DFS TEST REPORT

Applicant:	PAX Technology Limited
Address of Applicant:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong

Equipment Under Test (EUT)

Product Name:	Countertop Payment Terminal
Model No.:	A80
Trade mark:	PAX
FCC ID:	V5PA80SMBW
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	21 Oct., 2021
Date of Test:	22 Oct., to 01 Dec., 2021
Date of report issued:	13 Dec., 2021
Test Result:	PASS*

***In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*01 Dec., 2021*	*Original*
01	*13 Dec., 2021*	*Update manufacturer address.*

Tested by: Mike.ou ***Date:*** *13 Dec., 2021*

Test Engineer

Reviewed by: Winner Zhang ***Date:*** *13 Dec., 2021*

Project Engineer

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4 Test Summary

Test Items	Limit	Result
Channel Availability Check	> 60 seconds	N/A
UNII Detection Bandwidth	> 100% of the UNII 99% transmission power bandwidth	N/A
Statistical Performance Check	Radar type 1,2,3,4 ≧ 60% Aggregate Radar type 1~4 and 5 ≧ 80% Radar type 6 ≧ 70%	N/A
Channel Move Time	< 10 seconds	Pass
Channel Closing Transmission Time	< 20ms + aggregate of 60ms over remaining 10 second period	Pass
Non-Occupancy Period	> 30 minutes	N/A

Remark:

1. *Pass: means meet the requirements.*
2. *N/A: means not applicable.*
3. *The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).*

Test Method:	*ANSI C63.10-2013* *KDB 789033 D02 General UNII Test Procedures New Rules v02r01* *KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02*

5 General Information

5.1 Client Information

Applicant:	PAX Technology Limited
Address:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong
Manufacturer:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address:	401 and 402, Building 3, Shenzhen Software Park, Nanshan District, Shenzhen City, Guangdong Province, P.R.C

5.2 General Description of E.U.T.

Product Name:	Countertop Payment Terminal
Model No.:	A80
Transmitter frequency range:	5150MHz~5250MHz, 5250MHz~5350MHz 5470MHz~5725MHz, 5725MHz~5825MHz
Modulation type:	OFDM
WLAN Function:	802.11a/802.11n/802.11ac
Bandwidth:	20MHz/40MHz/80MHz
Antenna Type:	Internal Antenna
Antenna Gain:	2.0 dBi
DFS Operation Type:	☐ Master Device ☐ Slaver Device with Radar detection function ☒ Slaver Device without Radar detection function
Power supply:	Adapter 1: Model No.: G024A090100ZZUD Input: AC100-240V, 50/60Hz 0.8A Max Output: DC 9.0V, 1.0A Adapter 2: Model No.: ADS-18SG-09-2 09009G Input: AC100-240V, 50/60Hz 0.6A Max Output: DC 9.0V, 1.0A Adapter 3: Model No.: SW-0396A Input: AC100-240V, 50/60Hz 0.5A Max Output: DC 9.0V, 1.0A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Remark:	There are two kinds of EUT, one with modem, the other without. Choose to test the EUT with modem.

5.3 Test environment and mode

Data Load mode:	Keep the EUT in normal transmitting mode by WiFi
Temperature:	20 ~ 25 ℃
Humidity:	60% ~ 65%
Atmospheric pressure:	1012 kPa

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number
LENOVO	Laptop	SL510	2847A65
ASUS	Router	GT-AX11000	LAICHR000121

5.5 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

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

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.
Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: http://www.ccis-cb.com

5.9 Test Instruments list

Conducted method:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Spectrum Analyzer	Keysight	N9010B	MY60240202	10-27-2021	10-26-2022
Vector Signal Generator	Keysight	N5182B	MY59101009	10-27-2021	10-26-2022
RF Control Box	MWRF-test	MW100-RFCB	MW200927JYT	N/A	N/A
PDU	MWRF-test	XY-G10	N/A	N/A	N/A
Temperature Humidity Chamber	Deli	8840	N/A	03-08-2021	03-07-2022
Test Software	MWRF-tes	MTS 8310	Version: 2.0.0.0		

