

FCC and Industry Canada Testing of the
SureFlap Ltd
Automatic Pet Door, Model: IMPD**
In accordance with FCC 47 CFR Part 15C,
Industry Canada RSS-310 and
Industry Canada RSS-GEN

Prepared for: SureFlap Ltd
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FCC ID: XO9-IMPD00003
IC: 8906A-IMPD000003

COMMERCIAL-IN-CONFIDENCE

Date: November 2017
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Product Service

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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Jennifer Harris	30 November 2017	
Authorised Signatory	Matthew Russell	30 November 2017	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service 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, Industry Canada RSS-310 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Matthew Russell	30 November 2017	
Testing	Graeme Lawler	30 November 2017	

FCC Accreditation
UK0010 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: 2016, Industry Canada RSS-310: Issue 04 (2015-07) and Industry Canada RSS-GEN: Issue 04 (2014-11).



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ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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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	04 July 2017
2	To amend the FCC and IC IDs to all capital letters.	26 October 2017
3	Amended section 2.3 and added FCC designation number	22 November 2017

Table 1

1.2 Introduction

Applicant	SureFlap Ltd
Manufacturer	SureFlap Ltd
Model Number(s)	IMPD** (** represent the colour variation of the product.)
Serial Number(s)	A019-0142782 A019-0142785
Hardware Version(s)	Door 1.2 RF Module 4.0 LCD 1.0
Software Version(s)	Door 0.9 RF Module 0.9 LCD 1.0
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2016 Industry Canada RSS-310, Issue 04 (2015-07) Industry Canada RSS-GEN: Issue 04 (2014-11)
Order Number	1511
Date	20-April-2017
Date of Receipt of EUT	28-April-2017
Start of Test	12-June-2017
Finish of Test	22-June-2017
Name of Engineer(s)	Matthew Russell and Graeme Lawler
Related Document(s)	ANSI C63.10 (2013)



Product Service

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C, 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: Pet Door - 133 kHz						
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	15.209	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: Pet Door - 126 kHz						
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	15.209	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	IMPD** (** represent the colour variation of the product.)
Part Number	N/A
Hardware Version	Door 1.2 RF Module 4.0 LCD 1.0
Software Version	Door 0.9 RF Module 0.9 LCD 1.0
FCC ID (if applicable)	XO9-IMPD00003
Industry Canada ID (if applicable)	8906A-IMPD000003
Technical Description (Please provide a brief description of the intended use of the equipment)	Pet door connected by 2.4 GHz RF to a hub which is connected to the internet. Allows the conditional entry of animals based on RFID tags. Usually situated in an external door of a house.

INTENTIONAL RADIATORS									
Technology	Frequency Band (MHz)	Conducted Declared Output Power (dBm)	Antenna Gain (dBi)	Supported Bandwidth (s) (MHz)	Modulation Scheme(s)	ITU Emission Designator	Test Channels (MHz)		
							Bottom	Middle	Top
802.15.4	2.4 GHz	3.82	3.82	2	O-QPSK		2425	2450	2480
RFID	126 kHz	N/A							
RFID	133 kHz	N/A							

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	estimated 32 MHz (would require measurement to confirm)

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
External DC	Nominal Voltage		Maximum Current
Battery	Nominal Voltage		Battery Operating End Point Voltage
	6		5-6.5V
Can EUT transmit whilst being charged?			Yes ☐ No ☒

EXTREME CONDITIONS			
Maximum temperature	40	°C	Minimum temperature
			-20 °C



Product Service

Ancillaries
Please list all ancillaries which will be used with the device.
N/A

ANTENNA CHARACTERISTICS			
☐	Antenna connector	State impedance	Ohm
☐	Temporary antenna connector	State impedance	Ohm
☒	Integral antenna	Type	PCB
☐	External antenna	Type	

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

Name: Roger Geere
Position held: Principle Engineer Date: 27 June 2017

1.5 Product Information

1.5.1 Technical Description

Pet door connected by 2.4 GHz RF to a hub which is connected to the internet. Allows the conditional entry of animals based on RFID tags. Usually situated in an external door of a house.

