

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



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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		

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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:

D. A. Smith

Signature:

D. Barlow

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

CFR 47

Code of Federal Regulations: Pt 15 Subpart C - Radio Frequency Devices - Intentional Radiators

RSS-210 Issue 8

*Licence-exempt Radio Apparatus (All Frequency Bands):
Category I Equipment*

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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.	

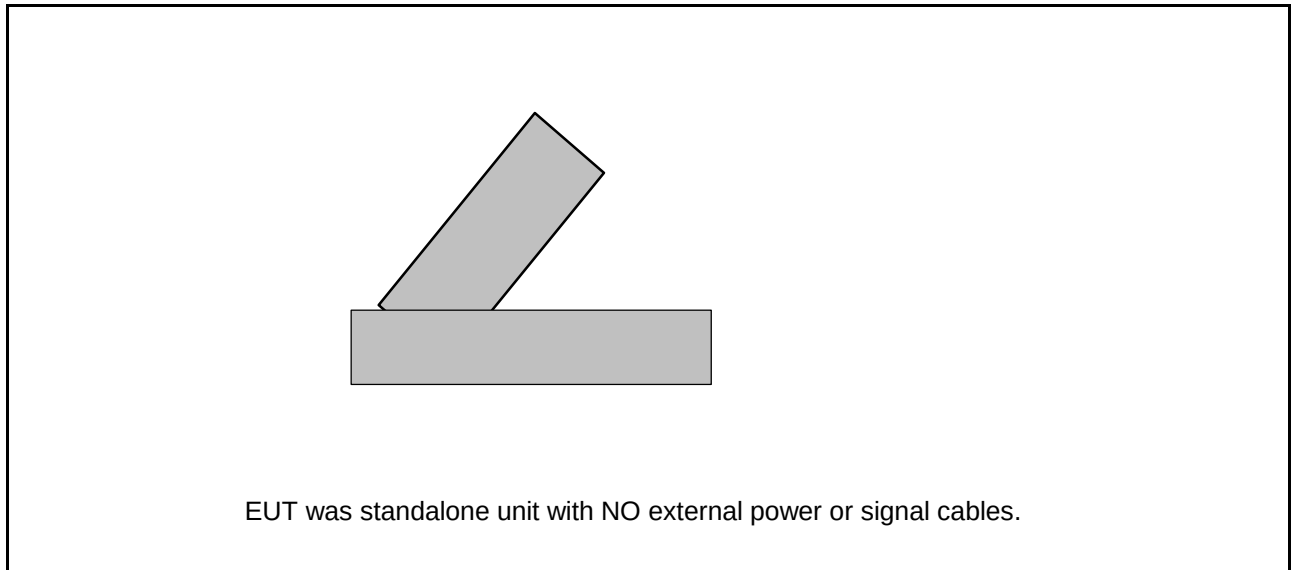
1.3 EUT Operating Modes

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



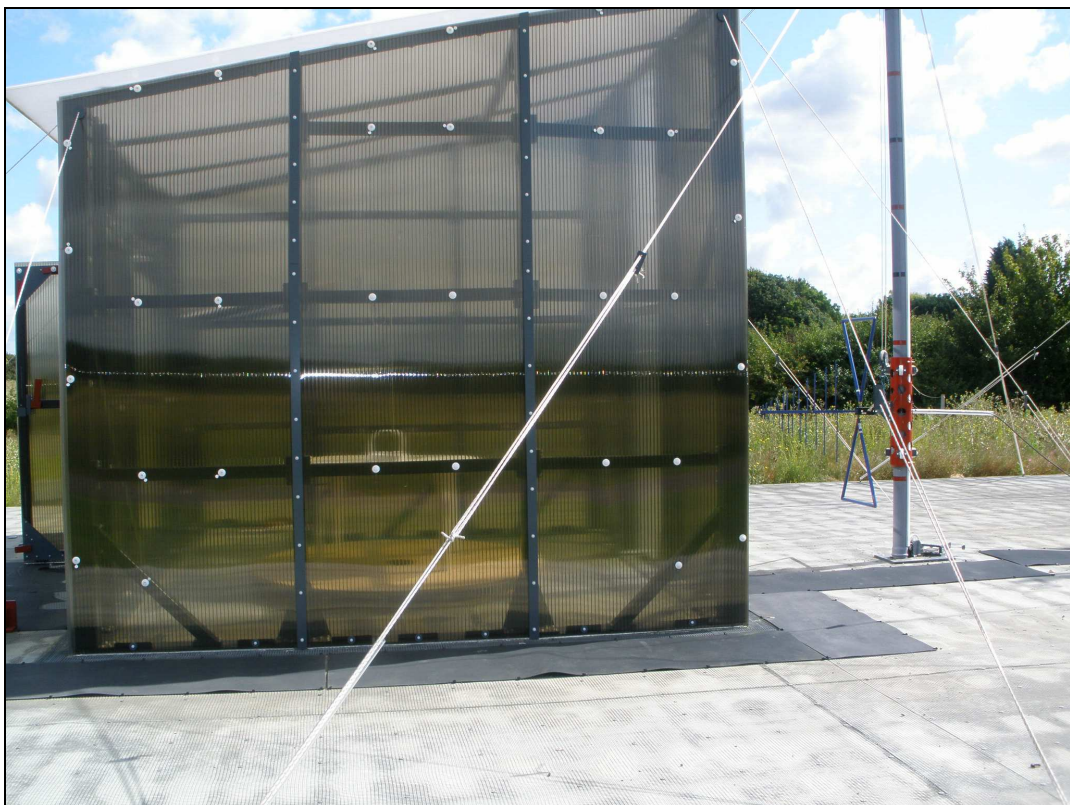
Photograph 2 Radiated Emissions - below 30MHz @10m

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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

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

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: $2400 / f \text{ (kHz)} \text{ uV/m}$

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: $\log(70/300) \text{ decades} = 0.632 \text{ decades}$.

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: $\log(10/300) \text{ decades} = 1.477 \text{ decades}$.

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	300	9.52	19.58	78.66
2nd	266	300	9.02	19.11	78.19
3rd	378	300	6.35	16.05	75.14
3rd	399	300	6.02	15.58	74.67
4th	504	30	47.62	33.56	52.64
4th	532	30	45.11	33.09	52.17
5th	630	30	38.10	31.62	50.70
5th	665	30	36.09	31.15	50.23
6th	756	30	31.75	30.03	49.12
6th	798	30	30.08	29.56	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
252	63.42	63.53	0.11
378	53.08	52.83	-0.25
504	55.6	55.71	0.11
630	38.71	39.56	0.85
756	50.08	50.33	0.25
266	80.15	80.06	-0.09
399	71.93	71.86	-0.07
531	59.56	59.54	-0.02
664	40.8	41.66	0.86
797	44.82	45.23	0.41

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 >= 2dB, 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

Company: Sureflap Ltd					Product: SureFeed								
Date: 15/08/2014					Test Eng: Peter Barlow								
Ports:													
Test: ANSI C63.4:2003					using limits of 15.209					=FCC B			
Ports: enclosure													
Test: 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	
Results											Minimum Margin		
											PASS/FAIL		
											3.4 dB		
											PASS		
Notes		Comments and Observations											
		Measurements made using 200Hz RBW peak detector. 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. 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. 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.											
Key:		F = loop face on to EUT. E = edge on											

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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						
The measurements above were made at 10m, 30m and 70m in order establish the extrapolation in measured level with respect to distance. The figures show that at these distances the extrapolation never drops below 50dB/decade. Key: F= loop face on to EUT, E= edge on						

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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

Company: Sureflap Ltd					Product: SureFeed									
Date: 18/08/2014					Test Eng: Peter Barlow									
Ports:														
Test: ANSI C63.4:2003					using limits of			15.209		=FCC B				
Ports: enclosure														
Test: 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		
Results										Minimum Margin PASS/FAIL		7.7 dB PASS		
Notes		Comments and Observations												
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: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	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

Company: Sureflap Ltd					Product: SureFeed								
Date: 18/08/2014					Test Eng: Peter Barlow								
Ports:													
Test: ANSI C63.4:2003					using limits of			15.209		=FCC B			
Ports: enclosure													
Test: 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	
Results											Minimum Margin		
											PASS/FAIL		
											6.6 dB		
											PASS		
Notes		Comments and Observations											
		120V units. Results of scans shown in plots 7 to 12.											
		Limits adjusted for measurement distances using a default extrapolation of 40dB/decade. All measurements made with peak detector.											

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

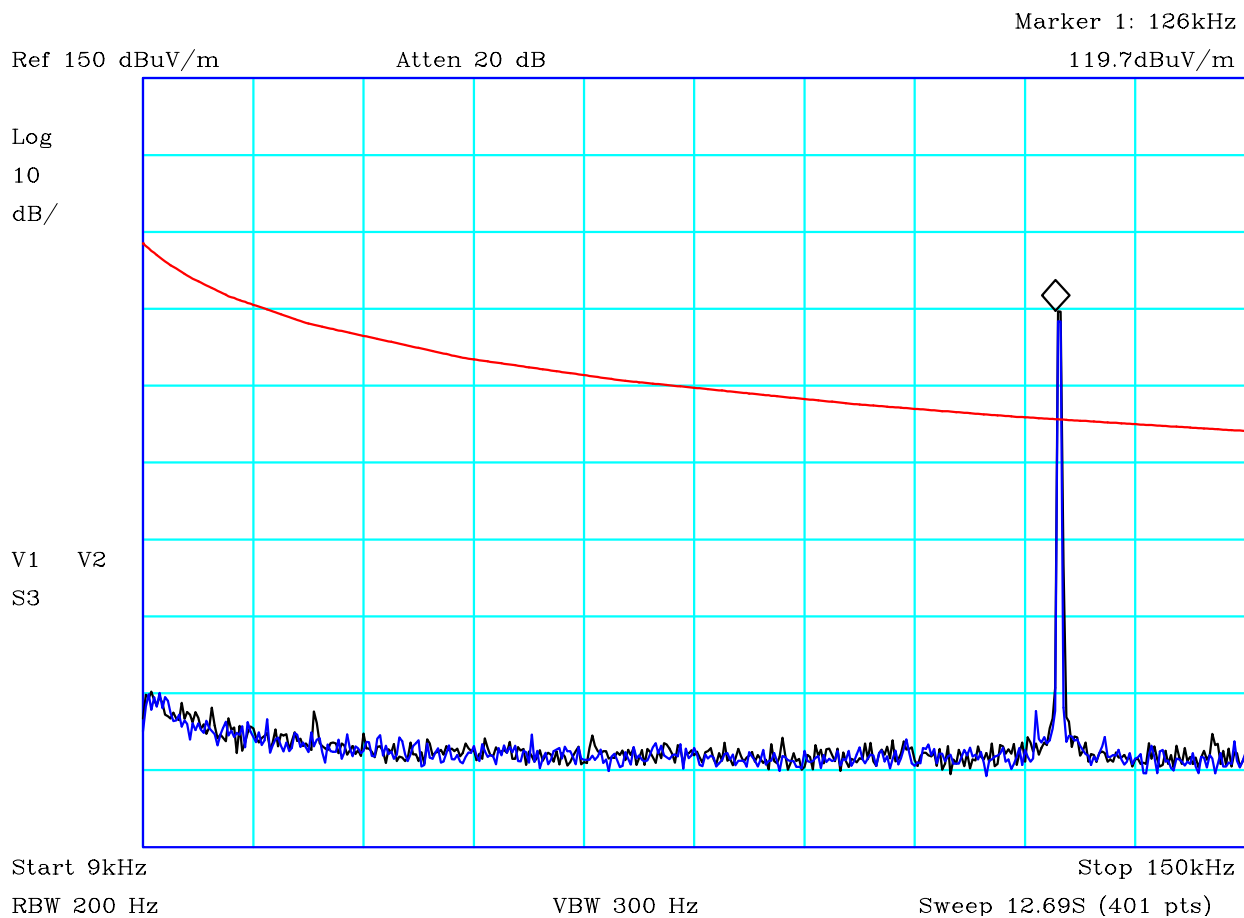
4.7 Radiated Emissions Results - Spurious Above 30MHz

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

Company: Sureflap Ltd					Product: SureFeed									
Date: 15/08/2014					Test Eng: Peter Barlow									
Ports:														
Test: ANSI C63.4:2003					using limits of			15.209		=FCC B				
Ports: enclosure														
Test: 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		
Results											Minimum Margin		9.8 dB	
											PASS/FAIL		PASS	
Notes	Comments and Observations													
	Results of scans shown in plots 16 to 19.													
	Measurements made using a 120kHz QP detector.													
	These measurements were made at 3m on an Open Area Test Site.													

