





23, Headington Drive, Cambridge. CB1 9HE

CB1 9FB Tel : 01954 251974 (test site) or : 01223 241140 (accounts) Fax : 01954 251907 web : www.dbtechnology.co.uk email: mail@dbtechnology.co.uk

REPORT ON ELECTROMAGNETIC COMPATIBILITY TESTS

Performed at: TWENTY PENCE TEST SITE

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

> > on

Cambridge Visual Networks Ltd

CODAlink 1

dated

12th March 2008

Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	12/03/08		Initial release		
2	26/03/08	All	FCC version	DB	DS
1					

Based on report template: v071019

	Report No: Issue No:	R2454 2	FCC ID: V6HCDL1		
dB	Test No:	T2609	Test Report	Page:	2 of 22

Equipment Under Test (EUT): CODAlink 1

Test Commissioned by: Cambridge Visual Networks Ltd

61 Selwyn Road Cambridge CB3 9EA

Representative: Quentin Stafford-Fraser

Test Started: 7th March 2008

Test Completed: 7th March 2008

Test Engineer: Peter Barlow

Date of Report: 12th March 2008

Written by: Peter Barlow Checked by: Derek Barlow

Signature: Signature:

Date: 12th March 2008 Date: 12th March 2008

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: 2007 Code of Federal Regulations: Pt 15 Subpart B- Radio Frequency Devices -

Class B Unintentional Radiators

Emissions Test Results Summary

CFR 47: 2007 PASS

Test	Port	Method	Limit	PASS/FAIL	Notes
Conducted Emissions	ac power	ANSI C63.4:2003	CISPR22(B)	PASS	
Radiated Emissions		ANSI C63.4:2003	CISPR22(B)	PASS	

specs_fccv070115

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1 EUT Details

1.1 General

The EUT was a Cambridge Visual Networks Ltd, CODAlink 1 ethernet network adapter for displays. The EUT allows VGA connected monitors to be plugged into ethernet networks. It included microprocessor circuitry with a maximum frequency of 133MHz. The EUT had local PS/2 mouse and keyboard ports. The EUT was tested with no keyboard or mouse connected at the manufacturer's request.

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 2 3 4 5 6	Cambridge Visual Networks Ltd mpw Samsung Samsung Sony Vaio Sony	CODAlink 1 SA070507 Sync master 172T AP04214-UV VGN-B3XP VGP-AC16V8	EUT EUT 5V ac adaptor LCD VGA monitor AC adaptor Laptop PC 16V AC adaptor	Prototype N/A M017HMEW401439K 0302026739AA 281852505300545 147886031 0016351	

1.2 Details of Interconnecting Cables

The following table lists details of the cables connected to the EUT.

From	То	Cable Type	Length	Notes
EUT (DC port)	PSU	2-core unscreened with integral ferrite at EUT end	1.8m	
EUT (Ethernet port)	Laptop	CAT5 FTP (screened)	3m	
EUT (VGA port)	Monitor	Screened VGA with 2x	1.8m	
		integral ferrites one at each end		
Monitor	PSU	2-core with integral ferrite at monitor	1.8m	
Monitor PSU	Mains	Standard 3-core IEC	1.8m	
Laptop	PSU	2-core	1.6m	
Laptop PSU	Mains	2-core	1m	
	•	•	'	•

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1.3 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	As received 07/03/2008 with screened (CAT5 FTP) ethernet lead.	Radiated_Emissions

