Report on the FCC Exposure Testing of SureFlap Ltd
Microchip Pet Feeder Connect, Model: iMPF
In accordance with 47 CFR Part 1 Subpart I 1.1310

Prepared for: SureFlap Ltd
7 The Irwin Centre
Scotland Road
Dry Drayton
Cambridge
Cambridgeshire
CD23 8AR
United Kingdom

Add value.
Inspire trust.

COMMERCIAL-IN-CONFIDENCE

FCC ID: XO9-IMF00-001 IC: 8906A-IMPF0001

Document Number: 75944242-17 | Issue: 02

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Stephen Wells	15 May 2019	
Authorised Signatory	Phil Harrison	15 May 2019	

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 47 CFR Part 1 Subpart I 1.1310. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Pete Dorey	15 May 2019	

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with 47 CFR Part 1 Subpart I 1.1310:2017.

TÜV SÜD
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

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

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	03 April 2019
2	Addition of FCC and IC ID numbers	15 May 2019

Table 1

1.2 Introduction

Applicant	SureFlap Ltd
Manufacturer	SureFlap Ltd
Model Number(s)	iMPF
Serial Number(s)	U001-0001142
Hardware Version(s)	00818-DA_05 iMPF General Assembly (_05: revision 05)
Software Version(s)	Firmware 01233_FF (but special version for TUV SUD testing)
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 1.1310: 2017 Radiofrequency radiation exposure limits
Order Number	2745
Date	16 October 2018
Date of Receipt of EUT	29 November 2018
Start of Test	05 February 2019
Finish of Test	05 February 2019
Name of Engineer(s)	Pete Dorey
Related Document(s)	OET65:97 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. IEEE C95.1:2005 IEEE Standard for Safety Levels with Respect to Human Exposure to radio Frequency Electromagnetic Fields, 3 kHz to 300 kHz. IEEE C95.3:2002 IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz–300 GHz.

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with RSS-102 Supplement SPR-002 is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: Two modes; 126 kHz (Green blinking light) and 133 kHz (Red blinking light)				
2.1	1.1310 Table 1	Measurement of Electric and Magnetic field exposure	Pass	OET Bulletin 65

Table 2

1.4 Product Information

1.4.1 Technical Description

The Equipment Under Test (EUT) was a SureFlap Ltd., Microchip Pet Feeder Connect.

The primary function of the EUT is to provide an automated Pet Feeder solution. It was connected by 2.4 GHz RF to a hub which was connected to the internet.

This allowed the conditional access to food based on the animal RFID tags which operate over the frequency 126 kHz to 133 kHz.

It is intended for use in a domestic environment, usually situated on the floor in a kitchen.

Additionally, the EUT has functionality to be setup over the internet via a dedicated App.

A dedicated hub was provided for the internet connection and paired with the Pet Feeder.

A full description and detailed product specification details are available from the manufacturer.

This report addresses only the RFID frequencies.

Figure 1 – General View

1.5 Deviations from the Standard

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

1.6 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
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.7 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Two modes; 126 kHz (Green blinking light) and 133 kHz (Red blinking light)		
Measurement of Electric and Magnetic Field Exposure	Pete Dorey	Not Accredited

Table 4

Office Address:

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

2 Test Details

2.1 RF Exposure Electric and Magnetic Fields

2.1.1 Specification Reference

1.1310, Table 1 Limits for maximum Permissible Exposure (MPE).
IEEE C95.1, Table 9 MPE
OET Bulletin 65, Section 3 Measuring RF Fields
IEEE C95.3, Section 6.3 Measurement procedures for external fields

2.1.2 Equipment Under Test and Modification State

Microchip Pet Feeder Connect - Modification State 0

2.1.3 Date of Test

05 February 2019

2.1.4 Test Method

Instrumentation:

The specifications allow the use of either a narrowband or broadband instrument: Broadband meter and probe to be used with isotropic response (3-axis probe). Measurement of average (rms) values.

