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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

Cyrus Audio Ltd

PreDAC

dated

4th June 2014

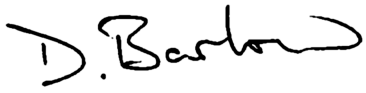
Document History

Issue	Date	Affected page(s)	Description of modifications	Revised by	Approved by
1	09/06/14		Initial release		

Based on report template:
v090319

Equipment Under Test (EUT):	PreDAC
Test Commissioned by:	Cyrus Audio Ltd Spitfire Close Ermine Business Park Huntingdon Cambridgeshire PE29 6XY
Representative:	Ceri Williamson
Test Started:	15th May 2014
Test Completed:	16th May 2014
Test Engineer:	Peter Barlow
Date of Report:	4th June 2014

Written by: Peter Barlow — Checked by: Derek Barlow

Signature:  Signature: 

Date: 4th June 2014 — Date: 9th June 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 **Class B**	*Code of Federal Regulations: Pt 15 Subpart B- Radio Frequency Devices - Unintentional Radiators*

Measurements performed at dB Technology FCC Listed test facility, registration No: 90528

Emissions Test Results Summary

CFR 47 **PASS**

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

specs_fccv100412

Contents

1 EUT Details

1.1 General

The EUT was a Cyrus PreDAC unit incorporating a preamp and advanced digital to analogue converter. The unit may be connected to a PC via a USB 2.0 connection. The PreDAC has an extra connector to enable the unit to be powered by an external regulated power supply (PSXR). The EUT included microprocessor circuitry with a maximum frequency of 480MHz requiring emissions tests to be performed up to 2GHz. To fully exercise all digital interfaces the EUT was tested with a Cyrus Xpower amplifier, CDT CD player and a MAC Book Pro.

The purpose of this report is to cover the USB operation of the unit for Certification as a computer peripheral. Operation in other modes is covered by the Verification process.

Testing was performed with the system connected as per Figure 1 diagram.

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	Cyrus Audio	PreDAC	USB preamplifier/DAC	Proto 1	EUT
2	Cyrus Audio	Xpower	Power Amplifier	Proto 1	
3	Cyrus Audio	CDT	CD Player	Proto 1	
4	Cyrus Audio	PSXR	PreDAC PSU	HNBB0151	EUT
5	Cyrus Audio	CLS50	Speakers	CLS50-M0196	
6	Apple Inc California	Mac Book Pro A1278	Laptop PC	C02HV69TDTY3 FCC ID: QDS-BRCM1055 IC: 4324A-BRCM1055	
7	Delta Electronics Ltd	ADP-60ADT	Laptop PSU	N/A	
8	Netgear	FS605v3	5 port switch	1FM1853S06387	
9	Netgear	DV-751AUK	AC-DC adapter	330-10148-01	

1.2 Details of Interconnecting Cables

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

From	To	Cable Type	Length	Notes
PreDAC (PSXR)	PSXR	Cyrus integral cable	0.5m	
PreDAC (Headphones)	Senizer HD600 headphones	Integral cable	3m	
Xpower (Speaker L&R)	CLS50 speakers	Cyrus Speaker Cable	1.25m	
Xpower (AC Power)	115V ac power	Cyrus Std mains	2m	
PreDAC (MCBUS In&Out)	CDT + Xpower (MCBUS)	Cyrus std Phono	0.5m	
PreDAC (Pre-out1 L&R)	Xpower	Cyrus std Phono	1.2m	
PreDAC (Pre-out2 L&R)	floating	Cyrus std Phono	1.2m	
PreDAC (Zone2 out L&R)	floating	Cyrus std Phono	1.2m	
PreDAC (In 1 L&R)	floating	Cyrus std Phono	1m	
PreDAC (In 2 L&R)	floating	Cyrus std Phono	2m	
PreDAC (In 3 L&R)	floating	Phono to mini din	1.5m	
PreDAC (In 4 L&R)	floating	Cyrus std Phono	0.5	
PreDAC (In 5 L&R)	floating	Cyrus std Phono	1.2m	
PreDAC (In 6 L&R)	floating	Cyrus std Phono	1.2m	
PreDAC (In 7)	CDT (Optical)	Fiber optic	N/A	
PreDAC (In 8)	Optical 2 not connected	N/A	N/A	
PreDAC (In 9)	CDT (SPDIFF out)	Cyrus std Phono	1m	
PreDAC (In 10)	floating	Cyrus std Phono	1m	
PreDAC (In 11 USB)	Laptop PC	USB 2.0 cable	2m	
PreDAC (AC Power)	115V ac power	Cyrus Std mains	2m	
PSXR (DC)	PreDAC (PSXR)	Cyrus integral cable	0.5m	
PSXR (AC Power)	115V ac power	Cyrus Std mains	2m	
CDT (MCBUS In&Out)	PreDAC + Xpower (MCBUS)	Cyrus std Phono	0.5m	
CDT (SPDIFF Out)	PreDAC (In 9)	Cyrus std Phono	1m	
CDT (Digital Optical)	PreDAC (In 7)	Fiber optic	N/A	
CDT (AC Power)	115V ac power	Cyrus Std mains	2m	

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	No modifications. EUT tested as received.	

1.4 EUT Operating Modes

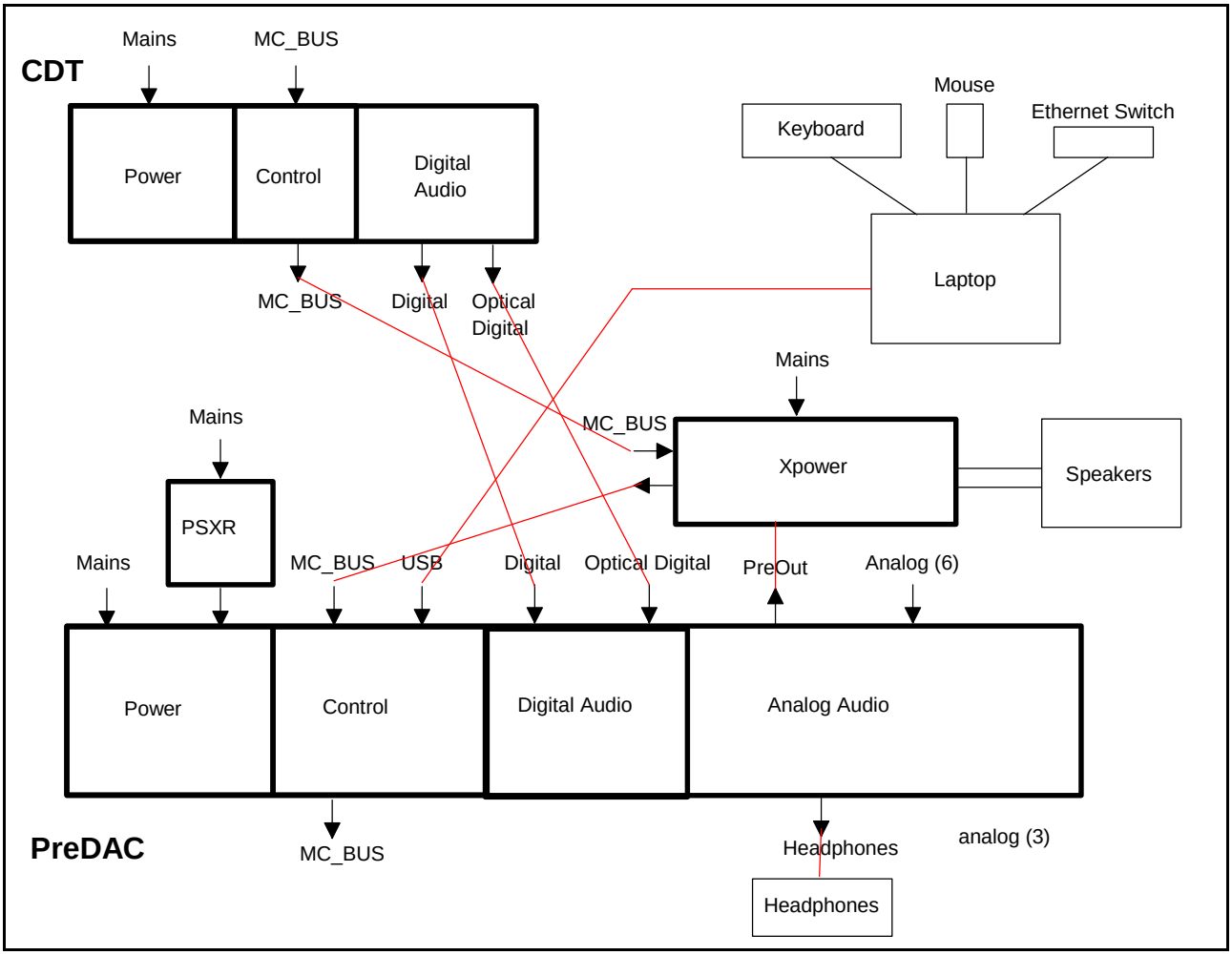
The EUT was tested in the following operating mode or modes. Generally, operating modes are chosen that will exercise the functions of the EUT as fully as possible and in a manner likely to produce maximum emission levels or susceptibility. Individual test result sheets reference the operating mode of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

Operating Mode	Details
1	PreDAC with USB Source from PC.

