Report on the FCC and IC Testing of:

SureFlap Ltd
Microchip Pet Feeder Connect. Model: iMPF

In accordance with FCC 47 CFR Part 15C and Industry Canada RSS-310 and Industry Canada RSS-GEN

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

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

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SIGNATURE			
P O Harrison			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Philip Harrison	Senior Engineer	Authorised Signatory	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 FCC 47 CFR Part 15C and Industry Canada RSS-310 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

SIGNATURE			
G. Lawler M. Choudhury			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Mehadi Choudhury	Engineer	Testing	15 May 2019
Graeme Lawler	Test Engineer	Testing	15 May 2019

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be in compliance with FCC 47 CFR Part 15C: 2017, Industry Canada RSS-310: Issue 04 (2015-07) and Industry Canada RSS-GEN: Issue 05 (2018-04) 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	05 February 2019
2	Change FCC ID from XO9-IMPF00-001 to XO9-IMF00-001	15 May 2019

Table 1

1.2 Introduction

Applicant	SureFlap Ltd
Manufacturer	SureFlap Ltd
Model Number(s)	iMPF
Serial Number(s)	U001-0001152 and 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	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2017 Industry Canada RSS-310: Issue 04 (2015-07) Industry Canada RSS-GEN: Issue 05 (2018-04)
Order Number Date	2745 07-November-2018
Date of Receipt of EUT	12-November-2018 and 27-November-2018
Start of Test	21-November-2018
Finish of Test	02-December-2018
Name of Engineer(s)	Mehadi Choudhury and 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 and Industry Canada RSS-310 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15C	RSS-310	RSS-GEN			
Configuration and Mode: 126 kHz - RFID Transceiver						
2.1	-	2.6	6.6	Emission Bandwidth	Pass	ANSI C63.10
2.2	-	2.6	6.11	Frequency Tolerance Under Temperature Variations	Pass	ANSI C63.10
2.3	-	2.6	6.12	Transmitter Output Power	Pass	ANSI C63.10
2.4	15.209	2.6	6.13	Transmitter Unwanted Emissions	Pass	ANSI C63.10
-	-	2.6	7.1	Receiver Emission Limits	N/T	Receiver exempt from Industry Canada requirements as not within the band 30-960 MHz as described in Industry Canada RSS-GEN, Clause 5.3.
Configuration and Mode: 133 kHz - RFID Transceiver						
2.1	-	2.6	6.6	Emission Bandwidth	Pass	ANSI C63.10
2.2	-	2.6	6.11	Frequency Tolerance Under Temperature Variations	Pass	ANSI C63.10
2.3	-	2.6	6.12	Transmitter Output Power	Pass	ANSI C63.10
2.4	15.209	2.6	6.13	Transmitter Unwanted Emissions	Pass	ANSI C63.10
-	-	2.6	7.1	Receiver Emission Limits	N/T	Receiver exempt from Industry Canada requirements as not within the band 30-960 MHz as described in Industry Canada RSS-GEN, Clause 5.3.

Table 2

1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	iMPF
Part Number	N/A
Hardware Version	00818-DA_05 iMPF General Assembly (_05: revision 05)
Software Version	Firmware release 01233_FF (but special version for TUV SUD testing)
Technical Description (Please provide a brief description of the intended use of the equipment)	Feeder connected by 2.4 GHz RF to a hub which is connected to the internet. Allows the conditional access to food based on the animal RFID tags. Usually situated on the floor in a kitchen.

EXTREME TEMPERATURE RANGE (over which equipment is to be type tested)				
Category I (General) -20ºC to +55ºC	☐	Yes	☒	No
Category II (Portable) -10ºC to +55ºC	☐	Yes	☒	No
Category III (Equipment for normal indoor use) 0ºC to +35ºC	☒	Yes	☐	No

TYPE OF EQUIPMENT							
☐	Fixed Station	☐	Transmitter	☐	Simplex	☒	Integral Antenna
		☒	Receiver	☒	Duplex	☐	Single Antenna
☐	Mobile Station	☐	Transceiver			☐	Two Antenna Connector
		☐	Battery Charger			☐	Multiple Antenna Connectors No.
☒	Portable Station						
☐	Transponder (Tag)	☐	Active	☐	Passive		

TRANSMITTER TECHNICAL CHARACTERISTICS		
Product Class :	3	(See EN 300 330 Subclause 6.1.2.)
ANTENNA CHARACTERISTICS		
For Class 1 Equipments - Average area for the loop		m^2 (See Note 1)
For Class 2 and 3 Equipments - Maximum current in the loop	1	Amps
FREQUENCY CHARACTERISTICS		
Transmitter frequency alignment range (See Note 2)	0.126 to 0.133	MHz
Transmitter channel switching frequency range (See Note 3)	0.126 to 0.133	MHz
CHANNEL SEPARATION - (if applicable)	7 kHz	
State the maximum number of channels over which the equipment can operate -		7 kHz

Notes

(1) The Area of the loop is the physical area and does not take into account the number of turns.

(2) The alignment range is the frequency range over which the receiver or the transmitter can be programmed and/or realigned to operate, without any physical change to components other than programmable read only memories or crystals (for the receiver or transmitter).

(3) The switching range is the maximum frequency range over which the receiver or the transmitter can be operated without reprogramming or realignment.

