

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
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dB Technology

[----- (Cambridge Ltd.) -----]

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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

DualScan

dated

29th August 2013

Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	29/08/13		Initial release		
2	26/09/13	13, 14, 15	Extrapolation, Modulation, Bandwidth & Detector information added	DB	DS

Based on report template:
v090319

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	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
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Equipment Under Test (EUT): DualScan

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

Representative: Darren Cawthorne

Test Started: 22nd July 2013

Test Completed: 25th July 2013

Test Engineer: Dave Smith

Date of Report: 29th August 2013

Written by: Dave Smith Checked by: Derek Barlow

Signature: 

Date: 29th August 2013 Date: 30th August 2013



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	<i>Code of Federal Regulations: Pt 15 Subpart C - Radio Frequency Devices - Intentional Radiators</i>
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RSS-210 Issue 8	<i>Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment</i>
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Emissions Test Results Summary

CFR 47

Test	Port	Method	Limit	PASS/FAIL	PASS	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

Test	Port	Method	Limit	PASS/FAIL	PASS	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 flap 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.

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 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 2). 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	DualScan	EUT sample set at 126kHz, 120V		
2	Sureflap Ltd	DualScan	EUT sample set at 126kHz, 80V		
3	Sureflap Ltd	DualScan	EUT sample set at 132.8kHz, 120V		
4	Sureflap Ltd	DualScan	EUT sample set at 132.8kHz, 80V		
5	Sureflap Ltd	DualScan	EUT sample continuously cycle through read modes		

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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	

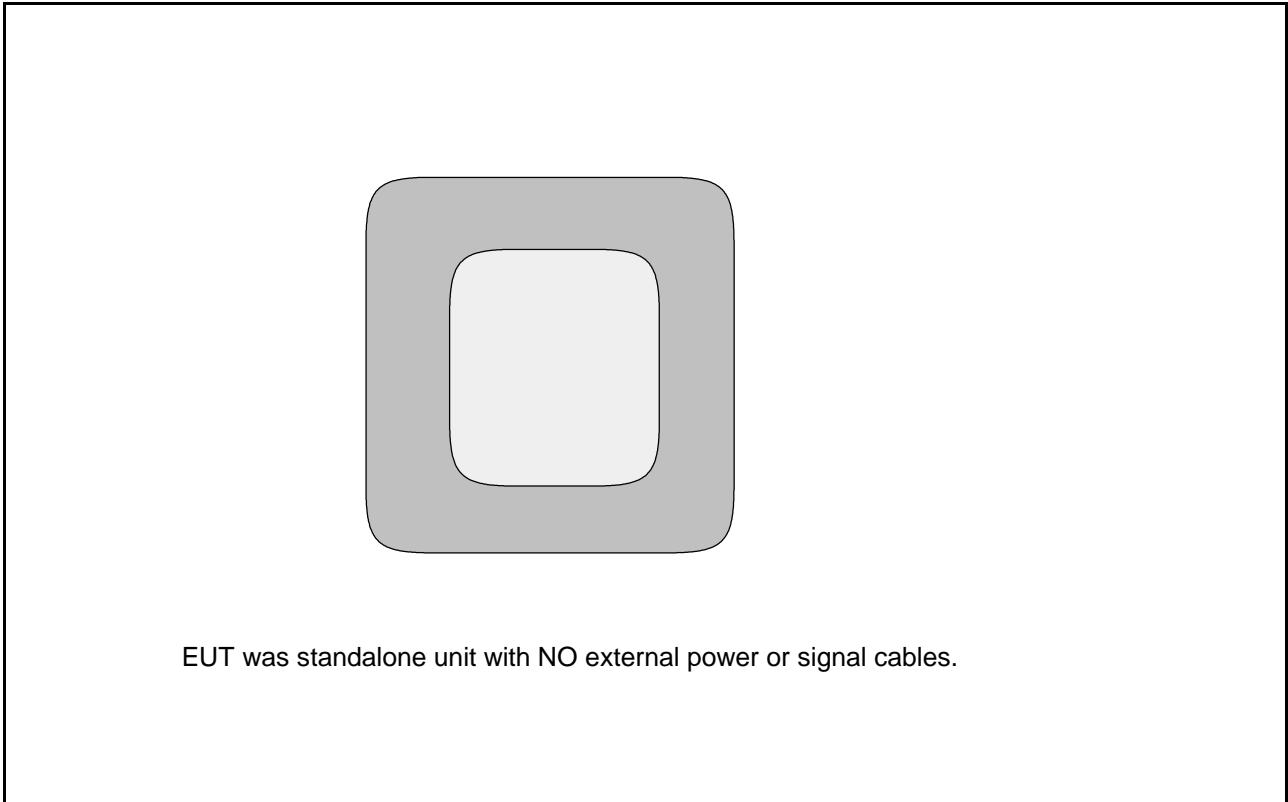
1.3 EUT Operating Modes

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.

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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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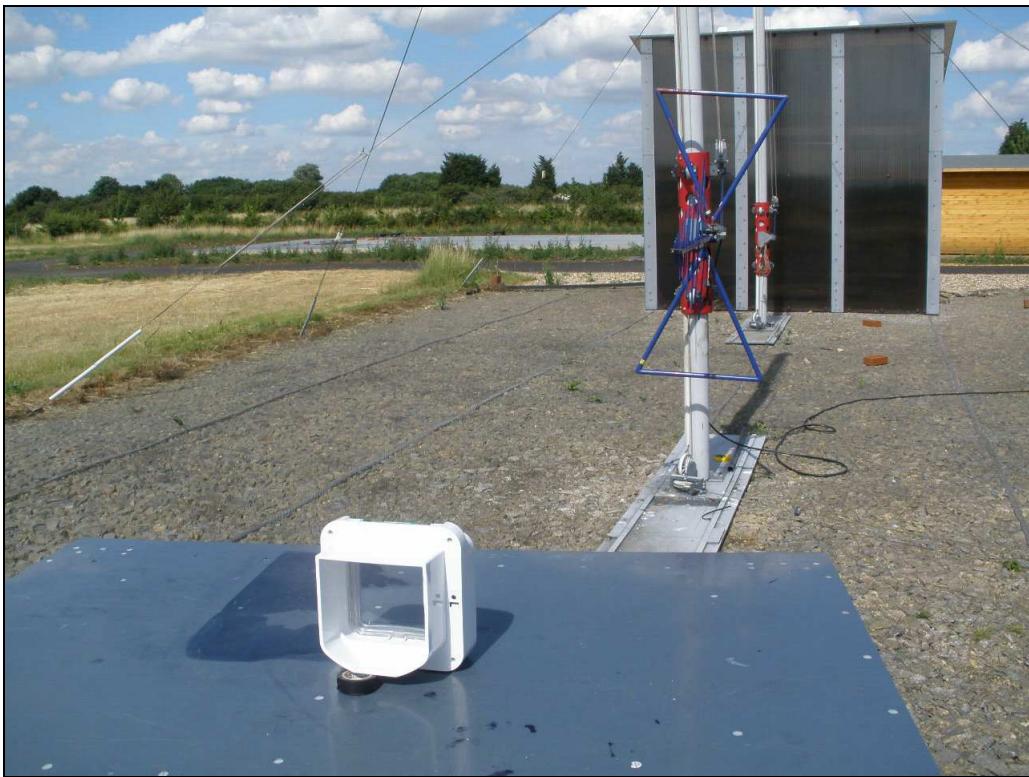


Photograph 3 Radiated Emissions - below 30MHz@ 100m



Photograph 4 Radiated Emissions - above 30MHz

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Photograph 5 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
A12	Chase Bilog CBL6111A	1012	30/01/2013	1 year
A24	Chase X-wing Bilog CBL6144 26MHz-3GHz	27590	30/10/2012	1 year
A9	EMCO 6502 Loop	2139	14/12/2012	1 year
R10	Narda PMM 9010 Receiver (10Hz-30MHz)	595WX11003	30/01/2013	1 year
R4	R&S ESVS10	843744/002	17/12/2012	1 year
R8	Agilent E7405A Spectrum Analyser	MY44212494	24/09/2012	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 to different distances.

The limits for emissions at frequencies below 490kHz are specified at a 300m distance and above 490kHz are specified at 30m. These distances are 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. The field strength calculations are as follows:

For frequencies below 490kHz: Field Strength (uV/m) at 300m = $2400 / f$ (kHz)

For frequencies above 490kHz and below 1.705MHz: Field Strength (uV/m) at 30m = $24000 / f$ (kHz)

Therefore, e.g. for 126kHz, Field Strength = $2400 / 126 = 19.05$ uV/m at 300m

Taking $20 \times \log (19.05)$ we get an equivalent field strength of 25.6 dBuV/m at 300m

Making a 40dB/decade adjustment for distance we have to add $40 \times \log (300m / Dm)$

For a distance of 100m we would therefore add $40 \times \log (300/100) = 19.08$ dB

For a distance of 30m we would add $40 \times \log (300/30) = 40$ dB etc....

The table below shows the limit levels at different distances for the two fundamental frequencies and their lower harmonics, using this 40dB/decade extrapolation :

	Frequency kHz	Reference Distance m	Reference Distance Level uV/m	Reference Distance Level dBuV/m	40dB/dec Level at 100m dBuV/m	40dB/dec Level at 30m dBuV/m	40dB/dec Level at 10m dBuV/m	40dB/dec Level at 3m dBuV/m
fund	126	300	19.05	25.60	44.68	65.60	84.68	105.60
fund	133	300	18.05	25.13	44.21	65.13	84.21	105.13
2nd	252	300	9.52	19.58	38.66	59.58	78.66	99.58
2nd	266	300	9.02	19.11	38.19	59.11	78.19	99.11
3rd	378	300	6.35	16.05	35.14	56.05	75.14	96.05
3rd	399	300	6.02	15.58	34.67	55.58	74.67	95.58
4th	504	30	47.62	33.56		33.56	52.64	73.56
4th	532	30	45.11	33.09		33.09	52.17	73.09
5th	630	30	38.10	31.62		31.62	50.70	71.62
5th	665	30	36.09	31.15		31.15	50.23	71.15
6th	756	30	31.75	30.03		30.03	49.12	70.03
6th	798	30	30.08	29.56		29.56	48.65	69.56

NOTE:

Actual measurements showed that the levels at the fundamental frequencies dropped at a rate of 53.1dB per decade between 10m and 100m. This extrapolation factor was therefore used to extrapolate between the 100m limit and the 10m limit for the fundamental frequencies. The 100m limit was calculated from the 300m limit using the 40dB/decade factor.

The 40dB/decade factor was used for the assessment of all of the harmonic measurements.

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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 28.

For carrier frequency level measurements a linear test receiver was used with a 200Hz bandwidth and a CISPR16 Average detector.

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 3Hz resolution bandwidth was used with a 30Hz 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 and CISPR16 quasi-peak detector were compared with results measured with the 3Hz / 30Hz / Peak Detector spectrum analyser setup. The results are shown below:

Frequency kHz	9kHz BW Quasi-Peak Measurement dBuV/m	3Hz Receiver BW 30Hz Video BW Peak Measurement dBuV/m	Difference in Reading relative to Quasi-peak 9kHz dBuV/m
252	66.65	66.58	-0.07
378	56.79	57.50	0.71
504	48.82	48.86	0.04
630	47.31	46.54	-0.77
756	49.12	48.88	-0.24
266	71.06	71.10	0.04
399	64.29	64.53	0.24
531	56.94	56.94	0.00
664	52.04	52.10	0.06
797	49.62	49.51	-0.11

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 3Hz bandwidth all showed a margin of >= 6.8dB, therefore any errors in measurement due to bandwidth and detector settings are insignificant in comparison with the margin displayed and the result shows a valid pass.

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4.3 Radiated Emissions Results - Carrier

Factor Set 1: A9_HI_V_13A CBL015_11A --

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R10 A9

Radiated Emissions

Company: Sureflap Ltd Product: DualScan Date: 22/07/2013 Test Eng: Dave Smith 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
					120V systems									
10	1	0	100	1	0.133	F	27.8	9.5		37.3	44.2	6.9		av
10	1	0	100	1	0.133	E	23.5	9.5		33.0	44.2	11.2		av
7	1	0	100	1	0.126	F	29.8	9.5		39.3	44.7	5.4		av
7	1	0	100	1	0.126	E	24.9	9.5		34.4	44.7	10.3		av
10	1	0	10	1	0.133	F	81.4	9.5		90.9	97.3	6.4		av
10	1	0	10	1	0.133	E	77.6	9.5		87.1	97.3	10.2		av
7	1	0	10	1	0.126	F	82.9	9.5		92.4	97.8	5.4		av
7	1	0	10	1	0.126	E	78.6	9.5		88.1	97.8	9.6		av
Results Minimum Margin PASS/FAIL								5.4	dB					
Notes	Comments and Observations													
	<p>The limit is specified at a distance of 300m. Initially measurements were made at 10m and a default extrapolation figure of 40dB/decade was applied. Under these conditions the units did not comply with the extrapolated limits, but the actual decay with distance was measured at 53.1dB/decade between 10m and 100m. The measurements made at 100m are shown above, with the limit at this distance adjusted using the 40dB/decade extrapolation. Results are also shown at 10m, using a limit adjusted by the 53.1dB factor as measured.</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.</p> <p>The magnetic field scans are shown in plots 1 to 15.</p>													
Key:	qp - quasi-peak, av - average, pk - peak F = loop face on to EUT, E = edge on													

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4.4 Radiated Emissions Results - Spurious <30MHz - 80V Units

Factor Set 1: A9_HI_V_13A CBL015_11A - -

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R8 A9

Radiated Emissions

Company: Sureflap Ltd								Product: DualScan							
Date: 22/07/2013				Test Eng: Dave Smith											
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		
5	1	0	10	1	0.266	F	46.2	9.5		55.7	78.2	22.5			
5	1	0	10	1	0.266	E	40.9	9.5		50.4	78.2	27.8			
5	1	0	10	1	0.399	F	42.4	9.5		51.9	74.7	22.7			
5	1	0	10	1	0.399	E	37.4	9.5		46.9	74.7	27.8			
5	1	0	10	1	0.531	F	35.9	9.5		45.4	52.2	6.8			
5	1	0	10	1	0.531	E	30.4	9.5		39.9	52.2	12.3			
5	1	0	10	1	0.664	F	22.0	9.5		31.5	50.2	18.8			
5	1	0	10	1	0.664	E	17.5	9.5		27.0	50.2	23.3			
5	1	0	10	1	0.797	F	28.7	9.5		38.2	48.7	10.4			
5	1	0	10	1	0.797	E	20.5	9.5		30.0	48.7	18.6			
2	1	0	10	1	0.252	F	39.8	9.4		49.3	78.7	29.4			
2	1	0	10	1	0.252	E	39.9	9.4		49.3	78.7	29.4			
2	1	0	10	1	0.378	F	38.3	9.3		47.6	75.1	27.5			
2	1	0	10	1	0.378	E	33.9	9.3		43.3	75.1	31.9			
2	1	0	10	1	0.504	F	34.0	9.5		43.5	52.6	9.1			
2	1	0	10	1	0.504	E	29.3	9.5		38.8	52.6	13.9			
2	1	0	3	1	0.630	F	54.2	9.5		63.6	71.6	8.0	#1		
2	1	0	10	1	0.630	E	21.5	9.5		31.0	50.7	19.7			
2	1	0	10	1	0.756	F	25.4	9.5		34.9	49.1	14.2			
2	1	0	10	1	0.756	E	21.7	9.5		31.2	49.1	17.9			
Results								Minimum Margin PASS/FAIL			6.8 dB				
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.													
#1		Measured at 3m because of high ambient.													

