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**dB Technology**

( Cambridge Ltd. )

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Testing

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## REPORT ON ELECTROMAGNETIC COMPATIBILITY TESTS

Performed at:  
**TWENTY PENCE TEST SITE**

**Twenty Pence Road,  
Cottenham,  
Cambridge  
U.K.  
CB24 8PS**

on

**Sureflap Ltd**

**SureFeed**

dated


**22nd September 2014**

### Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	23/09/14		Initial release		

Based on report template:  
v090319

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	Report No: <b>R3392</b> Issue No: <b>1</b>	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: <b>T5476</b>	<b>Test Report</b>	Page: 2 of 40

Equipment Under Test (EUT): SureFeed

Test Commissioned by: Sureflap Ltd  
7 The Irwin Centre  
Scotland Road  
Dry Drayton  
Cambridgeshire  
CB23 8AR

Representative: Darren Cawthorne


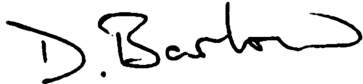
Test Started: 1st August 2014

Test Completed: 22nd August 2014

Test Engineer: Dave Smith/Peter Barlow

Date of Report: 22nd September 2014

Written by:                     Dave Smith                          Checked by:                     Derek Barlow                    

Signature:       Signature: 


Date:                     22nd September 2014                          Date:                     23rd September 2014                    

**dB Technology can only report on the specific unit(s) tested at its site. The responsibility for extrapolating this data to a product line lies solely with the manufacturer.**

## Test Standards Applied

<b>CFR 47</b>	<i>Code of Federal Regulations: Pt 15 Subpart C - Radio Frequency Devices - Intentional Radiators</i>
---------------	---

<b>RSS-210 Issue 8</b>	<i>Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment</i>
----------------------------	---

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## Emissions Test Results Summary


CFR 47					PASS
Test	Port	Method	Limit	PASS/FAIL	Notes
Conducted Emissions	ac power	ANSI C63.4:2003	15.207	N/A	#1
Radiated Emissions		ANSI C63.4:2003	15.209	PASS	

specs\_fccv100412

- #1 This test was not applicable because the EUT was powered by an internal battery and has no means of connection to an ac power source.


RSS-210					PASS
Test	Port	Method	Limit	PASS/FAIL	Notes
Radiated Spurious Emissions	enclosure	ANSI C63.4:2003	RSS_GEN Tables 5&6	PASS	

specs\_canadav111211

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## 1 EUT Details

### 1.1 General

The EUT was pet feeder with an RFID detector system. The EUT generates a magnetic field at one of two nominal frequencies: 126kHz or 133kHz. The driver output is set to one of two levels: 80V or 120V. Four samples were provided to constantly generate all four combinations of carrier level and frequency. A fifth sample was provided which continuously performed the normal read cycle which involves sequentially transmitting at all of the frequency / level combinations. A sixth sample was provided with carrier not powered (its normal operating mode until the optical sensor detects the presence of a pet).

The EUT is powered from an internal battery and has no connecting cables.

The EUT was considered an intentional radiator under the rules of CFR 47 part 15 subpart C. The general limits for intentional radiators (section 15.209) were applied. The carrier frequencies do not fall within the restricted bands of section 15.205.


**The EUT was found to comply with the general emissions limits of FCC CFR47 Part 15.209.**

For Canada the rules of RSS-210 were applied. The general limits for Licence-exempt apparatus were applied (Tables 5 and 6 of RSS-GEN Issue 3). These limits are identical to the limits applied for FCC testing.

**The EUT was found to comply with the general emissions limits of RSS-210**

Details of the EUT and associated peripherals used during the tests are listed below. Figure 1 shows the interconnections between the EUT and peripherals.

Item	Manufacturer	Model	Description	Serial No:	Notes
1	Sureflap Ltd	SureFeeder	EUT sample set at 126kHz, 120V		
2	Sureflap Ltd	SureFeeder	EUT sample set at 126kHz, 80V		
3	Sureflap Ltd	SureFeeder	EUT sample set at 132.8kHz, 120V		
4	Sureflap Ltd	SureFeeder	EUT sample set at 132.8kHz, 80V		
5	Sureflap Ltd	SureFeeder	EUT sample continuously cycle through read modes		
6	Sureflap Ltd	SureFeeder	EUT sample normal operating mode waiting for pet to approach - not transmitting		

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## 1.2 Modifications to EUT and Peripherals


Details of any modifications that were required to achieve compliance are listed below. The modification numbers are referred to in the results sections as appropriate.

Mod No:	Details	Implemented for
0	Original unit	
1	C69 changed to from 2.2nF to 3.3nF.	

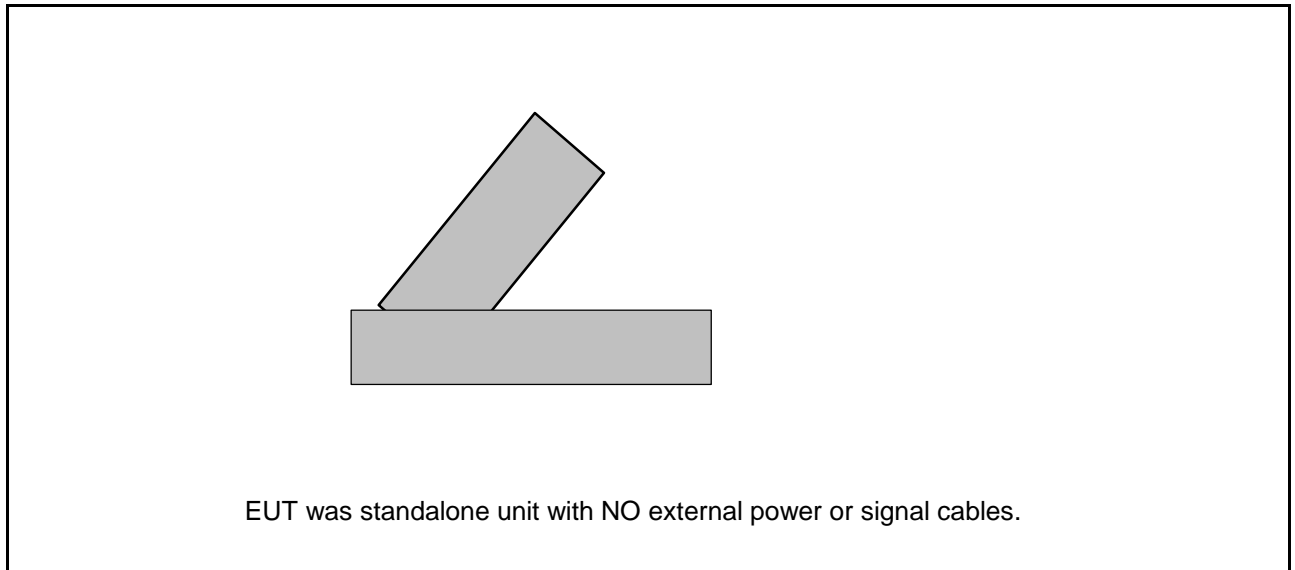
## 1.3 EUT Operating Modes


The EUT was tested in the following operating mode or modes. Generally, operating modes are chosen that will exercise the functions of the EUT as fully as possible and in a manner likely to produce maximum emission levels or susceptibility. Individual test result sheets reference the operating mode of the EUT.

Operating Mode	Details
1	Transmitting constantly at a fixed frequency and level. Normally the carrier is only activated when a cat enters the cat flap and so special test firmware was used to provide a constant transmission.
2	Running test firmware which continuously cycles through the normal read cycle, turning the RF on and off at the normal frequencies and levels. This mode was used to check that no transients occurred when turning the RF on and off.
3	Normal / Idle mode. In this mode the device is not transmitting the RF signal, it is merely checking for the presence of a pet using optical sensors.

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**Figure 1 General Arrangement of EUT**



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**Photograph 1 Radiated Emissions - below 30MHz @10m**



**Photograph 2 Radiated Emissions - below 30MHz @10m**

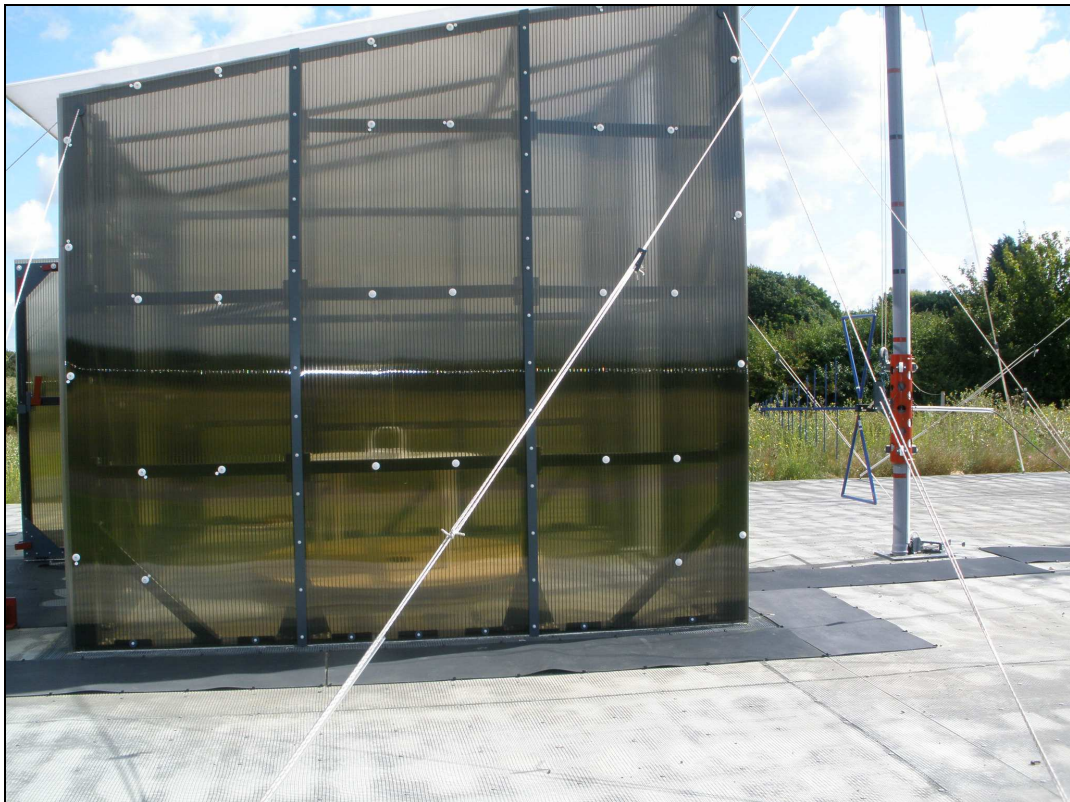
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**Photograph 3 Radiated Emissions - Carrier Extrapolation**



**Photograph 4 Radiated Emissions - above 30MHz**


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## 2 Test Equipment

The test equipment used during the tests was one or more of the items listed below. Individual test result sheets indicate which items were used.

Ref No:	Details	Serial Number	Cal Date	Cal Period
A15	Chase X-wing Bilog CBL6140 20MHz-2GHz	1047	28/10/2013	1 year
A5	Chase Bilog CBL6111A	1760	03/03/2014	1 year
A9	EMCO 6502 Loop	2139	13/03/2014	1 year
PRE3	dB Tech 100M-20G 36dB pre-amp	03	28/08/2013	1 year
R10	Narda PMM 9010 Receiver (10Hz-30MHz)	595WX11003	12/02/2014	1 year
R13	Anritsu MS2830A	6201180830	30/01/2014	1 year
R4	R&S ESVS10	843744/002	13/12/2013	1 year
R9	Agilent E7405A Spectrum Analyser	MY45110758	19/11/2013	1 year

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### 3 Test Methods

#### 3.1 Radiated Emissions below 30MHz

This section describes the general method of performing this test. The specific method used and any deviations from this general method are listed in the appropriate results section.

Initial scans are performed in a semi-anechoic screened room at a distance of 3m. Scans are performed over the frequency range specified in the test standard with a loop antenna both co-axially and orthogonally orientated with respect to the EUT. During these scans the EUT and peripherals are rotated through 360°. Bench top EUTs are placed on a non-conducting bench at a height of 0.8m above the ground plane. Floor standing EUTs are placed 0.1m above the ground plane. The results of the scans are shown in the plots included at the end of the report.

Significant emissions identified by the scans are measured on an open area test site at the appropriate test distance using a CISPR16 quasi-peak receiver. Maximised readings are obtained by rotating the EUT through 360° with the antenna at a height of 1m. Measurements are made with the antenna both coaxially and orthogonally orientated with respect to the EUT and the results tabulated.

Tabulated results are obtained by adding the raw reading from the receiver (in dBuV) to the appropriate correction factors for the antenna and cables to give a reading in dBuV/m. For example:

Frequency	Receiver reading	Correction Factor	Final level
126kHz	75.8 dBuV	8.0 dB/m	83.8 dBuV/m

$$\text{Final reading} = 75.8 + 8.0 = 83.8.$$

#### 3.2 Radiated Emissions above 30MHz

This section describes the general method of performing this test. The specific method used and any deviations from this general method are listed in the appropriate results section.

Initial scans are performed in a semi-anechoic screened room at a distance of 3m. Scans are performed over the frequency range specified in the test standard with the antenna both horizontally and vertically polarised. During these scans the EUT and peripherals are rotated through 360°. Bench top EUTs are placed on a non-conducting bench at a height of 0.8m above the ground plane. Floor standing EUTs are placed 0.1m above the ground plane. The results of the scans are shown in the plots included at the end of the report.

Significant emissions identified by the scans are measured on an open area test site at the appropriate test distance using a CISPR16 quasi-peak receiver. Maximised readings are obtained by rotating the EUT through 360° and adjusting the height of the antenna from 1m to 4m. Measurements are made with the antenna both horizontally and vertically polarised and the results tabulated.


Tabulated results are obtained by adding the raw reading from the receiver (in dBuV) to the appropriate correction factors for the antenna and cables to give a reading in dBuV/m. For example:

Frequency	Receiver reading	Correction Factor	Final level
160MHz	5.9 dBuV	12.6 dB/m	18.5 dBuV/m

$$\text{Final reading} = 5.9 + 12.6 = 18.5$$

### 4 Test Results

The following sections contain tabulated test results. Plots of various scans are included at the back of this section.

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#### 4.1 Extrapolation of Limits for Different Distances.

The limits for emissions at frequencies below 490kHz are specified at a 300m distance. This distance is often impractical due to either geographic issues or the signal to be measured being below noise floor.

Extrapolation is permitted at a standard 40dB/decade of distance for these frequencies. It is also possible to make measurements at various distances to establish the actual extrapolation.

