ANAVIEW

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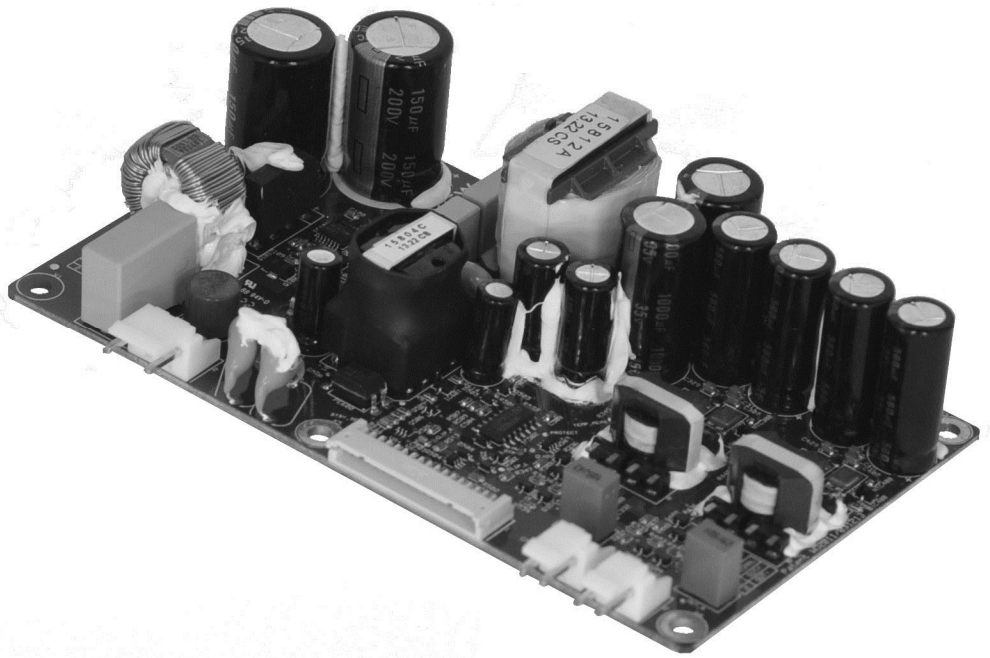
PRODUCT SPECIFICATION
AMPLIFIER MODULE
AMS0100



FEATURE LIST

- 2x50Wrms into 4Ý @ 1% THD
- 120Wrms BTL into 6Ý @ 1% THD
- Patented AMS (adaptive modulation servo) amplifier technology
- 100kHz load independent frequency range (-3dB)
- Almost flat THD vs frequency
- 115dB dynamic range
- Output impedance <10mÝ from 20Hz to 20kHz
- Differential inputs with 0.1% resistors for improved CMRR
- Automatic voltage doubler for universal mains
- Meets ErP and Energystar
- UL recognized
- CE approved
- +/-14V AUX outputs
- AUX output for third hanger channel

Article Number:	PDS-AMS0100	*Prepared:*	MC
Document Date:	2013-07-22	*Verified:*	JN
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SCOPE

These technical specifications describes the functionalities and features of the Anaview amplifier module AMS0100, an integrated audio solution combining high-end amplifier and power supply technology, capable of delivering 2x50W into 4Ω @1%THD, 2x25W into 8Ω @1%THD or 1x120W into 6Ω bridged. Short term RMS power 120 Wrms. Typical applications are audio receivers, powered speakers and residential audio system.

DISCLAIMER

The data sheet contains specifications that may be subject to change without prior notice. Responsibility for verifying the performance, safety, reliability and compliance with legal standards of end products using this subassembly falls to the manufacturer of said end product.

ANAVIEW products are not authorized for use as critical components in life support devices or life support systems without the express written approval of the president of ETAL Group AB. As used herein:
1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labelling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

GENERAL

Environmental conditions

Humidity	5 – 85% RH non condensing
Ambient Operating Temperature	0°C to +50°C
Storage Temperature	-40°C to +85°C

Regulations and compliances

EMC	Emission	Conducted Emission FCC 15V, Sec. 107 Class ”B” Radiated Emission FCC 15V, Sec. 109 Class ”B” Conducted Emission EN 55022 (2010) Class ”B” Telecom Conducted Emission EN 55022 (2010) Class ”B” Radiated Emission EN 55022 (2010) Class ”B” Power Line Harmonics EN 61000-3-2 (2006) + A1 (2009) + A2 (2009) Power Line Flicker EN 61000-3-3 (2008)	0.15 MHz – 30 MHz 30 MHz – 1 GHz 0.15 MHz – 30 MHz 0.15 MHz – 30 MHz 30 MHz – 1 GHz
	Immunity	ESD Immunity IEC 61000-4-2 (2008) Radio Frequency Immunity IEC 61000-4-3 (2006) + A1 (2007) + A2 (2010) Electrical Fast Transient Immunity IEC 61000-4-4 (2004) + A1 (2010) Surge Immunity IEC 61000-4-5 (2005) RF Common Mode Immunity IEC 61000-4-6 (2008) Power Frequency Magnetic Field IEC 61000-4-8 (2009) Voltage Dips and Short Interruptions IEC 61000-4-11 (2004)	Criterion B Criterion A Criterion B Criterion B Criterion B Criterion A Criterion B and C
Safety	LVD	IEC 60065:2001 + A1:2005 + A2:2010 EN 60065:2002 + A1:2006 + A11:2008 + A2:2010 + A12:2011 UL 60065 7th Ed. Revised 2012-09-21 CAN/CSA C22.2 No. 60065-03, 1st Ed., 2006-04 + A1:2006 + A2:2012	
Power Loss	ErP Energy Star	Designed to enable system compliance with: 2005/32/EC – 1275/2008: Standby/Off Mode Loss, Annex II Point 1 Energy Star – Consumer Audio Products, Phase II	

Miscellaneous product specifications

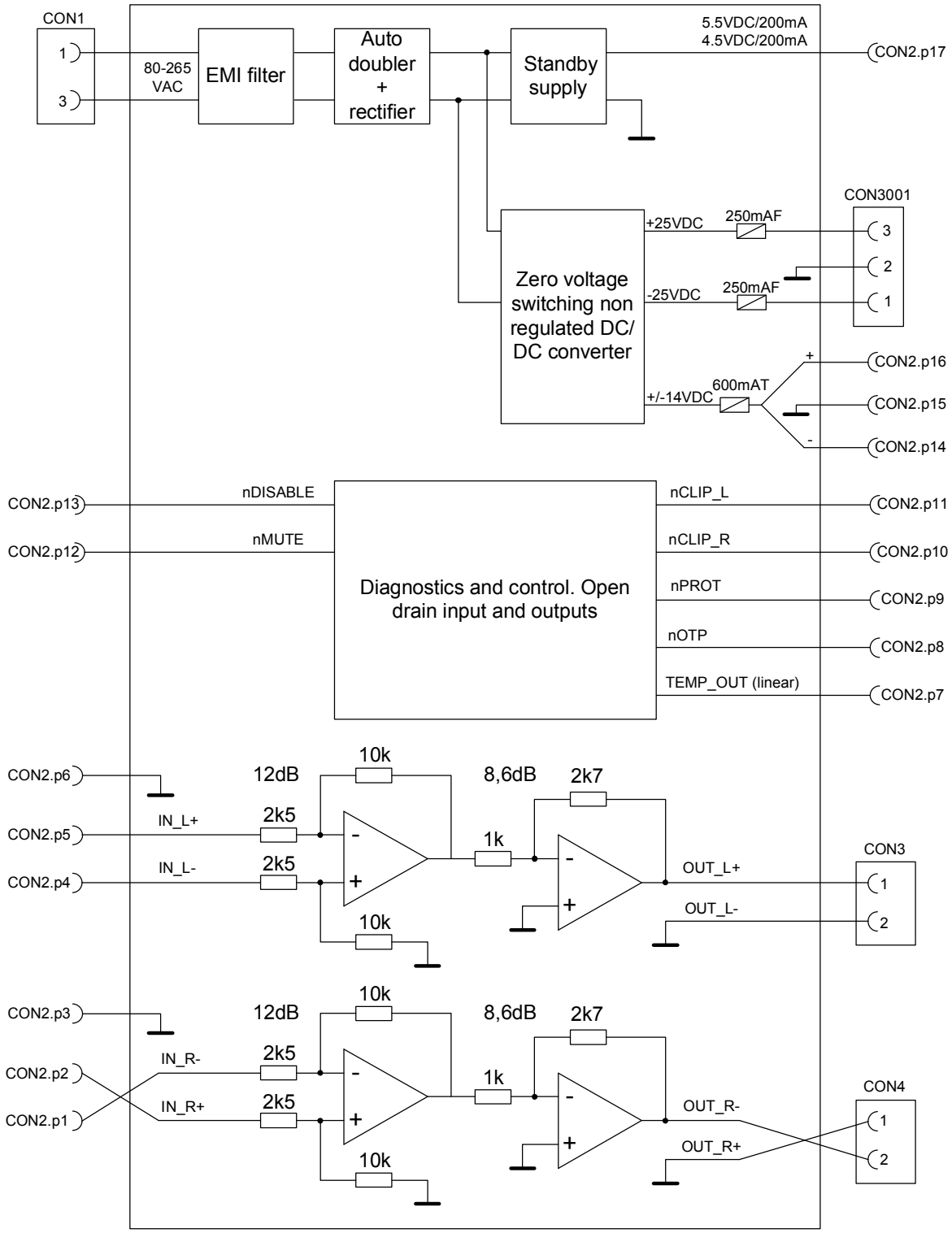
Cooling	Convection cooling
Mounting of the unit	See Figure 1 Board outline, dimensions
IEC Protection Class	Class II – Double insulation
Manufacturing according to workmanship standard	IPC-A-610, Revision D, February 2005

Model selection chart/ordering information

Model	Accepts Hanger Module†	Application
AMS0100-2300		Auto ranging 2-channel amplifier with 5.5V nominal standby supply meeting Energy Star/ErP.
AMS0100-2301		Auto ranging 2-channel amplifier with 4.5V nominal standby supply meeting Energy Star/ErP.
AMS0100-2500	✓	Auto ranging 2-channel amplifier with 5.5V nominal standby supply meeting Energy Star/ErP and ability to power 3rd channel for 2.1 systems and BTL + SE systems ideal for 2-way LF/HF active speakers.

† Hanger Module Option – offers AUX VS+ and VS- high voltage rails to power an optional Hanger Module amplifier channel.

BLOCK DIAGRAM



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MAINS VOLTAGE

Absolute maximum ratings

Parameter	Comment	Min	Max	Unit
Mains input voltage	The module automatically selects between 115/230V operation	-	264	VAC
Mains input freq.		45	63	Hz

Electrical specifications

Parameter	Comment	Min	Max	Unit
Recommended mains voltage range	For normal operation	95	240	VAC
Minimum mains starting voltage	Where all AUX supplies are available and amplifier is running.		90	VAC

AUDIO SPECIFICATIONS

Absolute maximum ratings

Parameter	Comment	Min	Max	Unit
Input signal single ended	Between IN_L+ and GND Between IN_L- and GND Between IN_R+ and GND Between IN_R- and GND	-	3	Vrms
Input signal balanced	Between IN_L+ and IN_L- Between IN_R+ and IN_R-	-	6	Vrms

Electrical specifications

Measured at 25°C ambient with no preheating unless otherwise specified

Parameter	Comment	Min	Typ	Max	Unit
Offset voltage	With open inputs		5	12	mV
Switching frequency	At idle with 4Ω load	370	400	430	kHz
Switching residual	At idle with 4Ω load		350		mVpk
Gain	At 1kHz with 4Ω load		20.6		dB
Idle noise	Unweighted with 4Ω load		25		µVrms
SNR 1W 8Ω	2.83Vrms/idle noise		101		dB
SNR 1W 4Ω	2.0Vrms/idle noise		98		dB
Dynamic range 4Ω	15Vrms/idle noise		115		dB
Common mode rejection	IN+ and IN- connected together. 100Hz signal applied to input. Rejection measured at the output.		55		dB

Input impedance single ended (*1)	Non symmetrical on positive and negative inputs	2.5		12.5	kΩ
Input impedance balanced (*1)	Non symmetrical on positive and negative inputs	1.39		12.5	kΩ
Upper bandwidth limit	Point of -3dB vs gain at 1kHz with 4Ω load		100		kHz
Gain deviation	From 20Hz to 20kHz		-0.2		dB
Upper full power bandwidth (*2)	Level calibrated at 1% THD at 1kHz.		20		kHz
Lower bandwidth limit (*3)	Point of -3dB vs gain at 1kHz with 4Ω load		DC		Hz
Recommended load impedance single ended	Recommended for optimized efficiency and audio performance	3	4	-	Ω
Recommended load impedance BTL	Recommended for optimized efficiency and audio performance	6	8	-	Ω
Output impedance @ 100Hz	Measuring output voltage while injecting 1Arms into output. 1mV=1mΩ		4		mΩ
Output impedance @ 20kHz	Measuring output voltage while injecting 1Arms into output. 1mV=1mΩ		4		mΩ

(*1) The input impedance on IN+ and IN- is not identical and also different between channels. See application notes below for more information.
(*2) Sustained operation at full power above this frequency may result in damage to the module.
(*3) Requires symmetrical loading and signal generation on both channels.