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4.5 Radiated Emissions Results - Spurious <30MHz - 120V Units

Factor Set 1: A9_HI_V_13A CBL015_11A --

Factor Set 2: - - -

Factor Set 3: - - -

Test Equipment: R8 A9

Radiated Emissions

Company: Sureflap Ltd								Product: DualScan										
Date: 22/07/2013				Test Eng: Dave Smith														
Ports:								Test:										
Ports: enclosure								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	39.1	9.4		48.5	78.7	30.1						
8	1	0	10	1	0.252	E	34.8	9.4		44.2	78.7	34.5						
8	1	0	10	1	0.378	F	32.5	9.3		41.8	75.1	33.4						
8	1	0	10	1	0.378	E	28.9	9.3		38.2	75.1	36.9						
8	1	0	10	1	0.504	F	26.2	9.5		35.7	52.6	17.0						
8	1	0	10	1	0.504	E	21.1	9.5		30.6	52.6	22.1						
8	1	0	3	1	0.630	F	50.9	9.5		60.4	71.6	11.3	#1					
8	1	0	10	1	0.630	E	26.5	9.5		36.0	50.7	14.7						
8	1	0	10	1	0.756	F	24.8	9.5		34.3	49.1	14.8						
8	1	0	10	1	0.756	E	20.7	9.5		30.2	49.1	18.9						
11	1	0	10	1	0.266	F	45.0	9.5		54.5	78.2	23.7						
11	1	0	10	1	0.266	E	39.9	9.5		49.4	78.2	28.8						
11	1	0	10	1	0.399	F	38.9	9.5		48.4	74.7	26.2						
11	1	0	10	1	0.399	E	33.8	9.5		43.3	74.7	31.4						
11	1	0	10	1	0.531	F	31.7	9.5		41.2	52.2	11.0						
11	1	0	10	1	0.531	E	26.6	9.5		36.1	52.2	16.1						
11	1	0	10	1	0.664	F	26.6	9.5		36.0	50.2	14.2						
11	1	0	10	1	0.664	E	22.2	9.5		31.7	50.2	18.5						
11	1	0	10	1	0.797	F	31.2	9.5		40.7	48.7	7.9						
11	1	0	10	1	0.797	E	21.4	9.5		30.9	48.7	17.8						
Results								Minimum Margin PASS/FAIL				7.9 dB						
Notes		Comments and Observations																
#1		<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/m.</p> <p>All measurements made with peak detector.</p> <p>Measured at 3m because of high ambient.</p>																

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 18 of 46

4.6 Radiated Emissions Results - Spurious Above 30MHz

Factor Set 1: A12_FS_13B CBL015_11A --

Factor Set 2: - - -

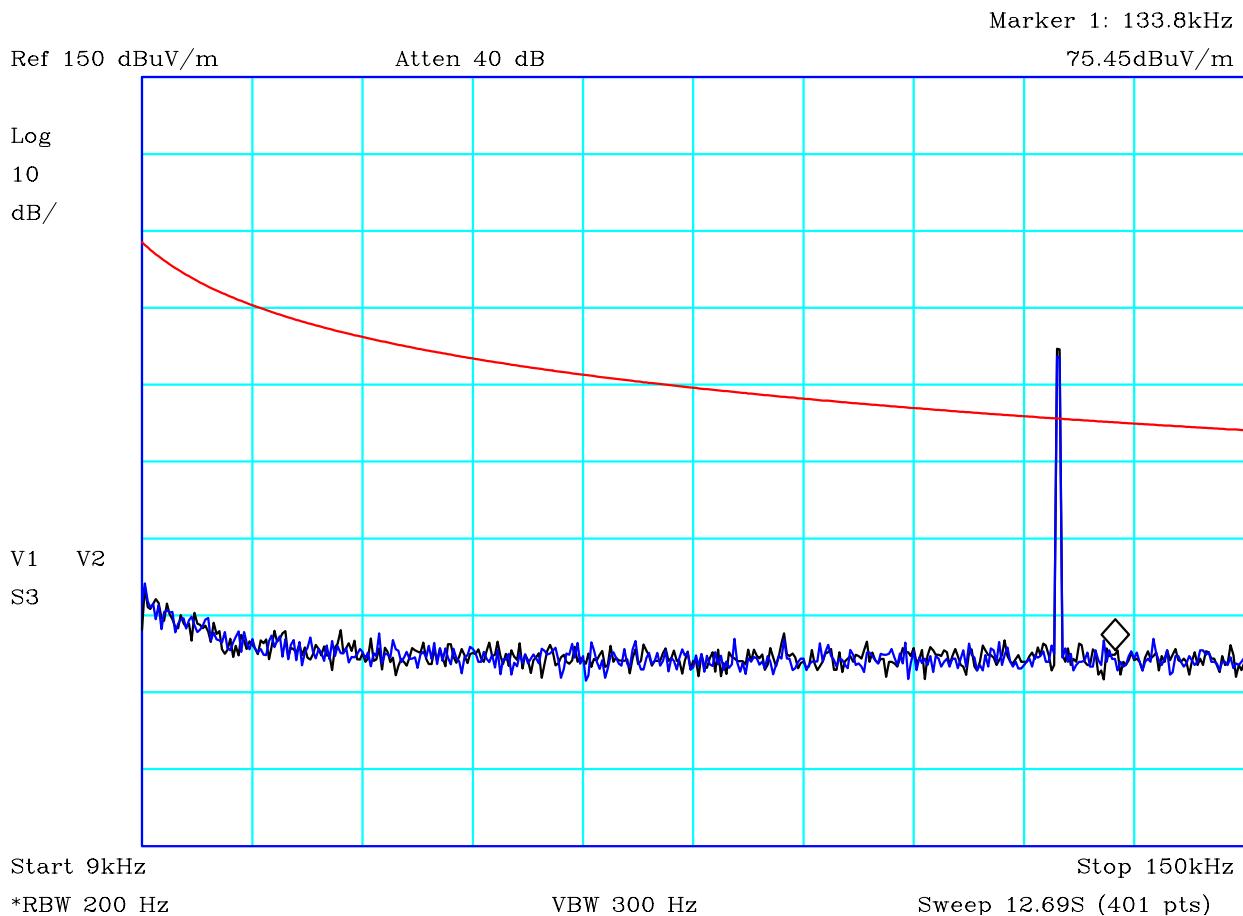
Factor Set 3: - - -

Test Equipment: R4 A12

Radiated Emissions

Company: Sureflap Ltd							Product: DualScan													
Date: 24/07/2013							Test Eng: Dave Smith													
<i>Ports:</i>																				
Test: ANSI C63.4:2003 using limits of							15.209 =FCC B													
<i>Ports:</i> 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							
24	1	0	3	1	117.970	V	0.6	13.0		13.6	43.5	29.9	qp							
24	1	0	3	1	117.970	H	4.3	13.0		17.3	43.5	26.2	qp							
24	1	0	3	1	137.631	V	0.2	13.0		13.2	43.5	30.3	qp							
24	1	0	3	1	137.631	H	2.2	13.0		15.2	43.5	28.3	qp							
24	1	0	3	1	157.295	V	0.2	12.1		12.3	43.5	31.2	qp							
24	1	0	3	1	157.295	H	5.7	12.1		17.8	43.5	25.7	qp							
Results							Minimum Margin PASS/FAIL													
							25.7 dB PASS													
Notes	Comments and Observations																			
	Results of scans shown in plots 16 to 25. Emissions above were made on the sample which cycled through all modes - which gave higher emissions during prescans.																			
Key:	qp - quasi-peak, av - average, pk - peak																			

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 19 of 46

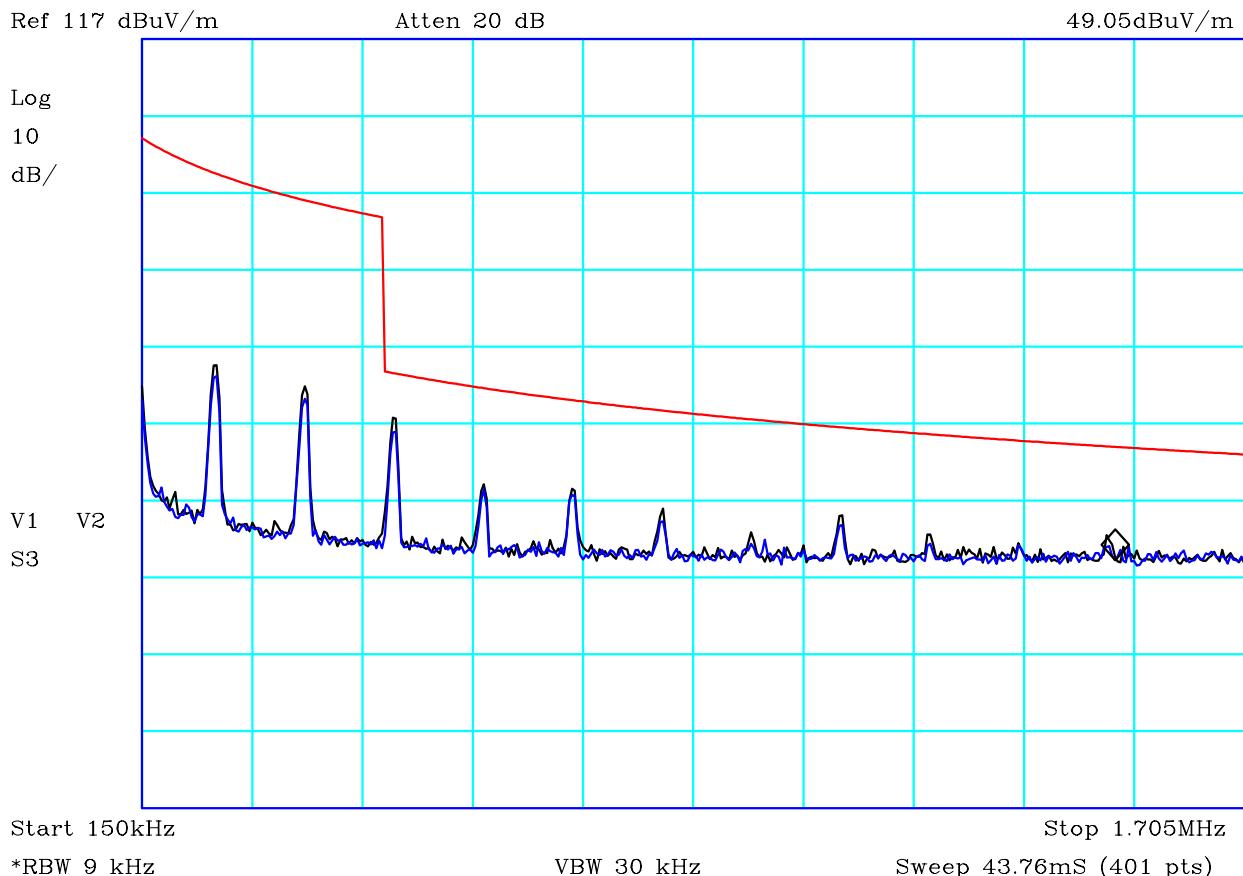


PLOT 1 Radiated Emissions - LF - 80V - 9kHz to 150kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on Blue: perpendicular 126kHz 80V Every 90 degs The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36255C3
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 20 of 46

Marker 1: 1.526MHz



CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 2 Radiated Emissions - LF - 80V - 150kHz to 1.705MHz

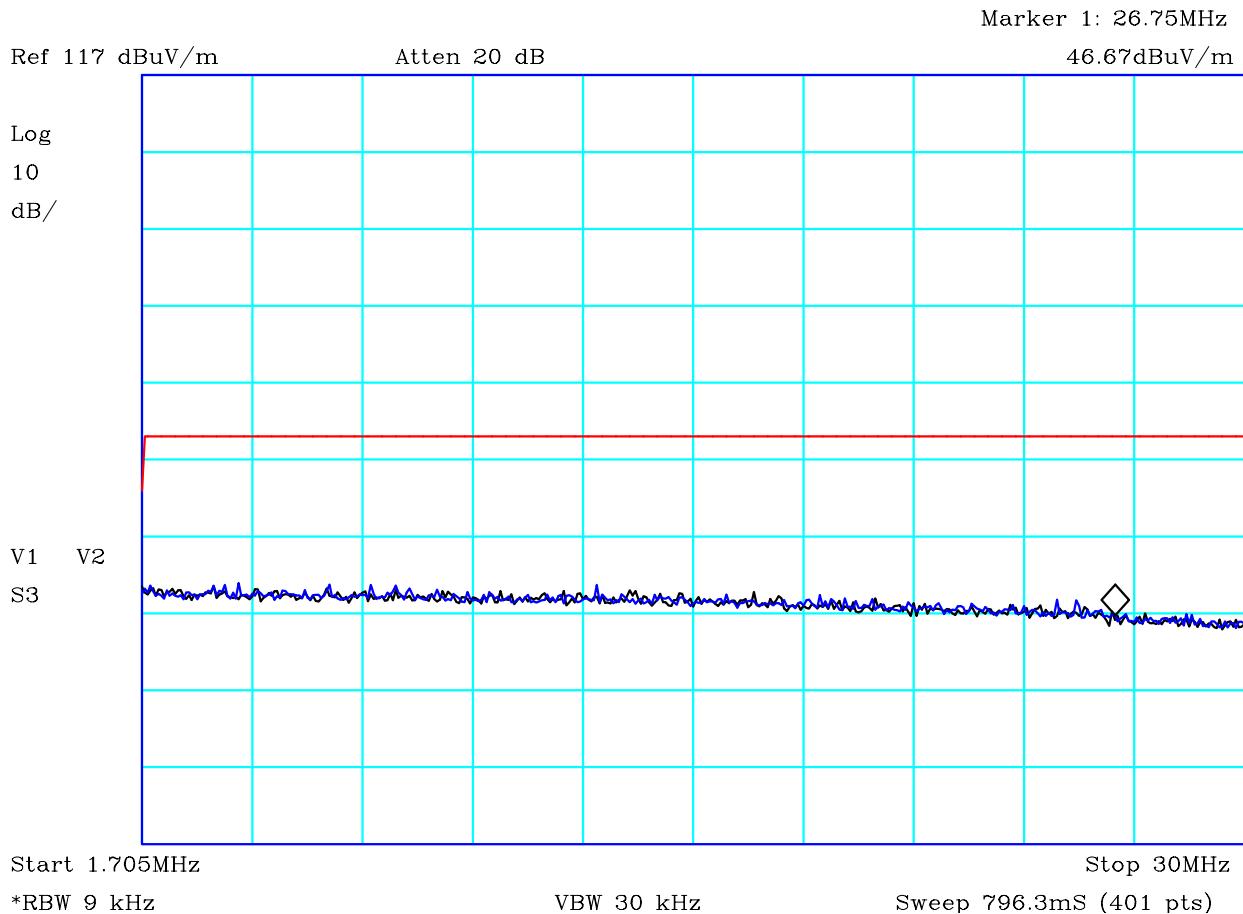
Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	

Black: face on Blue: perpendicular
126kHz 80V

The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.