The limit at 300m is:  $2400 / f$  (kHz) uV/m

At 126kHz the limit is therefore:  $20 \cdot \log(2400/126) = 25.6 \text{ dBuV/m @ 300m}$

At 132.8kHz the limit is therefore:  $20 \cdot \log(2400/132.8) = 25.14 \text{ dBuV/m @ 300m}$

For final measurements at the carrier frequency, two methods were used in this report.

The first was to take the measurement at 70m and use the default 40dB/decade extrapolation to calculate the limit at 70m.

The difference between 70m and 300m is:  $\log(70/300)$  decades = 0.632 decades.

Assuming an extrapolation of 40dB per decade, this gives a change in limit of  $40 \cdot 0.632 = 25.28 \text{ dB}$  when moving from 300m to 70m.

At 126kHz the limit is therefore:  $25.6 + 25.28 = 50.88 \text{ dBuV/m @ 70m}$

At 132.8kHz the limit is therefore:  $25.14 + 25.28 = 50.42 \text{ dBuV/m @ 70m}$

The second was to take the measurement at 10m and extrapolate the limit using the minimum dB/decade measured at different distances. Later results in this report show this measured extrapolation to be at least 50dB/decade.

The difference between 10m and 300m is:  $\log(10/300)$  decades = 1.477 decades.


Assuming an extrapolation of 50dB per decade, this gives a change in limit of  $50 \cdot 1.477 = 73.85 \text{ dB}$  when moving from 300m to 10m.

At 126kHz the limit is therefore:  $25.6 + 73.85 = 99.45 \text{ dBuV/m @ 10m}$

At 132.8kHz the limit is therefore:  $25.14 + 73.85 = 98.99 \text{ dBuV/m @ 10m}$

For all harmonic measurements, the default 40dB/decade extrapolation was used as shown in the table below:

	Frequency kHz	Reference Distance m	Reference Distance Level uV/m	Reference Distance Level dBuV/m	40dB/dec Level at 10m dBuV/m
2nd	252	<b>300</b>	9.52	<b>19.58</b>	78.66
2nd	266	<b>300</b>	9.02	<b>19.11</b>	78.19
3rd	378	<b>300</b>	6.35	<b>16.05</b>	75.14
3rd	399	<b>300</b>	6.02	<b>15.58</b>	74.67
4th	504	<b>30</b>	47.62	<b>33.56</b>	52.64
4th	532	<b>30</b>	45.11	<b>33.09</b>	52.17
5th	630	<b>30</b>	38.10	<b>31.62</b>	50.70
5th	665	<b>30</b>	36.09	<b>31.15</b>	50.23
6th	756	<b>30</b>	31.75	<b>30.03</b>	49.12
6th	798	<b>30</b>	30.08	<b>29.56</b>	48.65

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## 4.2 EUT Modulation and Measuring Bandwidths

The EUT transmits only unmodulated carriers at 126kHz and 133kHz. The carriers are alternately turned on and off. The on periods are between 80ms and 240ms each time - as shown in plot 22.

A 200Hz RBW peak detector was used for all emissions measurements at carrier frequencies.


For Open Area Test Site measurements of the harmonics, which were at a much lower level and affected by ambients, it was necessary to use a spectrum analyser with a narrower bandwidth. A 10Hz resolution bandwidth was used with a 10Hz video bandwidth and a peak detector. In view of the characteristics of the signal this was considered to be acceptable, but, in order to confirm that these settings would provide reliable data, comparative tests were performed in the anechoic chamber at a measuring distance of 3m.

Results measured using a 9kHz bandwidth CISPR16 quasi-peak detector were compared with results measured with the 10Hz / 10Hz / Peak Detector spectrum analyser setup. The results are shown below:

Equipment: 9kHz QP Receiver: R10 Narrow-band receiver: R9			
Frequency kHz	9kHz BW Quasi-Peak Measurement dBuV	10Hz Receiver BW 10Hz Video BW Peak Measurement dBuV	Difference in Reading relative to Quasi-peak 9kHz dB
<b>252</b>	63.42	63.53	<b>0.11</b>
<b>378</b>	53.08	52.83	<b>-0.25</b>
<b>504</b>	55.6	55.71	<b>0.11</b>
<b>630</b>	38.71	39.56	<b>0.85</b>
<b>756</b>	50.08	50.33	<b>0.25</b>
<b>266</b>	80.15	80.06	<b>-0.09</b>
<b>399</b>	71.93	71.86	<b>-0.07</b>
<b>531</b>	59.56	59.54	<b>-0.02</b>
<b>664</b>	40.8	41.66	<b>0.86</b>
<b>797</b>	44.82	45.23	<b>0.41</b>

**NOTE:** Relative measurements in an anechoic chamber - for comparison purposes only.

The measurement errors incurred by using this bandwidth can be seen to be less than +/- 1dB. The EUT harmonics measured using the 10Hz bandwidth all showed a margin of  $\geq 2$ dB, therefore any errors in measurement due to bandwidth and detector settings would not affect the overall result of the test.

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### 4.3 Radiated Emissions Results - Carrier

Factor Set 1: A9_HI_V_14A - - CBL015_14A	1 m cable
Factor Set 2: - - - -	
Factor Set 3: - - - -	
Test Equipment: R9 A9	

*Radiated Emissions*

<i>Company:</i> Sureflap Ltd	<i>Product:</i> SureFeed
<i>Date:</i> 15/08/2014	<i>Test Eng:</i> Peter Barlow
<i>Ports:</i>	
<i>Test:</i> ANSI C63.4:2003 using limits of 15.209	=FCC B
<i>Ports:</i> enclosure	
<i>Test:</i> ANSI C63.4:2003 using limits of RSS GEN	

Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_B dBuV/m	Margin FCC_B dB	Notes
Measurements made at 10m using 50dB/decade to extrapolate limit													
7	1	0	10	1	0.126	F	84.0	10.3		94.3	99.5	5.1	
7	1	0	10	1	0.126	E	78.8	10.3		89.1	99.5	10.3	
10	1	0	10	1	0.133	F	83.7	10.4		94.1	99.0	4.9	
10	1	0	10	1	0.133	E	78.4	10.4		88.8	99.0	10.2	
Measurements made at 70m using default 40dB/decade to extrapolate limit													
7	1	0	70	1	0.126	F	37.1	10.3		47.4	50.9	3.4	
7	1	0	70	1	0.133	F	36.5	10.4		46.9	50.4	3.6	


<b>Results</b>	<b>Minimum Margin</b>	<b>3.4 dB</b>
	<b>PASS/FAIL</b>	<b>PASS</b>

Notes	Comments and Observations
-------	---------------------------

	<p>Measurements made using 200Hz RBW peak detector.</p> <p>The limit is specified at a distance of 300m but it is normal to reduce the distance and extrapolate the limit. Relative measurements were made at distances of 10m, 30m and 70m as described on the next page. This shows an extrapolation of at least 50dB/decade. Results above show 10m readings with the limit extrapolated using this figure of 50dB/decade.</p> <p>An alternative approach is to take the 70m reading and use the default 40dB/decade to extrapolate the limit to this 70m distance. These figures are also shown above.</p> <p>Initial 10m measurements showed the emissions from 120V systems to be higher than from 80V systems and therefore final measurements were only performed on 120V units. The magnetic field scans are shown in plots 1,4,7 and 10.</p> <p>Key: F = loop face on to EUT, E = edge on</p>
--	---

#### 4.4 Radiated Emissions Results - Extrapolation with Distance for Carrier

Equipment: Receiver: R9 Loop Antenna A9						
Dist m	Freq. kHz	Ant Pol	Receiver Level dBuV	Level w.r.t. Level @10m dB	Extrapolation dB/decade	Notes
10	126.000	F	84.0	0.0		
30	126.000	F	58.9	-25.1	52.6	10m to 30m
70	126.000	F	37.1	-46.9	59.2	30m to 70m
10	132.800	F	83.7	0.0		
30	132.800	F	58.3	-25.4	53.2	10m to 30m
70	132.800	F	36.5	-47.2	59.2	30m to 70m
Comments and Observations						
<p>The measurements above were made at 10m, 30m and 70m in order establish the extrapolation in measured level with respect to distance.</p> <p>The figures show that at these distances the extrapolation never drops below 50dB/decade.</p> <p>Key: F= loop face on to EUT, E= edge on</p>						

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#### 4.5 Radiated Emissions Results - Spurious <30MHz - 80V Units

Factor Set 1: A9_HI_V_14A - - CBL015_14A	1 m cable
Factor Set 2: - - - -	
Factor Set 3: - - - -	
Test Equipment: R9 A9	

*Radiated Emissions*

<i>Company:</i> Sureflap Ltd		<i>Product:</i> SureFeed											
<i>Date:</i> 18/08/2014		<i>Test Eng:</i> Peter Barlow											
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003		using limits of	15.209 =FCC B										
<i>Ports:</i> enclosure													
<i>Test:</i> ANSI C63.4:2003		using limits of	RSS GEN										
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_B dBuV/m	Margin FCC_B dB	Notes
2	1	0	10	1	0.252	F	40.6	10.3		50.9	78.7	27.7	
2	1	0	10	1	0.252	E	34.8	10.3		45.1	78.7	33.6	
2	1	0	10	1	0.378	F	39.0	10.3		49.3	75.1	25.8	
2	1	0	10	1	0.378	E	33.4	10.3		43.7	75.1	31.5	
2	1	0	10	1	0.504	F	34.6	10.3		44.9	52.6	7.7	
2	1	0	10	1	0.504	E	29.1	10.3		39.3	52.6	13.3	
2	1	0	10	1	0.630	F	25.2	10.3		35.5	50.7	15.2	
2	1	0	10	1	0.630	E	27.1	10.3		37.3	50.7	13.4	
2	1	0	10	1	0.756	F	22.5	10.2		32.7	49.1	16.4	
2	1	0	10	1	0.756	E	16.7	10.2		26.9	49.1	22.2	
5	1	0	10	1	0.266	F	48.7	10.3		58.9	78.2	19.3	
5	1	0	10	1	0.266	E	43.3	10.3		53.6	78.2	24.6	
5	1	0	10	1	0.399	F	32.2	10.3		42.5	74.7	32.2	
5	1	0	10	1	0.399	E	26.7	10.3		37.0	74.7	37.7	
5	1	0	10	1	0.531	F	27.5	10.3		37.8	52.2	14.4	
5	1	0	10	1	0.531	E	22.2	10.3		32.5	52.2	19.7	
5	1	0	10	1	0.664	F	18.5	10.2		28.7	50.2	21.5	
5	1	0	10	1	0.664	E	13.7	10.2		23.9	50.2	26.3	
5	1	0	10	1	0.797	F	22.6	10.2		32.8	48.7	15.8	
5	1	0	10	1	0.797	E	20.9	10.2		31.1	48.7	17.6	
<b>Results</b>											<b>7.7</b>	<b>dB</b>	
											<b>PASS</b>		
<b>Minimum Margin</b>													
<b>PASS/FAIL</b>													
Notes	<b>Comments and Observations</b>												
	80V units. Results of scans shown in plots 1 to 6.  Limits adjusted for measurement distances using a default extrapolation of 40dB/decade. All measurements made with peak detector.												




	Report No: <b>R3392</b> Issue No: <b>1</b>	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: <b>T5476</b>	<b>Test Report</b>	Page: 17 of 40

#### 4.6 Radiated Emissions Results - Spurious <30MHz - 120V Units

Factor Set 1: A9_HI_V_14A - - CBL015_14A	1 m cable
Factor Set 2: - - - -	
Factor Set 3: - - - -	
Test Equipment: R9 A9	

*Radiated Emissions*

<i>Company:</i> Sureflap Ltd		<i>Product:</i> SureFeed											
<i>Date:</i> 18/08/2014		<i>Test Eng:</i> Peter Barlow											
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003		using limits of	15.209 =FCC B										
<i>Ports:</i> enclosure													
<i>Test:</i> ANSI C63.4:2003		using limits of	RSS GEN										
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_B dBuV/m	Margin FCC_B dB	Notes
8	1	0	10	1	0.252	F	42.2	10.3		52.5	78.7	26.2	
8	1	0	10	1	0.252	E	36.8	10.3		47.1	78.7	31.6	
8	1	0	10	1	0.378	F	35.8	10.3		46.1	75.1	29.0	
8	1	0	10	1	0.378	E	30.6	10.3		40.9	75.1	34.3	
8	1	0	10	1	0.504	F	27.9	10.3		38.2	52.6	14.5	
8	1	0	10	1	0.504	E	22.4	10.3		32.7	52.6	19.9	
8	1	0	10	1	0.630	F	26.6	10.3		36.9	50.7	13.8	
8	1	0	10	1	0.630	E	33.8	10.3		44.1	50.7	6.6	
8	1	0	10	1	0.756	F	24.7	10.2		35.0	49.1	14.1	
8	1	0	10	1	0.756	E	18.5	10.2		28.8	49.1	20.4	
11	1	0	10	1	0.266	F	51.4	10.3		61.6	78.2	16.6	
11	1	0	10	1	0.266	E	46.0	10.3		56.2	78.2	22.0	
11	1	0	10	1	0.399	F	44.4	10.3		54.7	74.7	20.0	
11	1	0	10	1	0.399	E	38.8	10.3		49.1	74.7	25.5	
11	1	0	10	1	0.531	F	33.7	10.3		44.0	52.2	8.2	
11	1	0	10	1	0.531	E	28.3	10.3		38.6	52.2	13.6	
11	1	0	10	1	0.664	F	15.2	10.2		25.4	50.2	24.8	
11	1	0	10	1	0.664	E	11.1	10.2		21.3	50.2	28.9	
11	1	0	10	1	0.797	F	12.7	10.2		22.9	48.7	25.8	
11	1	0	10	1	0.797	E	23.6	10.2		33.8	48.7	14.8	
<b>Results</b>											<b>6.6</b>	<b>dB</b>	
											<b>PASS</b>		
											<b>PASS</b>		
Notes	Comments and Observations												
	<p>120V units. Results of scans shown in plots 7 to 12.</p> <p>Limits adjusted for measurement distances using a default extrapolation of 40dB/decade. All measurements made with peak detector.</p>												