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 19 of 40

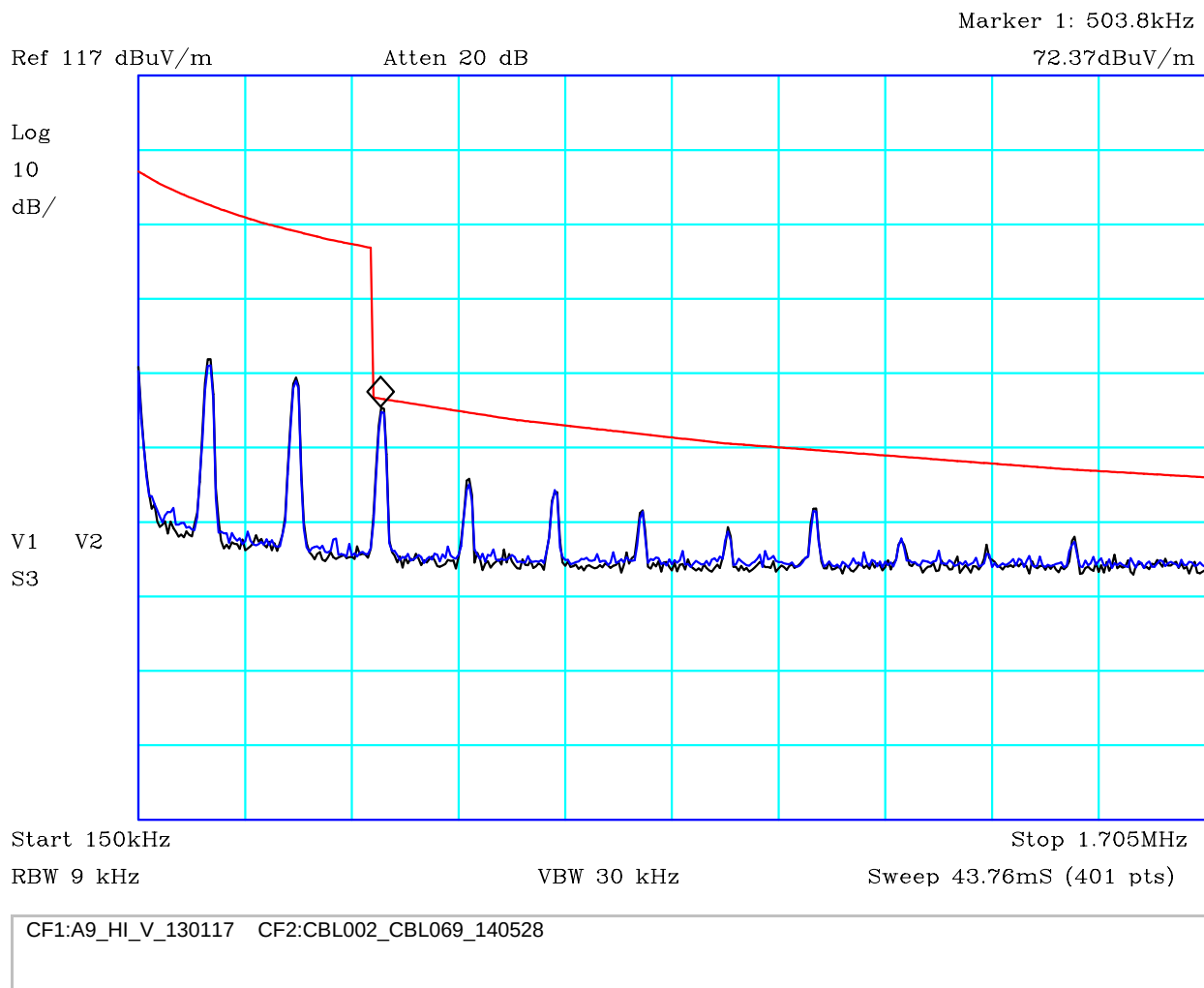


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	F+E
Angle	0-360	File:	H47154F1
		Mode:	1
		Modification State:	1
		Analysar:	R9

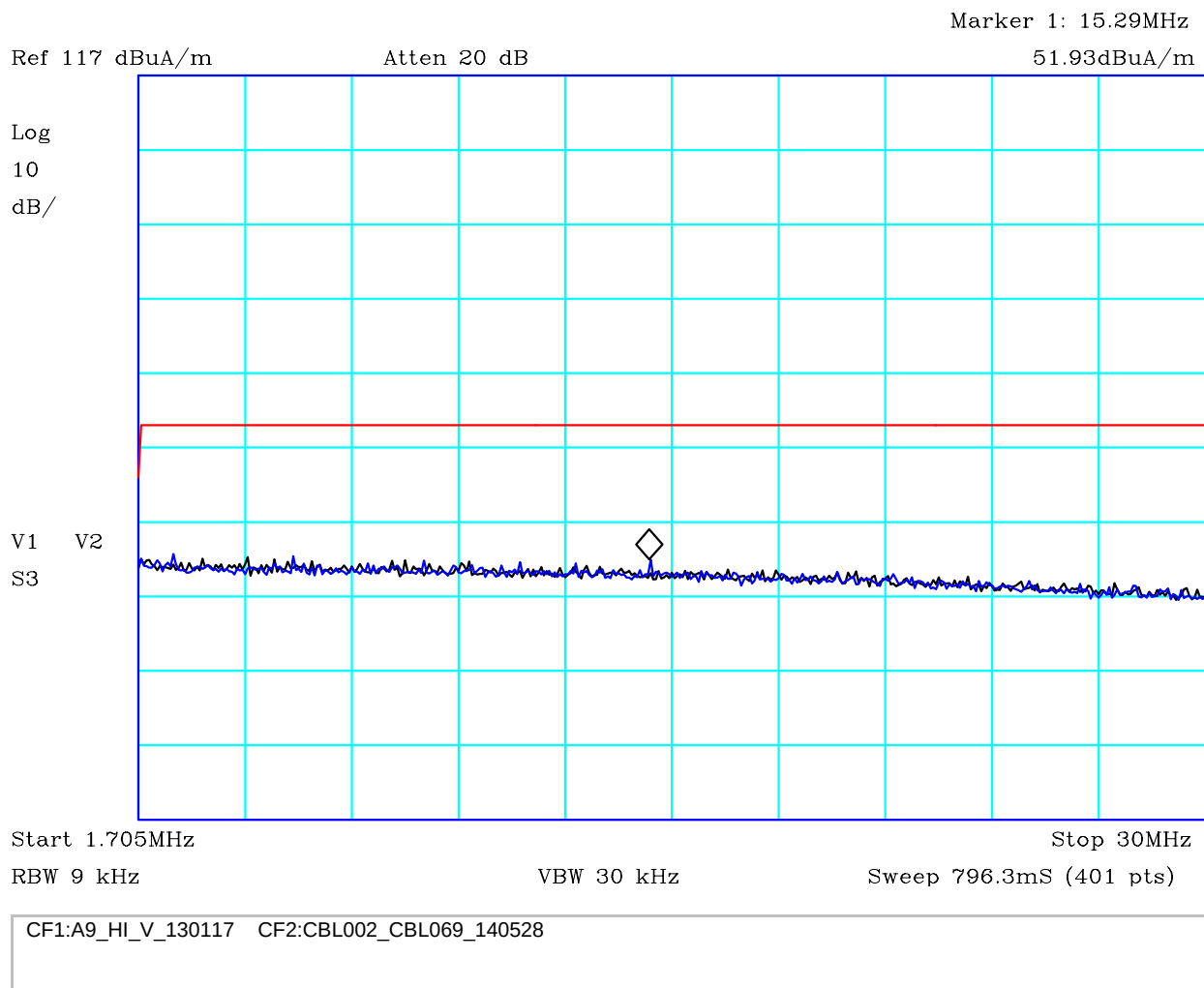
	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 20 of 40



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
Distance	3m	Polarisation	F+E
Angle	0-360	File:	H4715502
		Mode:	1
		Modification State:	1
		Analysar:	R9

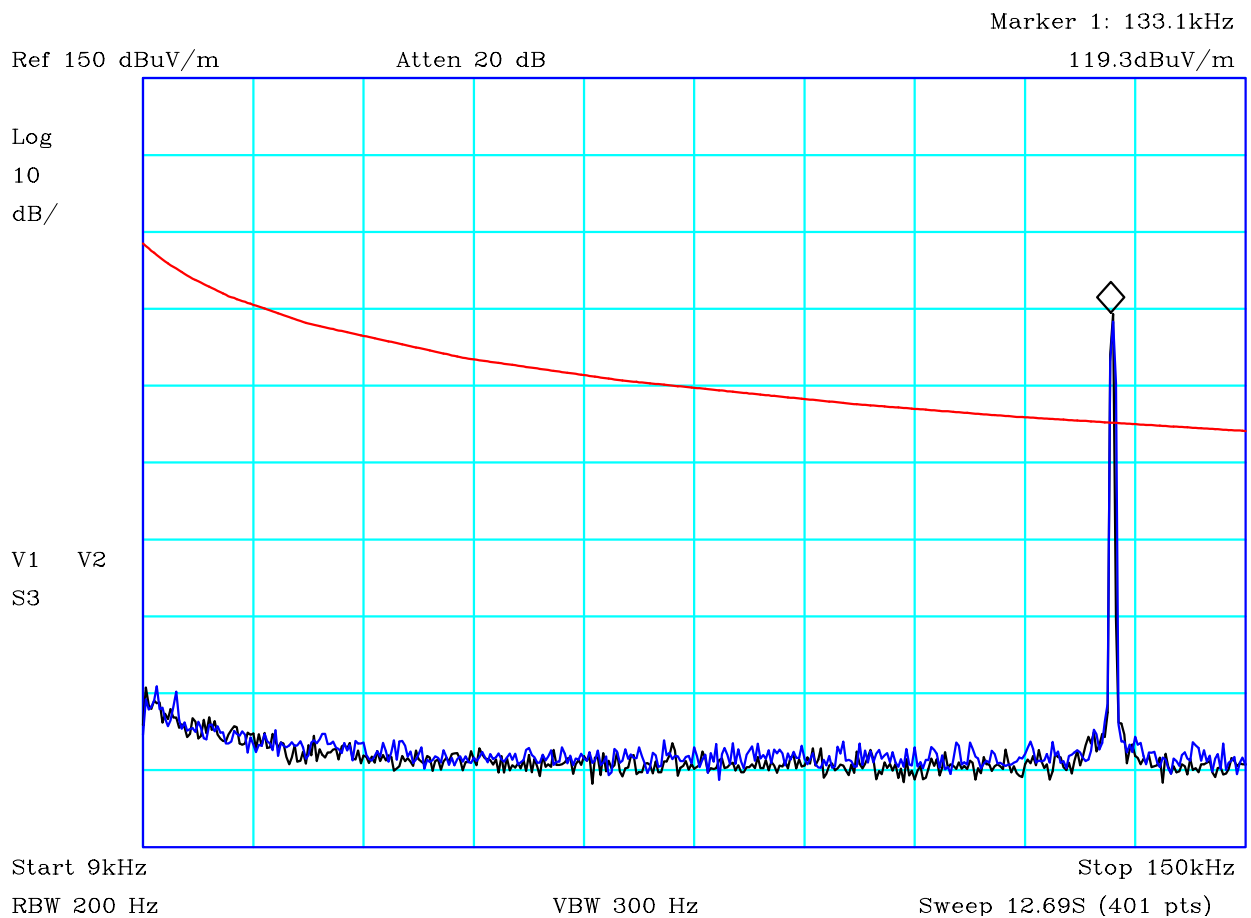
	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 21 of 40



