

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 15E, ISED
RSS-247 and ISED RSS-GEN
(5 GHz WLAN)

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



Add value.
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FCC ID: 2BCL8BVBFP0EUP IC: 24824-BVBFP0EUP

COMMERCIAL-IN-CONFIDENCE

Document 75957186-08 Issue 03

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	04 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 15E, 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	04 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 15E: 2021, ISED RSS-247: Issue 2 (2017-02) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3.



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Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

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



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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	Second Issue - To update FCC ID	31-August-2023
3	Third Issue – Update of IC	04-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 and 15079350142442990976
Hardware Version(s)	1.4
Software Version(s)	WIFI 2015 BLE 451
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15E: 2021 ISED RSS-247: Issue 2 (2017-02) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Order Number	1180900792
Date	30-November-2022
Date of Receipt of EUT	12-December-2022
Start of Test	20-January-2023
Finish of Test	30-April-2023
Name of Engineer(s)	Ahmad Javid
Related Document(s)	ANSI C63.10 (2020) ANSI C63.10 (2013) ANSI C63.4 (2014) KDB 996369 D04 Module Integration Guide v02



1.3 Brief Summary of Results

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

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15E	RSS-247	RSS-GEN			
Configuration and Mode: 5 GHz WLAN - Internal Antenna						
2.1	15.209 and 15.407 (b)	6.2	6.13 and 8.9	Spurious Radiated Emissions	Pass	Measurements as per KDB 996369 D04, clause 3.4 only.
Configuration and Mode: 5 GHz WLAN - External Antenna						
2.1	15.209 and 15.407 (b)	6.2	6.13 and 8.9	Spurious Radiated Emissions	Pass	Measurements as per KDB 996369 D04, clause 3.4 only.

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:	BVBFP0EUP	
Hardware Version:	1.4	
Software Version:	WIFI 2015 BLE 451	
FCC ID of the product under test – see guidance here	2BCL8BVBFP0EUP	
IC ID of the product under test – see guidance here	24824-BVBFP0EUP	

Table 3

Intentional Radiators

Technology	BLE	BLE	BLE	WiFi	WiFi (5 GHz)	
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 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: 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

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: 5GHz WLAN - Internal Antenna		
Spurious Radiated Emissions	Ahmad Javid	UKAS
Configuration and Mode: 5 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 15E, Clause 15.209 and 15.407 (b)
ISED RSS-247, Clause 6.2
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: 15079350142442990976 - Modification State 0

2.1.3 Date of Test

20-January-2023 to 30-April-2023

2.1.4 Test Method

Testing 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:

- 802.11a, 6 Mbps, 5180 MHz (CH36)
- 802.11n HT20, MCS0, 5180 MHz (CH36)
- 802.11n, HT40 MCS0, 5190 MHz (CH38)

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

The worst case mode from the above was identified as 802.11n HT20 with the internal antenna and 802.11n HT40 using the external antenna. 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.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 12.7.7.2 with max-hold trace to characterize the EUT. Where emissions were detected, final average measurements were taken using trace averaging.

The plots shown are the characterization of the EUT. The limits on the plots represent the most stringent case for restricted bands, (54/74 dBuV/m @ 3 m and 64/84 dBuV/m @ 1m) when compared to -27 dBm/MHz EIRP outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10dB 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:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

EIRP was converted to field strength at 3m using the following formula:
Field Strength (dBμV/m at 3 m) = EIRP (dBm) + 95.2 dB

2.1.5 Test Setup Diagram

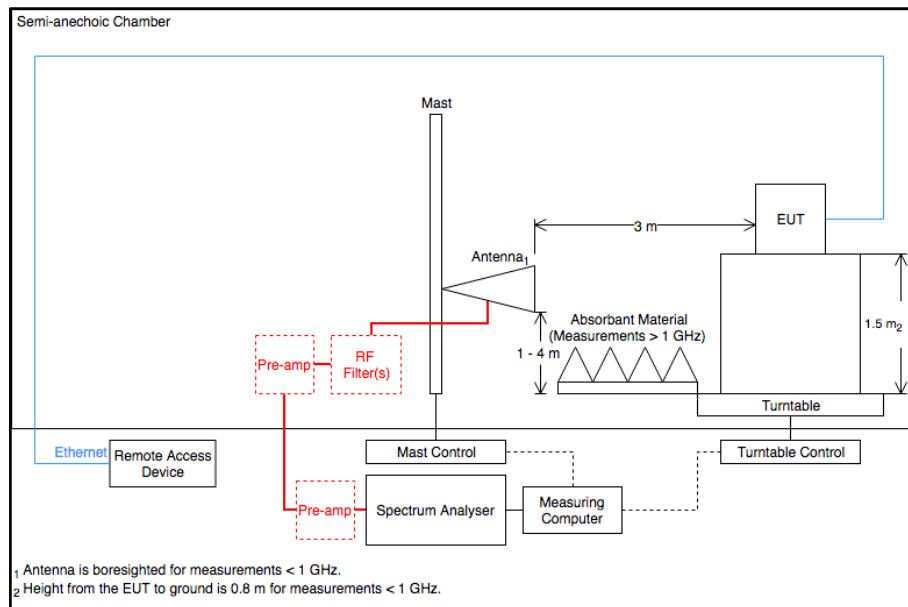


Figure 1 - Radiated Emissions Test Setup Diagram

2.1.6 Environmental Conditions

Ambient Temperature	20.6 - 21.5 °C
Relative Humidity	32.1 - 33.2 %

2.1.7 Test Results

5 GHz WLAN - Internal Antenna

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
112.139	39.18	43.52	-4.34	Q-Peak	dBuV/m	78	107	Vertical
250.001	41.35	46.02	-4.67	Q-Peak	dBuV/m	202	100	Vertical
250.007	42.89	46.02	-3.13	Q-Peak	dBuV/m	62	124	Horizontal

Table 16 - U-NII-1 - 5180 MHz (CH36), HT20, 30 MHz to 30 GHz

No other emissions found within 10 dB of the limit.

