

# JAPAN RADIO TEST REPORT

## Client Information:

Applicant: CHUWI Innovation And Technology (ShenZhen)co.,Ltd.  
Applicant add.: F2, Building 3 , Li jincheng Industrial Park , Industrial east Road, Longhua Street, Longhua District,ShenZhen City, China

## Product Information:

Product Name: Tablet PC  
Model No.: HiPad X  
Derivative model No.: N/A  
Brand Name: CHUWI  
Standards: Item 19 of Article 2 Paragraph 1  
MIC public notice 88:2004, annex 43

## Prepared By:

**Dongguan Yaxu (AiT) Technology Limited**

Add. : No.22, Jinqianling Third Street, Jitigang, Huangjiang,  
Dongguan, Guangdong, China

Date of Receipt: June 15, 2022      Date of Test: June 15~June 23, 2022  
Date of Issue: June 24, 2022      Test Result: Pass

This device has been tested and found to comply with the stated standard(s) above, which is (are) applicable only to the tested sample identified in the report.

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Reviewed by: \_\_\_\_\_



Approved by: \_\_\_\_\_





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## 2 Test Summary

| Test                               | Test Requirement       | Limit/Severity  | Result |
|------------------------------------|------------------------|---|--------|
| Antenna Requirement                | Item 19 of Article 2-1 | Notice 88 Appendix 43,B-1 (1)&(2)   | PASS   |
| Test frequency                     | Item 19 of Article 2-1 | Notice 88 Appendix 43, A-3  | PASS   |
| Frequency Error                    | Item 19 of Article 2-1 | ±50 PPM or less   | PASS   |
| Occupied Bandwidth                 | Item 19 of Article 2-1 | OFDM(802.11n(HT40)) : 26-40MHz<br>Others OFDM : 26MHz or less<br>DSSS : 26MHz or less   | PASS   |
| Spread-spectrum Bandwidth          | Item 19 of Article 2-1 | 500 kHz or more   | PASS   |
| Antenna Power                      | Item 19 of Article 2-1 | 10mW/MHz for 802.11b/g/n(HT20);<br>5mW/MHz for 802.11n(HT40)<br>Error + 20% -80%  | PASS   |
| Spurious Emission of Tx            | Item 19 of Article 2-1 | (1) Below 2387 MHz : -26dBm<br>(2) 2387 to 2400 MHz : -16dBm<br>(3) 2483.5 through 2496.5 MHz :<br>-16dBm<br>(4) Over 2496.5 MHz : -26dBm | PASS   |
| Interference prevention capability | Item 19 of Article 2-1 | Notice 88 Appendix 43, 44, 45   | PASS   |
| RF accessibility                   | Item 19 of Article 2-1 | Notice 88 Appendix 43, 44, 45   | PASS   |
| Spurious Emission of Rx            | Item 19 of Article 2-1 | (1) Below 1 GHz: -54dBm<br>(2) 1GHz or higher: -47dBm   | PASS   |

### Remark:

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

Item 19 of Article 2 Paragraph 1

### 2.1 Measurement Uncertainty

The report uncertainty of measurement  $y \pm U$ , 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   | Frequency Error / 99% & 90% Bandwidth | $\pm 0.85 \times 10^{-7}$ |
| 2   | Antenna Power                         | $\pm 0.70$ dB             |
| 3   | Spurious Emissions                    | $\pm 0.80$ dB             |
| 4   | DC / AC Power Source                  | $\pm 1.4\%$               |

### 3 Test Facility

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

**.CNAS- Registration No: L6177**

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on Aug.04, 2020

**FCC-Registration No.: 703111 Designation Number: CN1313**

Dongguan Yaxu (AiT) technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

**IC —Registration No.: 6819A CAB identifier: CN0122**

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

**A2LA-Lab Cert. No.: 6317.01**

Dongguan Yaxu (AiT) technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### 3.1 Deviation from standard

None

#### 3.2 Abnormalities from standard conditions

None

## 4 Version

| Revision Record |         |               |          |          |
|-----------------|---------|---------------|----------|----------|
| Version         | Chapter | Date          | Modifier | Remark   |
| 00              | -       | June 24, 2022 | -        | Original |
|                 |         |               |          |          |
|                 |         |               |          |          |
|                 |         |               |          |          |

### 4.1 Test Location

All tests were performed at:

Dongguan Yaxu (AiT) Technology Limited  
No.22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China.