Facility:	Anech_2	Height	1m	Mode:	1
Distance	3m	Polarisation		Modification State:	0
Angle	0-360	File:	H3625600	Analyser:	R8

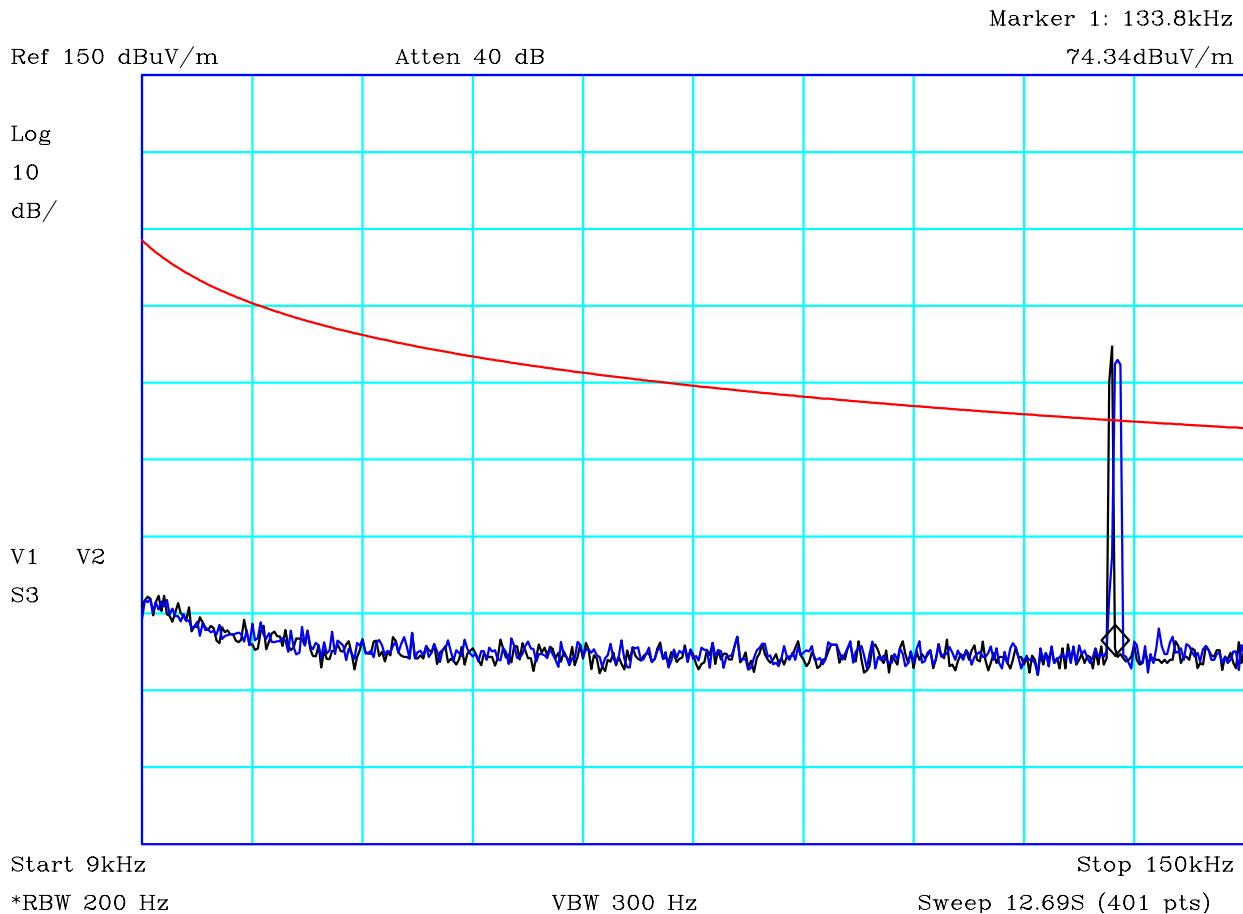
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 21 of 46



PLOT 3 Radiated Emissions - LF - 80V - 1.705MHz to 30MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on Blue: perpendicular 126kHz 80V The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H3625604
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 22 of 46

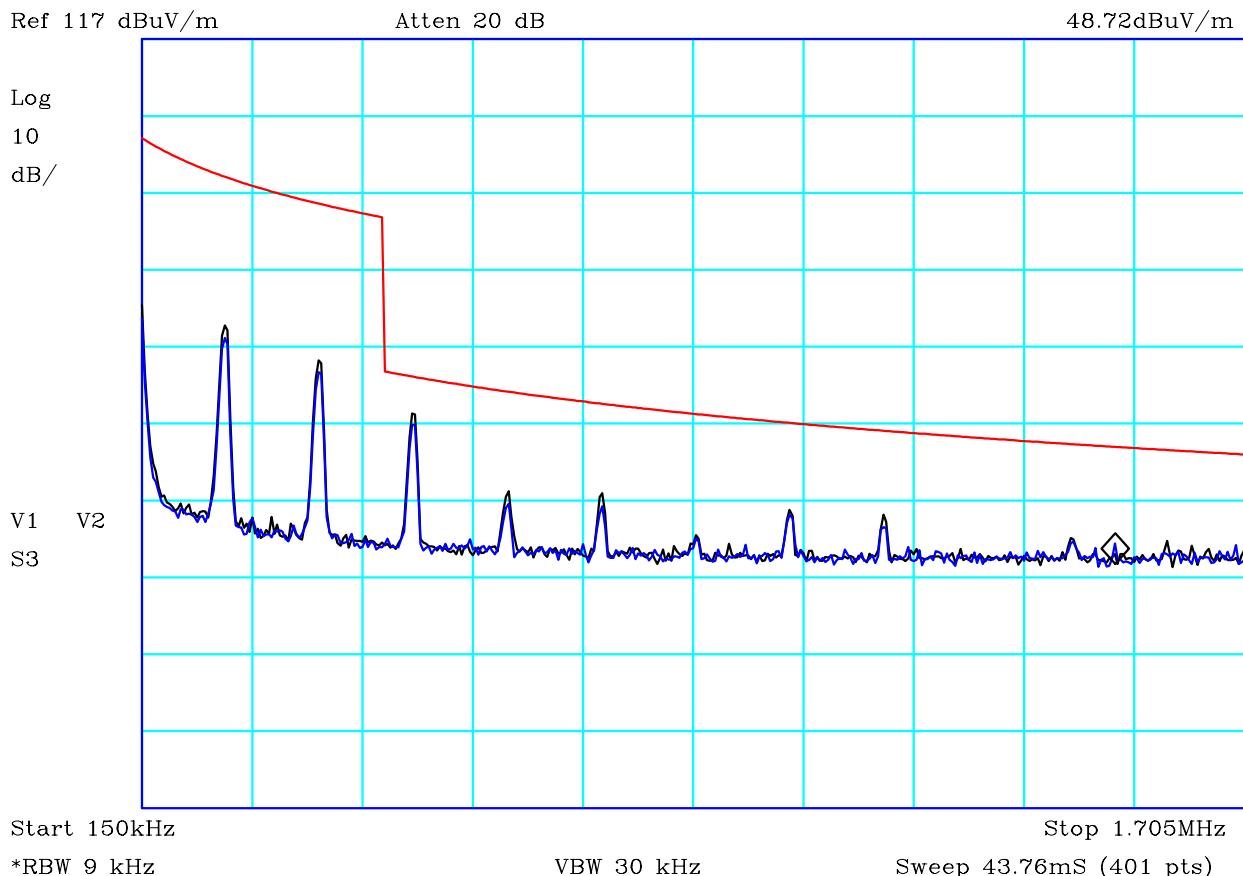


PLOT 4 Radiated Emissions - HF - 80V - 9kHz to 150kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on Blue: perpendicular 133kHz 80V Every 90 degs The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36255CF
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 23 of 46

Marker 1: 1.526MHz



CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 5 Radiated Emissions - HF - 80V - 150kHz to 1.705MHz

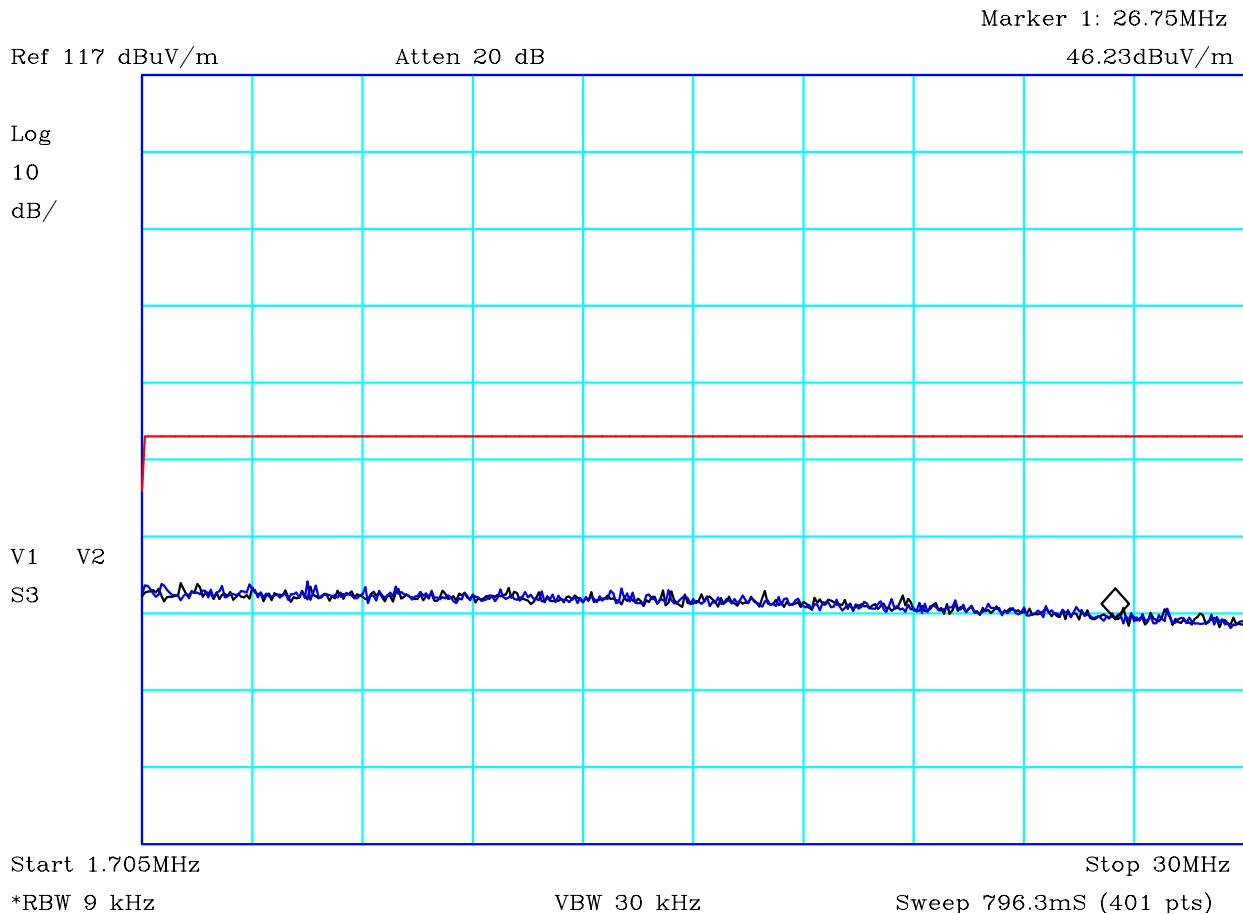
Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	

Black: face on Blue: perpendicular
133kHz 80V

The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.

Facility:	Anech_2	Height	1m	Mode:	1
Distance	3m	Polarisation		Modification State:	0
Angle	0-360	File:	H36255FA	Analyser:	R8

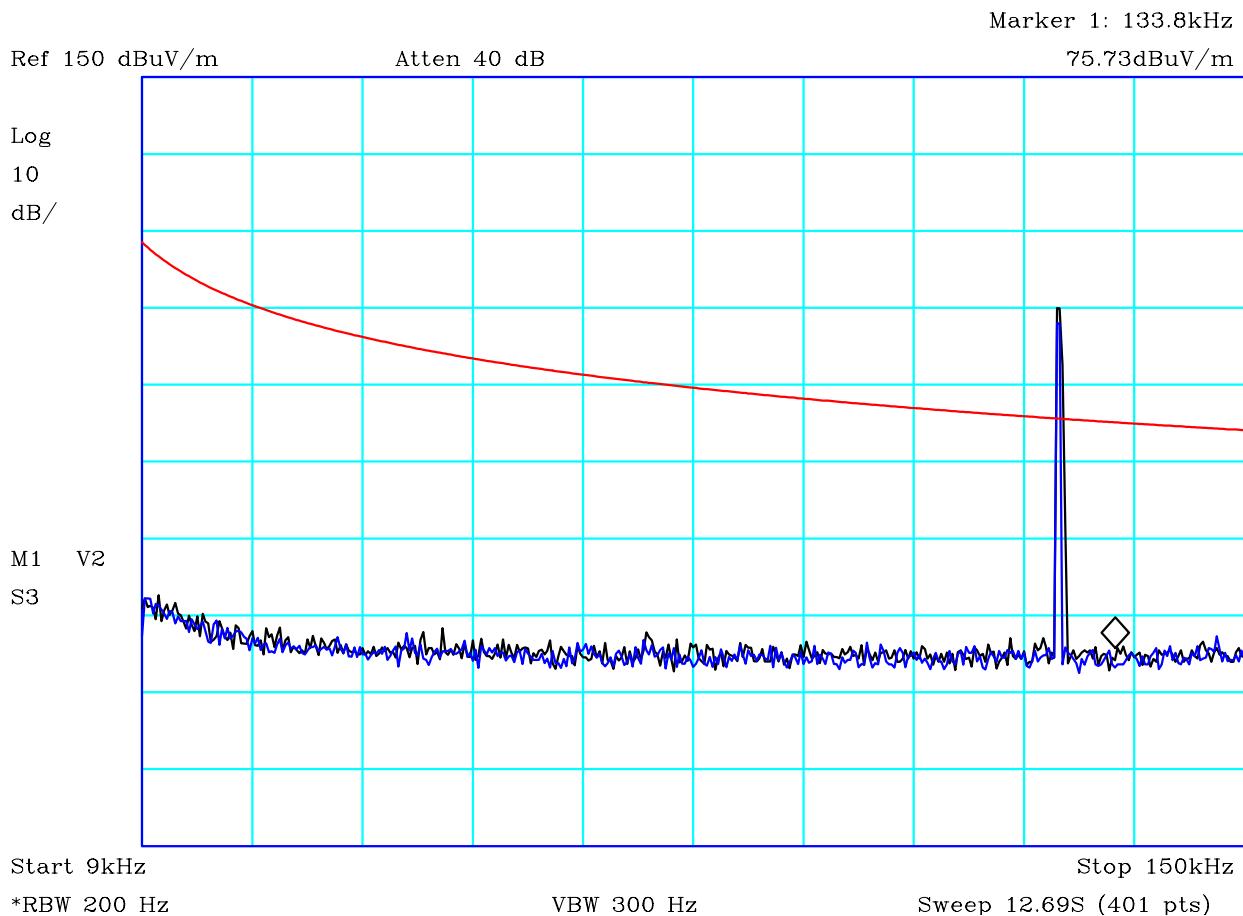
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 24 of 46



PLOT 6 Radiated Emissions - HF - 80V - 1.705MHz to 30MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on Blue: perpendicular 133kHz 80V The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36255F5
		Analyser:	R8

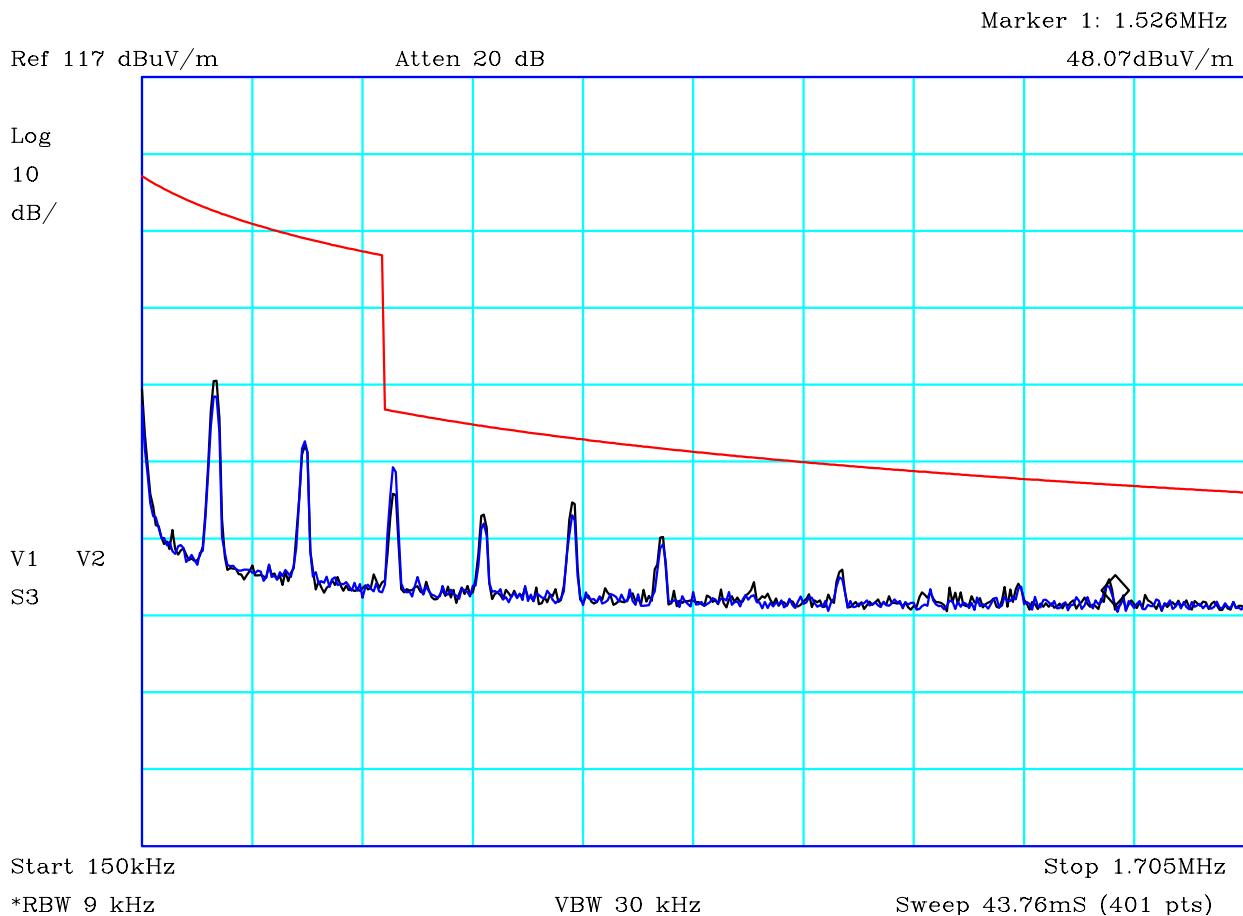
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 25 of 46