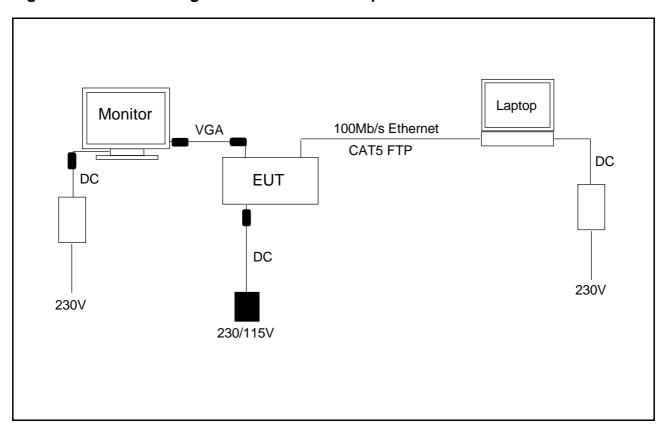
1.4 EUT Operating Modes

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	Laptop providing video over ethernet cable. The video consists of a window with a Scrolling H test running. The video format was 1280 x 1024 @ 75Hz. No keyboard or mouse was connected to the EUT. The video was then diplayed on the local VGA Monitor which was connected to the EUT's VGA output port.

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Figure 1 General Arrangement of EUT and Peripherals



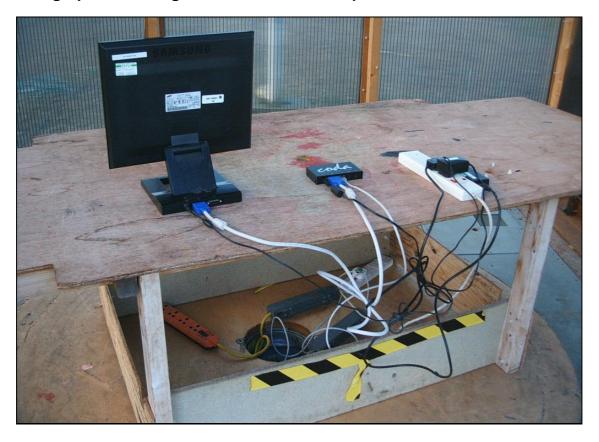
Photograph 1 Arrangement of EUT and Peripherals for Radiated Emissions



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Photograph 2 Arrangement of EUT and Peripherals for Radiated Emissions



Photograph 3 Arrangement of EUT and Peripherals for Conducted Emissions

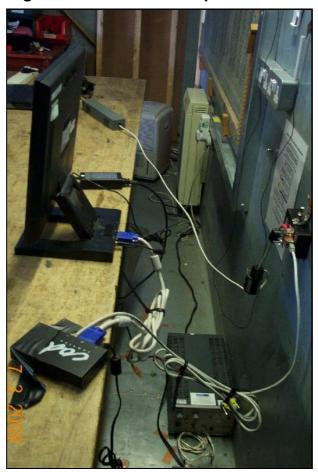


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Photograph 4 Arrangement of EUT and Peripherals for Conducted Emissions



Photograph 5 Arrangement of EUT and Peripherals for Conducted Emissions



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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
A12	Chase Bilog CBL6111A	1012
A5	Chase Bilog CBL6111A	1760
L1	EMCO 3825/2 LISN	1358
L2	R&S ESH3-Z5 LISN	843862/009
R1	CHASE LHR 7000	1056
R5	HP 8595E Spec. Analyser	3412A00701
R5B	dB Technology Pre-amp	dB001
R7	R&S ESVD	280576.333333333

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3 Test Methods

3.1 Conducted Emissions - ac power

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.

Bench top EUTs and peripheral equipment are normally placed on a 0.8m high non-conducting bench, positioned 0.4m from one of the metallic walls of a screened room. Floor standing EUTs are normally placed 0.1m above the metallic floor of the screened room. Mains leads are bundled so as not to exceed 1m.

The EUT is powered using a 50ohm/50uH Line Impedance Stabilisation Network (LISN). Peripherals are powered using a second a 50ohm/50uH LISN. These LISNs are bonded to the screened room floor.

With the correct supply voltage applied to the EUT scans are performed on both the live and neutral line outputs of the LISN using quasi-peak detection over the specified frequency range. The results of these scans are shown in the plots section at the end of the report.

Significant emissions identified by the scans are measured and the results tabulated. The table of results is shown in the conducted emissions results section.

3.2 Radiated Emissions

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.