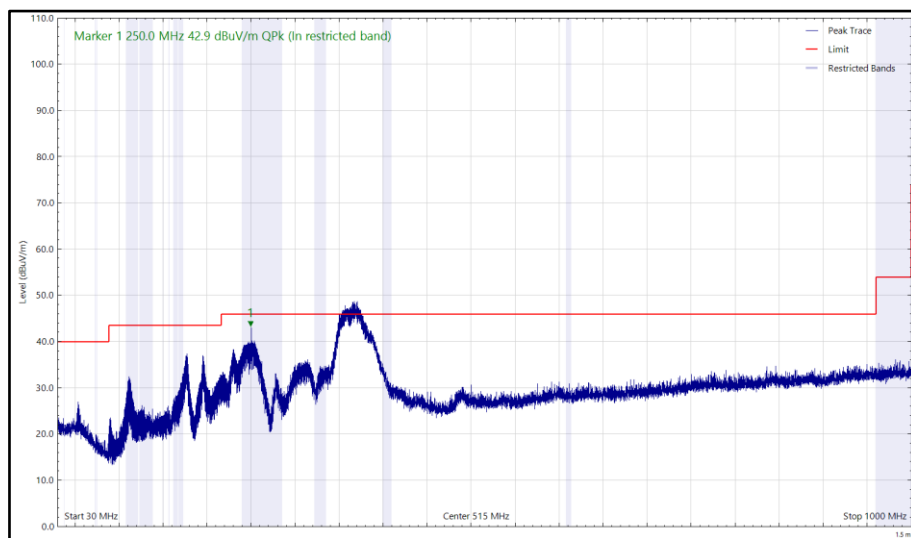


Figure 2 - U-NII-1 - 5180 MHz (CH36), HT20, 30 MHz to 1 GHz, Horizontal (Peak)

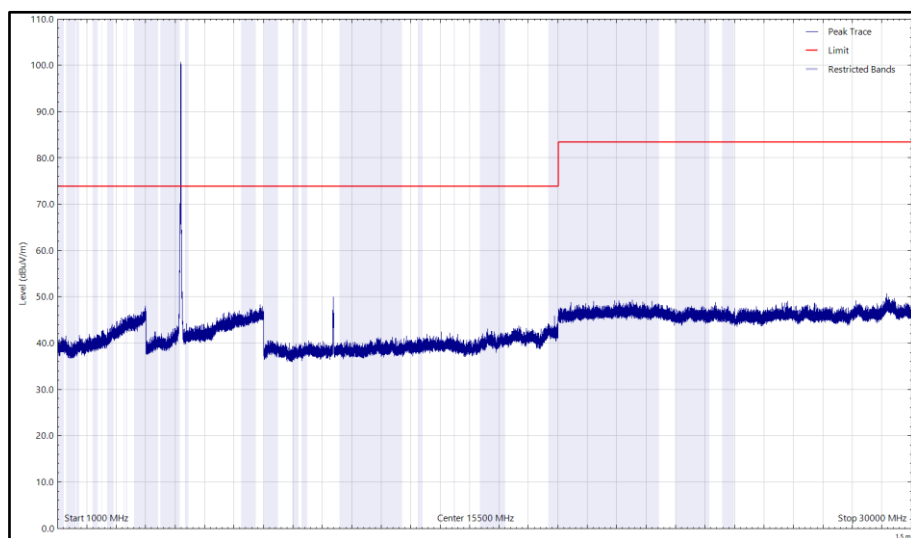


Figure 3 - U-NII-1 - 5180 MHz (CH36), HT20, 1 GHz to 30 GHz, Horizontal (Peak)

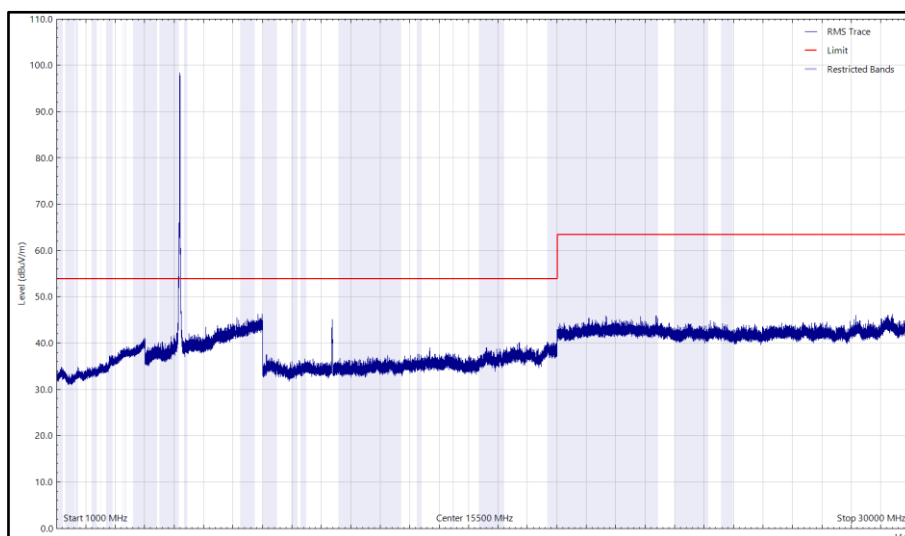


Figure 4 - U-NII-1 - 5180 MHz (CH36), HT20, 1 GHz to 30 GHz, Horizontal (rms)

