# FCC Part 15C Test Report

# FCC ID: 2ADUTLGPAU0A

| | |
|---|---|
| Product Name: | Panda Wireless AC600 Dual Band Wireless AC USB Adapter |
| Trademark: | N/A |
| Model Name : | PAU0A<br>IGU0A, PCU0A |
| Prepared For :<br><br>Address : | Panda Wireless, Inc.<br><br>15559 Union Ave, Suite 300, Los Gatos,CA 95032, United States |
| Prepared By :<br><br>Address : | Shenzhen BCTC Technology Co., Ltd.<br><br>No.101,Yousong Road,Longhua New District, Shenzhen,China |
| Test Date: | Apr. 22 - May 04, 2017 |
| Date of Report : | May 04, 2017 |
| Report No.: | BCTC-LH170300671-1E |

# VERIFICATION OF COMPLIANCE

| | |
|---|---|
| **Applicant's name**..... | Panda Wireless, Inc. |
| Address ..... | 15559 Union Ave, Suite 300, Los Gatos,CA 95032, United States |
| **Manufacture's Name** ..... | Panda Wireless, Inc. |
| Address ..... | 15559 Union Ave, Suite 300, Los Gatos,CA 95032, United States |

**Product description**

| | |
|---|---|
| Product name..... : | Panda Wireless AC600 Dual Band Wireless AC USB Adapter |
| Trademark ..... : | N/A |
| Model Name ..... : | PAU0A<br>IGU0A, PCU0A |
| Test procedure ..... : | FCC Part15.407 |
| Standards | ANSI C63.10-2013<br>KDB789033 D02 General UNII Test Procedures New Rules v01r02 |

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Result **Pass**

| | | |
|---|---|---|
| Prepared by(Engineer): | Snow Zeng |  |
| Reviewer(Supervisor): | Jade Yang |  |
| Approved(Manager): | Carson Zhang |  |

# TABLE OF CONTENTS

# 1.TEST SUMMARY

| Test Items | Test Requirement | Result |
|---|---|---|
| Conducted Emissions | 15.207 | N/A |
| Radiated Emissions | 15.407(b), 15.209 | PASS |
| 26dB bandwidth and 99%dB Bandwidth | 15.403(i)<br>15.407(e) | PASS |
| Power density | 15.407 (a) | PASS |
| Maximum Peak Output Power | 15.407 (a) | PASS |
| Emissions from out of band | 15.407 (b) | PASS |
| Transmission in case of Absence of Information | 15.407(c) | PASS |
| Frequency Stability | 15.407(g) | PASS |
| Antenna Requirement | 15.203 | PASS |

Note: N/A means not applicable.

### 1.1. TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.
Add. : No.101,Yousong Road,Longhua New District, Shenzhen,China
FCC Registered No.: 187086
IC Registered No.: 12655A

### 1.2. MEASUREMENT UNCERTAINTY

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

| No. | Item | Uncertainty |
|---|---|---|
| 1 | Conducted Emission Test | ±1.38dB |
| 2 | RF power,conducted | ±0.16dB |
| 3 | Spurious emissions,conducted | ±0.21dB |
| 4 | All emissions,radiated(<1G) | ±4.68dB |
| 5 | All emissions,radiated(>1G) | ±4.89dB |
| 6 | Temperature | ±0.5°C |
| 7 | Humidity | ±2% |

# 2.GENERAL PRODUCT INFORMATION

## 2.1. Product Function

Refer to Technical Construction Form and User Manual.

## 2.2. Description of Device (EUT)

<table>
<tr><td>Equipment</td><td colspan="2">Panda Wireless AC600 Dual Band Wireless AC USB Adapter</td></tr>
<tr><td>Trade Name</td><td colspan="2">N/A</td></tr>
<tr><td>Model Name</td><td colspan="2">PAU0A<br>IGU0A, PCU0A</td></tr>
<tr><td>Model Difference</td><td colspan="2">The product's different for model number and outlook color.</td></tr>
<tr><td>Product Description</td><td colspan="2">The EUT is a Panda Wireless AC600 Dual Band Wireless AC USB Adapter
<table>
<tr><td>Operation Frequency:</td><td>5180-5240,<br>5745-5825MHz(802.11a/n(HT20))<br>5190-5230,<br>5755-5795MHz(802.11n(HT40))</td></tr>
<tr><td>Modulation Type:</td><td>OFDM/DSSS</td></tr>
<tr><td>Bit Rate of Transmitter</td><td>Data speed (IEEE 802.11a): 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps<br>Data speed (IEEE 802.11n): Up to 433Mbps</td></tr>
<tr><td>Antenna Type:</td><td>PCB Antenna</td></tr>
<tr><td>Antenna Gain:</td><td>0dBi</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Channel List</td><td colspan="2">Please refer to the Note 2.</td></tr>
<tr><td>Power Source</td><td colspan="2">DC 5V</td></tr>
<tr><td>Adapter</td><td colspan="2">N/A</td></tr>
<tr><td>hardware version</td><td colspan="2">---</td></tr>
<tr><td>Software version</td><td colspan="2">---</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

Channel list

802.11a/n20

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 36 | 5180 | 40 | 5200 | 44 | 5220 |
| 48 | 5240 | 149 | 5745 | 153 | 5765 |
| 157 | 5785 | 161 | 5805 | 165 | 5825 |

802.11n40

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 38 | 5190 | 46 | 5230 | | |
| 151 | 5755 | 159 | 5795 | | |

802.11ac 80

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 42 | 5210 | 155 | 5775 | | |

## 2.3. Independent Operation Modes

The basic operation modes are:

| Pretest Mode | Description |
|---|---|
| Mode 1 | 802.11a CH36/CH40/ CH48/CH149/CH157/CH165 |
| Mode 2 | 802.11n(HT20) CH36/CH40/CH48/CH149/CH157/CH165 |
| Mode 3 | 802.11n(HT40) CH38/CH46/CH151/CH159 |
| Mode 4 | 802.11ac(HT80) CH42/ CH155 |
| Mode 5 | Link Mode |

| **For Radiated Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | 802.11a CH36/CH40/ CH48/CH149/CH157/CH165 |
| Mode 2 | 802.11n(HT20) CH36/CH40/CH48/CH149/CH157/CH165 |
| Mode 3 | 802.11n(HT40) CH38/CH46/CH151/CH159 |
| Mode 4 | 802.11ac(HT80) CH42/ CH155 |

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

(3) According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup” MCS0 for 802.a , MCS0 for 802.11n(HT20), MCS1 for 802.11n(H40), MCS0 for 802.11ac(HT80).

## 2.4. List of Test and Measurement Instruments

Conduction test equipment

| Item | Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until |
|---|---|---|---|---|---|---|
| 1 | Test Receiver | R&S | ESCI | 1166.5950K03 -101165-ha | 2016.08.27 | 2017.08.26 |
| 2 | LISN | SCHWARZBECK | NSLK8127 | 8127739 | 2016.08.27 | 2017.08.26 |
| 3 | LISN | R&S | NSLK8126 | 8126487 | 2016.08.27 | 2017.08.26 |
| 4 | RF cables | R&S | R204 | R20X | 2016.08.27 | 2017.08.26 |
| 5 | Attenuator | R&S | ESH3-Z2 | 143206 | 2016.08.27 | 2017.08.26 |

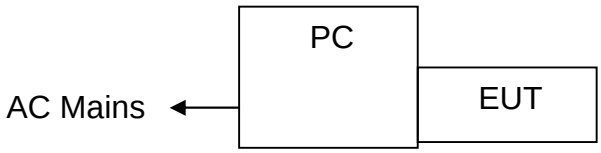
Radiation test, Band-edge test and 6db bandwidth test equipment

| Item | equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until |
|---|---|---|---|---|---|---|
| 1 | Spectrum Analyzer (9kHz-26.5GHz) | Agilent | E4407B | MY45108040 | 2016.08.27 | 2017.08.26 |
| 2 | Test Receiver (9kHz-7GHz) | R&S | ESPI | 101318 | 2016.08.27 | 2017.08.26 |
| 3 | Bilog Antenna (30MHz-1GHz) | R&S | VULB 9168 | VULB91 68-438 | 2016.08.27 | 2017.08.26 |
| 4 | Horn Antenna (1GHz-18GHz) | SCHWARZBECK | BBHA9120D | 1201 | 2016.09.03 | 2017.09.03 |
| 5 | Horn Antenna (14GHz-40GHz) | SCHWARZBECK | BBHA 9170 | 9170-181 | 2016.09.03 | 2017.09.03 |
| 6 | Amplifier (9KHz-6GHz) | SCHWARZBECK | BBV9744 | 9744-0037 | 2016.08.27 | 2017.08.26 |
| 7 | Amplifier (1GHz-18GHz) | SCHWARZBECK | BBV9718 | 9718-309 | 2016.08.27 | 2017.08.26 |
| 8 | Amplifier (18GHz-40GHz) | SCHWARZBECK | BBV 9721 | 9721-205 | 2016.08.27 | 2017.08.26 |
| 9 | Loop Antenna (9KHz-30MHz) | SCHWARZBECK | FMZB1519B | 00014 | 2016.09.03 | 2017.09.03 |
| 10 | RF cables1 (9kHz-1GHz) | R&S | R203 | R20X | 2016.08.27 | 2017.08.26 |
| 11 | RF cables2 (1GHz-40GHz) | R&S | R204 | R21X | 2016.08.27 | 2017.08.26 |
| 12 | Antenna connector | Florida RF Labs | N/A | RF 01# | 2016.08.27 | 2017.08.26 |
| 13 | Power Metter | ANRITSU | ML2487A | 6K00001568 | 2016.08.27 | 2017.08.26 |
| 14 | Power Sensor (AV) | ANRITSU | ML2491A | 030989 | 2016.08.27 | 2017.08.26 |
| 15 | Signal Analyzer 9kHz-26.5GHz | Agilent | N9010A | MY48030494 | 2016.08.27 | 2017.08.26 |
| 16 | Test Receiver 20kHz-40GHz | R&S | ESU 40 | 100376 | 2016.08.27 | 2017.08.26 |
| 17 | D.C. Power Supply | LongWei | PS-305D | 010964729 | 2016.08.27 | 2017.08.26 |

# 3. TEST SET-UP AND OPERATION MODES

## 3.1. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators




## 3.2. Special Accessories and Auxiliary Equipment

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|---|---|---|---|---|---|
| E-1 | Panda Wireless AC600 Dual Band Wireless AC USB Adapter | N/A | PAU0A | N/A | EUT |
| E-2 | PC (Provide by test lab) | ASUS | AWT8000 | N/A | I/P: AC 100-240V 60/60Hz |
| | | | | | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| | | | | |
| | | | | |

## 3.3. Countermeasures to Achieve EMC Compliance

None.

## 3.4. Test Operation Mode and Test Software

None.

# 4. EMISSION TEST RESULTS

## 4.1. Conducted Emission Measurement

POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Limit (dBuV) | | Standard |
|---|---|---|---|
| | Quasi-peak | Average | |
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 56.00 | 46.00 | FCC |
| 5.0 -30.0 | 60.00 | 50.00 | FCC |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| **Receiver** Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

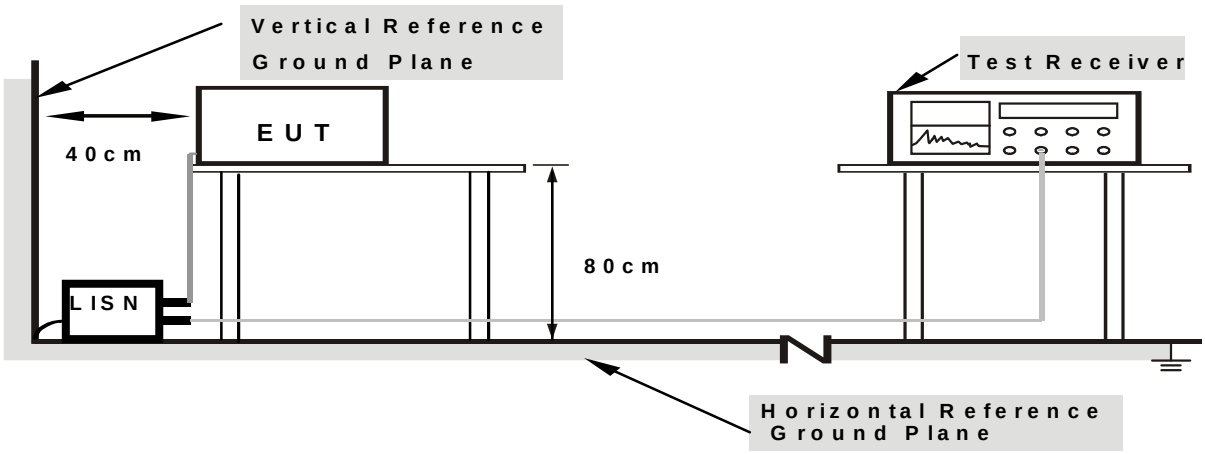
### 4.1.1. TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.1.2. DEVIATION FROM TEST STANDARD

No deviation

### 4.1.3. TEST SETUP



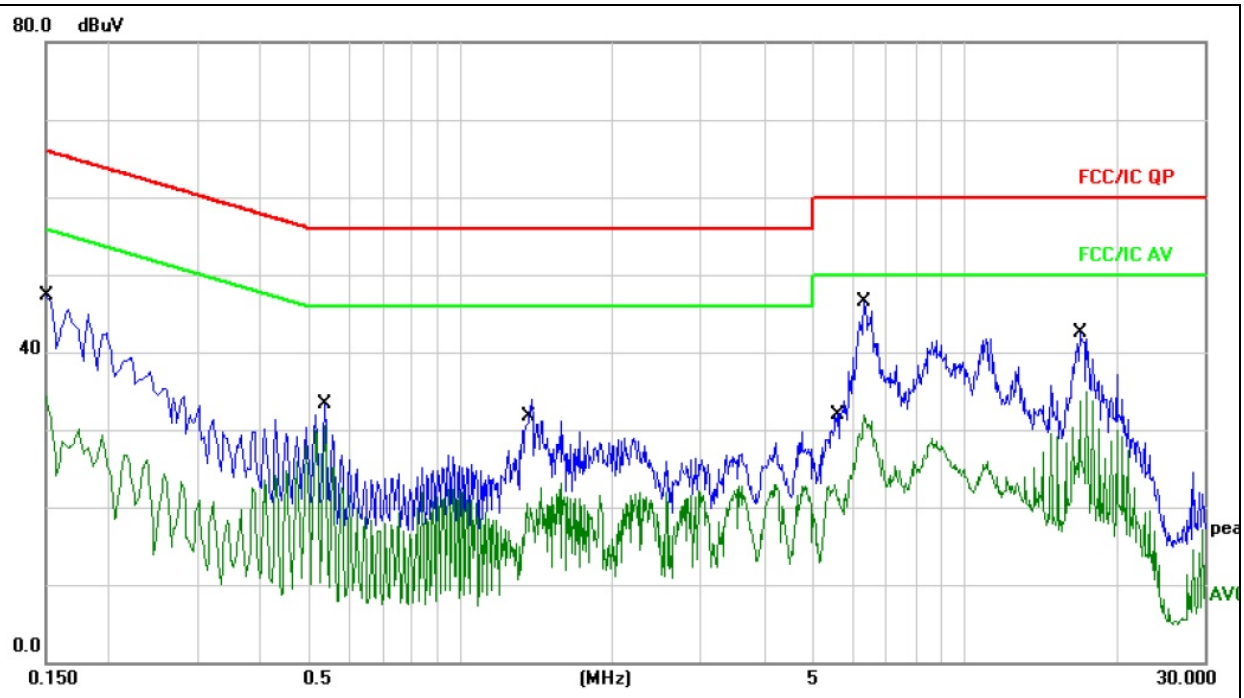

Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 4.1.4. EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it).
The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.
We pretest all adapter's emission, only the adapter 1's data was worst and the data was recording in the report.
The data only show the worst mode.
If peak level comply with Quasi-Peak limit, then the Quasi-Peak level is deemed to comply with Quasi-Peak limit.
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

### 4.1.5. TEST RESULTS

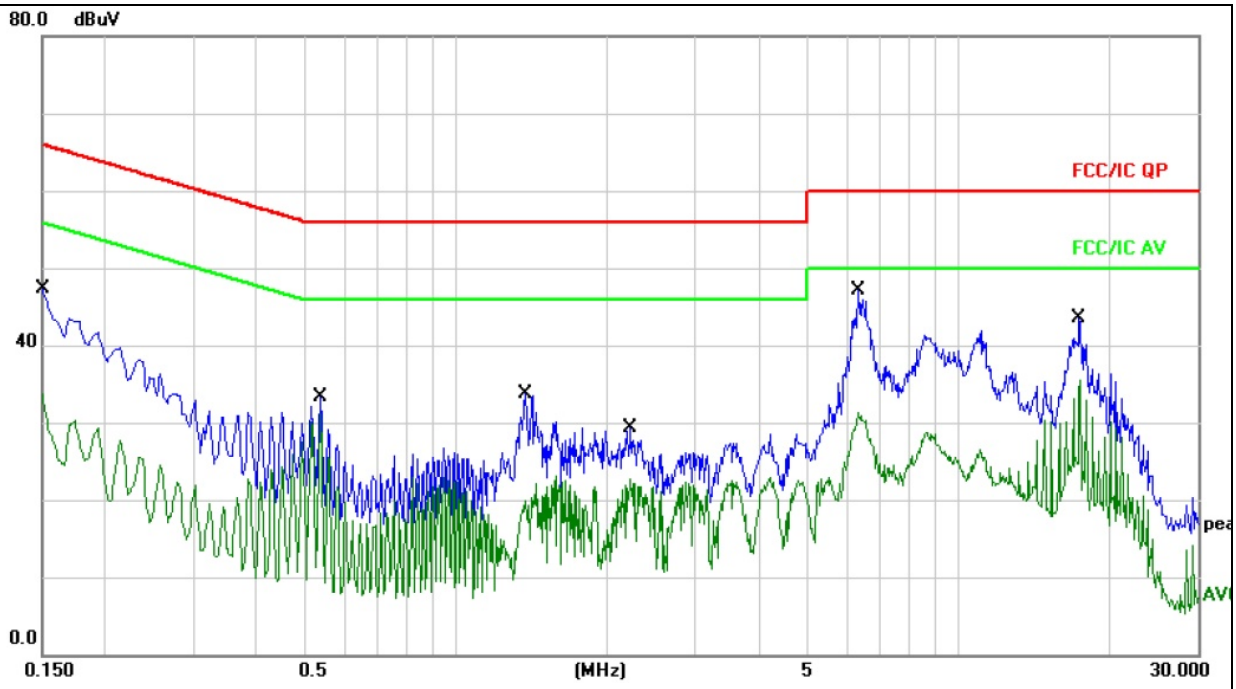
| Temperature： | 25 ℃ | Relative Humidity： | 54% |
|---|---|---|---|
| Pressure： | 1010hPa | Phase： | L |
| Test Voltage ： | AC 120V/60Hz | Test Mode： | Mode 5 |




Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1500 | 37.24 | 10.05 | 47.29 | 65.99 | -18.70 | QP | |
| 2 | | 0.1500 | 24.16 | 10.05 | 34.21 | 55.99 | -21.78 | AVG | |
| 3 | | 0.5380 | 23.08 | 10.12 | 33.20 | 56.00 | -22.80 | QP | |
| 4 | | 0.5380 | 20.46 | 10.12 | 30.58 | 46.00 | -15.42 | AVG | |
| 5 | | 1.3540 | 23.63 | 10.17 | 33.80 | 56.00 | -22.20 | QP | |
| 6 | | 1.3540 | 10.25 | 10.17 | 20.42 | 46.00 | -25.58 | AVG | |
| 7 | | 5.5420 | 21.53 | 10.12 | 31.65 | 60.00 | -28.35 | QP | |
| 8 | | 5.5420 | 12.88 | 10.12 | 23.00 | 50.00 | -27.00 | AVG | |
| 9 | * | 6.3460 | 36.33 | 10.09 | 46.42 | 60.00 | -13.58 | QP | |
| 10 | | 6.3460 | 21.84 | 10.09 | 31.93 | 50.00 | -18.07 | AVG | |
| 11 | | 16.9540 | 32.35 | 10.16 | 42.51 | 60.00 | -17.49 | QP | |
| 12 | | 16.9540 | 24.74 | 10.16 | 34.90 | 50.00 | -15.10 | AVG | |

| | | | |
|---|---|---|---|
| Temperature： | 25 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010hPa | Phase： | N |
| Test Voltage ： | AC 120V/60Hz | Test Mode： | Mode 5 |




Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1500 | 37.25 | 10.05 | 47.30 | 65.99 | -18.69 | QP | |
| 2 | | 0.1500 | 23.71 | 10.05 | 33.76 | 55.99 | -22.23 | AVG | |
| 3 | | 0.5380 | 23.15 | 10.12 | 33.27 | 56.00 | -22.73 | QP | |
| 4 | | 0.5380 | 20.90 | 10.12 | 31.02 | 46.00 | -14.98 | AVG | |
| 5 | | 1.3740 | 23.59 | 10.17 | 33.76 | 56.00 | -22.24 | QP | |
| 6 | | 1.3740 | 11.86 | 10.17 | 22.03 | 46.00 | -23.97 | AVG | |
| 7 | | 2.2340 | 19.14 | 10.18 | 29.32 | 56.00 | -26.68 | QP | |
| 8 | | 2.2340 | 12.51 | 10.18 | 22.69 | 46.00 | -23.31 | AVG | |
| 9 | * | 6.3420 | 36.98 | 10.09 | 47.07 | 60.00 | -12.93 | QP | |
| 10 | | 6.3420 | 21.18 | 10.09 | 31.27 | 50.00 | -18.73 | AVG | |
| 11 | | 17.4740 | 33.35 | 10.16 | 43.51 | 60.00 | -16.49 | QP | |
| 12 | | 17.4780 | 25.30 | 10.16 | 35.46 | 50.00 | -14.54 | AVG | |

## 4.2. Radiated Emission Measurement

### 4.2.1. Radiated Emission Limits (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/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 |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) | |
|---|---|---|
| | PEAK | AVERAGE |
| Above 1000 | 74 | 54 |

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz) |
|---|---|
| Below 1.705 | 30 |
| 1.705 – 108 | 1000 |
| 108 – 500 | 2000 |
| 500 – 1000 | 5000 |
| Above 1000 | 5th harmonic of the highest frequency or 40 GHz, whichever is lower |

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

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

### 4.2.2. TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter.
h Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

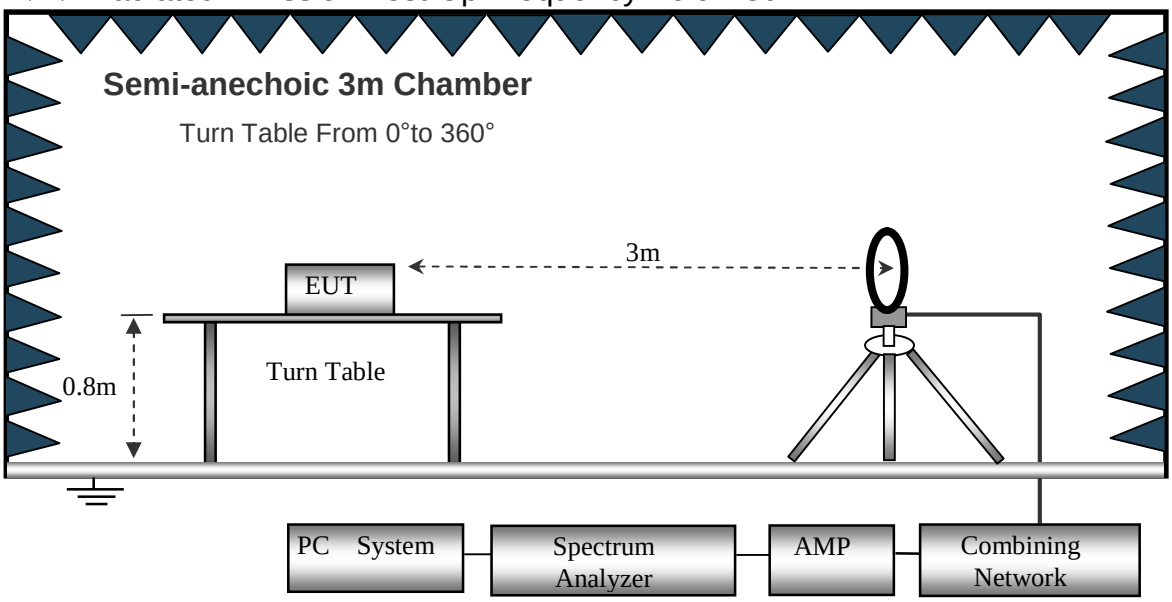
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

### 4.2.3. DEVIATION FROM TEST STANDARD

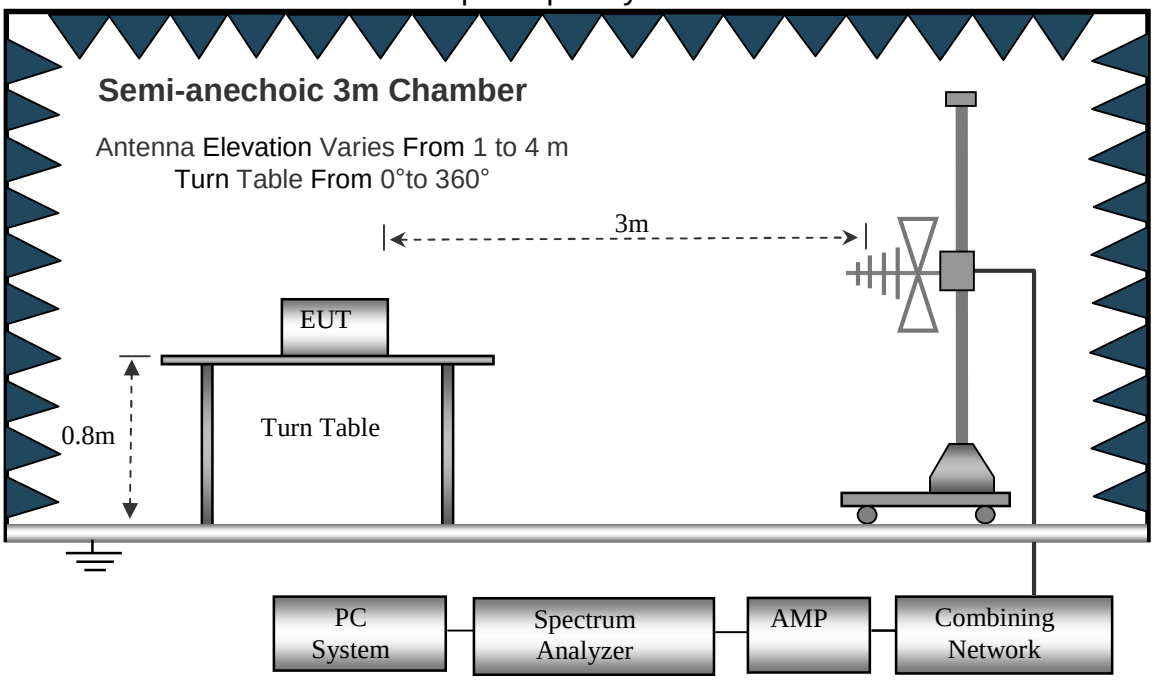
No deviation

## 4.2.4. TEST SETUP

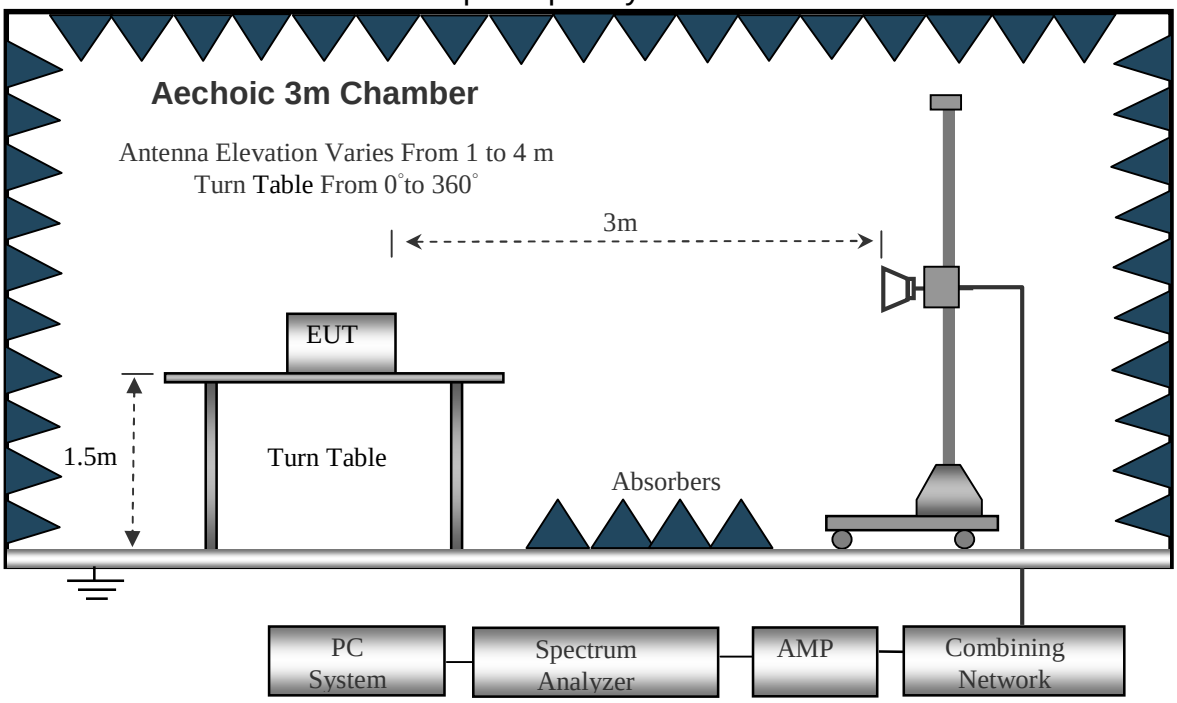
（A）Radiated Emission Test-Up Frequency Below 30MHz




（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz




## 4.2.5. EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

We pretest all adapter's emission, only the adapter 1's data was worst and the data was recording in the report.

The data only show the worst mode.

Radiated Spurious Emission (Below 30MHz )

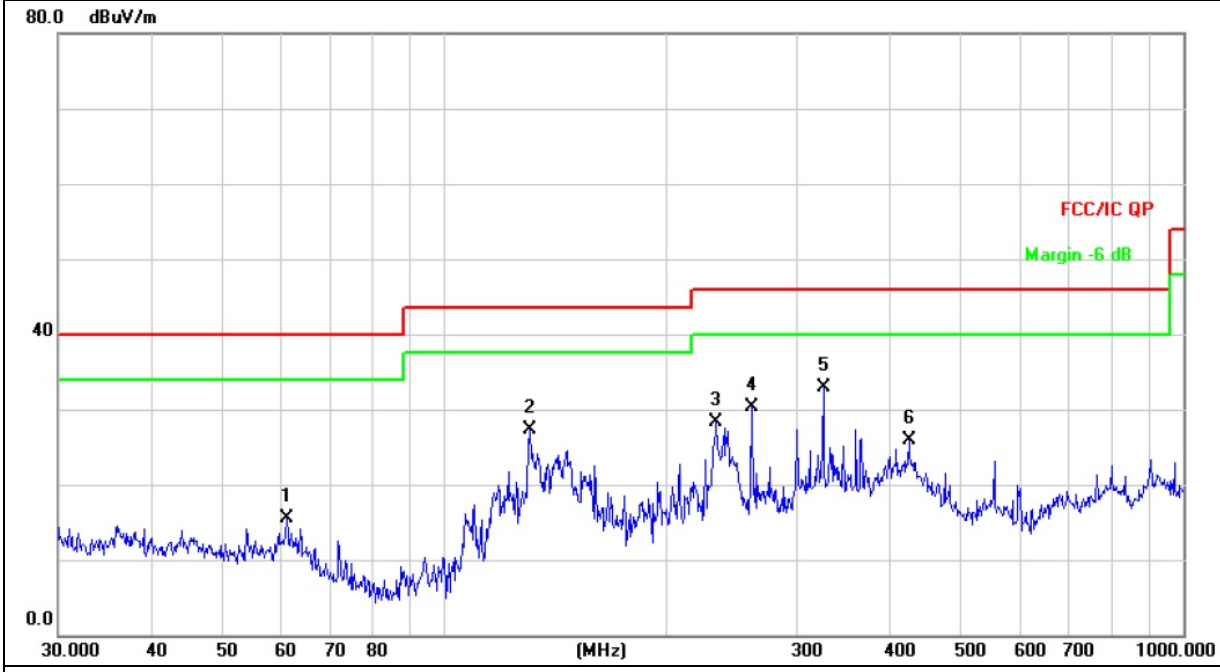
| | | | |
|---|---|---|---|
| Temperature： | 20 ℃ | Relative Humidity： | 48% |
| Pressure： | 1010 hPa | Polarization : | --- |
| Test Voltage ： | DC 5V | | |
| Test Mode ： | TX | | |

| Freq. | Reading | Limit | Margin | State |
|---|---|---|---|---|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB) | P/F |
| -- | -- | -- | -- | PASS |
| -- | -- | -- | -- | PASS |

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Radiated Spurious Emission (Between 30MHz – 1GHz)

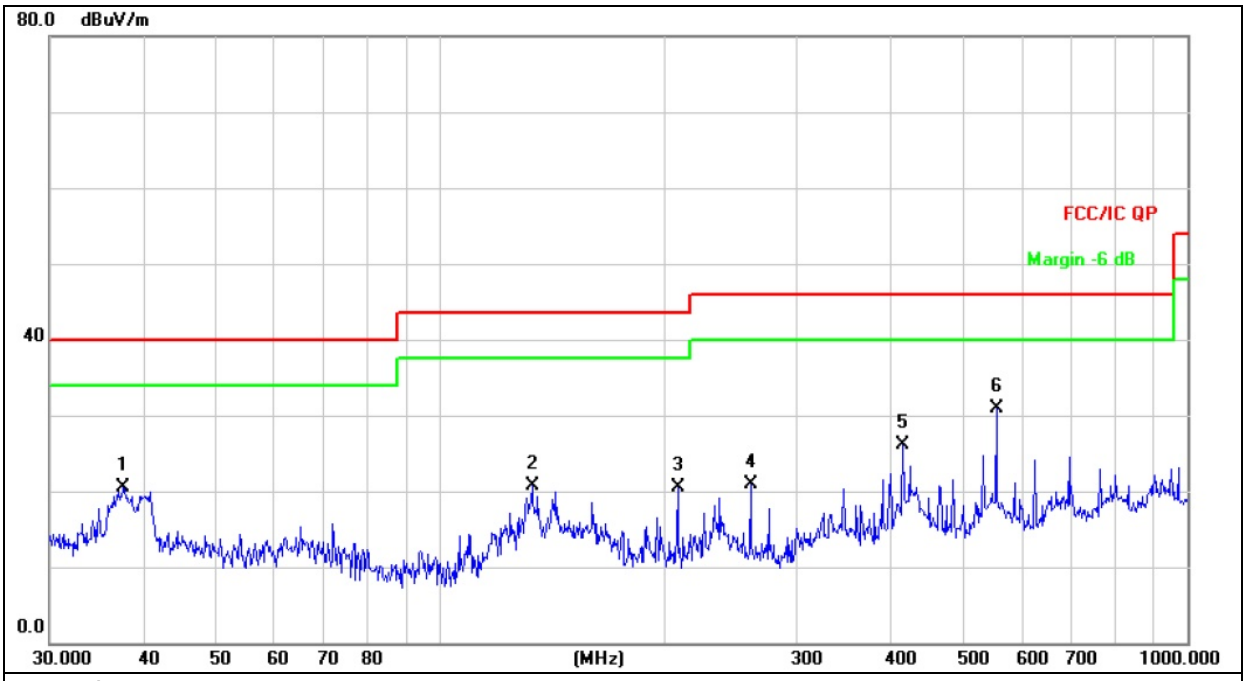
| | | | |
|---|---|---|---|
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Polarization： | Horizontal |
| Test Voltage ： | DC 5V | | |
| Test Mode ： (Worst) | Link Mode | | |




Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
All interfaces was connected, and BT TX mode was link.

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 61.1316 | 27.34 | -11.75 | 15.59 | 40.00 | -24.41 | QP |
| 2 | | 130.3789 | 41.38 | -14.08 | 27.30 | 43.50 | -16.20 | QP |
| 3 | | 233.3487 | 43.13 | -14.87 | 28.26 | 46.00 | -17.74 | QP |
| 4 | | 260.1444 | 44.18 | -13.91 | 30.27 | 46.00 | -15.73 | QP |
| 5 | * | 325.5958 | 44.80 | -11.92 | 32.88 | 46.00 | -13.12 | QP |
| 6 | | 425.0280 | 35.44 | -9.60 | 25.84 | 46.00 | -20.16 | QP |

| | | | |
|---|---|---|---|
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Polarization： | Vertical |
| Test Voltage ： | DC 5V | | |
| Test Mode ： (Worst) | Link Mode | | |




Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
All interfaces was connected, and BT TX mode was link.