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

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



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

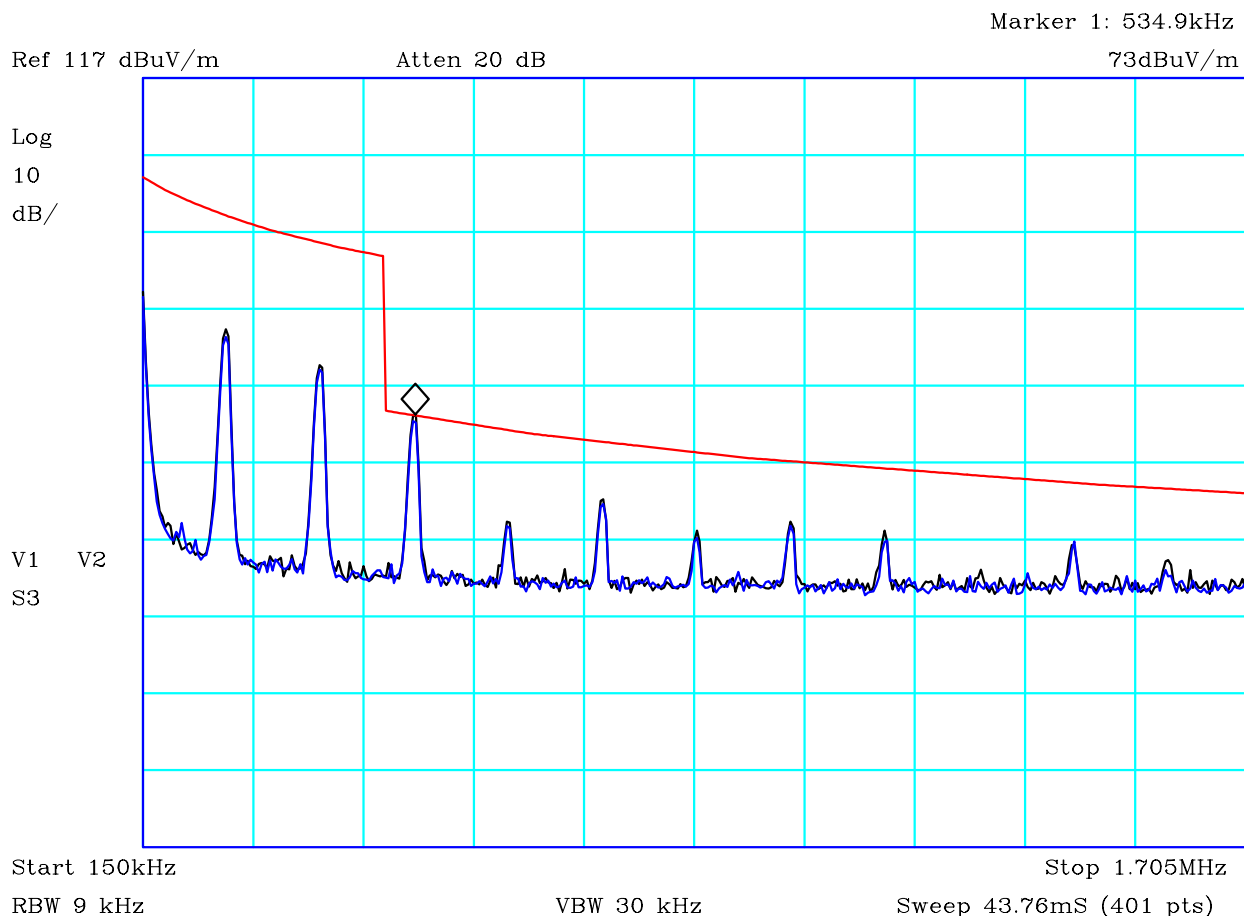
Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

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	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	1
Angle	0-360	File:	H4715535	Analyser:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 23 of 40

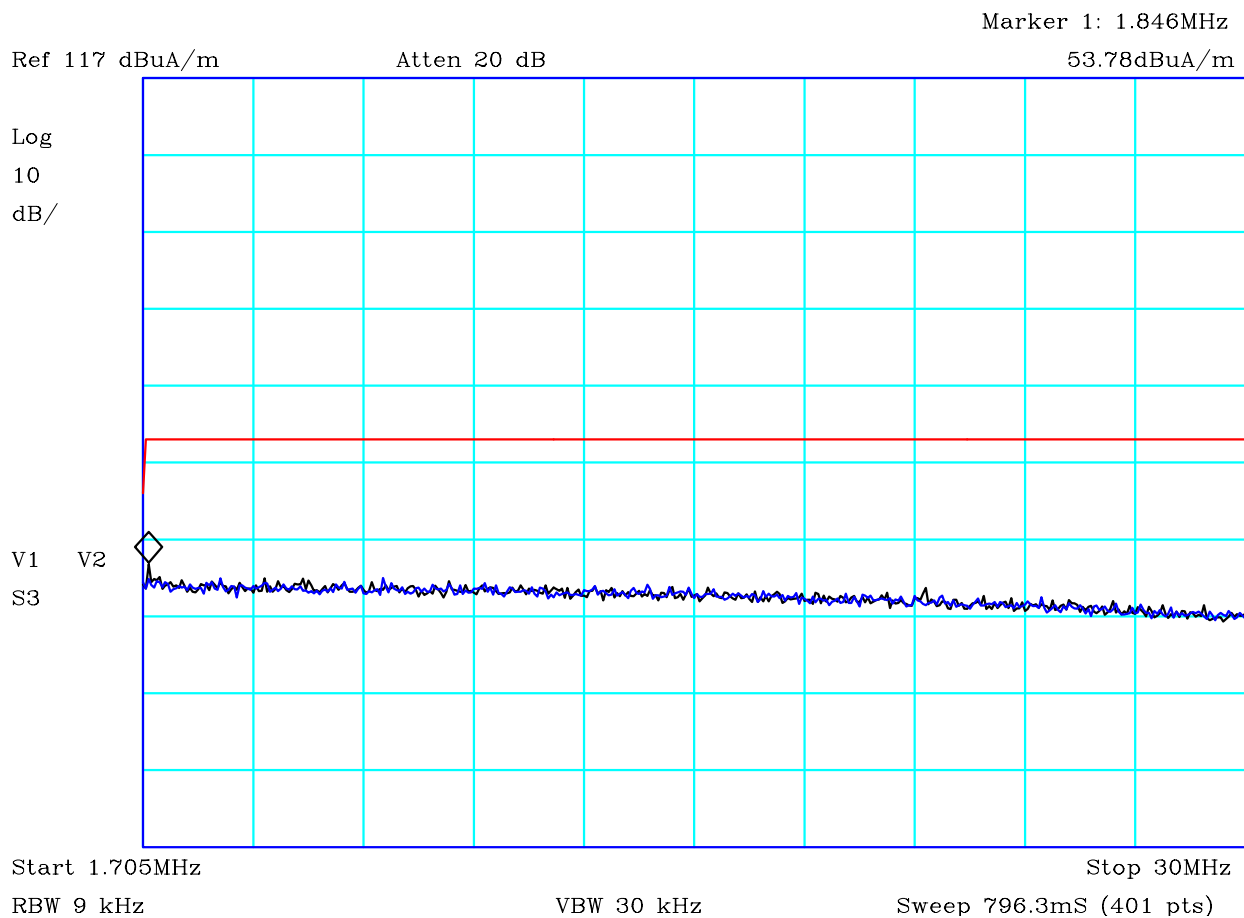


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H471553D
		Mode:	1
		Modification State:	1
		Analysers:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 24 of 40

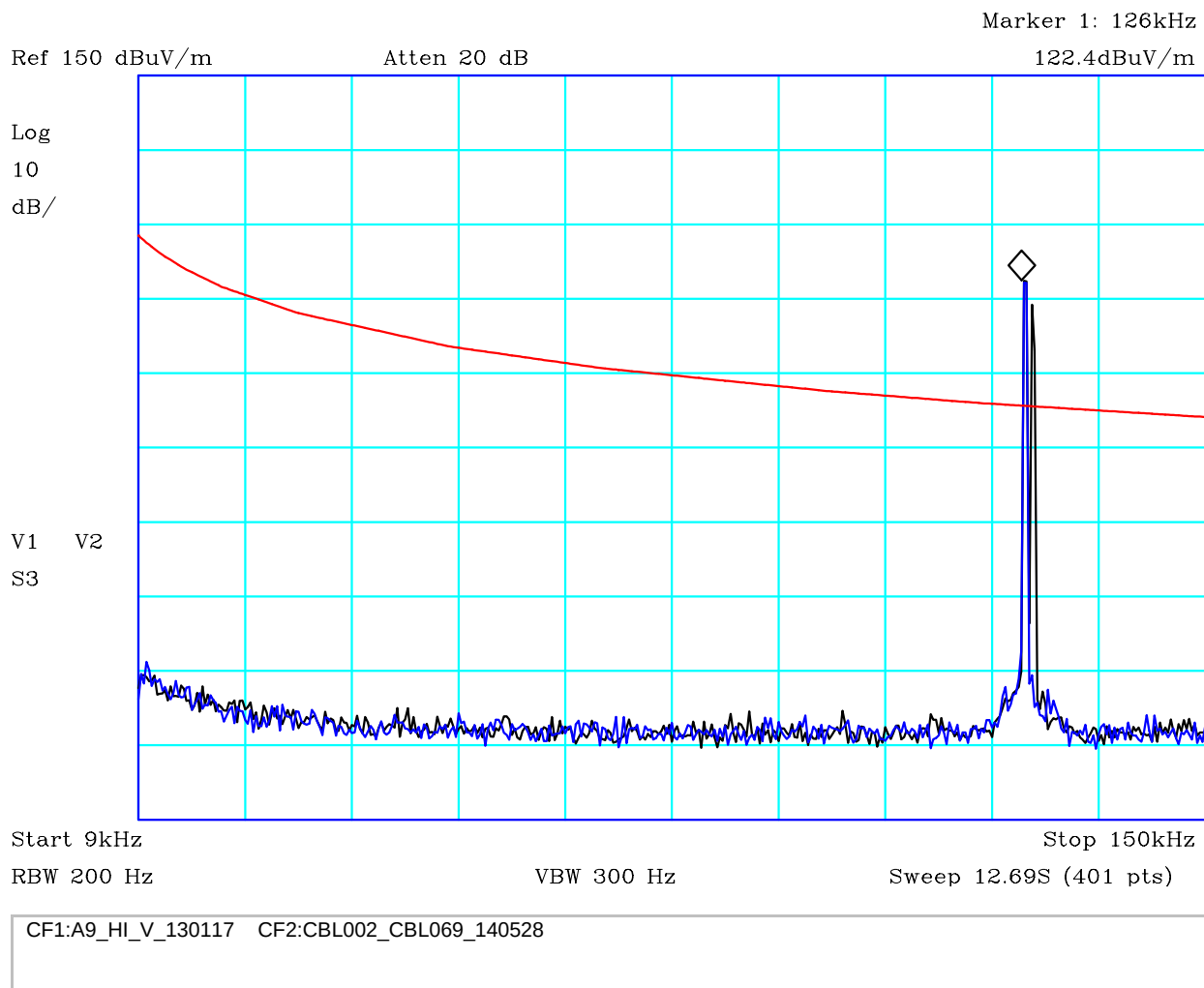


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4715543
		Mode:	1
		Modification State:	1
		Analysers:	R9