Figure 1 General Arrangement of EUT and Peripherals

The PreDAC could be connected to a domestic PC and so to test this at dB Technology it is necessary to go through the certification route.

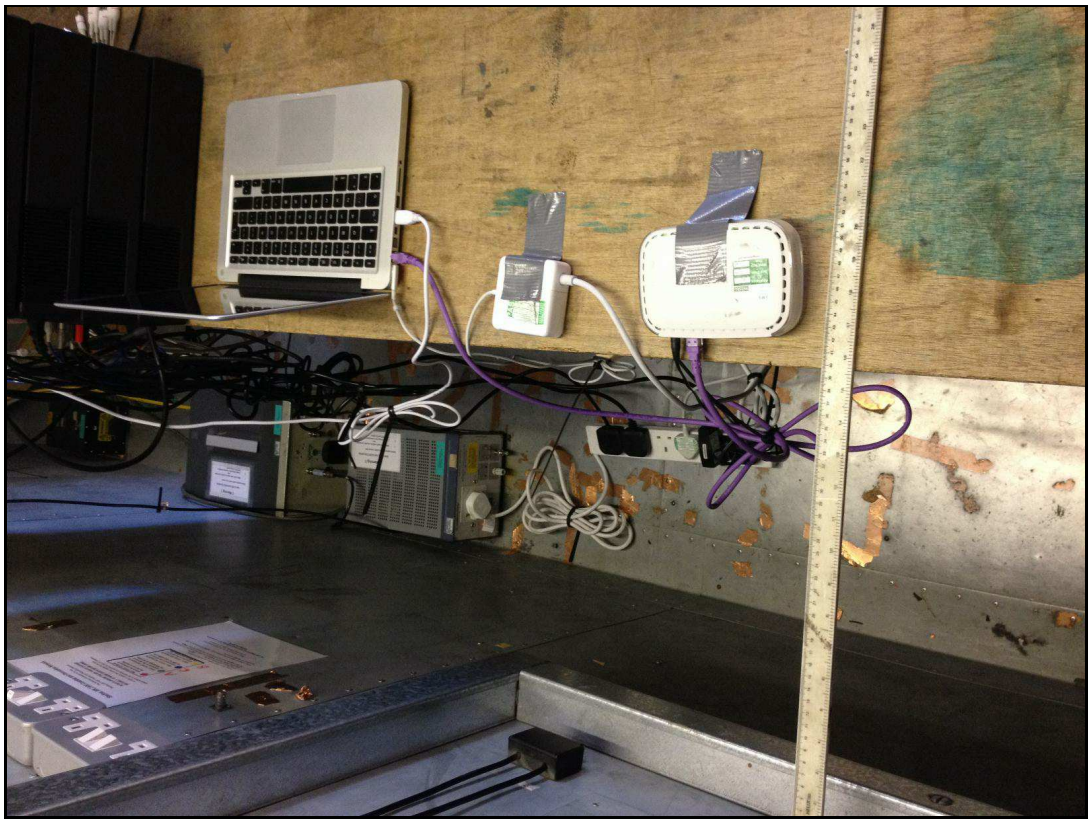
As a peripheral to a computer the FCC "minimum" set up is required. In addition, a device such as a CD player is needed to exercise the digital inputs. The CDT was used as a representative input device. The Xpower amplifier was used to terminate the main Preout and for connection of the MCBUS control signals.



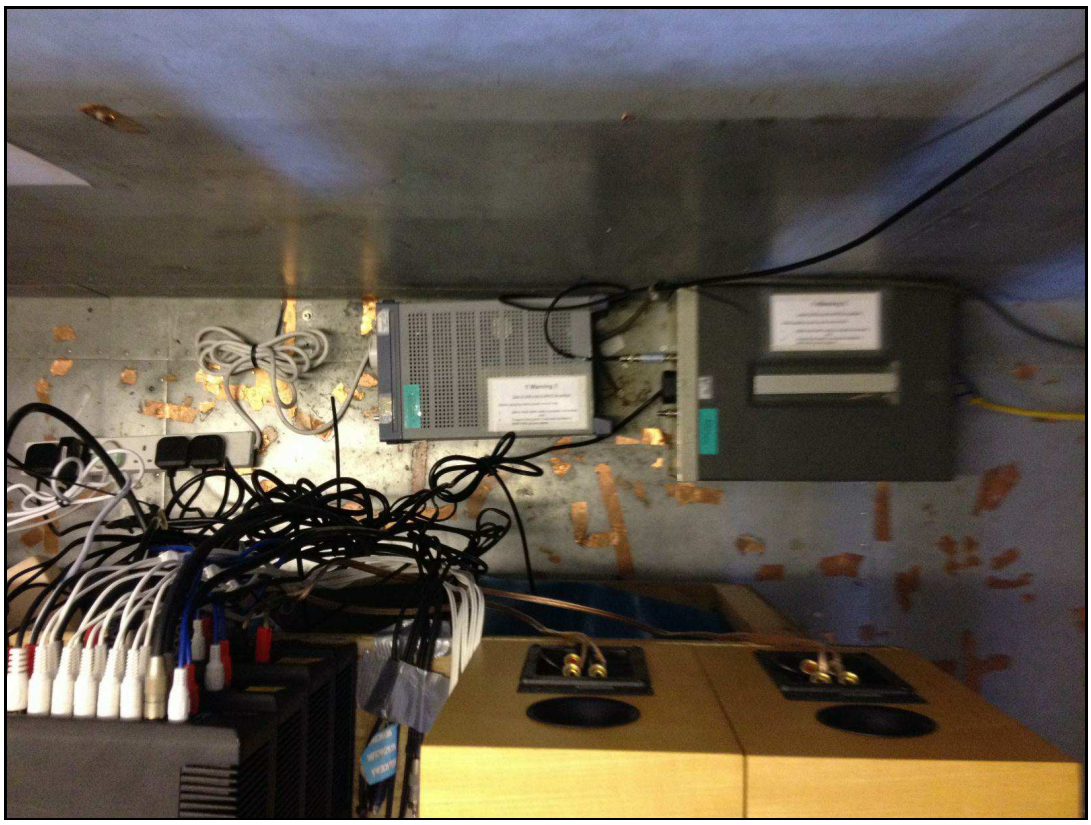
All other ports to be connected to floating cables.