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 37.6798 | 29.26 | -8.74 | 20.52 | 40.00 | -19.48 | QP |
| 2 | | 132.6850 | 34.52 | -13.91 | 20.61 | 43.50 | -22.89 | QP |
| 3 | | 207.8501 | 36.40 | -15.98 | 20.42 | 43.50 | -23.08 | QP |
| 4 | | 260.1444 | 34.76 | -13.91 | 20.85 | 46.00 | -25.15 | QP |
| 5 | | 416.1791 | 35.90 | -9.83 | 26.07 | 46.00 | -19.93 | QP |
| 6 | * | 554.8254 | 37.84 | -6.96 | 30.88 | 46.00 | -15.12 | QP |

Radiated Spurious Emission ( Above 1GHz)

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| **802.11a Band 1 Operation frequency:5180** | | | | | | | | | |
| V | 10360.00 | 57.31 | 39.55 | 17.85 | 26.83 | 62.44 | 74 | -11.56 | PK |
| V | 10360.00 | 38.29 | 39.55 | 17.85 | 26.83 | 43.42 | 54 | -10.58 | AV |
| V | 15540.00 | 52.36 | 38.33 | 18.63 | 28.21 | 60.87 | 74 | -13.13 | PK |
| V | 15540.00 | 34.78 | 38.33 | 18.63 | 28.21 | 43.29 | 54 | -10.71 | AV |
| V | 25450.00 | 37.13 | 37.23 | 20.36 | 30.35 | 50.61 | 74 | -23.39 | PK |
| H | 10360.00 | 57.82 | 39.55 | 17.85 | 26.83 | 62.95 | 74 | -11.05 | PK |
| H | 10360.00 | 38.75 | 39.55 | 17.85 | 26.83 | 43.88 | 54 | -10.12 | AV |
| H | 15540.00 | 52.55 | 38.33 | 18.63 | 28.21 | 61.06 | 74 | -12.94 | PK |
| H | 15540.00 | 34.01 | 38.33 | 18.63 | 28.21 | 42.52 | 54 | -11.48 | AV |
| H | 25450.00 | 37.11 | 37.23 | 20.36 | 30.35 | 50.59 | 74 | -23.41 | PK |
| **802.11a Band 1 Operation frequency:5200** | | | | | | | | | |
| V | 10400.00 | 57.64 | 39.61 | 17.89 | 26.89 | 62.81 | 74 | -11.19 | PK |
| V | 10400.00 | 38.96 | 39.61 | 17.89 | 26.89 | 44.13 | 54 | -9.87 | AV |
| V | 15600.00 | 52.75 | 38.47 | 18.67 | 28.27 | 61.22 | 74 | -12.78 | PK |
| V | 15600.00 | 34.56 | 38.47 | 18.67 | 28.27 | 43.03 | 54 | -10.97 | AV |
| V | 25450.00 | 37.62 | 37.23 | 20.36 | 30.35 | 51.10 | 74 | -22.90 | PK |
| H | 10400.00 | 56.97 | 39.61 | 17.89 | 26.89 | 62.14 | 74 | -11.86 | PK |
| H | 10400.00 | 37.84 | 39.61 | 17.89 | 26.89 | 43.01 | 54 | -10.99 | AV |
| H | 15600.00 | 52.36 | 38.47 | 18.67 | 28.27 | 60.83 | 74 | -13.17 | PK |
| H | 15600.00 | 34.12 | 38.47 | 18.67 | 28.27 | 42.59 | 54 | -11.41 | AV |
| H | 25450.00 | 38.00 | 37.23 | 20.36 | 30.35 | 51.48 | 74 | -22.52 | PK |
| **802.11a Band 1 Operation frequency:5240** | | | | | | | | | |
| V | 10480.00 | 56.84 | 39.69 | 17.93 | 26.94 | 62.02 | 74 | -11.98 | PK |
| V | 10480.00 | 38.69 | 39.69 | 17.93 | 26.94 | 43.87 | 54 | -10.13 | AV |
| V | 15720.00 | 52.29 | 38.53 | 18.73 | 28.32 | 60.81 | 74 | -13.19 | PK |
| V | 15720.00 | 34.31 | 38.53 | 18.73 | 28.32 | 42.83 | 54 | -11.17 | AV |
| V | 25450.00 | 37.40 | 37.23 | 20.36 | 30.35 | 50.88 | 74 | -23.12 | PK |
| H | 10480.00 | 56.73 | 39.69 | 17.93 | 26.94 | 61.91 | 74 | -12.09 | PK |
| H | 10480.00 | 39.29 | 39.69 | 17.93 | 26.94 | 44.47 | 54 | -9.53 | AV |
| H | 15720.00 | 52.20 | 38.53 | 18.73 | 28.32 | 60.72 | 74 | -13.28 | PK |
| H | 15720.00 | 34.21 | 38.53 | 18.73 | 28.32 | 42.73 | 54 | -11.27 | AV |
| H | 25450.00 | 36.32 | 37.23 | 20.36 | 30.35 | 49.80 | 74 | -24.20 | PK |

**Rema**rk:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| **802.11n(HT20) Band 1 Operation frequency:5180** | | | | | | | | | |
| V | 10360.00 | 56.98 | 39.55 | 17.85 | 26.83 | 62.11 | 74 | -11.89 | PK |
| V | 10360.00 | 38.07 | 39.55 | 17.85 | 26.83 | 43.20 | 54 | -10.80 | AV |
| V | 15540.00 | 52.06 | 38.33 | 18.63 | 28.21 | 60.57 | 74 | -13.43 | PK |
| V | 15540.00 | 34.58 | 38.33 | 18.63 | 28.21 | 43.09 | 54 | -10.91 | AV |
| V | 25450.00 | 37.56 | 37.23 | 20.36 | 30.35 | 51.04 | 74 | -22.96 | PK |
| H | 10360.00 | 57.49 | 39.55 | 17.85 | 26.83 | 62.62 | 74 | -11.38 | PK |
| H | 10360.00 | 39.52 | 39.55 | 17.85 | 26.83 | 44.65 | 54 | -9.35 | AV |
| H | 15540.00 | 52.25 | 38.33 | 18.63 | 28.21 | 60.76 | 74 | -13.24 | PK |
| H | 15540.00 | 33.82 | 38.33 | 18.63 | 28.21 | 42.33 | 54 | -11.67 | AV |
| H | 25450.00 | 36.91 | 37.23 | 20.36 | 30.35 | 50.39 | 74 | -23.61 | PK |
| **802.11n(HT20) Band 1 Operation frequency:5200** | | | | | | | | | |
| V | 10400.00 | 57.31 | 39.61 | 17.89 | 26.89 | 62.48 | 74 | -11.52 | PK |
| V | 10400.00 | 38.74 | 39.61 | 17.89 | 26.89 | 43.91 | 54 | -10.09 | AV |
| V | 15600.00 | 52.45 | 38.47 | 18.67 | 28.27 | 60.92 | 74 | -13.08 | PK |
| V | 15600.00 | 34.36 | 38.47 | 18.67 | 28.27 | 42.83 | 54 | -11.17 | AV |
| V | 25450.00 | 37.35 | 37.23 | 20.36 | 30.35 | 50.83 | 74 | -23.17 | PK |
| H | 10400.00 | 57.64 | 39.61 | 17.89 | 26.89 | 62.81 | 74 | -11.19 | PK |
| H | 10400.00 | 38.62 | 39.61 | 17.89 | 26.89 | 43.79 | 54 | -10.21 | AV |
| H | 15600.00 | 52.06 | 38.47 | 18.67 | 28.27 | 60.53 | 74 | -13.47 | PK |
| H | 15600.00 | 33.93 | 38.47 | 18.67 | 28.27 | 42.40 | 54 | -11.60 | AV |
| H | 25450.00 | 36.76 | 37.23 | 20.36 | 30.35 | 50.24 | 74 | -23.76 | PK |
| **802.11n(HT20) Band 1 Operation frequency:5240** | | | | | | | | | |
| V | 10480.00 | 57.07 | 39.69 | 17.93 | 26.94 | 62.25 | 74 | -11.75 | PK |
| V | 10480.00 | 37.85 | 39.69 | 17.93 | 26.94 | 43.03 | 54 | -10.97 | AV |
| V | 15720.00 | 52.50 | 38.53 | 18.73 | 28.32 | 61.02 | 74 | -12.98 | PK |
| V | 15720.00 | 34.45 | 38.53 | 18.73 | 28.32 | 42.97 | 54 | -11.03 | AV |
| V | 25450.00 | 37.59 | 37.23 | 20.36 | 30.35 | 51.07 | 74 | -22.93 | PK |
| H | 10480.00 | 56.96 | 39.69 | 17.93 | 26.94 | 62.14 | 74 | -11.86 | PK |
| H | 10480.00 | 38.45 | 39.69 | 17.93 | 26.94 | 43.63 | 54 | -10.37 | AV |
| H | 15720.00 | 52.41 | 38.53 | 18.73 | 28.32 | 60.93 | 74 | -13.07 | PK |
| H | 15720.00 | 34.35 | 38.53 | 18.73 | 28.32 | 42.87 | 54 | -11.13 | AV |
| H | 25450.00 | 37.44 | 37.23 | 20.36 | 30.35 | 50.92 | 74 | -23.08 | PK |

**Rema**rk:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| **802.11n(HT40) Band 1 Operation frequency:5190** | | | | | | | | | |
| V | 10380.00 | 57.03 | 39.55 | 17.85 | 26.83 | 62.16 | 74 | -11.84 | PK |
| V | 10380.00 | 38.10 | 39.55 | 17.85 | 26.83 | 43.23 | 54 | -10.77 | AV |
| V | 15570.00 | 52.10 | 38.33 | 18.63 | 28.21 | 60.61 | 74 | -13.39 | PK |
| V | 15570.00 | 33.61 | 38.33 | 18.63 | 28.21 | 42.12 | 54 | -11.88 | AV |
| V | 25450.00 | 37.60 | 37.23 | 20.36 | 30.35 | 51.08 | 74 | -22.92 | PK |
| H | 10380.00 | 57.54 | 39.55 | 17.85 | 26.83 | 62.67 | 74 | -11.33 | PK |
| H | 10380.00 | 38.56 | 39.55 | 17.85 | 26.83 | 43.69 | 54 | -10.31 | AV |
| H | 15570.00 | 52.29 | 38.33 | 18.63 | 28.21 | 60.80 | 74 | -13.20 | PK |
| H | 15570.00 | 34.84 | 38.33 | 18.63 | 28.21 | 43.35 | 54 | -10.65 | AV |
| H | 25450.00 | 36.88 | 37.23 | 20.36 | 30.35 | 50.36 | 74 | -23.64 | PK |
| **802.11n(HT40) Band 1 Operation frequency:5230** | | | | | | | | | |
| V | 10460.00 | 57.01 | 39.69 | 17.93 | 26.94 | 62.19 | 74 | -11.81 | PK |
| V | 10460.00 | 38.48 | 39.69 | 17.93 | 26.94 | 43.66 | 54 | -10.34 | AV |
| V | 15690.00 | 52.45 | 38.53 | 18.73 | 28.32 | 60.97 | 74 | -13.03 | PK |
| V | 15690.00 | 33.39 | 38.53 | 18.73 | 28.32 | 41.91 | 54 | -12.09 | AV |
| V | 25450.00 | 37.39 | 37.23 | 20.36 | 30.35 | 50.87 | 74 | -23.13 | PK |
| H | 10460.00 | 57.01 | 39.69 | 17.93 | 26.94 | 62.19 | 74 | -11.81 | PK |
| H | 10460.00 | 38.48 | 39.69 | 17.93 | 26.94 | 43.66 | 54 | -10.34 | AV |
| H | 15690.00 | 52.45 | 38.53 | 18.73 | 28.32 | 60.97 | 74 | -13.03 | PK |
| H | 15690.00 | 34.38 | 38.53 | 18.73 | 28.32 | 42.90 | 54 | -11.10 | AV |
| H | 25450.00 | 37.78 | 37.23 | 20.36 | 30.35 | 51.26 | 74 | -22.74 | PK |
| **802.11n(HT80) Band 1Operation frequency:5210** | | | | | | | | | |
| V | 10420.00 | 56.69 | 39.61 | 17.89 | 26.89 | 61.86 | 74 | -12.14 | PK |
| V | 10420.00 | 38.65 | 39.61 | 17.89 | 26.89 | 43.82 | 54 | -10.18 | AV |
| V | 15630.00 | 52.10 | 38.47 | 18.67 | 28.27 | 60.57 | 74 | -13.43 | PK |
| V | 15630.00 | 33.95 | 38.47 | 18.67 | 28.27 | 42.42 | 54 | -11.58 | AV |
| V | 25450.00 | 37.63 | 37.23 | 20.36 | 30.35 | 51.11 | 74 | -22.89 | PK |
| H | 10420.00 | 56.69 | 39.61 | 17.89 | 26.89 | 61.86 | 74 | -12.14 | PK |
| H | 10420.00 | 38.65 | 39.61 | 17.89 | 26.89 | 43.82 | 54 | -10.18 | AV |
| H | 15630.00 | 52.10 | 38.47 | 18.67 | 28.27 | 60.57 | 74 | -13.43 | PK |
| H | 15630.00 | 33.95 | 38.47 | 18.67 | 28.27 | 42.42 | 54 | -11.58 | AV |
| H | 25450.00 | 37.23 | 37.23 | 20.36 | 30.35 | 50.71 | 74 | -23.29 | PK |

**Rema**rk:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| **802.11a Band 4 Operation frequency:5745** | | | | | | | | | |
| V | 11490.00 | 57.12 | 39.73 | 18.19 | 27.31 | 62.89 | 74 | -11.11 | PK |
| V | 11490.00 | 38.16 | 39.73 | 18.19 | 27.31 | 43.93 | 54 | -10.07 | AV |
| V | 17235.00 | 53.18 | 38.59 | 18.92 | 28.41 | 61.92 | 74 | -12.08 | PK |
| V | 17235.00 | 33.67 | 38.59 | 18.92 | 28.41 | 42.41 | 54 | -11.59 | AV |
| V | 25450.00 | 37.17 | 37.23 | 20.36 | 30.35 | 50.65 | 74 | -23.35 | PK |
| H | 11490.00 | 57.63 | 39.73 | 18.19 | 27.31 | 63.40 | 74 | -10.60 | PK |
| H | 11490.00 | 38.62 | 39.73 | 18.19 | 27.31 | 44.39 | 54 | -9.61 | AV |
| H | 17235.00 | 53.37 | 38.59 | 18.92 | 28.41 | 62.11 | 74 | -11.89 | PK |
| H | 17235.00 | 33.90 | 38.59 | 18.92 | 28.41 | 42.64 | 54 | -11.36 | AV |
| H | 25450.00 | 36.95 | 37.23 | 20.36 | 30.35 | 50.43 | 74 | -23.57 | PK |
| **802.11a Band 4 Operation frequency:5785** | | | | | | | | | |
| V | 11570.00 | 57.45 | 39.76 | 18.25 | 27.39 | 63.33 | 74 | -10.67 | PK |
| V | 11570.00 | 38.83 | 39.76 | 18.25 | 27.39 | 44.71 | 54 | -9.29 | AV |
| V | 17355.00 | 53.57 | 38.62 | 19.16 | 28.48 | 62.59 | 74 | -11.41 | PK |
| V | 17355.00 | 33.45 | 38.62 | 19.16 | 28.48 | 42.47 | 54 | -11.53 | AV |
| V | 25450.00 | 37.46 | 37.23 | 20.36 | 30.35 | 50.94 | 74 | -23.06 | PK |
| H | 11570.00 | 56.78 | 39.76 | 18.25 | 27.39 | 62.66 | 74 | -11.34 | PK |
| H | 11570.00 | 38.71 | 39.76 | 18.25 | 27.39 | 44.59 | 54 | -9.41 | AV |
| H | 17355.00 | 53.18 | 38.62 | 19.16 | 28.48 | 62.20 | 74 | -11.80 | PK |
| H | 17355.00 | 34.01 | 38.62 | 19.16 | 28.48 | 43.03 | 54 | -10.97 | AV |
| H | 25450.00 | 37.84 | 37.23 | 20.36 | 30.35 | 51.32 | 74 | -22.68 | PK |
| **802.11a Band 4 Operation frequency:5825** | | | | | | | | | |
| V | 11650.00 | 57.21 | 39.79 | 18.32 | 27.42 | 63.16 | 74 | -10.84 | PK |
| V | 11650.00 | 37.94 | 39.79 | 18.32 | 27.42 | 43.89 | 54 | -10.11 | AV |
| V | 17475.00 | 53.62 | 38.66 | 19.24 | 28.53 | 62.73 | 74 | -11.27 | PK |
| V | 17475.00 | 33.54 | 38.66 | 19.24 | 28.53 | 42.65 | 54 | -11.35 | AV |
| V | 25450.00 | 37.70 | 37.23 | 20.36 | 30.35 | 51.18 | 74 | -22.82 | PK |
| H | 11650.00 | 57.10 | 39.79 | 18.32 | 27.42 | 63.05 | 74 | -10.95 | PK |
| H | 11650.00 | 38.54 | 39.79 | 18.32 | 27.42 | 44.49 | 54 | -9.51 | AV |
| H | 17475.00 | 52.54 | 38.66 | 19.24 | 28.53 | 61.65 | 74 | -12.35 | PK |
| H | 17475.00 | 33.44 | 38.66 | 19.24 | 28.53 | 42.55 | 54 | -11.45 | AV |
| H | 25450.00 | 37.61 | 37.23 | 20.36 | 30.35 | 51.09 | 74 | -22.91 | PK |

**Rema**rk:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| **802.11n(HT20) Band 4 Operation frequency:5745** | | | | | | | | | |
| V | 11490.00 | 57.19 | 39.73 | 18.19 | 27.31 | 62.96 | 74 | -11.04 | PK |
| V | 11490.00 | 38.21 | 39.73 | 18.19 | 27.31 | 43.98 | 54 | -10.02 | AV |
| V | 17235.00 | 53.25 | 38.59 | 18.92 | 28.41 | 61.99 | 74 | -12.01 | PK |
| V | 17235.00 | 34.71 | 38.59 | 18.92 | 28.41 | 43.45 | 54 | -10.55 | AV |
| V | 25450.00 | 37.73 | 37.23 | 20.36 | 30.35 | 51.21 | 74 | -22.79 | PK |
| H | 11490.00 | 57.70 | 39.73 | 18.19 | 27.31 | 63.47 | 74 | -10.53 | PK |
| H | 11490.00 | 38.67 | 39.73 | 18.19 | 27.31 | 44.44 | 54 | -9.56 | AV |
| H | 17235.00 | 53.44 | 38.59 | 18.92 | 28.41 | 62.18 | 74 | -11.82 | PK |
| H | 17235.00 | 33.94 | 38.59 | 18.92 | 28.41 | 42.68 | 54 | -11.32 | AV |
| H | 25450.00 | 37.01 | 37.23 | 20.36 | 30.35 | 50.49 | 74 | -23.51 | PK |
| **802.11n(HT20) Band 4 Operation frequency:5785** | | | | | | | | | |
| V | 11570.00 | 57.52 | 39.76 | 18.25 | 27.39 | 63.40 | 74 | -10.60 | PK |
| V | 11570.00 | 37.88 | 39.76 | 18.25 | 27.39 | 43.76 | 54 | -10.24 | AV |
| V | 17355.00 | 53.64 | 38.62 | 19.16 | 28.48 | 62.66 | 74 | -11.34 | PK |
| V | 17355.00 | 34.49 | 38.62 | 19.16 | 28.48 | 43.51 | 54 | -10.49 | AV |
| V | 25450.00 | 37.52 | 37.23 | 20.36 | 30.35 | 51.00 | 74 | -23.00 | PK |
| H | 11570.00 | 57.85 | 39.76 | 18.25 | 27.39 | 63.73 | 74 | -10.27 | PK |
| H | 11570.00 | 38.76 | 39.76 | 18.25 | 27.39 | 44.64 | 54 | -9.36 | AV |
| H | 17355.00 | 53.25 | 38.62 | 19.16 | 28.48 | 62.27 | 74 | -11.73 | PK |
| H | 17355.00 | 34.05 | 38.62 | 19.16 | 28.48 | 43.07 | 54 | -10.93 | AV |
| H | 25450.00 | 37.90 | 37.23 | 20.36 | 30.35 | 51.38 | 74 | -22.62 | PK |
| **802.11n(HT20) Band 4 Operation frequency:5825** | | | | | | | | | |
| V | 11650.00 | 57.28 | 39.79 | 18.32 | 27.42 | 63.23 | 74 | -10.77 | PK |
| V | 11650.00 | 37.99 | 39.79 | 18.32 | 27.42 | 43.94 | 54 | -10.06 | AV |
| V | 17475.00 | 53.69 | 38.66 | 19.24 | 28.53 | 62.80 | 74 | -11.20 | PK |
| V | 17475.00 | 34.58 | 38.66 | 19.24 | 28.53 | 43.69 | 54 | -10.31 | AV |
| V | 25450.00 | 37.76 | 37.23 | 20.36 | 30.35 | 51.24 | 74 | -22.76 | PK |
| H | 11650.00 | 57.17 | 39.79 | 18.32 | 27.42 | 63.12 | 74 | -10.88 | PK |
| H | 11650.00 | 38.59 | 39.79 | 18.32 | 27.42 | 44.54 | 54 | -9.46 | AV |
| H | 17475.00 | 53.60 | 38.66 | 19.24 | 28.53 | 62.71 | 74 | -11.29 | PK |
| H | 17475.00 | 34.48 | 38.66 | 19.24 | 28.53 | 43.59 | 54 | -10.41 | AV |
| H | 25450.00 | 38.67 | 37.23 | 20.36 | 30.35 | 52.15 | 74 | -21.85 | PK |