TRANSMITTER RF CARRIER CHARACTERISTICS		
MAXIMUM RATED TRANSMITTER OUTPUT		
	Watts	At transmitter permanent external RF output connector (for class 2 or 3 equipment)
or		
to be measured	dB(µA/m)	Field strength at 10 m (for class equipment with integral antenna)
or		
	dB(µA/m)	Field strength at 10 m (for class 4 equipment with integral antenna)
MINIMUM RATED TRANSMITTER OUTPUT		
	Watts	At transmitter permanent external RF output connector (for class 2 or 3 equipment)
or		
to be measured	dB(µA/m)	Field strength at 10 m (for class equipment with integral antenna)
or		
	dB(µA/m)	Field strength at 10 m (for class 4 equipment with integral antenna)
Transmit Power Control Range	dB	Transmit Power Control Step dB

TRANSMITTER - MODULATION			
Amplitude	☐	Other	☒
Frequency	☐	Details :	the feeder send out an unmodulated carrier
Phase	☐		

POWER SOURCE			
☐	AC mains		State voltage
	AC supply frequency	(Hz)	
	VAC		
	Max Current		
	Hz		
☐	Single phase		☐ Three phase
And / Or			
☐	External DC supply		
	Nominal voltage	V	Max Current A
	Extreme upper voltage	V	
	Extreme lower voltage	V	
Battery			
☐	Nickel Cadmium		☐ Lead acid (Vehicle regulated)
☒	Alkaline		☐ Leclanche
☐	Lithium		☐ Other Details :
6	Volts nominal.		
End point voltage as quoted by equipment manufacturer		5	V

AUTOMATIC EQUIPMENT SWITCH OFF	
If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum and minimum calculated values this shall be clearly stated.	
☐	Applies V cut-off voltage
☒	Does not apply

FREQUENCY IDENTIFICATION			
Each equipment, whether one or more submitted for tests shall carry clear identification (such as a serial number), together with the frequency identification displayed on the equipment.			
Equipment identification e.g. serial number	Channel No. (if applicable)	Transmit Nominal Frequency (MHz)	Receive Nominal Frequency (MHz)
unit 1 - mode 1		0.126	0.126
unit 2 - mode 2		0.133	0.133

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

Name: Nick Hill Position held: Managing Director
Date: 16th November 2018

1.5 Product Information

1.5.1 Technical Description

Feeder connected by 2.4 GHz RF to a hub which is connected to the internet. Allows the conditional access to food based on the animal RFID tags. Usually situated on the floor in a kitchen.

1.5.2 EUT Configuration and Rationale for Radiated Spurious Emissions

The EUT was placed on the non-conducting platform in a manner typical of a normal installation.

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
Serial Number: U001-0001152			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: U001-0001142			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 126 kHz - RFID Transceiver -		
Emission Bandwidth	Mehadi Choudhury	UKAS
Frequency Tolerance Under Temperature Variations	Mehadi Choudhury	UKAS
Transmitter Output Power	Graeme Lawler	UKAS
Transmitter Unwanted Emissions	Graeme Lawler	UKAS
Configuration and Mode: 133 kHz - RFID Transceiver -		
Emission Bandwidth	Mehadi Choudhury	UKAS
Frequency Tolerance Under Temperature Variations	Mehadi Choudhury	UKAS
Transmitter Output Power	Graeme Lawler	UKAS
Transmitter Unwanted Emissions	Graeme Lawler	UKAS

Table 4

Office Address:

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

2 Test Details

2.1 Emission Bandwidth

2.1.1 Specification Reference

Industry Canada RSS-310, Clause 2.6
Industry Canada RSS-GEN Clause 6.6

2.1.2 Equipment Under Test and Modification State

iMPFWT, S/N: U001-0001152 - Modification State 0

2.1.3 Date of Test

21-November-2018

2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.9.3 and Industry Canada RSS-Gen clause 6.6.