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: A019-0142782			
0	As supplied by the customer	Not Applicable	Not Applicable
Serial Number: A019-0142785			
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: Pet Door - 133 kHz		
Emission Bandwidth	Matthew Russell	UKAS
Frequency Tolerance Under Temperature Variations	Matthew Russell	UKAS
Transmitter Output Power	Graeme Lawler	UKAS
Transmitter Unwanted Emissions	Graeme Lawler	UKAS
Configuration and Mode: Pet Door - 126 kHz		
Emission Bandwidth	Matthew Russell	UKAS
Frequency Tolerance Under Temperature Variations	Matthew Russell	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

FCC Designation Number – UK0010 / Industry Canada Registration Number - IC2932B-1



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

IMPD**, S/N: A019-0142782 - Modification State 0 (126 kHz)
IMPD**, S/N: A019-0142785 - Modification State 0 (133 kHz)

2.1.3 Date of Test

21-June-2017

2.1.4 Test Method

This test was performed in accordance with Industry Canada RSS-GEN, clause 6.6.

2.1.5 Environmental Conditions

Ambient Temperature	24.1 °C
Relative Humidity	55.8 %



Product Service

2.1.6 Test Results

Pet Door - 133 kHz

Frequency (kHz)	99% Occupied Bandwidth (Hz)
133.0	6.05

Table 5 - Occupied Bandwidth Result

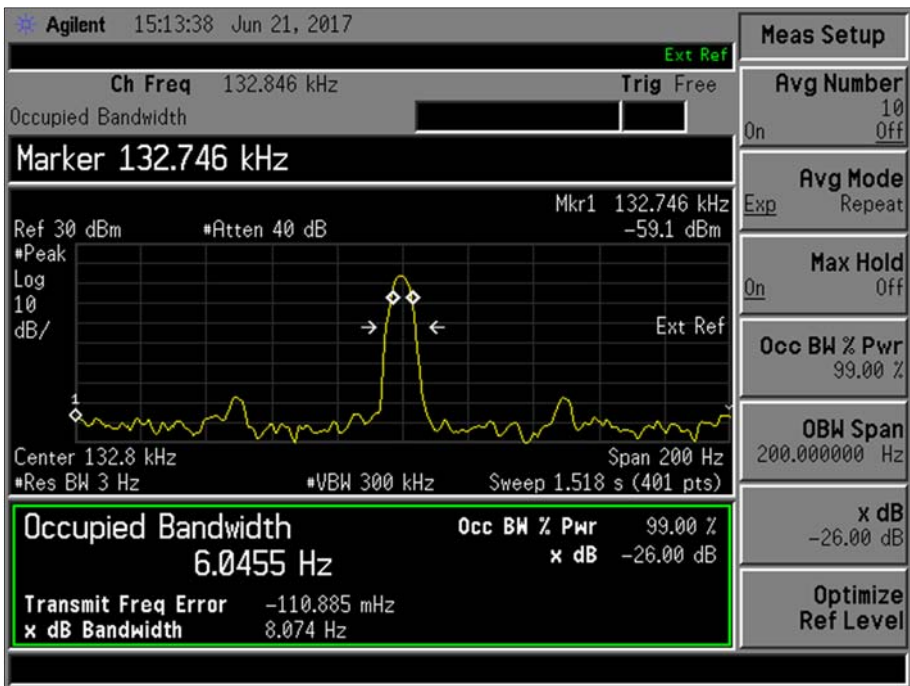


Figure 1 - Emission Bandwidth

Industry Canada RSS-GEN, Limit Clause

None specified.



