

RF TEST REPORT

Report nu	mber	RAPA24-O-018R			
	Name	NZIA Connect Inc.			
Applicant Logo		N/A			
	Address	#1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea			
Name		NZIA Connect Inc.			
Manufacturer	Address	#1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea			
Type of equ	lipment	TVWS Wireless Networking Radio System			
Basic mode	I name	NZC-WS35			
Multi mode	l name	N/A			
Serial nur	mber	N/A			
FCC ID		2AUON-NZC-WS35			
Test duration		Nov 16, 2023 to July 11, 2024			
Date of is	ssue	July 11, 2024			
Total page		37 Pages (including this page)			

SUMMARY

The equipment complies with the regulation; FCC Part 15 Subpart H

This test report only contains the result of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

July 11, 2024

2.27

Tested by MinGu Ji Tester July 11, 2024

류우렬

Reviewed by Wooyeol- Ryu Executive Manager



Test Report Version History

Version	Date	Reason for revision
1.0	Feb 8, 2024	Original Document
2.0	July 11, 2024	p.26 Interference protection requirements Test Modifed





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1. Description of EUT

1.1 Applicant

- Company name : NZIA Connect Inc.
- Address : #1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea
- Contact person : Lee Nam Ku / Senior Researcher / kevin@nzia.kr
- Phone/Fax : +82-70-4282-4700 / +82-2-851-3873

1.2 Manufacturer

- Company name : NZIA Connect Inc.
- Address : #1302, 286, Beotkkot-ro, Geumcheon-gu, Seoul, Republic of Korea
- Phone/Fax : +82-70-4282-4700 / +82-2-851-3873

1.3 Basic description

Product name
 Basic model name
 Alternative model name
 N/A

1.4 General description

- EQUIPMENT CLASS : WGF White Space Device with Geo-location Fixed
- Frequency Range : 470 MHz ~ 698 MHz
- Output Power : 21.67 dBm
- Modulation Type : QPSK
- Antenna Type : Patch Antenna
- Antenna Gain : 8.28 d
- Power Supply

. i atori / artorina
: 8.28 dBi
: AC 110.0 ~ 230.0 V

Start of Frequency range, MHz	End of Frequency range, MHz	Frequency range Bandwidth, MHz	Channel size, MHz	Low channel	Mid channel	High channel
470	698	228	6	473	587	695

1.5 Alternative type(s)/model(s)

There is no alternative type(s) and/or model(s).



2. General information of test

2.1 Test standards and results

	Applied Standards : FCC Part 15 Subpart H	
Section	Description of Test	Result
§ 15.713(g)(3)	Fixed white space device registration	Pass
§ 15.713(g)(3)(iii)	Unsuccessful registration – restricted coordinates	Pass
§ 15.713(g)(3)(v)	Unsuccessful registration due to incomplete information	Pass
§ 15.713(e)(6)	Unsuccessful registration due to HAAT > 250 m	Pass
§ 15.713(e)(6)	Unsuccessful registration due to antenna height that exceeds 30 m	Pass
§ 15.713(g)(3)(i) and	Unsuccessful registration due to incomplete information – FCC ID and Serial	Deee
(ii)	number	Pass
§ 15.713(a)(1)	48-hour channel scheduling	Pass
§ 15.713(a)(3)	Relocation of fixed TVBD	Pass
§ 15.711(c)(2)(i)	Fixed & Mode II TVDB database update	Pass
§ 15.711(c)(2)(iii)	Low-power auxiliary device protection	Pass
§ 15.712	Interference protection requirements (Fixed and personal/portable)	Pass
§ 15.711(c)(2)(ii)	Fixed and Mode II Power level reduction	Pass
§ 15.711(j)	Security	Pass

2.2 Description of EUT during the test

During the test, keep the EUT in continuously transmitting mode.

There was no mechanical or circuitry modification to improve RF and spurious characteristic, and any RF and spurious suppression device(s) was not added against the device tested.

The EUT was moved throughout the X, Y, and Z axis and worst case data was recorded in this report.



