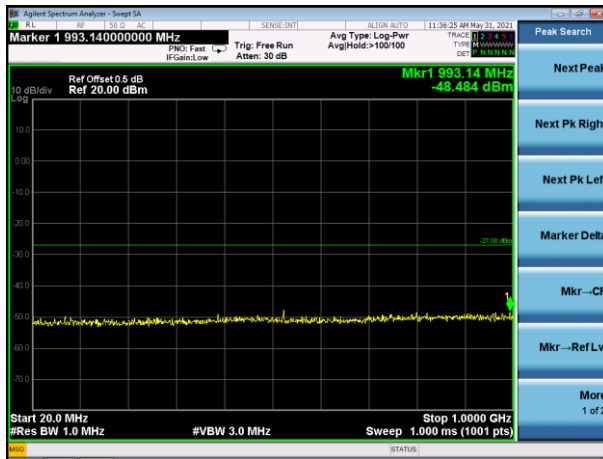
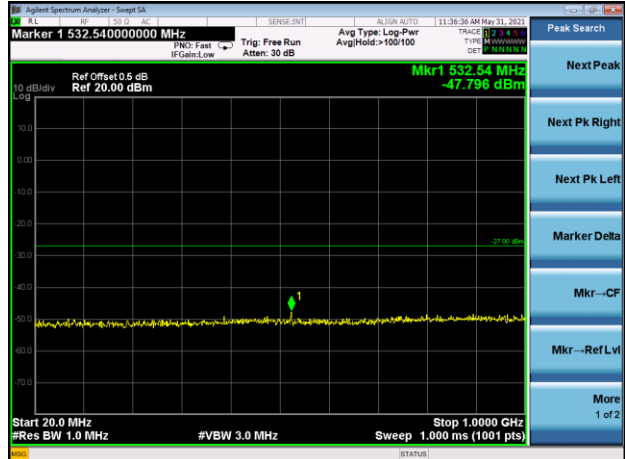


