC | APCM | |
| A | -- | -- | -- | -- | Powered by Adapter with WIFI(5G) Link |
| B | ☒ | ☒ | -- | ☒ | Powered by Battery with WIFI(5G) Link |
| C | -- | -- | -- | -- | Powered by USB with WIFI(5G) Link |

Where, **RE > 1G: Radiated Emission above 1GHz** **PLC: Power Line Conducted Emission**

**RE < 1G: Radiated Emission below 1GHz** **APCM: Antenna Port Conducted Measurement**

NOTE 1: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.

NOTE 2: "--"means no effect.

NOTE 3: The radiation part tests the dual-antenna MIMO as the worst combination.

- **Radiated Emission Test (Above 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (IF EUT with antenna diversity architecture).

☐ Support 802.11ax, device debugging is tested in Full RU state

☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Freq. Band (MHz) | Available Channel | Tested Channel | Modulation | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| B | 802.11ac (20MHz) | 5180-5240 | 36 | 36 | OFDM | MCS0 |

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- **Radiated Emission Test (Below 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).

☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Freq. Band (MHz) | Available Channel | Tested Channel | Modulation | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| B | 802.11ac(20MHz) | 5180-5240 | 36 | 36 | OFDM | MCS0 |

- **Power Line Conducted Emission Test:**

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).

☐ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.

☐ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Freq. Band (MHz) | Available Channel | Tested Channel | Modulation | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| B | 802.11ac(20MHz) | 5180-5240 | 36 | 36 | OFDM | MCS0 |

- **Band edge Measurement:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).

☐ Support 802.11ax, device debugging is tested in Full RU state

☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Freq. Band (MHz) | Available Channel | Tested Channel | Modulation | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| B | 802.11ac (20MHz) | 5180-5240 | 36 | 36 | OFDM | MCS0 |

- **Antenna Port Conducted Measurement:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).

☐ Support 802.11ax, device debugging is tested in Full RU state

☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Freq. Band (MHz) | Available Channel | Tested Channel | Modulation | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| B | 802.11ac (20MHz) | 5180-5240 | 36 | 36 | OFDM | MCS0 |

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## 6. Duty Cycle Measurement

5GHz WLAN (NII) operation is possible in 20MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Average. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

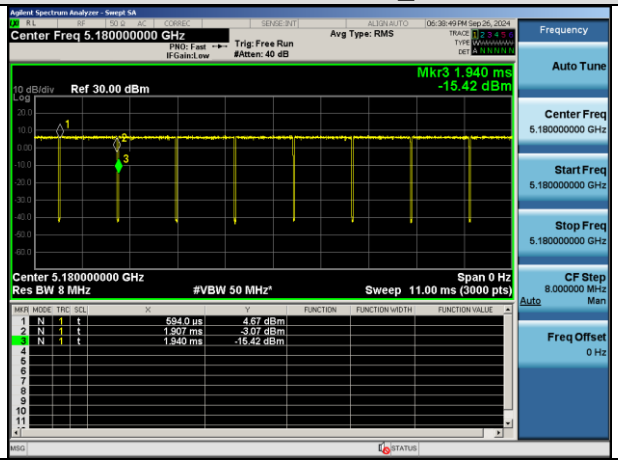
| Operating mode | Data rates (Mbps) | Duty Cycle (%) | Duty Cycle Factor (dB) |
|---|---|---|---|
| Band U-NII1:5150MHz-5250MHz | | | |
| 802.11ac_VHT20 | MCS0 | 98 | 18.24 |

Remark:

1. Duty Cycle factor = 10 * log (1/ Duty cycle)
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
3. Involving the test items of duty cycle compensation coefficient, the final results have been added and calculated by the software and presented.

The test plots as follows:

IEEE 802.11ac-VHT20_U-NII 1

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# 7. RF Output Power Measurement

## 7.1 Provisions Applicable

| Operation Band | EUT Category | | LIMIT |
|---|---|---|---|
| U-NII-1 | ☐ | Outdoor Access Point | 1 Watt (30 dBm)<br>(Max. e.i.r.p < 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon) |
| | ☐ | Fixed point-to-point Access Point | 1 Watt (30 dBm) |
| | ☐ | Indoor Access Point | 1 Watt (30 dBm) |
| | ☒ | Client devices | 250mW (23.98 dBm) |
| U-NII-2A | / | | 250mW (23.98 dBm) or 11 dBm+10 log B* |
| U-NII-2C | / | | 250mW (23.98 dBm) or 11 dBm+10 log B* |
| U-NII-3 | / | | 1 Watt (30 dBm) |

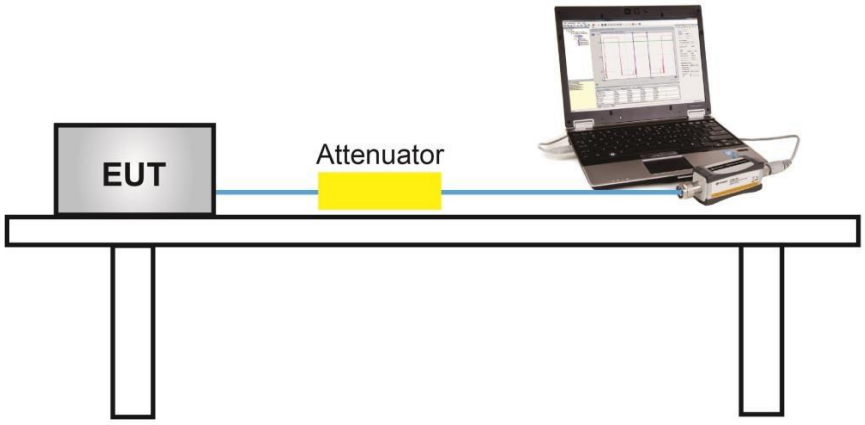
Note: Where B is the 26dB emission bandwidth in MHz.

## 7.2 Measurement Procedure

☒Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

1. The testing follows the ANSI C63.10 Section 12.3.3.1
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
3. The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
4. At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
5. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
6. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
7. Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
8. Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}.
9. The final test results have been increased by the duty cycle factor and recorded in the report.

## 7.3 Measurement Setup (Block Diagram of Configuration)

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### 7.4 Measurement Result

| Test Data of Conducted Output Power for band 5.15-5.25-Chain A | | | | |
|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | Average Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11ac20 | 5180 | 7.94 | 23.98 | Pass |

| Test Data of Conducted Output Power for band 5.15-5.25-Chain B | | | | |
|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | Average Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11ac20 | 5180 | 7.27 | 23.98 | Pass |

| Test Data of Conducted Output Power for band 5.15-5.25 GHz-MIMO | | | | |
|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | Average Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11ac20 | 5180 | 10.63 | 23.98 | Pass |

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# 8. 6dB&26dB Bandwidth Measurement

## 8.1 Provisions Applicable

The minimum 6dB bandwidth shall be at least 500 kHz.

## 8.2 Measurement Procedure

◆ **-6dB bandwidth (DTS bandwidth) Test setting:**

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW ⩾3*RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

◆ **99% occupied bandwidth test setting:**

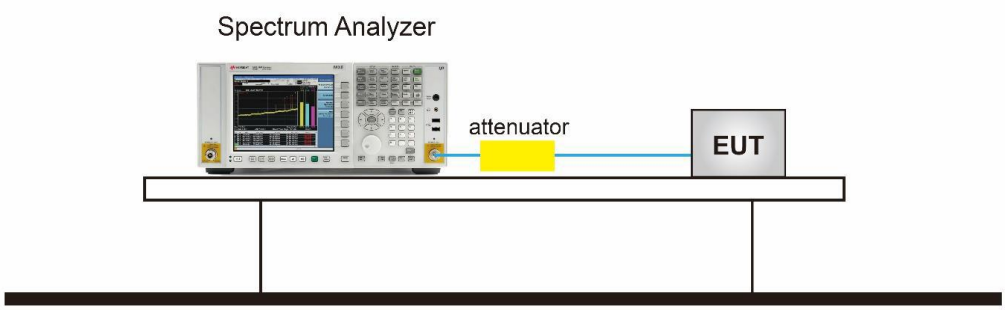
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

◆ **-26dB Bandwidth test setting:**

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

**Note:** The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

## 8.3 Measurement Setup (Block Diagram of Configuration)

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### 8.4 Measurement Results

| Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz-Chain A | | | | | |
|---|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | 99% Occupied Bandwidth (MHz) | -26dB Bandwidth (MHz) | Limits (MHz) | Pass or Fail |
| 802.11ac20 | 5180 | 17.613 | 21.52 | N/A | Pass |

| Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz-Chain B | | | | | |
|---|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | 99% Occupied Bandwidth (MHz) | -26dB Bandwidth (MHz) | Limits (MHz) | Pass or Fail |
| 802.11ac20 | 5180 | 17.563 | 20.03 | N/A | Pass |

