EMF TEST REPORT

Report number		RAPA22-O-057
Applicant	Name	Innonet Co., Ltd.
	Logo	N/A
	Address	Building C, Office 417, Munjeong Hyundai Knowledge Industry Center, 7, Beobwon-ro 11-gil, Songpa-gu, Seoul 05836
Manufacturer	Name	Innonet Co., Ltd.
	Address	Building C, Office 417, Munjeong Hyundai Knowledge Industry Center, 7, Beobwon-ro 11-gil, Songpa-gu, Seoul 05836
Type of equipment		Fixed TVWS Gateway
Basic model name		BUHST10
Multi model name		N/A
Serial number		N/A
FCC ID		2A9R3-BUHST10
Test duration		December 1, 2022 to December 26, 2022
Date of issue		December 27, 2022
Total page		8 Pages (including this page)

SUMMARY

The equipment complies with the regulation; FCC Part 15 Subpart C Section 15.247

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.

December 27, 2022

Tested by MinGu Ji
Tester

December 27, 2022

Reviewed by Wooyeol- Ryu
Executive Manager

Test Report Version History

Version	Date	Reason for revision
1.0	December 27, 2022	Original Document

CONTENTS

1. Description of EUT

1.1 Applicant

• Company name : Innonet Co., Ltd.
• Address : Building C, Office 417, Munjeong Hyundai Knowledge Industry Center, 7, Beobwon-ro 11-gil, Songpa-gu, Seoul 05836
• Contact person : Tae Hyun Kim / Researcher / thkim@innonet.net
• Phone/Fax : +82-2-406-8849 / +82-2-3012-8101

1.2 Manufacturer

• Company name : Innonet Co., Ltd.
• Address : Building C, Office 417, Munjeong Hyundai Knowledge Industry Center, 7, Beobwon-ro 11-gil, Songpa-gu, Seoul 05836
• Phone/Fax : +82-2-406-8849 / +82-2-3012-8101

1.3 Basic description

• Product name : Fixed TVWS Gateway
• Basic model name : BUHST10
• Alternative model name : N/A

1.4 General description

• EQUIPMENT CLASS : DTS – Digital Transmission Systems
• Frequency Range : 2 412 MHz ~ 2 462 MHz (802.11n(HT20))
: 2 402 MHz ~ 2 480 MHz (BT LE)
• Output Power : WLAN : 26.17 dBm
: BT : -0.356 dBm
• Modulation Type : QPSK, 16QAM, GFSK
• Antenna Type : WLAN : Dipole Antenna,
BT : Chip Antenna
• Antenna Gain : WLAN : SISO : 5.54 dBi ,
MIMO(ANT0+ANT1) : 8.55 dBi
BT : 4.18 dBi
• Power Supply : DC 24.0 V

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 C		
Section	**Description of Test**	**Result**
15.247 (a) (2)	Minimum 6 dB Bandwidth	Pass
15.247 (b) (3)	Maximum Peak Conducted Output Power	Pass
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Pass
	Radiated Emission which fall in the Restricted Band	Pass
15.247 (e)	Peak Power Spectral Density	Pass
15.207	Conducted Limits	Pass
15.209	Radiated Emission Limits	Pass
15.203	Antenna Requirement	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
TVWS-GW-PSU	Innonet Co., Ltd.	AC/DC Adapter	EUT
650G1	HP	Notebook	EUT
PA-1900-32HT	LITE-ON TECHNOLOGY(CHANGZHOU_Co., Ltd.	Power Adapter	Notebook

2.4 Test Facility

• FCC Registration No: 931589
• 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

3. MAXIMUM PERMISSIBLE EXPOSURE

3.1 RF Exposure Calculation

KDB 447498 was used as the guidance.

3.2 EUT Description

Kind of EUT	Fixed TVWS Gateway
Operating Frequency Band	☐ Wireless Microphone: 494.000 MHz ~ 501.000 MHz and 498.200 MHz ~ 505.200 MHz ■ WLAN: 2 412 MHz ~ 2 462 MHz ☐ WLAN: 5 180 MHz ~ 5 240 MHz ☐ WLAN: 5 745 MHz ~ 5 825 MHz ☐ Bluetooth: 2 402 MHz ~ 2 480 MHz ■ Bluetooth BLE: 2 402 MHz ~ 2 480 MHz ☐ Other : 2410 MHz ~ 2 480 MHz
MAX. RF OUTPUT POWER	26.67 dBm
Antenna Gain	8.55 dBi
Exposure Evaluation Applied	■ MPE ☐ SAR Exclusion ☐ N/A

3.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(dBm)	(mW)	Log	Linear			
2 412 ~ 2 462	802.11n(HT20)	26.17 ± 0.5	26.67	464.51	8.55	7.161	16.26	0.661 8	1.00
2 402 ~ 2 480	BT LE	-0.36 ± 0.5	0.14	1.03	6.0	3.981	0.57	0.000 364	1.00

According to above table, for 2 400 ~ 2 483.5 MHz Band, safe distance,

$D = 0.282 * \sqrt{(464.51 * 7.161)/1.00} = 16.26$ cm

For getting power density at 20 cm separation in above table, following formula was used.

$S = P * G / (4\pi * R^2) = 464.51 * 7.161 / (4 * 3.14 * 20^2) = 0.661\ 8$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna

Tested by MinGu Ji
/ Tester