



TEST REPORT

No. I21N00360-DFS

for

unitech Electronics Co., Ltd.

Wearable Computer

Model Name: WD200

with

Hardware Version: DVT2

Software Version: v117-0

FCC ID: HLEWD200BTNF

Issued Date: 2021-03-29

Designation Number: CN1210

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

Test Laboratory:

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1. Summary of Test Report

1.1. Test Items

Description	Wearable Computer
Model Name	WD200
Applicant's name	unitech Electronics Co., Ltd.
Manufacturer's Name	unitech Electronics Co., Ltd.

1.2. Test Standards

FCC Part15-2019; FCC 06-96-2006; KDB 905462-D02

1.3. Test Result

Pass

Please refer to "5.2. Test Results"

1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road,
Futian District, Shenzhen, Guangdong, P. R. China

1.5. Project data

Testing Start Date:	2021-03-01
Testing End Date:	2021-03-01

1.6. Signature



Lin Zechuang
(Prepared this test report)



Tang Weisheng
(Reviewed this test report)



Zhang Bojun
(Approved this test report)



2. Client Information

2.1. Applicant Information

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2.2. Manufacturer Information

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Contact Person Ben Chiang
E-Mail BenC@tw.ute.com
Telephone: 886-2-8912-1122
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment(AE)

3.1.About EUT

Description	Wearable Computer
Model name	WD200
RLAN Frequency Range	ISM Bands: 5250MHz~5350MHz 5470MHz~5725MHz
RLAN Protocol	IEEE 802.11a,802.11n-HT20/40,802.11ac-VHT20/40/80
Type of modulation	OFDM
Antenna	Integrated
Antenna Gain	SISO:1.0dBi MIMO:0.2dBi
Power Supply	3.85V DC by Battery
FCC ID	HLEWD200BTNF
Device Type (DFS)	Client without radar detection(only support client mode)
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2.Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Receive Date
UT04aa	950105210046	DVT2	v117-0	2021-02-07

*EUT ID: is used to identify the test sample in the lab internally.

3.3.Internal Identification of AE used during the test

AE ID*	Description	AE ID*
AE1	/	/

*AE ID: is used to identify the test sample in the lab internally.

3.4.General Description

The Equipment under Test (EUT) is a model of Wearable Computer with integrated antenna and battery.

It consists of normal options: Lithium Battery and USB Cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices Subpart E – UNII Devices	2019
FCC 06-96	Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) devices in the 5 GHz band	2006
KDB 905462	Compliance Measurement Procedures for Unlicensed-national Information Infrastructure Devices Operating in the 5250-5350 MHz and 5470-5725 MHz Bands Incorporating Dynamic Frequency Selection	D02

Note: This report is only for DFS

5. Test Results

5.1. Testing Environment

Normal Temperature: 15~35°C

Relative Humidity: 20~75%

5.2. Test Results

No	Test cases	Sub-clause of Part15E	Verdict
1	Channel move time and channel closing transmission time	15.407 (h)(2)(iii)	P

Please refer to **ANNEX A** for detail.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacture as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

This report only deal with the UNII DFS functions among the features described in section 3, and The EUT met all requirements of the reference documents.

The end user is not available to get and modify the parameters of the detected Radar Waveforms in this product.

6. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2021-12-30	1 year
2	Vector Signal General	SMU200A	104096	Rohde & Schwarz	2021-12-30	1 year
3	Shielding Room	S81	/	ETS-Lindgren	2022-11-14	3 year
No.	Equipment	Model	FCC ID	Manufacturer	Calibration Date	Calibration Period
4	Master AP	RT-AC9600R	MSQ-R TG03H	ASUS	/	/

7. Laboratory Environment

Measurement is performed in shielding room.