Power specifications SE operation

Maximum output current	Measured with one period of 1kHz sine wave		10		Apk
Maximum long term output power into 8Ω	Measured with both channels driven @ 1% THD+N		2x25		Wrms
Maximum long term output power into 4Ω	Measured with both channels driven @ 1% THD+N		2x50		Wrms
Maximum long term output power into 3Ω	Measured with both channels driven @ 1% THD+N		2x60		Wrms
Maximum infinite output power into 8Ω	Measured with both channels driven in 45°C ambient temperature.		2x6.25		Wrms
Maximum infinite output power into 4Ω	Measured with both channels driven in 45°C ambient temperature.		2x6.25		Wrms
Maximum infinite output power into 3Ω	Measured with both channels driven in 45°C ambient temperature.		2x7.5		Wrms
FTC power rating	1 hour pre heating with 1/8 of specified power and subsequently		2x25		Wrms

into 8Ω	5 min. with specified power at 120/230Vac, 1kHz input, ambient temp. 25'C still air. Open frame. Board mounted vertically.				
FTC power rating into 4Ω	1 hour pre heating with 1/8 of specified power and subsequently 5 min. with specified power at 120/230Vac, 1kHz input, ambient temp. 25'C still air. Open frame. Board mounted vertically.		2x50		Wrms
FTC power rating into 3Ω	1 hour pre heating with 1/8 of specified power and subsequently 5 min. with specified power at 120/230Vac, 1kHz input, ambient temp. 25'C still air. Open frame. Board mounted vertically.		2x45		Wrms
Max short term RMS power into 8Ω	500ms of 1kHz sine wave @ 1%THD.		30		Wrms
Max short term RMS power into 4Ω	500ms of 1kHz sine wave @ 1%THD.		56		Wrms
Max short term RMS power into 3Ω	500ms of 1kHz sine wave @ 1%THD.		67		Wrms

Power specifications BTL operation

Maximum long term output power into 8Ω	Measured with both channels driven @ 1% THD+N		100		Wrms
Maximum long term output power into 6Ω	Measured with both channels driven @ 1% THD+N		120		Wrms
Maximum continuous output power into 8Ω	Measured in 45°C ambient temperature.		15		Wrms
Maximum continuous output power into 6Ω	Measured in 45°C ambient temperature.		12.5		Wrms
FTC power rating into 8Ω	1 hour pre heating with 1/8 of specified power and subsequently 5 min. with specified power at 120/230Vac, 1kHz input, ambient temp. 25'C still air. Open frame. Board mounted vertically.		100		Wrms
FTC power rating into 6Ω	1 hour pre heating with 1/8 of specified power and subsequently 5 min. with specified power at 120/230Vac, 1kHz input, ambient temp. 25'C still air. Open frame. Board mounted vertically.		90		Wrms
Max short term RMS power into 8Ω	500ms of 1kHz sine wave @ 1%THD.		100		Wrms
Max short term RMS power into 6Ω	500ms of 1kHz sine wave @ 1%THD.		123		Wrms

DIAGNOSTIC SIGNALS

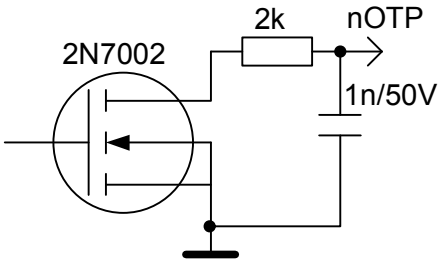
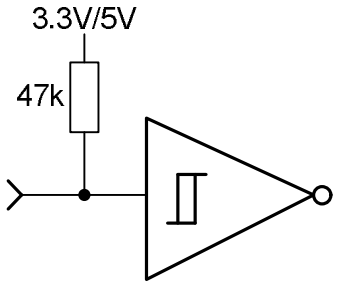
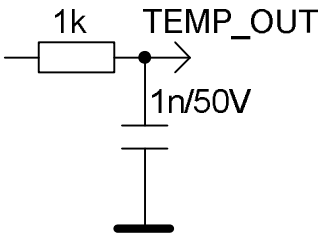
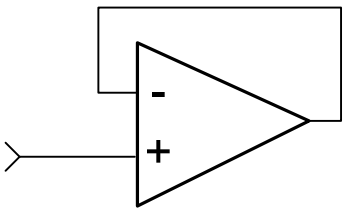
Diagnostics outputs	Output type	Voltage range		I Max cont.	Function
		Min	Max		
nPROT	Open drain with 2kohm in series(*1)	N/A	VA+(*3)	5mA	Signals during: - Over voltage shutdown - VA+/- fuse is blown - Startup until rails are OK
nCLIP_L	Open drain with 2kohm in series(*1)	N/A	VA+(*3)	5mA	Signals when the output generates >0,1%THD+N
nCLIP_R	Open drain with 2kohm in series(*1)	N/A	VA+(*3)	5mA	Signals when the output generates >0,1%THD+N
nOTP	Open drain with 2kohm in series(*1)	N/A	VA+(*3)	5mA	Signals when the hottest component reaches approx 110°C
TEMP_OUT	Linear(*2)	0	3.5	5mA	Displays the temperature of the hottest component inside AMS0100

(*1) Open drain outputs with 2kohm in series to limit the current.

(*2) The TEMP_OUT output is a linear signal with 1kohm in series to limit the current.

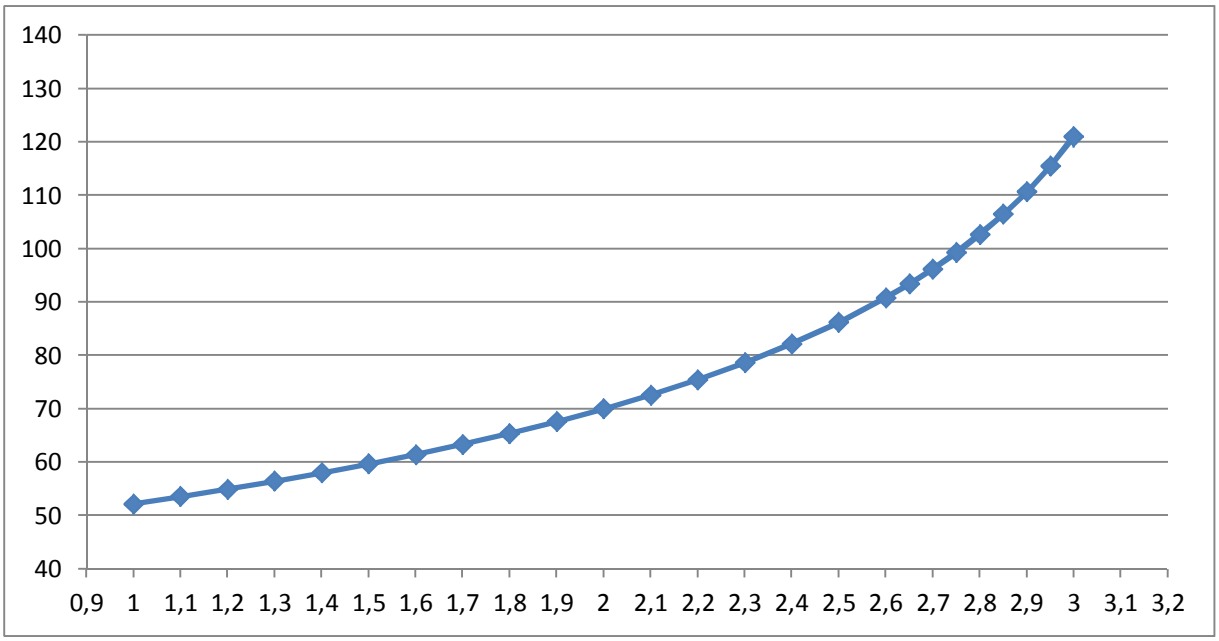
(*3) Recommended maximum voltage to which a pull up resistor should be connected.

Proposed interfaces

Diagnostics output	AMS0100 output circuit	Proposed interface
nPROT, nCLIP_L, nCLIP_R, nOTP. The MOSFET 2N7002 is turned on during the corresponsing situations.		
TEMP_OUT This output shows the temperature of the hottest position inside the module. Internal supervision shuts down the amplifiers when this output reaches 2.86V which corresponds to 100°C.		

Temp out

The below graph shows how the output signal TEMP_OUT follows the hottest component in the AMS0100 module. X-axis is voltage and Y-axis is temperature in °C. 2.86V on TEMP_OUT signal is shut down threshold.



The temperature can also be described using the formula below

TEMP=(3428/LN(53532-(15851*TEMP_OUT)))-273,15

CONTROL INPUTS

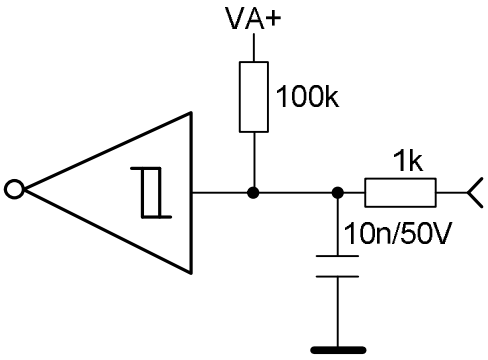
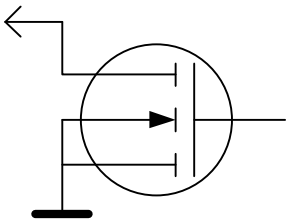
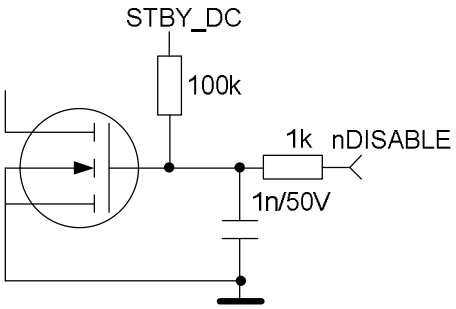
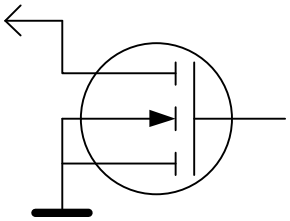
Absolute maximum ratings

Parameter	Comment	Min	Max	Unit
nDISABLE		0	VA+	V
nMUTE		0	VA+	V

Electrical specifications

Parameter	Comment	Min	Typ	Max	Unit
nDISABLE activation threshold	Threshold for disabling the AMS0100 module (active low)	1.0	2.0	2.75	V
nDISABLE deactivation threshold	Threshold for enabling the AMS0100 module	1.0	2.0	2.75	V
nDISABLE activation time	Time from setting nDISABLE low to amplifier stop		2		ms
nDISABLE deactivation time 230VAC	Time from setting nDISABLE high to amplifier start		1000		ms
nDISABLE deactivation time 115VAC	Time from setting nDISABLE high to amplifier start		2200	3000	ms
nMUTE activation threshold	Threshold for muting the AMS0100 module (active low). 30% of VA+.		0.3xVA+		V
nMUTE deactivation threshold	Threshold for unmuting the AMS0100 module. 70% of VA+.		0.7xVA+		V
nMUTE activation time	Time from setting nMUTE low to amplifier stop			1	ms
nMUTE deactivation time	Time from setting nMUTE high to amplifier start		8		ms

Proposed interfaces

Control signal	AMS0100 input circuit	Proposed interface
nMUTE When this input is pulled down the amplifiers are muted. The Schmitt trigger has CMOS thresholds and is supplied by VA+ meaning the "high to low" threshold is 70% of VA+ and the "low to high" threshold is 30% of VA+.		
nDISABLE The entire module is turned off and put in standby mode when this input is pulled down. During this state, only the STBY_DC output is available. The internal gate pull up resistor is pulled up to STBY_DC.		

AUXILIARY SUPPLIES

AUX outputs	Nom. voltage	Voltage fluctuation		I Max cont.	Comments
		Min	Max		
STBY_DC output supply **AMS0100-2300 AMS0100-2500**	+5.5VDC	+4.0VDC	+6.4VDC	200mA	25mA for <0,5W standby consumption
STBY_DC output supply **AMS0100-2301**	+4.5VDC	+3.6VDC	+5.5VDC	200mA	25mA for <0,5W standby consumption
AUX output supply voltage VA+(*1) No signal to 20Hz full power output 90-264VAC	+14VDC	+6.0VDC	+16.5VDC	600mA *2)	Max capacitive load 330uF
AUX output supply voltage VA-(*1) No signal to 20Hz full power output 90-264VAC	-14VDC	-6.0VDC	-16.5VDC	600mA *2)	Max capacitive load 330uF
AUX output supply voltage VS+(*1) No signal to 20Hz full power output 90-264VAC	+26VDC	+12.5VDC	+30.0VDC	250mA *3)	Optional feature. Only for supplying Anaview hanger module
AUX output supply voltage VS-(*1) No signal to 20Hz full power output 90-264VAC	-26VDC	-12.5VDC	-30.0VDC	250mA *3)	Optional feature. Only for supplying Anaview hanger module

(*1) The AUX outputs are unregulated and vary with load and AC input voltage.

(*2) Maximum continuous output current on VA+ and VA- is in sum 600mA. This allows for any load combination between the two outputs in total giving 600mA, i.e at most 600mA on one and 0mA at the other.

If these outputs are shorted a fuse (F200) blows and has to be replaced, see page 31.

(*3) Maximum continuous output current on VS+ and VS- is fused to 250mA each. These outputs should only be used to power a high frequency (>500Hz) 50W 4Ω hanger module.

STBY_DC vs load current

The standby voltage is only softly regulated and hence varies with the load current.

AUX outputs	Voltage fluctuation		Load range
	Min	Max	
AUX output supply voltage STBY_DC **AMS0100-2300** and **AMS0100-2500**	+4.0VDC	+6.4VDC	0 to 200mA
	+4.8VDC	+5.9VDC	2 to 20mA

POWER CONSUMPTION AND EFFICIENCY

Idle and standby consumption

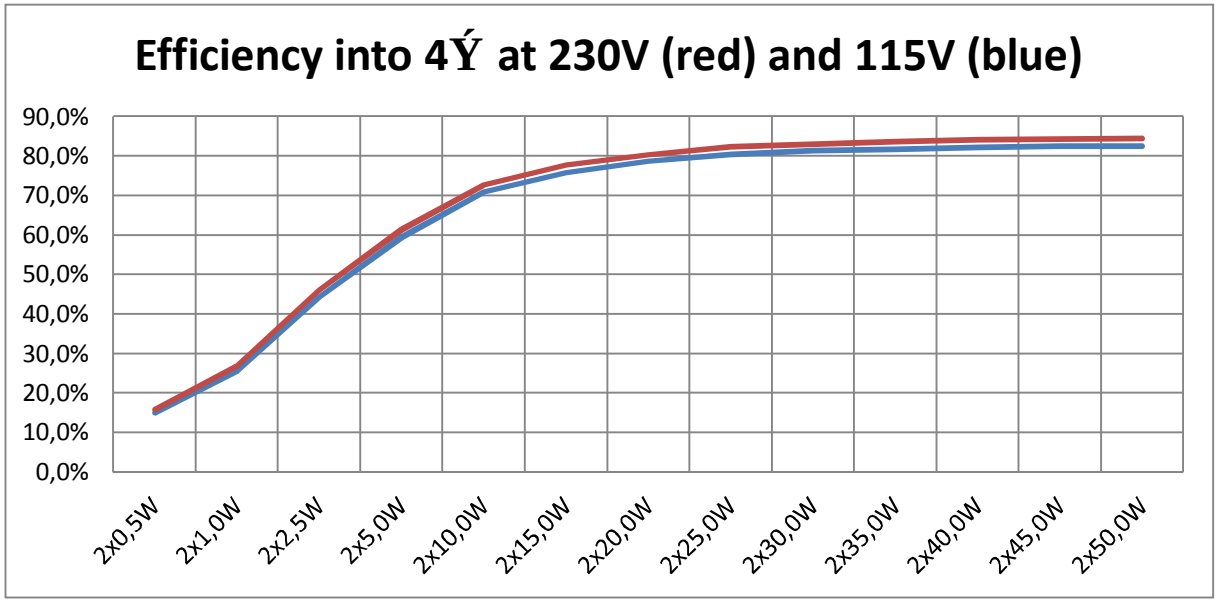
Parameter	Comment	Min	Typ	Max	Unit
Idle consumption at 230VAC	nMUTE and nDISABLE set high at 230VAC with no load on VA+/VA or STBY_DC		5.3		W
Idle consumption at 115VAC	nMUTE and nDISABLE set high at 230VAC with no load on VA+/VA or STBY_DC		5.7		W
Standby consumption at 230VAC, unloaded	nDISABLE set low at 230VAC with no load on STBY_DC		180		mW
Standby consumption at 115VAC, unloaded	nDISABLE set low at 115VAC with no load on STBY_DC		63		mW
Standby consumption at 230VAC, loaded	nDISABLE set low at 230VAC with 25mA load on STBY_DC		450		mW
Standby consumption at 115VAC, loaded	nDISABLE set low at 115VAC with 25mA load on STBY_DC		340		mW