2.3 Test configuration

Type of peripheral equipment used

Model	Manufacturer	Description	Connected to
650G1	HP	Notebook	EUT
PA-1900-32HT	LITE-ON TECHNOLOGY(CHANGZHOU_Co., Ltd.	Power Adapter	Notebook

2.4 Test Facility

- FCC Registration No: 927453
- IC Company address code: 9355B
- RRA Designation Number: KR0027

Place of Test

Anyang Test Site(RF Test Room)

#101 & B104 Anyang Megavalley, 268, Hagui-ro, Dongan-gu, Anyang-si, Gyeonggi-do, 14056, Korea



2.5 PRELIMINARY TEST

• Product description and theory of operation

- The TVWS base station is a outdoor unit that transmits independent carriers. Each carrier provides up to 32 Mbps by TVWS channels. The base station is deployed with an external SISO antenna. It is connected to the network through a SFP with AC input. The base station includes an GPS an external antenna. The base station main features include up to 32 Mbps throughput, up to 256 QAM modulation rates in 6 MHz channel bandwidths. The TVWS subscriber unit delivers up to 32 Mbps and includes a directional integrated flat panel antenna for quick and easy installation. TVWS is highly robust, a mandatory requirement for maintaining low operational costs in remote rural networks. The TVWS incorporates an embedded GPS, enabling dynamic spectrum allocation according to the regulation.

2.5.1 AC Power line Conducted Emissions Tests

Operation Mode	The Worse operating condition (Please check one only)
Transmitting mode.	X

2.5.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting mode.	Х



3. Measurement data

3.1 Fixed white space device registration

3.1.1 Requirement

• FCC Part15 subpart H, §15.713(g)(3)

3.1.2 Test Procedure

Prior to operating for the first time or after changing location, a fixed white space device must register with the white space database by providing the

information listed in paragraph (g)(3) of §15.713. Testing in accordance with KDB 416721 D01, III (2)(a)

3.1.3 Test environment

• 22 °C, 43 % R.H.



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3.1.5 Test Plots

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3.2 48-hour channel scheduling

3.2.1 Requirement

• FCC Part15 subpart H Section 15.713(a)(1), 15.711(c)(2)(iii)

3.2.2 Test Procedure

After receiving an available channel list, register a low-power auxiliary device on the WSD operating channel to operate on an available channel and in an upcoming time period when the device will be tested. Repeat the available channel request after the update interval and in the time period when the lowpower auxiliary device is scheduled to operate and confirm that the low-power device is accounted for in the schedule. Using the system management software, confirm that the device changes channels at the scheduled time. Testing in accordance with KDB 416721 D01, III (2)(h)

3.2.3 Test environment

• 22 °C, 43 % R.H.

3.2.4 Test Observations, settings

EUT implements a refresh time of 24 hours instead of 48-hour push notification wait.



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3.2.4 Test results

3.1.5 Test Plots

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3.3 Unsuccessful registration – restricted coordinates

3.3.1 Requirement

• FCC Part15 subpart H Section 15.713(g)(3)(iii)

3.3.2 Test Procedure

(3) The white space device registration database shall contain the following information for fixed white space devices:

(iii) Device's geographic coordinates (latitude and longitude (NAD 83));

3.3.3 Test environment

• 22 °C, 43 % R.H.

3.3.4 Test Observations, settings

EUT configured with incomplete information. The Contact TEL field has been intentionally left blank. After detecting the missing contact information, the EUT was identified as Fields missing when checking against the database.



3.3.4 Test Plots

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3.4 Unsuccessful registration due to incomplete information - FCC ID and Serial number

3.4.1 Requirement

• FCC Part15 subpart H Section 15.713(g)(3)(iii)

3.4.2 Test Procedure

- Configure the base EUT with missing contact information, e.g. email.
- The device software cannot proceed with registration and prompts user to enter the missing information.

3.4.3 Test environment

• 22 °C, 43 % R.H.

3.2.4 Test Observations, settings

The registration interface does not contain a mechanism by which the serial number or the FCC ID of the radio can be changed. The FCC ID and serial number are flash-programmed during the manufacturing process and could not be changed without being returned to the manufacturer.



