FCC and ISED Test Report

HID Global Corporation (US)
BluFi™ POE 5G with Universal Power, Model: BluFI-UP00

In accordance with FCC 47 CFR Part 15C, ISED RSS-247 and ISED RSS-GEN (2.4 GHz WLAN)

Add value.
Inspire trust.

Prepared for: HID Global Corporation (US)
600 Corporate Drive
Suite 300
Fort Lauderdale
FL 33334
UNITED STATES

FCC ID: 2BCL8BVBFPOEUP IC: 24824-BVBFPOEUP

COMMERCIAL-IN-CONFIDENCE

Document 75957186-07 Issue 03

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	05 September 2023

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C, ISED RSS-247 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Ahmad Javid	05 September 2023	

FCC Accreditation
492497/UK2010 Octagon House, Fareham Test Laboratory

ISED Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2021, ISED RSS-247: Issue 2 (02-2017) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.

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Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	06-July-2023
2	To update FCC ID	30-August-2023
3	Third Issue – Update of IC	05-September-2023

Table 1

1.2 Introduction

Applicant	HID Global Corporation (US)
Manufacturer	HID Global Corporation (US)
Model Number(s)	BluFI-UP00
Serial Number(s)	13967299199488037823, 95740613335981387 and 15079350142442990976
Hardware Version(s)	1.4
Software Version(s)	WIFI 2015 BLE 451
Number of Samples Tested	3
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2021 ISED RSS-247: Issue 2 (02-2017) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number Date	1180900792 30-November-2022
Date of Receipt of EUT	12-December-2022 and 11-April-2023
Start of Test	19-January-2023
Finish of Test	30-April-2023
Name of Engineer(s)	Ahmad Javid
Related Document(s)	ANSI C63.10 (2020) KDB 996369 D04 Module Integration Guide v02 ANSI C63.10 (2013) ANSI C63.4 (2014)

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, ISED RSS-247 and ISED RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15C	RSS-247	RSS-GEN			
Configuration and Mode: 2.4 GHz WLAN - Internal Antenna						
2.1	15.209 and 15.247 (d)	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	
Configuration and Mode: 2.4 GHz WLAN - External Antenna						
2.1	15.209 and 15.247 (d)	3.3 and 5.5	6.13 and 8.9	Spurious Radiated Emissions	Pass	

Table 2

1.4 Application Form

Equipment Description

Technical Description: *(Please provide a brief description of the intended use of the equipment including the technologies the product supports)*	•Gateway that can accept a variety of WIFI spectrums, 2.4 and 5 Ghz. •Gateway that uses a provides universal power adapter to handle multiple input voltages. Allows gateway to be powered by variety of HID and-or third-party accessories. These can include, but are not necessarily limited to: 9V, 12V, Solar, External Batteries, POE, USB, etc. •Compatible with Bluetooth low-energy (BLE) radio that is capable of transmitting and receiving all standard HID IOT sBeacon, tracking packets.
Manufacturer:	HID Global
Model:	BluFI-UP00
Part Number:	BVBFPOEUP
Hardware Version:	1.4
Software Version:	WIFI 2015 BLE 451
FCC ID of the product under test – see guidance here	2BCL8BVBFPOEUP
IC ID of the product under test – see guidance here	24824-BVBFPOEUP

Table 3

Intentional Radiators

Technology	BLE	BLE	BLE	WiFi	WiFi (5GHz)	
Frequency Range (MHz to MHz)	2402-2483.5	2402-2483.5	2402-2483.5	2412-2462	5.150-5.250	
Conducted Declared Output Power (dBm)	5	5	5	12	12	
Antenna Gain (dBi)	0	10	2	0	0	
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	1	1	1	2.4	20,40,80	
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	GFSK	GFSK	GFSK	OFDM	OFDM	
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)						
Bottom Frequency (MHz)	2402	2402	2402	2402	5150	
Middle Frequency (MHz)	2439	2439	2439	2439	5200	
Top Frequency (MHz)	2483.5	2483.5	2483.5	2483.5	5250	

Table 4

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	
Lowest frequency generated or used in the device or on which the device operates or tunes	
Class A Digital Device (Use in commercial, industrial or business environment) ☒ Class B Digital Device (Use in residential environment only) ☐	

Table 5

AC Power Source

AC supply frequency:		Hz
Voltage	9-24V 57V POE	V
Max current:		A
Single Phase ☐ Three Phase ☐		

Table 6

DC Power Source

Nominal voltage:	9-24 DC or 57V PoE	V
Extreme upper voltage:	24V or 57V PoE	V
Extreme lower voltage:	9V	V
Max current:	0.117 at 9V	A

Table 7

Battery Power Source

Voltage:		V
End-point voltage:		V *(Point at which the battery will terminate)*
Alkaline ☐ Leclanche ☐ Lithium ☐ Nickel Cadmium ☐ Lead Acid* ☐ **(Vehicle regulated)*		
Other ☐ Please detail:		

Table 8

Charging

Can the EUT transmit whilst being charged	Yes ☐ No ☐

Table 9

Temperature

Minimum temperature:	-20	°C
Maximum temperature:	+85	°C

Table 10

Cable Loss

Adapter Cable Loss (Conducted sample)		dB

Table 11

Antenna Characteristics

Antenna connector ☐			State impedance	50	Ohm
Temporary antenna connector ☐			State impedance	50	Ohm
Integral antenna ☑	Type:	Pifa	Gain	0	dBi
External antenna ☑	Type:	Dipole	Gain	9.4	dBi
For external antenna only: Standard Antenna Jack☑If yes, describe how user is prohibited from changing antenna (if not professional installed): Equipment is only ever professionally installed ☑ Non-standard Antenna Jack ☐ All part 15 applications will need to show how the antenna gain was derived either from a manufacturer data sheet or a measurement. Where the gain of the antenna is inherently accounted for as a result of the measurement, such as field strength measurements on a part 15.249 or 15.231 device, so the gain does not necessarily need to be verified. However, enough information regarding the construction of the antenna shall be provided. Such information maybe photographs, length of wire antenna etc.					