Tel.: +86.769.82020499 Fax.: +86.769.82020495

## 5 General Information

|                       |   |
|-----------------------|---|
| Manufacturer:         | CHUWI Innovation And Technology (ShenZhen)co.,Ltd.  |
| Manufacturer Address: | F2, Building 3 , Li jincheng Industrial Park , Industrial east Road, Longhua Street, Longhua District,ShenZhen City, China  |
| Product Name:         | Tablet PC   |
| Model No.:            | HiPad X   |
| Brand Name:           | CHUWI   |
| Derivative model No.: | N/A   |
| Operating Frequency   | 2412 MHz to 2472 MHz  |
| Type of Modulation:   | 802.11b: DSSS(CCK/QPSK/BPSK)<br>802.11g/n: OFDM(BPSK/QPSK/16QAM/64QAM)  |
| Transmit Data Rate:   | 802.11b:1/2/5.5/11 Mbps<br>802.11g:6/9/12/18/24/36/48/54 Mbps<br>802.11n(HT20):7.2/14.4/21.7/28.9/43.3/57.8/65/72.2 Mbps<br>802.11n(HT40):15/30/45/60/90/120/135/150 Mbps |
| Number of Channels    | 13 Channels for 802.11b/g/n(HT20)<br>9 Channels for 802.11n(HT40)   |
| Channel Separation:   | 5 MHz   |
| Antenna Type          | FPCB Antenna  |
| Antenna gain:         | 1.20dBi(2.4GHz), 0.8dBi(5.2GHz)   |
| Normal antenna power: | 802.11b: 1.5 mW/MHz<br>802.11g: 0.5mW/MHz<br>802.11n(HT20):0.5 mW/MHz<br>802.11n(HT40):0.5 mW/MHz   |
| Power Supply Range:   | DC 3.8V form battery  |
| Normal Test Voltage:  | The same as above   |
| Hard Ware Version:    | Z101L   |
| Soft Ware Version:    | V1.0  |
| Model difference:     | N/A   |

## 5.1 EUT Peripheral List

| No. | Equipment | Manufacturer                        | Model No. | Serial No. | Power cord | Signal cord |
|-----|-----------|-------------------------------------|-----------|------------|------------|-------------|
| 1   | Adapter   | HUIZHOU PUAN<br>ELECTRONICS CO.,LTD | UC13US    | N/A        | N/A        | 1           |

## 5.2 Test Peripheral List

| No. | Equipment | Manufacturer | EMC<br>Compliance | Model<br>No. | Serial No. | Power cord | Signal cord |
|-----|-----------|--------------|-------------------|--------------|------------|------------|-------------|
| 1   | N/A       | N/A          | N/A               | N/A          | N/A        | N/A        | N/A         |

## 6 Equipment Used during Test

| No | Test Equipment                | Manufacturer | Model No  | Serial No    | Cal. Date  | Cal. Due Date | Cal. Lab        |
|----|-------------------------------|--------------|-----------|--------------|------------|---------------|-----------------|
| 1  | SIGNAL Analyzer               | R&S          | FSV40     | 101470       | 2021.08.30 | 2022.08.29    | Guangzhou Lisai |
| 2  | EMI Measuring Receiver        | R&S          | ESR       | 101660       | 2021.08.30 | 2022.08.29    | Guangzhou Lisai |
| 3  | Mobile phone                  | Samsung      | GALAXY S4 | R33D20 SQYNW | N/A        | N/A           | N/A             |
| 4  | DC Power supply               | Manson       | HCS-3604  | G521100 129  | 2021.08.30 | 2022.08.29    | Guangzhou Lisai |
| 5  | Digital Phosphor Oscilloscope | Tektronix    | TDS3012   | B021220      | 2021.08.30 | 2022.08.29    | Guangzhou Lisai |
| 6  | Signal Generator              | Agilent      | N5182A    | MY50143 009  | 2021.08.30 | 2022.08.29    | Guangzhou Lisai |