Maximum load for ErP and Energy Star compliance

Compliance	Comment	STBY_DC	VA+/-	
ErP compliance	Maximum load to ensure <500mW standby consumption. Measured at 230VAC.	25	-	mA
Energy star	Maximum load (VA+ and VA- combined) to ensure <10W total idle consumption. Measured at 115/230VAC	25	240	mA

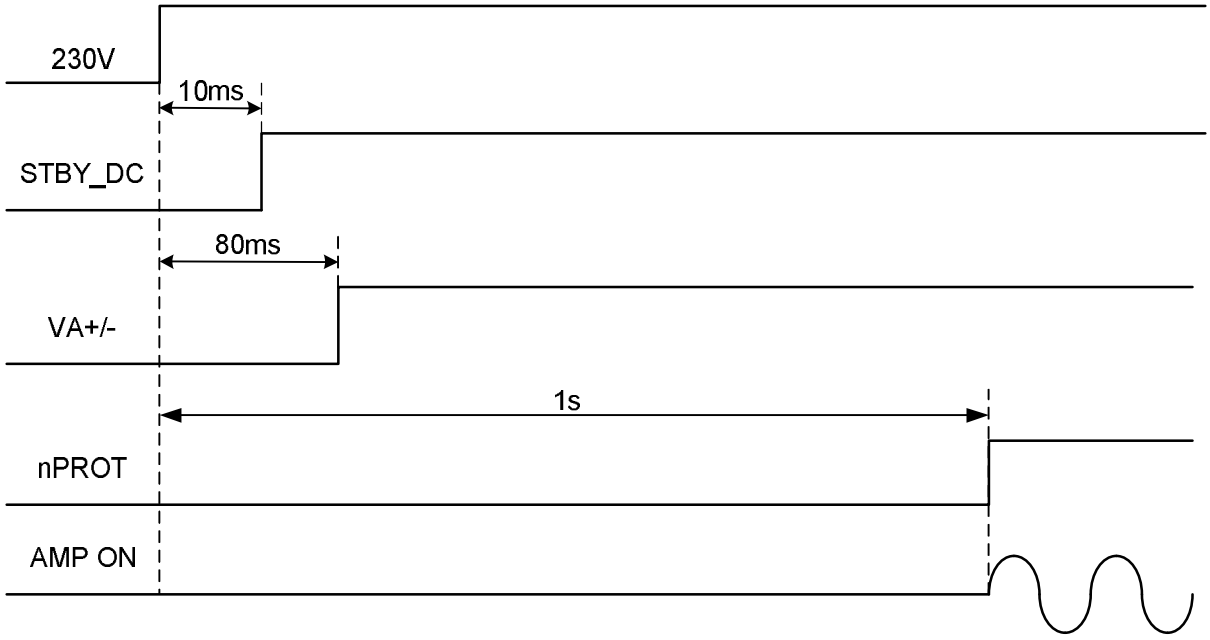
Efficiency

Into 4Ý at 230VAC and 115VAC

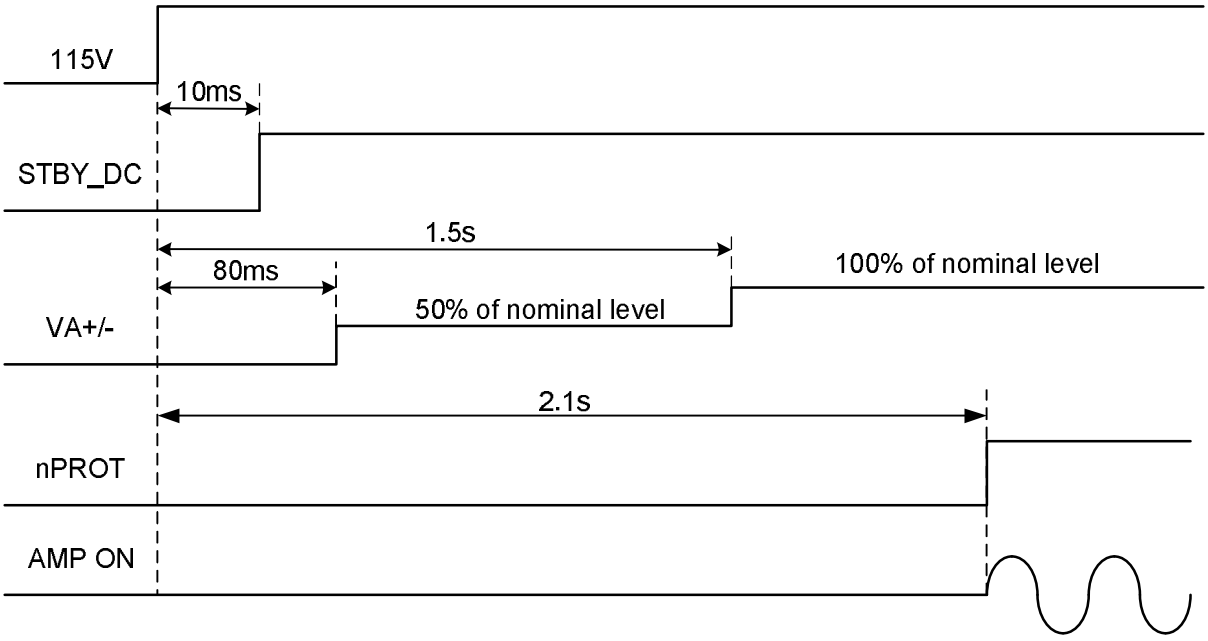


TIMING CHARTS

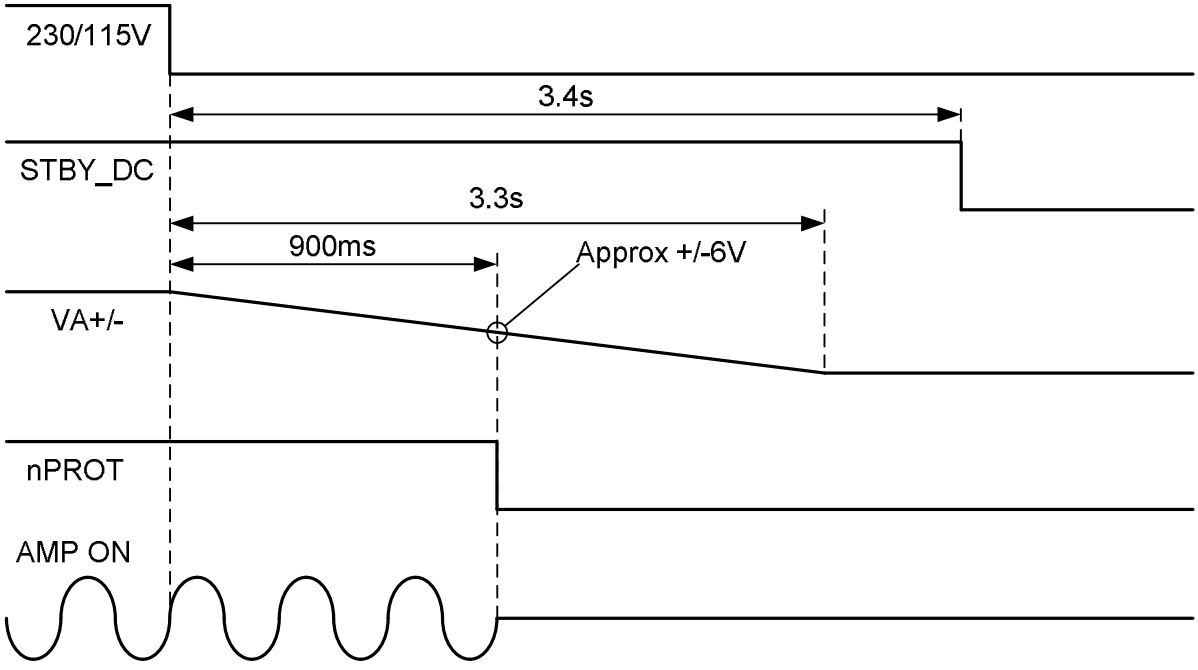
230V switch on



115V switch on

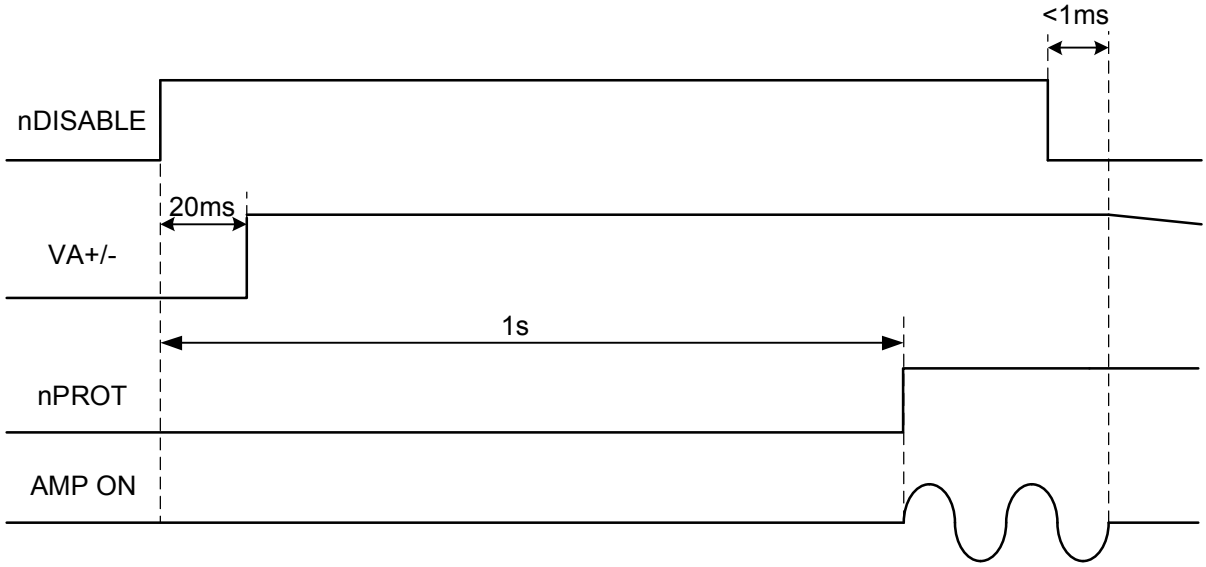


Mains switch off

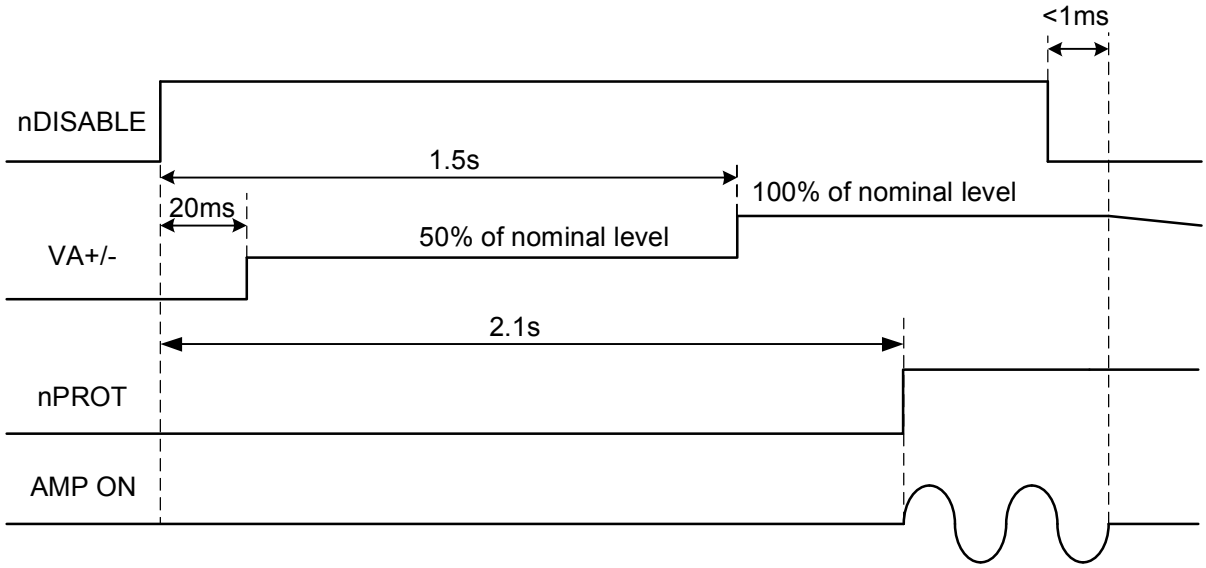


Note: Nominal load on VA+/- and STBY_DC

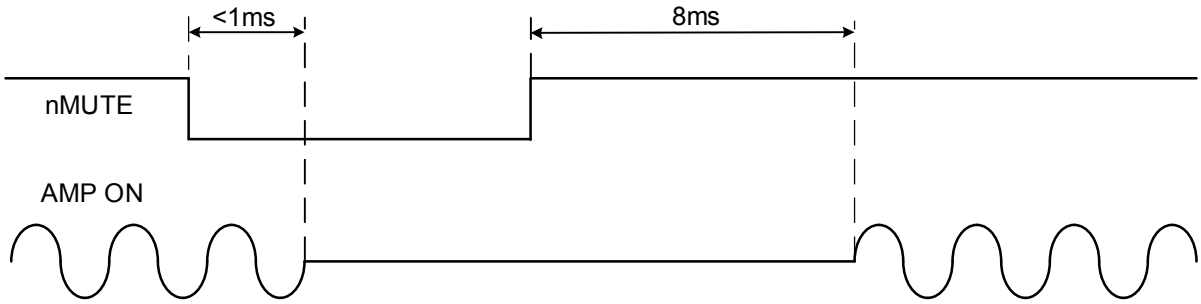
nDISABLE @ 230V



nDISABLE @ 115V



nMUTE



PROTECTION

Mains input fuse	T1.6AE Littelfuse 38211600000
Over temperature protection	Amplifier shut down by over temperature. Threshold temperature : 102(min) – 107(typ) – 112(max)°C TEMP_OUT is 2.86V at shut down. Sensor connected to power FETs of amplifier channels and to rectifier diodes in the power supply.
Over voltage protection	Power shut down by over voltage on output voltage rail. This can occur during severe railpumping or a mains voltage above 264VAC.
Over current protection	Current limit threshold: 10Apk (0.5Ω load, 1kHz burst). Power shut down when over current limit persists.