Table 12

Ancillaries (if applicable)

Manufacturer:		Part Number:	
Model:		Country of Origin:	

Table 13

I hereby declare that the information supplied is correct and complete.

Name: Matthieu Behroozi

Position held: Product Manager

Date: 05 June 2023

1.5 Product Information

1.5.1 Technical Description

Gateway that can accept a variety of WIFI spectrums, 2.4 GHz and 5 GHz.

Gateway that uses a provides universal power adapter to handle multiple input voltages. Allows gateway to be powered by variety of HID and-or third-party accessories. These can include, but are not necessarily limited to: 9V, 12V, Solar, External Batteries, POE, USB, etc.

Compatible with Bluetooth low-energy (BLE) radio that is capable of transmitting and receiving all standard HID IOT sBeacon, tracking packets.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: BluFI-UP00, Serial Number: 95740613335981387			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: BluFI-UP00, Serial Number: 13967299199488037823			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: BluFI-UP00, Serial Number: 15079350142442990976			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: BluFI-UP00, Serial Number: 95740613335981387			
1	Reduction in length of internal Coaxial RF cables to SNA bulk head and rerouting of UART cables (only used for commanding of Certification firmware, not present in final product).	Matthieu Behroozi	06-April-2023
2	Reduction in length of internal Coaxial RF cables to SNA bulk head and rerouting of UART cables (only used for commanding of Certification firmware, not present in final product) Replaced the PCB to a functioning one for the WiFi test.	Matthieu Behroozi	27-April-2023

Table 14

1.8 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4 GHz WLAN - Internal Antenna		
Spurious Radiated Emissions	Ahmad Javid	UKAS
Configuration and Mode: 2.4 GHz WLAN - External Antenna		
Spurious Radiated Emissions	Ahmad Javid	UKAS

Table 15

Office Address:

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Spurious Radiated Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209 and 15.247 (d)
ISED RSS-247, Clause 3.3 and 5.5
ISED RSS-GEN, Clause 6.13 and 8.9

2.1.2 Equipment Under Test and Modification State

BluFI-UP00, S/N: 13967299199488037823 - Modification State 0
BluFI-UP00, S/N: 95740613335981387 - Modification State 0
BluFI-UP00, S/N: 95740613335981387 - Modification State 1
BluFI-UP00, S/N: 95740613335981387 - Modification State 2
BluFI-UP00, S/N: 15079350142442990976 - Modification State 0

2.1.3 Date of Test

19-January-2023 to 30-April-2023

2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.

At the request of the applicant, investigation measurements were performed from 1-8 GHz on both the internal and external antenna port for the following operational modes:

- 802.11b, 1 Mbps, 2412 MHz (CH1)
- 802.11g, 54 Mbps, 2412 MHz (CH1)
- 802.11n, HT20 MCS0, 2412 MHz (CH1)

The above was performed using the DC 9V – 56 V Power Adaptor.

The worst case mode from the above was identified as 802.11b and measurements from 1-8 GHz were repeated using the POE.

The remainder of the test was then performed on the power source resulting in the worst emissions profile which was the 9V – 56 V Power Adaptor

Measurements were only performed over the frequency range specified in FCC Part 15.35(b) as required by KDB 996369 D04, clause 3.4.

Ports on the EUT were terminated with loads as described in ANSI C63.4 clause 6.2.4. For EUT's with multiple connectors of the same type, additional interconnecting cables were connected, and pre-scans performed to determine whether the level of the emissions were increased by >2 dB.

The plots shown are the characterisation of the EUT. The limits on the plots represent the most stringent case for restricted bands, (74/54 dBuV/m) when compared to 20 dBc outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

Where formal measurements have been necessary, the results have been presented in the emissions table.

2.1.5 Example Test Setup Diagram

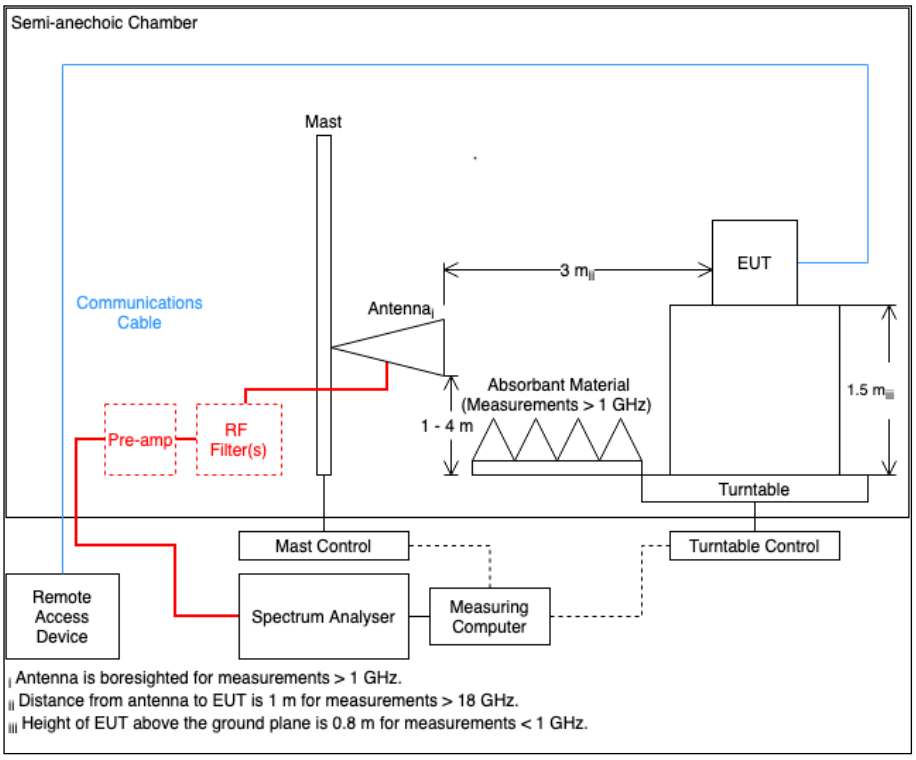

Figure 1

2.1.6 Environmental Conditions

Ambient Temperature	20.4 - 21.2 °C
Relative Humidity	32.1 - 35.1 %

2.1.7 Test Results

2.4 GHz WLAN - Internal Antenna

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
265.466	38.75	46.02	-7.27	Q-Peak	276	100	Vertical
271.409	38.13	46.02	-7.89	Q-Peak	59	104	Horizontal

Table 16 - 2412 MHz (CH1), 802.11b, 30 MHz to 13 GHz

No other emissions found within 10 dB of the limit.