## Test Plot

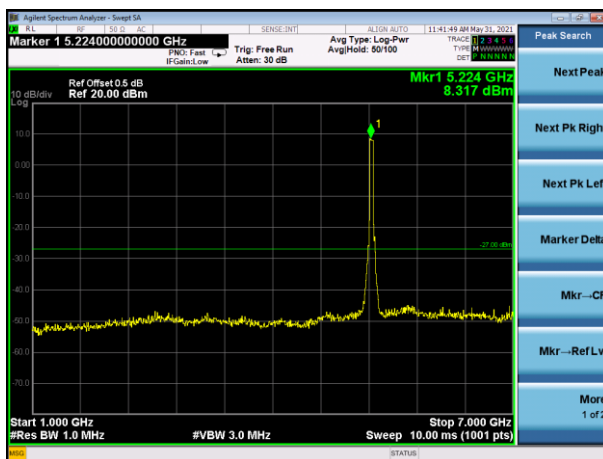
802.11ac40 on channel 46



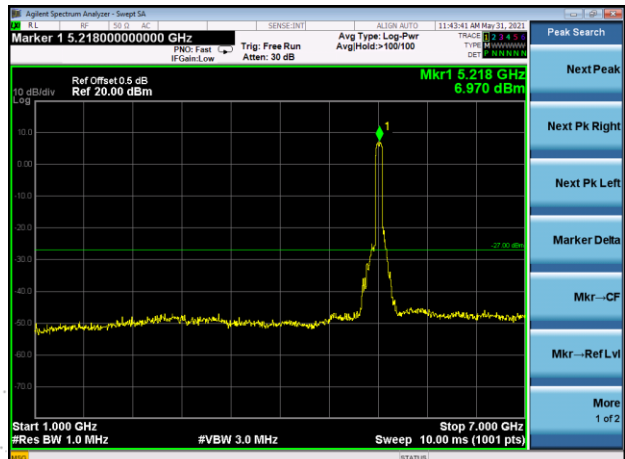
802.11ac80 on channel 42



802.11 ac40 on channel 46



802.11ac80 on channel 42



802.11 ac40 on channel 46



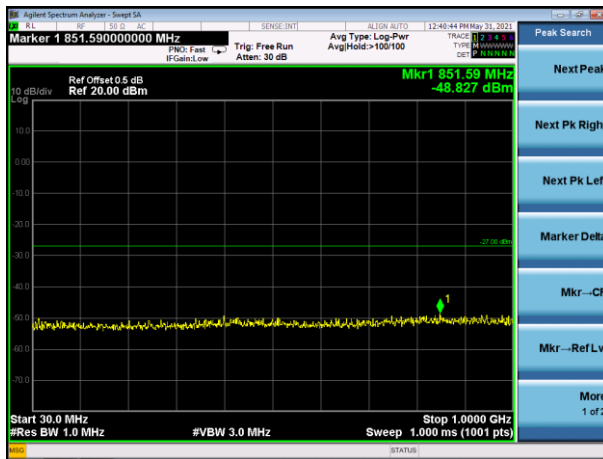
802.11ac80 on channel 42



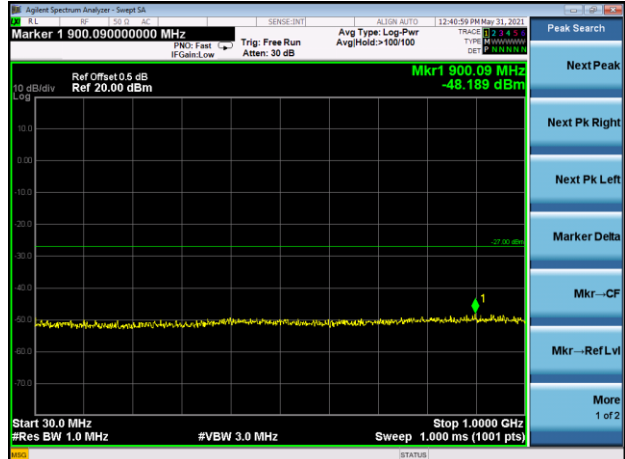
## 5.8G

### Test Plot

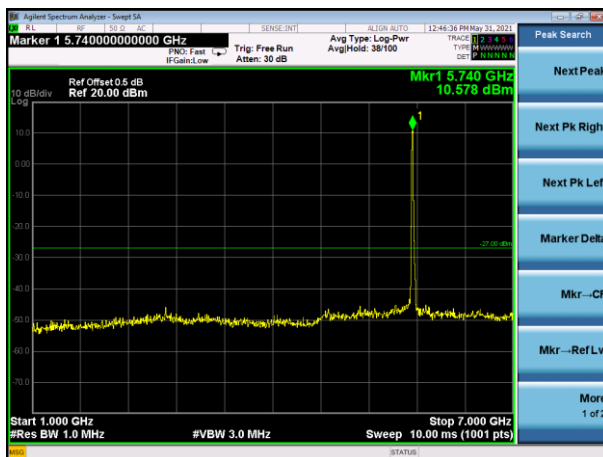
802.11a on channel 149



802.11a on channel 157



802.11a on channel 149



802.11a on channel 157



802.11a on channel 149

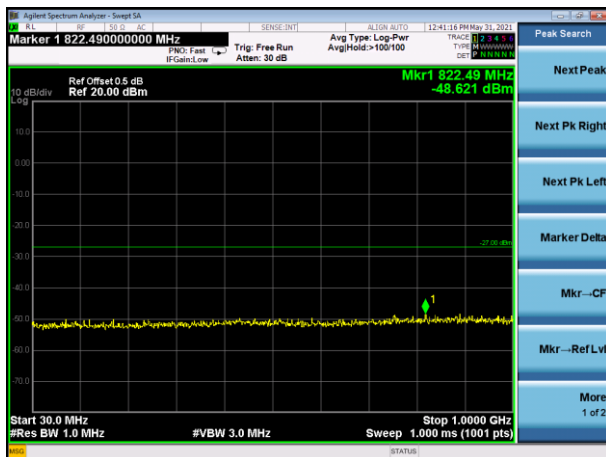


802.11a on channel 157

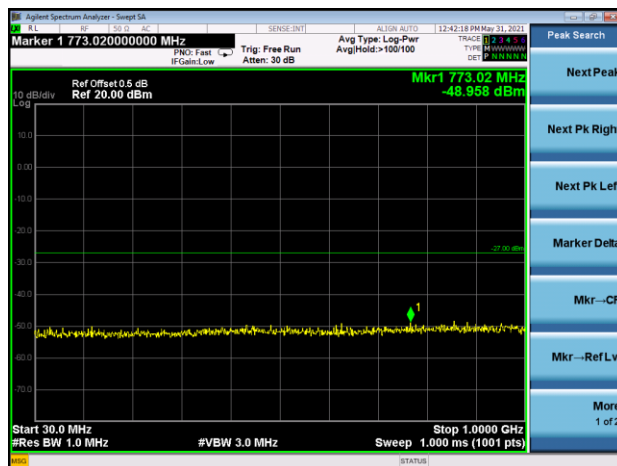


## Test Plot

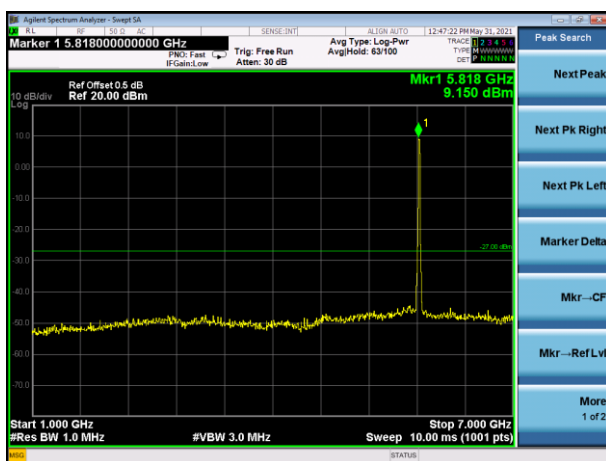
802.11a on channel 165



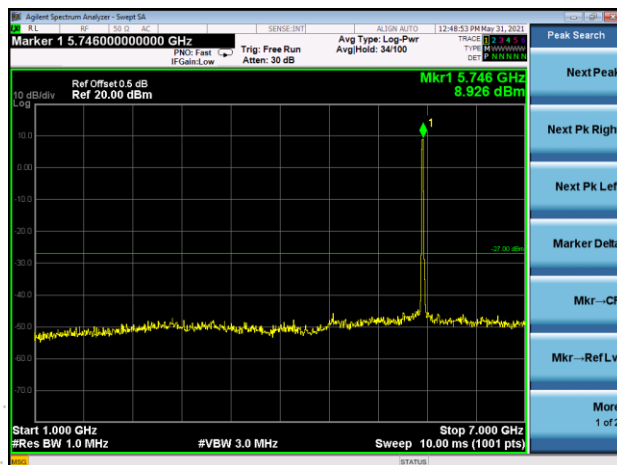
802.11n20 on channel 149



802.11a on channel 165



802.11n20 on channel 149



802.11a on channel 165

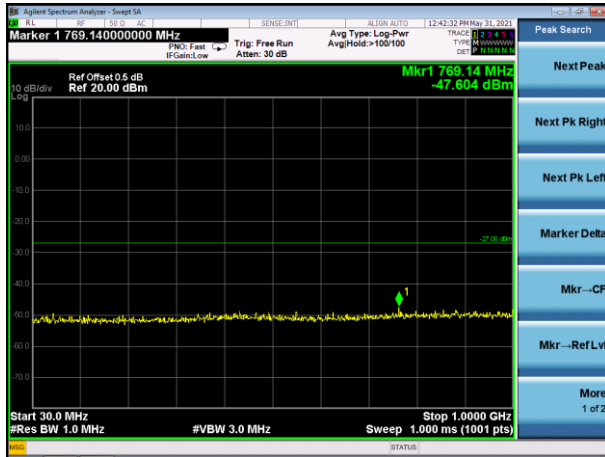


802.11n20 on channel 149

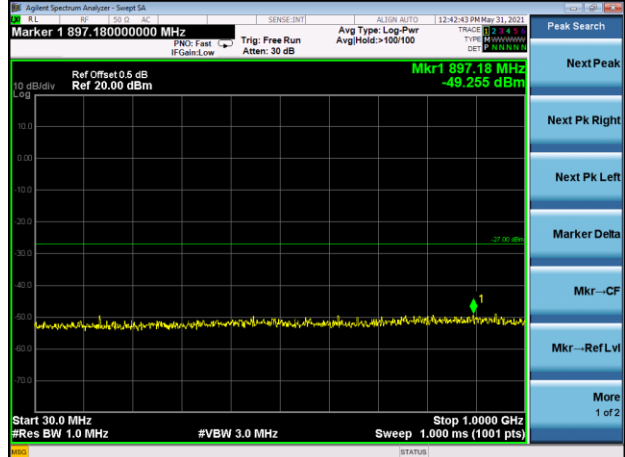


## Test Plot

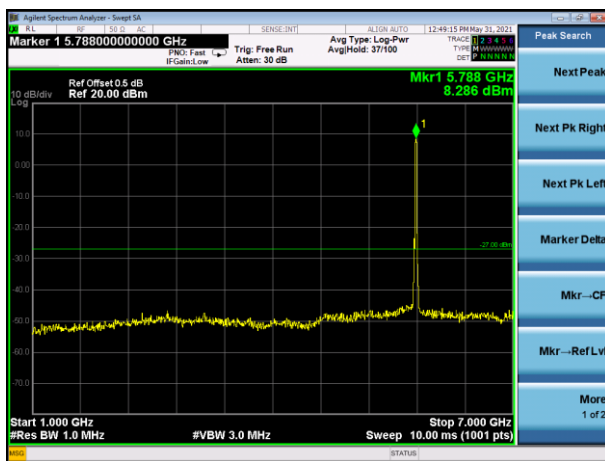
802.11n20 on channel 157



802.11n20 on channel 165



802.11n20 on channel 157



802.11n20 on channel 165



802.11n20 on channel 157

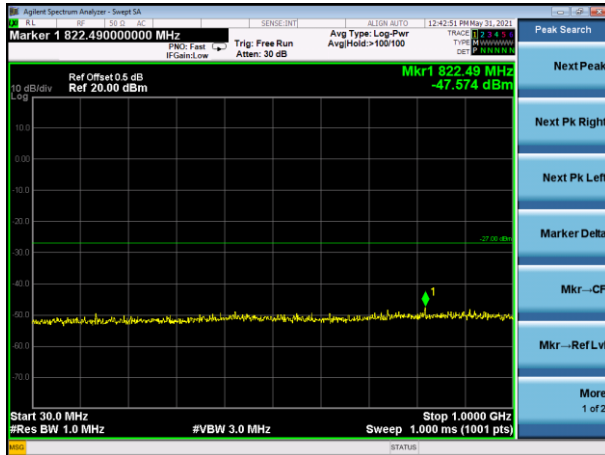


802.11n20 on channel 165

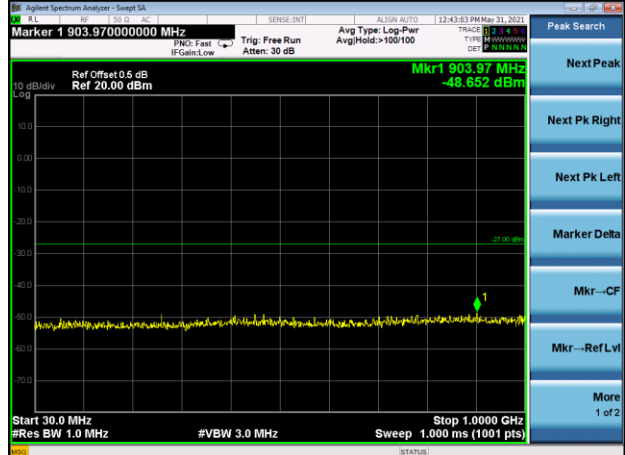


## Test Plot

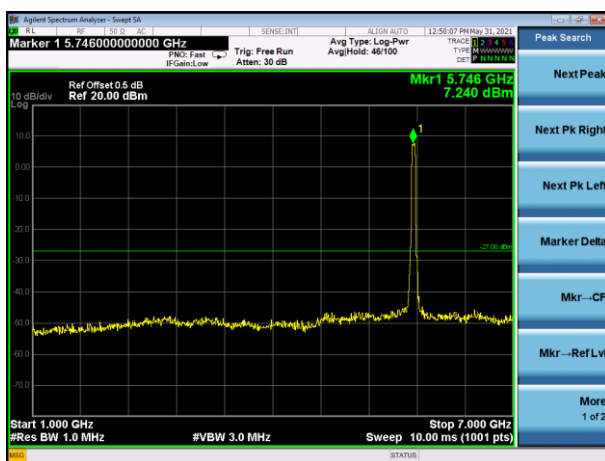
802.11n40 on channel 151



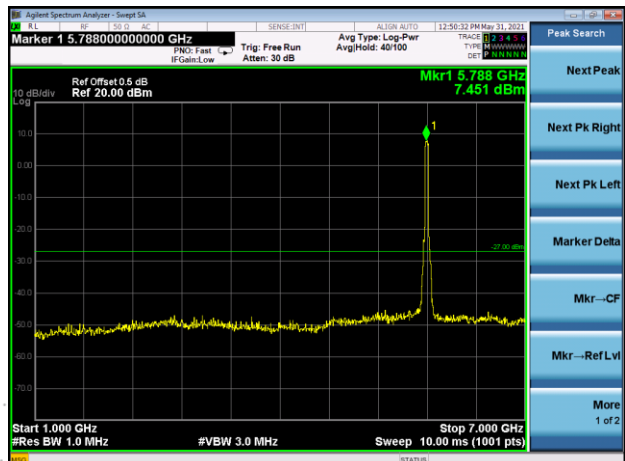
802.11n40 on channel 159



802.11n40 on channel 151



802.11n40 on channel 159



802.11n40 on channel 151



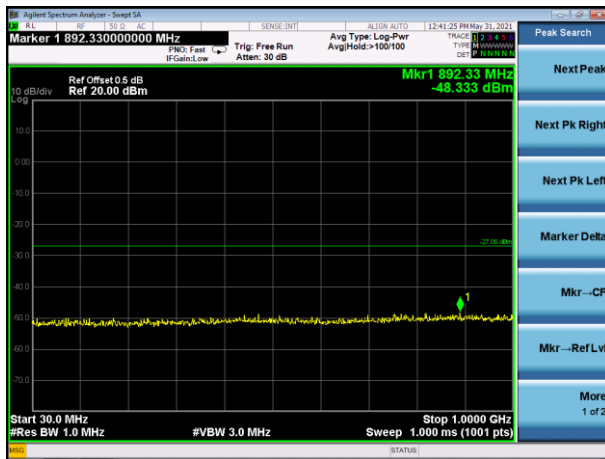
802.11n40 on channel 159



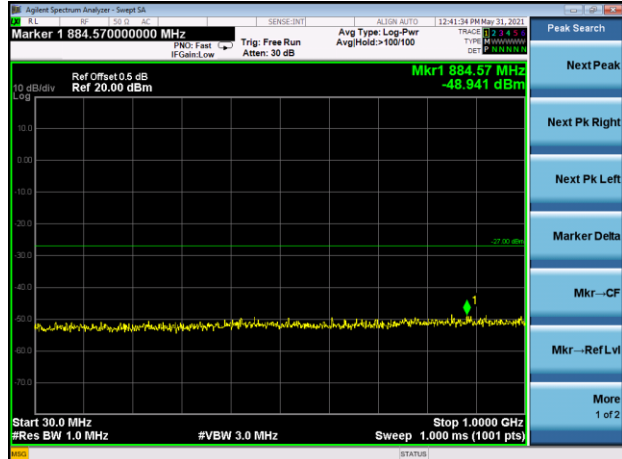