CONNECTIONS

Connector	Connector type	Mating connector
CON1 (mains)	2-pin, 0.312” (7.92mm) locking header JST S2P3-VH (LF) (SN)	JST VHR-3N Crimp terminal SVH-41T-P1.1
CON2 (signal)	17-pin dual Z-row connector JST S17B-CZHK-B-1	JST 17CZ-6H Crimp terminal SCZH-002T-P0.5
CON3,4 (speakers)	2pin 0.156” (3.96mm) locking header JST S2P-VH (LF) (SN)	JST VHR-2N Crimp terminal SVH-41T-P1.1
CON3001 (hanger)	3 pin 0.156” (3.96mm) locking header JST B3P-VH (LF) (SN)	JST VHR-3N Crimp terminal SVH-41T-P1.1

Mains voltage connector (CON1)

1	AC_N	Neutral
2	AC_L	Live

Signal connector pinning (CON2)

1	IN_R-	Right audio channel negative input.
2	IN_R+	Right audio channel positive input.
3	GNDs	Secondary side ground
4	IN_L-	Left audio channel negative input.
5	IN_L+	Left audio channel positive input.
6	GNDs	Secondary side ground
7	TEMP_OUT	Linear temp output signal.
8	nOTP	Over temp shutdown output signal.
9	nPROT	PSU shutdown output signal.
10	nCLIP_R	Clip detect output signal.
11	nCLIP_L	Clip detect output signal.
12	nMUTE	Mute input signal.
13	nDISABLE	Standby mode activation signal.
14	VA-	AUX output voltage VA-
15	GNDs	Secondary side ground
16	VA+	AUX output voltage VA+
17	STBY_DC	AUX output voltage STBY_DC

Left speaker connector (CON3)

1	OUT_L+	Left audio channel positive output.
2	OUT_L-	Left audio channel negative output.

Right speaker connector (CON4)

1	OUT_R+	Right audio channel positive output.
2	OUT_R-	Right audio channel negative output.

Hanger connector (CON3001)

1	VS-	AUX output voltage VS+
2	GNDs	Secondary side ground.
3	VS+	AUX output voltage VS-

MECHANICAL OUTLINE

Size (l x w x h)	130x75x30mm, see Figure 1. Board outline, dimensions below. Max component height/lead length on PCB bottom side: 4.0 mm 30mm height measured from bottom side of PCB to highest component on top side. For total height of unit add the 4mm max component height/lead length on PCB bottom side, i.e. 34mm.
Weight	170-180g depending on model
Mounting hole dia.	X1, X2 (non-plated): 3.5mm X3, X4, X5 (plated): 3.5mm
IP figures, encapsulation IP XY (X=Solids, Y=Liquids)	Open frame
Coloring, design and branding	AMS0100-2X00, black PCB

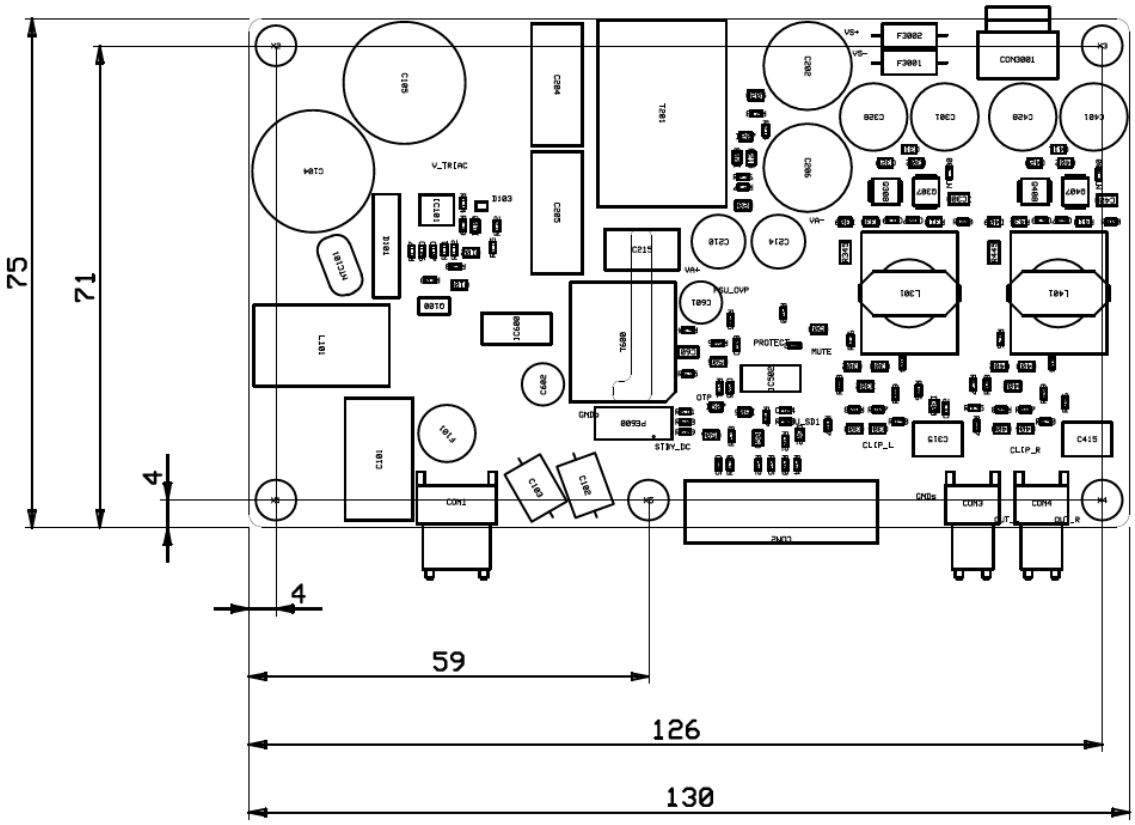


Figure 1. Board outline, dimensions and mounting holes.

AUDIO MEASUREMENTS

Gain and phase vs frequency

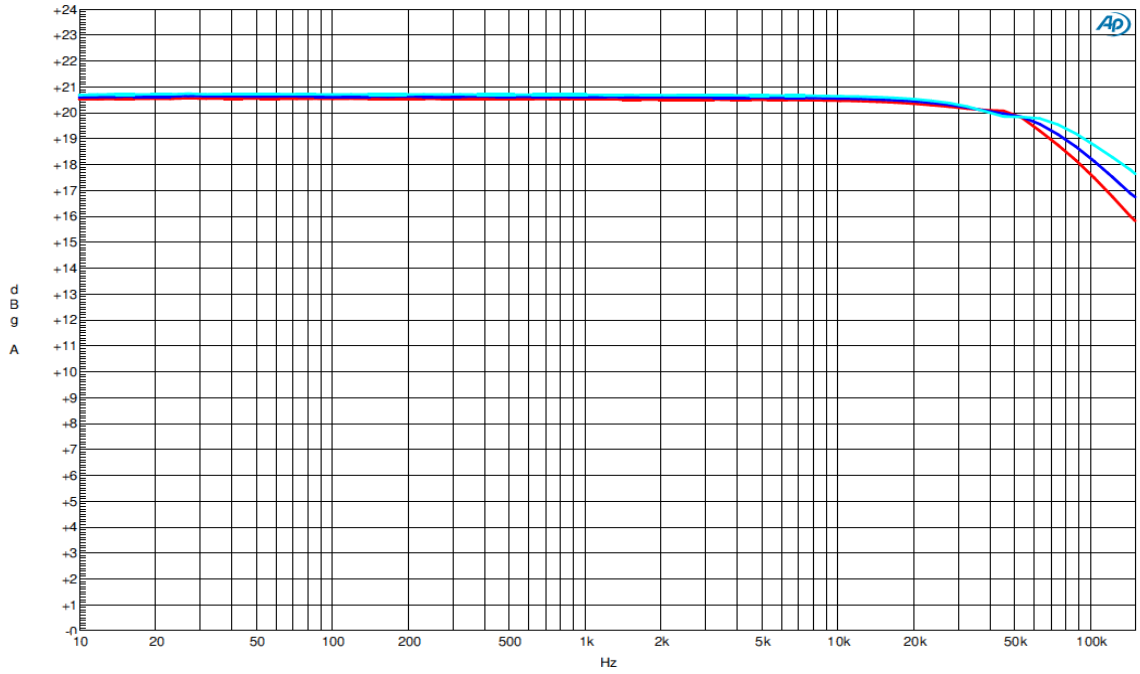


Figure 2. Frequency response 4Ω (red), 8Ω (blue) and open (cyan)

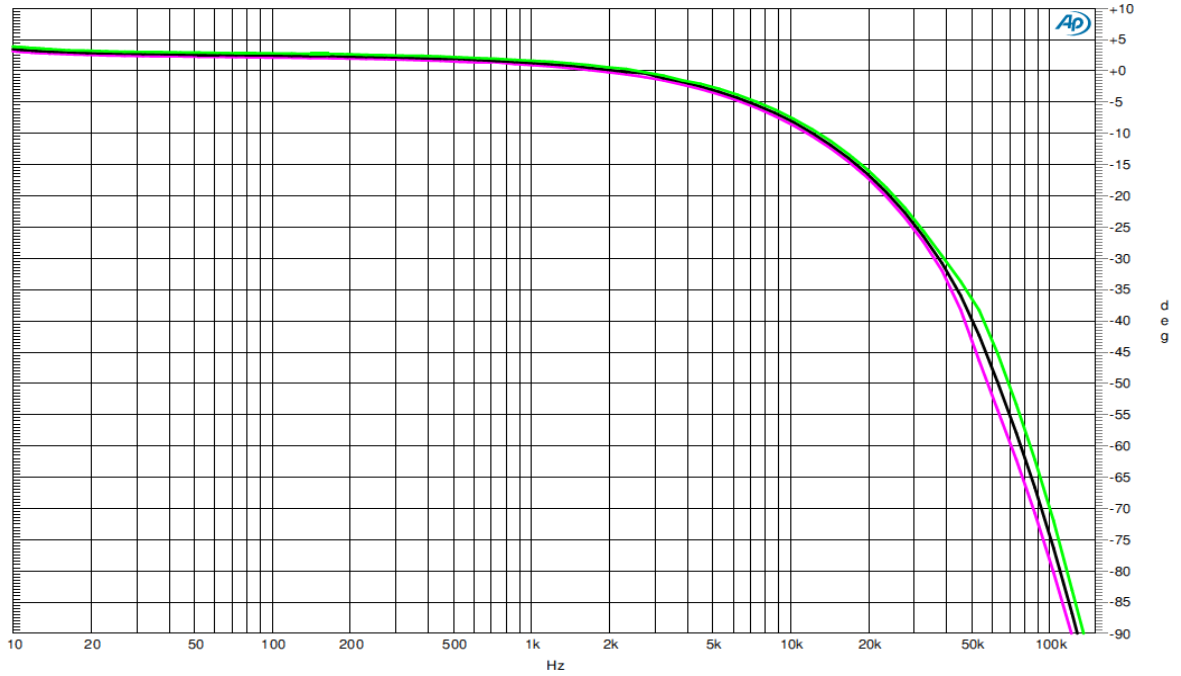


Figure 3. Phase response 4Ω (magenta), 8Ω (black) and open (green)**.**

THD vs power both channels driven and single channel driven

Anaview is here showing the THD vs power measurement with two channels driven and one channel driven. The reason for this is that in applications where both channels are driving similar loads, like in a stereo amplifier, the power supply is loaded by both channels and therefore limits how much total power that can be output. In an active 2-way speaker, which is quite a common application, only one channel drives a heavy load (the bass driver) and the other channel delivers a significantly lower RMS-power into the tweeter.