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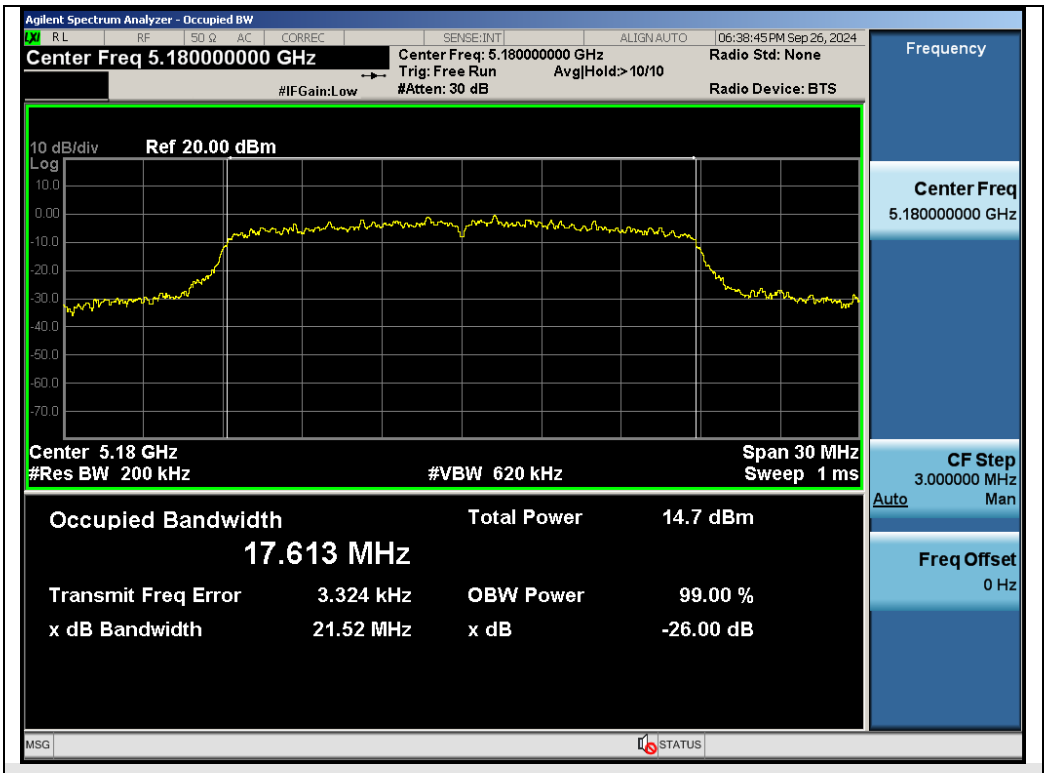
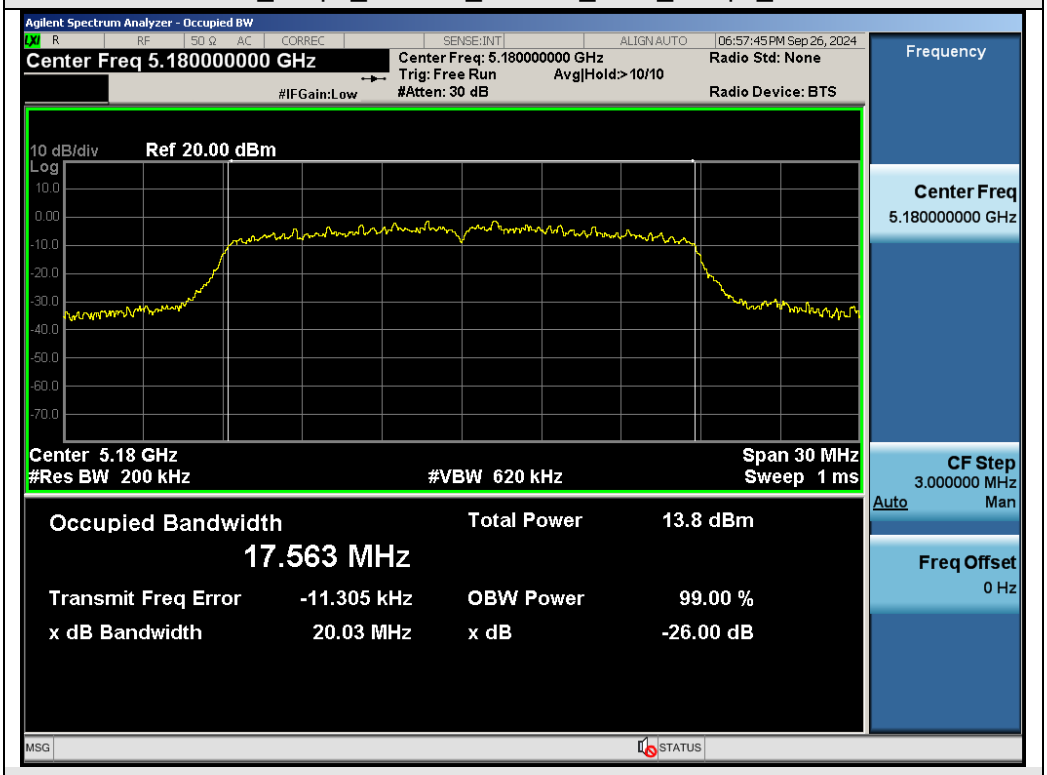
## Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz




Test_Graph_802.11a_Chain A_5180_6Mbps_OBW




Test_Graph_802.11a_ Chain B_5180_6Mbps_OBW

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# 9. Power Spectral Density Measurement

## 9.1 Provisions Applicable

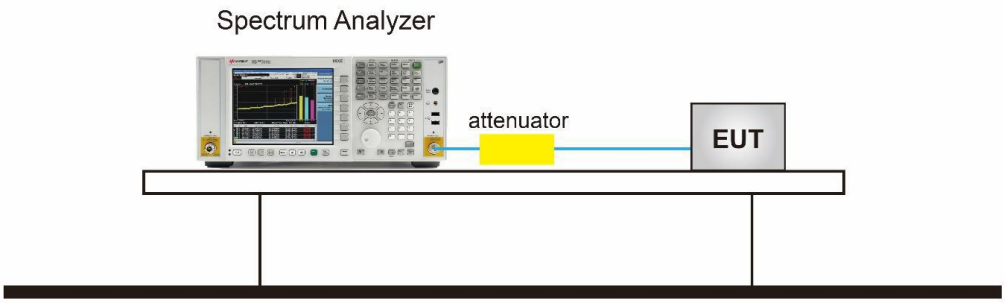
| Operation Band | EUT Category | | LIMIT |
|---|---|---|---|
| U-NII-1 | ☐ | Outdoor Access Point | 17dBm/ MHz |
| | ☐ | Fixed point-to-point Access Point | 17dBm/ MHz |
| | ☐ | Indoor Access Point | 17dBm/ MHz |
| | ☒ | Client devices | 11dBm/ MHz |
| U-NII-2A | / | | 11dBm/ MHz |
| U-NII-2C | / |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

## 9.2 Measurement Procedure

☒For Average power spectral density test:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz.
4. If measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100KHz
5. Set VBW≥[3×RBW].
6. Sweep Time=Auto couple.
7. Detector function=RMS (i.e., power averaging).
8. Trace average at least 100 traces in power averaging (rms) mode.
9. When the measurement bandwidth of Maximum PSD is specified in 100 kHz, add a constant factor 10*log(500kHz/100kHz) = 6.99 dB to the measured result.
10. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
11. Add [10 log (1/D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is 25%.
12. The final test results have been increased by the duty cycle factor and recorded in the report

## 9.3 Measurement Setup (Block Diagram of Configuration)

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### 9.4 Measurement Result

| Test Data of Conducted Output Power Density for band 5.15-5.25 GHz-Chain A | | | | |
|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | Average Power Density (dBm/MHz) | Limits (dBm/MHz) | Pass or Fail |
| 802.11ac20 | 5180 | -2.093 | 11 | Pass |

| Test Data of Conducted Output Power Density for band 5.15-5.25 GHz-Chain B | | | | |
|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | Average Power Density (dBm/MHz) | Limits (dBm/MHz) | Pass or Fail |
| 802.11ac20 | 5180 | -2.813 | 11 | Pass |

| Test Data of Conducted Output Power Density for band 5.25-5.35 GHz-MIMO | | | | |
|---|---|---|---|---|
| Test Mode | Test Channel (MHz) | Average Power Density (dBm/MHz) | Limits (dBm/MHz) | Pass or Fail |
| 802.11ac20 | 5180 | 0.57 | 11 | Pass |

Note:1.The Total PSD = $10*\log \{10^{(\text{Chain A PSD}/10)} + 10^{(\text{Chain B PSD}/10)}\}$.

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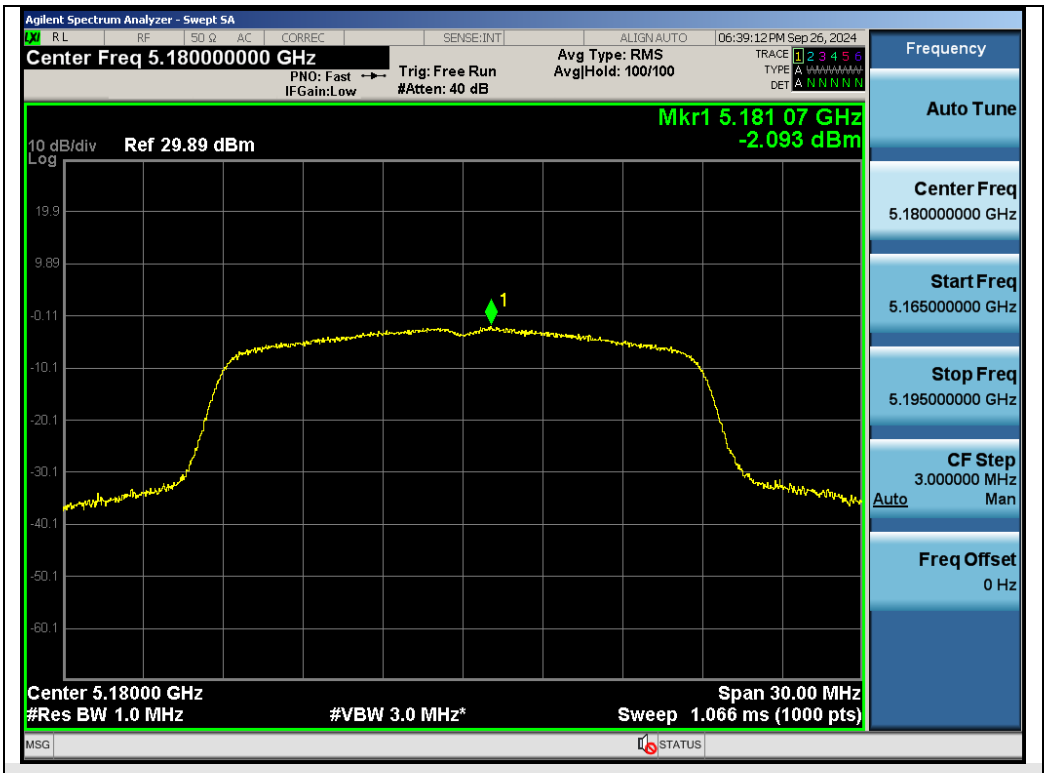
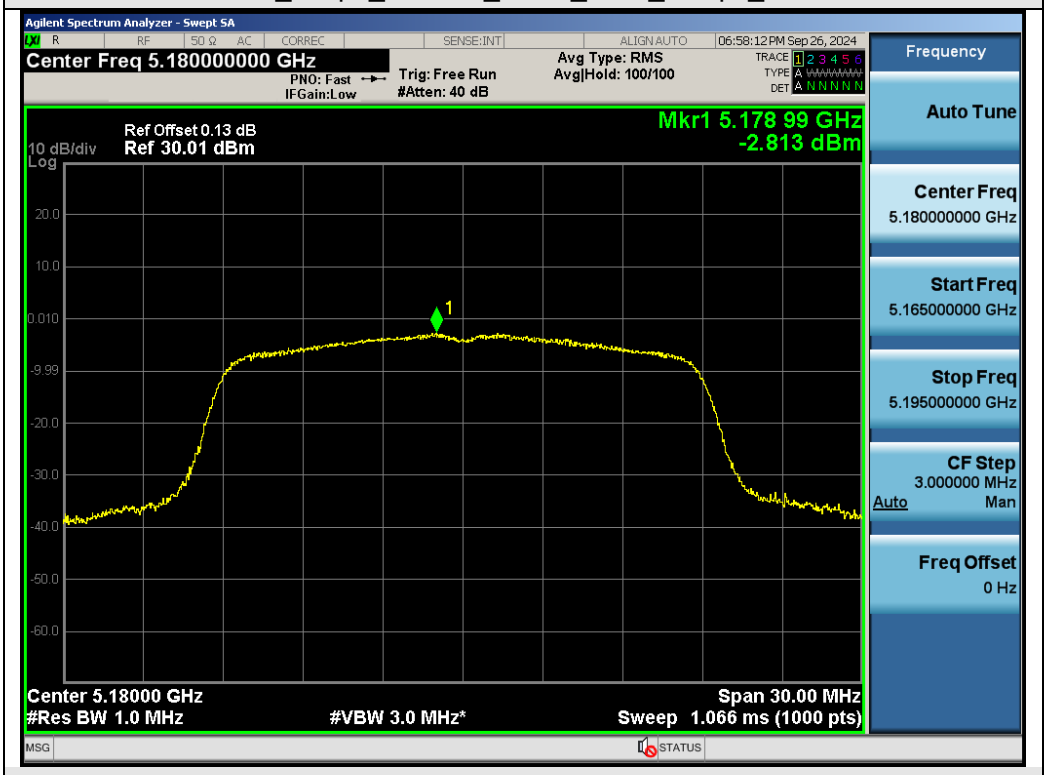
## Test Graphs of Conducted Output Power Spectral Density for band 5.15-5.25 GHz