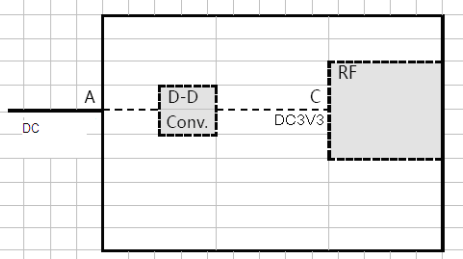
## 7 Test Results

### 7.1 Radio Technical Requirements Specification

**Table 1: Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2-1)**

| Items                                       | Technical standard   |
|---|--|
| Assigned frequency or designated frequency  | 2,400-2,483.5MHz   |
| Communication method                        | One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum  |
| Tolerance of frequency ( $\times 10^{-6}$ ) | $\pm 50$ ppm   |
| Tolerance of occupied bandwidth             | FH : 83.5MHz or less<br>FH + DS : 83.5MHz or less<br>FH + OFDM : 83.5MHz or less<br>OFDM (802.11n(HT40)): 26-40MHz<br>OFDM (802.11g/n(HT20)) : 26MHz or less<br>DSSS(802.11b) : 26MHz or less  |
| Antenna power                               | Designated value<br>(1) FH, FH+DS , FH+OFDM: 3mW/MHz<br>(used in the range of 2427 - 2470.75 MHz)<br>(2) OFDM , DS other than (1) 10mW/MHz<br>(3) Other than (1) & (2) 10mW<br>(4) OFDM OBW 26 - 40MHz: 5mW/MHz<br>Tolerance:+20%,-80%   |
| Antenna gain                                | 1) 12.14 dBi or less in principle<br>2) In case of directional antenna<br>(1) FH, FH+DS or FH+OFDM using 2427-2470.75 MHz<br>EIRP $\leq$ 16.91 dBm/MHz<br>(2) OFDM or DS other than (1) EIRP $\leq$ 22.14 dBm/MHz<br>(3) Other than (1) and (2): 22.14 dBm or less<br>(4) OFDM OBW 26 - 40MHz: 19.14dBm/MHz<br>(5) Half-power angle of directional antenna (e) in case of the item 2):e $\leq$ 360/A (The A is 10 in maximum.) |
| Tolerance of spurious emission intensity    | (1) Below 2387 MHz : 2.5 $\mu$ W<br>(2) 2387 to 2400 MHz : 25 $\mu$ W<br>(3) 2483.5 through 2496.5 MHz : 25 $\mu$ W<br>(4) Over 2496.5 MHz : 2.5 $\mu$ W   |
| Spreading bandwidth                         | DS,FH,FH+DS,FH+OFDM : 500kHz or more   |
| Spreading rate of spectrum                  | For DS system;(Spreading bandwidth) / (Frequency corresponding to transmission rate) $\geq 5$  |
| Limit of secondary radiated emissions       | (1) Below 1 GHz : 4 nW<br>(2) 1 GHz or higher : 20 nW  |
| Interference prevention function            | Shall have the function of automatic transmission and reception of identification sign.  |
| Structure                                   | Shall be of the structure that the RF and modulator sections excluding antenna cannot easily be opened.  |
| Note  | DS: Direct spread<br>FH: Frequency hopping<br>OFDM: Orthogonal frequency division multiplexing   |

