

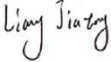

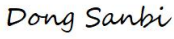


Test Report No.:  
FCCSZ2023-0009-RF3

## RF Test Report

**FCC ID** : 2AOKI-AL8731B  
**IC** : 23460-AL8731B  
**EUT** : WIFI Module  
**MODEL** : AL-8731B-WG-A,WF-R31B-UWD1  
**BRAND NAME** : AI-Link  
**APPLICANT** : Sichuan AI-Link Technology Co.,Ltd.  
**Classification Of Test** : N/A

**CVC Testing Technology (Shenzhen) Co., Ltd.**

<b>Applicant</b>		Name: Sichuan AI-Link Technology Co.,Ltd.	
		Address: Anzhou Industrial Park, Mianyang, Sichuan, P.R.C	
<b>Manufacturer</b>		Name: Sichuan AI-Link Technology Co.,Ltd.	
		Address: Anzhou Industrial Park, Mianyang, Sichuan, P.R.C	
<b>Equipment Under Test</b>		Product Name:WIFI Module	
		Model/Type: AL-8731B-WG-A, WF-R31B-UWD1	
		Brand Name: AI-Link	
		Serial NO.: N/A	
		Sample NO.:4-1	
Date of Receipt.	2023.09.13	Date of Testing	2023.09.13~2023.09.26
<b>Test Specification</b>		<b>Test Result</b>	
FCC Part 15, Subpart E, Section 15.407 Canada RSS-247 Issue 3 (2023-08) Canada RSS-Gen Issue 5 +A1+A2(2021-02)		PASS	
<b>Evaluation of Test Result</b>	The equipment under test was found to comply with the requirements of the standards applied.		
	Seal of CVC <b>Issue Date: 2023.09.26</b>		
Tested by:  <u>Liang Jiatong</u> Name      Signature	Tested by:  <u>Huang Meng</u> Name      Signature	Approved by:  <u>Dong Sanbi</u> Name      Signature	
<b>Other Aspects: NONE.</b>			
Abbreviations:OK, Pass= passed      Fail = failed      N/A= not applicable      EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.

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**RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCCSZ2023-0009-RF3	Original release	2023.09.26

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
FCC 15.407 RSS-247 clause 6.3	Channel Move Time	PASS	570.4 ms
FCC 15.407 RSS-247 clause 6.3	Channel Closing Transmission Time	PASS	200+aggregate of 7.8ms over remaining 10s period.
FCC 15.407 RSS-247 clause 6.3	Non-Occupancy Period and Client Beacon Test	PASS	≥30 min

Note: Since the product is client without radar detection function, only Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period and Client Beacon Test are required to be performed

## 1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
WIFI & Bluetooth Test System					/
Signal&Spectrum Analyzer	Rohde&Schwarz	FSV 30	104408	1 year	2024.5.21
#3Shielding room	MORI	443	N/A	3 year	2026.5.16
Wideband radio communication tester	Rohde&Schwarz	CMW 500	168778	1 year	2024.5.25
Analog signal Generator (100kHz ~ 40GHz)	Rohde&Schwarz	SMB 100A	181934	1 year	2024.5.21
Vector signal Generator (9kHz ~ 6GHz)	Keysight	N5182B	MY57301451	1 year	2024.4.25
Vector signal Generator (9kHz ~ 6GHz)	Rohde&Schwarz	SGT 100A	111724	1 year	2024.5.21
RF control unit(BT/WiFi)	Tonscend	JS0806-2-8CH	20E8060261	1 year	2024.5.21

## 1.2 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology (Shenzhen) Co., Ltd.

CABID:CN0137

Lab Address: No. 1301, Guangguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen City, Guangdong Province 518110 P.R.China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