**Remar**k:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| **802.11n(HT40) Band 4 Operation frequency:5755** | | | | | | | | | |
| V | 11510.00 | 56.96 | 39.73 | 18.19 | 27.31 | 62.73 | 74 | -11.27 | PK |
| V | 11510.00 | 38.06 | 39.73 | 18.19 | 27.31 | 43.83 | 54 | -10.17 | AV |
| V | 17265.00 | 53.03 | 38.59 | 18.92 | 28.41 | 61.77 | 74 | -12.23 | PK |
| V | 17265.00 | 32.58 | 38.59 | 18.92 | 28.41 | 41.32 | 54 | -12.68 | AV |
| V | 25450.00 | 37.54 | 37.23 | 20.36 | 30.35 | 51.02 | 74 | -22.98 | PK |
| H | 11510.00 | 57.47 | 39.73 | 18.19 | 27.31 | 63.24 | 74 | -10.76 | PK |
| H | 11510.00 | 38.51 | 39.73 | 18.19 | 27.31 | 44.28 | 54 | -9.72 | AV |
| H | 17265.00 | 53.22 | 38.59 | 18.92 | 28.41 | 61.96 | 74 | -12.04 | PK |
| H | 17265.00 | 33.80 | 38.59 | 18.92 | 28.41 | 42.54 | 54 | -11.46 | AV |
| H | 25450.00 | 36.82 | 37.23 | 20.36 | 30.35 | 50.30 | 74 | -23.70 | PK |
| **802.11n(HT40) Band 4 Operation frequency:5795** | | | | | | | | | |
| V | 11590.00 | 57.29 | 39.76 | 18.25 | 27.39 | 63.17 | 74 | -10.83 | PK |
| V | 11590.00 | 38.72 | 39.76 | 18.25 | 27.39 | 44.60 | 54 | -9.40 | AV |
| V | 17385.00 | 53.42 | 38.62 | 19.16 | 28.48 | 62.44 | 74 | -11.56 | PK |
| V | 17385.00 | 33.36 | 38.62 | 19.16 | 28.48 | 42.38 | 54 | -11.62 | AV |
| V | 25450.00 | 37.33 | 37.23 | 20.36 | 30.35 | 50.81 | 74 | -23.19 | PK |
| H | 11590.00 | 57.62 | 39.76 | 18.25 | 27.39 | 63.50 | 74 | -10.50 | PK |
| H | 11590.00 | 37.61 | 39.76 | 18.25 | 27.39 | 43.49 | 54 | -10.51 | AV |
| H | 17385.00 | 53.03 | 38.62 | 19.16 | 28.48 | 62.05 | 74 | -11.95 | PK |
| H | 17385.00 | 33.91 | 38.62 | 19.16 | 28.48 | 42.93 | 54 | -11.07 | AV |
| H | 25450.00 | 37.71 | 37.23 | 20.36 | 30.35 | 51.19 | 74 | -22.81 | PK |
| **802.11ac(HT80) Band 4 Operation frequency:5775** | | | | | | | | | |
| V | 11550.00 | 57.05 | 39.76 | 18.25 | 27.39 | 62.93 | 74 | -11.07 | PK |
| V | 11550.00 | 37.84 | 39.76 | 18.25 | 27.39 | 43.72 | 54 | -10.28 | AV |
| V | 17325.00 | 53.47 | 38.62 | 19.16 | 28.48 | 62.49 | 74 | -11.51 | PK |
| V | 17325.00 | 34.44 | 38.62 | 19.16 | 28.48 | 43.46 | 54 | -10.54 | AV |
| V | 25450.00 | 37.57 | 37.23 | 20.36 | 30.35 | 51.05 | 74 | -22.95 | PK |
| H | 11550.00 | 56.94 | 39.76 | 18.25 | 27.39 | 62.82 | 74 | -11.18 | PK |
| H | 11550.00 | 38.43 | 39.76 | 18.25 | 27.39 | 44.31 | 54 | -9.69 | AV |
| H | 17325.00 | 53.38 | 38.62 | 19.16 | 28.48 | 62.40 | 74 | -11.60 | PK |
| H | 17325.00 | 32.35 | 38.62 | 19.16 | 28.48 | 41.37 | 54 | -12.63 | AV |
| H | 25450.00 | 36.48 | 37.23 | 20.36 | 30.35 | 49.96 | 74 | -24.04 | PK |

**Remar**k:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

# 5. BAND EDGE COMPLIANCE TEST

## 5.1. Limits

According to FCC §15.407(b)

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

## 5.2. TEST PROCEDURE

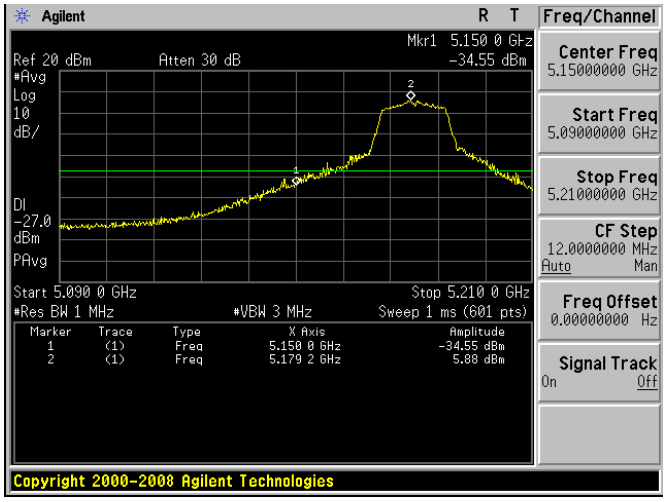
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then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

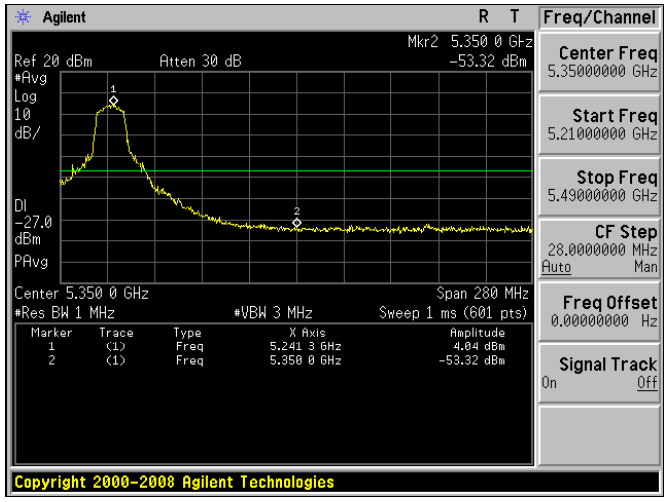
## 5.3. Test Data

Please see data as below:

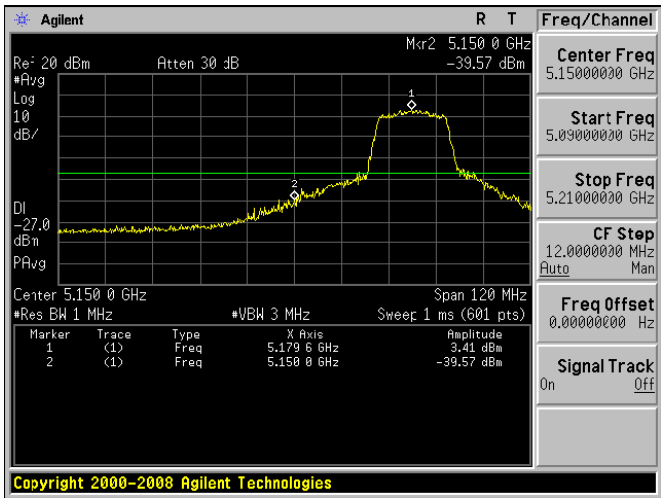
Band 1

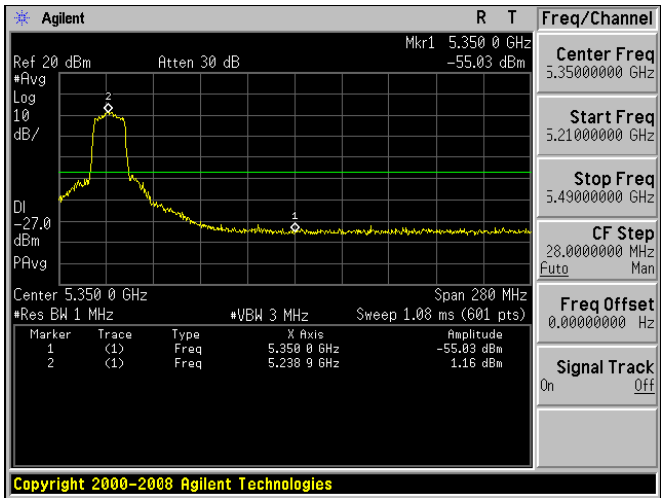
802.11a



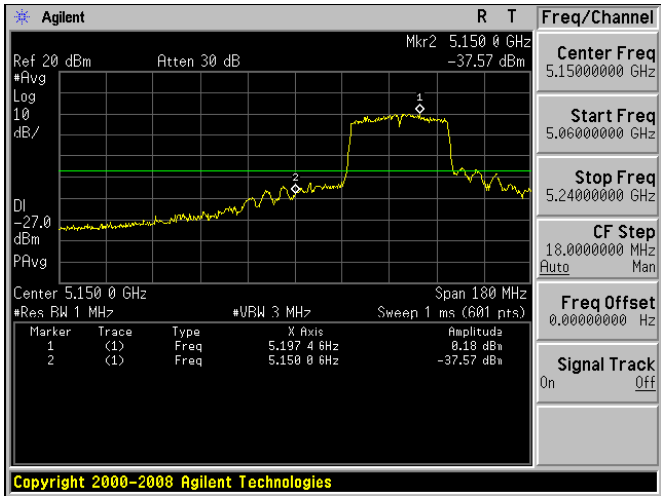



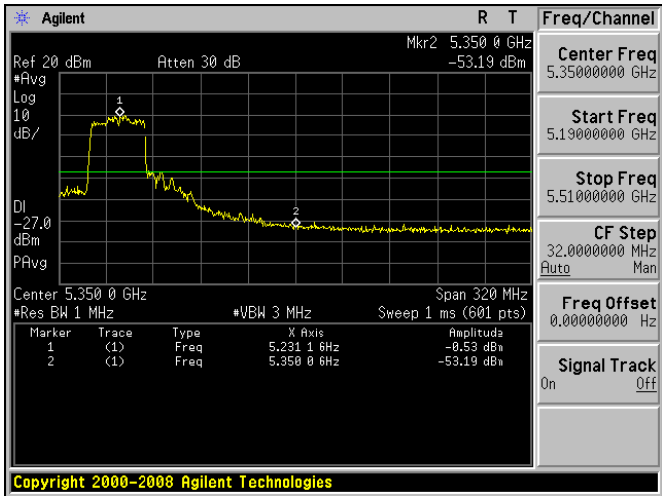

802.11n20



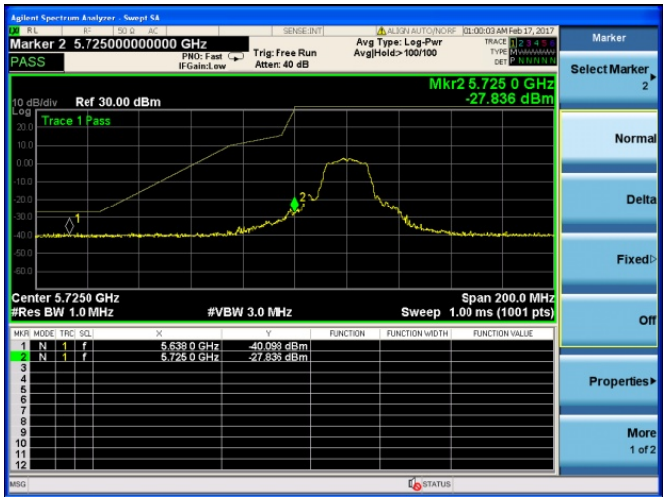

802.11n40

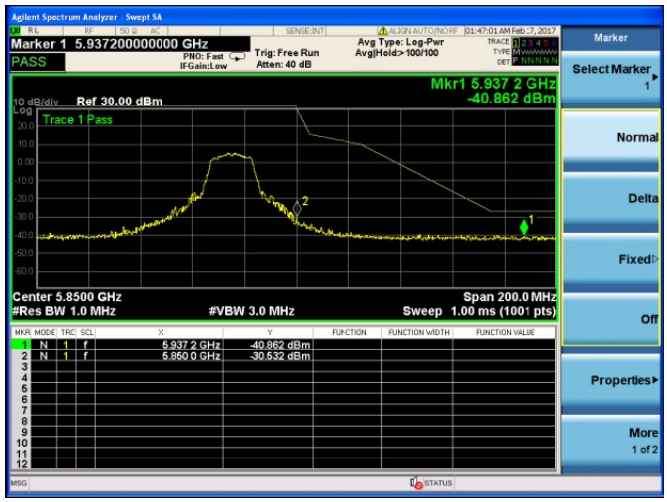


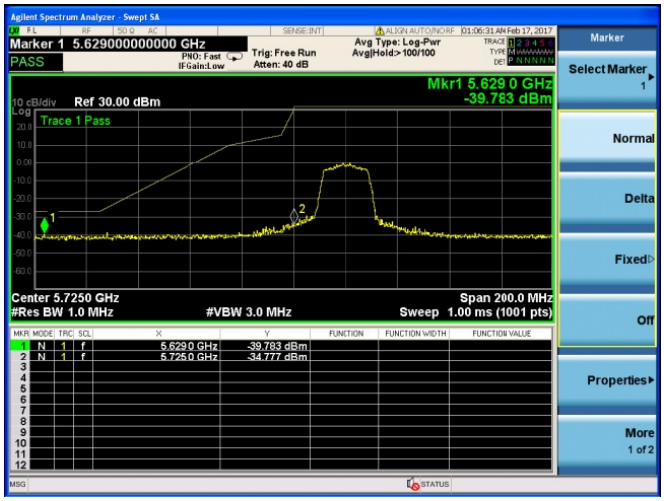
Band 4

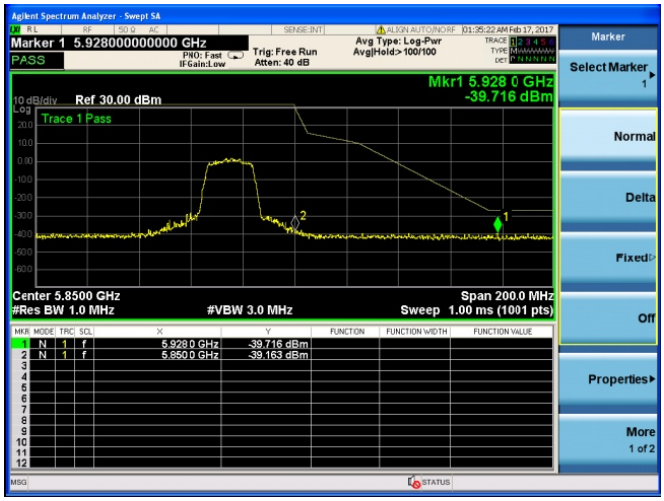
802.11a



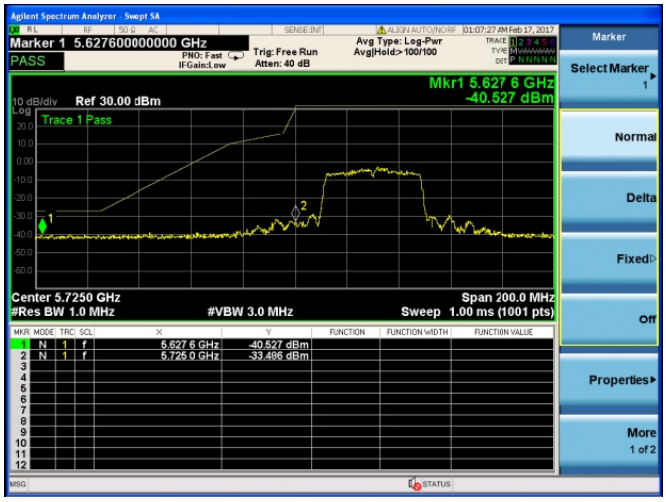




802.11n20

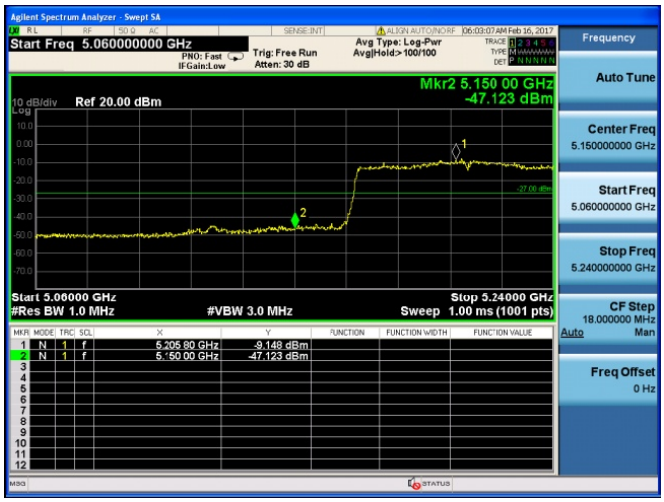


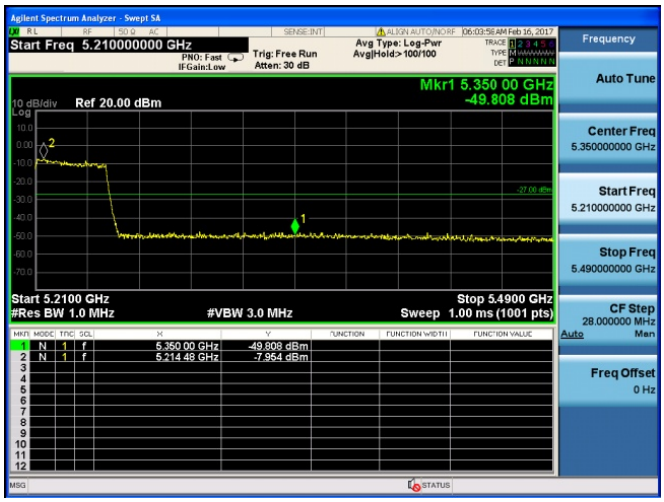




802.11n40

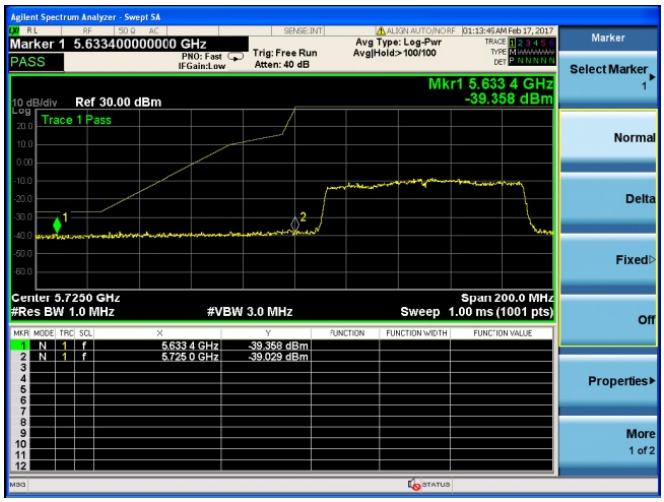


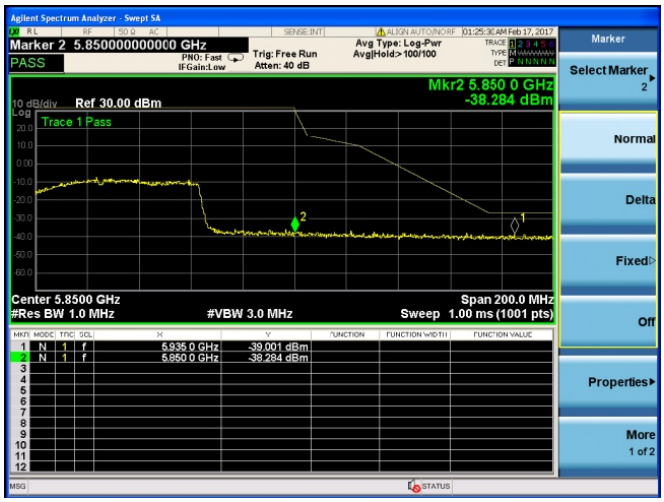

Band 1
802.11ac




Band 4
802.11ac



# 6. 26DB AND 99% BANDWIDTH TEST

## 6.1. Limits

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

## 6.2. TEST PROCEDURE

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3*RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

26dB bandwidth

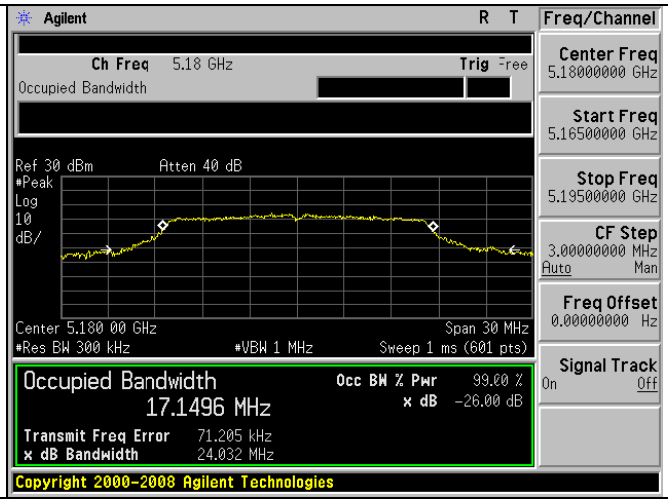
| | Frequency (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|
| 802.11a | 5180 | 17.150 | 24.032 |
| | 5200 | 17.142 | 23.924 |
| | 5240 | 17.358 | 27.55 |
| 802.11n (HT20) | 5180 | 17.846 | 21.35 |
| | 5200 | 17.820 | 21.31 |
| | 5240 | 17.815 | 21.23 |
| 802.11n (HT40) | 5190 | 36.086 | 39.00 |
| | 5230 | 36.132 | 38.90 |
| 802.11ac (HT80) | 5210 | 75.346 | 75.53 |

6dB bandwidth

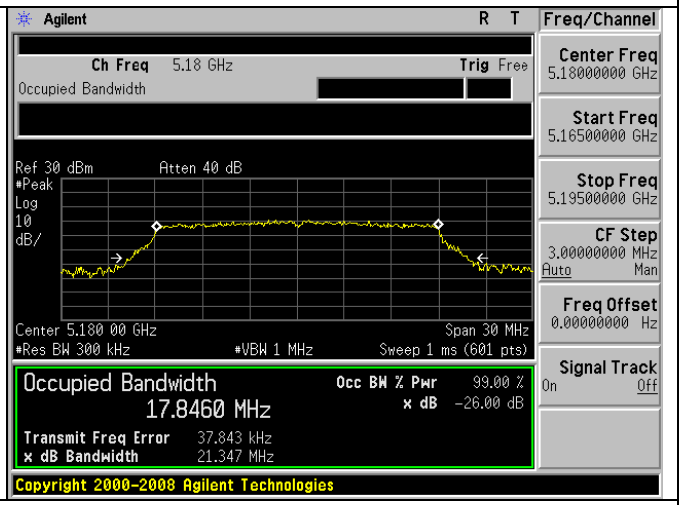
| | Frequency (MHz) | 6dB Bandwidth (MHz) | 99% Bandwidth (MHz) | Limit (MHz) |
|---|---|---|---|---|
| 802.11a | 5745 | 16.32 | 16.57 | >0.5 |
| | 5785 | 16.07 | 16.54 | >0.5 |
| | 5825 | 16.36 | 16.53 | >0.5 |
| 802.11n (HT20) | 5745 | 17.62 | 17.59 | >0.5 |
| | 5785 | 17.65 | 17.65 | >0.5 |
| | 5825 | 17.59 | 17.59 | >0.5 |
| 802.11n (HT40) | 5755 | 36.41 | 35.99 | >0.5 |
| | 5795 | 36.42 | 36.03 | >0.5 |
| 802.11ac (HT80) | 5775 | 75.96 | 75.29 | >0.5 |