2.1.5 Environmental Conditions

Ambient Temperature	21.0 °C
Relative Humidity	26.7 %

2.1.6 Test Results

126 kHz - RFID Transceiver

Frequency (MHz)	99% Occupied Bandwidth (Hz)
0.126	123.397

Table 5 - Occupied Bandwidth Result

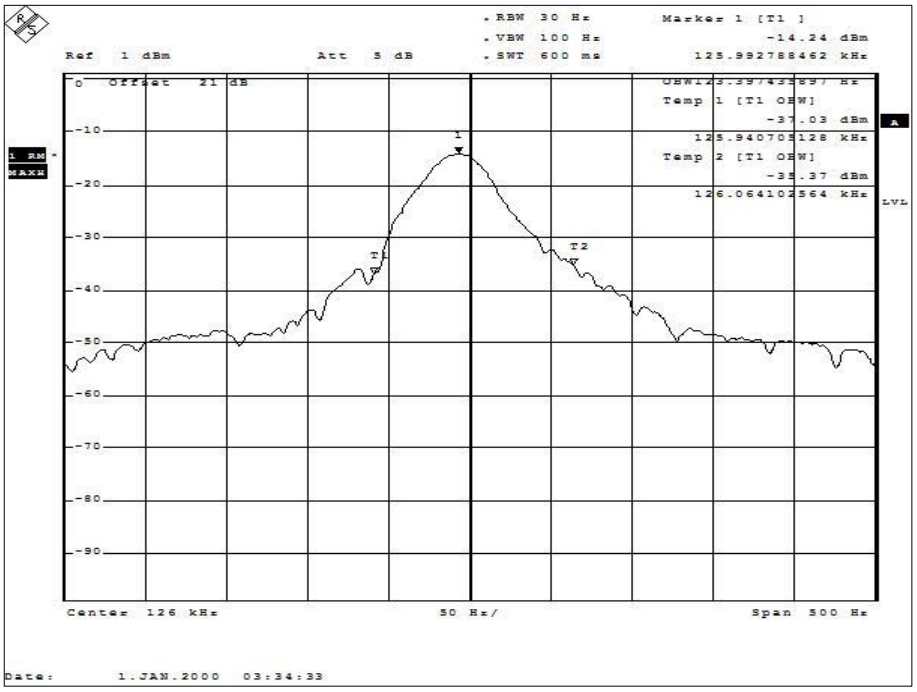

Figure 1 - Emission Bandwidth

Industry Canada RSS-Gen Limit Clause

None specified.

133 kHz - RFID Transceiver

Frequency (MHz)	99% Occupied Bandwidth (Hz)
0.133	129.808

Table 6 - Occupied Bandwidth Result

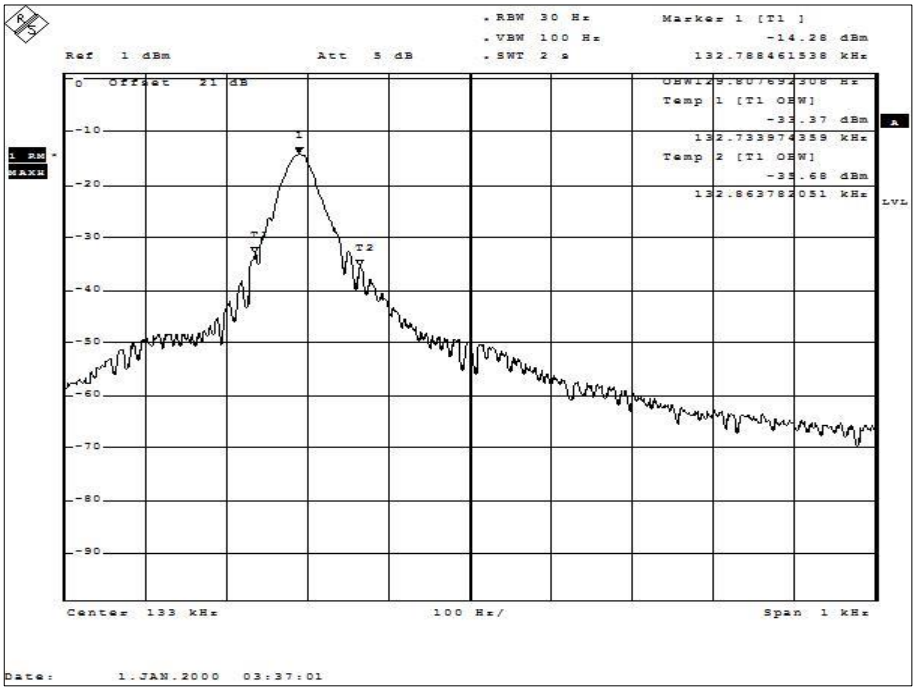

Figure 2 - Emission Bandwidth

Industry Canada RSS-Gen Limit Clause

None specified.

2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Loop 5.25)	Eaton	94605-1	2073	36	10-Oct-2019
Multimeter	Iso-tech	IDM101	2421	12	30-Oct-2019
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	19-Feb-2019
Attenuator (20dB, 2W)	Pasternack	PE7004-20	2943	12	18-Jul-2019
Hygrometer	Rotronic	I-1000	3220	12	13-Sep-2019
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	16-Apr-2019
Cable (40GHz)	Rosenberger	LU1-001-2000	5024	-	O/P Mon

Table 7

O/P Mon – Output Monitored using calibrated equipment

2.2 Frequency Tolerance Under Temperature Variations

2.2.1 Specification Reference

Industry Canada RSS-310, Clause 2.6
Industry Canada RSS-GEN, Clause 6.11

2.2.2 Equipment Under Test and Modification State

iMPFWT, S/N: U001-0001152 - Modification State 0

2.2.3 Date of Test

21-November-2018

2.2.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.8 and Industry Canada RSS-Gen clause 6.11.

The EUT was configured to operate with a modulated carrier. The spectrum analyser was configured for a span of 1 kHz, with a RBW/VBW of 30 Hz/100 Hz. The entire fundamental was displayed on screen and single marker was used to record the frequency of the maximum peak.

2.2.5 Environmental Conditions

Ambient Temperature	21.0 °C
Relative Humidity	26.7 %

2.2.6 Test Results

126 kHz - RFID Transceiver

Test Conditions		126 kHz	
Temperature	Voltage	Measured Frequency (kHz)	Frequency Error (Hz)
-30.0 °C	6.0 V DC	125.993	-7
+20.0 °C	6.9 V DC	125.993	-7
+20.0 °C	6.0 V DC	125.993	-7
+20.0 °C	5.1 V DC	125.993	-7
+50.0 °C	6.0 V DC	125.991	-9

Table 8 - Frequency Tolerance Results

Industry Canada RSS-Gen, Limit Clause 8.11

Transmitter frequency stability for licence-exempt radio apparatus shall be measured in accordance with Section 6.11. For licence-exempt radio apparatus, the frequency stability shall be measured at temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F) instead of at the temperatures specified in Section 6.11.