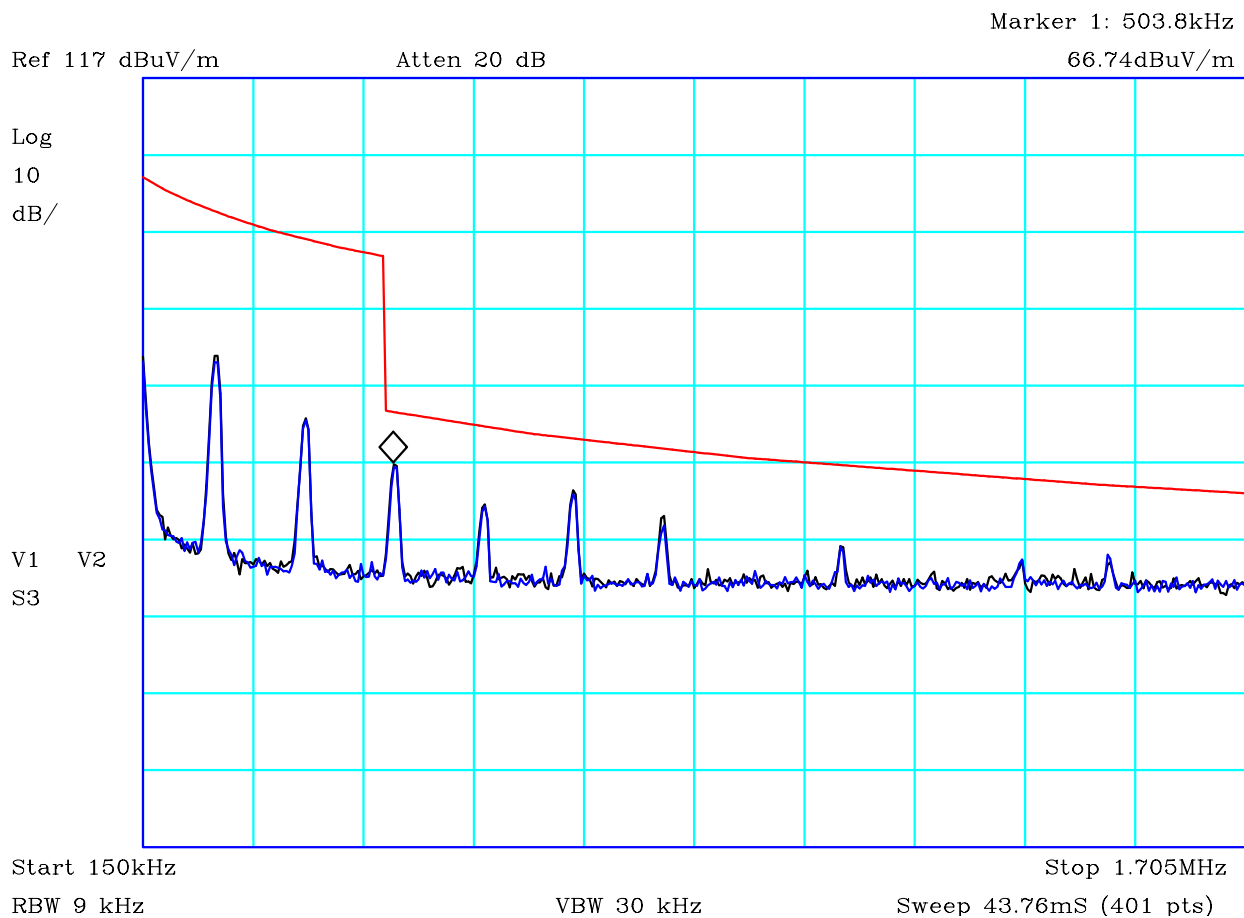
	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 25 of 40



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:	
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. Open area test site measurements showed this to be conservative.			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H47154D3
		Mode:	1
		Modification State:	1
		Analyser:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 26 of 40

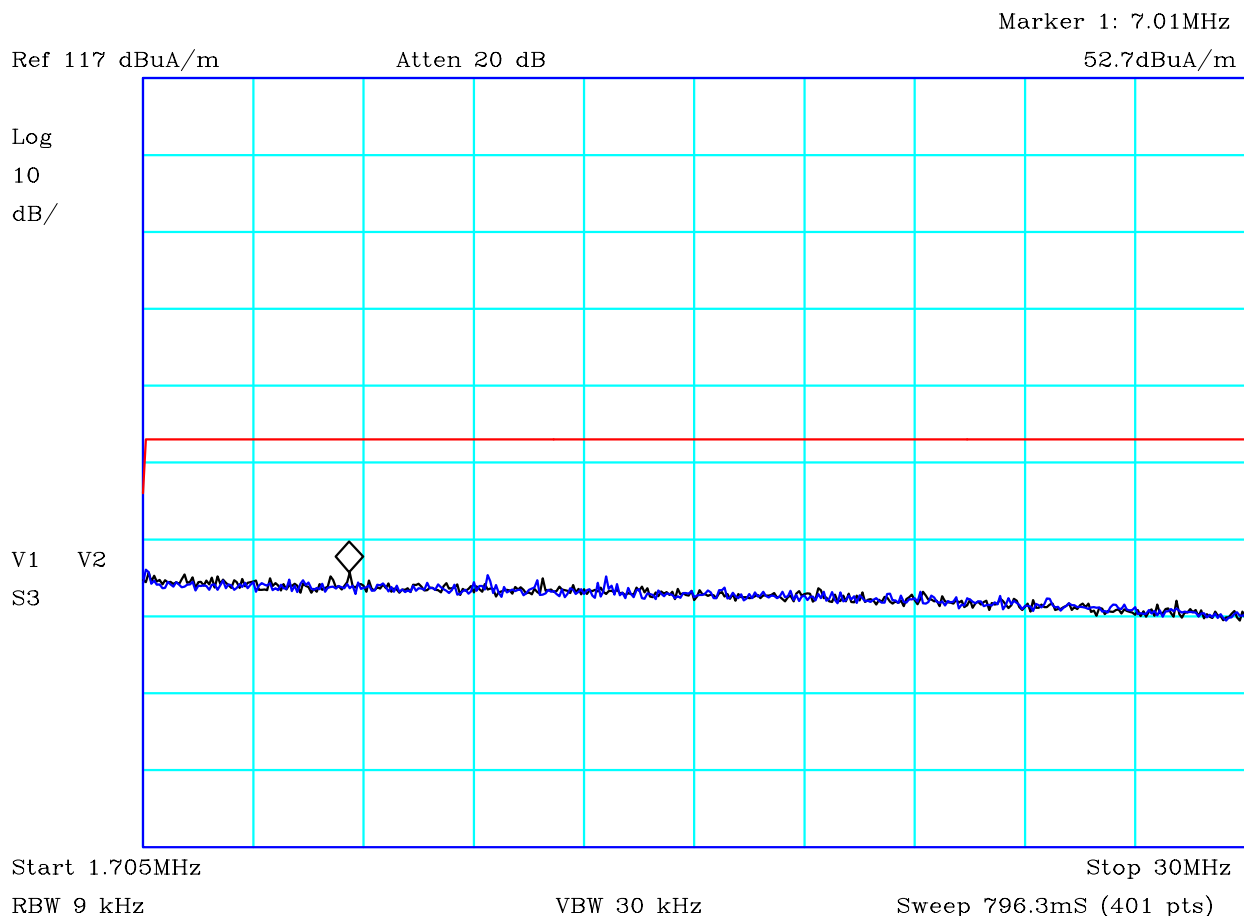


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H47154DA
		Mode:	1
		Modification State:	1
		Analysar:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 27 of 40

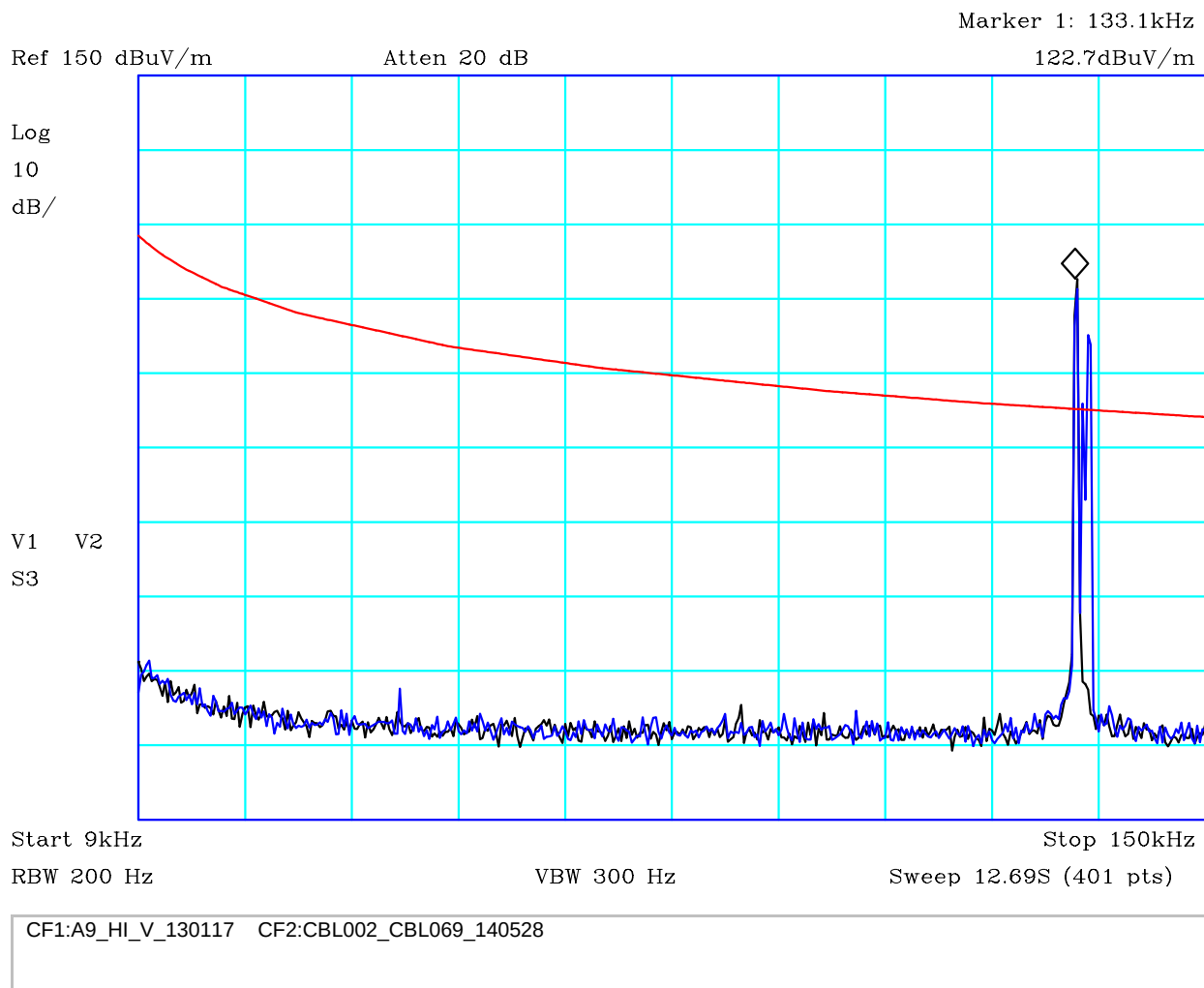


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H47154E0
		Mode:	1
		Modification State:	1
		Analysers:	R9