Both channels driven (stereo applications) and BTL

Note: Red is @ 100Hz, Magenta is @ 1kHz and blue is @ 6,67kHz

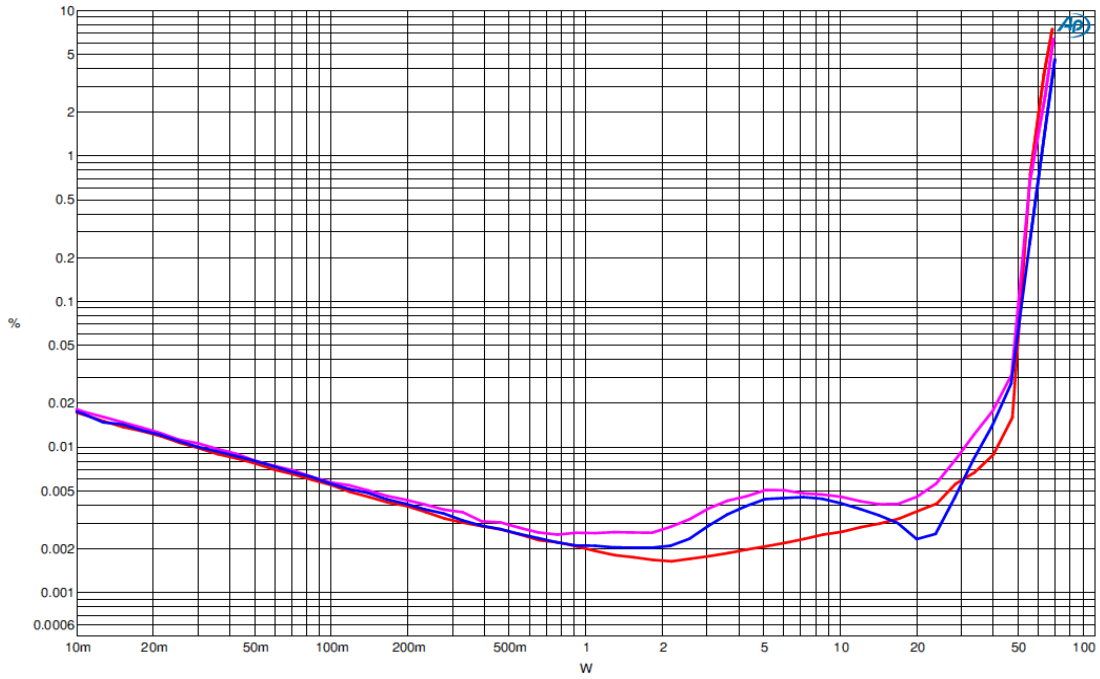


Figure 4. THD vs power 4Ω, 230VAC, both channels driven

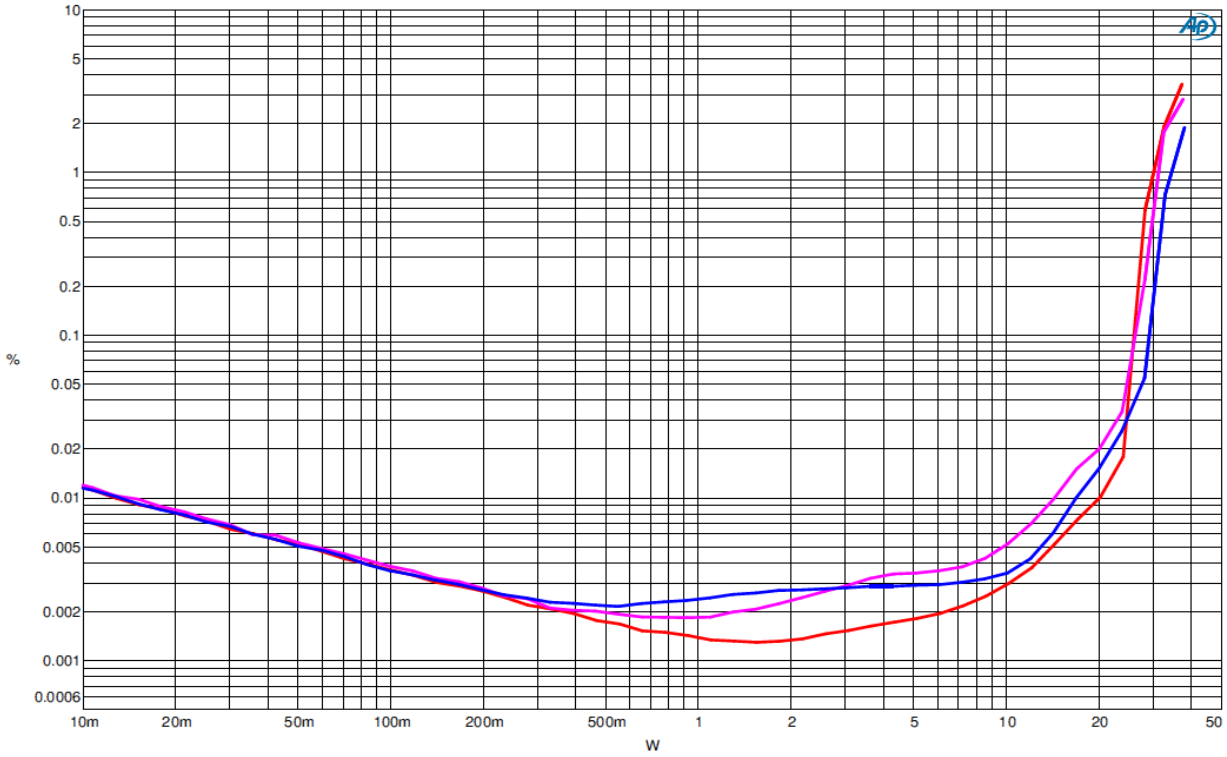


Figure 5. THD vs power 8Ω, 230VAC, both channels driven**.**

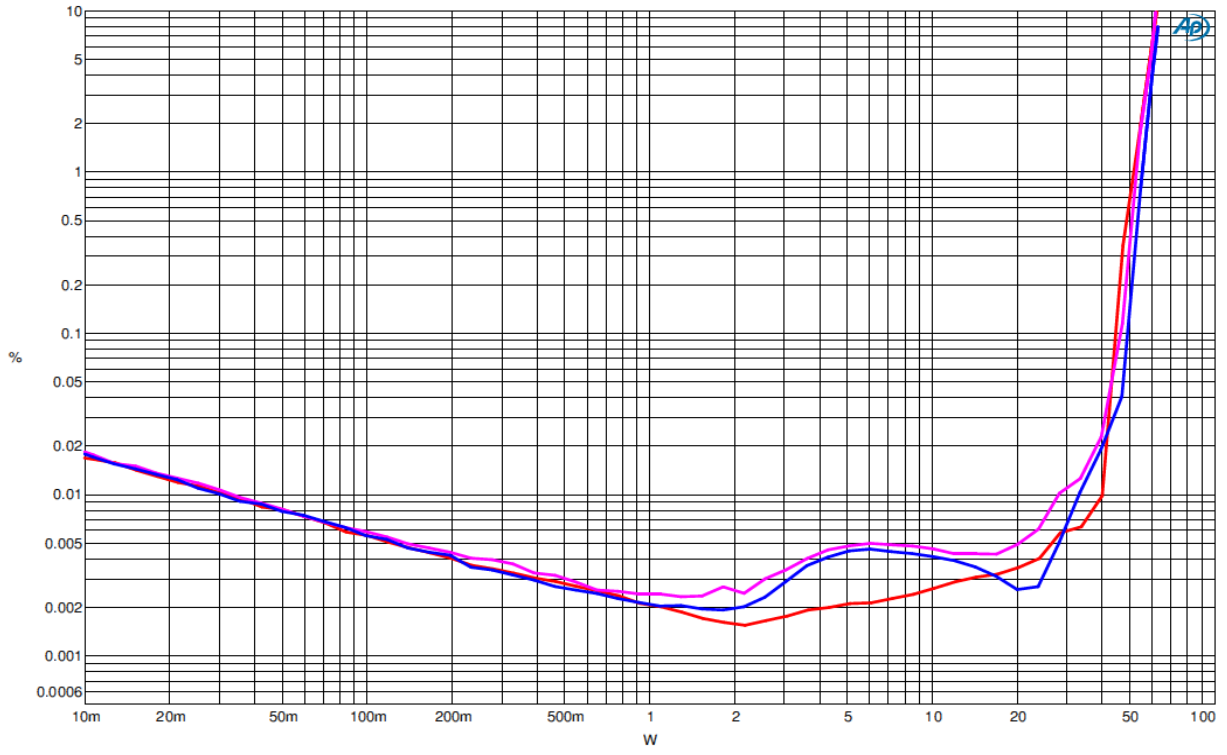


Figure 6. THD vs power, 4Ω, 115VAC, both channels driven**.**

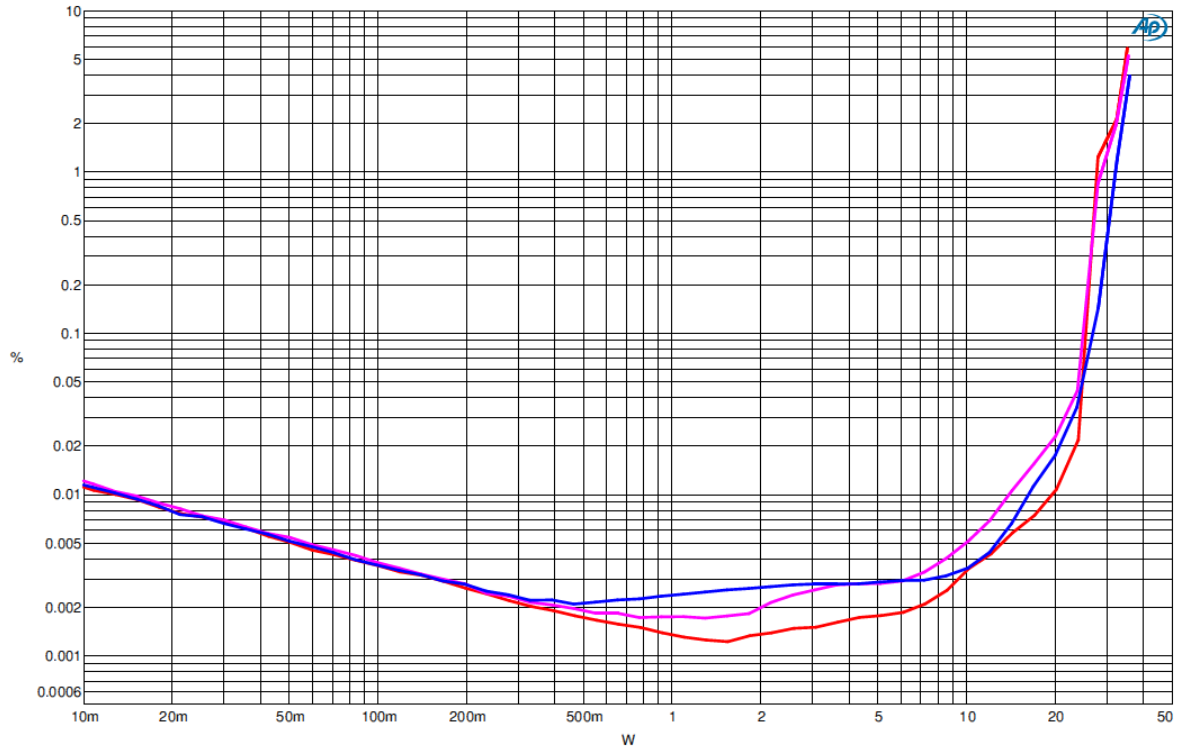


Figure 7. THD vs power, 8Ω, 115VAC, both channels driven**.**

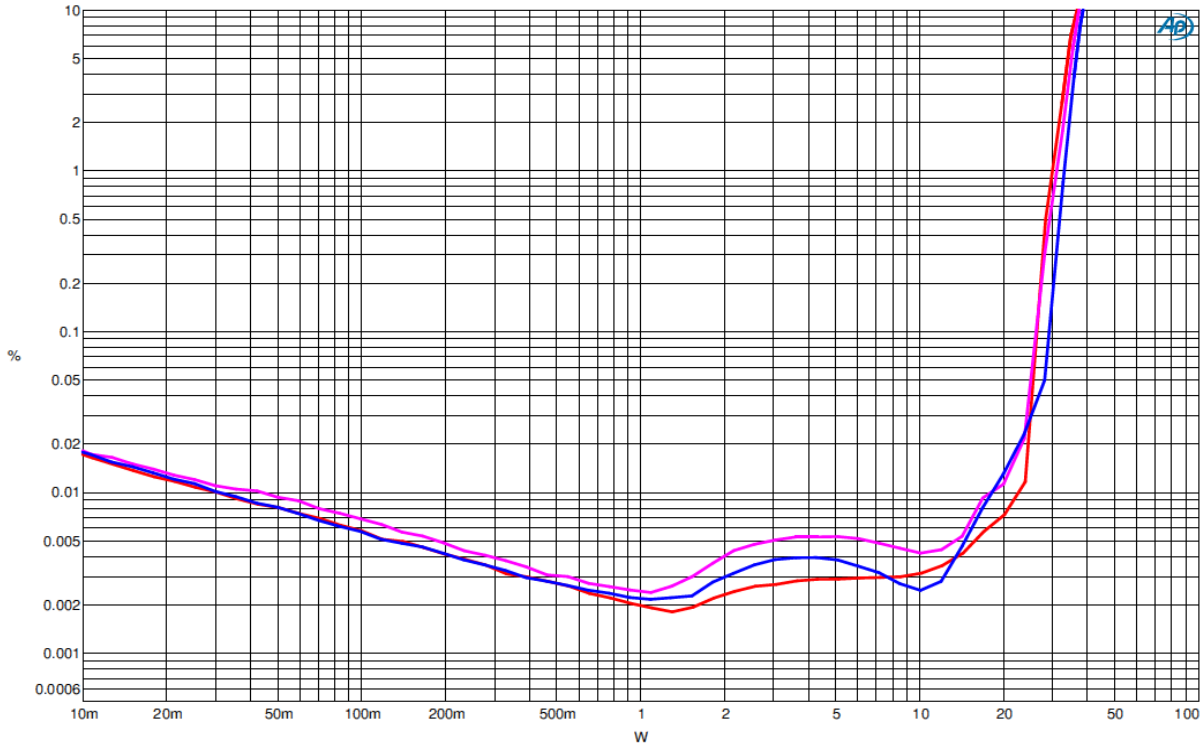


Figure 8. THD vs power, 4Ω, 90VAC, both channels driven**.**

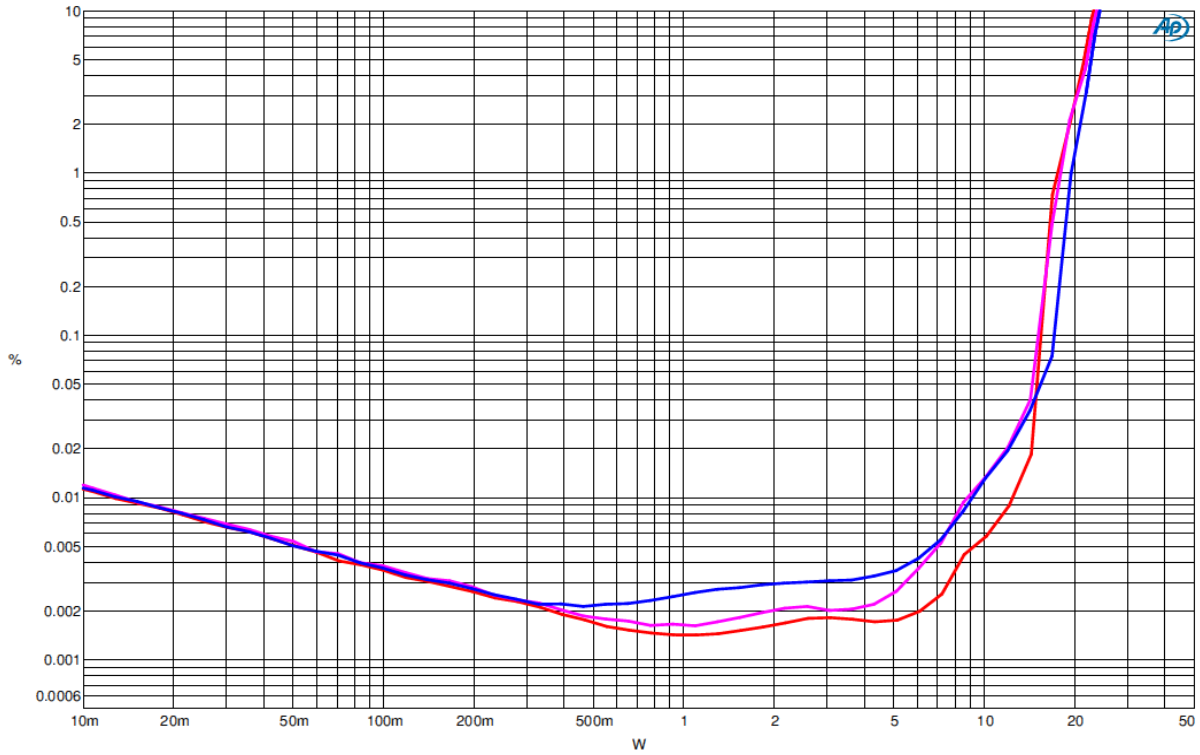


