# FCC Test Report

## SureFlap Ltd
## Pet Drinking Station, Model: iCWS

## In accordance with FCC 47 CFR Part 15C (RFiD)

Prepared for: SureFlap Ltd
Ground floor, Building 2020
Cambourne Business Park,
Cambourne,
Cambridgeshire,
CB23 6DW
United Kingdom

Add value.
Inspire trust.

FCC ID: XO9-ICWS001

## COMMERCIAL-IN-CONFIDENCE

Document 75950067-07 Issue 02

| SIGNATURE | | | |
|---|---|---|---|
| | | | |
| **NAME** | **JOB TITLE** | **RESPONSIBLE FOR** | **ISSUE DATE** |
| Matthew Russell | RF Team Leader | Authorised Signatory | 14 April 2021 |

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. The sample tested was found to comply with the requirements defined in the applied rules.

| RESPONSIBLE FOR | NAME | DATE | SIGNATURE |
|---|---|---|---|
| Testing | Graeme Lawler | 14 April 2021 | |

FCC Accreditation
90987 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: 2019 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 | 18 January 2021 |
| 2 | Second Issue | 14 April 2021 |

**Table 1**

## 1.2 Introduction

| | |
|---|---|
| Applicant | SureFlap Ltd |
| Manufacturer | SureFlap Ltd |
| Model Number(s) | iCWS |
| Serial Number(s) | Unit A - P001-0000318 |
| Hardware Version(s) | V2 as defined by 10850-DA-02 Poseidon General Assembly |
| Software Version(s) | Firmware 01742_FF |
| Number of Samples Tested | 1 |
| Test Specification/Issue/Date | FCC 47 CFR Part 15C: 2019 |
| Order Number<br>Date | 3957<br>21-September-2020 |
| Date of Receipt of EUT | 01-December-2020 |
| Start of Test | 06-December-2020 |
| Finish of Test | 12-December-2020 |
| Name of Engineer(s) | Graeme Lawler |
| Related Document(s) | ANSI C63.10 (2013) |

## 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C is shown below.

| Section | Specification Clause | Test Description | Result | Comments/Base Standard |
|---|---|---|---|---|
| Configuration and Mode: 126 kHz - RFID Transceiver | | | | |
| - | 15.203 | Antenna Requirement | N/T | The EUT has an integral antenna so therefore the requirement is met. |
| 2.1 | 15.209 | Field Strength of any Emission | Pass | |
| Configuration and Mode: 133 kHz - RFID Transceiver | | | | |
| - | 15.203 | Antenna Requirement | N/T | The EUT has an integral antenna so therefore the requirement is met. |
| 2.1 | 15.209 | Field Strength of any Emission | Pass | |

**Table 2**

## 1.4 Application Form

### Equipment Description

| | |
|---|---|
| Technical Description:<br>*(Please provide a brief description of the intended use of the equipment including the technologies the product supports)* | The iCWS is a pet drinking station designed to provide the user with a measurement of how much their pet is drinking. The unit includes load cells to weight the water as it is drunk and an RFID antenna to identify the animal drinking. The units also includes a 2.4 GHz link (802.15.4) for communication to the user App via a Sure Petcare Hub. |
| Manufacturer: | SureFlap Ltd. |
| Model: | iCWS |
| Part Number: | iCWSWT |
| Hardware Version: | V2 as defined by 10850-DA-02 Poseidon General Assembly |
| Software Version: | Firmware 01742_FF (but special version for TUV SUD testing) |
| FCC ID of the product under test – see guidance here | XO9-ICWS001 |
| IC ID of the product under test – see guidance here | 8906A-ICWS001 |

### Intentional Radiators

| | | | | | | |
|---|---|---|---|---|---|---|
| Technology | 802.15.4 | RFiD | | | | |
| Frequency Range (MHz to MHz) | 2.45 GHz | 126 kHz – 133 kHz | | | | |
| Conducted Declared Output Power (dBm) | 4.5 dBm | N/A | | | | |
| Antenna Gain (dBi) | +3 dBm | N/A | | | | |
| Supported Bandwidth(s) (MHz) (e.g 1 MHz, 20 MHz, 40 MHz) | 2.5 MHz | N/A | | | | |
| Modulation Scheme(s) (e.g GFSK, QPSK etc) | O-QPSK | AM | | | | |
| ITU Emission Designator (see guidance here) | 2M50G1D | | | | | |
| Bottom Frequency (MHz) | 2.425 | 0.126 | | | | |
| Middle Frequency (MHz) | 2.450 | 0.133 | | | | |
| Top Frequency (MHz) | 2.480 | 0.133 | | | | |