If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable standard (RSS), measurement of the frequency stability is not required provided that the occupied bandwidth of the licence-exempt radio apparatus lies entirely outside the restricted bands and the prohibited TV bands of 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz.

133 kHz - RFID Transceiver

Test Conditions		133 kHz	
Temperature	Voltage	Measured Frequency (kHz)	Frequency Error (Hz)
-30.0 °C	6.0 V DC	132.789	-211
+20.0 °C	6.9 V DC	132.787	-213
+20.0 °C	6.0 V DC	132.787	-213
+20.0 °C	5.1 V DC	132.788	-212
+50.0 °C	6.0 V DC	132.787	-213

Table 9 - Frequency Tolerance Results

Industry Canada RSS-Gen, Limit Clause 8.11

Transmitter frequency stability for licence-exempt radio apparatus shall be measured in accordance with Section 6.11. For licence-exempt radio apparatus, the frequency stability shall be measured at temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F) instead of at the temperatures specified in Section 6.11.

If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable standard (RSS), measurement of the frequency stability is not required provided that the occupied bandwidth of the licence-exempt radio apparatus lies entirely outside the restricted bands and the prohibited TV bands of 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz.

2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Loop 5.25)	Eaton	94605-1	2073	36	10-Oct-2019
Multimeter	Iso-tech	IDM101	2421	12	30-Oct-2019
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	19-Feb-2019
Attenuator (20dB, 2W)	Pasternack	PE7004-20	2943	12	18-Jul-2019
Thermocouple Thermometer	Fluke	51	3172	12	29-Nov-2018
Hygrometer	Rotronic	I-1000	3220	12	13-Sep-2019
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	16-Apr-2019
Climatic Chamber	Aralab	FitoTerm 300E45	4823	-	O/P Mon
Cable (40GHz)	Rosenberger	LU1-001-2000	5024	-	O/P Mon

Table 10

O/P Mon – Output Monitored using calibrated equipment

2.3 Transmitter Output Power

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209
Industry Canada RSS-310, Clause 2.6
Industry Canada RSS-GEN, Clause 6.12

2.3.2 Equipment Under Test and Modification State

iMPFWT, S/N: U001-0001142 - Modification State 0

2.3.3 Date of Test

04-December-2018

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3 and 6.4 and Industry Canada RSS-Gen clause 6.13.

The limit was extrapolated from 300 m to the measurement distance of 30 m in accordance with ANSI C63.10 Clause 6.4.4.2.

A CISPR Average detector was used for these measurements.

2.3.5 Environmental Conditions

Ambient Temperature	7.0 °C
Relative Humidity	65.1 %

2.3.6 Test Results

126 kHz - RFID Transceiver

Frequency kHz	Transmitter Output Power dBµV/m	Limit dBµV/m	Margin dBµV/m
126.027	-1.19	25.60	26.78

Table 11

FCC Part 15.209 requires that measurements be made at a distance of 300 m. The near field boundary was established as being 379.13 m, (47.77 / 0.126), (ANSI C63.10 Clause 6.4.4.1). Two measurement distances were chosen to establish the decay factor:

Measurement Distance (m)	Measured Field Strength (dBµV/m)	Measured Field Strength (µV/m)
10	85.50	18836.49
30	57.50	749.89

Table 12

Using the formula in Clause 6.4.4.4, the decay factor was determined:

$20 * [(\log (E_1 / E_2)) / (\log (d_1 / d_2))]$
= 20 * [(log (18836.49/ 749.89)) / (log (10/30))
= -58.69 dB

As the specification measurement distance of 300 m is within the near field boundary, only an extrapolation in the near field has been calculated:

Using the formula from Clause 6.4.4.7:
Extrapolated Field Strength = Field Strength Max – N * log (d_{LIMIT} / D_{MEAS})
= 57.50 – (58.89 * log (300 / 30)
= -1.19 dBµV/m

FCC Part 15C, Limit Clause 15.209

2400/126 = 19.05 µV/m = 25.60 dBµV/m

Industry Canada RSS-GEN Limit Clause 8.9

2400/126 = 19.05 µV/m = 25.60 dBµV/m

133 kHz - RFID Transceiver

Frequency kHz	Transmitter Output Power dBµV/m	Limit dBµV/m	Margin dBµV/m
132.820	-1.04	25.13	26.31

Table 13

FCC Part 15.209 requires that measurements be made at a distance of 300 m. The near field boundary was established as being 379.13 m, (47.77 / 0.126), (ANSI C63.10 Clause 6.4.4.1). Two measurement distances were chosen to establish the decay factor:

Measurement Distance (m)	Measured Field Strength (dBµV/m)	Measured Field Strength (µV/m)
10	84.10	16032.45
30	56.60	676.08

Table 14

Using the formula in Clause 6.4.4.4, the decay factor was determined:

$20 * [(\log (E_1 / E_2)) / (\log (d_1 / d_2))]$
= $20 * [(\log (16032.45 / 676.08)) / (\log (10/30))$
= -57.64 dB