PLOT 7 Radiated Emissions - LF - 120V - 9kHz to 150kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on! Blue: perpendicular 126kHz 120V. The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State:
Angle	0-360	File:	H3622545
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 26 of 46

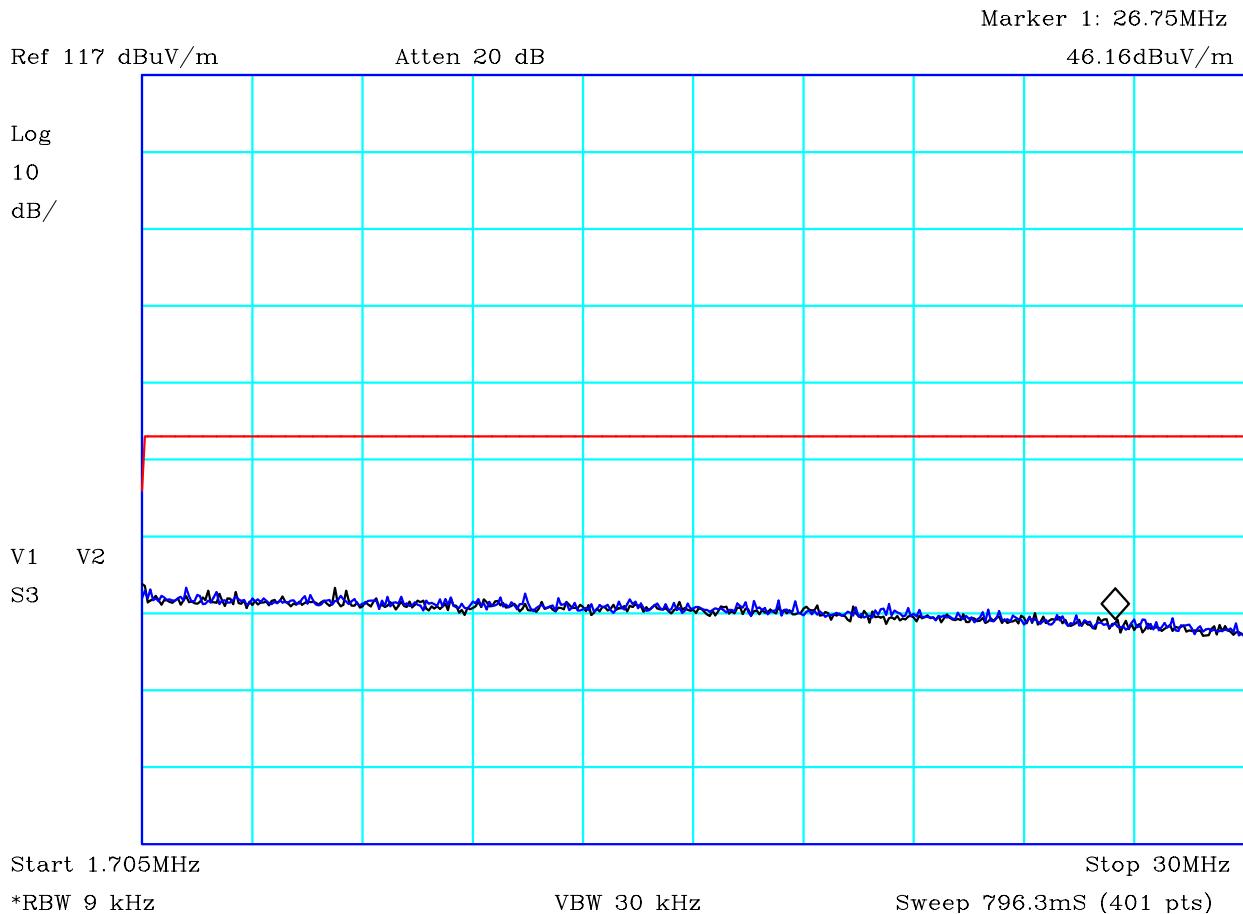


CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 8 Radiated Emissions - LF - 120V - 150kHz to 1.705MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on! Blue: perpendicular 126kHz 120V. The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H3622525
		Analyser:	R8

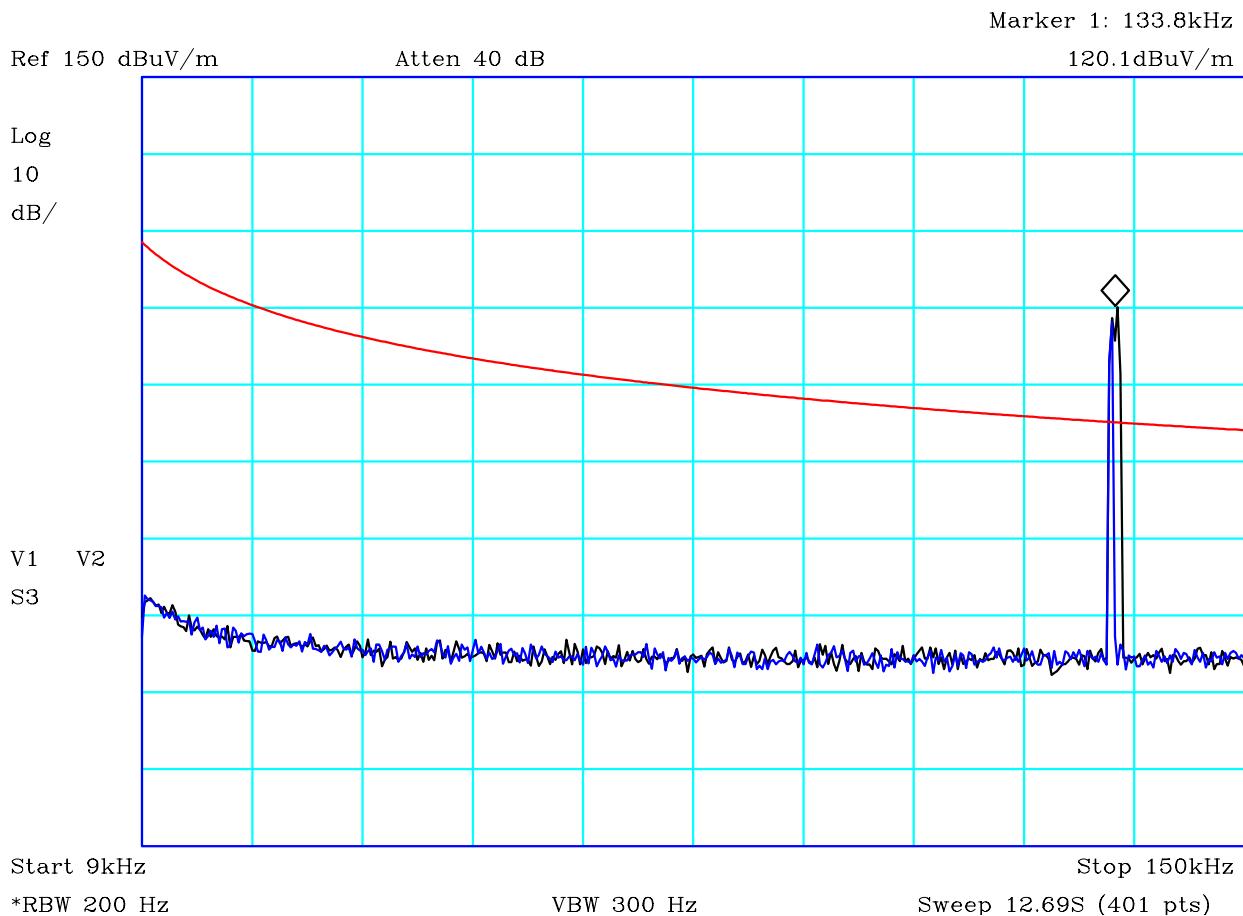
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 27 of 46



PLOT 9 Radiated Emissions - LF - 120V - 1.705MHz to 30MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on! Blue: perpendicular 126kHz 120V. The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H362252C
		Analyser:	R8

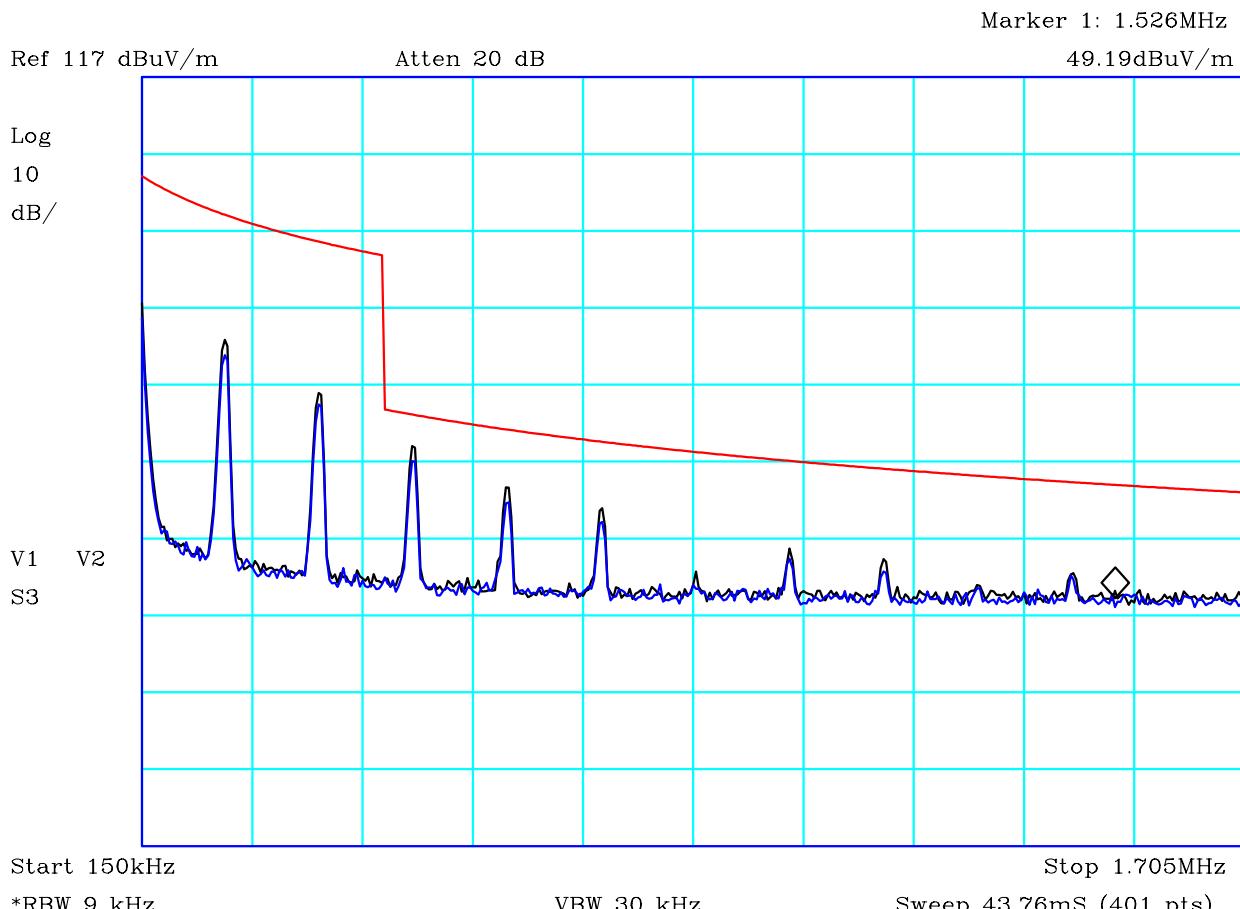
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 28 of 46



PLOT 10 Radiated Emissions - HF - 120V - 9kHz to 150kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face onl Blue: perpendicular 133kHz 120V.			
Measured at 45deg steps The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m,
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H3622505
		Analyser:	R8

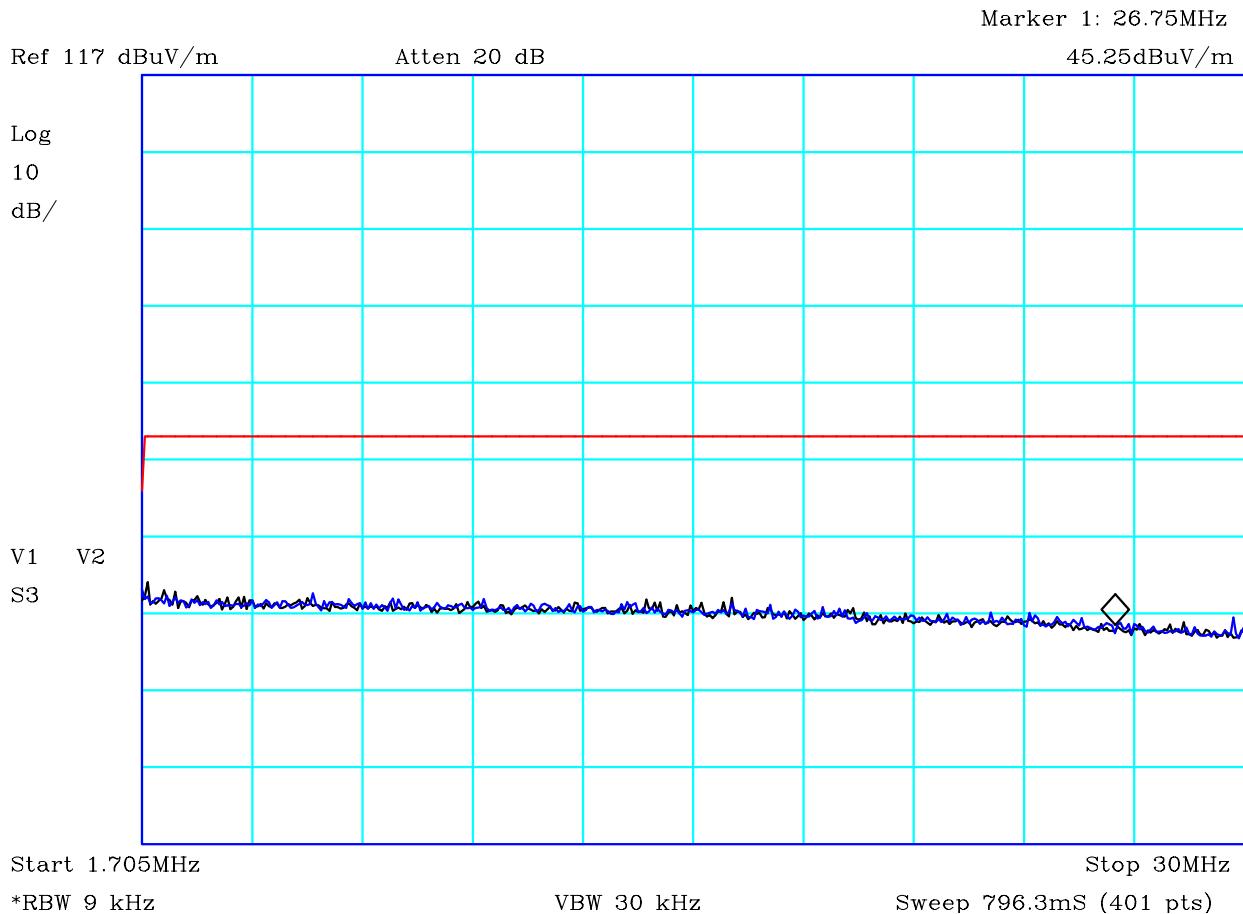
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 29 of 46