Test_Graph_802.11a_ANT1_5180_6Mbps_PSD




Test_Graph_802.11a_ANT1_5200_6Mbps_PSD

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# 10. Conducted Band Edge and Out-of-Band Emissions

## 10.1 Provisions Applicable

| | Applicable to | Limit | |
|---|---|---|---|
| Restricted bands | 789033 D02 General UNII Test Procedures New Rules v02r01 | Field strength at 3m (dBuV/m) | |
| | | PK: 74 | AV: 54 |
| Out of the restricted bands | Applicable to | EIRP Limit (dBm/MHz) | Equivalent field Strength at 3m (dBuV/m) |
| | FCC 15.407(b)(1) | PK: -27 | PK: 68.2 |
| | 15.407(b)(2) | | |
| | 15.407(b)(3) | | |
| | 15.407(b)(4) | See Note 2 | |

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \mu V/m, \text{ where P is the eirp (Watts).}$$

Note 2: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

## 10.2 Measurement Procedure

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
3. RBW = 1MHz; VBW= 3MHz; Sweep = auto; Detector function = Peak. (Test frequency below 1GHz)
4. RBW = 1 MHz; VBW= 3 MHz; Sweep = auto; Detector function = Peak. (Test frequency Above 1GHz)
5. Set SPA Trace 1 Max hold, then View.
6. Antenna gain and path loss have been compensated to the Correction factor.
7. Mark the maximum useless stray point and compare it with the limit value to record the result.

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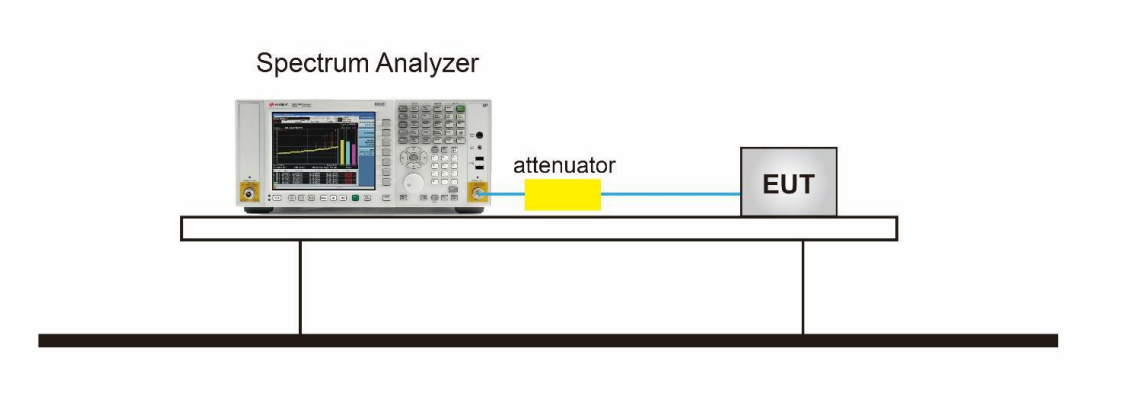
## 10.3 Measurement Setup (Block Diagram of Configuration)

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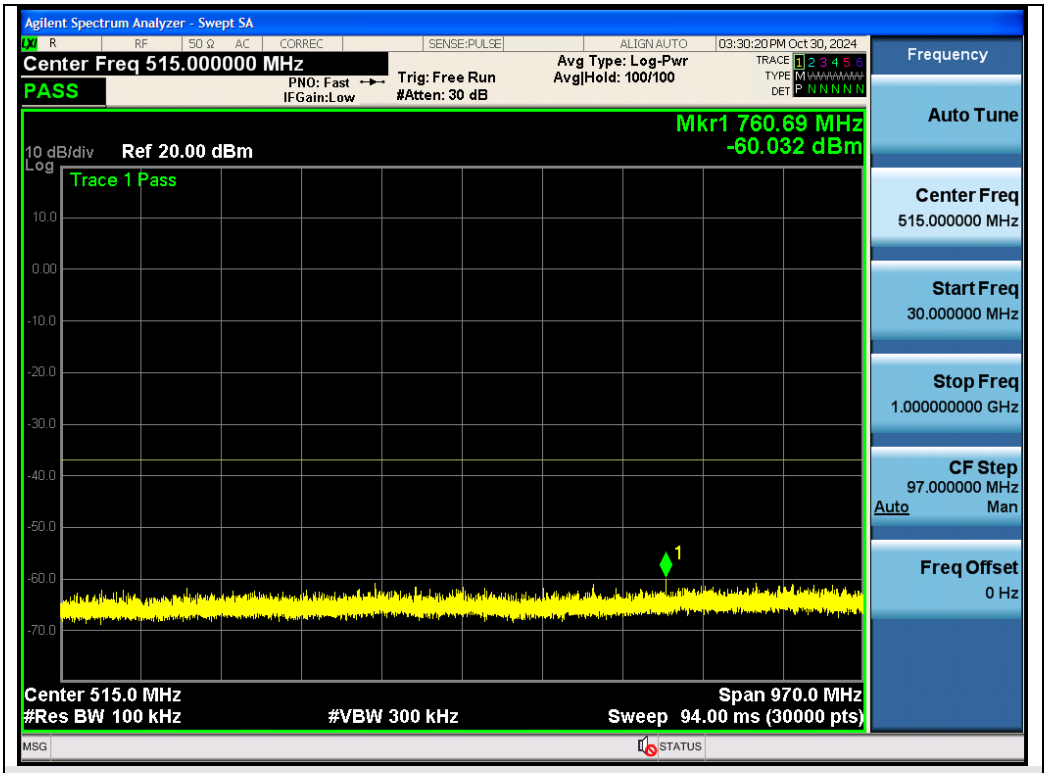
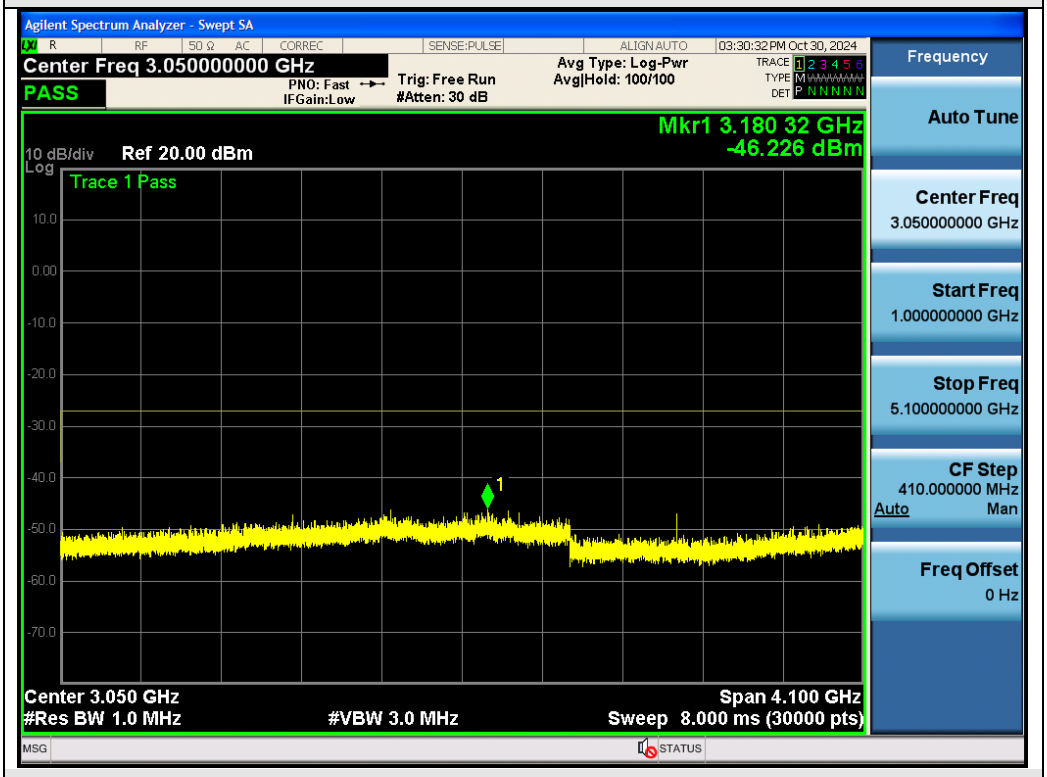
## 10.4 Measurement Results