3.5 Unsuccessful registration due to HAAT > 250 m

3.5.1 Requirement

• FCC Part15 subpart H Section 15.713(e)(6)

3.5.2 Test Procedure

A fixed device with an antenna height above ground that exceeds 30 meters or an antenna height above average terrain (HAAT) that exceeds 250 meters shall not be provided a list of available channels.

3.5.3 Test environment

• 22 °C, 43 % R.H.

3.5.4 Test Observations, settings

EUT was configured with information that included a location with HAAT of more than 250 m. It was verified, that after database rejection, the EUT didn't start the transmission.

To test this feature the device was configured with invalid information and requested to transmit on the channel. Once the database responded with an empty channel list as a result of the antenna height above ground, or excessive HAAT, the EUT didn't start to transmit.



3.5.4 Test Plots

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PAWS Token	d-fb11e66F-80ff-4312-8041-c41304		
Serial Number	WS35-236-0000016		
FCC ID	TEST-FCC-ID		
Manufacturer ID	NZIA		
Model ID	NZC-W835		
Ruleset ID	FccTvBandWhiteSpace-2010		
Device Type	Fixed V		
Location	lattude longitude 37.19379 -79.2317		
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3.6 Unsuccessful registration due to antenna height that exceeds 30 m

3.6.1 Requirement

• FCC Part15 subpart H Section 15.713(e)(6)

3.6.2 Test Procedure

A fixed device with an antenna height above ground that exceeds 30 meters or an antenna height above average terrain (HAAT) that exceeds 250 meters shall not be provided a list of available channels.

3.6.3 Test environment

• 22 °C, 43 % R.H.



3.5.4 Test Plots

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Manufacturer ID	NZIA	
Model ID	NZC-WS35	
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3.7 Relocation of fixed TVBD

3.7.1 Requirement

• FCC Part15 subpart H Section 15.713(a)(3)

The white space database serves the following function:

(3) To register the identification information and location of fixed white space devices and unlicensed wireless microphone users.

The Data base will not provide a channel list for a fixed TVBD at a location other than that registered.

3.7.2 Result

The implementation of the location input prevents the radio from requesting channels from another location other than the last successful registration. It is not possible for the user to input location information into the radio that would result in a channel request from a different location other than the current registration location. In the event of a change in the input location information, a new registration and channel request are sent using the same entered registration location information.



3.8 Fixed & Mode II TVDB database update

3.8.1 Requirement

• FCC Part15 subpart H Section 15.711(c)(2)(i), 15.711(h)

3.8.2 Test Procedure

Each fixed white space device must access a white space database over the Internet to determine the available channels and the corresponding maximum permitted power for each available channel that is available at its geographic coordinates, taking into consideration the fixed device's antenna height above ground level and geolocation uncertainty, prior to its initial service transmission at a given location. Testing in accordance with KDB 416721 D01, III(2)(e)

3.8.3 Test environment

• 22 °C, 43 % R.H.

3.8.4 Test Observations, settings

EUT was configured with proper registration information and the successful registration was verified. Database URL was modified from sandbox-paws.wavedb.uk to paws-usa.wavedb.ca. After the time of channel allocation has passed it was verified that without the proper database access the EUT received empty channel list and stopped the transmission. Then the URL was changed back to and it was verified that with the proper database access the EUT received a channel list and started the transmission. Testing was repeated with Base station disconnected from the internet and it was verified, that after refresh time both EUTs ceased transmission.



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3.8.4 Test Plots

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ESE. we Writer - MCOM L Set NZC-WS35 State = 51 192.168.200.254 L Set "error * Unable to get channel information. Mireless Network: V vvv D D (Inct I larly The Device Configuration section cover physical setlings of the radio hardware sch as channel, tarent defined writers Device Configuration General Setup Advanced Setlings NCT14/F Setlings Current Mode BS Catagete DCFE	In - [Smitph_ ← Work Regrame_	Z Document G +Gov 25 24 S KHE (R⊥14	3
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3.9 Low-power auxiliary device protection

3.9.1 Requirement

• FCC Part15 subpart H Section 15.711(c)(2)(i), 15.711(h)

3.9.2 Test Procedure

Each fixed white space devices shall access the database at least once a day to verify that the operating channels continue to remain available. Each fixed white space device must adjust its use of channels in accordance with channel availability schedule information provided by its database for the 48-hour period beginning at the time the device last accessed the database for a list of available channels.