PLOT 11 Radiated Emissions - HF - 120V - 150kHz to 1.705MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on! Blue: perpendicular 133kHz 120V. The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H3622512
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 30 of 46



CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 12 Radiated Emissions - HF - 120V - 1.705MHz to 30MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	

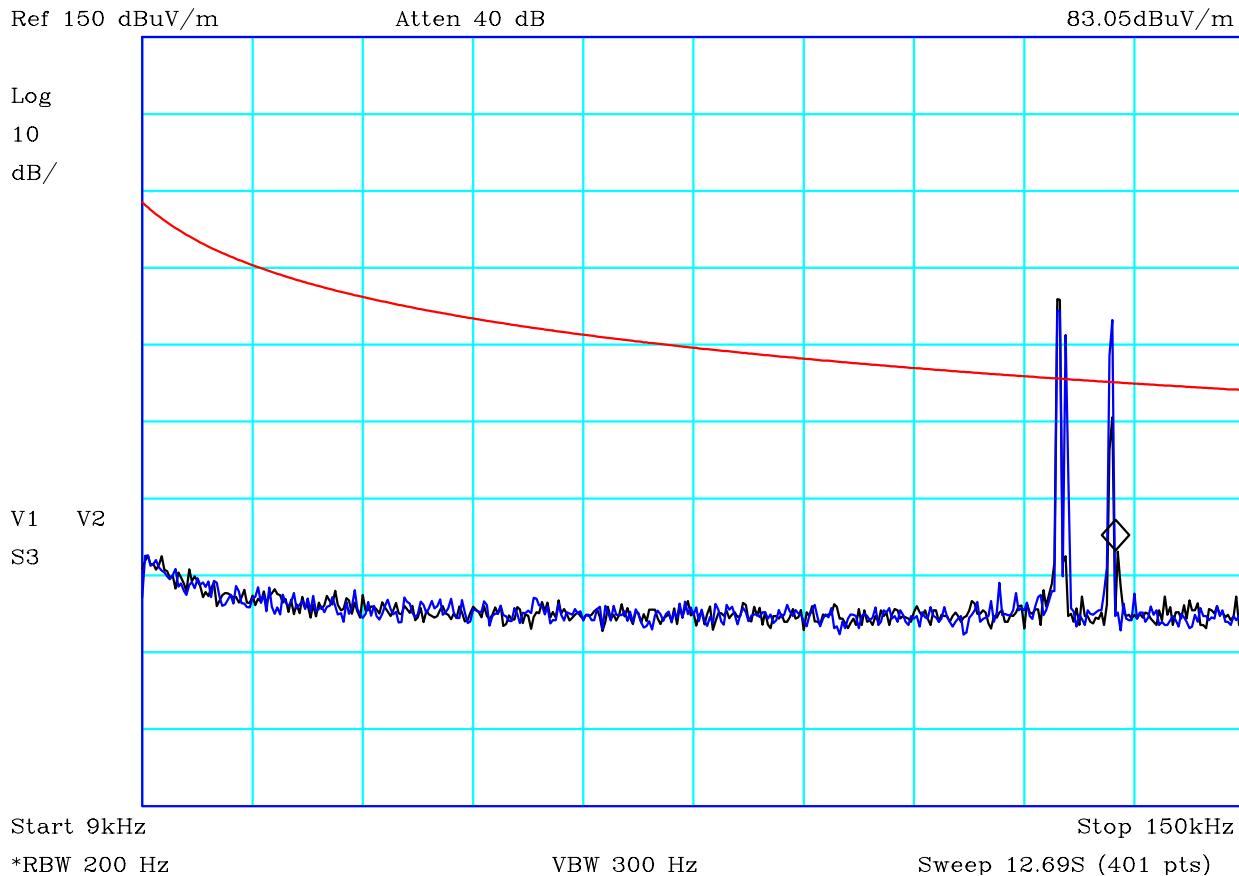
Black: face on! Blue: perpendicular
Sample A: 133kHz 120V.

The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.

Facility:	Anech_2	Height	1m	Mode:	1
Distance	3m	Polarisation		Modification State:	0
Angle	0-360	File:	H362251B	Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 31 of 46

Marker 1: 133.8kHz

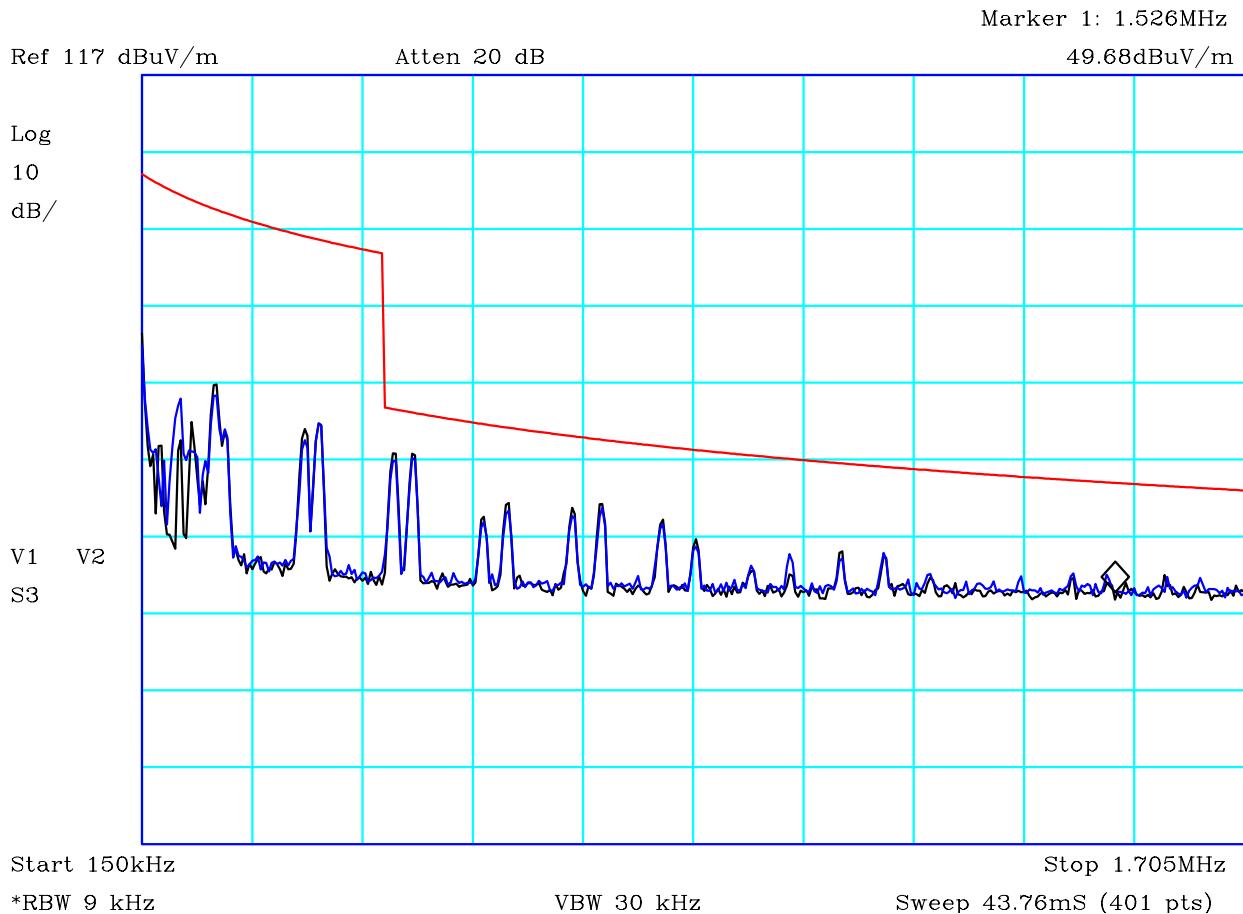


CF1:A9_HI_V_130117 CF2:CBL059_CBL018_CBL065_CBL060_100806

PLOT 13 Radiated Emissions - Cycling all modes - 9kHz to 150kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
Black: face on Blue: perpendicular			
Cycling all modes			
The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State:
Angle	0-360	File:	H36255DC
		Analyser:	R8

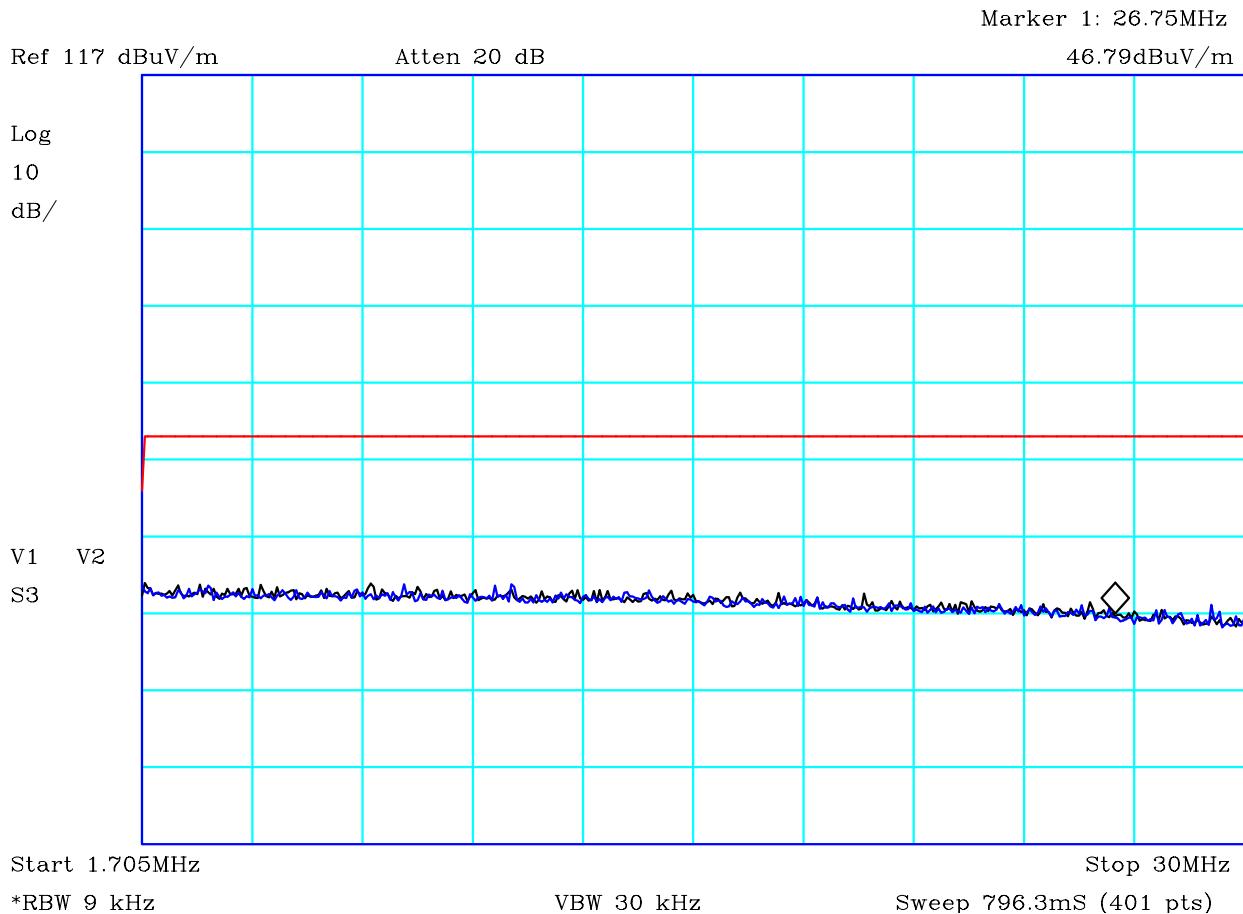
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 32 of 46



PLOT 14 Radiated Emissions - Cycling all modes - 150kHz to 1.705MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
<p>Black: face on Blue: perpendicular Cycling all modes The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.</p>			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36255E9
		Analyser:	R8

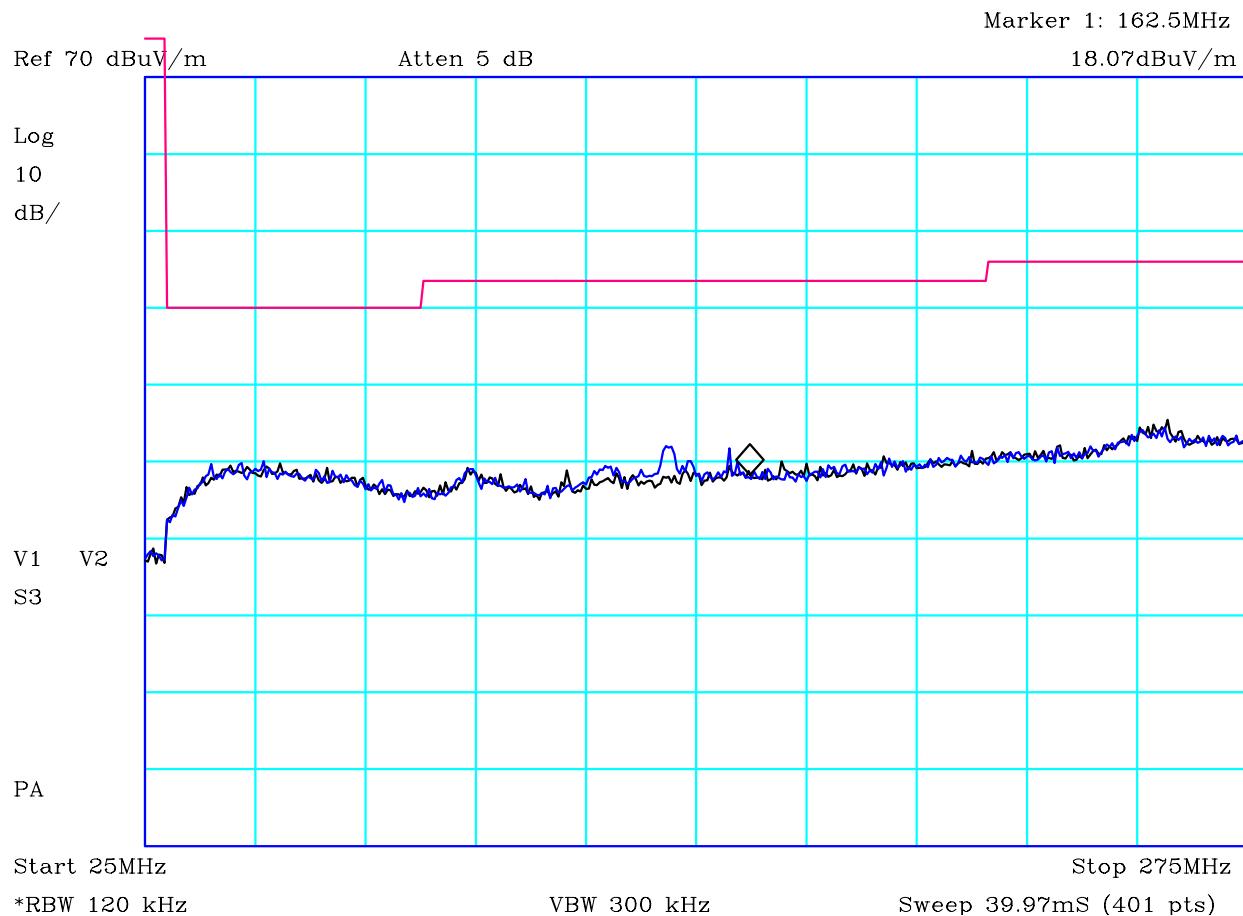
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
Test No: T5083		Test Report	Page: 33 of 46



