

FCC Test Report

Report No.: RFBIBJ-WTW-P22010311-2

FCC ID: HBW-GDOCAM3

Test Model: GDOCAM3

Received Date: Jan. 10, 2022

Test Date: Jan. 18 ~ Jan. 25, 2022

Issued Date: Feb. 17, 2022

Applicant: The Chamberlain Group Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

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FCC Registration / 788550 / TW0003

Designation Number: 281270 / TW0032



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Table of Contents

| | |
|---|-----------|
| Release Control Record | 4 |
| 1 Certificate of Conformity | 5 |
| 2 Summary of Test Results | 6 |
| 2.1 Measurement Uncertainty | 6 |
| 2.2 Modification Record | 6 |
| 3 General Information | 7 |
| 3.1 General Description of EUT | 7 |
| 3.2 Description of Test Modes | 8 |
| 3.2.1 Test Mode Applicability and Tested Channel Detail | 9 |
| 3.3 Duty Cycle of Test Signal | 11 |
| 3.4 Description of Support Units | 12 |
| 3.4.1 Configuration of System under Test | 12 |
| 3.5 General Description of Applied Standards and References | 12 |
| 4 Test Types and Results | 13 |
| 4.1 Radiated Emission and Bandedge Measurement | 13 |
| 4.1.1 Limits of Radiated Emission and Bandedge Measurement | 13 |
| 4.1.2 Test Instruments | 15 |
| 4.1.3 Test Procedures | 16 |
| 4.1.4 Deviation from Test Standard | 16 |
| 4.1.5 Test Setup | 17 |
| 4.1.6 EUT Operating Conditions | 18 |
| 4.1.7 Test Results | 19 |
| 4.2 Conducted Emission Measurement | 39 |
| 4.2.1 Limits of Conducted Emission Measurement | 39 |
| 4.2.2 Test Instruments | 39 |
| 4.2.3 Test Procedures | 40 |
| 4.2.4 Deviation from Test Standard | 40 |
| 4.2.5 Test Setup | 40 |
| 4.2.6 EUT Operating Conditions | 40 |
| 4.2.7 Test Results | 41 |
| 4.3 Transmit Power Measurement | 43 |
| 4.3.1 Limits of Transmit Power Measurement | 43 |
| 4.3.2 Test Setup | 43 |
| 4.3.3 Test Instruments | 44 |
| 4.3.4 Test Procedure | 44 |
| 4.3.5 Deviation from Test Standard | 44 |
| 4.3.6 EUT Operating Conditions | 44 |
| 4.3.7 Test Results | 45 |
| 4.4 Occupied Bandwidth Measurement | 48 |
| 4.4.1 Test Setup | 48 |
| 4.4.2 Test Instruments | 48 |
| 4.4.3 Test Procedure | 48 |
| 4.4.4 Test Results | 49 |
| 4.5 Peak Power Spectral Density Measurement | 52 |
| 4.5.1 Limits of Peak Power Spectral Density Measurement | 52 |
| 4.5.2 Test Setup | 52 |
| 4.5.3 Test Instruments | 52 |
| 4.5.4 Test Procedures | 52 |
| 4.5.5 Deviation from Test Standard | 53 |
| 4.5.6 EUT Operating Conditions | 53 |
| 4.5.7 Test Results | 53 |
| 4.6 Frequency Stability | 57 |
| 4.6.1 Limit of Frequency Stability Measurement | 57 |

| | | |
|----------|---|-----------|
| 4.6.2 | Test Setup | 57 |
| 4.6.3 | Test Instruments | 57 |
| 4.6.4 | Test Procedure | 57 |
| 4.6.5 | Deviation from Test Standard | 57 |
| 4.6.6 | EUT Operating Condition | 57 |
| 4.6.7 | Test Results | 58 |
| 4.7 | 6 dB Bandwidth Measurement..... | 59 |
| 4.7.1 | Limits of 6 dB Bandwidth Measurement..... | 59 |
| 4.7.2 | Test Setup..... | 59 |
| 4.7.3 | Test Instruments | 59 |
| 4.7.4 | Test Procedure | 59 |
| 4.7.5 | Deviation from Test Standard | 59 |
| 4.7.6 | EUT Operating Condition | 59 |
| 4.7.7 | Test Results | 60 |
| 5 | Pictures of Test Arrangements..... | 62 |
| | Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band) | 63 |
| | Annex B- Band Edge Measurement..... | 66 |
| | Appendix – Information of the Testing Laboratories | 70 |

Release Control Record

| Issue No. | Description | Date Issued |
|------------------------|------------------|------------------|
| RFBIBJ-WTW-P22010311-2 | Original Release | Feb. 17, 2022 |

1 Certificate of Conformity

Product: Hawkeye 3 Camera Module

Brand: Chamberlain

Test Model: GDOCAM3

Sample Status: Engineering Sample

Applicant: The Chamberlain Group Inc.

Test Date: Jan. 18 ~ Jan. 25, 2022

Standards: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Gina Liu , **Date:** Feb. 17, 2022
Gina Liu / Specialist

Approved by : Jeremy Lin , **Date:** Feb. 17, 2022
Jeremy Lin / Project Engineer

2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart E (Section 15.407) | | | |
|--|--|--------|---|
| FCC Clause | Test Item | Result | Remarks |
| 15.407(b)(9) | AC Power Conducted Emissions | Pass | Meet the requirement of limit. Minimum passing margin is -11.84 dB at 0.43800 MHz. |
| 15.407(b) (1/2/3/4(i/ii)/9) | Radiated Emissions & Band Edge Measurement | Pass | Meet the requirement of limit. Minimum passing margin is -0.51 dB at 5150.00 MHz. |
| 15.407(a)(1/2/3) | Max Average Transmit Power | Pass | Meet the requirement of limit. |
| --- | Occupied Bandwidth Measurement | - | Reference only |
| 15.407(a)(1/2/3) | Peak Power Spectral Density | Pass | Meet the requirement of limit. |
| 15.407(e) | 6 dB Bandwidth | Pass | Meet the requirement of limit. (U-NII-3 Band only) |
| 15.407(g) | Frequency Stability | Pass | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | Pass | Antenna connector is i-pex (MHF) not a standard connector. |

Note:

- For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
- For U-NII-1 band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|------------------------------------|--------------------|--------------------------------|
| Conducted Emissions at mains ports | 150 kHz ~ 30 MHz | 2.79 dB |
| Radiated Emissions up to 1 GHz | 9 kHz ~ 30 MHz | 3.00 dB |
| | 30 MHz ~ 200 MHz | 2.91 dB |
| | 200 MHz ~ 1000 MHz | 2.92 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 1.76 dB |

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

| | |
|------------------------------|--|
| Product | Hawkeye 3 Camera Module |
| Brand | Chamberlain |
| Test Model | GDOCAM3 |
| Status of EUT | Engineering Sample |
| Power Supply Rating | 5Vdc (from host equipment or adapter) |
| Modulation Type | 256QAM, 64QAM, 16QAM, QPSK, BPSK |
| Modulation Technology | OFDM |
| Transfer Rate | 802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 150Mbps 802.11ac: up to 433.3Mbps |
| Operating Frequency | 5180 ~ 5240 MHz, 5745 ~ 5825 MHz |
| Number of Channel | 5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) |
| Output Power | 78.886 mW for 5180 ~ 5240 MHz 66.222 mW for 5745 ~ 5825 MHz |
| Antenna Type | PCB antenna with 1.89 dBi gain (5180 ~ 5240 MHz) PCB antenna with 1.93 dBi gain (5745 ~ 5825 MHz) |
| Antenna Connector | i-pex (MHF) |
| Accessory Device | NA |
| Data Cable Supplied | NA |

Note:

- The EUT provide 1 completed transmitter and 1 receiver.

| Modulation Mode | Tx Function |
|------------------|-------------|
| 802.11a | 1TX |
| 802.11n (HT20) | 1TX |
| 802.11n (HT40) | 1TX |
| 802.11ac (VHT20) | 1TX |
| 802.11ac (VHT40) | 1TX |
| 802.11ac (VHT80) | 1TX |

- The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
- The device WiFi 2.4GHz, 5GHz and BT modes doesn't support simultaneously transmit.
- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

For 5180 ~ 5240 MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 36 | 5180 | 44 | 5220 |
| 40 | 5200 | 48 | 5240 |

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 38 | 5190 | 46 | 5230 |

1 channel is provided for 802.11ac (VHT80):

| Channel | Frequency (MHz) |
|---------|-----------------|
| 42 | 5210 |

For 5745 ~ 5825 MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 149 | 5745 | 161 | 5805 |
| 153 | 5765 | 165 | 5825 |
| 157 | 5785 | | |

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 151 | 5755 | 159 | 5795 |

1 channel is provided for 802.11ac (VHT80):

| Channel | Frequency (MHz) |
|---------|-----------------|
| 155 | 5775 |

3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure Mode | Applicable To | | | | Description |
|--------------------|---------------|-----------|-----|------|-------------|
| | RE \geq 1G | RE $<$ 1G | PLC | APCM | |
| - | √ | √ | √ | √ | - |

Where **RE \geq 1G**: Radiated Emission above 1 GHz **RE $<$ 1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **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**.
2. For radiated emission (below 1GHz) and power line conducted emission test items, the worst radiated emission mode was selected.
3. "-" means no effect.

Radiated Emission Test (Above 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|--------------------|----------------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 5180-5240 | 802.11a | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6.0 |
| - | | 802.11ac (VHT20) | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 7.2 |
| - | | 802.11ac (VHT40) | 38 to 46 | 38, 46 | OFDM | BPSK | 15.0 |
| - | | 802.11ac (VHT80) | 42 | 42 | OFDM | BPSK | 29.3 |
| - | 5745-5825 | 802.11a | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.0 |
| - | | 802.11ac (VHT20) | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 7.2 |
| - | | 802.11ac (VHT40) | 151 to 159 | 151, 159 | OFDM | BPSK | 15.0 |
| - | | 802.11ac (VHT80) | 155 | 155 | OFDM | BPSK | 29.3 |

Radiated Emission Test (Below 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|--------------------|----------------------|---------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 5180-5240 | 802.11a | 36 to 48 | 36 | OFDM | BPSK | 6.0 |

Power Line Conducted Emission Test:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|--------------------|----------------------|---------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 5180-5240 | 802.11a | 36 to 48 | 36 | OFDM | BPSK | 6.0 |

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Frequency Band (MHz) | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|--------------------|----------------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 5180-5240 | 802.11a | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 6.0 |
| - | | 802.11ac (VHT20) | 36 to 48 | 36, 40, 48 | OFDM | BPSK | 7.2 |
| - | | 802.11ac (VHT40) | 38 to 46 | 38, 46 | OFDM | BPSK | 15.0 |
| - | | 802.11ac (VHT80) | 42 | 42 | OFDM | BPSK | 29.3 |
| - | 5745-5825 | 802.11a | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.0 |
| - | | 802.11ac (VHT20) | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 7.2 |
| - | | 802.11ac (VHT40) | 151 to 159 | 151, 159 | OFDM | BPSK | 15.0 |
| - | | 802.11ac (VHT80) | 155 | 155 | OFDM | BPSK | 29.3 |

Test Condition:

| Applicable To | Environmental Conditions | Input Power | Tested by |
|---------------|--------------------------|----------------|----------------------|
| RE \geq 1G | 23 deg. C, 66 % RH | 120 Vac, 60 Hz | Randy Wu, Wade Huang |
| RE<1G | 23 deg. C, 67 % RH | 120 Vac, 60 Hz | Wade Huang |
| PLC | 25 deg. C, 75 % RH | 120 Vac, 60 Hz | Randy Wu |
| APCM | 25 deg. C, 60 % RH | 120 Vac, 60 Hz | Chris Lin |

3.3 Duty Cycle of Test Signal

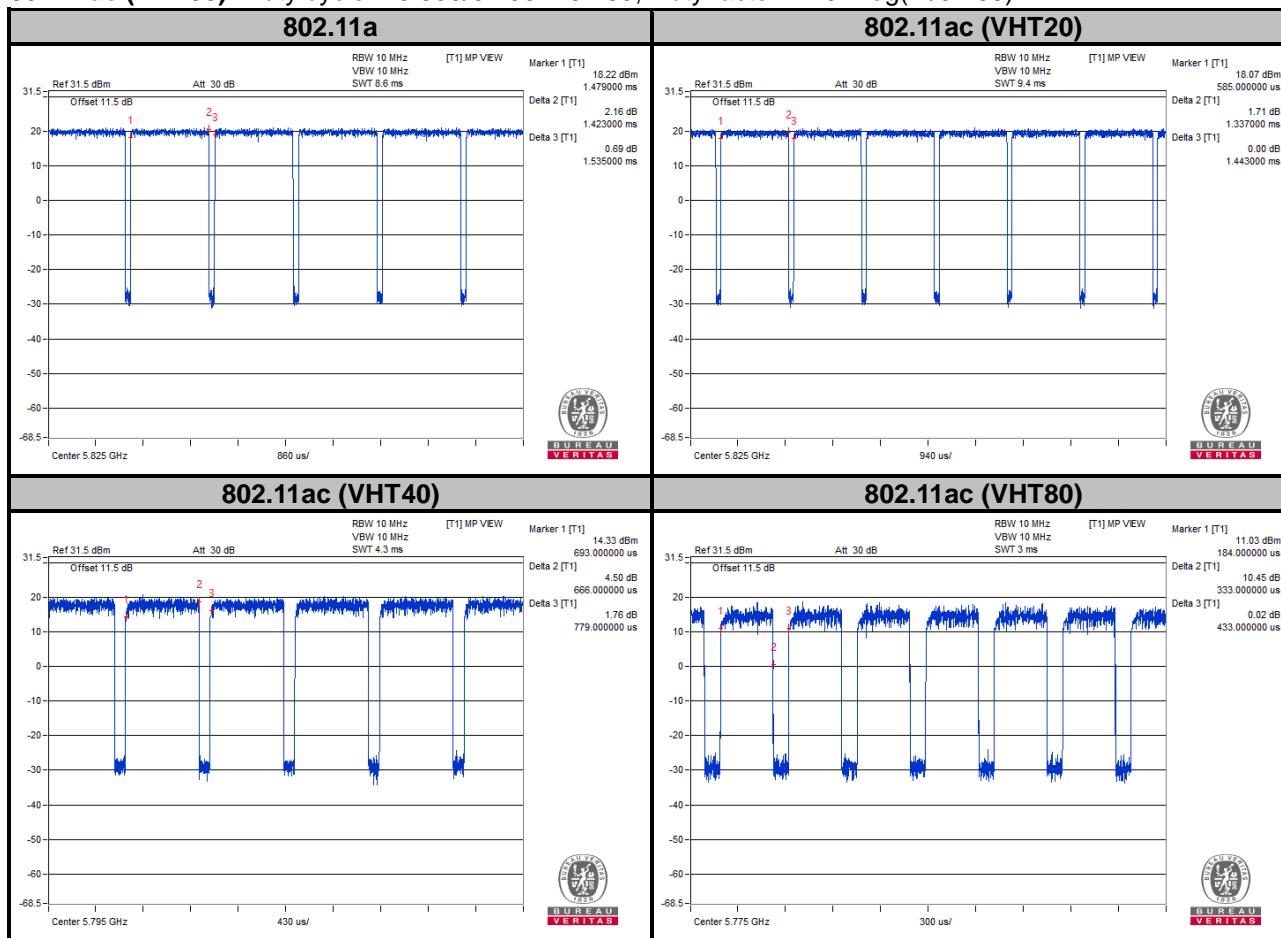
Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = $1.423/1.535 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$

802.11ac (VHT20): Duty cycle = $1.337/1.443 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$

802.11ac (VHT40): Duty cycle = $0.666/0.779 = 0.855$, Duty factor = $10 * \log(1/0.855) = 0.68$

802.11ac (VHT80): Duty cycle = $0.333/0.433 = 0.769$, Duty factor = $10 * \log(1/0.769) = 1.14$



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

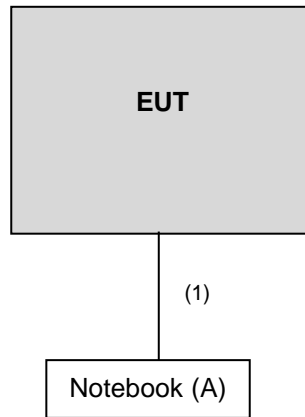
| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|----|----------|--------|----------------|------------|--------|---------|
| A. | Notebook | Lenovo | 20J4 MD A003TW | PF-11H9AK | N/A | - |

Note:

1. All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|----|---------------|------|------------|--------------------|--------------|--------------------|
| 1. | Console cable | 1 | 0.83 | Y | 0 | Provided by client |

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test Standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

| Frequencies (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 1000 MHz, 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 20 dB under any condition of modulation.