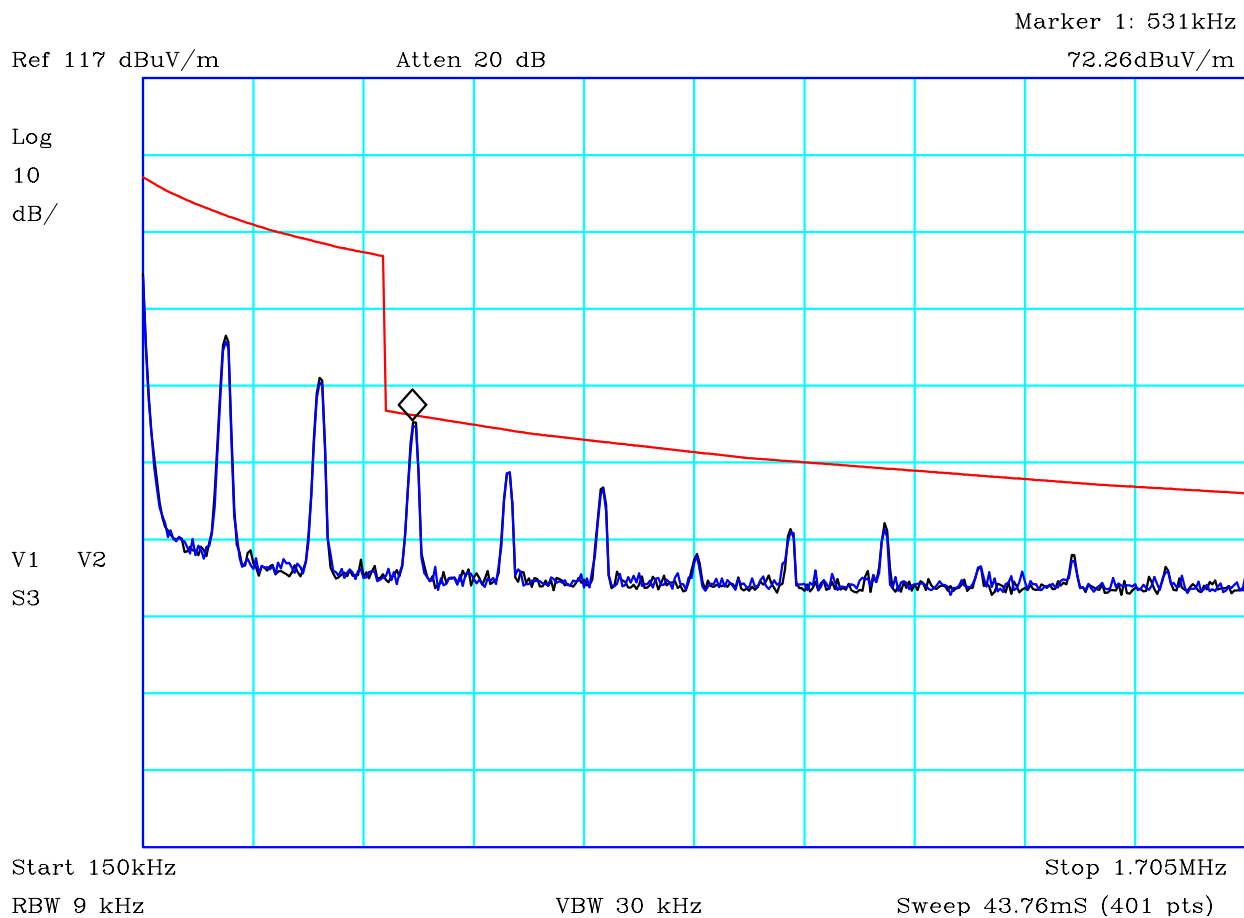
	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 28 of 40



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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H47154B9
		Mode:	1
		Modification State:	1
		Analysar:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 29 of 40

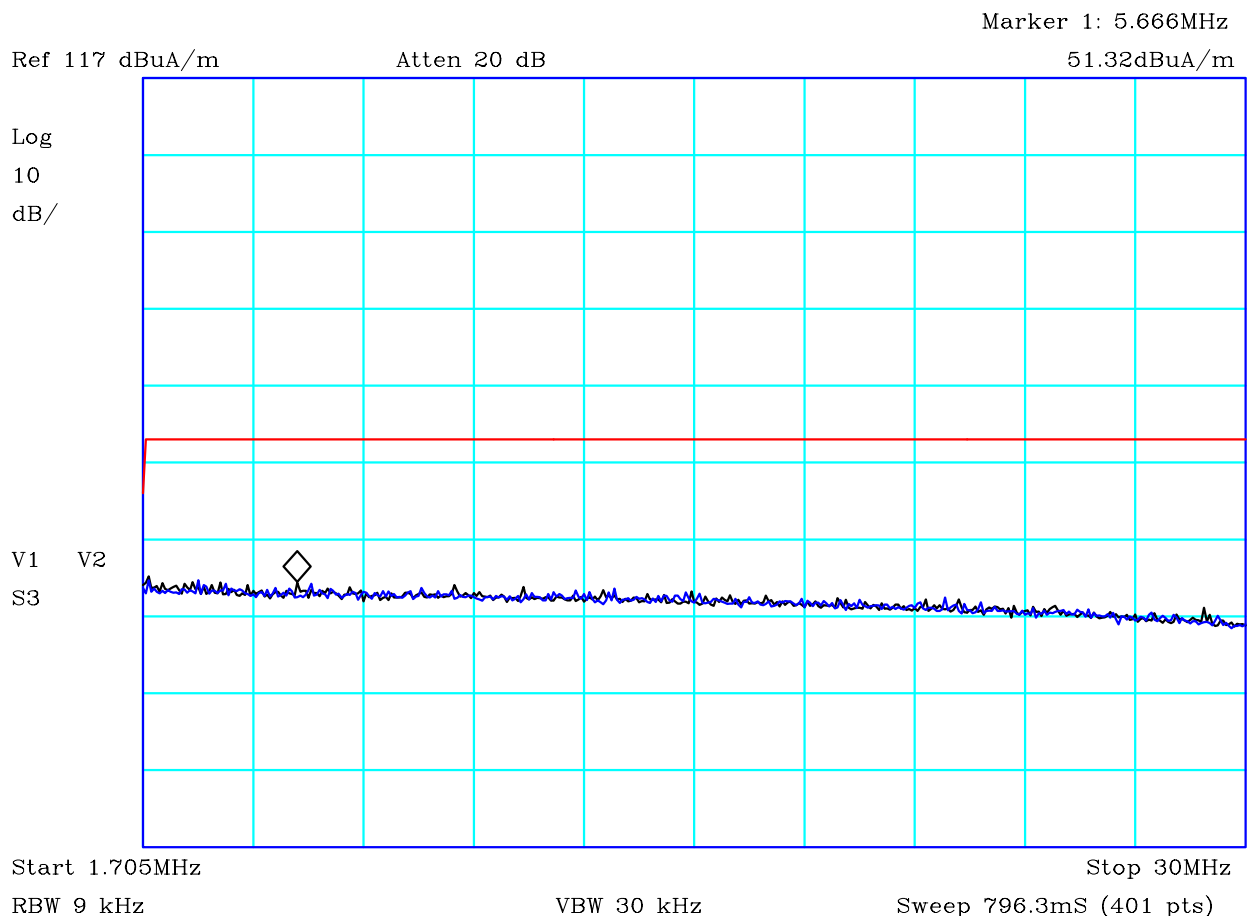


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H47154BD
		Mode:	1
		Modification State:	1
		Analysers:	R9

	Report No: R3392	FCC ID: XO9-MPF001-001	
	Issue No: 1	IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 30 of 40



CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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

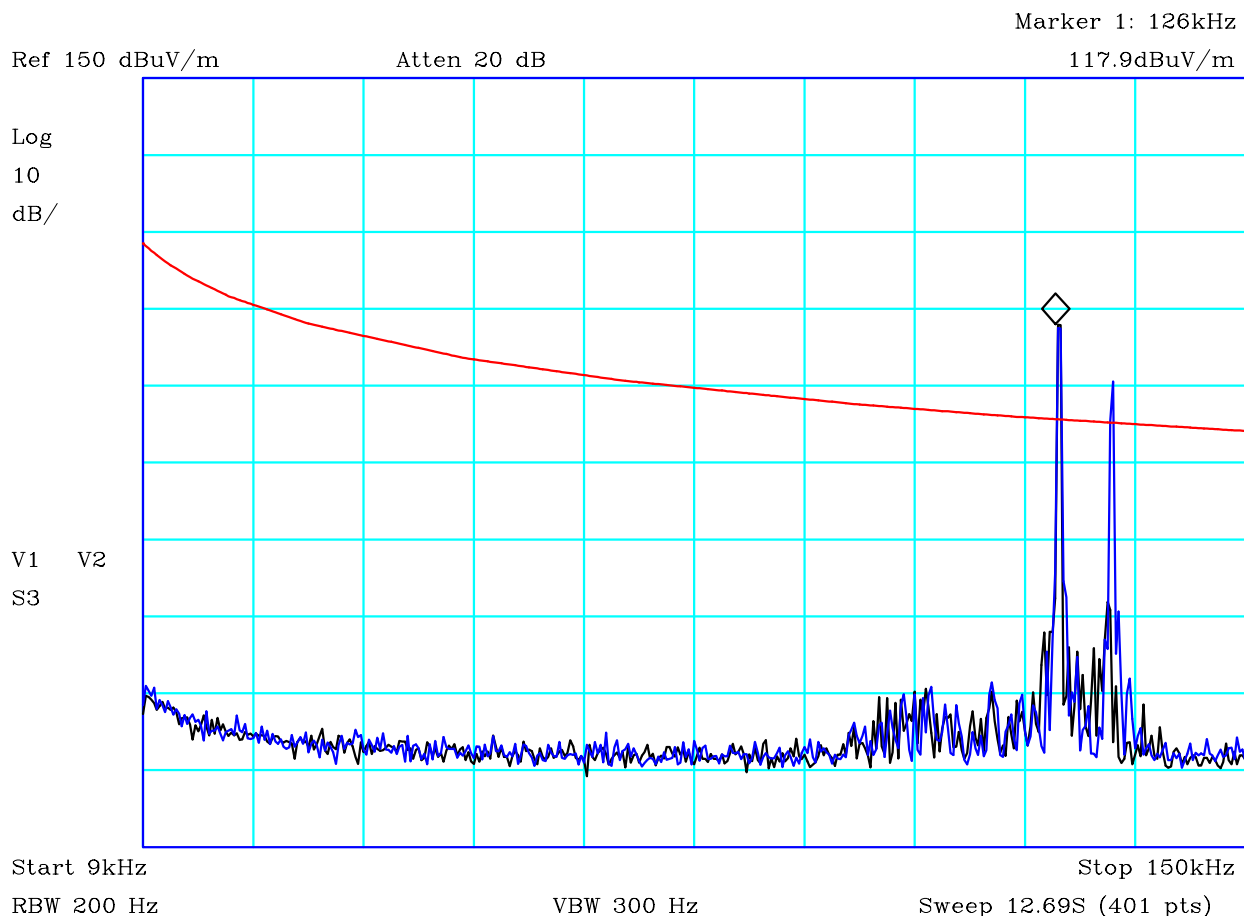
Company:	SureFlap	Product:	SureFeed
Date:	15/08/2014	Test Eng:	Peter Barlow
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m	Limit2:	
Limit3:		Limit4:	