PLOT 15 Radiated Emissions - Cycling all modes - 1.705MHz to 30MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	25/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(RED)	FCC_subpartC_@3m_40dB/dec	Limit2:	
Limit3:		Limit4:	
<p>Black: face on Blue: perpendicular</p> <p>Cycling all modes</p> <p>The red limit is the FCC part 15.209 limit extrapolated to 3m using a default 40dB per decade. In practice, an extrapolation of closer to 60dB per decade could be expected which would significantly increase the margins.</p>			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36255EF
		Analyser:	R8

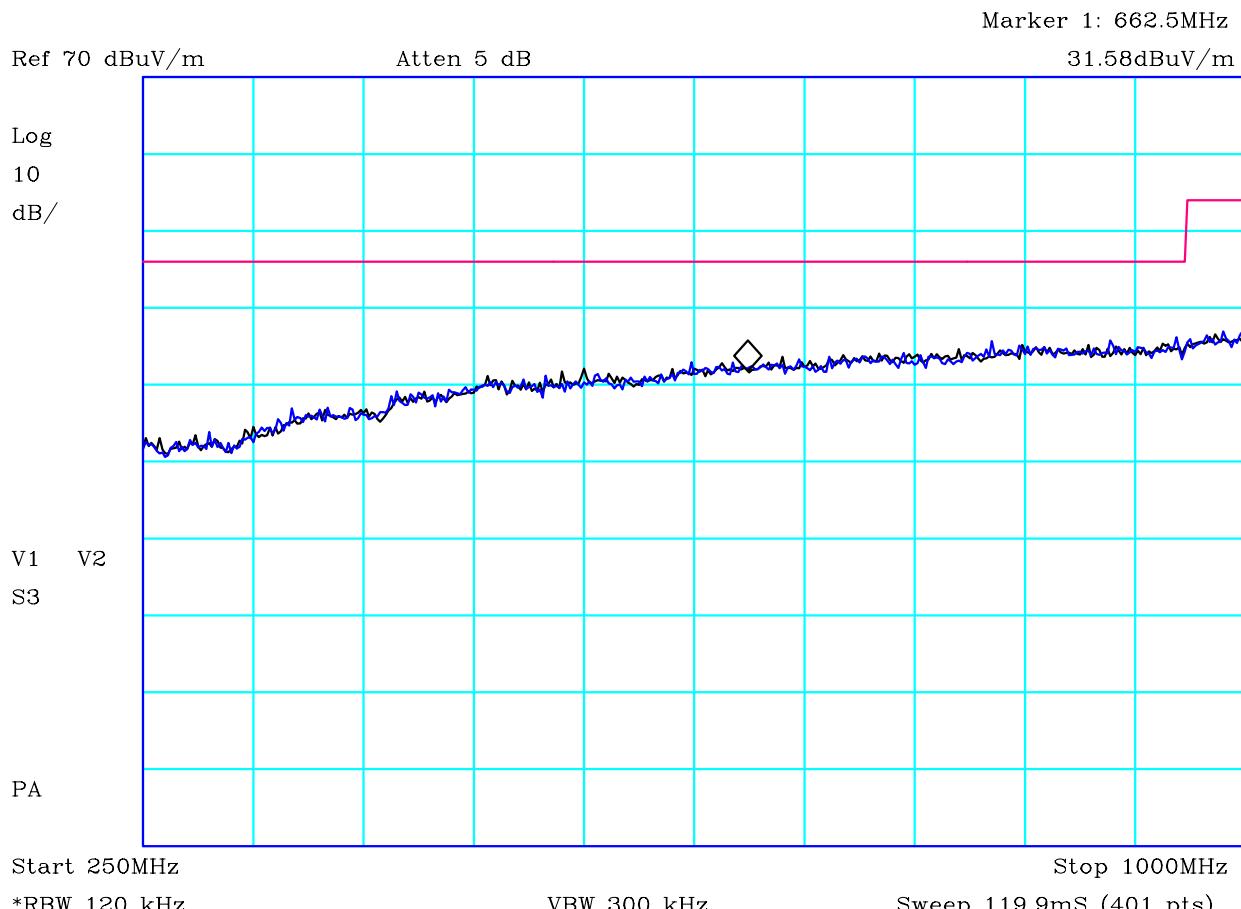
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 34 of 46



PLOT 16 Radiated Emissions - LF - 80V - 25MHz to 275MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 126kHz 80V.			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H362547F.txt
		Analyser:	R8

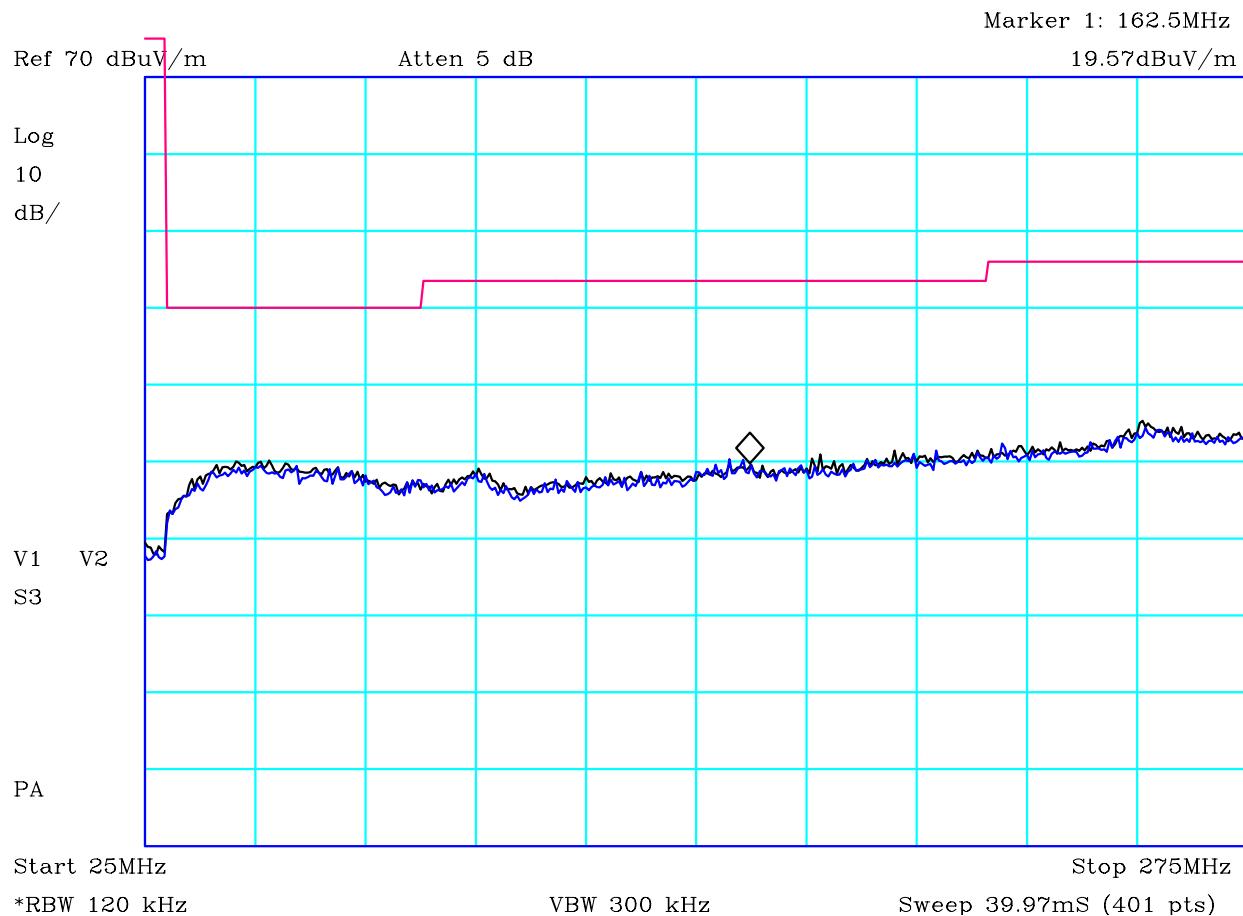
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 35 of 46



PLOT 17 Radiated Emissions - LF - 80V - 250MHz to 1GHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 126kHz 80V.			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H3625483.txt
		Analyser:	R8

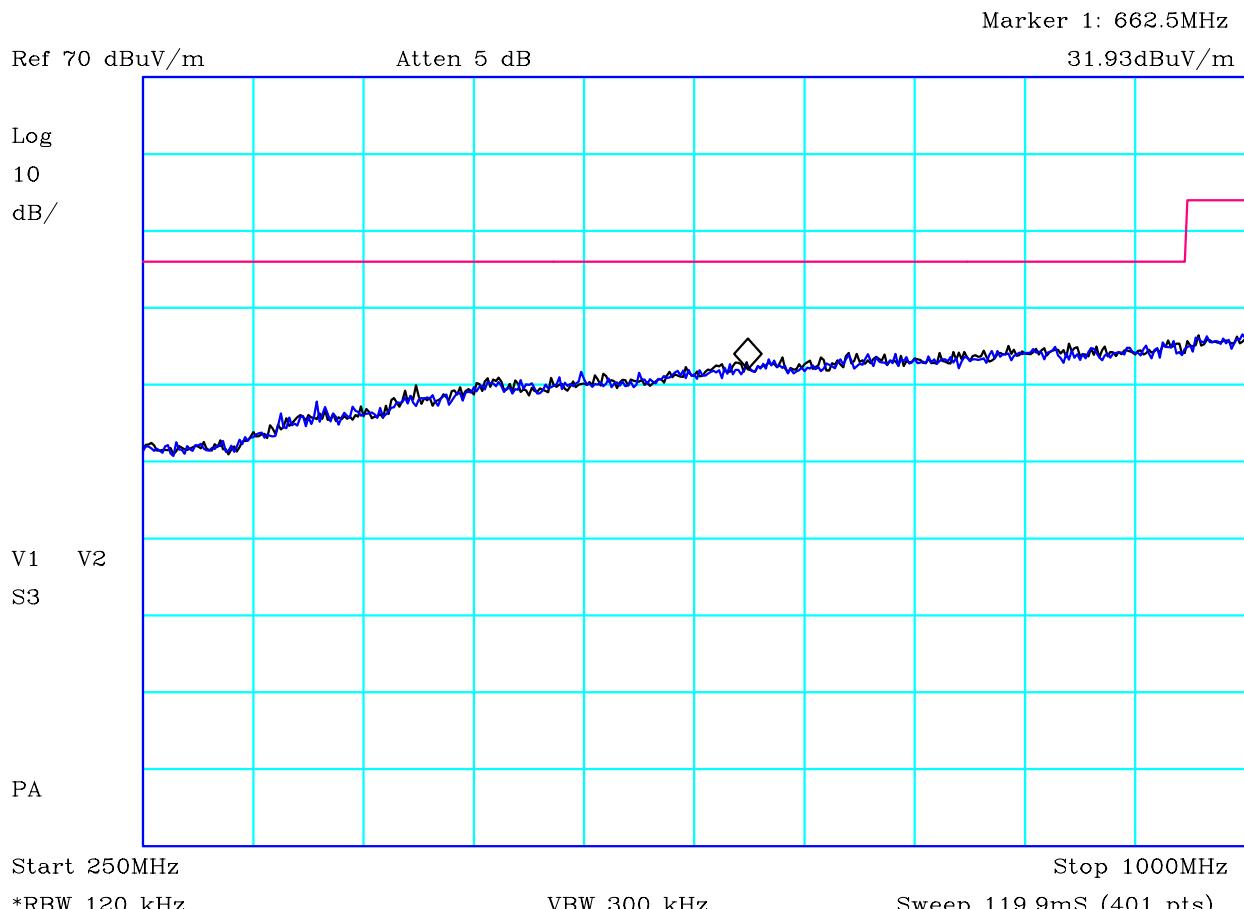
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 36 of 46



PLOT 18 Radiated Emissions - HF - 80V - 25MHz to 275MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 133kHz 80V.			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H362547A.txt
		Analyser:	R8

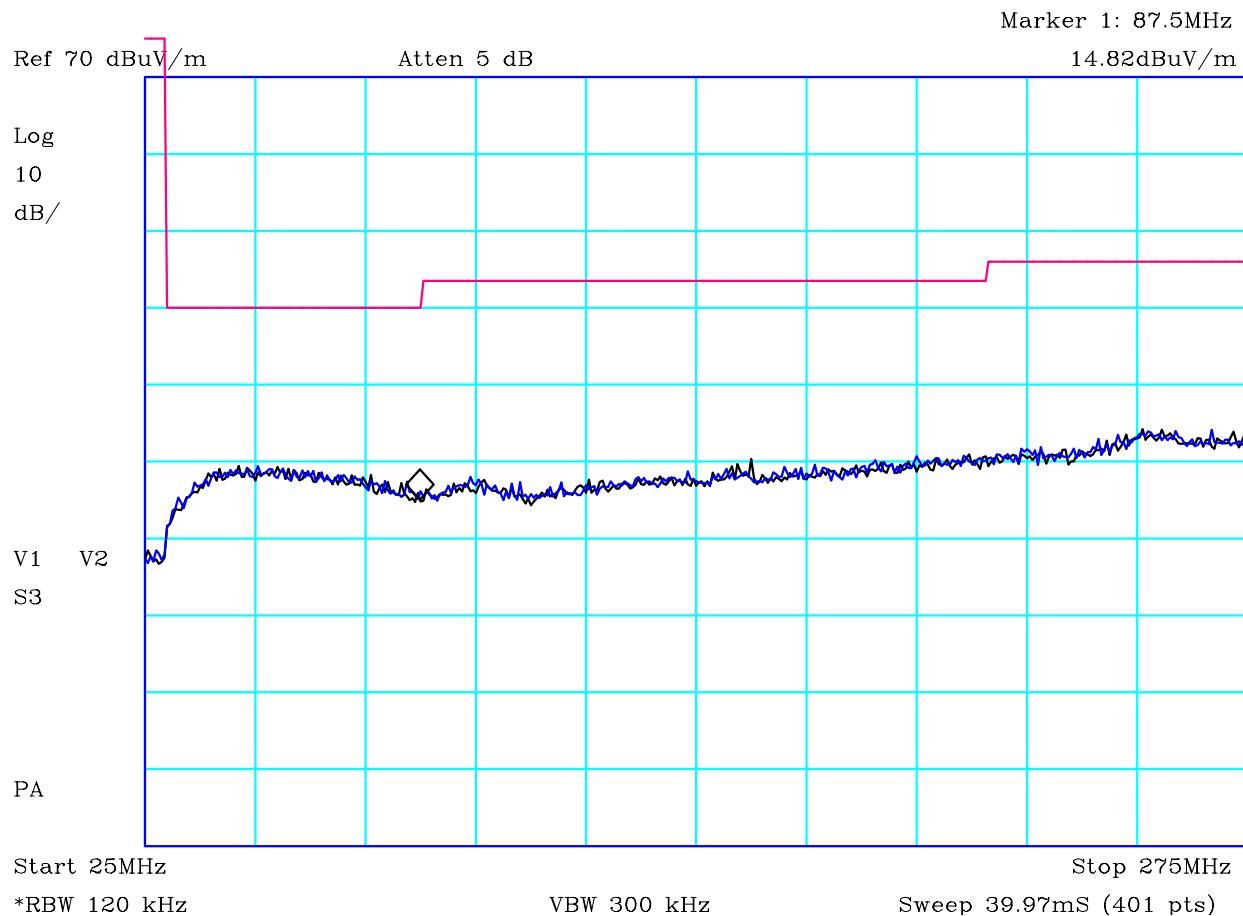
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 37 of 46



PLOT 19 Radiated Emissions - HF - 80V - 250MHz to 1GHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 133kHz 80V.			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H362547E.txt
		Analyser:	R8