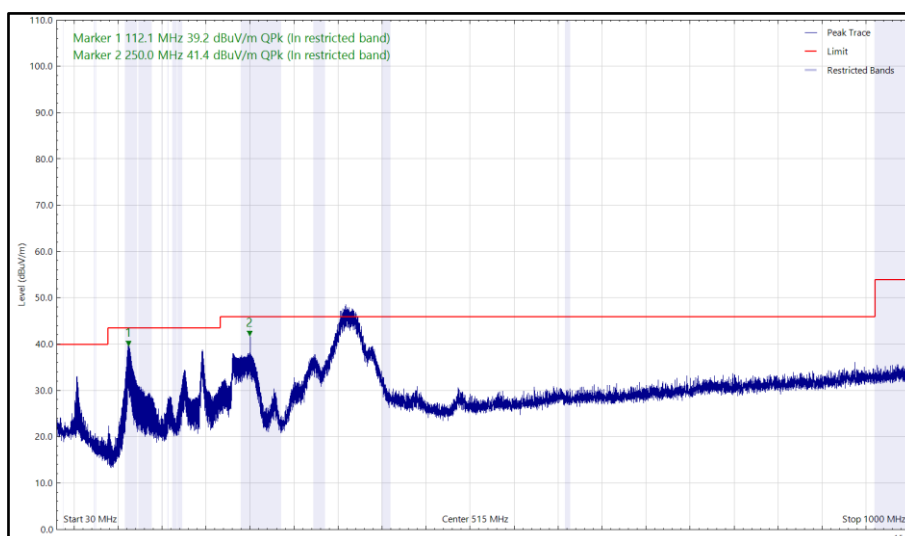


Figure 5 - U-NII-1 - 5180 MHz (CH36), HT20, 30 MHz to 1 GHz, Vertical (Peak)

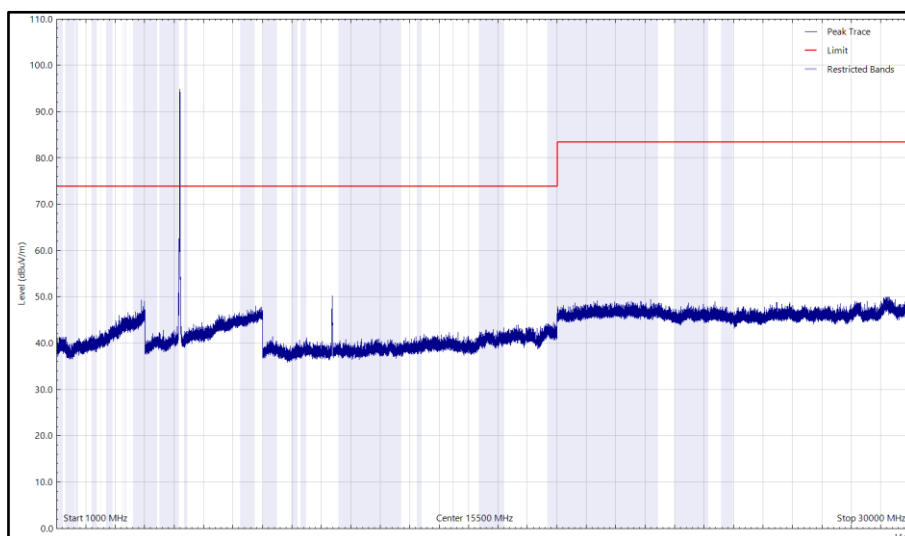


Figure 6 - U-NII-1 - 5180 MHz (CH36), HT20, 1 GHz to 30 GHz, Vertical (Peak)

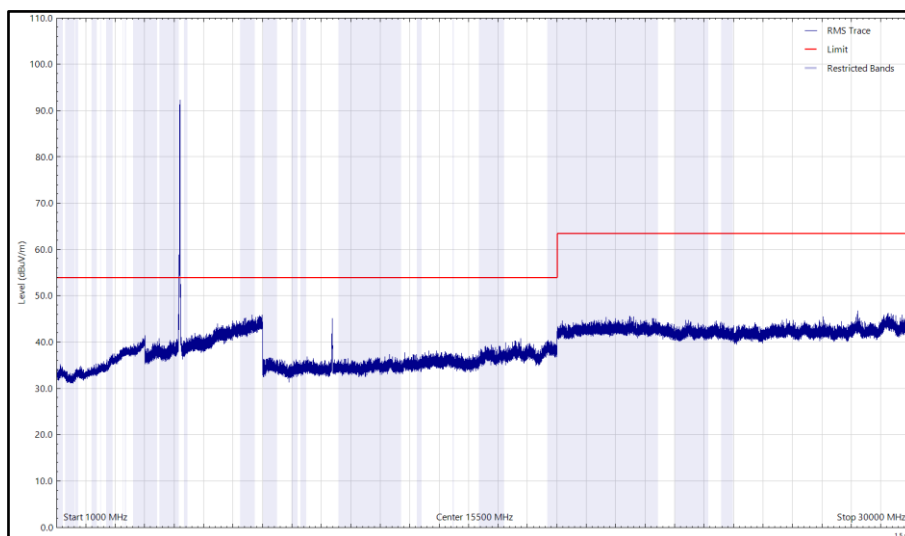


Figure 7 - U-NII-1 - 5180 MHz (CH36), HT20, 1 GHz to 30 GHz, Vertical (rms)

5 GHz WLAN - External Antenna

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
*								

Table 17 - 5190 MHz (CH36), HT40, 30 MHz to 30 GHz

*No emissions found within 10 dB of the limit.