Use of database protected entity interface to register protection for a low-power auxiliary device in the same location and channel which EUT has selected and operating. The registered protection for the low-power auxiliary device should be scheduled within the next 48-hour period. Testing in accordance with KDB 416721 D01, III (2)(I). (2)(e)

3.9.3 Test environment

• 22 °C, 43 % R.H.

3.9.4 Result

EUT was configured with proper registration information and the successful registration was verified. Meantime it was scheduled with WSDB that channel 30 would be registered for low-power device. After the time of channel allocation of the EUT has passed it was verified that the EUT stopped the transmission on the temporary restricted and removed from the channel list.



3.9.5 Test Plots





3.10 Interference protection requirements (Fixed and personal/portable)

3.10.1 Requirement

• FCC Part15 subpart H Section 15.712

3.10.2 Test Procedure

Using system management software or database, provide different location (coordinates) so that compliance with operating channel and power level is shown under each of the scenarios outlined in §15.712. Include a sample scan showing the total channel power and adjacent channel emission settings for test coordinates.

3.10.3 Test environment

• 22 °C, 43 % R.H.

3.10.4 Result

EUT was configured with proper registration information and the successful registration was verified. By changing the coordinates, the channels and limiting channels were checked.

When a device updates its channel list, the device disappears from the channel selection on the GUI when trying to set up a restricted channel.



3.10.5 Test Plots

	← → ♂ ▲ 주의 요설 192.168.200.254/cgi-bin/luci/admin/s			
NCKYSS Note Note Note Note Note Note Note Note				* 0 1 0 1
	NZC-WS	35 Status +	System + VPN + Network + Logout - TVWS BS (Decayor coverage)	
		Download DIR	/imp/update/	
<pre>Numerican Section /pre>	PAWS	Info		
		PAWS URL	https://sandbox-paws.wsdb.uk	
		DAINE Tokon	4 644-000 006 4313 0044 -44304	
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<pre>intermediate intermediate /pre>		Model ID	NZC-WSdb	
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<pre>view view view view view view view view</pre>		Location	37.8883 -777.0287	
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Outcome Use third Image:		Semi Minor Axis	5	
		Orientation	0	
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<pre>interview of the interview of the i</pre>	User Ir	ıfo		
And and a state of the state	user informat	don	Name	
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	Central S Of Interface General St	Current Mode Status Domling frequency Configuration etup Mode ESSIQ Network Hole ESSIQ WAM Mode	BS SBD: NZA! Mode: BS Weeks and accounts SBD: NZA! Mode: BS SBD: NZA! MODE: BS SB	



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	NZC-WS35 Status -	System + VPN + Network + Logaut	AT TVWS BS INTO REFRESHON	
	not11al0: Master "NZIA" w	ilan0: Master "NZIA-E84E06A6F241"		
	Wireless Network The Device Configuration section defined wireless metworks (if the r Configuration.	c: TVWS BS (nct11af0) covers physical settings of the radio hardware such as channel, transmit power alido hardware is multi-SSID capabile). Per network settings like encryption or of the setting of the setting of	r or anterina selection which are shared among all peration mode are grouped in the Interface	
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	Current Mode	BS Change to CPE		
	Status	SSID: NZIA Mode: BS 0% Wireless is not associated		
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	Hide ESSID	50 (689 MHz / 35 dbm) 51 (695 MHz / 35 dbm)		
	WMM Mode			
	Module	WSM-35(1W) ~		
29% ⊼⊒	Q 김색	📾 L 🖻 🧍 🎽 C 🛛 🕿 O 🦉	a 🖉 📮 🤨 🖼 🚆 🔹 o o	G A ♀ ≪ ► 2024-07-11 ♥ 4
	Before o	coordinate change Ch	annel List : 23	