### Un-intentional Radiators

| | |
|---|---|
| Highest frequency generated or used in the device or on which the device operates or tunes | 2.4 GHz |
| Lowest frequency generated or used in the device or on which the device operates or tunes | 32.768 kHz |
| Class A Digital Device (Use in commercial, industrial or business environment) ☐<br>Class B Digital Device (Use in residential environment only) ☒ | |

### AC Power Source

| | | |
|---|---|---|
| AC supply frequency: | | Hz |
| Voltage | | V |
| Max current: | | A |
| Single Phase ☐ Three Phase ☐ | | |

## DC Power Source

| | | |
|---|---|---|
| Nominal voltage: | | V |
| Extreme upper voltage: | | V |
| Extreme lower voltage: | | V |
| Max current: | | A |

## Battery Power Source

| | | |
|---|---|---|
| Voltage: | 6 | V |
| End-point voltage: | 4.5 | V *(Point at which the battery will terminate)* |
| Alkaline ☒ Leclanche ☐ Lithium ☐ Nickel Cadmium ☐ Lead Acid* ☐ **(Vehicle regulated)* | | |
| Other ☐ Please detail: | | |

## Charging

| | |
|---|---|
| Can the EUT transmit whilst being charged | Yes ☐ No ☐ |

## Temperature

| | | |
|---|---|---|
| Minimum temperature: | 0 | °C |
| Maximum temperature: | 35 | °C |

## Antenna Characteristics

| | | | | | |
|---|---|---|---|---|---|
| Antenna connector ☐ | | | State impedance | | Ohm |
| Temporary antenna connector ☐ | | | State impedance | | Ohm |
| Integral antenna ☒ | Type: | | Gain | | dBi |
| External antenna ☐ | Type: | | Gain | | dBi |
| For external antenna only:<br>Standard Antenna Jack ☐ If yes, describe how user is prohibited from changing antenna (if not professional installed):<br>Equipment is only ever professionally installed ☐<br>Non-standard Antenna Jack ☐ | | | | | |

## Ancillaries (if applicable)

| | | | |
|---|---|---|---|
| Manufacturer: | | Part Number: | |
| Model: | | Country of Origin: | |

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

Name: Dr David Hallas
Position held: Managing Director

Date: 05-01-2021

## 1.5 Product Information

### 1.5.1 Technical Description

The iCWS is a pet drinking station designed to provide the user with a measurement of how much their pet is drinking. The unit includes load cells to weight the water as it is drunk and an RFID antenna to identify the animal drinking. The units also includes a 2.4 GHz link (802.15.4) for communication to the user App via a Sure Petcare Hub.

## 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: iCWS, Serial Number: Unit A - P001-0000318 | | | |
| 0 | As supplied by the customer | Not Applicable | Not Applicable |

**Table 3**

## 1.8 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

| Test Name | Name of Engineer(s) | Accreditation |
|---|---|---|
| Configuration and Mode: 126 kHz - RFID Transceiver | | |
| Field Strength of any Emission | Graeme Lawler | UKAS |
| Configuration and Mode: 133 kHz - RFID Transceiver | | |
| Field Strength of any Emission | Graeme Lawler | UKAS |

**Table 4**

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom

# 2 Test Details

## 2.1 Field Strength of any Emission

### 2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209

### 2.1.2 Equipment Under Test and Modification State

iCWS, S/N: Unit A - P001-0000318 - Modification State 0

### 2.1.3 Date of Test

06-December-2020 to 12-December-2020

### 2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5.

Measurements of the fundamental were made at a distance of 30 m using an outdoor test site.

Spurious emission measurements were made at a distance of 3 m within a semi-anechoic chamber.

The limits were extrapolated from either 300 m or 30 m to the measurement distance stated above in accordance with ANSI C63.10 Clause 6.4.4.2.

For any emissions detected within 20 dB of the limit, a final measurement was made and recorded in the table below. The detector used for these measurements was a quasi-peak detector except for emissions within the bands 9 kHz to 90 kHz and 110 kHz to 490 kHz where a CISPR average detector was used.