Pet Door - 126 kHz

Frequency (kHz)	99% Occupied Bandwidth (Hz)
126.0	6.08

Table 6 - Occupied Bandwidth Result

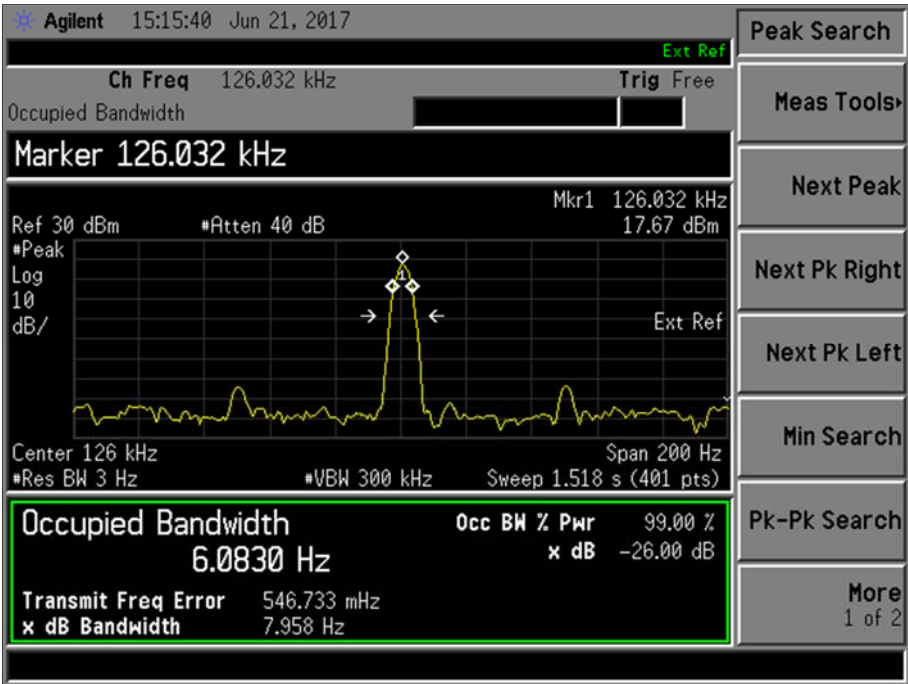


Figure 2 - Emission Bandwidth

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
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	09-Sep-2017
Multimeter	Iso-tech	IDM101	2419	12	14-Nov-2017
Hygrometer	Rotronic	I-1000	3220	12	23-Aug-2017
ESA-E Series Spectrum Analyser	Agilent Technologies	E4402B	3348	12	15-Sep-2017
Loop Antenna	ETS-Lindgren	7604	4134	24	27-Oct-2018
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	09-Sep-2017
2 metre N-Type Cable	Florida Labs	NMS-235SP-78.8-NMS	4622	12	12-Oct-2017

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

IMPD**, S/N: A019-0142782 - Modification State 0 (126 kHz)
IMPD**, S/N: A019-0142785 - Modification State 0 (133 kHz)

2.2.3 Date of Test

21-June-2017 to 22-June-2017

2.2.4 Test Method

This test was performed in accordance with Industry Canada RSS-Gen clause 6.11.

An unmodulated carrier was not available therefore the measurement was performed using a spectrum analyser. The spectrum analyser was configured for a span of 500 Hz, with an RBW/VBW of 3 Hz/300 Hz. The entire fundamental was displayed on screen an single marker was used to record the frequency of the maximum peak.

2.2.5 Environmental Conditions

Ambient Temperature 24.1 °C
Relative Humidity 55.8 %

2.2.6 Test Results

Pet Door - 133 kHz

Test Conditions		133.0 kHz	
Temperature	Voltage	Measured Frequency (kHz)	Frequency Error (Hz)
-30.0 °C	6.0 V DC	132.845	-155
+20.0 °C	6.9 V DC	132.841	-159
+20.0 °C	6.0 V DC	132.844	-156
+20.0 °C	5.1 V DC	132.844	-156
+50.0 °C	6.0 V DC	132.847	-153

Table 8

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.