## 7.2 E.U.T. Test Conditions

| Power supply:                       | DC 3.8V   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
|-------------------------------------|---|-----------------------|----------------------------------|------|-------|----------|-------|--------|-------|--------------------|----|----|----|--------------------|---|---|---|------------------------|---|----|---|-------------------------|---|---|---|
|                                     | All measurements were performed by rated voltage DC 3.8V.   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
|                                     | <div><p>Test below:<br/>1: The fluctuation of C point is under <math>\pm 1\%</math>, when input voltage from A point to the test equipment is fluctuated by <math>\pm 10\%</math>.</p></div>  |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
|                                     | <p>The mesurement result of the voltage fluctuation at RF circuit when DC3.8V +/- 10%</p> <table><tr><th>DC INPUT</th><th>DC3V3</th></tr><tr><td>3.8V</td><td>3.33V</td></tr><tr><td>4.2V</td><td>3.33V</td></tr><tr><td>3.4V</td><td>3.33V</td></tr></table> <p>Pre-test the EUT in all voltage mode at the DC 4.2V, DC 3.8V and DC3.4V and conducted to determine the worst-case mode, only the worst-case results (DC 3.8V) are recorded in this report.</p> <p>The EUT has the input voltage to the circuit of RF unit complies with output voltage limitation (<math>\pm 1\%</math>) against input voltage fluctuation (<math>\pm 10\%</math>).<br/>So, all measurements were conducted at only rated voltage DC 3.8V.</p> | DC INPUT              | DC3V3                            | 3.8V | 3.33V | 4.2V     | 3.33V | 3.4V   | 3.33V |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| DC INPUT                            | DC3V3   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 3.8V                                | 3.33V   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 4.2V                                | 3.33V   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 3.4V                                | 3.33V   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| Temperature:                        | 25.0 °C   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| Humidity:                           | 75 % RH   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| Atmospheric Pressure:               | 1010 mbar   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| Test frequencies:                   | If the EUT can be set to 3 of more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.   |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| Parameters of test software setting | <p>During testing channel &amp; power controlling software provided by the manufacturer was used to control the operating channel as well as the output power level.</p> <table><tr><th>Test software Version</th><th colspan="3">Test program: Enter EngineerMode</th></tr><tr><th>Channels</th><th>Low</th><th>Middle</th><th>High</th></tr><tr><td>802.11b Parameters</td><td>10</td><td>10</td><td>10</td></tr><tr><td>802.11g Parameters</td><td>8</td><td>8</td><td>8</td></tr><tr><td>802.11n(20) Parameters</td><td>8</td><td>36</td><td>8</td></tr><tr><td>802.11 n(40) Parameters</td><td>8</td><td>8</td><td>8</td></tr></table>   | Test software Version | Test program: Enter EngineerMode |      |       | Channels | Low   | Middle | High  | 802.11b Parameters | 10 | 10 | 10 | 802.11g Parameters | 8 | 8 | 8 | 802.11n(20) Parameters | 8 | 36 | 8 | 802.11 n(40) Parameters | 8 | 8 | 8 |
| Test software Version               | Test program: Enter EngineerMode  |                       |                                  |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| Channels                            | Low   | Middle                | High                             |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 802.11b Parameters                  | 10  | 10                    | 10                               |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 802.11g Parameters                  | 8   | 8                     | 8                                |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 802.11n(20) Parameters              | 8   | 36                    | 8                                |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |
| 802.11 n(40) Parameters             | 8   | 8                     | 8                                |      |       |          |       |        |       |                    |    |    |    |                    |   |   |   |                        |   |    |   |                         |   |   |   |

EUT channels and frequencies list:

| Channel | Frequency<br>(MHz) | Channel | Frequency<br>(MHz) |
|---------|--------------------|---------|--------------------|
| 1       | 2412               | 8       | 2447               |
| 2       | 2417               | 9       | 2452               |
| 3       | 2422               | 10      | 2457               |
| 4       | 2427               | 11      | 2462               |
| 5       | 2432               | 12      | 2467               |
| 6       | 2437               | 13      | 2472               |
| 7       | 2442               | /       | /                  |

Remark:

1. Test frequencies are lowest channel: 2412 MHz, middle channel: 2442 MHz and highest channel: 2472 MHz for 802.11b/g/n(HT20)
2. Test frequencies are lowest channel: 2422 MHz, middle channel: 2442 MHz and highest channel: 2462 MHz for 802.11n(HT40)

## 7.3 Antenna Requirement

### Standard requirement

Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.

### EUT Antenna

The antenna is integrated on the main FPCB and no consideration of replacement. The best case gain of the antenna is 1.20dBi.

Antenna

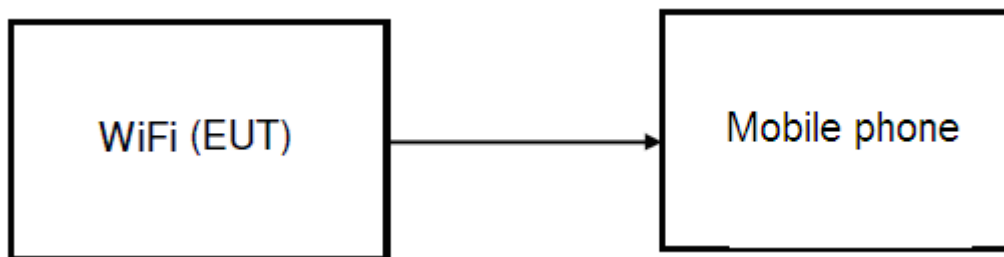


**Result:** All relevant tests will be carried out conducted.

## 7.4 Interference Prevention Function

The device consists of the FPCB antenna and 2.4 GHz WIFI IC; Component IC CPU also can use the protocol function to protect interference come from outside.