**Test Graphs of Spurious Emissions outside of the 5.15-5.25 GHz band**




Test_Graph_802.11ac20_CHAIN A_5180_6Mbps_Frequency Band 1




Test_Graph_802.11ac20_CHAIN A_5180_6Mbps_Frequency Band 2

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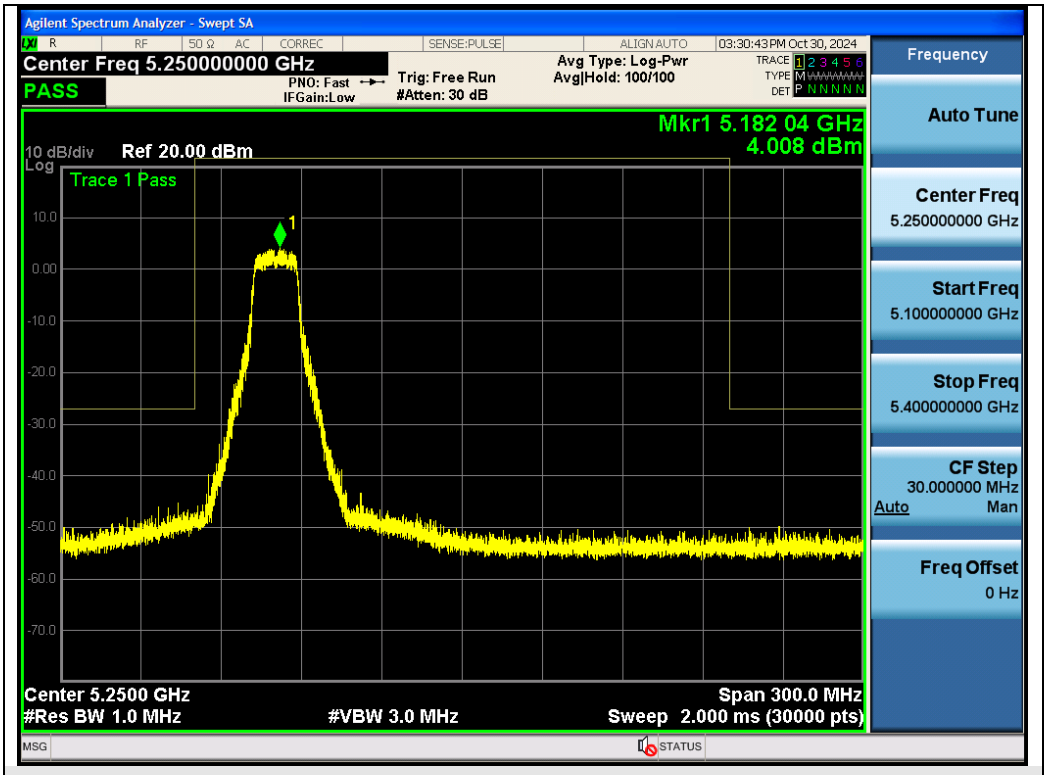
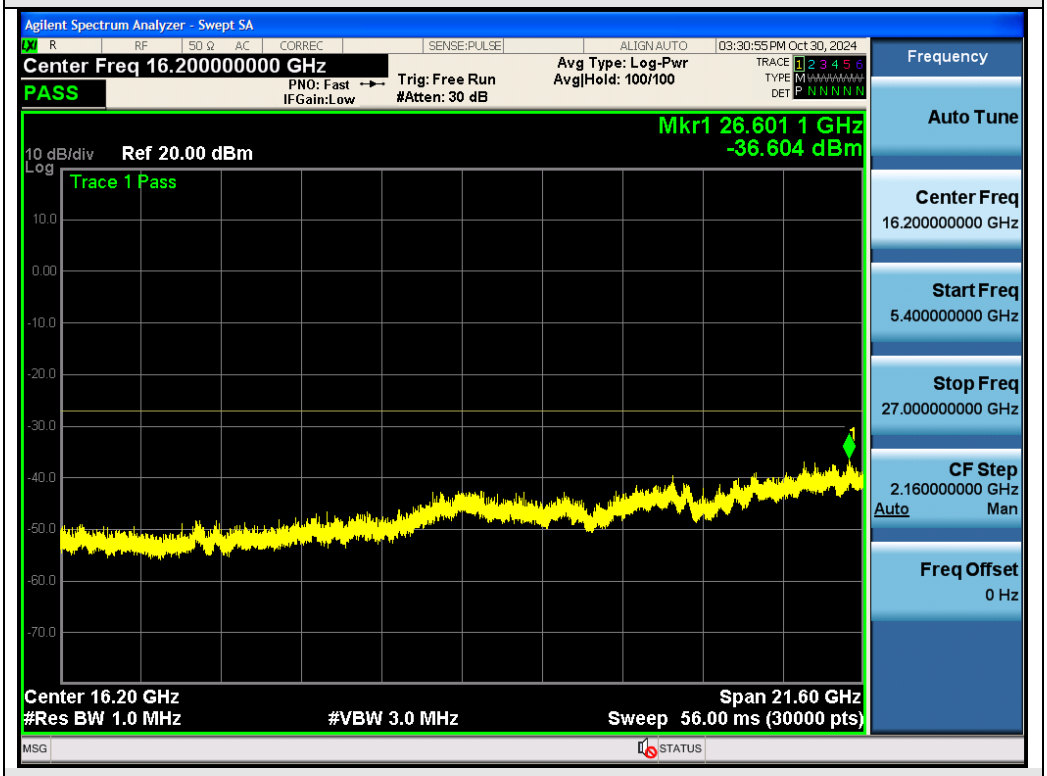



Test_Graph_802.11ac20_CHAIN A_5180_6Mbps_Frequency Band 3




Test_Graph_802.11ac20_CHAIN A_5180_6Mbps_Frequency Band 4

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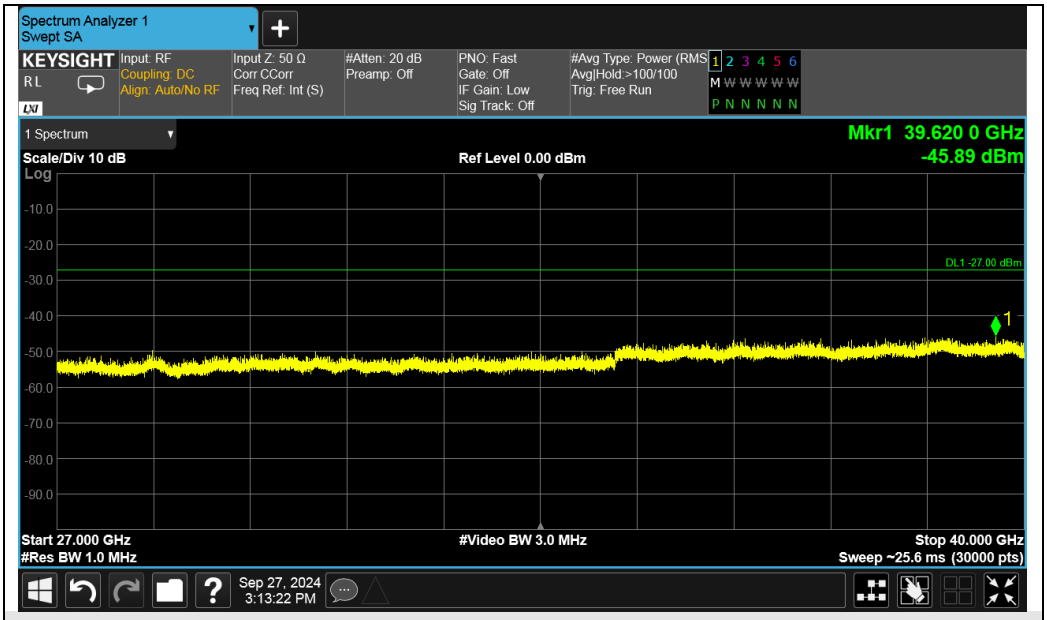
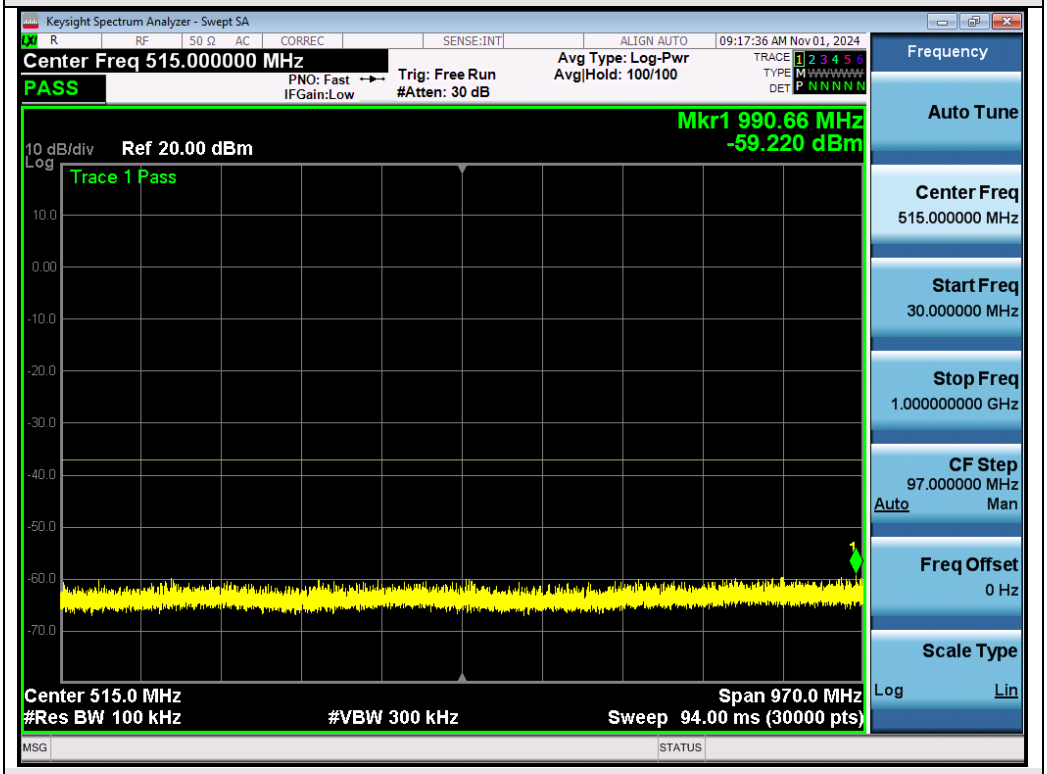