## Test Plot

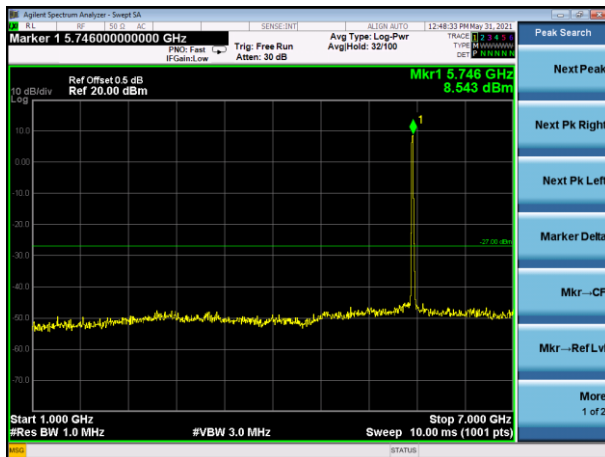
802.11ac20 on channel 149



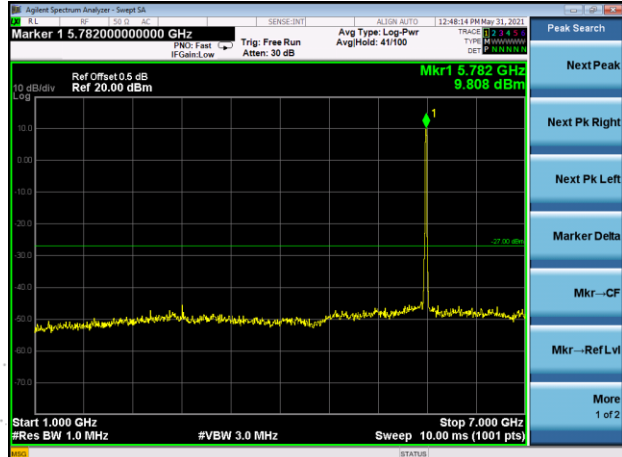
802.11ac20 on channel 157



802.11ac20 on channel 149



802.11ac20 on channel 157



802.11ac20 on channel 149

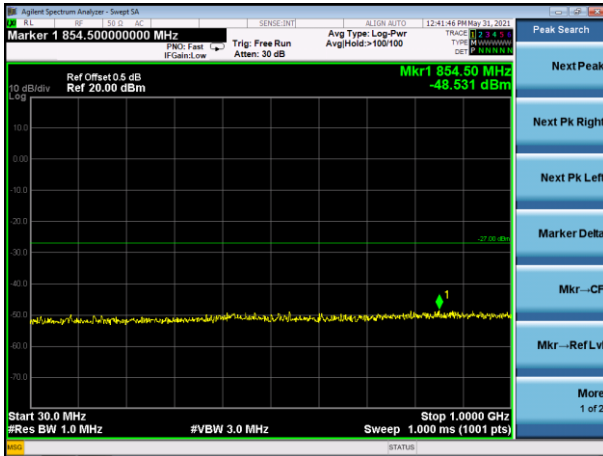


802.11ac20 on channel 157

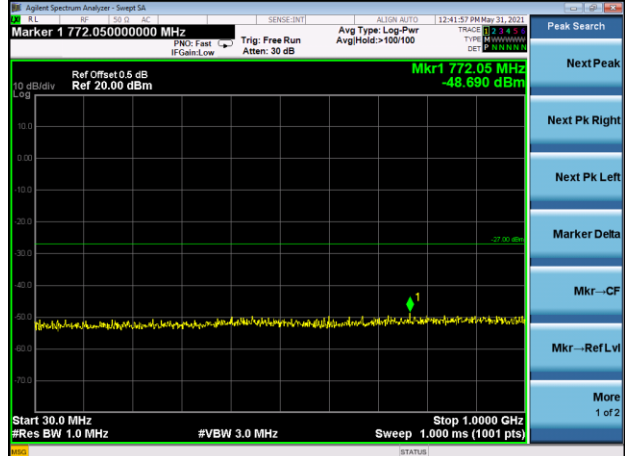


## Test Plot

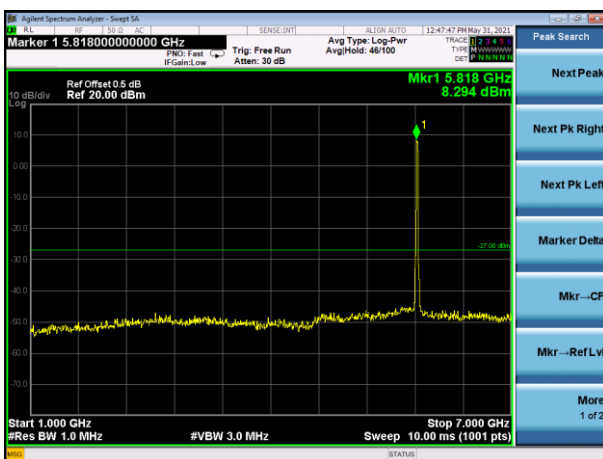
802.11ac20 on channel 165



802.11ac40 on channel 151



802.11ac20 on channel 165



802.11ac40 on channel 151



802.11ac20 on channel 165

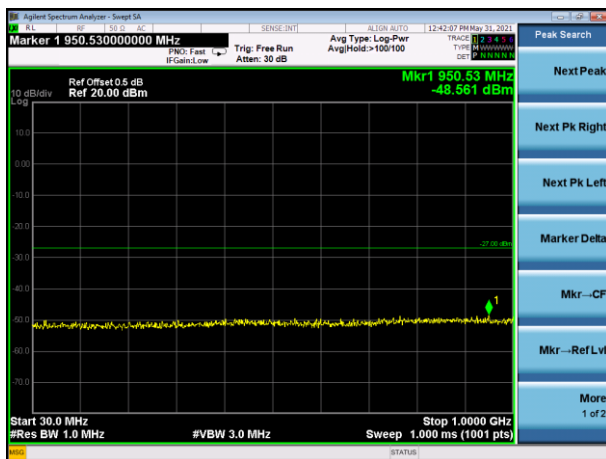


802.11ac40 on channel 151

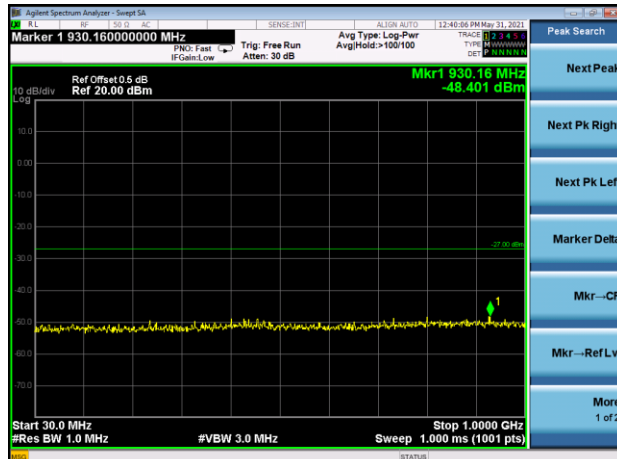


## Test Plot

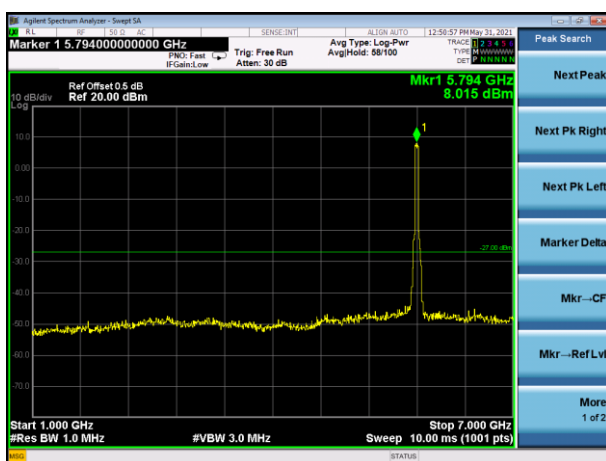
802.11ac40 on channel 159



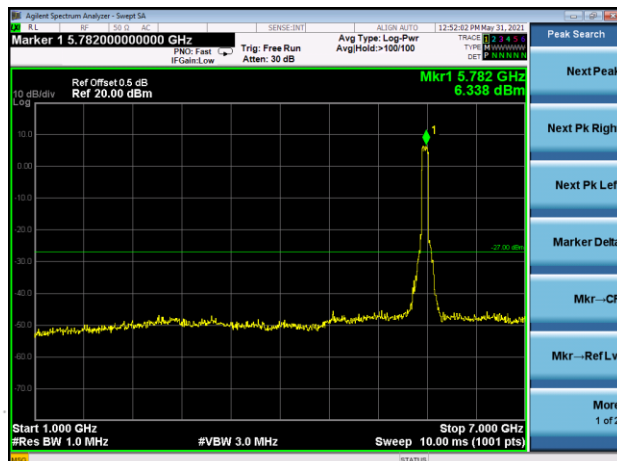
802.11ac80 on channel 155



802.11 ac40 on channel 159



802.11ac80 on channel 155



802.11 ac40 on channel 159



802.11ac80 on channel 155





## 13. FREQUENCY STABILITY MEASUREMENT

### 13.1 LIMIT

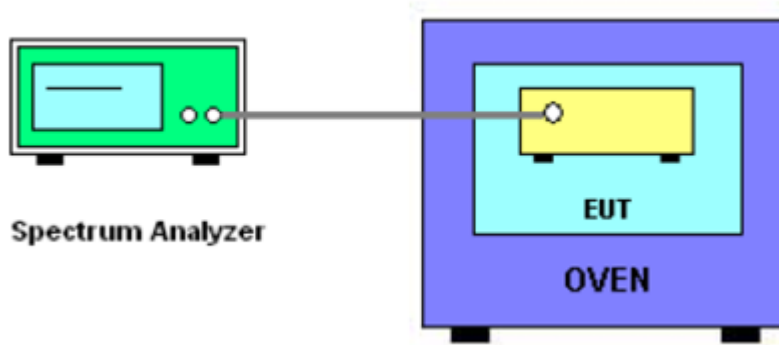
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be  $\pm 20$  ppm maximum for the 5 GHz band (IEEE802.11n specification).

### 13.2 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5.  $f_c$  is declaring of channel frequency. Then the frequency error formula is  $(f_c - f)/f_c \times 10^6$  ppm and the limit is less than  $\pm 20$  ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is  $-20^\circ\text{C} \sim 70^\circ\text{C}$ .

### 13.3 TEST SETUP LAYOUT



### 13.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

### 13.5 TEST RESULTS

|              |                                     |                    |              |