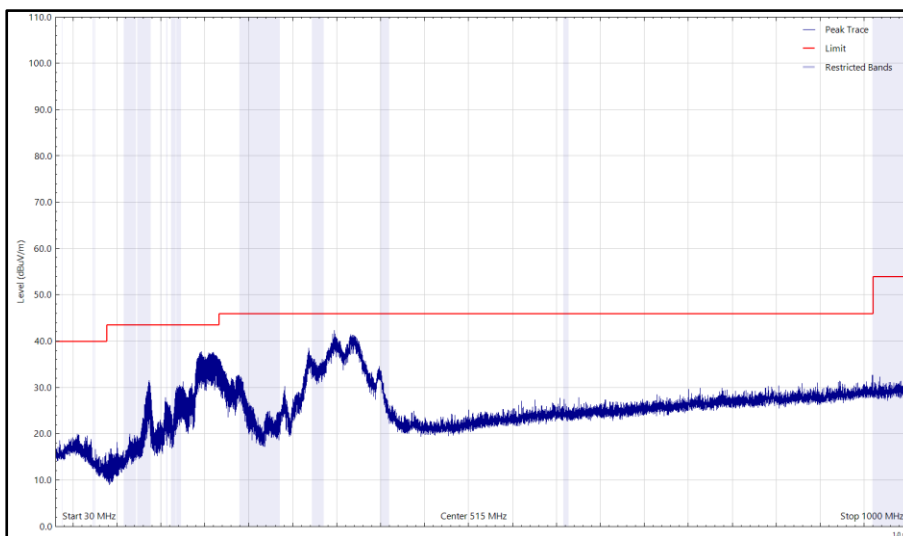


Figure 8 - 5190 MHz (CH36), HT40, 30 MHz to 1 GHz, Horizontal (Peak)

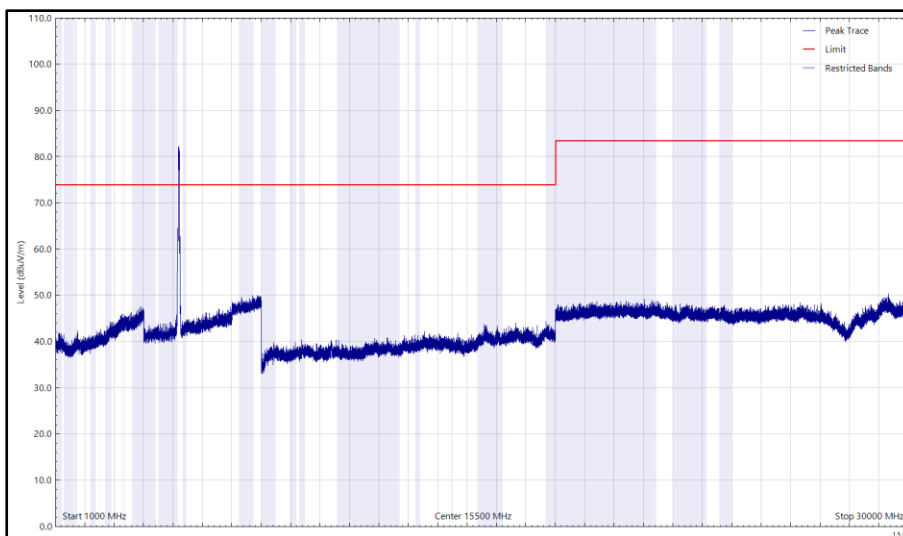


Figure 9 - 5190 MHz (CH36), HT40, 1 GHz to 30 GHz, Horizontal (Peak)

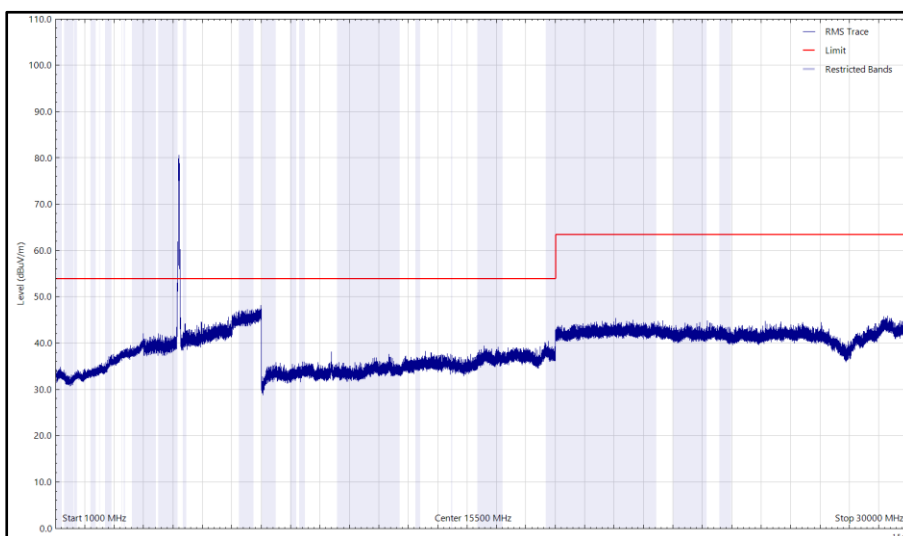


Figure 10 - 5190 MHz (CH36), HT40, 1 GHz to 30 GHz, Horizontal (rms)