Test_Graph_802.11ac20_CHAIN A_5180_6Mbps_Frequency Band 5




Test_Graph_802.11ac20_CHAIN B_5180_6Mbps_Frequency Band 1

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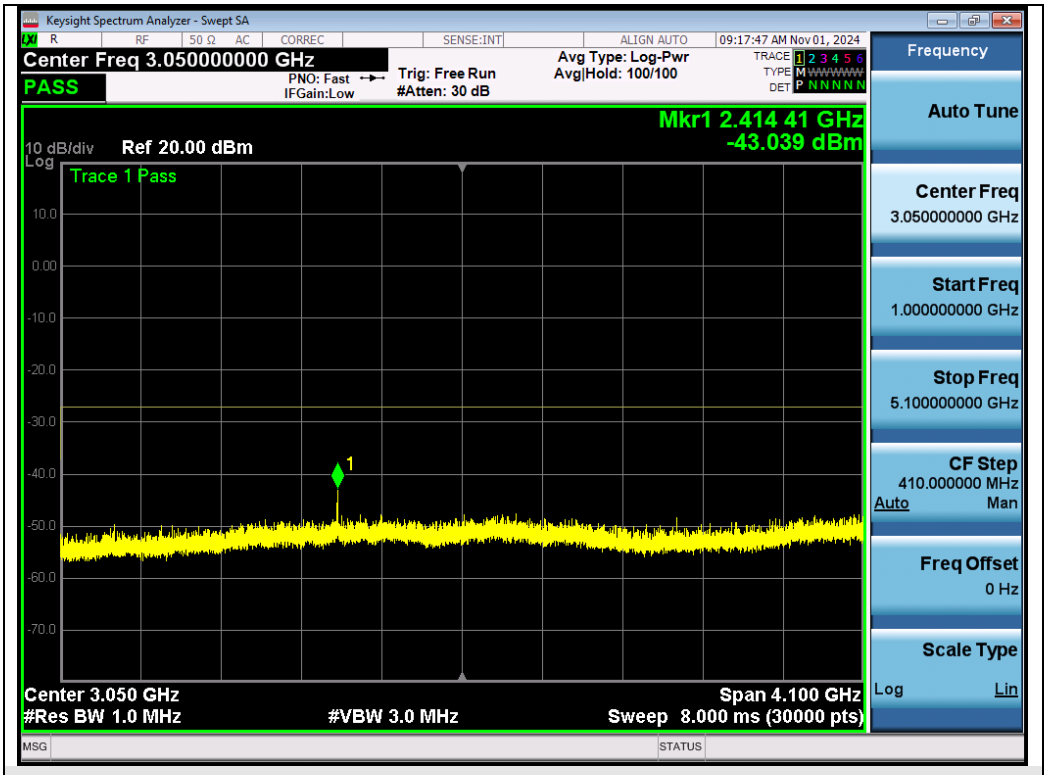
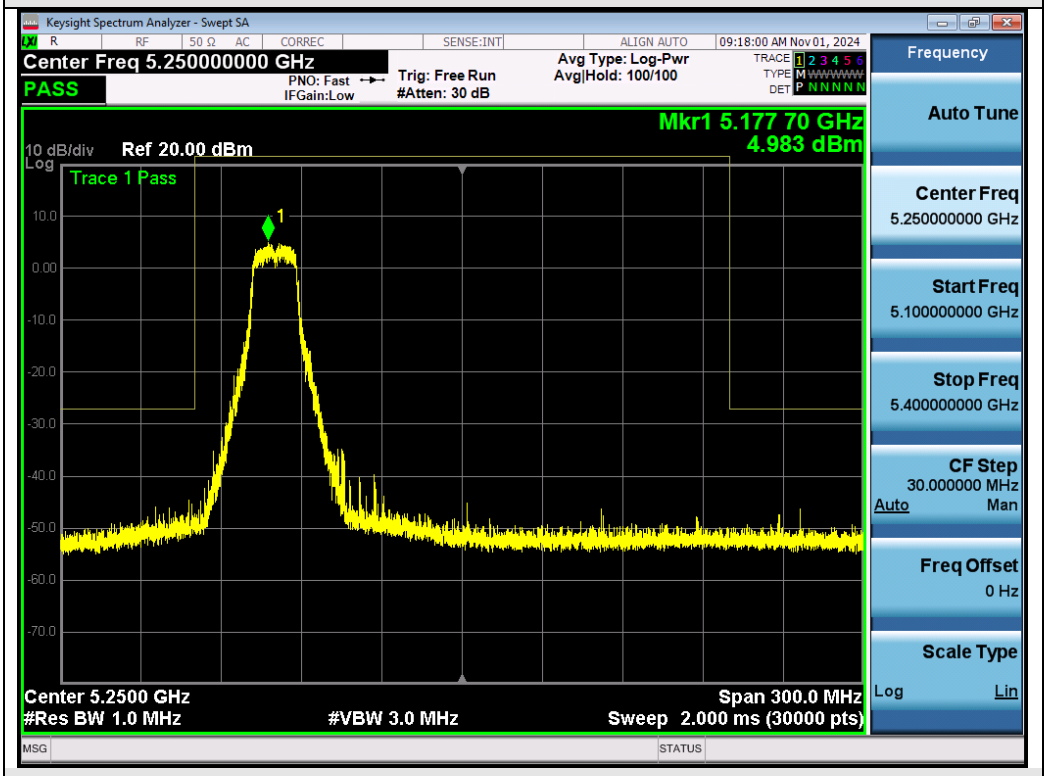


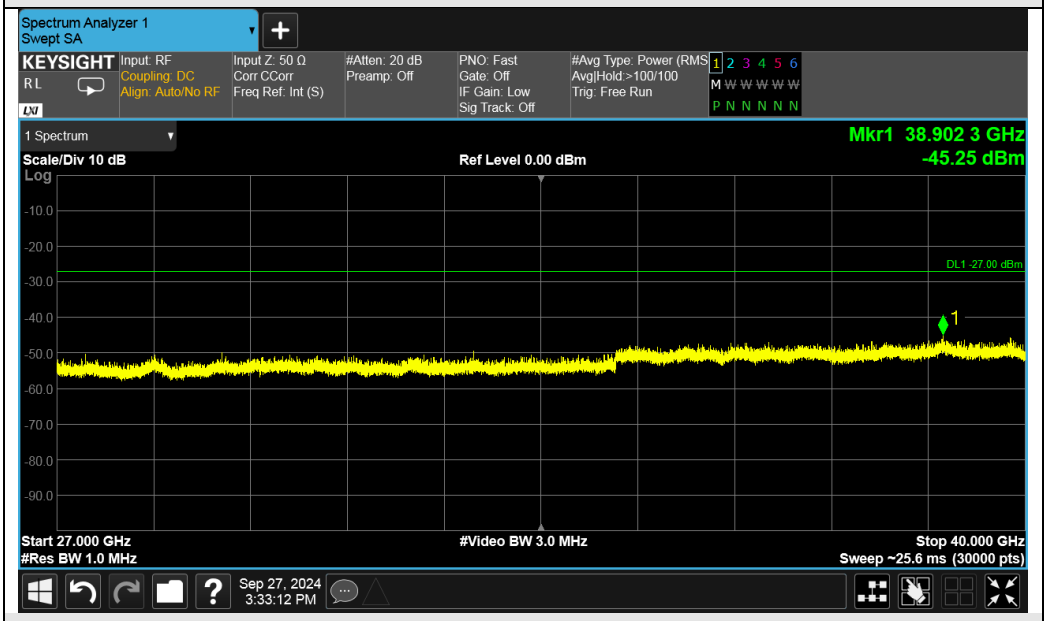

Test_Graph_802.11ac20_CHAIN B_5180_6Mbps_Frequency Band 2




Test_Graph_802.11ac20_CHAIN B_5180_6Mbps_Frequency Band 3

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Test_Graph_802.11ac20_CHAIN B_5180_6Mbps_Frequency Band 4




Test_Graph_802.11ac20_CHAIN B_5180_6Mbps_Frequency Band 5

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# 11. Radiated Spurious Emission

## 11.1 Measurement Limit

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 - 0.490 | 2400/F(kHz) | 300 |
| 0.490 - 1.705 | 24000/F(kHz) | 30 |
| 1.705 - 30.0 | 30 | 30 |
| 30 - 88 | 100 | 3 |
| 88 - 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

| | | | |
|---|---|---|---|
| Restricted bands | Applicable to | Limit | |
| | 789033 D02 General UNII Test Procedures New Rules v02r01 | Field strength at 3m (dBuV/m) | |
| | | PK: 74 | AV: 54 |
| Out of the restricted bands | Applicable to | EIRP Limit (dBm/MHz) | Equivalent field Strength at 3m (dBuV/m) |
| | FCC 15.407(b)(1) | PK: -27 | PK: 68.2 |
| | 15.407(b)(2) | | |
| | 15.407(b)(3) | | |
| | 15.407(b)(4) | See Note 2 | |

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30 P}}{3}$$ μV/m, where P is the eirp (Watts).

Note 2: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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**11.2 Measurement Procedure**

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

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The following table is the setting of spectrum analyzer and receiver.

| Receiver Parameter | Setting |
|---|---|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP |

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.Section G) Unwanted emissions measurement.