6 DFS Technical Requirements

6.1 DFS Parameters

Table D.1: Applicability of DFS Requirements Prior to Use of a Channel			
Requirement	**Operational Mode**		
	Master	**Client Without Radar Detection**	**Client With Radar Detection**
Non-Occupancy period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table D.2: Applicability of DFS requirements during normal operation		
Requirement	**Operational Mode**	
	Master	**Client Without Radar Detection**
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	**Operational Mode**	
	Master Device or Client with Radar Detection	**Client Without Radar Detection**
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Table D.3: DFS Detection Thresholds	
Maximum Transmit Power	**Value (See Notes 1,2, and 3)**
EIRP ≧ 200 mW	-64 dBm
EIRP < 200 mW and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 mW that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table D.4: DFS requirement values	
Parameter	**Value**
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 ms + an aggregate of 60ms over remaining 10 second period (See Notes 1 and 2)
U-NII Detection Bandwidth	Minimum 100% of the UNII 99% transmission power bandwidth (See Note 3)

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step, the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Table D.5: Short Pulse Radar Test Waveforms					
Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A Test B	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
			Aggregate (Radar Types 1-4)	80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

Table D.6: Long Pulse Radar Test Waveform							
Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Long Pulse Radar Test Signal Wave form 12 second transmission

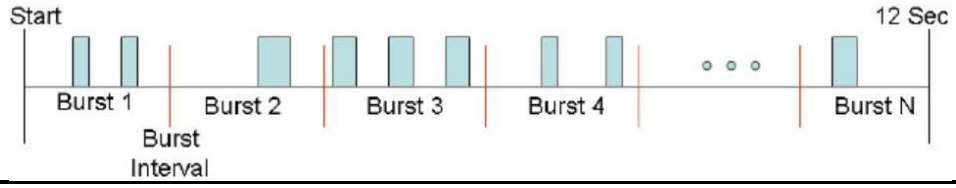


Table D.7: Frequency Hopping Radar Test Waveform							
Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	0	0.333	300	70%	30

6.2 DFS Technical Requirements

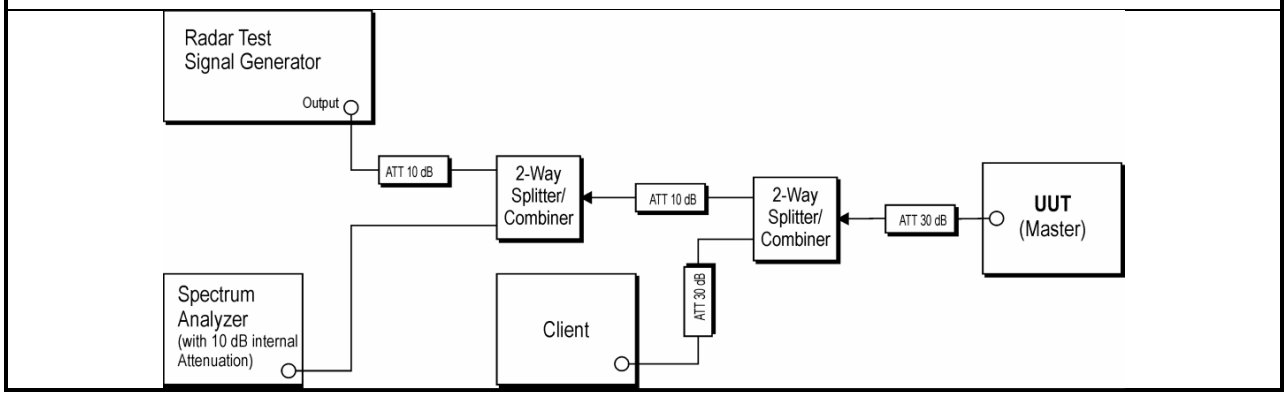
Requirement	DFS Operational mode		
	☐ Master	☒ Slave without Radar Detection	☐ Slave with Radar Detection
Channel Availability Check	√	Not Required	Not Required
UNII Detection Bandwidth	√	Not Required	√
Statistical Performance Check	√	Not Required	√
Channel Move Time	√	√	√
Channel Closing Transmission Time	√	√	√
Non-Occupancy Period	√	Not Required	√