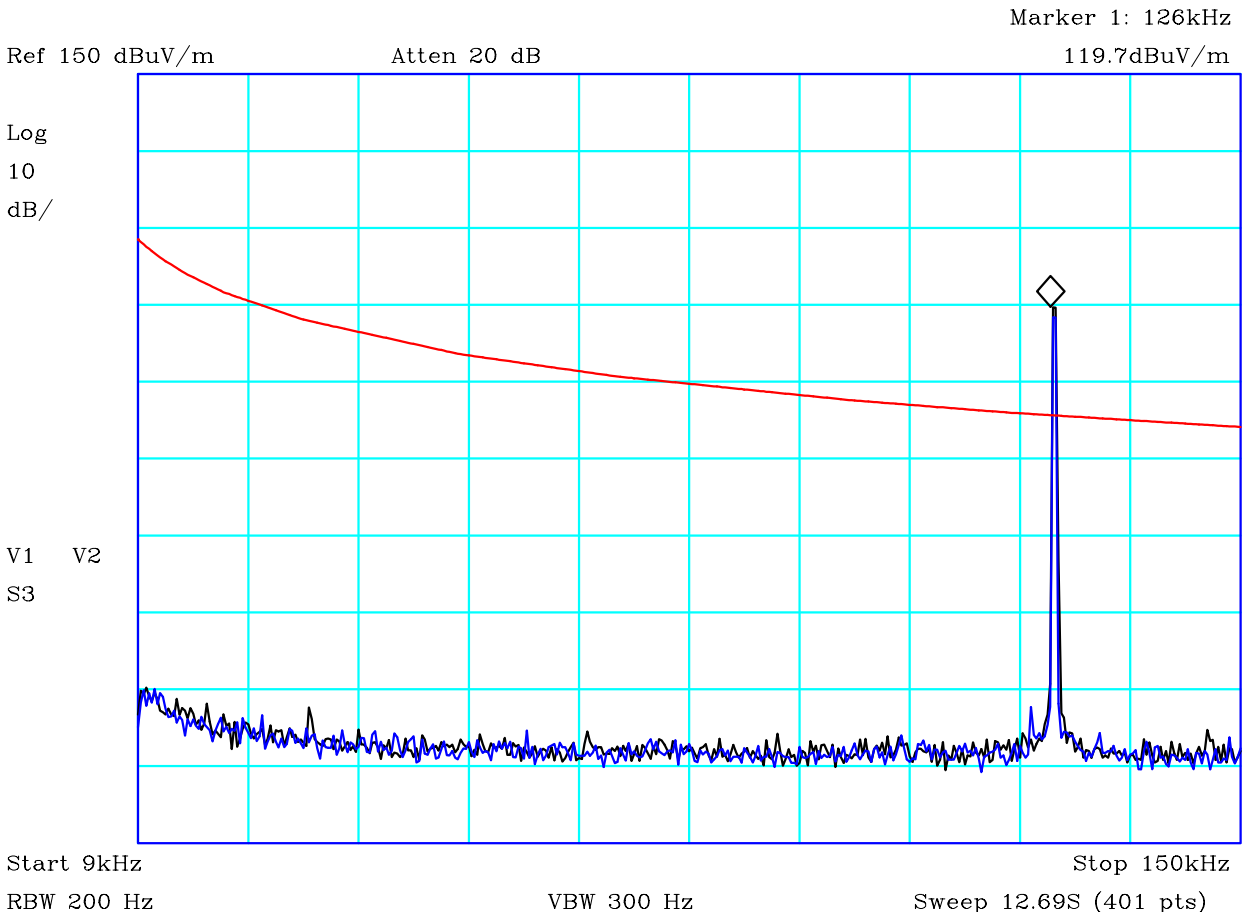
	Report No: <b>R3392</b> Issue No: <b>1</b>	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: <b>T5476</b>	<b>Test Report</b>	Page: 18 of 40

#### 4.7 Radiated Emissions Results - Spurious Above 30MHz

Factor Set 1: A5_14A - - CBL015_14A	1 m cable
Factor Set 2: - - - -	
Factor Set 3: - - - -	
Test Equipment: R4 A5 A15 PRE3 R9	

*Radiated Emissions*

<i>Company:</i> Sureflap Ltd		<i>Product:</i> SureFeed											
<i>Date:</i> 15/08/2014		<i>Test Eng:</i> Peter Barlow											
<i>Ports:</i>													
<i>Test:</i> ANSI C63.4:2003		using limits of	15.209 =FCC B										
<i>Ports:</i> enclosure													
<i>Test:</i> ANSI C63.4:2003		using limits of	RSS GEN										
Plot	Op Mode	Mod State	Dist m	Fact Set	Freq. MHz	Ant Pol	Rec. Level dBuV	Corr'n Factor dB/m	Corr'n Factor dB	Total Level dBuV/m	Limit FCC_B dBuV/m	Margin FCC_B dB	Notes
16	2	1	3	1	137.659	V	2.7	13.4		16.1	43.5	27.4	
16	2	1	3	1	137.659	H	9.8	13.4		23.2	43.5	20.3	
16	2	1	3	1	157.305	V	6.8	12.7		19.5	43.5	24.0	
16	2	1	3	1	157.305	H	15.7	12.7		28.4	43.5	15.1	
16	2	1	3	1	176.959	V	7.3	11.3		18.6	43.5	24.9	
16	2	1	3	1	176.959	H	14.9	11.3		26.2	43.5	17.3	
16	2	1	3	1	196.629	V	3.9	10.2		14.1	43.5	29.4	
16	2	1	3	1	196.629	H	9.5	10.2		19.7	43.5	23.8	
17	2	1	3	1	609.521	V	3.8	25.0		28.8	46.0	17.2	
17	2	1	3	1	609.521	H	7.0	25.0		32.0	46.0	14.0	
17	2	1	3	1	629.173	V	2.2	25.5		27.7	46.0	18.3	
17	2	1	3	1	629.173	H	7.3	25.5		32.8	46.0	13.2	
17	2	1	3	1	648.839	V	2.8	25.7		28.5	46.0	17.5	
17	2	1	3	1	648.839	H	10.5	25.7		36.2	46.0	9.8	
<b>Results</b>											<b>9.8</b>	<b>dB</b>	
											<b>PASS</b>		
<b>Minimum Margin</b>													
<b>PASS/FAIL</b>													
Notes	Comments and Observations												
	<p>Results of scans shown in plots 16 to 19.</p> <p>Measurements made using a 120kHz QP detector.</p> <p>These measurements were made at 3m on an Open Area Test Site.</p>												



CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528


### PLOT 1 Radiated Emissions - LF, Low Voltage - 9kHz to 150kHz

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

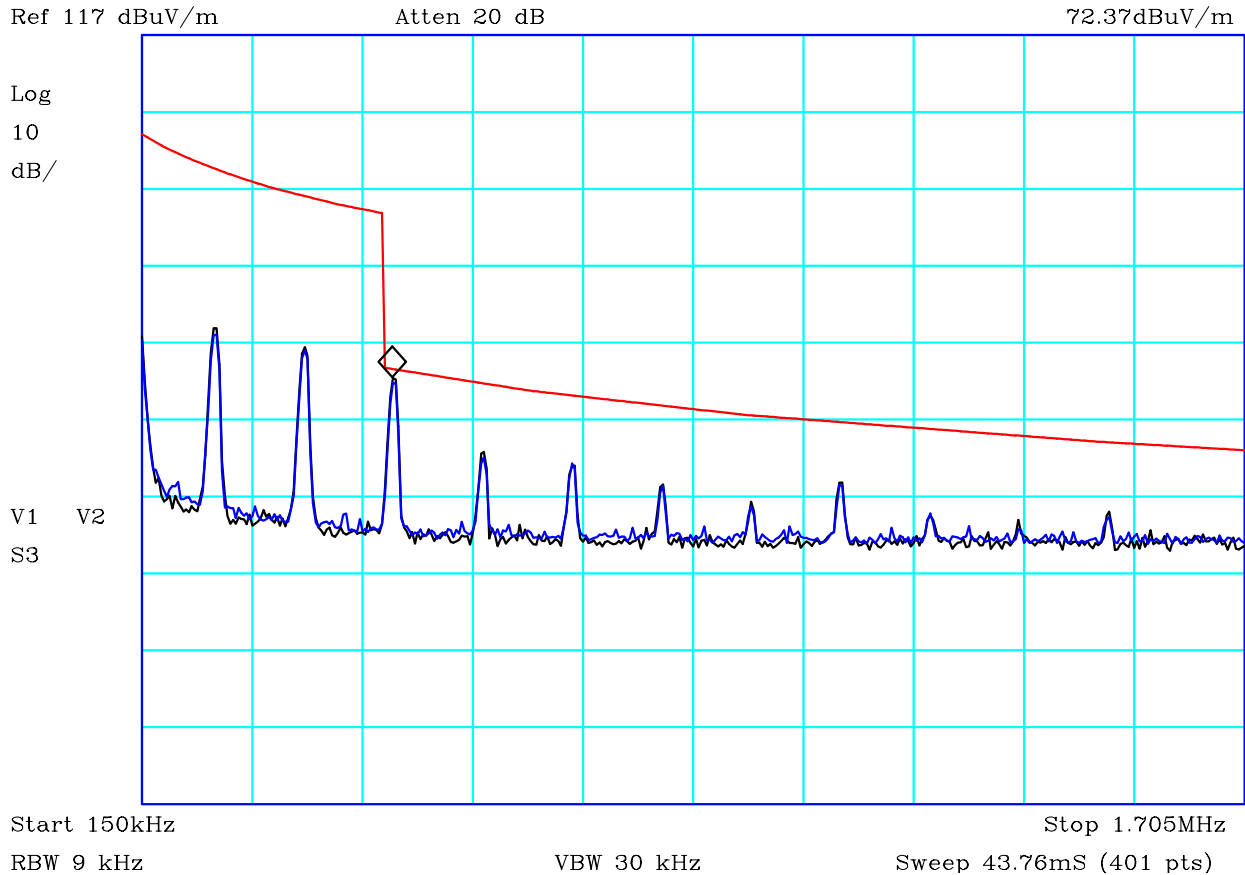
Black: Antenna face On, Blue: Antenna Edge On.  
SureFeed 126kHz 80V  
Mod.State: 1

Default extrapolation of 40dB/decade was used to establish the limit. Open area test site measurements showed this to be conservative.

Facility:	Anech_2	Height	1m	Mode:	1
Distance	3m	Polarisation	F+E	Modification State:	1
Angle	0-360	File:	H47154F1	Analyser:	R9

	Report No: <b>R3392</b>	FCC ID: XO9-MPF001-001	Page: 20 of 40
	Issue No: <b>1</b>	IC: 8906A -MPF01001	
Test No: <b>T5476</b>	<b>Test Report</b>		

Marker 1: 503.8kHz




CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528

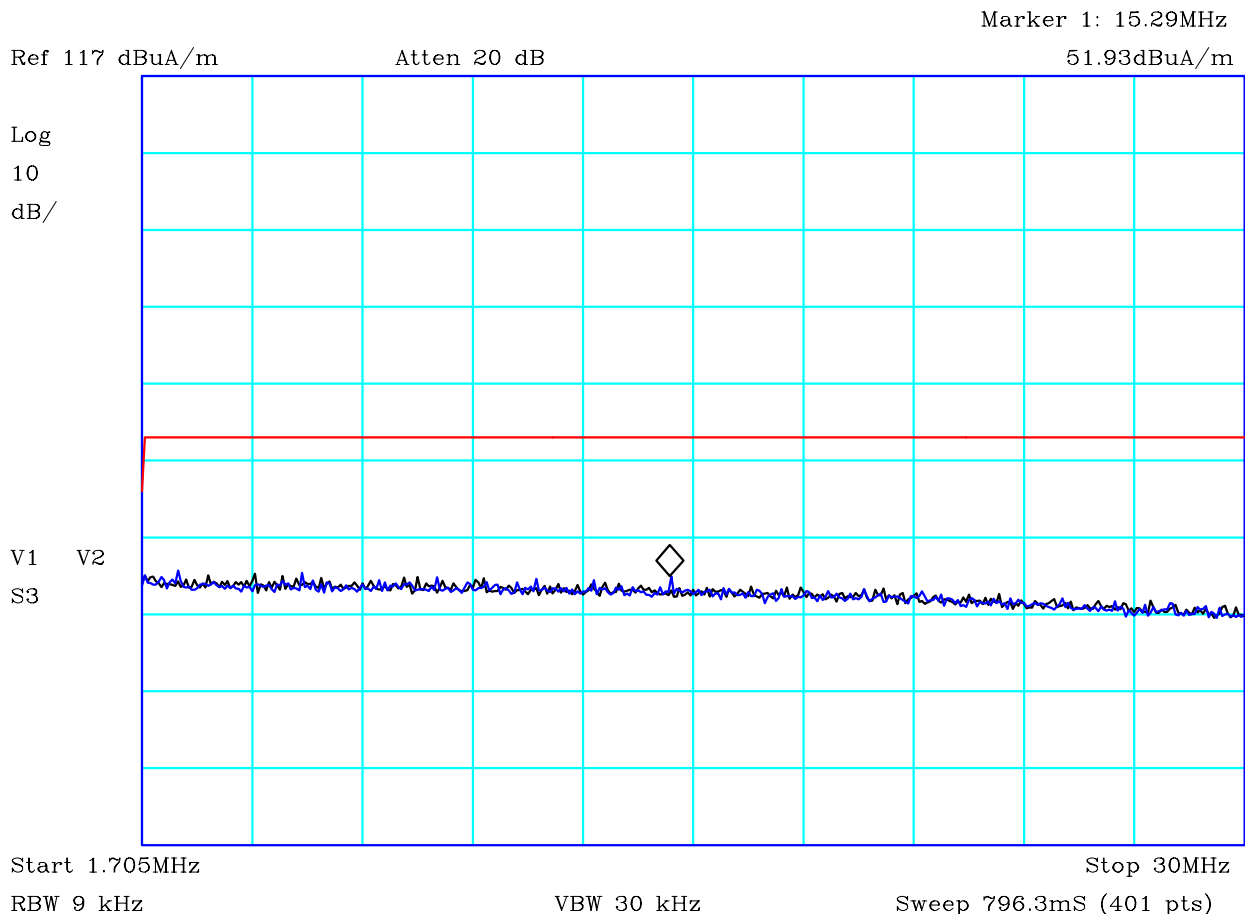
**PLOT 2 Radiated Emissions - LF, Low Voltage - 150kHz to 1.705MHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
 SureFeed 126kHz 80V  
 Mod.State: 1  
 Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	F+E	Modification State:	1
Angle	0-360	File:	H4715502	Analyser:	R9

	Report No: <b>R3392</b>	FCC ID: XO9-MPF001-001	
	Issue No: <b>1</b>	IC: 8906A -MPF01001	
Test No: <b>T5476</b>	<b>Test Report</b>		Page: 21 of 40



CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528


**PLOT 3 Radiated Emissions - LF, Low Voltage - 1.705MHz to 30MHz**

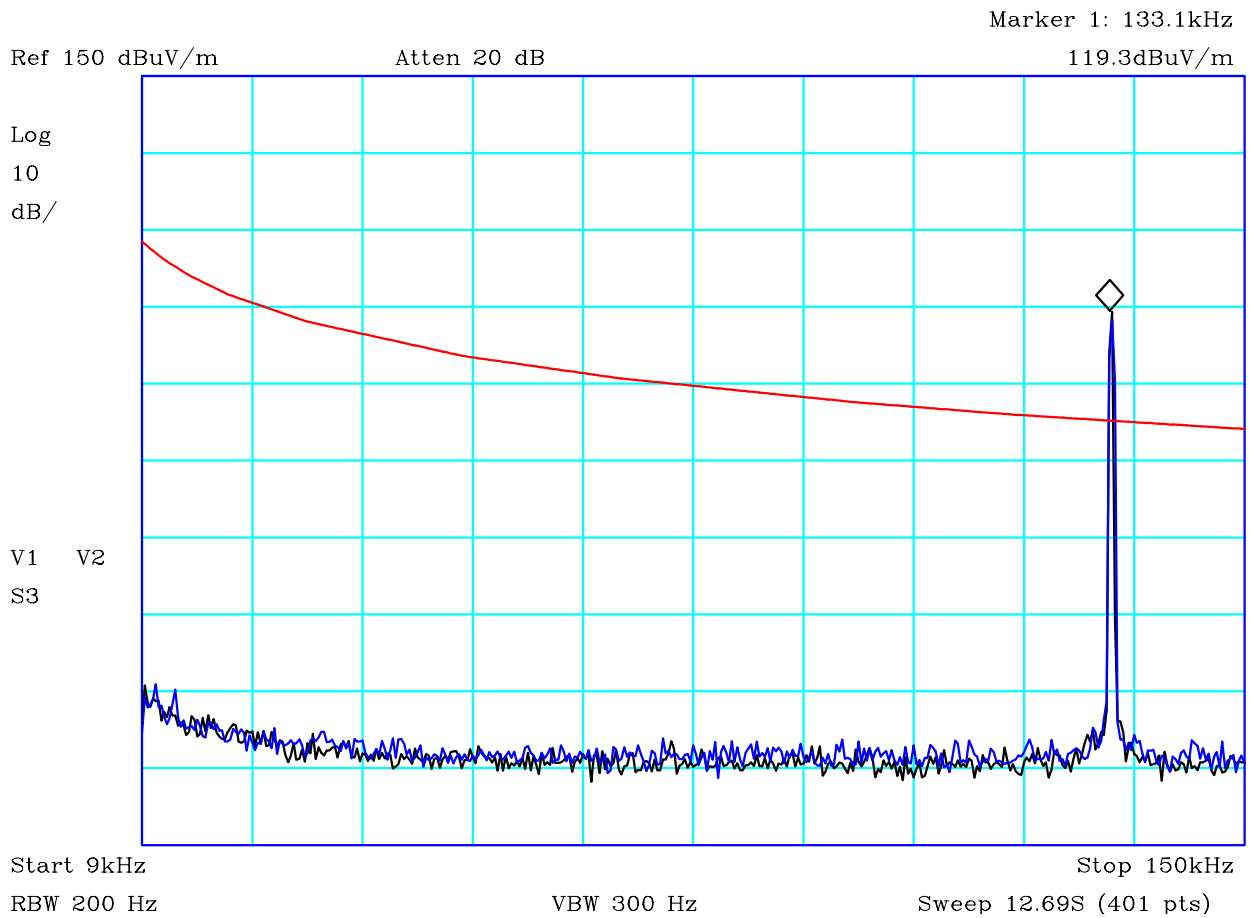
Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
 SureFeed 126kHz 80V  
 Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	F+E	Modification State:	1
Angle	0-360	File:	H471551D	Analyser:	R9

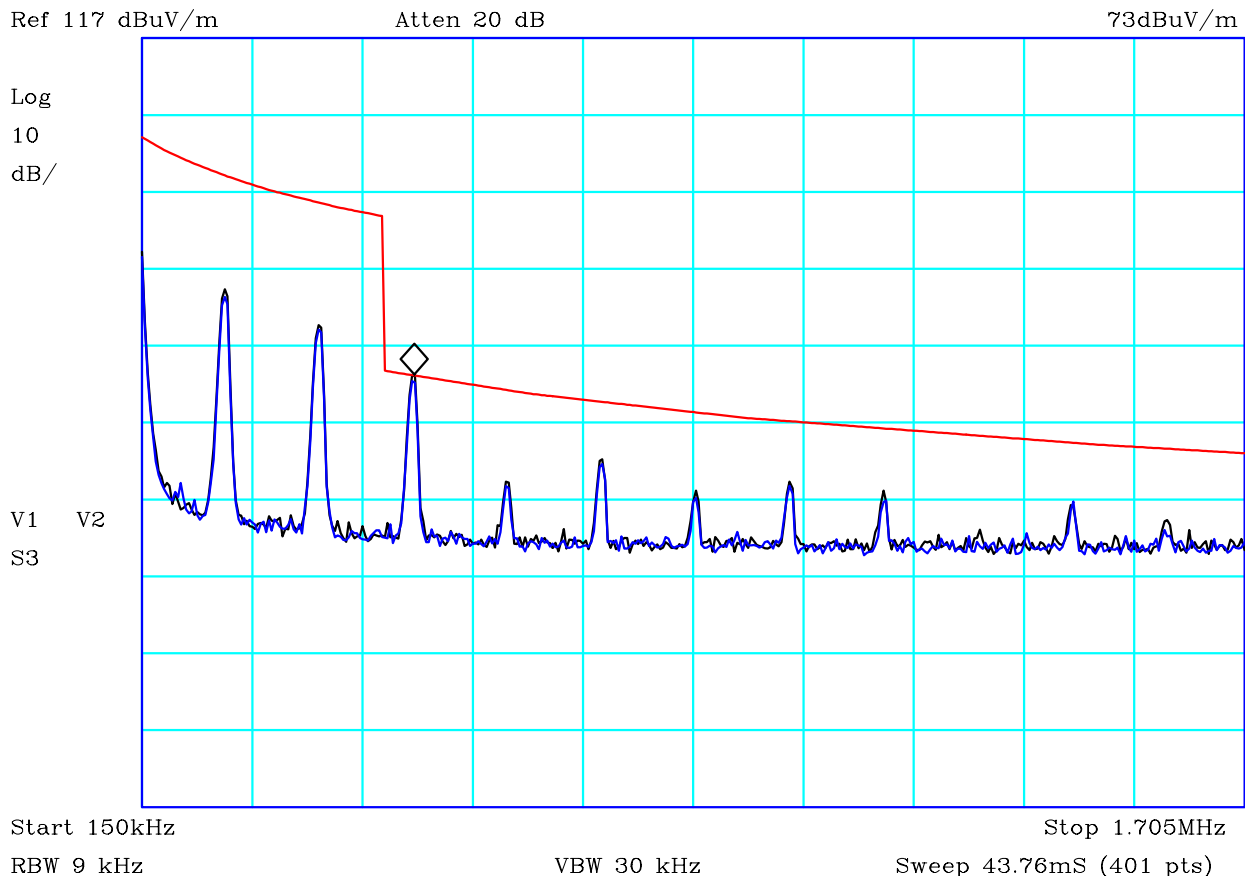
	Report No: <b>R3392</b>	FCC ID: XO9-MPF001-001	Page: 22 of 40
	Issue No: <b>1</b>	IC: 8906A -MPF01001	
	Test No: <b>T5476</b>	<b>Test Report</b>	



**PLOT 4 Radiated Emissions - HF, Low Voltage - 9kHz to 150kHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	
Black: Antenna face On, Blue: Antenna Edge On. SureFeed 133kHz 80V Mod.State: 1.			
Default extrapolation of 40dB/decade was used to establish the limit. Open area test site measurements showed this to be conservative.			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4715535
		Mode:	1
		Modification State:	1
		Analyser:	R9

Marker 1: 534.9kHz



CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528

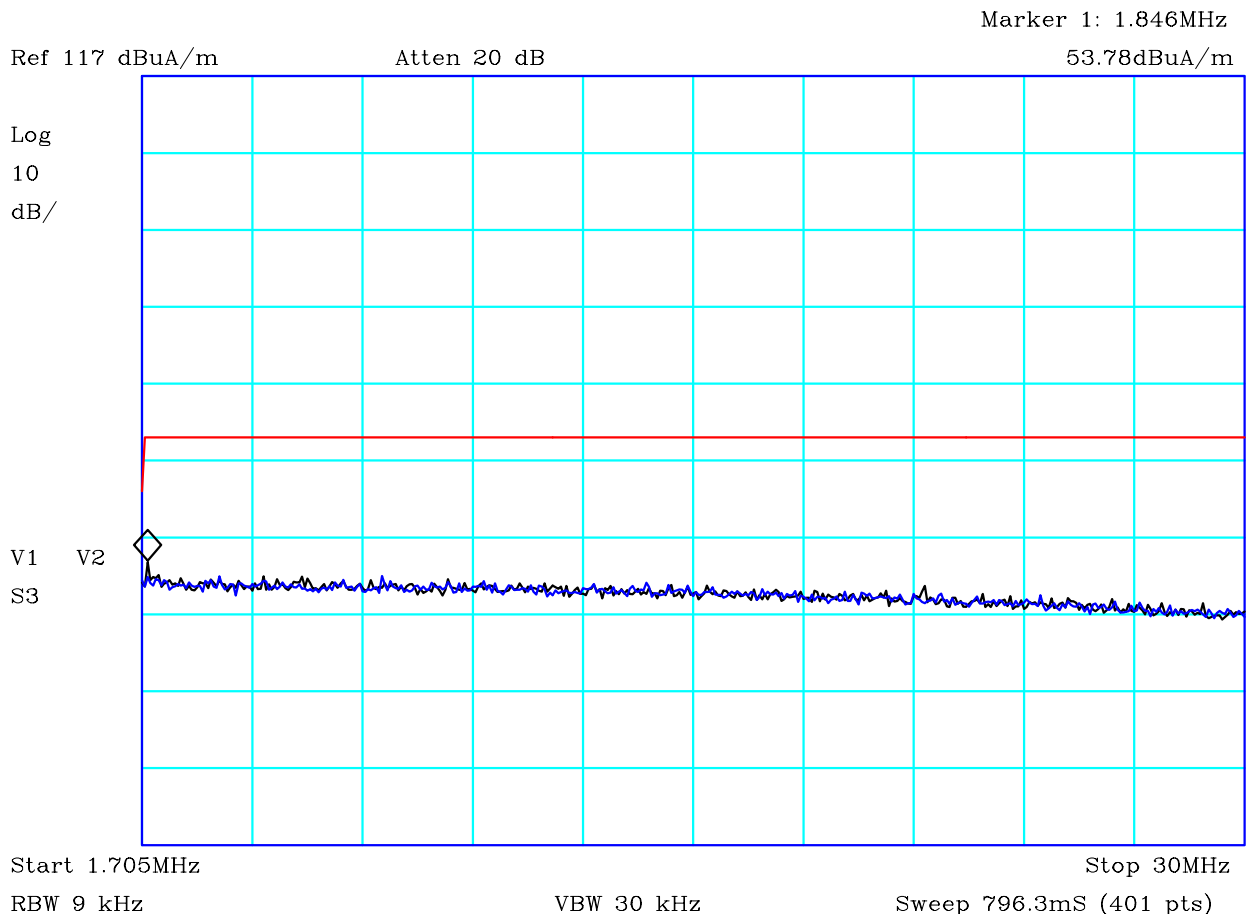
**PLOT 5 Radiated Emissions - HF, Low Voltage - 150kHz to 1.705MHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
 SureFeed 133kHz 80V  
 Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H471553D	Analyser:	R9



CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528

**PLOT 6 Radiated Emissions - HF, Low Voltage - 1.705MHz to 30MHz**


Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

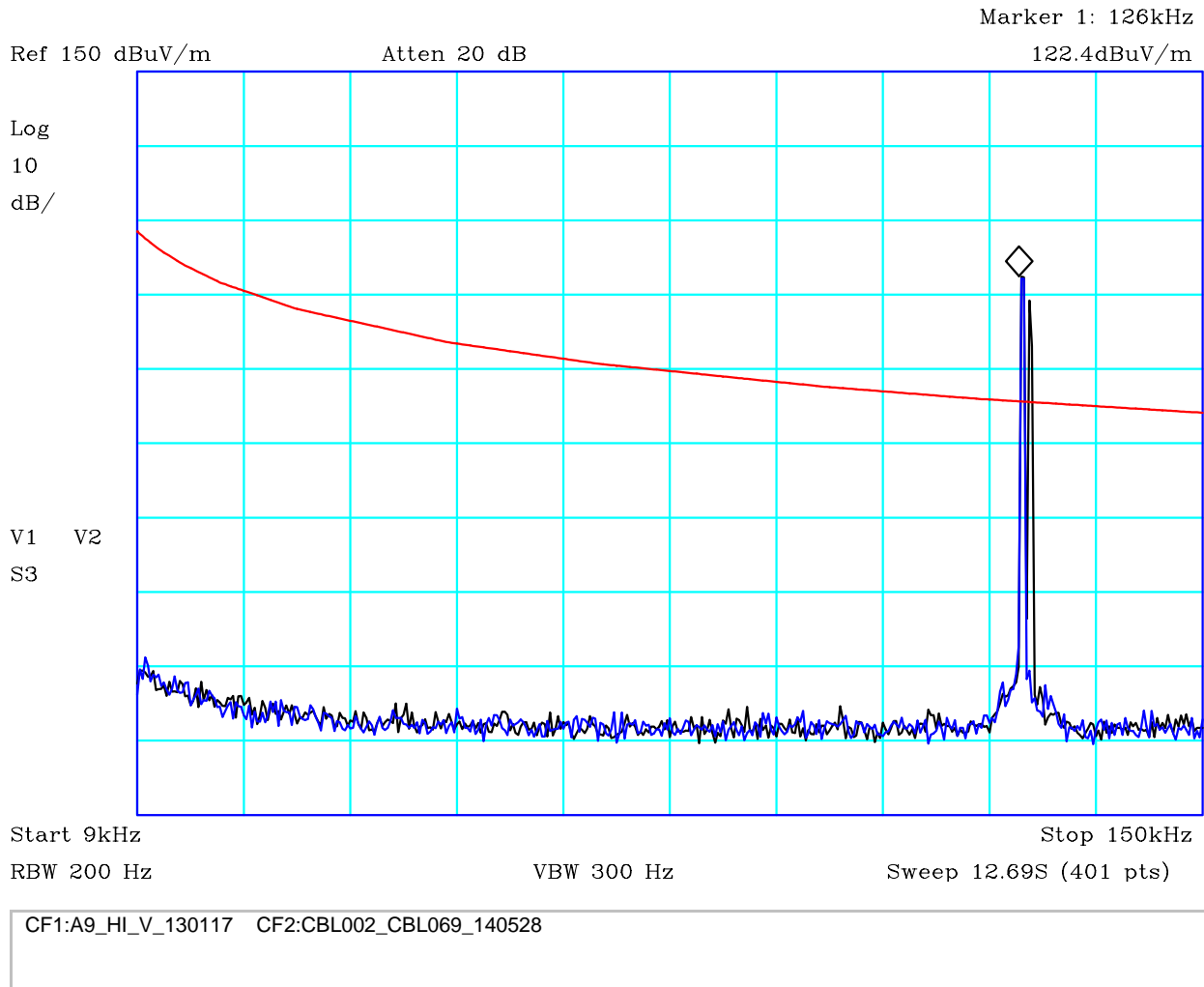
Black: Antenna face On, Blue: Antenna Edge On.  
SureFeed 133kHz 80V  
Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H4715543	Analyser:	R9