### 2.1.5 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 6.0 - 18.3 °C |
| Relative Humidity | 37.4 - 74.0 % |

### 2.1.6 Test Results

126 kHz - RFID Transceiver

| Frequency | Fundamental Field Strength (dBuV/m) | Measurement Distance (m) | Limit (dBuV/m) at measurement distance |
|---|---|---|---|
| 126 kHz | 59.42 | 30 | 65.59 |

**Table 5 - Fundamental Emission Field Strength**

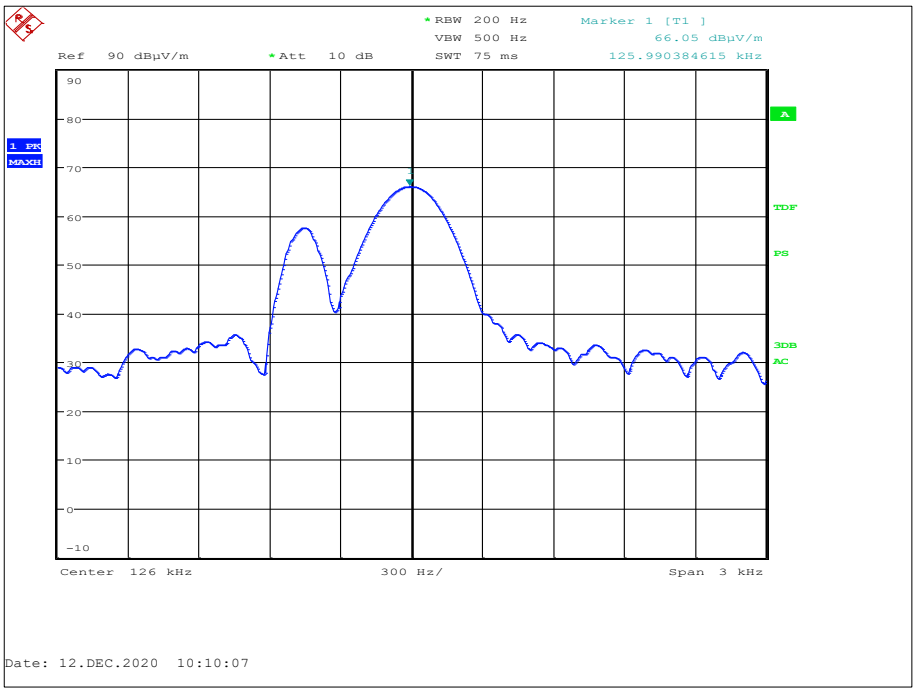


**Figure 1 - Plot of the Fundamental Emission**

| Frequency (MHz) | Results at Measurement Distance | | | Results at Limit Distance | | |
|---|---|---|---|---|---|---|
| | Level (µV/m) | Distance | Detector | Level (µV/m) | Distance | Detector |
| 0.251669 | 8100.28 | 3 m | CISPR Average | 1.28 | 300 m | CISPR Average |
| 0.378002 | 2314.73 | 3 m | CISPR Average | 0.58 | 300 m | CISPR Average |
| 0.503883 | 1614.36 | 3 m | Quasi-Peak | 16.14 | 30 m | Quasi-Peak |
| 0.629668 | 797.08 | 3 m | Quasi-Peak | 7.97 | 30 m | Quasi-Peak |
| 0.881490 | 413.05 | 3 m | Quasi-Peak | 4.13 | 30 m | Quasi-Peak |