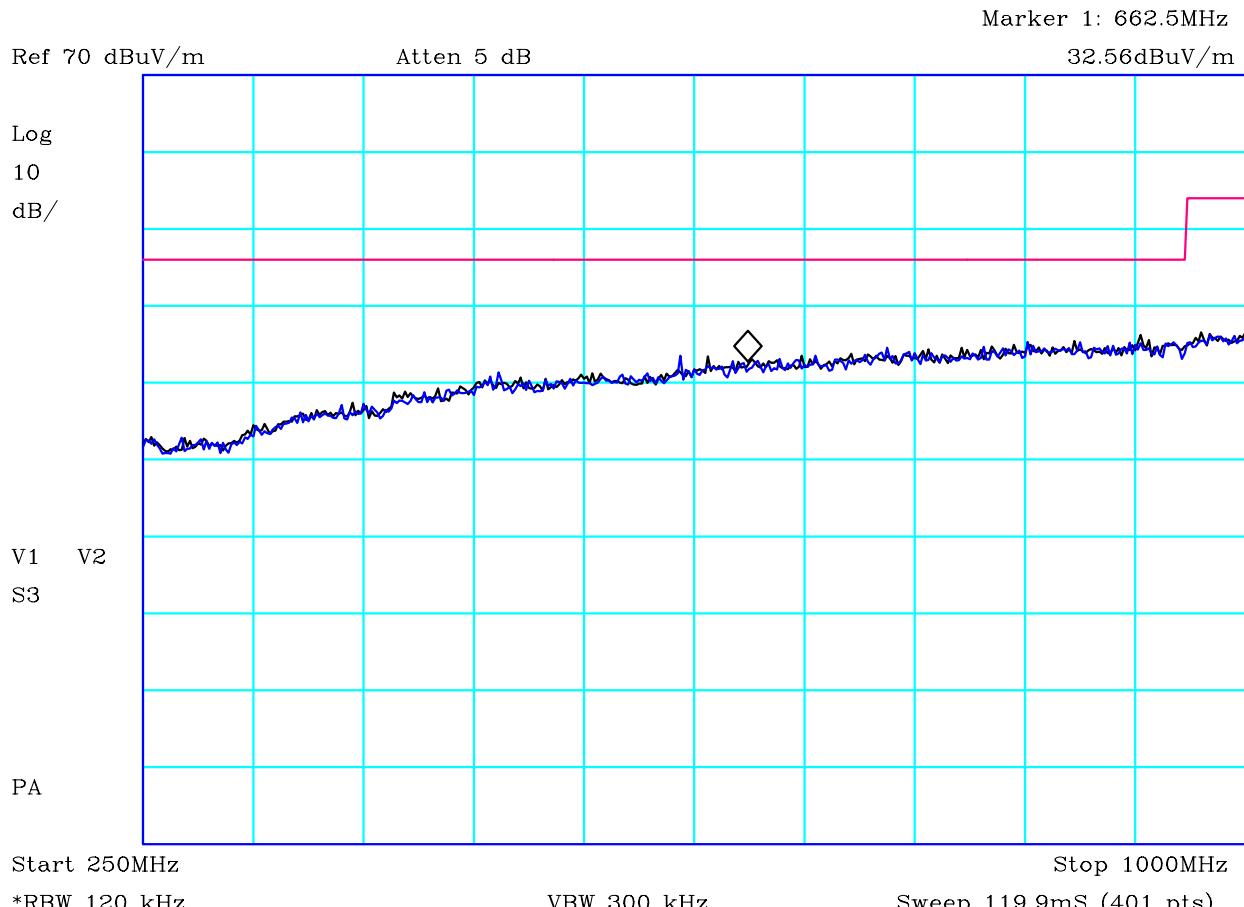
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 38 of 46



PLOT 20 Radiated Emissions - LF - 120V - 25MHz to 275MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 126kHz 120V.			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State:
Angle	0-360	File:	H3625478.txt
		Analyser:	R8

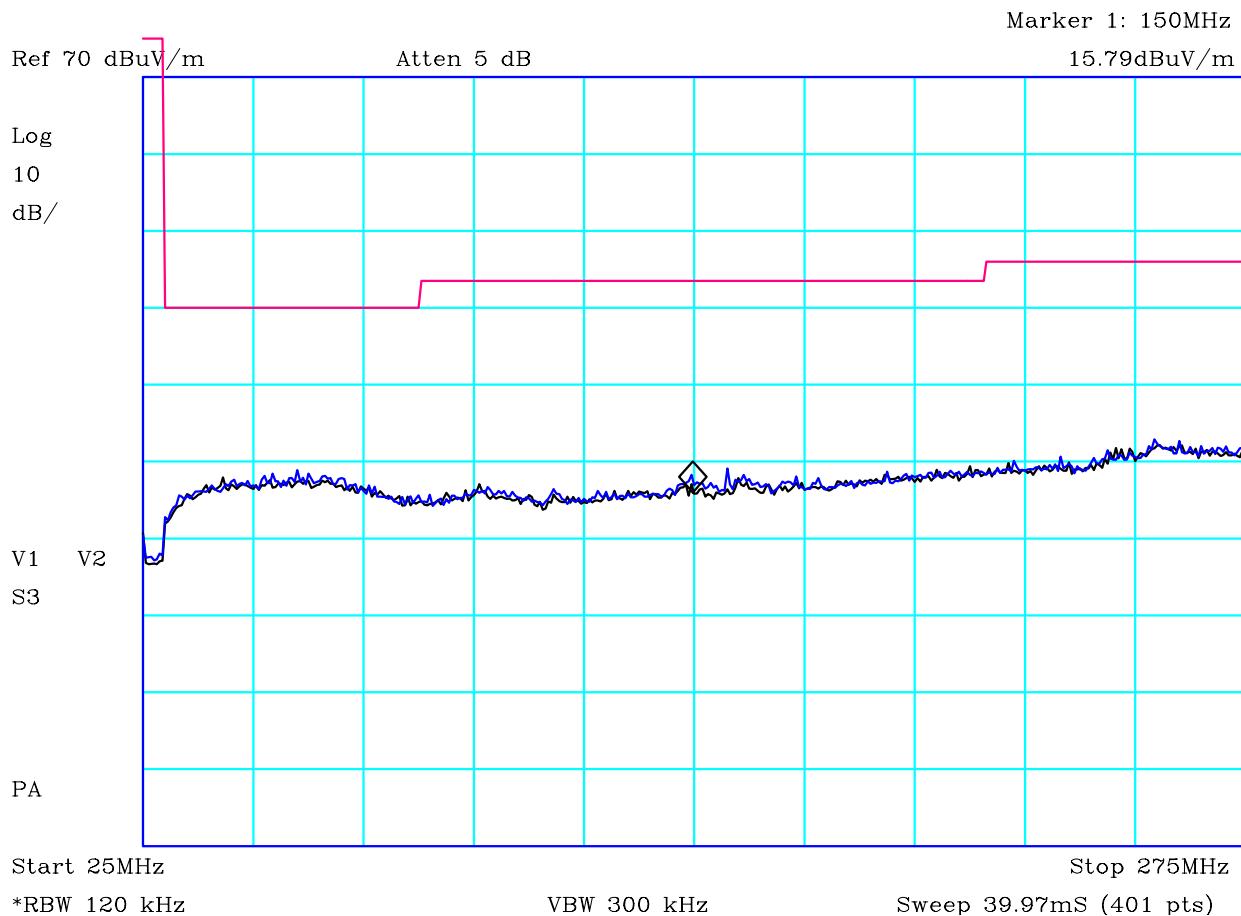
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 39 of 46



PLOT 21 Radiated Emissions - LF - 120V - 250MHz to 1GHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 126kHz 120V.			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H3625479.txt
		Analyser:	R8

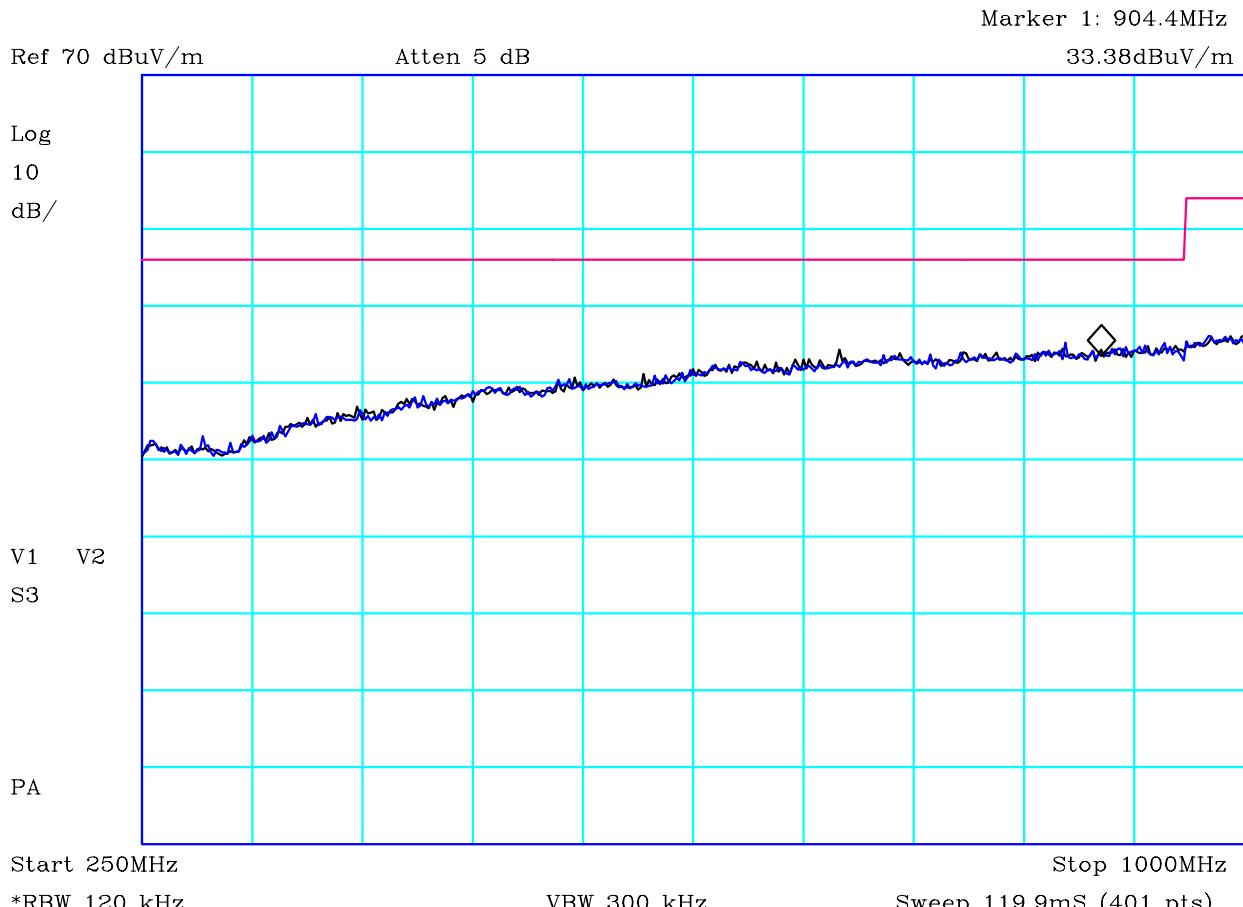
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 40 of 46



PLOT 22 Radiated Emissions - HF - 120V - 25MHz to 275MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 133kHz 120V.			
Facility:	Anech_2	Height	1m,1.5m,2m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36224CC
		Analyser:	R8

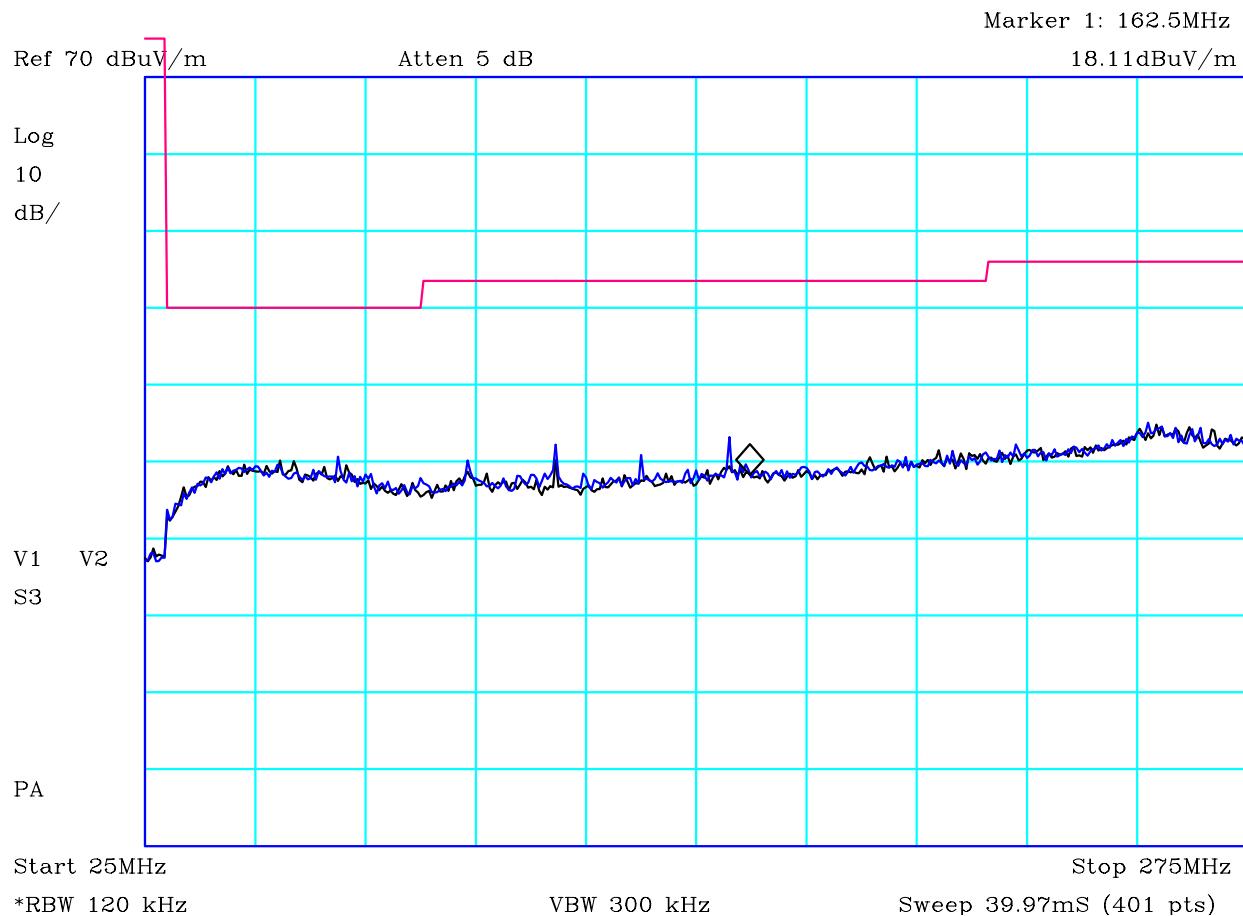
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 41 of 46



PLOT 23 Radiated Emissions - HF - 120V - 250MHz to 1GHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal 133kHz 120V.			
Facility:	Anech_2	Height	1m,1.5m,2m
Distance	3m	Polarisation	Modification State: 0
Angle	0-360	File:	H36224CA
		Analyser:	R8