Figure 9. THD vs power, 8Ω, 90VAC, both channels driven**.**

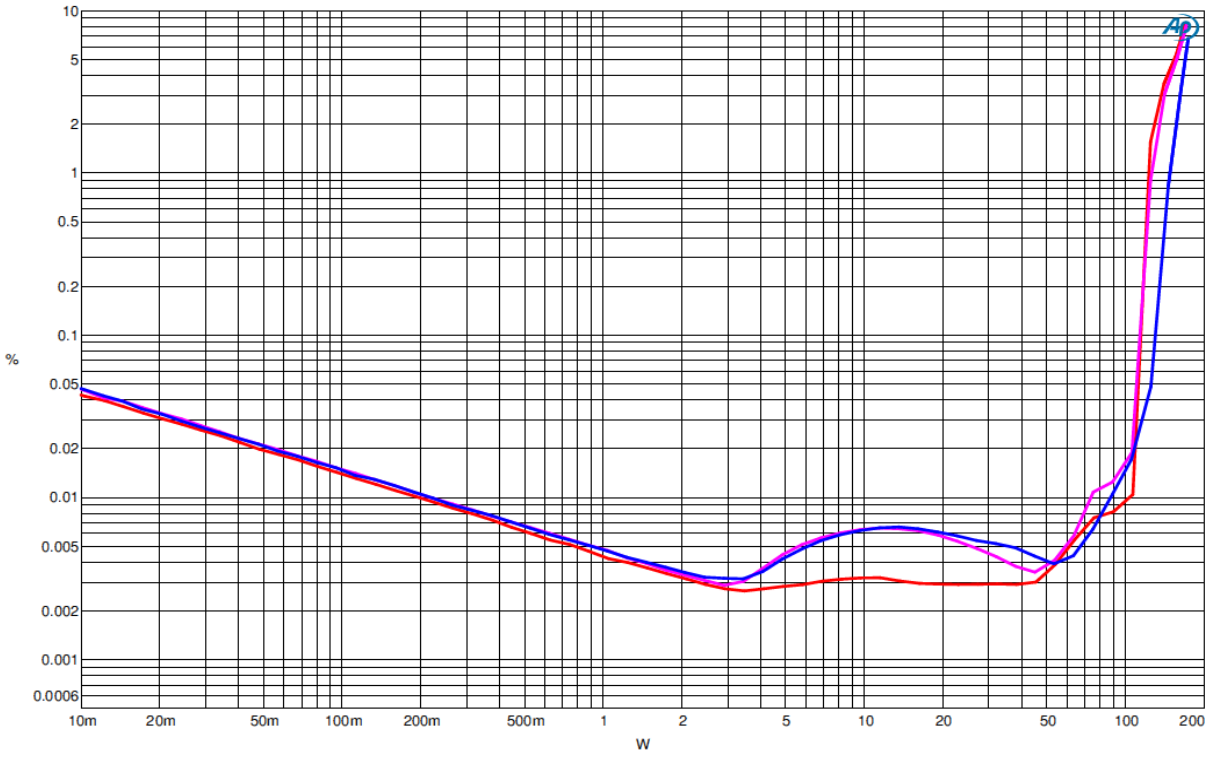


Figure 10. THD vs power, 6Ω **BTL**, 230VAC**.**

Single channel driven (active speaker application)

Note: Red is @ 100Hz, Magenta is @ 1kHz and blue is @ 6,67kHz

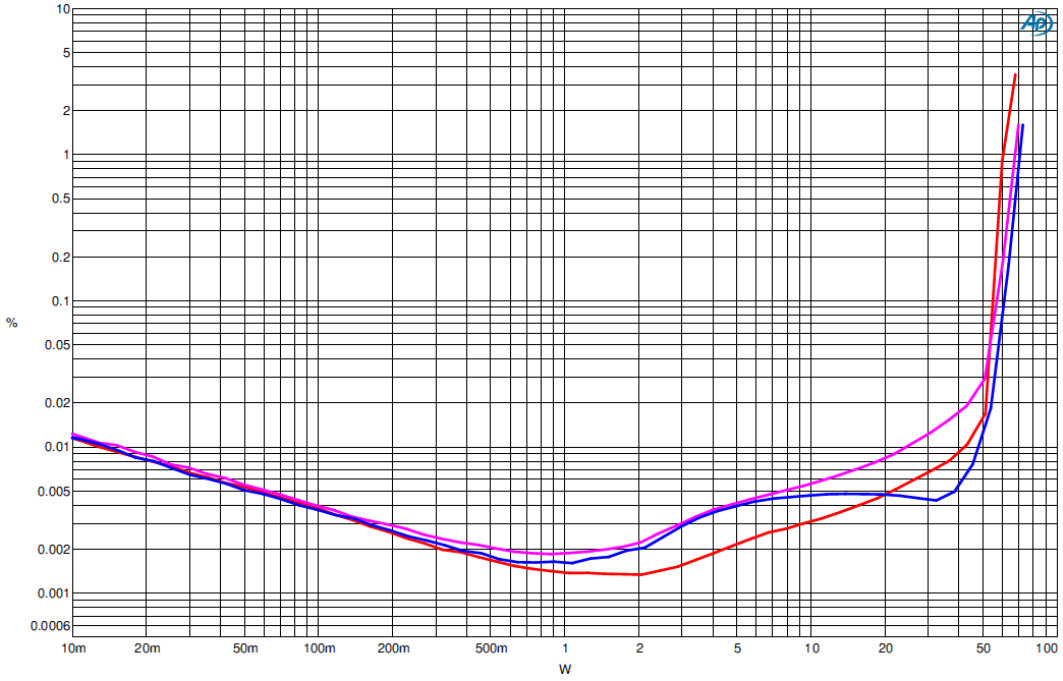


Figure 11. THD vs power, 4Ω, 230VAC single channel driven.

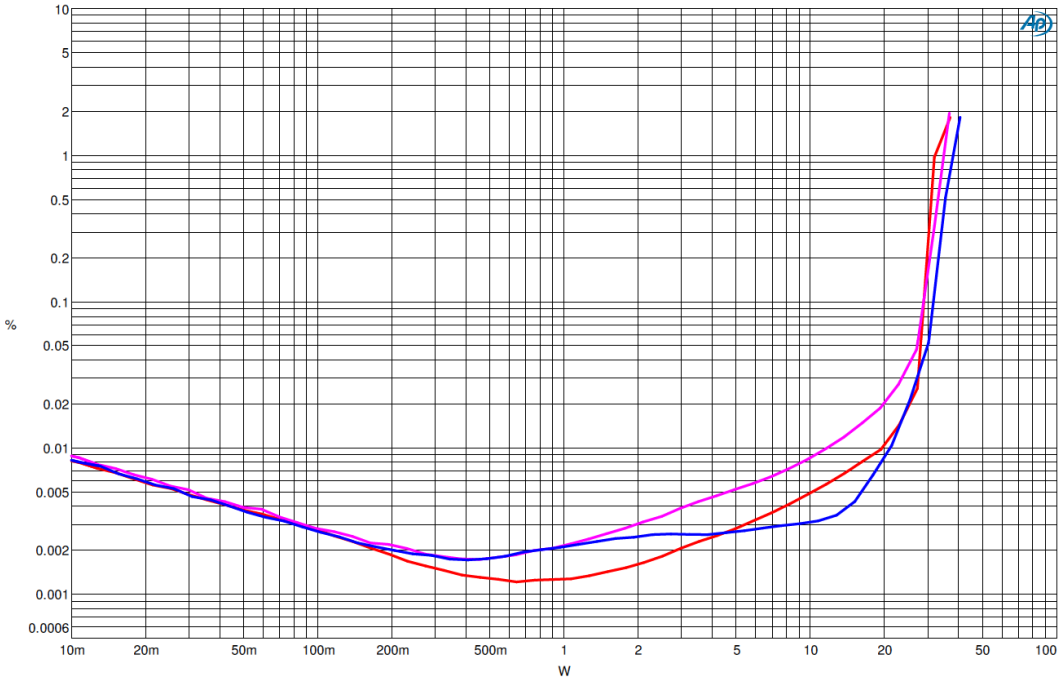


Figure 12. THD vs power, 8Ω, 230VAC single channel driven.

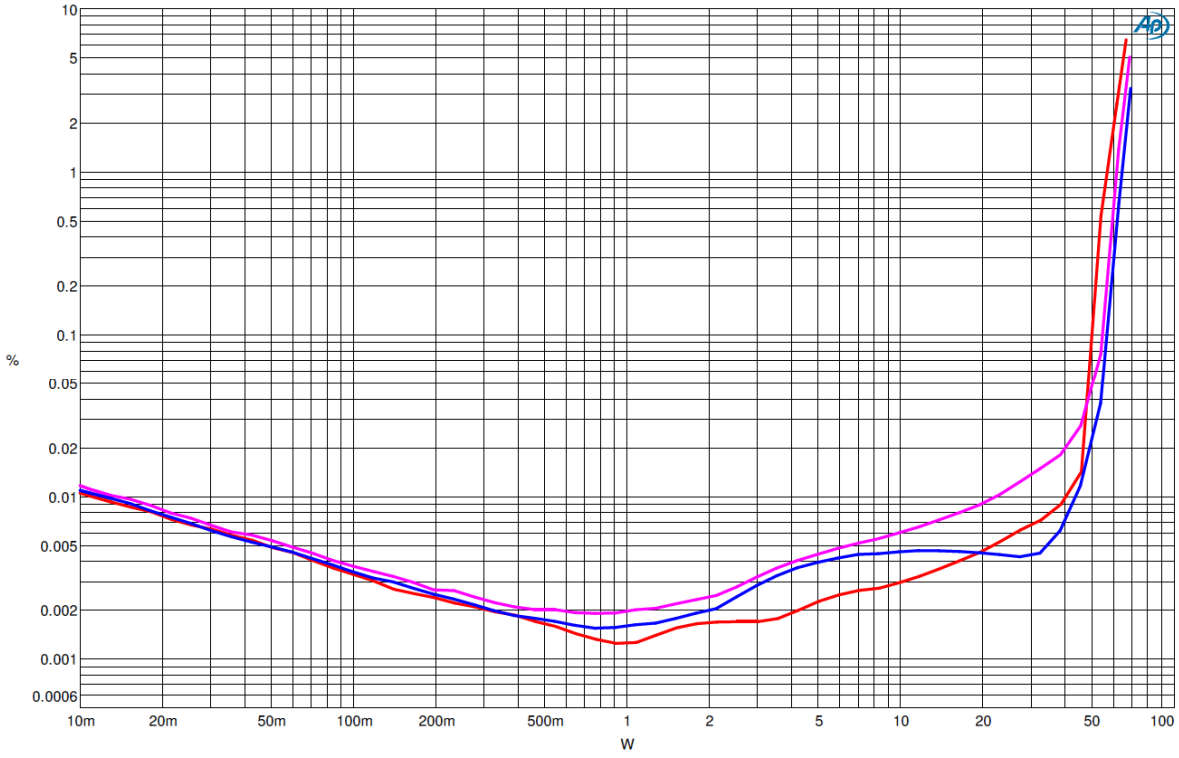


Figure 13. THD vs power, 4Ω, 115VAC single channel driven.

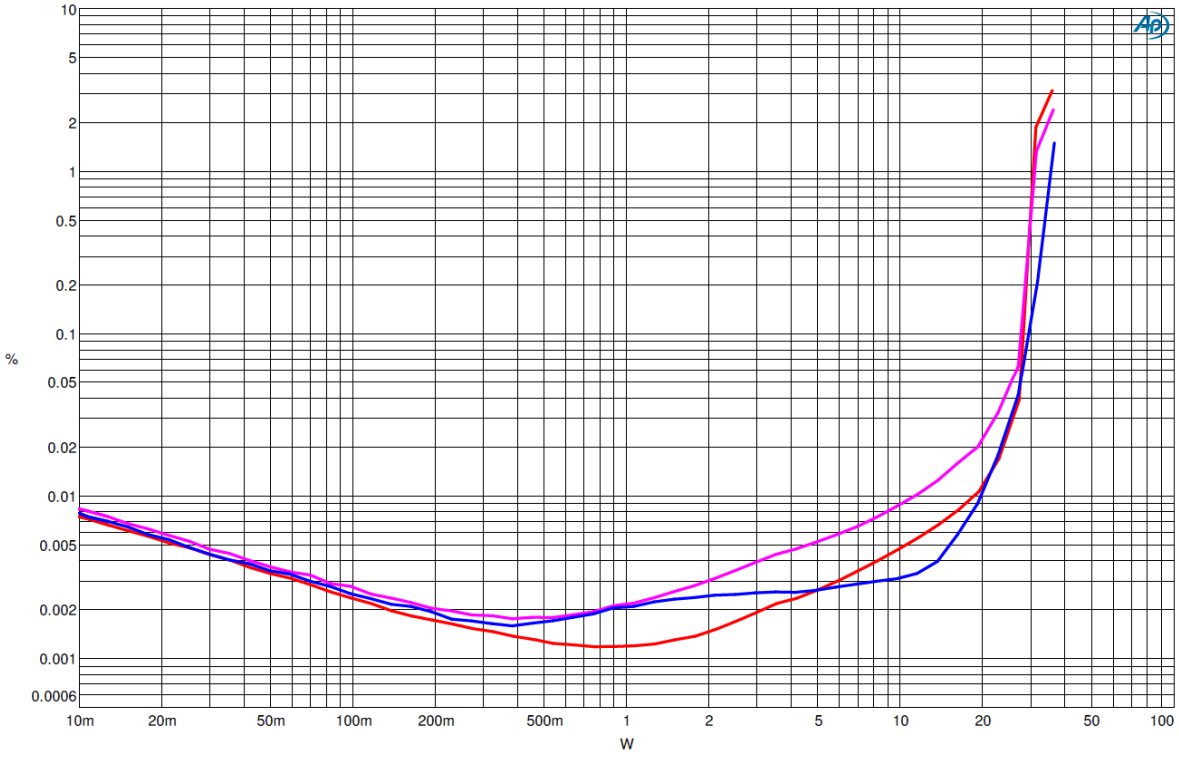


Figure 14. THD vs power, 8Ω, 115VAC single channel driven.