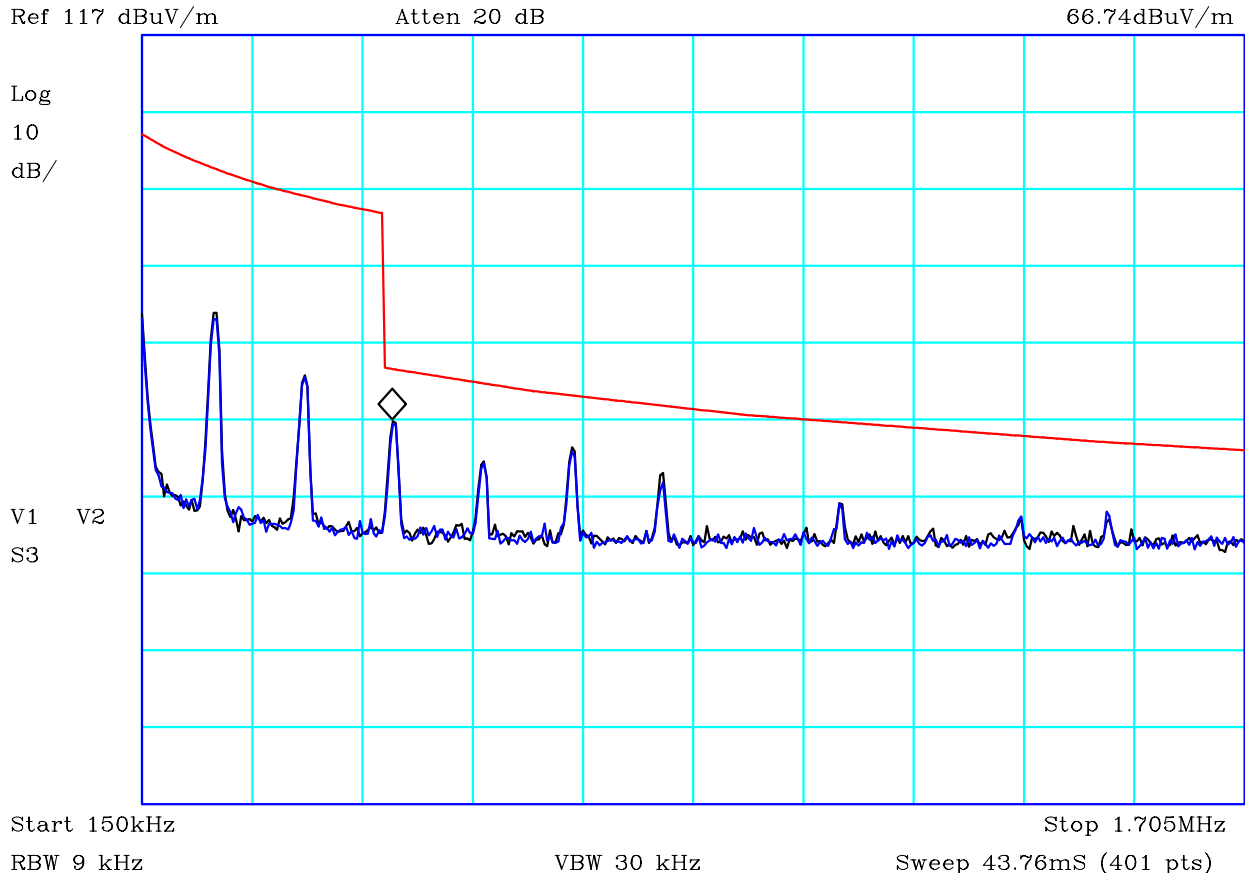
	Report No: <b>R3392</b>	FCC ID: XO9-MPF001-001		Page: 25 of 40
	Issue No: <b>1</b>	IC: 8906A -MPF01001		
	Test No: <b>T5476</b>	<b>Test Report</b>		



**PLOT 7 Radiated Emissions - LF, High Voltage - 9kHz to 150kHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	
<p>Black: Antenna face On, Blue: Antenna Edge On.  SureFeed 126kHz 120V  Mod.State: 1.</p> <p>Default extrapolation of 40dB/decade was used to establish the limit. Open area test site measurements showed this to be conservative.</p>			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H47154D3
		Mode:	1
		Modification State:	1
		Analyser:	R9

Marker 1: 503.8kHz



CF1:A9\_HI\_V\_130117    CF2:CBL002\_CBL069\_140528

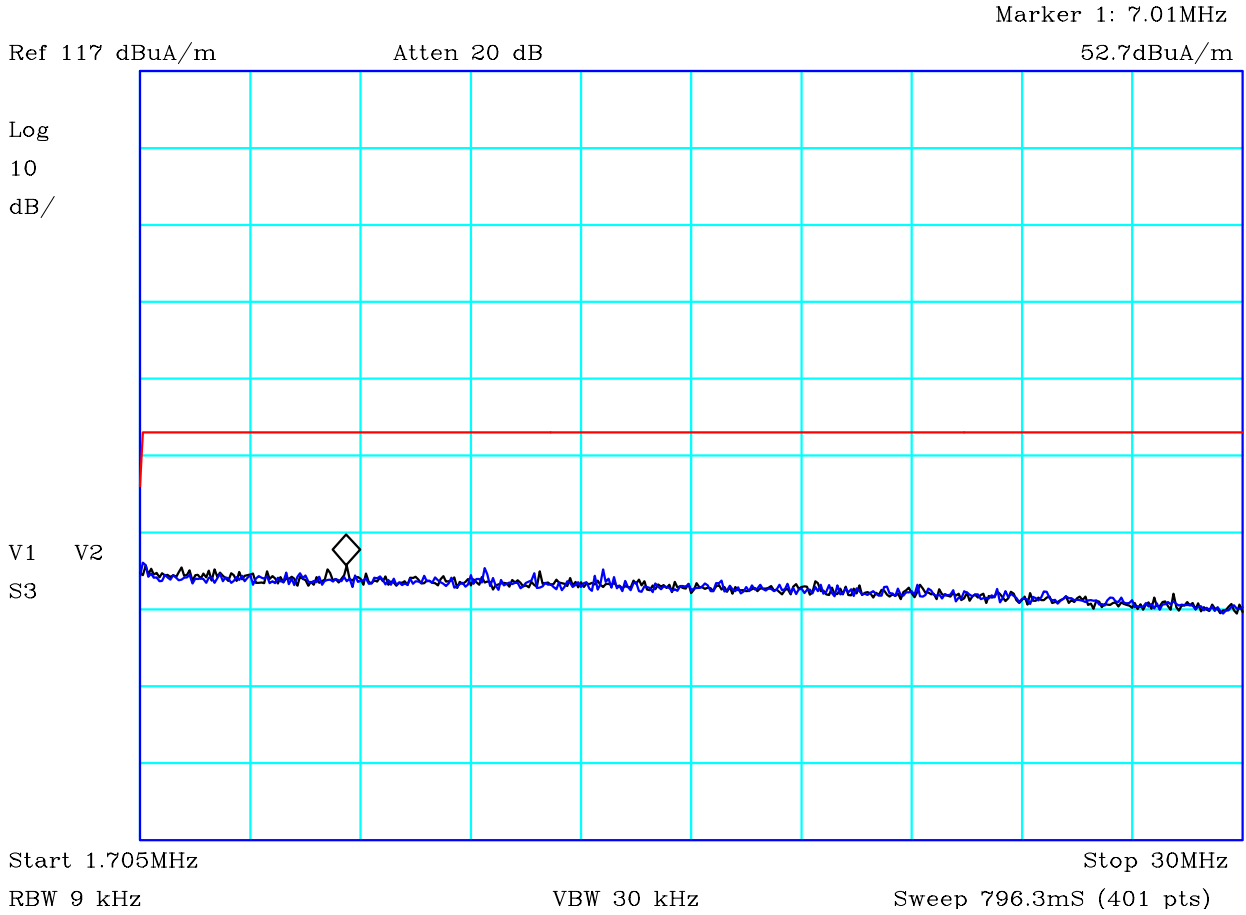
**PLOT 8 Radiated Emissions - LF, High Voltage - 150kHz to 1.705MHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
 SureFeed 126kHz 120V  
 Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H47154DA	Analyser:	R9



CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528

**PLOT 9 Radiated Emissions - LF, High Voltage - 1.705MHz to 30MHz**

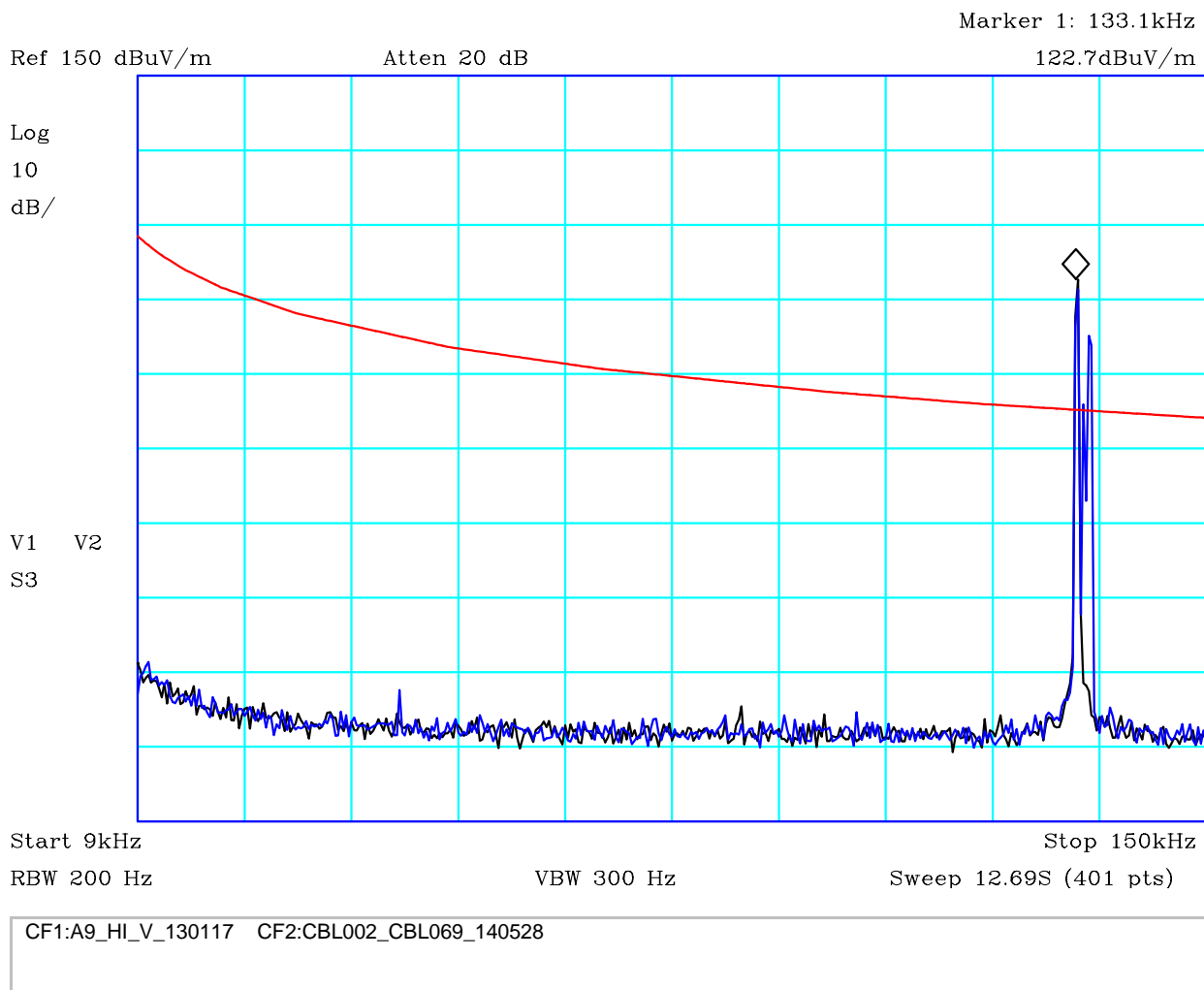
Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
 SureFeed 126kHz 120V  
 Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H47154E0	Analyser:	R9

	Report No: R3392	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	Page: 28 of 40
	Issue No: 1		
	Test No: T5476	<b>Test Report</b>	



### PLOT 10 Radiated Emissions - HF, High Voltage - 9kHz to 150kHz

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
 SureFeed 133kHz 120V  
 Mod.State: 1.8+3.3nF.