Limits of Unwanted Emission Out of the Restricted Bands

| Applicable To | | Limit | |
|--|---|---|---|
| 789033 D02 General UNII Test Procedures New Rules v02r01 | | Field Strength at 3 m | |
| | | PK: 74 (dBµV/m) | AV: 54 (dBµV/m) |
| Frequency Band | Applicable To | EIRP Limit | Equivalent Field Strength at 3 m |
| 5150~5250 MHz | 15.407(b)(1) | PK: -27 (dBm/MHz) | PK: 68.2 (dBµV/m) |
| 5250~5350 MHz | 15.407(b)(2) | | |
| 5470~5725 MHz | 15.407(b)(3) | | |
| 5725~5850 MHz | <input checked="" type="checkbox"/> 15.407(b)(4)(i) | PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4} | PK: 68.2 (dBµV/m) ^{*1} PK:105.2 (dBµV/m) ^{*2} PK: 110.8 (dBµV/m) ^{*3} PK:122.2 (dBµV/m) ^{*4} |
| | <input type="checkbox"/> 15.407(b)(4)(ii) | Emission limits in section 15.247(d) | |

^{*1} beyond 75 MHz or more above of the band edge.

^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.2 Test Instruments

| Description & Manufacturer | Model No. | Serial No. | Date Of Calibration | Due Date Of Calibration |
|--------------------------------------|-------------------------------------|-------------------------------------|---------------------|-------------------------|
| Test Receiver KEYSIGHT | N9038B | MY60180018 | Feb. 01, 2021 | Jan. 31, 2022 |
| Spectrum Analyzer KEYSIGHT | N9020B | MY60110462 | Dec. 21, 2021 | Dec. 20, 2022 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-995 | Oct. 28, 2021 | Otc. 27, 2022 |
| HORN Antenna RF SPIN | DRH18-E | 210104A18E | Nov. 14, 2021 | Nov. 13, 2022 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | 9170-995 | Nov. 14, 2021 | Nov. 13, 2022 |
| Loop Antenna TESEQ | HLA 6121 | 45745 | Jul. 21, 2021 | Jul. 20, 2022 |
| Preamplifier EMCI | EMC330N | 980783 | Jan. 17, 2022 | Jan. 16, 2023 |
| Preamplifier EMCI | EMC118A45SE | 980810 | Dec. 30, 2021 | Dec. 29, 2022 |
| Preamplifier EMCI | EMC184045SE | 980787 | Jan. 17, 2022 | Jan. 16, 2023 |
| RF signal cable EMCI | EMC104-SM-SM-(9000+3000+2000+1000) | 201230+ 201242+201238+ 210101 | Jan. 17, 2022 | Jan. 16, 2023 |
| RF signal cable EMCI | EMCCFD400-NM-NM-(9000+3000+500+500) | 201252+ 201250+ 201247+201245 | Jan. 17, 2022 | Jan. 16, 2023 |
| RF signal cable EMCI | EMC101G-KM-KM-(5000+3000+2000) | 201259+201256+2 01253 | Jan. 17, 2022 | Jan. 16, 2023 |
| Software BV CPS | ADT_Radiated_V7.6.1 5.9.5 | NA | NA | NA |
| Turn Table Max-Full | MFT-151SS-0.5T | NA | NA | NA |
| Turn Table Controller Max-Full | MF-7802BS | MF780208675 | NA | NA |
| Antenna Tower KaiTuo | NA | NA | NA | NA |
| Antenna Tower Controller KaiTuo | KT-2000 | NA | NA | NA |
| Wideband Power Sensor KEYSIGHT | N1923A | MY58190002 | May 05, 2021 | May 04, 2022 |
| Peak Power Analyzer KEYSIGHT | 8990B | MY51000485 | Jan. 18, 2022 | Jan. 17, 2023 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSW43 | 101582 | Apr. 01, 2021 | Mar. 31, 2022 |

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in WM Chamber 7.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna 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.
- d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

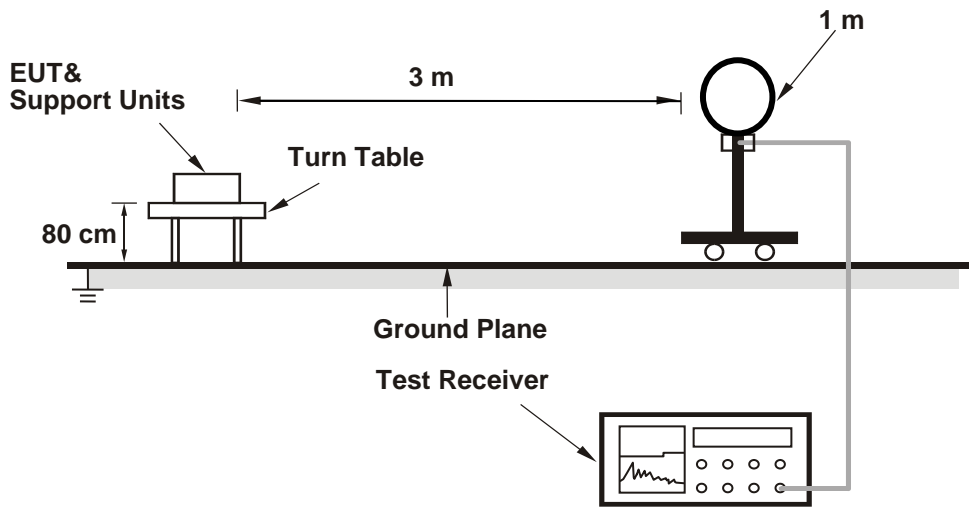
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
(11a: RBW = 1 MHz, VBW = 1 kHz ; 11ac (VHT20): RBW = 1 MHz, VBW = 1 kHz ;
11ac (VHT40): RBW = 1 MHz, VBW = 3 kHz ; 11ac (VHT80): RBW = 1 MHz, VBW = 10 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

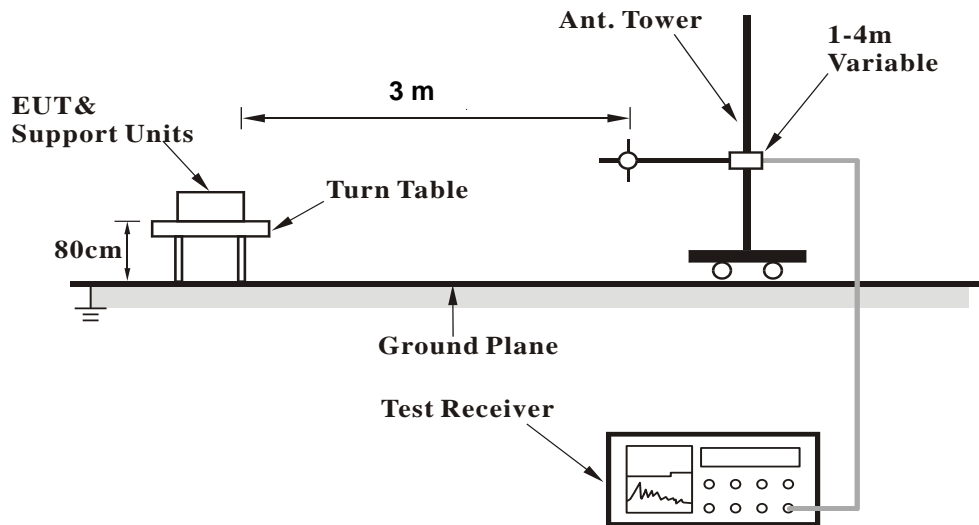
No deviation.

4.1.5 Test Setup

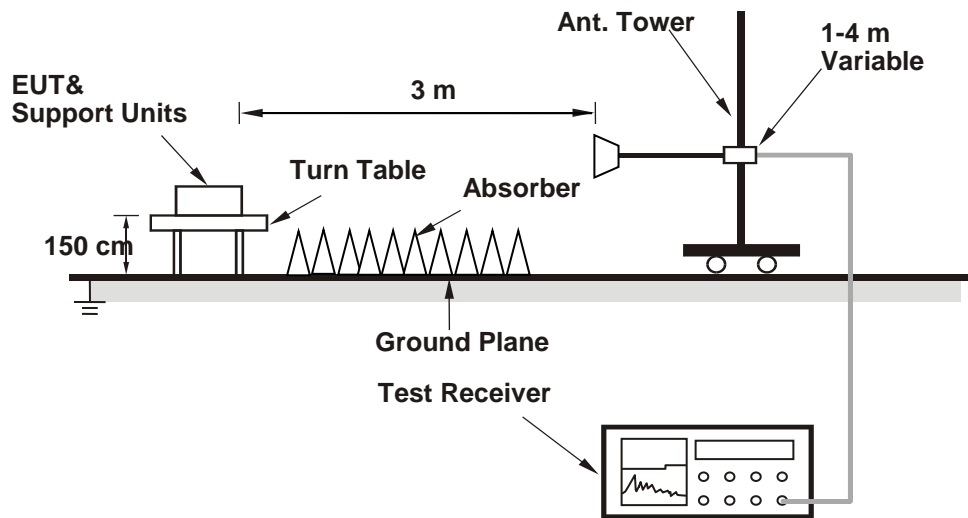
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data :