Pet Door - 126 kHz

Test Conditions		126.0 kHz	
Temperature	Voltage	Measured Frequency (kHz)	Frequency Error (Hz)
-30.0 °C	6.0 V DC	126.031	31
+20.0 °C	6.9 V DC	126.036	36
+20.0 °C	6.0 V DC	126.029	29
+20.0 °C	5.1 V DC	126.029	29
+50.0 °C	6.0 V DC	126.035	35

Table 9

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
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	09-Sep-2017
Multimeter	Iso-tech	IDM101	2419	12	14-Nov-2017
Thermocouple Thermometer	Fluke	51	3174	12	22-Dec-2017
Hygrometer	Rotronic	I-1000	3220	12	23-Aug-2017
ESA-E Series Spectrum Analyser	Agilent Technologies	E4402B	3348	12	15-Sep-2017
Loop Antenna	ETS-Lindgren	7604	4134	24	27-Oct-2018
Frequency Standard	Spectracom	Secure Sync 1200-0408-0601	4393	6	09-Sep-2017
2 metre N-Type Cable	Florida Labs	NMS-235SP-78.8-NMS	4622	12	12-Oct-2017

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

IMPD**, S/N: A019-0142782 - Modification State 0 (126 kHz)
IMPD**, S/N: A019-0142785 - Modification State 0 (133 kHz)

2.3.3 Date of Test

13-Nov-2017

2.3.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3 and 6.5 and Industry Canada RSS-GEN, clause 6.12.

2.3.5 Environmental Conditions

Ambient Temperature	5.0 °C
Relative Humidity	62.1 %

2.3.6 Test Results

Pet Door - 133 kHz

Frequency kHz	Transmitter Output Power dBμV/m	Limit dBμV/m	Margin dBμV/m
132.870	16.01	25.13	9.12

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 359.17 m, (47.77 / 0.133), (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	92.17	40597.57
30	67.61	2401.60

Table 12

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

$$\begin{aligned}
 & 20 * [(\log (E_1 / E_2)) / (\log (d_1 / d_2))] \\
 & = 20 * [(\log (40597.57 / 2401.60)) / (\log (10/30))] \\
 & = -51.6 \text{ dB}
 \end{aligned}$$

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:

$$\begin{aligned}
 \text{Extrapolated Field Strength} &= \text{Field Strength Max} - N * \log (d_{\text{LIMIT}} / D_{\text{MEAS}}) \\
 &= 67.61 - (51.6 * \log(300 / 30)) \\
 &= 16.01 \text{ dBμV/m}
 \end{aligned}$$

Test limits in accordance with FCC Part 15.209 = 2400/133 = 18.05 μV/m = 25.13 dBμV/m

Pet Door - 126 kHz

Frequency KHz	Transmitter Output Power dBμV/m	Limit dBμV/m	Margin dBμV/m
126.050	17.32	25.59	8.27

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	92.49	42121.13
30	68.22	2576.32

Table 14

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

$$\begin{aligned}
 & 20 * [(\log (E_1 / E_2)) / (\log (d_1 / d_2))] \\
 & = 20 * [(\log (42121.13 / 2576.32)) / (\log (10/30))] \\
 & = -50.9 \text{ dB}
 \end{aligned}$$

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:

$$\begin{aligned}
 \text{Extrapolated Field Strength} &= \text{Field Strength Max} - N * \log (d_{\text{LIMIT}} / D_{\text{MEAS}}) \\
 &= 68.22 - (50.9 * \log (300 / 30)) \\
 &= 17.32 \text{ dBμV/m}
 \end{aligned}$$

Test limits in accordance with FCC Part 15.209 = 2400/126 = 19.05 μV/m = 25.59 dBμV/m

2.3.7 Test Location and Test Equipment Used

This test was carried at Octagon House, Outdoor Location.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	9-Dec-2018
Antenna (Dish/Tripod/Adaptor, 1GHz-18GHz)	Rohde & Schwarz	AC-008	334	-	TU
Hygrometer	Rotronic	A1	2138	12	2-Feb-2018
Multimeter	Iso-tech	IDM101	2419	12	14-Nov-2017
Hygrometer	Rotronic	I-1000	3220	12	23-Aug-2017
EMI Test Receiver	Rohde & Schwarz	ESIB26	242	12	16-June-2017

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

IMPD**, S/N: A019-0142782 - Modification State 0 (126 kHz)
IMPD**, S/N: A019-0142785 - Modification State 0 (133 kHz)

2.4.3 Date of Test

12-June-2017 to 14-June-2017

2.4.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.4 and 6.5. and Industry Canada RSS-GEN, clause 6.13.