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: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 31 of 40

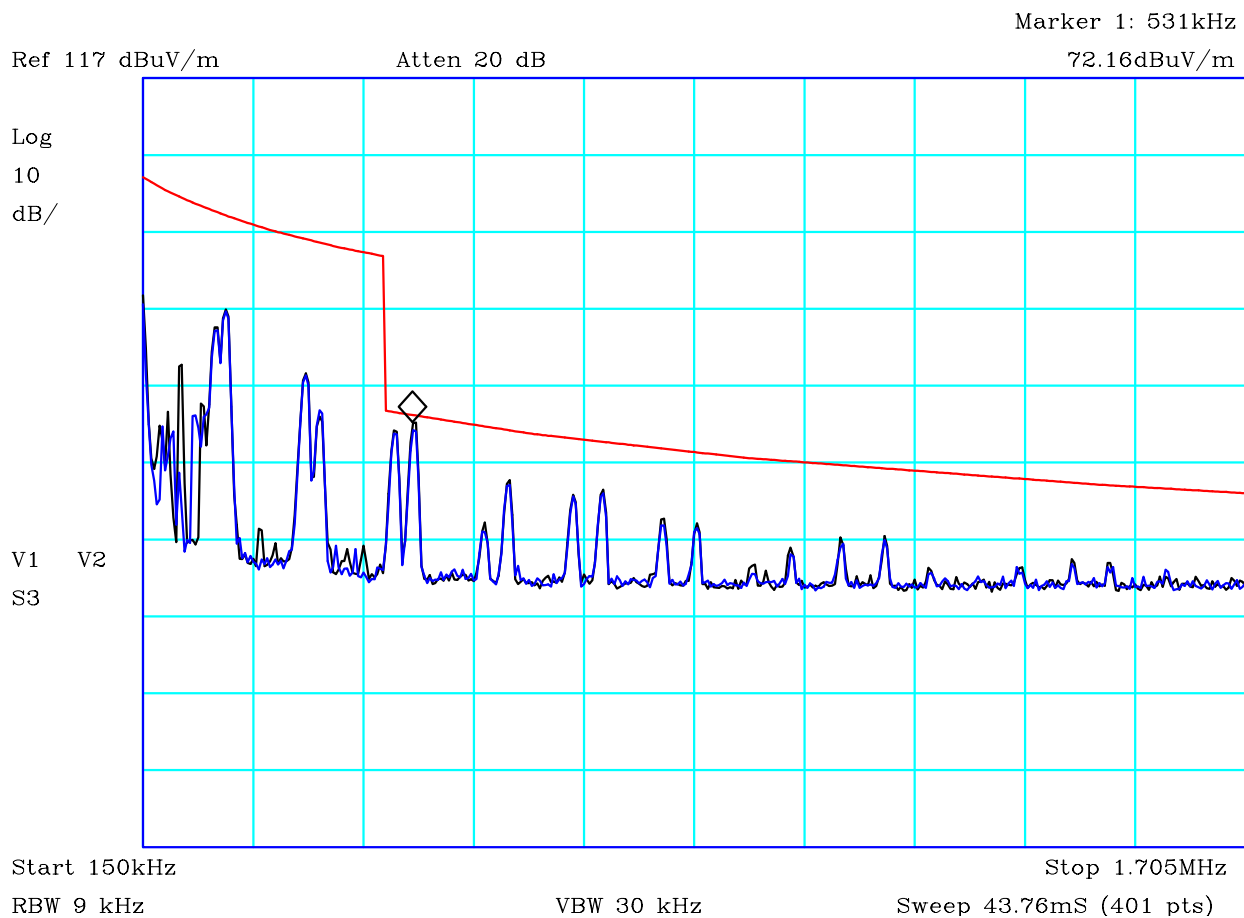


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 32 of 40

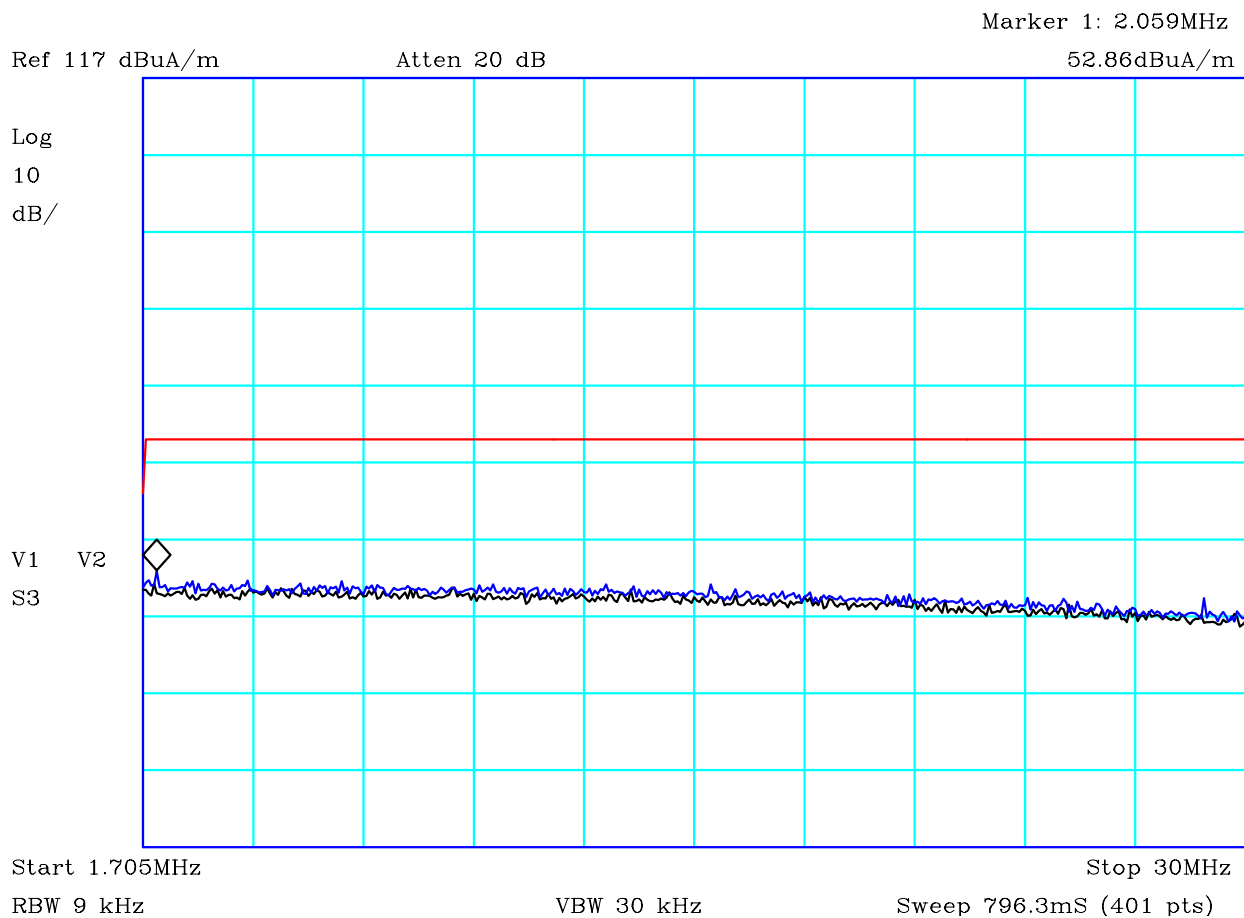


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

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:	
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.			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4715592
		Mode:	2
		Modification State:	1
		Analysers:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 33 of 40

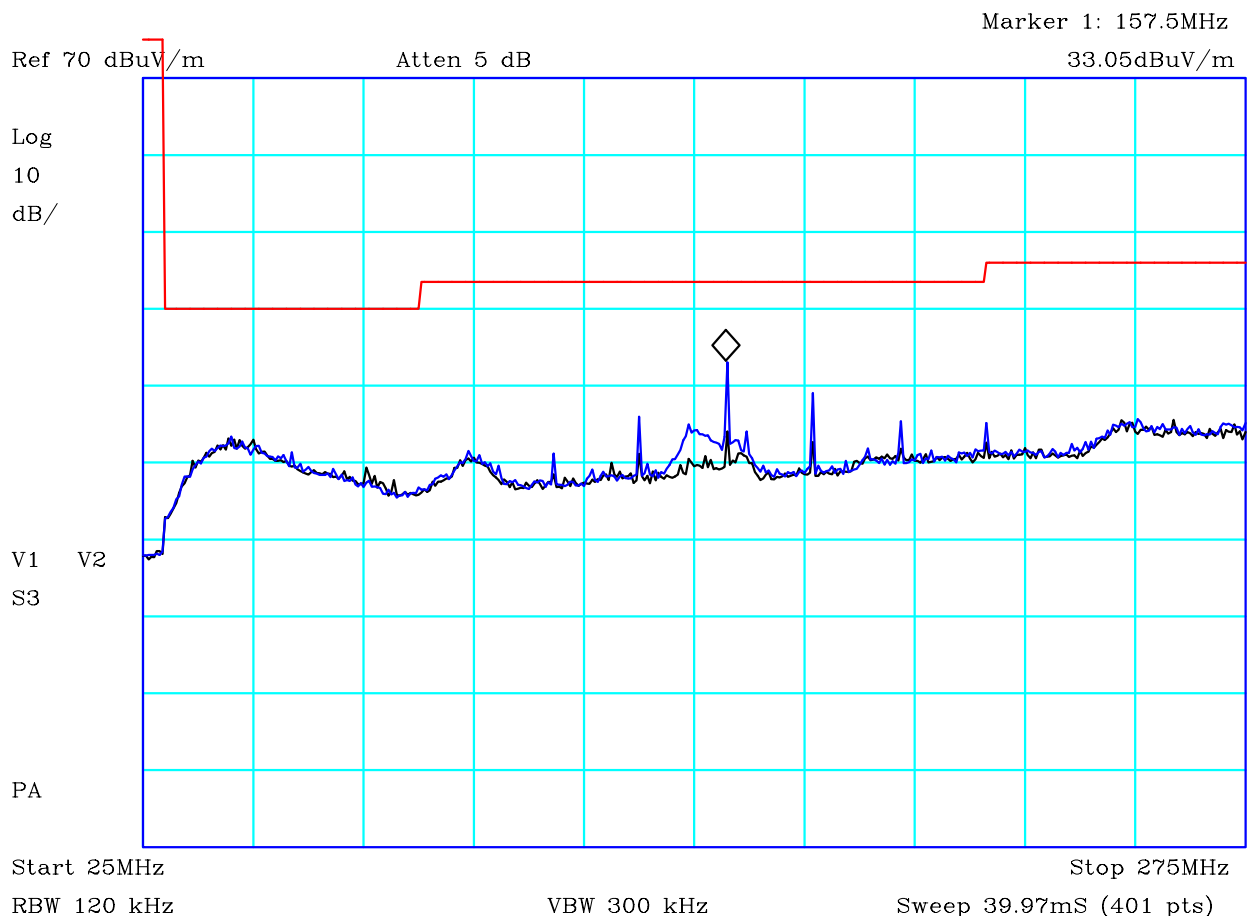


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_140528

PLOT 15 Radiated Emissions - Cycling All Modes - 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 Cycling all modes Mod.State: 1. Default extrapolation of 40dB/decade was used to establish the limit.			
Facility:	Anech_1	Height	1m
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4715598
		Mode:	2
		Modification State:	1
		Analysers:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 34 of 40