<http://www.cvc.org.cn>

## 2 GENERAL INFORMATION

### 2.1 GENERAL PRODUCT INFORMATION

<b>PRODUCT</b>	WIFI Module
<b>BRAND</b>	AI-Link
<b>TEST MODEL</b>	AL-8731B-WG-A
<b>ADDITIONAL MODEL</b>	WF-R31B-UWD1
<b>POWER SUPPLY</b>	DC 3.3V from host unit
<b>OPERATING FREQUENCY</b>	5260MHz ~ 5320MHz, 5500MHz ~ 5720MHz
<b>ANTENNA TYPE (Note 4)</b>	Antenna information see section 2.2
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	N/A
<b>HARDWARE REVISION</b>	JU17.820.1171-3
<b>SOFTWARE REVISION</b>	v5.13.0.1
<b>DEVICE TYPE</b>	<input type="checkbox"/> Master <input checked="" type="checkbox"/> Client without radar detection <input type="checkbox"/> Client with radar detection
Note: 1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report. 3. EUT photo refer to report (Report NO.: FCCSZ2023-0009-EUT). 4. Since the above data and/or information is provided by the client, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. 5. AL-8731B-WG-A and WF-R31B-UWD1 are electrical identical including the same software parameter and hardware design (i.e., circuit design, PCB Layout, RF module/circuit, antenna type(s) and antenna location, components on PCB, etc.), same mechanical structure and design (including product enclosure, materials, etc.), the only difference is the model name. 6. RSS-247 For the band 5600-5650 MHz, no operation is permitted. Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600-5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band. 7. At the same time, EUT provides a complete transmitter and a receiver. Ant1 and Ant2 cannot be transmitted simultaneously.	

## 2.2 ANTENNA INFORMATION

Antenna 1 has four different manufacturers of antennas, and antenna 2 has only one manufacturer. Antenna1 and antenna2 cannot be transmitted simultaneously.

### Antenna1

<b>NUMBER</b>		1#
<b>MANUFACTURER</b>		B&T
<b>ANTENNA TYPE</b>		PIFA Antenna
<b>MODEL</b>		TX-DM200BD113B63M
<b>PEAK GIAN</b>	2.4G	2.18dBi
	5G	4.33dBi

<b>NUMBER</b>		2#
<b>MANUFACTURER</b>		Yishengbang
<b>ANTENNA TYPE</b>		PIFA Antenna
<b>MODEL</b>		TX-DM200BD113Y63M
<b>PEAK GIAN</b>	2.4G	4.29dBi
	5G	4.55dBi

<b>NUMBER</b>		3#
<b>MANUFACTURER</b>		Jiexuntong
<b>ANTENNA TYPE</b>		PIFA Antenna
<b>MODEL</b>		TX-DM200BD113Y63M
<b>PEAK GIAN</b>	2.4G	3.92dBi
	5G	2.66dBi

<b>NUMBER</b>		4#
<b>MANUFACTURER</b>		JINGHONG
<b>ANTENNA TYPE</b>		PIFA Antenna
<b>MODEL</b>		TX-DM300BD113JH63M
<b>PEAK GIAN</b>	2.4G	2.72dBi
	5G	1.51dBi

### Antenna2

<b>MANUFACTURER</b>		WALSIN
<b>ANTENNA TYPE</b>		PIFA Antenna
<b>MODEL</b>		RFMTA170900NNLB003
<b>PEAK GIAN</b>	2.4G	3.68dBi
	5G	2.88dBi

Note: For the test results, the EUT had been tested with all Antenna. **Antenna1 4#** has the minimum antenna gain and is used for testing in this report. Only the worst case (**Antenna1 4#**) was shown in test report.



**2.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL**

BANDWIDTH	CHANNEL	TEST TYPE AND LIMIT
40MHz	CH62	Channel Move Time
		Channel Closing Transmission Time
		Non-Occupancy Period and Client Beacon Test

This test was investigated for different bandwidth (20MHz, 40MHz). The following plots was done on 40MHz as a representative.