|--------------|-------------------------------------|--------------------|--------------|
| Temperature: | 26 °C                               | Relative Humidity: | 54%          |
| Pressure:    | 101kPa                              | Test Voltage :     | AC 120V/60Hz |
| Test Mode :  | TX Frequency U-NII-1 (5180-5240MHz) |                    |              |

#### Voltage vs. Frequency Stability

| TEST CONDITIONS |    |           |       | Reference Frequency: 5180MHz |      |                      |                      |
|-----------------|----|-----------|-------|------------------------------|------|----------------------|----------------------|
|                 |    |           |       | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C)      | 20 | V nom (V) | ##### | 5180.00384                   | 5180 | 0.0038               | 0.7404               |
|                 |    | V max (V) | ##### | 5180.00436                   | 5180 | 0.0044               | 0.8423               |
|                 |    | V min (V) | ##### | 5180.00002                   | 5180 | 0.0000               | 0.0046               |
| Limits          |    |           |       | ±20ppm                       |      |                      |                      |
| Result          |    |           |       | Complies                     |      |                      |                      |

#### Temperature vs. Frequency Stability

| TEST CONDITIONS |     |        |     | Reference Frequency: 5180MHz |      |                      |                      |
|-----------------|-----|--------|-----|------------------------------|------|----------------------|----------------------|
|                 |     |        |     | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V)       | 120 | T (°C) | -20 | 5180.01269                   | 5180 | 0.0127               | 2.4501               |
|                 |     | T (°C) | -10 | 5180.01200                   | 5180 | 0.0120               | 2.3163               |
|                 |     | T (°C) | 0   | 5180.00208                   | 5180 | 0.0021               | 0.4010               |
|                 |     | T (°C) | 10  | 5180.00732                   | 5180 | 0.0073               | 1.4139               |
|                 |     | T (°C) | 20  | 5180.00303                   | 5180 | 0.0030               | 0.5849               |
|                 |     | T (°C) | 30  | 5180.01148                   | 5180 | 0.0115               | 2.2164               |
|                 |     | T (°C) | 40  | 5180.01203                   | 5180 | 0.0120               | 2.3222               |
|                 |     | T (°C) | 50  | 5180.00047                   | 5180 | 0.0005               | 0.0903               |
|                 |     | T (°C) | 60  | 5180.00078                   | 5180 | 0.0008               | 0.1508               |
|                 |     | T (°C) | 70  | 5180.00065                   | 5180 | 0.0006               | 0.1254               |
| Limits          |     |        |     | ±20ppm                       |      |                      |                      |
| Result          |     |        |     | Complies                     |      |                      |                      |