| | | | |
|------------------------|--------------|--------------------------|---------------------------|
| RF Mode | TX 802.11a | Channel | CH 36 : 5180 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|--------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 66.99 PK | 74.00 | -7.01 | 2.39 H | 360 | 65.20 | 1.79 |
| 2 | 5150.00 | 53.49 AV | 54.00 | -0.51 | 2.39 H | 360 | 51.70 | 1.79 |
| 3 | *5180.00 | 108.48 PK | | | 2.39 H | 360 | 68.12 | 40.36 |
| 4 | *5180.00 | 100.59 AV | | | 2.39 H | 360 | 60.23 | 40.36 |
| 5 | #10360.00 | 54.54 PK | 68.20 | -13.66 | 2.24 H | 355 | 47.23 | 7.31 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 64.58 PK | 74.00 | -9.42 | 1.03 V | 264 | 62.79 | 1.79 |
| 2 | 5150.00 | 51.47 AV | 54.00 | -2.53 | 1.03 V | 264 | 49.68 | 1.79 |
| 3 | *5180.00 | 107.67 PK | | | 1.03 V | 264 | 67.31 | 40.36 |
| 4 | *5180.00 | 99.18 AV | | | 1.03 V | 264 | 58.82 | 40.36 |
| 5 | #10360.00 | 54.30 PK | 68.20 | -13.90 | 1.16 V | 245 | 46.99 | 7.31 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|--------------|--------------------------|---------------------------|
| RF Mode | TX 802.11a | Channel | CH 40 : 5200 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | *5200.00 | 111.20 PK | | | 2.10 H | 360 | 70.85 | 40.35 |
| 2 | *5200.00 | 102.17 AV | | | 2.10 H | 360 | 61.82 | 40.35 |
| 3 | #10400.00 | 54.64 PK | 68.20 | -13.56 | 1.92 H | 344 | 47.22 | 7.42 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | *5200.00 | 110.65 PK | | | 1.00 V | 246 | 70.30 | 40.35 |
| 2 | *5200.00 | 101.57 AV | | | 1.00 V | 246 | 61.22 | 40.35 |
| 3 | #10400.00 | 54.31 PK | 68.20 | -13.89 | 1.18 V | 243 | 46.89 | 7.42 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|--------------|--------------------------|---------------------------|
| RF Mode | TX 802.11a | Channel | CH 48 : 5240 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | *5240.00 | 111.55 PK | | | 2.48 H | 360 | 71.33 | 40.22 |
| 2 | *5240.00 | 102.29 AV | | | 2.48 H | 360 | 62.07 | 40.22 |
| 3 | 5350.00 | 54.72 PK | 74.00 | -19.28 | 2.48 H | 360 | 53.30 | 1.42 |
| 4 | 5350.00 | 43.48 AV | 54.00 | -10.52 | 2.48 H | 360 | 42.06 | 1.42 |
| 5 | #10480.00 | 54.48 PK | 68.20 | -13.72 | 2.33 H | 320 | 47.36 | 7.12 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | *5240.00 | 110.10 PK | | | 1.15 V | 254 | 69.88 | 40.22 |
| 2 | *5240.00 | 101.52 AV | | | 1.15 V | 254 | 61.30 | 40.22 |
| 3 | 5350.00 | 56.24 PK | 74.00 | -17.76 | 1.15 V | 254 | 54.82 | 1.42 |
| 4 | 5350.00 | 43.64 AV | 54.00 | -10.36 | 1.15 V | 254 | 42.22 | 1.42 |
| 5 | #10480.00 | 53.94 PK | 68.20 | -14.26 | 1.20 V | 244 | 46.82 | 7.12 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|--------------|--------------------------|---------------------------|
| RF Mode | TX 802.11a | Channel | CH 149 : 5745 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5633.60 | 59.80 PK | 68.20 | -8.40 | 1.55 H | 311 | 57.33 | 2.47 |
| 2 | *5745.00 | 107.55 PK | | | 1.55 H | 311 | 65.86 | 41.69 |
| 3 | *5745.00 | 99.51 AV | | | 1.55 H | 311 | 57.82 | 41.69 |
| 4 | #5995.20 | 61.64 PK | 68.20 | -6.56 | 1.55 H | 311 | 58.63 | 3.01 |
| 5 | 11490.00 | 55.03 PK | 74.00 | -18.97 | 2.49 H | 41 | 47.01 | 8.02 |
| 6 | 11490.00 | 44.24 AV | 54.00 | -9.76 | 2.49 H | 41 | 36.22 | 8.02 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5602.40 | 60.09 PK | 68.20 | -8.11 | 2.07 V | 251 | 57.82 | 2.27 |
| 2 | *5745.00 | 110.50 PK | | | 2.07 V | 251 | 68.81 | 41.69 |
| 3 | *5745.00 | 101.78 AV | | | 2.07 V | 251 | 60.09 | 41.69 |
| 4 | #5998.00 | 61.68 PK | 68.20 | -6.52 | 2.07 V | 251 | 58.68 | 3.00 |
| 5 | 11490.00 | 55.70 PK | 74.00 | -18.30 | 1.97 V | 210 | 47.68 | 8.02 |
| 6 | 11490.00 | 44.76 AV | 54.00 | -9.24 | 1.97 V | 210 | 36.74 | 8.02 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|--------------|--------------------------|---------------------------|
| RF Mode | TX 802.11a | Channel | CH 157 : 5785 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5648.80 | 59.98 PK | 68.20 | -8.22 | 1.10 H | 306 | 57.42 | 2.56 |
| 2 | *5785.00 | 108.32 PK | | | 1.10 H | 306 | 66.49 | 41.83 |
| 3 | *5785.00 | 99.51 AV | | | 1.10 H | 306 | 57.68 | 41.83 |
| 4 | #5993.20 | 62.45 PK | 68.20 | -5.75 | 1.10 H | 306 | 59.44 | 3.01 |
| 5 | 11570.00 | 55.66 PK | 74.00 | -18.34 | 2.34 H | 111 | 47.75 | 7.91 |
| 6 | 11570.00 | 43.99 AV | 54.00 | -10.01 | 2.34 H | 111 | 36.08 | 7.91 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5634.00 | 60.02 PK | 68.20 | -8.18 | 1.06 V | 257 | 57.55 | 2.47 |
| 2 | *5785.00 | 110.97 PK | | | 1.06 V | 257 | 69.14 | 41.83 |
| 3 | *5785.00 | 101.98 AV | | | 1.06 V | 257 | 60.15 | 41.83 |
| 4 | #5996.80 | 61.93 PK | 68.20 | -6.27 | 1.06 V | 257 | 58.92 | 3.01 |
| 5 | 11570.00 | 55.48 PK | 74.00 | -18.52 | 2.11 V | 30 | 47.57 | 7.91 |
| 6 | 11570.00 | 44.23 AV | 54.00 | -9.77 | 2.11 V | 30 | 36.32 | 7.91 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|--------------|--------------------------|---------------------------|
| RF Mode | TX 802.11a | Channel | CH 165 : 5825 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5630.80 | 59.90 PK | 68.20 | -8.30 | 1.23 H | 313 | 57.45 | 2.45 |
| 2 | *5825.00 | 108.11 PK | | | 1.23 H | 313 | 66.19 | 41.92 |
| 3 | *5825.00 | 99.37 AV | | | 1.23 H | 313 | 57.45 | 41.92 |
| 4 | #5939.20 | 62.50 PK | 68.20 | -5.70 | 1.23 H | 313 | 59.47 | 3.03 |
| 5 | 11650.00 | 55.69 PK | 74.00 | -18.31 | 2.45 H | 100 | 47.81 | 7.88 |
| 6 | 11650.00 | 44.00 AV | 54.00 | -10.00 | 2.45 H | 100 | 36.12 | 7.88 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5602.80 | 60.67 PK | 68.20 | -7.53 | 1.49 V | 258 | 58.40 | 2.27 |
| 2 | *5825.00 | 110.64 PK | | | 1.49 V | 258 | 68.72 | 41.92 |
| 3 | *5825.00 | 102.29 AV | | | 1.49 V | 258 | 60.37 | 41.92 |
| 4 | #5971.20 | 63.24 PK | 68.20 | -4.96 | 1.49 V | 258 | 60.23 | 3.01 |
| 5 | 11650.00 | 55.24 PK | 74.00 | -18.76 | 1.99 V | 23 | 47.36 | 7.88 |
| 6 | 11650.00 | 43.92 AV | 54.00 | -10.08 | 1.99 V | 23 | 36.04 | 7.88 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT20) | Channel | CH 36 : 5180 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 64.99 PK | 74.00 | -9.01 | 2.51 H | 360 | 63.20 | 1.79 |
| 2 | 5150.00 | 53.48 AV | 54.00 | -0.52 | 2.51 H | 360 | 51.69 | 1.79 |
| 3 | *5180.00 | 110.30 PK | | | 2.51 H | 360 | 69.94 | 40.36 |
| 4 | *5180.00 | 101.47 AV | | | 2.51 H | 360 | 61.11 | 40.36 |
| 5 | #10360.00 | 54.53 PK | 68.20 | -13.67 | 2.42 H | 348 | 47.22 | 7.31 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 66.88 PK | 74.00 | -7.12 | 1.00 V | 245 | 65.09 | 1.79 |
| 2 | 5150.00 | 52.22 AV | 54.00 | -1.78 | 1.00 V | 245 | 50.43 | 1.79 |
| 3 | *5180.00 | 108.08 PK | | | 1.00 V | 245 | 67.72 | 40.36 |
| 4 | *5180.00 | 99.39 AV | | | 1.00 V | 245 | 59.03 | 40.36 |
| 5 | #10360.00 | 54.19 PK | 68.20 | -14.01 | 1.22 V | 241 | 46.88 | 7.31 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT20) | Channel | CH 40 : 5200 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5200.00 | 110.83 PK | | | 1.00 H | 247 | 70.48 | 40.35 |
| 2 | *5200.00 | 101.87 AV | | | 1.00 H | 247 | 61.52 | 40.35 |
| 3 | #10400.00 | 54.87 PK | 68.20 | -13.33 | 1.66 H | 210 | 47.45 | 7.42 |
| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5200.00 | 109.95 PK | | | 1.00 V | 247 | 69.60 | 40.35 |
| 2 | *5200.00 | 101.02 AV | | | 1.00 V | 247 | 60.67 | 40.35 |
| 3 | #10400.00 | 54.27 PK | 68.20 | -13.93 | 1.66 V | 210 | 46.85 | 7.42 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT20) | Channel | CH 48 : 5240 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5240.00 | 111.01 PK | | | 2.45 H | 360 | 70.79 | 40.22 |
| 2 | *5240.00 | 101.66 AV | | | 2.45 H | 360 | 61.44 | 40.22 |
| 3 | 5350.00 | 54.49 PK | 74.00 | -19.51 | 2.45 H | 360 | 53.07 | 1.42 |
| 4 | 5350.00 | 44.42 AV | 54.00 | -9.58 | 2.45 H | 360 | 43.00 | 1.42 |
| 5 | #10480.00 | 53.94 PK | 68.20 | -14.26 | 2.40 H | 360 | 46.82 | 7.12 |
| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *5240.00 | 109.47 PK | | | 1.02 V | 244 | 69.25 | 40.22 |
| 2 | *5240.00 | 100.85 AV | | | 1.02 V | 244 | 60.63 | 40.22 |
| 3 | 5350.00 | 55.57 PK | 74.00 | -18.43 | 1.02 V | 244 | 54.15 | 1.42 |
| 4 | 5350.00 | 43.62 AV | 54.00 | -10.38 | 1.02 V | 244 | 42.20 | 1.42 |
| 5 | #10480.00 | 54.00 PK | 68.20 | -14.20 | 1.21 V | 222 | 46.88 | 7.12 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT20) | Channel | CH 149 : 5745 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5612.80 | 60.13 PK | 68.20 | -8.07 | 1.53 H | 165 | 57.80 | 2.33 |
| 2 | *5745.00 | 108.07 PK | | | 1.53 H | 165 | 66.38 | 41.69 |
| 3 | *5745.00 | 99.55 AV | | | 1.53 H | 165 | 57.86 | 41.69 |
| 4 | #5993.60 | 62.16 PK | 68.20 | -6.04 | 1.53 H | 165 | 59.15 | 3.01 |
| 5 | 11490.00 | 55.81 PK | 74.00 | -18.19 | 2.41 H | 111 | 47.79 | 8.02 |
| 6 | 11490.00 | 44.10 AV | 54.00 | -9.90 | 2.41 H | 111 | 36.08 | 8.02 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5602.80 | 60.53 PK | 68.20 | -7.67 | 1.48 V | 251 | 58.26 | 2.27 |
| 2 | *5745.00 | 110.30 PK | | | 1.48 V | 251 | 68.61 | 41.69 |
| 3 | *5745.00 | 101.65 AV | | | 1.48 V | 251 | 59.96 | 41.69 |
| 4 | #5987.20 | 62.53 PK | 68.20 | -5.67 | 1.48 V | 251 | 59.53 | 3.00 |
| 5 | 11490.00 | 54.88 PK | 74.00 | -19.12 | 1.74 V | 66 | 46.86 | 8.02 |
| 6 | 11490.00 | 44.12 AV | 54.00 | -9.88 | 1.74 V | 66 | 36.10 | 8.02 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT20) | Channel | CH 157 : 5785 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5632.00 | 60.33 PK | 68.20 | -7.87 | 1.48 H | 165 | 57.88 | 2.45 |
| 2 | *5785.00 | 108.33 PK | | | 1.48 H | 165 | 66.50 | 41.83 |
| 3 | *5785.00 | 98.90 AV | | | 1.48 H | 165 | 57.07 | 41.83 |
| 4 | #6000.00 | 62.69 PK | 68.20 | -5.51 | 1.48 H | 165 | 59.68 | 3.01 |
| 5 | 11490.00 | 55.85 PK | 74.00 | -18.15 | 2.33 H | 156 | 47.83 | 8.02 |
| 6 | 11490.00 | 44.13 AV | 54.00 | -9.87 | 2.33 H | 156 | 36.11 | 8.02 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5640.40 | 59.88 PK | 68.20 | -8.32 | 1.67 V | 251 | 57.37 | 2.51 |
| 2 | *5785.00 | 110.87 PK | | | 1.67 V | 251 | 69.04 | 41.83 |
| 3 | *5785.00 | 101.94 AV | | | 1.67 V | 251 | 60.11 | 41.83 |
| 4 | #5952.40 | 62.38 PK | 68.20 | -5.82 | 1.67 V | 251 | 59.38 | 3.00 |
| 5 | 11570.00 | 55.25 PK | 74.00 | -18.75 | 1.96 V | 147 | 47.34 | 7.91 |
| 6 | 11570.00 | 44.12 AV | 54.00 | -9.88 | 1.96 V | 147 | 36.21 | 7.91 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT20) | Channel | CH 165 : 5825 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5634.00 | 60.95 PK | 68.20 | -7.25 | 1.48 H | 309 | 58.48 | 2.47 |
| 2 | *5825.00 | 107.81 PK | | | 1.48 H | 309 | 65.89 | 41.92 |
| 3 | *5825.00 | 98.81 AV | | | 1.48 H | 309 | 56.89 | 41.92 |
| 4 | #5970.40 | 62.19 PK | 68.20 | -6.01 | 1.48 H | 309 | 59.18 | 3.01 |
| 5 | 11650.00 | 55.44 PK | 74.00 | -18.56 | 1.98 H | 55 | 47.56 | 7.88 |
| 6 | 11650.00 | 43.91 AV | 54.00 | -10.09 | 1.98 H | 55 | 36.03 | 7.88 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5629.60 | 61.46 PK | 68.20 | -6.74 | 1.88 V | 256 | 59.02 | 2.44 |
| 2 | *5825.00 | 110.18 PK | | | 1.88 V | 265 | 68.26 | 41.92 |
| 3 | *5825.00 | 101.56 AV | | | 1.88 V | 265 | 59.64 | 41.92 |
| 4 | #5979.20 | 62.36 PK | 68.20 | -5.84 | 1.88 V | 256 | 59.36 | 3.00 |
| 5 | 11650.00 | 55.66 PK | 74.00 | -18.34 | 1.79 V | 103 | 47.78 | 7.88 |
| 6 | 11650.00 | 44.15 AV | 54.00 | -9.85 | 1.79 V | 103 | 36.27 | 7.88 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT40) | Channel | CH 38 : 5190 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 5150.00 | 66.61 PK | 74.00 | -7.39 | 2.50 H | 10 | 64.82 | 1.79 |
| 2 | 5150.00 | 53.46 AV | 54.00 | -0.54 | 2.50 H | 10 | 51.67 | 1.79 |
| 3 | *5190.00 | 103.04 PK | | | 2.50 H | 10 | 62.68 | 40.36 |
| 4 | *5190.00 | 95.13 AV | | | 2.50 H | 10 | 54.77 | 40.36 |
| 5 | #10380.00 | 54.58 PK | 68.20 | -13.62 | 2.11 H | 25 | 47.22 | 7.36 |
| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 5150.00 | 65.20 PK | 74.00 | -8.80 | 1.00 V | 246 | 63.41 | 1.79 |
| 2 | 5150.00 | 52.23 AV | 54.00 | -1.77 | 1.00 V | 246 | 50.44 | 1.79 |
| 3 | *5190.00 | 102.61 PK | | | 1.00 V | 246 | 62.25 | 40.36 |
| 4 | *5190.00 | 94.05 AV | | | 1.00 V | 246 | 53.69 | 40.36 |
| 5 | #10380.00 | 54.18 PK | 68.20 | -14.02 | 1.22 V | 222 | 46.82 | 7.36 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT40) | Channel | CH 46 : 5230 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 58.50 PK | 74.00 | -15.50 | 2.47 H | 360 | 56.71 | 1.79 |
| 2 | 5150.00 | 48.20 AV | 54.00 | -5.80 | 2.47 H | 360 | 46.41 | 1.79 |
| 3 | *5230.00 | 106.67 PK | | | 2.47 H | 360 | 66.42 | 40.25 |
| 4 | *5230.00 | 98.02 AV | | | 2.47 H | 360 | 57.77 | 40.25 |
| 5 | #10460.00 | 54.53 PK | 68.20 | -13.67 | 2.12 H | 341 | 47.33 | 7.20 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 59.76 PK | 74.00 | -14.24 | 1.09 V | 259 | 57.97 | 1.79 |
| 2 | 5150.00 | 47.55 AV | 54.00 | -6.45 | 1.09 V | 259 | 45.76 | 1.79 |
| 3 | *5230.00 | 105.49 PK | | | 1.09 V | 259 | 65.24 | 40.25 |
| 4 | *5230.00 | 97.86 AV | | | 1.09 V | 259 | 57.61 | 40.25 |
| 5 | #10460.00 | 54.08 PK | 68.20 | -14.12 | 1.24 V | 263 | 46.88 | 7.20 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT40) | Channel | CH 151 : 5755 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5608.00 | 60.78 PK | 68.20 | -7.42 | 1.06 H | 309 | 58.48 | 2.30 |
| 2 | *5755.00 | 104.22 PK | | | 1.06 H | 309 | 62.47 | 41.75 |
| 3 | *5755.00 | 96.81 AV | | | 1.06 H | 309 | 55.06 | 41.75 |
| 4 | #5988.00 | 61.72 PK | 68.20 | -6.48 | 1.06 H | 309 | 58.71 | 3.01 |
| 5 | 11510.00 | 55.31 PK | 74.00 | -18.69 | 2.11 H | 156 | 47.28 | 8.03 |
| 6 | 11510.00 | 44.23 AV | 54.00 | -9.77 | 2.11 H | 156 | 36.20 | 8.03 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5649.20 | 60.73 PK | 68.20 | -7.47 | 1.67 V | 250 | 58.17 | 2.56 |
| 2 | *5755.00 | 107.00 PK | | | 1.67 V | 250 | 65.25 | 41.75 |
| 3 | *5755.00 | 99.09 AV | | | 1.67 V | 250 | 57.34 | 41.75 |
| 4 | #5982.00 | 62.18 PK | 68.20 | -6.02 | 1.67 V | 250 | 59.18 | 3.00 |
| 5 | 11510.00 | 55.25 PK | 74.00 | -18.75 | 1.88 V | 64 | 47.22 | 8.03 |
| 6 | 11510.00 | 44.37 AV | 54.00 | -9.63 | 1.88 V | 64 | 36.34 | 8.03 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT40) | Channel | CH 159 : 5795 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5628.40 | 60.99 PK | 68.20 | -7.21 | 1.09 H | 306 | 58.56 | 2.43 |
| 2 | *5795.00 | 104.52 PK | | | 1.09 H | 306 | 62.67 | 41.85 |
| 3 | *5795.00 | 96.45 AV | | | 1.09 H | 306 | 54.60 | 41.85 |
| 4 | #5963.20 | 62.28 PK | 68.20 | -5.92 | 1.09 H | 306 | 59.27 | 3.01 |
| 5 | 11590.00 | 55.08 PK | 74.00 | -18.92 | 2.61 H | 304 | 47.21 | 7.87 |
| 6 | 11590.00 | 44.05 AV | 54.00 | -9.95 | 2.61 H | 304 | 36.18 | 7.87 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5608.80 | 60.50 PK | 68.20 | -7.70 | 1.64 V | 252 | 58.19 | 2.31 |
| 2 | *5795.00 | 107.77 PK | | | 1.64 V | 252 | 65.92 | 41.85 |
| 3 | *5795.00 | 99.41 AV | | | 1.64 V | 252 | 57.56 | 41.85 |
| 4 | #5948.00 | 61.95 PK | 68.20 | -6.25 | 1.64 V | 252 | 58.95 | 3.00 |
| 5 | 11590.00 | 55.08 PK | 74.00 | -18.92 | 2.11 V | 30 | 47.21 | 7.87 |
| 6 | 11590.00 | 44.13 AV | 54.00 | -9.87 | 2.11 V | 30 | 36.26 | 7.87 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT80) | Channel | CH 42 : 5210 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 66.22 PK | 74.00 | -7.78 | 2.48 H | 6 | 64.43 | 1.79 |
| 2 | 5150.00 | 53.48 AV | 54.00 | -0.52 | 2.48 H | 6 | 51.69 | 1.79 |
| 3 | *5210.00 | 99.54 PK | | | 2.48 H | 6 | 59.23 | 40.31 |
| 4 | *5210.00 | 88.73 AV | | | 2.48 H | 6 | 48.42 | 40.31 |
| 5 | #10420.00 | 54.80 PK | 68.20 | -13.40 | 2.15 H | 312 | 47.45 | 7.35 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 5150.00 | 65.76 PK | 74.00 | -8.24 | 1.00 V | 245 | 63.97 | 1.79 |
| 2 | 5150.00 | 52.22 AV | 54.00 | -1.78 | 1.00 V | 245 | 50.43 | 1.79 |
| 3 | *5210.00 | 98.97 PK | | | 1.00 V | 245 | 58.66 | 40.31 |
| 4 | *5210.00 | 87.83 AV | | | 1.00 V | 245 | 47.52 | 40.31 |
| 5 | #10420.00 | 54.13 PK | 68.20 | -14.07 | 1.33 V | 240 | 46.78 | 7.35 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

| | | | |
|------------------------|---------------------|--------------------------|---------------------------|
| RF Mode | TX 802.11ac (VHT80) | Channel | CH 155 : 5775 MHz |
| Frequency Range | 1GHz ~ 40GHz | Detector Function | Peak (PK) Average (AV) |

Antenna Polarity & Test Distance : Horizontal at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5647.60 | 62.13 PK | 68.20 | -6.07 | 1.51 H | 308 | 59.58 | 2.55 |
| 2 | *5775.00 | 100.73 PK | | | 1.51 H | 308 | 58.94 | 41.79 |
| 3 | *5775.00 | 91.16 AV | | | 1.51 H | 308 | 49.37 | 41.79 |
| 4 | #5962.80 | 61.50 PK | 68.20 | -6.70 | 1.51 H | 308 | 58.49 | 3.01 |
| 5 | 11550.00 | 54.84 PK | 74.00 | -19.16 | 2.10 H | 189 | 46.89 | 7.95 |
| 6 | 11550.00 | 43.61 AV | 54.00 | -10.39 | 2.10 H | 189 | 35.66 | 7.95 |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | #5648.80 | 64.02 PK | 68.20 | -4.18 | 1.45 V | 254 | 61.46 | 2.56 |
| 2 | *5775.00 | 103.51 PK | | | 1.45 V | 254 | 61.72 | 41.79 |
| 3 | *5775.00 | 93.05 AV | | | 1.45 V | 254 | 51.26 | 41.79 |
| 4 | #5972.80 | 62.42 PK | 68.20 | -5.78 | 1.45 V | 254 | 59.41 | 3.01 |
| 5 | 11550.00 | 55.20 PK | 74.00 | -18.80 | 1.66 V | 44 | 47.25 | 7.95 |
| 6 | 11550.00 | 43.69 AV | 54.00 | -10.31 | 1.66 V | 44 | 35.74 | 7.95 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