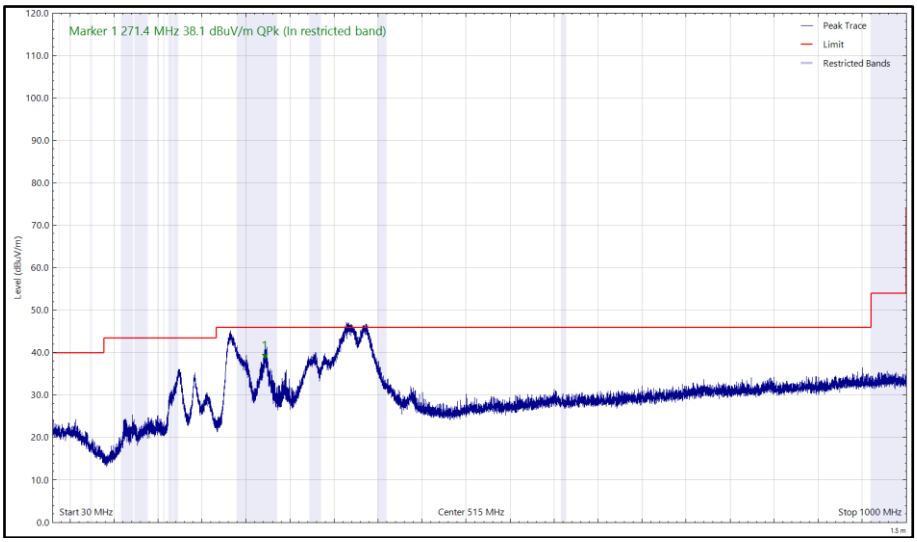

Figure 2 - 2412 MHz (CH1), 802.11b, 30 MHz to 1 GHz, Horizontal (Peak)

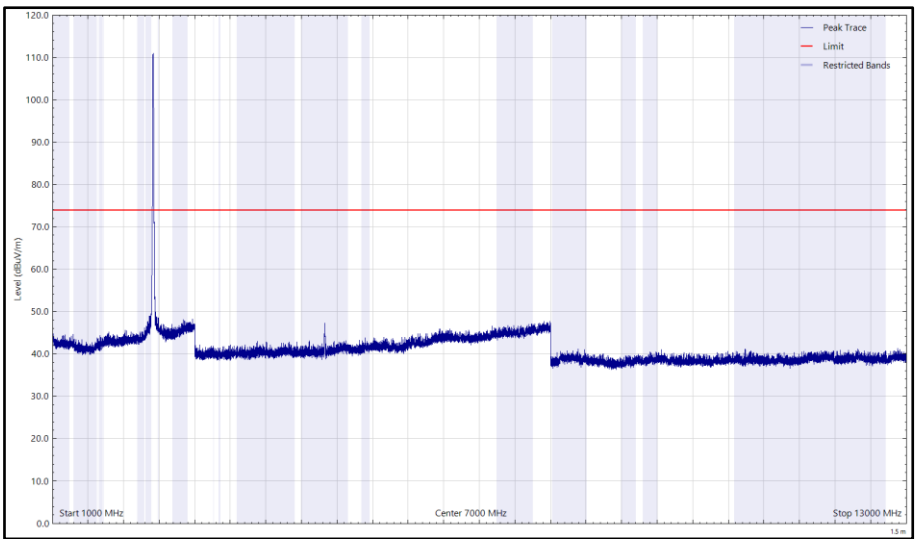

Figure 3 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Horizontal (Peak)

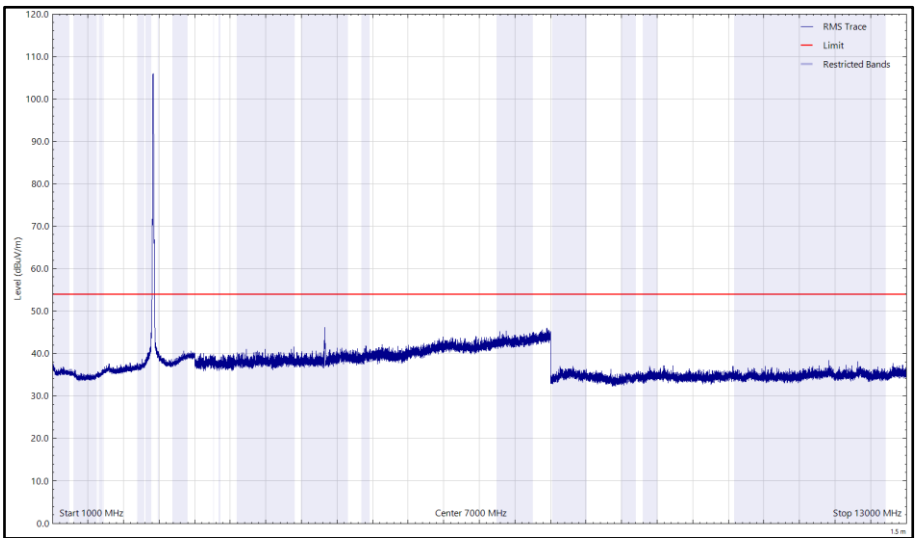

Figure 4 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Horizontal (rms)