As the specification measurement distance of 300 m is within the near field boundary, only an extrapolation in the near field has been calculated:

Using the formula from Clause 6.4.4.7:
Extrapolated Field Strength = Field Strength Max – $N * \log (d_{LIMIT} / D_{MEAS})$
= $56.60 – (57.64 * \log (300 / 30)$
= -1.04 dBµV/m

FCC Part 15C, Limit Clause 15.209

2400/133 = 18.05 µV/m = 25.13 dBµV/m

Industry Canada RSS-GEN Limit Clause 8.9

2400/126 = 18.05 µV/m = 25.13 dBµV/m

2.3.7 Test Location and Test Equipment Used

This test was carried out in EMC Open Area Test Site

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	09-Dec-2018
Antenna (Dish/Tripod/Adaptor, 1GHz-18GHz)	Rohde & Schwarz	AC-008	334	-	TU
Test Receiver	Rohde & Schwarz	ESIB40	1006	12	19-Jul-2019
Hygrometer	Rotronic	HP21	4989	12	26-Apr-2019

Table 15

TU - Traceability Unscheduled

2.4 Transmitter Unwanted Emissions

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209
Industry Canada RSS-310, Clause 2.6
Industry Canada RSS-GEN, Clause 6.13

2.4.2 Equipment Under Test and Modification State

iMPFWT, S/N: U001-0001142 - Modification State 0

2.4.3 Date of Test

02-December-2018

2.4.4 Test Method

This test was performed from 9 kHz to 30 MHz in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5 and Industry Canada RSS-Gen clause 6.13. The results pertaining to the other technologies supported by this product are detailed in separate reports.

Measurements were made at a distance of 3 m. The limit lines shown on the plot were extrapolated from either 300 m or 30 m to the measurement distance of 3 m 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.

2.4.5 Environmental Conditions

Ambient Temperature	18.6 °C
Relative Humidity	64.7 %

2.4.6 Test Results

126 kHz - RFID Transceiver

Frequency (MHz)	Results at Measurement Distance			Results at Limit Distance		
	Level (µV/m)	Distance	Detector	Level (µV/m)	Distance	Detector
0.504292	2474.57	3m	Quasi-Peak Detector	24.75	30m	Quasi-Peak Detector