Measurement:

Measurements of field strength to determine compliance are to be made, "at distances 20 cm or greater from any object." (OET Bulletin 65 Section 1).

SureFlap has declared a separation distance from antenna to the user/bystander of 100 cm. As normal usage conditions may result in lesser separation distances, this report has assessed the EUT at a distance of 20 cm which also demonstrates that exposure is compliant at 100 cm.

For frequencies equal to or less than 30 MHz measurements for determining compliance with MPE limits require independent measurement of both E field and the magnetic field (H).

At frequencies below about 1 MHz, the body of the person making the measurement may become part of the antenna, and error from probe/cable pickup and instrument/body interaction may be reduced by supporting the probe and electronics on a dielectric structure made of wood, styrofoam, etc. In all cases, it is desirable to remove all unnecessary personnel from an area where a survey is being conducted in order to minimize errors due to reflection and field perturbation.

For the assessment of thermal exposure, the electromagnetic fields are time-averaged over a period of 6 minutes.

Test setup requirements:

There are no further set up requirements in the specifications referenced.

Therefore, the test separation distance will be measured from each face of the EUT to the centre of the probe (as this is the calibration point). The EUT will be mounted on an 80 cm non-metallic table or floor standing for large equipment.

2.1.5 Limits

1.1310, Table 1 provides electric and magnetic field limits 300 kHz – 300 MHz.

There are no limits specified for frequencies from 100 kHz to 300 kHz. A conservative approach is to adopt the limits at 300 kHz. This approach is used by FCC for wireless power transfer devices in accordance with KDB680106. The applicable MPE limits for electric and magnetic field at the RFID frequency of 126 kHz and 133 kHz are:

- Electric field: 614 V/m
- Magnetic field: 1.63 A/m

2.1.6 Environmental Conditions

Ambient Temperature	21.3 °C
Relative Humidity	27 %
Ambient Electric Field	0.97 V/m
Ambient Magnetic Field	0.04 A/m

2.1.7 Validation Check Result

Validation Source	Demagnetizer coil at 20 cm
	Magnetic Field µT
Source level	169.2
Measured level	173.5

Table 5 – Validation Check

2.1.8 Test Results

Measurement Result (Electric Field Time Averaged)

Field Type	Measurement position	Frequency kHz	Field Strength Result (time averaged rms)	MPE Limit	Units	Test Separation Distance[1] (mm)	Compliance (Yes/No)
Electric field	Front	126	3.70	614	V/m rms	200	Yes
Electric field	RHS	126	6.95	614	V/m rms	200	Yes
Electric field	LHS	126	5.38	614	V/m rms	200	Yes
Electric field	Back	126	4.31	614	V/m rms	200	Yes
Electric field	Top	126	5.96	614	V/m rms	200	Yes
Electric field	Front	133	3.30	614	V/m rms	200	Yes
Electric field	RHS	133	6.21	614	V/m rms	200	Yes
Electric field	LHS	133	4.82	614	V/m rms	200	Yes
Electric field	Back	133	3.75	614	V/m rms	200	Yes
Electric field	Top	133	5.67	614	V/m rms	200	Yes

Table 6 – Electric Field (Time Averaged)

Measurement Result (Magnetic Field Time Averaged)

Field Type	Measurement position	Frequency kHz	Field Strength Result (time averaged rms)	MPE Limit	Units	Test Separation Distance[1] (mm)	Compliance (Yes/No)
Magnetic field	Front	126	1.50	1.63	A/m rms	200	Yes
Magnetic field	RHS	126	1.08	1.63	A/m rms	200	Yes
Magnetic field	LHS	126	0.99	1.63	A/m rms	200	Yes
Magnetic field	Back	126	0.70	1.63	A/m rms	200	Yes
Magnetic field	Top	126	1.46	1.63	A/m rms	200	Yes
Magnetic field	Front	133	1.36	1.63	A/m rms	200	Yes
Magnetic field	RHS	133	0.94	1.63	A/m rms	200	Yes
Magnetic field	LHS	133	0.91	1.63	A/m rms	200	Yes
Magnetic field	Back	133	0.59	1.63	A/m rms	200	Yes
Magnetic field	Top	133	1.33	1.63	A/m rms	200	Yes