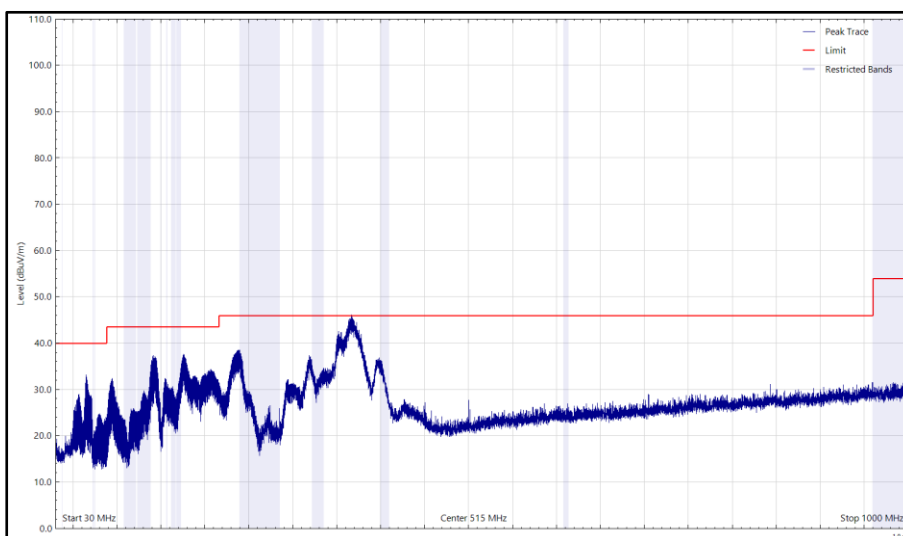


Figure 11 - 5190 MHz (CH36), HT40, 30 MHz to 1 GHz, Vertical (Peak)

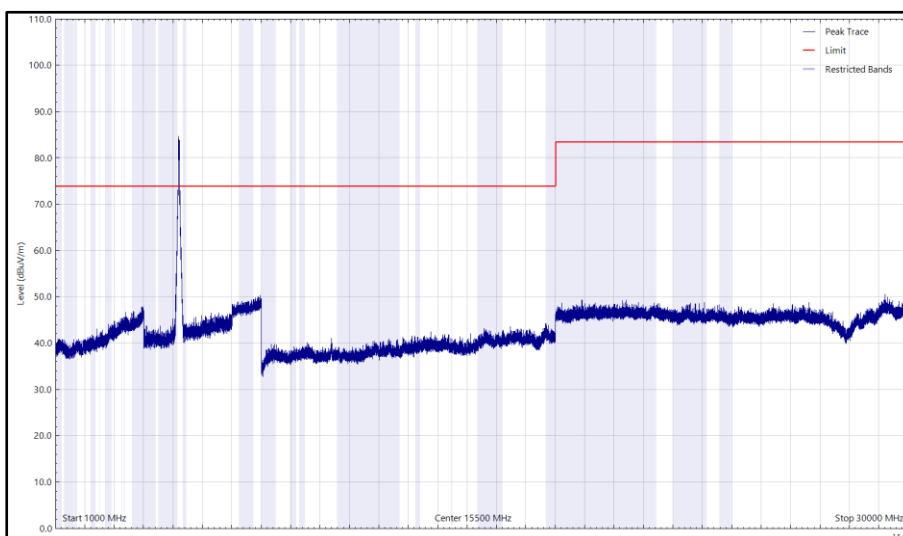


Figure 12 - 5190 MHz (CH36), HT40, 1 GHz to 30 GHz, Vertical (Peak)

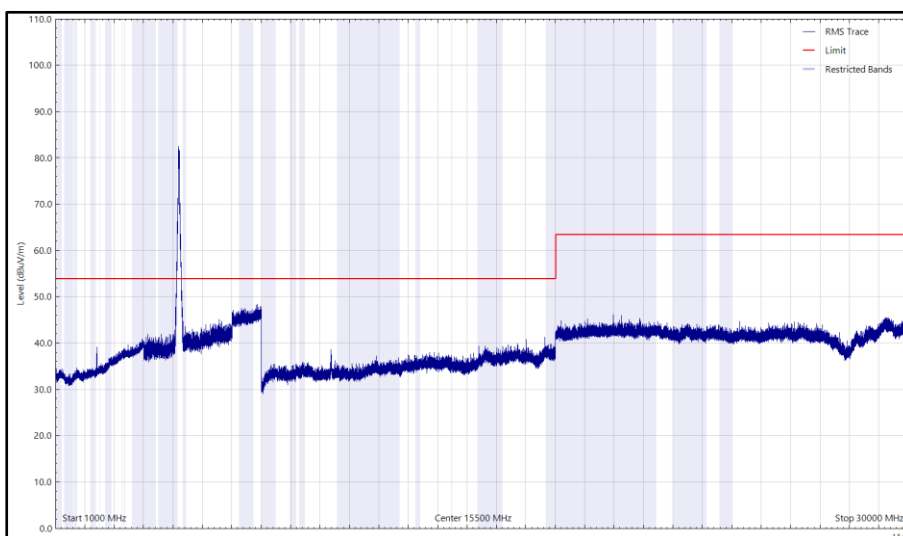


Figure 13 - 5190 MHz (CH36), HT40, 1 GHz to 30 GHz, Vertical (rms)



FCC 47 CFR Part 15, Limit Clause 15.407(b)(1)(2)(3)(4)

Emissions not falling within the restricted bands listed in FCC 47 CFR Part 15.209:

For transmitters operating in the 5.15-5.25 GHz band: ≤ -27 dBm/MHz outside 5150-5350 MHz.

For transmitters operating in the 5.25-5.35 GHz band: ≤ -27 dBm/MHz outside 5150-5350 MHz.