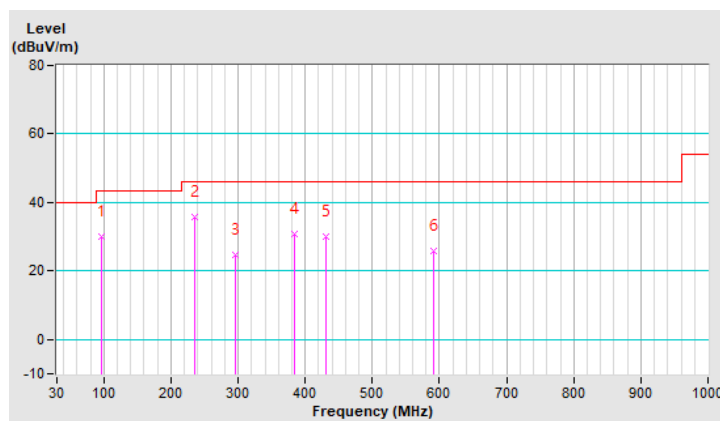
9 kHz ~ 1 GHz Worst-Case Data:

| | | | |
|------------------------|--------------|--------------------------|------------------|
| RF Mode | TX 802.11a | Channel | CH 36 : 5180 MHz |
| Frequency Range | 30MHz ~ 1GHz | Detector Function | Quasi-Peak (QP) |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 95.96 | 29.88 QP | 43.50 | -13.62 | 1.99 H | 343 | 53.50 | -23.62 |
| 2 | 234.67 | 35.91 QP | 46.00 | -10.09 | 1.49 H | 18 | 56.32 | -20.41 |
| 3 | 296.75 | 24.61 QP | 46.00 | -21.39 | 1.01 H | 207 | 42.77 | -18.16 |
| 4 | 384.05 | 30.95 QP | 46.00 | -15.05 | 1.01 H | 28 | 46.81 | -15.86 |
| 5 | 431.58 | 29.91 QP | 46.00 | -16.09 | 1.99 H | 10 | 44.55 | -14.64 |
| 6 | 591.63 | 25.78 QP | 46.00 | -20.22 | 1.49 H | 247 | 36.93 | -11.15 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



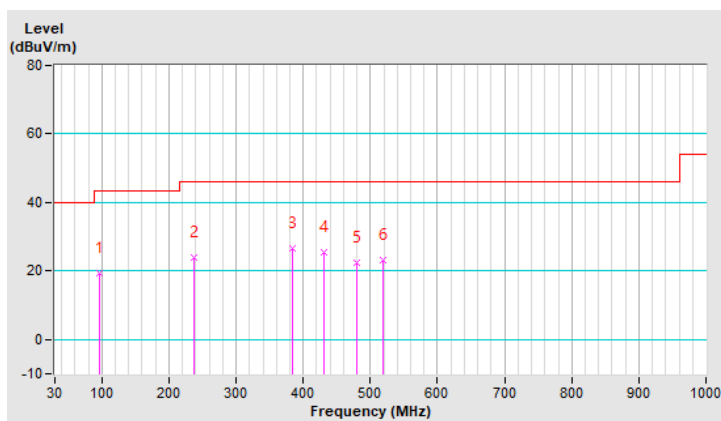
| | | | |
|------------------------|--------------|--------------------------|------------------|
| RF Mode | TX 802.11a | Channel | CH 36 : 5180 MHz |
| Frequency Range | 30MHz ~ 1GHz | Detector Function | Quasi-Peak (QP) |

Antenna Polarity & Test Distance : Vertical at 3 m

| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|----|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| 1 | 96.93 | 19.37 QP | 43.50 | -24.13 | 1.99 V | 236 | 42.79 | -23.42 |
| 2 | 237.58 | 23.81 QP | 46.00 | -22.19 | 1.51 V | 145 | 44.00 | -20.19 |
| 3 | 384.05 | 26.65 QP | 46.00 | -19.35 | 1.01 V | 18 | 42.51 | -15.86 |
| 4 | 431.58 | 25.64 QP | 46.00 | -20.36 | 1.51 V | 2 | 40.28 | -14.64 |
| 5 | 480.08 | 22.47 QP | 46.00 | -23.53 | 1.01 V | 267 | 36.24 | -13.77 |
| 6 | 519.85 | 23.06 QP | 46.00 | -22.94 | 1.01 V | 107 | 35.92 | -12.86 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

| Frequency (MHz) | Conducted Limit (dBuV) | |
|-----------------|------------------------|---------|
| | Quasi-Peak | Average |
| 0.15 - 0.5 | 66 - 56 | 56 - 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

- Note: 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|---|--------------------------|----------------|---------------------|-------------------------|
| Test Receiver ROHDE & SCHWARZ | ESR3 | 102412 | Jan. 29, 2021 | Jan. 28, 2022 |
| RF signal cable (with 10dB PAD) Woken | 5D-FB | Cable-cond2-01 | Sep. 04, 2021 | Sep. 03, 2022 |
| LISN/AMN ROHDE & SCHWARZ (EUT) | ESH2-Z5 | 100100 | Jan. 28, 2021 | Jan. 27, 2022 |
| LISN/AMN ROHDE & SCHWARZ (Peripheral) | ESH3-Z5 | 100312 | Sep. 17, 2021 | Sep. 16, 2022 |
| Software ADT | BV ADT_Cond_ V7.3.7.3 | NA | NA | NA |

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2 (Conduction 2).
 3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

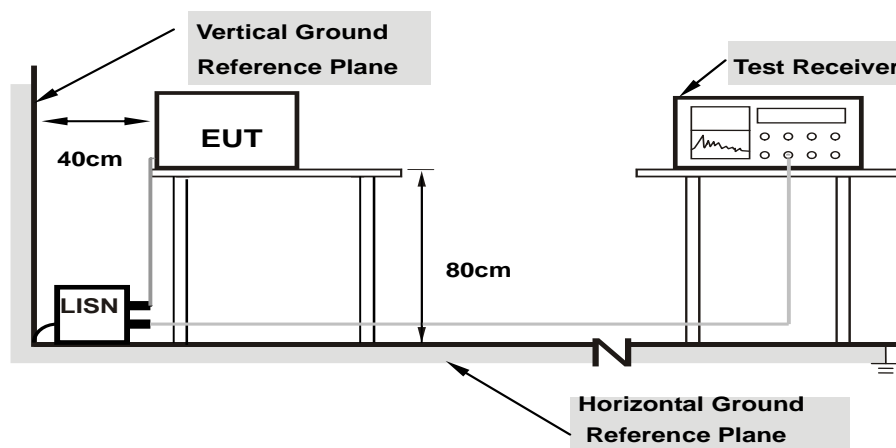
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

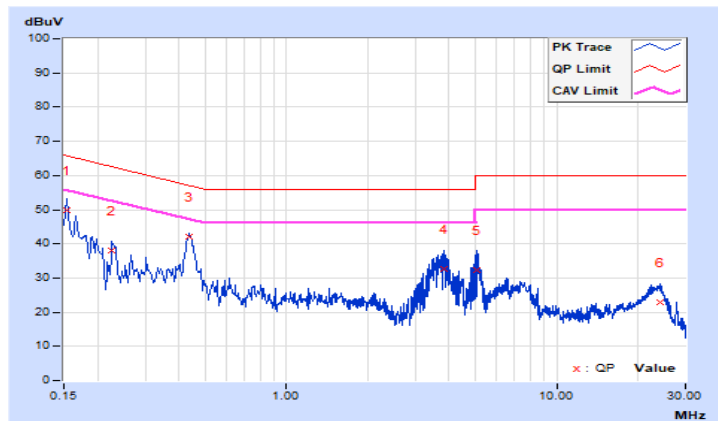
4.2.7 Test Results

| | | | |
|------------------------|----------------|---|--------------------------------------|
| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power | 120Vac, 60Hz | Environmental Conditions | 25 °C, 75% RH |
| Tested by | Randy Wu | Test Date | 2022/1/19 |

| Phase Of Power : Line (L) | | | | | | | | | | |
|---------------------------|-----------------|------------------------|----------------------|--------------|-----------------------|--------------|--------------|--------------|---------------|---------------|
| No | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV) | | Limit (dBuV) | | Margin (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15400 | 10.11 | 39.67 | 29.47 | 49.78 | 39.58 | 65.78 | 55.78 | -16.00 | -16.20 |
| 2 | 0.22600 | 10.13 | 28.00 | 15.89 | 38.13 | 26.02 | 62.60 | 52.60 | -24.47 | -26.58 |
| 3 | 0.43800 | 10.14 | 31.98 | 25.12 | 42.12 | 35.26 | 57.10 | 47.10 | -14.98 | -11.84 |
| 4 | 3.84600 | 10.24 | 22.53 | 10.71 | 32.77 | 20.95 | 56.00 | 46.00 | -23.23 | -25.05 |
| 5 | 5.05800 | 10.26 | 22.11 | 6.94 | 32.37 | 17.20 | 60.00 | 50.00 | -27.63 | -32.80 |
| 6 | 24.26600 | 10.31 | 12.52 | 5.93 | 22.83 | 16.24 | 60.00 | 50.00 | -37.17 | -33.76 |

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

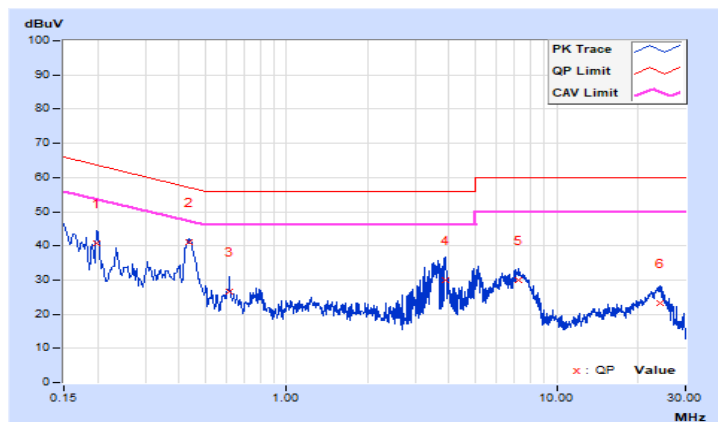


| | | | |
|------------------------|----------------|---|--------------------------------------|
| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) / Average (AV), 9kHz |
| Input Power | 120Vac, 60Hz | Environmental Conditions | 25 °C, 75% RH |
| Tested by | Randy Wu | Test Date | 2022/1/19 |

| Phase Of Power : Neutral (N) | | | | | | | | | | |
|------------------------------|-----------------|------------------------|----------------------|-------|-----------------------|-------|--------------|-------|-------------|--------|
| No | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV) | | Limit (dBuV) | | Margin (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.19800 | 10.13 | 30.64 | 19.52 | 40.77 | 29.65 | 63.69 | 53.69 | -22.92 | -24.04 |
| 2 | 0.43800 | 10.15 | 31.01 | 24.26 | 41.16 | 34.41 | 57.10 | 47.10 | -15.94 | -12.69 |
| 3 | 0.61400 | 10.16 | 16.29 | 9.98 | 26.45 | 20.14 | 56.00 | 46.00 | -29.55 | -25.86 |
| 4 | 3.89000 | 10.28 | 19.77 | 6.45 | 30.05 | 16.73 | 56.00 | 46.00 | -25.95 | -29.27 |
| 5 | 7.23800 | 10.36 | 19.48 | 12.09 | 29.84 | 22.45 | 60.00 | 50.00 | -30.16 | -27.55 |
| 6 | 24.06200 | 10.51 | 12.83 | 6.27 | 23.34 | 16.78 | 60.00 | 50.00 | -36.66 | -33.22 |

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Transmit Power Measurement

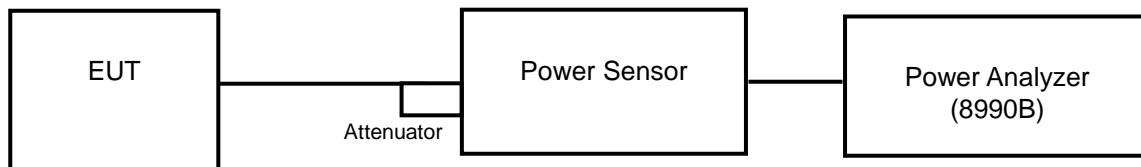
4.3.1 Limits of Transmit Power Measurement

| Operation Band | EUT Category | | Limit |
|----------------|--------------|-----------------------------------|---|
| U-NII-1 | | Outdoor Access Point | 1 Watt (30 dBm) (Max. e.i.r.p \leq 125 mW (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) |
| | √ | Mobile and Portable client device | 250 mW (24 dBm) |
| U-NII-2A | | | 250 mW (24 dBm) or 11 dBm + 10 log B* |
| U-NII-2C | | | 250 mW (24 dBm) or 11 dBm + 10 log B* |
| U-NII-3 | | √ | 1 Watt (30 dBm) |

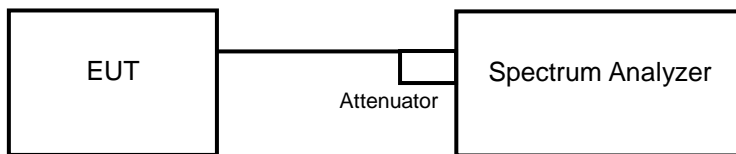
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

<Power Output Measurement>



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

<802.11a, 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80)>

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

26 dB Bandwidth

- a. Set RBW = approximately 1 % of the emission bandwidth.
- b. Set the VBW $\geq 3 \times$ RBW.
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

Power Output:

802.11a

| Channel | Frequency (MHz) | Maximum Conducted Power (mW) | Maximum Conducted Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---------|-----------------|------------------------------|-------------------------------|-------------------|-------------|
| 36 | 5180 | 52.723 | 17.22 | 24 | Pass |
| 40 | 5200 | 71.614 | 18.55 | 24 | Pass |
| 48 | 5240 | 72.778 | 18.62 | 24 | Pass |
| 149 | 5745 | 62.087 | 17.93 | 30 | Pass |
| 157 | 5785 | 63.973 | 18.06 | 30 | Pass |
| 165 | 5825 | 56.624 | 17.53 | 30 | Pass |

802.11ac (VHT20)

| Channel | Frequency (MHz) | Maximum Conducted Power (mW) | Maximum Conducted Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---------|-----------------|------------------------------|-------------------------------|-------------------|-------------|
| 36 | 5180 | 63.387 | 18.02 | 24 | Pass |
| 40 | 5200 | 68.077 | 18.33 | 24 | Pass |
| 48 | 5240 | 67.453 | 18.29 | 24 | Pass |
| 149 | 5745 | 61.802 | 17.91 | 30 | Pass |
| 157 | 5785 | 62.517 | 17.96 | 30 | Pass |
| 165 | 5825 | 54.325 | 17.35 | 30 | Pass |

802.11ac (VHT40)

| Channel | Frequency (MHz) | Maximum Conducted Power (mW) | Maximum Conducted Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---------|-----------------|------------------------------|-------------------------------|-------------------|-------------|
| 38 | 5190 | 36.559 | 15.63 | 24 | Pass |
| 46 | 5230 | 78.886 | 18.97 | 24 | Pass |
| 151 | 5755 | 66.222 | 18.21 | 30 | Pass |
| 159 | 5795 | 61.66 | 17.90 | 30 | Pass |

802.11ac (VHT80)

| Channel | Frequency (MHz) | Maximum Conducted Power (mW) | Maximum Conducted Power (dBm) | Power Limit (dBm) | Pass / Fail |
|---------|-----------------|------------------------------|-------------------------------|-------------------|-------------|
| 42 | 5210 | 24.946 | 13.97 | 24 | Pass |
| 155 | 5775 | 60.117 | 17.79 | 30 | Pass |

26 dB Bandwidth:

802.11a

| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) |
|---------|-----------------|------------------------|
| 36 | 5180 | 22.41 |
| 40 | 5200 | 32.99 |
| 48 | 5240 | 29.60 |

802.11ac (VHT20)

| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) |
|---------|-----------------|------------------------|
| 36 | 5180 | 29.11 |
| 40 | 5200 | 27.37 |
| 48 | 5240 | 29.76 |

802.11ac (VHT40)

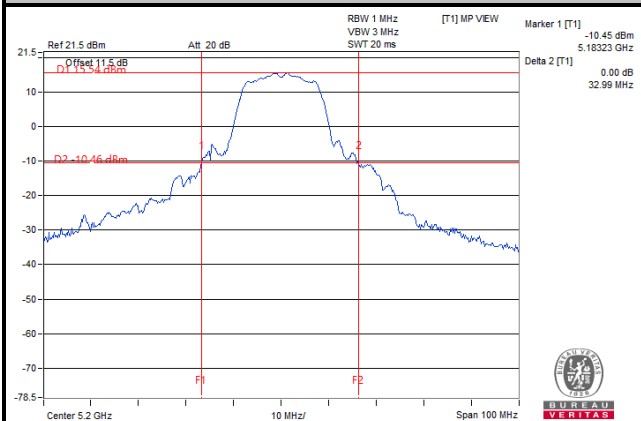
| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) |
|---------|-----------------|------------------------|
| 38 | 5190 | 48.88 |
| 46 | 5230 | 78.13 |

802.11ac (VHT80)