◆ **Procedure for Unwanted Emissions Measurements Below 1000MHz:**

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

◆ **Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz:**

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

◆ **Procedures for Average Unwanted Emissions Measurements Above 1000MHz:**

- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

◆ **Procedures for Average Unwanted Emissions Measurements Above 1000MHz:**

- RBW = 1 MHz
- VBW = 3 MHz • Detector = power averaging (rms), set span/(# of points in sweep) ≥ RBW/2.
- Averaging type = power averaging (RMS)
- The correction factor shall be offset is 10 log (1/x), where x is the duty cycle.

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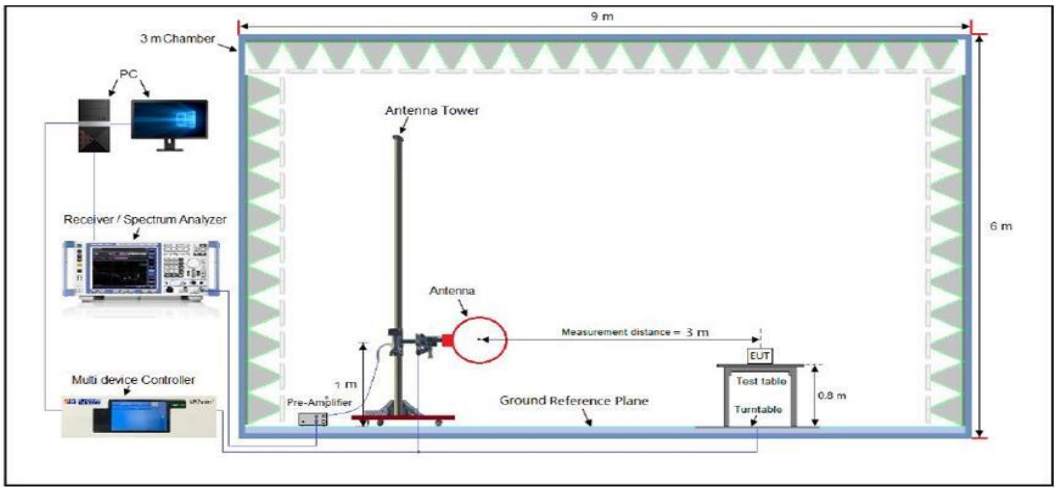
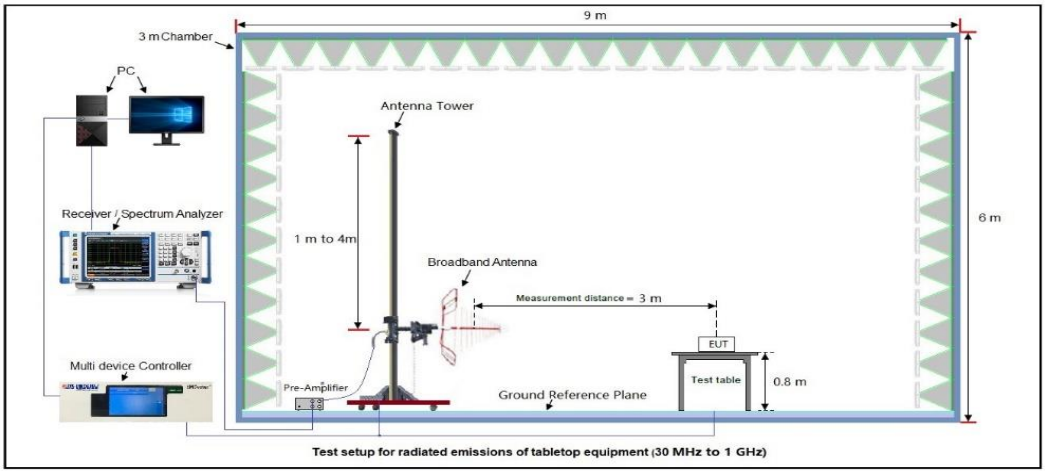
## 11.3 Measurement Setup (Block Diagram of Configuration)

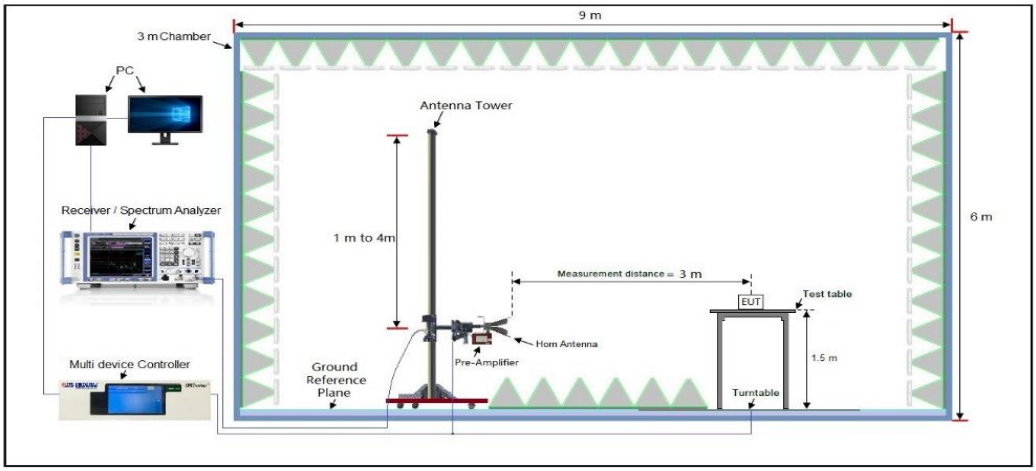
Radiated Emission Test Setup 9kHz-30MHz




Radiated Emission Test Setup 30MHz-1000MHz




Radiated Emission Test Setup Above 1000MHz

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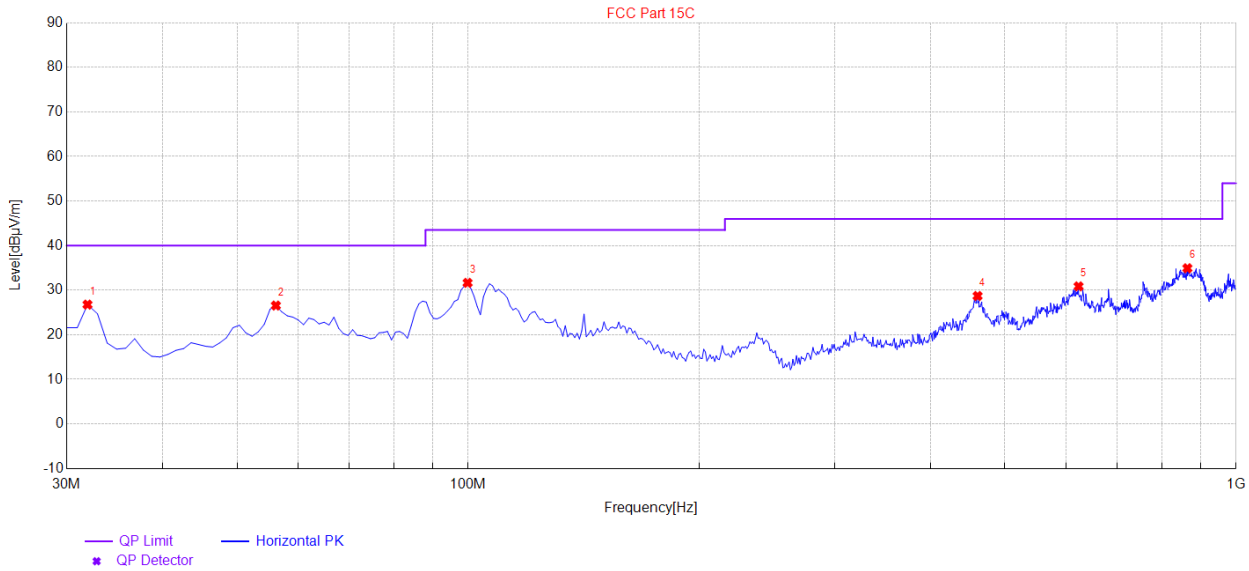
## 11.4 Measurement Result

**Radiated Emission Below 30MHz**

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

**Radiated Emission Test Results at 30MHz-1GHz**

| | | | |
|---|---|---|---|
| **EUT Name** | DRONE | **Model Name** | W5 |
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11ac(20MHz)_5180MHz | **Antenna** | Horizontal |




| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 31.94 | 26.77 | 12.70 | 40.00 | 13.23 | 100 | 240 | Horizontal |
| 2 | 56.19 | 26.56 | 16.86 | 40.00 | 13.44 | 100 | 50 | Horizontal |
| 3 | 99.84 | 31.65 | 17.03 | 43.50 | 11.85 | 100 | 20 | Horizontal |
| 4 | 460.68 | 28.71 | 24.60 | 46.00 | 17.29 | 100 | 10 | Horizontal |
| 5 | 623.64 | 30.86 | 25.40 | 46.00 | 15.14 | 100 | 320 | Horizontal |
| 6 | 864.2 | 34.93 | 29.87 | 46.00 | 11.07 | 100 | 170 | Horizontal |