2.4.5 Environmental Conditions

Ambient Temperature 20.6 °C
Relative Humidity 46.0 %

2.4.6 Test Results

Pet Door - 133 kHz

Frequency (MHz)	Quasi-Peak Level (µV/m) at 3m	Quasi-Peak Level (µV/m) at 30m
0.265625*	32210.69	5.36
0.398211*	13046.68	3.26
0.532451	4375.22	43.75
0.662901	1934.19	19.34
1.062439	839.46	8.39

Table 16 - Emissions Results - 9 kHz to 30 MHz

*These emissions have been extrapolated to a measurement distance of 300 m in accordance with FCC 47 CFR Part 15, Clause 15.209.

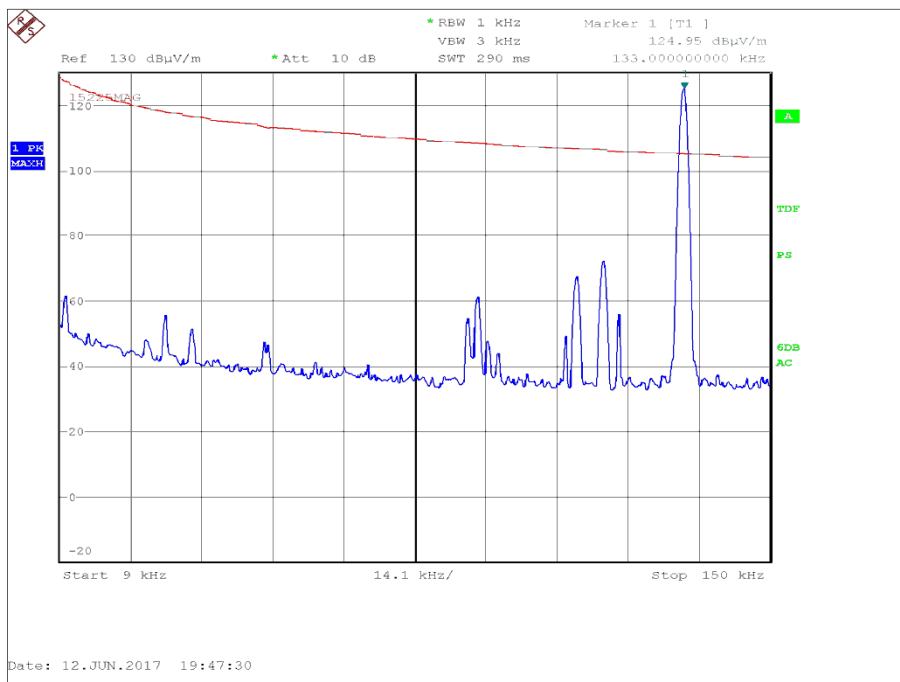


Figure 3 - Test Frequency Range 9 kHz to 150 kHz

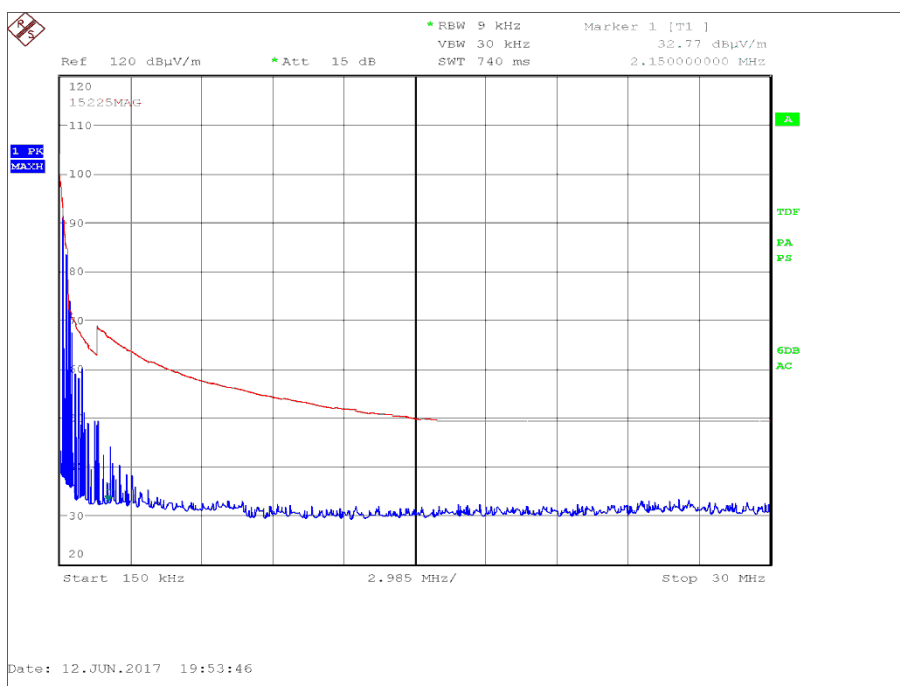


Figure 4 - Test Frequency Range 150 kHz to 30 MHz

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
31.327	30.3	40.0	-9.7	247	1.00	Vertical