Default extrapolation of 40dB/decade was used to establish the limit. Open area test site measurements showed this to be conservative.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H47154B9	Analyser:	R9

Marker 1: 531kHz

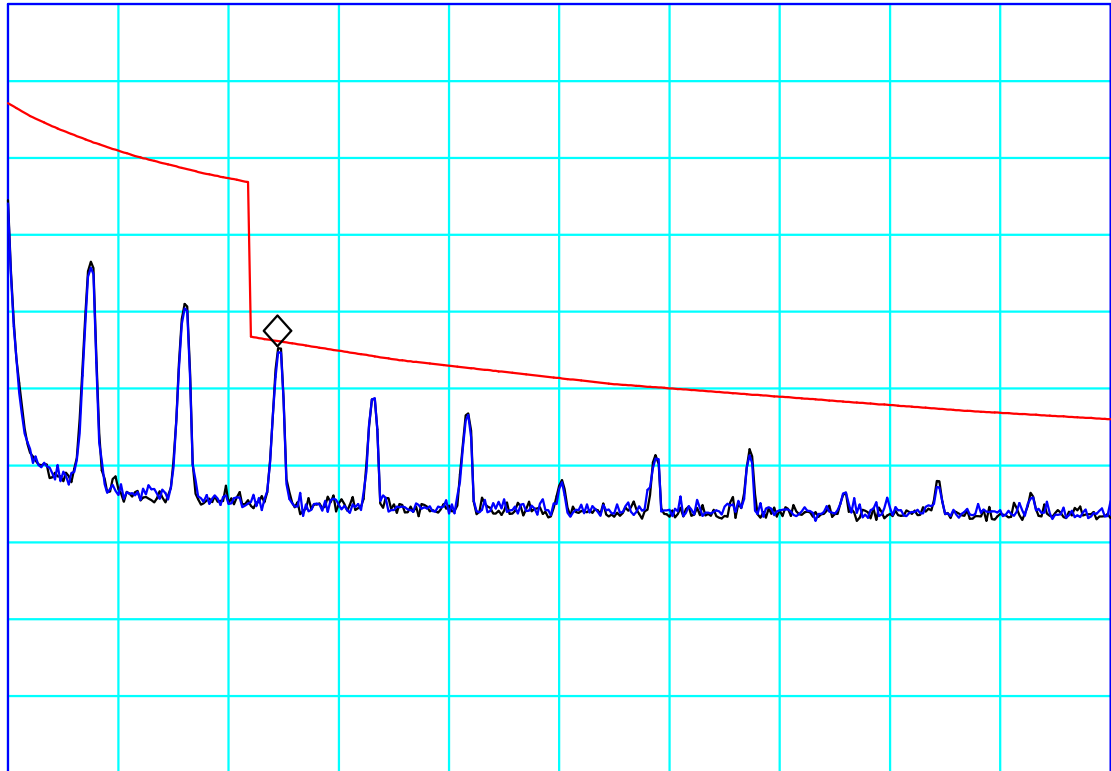
Ref 117 dBuV/m

Atten 20 dB

72.26dBuV/m

Log  
10  
dB/

V1 V2  
S3



Start 150kHz

Stop 1.705MHz

RBW 9 kHz

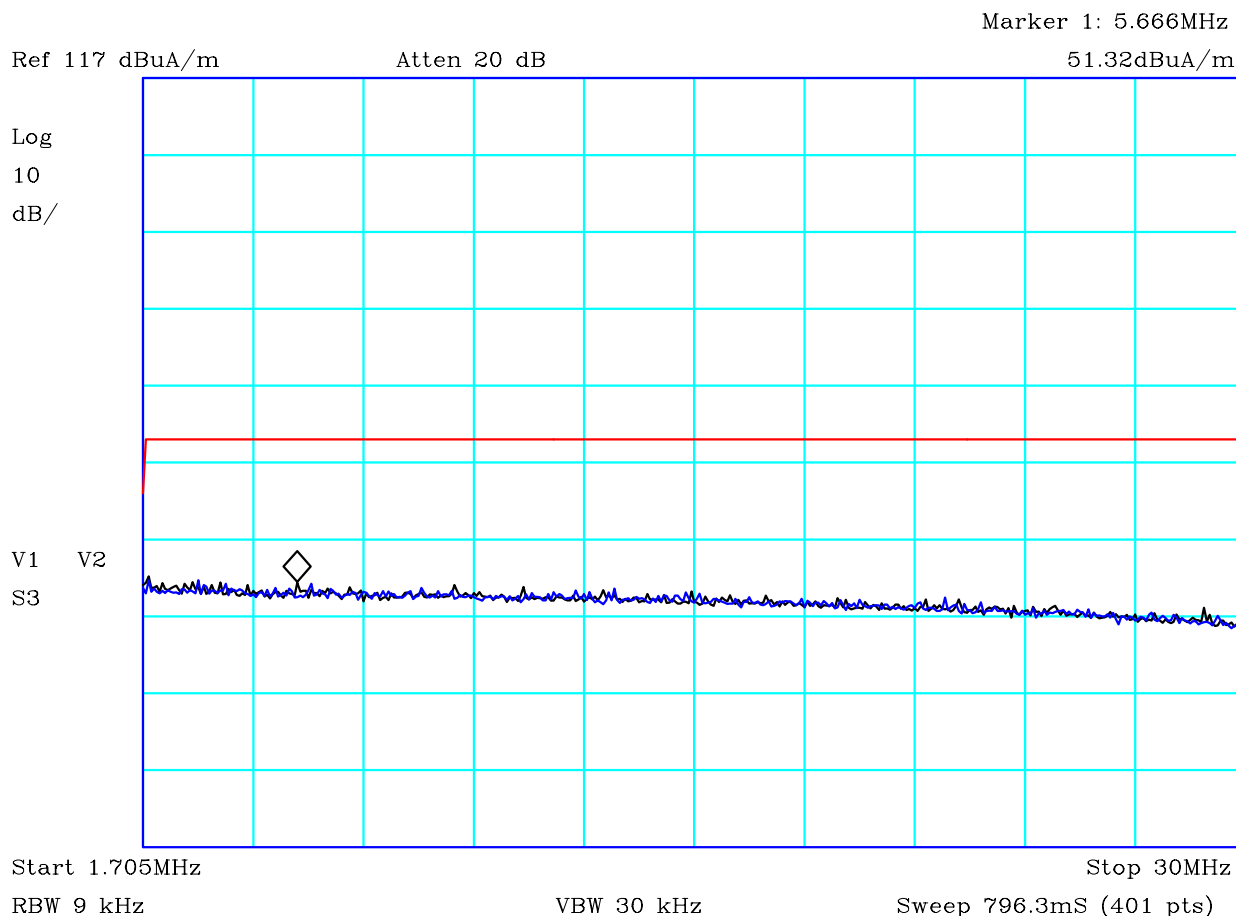
VBW 30 kHz

Sweep 43.76mS (401 pts)

CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528

**PLOT 11 Radiated Emissions - HF, High Voltage - 150kHz to 1.705MHz**

Company:	SureFlap	Product:	SureFeed		
Date:	15/08/2014	Test Eng:	Peter Barlow		
Method:	ANSI C63.4	Method:			
Limit1:(RED)	FCC_subpartC_@3m	Limit2:			
Limit3:		Limit4:			
Black: Antenna face On, Blue: Antenna Edge On. SureFeed 133kHz 120V Mod.State: 1.8+3.3nF.  Default extrapolation of 40dB/decade was used to establish the limit.					
Facility:	Anech_1	Height:	1m	Mode:	1
Distance:	3m	Polarisation:	V+H	Modification State:	1
Angle:	0-360	File:	H47154BD	Analyser:	R9



CF1:A9\_HI\_V\_130117 CF2:CBL002\_CBL069\_140528


### PLOT 12 Radiated Emissions - HF, High Voltage - 1.705MHz to 30MHz

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

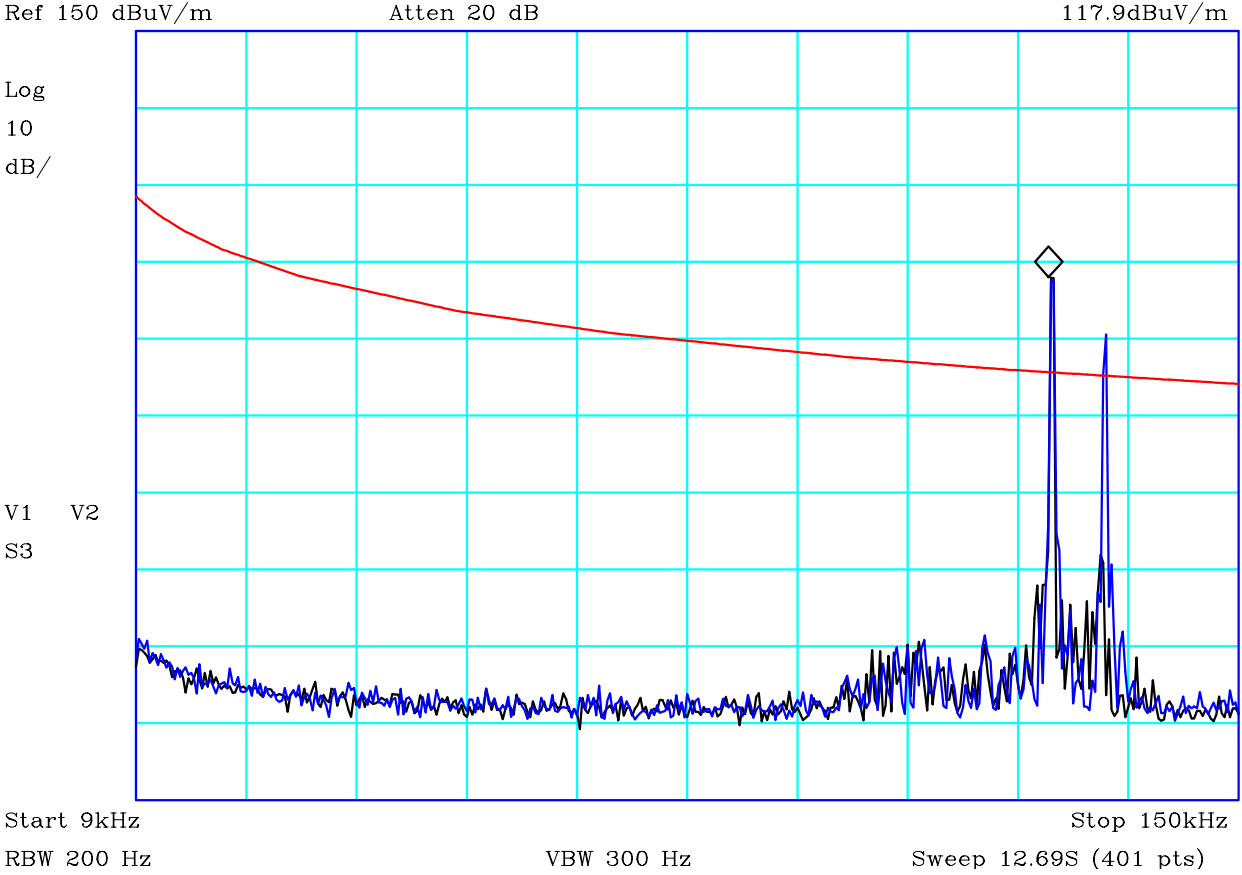
Black: Antenna face On, Blue: Antenna Edge On.  
SureFeed 133kHz 120V  
Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit.

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H47154C1	Analyser:	R9

	Report No: <b>R3392</b>	FCC ID: XO9-MPF001-001	
	Issue No: <b>1</b>	IC: 8906A -MPF01001	
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Marker 1: 126kHz



CF1:A9\_HI\_V\_130117    CF2:CBL002\_CBL069\_140528

**PLOT 13 Radiated Emissions - Cycling All Modes - 9kHz to 150kHz**

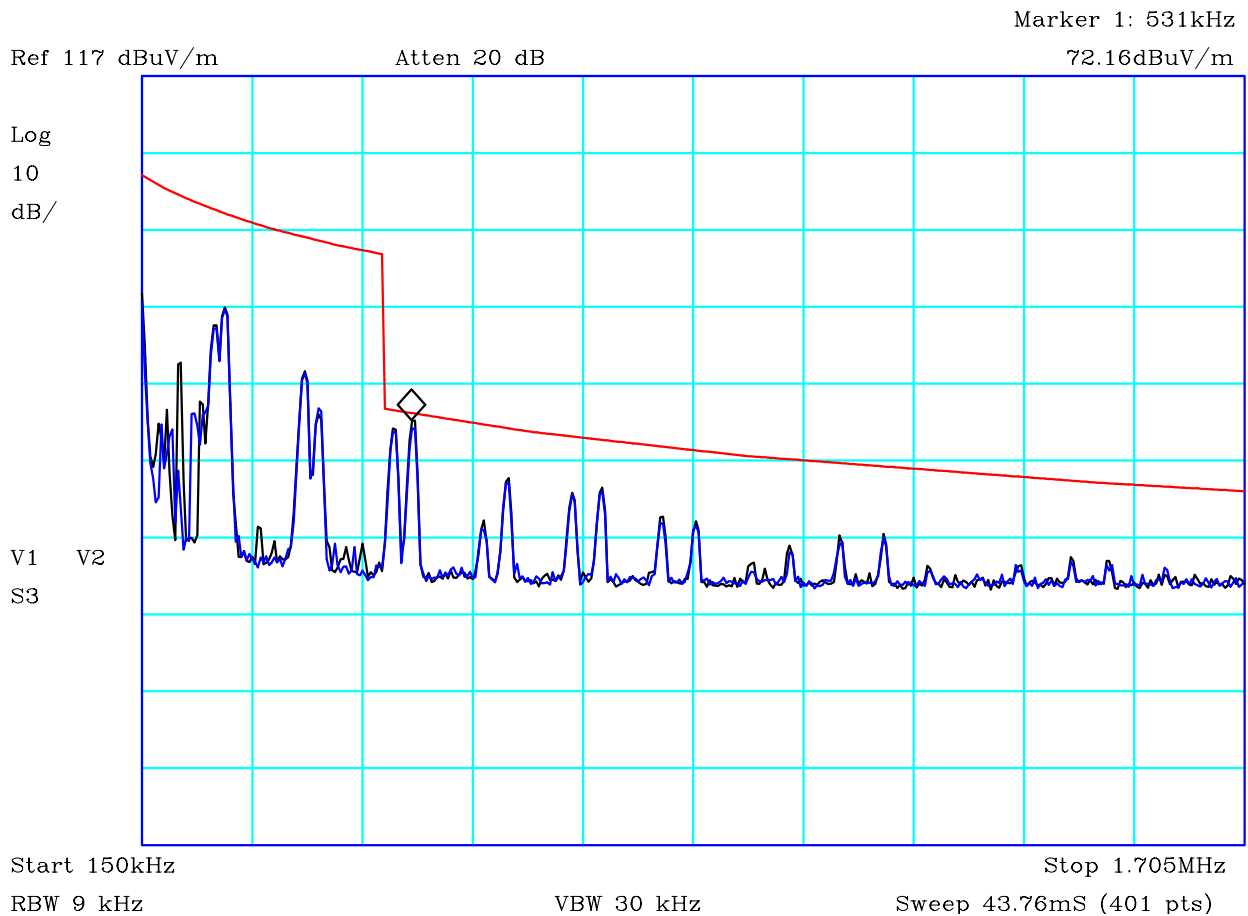
Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

Black: Antenna face On, Blue: Antenna Edge On.  
SureFeed Cycling all modes  
Mod.State: 1.