## Voltage vs. Frequency Stability

| TEST CONDITIONS |    |                 |            | Reference Frequency: 5200MHz |        |                      |                      |
|-----------------|----|-----------------|------------|------------------------------|--------|----------------------|----------------------|
|                 |    |                 |            | f                            | fc     | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C)      | 20 | V nom (V) ##### | 5200.01326 | 5200                         | 0.0133 | 2.5506               |                      |
|                 |    | V max (V) ##### | 5200.00171 | 5200                         | 0.0017 | 0.3284               |                      |
|                 |    | V min (V) ##### | 5200.00873 | 5200                         | 0.0087 | 1.6794               |                      |
| Limits          |    |                 | ±20ppm     |                              |        |                      |                      |
| Result          |    |                 | Complies   |                              |        |                      |                      |

## Temperature vs. Frequency Stability

| TEST CONDITIONS |     |        |     | Reference Frequency: 5200MHz |      |                      |                      |
|-----------------|-----|--------|-----|------------------------------|------|----------------------|----------------------|
|                 |     |        |     | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V)       | 120 | T (°C) | -20 | 5200.00861                   | 5200 | 0.0086               | 1.6559               |
|                 |     | T (°C) | -10 | 5200.01150                   | 5200 | 0.0115               | 2.2112               |
|                 |     | T (°C) | 0   | 5200.00157                   | 5200 | 0.0016               | 0.3011               |
|                 |     | T (°C) | 10  | 5200.00592                   | 5200 | 0.0059               | 1.1376               |
|                 |     | T (°C) | 20  | 5200.00541                   | 5200 | 0.0054               | 1.0395               |
|                 |     | T (°C) | 30  | 5200.01087                   | 5200 | 0.0109               | 2.0896               |
|                 |     | T (°C) | 40  | 5200.00869                   | 5200 | 0.0087               | 1.6709               |
|                 |     | T (°C) | 50  | 5200.00629                   | 5200 | 0.0063               | 1.2091               |
|                 |     | T (°C) | 60  | 5200.01276                   | 5200 | 0.0128               | 2.4529               |
|                 |     | T (°C) | 70  | 5200.00933                   | 5200 | 0.0093               | 1.7937               |
| Limits          |     |        |     | ±20ppm                       |      |                      |                      |
| Result          |     |        |     | Complies                     |      |                      |                      |

## Voltage vs. Frequency Stability

| TEST CONDITIONS |    |                 |            | Reference Frequency: 5240MHz |        |                      |                      |
|-----------------|----|-----------------|------------|------------------------------|--------|----------------------|----------------------|
|                 |    |                 |            | f                            | fc     | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C)      | 20 | V nom (V) ##### | 5240.00455 | 5240                         | 0.0045 | 0.8679               |                      |
|                 |    | V max (V) ##### | 5240.00394 | 5240                         | 0.0039 | 0.7515               |                      |
|                 |    | V min (V) ##### | 5240.00762 | 5240                         | 0.0076 | 1.4538               |                      |
| Limits          |    |                 |            | ±20ppm                       |        |                      |                      |
| Result          |    |                 |            | Complies                     |        |                      |                      |

## Temperature vs. Frequency Stability

| TEST CONDITIONS |     |        |     | Reference Frequency: 5240MHz |      |                      |                      |
|-----------------|-----|--------|-----|------------------------------|------|----------------------|----------------------|
|                 |     |        |     | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V)       | 120 | T (°C) | -20 | 5240.01007                   | 5240 | 0.0101               | 1.9224               |
|                 |     | T (°C) | -10 | 5240.01147                   | 5240 | 0.0115               | 2.1892               |
|                 |     | T (°C) | 0   | 5240.00964                   | 5240 | 0.0096               | 1.8392               |
|                 |     | T (°C) | 10  | 5240.00624                   | 5240 | 0.0062               | 1.1912               |
|                 |     | T (°C) | 20  | 5240.00983                   | 5240 | 0.0098               | 1.8767               |
|                 |     | T (°C) | 30  | 5240.01256                   | 5240 | 0.0126               | 2.3979               |
|                 |     | T (°C) | 40  | 5240.01120                   | 5240 | 0.0112               | 2.1371               |
|                 |     | T (°C) | 50  | 5240.00774                   | 5240 | 0.0077               | 1.4767               |
|                 |     | T (°C) | 60  | 5240.00146                   | 5240 | 0.0015               | 0.2778               |
|                 |     | T (°C) | 70  | 5240.00495                   | 5240 | 0.0049               | 0.9444               |
| Limits          |     |        |     | ±20ppm                       |      |                      |                      |
| Result          |     |        |     | Complies                     |      |                      |                      |

|              |                            |                    |              |
|--------------|----------------------------|--------------------|--------------|
| Temperature: | 26 °C                      | Relative Humidity: | 54%          |
| Pressure:    | 101kPa                     | Test Voltage :     | AC 120V/60Hz |
| Hzst Mode :  | TX Frequency(5745-5825MHz) |                    |              |

### Voltage vs. Frequency Stability

| TEST CONDITIONS |    |           |       | Reference Frequency: 5745MHz |      |                      |                      |
|-----------------|----|-----------|-------|------------------------------|------|----------------------|----------------------|
|                 |    |           |       | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C)      | 20 | V nom (V) | ##### | 5745.00275                   | 5745 | 0.00275              | 0.4785               |
|                 |    | V max (V) | ##### | 5745.00821                   | 5745 | 0.00821              | 1.4289               |
|                 |    | V min (V) | ##### | 5745.00589                   | 5745 | 0.00589              | 1.0261               |
| Limits          |    |           |       | ±20ppm                       |      |                      |                      |
| Result          |    |           |       | Complies                     |      |                      |                      |

### Temperature vs. Frequency Stability

| TEST CONDITIONS |     |        |     | Reference Frequency: 5745MHz |      |                      |                      |
|-----------------|-----|--------|-----|------------------------------|------|----------------------|----------------------|
|                 |     |        |     | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V)       | 120 | T (°C) | -20 | 5745.00758                   | 5745 | 0.00758              | 1.3186               |
|                 |     | T (°C) | -10 | 5745.00693                   | 5745 | 0.00693              | 1.2070               |
|                 |     | T (°C) | 0   | 5745.00388                   | 5745 | 0.00388              | 0.6761               |
|                 |     | T (°C) | 10  | 5745.00221                   | 5745 | 0.00221              | 0.3843               |
|                 |     | T (°C) | 20  | 5745.00005                   | 5745 | 0.00005              | 0.0079               |
|                 |     | T (°C) | 30  | 5745.00726                   | 5745 | 0.00726              | 1.2635               |
|                 |     | T (°C) | 40  | 5745.00332                   | 5745 | 0.00332              | 0.5786               |
|                 |     | T (°C) | 50  | 5745.00834                   | 5745 | 0.00834              | 1.4521               |
|                 |     | T (°C) | 60  | 5745.00113                   | 5745 | 0.00113              | 0.1969               |
|                 |     | T (°C) | 70  | 5745.01077                   | 5745 | 0.01077              | 1.8743               |
| Limits          |     |        |     | ±20ppm                       |      |                      |                      |
| Result          |     |        |     | Complies                     |      |                      |                      |