33.307	30.6	40.0	-9.4	67	1.00	Vertical
452.227	34.0	46.0	-12.0	260	1.19	Vertical
491.522	34.7	46.0	-11.3	249	1.00	Vertical
530.828	34.5	46.0	-11.5	265	1.00	Vertical
570.190	35.5	46.0	-10.5	234	1.00	Vertical

Table 17 - Emissions Results - 30 MHz to 1 GHz

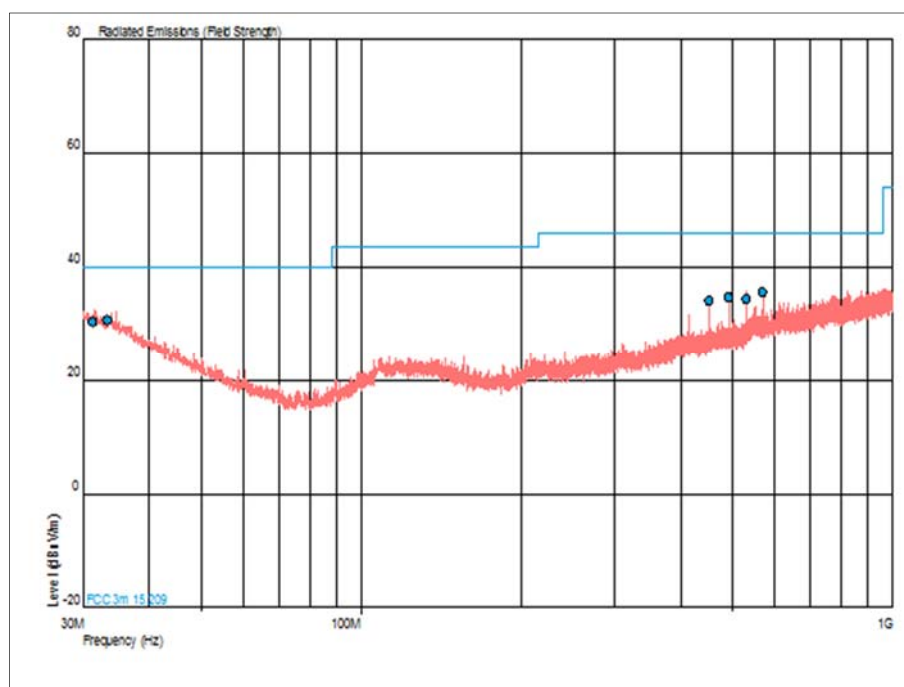


Figure 5 - Test Frequency Range: 30 MHz to 1 GHz

FCC 47 CFR Part 15C, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	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	5



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Industry Canada RSS-GEN, Limit Clause 8.9

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

Pet Door - 126 kHz

Frequency (MHz)	Quasi-Peak Level (μV/m) at 3m	Quasi-Peak Level (μV/m) at 30m
0.504166	1872.84	18.73
0.630289	1832.31	18.32
0.756058	1782.38	17.82