4 Test Results

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

	Report No: Issue No:	R2454 2	FCC ID: V6HCDL1		
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Conducted Emissions (Power) - Results - 115V ac power 4.1

Factor Set 1:	L1_07B	CSET001_07D	-	-	
Factor Set 2:	-	-	-	-	
Factor Set 3:	-	-	-	-	
Test Equipment:					

	icted F		ns (Powe	er)										
					al Netw	orks	Ltd	Produc	ct: C	ODAlink ²	1			
Date		07/03						Test Eng: Peter Barlow						
Port:		ac pov							-					
Test		ANSI	C63.4:	2003	using l	imits	of	CISPI	R22(B)					
Port: Test					using I	imita	of							
7031	•				using i	IIIIII	<u> </u>							
Plot	Ор	Mod	Line	Fact	Freq.	Det	Rec.	Corr'n	Total	Limit	Margin	Notes		
	Mode	State	(L/N)	Set	MHz	qp/	Level	Factor	Level		CISPR22(B)			
						av	dBuV	dB	dBuV	dBuV	dB			
1	1	0	L	1	0.199	qp	43.7	10.0	53.7	63.7	10.0	115V ac power		
1	1	0	L	1	0.199	av	35.7	10.0	45.7	53.7	8.0	115V ac power		
1	1	0	L	1	14.953	qp	33.6	10.6	44.2	60.0	15.8	115V ac power		
1	1	0	L	1	14.953	av	29.2	10.6	39.8	50.0	10.2	115V ac power		
			N.		0.000		4/ 7	100	F / 7	/ 2 F		44514		
2	1 1	0 0	N N	1	0.202 0.202	qp av	46.7 38.2	10.0 10.0	56.7 48.2	63.5 53.5	6.9 5.4	115V ac power 115V ac power		
_	'		14	'	0.202	av	30.2	10.0	40.2	33.3	3.4	115 v ac powei		
2	1	0	N	1	14.760	qp	31.5	10.6	42.1	60.0	17.9	115V ac power		
2	1	0	N	1	14.760	av	27.0	10.6	37.6	50.0	12.4	115V ac power		
										- 4	ID.			
	Resul	ts					Minimu PASS/F		Jin	5.4 PASS	dB			
No	tes						Comme	nts and	Obser	vations				
			Results	of sca	ans showi	n in pl	ots 1 ar	nd 2.						

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4.2 **Radiated Emissions Results**

Factor Set 1: A5_FS_07B CSET005_07A 25 m cable

Factor Set 2: Factor Set 3:

Test Equipment: R7 A5 CSET005

		nission:						Descri	l 4					
				ge V i	sual Netv	work:	s Ltd	Prod	C	ODAlin				
Date Ports		07/03	3/08					Test	Eng: P	eter Barlo	DW			
Test		ANSI	C63	.4:20	03 using	limits	s of	CISPR22(B)						
Ports	s:													
Test	:				using	limits	s of							
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 CISPR22(B) dBuV/m	Margin CISPR22(B) dB	Notes	
4 4 3 3 3 3 3 3 3	1 1 1 1 1 1	0 0 0 0 0 0	10 10 10 10 10 10 10	1 1 1 1 1 1 1 1	708.713 708.713 116.900 116.900 101.146 101.146 32.630 32.630	H V H V H V V	5.4 3.4 5.3 11.5 3.6 11.4 -3.8 6.5	26.7 26.7 13.4 13.4 11.7 11.7 17.7		32.1 30.1 18.7 24.9 15.3 23.1 13.9 24.2	37.0 37.0 30.0 30.0 30.0 30.0 30.0	4.9 6.9 11.3 5.1 14.7 6.9 16.1 5.8		
	Resul	ts		1	l		Minimu		gin		4.9	dB		
							PASS/F	AIL			PASS			
No	tes					Comr	ments ar	nd Obse	ervation	ns				
			Resu	lts of	scans shov	vn in p	olots 3 t	0 6.						