## 2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support Equipment							
NO	Description	Brand	Model No.	FCC ID	SN	Supplied by	
1	Wireless router	LINKSYS	WRT3200ACM	Q87-WRT3200A CM	19811609801 281	Lab	
1	Laptop	Lenovo	K4e-ARE120	/	MP20kshe	Lab	
Support Cable							
NO	Description	Quantity (Number)	Length (m)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

### 3 REQUIREMENTS AND PARAMETERS FOR DFS TEST

#### 3.1 APPLICABILITY OF DFS REQUIREMENTS

##### APPLICABILITY OF DFS REQUIREMENTS PRIOR TO USE A CHANNEL

REQUIREMENT	OPERATIONAL MODE		
	MASTER	CLIENT WITHOUT RADAR DETECTION	CLIENT WITH RADAR DETECTION
Non-Occupancy Period	✓	✓	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
Uniform Spreading	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓

##### APPLICABILITY OF DFS REQUIREMENTS DURING NORMAL OPERATION

REQUIREMENT	OPERATIONAL MODE		
	MASTER	CLIENT WITHOUT RADAR DETECTION	CLIENT WITH RADAR DETECTION
DFS Detection Threshold	✓	Not required	✓
Channel Closing Transmission Time	✓	✓	✓
Channel Move Time	✓	✓	✓
U-NII Detection Bandwidth	✓	Not required	✓

### 3.2 DETECTION THRESHOLD VALUES

DFS DETECTION THRESHOLDS FOR MASTER DEVICES AND CLIENT DEVICES WITH RADAR DETECTION

MAXIMUM TRANSMIT POWER	VALUE (SEE Note 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 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.

### 3.3 DFS RESPONSE 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 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	100% of the UNII transmission power bandwidth. See Note 3.

**Note 1:** The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:

- For the Short Pulse Radar Test Signals this instant is the end of the Burst.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the Radar Waveform.

**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 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

### 3.4 PARAMETERS OF DFS TEST SIGNALS

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

#### 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	Roundup $\left\{ \begin{matrix} \frac{1}{360} \\ \frac{19 \cdot 10^3}{PRI \cdot \mu sec} \end{matrix} \right\}$	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.					

#### LONG PULSE RADAR TEST WAVEFORM

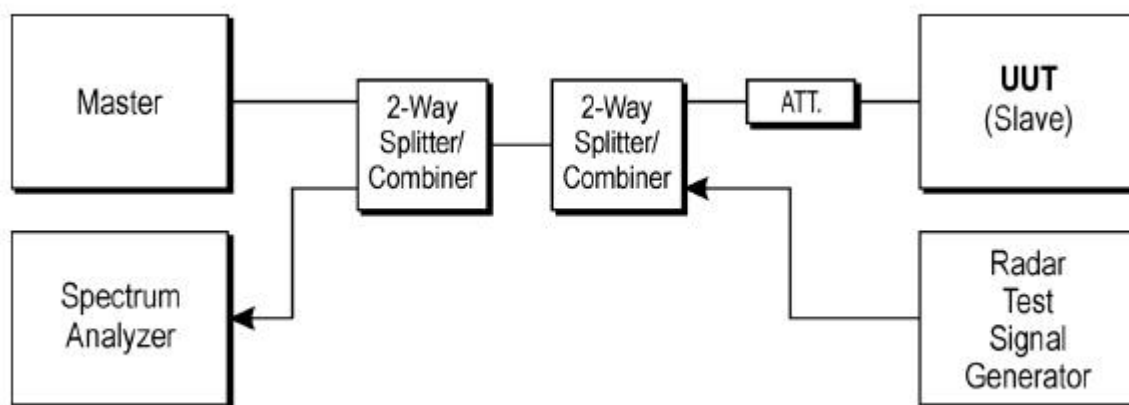
RADAR TYPE	PULSE WIDTH (μsec)	CHIRP WIDTH (MHz)	PRI (μsec)	NUMBER OF PULSES PER BURST	NUMBER OF BURSTS	MINIMUM PERCENTAGE OF SUCCESSFUL DETECTION	MINIMUM NUMBER OF TRIALS
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