Table 18 - Emissions Results - 9 kHz to 30 MHz

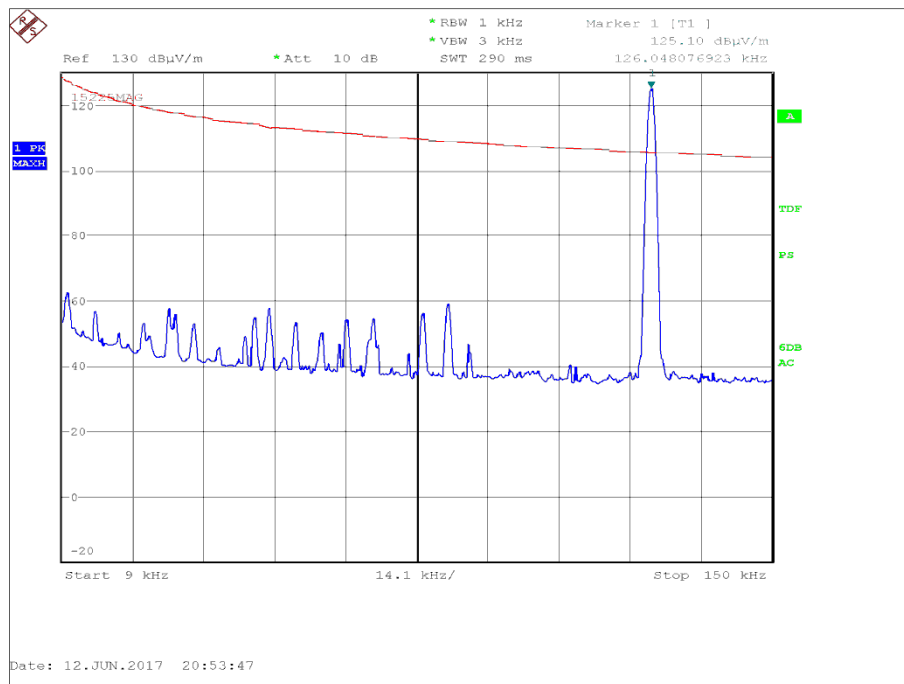


Figure 6 - Test Frequency Range 9 kHz to 150 kHz



Product Service

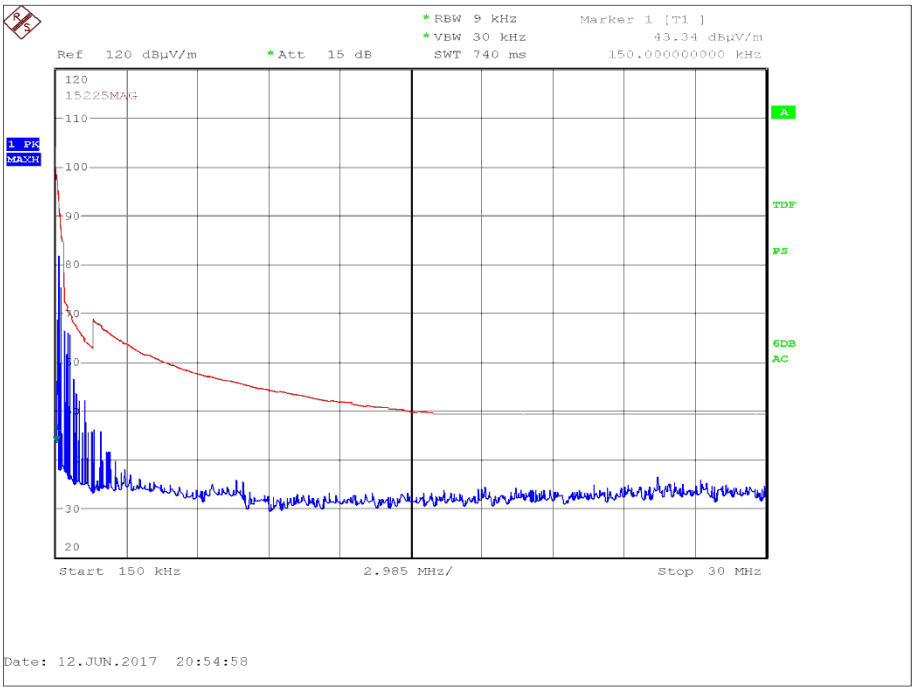


Figure 7 - Test Frequency Range 150 kHz to 30 MHz



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
30.233	30.9	40.0	-9.1	211	1.28	Vertical
31.727	30.2	40.0	-9.8	0	1.00	Vertical
491.558	33.6	46.0	-12.4	242	1.00	Vertical
530.834	34.9	46.0	-11.1	259	1.00	Vertical
570.190	35.2	46.0	-10.8	234	1.00	Vertical
609.480	33.2	46.0	-12.8	265	1.00	Vertical

Table 19 - Emissions Results - 30 MHz to 1 GHz

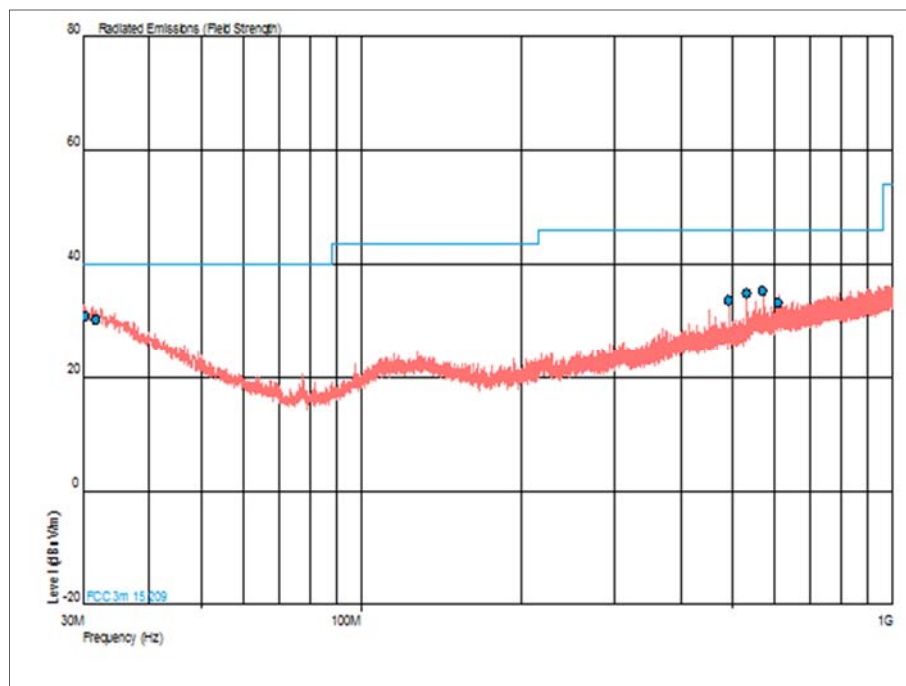


Figure 8 - Test Frequency Range: 30 MHz to 1 GHz

FCC 47 CFR Part 15C, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	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	5

Industry Canada RSS-Gen, Limit Clause 8.9

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3 metres)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

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	9-Dec-2018
Antenna (Dish/Tripod/Adaptor, 1GHz-18GHz)	Rohde & Schwarz	AC-008	334	-	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	1002	12	14-Oct-2017
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	A1	2138	12	2-Feb-2018
Antenna (Bilog)	Chase	CBL6143	2904	24	18-Jun-2017
Antenna (Log Periodic)	Schaffner	UPA6108	3108	12	23-Jun-2017
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	2-May-2018
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	12-Nov-2017
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU

Table 20

TU - Traceability Unscheduled



3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Emission Bandwidth	± 3.0 Hz
Frequency Tolerance Under Temperature Variations	± 3.8 Hz
Transmitter Output Power	Radiated: ± 5.1 dB Conducted: ± 0.96 dB
Transmitter Unwanted Emissions	9 kHz to 30 MHz: ± 3.4 dB 30 MHz to 1 GHz: ± 5.1 dB
Receiver Emission Limits	9 kHz to 30 MHz: ± 3.4 dB 30 MHz to 1 GHz: ± 5.1 dB

Table 21