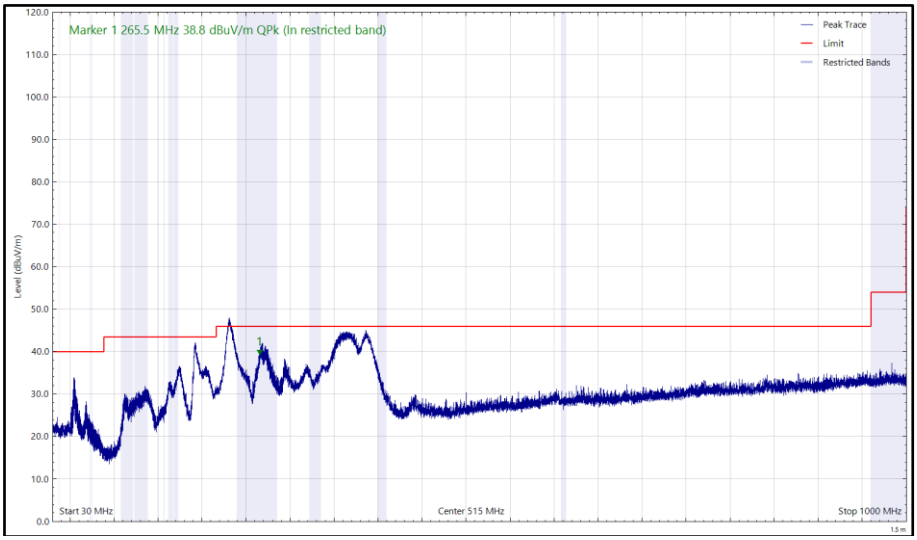

Figure 5 - 2412 MHz (CH1), 802.11b, 30 MHz to 1 GHz, Vertical (Peak)

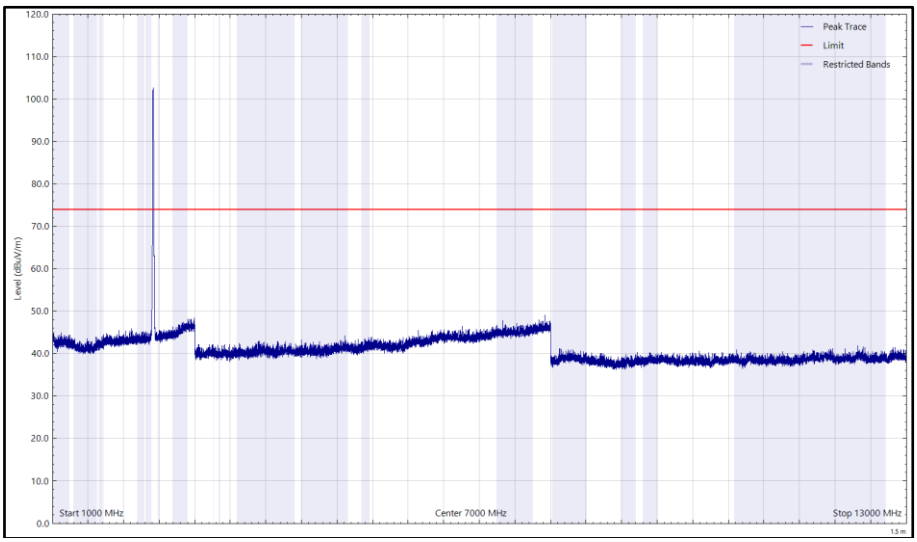

Figure 6 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Vertical (Peak)

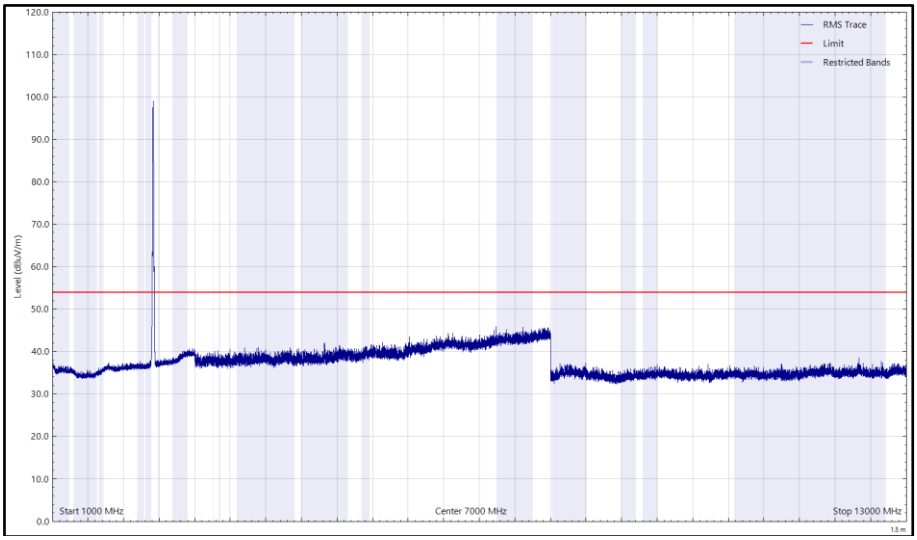

Figure 7 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Vertical (rms)

2.4 GHz WLAN - External Antenna

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 17 - 2412 MHz (CH1), 802.11b, 30 MHz to 13 GHz

*No emissions found within 10 dB of the limit.

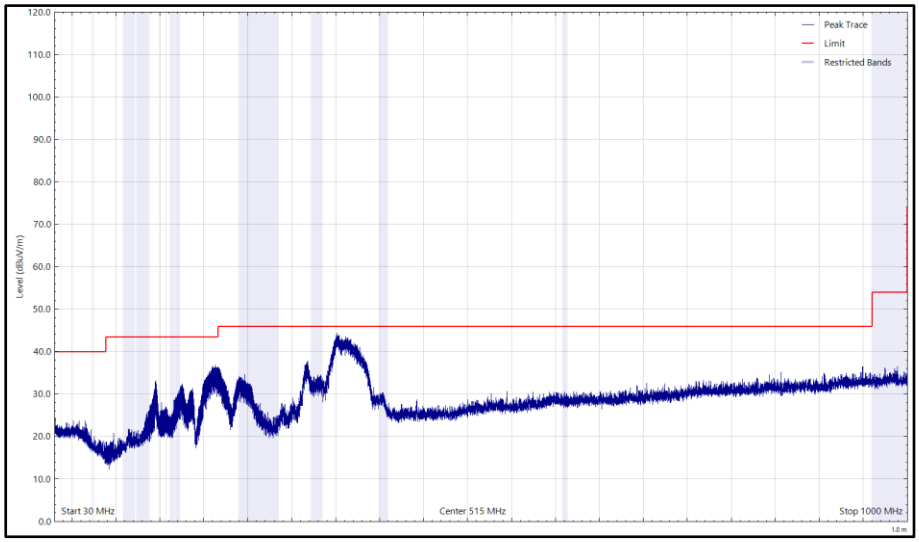

Figure 8 - 2412 MHz (CH1), 802.11b, 30 MHz to 1 GHz, Horizontal (Peak)