	Report No: Issue No:	R2454 2			ı	CC ID: V6	HCDL1					
dB	Test No:	T2609				Test Re	port			Page: 13 of 22		
Chase EMS	S 6.21	Notes										
Analyse 080	0307 C4L T260	09 115V ac po	wer									
Test: 150kF	Iz-30MHz (L1	+CSET001) d	BuV									
RF level	100	· 					Т Т		111			
dBuV	90											
080307 C 41	LT											
Quasi-peak	80								+++		_	
	70		1						$\perp \downarrow \downarrow$			
	60											
	50			++								
	30			+								
	40					1					+	
	30			\prod		<u> </u>						
	20		'	MM	1		MMIAL			Manual	ارزانسا	
	20					 	 			10 1046		
	10			++		<u> </u>			+++		Application of the same of the	
	o											
		0.3	3	0.6	1		3	6	10	1	30	

PLOT 1 Conducted Emissions - Neutral Line

Log Freq. (0.15 - 30)MHz

Company:	Cambridge	Visual Networks	Product:	CODAlink 1								
Date:	26 Mar 08		Test Engine	eer: Peter Barlow								
Test:	FCC pt 15		Limit:	CISPR (B)								
Notes:												
Op.Mode: Scrolling H test. No keyboard or mouse. 1280 * 1024 @ 75Hz.												
Rev D board -	issue 1 case. Scro	eened ethernet cable	connected to lapto	p via CDN9.								
EUT connected	d to local monito	r via VGA. Monitor	(L2) EUT PSU (I	L1).								
Equip:R1,L1,L	.2,,AB002,CBL0	05,CBL007, CDN9.										
Line:	Neutral	Attenuator:	10dB PAD	Operating Mode:	1							
Detector:	QuasiPeak			Mod. State:	0							
LISN:	EMCO	Filename:	C8326835.plt									

Limit CISPR22B (AV) AC POWER

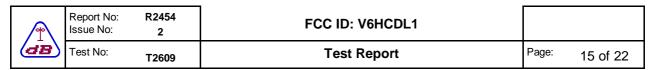
A	Report No: Issue No:	R2454 2			F	CC ID: V6I	HCDL1	I					
dB	Test No:	T2609				Test Rep	ort					Page:	14 of 22
Chase EMS	S 6.21	Notes											
Analyse 080	307 C5N T2609) 115V ac pov	wer										
Test: 150kH	Iz-30MHz (L1+	CSET001) dE	BuV										
RF level	100				П					П	T		
dBuV	90												
080307 C51	VТ												
Quasi-peak	80									П			
	70									Н	+		
	60									Ш			
	50	A											
	40											ىن	
) / /	1	A AMA A	hlhi.						
	30			\mathcal{W}	$\langle \langle \rangle \rangle$	<u> </u>				بارال	را به و		<u> </u>
	20	\(\sigma\)		1	₩	 	IIIII T	11.1	<u>, 1416.</u>	1	+	Manual Park	
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	О	0.3	0	.6	1	1	3		6	 	10	+	30