Shielded room

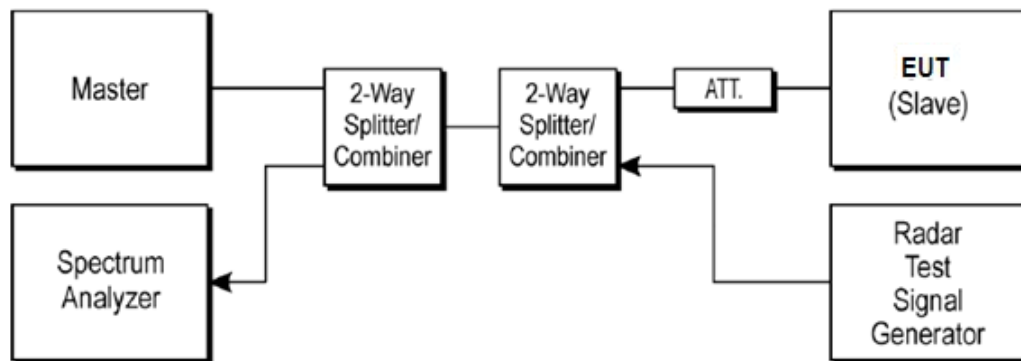
Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1 MHz, > 60 dB; 1 MHz - 1000 MHz, > 90 dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

The below figure shows the DFS setup, where the EUT is a WLAN device operating in slave mode, without Radar Interference Detection function. This setup also contains a device operating in master mode. The radar test signals are injected into the master device. The EUT (slave device) is associated with the master device. WLAN traffic is generated by streaming the mpeg file from the master to the slave in full monitor video mode using the media player.



A.1.2. Parameters of DFS test signal

1). Interference threshold values, master or client incorporation in service monitoring. For device Power less than 23dBm (E.I.R.P.), the threshold level is -62 dBm at the antenna port after Correction for antenna gain and procedural adjustments.

Because of conducted measurement performed, the calibration power from radar signal generator to antenna port of DFS test equipment is -62 dBm.

Maximum Transmit Power	Value
> 200 mW	-64 dBm
< 200 mW	-62 dBm

2). DFS requirement values

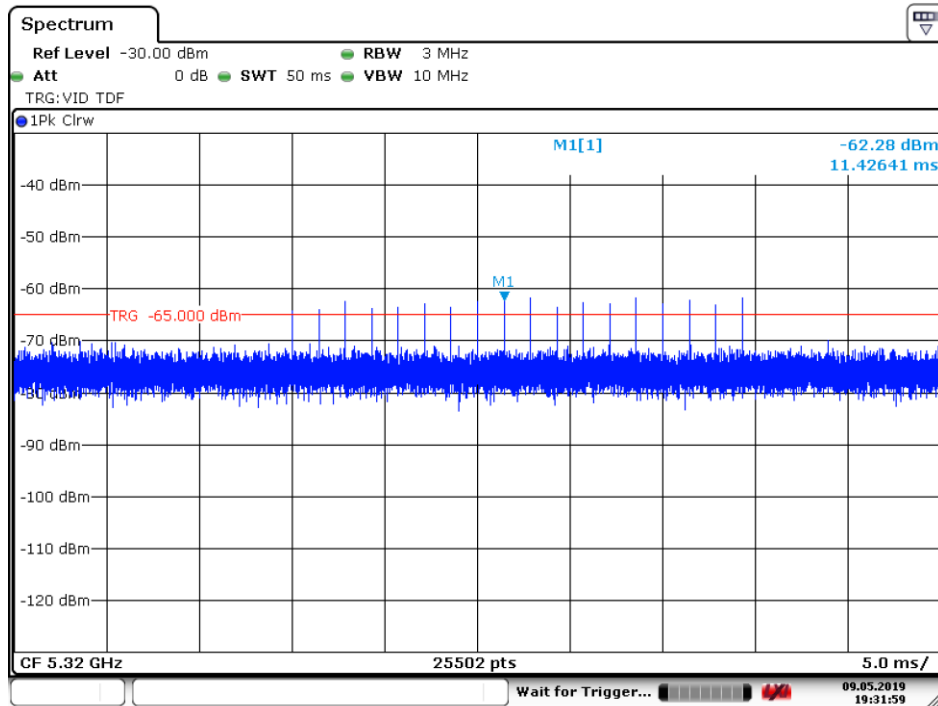
The required values are as the following table.

Parameter	Value
Non-occupancy	> 1800 s
Channel Availability Check Time	60 s
Channel Move Time	10 s
Channel Closing Transmission Time	200 ms + 60 ms
U-NII Detection Bandwidth	Minimum 80% of the 99% transmission power bandwidth

As the EUT is IP based system, the MPEG video file from NTIA website is used to steam to EUT via the Master device.