Photograph 1 Conducted Emissions

Photograph 2 Conducted Emissions



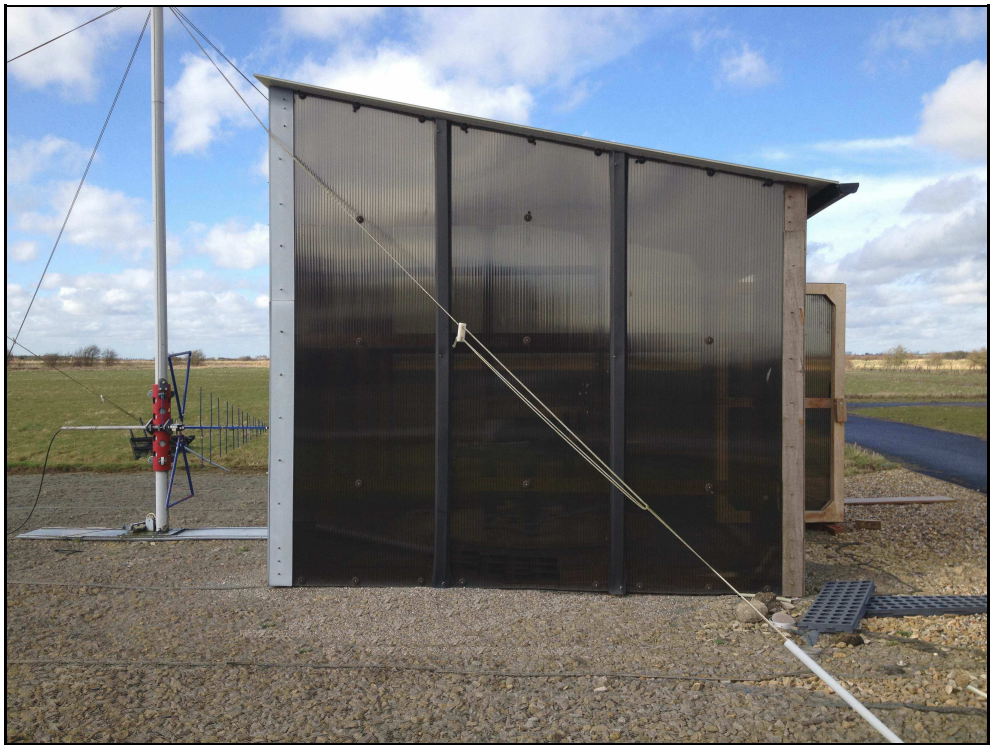
Photograph 3 Conducted Emissions



Photograph 4 Radiated Emissions

Photograph 5 Radiated Emissions

Photograph 6 3m Open Area Test Site



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 Interval
A15	Chase X-wing Bilog CBL6140 20MHz-2GHz	1047	28/10/2013	1 year
A5	Chase Bilog CBL6111A	1760	03/03/2014	1 year
L1	EMCO 3825/2 LISN	1358	21/02/2014	1 year
L2	R&S ESH3-Z5 LISN	843862/009	21/02/2014	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 (20MHz to 1GHz)	843744/002	13/12/2013	1 year

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 (O.A.T.S) at the appropriate test distance using a CISPR16 quasi-peak receiver with a 120kHz bandwidth. 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.

At frequencies where it is difficult to make measurements in the presence of ambient signals measurements are made in the anechoic chamber with the receiver bandwidth / detector set to both 120kHz / quasi-peak and 10kHz / average. The difference between these readings is used as a second correction factor which can be applied to 10kHz / average readings made on the OATS to convert them to the corresponding 120kHz /quasi-peak level. This allows some peaks to be measured more effectively in the presence of interfering ambients on the OATS by using the narrower bandwidth and average detector.

4 Test Results

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

4.1 Conducted Emissions (Power) - PreDAC 115V

Factor Set 1: L1_14A AB002_CBL005_CBL039_12A - -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R10 L1 CSET001 L2

Conducted Emissions (Power)

Company: Cyrus Audio Ltd *Product:* PreDAC
Date: 15/05/2014 *Test Eng:* Joshua Gawthrop
Ports: ac power
Test: ANSI C63.4:2003 using limits of FCC(B) =CISPR22(B)
Ports:
Test: using limits of

Plot	Op Mode	Mod State	Line (L/N)	Fact Set	Freq. MHz	Det qp/ av	Rec. Level dBuV	Corr'n Factor dB	Total Level dBuV	Limit CISPR22(B) dBuV	Margin CISPR22(B) dB	Notes
1	1	0	N	1	0.165	qp	32.0	10.1	42.1	65.2	23.1	Pre DAC 115V
1	1	0	N	1	0.165	av	23.4	10.1	33.4	55.2	21.8	Pre DAC 115V
1	1	0	N	1	0.400	qp	27.4	10.0	37.4	57.9	20.4	Pre DAC 115V
1	1	0	N	1	0.400	av	26.0	10.0	36.0	47.9	11.8	Pre DAC 115V
1	1	0	N	1	0.670	qp	30.5	10.1	40.6	56.0	15.4	Pre DAC 115V
1	1	0	N	1	0.670	av	23.8	10.1	33.9	46.0	12.1	Pre DAC 115V
1	1	0	N	1	0.795	qp	24.6	10.1	34.6	56.0	21.4	Pre DAC 115V
1	1	0	N	1	0.795	av	21.6	10.1	31.7	46.0	14.3	Pre DAC 115V
1	1	0	N	1	6.745	qp	28.2	10.2	38.4	60.0	21.6	Pre DAC 115V
1	1	0	N	1	6.745	av	22.2	10.2	32.4	50.0	17.6	Pre DAC 115V
1	1	0	N	1	16.055	qp	23.2	10.4	33.6	60.0	26.4	Pre DAC 115V
1	1	0	N	1	16.055	av	19.1	10.4	29.4	50.0	20.6	Pre DAC 115V
2	1	0	L	1	0.325	qp	21.4	10.0	31.4	59.6	28.2	Pre DAC 115V
2	1	0	L	1	0.325	av	17.7	10.0	27.7	49.6	21.9	Pre DAC 115V
2	1	0	L	1	0.400	qp	21.4	10.0	31.4	57.9	26.4	Pre DAC 115V
2	1	0	L	1	0.400	av	19.0	10.0	29.0	47.9	18.8	Pre DAC 115V
2	1	0	L	1	0.670	qp	21.3	10.1	31.3	56.0	24.7	Pre DAC 115V
2	1	0	L	1	0.670	av	18.0	10.1	28.0	46.0	18.0	Pre DAC 115V
2	1	0	L	1	5.645	qp	21.0	10.2	31.2	60.0	28.8	Pre DAC 115V
2	1	0	L	1	5.645	av	19.5	10.2	29.7	50.0	20.3	Pre DAC 115V
2	1	0	L	1	7.060	qp	26.0	10.2	36.2	60.0	23.8	Pre DAC 115V
2	1	0	L	1	7.060	av	20.9	10.2	31.2	50.0	18.8	Pre DAC 115V
2	1	0	L	1	11.290	qp	27.3	10.3	37.6	60.0	22.4	Pre DAC 115V
2	1	0	L	1	11.290	av	22.6	10.3	33.0	50.0	17.0	Pre DAC 115V

Results	**Minimum Margin**	**11.8 dB**	
	PASS/FAIL	**PASS**	

Notes	Comments and Observations
N.B	PreDAC 115V. Results of scans are shown in plots 1 and 2. PreDAC power direct to LISN L1. All other units powered by LISN L2 via a multi-way power strip.

4.2 Conducted Emissions (Power) - PSXR 115V

Factor Set 1: L1_14A AB002_CBL005_CBL039_12A - -
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R10 L1 CSET001 L2

Conducted Emissions (Power)

Company: Cyrus Audio Ltd *Product:* PreDAC
Date: 15/05/2014 *Test Eng:* Joshua Gawthrop
Ports: ac power
Test: ANSI C63.4:2003 using limits of FCC(B) =CISPR22(B)
Ports:
Test: using limits of

Plot	Op Mode	Mod State	Line (L/N)	Fact Set	Freq. MHz	Det qp/ av	Rec. Level dBuV	Corr'n Factor dB	Total Level dBuV	Limit CISPR22(B) dBuV	Margin CISPR22(B) dB	Notes
3	1	0	L	1	0.400	qp	22.5	10.0	32.6	57.9	25.3	PSXR 115V
3	1	0	L	1	0.400	av	21.9	10.0	31.9	47.9	15.9	PSXR 115V
3	1	0	L	1	0.675	qp	25.0	10.1	35.1	56.0	20.9	PSXR 115V
3	1	0	L	1	0.675	av	19.8	10.1	29.9	46.0	16.1	PSXR 115V
3	1	0	L	1	0.795	qp	21.2	10.1	31.3	56.0	24.7	PSXR 115V
3	1	0	L	1	0.795	av	18.4	10.1	28.4	46.0	17.6	PSXR 115V
3	1	0	L	1	6.965	qp	25.9	10.2	36.1	60.0	23.9	PSXR 115V
3	1	0	L	1	6.965	av	20.8	10.2	31.0	50.0	19.0	PSXR 115V
3	1	0	L	1	11.290	qp	23.4	10.3	33.7	60.0	26.3	PSXR 115V
3	1	0	L	1	11.290	av	20.6	10.3	30.9	50.0	19.1	PSXR 115V
3	1	0	L	1	15.850	qp	22.2	10.4	32.5	60.0	27.5	PSXR 115V
3	1	0	L	1	15.850	av	16.7	10.4	27.0	50.0	23.0	PSXR 115V
4	1	0	N	1	0.170	qp	28.5	10.0	38.5	65.0	26.4	PSXR 115V
4	1	0	N	1	0.170	av	20.7	10.0	30.7	55.0	24.2	PSXR 115V
4	1	0	N	1	0.400	qp	24.7	10.0	34.8	57.9	23.1	PSXR 115V
4	1	0	N	1	0.400	av	21.6	10.0	31.6	47.9	16.2	PSXR 115V
4	1	0	N	1	0.665	qp	25.3	10.0	35.4	56.0	20.6	PSXR 115V
4	1	0	N	1	0.665	av	20.1	10.0	30.1	46.0	15.9	PSXR 115V
4	1	0	N	1	3.985	qp	22.5	10.2	32.7	56.0	23.3	PSXR 115V
4	1	0	N	1	3.985	av	21.7	10.2	31.9	46.0	14.1	PSXR 115V
4	1	0	N	1	7.055	qp	26.1	10.2	36.3	60.0	23.7	PSXR 115V
4	1	0	N	1	7.055	av	21.6	10.2	31.8	50.0	18.2	PSXR 115V
4	1	0	N	1	11.290	qp	23.8	10.3	34.1	60.0	25.9	PSXR 115V
4	1	0	N	1	11.290	av	20.9	10.3	31.2	50.0	18.8	PSXR 115V

Results	**Minimum Margin**	**14.1 dB**	
	PASS/FAIL	**PASS**	

Notes	Comments and Observations
	PSXR power. Results of scans shown in plots 3 and 4.
N.B	PSXR power direct to LISN L1. All other units powered by LISN L2 via a multi-way power strip.