Table 7 – Magnetic Field (Time Averaged)

Measurement Result (Electric Field Instantaneous)

Field Type	Measurement position	Frequency kHz	Field Strength Result (time averaged rms)	MPE Limit	Units	Test Separation Distance[1] (mm)	Compliance (Yes/No)
Electric field	Front	126	4.04	614	V/m rms	200	Yes
Electric field	RHS	126	7.50	614	V/m rms	200	Yes
Electric field	LHS	126	5.73	614	V/m rms	200	Yes
Electric field	Back	126	4.90	614	V/m rms	200	Yes
Electric field	Top	126	6.52	614	V/m rms	200	Yes
Electric field	Front	133	3.53	614	V/m rms	200	Yes
Electric field	RHS	133	6.70	614	V/m rms	200	Yes
Electric field	LHS	133	5.13	614	V/m rms	200	Yes
Electric field	Back	133	4.18	614	V/m rms	200	Yes
Electric field	Top	133	6.37	614	V/m rms	200	Yes

Table 8 – Electric Field (Instantaneous)

Measurement Result (Magnetic Field Instantaneous)

Field Type	Measurement position	Frequency kHz	Field Strength Result (peak rms)	MPE Limit	Units	Test Separation Distance[1] (mm)	Compliance (Yes/No)
Magnetic field	Front	126	1.59	1.63	A/m rms	200	Yes
Magnetic field	RHS	126	1.13	1.63	A/m rms	200	Yes
Magnetic field	LHS	126	1.08	1.63	A/m rms	200	Yes
Magnetic field	Back	126	0.73	1.63	A/m rms	200	Yes
Magnetic field	Top	126	1.50	1.63	A/m rms	200	Yes
Magnetic field	Front	133	1.43	1.63	A/m rms	200	Yes
Magnetic field	RHS	133	0.98	1.63	A/m rms	200	Yes
Magnetic field	LHS	133	0.96	1.63	A/m rms	200	Yes
Magnetic field	Back	133	0.61	1.63	A/m rms	200	Yes
Magnetic field	Top	133	1.39	1.63	A/m rms	200	Yes

Table 9 – Magnetic Field (Instantaneous)

Note 1: The test separation distance is that declared by the manufacturer or the minimum distance for compliance that is ≥ 20 cm.

Measurement Result Frequency Spectrum

The frequency spectrum was viewed using the RF Field Meter FFT function to confirm the presence of the transmissions.