**Result: Pass**

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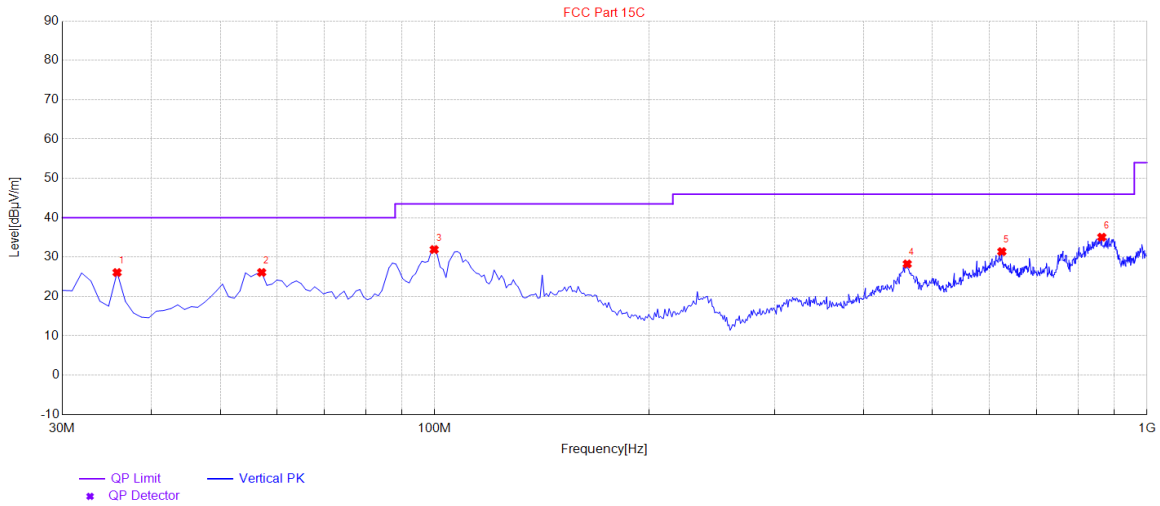
| EUT Name | DRONE | Model Name | W5 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11ac(20MHz)_5180MHz | Antenna | Vertical |




| NO. | Freq. [MHz] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 35.82 | 26.08 | 11.52 | 40.00 | 13.92 | 100 | 290 | Vertical |
| 2 | 57.16 | 26.10 | 17.13 | 40.00 | 13.90 | 100 | 0 | Vertical |
| 3 | 99.84 | 31.92 | 17.03 | 43.50 | 11.58 | 100 | 0 | Vertical |
| 4 | 460.68 | 28.27 | 24.60 | 46.00 | 17.73 | 100 | 40 | Vertical |
| 5 | 625.58 | 31.39 | 25.12 | 46.00 | 14.61 | 100 | 270 | Vertical |
| 6 | 864.2 | 35.06 | 29.87 | 46.00 | 10.94 | 100 | 0 | Vertical |

**Result: Pass**

**Note:**

1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
2. All test modes had been pre-tested, Refer to Chapter 5 of the report for details.

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**Radiated Emissions Test Results Above 1GHz**

| | | | |
|---|---|---|---|
| **EUT Name** | DRONE | **Model Name** | W5 |
| **Temperature** | 25°C | **Relative Humidity** | 60% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11ac(20MHz)_5180MHz | **Antenna** | Horizontal/Vertical |

Radiated Emission Above 1GHz–Horizontal

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Value Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 10360.000 | 50.11 | 9.14 | 59.25 | 68.20 | -8.95 | peak |
| 15540.000 | 50.63 | 10.22 | 60.85 | 74.00 | -13.15 | peak |
| 15540.000 | 31.79 | 10.22 | 42.01 | 54.00 | -11.99 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Radiated Emission Above 1GHz–Vertical

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Value Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 10360.000 | 48.99 | 9.14 | 58.13 | 68.20 | -10.07 | peak |
| 15540.000 | 47.39 | 10.22 | 57.61 | 74.00 | -16.39 | peak |
| 15540.000 | 32.33 | 10.22 | 42.55 | 54.00 | -11.45 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

**Result: Pass**

**Note:**

1. The amplitude of other spurious emissions from 1GHz to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.
2. Factor = Antenna Factor + Cable loss - Amplifier gain, Margin=Measure Result-Limit.
3. The “Factor” value can be calculated automatically by software of measurement system.
4. All test modes had been pre-tested. Refer to Chapter 5 of the report for details.

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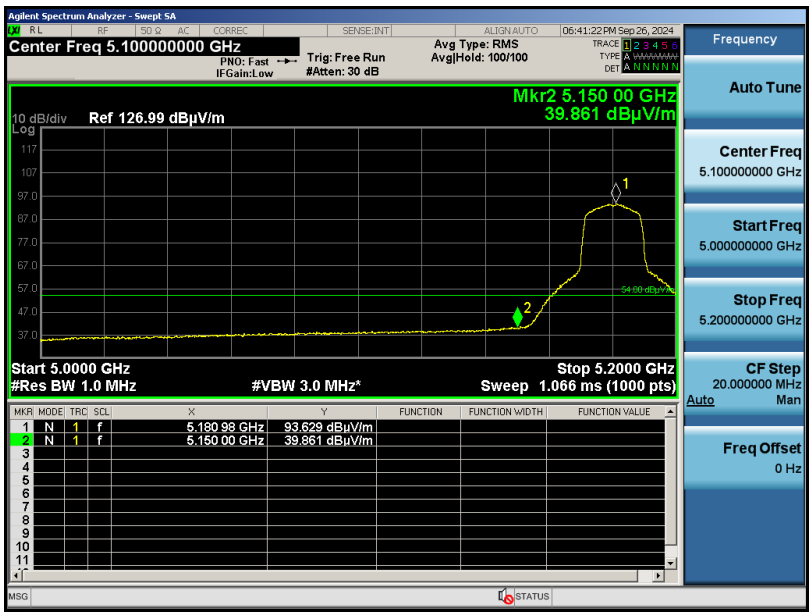
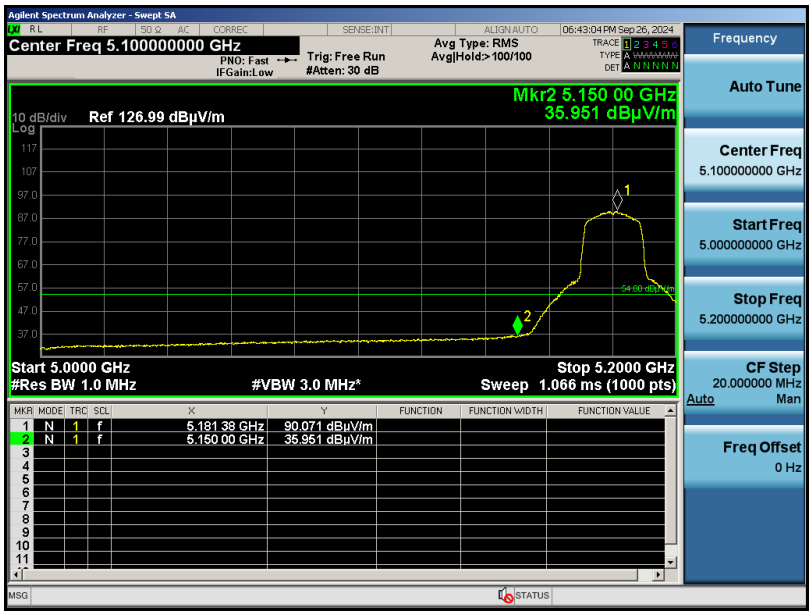
## Test Result for Band edge Emission at Restricted bands

| | | | |
|---|---|---|---|
| **EUT Name** | DRONE | **Model Name** | W5 |
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11ac20_5180MHz | **Antenna** | Horizontal |

Test Graph for Peak Measurement




Test Graph for Average Measurement




**Result: Pass**

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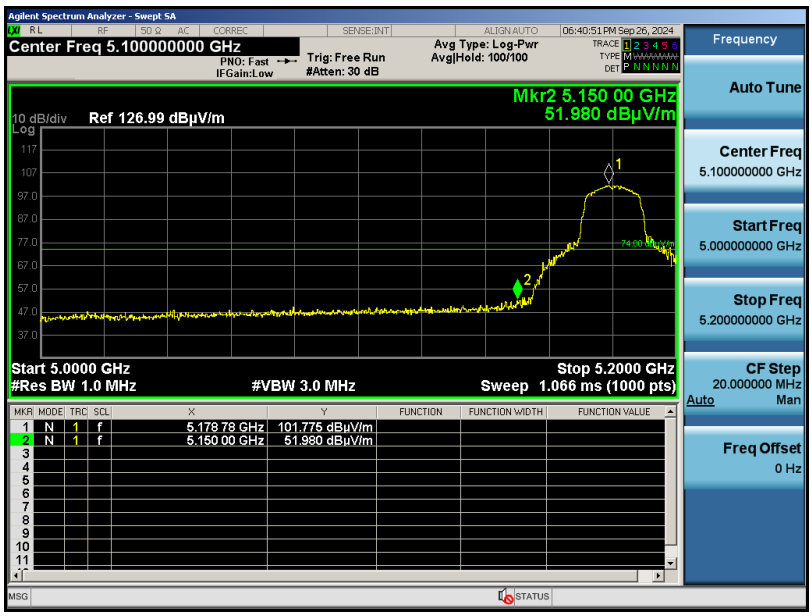
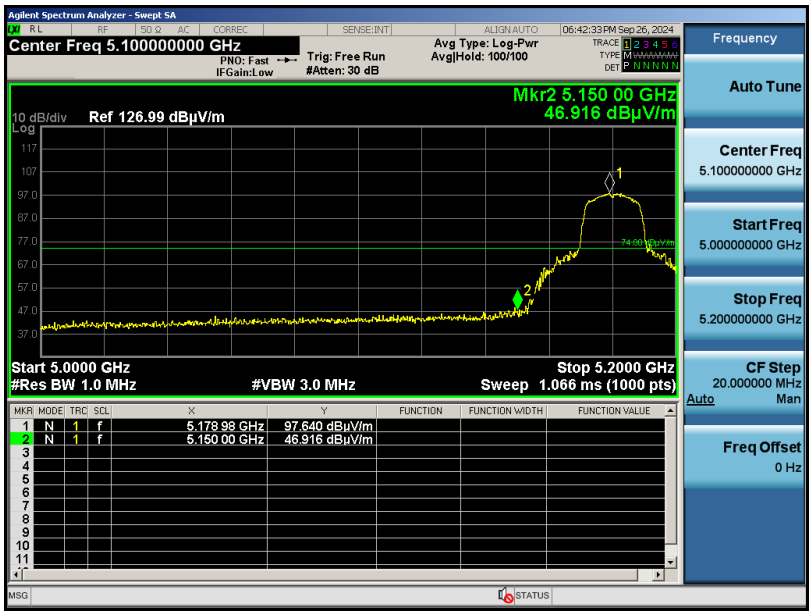
## Test Result for Band edge Emission at Restricted bands

| | | | |
|---|---|---|---|
| **EUT Name** | DRONE | **Model Name** | W5 |
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11ac20_5180MHz | **Antenna** | Vertical |