**Table 6 - Emissions Results - 9 kHz to 30 MHz**

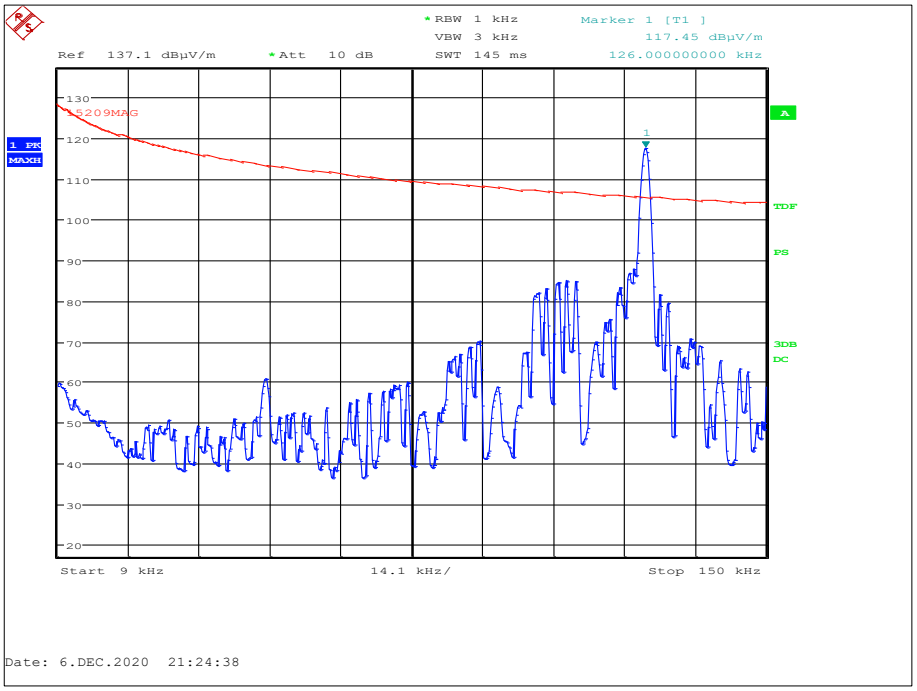


**Figure 2 - 9 kHz to 150 kHz**

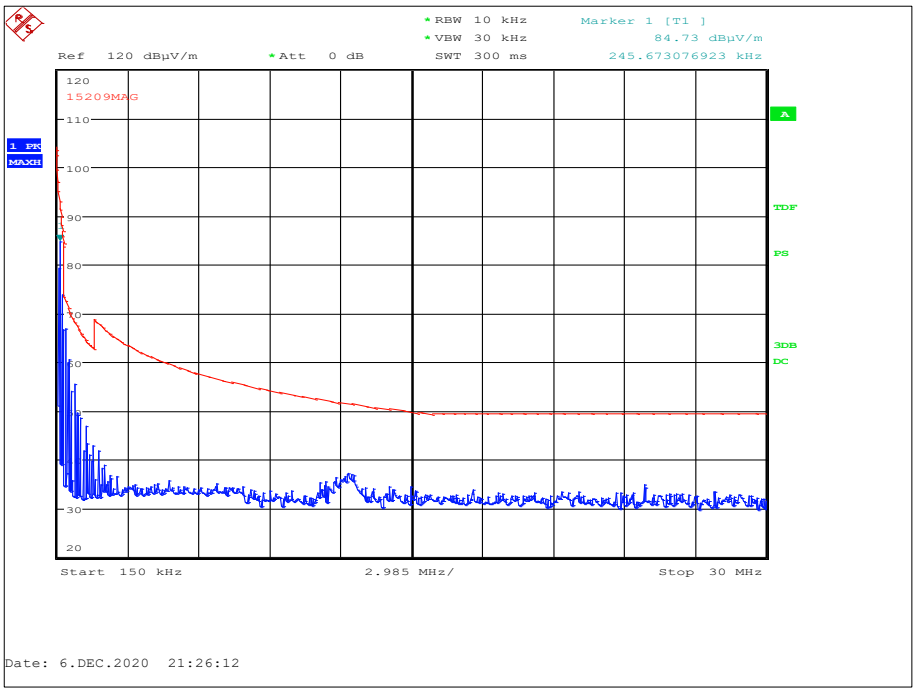


**Figure 3 - 150 kHz to 30 MHz**

| Frequency (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation | Orientation |
|---|---|---|---|---|---|---|---|---|
| * | | | | | | | | |

**Table 7 - Emissions Results - 30 MHz to 1 GHz**

* No emissions were detected within 10 dB of the limit.