Band 1

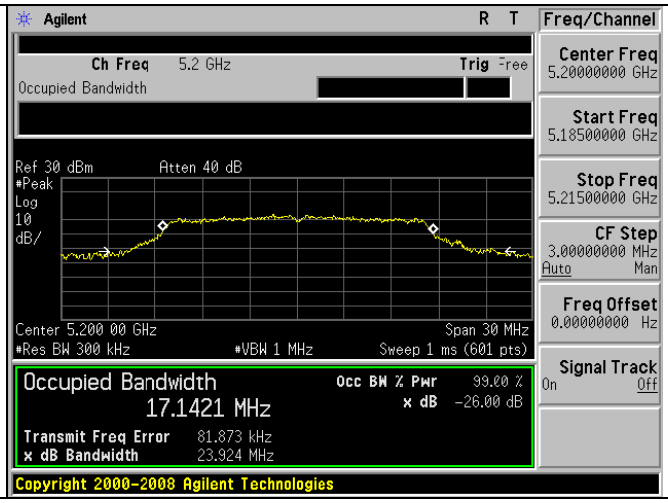
802.11a 5180MHz



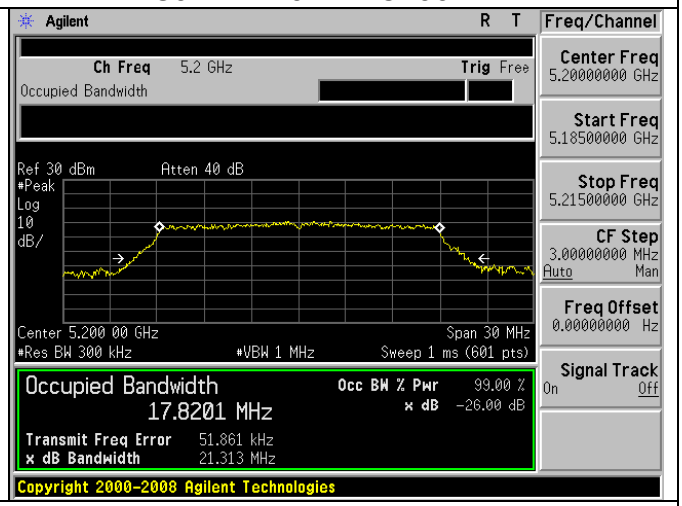

802.11n20MHz 5180MHz



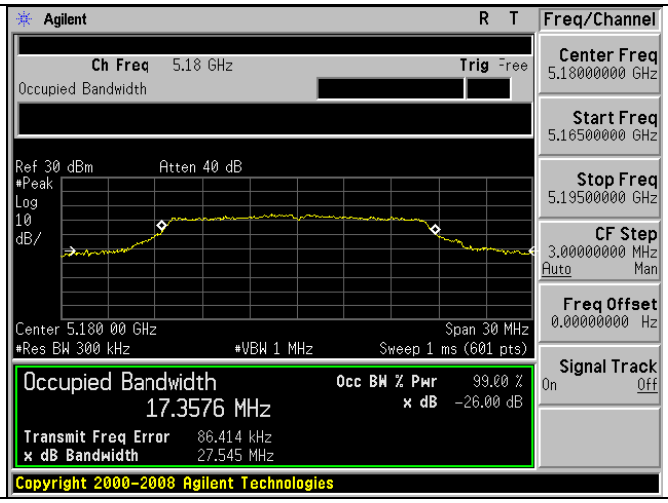

802.11a 5220MHz



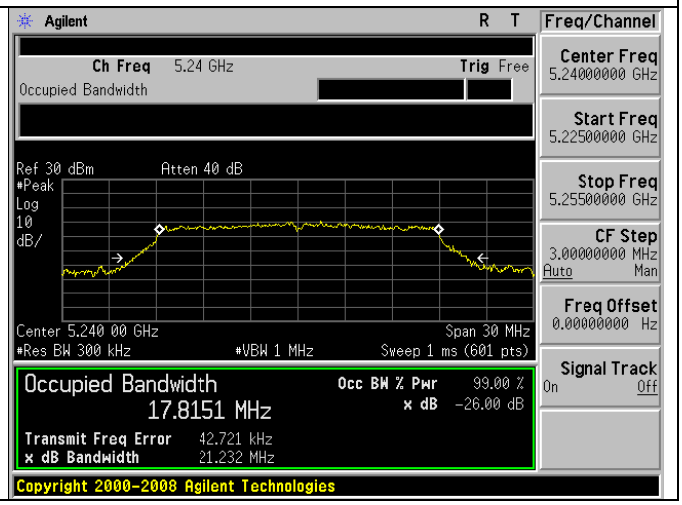

802.11n20MHz 5200MHz




802.11a 5240MHz

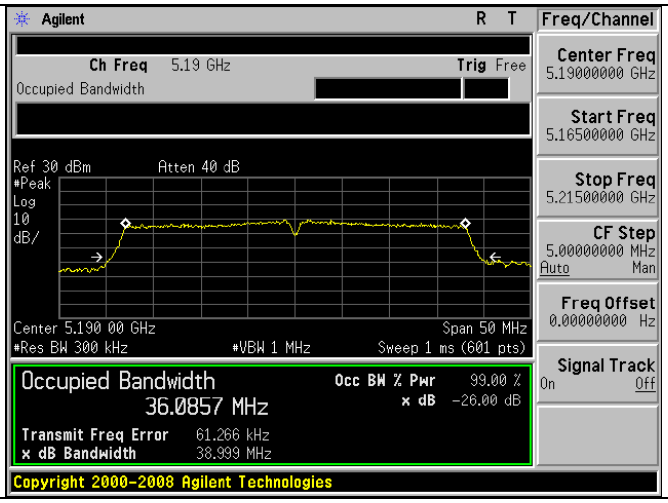



802.11n20MHz 5240MHz

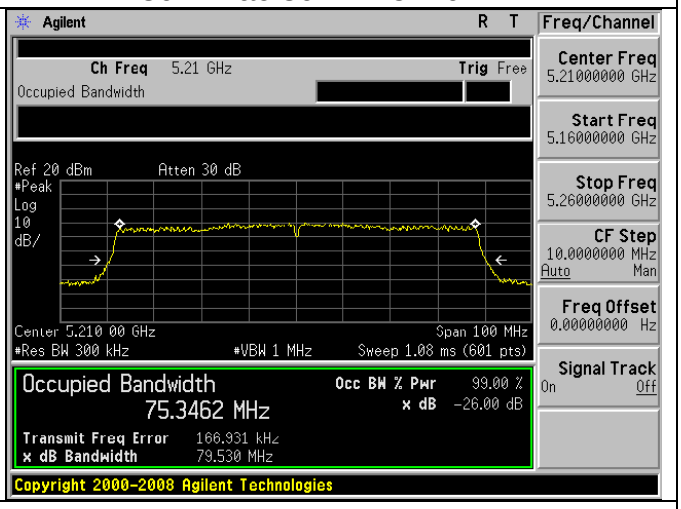


Band 1

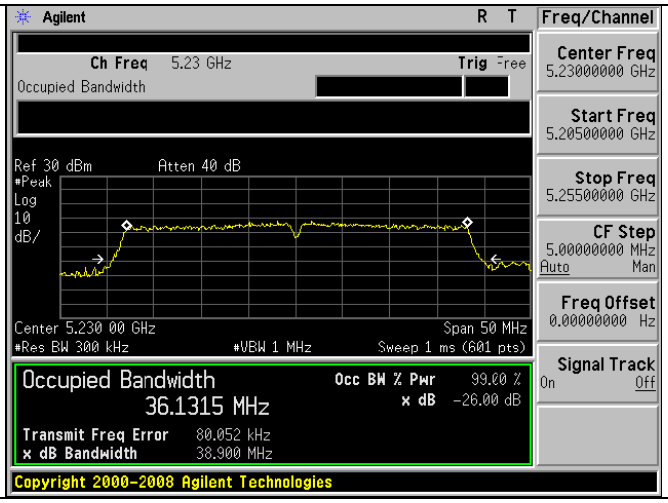
802.11n40MHz 5190MHz




802.11ac 80MHz 5210MHz

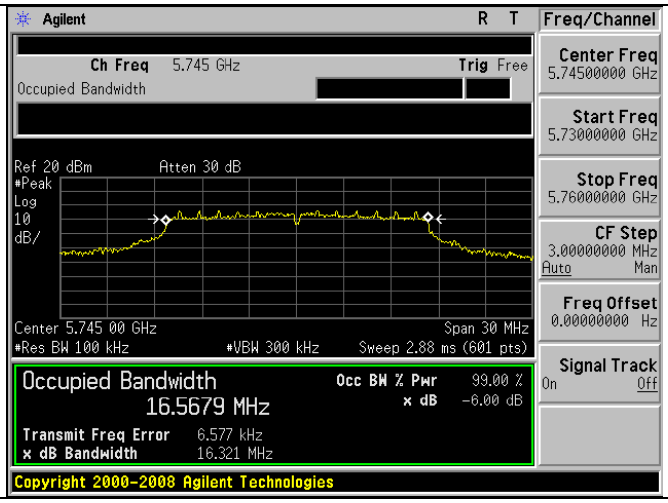



802.11n40MHz 5230MHz

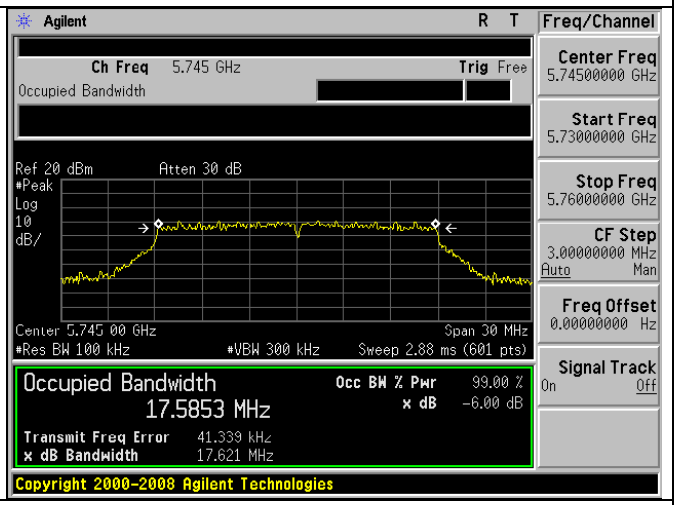


Band 4

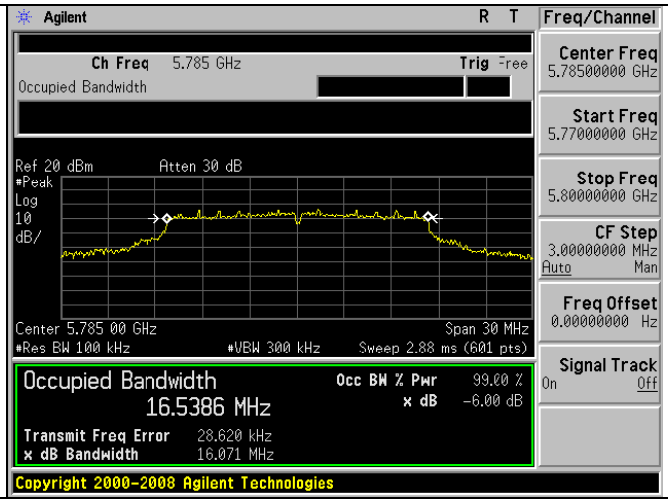
802.11a 5745MHz



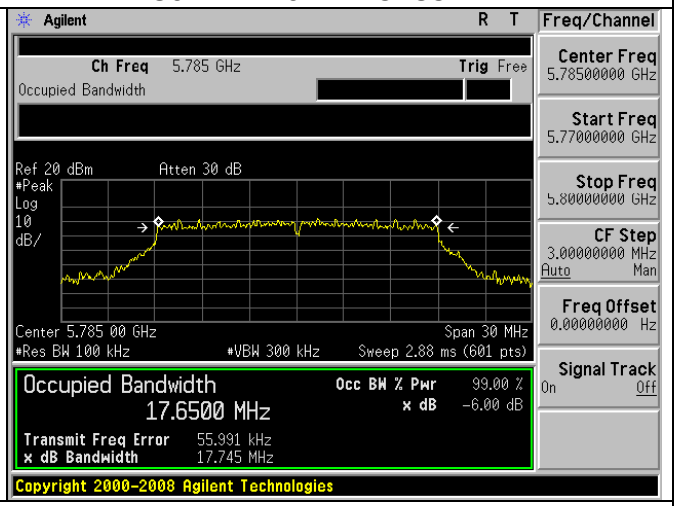

802.11n20MHz 5745MHz



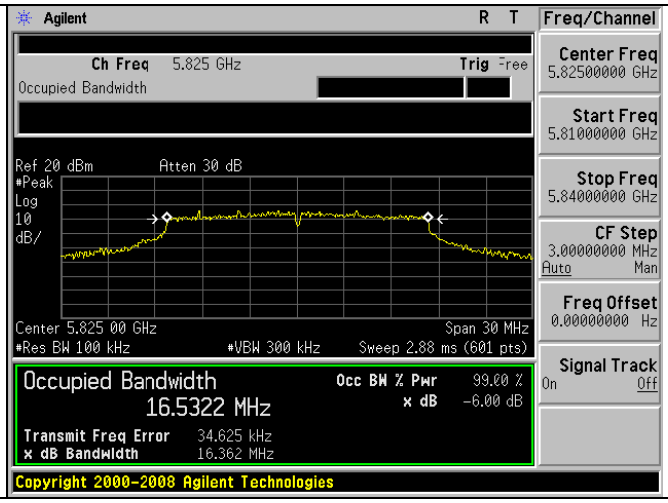

802.11a 5785MHz



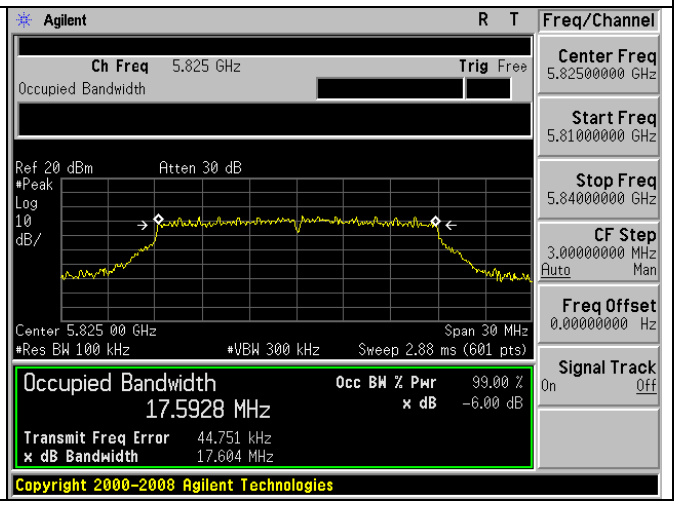

802.11n20MHz 5785MHz




802.11a 5825MHz

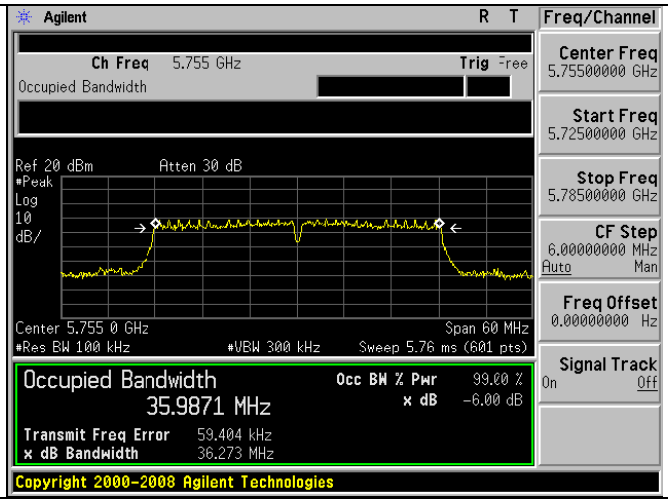



802.11n20MHz 5825MHz

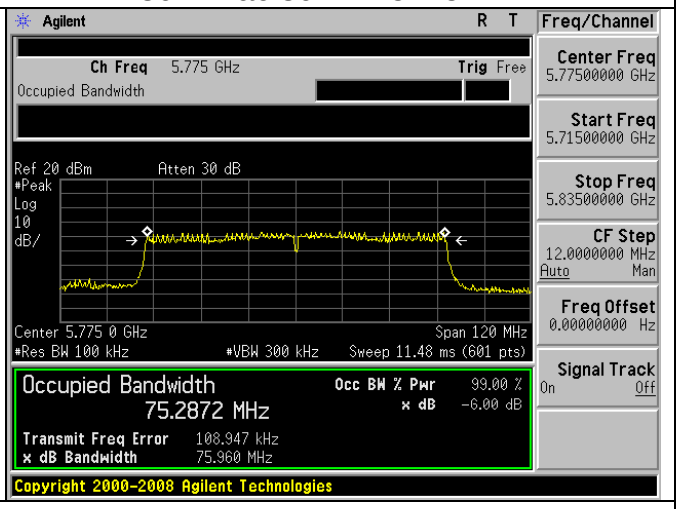


Band 1

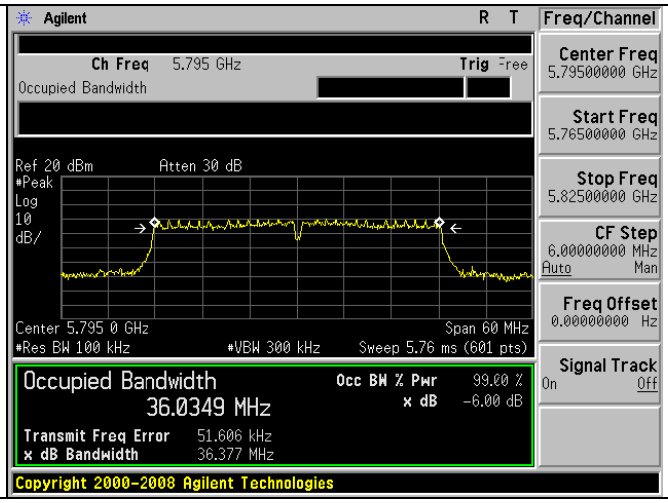
802.11n40MHz 5755MHz




802.11ac 80MHz 5775MHz




802.11n40MHz 5795MHz



# 7. OUTPUT POWER TEST

## 7.1. Limits

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

## 7.2. Test setup

1. The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):
2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

a. The Transmitter output (antenna port) was connected to the power meter.

b. Turn on the EUT and power meter and then record the power value.

c. Repeat above procedures on all channels needed to be tested.

## 7.3. Test result

| | Frequency (MHz) | Average Output Power(dBm) | Duty Factor (dB) | Total Output Power(dBm) | FCC Limit (dBm) | FCC Limit (mW) | Result |
|---|---|---|---|---|---|---|---|
| 802.11a | 5180 | 4.35 | 0.06 | 4.41 | 23.98 | 250 | Pass |
| | 5220 | 4.31 | 0.06 | 4.37 | 23.98 | 250 | Pass |
| | 5240 | 4.28 | 0.06 | 4.34 | 23.98 | 250 | Pass |
| | 5745 | 4.38 | 0.06 | 4.44 | 30.00 | 1000 | Pass |
| | 5785 | 4.39 | 0.06 | 4.45 | 30.00 | 1000 | Pass |
| | 5825 | 4.32 | 0.06 | 4.38 | 30.00 | 1000 | Pass |
| 802.11n (HT20) | 5180 | 4.27 | 0.07 | 4.34 | 23.98 | 250 | Pass |
| | 5220 | 4.29 | 0.07 | 4.36 | 23.98 | 250 | Pass |
| | 5240 | 4.18 | 0.07 | 4.25 | 23.98 | 250 | Pass |
| | 5745 | 4.24 | 0.07 | 4.31 | 30.00 | 1000 | Pass |
| | 5785 | 4.21 | 0.07 | 4.28 | 30.00 | 1000 | Pass |
| | 5825 | 4.25 | 0.07 | 4.32 | 30.00 | 1000 | Pass |
| 802.11n (HT40) | 5190 | 4.29 | 0.14 | 4.43 | 23.98 | 250 | Pass |
| | 5230 | 4.22 | 0.14 | 4.36 | 23.98 | 250 | Pass |
| | 5755 | 4.25 | 0.14 | 4.39 | 30.00 | 1000 | Pass |
| | 5795 | 4.19 | 0.14 | 4.33 | 30.00 | 1000 | Pass |
| 802.11ac (HT80) | 5210 | 4.29 | 0.28 | 4.57 | 23.98 | 250 | Pass |
| | 5775 | 4.30 | 0.28 | 4.58 | 30.00 | 1000 | Pass |

# 8. PEAK POWER SPECTRAL DENSITY TEST

## 8.1. Limits

In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.

## 8.2. Test setup

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

For U-NII-3 Band:

Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the

omission of procedure x, the integration with 26dB EBW bandwidth)

5. User the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).

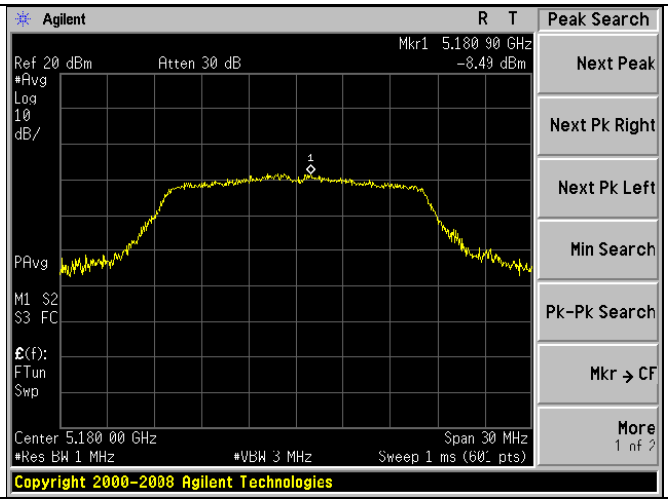
## 8.3. Test data

Test data as below

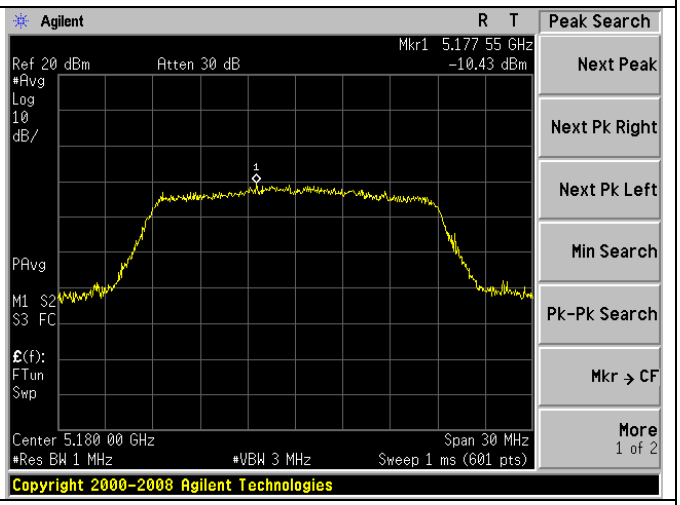
| | Frequency (MHz) | Reading Level (dBm) | Duty factor (dB) | Duty factor 10 log (1MHz/ RBW) | PPSD (dBm) | FCC Limit (dBm) | Result |
|---|---|---|---|---|---|---|---|
| 802.11a | 5180 | -8.49 | 0.06 | 0.0 | -2.11 | 11.00 | Pass |
| | 5220 | -9.71 | 0.06 | 0.0 | -1.98 | 11.00 | Pass |
| | 5240 | -9.65 | 0.06 | 0.0 | -1.84 | 11.00 | Pass |
| | 5745 | -4.66 | 0.06 | 2.92 | -1.68 | 30.00 | Pass |
| | 5785 | -3.95 | 0.06 | 2.92 | -0.97 | 30.00 | Pass |
| | 5825 | -3.93 | 0.06 | 2.92 | -0.95 | 30.00 | Pass |
| 802.11n (HT20) | 5180 | -10.43 | 0.07 | 0.0 | -2.23 | 11.00 | Pass |
| | 5220 | -12.27 | 0.07 | 0.0 | -2.09 | 11.00 | Pass |
| | 5240 | -12.18 | 0.07 | 0.0 | -2.30 | 11.00 | Pass |
| | 5745 | -4.45 | 0.07 | 2.92 | -1.46 | 30.00 | Pass |
| | 5785 | -4.88 | 0.07 | 2.92 | -1.89 | 30.00 | Pass |
| | 5825 | -4.02 | 0.07 | 2.92 | -1.03 | 30.00 | Pass |
| 802.11n (HT40) | 5190 | -13.81 | 0.14 | 0.0 | -5.33 | 11.00 | Pass |
| | 5230 | -14.88 | 0.14 | 0.0 | -5.76 | 11.00 | Pass |
| | 5755 | -5.62 | 0.14 | 2.92 | -2.56 | 30.00 | Pass |
| | 5795 | -5.41 | 0.14 | 2.92 | -2.35 | 30.00 | Pass |
| 802.11ac (HT80) | 5210 | -5.24 | 0.28 | 0.0 | -5.70 | 11.00 | Pass |
| | 5775 | -6.16 | 0.28 | 2.92 | -2.96 | 30.00 | Pass |