4.3 Radiated Emissions - 3m Semi-anechoic chamber measurements

Factor Set 1: A15_14A - - CBL002_CBL069_10A 1 m cable
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R4 A15

Radiated Emissions

Company: Cyrus Audio Ltd *Product:* PreDAC
Date: 15/05/2014 *Test Eng:* Joshua Gawthrop
Ports:
Test: ANSI C63.4:2003 using limits of FCC(B) =FCC_B
Ports:
Test: using limits 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 FCC_B dBuV/m	Margin FCC_B dB	Notes
5	1	0	3	1	90.319	V	20.8	8.8		29.6	43.5	13.9	qp max
5	1	0	3	1	90.319	H	10.1	8.8		18.9	43.5	24.6	qp max
5	1	0	3	1	95.964	V	13.2	10.9		24.1	43.5	19.4	qp max
5	1	0	3	1	95.964	H	9.8	10.9		20.7	43.5	22.8	qp max
5	1	0	3	1	101.609	V	18.6	11.7		30.3	43.5	13.2	qp max
5	1	0	3	1	101.609	H	19.5	11.7		31.2	43.5	12.3	qp max
5	1	0	3	1	108.000	V	23.2	8.6		31.8	43.5	11.7	qp max
5	1	0	3	1	108.000	H	23.1	8.6		31.7	43.5	11.8	qp max

Results	**Minimum Margin**	**11.7 dB**	
	PASS/FAIL	**PASS**	

Notes	Comments and Observations
	Results of scans are shown in plots 5 to 7. Formal maximised quasi-peak measurements of frequencies likely to fall on or close to local FM radio stations. These measurements were made using a 120kHz bandwidth and a quasi-peak detector at a measurement distance of 3m in a semi-anechoic chamber.
Key:	qp - quasi-peak, av - average, pk - peak

4.4 Radiated Emissions - 3m O.A.T.S

Factor Set 1: A5_FS_12B - - CBL015_11A 1 m cable
Factor Set 2: - - - -
Factor Set 3: - - - -
Test Equipment: R4 A5

Radiated Emissions

Company: Cyrus Audio Ltd *Product:* PreDAC
Date: 16/05/2014 *Test Eng:* Peter Barlow
Ports:
Test: ANSI C63.4:2003 using limits of FCC(B) =FCC_B
Ports:
Test: using limits 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 FCC_B dBuV/m	Margin FCC_B dB	Notes
5	1	0	3	1	30.000	V	9.7	19.0		28.7	40.0	11.3	
5	1	0	3	1	30.000	H	2.8	19.0		21.8	40.0	18.2	
5	1	0	3	1	50.823	V	20.1	8.6		28.7	40.0	11.3	
5	1	0	3	1	50.823	H	8.0	8.6		16.6	40.0	23.4	
5	1	0	3	1	55.325	V	21.1	7.2		28.3	40.0	11.7	
5	1	0	3	1	55.325	H	10.7	7.2		17.9	40.0	22.1	
5	1	0	3	1	56.456	V	16.8	6.9		23.7	40.0	16.3	
5	1	0	3	1	56.456	H	11.0	6.9		17.9	40.0	22.1	
5	1	0	3	1	67.750	V	21.2	6.4		27.6	40.0	12.4	
5	1	0	3	1	67.750	H	17.1	6.4		23.5	40.0	16.5	
5	1	0	3	1	72.020	V	24.3	6.9		31.2	40.0	8.8	
5	1	0	3	1	72.020	H	21.6	6.9		28.5	40.0	11.5	
5	1	0	3	1	84.016	V	22.8	9.2		32.0	40.0	8.0	
5	1	0	3	1	84.016	H	14.3	9.2		23.5	40.0	16.5	
5	1	0	3	1	90.319	V	20.8	10.3		31.1	43.5	12.4	
5	1	0	3	1	90.319	H	17.4	10.3		27.7	43.5	15.8	
5	1	0	3	1	101.609	V	15.3	11.7	7.9	34.9	43.5	8.6	10k av
5	1	0	3	1	101.609	H	7.5	11.7	7.9	27.1	43.5	16.4	10k av
5	1	0	3	1	108.012	V	7.8	12.4	4.4	24.6	43.5	18.9	10k av
5	1	0	3	1	108.012	H	11.4	12.4	4.4	28.2	43.5	15.3	10k av
7	1	0	3	1	287.929	V	16.9	15.9		32.8	46.0	13.2	
7	1	0	3	1	287.929	H	24.1	15.9		40.0	46.0	6.0	

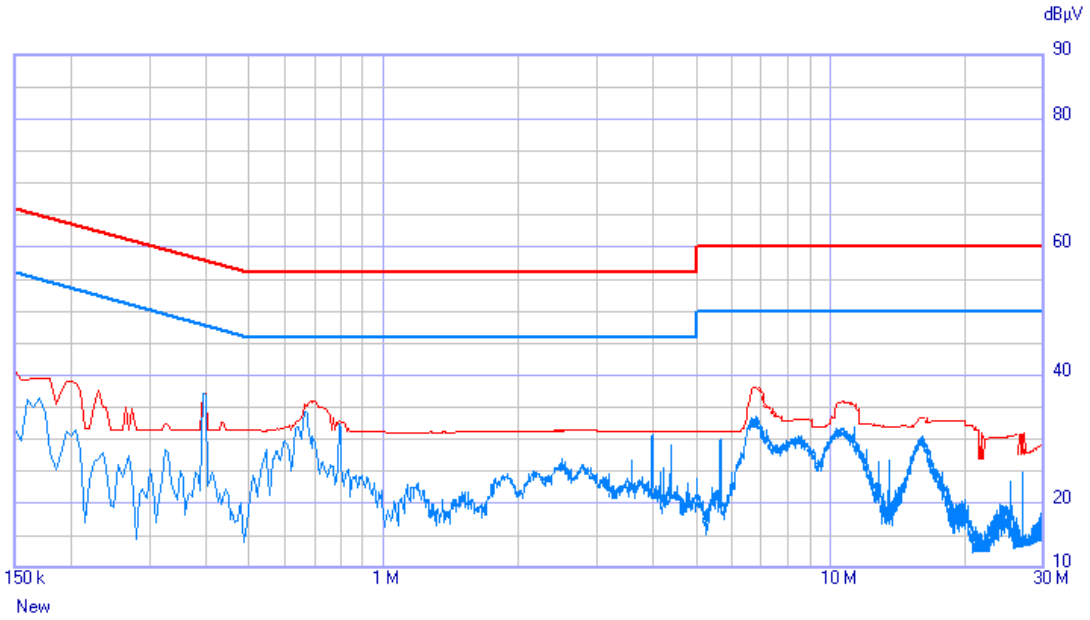
Results	**Minimum Margin**	**6.0**	**dB**
	PASS/FAIL	**PASS**	

Notes	Comments and Observations
	Results of scans shown in plots 5 to 7. The highest 11 frequencies are tabulated above. Further measurements were made. Unless otherwise noted measurements were made using a 120kHz bandwidth and a quasi-peak detector. These measurements were made at 3m on an Open Area Test Site.
Key:	qp - quasi-peak, av - average, pk - peak

4.5 Radiated Emissions Above 1GHz

Results of emissions measurements above 1GHz are shown in plots 8 & 9.

The plots show that maximised peak emissions were 28.8dB below the peak limit (8.84dB below the average limit). The video averaged plot shows a level 18.85dB below the average limit. It was therefore not considered necessary to tabulate individual values.



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (5 kHz)	P Q A pwr_B_QP Margin 5 dB	20 ms	9 kHz	10	OFF	ON	...	...
2	0.15	0.151	500 Hz	P pwr_B_Avg Margin 0 dB	1.9 ms	9 kHz	10	OFF	ON	...	...