Default extrapolation of 40dB/decade was used to establish the limit. Open area test site measurements showed this to be conservative.

Facility:	Anech_1	Height	1m	Mode:	2
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H471558B	Analysers:	R9

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dB Technology (Cambridge) Ltd.*



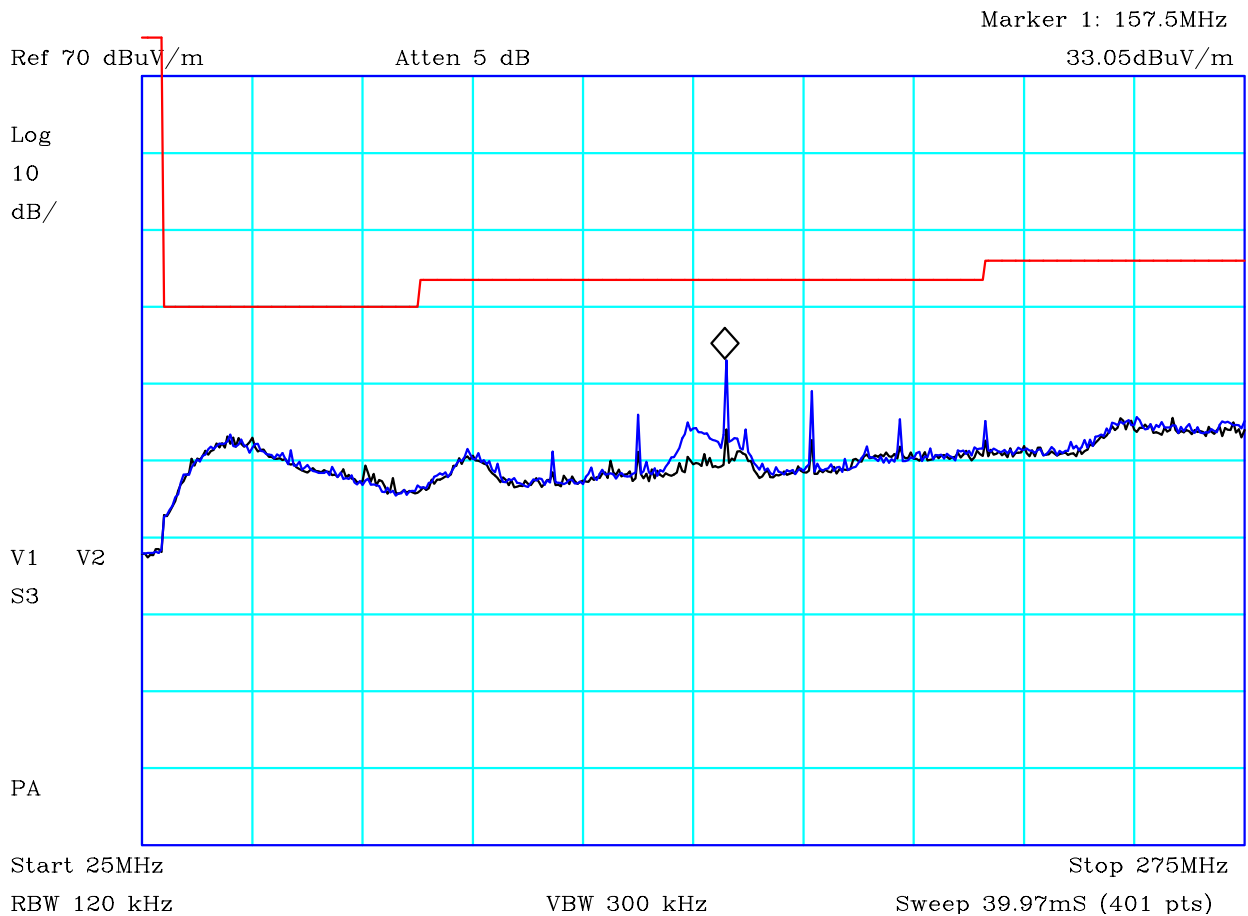
CF1:A9\_HI\_V\_130117    CF2:CBL002\_CBL069\_140528

**PLOT 14 Radiated Emissions - Cycling All Modes - 150kHz to 1.705MHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	
<p>Black: Antenna face On, Blue: Antenna Edge On.          SureFeed Cycling all modes          Mod.State: 1.</p> <p>Default extrapolation of 40dB/decade was used to establish the limit.</p>			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4715592
		Mode:	2
		Modification State:	1
		Analysers:	R9







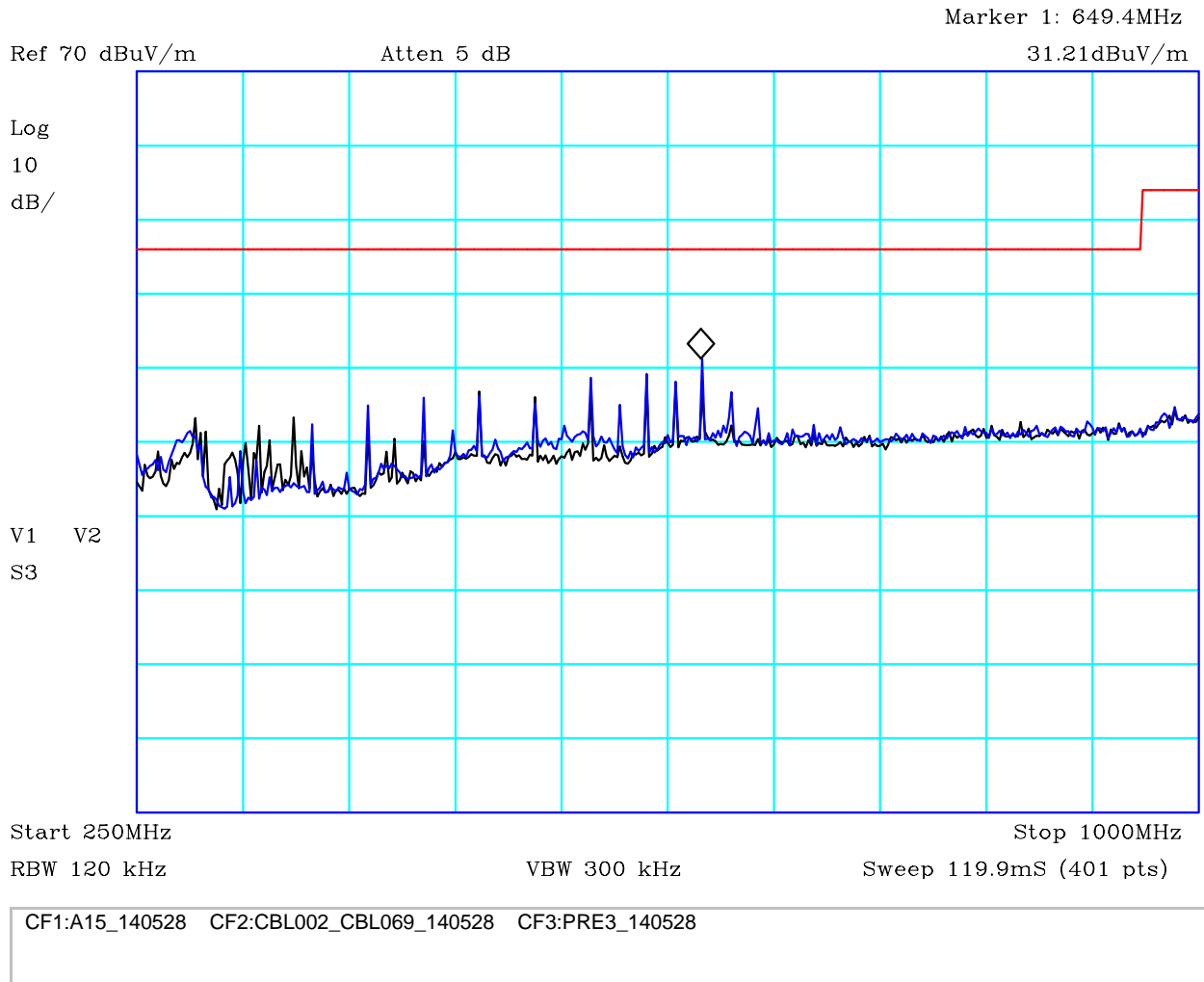
CF1:A15\_140528    CF2:CBL002\_CBL069\_140528

**PLOT 16 Radiated Emissions - Cycling All Modes - 25MHz to 275MHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	

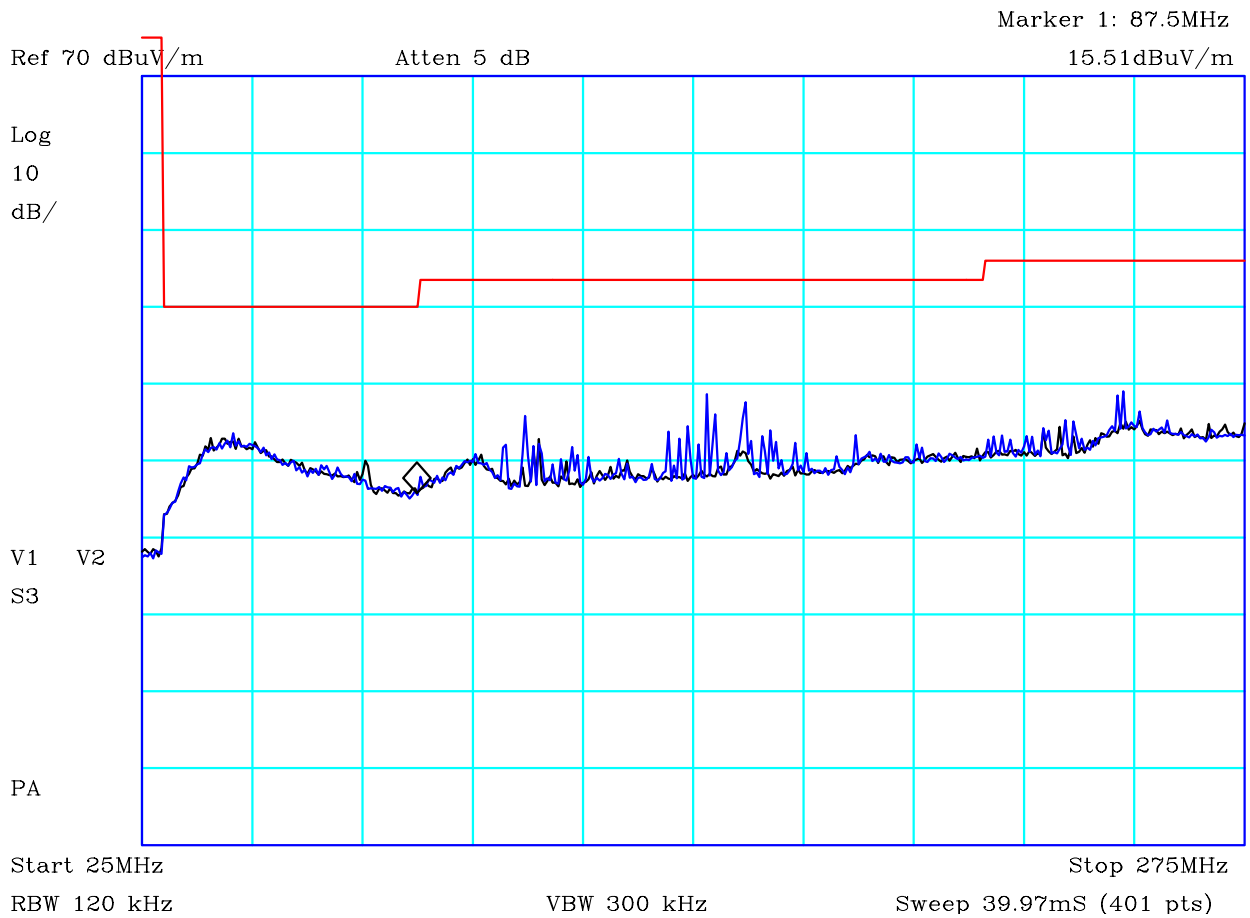
Black: Vertical, Blue: Horizontal  
Cycling all modes

Facility:	Anech_1	Height	1,1.5,2m	Mode:	2
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H4715680	Analyser:	R9



### PLOT 17 Radiated Emissions - Cycling All Modes - 250MHz to 1GHz

Company:	SureFlap	Product:	SureFeed		
Date:	15/08/2014	Test Eng:	Peter Barlow		
Method:	ANSI C63.4	Method:			
Limit1:(RED)	FCC(B)@3m	Limit2:			
Limit3:		Limit4:			
Black: Vertical, Blue: Horizontal Cycling all modes					
Facility:	Anech_1	Height	1,1.5,2m	Mode:	2
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H471568E	Analyser:	R9




CF1:A15\_140528    CF2:CBL002\_CBL069\_140528

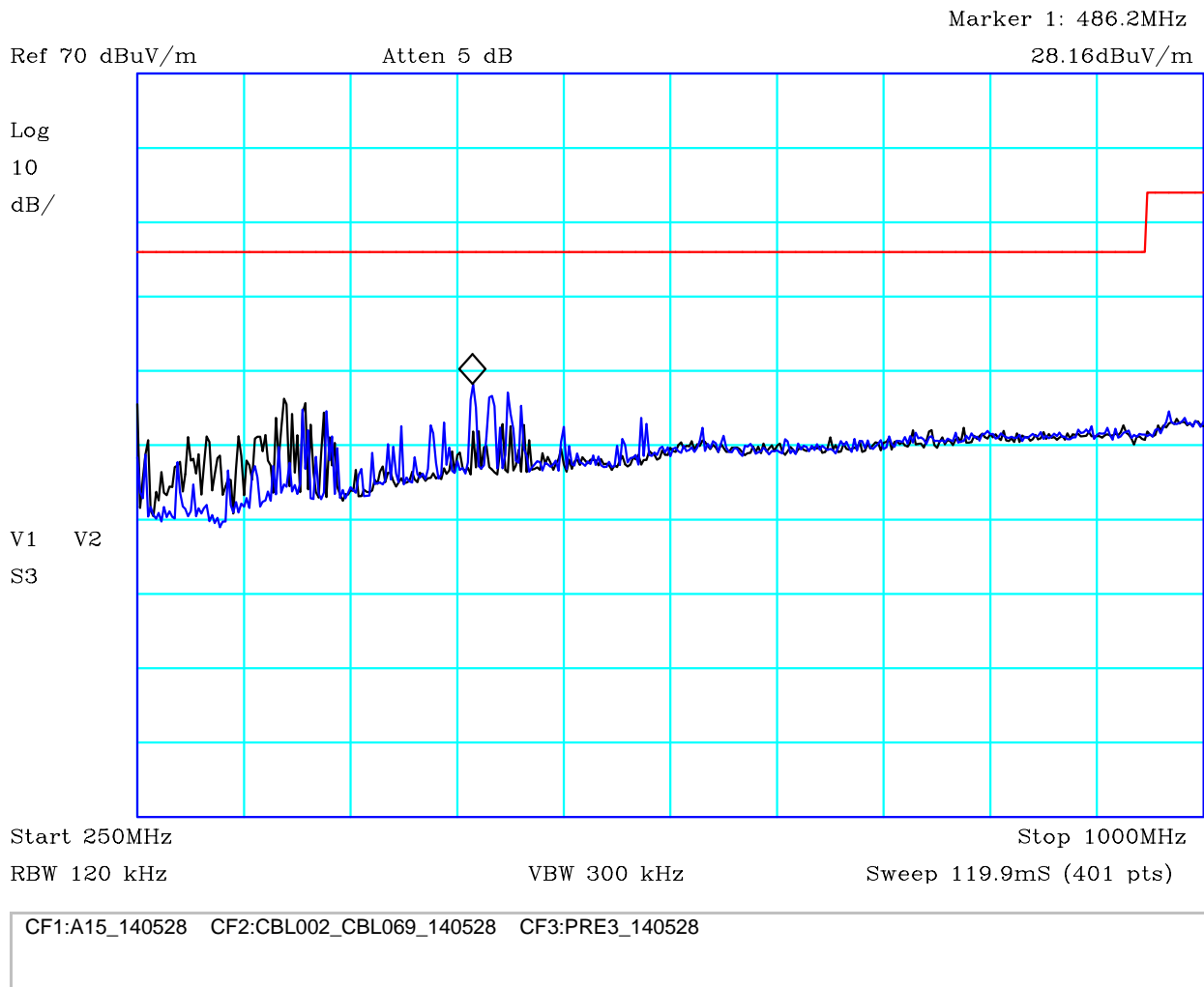
**PLOT 18 Radiated Emissions - Normal / Idle (awaiting cat) - 25MHz to 275MHz**

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	

Black: Vertical, Blue: Horizontal  
 Normal operating mode - waiting for cat to approach.