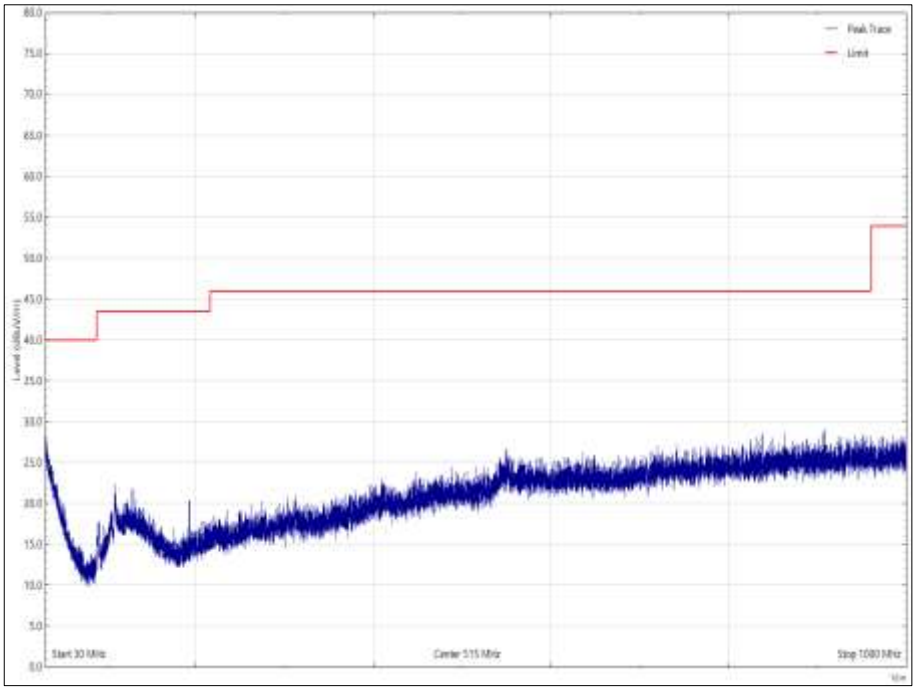


**Figure 4 - 30 MHz to 1 GHz**

| Frequency (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation | Orientation |
|---|---|---|---|---|---|---|---|---|
| * | | | | | | | | |

**Table 8 - Emissions Results - 30 MHz to 1 GHz**

* No emissions were detected within 10 dB of the limit.

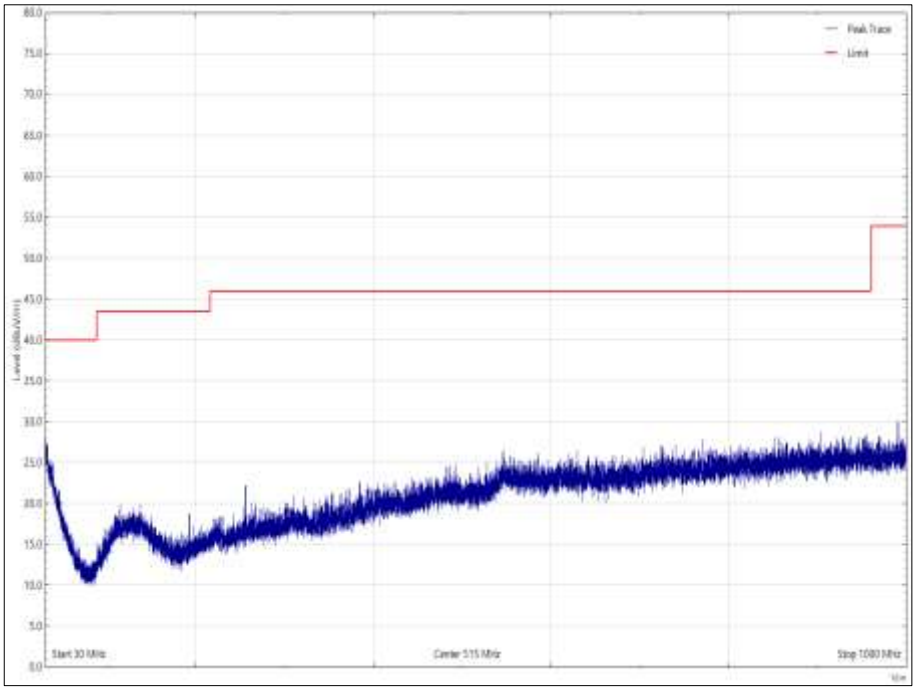


**Figure 5 - 30 MHz to 1 GHz**

133 kHz - RFID Transceiver

| Frequency | Fundamental Field Strength (dBuV/m) | Measurement Distance (m) | Limit (dBuV/m) at measurement distance |
|---|---|---|---|
| 132.790 | 57.36 | 30 | 65.13 |

