

TEST REPORT

Product : Tablet PC
Trade mark : CHUWI
Model/Type reference : UBook
Serial Number : N/A
Report Number : EED32P80690201
Date of Issue : Jun. 09, 2023
Product Class : Item 19 of Article 2 Paragraph 1
Test result : PASS

Prepared for:

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

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Compiled by:

mark.chen

Mark Chen

Reviewed by:

Tom Chen

Tom Chen

Approved by:

Aaron Ma

Aaron Ma

Date:

Jun. 09, 2023



Check No.: 8243120523

1 Version

Version No.	Date	Description
00	Jun. 09, 2023	Original

2 Test Summary

Test	Test Requirement	Limit/Severity	Result
Antenna Requirement	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43,B-1 (1)&(2)	PASS
Test frequency	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, A-3	PASS
Frequency Error	Item 19 of Article 2 Paragraph 1	±50 PPM or less	PASS
Occupied Bandwidth	Item 19 of Article 2 Paragraph 1	26 MHz or less	PASS
Spread-spectrum Bandwidth	Item 19 of Article 2 Paragraph 1	500 kHz or more	Reference test
Antenna Power	Item 19 of Article 2 Paragraph 1	Designated value: (1) FH, FH+DS , FH+OFDM 3mW/MHz (Used in the range of 2427-2470.75MHz) (2) OFDM , DS other than (1) :10mW/MHz (3) Other than (1) & (2) 10mW Tolerance: +20%,-80%	PASS
Spurious Emission of Tx	Item 19 of Article 2 Paragraph 1	(1) Below 2387 MHz : -26dBm (2) 2387 to 2400 MHz : -16dBm (3) 2483.5 through 2496.5 MHz : -16dBm (4) Over 2496.5 MHz : -26dBm	PASS
Dwell Time	Item 19 of Article 2 Paragraph 1	N/A	N/A
Interference prevention capability	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	PASS
RF accessibility	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	PASS
Spurious Emission of Rx	Item 19 of Article 2 Paragraph 1	(1) Below 1 GHz: -54dBm (2) 1GHz or higher: -47dBm	PASS

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

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4 General Information

5.1 Client Information

Applicant:	CHUWI Innovation And Technology (ShenZhen)co.,Ltd.
Address of Applicant:	F2, Building 3, Li jincheng Industrial Park, Industrial east Road, Longhua Street, Longhua District, ShenZhen City, China
Manufacturer:	CHUWI Innovation And Technology (ShenZhen)co.,Ltd.
Address of Manufacturer:	F2, Building 3, Li jincheng Industrial Park, Industrial east Road, Longhua Street, Longhua District, ShenZhen City, China
Factory:	ShenZhen ZhiWei Technology Co.,Ltd
Address of Factory:	4th-5th Floor, Bld 6 and East side of 3rd Floor Bld3, LiJinCheng Industrial Park, YouSong Community, Longhua Street, Longhua District, ShenZhen, China

5.2 General Description of EUT

Product Name:	Tablet PC
Model No.:	UBook
Trade Mark:	CHUWI
EUT Supports Radios application:	BT Double module, 2402MHz to 2480MHz
Operating Frequency:	2402 MHz to 2480 MHz
Rated power:	0.7mW
Number of Channels:	40 Channels
Type of Modulation:	GFSK
Transmission Rate:	1Mbps
Channel Separation:	2MHz
Antenna Type:	FPC Antenna
Antenna gain:	3.45dBi
Test Power Grade:	Default
Test Software of EUT:	QRCT
Power Supply:	Model:1-CHUSB202-128 Input:100-240V~50/60Hz 0.6A Output:12.0V --- 2.0A
	Battery DC 7.6V
Test Voltage:	DC 7.6V
Sample Received Date:	May 12, 2023
Sample tested Date:	May 12, 2023 to May 30, 2023

5.3 EUT test environment range

Temperature:	23°C
Humidity:	54% RH
Atmospheric Pressure:	1010mbar

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

5.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

5 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Keysight	N9010A	MY54510339	12-23-2022	12-22-2023
Signal Generator	Keysight	N5182B	MY53051549	12-19-2022	12-18-2023
Signal Generator	Agilent	N5181A	MY46240094	12-19-2022	12-18-2023
DC Power	Keysight	E3642A	MY56376072	12-19-2022	12-18-2023
Wi-Fi 7GHz Band Extender	JS Tonscend	TS-WF7U2	2206200002	06-11-2022	06-10-2023
RF control unit	JS Tonscend	JS0806-2	158060006	12-23-2022	12-22-2023
Communication test set	R&S	CMW500	120765	12-23-2022	12-22-2023
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	12-19-2022	12-18-2023
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	07-01-2022	06-15-2023
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	2.6.77.0518	---	---

Remark:

- Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
- Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipment is 1 year.