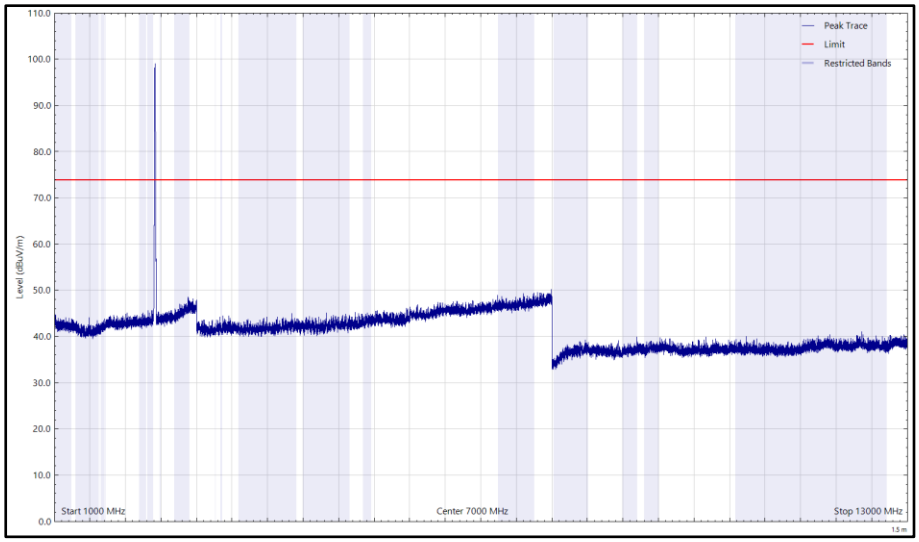

Figure 9 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Horizontal (Peak)

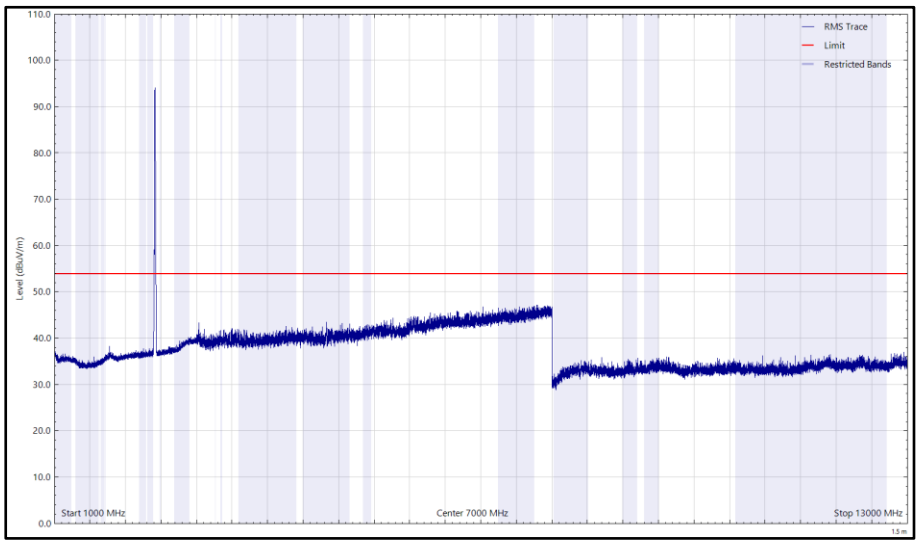

Figure 10 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Horizontal (rms)

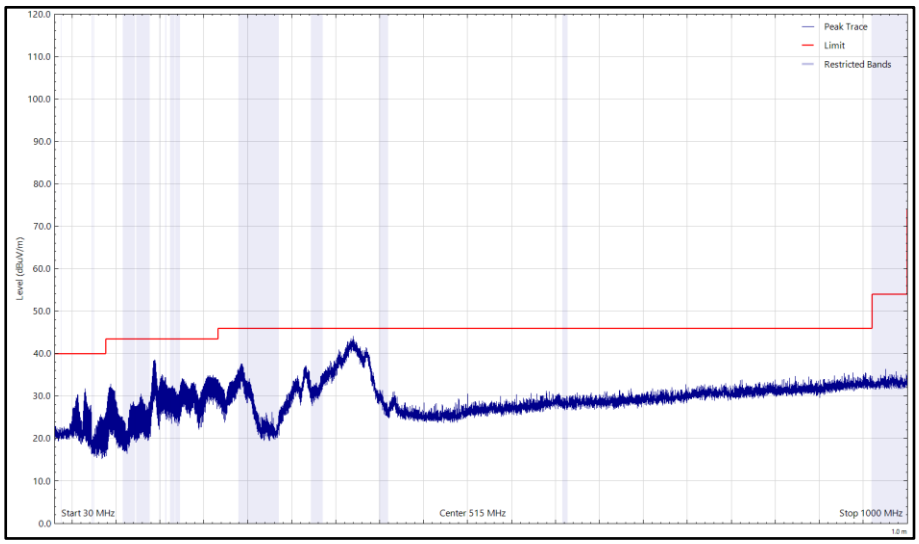

Figure 11 - 2412 MHz (CH1), 802.11b, 30 MHz to 1 GHz, Vertical (Peak)