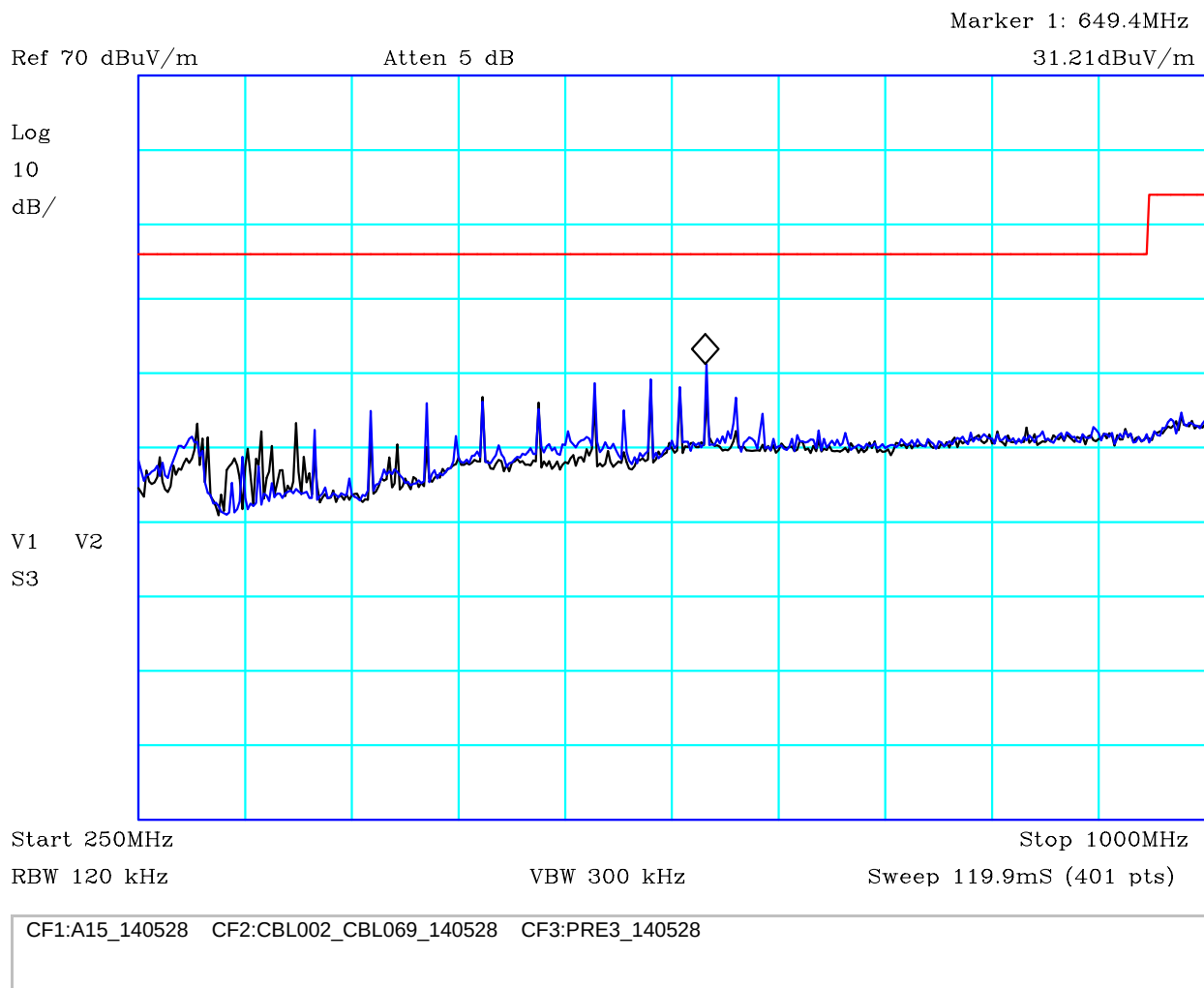


CF1:A15_140528 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4715680
		Mode:	2
		Modification State:	1
		Analysers:	R9

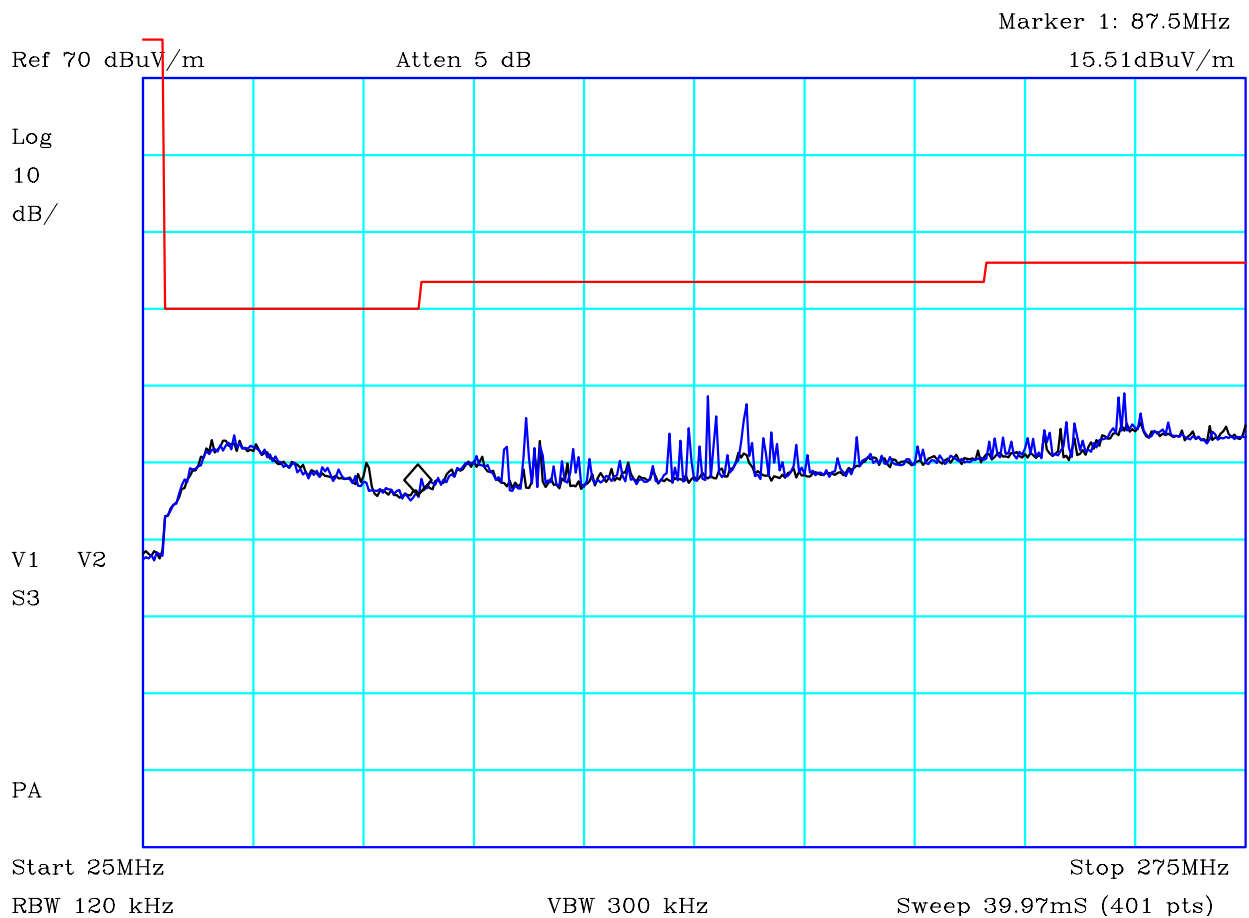
	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 35 of 40



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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H471568E
		Mode:	2
		Modification State:	1
		Analysers:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 36 of 40

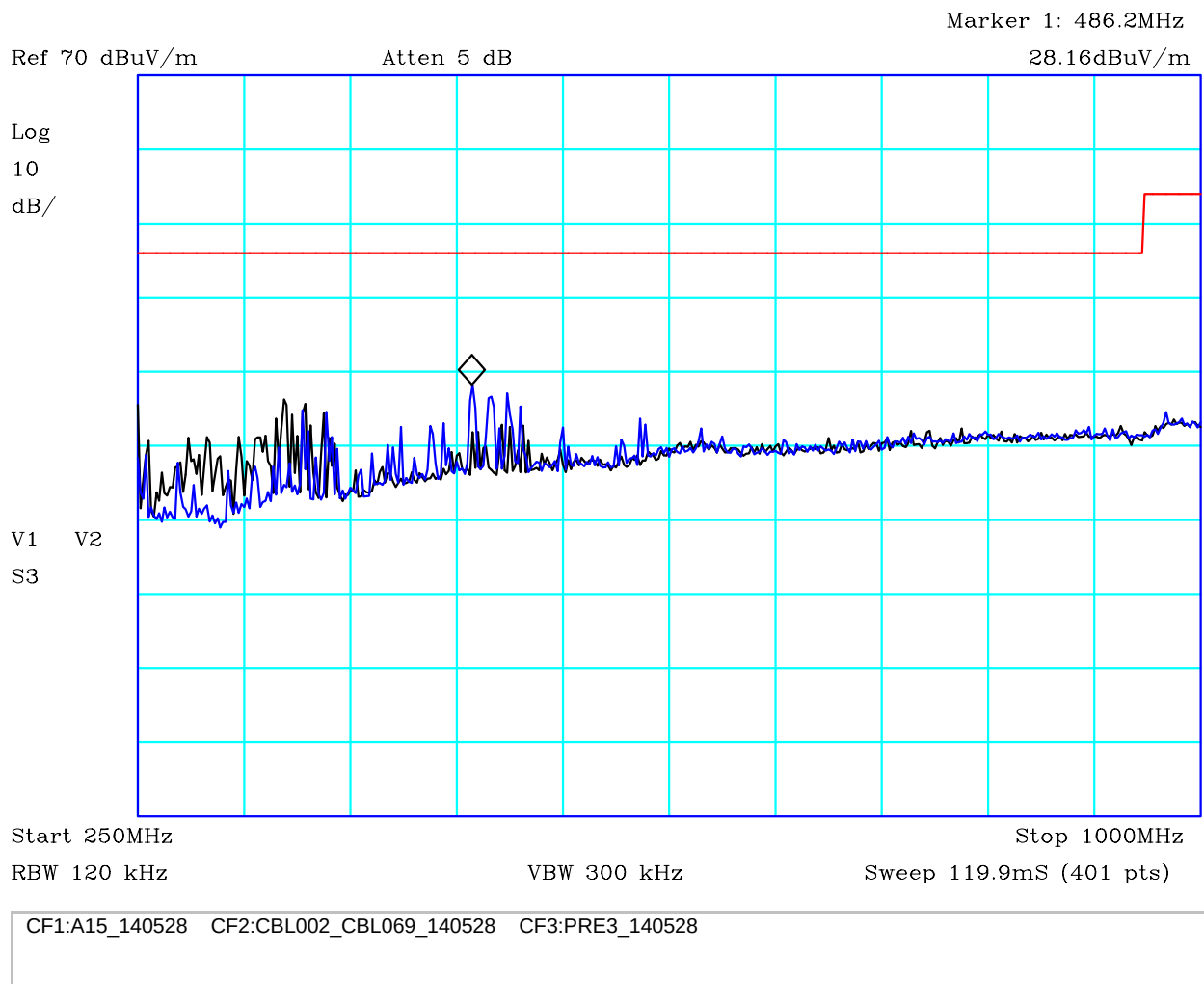


CF1:A15_140528 CF2:CBL002_CBL069_140528

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
Distance	3m	Polarisation	V+H
Angle	0-360	File:	H4811779
		Mode:	3
		Modification State:	1
		Analysers:	R9