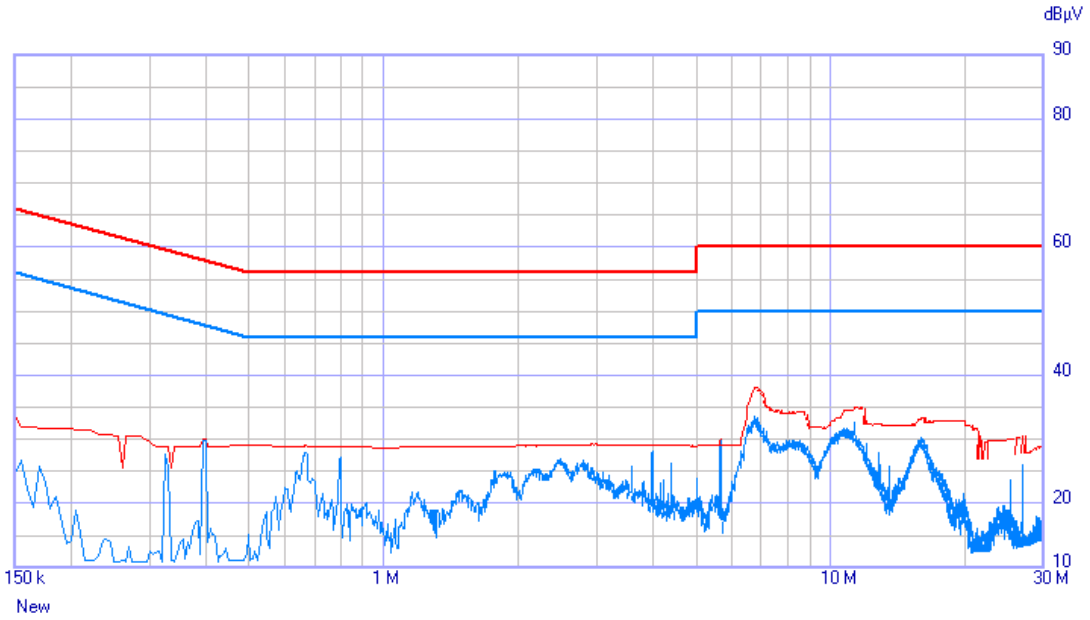
Ancillary = General
Limits:
pwr_B_QP
pwr_B_Avg
Factors:
L1
AB002_CBL005_CBL039
QPeak
Avg

PLOT 1 Conducted Emissions - 115V ac power - Neutral Line - PreDAC

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15 May 14	Test Engineer:	J. Gawthrop
Test:	FCC pt 15	Limit:	EN (B) QP + AV

Notes:
Op mode: USB streaming mode. Playing 1kHz tone. H pattern on PC.
Setup: PreDAC powered L1 115V. All other equipment powered via terminated L2.

Line:	Neutral 115V	Attenuator:		Operating Mode:	1
Detector:	Qp, Ave			Mod. State:	0
LISN:	EMCO	Filename:	C45156D9.png		



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (5 kHz)	P Q A pwr_B_QP Margin 5 dB	20 ms	9 kHz	10	OFF	ON	...	...
2	0.15	0.151	500 Hz	P pwr_B_Avg Margin 0 dB	1.9 ms	9 kHz	10	OFF	ON	...	...

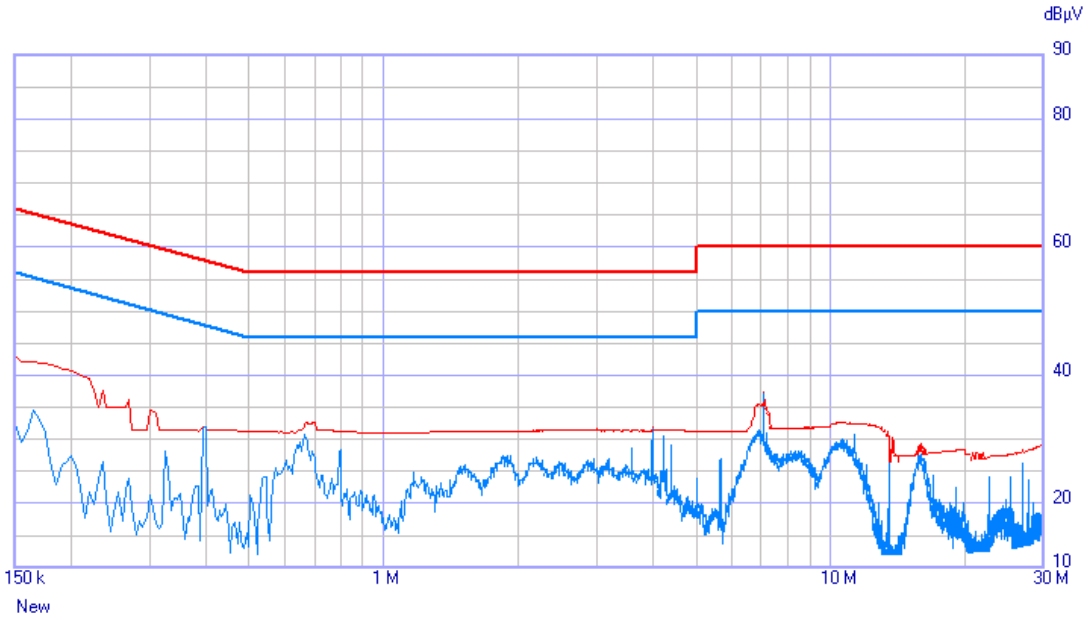
Ancillary = General
Limits:
pwr_B_QP
pwr_B_Avg
Factors:
L1
AB002_CBL005_CBL039
QPeak
Avg

PLOT 2 Conducted Emissions - 115V ac power - Live Line - PreDAC

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15 May 14	Test Engineer:	J. Gawthrop
Test:	FCC pt 15	Limit:	EN (B) QP + AV

Notes:
Op mode: USB streaming mode. Playing 1kHz tone. H pattern on PC.
Setup: PreDAC powered L1 115V. All other equipment powered via terminated L2.

Line:	Live 115V	Attenuator:		Operating Mode:	1
Detector:	Qp, Ave			Mod. State:	0
LISN:	EMCO	Filename:	C4515706.png		



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (5 kHz)	P Q A pwr_B_QP Margin 5 dB	20 ms	9 kHz	10	OFF	ON	...	...
2	0.15	0.151	500 Hz	P pwr_B_Avg Margin 0 dB	1.9 ms	9 kHz	10	OFF	ON	...	...

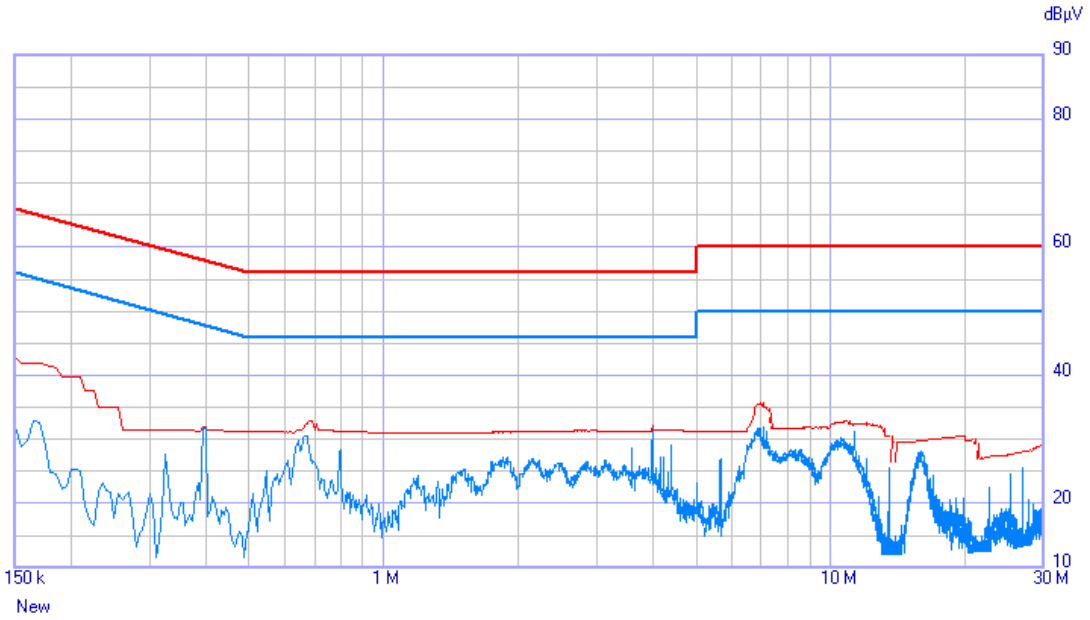
Ancillary = General
Limits:
pwr_B_QP
pwr_B_Avg
Factors:
L1
AB002_CBL005_CBL039
QPeak
Avg

PLOT 3 Conducted Emissions - 115V ac power - Live Line - PSXR

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15 May 14	Test Engineer:	J. Gawthrop
Test:	FCC pt 15	Limit:	EN (B) QP + AV

Notes:
Op mode: USB streaming mode. Playing 1kHz tone. H pattern on PC.
Setup: PSXR powered L1 115V. All other equipment powered via terminated L2.