3).Parameters of the reference DFS test signal

Pulse width W (μ s)	Pulse repetition frequency PRF (PPS)	Pulses per burst (PPB)
1	700	18



Radar Signal (Type 0)

A.2. Channel move time and channel closing transmission time**Measurement Limit:**

Test Items	Limit
Channel Move Time	< 10 s
Channel Closing Transmission Time	< 200 ms + 60 ms

Measurement Results:**Measurement Results:****Channel Move Time:**

Mode	Channel	Frequency (MHz)	Test Results	Conclusion
802.11a	64	5320	Fig.1	P
802.11ac-VHT80	106	5530	Fig.2	P

Channel Closing Transmission Time:

Mode	Channel	Frequency (MHz)	Test Results	Conclusion
802.11a	64	5320	Fig.3	P
802.11ac-VHT80	106	5530	Fig.4	P

See test graphs as following.

Conclusion: PASS

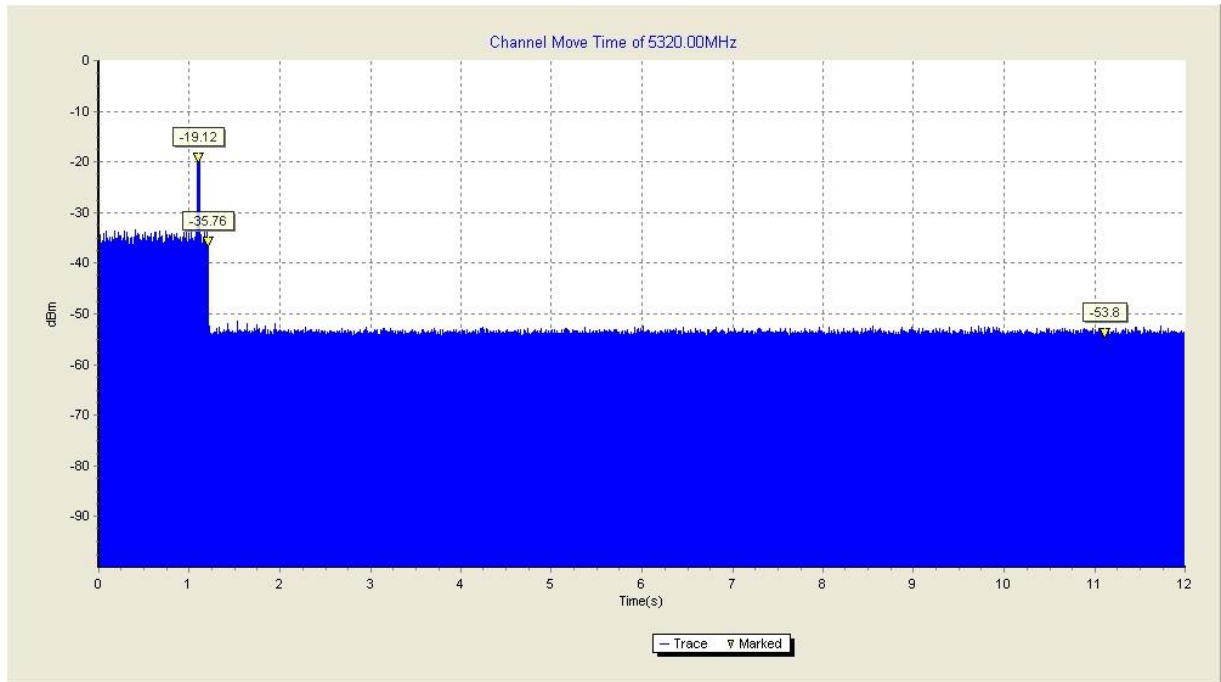


Fig.1 channel move time (802.11a Frequency Band: 5250MHz ~ 5350MHz)