6.3 DFS Threshold Level

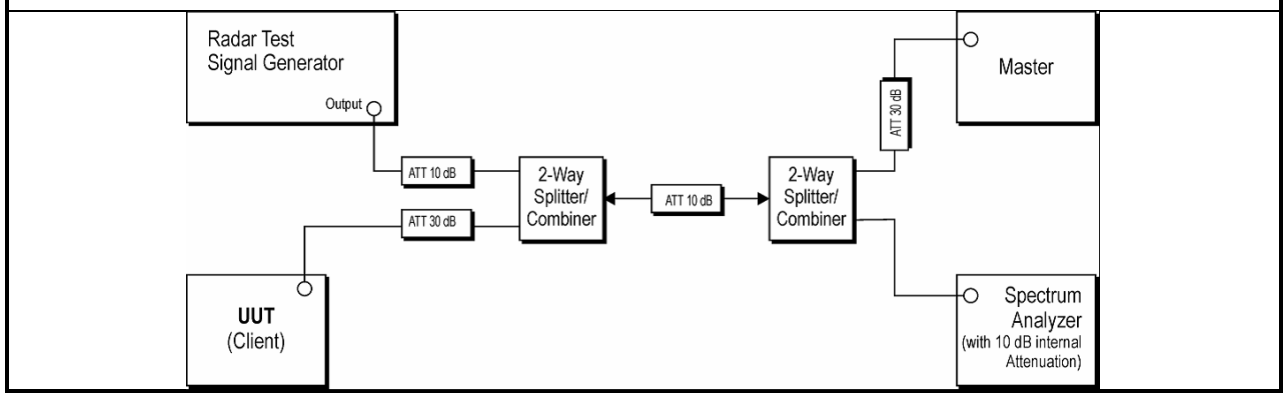
DFS Threshold Level	
5250MHz ~ 5350MHz	-62 dBm @ antenna connector
5470MHz ~ 5725MHz	-62 dBm @ antenna connector
Note: The worst case level was selected to perform the test.	