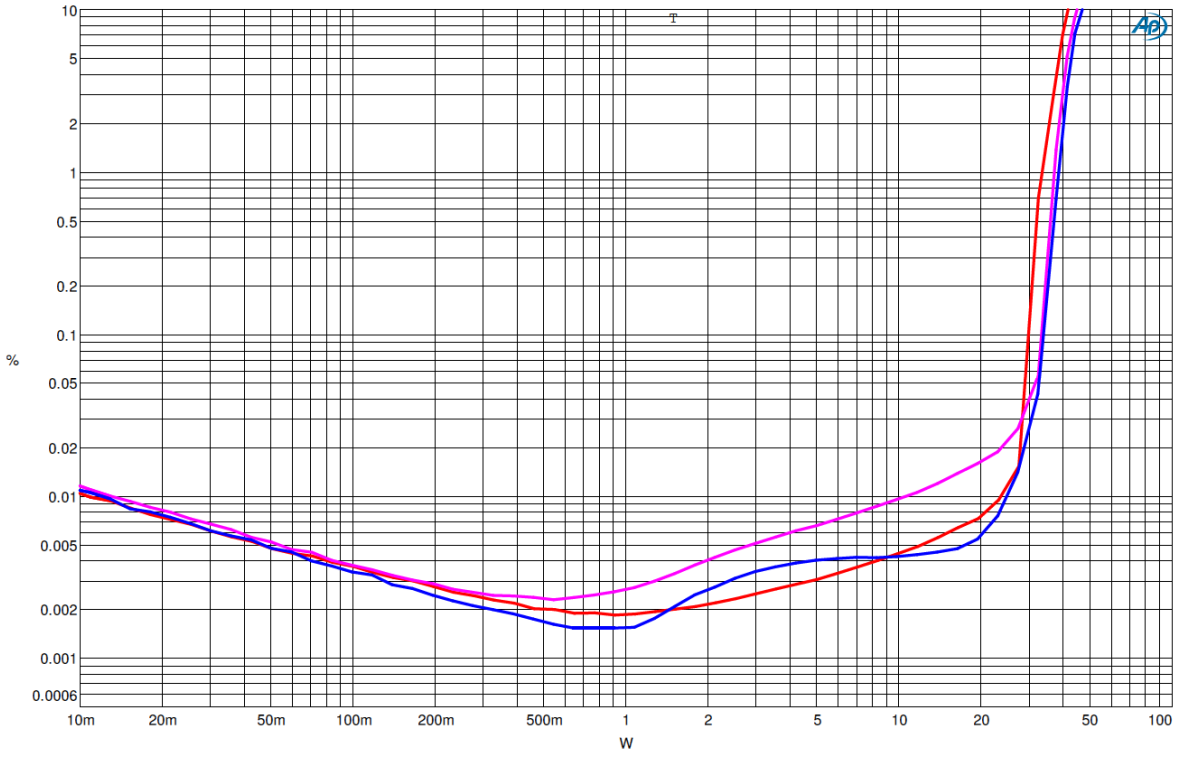


Figure 15. THD vs power, 4Ω, 90VAC single channel driven.

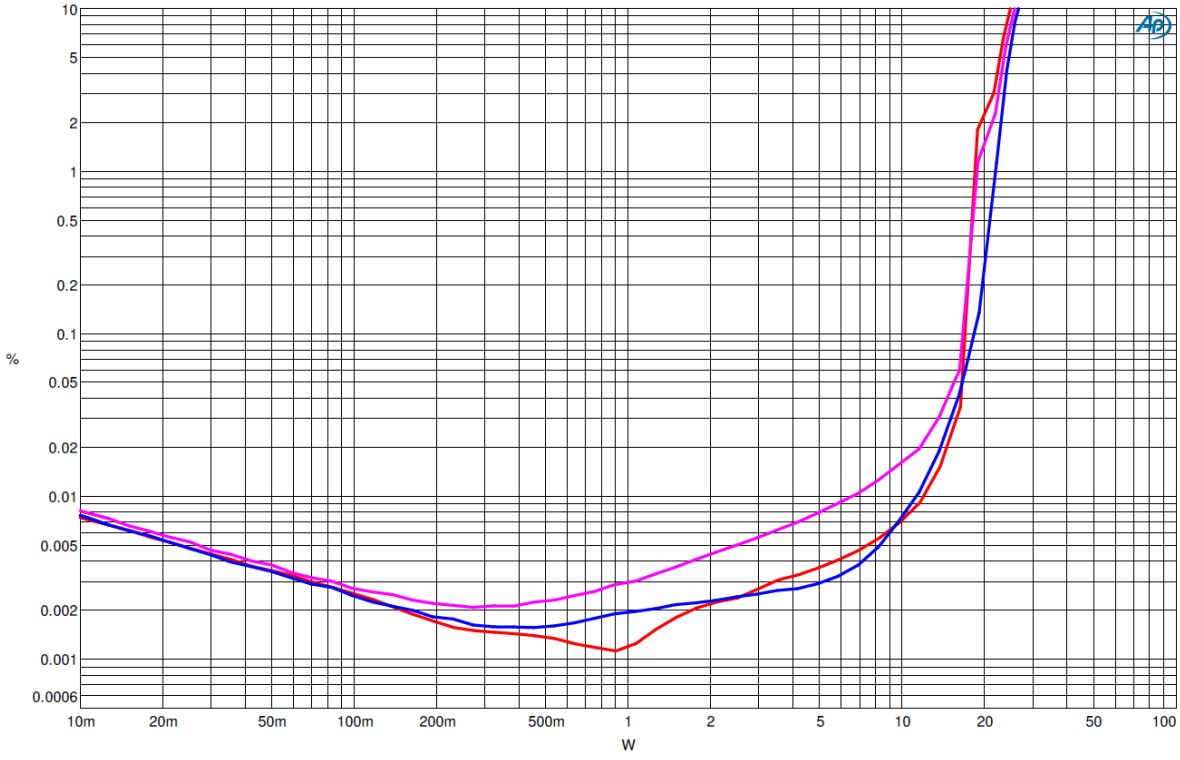


Figure 16. THD vs power, 8Ω, 90VAC single channel driven.

Output impedance and crosstalk

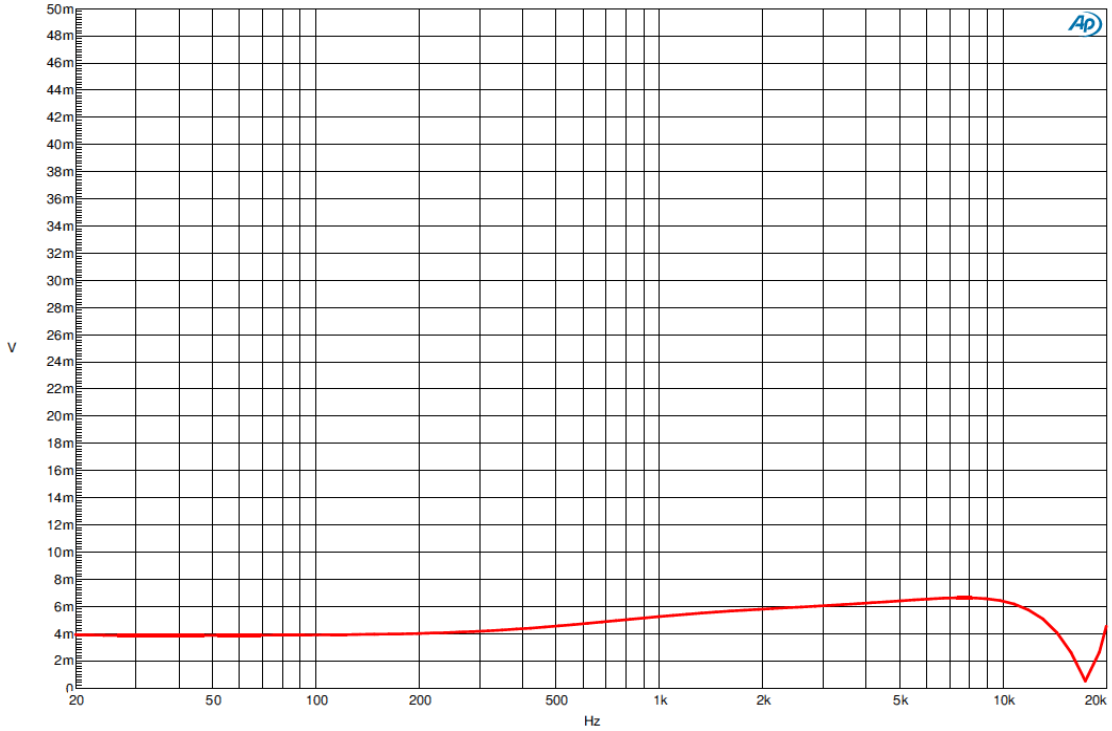


Figure 17. Output impedance 1mV=1mΩ**.**

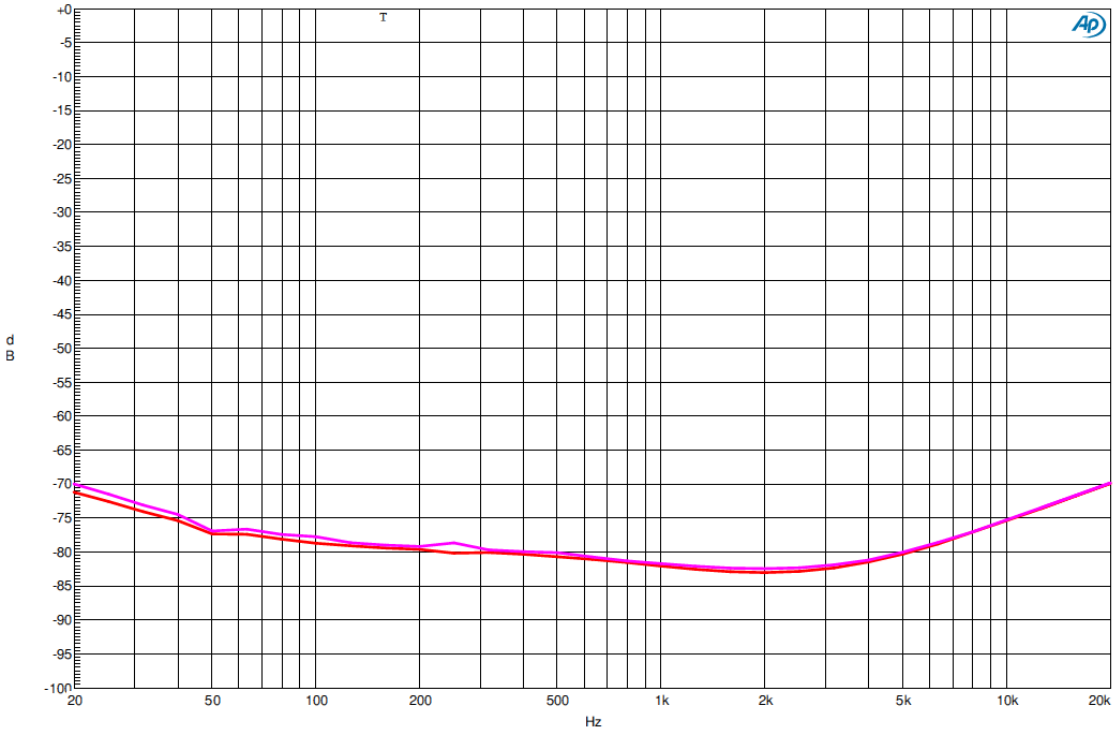
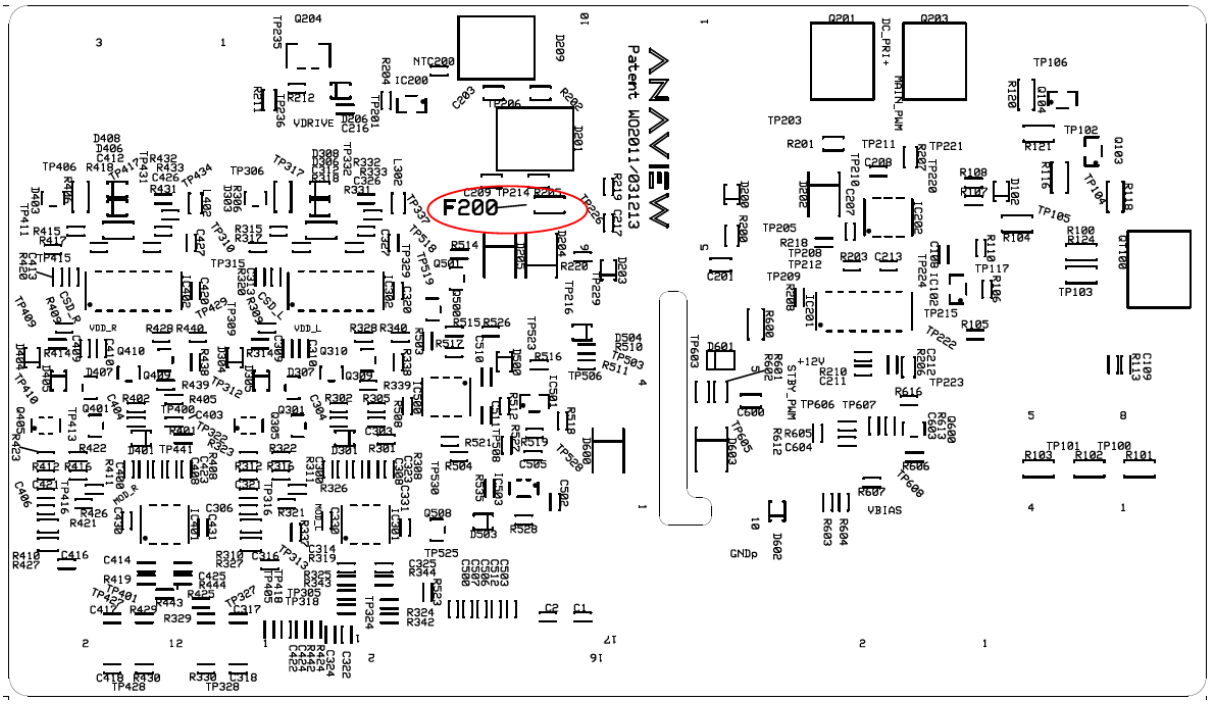


Figure 18. Crosstalk at 1W (magenta) and 10W (red)**.**

INSTRUCTIONS

Replacing VA+/VA- fuse

The auxiliary supplies VA+/- are protected by a surface mounted fuse. In case of overload this fuse will open and has to be replaced to get the supplies back.