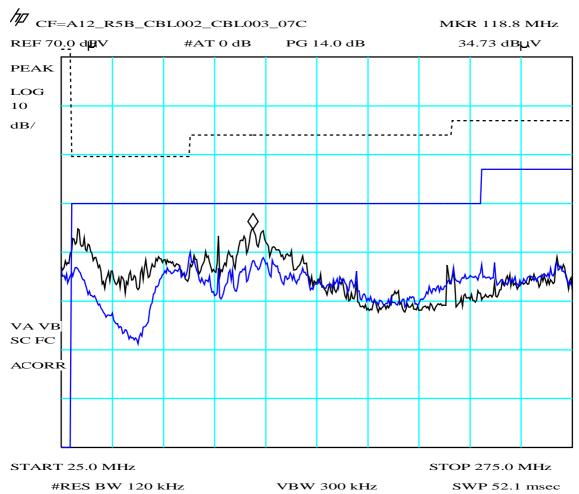
PLOT 2 Conducted Emissions - Live Line

Log Freq. (0.15 - 30)MHz

Company:	Cambridge \	Visual Networks	Product:	CODAlink 1						
Date:	26 Mar 08		Test Engine	er: Peter Barlow						
Test:	FCC pt 15		Limit:	CISPR (B)						
Notes:										
Op.Mode: Scrol	Op.Mode: Scrolling H test. No keyboard or mouse. 1280 * 1024 @ 75Hz.									
Rev D board - is	ssue 1 case. Scre	ened ethernet cable	connected to lapto	p via CDN9.						
EUT connected	to local monitor	via VGA. Monitor	(L2) EUT PSU (L	1).						
Equip:R1,L1,L2	2,,AB002,CBL00	05,CBL007, CDN9.								
Line:	Neutral	Attenuator:	10dB PAD	Operating Mode:	1					
Detector:	QuasiPeak			Mod. State:	0					
LISN:	EMCO	Filename:	C8326838.plt							

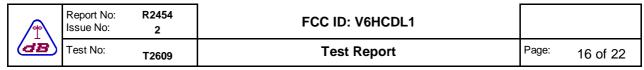
Limit CISPR22B (AV) AC POWER

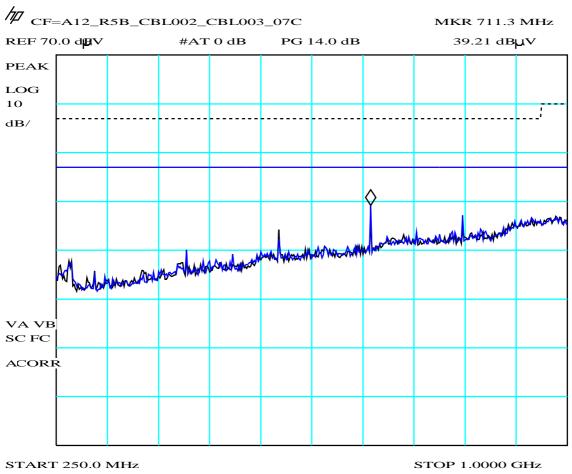




PLOT 3 Radiated Emissions - 25MHz to 275MHz

Company:	Cambridge Vis	ual Networks	Product:	CODAlink 1					
Date:	07 Mar 08		Test Engineer:	: Peter Barlow					
Test:	CISPR22		Limit:	CISPR (B) &	FCC (A)				
Notes:									
Op.Mode: Scroll	Op.Mode: Scrolling H test. No keyboard or mouse. 1280 * 1024 @ 75Hz.								
Rev D board - iss	sue 1 case. Screen	ed ethernet cable co	onnected to laptop of	outside of					
chamber. EUT co	onnected to local r	nonitor via VGA. N	Monitor and EUT P	SU's on the bench.					
Vertical = Black	Trace, Horizonta	l = Blue Trace							
Polarisation:	V + H	Orientation:	0 - 360°	Operating Mode:	1				
Distance:	3m	Antenna:	Bilog	Mod. State:	0				
Height:	1 m	Filename:	H830740A.plt						





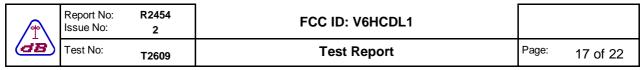
PLOT 4 Radiated Emissions - 250MHz to 1GHz