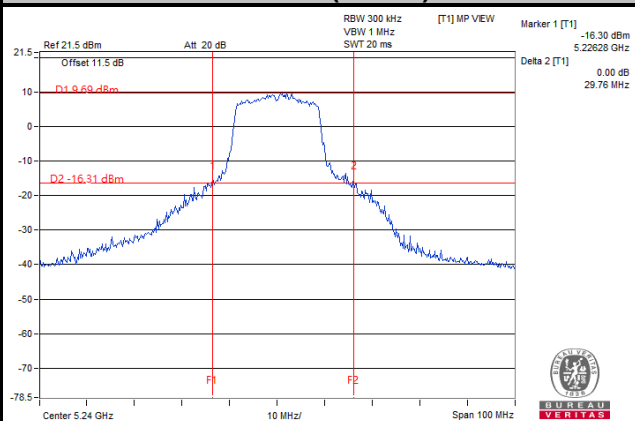
| Channel | Frequency (MHz) | 26 dBc Bandwidth (MHz) |
|---------|-----------------|------------------------|
| 42 | 5210 | 83.17 |

Spectrum Plot of Worst Value

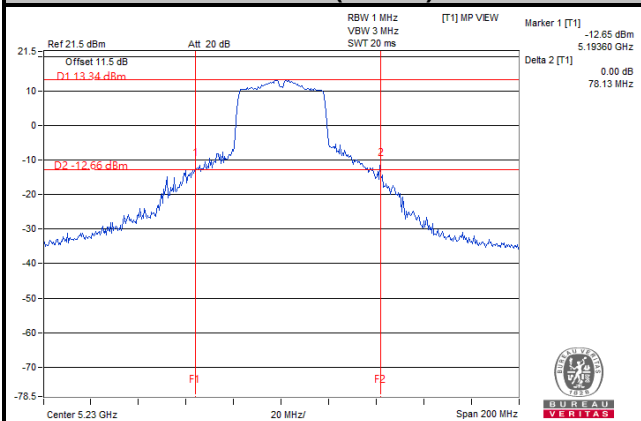
802.11a



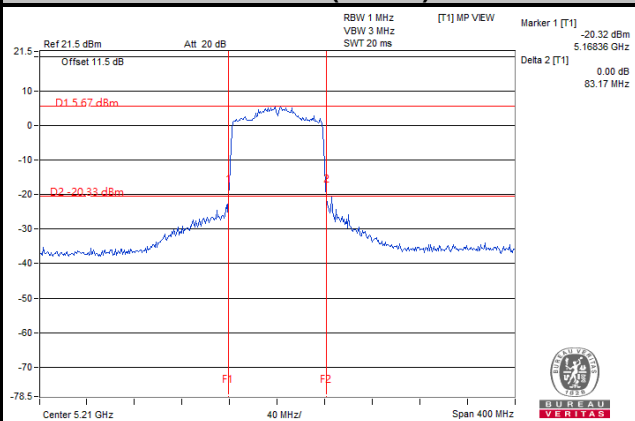
802.11ac (VHT20)



802.11ac (VHT40)

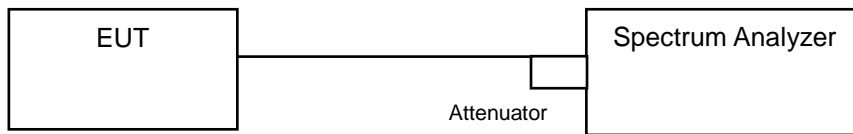


802.11ac (VHT80)



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.4 Test Results

802.11a

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |
|---------|-------------------------|--------------------------|
| 36 | 5180 | 17.16 |
| 40 | 5200 | 17.52 |
| 48 | 5240 | 17.76 |
| 149 | 5745 | 18.84 |
| 157 | 5785 | 18.72 |
| 165 | 5825 | 18.60 |

802.11ac (VHT20)

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |
|---------|-------------------------|--------------------------|
| 36 | 5180 | 18.36 |
| 40 | 5200 | 18.36 |
| 48 | 5240 | 18.36 |
| 149 | 5745 | 19.08 |
| 157 | 5785 | 18.96 |
| 165 | 5825 | 18.72 |

802.11ac (VHT40)

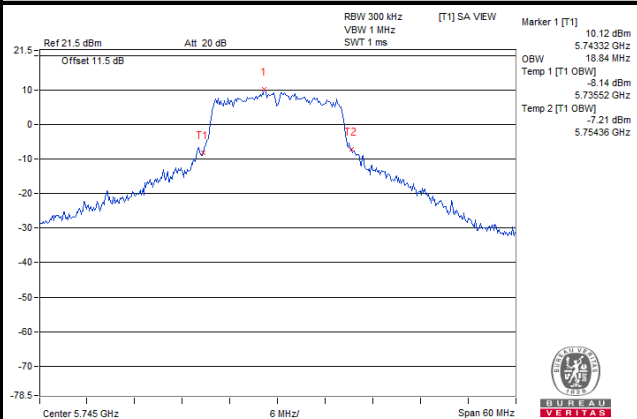
| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |
|---------|-------------------------|--------------------------|
| 38 | 5190 | 36.48 |
| 46 | 5230 | 37.20 |
| 151 | 5755 | 37.56 |
| 159 | 5795 | 37.32 |

802.11ac (VHT80)

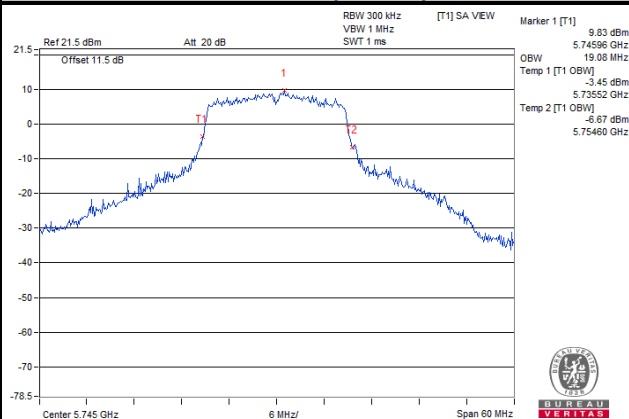
| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |
|---------|-------------------------|--------------------------|
| 42 | 5210 | 75.60 |
| 155 | 5775 | 76.32 |

Spectrum Plot of Worst Value

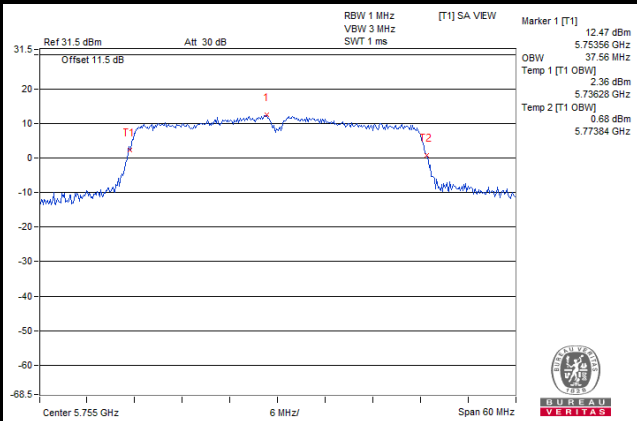
802.11a



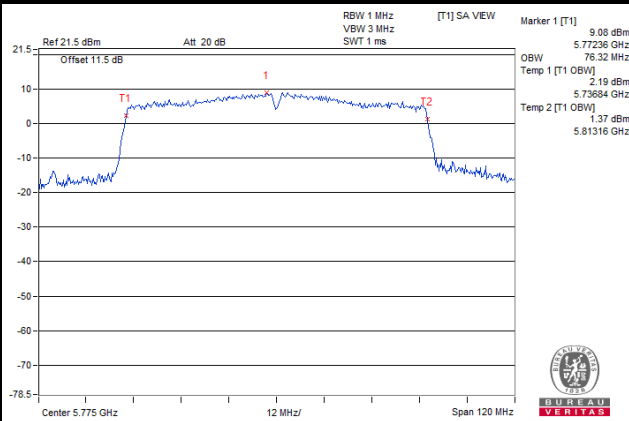
802.11ac (VHT20)



802.11ac (VHT40)

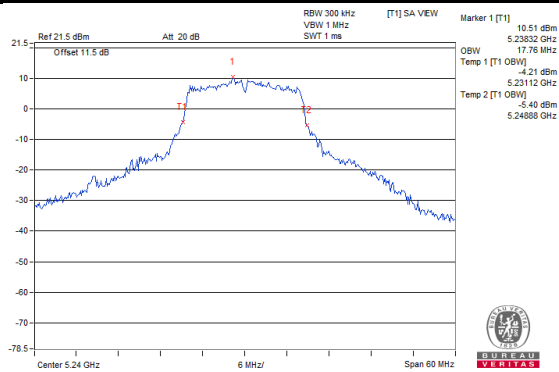


802.11ac (VHT80)

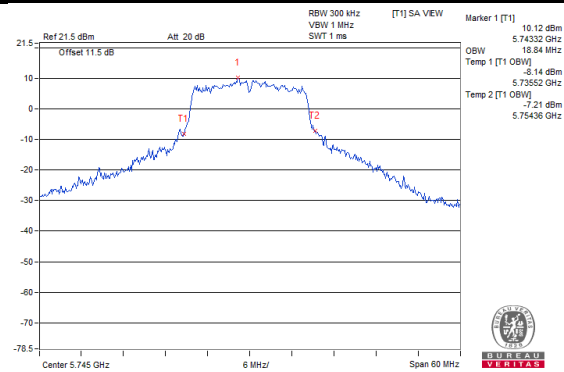


Spectrum Plot for Nearby DFS Band 802.11a

Ch 48 (5240 MHz)

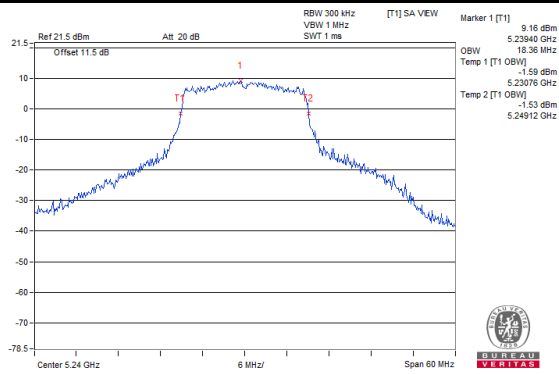


Ch 149 (5745 MHz)

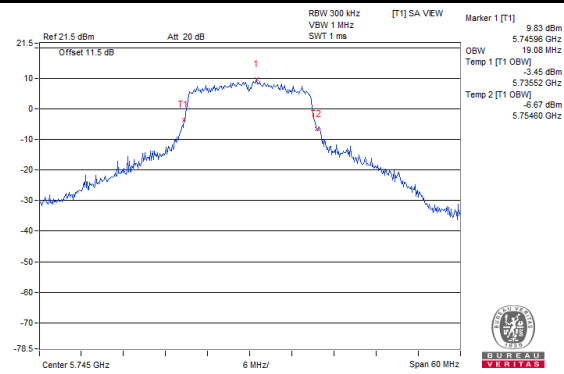


802.11ac (VHT20)

Ch 48 (5240 MHz)

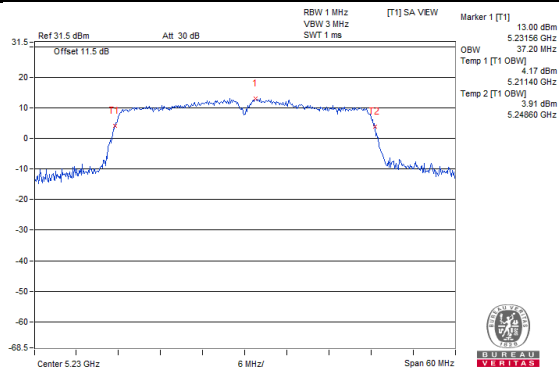


Ch 149 (5745 MHz)

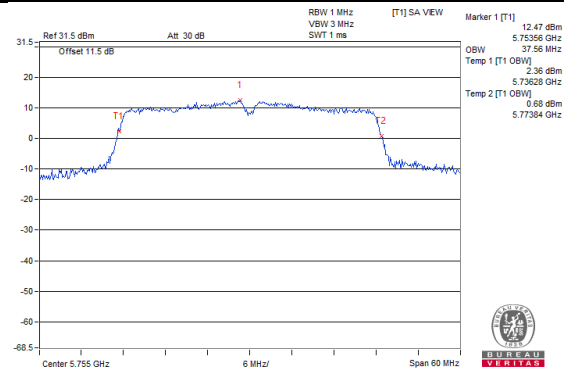


802.11ac (VHT40)

Ch 46 (5230 MHz)

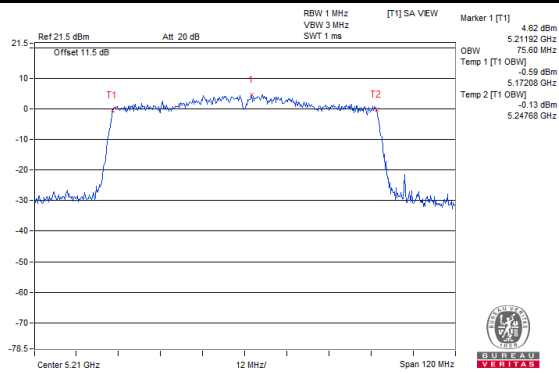


Ch 151 (5755 MHz)

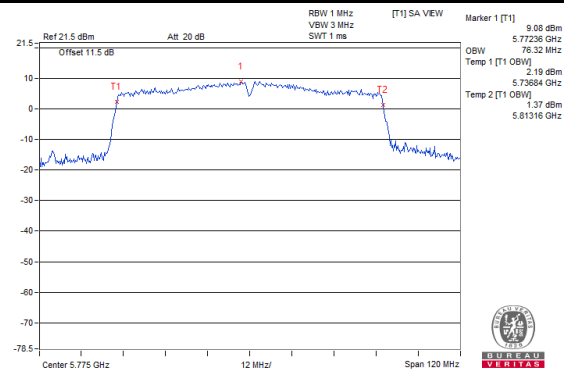


802.11ac (VHT80)

Ch 42 (5210 MHz)



Ch 155 (5775 MHz)

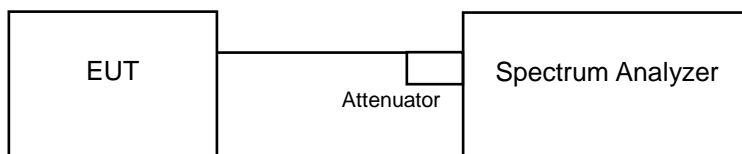


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

| Operation Band | EUT Category | | Limit |
|----------------|--------------|-----------------------------------|----------------|
| U-NII-1 | | Outdoor Access Point | 17 dBm/MHz |
| | | Fixed point-to-point Access Point | |
| | | Indoor Access Point | |
| | √ | Mobile and Portable client device | 11 dBm/MHz |
| U-NII-2A | | | 11 dBm/MHz |
| U-NII-2C | | | 11 dBm/MHz |
| U-NII-3 | | √ | 30 dBm/500 kHz |

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1 band:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW \geq 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

※ For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW \geq 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz} / 300 \text{ kHz})$.
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

For U-NII-1 Band

802.11a

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) | Duty Factor (dB) | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass / Fail |
|---------|-----------------|-------------------------------|------------------|--------------------------------|-------------------------|-------------|
| 36 | 5180 | 4.82 | 0.33 | 5.15 | 11 | Pass |
| 40 | 5200 | 5.57 | 0.33 | 5.90 | 11 | Pass |
| 48 | 5240 | 5.72 | 0.33 | 6.05 | 11 | Pass |

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) | Duty Factor (dB) | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass / Fail |
|---------|-----------------|-------------------------------|------------------|--------------------------------|-------------------------|-------------|
| 36 | 5180 | 4.82 | 0.33 | 5.15 | 11 | Pass |
| 40 | 5200 | 5.08 | 0.33 | 5.41 | 11 | Pass |
| 48 | 5240 | 5.17 | 0.33 | 5.50 | 11 | Pass |

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) | Duty Factor (dB) | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass / Fail |
|---------|-----------------|-------------------------------|------------------|--------------------------------|-------------------------|-------------|
| 38 | 5190 | -0.66 | 0.68 | 0.02 | 11 | Pass |
| 46 | 5230 | 2.41 | 0.68 | 3.09 | 11 | Pass |

Note: Refer to section 3.3 for duty cycle spectrum plot.