We can use the EUT connect a Mobile phone as AP to detect WiFi ID information, Test configuration:



Test Procedure:

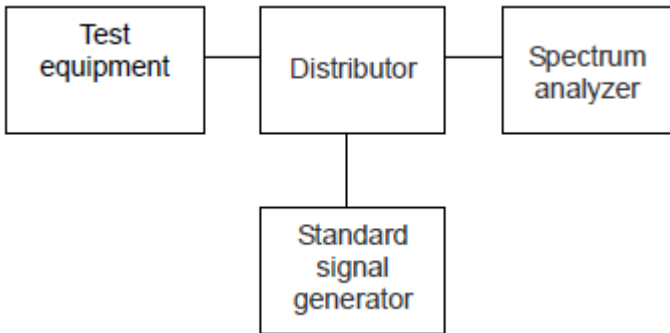
The measuring method is according to MIC Notice No.88 Appendix No.43. Run the WiFi and keep WiFi connecting at Mobile phone. The MIC address will be found in the incoming settings.

Test Results:

| WAN Configuration  |                                |
|--------------------|--------------------------------|
| Attain IP Protocol | Getting IP from DHCP server... |
| MAC Address        | A0:02:6A:C2:00:22              |

**Test result: The unit does meet the requirements.**

## 7.5 Carrier Sense Function

|                     |   |
|---------------------|---|
| Test Requirement:   | Item 19 of Article 2-1  |
|                     | Good or Not Good  |
| Test Status:        | Set the test equipment at the test frequency and the test spread code, and set it to the receiving mode in the beginning. When using external test device, connect with the test equipment by line connection.  |
| Test Configuration: |  <pre> graph LR     TE[Test equipment] --- D[Distributor]     D --- SA[Spectrum analyzer]     D --- SSG[Standard signal generator] </pre>   |
| Test Procedure:     | <ol style="list-style-type: none"> <li>Set the standard signal generator as follows:<br/> Carrier frequency: Center frequency of receiving frequency band of test equipment<br/> Modulation: No modulation.(note1)<br/> Output level: regulated level on antenna input of test equipment<br/> Note 1: The un-modulated carrier in the center frequency, when the carrier sense function of test equipment is not worked, if necessary, change the frequency or modulate it.</li> <li>Set the spectrum analyzer as follows:<br/> Center frequency: Center frequency of the bandwidth used.(note2)<br/> Sweep frequency band: 50MHz(note2)<br/> Resolution bandwidth: Approximately 1 MHz<br/> Video bandwidth: Comparable level with resolution bandwidth<br/> Trigger condition: Free-run<br/> Detective mode: positive peak<br/> Note 2: Under 26MHz of OFDM or other modulated method that with transmit function, set sweep frequency band as 0Hz, detective mode as sample, center frequency as the carrier frequency from 13MHz to 19MHz.</li> <li>Set the test equipment to the transmitting operation with the output of standard signal generator OFF, and confirm that it emits over 26MHz occupied frequency bandwidth OFDM radio wave, by using spectrum analyzer.</li> <li>Set the test equipment to the receiving mode.</li> </ol> |

5. With the output of standard signal generator ON, set the test equipment to the transmitting operation, and confirm that it does not emit over 26MHz occupied frequency bandwidth OFDM radio wave, by using spectrum analyzer.

#### LEVEL OF THE AMBIENT CARRIER

| FREQUENCY(MHz) | PCS (dBm) | C.F(dB) | S.G LEVEL |
|----------------|-----------|---------|-----------|
| 2422           | -42.11    | 10.22   | -30.69    |
| 2442           | -42.18    | 10.22   | -30.76    |
| 2462           | -42.26    | 10.22   | -30.84    |

#### Note:

$Pcs (dBm) = 22.79 + Gr - 20 \log(F)$

Gr: Antenna gain (**1.20dBi**)

F: Transmission Frequency (MHz)

CF= Distributor loss + cable loss

Test result: **Good.**

The EUT has carrier sense function, the EUT stop RF transmission signal after carrier inject to EUT.

**Test result: The unit does meet the requirements.**

## 7.6 Frequency Error

Test Requirement: Item 19 of Article 2-1

Tolerance of frequency:  $\pm 50 \times 10^{-6}$

Test Status: Test the EUT in transmitting mode with modulation.