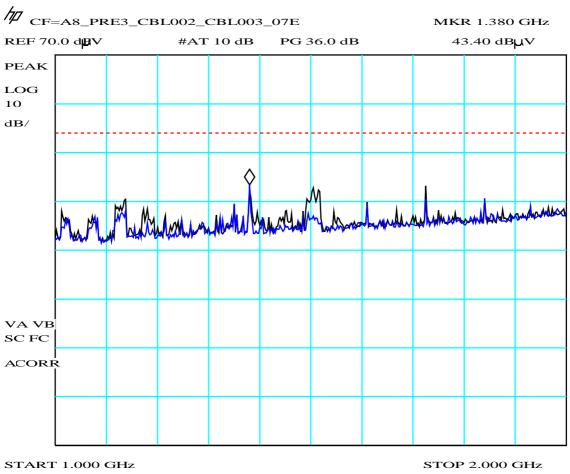
#RES BW 120 kHz

Company:	Cambridge	Visual Networks	Product:	CODAlink 1					
Date:	07 Mar 08		Test Eng	ineer: Peter Barlov	v				
Test:	CISPR22		Limit:	CISPR (B) &	& FCC (A)				
Notes:									
Op.Mode: Scro	Op.Mode: Scrolling H test. No keyboard or mouse. 1280 * 1024 @ 75Hz.								
Rev D board - i	ssue 1 case. Scr	eened ethernet cable	connected to lap	otop outside of					
chamber. EUT	connected to loa	cal monitor via VGA	. Monitor and E	UT PSU's on the bench	1.				
Vertical = Blac	ck Trace, Horizo	ontal = Blue Trace							
Polarisation:	V + H	Orientation:	0 - 360°	Operating Mode:	1				
Distance:	3m	Antenna:	Bilog	Mod. State:	0				
Height:	1m	Filename:	H830740F.plt						

VBW 300 kHz

SWP 156 msec





PLOT 5 Radiated Emissions - 1GHz to 2GHz

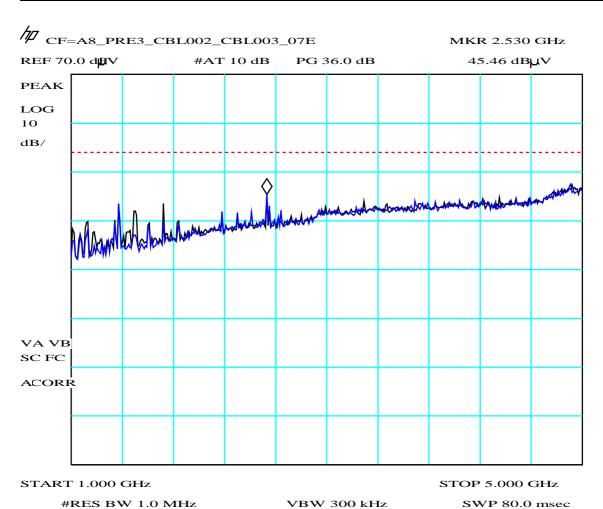
#RES BW 1.0 MHz

Company:	Cambridge Vis	sual Networks	Product:	CODAlink 1					
Date:	07 Mar 08		Test Engine	er: Peter Barlow					
Test:	FCC pt 15		Limit:	FCC(B)					
Notes:	Notes:								
Op.Mode: Scrol	Op.Mode: Scrolling H test. No keyboard or mouse. 1280 * 1024 @ 75Hz.								
Rev D board - is	sue 1 case. Screen	ed ethernet cable of	connected to laptop	outside of					
chamber. EUT o	connected to local	monitor via VGA.	Monitor and EUT	PSU's on the bench.					
Vertical = Black	k Trace, Horizonta	al = Blue Trace							
Polarisation:	V + H	Orientation:	0 - 360°	Operating Mode:	1				
Distance:	3m	Antenna:	DRG	Mod. State:	0				
Height:	1m	Filename:	H830743D.plt						

VBW 300 kHz

SWP 20.0 msec

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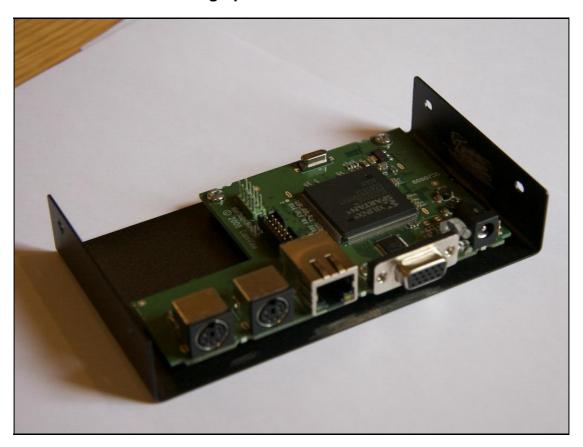
PLOT 6 Radiated Emissions - 1GHz to 5GHz