For transmitters operating in the 5.47-5.725 GHz band: ≤ -27 dBm/MHz outside 5470-5725 MHz

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Emissions within the restricted bands listed in FCC 47 CFR Part 15.209:

Frequency (MHz)	Field Strength (μ V/m) at 3m	Field Strength Limit (dB μ V/m) at 3m
30 to 88	100	40.00
88 to 216	150	43.52
216 to 960	200	46.02
Above 960	500	53.98

Table 18 - Radiated Emissions Limit Table (FCC)



ISED RSS-247, Limit Clause 6.2.1.2, 6.2.2.2, 6.2.3.2 and 6.2.4.2 and ISED RSS-GEN, Limit Clause 8.9

Emissions not falling within the restricted bands listed in ISED RSS-GEN, Clause 8.10:

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB.

For transmitters with operating frequencies in the bands 5250-5350 MHz and 5470-5725 MHz, all emissions outside the band 5250-5350 MHz and 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

Emissions falling within the restricted bands listed in ISED RSS-GEN, Clause 8.10:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$) at 3m	Field Strength Limit ($\text{dB}\mu\text{V/m}$) at 3m
30 to 88	100	40.00
88 to 216	150	43.52
216 to 960	200	46.02
Above 960	500	53.98

Table 19 - Radiated Emissions Limit Table (ISED)

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
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



Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
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	20-Apr-2024
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
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
Cable (K Type 2m)	Junkosha	MWX241-02000KMSKMS/B	5934	12	14-May-2023
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5942	24	03-Feb-2024
Double Ridge Active Horn Antenna (18-40 GHz)	Com-Power	AHA-840	6189	24	02-Jun-2024
Attenuator 4dB	Pasternack	PE7074-4	6202	24	16-Jul-2024