6.4 Test Setup Block

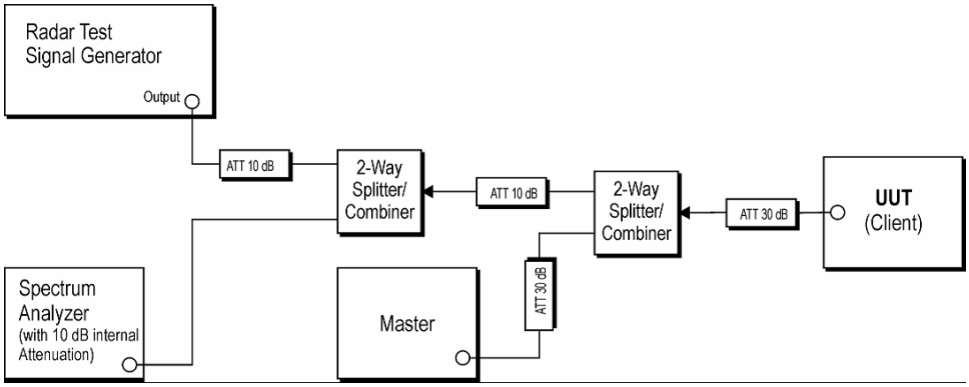
☐ **For master device**



☒ **For Slaver without radar detection function device**



☐ **For Slaver with radar detection function device**



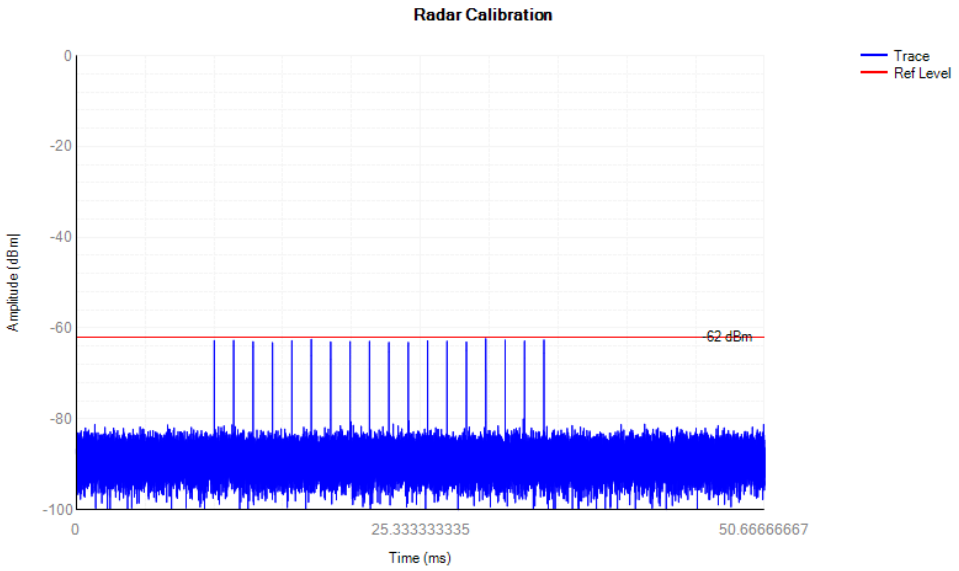
6.5 EUT Configuration for DFS Test

Test Items	Channel Frequency
Channel Move Time	5290MHz, 5530MHz
Channel Closing Transmission Time	5290MHz, 5530MHz

7 Test Result

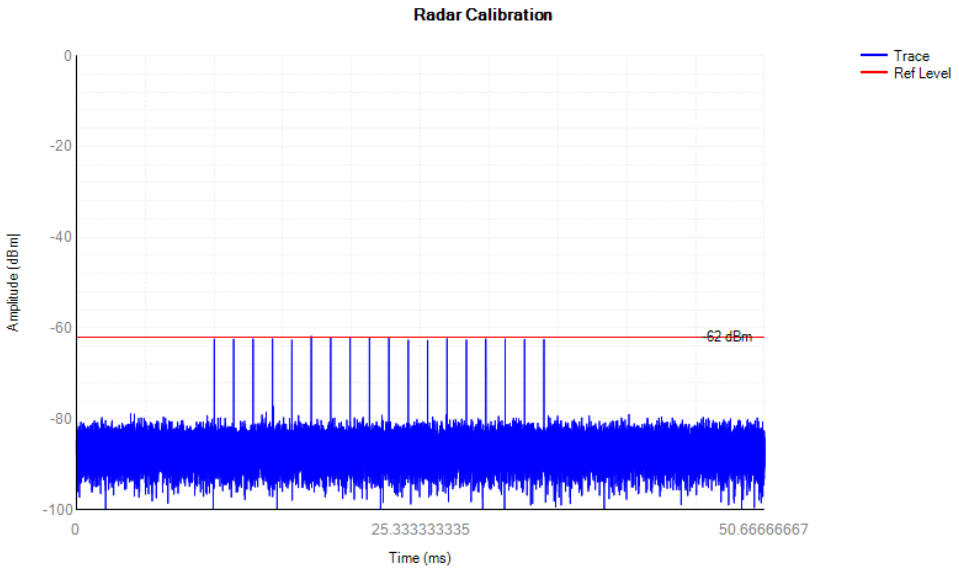
7.1 Verification of Radar Type and Level