**Table 9 - Fundamental Emission Field Strength**

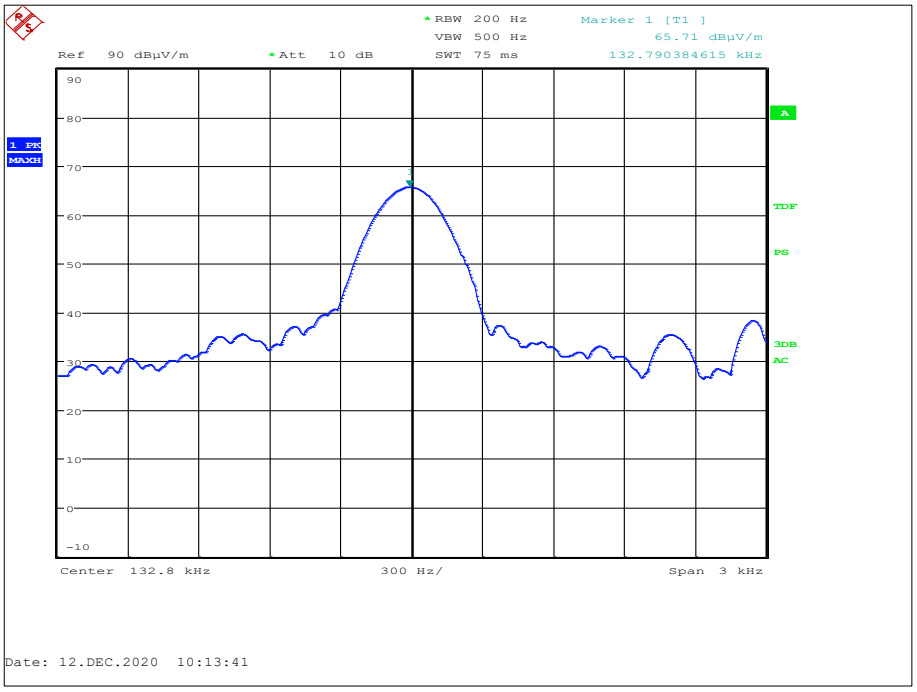


**Figure 6 - Plot of the Fundamental Emission**

| Frequency (MHz) | Results at Measurement Distance | | | Results at Limit Distance | | |
|---|---|---|---|---|---|---|
| | Level (µV/m) | Distance | Detector | Level (µV/m) | Distance | Detector |
| 0.266897 | 6591.74 | 3 m | CISPR Average | 1.11 | 300 m | CISPR Average |
| 0.398016 | 2468.89 | 3 m | CISPR Average | 0.62 | 300 m | CISPR Average |
| 0.530904 | 1487.65 | 3 m | Quasi-Peak | 14.88 | 30 m | Quasi-Peak |
| 0.663542 | 860.00 | 3 m | Quasi-Peak | 8.60 | 30 m | Quasi-Peak |
| 0.929167 | 460.79 | 3 m | Quasi-Peak | 4.61 | 30 m | Quasi-Peak |