Table 20

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

3 Photographs

3.1 Test Setup Photographs

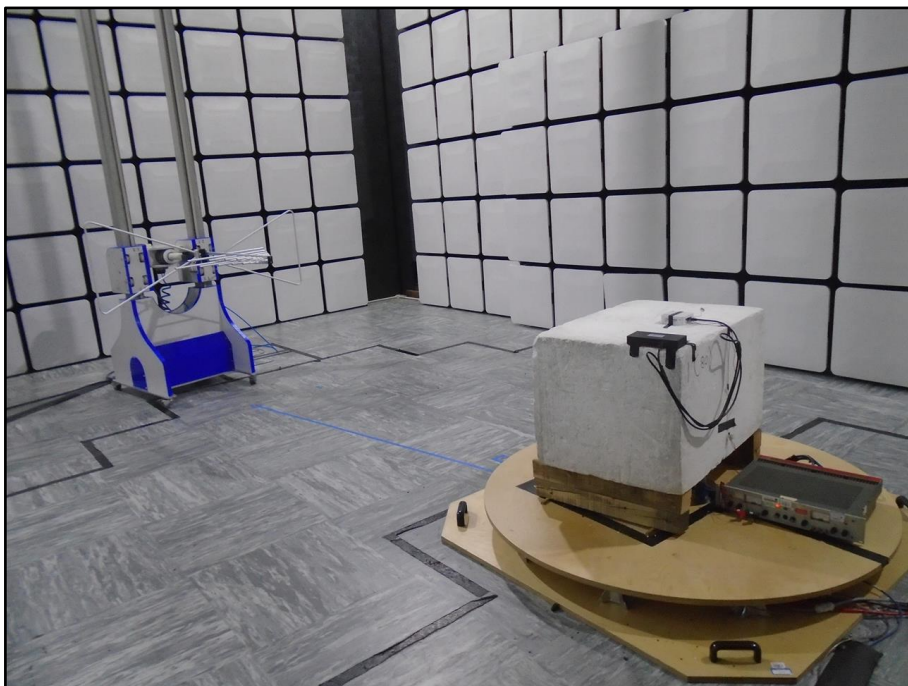


Figure 14 - Test Setup, Internal Antenna - 30 MHz to 1 GHz

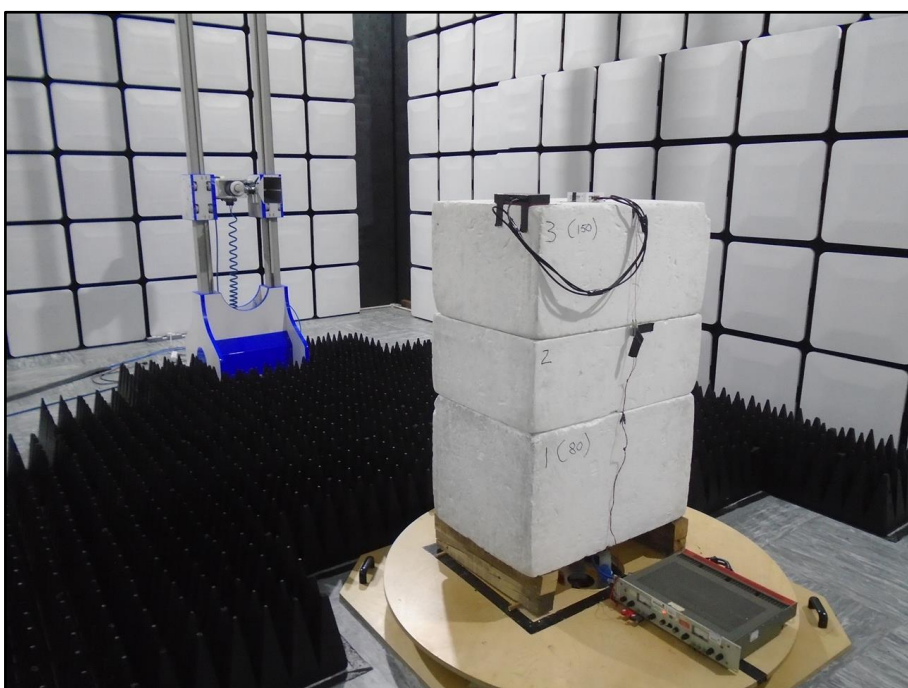


Figure 15 - Test Setup, Internal Antenna - 1 GHz to 8 GHz

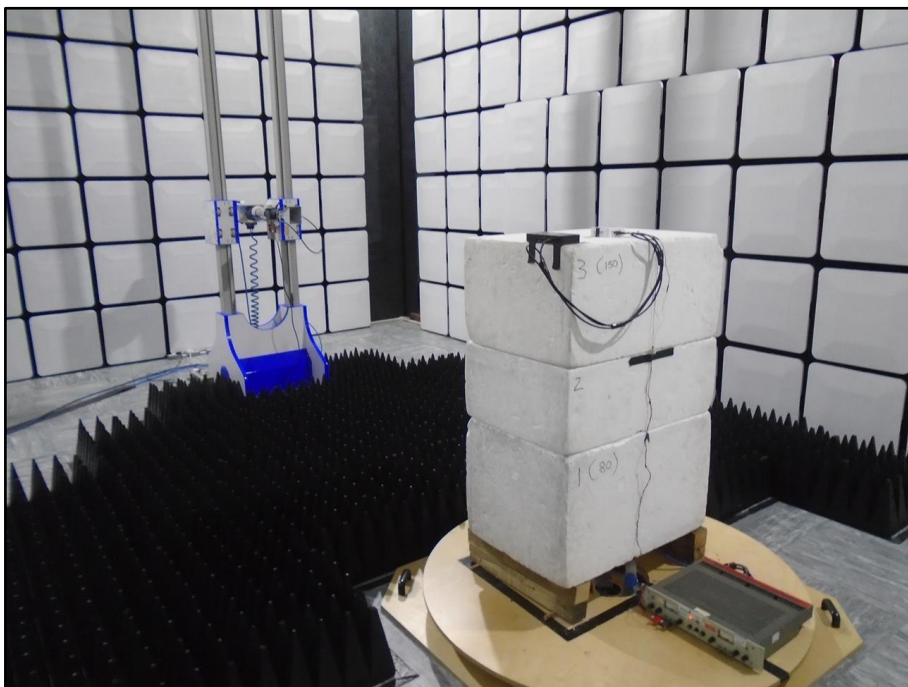


Figure 16 - Test Setup, Internal Antenna - 8 GHz to 18 GHz

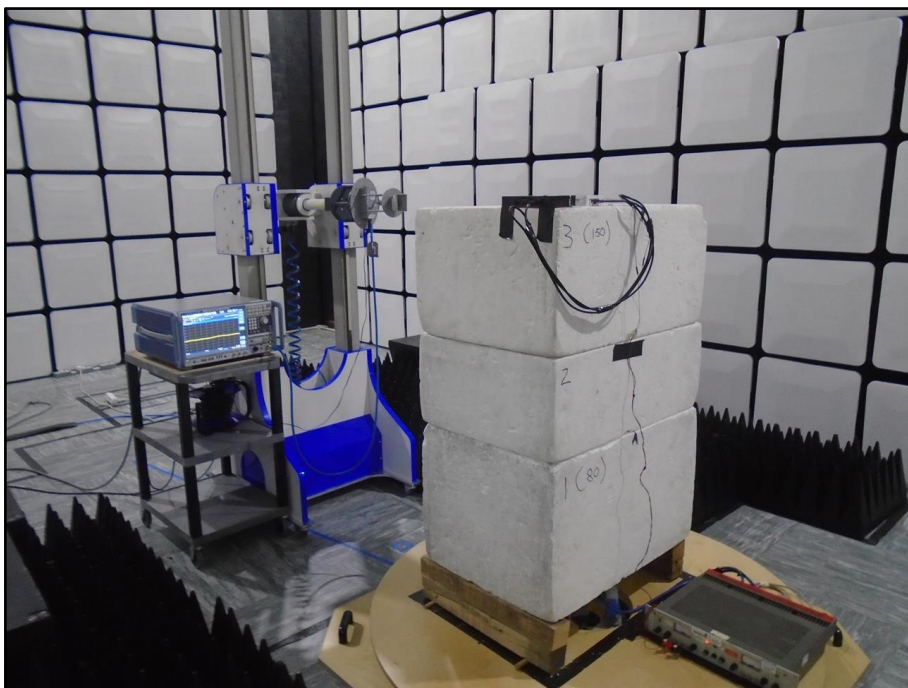