## Voltage vs. Frequency Stability

| TEST CONDITIONS |    |                 |            | Reference Frequency: 5785MHz |         |                      |                      |
|-----------------|----|-----------------|------------|------------------------------|---------|----------------------|----------------------|
|                 |    |                 |            | f                            | fc      | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C)      | 20 | V nom (V) ##### | 5785.00320 | 5785                         | 0.00320 | 0.5531               |                      |
|                 |    | V max (V) ##### | 5785.01347 | 5785                         | 0.01347 | 2.3278               |                      |
|                 |    | V min (V) ##### | 5785.00069 | 5785                         | 0.00069 | 0.1187               |                      |
| Limits          |    |                 | ±20ppm     |                              |         |                      |                      |
| Result          |    |                 | Complies   |                              |         |                      |                      |

## Temperature vs. Frequency Stability

| TEST CONDITIONS |     |        |     | Reference Frequency: 5785MHz |      |                      |                      |
|-----------------|-----|--------|-----|------------------------------|------|----------------------|----------------------|
|                 |     |        |     | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V)       | 120 | T (°C) | -20 | 5785.00630                   | 5785 | 0.00630              | 1.0894               |
|                 |     | T (°C) | -10 | 5785.00095                   | 5785 | 0.00095              | 0.1647               |
|                 |     | T (°C) | 0   | 5785.00980                   | 5785 | 0.00980              | 1.6948               |
|                 |     | T (°C) | 10  | 5785.00585                   | 5785 | 0.00585              | 1.0120               |
|                 |     | T (°C) | 20  | 5785.00368                   | 5785 | 0.00368              | 0.6358               |
|                 |     | T (°C) | 30  | 5785.00709                   | 5785 | 0.00709              | 1.2251               |
|                 |     | T (°C) | 40  | 5785.00724                   | 5785 | 0.00724              | 1.2511               |
|                 |     | T (°C) | 50  | 5785.01277                   | 5785 | 0.01277              | 2.2069               |
|                 |     | T (°C) | 60  | 5785.00610                   | 5785 | 0.00610              | 1.0541               |
|                 |     | T (°C) | 70  | 5785.00813                   | 5785 | 0.00813              | 1.4049               |
| Limits          |     |        |     | ±20ppm                       |      |                      |                      |
| Result          |     |        |     | Complies                     |      |                      |                      |

## Voltage vs. Frequency Stability

| TEST CONDITIONS |    |                 |            | Reference Frequency: 5825MHz |         |                      |                      |
|-----------------|----|-----------------|------------|------------------------------|---------|----------------------|----------------------|
|                 |    |                 |            | f                            | fc      | Max. Deviation (MHz) | Max. Deviation (ppm) |
| T nom (°C)      | 20 | V nom (V) ##### | 5825.00959 | 5825                         | 0.00959 | 1.6471               |                      |
|                 |    | V max (V) ##### | 5825.01028 | 5825                         | 0.01028 | 1.7653               |                      |
|                 |    | V min (V) ##### | 5825.00067 | 5825                         | 0.00067 | 0.1154               |                      |
| Limits          |    |                 |            | ±20ppm                       |         |                      |                      |
| Result          |    |                 |            | Complies                     |         |                      |                      |

## Temperature vs. Frequency Stability

| TEST CONDITIONS |     |        |     | Reference Frequency: 5825MHz |      |                      |                      |
|-----------------|-----|--------|-----|------------------------------|------|----------------------|----------------------|
|                 |     |        |     | f                            | fc   | Max. Deviation (MHz) | Max. Deviation (ppm) |
| V nom (V)       | 120 | T (°C) | -20 | 5825.00790                   | 5825 | 0.00790              | 1.3563               |
|                 |     | T (°C) | -10 | 5825.00184                   | 5825 | 0.00184              | 0.3151               |
|                 |     | T (°C) | 0   | 5825.01305                   | 5825 | 0.01305              | 2.2398               |
|                 |     | T (°C) | 10  | 5825.00729                   | 5825 | 0.00729              | 1.2520               |
|                 |     | T (°C) | 20  | 5825.00399                   | 5825 | 0.00399              | 0.6857               |
|                 |     | T (°C) | 30  | 5825.00507                   | 5825 | 0.00507              | 0.8707               |
|                 |     | T (°C) | 40  | 5825.00543                   | 5825 | 0.00543              | 0.9315               |
|                 |     | T (°C) | 50  | 5825.01304                   | 5825 | 0.01304              | 2.2387               |
|                 |     | T (°C) | 60  | 5825.00829                   | 5825 | 0.00829              | 1.4235               |
|                 |     | T (°C) | 70  | 5825.00025                   | 5825 | 0.00025              | 0.0424               |
| Limits          |     |        |     | ±20ppm                       |      |                      |                      |
| Result          |     |        |     | Complies                     |      |                      |                      |