**Table 10 - Emissions Results - 9 kHz to 30 MHz**

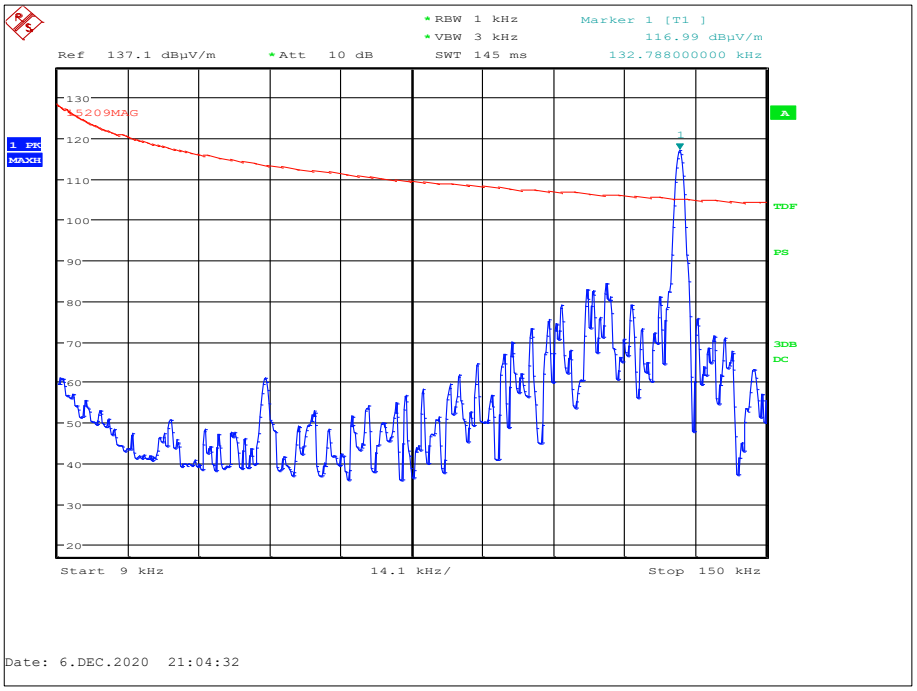


**Figure 7 - 9 kHz to 150 kHz**

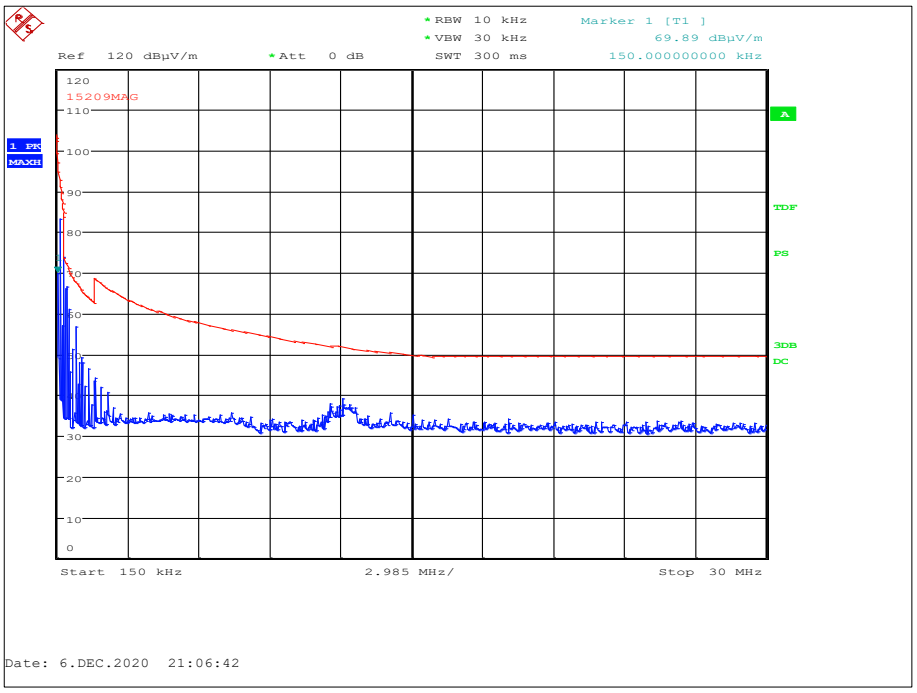


**Figure 8 - 150 kHz to 30 MHz**

| Frequency (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation | Orientation |
|---|---|---|---|---|---|---|---|---|
| * | | | | | | | | |

**Table 11 - Emissions Results - 30 MHz to 1 GHz**

* No emissions were detected within 10 dB of the limit.

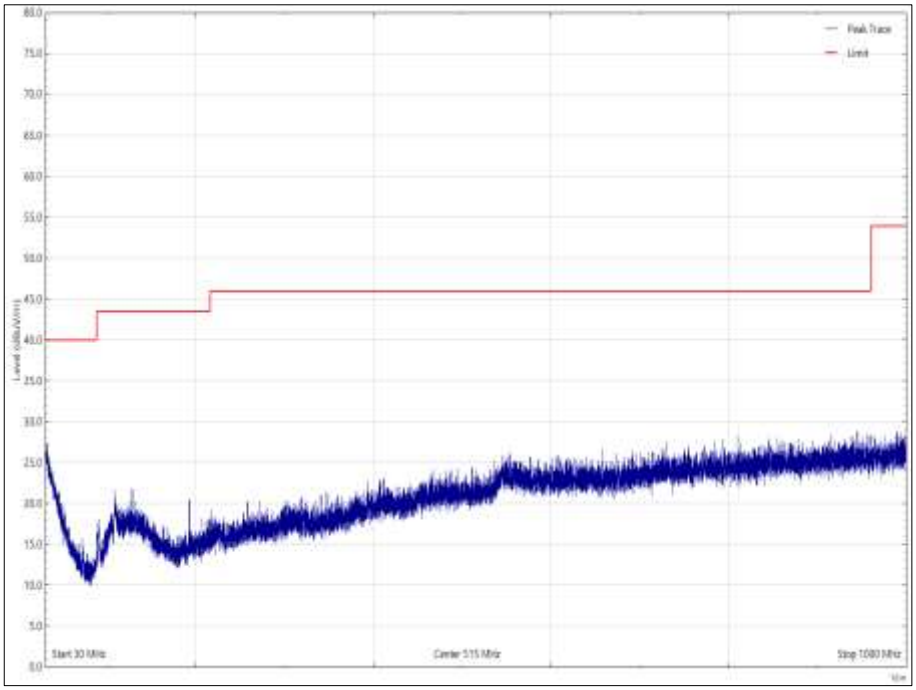


**Figure 9 - 30 MHz to 1 GHz**

| Frequency (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation | Orientation |
|---|---|---|---|---|---|---|---|---|
| * | | | | | | | | |

**Table 12 - Emissions Results - 30 MHz to 1 GHz**

* No emissions were detected within 10 dB of the limit.