Test Configuration:



Test Procedure:

1. Test Conditions:

Frequency Counter or Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, CW Tx

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 1MHz

RBW 10 kHz (Modulation OFF),

VBW 10 kHz (Modulation OFF),

Sweep Time Auto

Detector mode Positive peak

Indication mode Max hold

**Test result:**

***Please refer to Appendix B.1***

NOTE:

1). The nominal frequency shall be confirmed by the applicant and test lab.

2). Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40

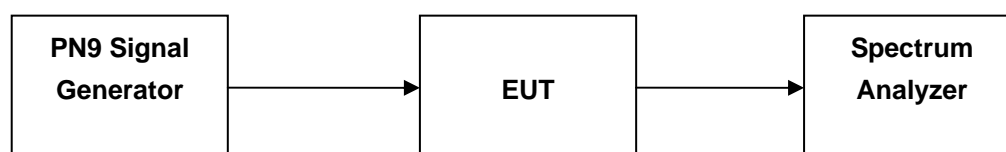
**Test result: The unit does meet the requirements.**



## 7.7 Occupied Bandwidth (99%)

|                   |  |
|-------------------|--|
| Test Requirement: | Item 19 of Article 2-1<br>OFDM (802.11n(HT40)): 26-40MHz<br>OFDM (802.11g/n(HT20)) : 26MHz or less<br>DSSS(802.11b) : 26MHz or less  |
| Test Status:      | Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below. |

Test Configuration:



Test Procedure:

- Test Conditions:  
Spectrum Analyzer is used for measurement.
- EUT conditions:  
Modulation/Spread/Hopping ON  
For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
- Spectrum Analyzer conditions:  
Frequency: Test Frequency  
Span 40MHz (DSSS,OFDM)  
RBW 300 kHz  
VBW 300 kHz  
Sweep Time Auto  
detector mode Positive peak  
Indication mode Max hold  
OBW 99%

**Test result:**

***Please refer to Appendix B.4***

NOTE:

- The nominal frequency shall be confirmed by the applicant and test lab.
- Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40

**Test result: The unit does meet the requirements.**

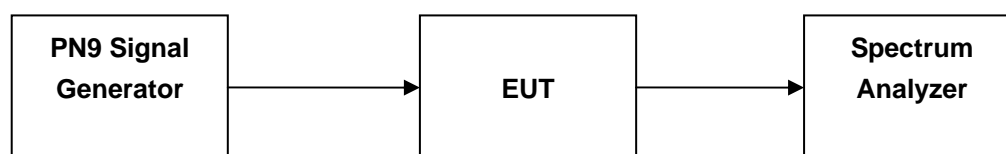
## 7.8 Spread Spectrum Bandwidth (90%)

Test Requirement: Item 19 of Article 2-1

500 kHz or more

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

Test Configuration:



Test Procedure:

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 40MHz (DSSS, OFDM)

RBW 300kHz

VBW 300kHz

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

OBW 90%

**Test result:**

**Please refer to Appendix B.5**

NOTE:

1). Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40

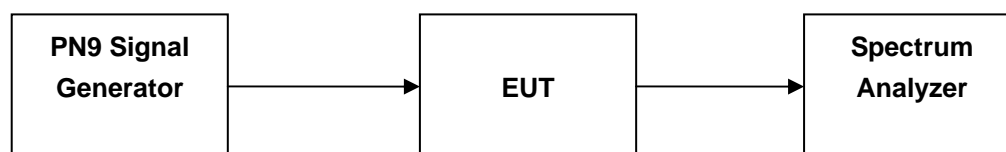
**Test result: The unit does meet the requirements.**

## 7.9 Antenna Power

Test Requirement: Item 19 of Article 2-1  
10mW/MHz for 802.11b/g/n(HT20); 5mW/MHz for 802.11n(HT40)

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

Test Configuration:



Test Procedure:

1. Test Conditions:

Power meter or Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 40 MHz (DSSS, OFDM)

RBW 1 MHz

VBW 1 MHz

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

**Test result:**

**Please refer to Appendix B.2, B.3**

1). Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40

Antenna Power calculate method:

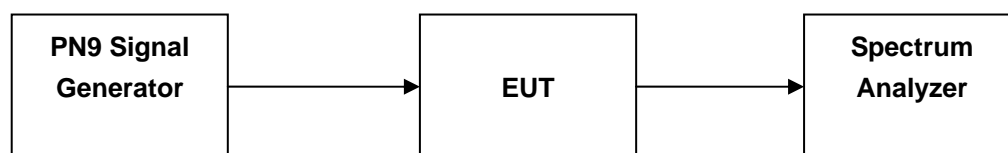
Antenna Power = Average<sub>mw</sub> + 10log(1/X), X = Time<sub>on</sub> / (Time<sub>Duty cycle</sub>) ≈ 1