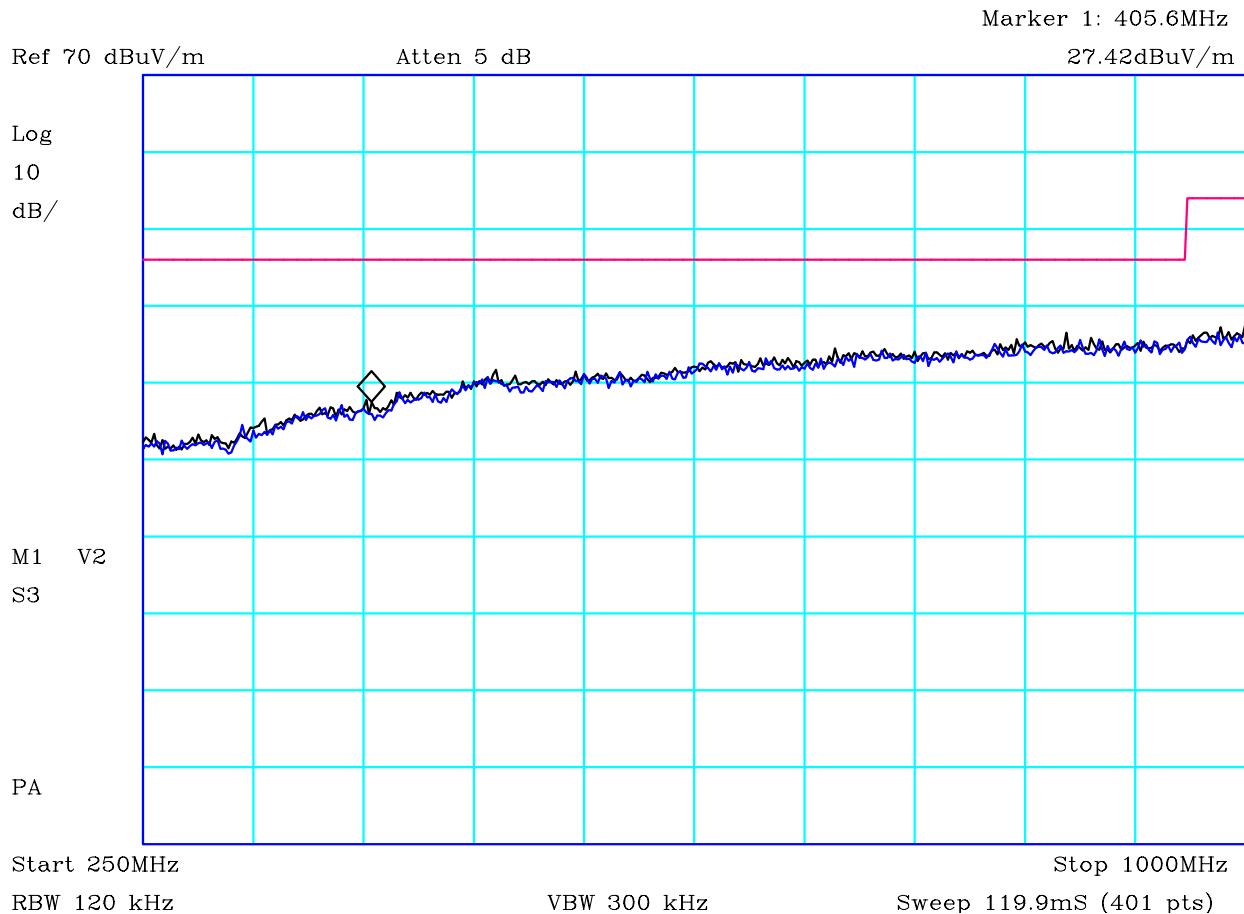
	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 42 of 46



PLOT 24 Radiated Emissions - Cycling all Tx Modes - 25MHz to 275MHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal			
Cycling all modes			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State:
Angle	0-360	File:	H3625485.txt

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 43 of 46

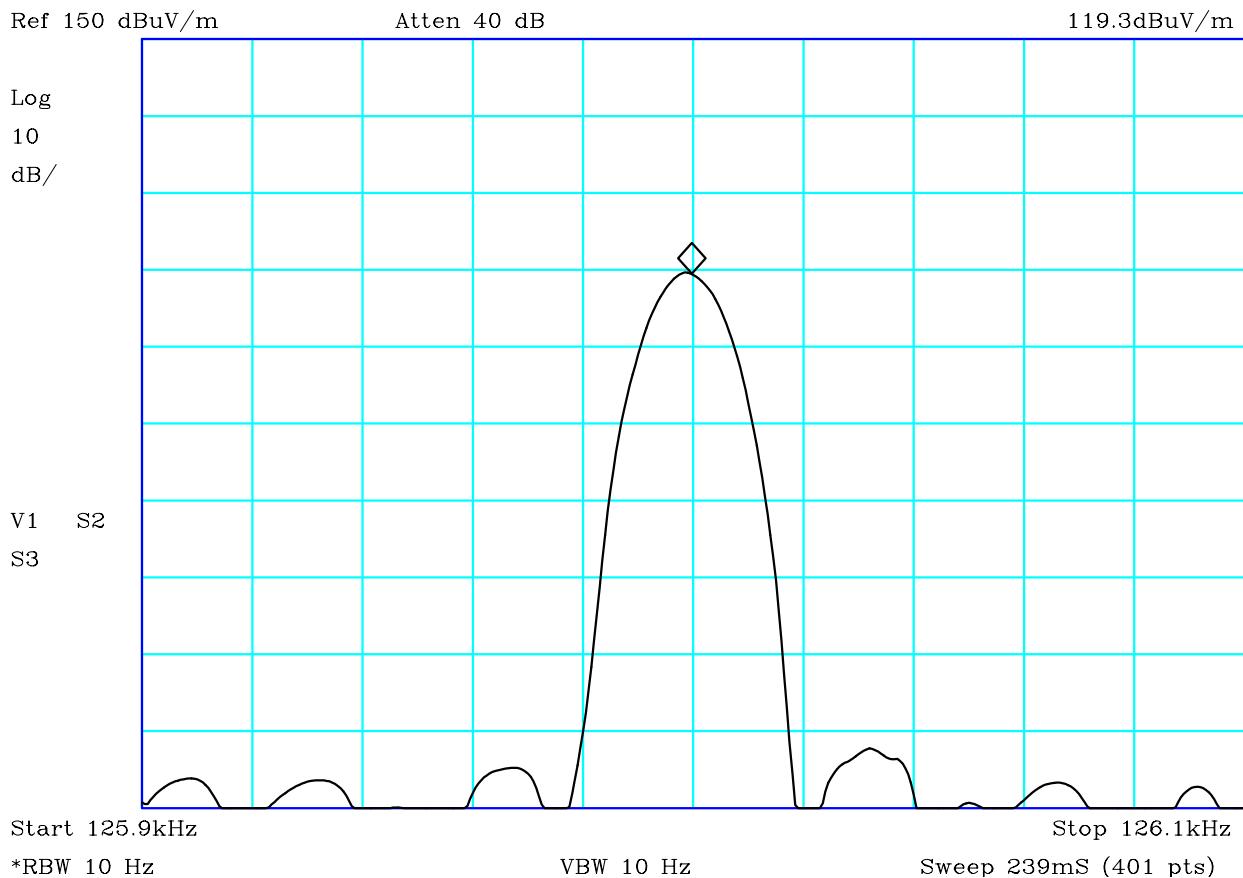


PLOT 25 Radiated Emissions - Cycling all Tx Modes - 250MHz to 1GHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	24/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:(VIO)	FCC(B)@3m	Limit2:	
Limit3:		Limit4:	
Black: vertical Blue: horizontal Cycling all modes			
Facility:	Anech_1	Height	1.5m
Distance	3m	Polarisation	Modification State:
Angle	0-360	File:	H362548A.txt

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 44 of 46

Marker 1: 126kHz



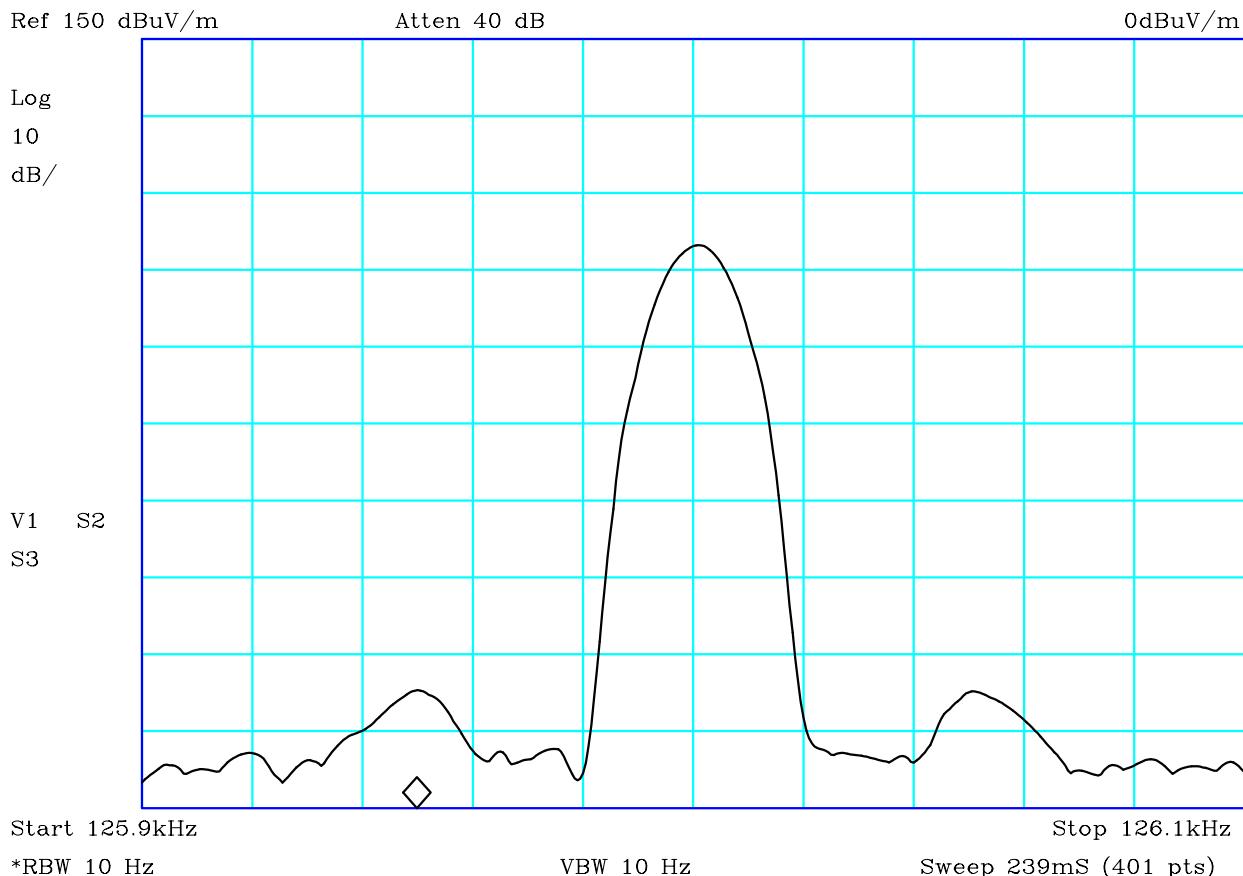
CF1:A9_HI_V_130117 CF2:CBL002_CBL069_100809

PLOT 26 Radiated Emissions - Bandwidth at 126kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:		Limit2:	
Limit3:		Limit4:	
126kHz 120V. Bandwidth @-30dBc points = 29Hz 99% Occupied bandwidth = 25Hz			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	1 face	File:	H36257A2
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
Test No: T5083		Test Report	Page: 45 of 46

Marker 1: 126kHz

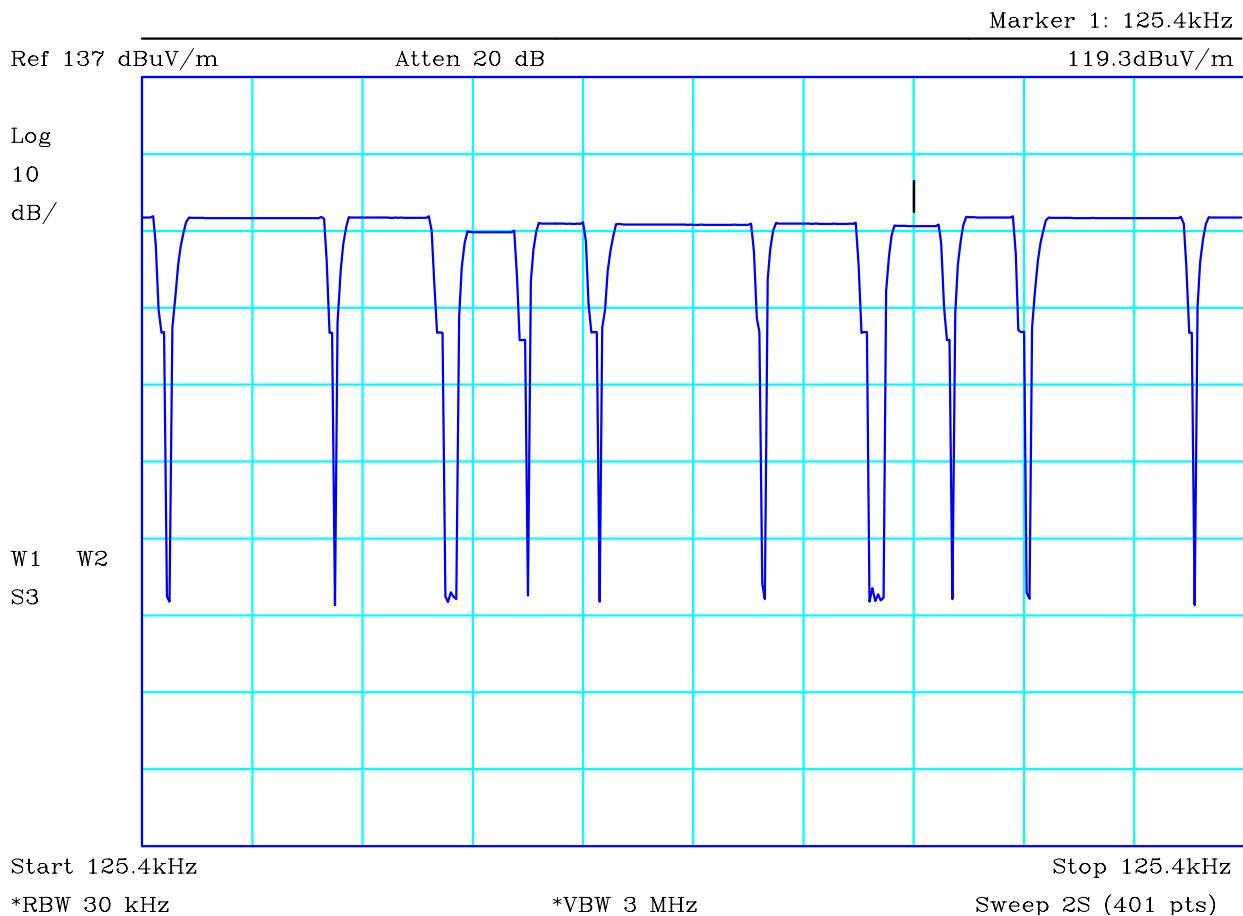


CF1:A9_HI_V_130117 CF2:CBL002_CBL069_100809

PLOT 27 Radiated Emissions - Bandwidth at 133kHz

Company:	Sureflap Ltd	Product:	DualScan
Date:	22/07/2013	Test Eng:	Dave Smith
Method:	ANSI C63.4	Method:	
Limit1:		Limit2:	
Limit3:		Limit4:	
133kHz 120V. Bandwidth @-30dBc points = 28Hz 99% Occupied bandwidth = 26Hz			
Facility:	Anech_2	Height	1m
Distance	3m	Polarisation	Modification State: 0
Angle	1 face	File:	H3625796
		Analyser:	R8

	Report No: R3261 Issue No: 2	FCC ID: XO9-DSCF-1001 IC: 8906A-DSCF1001	
	Test No: T5083	Test Report	Page: 46 of 46



PLOT 28 Radiated Emissions - Timing

Company:	Sureflap Ltd		Product:	DualScan	
Date:	22/07/2013			Test Eng:	Dave Smith
Method:	ANSI C63.4			Method:	
Limit1:				Limit2:	
Limit3:				Limit4:	
Timing					
Facility:	Anech_2	Height	1m	Mode:	2
Distance	3m	Polarisation		Modification State:	0
Angle	1 face	File:	H36257ED	Analyser:	R8