Facility:	Anech_1	Height	1,1.5,2m	Mode:	3
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H4811779	Analyser:	R9

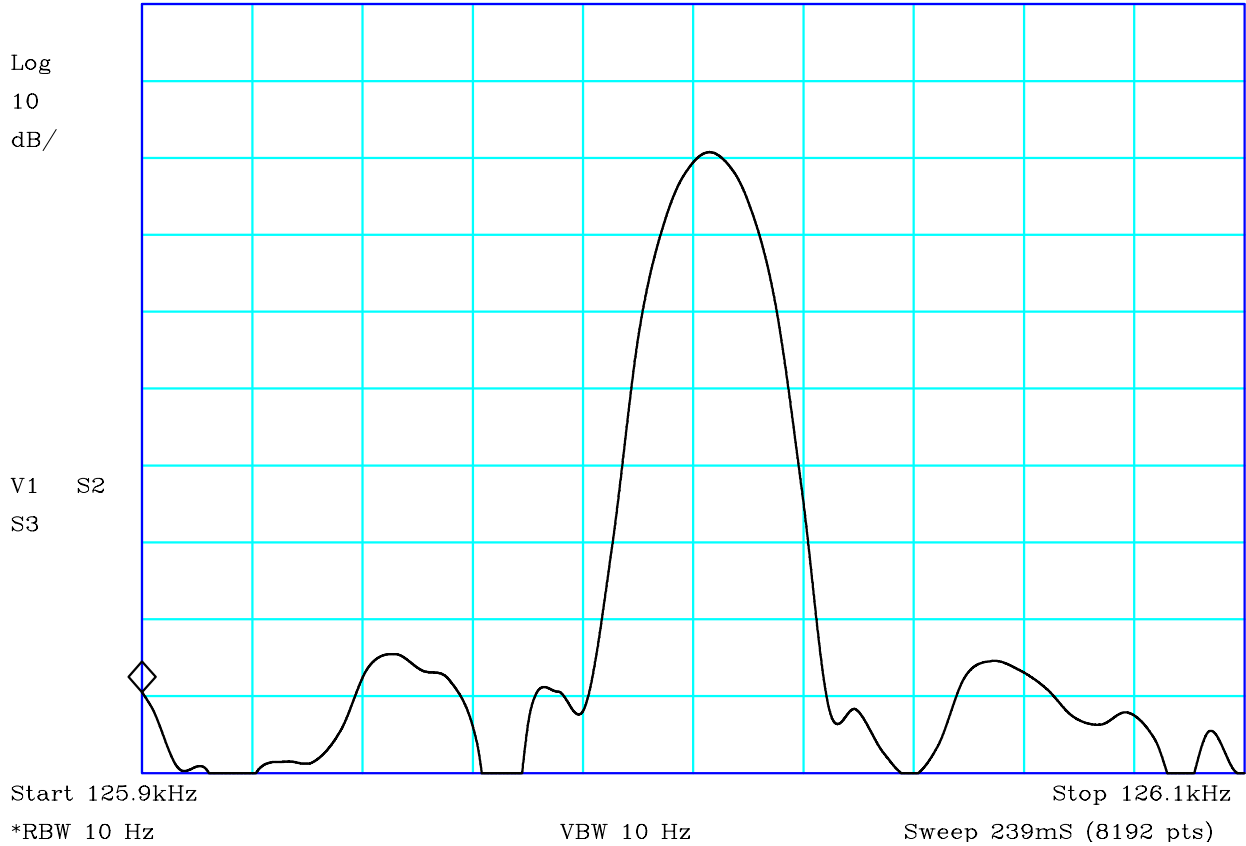
	Report No: <b>R3392</b>	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	Page: 37 of 40
	Issue No: <b>1</b>		
Test No: <b>T5476</b>	<b>Test Report</b>		



### PLOT 19 Radiated Emissions - Normal / Idle (awaiting cat) - 250MHz to 1GHz

Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: Vertical, Blue: Horizontal Normal operating mode - waiting for cat to approach.			
Facility:	Anech_1	Height	1,1.5,2m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H481177B
Mode:	3	Analysers:	R9
Modification State:	1		

Ref 140 dBuV/m                      Atten 20 dB                      Marker 1: 125.9kHz  
50.47dBuV/m



CF1:A9\_HI\_V\_130117    CF2:CBL059\_CBL018\_CBL065\_CBL060\_140528

**PLOT 20 Radiated Emissions - Bandwidth at 126kHz**

Company:	SureFeed	Product:	SureFeed
Date:	01/08/2014	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:		Limit2:	
Limit3:		Limit4:	

Blue: Antenna Edge On  
-30dBc bandwidth = 27Hz  
99% occupied bandwidth = 20Hz

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	E	Modification State:	0
Angle	90	File:	H470146C	Analyser:	R9

Marker 1: 132.8kHz

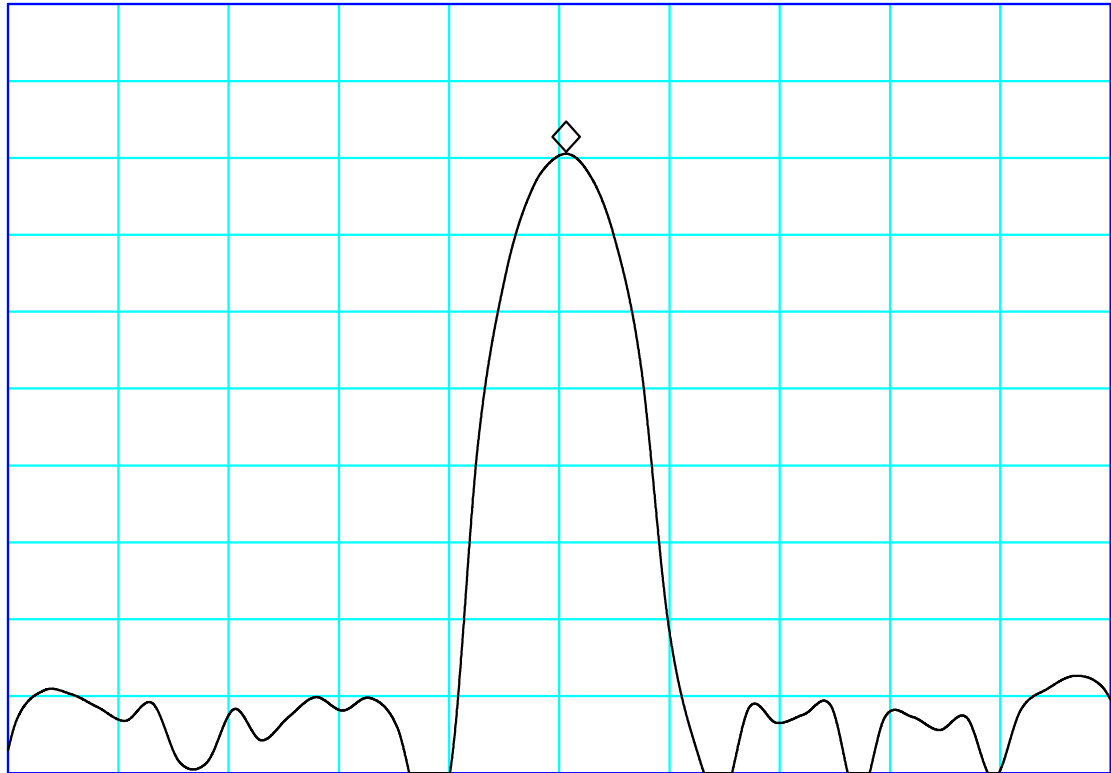
Ref 140 dBuV/m

Atten 20 dB

120.5dBuV/m

Log  
10  
dB/

V1 S2  
S3



Start 132.7kHz

Stop 132.9kHz

\*RBW 10 Hz

VBW 10 Hz

Sweep 239mS (8192 pts)

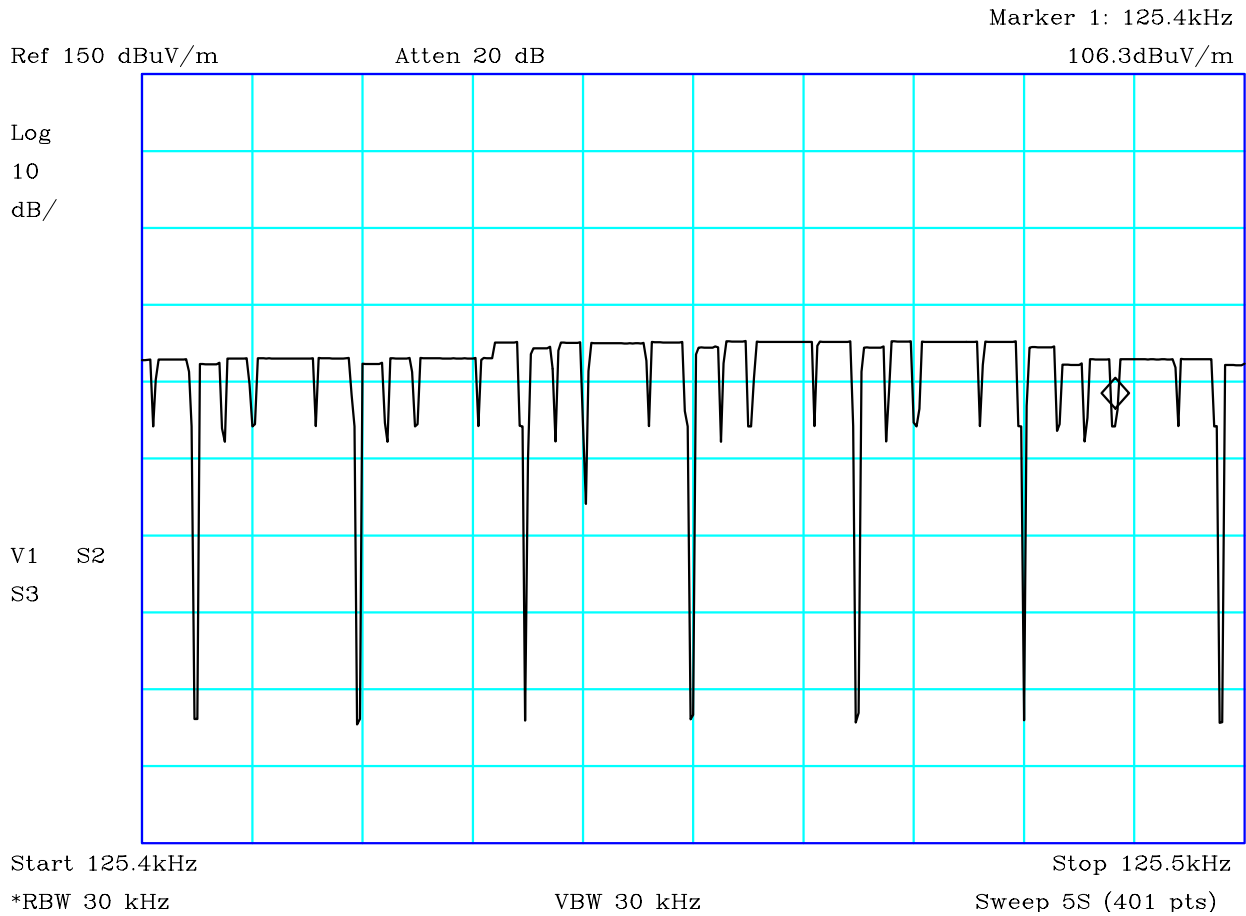
CF1:A9\_HI\_V\_130117 CF2:CBL059\_CBL018\_CBL065\_CBL060\_140528

**PLOT 21 Radiated Emissions - Bandwidth at 133kHz**

Company:	SureFeed	Product:	SureFeed
Date:	01/08/2014	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:		Limit2:	
Limit3:		Limit4:	

Blue: Antenna Edge On  
-30dBc bandwidth = 28Hz  
99% occupied bandwidth = 20Hz

Facility:	Anech_1	Height	1m	Mode:	1
Distance	3m	Polarisation	E	Modification State:	0
Angle	90	File:	H470147C	Analyser:	R9



CF1:A9\_HI\_V\_130117    CF2:CBL059\_CBL018\_CBL065\_CBL060\_140528

## PLOT 22 Radiated Emissions - Timing

Company:	SureFeed	Product:	SureFeed
Date:	01/08/2014	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:		Limit2:	
Limit3:		Limit4:	
Blue: Antenna Edge On Cycling all modes			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	E
Angle	90	File:	H4701452
		Mode:	1
		Modification State:	0
		Analyser:	R9