Normal antenna power: 802.11 b: 1.5 mW/MHz, 802.11 g: 0.5 mW/MHz, 802.11 g n(20)/n(40): 1.0 mW/MHz

**Test result: The unit does meet the requirements.**

## 7.10 Spurious Emissions of Tx

|                     |  |
|---------------------|--|
| Test Requirement:   | <p>Item 19 of Article 2-1</p> <p>(1) 30 to 1000MHz: 0.25<math>\mu</math>W/100kHz</p> <p>(2) Below 2387 MHz : 2.5<math>\mu</math>W/MHz</p> <p>(3) 2387 to 2400 MHz : 25<math>\mu</math>W/MHz</p> <p>(4) 2483.5 through 2496.5 MHz : 25<math>\mu</math>W/MHz</p> <p>(5) Over 2496.5 MHz : 2.5<math>\mu</math>W/MHz</p> |
| Test Status:        | <p>Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.</p>                            |
| Test Configuration: |  |



### Test Procedure:

- Test Conditions:  
Spectrum Analyzer is used for measurement.
- EUT conditions:  
Modulation/Spread/Hopping ON  
For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
- Spectrum Analyzer conditions:  
 Step 1  
 All spurious are measured from 30 MHz to 13 GHz by peak mode.  
 Step 2  
 IF the value measured by Step1 is 2 dB or less, measure in average mode.  
 Test setup for Step 1:  
 Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –13 GHz  
 RBW 1 MHz  
 VBW 1 MHz  
 Sweep Time Auto  
 detector mode Positive peak  
 Indication mode Max hold  
 Test setup for Step 2:  
 Frequency: Spurious Frequency  
 RBW 1 MHz  
 VBW 1 MHz  
 Sweep Time Auto  
 detector mode Sample  
 Indication mode Max hold

**Test result:**

**Please refer to Appendix B.6**

*Note:*

*1). Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40*

**Test result: The unit does meet the requirements.**

## 7.11 RF Accessibility

### Standard requirement

Article 2, Item (19) Notice 88 Appendix 43, 44, 45

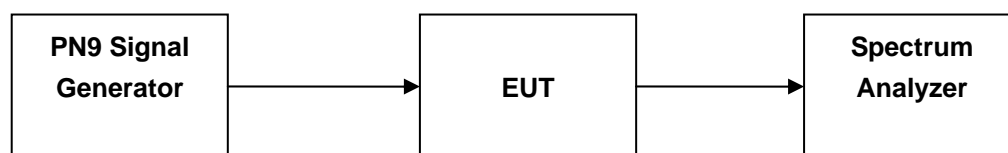
The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

We apply the product for Japan RF certification. We use shield for preventing end- user to access RF parts easily. The shield can only be opened by forced, which will result in damaging the case. Please refer to following for photo for details.



## 7.12 Spurious Emissions of Rx

|                     |  |
|---------------------|--|
| Test Requirement:   | Item 19 of Article 2-1<br>(1) Below 1 GHz : 4 nW<br>(2) 1 GHz and over : 20 nW   |
| Test Status:        | Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below. |
| Test Configuration: |  |



### Test Procedure:

- Test Conditions:  
Spectrum Analyzer is used for measurement.
- EUT conditions:  
Modulation/Spread/Hopping ON  
For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
- Spectrum Analyzer conditions:  
Step 1  
All spurious are measured from 30 MHz to 13 GHz by peak mode.  
Step 2  
IF the value measured by Step1 is 2 dB or less, measure in average mode.  
Test setup for Step 1:  
Frequency: 30 MHz – 1000 MHz , 1GHz –13 GHz  
RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)  
VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)  
Sweep Time Auto  
detector mode Positive peak  
Indication mode Max hold  
Test setup for Step 2:  
Frequency: Spurious Frequency  
Span 0 Hz  
RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)  
VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)  
Sweep Time Auto  
detector mode Sample  
Indication mode Max hold



**Test result:**

**Please refer to Appendix B.7**

*Note:*

*1). Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40*

**Test result: The unit does meet the requirements.**

**--End of Report--**