Line:	Live 115V	Attenuator:		Operating Mode:	1
Detector:	Qp, Ave			Mod. State:	0
LISN:	EMCO	Filename:	C4515726.png		



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (5 kHz)	P Q A pwr_B_QP Margin 5 dB	20 ms	9 kHz	10	OFF	ON	...	...
2	0.15	0.151	500 Hz	P pwr_B_Avg Margin 0 dB	1.9 ms	9 kHz	10	OFF	ON	...	...

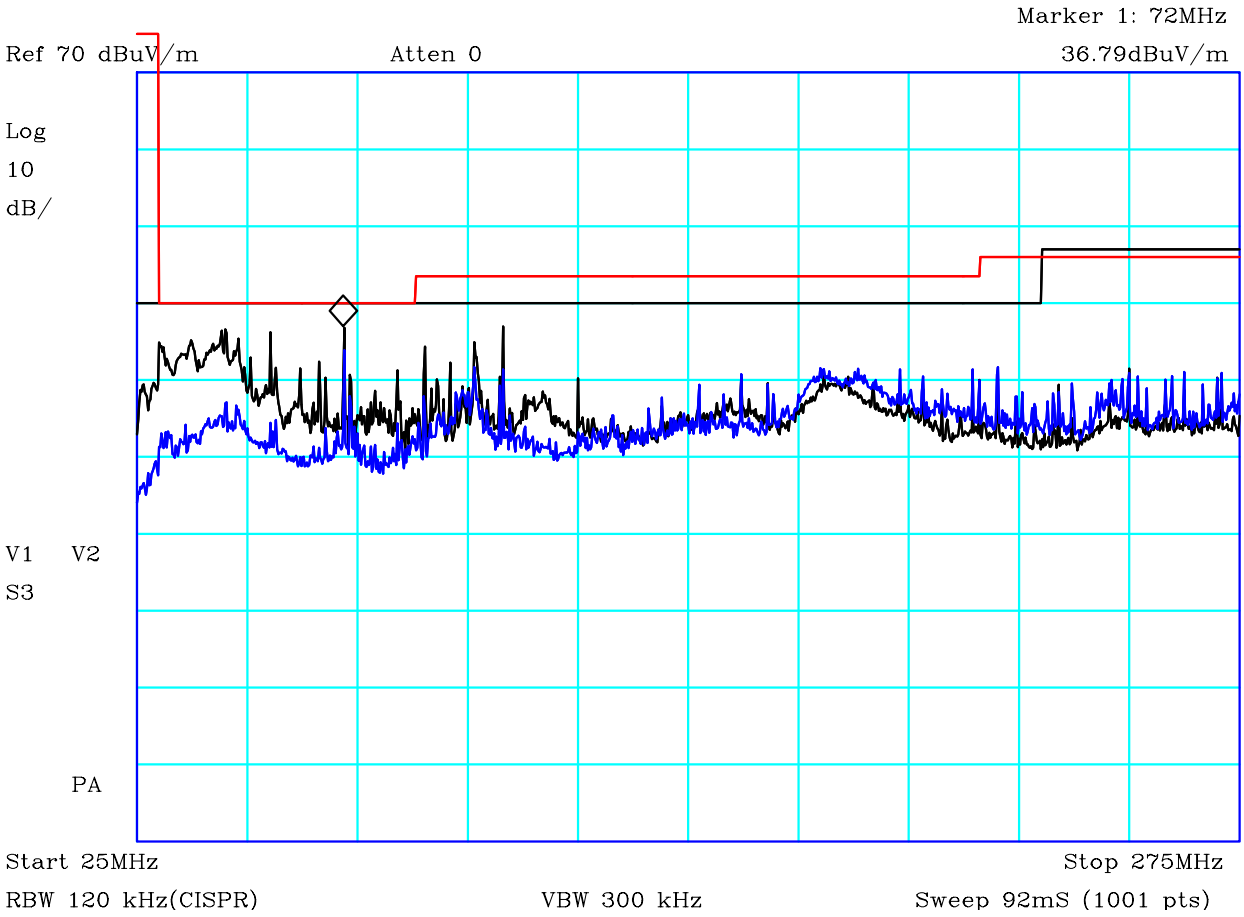
Ancillary = General
Limits:
pwr_B_QP
pwr_B_Avg
Factors:
L1
AB002_CBL005_CBL039
QPeak
Avg

PLOT 4 Conducted Emissions - 115V ac power - Neutral Line - PSXR

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15 May 14	Test Engineer:	J. Gawthrop
Test:	FCC pt 15	Limit:	EN (B) QP + AV

Notes:
Op mode: USB streaming mode. Playing 1kHz tone. H pattern on PC.
Setup: PSXR powered L1 115V. All other equipment powered via terminated L2.

Line:	Neutral 115V	Attenuator:		Operating Mode:	1
Detector:	Qp, Ave			Mod. State:	0
LISN:	EMCO	Filename:	C4515746.png		



CF1:A15_140317 CF2:CBL002_CBL069_100809 CF3:6db_PAD_140422

PLOT 5 Radiated Emissions - 25MHz to 275MHz

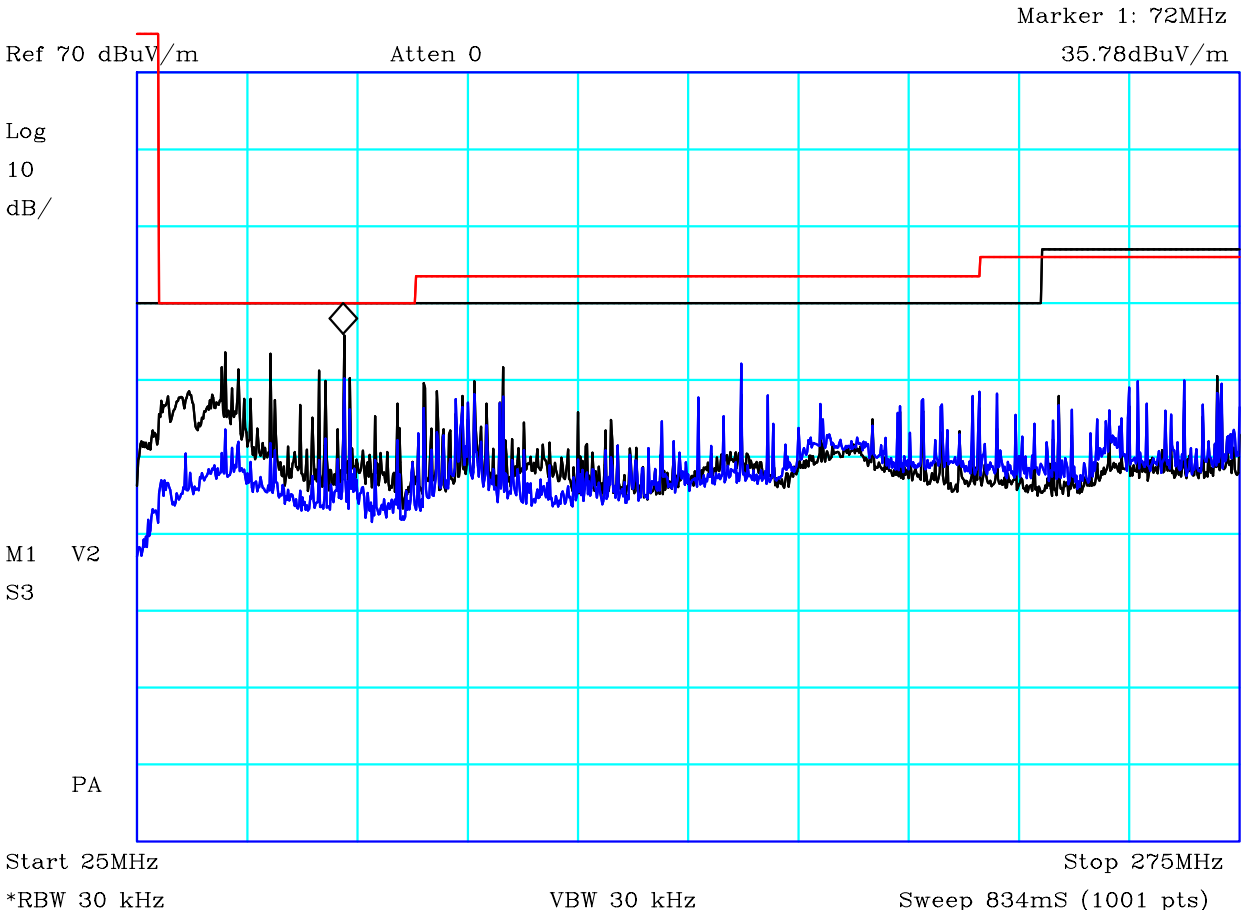
Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15/05/2014	Test Eng:	Joshua Gawthrop
Method:		Method:	
Limit1:(BLK)	EN55022(B)@3m	Limit2:(RED)	FCC(B)@3m
Limit3:		Limit4:	