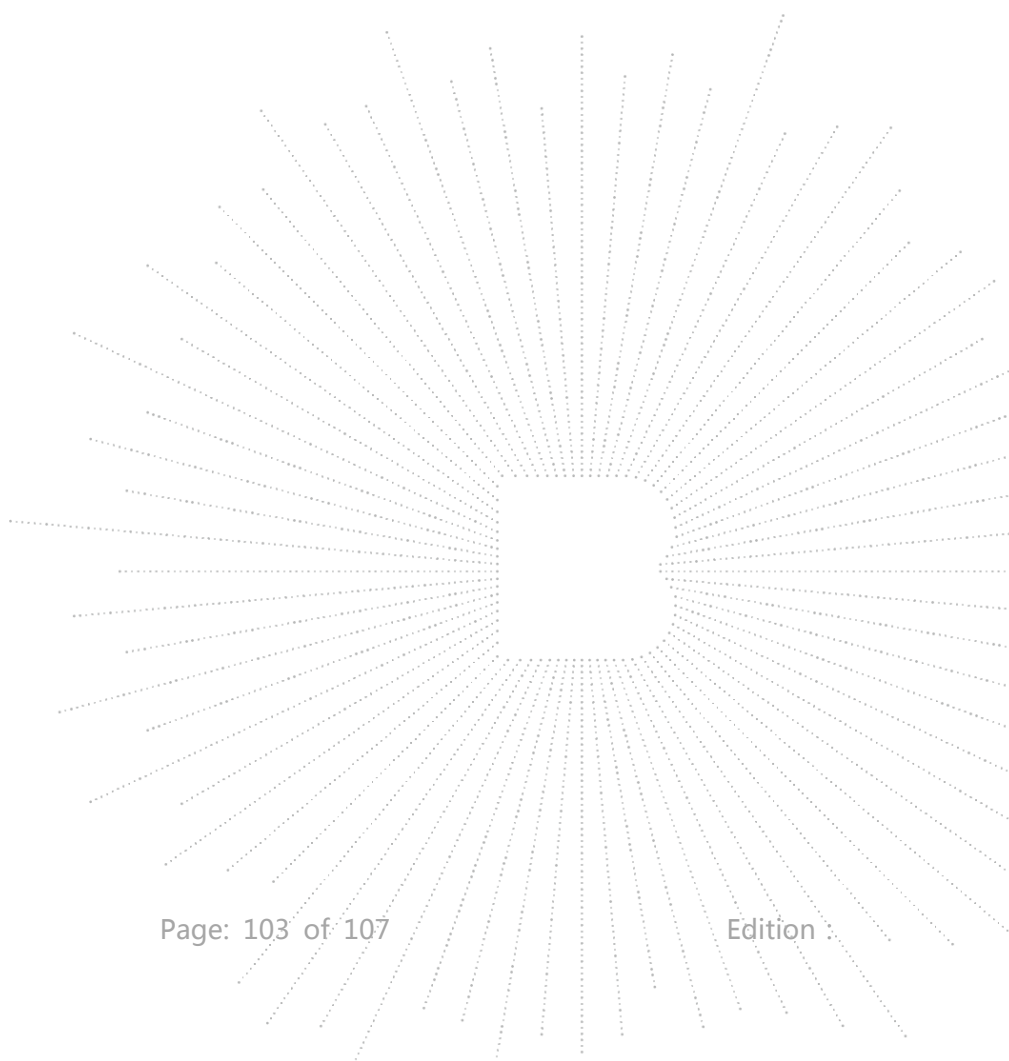
## 14. ANTENNA REQUIREMENT

### 14.1 Limit

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 14.2 Test Result

The EUT antenna is External antenna (A), gain: 2dBi and FPC antenna (B), gain: 1dBi. It comply with the standard requirement.



## 15. EUT PHOTOGRAPHS

**EUT Photo 1**

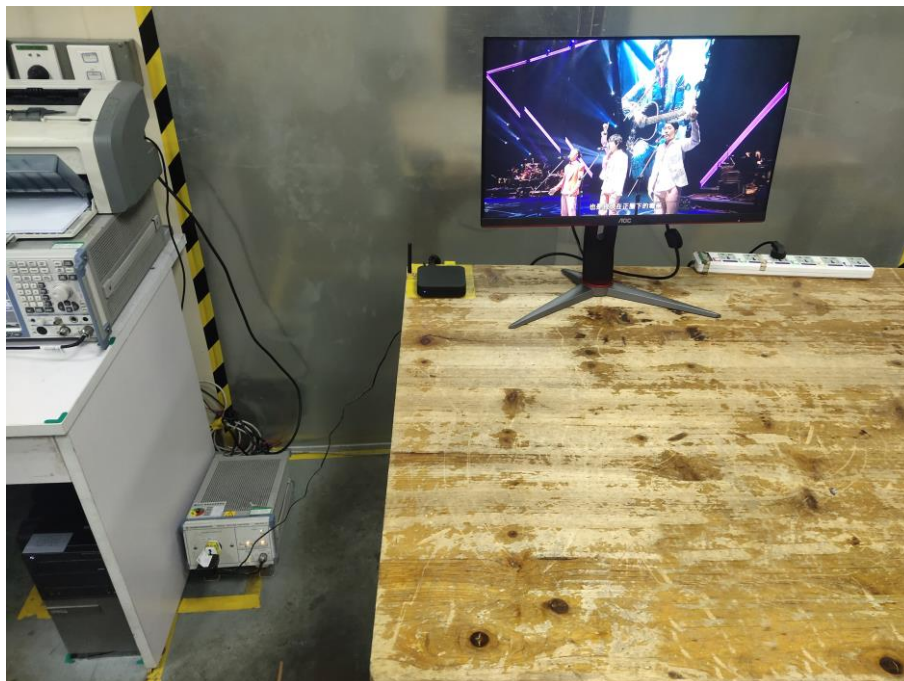


**EUT Photo 2**



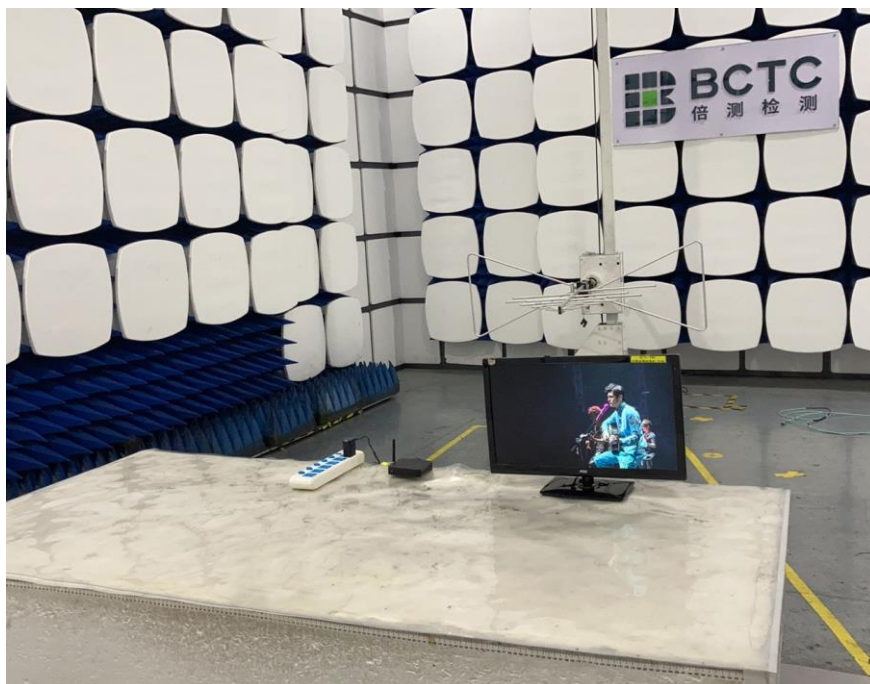
## 16. EUT TEST SETUP PHOTOGRAPHS

### Conducted Measurement Photos





## Radiated Measurement Photos





## STATEMENT

- 1.The equipment lists are traceable to the national reference standards.
- 2.The test report can not be partially copied unless prior written approval is issued from our lab.
- 3.The test report is invalid without stamp of laboratory.
- 4.The test report is invalid without signature of person(s) testing and authorizing.
- 5.The test process and test result is only related to the Unit Under Test.
- 6.The quality system of our laboratory is in accordance with ISO/IEC17025.
- 7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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\*\*\*\*\* END \*\*\*\*\*