Test Graph for Peak Measurement




Test Graph for Average Measurement




**Result: Pass**

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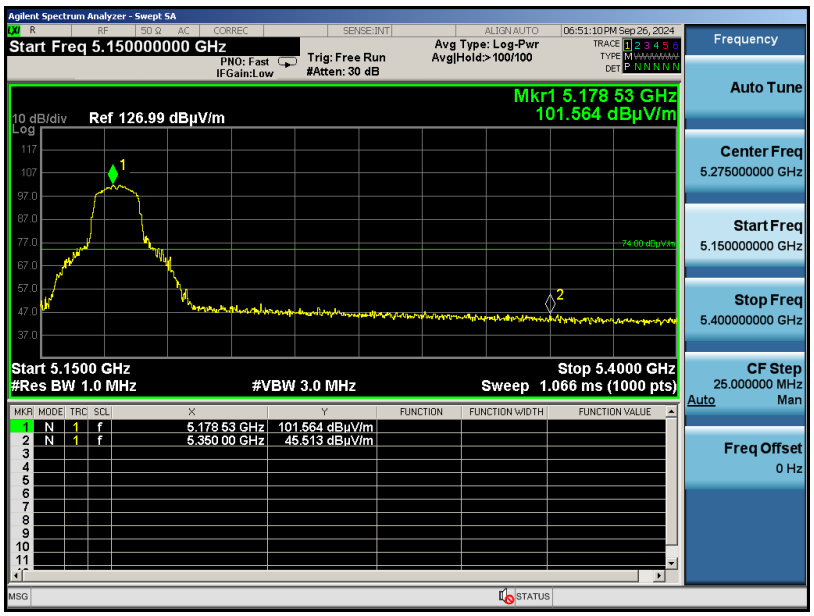
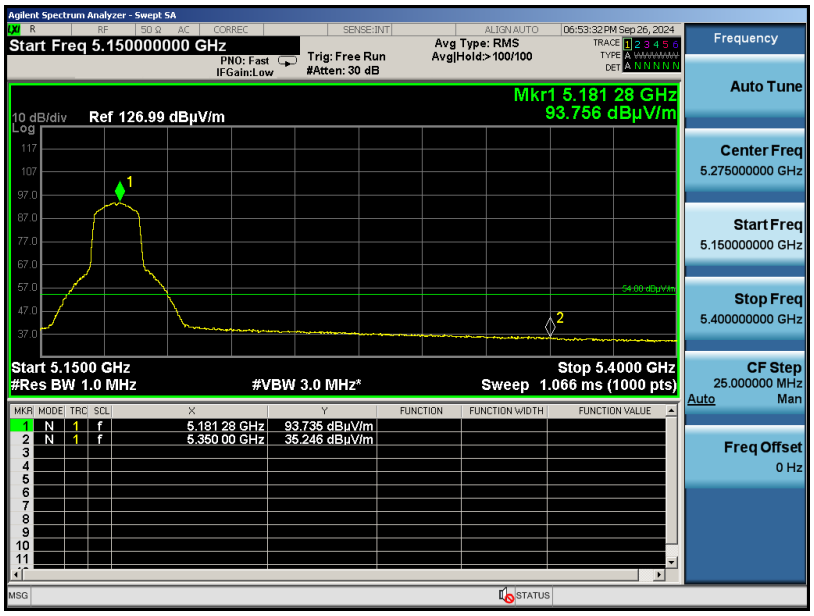
## Test Result for Band edge Emission at Restricted bands

| | | | |
|---|---|---|---|
| **EUT Name** | DRONE | **Model Name** | W5 |
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11ac20_5180MHz | **Antenna** | Horizontal |

Test Graph for Peak Measurement




Test Graph for Average Measurement




**Result: Pass**

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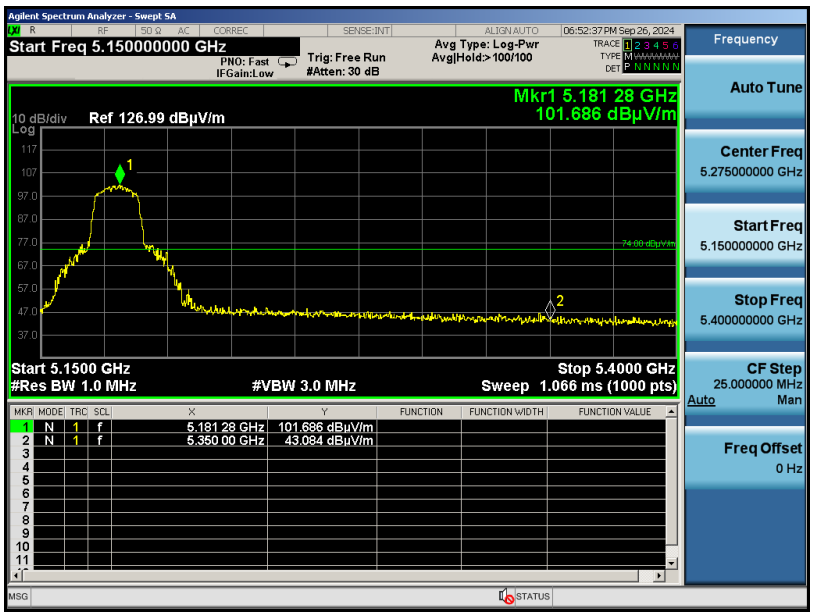
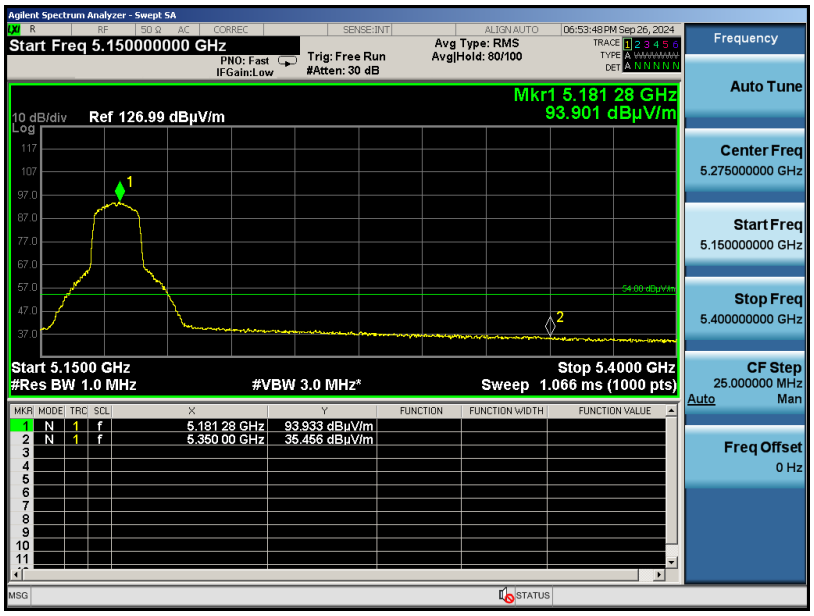
## Test Result for Band edge Emission at Restricted bands

| | | | |
|---|---|---|---|
| **EUT Name** | DRONE | **Model Name** | W5 |
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11ac20_5180MHz | **Antenna** | Vertical |

Test Graph for Peak Measurement




Test Graph for Average Measurement




**Result: Pass**

**Note:**

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1. The factor had been edited in the “Input Correction” of the Spectrum Analyzer.
2. All test modes had been pre-tested, Refer to Chapter 5 of the report for details.

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## 12. AC Power Line Conducted Emission Test

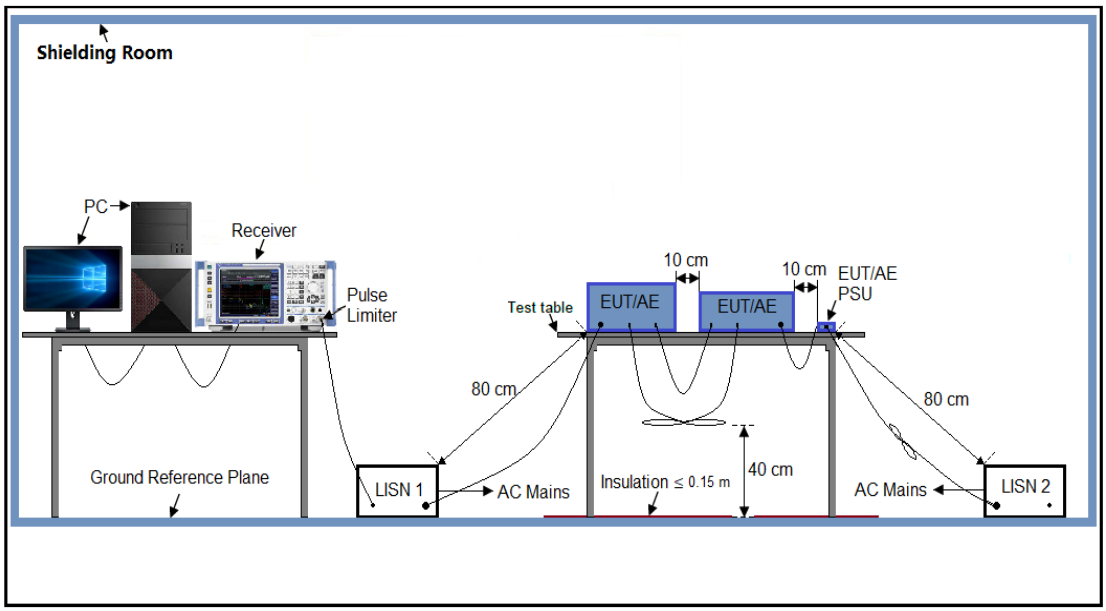
### 12.1 Measurement limit

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | Q.P (dBμV) | Average (dBμV) |
| 150kHz~500kHz | 66-56 | 56-46 |
| 500kHz~5MHz | 56 | 46 |
| 5MHz~30MHz | 60 | 50 |

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

### 12.2 Block Diagram of Line Conducted Emission Test

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### 12.3 Preliminary Procedure of Line Conducted Emission Test

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 Ohm load; the second scan had Line 1 connected to a 50 Ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 12.4 Final Procedure of Line Conducted Emission Test

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case was reported on the Summary Data page.

### 12.5 Test Result of Line Conducted Emission Test

Note: The WIFI function cannot transmit when charging.

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## Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC15705240915AP01

## Appendix II: Photographs of EUT

Refer to the Report No.: AGC15705240915AP02

**----End of Report----**

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# Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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