Table 16 - Emissions Results - 9 kHz to 30 MHz

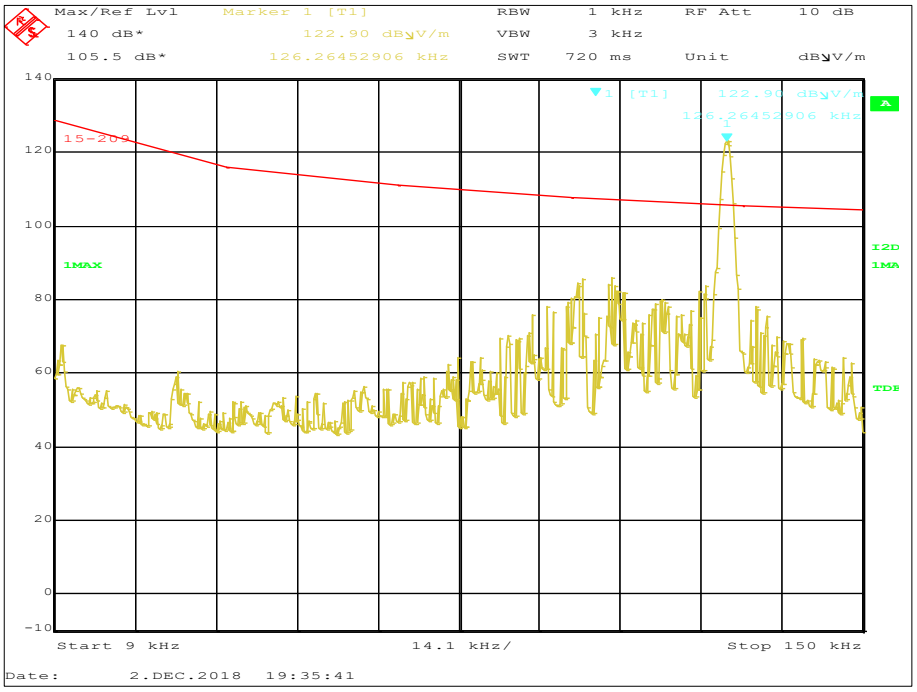

Figure 3 - 9 kHz to 150 kHz

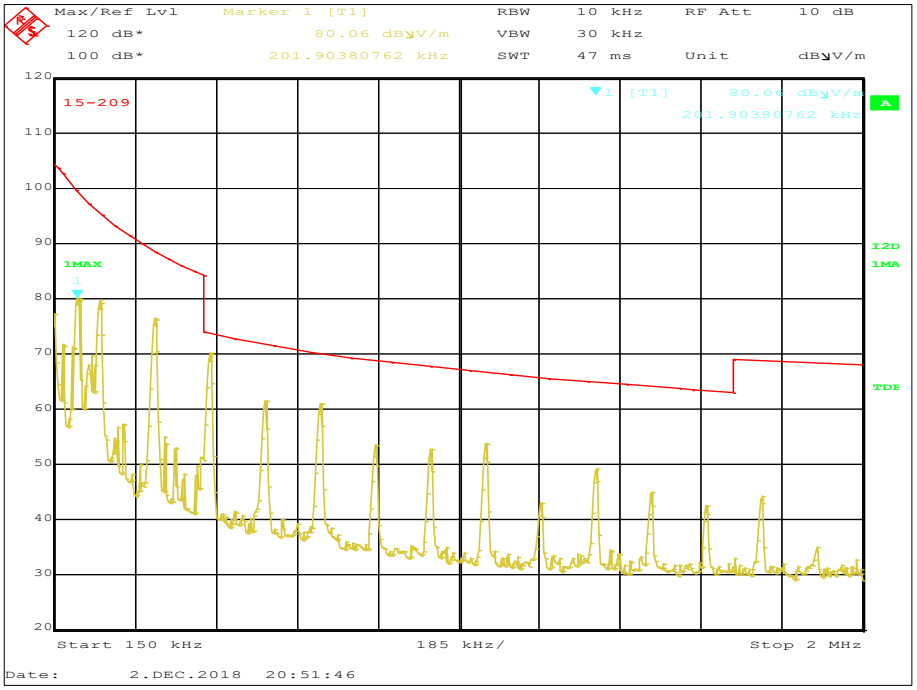

Figure 4 - 150 kHz to 2 MHz

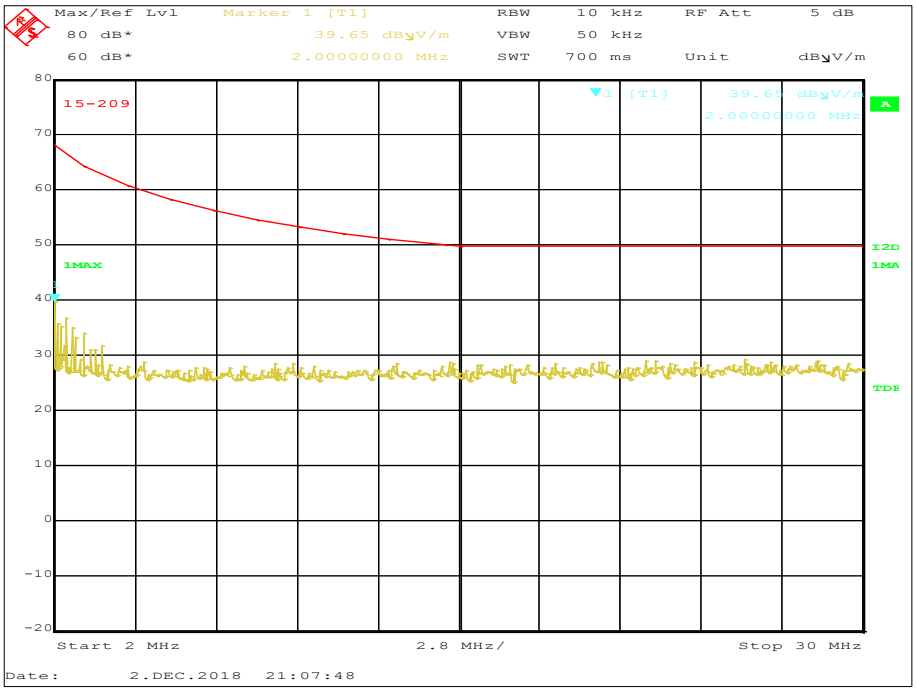

Figure 5 - 2 MHz to 30 MHz

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 17 - FCC Limit

Industry Canada RSS-Gen, Limit Clause 8.9

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

Table 18 - IC Limit, Below 30 MHz

Frequency (MHz)	Field Strength (µV/m at 3 metres)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 19 - IC Limit, Above 30 MHz

133 kHz - RFID Transceiver

Frequency (MHz)	Results at Measurement Distance			Results at Limit Distance		
	Level (µV/m)	Distance	Detector	Level (µV/m)	Distance	Detector
0.531794	2609.16	3m	Quasi-Peak Detector	26.09	30m	Quasi-Peak Detector