Op mode: USB streaming mode. Playing 1kHz tone.
Setup mode: Pre DAC with PSXR. CDT connected to Pre DAC via SPDIF Coaxial and optical. X Power with speakers, connected to Pre DAC via analog and MCBUS. Switch powered from 230V, all others from 115V. Macbook connected to Pre DAC via USB. Switch connected to Macbook via CAT6 SFTP cable. Headphones connected. All other ports floating cable.

Vertical polarisation = Black trace, Horizontal = Blue trace.

NOTE: No radiated emissions are required below 30MHz. For the purposes of an easily interpreted frequency axis only, the sweep starts at 25MHz.

Facility:	Anech_1	Height	1,1.5,2m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H44154B6.txt	Analyser:	R13



CF1:A15_140317 CF2:CBL002_CBL069_100809 CF3:6db_PAD_140422

PLOT 6 Radiated Emissions - 25MHz to 275MHz - 30kHz rbw

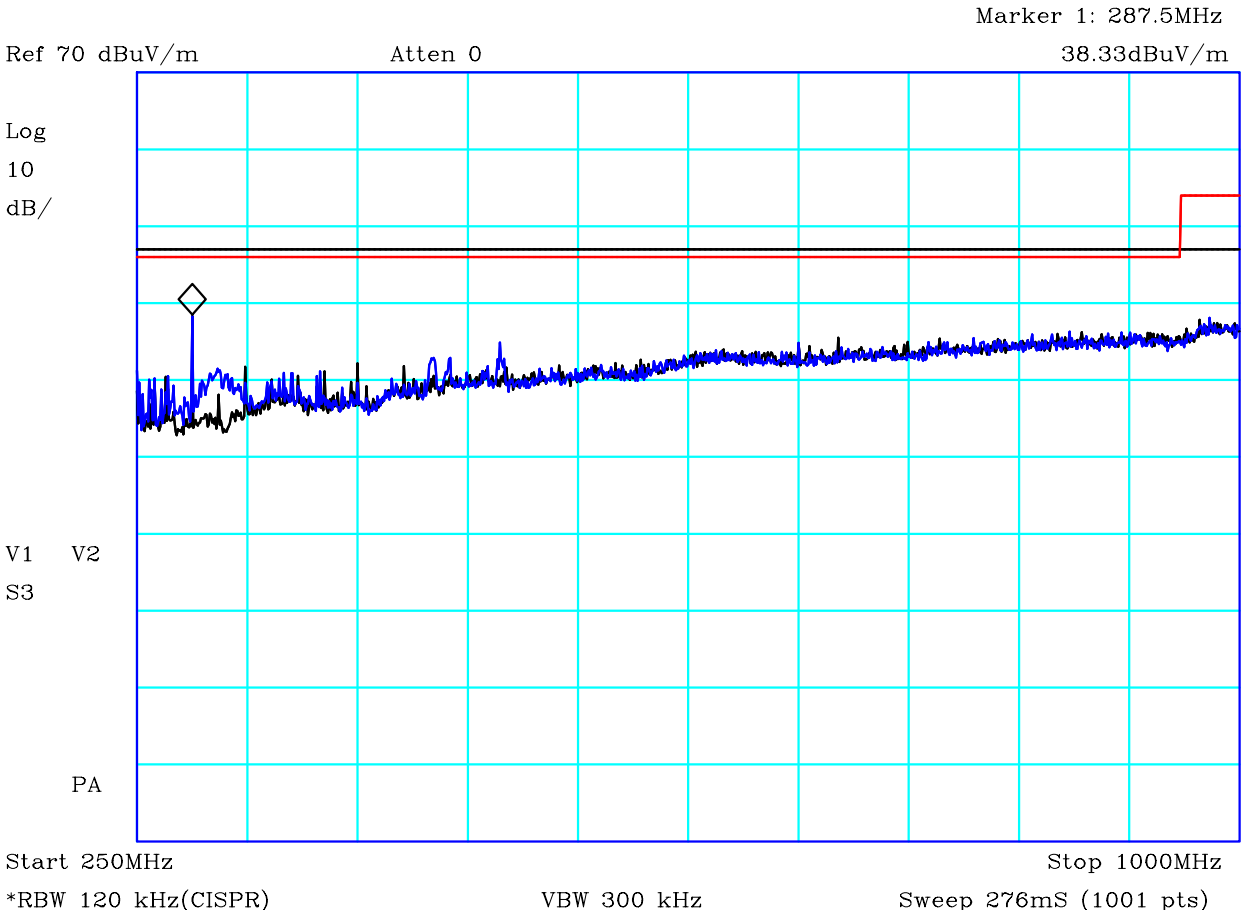
Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15/05/2014	Test Eng:	Joshua Gawthrop
Method:		Method:	
Limit1:(BLK)	EN55022(B)@3m	Limit2:(RED)	FCC(B)@3m
Limit3:		Limit4:	

Op mode: USB streaming mode. Playing 1kHz tone.
Setup mode: Pre DAC with PSXR. CDT connected to Pre DAC via SPDIF Coaxial and optical. X Power with speakers, connected to Pre DAC via analog and MCBUS. Switch powered from 230V, all others from 115V. Macbook connected to Pre DAC via USB. Switch connected to Macbook via CAT6 SFTP cable. Headphones connected. All other ports floating cable.

Vertical polarisation = Black trace, Horizontal = Blue trace.

30kHz rbw for information only.
NOTE: No radiated emissions are required below 30MHz.

Facility:	Anech_1	Height	1,1.5,2m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H44154CF.txt	Analyser:	R13



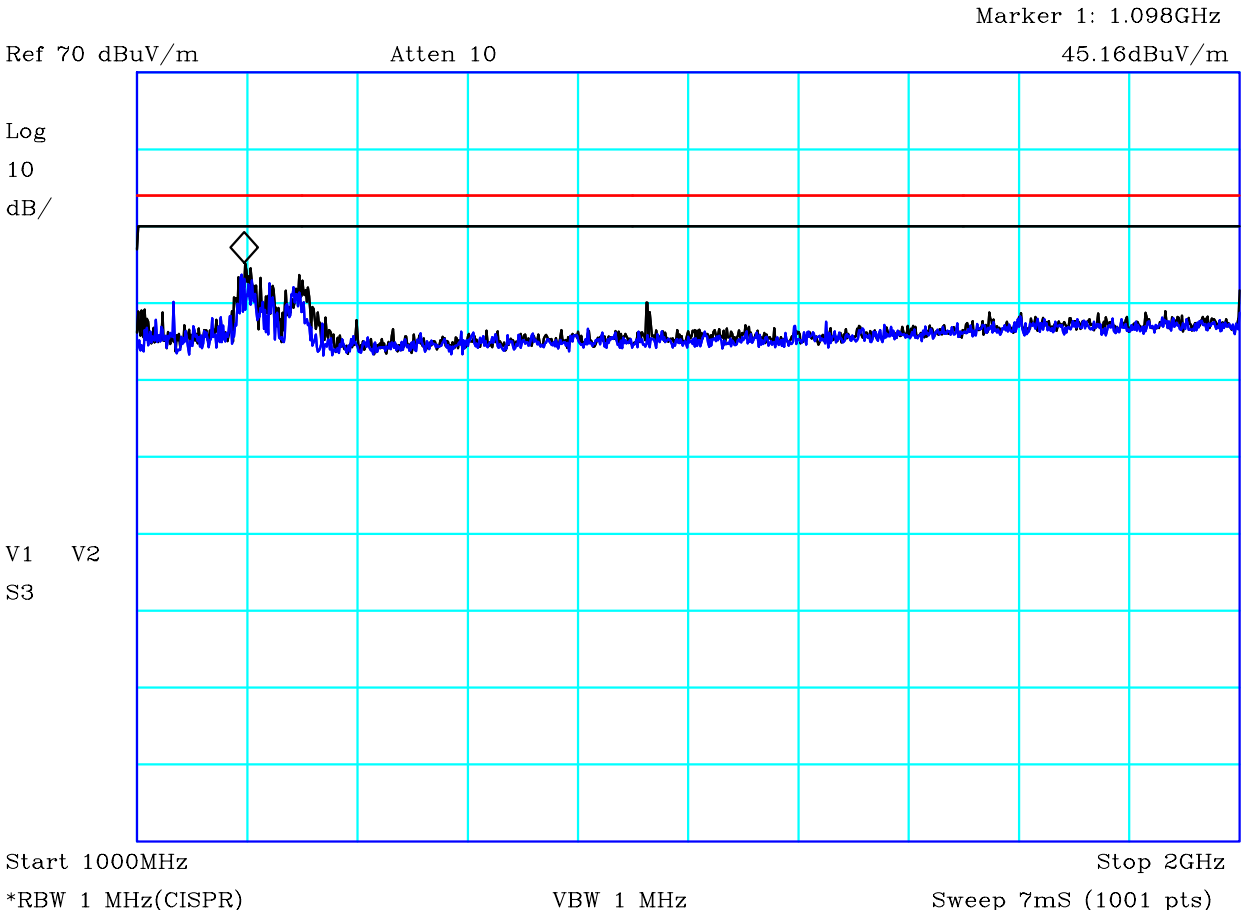
CF1:A15_140317 CF2:CBL002_CBL069_100809 CF3:6db_PAD_140422