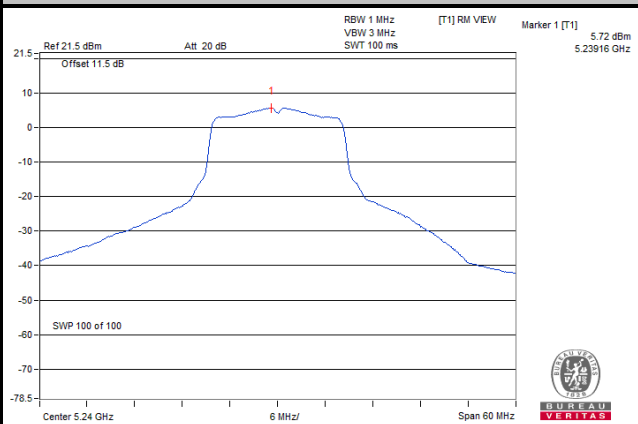
802.11ac (VHT80)

| Channel | Frequency (MHz) | PSD w/o Duty Factor (dBm/MHz) | Duty Factor (dB) | PSD with Duty Factor (dBm/MHz) | Maximum Limit (dBm/MHz) | Pass / Fail |
|---------|-----------------|-------------------------------|------------------|--------------------------------|-------------------------|-------------|
| 42 | 5210 | -6.02 | 1.14 | -4.88 | 11 | Pass |

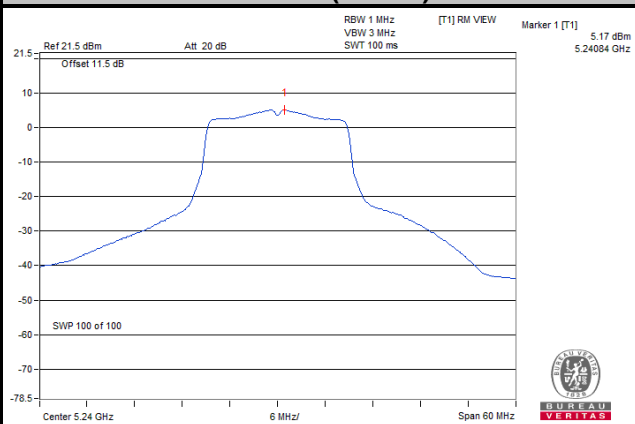
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

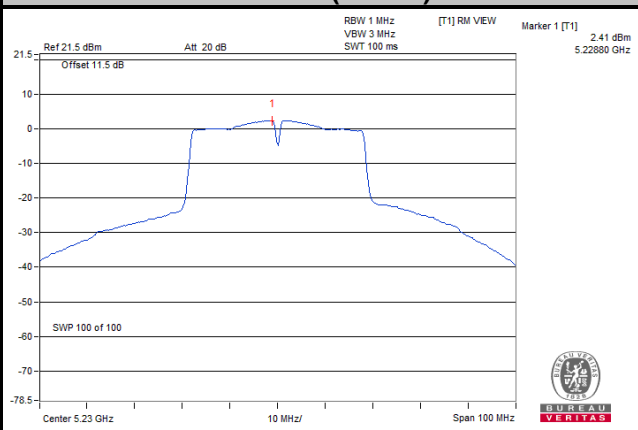
802.11a



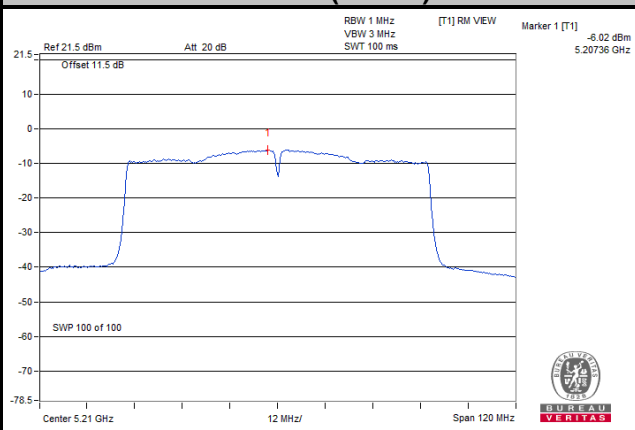
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

| Channel | Frequency (MHz) | PSD w/o Duty Factor | | Duty Factor (dB) | PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|---------------------|---------------|------------------|------------------------------------|---------------------|-------------|
| | | (dBm/300 kHz) | (dBm/500 kHz) | | | | |
| 149 | 5745 | -3.52 | -1.30 | 0.33 | -0.97 | 30 | Pass |
| 157 | 5785 | -2.84 | -0.62 | 0.33 | -0.29 | 30 | Pass |
| 165 | 5825 | -3.07 | -0.85 | 0.33 | -0.52 | 30 | Pass |

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

| Channel | Frequency (MHz) | PSD w/o Duty Factor | | Duty Factor (dB) | PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|---------------------|---------------|------------------|------------------------------------|---------------------|-------------|
| | | (dBm/300 kHz) | (dBm/500 kHz) | | | | |
| 149 | 5745 | -3.10 | -0.88 | 0.33 | -0.55 | 30 | Pass |
| 157 | 5785 | -3.27 | -1.05 | 0.33 | -0.72 | 30 | Pass |
| 165 | 5825 | -3.91 | -1.69 | 0.33 | -1.36 | 30 | Pass |

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

| Channel | Frequency (MHz) | PSD w/o Duty Factor | | Duty Factor (dB) | PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|---------------------|---------------|------------------|------------------------------------|---------------------|-------------|
| | | (dBm/300 kHz) | (dBm/500 kHz) | | | | |
| 151 | 5755 | -6.75 | -4.53 | 0.68 | -3.85 | 30 | Pass |
| 159 | 5795 | -7.07 | -4.85 | 0.68 | -4.17 | 30 | Pass |

Note: Refer to section 3.3 for duty cycle spectrum plot.

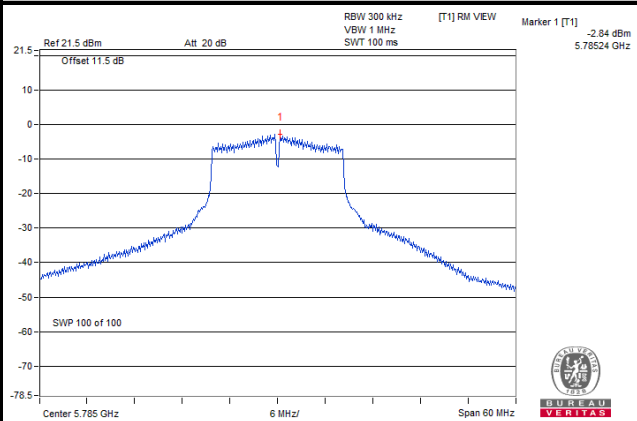
802.11ac (VHT80)

| Channel | Frequency (MHz) | PSD w/o Duty Factor | | Duty Factor (dB) | PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|---------------------|---------------|------------------|------------------------------------|---------------------|-------------|
| | | (dBm/300 kHz) | (dBm/500 kHz) | | | | |
| 155 | 5775 | -10.64 | -8.42 | 1.14 | -7.28 | 30 | Pass |

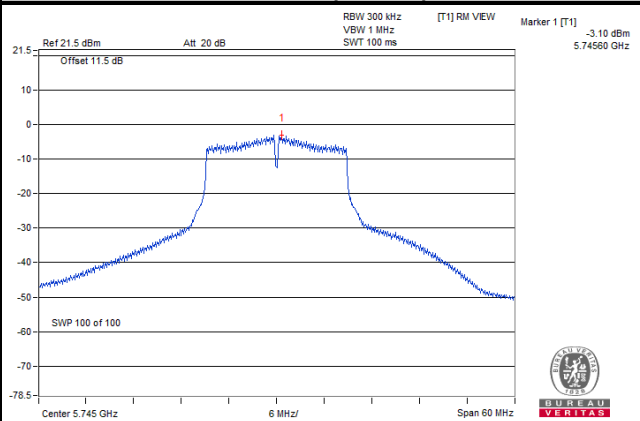
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

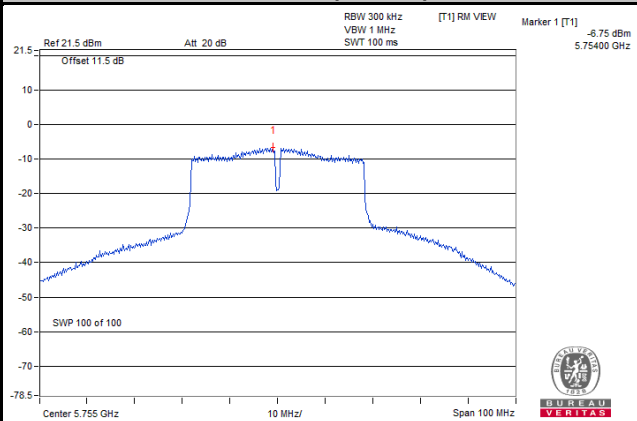
802.11a



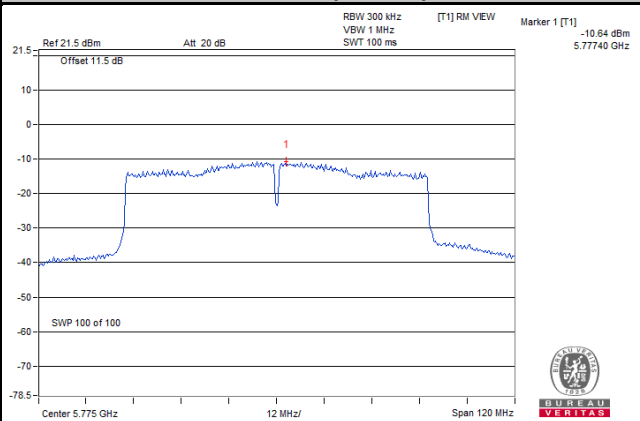
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

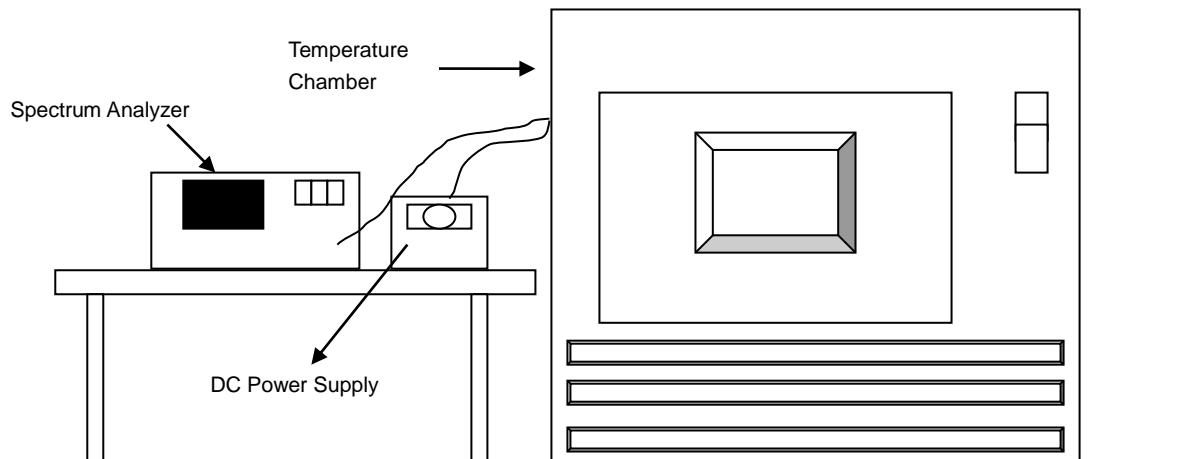


4.6 Frequency Stability

4.6.1 Limit of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
- Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

| Frequency Stability Versus Temp. | | | | | | | | | |
|----------------------------------|--------------------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
| Operating Frequency: 5180 MHz | | | | | | | | | |
| Temp. (°C) | Power Supply (Vdc) | 0 Minute | | 2 Minute | | 5 Minute | | 10 Minute | |
| | | Reading (MHz) | Result | Reading (MHz) | Result | Reading (MHz) | Result | Reading (MHz) | Result |
| 65 | 5 | 5179.9922 | Pass | 5179.9952 | Pass | 5179.9964 | Pass | 5179.9933 | Pass |
| 60 | 5 | 5180.0232 | Pass | 5180.0214 | Pass | 5180.0185 | Pass | 5180.0218 | Pass |
| 50 | 5 | 5179.9922 | Pass | 5179.992 | Pass | 5179.9927 | Pass | 5179.9921 | Pass |
| 40 | 5 | 5179.9888 | Pass | 5179.9849 | Pass | 5179.9855 | Pass | 5179.9849 | Pass |
| 30 | 5 | 5180.0128 | Pass | 5180.0101 | Pass | 5180.0132 | Pass | 5180.0134 | Pass |
| 20 | 5 | 5180 | Pass | 5180.0023 | Pass | 5180.0005 | Pass | 5180.002 | Pass |
| 10 | 5 | 5179.9861 | Pass | 5179.9863 | Pass | 5179.9834 | Pass | 5179.9861 | Pass |
| 0 | 5 | 5179.9929 | Pass | 5179.9929 | Pass | 5179.9906 | Pass | 5179.9923 | Pass |
| -10 | 5 | 5180.0096 | Pass | 5180.008 | Pass | 5180.0069 | Pass | 5180.0067 | Pass |
| -20 | 5 | 5180.0118 | Pass | 5180.0105 | Pass | 5180.015 | Pass | 5180.0116 | Pass |
| -25 | 5 | 5180.0164 | Pass | 5180.0199 | Pass | 5180.0152 | Pass | 5180.0188 | Pass |

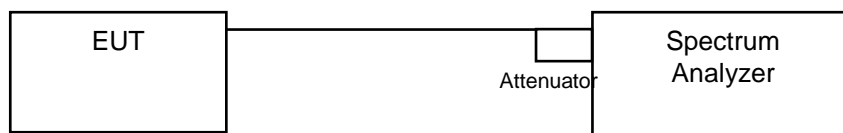
| Frequency Stability Versus Voltage | | | | | | | | | |
|------------------------------------|--------------------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
| Operating Frequency: 5180 MHz | | | | | | | | | |
| Temp. (°C) | Power Supply (Vdc) | 0 Minute | | 2 Minute | | 5 Minute | | 10 Minute | |
| | | Reading (MHz) | Result | Reading (MHz) | Result | Reading (MHz) | Result | Reading (MHz) | Result |
| 20 | 5.75 | 5179.9968 | Pass | 5179.9991 | Pass | 5179.996 | Pass | 5179.9977 | Pass |
| | 5 | 5180 | Pass | 5180.0023 | Pass | 5180.0005 | Pass | 5180.002 | Pass |
| | 4.25 | 5179.9907 | Pass | 5179.9876 | Pass | 5179.9876 | Pass | 5179.9894 | Pass |

4.7 6 dB Bandwidth Measurement

4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

802.11a

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------------------|-------------|
| 149 | 5745 | 16.14 | 0.5 | Pass |
| 157 | 5785 | 16.32 | 0.5 | Pass |
| 165 | 5825 | 16.32 | 0.5 | Pass |

802.11ac (VHT20)

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------------------|-------------|
| 149 | 5745 | 17.25 | 0.5 | Pass |
| 157 | 5785 | 17.12 | 0.5 | Pass |
| 165 | 5825 | 17.35 | 0.5 | Pass |

802.11ac (VHT40)

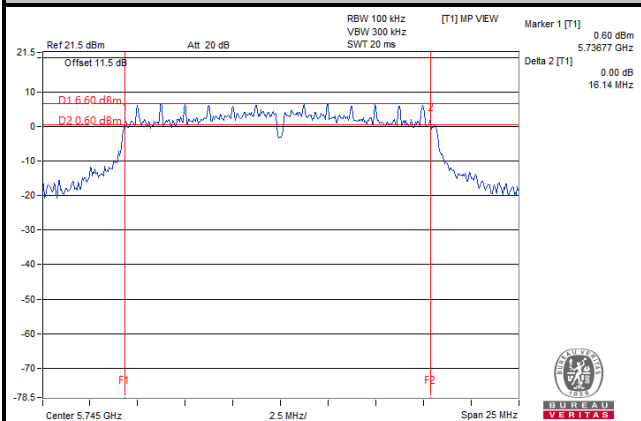
| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------------------|-------------|
| 151 | 5755 | 35.95 | 0.5 | Pass |
| 159 | 5795 | 35.93 | 0.5 | Pass |

802.11ac (VHT80)

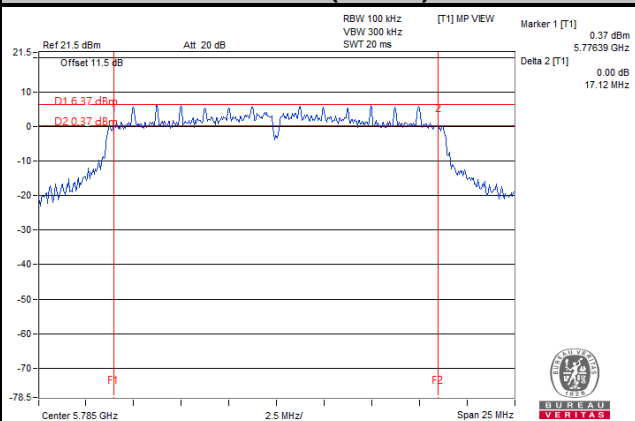
| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------------------|-------------|
| 155 | 5775 | 75.52 | 0.5 | Pass |

Spectrum Plot of Worst Value

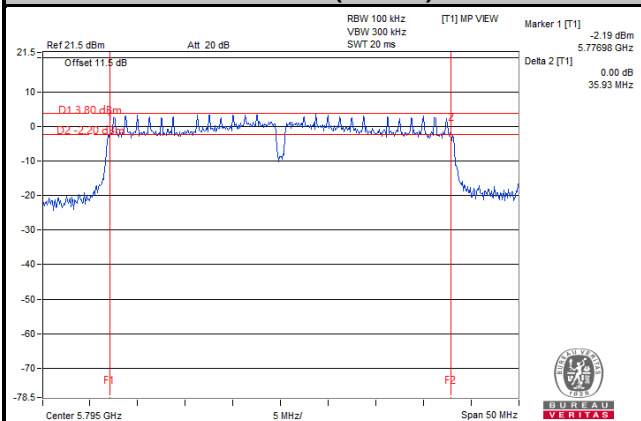
802.11a



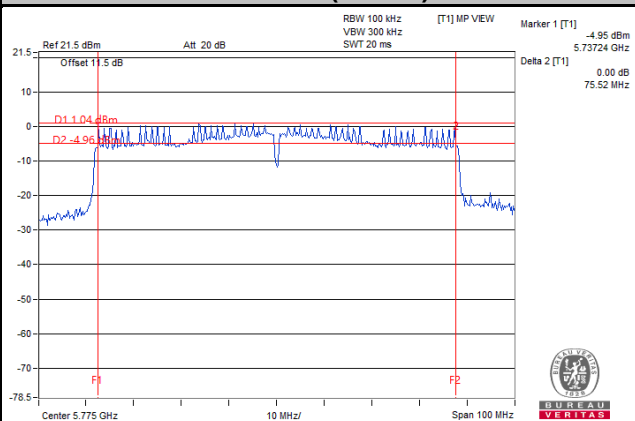
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



5 Pictures of Test Arrangements

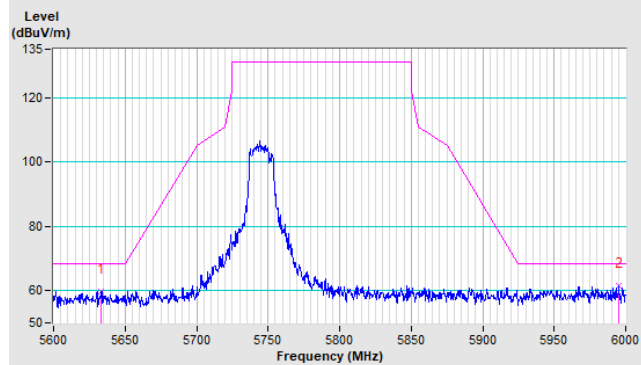
Please refer to the attached file (Test Setup Photo).

Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

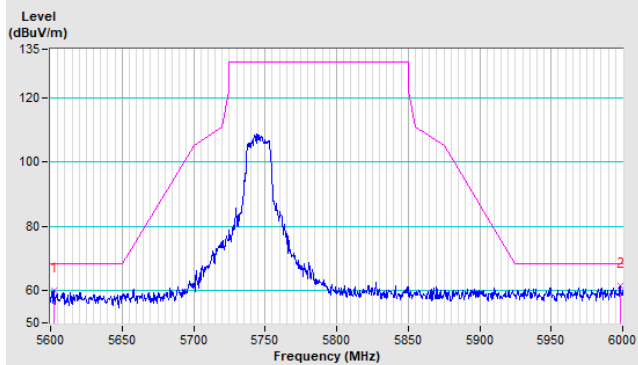
802.11a

CH 149 5745 MHz

Horizontal

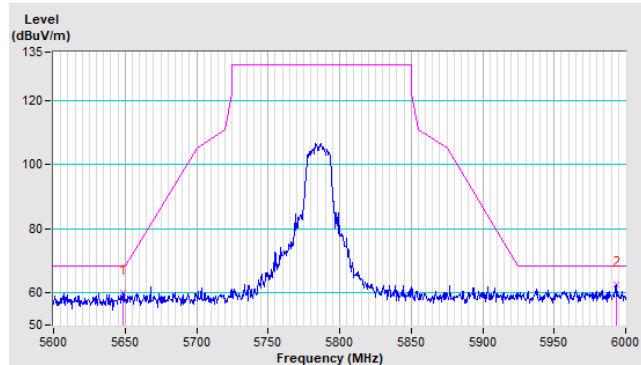


Vertical

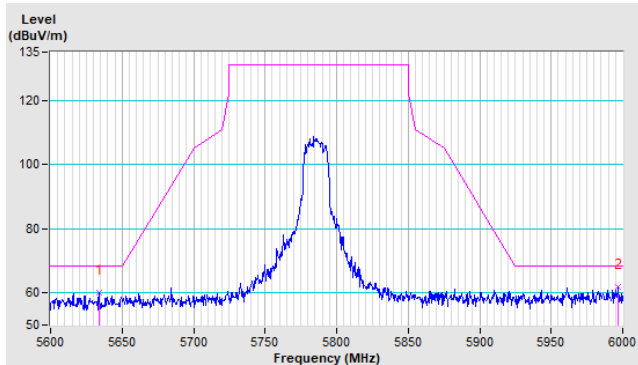


CH 157 5785 MHz

Horizontal

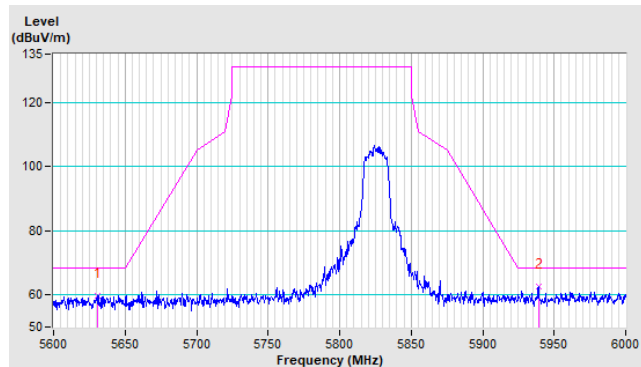


Vertical

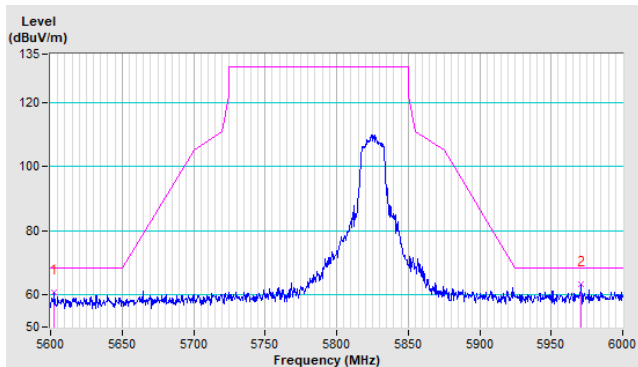


CH 165 5825 MHz

Horizontal



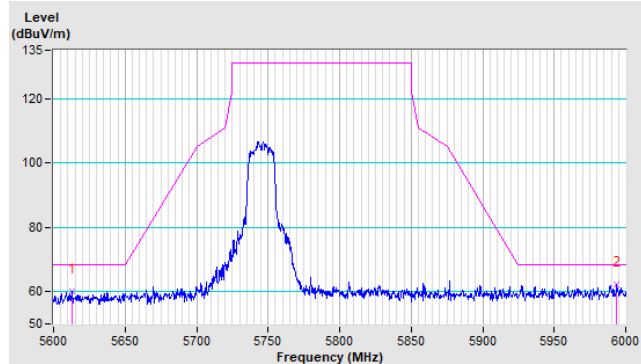
Vertical



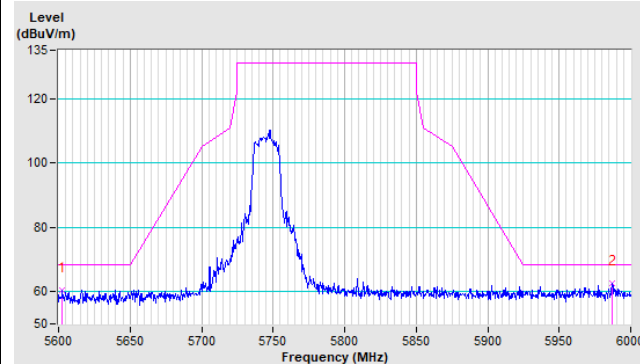
802.11ac (VTH20)

CH 149 5745 MHz

Horizontal

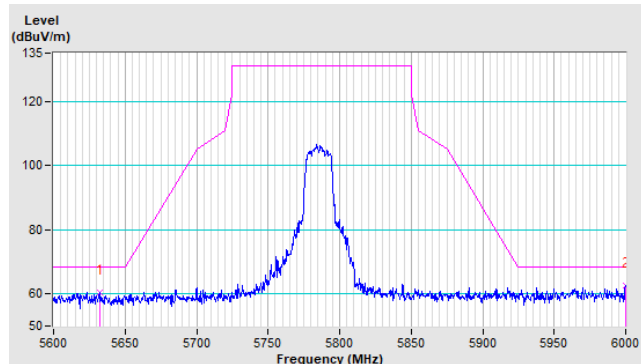


Vertical

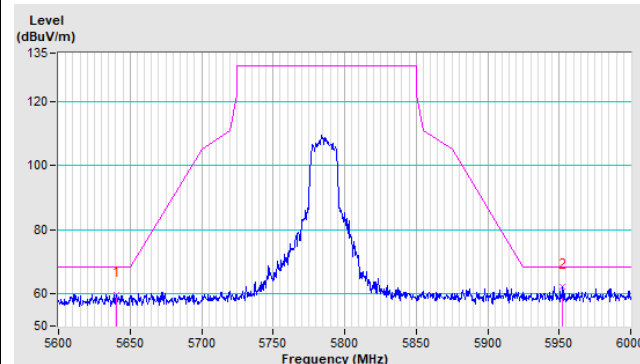


CH 157 5785 MHz

Horizontal

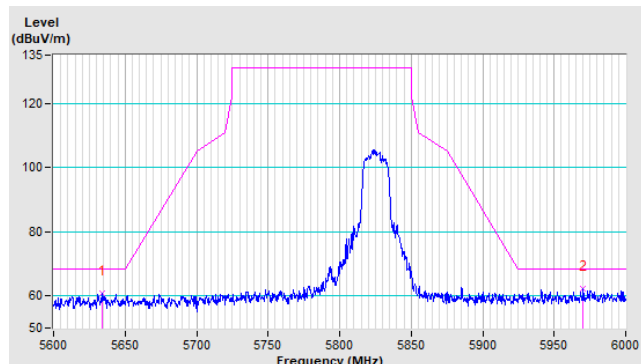


Vertical

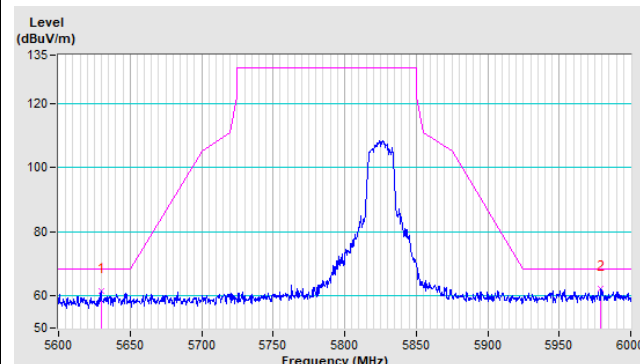


CH 165 5825 MHz

Horizontal



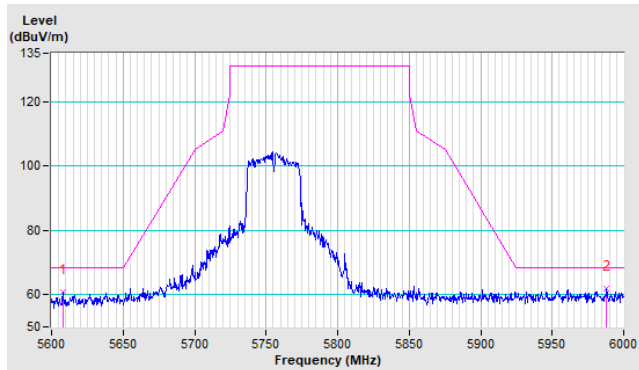
Vertical



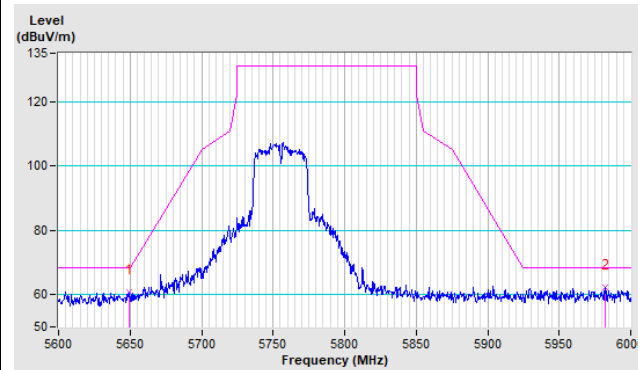
802.11ac (VTH40)

CH 151 5755 MHz

Horizontal

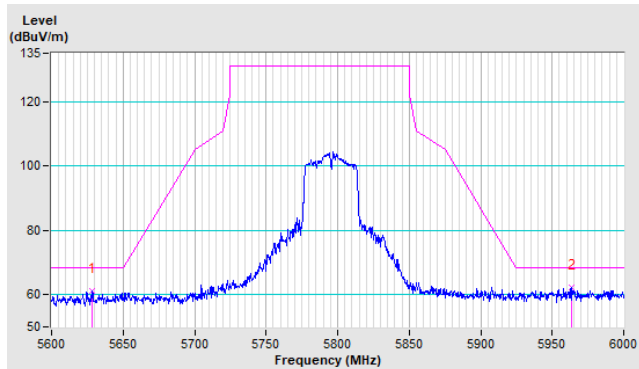


Vertical

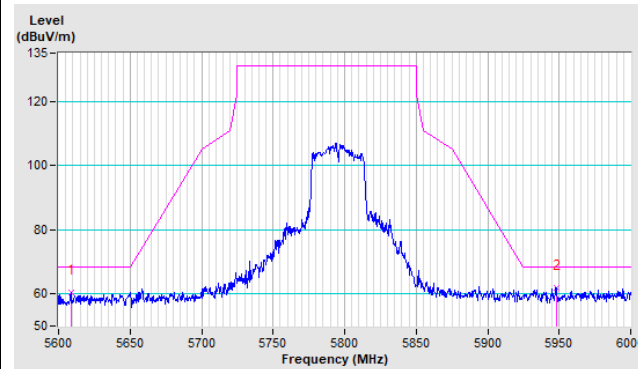


CH 159 5795 MHz

Horizontal



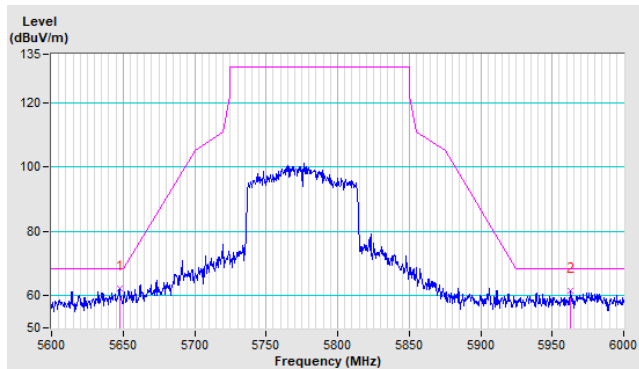
Vertical



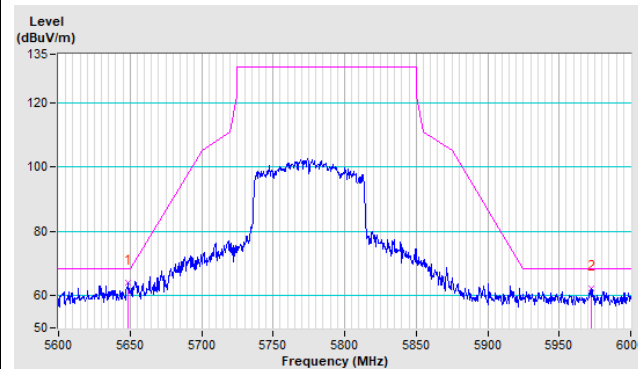
802.11ac (VTH80)