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, and the second s	x 0 1 👼 :
NZC-WS35 Status -	System + VPN + Network + Logout 🛋 TWVS BS
PAWS Token	d-tb11e66F-80F-4312-8041-e41304
Satial Mumber	W\$35-236-000016
FCC ID	TEST-FCC-ID
Manufacturer ID	NZIA
Model ID	NZC-WS35
Ruleset ID	FccTvBandWhiteSpace-2010
Device Type	Fixed V
Location	1810-de longitude 137.19379 79.2317
Confidencen	95
Semi Maior Axis	10
Semi Minor Axis	5
Orientation	V Height Type Height Uncertainty ACL > 20 0
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▼ ▼ NZC-WS35 - Wireless - LuC1 × +	
← → C (△ 수역 요청 192.168.200.254/cgi-bin/luci/admin/network/wireless/n	ct11af0.network1 ☆ 2 0 2 0 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2
NZC-WS35 Status +	System + VPN + Network + Logout IVWS BS AUTORETRESION
nct11af0: Master "NZIA"	Wan0: Master "NZIA-E84E00A0F211"
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NZ	C-WS35 Status	System + VPN + Network + Logout	
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Dev	/ice Configuratior		
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	Current Mode	BS	
		Change to CPE	
	Status	SID: NZIA Mode: BS 0% Wireless is not associated	
inte ©	Operating frequency erface Configurati eneral Setup Wireles Mode ESSUE	Mode Channel Weth CH Mode TVWS 114 (473 MHz/ 35 dbm) WM MHz/ uso paws Trans 114 (473 MHz/ 35 dbm) M MHz/ uso paws Channel 14 (474 MHz/ 35 dbm) Mode M MHz/ Starting 2 (575 MHz/ 35 dbm) Mode M MHz/ 2 (575 MHz/ 35 dbm) 2 (575 MHz/ 35 dbm) Mode M Settings 2 (575 MHz/ 35 dbm) 2 (575 MHz/ 35 dbm) M Settings M Settings 2 (575 MHz/ 35 dbm) 2 (575 MHz/ 35 dbm) M Settings M Settings 2 (575 MHz/ 35 dbm) 2 (575 MHz/ 35 dbm) M Settings M Settings 2 (575 MHz/ 35 dbm) 2 (575 MHz/ 35 dbm) M Settings M Settings	
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	WMM Mode		
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	After	coordinate change Channel List : 22	



3.11 Fixed and Mode II Power level reduction

3.11.1 Requirement

• FCC Part15 subpart H Section 15.711(c)(2)(ii), 15.715(e)

3.11.2 Test Procedure

Using system management software, make a channel availability request to the database. Using the spectrum analyzer, confirm that the WSD operates at no more than the maximum power level indicated by the database and that the power level cannot be set to a higher level than indicated by the database at that specific location. If the device cannot reduce power, it must cease operation. Testing in accordance with KDB 416721 D01, III (2)(o).

3.11.3 Test environment

• 22 °C, 43 % R.H.

3.11.4 Result

You receive a list of available channels from the channel server and store it in a structure. As the code processes this list, it generates a list of usable channels. However, if the channel is 36, 37, 38, 45, or 46, it will be ignored and not included in the list.

• Brief description of the two plots before and after (comparison).

In Plot 1, the information about the available channels from the server is displayed. Plot 2 shows the channels that are actually usable on the equipment among the available channels received from the server.

In Plot 1, channel 36, which is unavailable, is included, as well as channels 47, 48, 49, and 50, which are subject to output limitations lower than the equipment's output. These channels are removed from the available list provided to the user, as shown in Plot 2. Similarly, channel 36 is also removed from the list because it is unavailable, ensuring that it is not provided to the user, just like in Plot 2.

3.11.5 Test Plots

PAWS Information	
PAWS URL	https://sandbox-paws.wsdb.uk
PAWS Token	d-1b11e66f-80ff-4312-8041-c41304
Serial Number	WS20-23A-0000035
FCC ID	TEST-FCC-ID
Manufacturer ID	NZIA
Model ID	NZC-WS20
Ruleset ID	FocTvBandWhiteSpace-2010
Device Type	Fixed ~
Location	latitude longitude 37.8883 -77.0287
Confidencen	95
Semi Major Axis	10
Semi Minor Axis	5
Orientation	٥
Antenna	Height Type Height(m) Height Uncertainty AGL 29 0