#### 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	9	0.333	300	70%	30

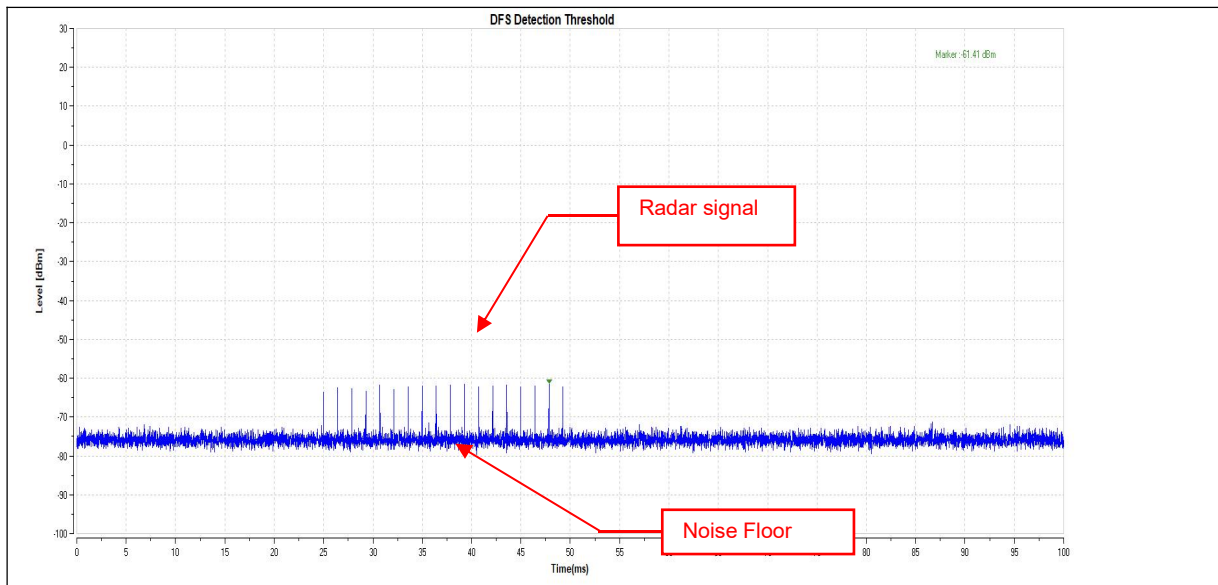
## 4 TEST RESULTS

### 4.1 TEST SETUP OF DFS



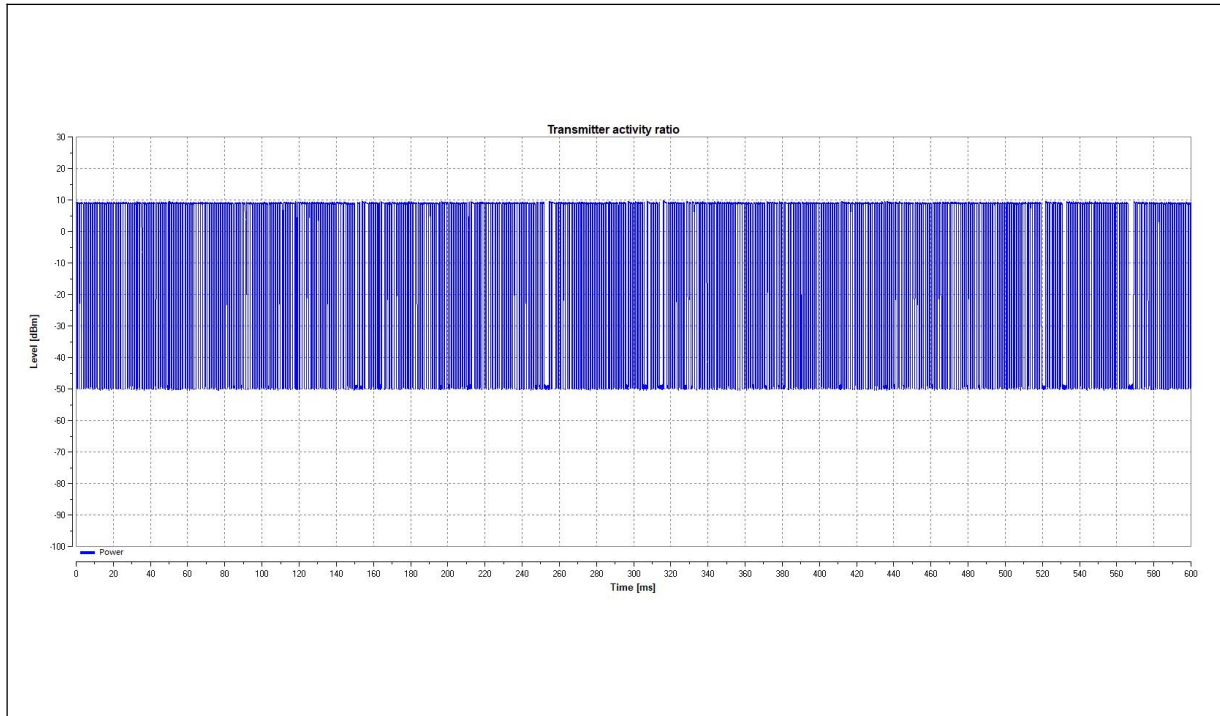
## 4.2 DFS DETECTION THRESHOLD

The antenna gain of the device is 1.51dBi, The Required detection threshold is  $-62.49\text{dBm} = -64 + 1.51\text{dBi}$ . The conducted radar burst level is set to  $-61.41\text{dBm}$ .