CH 155 5775 MHz

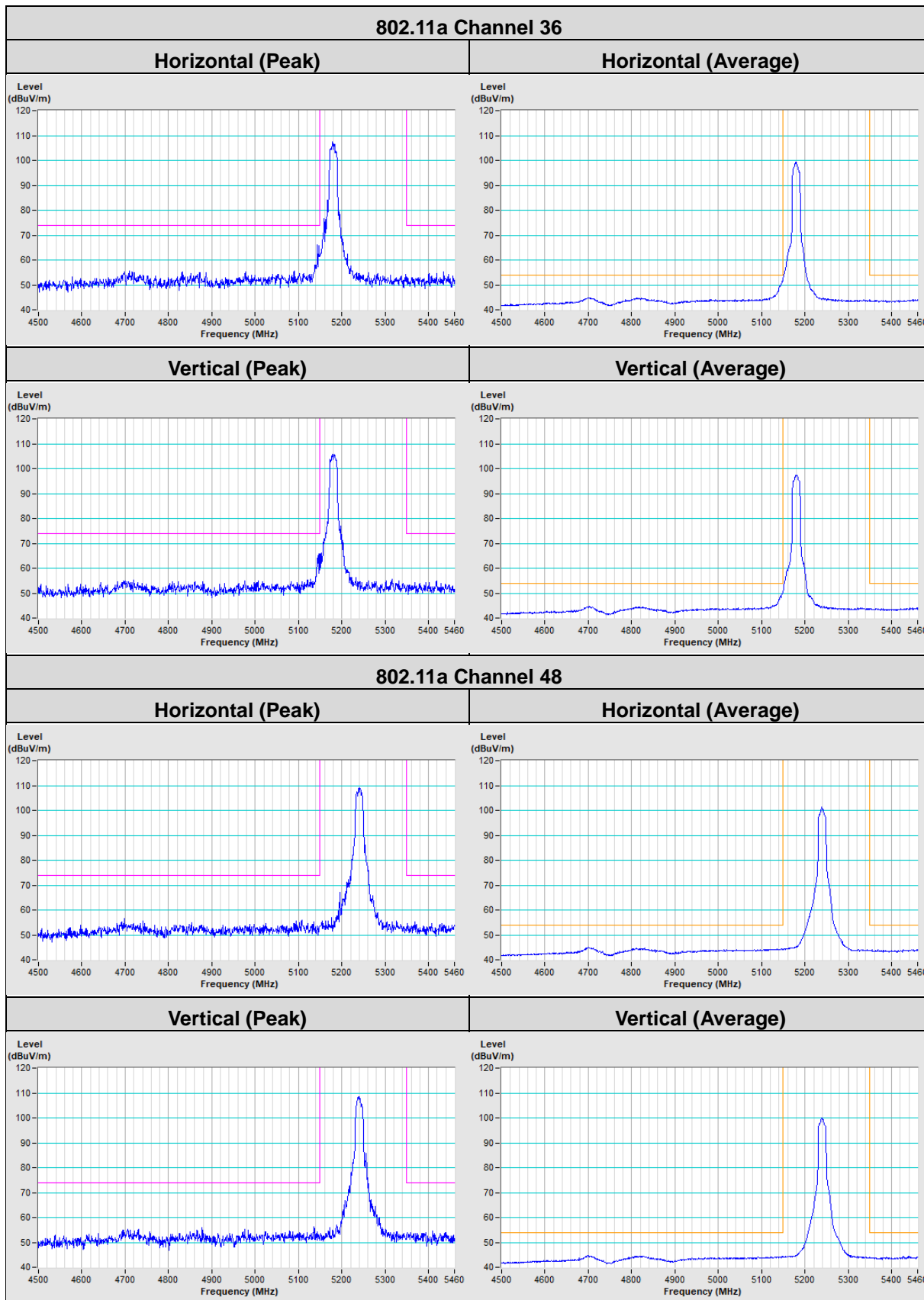
Horizontal



Vertical

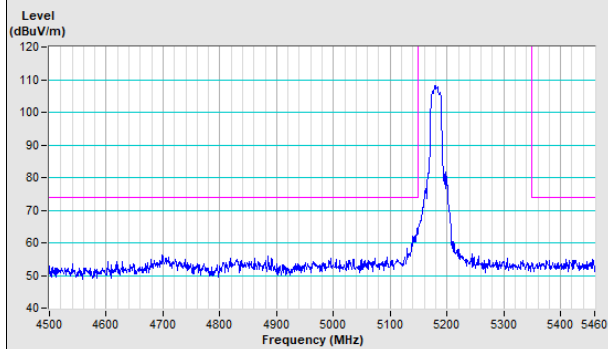


Annex B- Band Edge Measurement

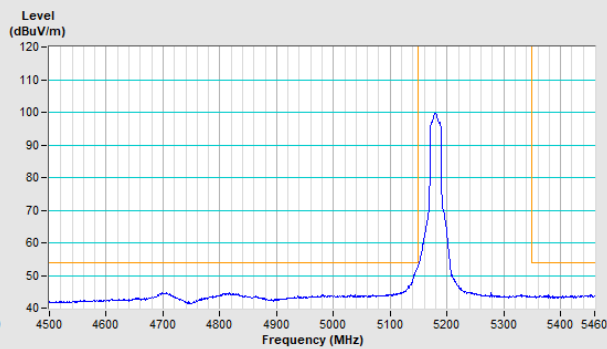


802.11ac (VHT20) Channel 36

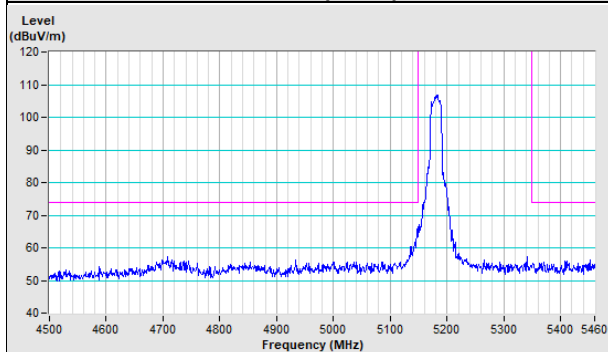
Horizontal (Peak)



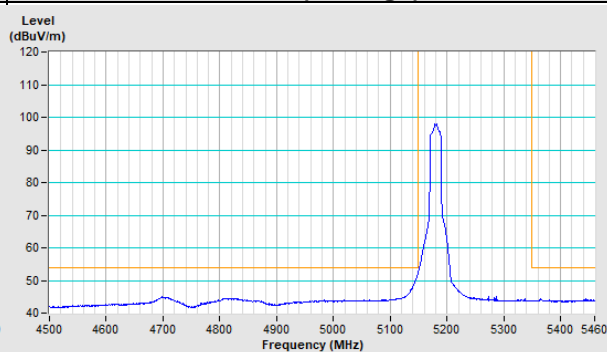
Horizontal (Average)



Vertical (Peak)

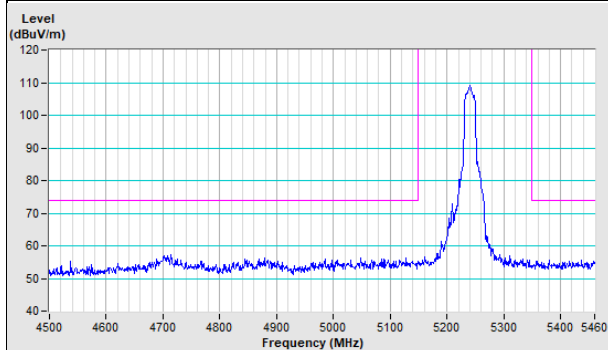


Vertical (Average)

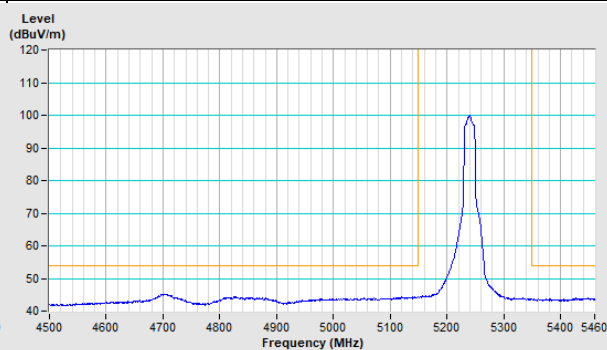


802.11ac (VHT20) Channel 48

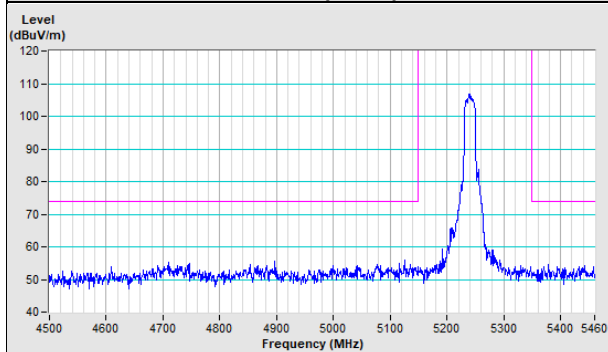
Horizontal (Peak)



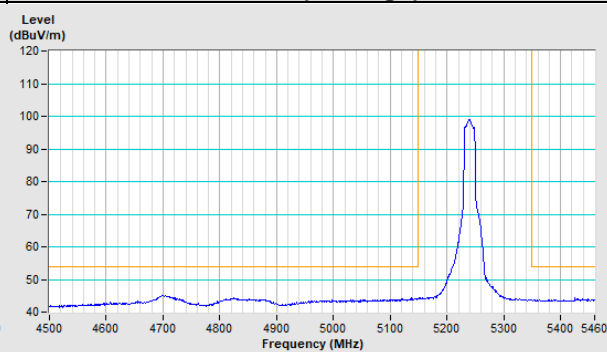
Horizontal (Average)



Vertical (Peak)

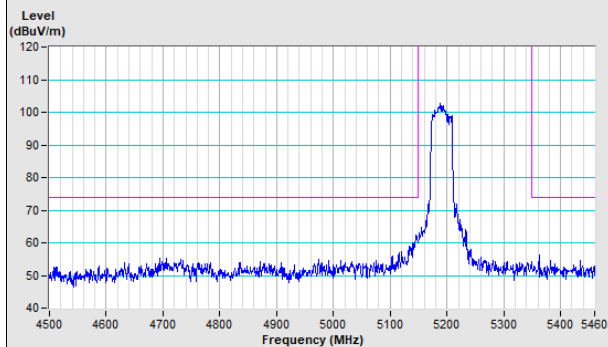


Vertical (Average)

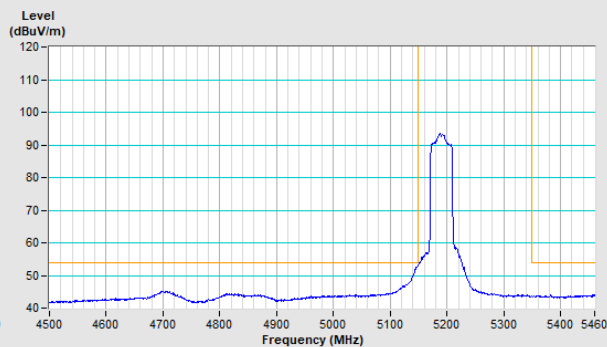


802.11ac (VHT40) Channel 38

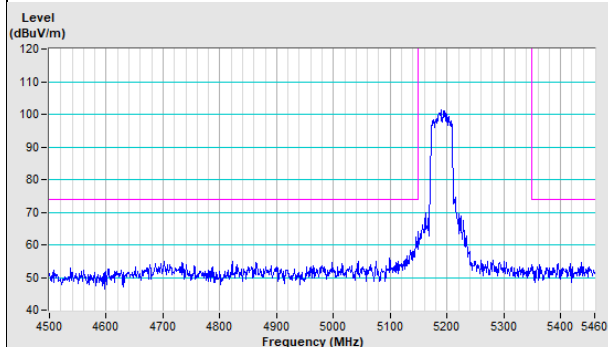
Horizontal (Peak)



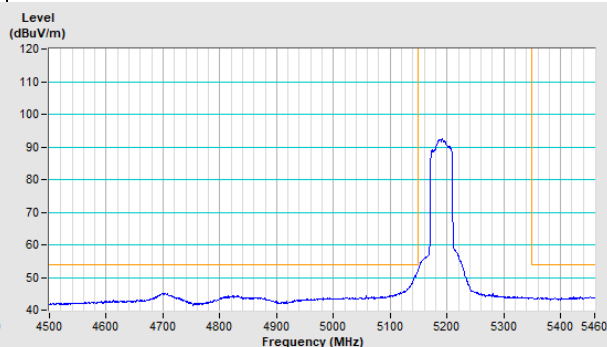
Horizontal (Average)



Vertical (Peak)

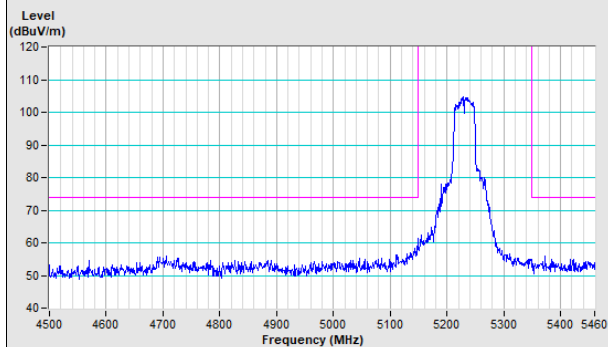


Vertical (Average)

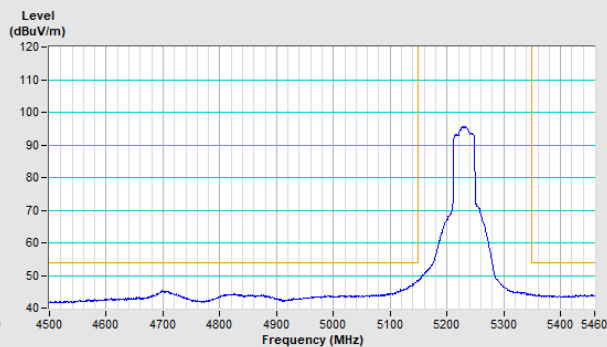


802.11ac (VHT40) Channel 46

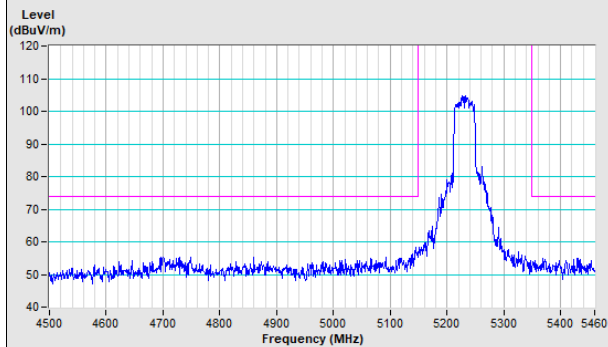
Horizontal (Peak)



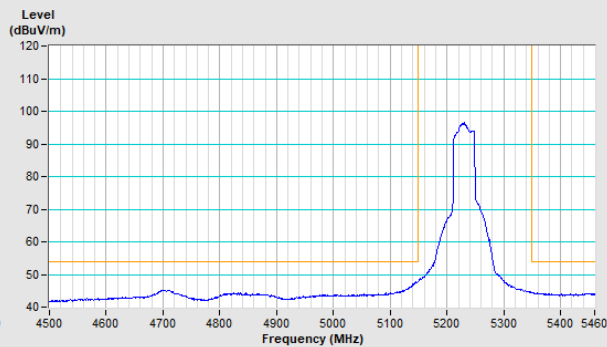
Horizontal (Average)



Vertical (Peak)

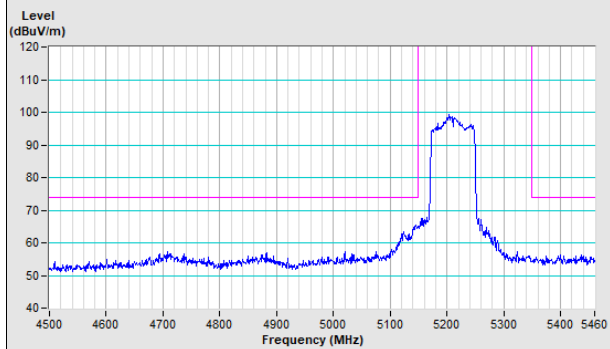


Vertical (Average)

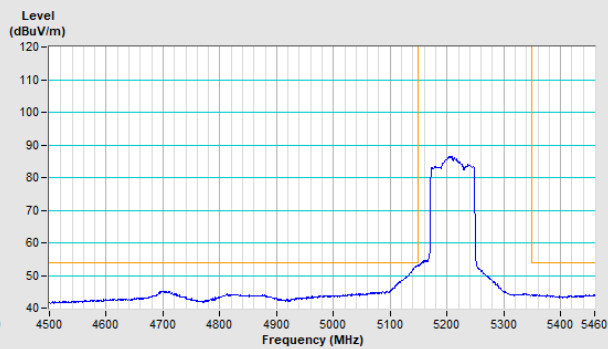


802.11ac (VHT80) Channel 42

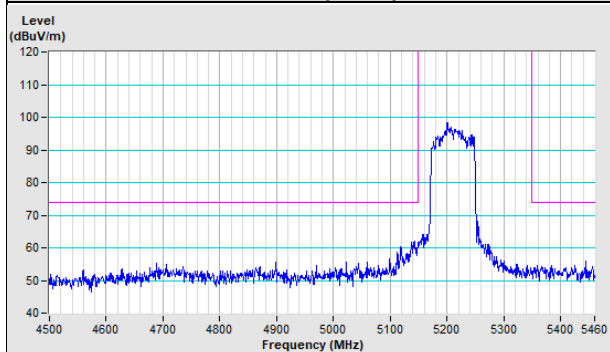
Horizontal (Peak)



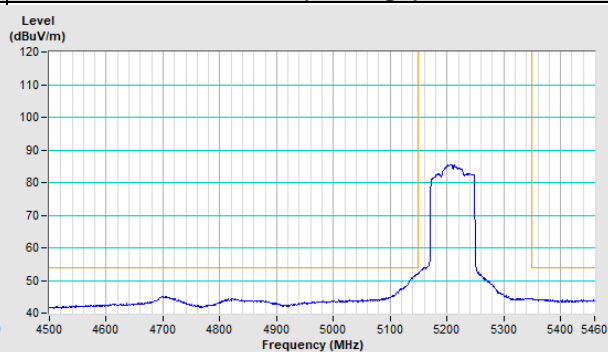
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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