Wireless Netw	vork: TVWS BS (nct11af0)
The Device Configuration s defined wireless networks (Configuration :	action covers physical settings of the radio hardware such as channel, transmit power or an if the radio hardware is multi-SSID capable). Per network settings like encryption or operativ
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Current N	ode BS
	Change to CPE
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Interface Configur	ation 22 (521 MHz / 42 dbm) 23 (527 MHz / 42 dbm)
General Setup Win	Hess Security 24 (533 MHz / 42 dbm) :ed Settings 25 (533 MHz / 42 dbm) :ed Settings
N	ode Bases (27 (551 MHz / 42 dom)) 28 (557 MHz / 42 dom) 29 (556 MHz / 42 dom)
ES	SID NZIA 30 (569 MHz / 42 dbm) 31 (575 MHz / 42 dbm) 36 (576 MHz / 42 dbm)
Net	vork not118 33 (587 MHz / 42 dom) Q Ch3 a (593 MHz / 42 dom) Ch3 a (593 MHz / 42 dom) Ch3 a (590 MHz / 42 dom) Lto attach to this wireless interface or fill out the
Hide <u>ES</u>	33 (399 WHz / 42 0001) 36 (605 MHz / 38 00m) <u>SID</u> 47 (671 MHz / 24 0bm)
Wireless Netwol The Device Configuration section defined wireless networks (if the Configuration.	k: TVWS BS (nct11af0) n covers physical settings of the radio hardware such as channel, transmit power or a radio hardware is multi-SSID capable). Per network settings like encryption or operat
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	Char 23 (527 MHz / 42 dbm) 24 (533 MHz / 42 dbm) 25 (59 MHz / 42 dbm)
Interface Configuration	26 (545 MHz / 42 dbm) 27 (551 MHz / 42 dbm)
General Setup Wireless	Security 28 (557 MHz / 42 dbm) :ed Settings 29 (563 MHz / 42 dbm) :ed who =
Mode	Base S 31 (575 MHz/ 42 dbm) 32 (581 MHz/ 42 dbm)
ESSID	NZIA 34 (599 MHz / 42 dbm) 35 (599 MHz / 42 dbm)
Network	36 (605 MHz / 26 dom) not11a 47 (57 MHz / 24 dom) 48 (677 MHz / 24 dom) 10 of the unit
Hide <u>ESSID</u>	50 (695 MHz / 24 00m) 51 (695 MHz / 40 0bm)
List of shannel	supported by all DB servers (Plett)
List of channels	



	verwor	k: TVWS	BS (nct	11af1)			
The Device Config defined wireless ne Configuration.	uration section tworks (if the i	covers physical s adio hardware is	settings of the ra multi-SSID capa	adio hardware such as channel, trans able). Per network settings like encry	smit power or antenna ption or operation mo	a selection which are shared amo ode are grouped in the <i>Interface</i>	ong all
Device Confi	guration						
General Setup	Advanced	Settings N	CT11AF Settings	s			
с	urrent Mode	BS					
		Change to Cl	PE				
	Status	SSID: NZI 0% Wireless is	IA_PAWS Mod is not associated	le: BS			
Operatir	na frequency	Mode Channe	el 5 MHz / 42 dbm)	Width CH Mode	hannel		
	.,,	14 (473 Chan 15 (479	3 MHz / 42 dbm 9 MHz / 42 dbm	1) ode			
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3.12 Security

3.12.1 Requirement

• FCC Part15 subpart H Section 15.711(j)

3.12.2 Test Procedure

White space devices shall incorporate adequate security measures to ensure that they are capable of communicating for purposes of obtaining lists of available channels only with databases operated by administrators authorized by the Commission, and to ensure that communications between white space devices and databases are secure to prevent corruption or unauthorized interception of data. This requirement applies to communications of channel availability and other spectrum access information between the databases and fixed and Mode II devices (it is not necessary for white space devices to apply security coding to channel availability and channel access information where they are not the originating or terminating device and that they simply pass through).

3.12.3 Test environment

• 22 °C, 43 % R.H.



3.12.4 Result

Information provided by the manufacturer.

i. What communication protocol is used between the database and the WSD?