### 4.3 CHANNEL LOADING

The radar signal was the same as transmitted channels, and injected into the antenna port of AP (master) with radar signal, measured the channel shutdown. The slave transmitted the test data to master, the transmitted duty cycle is 26.66%.



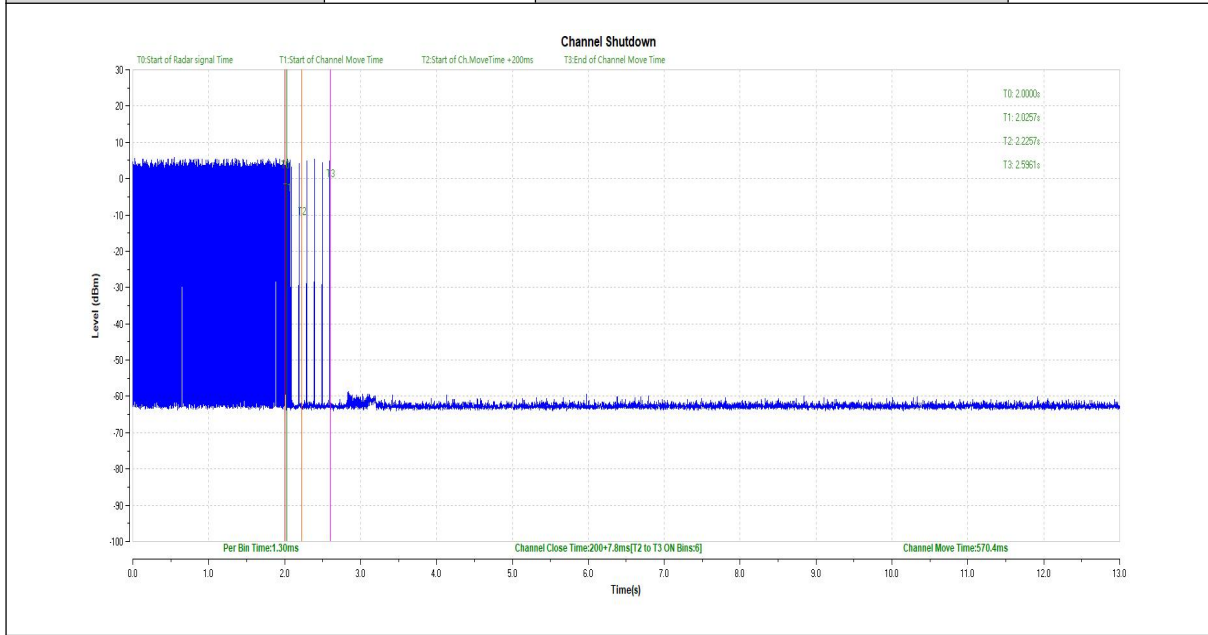
Note: Traffic signal: from slave transmit to master.