PLOT 7 Radiated Emissions - 250MHz to 1GHz

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15/05/2014	Test Eng:	Joshua Gawthrop
Method:		Method:	
Limit1:(BLK)	EN55022(B)@3m	Limit2:(RED)	FCC(B)@3m
Limit3:		Limit4:	

Op mode: USB streaming mode. Playing 1kHz tone.
Setup mode: Pre DAC with PSXR. CDT connected to Pre DAC via SPDIF Coaxial and optical. X Power with speakers, connected to Pre DAC via analog and MCBUS. Switch powered from 230V, all others from 115V. Macbook connected to Pre DAC via USB. Switch connected to Macbook via CAT6 SFTP cable. Headphones connected. All other ports floating cable.
Vertical polarisation = Black trace, Horizontal = Blue trace.

Facility:	Anech_1	Height	1,1.5,2m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H44154E0.txt	Analyser:	R13



CF1:A23_3m_120820 CF2:CBL002_CBL069_100809 CF3:PRE10_140204

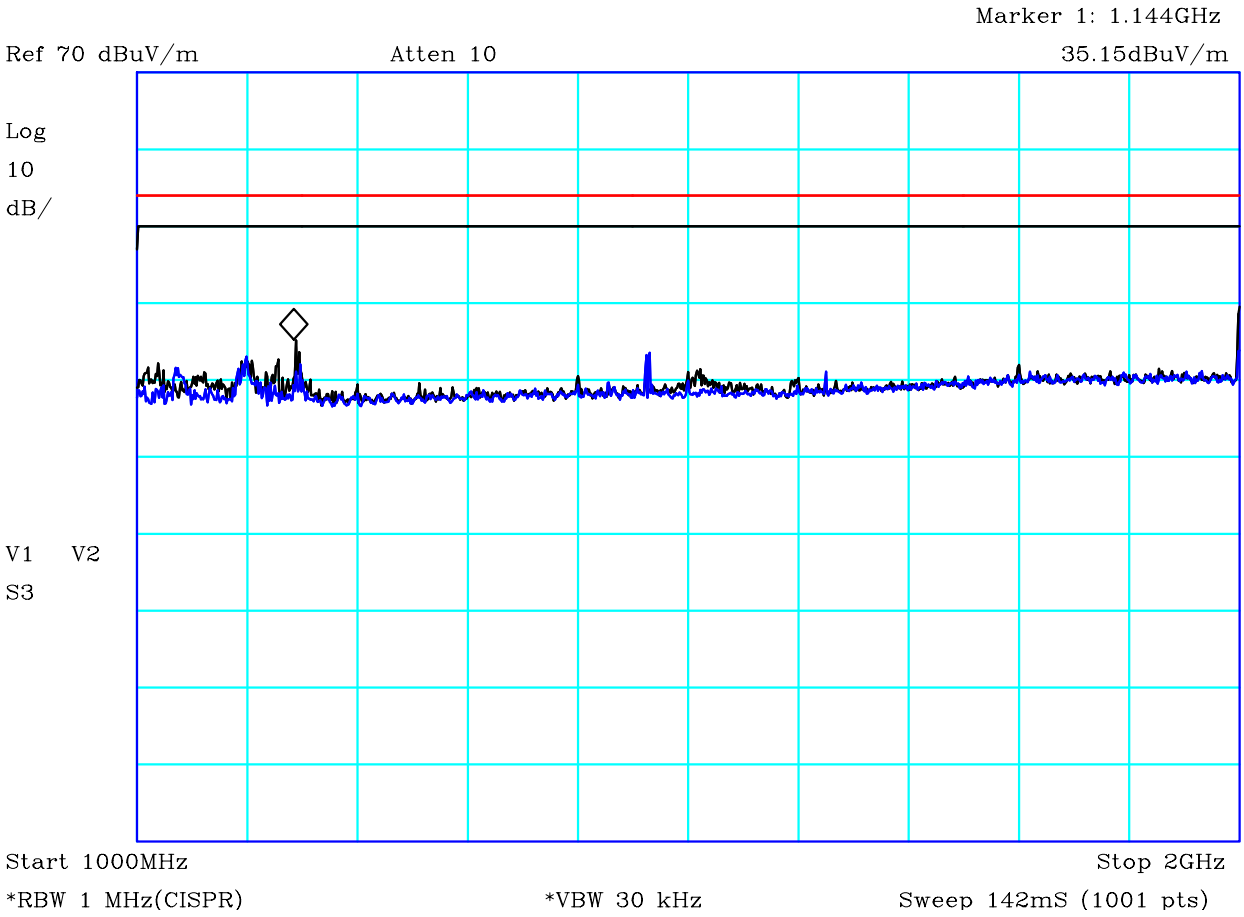
PLOT 8 Radiated Emissions - 1GHz to 2GHz - Peak Scan

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15/05/2014	Test Eng:	Joshua Gawthrop
Method:		Method:	
Limit1:(BLK)	EN55022(B)@3m	Limit2:(RED)	FCC(B)@3m
Limit3:		Limit4:	

Op mode: USB streaming mode. Playing 1kHz tone.
Setup mode: Pre DAC with PSXR. CDT connected to Pre DAC via SPDIF Coaxial and optical. X Power with speakers, connected to Pre DAC via analog and MCBUS. Switch powered from 230V, all others from 115V. Macbook connected to Pre DAC via USB. Switch connected to Macbook via CAT6 SFTP cable. Headphones connected. All other ports floating cable. Peak scan against average limits.
Vertical polarisation = Black trace, Horizontal = Blue trace.

Peak scan against average limits.

Facility:	Anech_1	Height	1,1.5,2m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H4415550.txt	Analyser:	R13



CF1:A23_3m_120820 CF2:CBL002_CBL069_100809 CF3:PRE10_140204

PLOT 9 Radiated Emissions - 1GHz to 2GHz - Video Average Scan

Company:	Cyrus Audio Ltd	Product:	PreDAC
Date:	15/05/2014	Test Eng:	Joshua Gawthrop
Method:		Method:	
Limit1:(BLK)	EN55022(B)@3m	Limit2:(RED)	FCC(B)@3m
Limit3:		Limit4:	

Op mode: USB streaming mode. Playing 1kHz tone.
Setup mode: Pre DAC with PSXR. CDT connected to Pre DAC via SPDIF Coaxial and optical. X Power with speakers, connected to Pre DAC via analog and MCBUS. Switch powered from 230V, all others from 115V. Macbook connected to Pre DAC via USB. Switch connected to Macbook via CAT6 SFTP cable. Headphones connected. All other ports floating cable.
Vertical polarisation = Black trace, Horizontal = Blue trace.

Video average scan against average limits.

Facility:	Anech_1	Height	1,1.5,2m	Mode:	1
Distance	3m	Polarisation	V+H	Modification State:	0
Angle	0-360	File:	H441555D.txt	Analyser:	R13