Table 20 - Emissions Results - 9 kHz to 30 MHz

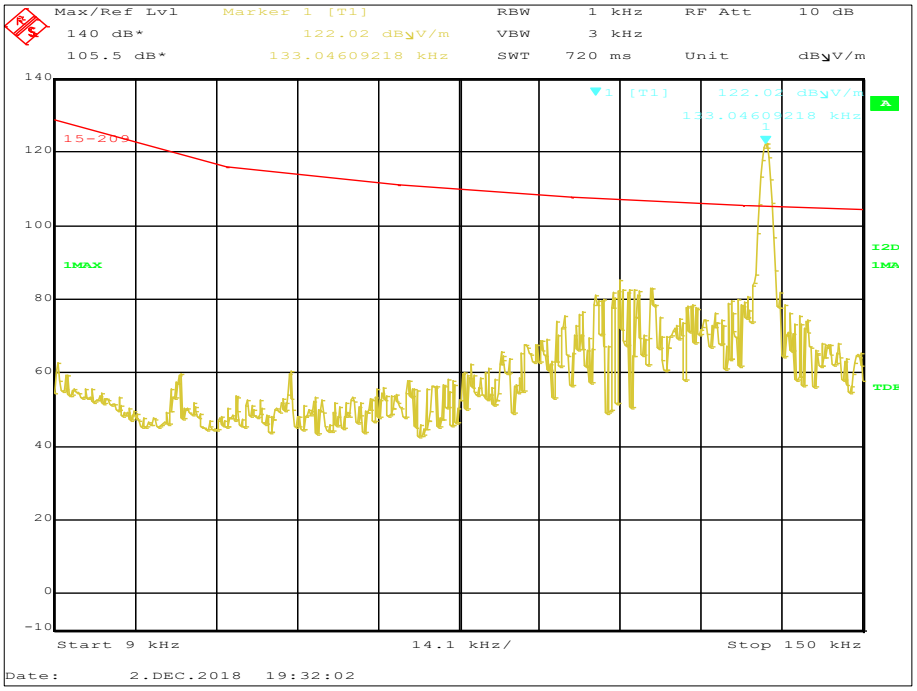

Figure 6 - 9 kHz to 150 kHz

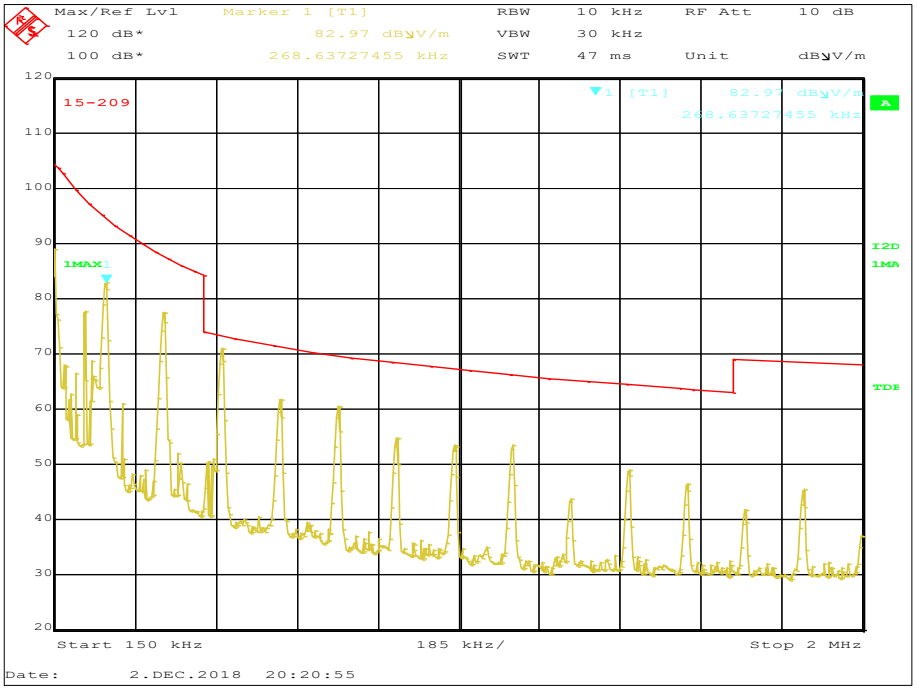

Figure 7 - 150 kHz to 2 MHz

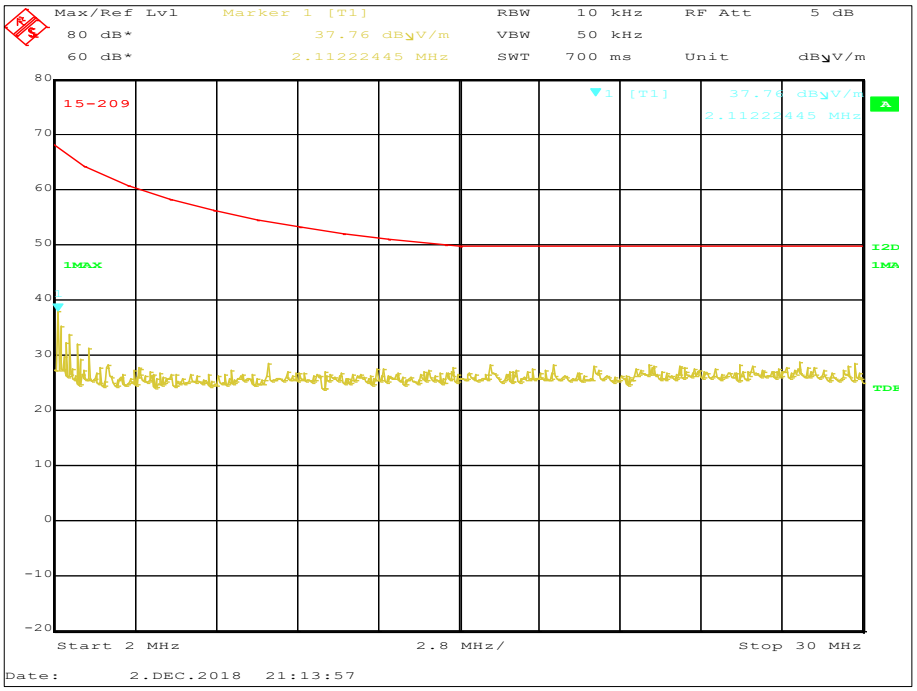

Figure 8 - 2 MHz to 30 MHz

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 21 - FCC Limit

Industry Canada RSS-Gen, Limit Clause 8.9

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

Table 22 - IC Limit, Below 30 MHz

Frequency (MHz)	Field Strength (µV/m at 3 metres)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 23 - IC Limit, Above 30 MHz