6 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 Paragraph 1)

Items	Technical standard
Assigned frequency or designated frequency	2400-2483.5MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency ($\times 10^{-6}$)	± 50 PPM
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + OFDM: 83.5MHz or less Others: 26MHz or less FH + DS: 83.5MHz or less OFDM: 38MHz or less
Antenna power	Designated value (1) FH, FH+DS, FH+OFDM: 3mW/MHz (used in the range of 2427 - 2470.75 MHz) (2) OFDM, DS other than (1) 10mW/MHz (3) Other than (1) & (2) 10mW Tolerance: +20%, -80%
Antenna gain	1) 12.14 dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM using 2427-2470.75 MHz EIRP \leq 16.91 dBm/MHz (2) OFDM or DS other than (1) EIRP \leq 22.14 dBm/MHz (3) Other than (1) and (2): 22.14 dBm or less (4) OFDM OBW 26 - 38MHz: 19.14dBm/MHz (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 μ W (2) 2387 to 2400 MHz: 25 μ W (3) 2483.5 through 2496.5 MHz: 25 μ W (4) Over 2496.5 MHz: 2.5 μ W
Spreading bandwidth	500kHz or more
Limit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
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 OFDM: Orthogonal frequency division multiplexing FH: Frequency hopping

Note: The Technical Standards described here do not cover all of the regulated items.

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Power Supply result:	The measurement result of the voltage fluctuation at RF circuit when DC 7.6V +/- 10%.	
	DC Input	RF circuit
	8.36V	3.30V
	7.60V	3.30V
	6.84V	3.30V

Test frequency

Test frequencies:	If the EUT can be set to 3 or 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.	
Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Test frequencies are the lowest channel: 0 channel (2402 MHz), Middle channel: 19 channel (2440 MHz) and highest channel: 39 channel (2480 MHz)

7.1.2 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 PCB and no consideration of replacement. The best case gain of the antenna is 3.45dBi.	
Result: An antenna connector is available, all relevant tests will be carried out conducted.	

7.1.3 Frequency Error

Measurement Record:


Uncertainty: $\pm 10\text{Hz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Enter the unmodulation mode for the product. Test in Channel lowest (2402MHz), middle (2440MHz) and highest(2480MHz), keep in continuously transmitting status.		
Test Configuration:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
Test Conditions:	Frequency Counter or Spectrum Analyzer is used for measurement.		
EUT conditions:	Modulation/Spread/Hopping off, CW Tx If EUT does not accept "Modulation OFF" mode in the measurement, you may use "Modulation ON" mode. In that case you can use the Max power Frequency as the measuring results.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 1MHz RBW 10KHz (Modulation OFF), VBW 10KHz (Modulation OFF), Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Tolerance of frequency: $\pm 50 \times 10^{-6}$		
Test result:	Refer to Appendix: BLE of Report No. EED32P80690201		

7.1.4 Occupied Bandwidth (99%)

Measurement Record:


Uncertainty: $\pm 10\text{KHz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
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:	<div style="text-align: center;">  <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre> </div>
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx 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 4MHz RBW 300kHz VBW 300kHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 99%
Technical standard:	26 MHz or less
Test result:	Refer to Appendix: BLE of Report No. EED32P80690201

7.1.5 Spread spectrum Bandwidth (90%)

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.: 54%	Press.: 1010 mbar
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:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx 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 4MHz RBW 300kHz VBW 300kHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 90%		
Technical standard:	500kHz or more		
Test result:	Refer to Appendix: BLE of Report No. EED32P80690201		

7.1.6 Antenna Power

Measurement Record:

Uncertainty: $\pm 10 \text{ kHz} / \pm 1 \text{ dB}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23.0°C	Humid.: 54%	Press.: 1010 mbar
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:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions(FHSS):	Frequency: Test Frequency Span 4MHz RBW 3MHz VBW 3MHz Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Antenna Power (1) FH, FH+DS, FH+OFDM 3mW/MHz or less (used in the range of 2427 - 2470.75 MHz) (2) OFDM, DS other than (1) 10mW/MHz or less (3) Other than (1) & (2) 10mW or less Tolerance: +20% -80%		
Test result:	Refer to Appendix: BLE of Report No. EED32P80690201		

7.1.7 Spurious Emissions of Tx

Measurement Record:

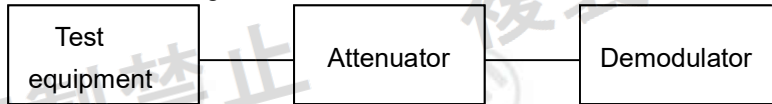
Uncertainty: $\pm 1\text{dB}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23.0°C	Humid.: 54%	Press.: 1010 mbar
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:	<div style="display: flex; align-items: center; justify-content: center; gap: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">PN9 Signal Generator</div> <div style="font-size: 24px;">→</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">EUT</div> <div style="font-size: 24px;">→</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Spectrum Analyzer</div> </div>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 13GHz by peak mode. Step2 If the value measured by Step1 is 2dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step1):	Frequency: 30MHz – 2400MHz , 2483.5MHz –13GHz RBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) VBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) Sweep Time Auto detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer conditions(Step 2):	Frequency: Spurious Frequency Span 0Hz RBW 1MHz VBW 1MHz Sweep Time Auto Detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 2387 MHz : 2.5 $\mu\text{W}/\text{MHz}$ (2) 2387 to 2400 MHz : 25 $\mu\text{W}/\text{MHz}$ (3) 2483.5 through 2496.5 MHz : 25 $\mu\text{W}/\text{MHz}$ (4) Over 2496.5 MHz : 2.5 $\mu\text{W}/\text{MHz}$		
Test result:	Refer to Appendix: BLE of Report No. EED32P80690201		

7.1.8 Interference prevention function

1) Measurement system diagram

(1) When transmitting identification code



2) Condition of measuring instrument

(1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.

3) Condition of test equipment The mode of normal use.

4) Measuring operation procedure

(1) When test equipment has the function to transmit identification code automatically:

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

00:e9:3a:a7:04:3c

5) Test result: The unit does meet the requirements (Good).

Test result: PASS

7.1.9 RF accessibility

Standard requirement

Article 49-20, paragraph 1 (a)

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.

<input type="checkbox"/>	Sealed with special screws.
<input type="checkbox"/>	Plastic chassis is being welded using ultrasonic waves.
<input type="checkbox"/>	Chassis is glued using a special adhesive.
<input type="checkbox"/>	Metal covers are spot-fused.
<input type="checkbox"/>	Cover is specially interlocked.
<input checked="" type="checkbox"/>	RF and Modulation components are covered with shielding case and this shielding case is soldered.
<input type="checkbox"/>	Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
<input type="checkbox"/>	Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
<input type="checkbox"/>	Shield case is welded at RF and modulation parts, and ID-ROM is glued with anon-transparent laminating agent.
<input type="checkbox"/>	RF and Modulation parts are mounted on PCB with surface mount technology, the antenna is printed on PCB, chip is welded on PCB, and there is no any adjustable parts on PCB or adjustable parts are not exposed. The interval of terminals: 0.5 mm Number of terminals: 33
<input type="checkbox"/>	Enclosure protection

7.2 Receiver Requirements

7.2.1 Spurious Emissions of Rx

Measurement Record:

Uncertainty: $\pm 1\text{dB}$

Test Requirement:	Item 19 of Article 2-1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23.0°C	Humid.: 54%	Press.: 1010 mbar
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:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
EUT conditions:	Rx		
Measurement Procedure:	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.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –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		
Spectrum Analyzer Conditions(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		
Technical standard:	(1) Below 1 GHz : 4 nW or less (2) 1 GHz and over : 20 nW or less		
Test result:	Refer to Appendix: BLE of Report No. EED32P80690201		