Band 1

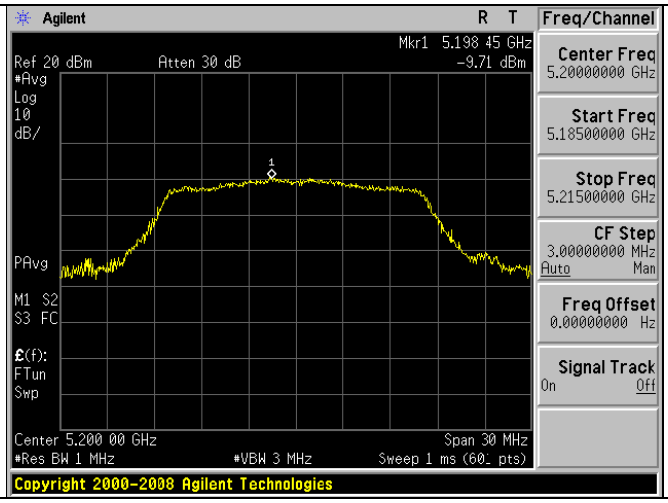
802.11a 5180MHz



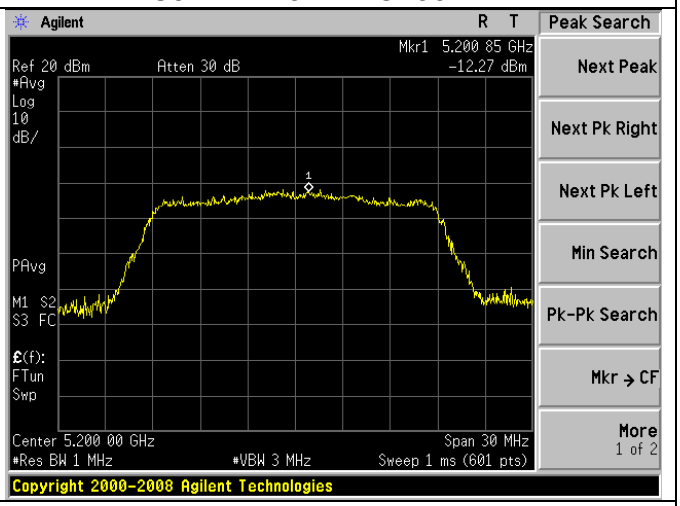

802.11n20MHz 5180MHz



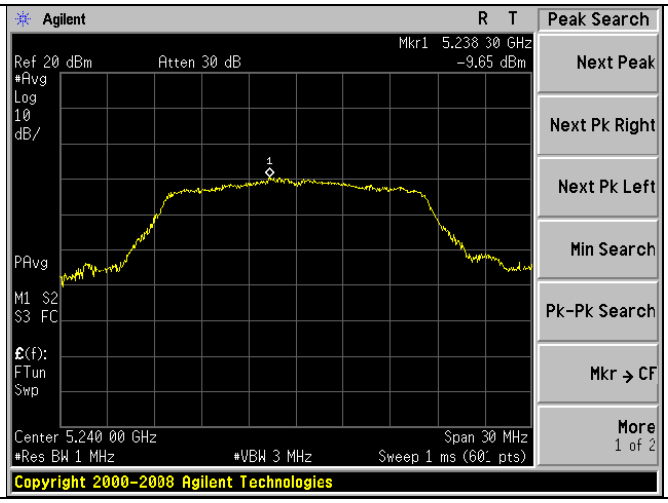

802.11a 5220MHz



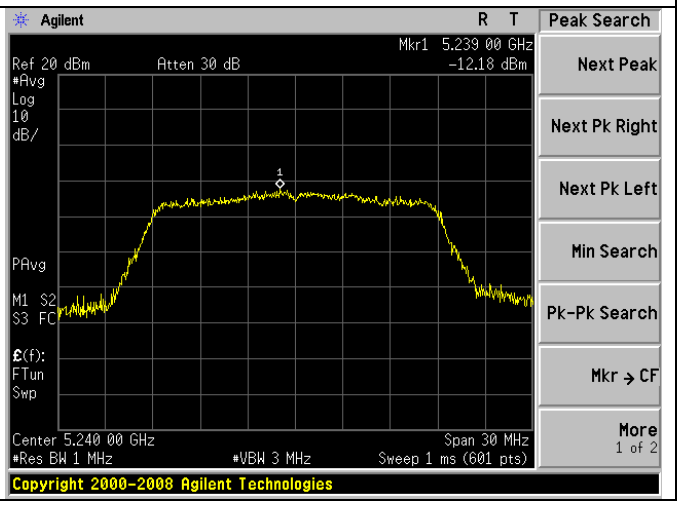

802.11n20MHz 5200MHz




802.11a 5240MHz

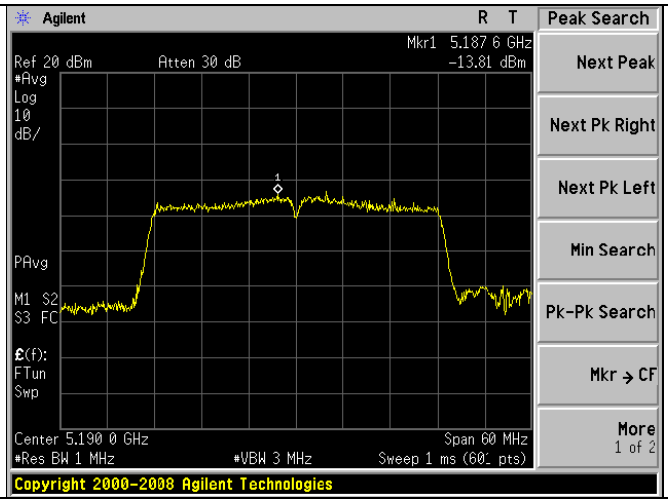



802.11n20MHz 5240MHz

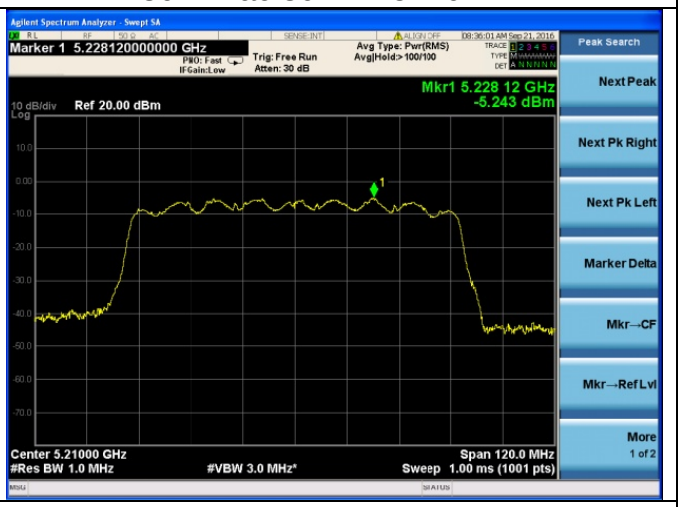


Band 1

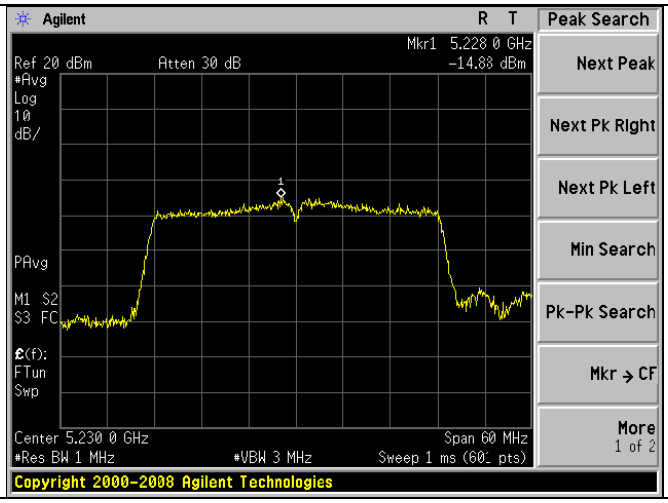
802.11n40MHz 5190MHz




802.11ac 80MHz 5210MHz



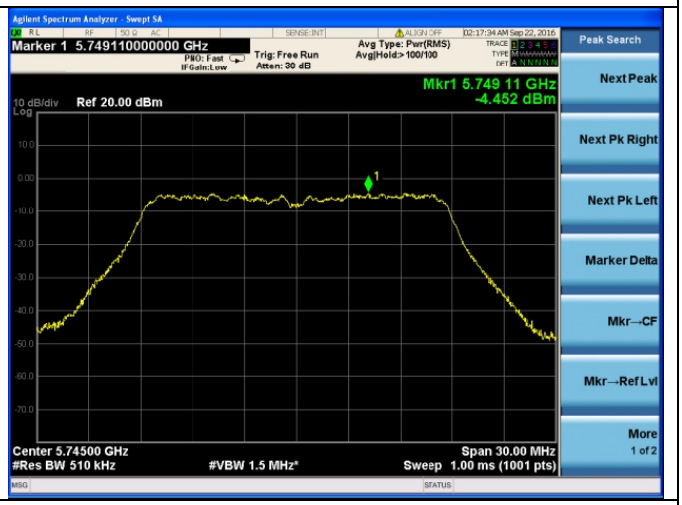

802.11n40MHz 5230MHz



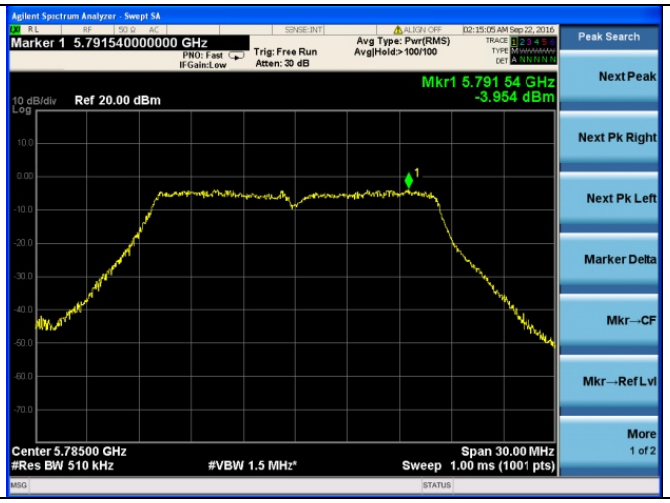
Band 4

802.11a 5745MHz

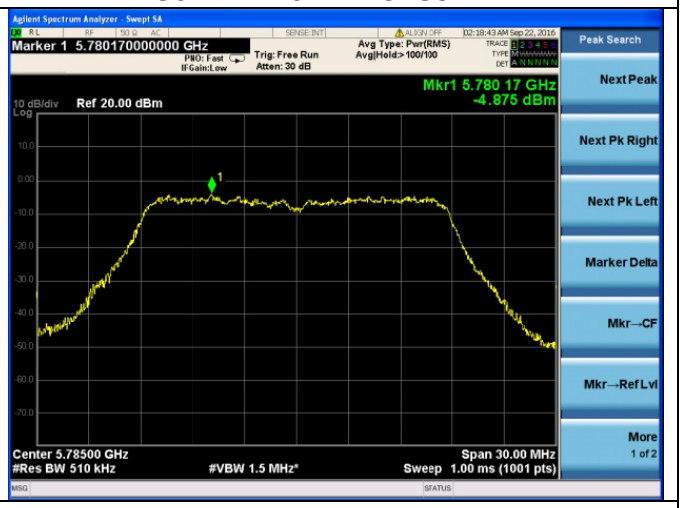

802.11n20MHz 5745MHz



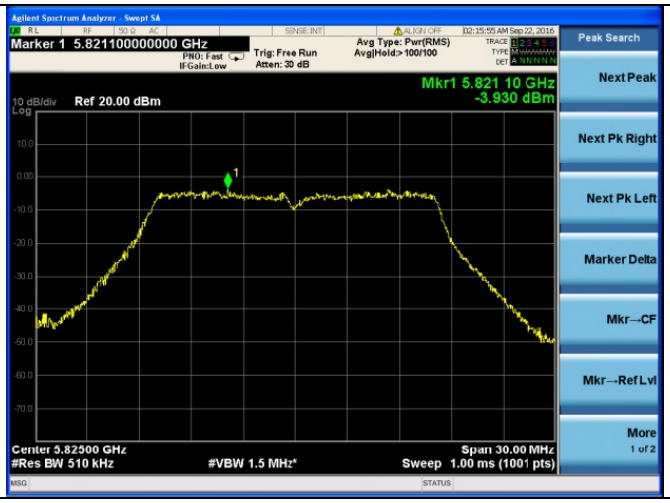

802.11a 5785MHz




802.11n20MHz 5785MHz

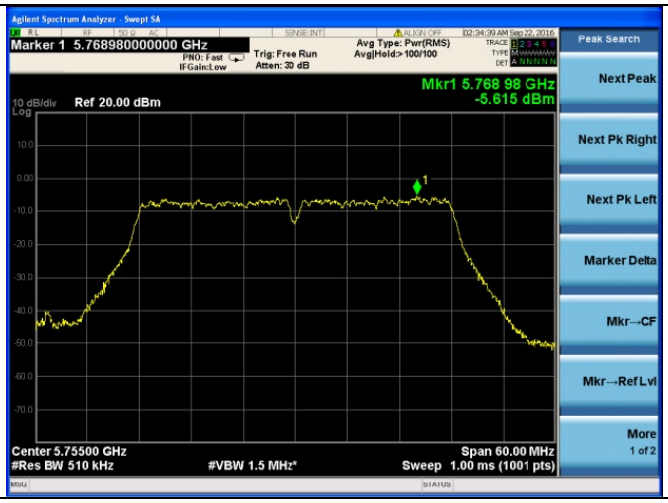
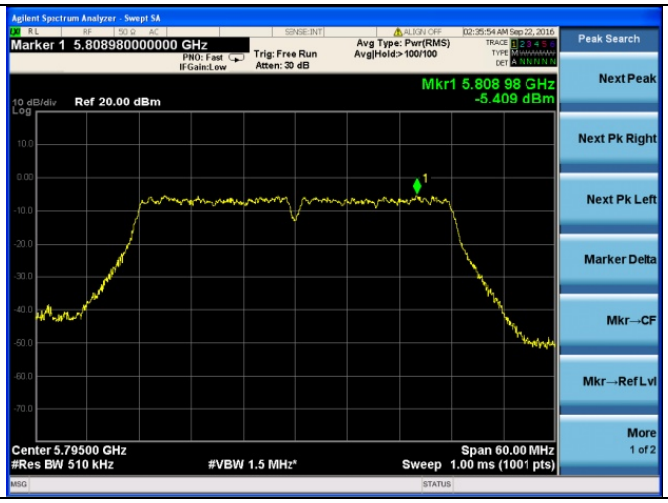



802.11a 5825MHz




802.11n20MHz 5825MHz

Band 4

| 802.11n40MHz 5755MHz | 802.11ac 80MHz 5775MHz |
|---|---|
|  |  |
| 802.11n40MHz 5795MHz | |
|  | |

# 9. DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

**Formula:**

Duty Cycle = Ton / (Ton+Toff)

**Measurement Procedure:**

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

Duty Cycle:

| Operation Mode | Duty Cycle | Duty Fator (dB)<br>10 * log (1/ Duty cycle) |
|---|---|---|
| 802.11a | 98.60% | 0.06 |
| 802.11n(HT20) | 98.50% | 0.07 |
| 802.11n(HT40) | 96.90% | 0.14 |
| 802.11ac(HT80) | 93.80% | 0.28 |

802.11a


802.11n(HT20)

802.11n(HT40)


802.11ac(HT80)

# 10. FREQUENCY STABILITY

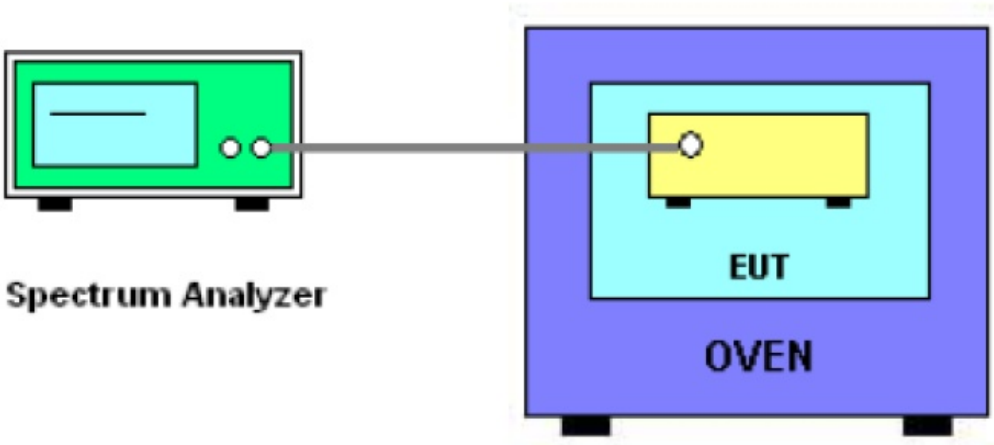
## 10.1. Limits

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 ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

## 10.2. Test setup

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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × $10^6$ ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
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°C~70°C.

## 10.3. Test setup Layout



## 10.4. Test data

Test data as below

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5180 | 5.00 | 25 | 5180 | 5180.01189 | -0.01189 | -2.2954 | ±20 | Pass |
| | 5.75 | | 5180 | 5180.01053 | -0.01053 | -2.0328 | | Pass |
| | 4.25 | | 5180 | 5180.01137 | -0.01137 | -2.1950 | | Pass |
| | 5.00 | -20 | 5180 | 5180.01241 | -0.01241 | -2.3958 | | Pass |
| | | -10 | 5180 | 5180.01124 | -0.01124 | -2.1699 | | Pass |
| | | 0 | 5180 | 5180.01147 | -0.01147 | -2.2143 | | Pass |
| | | 10 | 5180 | 5180.01128 | -0.01128 | -2.1776 | | Pass |
| | | 20 | 5180 | 5180.01245 | -0.01245 | -2.4035 | | Pass |
| | | 30 | 5180 | 5180.01078 | -0.01078 | -2.0811 | | Pass |
| | | 40 | 5180 | 5180.01035 | -0.01035 | -1.9981 | | Pass |
| | | 50 | 5180 | 5180.01114 | -0.01114 | -2.1506 | | Pass |
| | | 60 | 5180 | 5180.01162 | -0.01162 | -2.2432 | | Pass |
| | | 70 | 5180 | 5180.01178 | -0.01178 | -2.2741 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5190 | 5.00 | 25 | 5190 | 5190.01389 | -0.01389 | -2.6763 | ±20 | Pass |
| | 5.75 | | 5190 | 5190.01247 | -0.01247 | -2.4027 | | Pass |
| | 4.25 | | 5190 | 5190.01245 | -0.01245 | -2.3988 | | Pass |
| | 5.00 | -20 | 5190 | 5190.01134 | -0.01134 | -2.1850 | | Pass |
| | | -10 | 5190 | 5190.01167 | -0.01167 | -2.2486 | | Pass |
| | | 0 | 5190 | 5190.01152 | -0.01152 | -2.2197 | | Pass |
| | | 10 | 5190 | 5190.01147 | -0.01147 | -2.2100 | | Pass |
| | | 20 | 5190 | 5190.01187 | -0.01187 | -2.2871 | | Pass |
| | | 30 | 5190 | 5190.01235 | -0.01235 | -2.3796 | | Pass |
| | | 40 | 5190 | 5190.01452 | -0.01452 | -2.7977 | | Pass |
| | | 50 | 5190 | 5190.01234 | -0.01234 | -2.3776 | | Pass |
| | | 60 | 5190 | 5190.01374 | -0.01374 | -2.6474 | | Pass |
| | | 70 | 5190 | 5190.01268 | -0.01268 | -2.4432 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5200 | 5.00 | 25 | 5200 | 5200.01244 | -0.01244 | -2.3923 | ±20 | Pass |
| | 5.75 | | 5200 | 5200.01312 | -0.01312 | -2.5231 | | Pass |
| | 4.25 | | 5200 | 5200.01167 | -0.01167 | -2.2442 | | Pass |
| | 5.00 | -20 | 5200 | 5200.01541 | -0.01541 | -2.9635 | | Pass |
| | | -10 | 5200 | 5200.01247 | -0.01247 | -2.3981 | | Pass |
| | | 0 | 5200 | 5200.01345 | -0.01345 | -2.5865 | | Pass |
| | | 10 | 5200 | 5200.01246 | -0.01246 | -2.3962 | | Pass |
| | | 20 | 5200 | 5200.01512 | -0.01512 | -2.9077 | | Pass |
| | | 30 | 5200 | 5200.01241 | -0.01241 | -2.3865 | | Pass |
| | | 40 | 5200 | 5200.01246 | -0.01246 | -2.3962 | | Pass |
| | | 50 | 5200 | 5200.01262 | -0.01262 | -2.4269 | | Pass |
| | | 60 | 5200 | 5200.01357 | -0.01357 | -2.6096 | | Pass |
| | | 70 | 5200 | 5200.01175 | -0.01175 | -2.2596 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5210 | 5.00 | 25 | 5210 | 5210.01251 | -0.01251 | -2.4012 | ±20 | Pass |
| | 5.75 | | 5210 | 5210.01169 | -0.01169 | -2.2438 | | Pass |
| | 4.25 | | 5210 | 5210.01245 | -0.01245 | -2.3896 | | Pass |
| | 5.00 | -20 | 5210 | 5210.01362 | -0.01362 | -2.6142 | | Pass |
| | | -10 | 5210 | 5210.01456 | -0.01456 | -2.7946 | | Pass |
| | | 0 | 5210 | 5210.01257 | -0.01257 | -2.4127 | | Pass |
| | | 10 | 5210 | 5210.01624 | -0.01624 | -3.1171 | | Pass |
| | | 20 | 5210 | 5210.01247 | -0.01247 | -2.3935 | | Pass |
| | | 30 | 5210 | 5210.01624 | -0.01624 | -3.1171 | | Pass |
| | | 40 | 5210 | 5210.01452 | -0.01452 | -2.7869 | | Pass |
| | | 50 | 5210 | 5210.01364 | -0.01364 | -2.6180 | | Pass |
| | | 60 | 5210 | 5210.01429 | -0.01429 | -2.7428 | | Pass |
| | | 70 | 5210 | 5210.01346 | -0.01346 | -2.5835 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5230 | 5.00 | 25 | 5230 | 5230.01421 | -0.01421 | -2.7170 | ±20 | Pass |
| | 5.75 | | 5230 | 5230.01341 | -0.01341 | -2.5641 | | Pass |
| | 4.25 | | 5230 | 5230.01256 | -0.01256 | -2.4015 | | Pass |
| | 5.00 | -20 | 5230 | 5230.01511 | -0.01511 | -2.8891 | | Pass |
| | | -10 | 5230 | 5230.01187 | -0.01187 | -2.2696 | | Pass |
| | | 0 | 5230 | 5230.01547 | -0.01547 | -2.9579 | | Pass |
| | | 10 | 5230 | 5230.01426 | -0.01426 | -2.7266 | | Pass |
| | | 20 | 5230 | 5230.01274 | -0.01274 | -2.4359 | | Pass |
| | | 30 | 5230 | 5230.01314 | -0.01314 | -2.5124 | | Pass |
| | | 40 | 5230 | 5230.01267 | -0.01267 | -2.4226 | | Pass |
| | | 50 | 5230 | 5230.01287 | -0.01287 | -2.4608 | | Pass |
| | | 60 | 5230 | 5230.01367 | -0.01367 | -2.6138 | | Pass |
| | | 70 | 5230 | 5230.01461 | -0.01461 | -2.7935 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5240 | 5.00 | 25 | 5240 | 5240.01613 | -0.01613 | -3.0782 | ±20 | Pass |
| | 5.75 | | 5240 | 5240.01426 | -0.01426 | -2.7214 | | Pass |
| | 4.25 | | 5240 | 5240.01345 | -0.01345 | -2.5668 | | Pass |
| | 5.00 | -20 | 5240 | 5240.01264 | -0.01264 | -2.4122 | | Pass |
| | | -10 | 5240 | 5240.01315 | -0.01315 | -2.5095 | | Pass |
| | | 0 | 5240 | 5240.01267 | -0.01267 | -2.4179 | | Pass |
| | | 10 | 5240 | 5240.01594 | -0.01594 | -3.0420 | | Pass |
| | | 20 | 5240 | 5240.01514 | -0.01514 | -2.8893 | | Pass |
| | | 30 | 5240 | 5240.01361 | -0.01361 | -2.5973 | | Pass |
| | | 40 | 5240 | 5240.01287 | -0.01287 | -2.4561 | | Pass |
| | | 50 | 5240 | 5240.01412 | -0.01412 | -2.6947 | | Pass |
| | | 60 | 5240 | 5240.01361 | -0.01361 | -2.5973 | | Pass |
| | | 70 | 5240 | 5240.01274 | -0.01274 | -2.4313 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5745 | 5.00 | 25 | 5745 | 5745.01189 | -0.01189 | -2.0696 | ±20 | Pass |
| | 5.75 | | 5745 | 5745.01053 | -0.01053 | -1.8329 | | Pass |
| | 4.25 | | 5745 | 5745.01137 | -0.01137 | -1.9791 | | Pass |
| | 5.00 | -20 | 5745 | 5745.01124 | -0.01124 | -1.9565 | | Pass |
| | | -10 | 5745 | 5745.01245 | -0.01245 | -2.1671 | | Pass |
| | | 0 | 5745 | 5745.01457 | -0.01457 | -2.5361 | | Pass |
| | | 10 | 5745 | 5745.01541 | -0.01541 | -2.6823 | | Pass |
| | | 20 | 5745 | 5745.01258 | -0.01258 | -2.1897 | | Pass |
| | | 30 | 5745 | 5745.01624 | -0.01624 | -2.8268 | | Pass |
| | | 40 | 5745 | 5745.01245 | -0.01245 | -2.1671 | | Pass |
| | | 50 | 5745 | 5745.01345 | -0.01345 | -2.3412 | | Pass |
| | | 60 | 5745 | 5745.01247 | -0.01247 | -2.1706 | | Pass |
| | | 70 | 5745 | 5745.01316 | -0.01316 | -2.2907 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5755 | 5.00 | 25 | 5755 | 5755.01241 | -0.01241 | -2.1564 | ±20 | Pass |
| | 5.75 | | 5755 | 5755.01264 | -0.01264 | -2.1964 | | Pass |
| | 4.25 | | 5755 | 5755.01258 | -0.01258 | -2.1859 | | Pass |
| | 5.00 | -20 | 5755 | 5755.01354 | -0.01354 | -2.3527 | | Pass |
| | | -10 | 5755 | 5755.01261 | -0.01261 | -2.1911 | | Pass |
| | | 0 | 5755 | 5755.01326 | -0.01326 | -2.3041 | | Pass |
| | | 10 | 5755 | 5755.01276 | -0.01276 | -2.2172 | | Pass |
| | | 20 | 5755 | 5755.01624 | -0.01624 | -2.8219 | | Pass |
| | | 30 | 5755 | 5755.01258 | -0.01258 | -2.1859 | | Pass |
| | | 40 | 5755 | 5755.01361 | -0.01361 | -2.3649 | | Pass |
| | | 50 | 5755 | 5755.01297 | -0.01297 | -2.2537 | | Pass |
| | | 60 | 5755 | 5755.01611 | -0.01611 | -2.7993 | | Pass |
| | | 70 | 5755 | 5755.01422 | -0.01422 | -2.4709 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5775 | 5.00 | 25 | 5775 | 5775.01246 | -0.01246 | -2.1576 | ±20 | Pass |
| | 5.75 | | 5775 | 5775.01312 | -0.01312 | -2.2719 | | Pass |
| | 4.25 | | 5775 | 5775.01278 | -0.01278 | -2.2130 | | Pass |
| | 5.00 | -20 | 5775 | 5775.01516 | -0.01516 | -2.6251 | | Pass |
| | | -10 | 5775 | 5775.01426 | -0.01426 | -2.4693 | | Pass |
| | | 0 | 5775 | 5775.01378 | -0.01378 | -2.3861 | | Pass |
| | | 10 | 5775 | 5775.01264 | -0.01264 | -2.1887 | | Pass |
| | | 20 | 5775 | 5775.01358 | -0.01358 | -2.3515 | | Pass |
| | | 30 | 5775 | 5775.01462 | -0.01462 | -2.5316 | | Pass |
| | | 40 | 5775 | 5775.01326 | -0.01326 | -2.2961 | | Pass |
| | | 50 | 5775 | 5775.01275 | -0.01275 | -2.2078 | | Pass |
| | | 60 | 5775 | 5775.01641 | -0.01641 | -2.8416 | | Pass |
| | | 70 | 5775 | 5775.01342 | -0.01342 | -2.3238 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5785 | 5.00 | 25 | 5785 | 5785.01215 | -0.01215 | -2.1003 | ±20 | Pass |
| | 5.75 | | 5785 | 5785.01362 | -0.01362 | -2.3544 | | Pass |
| | 4.25 | | 5785 | 5785.01248 | -0.01248 | -2.1573 | | Pass |
| | 5.00 | -20 | 5785 | 5785.01342 | -0.01342 | -2.3198 | | Pass |
| | | -10 | 5785 | 5785.01267 | -0.01267 | -2.1901 | | Pass |
| | | 0 | 5785 | 5785.01426 | -0.01426 | -2.4650 | | Pass |
| | | 10 | 5785 | 5785.01327 | -0.01327 | -2.2939 | | Pass |
| | | 20 | 5785 | 5785.01275 | -0.01275 | -2.2040 | | Pass |
| | | 30 | 5785 | 5785.01316 | -0.01316 | -2.2748 | | Pass |
| | | 40 | 5785 | 5785.01267 | -0.01267 | -2.1901 | | Pass |
| | | 50 | 5785 | 5785.01512 | -0.01512 | -2.6137 | | Pass |
| | | 60 | 5785 | 5785.01547 | -0.01547 | -2.6742 | | Pass |
| | | 70 | 5785 | 5785.01378 | -0.01378 | -2.3820 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5795 | 5.00 | 25 | 5795 | 5795.01457 | -0.01457 | -2.5142 | ±20 | Pass |
| | 5.75 | | 5795 | 5795.01263 | -0.01263 | -2.1795 | | Pass |
| | 4.25 | | 5795 | 5795.01254 | -0.01254 | -2.1639 | | Pass |
| | 5.00 | -20 | 5795 | 5795.01267 | -0.01267 | -2.1864 | | Pass |
| | | -10 | 5795 | 5795.01341 | -0.01341 | -2.3141 | | Pass |
| | | 0 | 5795 | 5795.01328 | -0.01328 | -2.2916 | | Pass |
| | | 10 | 5795 | 5795.01267 | -0.01267 | -2.1864 | | Pass |
| | | 20 | 5795 | 5795.01467 | -0.01467 | -2.5315 | | Pass |
| | | 30 | 5795 | 5795.01326 | -0.01326 | -2.2882 | | Pass |
| | | 40 | 5795 | 5795.01514 | -0.01514 | -2.6126 | | Pass |
| | | 50 | 5795 | 5795.01361 | -0.01361 | -2.3486 | | Pass |
| | | 60 | 5795 | 5795.01267 | -0.01267 | -2.1864 | | Pass |
| | | 70 | 5795 | 5795.01413 | -0.01413 | -2.4383 | | Pass |