802.11ac80: 5290MHz



Radar Type 0

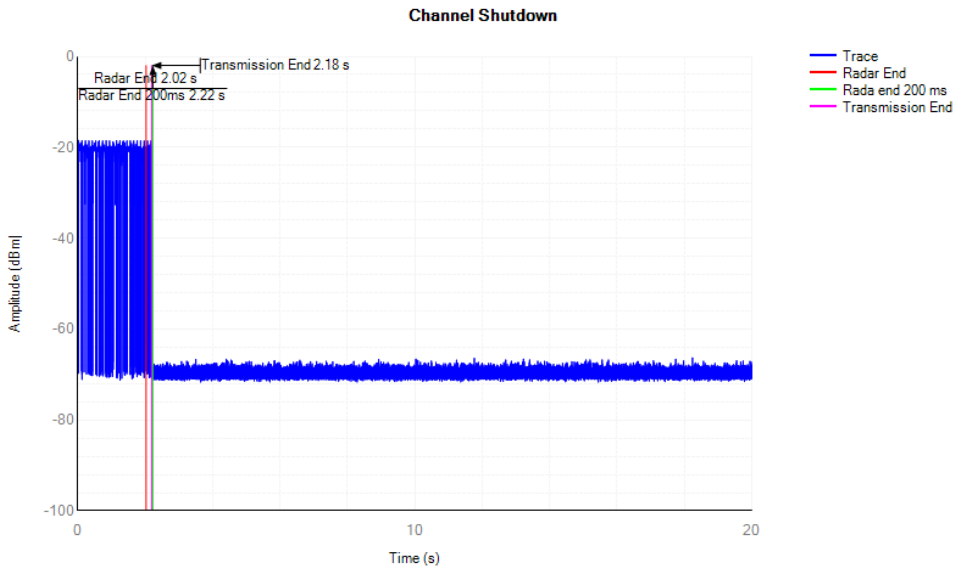
802.11ac80: 5530MHz



Radar Type 0

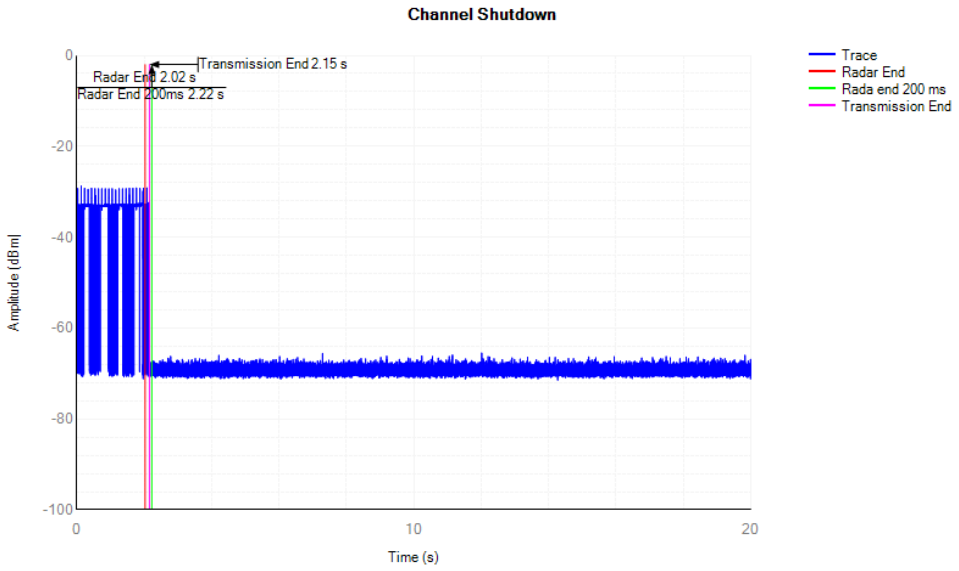
7.2 Channel Move Time and Channel Closing Transmission Time

80MHz/5290MHz



Test Items	Value	Limit
Channel Closing Transmission Time	146.5ms	260 ms
Channel Move Time	160.2 ms	10 s

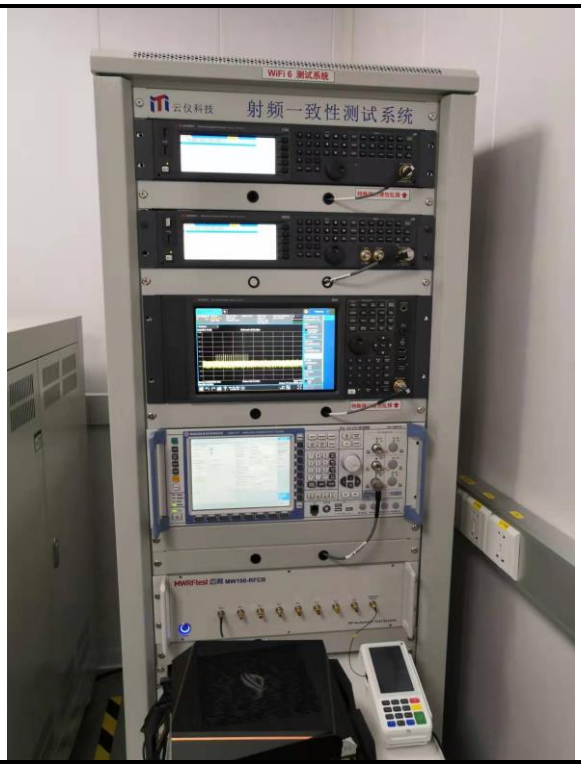
80MHz/5530MHz



Test Items	Value	Limit
Channel Closing Transmission Time	84 ms	260 ms
Channel Move Time	124.2 ms	10 s

Test Result: Pass

8 Test Setup Photo



9 EUT Constructional Details

Reference to the EUT Photos.

------ End of report ------