The Fixed WSD connects to the database using HTTPS over SSL/TLS. The database is certified by FCC which includes the protocol of how WSD interact with the database.

ii. How are communications initiated?

When the WSD is booted, the WSD accesses the URL set through the DNS and gateway and performs a handshake through SSL authentication to create a session of security communication. WSD begins communication with the database by sending INIT_REQ messages containing non-modifiable WSD technicians given by the manufacturer.

The WSD Descriptor contains;

• the device serial number

• manufacturer ID

• model ID

• FCC ID

iii. How does the WSD validate messages from the database?

SSL certificate verification through a standard third-party certification authority mechanism identifies the database and ensures that communication between WSD and the database is secure and authenticated.

iv. How does the device handle failure to communicate or authenticate the database?

If the WSD fails to communicate with the database, the device immediately stops communicating with the TVWS. The device then retries communication with the database every 10 seconds

v. How does the database validate messages from a WSD?

The database needs a specific API key given by the manufacturer to check the message of the WSD. Only a device with an API key registered in the database may receive communication from the database. The database verifies the validity of the WSD by matching the provided serial number, model ID, FCC ID and API key.

vi. What encryption method is used?

SSL/TLS1.2 encryption is used to encrypt packets sent between the WSD and the database.

vii. How does the database ensure secure registration of protected devices?

The database provides a public interface for registering a device. To access this interface, you must use authorized accounts, user names, and passwords to access the database web interface.



3.13 Location accuracy

3.13.1 Requirement

• FCC Part15 subpart H Section §15.711(b)

3.13.2 Test Procedure

For Fixed and Mode II devices, provide details regarding the technologies used by the device to determine its location and how, in case of other than GPS technology, the location uncertainty is calculated with a 95% confidence level

3.13.3 Results

EUT uses GPS technology for determining location.

The GPS manufacturer was confirmed to confirm that the corresponding details were supported.



4. Test equipment list

Use	Model Number	Manufacturer	Description	Serial Number	Cal. Date.(Interval)
\boxtimes	AMP 20-1000	INFINITECH	BROADBAND PRE-AMP	2013 05 00003	Dec 21, 2023(1Y)
\boxtimes	DS 2000S	Innco GmbH	Turn Table	N/A	N/A
\boxtimes	MA4000-EP-HS	Innco GmbH	Antenna Mast	N/A	N/A
\boxtimes	MA4640-XP-ET	Innco GmbH	Tilt Antenna Mast	N/A	N/A
\boxtimes	CO3000	Innco GmbH	Controller	N/A	N/A
\boxtimes	CO3000	Innco GmbH	Controller	N/A	N/A
\boxtimes	N9020A	Agilent	Spectrum Analyzer	MY50200260	Dec 21, 2023(1Y)
\boxtimes	FSV3007	R&S	Spectrum Analyzer	101334	Jun 18, 2024(1Y)
\boxtimes	6502	EMCO	Loop Antenna	9609-3087	Oct 23, 2023(2Y)
\boxtimes	VULB 9168	SCHWARZBECK	Bi-Log Antenna	180	Nov 16, 2022(2Y)
\boxtimes	8449B	Agilent	Preamplifier	3008A02013	Dec 21, 2023(1Y)
\boxtimes	3115	EMCO	Horn Antenna	9402-4229	Oct 23, 2023(2Y)
\boxtimes	ESCI7	Rohde & Schwarz	EMI Test Receiver	100938	Dec 21, 2023(1Y)
\boxtimes	ESH-Z2	Rohde & Schwarz	Pulse Limter	101631	Jun 17, 2024(1Y)
\boxtimes	ENV216	Rohde & Schwarz	LISN	101264	Jun 17, 2024(1Y)
\boxtimes	PE7019-20	PASTERNACK	Attenuator	TEMP_1	Jun 18, 2024(1Y)
\boxtimes	ES-SCAN	Rohde & Schwarz	EMI Software	N/A	N/A
\boxtimes	EMC32	Rohde & Schwarz	EMI Software	N/A	N/A
	SAS-574	A.H.Systems	Horn Antenna	595	Jun 21, 2024(2Y)
	PAM-840A	Com-power	Preamplifier	461334	Dec 21, 2023(1Y)