| Ref. Freq. (MHz) | Test Voltage (V) | Test Temp. (°C) | Measured Frequency (MHz) | Spectrum Frequency (MHz) | Δ Frequency (MHz) | Deviation (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|---|---|---|---|
| 5825 | 5.00 | 25 | 5825 | 5825.01246 | -0.01246 | -2.1391 | ±20 | Pass |
| | 5.75 | | 5825 | 5825.01361 | -0.01361 | -2.3365 | | Pass |
| | 4.25 | | 5825 | 5825.01425 | -0.01425 | -2.4464 | | Pass |
| | 5.00 | -20 | 5825 | 5825.01386 | -0.01386 | -2.3794 | | Pass |
| | | -10 | 5825 | 5825.01249 | -0.01249 | -2.1442 | | Pass |
| | | 0 | 5825 | 5825.01416 | -0.01416 | -2.4309 | | Pass |
| | | 10 | 5825 | 5825.01326 | -0.01326 | -2.2764 | | Pass |
| | | 20 | 5825 | 5825.01287 | -0.01287 | -2.2094 | | Pass |
| | | 30 | 5825 | 5825.01411 | -0.01411 | -2.4223 | | Pass |
| | | 40 | 5825 | 5825.01326 | -0.01326 | -2.2764 | | Pass |
| | | 50 | 5825 | 5825.01274 | -0.01274 | -2.1871 | | Pass |
| | | 60 | 5825 | 5825.01417 | -0.01417 | -2.4326 | | Pass |
| | | 70 | 5825 | 5825.01365 | -0.01365 | -2.3433 | | Pass |

# 11. TRANSMISSION IN THE ABSENCE OF DATA

## 11.1. Limits

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

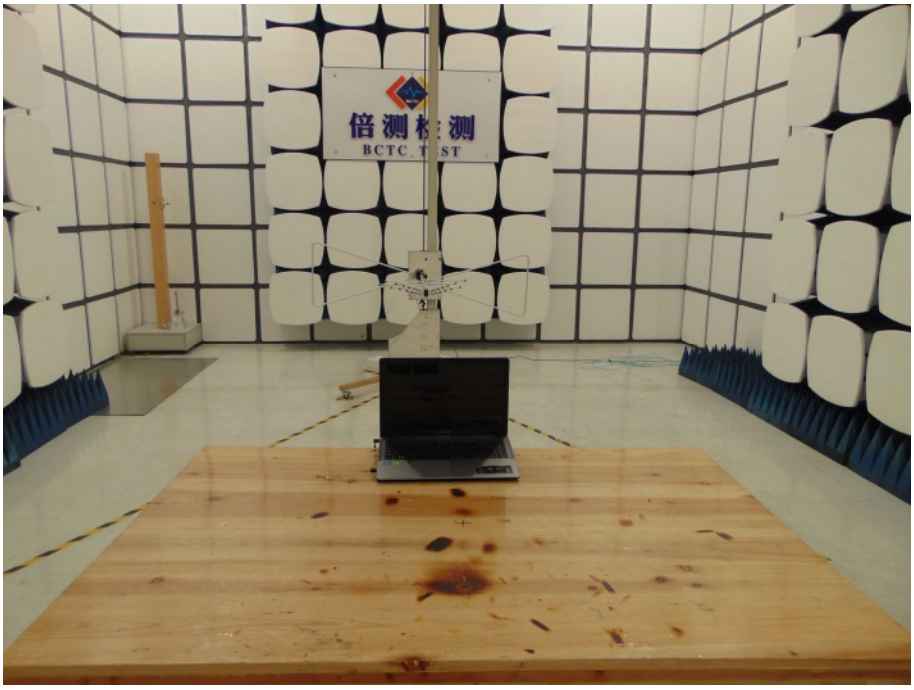
## 11.2. Test result

No non-compliance noted:

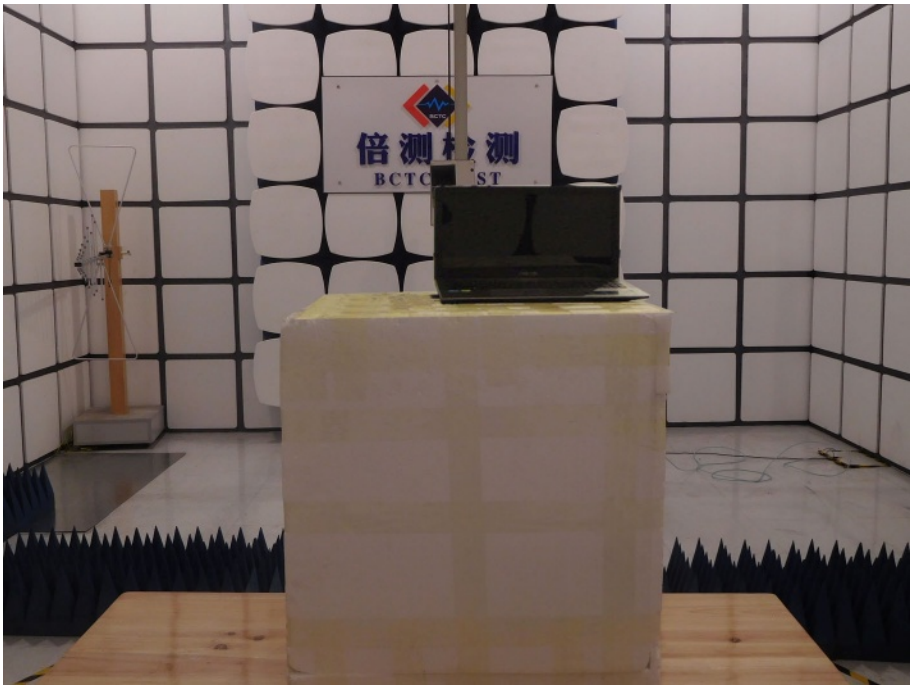
Refer to the theory of operation.

# 12. PHOTOGRAPHS OF TEST SET-UP

Radiated Emission Test

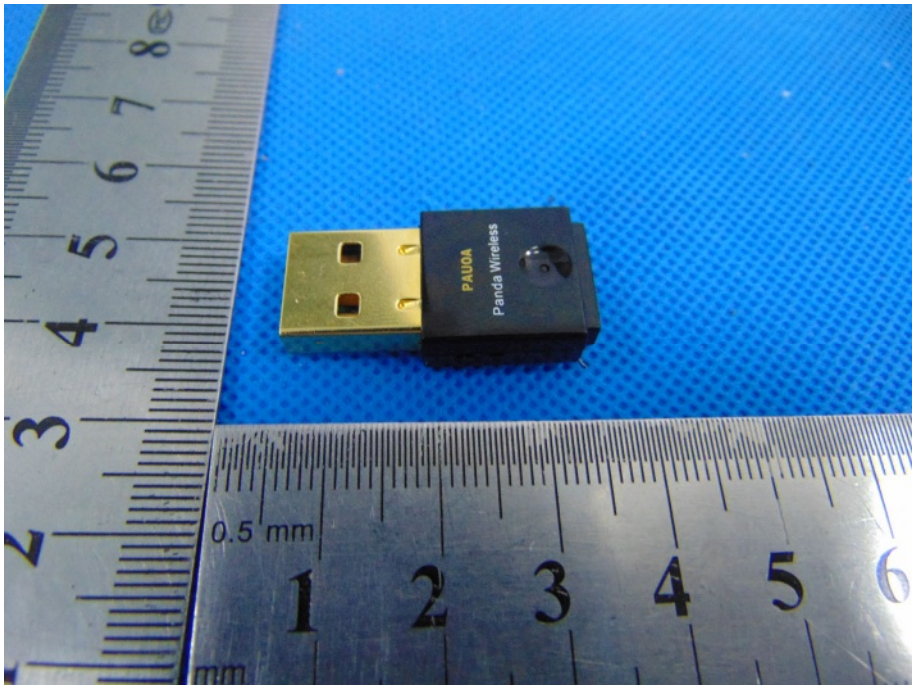


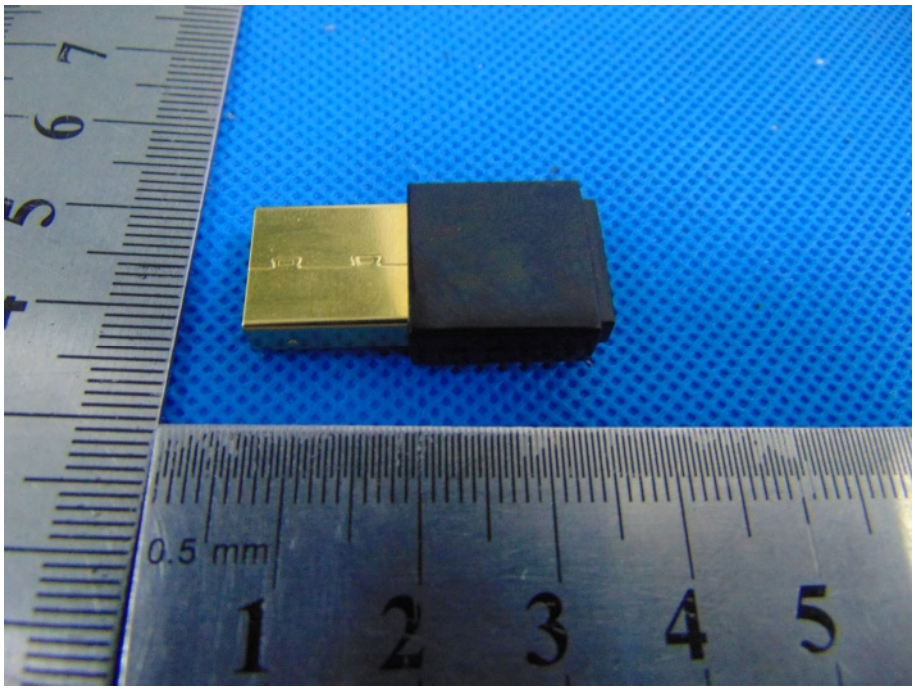
**Radiated Measurement Photos**

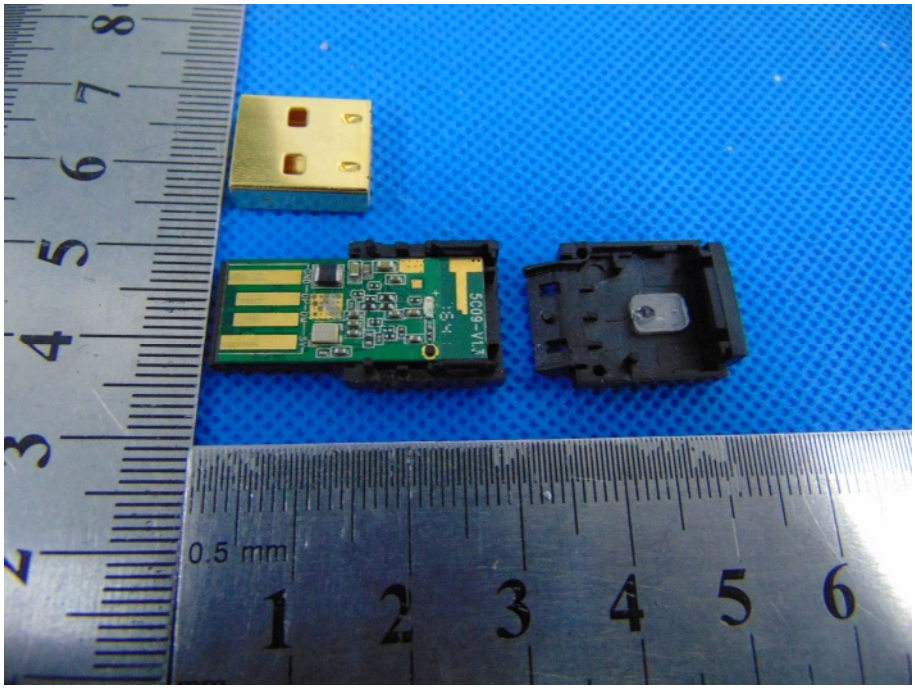


**Conducted Measurement Photos**

# 13. PHOTOGRAPHS OF THE EUT



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