Company:	Cambridge	Visual Networks	Product:	CODAlink 1	I				
Date:	07 Mar 08		Test Engi	neer: Peter Barlow	V				
Test:	FCC pt 15		Limit:	FCC(B)					
Notes:									
Op.Mode: Scro	Op.Mode: Scrolling H test. No keyboard or mouse. 1280 * 1024 @ 75Hz.								
Rev D board -	issue 1 case. Scr	eened ethernet cable	e connected to lap	top outside of					
chamber. EUT	connected to loc	al monitor via VGA	A. Monitor and EU	JT PSU's on the bench	1.				
Vertical = Bla	ck Trace, Horizo	ontal = Blue Trace							
Polarisation:	V + H	Orientation:	0 - 360°	Operating Mode:	1				
Distance:	3m	Antenna:	DRG	Mod. State:	0				
Height:	1 m	Filename:	H8307438.plt						

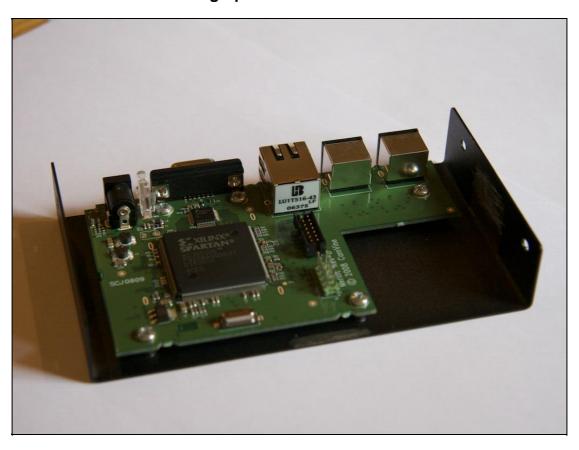
Frequ	Frequency List (MHz)									

1	Report No: Issue No:	R2454 2	FCC ID: V6HCDL1		
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Photograph 6 EUT PCB Front



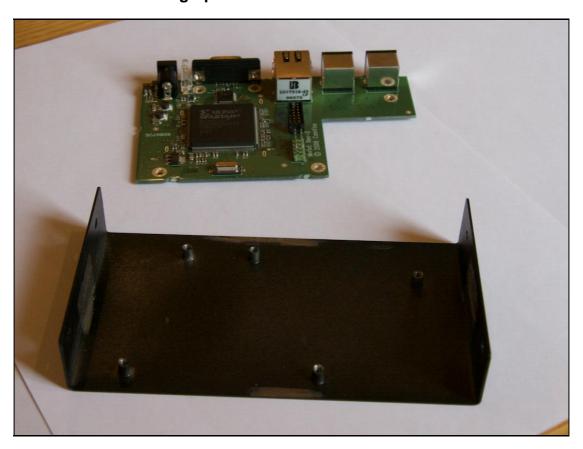
Photograph 7 EUT PCB Rear



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Photograph 8 EUT Enclosure Bottom



Photograph 9 EUT Enclosure Bottom



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Photograph 10 EUT AC adapter

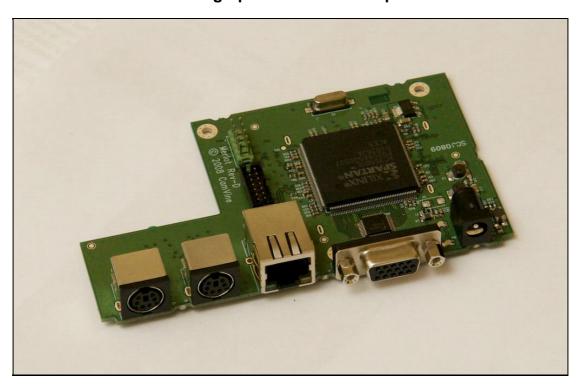


Photograph 11 EUT External Front



₫B	Report No: Issue No:	R2454 2	FCC ID: V6HCDL1		
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Photograph 12 EUT PCB Top



Photograph 13 EUT PCB Bottom