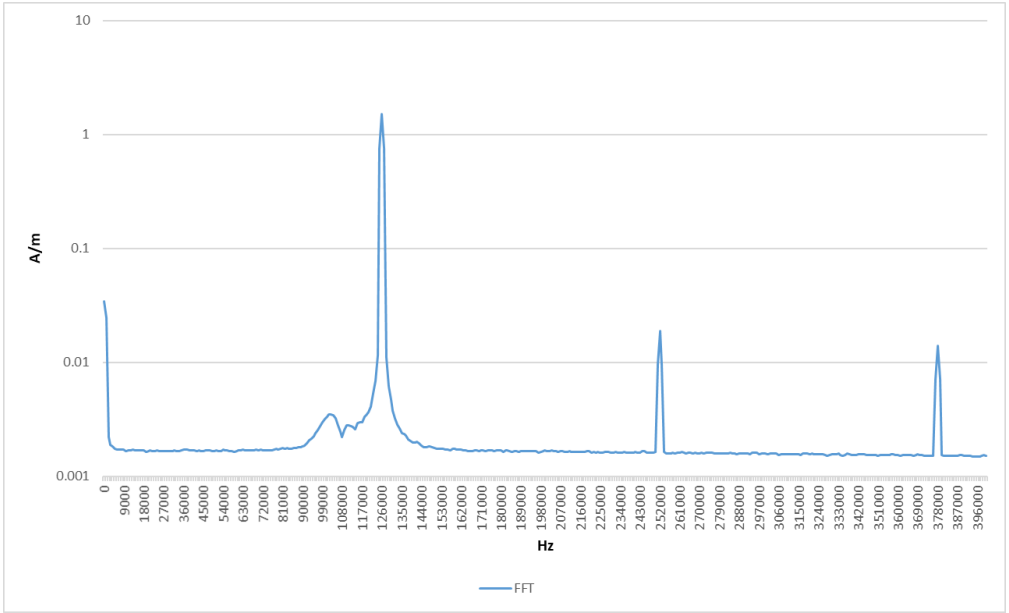

Figure 2 - Frequency Spectrum 126 kHz

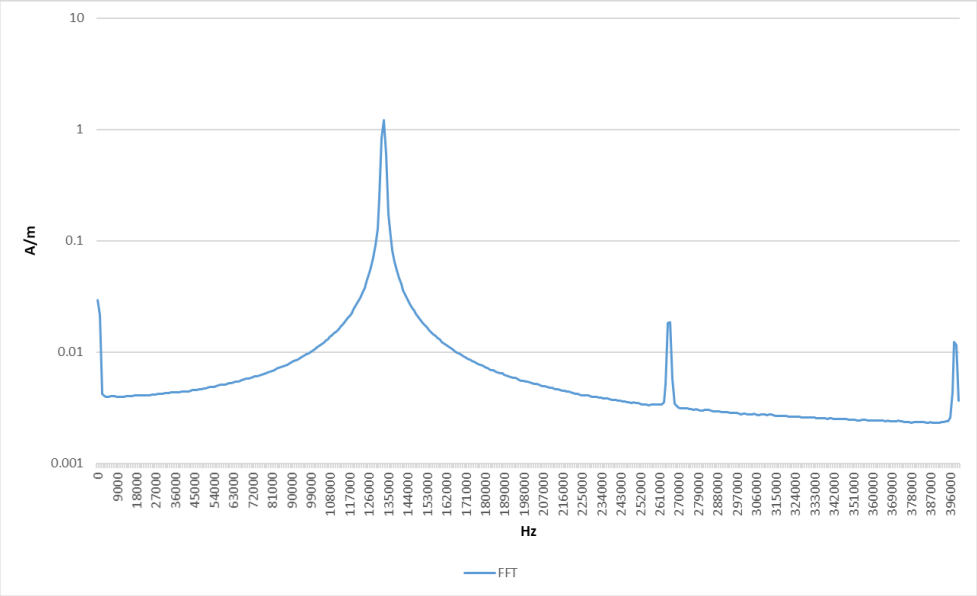

Figure 3 - Frequency Spectrum 133 kHz

2.2 Test Set-up Photographs

Figure 4 – Front Face Test Set-Up

Figure 5 – Right Hand Side Face Test Set-Up

Figure 6 - Left Hand Side Face Test Set-Up

Figure 7 – Back Face Test Set-Up

Figure 8 - Top Face Test Set-Up

2.3 Test Location and Test Equipment Used

This test was carried out in Screened Room 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EM Field Meter	Wavecontrol	SMP2 & WP400 Probe	SN 15SN0086 SN 16WP100162	24	14 Jan 2021
Thermo-hydrograph	Oregon Scientific	BAA913HG	N/A	12	N/A

Table 10

2.4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for the field measurements are:

Test Name	Measurement Uncertainty
Electric field strength V/m	±1.4 dB
Magnetic field strength A/m	±1.2 dB

Table 11