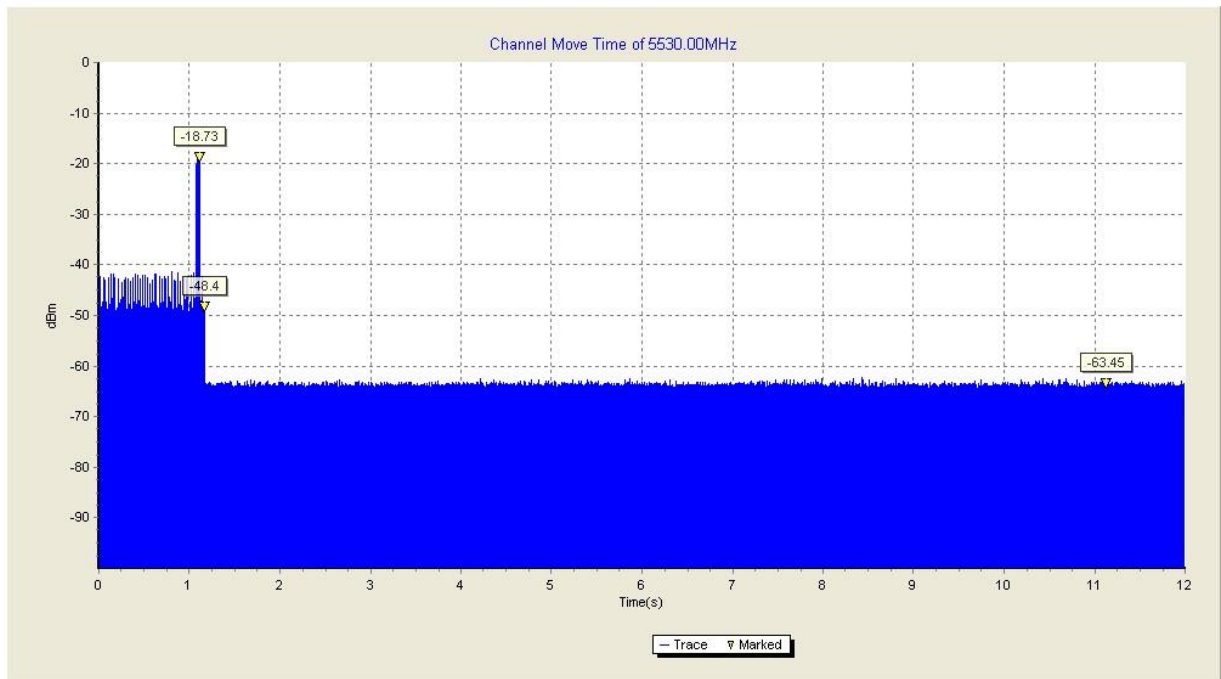


Fig.2 channel move time (802.11ac-VHT80 Frequency Band: 5470MHz~5725MHz)