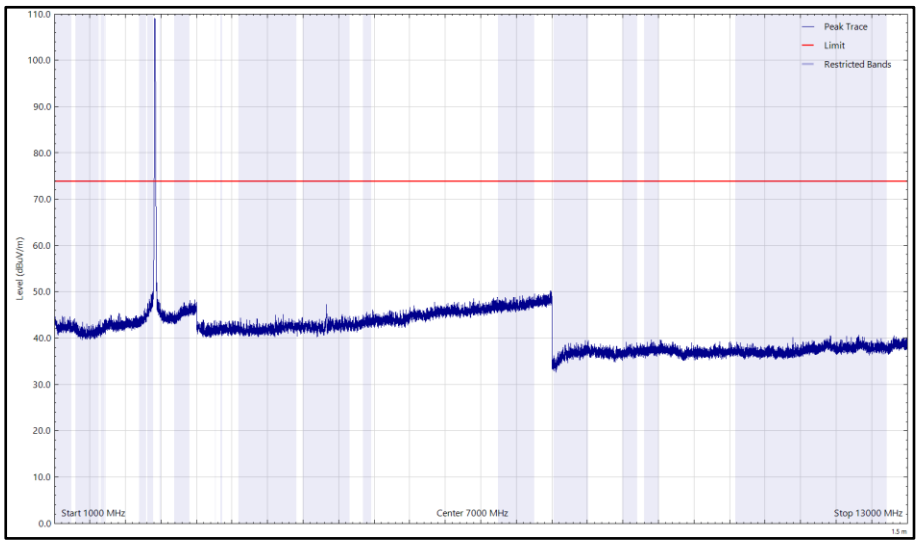

Figure 12 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Vertical (Peak)

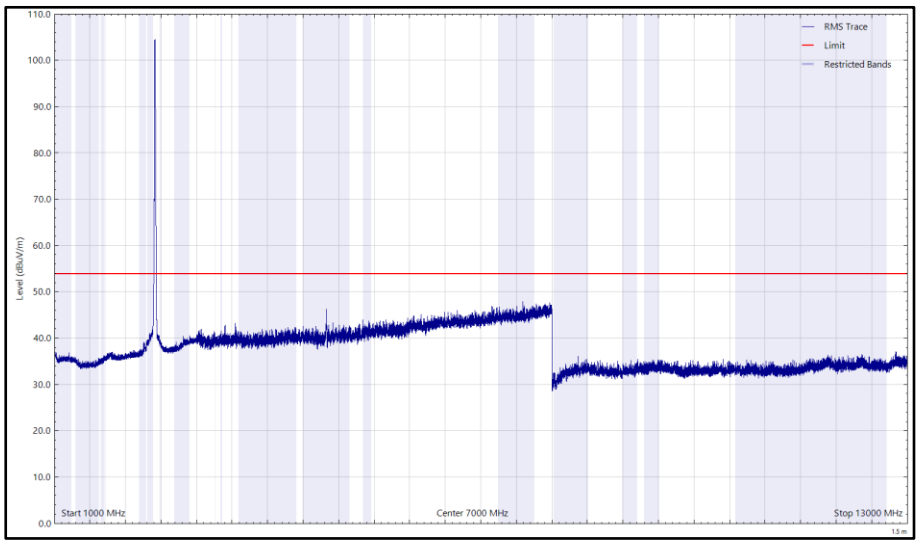

Figure 13 - 2412 MHz (CH1), 802.11b, 1 GHz to 13 GHz, Vertical (rms)

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in RSS-GEN, clause 8.10, must also comply with the radiated emission limits specified in RSS-GEN clause 8.9.

2.1.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Dual Power Supply Unit	Hewlett Packard	6253A	292	-	O/P Mon
Hygrometer	Rotronic	A1	2138	12	28-Sep-2023
Programmable Power Supply	Iso-tech	IPS 2010	2437	-	O/P Mon
True RMS Multimeter	Fluke	179	4006	12	29-Mar-2023
True RMS Multimeter	Fluke	179	4007	12	18-Nov-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5084	12	17-May-2023
Emissions Software	TUV SUD	EmX V3.1.11	5125	-	Software
Screened Room (11)	Rainford	Rainford	5136	36	24-Nov-2024
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 15WF	5160	-	TU
Antenna (DRG 1-10.5GHz)	Schwarzbeck	BBHA9120B	5215	12	28-May-2023
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5216	12	29-May-2023
Pre-amplifier (30 dB, 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	08-Apr-2023
Pre Amp 1 - 26.5 GHz	Agilent Technologies	8449B	5445	12	12-May-2023
Thermo-Hygro-Barometer	PCE Instruments	OCE-THB-40	5470	12	07-Apr-2023
Cable (K-Type to K-Type, 1 m)	Junkosha	MWX241-01000KMSKMS/A	5512	12	14-Apr-2023
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	5513	12	14-Apr-2024
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	12-Apr-2023
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	14-Apr-2024
Cable (N-Type to N-Type, 8 m)	Junkosha	MWX221-08000NMSNMS/B	5522	12	24-Mar-2023
Cable (N-Type to N-Type, 8 m)	Junkosha	MWX221-08000NMSNMS/B	5522	12	14-Apr-2024
3 GHz High pass Filter	Wainwright	WHKX12-2580-3000-18000-80SS	5547	12	11-May-2023
7 GHz High pass Filter	Wainwright	WHKX12-5850-6800-18000-80SS	5550	12	19-May-2023
8 - 18 GHz Amplifier	Wright Technologies	APS06-0061	5595	12	25-Oct-2023
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5942	24	03-Feb-2024

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Attenuator 4dB	Pasternack	PE7074-4	6202	24	16-Jul-2024