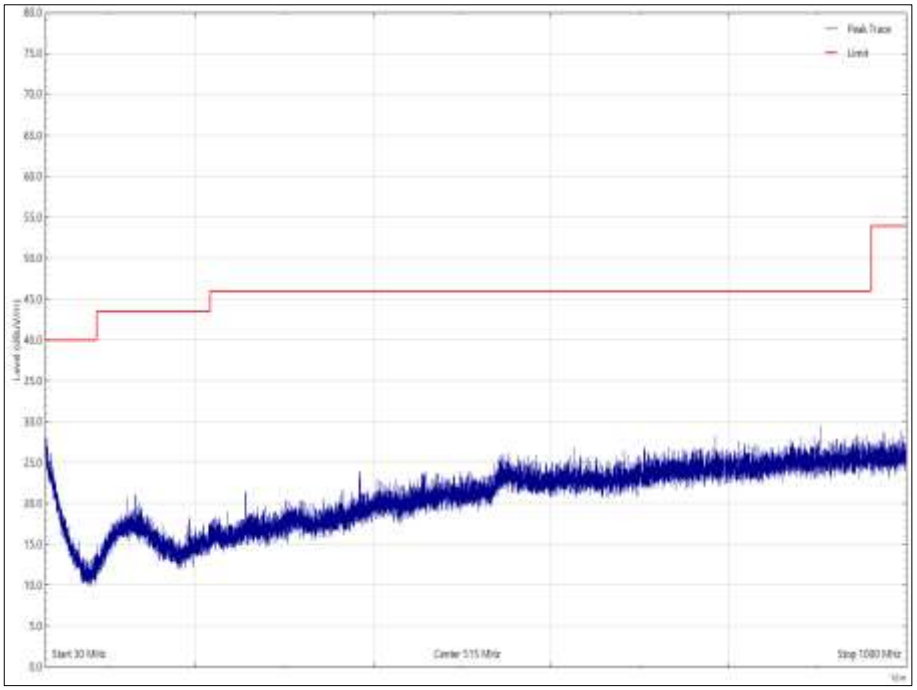


**Figure 10 - 30 MHz to 1 GHz**

FCC 47 CFR Part 15, Limit Clause 15.209

| Frequency (MHz) | Field Strength (µV/m) | Measurement Distance (m) |
|---|---|---|
| 0.009 to 0.490 | 2400/F (kHz) | 300 |
| 0.490 to 1.705 | 24000/F (kHz) | 30 |
| 1705 to 30 | 30 | 30 |
| 30 to 88 | 100** | 3 |
| 88 to 216 | 150** | 3 |
| 216 to 960 | 200** | 3 |
| Above 960 | 500 | 3 |

**Table 13**

NOTE: The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.

### 2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12 and Open Area Facility.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| Antenna with permanent attenuator (Bilog) | Schaffner | CBL6143 | 287 | 24 | 14-Oct-2022 |
| Hygromer | Rotronic | A1 | 2138 | 12 | 01-Jul-2021 |
| Comb Generator | Schaffner | RSG1000 | 3034 | - | TU |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 03-Jan-2021 |
| EmX Emissions Software | TUV SUD | V2.0.1<br>V.V2.0.1 | 5125 | - | Software |
| 3.5 mm 2m Cable | Junkosha | MWX221-02000DMS | 5428 | 12 | 15-Oct-2021 |
| Thermo-Hygro-Barometer | PCE Instruments | PCE-THB-40 | 5481 | 12 | 18-Mar-2021 |
| 8m N Type Cable | Junkosha | MWX221-08000NMSNMS/B | 5519 | 12 | 24-Mar-2021 |
| Turntable & Mast Controller | Maturo Gmbh | NCD/498/2799.01 | 5612 | - | TU |
| Tilt Antenna Mast TAM 4.0-P | Maturo Gmbh | TAM 4.0-P | 5613 | - | TU |
| HLA 6121 Active Loop Antenna | Teseq | HLA | 5616 | 24 | 01-Jul-2022 |
| 3m Semi Anechoic Chamber | MVG | EMC-3 | 5621 | 36 | 11-Aug-2023 |

**Table 14**

TU - Traceability Unscheduled

# 3 Photographs

## 3.1 Test Setup Photographs

**Figure 11 – 9 kHz to 30 MHz – Outdoor Test Site**

**Figure 12 – 9 kHz to 30 MHz – Semi Anechoic Chamber**

**Figure 13 – 30 MHz to 1 GHz**

# 4 Measurement Uncertainty

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

| Test Name | Measurement Uncertainty |
|---|---|
| Field Strength of any Emission | 9 kHz to 30 MHz: ± 3.4 dB<br>30 MHz to 1 GHz: ± 5.2 dB |

**Table 15**

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.