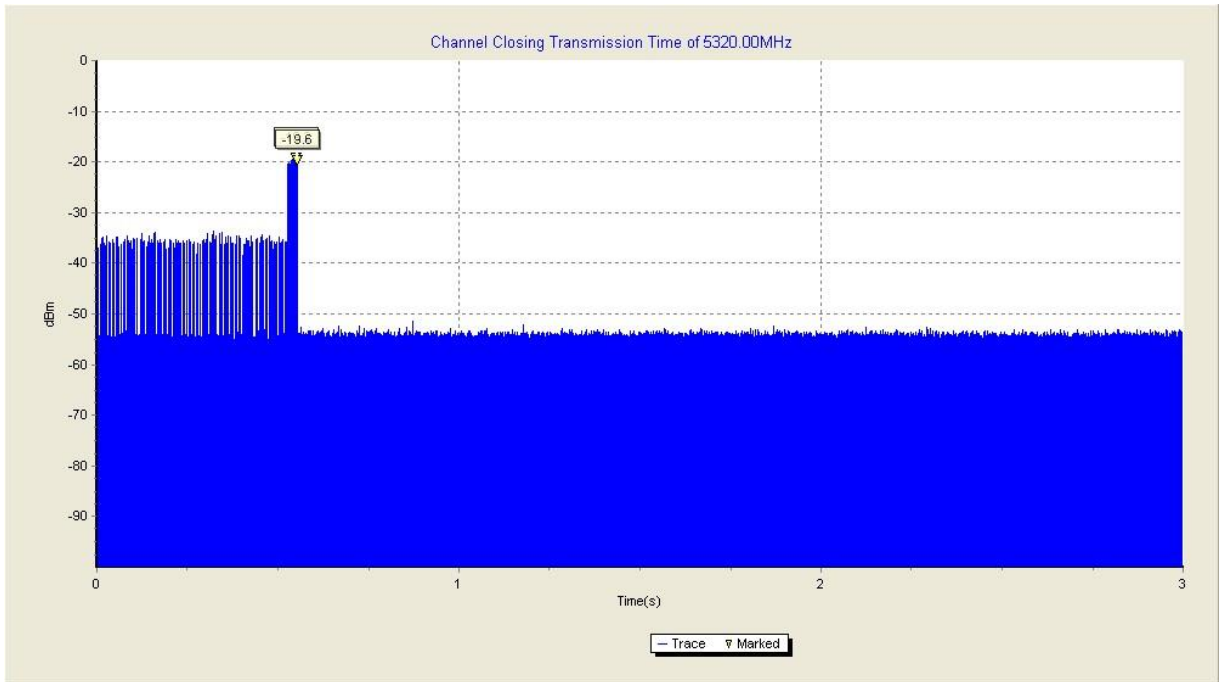


Fig.3 channel closing transmission time (802.11a Frequency Band: 5250MHz ~ 5350MHz)

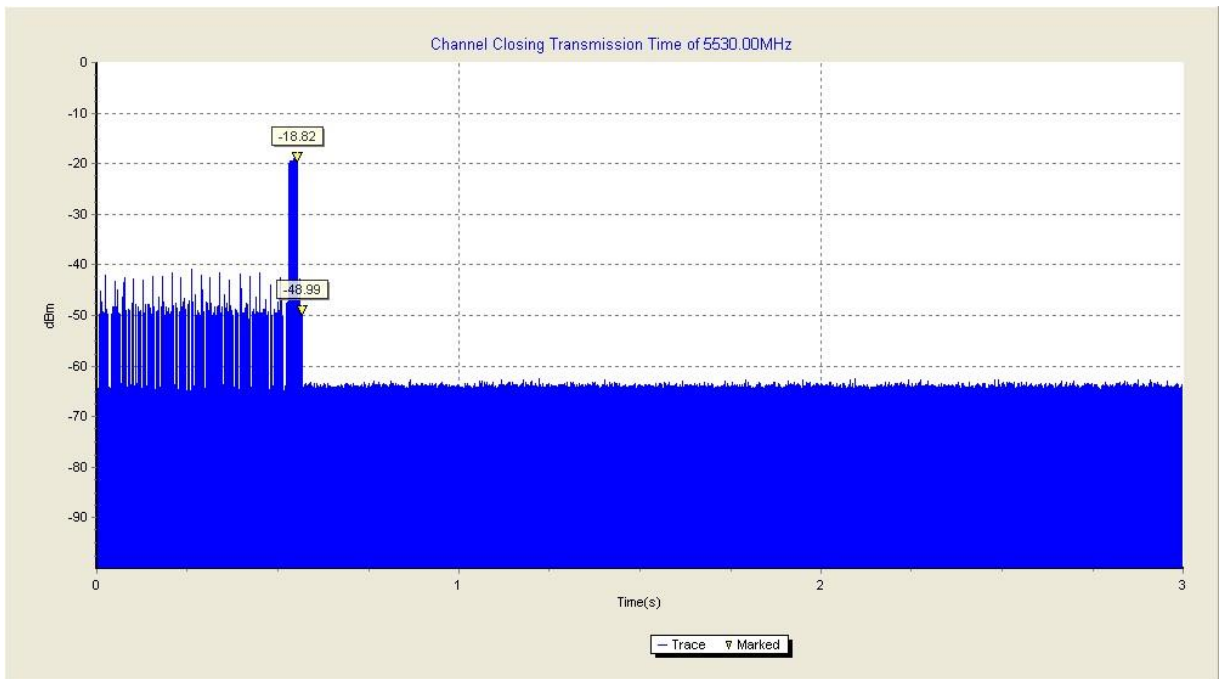


Fig.4 channel closing transmission time (802.11ac-VHT80 Frequency Band: 5470MHz~5725MHz)

ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP

Layout of Conducted Test



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