Figure 17 - Test Setup, Internal Antenna - 18 GHz to 30 GHz

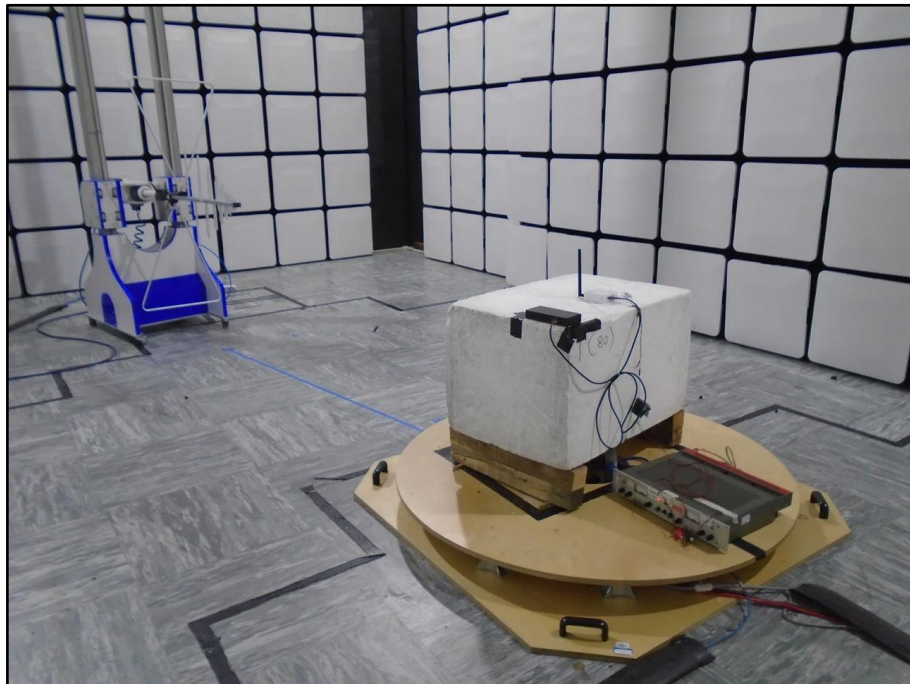


Figure 18 - Test setup, External Antenna - 30 MHz to 1 GHz

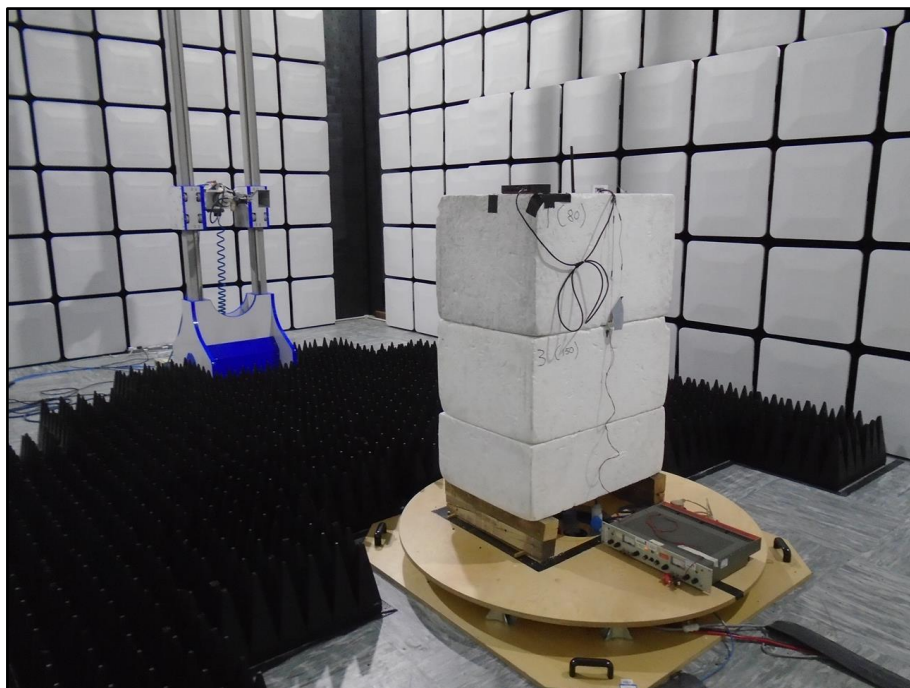


Figure 19 - Test setup, External Antenna - 1 GHz to 18 GHz

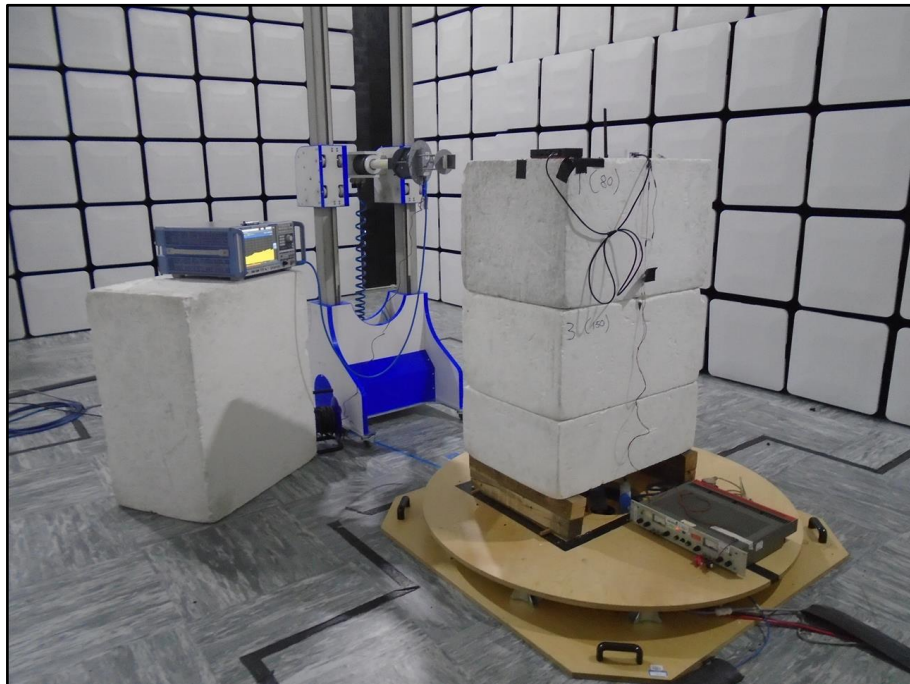


Figure 20 - Test setup, External Antenna - 18 GHz to 30 GHz



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 21

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.