2.4.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	09-Dec-2018
Screened Room (5)	Rainford	Rainford	1545	36	23-Jan-2021
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Test Receiver	Rohde & Schwarz	ESIB40	2941	12	07-Aug-2019
Hygrometer	Rotronic	HP21	4989	12	26-Apr-2019

Table 24

TU - Traceability Unscheduled

3 Photographs

3.1 Test Setup Photographs

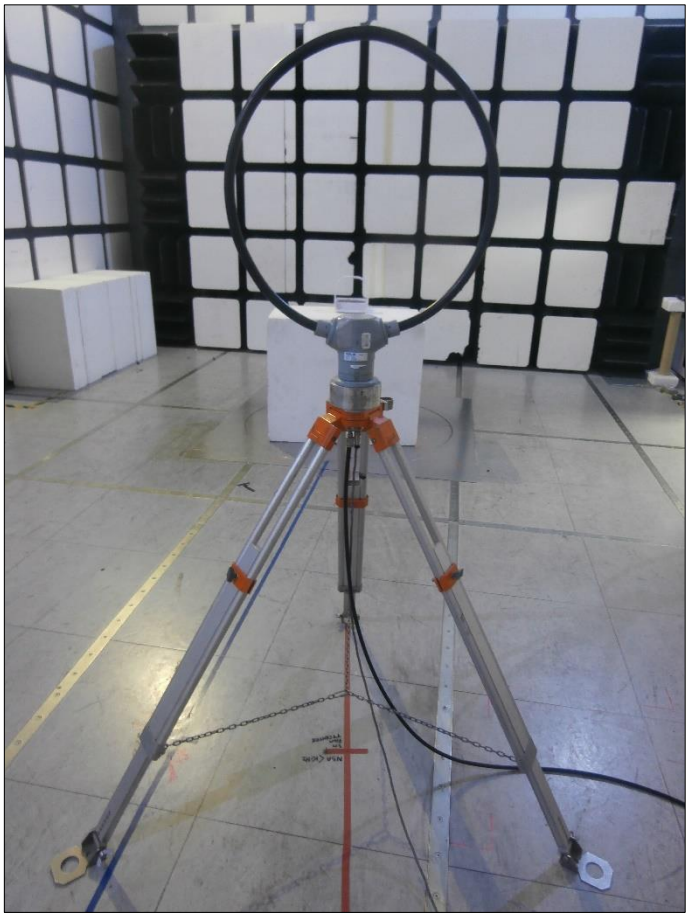

Figure 9 – Face On

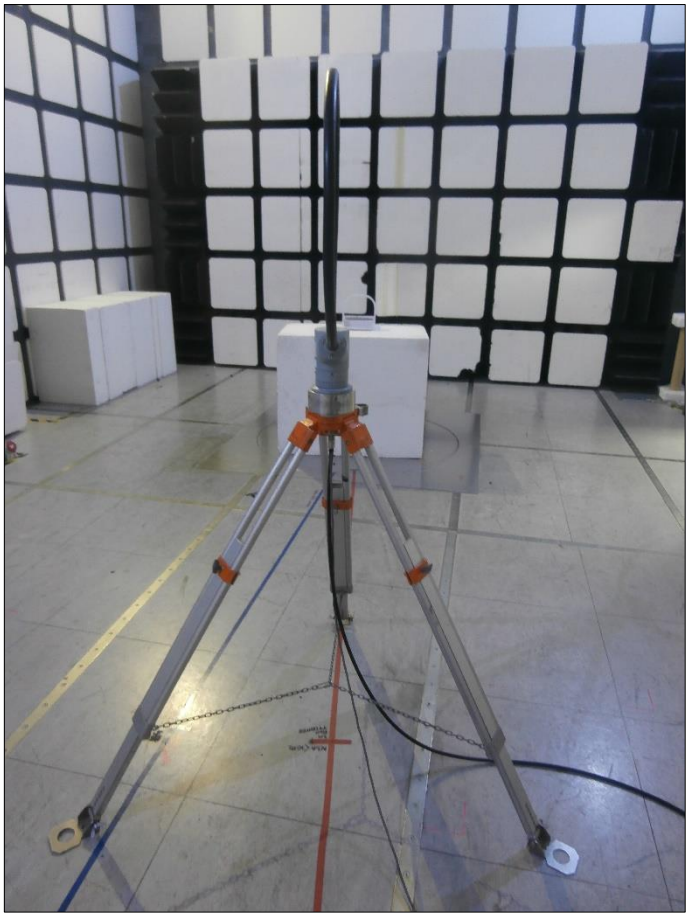

Figure 10 - Edge On

4 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Receiver Emission Limits	9 kHz to 30 MHz: ± 3.4 dB 30 MHz to 1 GHz: ± 5.2 dB 1GHz to 40GHz: ± 6.3 dB
Transmitter Unwanted Emissions	9 kHz to 30 MHz: ± 3.4 dB
Transmitter Output Power	Radiated: ± 5.2 dB Conducted: ± 0.96 dB
Frequency Tolerance Under Temperature Variations	± 0.006 kHz
Emission Bandwidth	± 0.0061 kHz

Table 25