Table 18

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment

3 Photographs

3.1 Test Setup Photographs

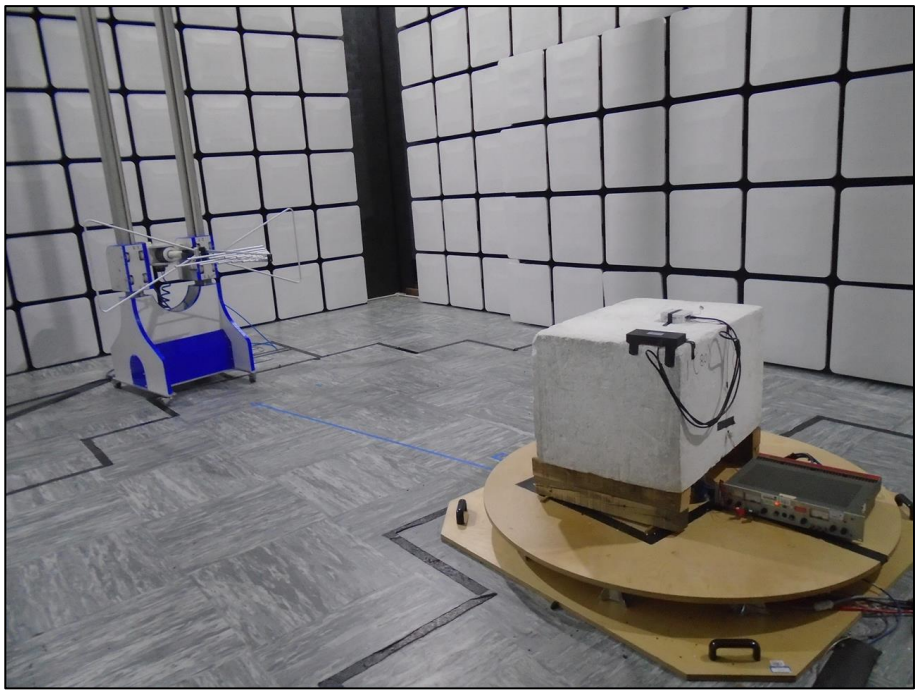

Figure 14 - Test Setup - 2.4 GHz WLAN Internal Antenna - 30 MHz to 1 GHz

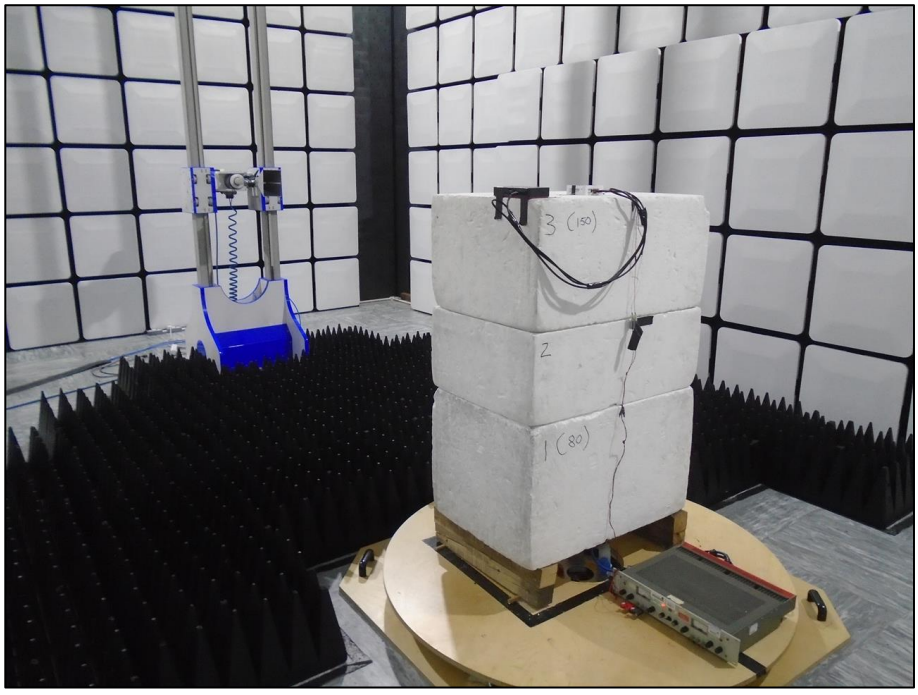

Figure 15 - Test Setup - 2.4 GHz WLAN Internal Antenna - 1 GHz to 8 GHz

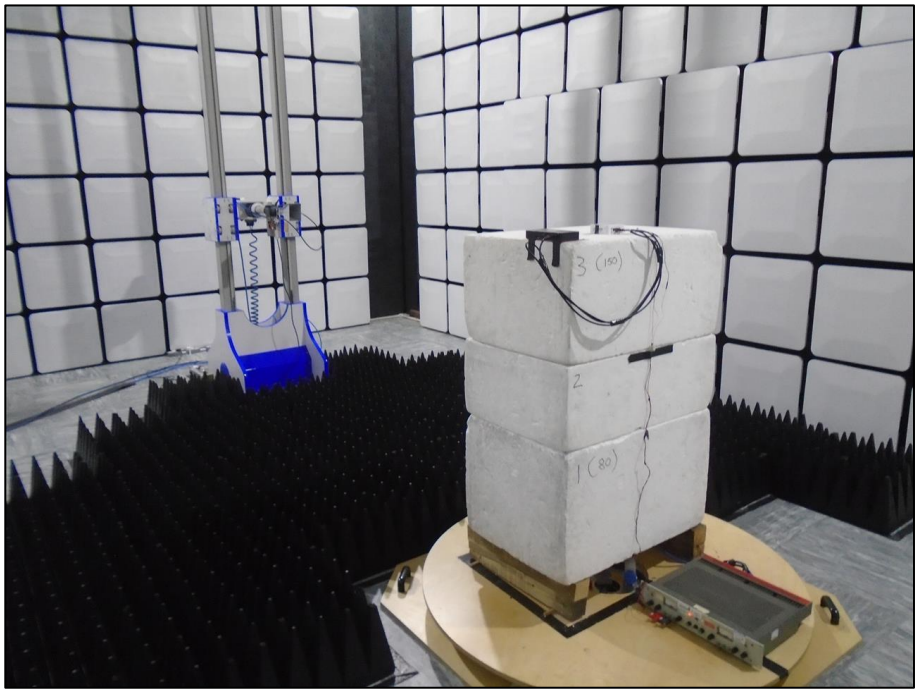

Figure 16 - Test Setup - 2.4 GHz WLAN Internal Antenna - 8 GHz to 13 GHz