**4.4 CHANNEL CLOSING TRANSMISSION AND CHANNEL MOVE TIME**

**Radar Signal 0**

Channel Move Time(ms)	570.4	Channel Closing Transmission Time(ms)	200+7.8
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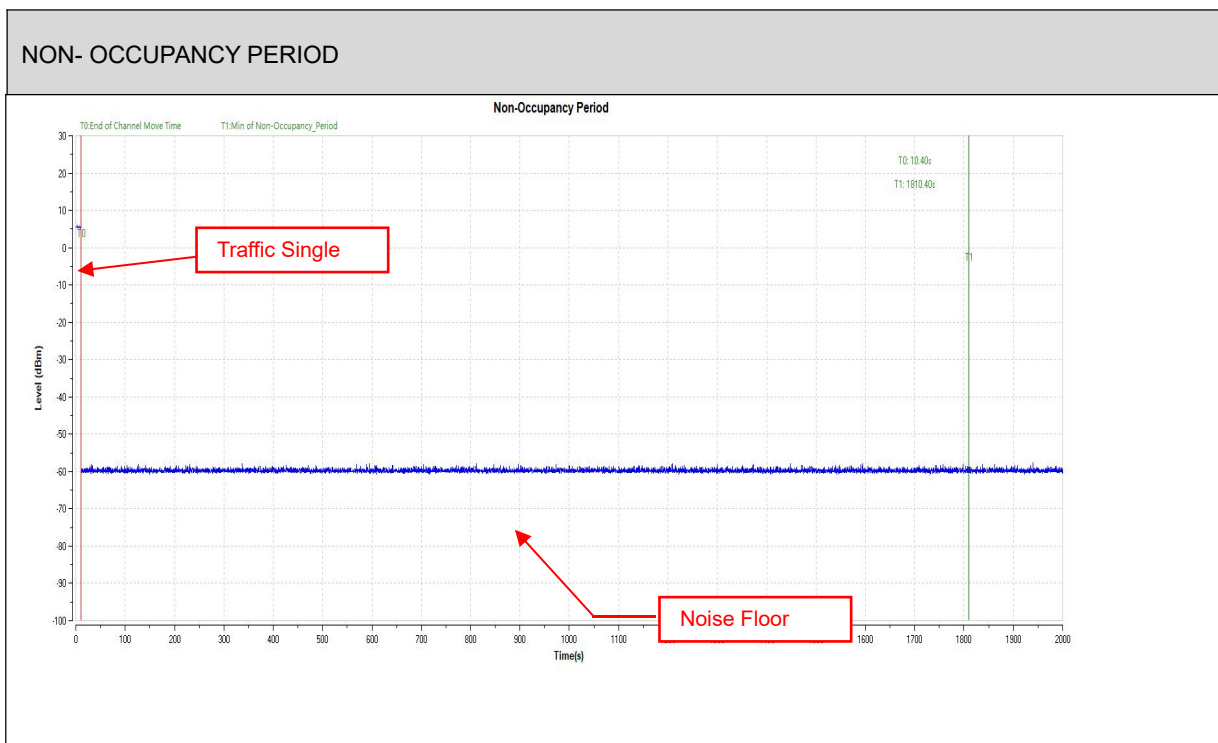


**NOTE:**

1. T0 denotes the Start of Rader Singnl Time.
2. T1 denotes the Start of Channel Move Time.
3. T2 denotes the Start of Channel Move Time + 200ms.
4. T3 denotes the End of Channel Move Time.
5. Per Bin Time = Sweep time (13000ms) / Sweep Point Bins (10000) = 1.3ms
6. Channel Closing Transmission Time(200 + 7.8ms) = 200+ ON Bins\* Per Bin Time