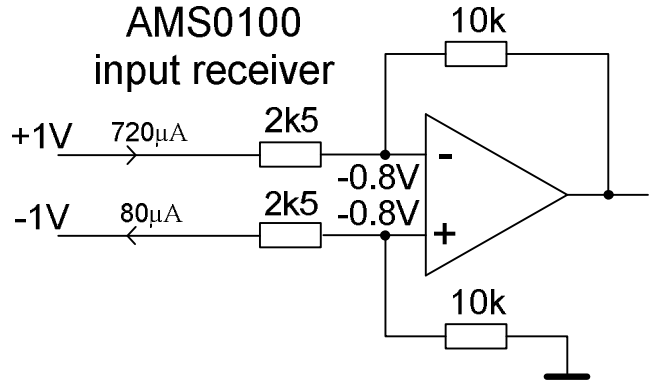
F200 is a 4A fuse from Littelfuse with article number 0440004.WR.

The maximum load on VA+/- can be seen in the table on page 13. The fuse value of 4A was choosen to tolerate the start-up charge energy of a capacitive load.

APPLICATION NOTES

Optimizing input stage CMRR

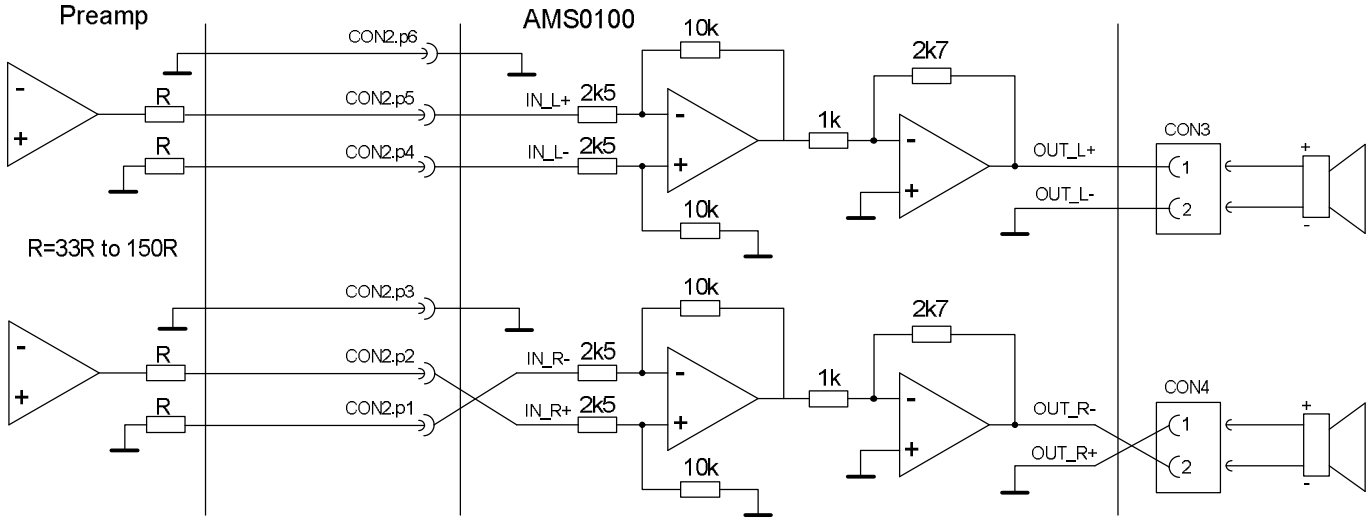
This is simplified drawing of the input of AMS0100. It is a typical circuit which is often used where the source impedance is well known and does not vary too much. Input currents are calculated when a balanced signal is applied. As can be seen the input impedance is not the same on both inputs and depending on which type of signal is applied (single ended or balanced) the input impedance changes.



This is however not a problem as long as a few precautions are made. Common mode rejection CMRR will be significantly improved by having the same source resistance on both the inputs.

Impedance balancing with single ended signal

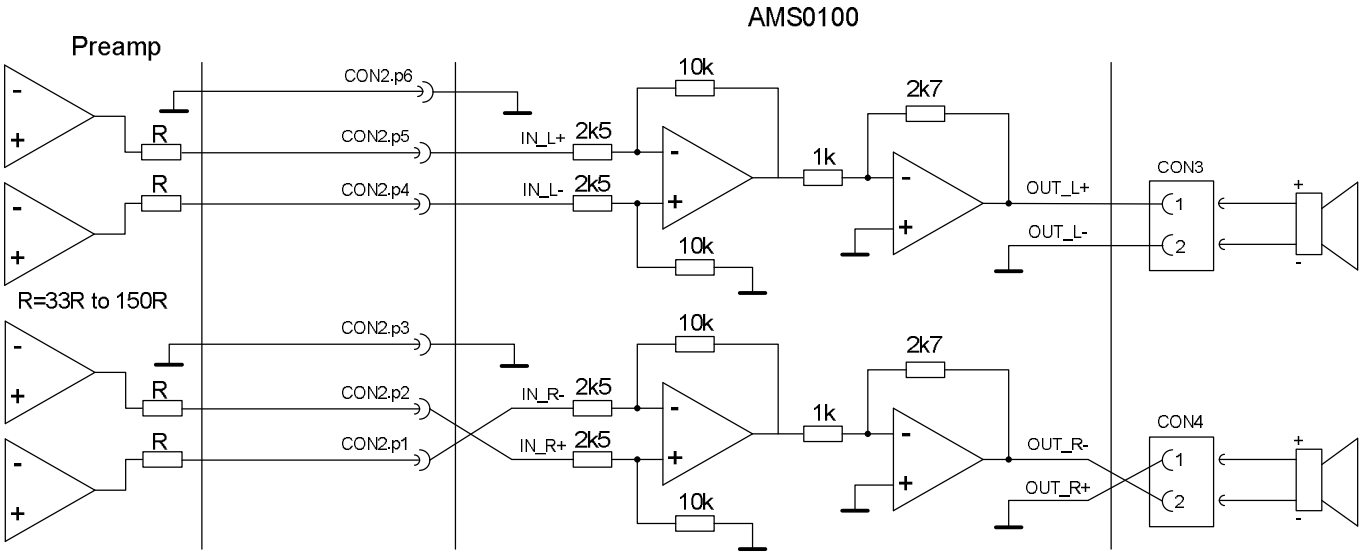
Below is shown a setup with an impedance balanced single ended source. This requires a balanced cable.



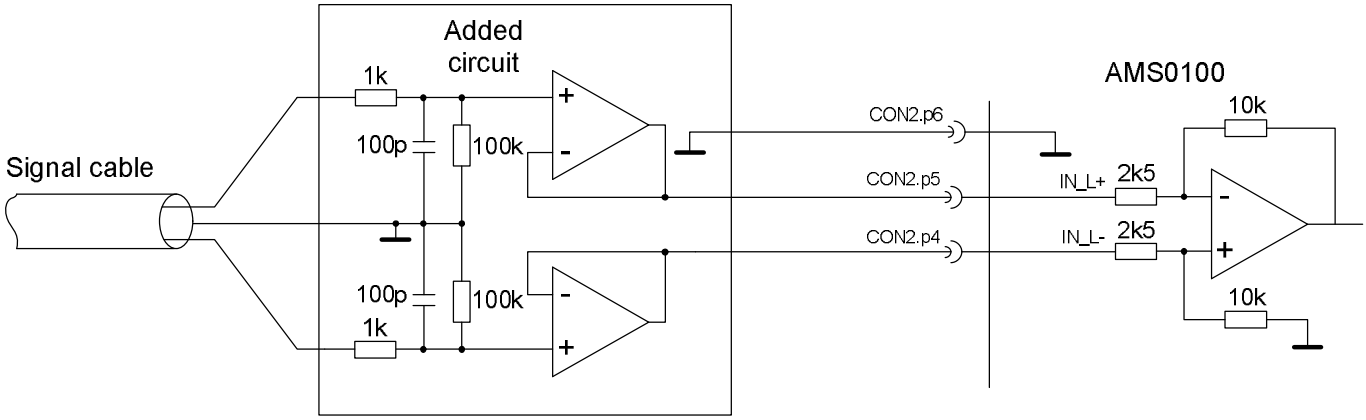
It is quite common to have a series resistance of 50ohm or more on the signal output so if the same resistance is placed in the opposite side of the signal of either sending or receiving side of the cable the CMRR rejection is intact.

Balanced input signal

If a balanced signal source is used the following setup applies.

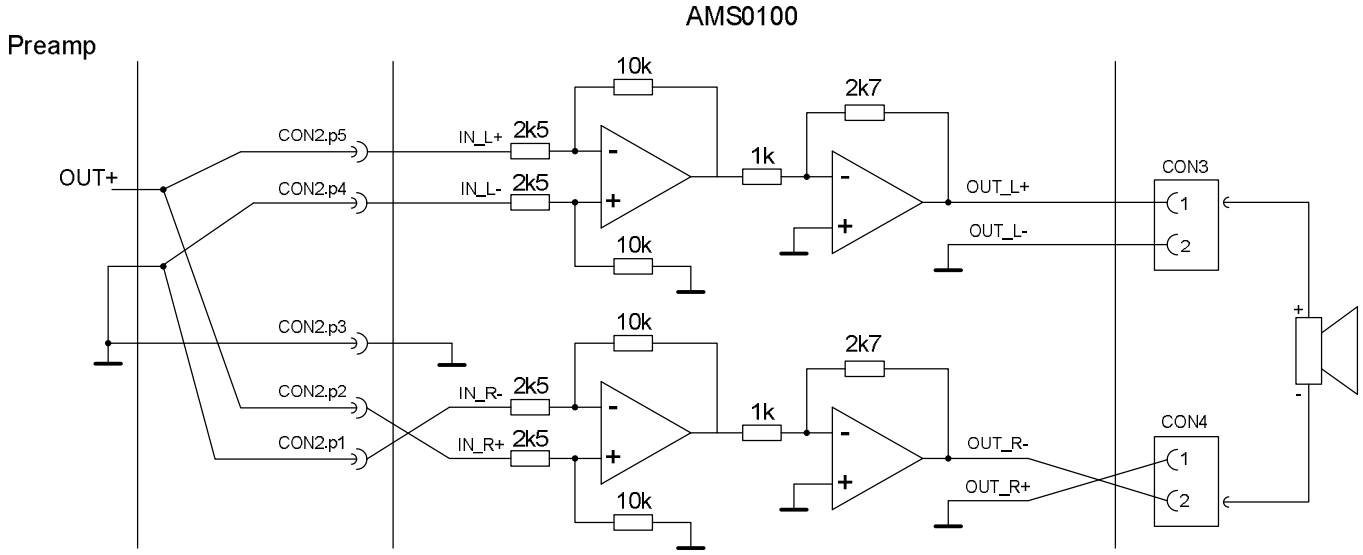


If long cables are used the cable impedance itself can contribute a lot to the series impedance and since that impedance is not very well defined (symmetrically) it can be an advantage to increase both the diff mode and common mode input impedance. In such a case an additional circuit as below can be added before the AMS module.

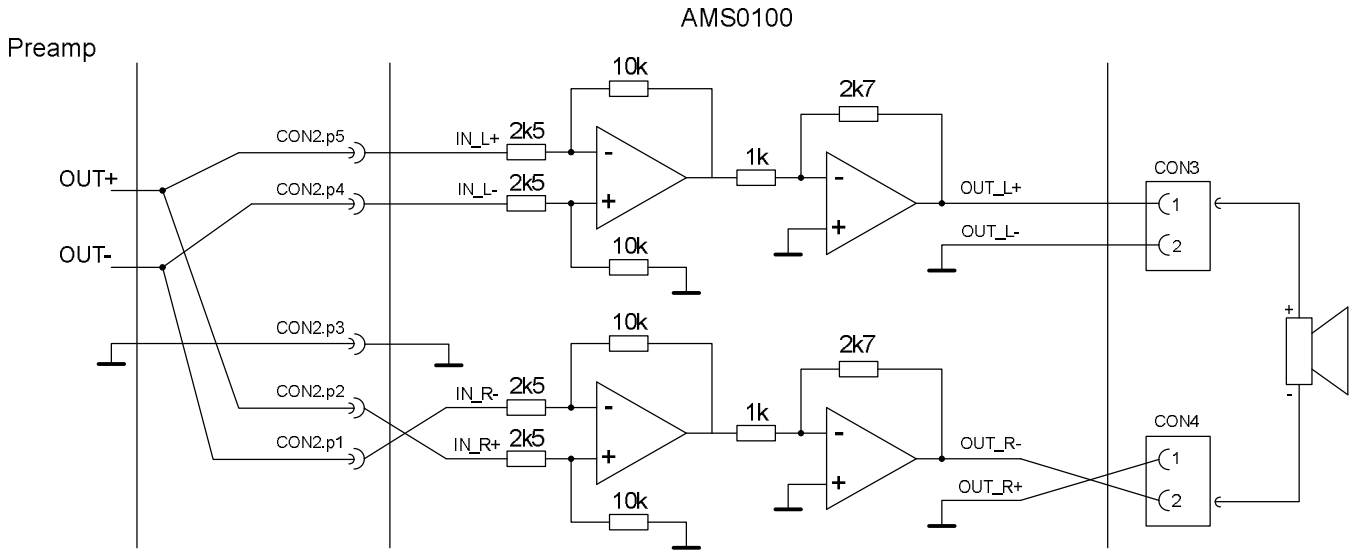


BTL setup

SE input signal



Balanced input signal



REVISION LOG

Rev.	Date	Item	Sign
A	2013-07-22	First official released revision.	PB
B	2013-09-04	Revised timing, audio specifications.	JN
C	2013-09-20	Revised temp specs, cleanup.	PB
D	2013-10-02	Cleanup.	JN
E	2013-10-15	Changed Safety standards.	PB
F	2013-10-29	Changed to maximum 330uF capacitive load for VA+/-. Revised contact information.	MC
G	2013-11-28	Changed STBY_DC voltage level vs load current Removed graphs for STBY_DC vs load current in disabled and enabled mode Changed maximum STBY_DC load to 25mA for ErP Updated Emission standards Changed the Weight from 140-150g to 170-180g Updated amendments in EMC compliances Changed ErP standby currents Disclaimer added	PB/MC/JN
H	2013-12-04	Added AMS0100-2301 as variant Updated info about auxiliary supplies VA+- voltage fluctuation updated AUX VS+- voltage fluctuation updated Energy star current updated	PB JN
I	2014-02-06	Instruction added on VA+/- fuse replacement	PB
J	2014-06-03	nDISABLE thresholds updated Updated information about VA+/- fuse	PB
K	2015-02-05	Corrected nMUTE timing graph and added max offset voltage	MC

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