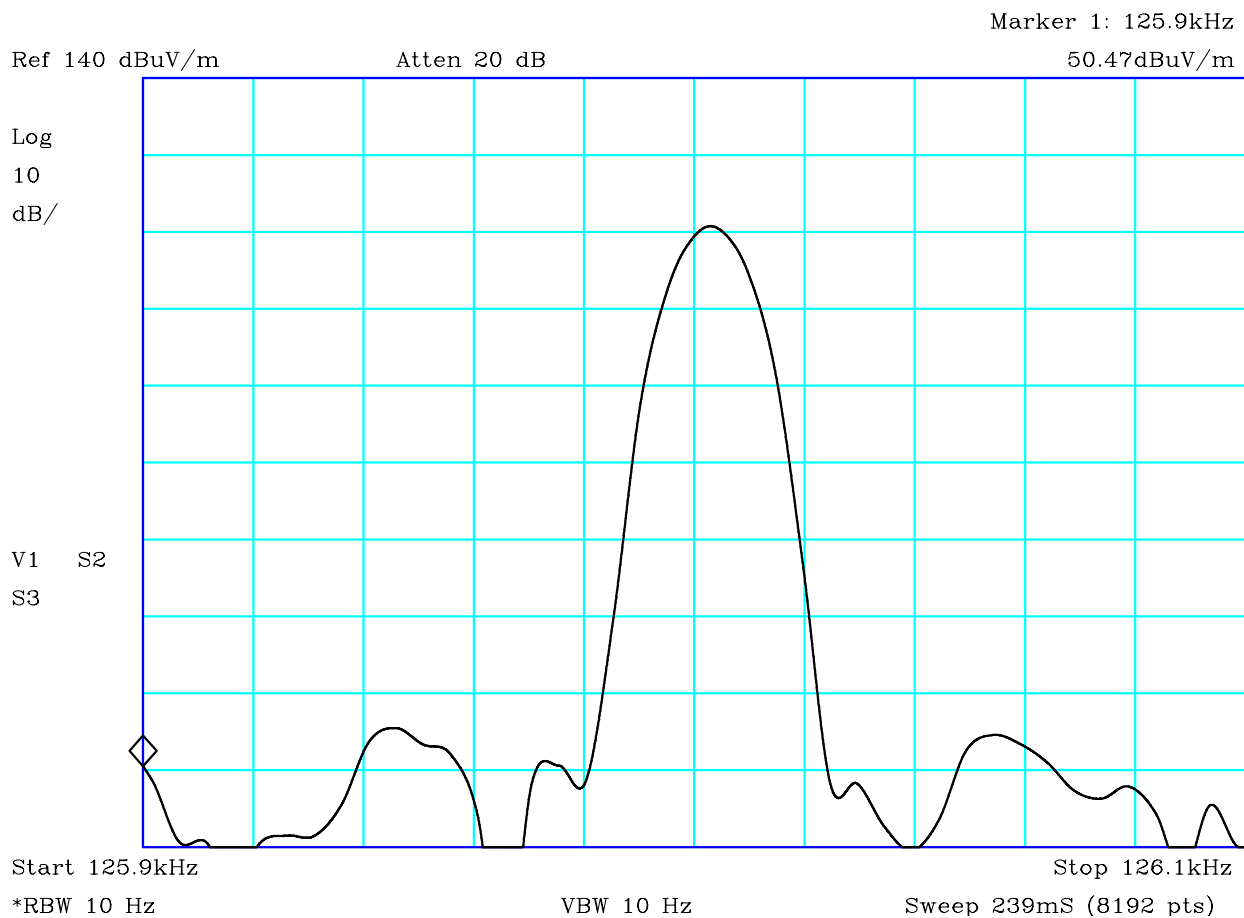
	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 37 of 40



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
		Modification State:	1
		Analysers:	R9

	Report No: R3392 Issue No: 1	FCC ID: XO9-MPF001-001 IC: 8906A -MPF01001	
	Test No: T5476	Test Report	Page: 38 of 40

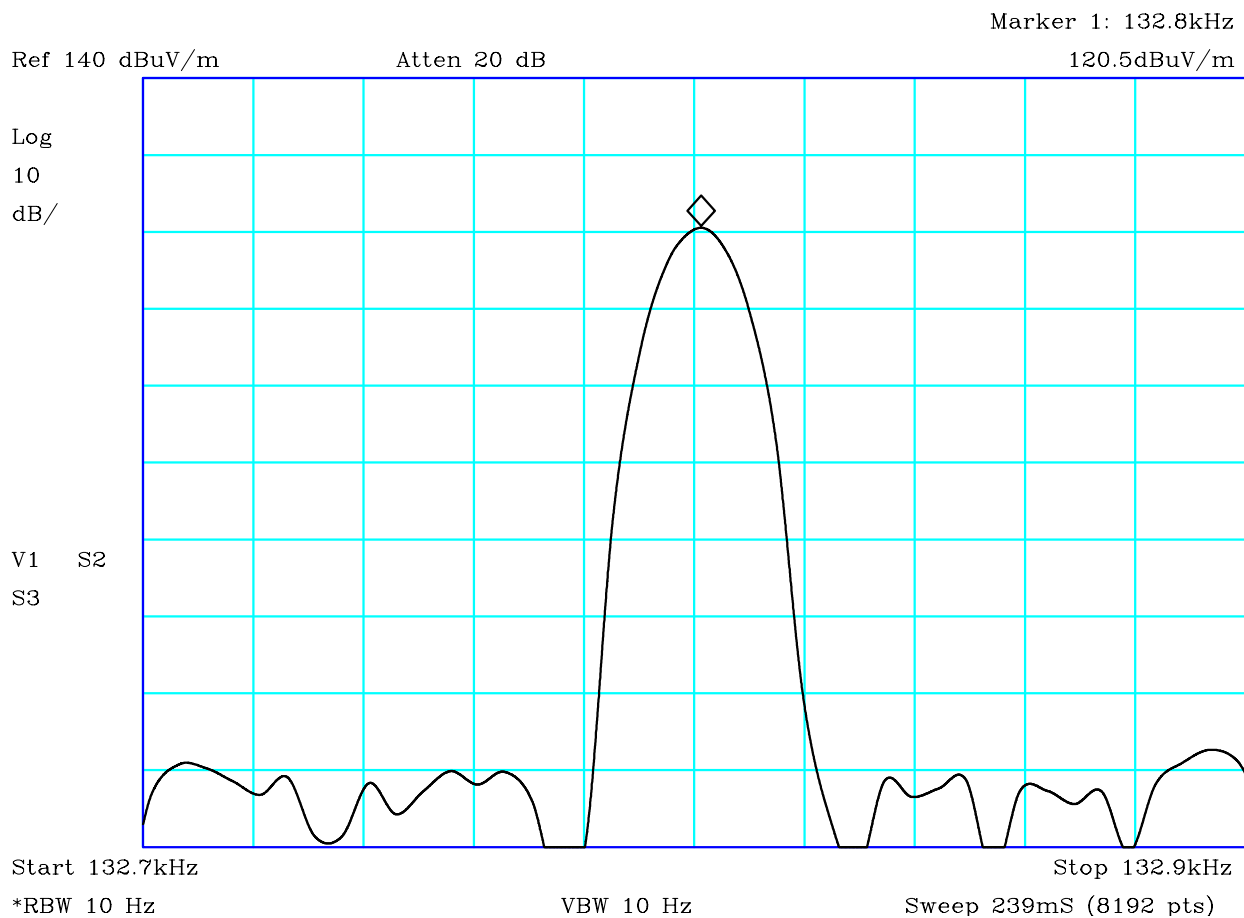


CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_140528

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

	Report No: R3392	FCC ID: XO9-MPF001-001	
	Issue No: 1	IC: 8906A -MPF01001	
Test No: T5476	Test Report		Page: 39 of 40



CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_140528

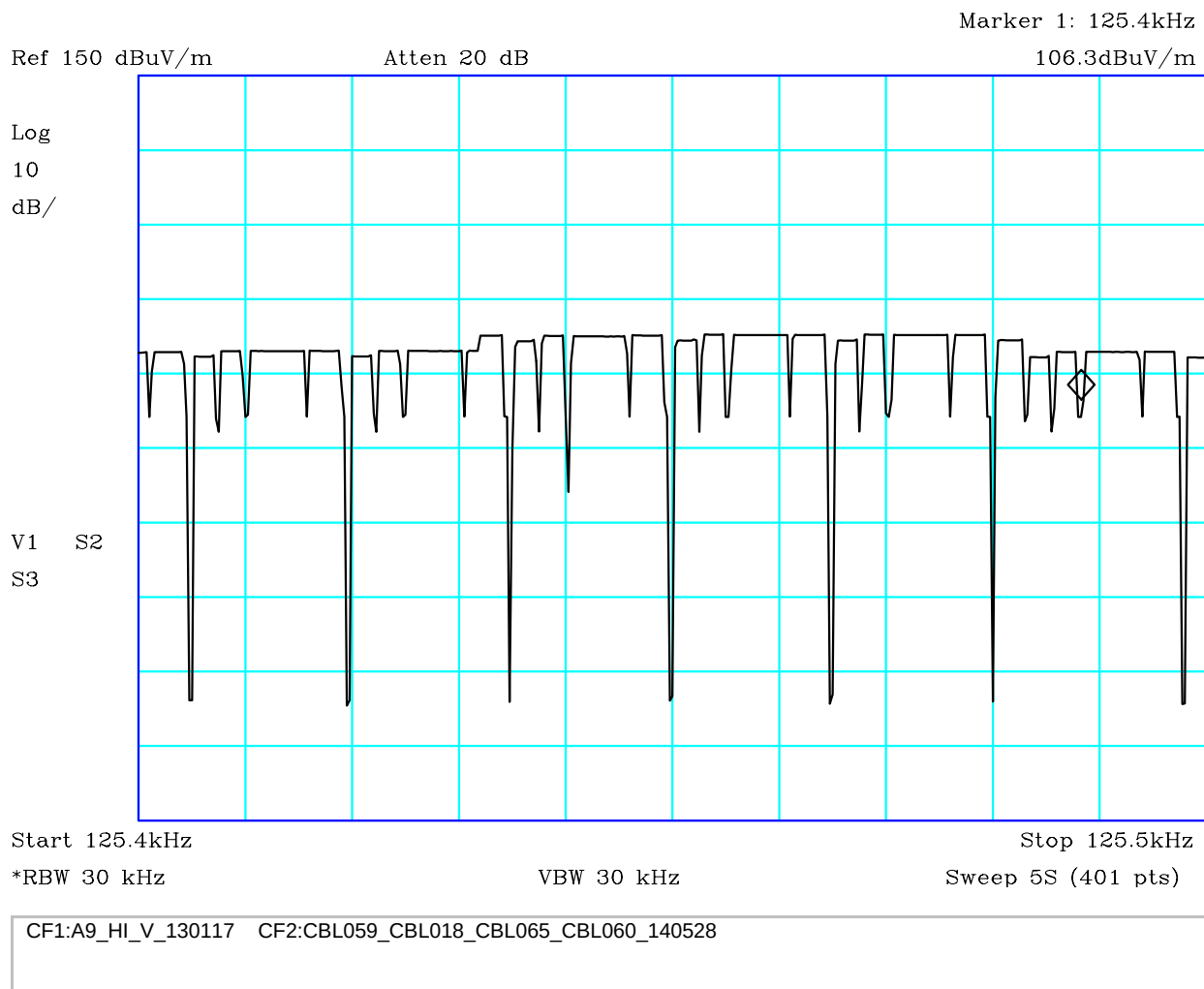
PLOT 21 Radiated Emissions - Bandwidth at 133kHz

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

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



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
		Analysers:	R9