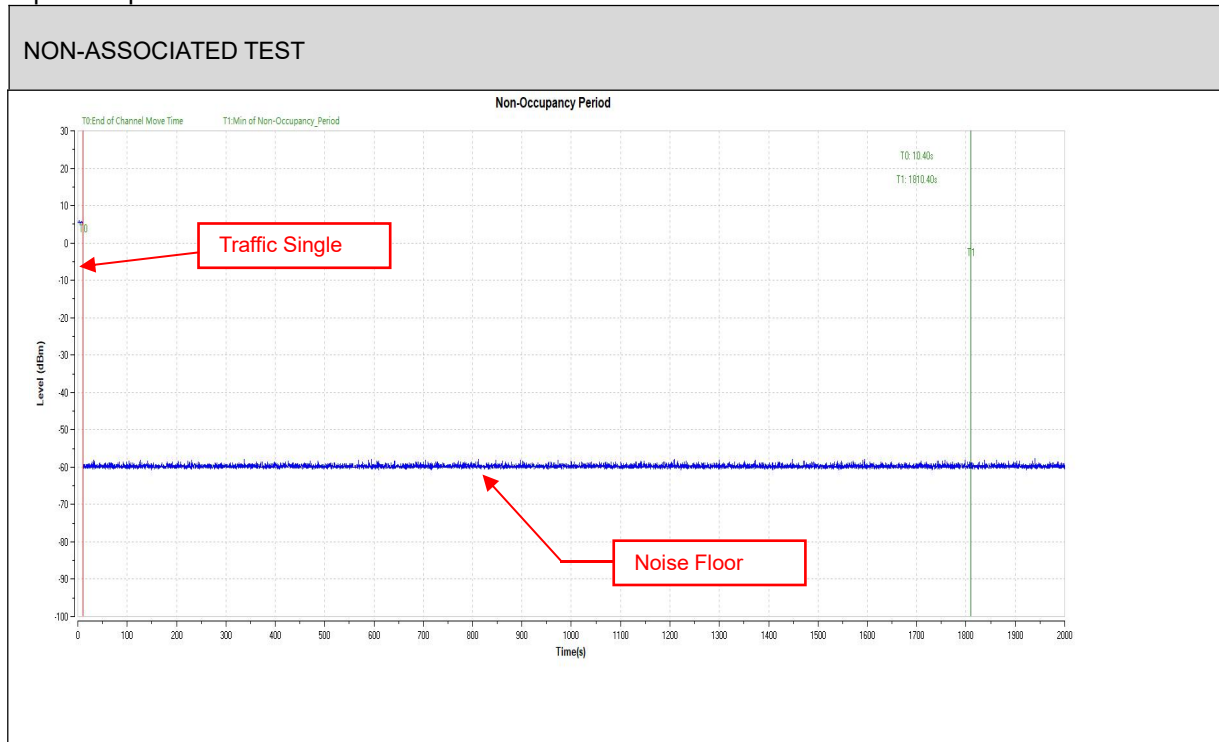
### 4.5 NON- OCCUPANCY PERIOD

- 1) Test results demonstrating an associated client link is established with the master on a test frequency
- 2) The client and DFS-certified master device are associated, and system testing will be performed with channel-loading for a non-occupancy period test.
- 3). The device transmits one type of radar as specified in the DFS Order.
- 4) The test frequency has been monitored to ensure no transmission of any type has occurred for 30 minutes;  
Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear;
- 5)An analyzer plot that contains a single 30-minute sweep on the original test frequency.



Master was off.

During the 30 minutes observation time, The UUT did not make any transmissions in the DFS band after UUT power up



## **5 PHOTOGRAPHS OF THE EUT**

Please refer to the attached file (External Photos report and Internal Photos).

**----- End of the Report -----**

## Important

- (1) The test report is valid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

*\*\*The test data and test results given in this test report should only be used for purposes of scientific research, teaching and internal quality control when the CMA symbol is not presented.\*\**

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