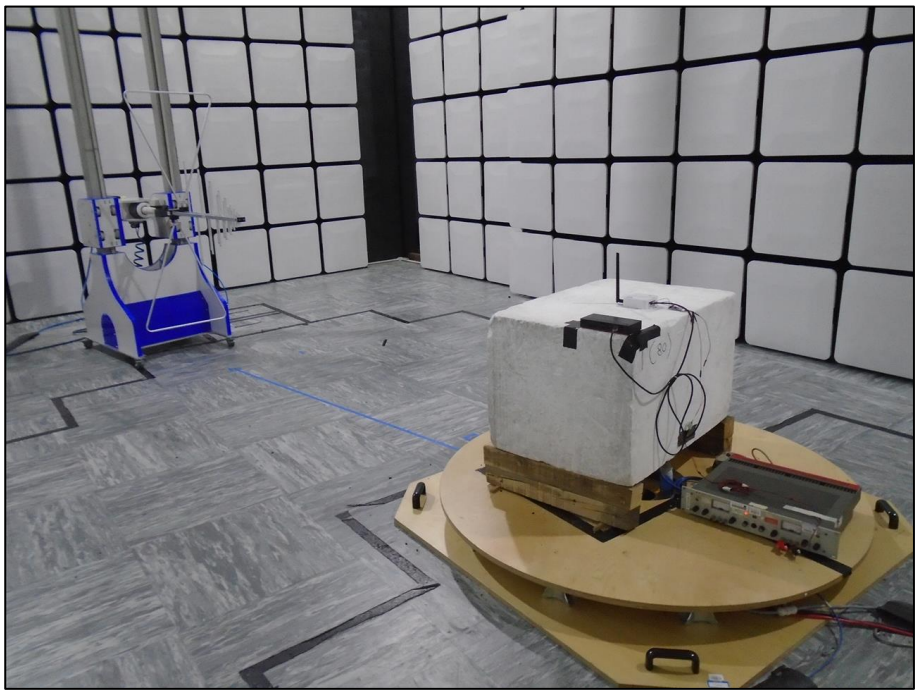

Figure 17 - Test Setup - 2.4 GHz WLAN External Antenna - 30 MHz to 1 GHz

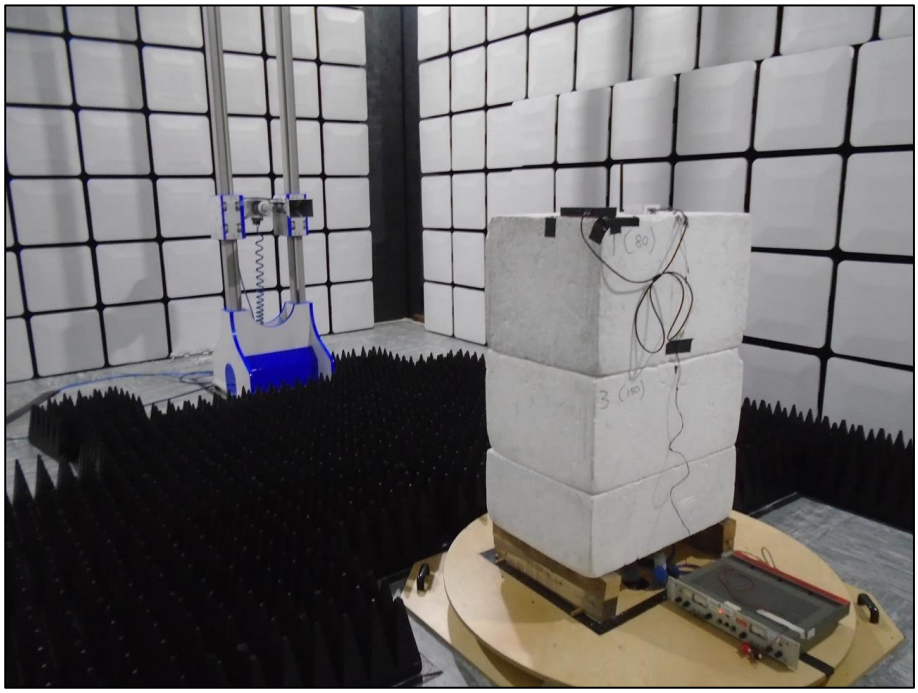

Figure 18 - Test Setup - 2.4 GHz WLAN External Antenna - 1 GHz to 8 GHz

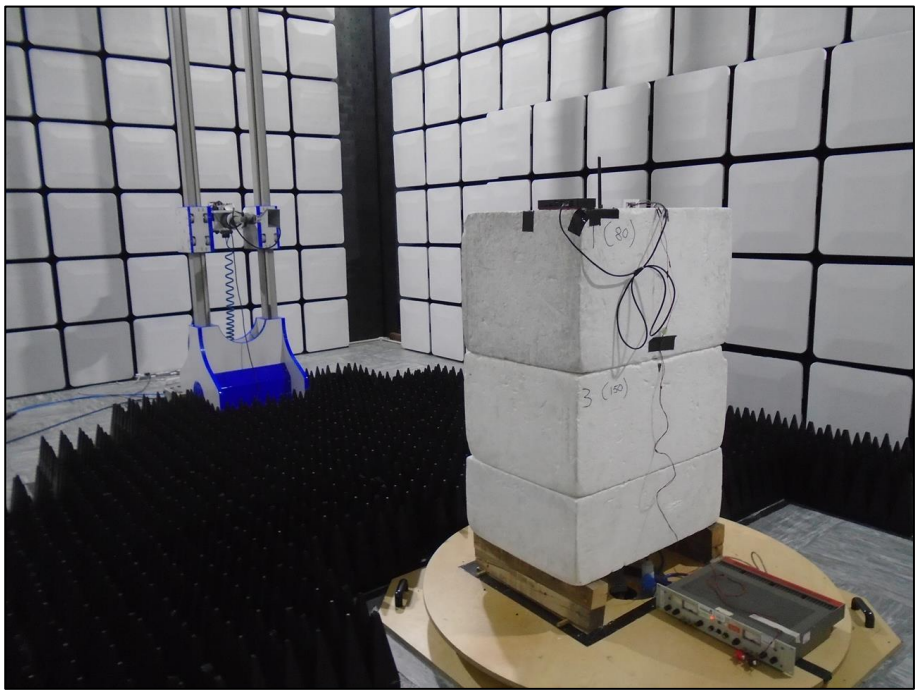

Figure 19 - Test Setup - 2.4 GHz WLAN External Antenna - 8 GHz to 13 GHz

4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 19

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.